Projections of Change
The earth’s climate has changed and will continue to change. Regional projections of climate change include increased: seasonal temperatures; frequency and duration of heat waves; precipitation; extreme precipitation events; drought; sea level rise; coastal flooding; sea surface temperature; and growing season, as well as decreased snow and ice cover (Source: Wake et al., 2011, 2014).

The rate at which climate will continue to change is dependent on a number of factors including: population growth, peak, and decline; economic growth and associated fossil fuel use; adoption of less fossil-fuel industries and cleaner, more efficient technologies; and carbon dioxide concentrations in the atmosphere. High and low emissions scenarios are used in climate change projections to account for this uncertainty.

Climate change will have widespread impacts on people, the economy, and the built and natural environments within the region. While the impacts of climate change on individuals and communities will vary in magnitude and scope, the overall effect of climate change on quality of life will be negative.

Infrastructure Impacts
The projected increase in precipitation and extreme precipitation events, in particular, pose a threat to the built environment. Climate change will increase the risk of flooding of buildings and infrastructure located in proximity to streams, rivers, and the coast. In many instances, existing infrastructure may not have the capacity to handle greater volumes of water. Coastal communities will face the added challenge of coping with sea level rise and storm surge.

Human Health & Well-Being
Temperature, extreme weather events, reduced air quality, and an increase in vector-borne diseases may impact the health of residents in the region and result in increased health care costs. Factors including age, socioeconomic status, and existing health conditions contribute to vulnerability of the region’s population.

Environmental Impacts
Changes in precipitation and temperature impact the natural systems and ecological functions that sustain quality of life in the region. Temperature and precipitation change will lead to greater volumes of pollutant containing stormwater runoff entering the region’s streams and rivers. This will impact drinking water quality, aquatic biota, and recreation opportunities. As the climate warms, species will continue to shift north, resulting in a change of forest composition and habitat.

Cultural and Economic Impacts
There will likely be significant economic implications associated with adapting to, coping with, and recovering from the impacts of severe storm events. This may strain already tight municipal budgets as well as potentially divert funding away from important projects. Climate change is also expected to have impacts on culturally and economically significant resources, including maple syrup production, as well as on the tourism and winter recreation industries. Additionally, individuals may also be affected by increased insurance rates and higher air conditioning costs. Coping with changes to the norm, the uncertainty of future climate change impacts, and identifying the best adaptation strategies to invest in can be an added stress on individuals and municipalities.

Adaptation Planning
Adaptation strategies are inherently local or regional in nature because anticipated changes in climate vary by region and because the impacts of those changes are dependent on vulnerability and the specific character of the population, built environment, and ecosystem of a place. Communities in New Hampshire have the opportunity and authority to adopt local action plans and adaptation measures to address issues that are of particular local concern.

Planning and preparedness is essential to minimizing the impacts of climate change. There are a range of adaptation strategies at the individual, community, and regional level to increase resiliency to climate change. Integrating climate change planning into existing planning documents is a key aspect of adaptation planning. Increasing awareness of health implications, expanding access to resources, identifying at risk infrastructure, and enhancing existing emergency preparation and planning and stormwater management efforts will be important to minimizing risks to people, and the build and natural environments.

Communities in the region are already implementing a range of adaptation strategies that enhance quality of life and reduce risk associated with climate change. Pairing adaptation and climate change mitigation efforts can be an effective and resource-efficient strategy to increase resilience and mitigate future climate change.
Climate Change: Findings & Trends

1.3 to 1.7°F increase in mean annual temperature since 1970; 4.5-9.0°F increase in annual max. and min. temperatures over next 100 years

Frumhoff et al., 2007

Warming of winter temperatures and decrease in winter snowcover; As much as 33 fewer snow-covered days by 2100

Wake et al., 2014

Increase in temperature, frequency, intensity, and duration of heat waves; up to approximately 22 more extremely hot days (over 95°F) per year

Wake et al., 2014

Increase in frequency of heavy rainfalls and increase in annual mean precipitation up to 8.8” by the end of the century

Wake et al., 2014

Increase in sea level of up to 1.7—6.3’ by 2100; 100 year flood still water elevations will range from 9.4-12.9’ by 2050 and 10.9-17.5’ by 2100

Wake et al., 2011

Four fold increase in annual sea temperature from 1970-2008 compared to the 1887-2008 trend

Wake et al., 2011

Earlier lake ice-out date ranging from 0.4 —1.6 days/decade earlier between 1887 and 2010

Wake et al., 2011

Increase in growing season by 12-42 days since 1960; northward shift in USDA plant hardiness zones between 1990-2006

Wake et al., 2011; USDA, 2014

Change in river flow; increase in annual discharge from the Lamprey and Oyster Rivers since data collection initiated in 1935

Wake et al., 2014

Impacts

Increased threat of invasive species

Wake et al., 2011

Northward shift in forest species

US Global Change Research Program, 2009

Decline of maple syrup industry

NH GSS, 2008

Decreased air and water quality

Wake et al., 2014

7% Short-term lengthening in growing season under high and low emissions scenarios

Long-term lengthening in growing season under high emissions scenario

30% Wake et al., 2014

The number of reported cases of Lyme’s Disease in New Hampshire has increased.

Observed weather-related outages to the bulk electric system have increased.

Local Solutions for the Strafford Region

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Climate Change: Findings & Trends

Short term, mid-century, and end-of-century temperature projections under high and low emissions scenarios in Southern New Hampshire

Wake et al., 2011

Adaptation

Climate change adaptation is action taken to avoid and minimize negative impacts and take advantage of positive impacts of a changing and increasingly variable climate. Adaptation includes changes in processes, practices, and structures to reduce potential damages associated with climate change.

Example Adaptation Strategies

- Create vulnerability maps that identify vulnerable assets, resources, and populations
- Conduct a municipal audit to identify barriers and incentives to implementing climate change planning and adaptation at the local level
- Integrate climate change planning into regional and local plans
- Continue and expand efforts to manage stormwater pollutant loading in the Great Bay watershed
- Utilize best available precipitation, floodplain, and temperature data when modifying culverts, building codes or design standards
- Ensure Hazard Mitigation Plans address risks associated with climate change
- Educate the public about health risks associated with heat, extreme weather events, and increase in vector-borne diseases
- Protect sensitive and vulnerable species and habitats; conserve areas for habitat expansion; increase removal and eradication efforts of pests and diseases
- Modify farming practices including crop varieties and timing of field operations to cope with changes in temperature and precipitation
- Reduce impervious surface cover to minimize flooding and reduce water quality impairment associated with heavy rainfall