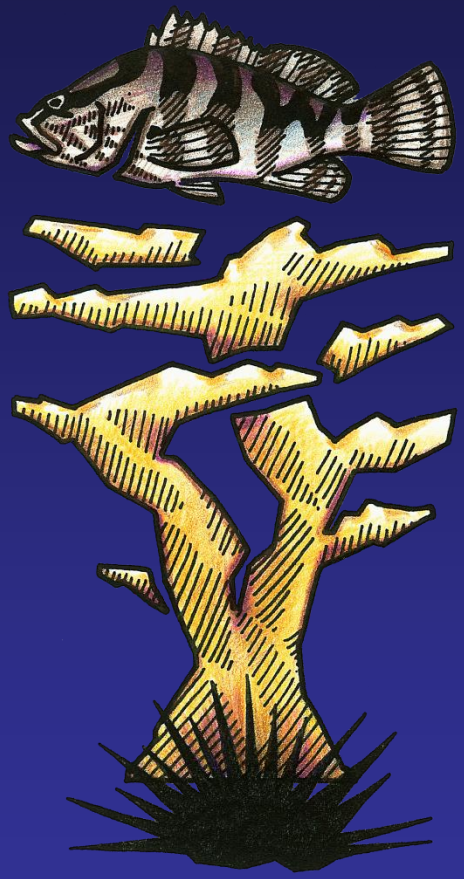
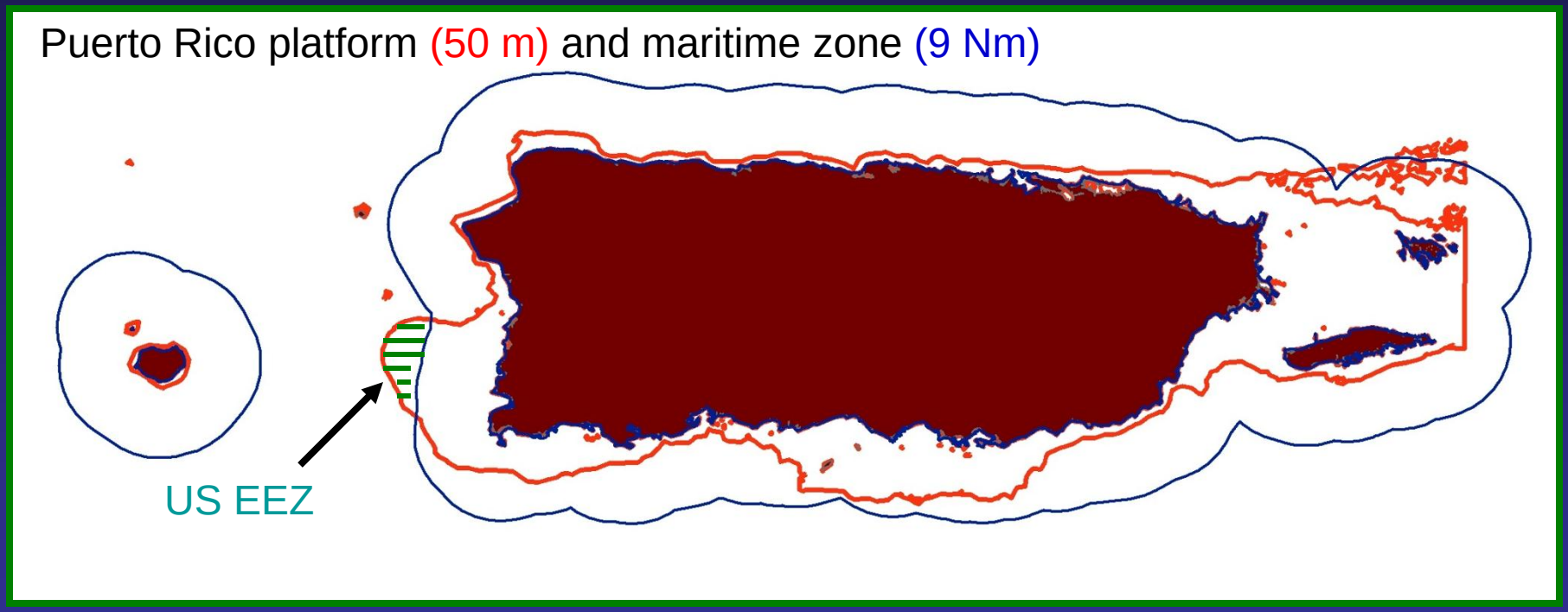


Caribbean Coral Reef Institute

CCRI as an Approach to Research

- Cooperative program with NOAA
- Develop, implement, and administer management-driven research and monitoring activities
- Interact with government agencies, public and private organizations
- Utilize fully the resource base of the region to collaborate and conduct research

Why CCRI? → Coral reef management means local action!



Capacities, Governance systems, Laws and regulations, Stakeholders, Social structures, Historical context, Physical geography

Fisheries Assessment

Spawning Aggregations

Acoustic detection & monitoring

Assessment of spawning stock

TEK and Aggregation Sites and Times

From 7 → 134 “Potential” Aggregations

27 now gone

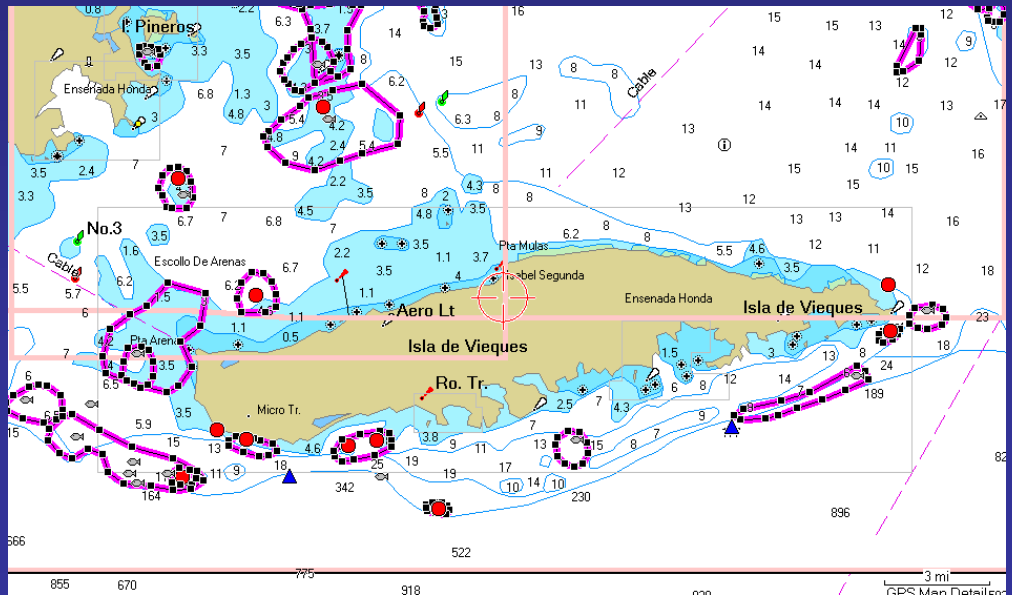
93 current w/ 76 sites being multispecies sites

61 species: snappers (12), groupers (11)

Marine Ornamentals

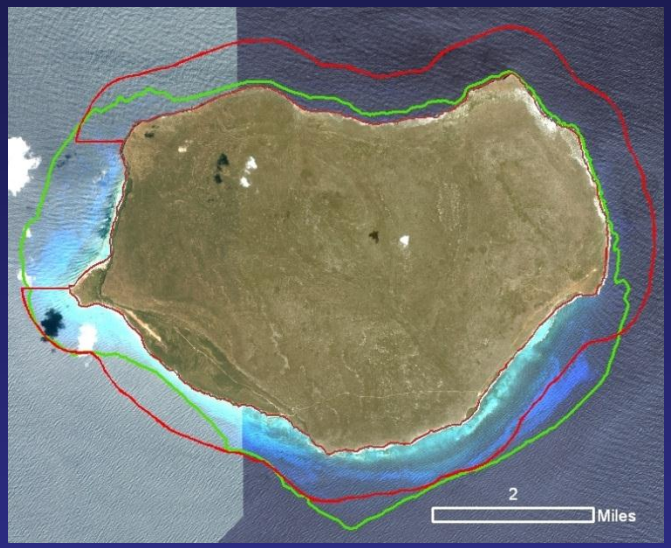
16 Fishes

20 Invertebrates

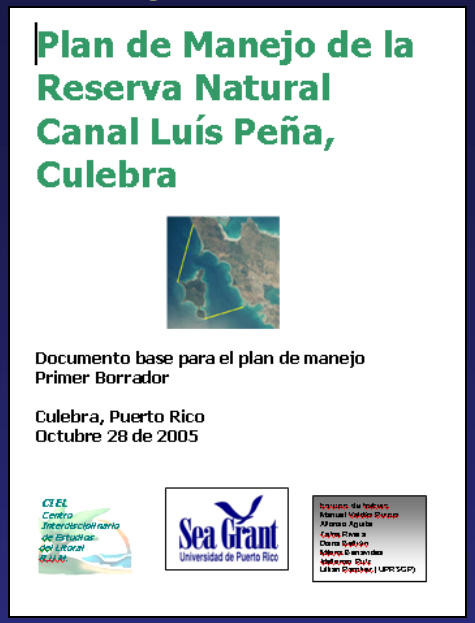


MPA's

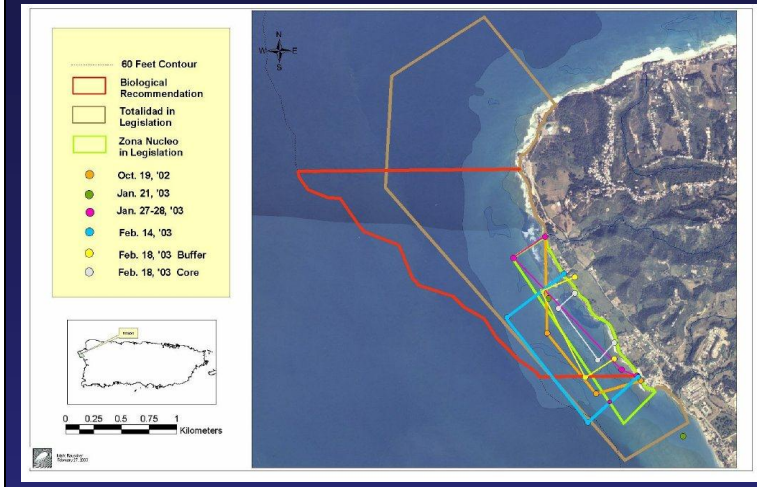
Critical Habitats & Zoning



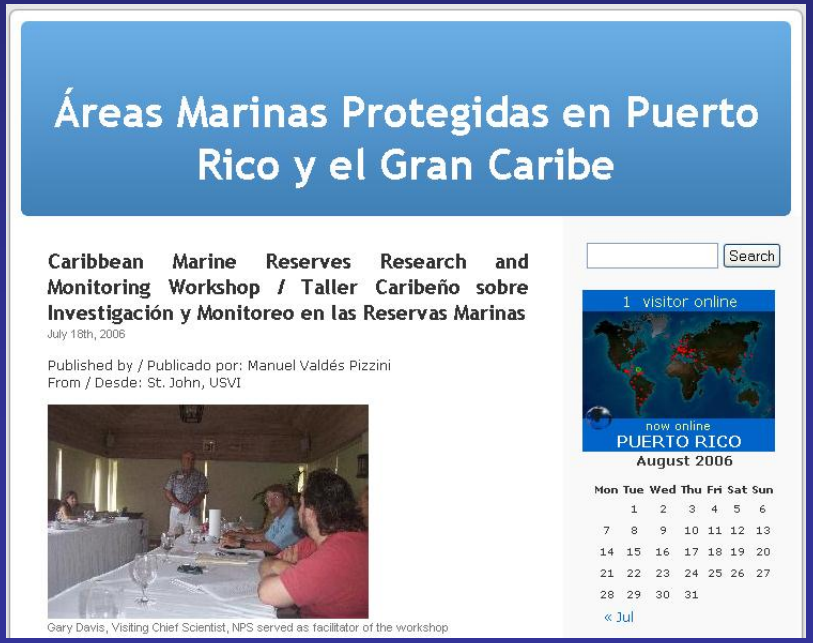
Management Plans



GPS Products



Outreach: Bilingual MPA Blog



Development & Implementation Steps

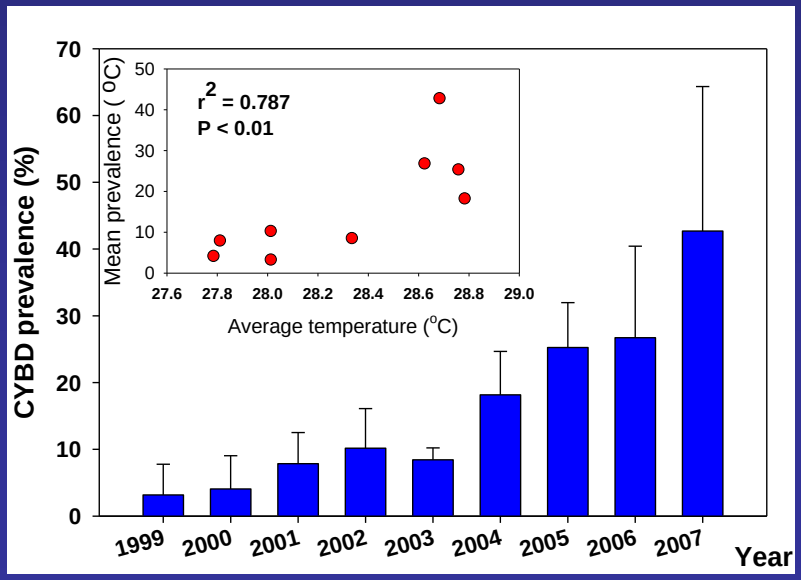
- Capacity building
- History
- Resource use
- Policy
- Language and concepts
- ID stakeholders, issues
- Education

Integrated Ecological Assessments

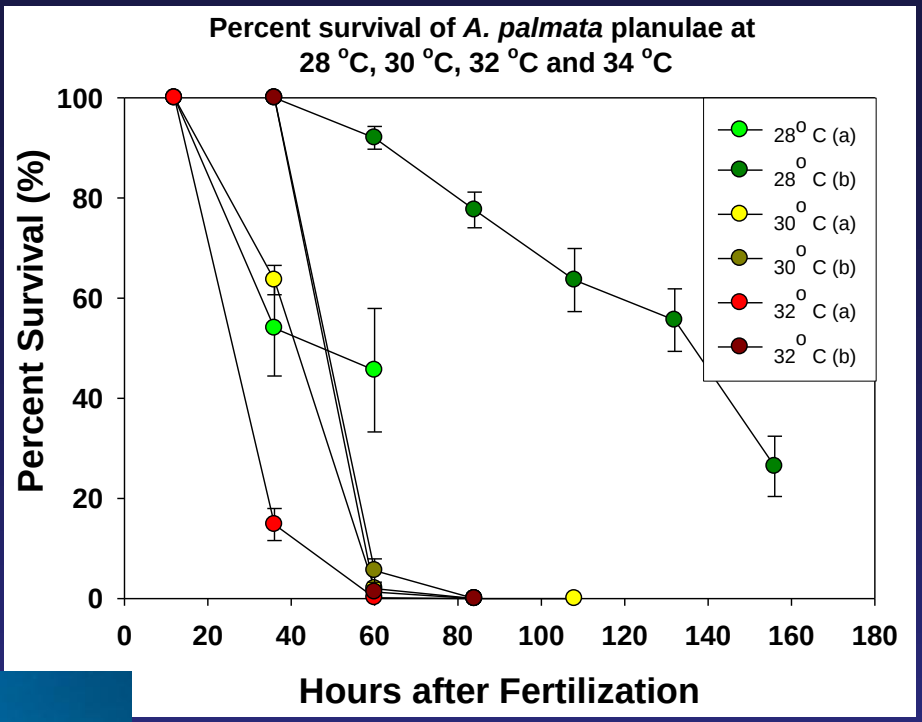
Processes Affecting Reef Resilience

Cyanobacterial and algal epizoic growth on corals

Response of diseased corals to rising temperature and nutrient pollution



Threatened Species: *Acropora*



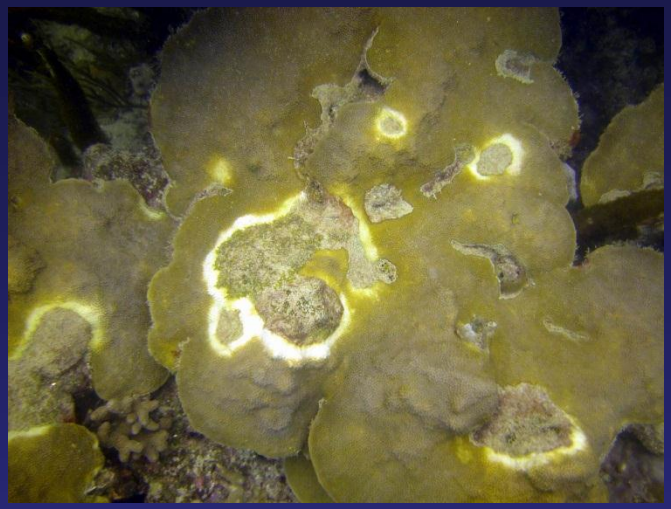
Early life history
Rearing
Temperature effects
Settlement Preferences
Survival

Spatial scale of genetic diversity

Colony → Reef→ Coast→ Island→ Region

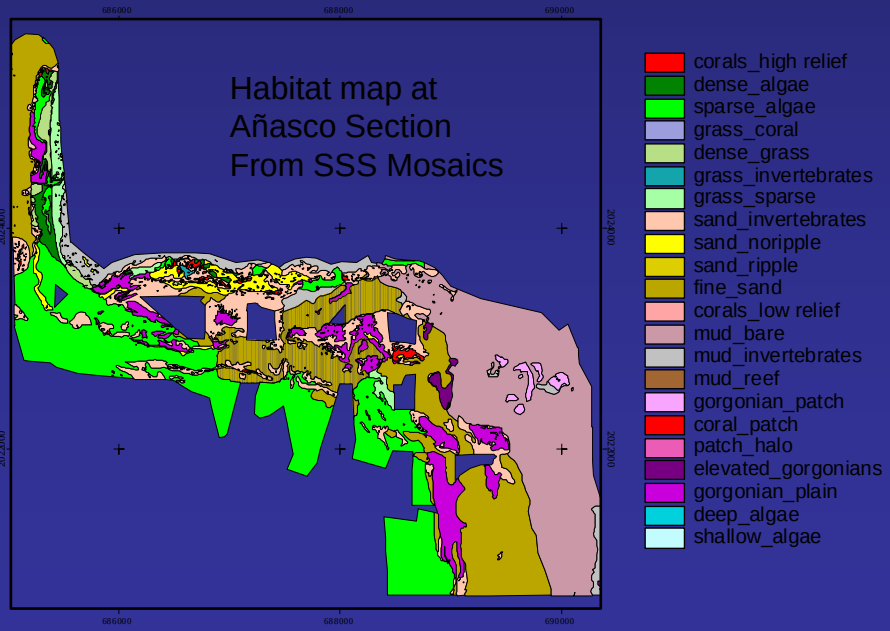
Non-fisheries Assessments

Disease

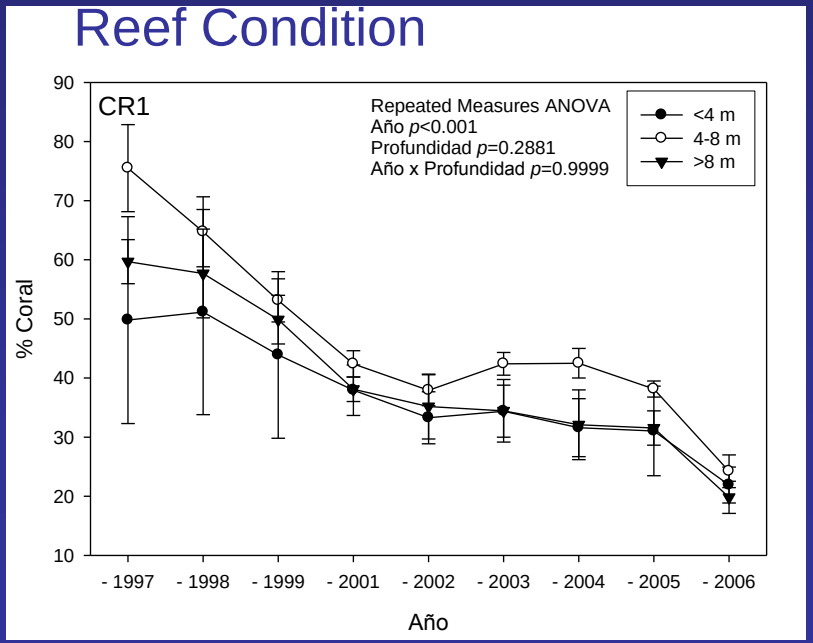


Bleaching

Detailed Habitat Maps



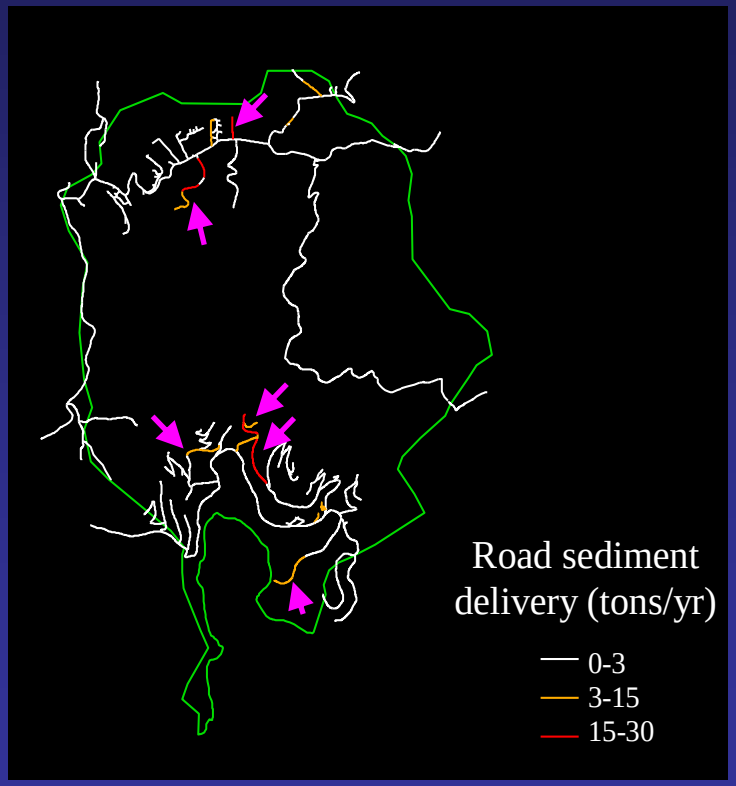
Reef Condition

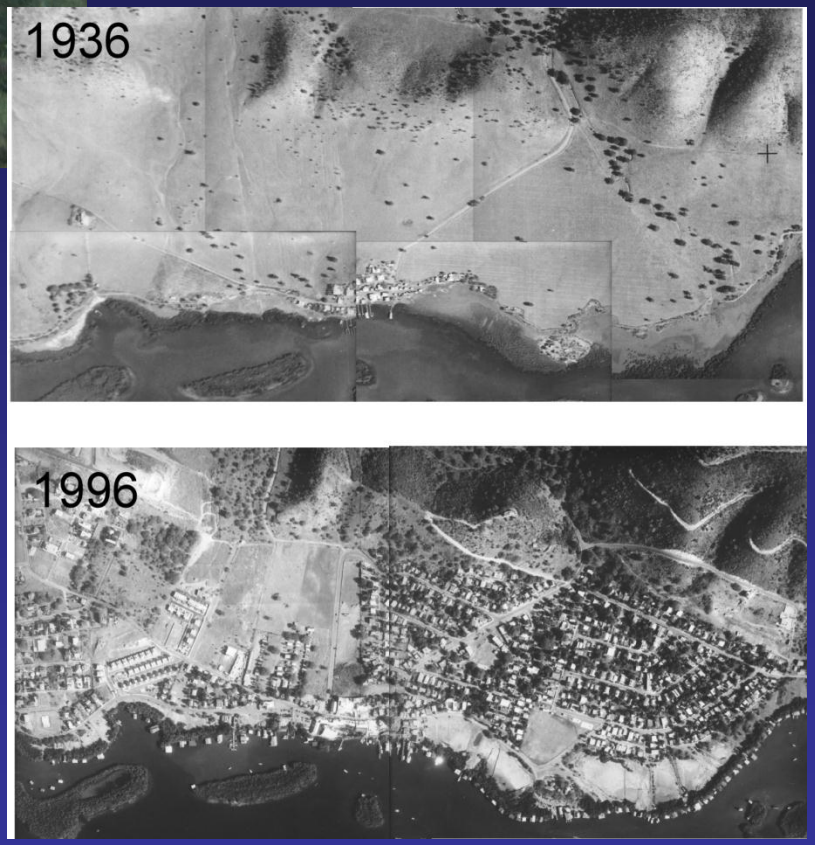


Non-point Source Pollution

Dispersal of Terrestrial Runoff Over the Shelf

GIS Modeling of Sedimentary Runoff





Erosion = f (Slope, Grain size, Cover, Rainfall, Time since disturbance)

Long-term land use dynamics and erosion processes

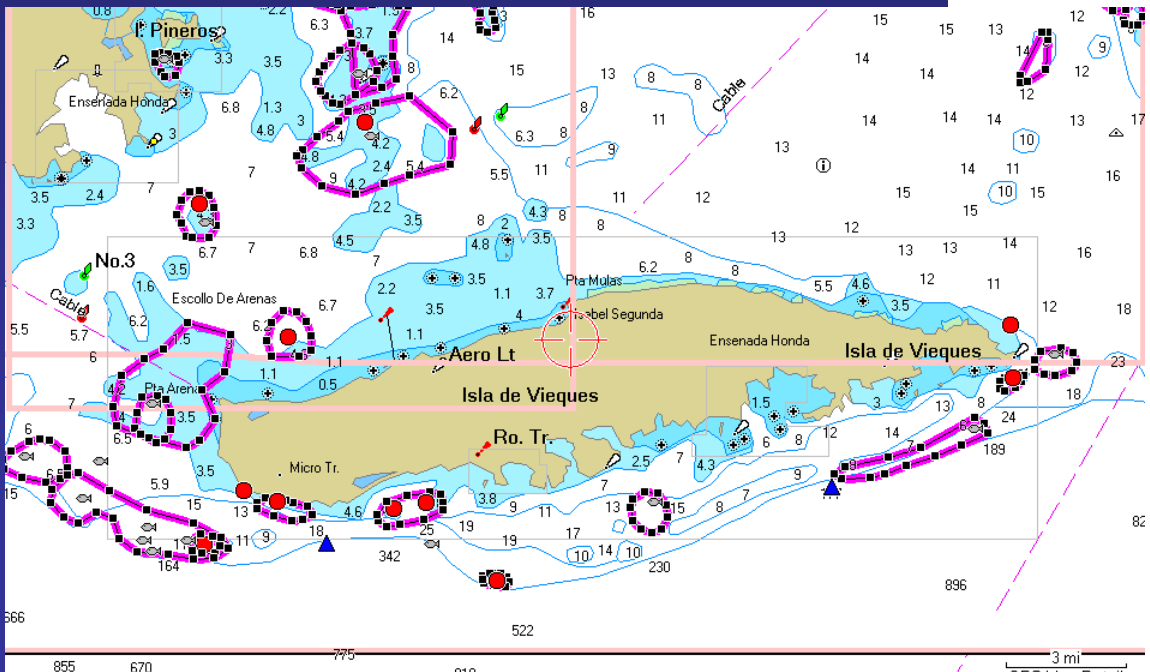
Fish Spawning Aggregations

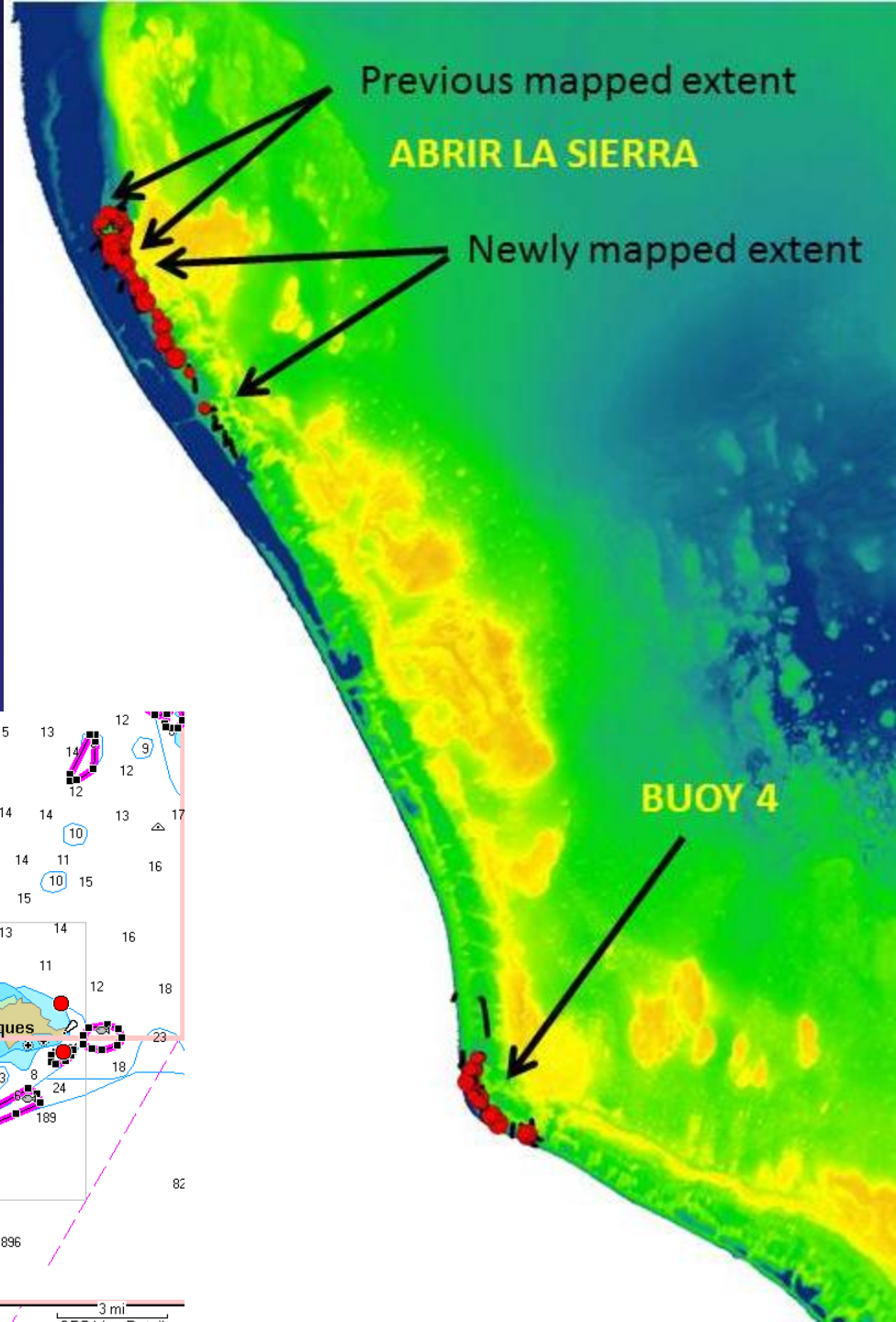
Mapping Suspected Locations

Discovering New Aggregations

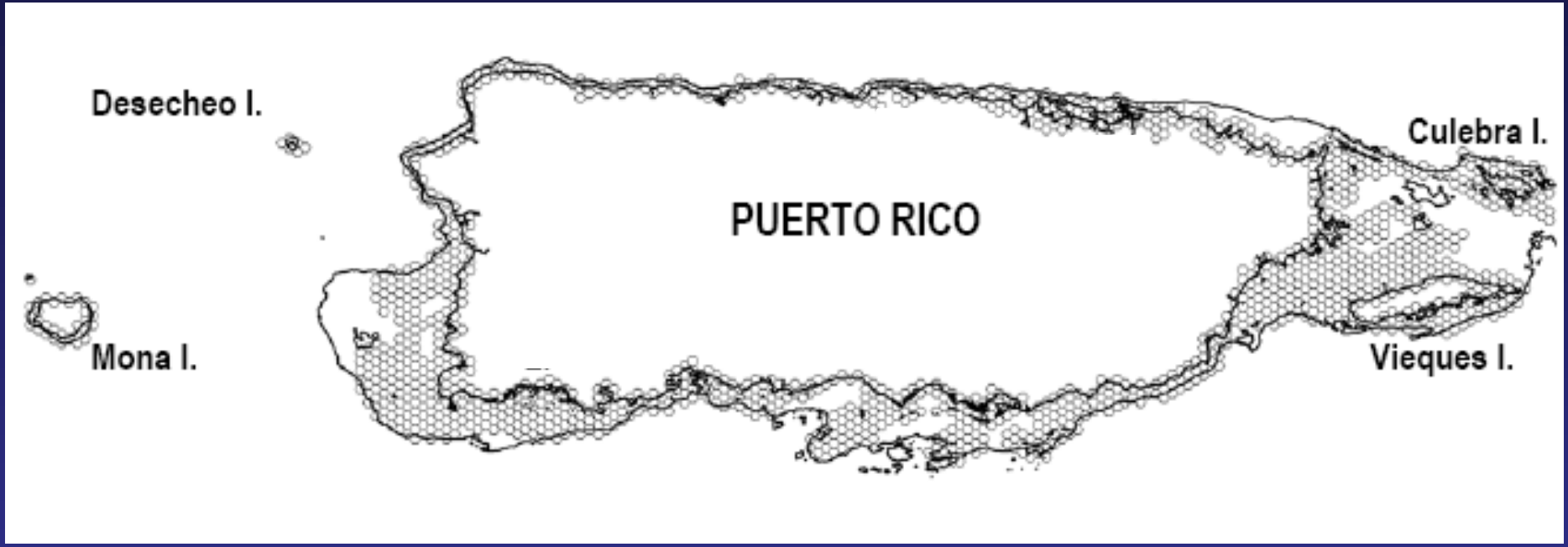
Mapping Extent

Determining Seasonality



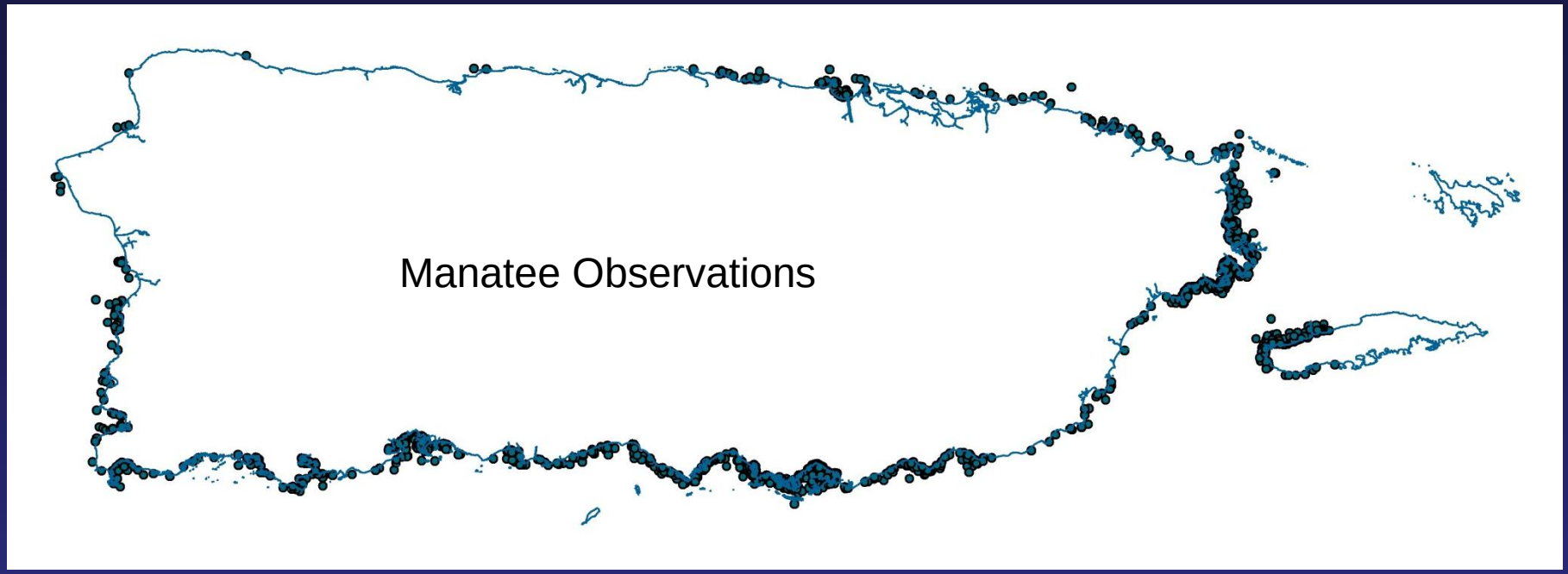


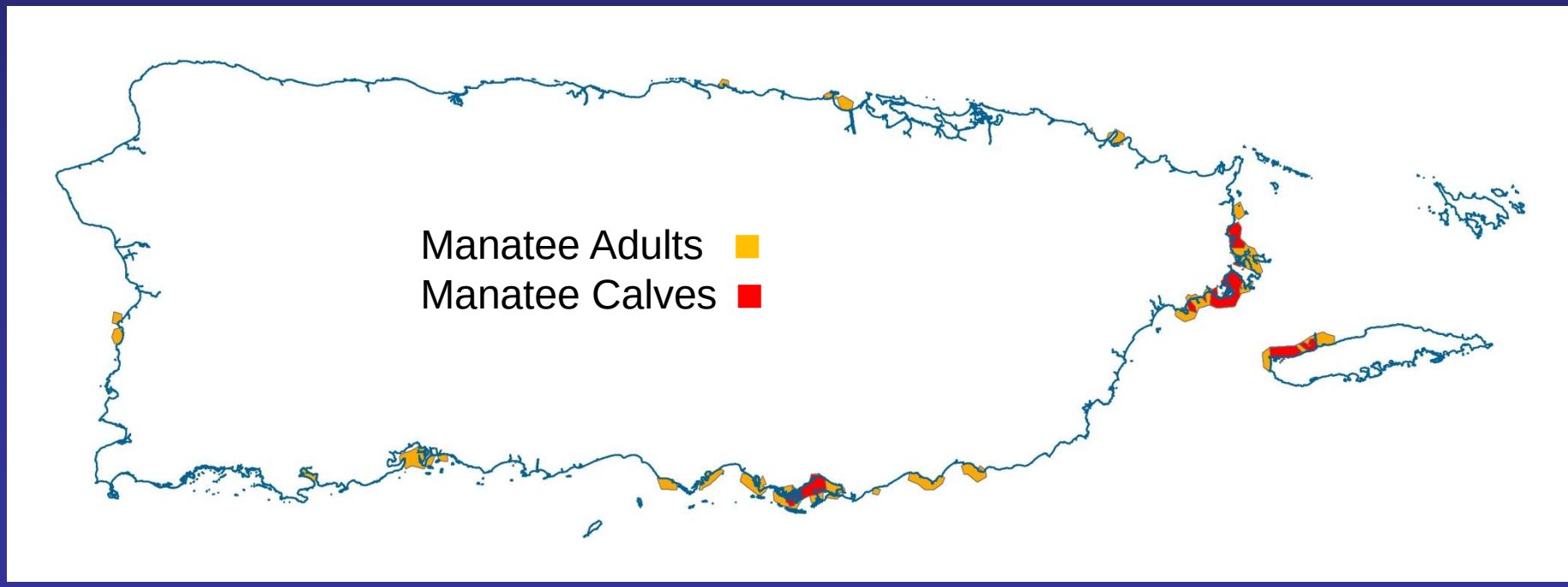
Marxan Analyses



Species Distributions

Hawksbill Turtle (Distr & Nests)
Leatherback Turtle (Distr & Nests)
Green Turtle (Distr & Nests)
Dolphins
Pelicans (Roosts & Nests)
Manatees (Adults & Calves)
Humpback Whales (Adults & Calves)
Queen Conch (Adults & Juveniles)

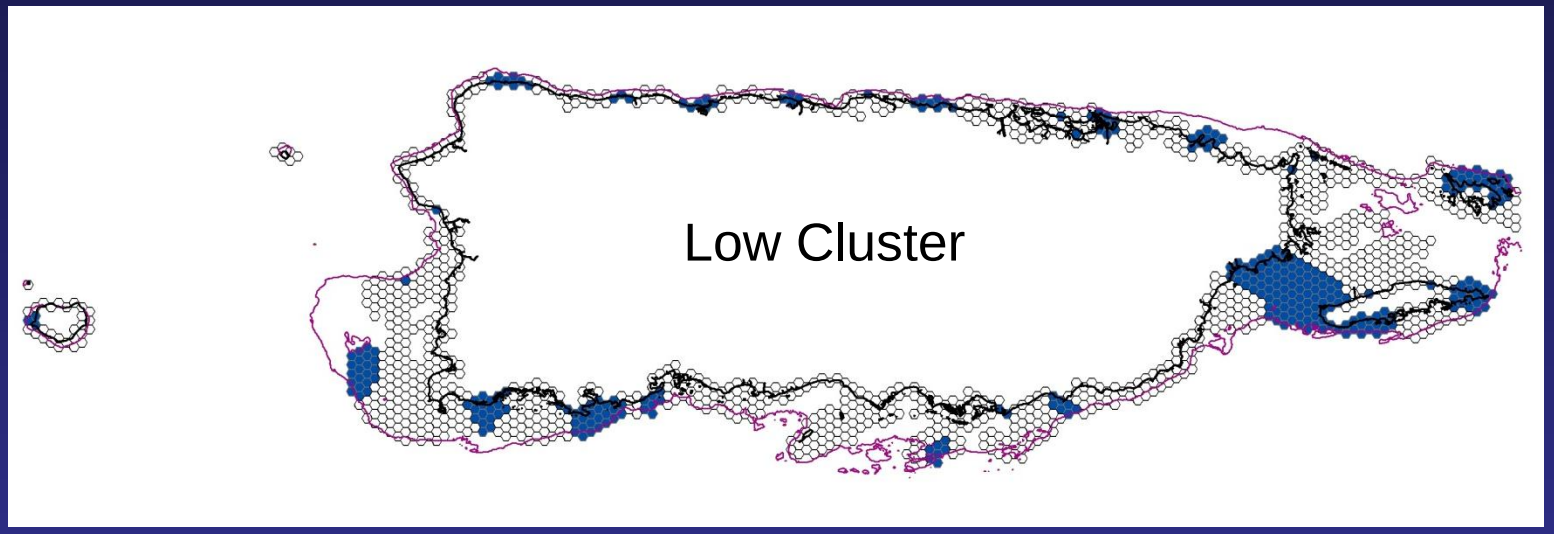

Manatee Observations

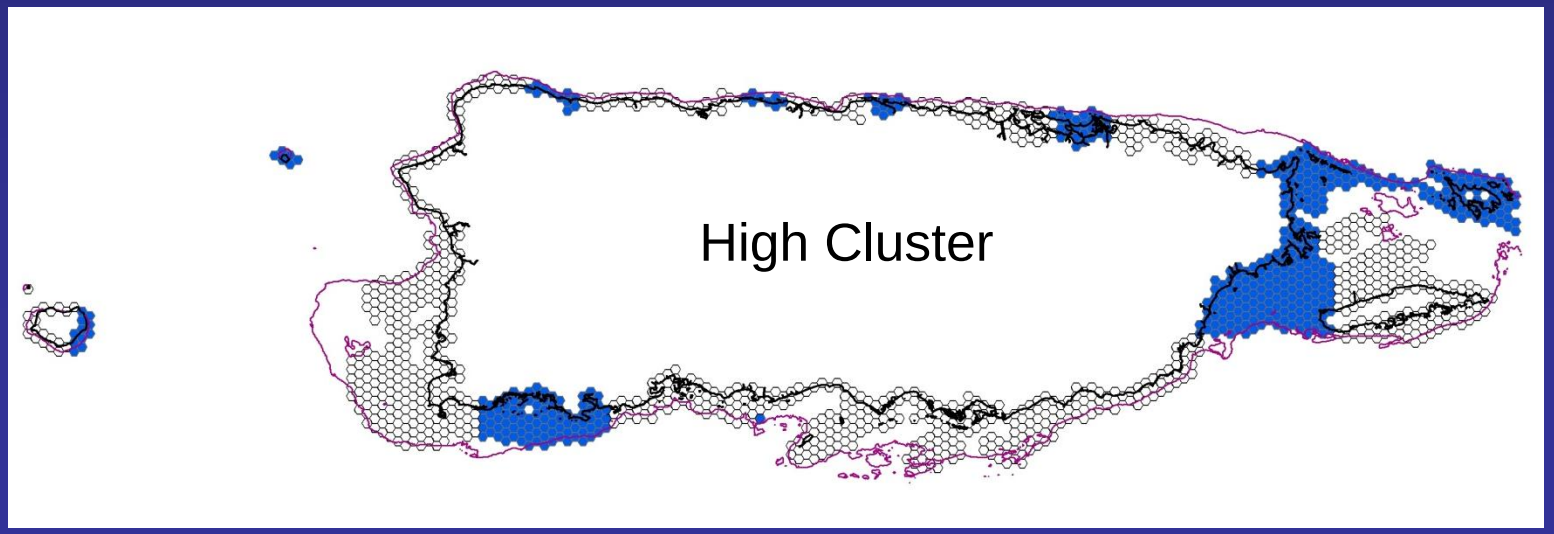

Manatee Adults
Manatee Calves

Incorporating Ecological Function into MPA Network Design in Coral Reef Ecosystems

Habitats as surrogates for biological communities
Definition and arrangement of habitats
Limits to habitat connectivity
Criteria for output assessment
Modeling cost of implementation

Best selection from Marxan

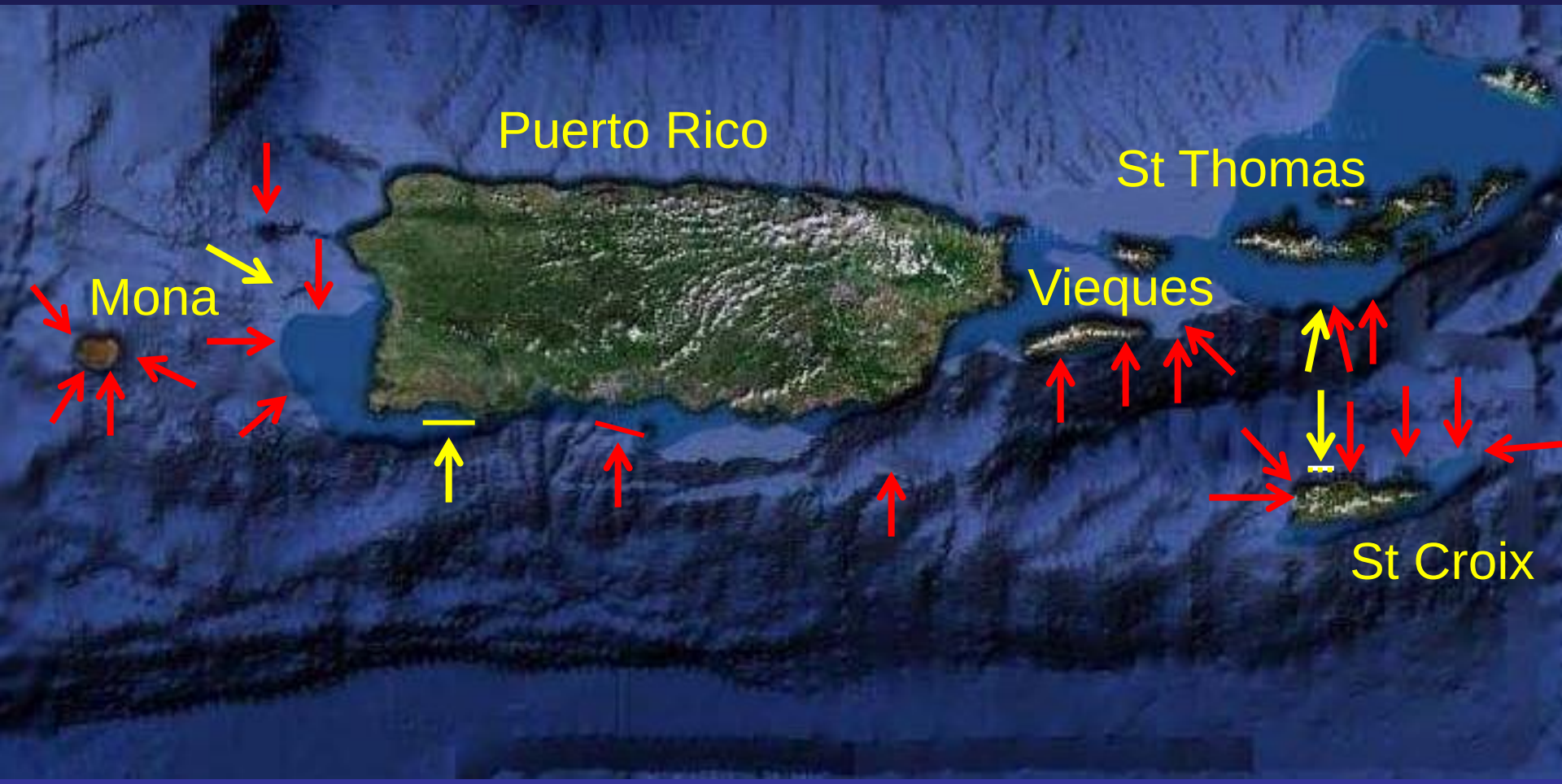


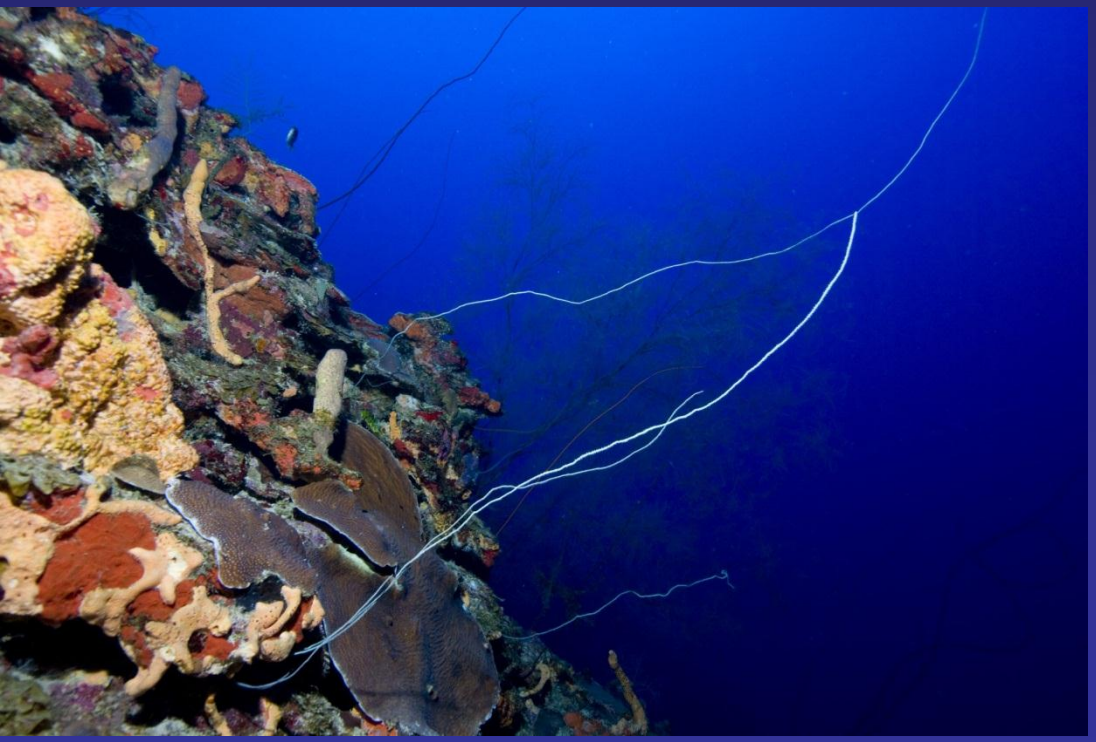


Cost to Functionality

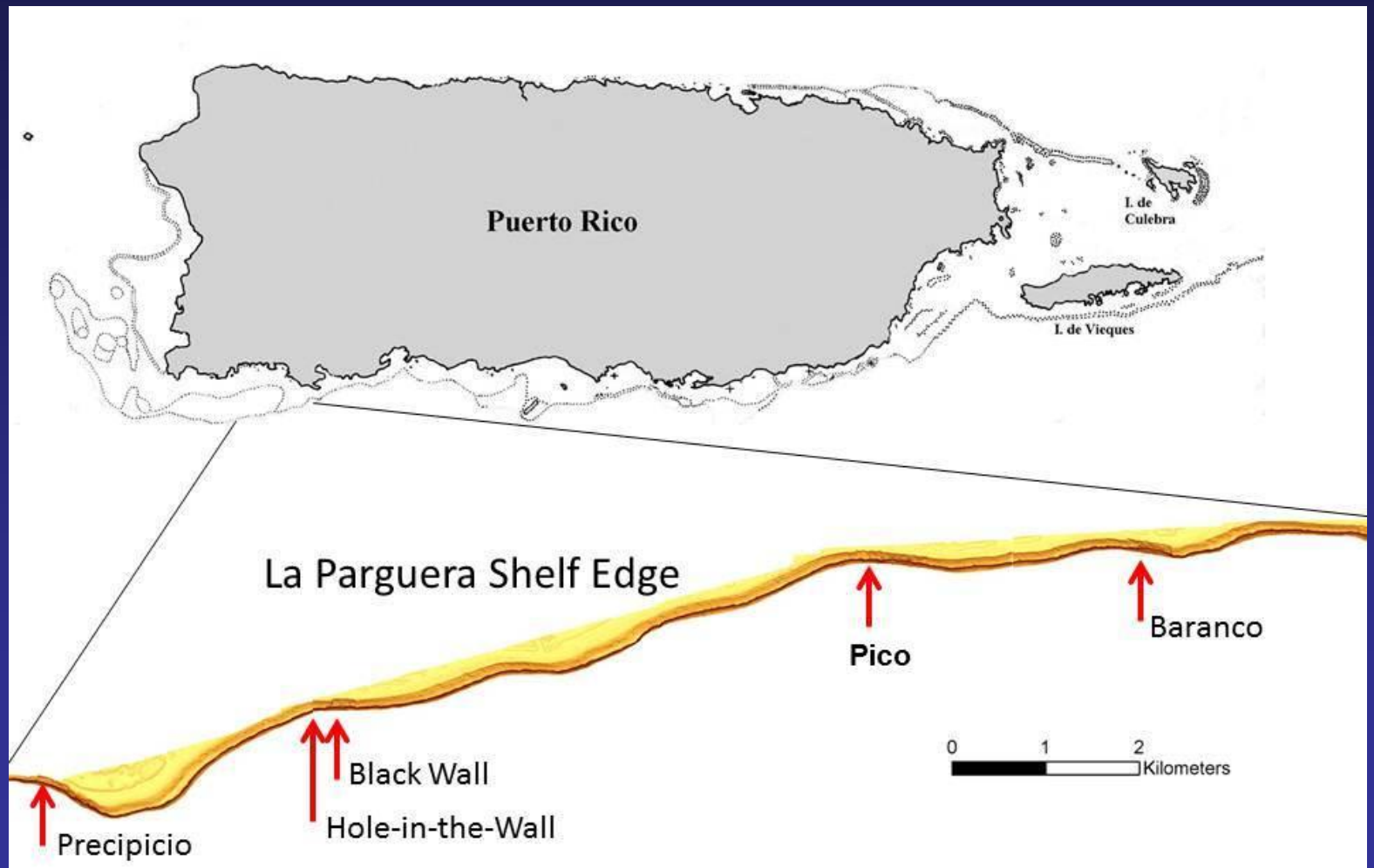
Marxan Run	Total Planning Units	Planning Units Included	% Area	% Above Null
Low Cluster				
Null Habitat	1353	230	17.00	
Functional Habitat	1353	299	22.10	30.0
High Cluster				
Null Habitat	1353	346	25.57	
Functional Habitat	1353	455	33.63	31.5

Mesophotic Coral Ecosystems





Large-scale Geomorphology Affects MCE Distribution



SW Sides - Greater MCE Development