

SCIENCE IN THE WHITE HOUSE:

Integrated Solutions to Climate Change, Loss of Biodiversity & Inequality/Inequity

UC Berkeley Hitchcock Lecture

March 12, 2025

The Honorable Jane Lubchenco, PhD



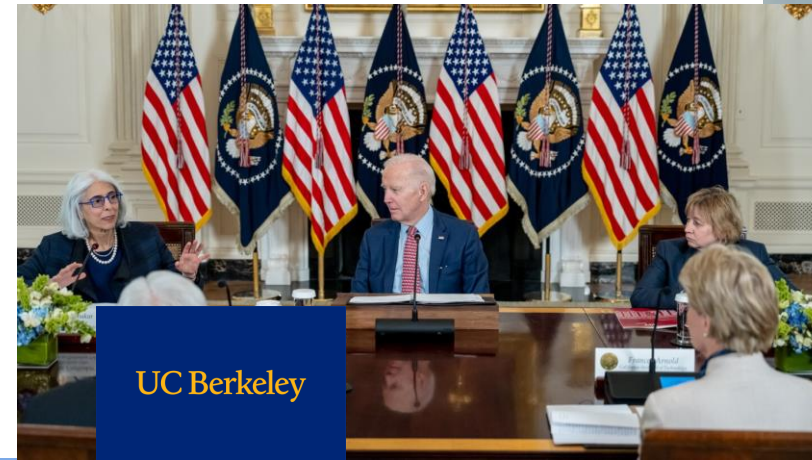
Oregon State
University

BLUF (Bottom Line Up Front)

1. The 3 challenges of climate change, loss of biodiversity & inequity/inequality are intimately interconnected.
2. Integrating their solutions is quite feasible & delivers more effective outcomes than dealing with each challenge separately.
3. Significant progress in achieving this integration over the last 4 years provides proof of concept, a roadmap, & timely opportunities for governments, the private sector and society.

Science in the White House Office of Science & Technology Policy (OSTP)

Mission: Harness the power of science, technology & innovation to achieve America's great aspirations.



Science in the White House

Office of Science & Technology Policy (OSTP)

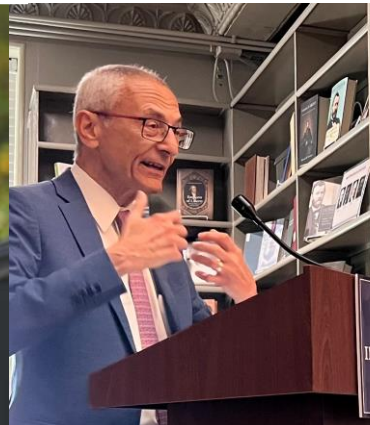
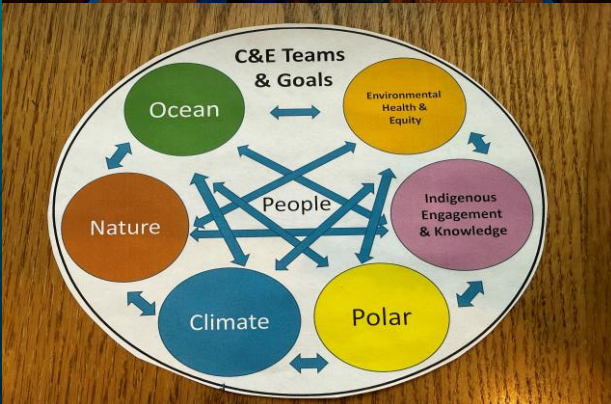
- Science for Policy; Policy for Science
- Science champions throughout Administration, starting with POTUS; OSTP = Cabinet level
- POTUS Directive: base policies on science & evidence; strengthen scientific integrity; PCAST
- Teams led by science-policy leaders: tech, health, energy, indus. innov, nat sec, sci & society, climate & environment





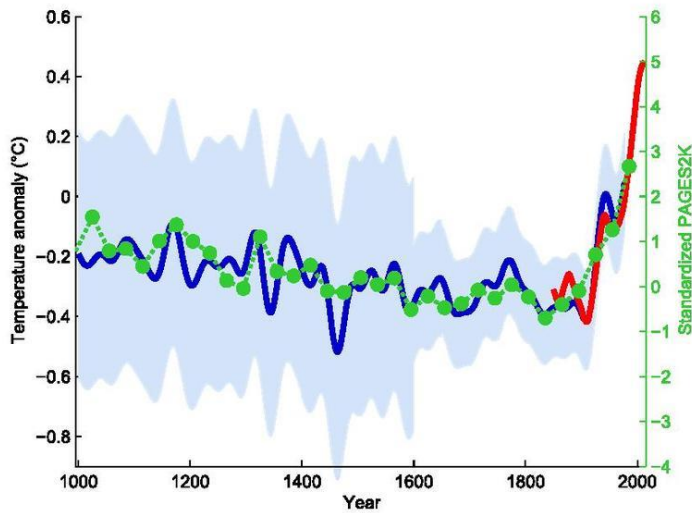
OSTP Climate & Environment Team

- Exceptional natural & social scientists, policy & law experts – working in (porous) teams
- Partnered with other OSTP teams, White House offices, & federal agencies
- Integrated, holistic approaches; historic ambition
- **Focus: for the most serious problems, align policy with science**

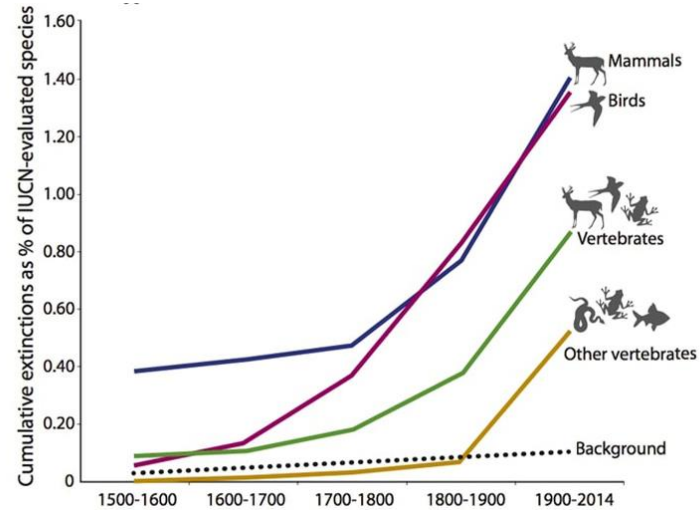


3 interconnected challenges

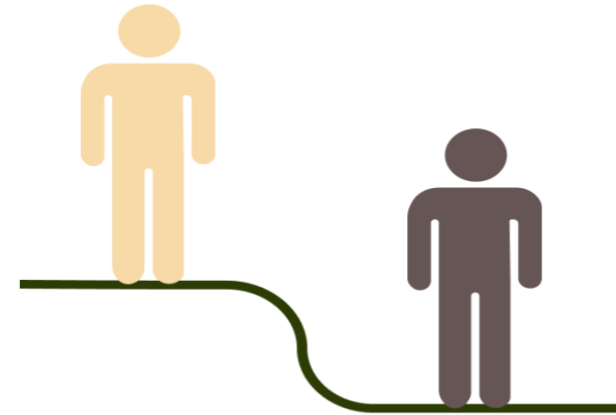
Climate Change



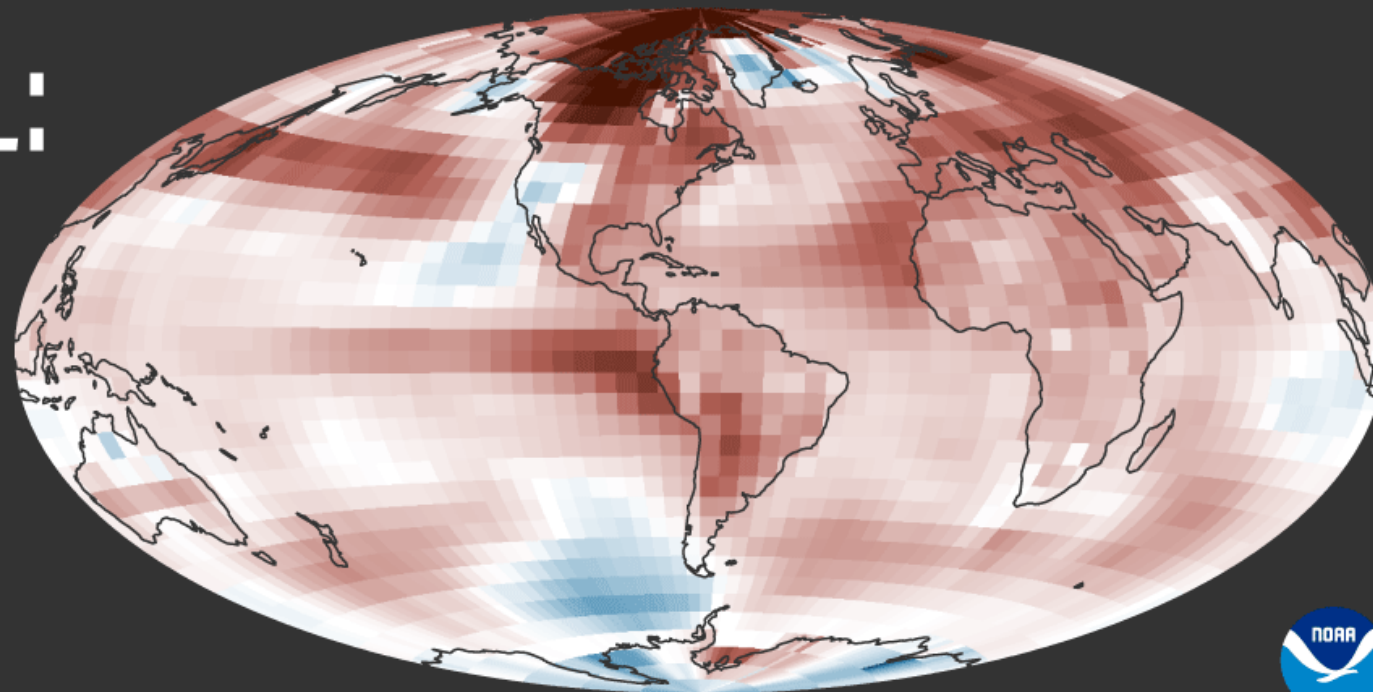
Nature Loss



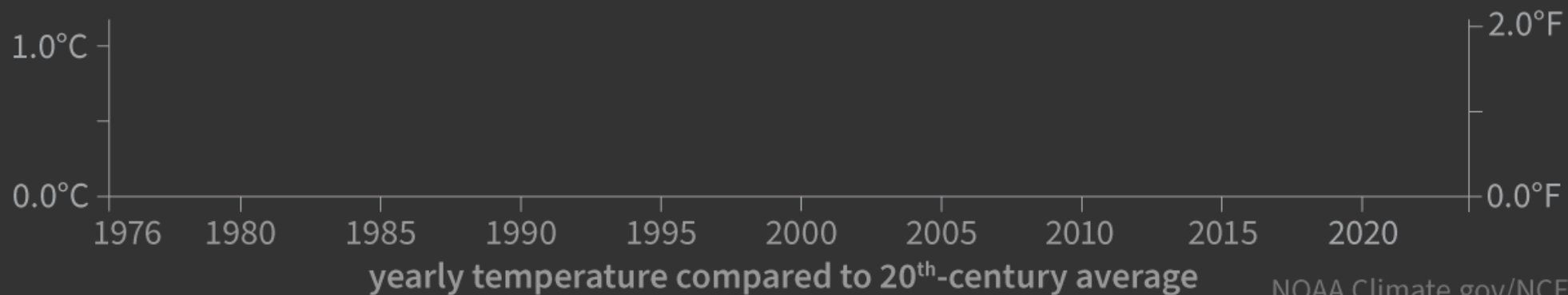
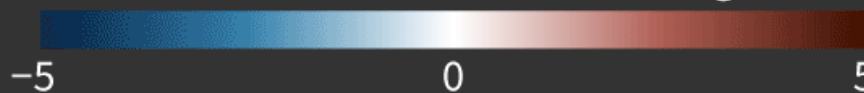
Inequality & Inequity



IT'S OFFICIAL:



Difference from 1991–2020 average (°F)

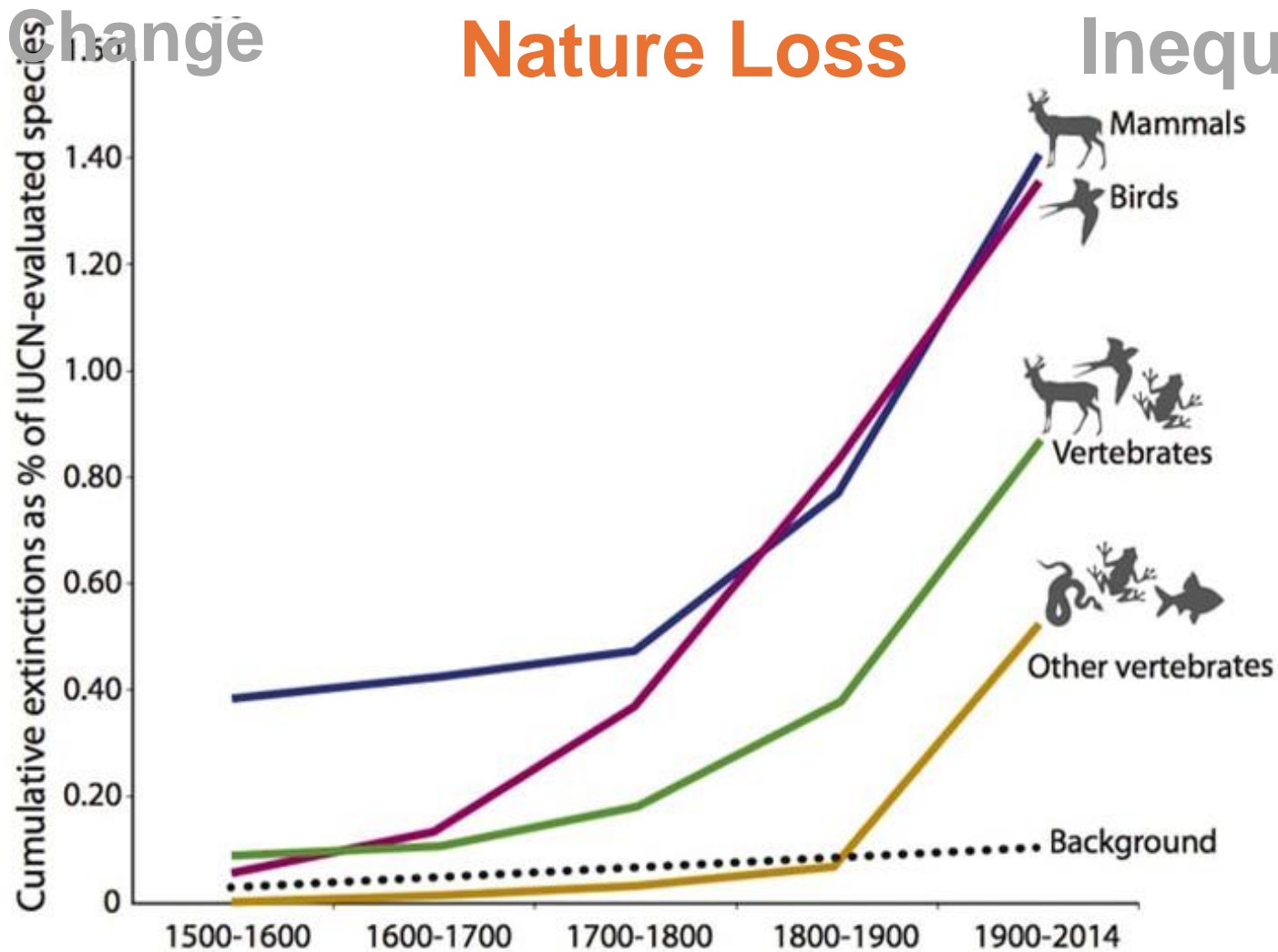


3 interconnected challenges

Climate Change

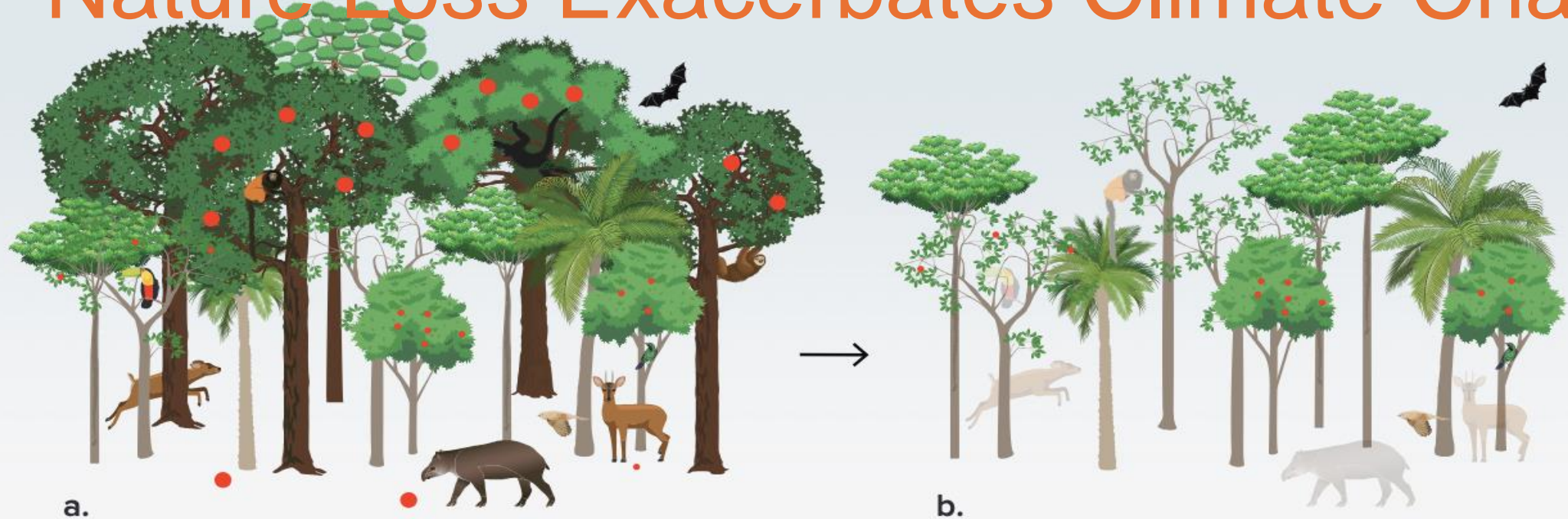
Nature Loss

Inequality & Inequity



WWF (2024) Living Planet Report 2024 – A System in Peril. WWF, Gland, Switzerland.

Nature Loss Exacerbates Climate Change

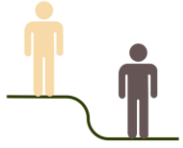


WWF (2024)
Living Planet
Report 2024 – A
System in Peril.
WWF, Gland,
Switzerland.

Loss of large fruit-eating animals by hunting in tropical forests leads to a decline in forest carbon storage, exacerbating climate change.

Why? A ↓ large fruit-eating animals ➡ no more dispersal of large fruits ● & seeds in the forest. Trees in this forest that store more carbon (**dark trunks**) have larger fruits & seeds. **Result:** carbon-poor, softwood tree species dominate the forest.

--figure modified from Bello et al. 2015

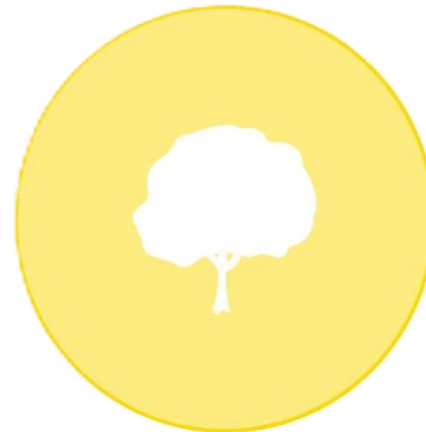
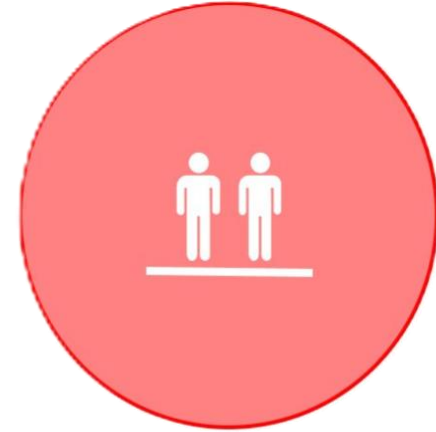


Inequality and Inequity

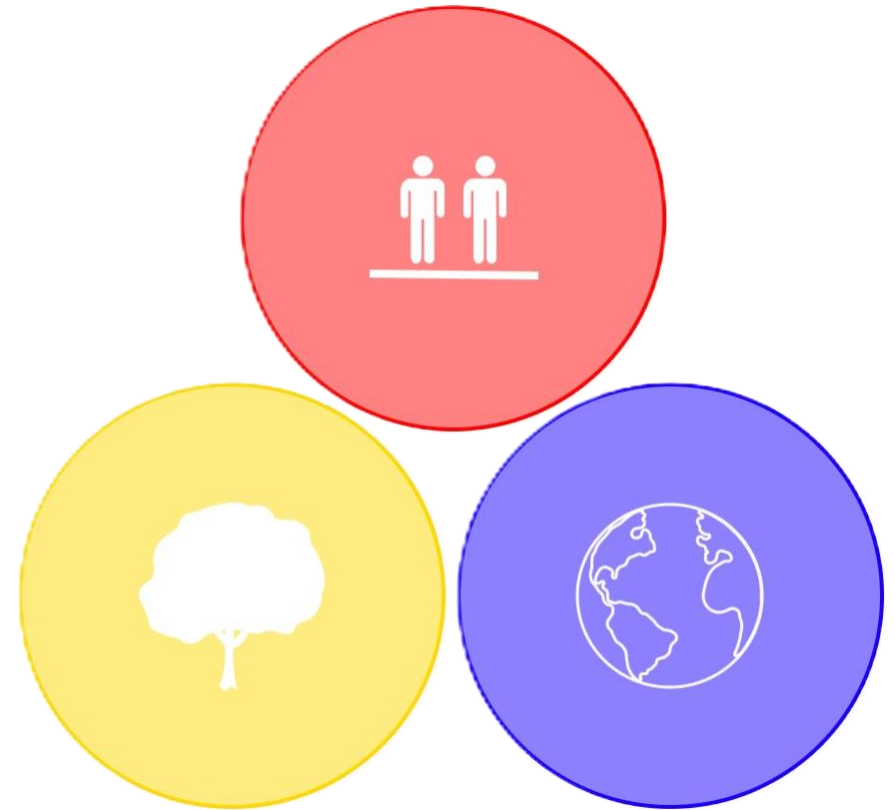
- Climate change can increase natural disasters, which can intensify health disparities in the US (Smith et al. 2022*)
- Poor countries are experiencing more days of extreme heat, leading to deaths (John 2024)



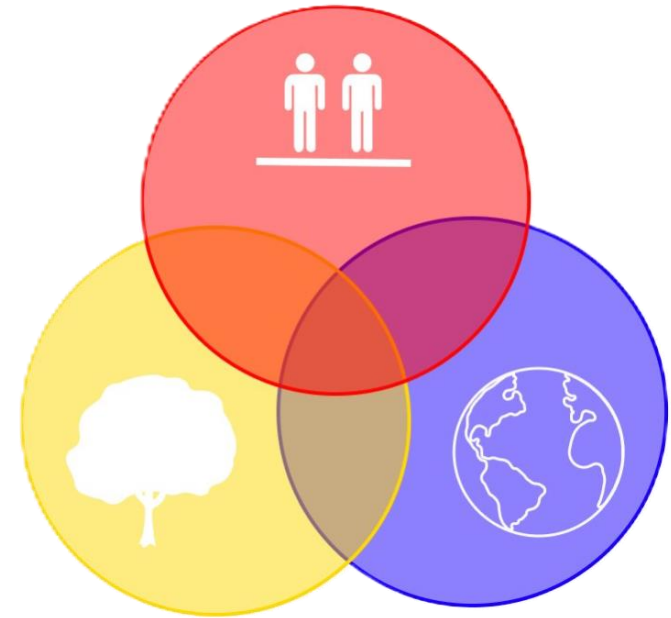
Despite these
interconnections,
solutions to the 3 crises
are typically siloed



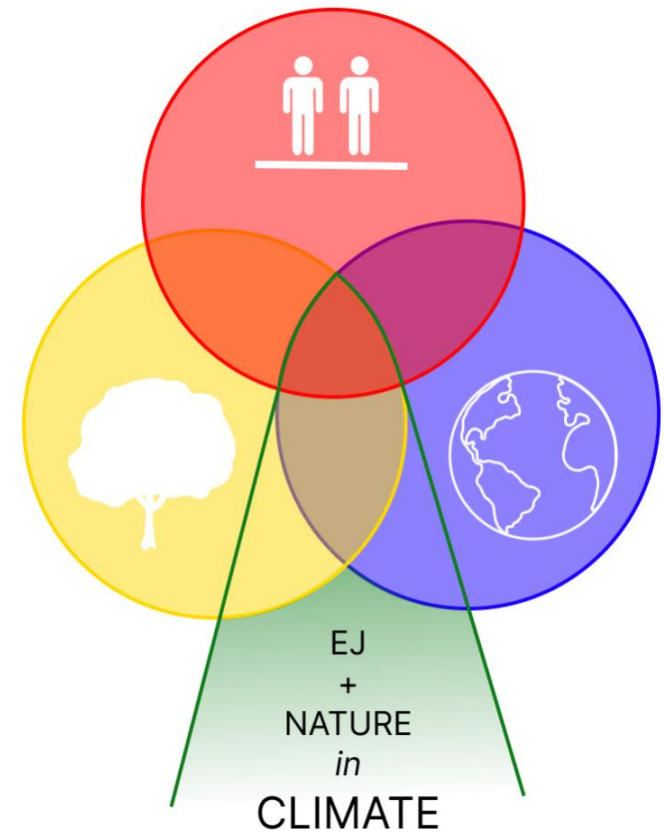
But they do not
have to be...



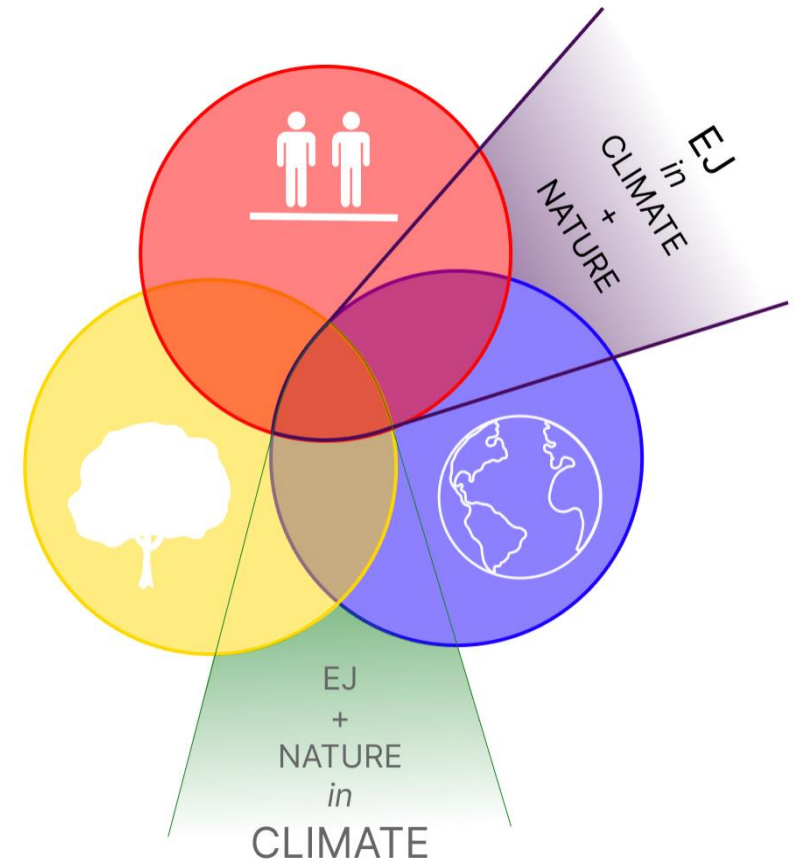
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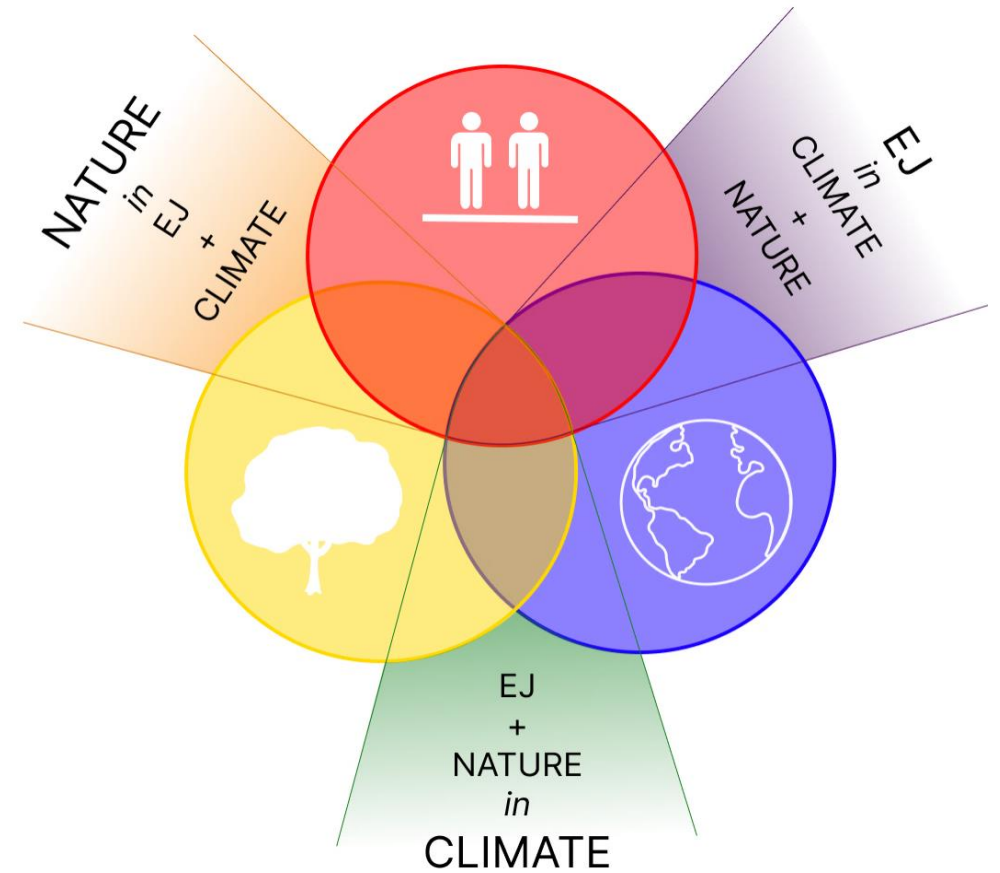
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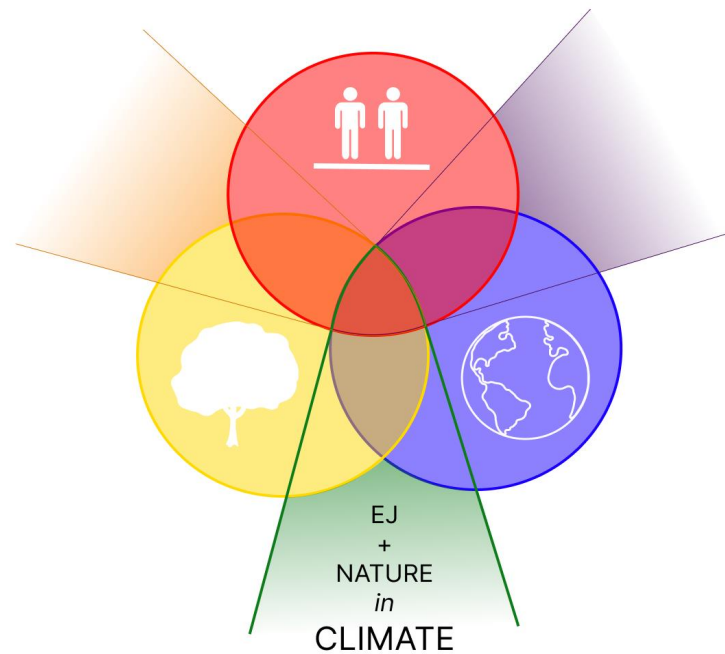
But they do not
have to be...



But they do not
have to be...



#1. We incorporated new knowledge to embed nature & EJ into **climate policies**



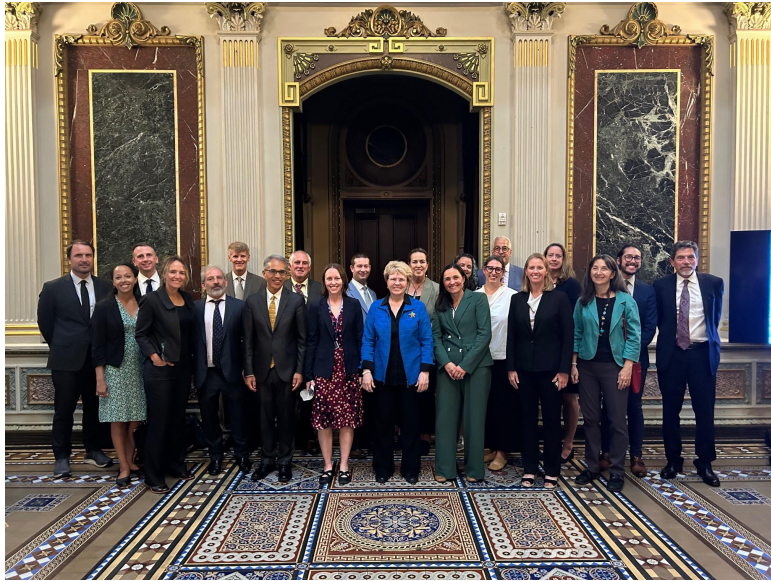
to align policy
with knowledge

#1. We incorporated new knowledge to embed nature & EJ into climate policies

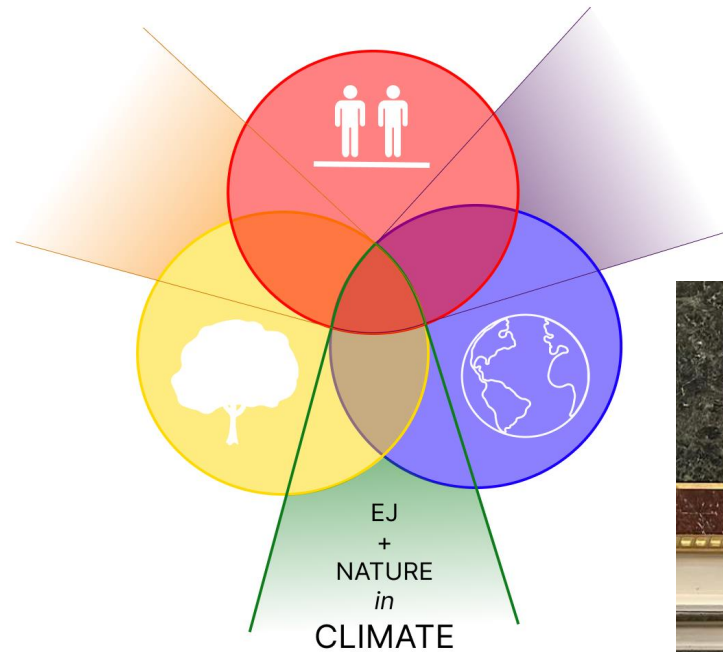


C&E Climate Team

#1. We incorporated new knowledge to embed nature & EJ into **climate policies**



C&E Climate Team



to align policy
with knowledge

US Global Change Research Program leadership.



Biden-Harris Administration: some Climate Commitments & Action

Commitment

- Slash GHG emissions in ½ by 2030
- Achieve 100% carbon-pollution-free electricity by 2035
- Achieve Net-zero emissions economy by 2050
- Deliver 40% of benefits to disadvantaged communities through Justice40
- Create good-paying jobs & grow the economy in doing the above



Action

- Passed the Inflation Reduction Act & Bipartisan Infrastructure Law
- Delivered >\$390 Billion in new investments in clean energy manufacturing, EVs & batteries, clean power projects
- Grew clean energy jobs in every state
- Quadrupled EV sales
- Attracted hundreds of billions of dollars in private sector investment

<https://bidenwhitehouse.archives.gov/climate/>

Traditional climate policy



Most climate policy

- A. Mitigation-centric
- B. Reduce emissions
- C. Technology-centric
- D. Land-focused
- E. Relies on
estimating GHG
emissions

Integrating nature & EJ into **climate** policies



= More holistic climate policy

Most climate policy

A. Mitigation

plus Adaptation

BHA Examples

1. Climate Resilience Framework and Strategy*
2. BIL, IRA \$ for adaptation
3. Justice40**.



Laura Petes

* <https://bidenwhitehouse.archives.gov/wp-content/uploads/2025/01/National-Resilience-Strategy.pdf>

** <https://bidenwhitehouse.archives.gov/environmentaljustice/justice40/>

The Evolution of Climate Policy

Most climate policy

1. Mitigation
2. Reduce emissions
3. Technology-centric
4. Land-based
5. Relies on estimating GHG emissions

More holistic climate policy

plus Adaptation

plus Carbon Removal

BHA Examples

Climate Resilience Framework

National Marine CDR Research Strategy*



* <https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/11/U.S.-Marine-Carbon-Dioxide-Removal-Research-Strategy.pdf>

The Evolution of Climate Policy

Most climate policy

1. Mitigation
2. Reduce emissions
3. **Technology**



More holistic climate policy

plus Adaptation
plus Carbon Removal
plus Nature

BHA Examples

Climate Resilience Framework
Marine CDR Research Strategy

1. **Nature-based Solutions Roadmap***
2. **New Benefit-Cost Analyses rules: mandate inclusion of ecosystem services****
3. **Much of \$50 billion in BIL & IRA for coastal resilience is for nature-based solutions.**

* <https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf>

** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/11/CircularA-4.pdf>

[and https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/02/ESGuidance_explanation.pdf](https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/02/ESGuidance_explanation.pdf)

The Evolution of Climate Policy



4. Land-based

More holistic climate policy

plus Adaptation

plus Carbon Removal

plus Nature

plus Ocean

BHA Examples

Climate Resilience Framework

Marine CDR Research Strategy

Nature-based Solutions

Ocean-based Solutions

1. **Ocean Climate Action Plan***
2. **Ocean Justice Strategy****
3. **EJ Science, Data and Research Plan*****

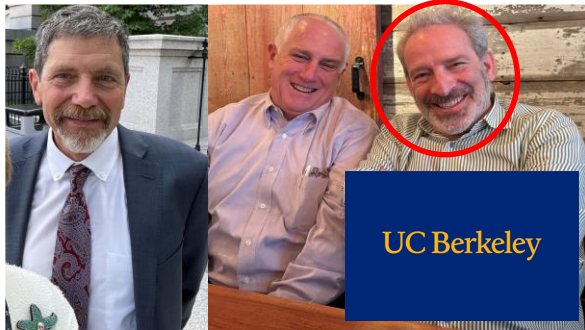
* https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/03/Ocean-Climate-Action-Plan_Final.pdf

** <https://bidenwhitehouse.archives.gov/ostp/news-updates/2023/12/08/ocean-justice-strategy/>

*** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/07/NSTC-EJ-Research-Plan-July-2024.pdf>

The Evolution of Climate Policy

Most climate policy



5. Estimate GHG emissions

More holistic climate policy

plus Adaptation

plus Carbon Removal

plus Nature

plus Ocean

plus Measure & Monitor GHGs

BHA Examples

Resilience Framework & Action

Marine CDR Research Strategy

Nature-based Solutions Roadmap

Ocean Climate Action Plan

Measure, Monitor, Report, & Verify GHGs Plan & implementation*.

* <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/11/NationalGHGMMISStrategy-2023.pdf>

Embedding nature & EJ into climate policies...

Most climate policy

1. Mitigation
2. Reduce emissions
3. Technology
4. Land-based
5. Estimate GHG emissions

Holistic climate policy

- plus** Adaptation
- plus** Carbon Removal
- plus** Nature
- plus** Ocean
- plus** Measure GHG emissions

BHA Examples

- Resilience Framework
- Marine CDR Research Strategy
- Nature-based Solutions Roadmap
- Ocean Climate Action plan
- MMRV

...leads to more effective climate policy.

Embedding nature & EJ into **climate** policies & communications

1. Fifth National Climate Assessment (2023)*

Impacts

Mitigation & Adaptation underway across the country

NCA5 Atlas

Art x Climate

En Español



NCA5 Chapter Leads
USGCRP leadership



UC Berkeley

Sol Hsiang
Simon Grennhill
Tianna Brunno
Rachel Morello-Frosch

* <https://nca2023.globalchange.gov/>

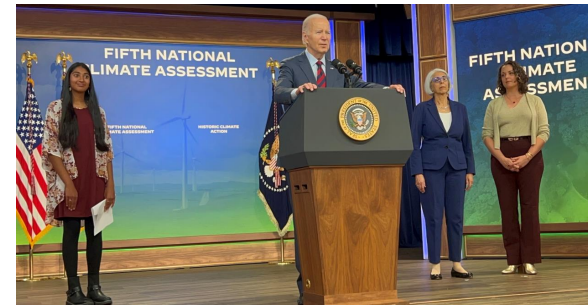
Embedding nature & EJ into **climate** policies & communications

1. Fifth National Climate Assessment (2023)*



NCA5 Chapter Leads
USGCRP leadership

1. Impacts
2. Mitigation & Adaptation underway across the country
3. NCA5 Atlas
4. Art x Climate
5. En Español



2. Climate Services**



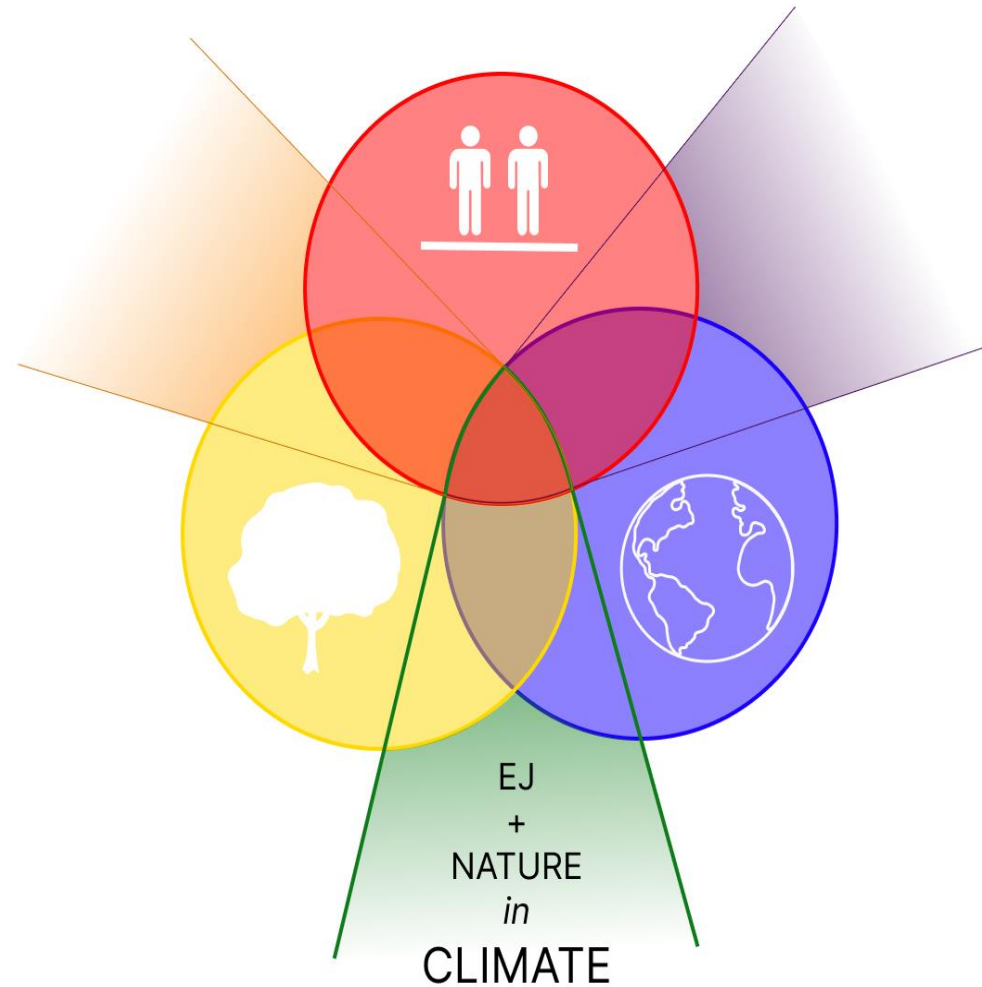
Climate Services leads

1. Data, products, information – to inform decisions
2. Scale-relevant, technical assistance, includes NbS
3. Novel products: Climate Mapping for Resilience & Adaptation; Climate Resilience Information System

* <https://nca2023.globalchange.gov/>

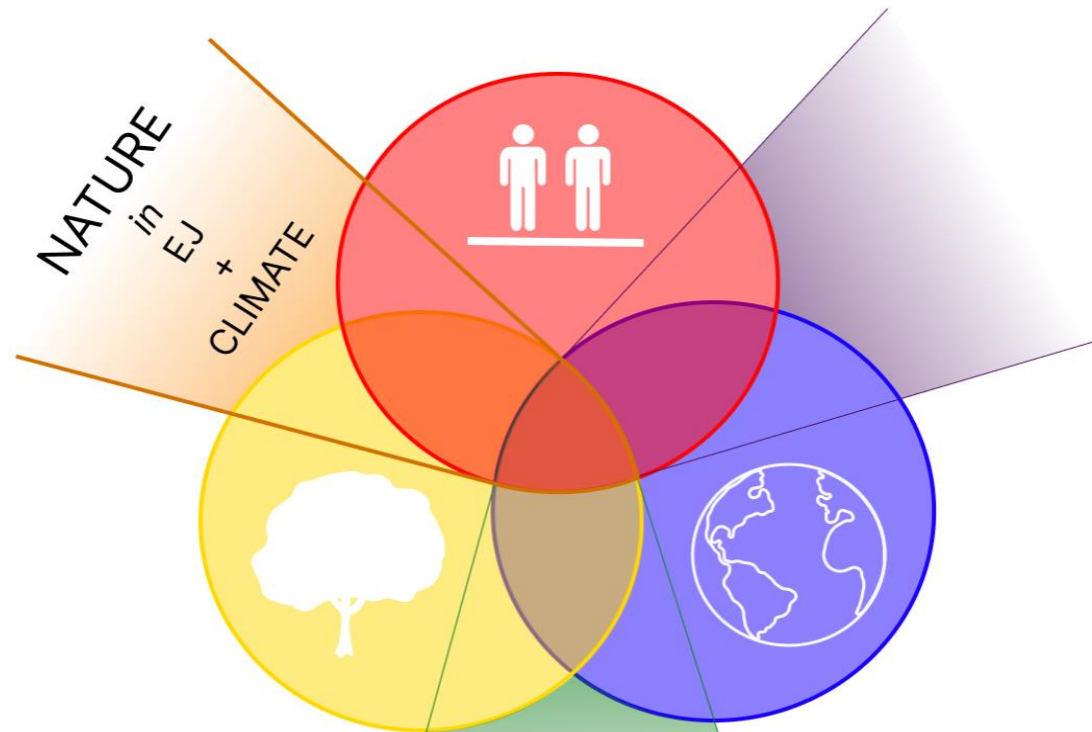
** https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/03/FTAC_Report_03222023_508.pdf

The result? Integrating nature & EJ into **climate**



improves climate outcomes

#2 We also incorporated new knowledge to embed **climate & EJ** into **nature** policies



to align policy with knowledge

#2 We incorporated new knowledge to embed climate & EJ into nature policies



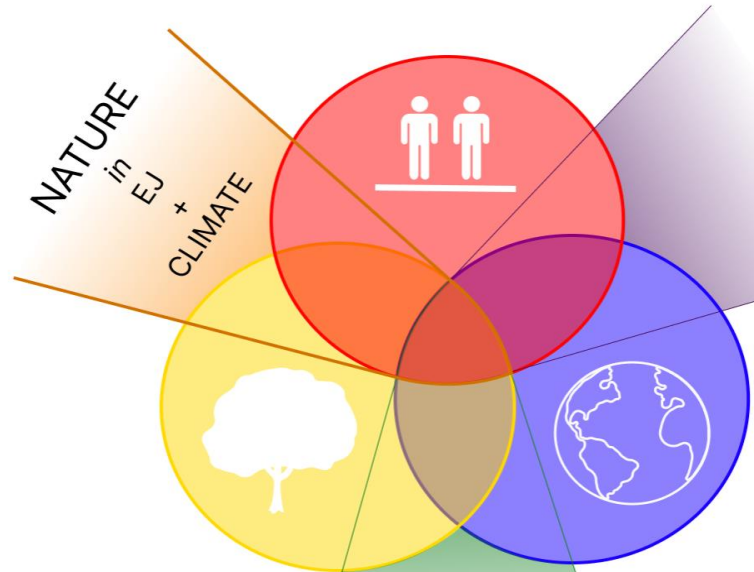
Sec Raimondo – Commerce
Announcing nat cap accounts



Sec. Haaland – Interior
Announcing Natl Nature Assess.



Chair Mallory – CEQ
Announcing NbS



Spec Pres
Adv
Podesta
announcing
Nature-
based
Solutions at
COP27



Ricky Revesz, OIRA, OMB.



1. Address Drivers of Loss of Nature

- Protected areas are critically important but won't stem the loss of nature.

30x30 is needed but not sufficient.

- 100% approach

Address drivers of biodiversity loss: habitat loss, overfishing & destructive fishing gear in the ocean, invasive species, climate change

2. Recognize what is at risk with nature loss

Health, economy, security, equity/equality, climate

Here's how we incorporated new knowledge to embed **climate & EJ** into **nature** policies

1. **Put nature on the economic balance sheet:**
Natural Capital Accounting*
2. **Include nature's benefits in federal Benefit-Cost Analysis:**
OMB Circular A-4 and A-94 now include ecosystem services**
3. **Recognize the importance of *natural* security:** for the first time ever, the *National Security Strategy* (2022) includes biodiversity, climate change, and polar regions*** ...

* <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/01/Natural-Capital-Accounting-Strategy-final.pdf>

and <https://bidenwhitehouse.archives.gov/ostp/news-updates/2024/04/23/a-successful-inaugural-year-for-natural-capital-accounting-in-the-united-states/>

** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/11/CircularA-4.pdf> and <https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/11/CircularA-94.pdf>

*** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/11/8-November-Combined-PDF-for-Upload.pdf>

...and more

4. **Conduct a knowledge assessment of nature in the country:**
initiated the country's first *National Nature Assessment**

UC Berkeley

Chris Schell
Lisa White
Timothy Bowles
Rachel Morello-Frosch

* Tallis, Crimmins, & Lubchenco 2023 *Frontiers in Ecol & the Environment*
and <https://www.federalregister.gov/documents/2022/10/31/2022-23593/framing-the-national-nature-assessment>

** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf>

...and more

4. **Conduct a knowledge assessment of nature in the country:**
*initiated the country's first **National Nature Assessment****
5. **Remove impediments to use of Nature-based Solutions:**
Nature-based Solutions Roadmap**
6. **Elevate the importance of nature to health and equity:**
*these connections are featured prominently in plans for the **National Nature Assessment***

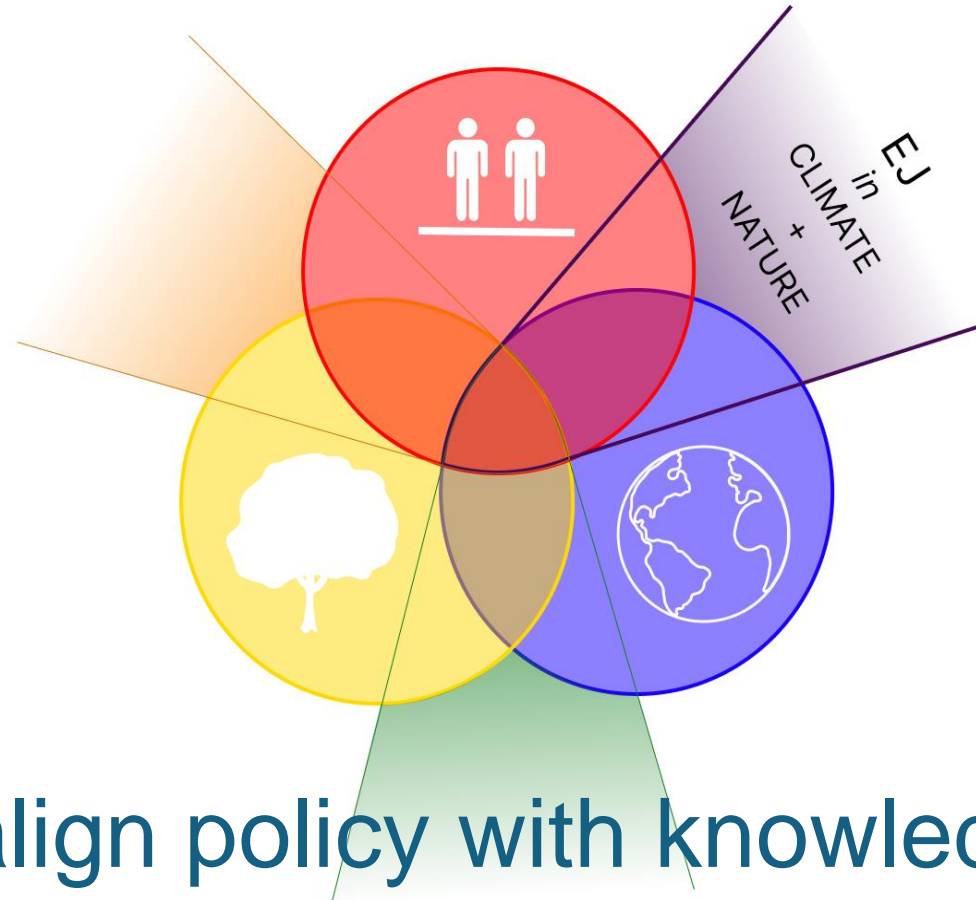
* Tallis, Crimmins, & Lubchenco 2023 *Frontiers in Ecol & the Environment*
and <https://www.federalregister.gov/documents/2022/10/31/2022-23593/framing-the-national-nature-assessment>
** <https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf>

The outcome: mainstreaming **nature** across federal policies and practices



*Tallis et al. 2024 *Science*;
and Preston et al 2024 *Eos*

#3: We also incorporated new knowledge to embed **nature & climate** in **EJ** policy



to align policy with knowledge

#3: We incorporated new knowledge to embed nature & climate in EJ policy



Dr. Robert D. Bullard

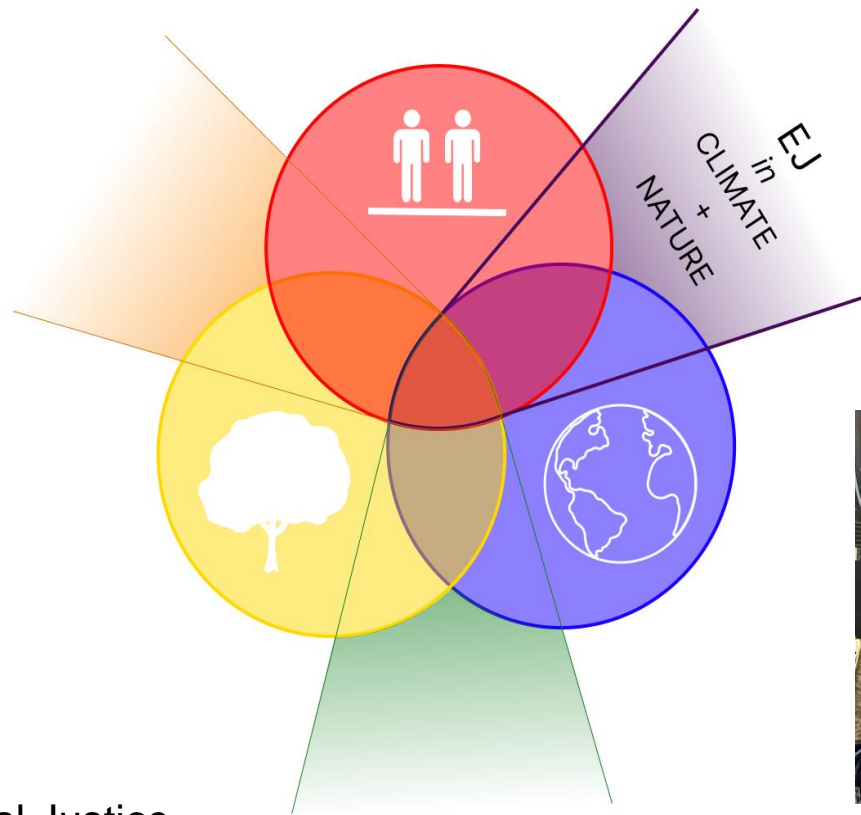


Dr. Kyle Powys Whyte



Reggy Shepard

Members,
WH Environmental Justice
Advisory Council



C&E Indigenous Knowledge team



Queen Quet
Gullah Geechee People



Violet Sage Waker
Northern Chumash
Tribal Council Chair

Embedding nature & climate in EJ policy

“Restoring and protecting a healthy environment—wherever people live, play, work, learn, grow, and worship— is a matter of justice and a fundamental duty that the Federal Government must uphold on behalf of all people.”
- President Biden, Executive Order 14096



Embedding climate & nature in EJ policy

1. Address historic & current inequitable burden of climate change

Justice40*

2. Provide meaningful opportunities for everyone affected by policies to participate in decisions that impact their health and environment

Ocean Justice Strategy**

3. Address significant gaps in science, data and research that currently hinder informed decisions

EJ Science, Data and Research Plan***

4. Recognize and elevate the importance of Indigenous Knowledge

White House Guidance to Agencies on Indigenous Knowledge****

*<https://bidenwhitehouse.archives.gov/environmentaljustice/justice40/>

** <https://bidenwhitehouse.archives.gov/ostp/news-updates/2023/12/08/ocean-justice-strategy/>

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**** <https://bidenwhitehouse.archives.gov/ostp/news-updates/2022/12/01/white-house-releases-first-of-a-kind-indigenous-knowledge-guidance-for-federal-agencies/>

3 interconnected pathways for durable change and outcomes

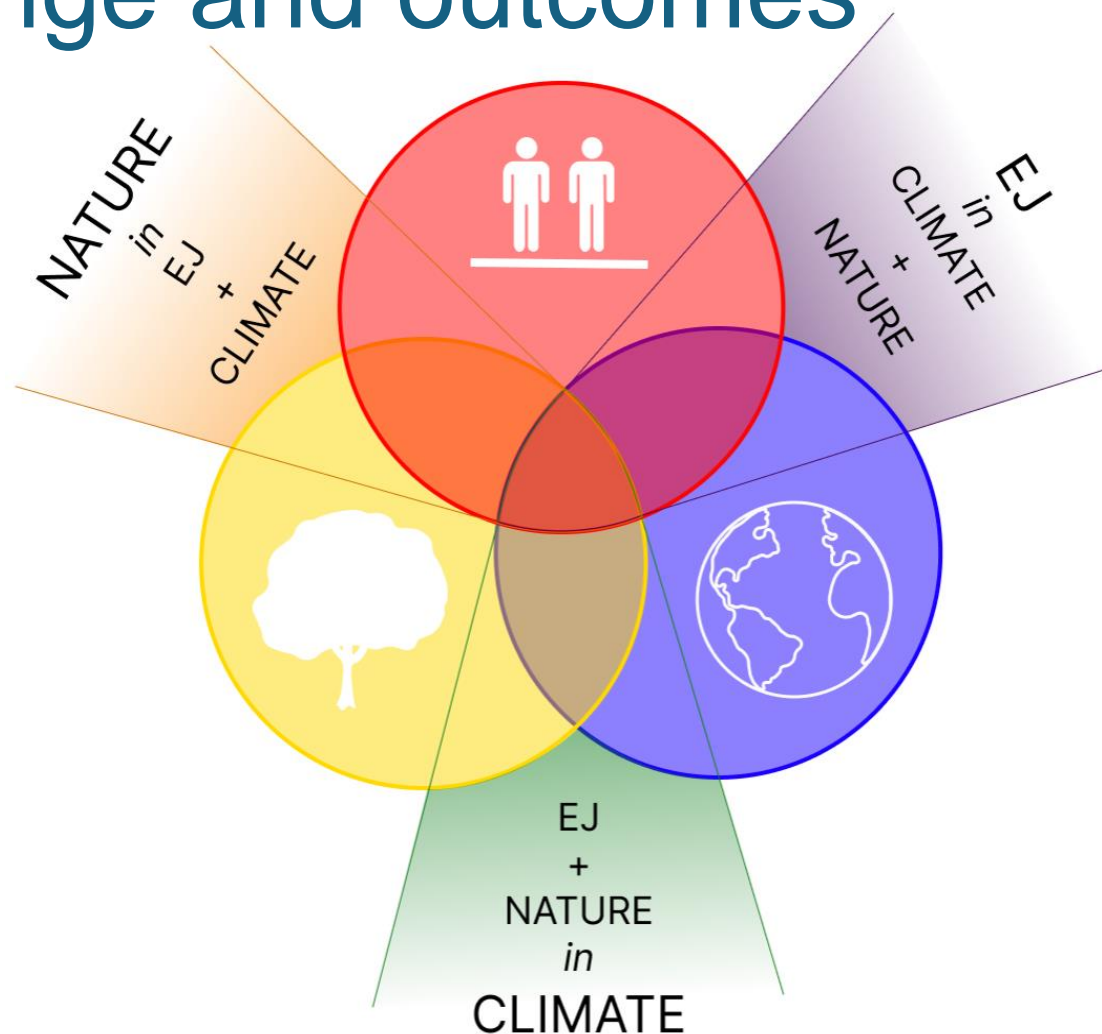
Climate

+

Nature

+

EJ

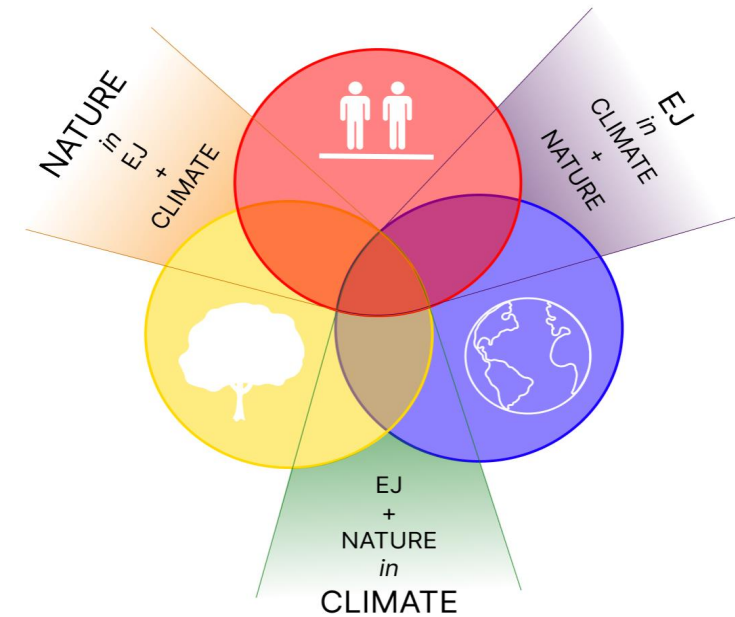


Integrated **Climate**, **Nature**, & **EJ** Policy & Action

- Historically Ambitious
- Integrated, holistic, science-informed
- Designed to be sticky
- Incorporated into national security & economic policies
- Involves not only new mandates, but significant new resources and powerful new incentives
- Delivers climate, nature, economic, security, & equity & justice benefits
- A down payment toward a better future.

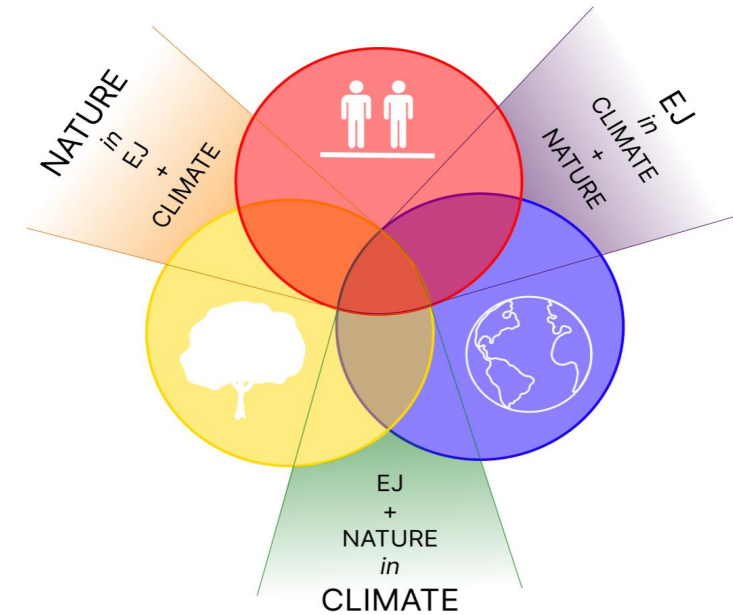
BLUF (Bottom Line Up Front)

1. Climate change, loss of nature & EJ are interconnected.
2. Integrating solutions is feasible & delivers more effective outcomes than siloed approaches.



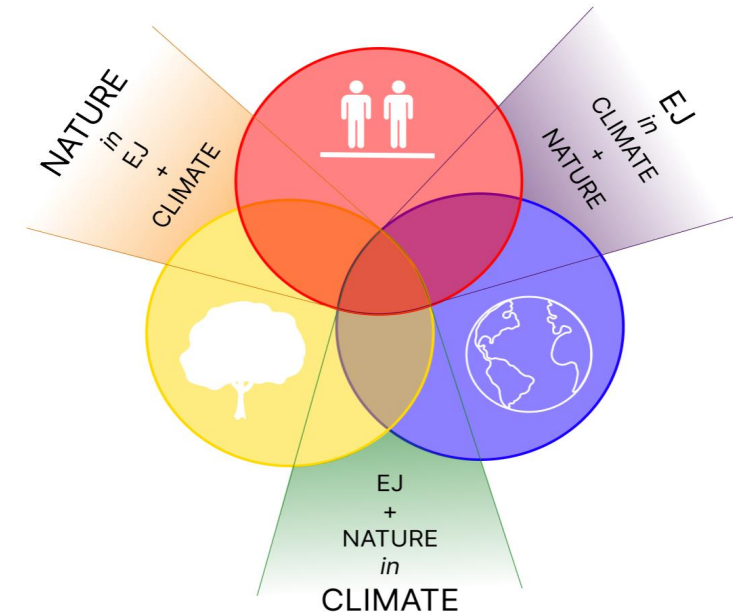
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Vatican Summit: From Climate Crisis to Climate Resilience



**Integrated solutions: climate + nature + EJ: adaptation + mitigation;
EJ; tech + nature; land + ocean → Inspirational action!**

The Vatican Summit inspired regional summits. The first was in California last week.

Committee of Climate-Resilient California and Californians (CRC2) presents:



the Pontifical Academy of Sciences

the Pontifical Academy of Social Sciences

Climate Resilient California and Californians (CRC2)

A Regional Summit in California to Help Launch
the Pontifical Academy of Sciences
and Social Sciences' Global Initiative:
From Climate Crisis to Climate Resilience



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UC Berkeley

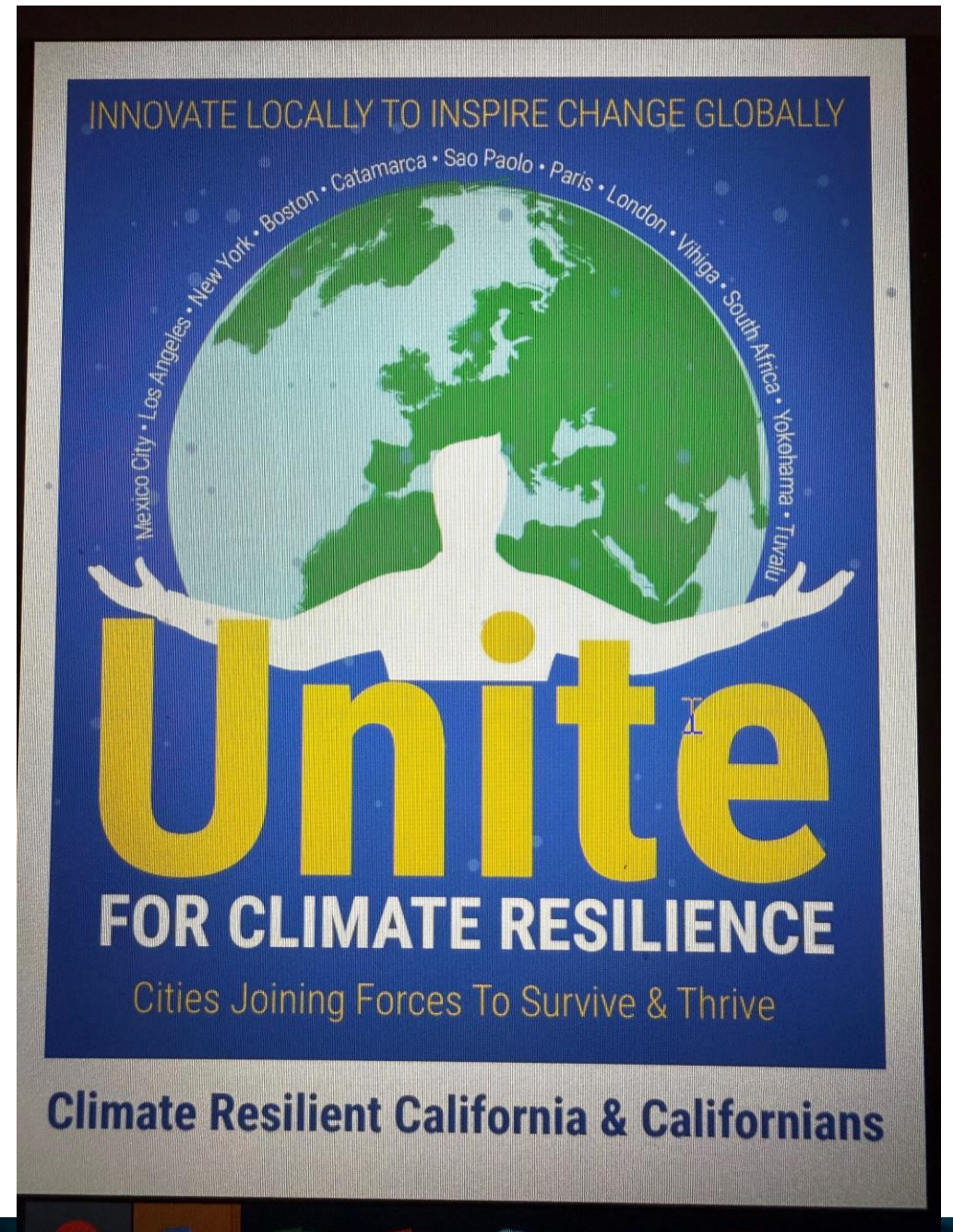
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A Regional Summit in California to Help Launch
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and Social Sciences' Global Initiative:
From Climate Crisis to Climate Resilience

Louise Bedsworth
David Ackerly
Dan Kammen
Alex Ken
Bella Santos

Climate Resilient California and Californians (CRC2)

1st of a series of
regional summits:
Mexico City, Los Angeles,
New York, Boston,
Catamarca, São Paulo,
Paris, London, Vihifa, South
Africa, Yokohama, Tuvalu





2017: “We are still in!”

2025: We can do this!”

Every fraction of a degree matters.

Every species matters.

Every person matters.

Agency. Urgency. Hope.