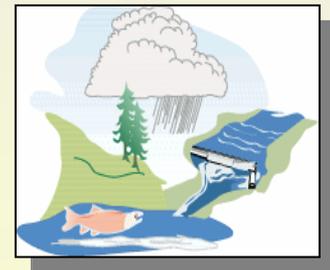


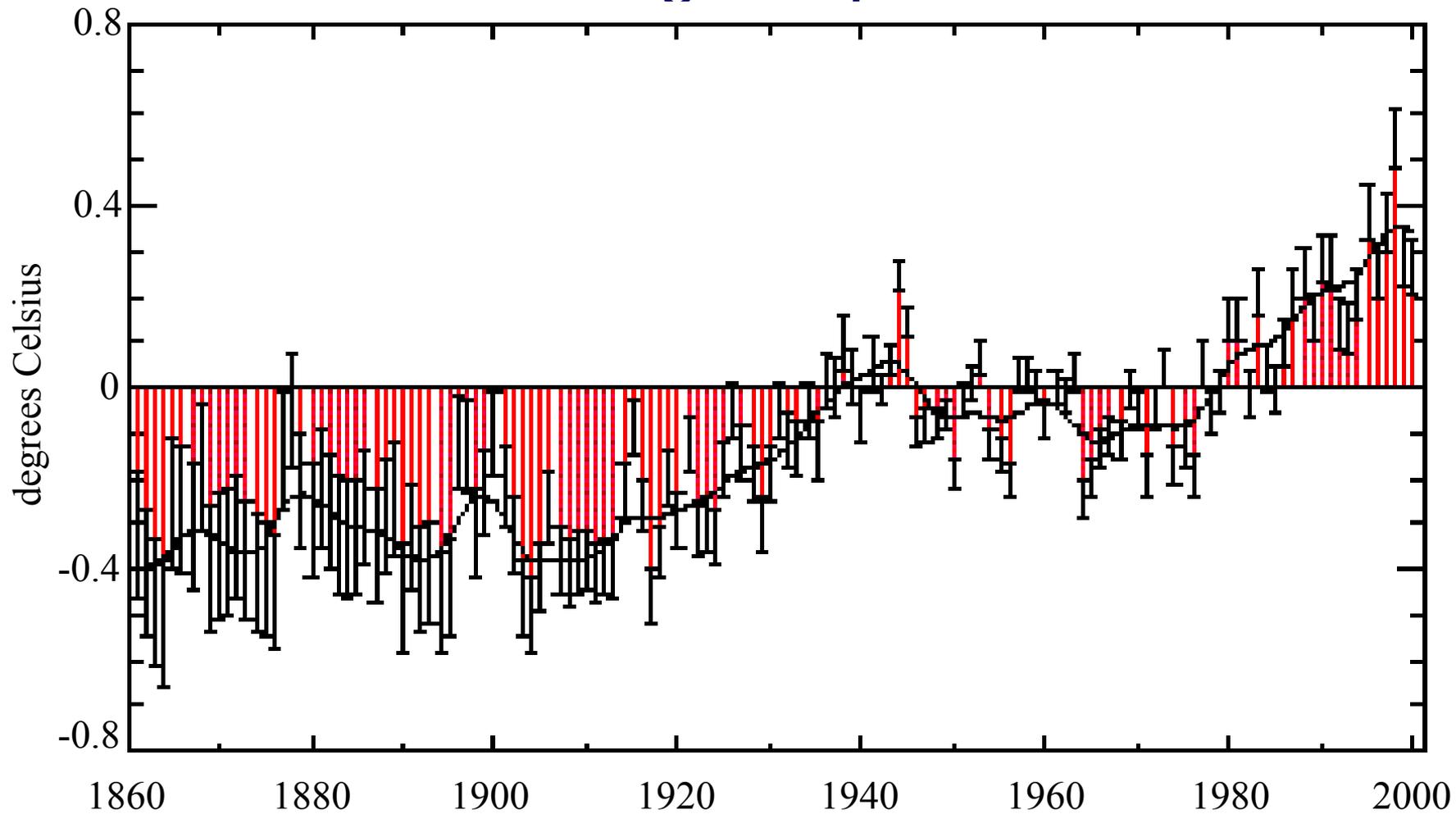
# Some Impacts of Climate Change in the Pacific Northwest

Philip Mote  
Climate Impacts Group  
University of Washington

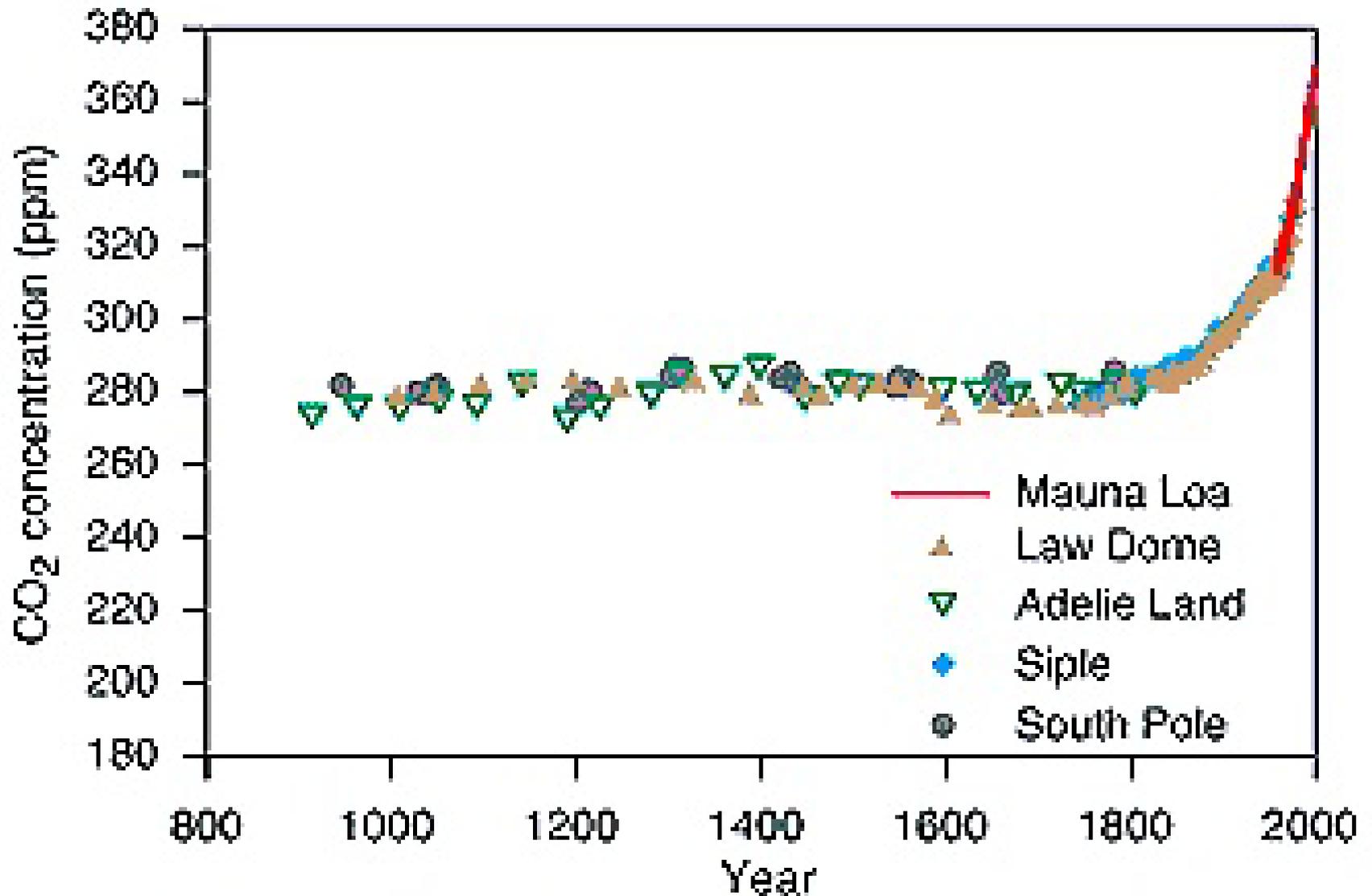


**Climate Science in the  
Public Interest**

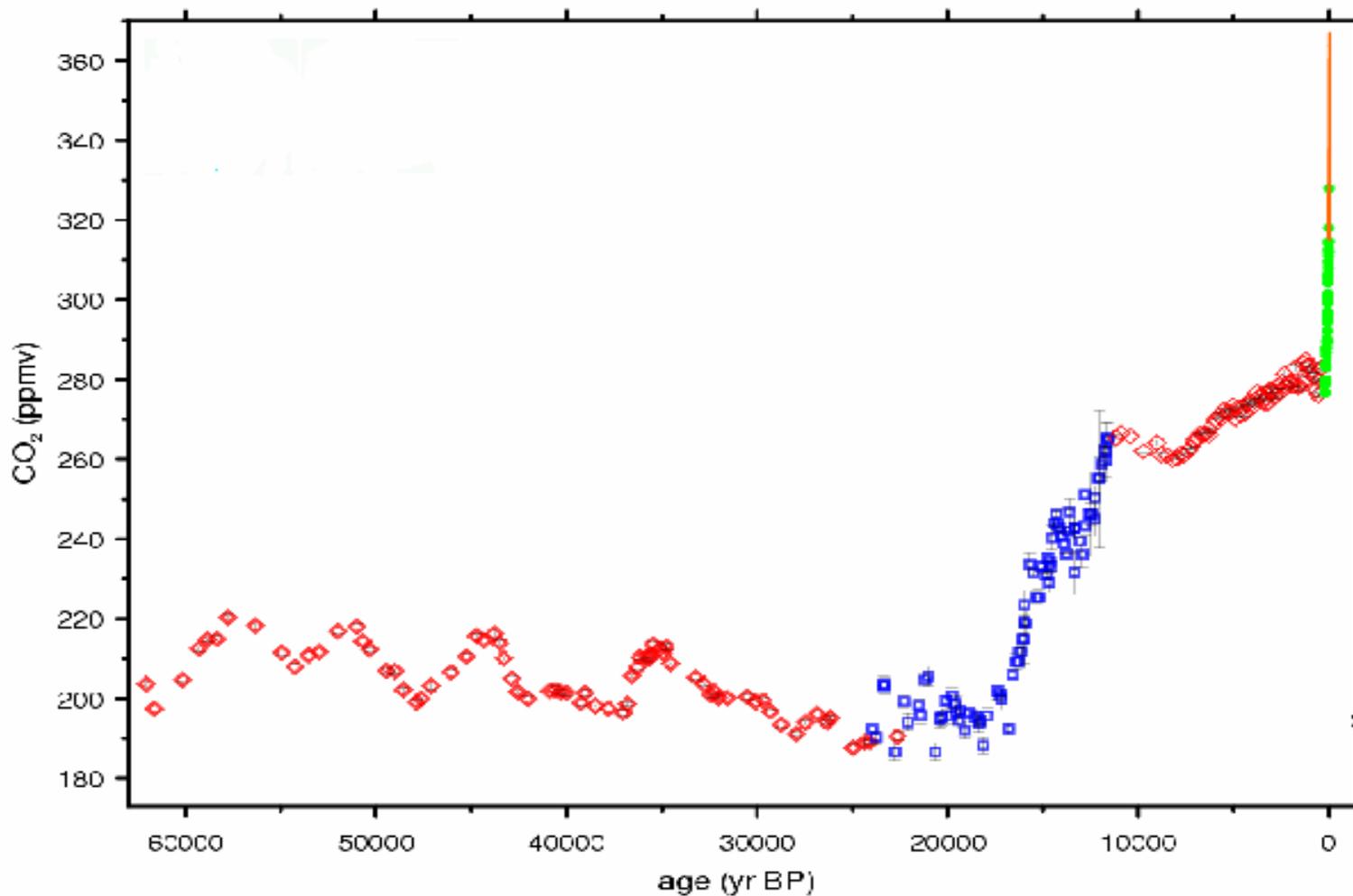
# Global average temperature



# Carbon dioxide: up 32%

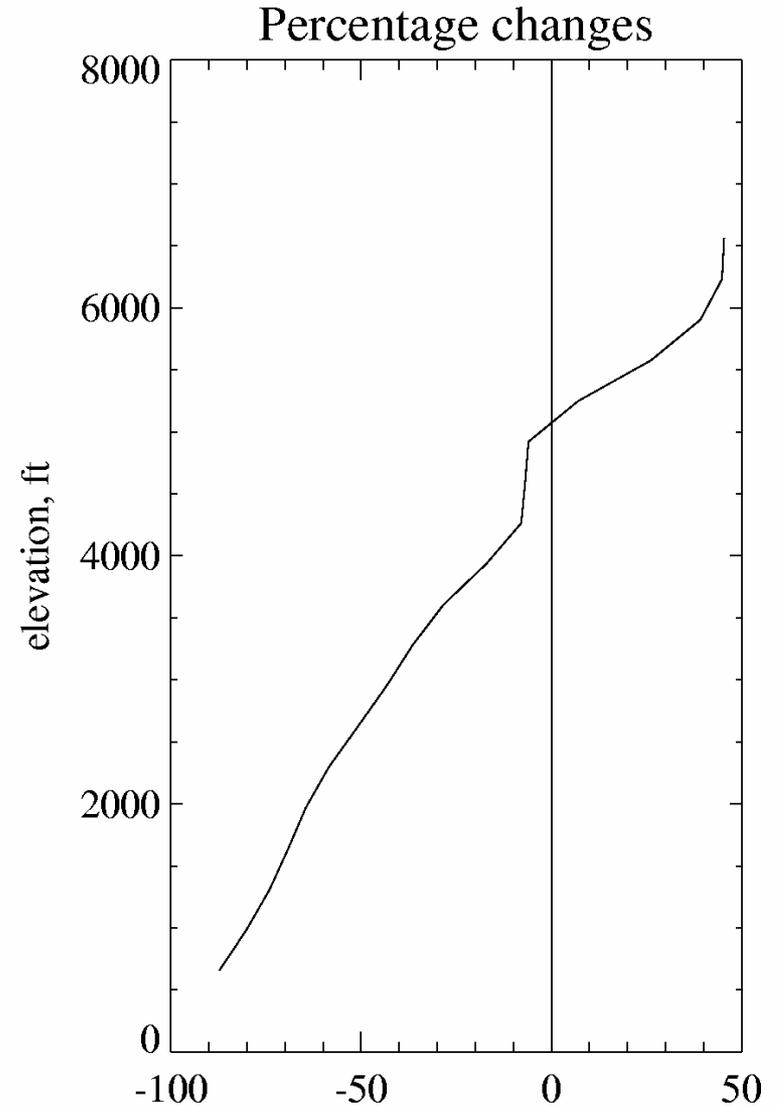
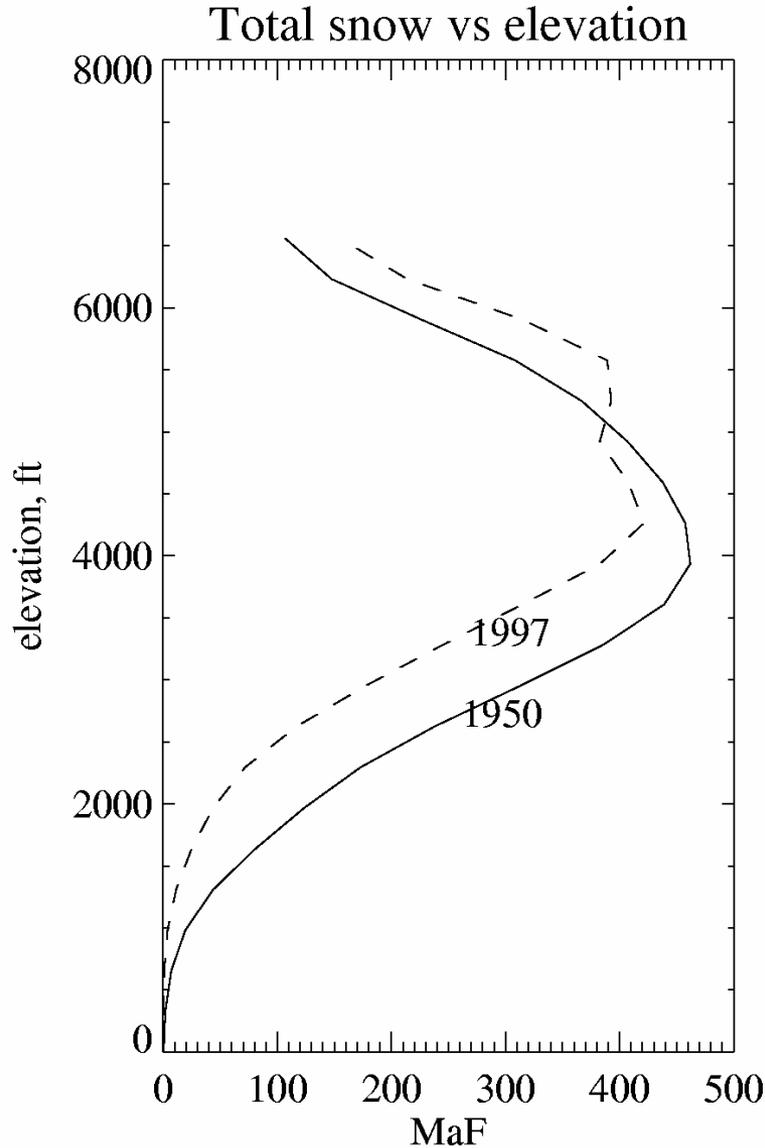


# Carbon Dioxide Levels Over The Last 60,000 Years



Source: University of Berne and National Oceanic and Atmospheric Administration

# Declining snowpack in the Cascades



From a simulation with a hydrology model

The South Cascade  
glacier retreated  
dramatically in the  
20th century



1928

Courtesy of the USGS  
glacier group



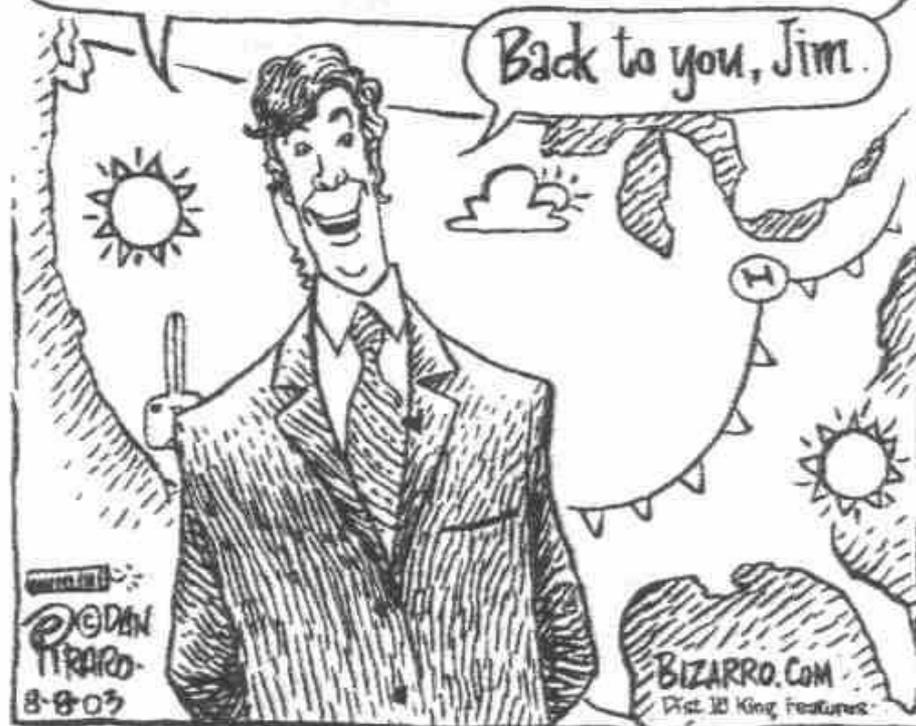
2000

USGS

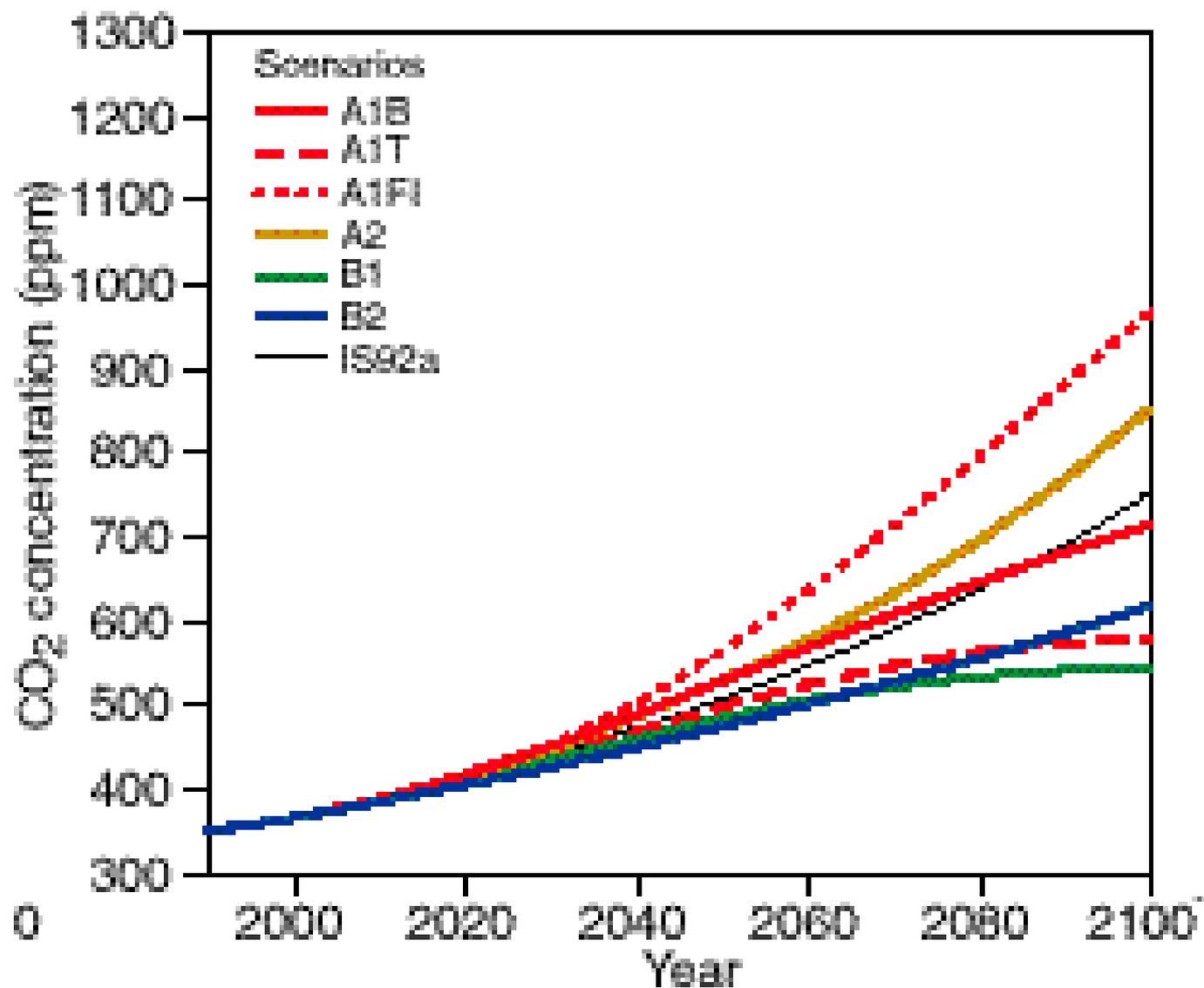
# BIZARRO

By Dan Piraro

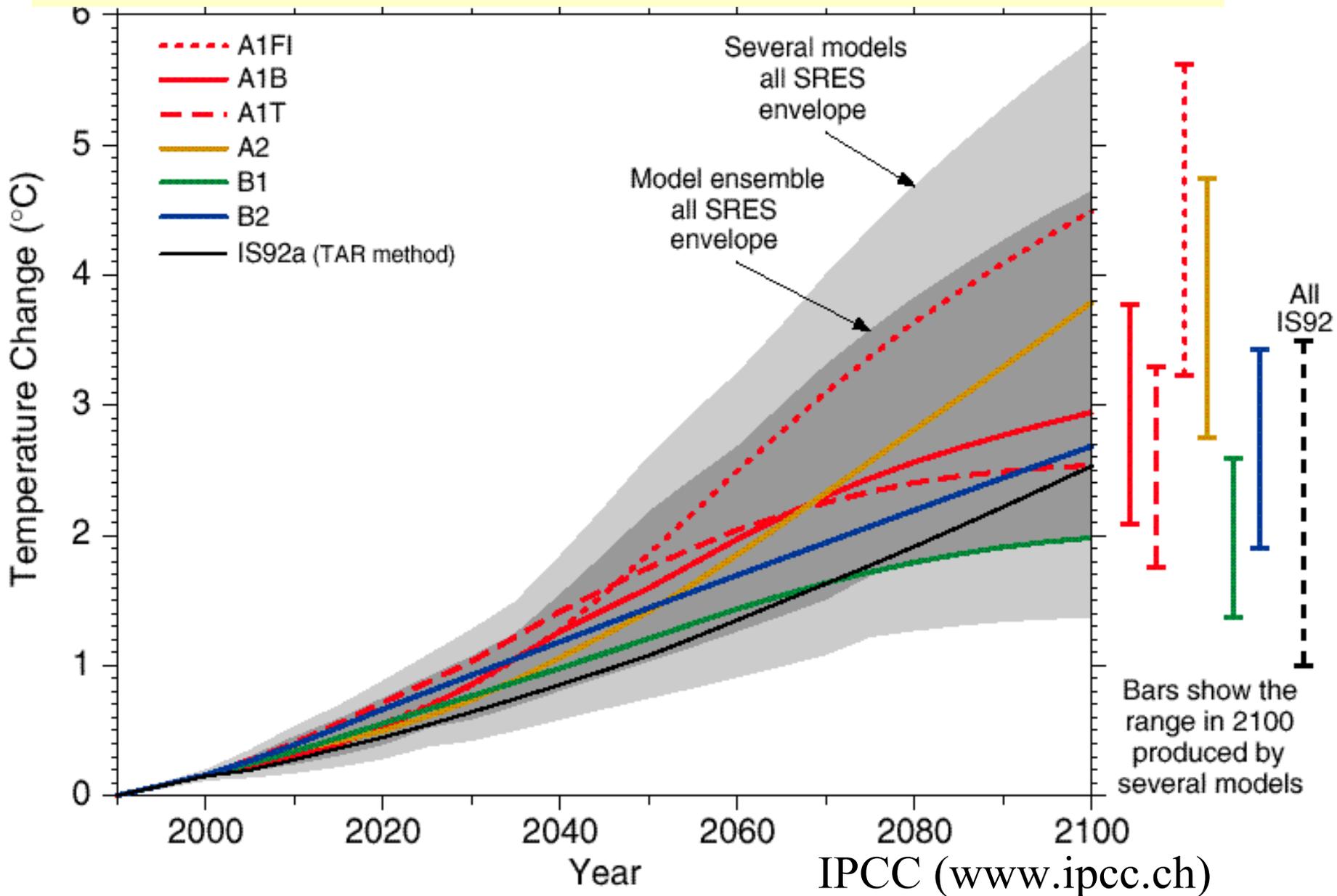
Our extended forecast includes global warming & the catastrophic end of the human race. But for the weekend, it's looking like sunny skies, mild temperatures, & a general apathy toward environmental concerns.



## (b) CO<sub>2</sub> concentrations



# 21<sup>st</sup> century temperature change



# Climate change in Washington

- Warming virtually certain: 0.4-1.0°F/decade
- Probably faster in winter and spring
- Probably, winter precipitation will increase
- Possibly, summer precipitation will decrease
- ?? Wind storms? Dry spells? Coastal fog?

# Main Impact: Less Snow

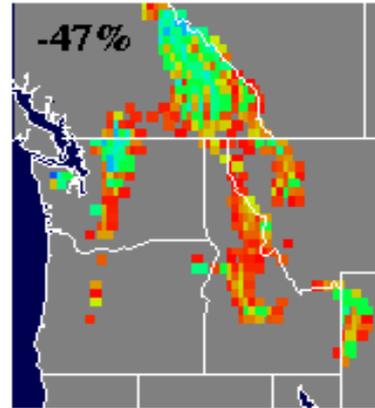
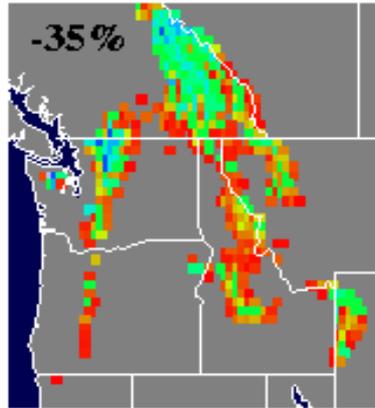
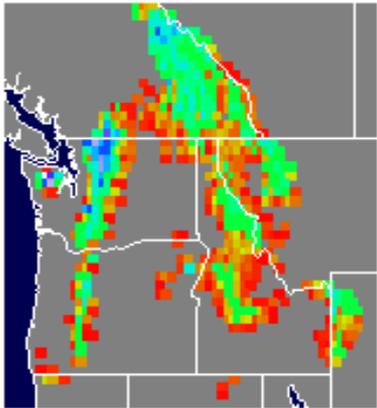
## April 1 Snowpack Projections

Pacific Northwest

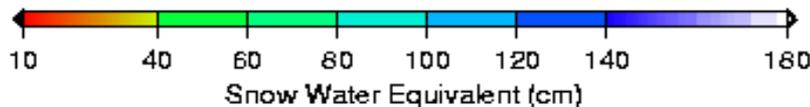
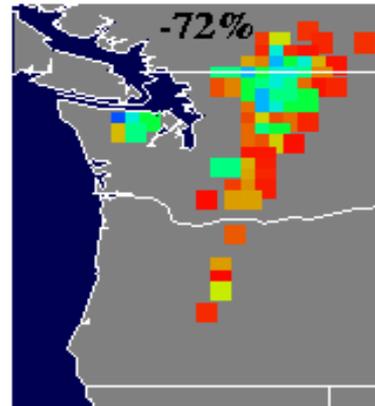
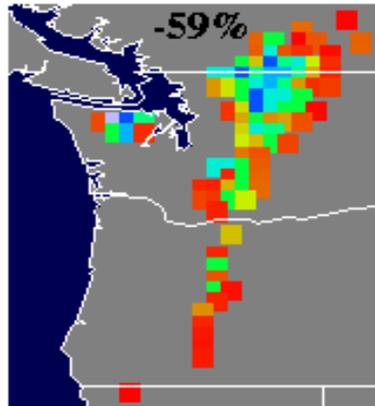
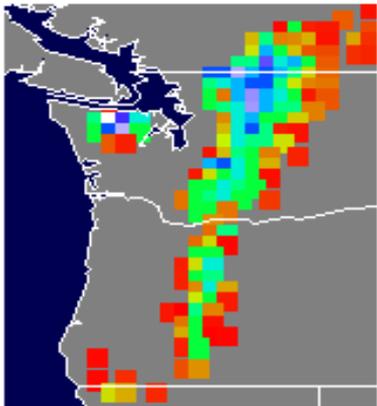
1950-99

2050s

2090s



Western WA/OR

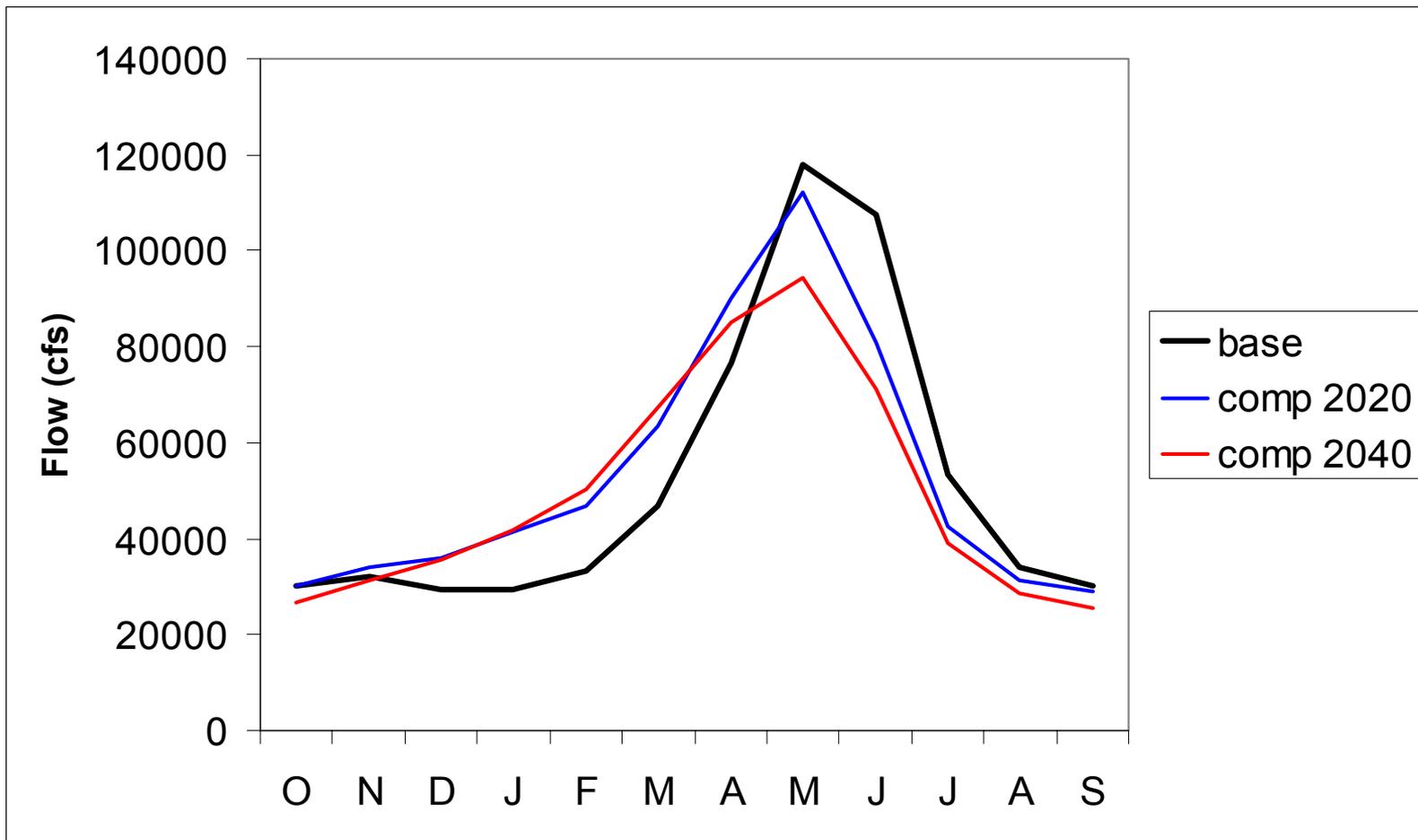


Less snow, earlier melt:

- ☁ More water in winter
- ☀ Less water in summer

***April 1 Snow Extent for the Columbia River Basin***

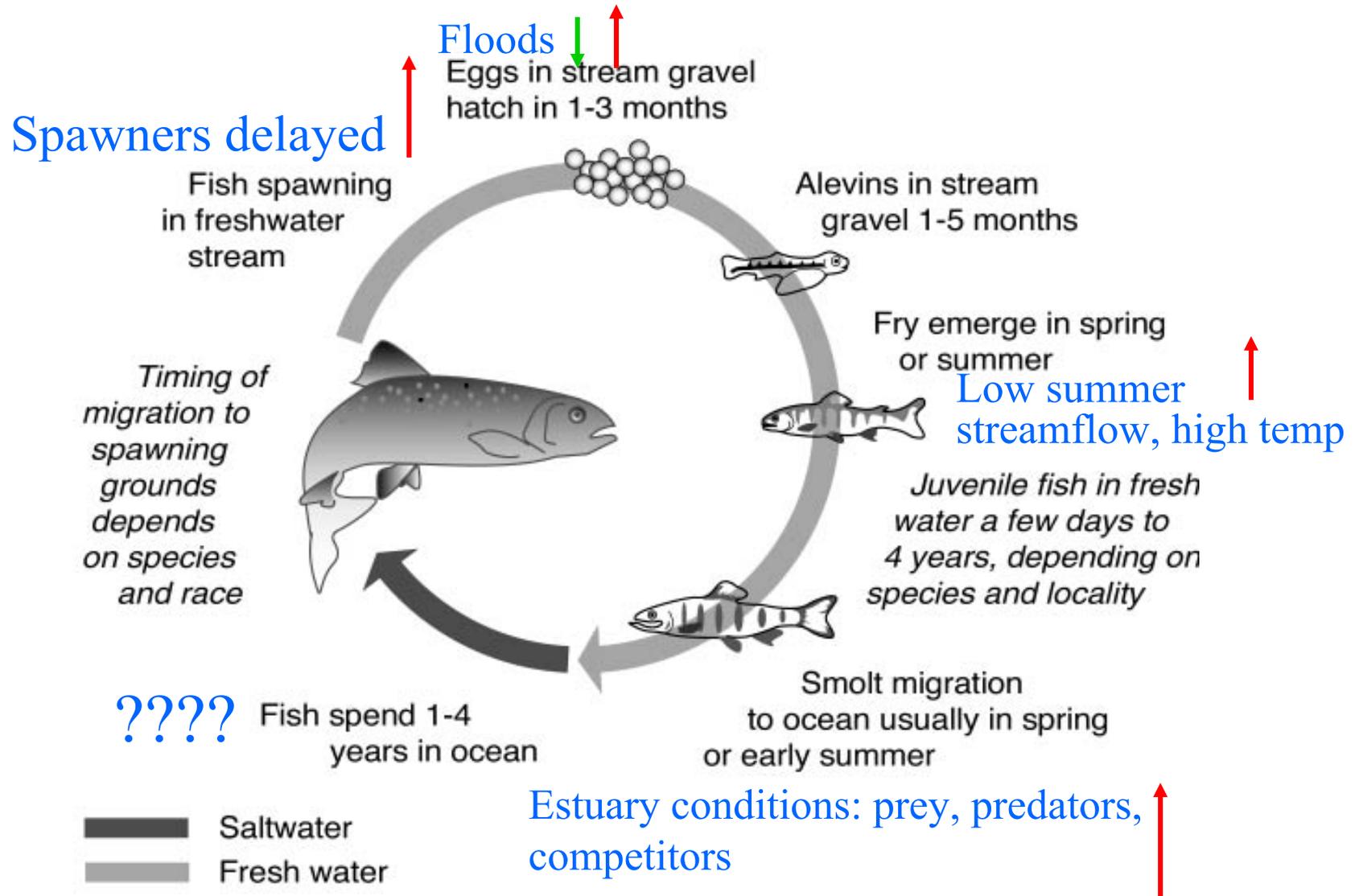
# Snake River at Ice Harbor



Reduced summer flows ==> shortages for irrigation, fish, hydro;  
less concern over flooding

Increased winter flows ==> more hydro production

# Salmon Life Cycle and climate damage



# Conclusions

- Regional climate change will take many forms, most of which we cannot predict
- Warming is virtually certain and has profound impacts: loss of snowpack, reduction in summer water supply, hardships for salmon and forests