Oak Ridge pegged for national ecological network

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Dozens of instruments to be deployed on the Oak Ridge Reservation and other sites around the nation will provide valuable information related to climate change, biodiversity and invasive species, infectious diseases and other areas of interest.

Walker Branch Watershed and other portions of the Department of Energy reservation will be part of the National Ecological Observatory Network, a multi-decade continental-scale research platform supported by the National Science Foundation. Oak Ridge is one of 20 sites selected from more than 80 proposed locations. Sixteen are within the continental United States while Alaska has two and Hawaii and Puerto Rico each have one.

"Being selected as a candidate core site to represent the Southern Appalachians and Cumberland Plateau domain is a reflection of the unique environmental and infrastructure qualities and the long history of excellent research conducted at Walker Branch Watershed," said Pat Mulholland, a senior scientist in Oak Ridge National Laboratory's Environmental Sciences Division.

"This study will complement other DOE climate change research in Walker Branch and other areas of the Oak Ridge Reservation and reflects ORNL's leadership in the science of climate change and its impacts."

The watershed comprises a 240-acre forest and has been the site of

short- and long-term studies of the ecological effects of environmental change. These studies have focused on the effects of energy technology-driven environmental changes on ecological processes within forest ecosystems over the past 40 years.

ORNL researchers continue to study the hydrological and biogeochemical responses to climate variability and change as well as conduct experiments on the response to climate change on forest growth, species composition, and stream organisms and metabolism.

With this new project, each site will include an intensively instrumented area as well as a variety of mobile instruments. All of the state-of-the-art instruments connected via wireless data communication devices will be standardized and focused on a core set of questions. The instruments will measure carbon dioxide and other gas exchanges between the forest, soil and atmosphere as well as physical, chemical and microbial properties of vegetation, soils and the stream. Some instruments will track specific organism populations. Data will be transmitted electronically to a central processing center and made available to scientists as well as the public.

When complete, this new effort will provide a continental-scale research platform for discovering and understanding the impacts of climate change, land-use change and invasive species on ecology. The National Science Foundation has funded NEON since September 2004. The network is expected to gather ecological data for more than 30 years.

Researchers are already looking forward to new views of ecology that will be created by continental-scale data. Just as meteorologists today can predict the path of a tornado or hurricane, ecologists using NEON data in the future may be able to more accurately forecast biological phenomena such as the spread of avian flu and the West Nile virus or the emergence of an invasive species.

"Being part of the NEON network will attract leading national and international ecologists to Oak Ridge," Mulholland said. "NEON infrastructure will also provide unique educational and research opportunities for students at all levels through website access to NEON results and on-site studies."

Source: DOE/Oak Ridge National Laboratory