CLIMATE CHANGE 101: WHAT CAN WE DO?

NEZ PERCE TRIBE CLIMATE CHANGE TASK FORCE

Presented by:
Stefanie Krantz - Climate Change Coordinator
• Brief overview and explanation of climate change and how scientists know the climate is changing
• What is at stake for the Nez Perce Tribe
• What are people doing to solve this problem?
• What is the Climate Change Resilience Team and Task Force doing to help?
• What can we do here locally?
GLOBAL WARMING AND CLIMATE CHANGE

Weather is what is outside the window today, climate is average weather over time!

GLOBAL WARMING

• Gradual rising of Earth’s Temperature
• Caused by the Greenhouse Effect

CLIMATE CHANGE

• Changes in temperature, precipitation, or wind patterns that occur over a significant time period; causes extreme weather, seasonal shifts, hydrogeologic changes...

USEPA 2016, NASA 2015
The planet would be frozen without the greenhouse effect!
The greenhouse effect is part of a complex climate system.

- Atmospheric Circulation moves heat
- Carbon Cycle moves, transforms, and stores CO₂
- Ocean Circulation moves and stores heat and CO₂
- Aerosols interact with solar energy

http://Milankovich Cycles
Early humans left Africa 2 million years ago. The Pacific Salmon is 6 million years old.

Temperature is the ratio of "light" oxygen-16 to "heavy" oxygen-18.

2017 Level of CO$_2$ is $\sim$410 ppm

Pre-Industrial CO$_2$ Levels

Industrial CO$_2$ Levels

1908

2500 BC

9500 BC; First agriculture 280 ppm

First moon landing 1969

Figure created by S. Nagi

National Geographic and NOAA 2017,
Union of Concerned Scientists
Early humans left Africa 2 million years ago. The Pacific Salmon is 6 million years old.

Temperature is the ratio of "light" oxygen-isotope-16 to "heavy" oxygen-isotope-18.

Carbon dioxide and the temperature of our planet from 800,000 years ago until the present day.

350 ppm CO₂ = Safe Level; (<2° C)

2017 Level of CO₂ is ~410 ppm

Industrial CO₂ Levels

Pre-Industrial CO₂ Levels

9500 BC; First agriculture 280 ppm

1969 first moon landing

National Geographic and NOAA 2017, Union of Concerned Scientists
HOW MUCH CO$_2$ WILL BE IN THE ATMOSPHERE BY 2100?

Projected Atmospheric Greenhouse Gas Concentrations

Atmospheric Carbon Dioxide Levels

U.S. EPA and www.globalchange.gov
Evidence of Change: Glaciers, Coral Reefs, Wildfires, Drought, and Floods

Kenai Fjords, Alaska

1940  2005

2010 summer wildfire in Idaho burned over 200,000 acres in a single day

American Samoa

Lake Oroville, California Drought

http://EIS/

Lake Chad, Africa 1963 to 2001

Lake Chad, Africa 1963 to 2001

Rocky Mountain National Park, Pine Beetle Outbreak

Sources: USGS, UNEP, NASA, NOAA, NPS
The Village That Will Be Swept Away
Residents of Newtok, Alaska, voted to relocate as erosion destroyed their land.

Quinault Indian Nation Plans for Village Relocation
As the threats of tsunami and sea level rise are joined by real and potential climate impacts, the Quinault community looks to move the lower village of Taholah to higher ground.
WHAT’S AT STAKE FOR THE NEZ PERCE TRIBE?
Fish

- Migratory Fish depend on food sources in the ocean and cold water in rivers to reproduce
- Fish time their migration with stream flow
- Peak stream flows are getting earlier and the summer low flow season is getting longer
- Unseasonable stream warming events can cause fish kills
Salmon Impacted Across Full Life-Cycle

Floods

Eggs in stream gravel hatch in 1-3 months

Alevisn in stream gravel 1-5 months

Fry emerge in spring or summer

Juvenile fish in fresh water a few days to 4 years, depending on species and locality

Smolt migration to ocean usually in spring or early summer

Fish spend 1-4 years in ocean

Timing of migration to spawning grounds depends on species and race

Warm, low streamflow

Ocean Acidification? Warmer sea surface temps?

Early peak flows
**Basin Transformations: Shifting from Snow to Rain**

Historical

Ratio of Peak SWE to Oct. to March Precipitation

- < 0.1 Rain dominant
- 0.1 - 0.4 Transition
- > 0.4 Snow dominant

**Medium Emissions Scenario**

A1B

2020s

2040s

2080s

Tohver et al. 2014; map by Rob Norheim (CIG)
TRADITIONAL GATHERING

• Seasonal shifts are changing plant phenology – the timing of leaf out, blooming, seed production, and tuber production
• Plants are moving upslope and north
• The root gathering season is shorter, and the quality of the roots is often lower
• Traditional knowledge of the timing of these events, harvesting and cultivation methods, and suitable habitat for plants is extremely valuable and needed for climate change adaptation planning
Can We Stop Global Warming?

CLIMATE
SUMMIT

WHAT IF IT'S
A BIG HOAX
AND WE CREATE A BETTER WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.
YES, WE CAN!

MILLIONS OF PEOPLE ARE WORKING ON IT AND SO IS THE NEZ PERCE TRIBE!

AND YOU CAN HELP!
The Nez Perce Tribe is Working on Short Term Mitigation Measures and Climate Adaptation Planning in order to...

• Educate community members and staff about what’s at stake and what can be done
• Reduce the tribe’s Carbon Footprint | Green our Transportation System
• Transition to Green Energy while Reducing Energy Use Now
• Use Green Products and Avoid Products that are NOT Green like Plastic and Styrofoam
• Create Green Jobs, a Sustainable Food Supply, and a hopeful future
• Restore Biological and Ecosystem Diversity and Save Fish and other First Foods
WHAT IS THE CLIMATE RESILIENCE TEAM DOING?

• Working on a Vulnerability Assessment and Climate Adaptation Plan
• Working on a Survey for Tribal Members
• Planning workshops/interviews with elders/tribal staff to learn about their observations (we can use as much help as we can get with this!!)
• Brainstorming about ways we can help and helpful projects that could be implemented
• Searching for funding
• Volunteering at the Community Garden
WHAT ARE THE TOP WAYS TO REDUCE OUR IMPACT TO THE CLIMATE?

1. Refrigerant Management
2. Wind Turbines (Onshore)
3. Reduced Food Waste
4. Plant-Rich Diet
5. Tropical Forests (stop cutting them down)
6. Educating Girls
7. Family Planning
8. Solar Farms
9. Silvopasture
10. Rooftop Solar
11. Regenerative Agriculture
12. Temperate Forests
13. Peatlands
14. Tropical Staple Trees
15. Afforestation
16. Conservation Agriculture
17. Tree Intercropping
18. Geothermal
19. Managed Grazing
20. Nuclear

http://www.drawdown.org/
Scientists, governments, TRIBES, engineers, citizens, and business leaders are working towards solving this crisis.

- Tesla has invented a car that travels 400 mpg on a charge and is putting charging stations all over!
- Wind Energy is now CHEAPER THAN COAL
- Soil restoration can take carbon out of the atmosphere!
Based on our findings, there are no technological or economic barriers to converting the entire world to clean, renewable energy sources. It is a question of whether we have the societal and political will."

~Mark Z. Jacobson

"So, Just How Much Would it Cost to Convert To Renewable Energy? Can we Afford it?"

This guy and his team at Stanford University figured out how! And, it is cheaper than the alternative and would create good jobs! Really! Check it out!

http://thesolutionsproject.org/
“This planet can be a paradise in the 22nd century.”

~E.O. Wilson

“We do not have to chose between
the economy and the environment

“It’s time to redefine the word ‘progress’ if we want to give a better future to our children.”

MAYALÚ KOKOMETI WAURÁ TXUCARRAMÄE
INDIGENOUS LEADER, MEBÉNGÖKRÉ NYRE MOVEMENT

#CRINBRAZIL

“In nature’s economy the currency is not money - it is life.”

--Environmental Activist, Vandana Shiva
QUESTIONS?

Qe 'ci 'yéw 'yew