



# Climate Adaptation and Tribal Resiliency

**Suzanne Settle**

**Burns Paiute Tribe**

**Emergency Management Director**

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# Climate Change History

## WELCOME TO THE ANTHROPOCENE

All of the epochs of our current era, the Cenozoic, end in –cene, meaning new. Anthros means HUMAN. Humans are a geological in this era. The question is when did “humans” start to affect the geology and climate? In the Industrial Age? The Great Acceleration in the 20<sup>th</sup> century? The Dawn of Agriculture 12,000 years ago?



# The Living and Breathing of the Planet

**This isn't the planet's first rodeo, it's just our first rodeo, as humans in this era.**

**200,000 years ago the planet 3.5 deg colder and moved to 5-9 deg colder. Ice sheets were miles thick. 45% of the Earth's surface was covered in glaciers.**

**The oceans were 300' lower than they are now. The Tribes at the time migrated south to warmer climates.**

**Then, 135, 000 years ago, the planet warmed up to 5 deg warmer than we are now. The Tribes at the time had to migrate to cooler climates.**

**Tribes were migratory. They followed the climate, the seasons, the animals - we were subsistence Tribes.**



**Somewhere between those periods there was a significant social advancement – tools were invented. Clothing became multi-layer, sewing implements (bone needles) antler-tipped spears, religious rituals and Tribal organization.**

**Approximately 17,000 years ago the planet started to warm up again.**

# The Younger Dryas

**The Cretaceous “hot greenhouse era” 92 million years ago and the Paleocene-Eocene era “thermal maximum” 56 million years ago were hotter than we “expect” to get and were followed by extreme cold periods in Earth’s history.**

**Carbon Dioxide levels during the Cambrian period were 20 times higher than our current levels and the Earth was 10 deg C warmer.**

**Climate change is the result of global warming but we are measuring global warming just from the industrial age.**

**From 1303 to 1850 we were in the middle of a “little ice age”. Causes potentially include a grand solar minimum, a reversal of the atmospheric circulation and a lot of volcanic activity.**

**We will experience extreme cold as the planet heats up – what a conundrum!**

## **GLOBAL WARMING VS CLIMATE CHANGE**

**“Although people tend to use these terms interchangeably, global warming is just one aspect of climate change.**

**“Global warming” refers to the rise in global temperatures due mainly to the increasing concentrations of greenhouse gases in the atmosphere.**

**“Climate change” refers to the increasing changes in the measures of climate over a long period of time – including precipitation, temperature, and wind patterns.” USGS**

# Human History – We Used to be Nomadic



**The Calusa Tribe of Florida – A tribe of about 50,000 were nomadic and when the water rose due to a warming planet they packed up and moved.**

**Indigenous people followed the climate, the food, the weather and the living and breathing of the planet.**

**Our current Indigenous Peoples still do this today in some areas – moving to other camps to follow the berry, bitterroot, wild herbs to hunting season for elk, buffalo, salmon, seal and whale.**

# Where We Are Now

**Now we live in big cities, in buildings that can't just be packed up and moved. We build in resort areas close to the shorelines, where the water is starting to encroach on the beaches and cities.**

**We don't adapt naturally, we adapt by using more fossil fuels to cool us in the rising temps from global warming and to warm us in the freezing temps from climate change. We are not adapting very well.**

**We see extreme weather, and now we're seeing increased solar activity and longer, more severe, weather patterns.**

**We are accelerating the process but this period will come.**



# Solutions

No economy on the planet today is will to trade economic growth for lower carbon emissions.

Solar and wind are not complete options. Author Gwyenne Dyer writes “The managers of the big grids who already have to cope with wildly fluctuating levels of demand are now being asked to deal with uncontrollable fluctuating levels of supply as well, and they can only go so far. It hasn’t come up much in public yet, because only Germany and Denmark have approached 20% in their renewables in their electricity generation mix, recently up to 27%, but most grid managers are very unhappy about going beyond that level of renewables in the system.”

Since we can’t predict wind or sun light we can’t just wholesale switch to such systems unless everyone will be happy with unknown periods of outages. We still have to use carbon based fuels.



# Discussion? Questions?

**Suzanne Settle**

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**[Suzanne.settle@burnspaiute-nsn.gov](mailto:Suzanne.settle@burnspaiute-nsn.gov)**