



U.S. Army



NOAA



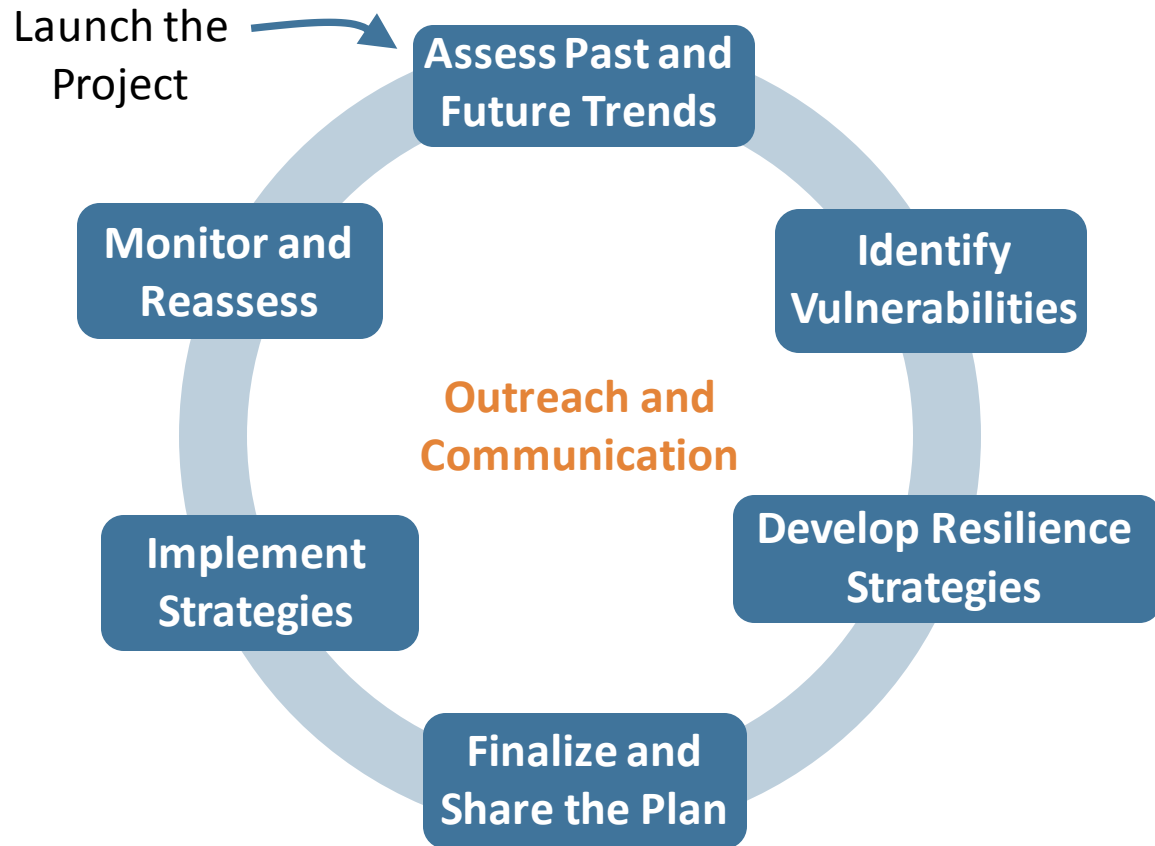
K. Schafer

Climate Resilience Plans

Examples from Santa Cruz, Swinomish Tribe, and Missoula

JULY MONTHLY FORUM

Same Process, Different Plans



Examples

1. Santa Cruz, California



2. Swinomish Tribe, Washington

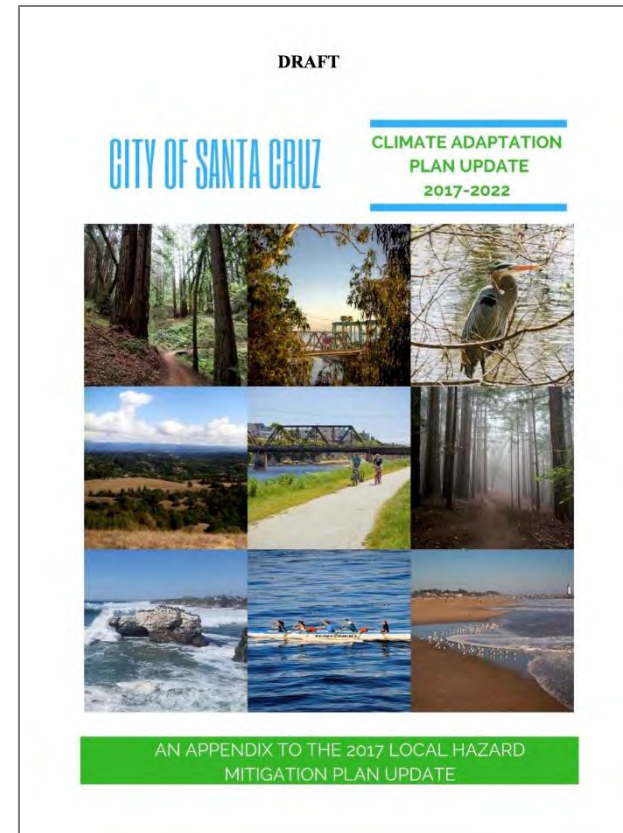


3. Missoula County, Montana



Santa Cruz, CA

- 2017 plan
- FEMA update NHMP
- City staff worked with university scientists
- City resolution



Santa Cruz, CA



- Covered environmental, social, and economic health, infrastructure function, and disaster resilience
- Social vulnerability assessed, scored, and mapped
- Public outreach – meetings and surveys

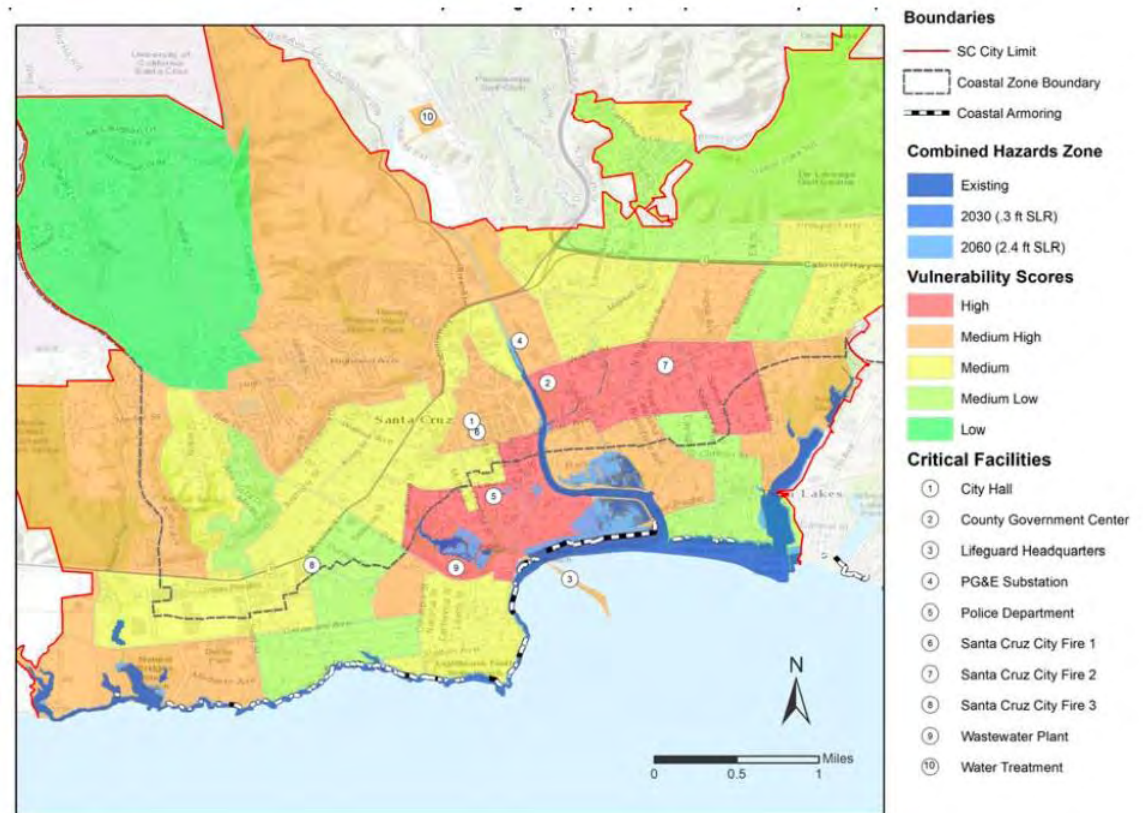
Vulnerabilities



- 275 buildings at risk from sea level rise by 2060; 250 more if existing levees and storms pumps fail
- 5 miles of pipes, 11 miles of roads at risk
- Property values lost = \$622 million (w/protection)
- Wetlands, habitats and coastal trails at risk, including 28 access locations, all pocket beaches, and 66% of wetlands

Social Vulnerability

- Income
- Elderly (65+)
- Language limitations
- Disability
- Crime incidence



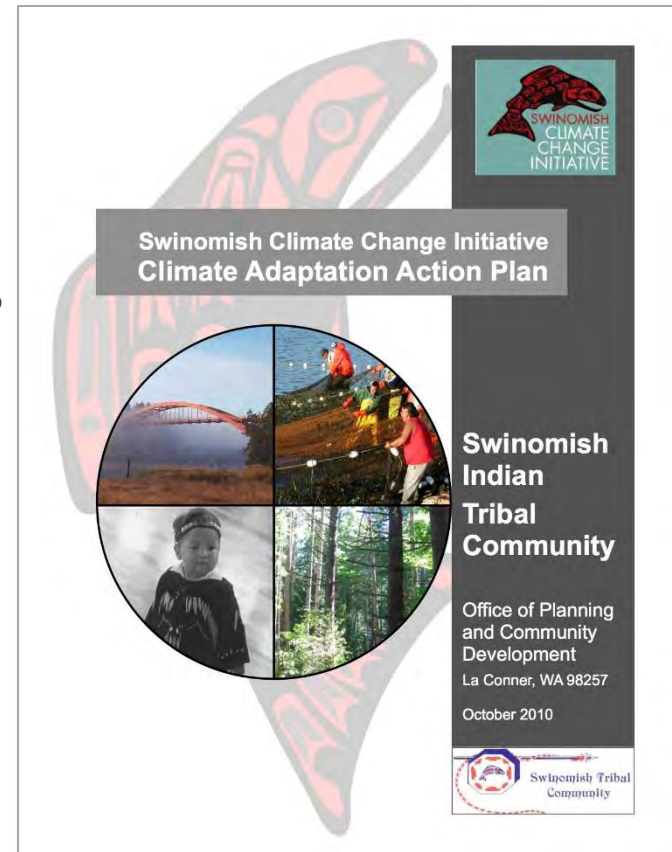
Resilience Strategies



- ✓ Augment water supply
- ✓ Reservoir reconstruction
- ✓ Replace bridges that exacerbate flooding
- ✓ Minimize wildfire risk (ongoing)
- ✓ Increase tree canopy (ongoing)
- Identify managed retreat areas
- Upgrade/relocate buildings, wharf, other infrastructure
- Protect downtown and beach
- Reduce water use
- Protect natural resources and visitor services
- Limit development in fire risk areas

Swinomish Tribe, WA

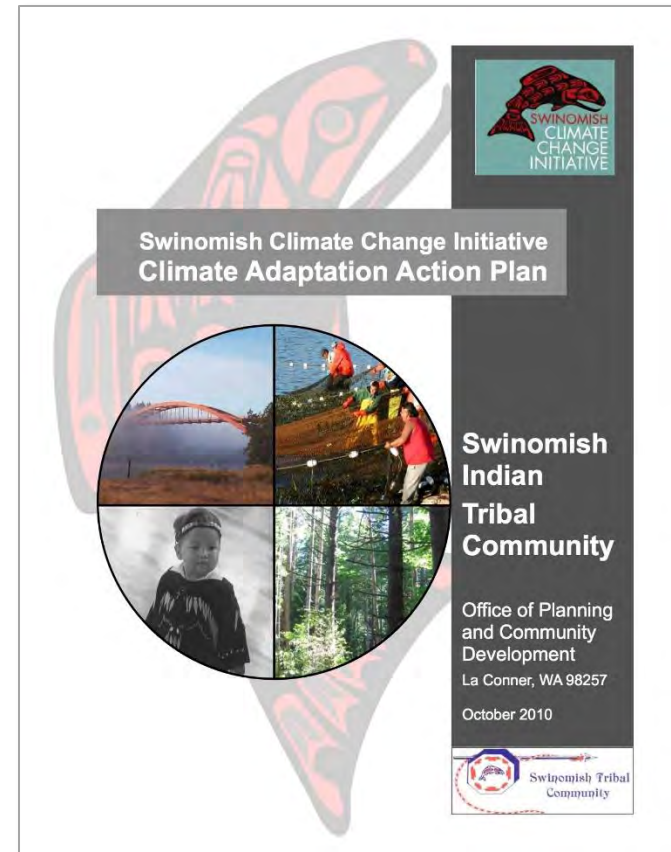
- 2010 plan
- Funded through Dept. of Health and Human Services, Admin. for Native Americans
- Assistance from Univ. of Washington
- Coastal and upland resources, health, infrastructure, services





Swinomish Climate Adaptation Action Plan

- Grounded in knowledge
- “place-based”
- Transcends boundaries
- Honorable community engagement strategy



Vulnerabilities



- Agricultural lands at risk from sea level rise
- 160 structures at risk (over \$83 million)
- High wildfire risk for 1,500 properties
- Vital transportation linkages at risk
- Shellfish beds, beach seine sites, harvest areas
- Heat related illnesses, respiratory ailments
- Sensitive cultural sites and traditional native species could be lost

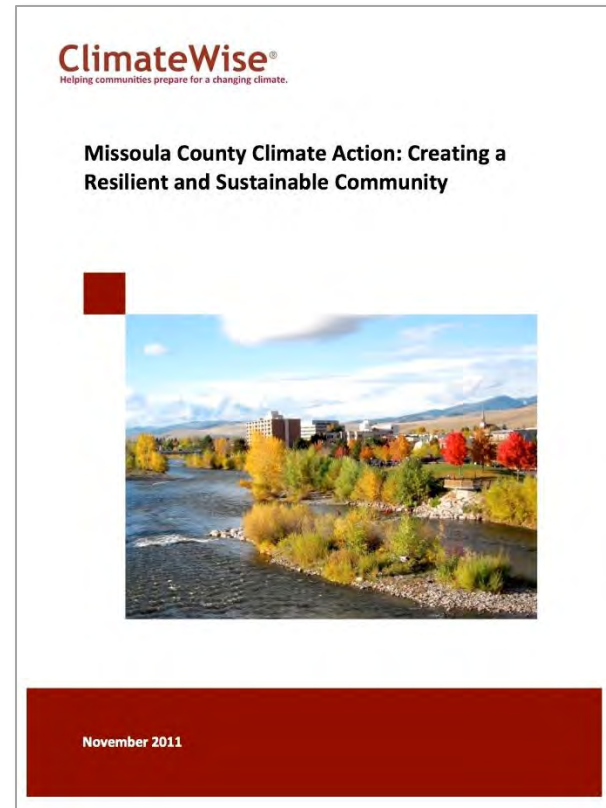
Adaptation Strategies

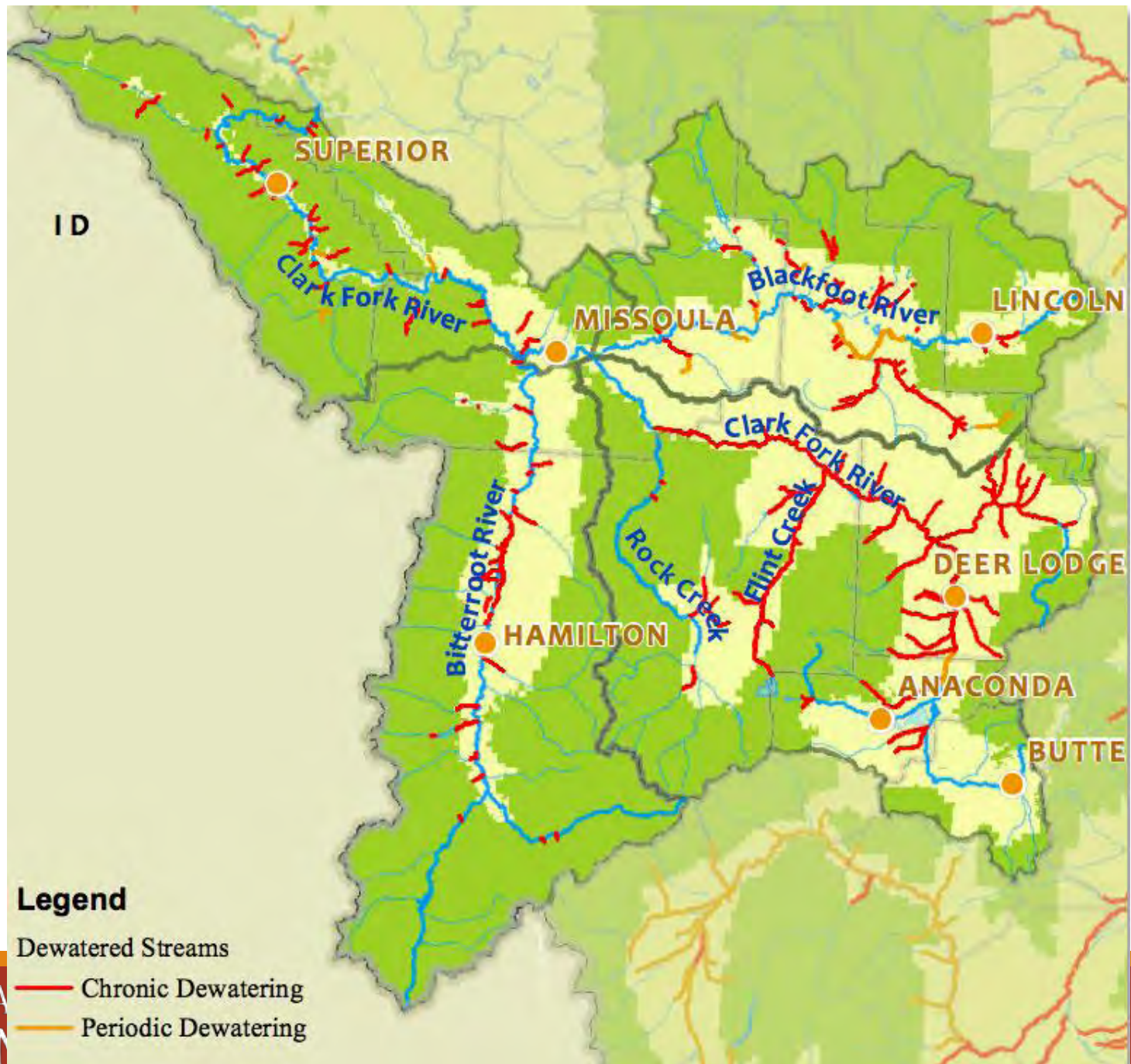


- Mapping shoreline risk zones, setback changes, rolling easements
- Restoration of pocket estuaries
- Enhance sediment inputs to maintain shellfish beds
- Aquaculture or buffering for shellfish
- Enhance Firewise management
- Retrofit homes passive cooling
- Assess seafood safety
- Raise road levels
- Develop alternate routes for emergency evacuation
- Water conservation/storage

Missoula County, Montana

- 2011 plan
- Led by three NGOs
- Values-based
- Five systems – Human, Built, Economic, Natural, Cultural





Vulnerabilities



- Increased water conflict – ag, fish & wildlife, industry, residential, outside markets
- Increasing risk and cost of fires & firefighting
- Respiratory illness and heart disease from declining air quality
- Low income populations in high flood risk areas
- Loss of quality of life related to natural areas and outdoor recreation

Adaptation Strategies



- Reintroduce beavers
- Obtain public ownership of water resources
- Education and outreach on water conservation
- Showcase success stories on restoration, agricultural innovations, etc.
- Improve air quality
- Insurance rates higher in high risk areas (flood, fire)
- Limit development in WUI
- Increase carbon storage in trees, soils, vegetation
- Education and collaborate with landowners (culture of self-reliance)
- Restore floodplains

Take Home

- Different plans
- Commonalities
 - Framework
 - Stakeholder engagement and local expertise
 - Extensive public outreach
 - Incorporated equity and environmental concerns

