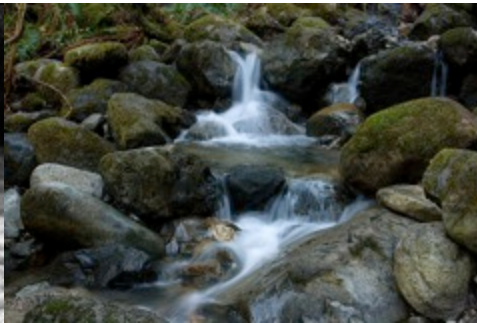


Climate-Smart Water Resource Management: Protecting the Life Aquatic in a Changing World

Rachel M. Gregg
April 30, 2013



The Life Aquatic in a Changing Climate

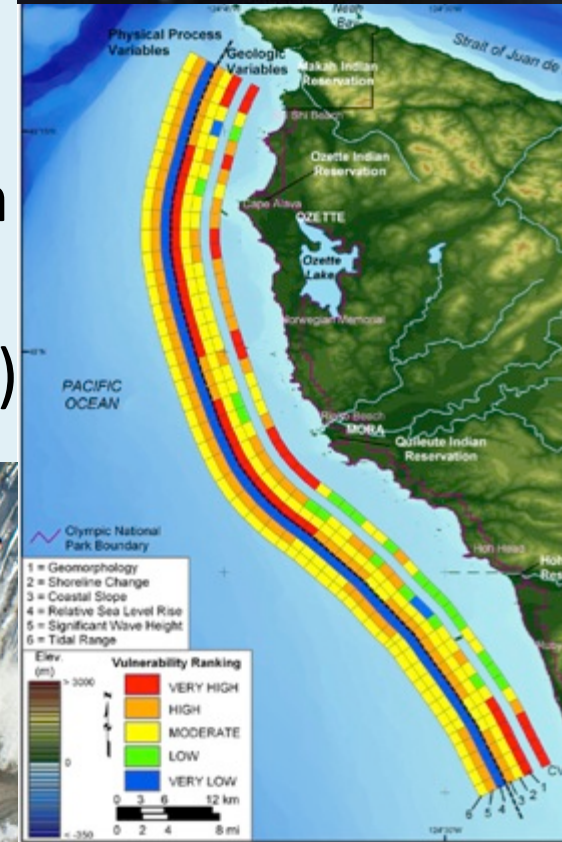
Changes in air and water temperatures

Sea level rise

Changes in precipitation patterns

Altered oceanic and atmospheric circulation

Changes in ocean chemistry (pH and salinity)



Responding to Climate Change

Mitigation is what we do to decrease the potential of climate change itself.

Adaptation is insurance given a non-zero probability that climate change will have an adverse effect on our investments.



Examples of Aquatic Adaptation Strategies

- Protecting and/or restoring ecosystems
- Improving flood and coastal protection measures
- Creating refugia/protected areas
- Increasing water supplies
- Increasing water resource use efficiency
- Incorporating climate change into Integrated Water Resources Management





EcoAdaptTM
Meeting the challenges of climate change

- 1. State of Adaptation Program**
finding out how people are fishing
- 2. Climate Adaptation Knowledge Exchange**
(CAKE; www.cakex.org)
connecting fishermen
- 3. Awareness to Action**
teaching others to fish
- 4. Adaptation Consultation**
fishing for you



Photos: Jonny Armstrong





State of Adaptation

- Survey and assess adaptation efforts
- Develop case studies
 - *Climate Adaptation Knowledge Exchange (www.cakex.org)*
 - *Adaptation Nation (climate-adaptation.blogspot.com)*
 - *The State of Marine and Coastal Adaptation in North America*
 - *The State of Climate Change Adaptation in the Great Lakes Region*
 - *The State of Adaptation in the United States*



“Climate change can be controversial but adaptation is something we all should be engaged in. It behooves each of us to consider the next steps on how to deal with this issue. [This] effort is a call to action to overcome the stubbornness and ennui towards climate change.”

- Louisiana Coastal Manager

EcoAdapt
The State of Marine and Coastal Adaptation in North America: A Synthesis of Emerging Ideas
Final Report
January 2012



EcoAdapt

The State of Climate Change Adaptation in the Great Lakes Region



Rachel M. Gregg, Corina M. Pardo, Jess M. Erickson, and James L. Hill
October 2012

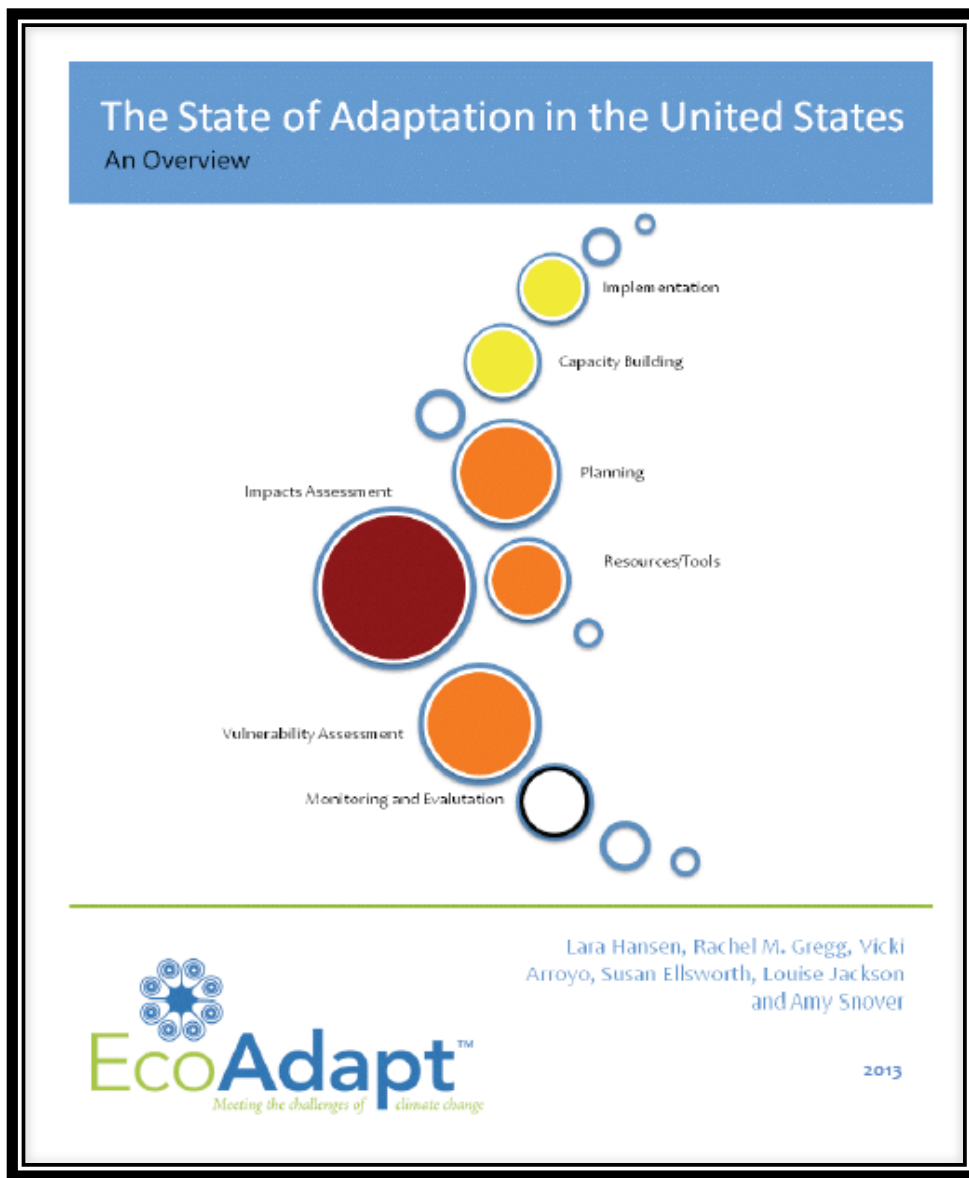
The State of Adaptation in the United States
An Overview



EcoAdapt

Spencer Haines, Rachel M. Gregg, Jess M. Erickson, James L. Hill, Corina M. Pardo, and James L. Hill
April 2012

The State of Adaptation in the United States



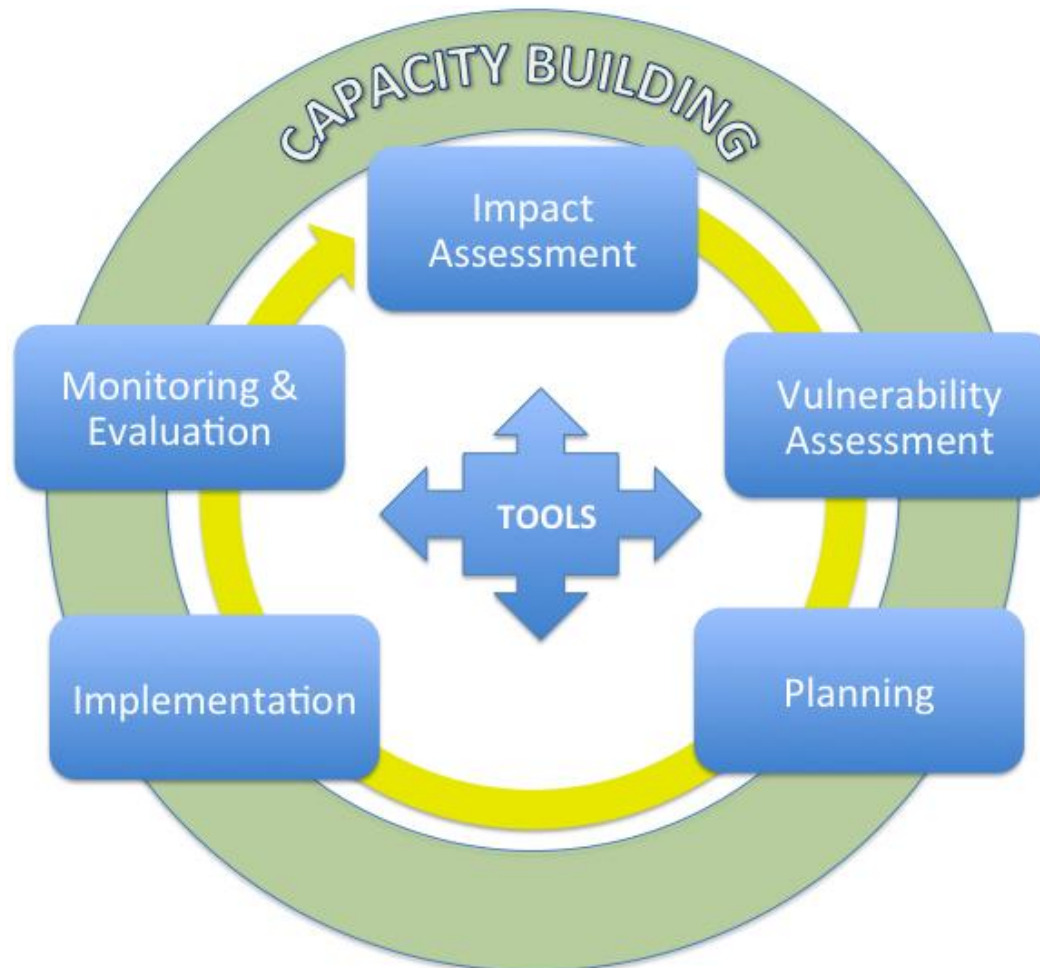
MacArthur Foundation
commissioned EcoAdapt

Examines trends in
adaptation:

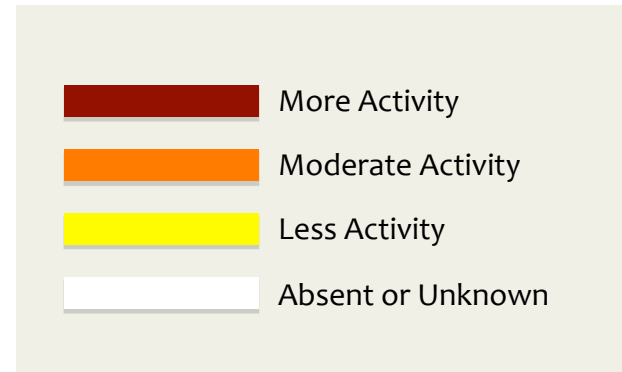
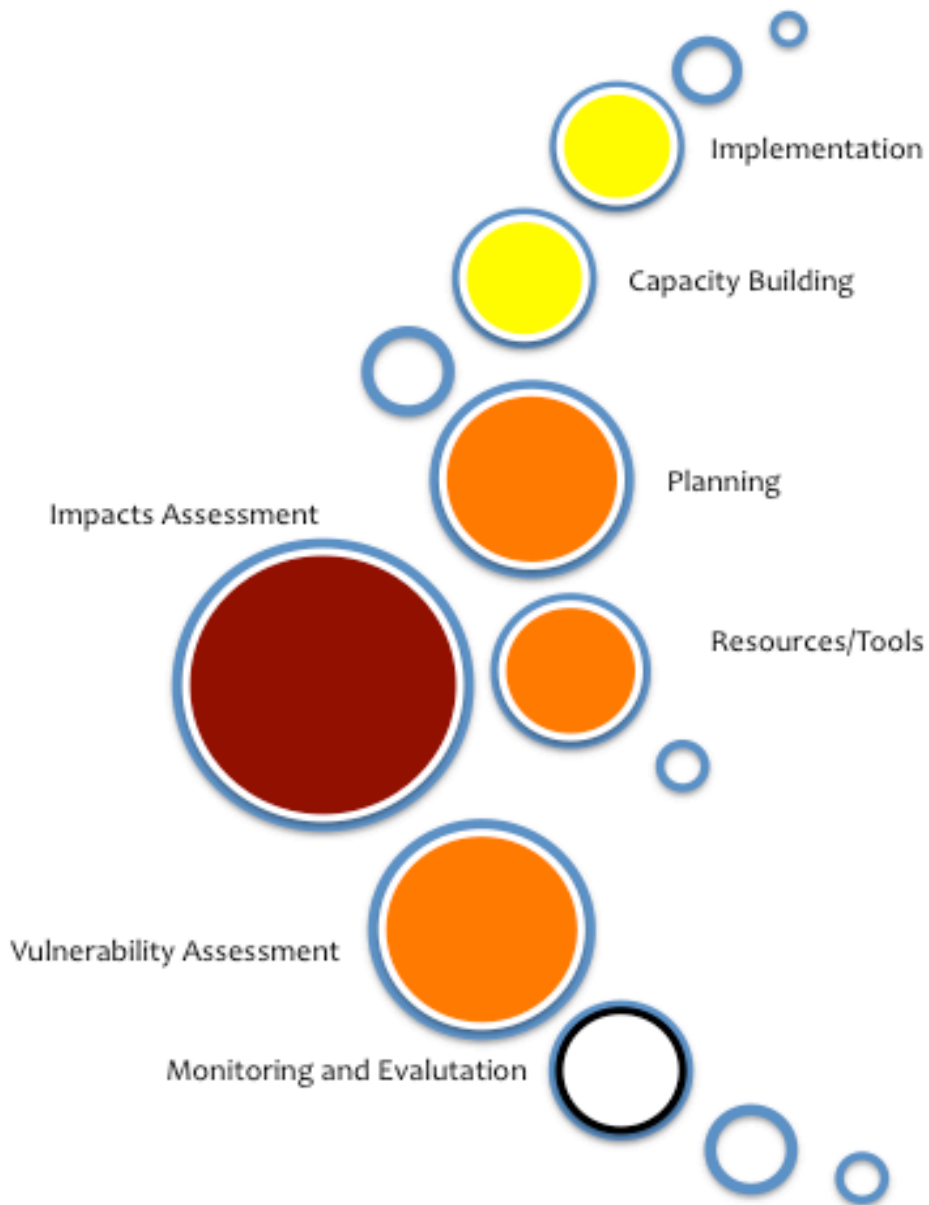
1. Policy (Georgetown Climate Center)
2. Agriculture (UC-Davis)
3. Built Environment (CIG)
4. Natural Resources (EcoAdapt)



Adaptation Cycle



Adaptation Activities Across all Sectors



Policy

Federal

Executive Order 13514
Federal Leadership in Environmental,
Energy and Economic Performance



NATIONAL *fish, wildlife & plants*
CLIMATE ADAPTATION STRATEGY

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



Federal Actions for a
Climate Resilient Nation



Program Report of the Interagency
Climate Change Adaptation Task Force

October 28, 2011

Tribal



SWINOMISH
CLIMATE
CHANGE
INITIATIVE



JAMESTOWN
SKLALLAM
TRIBE

"The Strong People"

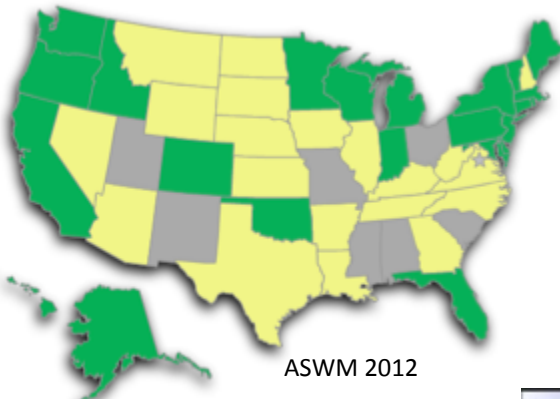


NEZ PERCE TRIBE

TREATY OF 1855

© NP 1995

State



ASWM 2012



2009 CALIFORNIA
CLIMATE ADAPTATION
STRATEGY

A Report for the Governor of the State of California
Prepared by the Governor's Office of Planning and Research



Local



HOMER · ALASKA
Halibut Fishing Capital
of the World



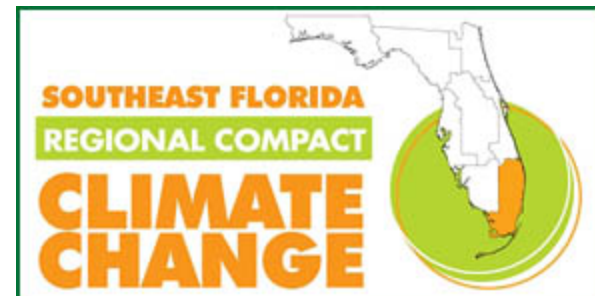
Preparing for a Changing Climate

Washington State's Integrated Climate Response Strategy



COLORADO CLIMATE ACTION PLAN

A STRATEGY TO ADDRESS GLOBAL WARMING

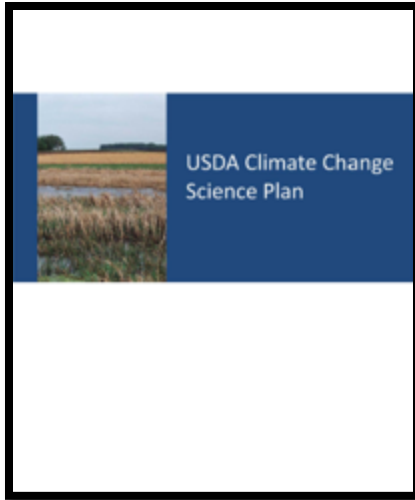


SOUTHEAST FLORIDA
REGIONAL COMPACT

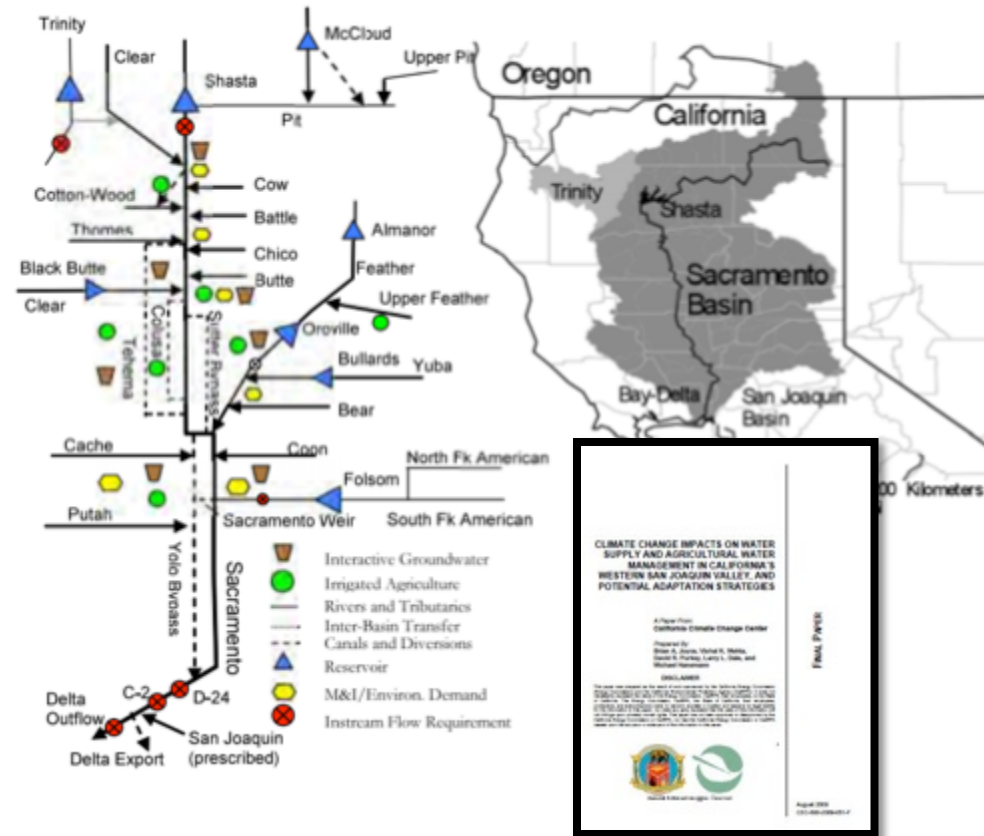
CLIMATE
CHANGE



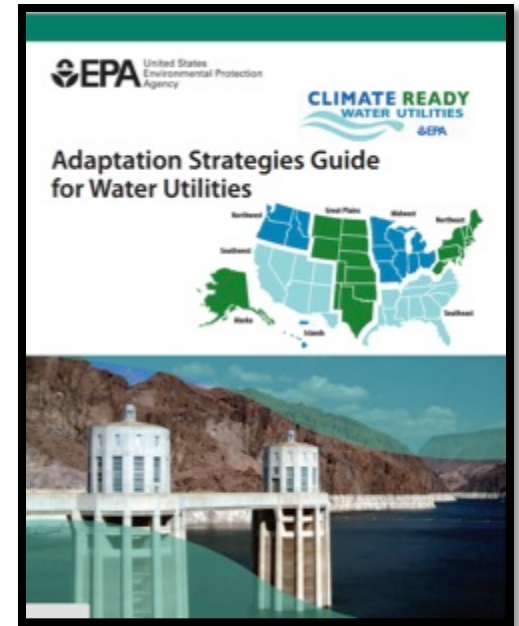
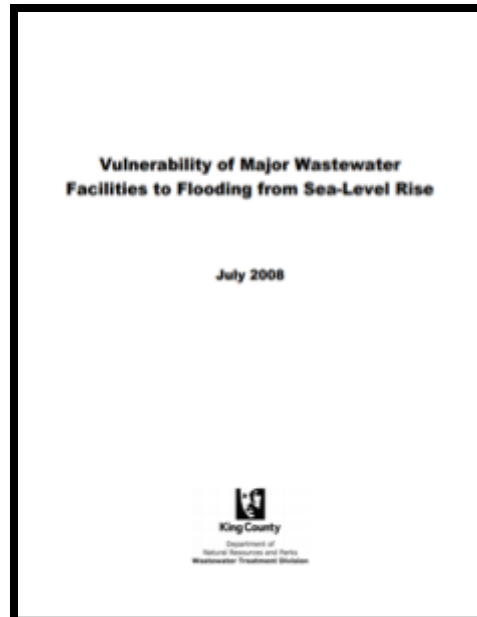
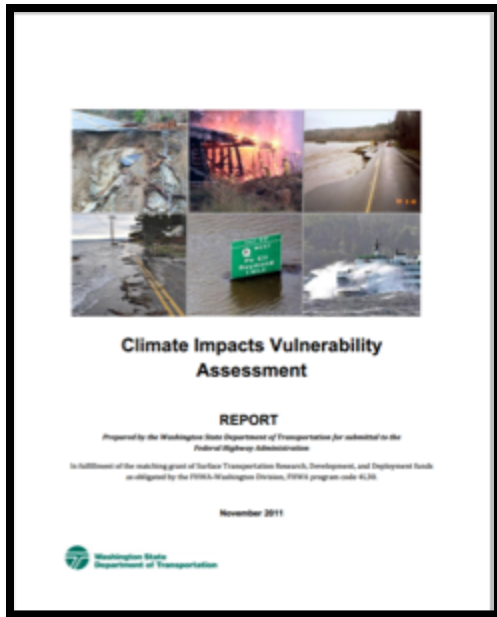
Agriculture



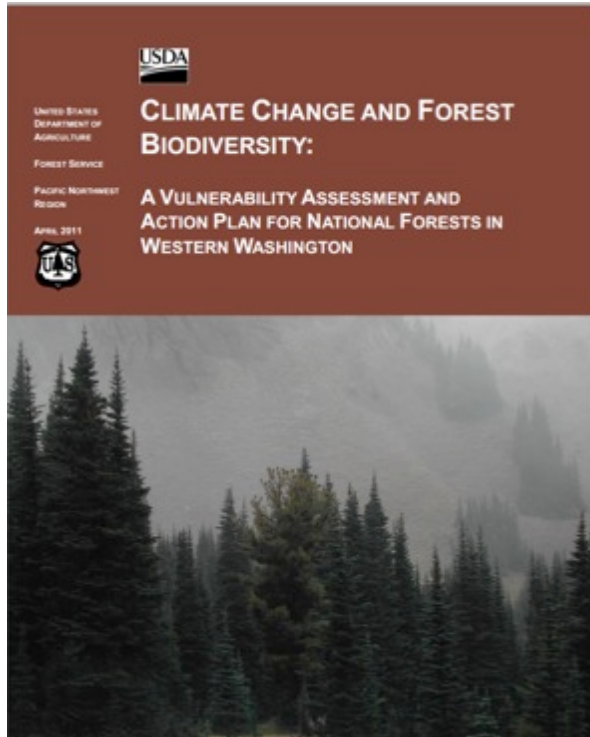
USDA Cooperative Extension



Built Environment



Natural Resources



North Cascadia Adaptation Partnership (NCAP)



Gaps and Opportunities

- Supporting implementation of strategies
- Building capacity for action
- Increasing cross-sectoral connections
- Building public awareness and buy-in
- Improving monitoring and evaluation





Awareness to Action

➤ Bring partners from awareness about climate impacts and adaptation to implementation

- Federal and state agencies
- Tribes
- Conservation organizations
- Community groups
- Foundations

EcoAdapt's Climate Vulnerability Assessment Quick Guide

V = E + S - AC

V = Vulnerability to climate change
E = Exposure is how much change occurs, including changes outside the project area that affect the target (e.g. loss of glaciers less of water supply)
S = Sensitivity is how much the target is affected by a given amount of change
AC = Adaptive Capacity is the ability of an individual, community, or ecosystem to adapt to change this reflects intrinsic traits (behavioral flexibility that allows individuals to respond to new situations) and extrinsic factors (e.g. degree of habitat fragmentation)

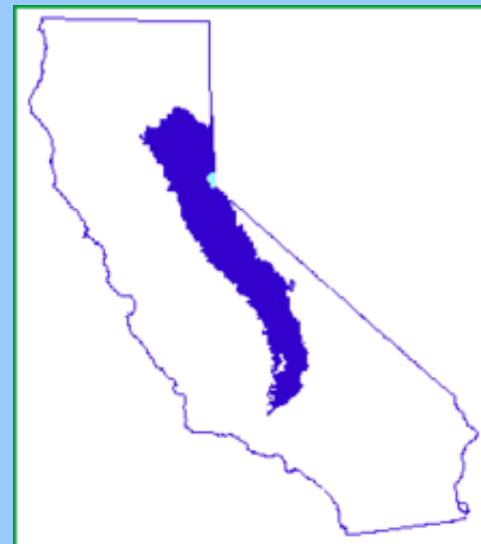
Exposure → Sensitivity → Potential Impact
Potential Impact → Adaptive Capacity → Vulnerability

Potential Impact = the result of the interaction between exposure and sensitivity

Nov 08 and Jan 2011

Your vulnerability assessment goal affects how you do the assessment (e.g. audience, target, spatial and temporal scale, products). Some possible targets/ objectives of a vulnerability assessment include:

1. Informing decisions about whether or not to **list** species under the Endangered Species Act
2. Setting **adaptation priorities** for an agency, land trust, or similar organization
3. Developing a **management plan** for a park, reserve, or other management unit
4. Deciding which management measures to use for a **restoration** project



EcoAdapt's Climate Adaptation Starter Kit

EcoAdapt's Climate Adaptation Starter Kit includes our top list of resources, tools, and adaptation examples to get you started. It is not intended to be fully comprehensive, but to provide a compilation of what we have found most practical and useful for planning, developing, and implementing climate adaptation.

The Climate Adaptation Starter Kit is divided into six parts:

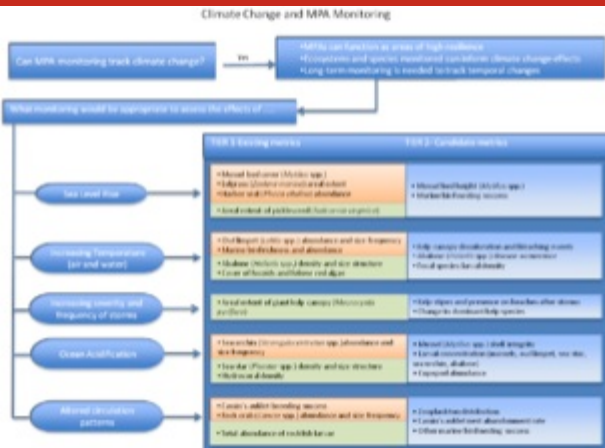
1. **Vulnerability Assessment** - resources for climate change vulnerability, risk and impact assessment.
2. **Adaptation Frameworks** - processes to guide the development of climate change adaptation strategies.
3. **Adaptation Portals and Tools** - a sampling of climate adaptation portals, tools, and resources.
4. **Examples of Adaptation Projects** - climate change adaptation case studies.
5. **Getting Started** - where to begin, working with what you already have, and avoiding maladaptation.
6. **Evaluation and Monitoring** - on how adaptation programs are succeeding.



Adaptation Consultation

- Designed to help partners at any stage in the planning process
- Specifically tailored to each partners' needs

MPA monitoring

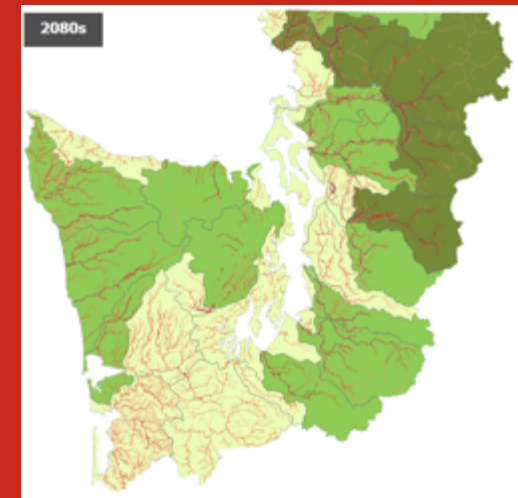


Adaptation Marketplace



www.adaptationmarketplace.org

Mapping and spatial tools





Climate Adaptation Knowledge

Exchange
www.CAKE.org

Why Make a CAKE?

- Everything we do is vulnerable to climate change but few people know what to do about it
- Adaptation is a rapidly developing field
- We are spending more time **reinventing**, not enough **innovating**



- **Georeferenced Database**
 - Map and text searches of all fields
- **Approachable content**
 - Interpretation, style, and personality
- **Building the community to build the field**



Opportunities

- Check out our Adaptation Starter Kit
- Read/Request State of Adaptation surveys and synthesis products
- Join CAKE and submit your content (www.CAKEx.org)
- Request an Adaptation Consultation
- Join us at the next National Adaptation Forum in 2015!

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www.EcoAdapt.org

