

STUFF TO PONDER ABOUT CLIMATE CHANGE



Luncheon Talk
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June 2019
Tribal Climate Camp
Flathead Lake Biological Station, MT

Some Basics About Climate Change



(1) It's Real & It's Happening

Intense Storms



Sea Level Rise



Catastrophic Wildfires



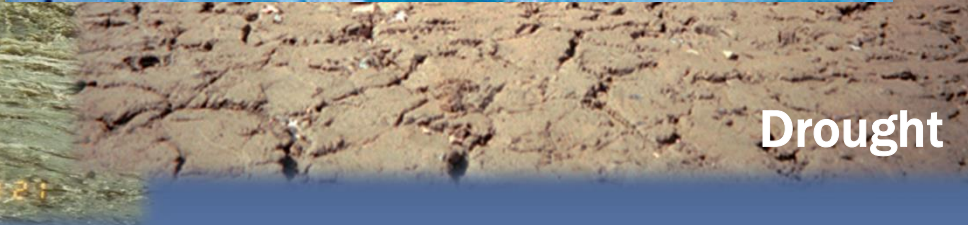
Habitat Change



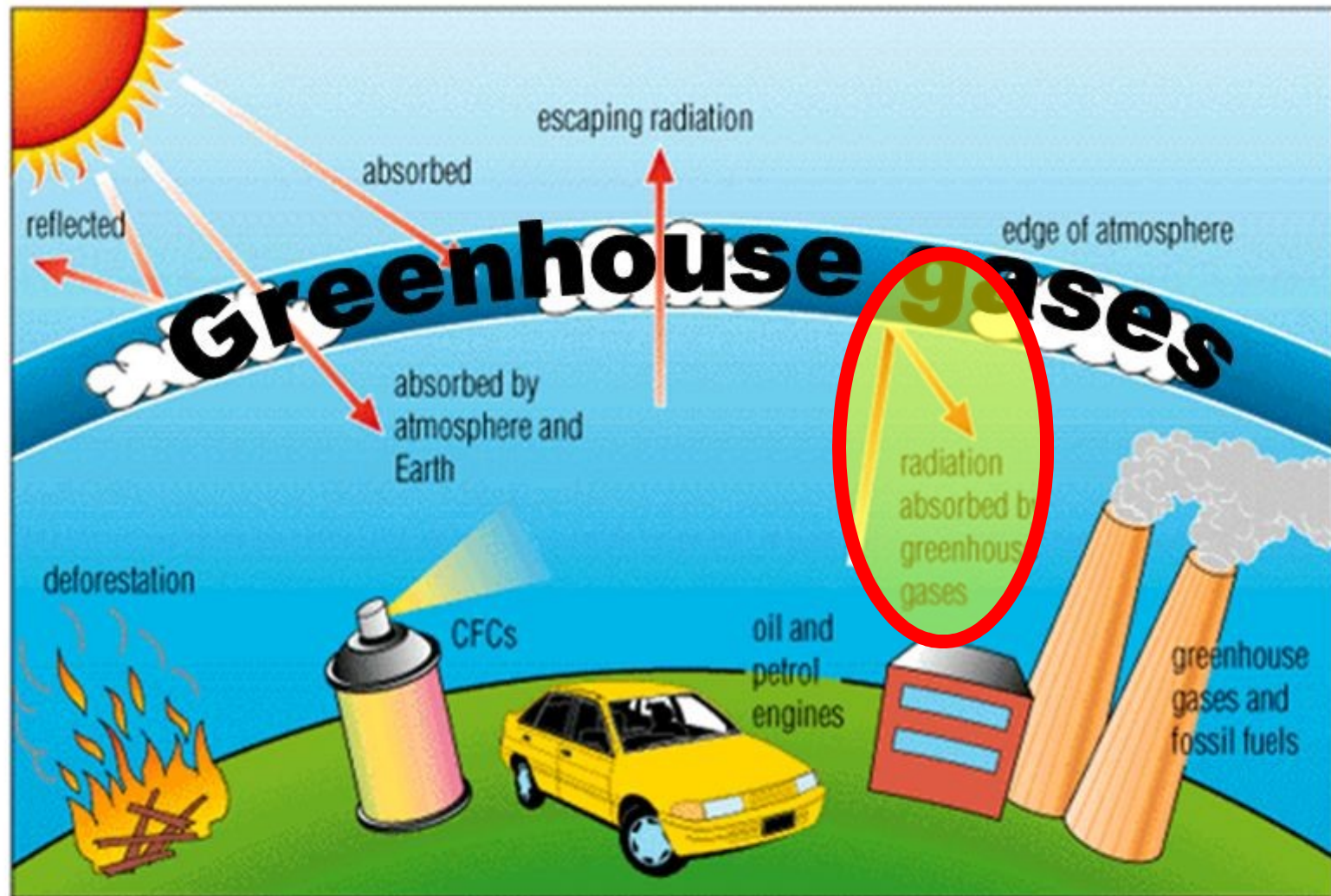
Floods



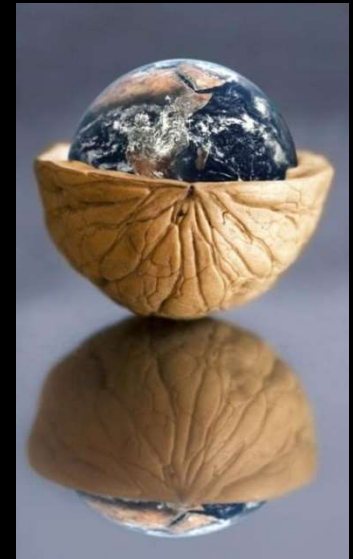
Drought



(2) Greenhouse effect



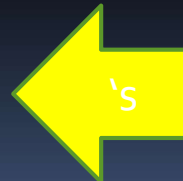
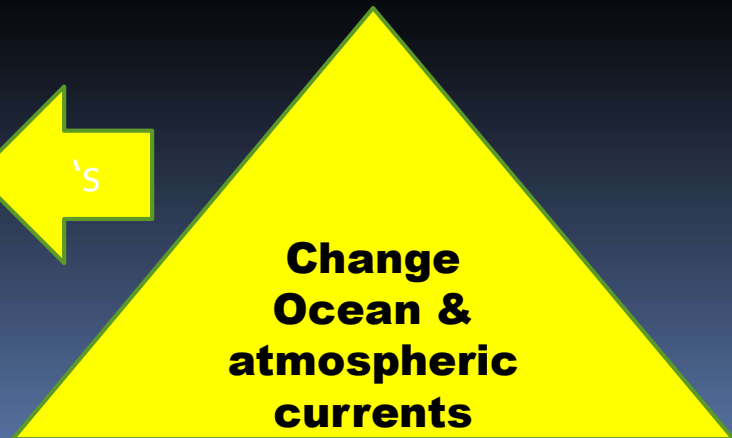
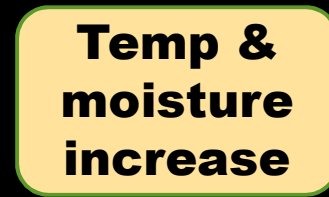
(3) Climate Change In a Nutshell



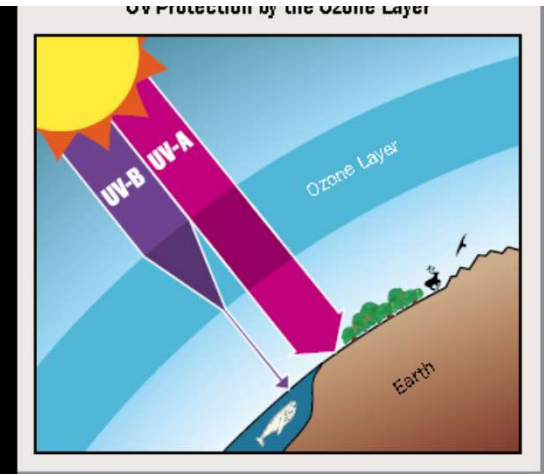
Sunlight enters atmosphere



Ultraviolet & Infrared Radiation Absorbed by Ozone

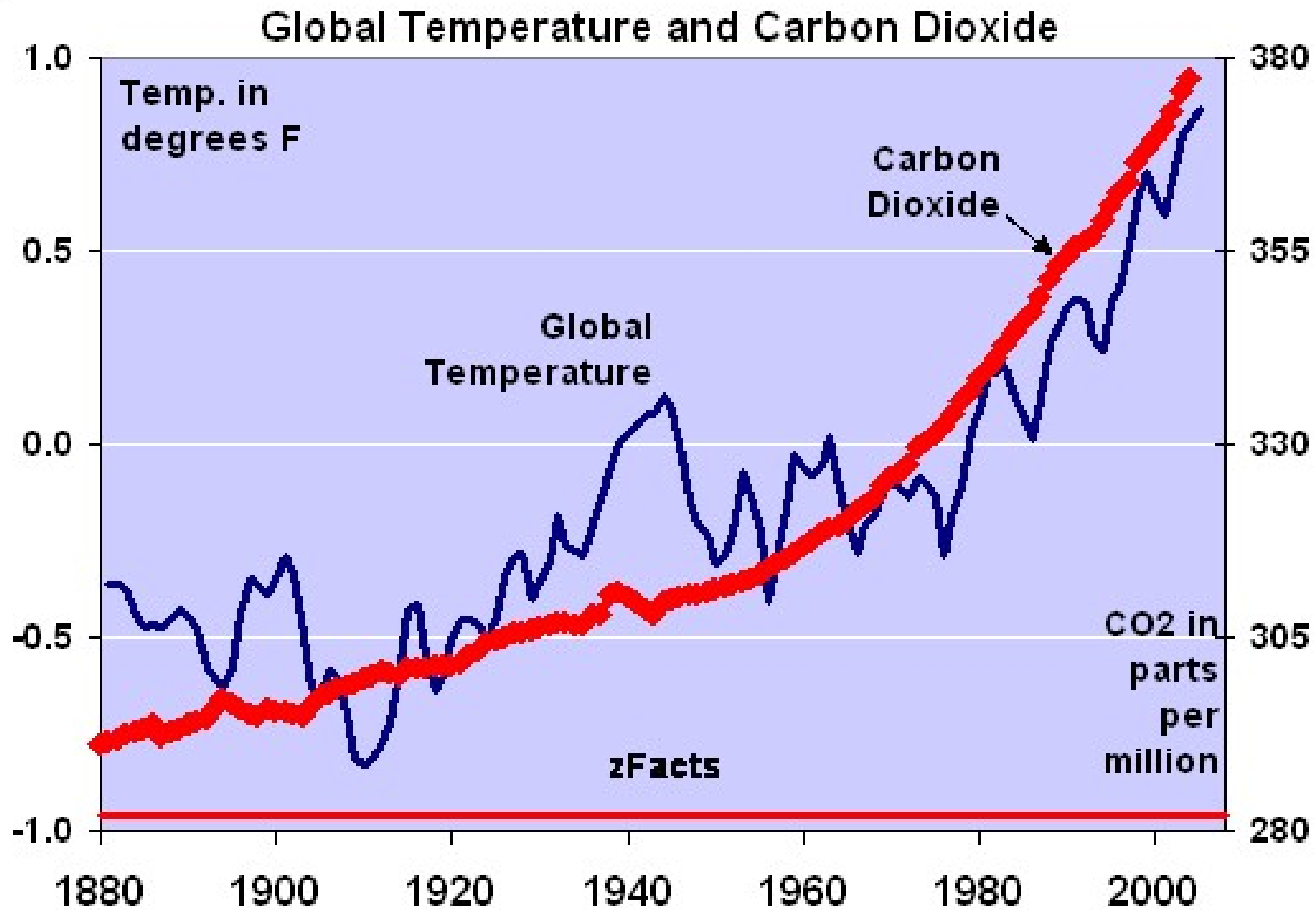


Ozone Depletion & Climate Change

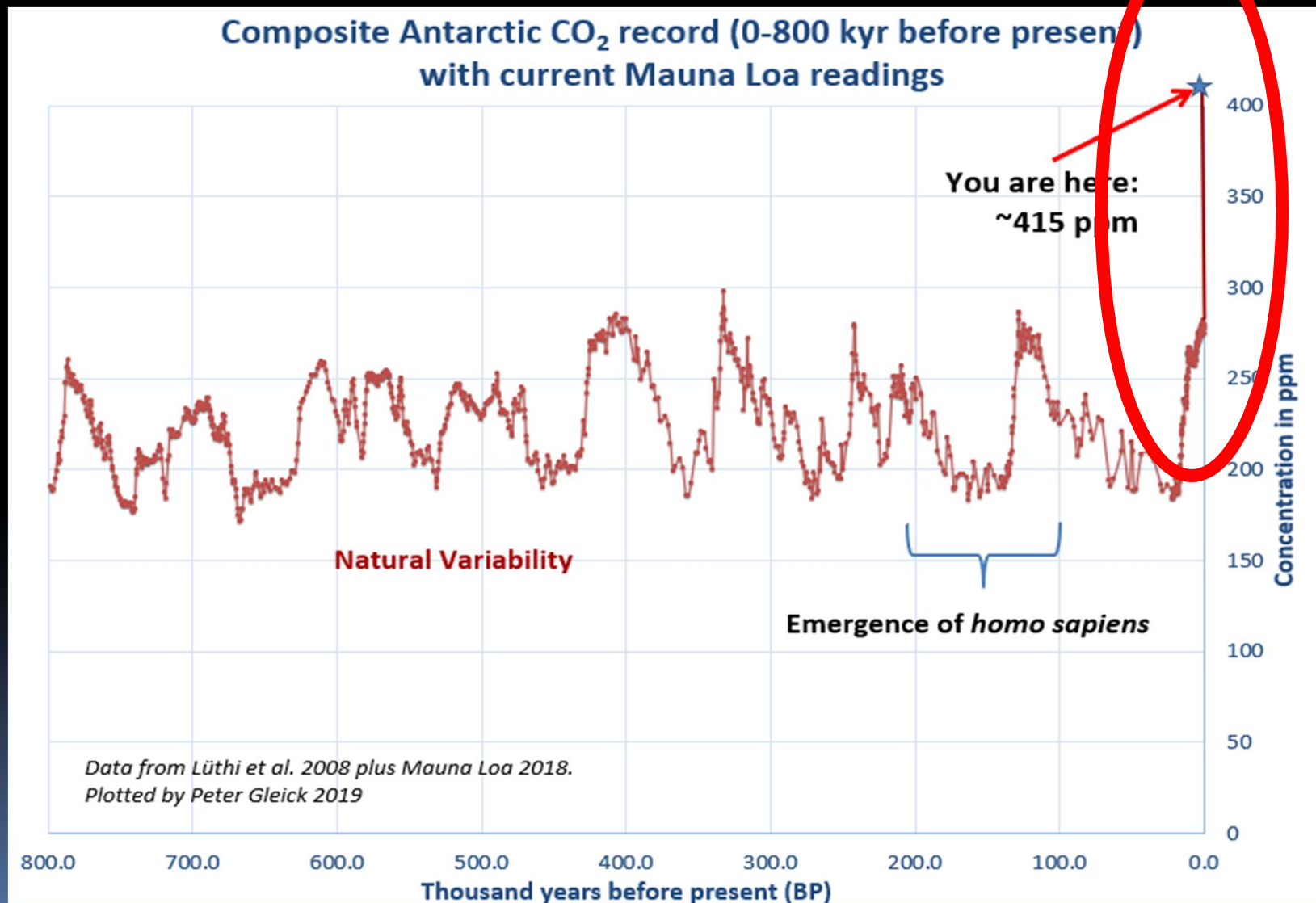


- Ozone absorbs both ultraviolet and infrared radiation and is destroyed through interactions with CFCs & HFCs . Depletion of ozone could cool the planet.
- **BUT we need the “right amount” Too little =**
 - Health risks – cancer and cataracts
 - Affects developmental processes in plants - competitive balance, herbivory, & plant diseases.
 - Reduces plankton production, damage to early developmental stages of fish, shrimp, crab, amphibians, and other species
 - Affects terrestrial and aquatic biogeochemical cycles (e.g., polar vortex), thus altering both sources and sinks of greenhouse gases

CO2 and Global Temperature



(4) CO₂ Level - "Where No Man Has Been Before" - Highest in 3 million years



(5) Not Just CO₂.

H₂O is determined by temperature and amplifies temperature. It persists for only a short time and is not a cause of long term global warming.

Sources of greenhouse gases

Gas	Main source	Greenhouse factor	Relative abundance
H ₂ O	Evaporation of oceans and lakes	0.1	0.10
CO ₂	Combustion of fossil fuels	1	0.036
CH ₄	Anaerobic decay of organic matter by livestock	30	0.0017
N ₂ O	Artificial fertilizers	160	0.0003
CFCs	Refrigerants and solvents	20000	0.00001

(6) About GHGs

Radiative Effect



Global Warming Potential and Atmospheric Lifetime for Major Greenhouse Gases

Greenhouse gas	Chemical formula	Global Warming Potential, 100-year time horizon	Atmospheric Lifetime (years)
Carbon Dioxide	CO ₂	1	100*
Methane	CH ₄	25	12
Nitrous Oxide	N ₂ O	298	114
Chlorofluorocarbon-12 (CFC-12)	CCl ₂ F ₂	10,900	100
Hydrofluorocarbon-23 (HFC-23)	CHF ₃	14,800	270

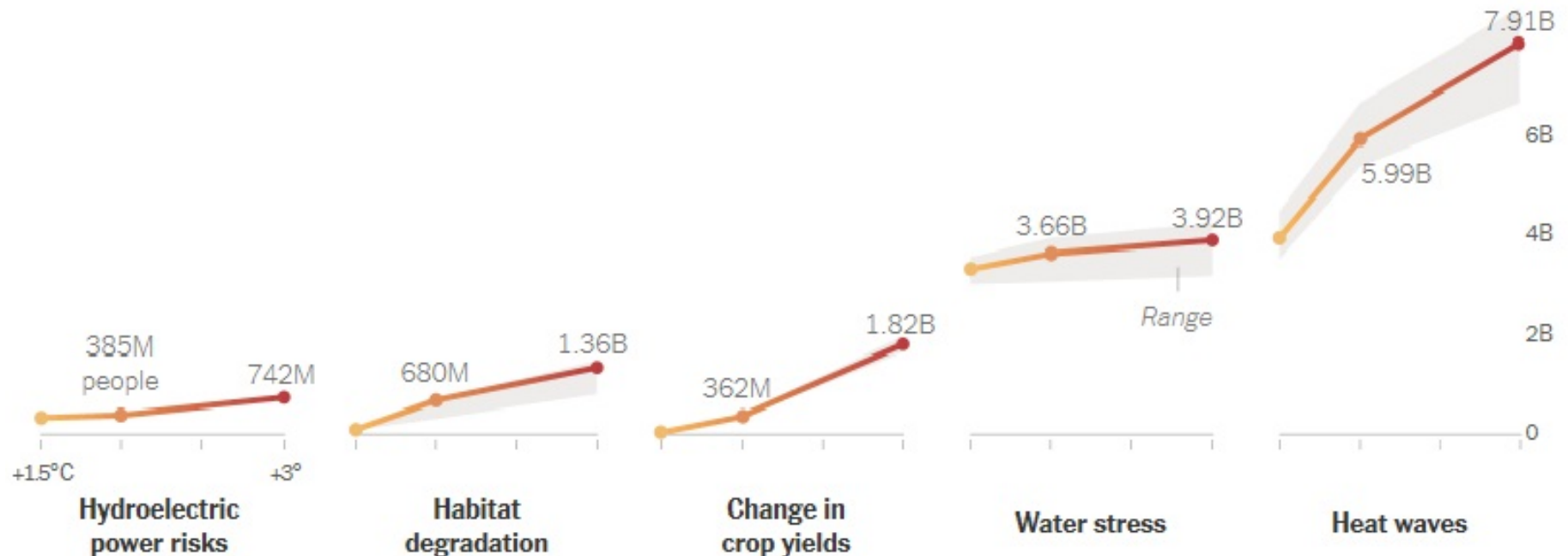
How Long



(7) Human Deaths Due To Global Warming

The Difference a Degree Makes

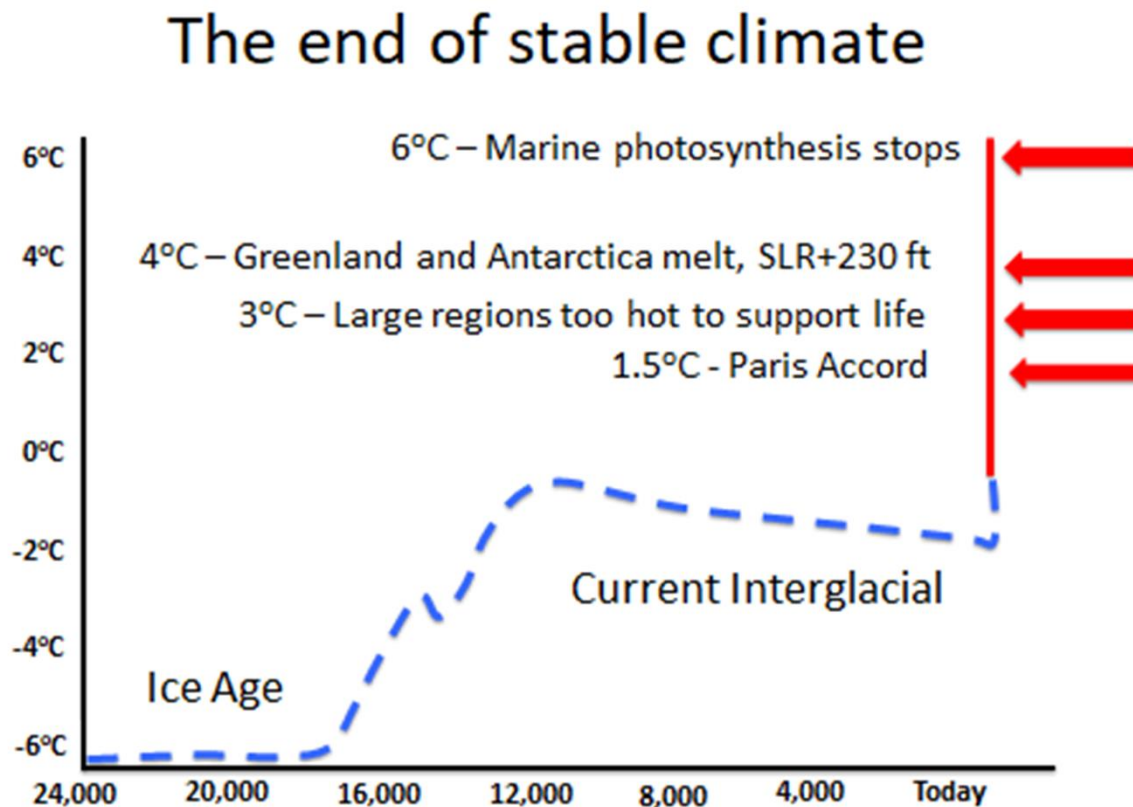
The number of people projected to experience heat waves, water stress and other climate events by 2050 rises sharply as the global mean temperature increases.



Note: Temperature change relative to pre-industrial baseline. Source: International Institute for Applied Systems Analysis from a report by the Intergovernmental Panel on Climate Change | By The New York Times

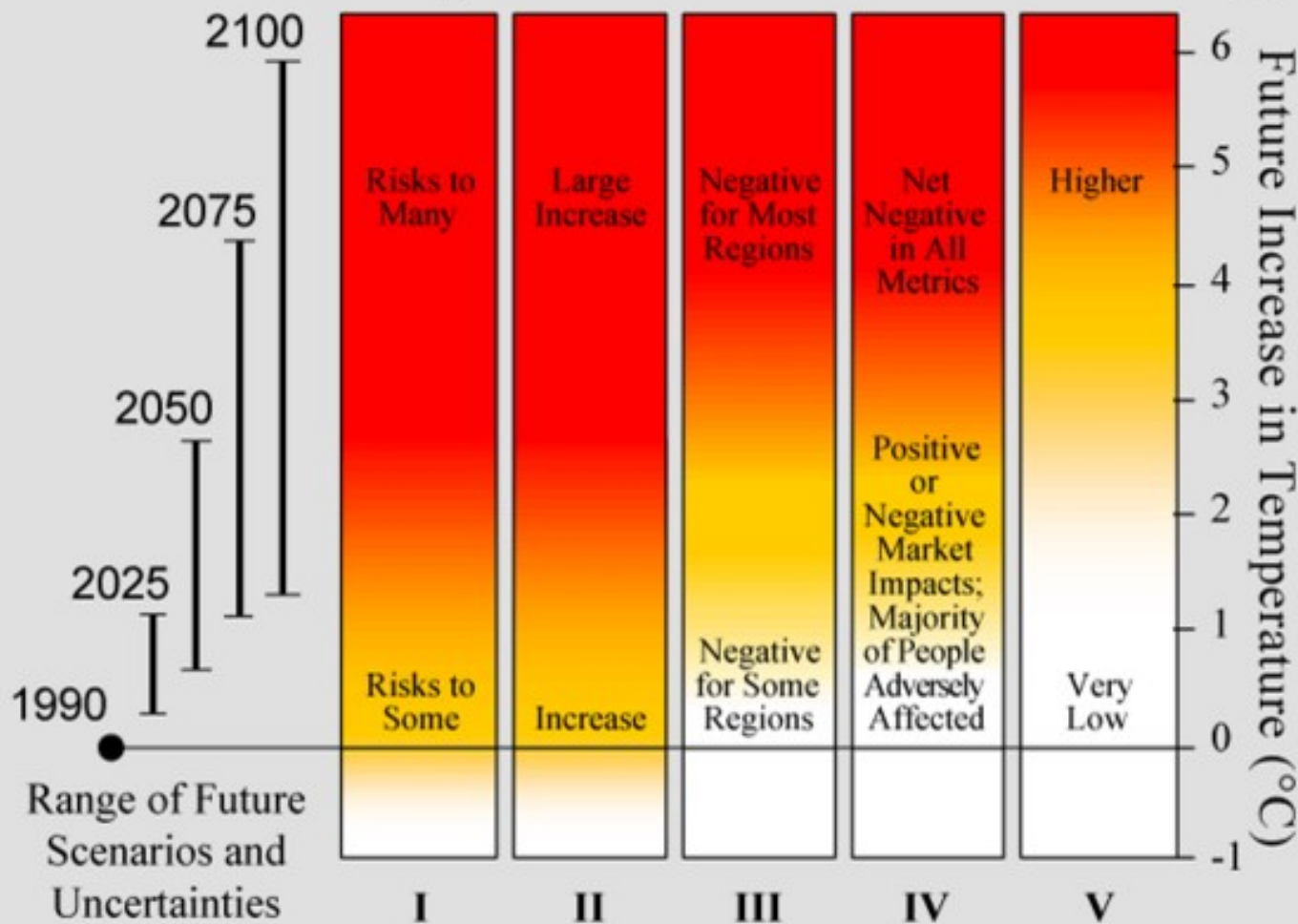
(8) Disaster ahead unless Action is Taken

- Climate change is an urgent problem, that demands attention



**URGENT
ACTION REQUIRED**

Risks and Impacts of Global Warming

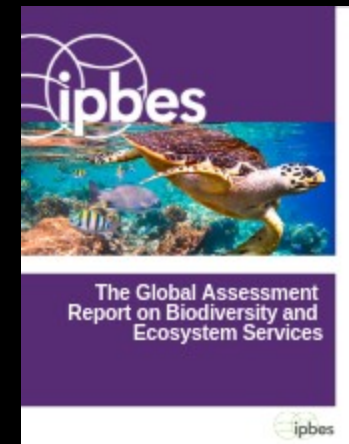


- I** Risks to Unique and Threatened Systems
- II** Frequency and Severity of Extreme Climate Events
- III** Global Distribution and Balance of Impacts
- IV** Total Economic and Ecological Impact
- V** Risk of Irreversible Large-Scale and Abrupt Transitions

Biodiversity At Risk 2019 Report

1 million
species at risk

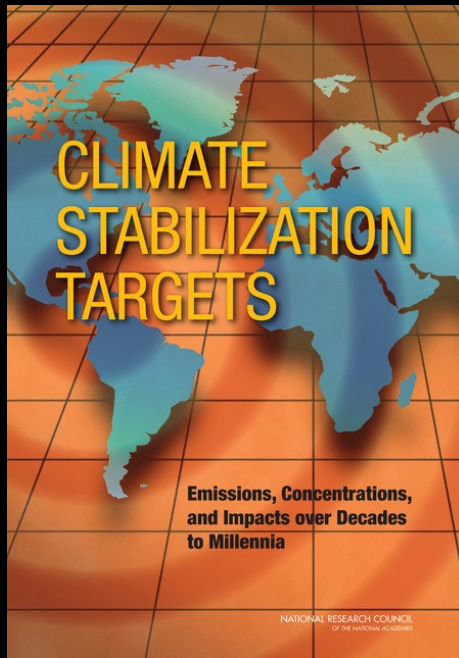
- 40% of insect species
- 17% of ocean wildlife
- 680 vertebrates
- 600 plant species have gone extinct in 250 years



BIODIVERSITY



Two Important References

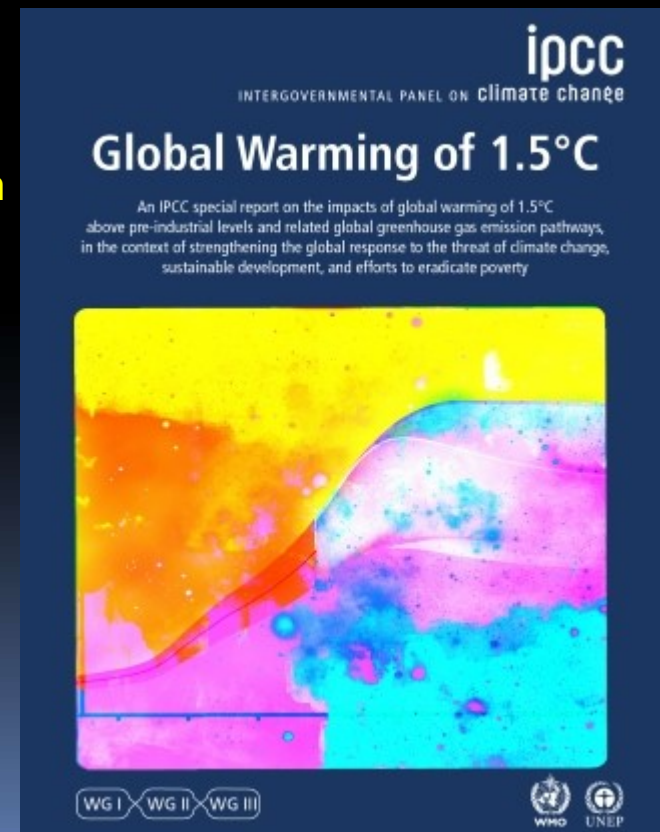


NAS Report Climate Stabilization Targets

<http://nas-sites.org/americasclimatechoices/other-reports-on-climate-change/climate-stabilization-targets/>

Intergovernmental Panel on Climate Change Special Report

<https://report.ipcc.ch/sr15/>



(9) We Can't Take Too Long



The UN Report indicates that we have just over a decade to take decisive action to avoid **very serious** consequences.

We are the last generation with a chance to avoid a dire future.

(10) Costs Of Climate Change

- **\$240B/yr due to extreme weather and health costs of fossil fuels**
 - *Economic Case For Climate Action In the U.S.*
- **\$81B/yr spent by military to protect oil supplies**
 - *SAFE (Securing America's Future Energy) Report*
- **Projected to cost to U.S. of \$250B/yr**
 - *NCA4 (4th National Climate Assessment)*
- **Globally, fossil fuel subsidies amounted to \$5.3T/yr (6.5% of World GDP) in 2015**
 - *2016 Report from IMF*

(11) Climate Change Is Scary,

The stakes are dear

- Disruption of environment
- Hurting natural resources – fish, timber, wildlife, traditional foods and Medicines
- Health risks
- The New Normal
 - Severe storms & extreme events
 - Ocean acidification, harmful algal blooms, hypoxia
 - Disease outbreaks
 - Displacement and replacement of native species

Confusing,



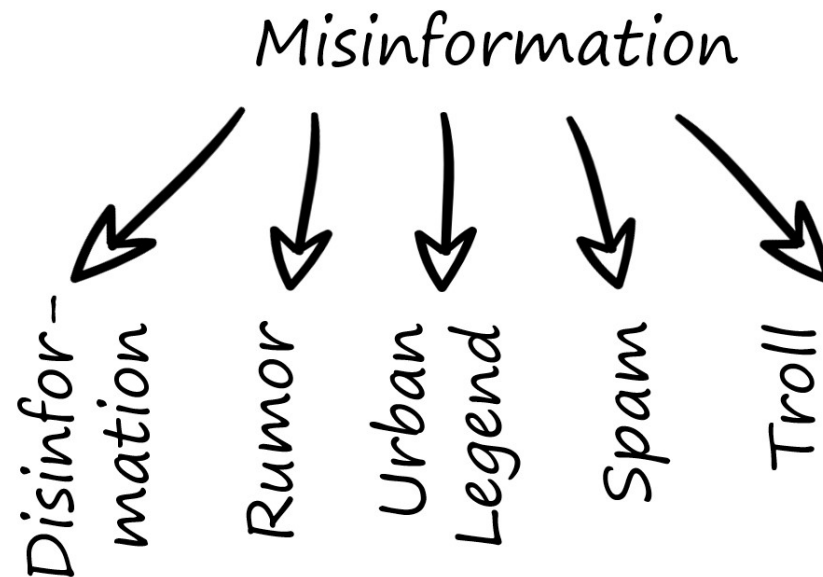
Lot's of uncertainty,
Disagreement abounds.

But Tribes are not helpless

And Complicated.

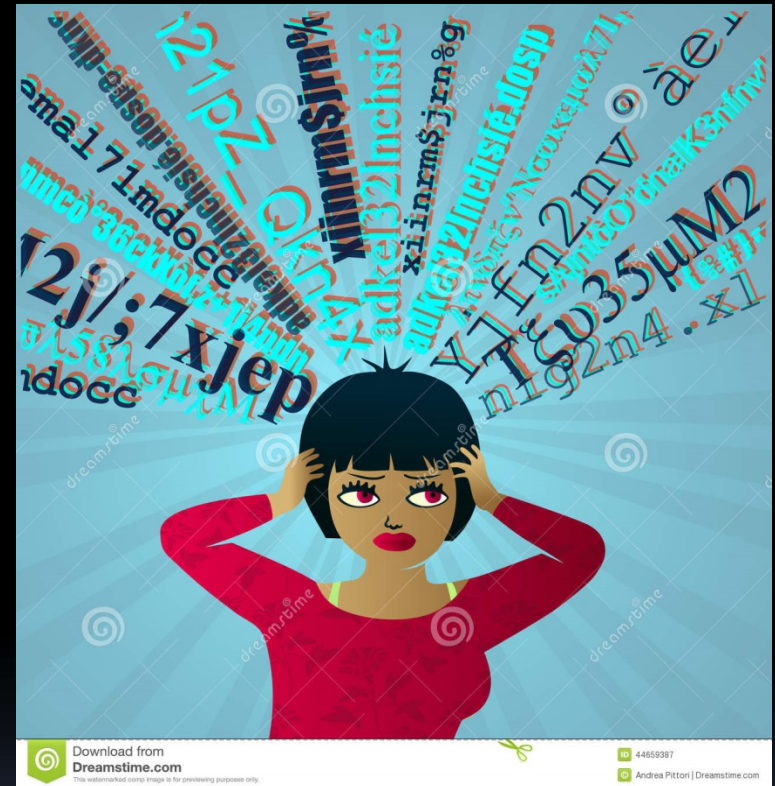
It's complicated. There are too many unanswered questions and it's moving too quickly. We're worried about unintended consequences.

Everything is connected. Things are changing. Culture, economy, politics. Overload of information and misinformation.



(12) Information Overload

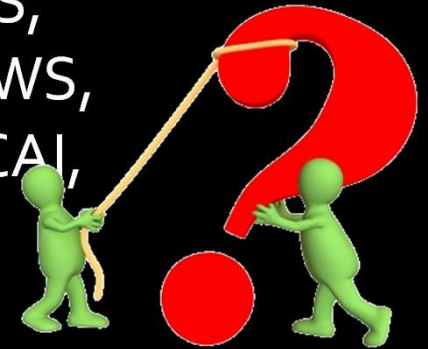
- Models & Data
- Downscaling/Upscaling complexities
- Risk & uncertainty
- Inconsistent, contradictory, science and advocacy based



BEWARE OF
“NORMATIVE”
SCIENCE

Lexicon of Climate Speak: A Plethora of Acronyms & Jargon

- GHG, CFC, HFC, CO₂ Equivalents, LCCs, CSS, Hubs, RISAs, ESA, NEPA, FEMA, ACCCNRS, USGS, NMFS, USFS, DoD, DoS, EPA, USFWS, BIA, ITEP, IPCC, IPBES, NAFWS, ATNT, NCAI, UNDRIP....
- Resilience, Restoration, Adaptation, Preparation, Mitigation, Carbon Neutrality, Kyoto Protocol, Environmental Justice, Climate Equity, Paris



UN Glossary:

http://unfccc.int/essential_background/glossary/items/3666.php

EPA Glossary:

<https://www3.epa.gov/climatechange/glossary.html>

Media Coverage: Social and Mass

Teaspoons

Bullets

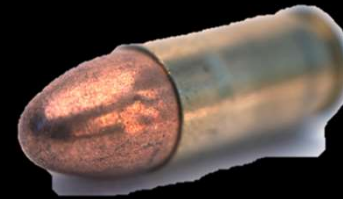
Superficial

Advocacy – mis/dis information

- Believers & Skeptics

Sensational

Climate Politics



Max Boykoff, U Colo Boulder

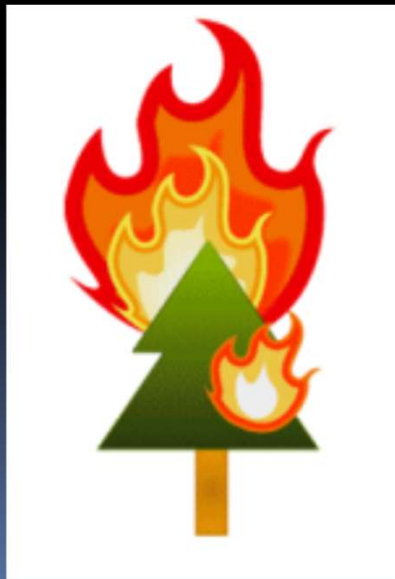
http://sciencepolicy.colorado.edu/publications/searchResults.php?field=author&pub_keyword=boykoff

e.g., <http://climamedia.com/>

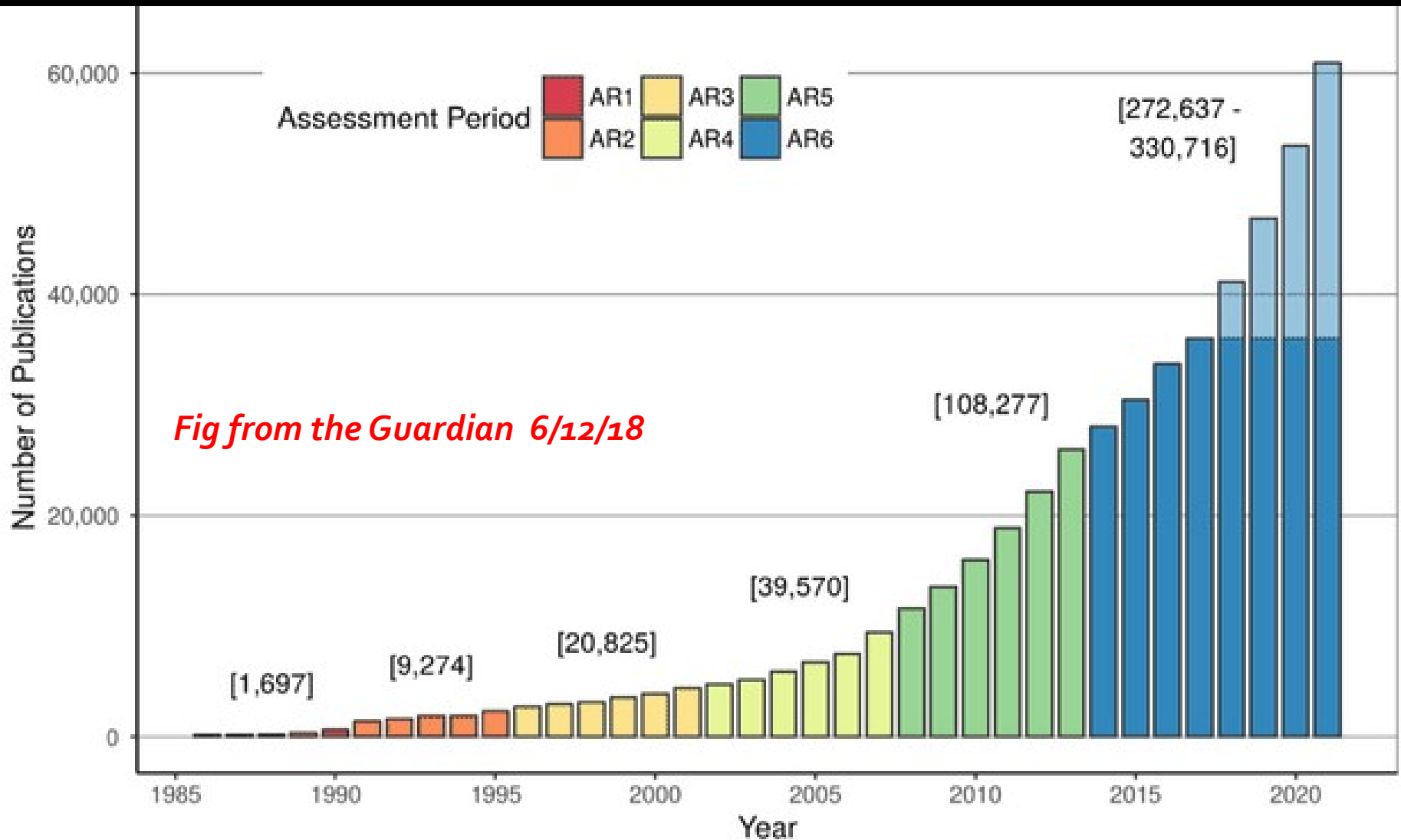


Climate Change Activism Takes Many Forms

- “Climate change activism in music today is akin to artists in the 1970s and their opposition to the Vietnam war.”
- Cartoons
- Climojis



Harder to Keep Up – Number of Climate-Related Publications

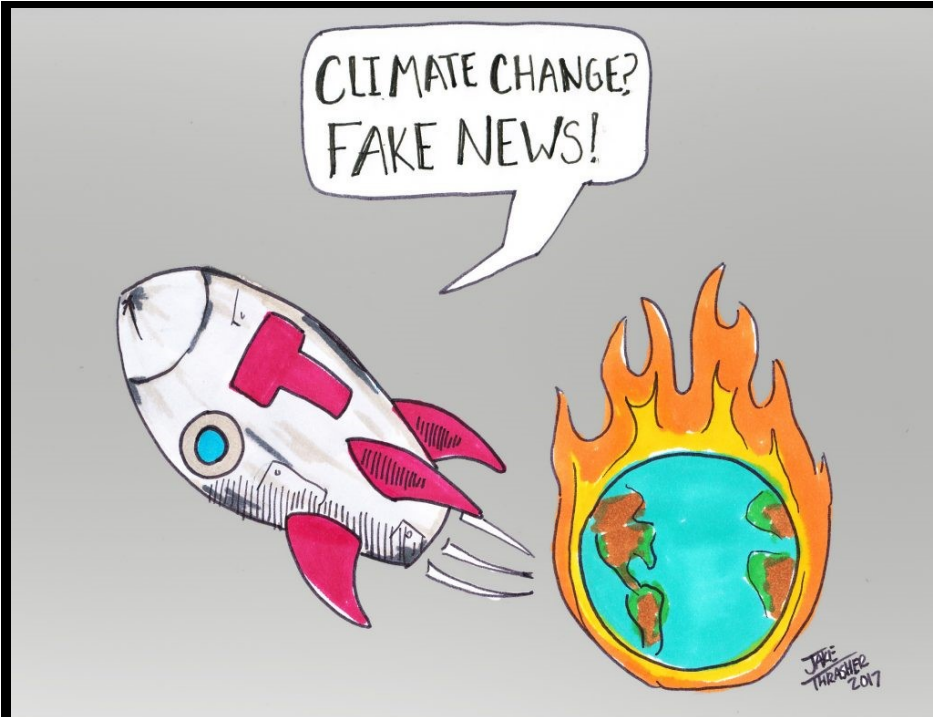


A Flood Of (Dis/Mis)Information





KING DONALD COMMANDS THE OCEAN to BACK OFF



**MORE
FAKE
NEWS**



INFOWARS

RADIO SHOW NEWS VIDEOS STORE TOP STORIES BREAKING NEWS CON

REPORT: NO GLOBAL WARMING FOR 215 MONTHS

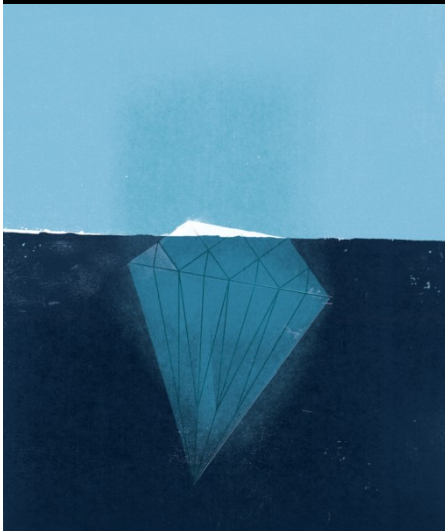
So-called "pause" in global warming has baffled climate scientists

Michael Bastasch | Daily Caller - SEPTEMBER 8, 2014

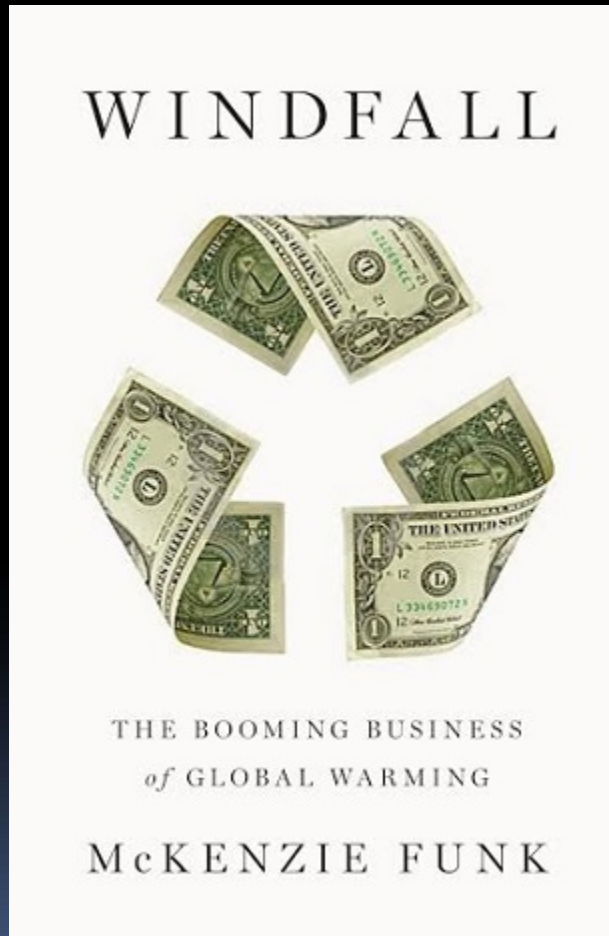


It's so common now

Not Everyone Wants To Address Problems: Climate Profiteers



There are those who seek to make fortunes off the misery of climate change.

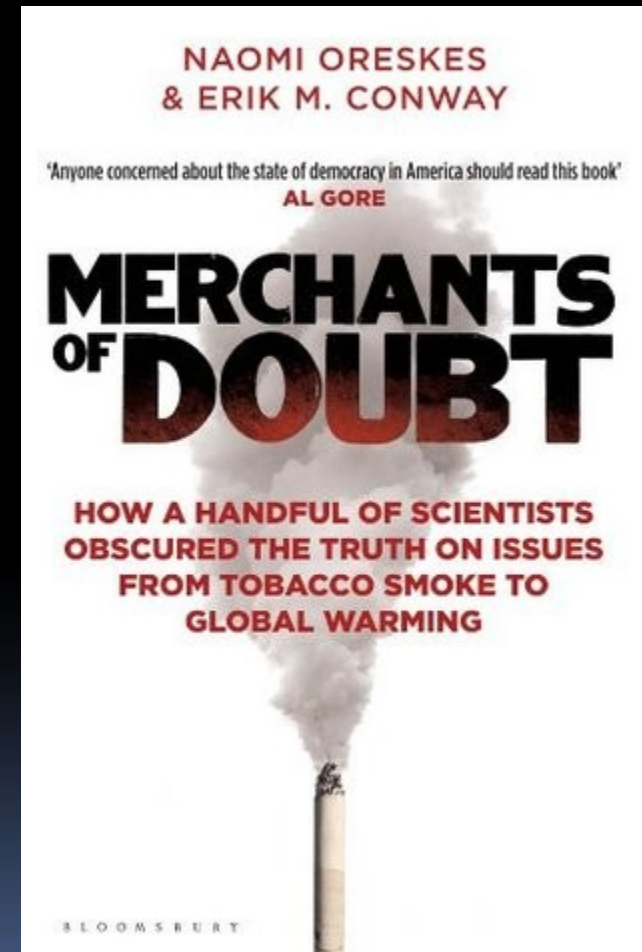


This book is about how we're preparing for the world we seem hell-bent on creating. It's about climate change, but not about the science of it, nor the politics, nor directly about how we can or why we should stop it. Instead, it's about bets being placed on a simple, cynical premise: that we won't stop it anytime soon.

Not Everyone Wants To Address Problems: Climate Profiteers

Biostitutes

Economic interests sponsor credentialed scientists to sow uncertainty and promote obfuscation.



Well financed disinformation campaigns

WANTED FOR CLIMATE CRIMES

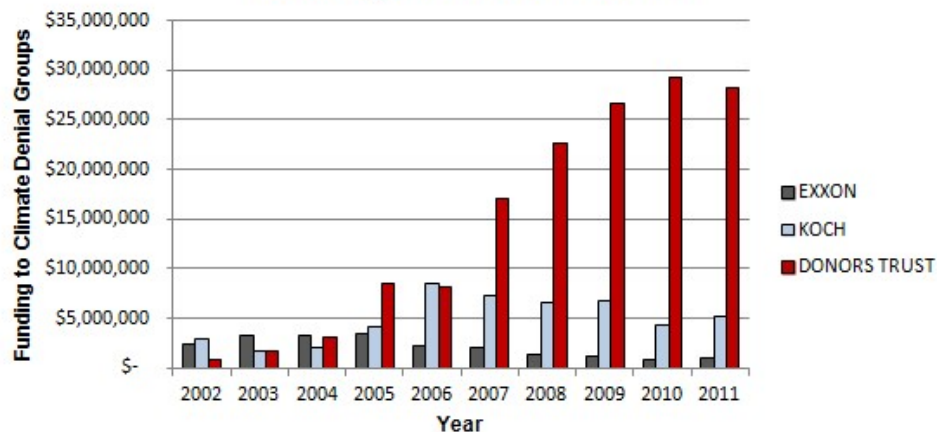
Fueling Catastrophic Climate Change
Peddling Fossil Fuel Addiction
Funding Junk Science to Deny Global Warming
Endangering People, the Planet, and Our Future

Charles Koch & David Koch



Koch Industries

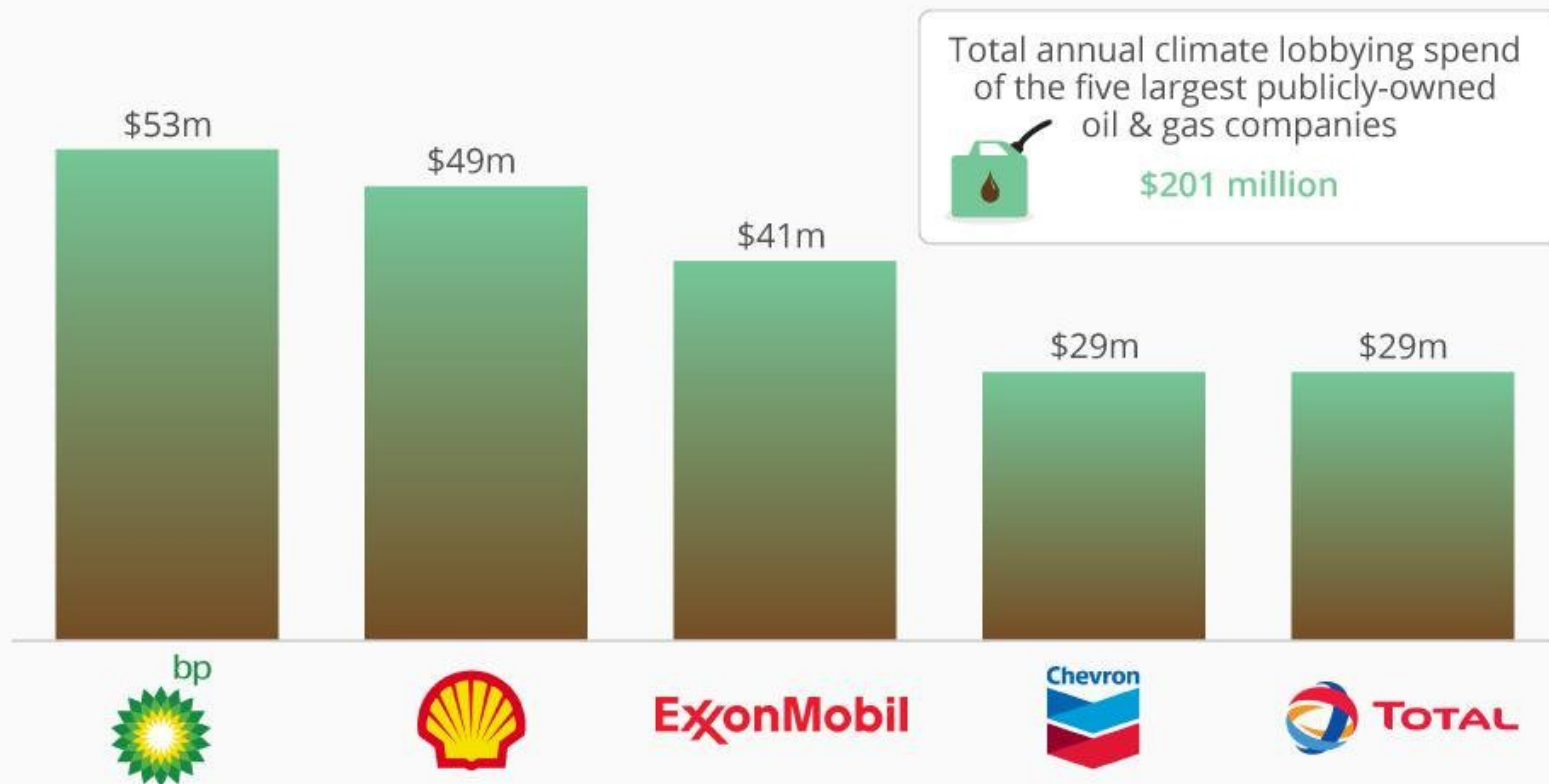
Exxon, Koch, and Donors Trust: Funding of Climate Denial



Big Oil Anti-Climate Lobbying

Oil Firms Spend Millions On Climate Lobbying

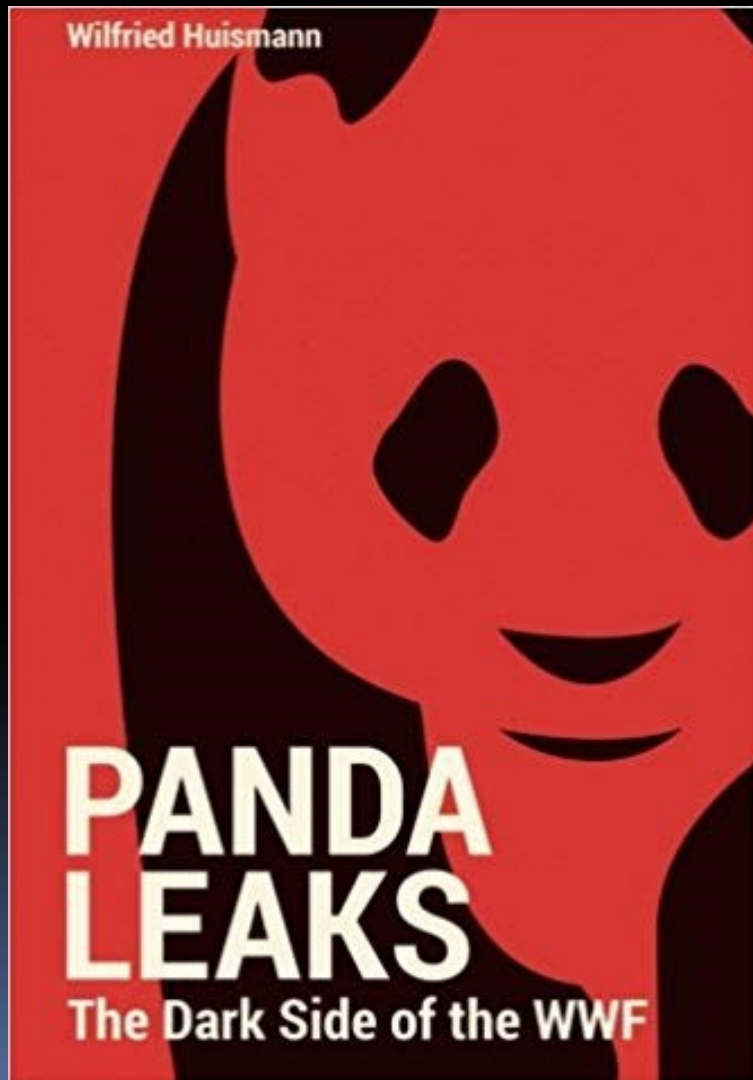
Annual expenditure on climate lobbying by oil and gas companies*



QIN experience with the Power of Big Oil \$ I-1631

- **QIN spearheaded a coalition to try pass Initiative 1631 to implement a carbon fee in Washington State**
 - Dedicated money, staff, and leadership to try to open the door to repairing environmental, economic, and cultural damage
- **But I-1631 was defeated in November 2018 as Big, Out of State Oil spent over \$32 million (98% out of state) to sway voters.**

Don't Be Fooled By Labels "Conservationists" & \$ Too



World Wildlife Fund accused of "selling its soul" to corporations in exchange for their donations, as well as forging alliances with powerful, non-sustainable businesses that are destroying the planet and "greenwashing" their operations under the conservation group's label.

Fear-Based Fundraising

"The overwhelming majority of communications material produced by the international conservation community is pessimistic. Conservation fundraisers have been habituated to rely on fear to prompt philanthropy."

Conservation Frontlines April 2019

Existential Threat: The Rise of Extinction Deniers



As a Tribal Professional, You will need to decide if something is



WWW sites:

SkepticalScience.com.

<https://climatefeedback.org/>

Book: "Climate Change: What Everyone Needs to Know"

Univ WA Course: Calling Bullshit

<http://callingbullshit.org/>



TRIBES AND CLIMATE CHANGE



Experience climate impacts first and the worst

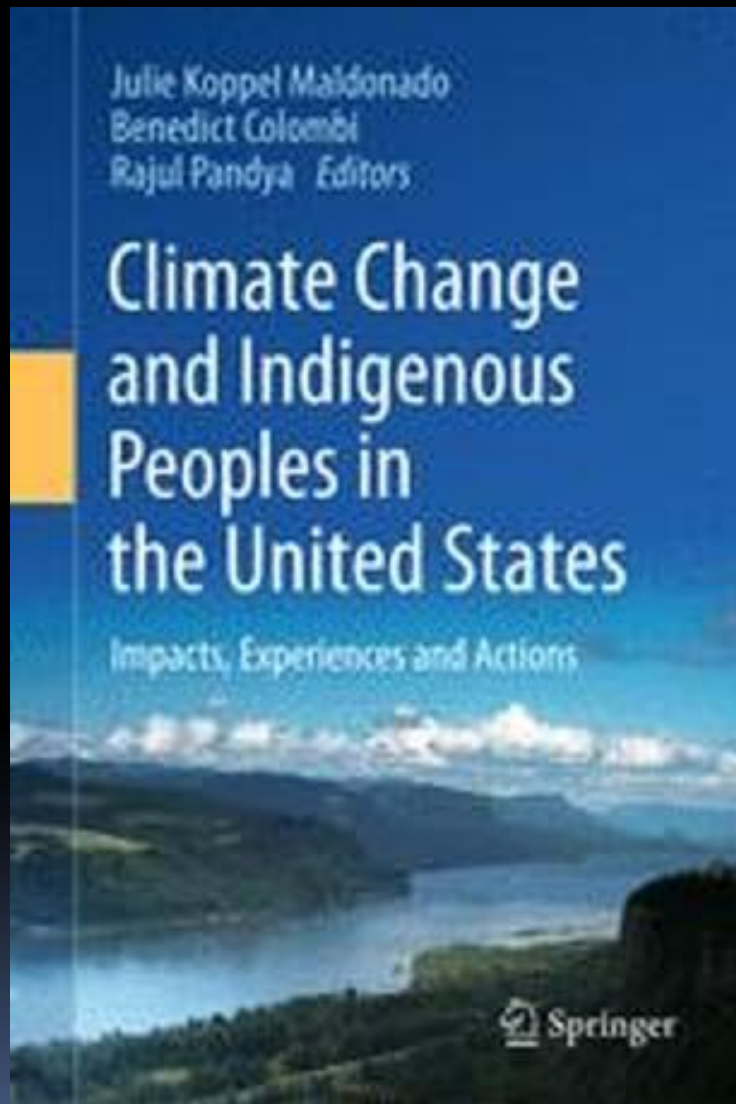
- Higher exposure
- More sensitive
- Less able to adapt

Climate change a risk multiplier

- Human & Mental Health

Chapter 15 & Regional Chapters of 4th National Climate Assessment: Tribes

- Livelihoods, economies, & cultures threatened. First Foods, sacred places, & cultural, spiritual, or ceremonial practices central to cultural heritages, identities, and physical and mental health.
- Face institutional barriers to management of water, land, other natural resources, and infrastructure
- Keys to adaptation include TK, resilient and robust social systems, and self-determination



**Climate Change Is
Global**

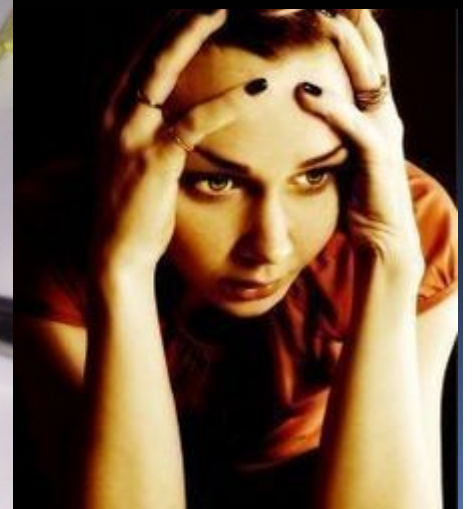
**But Impacts on Tribal
Communities and Places
Differ**

**If You're a Climate Newbie, You
Probably Have Questions,
Questions, and More Questions**

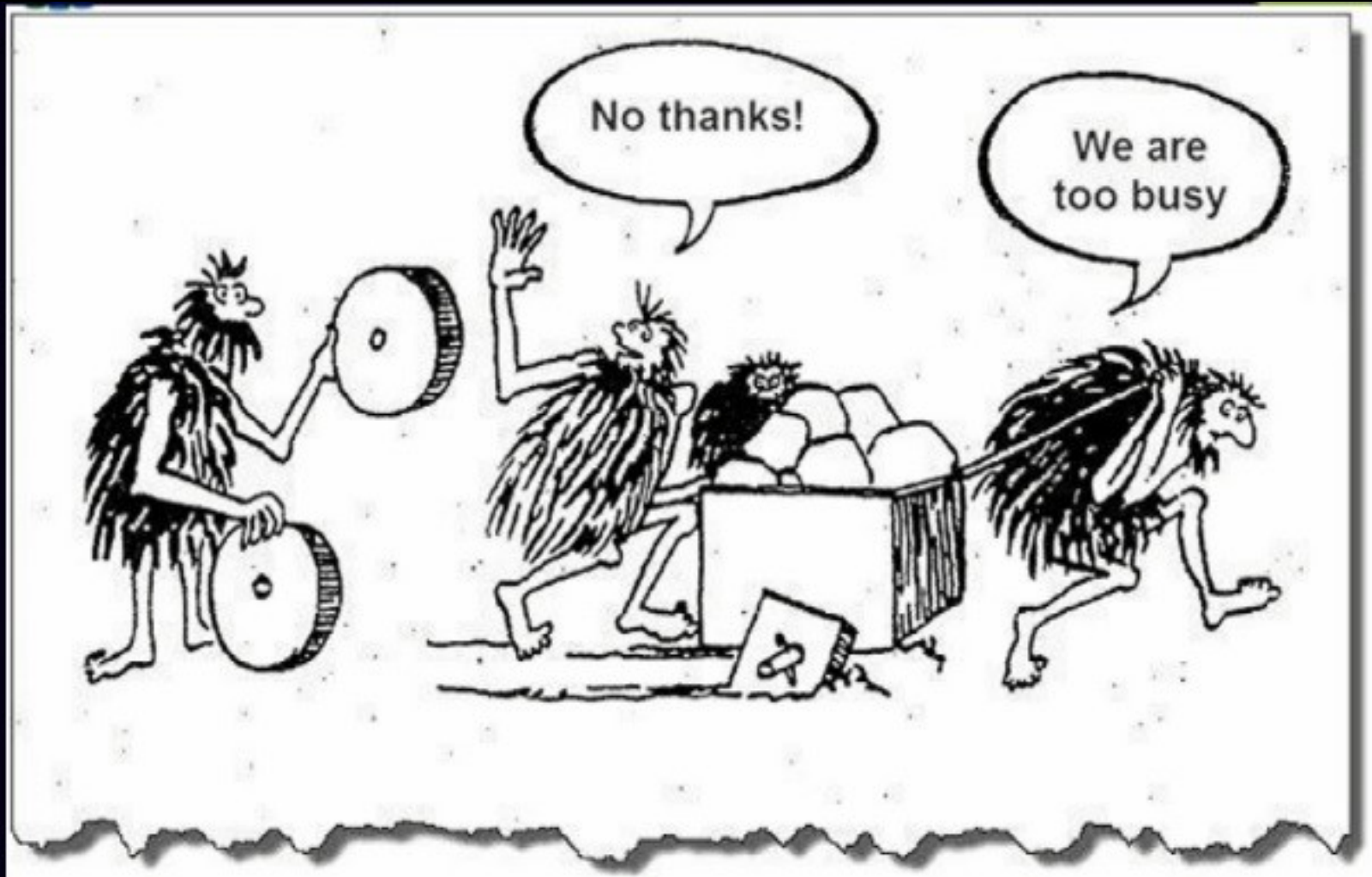




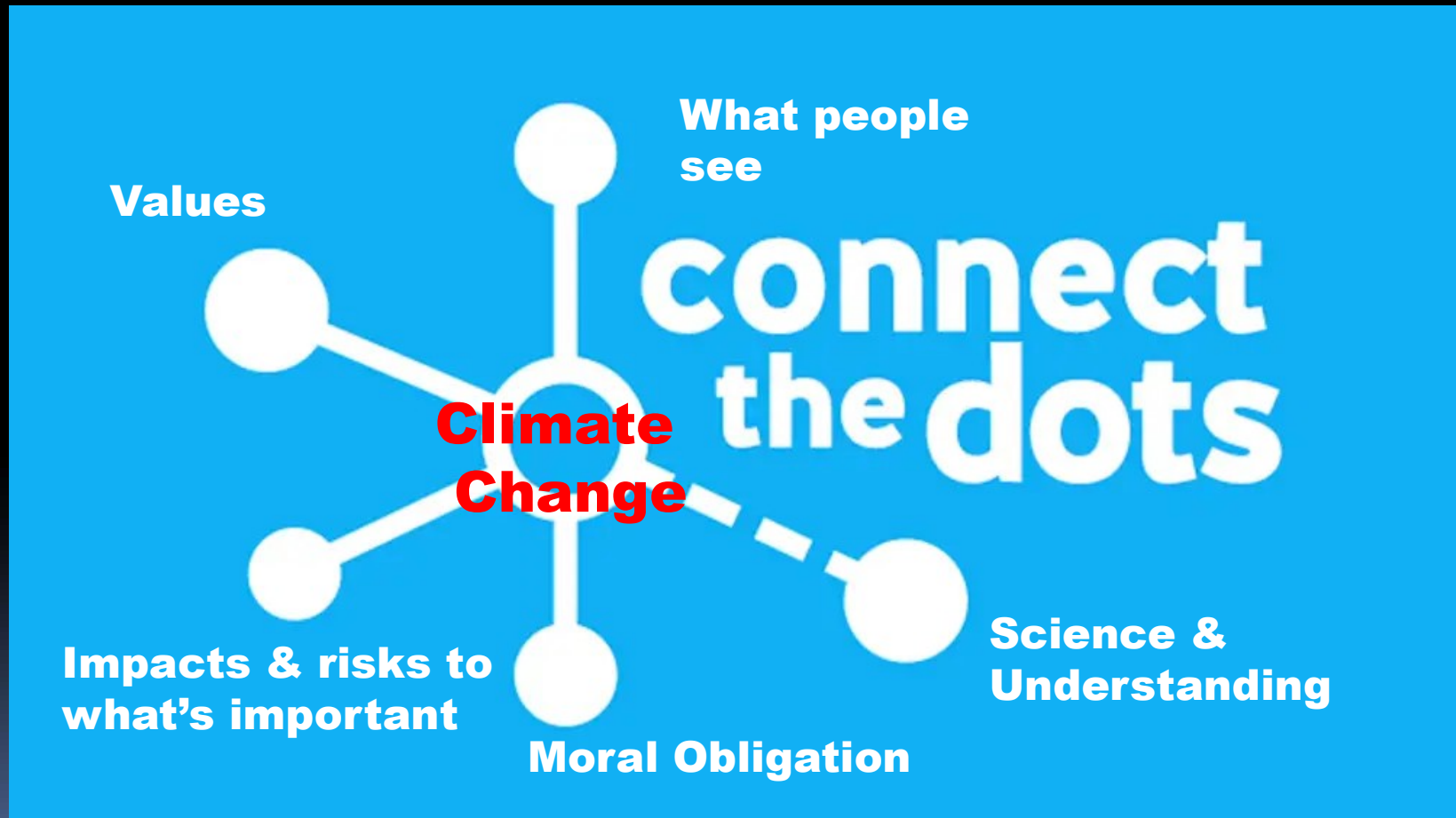
BIGGEST Question: How to Grab the Attention and Command Attention?



Offer Help?



It Will Be Up To You To



Next **BIGGEST** Question: How to Make
Something Actionable? – Make it relevant

Awareness
+ Concern
+ Information
+ Communication
= ACTION

Climate Communication

<http://ecoamerica.org/wp-content/uploads/2014/12/ecoAmerica-CRED-2014-Connecting-on-Climate.pdf>

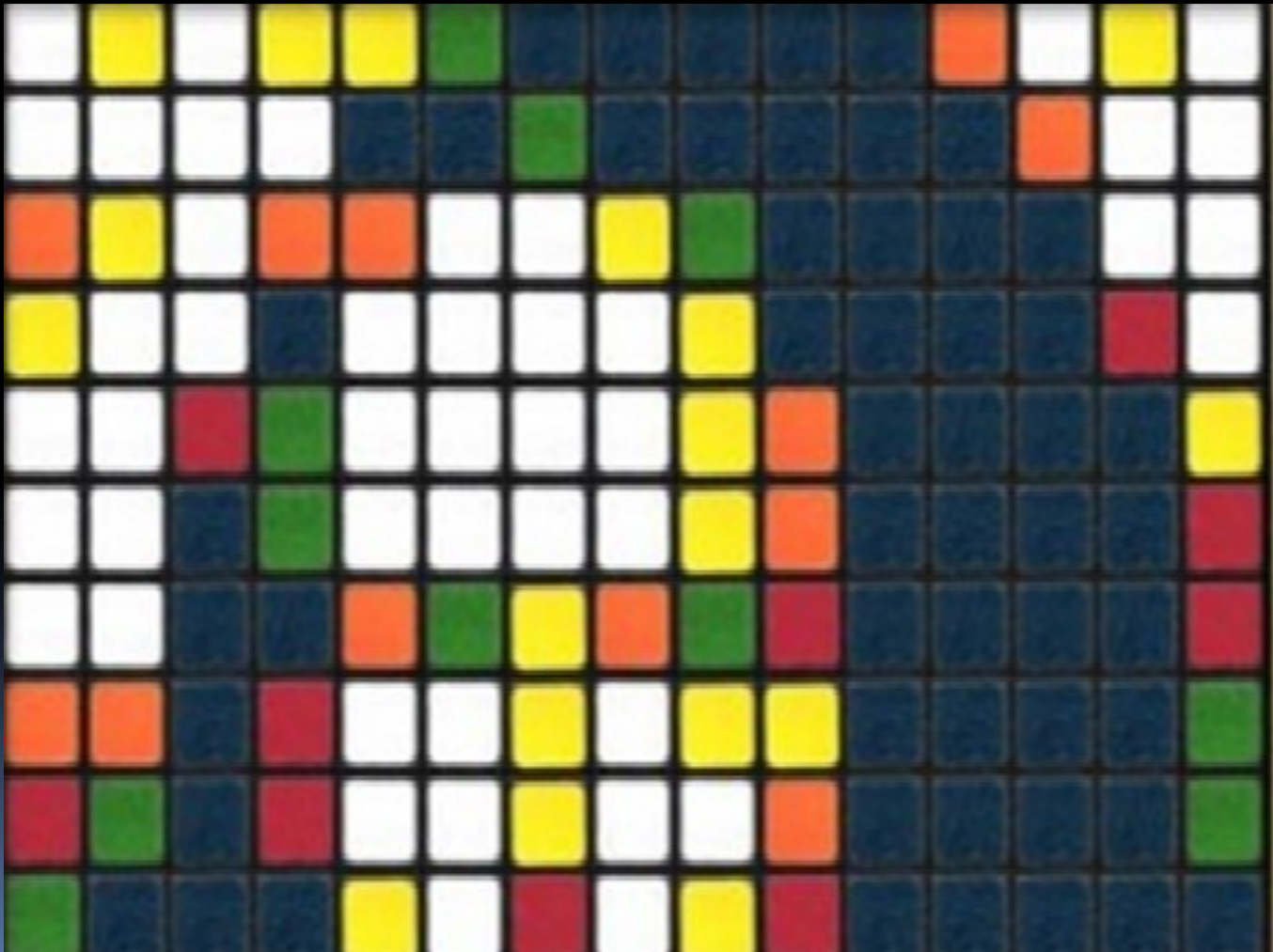
Videos: Google Katharine Hayhoe. Winner of 2018 Stephen H. Schneider Award for Outstanding Climate Science Communication

<https://www.youtube.com/channel/UCi6RkdaEgqRVKi3AzidF4ow>

A Few Hints

- Be opportunistic
- Importance of Interpersonal Relationships
- Build trust and confidence
- Be respectful
 - Be accurate, Don't exaggerate
 - Avoid Jargon
 - Quickly convey your message - Practice 2 minute "elevator speech"
 - Don't overwhelm
 - Pique interest

**Another challenge: putting
disparate pieces together to
support a long-term program**



Location





Quinault Nation Sovereign Government



Tribal Headquarters, Taholah



Quinault Modern Economy

Largest Employer in Grays Harbor County



Q Mart

- Fresh Deli
- Craft Beer
- Wine & Liquor
- Humidor Cigars
- Ethanol Free Fuel

Best Convenience Store/Gas Station

Open Daily 6am - 9pm

619 East Market Street | Aberdeen | 360.612.3377

Best Place to Shop 2016

**Quinault Beach
RESORT &
CASINO**



Quinault Homeland

- 220,000 acres
- Two main villages located at the mouths of rivers that originate in the Olympic rainforests.
- Natural Resource Based



Land of Breathtaking Beauty



Quinalts Are People of the Land and Sea



3,079 Tribal Members.

Quinault and Climate Change

Located at the nexus of the ocean, rivers, and mountains, Quinault must contend with

- Warming temperatures
- Storms & changes in hydrological patterns, sediment deposition, and erosion
- Sea level rise
- Ecological drought
- Hypoxia
- Acidification
- Harmful Algal Blooms
- Invasive species
- Alteration of spatial and temporal migration patterns of plants and animals, and sundry other impacts of climate change.

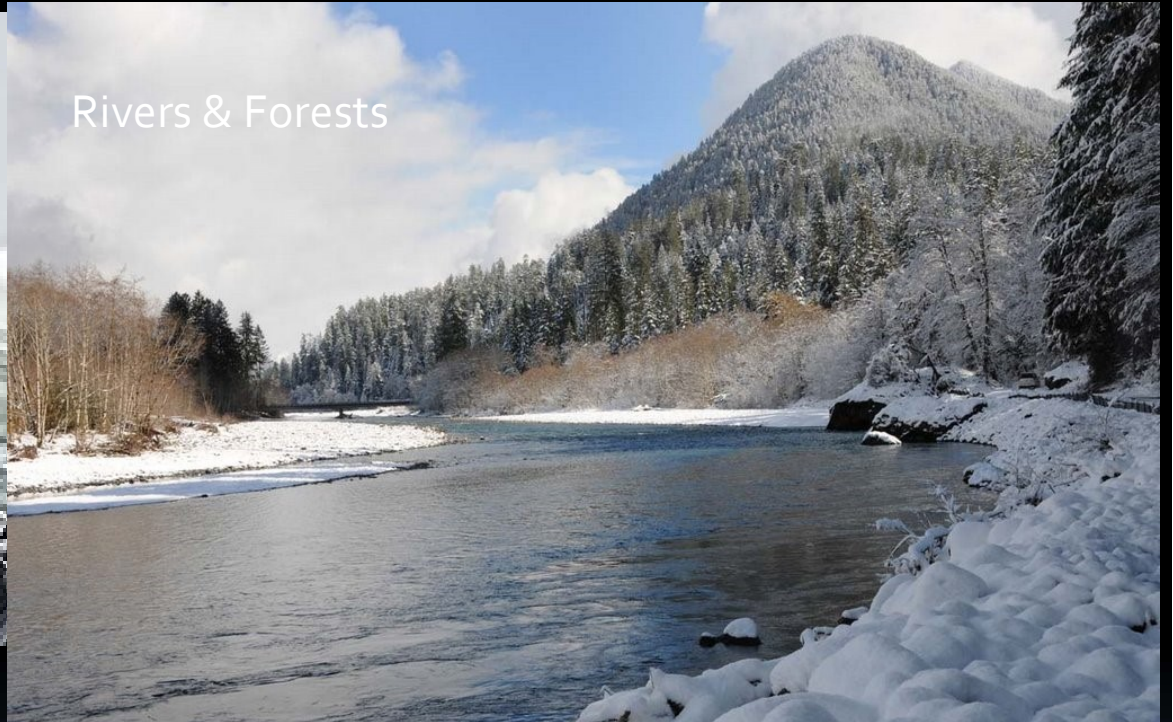


Water Is Central

Ocean



Rivers & Forests



Economy



Quinalts & Water

Village of Taholah Being Relocated



US Weather Service Award 4/30/19

QIN is StormReady and TsunamiReady



Wildfire In A Rainforest? YUP!



Paradise Fire 2015

June 2019 Gov Inslee included Olympic Rainforest area in drought emergency

Mountains Too - Disappearing Glaciers



Then



Now



Anderson Glacier on the southern slope of Mount Anderson. The top two are from the book, *Guide to the Geology of Olympic National Park* by Rowland W. Tabor, UW Press, 1975. They were taken by W.M. Cady. I took the bottom one in October 2004.



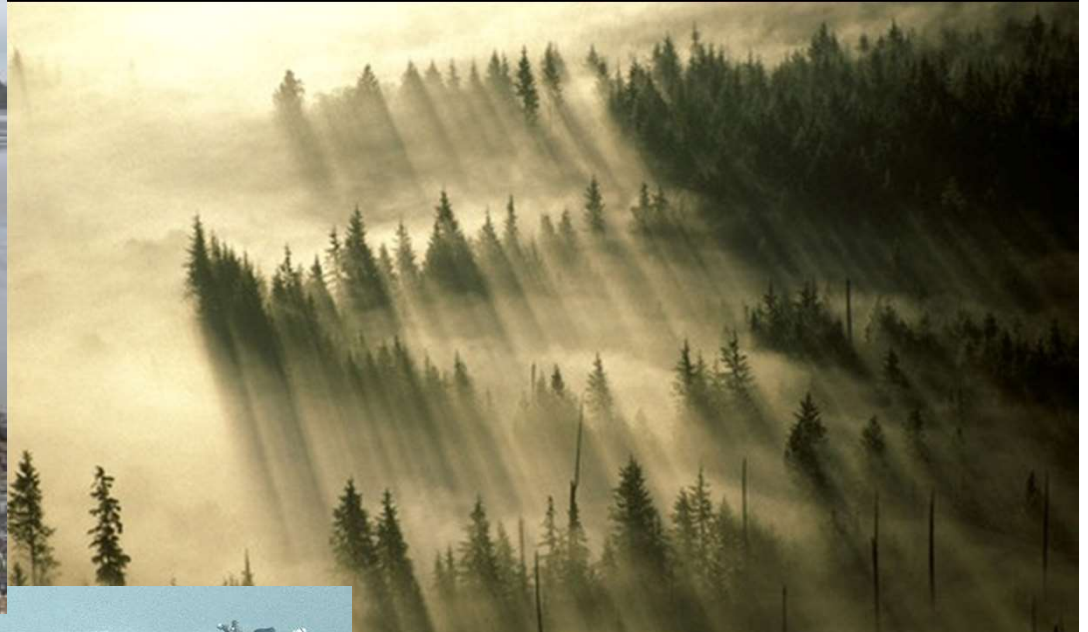
Rooted In The Past, But Adapting To Change



Racing Canoes



Water & Climate Change Are Affecting Communities, Culture, Economy &



The Ocean Is Changing

Fish Kill From Hypoxia (Lack of Adequate Oxygen) Event



AKA "Dead Zones"

Related to nutrient pollution from agriculture, fossil-fuel burning, and wastewater treatment effluent.

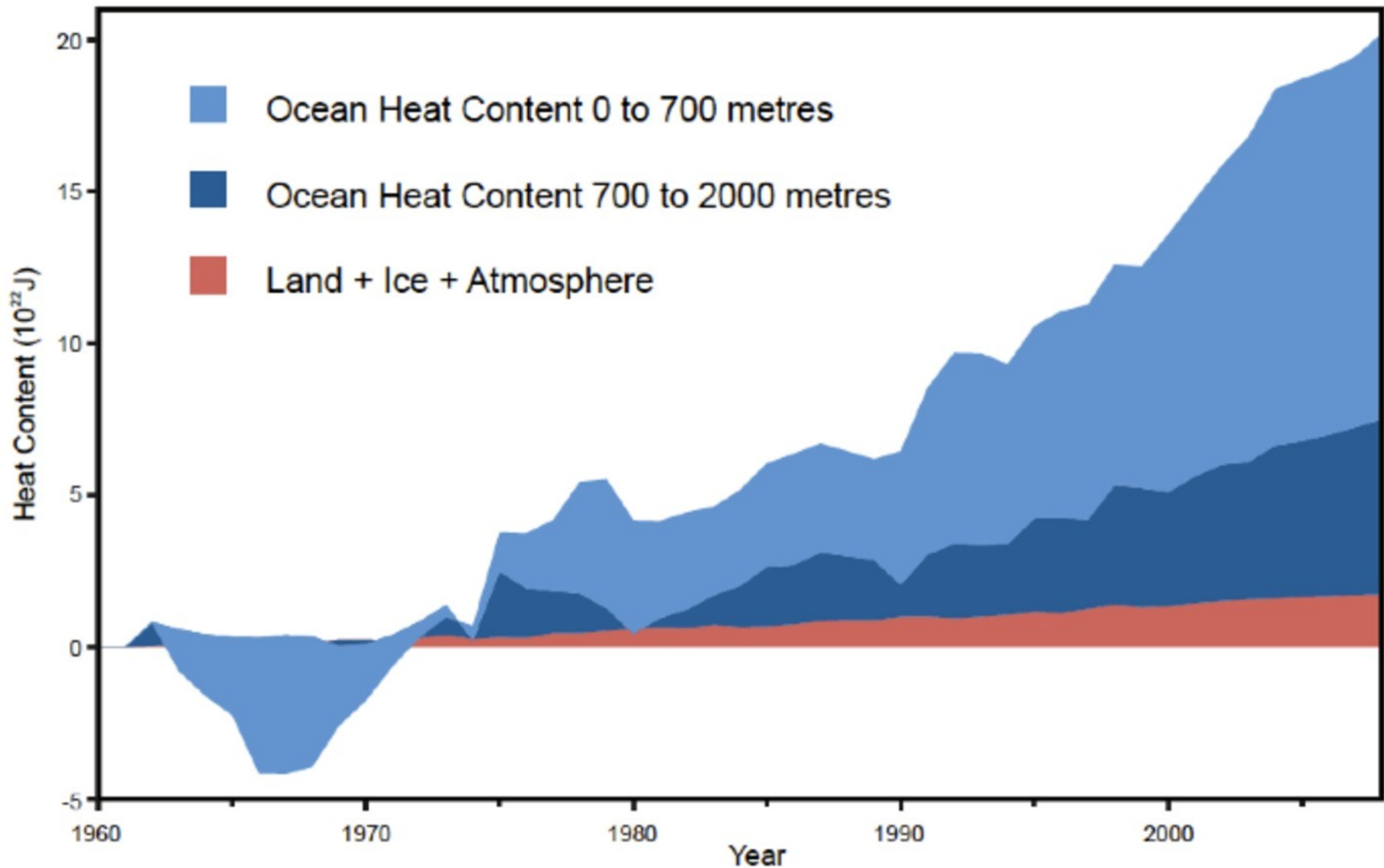
- In 2013, EPA estimated that the nation's stream length had high concentrations of nitrogen (28%) and phosphorus (40%).
- Over half of U.S. estuaries exhibit hypoxic conditions in any given year.
- Deoxygenation increasing warmer temperatures = decreased O₂ solubility, changes in mixing and respiration.

Harmful Algal Bloom At Point Grenville

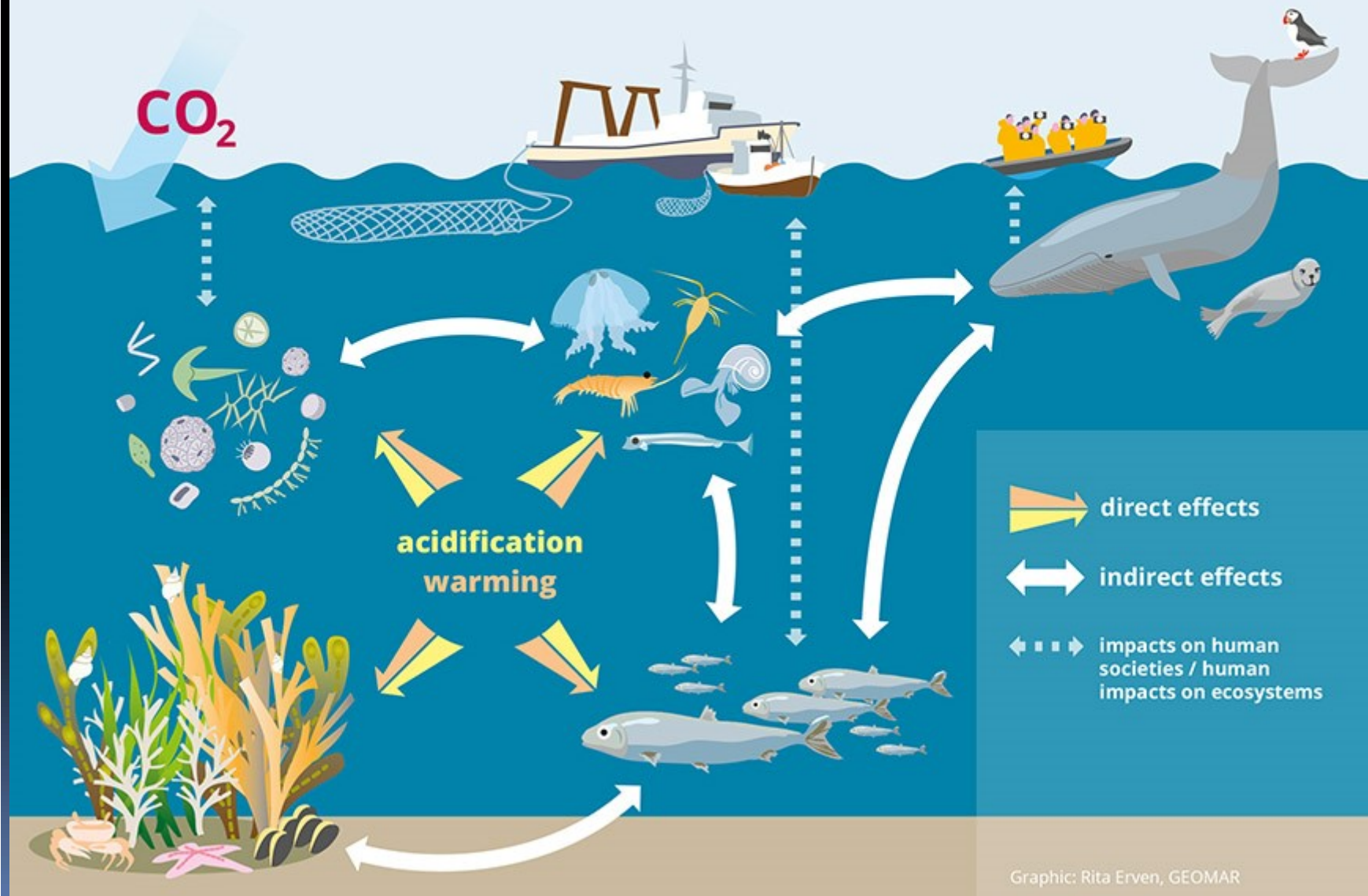


- HABs reported in every U.S. coastal state.
- U.S. impacts - > \$82 million in annual economic losses due to fish kills and poor water quality.
- Occurrence projected to increase with climate change, affecting coastal and lake communities.

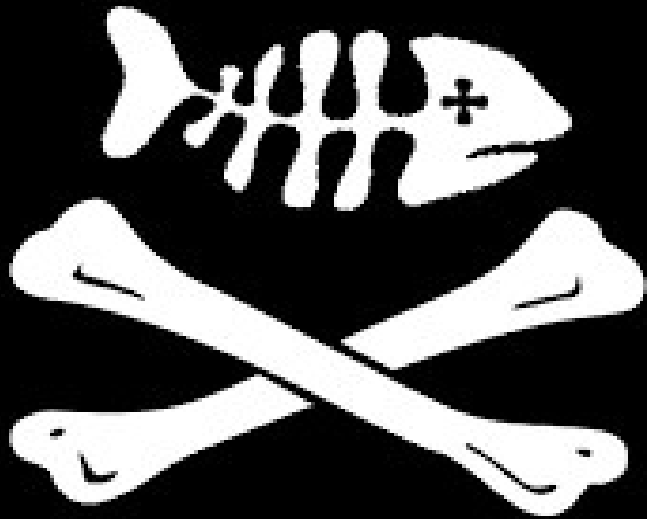
Ocean Temperatures Are Increasing



Ocean Acidification



Ocean Conditions



Domoic acid , razor clams & crab



Acidification, harmful algal blooms, & food web



Stream Productivity Is Decreasing

- For every 1° C increase, ecosystem productivity may decrease by 24%



Cultural Icon:

Quinault blueback
(sockeye)

**QIN participating
in development
of a Chehalis
Basin Strategy**

Restoring Ecosystem Function In the Upper Quinault River



Quinault Leadership



President Fawn Sharp

Leadership - focus on future generations and stewardship

- Village relocation
- Ecological restoration
- Participant in International Processes
- Washington State Initiative 1631
- Formation of 1st Americans PAC

For tribal leaders to lead, they need solid support

Community Action to Stop Oil Terminals



Some Things To Think About

Hmmmmmm...



If you don't know where you are or want to go, any path will do.

A Goal Without A Plan Is Just a Wish

A vision without the means to achieve it is only a dream.

Global Concern: People Are Worried



Student Strike in Melbourne

Frustrated and mad



Student Strike 3/15/19

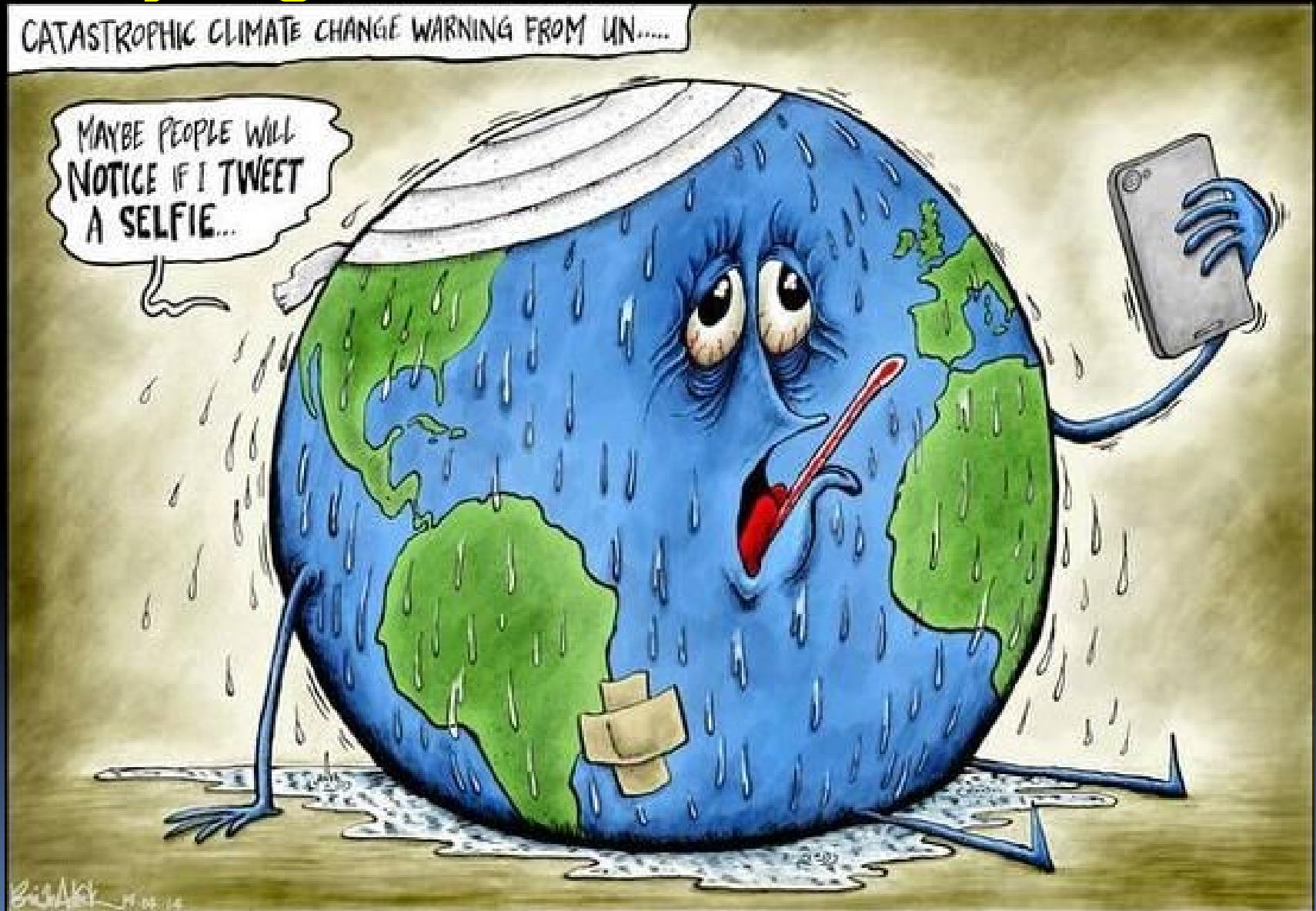
Organizers claim a million protesters in 2000+ places in 123 Countries



Trying to Garner Attention

CATASTROPHIC CLIMATE CHANGE WARNING FROM UN.....

MAYBE PEOPLE WILL NOTICE IF I TWEET A SELFIE...



Increasing Climate Activism



Julian v US: – The Case of the Century



Will the Courts Step In When Congress and the Administration Won't Take Action?

- 9th Circuit Hearing in Portland, OR on June 4, 2019 . Will Juliana proceed to trial? Will courts compel the federal government to reduce the amount of greenhouse gases in the atmosphere?
- Plaintiffs' claims are rooted in both the Constitution's 5th Amendment due process clause and the public trust principle that predates this nation
- Cases in the Netherlands, Pakistan, Australia, Colombia, and other nations have held governments accountable

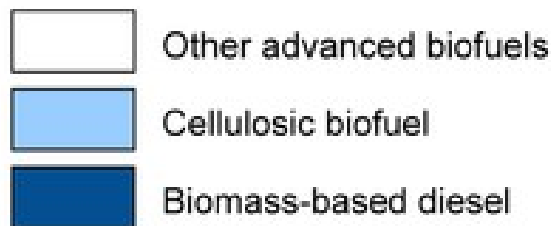
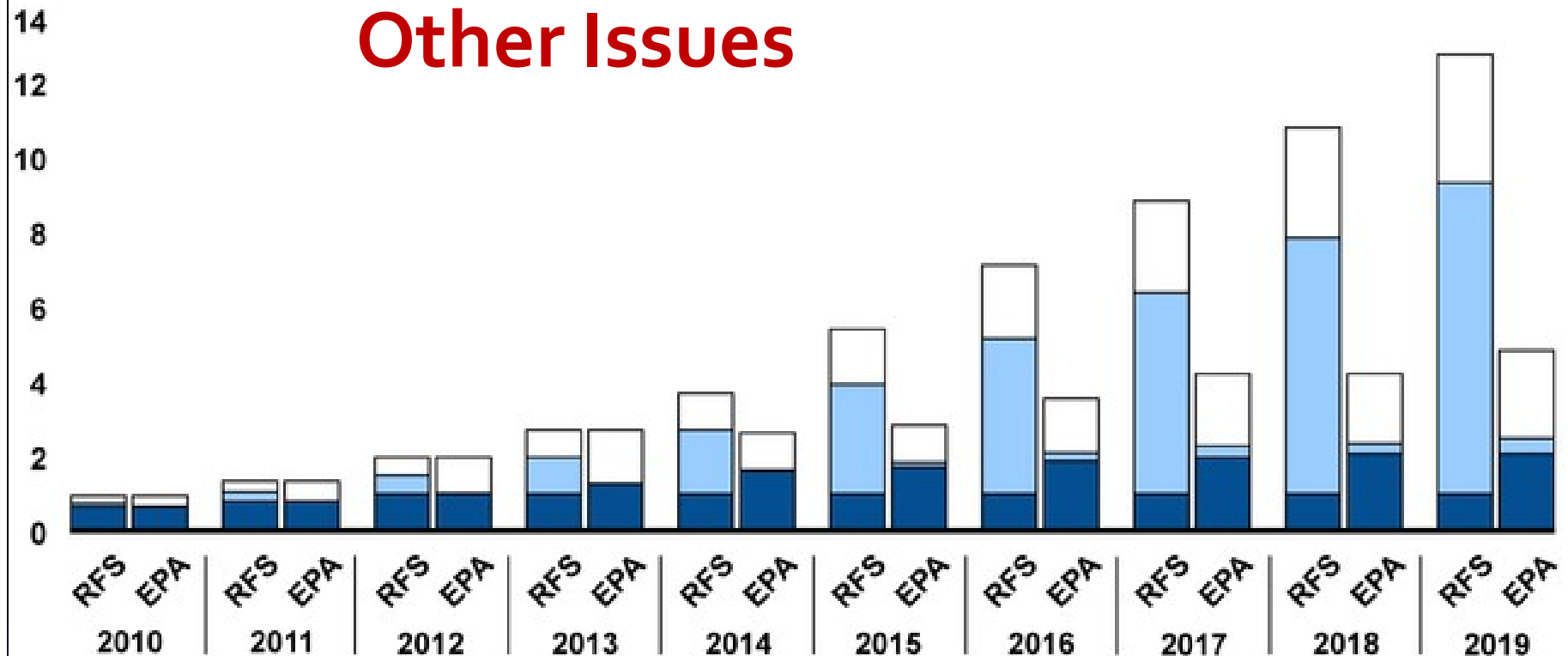
Issues In Juliana - Whether

- Children have a Constitutional right to a safe environment
- Defendants are responsible for some of the harm caused by climate change.
- Plaintiffs may challenge defendants' climate change policy in court. **Claim: The U.S. Government deliberately and recklessly allowed fossil fuel extraction, production, consumption, transportation and exportation, to escalate atmospheric CO₂ concentrations to levels unprecedented in human history. Its policies and practices have destabilized the climate system in a way that presents a significant endangerment to plaintiffs, with the damage persisting for millennia.**
- The court can direct defendants to change their policy without running afoul of the separation of powers doctrine.

Impacts of Government Policies and Standards

Other Issues

Billions of gallons

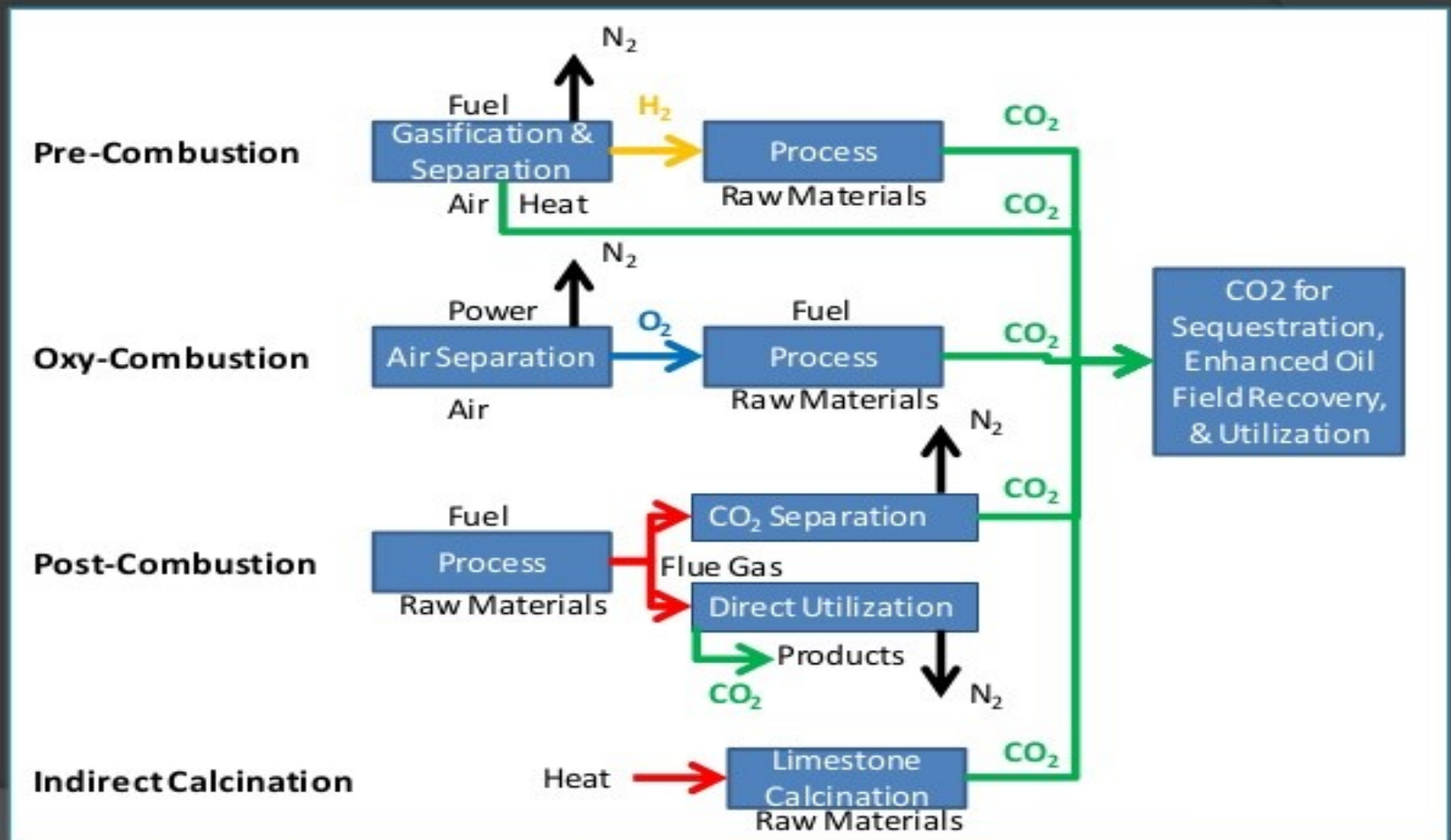


EPA: Volumes to be blended under Environmental Protection Agency (EPA) waivers
RFS: Volumes to be blended under the Renewable Fuel Standard (RFS) statute

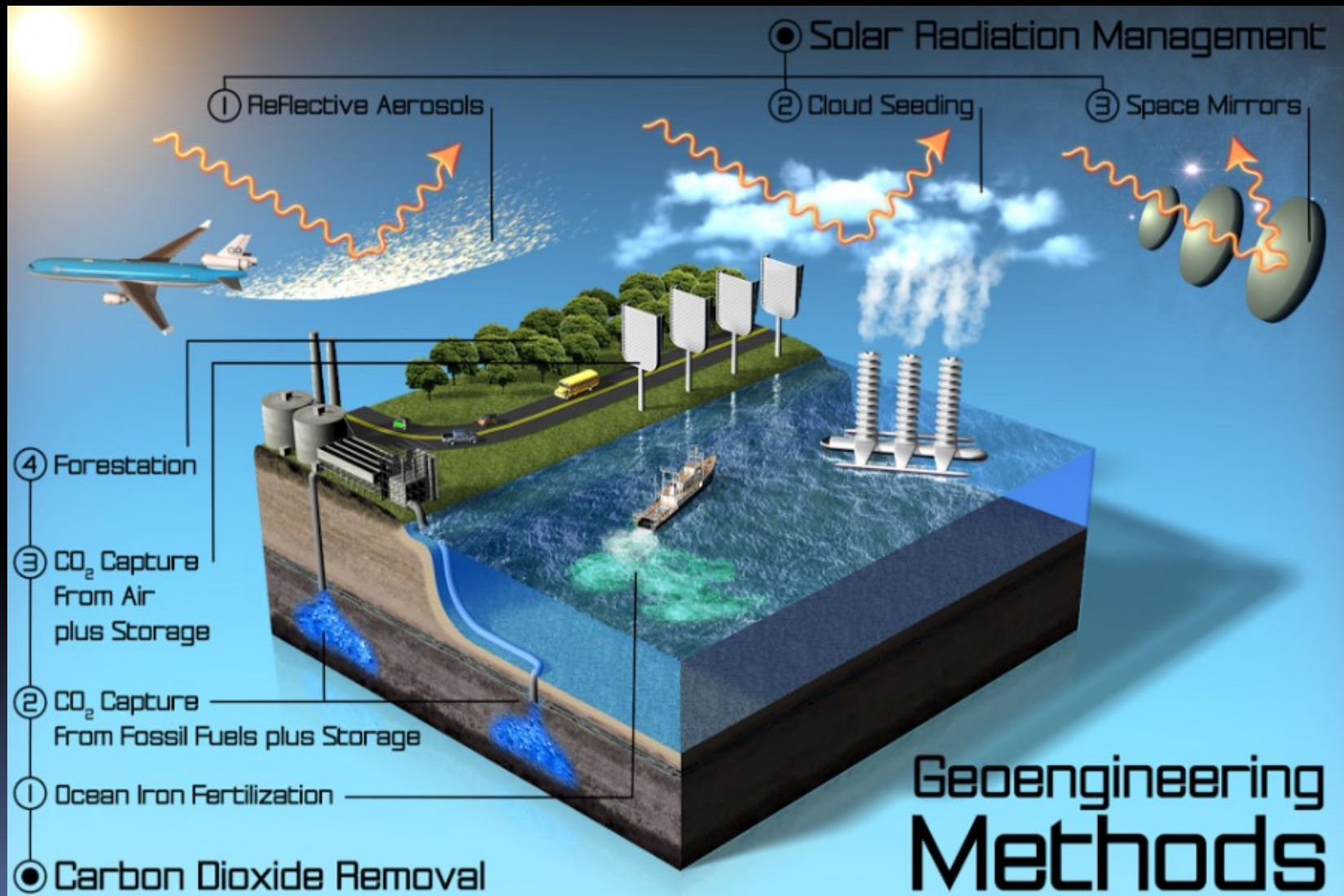
Source: GAO analysis of legal requirements and EPA data. | GAO-19-47

Emerging Technology

CO2 Capture Technologies



Geoengineering – A Last Resort?



What's Up? Green New Deal

- **Resolution introduced by Senator Markey and Congresswoman Ocasio-Cortez**
 - Conceptual framework for debate on how to decarbonize the economy – details vague
 - Economic & Environmental justice
- **Reaction**
 - Branded as socialist, unrealistic, impractical by Republican politicians
 - Lobbyists for vested interests spread mis/dis information about costs running into \$Trillions
 - Youth, intellectuals, and liberals welcome debate. Yale Climate Change Communication reported that 81% of voters support the resolution's description of the GND

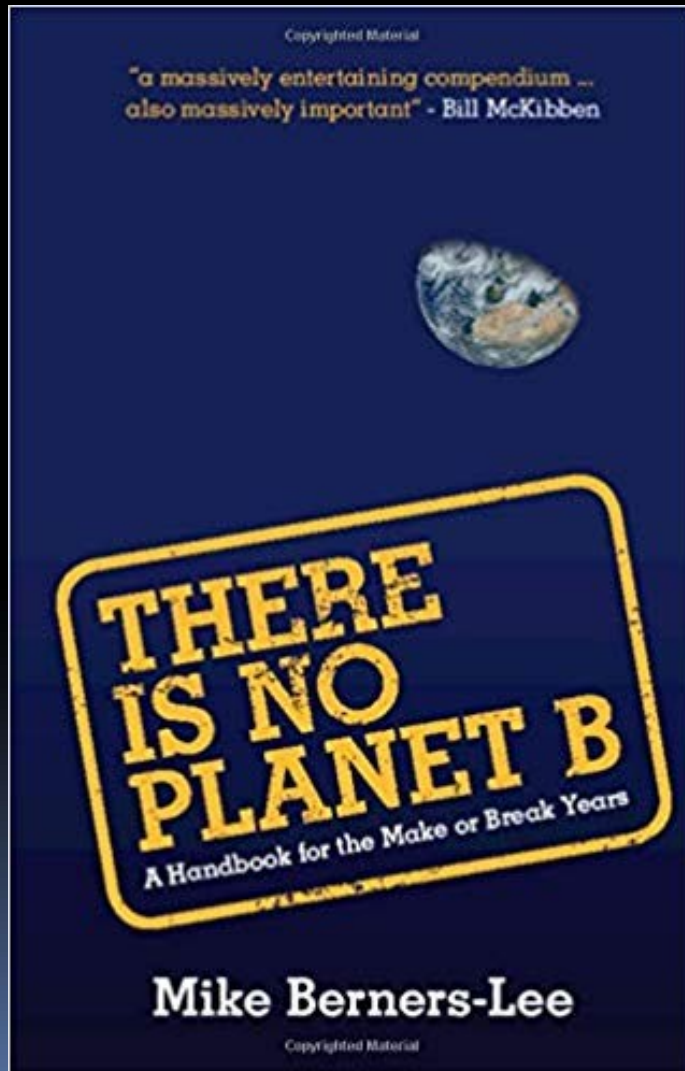
Many Ways To Address Climate Change



Hopefully, the wheels have started turning to see some paths that your tribe could choose.



A Useful Handbook For the Future? What We Can Do & Why




- Accessible Q&A
- Entertaining
- Informative
- Actionable

Climate Basics
What Can I Do?
Definitions

Now that you're here...



Do You Have a Better Idea?



**WHERE
DO YOU
WANT
TO GO?**

There's a lot to think about and many details to be worked out before choosing a path and taking the first step.



**THE
FIRST STEP**
TOWARDS GETTING SOMEWHERE
**IS TO DECIDE THAT YOU ARE NOT
GOING TO STAY
WHERE YOU ARE**

Some Advice: Stick To Your Roots

- Moral Imperative of stewardship for future generations
 - Secure homelands
 - Natural resource culture and economy
- Build a foundation for understanding and action incorporating cultural values, TKs, and modern science.
- Assert Leadership presence locally and internationally. Moral foundation: RESPECT & RECIPROCITY

Tribal Sovereignty

- Tribes are well positioned to be trustees in the looming climate crisis
 - **Political sovereigns**
 - **Regulate environment**
 - **Diplomacy**
 - **Reserved Treaty rights**
 - **Trust Responsibility**
 - **Co-Managers of Shared Resources**
- Consider exercising sovereign powers to hold fossil fuel interests accountable

International Efforts

- **Global stage is set for greater tribal engagement**
- **United Nations and Activist Forums**
- **Long-term , expensive commitment**
 - Processes, personalities, language
 - Need technical and policy support
 - Seek advice from veterans
 - Preston Hardison
 - Rudy Ryser
 - Merv Tano

Key principle: UNDRIP

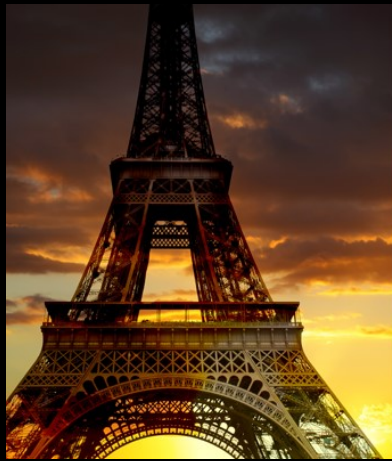
Free, Prior, & Informed Consent

- **Free:** un-coerced, unbiased, freedom of tribes to set procedure through which consent is given
- **Prior:** Consent prior to access and use, changes in use
- **Informed:** Disclosure of risks and opportunities. Provide all relevant information and risks – appropriate and balanced ”
- **Consent:**
 - Right to say no: Give or withhold consent
 - Not necessarily collective consent – collective rules

Litigation

- **Carbon Majors** – primary source of greenhouse gas emissions and purveyors of misinformation
- **Government** (State and Federal)
- Difficult hurdles to overcome, but tribes are in much stronger position than states, counties, youth, NGOs, and economic interest groups who have already sued.

Conferences & Webinars Abound International, National, Regional, Topical



10,000

Government representatives expected to land in Paris for the climate conference



Don't Become a Climate Groupie

Trying to cover everything can be costly, overwhelming and frustrating . It won't be possible. Be very selective.

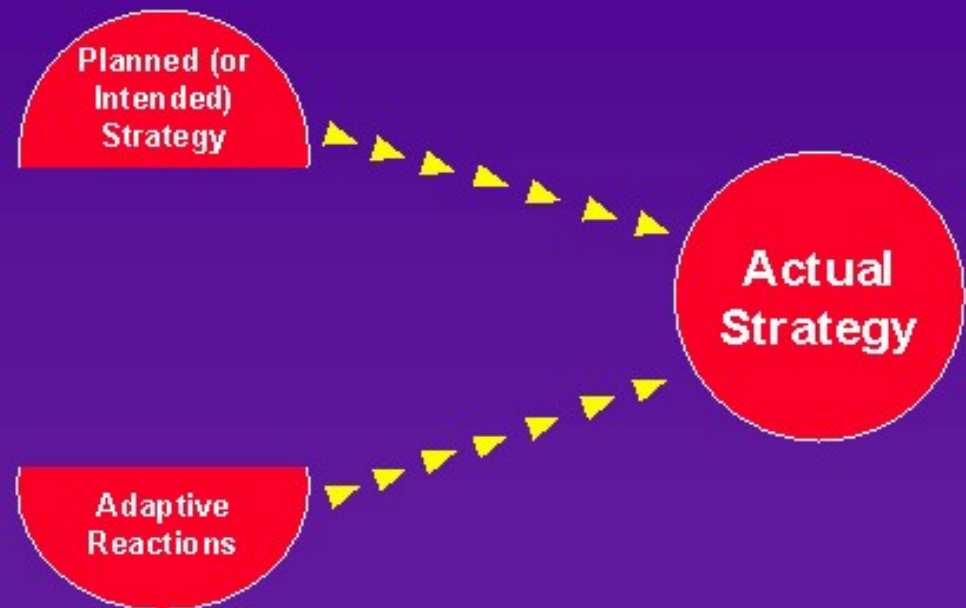
Know when you need help and how to get it

- Pacific NW Tribal Climate Change Project, especially the Tribal Climate Change Guide
 - <https://tribalclimate.uoregon.edu/>
- Institute for Tribal Environmental Professionals (ITEP)
 - <http://www7.nau.edu/itep/main/Home/>
- Personal Responsibility
 - Carbon Footprint Calculators

Those of You Who Are Developing Risk Assessments or Adaptation Plans

- Plans and circumstances change
- It's not the paper that matters most
- It's strategy & empowerment to act

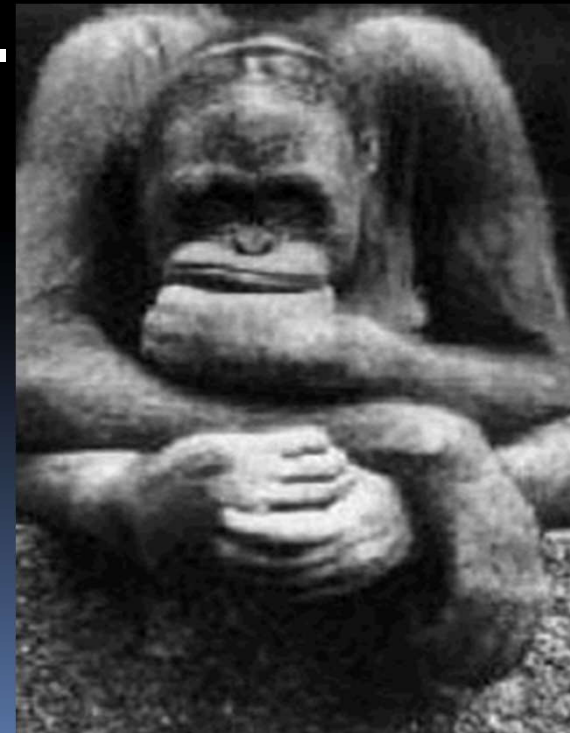
Strategy Is Both *Planned* and *Reactive* to Changing Circumstances



We're Only Just Beginning

~~scratch
the
surface~~

Thoughtful
deliberation is
needed.



A final word



The “Overton Window” Is Shifting

Sociologists and political scientists use the Overton window to indicate which ideas are within the realm of political tenability and ready for national discourse



Tribes are well positioned to make a difference

- **Stage has been set** with increasing recognition of the importance of including tribes in development of climate policies and actions
- **Unique leverage**
 - **Political sovereignty** – (environmental regulation, management authority, diplomacy, participation in regional, national and international fora).
 - **Legal position** – (treaty rights, federal trust responsibilities, co-trustees for shared resources, UNDRIP & FPIC).
 - **Vision, leadership, and moral high ground** – stewardship for future generations.



Make tribal voices heard: Advocates for climate action & champions for the environment. Ability to attract attention and forge partnerships.

Thank you for your attention

The End



Questions?

