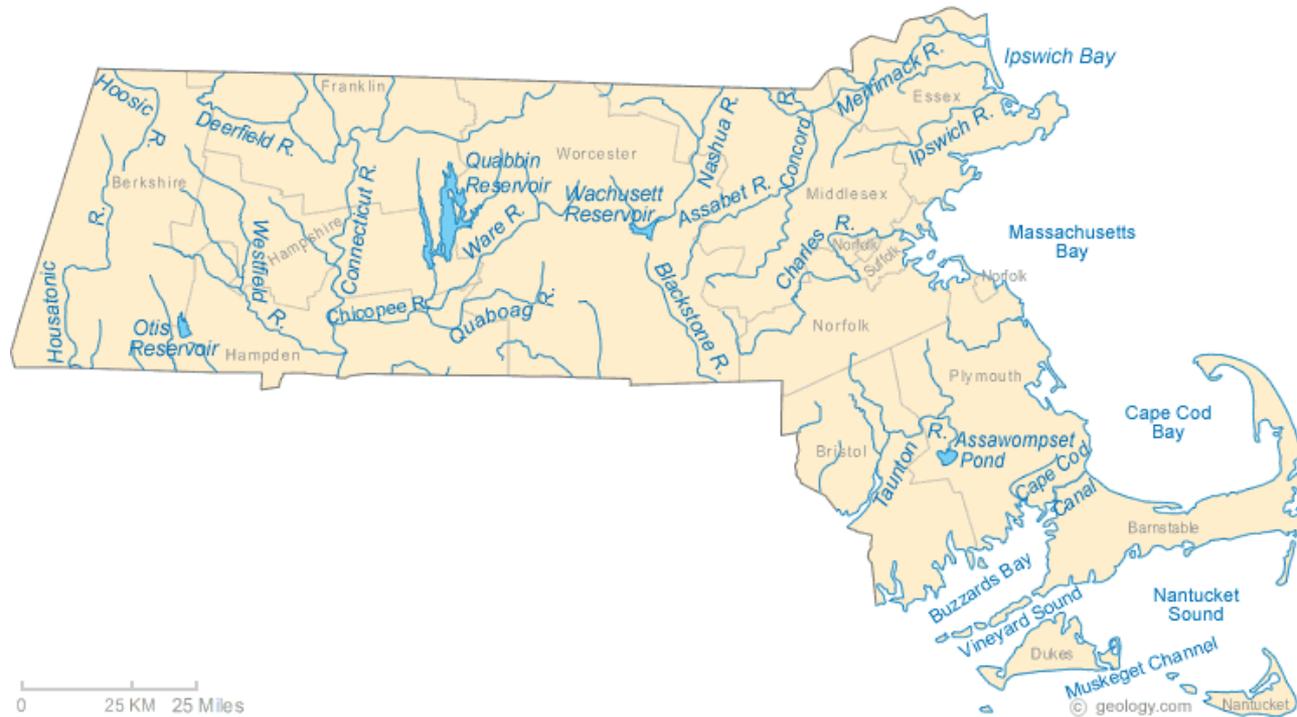


Climate Change State Profiles

Massachusetts



Observed and Projected Changes in Climate and their Impacts

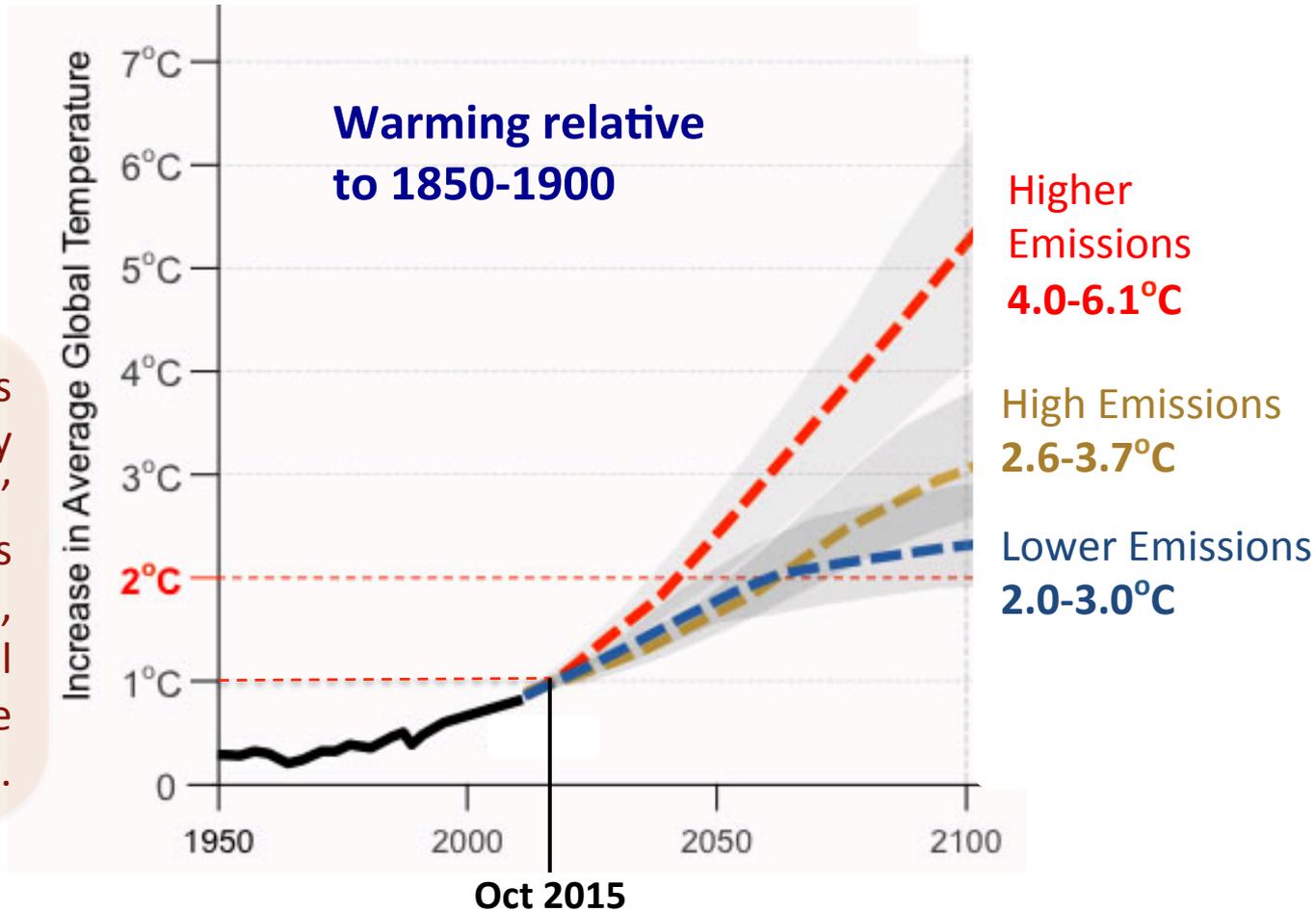
“To prevent dangerous interference with the climate system, the scientific view is that the increase in global temperature should be below 2°C [relative to pre-industrial levels]”.

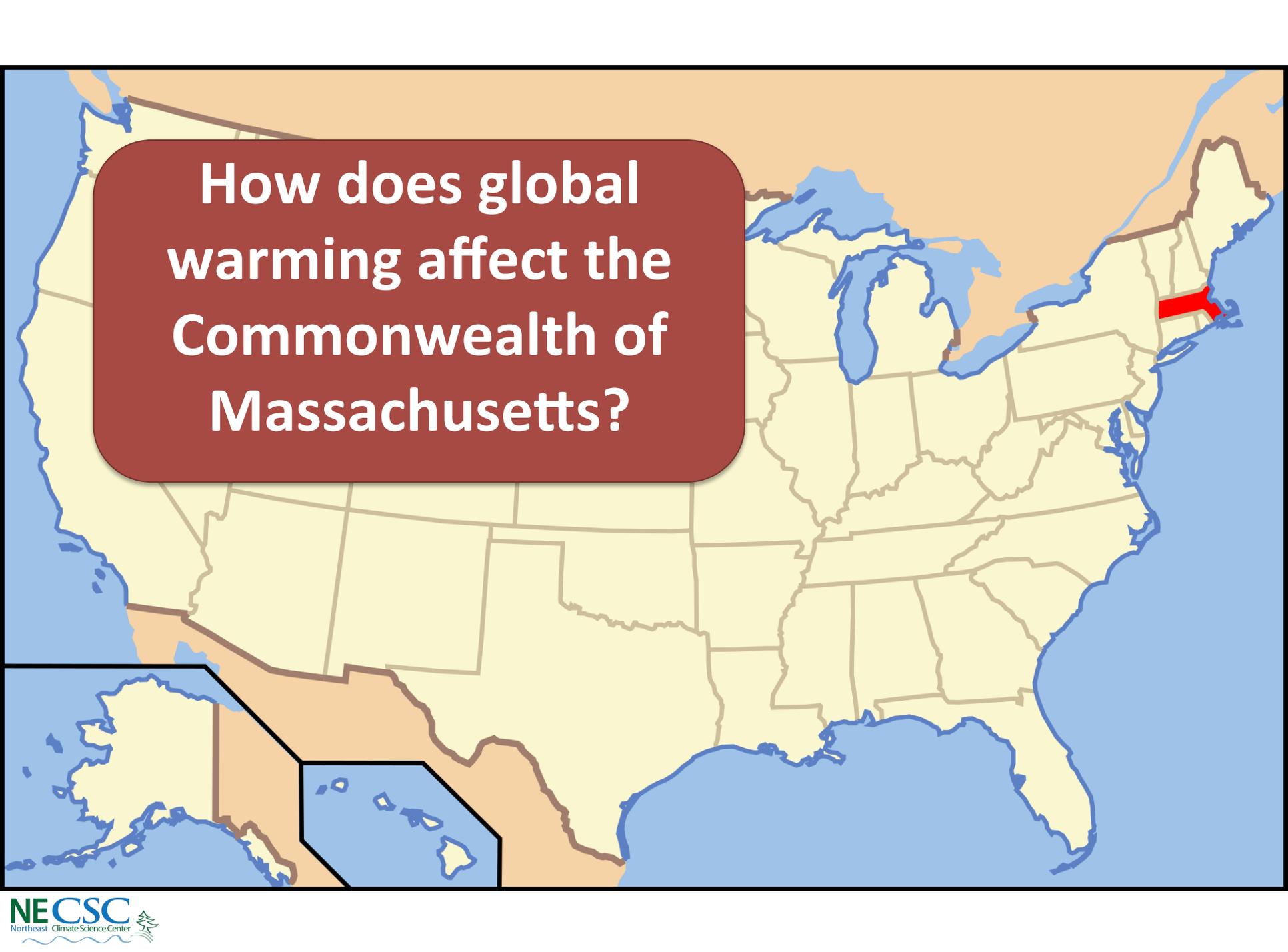
- United Nations Framework on
Climate Change, 2010

How will global temperatures change in the Future?

The global average temperature has already increased by about 1°C relative to pre-industrial levels.

Current CO₂ emissions are tracking the 'very high emissions' scenario; unless emissions are reduced, the 2°C threshold will be crossed before 2050.



A map of the United States with state boundaries outlined in brown. The state of Massachusetts is highlighted in red. A dark red rounded rectangle is overlaid on the left side of the map, containing white text. The map also shows the Great Lakes and the Gulf of Mexico in blue. An inset map in the bottom left corner shows Alaska and Hawaii.

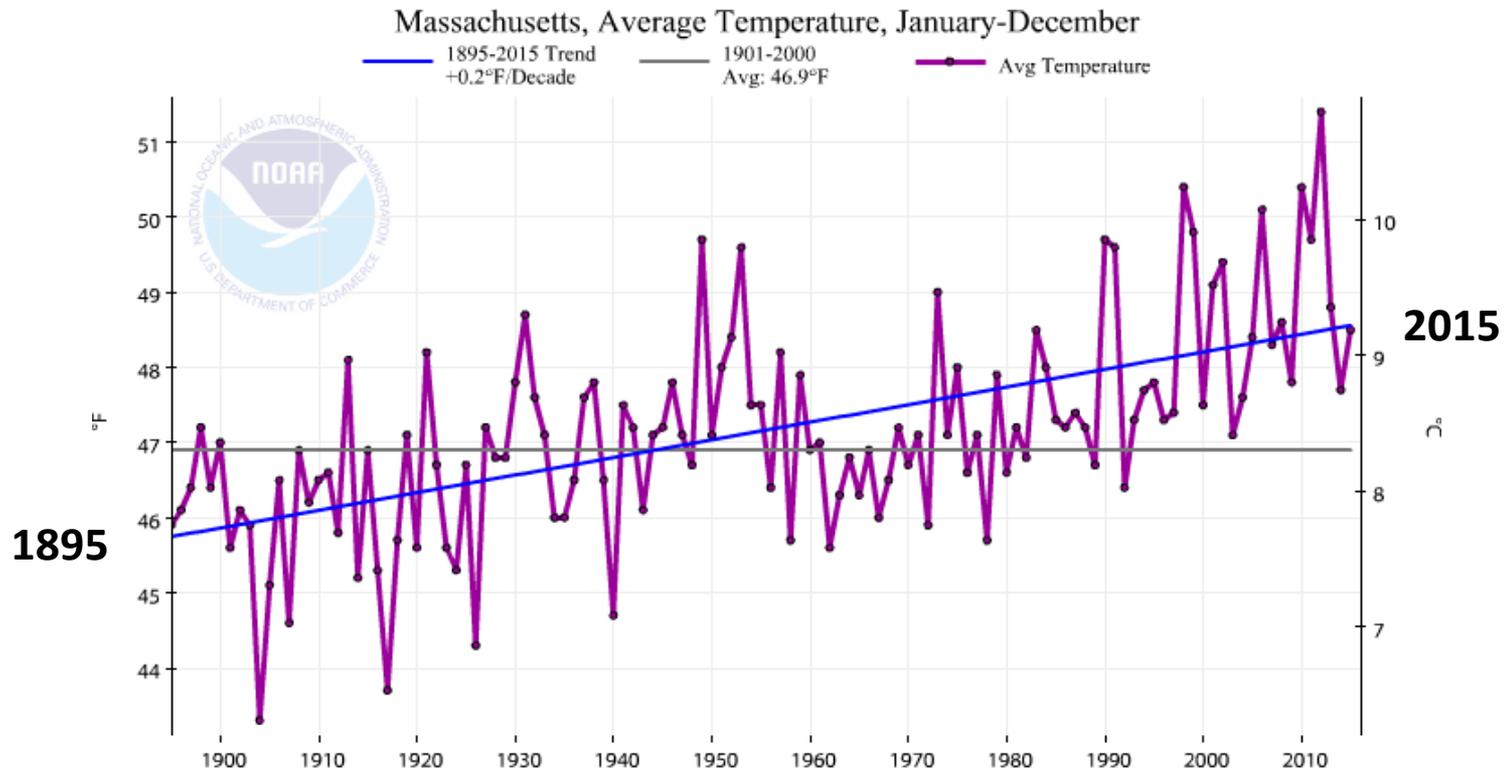
How does global warming affect the Commonwealth of Massachusetts?

Warming in Massachusetts



OBSERVATIONS

Annual mean temperatures have increased by about 2.4°F (1.3°C) since 1895.



Source: [NOAA](#)

Warming in Massachusetts

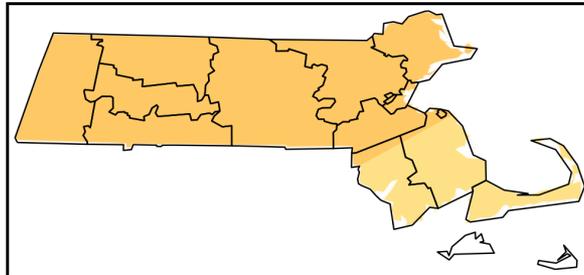


PROJECTIONS

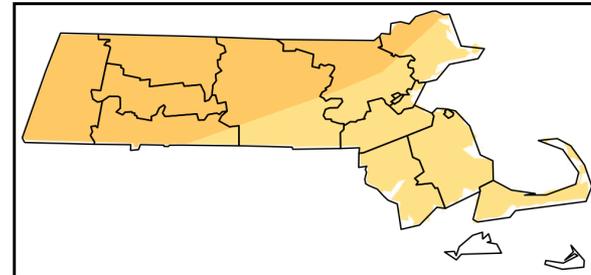
In the next 50-60 years, average summer and winter temperatures will increase by over 5°F (2.7°C).

Lower Emissions

Winter

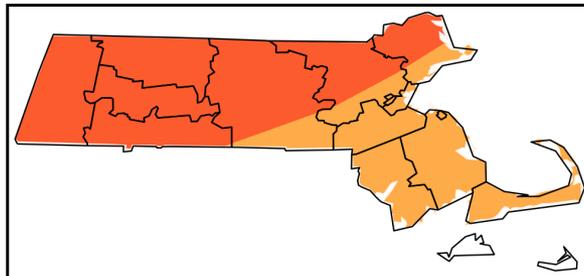


Summer

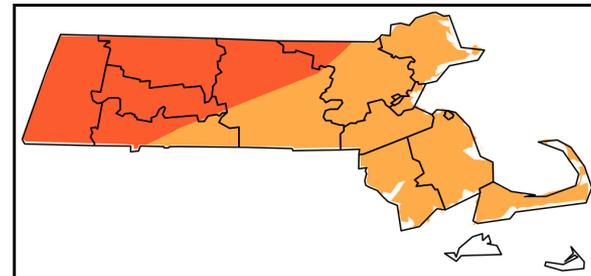


Higher Emissions

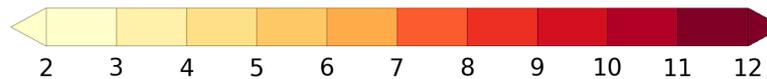
Winter



Summer



Warming in °F by 2070 relative to 1961-1990 mean

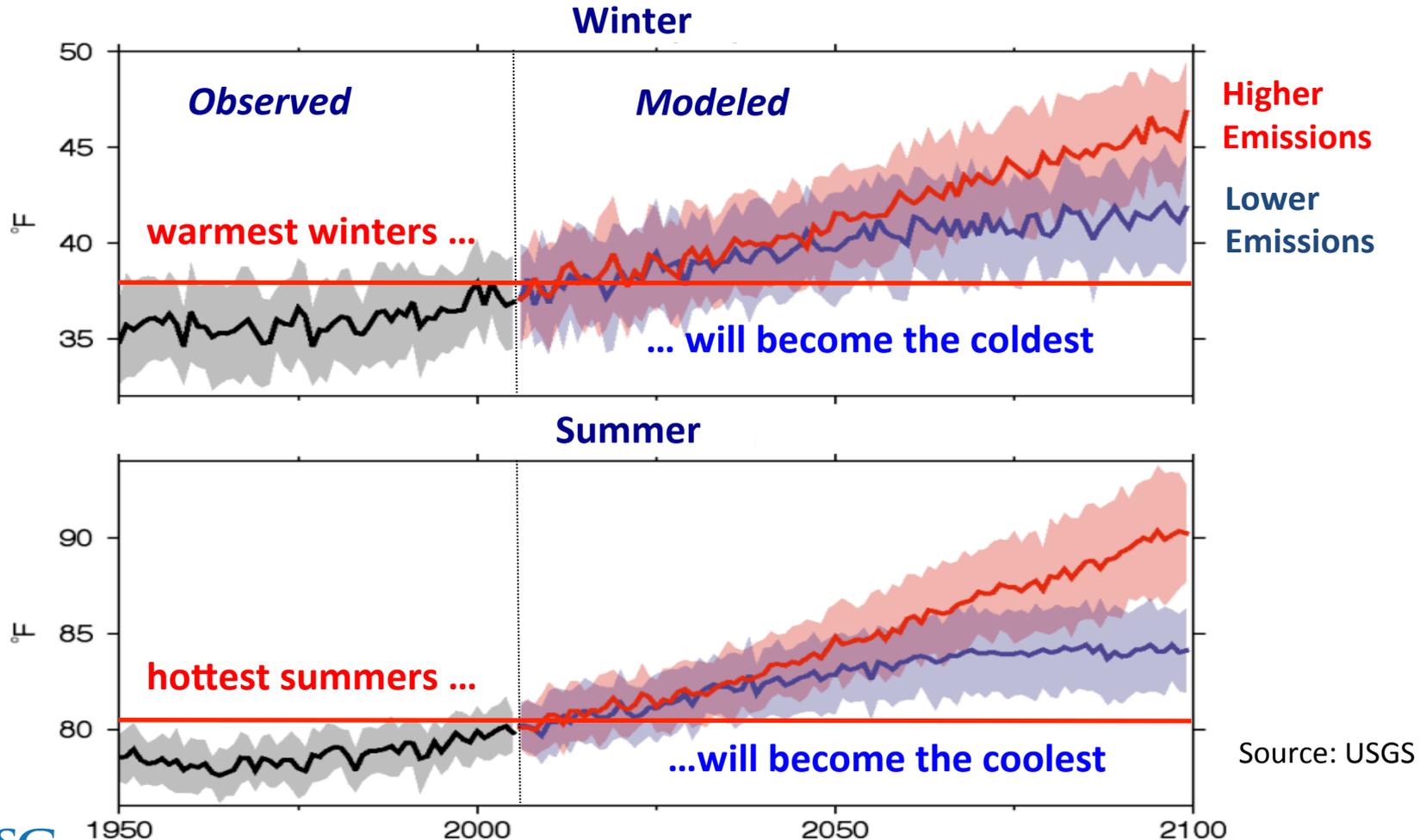


Warming in Massachusetts



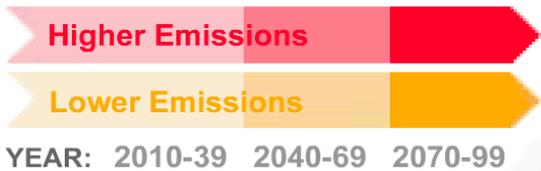
PROJECTIONS

How warm will Winter and Summer temperatures become?

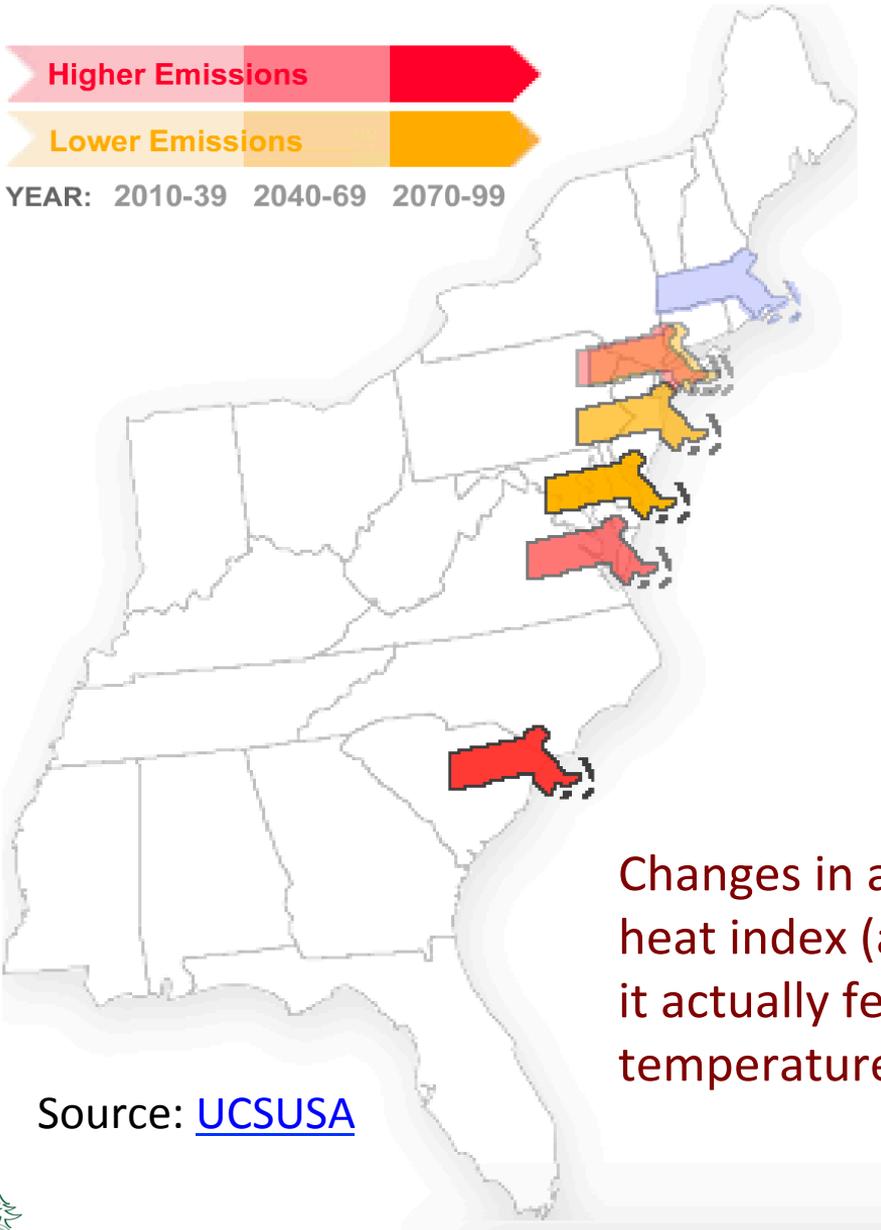


Source: USGS

Migrating Massachusetts Climate



YEAR: 2010-39 2040-69 2070-99



PROJECTIONS

Summer in Massachusetts by the end of this century could feel like a present-day typical summer in South Carolina.

Changes in average summer heat index (a measure of how it actually feels for a given temperature and humidity).

Source: UCSUSA

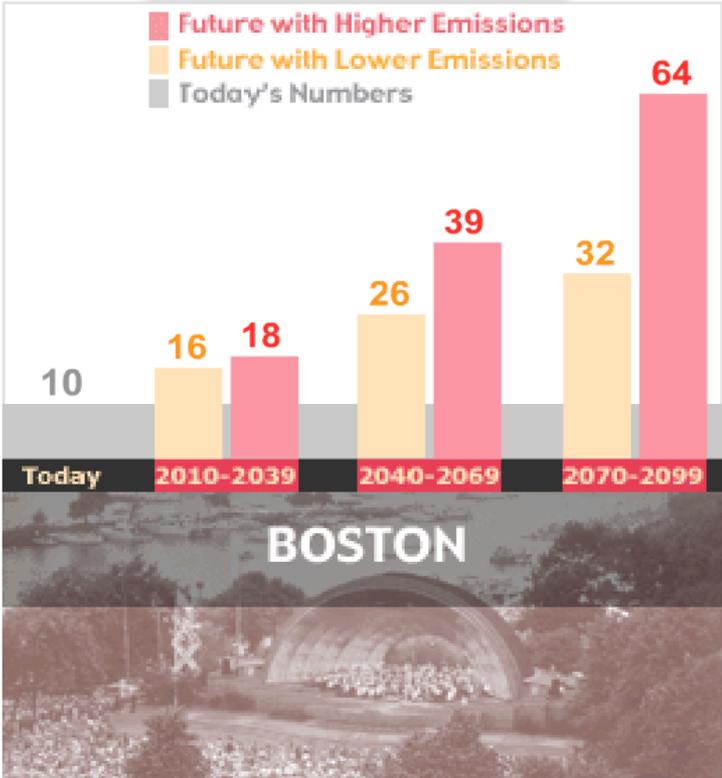
Extreme Heat



OBSERVATIONS

Summer daytime high temperatures in Boston rarely go above 90°F in today's climate.

Days over 90°F



Days over 100°F

Today	2070-2099	
1	6	24

↑ Lower Emissions ↑ Higher Emissions

PROJECTIONS

The number of days with dangerously high temperatures (above 90°F) is projected to increase significantly in the future.

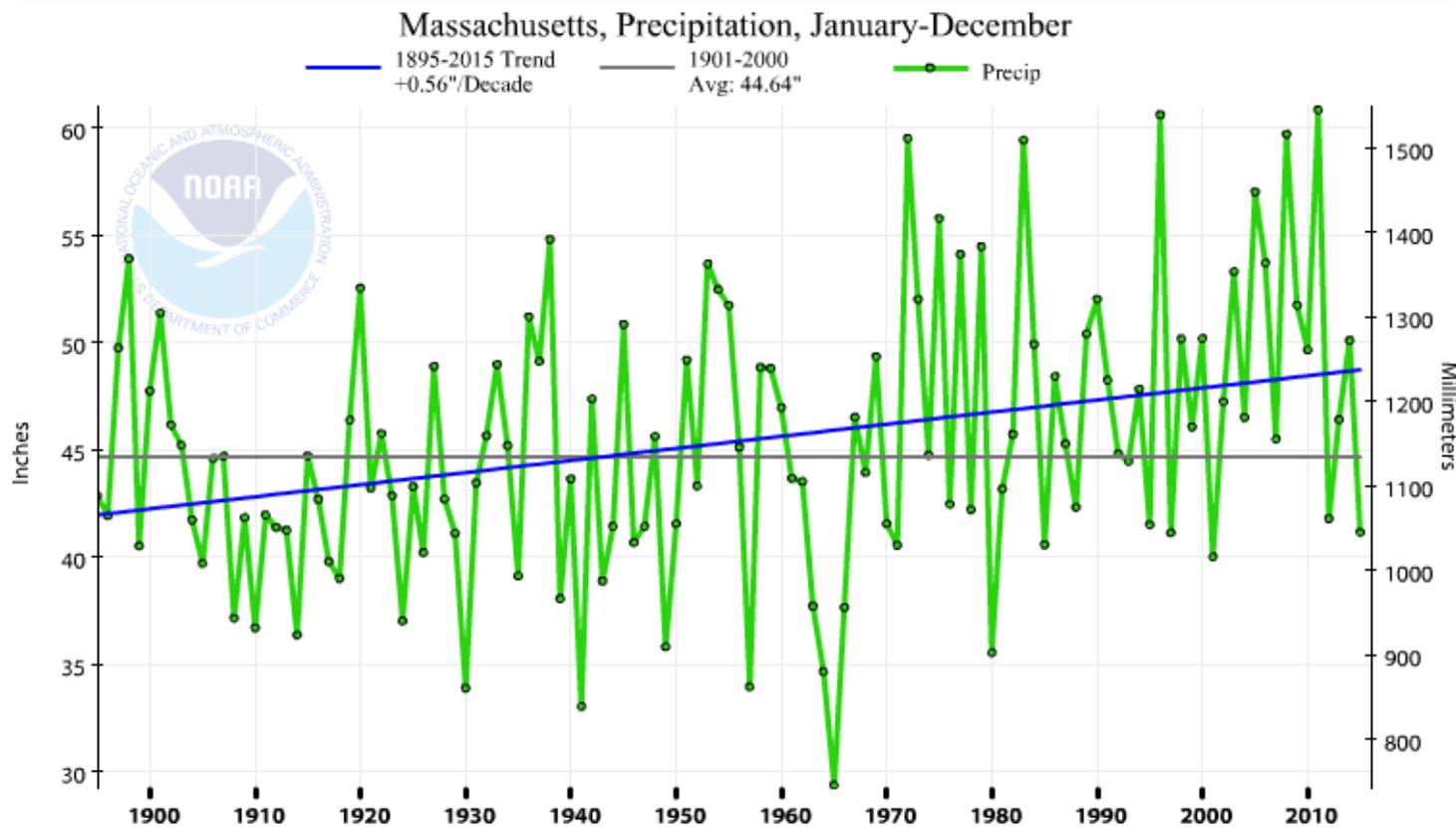
Source: UCSUSA

Rain and Snow in Massachusetts



OBSERVATIONS

Annual total precipitation (rain + snow) has increased over the last few decades.



In 8 out of the last 10 years, Massachusetts has received more precipitation than the 20th century average.

Devastating floods in recent years



Coastal flooding in Scituate, MA after winter storm Juno, Jan 2015



Taunton River flood in Taunton MA, March 2010

Floodwaters in Shelburne, MA after hurricane Irene, Aug 2011

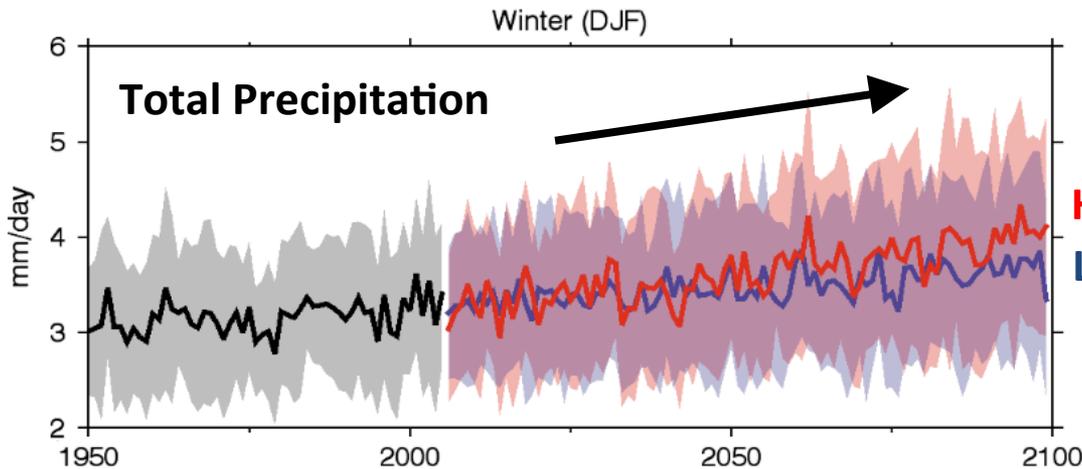


Rain and Snow in Massachusetts

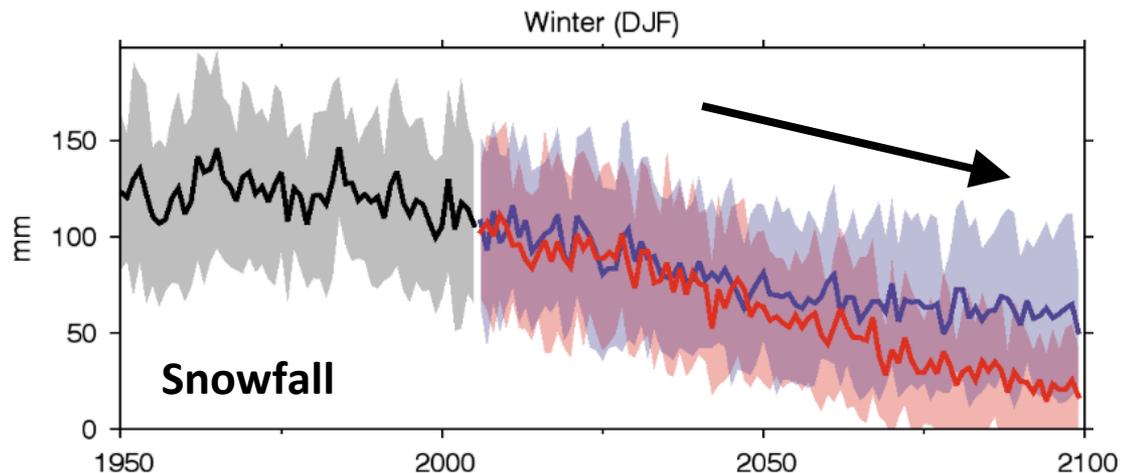


PROJECTIONS

Winter precipitation is projected to increase through the 21st century.



Due to increasing temperatures, there will be more rain and less snow.



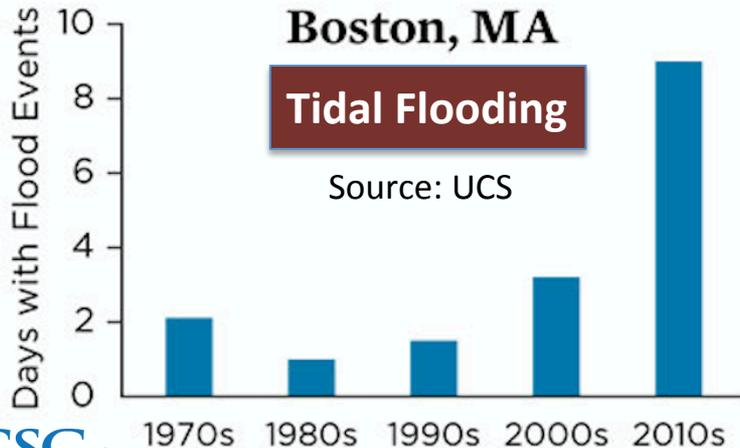
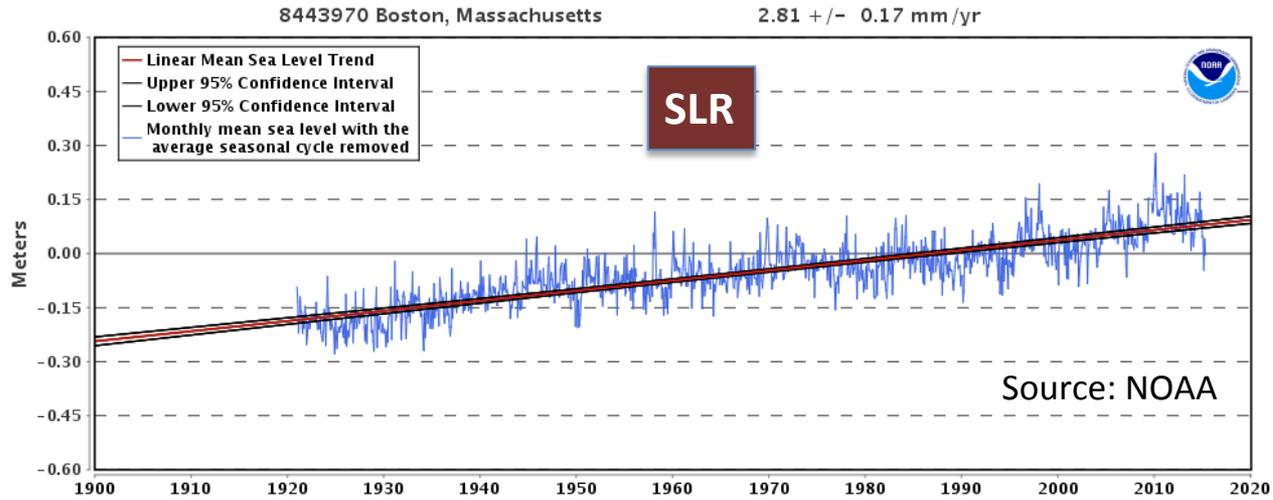
Projected changes in rainfall in summer are uncertain.

Sea Level Rise



OBSERVATIONS

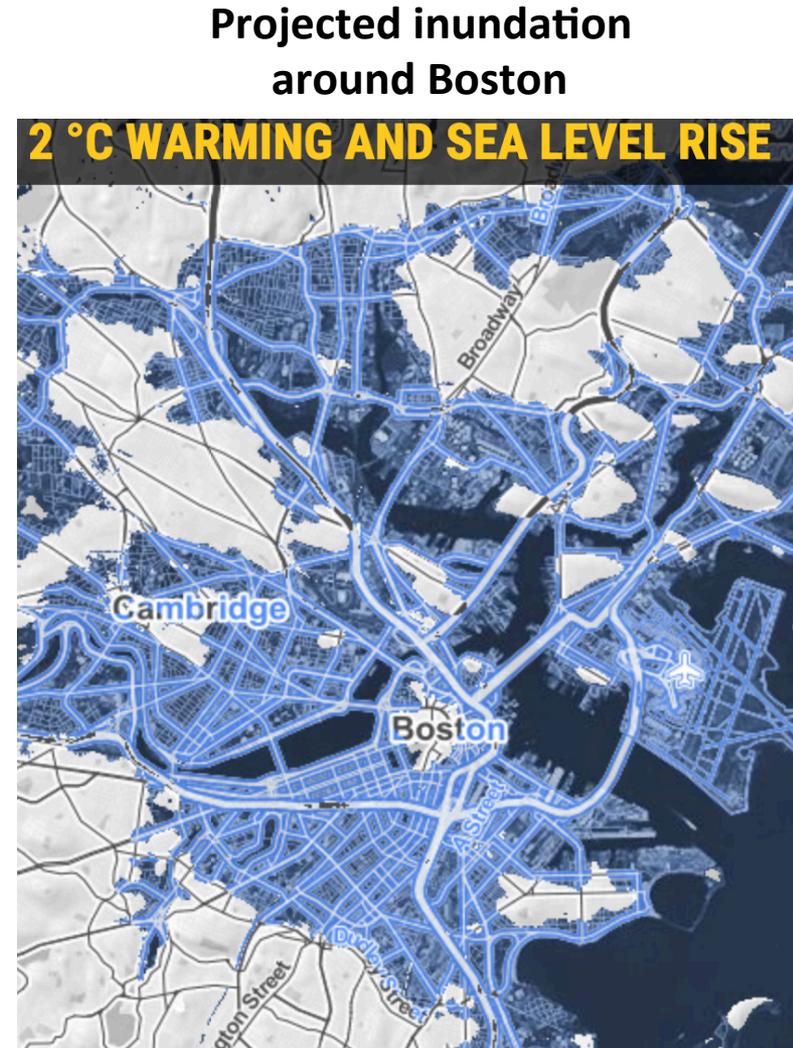
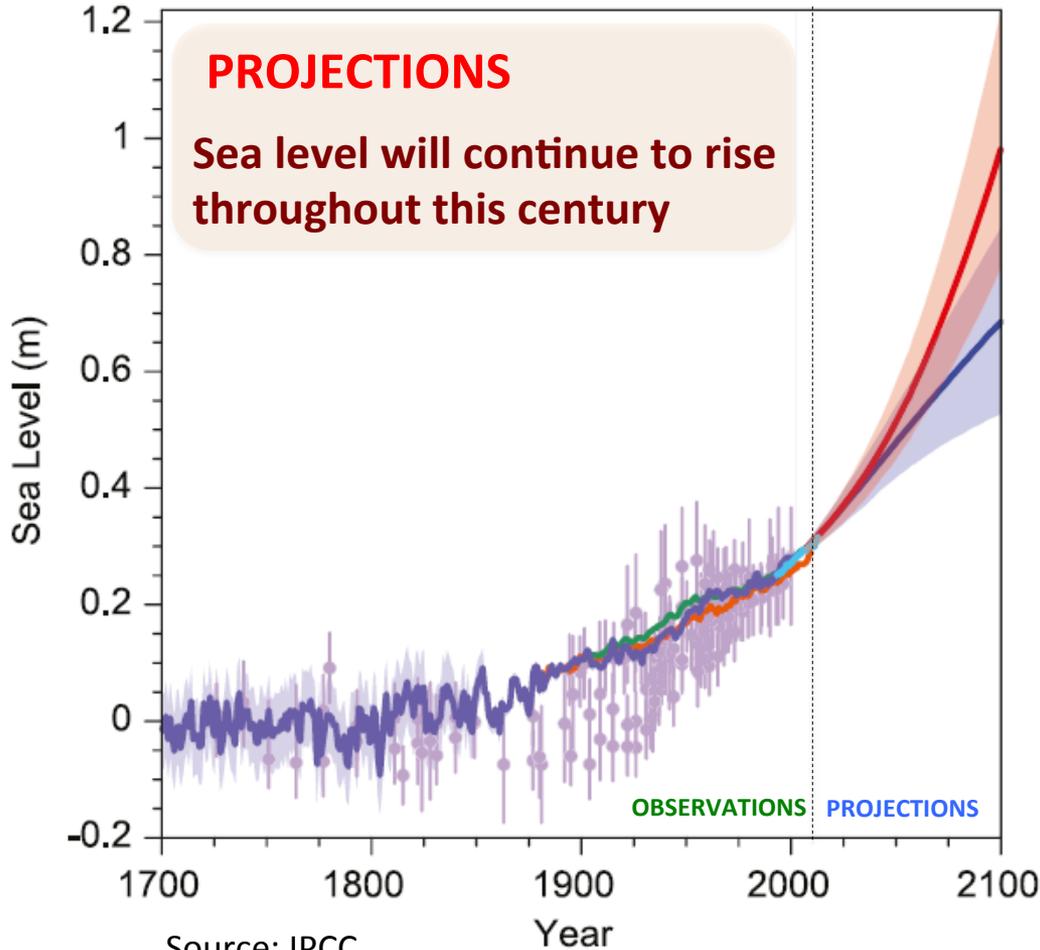
Over the last century, sea level has risen by about 0.9 feet around Boston MA.



Seemingly small increases in sea level can have large impacts along the coast due to storm surges and exceptionally high tides.

Communities in Boston are now seeing more days with tidal flooding.

Sea Level Rise



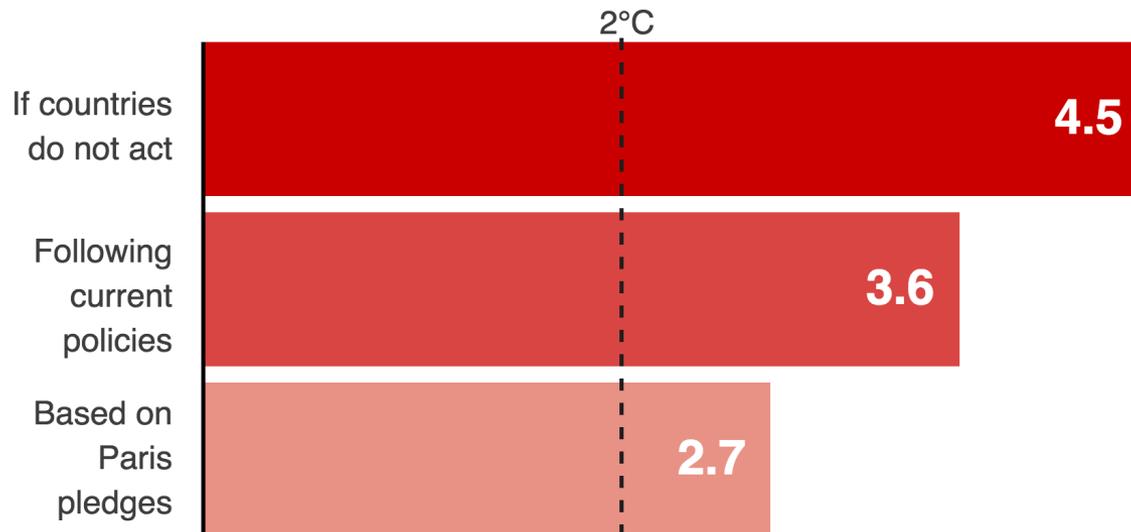
Source: Climate Central

Changes in sea level take decades to centuries. Warming of 2°C could eventually lead to about 6 meters of sea level rise.

Climate Summit in Paris [COP21]

An immediate action on local and global scales is required to limit the global mean temperature increase to 2°C (3.6°F).

Average warming (°C) projected by 2100



Source: Climate Action Tracker, data compiled by Climate Analytics, ECOFYS, New Climate Institute and Potsdam Institute for Climate Impact Research.

Strategies and Actions

National Climate Assessment:

The National Climate Assessment summarizes the impacts of climate change in the US, now and in the future.

Integrating Climate Change into State Wildlife Action Plan (SWAP):

The goals of SWAP are to generate proactive, comprehensive wildlife conservation strategies that assess the health, challenges, and potential actions each State would like to accomplish during the coming decade and beyond.

Massachusetts Fish and Wildlife Climate Action Tool:

Designed to inform and inspire local action to protect the Commonwealth's natural resources in a changing climate.

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WEB

<https://necsc.umass.edu/>