

Colorado River Hydrology: El Niño to the Rescue?

Lake Powell
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Water Education Foundation
Santa Fe, NM
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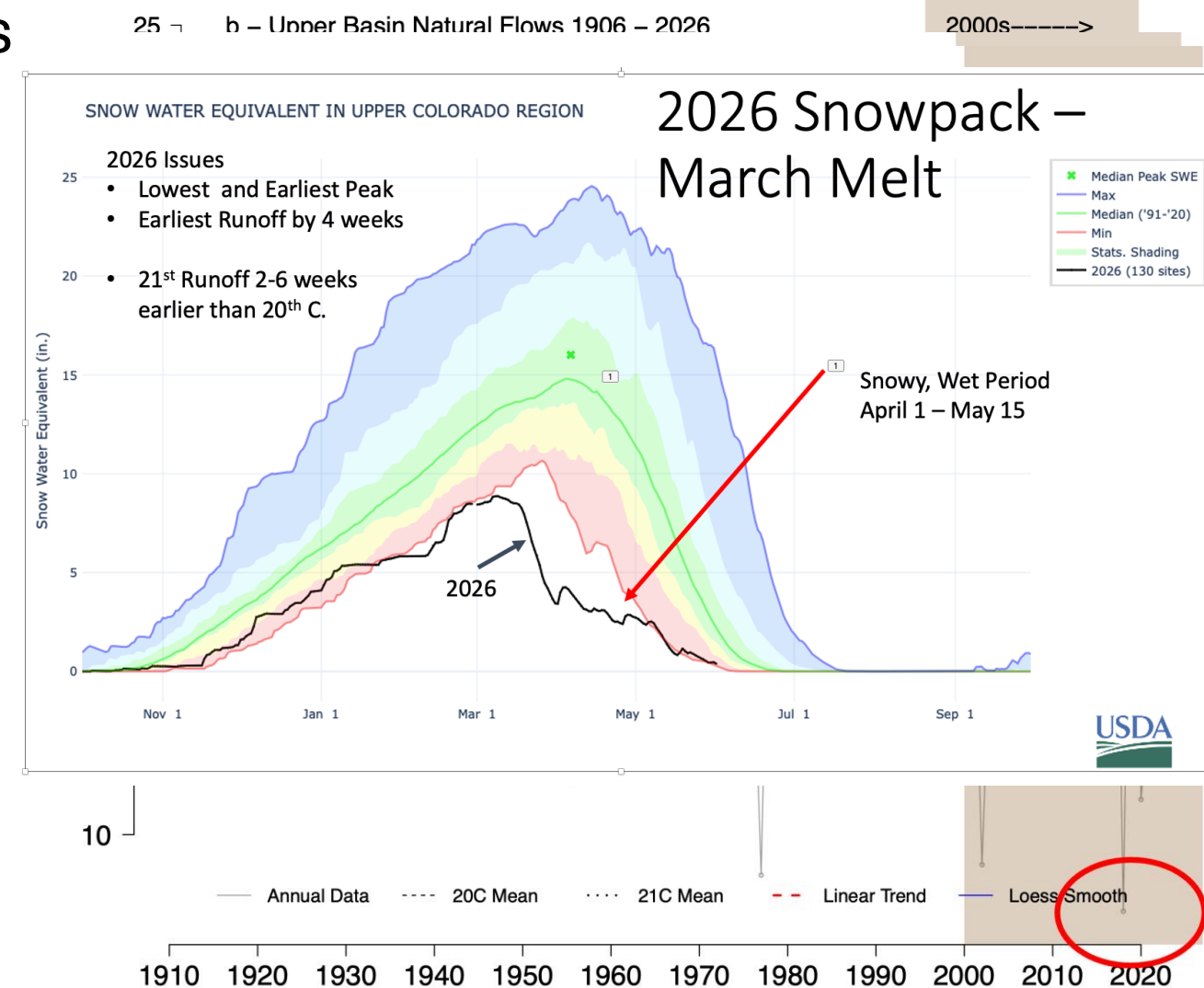
**COLORADO STATE
UNIVERSITY**

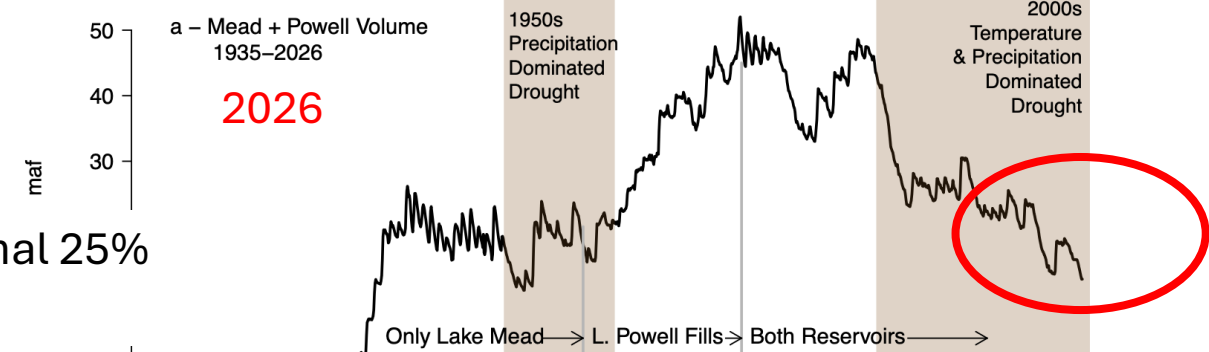
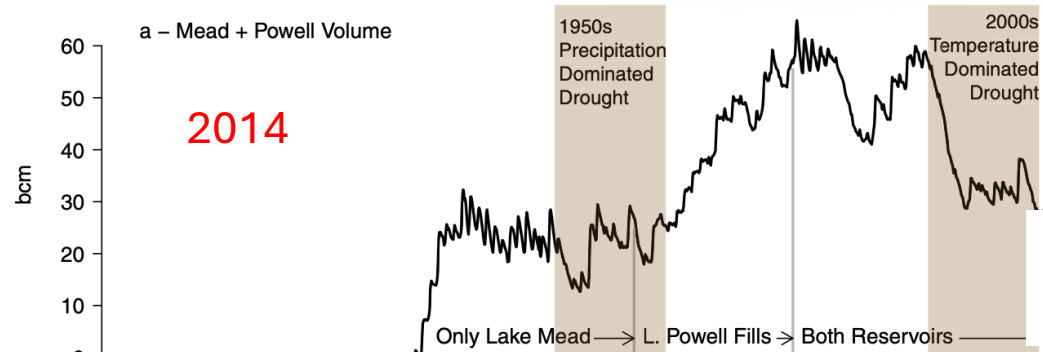


**COLORADO
WATER CENTER**

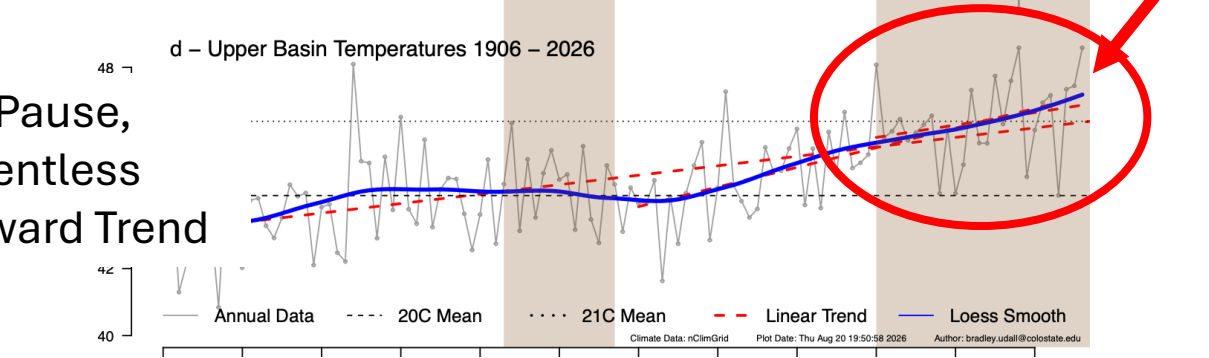
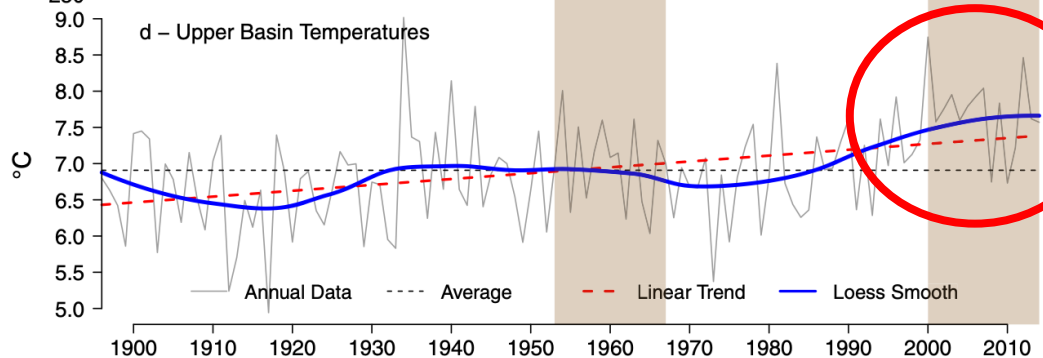
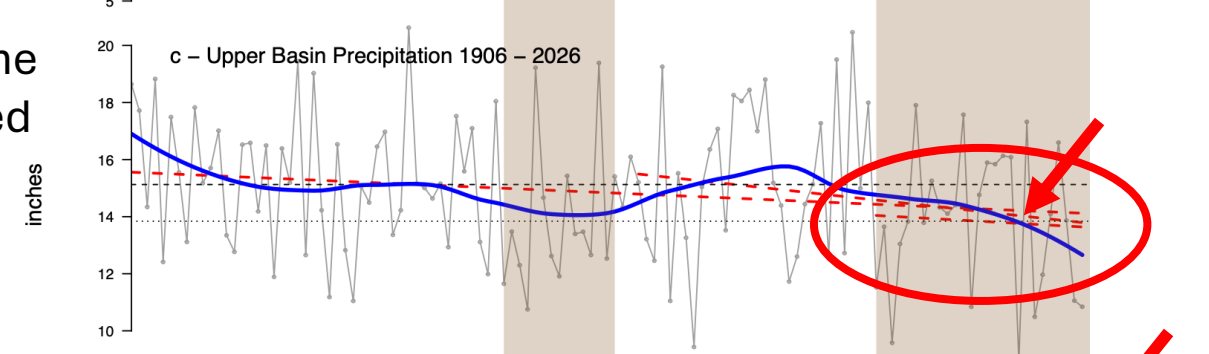
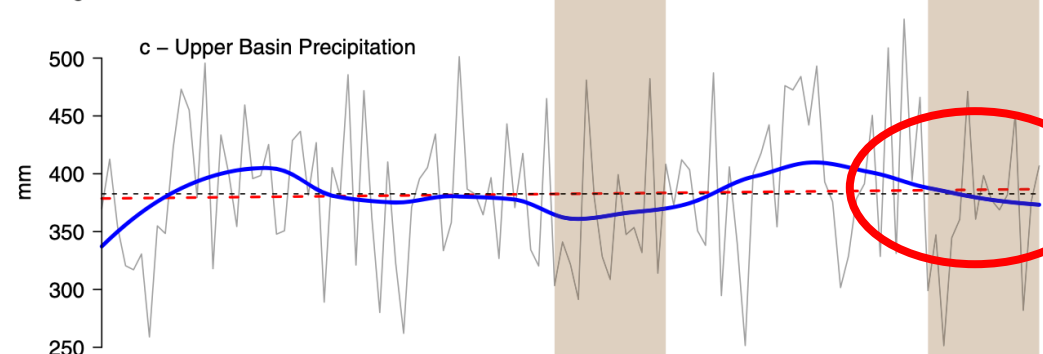
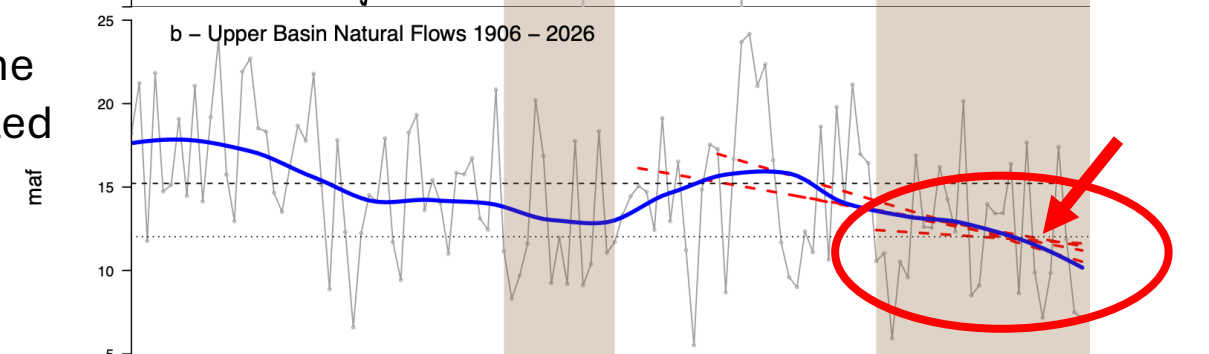
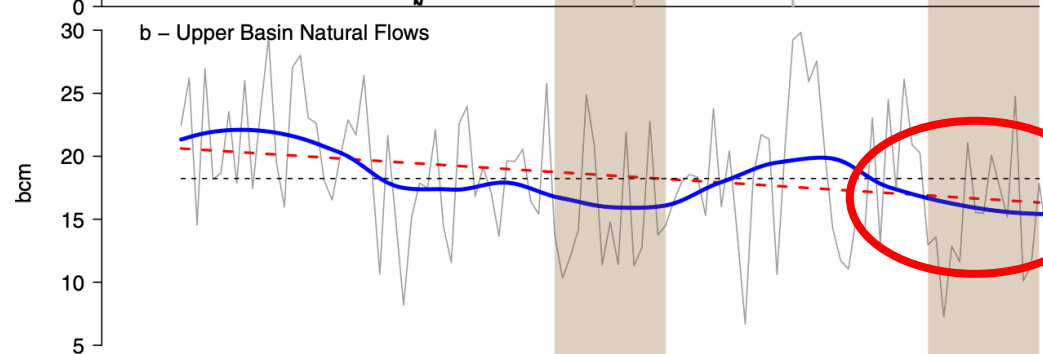
Colorado River Climate Summary

- Flows – Down 21% over last 27 Years
- Flows – Down 33% over last 7 Years
- Temperatures up 3.3°F Since 1970
- Precipitation – Down 9% Since 2020
- North Pacific Ocean Warming
Possible Precipitation Decline
Explanation
- March 2026 Unprecedented
Warming & Snowpack





Additional 25%
Loss



Super El Niño

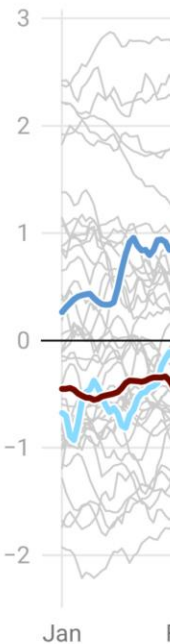
El Niño southern oscillation 'Jaw-dropping' El Niño bursts through temperature record months before peak

NOAA OISS
Sun, Sep 20,

er.org
ty of Maine

'Godzilla-level' phenomenon is supercharging the climate crisis and will have a huge impact on communities across the world

The 20
Daily Niño



Source: NOAA



A firefighter at a wildfire in Ogan Ilir, Sumatra, Indonesia. Photograph: Mast Irham/EPA

El Nino with Warm North Pacific very rare.

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Brief

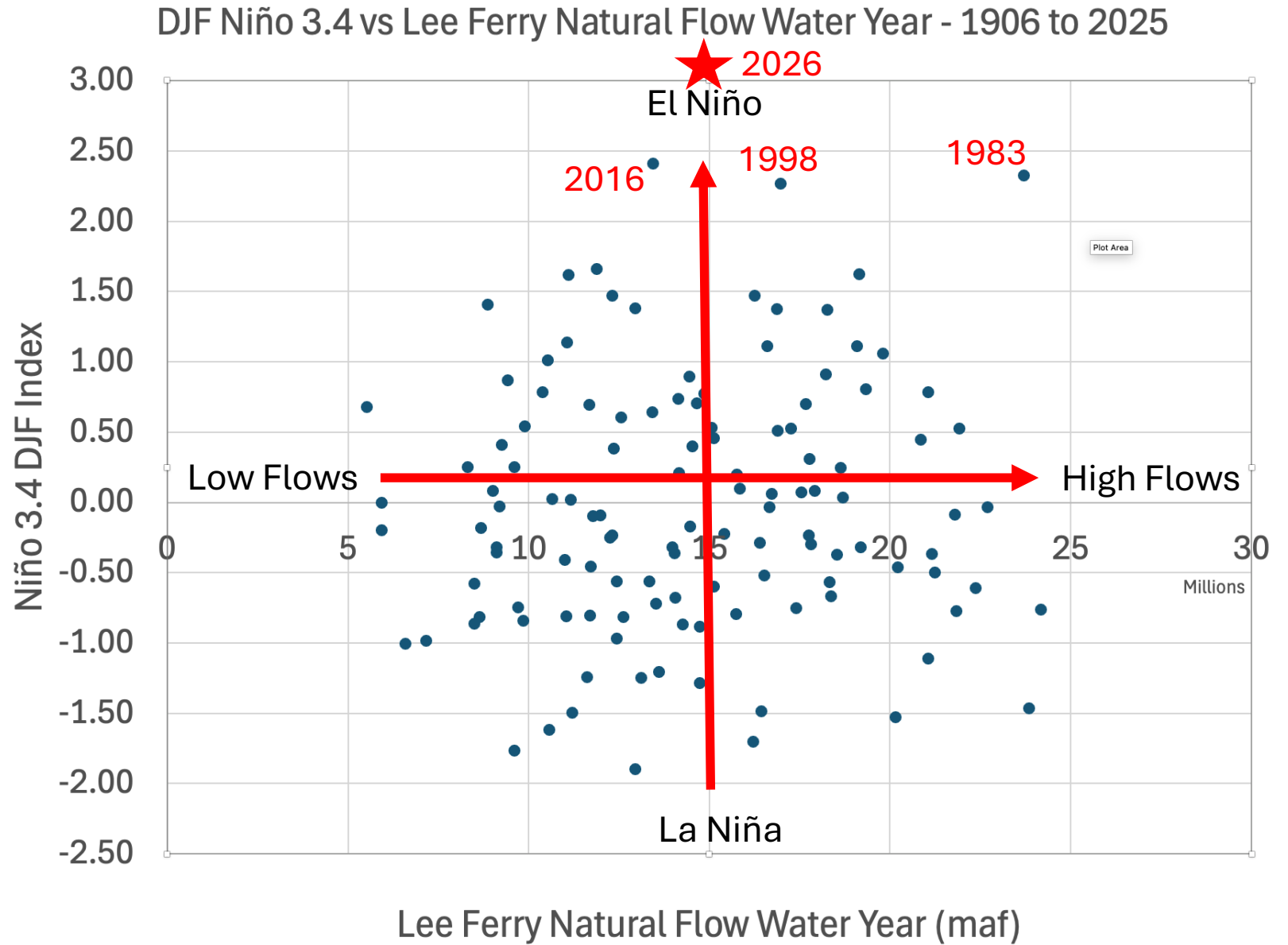
The Guardian

El Niño and CRB Lee Ferry Natural Flows

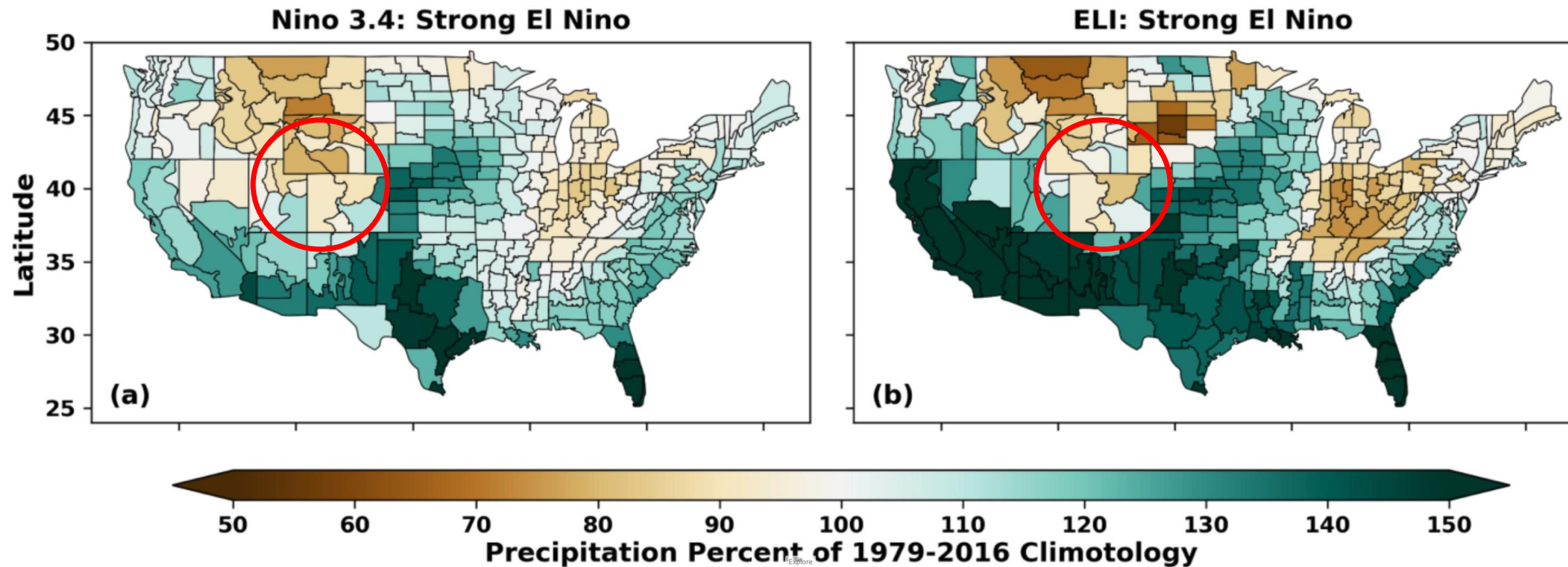
- No relationship between Niño3.4 and Lee Ferry Natural Flows

Note: Lower Basin and CA do see wetter conditions during El Niño.

One big year will not solve our problems.



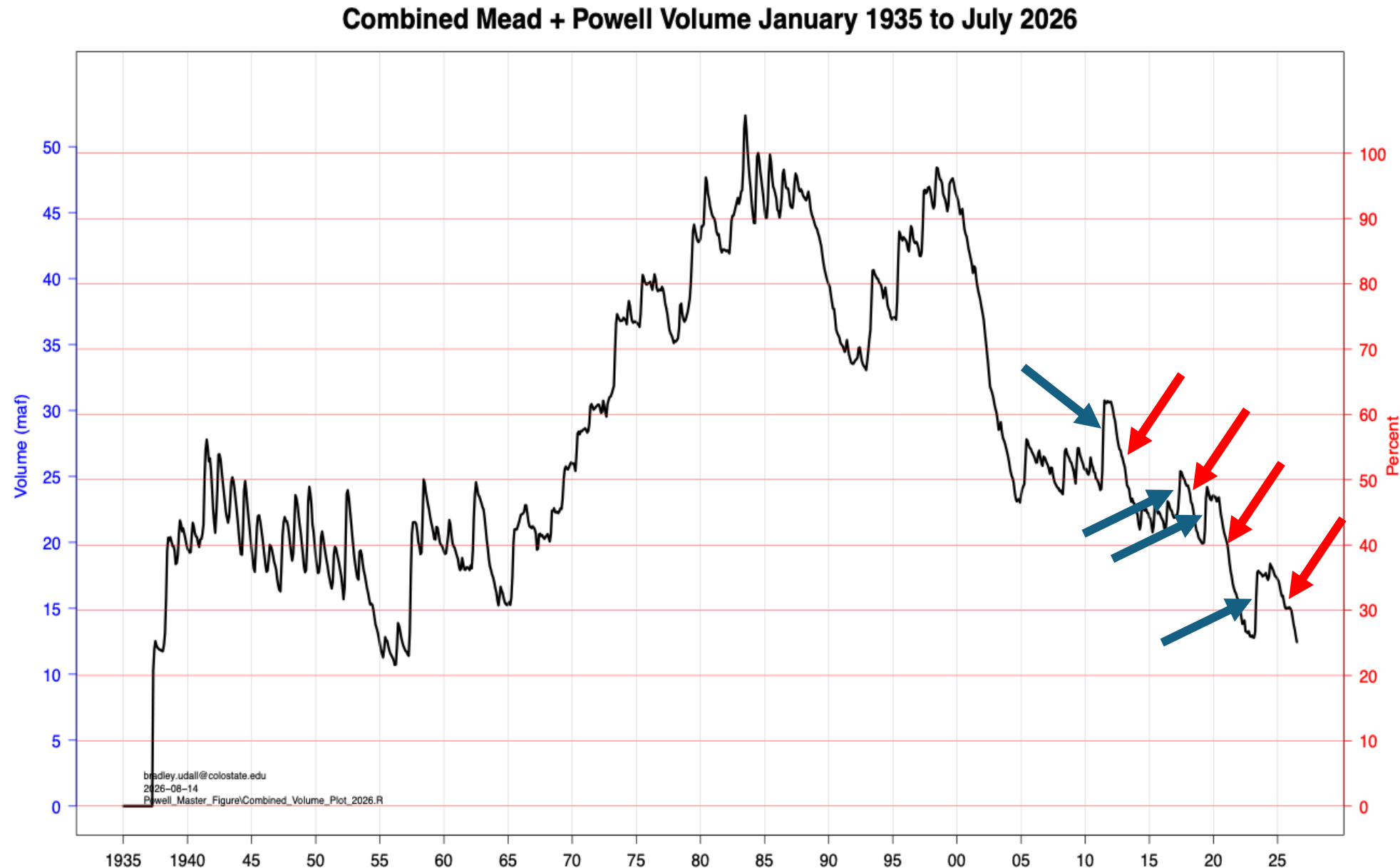
Multi-Year Composites of Strong El Nino Years show no precipitation increases in the Colorado River Basin



What happens to our reservoirs after big years?

- 2011 – 20 maf
 - 2012, 2013
- 2017 – 16 maf
 - 2018
- 2019 – 18 maf
 - 2020, 21, 22
- 2023 – 17 maf
 - 2024, 25, 26

Every time we've
had a big year, the
next 1 to 3 years
wipe out that gain.



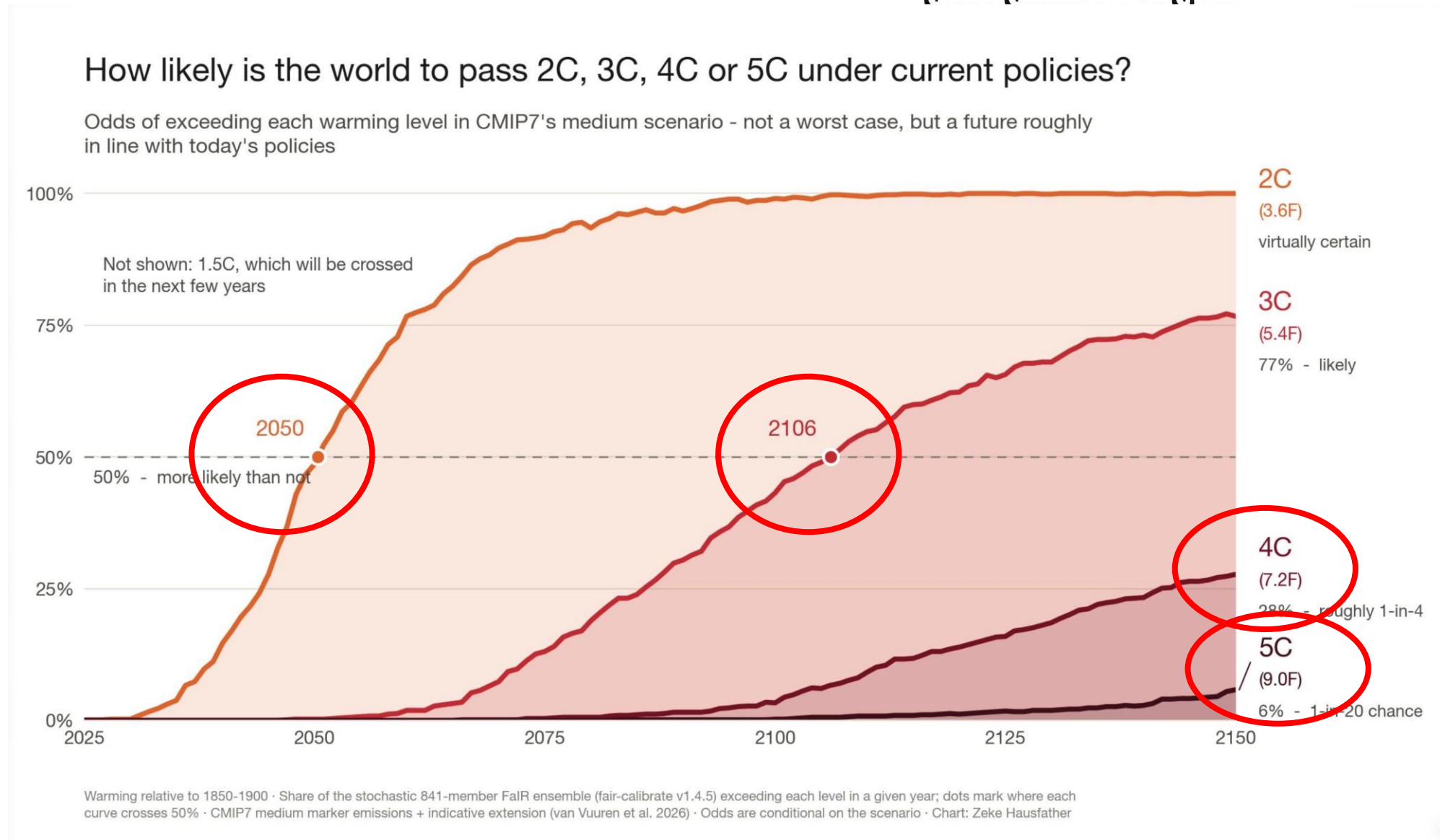
Alarming Forecasts for Future Temperatures

2°C by 2050
– 50% chance

3°C by 2100
– 50% chance

4°C by 2150
– 25% chance

5°C by 2150
– 5% chance



Geoengineering to the Rescue?

“Do we really want to play dice with our planet”



- If warming $> \sim 2^{\circ}\text{C}$ immense pressure to cool the planet
- A variety of techniques possible
- Will affect clouds, aerosols, water cycle in unknown ways
- Will not solve - only delay
- Hard to stop once started
- Divides Scientific Community

Take Home: This Has the Potential
to Make our Job even harder.

‘Termination shock’: trust our expert warnings on geoengineering’s planetary risks

Raymond Pierrehumbert, Julia Slingo,
Michael Mann and Valerie Masson-
Delmotte

Do we really want to play dice with our planet?

June 19, 2026

Why Such Limited Responses to Climate Threats?

Please don't let these be
excuses for “doomerism”.

- Beckert Ideas
- Capitalism
 - A Carbon Tax would go a long way to solutions
- Consumer Behavior
 - Rethink Consumption = Freedom
- Governance
 - Elect Me! I will raise your taxes and limit your consumption!



Jens Beckert

How We Sold Our Future

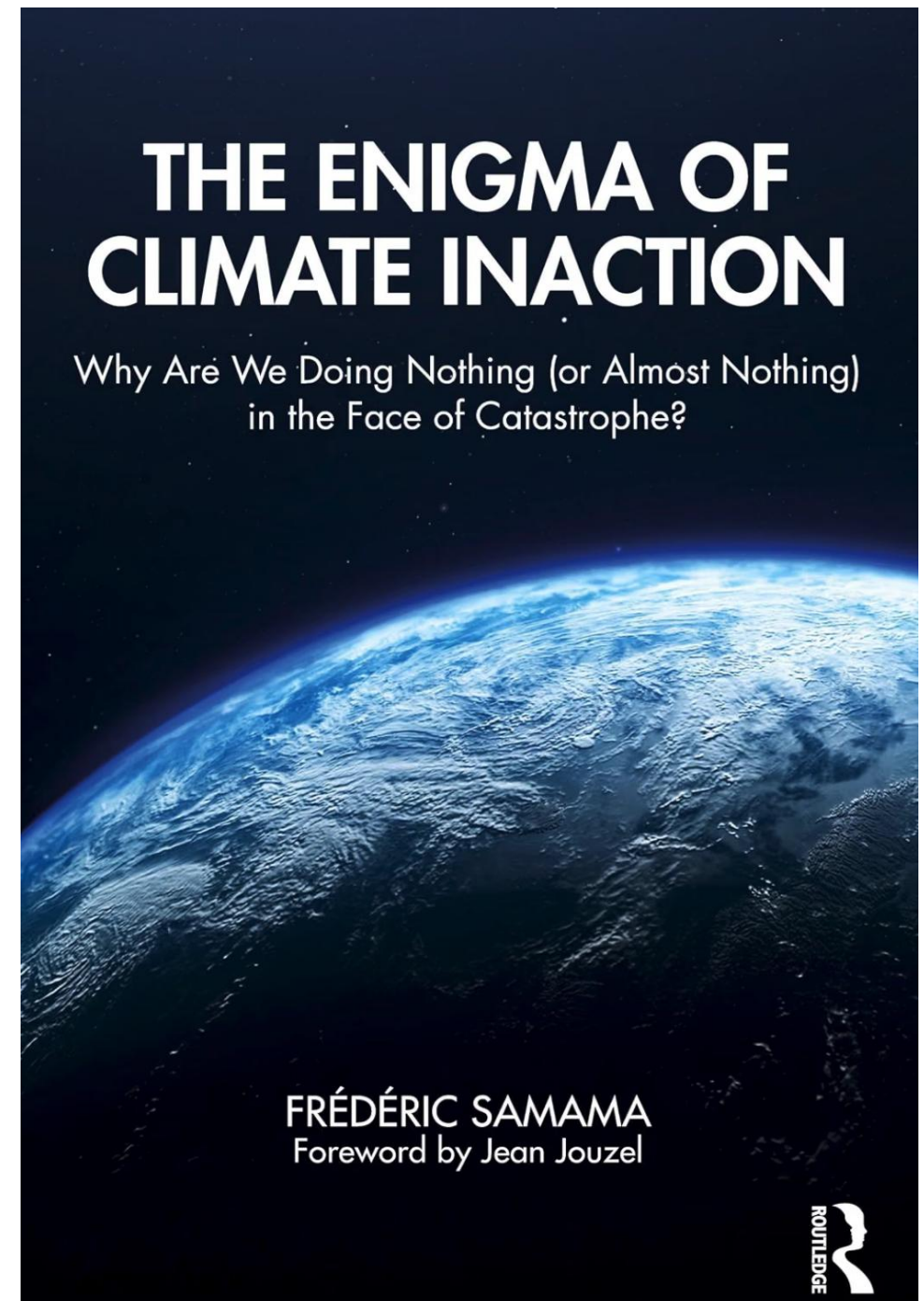
The Failure to Fight
Climate Change

Why Such Limited Responses to Climate Threats?

Samama Ideas

- Threats need to be...
 - Immediate, Shared, Solvable
- Rationalization Excuses
 - Tech will Fix, Not Bad, Not in my Lifetime
- Collective Action Problem
 - Individual Actions Negligible
 - Responsibility Diffuse
 - Benefits Global + Delayed
 - Costs Local + Immediate
- Today's Dominant Societal Frameworks Misaligned with Nature of the Climate Crisis
 - “Societal Bubbles”
- Delay Looks Rational but may be Catastrophic

Take Home: Help solving our Colorado River Climate Change problem will be a long time coming.



Ending Thoughts

- All Colorado River Climate Change Metrics Bad to Horrendous
- El Nino might buy us a year or 3
- No Indication that world will rise to climate challenge
 - Calvary is not coming to help
 - Might Even Double-Down in harmful ways
- But Samama provides some hope for Colorado River Solutions

Why Such Limited Responses to Climate Threats?

1 Samama Ideas

- 2 • Threats need to be...
 - 2 • Immediate, Shared, Solvable
- 3 • Rationalization Excuses
 - 3 • Tech will Fix, Not Bad, Not in my Lifetime
- 4 • Collective Action Problem
 - 4 • Individual Actions Negligible
 - 4 • Responsibility Diffuse
 - 4 • Benefits Global + Delayed
 - 4 • Costs Local + Immediate
- 5 • Today's Dominant Societal Frameworks Misaligned with Nature of the Climate Crisis
 - 5 • "Societal Bubbles"
- 6 • Delay Looks Rational but may be Catastrophic

7 But what about a Colorado River lens on this?

End

*"Could be worse.
Not sure how, but it could be."*
~Eeyore

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