

EFFECTS OF CLIMATE CHANGE ON TRIBAL MOBILITY ON LAND & WATER BASED TRIBES:

SUSTAINABILITY, RESILIENCY, & MOBILIZING FOR CLIMATE CHANGE

Short film included: Chief Patrick Mitchell, Canadian Kanaka Bar Tribe,
an example of *Sustainability, to cut down on our carbon-footprint*

By: Angelena Campobasso, MURP, MPA

Introduction & brief overview

- **Climate change is effecting the world's North & South poles, Gulf of Oman ocean, & Greenland's ice sheets, all water bodies across the world; & the releasing of methane gases**
- **Case Studies: Colville Tribe, Alaskan Tribes, & the Swinomish Tribe**
- **Sustainability & Resiliency**
- **Kanaka Bar Indian Tribe in Canada, Chief Patrick short film**
- **Where do we go from here?**
- **In an ideal world**
- **The Medicine Wheel Methodology**
- **Policy & legislation stakeholders & next steps**
- **The Paris Agreement**

- **A Climate Recovery Emergency Declaration needs to happen for all humanity, to sustain life on planet Earth, our only home**
- **For sustainability, we must balance people, profit, & planet**
- **Sea-level rise is now unstoppable in our human lifespan;**
- **We now need to retreat our communities & infrastructure from the coast lines**

As the climate changes & the Earth's temperature rises, the oceans are heating up, & warmer water contains less oxygen. Worse still, when low-oxygen water is processed, nitrous oxide is produced instead of carbon dioxide, & that's 300 times more harmful to our atmosphere.



Dr. Queste explained, “Our research shows that the situation is actually worse than feared – & that the area of the dead-zone [in the Gulf of Oman] is vast & growing. The ocean is suffocating.”

The Ocean Is Suffocating’: Dead Zone Bigger Than Scotland Identified in Gulf of Oman

By **Ruth Schuster** Apr 29, 2018

sputniknews.com/environment/201804281063996192



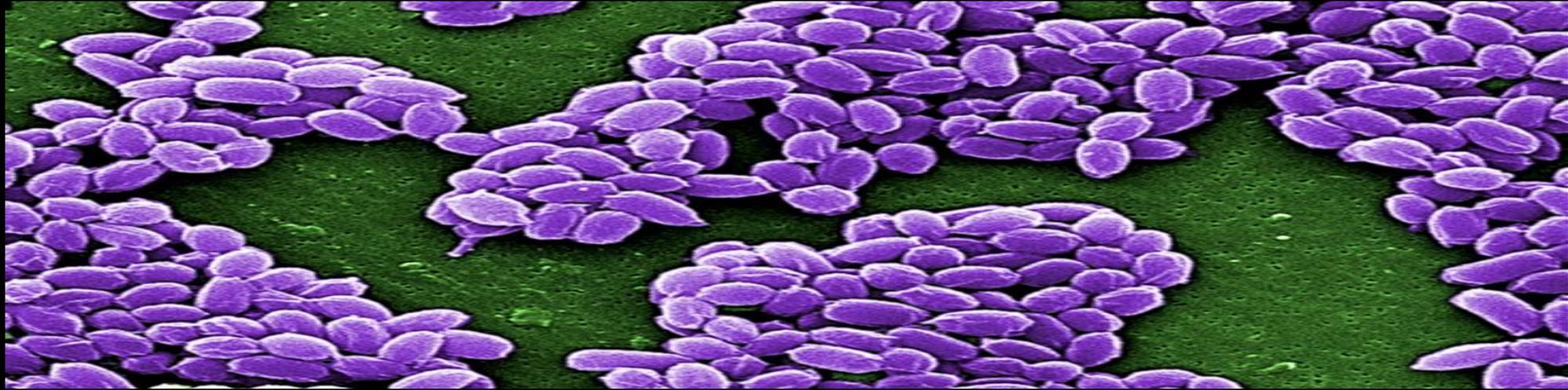


Dead zones can also be caused – or at least exacerbated – by runoff of fertilizer & sewage which leads to algal blooms. The ultimate death of all those algae cells, & local marine life, causes oxygen depletion in the ocean.

Scientists had removed an ice-core in Alaska from the permafrost in order to study its composition when they noticed something unusual. The sample, contained a frozen colony of ancient bacteria.

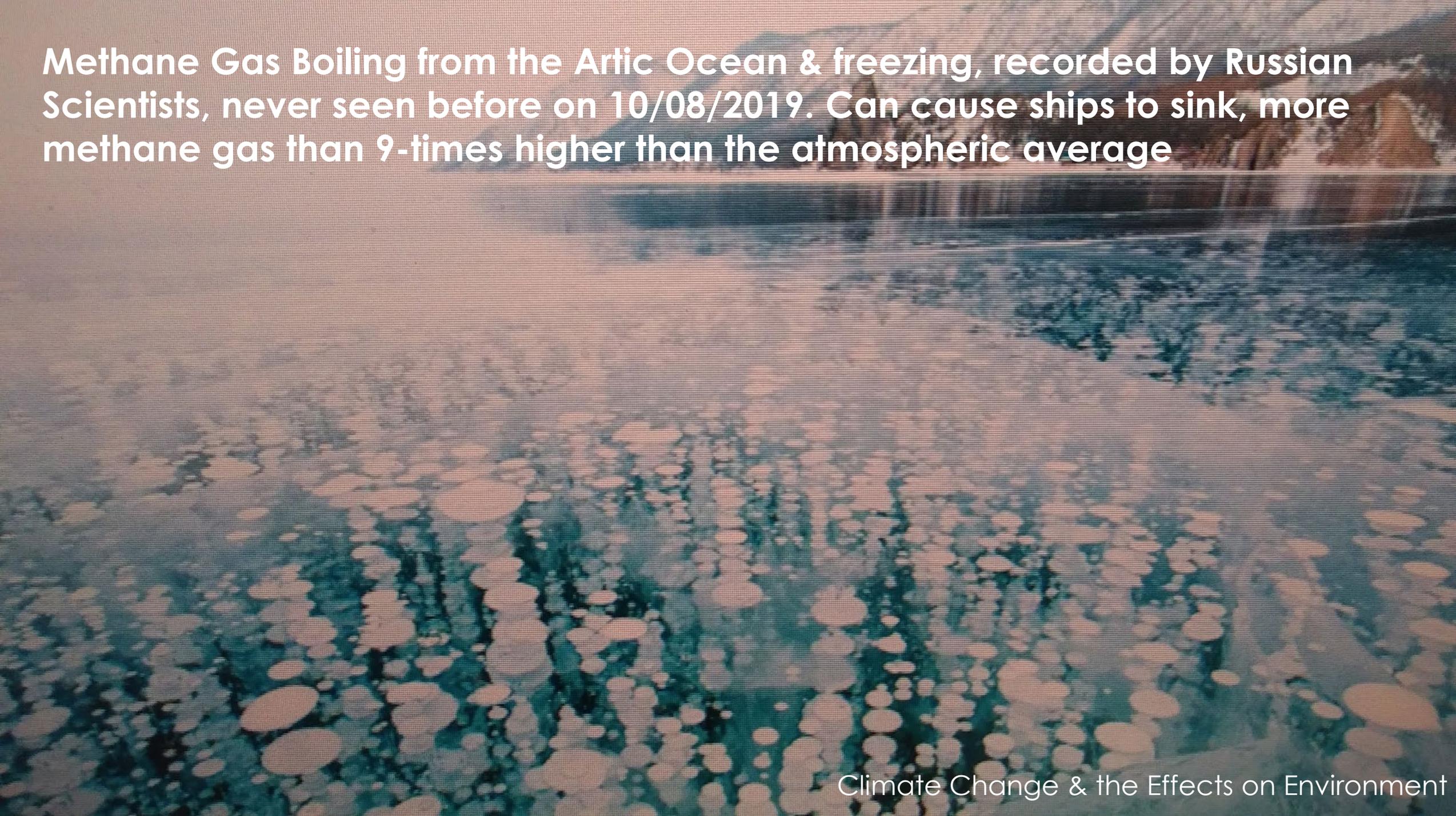


Once defrosted, the bacteria came back to life. Scientists also made an ominous observation, the bacteria could end human life as we knew it...



As the bacteria ate, they produced methane. The gas isn't completely harmless; it is actually an incredibly potent greenhouse gas, which traps more of the sun's heat than carbon dioxide.

Methane Gas Boiling from the Arctic Ocean & freezing, recorded by Russian Scientists, never seen before on 10/08/2019. Can cause ships to sink, more methane gas than 9-times higher than the atmospheric average



In short, global warming will release more & more of the ancient bacteria. Those microbes will produce methane which, in turn, will increase the speed at which Earth heats up.





“With the North & South poles also melting is raising sea levels. Coastal Greenland's ice sheet has reached the "point of no return" & would continue to melt even if the climate crisis were halted, a new study has found.

The study, published in the journal Communications Earth & Environment, used more than 30 years of satellite data to determine that the ice sheet would continue to shrink even if surface melting decreased.”(EcoWatch - Greenland’s Ice Sheet Has Reached ‘Point of No Return’, Olivia Rosane, Aug. 17, 2020)

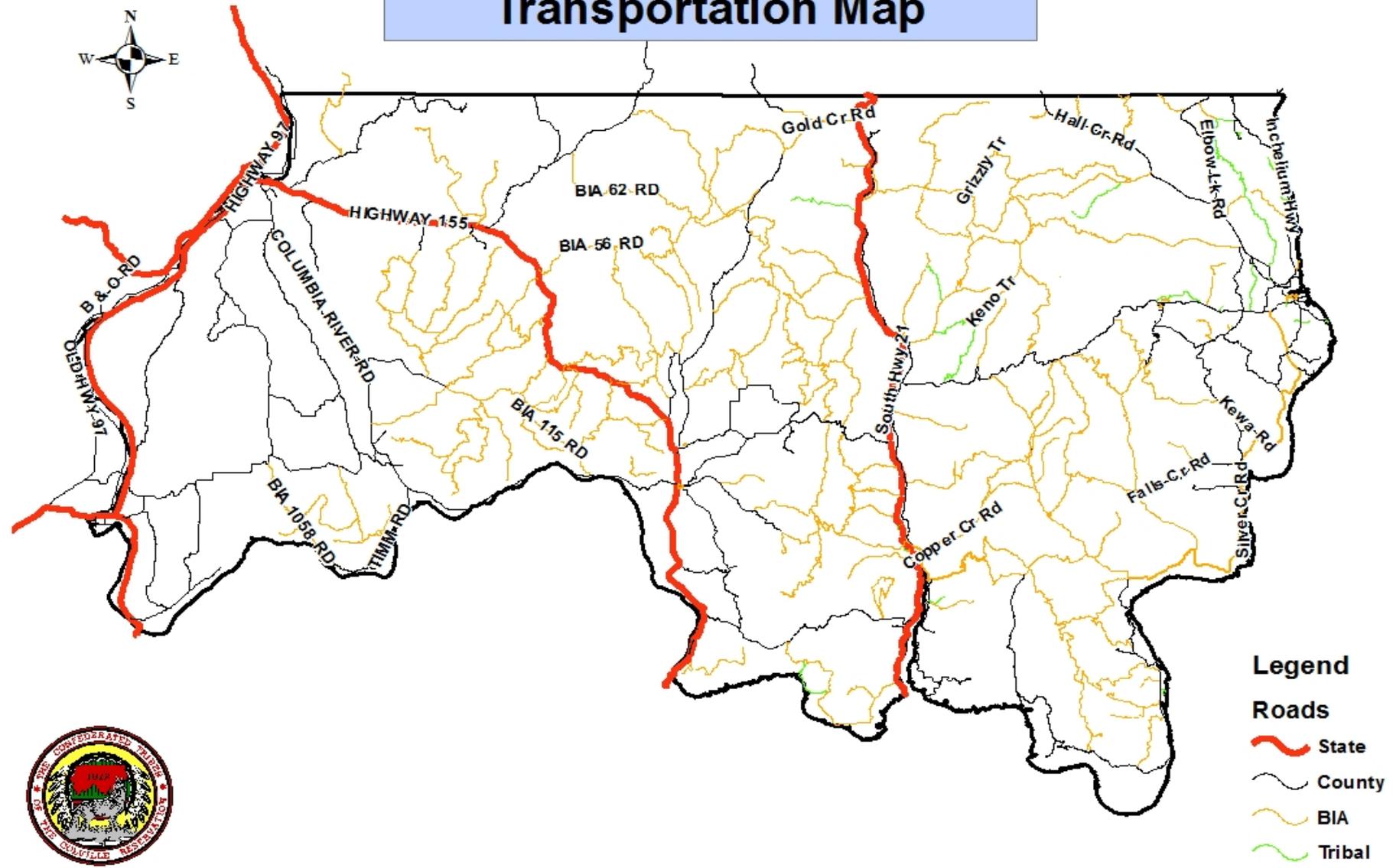
Once permafrost melts, that ground is capable of sustaining plant life. If that newly accessible land is filled with trees, their carbon-dioxide-consumption could help offset the increased methane in the atmosphere.

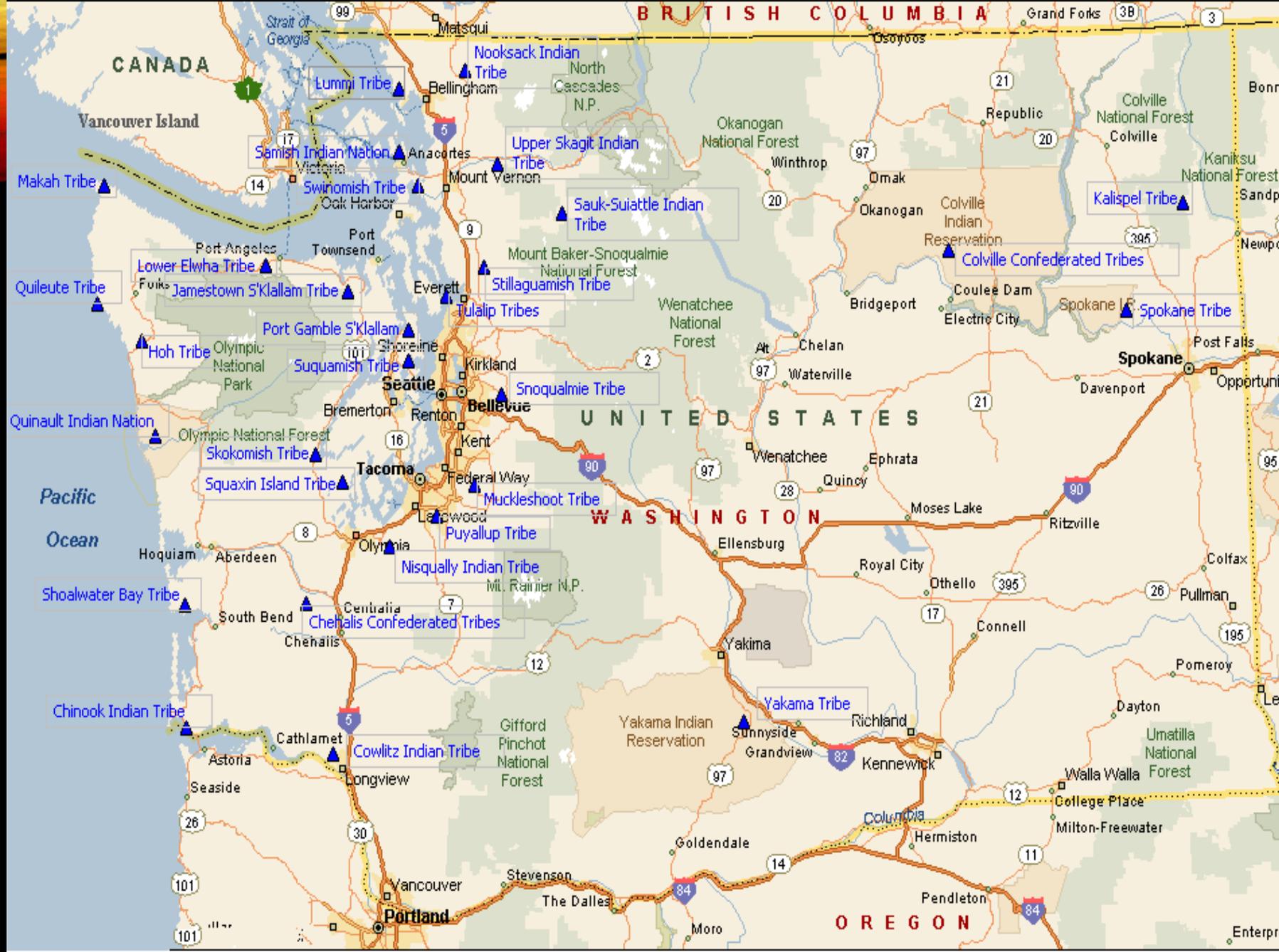


EFFECTS ON TRIBAL MOBILITY WITH THE COLVILLE TRIBE

- 1) Colville Tribe is 1.4 million acres, land base tribe**
- 2) 2015 - Major Fires across the Colville Reservation**
- 3) 2016 - Major Wind Storm through the Keller District**
- 4) 2017 - Major Flooding across the Colville Reservation, including Ferry & Okanogan Counties:**
 - State Highways flow through the Colville Reservation**

Colville Confederated Tribes Transportation Map





COLVILLE INDIAN RESERVATION



Peter Dan/Manila Creek Road, Okanogan County



April 18, 2017

OMAK LAKE RD., BIA 69



OMAK LAKE RD., BIA 69



BRIDGE & LOG JAM AT 21 MILE

River gage at Keller registered a three foot drop in water level between 0200 & 0215 hrs. April 9, 2017; two families were stranded behind bridge



HWY 21, NORTH OF SILVER CREEK BRIDGE



April 11, 2017



April 18, 2017

Colville Tribe Case Study

Native America

Have a news tip?
Contact the Tribune
(509)634-2223
tribune@colvilletri

Another slide on Manilla Creek



MANILLA CREEK ROAD

E. Sanpoil Road (south washout)



April 18, 2017; damaged residential road

Colville Tribe Case Study

MT. TOLMAN FIRE CENTER



Destroyed by flood February 16, 2017; adjacent NRE offices damaged

HOME LOST IN KELLER, WA.



April 9, 2017 before collapse



April 10, 2017 in snow

STRAWBERRY CREEK BRIDGE, BIA RT. 1025



Okanogan County, FLH

21 MILE BRIDGE AFTER LOG JAM REMOVED & ABUTMENT REPAIRED



WEST FORK: GOLD CREEK BRIDGE, HWY 21



Reported on April 8, 2017

Colville Tribe Case Study

WESTFORK: GOLD CREEK BRIDGE

- Temporary one-lane bridge in place until full bridge replacement can happen
- WSDOT FUNDED



BARNABY CREEK



2019 INCHELIUM HWY. LANDSIDE



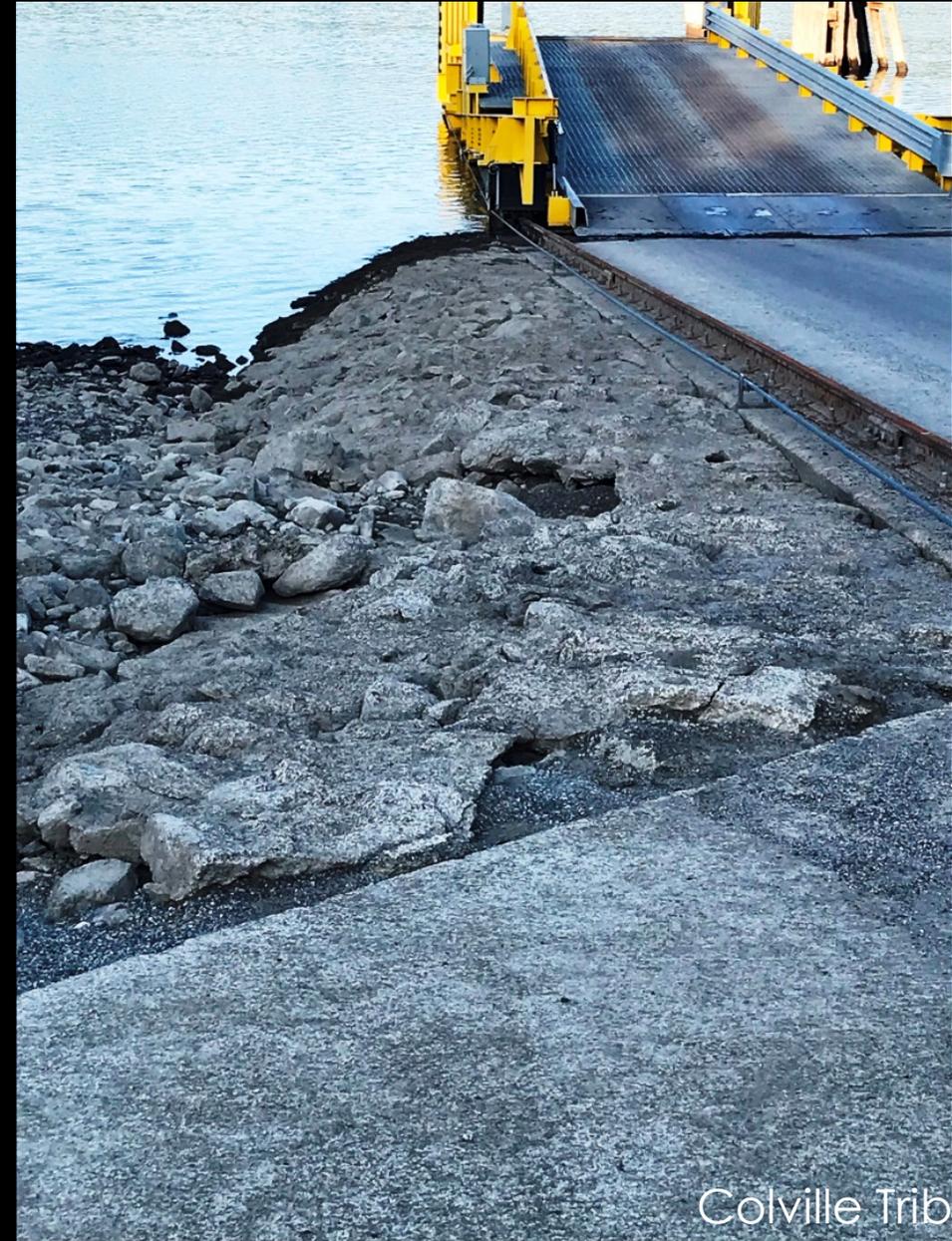
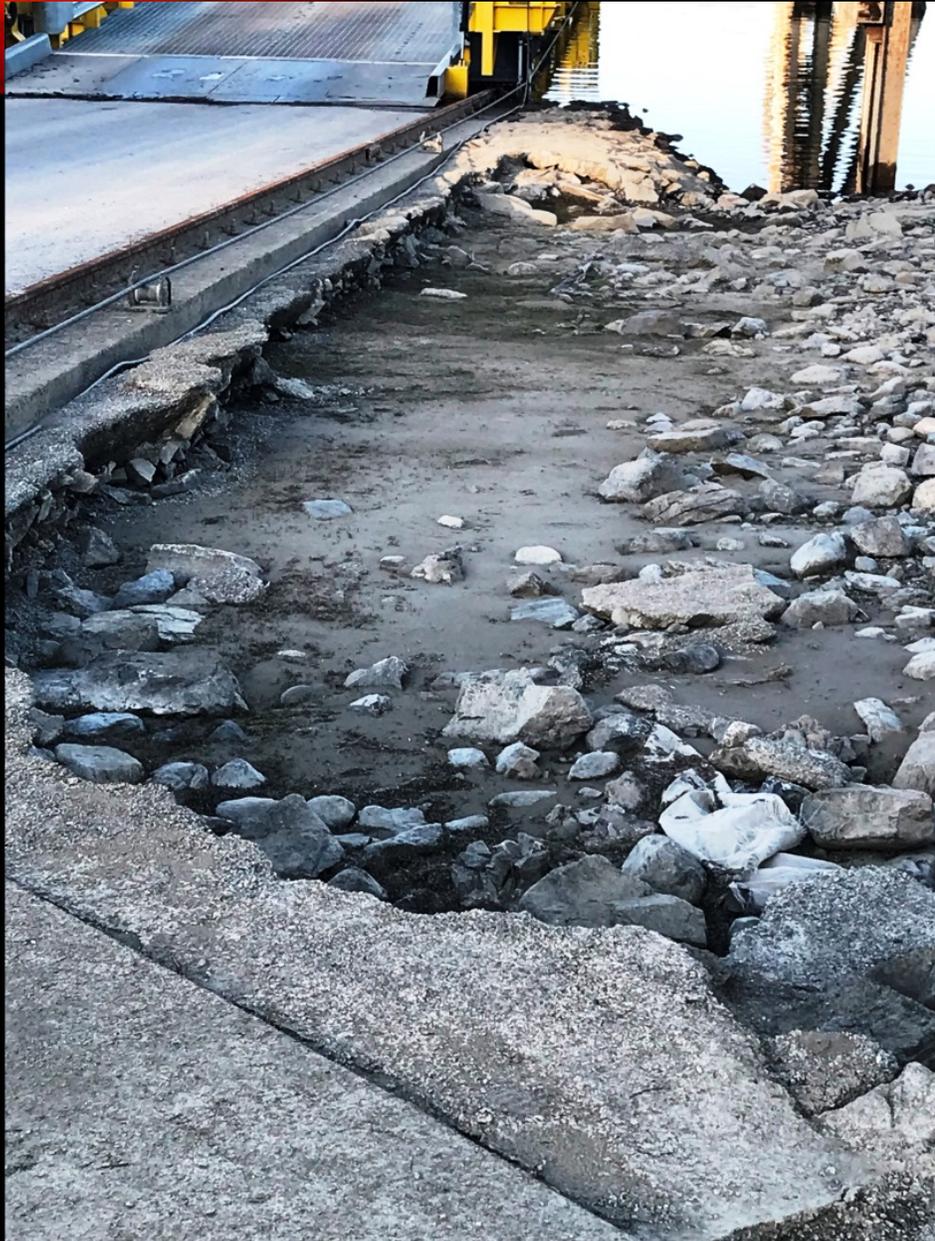
INCHELIUM HIGHWAY, FERRY COUNTY



INCHELIUM GIFFORD FERRY PILINGS



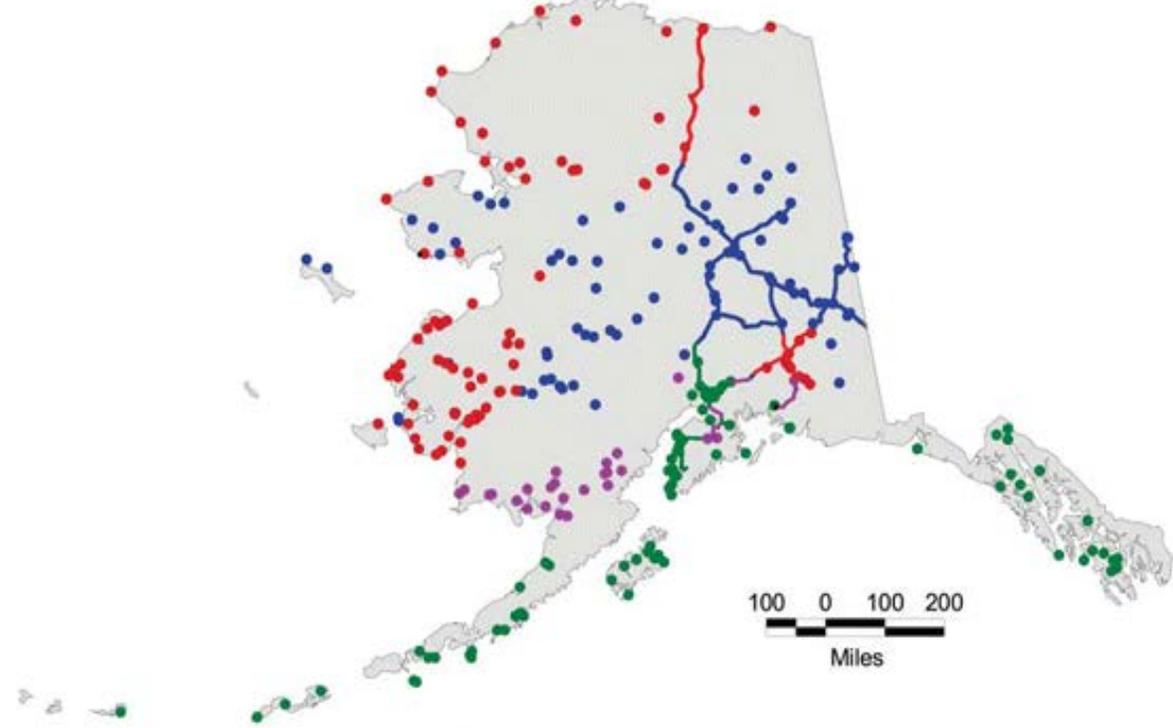
INCHELIUM GIFFORD FERRY PILINGS



- **From 2015 until now, the Colville Tribe has used *FEMA & Emergency Relief for Federal-owned Roads (ERFO)* Funding for major Climate Change events, with NOT enough funding to handle all disastrous events**
- **Policy changes for more funding to be allocated to Tribes for Transportation, transit, emergency-services & shelters, police-power, relocation efforts of tribal communities, lands management for prevention of forest fires, landslides, flooding, & more planning funding for Climate Change**

Summary of Alaska Highways Susceptible to Permafrost

Alaska is the largest state in the United States, accounting for about 20% of the total area of the United States and more than twice the land area of Texas. Alaska includes lands on both sides of the Arctic Circle, which makes the United States an Arctic nation.



Permafrost-Susceptible Roads

- Continuous (90 – 100%)
- Discontinuous (50 – 90%)
- Sporadic (10 – 50%)
- Less than 10%

Permafrost-Susceptible Communities

- Continuous (90 – 100%)
- Discontinuous (50 – 90%)
- Sporadic (10 – 50%)
- Less than 10%

Summary of Alaska Highways Susceptible to Permafrost

| Permafrost Extent | Road Distance (mi) |
|--------------------------|--------------------|
| Continuous (90 – 100%) | 456 |
| Discontinuous (50 – 90%) | 1,211 |
| Sporadic (10 – 50%) | 189 |
| Less than 10% | 281 |

Summary of Alaska Communities Susceptible to Permafrost

| Permafrost Extent | Total Communities | Population |
|--------------------------|-------------------|------------|
| Continuous (90 – 100%) | 87 | 40,811 |
| Discontinuous (50 – 90%) | 79 | 47,140 |
| Sporadic (10 – 50%) | 26 | 5,235 |
| Less than 10% | 129 | 396,821 |

Alaska Transportation & Infrastructure Impacts:

Climate change leads to more permafrost thaw & disruptions to freeze-thaw cycles that can increase frost heaves & subsidence. This can potentially cause damage to transportation infrastructure in Alaska, including highways, railroads, & airstrips. Uneven sinking of the ground in response to permafrost thaw is likely to add significant costs to the maintenance & repair of transportation infrastructure & buildings. Many of Alaska's highways are built in permafrost areas & are subject to damage if the permafrost thaws.

<http://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-Alaska.html>

ALASKA HOME TO 229 FEDERALLY RECOGNIZED TRIBES

Relocation of Alaska Native Villages: As temperature across the Arctic rise at twice the global average, the impacts of climate change in Alaska are already being felt (IPCC 2007). Alaska Natives are among the most impacted in this region, according to the Government Accountability Office in 2004, flooding & erosion affected 86% of Alaskan Native Villages to some profile examines the challenges of relocation & offers examples from the 3 Alaska Native villages working to protect their people, culture, & natural resources

<http://tribalclimate.uoregon.edu/tribal-profiles/relocation-of-Alaska-native-villages/> or

http://www4.nau.edu/tribalclimatechange/tribes/ak_Inupiaq_AkRelocation.asp

ALASKAN TRIBES: “THE RISING TIDE: MIGRATION AS A RESPONSE TO LOSS & DAMAGE FROM SEA LEVEL RISE (SLR)”

U.S. Government Accountability Office (GAO) in 2009 found that the 4 villages requiring immediate relocation, only one had identified a site for resettlement that was deemed safe, sustainable, & desirable by the villagers & various levels of (GAO, 2009). In 2006, it was predicted that the villages of Kivalina, Newtok & Shishmaref have less than 15 years to relocate & the cost of relocating each community would be approximately \$80 to 200 million USD (Corps House Report, 2004 in GAO, 2009)

The ground under a home in Shishmaref, Alaska collapses from erosion. Image credit: [The Alaska Conservation Foundation \(2010\)](#)



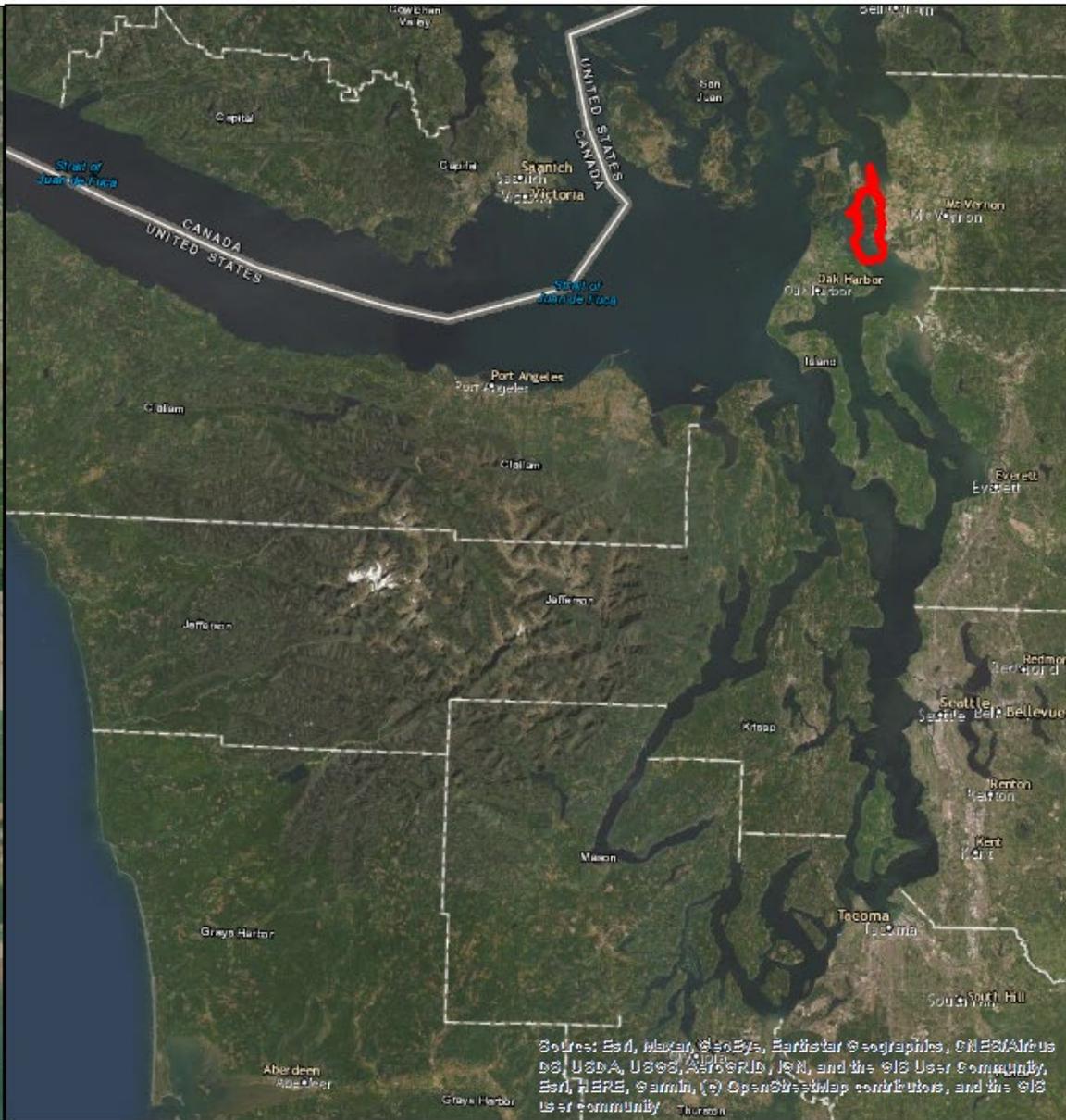
Swinomish Tribe – Coastal Tribe in Washington State

Swinomish Tribe at the forefront of Planning for Climate Change

In 2007, the Swinomish Tribe passed a climate change proclamation in response to growing concerns about potential impacts of climate change on the Swinomish Indian Reservation.

<http://tribalclimate.uoregon.edu/tribal-profiles/Swinomish/> or [ww4.nau.edu/tribalclimatechange/tribes/northwest_swinomish.](http://ww4.nau.edu/tribalclimatechange/tribes/northwest_swinomish)

(A Guide for Tribal Leaders on U.S. Climate Change Programs, June 8, 2011)



Legend

 Swinomish Reservation

Inundation of low-lying roads & bridge approaches.

Swinomish Technical Report: increasing sea levels have the potential to inundate roads on & leading to the Reservation where such roads are not adequately protected by dikes, or where rising sea levels eventually top dikes. Responding to this threat will ultimately require daunting projects that will likely be both considerably expensive & considerably complex, especially considering the inter-jurisdictional coordination that will also be required. Given the uncertainties of the rate of sea level rise, it is not practical to implement strategies that are non-adaptive to changes, although early protections may be so due to the prohibitive cost of other options. Raising dikes & road levels may counter higher sea levels & storm surges in the short term, but will ultimately prove ineffective as sea levels continue to rise. Transportation facilities most vulnerable to these impacts are located in the inundation risk zone. Depending on the level of risk accepted by the community, there are a range of adaptation responses that can be applied, both short term & long term.

Roads & Bridges:

A transportation network should be provided that will adequately satisfy the requirements for everyday access, tourism, & emergency vehicle access & evacuation in a safe & effective manner.

Adaptation strategies:

- **Build/raise dikes**
- **Raise road levels**
- **Relocate routes – R.O.W's could become an issue**
- **Abandon routes – vacate in inundation risk zones**
- **Develop alternative route plan for roads in inundation risk zones**
- **Restrict construction of public roads in risk zones**

(Swinomish Climate Change Initiative Climate Adaptation Action Plan, Oct. 2010)



Sustainability & Resiliency for Tribes

Sustainability & Resiliency for Tribes

- Tribes are ever-facing wildfires, threats of hurricanes, earthquakes, flooding, landslides, rising of waters, relocation efforts, sustainability challenges with increasing warming of the earth & climate changing effects from mother nature, to pandemics
- As disasters grow, Tribes need to prepare for the safety & security of their people, lands, economic development, culture, & protection of tribal sovereignty
- Tribal resiliency towards plans for recovery, mitigating for future disasters & emergencies

- **Develop a resiliency education program for the tribal leadership/Councils**
- **Research & development of resiliency strategies for tribal governmental departments & enterprises**
- **Development of staffing with cost analysis**
- **Administrative review for assessing proper staffing within the Tribal Resiliency Program**
- **Continued development of teleworking from home strategies, cost sharing, & job sharing, consistent with the Tribal Resiliency Program**
- **Development of resiliency training programs for the Tribal members, including personal/family preparedness programs**
- **Development of Community Emergency Response Team (CERT)**
- **Create a Vision & Structure for Sustainability & Resilient Tribal Communities**

Sustainability & Resiliency for Tribes

- Involving all necessary stakeholders from Indian Country such as: tribal leaders, planners, transportation & transit planners, public safety, emergency management, wildfire management, health adm., disaster deployment services, surrounding counties, state, federal agencies, & outside vendors
- Up-to-date disaster & emergency plan preparedness
- Up-to-date Comprehensive Plans (20 to 30 year generational plans for entire tribal system)
- Up-to-date Long Range Transportation Plans (20 year transportation plan)
- Up-to-date Tribal Transportation Plans (3 to 5 year transportation plan)
- Up-to-date Inventory of all Transportation Assets into the Bureau of Indian Affairs (BIA) Reservation Inventory Field Data System (RIFDS)

HOW DO WE CHANGE OUR LIVES TO STOP CLIMATE CHANGE DEVASTATION?

**Reducing fossil fuels;
harnessing the 4
elements:**

Solar, Wind, Water, Earth

STOP burning fossil fuels

STOP production of fossil fueled cars:

**Produce ONLY vehicles with the use
of non-harming agents to the
environment by:**

**Build only solar paneled, electric, &
hemp running vehicles, airplanes, &
cargo-ships, & boats**

**Stopping all use &
production of
environmental harmful
chemicals:**

**STOP USE of chemicals in farming &
food production, & killing of our
pollinators**

**STOP USE of chemicals in economic
development**

**STOP USE of chemicals in growth
development**

**STOP USE of chemicals used by Big
Corporations**

**Decommissioning of Dams, so the fish
can replenish & the oceans can
cleanse**

**Oceans food bounties can remain
clean for consumption**

**Instead of Taking from the
Earth:**

**Renew & give back what you take
from the Earth**

**Learn how to be Sustainable
Communities to cut down your
carbon footprint**

Organic Production Farming ONLY to:

Stop the destruction of the Coral Reefs

Stop destruction of our pollinators

**Innovation & Sustainable Technology
is available & as humans we MUST USE
IT!**



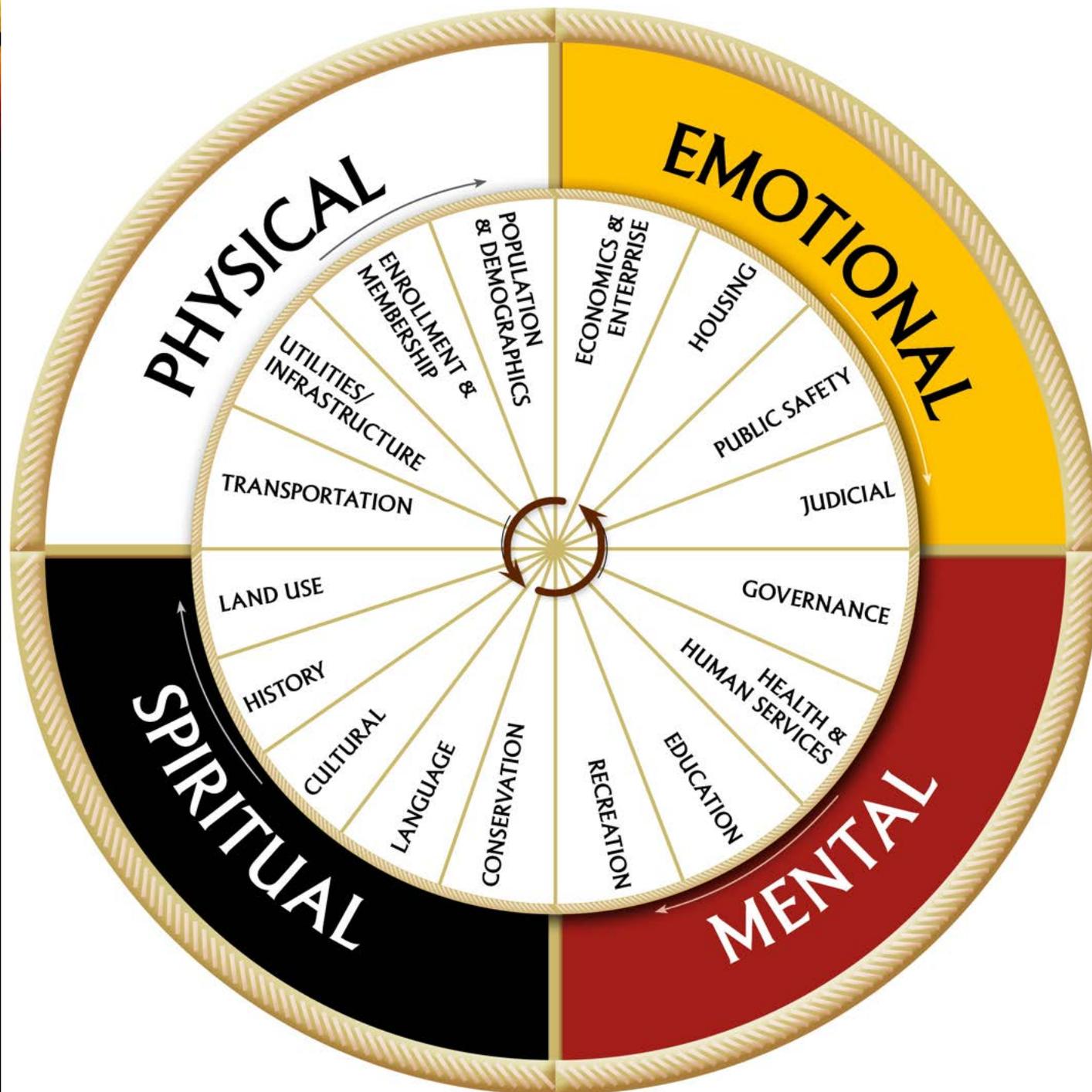


PHYSICAL

EMOTIONAL

SPIRITUAL

MENTAL



**Medicine
Wheel
Methodology**

POLICY & LEGISLATION STAKEHOLDERS

- 1) National Congress of American Indian (NCAI- representation of all 573 Tribes across the U.S.), Fawn Sharp, President, fsharp@Quinault.org, Kevin Allis (CEO), kallis@ncai.org
- 2) Tribal Transportation/Transit policy analyst, Tyler Scribner, tscribner@NCAI.org
- 3) Pacific Northwest Climate Change (PNW)- Kathy Lynn, Tribal Climate Change Project Coordinator, kathy@uoregon.edu, (541) 346-5777
- 4) 350 Spokane Climate Change & 350 U.S. Climate Change: 350.org
- 5) Citizens Against Climate Change: citizensclimatelobby.org
- 6) USDA Forest Service, Pacific Northwest Research, edonoghue@fs.fed.us, (503) 808-2018
- 7) Federal agencies document: Climate Change Adaptation, www.pewclimate.org/publications/report/climate-change-adaptation-what-federal-agencies-are-doing
- 8) The Institute for Environmental Professionals on Tribes & their Climate Change website: www4.nyu.edu/tribalclimatechange/tribes/northwest.asp

POLICY & LEGISLATION STAKEHOLDERS continued

9) Tribal Law firms for Climate Change:

Sonosky, Matthew S. Jaffe MJAFFE@sonosky.com, Chambers, Hobbs, or Straus

10) Bureau of Indian Affairs (BIA):

LeRoy Gishi (202) 513-7711, leroy.Gishi@bia.gov

Sheldon Kipp, (505) 563-3322, Sheldon.kipp@bia.gov

11) Federal Emergency Management Agency (FEMA), FEMA.gov, (800) 621-3362

12) Emergency Relief Federal Org. (ERFO)

13) Army Corps of Engineers (ACE)

14) State Governors

15) Federal & policy law makers

16) President of the U.S.

17) United Nations for Climate Change; rejoining the Paris Accord

THE PARIS AGREEMENT

The partnership has seven thematic focus areas:

- Land use
- Oceans and coastal zones
- Water
- Human settlements
- **Transportation**
- Energy
- Industry

President Trump announced the United States' withdrawal from the Paris Agreement on climate change in the Rose Garden on June 1, 2017.

Transport climate targets & the Paris Agreement

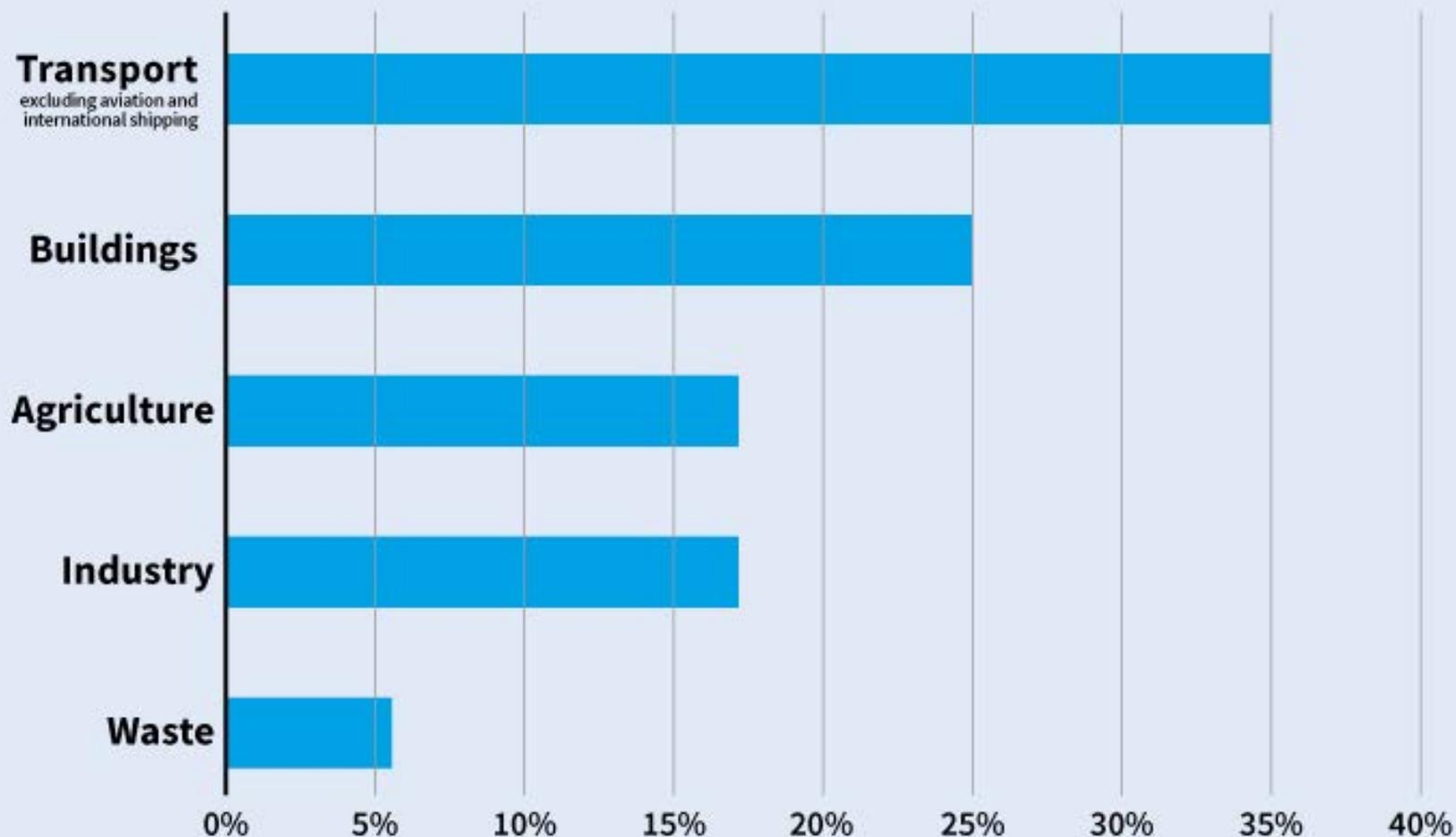
The European Union (EU) has binding climate targets for 2020 & 2030 which apply to transport. By signing the Paris Agreement, the EU also implicitly accepted 2050 targets.

In the EU, there are two main tools to reduce greenhouse gases, which are responsible for climate change: the EU emissions trading system (ETS) & the Climate Action Regulation (CAR) – formerly known as the Effort Sharing Decision (ESD).

The EU ETS covers between 40-45% of all GHG emissions & it includes most of the power sector, large industries &, currently, intra-EU flights. Installations under the EU ETS need to surrender allowances equivalent to their annual emissions. Allowances are either received for free, bought in public auctions or traded with other installations.

Transport: the biggest non-ETS sector

Greenhouse gas emissions from sectors outside the ETS (ESD) 2016



Sectors included in the 2030 climate targets

- **Transport:** it includes road transportation, domestic shipping, non-electric railways & other transportation (pipelines, off-road). Domestic aviation is in the ETS. International shipping & aviation are outside the scope of the CAR as they are theoretically dealt with by international United Nations agencies, the International Maritime Organization & the International Civil Aviation Organization.
- **Buildings:** energy use mostly in households & services (except electricity consumption, for which emissions are allocated to electricity producers, thereby falling under the ETS).
- **Agriculture:** non-CO₂ emissions (CH₄ & NO₂) from enteric fermentation (CH₄ from herbivores), manure management, agricultural soils (fertilizers), among other less relevant categories.
- **Energy industries:** energy industries not included in the ETS because they are not big enough to be included.
- **Waste:** emissions from solid waste disposal on land, wastewater, waste incineration & any other waste management activity
- **Industrial processes:** mostly F-gases (HFCs, PFCs, SF₆) used in air-conditioning (65% in CO₂-eq in 2013), fire protection, aerosols, insulating gas in high voltage switchgear.

Climate targets up to 2020

The current ESD (Decision No 406/2009/EC) was designed to achieve a *climate target* of -10% GHG emissions of all ESD sectors at the EU level by 2020 compared to 2005 levels. Each member state has a different target to meet by 2020, & an annual trajectory of targets. In the current period, which runs between 2013 & 2020, some member states with high GDP per capita had to reduce their emissions by 20% while others could still increase them by 20%, as is the case for member states with the lowest GDP per capita.

**SURTCOM- SMALL URBAN RURAL
TRIBAL CENTER ON MOBILITY**

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