# Initial results from a pilot study to understand dolphinfish (*Coryphaena hippurus*) trans-boundary movements in the Eastern Pacific Ocean


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# Conventional tagging pilot study to investigate dispersal of dorado caught in Ecuadorian and Peruvian waters

**Objective**: To better understand the potential for trans-national movements of dorado

**Rationale**: Dorado is an important resource shared among the 11 nations in the Americas that exploit it, partitioning the resource take is important to sustained, reliable abundance

**Partnership**: Collaboration between management, scientific and fishing organizations

**Our role:** To analyze tag recapture data within the context of biological and oceanographic conditions

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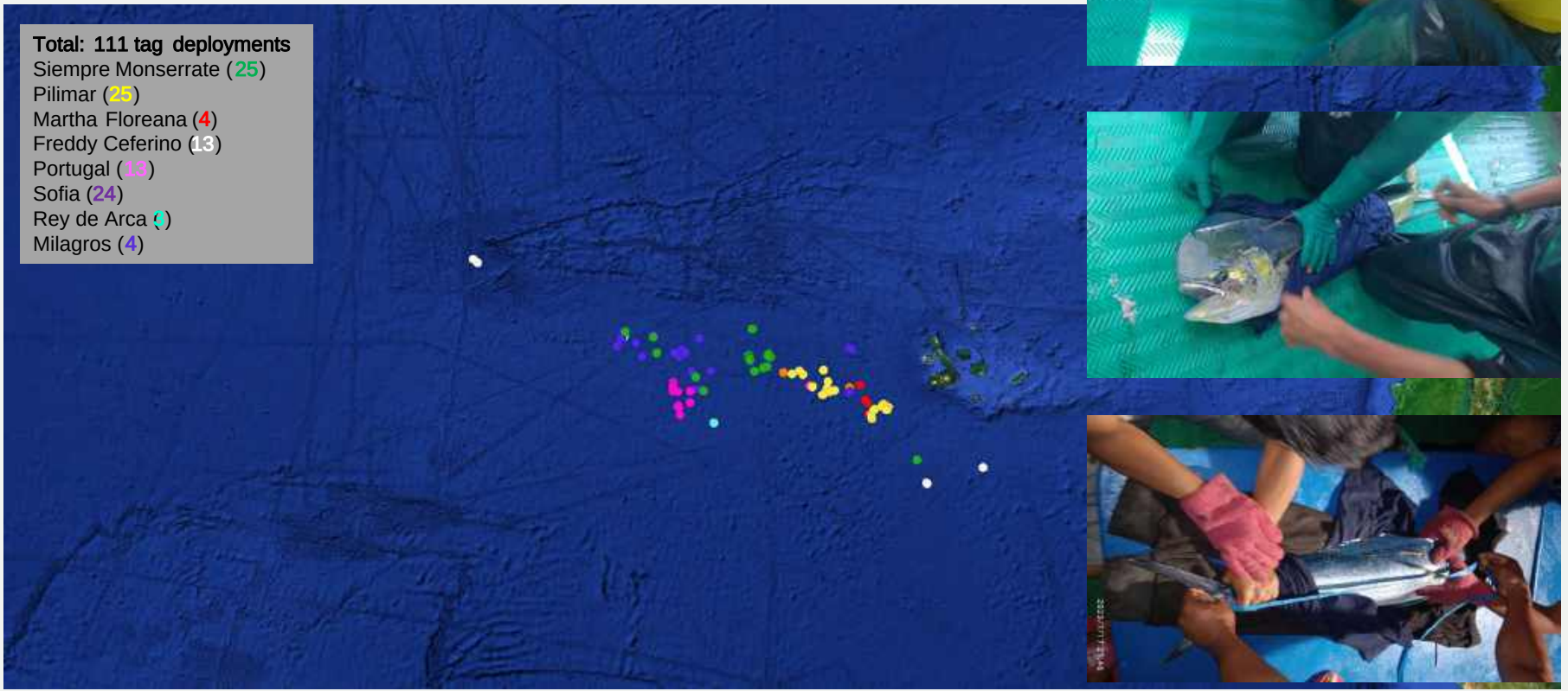
# Collaboration, training, and community engagement to deploy and recapture conventional tags

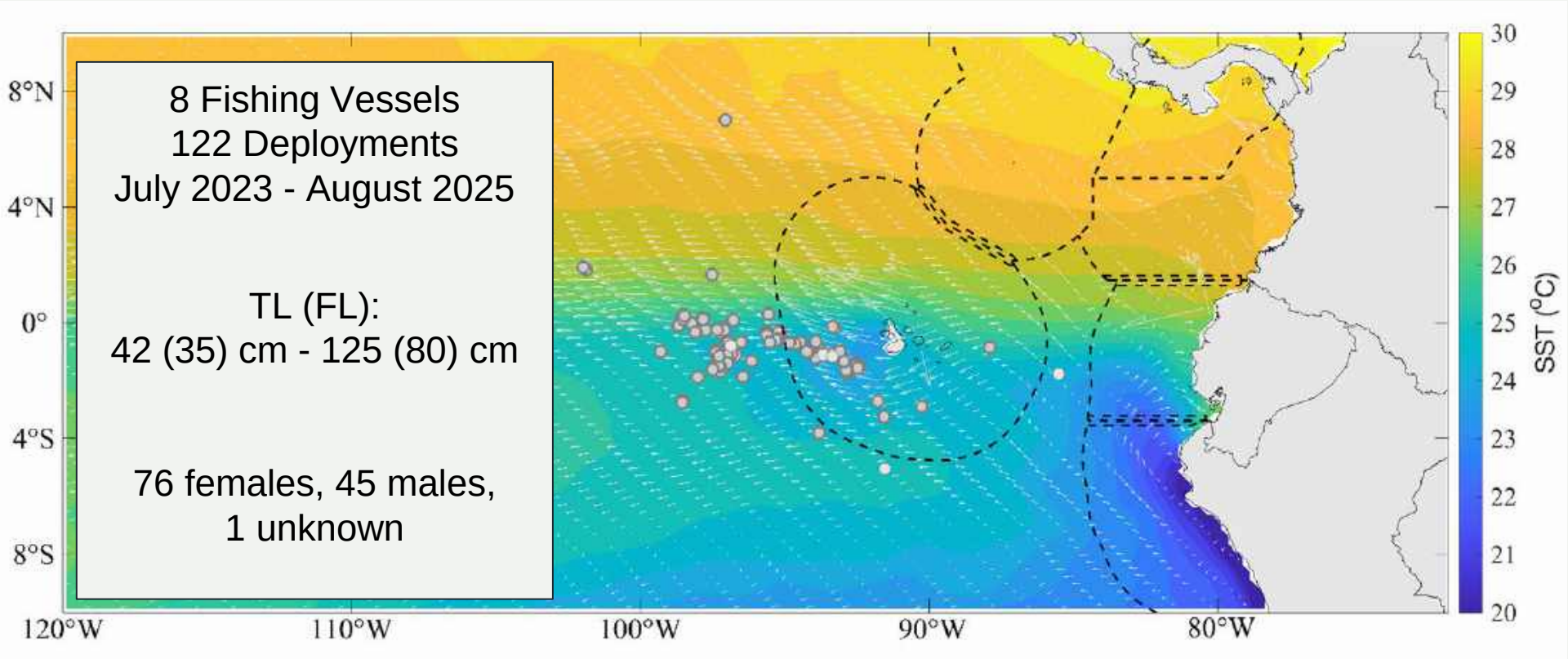
Tag Application & Recovery Training workshops

Tag Recovery Campaign


# Conventional Tag Deployments




# Deployments in spanned from strong El Niño (2023) to neutral conditions (2024-2025)



# Dispersal and life history were explored within the context of oceanography for recaptured tags

## MOVEMENT

Dispersal rates were calculated as a great circle distance between deployment and recapture locations.

Rates were standardized by total length.

## OCEANOGRAPHY

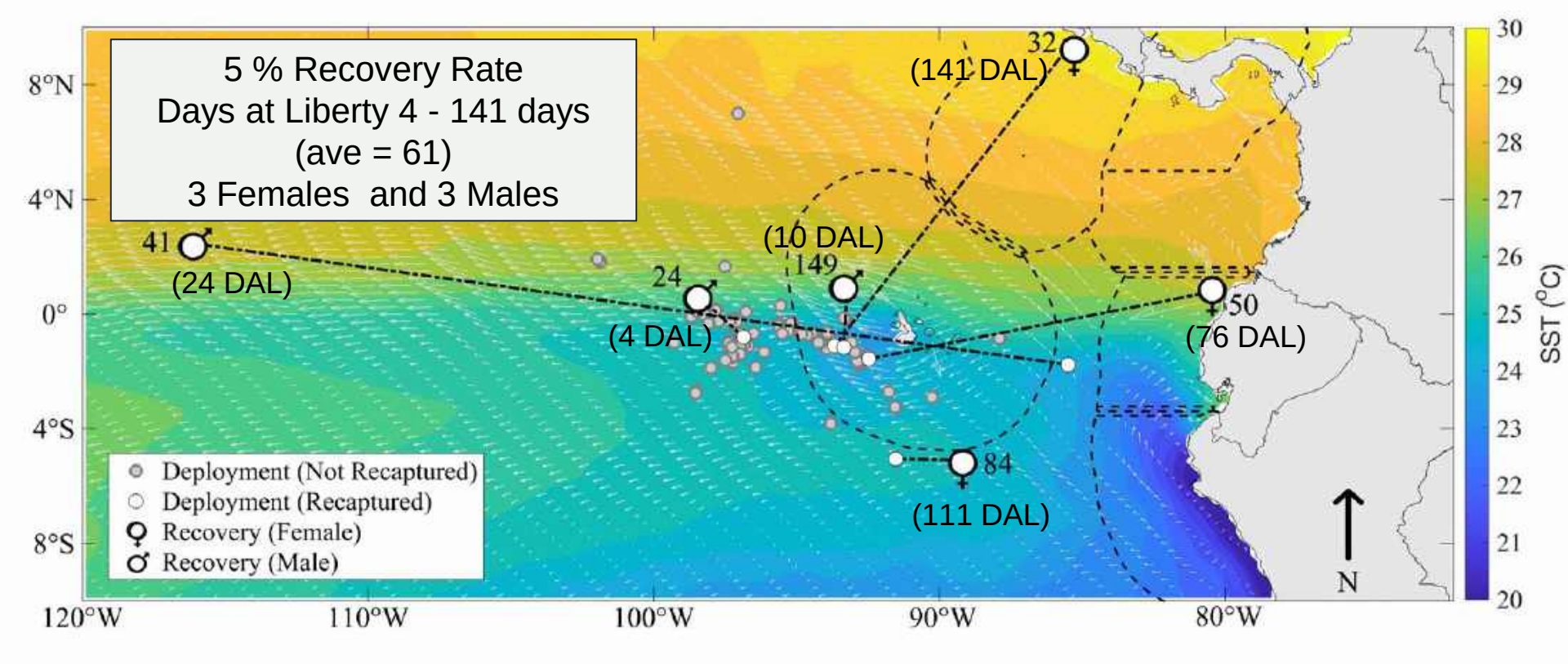
Timeseries of sea surface temperature, surface currents, and mixed layer depth were derived from satellite data during the time a recaptured fish was at liberty at both the deployment and recovery sites.

## LIFE HISTORY

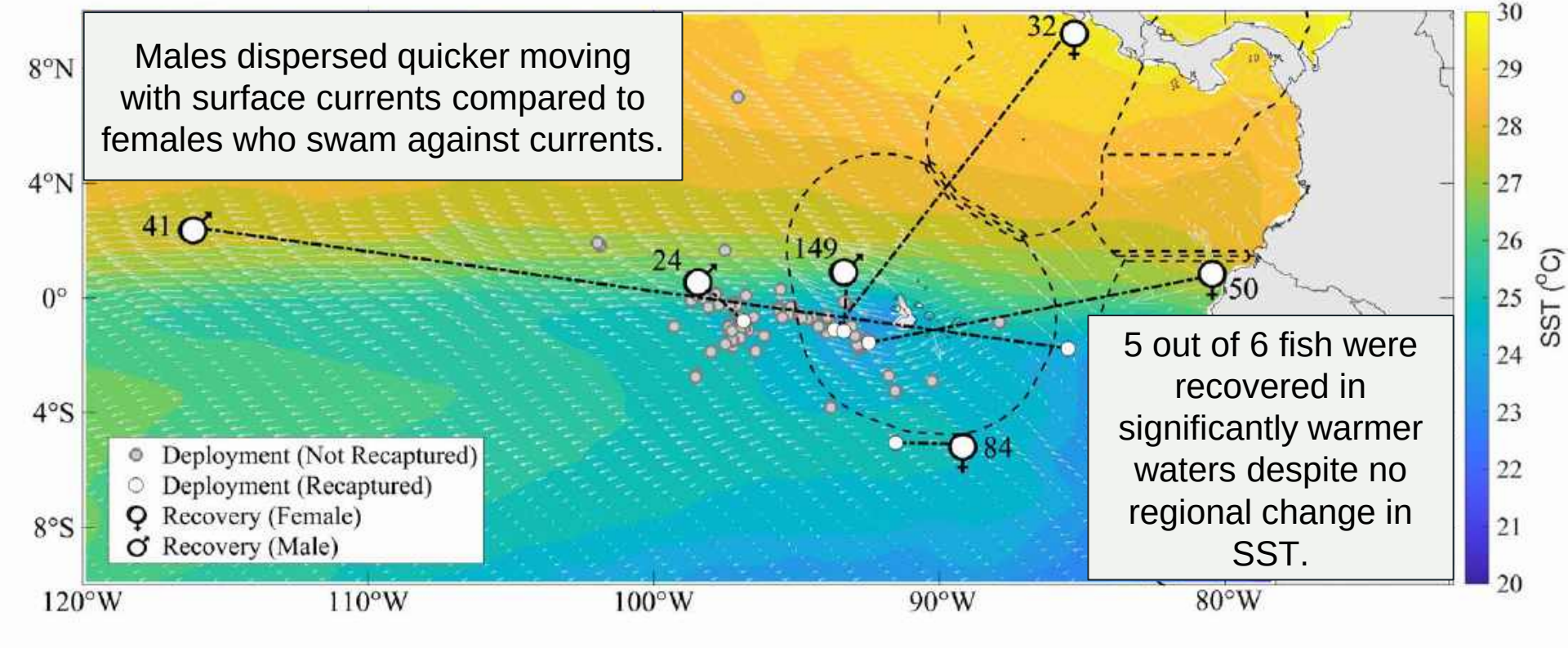
Age at length was estimated using von Bertalanffy parameters for females (males) : tø = -0.037(0.038), K = 0.99 (1), L∞ - 125(126)

Growth rates were calculated from the change in total length over days at liberty.

# Pilot study demonstrated value and feasibility of conventionally tagging in the region



# Diversity of dispersal reveals general patterns with respect to sea surface temperature and surface currents

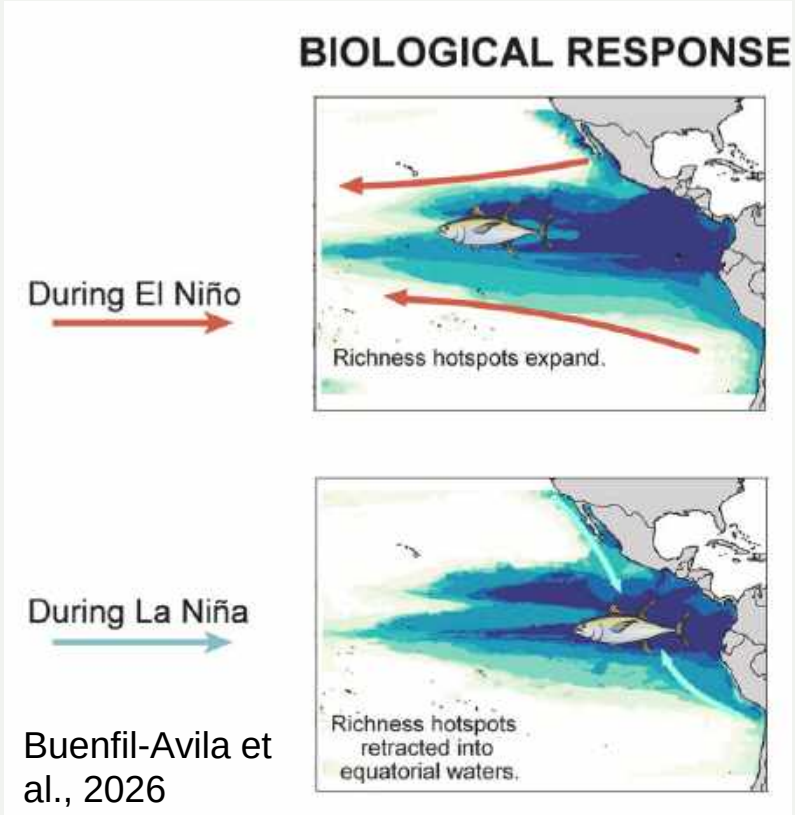


# Age and Growth VBGF

| Tag Number | 32 | 50 | 84 | 24 | 41 | 149 |
|---|---|---|---|---|---|---|
| Deployment Date | 7/11/23 | 9/22/23 | 7/8/23 | 8/28/23 | 9/18/23 | 9/22/23 |
| Days at Liberty | 141 | 76 | 111 | 4 | 24 | 10 |
| Sex | F | F | F | M | M | M |
| Total Length at Deployment (cm) | 42 | 91 | 101 | 92 | 100 | 100 |
| Growth rate (cm/d) | 0.47 | 0.2 | 0.21 | 0.25 | 0.25 | 0.5 |
| Estimated age at tagging (Months) | 3.48 | 10.8 | 13.56 | 11.64 | 13.2 | 12 |
| Estimated hatch date | 3/11/23 | 11/22/22 | 6/8/22 | 9/28/22 | 8/18/22 | 9/22/22 |
| ONI on Estimated Hatch Date | -0.1 | -0.9 | -0.9 | -1 | -0.9 | -1 |

# ENSO may influence dorado population dynamics through the expansion and contraction of habitat

Buenfil-Ávila, A., Ortega-García, S., Villalobos, H., Nori, J., Jakes-Cota, U., Moncayo-Estrada, R., Reygondeau, G., 2026. Spatial richness patterns of large pelagic fishes in the Eastern Pacific Ocean. Marine Environmental Research 216, 107860. https://doi.org/10.1016/j.marenvres.2026.107860


Buenfil-Avila et al., 2026

# Movement rules -> Influence of ENSO -> Population Structure

**Validation**

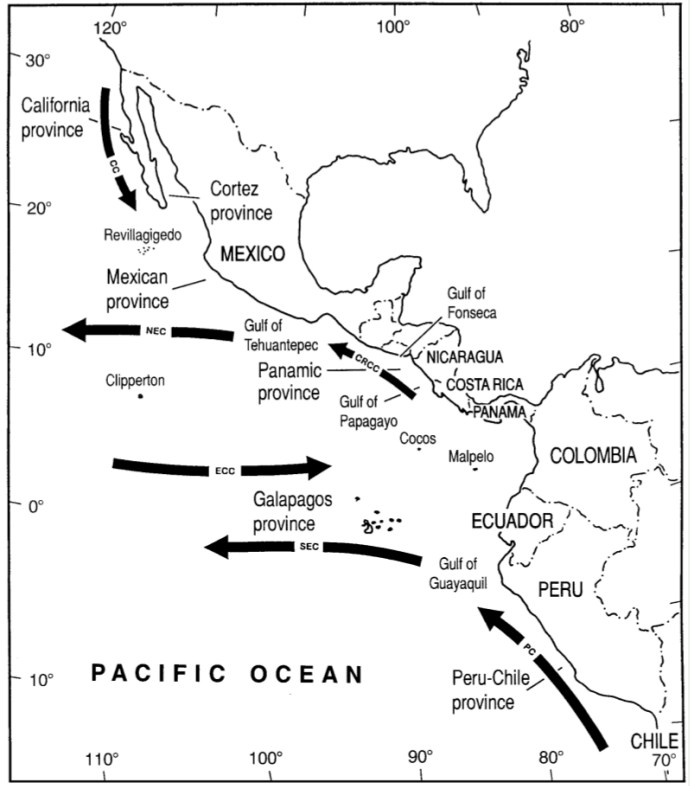
- Increase dataset
- Establish pdf of fish movement relative to oceanography

**Dispersal**

- Simulate movement under ENSO regimes
- Estimate the potential mixing and dispersal distances

**Population Dynamics**

- Does the model predict isolated populations due to ENSO?




(Cortes, 1997)

# Electronic tagging efforts provide more than dispersal data

- Thermal and vertical habitat use
- Insights into potential FAD use
- Mortality and predation rate estimations
- Fisheries-independent recovery (in deep water)
- More efficient data collection with higher rates of data collection per fish tagged.
- Comparison with northern EPO fish


Data Observation Network for Earth (DataONE) & Animal Tracking Network (ATN)

- https://doi.org/10.24431/rw1k9h3
- https://portal.atn.ioos.us
- Eastern Pacific Ocean Dolphinfish Project, 2010-2024

# Important Metrics for Understanding Dolphinfish Dispersal from Egg to Egg

- Fitness at hatching
  - *Water temp*
  - *Age of mother*
  - *Feeding during egg development*
- Time to nekton
- Swimming capabilities
- Currents
- Floating Objects/Food
- Escaping mortality

**Thank You!**

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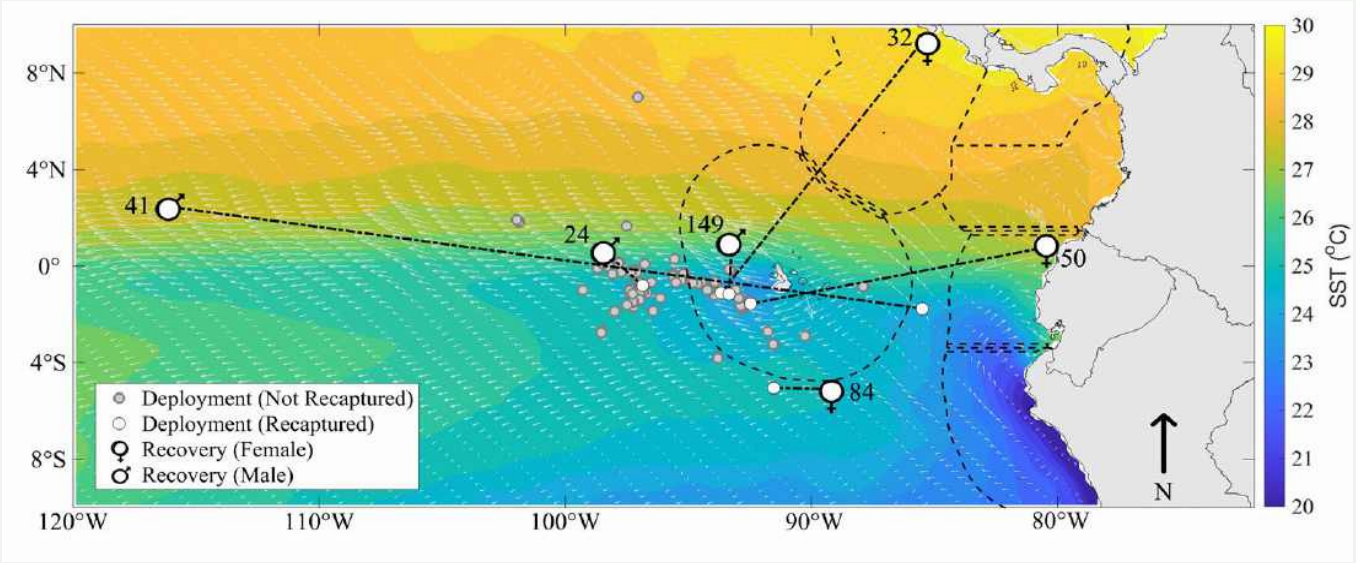


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