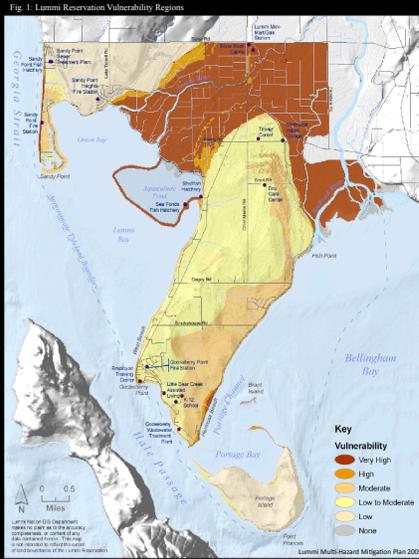


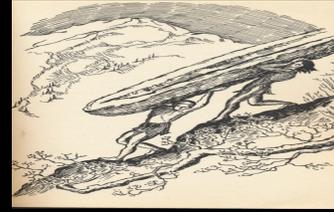
The Lummi Tribe and Climate Change

The Effects on Culture, Economics, and Health

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A depiction of the the most venerable areas of the Lummi reservation



Abstract:

- The Lummi tribe governed by the Lummi Nation is a Native American tribe, which inhabits the coast of Washington State. In 1855 the tribe was paid \$165,000 for their land and to relocate to what is now the Lummi reservation, which includes the Lummi Peninsula and Portage Island.
- Increased weather events due to global climate change have caused coastal erosion to quicken along Pacific Northwest Coasts, this plays a significant role on the future of the Lummi reservation.
- I explore how culturally important species such as salmon, shellfish, and plants will be affected by climate change. My research paper hopes to illuminate the affects that climate change will have on the Lummi people and their land and explore the implications this will have on an entire peoples culture.

Background:

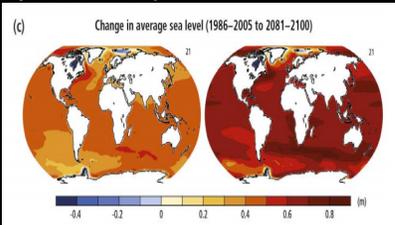
- The Lummi reservation lies ten miles west of Bellingham, Washington and encompasses a length of about 8 and a half miles. About 7,600 acres of land remains in control by the Lummi Indians. In addition 5,000 acres of shallow tideland has been allotted to the Lummi people for fishing practices.
- Major economic factors on the Lummi Reservation include: shellfish aqua ponds, fish hatcheries, and timber.
- Due to the tribes long history in Puget Sound the Lummi Reservation plays a large role in the Lummi people's culture and economics.

Figure 2: Global Sea Level Rise Averages

		2046-2065		2081-2100	
Scenario		Mean	Likely range ^c	Mean	Likely range ^c
Global Mean Surface Temperature Change (°C)	RCP2.6	1.0	0.4 to 1.6	1.0	0.3 to 1.7
	RCP4.5	1.4	0.9 to 2.0	1.8	1.1 to 2.6
	RCP6.0	1.3	0.8 to 1.8	2.2	1.4 to 3.1
	RCP8.5	2.0	1.4 to 2.6	3.7	2.6 to 4.8
Global Mean Sea-level Rise (m)	RCP2.6	0.24	0.17 to 0.32	0.40	0.26 to 0.55
	RCP4.5	0.26	0.19 to 0.33	0.47	0.32 to 0.63
	RCP6.0	0.25	0.18 to 0.32	0.48	0.33 to 0.63
	RCP8.5	0.30	0.22 to 0.38	0.63	0.45 to 0.82

An Illustration of IPCC global mean sea level rise predictions IPCC-2014

Fig. 3: Global sea level rise map



Focusing on the west coast of the United States we can that sea level rise will have serious impacts on coastal communities over the next century

Fig. 4: Lummi Reservation Elevation map



Lummi Reservation general elevation maps shows the most venerable areas to sea level rise

Hypothesis & Approach:

- Given climate predictions of the IPCC and other peer reviewed sources it is apparent that coastal areas will be widely affected by global climate change.
- Since the Lummi Tribe relies heavily on the reservation for cultural practices, economic revenue, and tribal self-determination climate change in this area must be analyzed closely in order to gain insight on how it will affect the reservation and thus the tribe.
- The Lummi Mitigation plan discusses major venerable reservation areas these include coastal erosion, flooding, drought, pollution of fresh water aquifers, increased severity of winter storms, and damage of aqua agriculture
- Increased climate events and rising sea levels will have a large affect on the Lummi tribes economic system, health, and cultural heritage
- The loss of land and increased spending on climate related disaster may increase dependency on outside sources and affect tribal sovereignty

Fig. 5: Nooksack River Flood History

Date	Flow (cfs)	Mean (ft)	Channel (ft)	Channel (ft)	Bank (ft)
1973	100,000	10	10	10	10
March 15, 1974	100,000	10	10	10	10
November 15, 1974	100,000	10	10	10	10
December 15, 1974	100,000	10	10	10	10
January 15, 1975	100,000	10	10	10	10
February 15, 1975	100,000	10	10	10	10
March 15, 1975	100,000	10	10	10	10
April 15, 1975	100,000	10	10	10	10
May 15, 1975	100,000	10	10	10	10
June 15, 1975	100,000	10	10	10	10
July 15, 1975	100,000	10	10	10	10
August 15, 1975	100,000	10	10	10	10
September 15, 1975	100,000	10	10	10	10
October 15, 1975	100,000	10	10	10	10
November 15, 1975	100,000	10	10	10	10
December 15, 1975	100,000	10	10	10	10
January 15, 1976	100,000	10	10	10	10
February 15, 1976	100,000	10	10	10	10
March 15, 1976	100,000	10	10	10	10
April 15, 1976	100,000	10	10	10	10
May 15, 1976	100,000	10	10	10	10
June 15, 1976	100,000	10	10	10	10
July 15, 1976	100,000	10	10	10	10
August 15, 1976	100,000	10	10	10	10
September 15, 1976	100,000	10	10	10	10
October 15, 1976	100,000	10	10	10	10
November 15, 1976	100,000	10	10	10	10
December 15, 1976	100,000	10	10	10	10
January 15, 1977	100,000	10	10	10	10
February 15, 1977	100,000	10	10	10	10
March 15, 1977	100,000	10	10	10	10
April 15, 1977	100,000	10	10	10	10
May 15, 1977	100,000	10	10	10	10
June 15, 1977	100,000	10	10	10	10
July 15, 1977	100,000	10	10	10	10
August 15, 1977	100,000	10	10	10	10
September 15, 1977	100,000	10	10	10	10
October 15, 1977	100,000	10	10	10	10
November 15, 1977	100,000	10	10	10	10
December 15, 1977	100,000	10	10	10	10
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February 15, 1978	100,000	10	10	10	10
March 15, 1978	100,000	10	10	10	10
April 15, 1978	100,000	10	10	10	10
May 15, 1978	100,000	10	10	10	10
June 15, 1978	100,000	10	10	10	10
July 15, 1978	100,000	10	10	10	10
August 15, 1978	100,000	10	10	10	10
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October 15, 1978	100,000	10	10	10	10
November 15, 1978	100,000	10	10	10	10
December 15, 1978	100,000	10	10	10	10
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