Climate change creating record stress on ecosystems, experts say

Umair Irfan, Environment & Energy Publishing, 12-19-12

Ecosystems are facing historic pressures brought on by a changing climate, according to researchers. From shorter winters to extreme rainfall, climate change will create a new normal for trees, birds, insects and people.

"U.S. ecosystems are undergoing massive change due to climate change," said Nancy Grimm, a senior scientist at the Global Institute of Sustainability at Arizona State University. "Ecological systems are under more stress than at any other time in history."

Grimm co-authored a report titled "Impacts of Climate Change on Biodiversity, Ecosystems and Ecosystem Services." The findings will inform the National Climate Assessment from the U.S. Global Change Research Program, which is due out next month. The researchers combed through academic literature and pooled their findings on how a warming planet would reverberate through nature.

Speaking on a conference call yesterday, Grimm cited damage from Superstorm Sandy as an example of how diminished coastal habitats like mangroves and marshes can lead to extensive flooding and erosion. She added that some of these changes are irreversible and that some species may go extinct due to the climate, while others form never-before-seen communities as they move to climes that are more hospitable.

Ecosystems also provide ongoing services, like filtering water and retaining topsoil. Shifting weather patterns can severely impair these functions, according to the Natural Capital Project's managing director, Mary Ruckelshaus. As vegetation moves and habitats become warmer, fisheries and other animal ranges can move to different regions, with severe economic consequences for anglers and coastal communities. These changes are happening faster than previously thought, she added.

Peter Groffman, a microbial ecologist at the Cary Institute for Ecosystem Studies, said during the call that climate changes are not always deleterious and that some environments may thrive under warmer conditions. "We have been saying for decades that if it gets warmer and it gets wetter, our forests are going to grow better," he said.

However, these climate changes may also make forests more inviting for pests like pine beetles, which devastated trees this year in the western United States. "These pest outbreaks are worse than they would be because we've lost these very cold temperatures" over winters, Groffman said.

This raises questions about how ecologists should adapt and whether they should restore ecosystems to levels seen in the past or build with an eye for a warmer world decades down the line. "The bottom line is that these impacts are not going to happen in 50 to 100 years; many of them are already here and will get worse over time," said Bruce Stein, who leads the climate change adaptation section at the National Wildlife Federation.