Reframing Climate Adaptation
and
Plans for the National Climate Assessment

Climate Adaptation in the Mid-Atlantic March 24, 2010
Cambridge, Maryland

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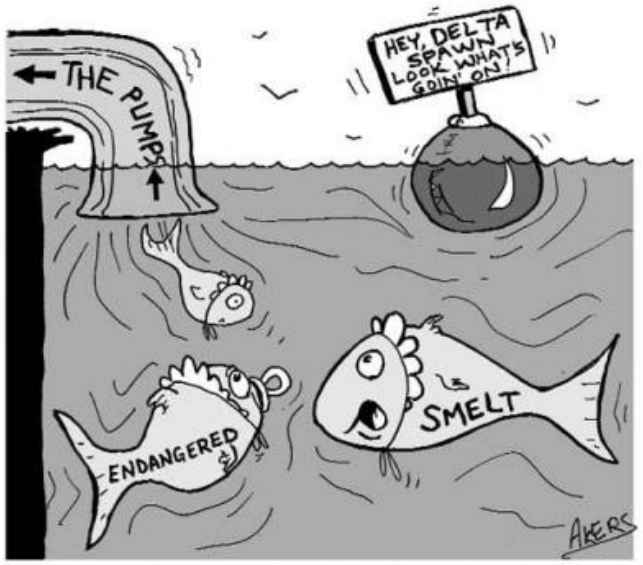
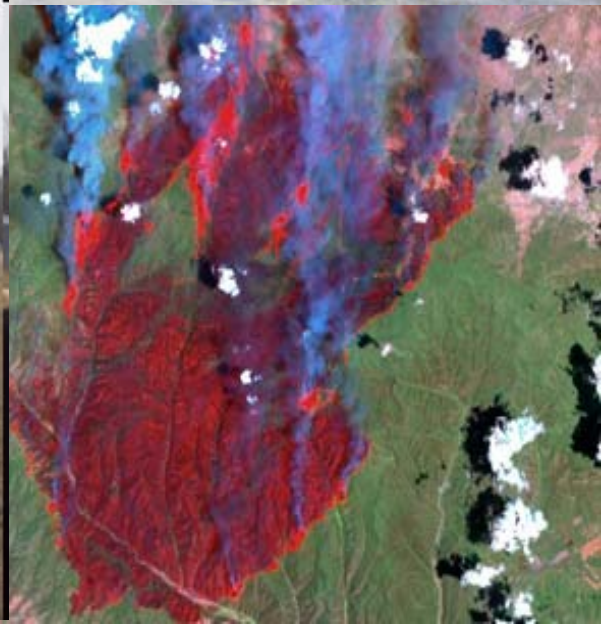
Most of the impacts of climate change are felt through changes in the water cycle

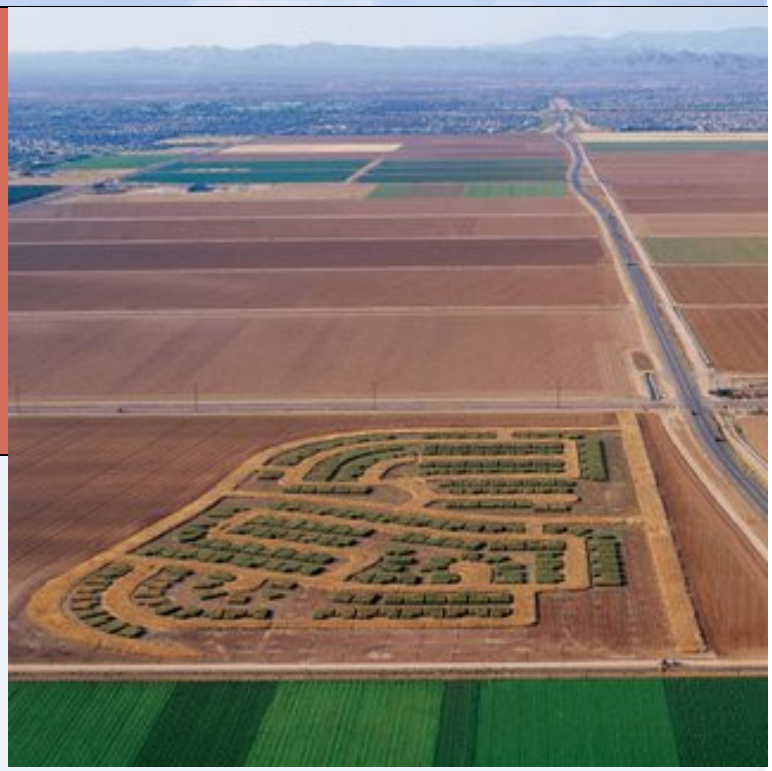


"IF ONLY THEY COULD JUST BYPASS US"



Climate change drivers related to water

•Temperature is a hydrologic variable affecting both supply and demand

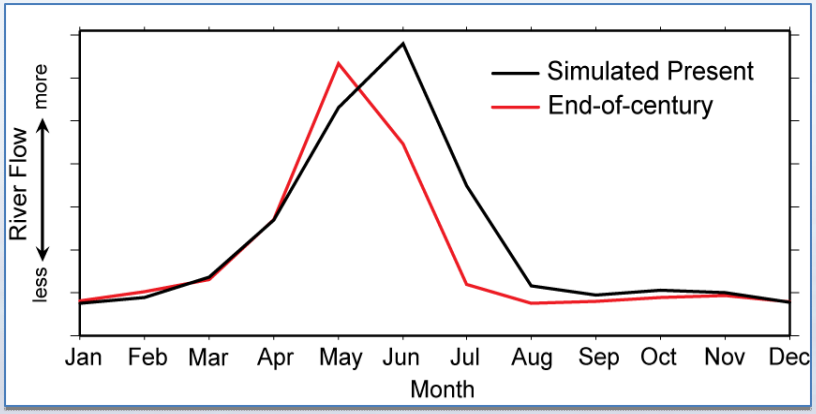


Climate change will affect

- Partitioning of precipitation: surface runoff, groundwater, evapo-transpiration
- Water temperature and quality
- Groundwater-surface water interactions
- Rate of change; thresholds

Impacts of Climate Change on Water Cycle

- Less supply/storage from snow melt
  - Higher % of precipitation as rain vs snow
  - Earlier melt and peak flows
- Loss of reservoir storage
  - Evaporation and sedimentation
  - Dam operating constraints (e.g., flood control)
- More extreme events, both floods and droughts
- Serious implications for aquatic ecosystems



Impacts on Western Water Supplies

- Projected climate change impacts on flows in the Colorado are significant; multiple studies project a range from 11% to 40% reduction in runoff by 2050
- Increases in municipal demand result in even higher stress on the system

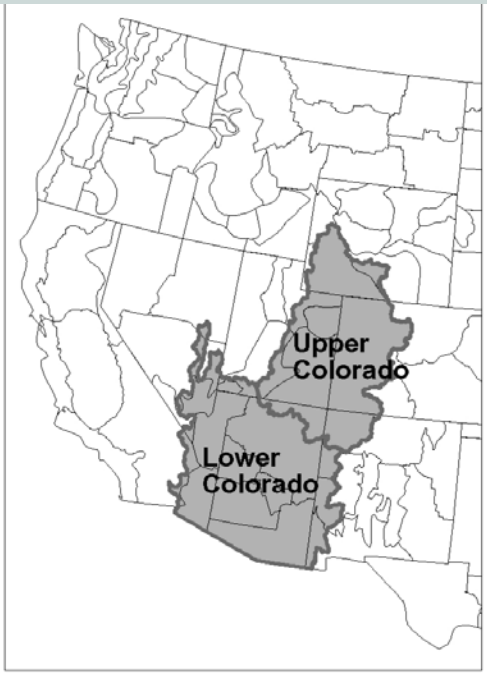
But: How much information do we really need to make better decisions?

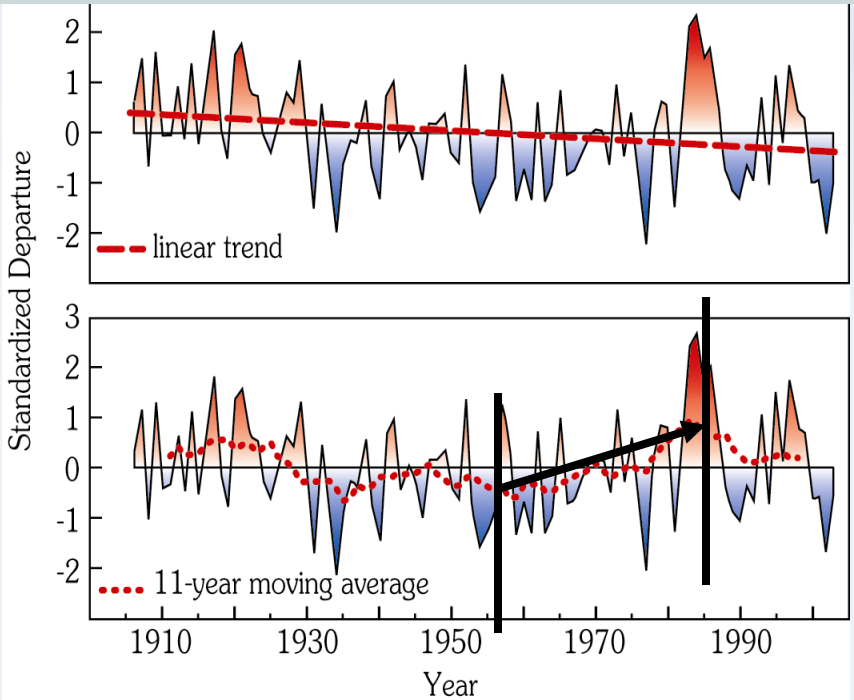
“ We may not know the magnitude or the rate of change over time, but we know the direction”

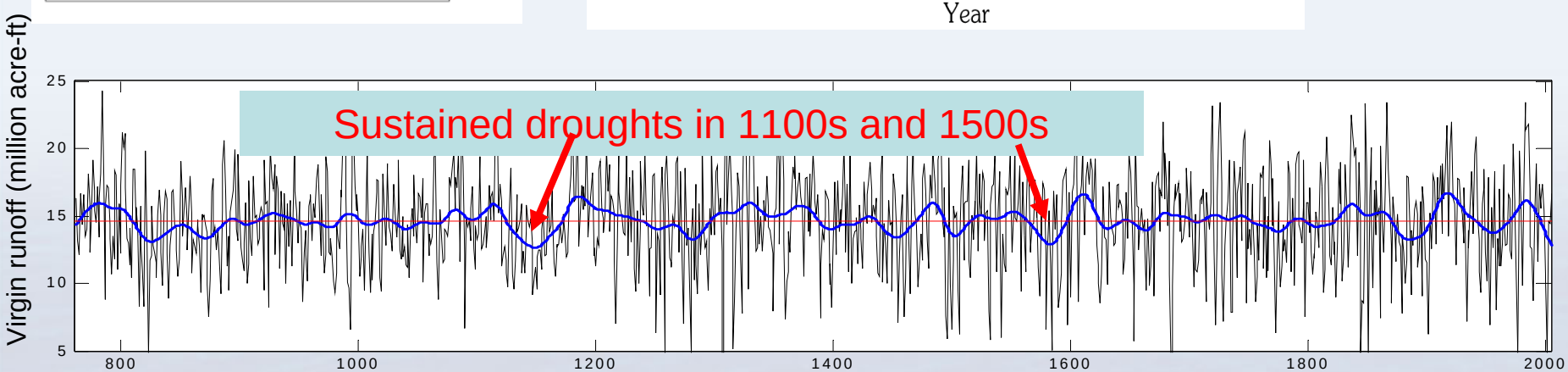
Reframing

- Managers make decisions with imperfect information all the time – why is climate change different?
- Adaptive management – deliberate learning by doing
- Co-benefits – it is not all about climate change, justify action by addressing other vulnerabilities
- Small institutional and legal changes can make a big difference, eg eliminating conflicting mandates
- Potential for partnerships and economic opportunity
- Climate change as an excuse to do integrated planning, eg NYC – or do things that make sense anyway, eg changes to the National Flood Insurance program; it is a good integrating concept

Reframing: Developing a long-term perspective on variability and trends







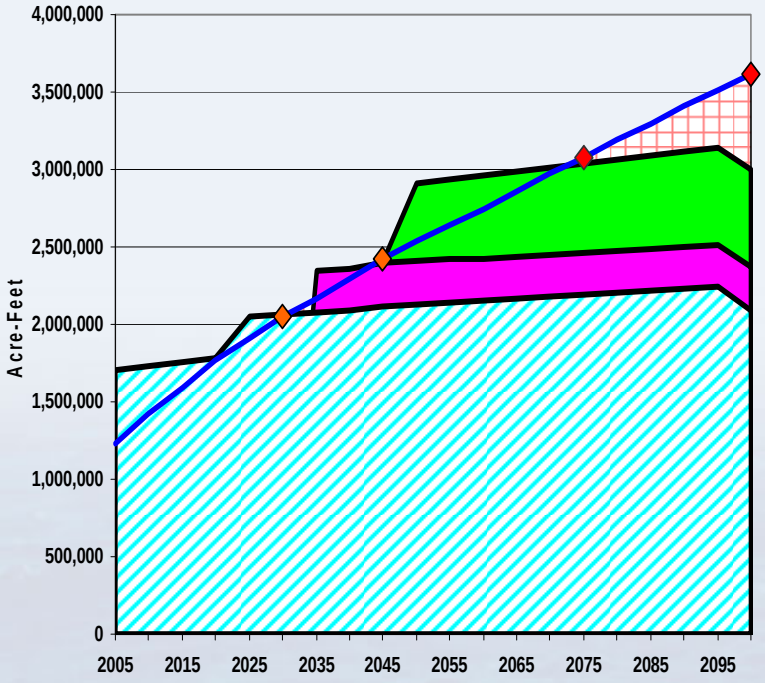
Data from Meko et al., Geophysical Res.

Reframing: The “Watergy” Perspective

- Most water technology solutions are energy-intensive:
  - irrigated agriculture,
  - pumping groundwater,
  - inter-basin transfers,
  - desalination,
  - cloud seeding,
  - dry cooling
- Energy-intensive options will be less attractive in the future.
- Conservation has double benefits: it saves water and it saves energy.

Reframing: Planning Tools

- Expand planning scenarios to bracket a wider range of outcomes (include both supply and demand impacts)
  - Include social and physical factors that create the context within which climate change impacts will be felt
  - Connect adaptation and mitigation objectives



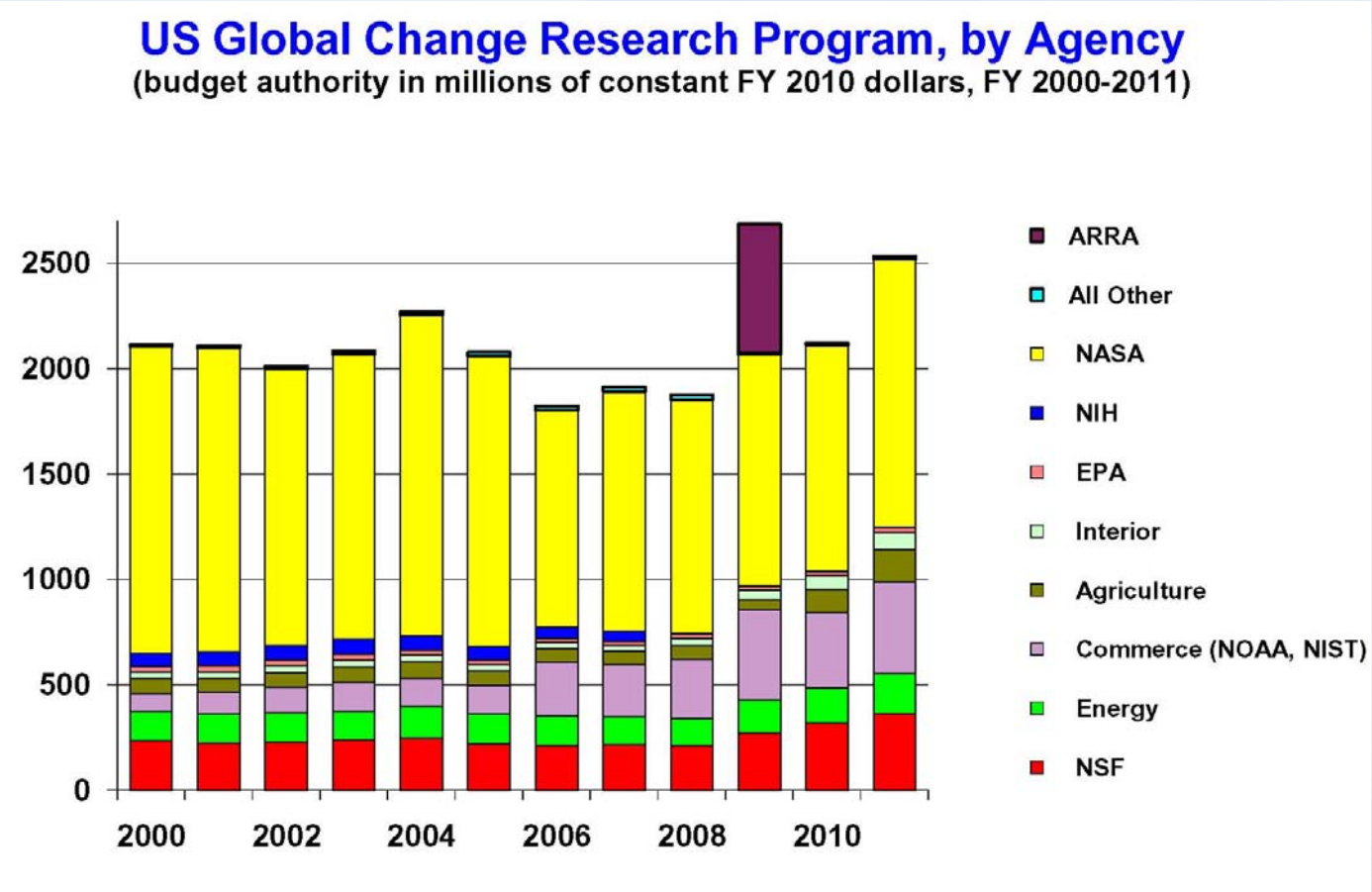
U.S. Global Change Research Program

- Mandated by Congress in the Global Change Research Act of 1990 (P.L. 101-606)

- Goals
  - To improve understanding of uncertainties in climate science
  - To expand the global observing systems
  - To develop science-based resources to support policymaking and resource management
  - To communicate findings broadly among scientific and stakeholder communities
  - 13 Agencies

U.S. Global Change Research Program

2011 proposed budget up 21 percent or $439 million over the 2010 enacted level



FY 2009 figures include Recovery Act funding.
FEB. '10 OSTP

The National Climate Assessment

Section 106: Scientific Assessment

- On a periodic basis (**not less frequently than every 4 years**), the Council, through the Committee, shall prepare and submit to the President and the Congress an assessment which –

- **integrates, evaluates, and interprets the findings of the Program** and **discusses the scientific uncertainties** associated with such findings;

- **analyzes the effects of global change** on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and

- **analyzes current trends in global change, both human- induced and natural**, and projects major trends for the subsequent 25 to 100 years.

Completed June, 2009

Website:
www.globalchange.gov

Other USGCRP Activities

Coordination and Planning

- Interagency Working Groups, Coordination Office
- Strategic Planning
- International research cooperation and coordination (IPCC, etc.)

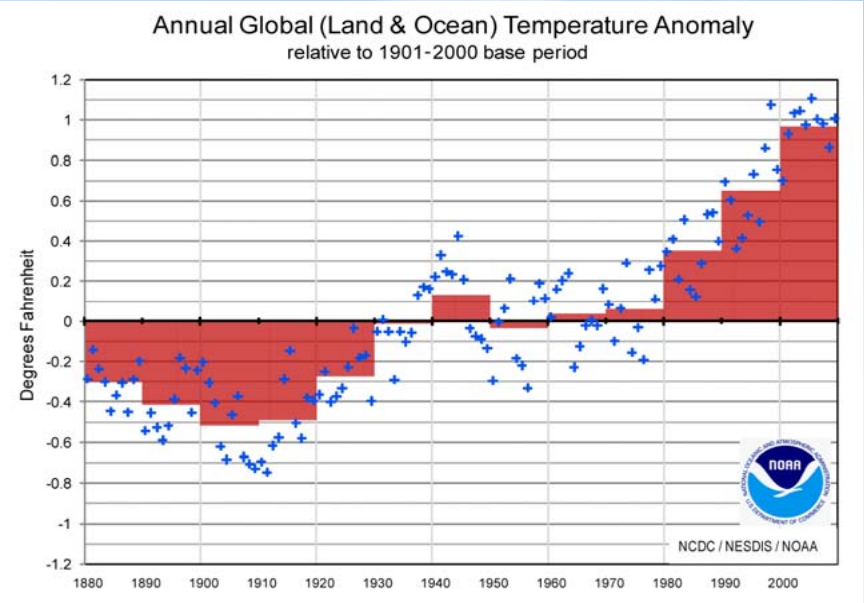
Selected Products

- Our Changing Planet (annually)
- 21 CCSP Synthesis and Assessment Products (2006 – 2009)
- Impacts of Climate Change on the US (2009) (Unified Synthesis Product)

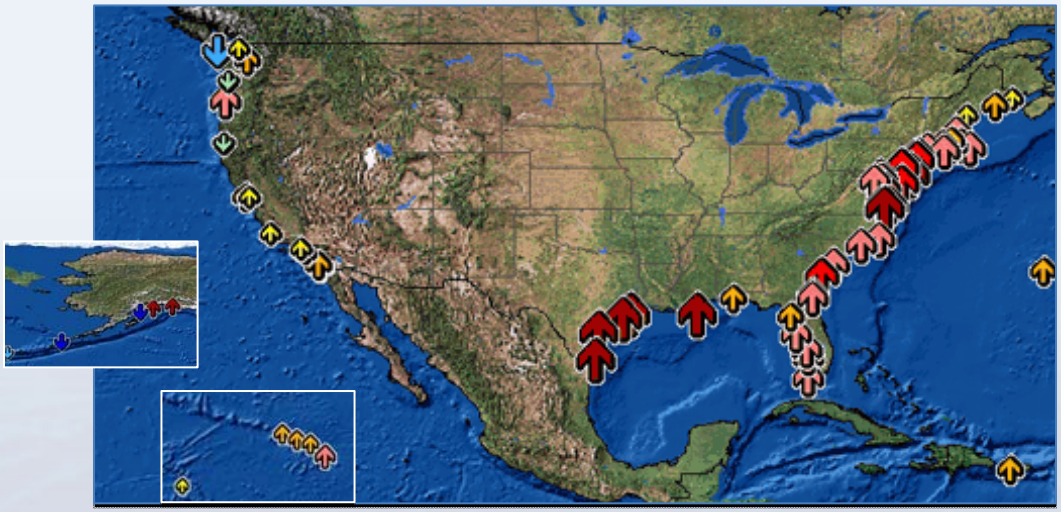
Global Climate Change Impacts on the United States (released June, 2009)

- How has climate already changed?
- How is it projected to change under lower and higher emission scenarios?
- How has climate change affected regions and sectors in the U.S., and how will it affect them in the future?
- 10 key findings summarize report highlights

Global Temperature Anomalies



Blue dots—annual global anomalies
Red bars—decadal-average anomalies

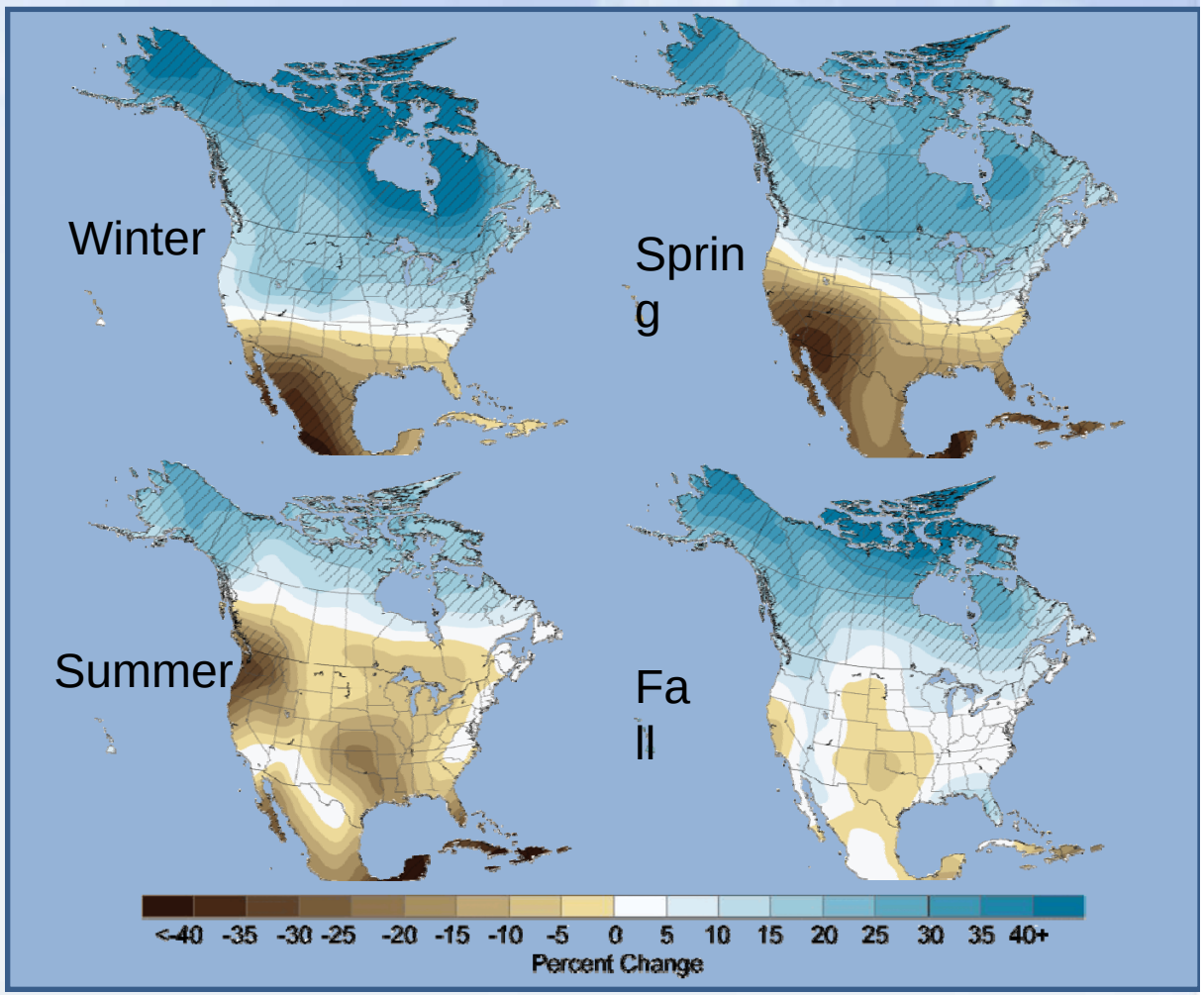


Observed Changes in Sea Level Around the US

Climate changes are underway in the U.S. and are projected to grow

- Confidence in precipitation projections are generally lower than for temperature
- Good confidence in projections of the overall pattern of changes (wetter north, drier south)
- Less confidence in the exact location of the transition

Projected Change in Precipitation by 2080-2099



15 climate models, end of century, higher emissions scenario;
Hatched areas are areas of lower confidence

US Impacts Report

Principles

- **Maximize engagement of federal agencies**
- **Maximize engagement of stakeholders and lasting partnerships** outside of the federal government, including input and feedback for impacts, mitigation and adaptation analyses
- **Prioritize information that helps minimize risk** associated with climate change impacts; seek equitable approaches to adaptation and mitigation that protect the most vulnerable regions, ecosystems, populations and systems (transportation, energy, etc)

Principles

- **Ensure a sustainable process** that supports science, adaptation, climate services and mitigation efforts (as appropriate)
- **Efficiently coordinate efforts** across regions and sectors at multiple scales
- **Ensure an adaptive approach that responds to new information** over time
- **Include consideration of economic implications** of both action and inaction in responding to climate impacts

Assessment 3.0: Supporting decisions

- Focus on process *and* product
- Build assessment capacity across regions and sectors – both horizontal and vertical
- Nested matrix, flexible in space and time
- Cross-sectoral, interdisciplinary approach that recognizes decision context
- Leading the investments in science for adaptation and mitigation
- Independent oversight
- Scientific credibility

Choices

- Robustness vs expedience in decision-making
  - How can we ask and answer the right questions? Is downscaling always the answer?
  - How can we produce information in ways that are useful, timely, credible; AND stand the test of time?
  - How can we produce a credible economic assessment that accounts for ecosystem services and intergenerational equity?

Design considerations

- How to assign regions and sectors to agencies?
- How to handle the intersections, eg the energy and water nexus – which have different regional implications?
- How to deal with prioritizing research investments, equity, etc?
- How to address the international dimensions, national security?

Design considerations

- How to address intersections of mitigation and adaptation?
- How to build and support the partner networks?
- New mechanisms for economic assessment?
- Assessment humor – documentation of climate cartoons etc.

Climate Change Adaptation Task Force
Co-chaired by CEQ-OSTP-NOAA

Managed by CEQ

Initial Workgroups:

- Agency adaptation; international; science; insurance; water
- Expanded topics: urban, health, ecosystems, etc.
- Workplans for next 4 months

Working on recommendations towards a national strategy in October

- Focused on government operations

National Adaptation Summit
May 25-27

- A national-level discussion of effective adaptation strategies to respond to climate change and its impacts
- Public and private actors, focused on better communication of adaptation science and access to better information and tools
- Tied to ongoing planning of climate research and services in the federal government