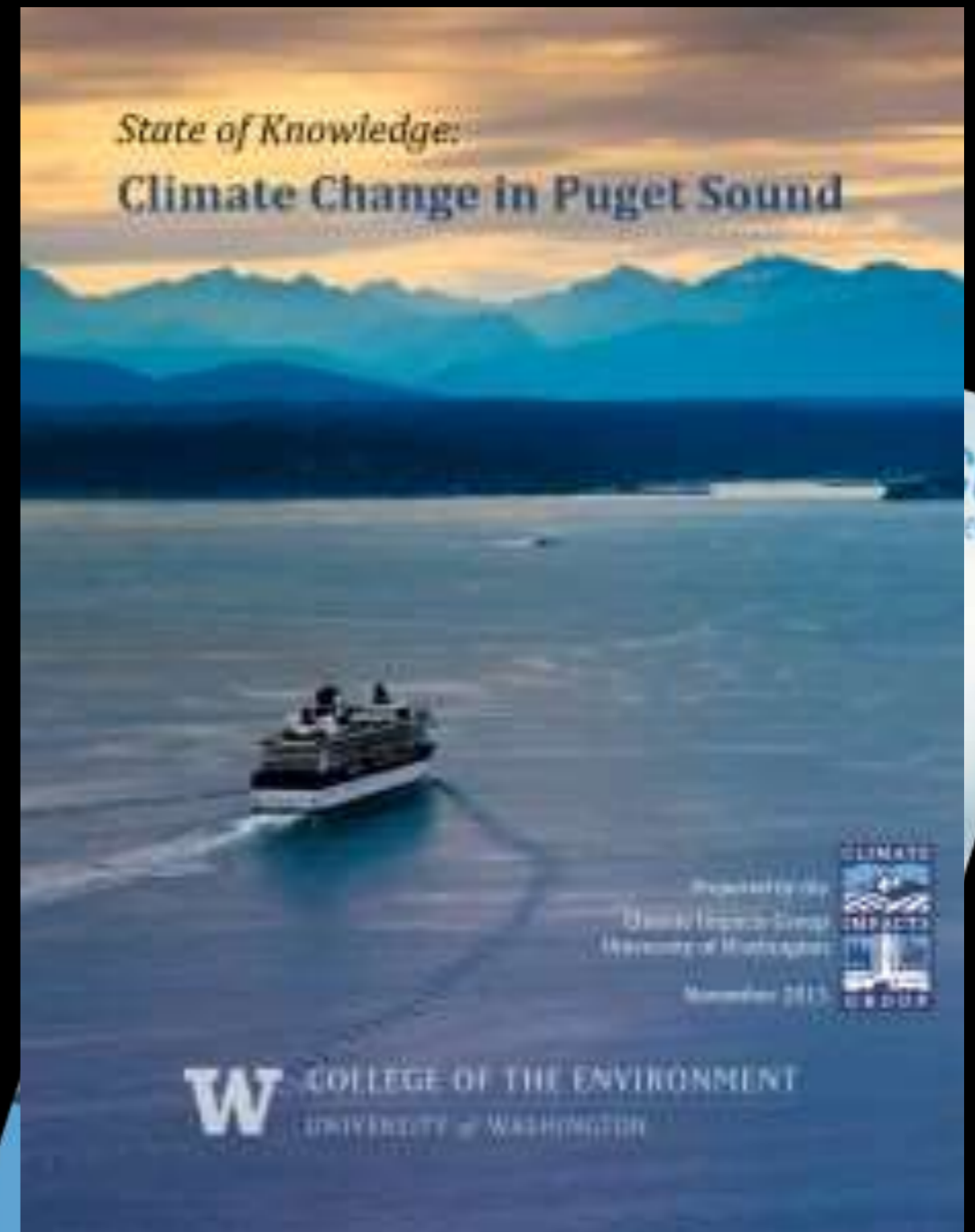
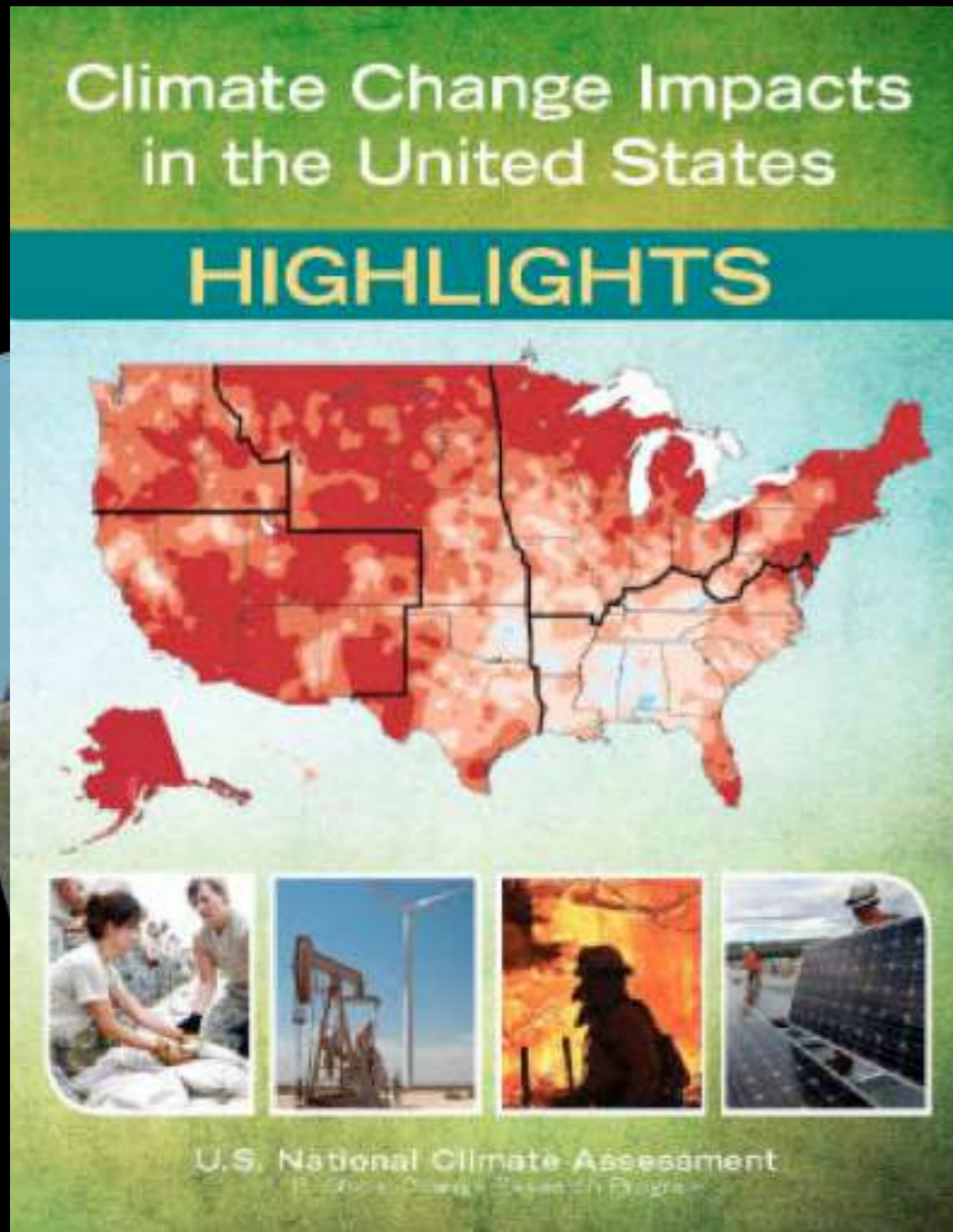


Climate change – what environmental changes can we expect to see in Washington?



Recent Reports Affecting the Discussion



Governor Inslee's Executive Order

Carbon Emissions Reduction Taskforce

Convene a taskforce to make recommendations for a carbon emissions reduction program for consideration during 2015 legislative session.



Coal-Fired Electricity Transition

Work with private utilities and federal agencies to facilitate the transition from coal to cleaner electricity sources.



Governor Inslee's Climate Executive Order

"This is the right time to act. This is the right place. And we are the right people to make this happen."

— Gov. Inslee, April 29, 2014



Energy Efficiency

Focus on saving costs and reducing emissions from buildings by improving their efficiency and taking advantage of clean power.



Clean Technology

Develop a new state program to support renewable energy and energy efficiency technology innovation in the public and private sectors.

Clean Transportation

Decide how to accelerate our use of clean cars and clean fuels, and reduce transportation emissions.



#ActOnClimate
bit.ly/ClimateWA

How a Changing Climate Potentially Impacts Various Sectors in Washington

Water supply: Potential summer water shortages due to reduced snowpack and timing of precipitation

Forests: A rise in forest mortality is also expected due to increasing wildfire, insect outbreaks, and diseases

Agriculture: Varying effects from warming temperatures, increasing water stress, declining availability of irrigation water, and changing pressures from pests, weeds, and pathogens

Coastal Flooding: Sea level estimated to rise 6" to +50" by 2100 for Puget Sound

Infrastructure (roads, telecomm, electrical, etc.): Impacts that can increase risks to infrastructure include projections for more frequent or more severe flooding, extreme heat, extreme precipitation, storm surge, salt water intrusion, mudslides, erosion, wildfire, and inundation of low-lying areas.

(From CIG report)

How will climate change affect our water supply?

- decreases in mountain snowpack
- shifts in stream flow

results in ...

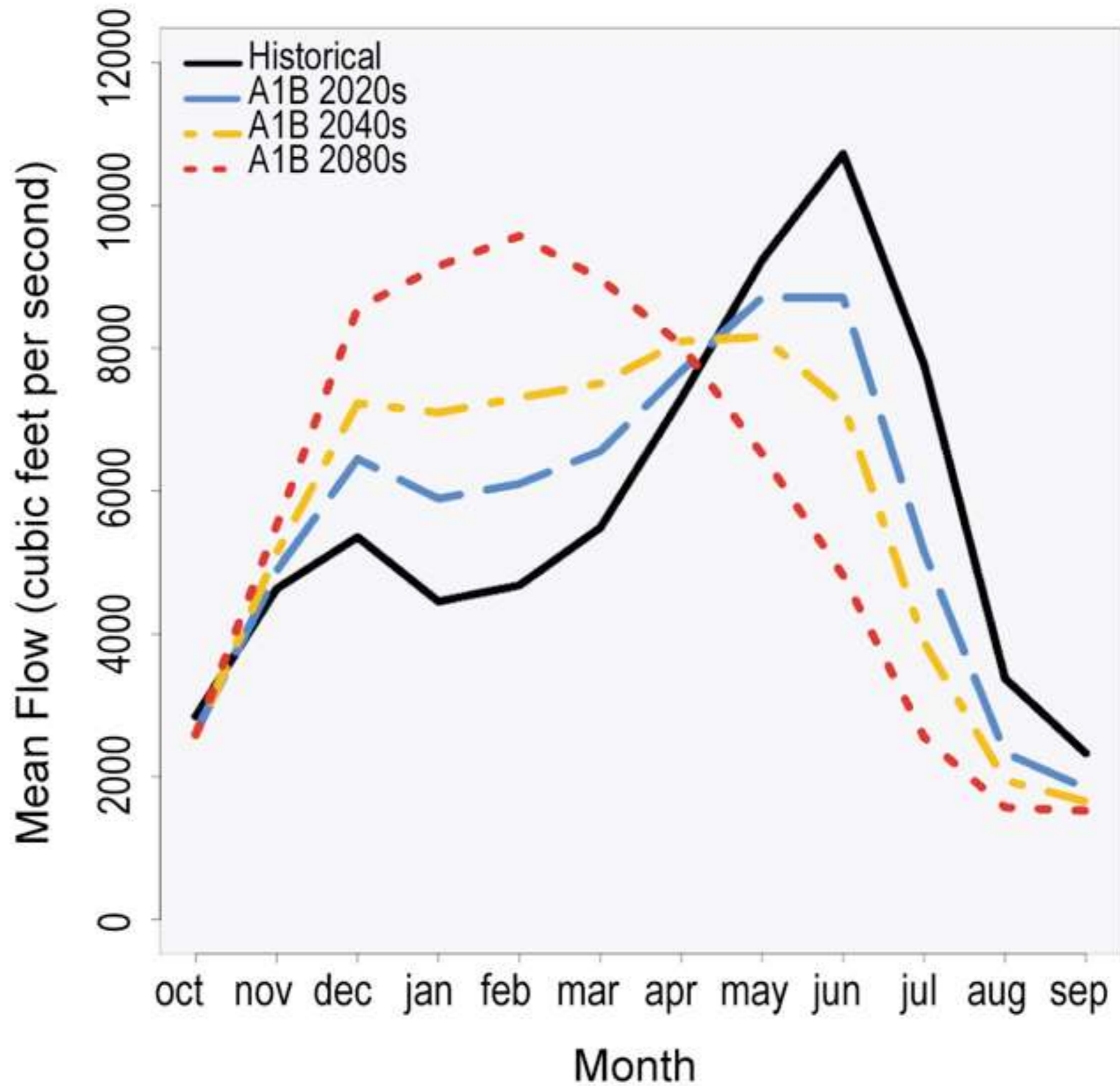
heavier stream flows
in winter and spring



decreased available water
in the summer



Future Shift in Timing of Stream Flows

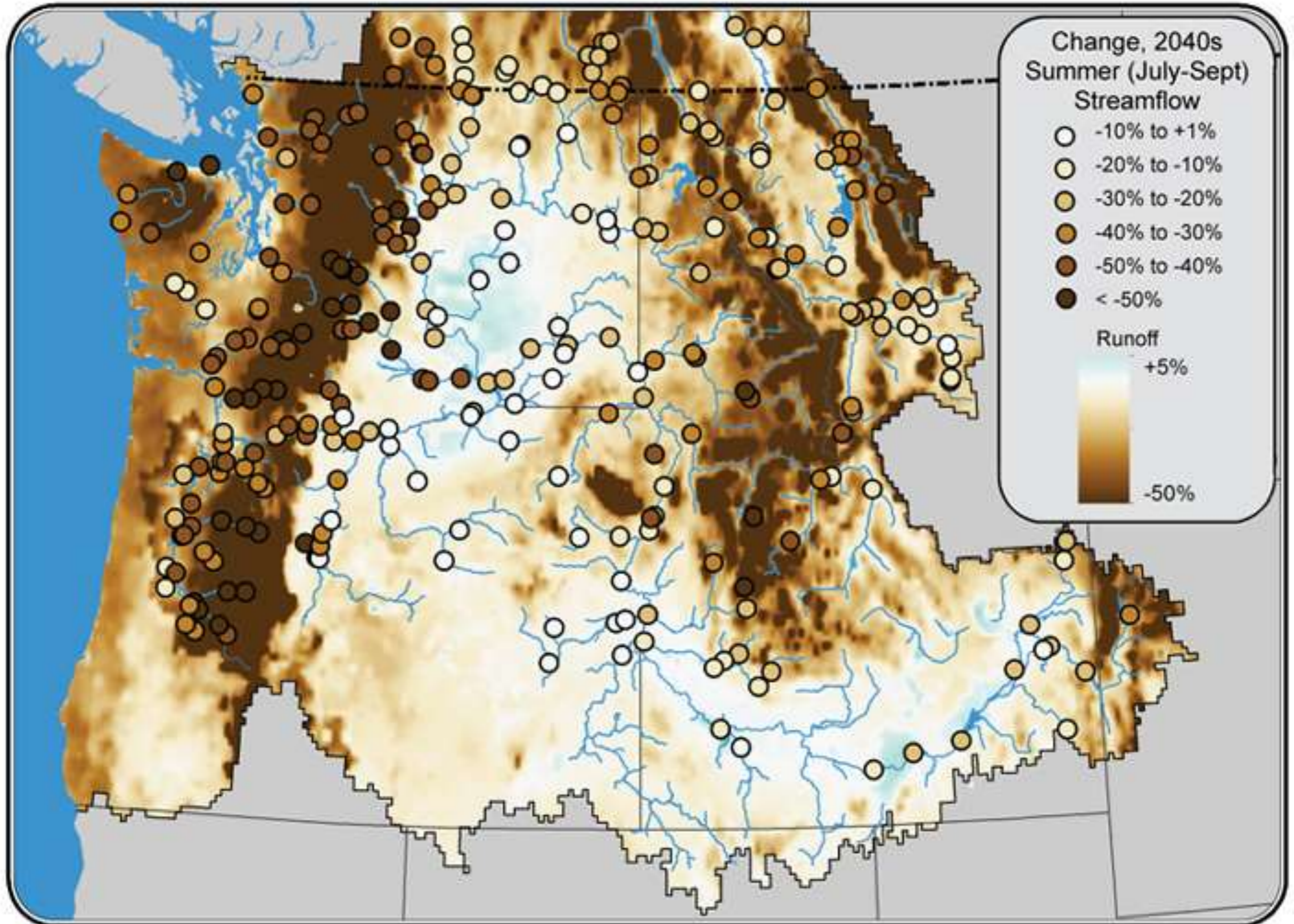


Additional impacts:

- **population** has **increased** in the NW
- **snowpack** has **decreased** by 30%
- the NW produces 40% of the hydropower in the U.S.

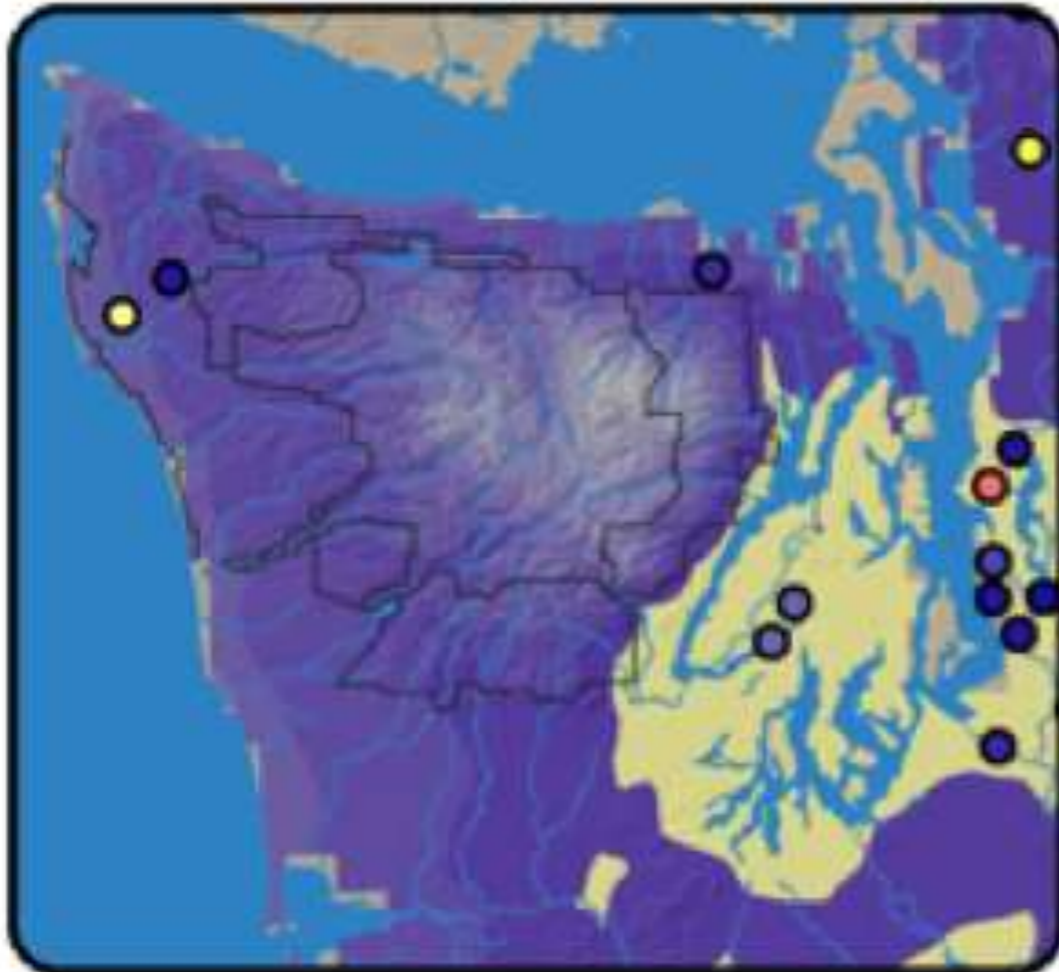


Reduced Summer Flows

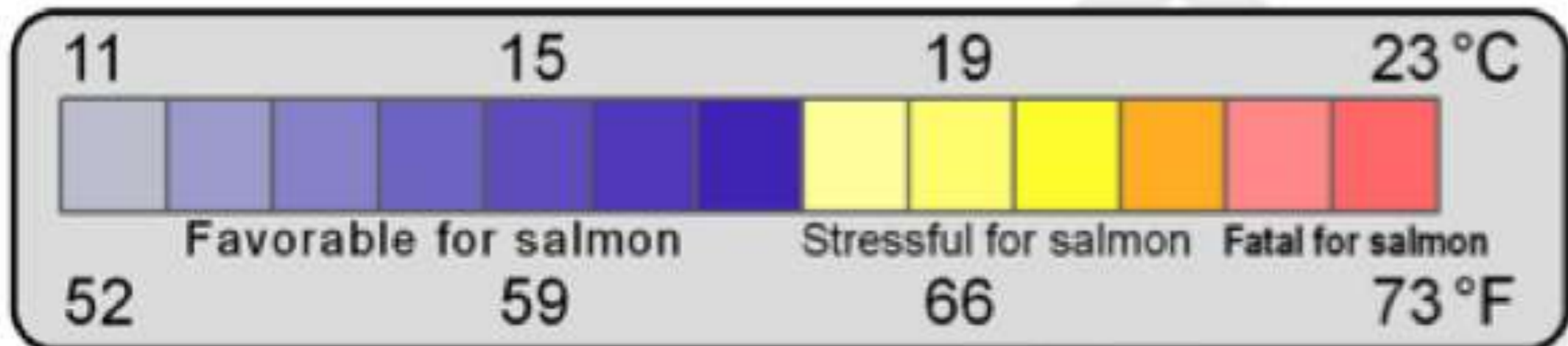
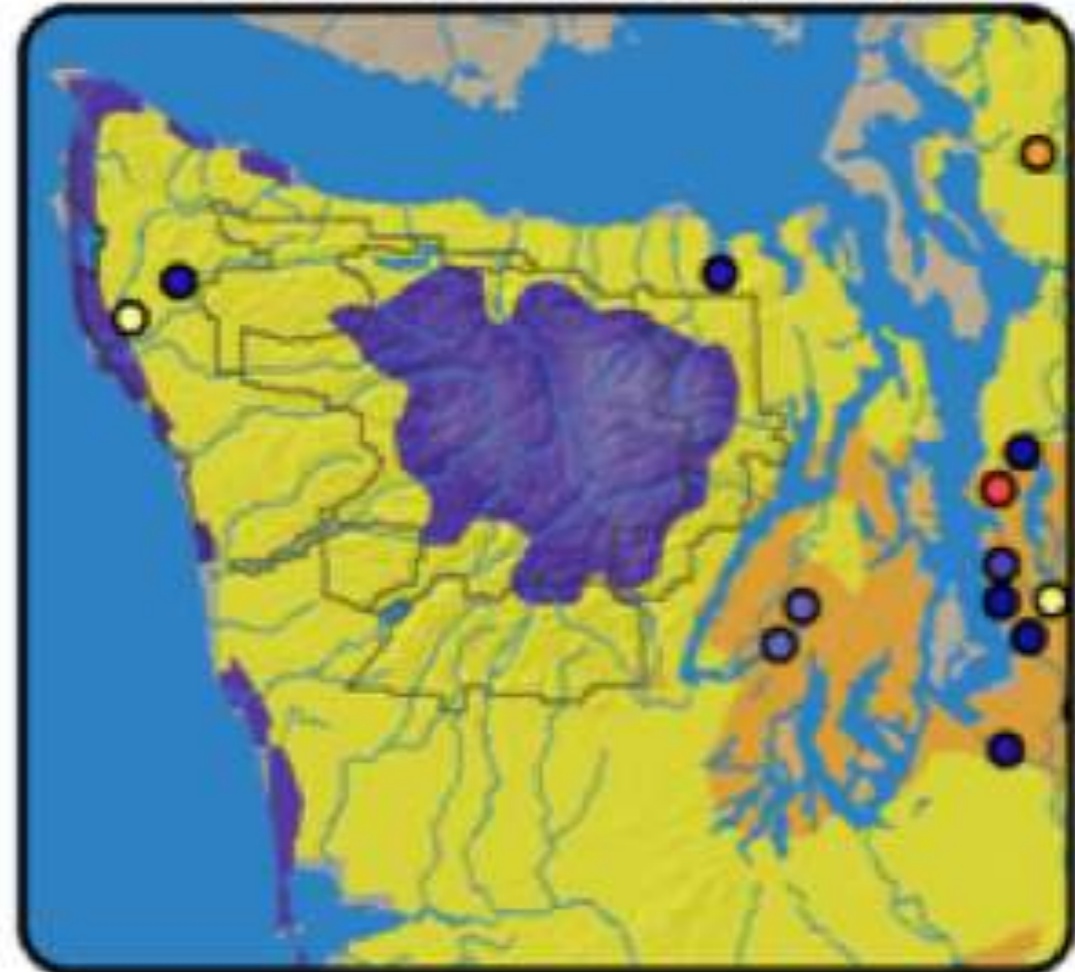


Water temperatures and salmon

Historical (1970-1999)



2040s medium (A1B)

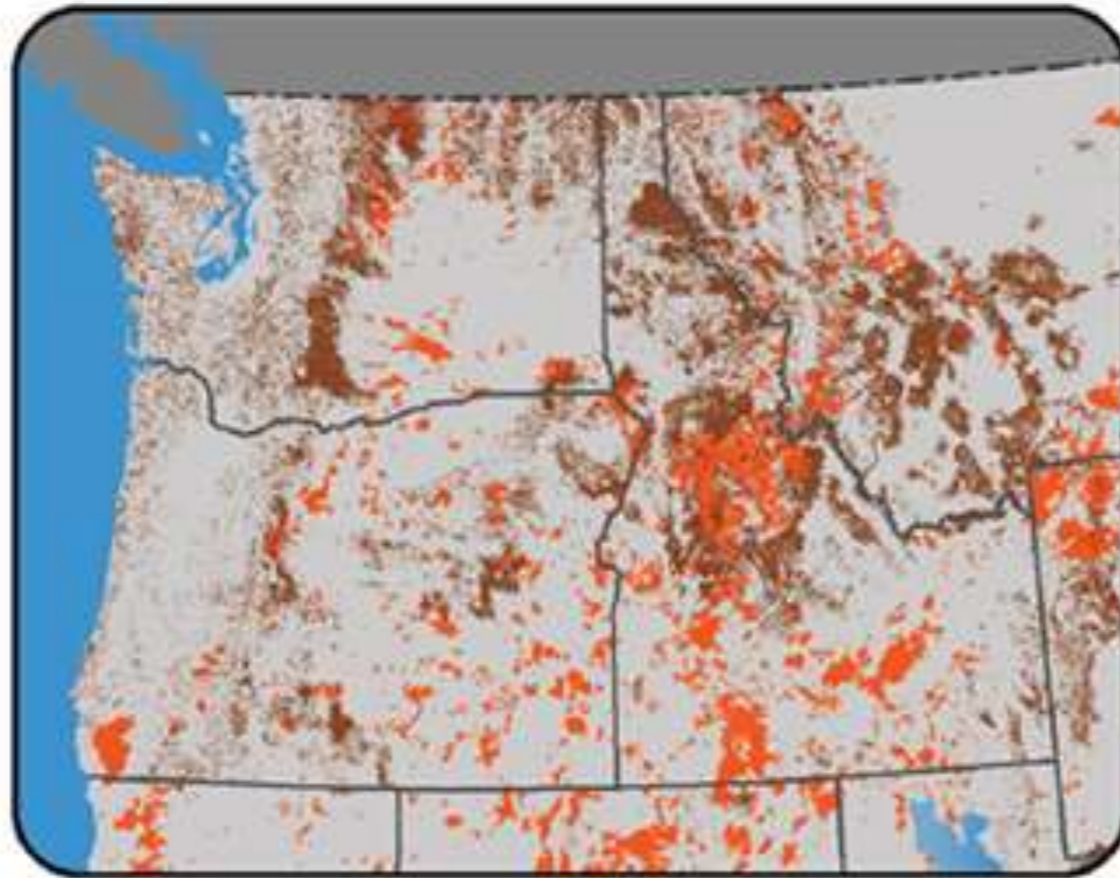


How will climate change affect our forests?





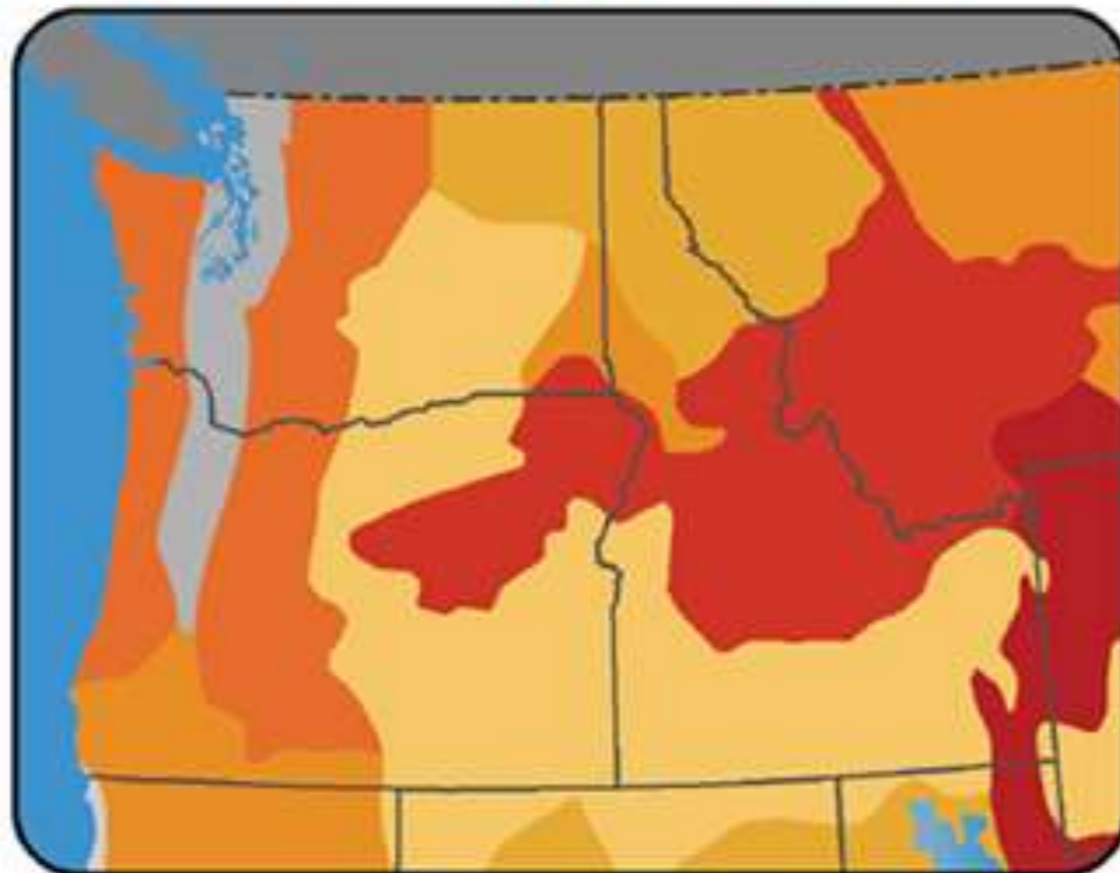
**The Carlton Complex fire in 2014
burned 400 square miles
making it the largest fire in Washington's history**

Insects and Fire in Northwest Forests



Recent Disturbance

-  Fire area
-  Insect and disease area



Projected Increase in Area Burned

-  600% to 700%
-  500% to 600%
-  400% to 500%
-  300% to 400%
-  200% to 300%
-  100% to 200%
-  Not modeled

Effects on Agriculture in Washington



Warming



Increased CO₂



Changing Precipitation



Irrigation Water Supply

Effects on Infrastructure in Washington



Severe Flooding

Effects on Infrastructure in Washington



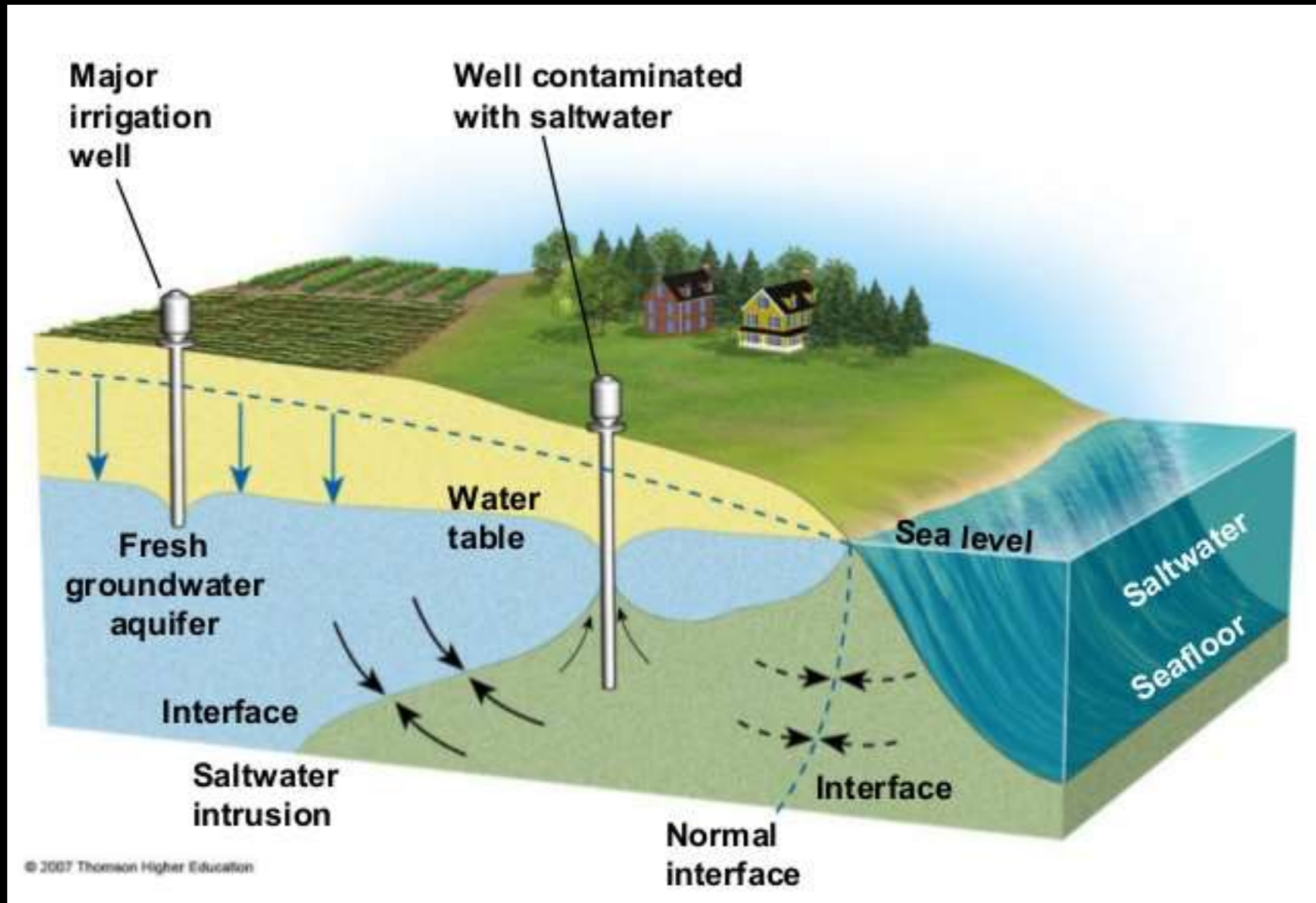
Extreme Heat

Effects on Infrastructure in Washington



Severe Storms

Effects on Infrastructure in Washington



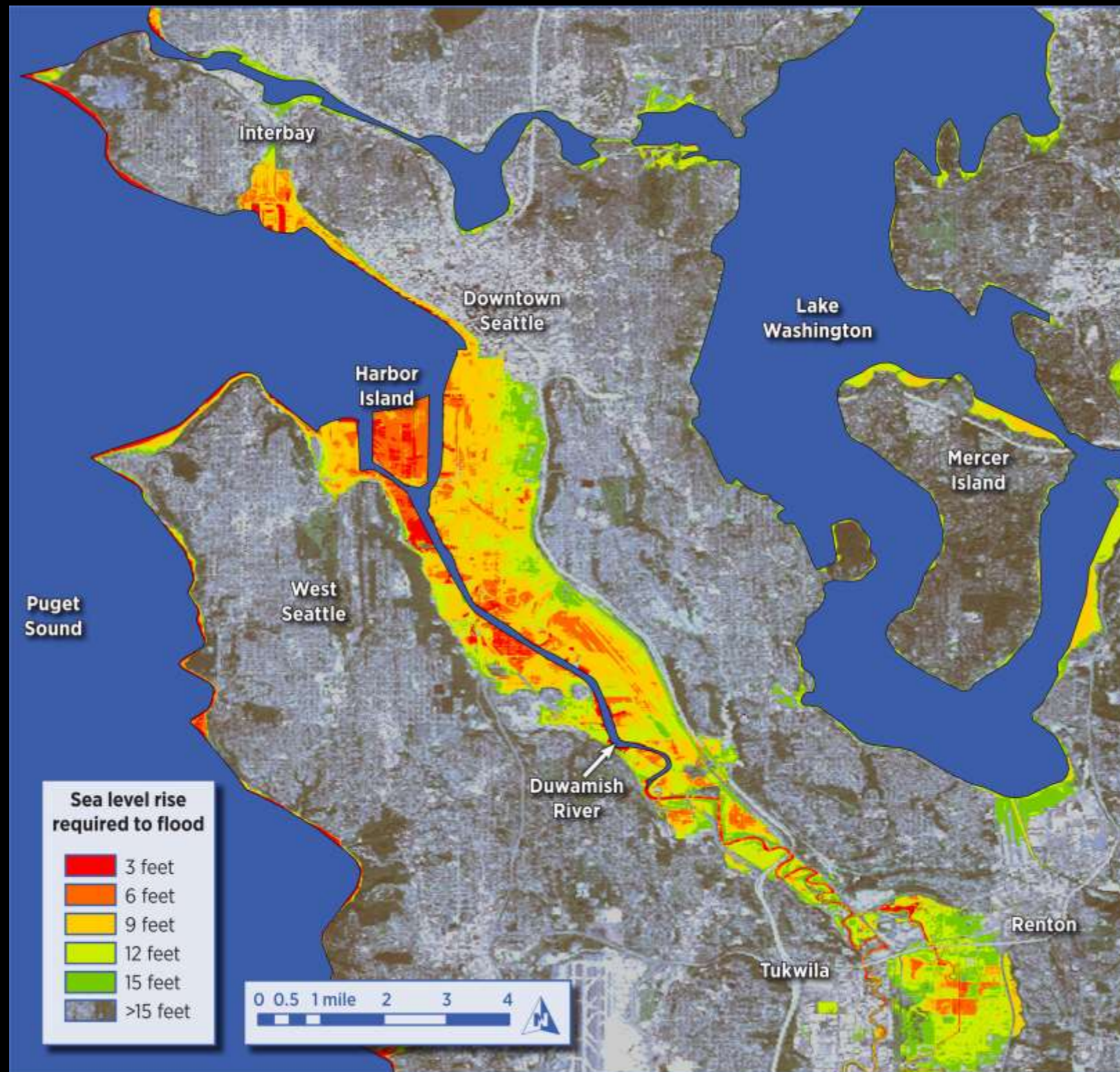
Saltwater Intrusion

Effects on Infrastructure in Washington



Mudslides and Erosion

Effects on Infrastructure in Washington



Inundation of Low-lying Areas

Sea Level Rise & Coastal Flooding



Sea Level Rise, nationwide



How will climate change affect the Salish Sea?





SALISH SEA

BRITISH COLUMBIA

STRAIT OF GEORGIA

Vancouver

STRAIT OF JUAN DE FUCA

PUGET SOUND

Seattle

WASHINGTON

Ocean Acidification





375 ppm
+1°C



450-500 ppm
+2°C



> 500 ppm
>+3°C

By the end of this century the surface waters of the ocean could be nearly 150% more acidic, resulting in a pH that the oceans haven't experienced for more than 20 million years.

pH of Water in Puget Sound

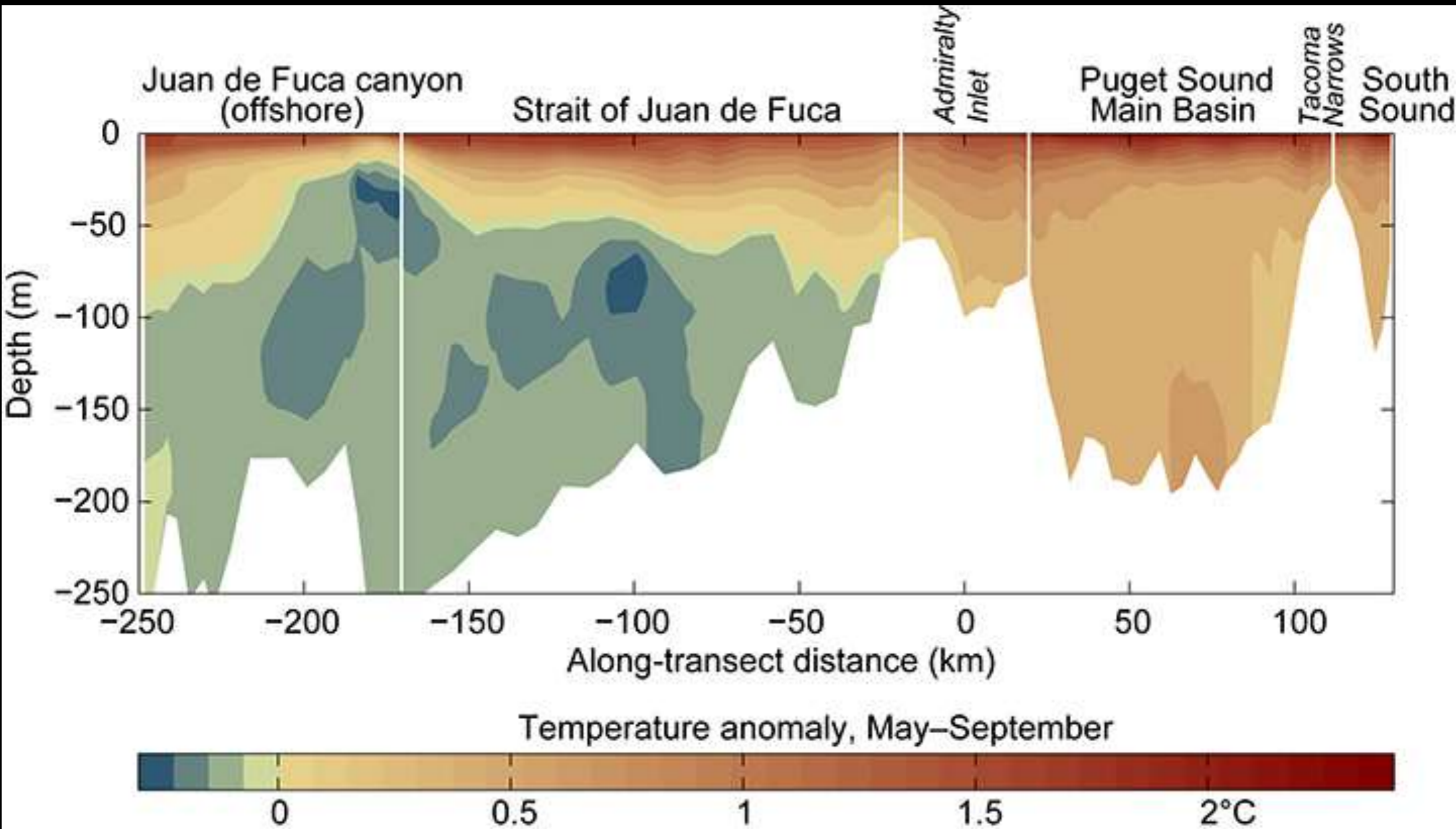


- most water in the Sound is from the *California Undercurrent*, a subsurface current that originates below a productive fishing area off the coast of Mexico and brings water that is high in nutrients and CO₂, but low in oxygen and pH, north along the coast.

Readings taken by UW researchers at the dock in Friday Harbor:

- CO₂ is 650 ppm vs. atmospheric CO₂ of 400ppm
- pH is 7.8
- worldwide average was 8.2; now has dropped to 8.1

Warming Ocean Temperatures



Harmful Algal Blooms



Warming Ocean Temperatures



Suppose you are commuting to work in your car. What are you likely to encounter?

