Project title

New Initiatives for Synthesis and Collaboration in Ecosystem Science in the Northeast

Principal Investigator:

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This project provided support for the Northeastern Ecosystem Research Cooperative (NERC), the principal scientific organization connecting ecosystem scientists studying forests and streams in the Northern Forest region. As part of this project, we maintained the NERC web site, compiled and checked three major integrated data sets and made them available on-line, and hosted two NERC conferences (2013 and 2015).

Funding support for this project was provided by the Northeastern States Research Cooperative (NSRC), a partnership of Northern Forest states (New Hampshire, Vermont, Maine, and New York), in coordination with the USDA Forest Service.
http://www.nsrcforest.org

Project Summary

This project provided support for the Northeastern Ecosystem Research Cooperative (NERC), a collaborative organization of ecosystem scientists for the Northeastern U.S. and eastern Canada. For the last 15 years the NERC has facilitated regional scale collaboration and synthesis of information on ecosystem science as applied to environmental issues in the northeastern U.S. and southeastern Canada. The goals of the NERC are similar to the goals of NSRC's Theme 2: synthesis of scientific information in the region pertaining to environmental issues such as pollution, climate change, and biomass energy production, and transmission of scientific knowledge to policy makers and land managers. NERC activities have included prominent papers synthesizing information on ecosystem function across the region, support for young scientists, support for monitoring programs, and interaction with policy makers and land managers in the Northern Forest. In this project, several initiatives were undertaken to broaden the collaborative and synthetic research within the NERC. First, we compiled and integrated datasets from several NERC synthesis projects and made the data sets available on our web site and accessible through a national ecological data registry. Second, we held two of NERC's biennial research conferences (in 2013 and 2015). NERC Conferences have become the premier locations for scientific interactions and information exchange among ecosystem scientists studying forests and streams in the Northeast. Third, we provided enhanced opportunities for young scientists (graduate and undergraduate students) to attend our conferences, as well as other regional conferences and workshops, and to become part of the scientific network that will help provide the foundation for future collaborative relationships and a sense of regional identity.

Background and Justification

- The goal of the NERC is to promote integrated regional research on the health of forest and aquatic ecosystems, by emphasizing
  - (1) a shared regional perspective among the cooperators,
  - (2) exchange of information and ideas through workshops and shared databases,
  - (3) development of integrated regional research projects,
  - (4) synthesis of existing data by cross-site comparisons and regional models,
  - (5) support for long-term monitoring in the region, and
  - (6) interaction among research scientists, resource managers and policy makers.

- Membership includes about 250 scientists, government employees, policymakers, and private citizens

- NERC serves to facilitate information and idea exchange among members.

- For the scientists, which constitute most of the membership, NERC is a source of new ideas and collaborations and a venue for developing scientific papers and proposals.

- For NSRC, the collaborations developed in the NERC lead to many high-quality, collaborative NSRC proposals on regional science pertaining to the health of forests and surface waters.

- For land managers and policymakers, NERC meetings provide a concise summary of new and emerging research on the forests and streams of the region

Results/Project outcomes (1)

- Integrated and checked data from several NERC regional synthesis projects and made the data sets available on the NERC web site.

- Descriptions of the data sets, associated metadata, and the data files are available through the following links:

- Foliar Chemistry Data http://www.nercscience.org/Metadata_FoliarChemistry.html
- Soil Chemistry Data http://www.nercscience.org/Metadata_SoilChemistry.html
- Surface Water Chemistry Data http://www.nercscience.org/Metadata_SurfaceWaterChemistry.html

Results/Project outcomes (2)

- Held two NERC Conferences, in 2013 and 2015
- 2013 Conference
  - 107 attendees
  - 30% of attendees were graduate students, supporting our goal of encouraging young scientists
  - Included scientific sessions on
    - Air pollution and critical loads
    - Climate change
    - Dissolved organic matter in streams and lakes
    - Mercury pollution
    - Urban ecosystems
    - Open-topic sessions for platform presentations and posters

Results/Project outcomes (3)

- 2015 Conference
  - 80 attendees
  - 31% of attendees were graduate students
    - We awarded three certificates for “Best Student Presentations”
  - Included scientific sessions on
    - The science and management of cumulative effects of multiple stressors on forested landscapes
    - Cold and understudied: Dormant season pattern and process in Northeastern watersheds
    - Ecosystem services
    - Extreme weather events
    - Invasive species and conservation
    - Coupling soil and surface water chemistry: The role of environmental change
    - Biogeochemistry of nitrogen and calcium related to air pollution and tree harvesting
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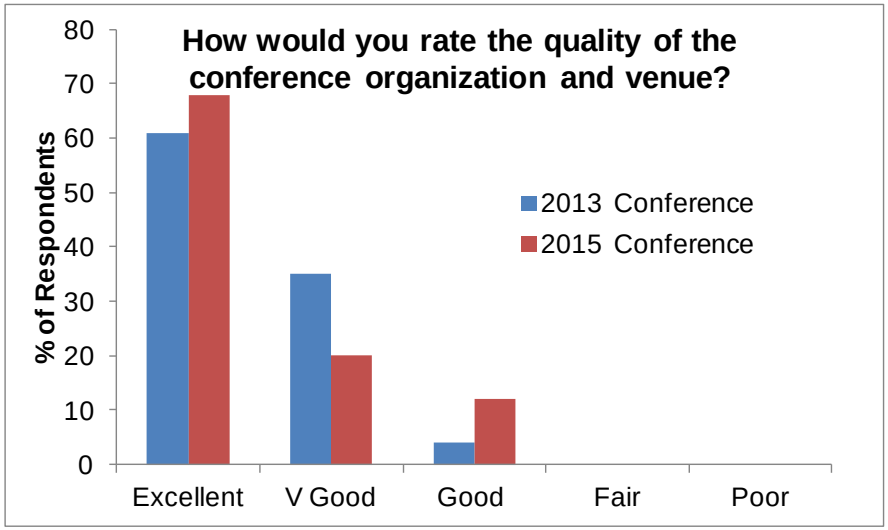
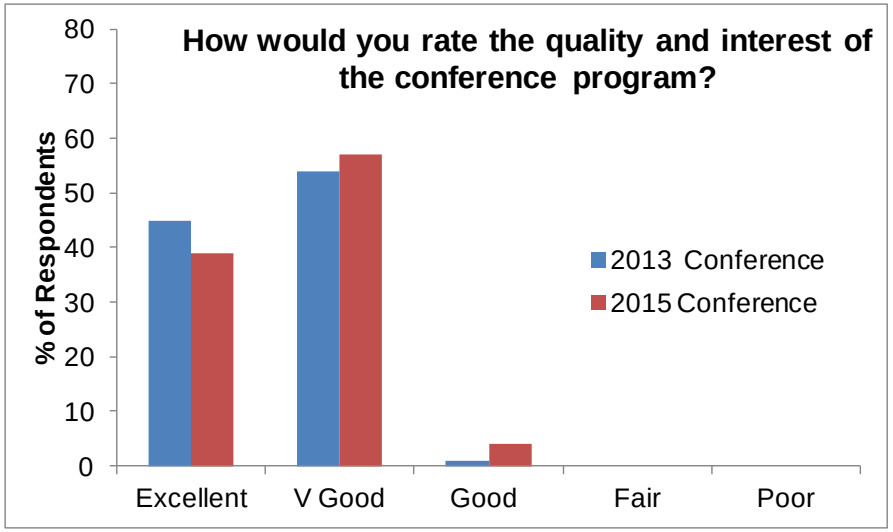
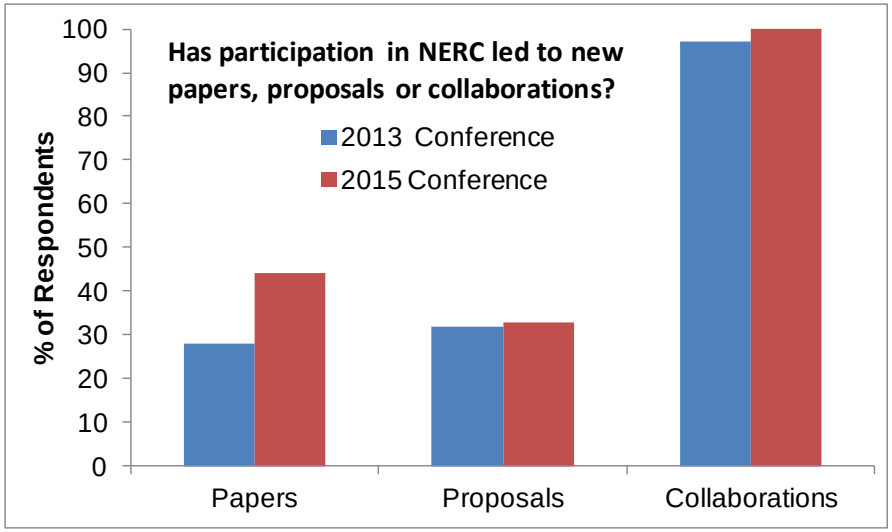
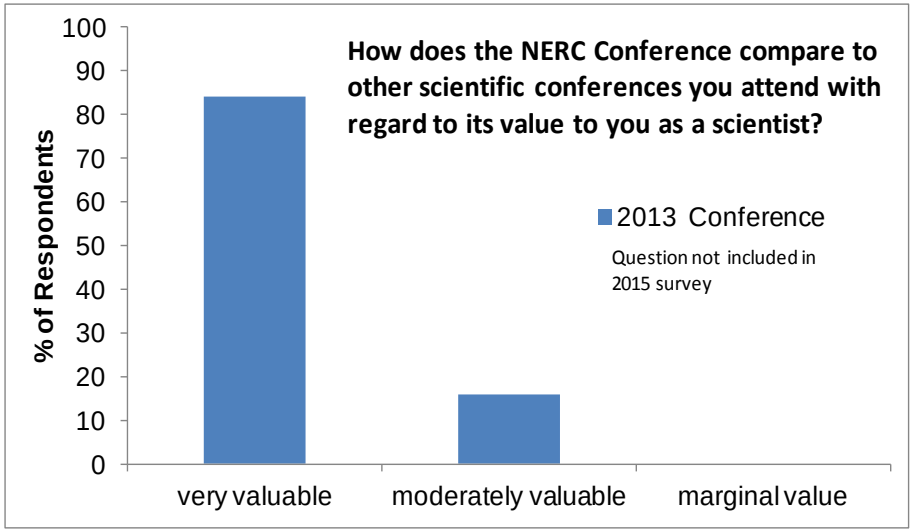
Results/Project outcomes (4)

- Post-conference online surveys indicate that the NERC Conferences are very popular and the organization is fulfilling its mission of enhancing collaborative science









Implications and applications in the Northern Forest region

- The NERC Conferences provide a venue for scientists, resource managers and policymakers to share information and ideas on the health of the Northern Forest.
- The NERC web site provides access to valuable data sets collected during NERC regional synthesis projects and to descriptions of regional research sites.
- NERC has taken an active role in bringing young scientists into the regional community of scientists and encouraging integrated, collaborative research on the Northern Forest region.

Future directions

- We hope to keep the NERC organization active and vital, improve the web site, and continue the series of biennial meetings. This will require continued funding which we do not yet have.

- We are interested in closer partnership with NSRC to improve outreach to regional stakeholders and enhance the exchange of information among scientists, government agencies, policymakers, and land owners/managers.

List of products

- NERC web site (www.nercscience.org)
- 2013 Conference.

  Program at http://www.nercscience.org/nerc_conference_program_2013.pdf
- 2015 Conference

  Program at http://www.nercscience.org/nerc_conference_program_2015.pdf
- Publication supported by this grant, using NERC regional datasets:
  - Crowley K, McNeil B, Lovett G, Canham C, Driscoll C, Rustad L, Denny E, Hallett R, Arthur M, Boggs J, Goodale C, Kahl J, McNulty S, Ollinger S, Pardo L, Schaberg P, Stoddard J, Weand M, Weathers K. 2012. Do Nutrient Limitation Patterns Shift from Nitrogen Toward Phosphorus with Increasing Nitrogen Deposition Across the Northeastern United States? *Ecosystems* 15: 940-957.