How will global warming of 2°C affect Maine?

Observed and projected changes in climate and their impacts

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UMASS AMHERST

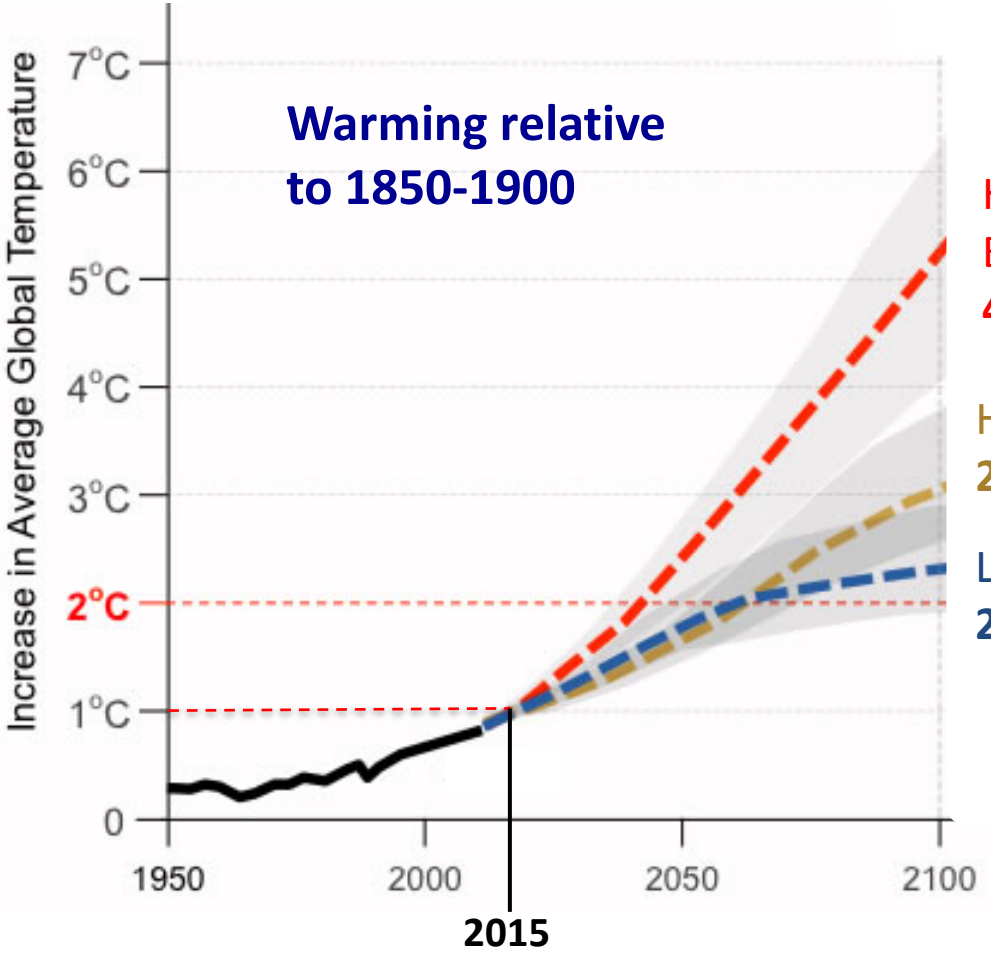
"To prevent dangerous interference with the climate system, the scientific view is that the increase in global temperature should be below 2°C [relative to pre-industrial levels]".

- 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 (1.8°F) relative to pre-industrial levels.

Current CO_2 emissions are tracking the 'higher emissions' scenario; unless emissions are reduced, the 2°C threshold will be crossed before 2050.



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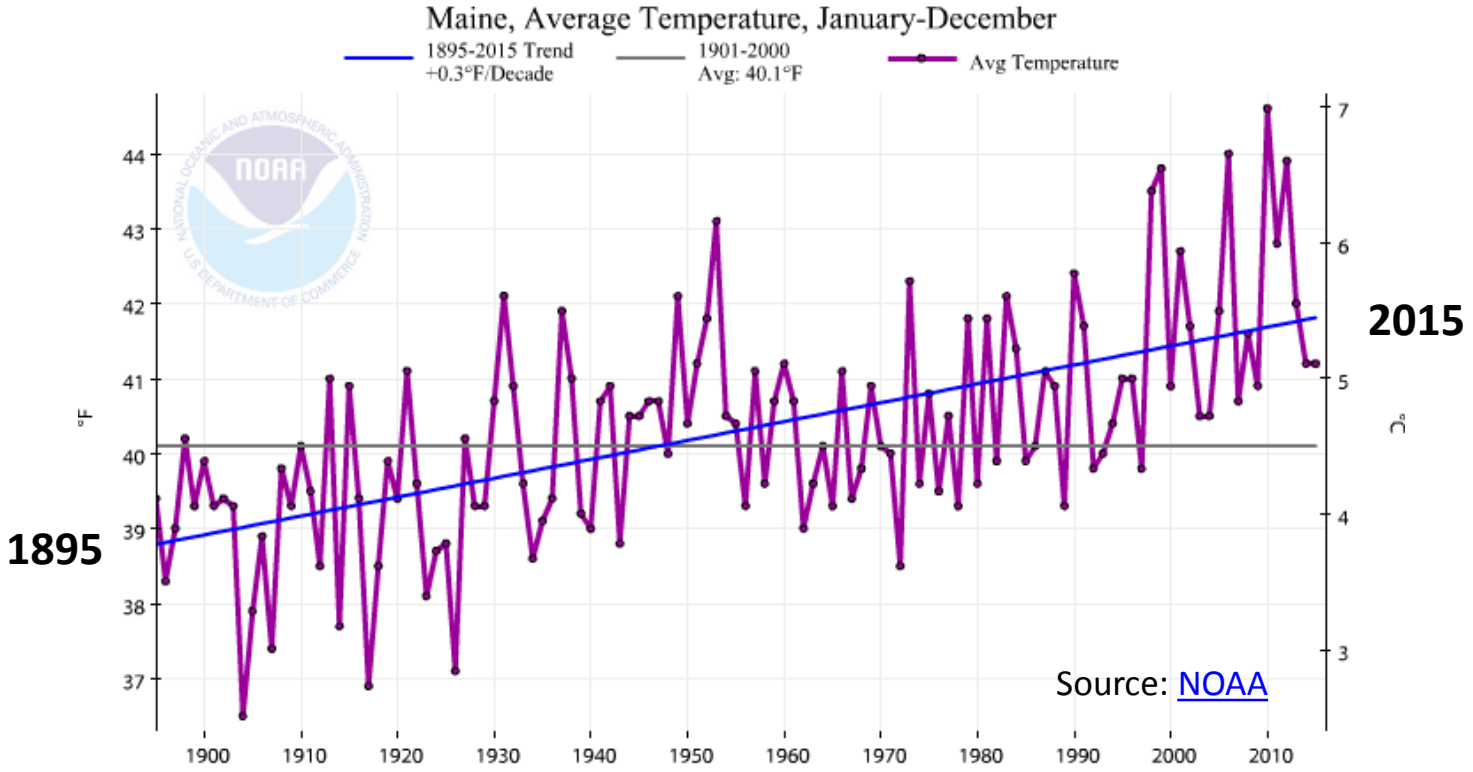
Warming in Maine

OBSERVATIONS **The annual mean temperature in ME has already increased by about 3.1°F (1.7°C) since 1895 – faster than the rise in global mean temperature.**



The annual mean temperature in ME has exceeded the 20th-century average every year since 1998 (the last 17 years).

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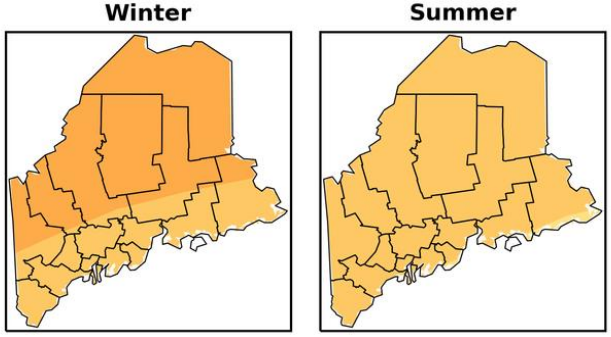
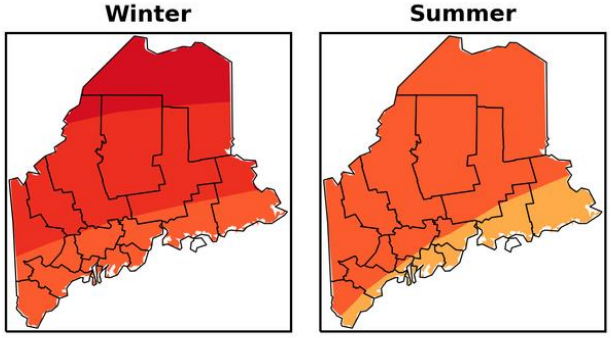
Warming in Maine

PROJECTIONS **In the next 50-60 years, when global warming crosses the 2°C threshold, ME average summer and winter temperatures are projected to increase by over 5°F (2.8°C) relative to pre-industrial levels.**

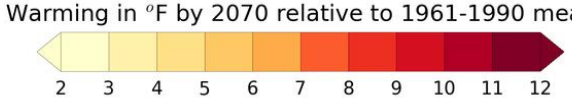
Lower Emissions



Higher Emissions



Source: *produced by CSRC, UMass Amherst*



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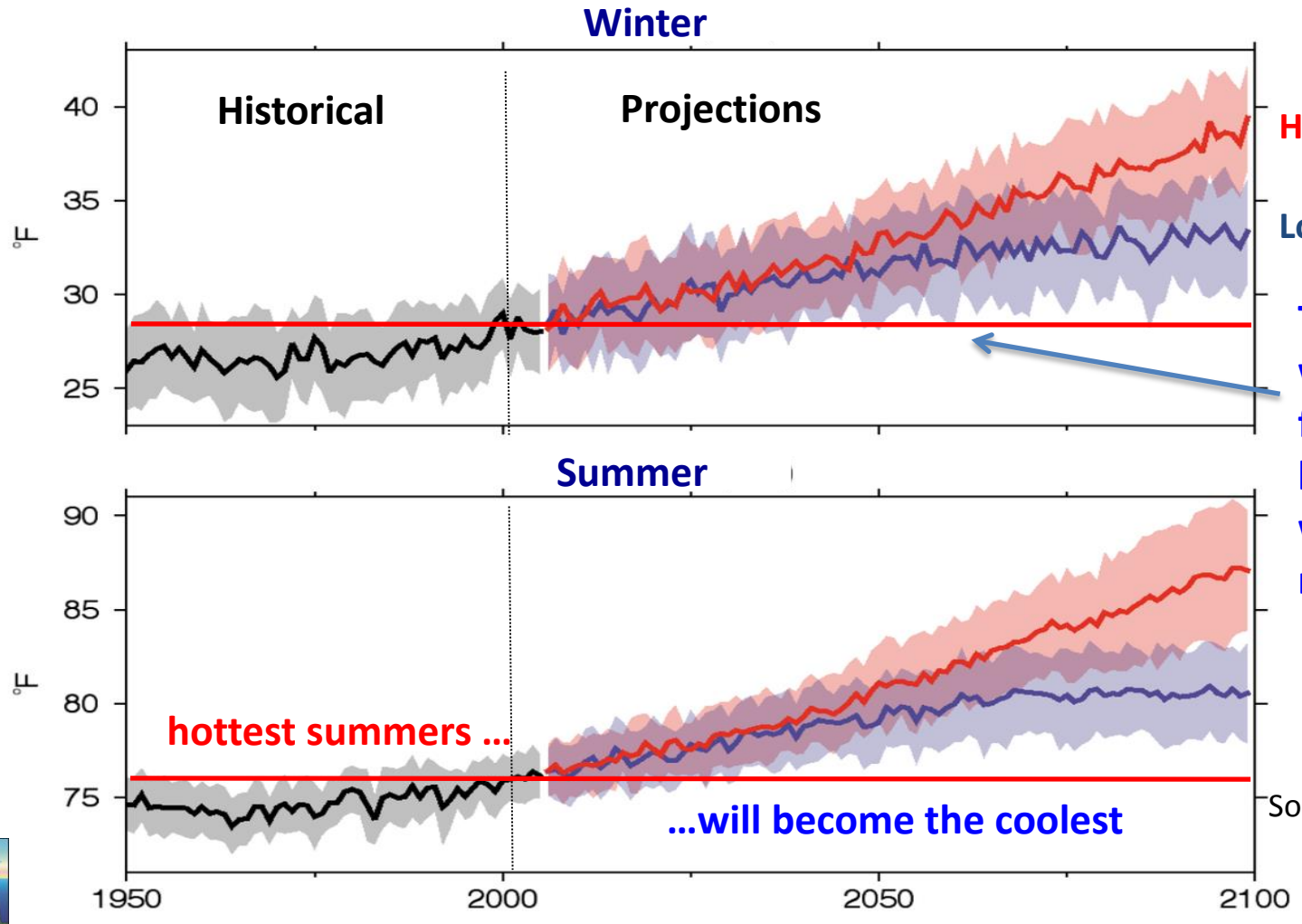
Warming in Maine

PROJECTIONS How warm will Winter and Summer temperatures become?



Higher Emissions

Lower Emissions

The coldest winters in future will be like the warmest of recent years

Source: USGS

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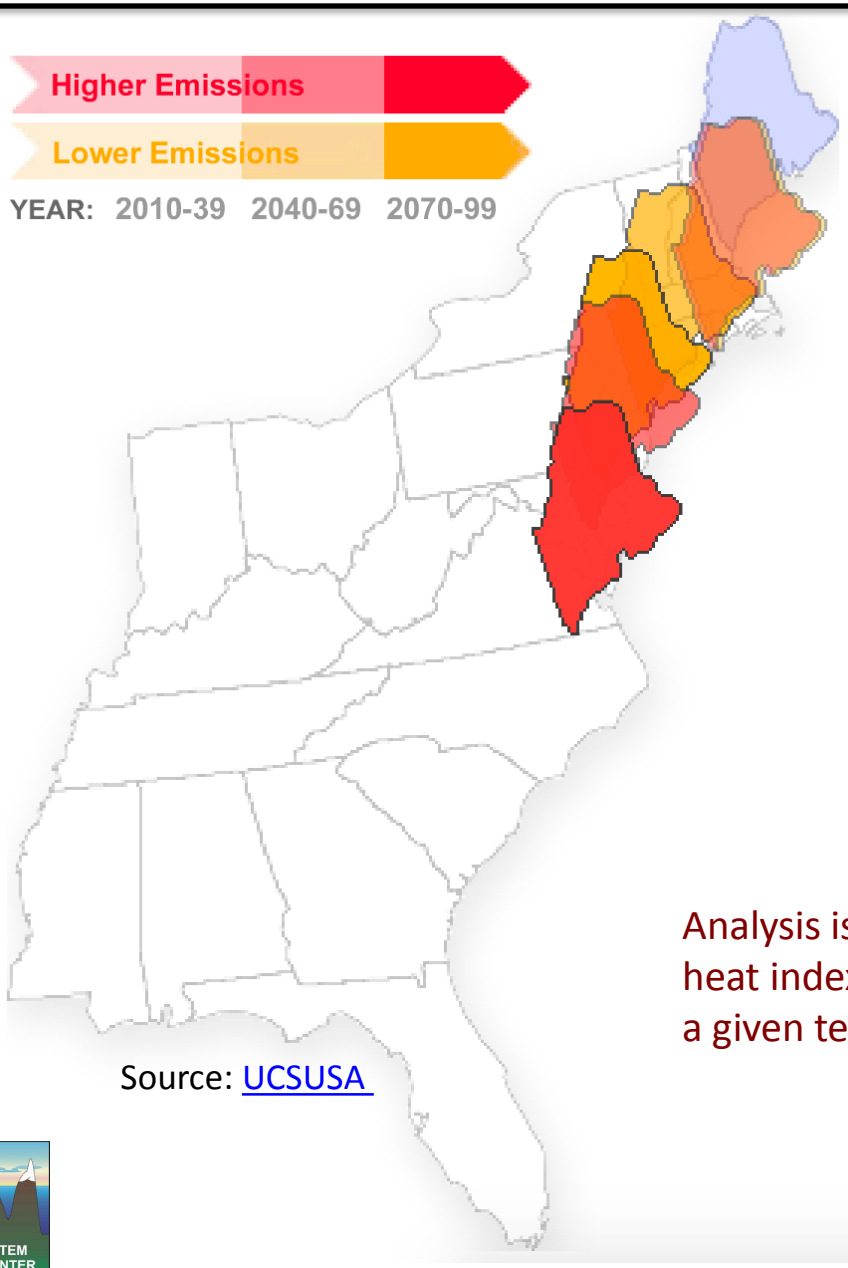
Migrating Maine Climate



Source: UCSUSA

PROJECTIONS

Summer in Maine by the end of this century could feel like a present-day typical summer in Maryland

Consequences:

Negative impacts on human health, ecosystems, and the economy.

Analysis is based on changes in average summer heat index (a measure of how it actually feels for a given temperature and humidity).

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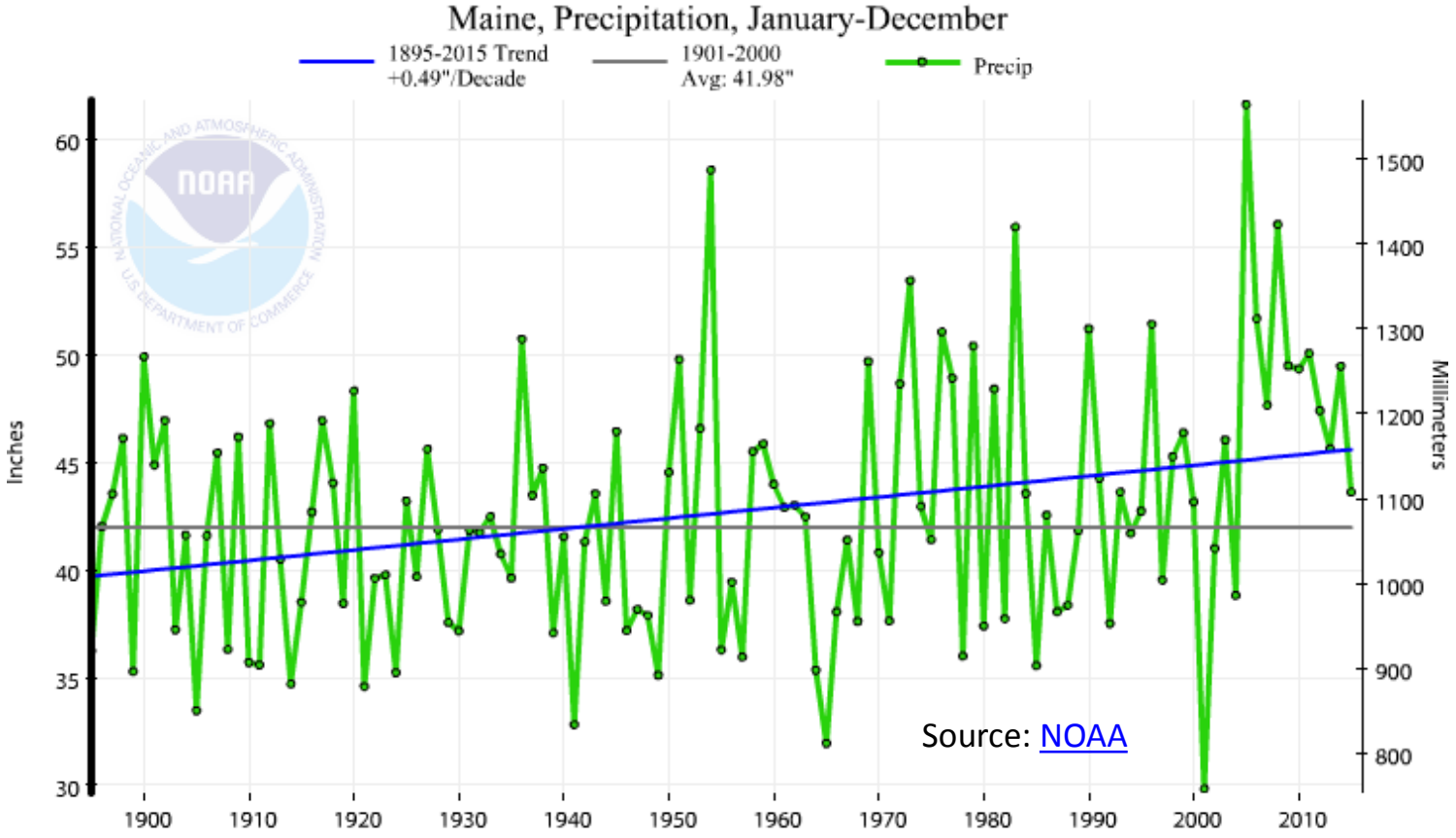
Rain and Snow in Maine

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



Every year for the last 10 years, Maine has received more precipitation than the 20th century average.

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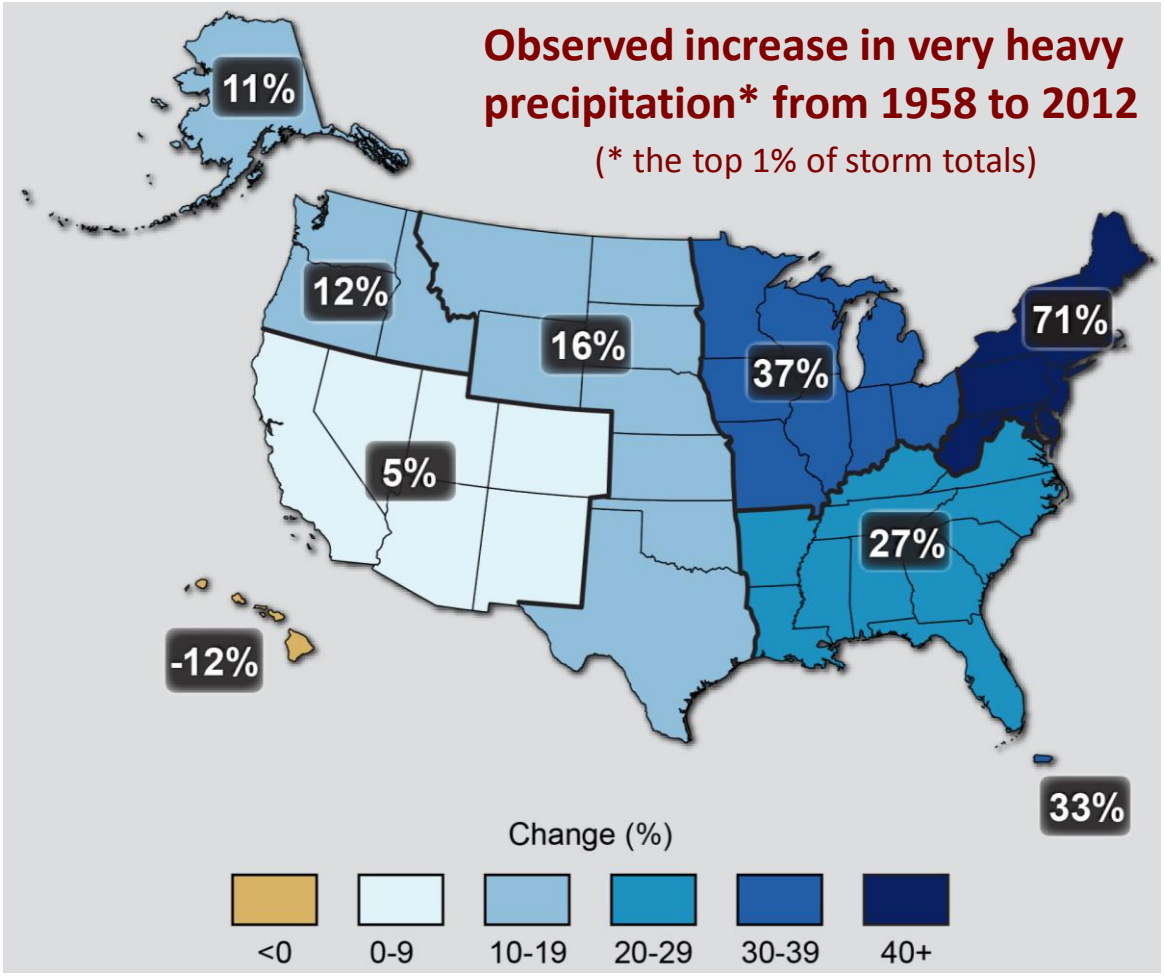
Very Heavy Rainfall

OBSERVATIONS

The amount of precipitation falling during intense multi-day events has increased significantly in the Northeast US.



Source: NCA 2014

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Destructive flooding

Flash flooding in Brownville, ME after area is hit with powerful storms, 2012

Streets flooded after record rain in Portland, ME, 2015

St. John River floods in Fort Kent, ME, 2008

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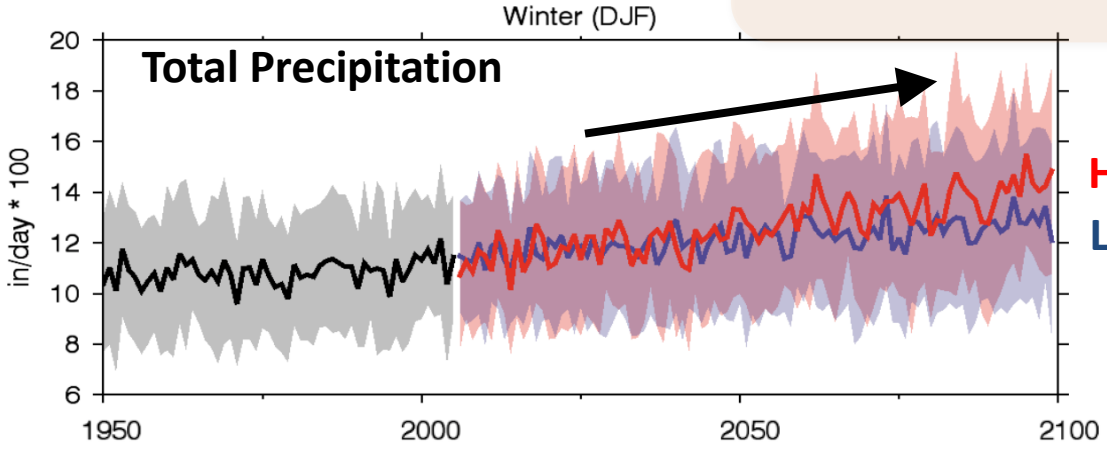
Rain and Snow in Maine

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

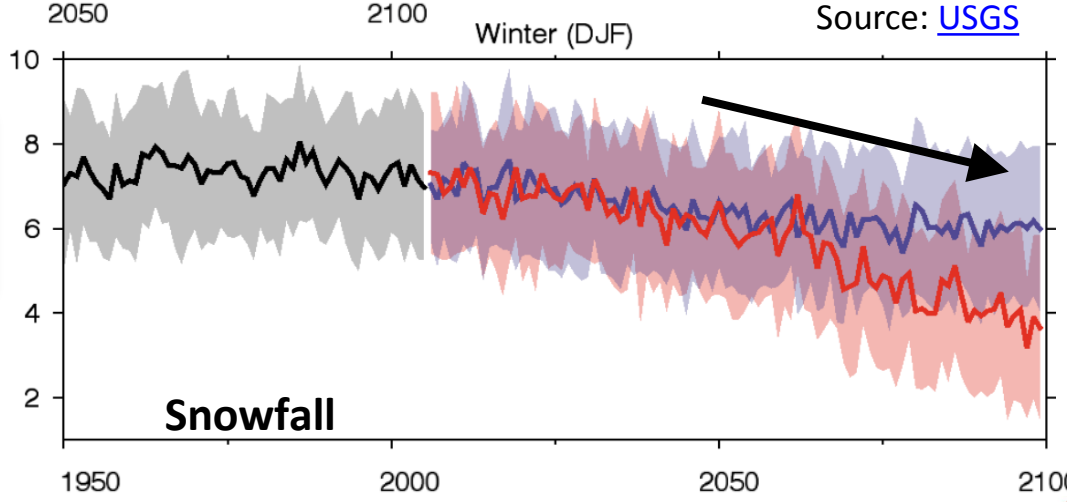


Higher Emissions

Lower Emissions

Source: USGS

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



Projected changes in rainfall in summer are uncertain.

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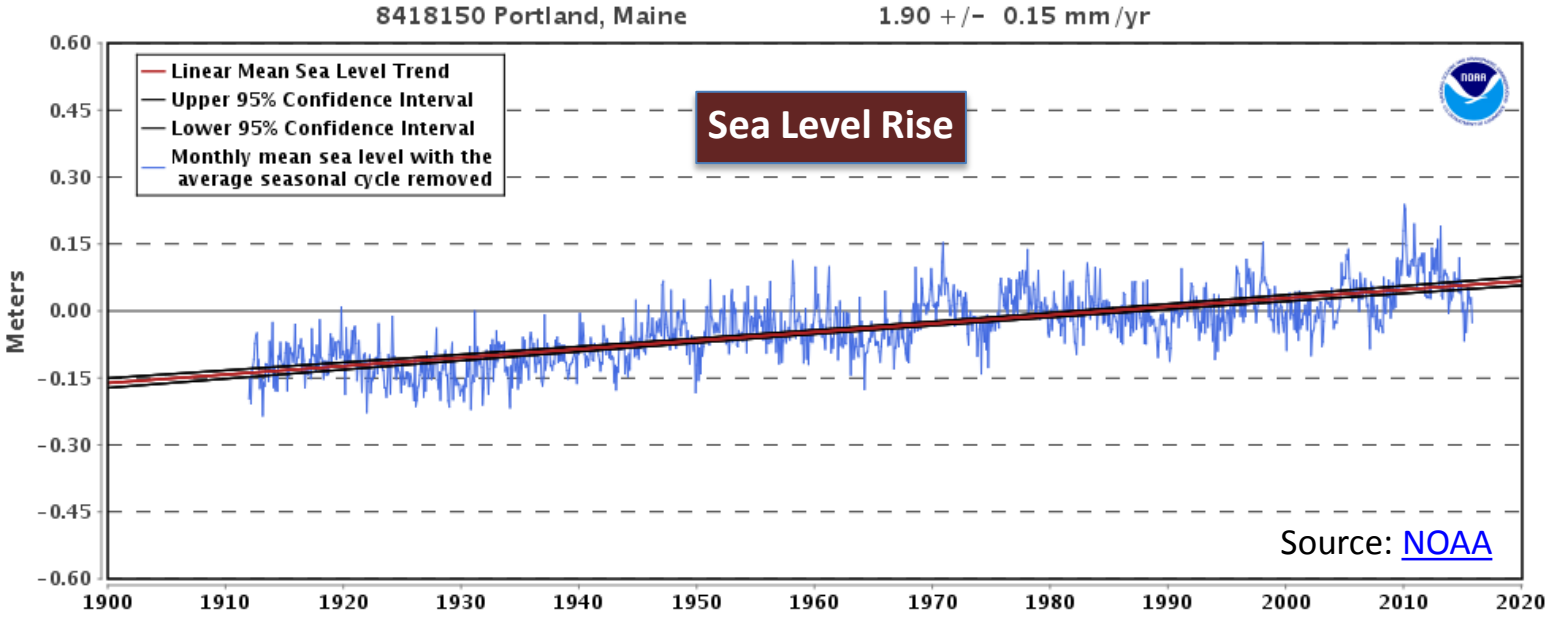
Sea Level Rise

OBSERVATIONS Over the last century, sea level has risen by about 0.6 feet around Portland, ME.



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

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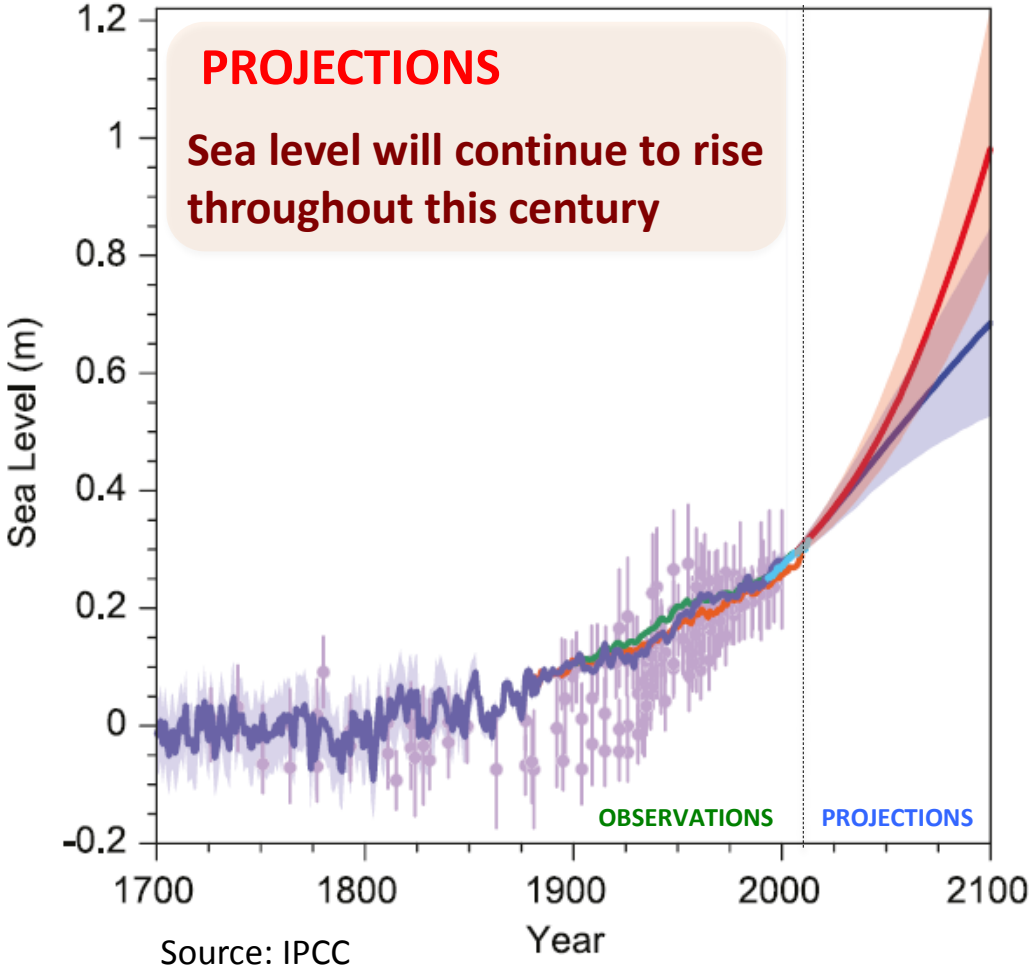
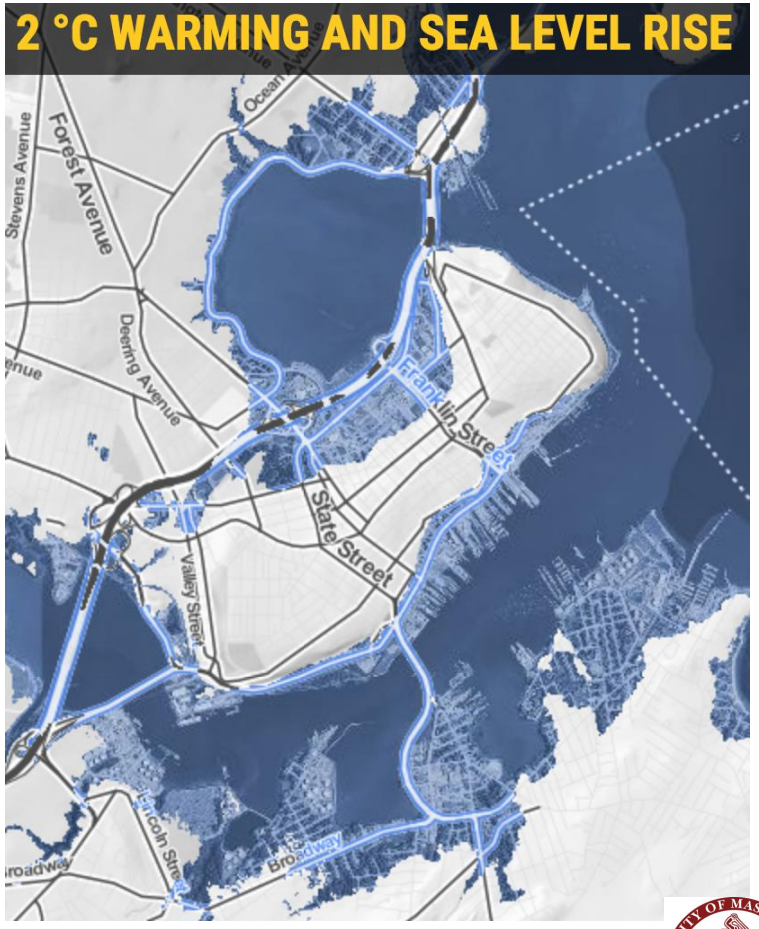
Sea Level Rise



Source: IPCC

Recent studies indicate that we are likely to experience more than 1m (3.3ft) of sea level rise by 2100

Projected inundation around Portland



Source: Climate Central

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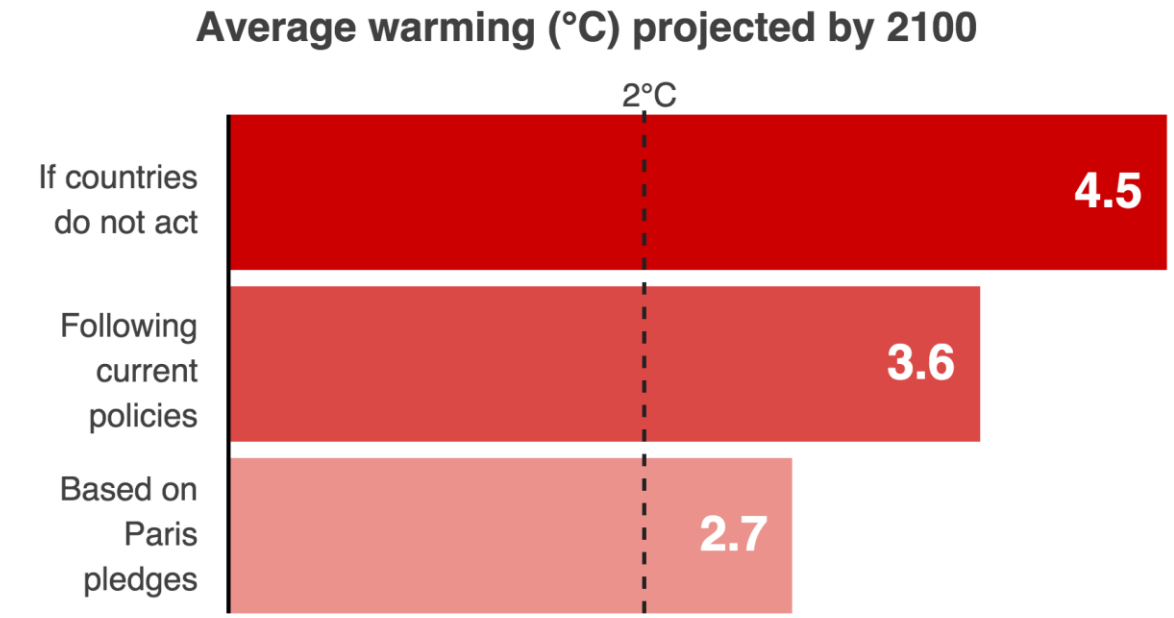
Climate Summit in Paris [COP21]

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



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

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Strategies and Actions

National Climate Assessment:

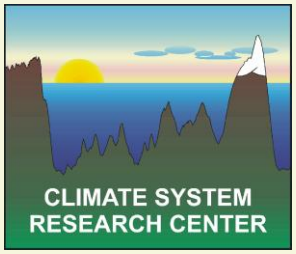
The National Climate Assessment summarizes the impacts of climate change in the US, now and in the future.

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.

Climate and Health Assessment:

This scientific assessment examines how climate change is already affecting human health in the US and the changes that may occur in the future.



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