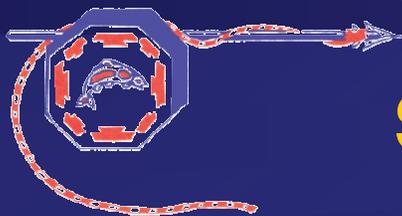


Tribal Transportation Planning Organization

April 14, 2010



Climate Change Impacts on Regional Transportation

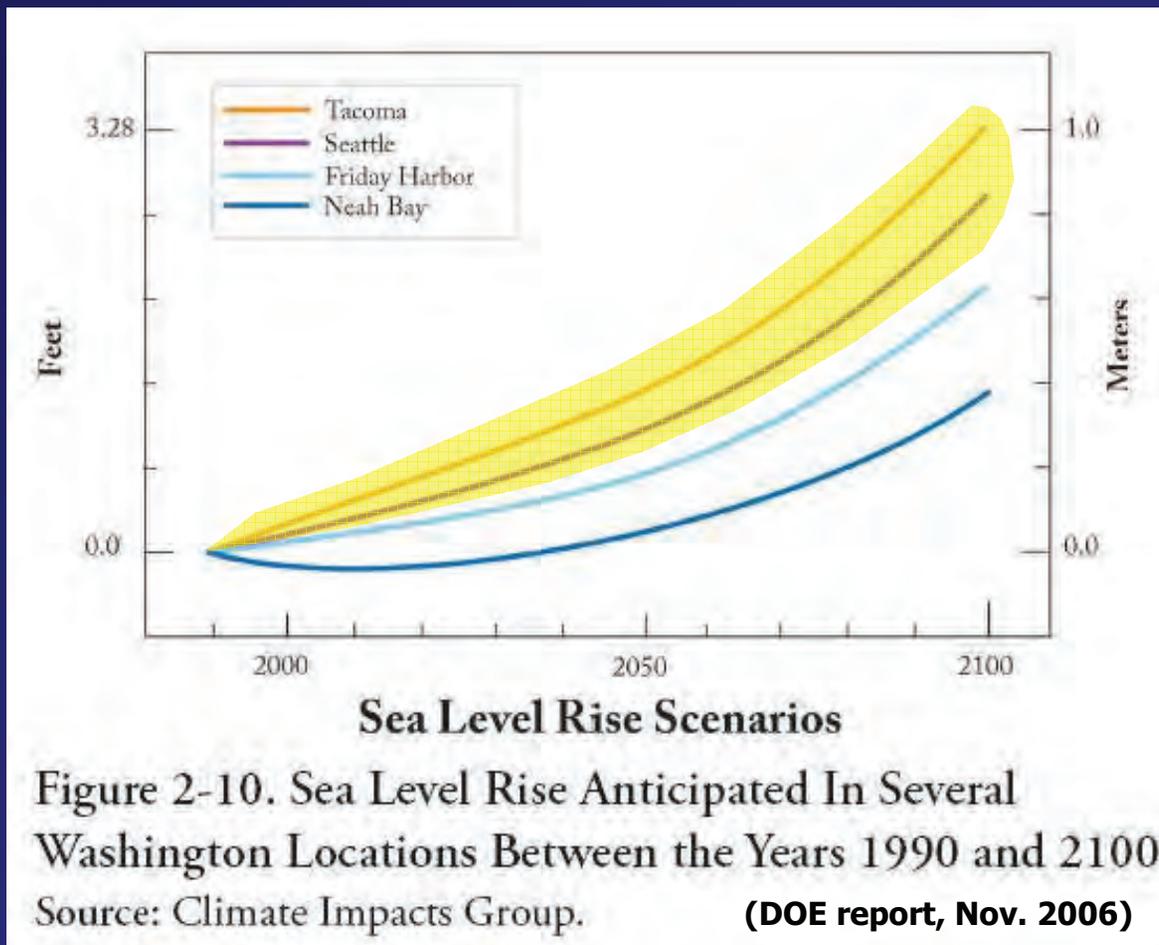


Swinomish Indian Tribal Community

Motivations for Swinomish study

- **CO₂ emissions, observations exceeding worst-case scenarios (IPCC, CIG)**
- **Local extreme weather events (Feb. 2006, Nov. 2006)**
- **Connection to ancestral homeland (Reservation) requires response**
- **Regional recognition of issues (WA DOE report, Nov. 2006)**

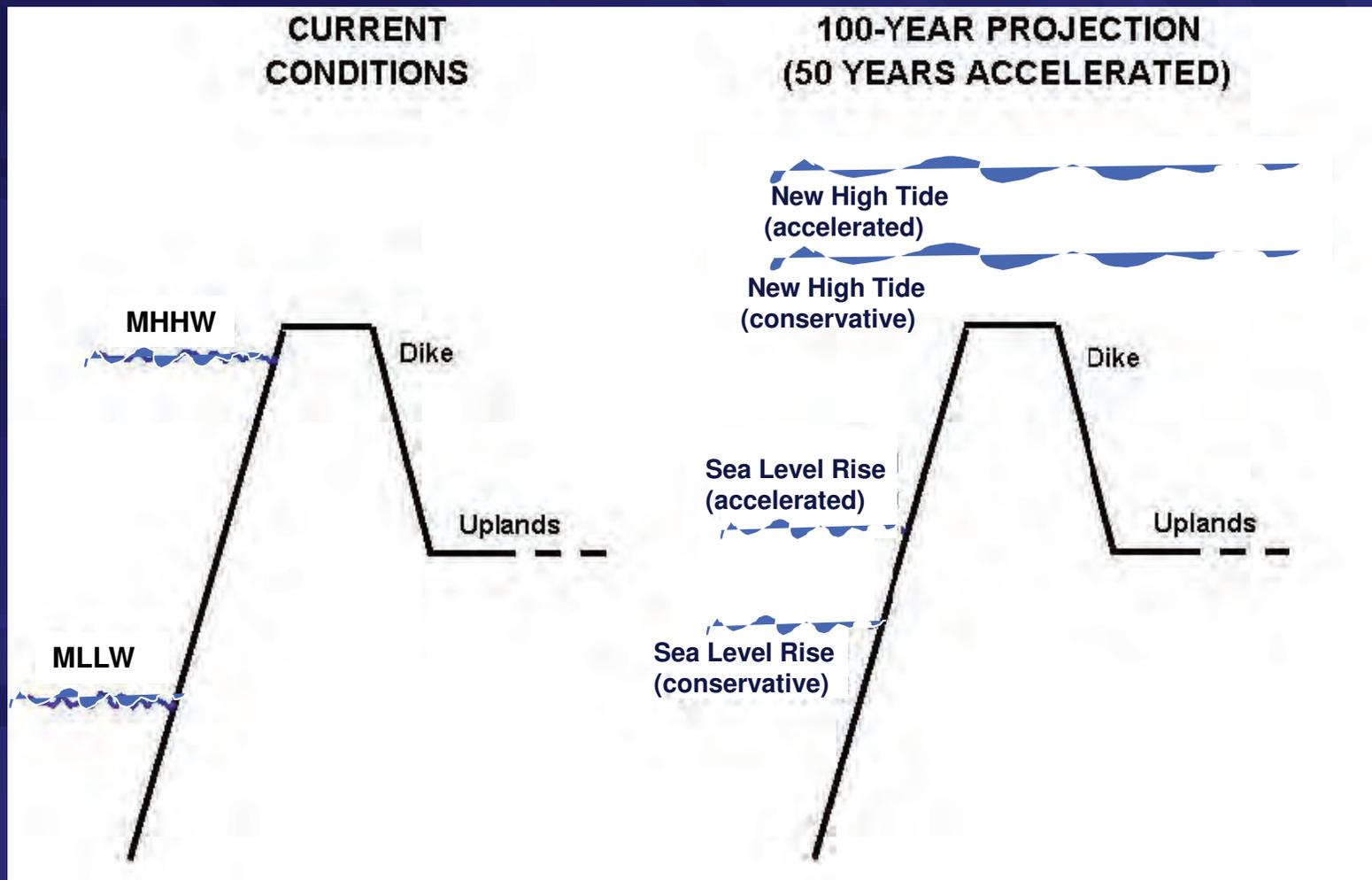
Potential sea level rise, Puget Sound



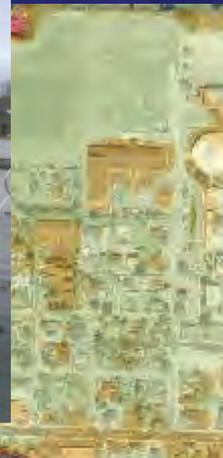
Setting of Swinomish Indian Reservation



Sea level rise scenarios, low-lying areas

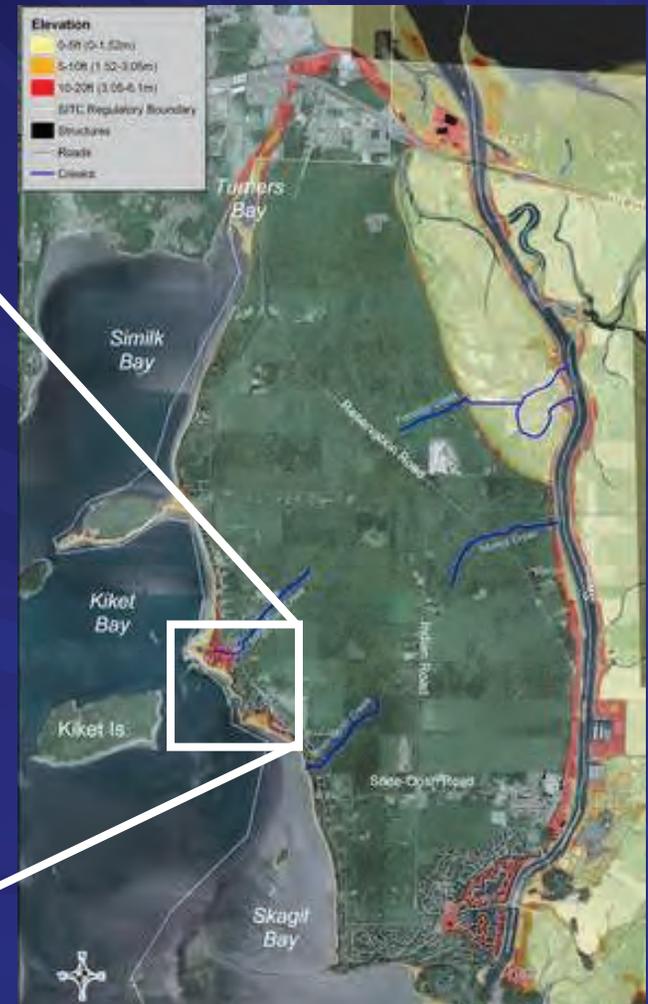


Storm surge, February 2006

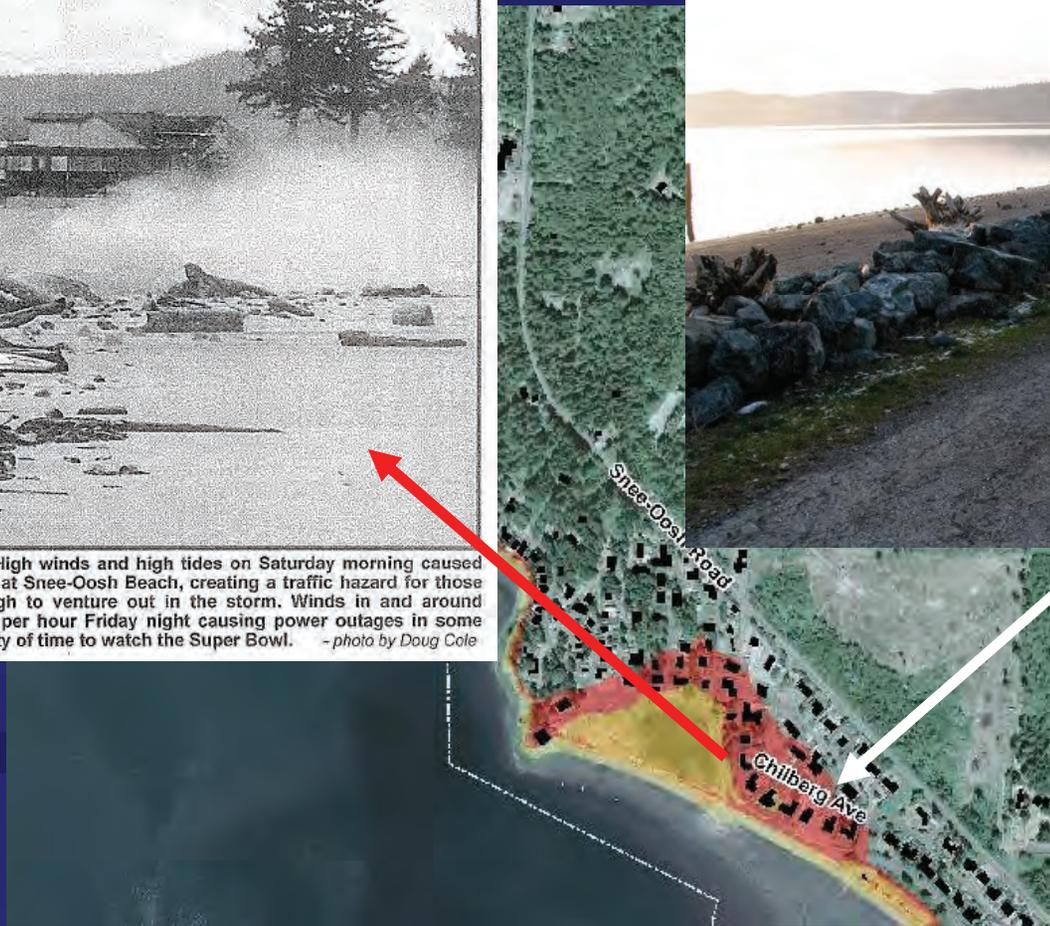
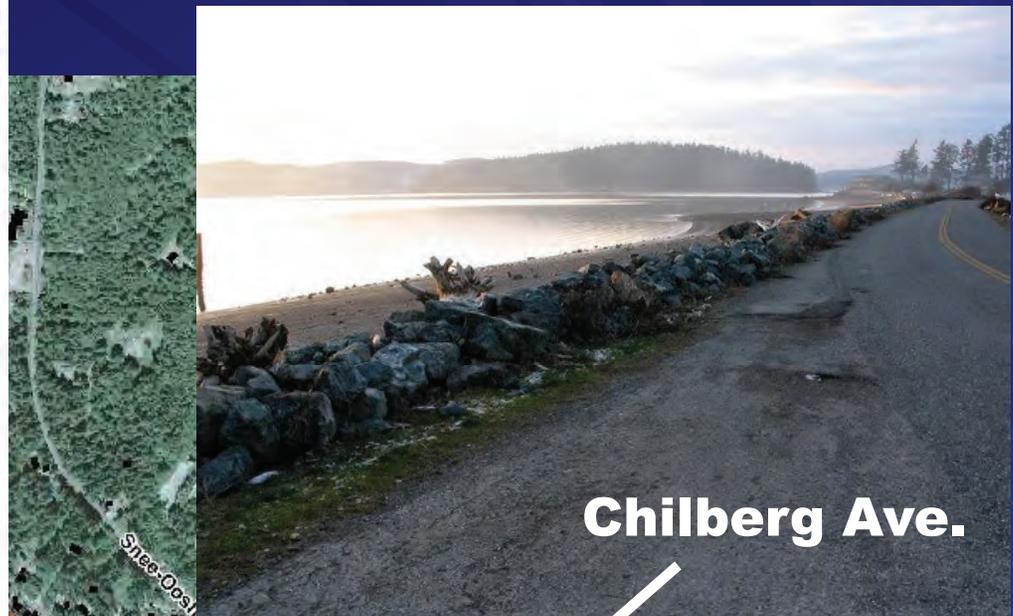
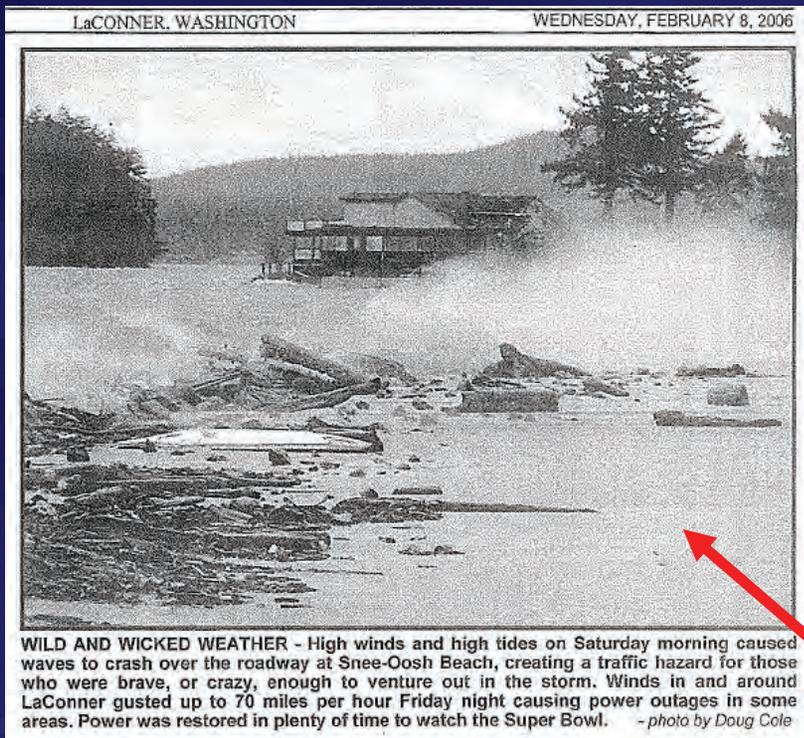


(photos courtesy of John Doyle)

Storm surge, February 2006



Storm surge, February 2006



Extreme high tides, Jan. 2010 (El Nino)



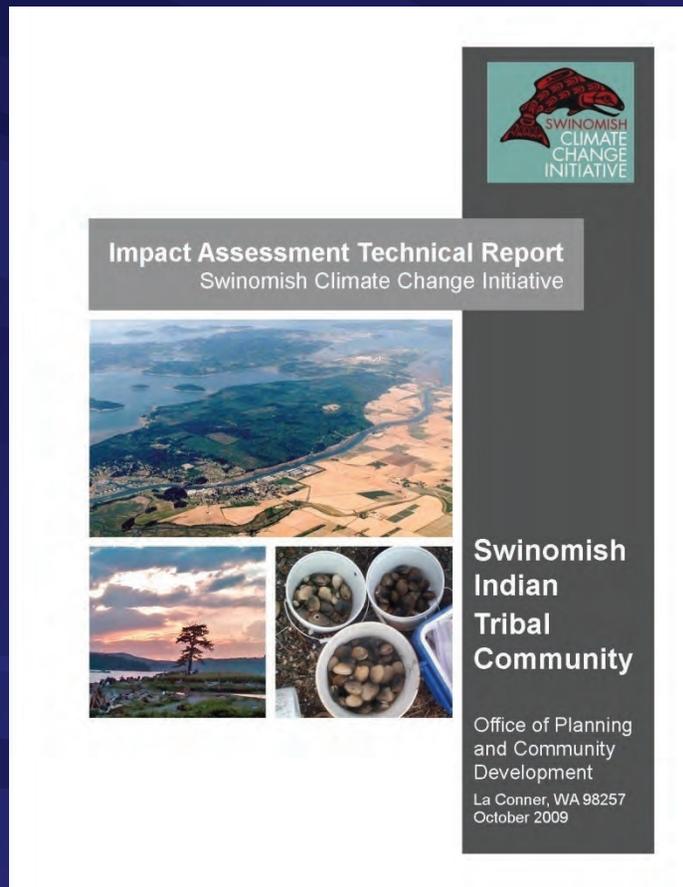
Swinomish Climate Change Initiative

- **Focus is local impacts, adaptation**
- **Two-year, \$400,000 project**
- **80% federal funding (ANA), 20% Tribal**
- **First year: Impact assessment, publish technical report (Oct. 2009)**
- **Second year: Develop strategy options, publish Action Plan (Sept. 2010)**

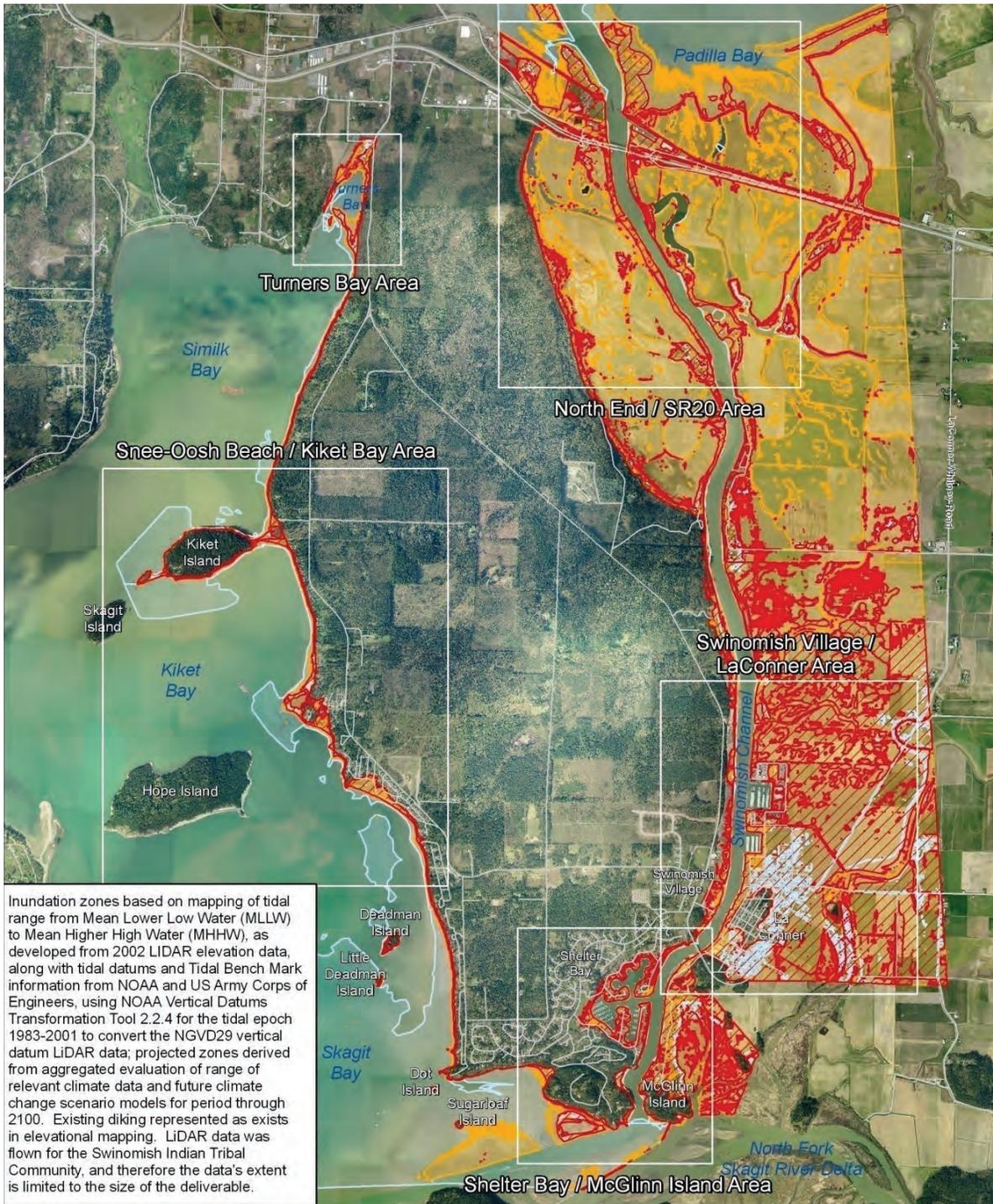
Project participants

- **UW Climate Impacts Group**
- **Skagit River System Cooperative**
- **Town of LaConner**
- **Skagit County**
- **Shelter Bay Community**

Impact Assessment Technical Report

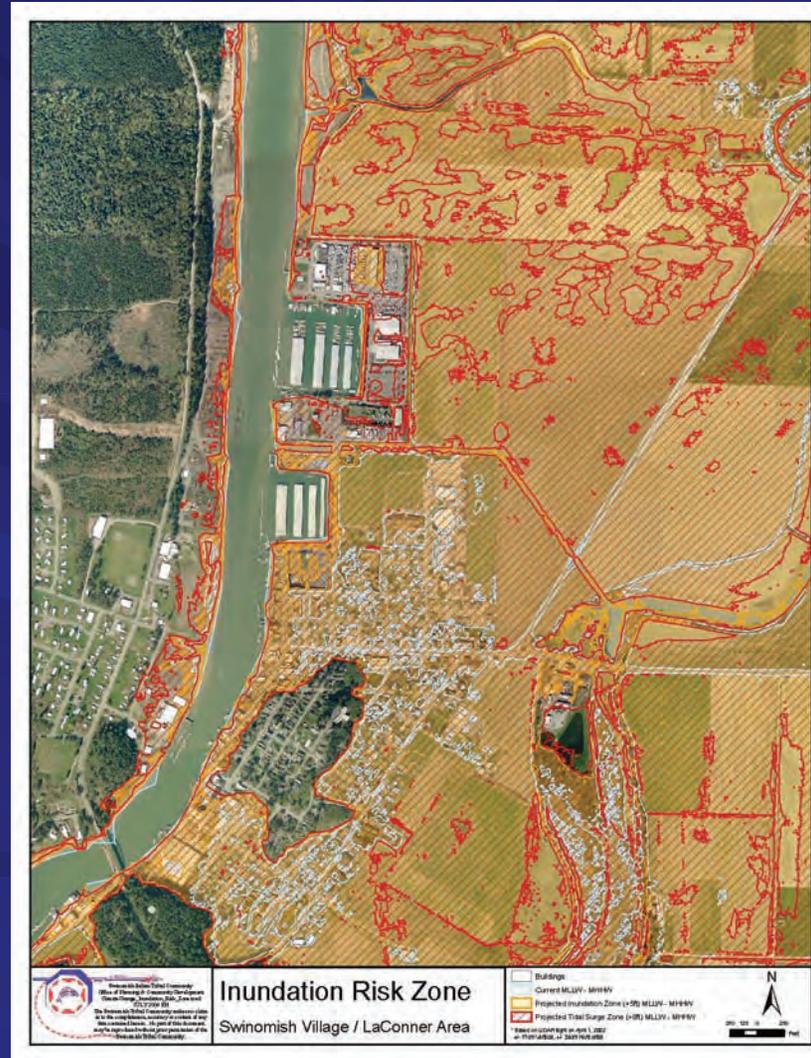
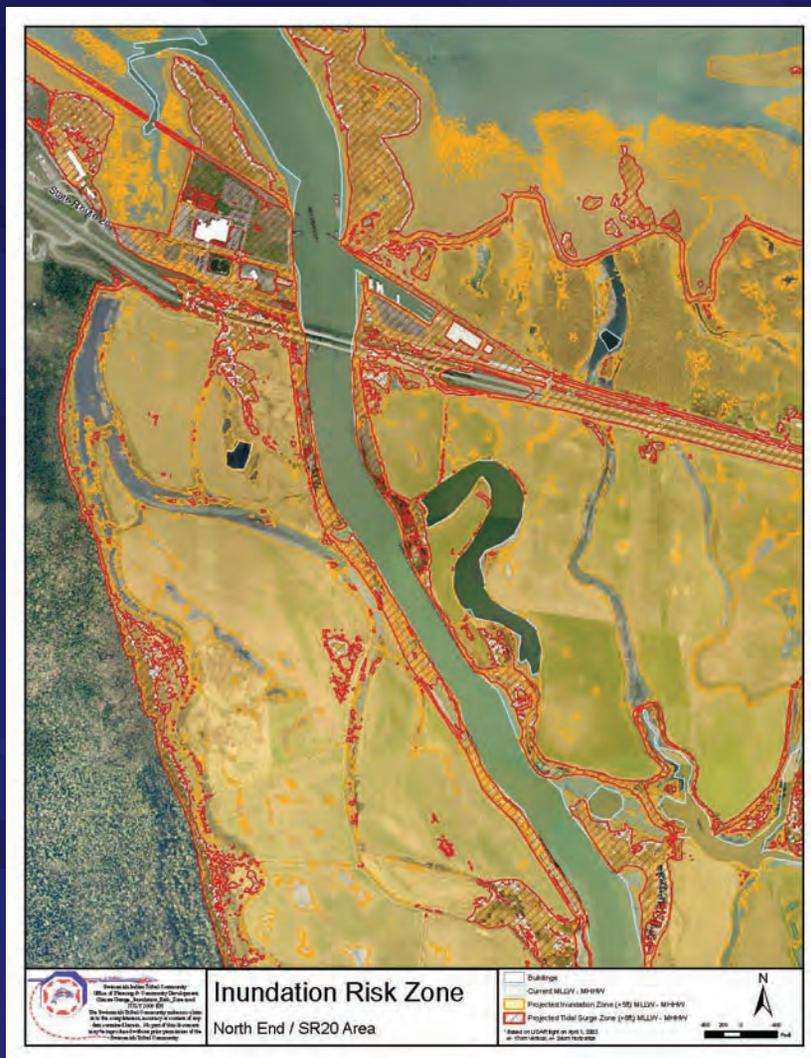


- Review of climate data
- Broad impact analysis
- Many disciplines/sectors
- Risk zone mapping
- Inventory of at-risk assets
- Vulnerability assessment
- Risk analysis
- Basis for Action Plan



Inundation Risk Zones – Sea Level Rise & Tidal Surge

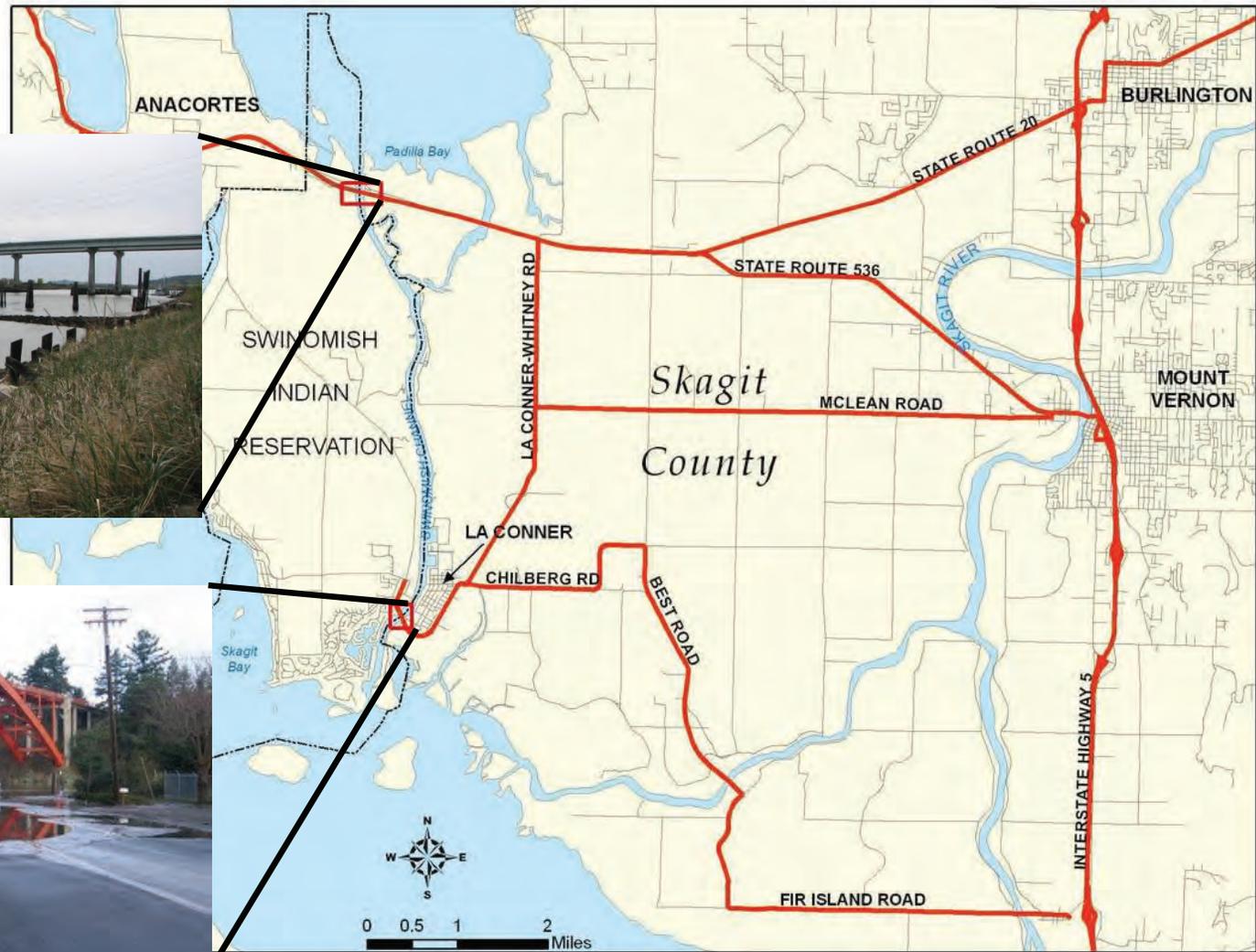
Inundation Risk Zones – detail



Potential sea level rise impacts – built environment (Swinomish)

- ~1,100 low-lying acres at risk
- 180 structures, over \$100 million value
- Access/transportation links at risk
- Economic development land at risk
- Impaired marine/port facilities
- Erosion, flood damage from storm surges

Access routes to Fidalgo Island and Swinomish Reservation



Climate Impacts to Transportation

Transportation Element	Potential Impacts	Vulnerability (impact level)	Estimated Risk	Potential Priority
Access/ Circulation	Higher tides top dikes, causing inundation of access routes, travel disruption, isolation from mainland (long-term impact)	High	High	High
	Higher, more frequent storm/ tidal surges, causing travel disruption/ road closures, restriction of access, isolation (short term duration events)	Medium-High	Medium	Medium
Road System Integrity	Flood damage from storm/tidal surge, buckling/cracking from higher temperatures	Medium	Medium	Medium
Bridges	Erosion of bridge footings from higher tides/ storm surges	Medium	Medium	Medium
	Increased deterioration/ fatigue of bridge structure and joints from increased or prolonged heat	High	Medium-High	Medium-High
Marine Transport Facilities	Increasing inundation of marine facilities and ports from gradual sea level rise and higher tides	High	High	High

Significant Regional Issues

- **Short-term threat to connectivity/ mobility (storm surge)**
- **Long-term risk, potential isolation from mainland (sea level rise)**
- **Collective population of ~ 45,000 potentially affected**
- **Impacted communities – Swinomish, LaConner, Anacortes, Oak Harbor, Coupeville, etc.**
- **Impacted facilities – ferry terminals, services, refineries, Whidbey NAS**

Addressing Cross-jurisdictional Issues

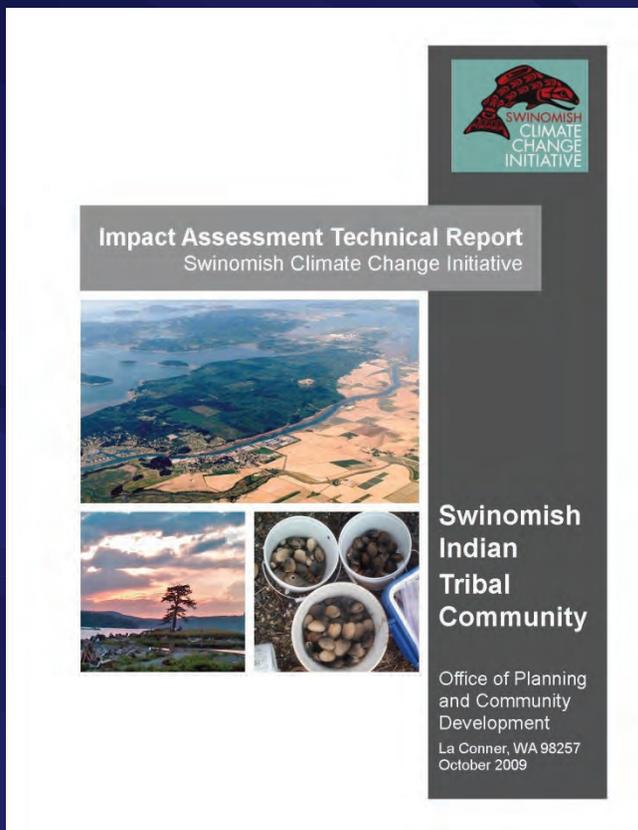
- **Expand discussion with affected jurisdictions, stakeholders – LaConner, Anacortes, Skagit County, WSDOT**
- **Identify common interest – Fidalgo Island access and connectivity**
- **Develop concept as new regional priority for RTPO**

Proposal to Skagit RTPO

- Because of potential impacts on multiple jurisdictions and connectivity to Fidalgo Island, there is strong consensus among affected stakeholders on the need to prioritize and elevate the issues through regional transportation planning.
- Concept of priority for Fidalgo Access Corridor Preservation is proposed as a first step toward a regional process to address critical connectivity issues.

Next Steps

- **Identify/refine project concepts for Fidalgo Access Corridor Preservation**
- **Work with Skagit RTPO to prioritize in regional plan (Island RTPO?)**
- **Work with jurisdictions to prioritize potential project on TIP's**
- **Prioritize on Tribal TIP for IRR funding contribution**



**Swinomish Climate Change
Project Coordinator:
Ed Knight, AICP, Senior Planner
eknight@swinomish.nsn.us**

**Presentation preparation:
Tara Tisdale, Associate Planner
Ed Knight, Senior Planner**

**[www.swinomish.org/departments/planning/
climate_change/climate_main.html](http://www.swinomish.org/departments/planning/climate_change/climate_main.html)**