

Understanding Climate Impacts and Responses

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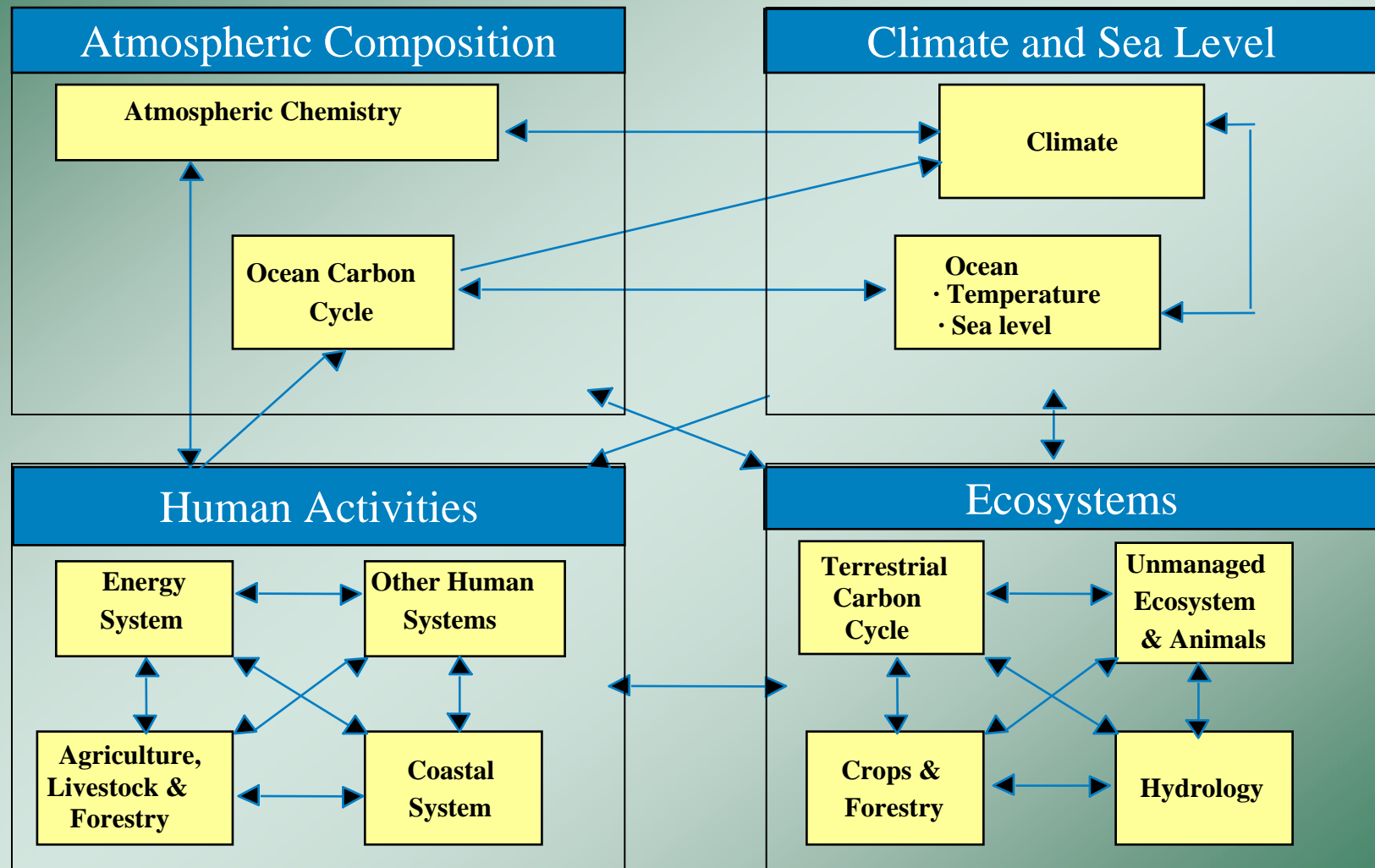
JGCRI

Joint Global Change Research Institute

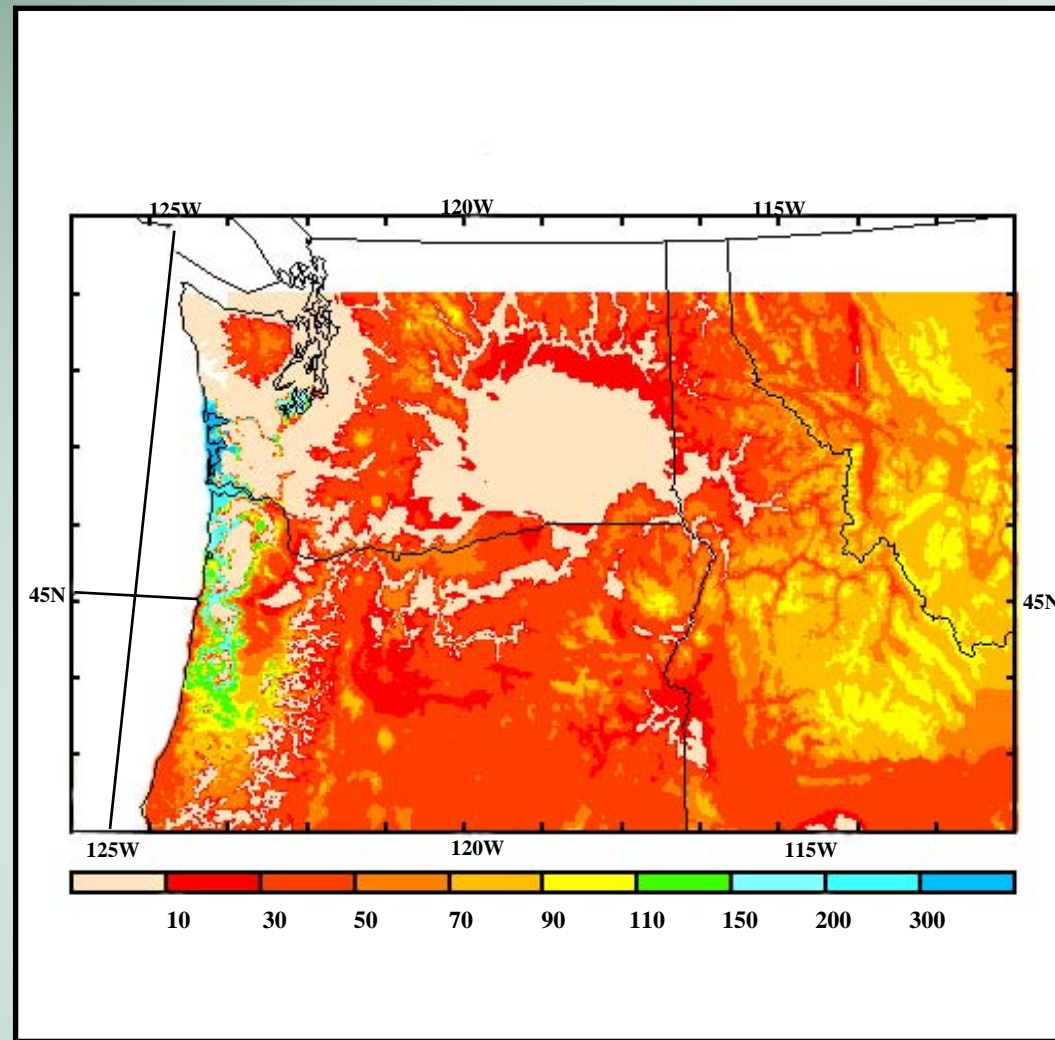
Points for Today ...

- Draw lessons from other areas that might help thinking about climate.
- Water is a critical component of the climate system and 'carries' many of its impacts
- Adaptation to climate is already an important feature of society.
- Climate strategies will need to be incorporated in other plans and strategies.

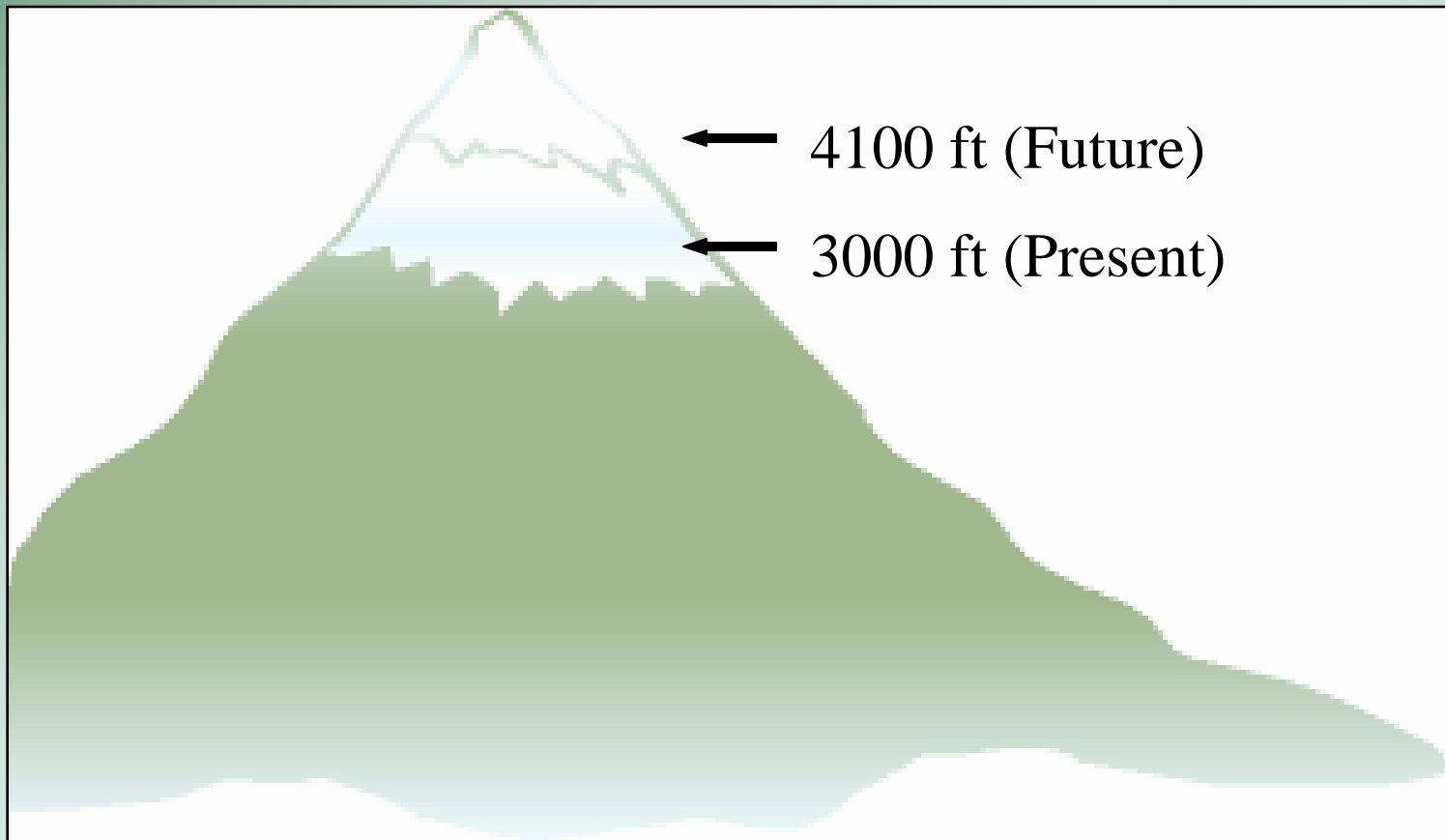
Understanding Climate Change Involves a Complex Set of Interactions



One of the best known impacts is on snow pack ...

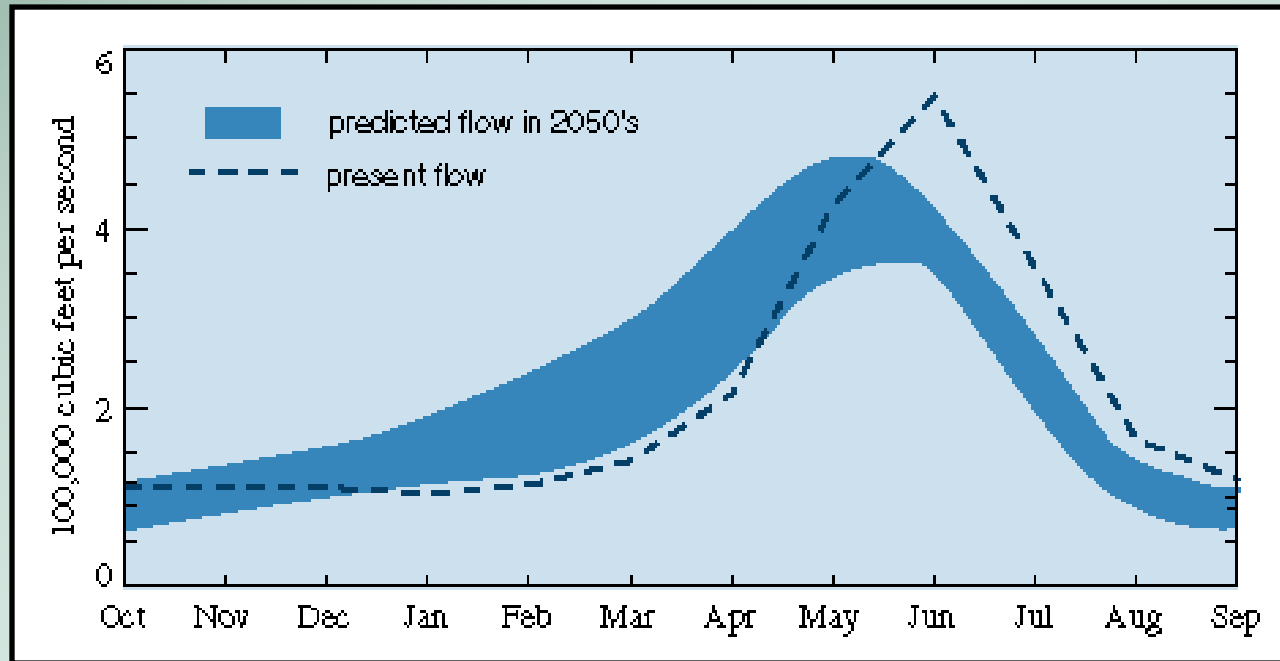


As the temperature rises the the snow line rises as well ...



The temperature also affects the form of precipitation and therefore stream flow ...

Columbia River Streamflow at the Dalles, OR



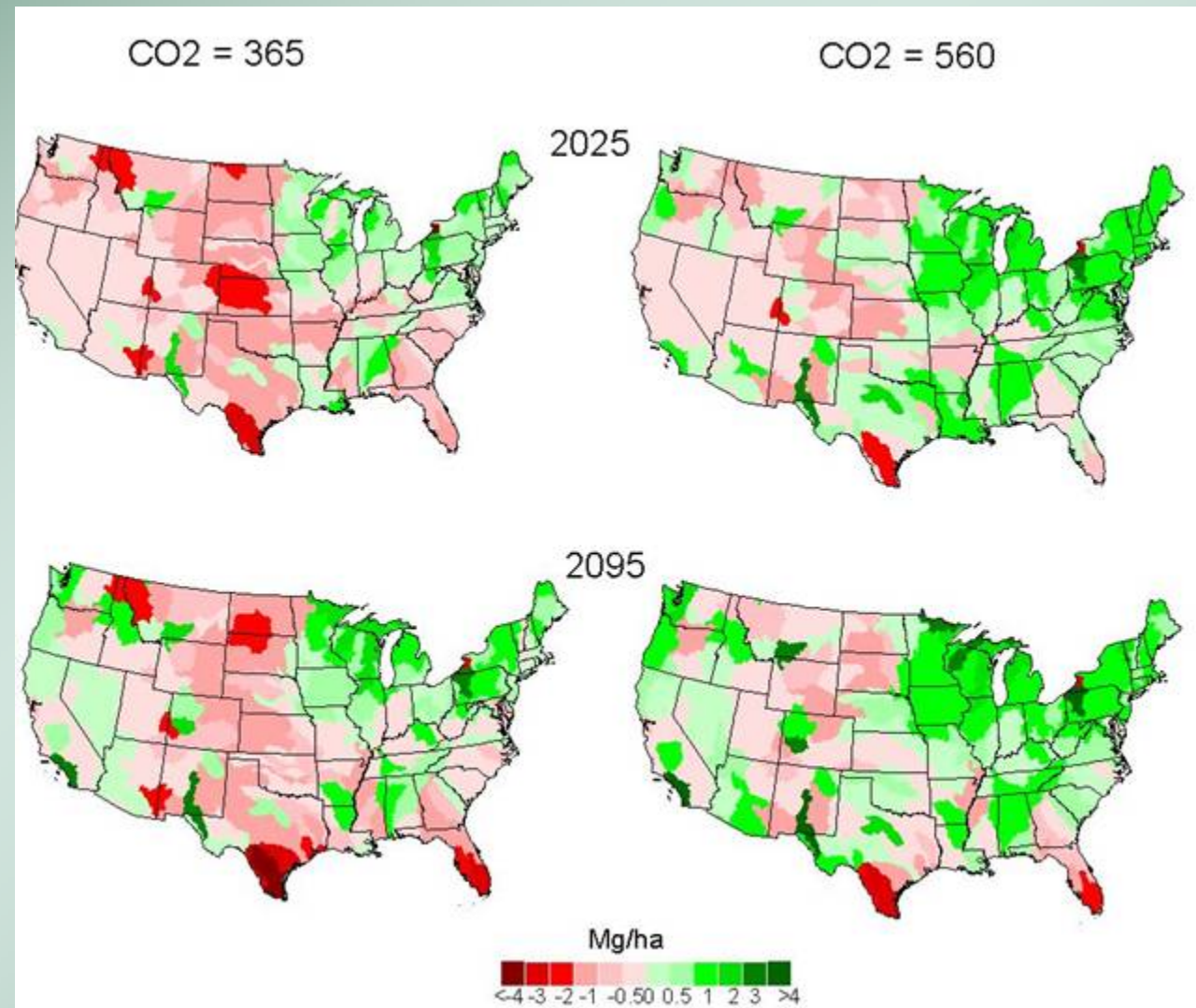
(Hamlet et al., University of Washington)

Applying the climate results can be very complicated

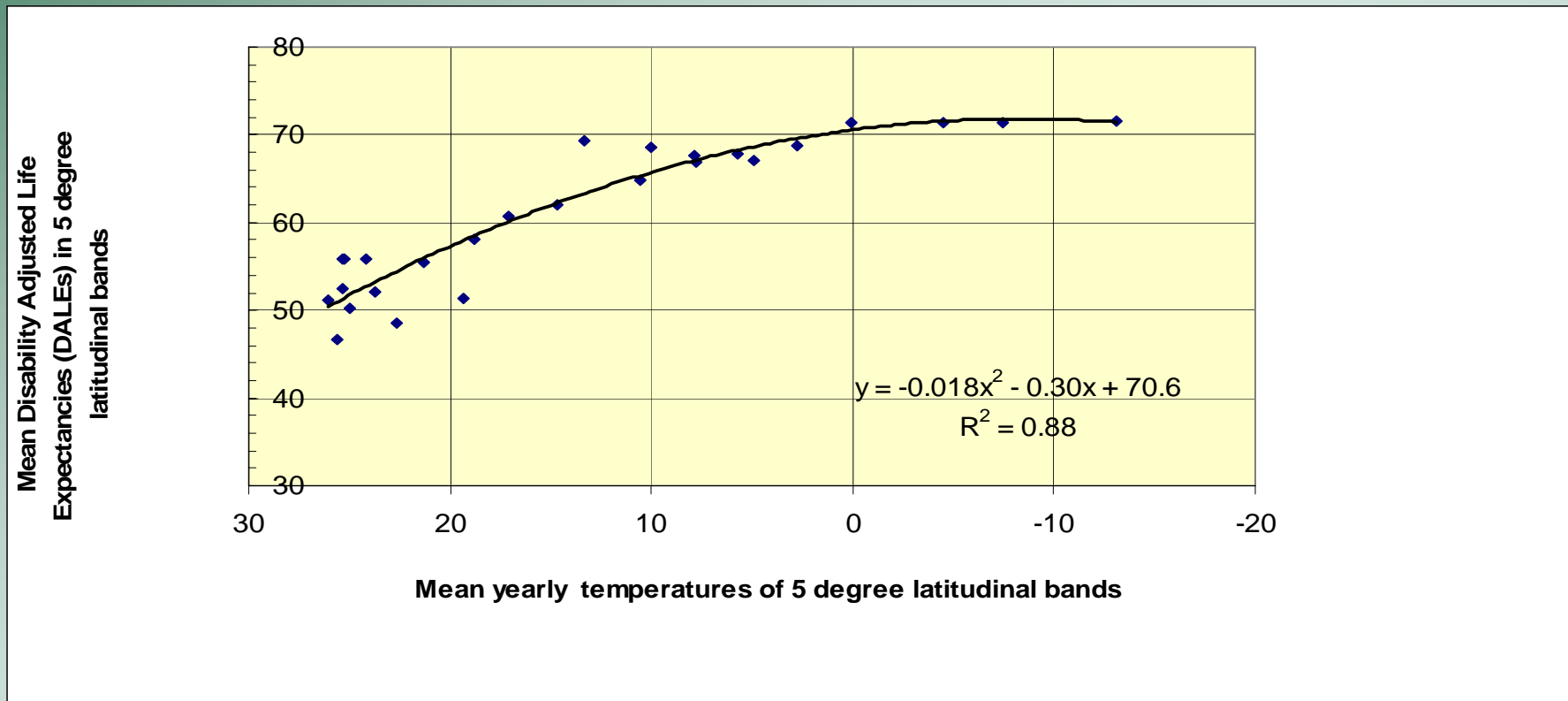


Remember that climate is not the only thing that is changing

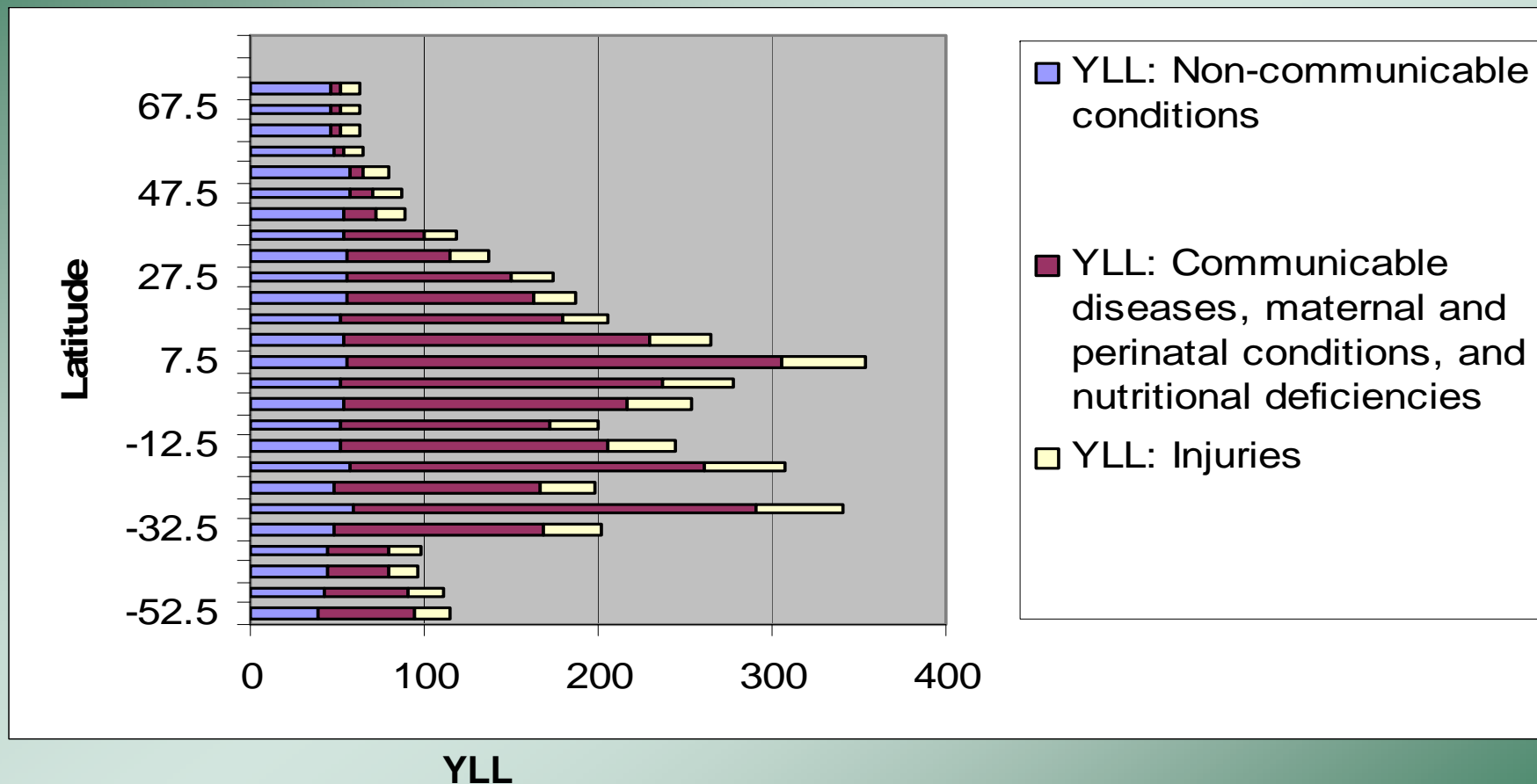
- From the US National Assessment of the Impacts of Climate Change



Sometimes intuition fails: the initial analysis of health and temperature is provocative

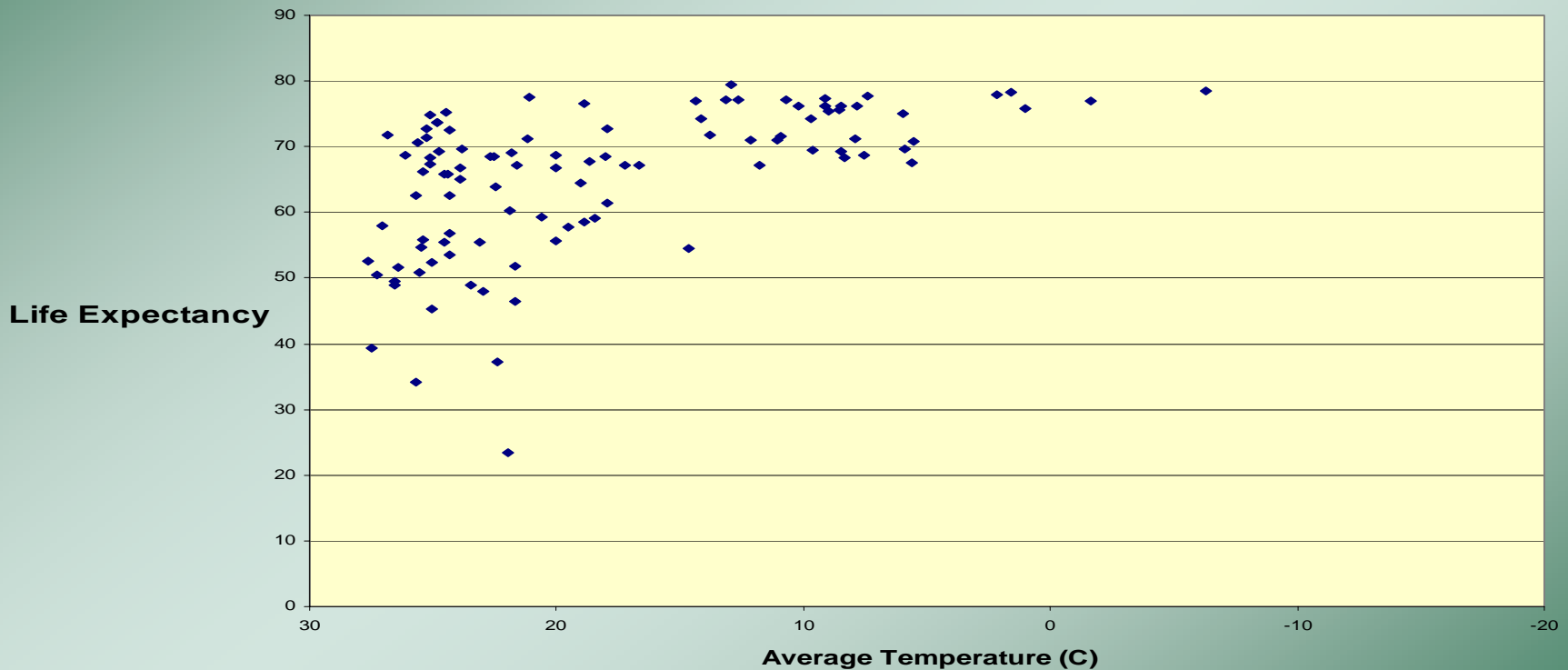


... And communicable diseases seem to drive the results ... consistent with the conventional wisdom ...



For country data, the temperature pattern is less distinct - why is that?

Adjusted average Temperature and Life Expectancy

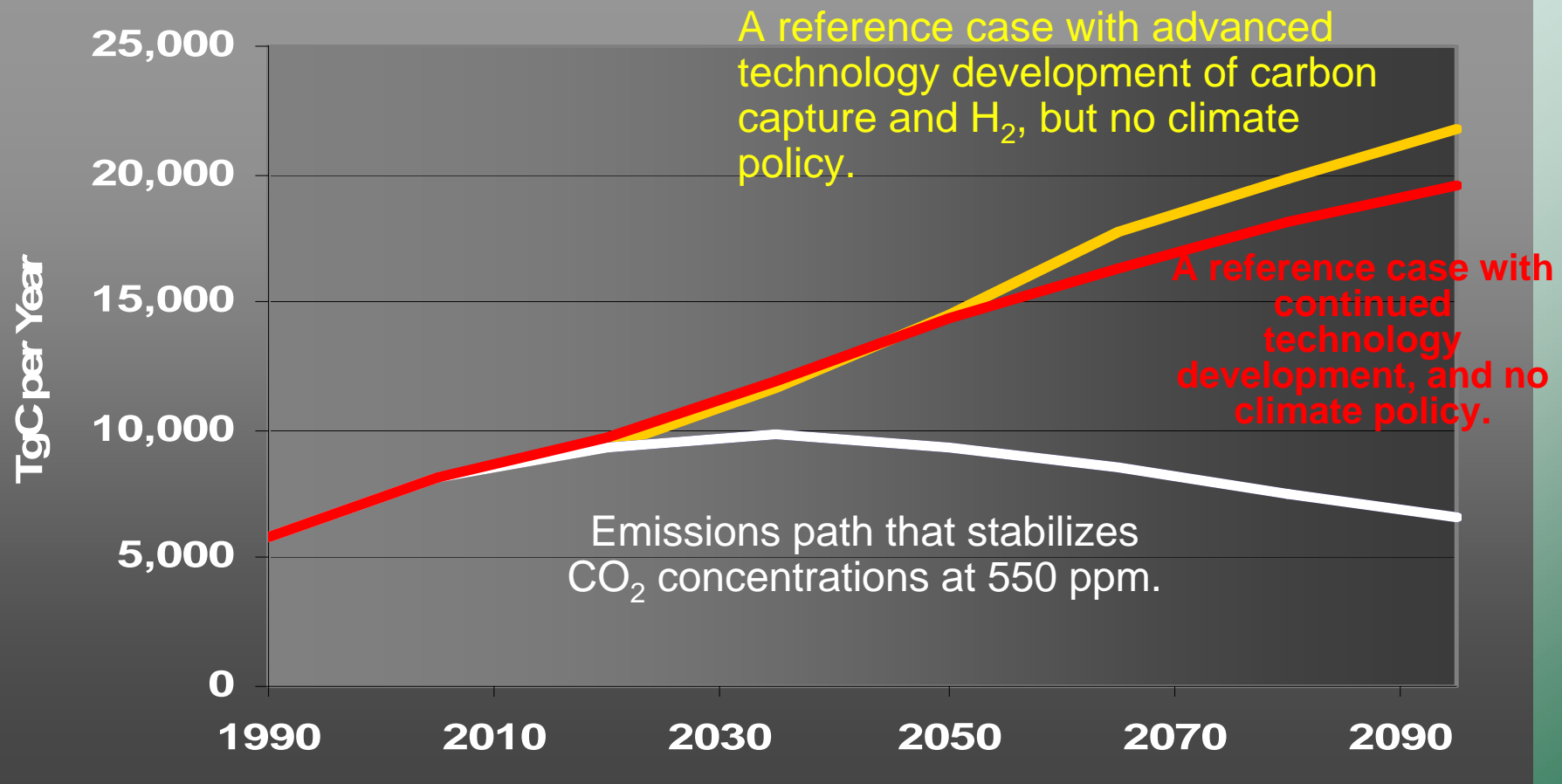


It is not so counterintuitive when you think about it ...

- On the surface temperature is important
 - Communicable and vector born diseases are probably the mechanism
 - However availability of basic services has a profound effect on life expectancy
 - Water, Medical services, Literacy, Income
- ... resilience is a product of development ...

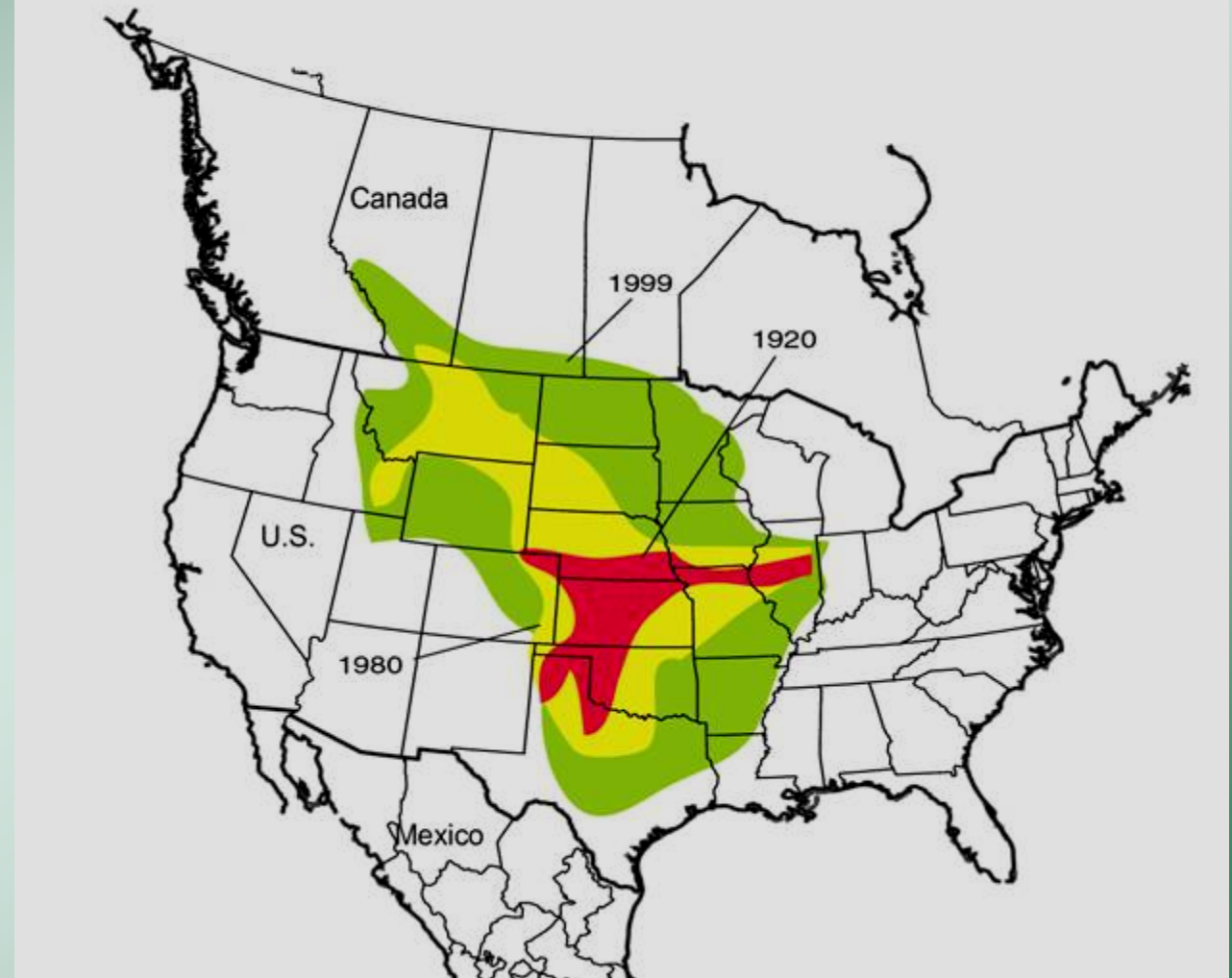
Counterintuitive results exist on the mitigation side as well ...

Energy Related Carbon Emissions



Agricultural advances illustrate development as an adaptation to climate

Extent of the hard red winter wheat in North America: 1920, 1980 and 1999
(Source: Rosenberg (1982), Economic Research Service, USDA, 1999)



This change in range is far greater than projected movement of the range due to climate change.

Ten Suggestions

- View the issue of climate change holistically, **not just as the problem of emissions reductions**.
- Recognize that, for climate policymaking, institutional limits to global sustainability are at least as important as environmental limits.
- Prepare for the likelihood that social, economic, and technological change will be more rapid and have greater direct impacts on human populations than climate change.
- Recognize the limits of rational planning.
- Employ the full range of analytic perspectives and decision aids from the natural and social sciences and the humanities in climate change policymaking.
- Design policy instruments for real world conditions rather than try to make the world conform to a particular policy model.
- **Incorporate climate concerns into other more immediate issues**, such as employment, defense, economic development, and public health.
- **Take a regional and local approach** to climate policymaking and implementation.
- Direct resources into **identifying vulnerability and promoting resilience**, especially where the impacts will be the greatest.
- Use a pluralistic approach to decision making.

