

## **Learning to Fall: Preparing for a future of climate change on the Seacoast**

By Dave Kellam, NHEP Project Coordinator

One of life's certainties is that gravity will get the best of you at times and you will fall down. Falling is inevitable, but how much damage that fall will do is somewhat under your control. If you don't wittingly step off a cliff or carry heavy loads that can crush you, and stay flexible so you can roll with the impact, chances are you can avoid an emergency room visit.

Metaphorically, this is also good advice when dealing with climate change. Like falling, changing climate is inevitable. University of New Hampshire Climatologist Cameron Wake notes that "There is no question that our climate is changing and there is a certain amount of warming that we are already committed to over the next one to two decades. What we can influence now is the degree of change that will occur over the next 100 years. The choices we make today regarding how we generate and use energy will determine if our changing climate is something we can reasonably adapt to or if the amount of climate change will be catastrophic."

Wake bases his statements on a combination of sources including long-term monitoring data of climate indicators, global circulation models that were downscaled to focus on New England, and a 2007 report by Northeast Climate Impacts Assessment (a team of 50 independent scientists working with the Union of Concerned Scientists).

Entitled "Confronting Climate Change in the U.S Northeast", the report quantified the impact of two emission scenarios of heat trapping gases (aka greenhouse gases) on the climate over the next 100 years: 1) a higher-emissions scenario based on current emissions and, 2) a lower-emission scenario assuming a decline of emissions by the middle of the century.

The two emission scenarios show starkly different consequences for New England. The lower-emissions scenario reduces some winter activities (such as ice fishing and skiing), but the higher-emissions course essentially eliminates most traditional winter recreation throughout most of the region. As another example, the higher-emissions scenario indicates that historic cod habitat in Georges Bank will become too warm to support the cold water species. With lower-emissions, cod continue to live in Georges Bank. Under either scenario we can expect an increase in the frequency and severity of extreme coastal flooding events, however, following a lower-emissions scenario rather than a higher one reduces an extreme flooding events from once a decade to once every two decades. Finally, the number of days above 90 degrees in the summer is expected to rise from the average of 10 today, to 32 under lower-emissions and to 66 under higher-emissions by the end of this century – essentially creating a summer-long "heat wave" each year.

So, it appears we are headed for a "climate fall". But we can take action and prepare ourselves to avoid catastrophic results. First, we need to change course to get on the lower-emissions scenario path – better to take a tumble down a steep hill than off a high

cliff. To change course we must switch to clean renewable energy sources, improve vehicle and building efficiency and protect natural landscapes.

Second, we need to manage the heavy loads that will burden us. In the case of climate change, this means heavy volumes of water from increased extreme rain events and rising sea levels. Municipalities should plan for more spring and autumn flooding. Many culverts and bridges need to be upgraded to avoid catastrophic failure during floods, while new and existing developments need to adopt low impact development techniques that reduce stormwater runoff and maximize infiltration into the ground. Runoff must not simply be moved quickly to sea, because climate models also predict more frequent droughts in the summer.

The third thing we can do to escape a “broken neck” is to roll with the changing conditions. Developers must recognize that site conditions are dynamic and new home builders should allow extra distance from wetlands and refuse to build on steep slopes. Communities should respect flood-prone waterways by increasing the vegetated buffer between development and surface water. Coastal communities must act aggressively because extreme rain events are magnified by storm surges, beach erosion, and rising sea levels.

Already, communities are working to mitigate the inevitable impacts. The Town of Keene, in cooperation with Antioch University of New England, conducted a detailed analysis of culverts in a local watershed and determined that a majority of them are expected to fail in the next 100 years. The Town is now embarking on an upgrade plan that replaces undersized culverts over the next few decades. This type of proactive planning dramatically reduces future damage and costs.

The State of New Hampshire is also proactively studying climate change and on January 18, 2008 held its first meeting of the New Hampshire Climate Change Policy Task Force. According to Governor Lynch “This Task Force is charged with developing and implementing a Climate Change Action Plan, which will be a comprehensive strategy for helping stem climate change and protecting our quality of life here in New Hampshire.” Enabling legislation, meeting agendas, local climate change resources, and a draft outline of the Action Plan can be seen at <http://www.nh.gov/climate/>.

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Eye on our Estuaries is an educational column initiated by the New Hampshire Estuaries Project (NHEP) about coastal watershed issues. The NHEP is a collaborative program involving governmental agencies, universities, nonprofit organizations, businesses and the public to protect, enhance and monitor the environmental quality of the state's coastal bays and rivers. NHEP is funded in part by a grant from the U.S. Environmental Protection Agency. For details, visit [www.nhep.unh.edu](http://www.nhep.unh.edu).