



Project Impacts

NSRC-FUNDED RESEARCH FINAL REPORT

Northeast Environmental Sensor Network Encourages Scientist Collaboration and Public Engagement

PROJECT AWARD YEAR AND TITLE:
2013

Development of Real-Time Environmental Sensor Technology and Applications for the Northeast: A Proposal from the NERC Northeastern Environmental Sensor Working Group (NESN)

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Smart Forests
for the 21st Century

Home Sites Data Data Visualization Gallery Educators Toolbox Scientists Toolbox



Installing the smart forests sensors at the Marcell Experimental Forest

News and Events

Special Project
Assistant to the
Smart Forests hired

Ivonne Trujillo starts in a ten month internship as Special Project Assistant to the Smart Forests. October 1, 2017.

[Read more](#)

Chinese National
Academy of Sciences

Science and sound resource management depend on accurate and timely environmental data. Smart Forests is an initiative to bring together instrumental sites within the USDA Forest Service Experimental Forests and Ranges network, and additional sites within the Northeast region of the US. These sites have invested in digital environmental sensor and telecommunications capacity to create the Smart Forests Network, and provide a foundation of data for integrated research and monitoring efforts.



[Click map to view Smart Forests site details](#)

Advances in environmental sensor technology, wireless communications, and software applications have enabled development of low-cost, low-power environmental sensors and sensor networks that can communicate environmental conditions to researchers, managers and the public in real time. This emerging technology generates information at unprecedented temporal and spatial scales and helps to better understand the physical, chemical, and biological “pulse” of terrestrial and aquatic ecosystems.

NSRC researchers established the Northeast Environmental Sensor Network (NESN) to help the regional research community develop and share infrastructure and expertise on operating, maintaining, and analyzing environmental sensor data and making it public. They envision a regional long-term, multi-site, multi-sensor network to detect short and long-term environmental change in northeastern North America. To address sustainability of this network, NESN merged resources with the USDA Forest Service Smart Forests network, which has a longer funding timeline.

Researchers established an interactive web portal that serves as a demonstration site and information clearinghouse and points users – scientists, educators, and the public – to relevant information sources and real-time data visualizations from ecosystem study sites in the Northeast. They developed tools and displays for merging near real-time data streams from multiple sites to encourage data comparison and collaboration among investigators. Researchers use high resolution environmental sensor data to run an ecosystem-scale carbon and nitrogen cycling model in real time on daily time steps for the Northeast and to better understand ecosystem dynamics during the critical winter-to-spring transition in the Northeast. These real time “windows on watersheds” provide exciting new ways to engage the public and provide novel tools for educators and students.



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