USGS
science for a changing world

The Wildlife Energy Frontier

Science Providing Solutions for the Future

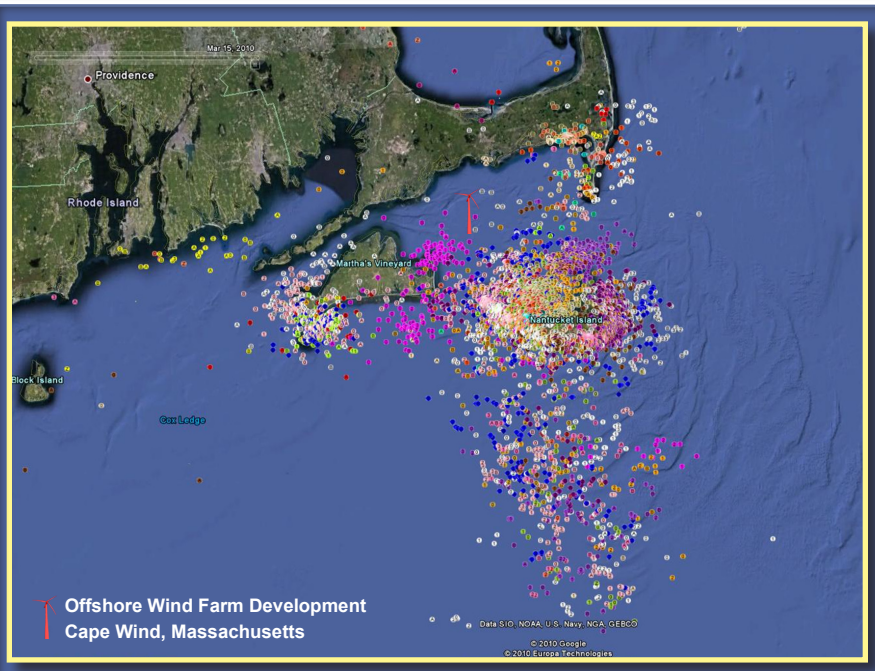
The U.S. Geological Survey is providing the science needed to meet the Nation's challenges in understanding the complexities of developing a green, renewable energy economy while supporting wildlife and critical wildlife habitat.

Renewable energy development, specifically wind and solar power, will reduce carbon emissions. As the Nation moves towards a more renewable energy economy, scientific information will help support sustainable, responsible development.

Wind energy development in the United States broke all previous records in 2009, and the rate of development continues to accelerate as the country begins this shift towards renewable energy. Conservation and stewardship of our Nation's wildlife and habitats must be harmonized with renewable energy development and scientific information can provide for the foundation for sound decisions and planning.

Research and Monitoring can support:

- Identification of areas critical for migration, breeding, wintering, or other sensitive life history stages of wildlife to inform siting of renewable energy infrastructure
- Comprehensive environmental assessments for renewable energy projects
- The continued development of a rigorous regulatory framework
- Opportunities to enhance wildlife habitat and conservation goals in concert with renewal energy development
- The production and transmission of electricity can be done in areas that minimize impacts to wildlife and critical wildlife habitat
- Comprehensive monitoring programs to support adaptive management
- Development of techniques and tools for mitigation of impacts, in terms of habitat quantity and quality



Wildlife research and monitoring, from bird banding to satellite tracking, is providing the scientific information needed for responsible renewable energy development. Bird movements throughout North America are studied using the capabilities of the Bird Banding Laboratory located at the USGS Patuxent Wildlife Research Center in Laurel, Maryland. Patuxent scientists are using satellite telemetry to study seaduck movements and habitats along the Atlantic Coast where wind energy production is progressing.

The electric transmission line constructed in 1962 within the Patuxent Research Refuge (left photo) has provided new insight and tools for managing vegetation and habitat that supports migrating and resident birds while ensuring safe and reliable power transmission. The USGS powerline management research at Patuxent Wildlife Research Center shows how scrub/brush habitat can actually promote wildlife use as opposed to traditional powerline mowing (right photo). More than 80,000 birds have been banded under this experimental powerline corridor at Patuxent since June 1982.

For more information contact: U.S. Geological Survey, Patuxent Wildlife Research Center, Dr. Gregory J. Smith, Director

Climate Change and Wildlife

Science Providing Solutions for the Future

For seven decades, scientists at the USGS Patuxent Wildlife Research Center in Laurel, Maryland have studied the habitat, food habits, and population characteristics of waterfowl on Chesapeake Bay and the Atlantic Coast.

Possible temperature increases and sea level rise in Chesapeake Bay could alter the food available to diving ducks and other bird species as the flora and fauna of the Bay change. Understanding the temperature range tolerance of key plant and invertebrate species of the Chesapeake, and the arrival times and distribution of ducks and other wildlife, will help managers plan adaptation strategies to conserve our wildlife heritage.

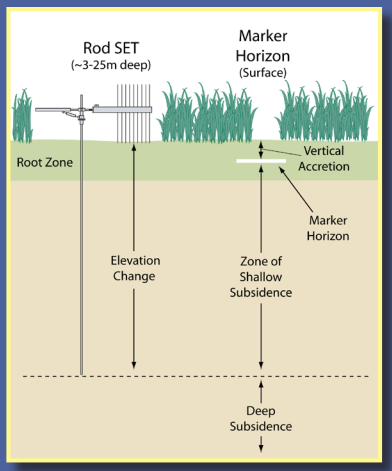
NABPP

North American Bird Phenology Program

The North American Bird Phenology Program evolved from a network of volunteer observers who recorded information on first arrival dates, maximum abundance, and departure dates of migratory birds across the North America. Active between 1880 and 1970, the program was coordinated by the Federal government and sponsored by the American Ornithologists' Union. It exists now as a historic collection of six million migration card observations, illuminating almost a century of migration patterns and population status of birds. Today, in an innovative project to curate the data and make them publicaly available, the records are being scanned and placed on the internet, where volunteers worldwide transcribe these records and add them into a database for analysis. These records and current new similar records will document changes in bird use of areas allowing researchers and managers to understand the effects of climate change on bird populations.

Surface Elevation Table

USGS Patuxent Wildlife Research Center scientists have developed a device, the Surface Elevation Table (SET) to accurately measure and monitor elevation change in coastal wetland ecosystems. Combining SET data with analytical models improves our ability to forecast future responses of these vulnerable areas around the world. Sea level rise is threatening the coastal regions of the World. The approach described here can empower decision makers to develop robust and realistic adaptation strategies for the next century.

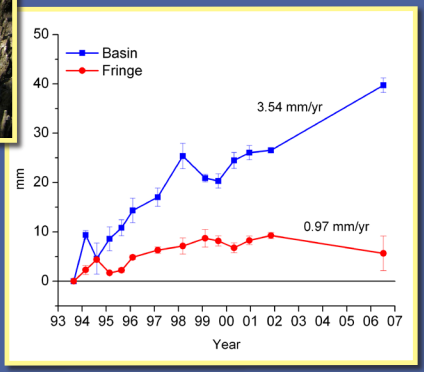


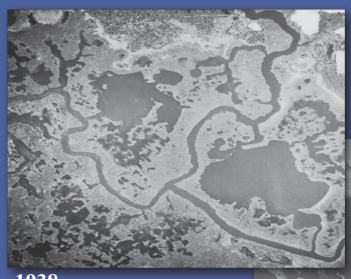
Conceptual diagram showing the SET and marker horizon techniques.

Above: SET device, Queensland, Australia

Right: SET elevation change measured at two mangrove forests in Florida, USA.

SETs have also been used for long term monitoring of elevation change in mangrove wetlands in the Caribbean, Micronesia, New Zealand, Australia, and the United States. Some of these data sets go back as far as 15 years.





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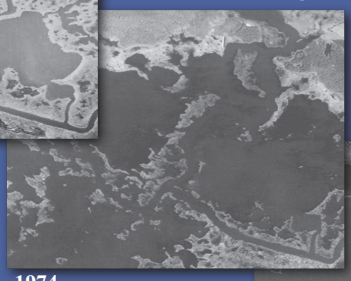

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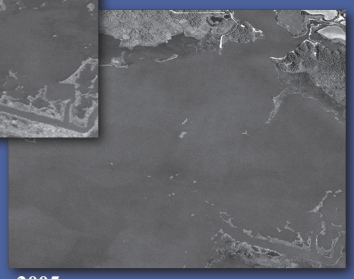

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Wetland loss at Blackwater National Wildlife Refuge.

For more information contact: U.S. Geological Survey, Patuxent Wildlife Research Center, Dr. Gregory J. Smith, Director