

An underwater photograph showing a diver on the left side of the frame, swimming towards a large, dark, rocky reef structure that dominates the right and center. The water is a deep blue, and the lighting is somewhat dim, creating a moody atmosphere. The diver is wearing a black wetsuit and yellow fins. The reef is covered in various marine life, including what appears to be a large, flat, circular object, possibly a piece of coral or a rock.

The State of Marine Research in Cuba

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Marine Research in Cuba



General characteristics of coastal marine ecosystems



Main threats



Research areas and institutions

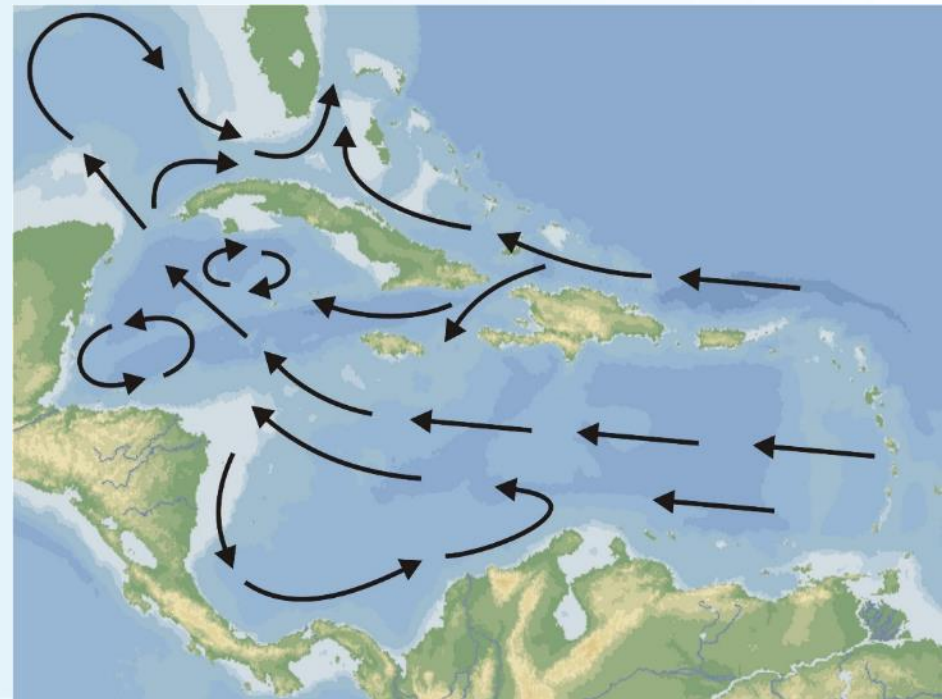


General characteristics of Cuban marine ecosystems



Climatic conditions

- Subtropical climate
- Annual average of precipitation: 1375 mm
- Tides: change of 20 cm/day
- Seasons: **dry** (November to April) and **rainy** (May to October)
- Extreme meteorological events



General characteristics of Cuban marine ecosystems



Strong physical, genetic and ecological connectivity!

Mangrove and estuaries



Seagrass beds

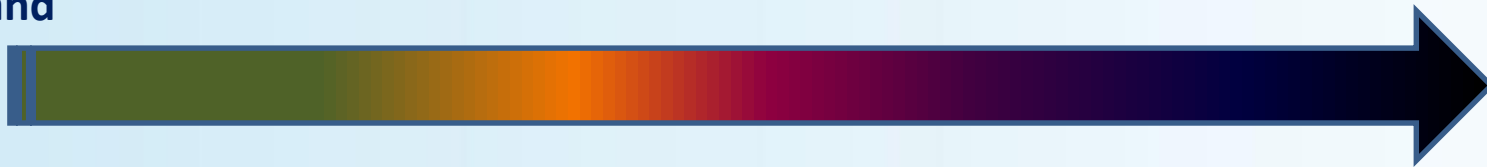


Coral reefs



Land

Open sea



Cuban mangroves

- ~ 5.1 % of Cuban archipelago surface.
- ~ Represent approximately 20.1 % of forest cover.
- ~ Occupy, approximately, between 60 - 70 % of our coast line.
- ~ High ecological significance because represent transition between land and sea.



Cuban seagrass beds

- Vertical distribution since intertidal zone to 15 m depth.
- 6 species.
- Variable density (20-4000 leaf/m²).
- Variable biomass (0.05-2 kg/m²).
- Highly influenced by environmental factors.



Cuban coral reefs

- Shelf edge extends approximately 5746 km.
- Total extension of coral reefs is ~3781 km.
- Cuban coral reefs can be found along almost the entire border of Cuban shelf and many of the gulfs.

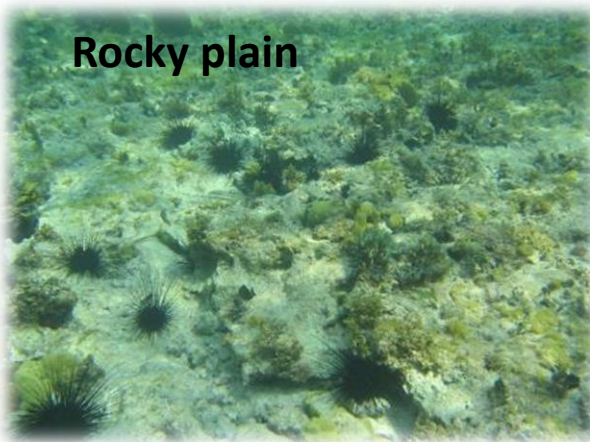


Main biotopes of Cuban coral reefs

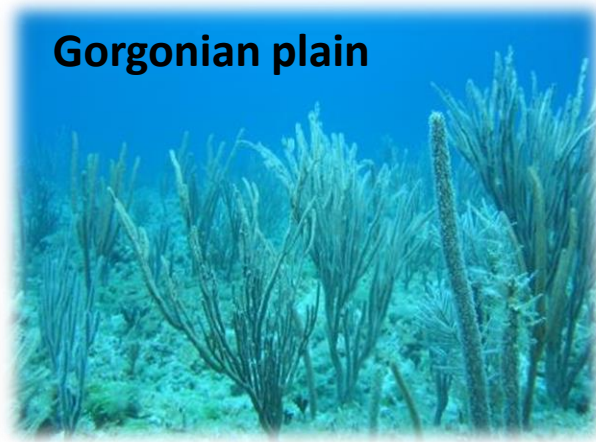
Crest



Rocky plain



Gorgonian plain



Terrace edge



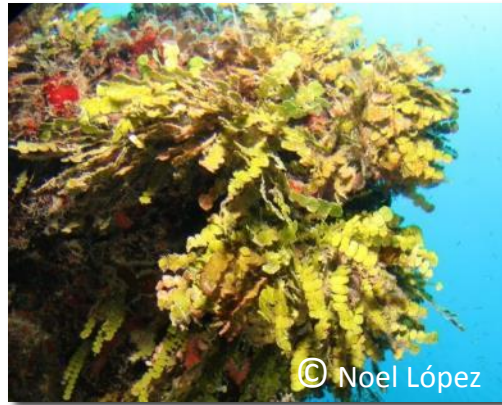
Spur and groove



Distribution of mangroves, seagrass and coral reefs in western cuban region

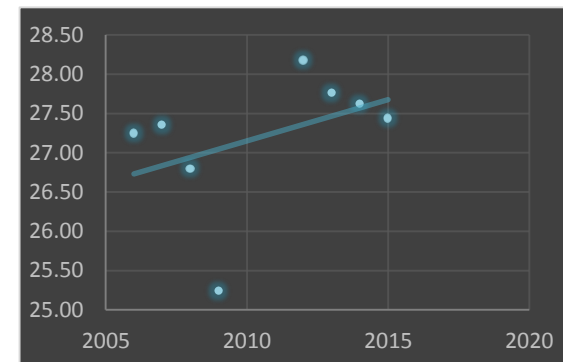


Biodiversity



Main threats

- Subsistence overfishing
- Sedimentation and land-based pollution
- Direct damages
- Effects of climate change
- Bleaching and diseases





What we do in front of this scenario?



Research

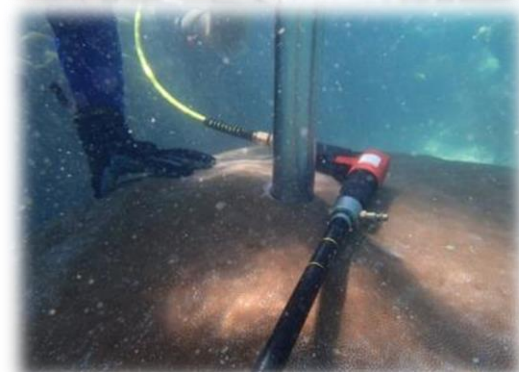


Building capabilities



Main research lines

- Oceanographic, ecologic and genetic connectivity.
- Population genetics.
- Coastal processes.
- Marine meteorology.
- Biodiversity patterns.
- Paleoclimatic reconstruction.
- Marine protected areas.
- Endangered species (sharks, manatíes).
- Invasive species (lion fish, clarias).
- Bioproducts.
- Fisheries management and research in stock fisheries.
- Effects of natural and anthropogenic impacts.
- Health of coastal ecosystems (mangrove, seagrass beds and coral reefs).
- Global change.
- Resilience processes.
- Conservation and management of coastal ecosystems.





INSTITUTIONS





Minister of higher education

Universities

Research centers

Environmental network

Local development network

CITMA

Environmental agency

Protected areas

National Aquarium

ICIMAR

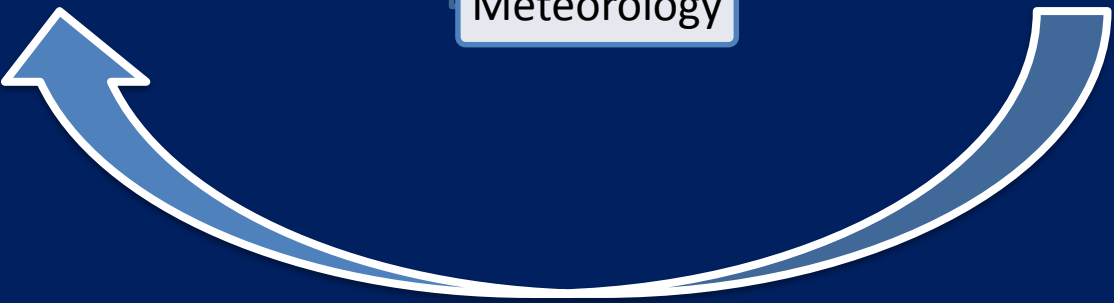
CIEC

Meteorology

MINAL

CIP

Fisheries regulations

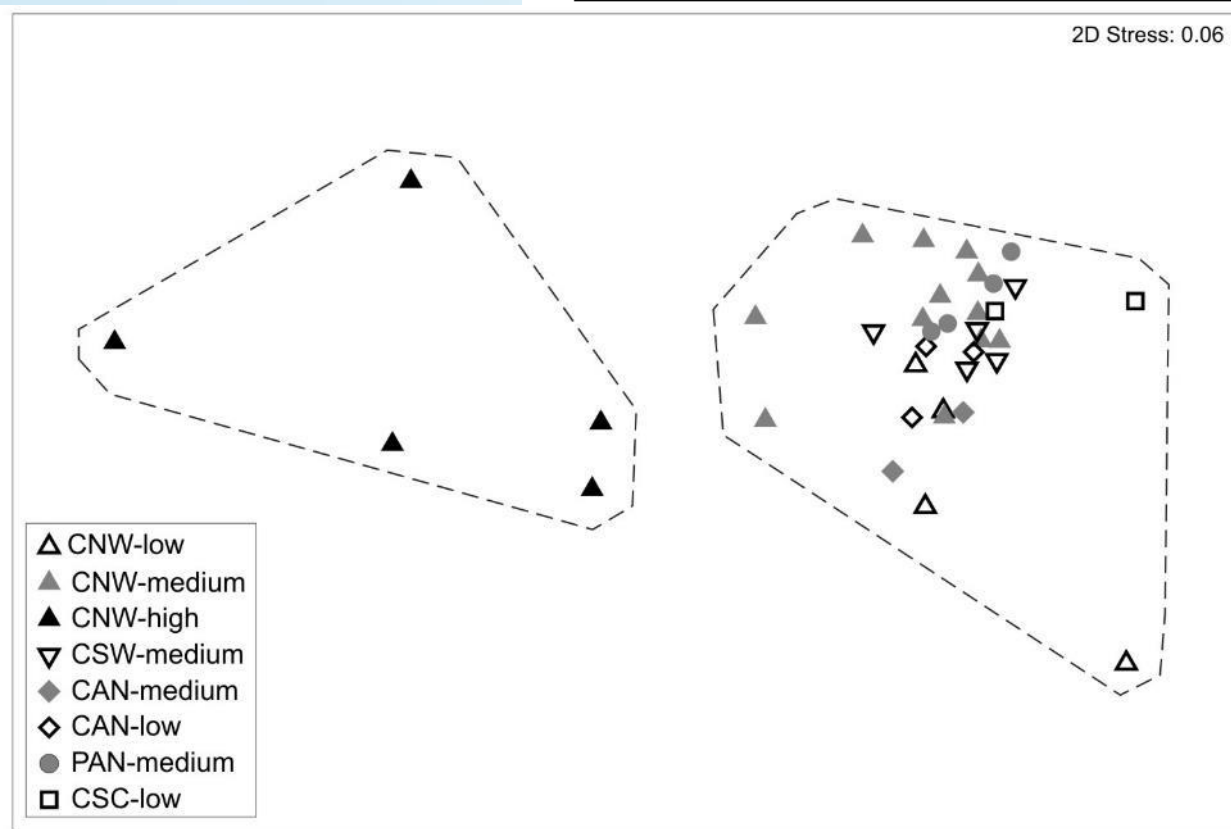
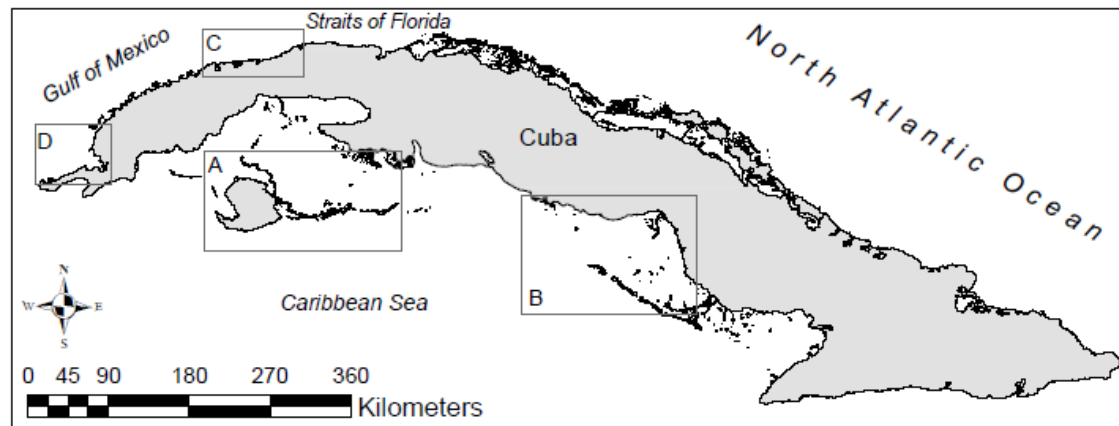




Only as example...



General status (benthos)

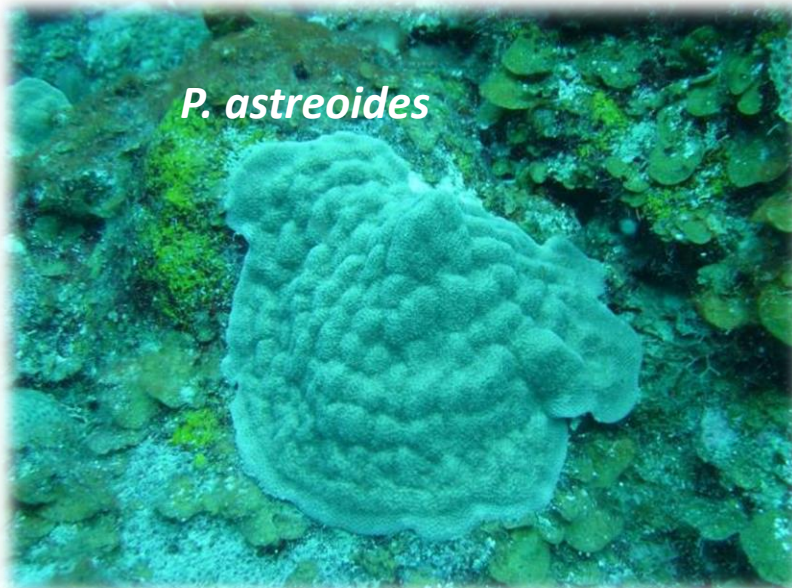
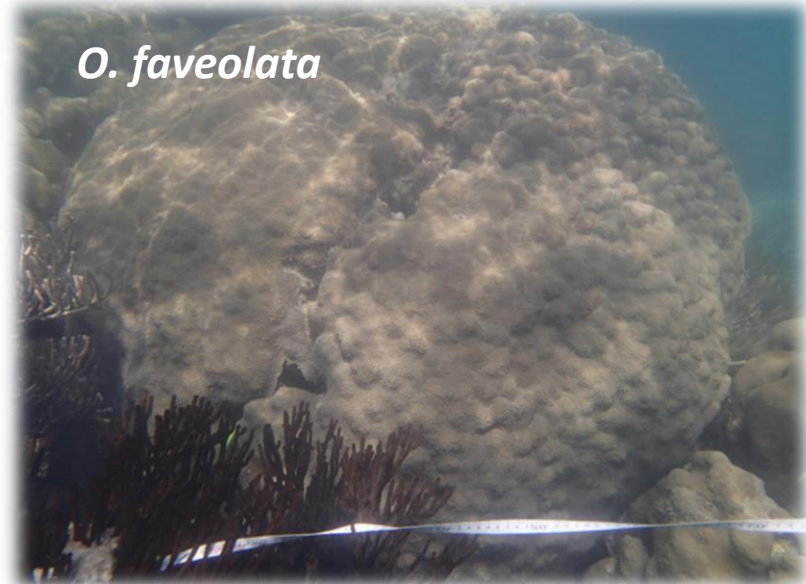


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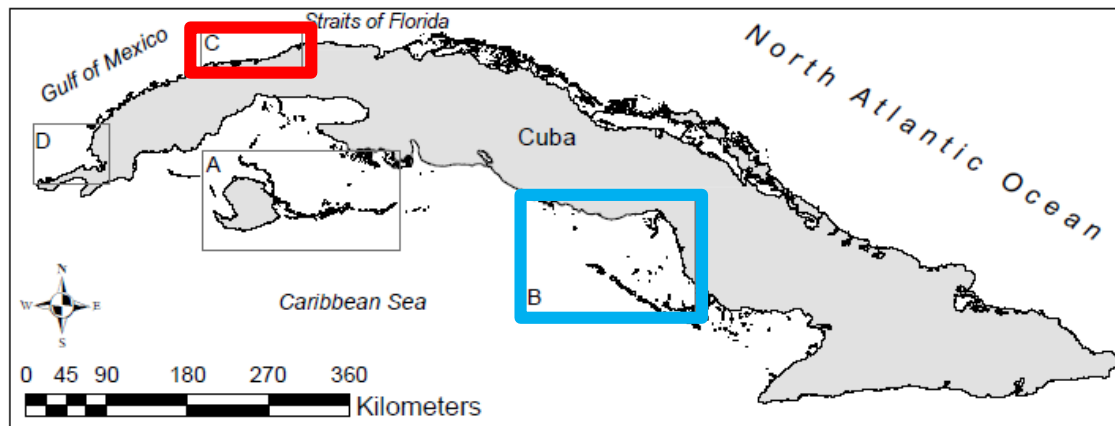
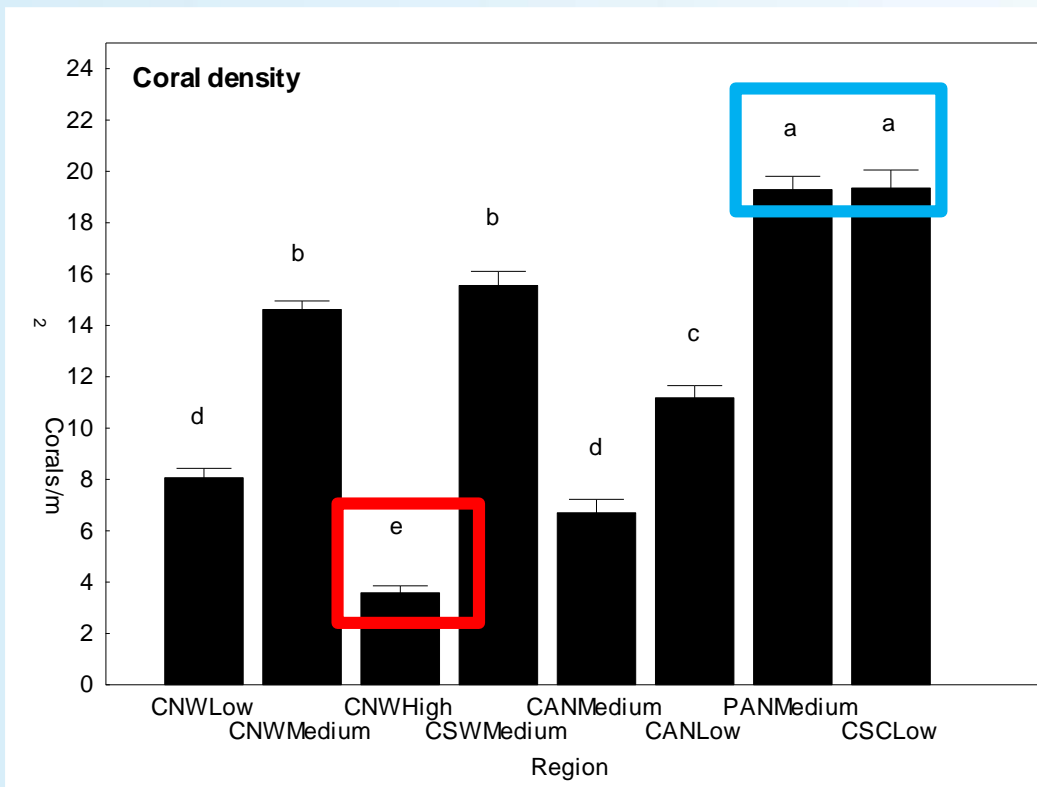


All reefs (min-max)	
Coral cover	9.9-28.5
Density	0.6-1.6
Max diam	21.1-34.2
Anc mor	4.8-14.8
Rec mor	0-0.9
Recruits	3.7-14.0
Macroalgae	14.9-231.4
Cal algae	3.7-90.2
Diadema	0-0.78

General status (benthos)



General status (benthos)



General status (fishes communities)



Los Colorados

Density (ind/1000m ²)	11.9+/-1.6
Biomass (kg/1000m ²)	17.8+/-2.0

Punta Francés

Density (ind/1000m ²)	11.9 +/- 1.5
Biomass (kg/1000m ²)	15.8+/-1.5

Jardines de la Reina

Density (ind/1000m ²)	28.5+/-3.1
Biomass (kg/1000m ²)	45.7+/-4.4



General status (fishes communities)

S. barracuda



L. analis
(Mutton snapper)



M. atlanticus
(Tarpon)



S. guacamaia
(Parrotfish)



L. maximus
Wrasses



D. americana
(Stingrays)



Womens in the sea





*Please feel very welcome to visit
Cuban marine ecosystems!*