



2015 SENCER Summer Institute

Worcester Polytechnic Institute
July 30 - August 3, 2015



www.ncsce.net
www.sencer.net

Twitter: @ncsce
Twitter: @sencernet

#SSI2015

TABLE OF CONTENTS

Welcome Note

SSI 2015 by the Numbers

Sustainability at SSI 2015

MAPS, SCHEDULES, SSI STAFF, Internet Access Information

- Shuttle Information
- Map of Worcester Polytechnic Institute and the Worcester area
- Where to Find SSI Staff
- Internet Access

NOTE TAKING

- Guide and Format

AT-A-GLANCE SCHEDULES

- Institute Schedule At-A-Glance
- SSI 2015 Sessions At-A-Glance
- SSI 2015 Tracks At-A-Glance

NOTES ON THE PROGRAM BY DAY

- July 30
- July 31
- August 1
- August 2
- August 3

ROSTERS AND SPEAKERS BIOS

- Participants, Alphabetically by Last Name
- Participants, Contact Information by Institution
- Biographical Sketches of SSI 2015 Plenary Speakers, Core Faculty, Session Presenters, Institute Organizers, and Staff

PARTICIPANT GOALS



Greetings and welcome! This is our 15th SENCER Summer Institute and we are delighted to be hosted by Worcester Polytechnic Institute. Special thanks to Karen Kashmanian Oates, Tara Mann, and the entire WPI community for your hospitality.

Your proposed projects, collaborations, and plans, though diverse in scope and content, embrace a common goal: to improve learning and strengthen civic engagement. (Excerpts from your applications are included in this book.) To enable the SENCER program to grow beyond college campuses to include new partnerships and stronger regional organizations, we are pleased to offer a special welcome to representatives from three associated projects designed to expand our community of practice: the W. M. Keck Foundation supported Science and Civic Engagement Western Network (SCEWestNet), the National Science Foundation supported SENCER-Informal Science Education (SENCER-ISE) initiative, and the NSF supported Engaging Mathematics project.

We have worked to create a meeting rich with opportunities for you to begin accomplishing the goals that brought you here. But our days together also offer opportunities for networking, learning from one another, thinking about things in new ways, and for planning to stay connected. The SENCER Summer Institute opens up possibilities for working with our SENCER Leadership Fellows (for collegial advice and support), our SENCER Centers for Innovation (for continuity and work on issues of regional significance), with the National Center (for access to national resources), and with folks facing similar challenges and pursuing similar goals.

There are a few features of the SSI 2015 program that we would like to call to your attention:

- We are continuing with a new note taking and planning strategy, started last year and designed for us by Stephen Carroll of Santa Clara University, a leader of our assessment initiative. Please familiarize yourself with the materials (under a tab in this book) and complete the warm-up exercise before you attend the sessions, if possible.
- We are offering four blocks of work sessions (interactive, workshop or design studio in style of 90 minutes each) and three blocks of concurrent sessions (60-minute sessions embracing a diverse set of pedagogical strategies and teaching styles). In addition to containing abstracts for each session, the “Notes on the Program” section of this book offers suggestions to help you make choices of which to attend.
- Please affiliate with a regional SENCER Center for Innovation (SCI). On Sunday, August 2nd, you will have an opportunity to meet all of the SCI co-directors who are with us in Worcester during lunch.
- We have scheduled two blocks of “formal” team time. If you are not part of a team or a group, we are offering a special two-part workshop that will enable us to get to know one another and do some productive work. Teams and groups are free to meet on their own, of course, and to invite consultation from members of the SENCER core faculty. If you have requested a consultation with SENCER leaders, SSI staff will introduce you to your consultant at the beginning of the first team time in Alden Hall.
- Please, if you haven’t done so already, register for a Monday morning workshop. These workshops will be followed by a brief closing lunch.

In the spirit of scientific inquiry and democratic practice, we conceived of SENCER as an experiment. We use the critiques and suggestions of those with whom we have worked to shape our planning. Do not hesitate to make suggestions and, by all means, please complete our online evaluation. We take your advice very seriously.

We look forward to working with you and are confident that we will accomplish much together.

SENCER SUMMER INSTITUTE 2015

BY THE NUMBERS

235 Invited Participants and Facilitators

37 Groups and Teams

21 Individual Participants

5 Engaging Mathematics Partner Institutions

117 New Participants

118 Alumni Participants

We welcome representatives from 104 colleges and universities, informal science education institutions, non-profits, government agencies, school systems, and foundations.

SUSTAINABILITY AT SSI 2015

In the interest of minimizing the environmental impact of SSI on our host campus and its community, we have continued some traditions from previous meetings, and have begun a few new ones at this year's Institute:

- We have provided backpacks, tumblers which are reusable with both hot and cold beverages, and high-quality pens to each participant so that you will be able to use these items after the Institute ends.
- Our leftover food from meals during the Institute will be donated to veterans in need here in Worcester.
- Our reception at Tuckerman hall will make use of eco-friendly and sustainable dinnerware.
- Our session presenters are continuing use of digital materials rather than paper, where possible, and finding ways to print fewer materials without sacrificing the quality of their sessions.
- We have reduced the size of the program book, streamlining the at-a-glance schedules and adding emails to participant rosters, rather than providing this information separately. Full contact information will be made available privately to participants online after the Institute.
- We have also been fortunate this year that our lodging is close enough to the Worcester Polytechnic Institute main campus that we can eliminate the carbon footprint of shuttles to campus for most participants this year.

Going forward, we are always open to further ideas of how we can create a more sustainable meeting. Please let us know if you have any suggestions of how we can be a greener organization and put on greener events.

SSI 2015 SHUTTLE, PARKING, INTERNET ACCESS INFORMATION, AND STAFF LOCATIONS

HOTEL SHUTTLES

Worcester Polytechnic Institute is located within walking distance of Faraday Hall and the Courtyard by Marriott hotel. The walk is approximately 15 minutes. If you require one, a shuttle to Worcester Polytechnic Institute is available upon request at the hotel's front desk.

If you are staying at the Residence Inn, a shuttle to Worcester Polytechnic Institute is available upon request at the hotel's front desk.

PARKING AT WORCESTER POLYTECHNIC INSTITUTE

SSI 2015 Parking is located at the Park Avenue Garage on 151 Salisbury Street.

All participants should have received a pre-conference email which included a link to download and print a parking pass. If you did not receive this email, or did not print a parking pass, passes are available at the SSI 2015 Check-in Desk and in the SSI 2015 Staff Office.

SUNDAY, AUGUST 2ND – AFTERNOON ACTIVITIES

Still River Winery: The shuttle taking participants to the Still River Winery Tasting will pick up at the traffic circle by the sports and recreation center. The tour will pick up again at approximately 4:30 PM and return to WPI.

Boston Freedom Trail: The shuttle taking participants to the Boston Freedom trail will pick up at the traffic circle by the sports and recreation center. The tour will drop off at the USS Constitution and then pick up at Surface Artery southbound, between Hanover and North Streets at 7:00 PM and return to WPI.

Tower Hill Botanic Gardens: The shuttle taking participants to the Tower Hill Botanic Gardens will pick up at the traffic circle by the sports and recreation center. The tour will pick up again at approximately 5:00 PM and return to WPI.

INTERNET ACCESS AT WORCESTER POLYTECHNIC INSTITUTE

The SENCER Summer Institute has been provided guest access to Worcester Polytechnic Institute's guest wireless network. Different usernames and passwords are needed for different days of the Institute.

To connect as a wireless network guest user:

1. Use your wireless network connection software to connect to the wireless network named **WPI-Guest**. Launch a web browser like Internet Explorer, Safari, or Firefox.

2. Enter the username and password exactly as shown below:

Username: SENCER First Three Day Pass

Password: hZgegsP4

Duration of Access: July 30 - August 1

Please note the duration counter begins the first time that the guest account is logged in.

The Username and password for the end of the Institute are:

Username: SENCER Second Three Day Pass

Password: Zs6B8gTx

Duration of Access: August 2 - August 4

WHERE TO FIND SSI STAFF

SSI 2015 On-Site Staff

Hailey Chenevert

Christine DeCarlo

Kyle Simmons

Ashley Stanley

Tyler Chaulk

Staff Office Locations

SSI staff will be available through the institute to assist all participants and facilitators. From breakfast until the last session of the day (when receptions or dinners begin), you may find SSI staff in the following locations:

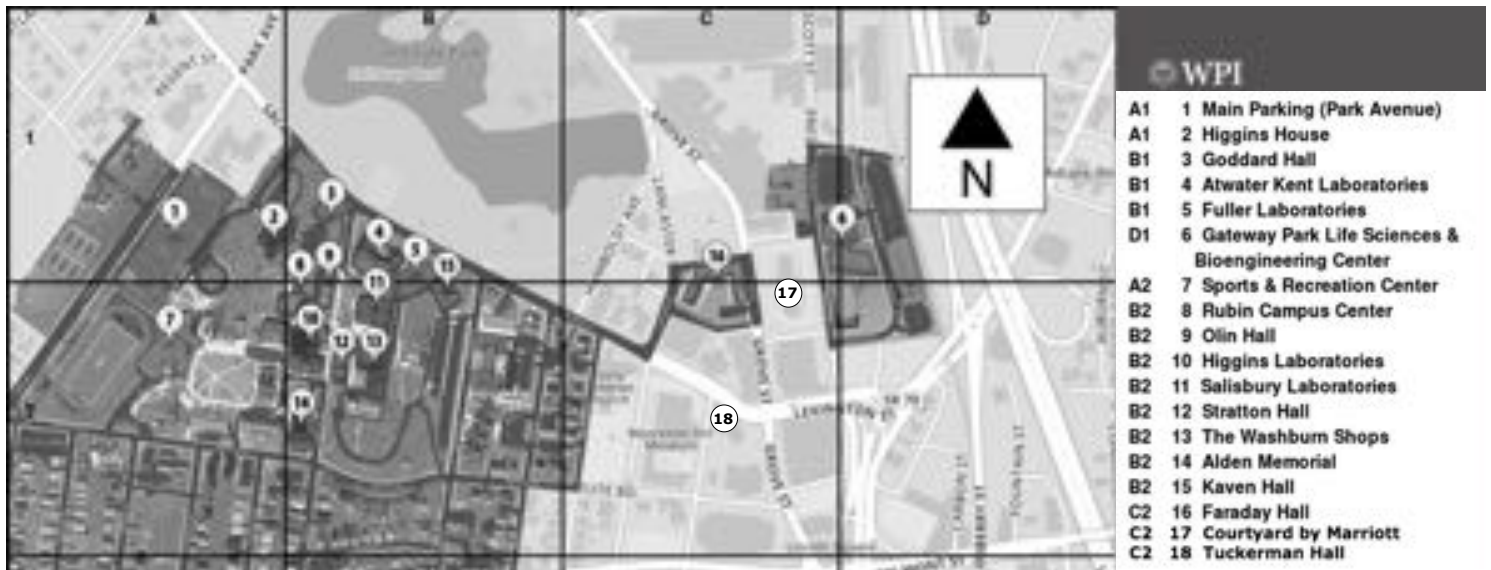
Thursday, July 30th - Monday August 3rd

Salisbury Labs Building Room 121 – Office of Dean of Arts & Sciences

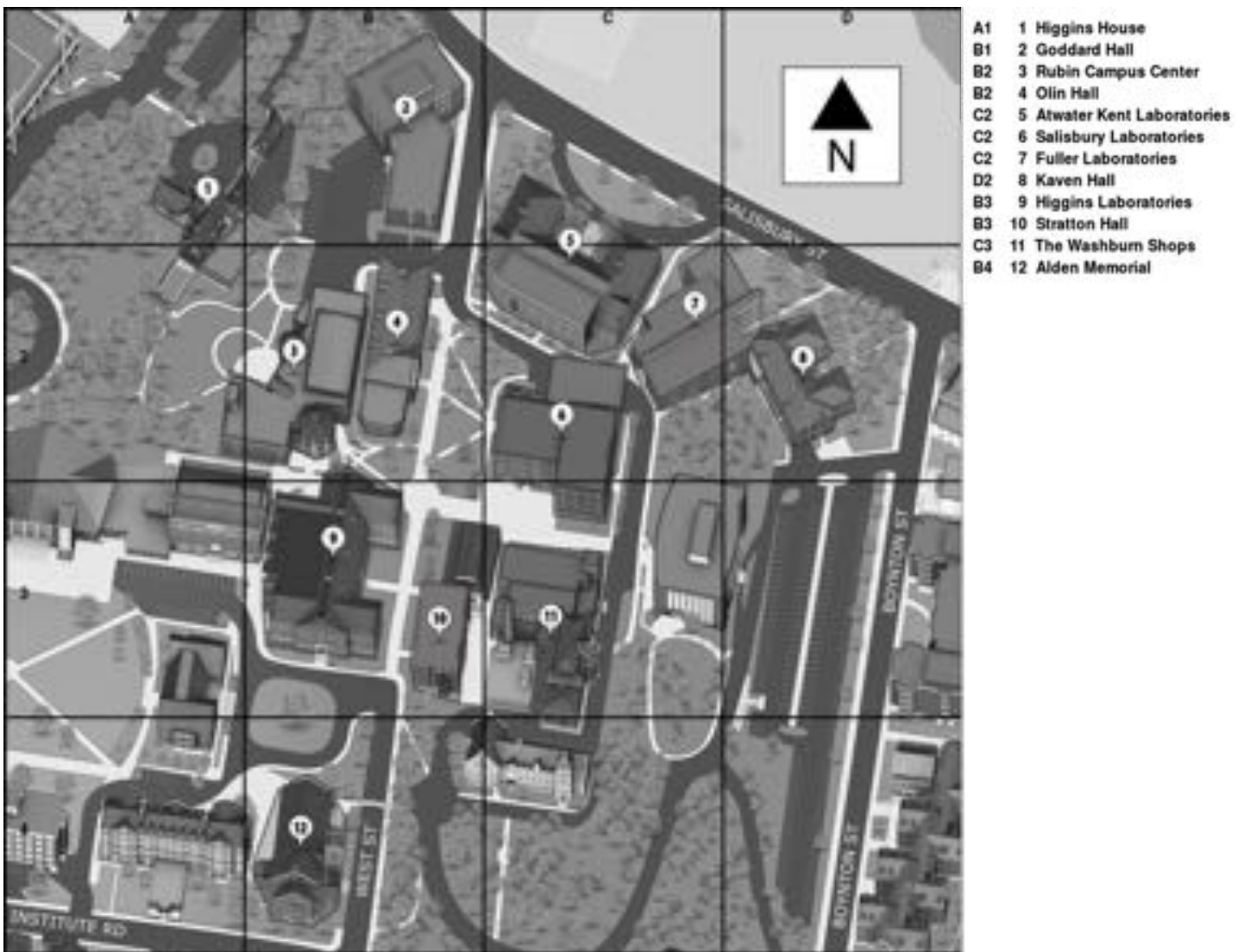
In Case of Emergency

In case of emergency after Institute hours, please call (202) 276-2343. A staff member will be available overnight to answer your call.

SSI 2015 Meeting and Session Locations, Faraday Hall, and Courtyard by Marriott



SSI 2015 Session Locations (Located in A1-B2 of above map)



SENCER WORKBOOK: NOTE TAKING

This workbook is an effort to turn your SENCER Summer Institute experience into something more lasting than the usual conference experience.

We all know how conferences usually go: you attend many wonderful sessions, meet great new colleagues with ideas and expertise that sound really useful to you, and collect brilliant new ideas you can't wait to try when you get home. You leave the conference happily exhausted: inspired and energized by all the sharing and learning you've done at the conference. You head home full of optimism and excitement. Then you arrive at your office, plop your conference packet down on your desk, get buried by accumulated emails and other work, and somehow never quite get around to implementing all those fabulous ideas you left the conference with. If, by some stroke of luck, you do find a few minutes to review your conference notes, they seem out of context and lack that spark of inspiration; you quickly feel overwhelmed by the details and end up just filing them away, in case you need to refer to them later. This workbook is an effort to break this cycle by helping you organize your conference experience—and notes—in ways that will make it easier for you to put what you learn into practice.

This workbook has four main sections:

1. A place to set goals and to organize the resources you'll need to achieve them;
2. Some worksheets to help organize the notes you take in the conference sessions and make them more immediately useful;
3. A space to review and reflect—because research shows that this is the single most important thing you can do to remember what you learned; and
4. A place to record action items you want to accomplish when you get home.

A One-Minute Warm-Up Exercise: Maintaining Healthy Habits

Attending conferences can challenge the routines that keep us healthy at home unless we plan for those challenges and take proactive steps to maintain the habits that matter to us. Habits around things like sleep, exercise and diet strongly affect learning and mental performance in addition to wellbeing. If you have a fitness routine at home, will you make time at the SSI to exercise? If you've worked hard to build healthy eating habits at home, how will you resist temptation here? Take one minute to jot down some answers to these questions: What habits do you want to commit to while here? Which ones are okay to let go of until you get home?

Establishing Purpose: A Three-Minute Freewrite

Keep this short and sweet: set your phone to timer or stopwatch, or use your watch (with a second hand, please), to give you three minutes to answer the question below. Write whatever comes to mind and keep writing until your timer goes off. Don't overthink: the goal is just to come up with three to five things you want to take away from your time here. You don't need to write complete sentences, but do use verbs to ensure that your list is action-oriented. You may spend a couple of minutes revising after your timer goes off, but the point here is to capture a snapshot, not write an essay.

What do you hope to gain by attending this SENCER Summer Institute?

Articulating Your Purpose: Setting Goals

Now that you have a sense of your overall expectations for the conference, it's time to set some concrete goals. These pages ask you to identify three specific goals or objectives that you hope to achieve at this SSI. To keep your goals grounded and attainable, it is often useful to think about them in terms of things you hope to accomplish in the next two to six months.

Goal or Objective #1:

Sessions related to this goal or objective:

Session title:

Presenter's Name(s):

Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?

Networking related to this goal or objective:

Who did you meet?

What did you talk about?

Notes related to Goal or Objective #1:

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.

Goal or Objective #2:

Sessions related to this goal or objective:

Session title:

Presenter's Name(s):

Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?

Networking related to this goal or objective:

Who did you meet?

What did you talk about?

Notes related to Goal or Objective #2:

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.

Goal or Objective #3:

Sessions related to this goal or objective:

Session title:

Presenter's Name(s):

Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?

Networking related to this goal or objective:

Who did you meet?

What did you talk about?

Notes related to Goal or Objective #3:

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.

Worksheets: Metacognitive Note-Taking for Better Retention

To Begin: This approach to note-taking can make your time taking notes more effective because it is based on how you learn. Whenever you start a new section of notes, write the Date, Course/Session & Topics on the top of the page, then draw a line down the middle of the page, 1/4 or 1/3 the way from the left edge. At the end of each session, take 5 minutes to summarize what you most want to remember and follow up on.

Date:	Course/Session:	Topics:
Objectives: <i>Putting this information at the top of the page primes your brain with what you already know about these topics, making it faster and easier for you to make new connections. It also makes it easier to keep your notes organized. Under <u>Objectives</u>, note which of your conference objectives you want to work on in this session. Also note session goals here.</i>		
Reflections/Comments Reflections: <i>Use this space for noting your reactions and responses to what happens during the session. Make sure you capture your emotional responses, since they have the largest effect on your ability to recall what happened.</i> <i>Write or draw, include your feelings, questions, emerging ideas and other comments. Note items to follow up on here too.</i> <i>When you review, your associations with how you experienced what happened will make it easier to remember. What you put in this column acts as a key and an index, aiding recall.</i> <i>This section keeps your note-taking active and metacognitive.</i>	Notes Notes: <i>Use this space for taking notes on what is being presented, using whatever method you like. These are notes on content.</i>	
	Summary: <i>Here's where brain-based research really kicks in. At the bottom of your notes for each talk, draw a line below your notes to write a summary. As soon as possible after the talk (but in any case, before you sleep), take 3-5 minutes to write a summary of what you want to remember from these notes. Writing your summaries before you sleep will help solidify the new neural connections you want to keep.</i> <i>If you review your summaries within 24 hours, you do even more to move what you learned from short term to long term memory.</i> <i>When you review your notes, in most cases all you'll need to review is your summaries. Not sure what to write in the summary? One of the easiest ways to do it is in 3 sentences:</i> 1) summarize what the speaker is proposing you think about or do differently 2) reference the key supports for the proposition 3) make a bulleted list of what you most want to remember later ** most valuable <i>Then create appropriate items in your calendar and to do lists.</i>	
Summary:		

Review of Metacognitive Note-Taking in Order of Importance:

- 1) Writing a summary is the most important thing you can do to help you retain what happened in a session.
 - a. Keep the summary short so that you will do it and so that you won't overthink. This is supposed to be a summary, not a recapitulation of the material. Part of the value of the process comes from the fact that you have to decide what is most important.
 - b. Write your summary as close to the end of the session as possible. Ideally, you want to write the summary before you attend the next session. In any case, you want to write it before you sleep, since one important function of sleep is to erase non-essential information accumulated during the day (and if you haven't marked the things that happened in the session as important, they are likely to be deleted). Another important function of sleep is to consolidate and file memories, so again, having that summary written before you sleep helps your brain process it appropriately.
 - c. Reviewing your summary within 24 hours helps move what you learned from short-term to long-term memory. (Regular, repeated review is the best way to learn/remember anything.) After writing the summary, this is the next-most important thing you can do to help you retain what you learned.
 - d. Ideally, you write a summary for every 40-45 minutes worth of material in a lecture of average density. A summary for every two pages of notes is about right.
- 2) The second-most important thing you can do to help you retain what you learned in a session is to make your note-taking actively metacognitive.
 - a. Making your note-taking dialectical keeps your brain actively looking for connections—and making connections is how learning works.
 - b. Paying attention in this way helps keep you engaged and motivated.
 - c. Making your note-taking active helps prevent you from becoming passive—a state in which learning is not possible.
 - d. The mental “soundtrack” that you record in the left column is a far better aid to recall than the content itself. Recording your emotional responses is especially effective in this regard because along with repetition, emotions have the biggest influence on your ability to recall.
 - e. Writing down questions and reactions provides armatures for future reflection and further learning.
- 3) Writing header information at the top of the page facilitates learning.
 - a. Reviewing what you know about the topic moves existing knowledge into working memory, making access to that knowledge easier and faster. This improves your ability to make connections between existing knowledge and what happens in the session.
 - b. Writing out your objectives before you start keeps you focused on what you want to learn.

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Date: _____ Course/Session: _____ Topic: _____

Objectives for this session:

Reactions/Comments

Notes

Summary:

Review and Reflect:

Reflections for Thursday, August 1:

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

Reflections for Friday, August 2:

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

Reflections for Saturday, August 3:

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

Reflections for Sunday, August 4:

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

Reflections for Monday, August 5:

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

Action Items:

This is a place to plan specific actions for the near future. Items might include books or resources to order, people to contact, course changes to make, materials to work on, etc. List at least five things you will do within two weeks of your return home. Having a short list of items directly related to your purposes for attending the conference should help you maintain the energy and momentum you developed at the SSI.

1)

2)

3)

4)

5)

SENCER Summer Institute 2015 Schedule at a Glance

Thursday, July 30, 2015

Time	Event	Location
7:00 AM - 4:00 PM	SSI 2015 Registration	Alden Hall Lobby
8:00 AM - 12:00 PM	Strategic Planning Group Meeting	Higgins House
12:00 - 3:00 PM	SCI Co-Director and Co-PI, and Engaging Mathematics Meetings	Higgins House
3:00 - 4:00 PM	SENCER Summer Institute New Participant Orientation	Alden Hall
4:30 PM - 6:30 PM	SENCER Summer Institute 2015 Opening Plenary Address	Alden Hall
6:30 PM - 8:00 PM	SENCER Summer Institute Opening Gala Dinner	Tuckerman Hall

Friday, July 31, 2015

7:00 - 8:30 AM	Breakfast	Alden Hall
8:30 - 10:00 AM	All-Institute Plenary Session II	Alden Hall
10:15 - 11:45 AM	Work Sessions I	WPI Classrooms
11:45 AM - 1:00 PM	Lunch and Demonstration from G. Wiz	Alden Hall
1:15 - 2:15 PM	Concurrent Sessions I	WPI Classrooms
2:30 - 3:30 PM	Team Time, Individual Representative Session, and Initiative Meetings	WPI Campus
3:45 - 5:15 PM	Work Sessions II	WPI Classrooms
5:15 - 7:15 PM	Poster Presentations I	Rubin Campus Center

Saturday, August 1, 2015

7:00 - 8:30 AM	Breakfast	Alden Hall
8:30 - 10:00 AM	All-Institute Plenary Session III	Alden Hall
10:15 - 11:45 AM	Work Sessions III	WPI Classrooms
11:45 AM - 1:00 PM	Lunch	Alden Hall
1:15 - 2:15 PM	Team Time, Individual Representative Session, and Initiative Meetings	WPI Campus
2:30 - 3:30 PM	Concurrent Sessions II	WPI Classrooms
3:30 - 5:00 PM	Poster Presentations II	Rubin Campus Center
5:00 - 7:00 PM	Dinner Honoring Leaders in the NCSCE Community	Campus Center Odeum

Sunday, August 2, 2015

7:00 - 8:30 AM	Breakfast	Alden Hall
8:30 - 10:00 AM	All-Institute Plenary Session IV	Alden Hall
10:15 - 11:45 AM	Work Sessions IV	WPI Classrooms
11:45 AM - 1:00 PM	Lunch	Alden Hall
1:15 - 2:15 PM	Concurrent Sessions III	WPI Classrooms
2:30 PM	Afternoon Activities	Worcester and Boston
3:00 - 5:00 PM	Public Policy Planning Group Meeting	WPI Classrooms

Monday, August 3, 2015

7:00 - 8:30 AM	Breakfast	Alden Hall
8:30 - 9:30 AM	All-Institute Plenary Session V	Alden Hall
9:30 AM - 12:30 PM	Workshops	WPI Classrooms
12:30 - 1:00 PM	Institute Adjournment and Lunch	Alden Hall

Thursday - Sunday evenings following sessions, The Goat's Head Restaurant will be open to SSI Participants.

SSI 2015 Concurrent Sessions, Work Sessions, Workshops, Poster Presentations, and Meetings at a Glance

Thursday, July 30, 2015

Pre-Institute Meetings: 8:00 AM - 12:00 PM

Title	Presenter/Facilitator	Location
Strategic Planning Group Meeting, Part II	Jonathan Bucki	Higgins House

Pre-Institute Meetings: 12:00 - 3:00 PM

SCI Co-Director and Co-PI Meeting	Jonathan Bucki	Higgins House
Engaging Mathematics Informal Meeting	Cindy Kaus, Christine DeCarlo	Higgins House Library

Friday, July 31, 2015

Work Sessions I: 10:15 - 11:45 AM

Plenary Follow-up Session: Designing Data Science Programs Through Business and Higher Education Collaboration	Brian Fitzgerald	Fuller Labs 320
Plenary Follow-up Session: Mathematics and Civic Engagement	Victor Donnay, Engaging Mathematics Partners	Goddard Hall 227
The Science Communication Disentanglement Project	Dan Kahan	Higgins Labs 116
Teaching as Community Property: An Introduction to the Scholarship of Teaching and Learning	Matt Fisher	Kaven Hall 116
Designing a SENCER Model in About an Hour	Ellen Goldey	Stratton Hall 202
Integrating Humanities in STEM Education	Gillian Backus, Rita Kranidis, Eliza Reilly	Washburn 229
MetaLearning: Building Effective Self-Directed Learners	Stephen Carroll	Higgins Labs 202

Concurrent Sessions I: 1:15 - 2:15 PM

What's Missing?: Gaps in the SENCER Program and Strategies to Fill Them	Wm. David Burns, Dave Ferguson, Natalie Kuldell	Fuller Labs 320
Update on Next Generation Science Standards	Stephen Carroll, Chris Lazzaro	Goddard Hall 227
SENCER States - Expanding the (Net)Work	SENCER Hawaii Teams	Higgins Labs 116
Moving Your Career Forward – Your Next Step	Karen Kashmanian Oates	Kaven Hall 116
Publishing in Science and Civic Engagement: An International Journal	Matt Fisher, Eliza Reilly	Stratton Hall 202
Developing SENCER Initiatives for New Teams	Dick Sheardy	Washburn 229
Naturalist Outreach Program: Improving Undergraduate Education through Science Outreach and Civic Engagement	Linda Rayor	Atwater Kent 232
Creating a Sustainable STEM Program for Underrepresented Communities	Virginia McHugh-Kurtz	Higgins Labs 114
Why Do Students Fail? Inspiring and Motivating Students to Take Charge of Their Own Education	Abour H. Cherif, Farah Movahedzadeh	Higgins Labs 154
Making Physiology Relevant to Students' Lives	Anna Rozenboym	Higgins Labs 202
Engaging Mathematics and Statistics throughout New York City	Mangala Kothari, Alioune Khoule, Marina Nechayeva	Olin Hall 126
Using Testing as a Way of Teaching in Math and Science Classrooms	Andrew Kerr	Olin Hall 218

Team Time, Individual Representative Session, and Initiative Meetings: 2:30 - 3:30 PM

Team Time (Meet Danielle and Kyle to be matched in the lobby of Alden Hall at 2:15 PM)	Groups, Teams, and Consultants	WPI Campus
Session for Individual Representatives	Wm. David Burns	Fuller Labs 320
Engaging Mathematics Meeting	Cindy Kaus, Christine DeCarlo	Goddard Hall 227

Work Sessions II: 3:45 - 5:15 PM

Tethering Civic Engagement and Innovative Science Teaching to the University Rewards System	Sherryl Broverman	Fuller Labs 320
Addressing Diversity Issues in STEM Education	David Ferguson, Judith Iriarte-Gross, Ellen Mappen	Goddard Hall 227
Making Real-World Connections with Multimedia	Andrea Aust	Higgins Labs 116
Fostering Interdisciplinary STEM Research Partnerships	Rick Duschl	Kaven Hall 116
"MacGyver on the Hudson"	Matt Mogensen, Frank Wattenberg	Washburn 229
Analytics & Heuristics: Using Big Data to Reintegrate the Human in Technical Problems	Brent Faber	Stratton Hall 202
Rewiring Life: The Civic Dimensions and Teaching Opportunities in Biological Engineering	Natalie Kuldell	Higgins Labs 202

Poster Sessions I - Classroom Programs: 5:15 - 7:15 PM

SALG assessment of "Music and Science"	Ann Knipschild, Paula Bobrowski, Robert Holm, Nancy Haak	Forkey Commons
Emerging Infectious Diseases: Teaching Ebola and More	Rachel A. Bergstrom, Marion Field Fass	Forkey Commons
Assessing Student Learning Gains in General Education Science Classes	Julia Nord, Thomas Wood	Forkey Commons
Linked Courses (LC) and SENCER at Harry S Truman College, an Integrated Model	Mahesh Gurung, Raymund Torralba	Forkey Commons
Mathematics Classroom Engagement and Its impact On Students' Achievement	Alioune Khoule, Mangala Kothari	Forkey Commons
Implementing Authentic Research Experiences into Freshman Biology Courses Through the Small World Initiative	Kim Sadler, Drew Sieg	Forkey Commons
STEAMed Rice: Engaging STEM and the Humanities Through Food	Rita Kranidis	Forkey Commons
Four Weeks on Water	Doug Earick, Cyndy Carlson, Rachel Whitaker, Sarah Turtle	Forkey Commons
Incorporating Project Based Learning Into Actuarial Science at Roosevelt University	Wanwan Huang	Forkey Commons
Design and Implementation of a SENCER-based Research Methods Course for Freshman Undergraduate Students	Sharadha Sambasivan, Tracy Callender, Candice. J. Foley, Nina Leonhardt, W. Troy Tucker	Forkey Commons
Physics Photo-Book	Nasrin Mirsaleh Kohan	Forkey Commons
The "Finding Physics" Project – Making Physics Relevant for Introductory Level Students	Judy Beck, James Perkins	Forkey Commons
SENCER in Hawai'i	Hokulani Aikau, Patricia Buskirk, Robert Franco, Noelani Goodyear-Kā'opua, Ulla Hasager, Kalei Kanuha, Willy Kauai, Denise Konan, David Krupp, Wendy Kuntz, Darren T. Lerner, Ilima Long, Michael Ross	Forkey Commons
Excellence in Collegiate Teaching: A Synthesis of Theory and Evidence	Linden Higgins	Forkey Commons
Healthy People 2020 Implementation Starts in the Classroom	Heather Pelzel	Forkey Commons

Saturday, August 1, 2015

Work Sessions III: 10:15 - 11:45 AM

Plenary Follow-up Session: Partnership and Collaborations between Higher Education and the National Parks	Julia Washburn	Higgins Labs 116
Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome	Shawn Fitzgerald, Matthew Greb, Jerry Kobylski, Matthew Mogensen, Franz Rademacher, Reginald Shelton	Higgins Labs 218
Revitalizing General Biology	Monica Devanas, Theo Koupelis, Terry McGuire, Eliza Reilly	Salisbury Labs 104
Civic Engagement Strategies	Glenn Odenbrett, Pam Proulx-Curry	Salisbury Labs 305
Designing a Curriculum for Deep Learning	Karen Kashmanian Oates, Tara Mann	Salisbury Labs 402
Interpreting Data: A Cautionary Tale	Randy Paffenroth	Salisbury Labs 411

Team Time and Individual Representative Session: 1:15 - 2:15 PM

Team Time	Groups, Teams, and Consultants	WPI Campus
Session for Individual Representatives, Part Two	Wm. David Burns	Higgins Labs 116

Concurrent Sessions II: 2:30 - 3:30 PM

Reflective Practice	Monica Devanas	Higgins Labs 116
Adapting Large Lecture Formats SENCERized Teaching and Civic Engagement	Garon Smith	Salisbury Labs 305
NCSCE/SENCER Sustainability: Members	Jonathan Bucki, Danielle Kraus Tarka	Salisbury Labs 104
Leading Change in a Dynamic Environment	Karen Kashmanian Oates, Theo Koupelis	Salisbury Labs 411
A Relevant Technical Education Model for Non-STEM College Students	Herbert Schanker	Higgins Labs 114
Communicating Your Science: The Dual Poster Concept	Cynthia Maguire	Higgins Labs 154
Four Weeks on Water	Cyndy Carlson, Doug Earick, Rachel Whitaker	Higgins Labs 202
Adapting Social Media to Case Study Development in a SENCER Model Course, Mysteries of Migration	Julia Nord, Tyler Fabian, Tom Wood	Salisbury Labs 105
Incorporating Civic Engagement in Undergraduate Research	Richard Sheardy, Joe Kirsch	Salisbury Labs 402
Overcoming Barriers Toward Teaching Visually Impaired Students	Eugene Allevato	Salisbury Labs 406
How to Break Free from Lecture Style Teaching in your Anatomy Courses	Naveen Aman, Vijayalakshmi Natarjan	Salisbury Labs 407
Getting Started with the SENCER-SALG	Stephen Carroll	Higgins Labs 218

Poster Presentations II - Community Programs: 3:30 - 5:00 PM

Chemistry in the Community	Paul Morgan	Forkey Commons
Engineering Students Engaging Butler University's Center for Urban Ecology	Joe Kirsch, Jessica McCormick	Forkey Commons
Naturalist Outreach Program: Improving Undergraduate Education Through Science Outreach and Civic Engagement	Linda Rayer	Forkey Commons
SEEing Science in Appalachia	Martin Brock	Forkey Commons
Exposing Undergraduates to Cancer Research in an Introductory Cell Biology Course	Caleb Kersey, Rachel Stevens Salmon	Forkey Commons
Case Studies for a Broader Audience: Using Social Media to Break out of the Classroom	Thomas Wood, Julia Nord	Forkey Commons
SENCERizing a Routine SALT Course With a Twist on Civic Engagement	Tamera Klingbyll, Ginger Reasonover	Forkey Commons

Community Engagement Uniting Campuses and Integrating Science	Tamera Klingbyll, Linda Phipps, Ginger Reasonover	Forkey Commons
It's NHISE to Connect. How the NH Informal Science Educators (NHISE) Network can Connect Research Scientists with the General Public	Will Broussard, Kate Leavitt	Forkey Commons
Prospect Park Biodiversity – a SENCERized Multidisciplinary Project	Andrew Cook, Edrouine Gabriel, Eni Sejdini, Erica Yeboah, Mallessa Yeboah, Bryan Cespedes, Victor Aderara, Farjana Ferdousy, Natassa Gavalas, Natalie Nelson, Urmi Ghosh-Dastidar, Sandie Han, Diana Samaroo, and Liana Tsenova	Forkey Commons
Learning For and With Nature: Civic Engagement For the Sustainability of Urban Trees and Parks	Irene Dabrowski	Forkey Commons
On Target to Sustainability	Cynthia Maguire	Forkey Commons
Introducing First Semester Students to Science and Civic Engagement in a Freshman Seminar Class on Honeybees and Humans:	Cathy Whitlock	Forkey Commons
Back to 7th Grade: A Progress Report on Seeking STEM's Pilot	Susan Reiser, Cathy Whitlock, Judy Beck	Forkey Commons
Is Hawai'i the first 'SENCER State'?	Patricia Buskirk, Robert Franco, Ulla Hasager, David Krupp, Wendy Kuntz, Darren T. Lerner, Michael Ross	Forkey Commons

Sunday, August 2, 2015

Work Sessions IV: 10:15 - 11:45 AM

Active Learning	Monica Devanas, Drew Sieg	Higgins Labs 116
Building on the Intellectual Work of Teaching for Course and Curriculum Development	Matt Fisher	Higgins Labs 218
Science and Human Rights	Karen Kashmanian Oates, Jessica Wyndham	Salisbury Labs 104
SENCERizing Science Writing	Brent Faber, Tara Mann	Salisbury Labs 305
Modeling Data: Understanding Complex Biological Data Using Simple Simulation Tools	Liz Ryder	Salisbury Labs 402
Robotics and Artificial Intelligence — A Panel Discussion	Matt Mogensen, Frank Wattenberg	Salisbury Labs 411

Concurrent Sessions III: 1:15 - 2:15 PM

Getting Started with the SENCER-SALG	Stephen Carroll	Higgins Labs 116
SENCER and your Career	Rob Sanford	Higgins Labs 218
The Changing Digital Landscape and It's Impact on Healthcare	Chuck Gahun	Salisbury Labs 104
Department-wide Reform of STEM Education: Lessons from the National PULSE Project to Transform Biology	Ellen Goldey	Salisbury Labs 305
The Role of Research in SENCER Programs	Wm. David Burns, Amy Shachter	Salisbury Labs 402
Storytelling, New Media Strategies and Emerging Technologies: Building Bridges between Natural Sciences, Social Sciences and Indigenous Knowledge to Tackle the Problem of Climate Change in Hawai'i	Patricia Amaral Buskirk, Ulla Hasager	Salisbury Labs 411
Connecting Computer Science to Society: Building a Community of Educators	Susan Reiser, Pamela Silvers	Higgins Labs 114
Using Hurricane Sandy As A Unique Learning Opportunity Utilizing Academic Service Learning and Civic Engagement	Marilyn Dono-Koulouris, Roberta Hayes	Higgins Labs 154
Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?	Jonathan Bucki, Hailey Chenevert, Ellen Mappen	Higgins Labs 202
Survey Research	Janice Ballou	Salisbury Labs 105

Experiences with Civic Engagement at Truman State University	LaRoy Brandt, Janice Clark, Alicia Wodika	Salisbury Labs 406
NCSCE/SENCER Sustainability: Members	Jonathan Bucki, Danielle Kraus Tarka	Salisbury Labs 407
Monday, August 3, 2015 Workshops: 9:30 AM - 12:30 PM		
Pearls of Practice: Identifying the Pearls in your Courses	Karin Matchett	Fuller Labs 311
Portfolios and Career Development	Monica Devanas	Fuller Labs 320
Writing Good Proposals to Support your SENCER Work	Wm. David Burns	Salisbury Labs 104
Students and Social Media: Participating in Broader Conversations	Andrea Aust	Salisbury Labs 105
Facilitating Strategic and Difficult Conversations	Jonathan Bucki	Salisbury Labs 305
Inquiring Into Our Students' Learning: Developing Your Scholarship of Teaching and Learning Project	Matt Fisher	Salisbury Labs 402
Essential Elements of Online and Blended Courses	Adrienne Wootters	Salisbury Labs 406
Developing Curriculum Using Real World Data	Cindy Kaus	Salisbury Labs 407
Enduring Understandings Training (by invitation only)	Stephen Carroll, Chris Lazzaro	Salisbury Labs 401

SSI 2015 Tracks

Working and Teaching with Data

Block	Title	Presenters/Facilitators
7/30 Plenary	STEM skills for All: Quantitative Literacy in the 21st Century	Brian Fitzgerald
Work Sessions I	Plenary Follow-up Session: Designing Data Science Programs Through Business and Higher Education Collaboration	Brian Fitzgerald
Work Sessions II	Analytics & Heuristics: Using Big Data to Reintegrate the Human in Technical Problems	Brent Faber
Work Sessions III	Interpreting Data: A Cautionary Tale	Randy Paffenroth
Concurrent Sessions II	A Relevant Technical Education Model for Non-STEM College Students	Herbert Schanker
Work Sessions IV	Modeling Data: Understanding Complex Biological Data Using Simple Simulation Tools	Liz Ryder
Concurrent Sessions III	Survey Research	Janice Ballou

Scientific and Research-based Approaches to Learning

8/2 Plenary	How Can the SENCER Ideals Support the Challenging and Changing Institutional Accreditation Landscape?	Jerry Kobylski
Work Sessions I	Teaching as Community Property: An Introduction to the Scholarship of Teaching and Learning	Matt Fisher
Concurrent Sessions I	Publishing in Science and Civic Engagement: An International Journal	Matt Fisher, Eliza Reilly
Work Sessions II	Fostering Interdisciplinary STEM Research Partnerships	Rick Duschl
Work Sessions III	Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome	Shawn Fitzgerald, Matthew Greb, Jerry Kobylski, Matthew Mogensen, Franz Rademacher, Reginald Shelton
Concurrent Sessions II	Getting Started with the SENCER-SALG	Stephen Carroll
Work Sessions IV	Building on the Intellectual Work of Teaching for Course and Curriculum Development	Matt Fisher
Concurrent Sessions III	Getting Started with the SENCER-SALG	Stephen Carroll
Workshop	Inquiring Into Our Students' Learning: Developing Your Scholarship of Teaching and Learning Project	Matt Fisher

Improving Mathematics Education

7/31 Plenary	Connecting Math and Sustainability	Victor Donnay
Work Sessions I	Plenary Follow-up Session: Mathematics and Civic Engagement	Victor Donnay, Engaging Mathematics Partners
Concurrent Sessions I	Engaging Mathematics and Statistics throughout New York City	Mangala Kothari, Alioune Khoule, Marina Nechayeva
Workshop	Developing Curriculum Using Real World Data	Cindy Kaus

Public Engagement with Science

8/1 Plenary	The National Park Service and the Nation's Learning Landscape	Julia Washburn
Work Sessions I	The Science Communication Disentanglement Project	Dan Kahan
Concurrent Sessions I	Naturalist Outreach Program: Improving Undergraduate Education through Science Outreach and Civic Engagement	Linda Rayor
Work Sessions II	Making Real-World Connections with Multimedia	Andrea Aust
Work Sessions III	Plenary Follow-up Session: Partnership and Collaborations between Higher Education and the National Parks	Julia Washburn

Concurrent Sessions II	Adapting Social Media to Case Study Development in a SENCER Model Course, Mysteries of Migration	Julia Nord, Tyler Fabian, Tom Wood
Work Sessions IV	Science and Human Rights	Karen Kashmanian Oates, Jessica Wyndham
Concurrent Sessions III	The Changing Digital Landscape and It's Impact on Healthcare	Chuck Gahun
Concurrent Sessions III	Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?	Jonathan Bucki, Hailey Chenevert, Ellen Mappen
Workshop	Students and Social Media: Participating in Broader Conversations	Andrea Aust
The Future of NCSCE and SENCER		
Concurrent Sessions I	SENCER States - Expanding the (Net)Work	SENCER Hawaii Teams
Concurrent Sessions II	NCSCE/SENCER Sustainability: Members	Jonathan Bucki, Danielle Kraus Tarka
Concurrent Sessions III	NCSCE/SENCER Sustainability: Members	Jonathan Bucki, Danielle Kraus Tarka, Eliza Reilly
Engaging Underrepresented Communities in Science		
8/3 Plenary	A Little Bit of Leaven: The SENCER Work of Lipscomb University	Autumn Marshall
Concurrent Sessions I	Creating a Sustainable STEM Program for Underrepresented Communities	Virginia McHugh-Kurtz
Work Sessions II	Addressing Diversity Issues in STEM Education	David Ferguson, Judith Iriarte-Gross, Ellen Mappen
Concurrent Sessions II	Overcoming Barriers Toward Teaching Visually Impaired Students	Eugene Allevato
Concurrent Sessions III	Storytelling, New Media Strategies and Emerging Technologies: Building Bridges between Natural Sciences, Social Sciences and Indigenous Knowledge to Tackle the Problem of Climate Change in Hawai'i	Patricia Amaral Buskirk, Ulla Hasager
Professional Development		
Concurrent Sessions I	Moving Your Career Forward – Your Next Step	Karen Kashmanian Oates
Work Sessions II	Tethering Civic Engagement and Innovative Science Teaching to the University Rewards System	Sherryl Broverman
Concurrent Sessions II	Leading Change in a Dynamic Environment	Karen Kashmanian Oates, Theo Koupelis
Concurrent Sessions III	SENCER and your Career	Rob Sanford
Workshop	Portfolios and Career Development	Monica Devanas
Curriculum and Pedagogy		
Work Sessions I	Designing a SENCER Model in About an Hour	Ellen Goldey
Work Sessions I	Integrating Humanities in STEM Education	Gillian Backus, Rita Kranidis, Eliza Reilly
Concurrent Sessions I	What's Missing?: Gaps in the SENCER Program and Strategies to Fill Them	Wm. David Burns, Dave Ferguson, Natalie Kuldell
Work Sessions III	Designing a Curriculum for Deep Learning	Karen Kashmanian Oates, Tara Mann
Work Sessions IV	Robotics and Artificial Intelligence — A Panel Discussion	Matt Mogensen, Frank Wattenberg
Concurrent Sessions III	Connecting Computer Science to Society: Building a Community of Educators	Rebecca Bruce, Susan Reiser, Pamela Silvers
Workshop	Essential Elements of Online and Blended Courses	Adrienne Wootters

THURSDAY, JULY 30TH

Notes on the Program

All Institute sessions will be held at Worcester Polytechnic Institute.

Hotel shuttles are available to the WPI campus upon request from either the Courtyard by Marriott hotel, or the Residence Inn hotel. The Courtyard by Marriott is also located within walking distance of the WPI campus (approximately 15 minutes). Please check the maps included in the program book for paths to Institute session locations.

7:00 A.M. – 4:00 P.M.

SSI 2015 CHECK-IN

Alden Hall Lobby

All SSI 2015 participants and facilitators should check in with SSI staff upon arrival at Worcester Polytechnic Institute (WPI) to receive SSI materials, including printed copies of the SSI program, poster session abstracts, name badges (which are required for access to SSI meals and events), a backpack (a new idea given to us by Herb Schanker), and a reusable mug for both hot and cold drinks.

8:00 A.M. – 12:00 P.M.

STRATEGIC PLANNING GROUP MEETING

Higgins House

This meeting is by invitation only.

12:00 P.M. – 3:00 P.M.

SCI CO-DIRECTOR AND CO-PI MEETING

Higgins House

This meeting is by invitation only.

12:00 P.M. – 3:00 P.M.

ENGAGING MATHEMATICS MEETING

Higgins House Library

This meeting is by invitation only.

3:00 P.M. – 4:00 P.M.

SENCER SUMMER INSTITUTE NEW PARTICIPANT ORIENTATION

Alden Hall

The SSI 2015 New Participant Orientation will be an opportunity for those new to the SENCER community and the Summer Institute to learn more about our work, and to network with other new participants before the Institute begins.

4:30 P.M. – 6:30 P.M.

SSI 2015 OPENING PLENARY SESSION

Alden Hall

Karen Kashmanian Oates, presiding

Welcome

Laurie Leshin, laleshin@wpi.edu

President

Worcester Polytechnic Institute

Taking Note and Note Taking: Making the SSI Learning Experience More Durable

Stephen Carroll, scarroll@scu.edu

Senior Lecturer

Santa Clara University

Plenary Presentation: STEM Skills for All: Quantitative Literacy in the 21st Century

Brian Fitzgerald, brian.fitzgerald@bhef.com

Chief Executive Officer

Business-Higher Education Forum

The ubiquity of data is transforming organizations in the private, public, and non-profit sectors into data-intensive enterprises. These enterprises view data as an essential resource that can be used to innovate, unlock value and increase the breadth and quality of products and services. This transformation brings with it increasing demand for 21st century skills. Data science and analytics has rapidly become a new form of 21st century quantitative literacy for high-performing, data-intensive organizations in all sectors.

Once the purview of the STEM disciplines, the demand for higher-order quantitative literacy has begun to permeate many non-STEM fields with clear implications for undergraduate education in the social sciences, arts and humanities. The visual arts, for example, play a key role in unlocking the narrative that data science and analytics can uncover through data visualization. More broadly, a deeper understanding of data and the analytical frameworks inherent in data science can help engage more citizens in the fundamental challenges of the 21st century.

The Business-Higher Education Forum, a membership organization of business and higher education leaders, has launched the National Higher Education and Workforce Initiative to create new capacity among its member institutions to equip undergraduates with skills in fields like data science and analytics, and to create a community of practice of practice among the faculty who are leading the transformation of undergraduate education across a number of disciplines.

Aims for SSI 2015

Wm. David Burns, david.burns@sencer.net

Executive Director

National Center for Science and Civic Engagement

6:30 P.M. – 8:00 P.M. SSI 2015 GALA WELCOME DINNER

Tuckerman Hall, Massachusetts Symphony Orchestra

Tuckerman Hall, the site of tonight's dinner, is located at 10 Tuckerman Street, a few blocks from campus. Parking, if necessary, is located at 39 Salisbury Street. NCSCE Staff will also lead the group over to Tuckerman hall on foot.

8:00 P.M. – 11:00 P.M. POST-SESSION MIX AND MINGLE

Goat's Head Restaurant

Each evening, the Goat's Head Restaurant will be open for SSI participants to mix and mingle following the day's activities. A cash bar will be available.

FRIDAY, JULY 31ST

Notes on the Program

Hotel shuttles are available to the WPI campus upon request from either the Courtyard by Marriott hotel, or the Residence Inn hotel. The Courtyard by Marriott is also located within walking distance of the WPI campus (approximately 15 minutes). Please check the maps included in the program book for paths to Institute session locations.

7:00 A.M. – 8:30 A.M.

BREAKFAST

Alden Hall

8:30 A.M. – 10:00 A.M.

ALL-INSTITUTE PLENARY SESSION II

Alden Hall

David Ferguson, presiding

Plenary Presentation: Connecting Math and Sustainability

Victor Donnay, vdonnay@brynmawr.edu

Professor, Department of Mathematics

Bryn Mawr College

How can we better inspire our students to study and succeed in mathematics? Victor Donnay will discuss his experiences in using issues of civic engagement, particularly environmental sustainability, as a motivator. He will present a variety of ways to incorporate issues of sustainability into math and science classes ranging from easy-to-adapt extensions of standard homework problems to more elaborate service learning projects. He will share some of the educational resources that he helped collect as chair of the planning committee for Mathematics Awareness Month 2013 - The Mathematics of Sustainability, as well as his TED-Ed video on Tipping Points and Climate Change. He has used these approaches in a variety of courses including *Calculus*, *Differential Equations* (a SENCER model course), *Mathematical Modeling*, and a Senior Seminar.

10:15 A.M. – 11:45 A.M.

WORK SESSIONS I

A NOTE ON THE SSI 2015 WORK SESSIONS

Work sessions are 90-minute sessions organized to achieve the following aims: To

- Provide newcomers with an introduction to basic elements of the SENCER approach,
- Provide alumni with opportunities to apply the SENCER approach to new challenges,
- Enable follow-up conversations with plenary speakers,
- Provide workshop-style training on active-learning pedagogies and appropriate assessment,
- Offer hands-on design and implementation planning opportunities, and
- Engage participants in thinking about new policy directions and their implications.

There are no repeat sessions, though there are multiple sessions that pursue any particular theme. We recommend that teams split up to assure broad exposure to the offerings in each work session block.

Plenary Follow-up Session: Designing Data Science Programs Through Business and Higher Education Collaboration

Fuller Labs 320

Track: Working and Teaching with Data

Brian Fitzgerald, brian.fitzgerald@bhef.com
Business-Higher Education Forum

Despite rising demand for data science skills, a Business-Higher Education Forum (BHEF) analysis of programmatic offerings at 24 research universities in 2013 indicated that while some universities offered data science and analytics programs at the graduate level, the ability of undergraduate students to gain exposure to data science was exceptionally limited. No university offered an undergraduate major, minor or concentration in data science. While a number of institutions are in the process of developing, or have developed data science or analytics programs of various types, wide-scale adoption in the STEM disciplines, let alone in the social sciences, arts and humanities, remains elusive. In addition to promoting broader adoption where appropriate, program development with the involvement of leading-edge data-intensive companies, non-profits and cultural institutions can enrich the learning experience for students by providing real-world applications of analytics.

BHEF has addressed these issues by catalyzing deep partnerships between member academic institutions and member companies like IBM to inform the development of undergraduate data science majors, minors and concentrations across a range of disciplines.

The Science Communication Disentanglement Project

Higgins Labs 116

Track: Public Engagement with Science

Dan Kahan, dan.kahan@yale.edu
Yale University

Climate change and *human evolution* are both examples of the science communication *entanglement* problem. This problem occurs when facts that are the subject of scientific investigation become enmeshed in antagonistic cultural meanings that transform positions on those facts into badges of membership in opposing cultural groups. This condition is actually rare, but where it occurs the consequences can be both spectacular, and spectacularly damaging, to propagation of both our collective knowledge and the norms of constructive deliberation essential to enlightened self-government. The session will feature existing research on how to *disentangle* knowledge from antagonistic meanings both in and outside the classroom. The primary goal, however, will be to draw on the informed judgment of the participants to form conjectures on how, using the tools of empirical inquiry, educators and other science communicators can enlarge public understanding of how to protect free and reasoning citizens from being put in the position of having to choose between knowing what's known by science and *being* who they are.

Plenary Follow-up Session: Mathematics and Civic Engagement

Goddard Hall 227

Track: Improving Mathematics Education

Victor Donnay, vdonnay@brynmawr.edu

Bryn Mawr College

Anthony Dunlop, anthony.dunlop@normandale.edu

Normandale Community College

Cathy Evins, cevins@roosevelt.edu

Bárbara González, bgonzalez@roosevelt.edu

Roosevelt University

Cindy Kaus, cindy.kaus@metrostate.edu

Metropolitan State University

Mangala Kothari, mkothari@lagcc.cuny.edu

Alioune Khoulé, akhoule@lagcc.cuny.edu

LaGuardia Community College

Frank Wattenberg, frank.wattenberg@usma.edu

United States Military Academy

In this hands-on session, participants will try out lessons and curricular units that faculty from the Engaging Mathematics project have developed, all of which illustrate how to connect important topics in mathematics to a variety of civic issues. There will be a range of lessons at different levels including general education, statistics, calculus and differential equations. Participants will reflect on how they could use these lessons in their own teaching. In addition to Victor Donnay, other presenters are participants from the SENCER Engaging Mathematics initiative.

Teaching as Community Property: An Introduction to the Scholarship of Teaching and Learning

Kaven Hall 116

Track: Scientific and Research-based Approaches to Learning

Matt Fisher, matt.fisher@email.stvincent.edu

Saint Vincent College

The scholarship of teaching and learning (SoTL) has been described as the systematic inquiry into our students' learning. But what does that inquiry and scholarship look like in real life? How does SoTL accomplish the "public" and "communal" aspects that are an integral part of any form of scholarship? How does this form of scholarship connect to the concerns of faculty involved in SENCER? This session will provide an overview of SoTL for SSI participants. We will look at some of the important characteristics of SoTL, with particular emphasis placed on the types of questions asked and the range of evidence that faculty can consider gathering. An overview of various ways that faculty can make their work public will also be examined in the session.

Designing a SENCER Model in About an Hour

Stratton Hall 202

Track: Curriculum and Pedagogy

Ellen Goldey, goldeyes@wofford.edu

Wofford College

Regardless of whether you are working with students majoring in STEM or other disciplines, SENCERizing your courses will make them more relevant to students. The mission of SENCER is to develop the knowledge, skills, and dispositions of students by teaching "through" the lens of wicked problems that are often trans-disciplinary in nature. This session uses a heuristic to engage teams of participants in a step-by-step process that yields an outline of a new or revised course. The main goal of the workshop is for you to engage in the process, but don't be surprised if you fall in love with the course you develop!

Integrating Humanities in STEM Education

Washburn 229

Track: Curriculum and Pedagogy

Rita Kranidis, rita.kranidis@montgomerycollege.edu

Montgomery College

Gillian Backus, gbackus@nvcc.edu

Northern Virginia Community College

Eliza Reilly, eliza.reilly@ncsce.net

National Center for Science and Civic Engagement

The national focus on STEM education as a driver of economic and technological development has produced a parallel awareness among educators of the limits of traditional STEM education in helping students contextualize and situate their knowledge and use it to address complex social and civic problems. This session will provide an overview of the long-standing argument for, and benefits of, integrating science and humanities content in the college curriculum, and provide two current examples, drawn from community colleges, of innovative approaches to inter- and trans-disciplinary curriculum.

MetaLearning: Building Effective Self-Directed Learners

Higgins Labs 202

Stephen Carroll, scarroll@scu.edu

Santa Clara University

In the 21st century, both professional and personal success depend on being able to adapt swiftly and effectively to rapidly changing circumstances. Thus, the most important skill college students need to learn is HOW TO LEARN independently, consciously and with maximum efficiency. In this work session, you'll learn by doing—experiencing brain-based learning activities and pedagogies you can use to accelerate students' progress toward becoming effective self-directed learners. You'll leave with resources and curricula to facilitate metalearning and an assessment instrument to help prove that it works. Participants will recognize and understand some of the myths and misperceptions that inhibit students' ability to learn efficiently and effectively; acquire and practice techniques to overcome these

barriers; be motivated to incorporate the latest scientific research/evidence about how people learn into their teaching practices; and leave the session with a set of resources and experiences that will allow them to quickly integrate what they've learned into their teaching practices.

11:45 A.M. – 1:00 P.M.

LUNCH

Alden Hall

Dramatic Demonstrations to Engage Large Classes

Alden Hall

Garon Smith, garon.smith@mso.umt.edu

University of Montana

A fun way to underscore the process in which science is done is to simulate its practice within a classroom or public presentation setting. The presenter (in the guise of G. Wiz) will share with participants several of his favorite potions that promote audience participation in observing physical phenomena, formulating a hypothesis, and then testing the hypothesis. Part of the lesson's value is revealed in deliberately choosing a wrong hypothesis to test. In repeating the demonstration, even though the hypothesis is totally off base, most audience members quickly identify a better explanation the second time through. It is important to help students understand that in performing experimental replications, the brain is subconsciously processing information at a sophisticated level. Planned demonstrations include an ink-making spell, a freezing spell, and a magical mathematics trick. The presenter hopes that, as a result of attending this session, participants will employ similar activities in a variety of venues to more effectively engage their science audiences, and that those interested in this approach will form an informal group to share ideas and success stories, and enlarge the collection of useful demonstrations.

1:15 P.M. – 2:15 P.M.

CONCURRENT SESSIONS I

A NOTE ON THE SSI 2015 CONCURRENT SESSIONS

Over the course of SSI 2015, there will be three sets of concurrent sessions. Each session is scheduled for 60 minutes and contains about a dozen program options. We have tried to spread the sessions on common themes over all three concurrent session time periods, so that you can pursue one theme in depth or cover as many different themes as you wish. We have a mix of presentations by SENCER core faculty members, as well as reports from the field by alumni and guests. Given our current work building partnerships, both among colleges, and between colleges and the informal science education community, there will also be sessions focused on strengthening community connections through research and partnerships, and integrating new media in courses and programs. The shaded areas by some of the sessions identify the track of which the session is a part. We've asked all session leaders to keep the sessions as interactive and lively as possible. As always, we regard all of our participants as partners in learning and encourage you to contribute your expertise to all the sessions you attend.

There are many options for you to consider. Past experience has shown that teams that meet in advance to map out how they will take advantage of the range of opportunities within each concurrent session get the most from the Institute.

What's Missing?: Gaps in the SENCER Program and Strategies to Fill Them

Fuller Labs 320

Track: Curriculum and Pedagogy

Wm. David Burns, david.burns@sencer.net
National Center for Science and Civic Engagement

Dave Ferguson, david.ferguson@stonybrook.edu
Stony Brook University

Natalie Kuldell, nkuldell@mit.edu
Massachusetts Institute of Technology

Someone once said, "SENCER is as SENCER does." That is a fair description of what is now a diverse set of applications and programs developed by on-campus collaborators working to bring the SENCER ideals to life. The results are remarkable, with new applications in informal education, economics, and student research, as well as emerging programs in the arts and humanities. But there are areas of critical importance where the SENCER program has a dearth of models to share: engineering, technology, computer science, and social sciences, like sociology and psychology. And there are potential lines of work that have not been sufficiently explored and developed, including courses for STEM majors, applications in Pre-K-12 education, connections to more general public education through, for example, America's public libraries. What can we do about this? This session will focus on the gaps in the SENCER program and will consider why they exist, what can be done to fill them, and what our goals should be developed to reach out to missing disciplines and respond to the challenges of new, complex civic questions. The session will be informal, provocative, welcoming, and, if successful, productive. The goal is to leave the session with a better sense of what's missing and some ideas about what can be done to fill in the gaps. If you are attending SSI 2015 and have an idea that you would like to pitch to senior SENCER personnel, or if you'd like to simply speculate about something that you wish SENCER could make available to you, please attend this session and make your contribution. Your participation will be most welcome.

Update on Next Generation Science Standards

Goddard Hall 227

Stephen Carroll, scarroll@scu.edu
Santa Clara University

Chris Lazzaro, clazzaro@collegeboard.org
The College Board

This session will examine the impact of the Next Generation Science Standards (NGSS) on three different areas: assessment, teacher education programs, and school systems. The new science standards basically establish learning expectations for students that integrate three important dimensions – science and engineering practices, disciplinary core ideas, and crosscutting concepts. The session will begin with a brief overview of the NGSS project, looking at the vision for creating them and how they can be used. In terms of assessment, the NGSS will have a profound effect on the types of science items developed and what these items are supposed to measure. What changes in assessment can we expect to see and how can these assessments align closely to the vision of the NGSS?

SENCER States - Expanding the (Net)Work

Higgins Labs 116

Track: The Future of NCSCE and SENCER

Christine DeCarlo, christine.marie.decarlo@ncsce.net
Danielle Kraus Tarka, danielle.kraus@ncsce.net
National Center for Science and Civic Engagement

Amy Shachter, ashachter@scu.edu
Santa Clara University

Robert Franco, bfranco@hawaii.edu
Wendy Kuntz, wkuntz@hawaii.edu
Michael Ross, mikeross@hawaii.edu
Kapiolani Community College, University of Hawaii

Patricia Amaral Buskirk, pbuskirk@hawaii.edu
Thomas Giambelluca, thomas@hawaii.edu
Ulla Hasager, ulla@hawaii.edu
Eōmailani Kukahiko, eomai@hawaii.edu
Darren Lerner, lerner@hawaii.edu
University of Hawai'i at Mānoa,

Michael Hayes, mthayes@hawaii.edu
Albie Miles, albie@hawaii.edu
University of Hawai'i, West O'ahu

What is a SENCER State? Why become a SENCER State? This highly interactive session is presenting and inviting discussion about how SENCER ideals, practices and resources can contribute to the creation of state-level networks of researchers and practitioners working together in education towards solving capacious and contested issues of our time. We will focus on the example of Hawai'i, which has, over several years, developed a statewide SENCER community across institutions, campuses, disciplines, and communities – creating a network of researchers and practitioners integrating indigenous knowledge, social sciences, and natural sciences. These efforts were substantially strengthened and inspired by the recent SCI-West regional meeting, Hawai'i Institute, and house calls.

Moving Your Career Forward – Your Next Step

Kaven Hall 116

Track: Professional Development

Karen Kashmanian Oates, koates@wpi.edu
Worcester Polytechnic Institute

So you have been at University X for several years and you're wondering what the next phase in your career might be—a central executive position, a more outward-looking administrative position, or a position that is more balanced between teaching and administration? Successful and fulfilling careers take many forms in the new academy. We will explore options for mid-career academics and the steps that can get you on track for your next position. Together we will dissect two case studies, engage in a dialogue, and position you (or others) to be competitive for the next steps in advancing your career goals. We will end the session with the creation of a personalized strategic career development plan.

Publishing in *Science and Civic Engagement: An International Journal*

Stratton Hall 202

Track: Scientific and Research-based Approaches to Learning

Matt Fisher, matt.fisher@email.stvincent.edu

Saint Vincent College

Eliza Reilly, eliza.reilly@ncsce.net

National Center for Science and Civic Engagement

This session will continue the exploration of the Scholarship of Teaching and Learning through an introduction to the National Center's peer-reviewed e-journal *Science Education and Civic Engagement: An International Journal*. The session will cover the journal's mission, content areas, and editorial process and will welcome questions and proposals for submissions from prospective contributors. If you are interested in disseminating your work on SENCER or other science education projects with civic components, please attend!

Developing SENCER Initiatives for New Teams

Washburn 229

Dick Sheardy, rsheardy@mail.twu.edu

Texas Woman's University

SENCER was developed to tackle two pressing national problems—to encourage more students to choose majors and careers in STEM and to improve science literacy by linking it to pressing civic issues of proven interest to students. But while improving science learning through civic engagement is a great idea, all curricular redesign has both promise and pitfalls. This session will focus on workable solutions to science education reform, from the departmental and college level, with an emphasis on the needs of those just getting started. Newcomers will be encouraged to take advantage of the SENCER network and will learn how the regional SENCER Centers for Innovation (SCI) and SENCER Leadership Fellows can provide advice and help on how to overcome the challenges of implementing innovative curriculum.

Naturalist Outreach Program: Improving Undergraduate Education through Science Outreach and Civic Engagement

Atwater Kent 232

Track: Public Engagement with Science

Linda Rayor, lsr1@cornell.edu

Cornell University

Formally training undergraduates to do effective scientific outreach greatly enhances the probability that these students will go on to become STEM teachers, or that they will continue to do informal science education that communicates the value of science to the public. Doing science outreach directly benefits college students' engagement and skill in STEM education and is empowering to students as citizens. Since 2005, Dr. Linda S. Rayor has taught the Naturalist Outreach Practicum (<http://blogs.cornell.edu/naturalistoutreach>) an innovative, experiential, community engaged service-learning course that teaches how to do effective scientific outreach in environmental biology.

The goals of her course are fourfold: to train college students to speak about science with passion and clarity, to provide experience doing science outreach in different contexts, to learn about the diversity of careers in informal and formal science education, and to develop civically engaged outreach leaders of the future.

The program has had a multiplying effect that reaches well beyond the university, with over 40% of 305 students going on to become teachers, assuming leadership positions in existing outreach programs, developing their own outreach programs, or redirecting their careers into informal or formal science education. This presentation will explain how the strategies of the Naturalist Outreach science outreach program can be transferred to other universities or high schools to improve undergraduate education.

Using Testing as a Way of Teaching in Math and Science Classrooms

Olin Hall 218

Andrew Kerr, akerr2@ccc.edu
Harry S. Truman College

Too often, the classroom “learning process” involves a teacher lecturing to passive students. Yet research shows that student learning improves when students actively engage the material. This engagement can mean working on math and science problems in class, and it can also mean more taking more quizzes and tests.

This session will focus on the use of testing and pre-testing as a way of fostering learning in the classroom. Studies suggest that students learn better when they practice directly with the material, rather than when they watch an expert demonstrate the material. More frequent, lower-stakes tests, combined with some amount of pre-testing, might turn testing from a mere assessment of previous learning into a powerful tool for current learning. Much of the session will be an opportunity for fellow instructors to share their own experiences with testing and to explore the ways that testing can foster, and not just assess, learning.

Creating a Sustainable STEM Program for Underrepresented Communities

Higgins Labs 114

Track: Engaging Underrepresented Communities in Science

Virginia McHugh-Kurtz, vmchughkurtz@roosevelt.edu
Roosevelt University

STEM may be critical workforce preparation for some, but too many underrepresented communities are being denied this opportunity. In response, a STEM program, called RU Illuminate, has been developed to increase interest in STEM fields and careers in young women. At these events, students are introduced to a variety of STEM fields using fun, interesting, and stimulating activities designed to generate interest in STEM fields. Some of these activities include engineering marshmallow catapults, DNA extraction from strawberries, investigating prairie pollinators, computer programming, and microscopic investigation. Data shows that the RU Illuminate event successfully increased interest in STEM fields among underrepresented communities. In addition, it is a revenue neutral STEM fair that does not require institutional support, and important factor in an era of budget reduction. Participants in this session will gain an overview of RU Illuminate and have the opportunity to provide feedback and explore ways of creating a sustainable STEM outreach program in their own institutional setting.

Why Do Students Fail? Inspiring and Motivating Students to Take Charge of Their Own Education

Higgins Labs 154

About H. Cherif, abourcherif@att.net

DeVry University

Farah Movahedzadeh, fmovahedzadeh@ccc.edu

Harold Washington College

Over the last few years, we have conducted three separate studies encompassing 739 students, 190 faculty, and 237 academic leaders to address why students fail at the college level. The majority of students felt that most faculty and the current educational system do not sufficiently motivate them to learn and succeed. Faculty, on the other hand, attributed the root cause of failure to student behavior and to the lack of both cognitive and academic preparation. Academic leaders mentioned “not ready for college,” lack of effort, and insufficient motivation as the main factors.

In this presentation participants will hear an overview of these studies as well as concrete examples of how the college learning environment and instructional pedagogy can be improved, and how faculty, educators, and academic leaders can inspire and help students succeed. The focus will be on Harold Washington’s project-based learning curriculum and the impressive outcomes achieved over the last few years.

Making Physiology Relevant to Students’ Lives

Higgins Labs 202

Anna Rozenboym, anna.rozenboym@kbcc.cuny.edu

Kingsborough Community College

The session will provide an overview of a curricular redesign, based on SENCER ideals, for *Human Anatomy and Physiology* courses. The curriculum incorporated civic engagement assignments centered on food-related social issues identified by students. Students investigated the relationship between demographic and socioeconomic variables and issues such as obesity, diabetes, eating disorders, “food-deserts,” over consumption of soda, sugar, caffeine, alcohol, and fast food. Grounding human physiology in the context of public health challenges of their choice increased engagement with the subject matter of the course and allowed students to demonstrate understanding of normal physiologic processes as well as pathophysiology of digestive, cardiovascular, respiratory, urinary, lymphatic and reproductive systems. The assignments are adaptable to other biology-based courses such as *Biology of Women* and *Nutrition*. Highlights of student work will be discussed and preliminary results of the SALG assessments will be covered.

Engaging Mathematics and Statistics throughout New York City

Olin Hall 126

Track: Improving Mathematics Education

Mangala Kothari, mkothari@lagcc.cuny.edu
Alioune Khoule, akhoule@lagcc.cuny.edu
Marina Nechayeva, mnechayeva@lagcc.cuny.edu
LaGuardia Community College

LaGuardia Community College is one of the partners of the Engaging Mathematics SENCER Project, a three-year, NSF funded effort initiated in 2014 to create a national community of practice to make mathematics relevant and more engaging to students. As part of the project, LaGuardia faculty are developing an *Elementary Statistics* course around themes based in New York City, to fit needs of a unique urban student population. The in-class and out-of-classroom activities use current NYC data related to urban issues such as changes in city demographics, income and housing inequalities, or impacts and adaptation to climate change. We will present a preview of some of these lessons and share our experience of piloting these materials in an *Elementary Statistics* class.

We will also present highlights of our pilot study that revealed that using this conceptual approach in elementary algebra class is not only engaging to students but also has a greater impact on students' mathematics achievement when compared to the use of a more procedural approach.

The session concludes with our future plans to promote SENCER culture beyond the scope of a single discipline by incorporating data-driven student research into mainstream teaching and creating a Student Data Research Center where students can work with a librarian, to master information mining, with a mathematician to get assistance with data manipulation and analyses, and with an expert from Writing Center to communicate their results.

2:30 P.M. – 3:30 P.M.

**TEAM TIME, TEAM CONSULTATIONS, INDIVIDUAL REPRESENTATIVE SESSION, AND
INITIATIVE MEETINGS**

Team Time

Teams may find any suitable location on campus to conduct a team meeting. If you requested a team consultation on your SSI 2015 application, please meet Kyle in the lobby of Alden Hall to be matched with your consultant.

Engaging Mathematics Partners Meeting

Goddard Hall 227

By invitation.

Session for Individual Representatives

Fuller Labs 320

Wm. David Burns, david.burns@sencer.net
National Center for Science and Civic Engagement

Note: This is an Optional Program for Individual Participants

Man, Monkeys, and Article 15:

"I give them my leftovers like roti but then they ran away with my onions."

David Burns, the SENCER Principal Investigator and NCSCE Executive Director, would like to get to know you, and, through hearing your reactions and suggestions about SSI 2015, enable you to help shape next year's SSI. Towards that end, we invite you to join him in Fuller Labs Room 320. Together we will work on a real problem, a perfect example of "multidisciplinary trouble"— to use June Osborn's memorable phrase: the growing population of monkeys in New Delhi. We did this last year and it was, to use a technical term, a "blast." Not only that, real knowledge production occurred. We hope the same will be true for this year's sessions.

We plan to work together on this complex, capacious, and as of now unsolved problem that has many dimensions: human and animal behavior; urban ecology; invasive species or sacred being (or both, depending on your point of view); religious belief and practice; challenges in urban planning, public policy, economics, power, and inequality; and, human rights, specifically the right to enjoy the benefits of science (Article 15), but also the right to one's religious beliefs and practices.

We'll watch a brief video, divide into teams, identify the various experts among us who can help, and then work together during this work session and Saturday's to see if we can learn something, have fun doing so, and maybe even come up with some promising answers to a most interesting and vexing problem. While we are doing so, you will learn a bit more about the SENCER approach.

For background reading on man, monkeys and New Delhi, see:

<http://www.nytimes.com/2012/05/23/world/asia/fed-by-indians-monkeys-overwhelm-delhi.html>.

For background reading on Article 15 ("to enjoy the benefits of scientific progress and its applications") of the International Covenant on Economic, Social and Cultural Rights (ICESCR), see:

http://shr.aaas.org/Programs/program_article15.htm.

We look forward to seeing you.

3:45 P.M. – 5:15 P.M.

WORK SESSIONS II

Tethering Civic Engagement and Innovative Science Teaching to the University Rewards System

Fuller Labs 320

Track: Professional Development

Sherryl Broverman, sbrover@duke.edu
Duke University

How do you pursue personally fulfilling work that still allows you to progress professionally? What are the advantages of having students connect their academic work to an external partner and a messy, unscripted problem? This workshop will explore a case study of how one faculty member developed a deep community relationship that led to interdisciplinary collaborations, significant community change, and peer-reviewed publications. Participants will learn how to identify the needs of the different stakeholders involved (themselves, their colleagues, their administration, their students, and their partners) and create learning activities and outcomes to satisfy them all.

Addressing Diversity Issues in STEM Education

Goddard Hall 227

Track: Engaging Underrepresented Communities in Science

David Ferguson, david.ferguson@stonybrook.edu
Stony Brook University

Judith Iriarte-Gross, judith.iriarte-gross@mtsu.edu
Middle Tennessee State University and Tennessee SCORE

Ellen Mappen, ellen.mappen@ncsce.net
National Center for Science and Civic Engagement

In this work session, participants will explore ways to broaden the participation, retention and graduation of underrepresented groups in STEM fields including efforts directed at women, underrepresented minorities, economically-disadvantaged students, and first-generation college students, as well as STEM faculty.

The presenters will examine strategies that motivate women and underrepresented minorities in their undergraduate education. David Ferguson will talk about the role of curricular and pedagogical changes, including SENCER courses, and the academic support programs that promote access and success in STEM education. Ellen Mappen will focus on efforts to encourage women in STEM, and will present results of studies that identify successful strategies for increasing the interest of young women in technology careers. Judith Iriarte-Gross will share information about the new MTSU Quest for Student Success and its efforts in advising and classroom teaching, particularly for underrepresented students. Participants will be asked to reflect on diversity issues in STEM education on their campus and to share best practices with the workshop audience. The session goal is to help participants identify pedagogies, curricula, and institutional learning environments that can strengthen civic culture on and beyond the campus and promote the academic success of underrepresented minorities and women.

Making Real-World Connections with Multimedia

Higgins Labs 116

Track: Public Engagement with Science

Andrea Aust, aaust@kqed.org

KQED

This session focuses on the benefits of using multimedia in teaching and learning science, and on strategies for using media to effectively engage students. Participants will discuss how and why they currently use media in their courses and explore ways to help students use media in the classroom to introduce topics, provide real-life examples of broad social issues, offer different perspectives on a topic, present career opportunities, stimulate critical thinking skills, and provide multiple methods of reaching diverse learners.

This pedagogical approach will be modeled using various science-based public media resources, including video, audio, and online articles. Participants will be shown how to access the content for use in their own courses. Science media from the San Francisco Bay Area's public media station, KQED, as well as other public media will be examined as a resource for instructors' continued personal professional development.

Lastly, KQED's Do Now project—a participatory activity for students—will be introduced as a way for students to engage in public conversations about scientific topics and gain practice in sharing ideas and engaging in discussion and debate.

Note: The Do Now project will be more thoroughly discussed during the "Students and Social Media: Participating in Broader Conversations" workshop on Monday, August 3.

Fostering Interdisciplinary STEM Research Partnerships

Kaven Hall 116

Track: Scientific and Research-based Approaches to Learning

Rick Duschl, rad19@psu.edu

Penn State University

This session will overview recent reports and workshops coordinated by the National Research Council and National Science Foundation. The shift to the teaching and learning of STEM practices has implications for K-12 education but also for undergraduate programs engaging in Design-Based Educational Research. Two foci for the session will be 'Integrated STEM' and 'Science of Learning' initiatives and goals.

“MacGyver on the Hudson”

Washburn 229

Matt Mogensen, matthew.mogensen@usma.edu

Frank Wattenberg, frank.wattenberg@usma.edu

United States Military Academy

This discussion-based session on robotics and artificial intelligence will consider how our lives will change dramatically over the next few decades with the use of robotic agents driven by artificial intelligence, a development that will generate both opportunity and obligation for educators. This is a hands-on workshop in the spirit of the “maker movement.” Participants will build simple robotic devices using inexpensive and widely available equipment. Cadets in a pilot program at the United States Military Academy, for example, are each given a “personal robotics laboratory,” costing about \$300.00, which allows them to build a huge variety of robotic devices. Participants will experience some of the classroom-ready materials that can be used to teach basic STEM content. More importantly, however, we will see how we can help our students develop their own ideas and understand both the potential and limitations of robots and artificial intelligence.

Note: If you have a personal computer on hand, you may wish to bring it to this session and pre-load the software at <http://www.arduino.cc/en/Main/Software>. This is not necessary, but would be worthwhile.

Analytics & Heuristics: Using Big Data to Reintegrate the Human in Technical Problems

Stratton Hall 202

Track: Working and Teaching with Data

Brent Faber, bfaber@wpi.edu

Worcester Polytechnic Institute

Heuristics are formal strategies for generating content that use structured processes to discover information, find solutions to problems, or propose alternatives. As such, heuristics can be important for teaching creativity and especially, for teaching students to think “laterally” about problems, rather than in disciplinary silos.

Similarly, analytics is concerned with transforming raw and unstructured data into forms that can be mined, interpreted and validated. More importantly, large data sets can now be joined on unique data points to connect data that, at first consideration, may not be seen to have much in common. For example, data may be joined by zip code to produce geographic analysis, or by ethnicity, gender, or age to group data by other demographic variables.

Using three case studies from student projects, this session will demonstrate how large data sets can be used to introduce science and engineering students to the human dynamics of technical and scientific problems.

Rewiring Life: The Civic Dimensions and Teaching Opportunities in Biological Engineering

Higgins Labs 202

Natalie Kuldell, nkuldell@mit.edu

Massachusetts Institute of Technology

Bill Gates once told *Wired* magazine that if he were young today he “would be hacking biology,” but what happens when the DNA code that runs living cells can be easily reprogrammed? Genetically engineered machines are being designed and built by college students as well as high school and middle school students in the context of their lab classes, design competitions, and summer camps. This session will provide background on the emerging field of synthetic biology, describe existing examples of how it is being taught, and include some “hands-on” examples of its design framework in action. Opportunities for public engagement around the legitimate promise and potential perils associated with this hyped field—the compelling civic issues that will undoubtedly emerge as this technology advances—will also be identified and discussed.

5:15 P.M. – 7:15 P.M. POSTER PRESENTATIONS I

Rubin Campus Center, Forkey Commons

A NOTE ON THE SSI 2015 POSTER PRESENTATIONS

We are pleased to invite you to attend special poster sessions that feature the work of SSI 2015 participants. Poster authors will be on hand to share their work, exchange ideas, and answer questions during the designated Poster Presentations time. Posters will be on display during the afternoons of July 31 and August 1. You will receive a booklet with your registration materials that will include abstracts for each project displayed, as well as contact information for poster authors. We hope that this booklet will facilitate meaningful exchanges during the Institute and encourage you to follow up with colleagues after the Institute. Refreshments will be served during the presentations on July 31, and following the presentations on August 1.

This set of poster presentations focuses on classroom programs. More information, including poster abstracts, can be found in the SSI 2015 Poster Presentations Booklet.

7:15 P.M. – 11:00 P.M. POST-SESSION MIX AND MINGLE

Goat's Head Restaurant

Each evening, the Goat's Head Restaurant will be open for SSI participants to mix and mingle following the day's activities. A cash bar will be available.

SATURDAY, AUGUST 1ST

Notes on the Program

Hotel shuttles are available to the WPI campus upon request from either the Courtyard by Marriott hotel, or the Residence Inn hotel. The Courtyard by Marriott is also located within walking distance of the WPI campus (approximately 15 minutes). Please check the maps included in the program book for paths to Institute session locations.

7:00 A.M. – 8:30 A.M.

BREAKFAST

Alden Hall

8:30 A.M. – 10:00 A.M.

ALL-INSTITUTE PLENARY SESSION III

Alden Hall

Eliza Reilly, presiding

Plenary Presentation: The National Park Service and the Nation's Learning Landscape

Julia Washburn, julia_washburn@nps.gov

Associate Director for Interpretation, Education and Volunteers

National Park Service

Julia Washburn, Associate Director for Interpretation, Education and Volunteers for the National Park Service, will highlight the role of the National Park Service as part of the nation's learning landscape, especially regarding scientific and historical literacy. Washburn will give examples of how our nation's National Parks serve as places for inspiration, recreation, conservation, and learning, as well as places of healing and reconciliation. She will highlight some of the challenges that the parks face today, and some of the strategies the NPS has identified to achieve relevance in its second century.

10:15 A.M. – 11:45 A.M.

WORK SESSIONS III

Plenary Follow-up Session: Partnership and Collaborations between Higher Education and the National Parks

Higgins Labs 116

Track: Public Engagement with Science

Julia Washburn, julia_washburn@nps.gov

National Park Service

Join Julia Washburn, National Park Service Associate Director for Interpretation, Education and Volunteers, to discuss potential partnerships and collaborations between higher education organizations and the national parks to promote science literacy and civic engagement. This will be an interactive dialog and brainstorming session.

Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome

Higgins Labs 218

Track: Scientific and Research-based Approaches to Learning

Shawn Fitzgerald, shawn.fitzgerald@usma.edu
Matthew Greb, matthew.greb@usma.edu
Jerry Kobylski, gerald.kobylski@usma.edu
Matthew Mogensen, matthew.mogensen@usma.edu
Franz Rademacher, franz.rademacher@usma.edu
Reginald Shelton, reginald.shelton@usma.edu
United States Military Academy

Many higher education institutions have student learning outcomes aimed at producing critical and creative thinkers who can solve complex problems. Research indicates that an effective method for developing these skills is to present students with complex problems that require knowledge grounded in multiple disciplines, and there is a growing trend towards more interdisciplinary offerings in the college curriculum. At West Point, our interdisciplinary program is in its third year and involves approximately 15 “general education” courses. We will briefly summarize our interdisciplinary efforts to date and then focus the discussion on a framework, based on SENCER ideals, that we have utilized throughout our development process. Participants will be asked to contribute during multiple breakout sessions that will focus on identifying appropriate learning outcomes and assessments and some of West Point’s direct and indirect assessment results will be presented. We will conclude with a discussion on the potential challenges that arise during the development and implementation of an interdisciplinary program.

Note: This session will be offered in lieu of a traditional plenary follow-up session.

Revitalizing General Biology

Salisbury Labs 104

Monica Devanas, devanas@ctaar.rutgers.edu
Terry McGuire, mcguire@dls.rutgers.edu
Rutgers University

Theo Koupelis, tkoupeli@broward.edu
Broward College

Eliza Reilly, eliza.reilly@ncsce.net
National Center for Science and Civic Engagement

Introductory Biology can be an important gateway course to further undergraduate study in the sciences. More often, it is the only science course many undergraduates will take. At the same time, the biological sciences are witnessing extraordinary advances in knowledge and are central to addressing many current civic challenges. This discussion-based session is intended as a forum to discuss the limitations of the traditional *General Biology* curriculum, and the materials and texts that currently support it, and to propose alternative approaches. What do students really need to know? What range of materials and teaching tools will help faculty engage and retain student interest in biology? How can SENCER, and its community of innovators, contribute to this effort?

Civic Engagement Strategies

Salisbury Labs 305

Glenn Odenbrett, glenn.odenbrett@case.edu
Case Western Reserve University

Pam Proulx-Curry, pamela.proulxcurry@maine.edu
University of Maine at Augusta-Bangor

SENCER courses that include service-learning activities benefiting community-based organizations can serve as a powerful engine of civic engagement that also significantly enhance learning. The goals of this session are to provide participants with an overview of best practices in service learning, robust examples of how service learning has enriched undergraduate coursework in the sciences and engineering, and the opportunity to identify and develop service-learning activities that could be integrated into coursework on their own campuses.

Designing a Curriculum for Deep Learning

Salisbury Labs 402

Track: Curriculum and Pedagogy

Karen Kashmanian Oates, koates@wpi.edu
Tara Mann, tmann@wpi.edu
Worcester Polytechnic Institute

In this session, attendees will examine the motivations behind the courses we teach—why are they taught, and for what end? In a workshop format, the presenters will link participants' specific objectives to what we know about how people learn. From these discussions, presenters and participants will be able to identify and talk through the elements of their courses that help students learn and meet the course's learning objectives—and they will also discover where and why sometimes these elements fail to meet the objectives.

Interpreting Data: A Cautionary Tale

Salisbury Labs 411

Track: Working and Teaching with Data

Randy Paffenroth, rcpaffenroth@wpi.edu
Worcester Polytechnic Institute

Making decisions and gaining insights from data are overarching goals of modern Data Science. However, how does one know that the decisions made or the insights uncovered are actually sound? While nothing is certain (except "death and taxes," as Ben Franklin noted) there are many tools that one can use to identify which inferences, estimates, or conclusions are actually supported by a given collection of data, and which are not.

Here we will discuss some examples that illuminate classic flaws in reasoning about data, including:

- The Base Rate Fallacy – If you take a test for a disease and it comes back positive, then what are the chances you actually have the disease?
- Over-fitting – Do complicated models help one understand data, or do they actually mislead?

- Training and Testing – Why do you believe that insights you gain from data will actually still be true when new data arrives?

All of these topics will be presented by way of concrete examples, do not require any statistical background, and will be suitable for incorporation into classes that are not necessarily mathematically focused.

11:45 A.M. – 1:00 P.M. LUNCH

Alden Hall

1:15 P.M. – 2:15 P.M. TEAM TIME

Team Time

Teams may find any suitable location on campus to conduct a team meeting.

Session for Individual Representatives, Part Two

Higgins Labs 116

Wm. David Burns, david.burns@sencer.net
National Center for Science and Civic Engagement

2:30 P.M. – 3:30 P.M. CONCURRENT SESSIONS II

NCSCE/SENCER Sustainability: Membership

Salisbury Labs 104

Track: The Future of NCSCE and SENCER

Jonathan Bucki, jonathan@dendros.com
The Dendros Group, LLC

Danielle Kraus Tarka, danielle.kraus@ncsce.net
National Center for Science and Civic Engagement

Do you care about the future of SENCER and NCSCE? Do you have ideas how to make this effort more valuable to more people? We need you! NCSCE/SENCER has been engaged in strategic planning for past several years. One of the ideas we are actively exploring is membership as a revenue and sustainability strategy. We need your help exploring the pros and the cons and different ideas for ensuring value to our stakeholders. We will also explore the lifecycle of participants in our programming, from when they hear about us to when they actively engage as leaders and scholars. Facilitated by Jonathan Bucki of the Dendros Group, and Danielle Kraus Tarka, Deputy Director of NCSCE, we promise a valuable and stimulating conversation for all participants regardless of your historical connection to SENCER and NCSCE.

Reflective Practice

Higgins Labs 116

Monica Devanas, devanas@ctaar.rutgers.edu
Rutgers University

Reflective learning practices allow students to step away from and analyze their learning experience to help them develop critical thinking skills and improve on their future performance. Reflective learning moves students from superficial or surface learning to deep learning through a range of activities that include self-reflection, peer reviews, and personal development plans. Understanding assessment criteria and acting on feedback is also a way of encouraging students to reflect on what they have learned and how they can improve.

Participants in this session will consider an array of reflection strategies that will help their students:

- Identify gaps in their study habits and ways to improve
- Better understand their approaches to assessment and testing to improve in the future
- Provide evidence and examples of the skills, critical thinking and mastery of content
- Identify opportunities for learning or developing skills outside their course of study, and
- Develop transferable skills that are valuable for their future careers

Getting Started with the SENCER-SALG

Higgins Labs 218

Track: Scientific and Research-based Approaches to Learning

Stephen Carroll, scarroll@scu.edu
Santa Clara University

This session will introduce attendees to the SENCER–SALG (Student Assessment of their Learning Gains) and provide instructions on how to use it to assess student learning in their classes. The session will begin with some basic principles of the SENCER–SALG’s design and show how understanding those principles will help faculty members use the instrument more effectively. Working directly with the SENCER–SALG website, participants will learn how to set up survey instruments for their own classes, how to administer the surveys, and how to interpret the results. Participants will learn how to customize the instrument to include their own course goals as well as SENCER’s programmatic goals. This session is especially geared for those new to the SENCER–SALG. Attendees will become comfortable with the SENCER–SALG and motivated to use it to help them understand in more detail what (and how) students are learning in their classrooms.

Participants will be able to:

- Understand basic principles of assessing student learning (especially as they are manifested in the SENCER–SALG),
- Use the SENCER–SALG to assess student learning in their classes, and
- Customize the SENCER–SALG to include their own course goals as well as SENCER’s.

Note: if your team or group is not familiar with the SALG, we suggest one member attend one of the sessions. Use of the SALG is required on Post-Institute Implementation Award applications that involve courses or academic program revision or development.

Adapting Large Lecture Formats to SENCERized Teaching and Civic Engagement

Salisbury Labs 305

Garon Smith, garon.smith@mso.umt.edu

University of Montana

Some people think it is impossible to use the SENCER approach, and attempt any form of authentic civic engagement, in large, content-driven, lecture-style STEM classes. This session shows you how it can be done. *Chemistry 121*, a SENCER course at the University of Montana, successfully engages ~800 students a year in addressing serious science-oriented societal problems and following-up with civic action. After introducing the relevant topics during class-time, an “extra credit” mechanism motivates students to participate in relevant outside-of-class activities including after-school mentoring of at-risk students, attending or testifying at local policy formulation hearings, chairing sessions at our campus undergraduate research conference, judging grade school science fairs, and staffing stations at our city’s annual household hazardous waste cleanup days.

Analyses of raw course averages versus extra credit points reveal that students across the entire range of academic performance take advantage of these “extra credit” opportunities. Responses collected during administration of the SENCER-SALG support both the appeal and efficacy of this course strategy. Participants will (1) recognize that the extra credit strategy involves a minimum of “time stealing” from content delivery so that this mechanism can be used in majors just as easily as in non-majors courses; (2) be alert to choosing example problems based on real-world, local issues that respect the interests of the students but also support the course content; (3) appreciate that getting the students active in the community is a win-win-win situation, for the student, the community and the institution.

Leading Change in a Dynamic Environment

Salisbury Labs 411

Track: Professional Development

Karen Kashmanian Oates, koates@wpi.edu

Worcester Polytechnic Institute

Theo Koupelis, tkoupeli@broward.edu

Broward College

W.E. Deming once said that “evolution is not mandatory, extinction is always an option.” This statement also holds true for programs and approaches to higher education and learning. When it comes to education models, without change through time, extinction is an option. This session will describe how change on college campuses can be accomplished through a thoughtful process of strategic alignment and a methodology that utilizes John Kotter’s (author of *Leading Change*) approach.

Research has shown that it requires 75% of campus stakeholders to reach the critical mass needed to implement and institutionalize change on a campus. At colleges and universities, getting a 75% rate for almost anything is difficult, to say the least. Further, developing a sense of urgency around the need for change may provide the initial spark to get things moving, but not for sustained impact. This session will examine the processes used by more than 100 companies to remake themselves into better competitors. Colleges and universities are using this same approach to generate the support needed to initiate new policies and procedures while respecting authentic shared governance.

A Relevant Technical Education Model for Non-STEM College Students

Higgins Labs 114

Track: Working and Teaching with Data

Herbert Schanker, herbert.schanker@csi.cuny.edu
CUNY at the College of Staten Island

The Computer Science Department at the College of Staten Island (CSI), in order to prepare their student body to become useful citizens in this complex, and fast changing environment, offers a comprehensive general education technology course. This multi-section course has become very popular and a special TechEP (acronym for Technical Education Program) web site was developed to support the program. TechEP was selected as a national SENCER model in 2014.

The technology course and its related TechEP website were designed to achieve important student learning goals of information literacy, quantitative and mathematical reasoning, social responsibility and civic engagement, and written and oral communication skills. This presentation will provide a discussion of TechEP's curriculum, lectures, labs, mathematics, media, and the range civic issues addressed.

Communicating Your Science: The Dual Poster Concept

Higgins Labs 154

Cynthia Maguire, cmaguire@twu.edu
Texas Woman's University

Many scientists struggle to communicate the results and implications of their work to the public. Disciplines and sub-disciplines tend to produce their own vocabularies, which are not understood by "outsiders," even by other scientists in complementary fields of research. By learning to reduce jargon and describe highly complex ideas so that they are easily understood by non-specialists, researchers will be better equipped to share the significance of their work with the public, including people in other disciplines, and inform policy makers about their science. Good communication skills can greatly support a young scholar's metamorphosis from novice to professional scientist.

Dual posters are an effective way for science students to learn how to effectively communicate their research to non-experts. Using a handbook with a step-by-step process for translating an existing scientific "technical" poster into a "public" poster student researchers learn how to explain their work clearly while keeping the integrity of their science intact. The presenter is seeking collaborators to develop this concept in a variety of academic institutions and disciplines with the goal of assessing the effectiveness of the dual-poster as a communications and teaching tool. Considering our extremely small sample size, additional data from other institutions is needed to add credibility to this claim. Results of the pilot study of dual poster effectiveness will be presented, along with questions that will focus future research.

Four Weeks on Water

Higgins Labs 202

Cyndy Carlson, cyndycarlson@gmail.com
New England College

Doug Earick, dlearick@mail.plymouth.edu
Plymouth State University

Rachel Whitaker, rwhitaker@ccsnh.edu
White Mountains Community College

Inspired by the Summer 2014 SENCER Institute, a team of faculty representing three 2-year and 4-year New Hampshire colleges developed an integrated, multi-disciplinary environmental science curriculum that was taught concurrently at their separate institutions during the Spring semester of 2015. The new curriculum, titled *Four Weeks on Water*, utilized SENCER ideals to impact learning and engagement of 16 Community College students and 42 students at the four-year college students completed cross-institutional website development projects on an issue or problem of concern around the topic of water in New Hampshire. Critical aspects of the curriculum included (a) the utilization of “flipped classroom” technologies for shared instruction; (b) usage of Google multi-platform supports, including Docs, Hangouts, Sites, and Drive; (c) focus on the development of 21st Century learning skills; (d) the use of real-time data and the development of data literacy skills; and (e) a focus on engaging learning on relevant issues. Issues arising during the roll out of the curriculum included asynchronous class times and semester schedules, technology availability and reliability, and differential student motivation.

At this session, faculty involved in the development and implementation of the project will give concrete advice to other institutions hoping to develop similar projects, including lessons learned, technology issues, and inter-institution communication. Faculty will provide personal reflections on the impact of the curriculum on their classes and on students’ learning, including summary of the SALG results and presentation of student project outcomes and projects. Those attending the session will have ample opportunity to ask questions, suggest next steps for the project, and discuss the potential for future inter-institutional collaborations.

Adapting Social Media to Case Study Development in a SENCER Model Course, *Mysteries of Migration* *Salisbury Labs 105*

Track: Public Engagement with Science

Julia Nord, jnord@gmu.edu
Tyler Fabian, tfabian@masonlive.gmu.edu
Tom Wood, twood@gmu.edu
George Mason University

Mysteries of Migration is one of the original SENCER model courses that uses group learning and semester-long development and presentation of case studies focused on current events. Integration of the biology of migration, public policy and ethics creates a learning environment for students to pursue complex problems of their own choosing. The course has evolved to include opportunities for students to communicate their learning outside the classroom through social media. This session will discuss this new integrated and student-centered approach.

Incorporating Civic Engagement in Undergraduate Research

Salisbury Labs 402

Session topics: Undergraduate Research, Teaching and Learning

Joseph Kirsch, jkirsch@butler.edu

Butler University

Richard Sheardy, rsheardy@mail.twu.edu

Texas Woman's University

For many years we have discussed and analyzed the role of civic engagement in enhancing student learning in the lecture hall. However, the role of undergraduate research has been relatively under-explored. As SENCER has extended its impact to science majors, the incorporation of civic engagement into undergraduate research has become an increasingly important question.

This workshop will feature presentations by faculty who have had success in coupling civic engagement and undergraduate research. The ultimate goal of the workshop is to provide not only a platform for discussion, but to also to help participants develop research projects for students that have significant civic engagement components. At the end of the workshop, each participant will have a workable plan that can be used in the upcoming academic year for getting students involved in research-based activities addressing a local civic issue.

Overcoming Barriers Toward Teaching Visually Impaired Students

Salisbury Labs 406

Track: Engaging Underrepresented Communities in Science

Eugene Allevato, eugene.allevato@woodbury.edu

Woodbury University

This session will argue that a project-based approach is an effective strategy for teaching statistics to the visually impaired (VI), which is a growing segment of general education students. Because many instructors still have outmoded views and misconceptions about teaching the VI student an instrument was developed to evaluate the instructors' attitudes and behaviors and to identify potential benefits and challenges related to education of the visually impaired.

The study utilized a mixed-method approach integrating qualitative and quantitative research. Initial results indicate that being a member of the SENCER community and being involved in designing civic engagement courses fosters a more positive attitude towards teaching the VI, which in turn influences the success of the VI student's participation and inclusion in mainstream education. This study has demonstrated that a project-based activity may be a key strategy for motivating and engaging the VI student in the learning process.

How to Break Free from Lecture Style Teaching in your Anatomy Courses

Salisbury Labs 407

Naveen Aman, naman@ccc.edu

Vijayalakshmi Natarajan, vnatarajan@ccc.edu

Harry S. Truman College

At Truman College, Incorporating technology into human anatomy and physiology courses has resulted in major gains in student learning as measured by the SALG. Results collected from over four semesters indicated over 60% improvement in anatomy and physiology-I and over 55% in anatomy and physiology-II courses. SENCERized topics in those selected sections included, “Ebola virus” and “Anatomy and Pathology of Bones” for the evaluation of student’s understanding of the current societal issues using quantitative and qualitative data. The Truman College Anatomy and Physiology Department was able to achieve these results by adopting a “student-oriented” method, rather than a “teacher-centered” method of lecturing, one that incorporates discussion forums, group activity and case studies into the lectures. This session will help participants to explore all the possible technologies for student-oriented teaching of anatomy and physiology that do not require a high degree of technology expertise.

3:30 P.M. – 5:00 P.M. POSTER PRESENTATIONS II

Rubin Campus Center, Forkey Commons

This set of poster presentations focuses on community programs. More information, including poster abstracts, can be found in the SSI 2015 Poster Presentations Booklet.

5:00 P.M. – 7:00 P.M. DINNER HONORING LEADERS IN THE NCSCE COMMUNITY

Campus Center Odeum

Amy Shachter, presiding

All SSI 2015 participants are invited and encouraged to attend. During the dinner, we will bring attention to the leaders of all NCSCE initiatives, as well as SENCER Leadership Fellows, and other honored guests who are joining us for the Institute. All SSI participants are invited to attend.

Conversation: Scaling STEM Reforms

Rick Duschl, rad19@psu.edu
Penn State University

Wm. David Burns, david.burns@sencer.net
National Center for Science and Civic Engagement

Danielle Kraus Tarka, danielle.kraus@ncsce.net
National Center for Science and Civic Engagement

Mercedes Talley, mtalley@wmkeck.org
W.M. Keck Foundation

Presentation of the William E. Bennett Team and Individual Awards for Extraordinary Contributions to Citizen Science

7:00 P.M. – 11:00 P.M. POST-SESSION MIX AND MINGLE

Goat’s Head Restaurant

Each evening, the Goat’s Head Restaurant will be open for SSI participants to mix and mingle following the day’s activities. A cash bar will be available.

SUNDAY, AUGUST 2ND

Notes on the Program

Hotel shuttles are available to the WPI campus upon request from either the Courtyard by Marriott hotel, or the Residence Inn hotel. The Courtyard by Marriott is also located within walking distance of the WPI campus (approximately 15 minutes). Please check the maps included in the program book for paths to Institute session locations.

7:00 A.M. – 8:30 A.M.

BREAKFAST

Alden Hall

8:30 A.M. – 10:00 A.M.

ALL-INSTITUTE PLENARY SESSION IV

Alden Hall

Monica Devanas, presiding

Plenary Presentation: How Can the SENCER Ideals Support the Challenging and Changing Institutional Accreditation Landscape?

Jerry Kobylski, gerald.kobylski@usma.edu

Professor of Mathematical Sciences

United States Military Academy

Why are assessment and accreditation topics becoming more prominent in our faculty meetings? How can I integrate into my course disciplinary guidelines, student and personal interests, effective pedagogical techniques, and the growing assessment requirements? In addition to my students, who else at my school would be interested in my assessment work, and help garner more course support? Will anyone really "look" at my assessment results?

These questions and more will be addressed as we discuss the extraordinary pace of change in the higher education landscape and institutional accreditation. Because of the escalating cost of higher education and the numerous critical evaluations of the quality of higher education, concerns have been raised by stakeholders, which include federal and state governments, college staff and faculty, and current and prospective students and their families.

During this session, we will discuss some trends and accompanying challenges found in schools throughout the seven regional accrediting regions. We will further discuss how the SENCER ideals can support our institutional efforts to demonstrate the quality and accountability of our learning processes, and thus potentially improve institutional support for SENCER approaches in the curriculum.

10:15 A.M. – 11:45 A.M.

WORK SESSIONS IV

Active Learning

Higgins Labs 116

Monica Devanas, devanas@ctaar.rutgers.edu
Rutgers University

Drew Sieg, robert.sieg@mtsu.edu
Middle Tennessee State University

Active learning engages students in their learning by encouraging thoughtful reflections, the practice of new skills, and the application of new knowledge. Active learning includes any activity that students do before, during, or after class that moves them beyond passive listening and note taking – to explore the materials, to consider what they have read, seen and heard, apply it to real life situations or new problems, and proactive the process of adapting and applying learning while alone, in pairs, or in groups. Decades of research in multiple disciplines, several models of instruction, and emerging best practices in assessing student learning are available for support the faculty member who believes students will learn better when classroom activity is not limited to lecturing alone. This session will provide an overview of effective practices in active learning.

Participants, working in small groups, will:

- Consider benefits and drawbacks to active learning
- Share their own efforts to incorporate active learning strategies
- Explore “Process Oriented Guided Inquiry Learning” (POGIL) strategies, and
- Examine active learning strategies for lab settings.

Building on the Intellectual Work of Teaching for Course and Curriculum Development

Higgins Labs 218

Track: Scientific and Research-based Approaches to Learning

Matt Fisher, matt.fisher@email.stvincent.edu
Saint Vincent College

The standards of scholarly work first proposed by Glassick, Huber, and Maeroff – clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique – have long been part of the discussion of individual faculty practice in their disciplines. But can these same standards, and a scholarly approach to teaching, serve as a resource for faculty concerned with developing or revising either courses or curricula? This session will focus on how the standards and criteria of the scholarship of teaching and learning (SoTL) have been applied to the intellectual work of teaching in a way that supports development and improvement of courses and curriculum. Examples will include work done by faculty in the SENCER community.

Science and Human Rights

Salisbury Labs 104

Track: Public Engagement with Science

Jessica Wyndham, jwyndham@aaas.org
American Association for the Advancement of Science

Karen Kashmanian Oates, koates@wpi.edu
Worcester Polytechnic Institute

How does what we do as scientists, engineers, scholars and educators connect to the universal human right to benefit from science as well as the ability to apply scientific knowledge across humankind? Do our obligations go beyond our scientific responsibilities to our discipline? In this interactive work session we will explore the connection between scientists, and the human right to science as well as our professional obligation.

Participants will learn about the various activities of the AAAS committee on human rights and science, analyze recent case studies, and discuss the recent allegations regarding torture implicating the American Psychological Association.

SENCERizing Science Writing

Salisbury Labs 305

Brent Faber, bfaber@wpi.edu
Tara Mann, tmann@wpi.edu
Worcester Polytechnic Institute

Studying and doing science is a vocabulary-rich process. Scientific vocabulary can be elegant, efficient, and an important element in establishing a student's knowledge and credibility. At the same time, a sophisticated and specialized vocabulary can mask incomplete or ineffective understanding of key details and processes. This is not only an issue for the public understanding and communication of science, but, as we will see, for safety and efficacy in STEM professions. For example, the safety issues in health care related to clarity of communication are immediate and pressing: from 2008 to 2011, between 210,000 and 400,000 deaths each year were associated with preventable harm in hospitals—making preventable harm to patients the 3rd leading cause of death in the US (J. of Patient Safety, 2013, 9/3: 122-128). The challenge of better preparing future professionals are immediate and serious.

In this session, participants will create assignments, tools, and methods for teaching science writing. Our aim is to teach students to be cognizant of the civic, safety, and scientific implications of what they are learning as they build their vocabulary and improve their writing skills. We will also be available throughout the Summer Institute to work with participants on science writing courses and assignments.

Modeling Data: Understanding Complex Biological Data Using Simple Simulation Tools

Salisbury Labs 402

Track: Working and Teaching with Data

Liz Ryder, ryder@wpi.edu
Worcester Polytechnic Institute

Things are getting complicated. In biology in particular, datasets are growing exponentially in size, and what we know about biological systems grows ever more complex. How can we get biology students, to become more comfortable with using computational and mathematical tools to analyze these data?

In this workshop, I will demonstrate several simulations built using the freely available software Starlogo Nova, which is easy to learn, and has a great visual interface. With only a few lines of code, you can see molecules, cells, or organisms moving on the screen. In our 'Simulation in Biology' course, we teach students to build biological simulations of their choice using this software. Not only do they learn to program through a project that speaks directly to their interests, through building and evaluating a simulation, they end up with a much deeper understanding of the biology. Although the examples are drawn from biology, this approach can be used to model many kinds of systems.

We are building a 'Simulation in Biology' kit, which we hope will allow biologists with no programming experience to teach this course at other schools. Come and see if you would like to be a beta test site!

Note: Please bring your computer and/or mobile device (tablet, smartphone) to fully participate in this session.

Robotics and Artificial Intelligence — A Panel Discussion

Salisbury Labs 411

Track: Curriculum and Pedagogy

Matt Mogensen, matthew.mogensen@usma.edu
Frank Wattenberg, frank.wattenberg@usma.edu
United States Military Academy

Our lives will change dramatically over the next few decades as the use of robots and artificial intelligence becomes more widespread. Robots can free us from dangerous and tedious jobs but they can also put us out of work and infringe upon our personal freedom and privacy. Robots interacting with humans use algorithms based on profiling when they determine whether we get a loan and on what terms, and legacy drivers (that's you and me) could find themselves banned from our roads when self driving vehicles become the norm. The robotic revolution presents educators with both an enormous opportunity and an urgent obligation. Whether robots change our world for the better or for the worse will depend on the personal and public policy decisions we and our students make over the next few years. These decisions must be informed by a deep understanding of the STEM disciplines together with law, ethics, economics, and all the social sciences and humanities.

This will be an open-ended panel and audience discussion based in part on our experiences with cadet projects at the United States Military Academy, workshops and discussions at several national meetings, and a pilot program starting this August exploring the possibility of using robotics and artificial intelligence as an interdisciplinary theme across our curriculum.

11:45 A.M. – 1:00 P.M.

LUNCH

Alden Hall

1:15 P.M. – 2:15 P.M. CONCURRENT SESSIONS III

Getting Started with the SENCER-SALG

Higgins Labs 116

Track: Scientific and Research-based Approaches to Learning

Stephen Carroll, scarroll@scu.edu

Santa Clara University

This session will introduce attendees to the SENCER–SALG (Student Assessment of their Learning Gains) and provide instructions on how to use it to assess student learning in their classes. The session will begin with some basic principles of the SENCER–SALG’s design and show how understanding those principles will help faculty members use the instrument more effectively. Working directly with the SENCER–SALG website, participants will learn how to set up survey instruments for their own classes, how to administer the surveys, and how to interpret the results. Participants will learn how to customize the instrument to include their own course goals as well as SENCER’s programmatic goals. This session is especially geared for those new to the SENCER–SALG. Attendees will become comfortable with the SENCER–SALG and motivated to use it to help them understand in more detail what (and how) students are learning in their classrooms.

Participants will be able to:

- Understand basic principles of assessing student learning (especially as they are manifested in the SENCER–SALG),
- Use the SENCER–SALG to assess student learning in their classes, and
- Customize the SENCER–SALG to include their own course goals as well as SENCER’s.

Note: if your team or group is not familiar with the SALG, we suggest one member attend one of the sessions. Use of the SALG is required on Post-Institute Implementation Award applications that involve courses or academic program redesign or development.

SENCER and your Career

Higgins Labs 218

Track: Professional Development

Rob Sanford, rsanford@usm.maine.edu

University of Southern Maine

We are in an era of transition in the academy, with fewer tenure-track positions, and less likelihood of working at one institution through retirement. Career management has become an essential skill for both new and mid-career faculty. This session will explore ways in which SENCER can assist the professional and career development of its participants, with a focus on some individual strategies tailored to your personal situation and goals.

The Changing Digital Landscape and Its Impact on Healthcare

Salisbury Labs 104

Track: Public Engagement with Science

Chuck Gahun, chuck.gahun@sencer.net
National Center for Science and Civic Engagement

Over the last decade, technology has had a profound effect on the healthcare ecosystem. The entire landscape of healthcare delivery is changing due to the growing use of data and devices. When data is combined with technology, it has the ability to provide patients and healthcare providers with more information about their health – in real time. Ultimately, this change in the digital landscape is helping us understand the human body better as well – leading us to new hypotheses and conclusions about major diseases and epidemics. This session will explore the civic issues that these changing dynamics in healthcare are impacting through this patient centric education revolution.

Department-wide Reform of STEM Education: Lessons from the National PULSE Project to Transform Biology

Salisbury Labs 305

Ellen Goldey, goldeyes@wofford.edu
Wofford College

PULSE (Partnership for Undergraduate Life Sciences Education) and SENCER join forces in this workshop to engage teams (or individuals) in strategies for developing a shared vision for department-wide improvement. Using a rubric designed by the PULSE Fellows, participants will consider ten factors known to improve learning and faculty efficacy. Participants will reflect on where their department is now, establish priorities for improvement, share best practices, and discuss ways to overcome the myriad of challenges in department-level change. Regardless of your disciplinary affiliation or title, this session will be helpful in modeling how you can engage your faculty colleagues in discussing these issues back home.

The Role of Research in SENCER Programs

Salisbury Labs 402

Wm. David Burns, david.burns@sencer.net
National Center for Science and Civic Engagement

Amy Shachter, ashachter@scu.edu
Santa Clara University

Every year since the first SENCER Summer Institute in 2001, the Summer Institute program has included at least one session on undergraduate research, usually with an emphasis on community-based research. The reasons for this are obvious: First, a focus on complex, contested, unsolved civic issues begs a set of questions, and these questions require the products of serious, systematic inquiry, which is another way of describing “research.” Second, students simply learn more, and learn better, when they are engaged in serious discovery. It’s good practice.

Earlier this year, Jay Labov, a long-time leader in the SENCER community and Senior Advisor for Education and Communications to the National Research Council of the National Academy of Sciences, organized a “Convocation on Integrating Discovery-Based Research Into the Undergraduate Curriculum.” The Convocation had an ambitious agenda, including a focus on “models [that] have been developed to engage larger numbers of undergraduates in research using an academic year course-based format.” SENCER leaders Cathy Middlecamp and David Burns, were invited to present on programs that use the campus itself as a site for research (Middlecamp) and on community-based (external) challenges, as sites and/or topics for research (Burns).

The Convocation sought to identify best practices for implementation, consider a variety of approaches to instantiate authentic research in undergraduate courses, and identify important challenges. A report will be produced for general distribution this Fall.

This session will highlight how research can be incorporated in SENCER courses (Shachter) and will feature a report on the Convocation by one of its participants (Burns).

**Storytelling, New Media Strategies and Emerging Technologies:
Building Bridges between Natural Sciences, Social Sciences and Indigenous Knowledge to Tackle the Problem of Climate Change in Hawai‘i**

Salisbury Labs 411

Track: Engaging Underrepresented Communities in Science

Patricia Amaral Buskirk, pbuskirk@hawaii.edu

Ulla Hasager, ulla@hawaii.edu

University of Hawai‘i at Mānoa

This interactive session will present a work in progress that uses new media strategies and emerging technologies to address the problem of climate change in Hawai‘i. The proposed communication platform integrates emerging digital interactive technology with innovative documentary practices to increase the ways audiences may engage with the content. This new form of interactive storytelling offers the opportunity to communicate the impact of climate change through an indigenous perspective, and allows for integration of multimedia communication strategies and campaigns to encourage community support and activism. This interdisciplinary approach to climate change seeks to build a bridge between Indigenous knowledge and Western science, as well as to merge the arts and sciences to enhance student learning. Social media and cross-promotional campaigns are included in the communication strategy, to drive audiences towards websites and to present simple and straightforward ways for individuals to get actively involved.

Connecting Computer Science to Society: Building a Community of Educators

Higgins Labs 114

Track: Curriculum and Pedagogy

Susan Reiser, reiser@unca.edu
University of North Carolina at Asheville

Pamela Silvers, pamelajsilvers@abtech.edu
Asheville-Buncombe Technical Community College

The US Bureau of Labor and Statistics, President Obama, and industry leaders all assert that we need to graduate more computer science majors and, in particular, that we need to graduate more female computer science majors. Assessment data suggests that SENCER approaches are particularly effective, especially in retaining women STEM majors.

How can we expand the number of women in our programs? How can we help students apply their computer science content to matters of real civic consequence? How can we link our programs to the community, to society? Computing programs at the University of North Carolina at Asheville (UNC Asheville) and Asheville-Buncombe Technical Community College (AB Tech) will share their initiatives designed to address these issues. At UNC Asheville, two SENCERized computer science courses were piloted last year: an introductory programming course in which students built games for the North Carolina standard course of study, and an introductory general education course, creative fabrication. AB Tech will share some of successful strategies for recruiting women into their technology programs. Please attend and share your ideas and experiences!

Using Hurricane Sandy As A Unique Learning Opportunity Utilizing Academic Service Learning and Civic Engagement

Higgins Labs 154

Marilyn Dono-Koulouris, donokoum@stjohns.edu
Roberta Hayes, hayesr@stjohns.edu
St. John's University

In the New York area, Staten Island was one of the hardest hit areas by Super Storm Sandy. In the spring semester following the storm a learning community, consisting of students in *Scientific Inquiry* and *Discover New York*, performed Academic Service Learning projects within the beach areas affected by the storm. As part of an *Introduction to Academic Service Learning and Civic Engagement* groups of students were also assigned one of the areas affected by the storm for their project focus.

This presentation will demonstrate how students studied the effects of Hurricane Sandy on the neighborhood, human health, and the local ecology an experience that contributed to the public knowledge about the disaster, heightened their critical thinking skills and increased their ethical awareness in preparation for service and leadership roles in the local, national, and international spheres. Student research projects and the data collected addressed ecological damage to trees and fauna, an analysis of governmental responses by neighborhood, and saltwater intrusion on plant growth.

Survey Research

Salisbury Labs 105

Track: Working and Teaching with Data

Janice Ballou, jballou@optonline.net
National Center for Science and Civic Engagement

Survey Research (aka polling) is ubiquitous. But are all surveys created equal? The main goal for this one-hour session is to give participants resources that can be used to critically assess survey quality by evaluating the scientific (or unscientific) methods used to generate data. This ability is particularly important as the amount of data increases and Big Data competes with traditional scientific survey research methods.

Why do informed citizens need to know how to evaluate survey research? We will review examples of how these data and related statistics influence public opinion and policy to illustrate why methods matter. Examples will include rigorous federal studies, such as the U.S. Census and Bureau of Labor Statistics data, used to determine government policy and funding decisions; the National Science Foundation longitudinal studies to track the science and engineering workforce; polls on health attitudes and behaviors; and pre-election media polling.

Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?

Higgins Labs 202

Jonathan Bucki, jonathan@dendros.com
The Dendros Group, LLC

Hailey Chenevert, hailey.chenevert@ncsce.net
National Center for Science and Civic Engagement

Ellen Mappen, ellen.mappen@ncsce.net
National Center for Science and Civic Engagement

Over the last few years, NCSCE's (the National Center for Science and Civic Engagement) SENCER-ISE (Science Education for New Civic Engagements and Responsibilities—Informal Science Education) initiative has supported cross-sector partnerships between a range of informal science education institutions (i.e. science and nature centers, museums, zoos, etc.) and higher education institutions. NCSCE is now taking stock of what we have learned from the interactions of the participating educators as we look towards the future nature of our work in this area.

We are looking to involve members of the SENCER community in the planning process and this session is one part of the ongoing process. Participants will get a brief overview of the initiative, hear what we have learned from our external evaluators about the partners' experiences, and discuss the benefits and challenges of working across the sectors. The remainder of the session will be spent thinking about how the current structure can evolve to serve a larger audience and getting input from the attendees on what they think this initiative can become.

Experiences with Civic Engagement at Truman State University

Salisbury Labs 406

LaRoy Brandt, lbrandt@truman.edu
Janice Clark, jclark@truman.edu
Alicia Wodika, awodika@truman.edu
Truman State University

The purpose of the session is to highlight three courses that incorporate civic engagement and service learning components including: (1) a freshman introductory biology course that introduces students to water quality monitoring and relates these results to institutional and municipal watershed policies, (2) an upper level *Restoration Ecology* course, which addresses the application of ecological concepts to develop multiple stakeholder, restoration projects, and (3) an upper level *Program Implementation and Evaluation* course that contains a number of civic engagement modules focused on health education and public health. Finally, we'll discuss the inclusion of a "Bulldogs in Action" first year experience service opportunity within the community.

The intent of these projects is to fully integrate civic engagement into the college experience. Outcomes from service learning experiences include greater cultural competency and literacy, utilization of transferrable skills in community settings, application of theory to practice, implementation and evaluation of their projects and experiences, and finally, evaluation of policies and advocacy for change. Ultimately, students can recognize the connection between course content and actual practice, and their relevance to the community in which they live.

NCSCE/SENCER Sustainability: Membership

Salisbury Labs 407

Track: The Future of NCSCE and SENCER

Jonathan Bucki, jonathan@dendros.com
The Dendros Group, LLC

Danielle Kraus Tarka, danielle.kraus@ncsce.net
National Center for Science and Civic Engagement

Eliza Reilly, eliza.reilly@ncsce.net
National Center for Science and Civic Engagement

Do you care about the future of SENCER and NCSCE? Do you have ideas how to make this effort more valuable to more people? We need you! NCSCE/SENCER has been engaged in strategic planning for past several years. One of the ideas we are actively exploring is membership as a revenue and sustainability strategy. We need your help exploring the pros and the cons and different ideas for ensuring value to our stakeholders. We will also explore the lifecycle of participants in our programming, from when they hear about us to when they actively engage as leaders and scholars. Facilitated by Jonathan Bucki of the Dendros Group, Danielle Kraus Tarka, and Eliza Reilly of NCSCE, we promise a valuable and stimulating conversation for all participants regardless of your historical connection to SENCER and NCSCE.

2:30 P.M.

AFTERNOON ACTIVITIES

Participation in afternoon activities except for the Worcester Art Museum requires pre-registration, as space is limited. If you did not sign up but are interested in an activity, please talk with a NCSCE staff member to learn if space is available.

WPI Sports and Recreation Center, Worcester and Boston

Participants going to Sunday Afternoon activities will meet at the Sports and Recreation Center Buses for afternoon activities will be specially marked.

Worcester Art Museum

The Worcester Art Museum is world-renowned for its 35,000-piece collection of paintings, sculpture, decorative arts, photography, prints, drawings and new media. The works span 5,000 years of art and culture. View paintings by Cassatt, Gauguin, Goya, Monet, Sargent and Whistler; admire floor mosaics from the ancient city of Antioch; see cutting-edge contemporary art; and discover the Museum's many other treasures. Special exhibitions showcase the masterworks, seldom-seen gems, and important works on loan (from <http://www.worcesterart.org/>).

Tower Hill Botanic Garden

Tower Hill Botanic Garden is the headquarters of the Worcester County Horticultural Society [WCHS]. The third oldest active horticultural society in the U.S., WCHS was incorporated in 1842 as a non-profit "educational organization for the purpose of advancing the science and encouraging and improving the practice of horticulture." For nearly 150 years this was accomplished through a busy schedule of flower shows and educational programs based in downtown Worcester. The Society purchased Tower Hill Farm in 1986 with the belief that the Society could best fulfill its goals by developing a garden open to the public (from <http://www.towerhillbg.org/>).

Still River Winery

Still River Winery is a warm and welcoming home-based winery located 25 miles west-northwest of Boston in the heart of scenic Harvard, MA. Harvard is known for its many historic farmhouses, picturesque New England town common, stone walls, hard working apple farms and the village of Still River with its stunning western vistas (from <http://stillriverwinery.com/>).

Boston Freedom Trail

The Freedom Trail is a 2.5-mile, red-lined route that leads you to 16 historically significant sites -- each one an authentic treasure. Explore museums and meetinghouses, churches, and burying grounds. Learn about the brave people who shaped our nation. Discover the rich history of the American Revolution, as it began in Boston, where every step tells a story (from <http://www.thefreedomtrail.org/>).

3:00 P.M. – 5:00 P.M.

NCSCE PUBLIC POLICY PLANNING GROUP MEETING

Salisbury Labs 105

This meeting is by invitation only.

7:00 P.M. – 11:00 P.M.

POST-SESSION MIX AND MINGLE

Goat's Head Restaurant

Each evening, the Goat's Head Restaurant will be open for SSI participants to mix and mingle following the day's activities. A cash bar will be available.

MONDAY, AUGUST 3RD

Notes on the Program

Hotel shuttles are available to the WPI campus upon request from either the Courtyard by Marriott hotel, or the Residence Inn hotel. The Courtyard by Marriott is also located within walking distance of the WPI campus (approximately 15 minutes). Please check the maps included in the program book for paths to Institute session locations.

7:00 A.M. – 8:00 A.M.

BREAKFAST

Alden Hall

8:00 A.M. – 9:30 A.M.

ALL-INSTITUTE PLENARY SESSION V

Alden Hall

Danielle Kraus Tarka, presiding

Plenary Presentation: A Little Bit of Leaven: The SENCER Work of Lipscomb University

Autumn Marshall, autumn.marshall@lipscomb.edu

Associate Professor and Academic Chair, Nutrition

Lipscomb University

“A little leaven leavens the whole lump.” The SENCER work at Lipscomb University is like a little bit of leaven: a modest experiment with integrated science courses is having an impact in many places, some expected and some unexpected.

Before our first foray into SENCERized science courses, the university created a first year seminar program that involved integrated disciplines (including STEM) in a writing intensive course. Since the arrival of Ben Hutchinson in 2004, the university has been working to SENCERIZE general education science courses and the first integrated science courses were introduced in 2009. Since that time, the entire general education program at Lipscomb has begun to integrate many disciplines, including STEM, Humanities, and Social Sciences.

In 2006, Richard Goode began the Lipscomb Initiative For Education (LIFE) program to provide an Associate of Arts degree to women in prison in Nashville. The physical science course for that degree was the SENCERized blend of physics and nutrition. Most recently, competency based education has come to Lipscomb, providing a maximum of 30 credits for knowledge gained through experience, and many of the students in the LIFE program have received the full 30 allowable credits.

These programs, now so intertwined, are providing new avenues of science education and civic engagement for both students on campus and students in prison.

9:30 A.M. – 12:30 P.M.

WORKSHOP SESSIONS

Pearls of Practice: Identifying the Pearls in your Courses

Fuller Labs 311

Karin Matchett, karin@tomorrowsfootprint.com

Tomorrow's Footprint

“Pearls” are small activities or assignments that SENCER instructors use to engage students in learning scientific concepts through social/civic questions, or in making deeper use of their scientific knowledge by connecting it with real-world questions in their communities or daily lives.

In this workshop, we will examine several newly minted Pearls, focusing on their key components and their connections to the SENCER ideals and College Board's Enduring Understandings. We then will open the discussion to participants' ideas for new Pearls. Working in small groups as well as together, participants will help one another explore structures and topics that could be developed into “Pearls” in the coming year.

Portfolios and Career Development

Fuller Labs 320

Track: Professional Development

Monica Devanas, devanas@ctaar.rutgers.edu

Rutgers University

This workshop will investigate the flexibility of the portfolio format for describing and documenting many academic functions, including course portfolio, student portfolio, and administrative portfolio. The session will illustrate how the three basic components of the portfolio structure—what, why, and how well—can be adapted to serve various needs of faculty, students and administrators and others interested in quality and accountability. Formats for these various types of portfolios will be briefly presented followed by discussion and development of portfolio components customized to suit needs and interests of the participants.

A variety of portfolio applications will be presented. The participants will determine the directions and depth of discussion of applications of portfolio structure. Participants will practice applying the core elements of portfolios to their own needs, courses, programs, or institutions, as well as for their own professional development.

Writing Good Proposals to Support Your SENCER Work

Salisbury Labs 104

Wm. David Burns, david.burns@sencer.net

National Center for Science and Civic Engagement

The goal of this workshop is to equip participants with knowledge that will make them more competitive in the NSF grants competitions for education projects. Participants will engage in several brief exercises, and will read an authentic NSF proposal, evaluate it individually, and then discuss it in groups of five to eight people, the size of typical review panels in the division of undergraduate education.

Students and Social Media: Participating in Broader Conversations

Salisbury Labs 105

Track: Public Engagement with Science

Andrea Aust, aaust@kqed.org

KQED

This session will address the implementation of social media and simple media production as tools to engage students in civic discourse through KQED's Do Now project. Do Now provides students with a platform to discuss current, engaging scientific issues, like de-extinction, fracking and genetically modified organisms, through social media. Students research topics, share their thoughts, respond to each other's ideas, craft multimedia arguments and search for online publications to support their claims. They move from being purely consumers of media to active participants in conversations, often times looking at a national issue through the lens of their local communities.

Participants in this session will walk through the Do Now process, which includes reading a short article about a current scientific topic, reviewing a featured media resource and then responding to a question about the topic via Twitter or a comment on the KQED website. Various forms of student responses (e.g. tweets, comments, blog posts, infographics) from high school classrooms that are currently participating in Do Now will be reviewed as examples. Session participants will be introduced to ways that students can illustrate their viewpoints using a variety of free media-making tools. Best practices for using Do Now with students will also be discussed.

A small group of professors and classrooms in the SENCER community will be piloting the development of Do Now posts in Fall 2015, as well as participating in the discussions. This workshop will provide information for others interested in joining the pilot in the fall or spring semesters.

Note: Please bring your computer and/or mobile device (tablet, smartphone) to fully participate in this session.

Facilitating Strategic and Difficult Conversations

Salisbury Labs 305

Jonathan Bucki, jonathan@dendros.com

The Dendros Group, LLC

In the academy, the complexity of change is often daunting, requiring attention to a variety of stakeholders with multiple interests and perspectives. Navigating difficult and strategic conversations is an important skill in leading planning and other change efforts. In this workshop, we will explore a "meta" method for leading conversations with individuals and groups that brings order and flow to the experience. Using the Focused Conversation Method, participants will learn how to design conversations to maximize engagement and effectiveness. They will learn how to facilitate challenging and difficult conversations with faculty, administrators and other stakeholders. We will also explore how to anticipate and diffuse useless friction in planning and other conversations. This method is useful for groups considering proposals, reflecting on progress, developing planning processes, and engaging around sensitive issues. We will pay particular attention to conversations between faculty and administrators.

Many SENCER SSI attendees have participated in planning workshops facilitated by Jonathan Bucki of the Dendros Group. Over the last several SSI's, he has received many requests for information about the participatory facilitation techniques he uses. Now is your chance to explore a different approach to facilitating conversations. A follow-up webinar will be scheduled in September 2015 for participants to expand on this topic area and introduce new participatory leadership tools. This effort arises out of the recent department chairs training hosted by NCSCE.

Inquiring Into Our Students' Learning: Developing Your Scholarship of Teaching and Learning Project
Salisbury Labs 402

Track: Scientific and Research-based Approaches to Learning

Matt Fisher, matt.fisher@email.stvincent.edu
Saint Vincent College

This workshop is designed for SSI participants who are exploring a question related to student learning that they want to investigate more thoroughly. Through examination of the work of faculty who have been actively involved in SENCER and participated in SoTL workshops at past Summer Institutes, participants will develop an understanding of important characteristics of the scholarship of teaching and learning that can guide them in the development of project ideas. Time will also be provided for participants to start framing the question(s) for their own SoTL work and to identify forms of evidence that could be collected that could answer the questions. The workshop will include a short introduction to qualitative evidence and its analysis as part of the wider discussion of types of evidence. A significant part of the workshop is structured around individual reflection and small group discussion to help participants develop and revise their project ideas. Information about resource and tools for continuing to engage in this work will also be provided. Participants will leave the workshop with a more developed project and a list of specific "next steps" to take.

Essential Elements of Online and Blended Courses
Salisbury Labs 406

Track: Curriculum and Pedagogy

Adrienne Wootters, adrienne.wootters@mcla.edu
Massachusetts College of Liberal Arts

Online and blended (hybrid) courses are being offered with increasing frequency at all levels, from introductory to graduate courses. Typically, online STEM courses are offered as traditional introductory courses, with the students watching online lectures and taking traditional exams online. Teaching courses that embody the SENCER ideals in an online format is a challenge, but creative use of available technology, and development of the online class community can make for a rich and rewarding course. In this task-oriented workshop, we will explore the basic elements of successful online and blended courses, which include use of finding and creating resources for students, creating and nurturing an online community, and assessment of student work.

Note: Please bring a laptop computer to the workshop for full participation.

Developing Curriculum Using Real World Data

Salisbury Labs 407

Track: Improving Mathematics Education

Cindy Kaus, cindy.kaus@metrostate.edu

Metropolitan State University

In this session, participants will be given data on a civic/social/environmental issue and will work in groups to develop mathematics and interdisciplinary class activities based on the data. Faculty from all disciplines are welcome to join this session and contribute their expertise to the discussion and the development of the curriculum. Each group will develop activities appropriate for one of the following courses: developmental mathematics, college algebra, statistics, calculus, or an interdisciplinary course of the group's choice. In addition to developing the curriculum, the groups will discuss the vocabulary, numeracy and computation skills necessary for the students to complete the activity and how the curriculum aligns with the current curriculum in these courses. This three-hour workshop will offer participants concrete ideas on how to incorporate civic engagement into mathematics or mathematics related courses. Curriculum generated from this workshop will be enhanced by the Engaging Mathematics team and publicly available to all faculty on the Engaging Mathematics website.

Enduring Understandings Training

Salisbury Labs 401

Track: Scientific and Research-based Approaches to Learning

Stephen Carroll, scarroll@scu.edu

Santa Clara University

Chris Lazzaro, clazzaro@collegeboard.org

The College Board

The Enduring Understandings training workshop is by invitation only.

If you are interested in the Enduring Understanding project, we will be offering an assessment project training webinar after SSI 2015. The webinar will be on August 18, 2015 from 1-2pm (Eastern time). The webinar is designed for those who intend to implement pre- and post-course assessments in their upcoming fall semester courses that cover topics in chemistry, physics, and/or biology. The course assessments will contain both student self-assessment survey questions and content knowledge questions mapped to academic standards used by the College Board.

You can register for the webinar online by following this link: <https://ncsce.wildapricot.org/event-1973622>. Registration will be open through August 11. A recording of the webinar will be made available shortly after the event.

12:30 P.M.

INSTITUTE ADJOURNS

Alden Hall

Following the conclusion of SSI 2015, a lunch buffet will be served in Alden Hall. All participants are invited to attend.

BIOGRAPHICAL SKETCHES OF SSI 2015 PLENARY SPEAKERS, CORE FACULTY, SESSION PRESENTERS, INSTITUTE ORGANIZERS, AND STAFF

Eugene Allevato joined Woodbury University as an adjunct faculty member in 2001. He teaches Business Statistics, Advanced Statistics, Research Methods, Physical Science and College Algebra and, in 2006, was awarded Professor of the Year. After attending the 2006 SENCER Summer Institute, Eugene implemented the SENCER philosophy in all his courses with significant success. Students' gains have exceeded expectations and some student's projects have been accepted in conferences such as ECOWAVE 2008 and NCER (National Conference Ecosystems Restoration, 2009). Eugene has developed and designed new SENCER courses such as Water Issues in Los Angeles, Spirituality and Quality Management in the Workplace, Environmental Issues: Science and Spirituality, and Eco-Ethics. In addition, Eugene has introduced inter-classroom collaboration across two different courses and community services engagement based on group projects involving students' majors. His experience in industry includes working in basic research and as a manufacturing engineer. He has published more than fifteen scientific publications. He worked at Rockwell and Boeing before coming to Woodbury University. He received his Ph.D. from the University of Wales in electrical engineering, master's in material science from the Military Engineering Institute and a master's of business administration from Woodbury University.

At SSI 2015, Eugene Allevato will present the concurrent session "Overcoming Barriers Toward Teaching Visually Impaired Students."

Andrea Aust is the science education manager at KQED. In her role, Andrea develops science education resources and provides training for educators on how to integrate media and media production into science classrooms. She has worked on projects including the public television series Jean-Michel Cousteau: Ocean Adventures and Saving the Bay, and the award-winning science, nature and environment series QUEST. Andrea graduated from UC Berkeley with a bachelor's in environmental science and earned her master's in teaching and multiple subject teaching credentials from the University of San Francisco. Before arriving at KQED, she taught, developed, and managed marine science and environmental education programs in Aspen, Catalina Island, and the Bay Area.

At SSI 2015, Andrea Aust will facilitate the work session "Making Real-World Connections with Multimedia," and present the workshop "Students and Social Media: Participating in Broader Conversations."

Gillian Backus is a professor of biology at Northern Virginia Community College, Loudoun Campus where she teaches Anatomy and Physiology and Introductory Biology. As a member of a Faculty Learning Community, Gillian and several colleagues have developed a two-credit honors independent study that merges science and art, essentially turning STEM into STEAM. The course has now run two times with great success. Gillian earned her Ph.D. in toxicology from the University of North Carolina-Chapel Hill. She then moved to northern Virginia and participated as a Science and Technology Policy Fellow at the National Academies of Science (Washington DC). Her fellowship placement at the Koshland Science Museum opened her eyes to the world of informal science education and allowed her to develop educational exhibit materials. Gillian then worked for the US EPA in Washington, DC. evaluating chemical risk assessment. She graduated with a bachelor's degree magna cum laude from Mount Holyoke College with a biology major and French minor.

At SSI 2015, Gillian Backus will co-facilitate the work session "Integrating Humanities in STEM Education."

Janice Ballou is a nationally recognized survey research methodologist with more than 40 years of experience. Currently an independent consultant; before retirement Ballou was a vice president and Senior Fellow at Mathematica Policy Research, Inc. Her prior position was director of the Rutgers University Center for Public Interest Polling. Her publications include "Survey Data Collection Methods" a chapter in *Counting Working-Age People with Disabilities: What Current Data Tell Us and Options for Improvement*; "Web of Caring: Development of Web-Survey Best Practices" and "Diversity of Methods: Assessment of Quantitative and Qualitative Research Multiplier Effect" in *Proceedings of the American Statistical Association Section on Survey Research Methods*; "Ensuring PhD Development of Responsible Conduct of Research: Who's Responsible?" (co-author) in *Science and Engineering Ethics*. She has held multiple elected offices in the American Association for Public Opinion Research and served on the *Public Opinion Quarterly* Advisory Committee and the Survey Practice Editorial Board.

At SSI 2015, Janice Ballou will present the concurrent session "Survey Research."

LaRoy Brandt is an assistant professor at the Truman State University. In this capacity, he teaches first and second semester introductory biology courses in the biology majors, freshman sequence. LaRoy also teaches upper level ecology courses on occasion and a fermentation science class. He conducts water quality monitoring for the Missouri Stream Team program and incorporates students into community water quality research projects with much of his water quality work is the foundation of his civic engagement curricula. LaRoy holds a BS in Biology from Missouri State University, an MS in biology from the University of Central Missouri, and a PhD in Entomology from the University of Kansas.

At SSI 2015, LaRoy Brandt will co-present the concurrent session "Experiences with Civic Engagement at Truman State University"

Sherryl Broverman of Duke University focuses her research on how the inclusion of civic issues, international connections, and social engagement alters the cognitive and affective responses of non-major science students to science education; how course design impacts the demographics (gender, race, etc) of student enrollment in elective science courses; developing international research service learning in the sciences; and the factors that impact education and health outcomes for girls in rural Kenya.

At SSI 2015, Sherryl Broverman will facilitate the work session “Tethering Civic Engagement and Innovative Science Teaching to the University Rewards System.”

Jonathan Bucki has worked with a variety of collaborations, organizations and community groups to build their capacity to respond effectively to the reality of their customers and participants. He seeks to adapt cutting-edge ideas and applications and make them appropriate and effective for each organization. As a trainer and facilitator, Jonathan brings an energetic, creative and humorous spirit to his work. Working across the nonprofit and government sectors, Jonathan has designed training and planning processes for individual organizations as well as for complex collaborative efforts. In addition to facilitating complex planning processes, he also helps organizations preserve and capture knowledge during key personnel changes. His clients include a diverse group of organizations, from local cultural groups to multi-billion dollar federal agencies, working in a variety of disciplines from conservation to human services. In higher education, he has facilitated many stakeholder engagement and strategic planning projects and enjoys the challenge of working in the structure and culture of academic organizations. Jonathan holds a bachelor’s degree from St. Olaf College, Northfield, Minnesota. He also attended L’Institut Protestant de Theologie, Faculte de Theologie Protestante in Montpellier, France. An avid green wood worker and musician, he co-founded the Two Rivers Folk School and is interested in the preservation and practice of traditional wisdom and craft. He splits his time between Saint Paul, MN and rural Saint Croix Falls, WI.

At SSI 2015, Jonathan Bucki will co-present the concurrent sessions “NCSCE/SENCER Sustainability: Members,” and “Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?” and present the workshop “Facilitating Strategic and Difficult Conversations.”

Wm. David Burns is the executive director of the National Center for Science and Civic Engagement, co-founder and principal investigator of SENCER, publisher of Science Education and Civic Engagement - An International Journal, and professor of general studies at Harrisburg University of Science and Technology. He also serves or has served as principal investigator for the National Center's Great Lakes Stewardship Through Education Network (GLISTEN) project, Science and Civic Engagement: Western Network (SCEWestNet), SENCER-ISE, an initiative to connect formal science education at the college level with informal science educators (museums, aquaria, science journalists, etc.), and Engaging Mathematics, an initiative which applies the SENCER method to college-level mathematics courses, with the goal of using civic issues to make math more relevant to students.

Prior to establishing the National Center, David served as senior policy director for the Association of American Colleges and Universities (AAC&U). During his nine years with AAC&U, he established the Center for Disease Control and Prevention-sponsored Program for Health and Higher Education and created the Summer Symposia dedicated to exploring the power that students have to improve the health of colleges and communities. For 23 years, David was a member of the administration of Rutgers, the State University of New Jersey. David is the principal author and editor of the book, Learning for Our Common Health, and, among other publications, the article, "Knowledge to Make Our Democracy." In 2008, the American Society for Cell Biology honored David and SENCER co-founder Karen Kashmanian Oates with the Bruce Alberts Award for Excellence in Science Education. David's undergraduate and graduate work (at Rutgers) was in political science with a concentration on political theory. He was a Woodrow Wilson National Fellow.

At SSI 2015, Wm. David Burns will outline the aims for the Institute; co-present the concurrent sessions "What's Missing? Gaps in the SENCER Program and Strategies to Fill Them," and "The Role of Research in SENCER Programs," facilitate the sessions for individual representatives, and present the workshop "Writing Good Proposals to Support your SENCER Work

Patricia Amaral Buskirk is an Assistant Professor in the School of Communications at the University of Hawai'i where she teaches digital media arts and is researching new media strategies and emerging digital interactive technology to increase civic engagement. She has also worked as a producer, director, editor for independent films, and has worked with CNN, NBC, CBS, ESPN and Fuji TV. Patricia is a former member of the International Photographers of the Motion Picture and Television Industries (IATSE) Hawaii Local 665 and Hollywood Local 659. Patricia earned a masters of fine arts degree from Savannah College of Art and Design.

At SSI 2015, Patricia Amaral Buskirk will co-present the concurrent sessions "Storytelling, New Media Strategies and Emerging Technologies: Building Bridges between Natural Sciences, Social Sciences and Indigenous Knowledge to Tackle the Problem of Climate Change in Hawai'i," and "SENCER States - Expanding the (Net)Work."

Cyndy Carlson is assistant professor of civil engineering at Merrimack College, in Andover NH. In 2010, she completed her PhD in Natural Resources and Earth Systems Science (NRESS) in the Department of Civil Engineering at UNH, along with a minor in College Teaching. Cyndy has also spent 10-years as a water resources engineer, working locally and internationally on projects related to engineering and public health, including storm water, combined sewer flow, and local governance of water resources, and was assistant professor of environmental science at New England College in Henniker, NH. She spent a week in Summer 2015 teaching leadership skills on Ile a Vache, off the coast of Haiti. At SSI 2015, Cyndy Carlson will co-present the concurrent session "Four Weeks on Water."

Stephen Carroll's projects focus on intersections of pedagogy, technology, assessment, writing, and learning. His career-long involvement in faculty development includes founding and developing a teaching center at UC Berkeley, publications in books about teaching, and dozens of presentations on assessment and teaching and learning at national conferences. He has directed writing programs at Berkeley and Santa Clara University (SCU), where he has recently served as the Faculty Director for a Residential Learning Community. Dr. Carroll has developed and taught a number of experimental, cross-disciplinary pilot courses to explore new ways to enhance student learning, and is investigating using course-specific writing practices to enhance learning in the sciences. His recent publications focus on how to use assessment practices to drive innovation in teaching and learning and on leveraging existing technologies to enhance communication and accelerate learning, especially in undergraduate learning communities. His current research focuses on using the latest findings in neurobiology, cognitive science and learning theory to improve teaching and learning. He is especially focused on helping students become more self-directed learners by teaching them metalearning skills. He currently runs a pilot program that builds on this research, using Learning Facilitators—peers who tutor students on learning strategies—to improve academic performance at all levels.

At SSI 2015, Stephen Carroll will present the SSI note-taking session "Taking Note and Note Taking: Making the SSI Learning Experience More Durable," facilitate the work session "MetaLearning: Building Effective Self-Directed Learners," co-present the concurrent session "Update on Next Generation Science Standards," present the concurrent sessions "Getting Started with the SENCER-SALG," and co-present the workshop "Enduring Understandings Training."

Hailey Chenevert works primarily with the SENCER-ISE (Science Education for New Civic Engagements and Responsibilities- Informal Science Education) initiative. In this capacity, she serves as part of the project leadership team, takes part in the review and distribution of partnership awards, liaisons with project advisors, consultants, and evaluators, and supports developing partnerships. Hailey brings experience in the informal education field from previous work with the Smithsonian Center for Folklife and Cultural Heritage. While at the Smithsonian, she worked with over 25 universities, the USDA, and the Association of Public and Land-grant Universities to create Campus and Community: Public and Land-grant Universities and the USDA at 150, a program for the 2012 Smithsonian Folklife Festival. Hailey holds a degree from Michigan State University, as well as a specialization in Museum Studies.

At SSI 2015, Hailey Chenevert will co-present the concurrent session "Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?" and will serve as part of the SSI 2015 on-site staff.

Abour H. Cherif is the national associate dean of curriculum for math and science, and clinical laboratory sciences at DeVry University Home Office, Downers Grove, IL. He is past president (2008–2009) of the American Association of University Administration (AAUA). He holds a B.S. from Tripoli University, an MS.T. from Portland State University, and a Ph.D. From Simon Fraser University, Canada. Dr. Cherif's professional work includes curriculum design, development and reform, instructional and assessment design, evaluation techniques, faculty, and academic leadership. He has received a number of teaching, curriculum development, instructional strategies, and leadership awards including the 1992 Aristotle Academy Team Work Award, the 1999 ISTA Outstanding Preserve Science Education Award, the 1998 IIHFD Outstanding Accomplishments and Leadership Award, 2003 DeVry University iOptimize Initiative Award, 2010 AAUA Outstanding Service Award, and co-led the development and creation of a "Supportive Community for Faculty and Staff Pursuing Doctorates" which led to DeVry University receiving the 2015 AAUA Exemplary Model Award. Dr. Cherif served and or serves on the editorial boards of a number of journals including The Science Education Review, Journal of College Science Teaching, Review of Human Factor Studies Journal, Journal for Higher Education Management, to name a few. Dr. Cherif serves on the executive and or advisory boards of a number of organizations, including International Institute of Human Factor Development (IIHFD), American Association of University Administration (AAUA), to name a few.

At SSI 2015, Abour H. Cherif will co-present the concurrent session "Why Do Students Fail? Inspiring and Motivating Students to Take Charge of Their Own Education."

Janice Clark is a professor in the Department of Health and Exercise Sciences Department at Truman State University where she teaches a variety of courses in the Health Science major (Principles of Health Education, Environmental Health, Consumer Health, Program Assessment & Planning in Health, and Program Implementation & Evaluation in Health). She also provides academic advising to pre-medical sciences students in the major. Janice has taught at Truman for 11 years, holds a Doctorate in Education in Health Education from the University of Kansas, and is a Master Certified Health Educator (MCHES).

At SSI 2015, Janice Clark will co-present the concurrent session "Experiences with Civic Engagement at Truman State University."

Christine Marie DeCarlo supports SENCER programming and the Engaging Mathematics initiative, and manages NCSCE's digital media. Christine's professional background is in K-12 science education, communication, and assessment. Prior to joining NCSCE, she developed science test questions and instructional materials for Assessment Technology, Incorporated, and taught marine biology courses at Newfound Harbor Marine Institute. Christine graduated from the University of Pittsburgh with a bachelor's degree in biology and a certificate in Latin American studies.

At SSI 2015, Christine DeCarlo will co-present the concurrent session "SENCER States - Expanding the (Net)Work," and will serve as part of the SSI 2015 on-site staff.

Monica Devanas has been teaching microbiology for over twenty years. She is active in issues of science education programs for retention of women in science, and in NSF-funded grants to enhance science education both at Rutgers and in pre-college populations. Her course *Biology, Society, and Biomedical Issues: HIV/AIDS*, first taught in 1992, has been recognized as a model course by SENCER. In 1992, she joined the new Teaching Excellence Center as associate director. She is now director of faculty development and assessment programs for the renamed Center For Teaching Advancement and Assessment Research (ctaar.rutgers.edu), where she leads workshops on teaching portfolios, curriculum design, learning styles, active and cooperative learning, and instructional technology. Monica offers workshops for faculty and administrators on assessment and assists deans in accreditation reviews and their own reviews by faculty. She consults with Peter Seldin on his "Teaching Portfolio Workshops," contributing chapters to books on teaching portfolios, administrative portfolios, and strategies to improve teaching. Monica is a Co-Principal Investigator for SENCER and the very proud recipient of the 2013 William E. Bennett Award.

At SSI 2015, Monica Devanas will co-facilitate the work sessions "Revitalizing General Biology," and "Active Learning," present the concurrent session "Reflective Practice," and present the workshop "Portfolios and Career Development."

Victor Donnay is Director of the Environmental Studies Program and William Kenan, Jr. Professor of Mathematics at Bryn Mawr College whose Mathematics Department received the 2013 AMS Award for Exemplary Achievement for its success in encouraging women to study mathematics. In addition to his research on chaotic dynamical systems arising in geodesic flows and in billiard systems, he has worked extensively on issues of K-16 education in projects funded by the NSF Math Science Partnership and Noyce programs. He is interested in connecting math to issues of Civic Engagement with a particular focus on sustainability. His Differential Equations course was chosen as a model course by the SENCER project and he was Chair of the Advisory Committee for Mathematics Awareness Month 2013 -The Mathematics of Sustainability.

At SSI 2015, Victor Donnay will present the plenary session "Connecting Math and Sustainability", and co-facilitate the work session "Plenary Follow-up Session: Mathematics and Civic Engagement."

Marilyn Dono-Koulouris is the Program Coordinator of the Freshmen Discover New York Program on the Staten Island Campus of St. John's University. In this role, she is the program director for all incoming freshmen as well as the liaison with the Director of the Institute of Core Studies on the Queens Campus of St. John's University. She works with the director of Student Life in planning and implementing various out-of-the-classroom cultural visits within New York City. She also works with the director of the Academic Service Learning Program planning and implementing the freshmen required ASL projects and site visits. Prior to coming to St. John's University, Marilyn has had extensive experience as a school administrator within private business schools as well as a financial background in the corporate world. Marilyn holds a MBA in finance and management from Wagner College and a Doctorate in Instructional Leadership from St. John's University.

At SSI 2015, Marilyn Dono-Koulouris will co-present the concurrent session “Using Hurricane Sandy As A Unique Learning Opportunity Utilizing Academic Service Learning and Civic Engagement.”

Richard A. Duschl, (Ph.D. 1983 University of Maryland, College Park) is the Waterbury Chair Professor of Secondary Education at Penn State University. Prior to joining Penn State Richard held the Chair of Science Education at King’s College London and served on the faculties of Rutgers, Vanderbilt and the University of Pittsburgh. He chaired the National Research Council research synthesis report *Taking Science to School: Learning and Teaching Science in Grades K-8* (NRC, 2007) and was a member of the *Next Generation Science Standards* national leadership team; co-chairing the Earth/Space Sciences writing team. With Richard Grandy, he co-edited *Teaching Scientific Inquiry: Implications for Research and Implementation*. His research interests focuses on establishing epistemic learning environments and on the role of students’ inquiry and argumentation processes. Richard has twice received the ‘JRST Award’ (1989; 2003) for the outstanding research article published in the Journal of Research in Science Teaching and in 2015 received the NARST Distinguished Contributions Award for Research in Science Education. From 2008-2011 he was NARST President. For a decade he served as editor of Science Education. From November 2012 to December 2014 Richard joined the National Science Foundation in the Directorate of Education and Human Resources (EHR) as Director, Division of Research on Learning and as Senior Advisor in EHR.

At SSI 2015, Richard Duschl will facilitate the work session “Fostering Interdisciplinary STEM Research Partnerships,” and participate in a panel discussion on scaling STEM reforms at the SENCER leadership dinner.

Anthony Dunlop is an instructor of mathematics at Normandale Community College. In his role as an Engaging Mathematics partner, he is enhancing Mathematics for the Liberal Arts, a math course designed for humanities and other non-STEM majors. In its current form, students analyze real data from the nearby Nine Mile Creek watershed. Tony will add modules to the course that cover topics such as wildlife management, energy production and use, and water table depletion and replenishment. He will also modify new and existing modules into a stand-alone format for use in statistics and remedial algebra classes, and will develop templates for the modules so that instructors can include their own, locally sourced data.

At SSI 2015, Anthony Dunlop will co-facilitate the work session “Plenary Follow-up Session: Mathematics and Civic Engagement.”

Doug Earick is a research assistant professor and coordinator of science education programs at Plymouth State University in Plymouth, NH. He received both his BS and MS degrees from the University of New Mexico. Having taught at the middle school, high school, and university levels, Doug has over 25 years of experience in science education. Over the past decade, much of his work has been in the development, implementation and evaluation of K-16 teacher professional development and innovative science curriculum projects. At PSU, he teaches both environmental science courses to graduate and undergraduate students, and teacher preparation courses for pre-service science education students. He is currently involved in several state and federally funded projects around STEM education, including the NSF-funded NH EPSCoR program.

At SSI 2015, Doug Earick will co-present the concurrent session “Four Weeks on Water.”

Cathy Evins is a mathematics instructor and co-coordinator of Developmental and General Education at Roosevelt University. She also serves as an Engaging Mathematics partner. She works with Bárbara González to design College Algebra: Modeling the City, a course that uses Chicago’s social justice issues, such as transportation, crime, water, food access, infrastructure, and demographics, to teach STEM and business majors about mathematics. They expect their findings to ultimately result in a new college algebra textbook.

At SSI 2015, Cathy Evins will co-facilitate the work session “Plenary Follow-up Session: Mathematics and Civic Engagement.”

Brenton Faber is a professor of writing at Worcester Polytechnic Institute. A sociolinguist by training, his research areas include medical and scientific rhetoric, the emergence of new concepts in science, and communication in emergency medicine. He received his Ph.D. from the University of Utah, master's degree from Simon Fraser University (Canada), and bachelor's degree from the University of Waterloo (Canada). He has written about the emergence of nanoscience and technology in science and engineering and the phenomenon of big data and analytics - especially as it pertains to medical practice, epidemiology, and population health.

At SSI 2015, Brenton Faber will facilitate the work session “Analytics & Heuristics: Using Big Data to Reintegrate the Human in Technical Problems,” and co-facilitate the work session “SENCERizing Science Writing.”

Tyler Fabian is currently a master's student at George Mason University studying Environmental Science and Public Policy. Currently he is a GTA at George Mason University teaching Geology 101 labs and plans to complete his masters next year in the spring of 2016. In his senior year of undergraduate Tyler gained experience in using a tool called SALG to help enhance the assessment of the Natural Science, General Education Learning Outcomes, specifically in Geology 101 and 102. Tyler holds a bachelor's degree in Earth Science at George Mason University as well as a Virginia teacher's licensure for 6-12 in Earth Science.

At SSI 2015, Tyler Fabian will co-facilitate the work session “Adapting Social Media to Case Study Development in a SENCER Model Course, Mysteries of Migration.”

David Ferguson holds a Ph.D. from the University of California, Berkeley where he studied mathematics and mathematics education. He is a distinguished service professor and chair of the department of technology and society in the College of Engineering and Applied Sciences at Stony Brook University. He holds a joint appointment in the department of applied mathematics and statistics. In addition to his departmental responsibilities, he holds the position of associate provost for diversity and inclusion. He has directed numerous projects, including a half-dozen NSF projects, aimed at improving science, technology, engineering, and mathematics (STEM) education at both the undergraduate and graduate levels. His research and teaching thrusts are in the areas of problem solving, advanced technologies in the learning and teaching of mathematics and science, and socio-technological decision-making. Dave is a New York State and national leader in programs to enhance the participation of underrepresented groups in science and engineering. He directs two NSF-funded projects in this area: the SUNY Louis Stokes Alliance for Minority Participation (LSAMP), and the Alliance for Graduate Education and the Professoriate--Transformation Project (AGEP-T). He is co-director of the Stony Brook's Science and Technology Entry Program (STEP) and Collegiate Science and Technology Entry Program (CSTEP)—both funded by the New York State Education Department. He is the recipient of several awards: the U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM), the Archie Lacey Award of the New York Academy of Sciences, and the Engineering Educator Award of the Joint Committee on Engineering of Long Island. Dave is also a Co-Principal Investigator for SENCER.

At SSI 2015, David Ferguson will co-present the concurrent session “Engineering as a Gateway,” and co-facilitate the work session “Addressing Diversity Issues in STEM Education”

Matt Fisher is an associate professor of chemistry at Saint Vincent College where he was department chair for seven years. He is also a senior fellow with the National Center for Science and Civic Engagement, where he coordinates NCSCE's efforts in the scholarship of teaching and learning. He received a bachelor's degree in biochemistry from Temple University in 1982 and a Ph.D. in biochemistry from the University of Wisconsin-Madison in 1990. In addition to his responsibilities as a faculty member, Matt is a member of the college's Biotechnology Advisory Committee and was the director of Saint Vincent College's Teaching Enhancement and Mentoring Program for seven years. He has developed two SENCER model courses: Chemistry of Daily Life: Diabetes and Malnutrition (2005) and Undergraduate Biochemistry Through Public Health Issues (2009). Chemistry of Daily Life is a course for non-science majors that fulfills general education requirements while Undergraduate Biochemistry Through Public Health consists of two courses for undergraduate STEM majors. Matt has been an active member of the American Chemical Society's (ACS) Division of Chemical Education, serving on the Division Program Committee and as meeting program co-chair for the Division's program at the August 2008 ACS National Meeting in Philadelphia. He was a member of the ACS Committee on Environmental Improvement (CEI) for over a decade, helped lead CEI's efforts in regards to education during that time, and chaired the committee in 2013. He now serves as a member of the ACS Committee on Science. Matt is a 2005 Carnegie Scholar and spent the 2005-2006 academic year working on a project to connect

topics in undergraduate biochemistry to public policy, public health, and institutional/personal values in support of integrative learning. He has given presentations at conferences and facilitated workshops on integrative learning in the context of undergraduate science courses and published several book chapters on his work in SENCER. Matt has been recognized as an ACS Fellow and received the ACS-CEI Award for Incorporating Sustainability into Chemistry Education in 2015.

At SSI 2015, Matt Fisher will facilitate the work sessions “Teaching as Community Property: An Introduction to the Scholarship of Teaching and Learning,” and “Building on the Intellectual Work of Teaching for Course and Curriculum Development,” co-present the concurrent session “Publishing in Science and Civic Engagement: An International Journal,” and present the workshop “Inquiring Into Our Students’ Learning: Developing Your Scholarship of Teaching and Learning Project.”

Brian Fitzgerald serves as the chief executive officer of the Business-Higher Education Forum, developing long-term strategy for the membership organization. Under Dr. Fitzgerald's leadership, BHEF's National Higher Education and Workforce Initiative (HEWI) has emerged as the organization's strategic enterprise. Through BHEF member collaboration, HEWI includes regional projects focused on business-higher education partnerships in selected states, as well as national networks that disseminate insights and scale effective practices. The Wall Street Journal featured BHEF and its work in a front-page article, and the National Science Foundation recognized HEWI's success with a five-year, \$4.5M grant to increase persistence and diversity in undergraduate STEM education.

Prior to joining BHEF, Dr. Fitzgerald served as staff director for the federal Advisory Committee on Student Financial Assistance, which advises Congress on higher education and student aid policy. Dr. Fitzgerald has written extensively on policies to improve college access and success. He also served as an adjunct associate professor of government at American University, teaching advanced studies courses on the politics of education. In the private sector, Dr. Fitzgerald held senior project management positions for large-scale education research projects for federal agencies. Earlier in his career, he served as assistant dean and as a lecturer in education at Bates College in Lewiston, Maine.

At SSI 2015, Brian Fitzgerald will present the plenary session “STEM skills for All: Quantitative Literacy in the 21st Century”, and facilitate the work session “Designing Data Science Programs Through Business and Higher Education Collaboration”

Shawn Fitzgerald is a Major in the United States Army and a 3rd year instructor in the Department of Physics and Nuclear Engineering. He graduated from the United States Military Academy in 2003 with a Bachelor of Science degree in Chemistry and Chemical Engineering. In 2013, he graduated from the Massachusetts Institute of Technology, where he earned a Master of Science degree in nuclear science and engineering and a Master of Science degree in political science. MAJ Fitzgerald's awards and decorations include: the Bronze Star Medal, the Meritorious Service Medal (1OLC), the Army Commendation Medal (1OLC), the Army Achievement Medal (1OLC), the Iraqi Campaign Medal, the Korea Defense Service Medal, the Army Parachutist Badge, and the Army Combat Action Badge.

At SSI 2015, Shawn Fitzgerald will co-facilitate the work session "Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome."

Robert Franco has led successful efforts to institutionalize innovations in international education, service learning, civic engagement, STEM and sustainability at Kapi'olani Community College, University of Hawai'i for 25 years. He has also been a senior consultant and trainer for national Campus Compact, assisted in the initial creation of the Carnegie Foundation Community Engagement Classification, and was named one of 20 national "Beacons of Vision, Hope, and Action" by the Community College National Center for Community Engagement. He currently is the Project Director for a three-year, national Teagle Foundation initiative entitled, "Student Learning for Civic Capacity: Stimulating Moral, Ethical, and Civic Engagement for Learning that Lasts." Since 2008, as a SENCER Leadership Fellow, he has written a backgrounder on service learning and its application to science education, and an article for the SECEI Journal exploring science and civic engagement in Asia.

At SSI 2015, Robert Franco will co-present the concurrent session "SENCER States - Expanding the (Net)work."

Chitwan (Chuck) Gahun is a director with Medullan, Inc, a digital health consultancy based out of Cambridge, MA. He has over 16 years of IT experience in the non-profit, public health, and financial sectors and is adept at leveraging best practices in project, program, and portfolio management and leading cross-functional teams to deliver results. During his consulting career, he has worked with several major organizations, such as Blue Cross and Blue Shield, Department of Health and Human Services, the National Cancer Institute, Centers of Disease Control, and the International Monetary Fund.

Mr. Gahun is a digital strategy thought leader and an organizational change agent who helps organizations pivot their business models to meet changing market demands. His technical delivery expertise spans a range of solutions, from mobile applications and content management systems to online directories and e-publications. He is a certified Project Management Professional (PMP), a certified Scrum Master, and earned a master's degree in technology management from George Mason University. In addition to working at Medullan, Inc., Chuck continues to consult with the National Center staff on web and project management activities.

At SSI 2015, Chuck Gahun will present the concurrent session "The Changing Digital Landscape and It's Impact on Healthcare."

Ellen Goldey is the William R. Kenan Jr. Professor and chair of the biology department at Wofford College. She earned a bachelor's degree from the University of the South and master's and Ph.D. from Miami University. Ellen is a SENCER Leadership Fellow and has been working with SENCER since 2001. In 2012 she was named one of forty national Leadership Fellows in the Partnership for Undergraduate Life Sciences Education (PULSE), a collaborative effort of the NSF, NIH/NIGMS, and HHMI to catalyze department-wide change in undergraduate life sciences (see www.pulsecommunity.org). She was principal investigator on two projects funded by NSF. The first, Seeing the Big Picture: Linking the Sciences and the Humanities, combined two general education courses into learning communities for first year students. In the second, Ellen and her colleagues transformed the first year curriculum in biology with two new core courses: Biological Inquiry and Evolution and Development. Biological Inquiry is taken by over half of Wofford's incoming students (regardless of major track), and the course builds core competencies and employs best pedagogies (e.g., guided inquiry and open-ended research). Embracing the SENCER ideals, malaria is a recurring course topic through which students explore subject areas from ecology to molecular biology. Evidence from the project's strong assessment plan has guided further refinement of the course since its implementation in the fall of 2009. Ellen was co-PI on a two-institution (Wofford College and Elon University) collaborative grant from the Teagle Foundation to assess religious, non-religious, and spiritual climate on each campus and use the evidence to foster pluralism; work done in partnership with the Chicago-based Interfaith Youth Core. She is a member of the cadre of Wabash Teagle Assessment Scholars that assist campuses in their efforts to use assessment evidence to guide improvement. Twice Wofford's Faculty Member of the Year, she was named Outstanding Educator of the Year by the United Methodist Higher Education Foundation and is the inaugural recipient of the Roger Milliken Award for Excellence in the Teaching of Science. Prior to coming to Wofford in 1995, Ellen was a developmental neurotoxicologist at the United States Environmental Protection Agency in North Carolina.

At SSI 2015, Ellen Goldey will facilitate the work session "Designing a SENCER Model in About an Hour," and present the concurrent session "Department-wide Reform of STEM Education: Lessons from the National PULSE project to Transform Biology."

Bárbara González is a SENCER leadership fellow and Engaging Mathematics partner. She is an associate professor of mathematics at Hofstra University. Formerly she was the chair and an associate professor of mathematics, statistics, and actuarial science at Roosevelt University. Bárbara teaches courses to both majors and non-majors throughout the department's curriculum. Her current research interests lie in three areas: probability, statistics and mathematics education. She earned a master's and Ph.D. in statistics from Cornell University, and worked as an assistant professor at the University of Louisiana at Lafayette.

At SSI 2015, Bárbara González will co-facilitate the work session "Plenary Follow-up Session: Mathematics and Civic Engagement."

Matthew Greb is a Major in the United State Army and currently serving as an instructor of chemistry and life science at the United States Military Academy at West Point. He is the assistant course director for General Chemistry, a course taken by the vast majority of freshmen. In this role, Matthew manages the daily execution of the course, to include lesson management and student testing. He brings with him experience integrating technology in education, and working on interdisciplinary curriculum development. Matthew graduated with a bachelor's degree in chemistry from West Point, and holds a master's degree from the Air Force Institute in Technology, where he specialized in nuclear weapon effects and the isolation of pre-detonation particles from a complex environment.

At SSI 2015, Matthew Greb will co-facilitate the work session "Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome."

Ulla Hasager is Director of Civic Engagement for the College of Social Sciences at the University of Hawai'i at Mānoa and faculty at the Department of Ethnic Studies. Dr. Hasager has extensive experience in incorporating civic engagement, the STEM disciplines, and SENCER principles with social sciences and indigenous epistemologies and practices. She is a leader in the work of building a statewide, interdisciplinary network of faculty, students, and community partners practicing SENCER principles in Hawai'i. Dr. Hasager is an anthropologist from the University of Copenhagen, Denmark, and teaches ethnic studies and anthropology. She also coordinates several large, interdisciplinary and inter-institutional service-learning programs for students, train faculty, and build community relations. Areas of research include Hawai'i and the Pacific, environmental anthropology, ethnic relations, indigenous rights, and educational anthropology. Her current research focuses on assessment of the role of civic engagement and interdisciplinary work in education and community building.

At SSI 2015, Ulla Hasager will co-present the concurrent sessions "Storytelling, New Media Strategies and Emerging Technologies: Building Bridges between Natural Sciences, Social Sciences and Indigenous Knowledge to Tackle the Problem of Climate Change in Hawai'i," and "SENCER States - Expanding the (Net)Work."

Michael Hayes is an Associate Professor in the Division of Education at the University of Hawai'i West O'ahu. He teaches courses in the Social Foundations of Education where his students participate in significant service learning activities. Dr. Hayes is also the coordinator of Community Engagement and Service learning at the university where he creates service opportunities for faculty, students and staff that are focused on the environment, natural resources and Hawaiian culture.

At SSI 2015, Michael Hayes will co-present the concurrent session "SENCER States - Expanding the (Net)work."

Roberta Hayes is an Associate Professor at St John's University in New York City in the Institute for Core Studies, teaching Biology, Forensic Genetics and Core Curriculum courses in Scientific Inquiry using different thematic approaches. Her research expertise has focused on using the immune system to fight high-grade primary brain cancers, stem cell therapy, cancer epidemiology, and medical bioethics. She has spent over 20 years applying immunologic approaches to the novel design and the execution of new therapeutic services for cancer patients, including cancer vaccines and immune therapies, in the clinical hospital setting. She is also one of the founding members of the Children's Cord Blood Bank and Research Foundation, a 501(c)3 charity, raising awareness for the need to save newborn umbilical cord blood stem cells for children and adults needing transplants due to genetic illnesses and blood disorders. Dr. Hayes received her Bachelor of Science degree with a major in Biology from Marquette University in Milwaukee Wisconsin, and a Ph.D. in Immunology and Microbiology from the University of Colorado, Health Sciences Center in Denver, Colorado.

At SSI 2015, Roberta Hayes will co-present the concurrent session "Using Hurricane Sandy As A Unique Learning Opportunity Utilizing Academic Service Learning and Civic Engagement."

Judith Iriarte-Gross is a professor of chemistry and director of the Women In STEM (WISTEM) Center at MTSU. She completed a post-doctoral research project, which focused on inorganic polymers at Southern Methodist University. Before joining Middle Tennessee State University (MTSU) in 1996, she worked as a chemist for the FDA and as a chemist and lab manager in the plastics industry.

Dr. Iriarte-Gross has been a PI or Co-PI on six NSF awards, of which three have been awarded during the past five years. In 2007, Dr. Iriarte-Gross was awarded an NSF grant titled A Dissemination Project To Increase Girls Raised in Tennessee Science (GRITS) (#0631773). In 2009, she was named director of the MTSU Women In STEM (WISTEM) Center, the only such Center in Tennessee for girls and women in STEM. In July 2014, Dr. Iriarte-Gross and four other STEM faculty at Middle Tennessee State University (MTSU), were awarded a National Science Foundation ADVANCE grant for 2014 to 2016. This study, A Catalyst to ADVANCE the Participation and Advancement of Women in Academic STEM Careers at Middle Tennessee State University, will focus on identifying barriers that affect recruitment, retention, participation and promotion of women STEM faculty at MTSU.

Dr. Iriarte-Gross is nationally known for her advocacy for encouraging girls and women in the sciences. She is involved in local and national programs, which support the recruitment, retention and graduation of girls and women in STEM education and careers. For this work, she is a nominee for the 2014 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. In May 2014, she was awarded the first Athena International Leadership by Rutherford CABLE. The Nashville Business Journal named her a 2015 Woman of Influence in the mentoring/inspiration category.

At SSI 2015, Judith Iriarte-Gross will co-facilitate the work session “Addressing Diversity Issues in STEM Education”

Dan Kahan is the Elizabeth K. Dollard Professor of Law & Professor of Psychology at Yale Law School. His primary research interests are risk perception and science communication. He is a member of the Cultural Cognition Project, an interdisciplinary team of scholars who use empirical methods to examine the impact of group values on perceptions of risk and related facts. In studies funded by the National Science Foundation, his research has investigated public disagreement over climate change, public reactions to emerging technologies, and conflicting public impressions of scientific consensus. Articles featuring the Project’s studies have appeared in a variety of peer-reviewed scholarly journals including the Journal of Risk Research, Judgment and Decision Making, Nature Climate Change, Science, and Nature. He is a Senior Fellow at the National Center for Science and Civic Engagement and a member of the American Academy of Arts and Sciences.

At SSI 2015, Dan Kahan will facilitate the work session “The Science Communication Disentanglement Project.”

Cindy Kaus is an associate professor and chair of mathematics at Metropolitan State University in St. Paul, MN. She earned her bachelor’s and master’s degrees in electrical engineering at Arizona State University and her Ph.D. in mathematics at the University of Arizona. In 2014, Cindy was a Fulbright Scholar at the University of Seychelles, Africa where she taught Calculus, helped the university to develop their mathematics education program and began developing an environmental statistics course. She is also currently a Co-PI on the NSF funded grant “Engaging Mathematics – Building a National Community of Practice.”

An advocate of incorporating civic issues in mathematics to reach groups of students typically underrepresented in the STEM disciplines, she has directed and co-directed various grants leading to curriculum reform in mathematics. In addition, she served as co-director of Mpower, a year round mathematics program for urban middle school girls. She has been rewarded for her service to women at Metropolitan State University and has won awards for her outstanding teaching at Metropolitan State University, the University of Minnesota and the University of Arizona.

To encourage teaching mathematics through civic issues, Cindy co-chaired a session at the Mathematical Association of America's MathFest 2008 entitled "Teaching Mathematics and Statistics through Current Civic Issues," hosted the 2009 Midwest SENCER Center for Innovation Fall Symposium entitled "Teaching Quantitative Reasoning through Civic Issues" and served as a visiting mathematician at the National Center for Science and Civic Engagement for the 2008-2009 academic year. Cindy was elected to the inaugural class of SENCER Leadership Fellows in July of 2008. Prior to coming to Metropolitan State University, Cindy was a visiting assistant professor of mathematics at the University of Minnesota and an electrical engineer at Honeywell Satellite Systems in Glendale Arizona.

At SSI 2015, Cindy Kaus will co-facilitate the work session "Plenary Follow-up Session: Mathematics and Civic Engagement," and present the workshop "Developing Curriculum Using Real World Data."

Andrew Kerr is Assistant Chair of the Mathematics Department at Truman City College in Chicago. In this role, he has enjoyed the opportunity to help Truman City College move forward on new developmental education initiatives such as co-requisites and a math emporium. He also teaches developmental education courses himself, and works very closely with adjunct faculty. Andrew Kerr earned his Masters in mathematics education at DePaul University.

At SSI 2015, Andrew Kerr will present the concurrent session "Using Testing as a Way of Teaching in Math and Science Classrooms."

Alioune Khoule is currently a Assistant Professor at LaGuardia Community College in the Department of Mathematics, Engineering and Computer Sciences. He earned a bachelor and master in pure mathematics from Saint John's University, and a doctorate degree in Mathematic Education from Columbia University. He has been teaching for about eight years. In fall 2008, he was inspired by a project that he was involved at LaGuardia Community College called "Project Quantum Leap". The latter was an innovative effort by the Department of Mathematics, Engineering and Computer Science of LaGuardia Community College to address the needs of their students by solving the challenges of basic skills education in mathematics. Since then, Dr. Khoule's researches have been concentrated on ways of teaching that allow developments math students to better understand the subject matter .He investigated the relationship between conceptual knowledge and mathematics anxiety of remedial mathematics students in an urban community college. The impact that conceptual understanding has on mathematics achievement was also examined.

Dr. Khoule also focuses on the benefit of ongoing online exchange of pedagogical ideas to both faculty and developmental students. Dr. Khoule's current researches focus on the idealization of objects and relations in a form appropriate for mathematical representation. He is currently working on finding a model for the recent Ebola outbreak in Guinea Conakry.

At SSI 2015, Alioune Khoule will will co-facilitate the work session "Plenary Follow-up Session: Mathematics and Civic Engagement," and co-present the concurrent session "Engaging Mathematics and Statistics throughout New York City."

Joseph Kirsch is a professor of chemistry who has served as associate provost of academic programs at Butler University during the initial implementation of the new core curriculum (general education program), as an interim dean of the College of Liberal Arts and Science at Butler University, and as head of the chemistry department at Butler University. Joe is currently serving as coordinator of the Butler Engineering Dual Degree Program, which results from a partnership between Butler and Purdue School of Engineering and Technology in Indianapolis. He has taught Physical Chemistry, Organic Chemistry, General Chemistry for Majors, and Chemistry for Non-Majors, while also mentoring undergraduate students in research projects. Joe's research interests are in the study of molecular interactions by infrared spectroscopy, and he earned his Ph.D. from the University of Illinois.

At SSI 2015, Joseph Kirsch will co-present the concurrent session “Incorporating Civic Engagement in Undergraduate Research.”

Gerald Kobylski graduated with a Ph.D. in interdisciplinary studies (Systems Engineering and Mathematics) from Stevens Institute of Technology, NJ, and has earned masters degrees from Western New England College (MBA), the Georgia Institute of Technology (Operations Research), and the Naval War College (Strategic Studies). He currently is co-leading a thrust to infuse interdisciplinary education into West Point's core academic curriculum. He is also deeply involved with pedagogy, faculty development, and assessment. Jerry is a Professor of Mathematical Sciences at the United States Military Academy, and a Commissioner for the Middle States on Higher Education.

At SSI 2015, Gerald Kobylski will present the plenary session “How Can the SENCER Ideals Support the Challenging and Changing Institutional Accreditation Landscape?” and co-facilitate the work session “Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome.”

Mangala Kothari is an associate professor in the Department of Mathematics, Engineering, and Computer Sciences at LaGuardia Community College and a Co-Principal Investigator for the National Center's Engaging Mathematics initiative. She is working with a team of faculty at LaGuardia to develop an Elementary Statistics course that includes a variety of topics related to the theme of society and environment. The course will provide students an opportunity to learn concepts in introductory statistics course by describing how it can be applied to social, civic, and environmental issues. Dr. Kothari earned her Ph.D. in mathematics from Indian Institute of Technology, Mumbai, India in 1990. She has taught a variety of graduate and undergraduate courses in mathematics in India and the US. Dr. Kothari's research work includes study of Banach Spaces of Almost periodic functions, a branch of mathematics that relates to Operator Theory & Functional Analysis. Her recent work is focused on applications of almost periodic functions to biochemical systems and on partial functional differential equations. Currently, Dr. Kothari is also exploring best teaching practices in basic mathematics education.

At SSI 2015, Mangala Kothari will co-facilitate the work session “Plenary Follow-up Session: Mathematics and Civic Engagement,” and co-present the concurrent session “Engaging Mathematics and Statistics throughout New York City.”

Theo Koupelis is Dean of Academic Affairs at Broward College in Florida. He was previously a professor of physics and astronomy at the University of Wisconsin-Marathon. He earned a Ph.D. in physics and astronomy from the University of Rochester and specializes in the theoretical modeling of astrophysical outflows (jets). He is the author of the astronomy textbook “In Quest of the Universe” and he is active in science education at all levels: while in Wisconsin, he served as science advisor to the Birch Trails Girl Scouts (which includes 4,000 scouts in ten counties), as organizer of the Science Teaching Alliance (which involved his school and area K-12 schools), and as an officer and President of the Wisconsin Association of Physics Teachers. He has also served on a number of committees of the American Association of Physics Teachers and is a Board member of the Midwest Institute for International and Intercultural Education (MIIE). Civic engagement, outreach efforts, and interdisciplinary approaches to teaching have been at the core of his work as faculty and administrator; his course “Science, Society and Global Catastrophes” (which he co-taught with four other colleagues) was selected as one of the four models presented at SSI 2001.

At SSI 2015, Theo Koupelis will co-present the concurrent sessions “Leading Change in a Dynamic Environment,” and “Revitalizing General Biology.”

Natalie Kuldell has taught in the department of biological engineering at the Massachusetts Institute of Technology for the past 12 years. She develops discovery-based curricula drawn from the current literature to engage undergraduate students in structured, reasonably authentic laboratory and project-based experiences. Natalie is the founder and President of The Biobuilder Educational Foundation, a nonprofit organization that takes cutting-edge research projects in synthetic biology and transforms them into teachable modules that students and teachers can investigate together. Started in 2007, BioBuilder was created in response to numerous requests for synthetic biology learning materials from policy makers, environmental groups, and members of the media needing to know more about the basic biology involved, as well as scientists wanting to know more about the engineering aspects of the field. Natalie studied chemistry as an undergraduate at Cornell, completed her Ph.D. and post-doctoral work at Harvard Medical School, and taught at Wellesley College before joining the faculty at MIT. She is currently a SENCER visiting scholar.

At SSI 2015, Natalie Kuldell will co-present the concurrent session “What’s Missing: Gaps in the SENCER Program and What We Can Do to Fill Them,” and will facilitate the work session “Rewiring Life: The Civic Dimensions and Teaching Opportunities in Biological Engineering.”

Wendy Kuntz is Assistant Professor of Biology and Ecology at Kapi'olani Community College, University of Hawaii System. In this role, she oversees non-majors introductory biology, ecology and environmental science courses and teaches the majors ecology and evolution course. Her research interests are in applied ecology and conservation biology. She has experience in designing service and research projects to engage students, including partnerships with community and professional groups. Campuswide, Dr. Kuntz leads efforts in service, sustainability and civic engagement, and integrating sustainability across the curriculum. She currently serves as chair of the Faculty Senate Committee for Sustainability. Dr. Kuntz has a B.A. (Zoology) from Connecticut College, a M.S. (Environmental and Resource Science) from the University of Nevada, Reno and a Ph.D. (Zoology with specialization in Ecology and Evolutionary Conservation Biology) from the University of Hawaii.

At SSI 2015, Wendy Kuntz will co-present the concurrent session "SENCER States - Expanding the (Net)work."

Christopher Lazzaro is the director of science education at the College Board, where he has worked for the past six years. During his time at the College Board, Chris has worked on projects ranging from professional development programs for science teachers, the AP Science redesign, and the creation of the Science College Board Standards for College Success. Prior to his employment at the College Board, Chris taught middle school earth science and chemistry, as well as high school physics, in New York City. Chris earned a bachelor's degree in earth and planetary sciences with a minor in physics, and a master's degree in physics education from New York University. Chris also holds a Ph.D. from Columbia University in science policy and education.

At SSI 2015, Christopher Lazzaro will co-present the concurrent session "Update on Next Generation Science Standards," and co-present the workshop "Enduring Understandings Training."

Darren Lerner serves as Director for the University of Hawai'i Sea Grant College Program (UH Sea Grant) and interim Director for the UH Water Resources Research Center (WRRC). For several years he has been managing all aspects of the program including extension, communication, education, and research coordination. Dr. Lerner leads and serves the program's scholarly and creative faculty, staff, and partners in moving UH Sea Grant and the WRRC forward to face the challenges as well as embrace the opportunities that the unique environments in Hawai'i and the Pacific region presents including rising ocean levels, coastal erosion, water resource quality and quantity, invasive species, increasing land-use and development, pollution, and surging populations. Lerner also serves as affiliate research faculty at the Hawai'i Institute of Marine Biology where he conducts a research program focused on environmental physiology of fishes. Lerner bridges the traditional science disciplines with a bachelor's degree in political science and psychology, a master's in zoology, and his PhD in organismic and evolutionary biology from the University of Massachusetts, Amherst.

At SSI 2015, Darren Lerner will co-present the concurrent session "SENCER States - Expanding the (Net)Work."

Cynthia Maguire is a senior lecturer in core science and chemistry courses at Texas Woman's University (TWU) in Denton, Texas. She holds a bachelor's in medical technology from the University of Central Oklahoma (1976), and two master's degrees, biology (2001) and chemistry (2004) from TWU. Her research interests include using the scholarship of teaching and learning (SoTL) as a way to improve science education; and environmental sustainability issues, particularly those involving water resources and native plants. Several of TWU's SCI prefix core courses follow the SENCER guidelines and Cynthia has been a strong proponent of the SENCER approach in developing courses related to sustainability at TWU. She has recently helped develop a multidisciplinary certificate program, Science Society and Sustainability, and is one of a team of three professors teaching its interdisciplinary foundation course, Community Conversations in Sustainability. Since the spring of 2010, Cynthia has been the lead researcher for the SENCER Dual Poster project. She was named a SENCER Leadership Fellow in 2012 and again in 2014.

Outside interests include service to benefit the native plants and habitats of Texas through leadership in the Native Plant Society of Texas (NPSOT). Cynthia uses her involvement with NPSOT to model civic engagement for her students, and to help them be aware of sustainable, water-conserving landscaping practices on their property and in their communities.

At SSI 2015, Cynthia Maguire will present the concurrent session "Communicating Your Science: The Dual Poster Concept."

Tara Mann is the director of operations for the Arts and Sciences department at Worcester Polytechnic Institute. Tara is responsible for coordinating a range of projects in the Office of the Dean including the work of the Provost's Global Task Force and programs to support students interested in applying to medical, dental and veterinary schools. She also serves as the Director of the Switzerland project center and Co-Director of the Science for New Civic Engagement and Responsibilities Center of Innovation New England. Prior to joining WPI, Tara was faculty in the department of molecular and cellular biology at Harvard University where she served as a preceptor responsible for course design and laboratory curriculum in undergraduate courses including cell biology. Tara received her PhD from the University of Alabama at Birmingham where she studied cytoskeletal elements of the protozoan parasite *Toxoplasma gondii*.

At SSI 2015, Tara Mann will co-facilitate the work sessions "Designing a Curriculum for Deep Learning," and "SENCERizing Science Writing"

Ellen Mappen is a senior scholar and the project director for Informal Science Education Programs at NCSCE. SENCER-ISE, an initiative funded by the National Science Foundation and The Noyce Foundation, looks to develop partnerships between SENCER faculty and informal science educators that benefit students and the general public. She was the founding and long-time director of the Douglass Project for Rutgers Women in Math, Science and Engineering (1986-2003). Under her direction, this initiative offered co-curricular activities at the precollege and undergraduate levels. Working with science, mathematics, and engineering faculty, she developed a research course for first-year students that

involved small group projects and student presentations of their findings. She served as the course coordinator for number of years. Under her leadership, the project received the 1999 National Science Foundation's Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. From 2003-2006, she administered a program for high school students in a health sciences high school located in New Brunswick, New Jersey and organized programs for these students at a local medical center. Her academic background includes a Ph.D. in history from Rutgers University. She has written on women's participation in the workforce in late nineteenth and early twentieth century Britain and on the role of co-curricular initiatives for encouraging women to enter STEM studies. She is one of the authors of a *Review of the Literature on Increasing the Representation of Women Undergraduates in STEM Disciplines Through Civic Engagement Pedagogies*, along with then graduate student David B. Knight and Professor Stephanie L. Knight of the Pennsylvania State University (SECEIJ, Winter 2011. 3(1): 36M47). She co-authored, with the late Alan J. Friedman, Ph.D., Consultant for Museum Development and Science Communication, "SENCER-ISE: Establishing Connections between Formal and Informal Science Educators to Advance STEM Learning through Civic Engagement" (SECEIJ, Summer 2011. 3 (2): 31M37). She and Dr. Friedman also co-authored a chapter, "Formal/Informal Science Learning through Civic Engagement: Both Sides of the Education Equation," in *Science Education and Civic Engagement: The Next Level* (eds. Richard D. Sheardy and Wm. David Burns (2012, ACS).

At SSI 2015, Ellen Mappen will co-facilitate the work session "Addressing Diversity Issues in STEM Education," and co-present the concurrent session "Making Connections with Informal Science Educators: What Have We Learned from SENCER-ISE and Where Do We Go From Here?"

Autumn Marshall earned her bachelor's in dietetics from Lipscomb University, her master's in nutrition and her Dietetic Internship experience at Texas A & M University, and her Ph.D. in nutrition from Auburn University. Prior to joining the faculty at Lipscomb University, she served as a registered dietitian in many roles: research fellow, WIC nutrition educator and clinic manager, clinical nutrition manager in a hospital, Extension System nutrition educator, Certified Lactation Counselor, and prn clinical dietitian. She has served as the academic chair of the Nutrition Department at Lipscomb since 2008, and now serves as the academic chair of the newly merged Department of Nutrition and Kinesiology. Autumn is beginning her 16th year on the faculty at Lipscomb University, and was named a SENCER Fellow in December 2010.

At SSI 2015, Autumn Marshall will present the plenary session "A Little Bit of Leaven: The SENCER Work of Lipscomb University."

Karin Matchett is a writer, traveler, researcher, and builder and holds a bachelor's in biology and a Ph.D. in the history of science. Her writing/editing/co-thinking work spans the policy arena, science education, the biological sciences, engineering, and technology, with a focus on energy efficiency, renewable energy, and the vast question of climate.

At SSI 2015, Karin Matchett will present the workshop "Pearls of Practice: Identifying the Pearls in your Courses."

Terry McGuire is an emeritus professor in the department of genetics at Rutgers University. He obtained his bachelor's degree from the Ohio State University and his doctorate from the University of Illinois at Urbana-Champaign. He has published in many different areas including Mendelian and mathematical genetics, behavioral and neural genetics, and ecological genetics. He has designed and taught a wide range of courses within the department of genetics. Terry has been an active participant in the SENCER project. He has been a SENCER senior associate and core faculty member since 2004, and serves as a Senior Fellow of the NCSCE. He is the author of a SENCER backgrounder describing his journey as a professor. With Monica Devanas, he is co-director of the SENCER Center for Innovation-Midatlantic. In addition to his work with SENCER, he is a BEN (BioSciEdNet) Scholar (2006), BEN Mentor (2012) and a Rutgers Presidential CASTL Fellow (Carnegie Academy for the Scholarship of Teaching and Learning). In 2007, he was recognized for his Distinguished Contributions to Undergraduate Education in the School of Arts and Sciences at Rutgers University. He was also a lead editor for the online learning resource Scitable – Nature Education. In 2010 his new course, Evolutionary Medicine, was selected as a SENCER Model.

At SSI 2015, Terry McGuire will co-facilitate the work session “Revitalizing General Biology.”

Virginia McHugh-Kurtz is an adjunct instructor of biology at Roosevelt University and Elgin Community College. Her teaching responsibilities include courses in general biology, environmental biology, and a general education course that explores the process, context and societal impact of scientific inquiry. Virginia served as the program coordinator for the NIH-funded Bridges to Baccalaureate program, a partnership between Roosevelt University and Elgin Community College, and served as a mentor for the program for two years. Virginia established a prairie restoration project at Elgin Community College; which benefits the students by integrating service-learning into their general honors biology education while benefiting the surrounding ecosystem as well. Recently, Virginia developed a STEM workshop at Roosevelt University, RU Illuminate, for school age girls to increase interest and diversity in STEM fields. Virginia earned her master's degree from the University of Illinois in 2006. Virginia began teaching at Roosevelt University in 2007 and Elgin Community College in 2008.

At SSI 2015, Virginia McHugh-Kurtz will present the concurrent session “Creating a Sustainable STEM Program for Underrepresented Communities.”

Albie Miles is Assistant Professor of Sustainable Community Food Systems at the University of Hawai'i, West O'ahu. Dr. Miles received his Ph.D. in Environmental Science, Policy and Management from UC Berkeley in 2013. His research explores the relationship between farming system biodiversity and ecosystem services from agriculture and the structural obstacles to more sustainable food and farming systems. He has held posts at the UN Food and Agriculture Organization and the Center for Agroecology and Sustainable Food Systems at UC Santa Cruz.

At SSI 2015, Albie Miles will co-present the concurrent session “SENCER States - Expanding the (Net)work.”

Matthew Mogensen is a Major in the United State Army and currently serving as an instructor of mathematics at the United States Military Academy at West Point. He is the assistant course director for Single Variable Calculus, a course taken by the vast majority of freshmen. In this role, Matt manages the daily execution of the course, to include lesson management and student testing. He brings with him experience integrating technology in education, and working on interdisciplinary curriculum development. Matt graduated with a bachelor's degree in computer science from West Point, and holds a master's degree from the Massachusetts Institute of Technology, where he specialized in operations research and optimization of transportation systems.

At SSI 2015, Matthew Mogensen will co-facilitate the work sessions “MacGyver on the Hudson,” “Robotics and Artificial Intelligence — A Panel Discussion,” and “Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome.”

Farah Movahedzadeh is an associate professor and currently the co-Chair of the Department of Biological Sciences at Harold Washington College in Chicago, Illinois. She received a doctorate degree in Clinical Lab Sciences from Iran University of Medical Sciences (IUMS), and a Ph.D. in Molecular Biology and Microbiology from the University College of London (UCL) and the National Institute for Medical Research (NIMR). She was elected as a SENCER Leadership Fellow in 2012. Her skills and areas of expertise include molecular biology, microbiology, clinical lab sciences, hybrid/blended teaching, and project-based learning. She also actively pursues her research on essential genes as drug targets for tuberculosis at the College of Pharmacy in the University of Illinois at Chicago. She has published numerous research articles in both basic science and in pedagogy and scholarship of teaching.

At SSI 2015, Farah Movahedzadeh will co-present the concurrent session “Why Do Students Fail? Inspiring and Motivating Students to Take Charge of Their Own Education.”

Lakshmi Natarajan is a tenured biology instructor of Truman College- one of city colleges of Chicago. She finished her medical school education in Russia and then came to US to finish her graduate studies in biotechnology. After which she pursued her passion by working in Rush University. She worked with growing HIV and quantitating them. She worked on identifying the mutation on HIV on different strains and the effects of NNRTI subset on acute HIV infections. She later got an opportunity to teach in Truman College. She started incorporating new teaching techniques she learned from getting her Mastering in Online Teaching certificate in her classes. He has added one minute essays, conducting group quizzes, and integrating voice over power-points, power-points for histology explain the structures that needs to be focused, discussion boards, case-studies, research articles into her Anatomy and Physiology courses. She has changed her course from a teacher-oriented course into a student-oriented course.

At SSI 2015, Lakshmi Natarajan will co-present the concurrent session “How to Break Free from Lecture Style Teaching in your Anatomy Courses.”

Marina Nechayeva fell in love with Mathematics and started teaching while still a high school student in Ukraine. She has since studied at three universities (CUNY, Rutgers and Sorbonne Nouvelle) and taught at four colleges (City College, Lehman College, The New School and LaGuardia Community College). She holds a PhD in Mathematics from CUNY Graduate Center and is an Associate Professor and the coordinator of Statistics course sequence at the Math Engineering and Computer Science department of LaGuardia Community College. At the core of her teaching is an aspiration to let students regain their urge to take on big, meaningful questions, then guide them in mastering tools they need to persevere in and enjoy looking for difficult answers. Professional interests of Dr. Nechayeva include Real Analyses, Number Theory, Fourier Analysis, Lattice-Points Problems, Potential Theory, Thomson Problem, Statistics, Information Theory, Set Theory and Logic. Her hobbies are impossible pursuits such as translating poetry and photographing sunsets.

At SSI 2015, Marina Nechayeva will co-present the concurrent session “Engaging Mathematics and Statistics throughout New York City.”

Karen Kashmanian Oates is a nationally recognized scientist, science educator, and higher education leader. She is the Peterson Family Dean of Arts and Sciences at Worcester Polytechnic Institute. As the inaugural holder of the Peterson Family Deanship of Arts and Sciences, she oversees seven academic departments, as well as several interdisciplinary programs including environmental science, robotics and interactive media and game development. Previously, she served as a deputy director of the Division of Undergraduate Studies National Science Foundation (NSF). At the NSF, she managed a budget of over \$380 million and a staff charged with supporting innovative programs to strengthen undergraduate education and help revitalize American entrepreneurship and competitiveness. A biochemist, Karen’s early research focused on various chemical and biological aspects of breast cancer and biologic therapies for cancer. After receiving her Ph.D. at George Washington University Medical Center in biochemistry, she worked as a visiting scientist at the National Institutes of Health's Oncology and Hematology Division. She then began her academic career at George Mason University, where, as associate dean for the new College of Integrated and Interdisciplinary Studies, she helped create George Mason's New American College environment. She later served as inaugural provost for the Harrisburg University of Science and Technology, where she established the National Center for Science and Civic Engagement and helped secure NSF funds for SENCER- Science Education for New Civic Engagement and Responsibilities. Among the honors she has received are the Bruce Alberts Award, presented by American Society for Cell Biology for excellence in science education reform, and the Distinguished Public Service Award, the highest civilian honor presented by the City of Harrisburg, Pennsylvania. Karen is an AAAS Education Fellow and was recently named a 2015-2016 Sigma Xi Distinguished Lecturer and the 2015 Alumni of the Year in Science for Rochester Institute of Technology.

At SSI 2015, Karen Kashmanian Oates will preside over the July 30th opening plenary, present the concurrent session “Moving Your Career Forward – Your Next Step,” co-present the concurrent session “Leading Change in a Dynamic Environment,” and co-facilitate the work sessions “Designing a Curriculum for Deep Learning,” and “Science and Human Rights.”

Glenn Odenbrett is a nationally recognized leader in the area of integrating community service with undergraduate coursework, and regularly serves as either a coordinator or campus team facilitator for conferences and training institutes in this area. In 1998, he organized and hosted a national institute on service learning in the Science, Engineering, and Mathematics (SEAMS) disciplines, and has presented workshops on this topic at previous SENCER Summer Institutes. During his 11-year tenure as director of the Office of Student Community Service at Case Western Reserve University, he coordinated faculty development initiatives that promoted service-learning and community-based research across the undergraduate curriculum. This past March, as a SENCER Leadership Fellow, he coordinated a SENCER-based Great Lakes Stewardship Conference that attracted faculty, students, and community partners from seven states and Quebec. Glenn served as the program director for the Great Lakes Innovative Stewardship Through Education Network (GLISTEN).

At SSI 2015, Glenn Odenbrett will co-facilitate the work session “Civic Engagement Strategies.”

Randy Paffenroth graduated from Boston University with degrees in both mathematics and computer science and he was awarded his Ph.D. in Applied Mathematics from the University of Maryland in June of 1999. After attaining his Ph.D., Dr. Paffenroth spent seven years as a Staff Scientist in Applied and Computational Mathematics at the California Institute of Technology. In 2006 he joined Numerica Corporation where he held the position of Computational Scientist and Program Director. Dr. Paffenroth is currently an Associate Professor at Worcester Polytechnic Institute with a joint appointment in the Mathematical Sciences Department and Data Science Program. His technical interests include machine learning, signal processing, large-scale data analytics, compressed sensing, and the interaction between mathematics, computer science and software engineering, with a focus on applications in cyber-defense.

At SSI 2015, Randy Paffenroth will facilitate the work session “Interpreting Data: A Cautionary Tale.”

Franz Rademacher is a Lieutenant Colonel in the United State Army and currently serving as an Assistant Professor of history at the United States Military Academy at West Point. He teaches electives in Diplomatic History and German History, along with two core courses, Military History and the freshman course in Regional history. Franz graduated with a bachelor's degree in history from West Point, and holds a doctorate from The Ohio State University, where he specialized in European Diplomacy.

At SSI 2015, Franz Rademacher will co-facilitate the work session “Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome.”

Linda S. Rayor, Department of Entomology at Cornell University, specializes in spider behavior and science outreach. Linda has won numerous teaching awards for her courses on Spider Biology, Insect Behavior, and a course on how to do effective scientific outreach (Naturalist Outreach Practicum). The awards include 2015 Animal Behavior Society career teaching award, and at Cornell the Innovative Teacher Award, and Kaplan Family Distinguished Faculty Fellow in Service-Learning award. Linda directs the Naturalist Outreach Program, a large K-12 STEM outreach program that emphasizes backyard

biology (<http://blogs.cornell.edu/naturalistoutreach>). In collaboration with Park Productions (Ithaca College), she produces a series of short science content videos on understanding nature (<http://www.youtube.com/naturalistoutreach>). In October, Linda is hosting an NSF-sponsored professional development workshop 'Improving undergraduate education through science outreach'. Linda's research focuses on the costs and benefits of group living in Australian huntsman spiders.

At SSI 2015, Linda Rayer will present the concurrent session "Naturalist Outreach Program: Improving Undergraduate Education through Science Outreach and Civic Engagement."

Eliza Jane Reilly has two decades of experience in the design and implementation of programs and materials to advance curriculum, academic leadership and faculty development. Her past roles include Executive Director of the American Conference of Academic Deans, Director of Programs at the Association of American Colleges and Universities, and most recently, Director of the Phillips Museum of Art at Franklin & Marshall College. Eliza is the General Editor of the SENCER Models, the co-Editor of the journal, a consultant to Engaging Mathematics, and an advisory board member of SENCER-ISE.

At SSI 2015, Eliza Reilly will co-facilitate the work sessions "Integrating Humanities in STEM Education," "Revitalizing General Biology," and co-present the concurrent sessions "Publishing in Science and Civic Engagement: An International Journal," and "NCSCE/SENCER Sustainability: Members"

Susan Reiser is an educator with a private sector background in software development and network support. She serves as the SENCER SCI-South co-director and, at UNC Asheville, as a lecturer in the Computer Science and New Media Departments and as the Associate Dean of Natural Sciences. In addition to her corporate work, Susan developed visualization applications for Duke's Basic Arrhythmia Lab. She is currently obsessed with computing in the arts, 3D printing, Processing, and embedded systems. In the 2015-2016 academic year she looks forward to developing a SENCER'ized software engineering course and, along with her colleague Rebecca Bruce, adding 3D printing to their SENCER'ized CSO course, Creative Fabrication. Susan has a BS in Computer Science from Duke with a concentration in zoology, and an MS in Computer Science from the University of South Carolina. Her current interests and publications are at the creative intersection of computer science and the arts.

At SSI 2015, Susan Reiser will co-present the concurrent session "Connecting Computer Science to Society: Building a Community of Educators."

Michael Ross is the Botany Instructor at Kapi`olani Community College, Honolulu, HI. In this role, he teaches and coordinates all undergraduate botany and ethnobotany courses at the college. His research focuses on issues related to conservation and restoration of the native Hawaiian flora and culture. Michael is a leader for the Mālama I Nā Ahupua`a service and sustainability learning program and an advocate for community-based management of resources. Furthermore, he manages the KCC campus greenhouse, where he is involved in overseeing many undergraduate botany research projects. Michael holds a B.S. (Botany) and M.S. (Botany) from the University of Hawai`i at Mānoa.

At SSI 2015, Michael Ross will co-present the concurrent session “SENCER States - Expanding the (Net)Work.”

Anna Rozenboym is an Assistant Professor in the Department of Biological Sciences at Kingsborough Community College where she teaches Human Anatomy and Physiology courses geared towards students aspiring to enter allied health fields. Her educational background is in Psychology and Neuroscience with experience in both basic science and applied translational research. At this time in her career, she is focused on researching innovative pedagogy practices, student learning, engagement and motivation. Through incorporating Civic Engagement into curriculum of science courses, she hopes to make material learned in class relevant and useful to students with a goal to equip and empower them to become educated consumers of the healthcare industry as well as compassionate and expert health care providers.

At SSI 2015, Anna Rozenboym will present the concurrent session “Making Physiology Relevant to Students’ Lives”

Liz Ryder is an Associate Professor in the Department of Biology and Biotechnology at Worcester Polytechnic Institute, and is the Director of WPI's Program in Bioinformatics and Computational Biology. She holds an A.B. in Statistics from Princeton University, an M.S. in Biostatistics from the Harvard T.H. Chan School of Public Health, and a Ph.D. in genetics from Harvard University, and has 20 years of experience as a developmental neurobiologist studying how neurons make precise connections during formation of the brain. Recently, Dr. Ryder has begun to develop and use biological simulations extensively in both her research and her teaching. She is collaborating with Dr. Robert Gegear, an ecology professor at WPI, to create computational models of virtual bees to study the causes of pollinator decline. In collaboration with Dr. Brian White at the University of Massachusetts Boston, Dr. Ryder received an NSF award to develop and disseminate a new course, 'Simulation in Biology'. Students in the class learn to create their own simulations of a biological system they are interested in. Developing these simulations not only introduces biology students to computational modeling, but also gives them a much deeper understanding of their chosen biological system. Dr. Ryder has also introduced high school students to building biological simulations, and is running a workshop for high school teachers in collaboration with Dr. Gegear this summer.

At SSI 2015, Liz Ryder will facilitate the work session “Modeling Data: Understanding Complex Biological Data Using Simple Simulation Tools.”

Rob Sanford is a professor and the chair of the department of environmental science at the University of Southern Maine. His research interests include: environmental impact assessment, environmental archaeology, and site plan review of water-related impacts. After earning a bachelor's degree in anthropology at the State University of New York College at Potsdam, he received his master's and Ph.D. in environmental science from the SUNY College of Environmental Science and Forestry at Syracuse. Rob is co-director of the SENCER Center for Innovation-New England. He can frequently be seen around campus peddling a three-wheeled solar-assisted vehicle.

At SSI 2015, Rob Sanford will present the concurrent session "SENCER and your Career."

Herbert Schanker is an associate professor of computer science at College of Staten Island (CSI) of City University of New York (CUNY). He received his bachelor's and master's degrees in electrical engineering from City College and was licensed in New York as a professional engineer. Herb's area of expertise is in the area of computer science, data communications and digital systems. He has been affiliated with ITT, European American Bank, Stony Brook University, New York Medical College, and Sequential Information Systems. In his present teaching position at CUNY's College of Staten Island he has taught all levels of computer science, engineering and technology subjects where he developed original courses in computers and data communications. Through his involvement with SENCER, he and his colleagues have improved learning and assessment and increased interest in computer science study. This has increase interest for the computer science survey course's student body. He has previously served as the computer science's department representative to the college wide General Education Committee, where he has strongly promoted the importance of technology study for all majors.

At SSI 2015, Herbert Schanker will present the concurrent session "A Relevant Technical Education Model for Non-STEM College Students."

Amy Shachter is the senior associate provost for research and faculty affairs and an associate professor of chemistry at Santa Clara University. She received her bachelor's degree at Knox College and earned her Ph.D. in inorganic chemistry at the University of Colorado-Boulder. Her research interests center on porphyrin synthesis. Her work to improve undergraduate science education has been supported by the Howard Hughes Medical Institute, the National Science Foundation, W.M. Keck Foundation, and the Camille and Henry Dreyfus Foundation.

At SSI 2015, Amy Shachter will co-present the concurrent sessions "SENCER States - Expanding the (Net)Work," and "The Role of Research in SENCER Programs"

Richard Sheardy received his bachelor's degree in chemistry education at Michigan State University. After earning his Ph.D. in organic chemistry at University of Florida, he held a post-doctoral fellowship in biophysics at the University of Rochester. He began his academic career at the Hazleton Campus of Pennsylvania State University and then went to Seton Hall University where he initiated his research on DNA conformation and stability. At Seton Hall, Richard mentored sixteen Ph.D. students. In 2006, he moved to Texas Woman's University where he is currently a professor and Chair of the department of Chemistry and Biochemistry. He teaches general chemistry, organic chemistry, physical chemistry, and biochemistry and continues his research focusing on the structure, stability and ligand binding

properties of DNA quadruplexes. He is on the Board of Directors for the Calorimetry Conference, is co-director of the SENCER Center for Innovation-Southwest and is a SENCER Leadership Fellow. In August of 2008, Richard organized a symposium for the national meeting of the American Chemical Society (ACS) in the Division of Chemical Education featuring speakers from around the country presenting the why for's and how to's of SENCER. As a result of that symposium, he edited and contributed a chapter to Science Education and Civic Engagement: The SENCER Approach, published by the American Chemical Society Symposium Books series. With Trace Jordan and Matt Fisher, Richard helped organize another symposium (Civic Engagement and Chemistry Education) for the annual meeting of the ACS in 2009. He also organized a SENCER symposium at the 2010 Biennial Conference on Chemical Education (BCCE). He has presented invited talks on the SENCER approach at the annual meeting of Partners in Science (San Diego, CA) and at the Green Chemistry and Engineering Conference (College Park, MD). More recently, Richard organized a third symposium at the fall 2011 meeting of the American Chemical Society titled Science Education and Civic Engagement: The Next Level. The proceedings of that symposium have recently been presented in a second ACS Symposium book, Science Education and Civic Engagement: The Next Level (eds. Richard D. Sheardy and Wm. David Burns (2012, ACS).

At SSI 2015, Richard Sheardy will present the concurrent session “Developing SENCER Initiatives for New Teams” and will co-present the concurrent session “Incorporating Civic Engagement in Undergraduate Research.”

Reginald (Reggie) Shelton is a Captain in the United States Air Force, and currently serving as an instructor of mathematics at the United States Military Academy at West Point. He is the course director for Multi-Variable Calculus, a course taken by sophomore STEM majors. In this role, Reggie is responsible for curriculum development, daily operations, and student testing. Reggie is also heavily involved in STEM outreach efforts to middle and high school students, and is a member of the West Point interdisciplinary curriculum development team. He graduated with a bachelor's degree in mathematical sciences from the Air Force Academy, and holds a master's degree in operations research from the Florida Institute of Technology.

At SSI 2015, Reginald Shelton will co-facilitate the work session “Developing an Interdisciplinary Program: Learning Outcomes, Assessments, and Challenges to Overcome.”

Drew Sieg is a visiting assistant professor and resident honors scholar at Middle Tennessee State University. His area of research expertise is in marine chemical ecology, namely how chemical defenses protect plants against herbivores and pathogens. At MTSU, his focus has shifted towards biology education, particularly ways to incorporate authentic research and active learning into the classroom. He is a partner instructor in the Small World Initiative, a teaching and research collaboration that utilizes the search for new antibiotics as a running theme for introductory biology courses. Drew received his bachelor's degree in biology from the University of Richmond in 2007 and his Ph.D. from Georgia Tech in 2013.

At SSI 2015, Drew Sieg will co-facilitate the work session “Active Learning.”

Pamela Silvers teaches in the Computer Technologies Department at Asheville-Buncombe Technical Community College. Currently she is Principal Investigator (PI) for an NSF ATE Grant entitled Skilled Workers Get Jobs: Recruiting Women and Retaining ALL Students. In two years the number of female students in identified programs increased from 39 to 75 students.

A-B Tech has been notified that they are funded (as of July 1) for a three-year NSF ATE Grant entitled Skilled Workers Get Jobs 2.0: Appalachian Impact. Pamela will be serving as PI for the project, which includes seven community colleges in North Carolina, Tennessee and Virginia.

Pamela has shared strategies for recruiting and retaining students at numerous conferences including those hosted by the North Carolina Computer Instruction Association (NCCIA), Hi-Tec, NSF ATE, Association Supporting Computer Users in Education (ASCUE), STEM Tech, American Association of Community Colleges, NCWIT, and the North Carolina Community College System.

At SSI 2015 Pamela Silvers will co-present the concurrent session “Connecting Computer Science to Society: Building a Community of Educators”

Kyle Simmons is the Faculty Development Events Manager for NCSCE, SENCER, and related initiatives. In this role, he plans and manages NCSCE's signature annual events, the SENCER Summer Institute, and the DC Symposium, and provides support for other regional meetings. He also works with regional organizations and initiatives to ensure communication and the sharing of best practices. Kyle brings with him experience from his work with the Junior Statesmen Foundation, where he planned and managed civic education conferences for high school students. Kyle holds a bachelor's degree in political science from Howard University.

At SSI 2015, Kyle Simmons will coordinate the Institute staff.

Garon Smith is a professor of chemistry at The University of Montana in Missoula. He received an environmental biology degree from the University of Colorado at Boulder in 1973 and an applied chemistry degree from the Colorado School of Mines in 1983. At Montana, Garon teaches the first half of a year long introductory chemistry course for more than 1000 applied science majors – forestry, wildlife biology, healthcare professions and human performance. He has also taught several courses at the graduate level including: Environmental Chemistry, Atmospheric Chemistry, Chemical Separations and Surface Chemistry. Many of his courses have been developed through his association with SENCER and through grants from the National Science Foundation. Garon is a senior associate with the Center and spent a portion of his sabbatical at their national headquarters. In 2008, he was named a SENCER Leadership Fellow. He exemplifies civic engagement for faculty as Chair of many environmental and health boards, including the Board of Health and the Water Quality District Board. He served 10 years as the governor's appointed Ph.D. scientist on the Montana Board of Environmental Review. He completed nine years on the Board of Governors for the National Conferences on Undergraduate Research (NCUR) and hosted their national conferences at Montana in both 2000 and 2010. For six years

he directed an eight week NSF Research Experiences for Undergraduates program (REU) in environmental chemistry. In the guise of Garon the Wizard, or G. Wiz, he makes more than fifty appearances each year in schools, at NSF science institutes and in teaching workshops around the country. As the 2011 PittCon Faraday Lecturer, he performed to a combined audience of 7000 students and residents of the Pittsburgh area. He has been on six-month sabbatical at the Universities of Otago and Waikato in New Zealand for an international wizarding tour where he has done 112 programs for 10,000 students at schools throughout the country. As the 2011 PittCon Faraday Lecturer, he performed to a combined audience of 7000 students and residents of the Pittsburgh area. He is currently at work on a book, *The Potions: 101 Book of Spells*, a treatise on how to use wizardry as a pedagogical hook for science classes at all levels. Garon has also received a number of teaching and service awards, including the Montana Professor of the Year by the Carnegie Foundation and the 2008 Distinguished Service Award from the Montana Environmental Health Association.

At SSI 2015, Garon Smith will present the special session “Dramatic Demonstrations to Engage Large Classes,” and present the concurrent session “Adapting Large Lecture Formats to SENCERized Teaching and Civic Engagement.”

Mercedes Talley is a native of Los Angeles. She graduated from Stanford University, receiving a BS in general engineering (1974) and an MS in environmental engineering (1975), and was elected to Tau Beta Pi. After being commissioned into the U.S. Public Health Service, Ms. Talley designed water and sewer systems for Native American villages in Alaska. She then returned to Southern California and worked as a trouble-shooting engineer at the main wastewater treatment plant for Los Angeles County. She earned a second master's degree at UCLA in kinesiology (1985), with a focus on the biochemistry and biomechanics of musculoskeletal tissues. This was followed by a teaching career in secondary science at the Marlborough School and Rolling Hills Preparatory School, both in the Los Angeles area. Between these teaching appointments, Ms. Talley produced multimedia programs to support public participation in environmental planning and served as a planning commissioner for the Town of Mammoth Lakes in the eastern Sierra Nevada. She joined the program staff of the W. M. Keck Foundation in May 1997, and she is currently a program director for science, engineering and the liberal arts.

At SSI 2015, Mercedes Talley will moderate the panel discussion on scaling STEM reforms at the SENCER leadership dinner.

Danielle Kraus Tarka is the deputy executive director for the National Center for Science and Civic Engagement. She manages all national office operations and supervises the coordination of SENCER and the Center's national events, including the annual Summer Institute and Washington Symposium and Capitol Hill Poster Session. Danielle ensures linkages across the NCSCE's SENCER, GLISTEN, SENCER-ISE, SCEWestNet, Engaging Mathematics, and other developing initiatives, as well as the websites to support communication and dissemination of resources. She researches new program opportunities, leads strategic planning activities, and coordinates grant preparation and management of awarded funds, including subgrant programs. She earned her bachelor's degrees from the Pennsylvania State University and completed a nonprofit management executive certificate program at Georgetown University.

At SSI 2015, Danielle Kraus Tarka will co-present the concurrent sessions "NCSCE/SENCER Sustainability: Members," "SENCER States - Expanding the (Net)Work," and will preside over the final plenary session.

Julia Washburn is the newly appointed National Parks Service Associate Director for Interpretation and Education. She is a conservation professional with more than 20 years experience working to help people of all ages form deep personal connections with their environment and heritage. Prior to rejoining the NPS in September 2010, Julia served as an interpretive planning consultant and provided staff support to the National Parks Second Century Commission regarding a national vision for education in the next century of the National Park Service. Previously, she served as Interpretive Specialist for the NPS Conservation Study Institute at Marsh-Billings-Rockefeller National Historical Park, and Senior Vice President for Grants and Programs at the National Park Foundation, the congressionally chartered, non-profit fundraising partner of the National Park Service. She has also worked as a park ranger and education specialist at six national parks, the NPS National Capital Region Office, and as a science teacher in the U.S. Peace Corps. She holds a master's degree in museum education leadership from Bank Street College of Education and a bachelor's degree in biology and psychology from Mount Holyoke College. Currently, Julia also serves as an Adjunct Professor in the George Washington University Museum Education Graduate Program.

At SSI 2015, Julia Washburn will present the plenary session "The National Park Service and the Nation's Learning Landscape", and facilitate the work session "Partnership and Collaborations between Higher Education and the National Parks"

Frank Wattenberg is a professor in the Department of Mathematical Sciences at the United States Military Academy (USMA). He is particularly interested in teaching mathematics in the context of real world applications, especially applications involving consequential and often controversial questions of personal and public policy. He also has a long-standing interest in developing students' abilities to use technology in the same ways we do in our careers and research. He approaches mathematics as a modeling language used to express, manipulate, and communicate ideas about how the world operates. He is a PI or CO-PI on several NSF-funded projects, including the Engaging Mathematics Project. One of the most important and fundamentally interdisciplinary problems we face as individuals and a civilization is how we will share our world with robotic devices driven by artificial intelligence. Such devices have the potential to relieve us of dangerous and tedious tasks but they also threaten our jobs,

freedom, and privacy — for example, we are now making decisions on how we will share public roads with self-driving vehicles but within the next few years the question will shift to whether and how self-driving vehicles will share public roads with legacy drivers — you and me. Frank is currently developing curriculum materials and pedagogy for using robotics and artificial intelligence as an interdisciplinary theme in mathematics courses and throughout the curriculum. Cadets in a pilot section of the first semester of the core mathematics sequence at USMA this fall will each have their own “Personal Robotics Laboratory” and will use the mathematics they are learning to build robotic devices and imbue them with artificial intelligence. We expect this will develop their abilities as resourceful and agile tinkerers.

At SSI 2015, Frank Wattenberg will co-facilitate the work sessions “Plenary Follow-up Session: Mathematics and Civic Engagement,” “MacGyver on the Hudson,” and “Robotics and Artificial Intelligence — A Panel Discussion.”

Rachel Whitaker is an assistant professor of environmental science at White Mountains Community College, in Berlin, NH. She received her M.S. in Biology from Plymouth State University in 2011 after conducting research with NH Fish and Game on high elevation populations of brook trout in northern NH. Rachel continues to work closely with the NH Fish and Game Department conducting research on cold-water fish and providing fieldwork opportunities for her students at WMCC. Rachel is also involved in data collection with LoVoTECS at PSU, CoCoRaHS, Clean Water Healthy Trout, and the Dartmouth College Grant. On her own time, Rachel maintains a small, pasture-based farm raising chickens and dairy goats.

At SSI 2015, Rachel Whitaker will co-present the concurrent session “Four Weeks on Water.”

Alicia Wodika is a temporary assistant professor at Truman State University in the Health and Exercise Sciences Department. She teaches Global Public Health, Research Methods for the Health Sciences, Human Sexuality, Environmental Health, and Epidemiology. Alicia received a bachelor’s degree in biological science from Aurora University, a master’s degree in biological science from Western Illinois University, and a Ph.D. in health education from Southern Illinois University Carbondale

At SSI 2015, Alicia Wodika will co-present the concurrent session “Experiences with Civic Engagement at Truman State University.”

Jessica Wyndham is associate director of the American Association for the Advancement of Science's (AAAS) Scientific Responsibility, Human Rights and Law Program, where she directs the Article 15 project, aimed at engaging the scientific community in elucidating, promoting and assisting in the realization of the human right to enjoy the benefits of scientific progress. She is also coordinator of the AAAS Science and Human Rights Coalition. Jessica has worked extensively with national human rights institutions throughout Asia, the Pacific, Africa and the Americas and served as Legal Adviser for the Brookings Institution Project on Internal Displacement and the United Nations Office of the High Commissioner for Human Rights in Ecuador. Jessica is also currently an adjunct professor at George Washington University where she teaches a graduate course on internal displacement. Jessica holds a bachelor of arts (with Honors), a bachelor of laws (with Honors) and a master of laws.

At SSI 2015, Jessica Wyndham will co-facilitate the work session "Science and Human Rights."

SSI 2015 PARTICIPANT GOALS

Applicants are listed alphabetically by institution and last name. Team leaders are followed with an asterisk.

Alfred State College SUNY

*Mark Amman, Danielle Bond, David Kendall, Alice Tarun**

I am interested in incorporating civic engagement, socio-ethical issues and sustainability in the Biology courses that I teach at Alfred State College. I believe that the SENCER methodology, particularly with its emphasis on promoting student engagement and learning through authentic problem-solving experiences, would be an ideal strategy to motivate and engage students in active, creative, and sustained learning. I hope to learn strategies to integrate SENCER approaches in my courses and guidance and instruction on the implementation and assessment of their effectiveness. In particular I am designing an introductory course on Genomics and Bioinformatics that incorporates SENCER approaches. The course has a project-based learning component where students apply genomic and bioinformatics tools to collaborate on an annotation project with researchers as well as a DNA Barcoding project to participate in a global effort to catalog biological diversity. I hope to include field work and activities that will allow the students to explore and research on the environs in the Finger Lakes region so they can have a “sense of place” and more appreciation of the unique ecology of the region. I will be selecting course materials and activities that will help the students determine the potential applications of genomic data to medical research, therapeutics and personalized medicine. More importantly I will use course materials and examples that I hope will lead students to understand and appreciate the medical, social, ethical, and legal issues associated with the availability of personal genomic information. In my General Biology classes I would like to improve my students’ science literacy on important topics such as sustainability and global climate change so they can make better choices that are good for the environment. In my Genetics course I would like to focus on case studies and activities that will allow them to make informed decisions on how they view genetically modified food and the use of genetic engineering and stem cells for research or therapeutics. There is a wide gap in opinion between scientists and the public on issues such as climate change. There is also a big disconnect on what science research reveals and how the media and the public perceive these findings. By engaging students on these issues they develop critical thinking skills to help them understand and sort through the multitude of information available to them, and to use this information in their opinion-forming and decision-making processes.

Auburn University

Paula Bobrowski, Nancy Haak, Robert Holm, Ann Knipschild*

Attendance at SSI 2014 continued to enrich and engage our efforts to widen the exposure of SENCER to the Auburn University community. The team presented a well-received poster at SSI 2014; had meaningful sessions with our mentor Dr. Keith Krumpe and were encouraged to submit a proposal for an NSF sub award (which we submitted and were subsequently awarded). We have chosen to attend SSI 2015 to further the development of SENCER-like courses at Auburn and to further our SENCER-funded research and civic engagement. We will continue to use information gathered from colleagues and mentors at SSI 2015 to further explore the interdisciplinary aspects of SENCER, opportunities for curriculum development, civic engagement and proposal development for external funding. We are also interested in furthering our understanding of the relationship between the arts and neuroscience, and exchanging ideas and results with colleagues conducting research in this field. We are also planning to bring new faculty to SSI 2015 and introduce them to SENCER.

Brown University

Kathleen Hess, Sandra Russo-Rodriguez, David Targan, Kyle Trenshaw*

With the SSI so close to Brown University this year, we feel it would be inconceivable not to take the opportunity to expose more motivated Brown faculty to the SENCER experience. Toward this goal, we formed the Chemistry Innovations Group with three female faculty members from the Department of Chemistry committed to making chemistry courses at Brown more enjoyable, engaging, and inclusive, as well as the STEM Education Postdoctoral Researcher from the Sheridan Center for Teaching and Learning and the Associate Dean of the College for Sciences from the Science Center as institutional support for the faculty members' efforts and ideas. Our plans for the upcoming academic year (2015-2016) include fully flipping two introductory chemistry courses, eliminating (or at least significantly reducing) any need for a "remedial" chemistry course for students with poor high school preparation, and incorporating more hands-on, real world experiences for students that engage them more fully as "Chemistry at Brown" and in the larger Brown community. After the impact made by the 2014 SSI on STEM education here at Brown, we are excited to bring new faces and take away new perspectives at the SSI this year!

Butler University and Central Plains SENCER Center for Innovation

Donald Braid, Joe Kirsch, Jessica McCormick, Paul Morgan, Kimberly Vogt*

Butler University and the Central Plains SCI are mounting a joint effort to recruit a team for the SENCER Summer Institute. In the past, Butler University has focused on a Butler team; however, this year we are making an effort to recruit participants from other institutions in the Central Plains area to be part of an institutionally diverse team.

Carolina Day School

Joanne Bartsch, Prudence Munkittrick*

We teach at an independent, college preparatory high school in Asheville, NC that has, over the past several years, struggled with reconciling a traditional definition of college preparatory with what we know to be successful, progressive educational practices. As a school community, we are in the process of restructuring our curriculum so that it is more focused, more relevant and engaging to students and more directed towards the development and use of critical thinking and problem solving skills. Based on previous experience with SSI2014, we believe that a SENCER like approach to our classes, even as early as ninth grade, will help us meet our goals. Also, based on the experience at SSI2014, we think that the opportunity to talk with college professors will help us better understand what our students will need in order to be successful in a postsecondary academic environment.

Cornell University

*Linda Rayor**

The SENCER Summer Institute program sounds like it will be an incredibly valuable experience to increase my knowledge of science learning pedagogy and to help me upgrade the scientific complexity of my teaching. I am particularly interested in learning more about the SENCER approach to science education as civic engagement and in the opportunities to learn about more resources and networking. In the next year, I will be hosting my own professional development workshop on the value of using science outreach training as a way to empower and engage college students in STEM teaching. Additionally, I hope to apply for an NSF-AISL grant related to my program and feel that the SENCER Summer Institute would expose me to a broader view of teaching science education than I currently have a talented practitioner.

CUNY at College of Staten Island

*Herbert Schanker**

As an alumni of previous SSIs I have learned there of many ideas and tools to help improve both STEM and non-STEM students' interest and learning in the field of technology. Areas that have been integrated successfully in our science general education course and accompanying model web site include increased hands-on work, grouping, assessment and civic tied STEM learning. As at other SSI conferences I hope and expect to pick up or at a minimum fine-tune previous methods and tools for the improved teaching of this subject at CSI.

Defender of Design

*Aarin Stewart**

As a past participant of the SENCER symposia, it was through that experience that I truly became aware of the necessity to communicate at a civic capacity the understanding of science as well as promote further civic engagement initiatives in my community. During the final year of my undergraduate studies, a colleague and I created a children's book developed from the research conducted on storm water remediation. Since then, the children's book has evolved into an educational tool to reach youth in a relatable manner about the environment. If accepted by SSI 2015, I would benefit greatly by the opportunity to learn to become more effective in curriculum design, goal setting, and building collaborative connections.

Saving the environment has become such an overwhelming subject that it seems many have tuned out the dragged out lecture. While articles and news coverage continue to surface about the effect of human behavior resulting in ocean pollution, getting directly involved in solving the problem appears to be far-flung. Considering numerous unexplained mortality events that have taken place in recent years, it is evident that a keener attention is needed to educate young and old to take action for a positive change. This civic issue is approached in a way to teach children about science, aquatic life, and how we interact with the ocean impacts our World. Ultimately, taking care of the environment will be characterized as a lifestyle choice rather than the "good deed of the day."

My goals for the year following SSI 2015 are to help my community define stewardship, understand that people affect the environment, define pollution as causing harm to the environment, and understand some types of pollution. Ultimately, children should feel the environment's well-being is entrusted to his or her care. Success will be measured by my ability to refine an educational kit that will be demonstrated locally at elementary schools within the Los Angeles County.

Within the next year I plan on continuing my education by pursuing a MBA degree of a Marketing concentration. It has always been my transdisciplinary studies that have propelled me to discover new and innovative ways to communicate complex messaging in an easily digestible manner. In addition, I plan on launching a non-profit organization, named Spot's Promise, dedicated to providing to the public scientific and educational tools to continue to foster the curiosity and commitment to oceanic health.

DeVry University and Harold Washington College

*Abour Cherif, Farah Movahedzadeh**

In the last five years we have been involved in conducting a research on why students fail at the college level. With our experience in talking with students, faculty, and academic leaders, we have come to understand how we can inspire and motivate students to engage in the learning process. We would like to outline the innovative methods such as Project Based Learning that have been used over the last few years in Harold Washington College and the outcomes of its implementation.

Eastern Kentucky University

*Martin Brock**

We have been teaching courses in our honors program that offer science courses with a civic engagement component, but we want to do several things to enhance this: 1) to connect with other institutions with similar programs, 2) to expand our list of ideas that represent smart and creative ways to engage our students, and 3) to use civic engagement as a mechanism to develop and facilitate service projects consistent with our student learning objectives.

Emporia State University

Christopher Alderman, Breianna Brooks, Andrew Miller, Diane Nutbrown, Andy Renteria*

At Emporia State University (ESU), our interest in the SENCER Summer Institute (SSI) is twofold:

- 1) We plan to implement what we learn at SSI in an honors section of our first-year chemistry sequence.
- 2) As much as possible, we would also like to use learner-centric instructional techniques (including problem-based learning) in the rest of our chemistry curriculum. The goals of SENCER and our Honors College overlap in significant ways. Specifically, both focus on community engagement and open-ended problem solving. We (the chemistry faculty) have made small attempts at introducing problem-based learning and would strongly benefit from a more structured approach. Thus, SSI is an excellent opportunity for us to develop new curricular approaches both for classes associated with the Honors College and with our core chemistry classes.

ESU is a regional four-year institution, and our chemistry department has ~60 majors (including chemistry, biochemistry and molecular biology, physical science education and pre-engineering tracks). After a significant investment in ESU from the state legislature, the mission of the Honors College has expanded to include substantial community service and leadership components. In order to offer an honors section in our first-year chemistry sequence, we need a curriculum that will connect chemistry practice to local community issues. Furthermore, the honors section will be offered continuously every spring semester with new students and an evolving community with new challenges. To develop a curriculum for such a course, we are in need of strong logic models that will connect student learning to successful project completion and will include tools for assessment and curricular revision. It is our hope that through participating in SSI, we will be able to design a more effective curriculum that will meet the goals of the Honors College and of SENCER.

Freed-Hardeman University

*Caleb Kersey**

I have several motivating factors in attending SENCER Summer Institute 2015, with my primary goal being my continual exposure to SENCER ideals in order to transform my pedagogical approach. I also plan to disseminate the results of a SENCERized course where Dr. Rachel Salmon and I collaborated to teach our BIO205 Cell Biology course through the filter of cancer biology. Dr. Salmon presented the preliminary results (one semester) of this effort at SSI 2014 and I plan to present a poster showing the culmination of three semesters of our SENCER driven Cell Biology course. In addition, I received the 2014 Post Institute Implementation award to teach BIO 335 Genetics, using the exoneration of the wrongfully accused as a framework to teach core DNA concepts. I would like to use the collaborative sessions to gain ideas about improving this proposed effort. I also need more training in the area of assessment, especially the application of SALGs.

George Mason University and the Galapagos Conservancy

*Tyler Fabian, Sarah Kuppert, Mary Nelson, Julia Nord, Thomas Wood**

Mason is a long-term SENCER institution supporting faculty development and course creation and revision over fifteen years, largely through New Century College. This year, we are continuing to reform STEM education primarily in our College of Science through our STEM Accelerator program. Bringing new faculty into SENCER will promote faculty development, course revision and cohesion with other nationally known STEM reform programs.

Harry S. Truman College

*Mahesh Gurung, Andrew Kerr, Vijayalakshmi Natrajan, Harry Sdralis, Raymund Torralba**

Our team from Truman College brings to SSI 2015 several faculty members who are new to the SSI. Their attendance would help us get closer to achieving some of the goals of the 2105-2016 SENCER sub-award, which are: (1) to increase the college's capacity to offer highly integrated, linked courses or Learning Communities (LCs) organized around topics related to sustainable development; (2) to increase the number of faculty members who apply SENCER ideals through the LCs or stand-alone science courses; and (3) to increase the number of integrated learning experiences that foster critical thinking and writing.

Truman College, one of the City Colleges of Chicago (CCC), is a comprehensive community college that provides the first two years of baccalaureate degree courses as well as occupational and adult education programs. We serve a very diverse student body. As such, the team will also solicit SENCER leaders and fellow attendees for ideas and best practices on how to establish effective collaboration between our SENCER faculty and the college support staff in improving outcomes for our students, whether in the LCs or in unlinked science courses.

Our goals are consistent with the City Colleges of Chicago's Reinvention goals, and therefore have significant support across various sectors of the college and the district. These goals include (1) increasing the number of students earning college credentials of economic value and, (2) increasing the rate of transfer to Bachelor's degree programs following CCC graduation

We commit to supporting our new attendees in developing modules or entire courses or LCs in the year following SSI2015.

Hofstra University

*Sylvia Silberger**

I hope to learn about new ideas in incorporating SENCER ideas into mathematics education and to present a project that I am doing with two colleagues, that links a precalculus course with an environmental science course and a writing course. Students will take the three courses together.

Indiana State University

Richard Harden, Catherine Paterson, Jim Speer*

We are interested in attending the 2015 Summer Institute to become more familiar with strategies and techniques that are being utilized across the SENCER community. Our team is currently focused on increasing the number of SENCER courses offered, within various disciplines, on the Indiana State University campus. Our university currently has 35 courses that have converted to the SENCER mode; this number is expected to increase within the next year. Our team intends to use the information that is provided through the various workshops at SSI 2014 to help foster professional growth within our SENCER Leadership team and faculty.

SENCER at the University of Hawai'i: Interdisciplinary and Inter-Campus Collaborations

Robert Franco, Ulla Hasager, Darren Lerner, Wendy Kuntz, Michael Ross*

The University of Hawai'i team brings together community college and research university faculty to develop SENCER courses, programs, and civic engagement active learning opportunities that connect interdisciplinary Natural and Social Sciences, Native Hawaiian Studies and epistemology, and the Arts and Humanities via grants from the Keck and Teagle Foundations. Courses in biology, botany, anthropology, engineering, ethnic studies, political science, education, and the humanities, have been Sencerized and team members are tackling issues in island ecosystems: climate change, watershed management, invasive species, coral reef deterioration, and sustainable food systems. Service-learning and undergraduate research assignments enable active learning that empowers students as change agents.

Kingsborough Community College

*Anna Rozenboym**

Teaching at an urban community college involves working with a student population from widely diverse socioeconomic, educational, ethnic, and cultural backgrounds, who have equally diverse educational motivations and career goals. Many of my biology students aspire to enter careers in healthcare professions. Teaching students presents an additional challenge of delivering exceedingly dense course material, while maintaining a motivational, student-centered framework that contextualizes this content. As an alumnus of SSI 2013 and SSI 2014, a team leader representing the Biology Department from Kingsborough Community College, I would like to take this opportunity to attend SSI 2015 in hopes of sharing my experience developing curriculum for SENCER-inspired biology courses as well as learning innovative pedagogy from my peers. I greatly appreciate SENCER movement and would like to continue to play part in disseminating new approaches to integrative and student-centered learning.

In the past year, I led a team of inspired Biology Faculty in implementation of curriculum emphasizing student learning of biology through relevant public issues, such as food availability and justice. I am proud to say that my team and I were awarded SENCER Implementation Award in 2013. Currently, I am in the second semester of implementing my re-designed course to enhance student learning of anatomy and physiology by building an explicit link between course content and food issues related to human health and healthcare. In the next couple of months I will conduct a formal assessment of results obtained through the SALG survey. I look forward to sharing feedback of students as well as my impressions with the SENCER community and hope to obtain insights into SENCER-inspired curriculum development.

Inspired by SSI 2014, I have applied and was awarded an Individual SENCER Implementation Award to conduct a student-led research project into the Civic Engagement component of my courses. In the next year, I will be working with student-researchers on design and implementation of research protocol that will involve peer-led focus groups centered on assessment of civic engagement assignments offered in class. I look forward to informal student feedback on usefulness of civic engagement in Anatomy and Physiology courses. Further, I intend to redesign curriculum in order to incorporate SENCER ideals into a Biology of Women course that I currently teach at Kingsborough.

LaGuardia Community College*Alioune Khoule**

Remedial mathematics has become an academic and career obstacle for many students, especially those in community colleges. In fact, it has become the largest single barrier to student advancement. Approximately 23.2% of first and second year community college students enrolled in a remedial or preparatory course in 1999-2000. Among those students, 75.6% enrolled in a remedial mathematics course (National Center for Education Statistics, NCES, 2000). Therefore, I have been working on ways to stimulate student's engagement in remedial mathematics classroom as well as putting a lot of emphasis on the concepts of basics algebra. My interest in attending the summer institute is to share work that I have been doing about student engagement in remedial mathematics classroom and how it affects students' mathematics achievement. I hope to learn new SENCER approaches or projects that connect remedial mathematics topics to real life issues.

My plan is to apply what I will learn in SSI 2015 in my classroom to help students nurture their mathematics understanding. Therefore, I have been working on ways to stimulate students engagement in remedial mathematics classroom as well as putting a lot of emphasis on the concepts of basics algebra. My interest in attending the summer institute is to share works that I have been doing to increase students' engagement in the remedial mathematics classroom and how it affects their mathematics achievement. I hope to learn new SENCER approaches or projects that connect remedial mathematics topics to real life issues.

My plan is to implement a series of professional development workshops, within LaGuardia College, targeting faculty who are generally without the resources to explore and nurture ways to design a mathematic project and how to implement it in the classroom.

LaGuardia Community College*Mangala Kothari, Marina Nechayeva**

Through consistent use of SENCER activities in the classroom, we hope to realize our goal: let students rediscover the desire to take on big, real questions, then guide them in building skills and mastering tools needed to persevere and delight in looking for difficult answers. To this effect we have developed and will pilot two SENCER-like Statistics sections, to further enhance the course that is already in spirit, if not always in the letter, so closely aligned with the principles of SENCER. However, most students will not be radically transformed by their experience, however positive, if it is limited to one course. So how can we promote SENCER culture beyond the scope of a single discipline, what can we do to promote serious data driven student research and help incorporate such research into mainstream teaching? We propose to create a Student Data Research Center where students can work with a librarian to master information mining, with a mathematician to get assistance with data manipulation and analyses and with an expert from Writing Center to write about the results. We hope to get grant funding to pilot the Center in 2015. Because this is a new service, use of it will be mandatory for a sample of statistics and non-statistics classes (where there is some sort of data component) for the first year. This will give the service exposure and allow for stronger assessment. Student and instructor satisfaction surveys as well as student outcomes (exam and project grades, relevant core competency scores) compared to the baseline will be used to assess the success of the service.

Lakes Region Community College

*Andy Duncan**

As a first-time applicant to the SENCER Summer Institute, I look forward to learning and reflecting on effective methods for teaching scientific concepts. Even though I have been an educator for a number of years, I have virtually no formal training in pedagogy nor in the science of learning. That is what most excites me about SENCER Summer Institute.

My field is sustainable energy, which is rich in its connections to applied research, public policy and civic engagement. The SSI also connects very well with the New Hampshire EPSCoR seed grant I received to collaborate between my community college and a nearby state university. The grant uses energy and sustainability as a vehicle for applied student research, and to generate greater interest in STEM fields. In particular, I am teaching a new "Energy and Sustainability" science course which has many opportunities for engaged learning!

Specific goals and plans for the year after the SENCER Summer Institute include:

(1) Continuing to develop the Energy and Sustainability course, applying the SENCER model to course concepts, labs and a student research project.

(2) Developing mini science-of-energy modules for high school visits. These energy modules would stimulate student interest in the study of science and its applications using hands-on engagement as a theme.

(3) Planning a summer 2016 workshop for the Energy and Sustainability course for high school teachers who are qualified and interested in teaching this as a college course. The SSI and the SENCER model will be useful in planning this workshop, and I am hoping to collaborate with other SSI attendees who have similar goals or expertise.

(4) Using the SENCER model in the reinvigoration of the Energy and related curriculum at Lakes Region Community College. We are in the midst of re-visioning and rethinking how we teach about energy and environmental/sustainability topics. So in a more general sense SSI will help inspire me to consider new approaches to our curriculum.

In addition, I would like to be a resource person at my community college for infusing the SENCER model across multiple disciplines in the sciences, applied technologies, mathematics and liberal arts. We have a tremendous challenge with remedial mathematics, for example.

In summary I am excited about being able to focus on the pedagogy of science, and look forward to sharing my practical experiences and knowledge of the energy field.

Lipscomb University

Todd Gary, Tamera Klingbyll, Autumn Marshall, Ginger Reasonover*

Our goal is to continue to expand trans-disciplinary STEM-related courses which have been developed and implemented at Lipscomb University to satisfy the 6-hour science requirement for K–6 education majors, to satisfy general education requirements of the university core curriculum, and to expand to partner with the Lipscomb Academy Elementary School in their efforts to be a "green" school. We would also like to support the integrated science courses at the TN Prison for Women, and possibly expand that program to other corrections facilities.

Trans-disciplinary approaches in these courses involve multiple disciplines with the possibility of new perspectives beyond those disciplines. Our idea is that trans-disciplinary inquiry focuses on the issue, rather than the individual disciplines involved. Faculty from biology, nutrition, physics and education, while utilizing civic engagement, service learning (SALT), integrated laboratories, literature, and case studies, will be challenged to enhance student learning and improve attitudes involving science.

Assessment instruments need to be developed and used such as the current SALG, SALT and university student course evaluations to assess content knowledge and science attitudes. We need to emphasize the evaluation piece this year in particular, as we prepare for our SACSCOC site visit in the short term. Emphasis will be given to relating trans-disciplinary labs and classroom demonstrations related to the case studies and/or civic engagements involving the students. Assessment instruments will be given in traditional courses, courses in the prison, and lessons and labs in the elementary school setting to compare content knowledge and science attitudes.

A continuing objective is to create and develop appropriately integrated, inquiry-focused lab experiments with connections to two or more state or national science standards with assessments by bringing faculty from different sciences together in regular discussions and development workshops. This year we would like to be more involved with the elementary school, providing both hands-on service learning experiences for our pre-service teaching majors and excellent science opportunities for the K-4 students at the elementary school. We also hope to have more "outside" students (meaning traditional Lipscomb undergraduates) enroll in the integrated science course at the prison to encourage social and spiritual, as well as intellectual, development. Education majors in that setting would see first-hand the challenges of providing education with limited technological and laboratory resources.

Madonna University

*Jodi Barta, Ted Biermann**

Our goal is to get new updated ideas in teaching science for engaging and exciting students, and share our experiences in teaching of forensic science through research

Massachusetts College of Liberal Arts

*Carolyn Dehner, Elizabeth Hartung, Duy Nguyen, Adrienne Wootters**

Our goal is to create and put through governance an introductory course for first-year STEM majors in math that addresses data interpretation, manipulation, and presentation. It is our hope that this course will aid in the retention of STEM majors, particularly for those in life and environmental sciences, whose preparation is often weak. In addition to connecting with colleagues, we would like to work as team to find ways to incorporate project-based and problem-based learning into our courses, and we would like to bring what we have learned back to our MCLA colleagues.

Miami Dade College

Elodie Billionniere, Lesley Nadal, Rene Revuelta

Miami Dade College InterAmerican Campus is interested in sending faculty representatives to SSI 2015 as both part of our Focus on Pedagogy professional development efforts as well as a continuation of the work begun by the college's Earth Ethics Institute (EEI) who are working on integrating the SENCER approach into their Global Sustainability and Earth Literacy Studies (GSELS) college-wide learning network. We believe SENCER's focus in Scholarship of Teaching and Learning, active learning techniques, and civic learning/engagement will be of great benefit to campus faculty. After attending SSI 2015, we hope to develop campus-level workshops for faculty where those who have attended the summer institute can share what they've learned. Additionally, our SSI 2015 attendees will run at least one of their Fall 2015 classes as combined SENCER/GSELS, using the topic of environmental sustainability as the issue of civic import through which class content is presented, and also the Student Assessment of Learning Gains (SALG) developed by EEI for the Sustainability & SENCER Challenge. The Sustainability & SENCER Challenge previously enabled eight MDC faculty to successfully incorporate the SENCER approach into their classes and paved the way for further SENCER-related work throughout the college.

Middle Tennessee State University

Judith Iriarte-Gross, Drew Sieg*

We are excited to report that SENCER is expanding on the MTSU campus. We are building a strong community of practitioners in our College of Basic and Applied Sciences. We are also promoting the SENCER ideals to other colleges on campus through the Experiential Scholars (EXL) program, which is directed by Carol Swayze, a member of our SENCER team. We also include both undergraduate and graduate students in our work as we discuss the importance of STEM with respect to civic engagement. As we reflect on the time since SSI 2014, we realize that we need to make a concerted effort to reach out other STEM and non-STEM disciplines on campus. We also have an American Democracy Project on campus, which would make for a rich collaboration. We are looking forward to SSI 2015 where we can explore more opportunities from the SENCER community.

We offered two professional development workshops since SSI 2014. Our SSI 2014 team members, Drew Sieg, Keying Ding and myself, presented an introduction to SENCER along with suggestions on how to engage students in the biology and chemistry classrooms. This presentation was in fall 2014 and interested faculty in the College of Education. In March 2015, we hosted SENCER Senior Fellows: Ellen Mappen and Monica Devanas, as Distinguished Lecturers. Ellen and Monica provided a well-attended workshop (faculty and graduate students) on professional portfolios. They also spent time with students in the Honors SENCER class: Contemporary Issues in Science. I propose that we continue with offering professional development workshops to our campus as we build the MTSU SENCER community. One such workshop would focus on designing a SENCER class project.

In the past year, we successfully piloted two biology courses that emphasized both civic engagement and authentic research experiences for undergraduates (see models and experiences for details). Both of these courses were tested in an Honors setting with the expectation that if successful, we could offer these courses to non-Honors students. These courses are a direct response to the Presidential Vision and Change call for pedagogical reform in STEM. We are evaluating how these changes affect students at a regional state university.

Monmouth University

Catherine Duckett, Bernadette Dunphy, Robin Kucharczyk, Jeffery Weisburg*

The Monmouth University team is focused on more seamlessly integrating active learning and incorporating civic issues in to our classrooms. We are focused on teaching through Climate Change (CC) and medically relevant civic issues, including those related to CC but including others such as antibiotic resistance and consequences of vaccination refusal. Our team is interdisciplinary including three biologists and a chemist and we hope to contribute to curricular reforms in both the biology and chemistry departments in the coming year. Bernadette Dunphy, chair of biology, will lead curricular reform in the department and collaborate with Jeffery Weisburg on reforms in the Anatomy and Physiology sequences. We also plan innovations in immunology and microbiology. Robin Kucharczyk will focus on curricular reforms to the Organic lab curriculum, integrating CC examples into the general chemistry sequence for majors and on improving the non-majors climate change course. Catherine Duckett, an evolutionary biologist and Associate Dean, will work on our general education sequence, which is under review, as well as innovations and improvements in our climate science courses.

Montgomery College

Marcia Bronstein, Rita Kranidis, Monica Mallini, Carol Moore, Karl Smith*

Our team comprised of STEM and Humanities faculty as well as an instructional designer and the Director of the Global Humanities Institute, represents a broad effort at Montgomery College, MD, to build a globalized curriculum that includes collaborations between STEM fields and the Humanities. Our institution has redesigned our General Education program to promote thematic approaches centered on interdisciplinarity on many levels. Our work in linking STEM and Humanities [and appropriate social sciences] has just begun. We will benefit from the experience that participants in the SENCER summer Institute have to share. We also want to share our process and what we have accomplished thus far.

Mount Washington Observatory

*William Broussard**

As part of the Education and Outreach effort within an NSF-EPSCoR grant titled, "Ecosystems and Society," my participation in the SENCER Summer Institute will give me vital capacity-building skills toward the creation of a sustainable network of New Hampshire-based informal science education institutions. Currently our network consists of 10 centers of varying size, content area, and outreach effort. We belong to a number of regional professional organizations but have no NH-based, central repository for sharing ideas, professional development opportunities, or potential funding sources. Participation in the SENCER Summer Institute will broaden our impact as a unified network of STEM practitioners in New Hampshire and boost our capacity to receive funding for partner-led initiatives.

New Hampshire Institutions

Cyndy Carlson, Doug Earick, Rachel Whitaker*

After participating in the SENCER Summer Institute in 2014, a team of faculty from 3 different New Hampshire institutions of higher education has developed a multi-week curriculum called "Four Weeks of Water". With a goal of engaging non-science majors in our general education classes, the curriculum highlights issues relating to the challenges of water use (and abuse) and water-focused research in our state. As part of this work, students in our classes have worked in teams to develop a novel research study focused on an issue of particular interest to them. Through this, students have gained 21st century skills in conducting research through the collection and analysis of real-time data, in presenting their research to a larger audience, and in working collaboratively in groups made up of people from diverse locations across the state.

Following this year's efforts, the team hopes to share the results of their work (and the work of their students) with others in attendance at the 2015 SSI. With a clear focus on the application of SENCER ideals, we hope to improve on our preliminary work and develop the Four Weeks of Water curriculum further – potentially including faculty from other institutions who might be interested in collaborating.

New Hampshire Technical Institute: Concord's Community College

*Tracey Lesser**

I want to be able to begin every lecture, lab and discussion by saying, “the reason you need to understand this subject is...” or “the practical application of this material is...” I am a Chemistry professor at a community college, and students come to a community college for as many different reasons as there are different students, but they all have something that they need to get out of the courses that I teach. No one takes my Chemistry courses to become a chemist - many students are in career-oriented programs such as mechanical and manufacturing-engineering, dental hygiene, or pre-nursing and many are just taking my course as a prerequisite for physical therapy and P.A. programs they hope to transfer into. This brings up an intrinsic conflict: the basic curriculum that I must teach often may seem only tenuously related to the student's academic goals. Further, many community college students are still developing the ability to connect short-term work to long-term goals. If I can connect the material I teach with my student's goals then they are more likely engage the material and to take responsibility for their own learning.

I am constantly looking for real-world applications for the chemistry theory that I teach. Along those lines, this year I received a grant from NH EPSCoR for a project entitled “Soil Science and Service Learning at the Sycamore Community Garden in Concord, NH”. For this project my students and I will be collecting soil samples from a Community Garden on campus that serves to provide nearly 130 Nepalese, Burundi and Sudanese refugee families with a 13' x 26' garden plot. We will initially have the collected soil analyzed by the UNH Soil Microbiology lab and UNH Cooperative Extension and we will subsequently use this data to calibrate our own equipment and examine the soil nutrients and use patterns for each culture. A goal of this project is to show that community college students can do meaningful research with low-cost equipment that can be of a genuine benefit to the community. I aim to have soil monitoring and analysis become a standard part of the introductory environmental science and chemistry course curriculum. My challenge for this coming year is to take the basic framework of the grant and turn it into a complete program that enables the different populations to achieve their academic, research, and civic goals.

New York City College of Technology, CUNY

*Edrouine Gabriel, Erica Yeboah, Mallessa Yeboah**

Our group is attending this year's SSI in order to present our work, Prospect Park Biodiversity – a SENCERized Multidisciplinary Project.

This multidisciplinary project involves investigating the water quality and biodiversity of the Prospect Park Lake in Brooklyn, NY. The project involves three disciplines: Chemistry, Biology, and Mathematics. During the fall 2014 semester, faculty and students made a trip to Prospect Park to collect water samples from various sites. The objectives of the project are as follows:

- 1) To provide a multidisciplinary practical learning experience by combining chemistry, mathematics, and microbiology together and by reaching “beyond the typical constraints of a single content area”
- 2) To perform chemical testing on the levels of pH, nitrate, iron, and dissolved oxygen, conductivity in water samples (Chemistry: co-mentored by Prof. Diana Samaroo)

- 3) To determine the total number of bacteria and the fecal contamination by measuring coliforms and specifically E. coli and Enterococcus (Microbiology: co-Mentored by Prof. Liana Tsenova)
- 4) To perform regression analysis and hypothesis testing, based on the collected data (Mathematics: co-mentored by Professors Urmi Ghosh-Dastidar and Sandie Han)
- 5) To provide students with tools for assessing civic issues
- 6) To draw meaningful inference based on the analysis and take civic actions.

All participated students and faculty from Biology, Chemistry, and Mathematics worked collaboratively in all aspects of the project including water sample collection from the Brooklyn Prospect Park, performing chemical and biological tests on the sample, mathematically analyzing the data, and making meaningful inferences about what they have learned. Faculty mentors who mentored this project alphabetically are: Urmi Ghosh-Dastidar (Mathematics), Sandie Han (Mathematics), Diana Samaroo (Chemistry), and Liana Tsenova (Biology).

Acknowledgement: This work is supported by the SENCER 2013 post implementation sub award. The authors also greatly acknowledge the Emerging Scholar and the Black Male Initiative Programs at New York City College of Technology for their continued support and funding.

New York City College of Technology/CUNY

Juanita But, Davida Smyth*

As educators, we fully embrace the vision of SENCER to improve scientific education and increase the civic capacity of students and community members. We believe that this cannot be done without first re-considering the present status of how the majority of STEM courses are taught in the classrooms and reflect on how they should be taught to engage students and increase their civic capacity. First of all, civic scientific engagement is achievable only when there is civic scientific literacy. In order to teach “basic scientific content through complex unsolved civic challenges” effectively, we have to understand the challenges our learners face. Ability and interest go hand in hand as much as inability and fear. Having labored to improve the STEM disciplinary literacy of our students, who mainly come from low-income, underprivileged, and low-literacy families, we can conclude from our assessments to date that for many of our students the major hurdle, among others, to learning basic scientific content is their lack of one basic skill—reading.

Not only does this affect their learning in the STEM disciplines, but also their awareness, understanding, and interest in engaging in public discourses that require scientific literacy. Very often, colleagues complain about students’ lack of knowledge and interest in the critical issues in the world or their immediate communities, but they seldom realize that this is attributed to the fact that these young minds “have not been trained to read,” as one of our students confessed. Therefore, an urgent need exists in the discussion of increasing civic scientific literacy, which is how we can enhance students’ reading ability.

In attending the SSI, our goal is twofold. First of all, we intend to generate insights through engaging our colleagues in conversations about disciplinary literacy and gaining their perspectives on the role, the requirements, and the challenges of “reading to learn” in various STEM disciplines. Secondly, we aim to work with interested colleagues to identify and design effective strategies and assessment tools that can help students overcome their challenges in reading, and enable them to become independent readers and civic-minded learners within and across the STEM disciplines.

n the year following SSI, we plan to promote civic scientific literacy in our college community and help our students develop this essential 21st Century skill. We will work toward this goal through faculty development and peer mentoring to improve disciplinary and critical reading proficiency of our students. We also plan to establish a college-wide platform for student-led discussion of complex, unsolved science-related civic issues to generate interest among students and engage the college community.

New York University

*Robert Ellis**

I work in two disciplines. Teaching and counseling HS dropouts in NYC, I see the need for STEM education to prepare for them for the HSE (high school equivalency) exam and a career beyond. In addition as a Mathematics teacher at NYU, I hope to inculcate to my students a finer sense of Mathematics and Science in the real world.

Normandale Community College

*Tony Dunlop**

I am involved in the Engaging Mathematics initiative, working on modules for a general education-level math course, with possible relevance to other courses. I will seek input especially regarding putting together the course I've developed for portability, with particular interest in strengthening its writing component. I taught the course in Fall 2014 and plan a poster session with emphasis in student assessment, via the SALG and my own content questions.

North Dakota State University

Jeffrey Boyer, Tami Dahl, Debasree Chatterjee Dawn, Rob Gordon, Jared Ladbury, Scott Wood*

Our overall goal for attending SSI 2015 is to continue to broaden the impact of the SENCER Ideals within NDSU's College of Science and Mathematics (CSM). We plan to send additional faculty members who teach large enrollment courses for science majors to SSI 2015. A previous redesign effort focused on a course for non-science majors. By targeting faculty members who teach large enrollment courses for science majors, we attempt to broaden the impact of the SENCER Ideals within the College by redesigning existing courses for science majors that will impact a large number of students, especially those in STEM fields. We aim to continue to build capacity

A secondary goal for this implementation project is to continue to refine existing courses to reflect SENCER Ideals. Faculty who have previously attended an SSI realize that there is still more work to be accomplished. For example, we plan to integrate game-based learning as a strategy for science learning, student engagement, and civic engagement into a general education science course. Specifically, we plan to integrate "games for social change" such that students will reinforce science learning and civic engagement while playing games. In addition, students will brainstorm and design new games that promote science learning and civic engagement.

Northeastern Illinois University

David Rutschman, Sudha Srinivas*

The STEM Departments at NEIU have been working for over six years to design an interdisciplinary Environmental Science Program. The Program is now in place and has been approved by the Illinois Board of Higher Education.

We are now in the phase of implementation, and it is our desire to have as many faculty as possible experience the SENCER approach by attending a Summer Institute. We have attended regularly over the last six or so years and there is a strong core of SSI alums that we want to keep growing.

Northern Virginia Community College

*Gillian Backus**

College-wide, BIO101 sections are brimming to capacity, but our student pass rates are abysmal. During last year's SSI 2014, our team worked to incorporate SENCER ideals into our Bio 101 curriculum, believing that by reassessing the way we present our syllabus, our goals, and our objectives, we can engage our Biology students from day one. We worked with Cathy Middlecamp to re-envision BIO101 around the curious question of whether food influences our chances of getting (or not getting) cancer. This year, we wish to return to SSI to further these discussions, assess our comprehensive series of learning modules, share best practices and lessons learned, and to brainstorm ways to offer multiple sections of a theme-based Bio101 on our campus and college-wide. We wish to hone our teaching practices in Bio101 to encourage student responsibility, and will help our students become better-informed, healthier citizens. Our two specific goals are to refine the baby steps we began last summer in Bio101, and to brainstorm ways that other Biology sections and courses can be encouraged to be redesigned using SENCER ideals.

Roosevelt University

Cathy Evins, Barbara Gonzalez, Wanwan Huang, Virginia McHugh-Kurtz, Mary Williams*

Cathy Evins, math instructor and co-coordinator of the Developmental and General Education Math courses, and Barbara Gonzalez, Associate Professor and chair of the Mathematics and Actuarial Science department, are long time SSI attendees. They are also part of the Engaging Mathematics Initiative. For Engaging Mathematics they are revising the existing College Algebra course to focus on The City. This summer they will be writing new course material with examples and problems relating to the city of Chicago and cities in general. At SSI they will meet and work with the EM members from other institutions for working meetings and presenting our work to the SSI audience. This will be the first SSI for Mary Williams who is the co-coordinator of the Developmental and General Education Math courses at Roosevelt. Mary has worked closely with both Cathy and Barbara on the College Algebra course and other math courses that we have "SENCERized" over the years. We are excited to introduce her to world of SENCER and the productive time at the Summer Institute. Virginia McHugh-Kurtz will be working to develop new Computer Science and courses using real-world socioeconomic problems to engage and retain students in Computer Science

Rutgers - New Jersey Medical School

*Nicholas M. Ponzio**

On July 1, 2013, seven schools of the University of Medicine and Dentistry of New Jersey (UMDNJ) became part of Rutgers University as its new Rutgers Biomedical and Health Sciences (RBHS) program. These units include New Jersey Medical School, Robert Wood Johnson Medical School, New Jersey Dental School, School of Nursing, School of Public Health, Graduate School of Biomedical Sciences, and School of Health Related Professions. This integration presented opportunities to initiate new educational programs that did not previously exist within the schools of the new RBHS. I received a Post SSI Implementation Award in 2013 to develop a new course on Interprofessional Education among the faculties and students of the Rutgers University Biomedical and Health Sciences. I gave a poster at SSI 2014 about this course, and will attend SSI 2015 to give an update on our progress in implementing this course at RBHS.

Southern Connecticut State University

*Therese Bennett, Susan Cusato, Adam Goldberg, Winnie Yu**

As education continues to evolve and find more effective ways to enhance student learning we as faculty seek to find strategies that engage students and provide useful knowledge and skills that can be applied in “real life”. Integrating systems thinking into STEM based courses helps prepare students to think in a holistic manner. Since science content courses are generally taught from a discipline specific perspective and a narrow viewpoint, students struggle to make the connections between what they learn and real world applications. The recent focus on STEM as in integrated approach to science teaching provides the perfect venue for “systems” based activities.

SENCER holds as one of its Ideals that teaching be conducted “through complex, contested, capacious, current, and unresolved public issues to basic science.” Many of today’s greatest challenges in science are focused around issues such as climate change, cancer, pandemic outbreaks, quality food production, water resources and disposal of waste. All these issues are products of a natural system that has gone awry. To understand or develop potential solution the issue must be viewed as a system. This skill is being increasingly recognized as critical in professions from environmental science, medicine, education and business.

We hope to attend the Institute as a team of STEM faculty to develop a shared interest in integrating Systems Thinking into our courses. We hope that as a team, we will gain insights in how Systems Thinking can help students apply content knowledge. The Institute would also provide us with an opportunity to explore different curricular models that could be used. There are many references and activities that use Systems Thinking and sharing those that are unique to our disciplines would be very useful. The goal would be for the team to leave the Institute with an enhanced appreciation and a pedagogy of how Systems Thinking can build interdisciplinary knowledge and enhances problem-solving skills.

As a team our goal would be to begin an interdisciplinary collaboration in Systems Thinking so that we can share techniques, strategies and opportunities to better serve our students. We believe that all students will benefit from experience and skill in using Systems Thinking. However, STEM students may have the most to gain as science is traditionally taught as a stand-alone discipline.

A SCSU Faculty Development Grant Proposal with a similar theme will be submitted for the 2015-16 academic year. Those funds would allow our team to open up this collaboration to interested faculty from all departments. This potential collaboration may help break down silos and enhance our ability to use Systems Thinking as pedagogy throughout campus.

St John's University

*Irene Dabrowski, Marilyn Dono-Koulouris, Roberta Hayes**

The St John’s University SENCER Team (Science Education for New Civic Engagement & Responsibility) is in the process of implementing this unique pedagogy on our Staten Island campus. Three Core courses will be linked in a first year student Learning Community.

Our proposed theme for unifying these Core courses is Sustainability and Urbanization: NYC Parks and Neighborhoods. An electronic portfolio platform will be used to connect, evaluate, assess and archive student materials and learning instruments from each course in the community. Students will be encouraged to include photos, videos and voice-recorded reflections in their e-portfolio project descriptions. Each individual course in the Learning Community will focus on the aspects of the Sustainability theme that involves their specific discipline, while connecting and reinforcing the related course materials covered by the other instructors, sharing discussions and projects related to the unifying theme.

The Core competencies emphasized include problem-solving, critical thinking, writing and rhetorical analysis, oral presentation, information literacy, and quantitative reasoning. Scientific Inquiry (SCI 1000c) fosters an appreciation of science and nature, as well as promotes scientific literacy and civic engagement in non-major undergraduate students to encourage evidence-based thinking and introduce discussions about society and science, and ethics. Coupled with other Core courses such as Discover New York, Introduction to Sociology and/or First Year Writing studies, we propose to link key learning activities, writing assignments, Academic Service Learning (ASL) Projects and initiate an invited guest lecture series distributed across the three Core courses. The Discover New York course relates complex social problems often encountered in New York City's history and contrasts the historical situations with the present and ever-changing urban city neighborhoods. Topics integrated into DNY neighborhood research include Immigration, Homelessness, Environmental issues, and Civic Responsibility.

Moreover, under the direction and expertise of a professor of rhetoric and writing, students will explore the theme of sustainability and urbanization in written and creative forms of persuasion. Rhetorical analysis looks at how a text persuades, informs, and/or generally communicates. Exercises will include a visual rhetorical analysis of sample (sustainability-themed) websites, to prepare them to integrate create artifacts (e-portfolio websites) that use visuals.

Because of the strong focus on community, An Introduction to Sociology focusing on the Urban Environment is included, which will allow students to explore the relationship of urban places and spaces, the expression of social scientific ideas and concepts in writing, and help develop the skill set of interviewing and descriptive ethnographic research, which will complement science, writing and DNY.

Stony Brook University

*Thomas Woodson**

Engineers think of themselves as problem solvers, but too often in development contexts, they inadvertently become unintended problem creators. These problems often arise because engineers have not been trained to engage with the community. The Community Engagement Workshop (CEW), a program birthed from the Arizona State Center for Nanotechnology in Society, is a two-day program to train engineers and help them avoid cultural misconceptions, misunderstandings, miscommunication, and the general ignorance of ignorance that can doom development projects. By being trained to engage thoughtfully and partner alongside community partners, engineers can increase the chances that their projects will have a lasting positive impact. The goal of attending the SENCER Summer Institute is to learn more about science education for civic engagement and how our team at Stony Brook can improve the program utilizing some cutting edge learning techniques.

Suffolk County Community College Continuing Education

Candice Foley, Nina Leonhardt, Sharadha Sambasivan, W. Troy Tucker*

Climate change and sustainability continue to be headline features in Long Island's leading newspaper, Newsday, which expose students at Suffolk County Community College (SCCC) to these timely issues of environmental and global import. The college's own Professor Scott Mandia, a nationally recognized climate-change expert, contributes frequently to the discussion in the media and at the College. The SENCER team will continue to leverage this foundation, building on our faculty's preliminary work on citizen science topics in engineering, chemistry, pre-calculus, meteorology and physical geology. The SENCER team has re-designed chemistry courses and has shared the SENCER ideals with physical sciences and engineering faculty. These courses, including online courses, incorporate inquiry, hands-on, and community-based activities that address strategies to mitigate the deleterious effects of human activities on climate and the environment. Examples will continue to be drawn from locally relevant topics including the over-use of fertilizers, impacts of septic systems on the Island's aquifer system, greenhouse gas sources and the breathable atmosphere.

The current SENCER team will be complemented by the formation of a second SENCER team that will include additional science and engineering professors and students as well as at least one professor and journalism class. This team increasingly multi-disciplinary approach will promote community engagement while improving undergraduate STEM education.

Students will be encouraged to participate in research projects related to these topics at Stony Brook University and Brookhaven National Laboratory. These activities complement our work under an ongoing award from the National Science Foundation Advanced Technical Education program to develop a green energy option in engineering science and electrical technology and to infuse understanding about energy use in general education courses.

We will share our work with colleagues at educational institutions across Long Island. The SCCC SENCER team will also offer a session on SENCER as part of SCCC's Professional Development series, as well as present a paper or poster at national and international science education forums and at a future SSI

Texas Woman's University and the Southwest SENCER Center for Innovation

Teresa Brown, Regina Horne-Espree, Karla Kosub, Cynthia Maguire, Nasrin Mirsaleh-Kohan, Solomon Nfor, Shaumarie Scoggins, Richard Sheardy, Martha Trevino, Kathryn White*

Attending the SSI 2015, we hope to share our ideas and models for our SENCERized courses with others and also learn from other presenters and participants on the types of projects and assessment techniques they apply in their classrooms. We further hope not only to improve current SENCERized courses but also increase the number of disciplines using SENCERized courses in our university. Our team includes members from different disciplines and departments so this diversity would permit us to bring the SENCER ideas to different disciplines in our university. Additionally, we are also hopeful to involve more regional universities in the SENCER program. Overall, we hope to support the SENCER program to move forward and to involve more educational institutions.

Trinity Washington University

Steven Gable, Shizuka Hsieh, Sita Ramamurti, Diana Watts*

Integrating civic engagement and STEM fits with the mission at Trinity Washington University's College of Arts and Science, a traditional women's liberal arts college and minority-serving institution. A goal of the General Education Curriculum is to "Explore and connect fields of knowledge in the liberal arts." Civic engagement and STEM can also address the University's mission for social justice, through teaching environmental justice and social sustainability. There are several places in which civic engagement can fit into STEM education at Trinity, including courses targeted at first-year retention to Capstone Seminar courses that "provide students with the opportunity to connect and integrate the skills, knowledge, values, and capacities acquired through their earlier coursework in the Gen Ed curriculum." Also, given the ongoing redesign of our math program to focus on quantitative literacy, there are additional opportunities to develop new courses that specifically bridge the STEM courses and civic engagement.

To initiate activities towards integrated civic engagement and STEM in the Trinity curriculum, we envision several options. One would be the development of modules designed for incorporation into existing and/or new courses, which integrate multi-disciplinary skills and thinking. A second option would be to develop new courses from this specific STEM/ civic engagement perspective. The focus for both options would be on environment and sustainability issues. STEM skills will include describing, analyzing, and modeling data, to help students master the skill of using mathematics in context. This approach would challenge students to engage in an in-depth analysis of content that connects seemingly diverse and separate disciplines such as art and science. Both modules and courses would emphasize thinking across systems, modes of inquiry, and the inter-connectedness of disciplines and issues. Topics selected will be current and ongoing issues that introduce students to complexity, challenge them to seek solutions in the face of incomplete knowledge, and encourage critical thinking from multiple perspectives.

Truman State University

LaRoy Brandt, Janice Clark, Alicia Wodika*

As a Liberal Arts institution, Truman State University is dedicated to providing students with high-impact, educational experiences be it through research, service learning, study abroad, or various forms of civic engagement. Although we do have a number of examples of “good” practice (i.e., many high-impact practices in place, faculty dedicated to maximizing student learning and growth, an active civic engagement task force, etc.), Truman has few obstacles we would like to overcome to ensure that each student is provided the opportunity to grow into a scientifically literate member of democratic society. More specifically, we would like to cultivate students, who have both the desire and the knowledge, to address societal problems effectively and be engaged in understanding local, regional, national, and global issues. We feel that attending the 2015 SENCER Summer Institute (SSI) will help us overcome some of the hurdles with which Truman is faced. Our plan is that by incorporating the knowledge, techniques, and pedagogical strategies we expect to learn at the summer institute into own courses, we can use their successful implementation to help establish STEM civic engagement as a central hub for future growth in university-wide pedagogies. As such, we have developed a civic issue, the Colonialization of Rural America, where STEM disciplines can represent the initial hub for civic engagement through the introduction of applying scientific knowledge to address local-scale societal issues ultimately leading to a much broader web of topics (i.e., human health, food security, economic depletion, land loss,). With the modest goals we have set, our attendance at the SSI should increase our potential for success as our improved understanding of civic engagement pedagogies will help us implement more effective teaching and learning strategies. As our team is a dedicated core group of faculty and staff from a variety of disciplines, we expect that attending SSI will help increase the number of curriculum modules developed that can be utilized in multiple ways such that the each module, in part or in total, can be co-opted for use in a different course, or even a different format. Throughout the 2015-2016 year following our attendance to SSI, our expected implementation of improved civic engagement modules in our courses and those in our pre-semester, freshman introduction to college life, we expect STEM civic engagement efforts to be increasingly recognized across campus, which will reinforce STEM as a central hub for civic engagement. Our hope is that with this greater exposure on the Truman campus, we will be poised to foster greater participation in broader multi-disciplinary civic engagement efforts across the entire campus and in the local community.

United States Military Academy

Shawn Fitzgerald, Matthew Greb, Jerry Kobylski*, Matt Mogensen, Franz Rademacher, Reggie Shelton, Frank Wattenberg

As Army officers our graduates are confronted with situations in which disciplinary knowledge usually will not suffice. Our West Point interdisciplinary team has been building learning experiences during the past four years that integrate the curriculum (combining their intellectual breadth and depth) to develop their abilities as interdisciplinary problem solvers. This interdisciplinary effort is already having a major impact on the academic culture at USMA and on the future Army leaders whose development is our primary mission.

During the next academic year, USMA seeks to continue to improve its interdisciplinary culture and develop students' interdisciplinary problem solving skills. Although our team has achieved much during the past four years, we have much more to do, particularly since our core course requirements have just been revised significantly. Our goals for SSI 2015 are to:

- Share our processes and results with the SENCER community.
- Obtain feedback from SENCER colleagues on how we can improve.
- Learn about some of the best practices in higher education regarding integrative learning.
- Improve assessment efforts for our cadet interdisciplinary outcomes.
- Determine what additional connections can be made between sophomore and freshman courses.
- Continue to build the strong relationships we have with the SENCER community and develop new ones!

University of Georgia Odum School of Ecology

*James Wood**

I am graduate student developing a service-learning course on the ecology of urbanized landscapes and the role that community organizations are playing in improving ecosystem health. The target audience is mid-level undergraduate students and the course will be offered spring 2016. The course is intended to introduce students to the complex ecology of urban areas focusing on topics such as biodiversity and pollinators' decline, invasive exotic species, and urban stream syndrome. I want student participation with local community organizations to be an important component of the course. I hope that attending the SENCER conference will improve the effectiveness of the urbanized landscapes course and can introduce me to strategies for incorporating civic engagement into other STEM courses that I will teach.

University of Hawai'i West O'ahu

Michael Hayes, Albie Miles, Sheryle Proper, Esther Wideasih*

Our purpose for participating in the SENCER summer institute is to engage with a supportive community of people to expand and deepen our community engagement for the purpose of transforming our science and math teaching. The University of Hawai'i @ West O'ahu is a new university that moved to its permanent campus in fall of 2012. The university is just beginning to focus on community engagement and service learning.

As an organization SENCER supports the values and practices that our faculty and university find compelling for transforming our undergraduate science and math instruction and learning. It is an organization driven by core values that are consistent with our vision of quality science teaching that include civic responsibility, community engagement and inquiry. We believe that integrating such values, practices and pedagogies into our science and math programs will lead to deeper levels of student learning, enhance retention and increase graduation rates.

The crucial issues facing Hawai'i emerge from our unique position as an island state and include natural resource management, global climate change, food sovereignty and energy. As a small island in the middle of the Pacific, Hawai'i has become almost completely dependent on imports of all kinds and virtually 90% of our food is imported. Addressing these issues is imperative to building and nurturing a thriving and abundant society.

Participating in the summer institute will provide our team with the opportunities to engage with individuals and other teams on how to successfully transform our science and math teaching at the university. The institute offers unparalleled opportunities to network with other universities and programs, access resources and work towards the development of programs.

Our goals for attending the SENCER Summer institute include:

1. Expand community engagement and service learning opportunities in science and math for faculty and students.
2. Increase undergraduate community-based research opportunities for our undergraduate students.
3. Apply for a SENCER Implementation Award to establish and support initial programs created at our Community Engagement and Service Learning Summit.
4. Complete grant applications to the NSF-USES program to fund projects established at our community Engagement and Service Learning Summit.
5. Meet with SENCER consultants and regional and local partners during the 2015-2016 school year to aid in establishing vibrant programs for transforming undergraduate science education.
6. Garner support from University administration for the SENCER program that will emerge from our summit and the summer institute.
7. Collaborate with our office of Institutional Effectiveness to create and organize data for understanding the impact of our new programs on student understanding, achievement, retention and graduation.

University of Hawai'i at Mānoa

Patricia Buskirk, Thomas Giambelluca, Ulla Hasager, Eōmailani Kukahiko, Darren Lerner*

Based on collaboration started at SSI 2013, the University of Hawai'i at Mānoa College of Social Sciences has launched the Native Hawaiian Initiative (NHI) and specifically the Native Hawaiian Leadership Program -- engaged student-learning initiatives based on SENCER principles, civic engagement, and indigenous knowledge and practices. This approach is intended to improve Native Hawaiian undergraduate student engagement and retention, because, despite increases in enrollment and graduation rates, Native Hawaiians continue to be underrepresented at the university.

Drawing on SENCER ideals, indigenous values and knowledge, and social sciences research results and methods, we are working through an integrated planning process including students, faculty, and community partners and are designing new interdisciplinary and community-engaged SENCER courses and civic-engagement programs that foster understanding of how social sciences and indigenous knowledge can be integrated with the STEM disciplines to address capacious issues locally and globally. We have begun the implementation process for a specific series of courses integrated into a two-year leadership development program that includes course work, community-based research and - engagement, and peer mentoring for Native Hawaiian undergraduates at CSS. The most important issues pertain to survival of environment and people of Hawai'i and the Pacific and include issues such as food sovereignty and climate change.

At SSI 2015 we will share our research, experiences. Our goals for participating are to continue to: educate and strengthen our core team of social sciences faculty in practicing the SENCER principles grounded in traditional Hawaiian values such as kuleana (responsibility/civic engagement), 'ohana (family/community) and ahupua'a (traditional land division, environment, sustainability); work together to develop and implement a work plan for the coming years including continuing to expand our network of faculty cooperating across disciplines statewide; seek inspiration and support for research and teaching strategies that strengthen learning, science literacy, critical thinking and assessment and build strong civic engagement among students and faculty; continue to develop our NHLP and NHI initiatives as well as the curriculum for our courses and programs; and finally: develop a new focus on integrating computer science through new interactive media.

Our work is at the center of the implementation of the University's strategic plan which, grounded in the traditional values of the Native Hawaiian host culture, seeks to foster creative and interdisciplinary, local, national, and international collaboration around solutions to important societal issues through excellence in teaching, research, and community engagement, while promoting environmental sustainability, ethics, justice and civically engaged students, faculty, and administrators.

University of Hawai'i Sea Grant College Program

*Darren Lerner**

The University of Hawai'i Sea Grant College Program (UH Sea Grant) and its Center of Excellence in Marine Science Education (Center) in partnership with the UH College of Education and College of Social Sciences is dedicated to building partnerships that enhance marine science education at all levels (kindergarten through graduate school and the public community) in order to foster understanding of the natural world and the role of humans in it. The Center serves to incorporate a multidisciplinary approach to its mission, encourage interdisciplinary approaches to teaching pedagogy and the learning environment, and combines nearly 50 years of outreach and civic engagement expertise through partnership with UH Sea Grant extension faculty at UH and across a national network of practitioners in 33 coastal, island and Great Lakes programs including Puerto Rico and Guam.

I seek to incorporate SENCER principles, civic engagement, and indigenous knowledge and practice into the development of a new undergraduate curriculum with potential to serve as a 5 year undergraduate to master's degree focused on global environmental policy (GEP). The GEP will serve as a companion to the highly successful University of Hawai'i Global Environmental Science Program (GES). The degree program in GES is a holistic, scientific, approach to the study of Earth and Earth's physical, chemical, biological, and human systems. The GEP will compliment this by providing focused pathways for students to investigate natural as well as economic, policy, and social systems and their response to and interaction with the Earth system. We are working through an integrated planning process including students, faculty, and community partners to design GEP such that it will reflect community-engaged SENCER courses and civic-engagement programs that foster understanding of how social sciences and indigenous knowledge can be integrated with the existing GES (a STEM discipline) program. This will ultimately provide a two-track undergraduate to master's program that will incorporate a student summer internship with federal, state, or local agencies, private industry, non-profit organizations or community groups to provide hands on learning experiences in real word situations, engage and interact with community leaders and decision makers and serve as a launching pad for careers in global environmental policy.

University of Illinois at Chicago

*Robyn Gregory**

The math department at UIC wants a reform towards a more active learning in developmental math courses. I firmly support such reform and will be an integral part of it. I believe SENCER can help us achieve our goals.

University of Maine at Augusta

*Anne Blannke, Constance Holden, Robert Kellerman, Pamela Proulx-Curry**

Having recently been appointed Co-coordinator for the University of Maine at Augusta's two campuses and eight outreach centers, I am trying to build a team who can work together and support each other in promoting and expanding on the university's civic engagement efforts. I am hoping that the 2015 SSI will provide an opportunity for the faculty new to incorporating Civic Engagement into their courses to learn more about how to do it, and for the more experienced faculty to begin developing a regional and national network with whom to share their experiences.

University of North Carolina at Asheville

Judy Beck, James Perkins, Susan Reiser, Pamela Silvers, Cathy Whitlock*

We are interested in attending the SSI this summer to get ideas to advance two interdisciplinary SENCER projects at UNC Asheville. The first project, Seeking STEM, began last spring when we were awarded a small block grant from UNC Asheville to create an interactive scavenger hunt for 7th graders. We proposed involving students as undergraduate researchers and applied for funding for the students. Our initial two proposals for student compensation were, unfortunately, rejected. However, we just received funding for student researchers from the NC Science Festival. As you might imagine, not having funding impacted our schedule – we are behind. Accordingly, we will call this past academic year our proof-of-concept year. Next year, we want to scale up the project to reach more college and middle school students. We look to SENCER for assessment and scaling-up guidance in addition to advice for improving our teaching in computer science, physics, and math.

The second SENCER course is also in its infancy: Creative Fabrication. This introductory computer science course fulfills a general education requirement as a diversity intensive course. This course engenders diversity by challenging the notion of what it means to be normal by looking through the lens of disability. Including disability, as part of embracing diversity, in teaching can take many forms, such as making classes accessible to students with disabilities, accommodating your own disability in a class, and/or incorporating disability studies perspectives into course content. While all approaches are interesting and potentially meaningful diversity experiences, we have selected the later—that of raising disability awareness.

University of Southern Maine

*S. Monroe Duboise**

I have valued being a member of the SENCER community nationally and in New England since the SSI 2003 when I first participated as a faculty team member from the Honors Program at the University of Southern Maine (USM). SENCER has provided inspiration, ideas, and sometimes wisdom within a collaborative community of practice that has grounded and informed my academic and civic engagement during these years as a faculty scientist and educator in a public comprehensive university that has faced formidable financial and governance challenges that are now increasingly being experienced in public higher education across the nation. In addition to working with interdisciplinary USM colleagues, the involvement of my laboratory research team in science education also has included many pre-college students and their teachers in efforts associated with our interests in environmental microbiology, virology, nanobiotechnology, synthetic biology, and nanomedicine. Due to institutional transitions of recent months, I am applying to attend SSI 2015 as an individual SENCER SSI alumnus in the process of connecting recent activities and collaboration with those in formative development.

University of Vermont

*Linden Higgins**

I am interested in attending the institute to network and interact with like-minded science faculty, as I complete my M. Ed. and start my new career. My goals for attending are to form new connections and gain perspective on how others approach the challenges of teaching our increasingly diverse collegiate population. My plans for the next year are to become permanently and full-time employed in a situation that makes full use of my knowledge and skills.

University of Wisconsin - Whitewater

*Elizabeth Hachten, Christina Jones, Kate Ksobiech, Heather Pelzel**

The 2015 University of Wisconsin-Whitewater SENCER team is focusing on the area of public health. Our team includes faculty from biology, communication and history. Our goal is to integrate SENCER principles into a campus-wide initiative aligned with AAC&U's "The Educated Citizen and Public Health" to expand offerings in the public health area. We intend to use learning from the summer SENCER institute as we develop new courses, plan new minors or majors, and revise existing courses in the health area. Upon returning from the institute, our team will lead a workshop to disseminate SENCER principles to a larger group of faculty and community members who are part of our campus inter-professional health initiative. Throughout the 2015-16 academic year, our team along with colleagues in several other departments, will design and implement new "SENCERized" courses in public health, epidemiology, global health, and medical terminology, and explore ways to revise existing courses using SENCER principles. To make the relationship between their academic learning and life-long civic engagement more transparent to students, we will connect the students' classroom and laboratory learning experiences to both larger public health debates and to specific health concerns of nearby Wisconsin communities.

Woodbury University*Eugene Allevato**

We, at Woodbury University, adopted the SENCER philosophy in most of our courses. We advocate student engagement in social issues and understand the importance of bringing real world problems to the classroom. Recently, the number of students with disabilities has increased as visually impaired students have more access to general education; we have examined the implementation of a project based instruction model as a form of student engagement activity. In this case, a visually impaired student prepared an instrument to investigate faculty attitudes and behaviors towards teaching the visually impaired. The outcome was shown to be very effective for the learning outcomes of statistical concepts and gave faculty a better understanding of instructional models geared towards the visually impaired. The purpose of our participation in the SENCER summer institute this year is to share our experience from both the faculty and student perspective, as the visually impaired student will be coming to the summer institute to present his research in a session. Following is the abstract that the student will present. Title: A Project-based Approach to Teach Statistics to Visually Impaired Students: Overcoming Barriers toward Teaching Visually Impaired Students in Regular and Visual Arts Classes.

The purpose of the present study is to demonstrate that the project-based approach is an appropriate strategy to teach statistics to a visually impaired student. As the visually impaired (VI) are increasingly becoming students in general education, many instructors still have varying views and preconceived misconceptions about teaching the VI student, in particular for visual arts classes. This fact motivated the selection of a project involving the development of an instrument to evaluate the instructors' attitudes and behaviors towards teaching the visually impaired in order to identify potential benefits and challenges related to education of the visually impaired. This study utilized a mixed-method approach integrating qualitative and quantitative research. Data was collected utilizing survey-monkey from 64 faculty members. Results indicated that those instructors that had previous experience teaching VI students had an overall higher score to reflect positive attitude and differ significantly from those that never had taught VI with a p-value of 0.018.

The categorization of open-ended questions seemed to indicate that instructors' positive attitudes and willingness to accept students with disability may influence the success of the VI student's participation in mainstream education. This process helped identify attitudes and challenges that faculty encounter in the prospect of teaching the VI, such as the misconception that visual arts majors are not appropriate for VI students. This study has demonstrated that a project-based activity may be a key component to motivate and engage the VI student in the learning process, similarly to sighted students.

Worcester Polytechnic Institute*Jennifer deWinter, Brent Faber*, Randy Paffenroth, Liz Ryder*

Our team is interested in data and the many ways data can be used to solve problems. We each have different interests and approaches but find many common themes in our work and our teaching goals. We look forward to sharing our approaches and learning new ways to work together and to work with the larger community.

Worcester Polytechnic Institute

*David Spanagel**

In my first incarnation as a graduate student (1983-84), I pursued research in mathematical problem solving at the University of Rochester under the direction of Dr. Alan H. Schoenfeld. I was a key junior collaborator in the development and composition of his much-cited books on the role of metacognition in active learning, the value of teaching heuristic methods for mathematical problem solving to college students. See, for example: Schoenfeld, A.H. 1983 Problem solving in the mathematics curriculum: A report, recommendation and annotated bibliography. Mathematical Association of America Notes No. 1.; and Schoenfeld, A.H. 1984 Mathematical Problem Solving. Orlando, FL: Academic Press.

My goals for this meeting are related specifically to work that I am now undertaking to coordinate the WPI portion of a joint 5-university Teagle Foundation grant designed to support the integration of liberal arts into engineering education through the NAE's Grand Challenges Scholars Program. In particular, I hope to learn more at the 2015 SENCER Summer Institute about assessment methods for documenting the impact of programmatic developments of this type, both on student attitudes toward the importance of integration of knowledge across disciplinary boundaries, and on student learning outcomes within and beyond those various disciplines.