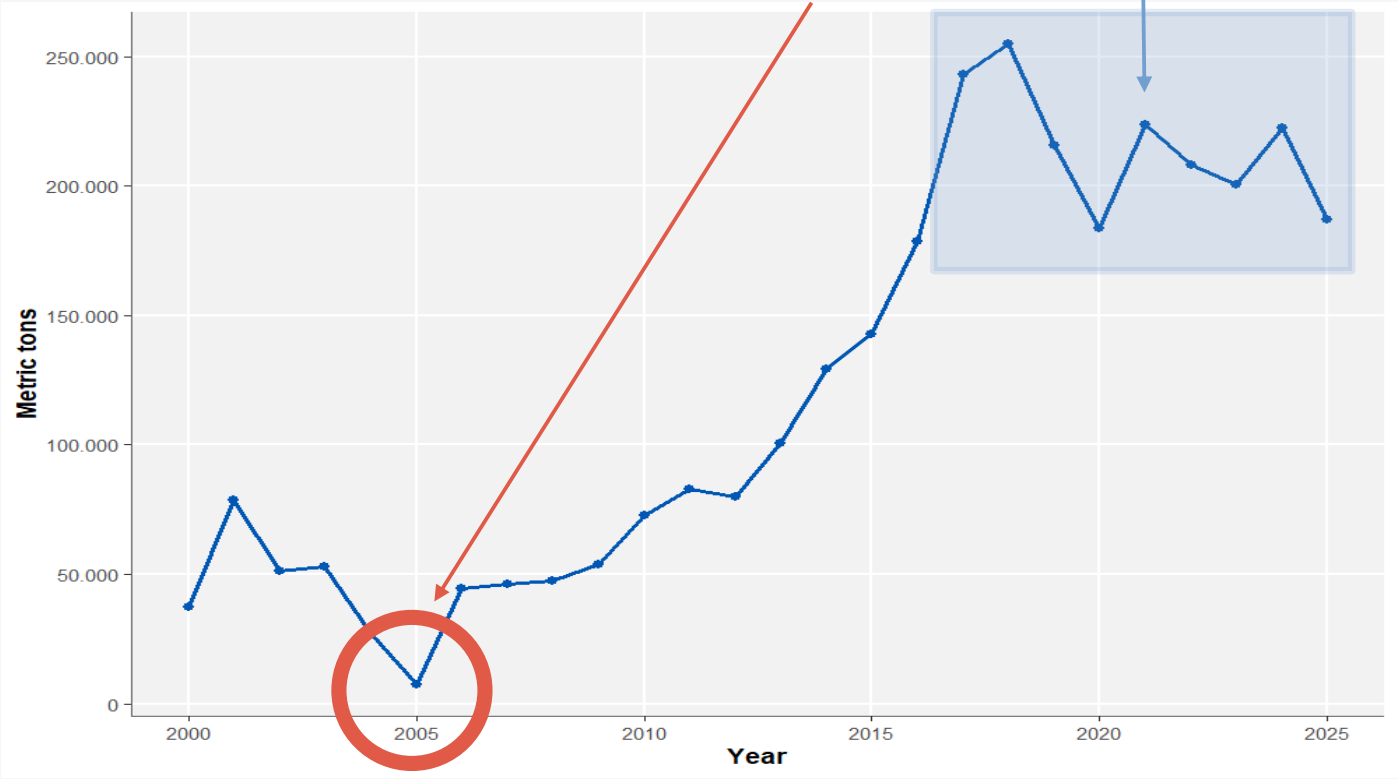
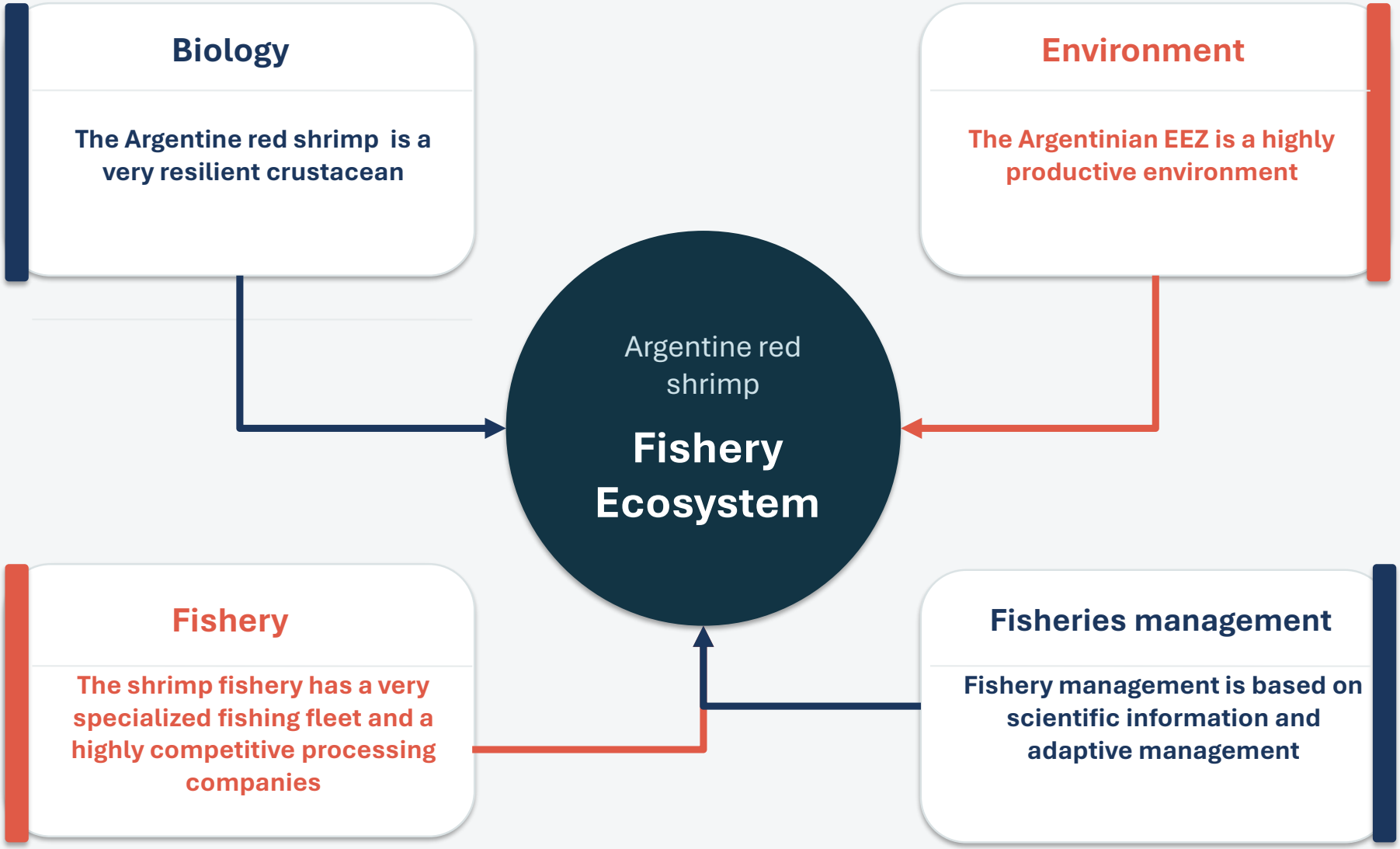
The Argentine red shrimp fishery.

How did we go from here to here?



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Biology
The Argentine red shrimp is a very resilient crustacean
Environment
The Argentinian EEZ is a highly productive environment
Argentine red shrimp
Fishery Ecosystem
Fishery
The shrimp fishery has a very specialized fishing fleet and a highly competitive processing companies
Fisheries management
Fishery management is based on scientific information and adaptive management

● Key Biological Traits

• **High Growth Rate:** Reaches commercial size quickly within its first year.

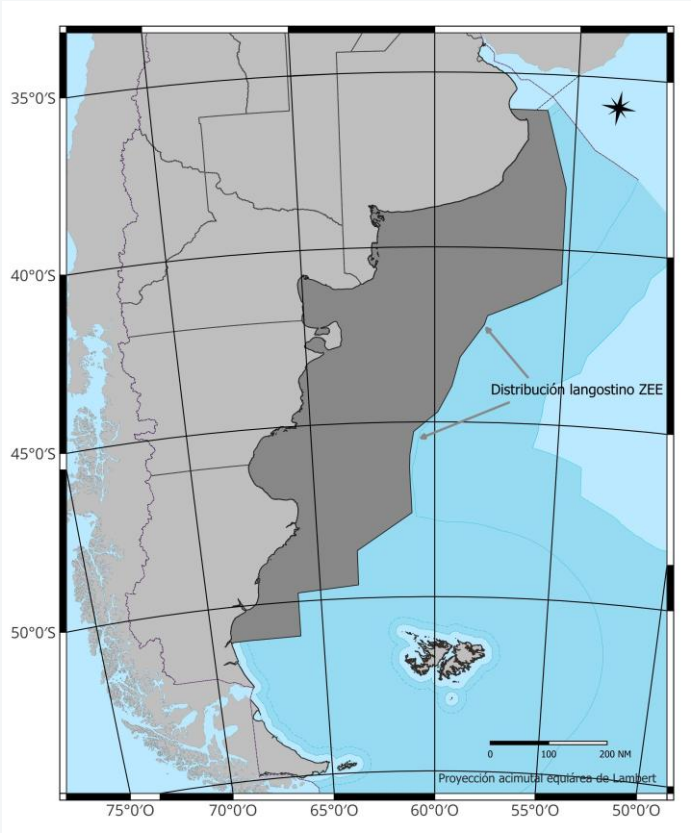
• **Short Lifespan:** Highly dynamic population turnover (approx. 3/4 years).

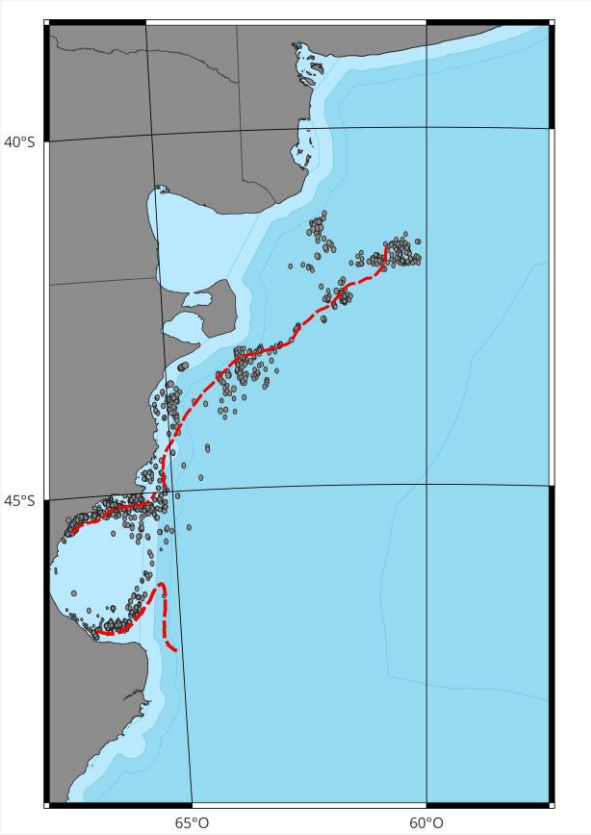
• **High Fecundity output:** Females can release up to 1 million eggs.

Spatial & Reproductive Dynamics

• **Wide Distribution:** Dense concentrations across the Argentine EEZ, coastal areas, and major gulfs.

• **Extensive Spawning:** Spawning activity occurs over vast coastal and shelf areas, driven by oceanographic fronts



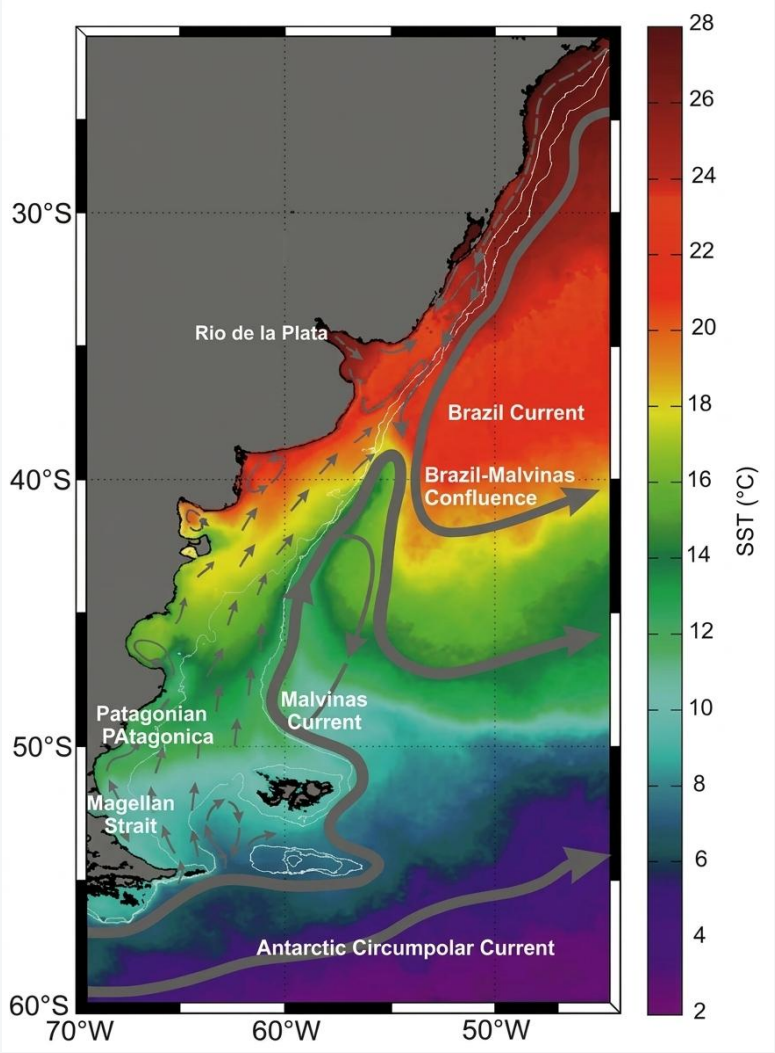


Environmental drivers

Oceanographic Drivers

- **Patagonian Currents:** Cold, nutrient-rich sub-Antarctic waters fueling the Patagonian Shelf.

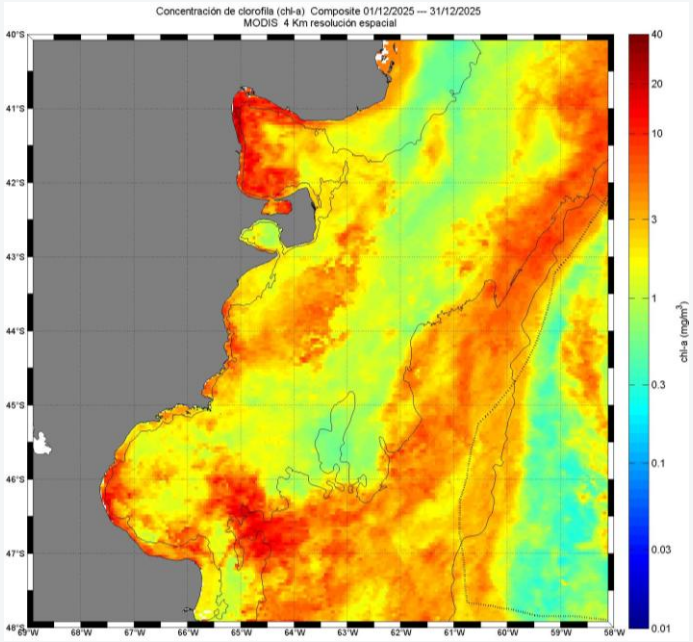
- **Frontal Zones:** Thermal and tidal fronts concentrating organic matter and plankton.



The Perfect Habitat

- **Chlorophyll Blooms:** Massive phytoplankton concentrations providing optimal food supply.

- **Ecological Niche:** Ideal temperature and salinity ranges for rapid growth and massive aggregation.



Fishery Evolution & Dynamics

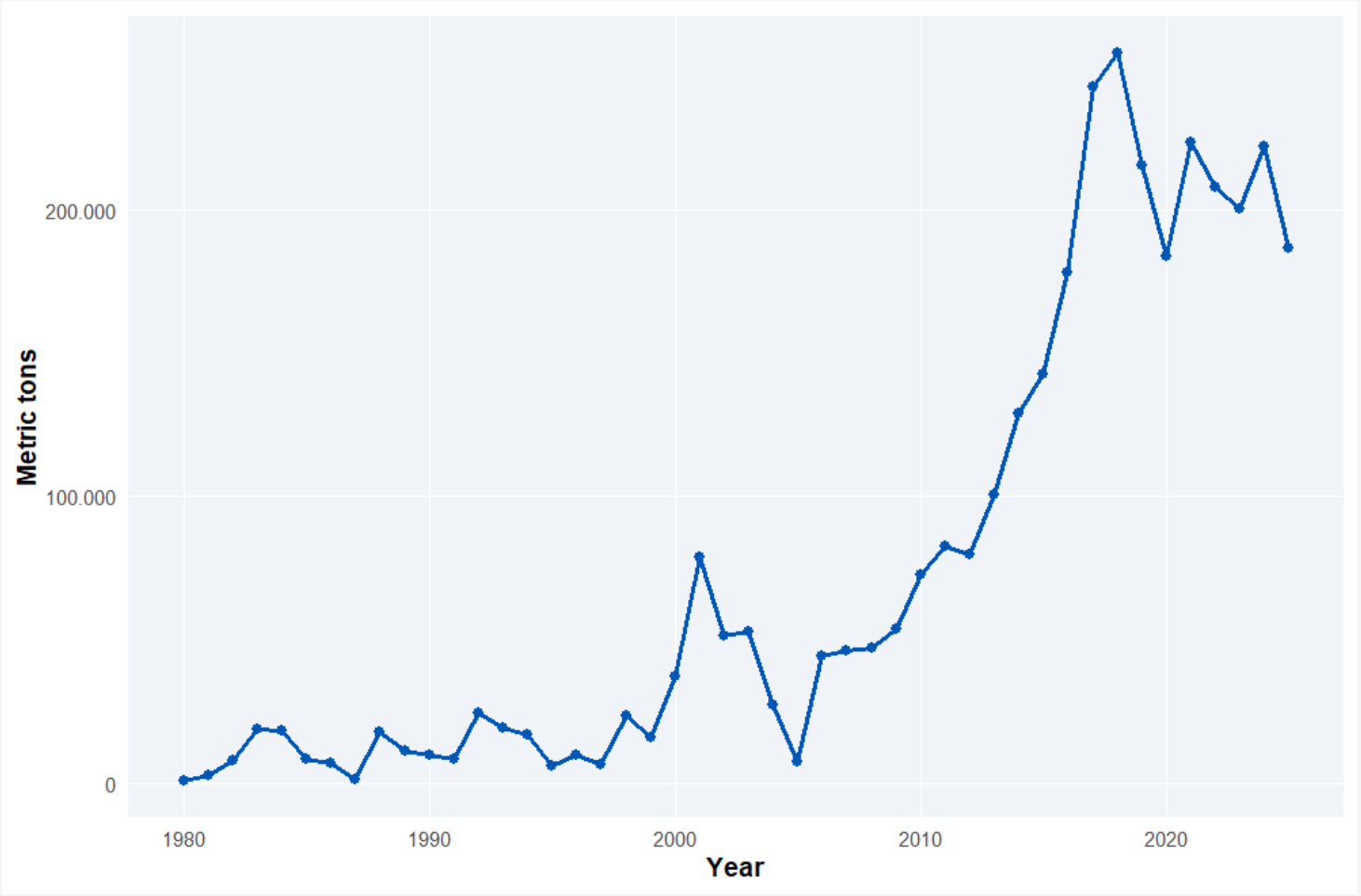
1950s–1980s
Small-scale coastal fishery

1980s
Industrial expansion following major discoveries in San Jorge Gulf.

1990–2005
Surging fishing effort and overexploitation leading to the 2005 collapse.

2006–2018
Management improvements and fishery expansion across the EEZ.

Since 2019
Full adaptive management implementation and landing stabilization.

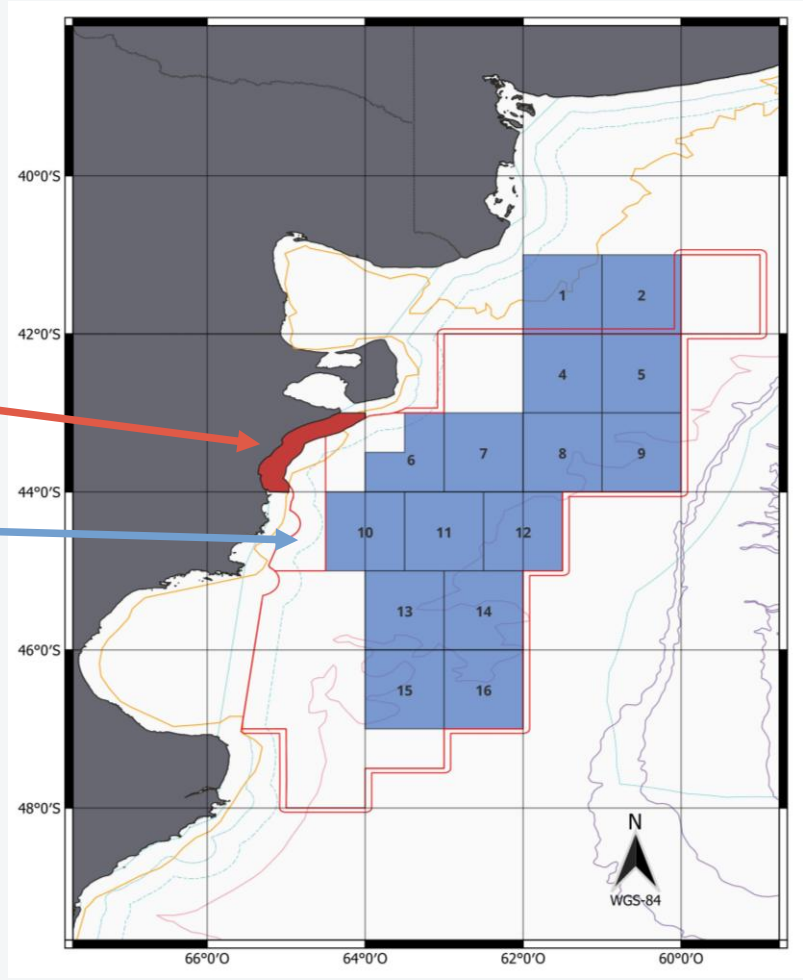


One stock, two management systems

The fishing fleet changes strategy to follow the resource population dynamic.

The Dynamic System

- **Inshore Season (Nov-Mar):** Reproductive period focused on shallow coastal waters.
- **Offshore Season (Apr-Oct):** Recruitment & growth period shifting to the deeper EEZ waters.



Fleet & Spatial Dynamics

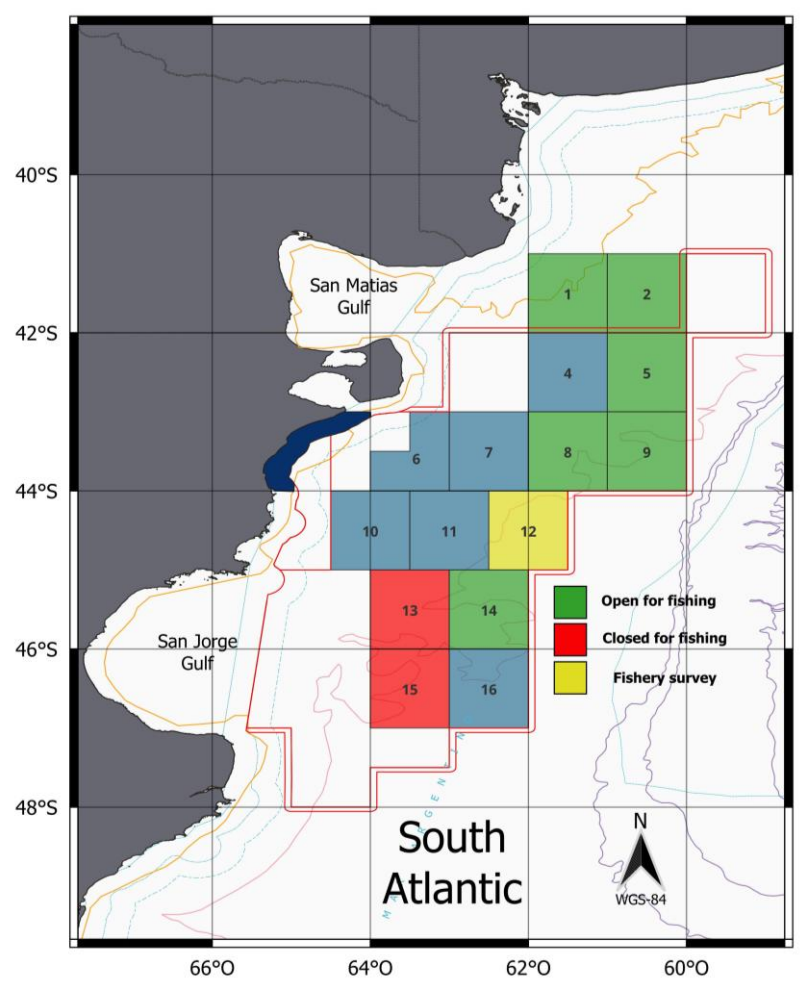




- **Dual Fleet Action:** Exploited by large freezer and wetfish trawlers (offshore) and coastal wetfish vessels (inshore).
- **Grid Management:** 16 independent management zones under real-time dynamic closures.

Adaptive & Dynamic Management

16 independent management areas



The Process

- **Grid Assessment:** 16 independent areas monitored through a 4-day experimental fishery survey to determine opening.
- **Continuous Surveillance:** Near real-time data collected daily by on-board fisheries observers.

Critical Closure Thresholds

Daily Monitoring: Near real-time tracking of CPUE.

Juvenile Shrimp Cap: Max 20% of catches (<40 pcs/kg).

Hake Bycatch Limit: Strict 0.2 ratio threshold (triggers immediate local or season closure).

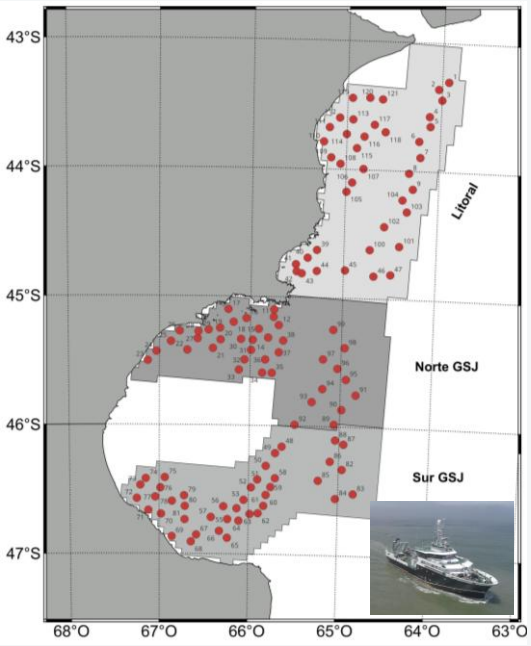
Biological Safeguard: Season ends when mature females reach 35%.

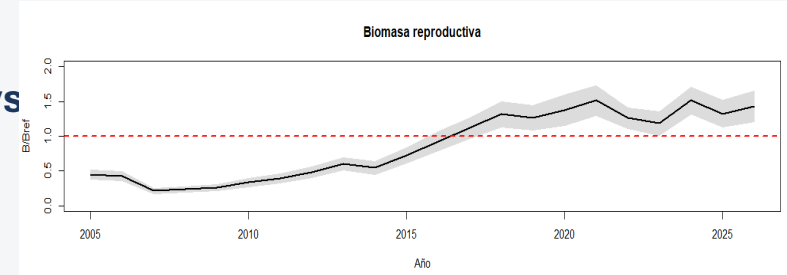
Research

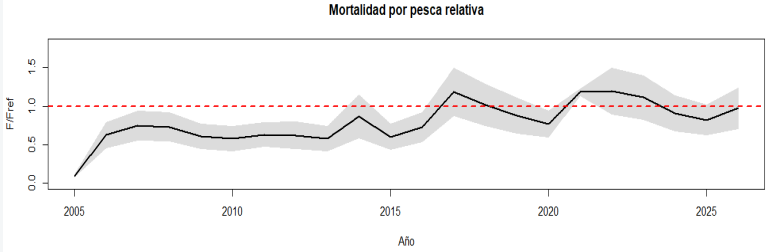
Fishery-Independent Surveys

- **Annual Monitoring:** Three oceanographic and biological research campaigns per year.

- **Spatial Tracking:** Status of the red shrimp population egg, larva, and adult sampling grids across the Patagonian shelf.



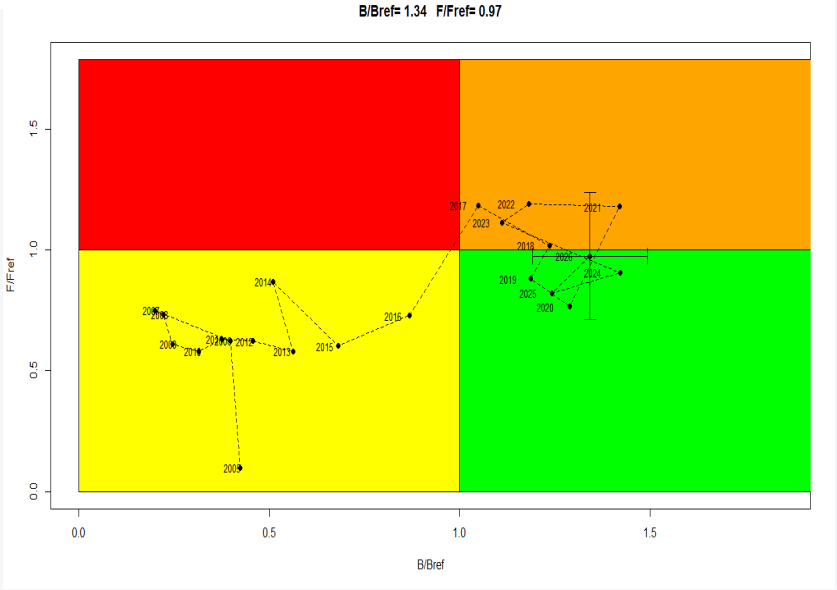




Population Dynamics

- **Stock Assessment:** Mathematical modeling of recruitment, biomass, and fishing mortality.

- **Biological Trends:** Continuous auditing of spawning trends and cohort strength over the years.



Ecosystem-Based Approach

- **Holistic Science:** Integrating environmental factors, ocean currents, and trophic interactions.

- **Precautionary Limits:** Determining safe biological thresholds and managing bycatch interaction points.

Oportunities & Benefits



Market & Economic Benefits

• **Premium Positioning:** High global demand driven by large-sized, wild-caught red shrimp.

• **Socio-Economic Stability:** Securing long-term employment and growth for coastal and inland regions.





Certification & Sustainability

• **MSC Certified:** Marine Stewardship Council certification achieved for both coastal and offshore fisheries.

• **Brand Value:** Leveraging the "Mar Argentino" origin seal to access high-value international markets.

Challenges & Future Risks



Environmental & Domestic Risks

- **Climate Drivers:** Climate change impacts on population dynamics and resource accessibility.
- **Operational Strain:** Rising fuel and transportation costs altering fishing economics.



Market Dynamics & Competition

- **The Aquaculture Threat:** Defending premium wild-caught shrimp against low-priced farmed competitors.
- **Trade Barriers:** Overcoming para-tariff restrictions in key international markets.

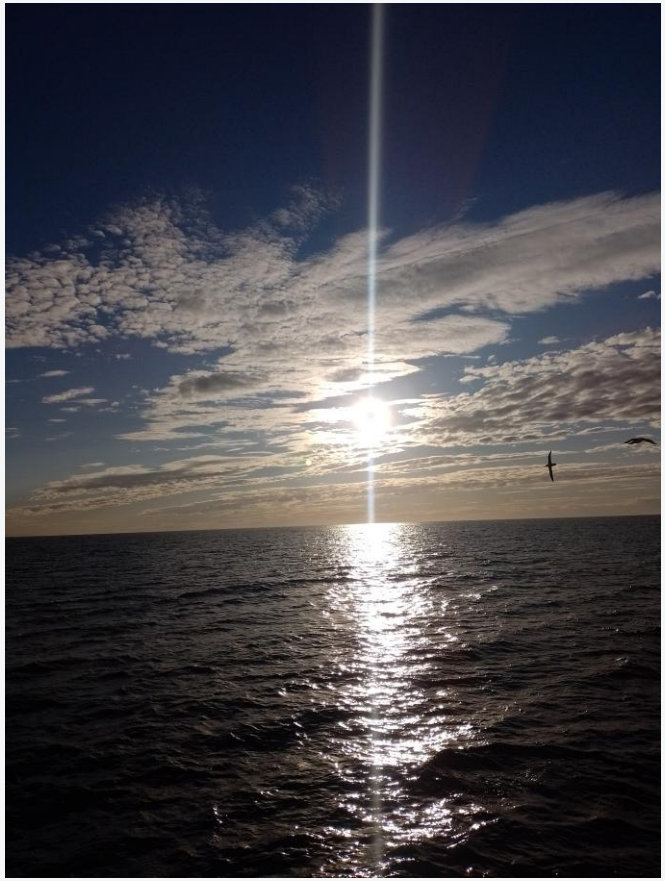


Management & Governance Challenges

- **Dynamic Framework:** Adapting HCR and assessing transitions to TAC, Spatial TAC, or ITQ systems.
- **Ecosystem Approach:** Maintaining real-time daily management while developing an Ecosystem-Based Plan.

Strategic Opportunity:

Developing new value-added products and exploring unexploited international markets through certified sustainability.



Science, Government, and Industry:

Aligned for a Sustainable Fishery

Thank you!

Juan de la Garza, *M.Sc.*
Programa Pesquería de Langostino
INIDEP

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