Climate Change & the importance of mitigating carbon emissions

Helen.Neville@tu.org

Three ways to address climate change

- **Adaptation:** increasing resistance and resilience for fish so they can better handle the stress of climate change
- **Sequestration:** capturing and storing carbon (in soil, vegetation, or via technology)
- **Mitigation:** reducing carbon emissions (including preventing loss of CO_2 from land/riverscapes by protecting and restoring systems)

TU is working in all 3 realms

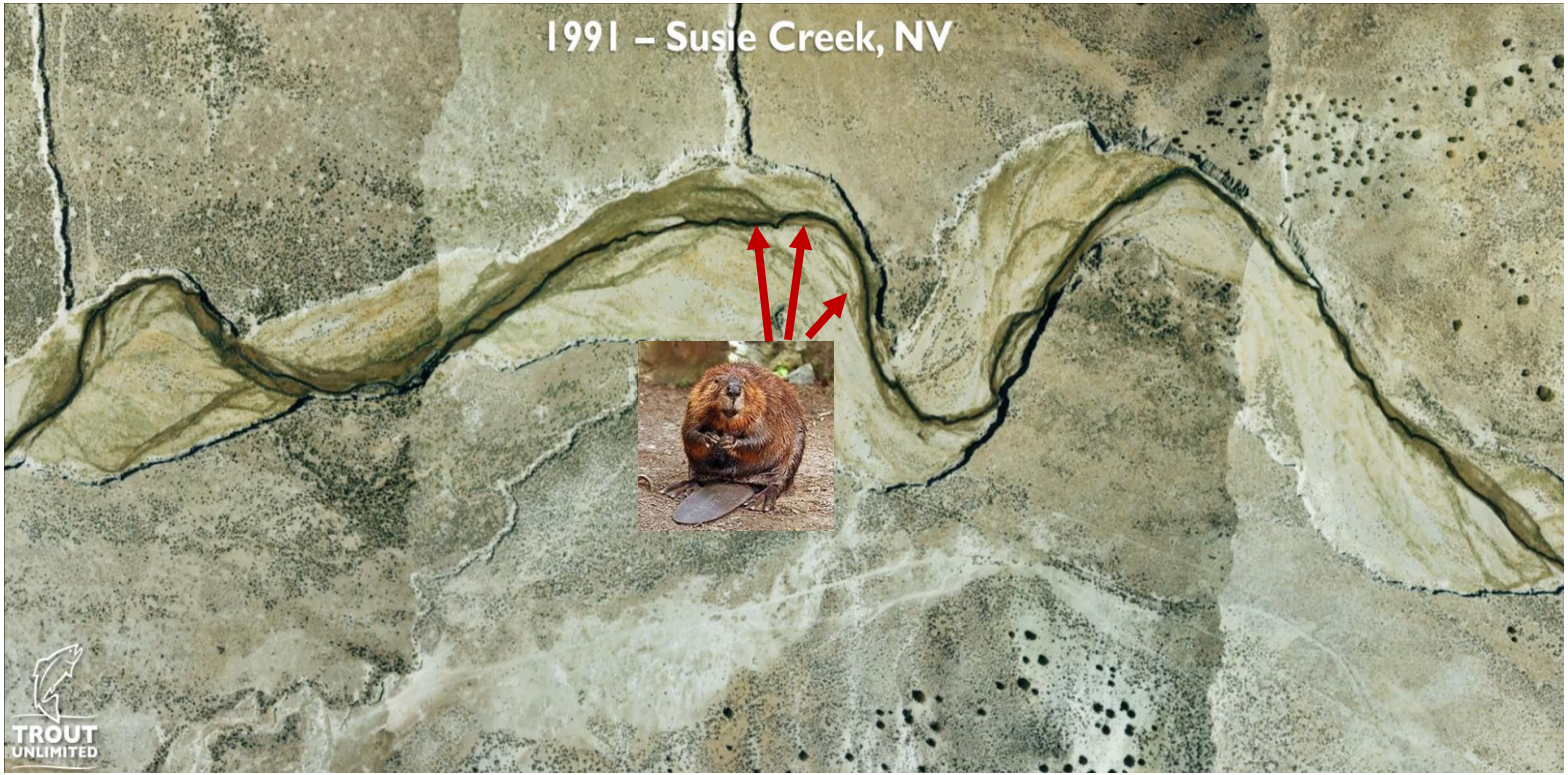
Adaptation…what do trout need?

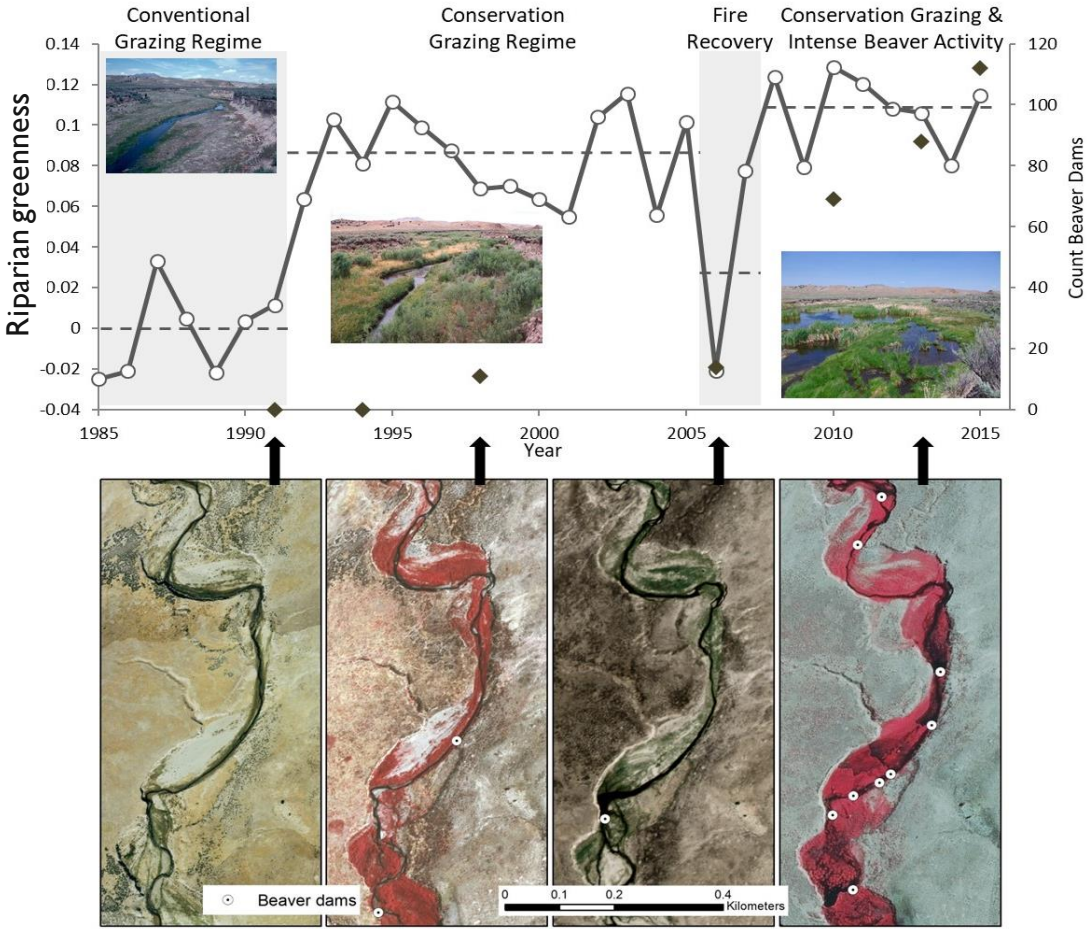
Trout and salmon need access to **large, complex, cold & healthy habitats**

They have reduced resiliency when habitat is:

- Small
- Isolated
- Degraded
- Flow-altered
- Warm
- Simplified
- Occupied by non-native species

Ample opportunity to reverse legacy of impacts





Remote sensing showed change in vegetation equivalent to ***+800 ft or +10 inches of yearly precipitation***

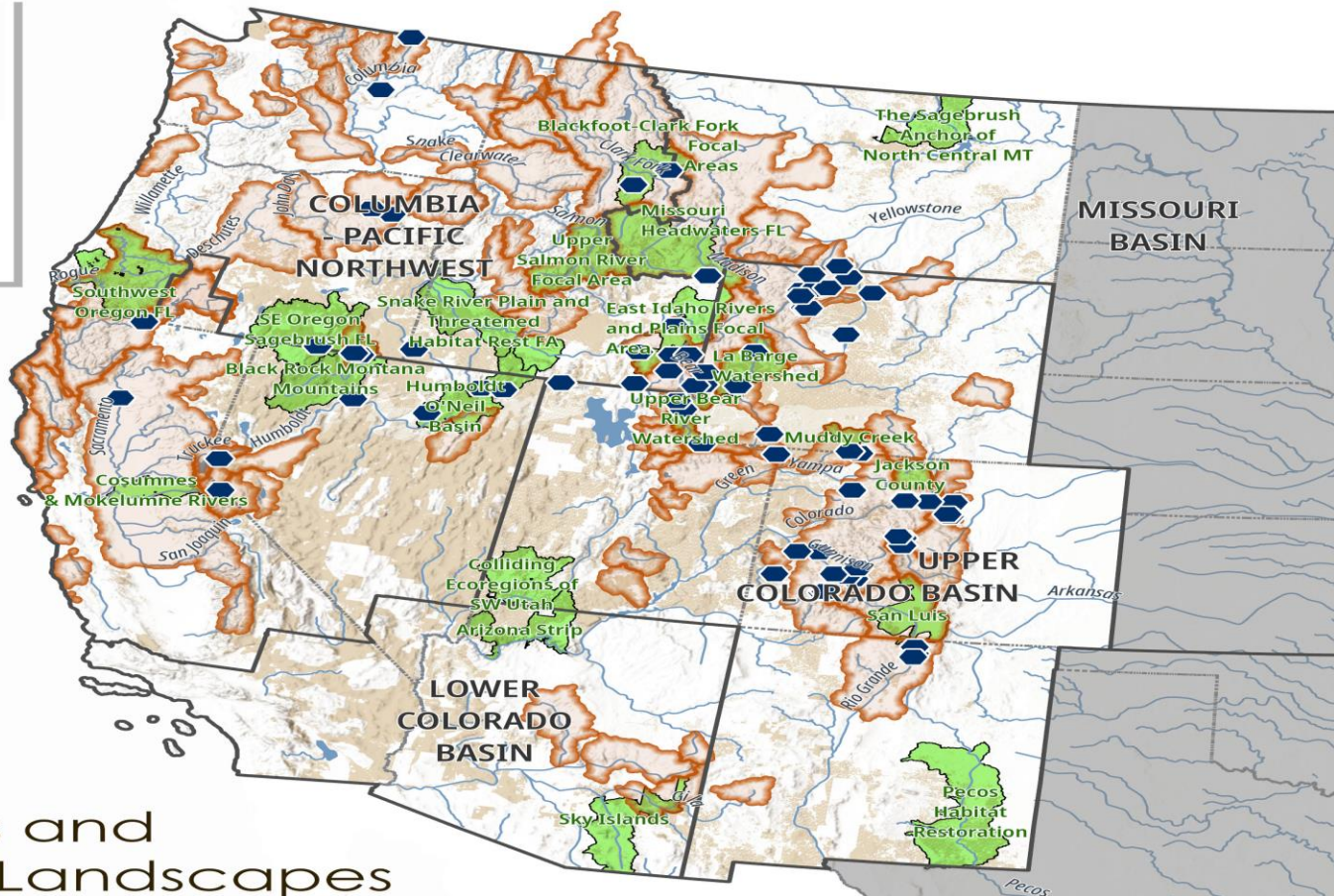
=2x average annual precipitation!

Wells show 2-foot increase in groundwater

= adaptation & *sequestration*

TU Science: Fesenmyer et al. 2018 PLOS One

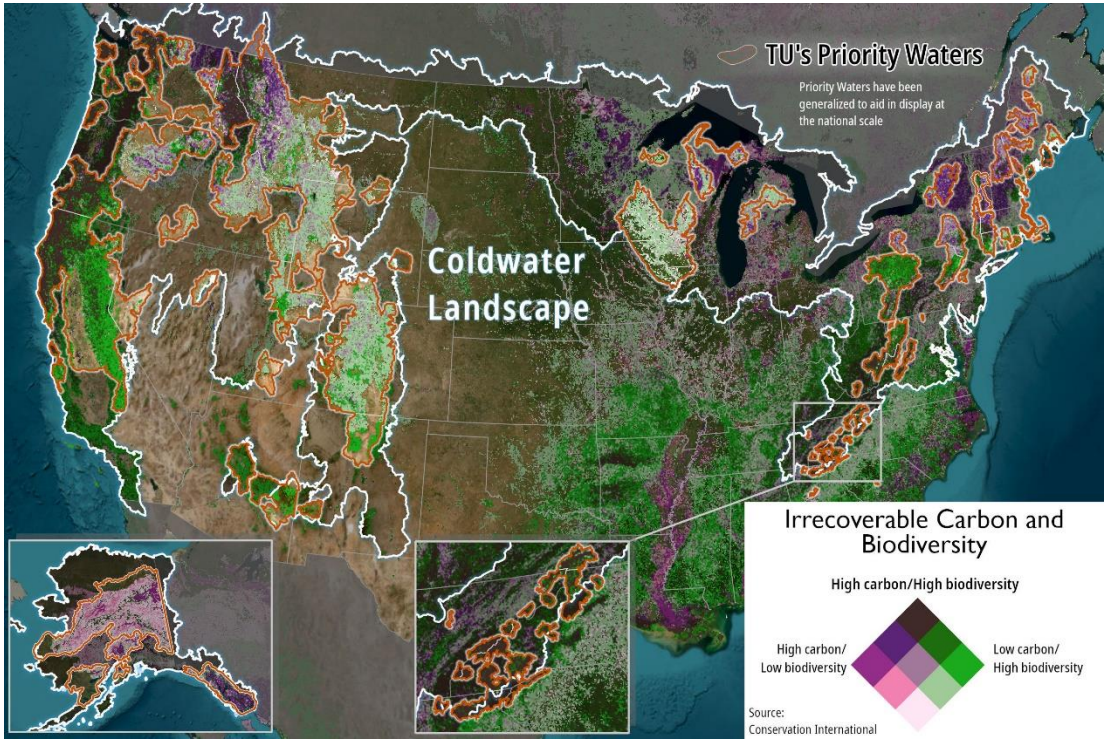
Process-Based Restoration = Resilience



TU Proposed Projects
TU Priority Waters
BLM Restoration Landscapes
BLM Lands

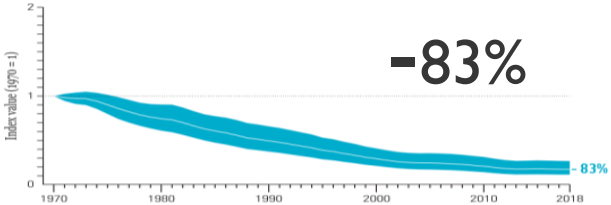
TU Priority Waters and BLM Restoration Landscapes

Nature-Based Solutions +Biodiversity + Climate



Biodiversity essential for addressing climate change:

The *most intact, biodiverse systems store the most carbon – so the two are inseparable*



Almond et al. 2022 WWF Living Planet Report

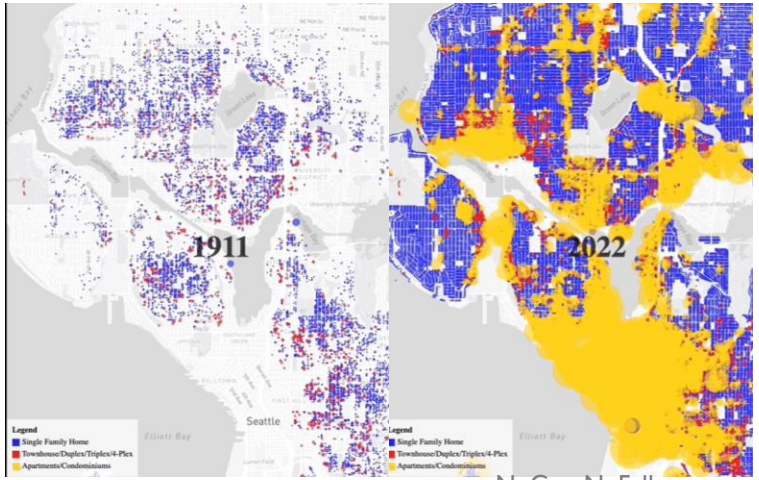
POLICY PERSPECTIVE

Conservation Letters
A journal of the Society for Conservation Biology
Open Access
WILEY

An inconvenient misconception: Climate change is not the principal driver of biodiversity loss

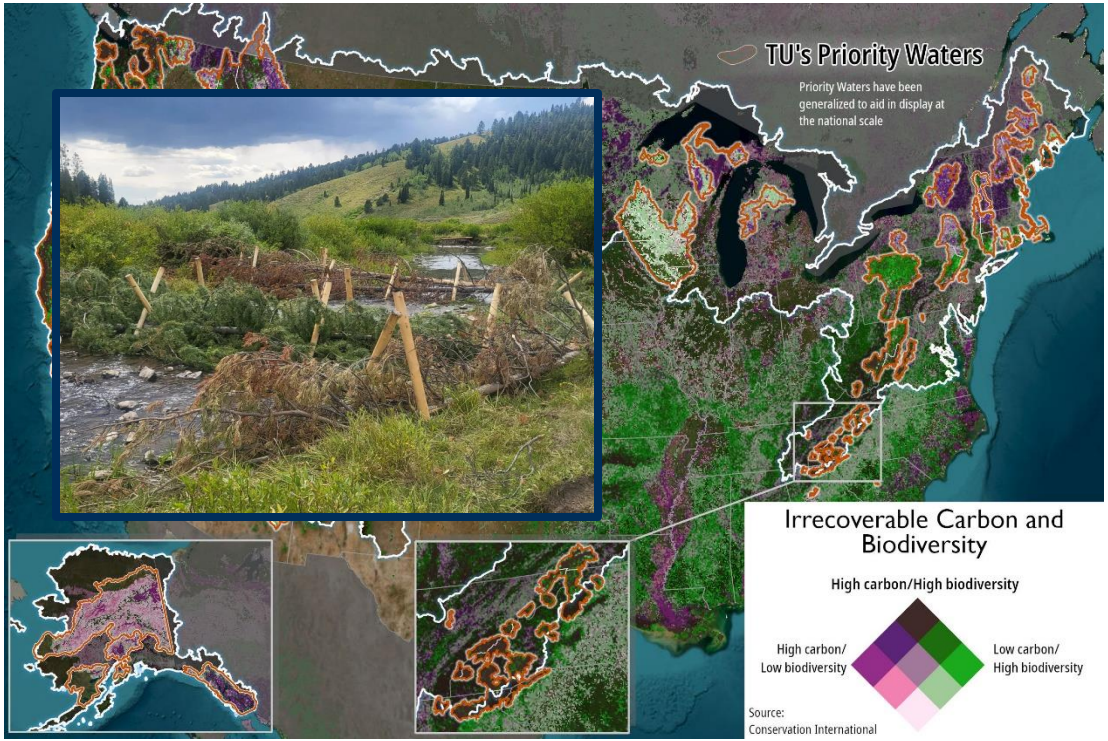
Caro et al. 2021

1) = Habitat loss, degradation, isolation, non-native species…



NoGearNoFall

Nature-Based Solutions +Biodiversity + Climate



Emma Lundberg, PhD
Aquatic Resiliency Scientist

Fisheries, PBR/beaver Human dimensions

Jordan Fields, PhD
Aquatic Resiliency Scientist

Fluvial Geomorphology, Hydrology, Carbon Dynamics

And things like dam removals:

Methane emissions from reservoirs are increasing

By Sara Zaske, WSU News & Media Relations

28 times *as potent as carbon dioxide at trapping heat in the atmosphere (EPA).*

And your tree plantings

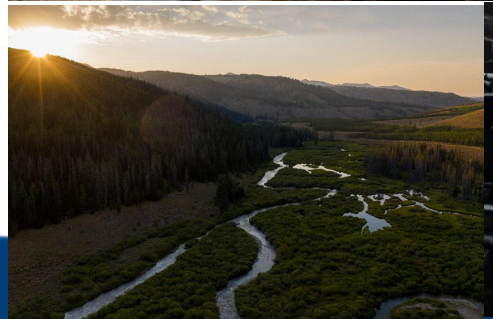
PLANT FOR OUR FUTURE TROUT UNLIMITED

PLANT FOR OUR FUTURE

HOSTING TREE PLANTINGS TO RESTORE STREAMS, BUILD COMMUNITIES AND SEQUESTER CARBON DIOXIDE TO COMBAT CLIMATE CHANGE

Because they matter for all 3 approaches

- 71 planting events x 10 states
- 41,948 trees planted
- 52 acres restored
- CO_2 storage equivalent of removing 150 cars/year



Natural Climate Solutions policy at scale:

30x30/America the Beautiful: Science-based goal to protect biodiversity and prevent climate tipping point of 1.5°C by maintaining in-tact natural systems in lands and waters.

scientific reports

2023

Check for updates

OPEN

Natural climate solutions provide robust carbon mitigation capacity under future climate change scenarios

David C. Marvin[1]✉, Benjamin M. Sleeter[2], D. Richard Cameron[3], Erik Nelson[4] & Andrew J. Plantinga[5]

Yes, and…

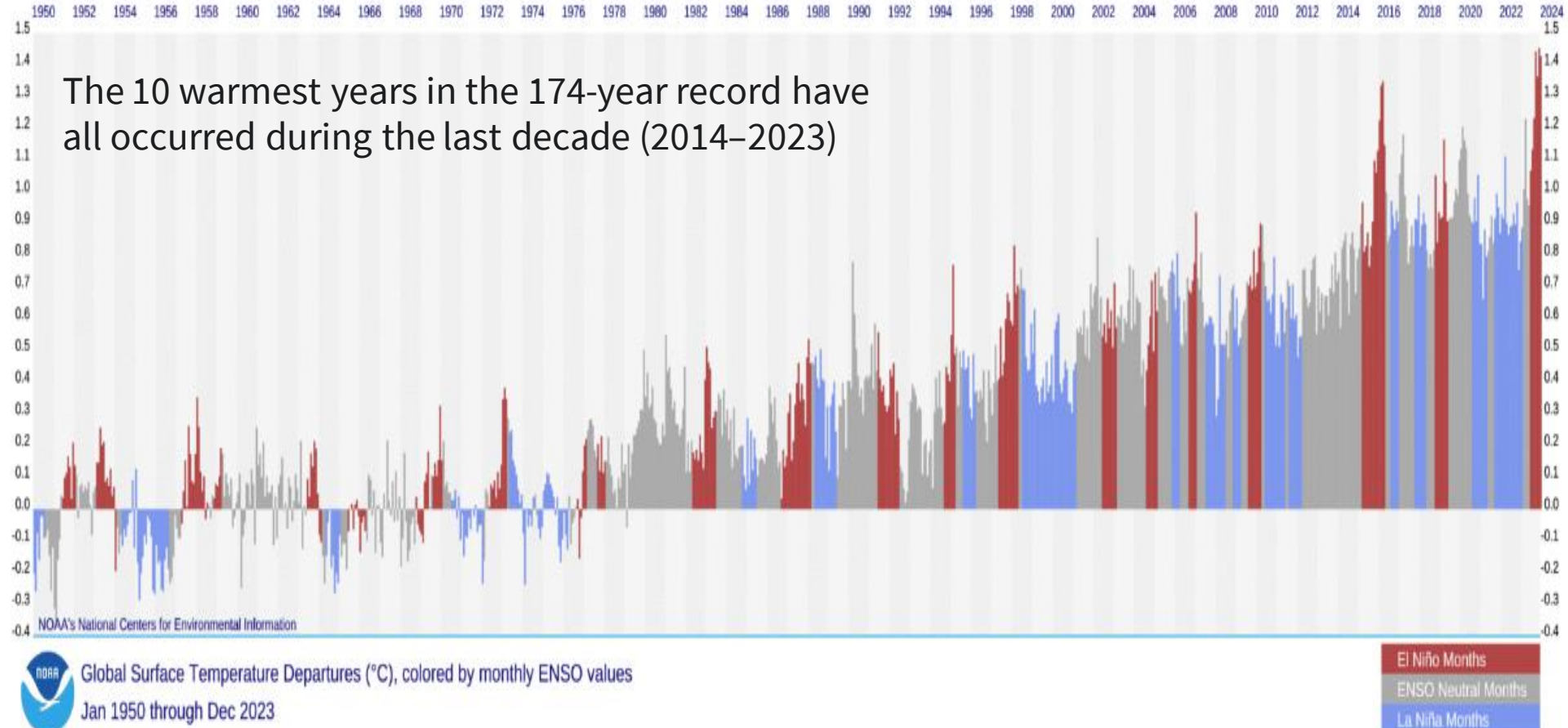
POLICY FORUM | CLIMATE CHANGE

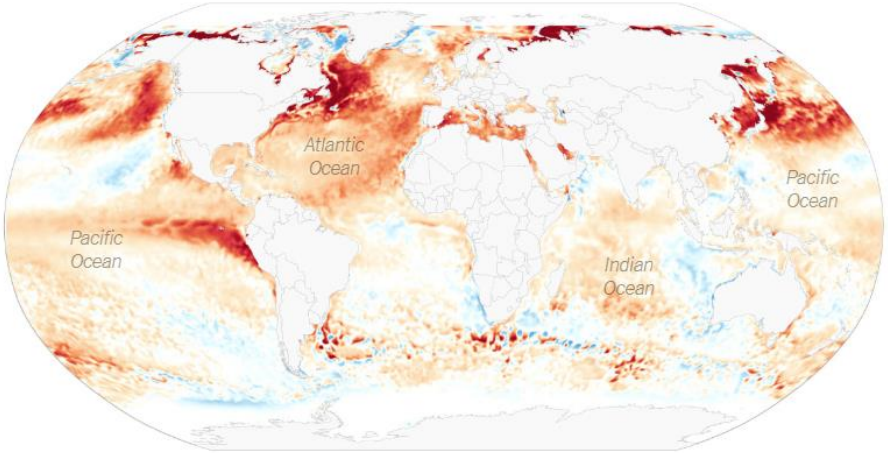
Natural climate solutions are not enough

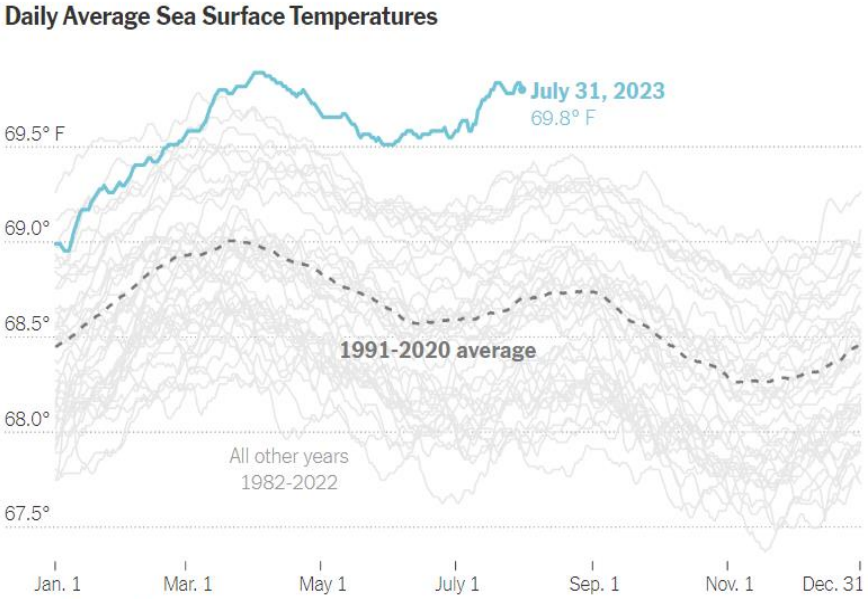
Christa M. Anderson[1], Ruth S. DeFries[2], Robert Litterman[3], Pamela A. Matson[4], Daniel C. Nepstad[5], Stephen Pacala[6], Willia...
+ See all authors and affiliations

"...the benefits of NCS do not decrease the imperative for **mitigation** from the energy and industrial sectors."

2023 was the warmest year since global records began in 1850







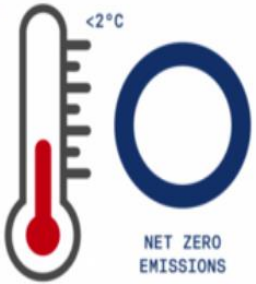
What This Year's 'Astonishing' Ocean Heat Means for the Planet

NYT

We stand to lose so much more without other Mitigation

PARIS CLIMATE AGREEMENT

1.



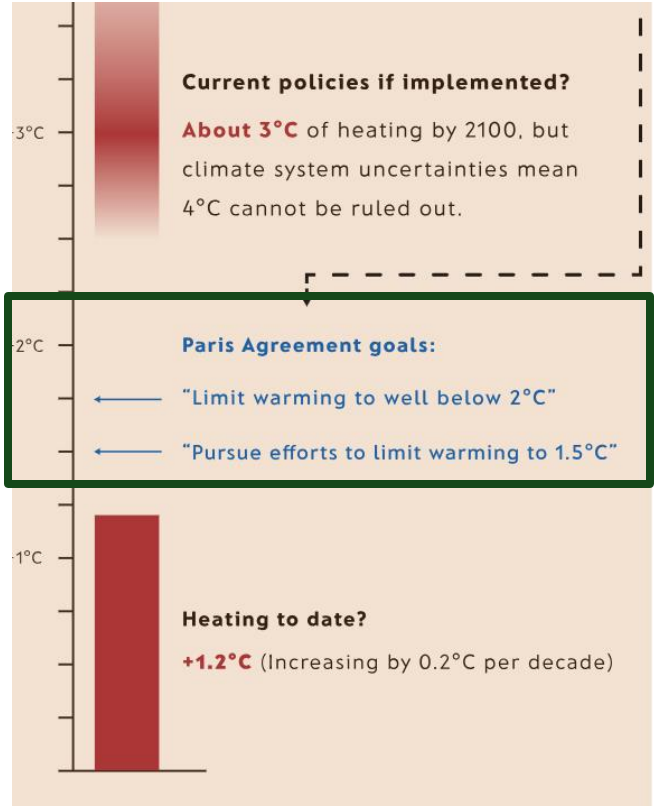
Limit the avg. global temperature increase to < 2° centigrade + achieve net zero emissions by mid-century

2.

Enhance resilience and adaptation to climate impacts certain to occur

3.

Align financial flows in the world with these objectives

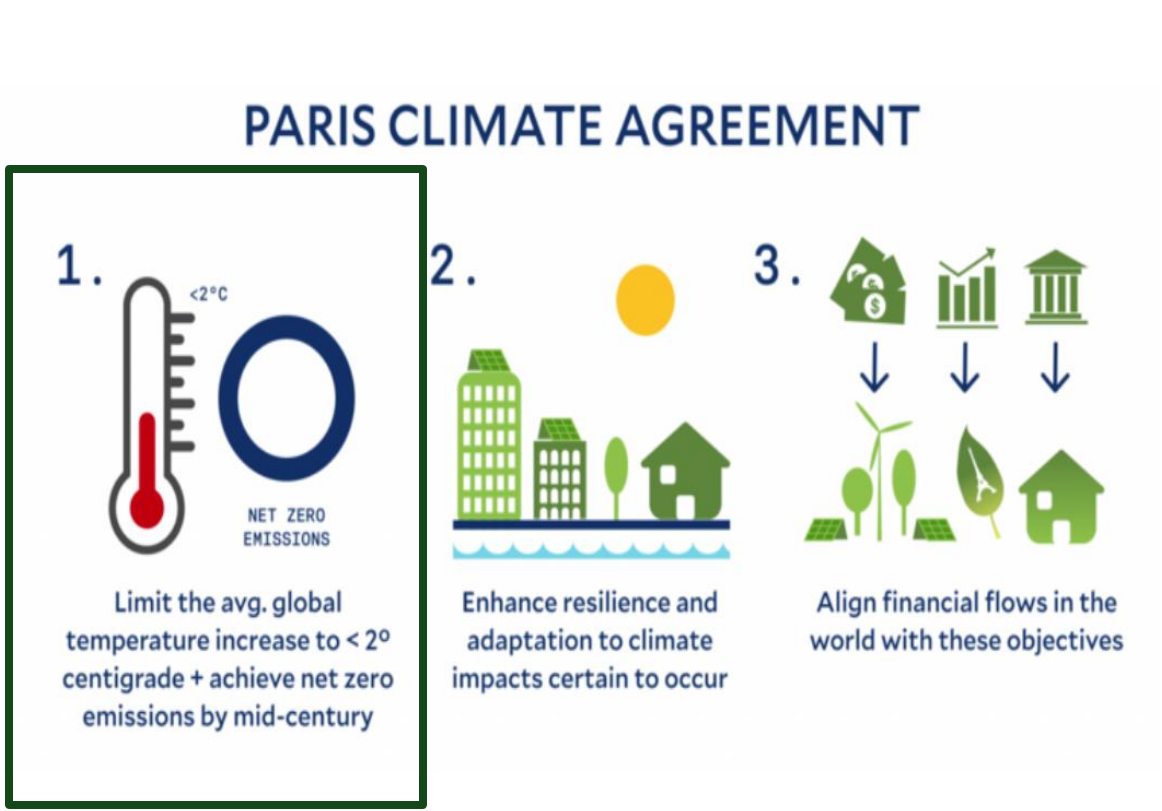


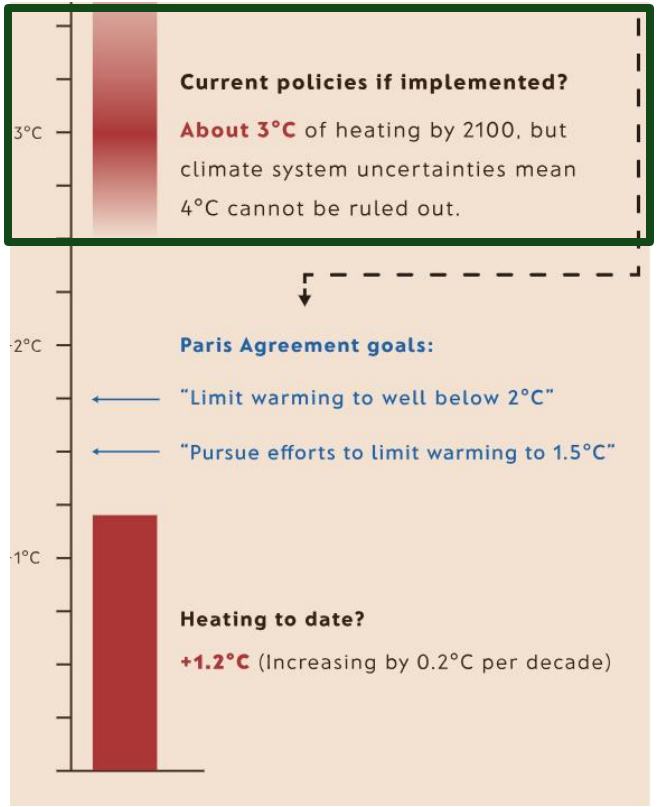
What's in a number?

Difference between1.5 and 2 degrees

- 2x loss vertebrate and plant species
- 3x insect loss
- 2x reduction in fisheries

We stand to lose so much more without Mitigation





"The time for band-aids is past. Nothing less than the future of trout and salmon; the future of fishing—the future for our children is at stake."

President and CEO of Trout Unlimited

Thanks! hneville@tu.org