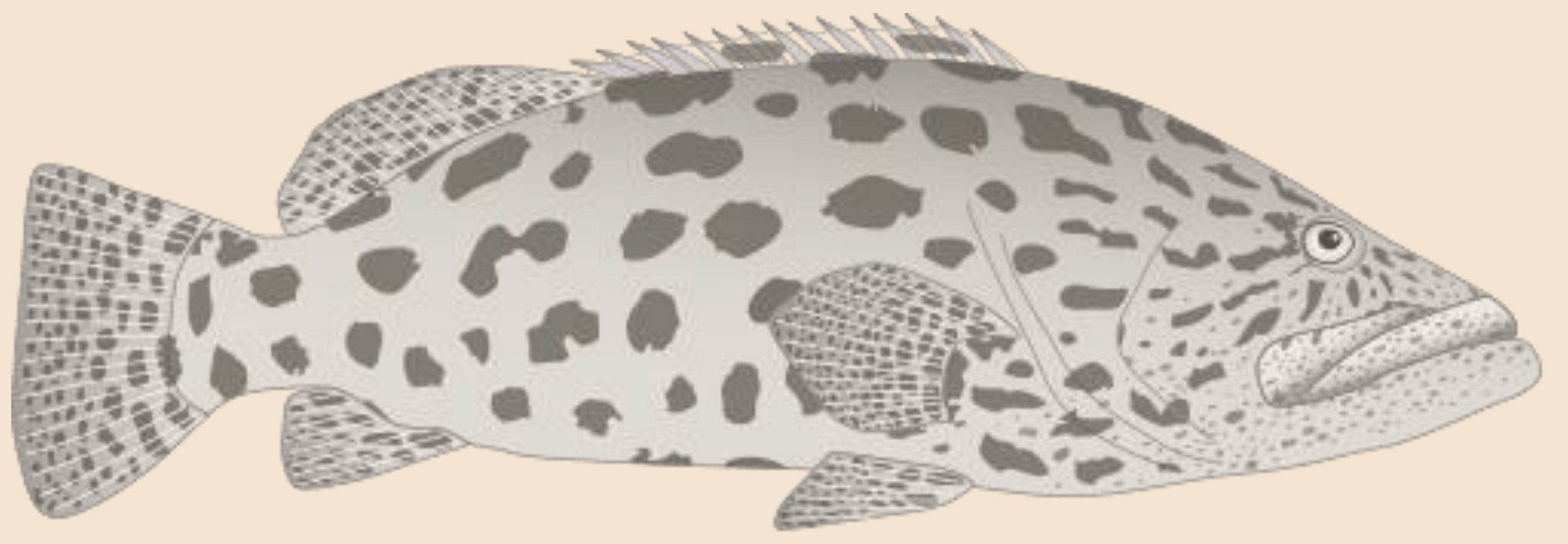
Spatio-temporal changes of *Mycteroperca spp* in the Gulf of California, Mexico



XIII CONGRESO MEXICANO DE ARRECIFES CORALINOS
IV CONGRESO PANAMERICANO DE ARRECIFES CORALINOS

H.MANIQUET[1,2], B.FREDERICH[2], D.OLIVIER [1]

[1] Departamento Académico de Ciencias Marinas y Costeras, Universidad Autónoma de Baja California Sur, La Paz, México

[2] Laboratory of Evolutionary Ecology, ULiège, Allée du six Août 11, Liège, 4000, Belgium

Background:

The Gulf of California (GC) is the most important fishing area in Mexico and small-scale reef fisheries play an important socio-economic role for the region. The genus *Mycteroperca* (Epinephelidae) includes four large-sized species which represent a major component of reef fisheries in the GC. Some of these species are known to have declined in the last decades (e.g. *M.jordani* endangered status in the IUCN Red list), while data are insufficient to evaluate the status of others (*M.xenarcha* and *M.prionura*). *Mycteroperca rosacea* is the most caught species in the region, and although it is the most studied, large spatial and temporal studies of its distribution are still lacking.

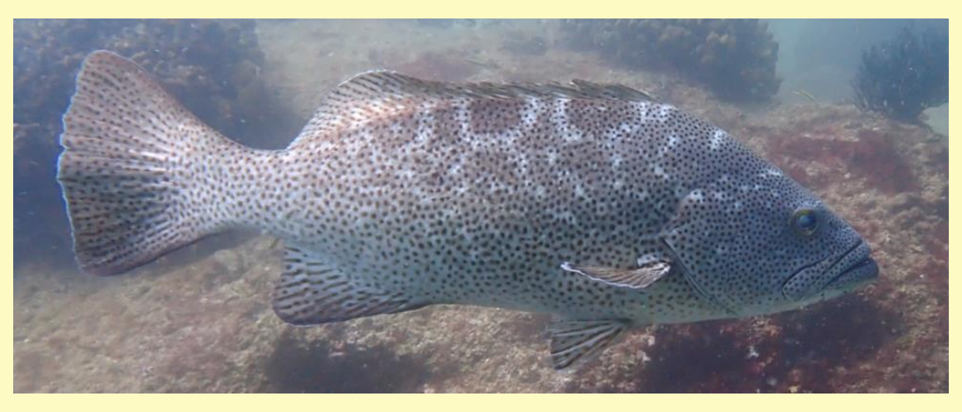
Objectives:

To assess the spatio-temporal changes in *Mycteroperca spp* biomass in the Gulf of California, Mexico

Methods:

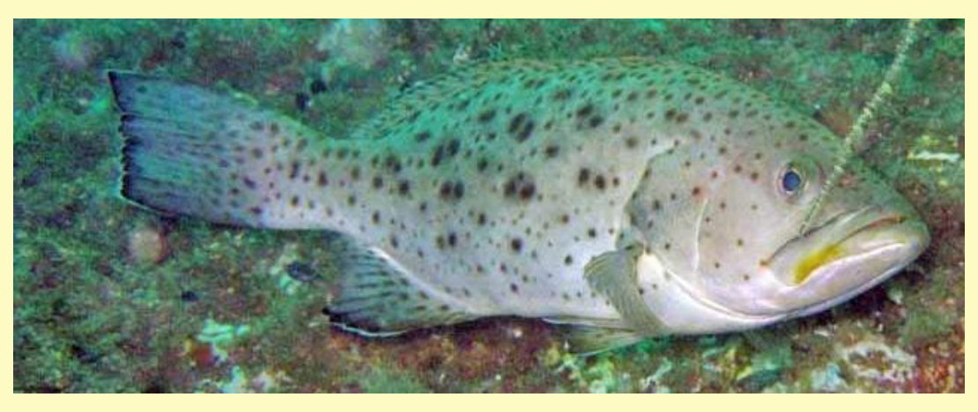
Surveyed sites:
160 rocky reefs (2-30m depth), data between 1998-2024 by : COBI Niparajá UABCS Promares Panga

Monitoring activity:
Abundance & size estimation of 4 species of *Mycteroperca spp*



Mycteroperca rosacea

Mycteroperca jordani



Mycteroperca prionura

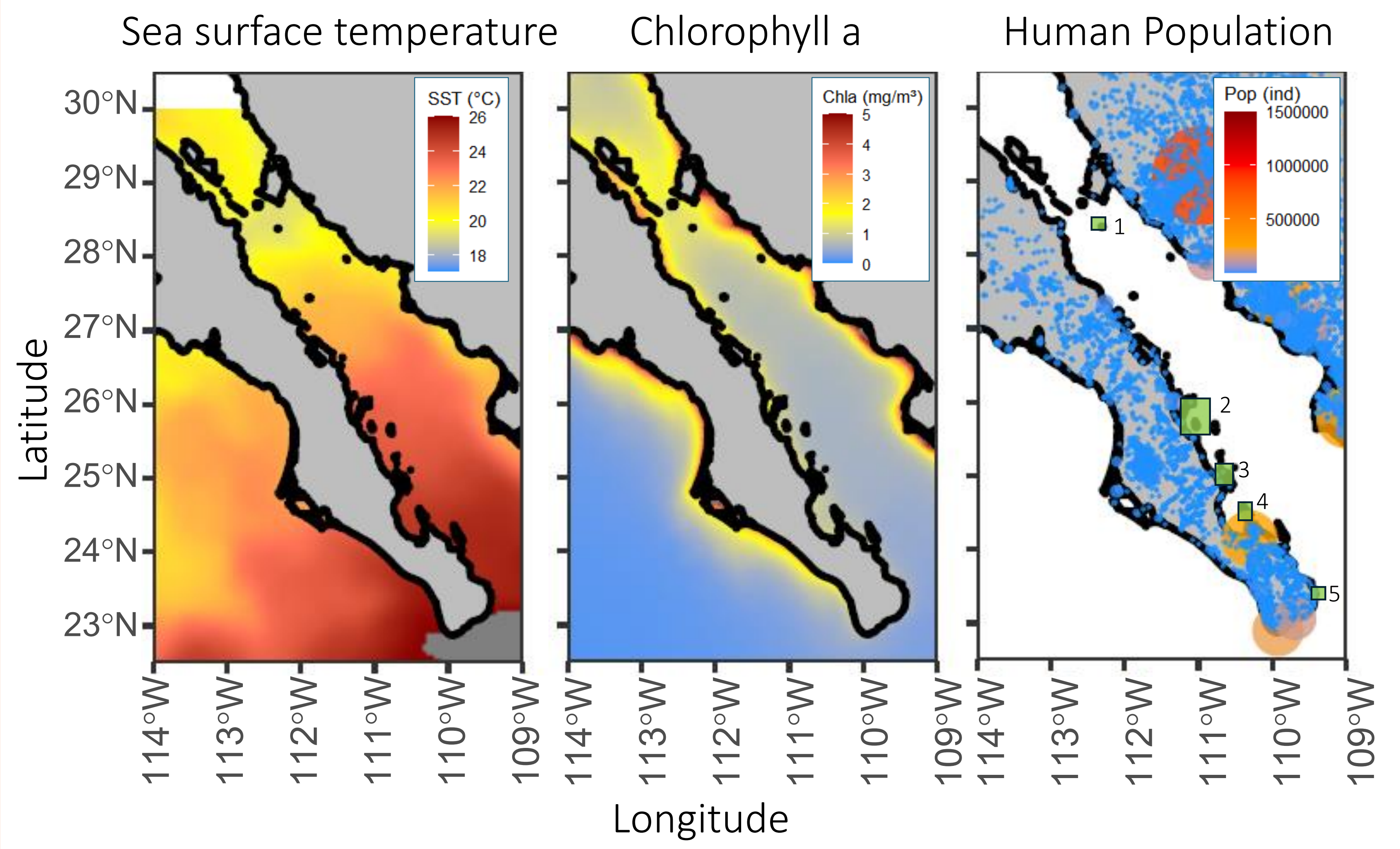
Mycteroperca xenarcha

Statistical analyses:
Spatial variation and Explanatory variables: Generalized linear model (GLM) with negative binomial (*M.rosacea*) or bernouilli (*M.jordani* and *M.prionura*) distribution
Temporal variation in 5 mixed marine protected area: Generalized linear mixed model (GLMM) with negative binomial (*M.rosacea*) or bernouilli distribution (*M.jordani* and *M.prionura*) and Site as random

Results:

Explanatory variables: On *M.rosacea* biomass and *M.jordani* and *M.prionura* presence

🟩 Marine protected area (MPA): No-take zone

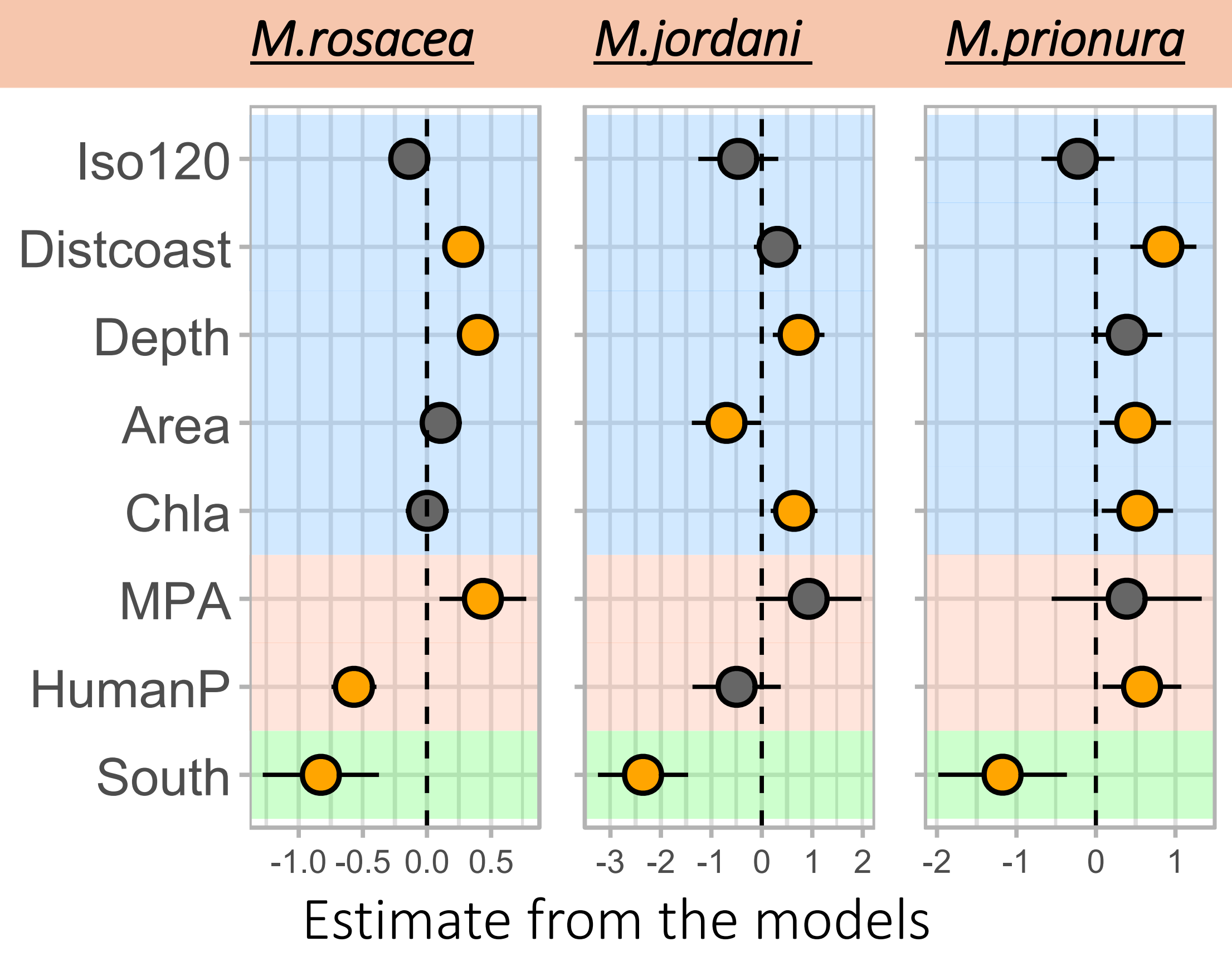


▢ Environmental variables: Distance to the isobath 120m, Distance to the coast, Depth, Shelf area, Chlorophyll a

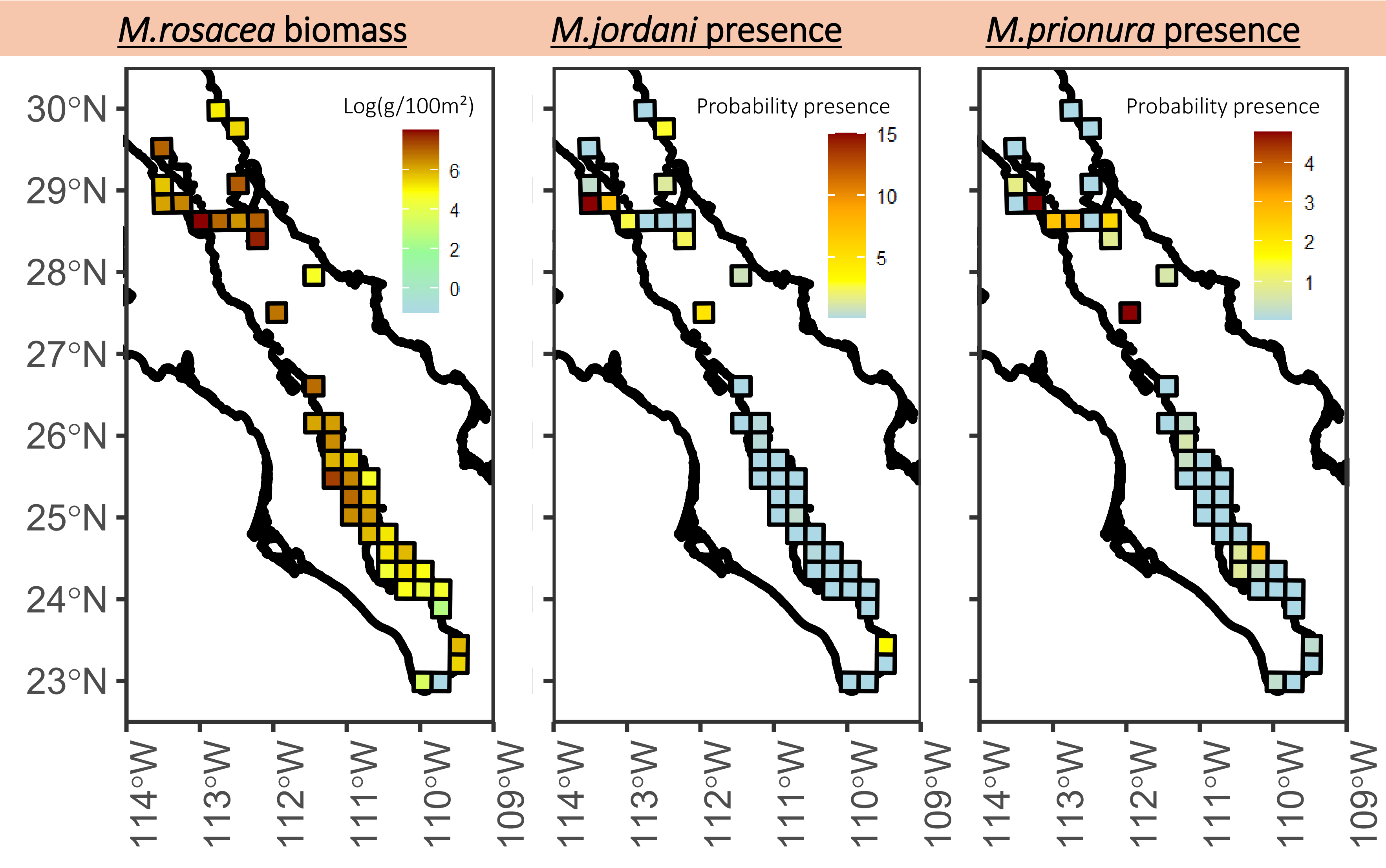
🟥 Anthropogenic impacts: No-take zone and Human population around 50km

🟩 Geographic factor: Locality southern part of the GC

● Significance



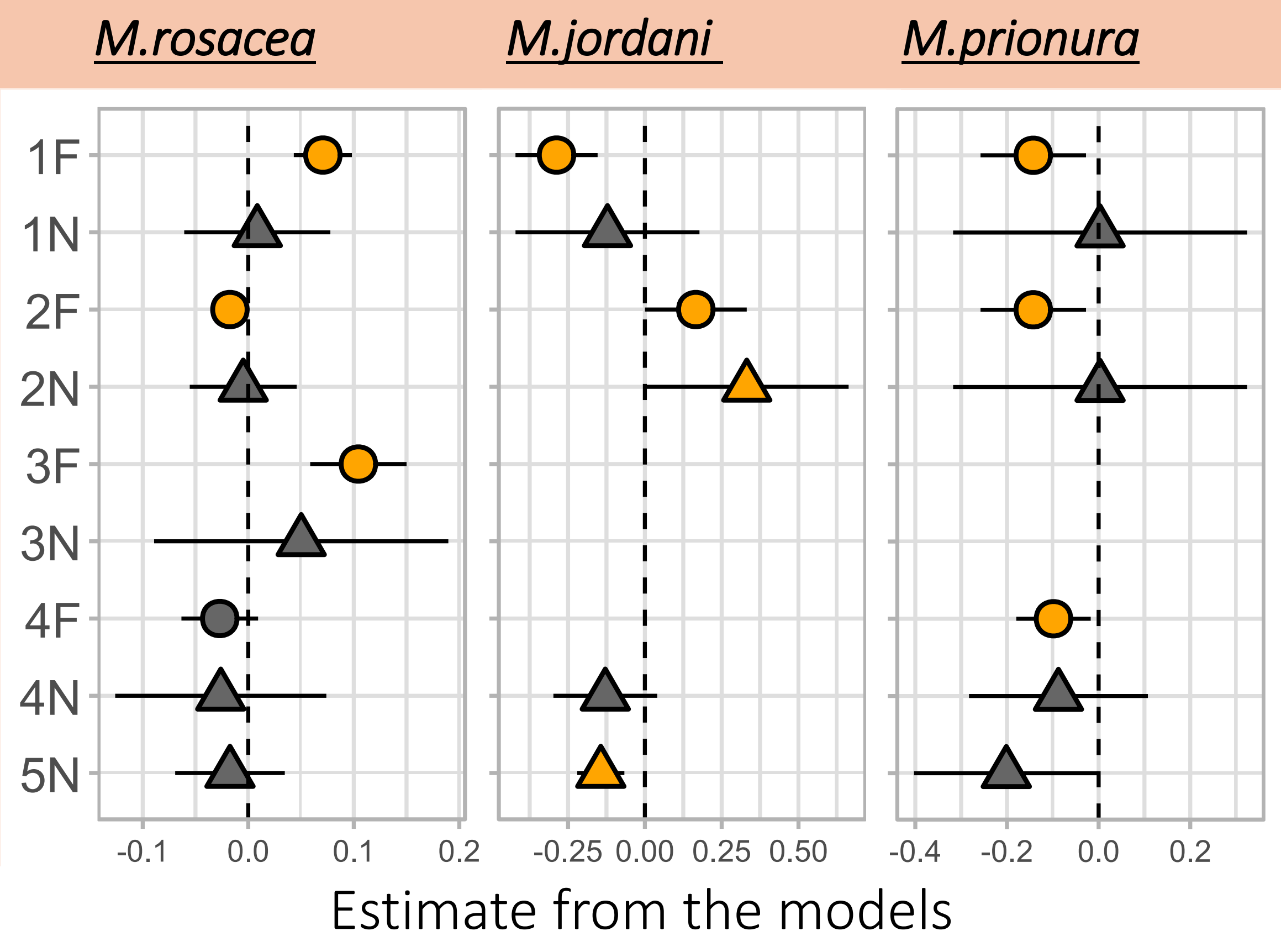
Spatial variation: *M.xenarcha*: almost absent in all data collected



Temporal variation:

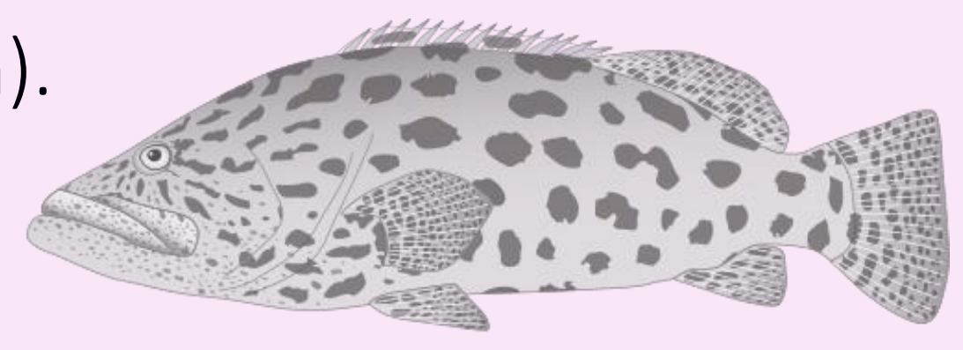
On *M.rosacea* biomass and *M.jordani* and *M.prionura* presence

▲ No-take zone (N)
● Fishing zone (F)
● Significance



Discussion & Conclusion:

- ❖ Analyses of presence of *Mycteroperca spp* confirm the **rarity** of certain species such as *M.prionura* and the **absence** of *M.xenarcha* within the first 30m of depth.
- ❖ The **central-north region** of the Gulf of California seems important for the population of *Mycteroperca spp*.
- ❖ The groupers are more found in **isolated area** (deeper and far from the coast) with **limited human impact** for *M.rosacea* (MPA and small human population).
- ❖ The temporal variations depend on the species and the region with an **overall stable** trend except for *M.prionura*, which is declining in fishing areas.



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