

Questions and Answers on the Science & Technical Advisory Panel Report to the NH Coastal Risks and Hazards Commission:

"Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends"

What is the report?

The report summarizes the large volume of published scientific research pertaining to climate change and how it will affect flooding hazards in coastal New Hampshire. Specifically, the report outlines plausible sea level rise scenarios for coastal New Hampshire to the end of the century and also suggests assumptions that should be used in planning for storm surge and extreme precipitation.

Why did the Commission request the report?

The Commission, which was established by the N.H. Legislature in 2013 (SB167 / RSA 483-E), is charged with recommending legislation, rules, and other actions to prepare for projected sea level rise and other coastal watershed flood hazards and the risks such hazards pose to municipalities and state assets in New Hampshire. Regular review of National Oceanic and Atmospheric Administration and other scientific agency projections of coastal storm inundation, and flood risk is required in the legislation that established the Commission.

What did the Commission feel was needed from a panel of experts?

The Commission's charge to the Science and Technical Advisory Panel (Panel) was to:

1. Ensure the Commission is aware of and using the best available and relevant scientific and technical information to inform its recommendations
2. Assist the Commission in interpreting and reconciling conflicting projections, scenarios and probabilities about future conditions
3. Review, evaluate, and respond to any major theory and supporting evidence put forward refuting the high likelihood of continued, accelerated sea-level rise and increased coastal risks and hazards

Who wrote the report?

At the request of the New Hampshire Coastal Risks and Hazards Commission steering committee, the members of the Panel were recruited by Commission member Dr. Paul Kirshen with input from Commission member Frederick Rice. The coordinating lead authors are UNH professors Paul Kirshen and Cameron Wake. Matt Huber (UNH), Kevin Knuuti (US Army Corps of Engineers), Mary Stampone (UNH and NH Climate Office) are contributing lead authors.

The members of the Panel are

- Frederick Chormann, NH State Geologist and Director of the NH Geological Survey
- Rob Flynn, Hydraulic Engineer, U.S. Geological Survey
- Sherry Godlewski, NH Department of Environmental Services
- Matt Huber, Department of Earth Sciences and Institute for the Study of Earth Oceans and Space, UNH
- Paul Kirshen, Research Professor Department of Civil Engineering and Institute for the Study of Earth Oceans and Space, UNH (Panel Chair)
- Kevin Knuuti, US Army Corps of Engineers
- Steve Miller, NH Fish & Game and Great Bay National Estuarine Reserve
- Ann Scholz, NH Department of Transportation
- Mary Stampone, Associate Professor, Dept. of Geography and NH State Climatologist
- Cameron Wake, Research Associate Professor, Institute for the Study of Earth Oceans and Space and Department of Earth Sciences, UNH; Josephine A. Lamprey Professor in Climate and Sustainability, UNH Sustainability Institute
- Thomas Wismuller (NASA – Ret.)

On what information is the report based?

The report and its recommendations are based on scientifically based, peer-reviewed literature. No new science was done by the Panel. The New Hampshire Coastal Risks and Hazards Commission steering committee agreed that the

basis of the science panel's work must be in peer reviewed science and that skepticism is consistent with a scientific approach.

What does 'peer review' mean?

Peer review is the evaluation of work (by one or more people of similar competence) to the producers of the work (peers). Peer review constitutes a form of self-regulation by qualified members of a profession within the relevant field. Peer review methods are employed to maintain standards of quality, improve performance, provide credibility and reduce the dissemination of unsubstantiated results and unacceptable interpretations. Publications that have not undergone peer review are regarded with a higher degree of skepticism by academics and scientists.

Has the report itself been reviewed by experts outside of the panel?

Yes. The Panel sought, received and incorporated comments on the draft report from internationally recognized experts in the field of sea level rise and coastal storms: Robert Kopp (Rutgers University), Stephen Gill (National Ocean Service, National Oceanic and Atmospheric Administration), and Kerry Emanuel (Massachusetts Institute of Technology).

What does the report say?

The report summarizes the varying scientific information on the anticipated future coastal flood hazards attributed to sea level rise (SLR), storm surge, and increased precipitation. The Panel's report also includes advice on the planning parameters that the Commission should use in framing its recommendations. The conclusions reached by the Panel regarding future coastal flood hazards are consistent with the Third U.S. National Climate Assessment completed in 2013-2014

How certain are we about the threats to New Hampshire from sea level rise?

Global sea levels have been rising for decades and are expected to continue to rise well beyond the end of the 21st century. The report presents plausible results that sea level will rise between 0.6 and 2 feet by 2050 along New Hampshire's coast, and between 1.6 and 6.6 feet by 2100 from 1992 conditions. The report recommends, however, that for coastal locations where there is little tolerance for risk in protecting new infrastructure or existing coastal settlements, infrastructure or ecosystems, that the range of 1.3 to 2.0 feet is used for the year 2050 and 3.9 to 6.6 feet is used for 2100. In planning for a future condition a relatively narrow range of numbers is the most useful, yet if we want relative certainty that the estimate will be right, we have to accept a wider range. There is a tradeoff between certainty and precision. As time goes on, we expect this uncertainty to decrease and the plausible range to narrow. The report, therefore, recommends that sea level rise assumptions be reviewed frequently, as often as every two years if warranted by the availability of new supporting science.

Who paid for the report?

The report is a product of an ad-hoc Science and Technical Advisory Panel chaired by CRHC Commission member Dr. Paul Kirshen and composed of scientists and experts in the fields of meteorology, engineering, climate, hydrology and other related sciences. Members of the Panel contributed their time and services pro bono; there was no cost for the report.

How is this report to the Commission related to the new FEMA flood maps?

The report is unrelated to the new FEMA flood maps. The FEMA maps, based upon past trends, model flood conditions intended to represent existing conditions. This report describes potential future conditions as influenced by accelerating sea level rise and changes in storm surge and precipitation.

How will the Commission use this report?

The report will be used as the basis for understanding the plausible range of flooding conditions that coastal New Hampshire will face in the future as a result of sea level rise, storm surge and precipitation. That information will help inform the Commission as it assesses the specific vulnerabilities and risks that are likely to develop. This, in turn, will form the foundation of the recommendations the Commission will make to advise the State and municipalities about the policies and actions that should be undertaken to prepare for increased flooding hazards. The Commission will complete its work by December 2016 and will release interim reports to the N.H. Legislature in November of 2014 and 2015. The full report as well as information about the Commission are available at <http://nhcrhc.stormsmart.org/>