

Introduction to Climate Change Adaptation Planning



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Presentation Overview

- Why plan and prepare?
- Assessments and adaptation plans
- Adaptation planning frameworks
- Steps
- ITEP toolkit



*Trees Killed by the 2011 Las Conchas Fire in New Mexico.
Credit: Craig D. Allen/USGS*



Navajo National Monument, AZ



*Flathead Lake, MT, Confederated Salish
and Kootenai Tribes*

In the news...

Wildfires Scorching Northwest, Including Tribal Lands

(Indian Country Today, 8/25/15)

Southwest's water crisis hitting Navajo people first – and hardest

(© 2015 azcentral, 8/21/15)

3 Missing in Heavily Native Sitka, Alaska After Torrential Rains, Landslides

(Indian Country Today, 8/19/15)

Scientists fear toxic algae bloom spreading on Pacific coast

(Al Jazeera America, 8/1/15)



Brook trout. Photo credit: USFWS



Kivalina, Alaska. Photo credit US Coast Guard/ Lt. Cdr. Micheal McNeil



Photo credit: M. Lockhart/USFWS

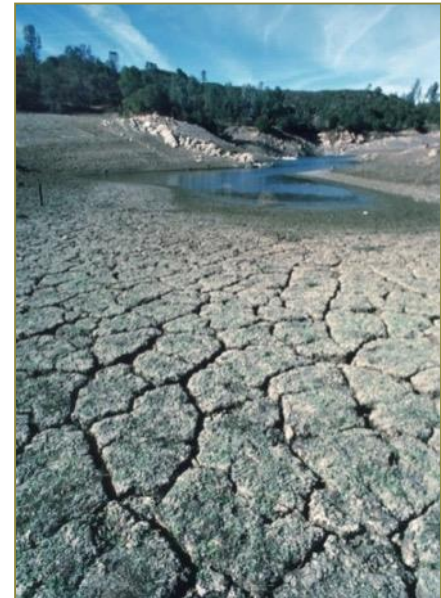


Photo credit: USDA NRCS



*Sand dune migration on Navajo Nation. .
Photo credit: M. Hiza, USGS*



Photo credit: Josh O'Connor/USFWS

Climate Change Mitigation and Adaptation

- **Mitigation:** Dealing with causes. Actions that reduce level of greenhouse gases in atmosphere
- **Adaptation:** Dealing with effects. Taking action to minimize impacts of climate change



Saint Regis Mohawk Tribe, NY



Oneida Nation of Wisconsin



Rain collection barrel

Why plan and prepare for climate change?



Hopi dancers



Mission Mountains, Confederated Salish and Kootenai Tribes, MT



Rio Grande, NM. Taos Pueblo on right.



Dead ponderosa in Jemez Mountains of NM. Photo credit: Craig D. Allen/ USGS



Salmon drying on a rack in Alaska. Photo credit: David Bezaire and Susi Havens - Bezaire

Assessments and plans

Vulnerability assessment: understand how climate change will affect tribe and resources

Adaptation plan: tells what to do

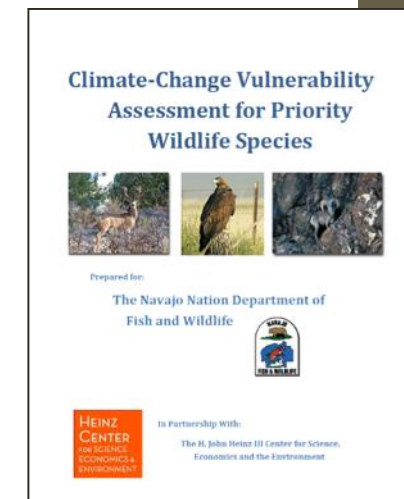
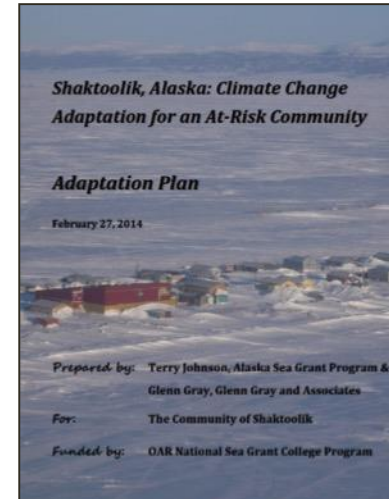
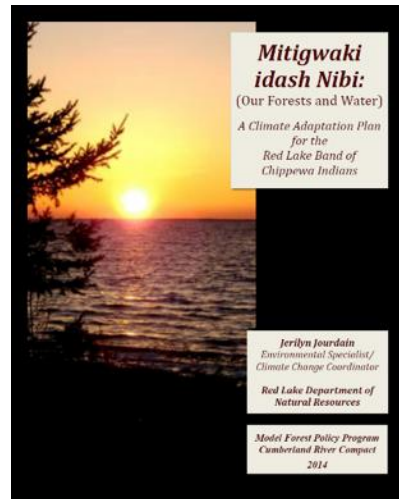
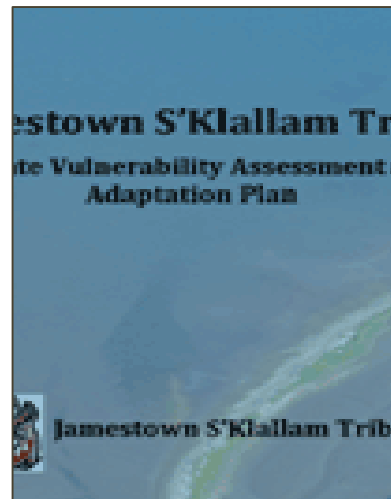
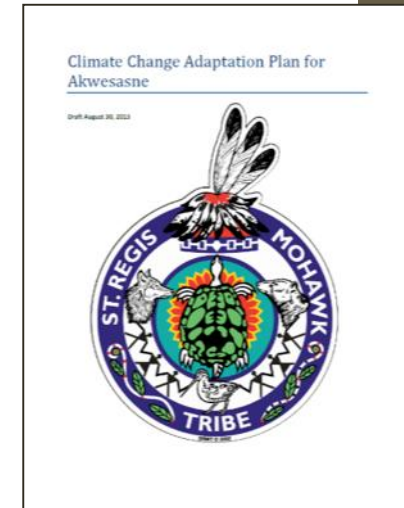
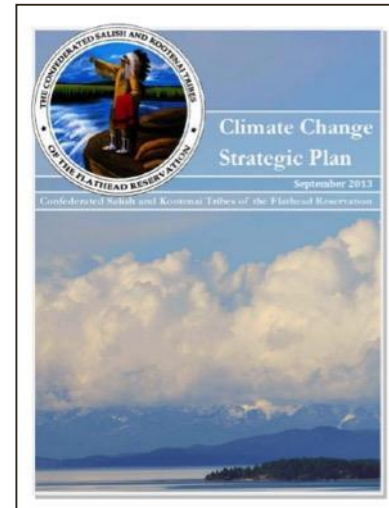
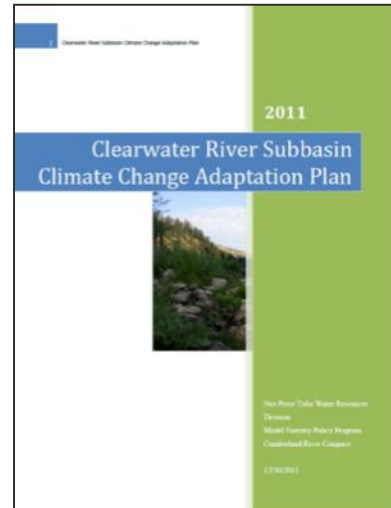
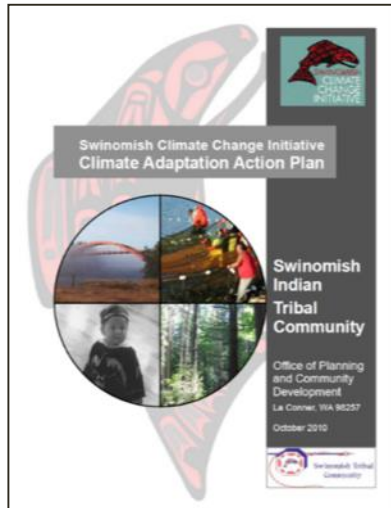


Corn field – the Hopi have done dryland farming for centuries

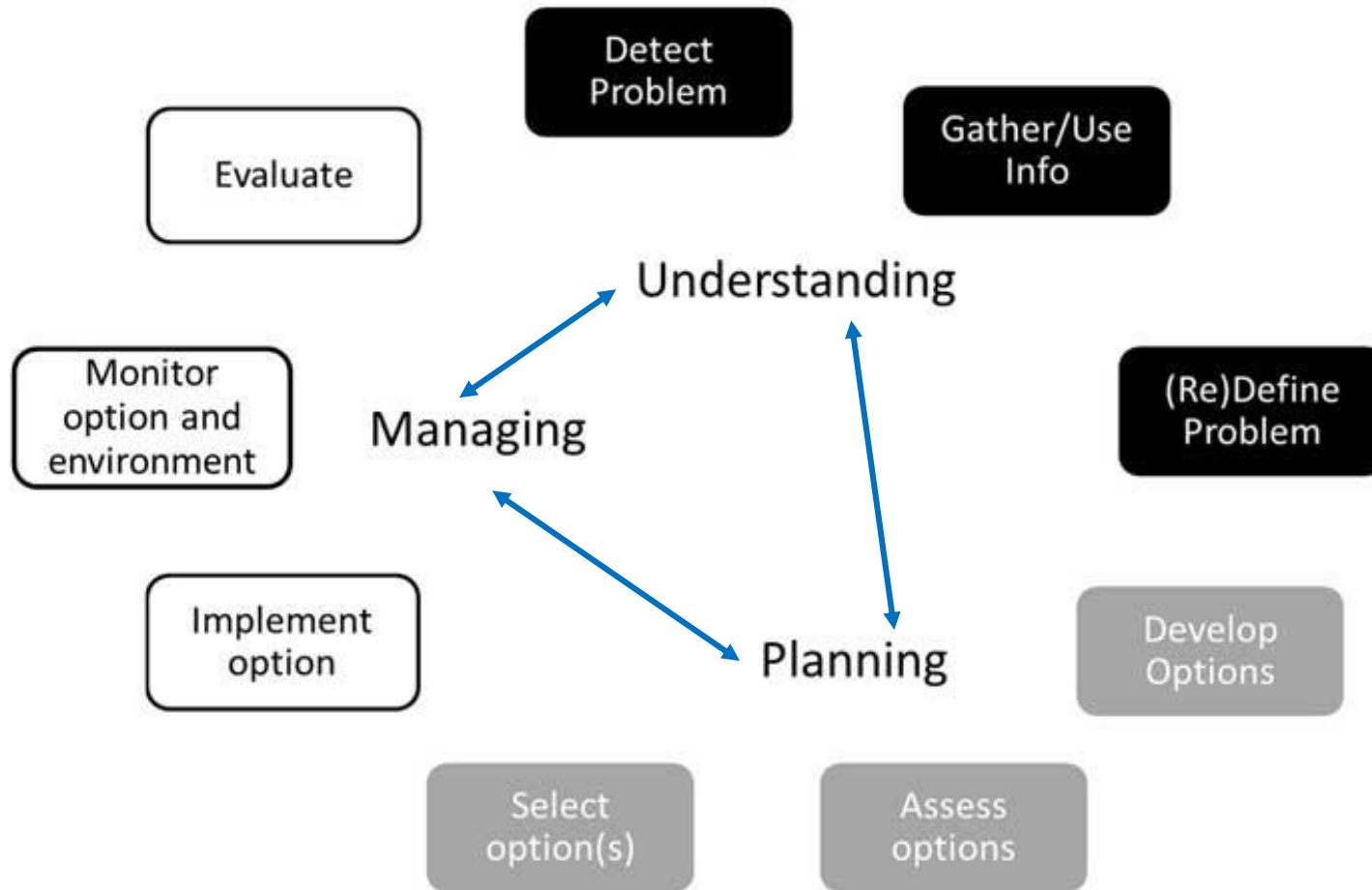


Quinault Indian Nation, WA

Assessments and Plans by Tribes



Adaptation Planning: Phases and Processes



Source: Moser and Ekstrom (2010)

Adaptation Planning Frameworks

The screenshot displays the U.S. Climate Resilience Toolkit website. The header includes the toolkit logo, navigation links (Get Started, Taking Action, Tools, Topics, Expertise), and a search bar. The main content area features a large blue banner with the title 'Meet the Challenges of a Changing Climate' and a descriptive paragraph. To the right of the banner is a vertical list of five steps in the Adaptation Planning Framework, each in a colored box with a number. The steps are: 1. Identify the Problem, 2. Determine Vulnerabilities, 3. Investigate Options, 4. Evaluate Risks & Costs, and 5. Take Action. The fifth step is highlighted in a darker blue. At the bottom of the banner, there are navigation arrows and a series of dots indicating the current position in the framework.

U.S. Climate Resilience Toolkit

About | Contact | Funding Opportunities | FAQ

Get Started Taking Action Tools Topics Expertise

Search

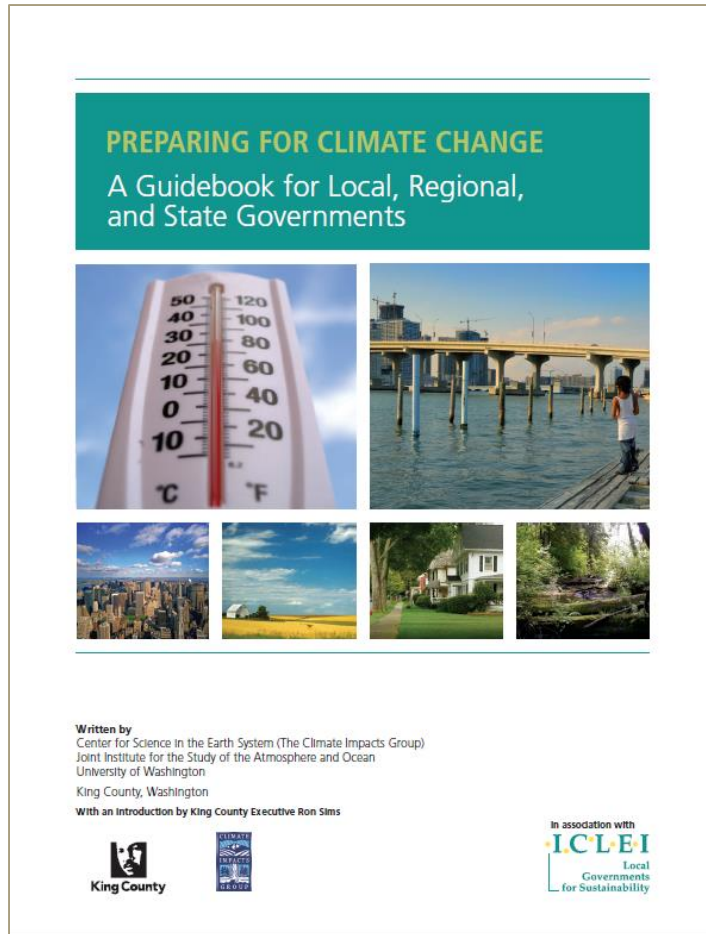
Meet the Challenges of a Changing Climate

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

Available at: <http://toolkit.climate.gov/>

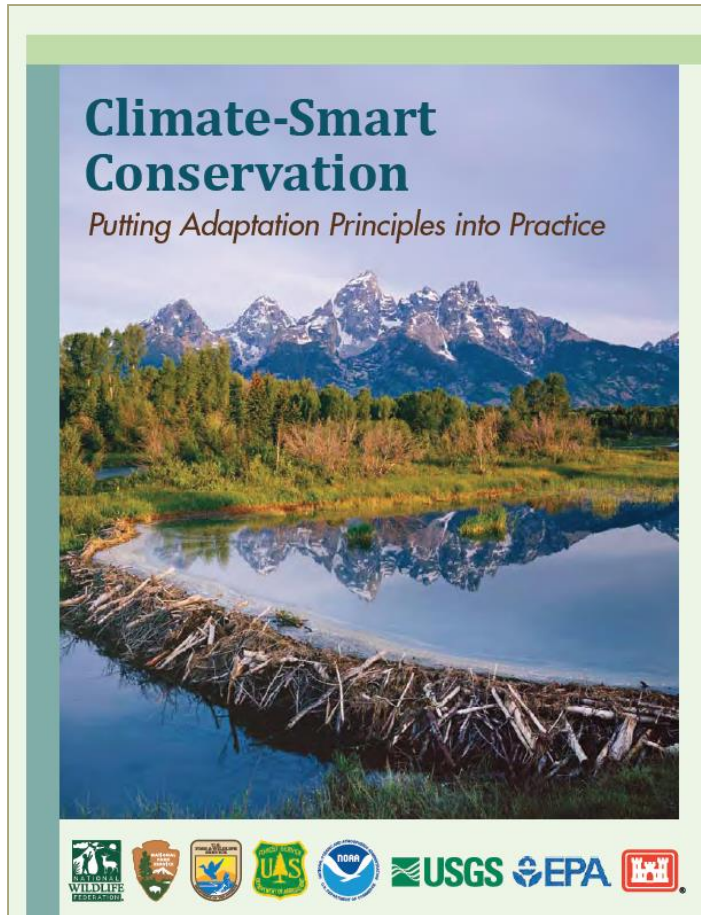
Adaptation Planning Frameworks



Available at:

<http://cses.washington.edu/cig/fpt/guidebook.shtml>

Adaptation Planning Frameworks



Available at:

http://www.nwf.org/pdf/Climate-Smart-Conservation/NWF-Climate-Smart-Conservation_5-08-14.pdf

Adaptation Planning Frameworks

Climate Change Handbook for Regional Water Planning

(CA Dept. of Water Resources)

<http://www.water.ca.gov/climatechange/CCHandbook.cfm>

California Adaptation Planning Guide

(CA Natural Resources Agency, CA Emergency Mgmt. Agency)

http://resources.ca.gov/climate/safeguarding/adaptation_policy_guide/

Being Prepared for Climate Change: A Workbook for Developing Risk-Based Climate Change Adaptation Plans (USEPA)

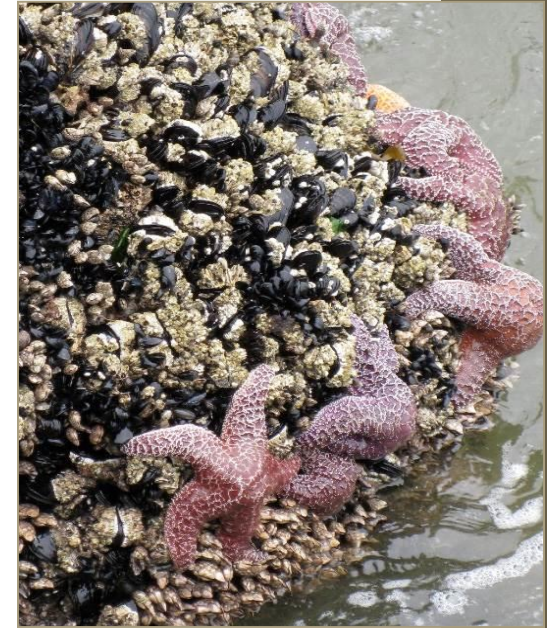
http://www2.epa.gov/sites/production/files/2014-09/documents/being_prepared_workbook_508.pdf

And more...

Getting Started

Initial scoping/decisions

- Questions to answer?
- Decisions that assessment will support?
- Sectors/planning areas? What is important to tribe?



Alaska



Little Colorado River, Navajo Nation, AZ



Tohono O'odham Nation, AZ

Getting Started

Initial scoping/decisions

- Who will be involved?
- Technical assistance needs
- Budget



Dead pinyon pine trees near Flagstaff, AZ

Build support - secure “buy in” from tribal leadership and community



Climate change fact sheet

Getting Started

Get organized

- Climate change planning team, team lead
- Workshop
- Vision and guiding principles
- Guide for planning process

Form partnerships

Secure funding



Small group discussions at ITEP climate change training

Impact Assessment

How is climate changing in region?

Gather relevant data; reach out to experts

Climate data and assessments, tribal monitoring records, traditional knowledges

Guidelines for Considering Traditional Knowledges in Climate Change Initiatives

<https://climatetkw.wordpress.com/>



Cook Inlet, AK



Navajo Nation, AZ



Pyramid Lake Paiute Tribe, NV

Impact Assessment

- Which sectors?
- How? Where? When?
- Probability of impact
- Consequences

Which tribal depts., programs, goals and objectives will be affected?



Farm fields in northeastern Oregon



Forest on Menominee Indian Reservation, WI



Sand dune migration on Navajo Nation, AZ

Vulnerability Assessment

Vulnerability = susceptibility to harm

Vulnerability assessment – understand how climate change will affect tribe and its resources

- *What* things are most vulnerable and least vulnerable
- *Why* they are vulnerable and not vulnerable



Eastern Band of Cherokee in North Carolina



A pueblo in New Mexico

Vulnerability Assessment

Exposure: How much sector is exposed to change in climate or its impacts

Sensitivity: How much sector is affected

Adaptive capacity: Ability to adapt with minimum disruption and cost



Newtok, Alaska. Photo credit: Travis/Flickr

Vulnerability Assessment

Assess vulnerability

Consider exposure, sensitivity, and adaptive capacity

High sensitivity + low adaptive capacity → high vulnerability

Vulnerability Matrix

SENSITIVITY	ADAPTIVE CAPACITY		
	HIGH	MEDIUM	LOW
HIGH	MEDIUM	MEDIUM-HIGH	HIGH
MEDIUM	MEDIUM-LOW	MEDIUM	MEDIUM-HIGH
LOW	LOW	MEDIUM-LOW	MEDIUM



Sheep at Navajo Nation

Risks

Assess risks

Consider consequences and probability of impact

High consequences + high probability → high risk



Aleut subsistence fisherman with chinook and sockeye salmon. Photo credit: USFWS

Risk Matrix

CONSEQUENCES	PROBABILITY		
	HIGH	MEDIUM	LOW
HIGH	HIGH	MEDIUM-HIGH	MEDIUM
MEDIUM	MEDIUM-HIGH	MEDIUM	MEDIUM-LOW
LOW	MEDIUM	MEDIUM-LOW	LOW

Prioritization

Identify priority planning areas

Consider risk and vulnerability

Higher risk + higher vulnerability
→ higher priority for planning

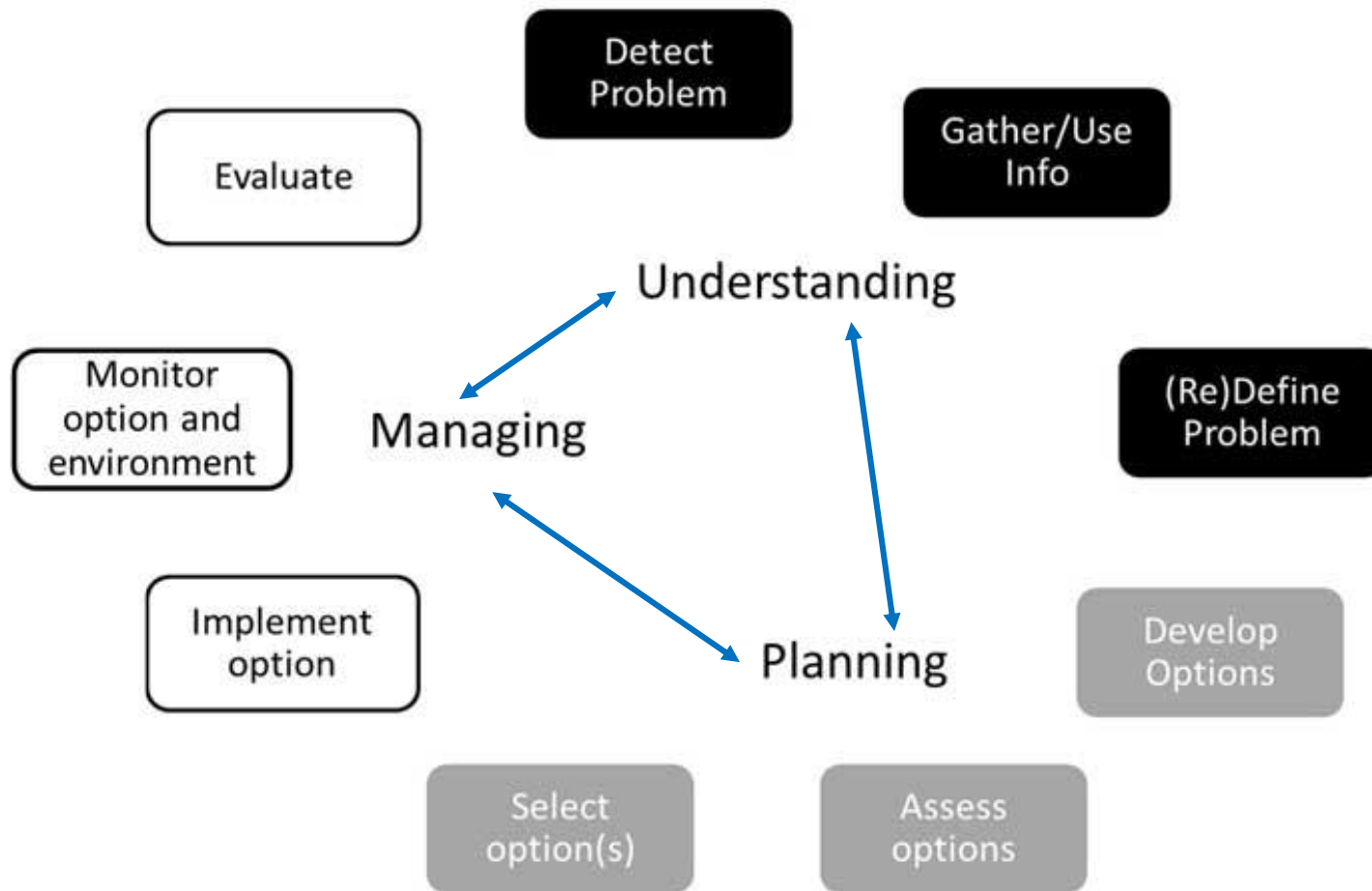


Dust storm near Winslow, AZ. Photo credit: Seth Munson/USGS

Prioritization Matrix

RISK	VULNERABILITY	
	HIGHER	LOWER
HIGHER	HIGH	MEDIUM
LOWER	MEDIUM	LOW

Adaptation Planning: Phases and Processes



Source: Moser and Ekstrom (2010)

Adaptation Strategies: Goals and Actions

Adaptation goal: what you want to accomplish in priority planning area

Adaptation action: activity to achieve goal



Quinault River, Quinault Indian Nation, WA



Replica of a traditional Yurok home, CA



North of Santa Fe, NM

Adaptation Strategies: Goals and Actions

Example:

Swinomish Tribe—Shellfish

- Goal: Fishery and shellfish resources of the Reservation should be restored and enhanced, maintaining the traditional livelihood based upon these resources
- Actions: Shoreward habitat migration, establish beds



Swinomish Reservation, WA

Write and Mainstream Plan

Write your adaptation plan

“Mainstream” into other existing plans

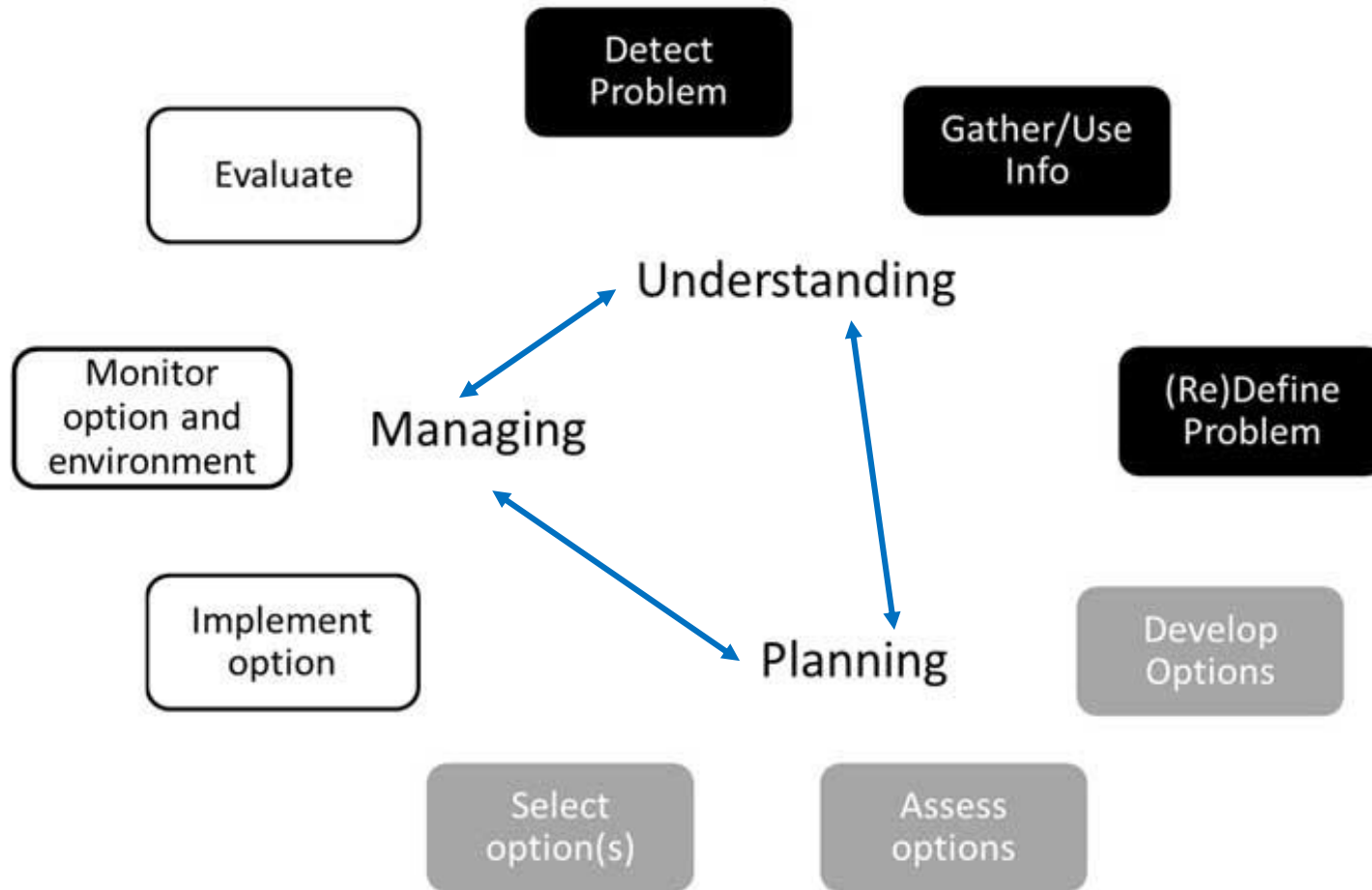


Saint Regis Mohawk Tribe, NY



2010 Schultz Fire in Flagstaff, AZ

Adaptation Planning: Phases and Processes



Source: Moser and Ekstrom (2010)

Tribal Climate Change Adaptation Planning Toolkit

- Background Material
- Checklist
- Template: Adaptation Planning Guide
- Template: Tribal Resolution
- Worksheet: Adaptation Planning
- Spreadsheet: Adaptation Planning
- Template: Adaptation Plan
- List: Guides and Tools
- List: Tribal Adaptation Plans



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For more information about ITEP's Tribal Climate Change Program, please visit our website:

<http://www7.nau.edu/itep/main/ClimateChange/>

Tribes & Climate Change website:

<http://www7.nau.edu/itep/main/tcc/Home/>

Except where noted otherwise, photos in this presentation were taken by ITEP staff.