



Ecosystem Forecasts and Long-Term Ocean Measurements

New Approaches to Understanding Planetary Change

This accelerating quest to understand planetary change also brings the accelerated need to find new ways of observing our environment. Therefore, a particular observing system funded by the National Science Foundation (NSF) might focus on the atmosphere, land or ocean while still coordinating with other systems in an interlocking grid. Two examples follow:

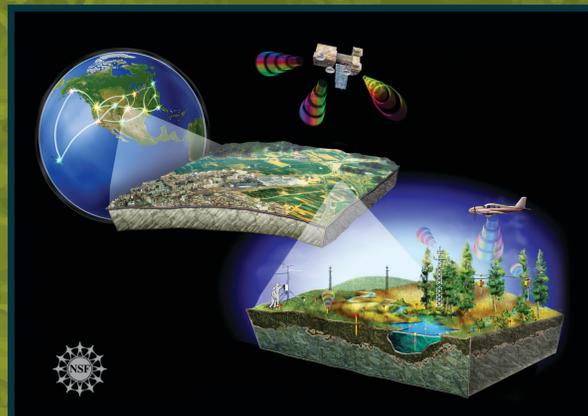
From Land...

Society needs "ecosystem forecasts" in the same way it depends on weather forecasts. Resource managers, for example, make decisions that affect ecosystems for decades. The National Ecological Observatory Network (NEON) is developing North American continent-spanning, land-based research infrastructure for ecological observations and experiments. NEON will provide data for research on processes at all spatial scales, time scales and levels of biological organization, from regions, to local ecosystems, to microbes.

Fixed sensors and towers, mobile suites of instruments, rapid deployment systems placed on vehicles, airborne observation capabilities and a full range of *in situ* observations will give NEON scientists the basic information to develop and validate models that can be used to predict the effects of climate change, including increased drought, wildfires, infectious disease outbreaks and the spread of invasive species.

NEON: www.neoninc.org

OOI: http://www.joiscience.org/ocean_observing



...To the Seas

NSF's Ocean Observatories Initiative (OOI) will gather continuous observations from near-shore and remote areas of the seas, providing the basis for a new understanding of the ocean and allowing scientists access to long-term measurements of the ocean and the seafloor. High-tech ocean observatories will be located in the depths of California's Monterey Bay and other sites.

As a network of global, regional and coastal ocean observatories, OOI will be linked to the Internet via seafloor cables and satellites. Marine scientists will answer questions such as: How does climate change impact ocean ecosystems, including declining fisheries and increasing harmful algal blooms? How can ocean-bottom seismic readings give us early warnings of the undersea earthquakes that precede tsunamis?

Knowledge from these and an array of additional NSF Earth observation systems is critical in adapting to a changing world and mitigating the changes that have already occurred.

