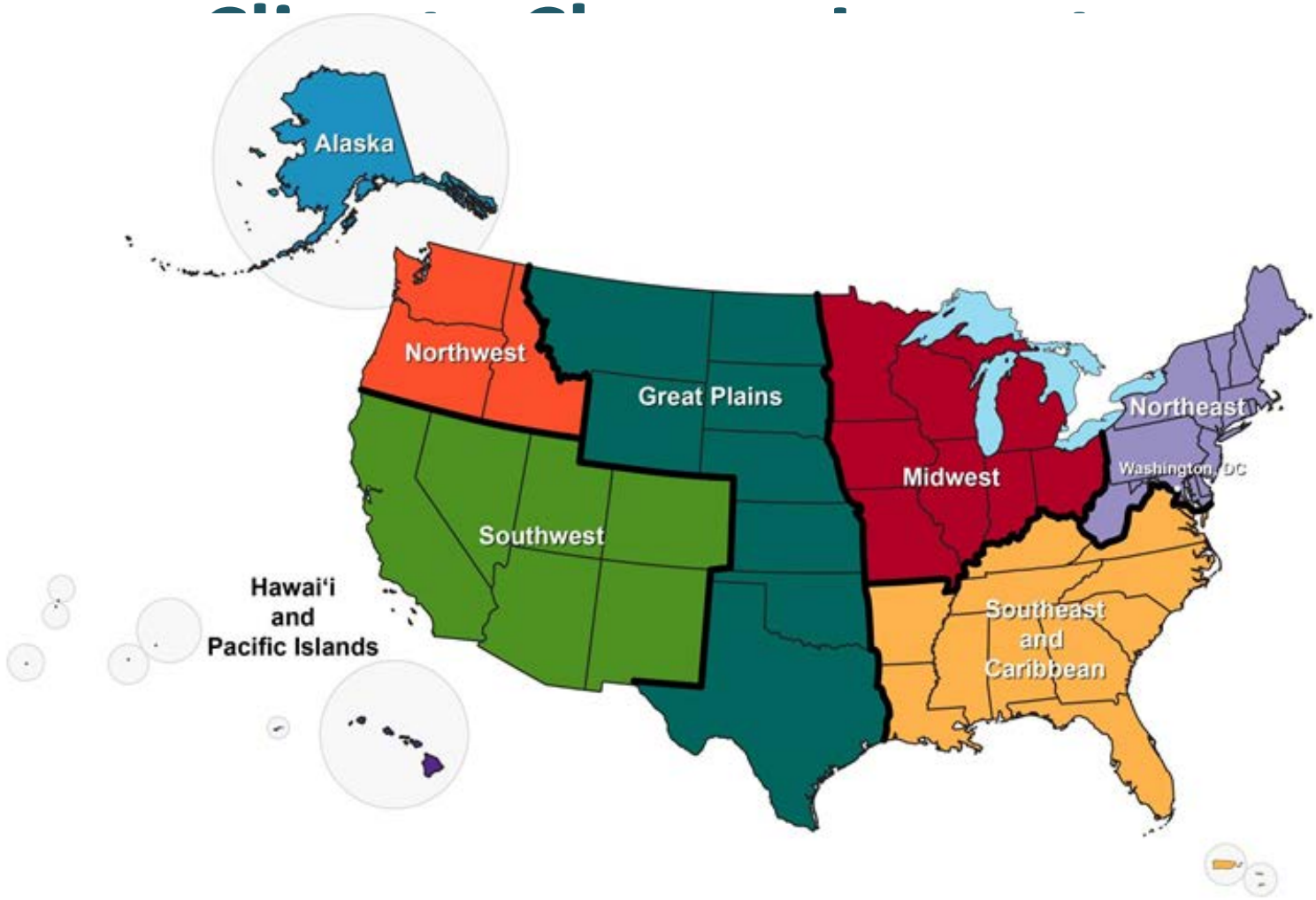
Western USA Regional Climate Risk

Kevin Werner
National Oceanic and Atmospheric Administration (NOAA)
Western Region Climate Services Director
Seattle, WA
Kevin.werner@noaa.gov
206.860.3490

Third National Climate Assessment



GlobalChange.gov
U.S. Global Change Research Program

U.S. Global Change Research Program
National Climate Assessment

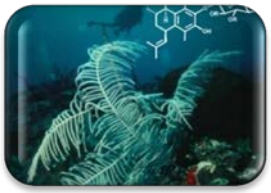
Main Messages

- Largest & most comprehensive **for the U.S.**
- Climate change is happening **now**
- America is **feeling the effects**
- Important **opportunities** to manage & prepare

GlobalChange.gov
U.S. Global Change Research Program

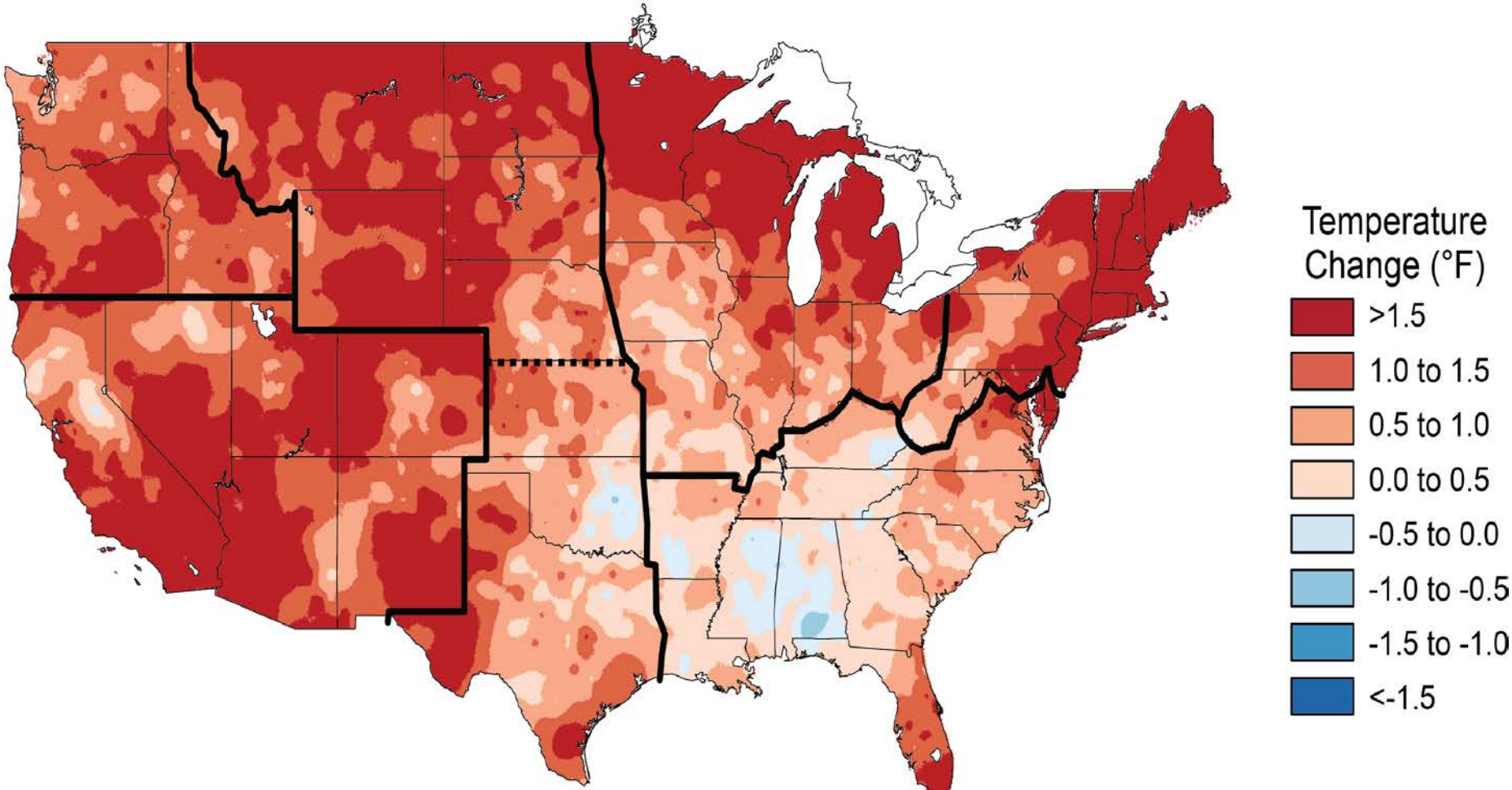
U.S. Global Change Research Program
National Climate Assessment

What is at Risk? What Can We Do?



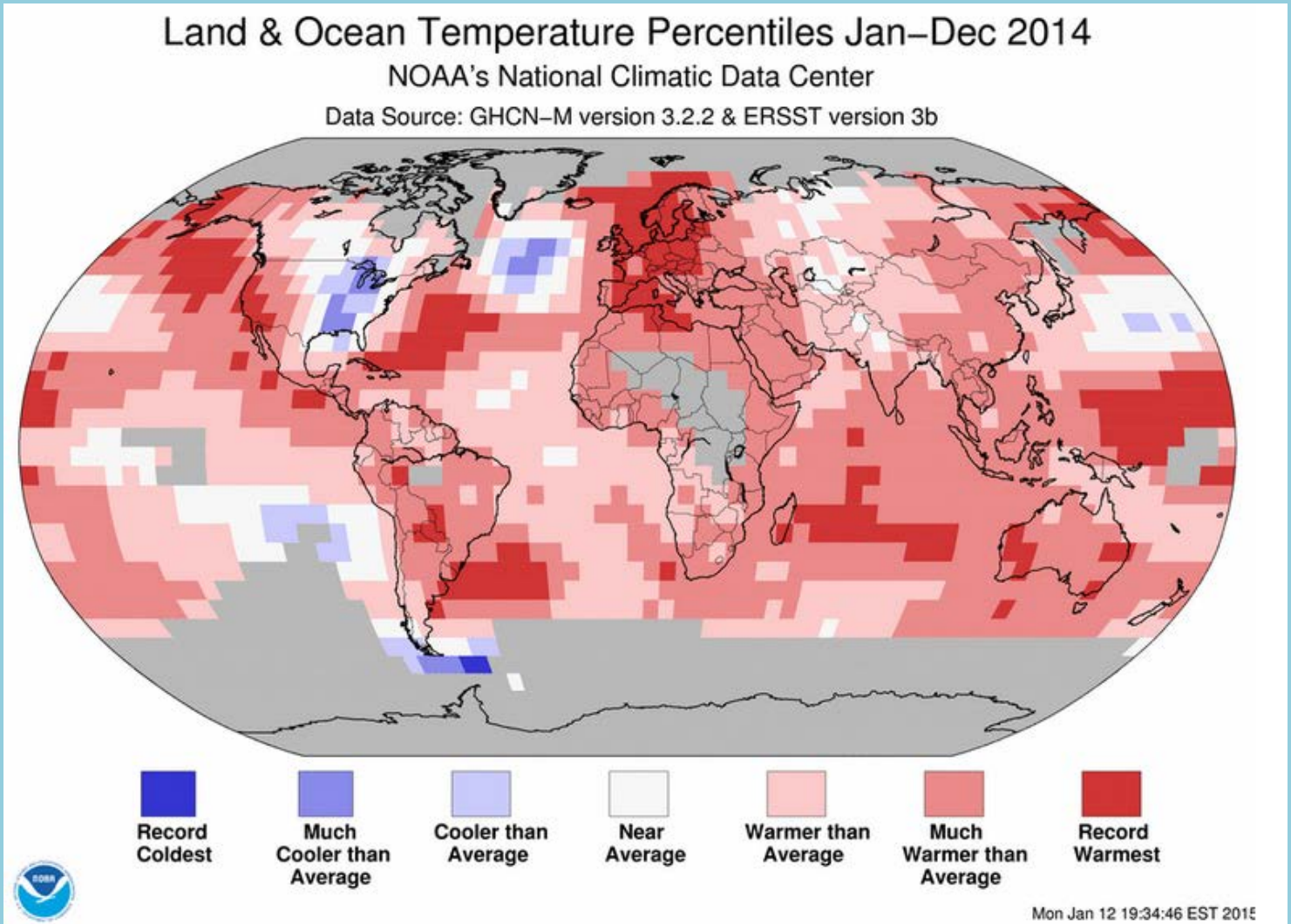
THE ROCKEFELLER FOUNDATION

Observed U.S. Temperature Change



Past 22 years (1991-2012) compared to 1901-1960 average

2014 Global Temperature



Source: http://www.ncdc.noaa.gov/sotc/global/

U.S. Global Change Research Program
National Climate Assessment

Global Temperatures

RANK 1 = WARMEST PERIOD OF RECORD: 1880–2014	YEAR	ANOMALY °C	ANOMALY °F
1	2014	0.69	1.24
2 (tie)	2010	0.65	1.17
2 (tie)	2005	0.65	1.17
4	1998	0.63	1.13
5 (tie)	2013	0.62	1.12
5 (tie)	2003	0.62	1.12
7	2002	0.61	1.10
8	2006	0.60	1.08
9 (tie)	2009	0.59	1.06
9 (tie)	2007	0.59	1.06

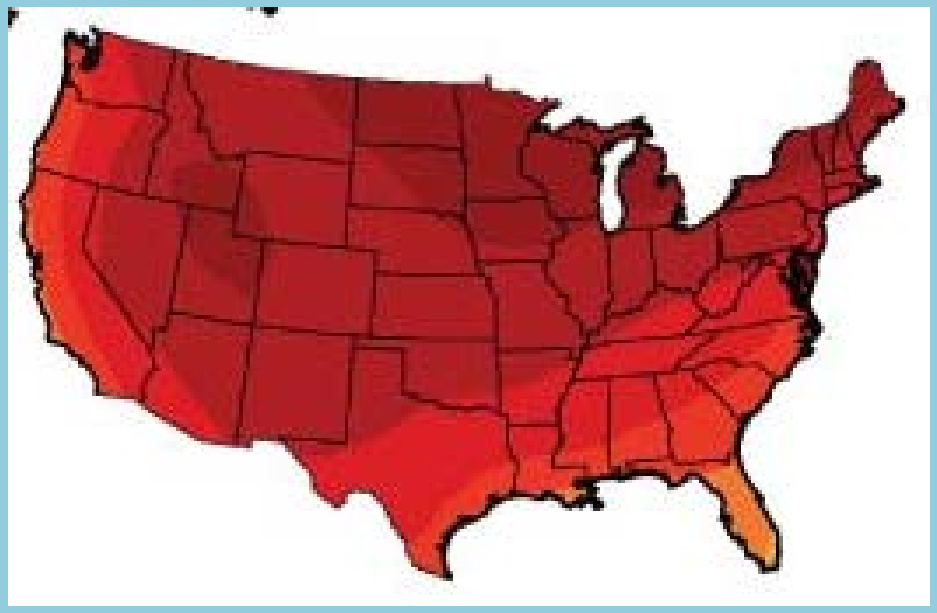
Source: http://www.ncdc.noaa.gov/sotc/global/

U.S. Global Change Research Program
National Climate Assessment

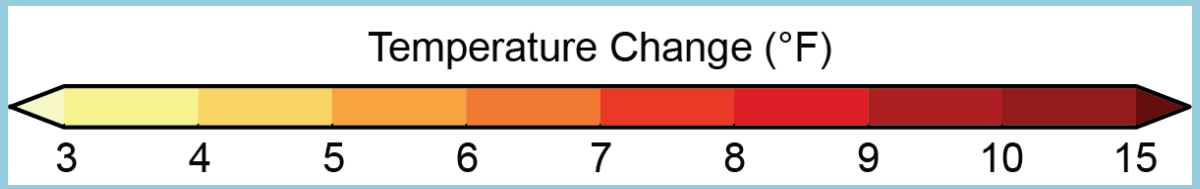
Projected Temperature INCREASE by our Grandchildren's Time

Significant Emissions Reduction

Current Emissions Continue



2071-2099 relative to 1970-1999



U.S. Global Change Research Program
National Climate Assessment

Key Messages for the West

Northwest:

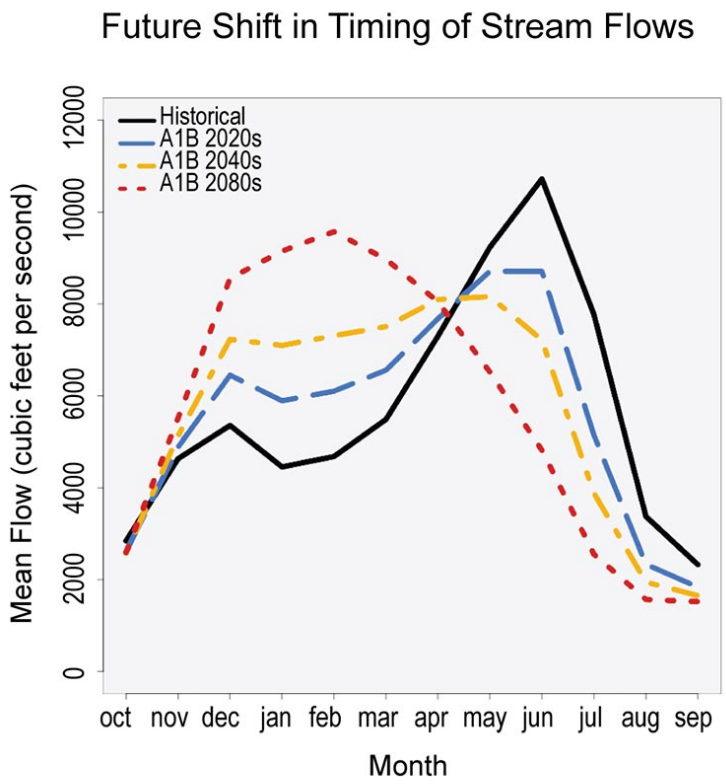
1. Water Related Challenges
2. Coastal Vulnerabilities
3. Impacts on Forests
4. Adapting Agriculture

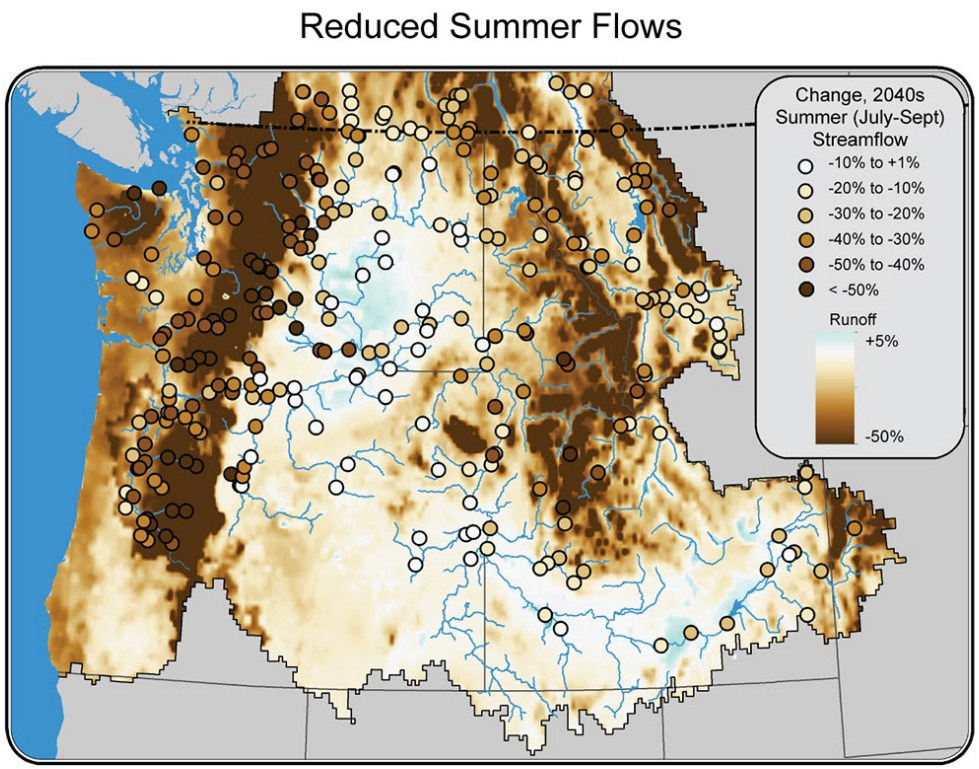
Southwest:

1. Reduced Snowpack and Streamflows
2. Threats to Agriculture
3. Increased Wildfire
4. Sea Level Rise and Coastal Damage
5. Heat Threats to Health

U.S. Global Change Research Program
National Climate Assessment

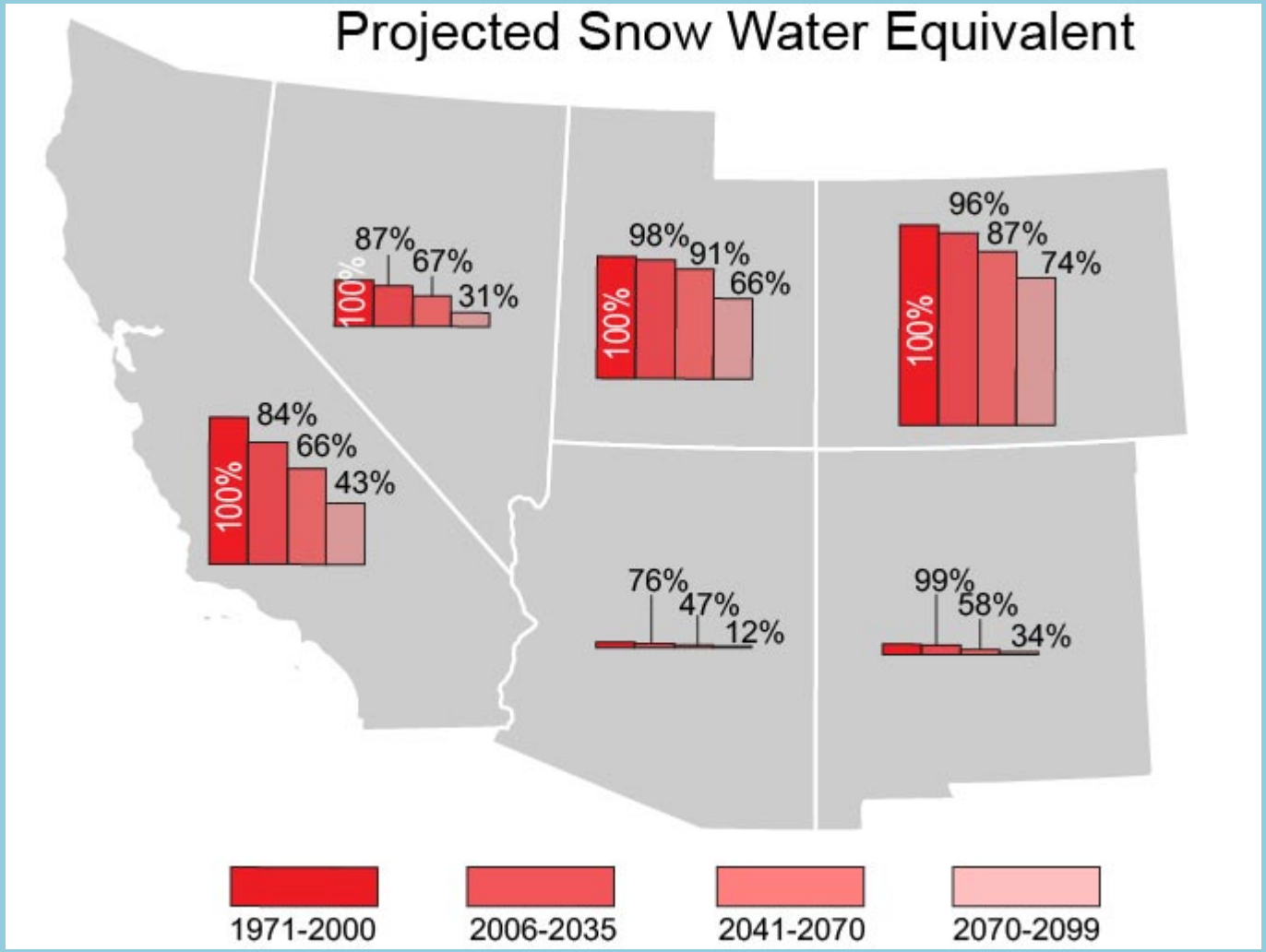
Water-related Challenges





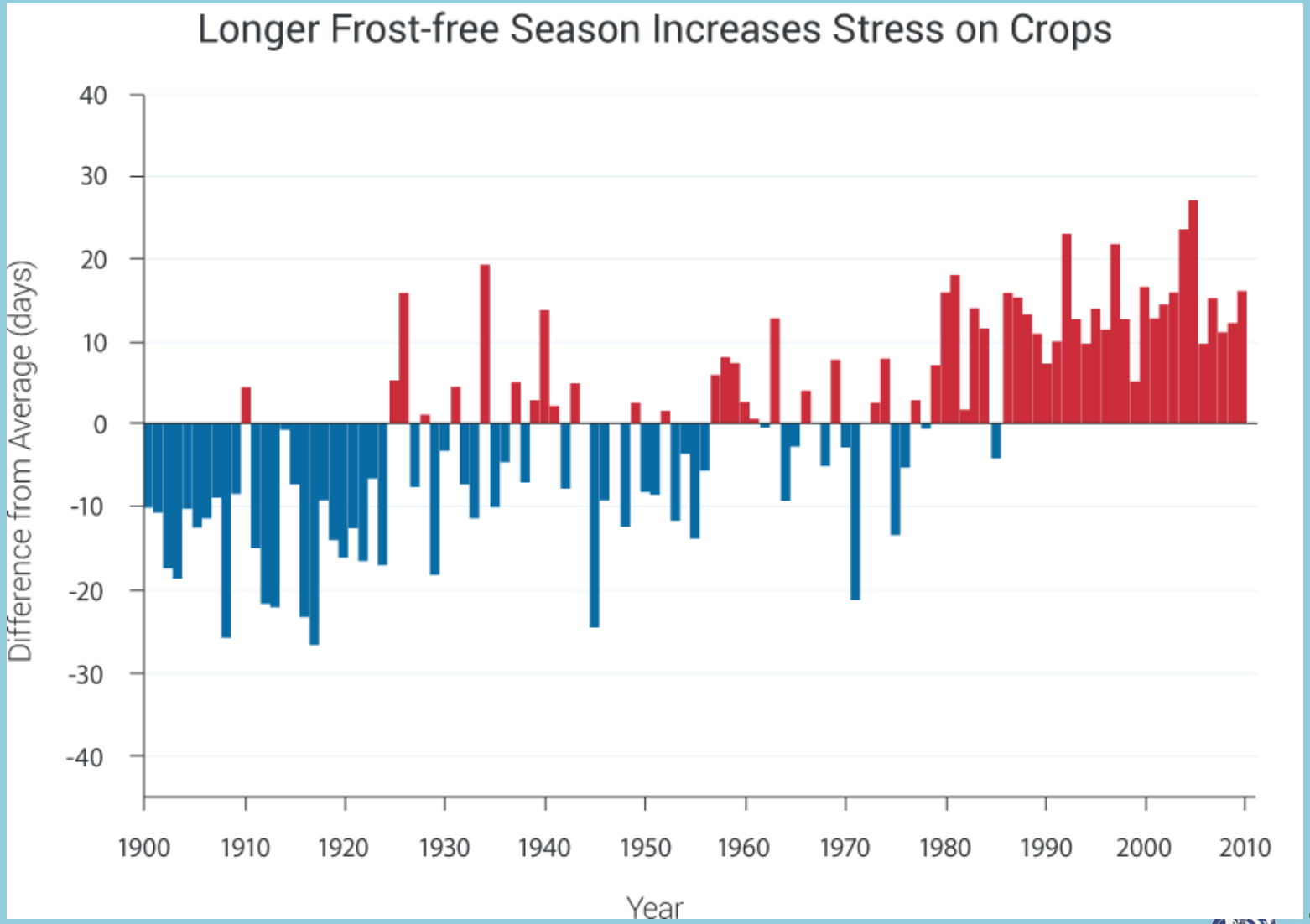
U.S. Global Change Research Program
National Climate Assessment

Water-related Challenges



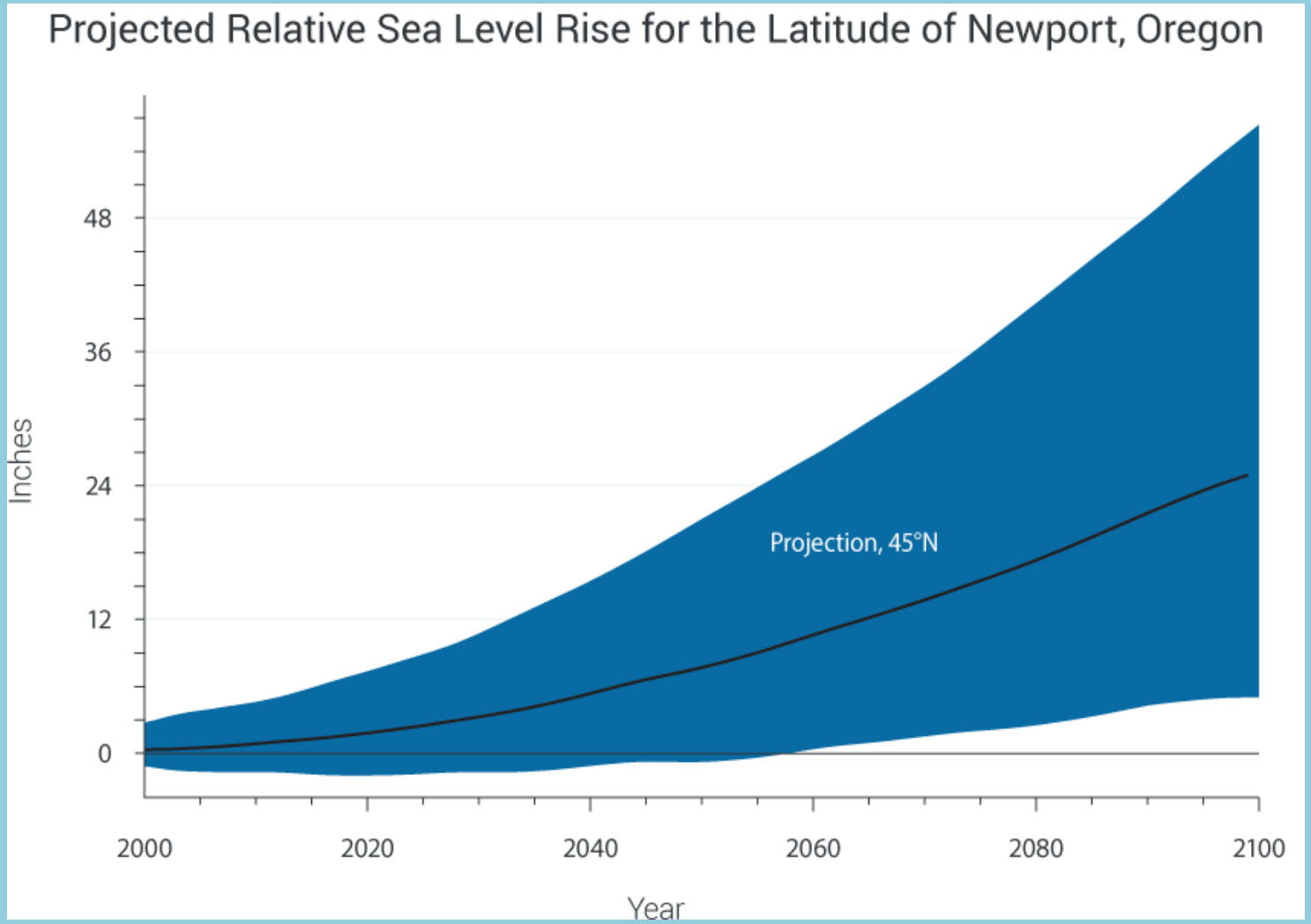
U.S. Global Change Research Program
National Climate Assessment

Threats to Agriculture



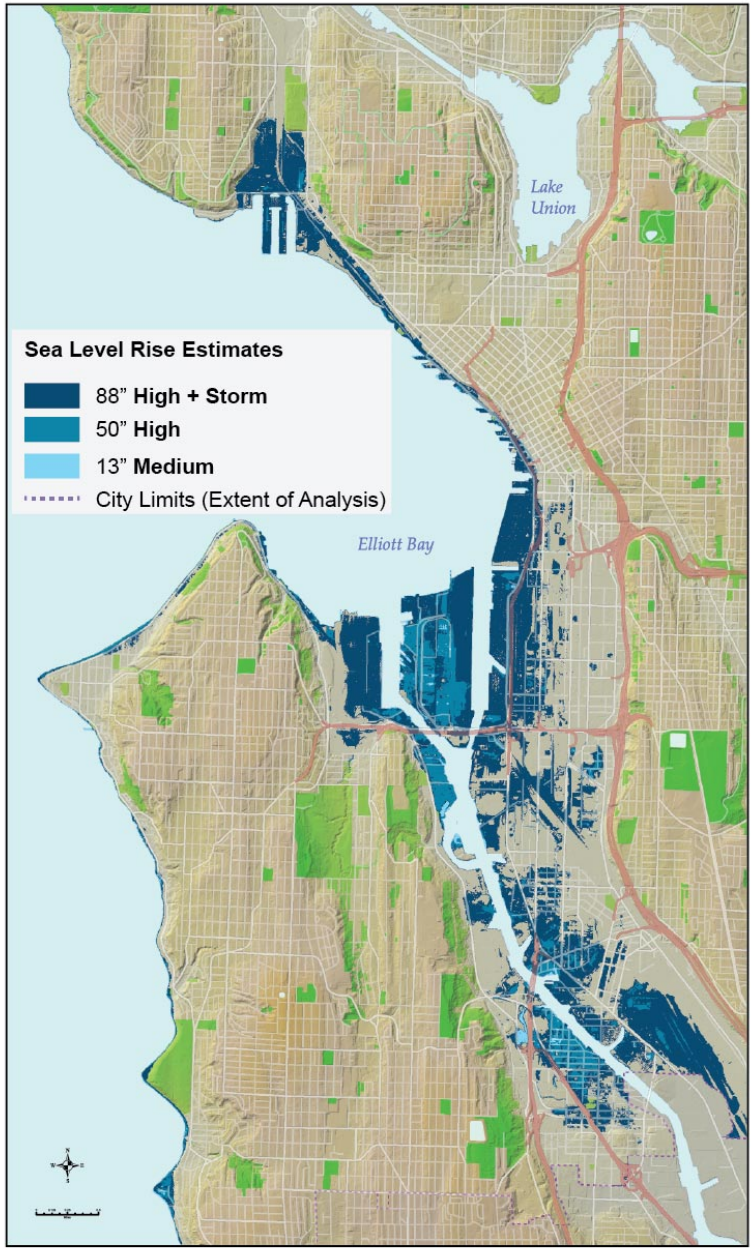
Global Change Research Program
National Climate Assessment

Coastal Vulnerabilities



U.S. Global Change Research Program
National Climate Assessment

Rising Sea Levels and Changing Flood Risks in Seattle



U.S. Global Change Research Program
National Climate Assessment

Regional Reports

Southwest:
nca2014.globalchange.gov/report/regions/southwest

Northwest:
nca2014.globalchange.gov/report/regions/northwest

Alaska:
nca2014.globalchange.gov/report/regions/alaska

Hawai'i:
nca2014.globalchange.gov/report/regions/hawaii-and-pacific-islands

U.S. Global Change Research Program
National Climate Assessment

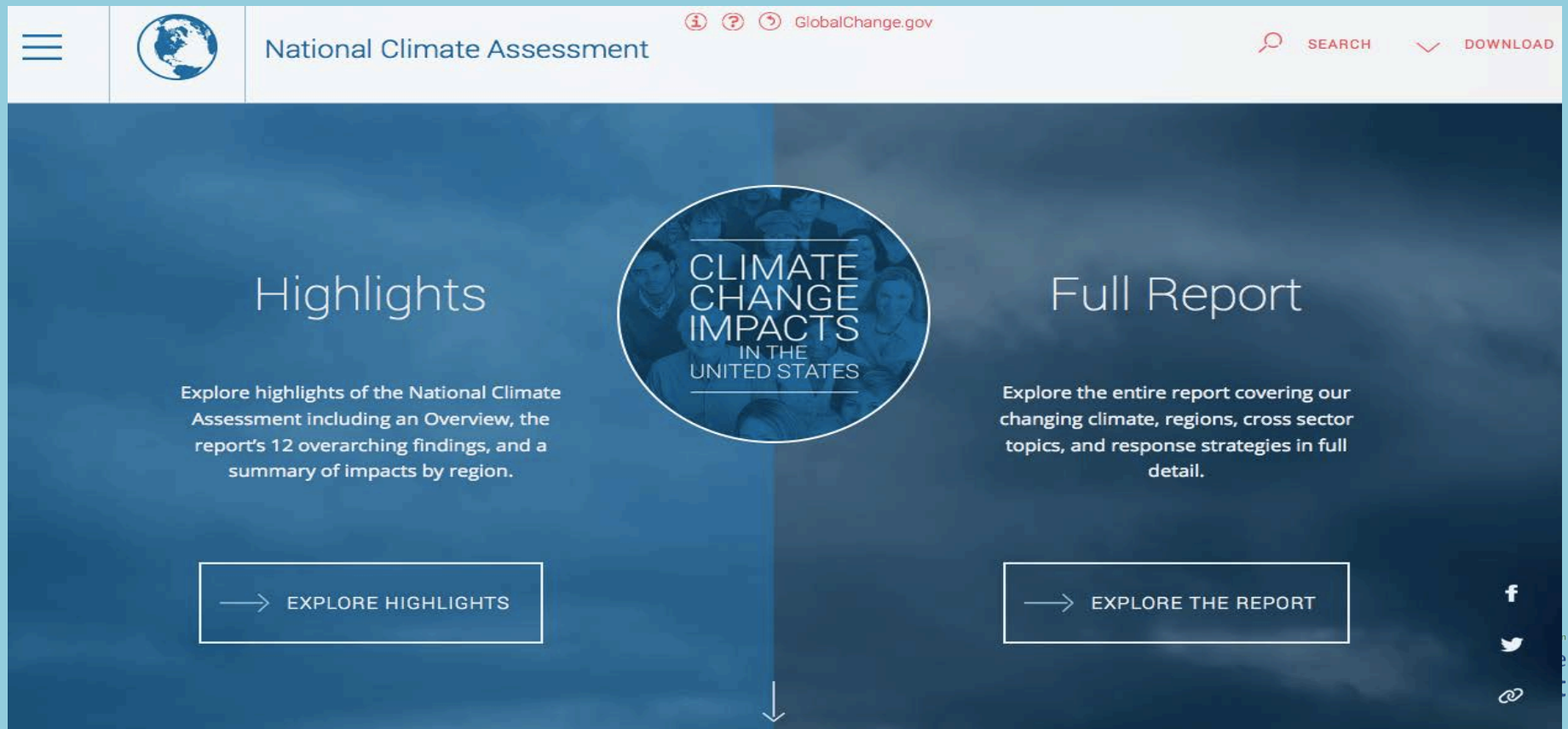
Regional Resources

- State Climatologists: http://stateclimate.org/
- Regional Climate Centers: http://www.ncdc.noaa.gov/customer-support/partnerships/regional-climate-centers
- Quarterly Climate Summaries/Outlooks (2 page Summaries): http://www.drought.gov/drought/content/resources/reports
- NOAA River Forecast Centers: http://water.weather.gov/ahps/rfc/rfc.php
- NOAA Regional Integrated Climate Assessments: http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/RISAProgram/AboutRISA.aspx
- DOI Landscape Conservation Cooperatives
- DOI Climate Science Centers
- USDA Agriculture Hubs
- And more

U.S. Global Change Research Program
National Climate Assessment

Resources

- ✓White House Climate Change: www.WhiteHouse.gov/climate-change
- ✓US Global Change Research Program: www.globalchange.gov
- ✓External Resources: www.globalchange.gov/engage/external-resources
- ✓Third National Climate Assessment portal: nca2014.globalchange.gov



nca2014.globalchange.gov

U.S. Global Change Research Program
National Climate Assessment

U.S. Climate Resilience Toolkit

Get Started | Taking Action | Tools | Topics | Expertise

About | Contact | Funding Opportunities | FAQ

Search

Meet the Challenges of a Changing Climate

The Climate Resilience Toolkit provides resources and a framework for understanding and addressing the climate issues that impact people and their communities.

1. Identify the Problem
2. Determine Vulnerabilities
3. Investigate Options
4. Evaluate Risks & Costs
5. Take Action

Find Out How People Are Building Resilience

Forests to Faucets
Watch video ›

Building a Bridge to Reduce Risk
Watch video ›

Dune Migration and Shoreline Protection
Watch video ›

Louisiana's Front Line Defense from Storm and Surge
Watch video ›

http://toolkit.climate.gov/

http://www.data.gov/climate/

Search Data.gov

DATA.GOV

DATA TOPICS IMPACT APPLICATIONS DEVELOPERS CONTACT

CLIMATE

Themes Data Resources Challenges FAQ Feedback

Here you can find data related to climate change that can help inform and prepare America's communities, businesses, and citizens. Initially, in this pilot phase, you can find data and resources related to coastal flooding and food resilience. Over time, you will be able to find additional data and tools relevant to other important climate-related impacts, including risks to human health, ecosystems, and energy infrastructure. Please share your feedback.

HIGHLIGHTS

Launch of Ecosystem-Vulnerability theme of Climate.Data.Gov

The U.S. government has released a collection of data and tools that will advance planning capabilities for the impacts of climate change on our nation's ecosystems. The data and tools will provide information and will help to stimulate innovation in preparing for climate impacts on fire regimes, water availability, carbon sequestration, biodiversity conservation, ocean health, and the spread of invasive species. Here are some examples of how the data and tools could be used:

www.globalchange.gov/browse/federal-adaptation-resources

Federal Adaptation Resources

- Overview
- Resources by Category
- Federal Agency Adaptation Plans
- August 2013 GreenGov Workshop Resources

Overview

This collection of resources by and for Federal agencies is intended to support the planning and implementation of measures to adapt to climate change. Some of the information here may also be useful to other audiences, such as businesses, natural resource managers, and state, local, and tribal governments. Resources range from executive orders and technical reports to programs, networks, tools, and guides.

As new resources become available, we will improve and update this collection so as to best help agencies meet the requirements outlined in Executive Order 13653 (Preparing the United States for the Impacts of Climate Change) and the related guidance provided by the Office of the Federal Environmental Executive (Preparing Federal Agency Climate Change Adaptation Plans in Accordance with Executive Order 13653).

Resources by Category

Resources in this collection are grouped by categories of research and information needs identified in USGCRP's review of the 2013 Federal Agency Adaptation Plans.

- Built Infrastructure

FEATURED LINKS

U.S. Climate Resilience Toolkit | Partner

The U.S. Climate Resilience Toolkit has science-based resources and real-world case studies to help communities address the impacts of climate change.
View >

Questions?

The Third National Climate Assessment

http://nca2014.globalchange.gov
http://www.globalchange.gov

facebook.com/usgcrp

@usgcrp
#NCA2014

GlobalChange.gov
U.S. Global Change Research Program

National Climate Assessment