

10 October 2025

5th Annual HPU Sea Turtle Workshop

Hawai'i Pacific University | Honolulu, Hawai'i

Emerging Insights from the **STRETCH Project:**

Juvenile North Pacific Loggerheads As Sentinels of Ocean Change

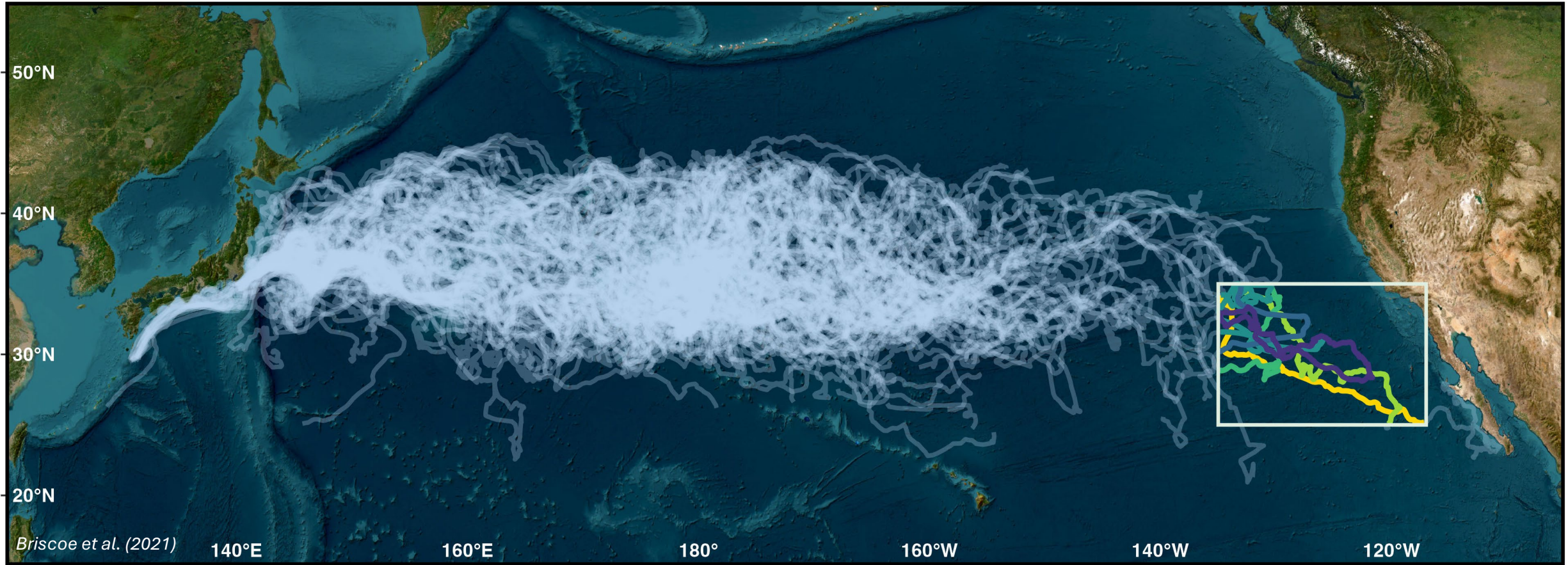


Dana K. Briscoe

Stanford University | dana.briscoe@stanford.edu

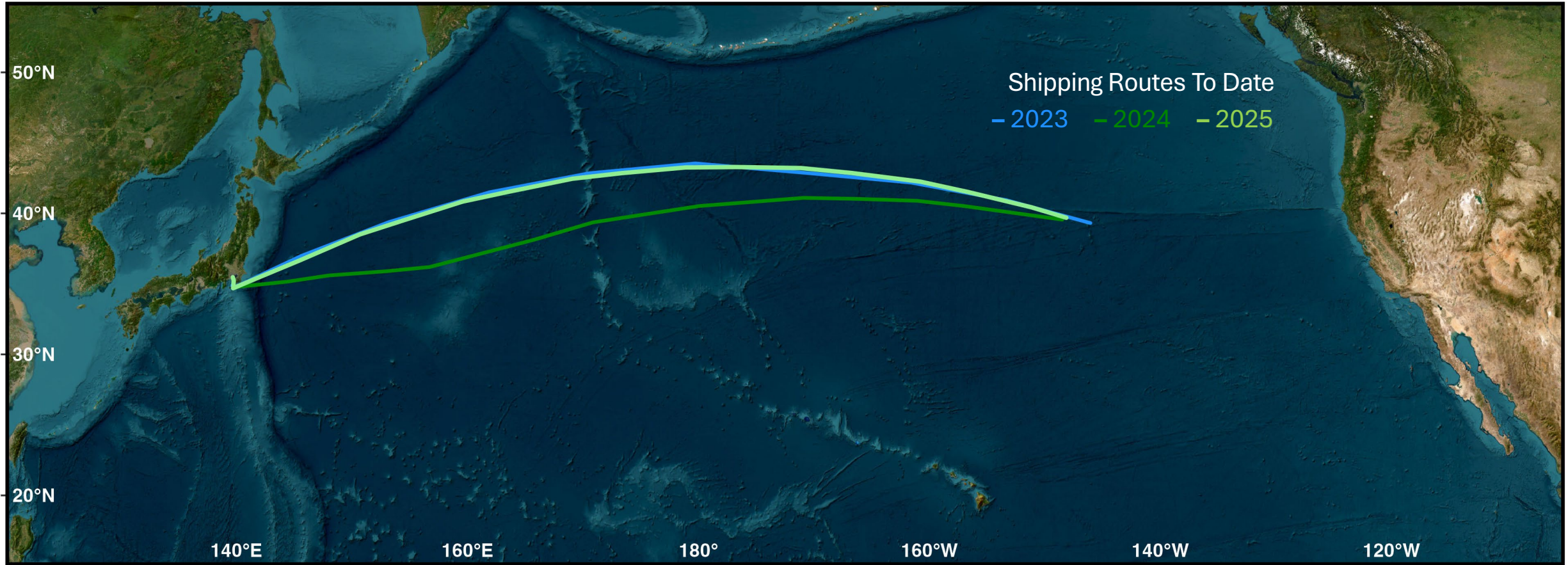


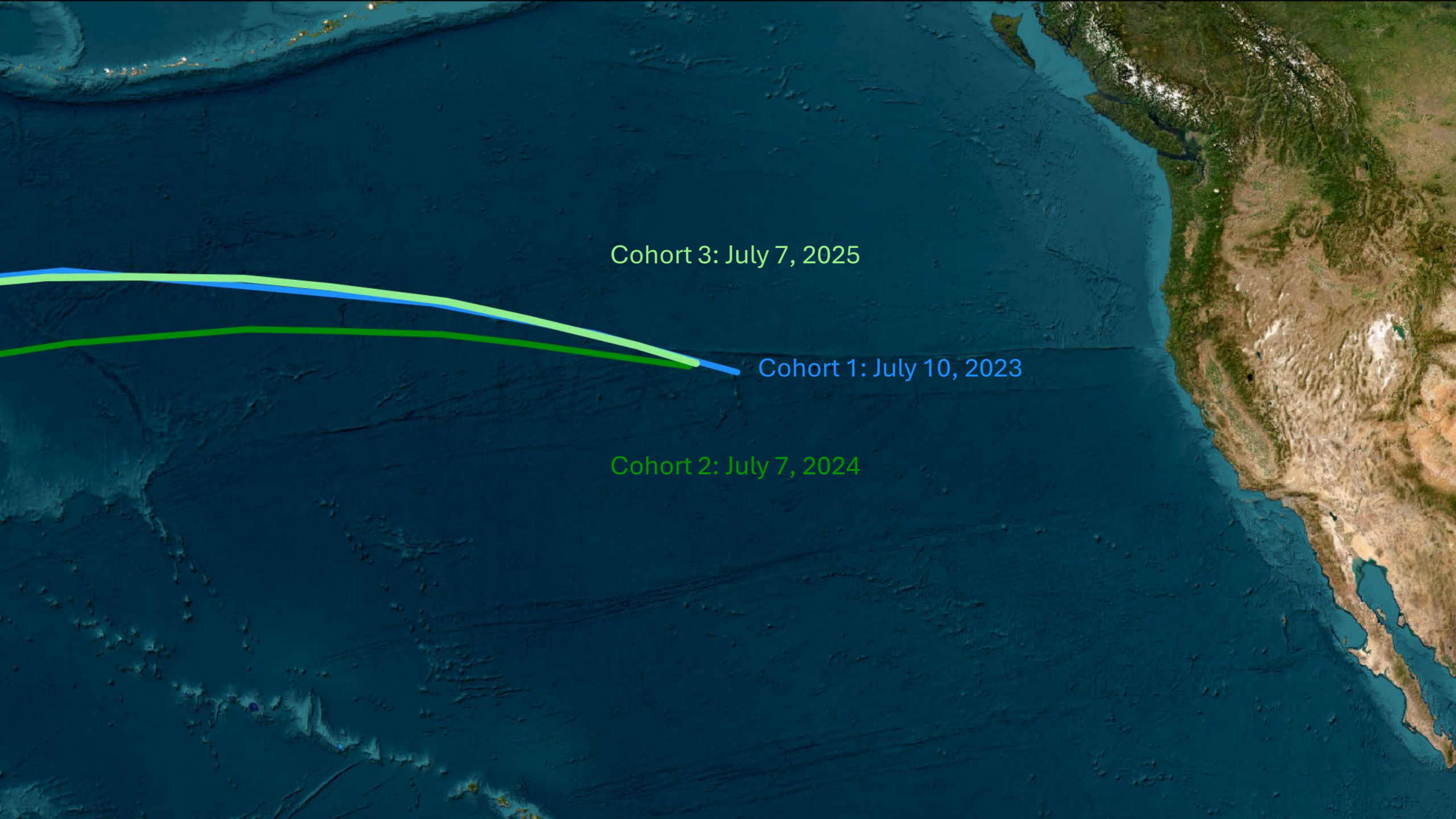
The Thermal Corridor Hypothesis



Satellite Tracks of Juvenile North Pacific Loggerhead Sea Turtles (n=231, 1997 – 2013)

STRETCH | Sea Turtle Research Experiment on the Thermal Corridor Hypothesis



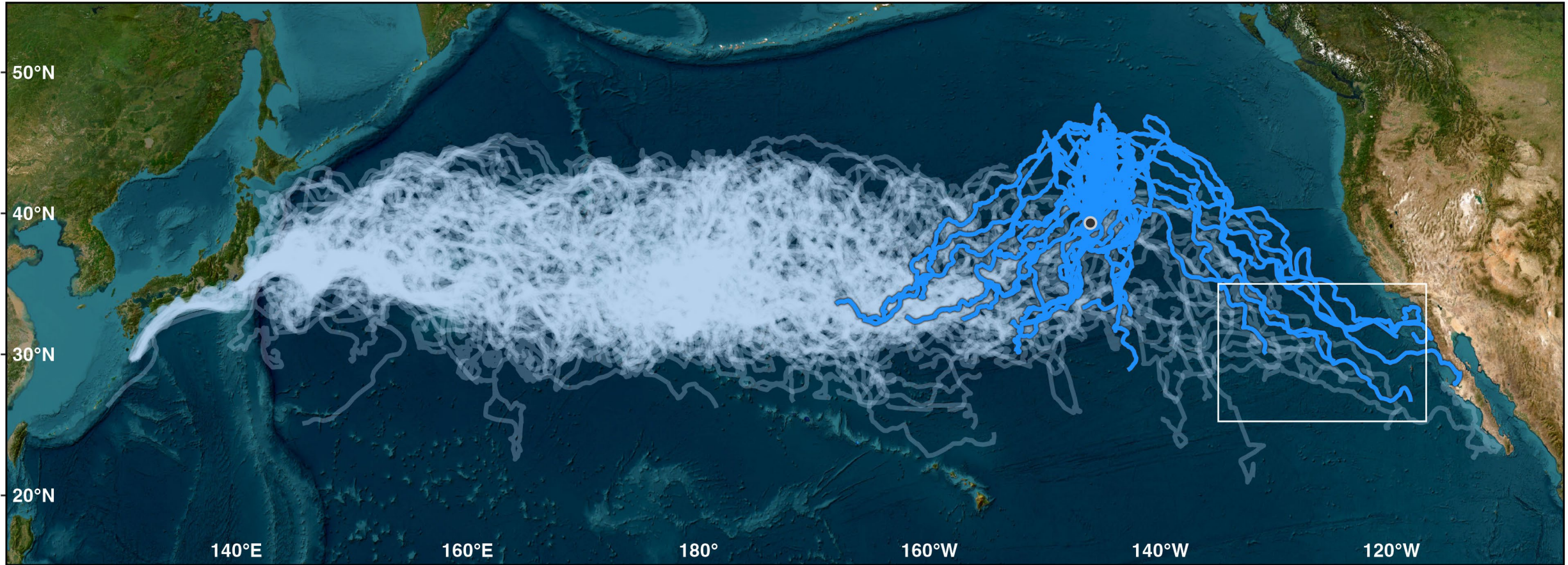


Cohort 3: July 7, 2025

Cohort 1: July 10, 2023

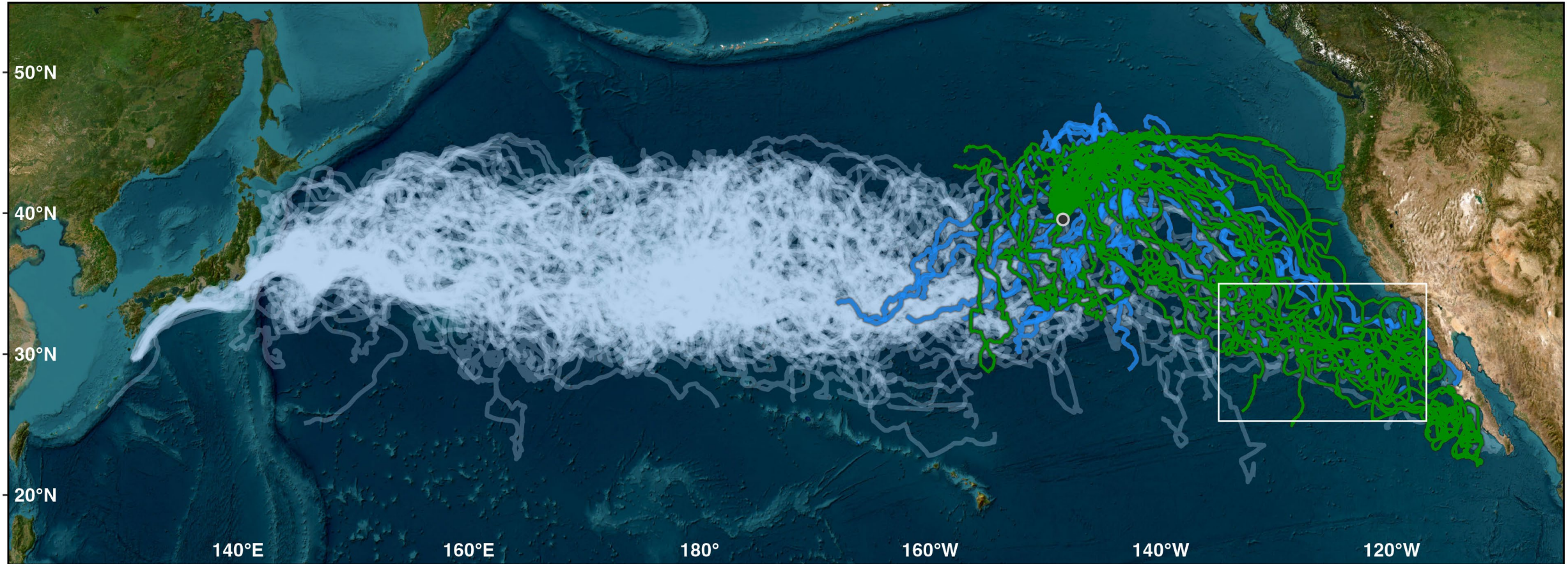
Cohort 2: July 7, 2024

STRETCH | Cohort 1: July 2023 – April 2024



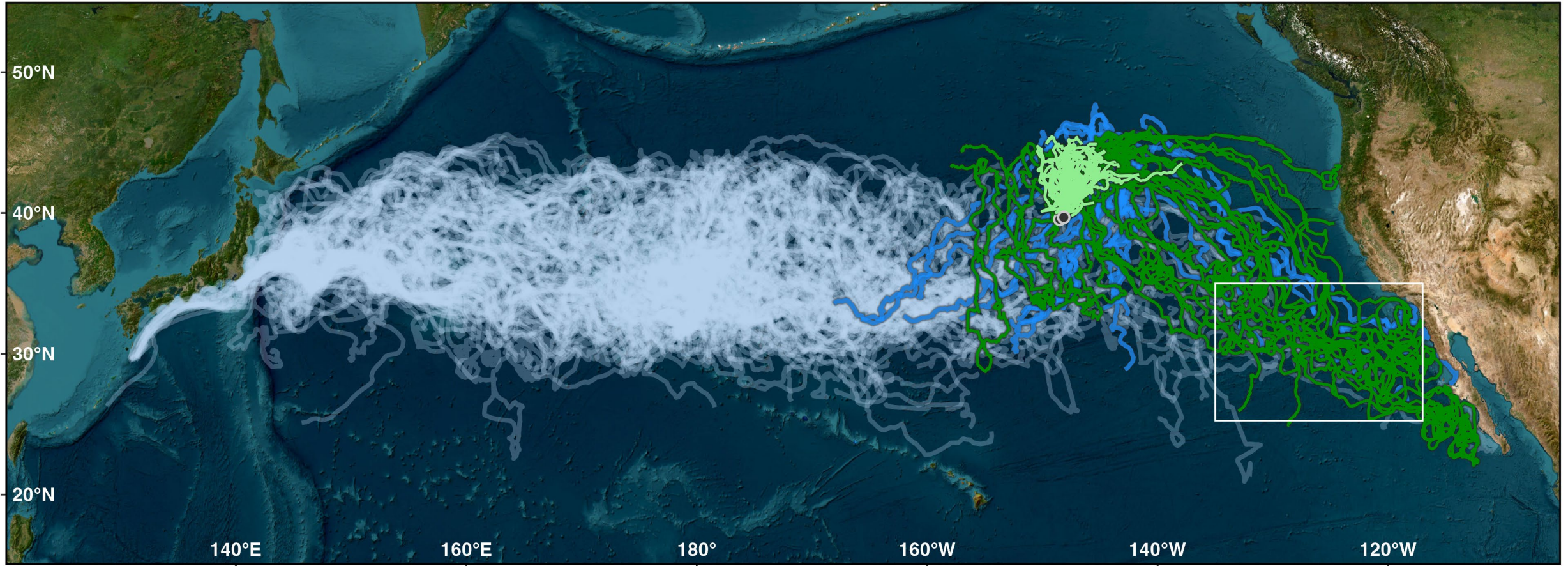
Total Transmission Days: 267

STRETCH | Cohort 2: July 2024 - Present



Total Transmission Days: 461... and counting!

STRETCH | Cohort 3: July 2025 - Present



Total Transmission Days: 96... and counting!

What have we learned so far?

Summary

- 1) The ocean has changed
- 2) Multi-decade northward shift in turtle habitat
- 3) New migratory pathways by individuals



Result:

Juvenile loggerheads have emerged as a **sentinel species**, signaling North Pacific Ocean ecosystem change

Summary

- 1) The ocean has changed
- 2) Multi-decade northward shift in turtle habitat
- 3) New migratory pathways by individuals



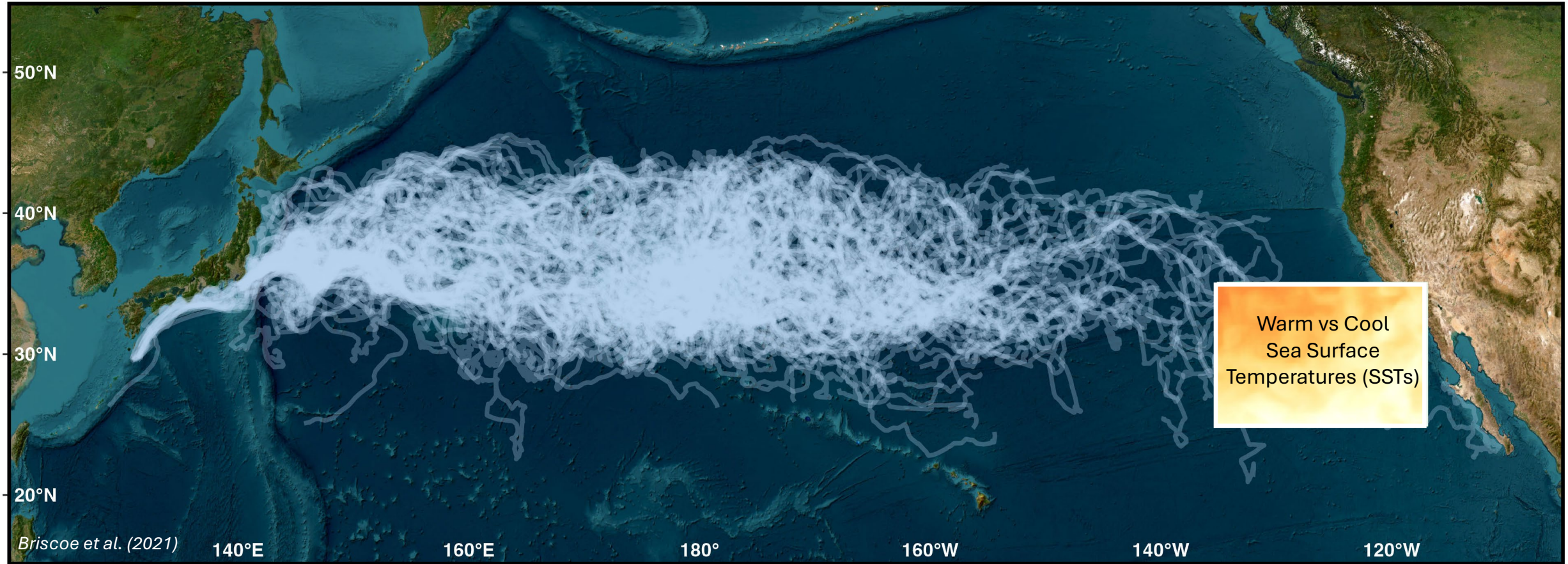
Result:

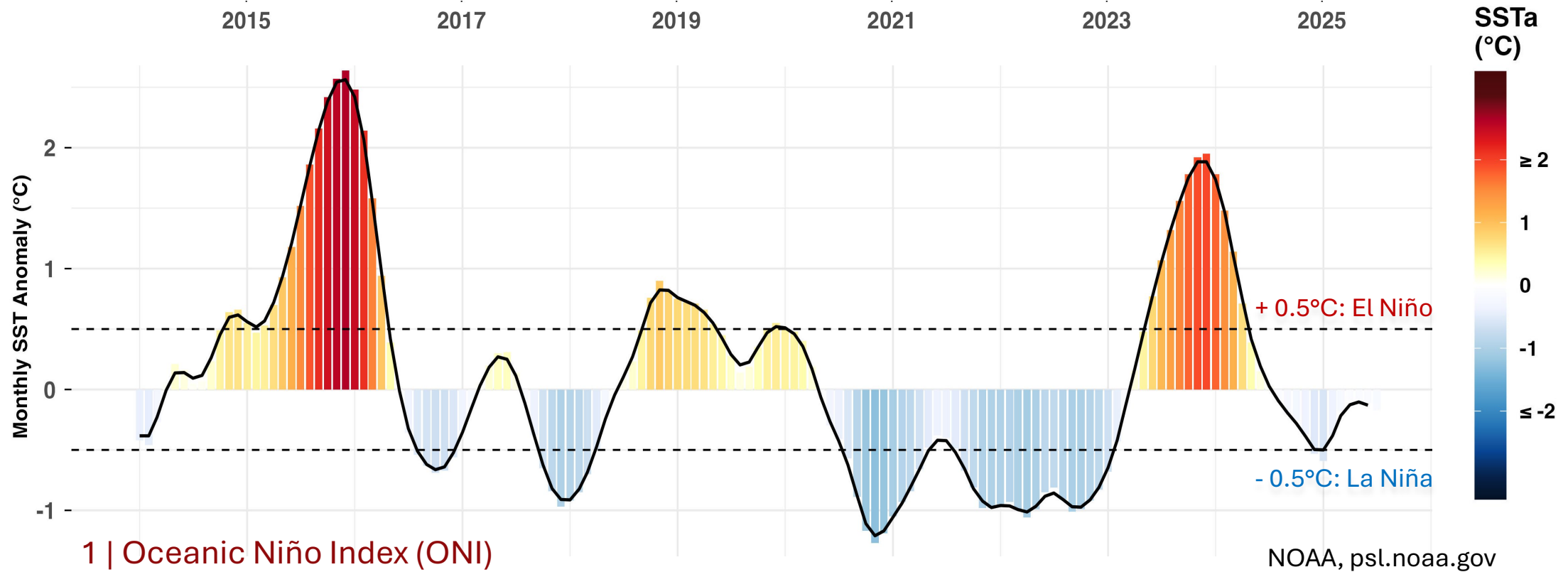
Juvenile loggerheads have emerged as a **sentinel species**, signaling North Pacific Ocean ecosystem change

Research Publications & More! <https://georgehbalazs.com/>

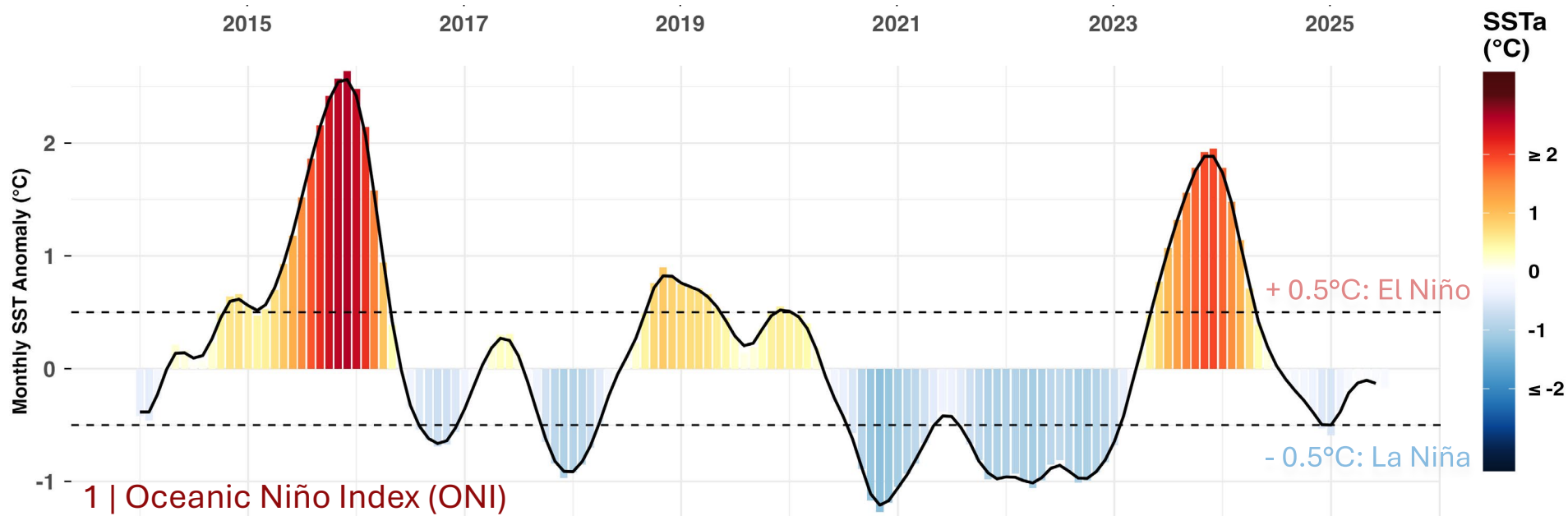
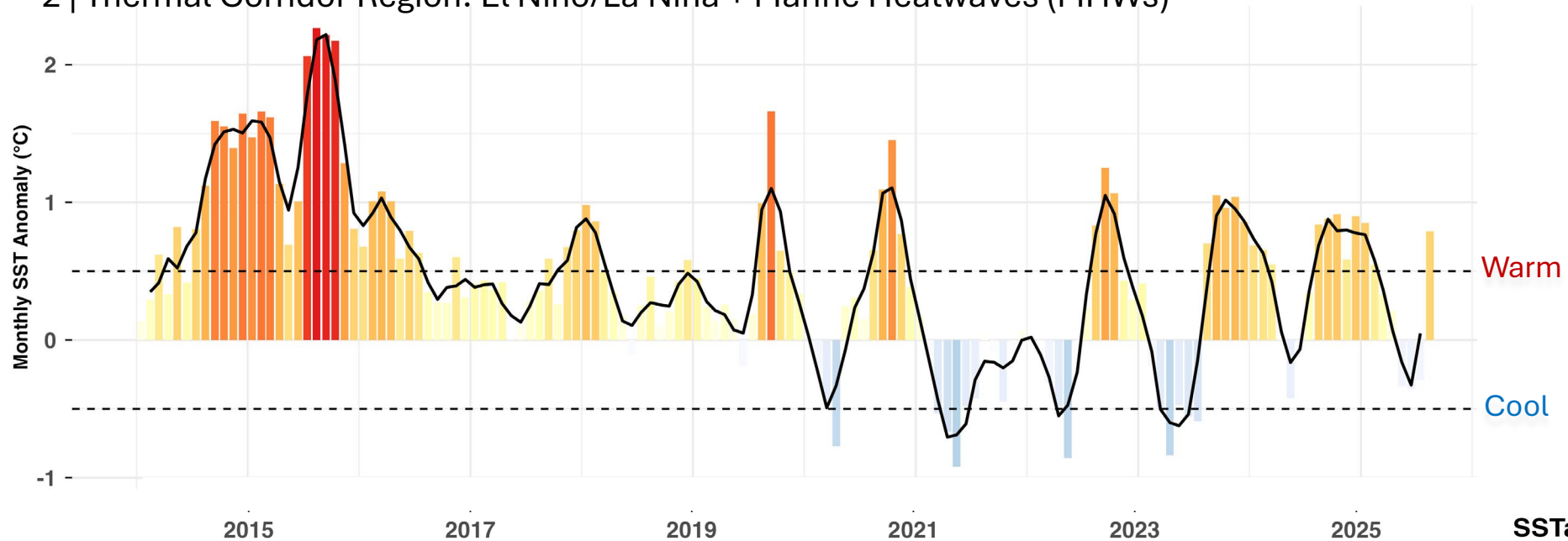
Photo Credit : Ralph Pace

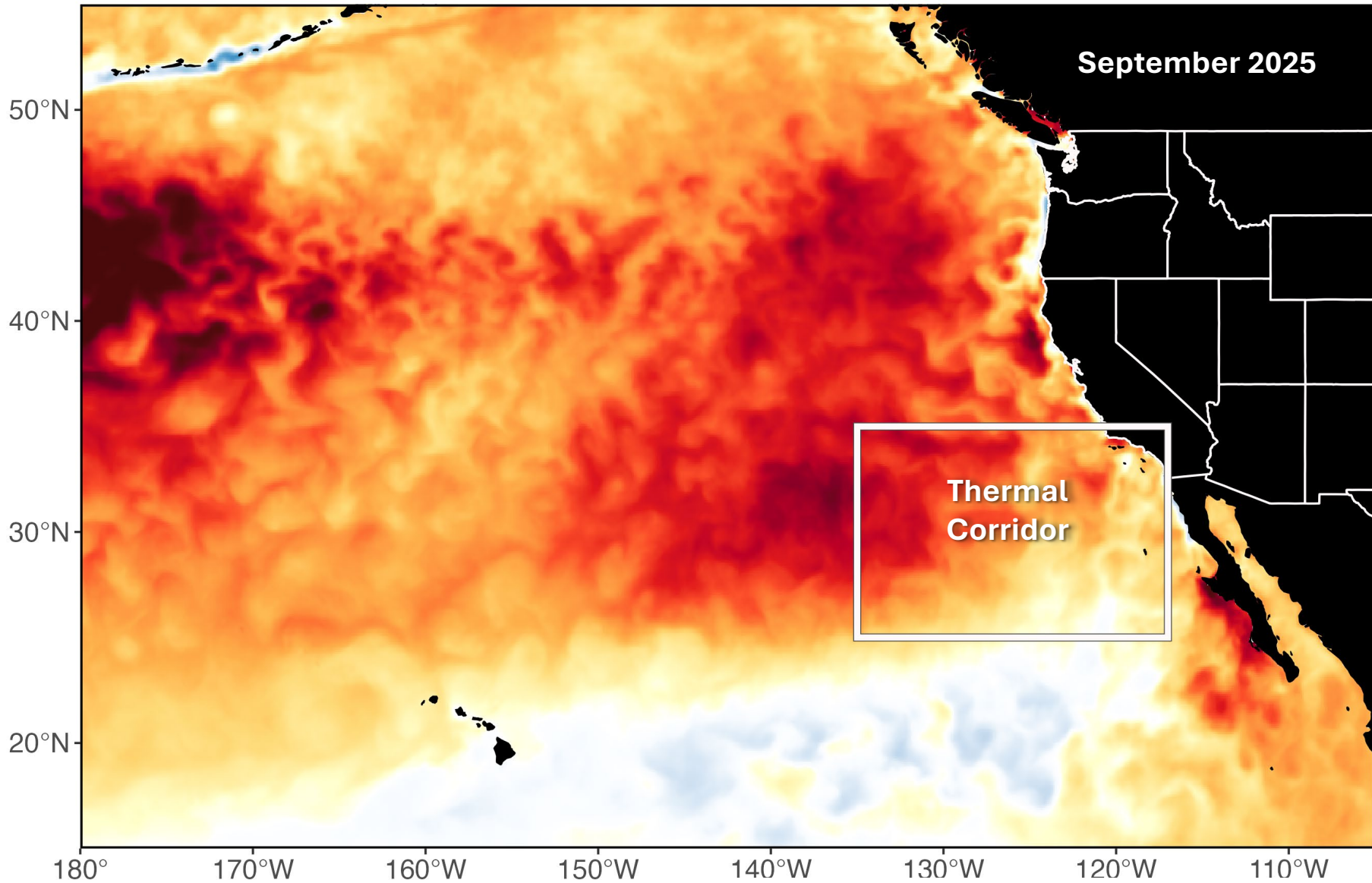
The Thermal Corridor Hypothesis



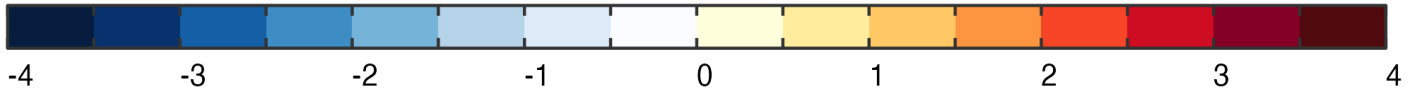


2 | Thermal Corridor Region: El Niño/La Niña + Marine Heatwaves (MHWs)

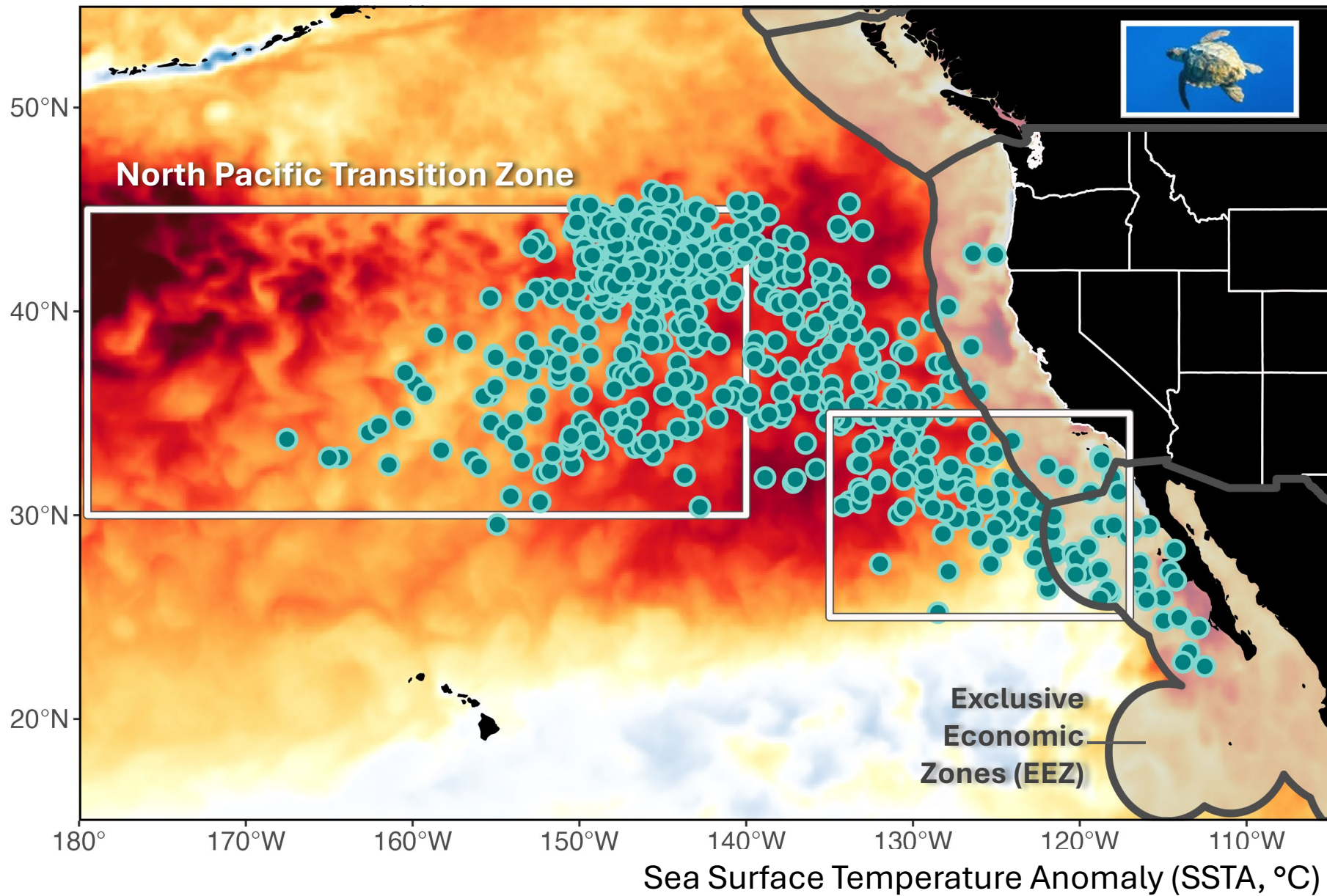




Sea Surface Temperature Anomaly (SSTA, °C)

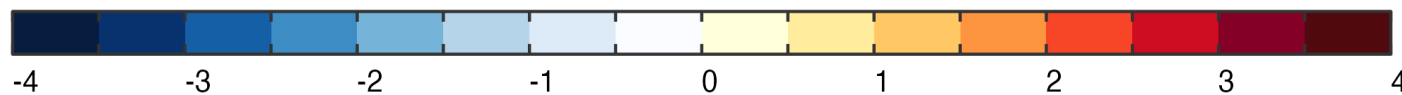


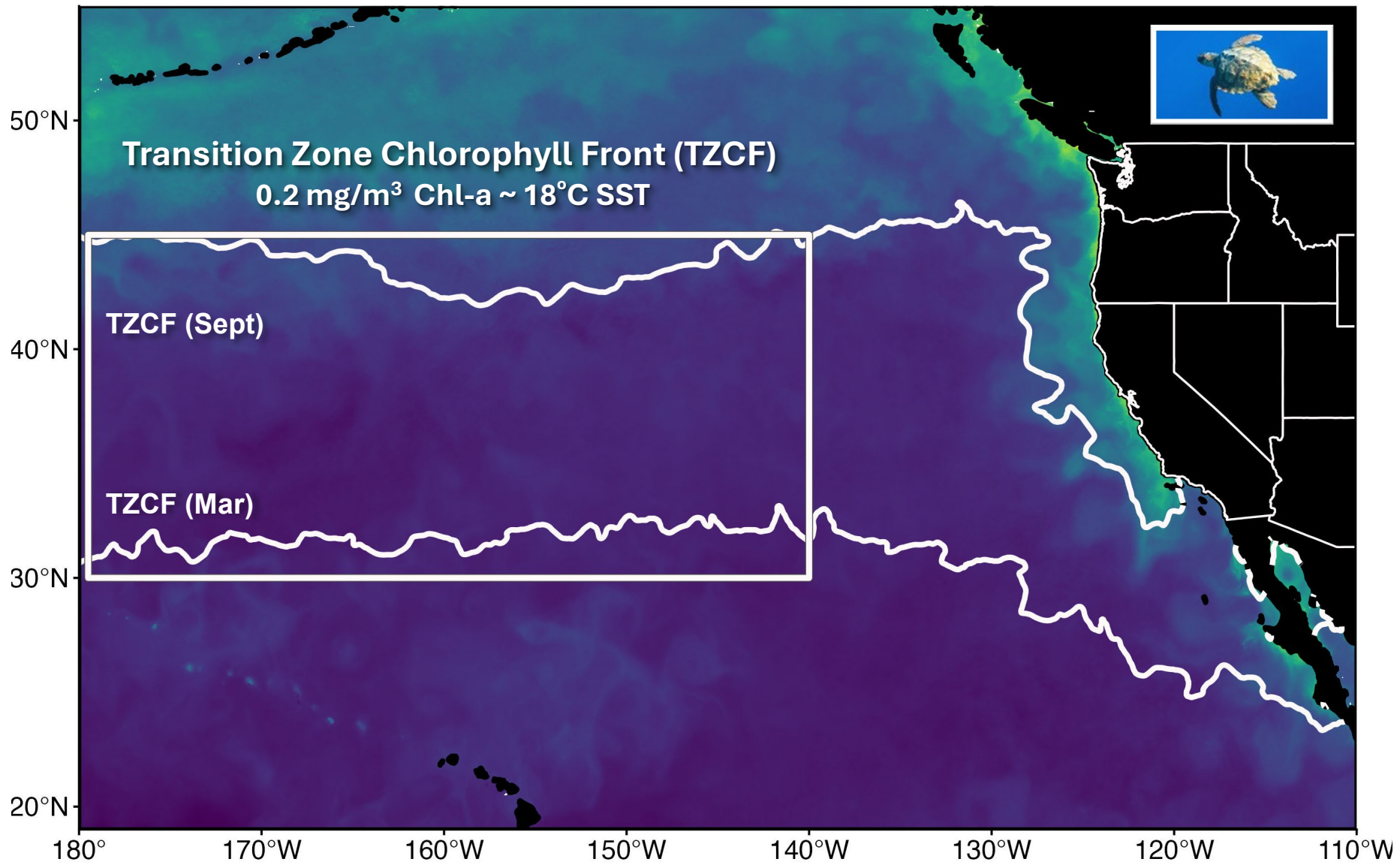
Data source:
NOAA, Coral Reef Watch
Monthly, 5km



**STRETCH
Cohorts 1-3**

● Monthly positions



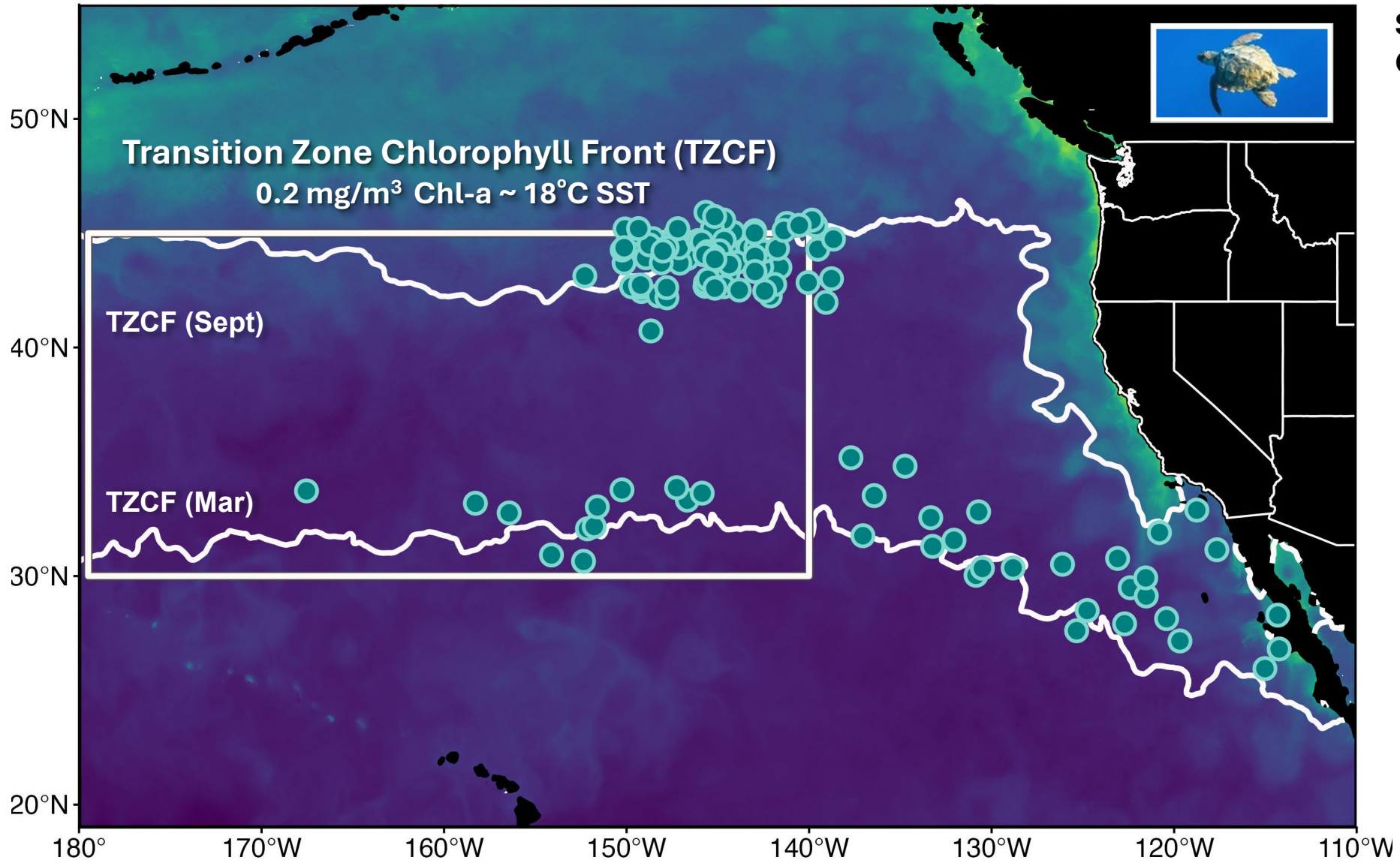


For more on TZCF:
 Polovina et al.
 (2001; 2008; 2017)

Chlorophyll-a (mg/m³)



Data source:
 Copernicus Global Ocean
 Colour L4, Monthly, 4km



**STRETCH
Cohorts 1-3**

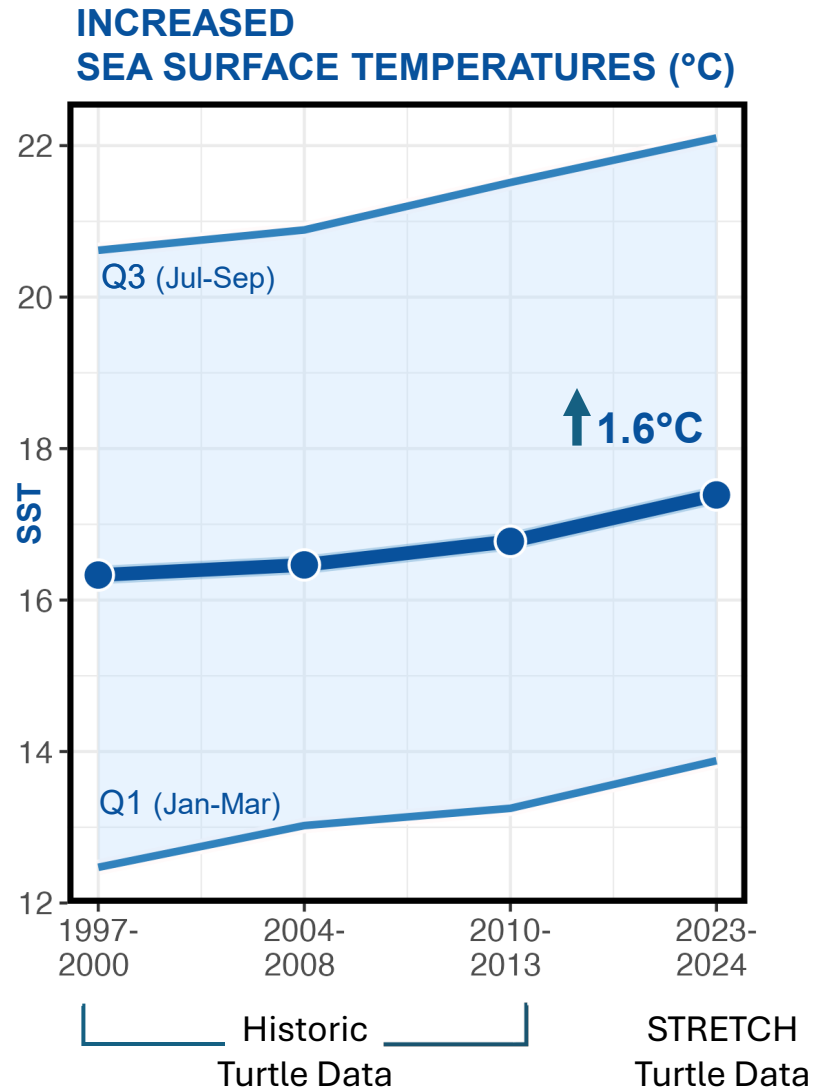
- March & September positions



*For more on TZCF:
Polovina et al.
(2001; 2008; 2017)*

Data source:
Copernicus Global Ocean
Colour L4, Monthly, 4km

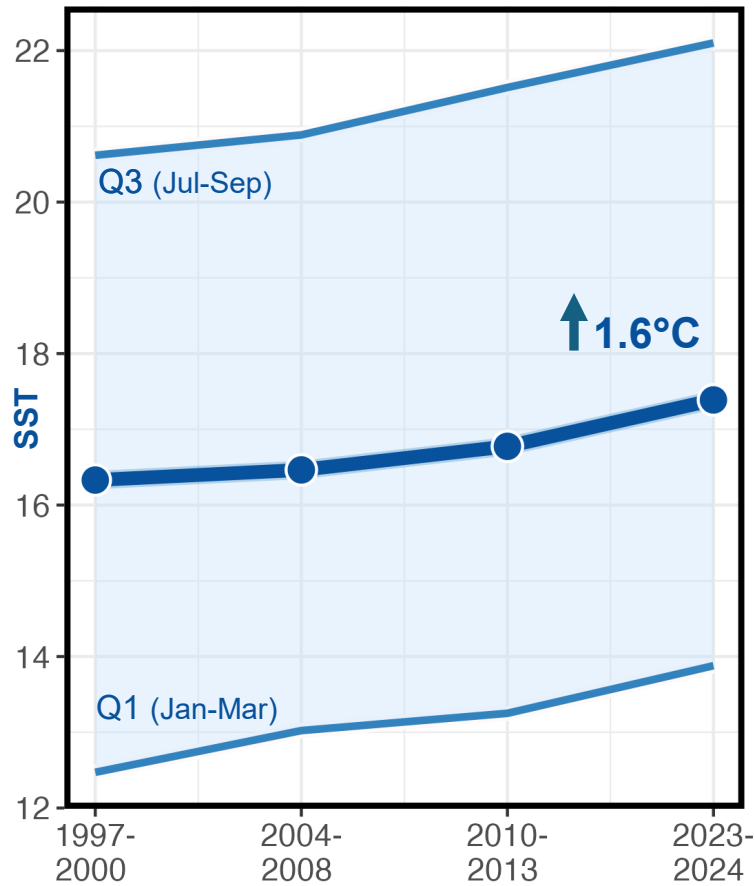
Multi-decade Shift in the Eastern North Pacific



Multidecade Shift in the Eastern North Pacific

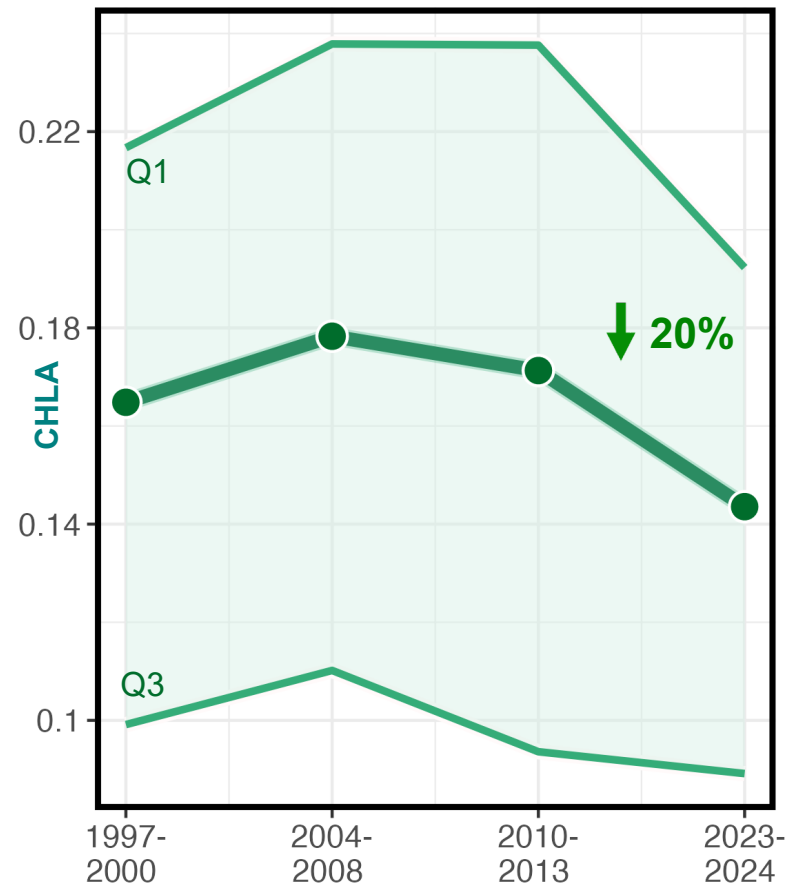


**INCREASED
SEA SURFACE TEMPERATURES (°C)**



Historic Turtle Data STRETCH Turtle Data

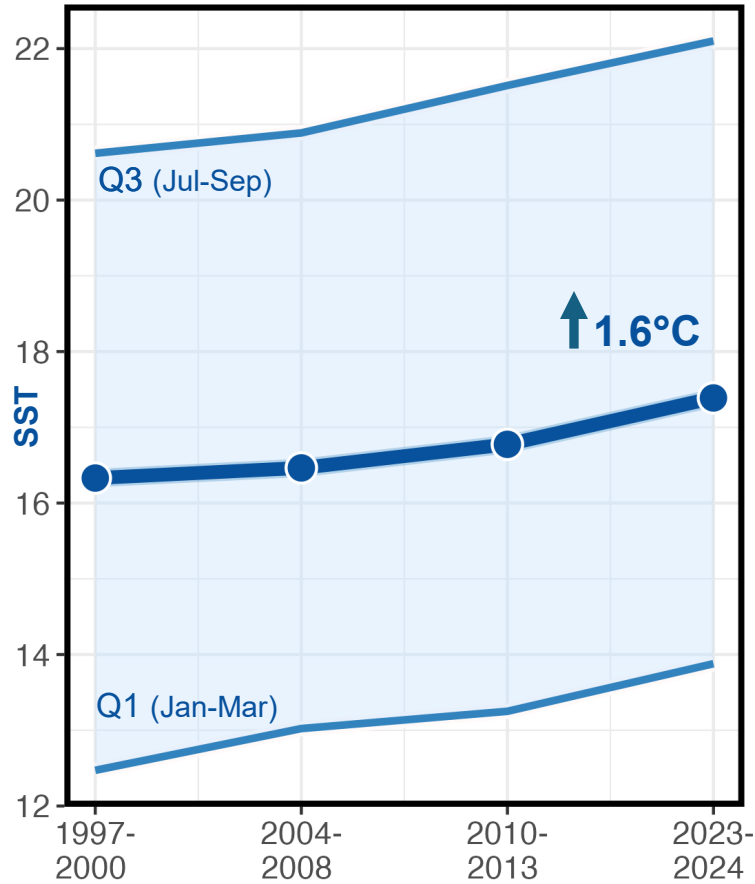
**DECREASED
CHLOROPHYLL-A (mg/m³)**



Year Group

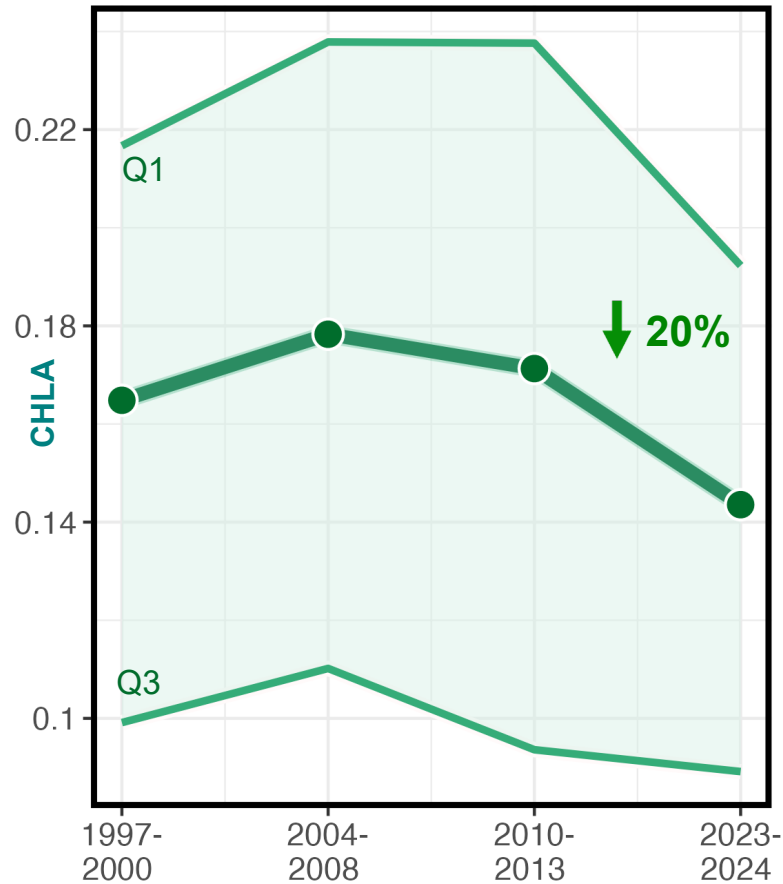
Multidecade Shift in the Eastern North Pacific

**INCREASED
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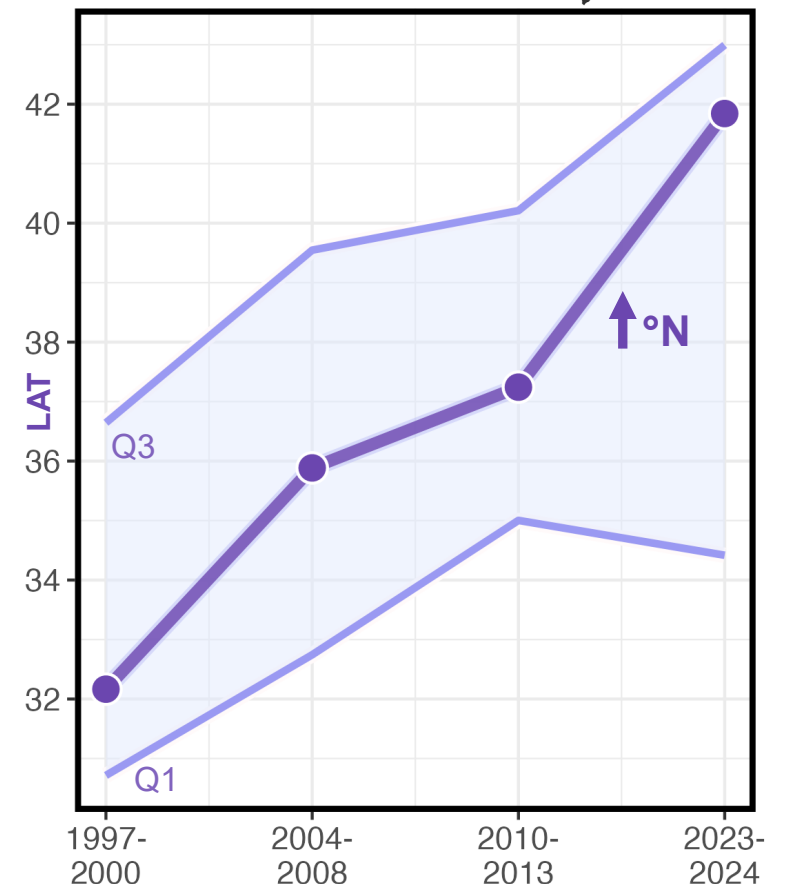
Historic Turtle Data STRETCH Turtle Data

**DECREASED
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Year Group

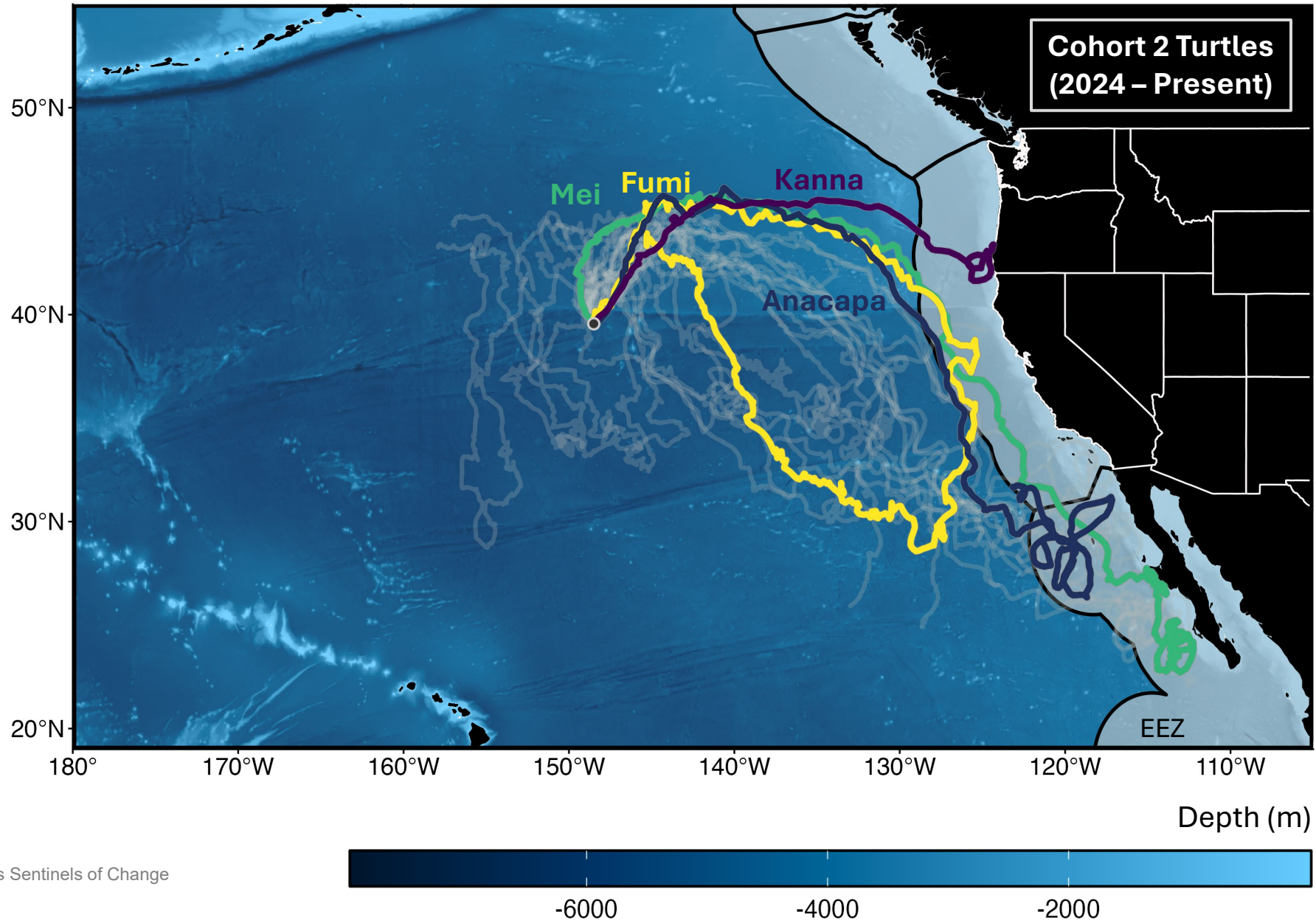
**NORTHWARD
JUVENILE LOGGERHEAD LATITUDES (°N)**





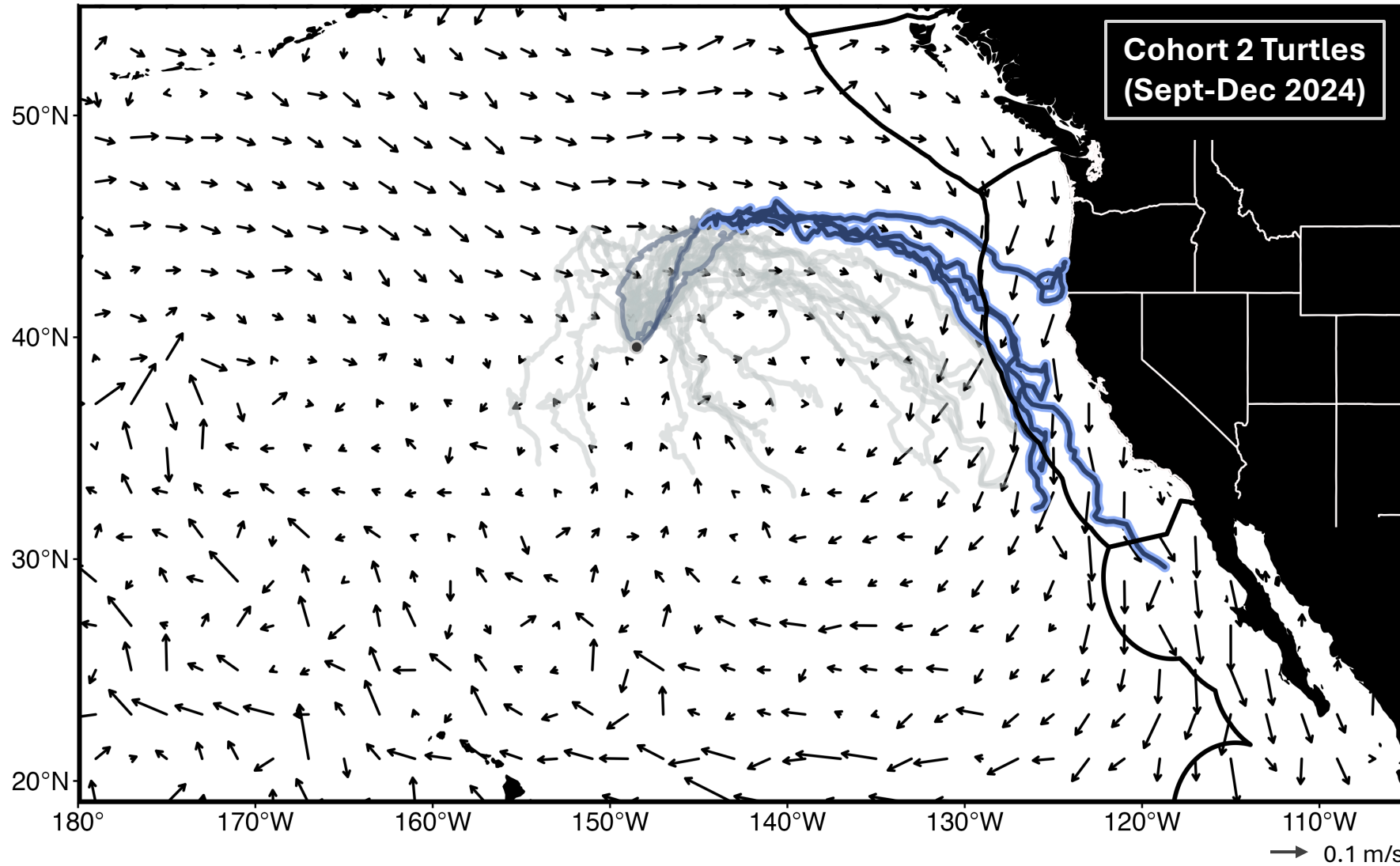
*Photo:
Yuki Oshima,
Port of Nagoya Public Aquarium*

Four More Sentinel Turtles 🐢



*For more
loggerheads in the
CA Current:
Early-Capistrán et
al, 2024;
Eguchi et al. 2018*

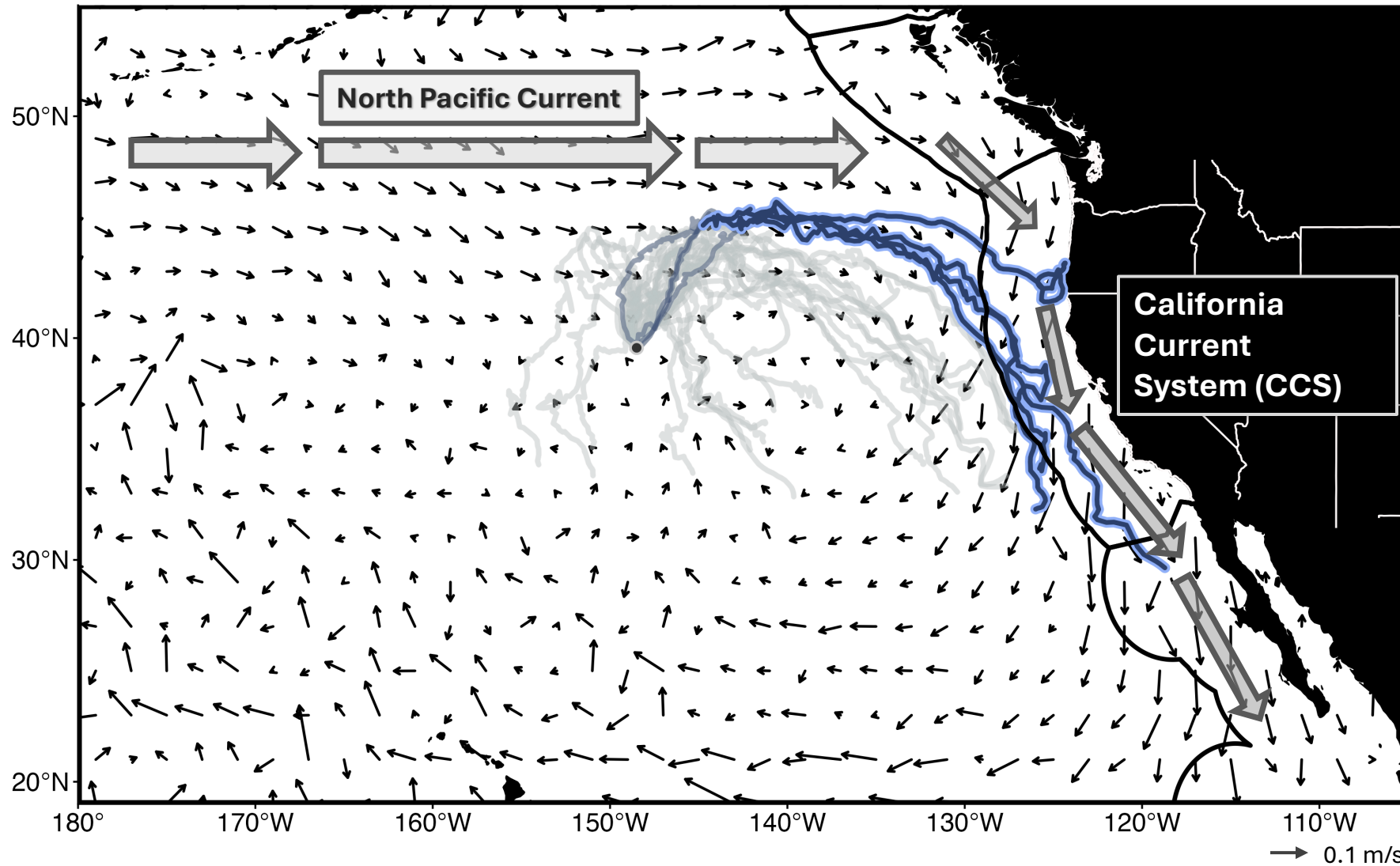
Four More Sentinel Turtles & Surface Currents



*For more loggerheads
& currents:
Gaspar et al. 2025*

Data source:
Copernicus Global Total
Current, Monthly, 0.25°

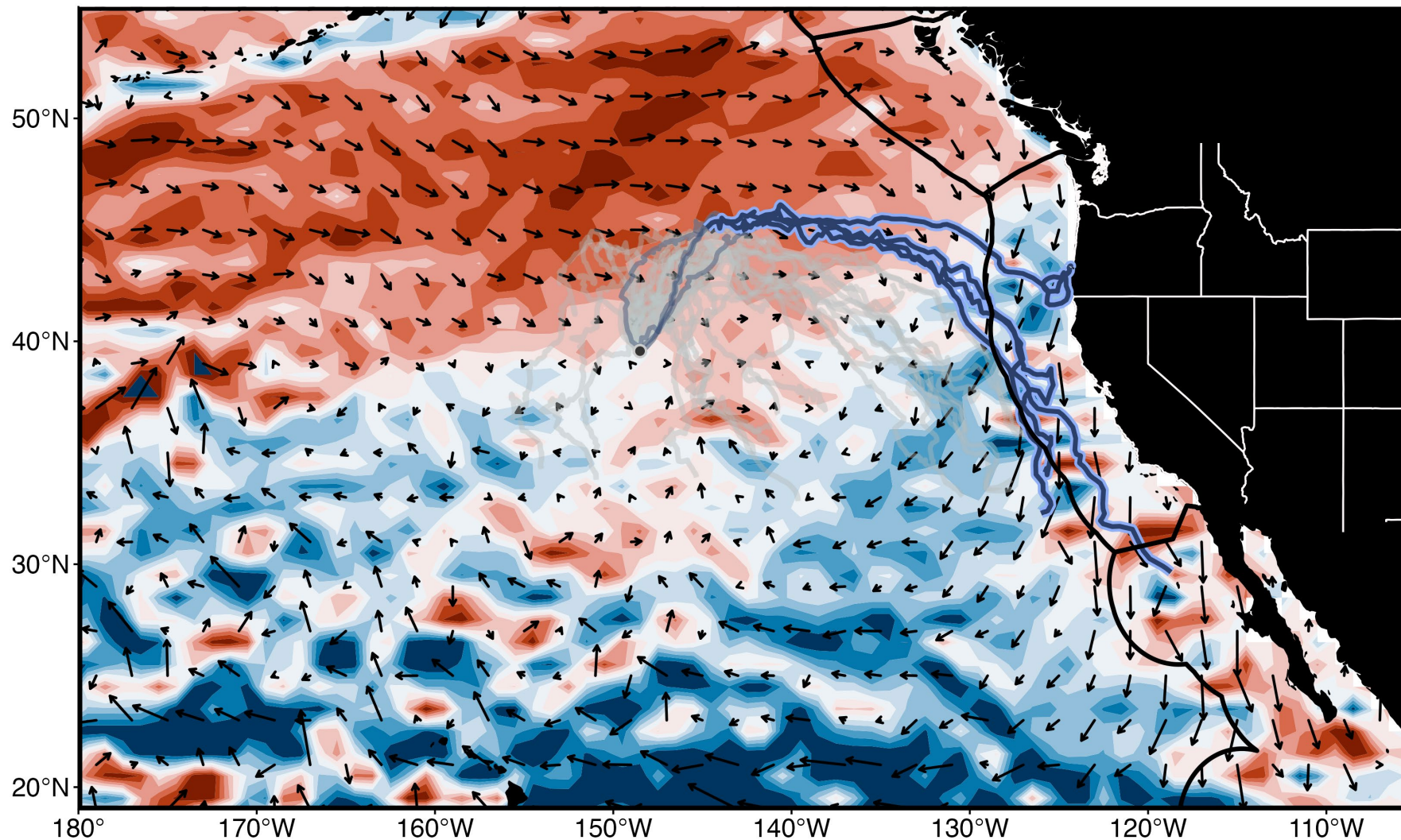
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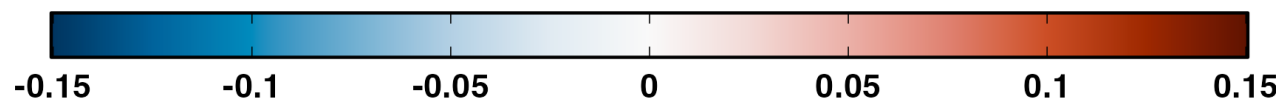
Data source:
Copernicus Global Total
Current, Monthly, 0.25°

Four More Sentinel Turtles & Surface Currents

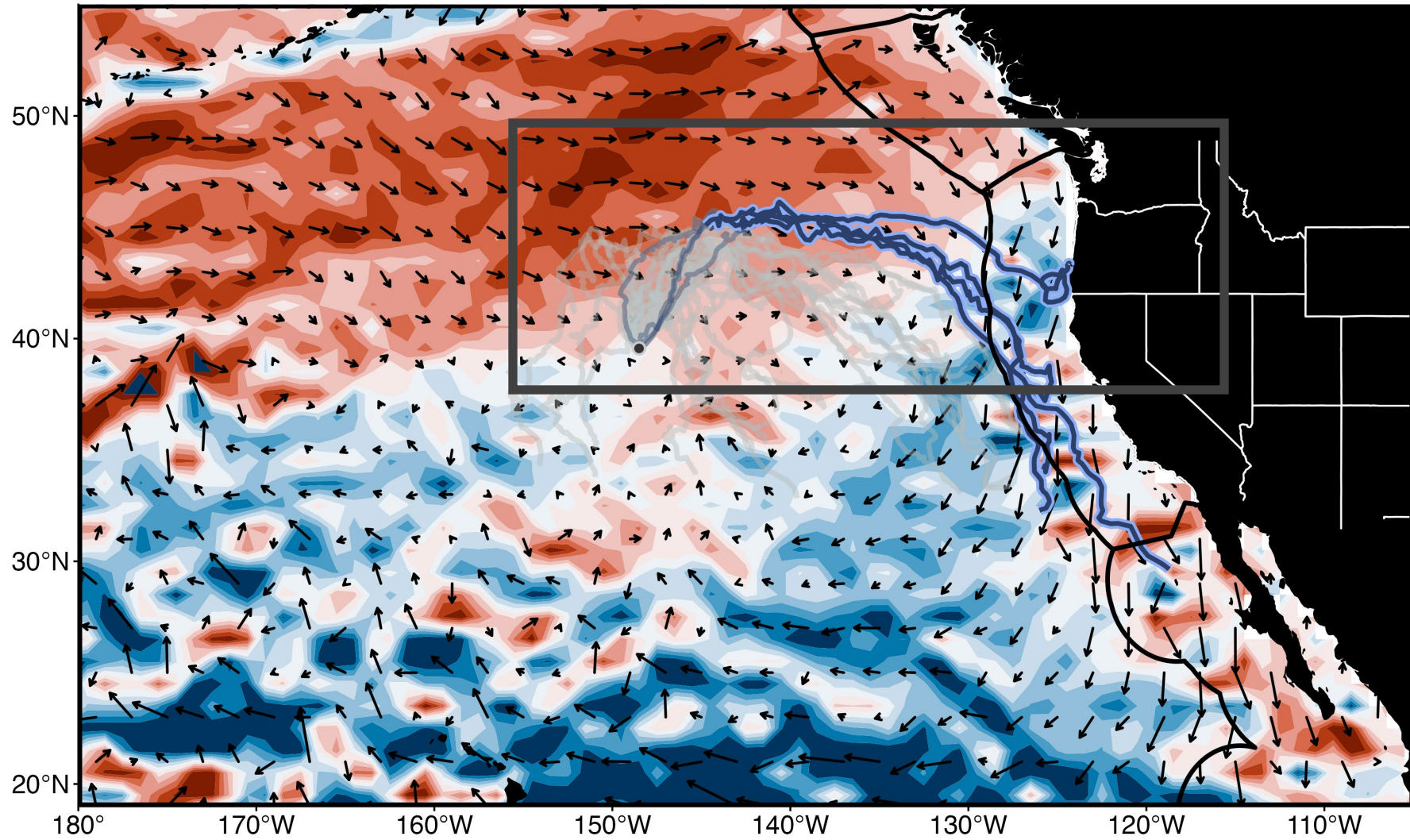


Data source:
Copernicus Global Total
Current, Monthly, 0.25°

Westward ← Zonal Surface Current (m/s) → Eastward

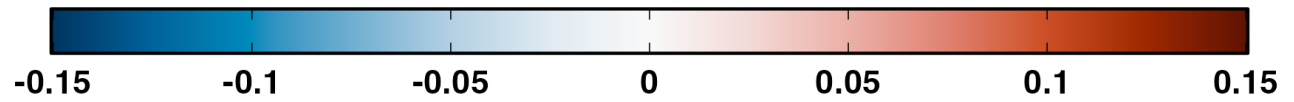


Four More Sentinel Turtles & Surface Currents

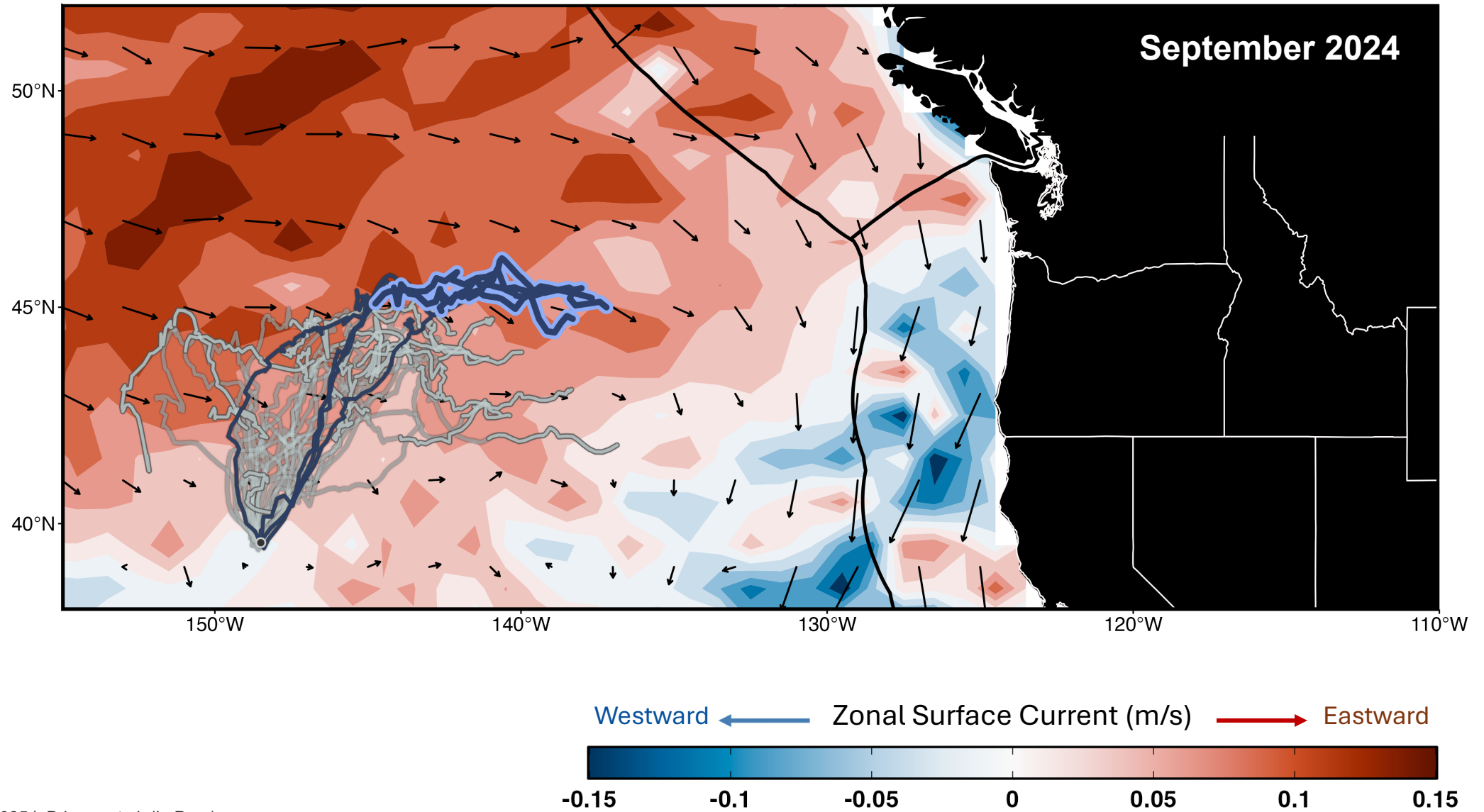


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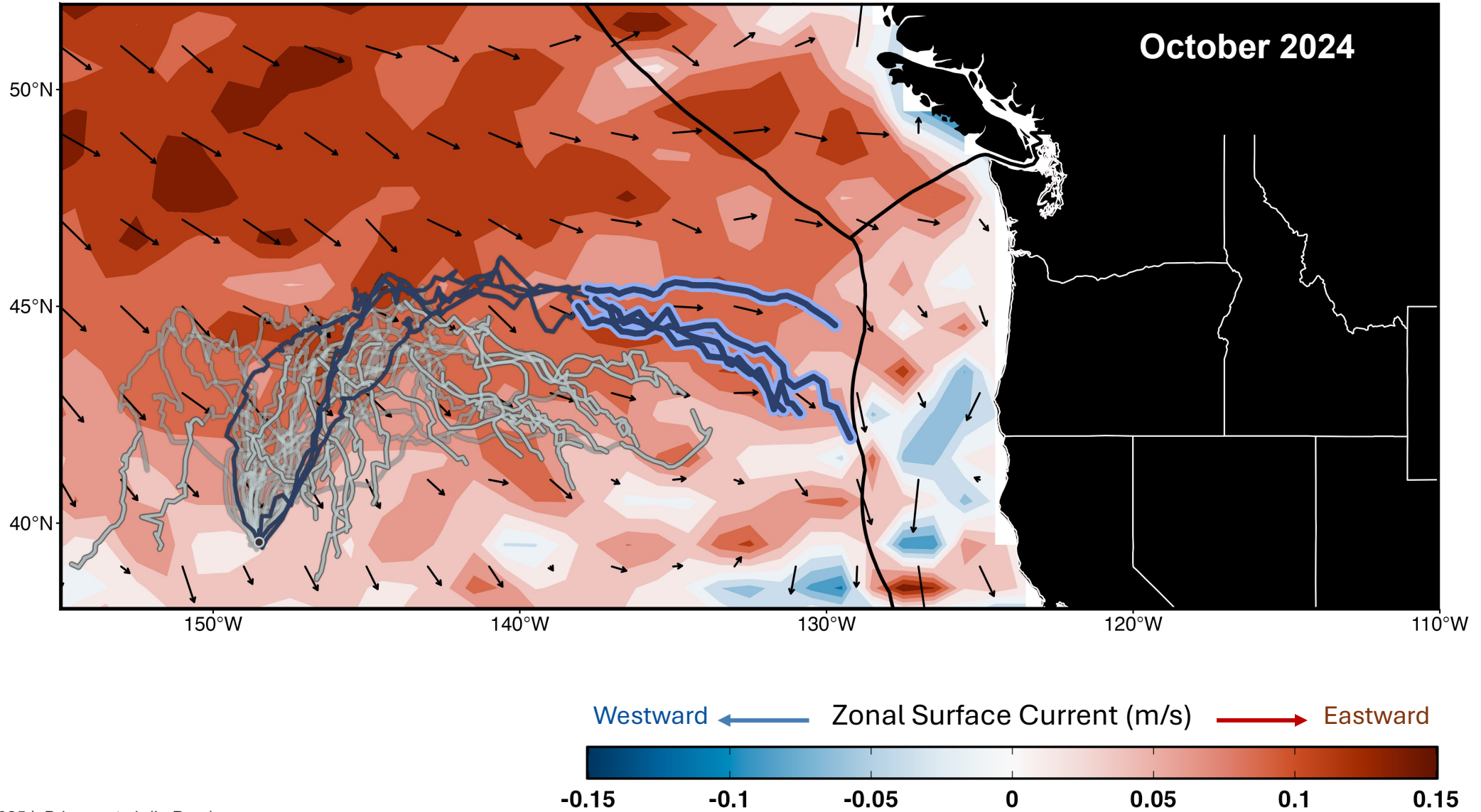
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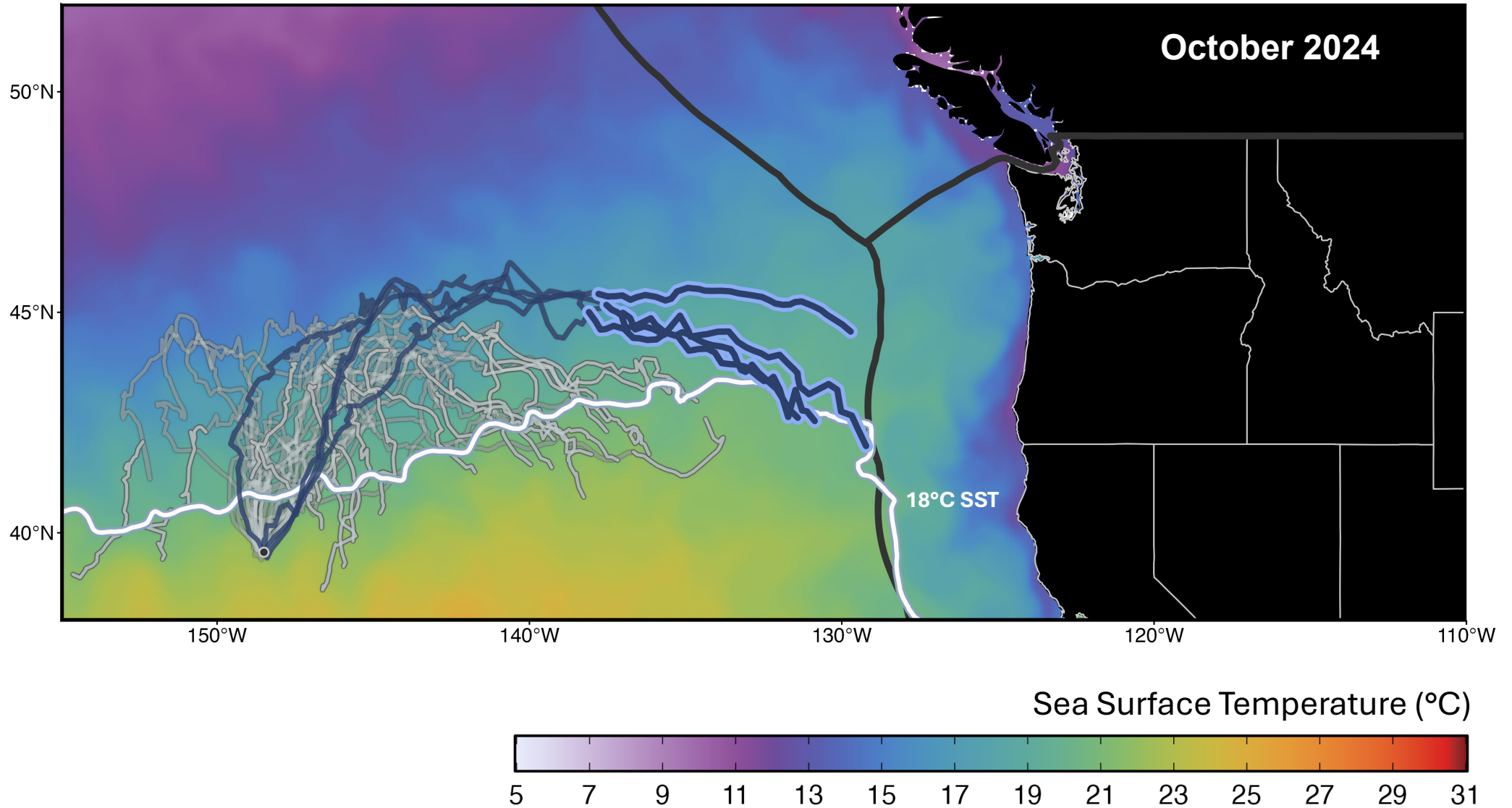
Turtle Movements into the Northern California Current System



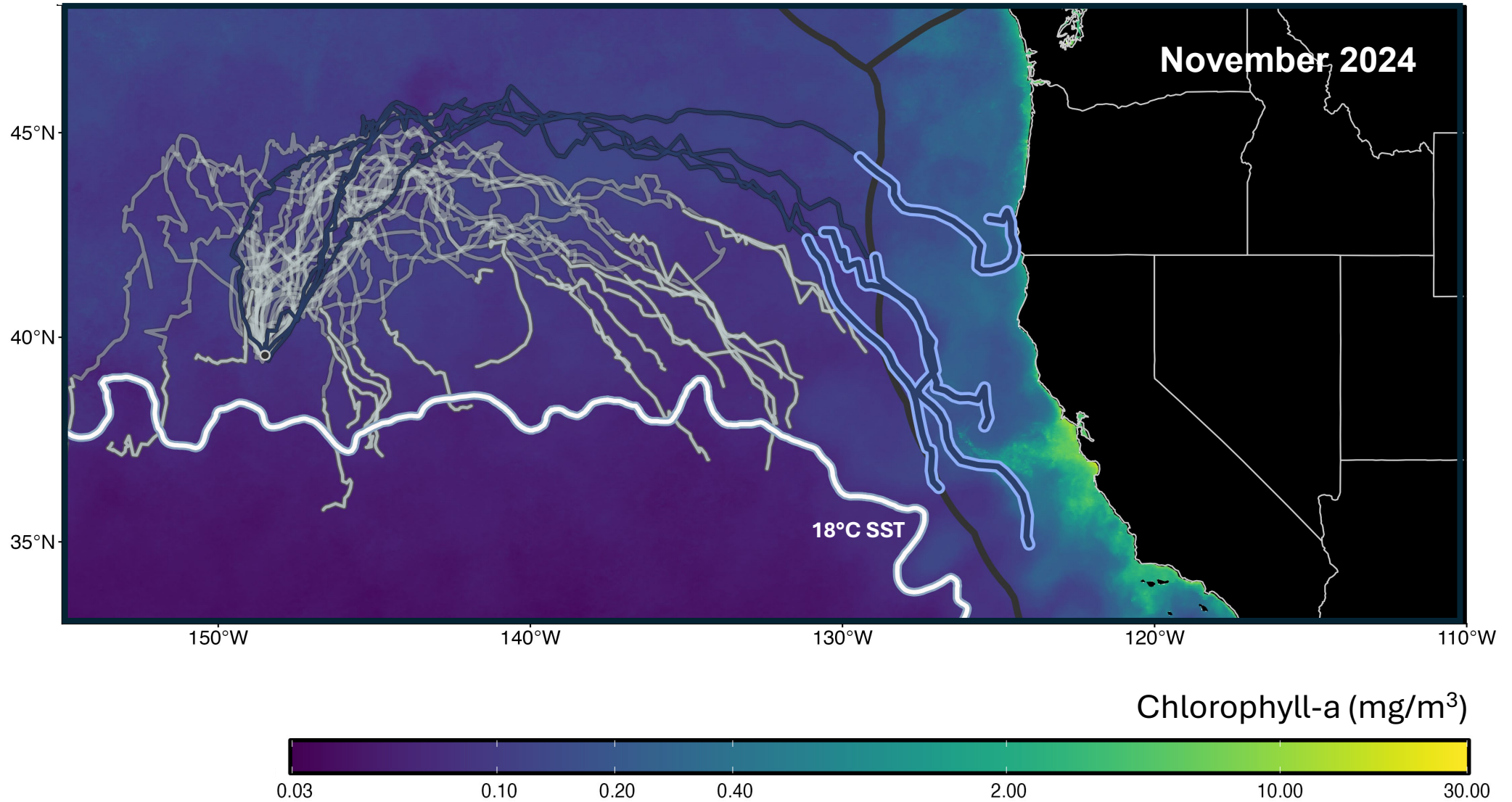
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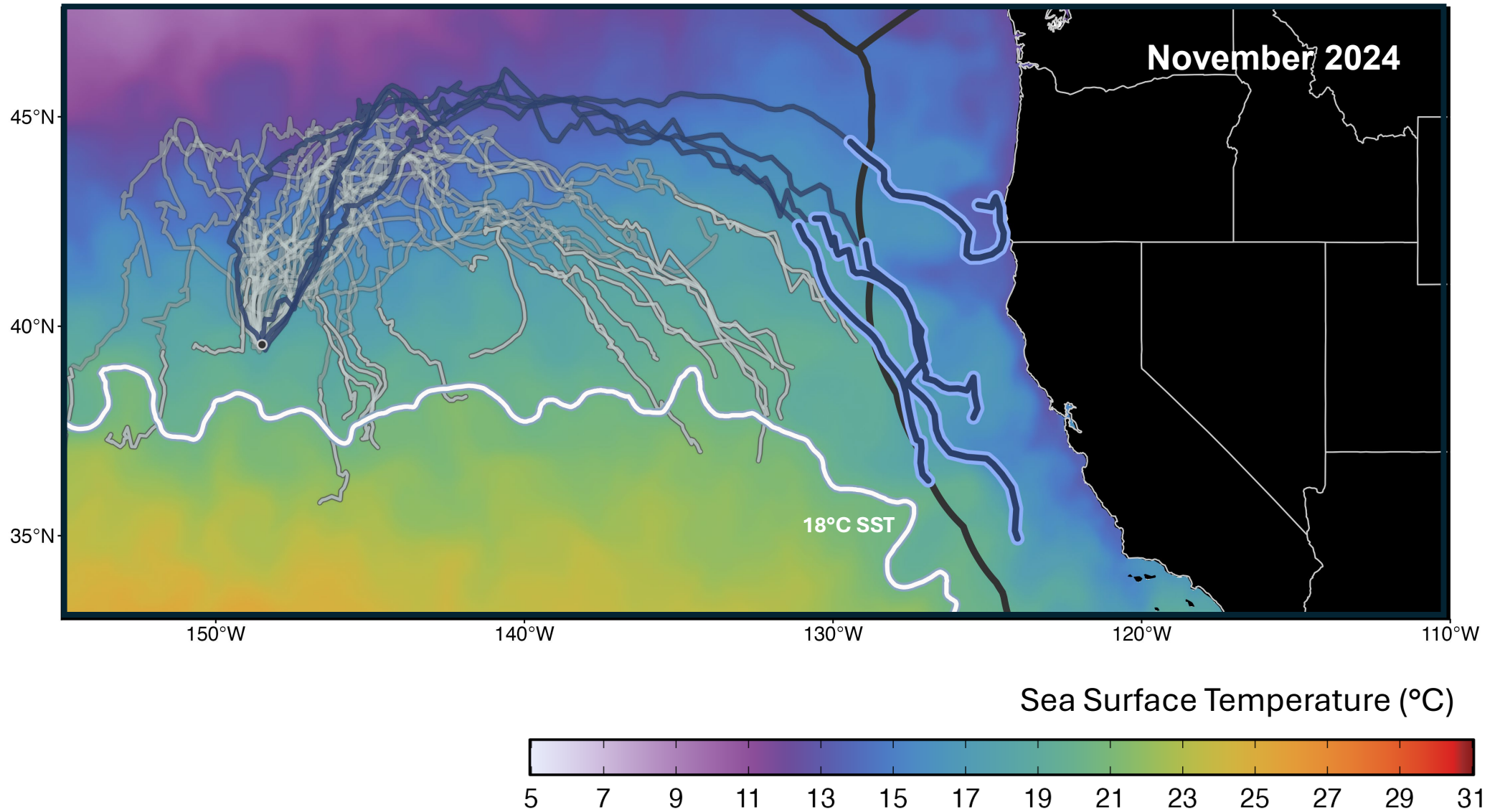
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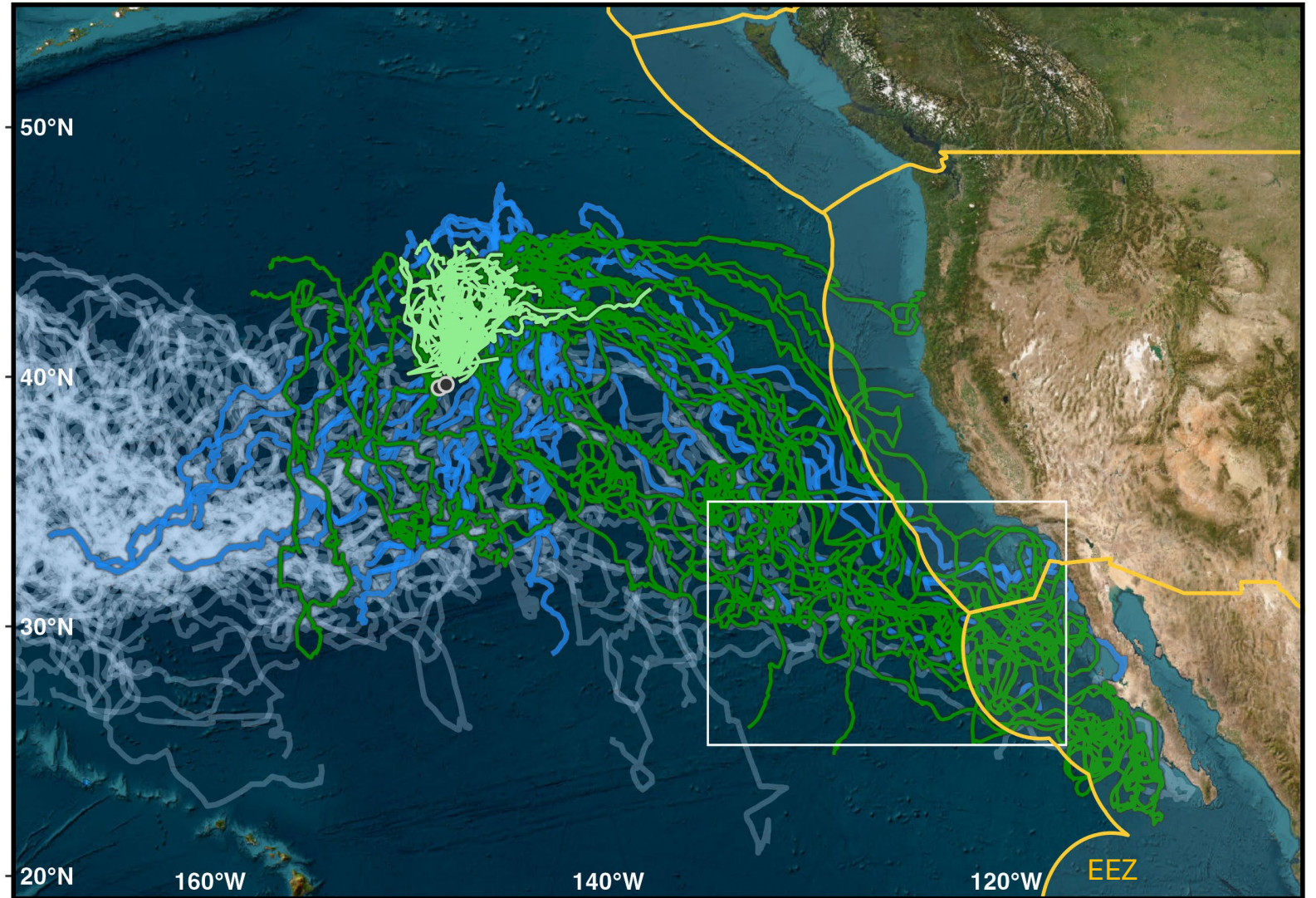


Four More Sentinel Turtles: Divergent Outcomes of Success



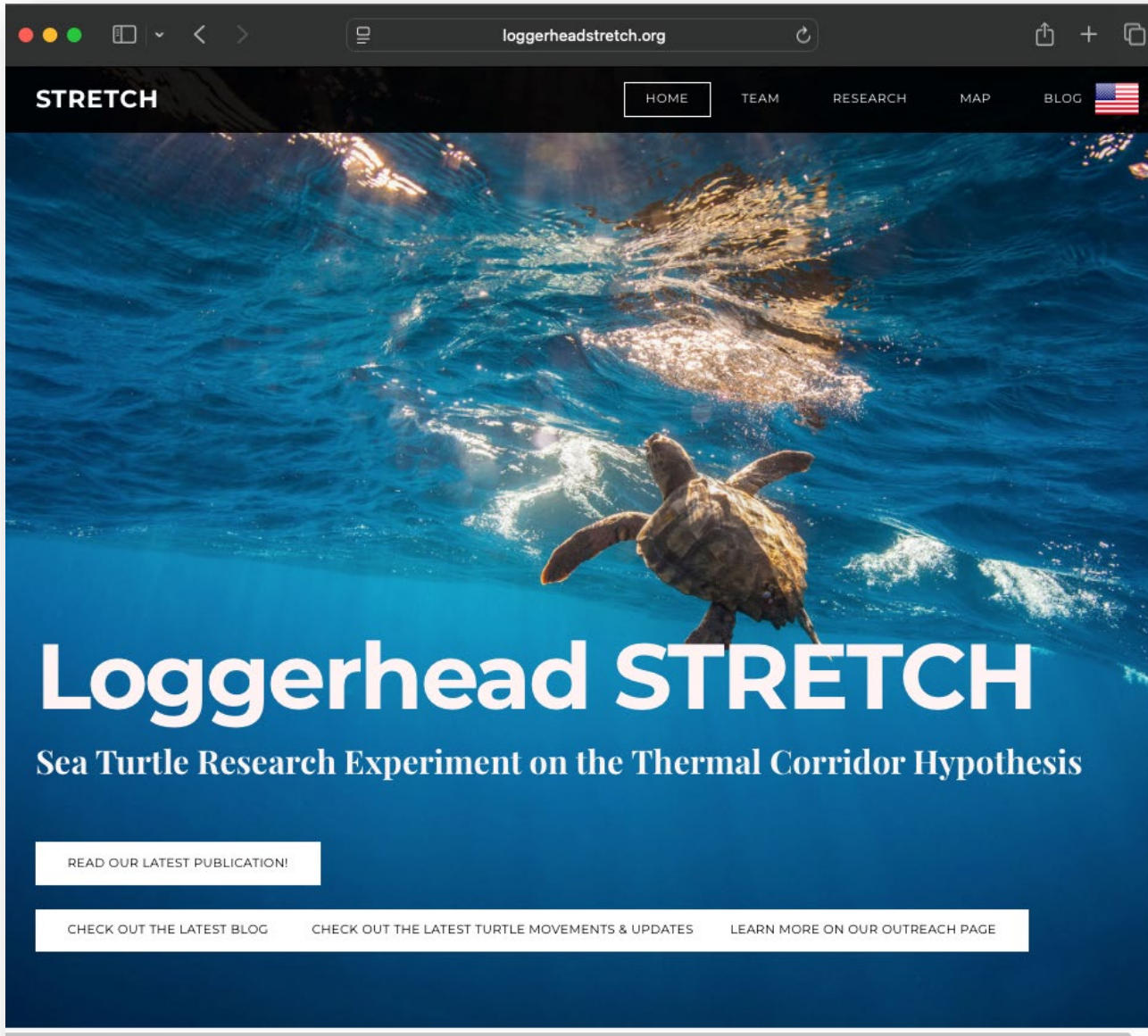
Project STRETCH: Where To Next?

- Cohort 4 Release:
What will the **ocean conditions** be in 2026?
- Increased conservation & management focus in US/MX EEZs
- Stay Tuned...So many great STRETCH talks today!



Learn More on the Project website:

loggerheadSTRETCH.org



The Project Blog:

stretchupdates.blogspot.com



Thank you!

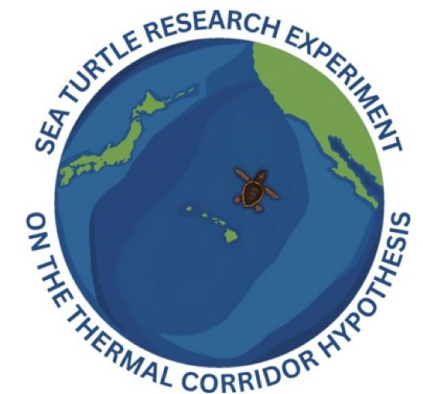


GORDON AND BETTY
MOORE
FOUNDATION

 **NATIONAL
GEOGRAPHIC**

**PORT OF NAGOYA
PUBLIC AQUARIUM**

Mitsui O.S.K Lines



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