June 2025

Delta Synthesis Working Groups

A partnership between the Delta Science Program and National Center for Ecological Analysis and Synthesis (NCEAS)

Delta Science Program

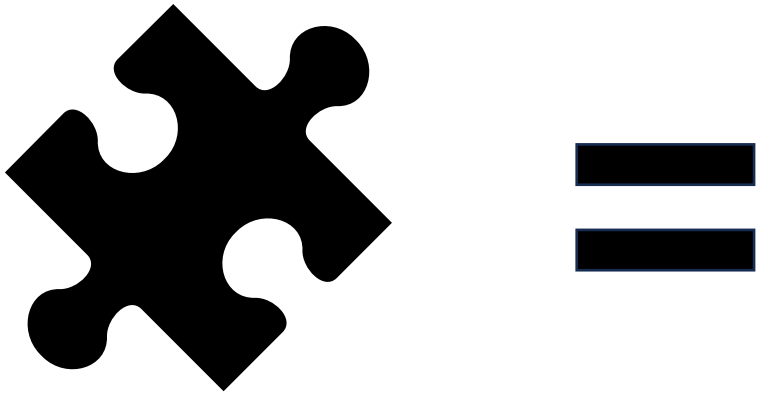
DELTA STEWARDSHIP COUNCIL

What is synthesis?

The process of combining
disparate data, information…

…to see the **bigger picture**
and gain **new insights.**

Most puzzle pieces come from monitoring survey data

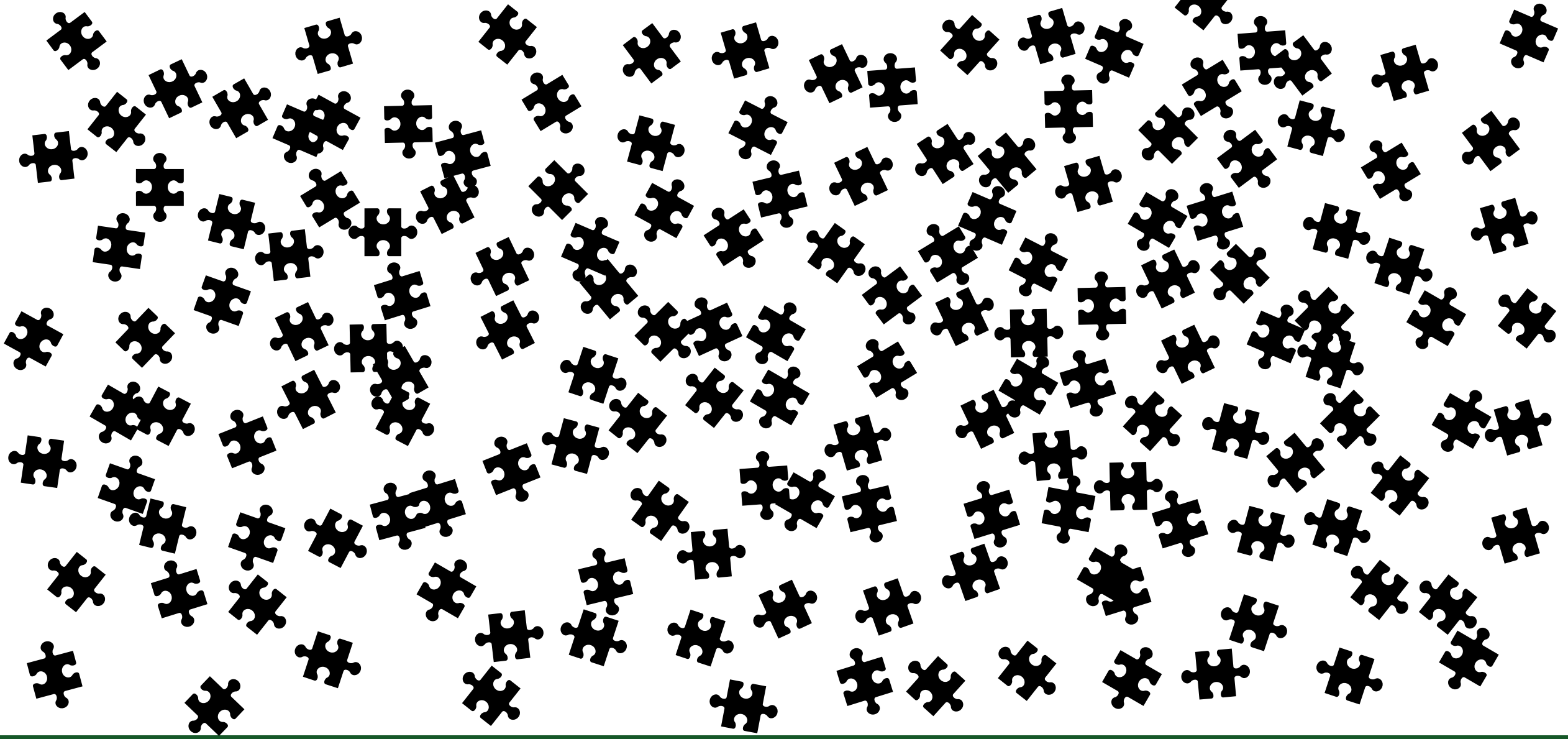


=

20mm Survey

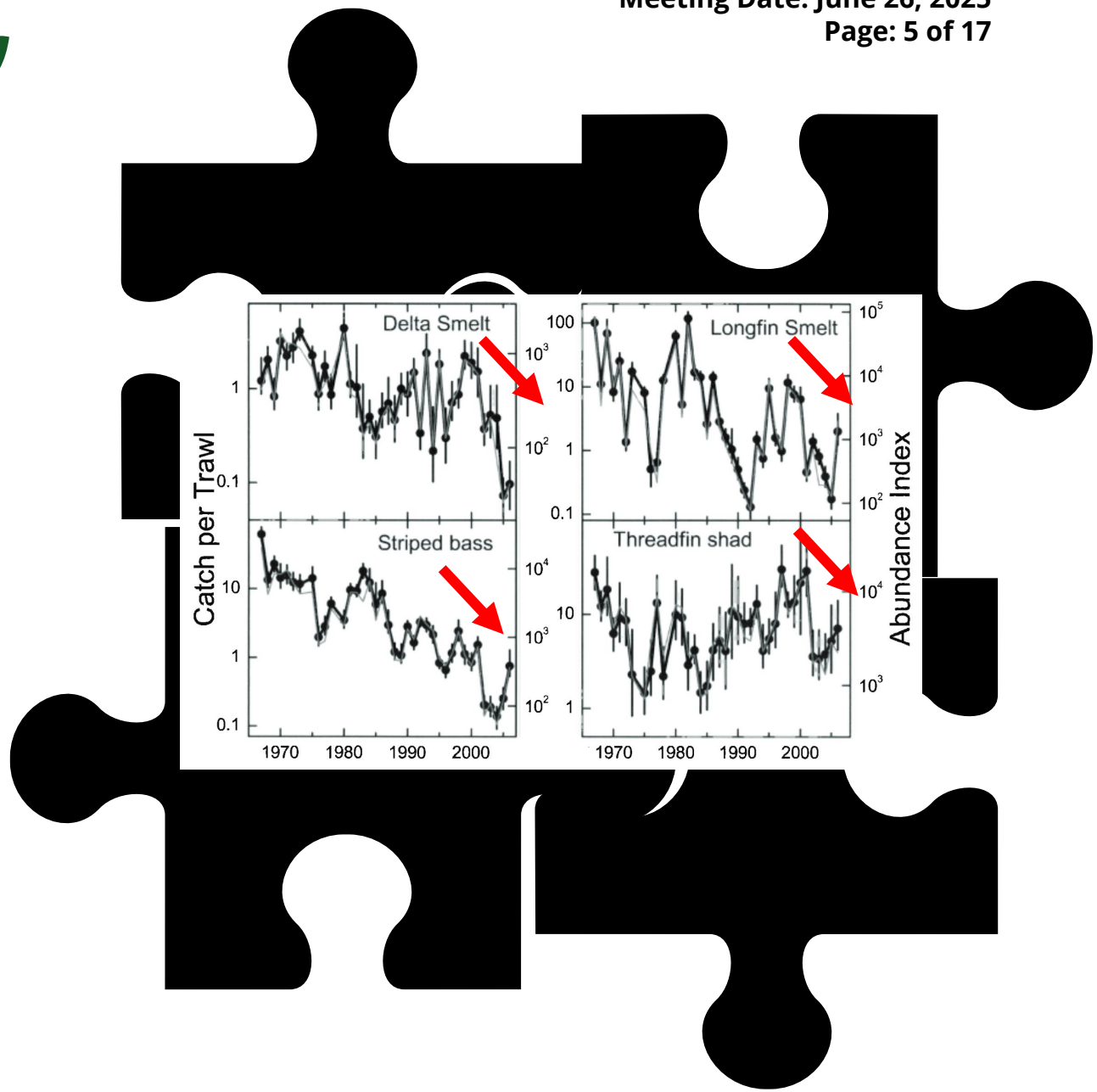
Source: IEP

The Delta has over 156 puzzle pieces!



A Synthesis Success Story

- Smelt Larval Study
- 20mm Survey
- Juvenile Fish
- Fall Midwater Trawl
- Spring Kodiak Trawl



Synthesis is a DSP Core Function

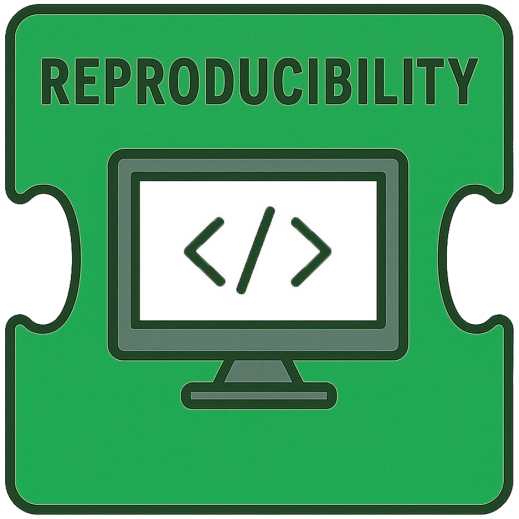
"The mission of the Delta Science Program shall be to ***provide the best possible unbiased scientific information*** *to inform water and environmental decisionmaking in the Delta […] through* ***synthesizing and communicating scientific information*** *to policymakers and decisionmakers…"*

2009 Delta Reform Act

Open science principles for synthesis

Open data

Data and information can be **found and used by anyone**, openly and without cost.



Open methods

Methods and statistical code are shared **transparently** so the work can be **replicated** by anyone.

Open collaborations

Participants from **diverse backgrounds**, **perspectives, disciplines, and ways of knowing** are involved in a research process.

National Center for Ecological Analysis and Synthesis (NCEAS)

- Established in 1995 at UC Santa Barbara
- Globally recognized institution for synthesis science
- 3 areas of focus: data science, research and training

Arctic Data Center

Our partnership with DataONE and the National Centers for Environmental Information at the National Oceanic and Atmospheric Administration (NOAA) to increase the accessibility of Arctic data.

Western Wildfire Resilience Index

Modeled after the Ocean Health Index, the WWRI will provide holistic assessment of the US and Canadian West's resilience to wildfires.

Gulf Ecosystem Initative

Our partnership with the NOAA RESTORE team seeks to solve pressing problems across climate change, fisheries, and natural resource management in the Gulf of Mexico.

Long Term Ecological Research (LTER) Network Office

NCEAS operates the Long Term Ecological Research (LTER) Network Office, the hub for LTER synthesis research, education, and outreach activities.

NCEAS learning hub

https://deltacouncil.ca.gov/delta-science-program/science-synthesis-working-group

Delta Synthesis Working Group Goals

1. **Provide high-quality training** in data science and statistical techniques to researchers from a range of disciplines working in the Bay-Delta;

2. **Support participants in directly applying new skills** i**n synthesis projects** to produce meaningful outputs that advance our state of knowledge; and

3. **Create a venue for enhanced collaboration** between researchers from state and federal agencies, non-governmental organizations, and academia.

Delta Science Program
DELTA STEWARDSHIP COUNCIL

NCEAS

Delta Synthesis Working Groups

3 weeks

DATA SCIENCE TRAININGS

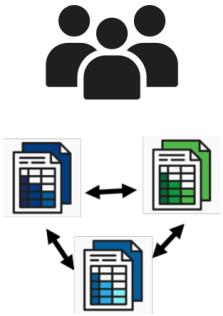
RESEARCH QUESTIONS

What factors affect Delta **food webs**?

What are the **social benefits** and **impacts** of **restoration**?

What are **social**, **economic**, and **ecological** costs and benefits of **levees**?

GROUPS INTEGRATE & ANALYZE DATA



Delta Synthesis Working Groups

3 weeks | 1-2 years

DATA SCIENCE TRAININGS

RESEARCH QUESTIONS

What factors affect Delta **food webs**?

What are the **social benefits** and **impacts** of **restoration**?

What are **social**, **economic**, and **ecological** costs and benefits of **levees**?

GROUPS INTEGRATE & ANALYZE DATA

PRODUCTS

Training curriculum

Integrated datasets

Publications of insights

IMPACTS

Enhanced capacity for synthesis science

Addressed knowledge gaps

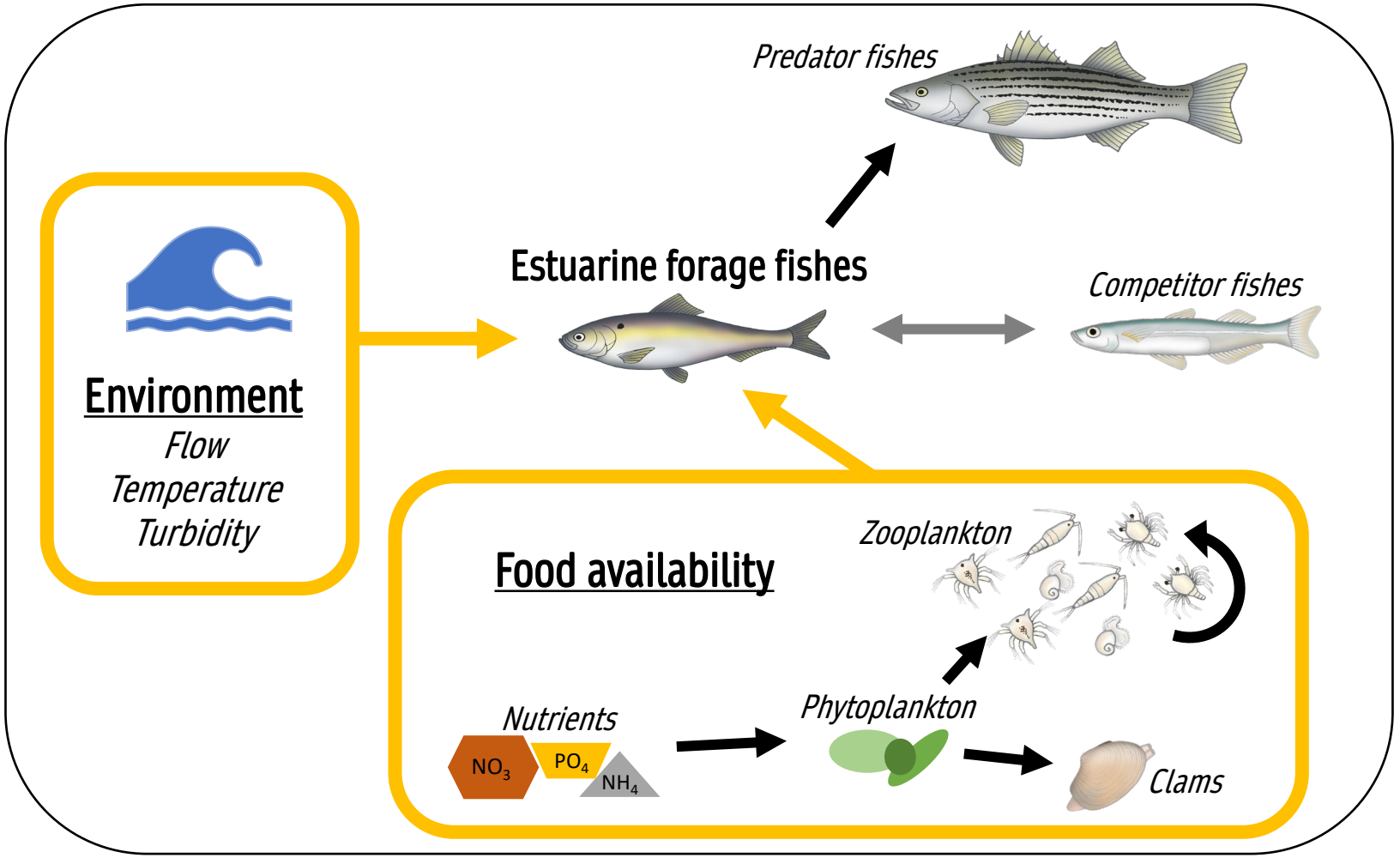
Strengthened collaborative networks

2021: Drivers of the estuarine food supply

40+ years of data from 7 monitoring surveys analyzed to model the estuary's food web

Key takeaway:

Environmental conditions and food availability have **similar effects** on prey fish abundance



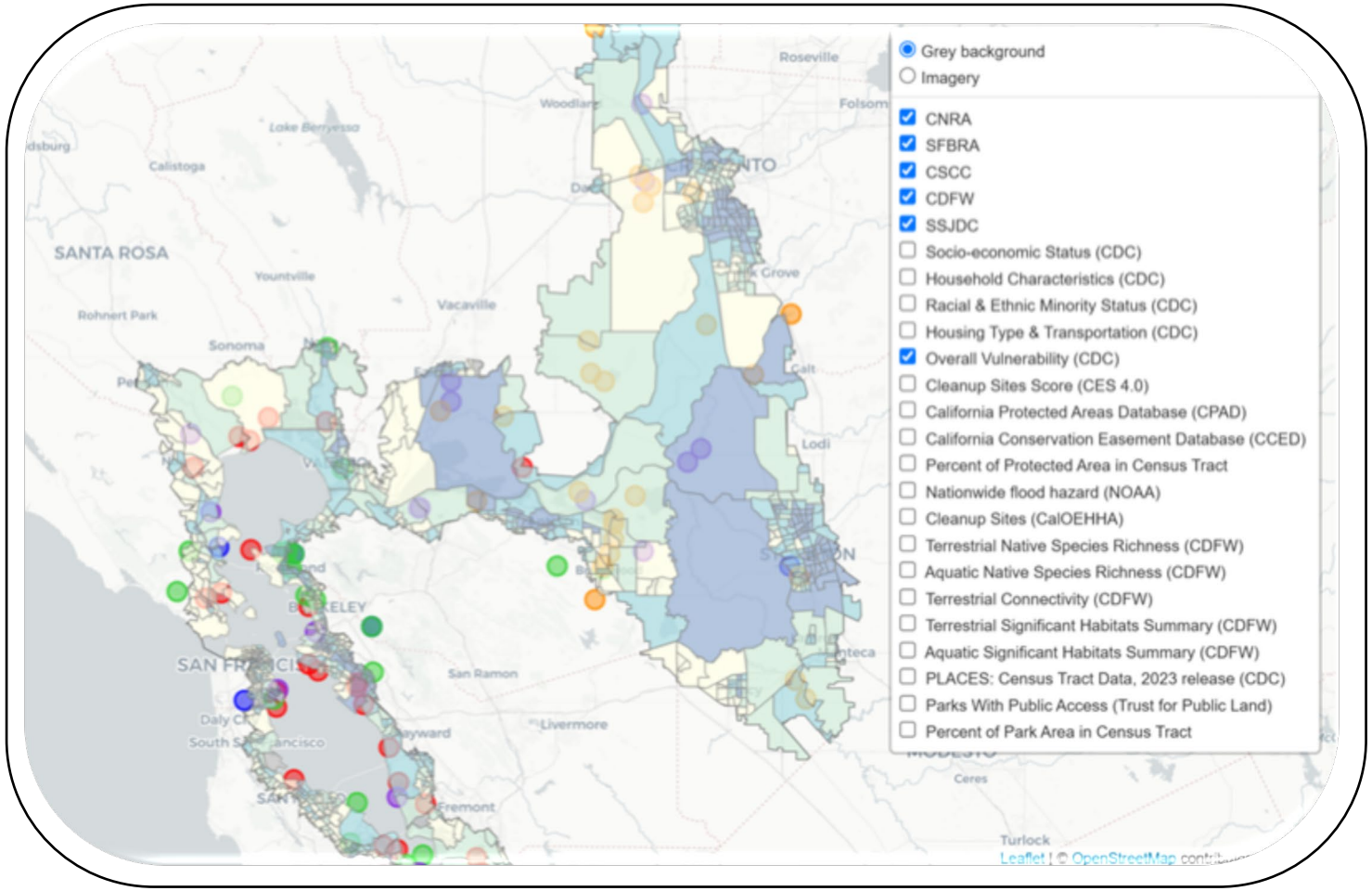
Rogers et al. 2024. Evaluating top-down, bottom-up, and environmental drivers of pelagic food web dynamics along an estuarine gradient. Ecology.
https://doi.org/10.1002/ecy.4274

2023: Managing the Delta as a social-ecological system

60+ restoration projects evaluated for environmental goals and **social benefits** and **impacts**

Key questions:

- What are social-ecological benefits of Delta restoration projects?
- How do restoration projects fill social equity needs and gaps?



Who has participated?

Delta Stewardship Council
A CALIFORNIA STATE AGENCY

CALIFORNIA Water Boards

UCDAVIS
UNIVERSITY OF CALIFORNIA

U.S. FISH & WILDLIFE SERVICE

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

UCMERCED

OEHHA
SCIENCE FOR A HEALTHY CALIFORNIA

NOAA FISHERIES

DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

San Francisco ESTUARY PARTNERSHIP

Berkeley
UNIVERSITY OF CALIFORNIA

USGS
science for a changing world

BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

UC SANTA CRUZ

BUREAU OF RECLAMATION

Participant takeaways

"I wish everyone who worked with scientific data would take this course."

"This workshop has been so great at improving my R skillset."

"The tools we learned are directly applicable to the synthesis analyses that are needed for ecological/social-justice-focused Bay-Delta management."

What's next

New for 2025!

Call for participants

An open invitation for anyone to share their interest in obtaining data science skills

Call for ideas

Seeking input on priority topics for which existing, publicly available data can be leveraged to inform Bay-Delta management needs

Thank you

Connect with us

Scan the QR code to subscribe to our listserv

Deltacouncil.ca.gov

@DeltaCouncil

@deltastewardshipcouncil

Delta Stewardship Council

@deltastewardshipcouncil