

More extreme weather predicted in national climate report

1 February 2013, by Krishna Ramanujan

Americans can expect more heat waves, heavy downpours, floods and droughts, sea level rise and ocean acidification, according to a draft national climate assessment report that included two Cornell researchers as lead authors.

David Wolfe, professor of horticulture, was a lead author on a Northeast [climate](#) section, and Drew Harvell, professor of ecology and [evolutionary biology](#), was a lead author of an oceans and marine resources section in the Federal Advisory Committee's Draft Climate Assessment Report, released this month.

Overall, the U.S. average temperature has risen by about 1.5 degrees since 1895, but 80 percent of that change has occurred in the last 32 years, according to the report. By the end of the century, temperatures could rise anywhere from 3 to 10 degrees Fahrenheit, depending on human actions, or inaction, to reduce [greenhouse gas emissions](#).

The report's Northeast section points to climate-related issues facing 64 million people that live in a region marked by high-density urban, coastal, natural and agricultural areas.

"This document will be an essential science-based resource for decision-makers in our communities and businesses who are rolling up their sleeves to take on the challenges and build resilience to climate change," said Wolfe, who chairs the Climate Change Focus Group at Cornell's Atkinson Center for a Sustainable Future.

Highlights from the section for 12 Northeast states find that:

- [Heat waves](#), [coastal flooding](#) due to [sea level rise](#) and river flooding from extreme precipitation events will increasingly threaten the region's environmental, social and economic systems.

- These climate-related hazards, along with increased pressure from pests and disease, will stress agriculture and ecosystems. Research and outreach efforts are under way to help farmers cope.
- State and municipality-level measures to implement adaptations are still at early stages, even though many local and state governments and organizations have begun planning for climate changes.

With regard to the nation's ocean areas and resources, the United States depends heavily on oceans for seafood, recreation and tourism, transportation, and critical resources, according to the report.

"The ocean resources chapter is new this year, reflecting the increasingly significant impacts being catalogued in marine ecosystems, in addition to the coastal impacts described in a separate chapter of the report," said Harvell, associate director for environment at the Atkinson Center.

Over the past century, global sea levels have risen by 8 inches, while average U.S. coastal sea surface temperatures have risen by almost 1 degree Fahrenheit, greatly affecting coral and other ecosystems, while holding heat that will also warm the atmosphere.

Key points from this section include:

- Sea levels will continue to rise, impacting climate, ocean circulation, chemistry and ecosystems.
- The ocean absorbs about 25 percent of human-caused carbon dioxide emissions to the atmosphere, which causes [ocean acidification](#) that will likely reduce growth and survival of shellfish stocks in all regions.
- Habitat loss will continue in places like the

Arctic and coral reefs, while other areas will gain habitat for some species, thereby altering ecosystems. Coral reefs, for example, are extremely endangered and near collapse in some regions. Rising sea surface temperatures will lead to more diseases for both humans and marine life.

- Such human uses of the ocean as transportation, resource use and extraction, recreational and tourism activities and industries, will be affected in positive and negative ways by climate change.
- Some ocean policies, practices and management efforts—including increasing the resilience of built infrastructures or natural marine ecosystems—may serve as models for adapting to climate change in the oceans.

Provided by Cornell University

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