North Atlantic LCC Technical Committee
Aquatic Ecosystems Subgroup

**Science Needs Status as of March 18, 2013**

Reflecting:
Teleconference February 26, 2013 (meeting notes previously distributed)
Teleconference March 15, 2013
Participants were Rick Bennett, Julie Devers, Jeff Horan, Callie McMunigal, Pete Murdoch, and Scott Schwenk

Current NALCC-supported Projects with Substantial Aquatic Component

1) Designing Sustainable Landscapes (DSL) – UMass Amherst
2) Forecasting changes in aquatic systems / brook trout – USGS Conte Lab
3) Decision support tool to assess aquatic habitats and threats – Downstream Strategies
4) Climate Change Vulnerability Index for Northeast Species – NatureServe
5) Vulnerabilities to Climate Change of Northeast Fish and Wildlife Habitats – Manomet

(Also, Northeast Climate Science Center is sponsoring two related projects gathering data on and modeling stream temperatures.)

Candidate High Priority Topics

1) Mapping culverts and other barriers
2) Forecasting water management, including withdrawals and returns
3) Collecting and organizing biological data (including fish, mussels, and macroinvertebrates)
4) Improving predictions of groundwater influences on stream flow and temperature
5) Obtaining better information about developed land classes
6) Improving characterization of stream floodplains
7) Considering costs and other socioeconomic considerations in conservation design

Description of Topics

1) Mapping culverts and other barriers

*Justification* – considerable effort has been invested in mapping the locations of dams, but other barriers to stream connectivity, including culverts and also natural barriers (such as waterfalls), are not comprehensively mapped. As a result, efforts to identify and prioritize restoration efforts to restore natural aquatic connectivity are hampered.

*Scope* – further discussions needed as to how to prioritize action in this area.

*Team / staff questions and comments* – potential to link an NALCC effort to possible projects to map culverts and other barriers in coastal watersheds as Hurricane Sandy response.

2) Forecasting water management, including withdrawals and returns

*Justification* – the quantity and timing of water management can have major impacts on stream flows, and such effects may increase with expanding human populations and climate change. Better characterizing current water management, withdrawal from streams and aquifers, and water return will benefit conservation efforts for streams. Future forecasts or scenarios of water usage would also benefit long-term planning.

*Scope* – effort could focus on particular structures (e.g., dams) or sectors (e.g., energy usage).

*Team / staff questions and comments* – further exploration of current regional investigations would be helpful.

3) Collecting and organizing biological data (including fish, mussels, and macroinvertebrates)

*Justification* – regional collection and integration of existing data on the occurrence and abundance of fish and other aquatic species could have many uses in conservation design and is necessary for the new NALCC project led by Downstream Strategies. This work would complement other efforts to promote integration of data for physical and chemical properties of rivers and streams.

*Scope* – direct need would be to assist Downstream Strategies in data identification and collection. Use of existing databases – such as MARIS – should be explored. EPA's National Aquatic Resource Assessments also have compiled biological data.

*Team / staff questions and comments* – such a project could involve increasing NALCC staff capacity, such as temporary, partial funding for a project manager to coordinate efforts among states and other partners.

4) Improving predictions of groundwater influences on stream flow and temperature

*Justification* – groundwater flows have a large impact on streamflows and temperature but are difficult to map on a regional scale. This inhibits the effectiveness of projects focusing on current and future capacity of streams to support aquatic life, including several NALCC-sponsored projects.

*Scope* – discussion needed on what is feasible for this project in the short-term.

*Team / staff questions and comments* –


5) Obtaining better information about developed land classes

*Justification* – developed lands are not well-mapped by the NLCD, which is the primary land cover product for developed lands in the Northeast. This complicates understanding the condition of aquatic (as well as terrestrial) resources both currently and into the future.

*Scope* – to be discussed further

*Team / staff questions and comments* –


6) Improving characterization of stream floodplains

*Justification* – the functions of streams and their connections with their terrestrial environment are influenced by the nature of their floodplains, but these are difficult to characterize because small differences in elevation can have substantial impacts on floodplain characteristics.

*Scope* – better, high resolution elevation data, such as that provided by LiDAR, could help address this need.

*Team / staff questions and comments* – feasibility of regional-scale work in this area needs further discussion.


7) Considering costs and other socioeconomic considerations in conservation design

*Justification* – decision support tools have tended to focus on the ecological importance of sites in prioritization, but other considerations such as costs need to be considered for effective, realistic management decisions.

*Scope* – mapping or other spatial analyses of socioeconomic factors such as the likely costs of restoration and conservation in aquatic ecosystem management.

*Team / staff questions and comments* – further discussion needed on the value in addressing this need and whether it can be incorporated into existing projects.