



Town Hall on Sustained Assessment of Climate Change in the Southwest

La Jolla, CA | January 18, 2013

8:45 – 3:00

WiFi Password: Traditions1

PDF of Agenda Available Here:

<http://www.climas.arizona.edu/NCATownHall>



California's Climate Policy: The Important Role of Science and Assessment



Louise W. Bedsworth, PhD
Office of Governor Edmund G. Brown
Office of Planning and Research



The National Climate Assessment: Overview

Emily Therese Cloyd

National Climate Assessment

US Global Change Research Program National Coordination Office

Fred Lipschultz

National Climate Assessment

US Global Change Research Program National Coordination Office

Southwest Regional Town Hall

La Jolla, CA | January 18, 2013



Meeting Objectives

- Learning about the process that led to the production of the draft Third National Climate Assessment
- Understanding how to submit official comments on the draft NCA Report
- Sharing local and regional perspectives on NCA-related topics (climate impacts, vulnerability assessments, adaptation activities)
- Helping to identify ways that people and organizations in this region can be active participants in a sustained assessment process



US Global Change Research Program

Global Change Research Act
(1990) Mandate:

“To provide for development and coordination of a comprehensive and integrated United States research program which will assist the Nation and the world to **understand, assess, predict, and respond** to human-induced and natural processes of global change.”



United States
Global Change
Research Program



13 Federal Departments & Agencies +
Executive Office of the President



U.S. Global Change Research Program
**National Climate
Assessment**

National Climate Assessment: GCRA (1990), Section 106

...not less frequently than every 4 years, the Council... shall prepare... an assessment which –

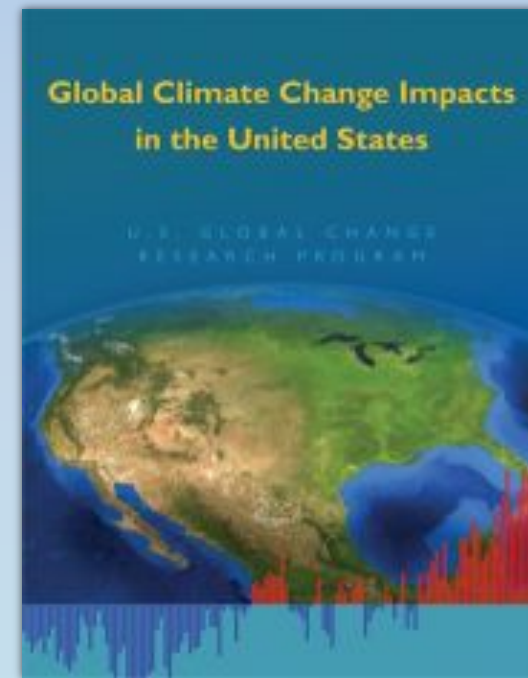
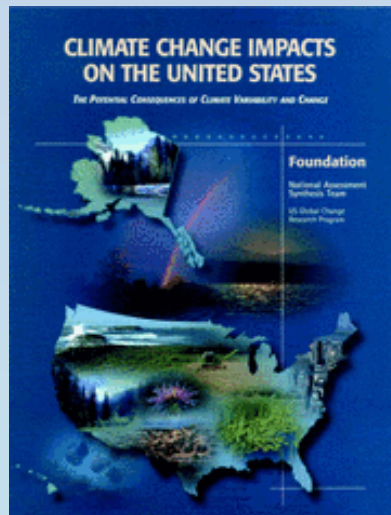
- integrates, evaluates, and interprets the findings of the Program (USGCRP) and discusses the scientific uncertainties associated with such findings;
- analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, 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.

Previous National Climate Assessments

Climate Change Impacts on the United States (2000)



Climate Change Impacts in the United States (2009)



<http://nca2009.globalchange.gov/>

The “New” National Climate Assessment



Goal

- Enhance the ability of the United States to **anticipate, mitigate, and adapt** to changes in the global environment.

Vision

- Advance an **inclusive, broad-based, and sustained process** for assessing and communicating scientific knowledge of the impacts, risks, and vulnerabilities associated with a changing global climate in support of decision-making across the United States.

Goals for the NCA

- A **sustained process** for **informing an integrated research program**
- New approaches to development and use of **scenarios at multiple scales**
- **Evaluation** of the implications of alternative **adaptation and mitigation options**
- **Community building** within regions and sectors that can lead to enhanced resilience



Outcomes of the NCA

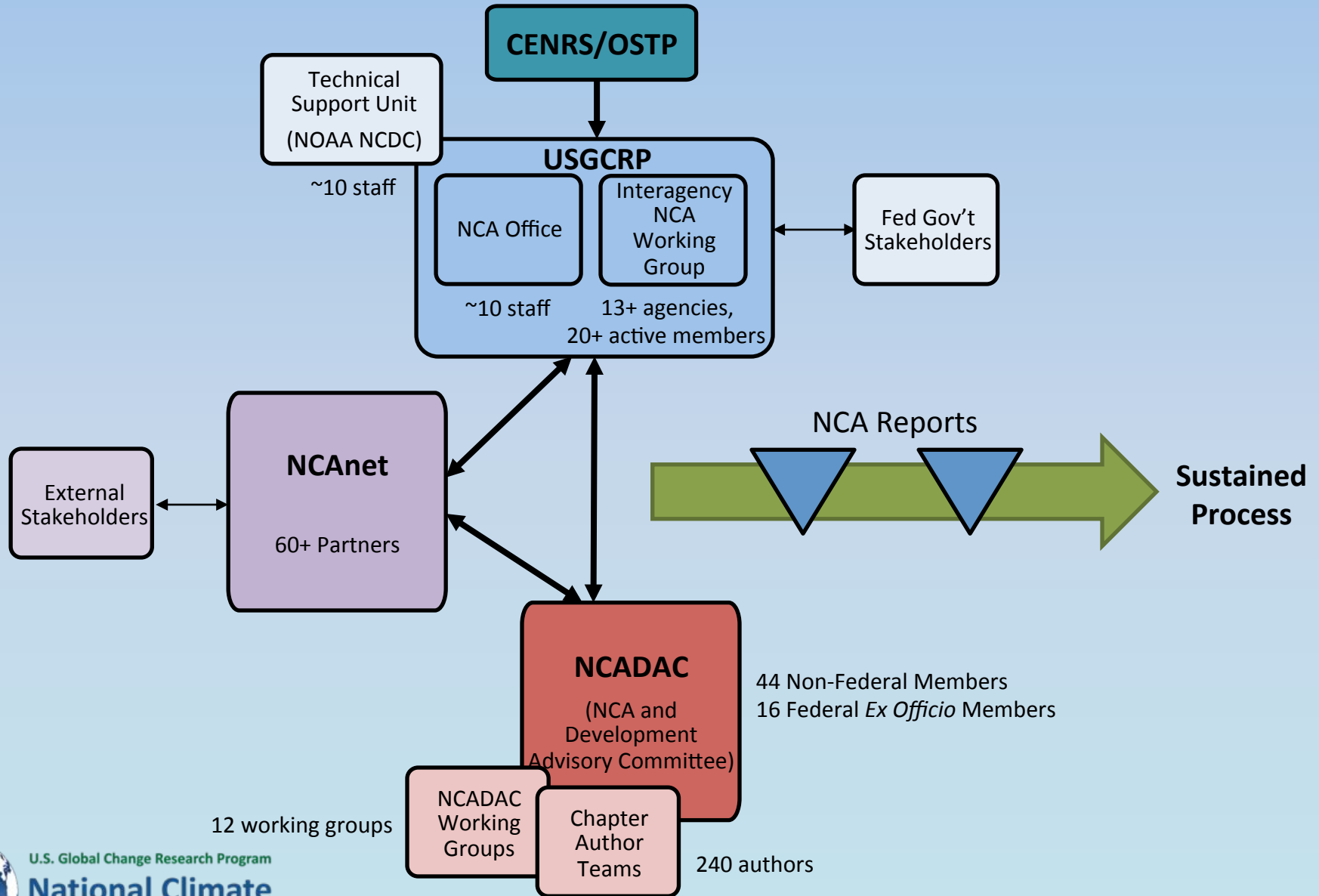
- **Ongoing, relevant, highly credible analysis** of scientific understanding of climate change impacts, risk, and vulnerability
- Enhanced timely **access to Assessment-related data** from multiple sources useful for decision making
- **Systematic evaluation** of progress towards reducing risk, vulnerability, and impacts
- **National indicators** of change and the capacity to respond



Process to Date

- Interagency Working Group (INCA, 13+ agencies) plans and manages federal components
- 60 member National Climate Assessment and Development Advisory Committee (NCADAC) responsible for development the Third NCA Report and providing advice on the sustained NCA process
- 240 authors selected by NCADAC, from academic, public, and private sectors
- 60+ members in NCAnet, a network of partners (mostly) outside of the federal government that connects the NCA to assessment stakeholders

NCA Structure



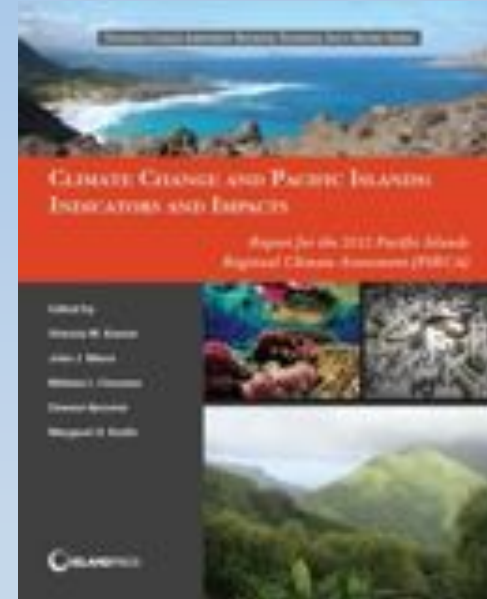
Process to Date

- Process-focused workshops established consistent methodologies, models, scenarios, and approaches
- Regional and sectoral workshops convened by agency-sponsored technical input teams
- Listening sessions and symposia at professional society meetings focusing on ecosystems, water, meteorology, soil science, applied anthropology, resource management, and more



Process to Date

- First “request for information”:
250+ technical inputs from 100+ individuals and teams, including:
 - New regional climate histories and projections for each region
 - New sea level rise scenarios
 - **In-depth foundational assessments for each region and most sectors**
- Author teams delivered their draft chapters to the NCADAC
- Draft report released January 11, Public comment period opened January 14



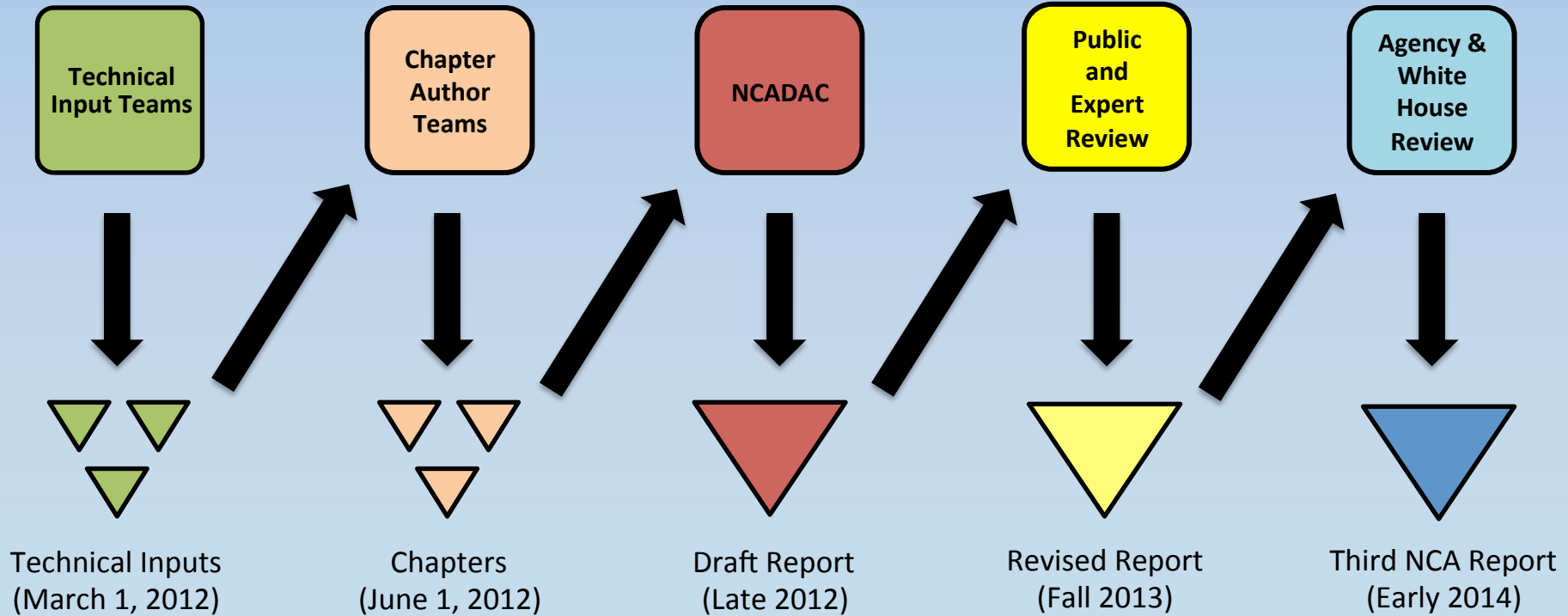
Island Press is publishing most of the regional technical inputs over the next few months:
<http://www.cakex.org/NCAreports>
(Pacific Islands and Coasts currently available, Southwest expected in February 2013)

Most of the federal agency-sponsored reports are available from
<http://www.globalchange.gov/what-we-do/assessment/nca-activities/available-technical-inputs>

Third NCA Report Process

Federal agencies,
universities, NCAnet
members, and others

January 14 –
April 12, 2013



Products and Outcomes

- Third NCA Report as an e-book (300+ pages) and accompanying printed summary document (50 pages) [early 2014]
- First stage of the Global Change Information System (GCIS), which will provide access to the underlying information and analyses used in the NCA Report [early 2014]
- Foundation for strong communications products and processes useful to a variety of audiences, including national, regional, state, and local decision makers
- Sustained assessment process – special topics reports, future synthesis reports, strengthening assessment capacity

Outline for Third NCA Report

- Letter to the American People
- Executive Summary: Report Findings
- Introduction
- Our Changing Climate
- Sectors & Sectoral Cross-cuts
- Regions & Biogeographical Cross-cuts
- Responses
 - Decision Support
 - Mitigation
 - Adaptation
- Agenda for Climate Change Science
- The NCA Long-term Process
- Appendices
 - Commonly Asked Questions
 - Expanded Climate Science Info



Sectors

- Water Resources
- Energy Supply and Use
- Transportation
- Agriculture
- Forestry
- Ecosystems and Biodiversity
- Human Health



Sectoral Cross-Cuts



- Water, Energy, and Land Use
- Urban Systems, Infrastructure, and Vulnerability
- Impacts of Climate Change on Tribal, Indigenous, and Native Lands and Resources
- Land Use and Land Cover Change
- Rural Communities
- Biogeochemical Cycles



Regions & Biogeographical Cross-Cuts

Oceans and
Marine
Resources



Coasts,
Development,
and Ecosystems



U.S. Global Change Research Program

**National Climate
Assessment**

Review of Draft Third NCA Report

Draft report information:

<http://www.globalchange.gov/what-we-do/assessment/draft-report-information>

Comments **MUST** be submitted via the online comment tool

Main NCA page:

<http://assessment.globalchange.gov>

- Public comment period: January 14 – April 12, 2013
- Town hall meetings in each of the eight geographic regions
- Sessions at several professional society meetings prior to and during comment period
- Review by National Research Council panel
- Review comments are an important part of the process of producing a credible and relevant report

What will happen to the comments?

- Comments will be sorted by chapter and provided to the authors
 - Although commenters must identify themselves in the online form, their identity will not be provided to the authors or review editors during the response period
- Authors and NCADAC will prepare responses
 - All comments will be responded to
- Changes will be made to the draft document
- Review editors will assess the adequacy of the responses
- The National Research Council will review the revised document and evaluate the adequacy of responses
- A revised draft report will be prepared for review and approval by the NCADAC
 - The document will be submitted for US Government review, then will be considered for submittal to Congress as the government's response to the GCRA requirements
- Comments and responses will be publicly available



Thank you!

For more information:

<http://assessment.globalchange.gov>

Emily Therese Cloyd, NCA Public Participation and
Engagement Coordinator

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National Climate Assessment 2013 Draft Report Overview of Key Findings

James L. Buizer
National Climate Assessment
Development Advisory Committee

University of Arizona

La Jolla, California
January 18, 2013



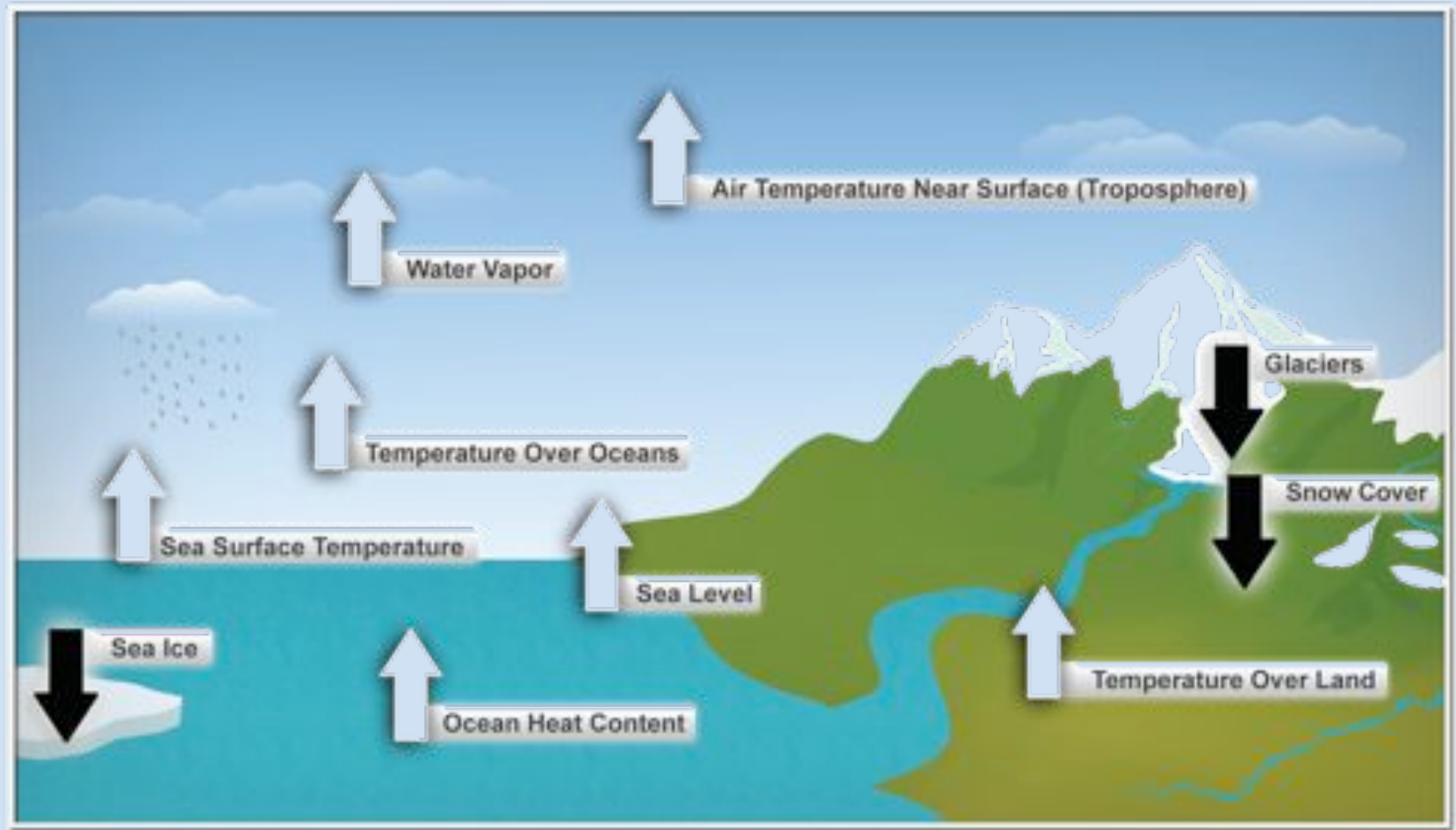
Key Finding #1

Global climate is changing, and this is apparent across the U.S. in a wide range of observations. The climate change of the past 50 years is due primarily to human activities, predominantly the burning of fossil fuels.



Global Climate is Changing

Ten Indicators of a Warming World

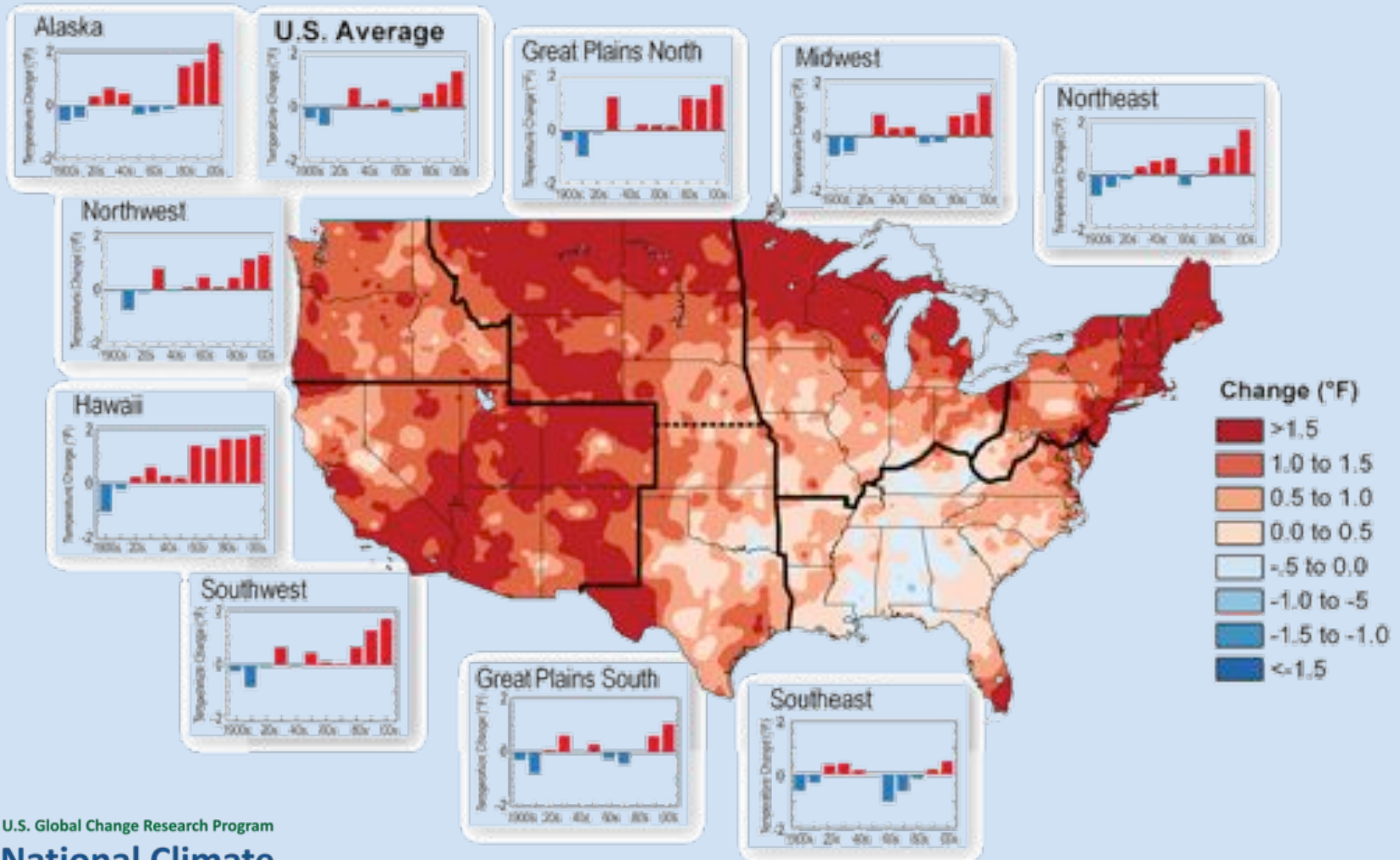


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**National Climate
Assessment**

Apparent Across the Nation

Observed U.S. Temperature Change

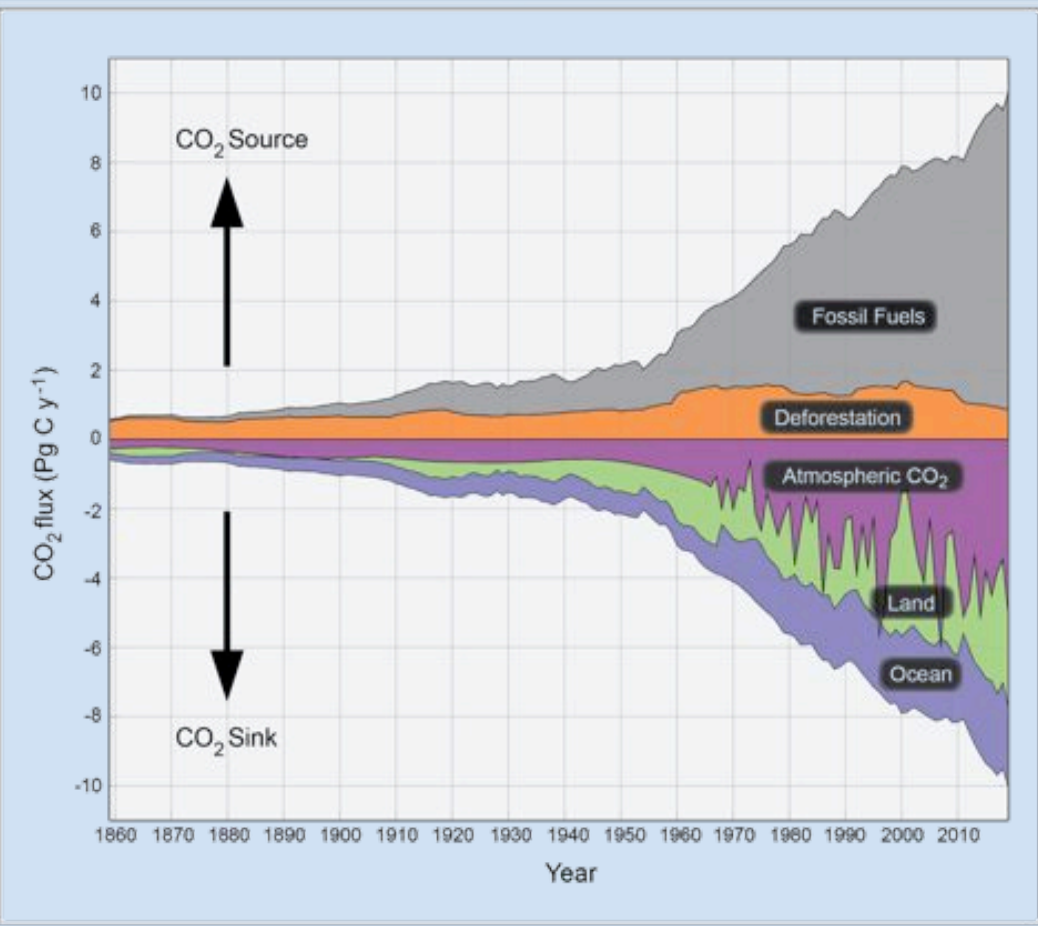


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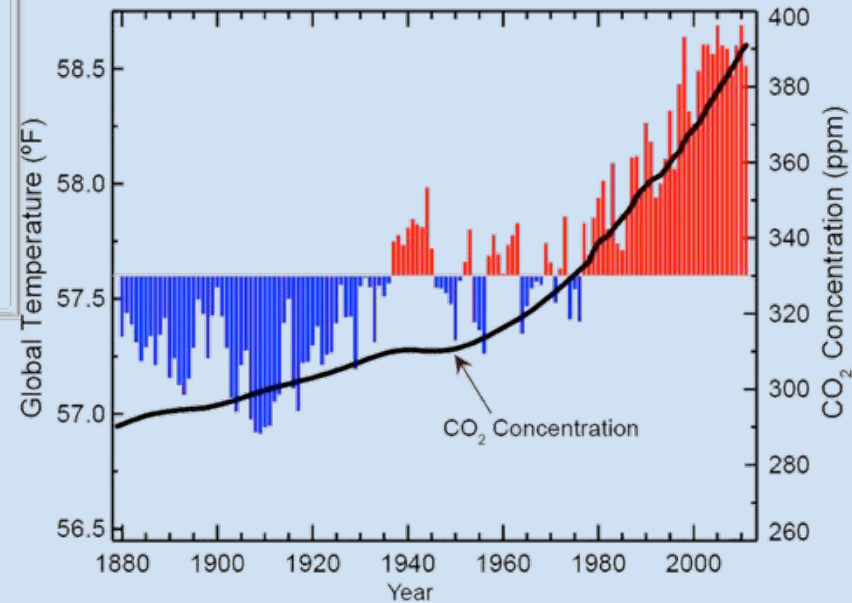
National Climate Assessment

Due to Humans

Human Activities and the Global Carbon Budget



Global Temperature and Carbon Dioxide



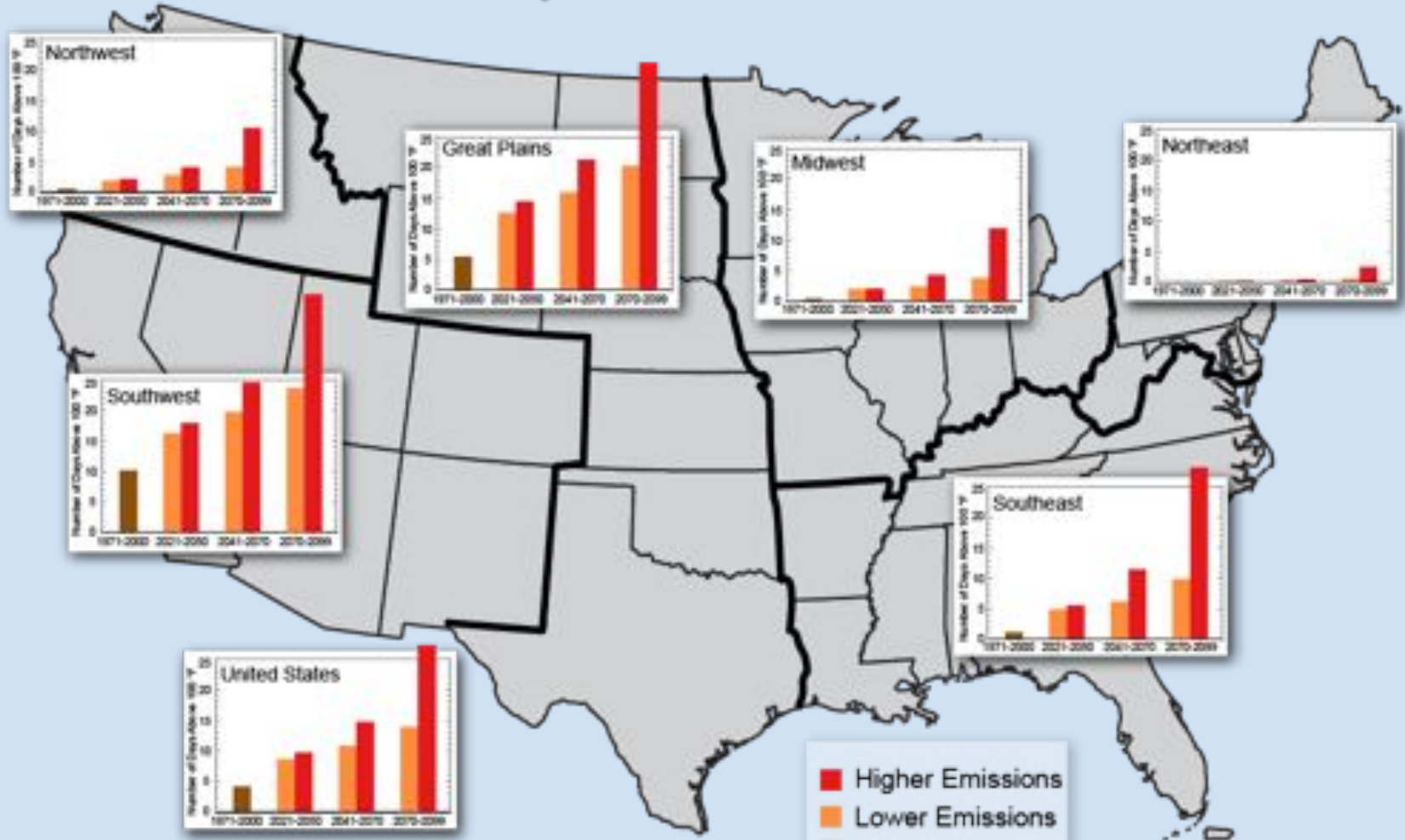
Key Finding #2

Some extreme weather and climate events have increased in recent decades, and there is new and stronger evidence that many of these increases are related to human activities.



Extreme Weather Nationally

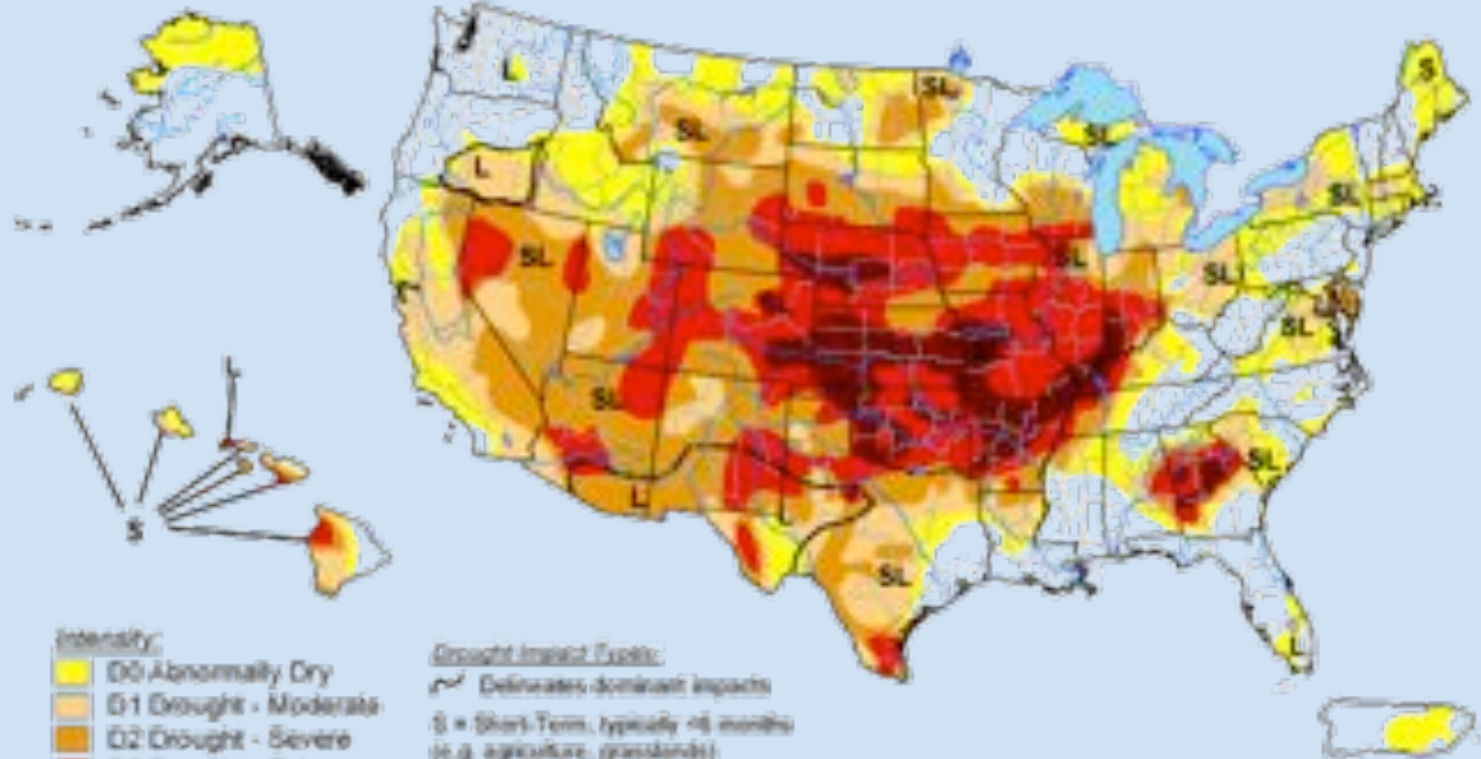
Days Over 100°F



Extreme Weather Nationally

U.S. Drought Monitor


August 14, 2012
Valid 7 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- S** = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L** = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



Released Thursday, August 16, 2012

Author: Michael Brewen/Liz Love-Brotak, NOAA/NESDIS/WCDC



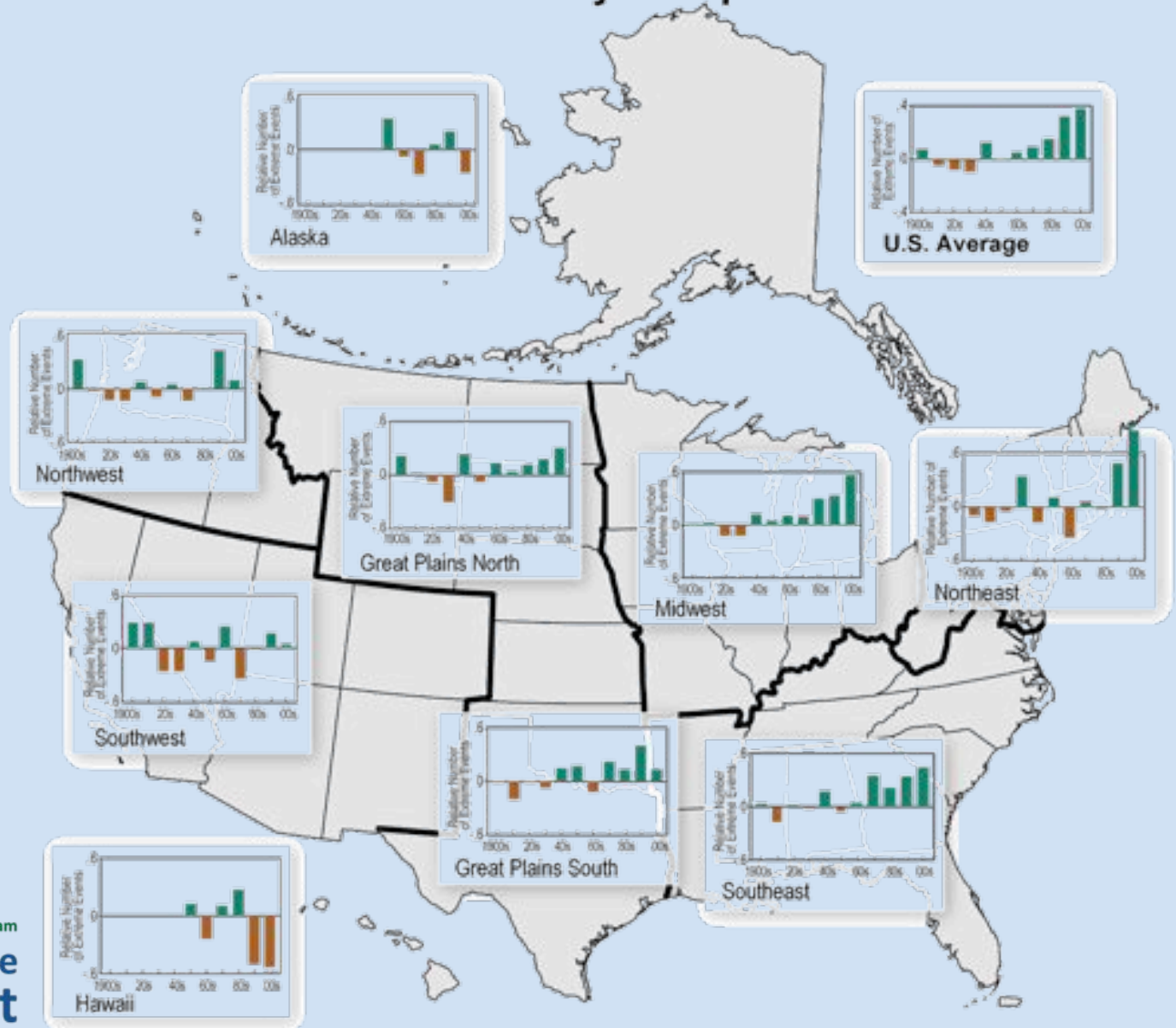
U.S. Global Change Research Program

National Climate Assessment

<http://droughtmonitor.unl.edu/>

Extreme Weather Nationally

Extreme Heavy Precipitation



Key Finding #3

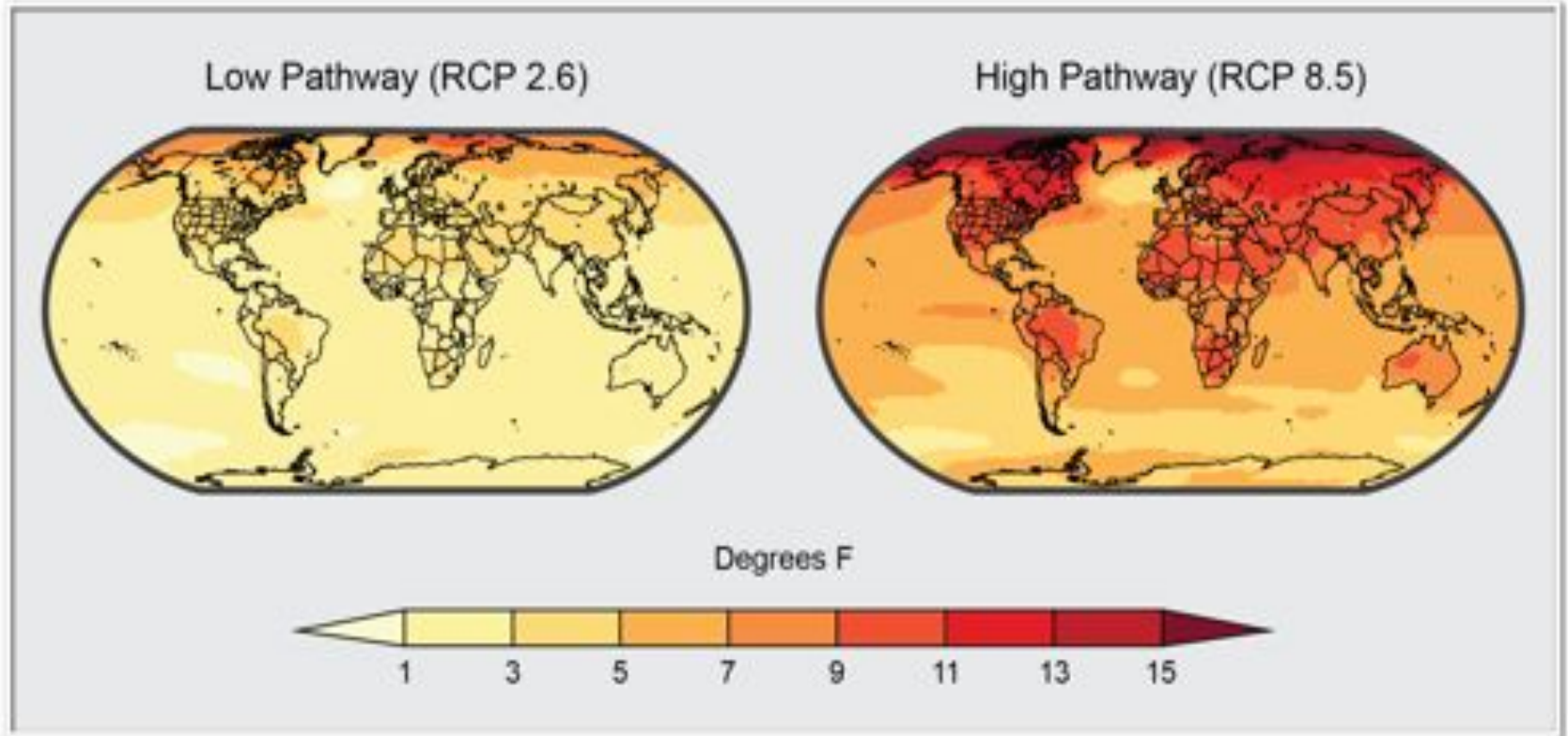
Human-induced climate change is projected to continue and accelerate significantly if emissions of heat-trapping gases continue to increase.

- Heat-trapping gases already in the atmosphere have committed us to a hotter future.
- The magnitude of climate change beyond the next few decades depends primarily on the amount of emissions emitted now and in the future.



Continued Emissions

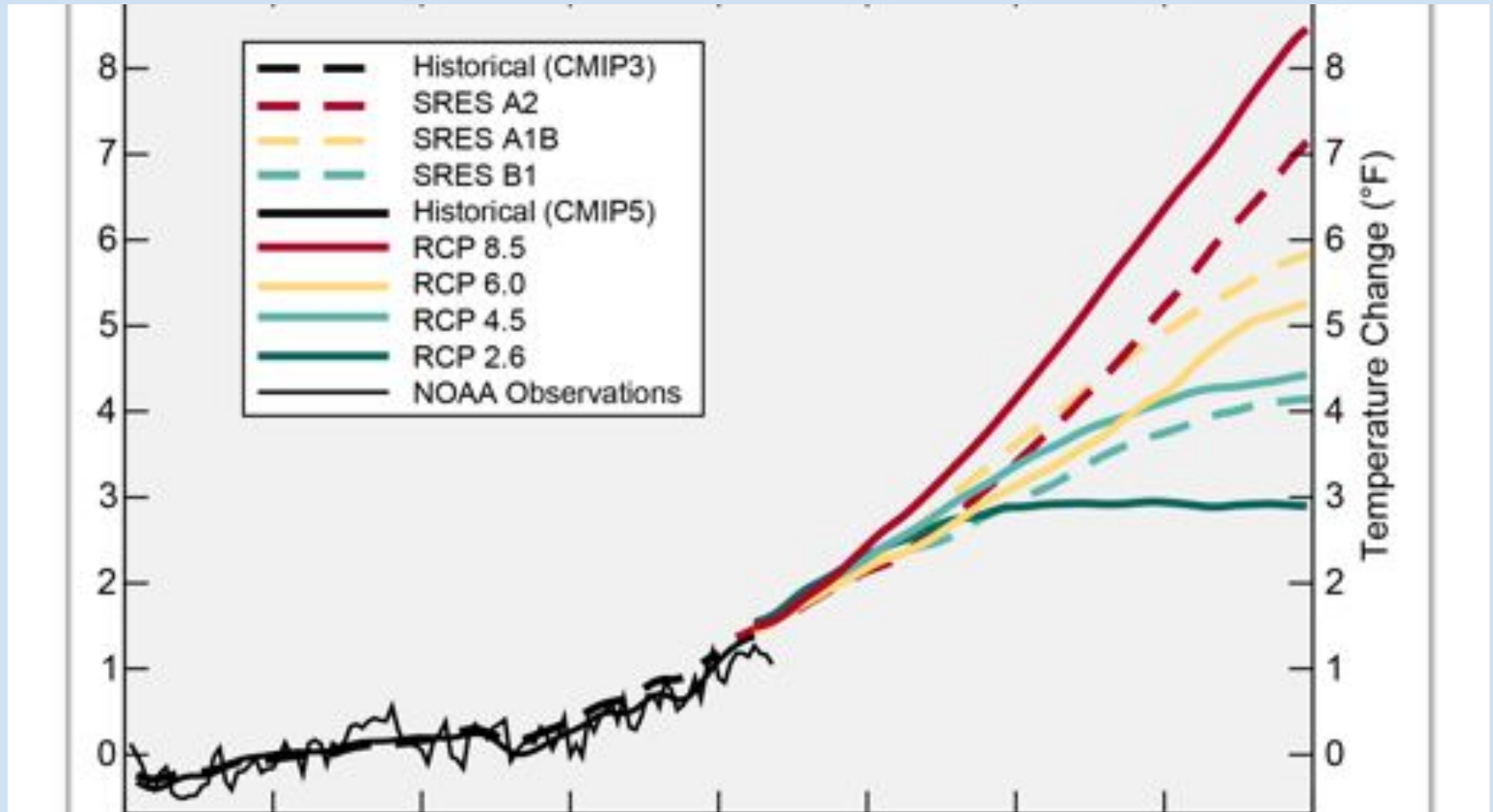
Largest Temperature Increases Over Continents



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Assessment**

Future Temperatures Depends on Rates of Emissions



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National Climate Assessment

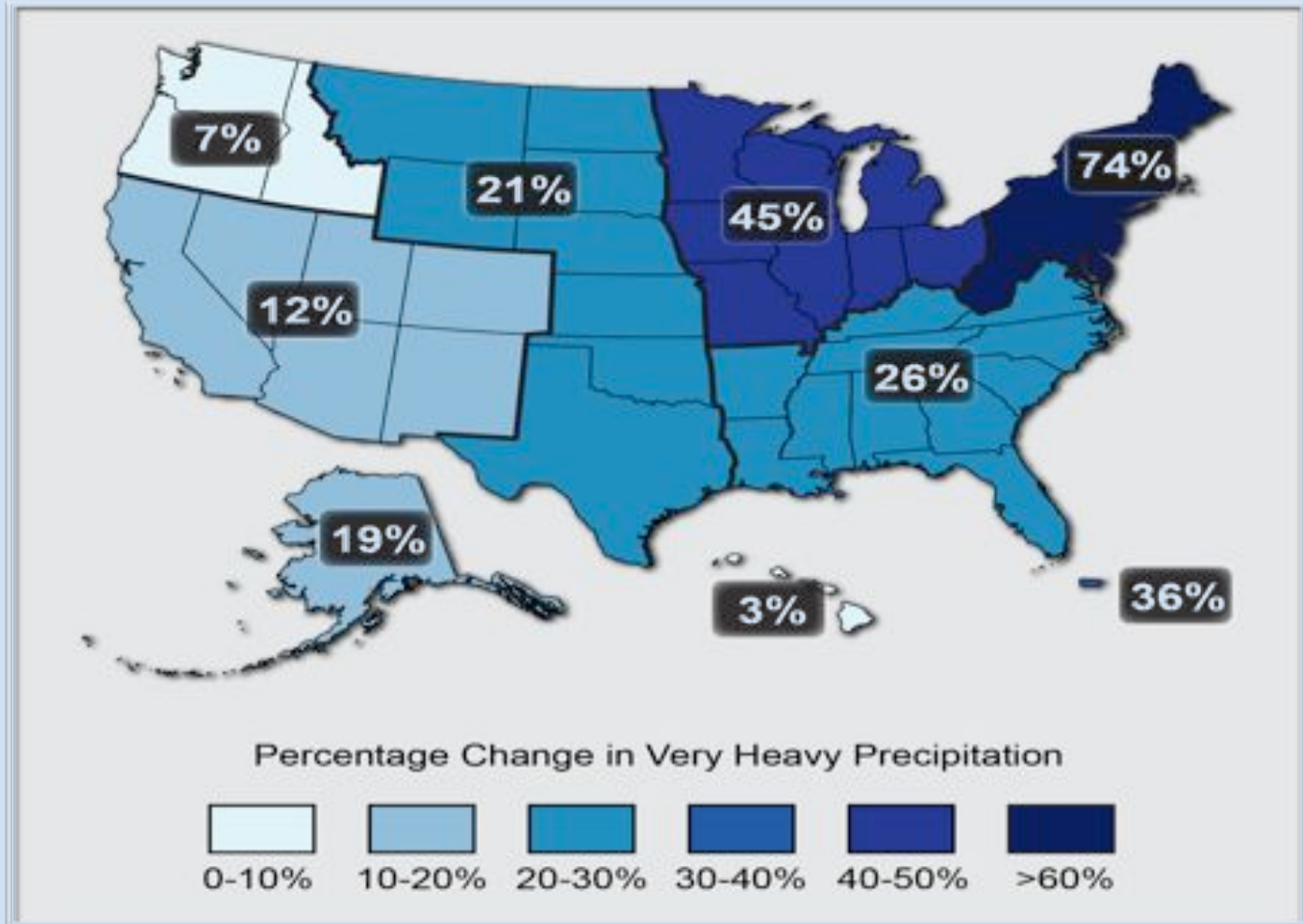
Key Finding #4

Impacts related to climate change are already evident in many sectors and are expected to become increasingly challenging across the nation throughout this century and beyond.



Impacts Already Evident

Percentage Change in Very Heavy Precipitation

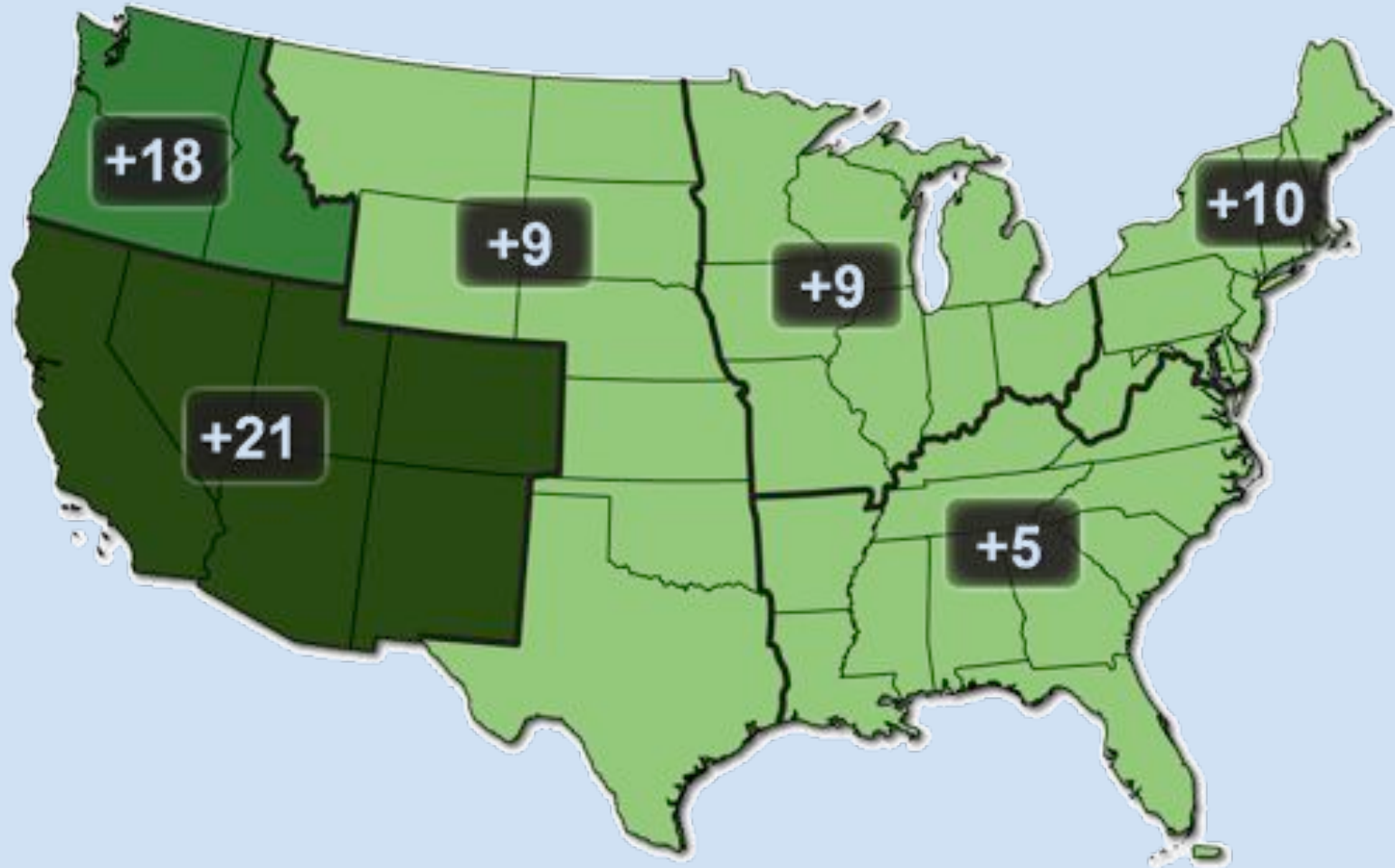


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National Climate Assessment

Impacts Already Evident

Observed Changes in Frost-Free Season



Increases in Annual Number of Days

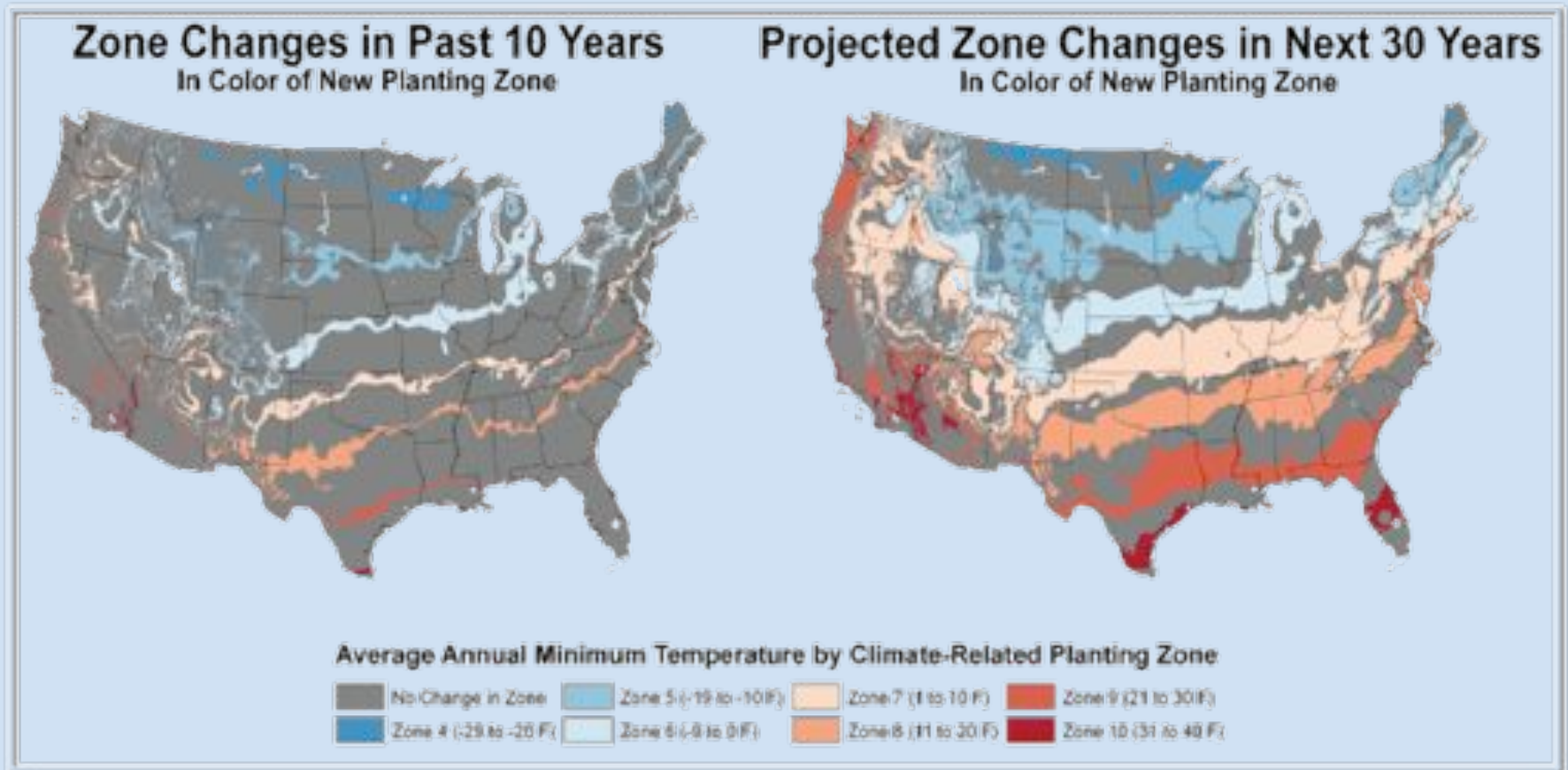


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Adverse impacts to crops and livestock

Shift in Plant Hardiness Zones

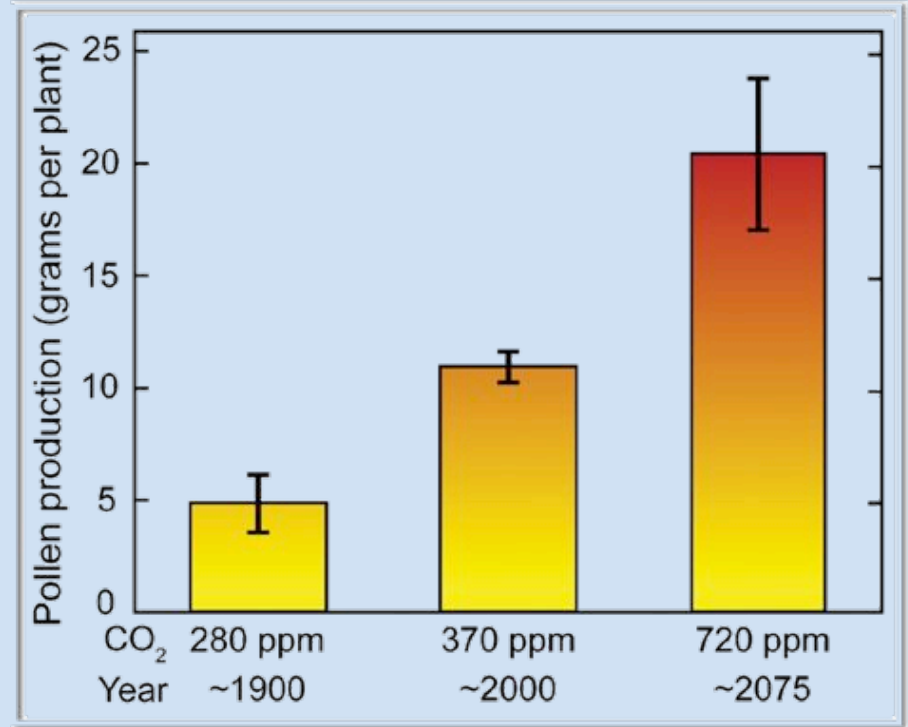


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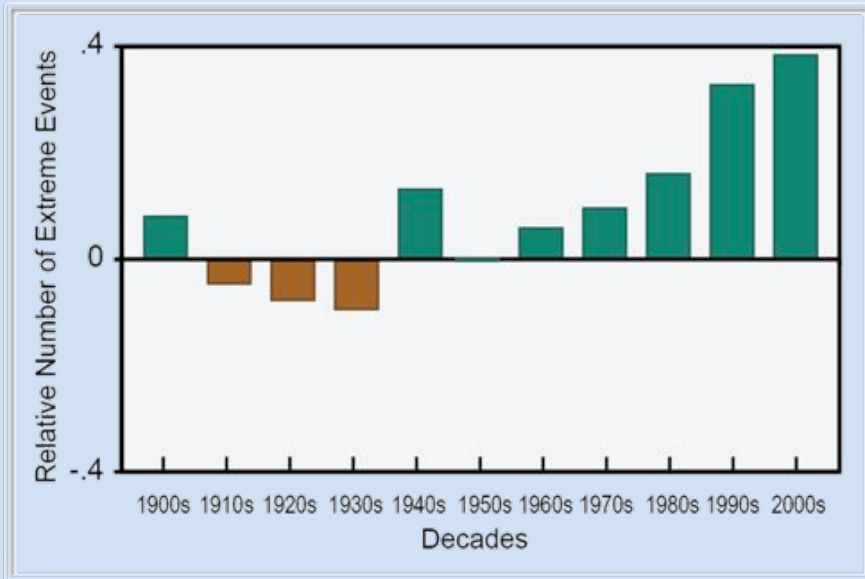
**National Climate
Assessment**

Impacts Already Evident

Pollen Counts Rise with Increasing Carbon Dioxide



Observed U.S. Trends in Heavy Precipitation

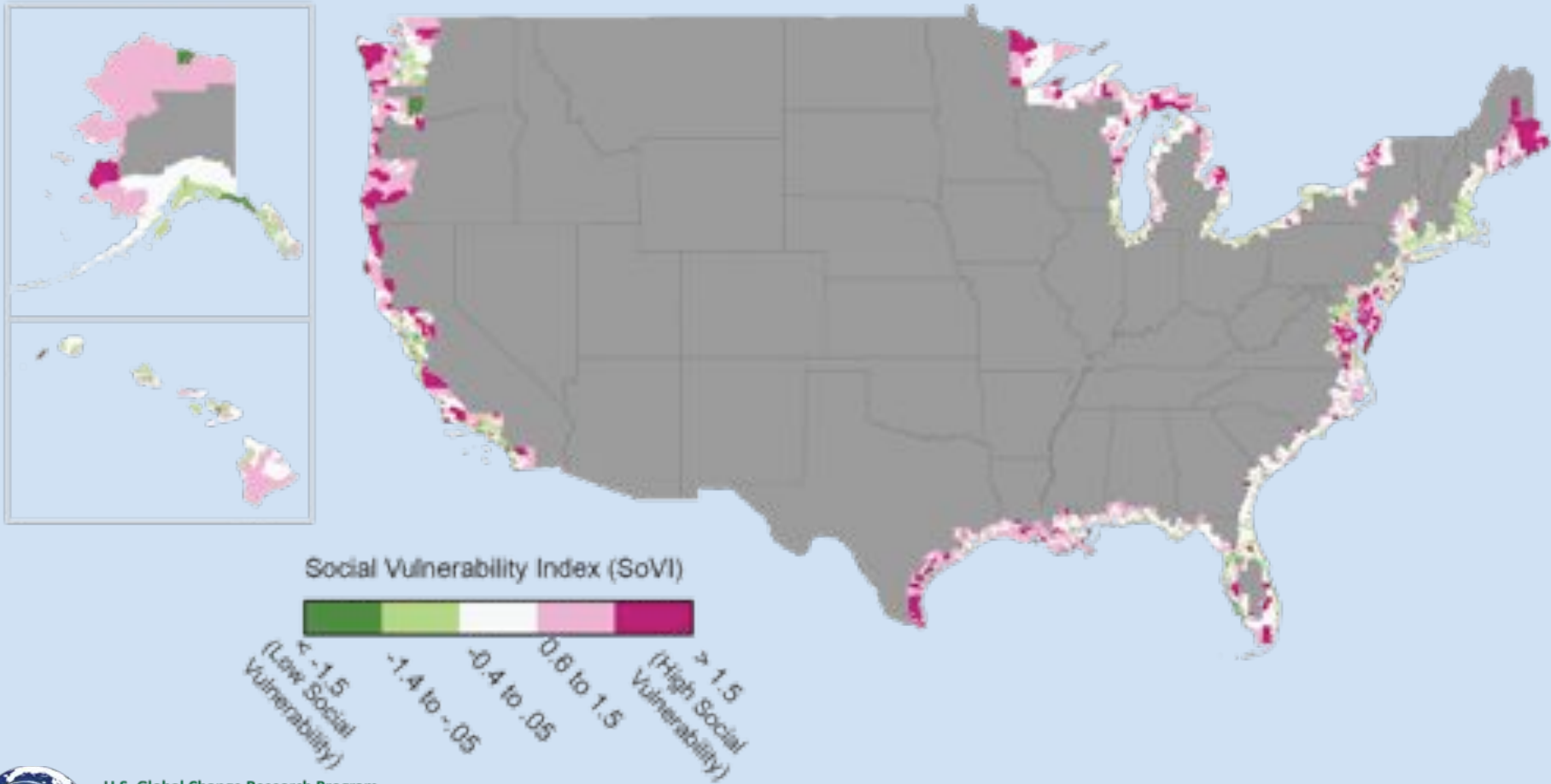


Human Health & Well-being

a

Risk of Shoreline Change

Social Vulnerability Index

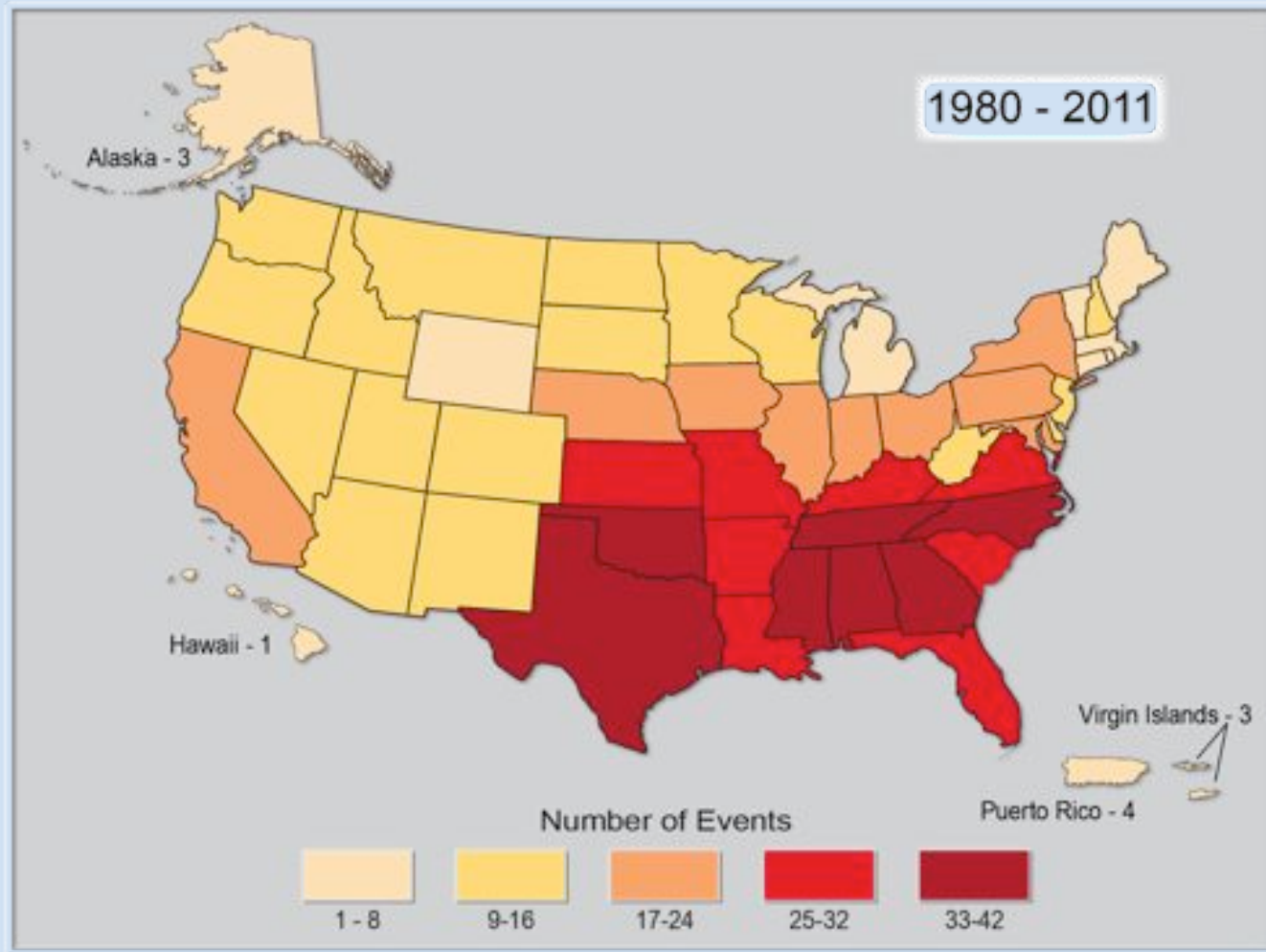


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Assessment**

Impacts Already Evident

Billion Dollar Weather/Climate Disasters



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National Climate
Assessment

Key Finding #5

Climate change threatens human health and well-being in many ways, including impacts from increased extreme weather events, wildfire, decreased air quality, Diseases transmitted by insects, food, and water, and threats to mental health.

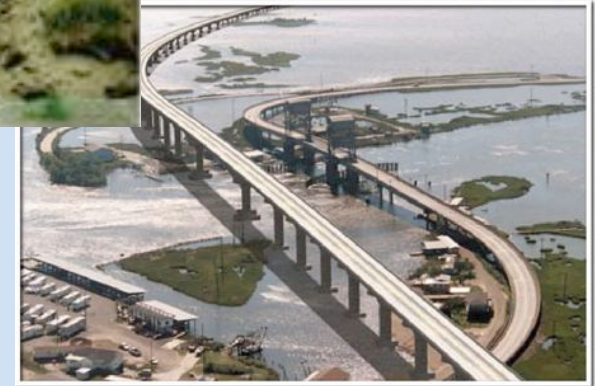
Smoke from Wildfires has Widespread Health Effects





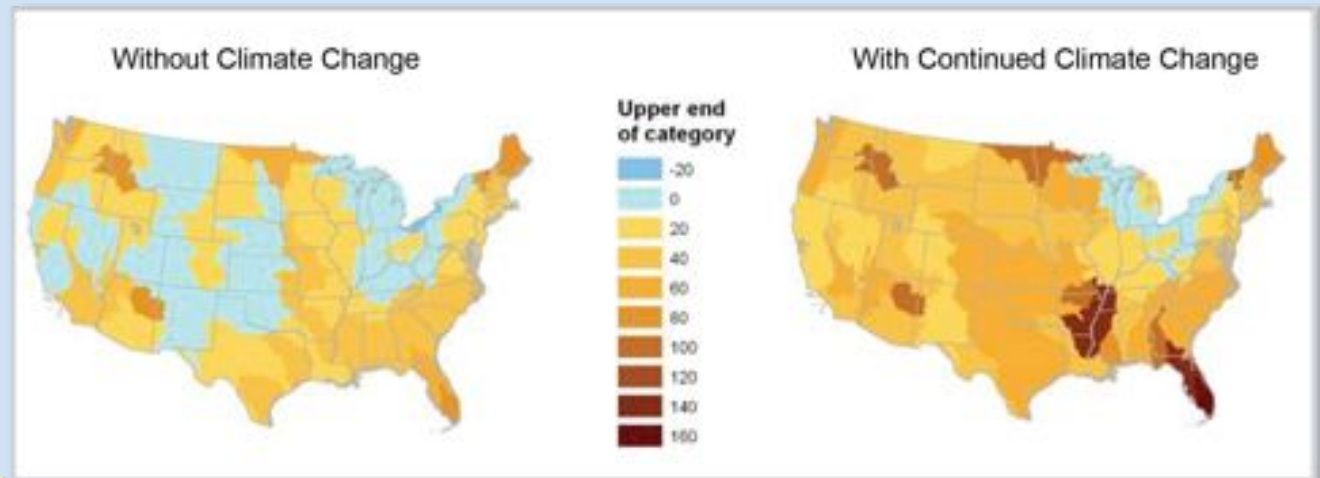
Key Finding #6

Infrastructure across the U.S. is being adversely affected by phenomena associated with climate change, including sea level rise, storm surge, heavy downpours, and extreme heat.



Key Finding #7

Reliability of water supplies is being reduced by climate change in a variety of ways that affect ecosystems and livelihoods in many regions, particularly the Southwest, the Great Plains, the Southeast, and the islands of the Caribbean and the Pacific, including the State of Hawai`i.



Key Finding #8

Adverse impacts to crops and livestock over the next 100 years are expected. Over the next 25 years or so, the agriculture sector is projected to be relatively resilient, even though there will be increasing disruptions from extreme heat, drought and heavy downpours. U.S. food security and farm incomes will also depend on how agricultural systems adapt to climate changes in other regions of the world.

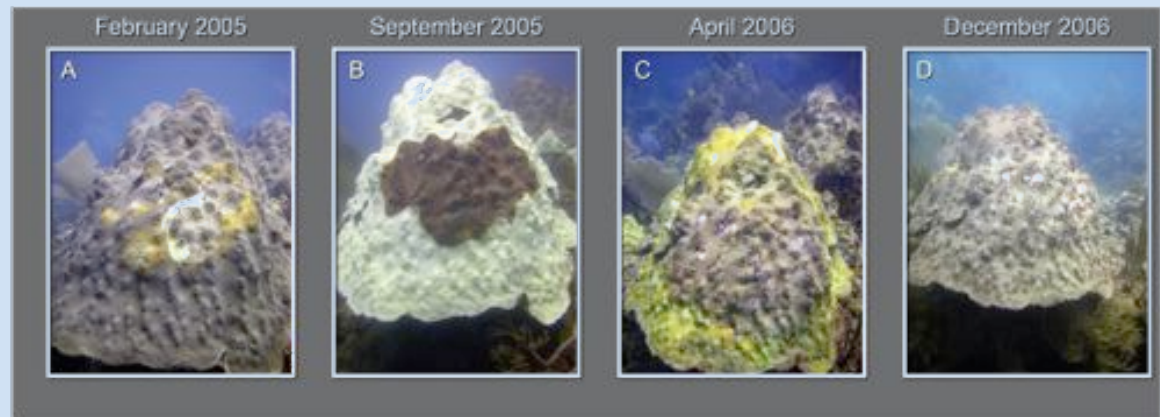




Key Finding #9

Natural ecosystems are being directly affected by climate change, including changes in biodiversity and location of species. As a result, the capacity of ecosystems to moderate the consequences of disturbances such as droughts, floods, and severe storms is being diminished.

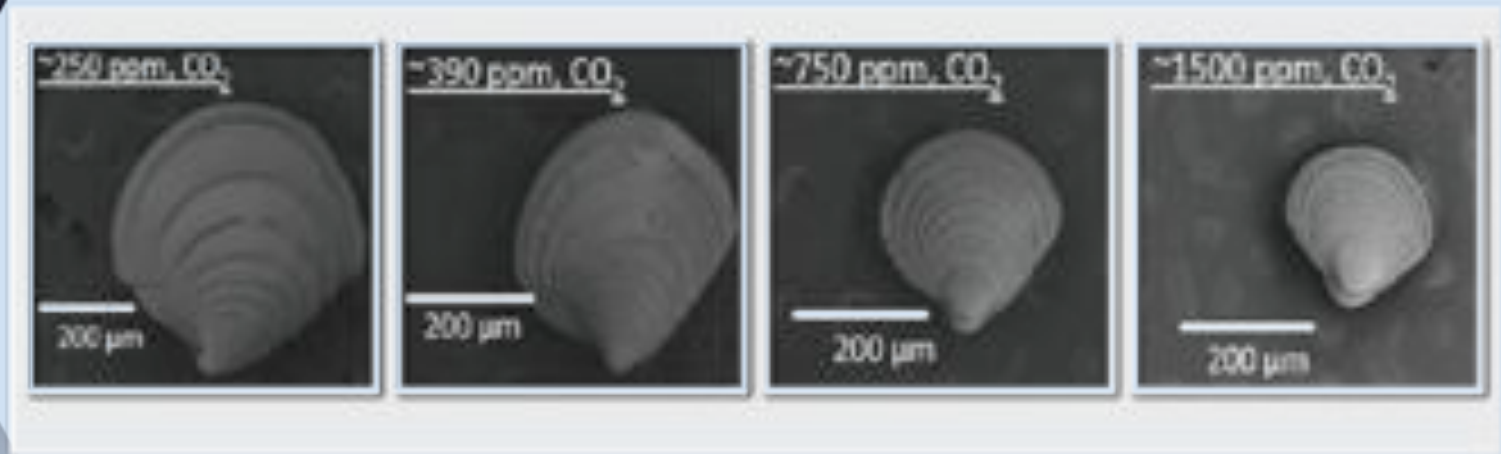
Warming Seas are a Double-Blow to Corals



Key Finding #10

Life in the oceans is changing as ocean waters become warmer and more acidic.

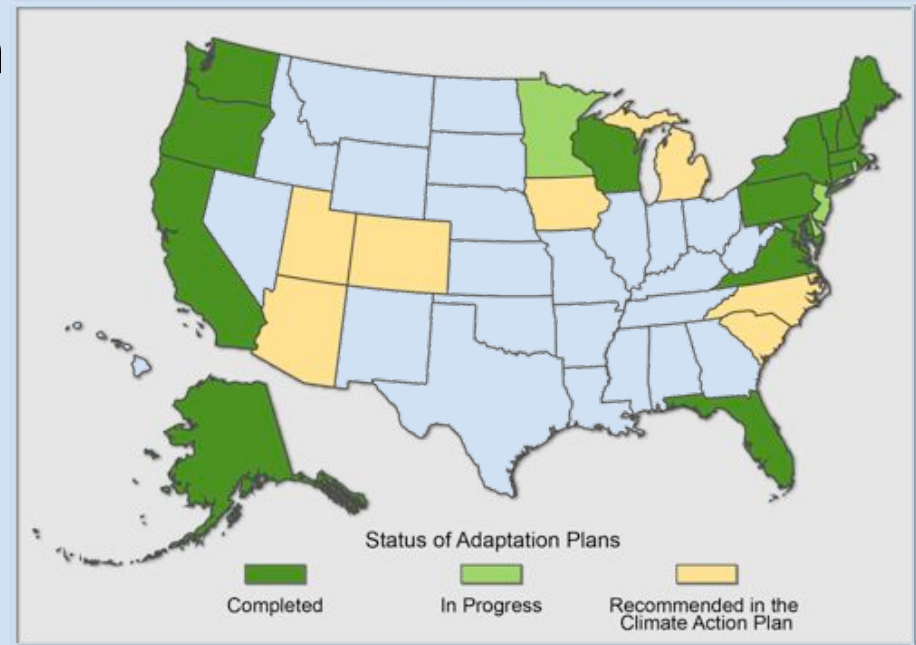
Ocean Acidification Causes Clams to Shrink



Key Finding #11

Planning for adaptation (to address and prepare for impacts) and mitigation (to reduce emissions) activities is increasing, but progress with implementation is limited.

Climate Adaptation Plans



Adaptation Process



U.S. Global Change Research Program
National Climate Assessment

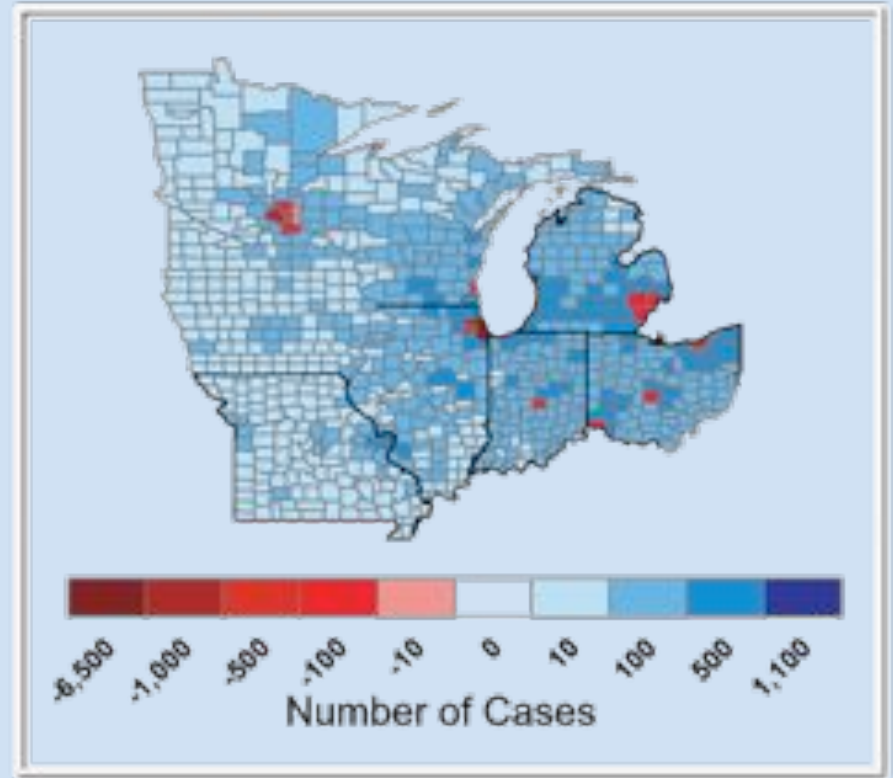
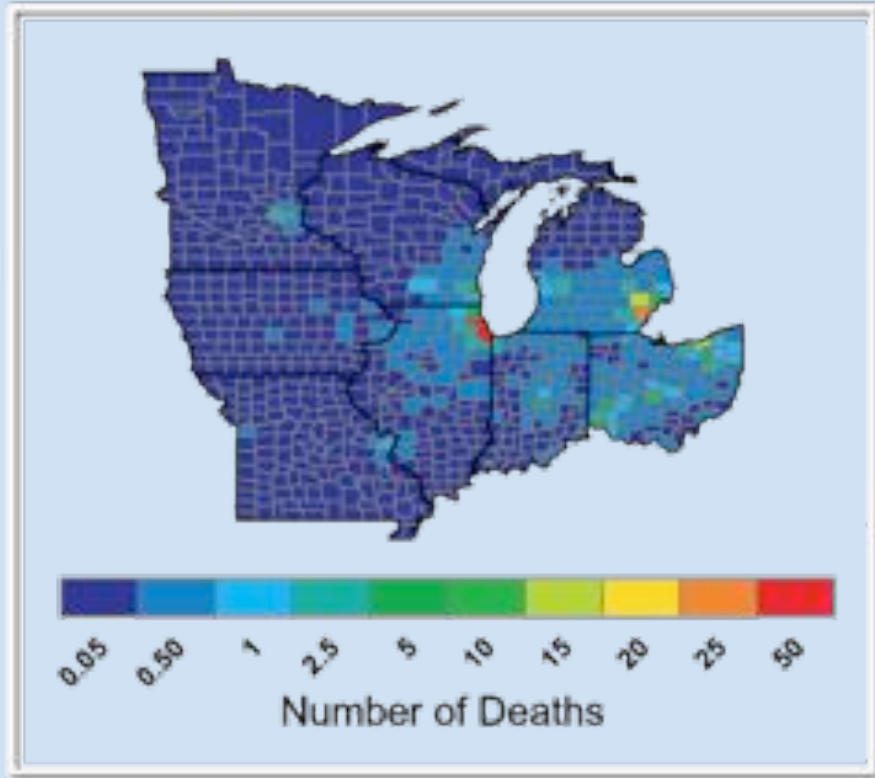


National Climate Assessment

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Adaptation in the Health Sector

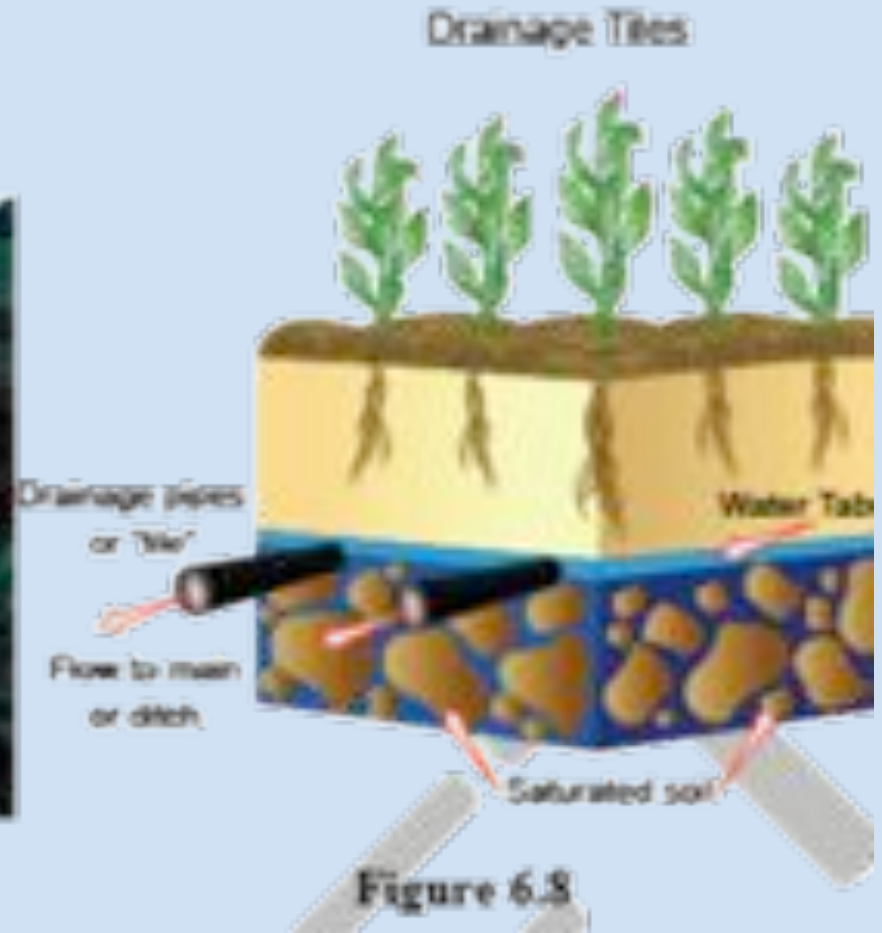
Reducing Emissions, Improving Health



Adaptation in Agriculture



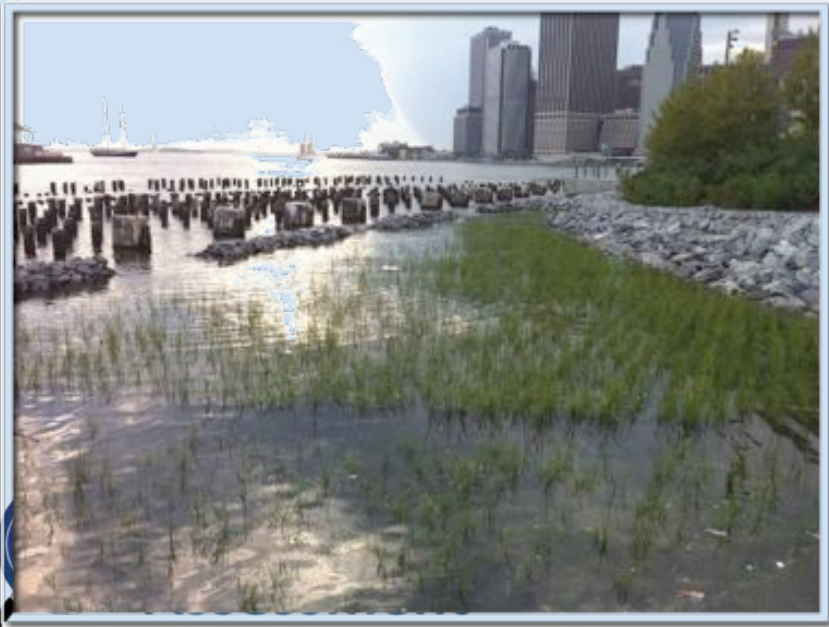
Figure 6.7



Effectiveness of Fuel Treatments



Ecosystem Restoration



Planning

Adaptation Possibilities for Coastal Infrastructure



**National
Climate
Assessment**

U.S. Global Change Research Program

Thank you

National Climate Assessment Southwest Region: Key Findings

Town Hall on Sustained Assessment of
Climate Change in the Southwest
January 18, 2013

Gregg Garfin, The University of Arizona



Gregg Garfin, University of Arizona

Guido Franco, California Energy Commission

Hilda Blanco, University of Southern California

Andrew Comrie, University of Arizona

Patrick Gonzalez, National Park Service

Thomas Piechota, University of Nevada, Las Vegas

Rebecca Smyth, NOAA

Reagan Waskom, Colorado State University

Climate & Water

Agriculture

Forests & Fires

Coasts

Urban Areas & Health

Energy & Water

Tribal & Border Communities





50%





95%

Salt Lake City



Denver

92.7%



Las Vegas



Albuquerque



Phoenix



Los Angeles

La Región Transfronteriza









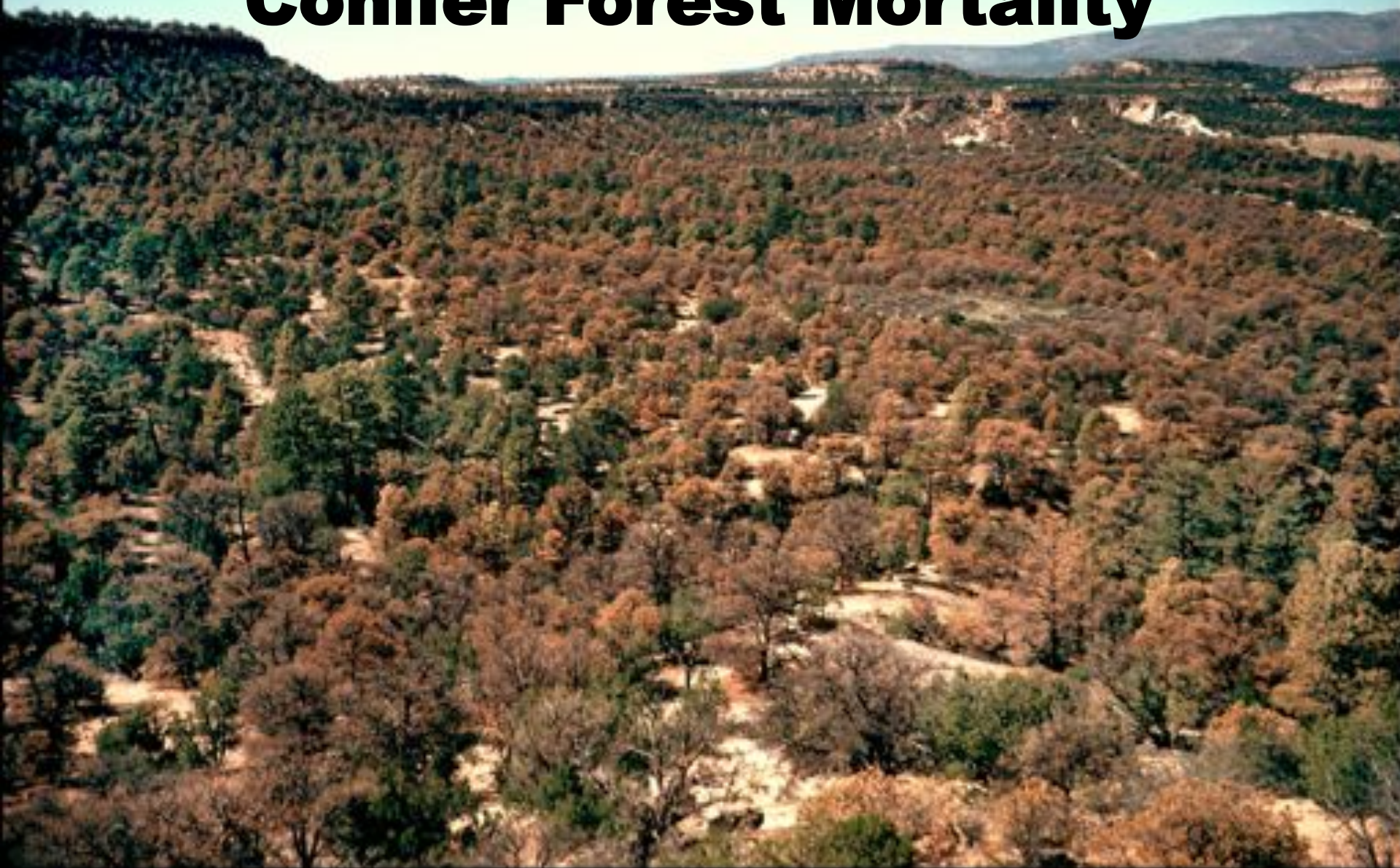


**Elephant Butte Reservoir
Rio Grande**



**Lake Mead
Colorado River**

Conifer Forest Mortality



Jemez Mountains
Craig Allen, USGS

Forests and Fire: Challenges

Erosion



Fire



Mortality







Higher Emissions (A2)



2021–2050



2041–2070



2070–2099

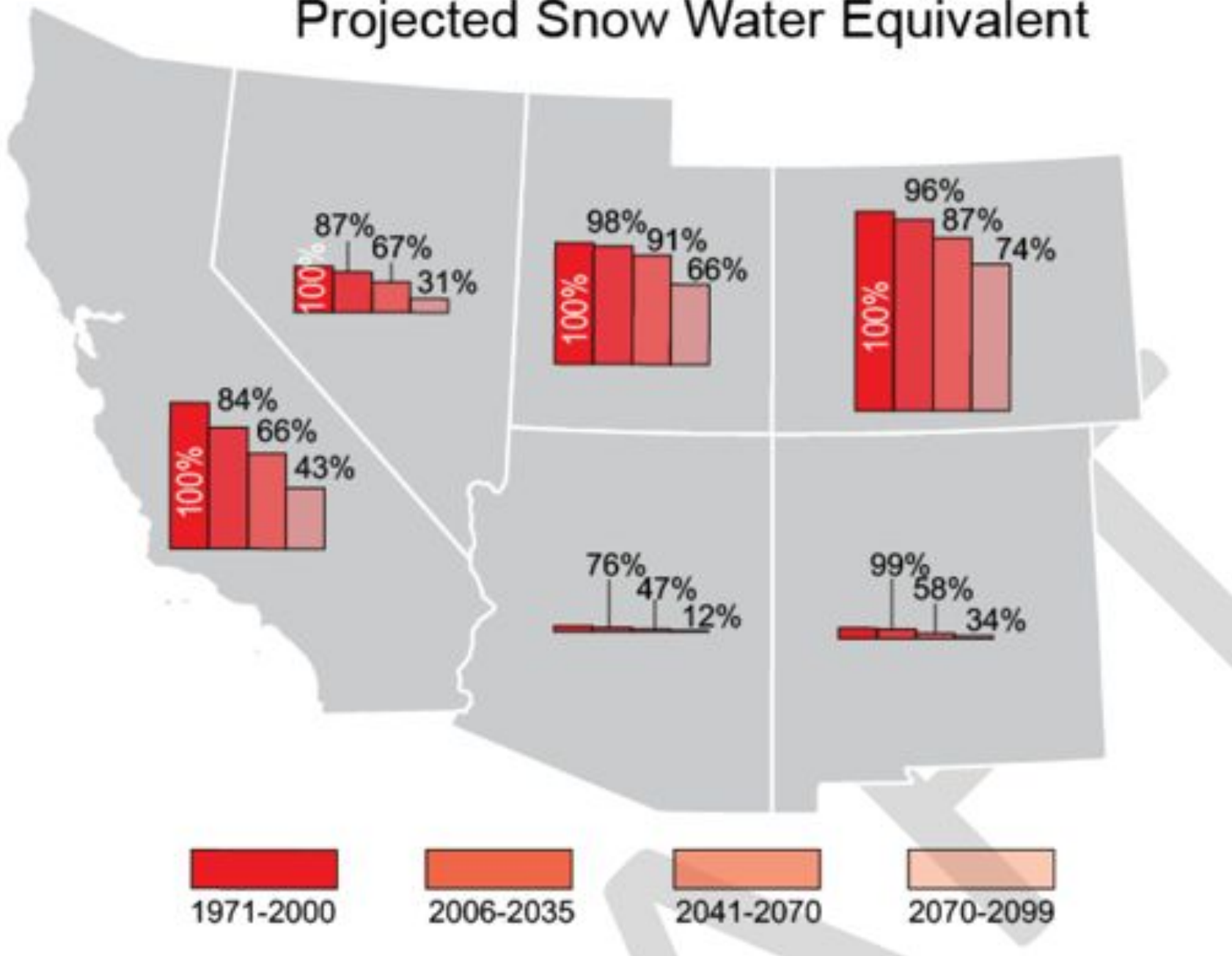
Lower Emissions (B1)

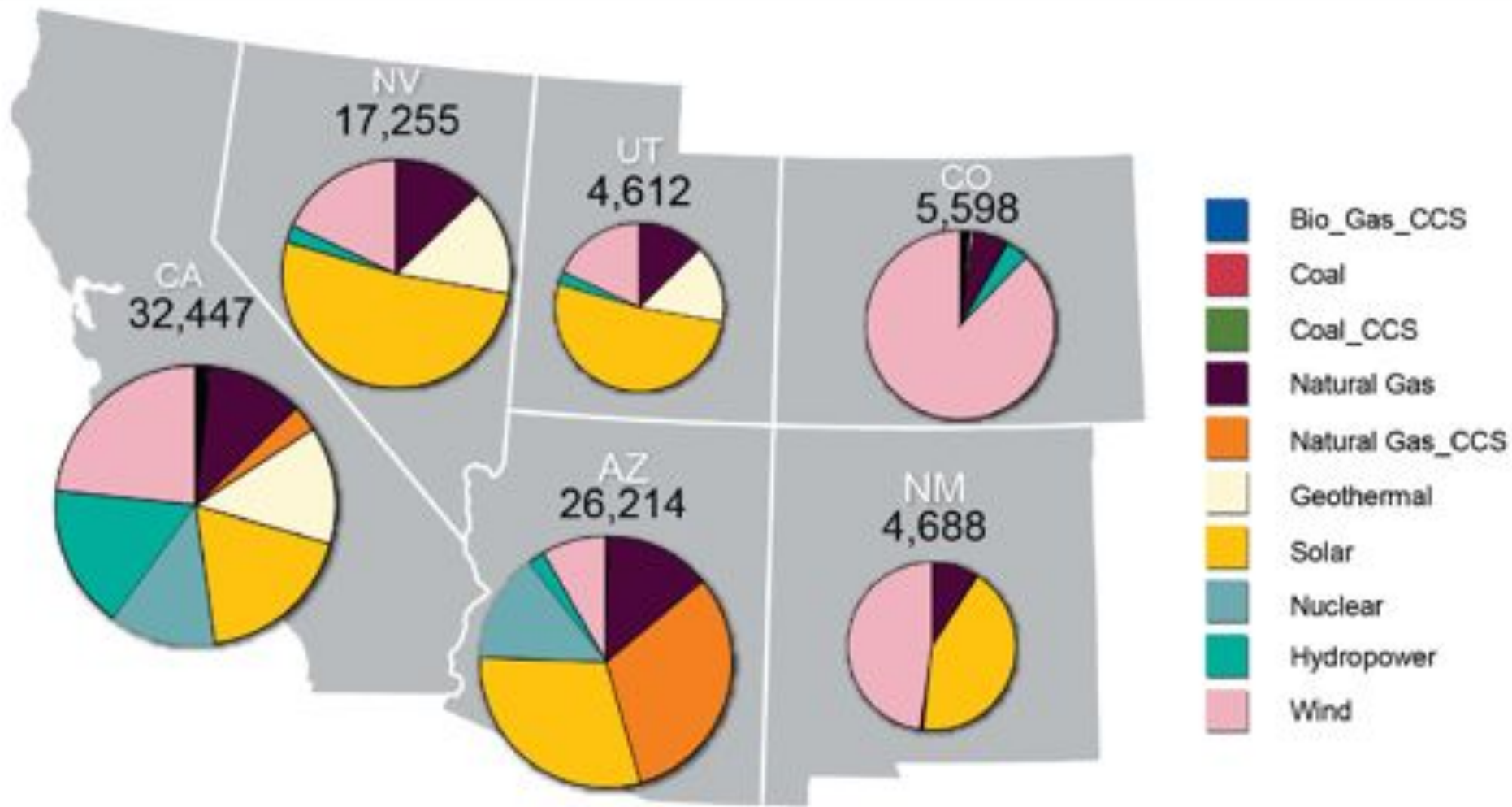


Degrees F



Projected Snow Water Equivalent







Los Conchas Fire New Mexico, 2011





18 January 2013 – NCA Town Hall – La Jolla, CA



18 January 2013 – NCA Town Hall – La Jolla, CA

Urban Heat Spiral

**Brownouts/
Outages**

Cooling centers,
neighbors
check on
elderly

**Energy
System
Stress**

Move to
smart grid; add
solar generation
for summer
peak demand

**More Electricity
Demand**

Reduce electrical
demand for other uses

**More Heat
Waves**

White roofs,
plant trees,
increased
shading

**More Air
Conditioning
Use**

Reduce non-AC
demand
via energy star
appliances



Spot News

Southern California Blackouts in San Diego,
South Orange County During Heatwave

By Dennis Romero Fri., Sep. 9 2011 at 12:31 AM

Categories: [Spot News](#)

62 Comments

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NCA WATER RESOURCES FINDINGS *With a Southwestern slant*

Mike Dettinger

US Geological Survey, Scripps Institution of Oceanography, La Jolla

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David Yates, *University Corp for Atmospheric Research*



Southwest Climate
Science Center



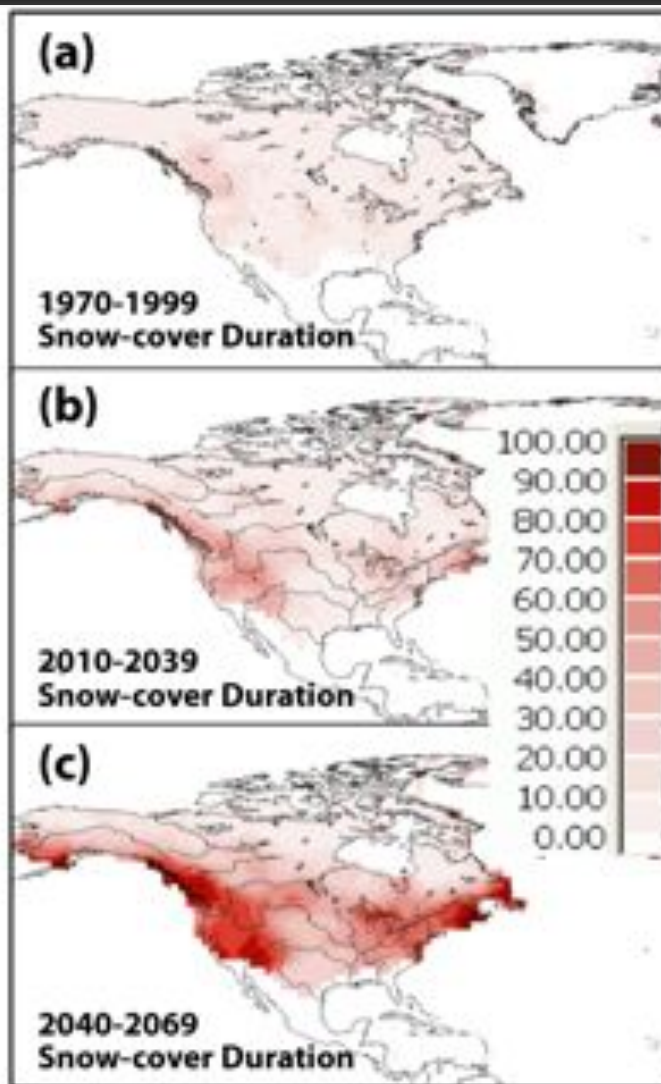
Key Findings regarding the Water Cycle:

- 1. Annual precipitation & runoff will decline**, and have been declining in the Southwest. **Snow reserves are expected to continue declining** in response to warming.
- 2. Droughts expected to intensify**, resulting in reduced water availability in the Southwest in response to both declining precipitation & rising temperatures.
- 3. Floods have NOT been increasing in the Southwest yet, but are projected to increase in the future** in a few studies. In California, sea-level rise may be expected to compound problems associated with larger floods in coastal areas.
- 4. Ground-water recharge & availability may be expected to change**, but not clear **how** yet. Much southwestern recharge derives preferentially from snowmelt, and as snowmelt changes, net impacts on groundwater systems remain uncertain.
- 5. Water quality in rivers and lakes are likely to be affected in uncertain ways** by rising temperatures and changing precipitation rates, timing and drought.

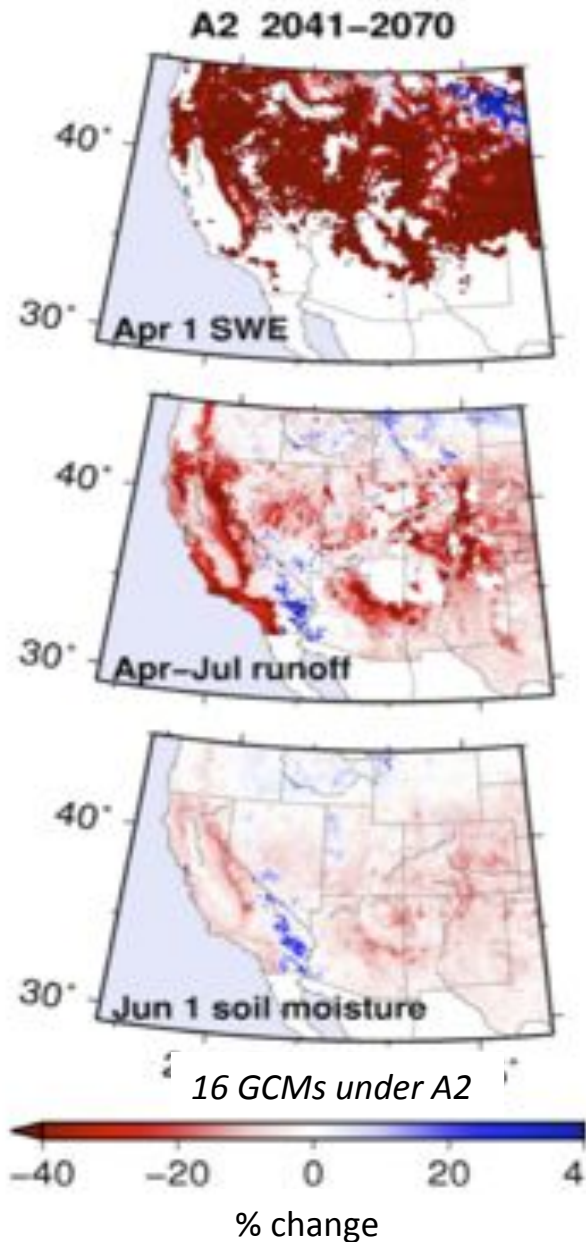
Key Findings regarding Water Resources:

7. **Surface & ground water supplies** are expected to be reduced further by declining runoff & groundwater-recharge changes, **increasing the likelihoods of water shortages for many off-stream & in-stream water uses.**
8. **Increasing flood risks** will affect safety, health, infrastructure, economies and ecosystems in many basins.
9. **Historical or existing practices may not be well suited** for these new risks, vulnerabilities and opportunities.... Think, “**stationarity is dead.**”
10. Recommended response: **Increase resilience and enhance adaptive capacity**; however, these moves will always be made in contexts of many other challenges & uncertainties.

#1: Snow reserves & ultimately runoff are projected to decline



Percentage of GCMs with Significant Decreases
8 GCMs under A2 emissions

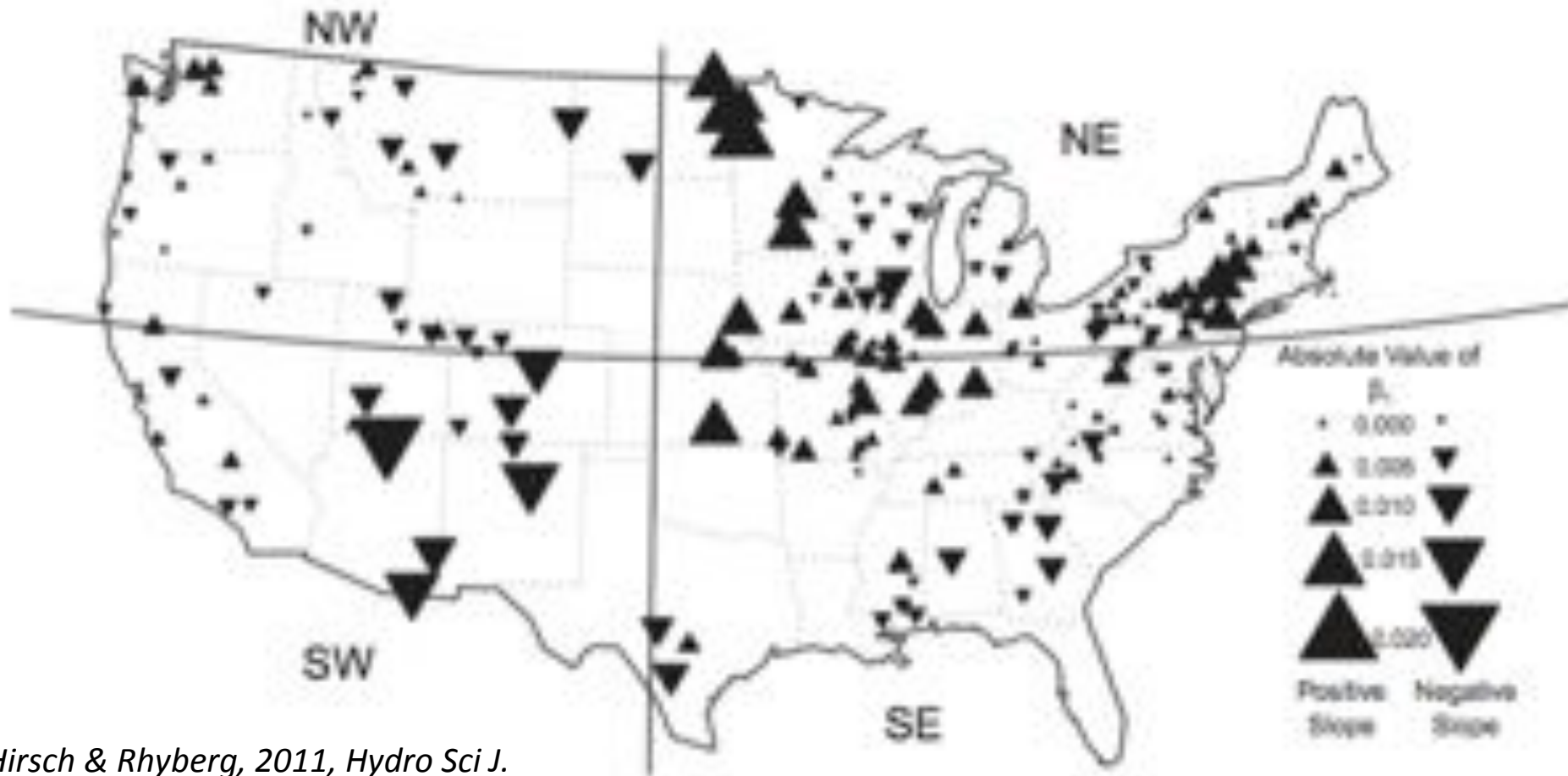


NCA
Fig. 3.1

Brown &
Mote, 2009

#3: Floods have NOT been increasing in the SW yet, but projected to increase

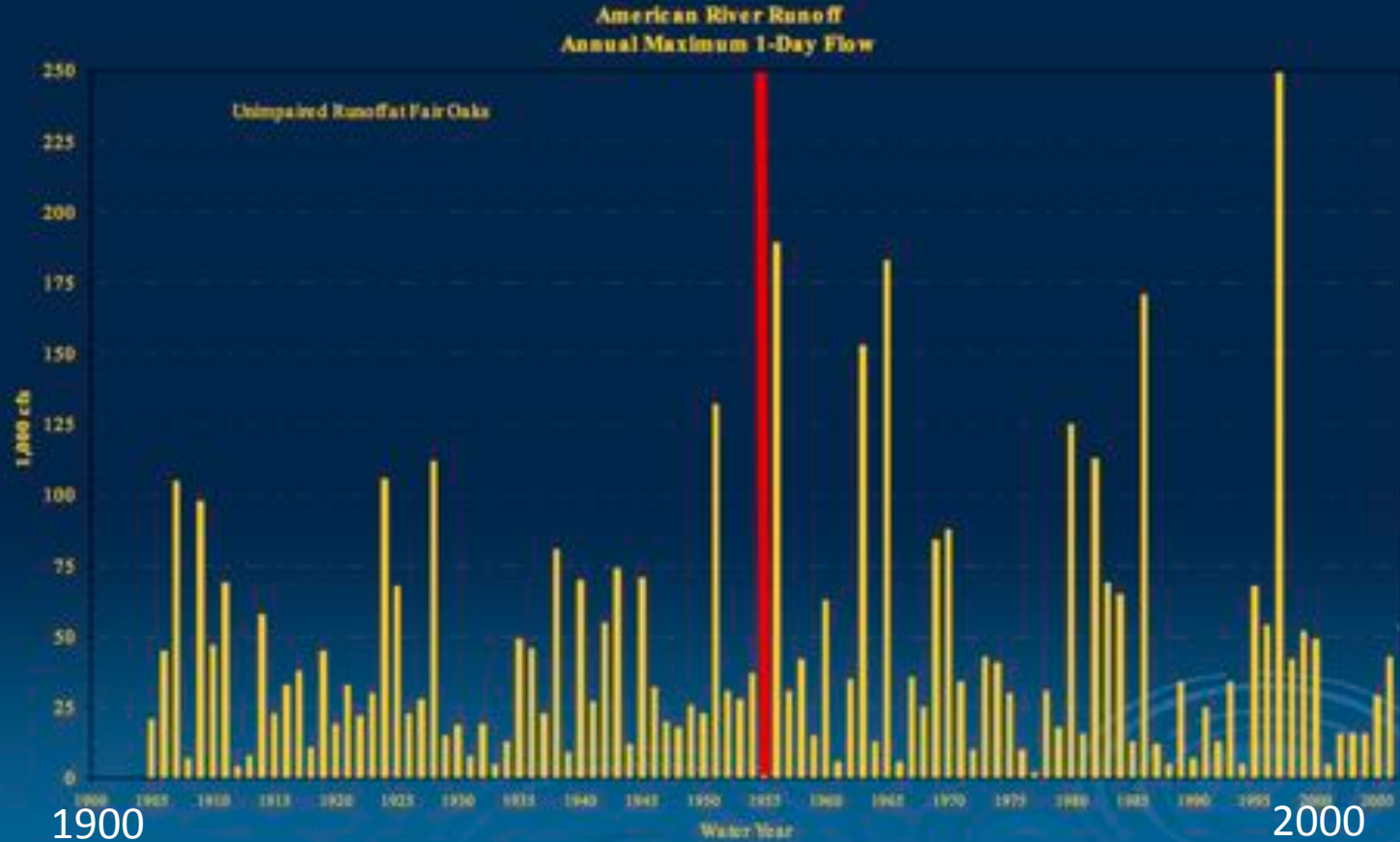
Trends in Historical Annual PeakFlow Series at USGS HCDN Stream Discharges, > 85 yrs



Hirsch & Rhyberg, 2011, *Hydro Sci J.*

#3: Floods have NOT been increasing in the SW yet, but projected to increase

Changes in Peak Flows American River



Red Line = Construction of Folsom Dam

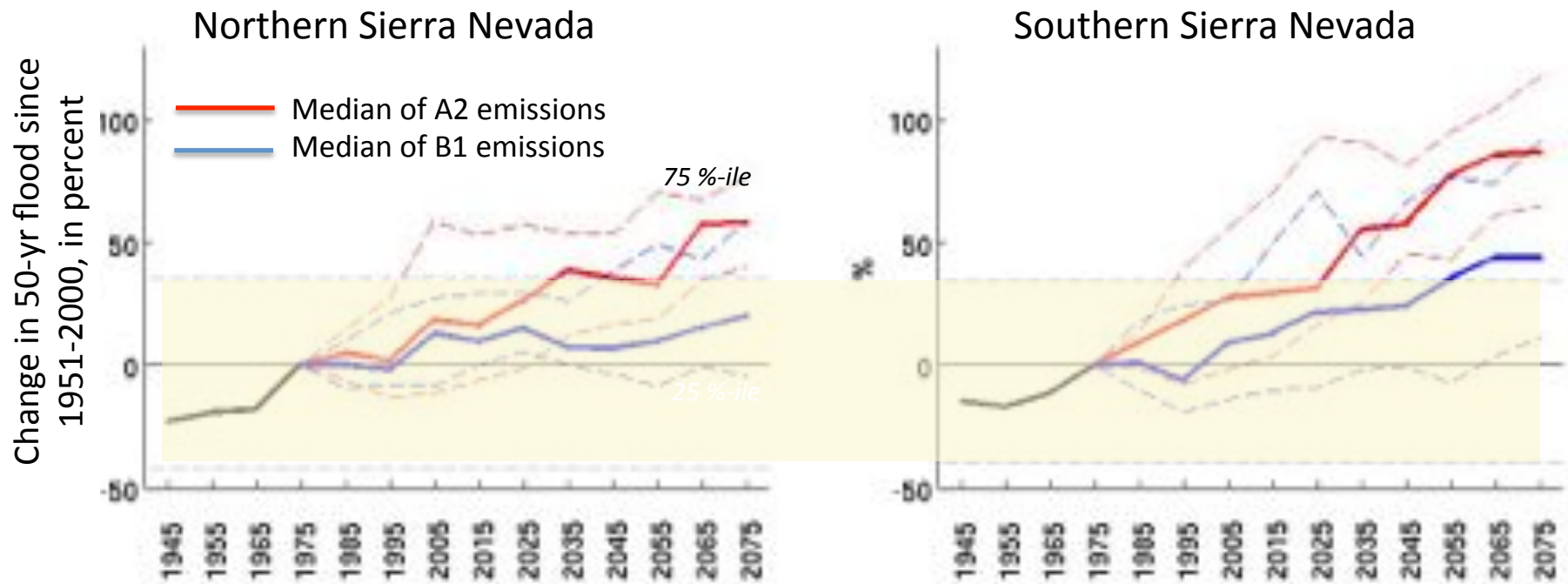
L. Snow, CA DWR, 2007

#3: Floods have NOT been increasing in the SW yet, but projected to increase



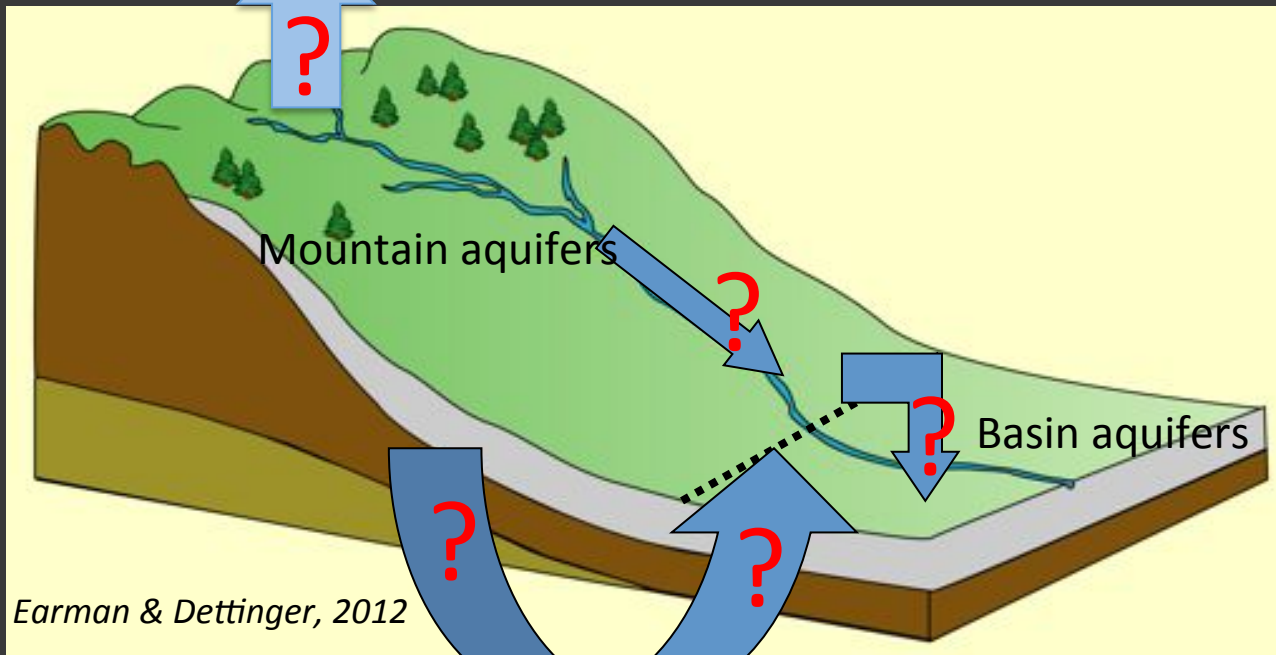
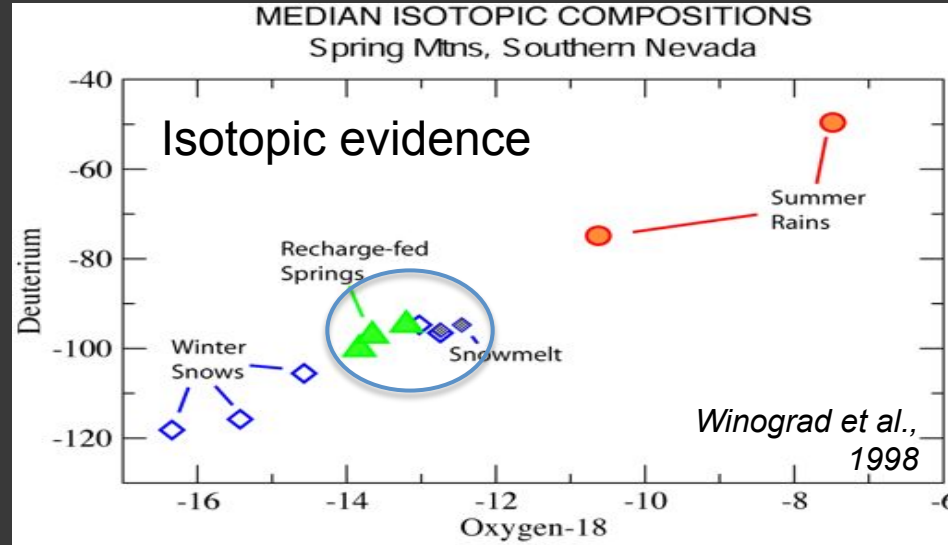
Projected 50-yr floods from Sierra Nevada

Distributions from ensemble of 16 different AR4 GCMs



#4: Ground-water recharge & gw availability may be expected to change

In arid-semiarid zones of Southwest, recharge comes preferentially from mountain snowmelt.



Thus, changes in mountain snowpacks are likely to affect locations and perhaps amounts of recharge in SW.

#7: Increasing likelihoods of water shortages for off-stream & in-stream water uses

Percentage changes in Water Withdrawals from 2005 to 2060

A2 emissions, 3 GCMs

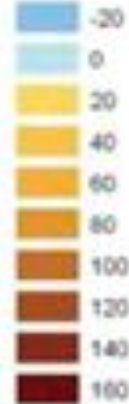
Without Climate Change



With Continued Climate Change



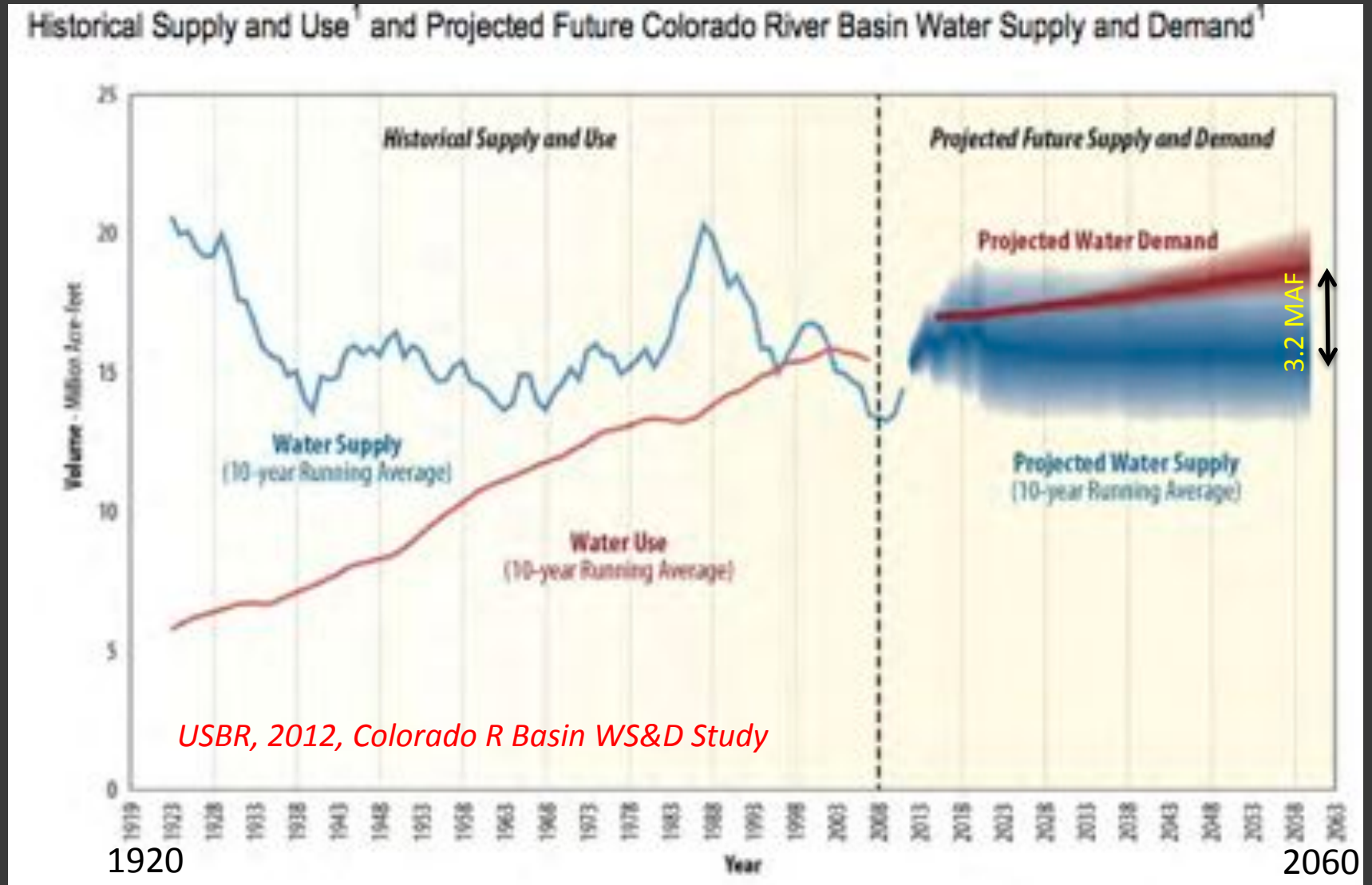
Upper end
of category



Foti et al., USFS, 2012

Without climate change, US demand for water increases by 3 to 8% in next 50 yrs;
With climate change, increase is 25 to 35%!

#7: Increasing likelihoods of water shortages for off-stream & in-stream water uses



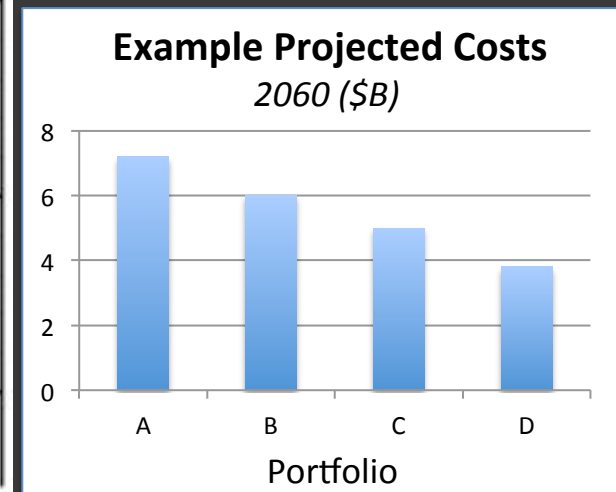
Long-term projected median imbalance rises to about 3.2 MAF by 2060.

#9: Historical or existing practices may not be well suited

Percentages of Years Vulnerable, Upper/Lower Colorado Basins

Water Supply Scenario	Portfolio	Upper Basin Vulnerability (Lee Ferry Deficit)	Lower Basin Vulnerability (Lake Mead Pool Elevation < 1,000 feet msl)
Observed Resampled	Baseline	0%	7%
	Portfolio A	0%	0%
	Portfolio B	0%	0%
	Portfolio C	0%	0%
	Portfolio D	0%	0%
Paleo Resampled	Baseline	0%	9%
	Portfolio A	0%	0%
	Portfolio B	0%	0%
	Portfolio C	0%	0%
	Portfolio D	0%	1%
Paleo Conditioned	Baseline	5%	16%
	Portfolio A	0%	2%
	Portfolio B	2%	2%
	Portfolio C	0%	3%
	Portfolio D	2%	4%
Downscaled GCM Projected	Baseline	18%	44%
	Portfolio A	3%	11%
	Portfolio B	8%	11%
	Portfolio C	4%	17%
	Portfolio D	11%	18%

USBR "Basin Study", 2012



Costs, Upper & Lower Basin reliability benefits & losses, & underlying tradeoffs all must be weighed...but **climate change amplifies the vulnerabilities regardless.**

Finding #10: Increasing resilience & enhancing adaptive capacity are useful strategies for water resource management and planning in the face of climate change.

Increase resilience and enhance adaptive capacity:

→ Value and promote diversity of mgmt & adaption options.

Amidst many other challenges & uncertainties:

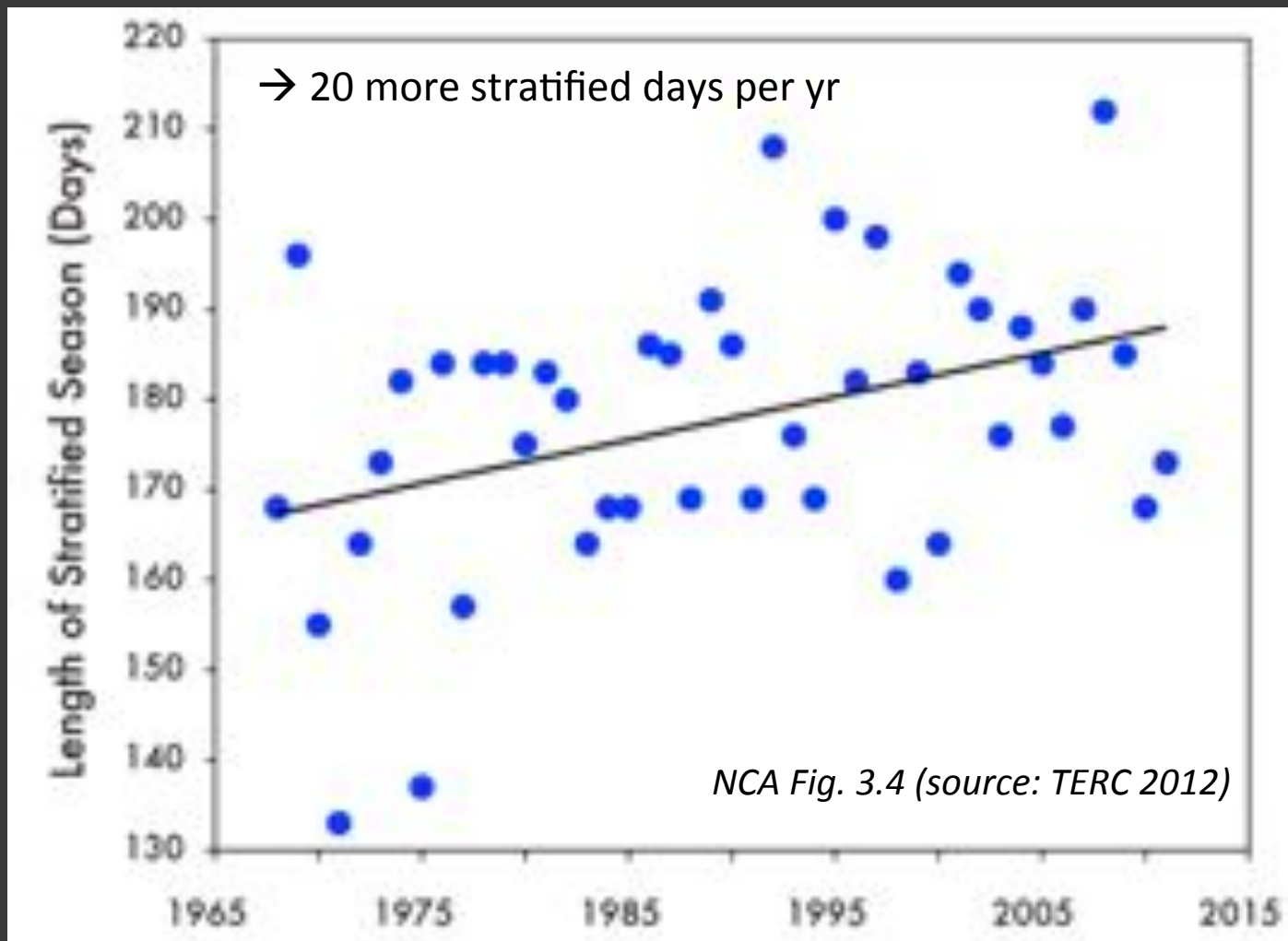
→ Tradeoffs will be the norm forever; do not treat climate change as an isolated issue.



Southwest Climate
Science Center



Observed Changes in Lake Stratification & Mixing: Lake Tahoe, CA



National Climate Assessment Southwest Region: Wildfire and Ecosystems

Town Hall on Sustained Assessment of Climate Change in
the Southwest January 18, 2013

Anthony L. Westerling, University of California, Merced



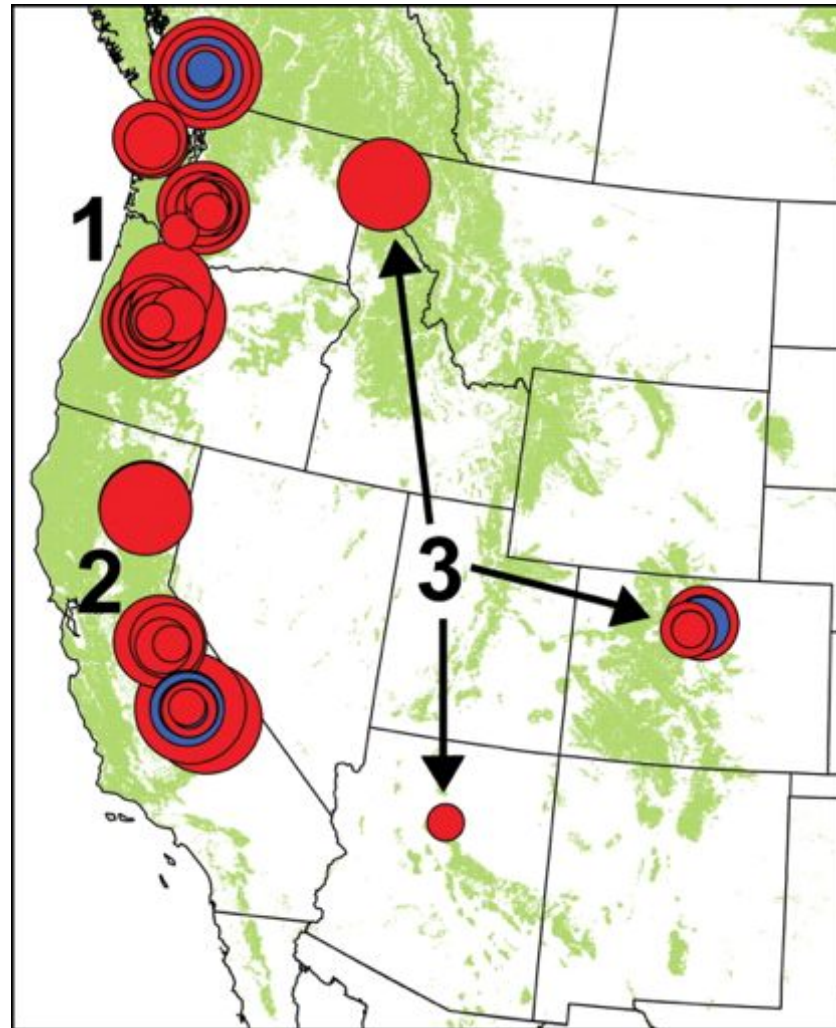
NCA Chapter 20: Southwest Key Message on Wildfire

- **Increased warming, due to climate change, and drought have increased wildfires and impacts to people and ecosystems in the Southwest.**
- **Fire models project more wildfire and increased risks to communities across extensive areas.**

Warming affects tree mortality via multiple pathways:

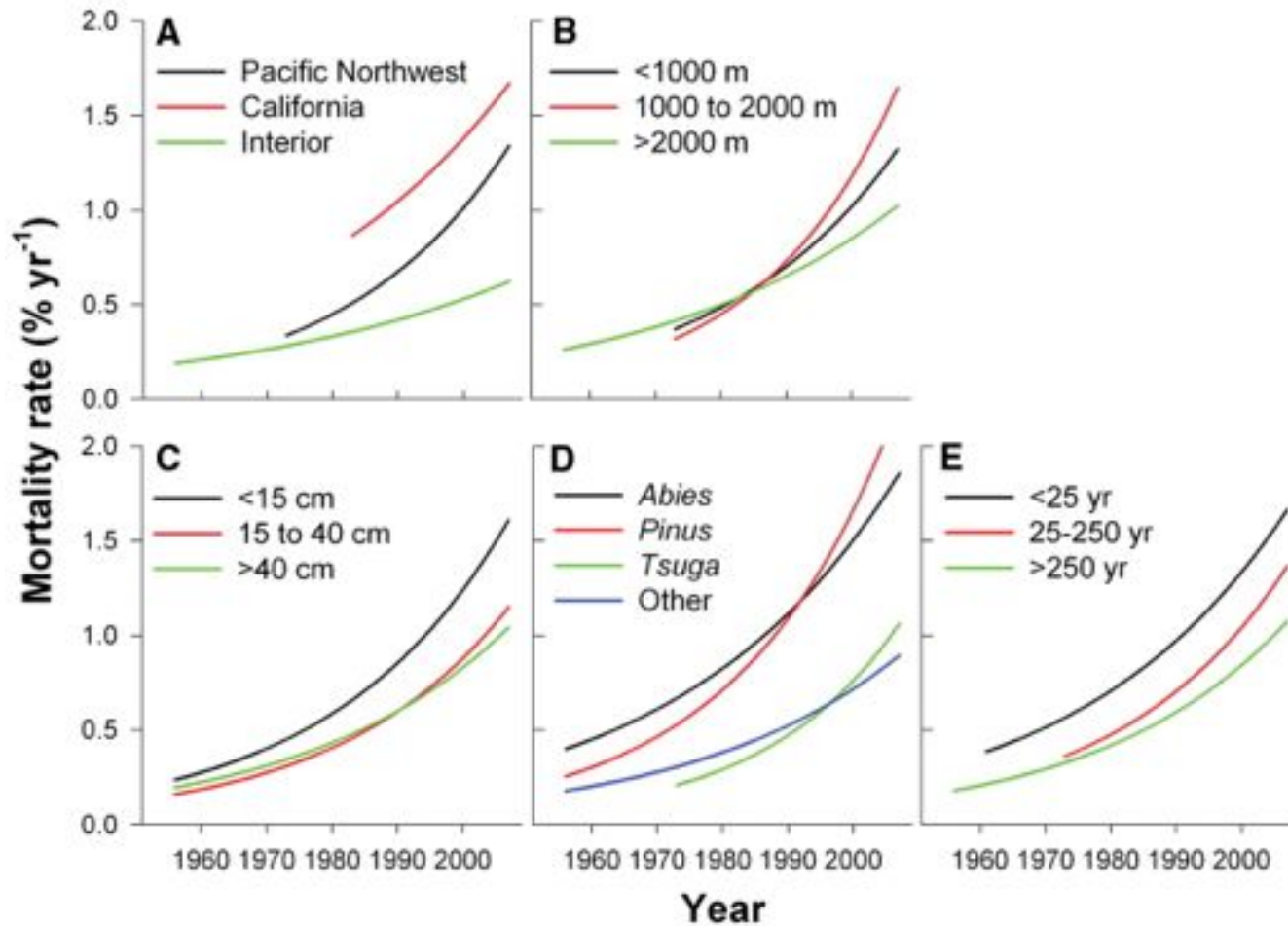
- background (non-catastrophic) tree mortality
 - particularly from drought stress
- bark beetle outbreaks
- wildfire

Fig. 1. Locations of the 76 forest plots in the western United States and southwestern British Columbia.



P J van Mantgem et al. Science 2009;323:521-524

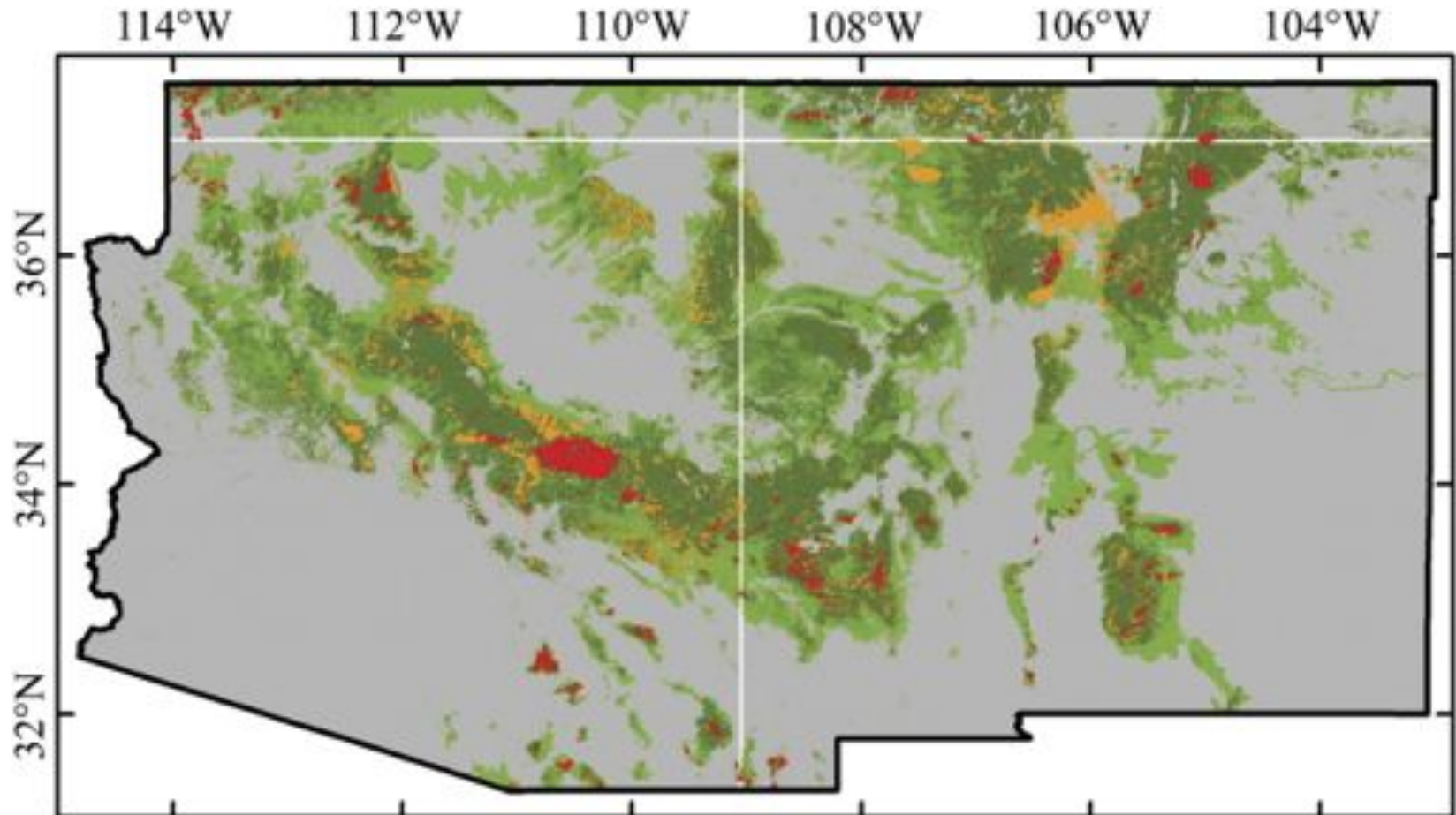
Fig. 2. Modeled trends in tree mortality rates for (A) regions, (B) elevational class, (C) stem diameter class, (D) genus, and (E) historical fire return interval class.



P J van Mantgem et al. Science 2009;323:521-524

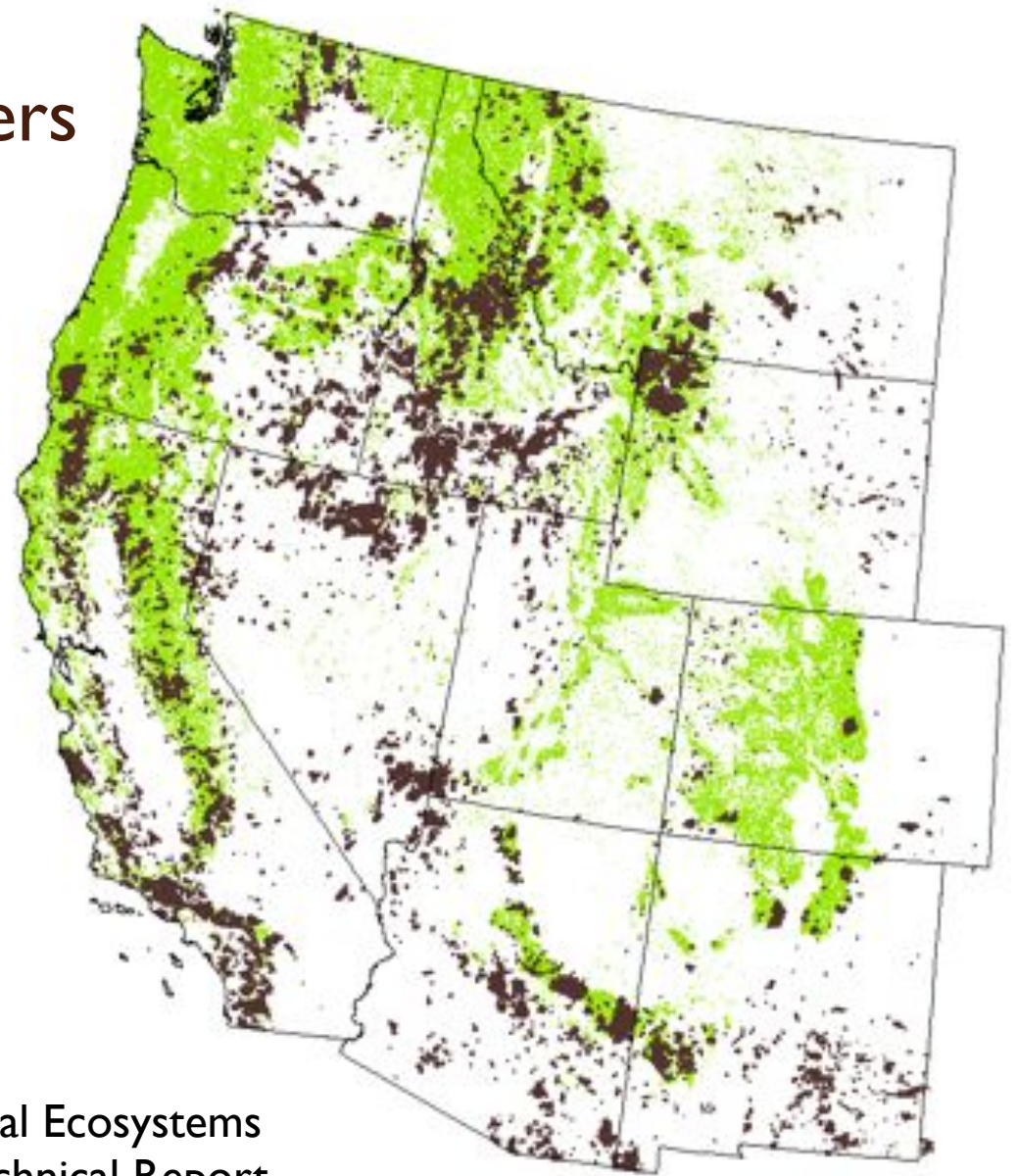
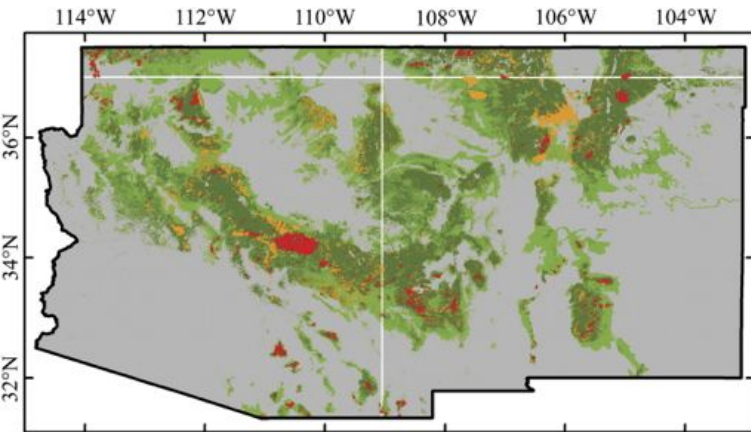


Map of SW forest and woodland mortality due to bark beetles from 1997 to 2008 (orange) and wildfire (red) from 1984 to 2006.



Williams A P et al. PNAS 2010;107:21289-21294

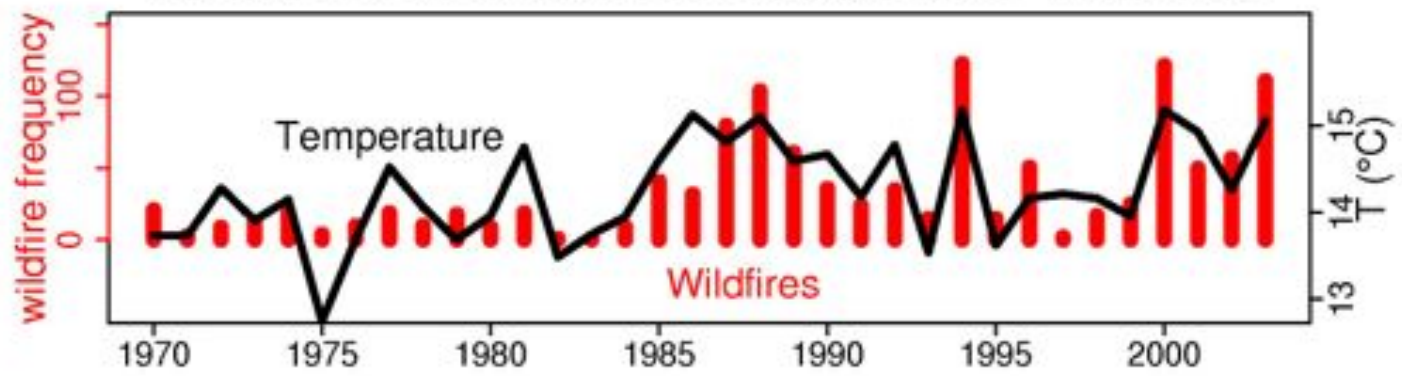
Area Burned Perimeters 1985 - 2011



Fleishman, et al 2012 Chapter 8: Natural Ecosystems
The Southwest Climate Assessment Technical Report

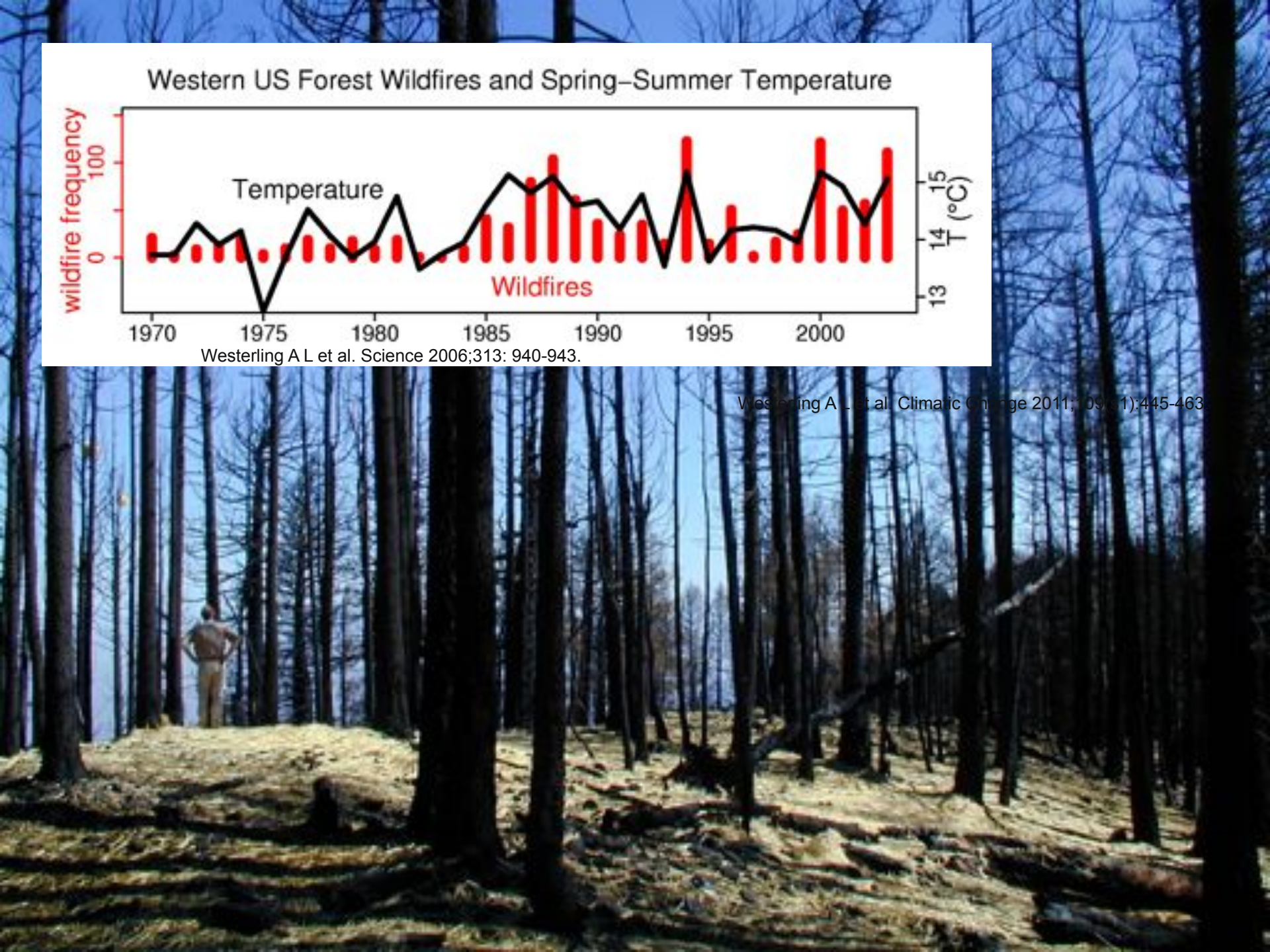


Western US Forest Wildfires and Spring–Summer Temperature

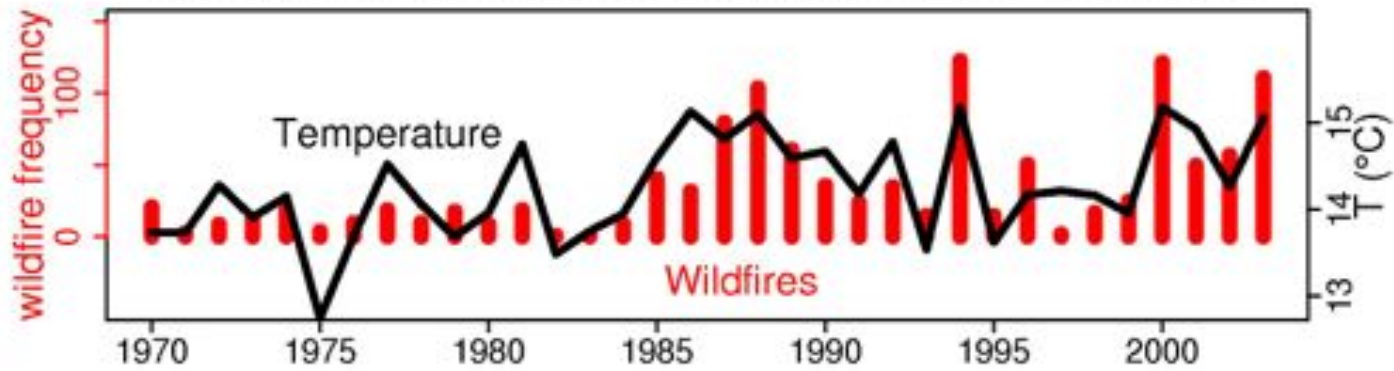


Westerling A L et al. Science 2006;313: 940-943.

Westerling A L et al. Climatic Change 2011; 109 (1):445-463

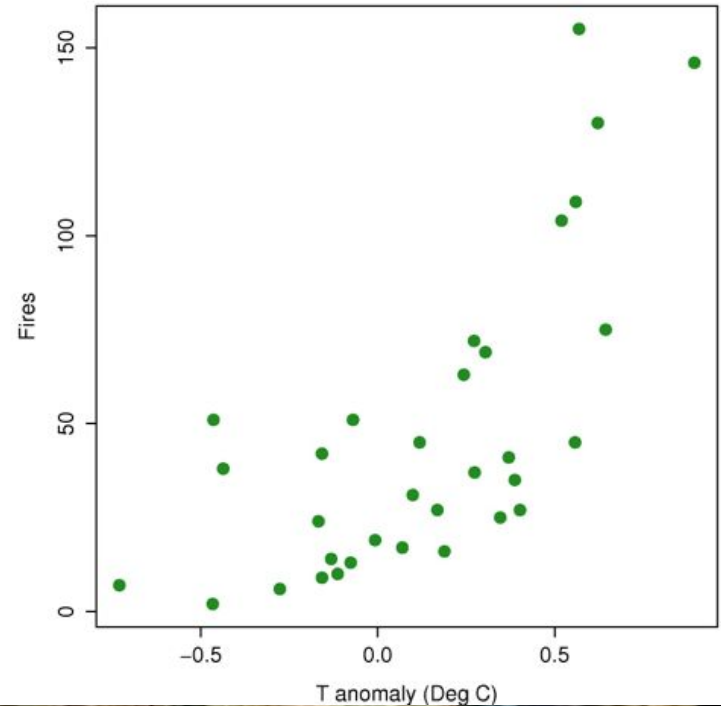


Western US Forest Wildfires and Spring–Summer Temperature

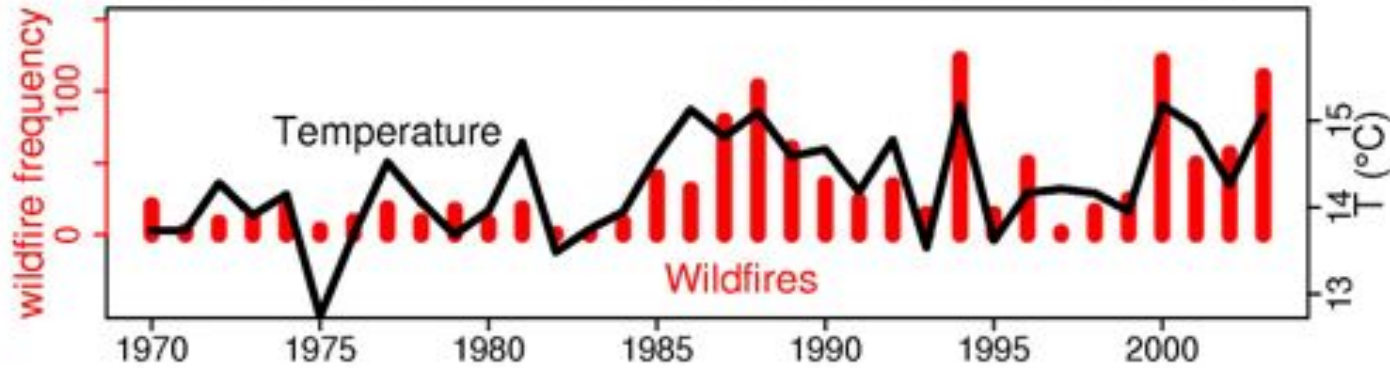


Westerling A L et al. 2006 Science 2006;313: 940-943.

Westerling, A. L. 2009: "Wildfires," Ch. 8: Climate Change Science and Policy, Schneider et al

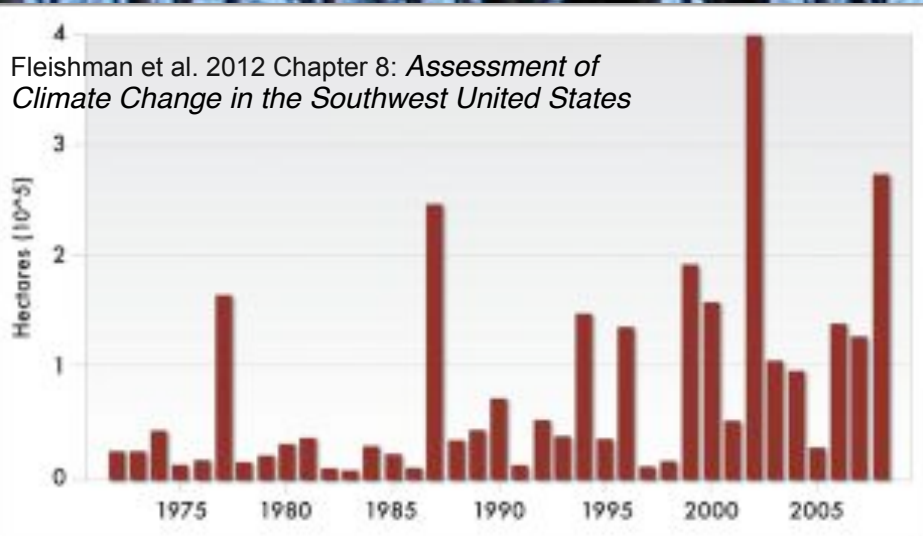


Western US Forest Wildfires and Spring–Summer Temperature

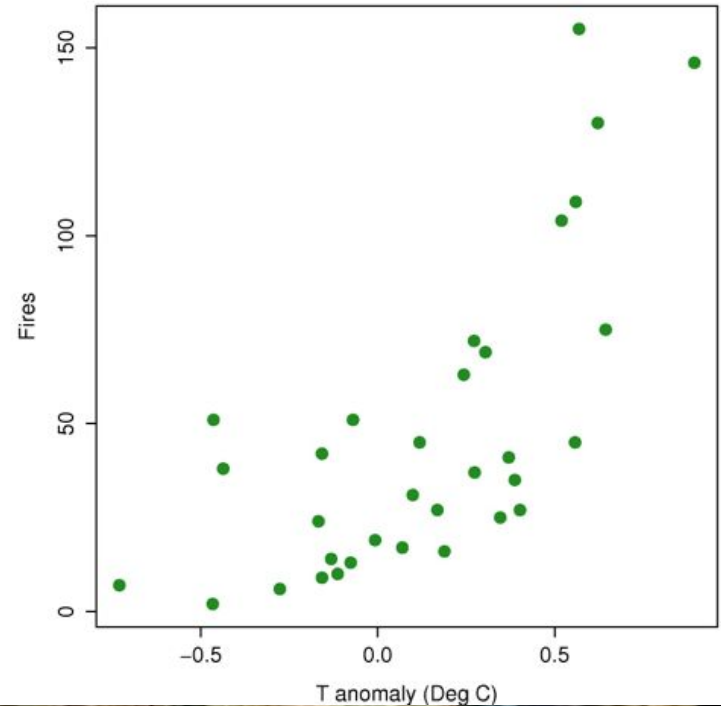


Westerling A L et al. 2006 Science 2006;313: 940-943.

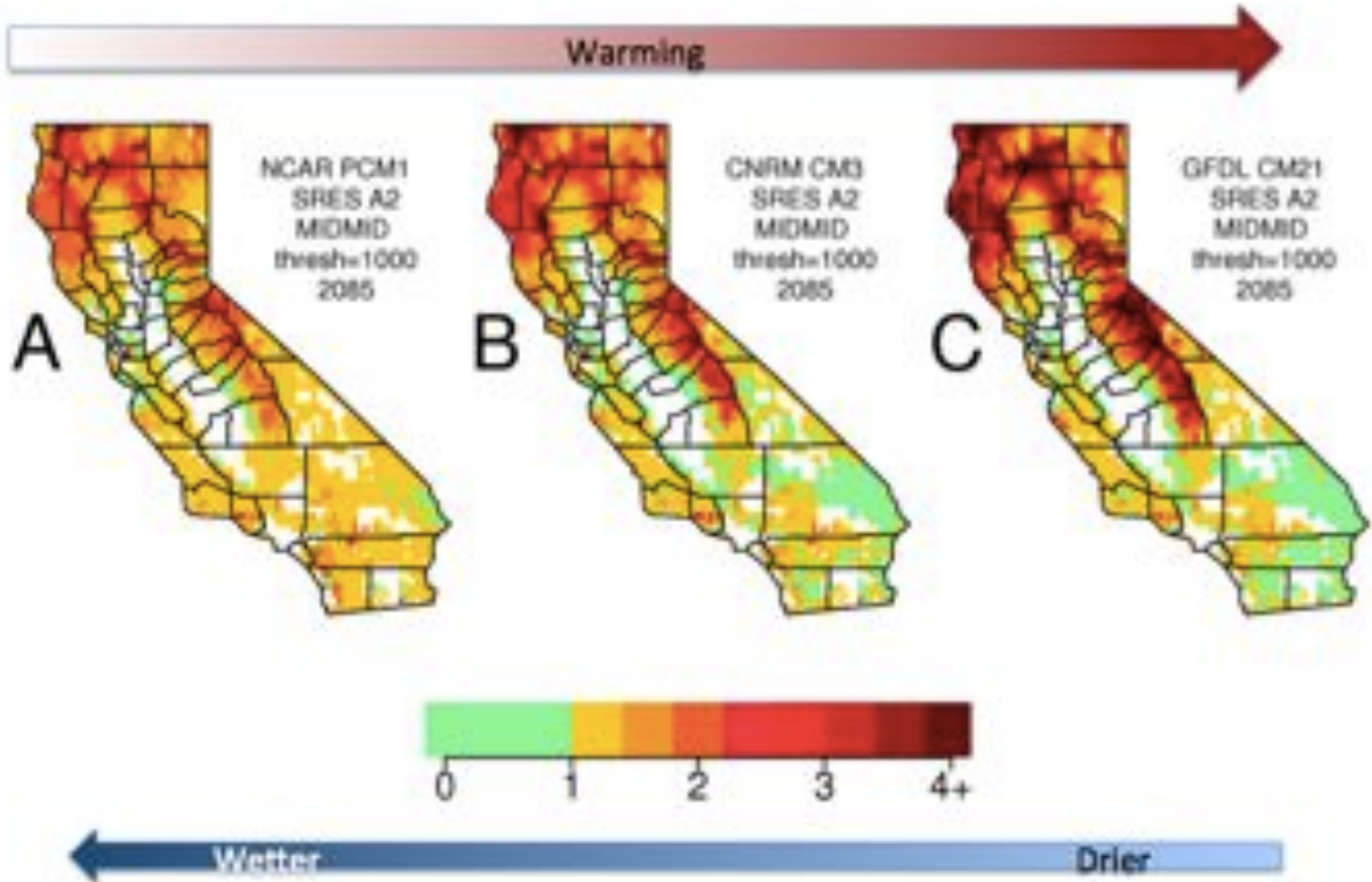
Fleishman et al. 2012 Chapter 8: *Assessment of Climate Change in the Southwest United States*



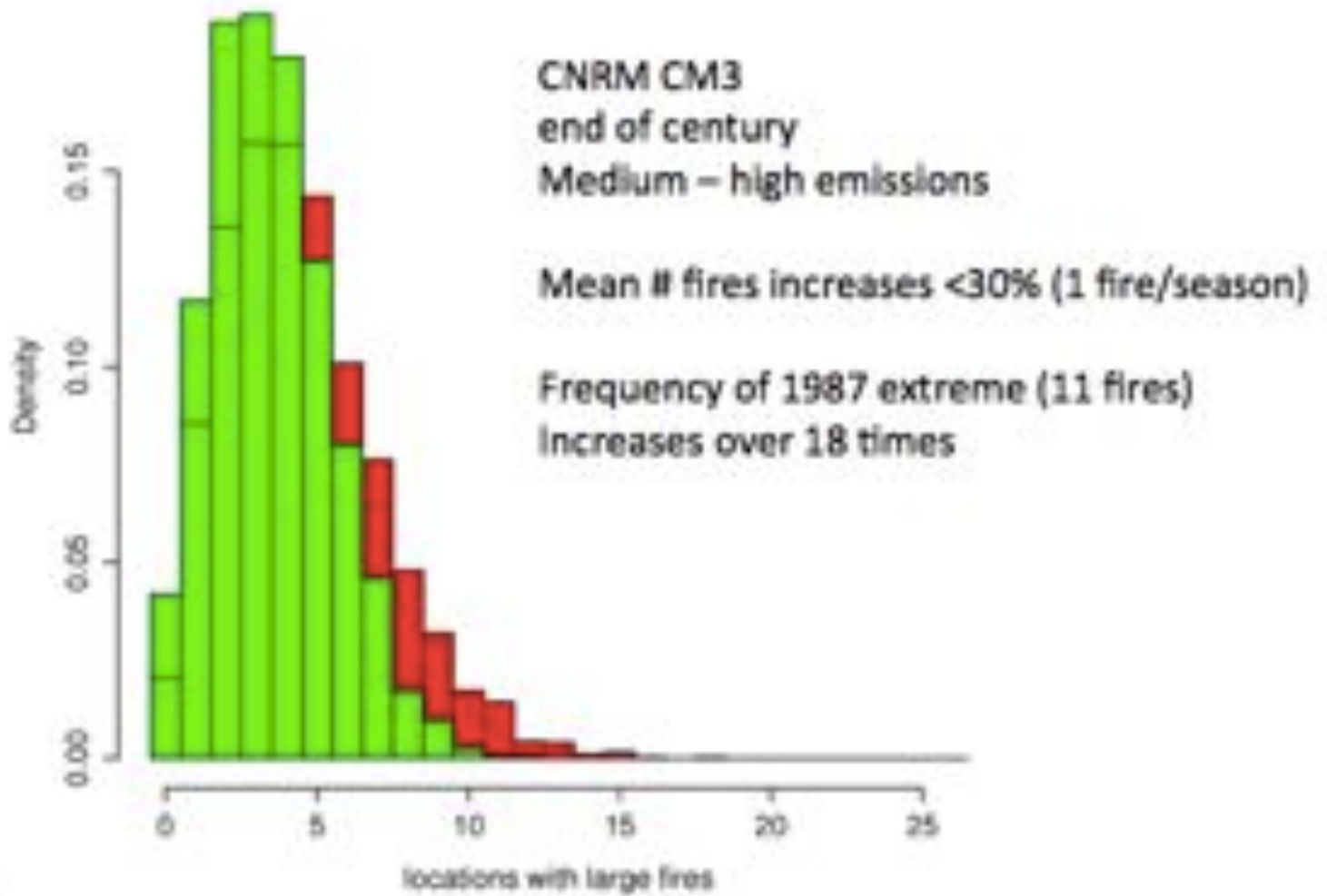
Westerling, A. L. 2009: "Wildfires," Ch. 8: Climate Change Science and Policy, Schneider et al



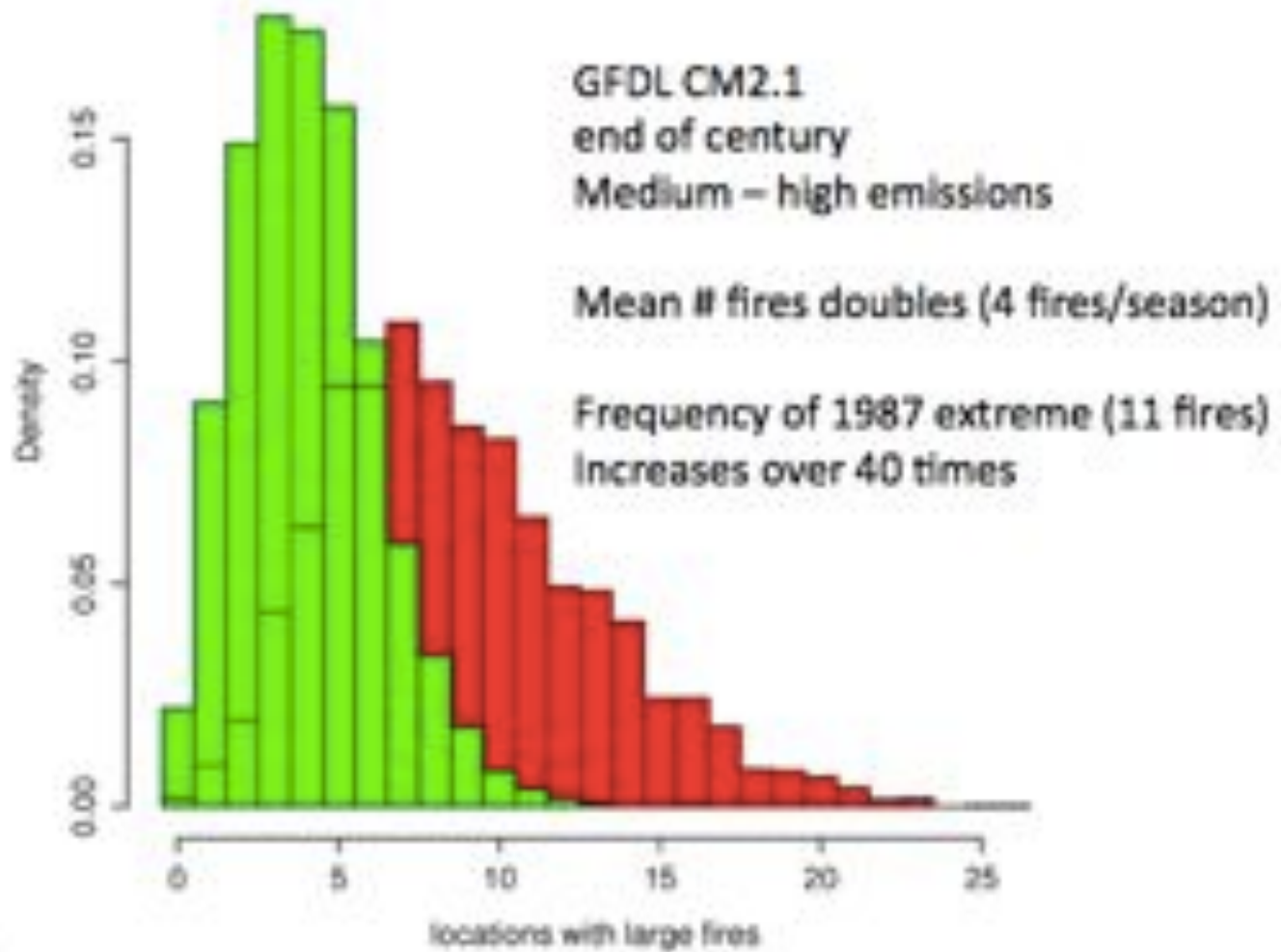
Projected Changes in Burned Area



Southern Sierra Summer Fire Frequency

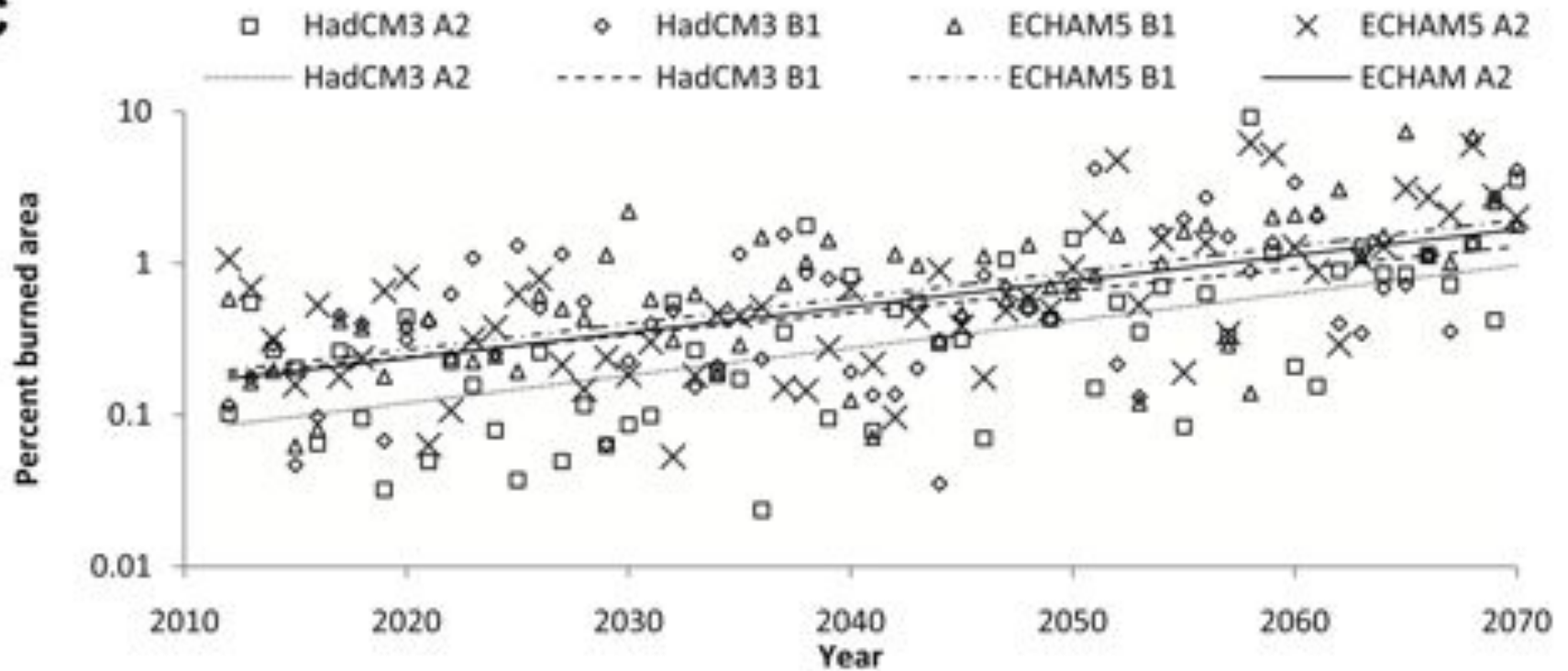


Southern Sierra Summer Fire Frequency



Colorado Rockies burned area projections

C



National Climate Assessment
Southwest Chapter
Sea Level Rise and
Coastal Damage

Rebecca A. Smyth, Lead Author
Regional Division Chief, NOAA Coastal Services Center



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

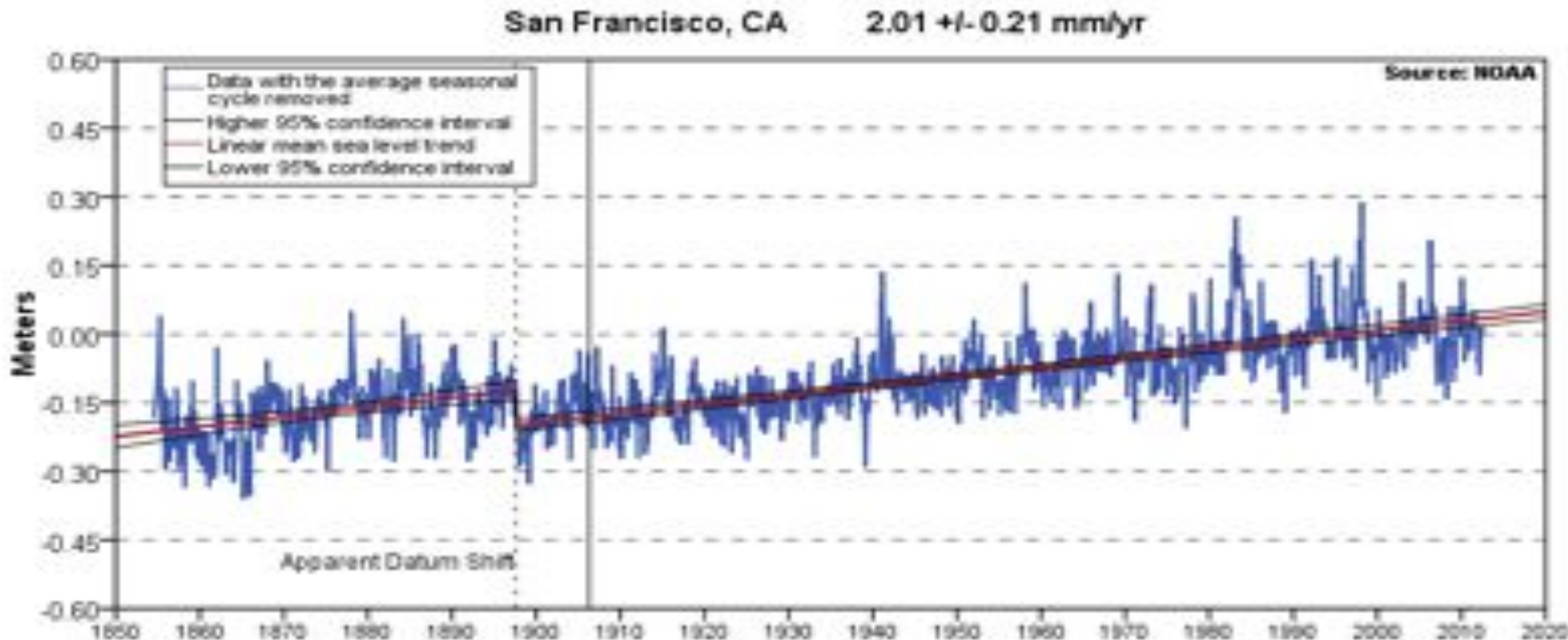
The Key Coastal Message

- Flooding and erosion in coastal areas will increase due to sea level rise
- The result will be increased damage to our coastal resources and this damage will reach further inland.



The West Coast - Where we are today

- The last century has seen 6.7 – 7.9 inches of Sea Level Rise
- Flooding at high tide of key infrastructure is already occurring due to this rise



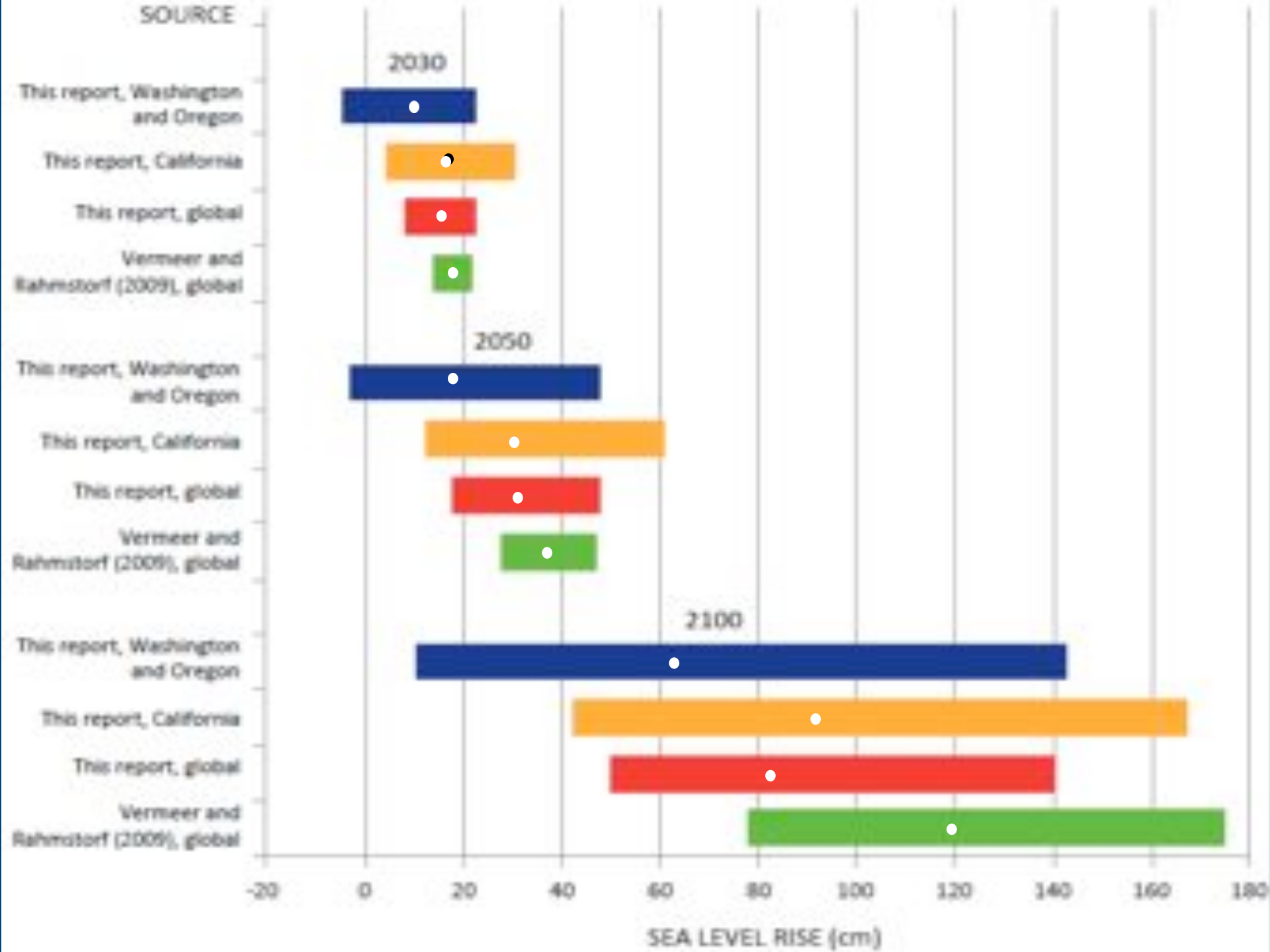
The California Coast and the Future

- Sea Level will increase along the California coast
- These higher water levels will cause greater storm impacts in more areas as waves reach further inland



Photo: Docent Joyce, Morro Strand





Human Impacts

The risk and vulnerability

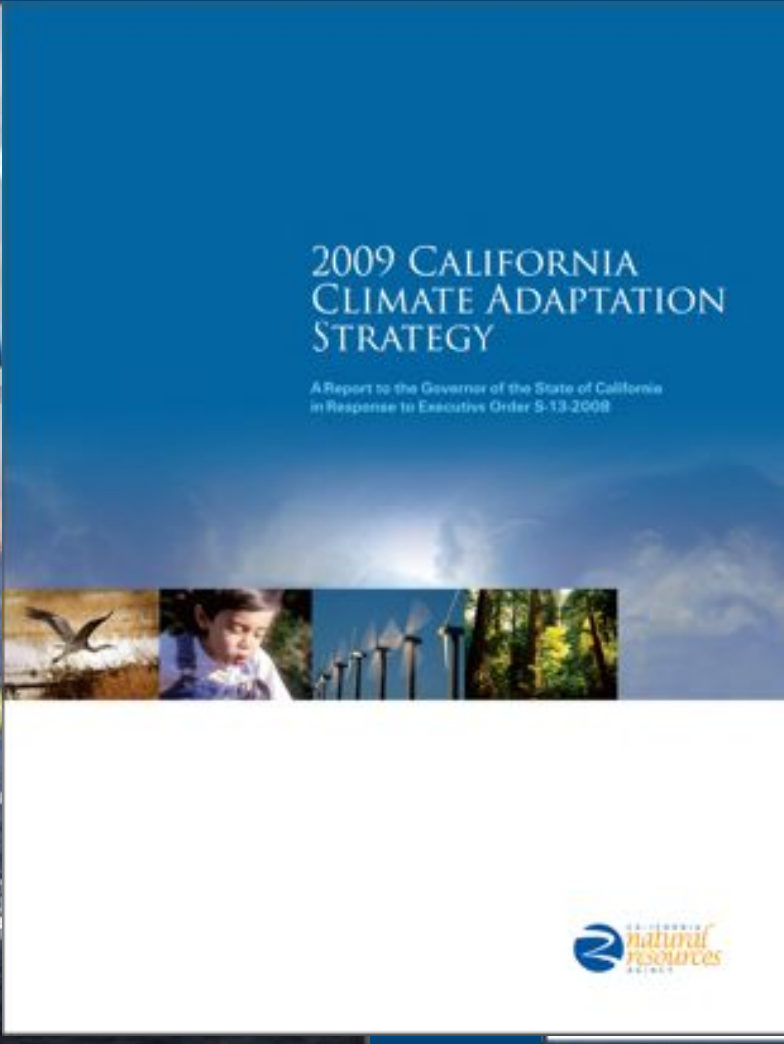
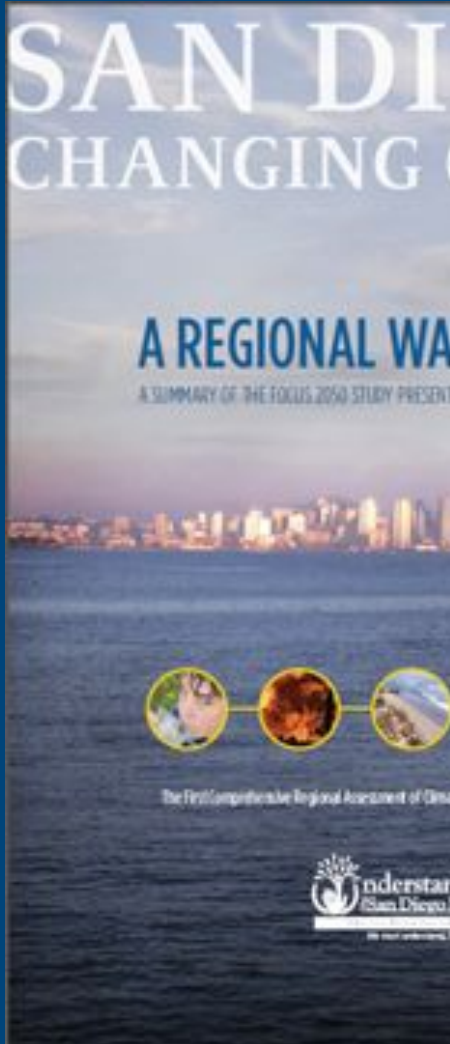
- Sea Level Rise will increase the risk from a 100 year flood
- The increased risk to coastal human population from a 100 year flood will increase from 140,000 to 420, 000 people
- 18% of this population is highly vulnerable



Coastal Adaptation



Planning for Adaptation



Thank You



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY



The National Climate Assessment: Creating a Sustained Assessment Process

James L. Buizer

National Climate Assessment Development &
Advisory Committee

University of Arizona

Southwest Town Hall Meeting

La Jolla, CA

January 18, 2013

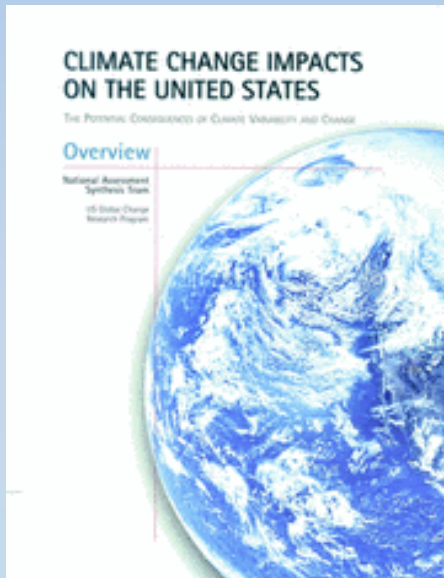




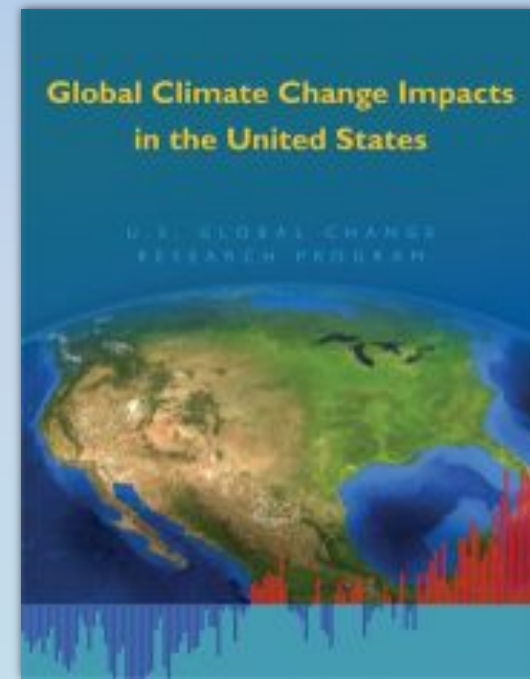
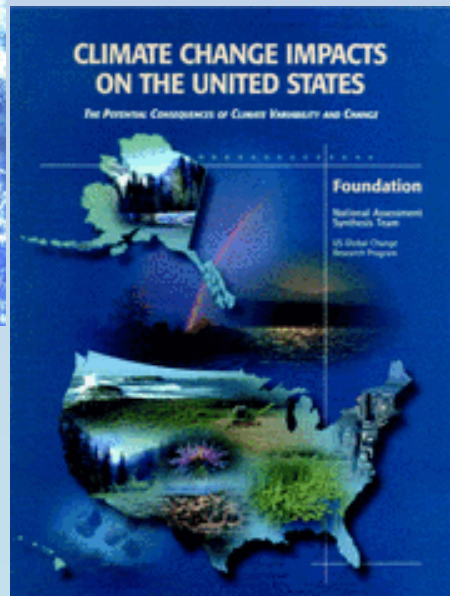
**Another
Problem
caused by
deforestation**

Previous National Climate Assessments

Climate Change Impacts on the United States (2000)



Climate Change Impacts in the United States (2009)



<http://nca2009.globalchange.gov/>

The “New” National Climate Assessment

Vision

Advance an inclusive, broad-based, and sustained process for assessing and communicating scientific knowledge of the impacts, risks, and vulnerabilities associated with a changing global climate in support of decision-making across the United States.



Ensuring a Sustained Assessment

- **Creating and sustaining the capacity to conduct and use assessments** is an essential part of the NCA process
- The National Climate Assessment and Development Advisory Committee (NCADAC) is charged with **both producing a synthesis assessment report and providing advice** on the sustained process
- The sustained assessment **process is already underway**



Outcomes of the NCA Sustained Assessment

- **Ongoing, relevant, highly credible analyses** of the scientific understanding of climate change impacts, risk, and vulnerability
- Enhanced timely **access to Assessment-related data** from multiple sources useful for decision making
- **Systematic evaluation** of progress towards reducing risk, vulnerability, and impacts
- **National indicators** of change and the capacity to respond



Sustained Assessment

Foundational and Special Topics

- Foundational Topics (supportive of 2017 synthesis report and beyond)
 - **Sustained assessment**
 - Scenario development (continuous as new data becomes available)
 - Integration with CMIP5 outputs
 - Land cover/use cover updates
 - Guidance on use of model data
 - **Indicators**
 - Valuation (cost of impacts/benefits of adaptation)
- Special topics Reports (require more depth than is afforded by coverage within a synthesis report)
 - Food security
 - International context
 - Water and drought
 - Large biophysical regions (e.g., Arctic or Mississippi Watershed)



U.S. Global Change Research Program

**National Climate
Assessment**

Sustained Assessment

Why Consider Special Reports and Activities?

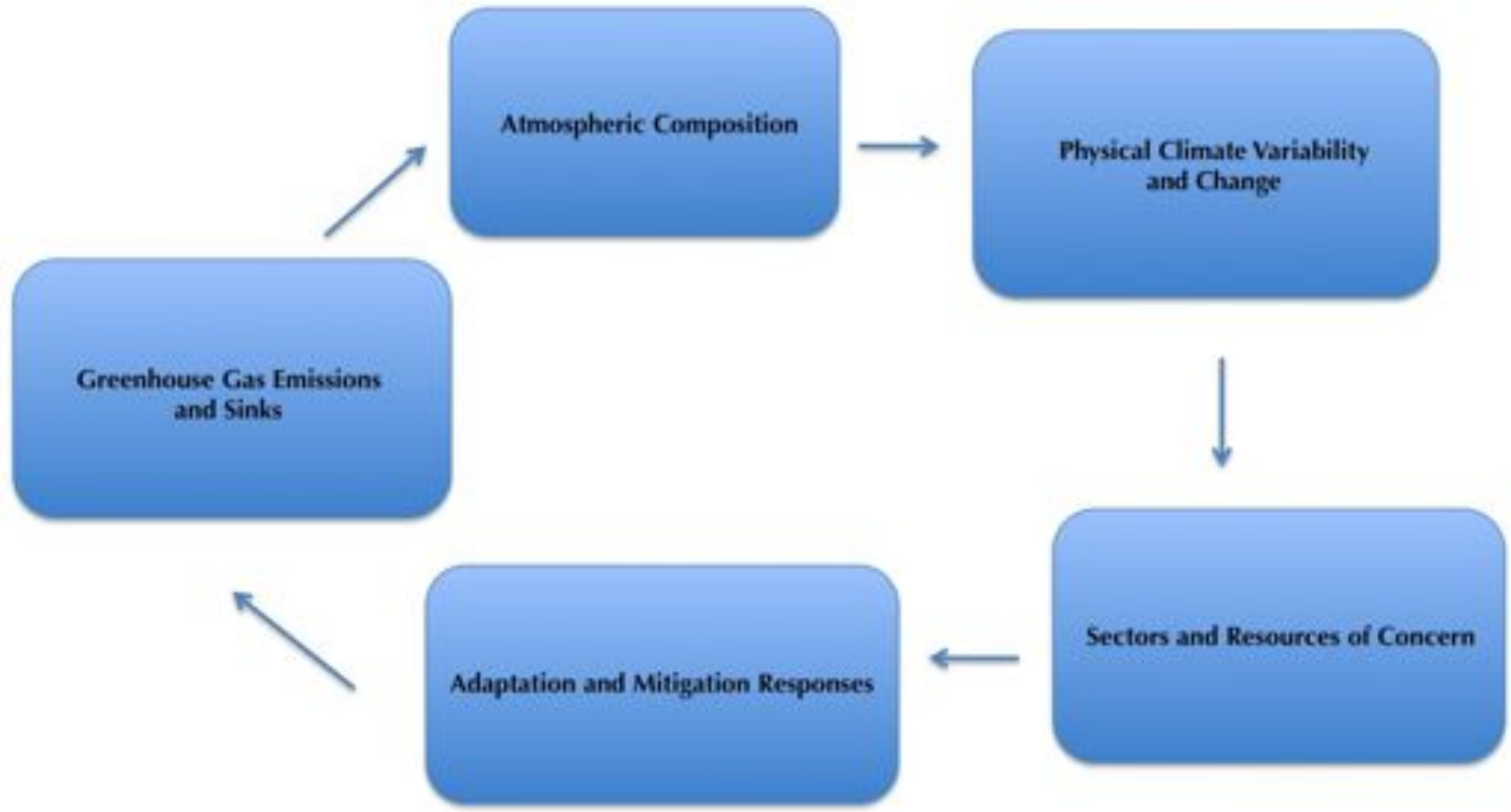
- Deepen understanding of climate change effects on a particular sector or region that are of national importance
- Investigate new scientific issues of concern
- Build capacity to conduct more sophisticated, useful, and credible assessments over time
- Better support decisions that reduce risk and increase opportunities
- Enable a full review for issues of national importance in an efficient and credible way

National Climate Assessment Indicators

The goals for the NCA indicators are to:

- Provide meaningful, authoritative climate-relevant measures about the status, rates, and trends of key physical, ecological, and societal variables and values
- Inform decisions on management, research, and education at regional to national scales
- Identify climate-related conditions and impacts to help develop effective mitigation and adaptation measures
- Provide analytical tools by which user communities can derive their own indicators for particular purposes

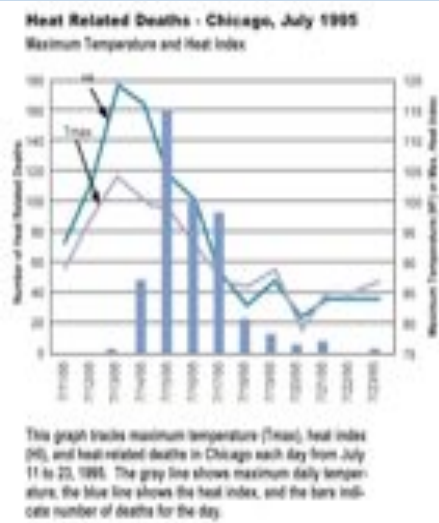
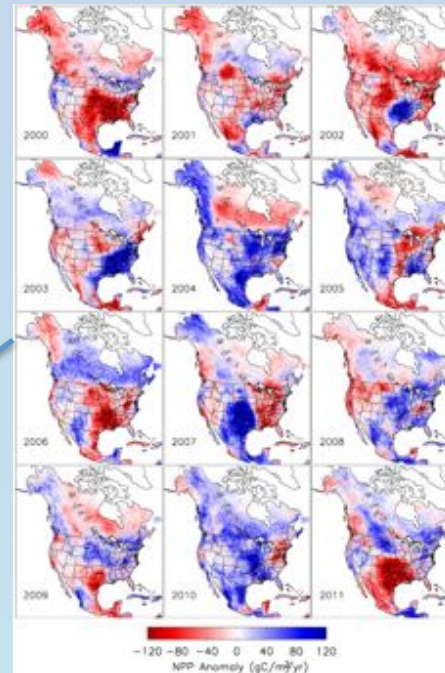
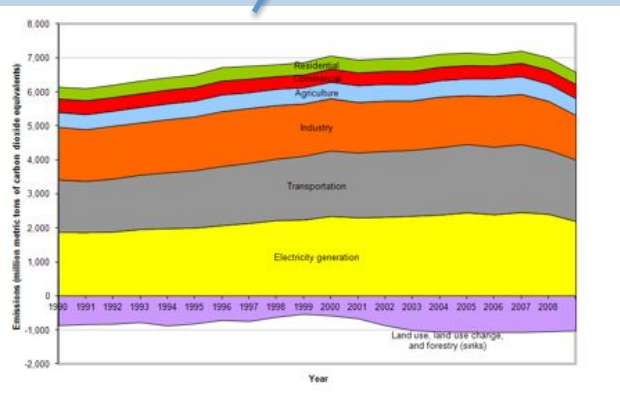
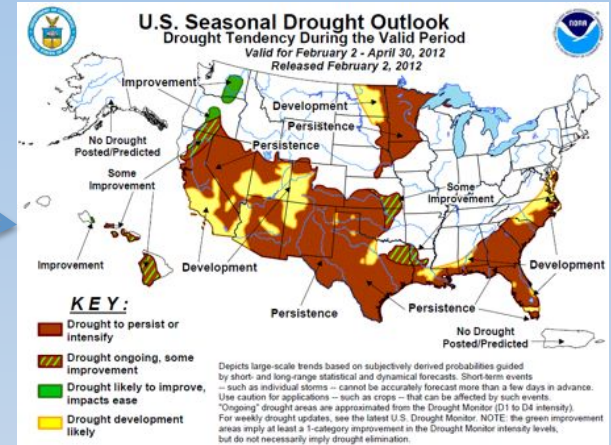
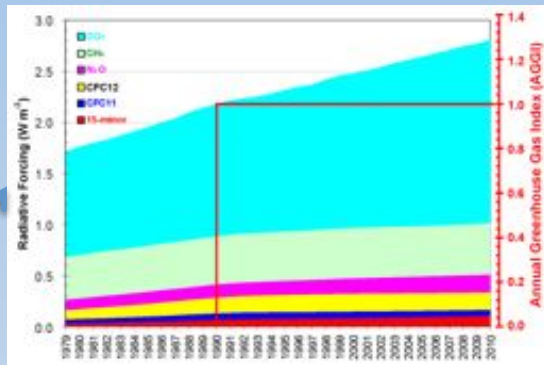
Indicators Framework



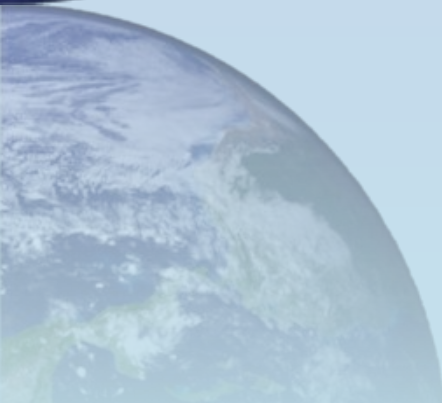
U.S. Global Change Research Program

**National Climate
Assessment**

Indicators Examples

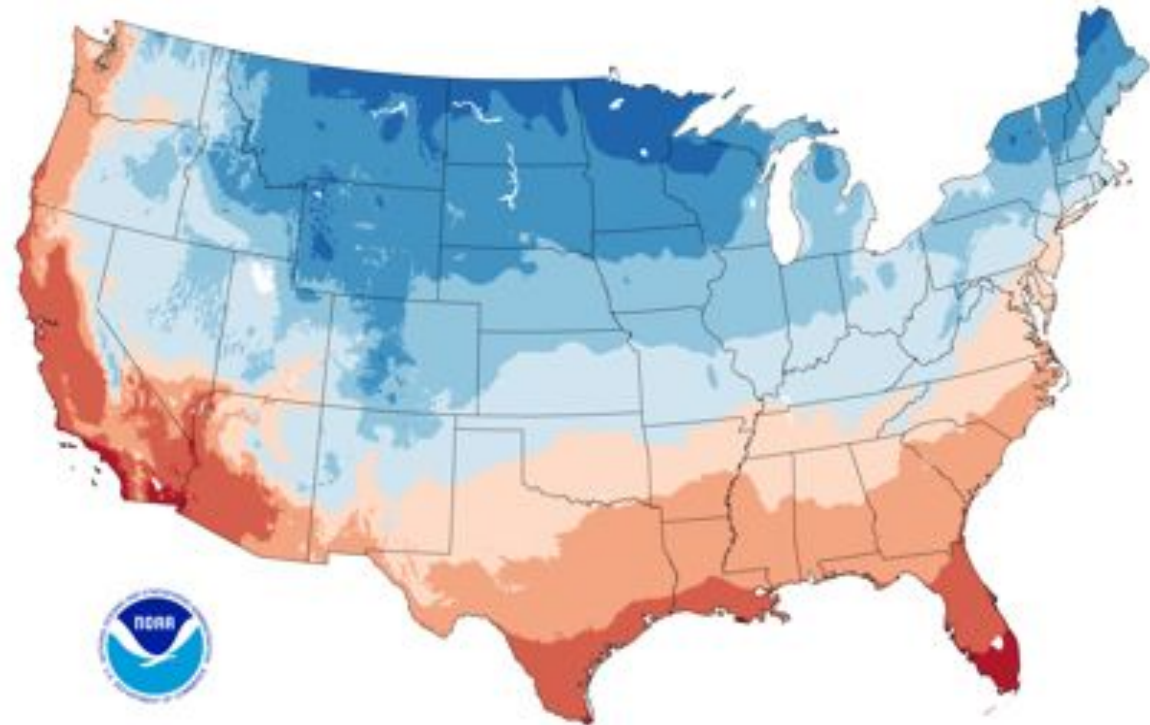


Adaptation and Mitigation Responses



Climate-Related Planting Zones

Based on 1971-2000 Climate Normals



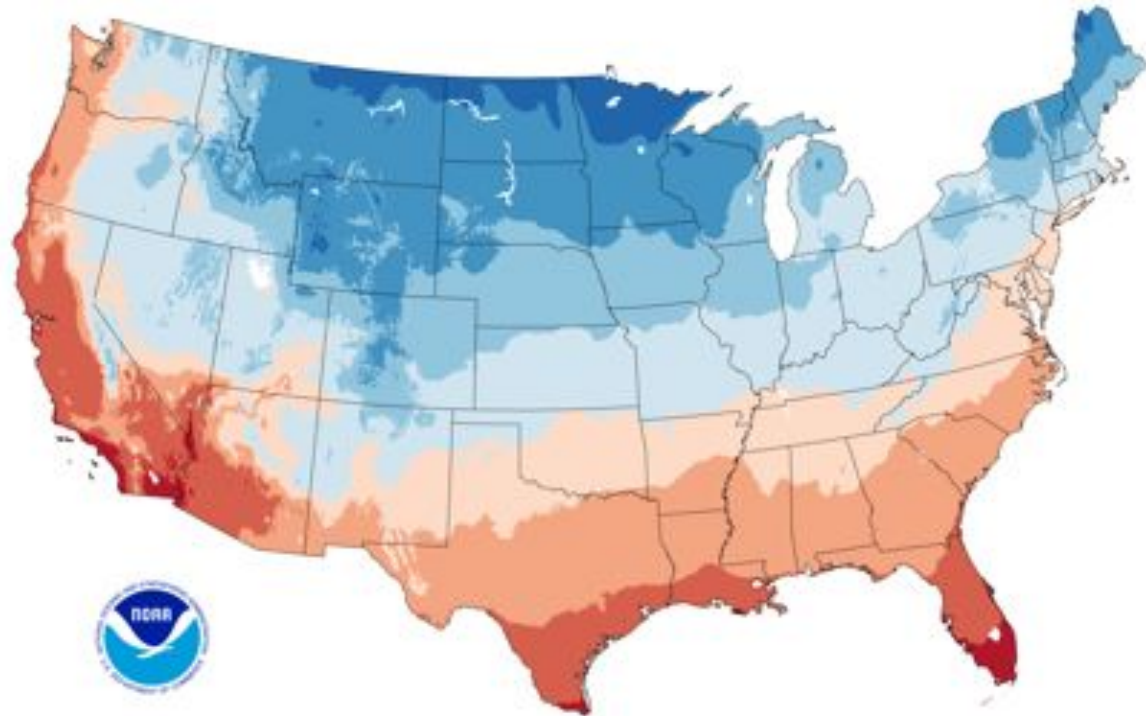
Average Annual Minimum Temperature by Climate-Related Planting Zone



Disclaimer: This illustration of nationwide patterns and changes in climate-related planting zones for gardeners was created as a special service to the American Public Gardens Association by the National Oceanic and Atmospheric Administration (NOAA). The official Plant Hardiness Zone map was prepared by the U.S. Department of Agriculture (USDA) in 1990 using data collected and distributed by NOAA. USDA is currently updating its official map, which will soon be available via the Internet.



Climate-Related Planting Zones Based on New 1981-2010 Climate Normals



Average Annual Minimum Temperature by Climate-Related Planting Zone

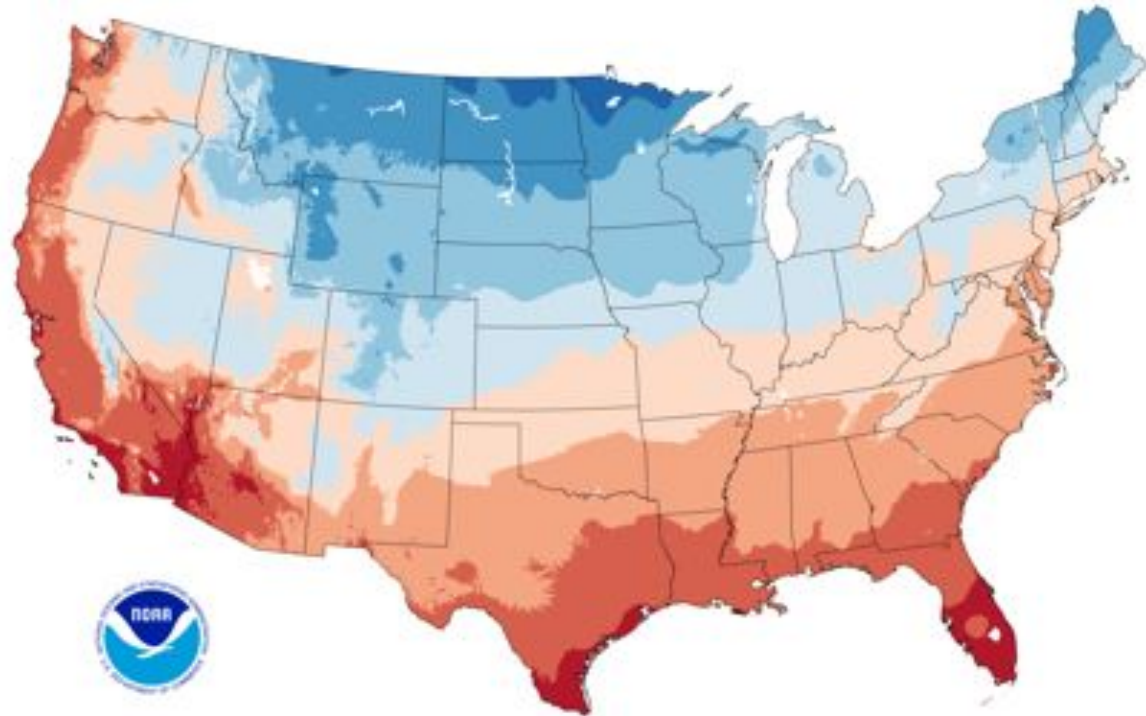


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Climate-Related Planting Zones: 2011-2040 Based on 1971-2010 Trends



Average Annual Minimum Temperature by Climate-Related Planting Zone

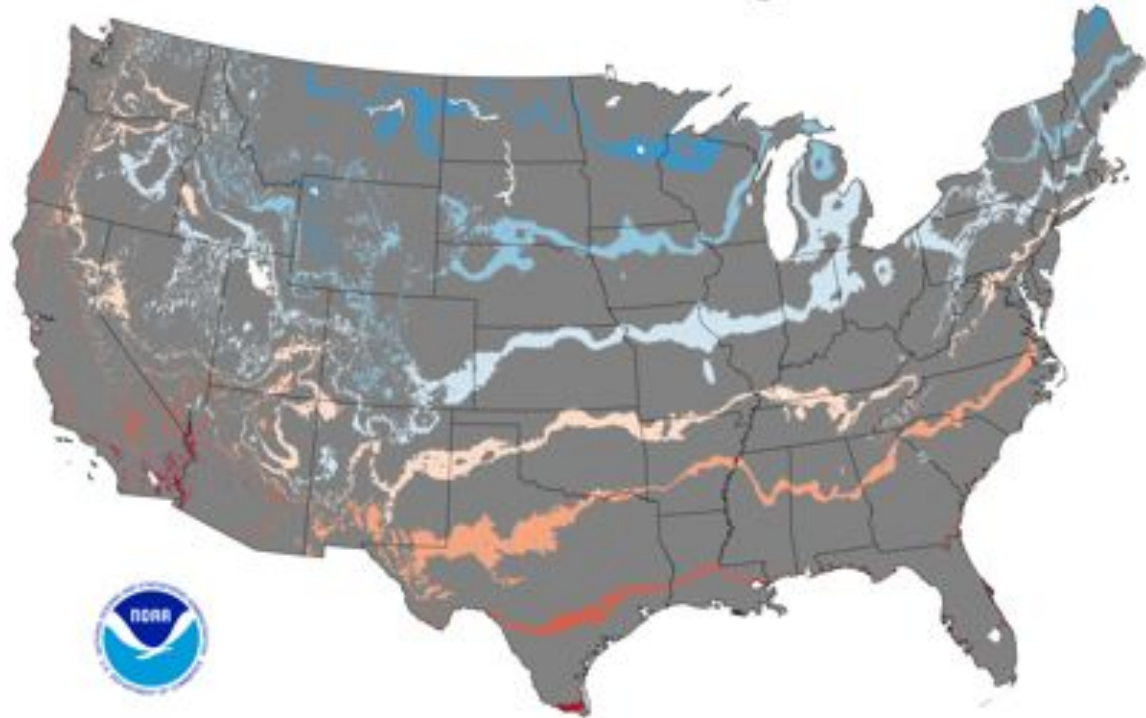


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Zone Changes in Past 10 Years In Color of New Planting Zone



Average Annual Minimum Temperature by Climate-Related Planting Zone

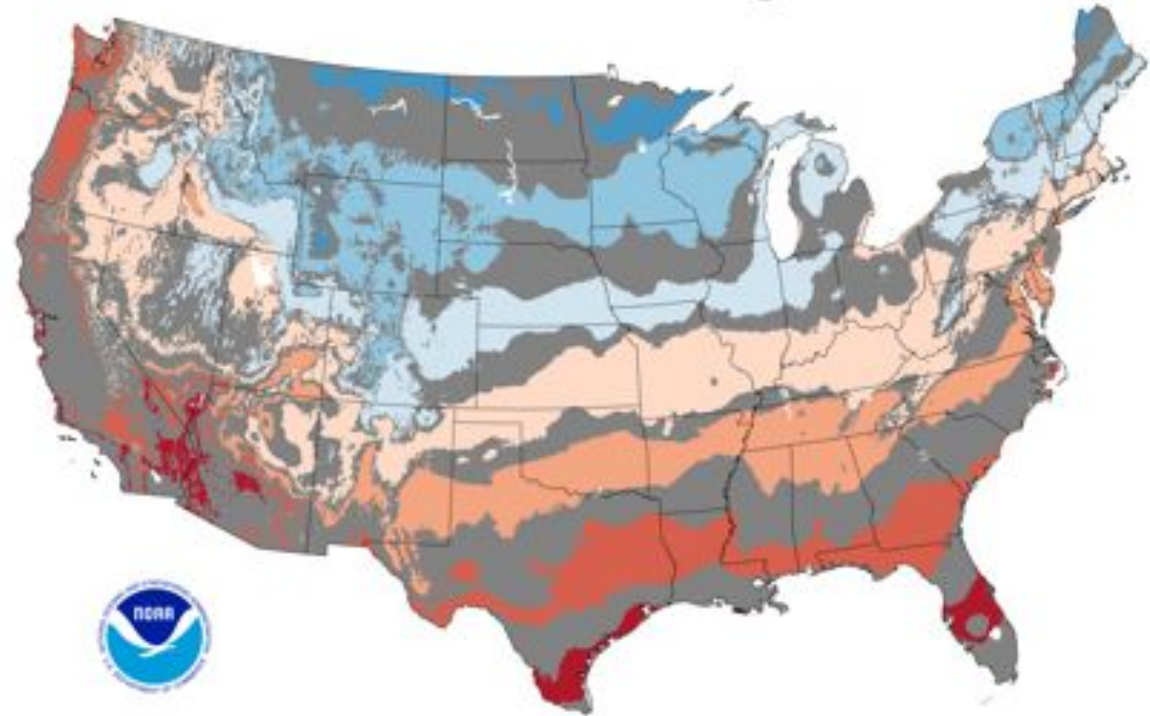
No Change in Zone	Zone 5 (-19 to -10 F)	Zone 7 (1 to 10 F)	Zone 9 (21 to 30 F)
Zone 4 (-29 to -20 F)	Zone 6 (-9 to 0 F)	Zone 8 (11 to 20 F)	Zone 10 (31 to 40 F)

Disclaimer: This illustration of nationwide patterns and changes in climate-related planting zones for gardeners was created as a special service to the American Public Gardens Association by the National Oceanic and Atmospheric Administration (NOAA). The official Plant Hardiness Zone map was prepared by the U.S. Department of Agriculture (USDA) in 1990 using data collected and distributed by NOAA. USDA is currently updating its official map, which will soon be available via the Internet.





Projected Zone Changes in Next 30 Years In Color of New Planting Zone



Average Annual Minimum Temperature by Climate-Related Planting Zone

No Change in Zone	Zone 5 (-19 to -10 F)	Zone 7 (1 to 10 F)	Zone 9 (21 to 30 F)
Zone 4 (-29 to -20 F)	Zone 6 (-9 to 0 F)	Zone 8 (11 to 20 F)	Zone 10 (31 to 40 F)

Disclaimer: This illustration of nationwide patterns and changes in climate-related planting zones for gardeners was created as a special service to the American Public Gardens Association by the National Oceanic and Atmospheric Administration (NOAA). The official Plant Hardiness Zone map was prepared by the U.S. Department of Agriculture (USDA) in 1990 using data collected and distributed by NOAA. USDA is currently updating its official map, which will soon be available via the Internet.



Current Sustained Assessment Activities: Phase I of Regional Coordination of Science and Services



An Activity of the Interagency Climate Change Adaptation Task Force
Phase 1: Regional Hubs for the NCA

Sustained Assessment Special Report

Proposed Outline

- Executive summary and key messages
- Introduction – Purpose and scope of document
- History of assessments, rationale for a sustained process and the ‘new vision’
- Components of a sustained assessment
 - Foundational aspects
 - Special reports
- Organizing a sustained assessment process
 - Infrastructure, central and distributed capacity
- Implementing a sustained assessment approach
 - Roles and responsibilities of the federal government
 - Private, academic, foundation and NGO partners
 - Knowledge networks
 - Criteria for prioritization of activities
 - Need for ongoing support
- Early successes and opportunities
- Gaps and needs

**Anticipated release:
August 2013**



U.S. Global Change Research Program

**National Climate
Assessment**

Contributions: Assessment Capacities



- **Meetings, workshops, and other dialogues**
 - Discussions among producers and users of assessments
 - Throughout assessment process
- **Supporting indicator systems**
 - Identifying / maintaining key observation & monitoring systems
 - Integrating across data sets to create indicators
- **Stakeholder analyses**
 - Knowledge and attitudes
 - Communication pathways
 - Network analyses
- **Communicating with stakeholders**
 - Outreach and educational materials
 - Evaluating effectiveness and use

Discussion Questions

- What activities planned as a part of the sustained assessment process (e.g., indicators, scenario planning, NCAnet, etc.) do you think are of great interest? What can this community contribute to those activities?
- What other data collection, research, and/or decision making activities are you already involved in that might contribute to NCA reports and processes? What new efforts might be organized?

Discussion Questions

- In addition to the Southwest chapter, what other chapters in the NCA report do you see as of great interest to the region?
- What topics do you not see represented in the 2013 report that you would like to see addressed in future NCA products? How can this community contribute to developing those products?

*In theory there is no difference
between theory and practice.*

In practice there is.

- Yogi Berra -



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Thank you!

Questions and Discussion

