



Regional Highlights from *Global Climate Change Impacts in the United States*

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Northwest

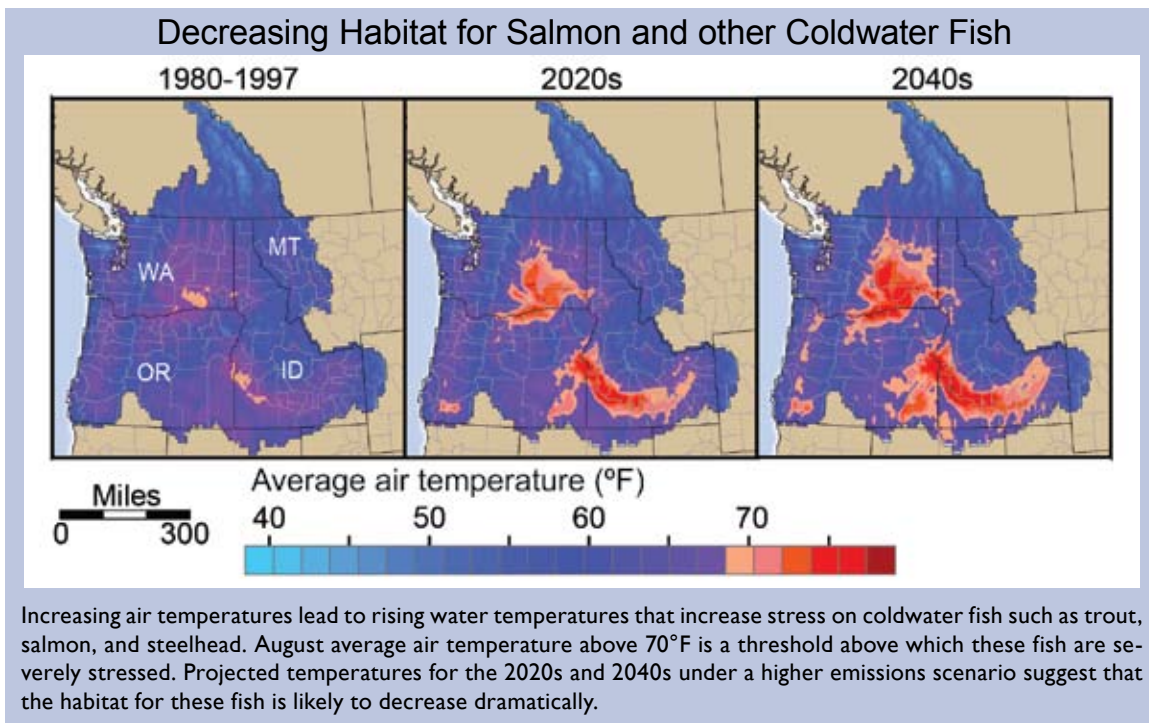
Annual average temperature over the Northwest region as a whole rose about 1.5°F over the past century, with some areas experiencing increases up to 4°F.

The region's average temperature is projected to rise another 3 to 10°F in this century, with higher emissions scenarios resulting in warming in the upper end of this range. Increases in winter precipitation and decreases in summer precipitation are projected by many climate models, though these projections are less certain than those for temperature. Impacts related to changes in snowpack, streamflows, sea level, forests, and other important aspects of life in the Northwest are already underway, with more severe impacts expected over the coming decades in response to continued and more rapid warming.

Key Issues

Salmon and other coldwater species will experience additional stresses as a result of rising water temperatures and declining summer streamflows.

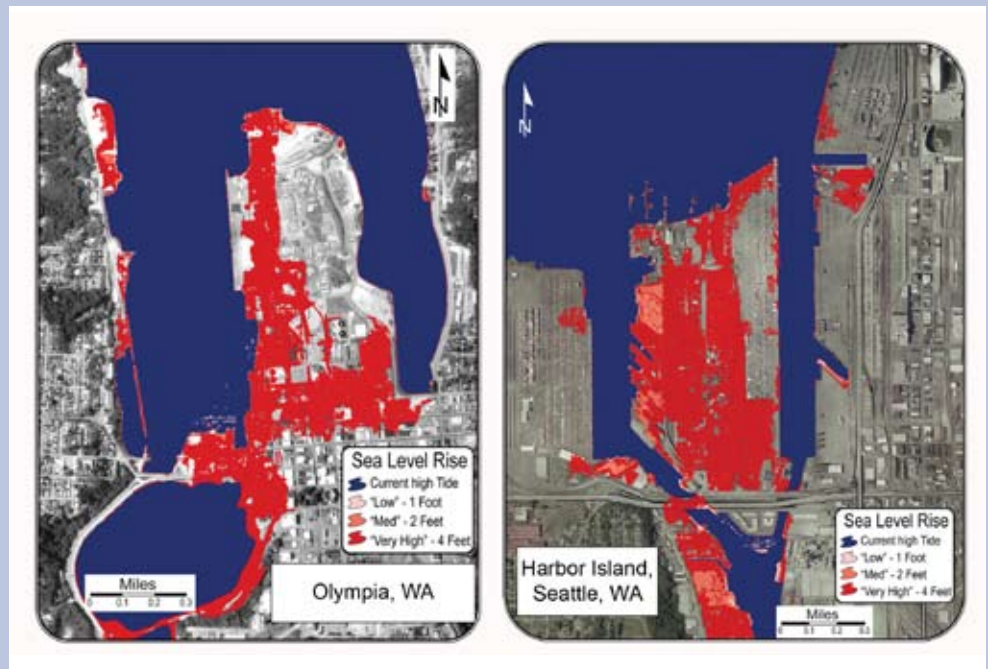
Northwest salmon populations are already at historically low levels due to variety of human-induced stresses. Climate change affects salmon throughout their life stages and poses an additional stress. Studies suggest that about a third of the current habitat for the Northwest's salmon and other coldwater fish will no longer be suitable for them by the end of this century due to climate change.



Sea-level rise along vulnerable coastlines will result in increased erosion and the loss of land.

Climate change is expected to exacerbate many of the stresses and hazards currently facing the coastal zone. Sea-level rise will increase erosion of the coast and cause the loss of beaches and significant coastal land areas. Among the most vulnerable parts of the coast is the heavily populated south Puget Sounds region, which includes the cities of Olympia, Tacoma, and Seattle, Washington.

Northwest Cities at Risk to Sea-Level Rise



Highly populated coastal areas throughout Puget Sound, Washington, are vulnerable to sea-level rise. The maps show regions of Olympia and Harbor Island (both located in Puget Sound) that are likely to be lost to sea-level rise by the end of this century based on moderate and high estimates.

Declining springtime snowpack leads to reduced summer streamflows, straining water supplies.

The Northwest is highly dependent on temperature-sensitive springtime snowpack to meet growing and often competing water demands such as municipal and industrial uses, agricultural irrigation, hydropower production, navigation, recreation, and in-stream flows that protect aquatic ecosystems including threatened and endangered species. Higher temperatures are causing more winter precipitation to fall as rain rather than snow and are contributing to earlier snowmelt. Further declines in snowpack are projected, reducing the amount of water available during the warm season.

Increased insect outbreaks, wildfires, and changing species composition in forests will pose challenges for ecosystems and the forest products industry.

Higher summer temperatures and earlier spring snowmelt are expected to increase the risk of forest fires by increasing summer moisture deficits; this pattern has already been observed in recent decades. Drought stress and higher temperatures will decrease tree growth in most low- and mid-elevation forests and will also increase the frequency and intensity of mountain pine beetle and other insect attacks, further increasing fire risk and reducing timber production, an important part of the regional economy.

The full report, including references for the material above, can be found online at:
www.globalchange.gov/usimpacts

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