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Coastal Resources Center
University of Rhode Island

MANAGING FRESHWATER INFLOWS TO ESTUARIES

Samana Bay Rapid Ecological Assessment

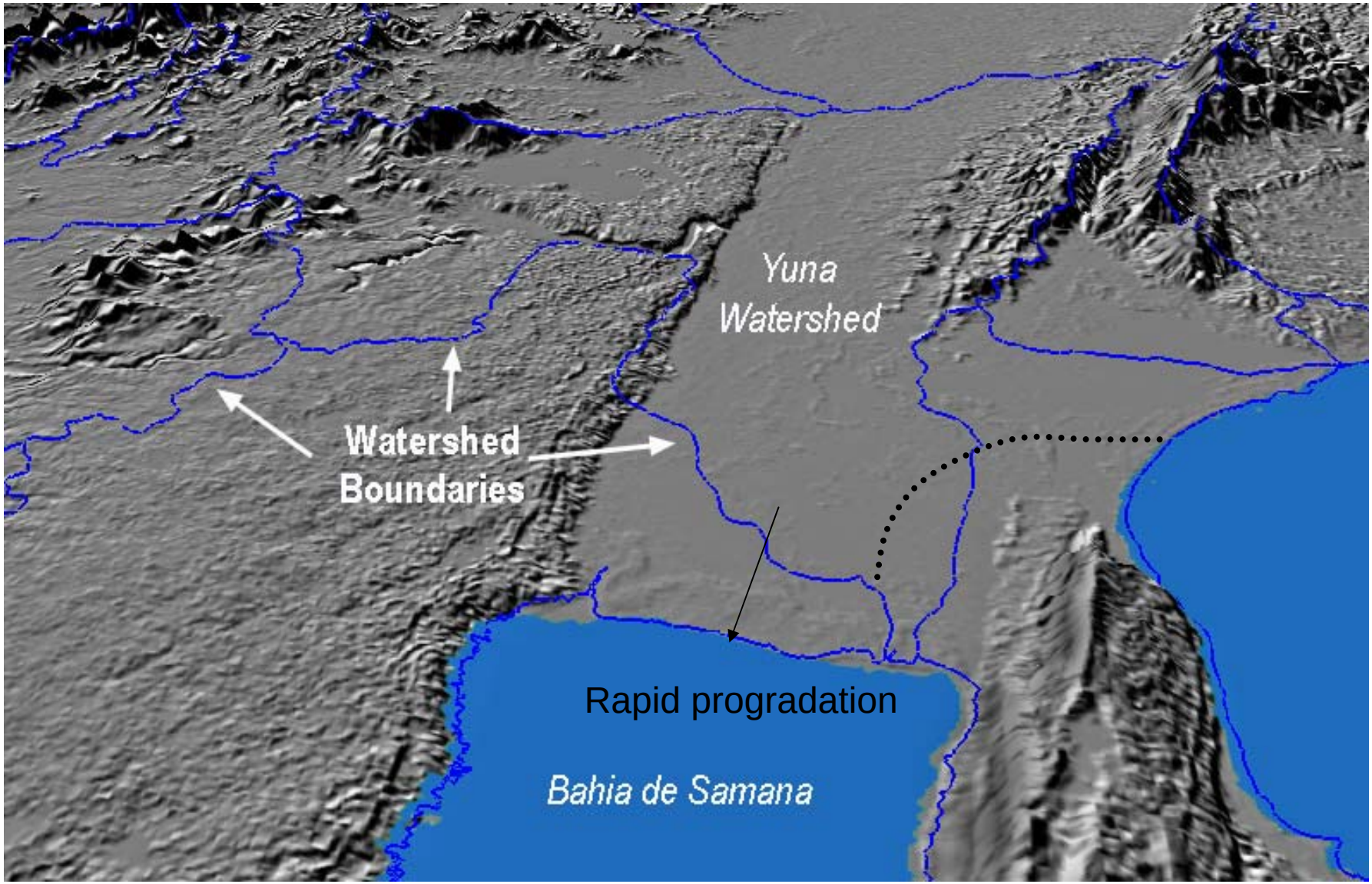
Phil Kramer

Kramer, P. (2005). Samana Bay Rapid Ecological Assessment. Presented at: The USAID Watersheds Planning Meeting (May 19-20). Washington, DC: The Nature Conservancy.

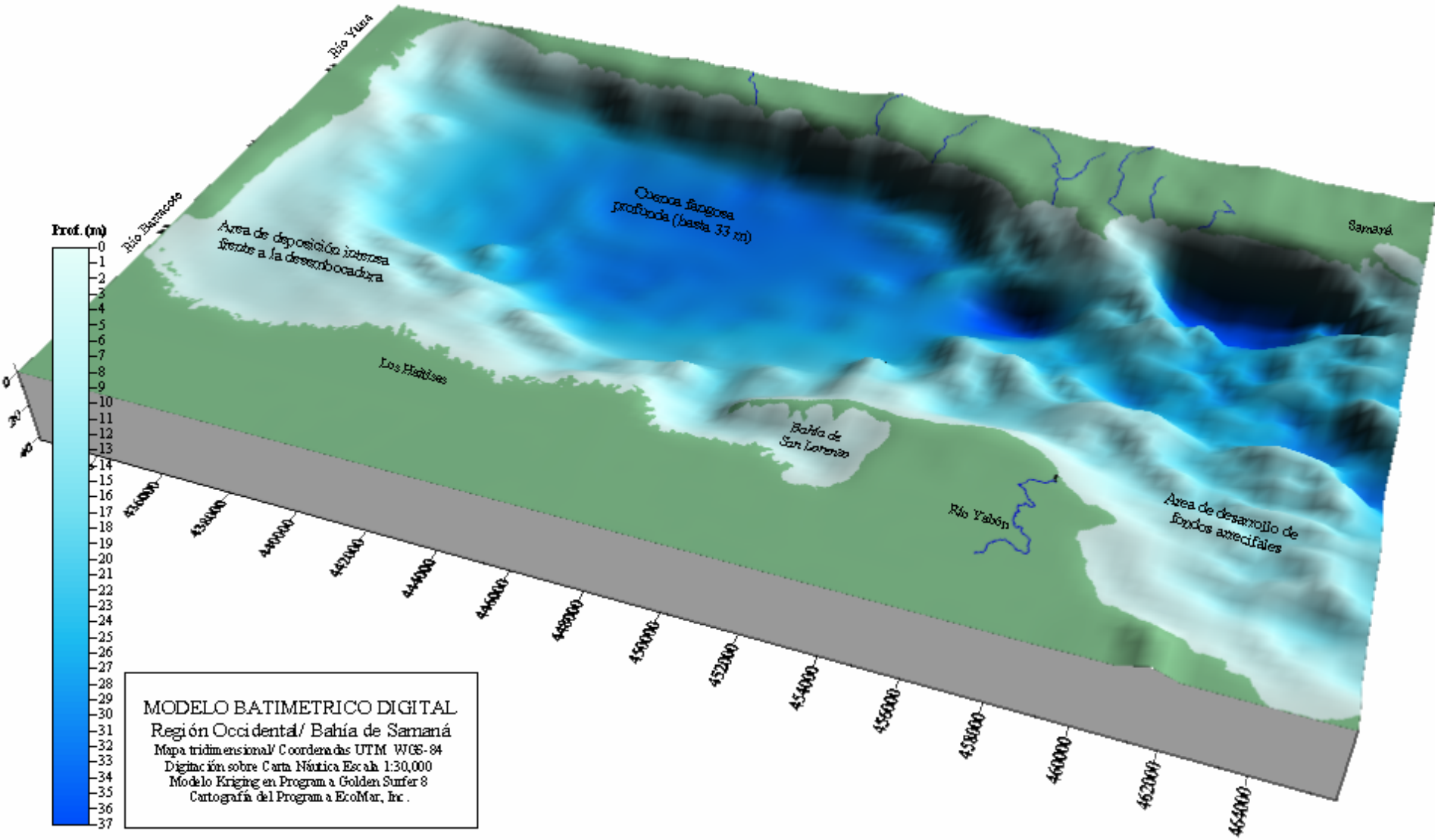
Samana Bay Rapid Ecological Assessment

March 13-22, 2005

Philip Kramer, The Nature Conservancy
USAID watersheds planning meeting
Washington DC, May 19-20,2005.



Tectonic Estuary (e.g., San Francisco Bay, Gulf of California)
Relative sea level is FALLING as uplift takes place (still-stand notches in limestone Cliffs).


Prof. (m)
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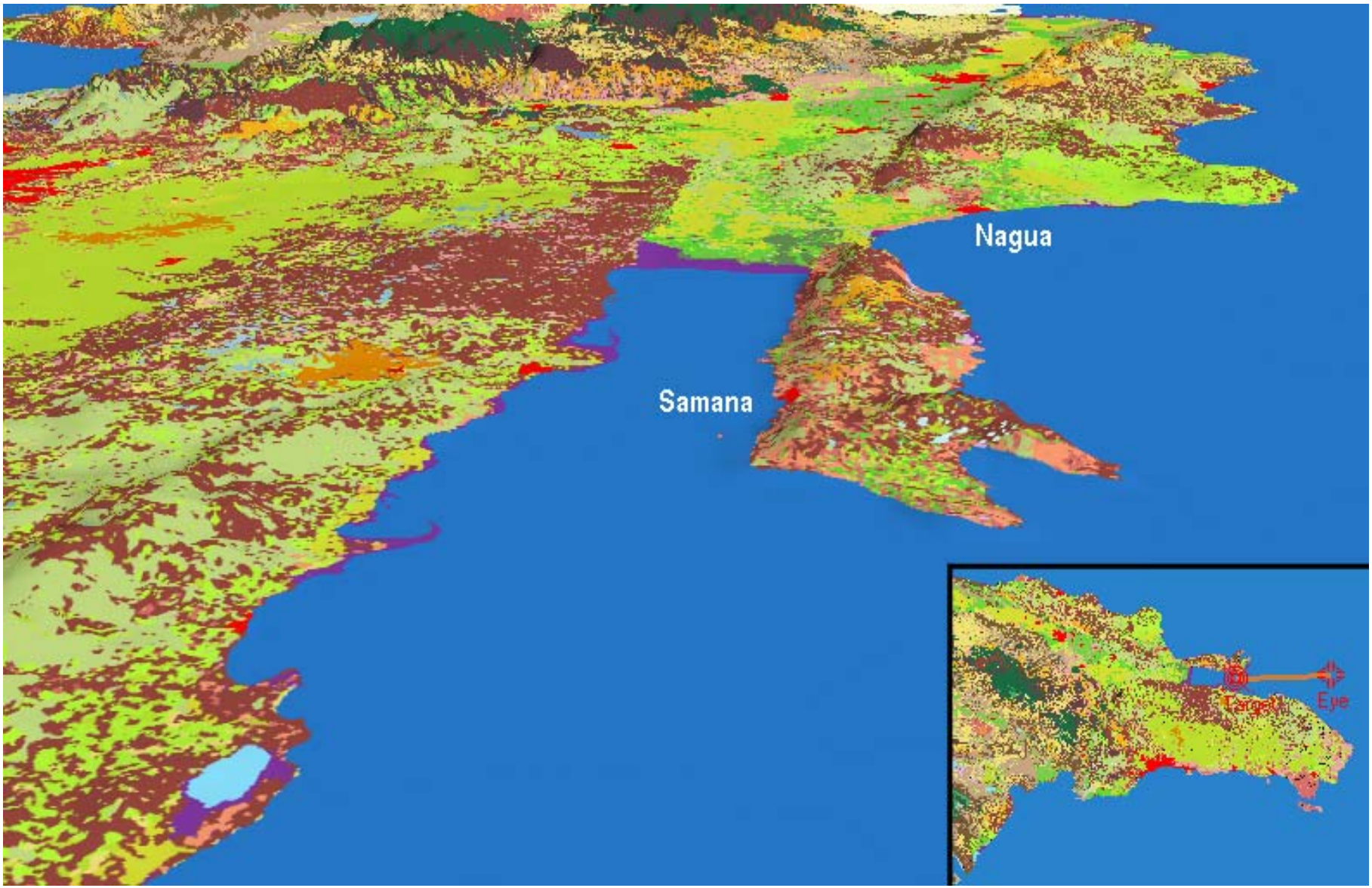
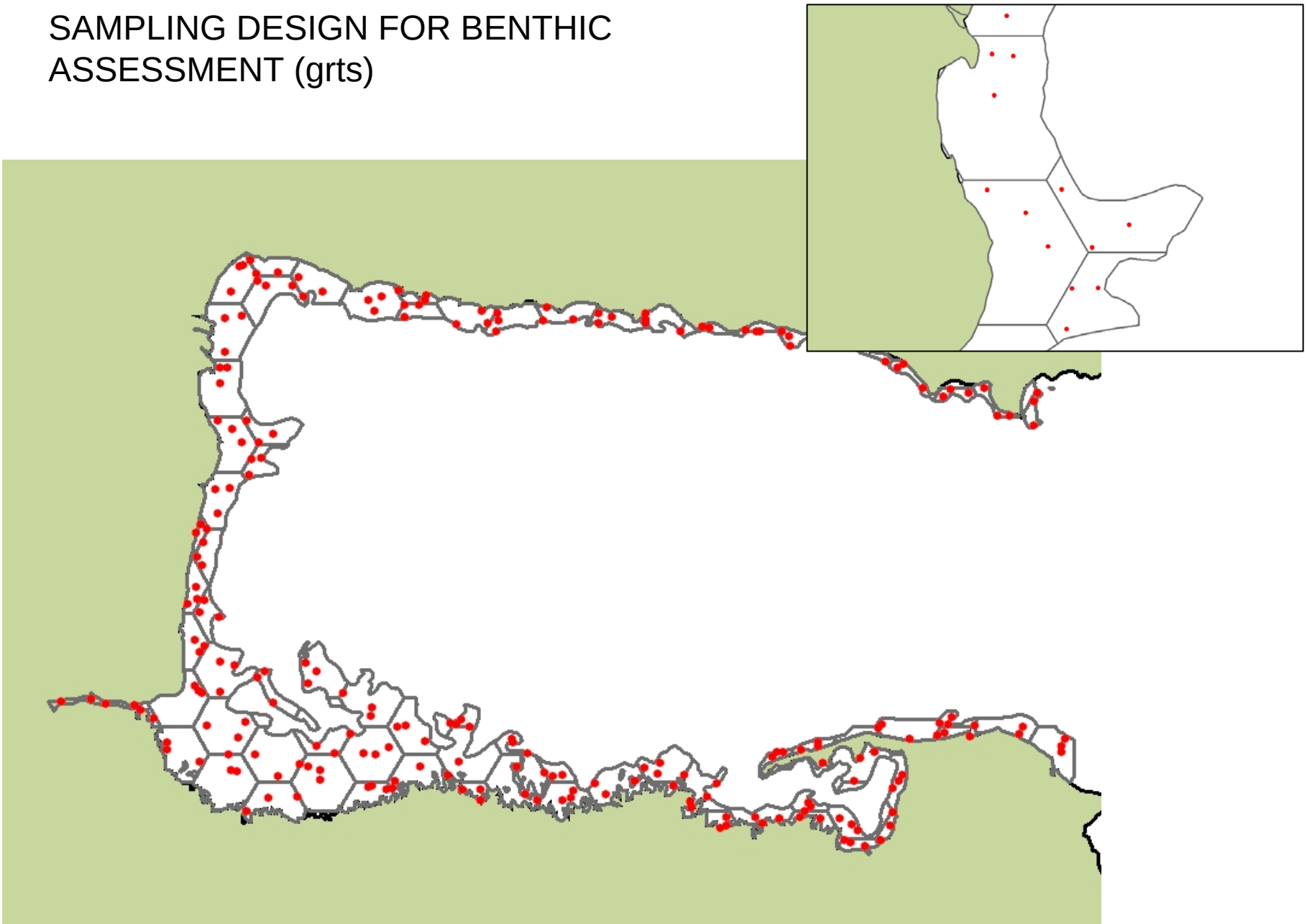
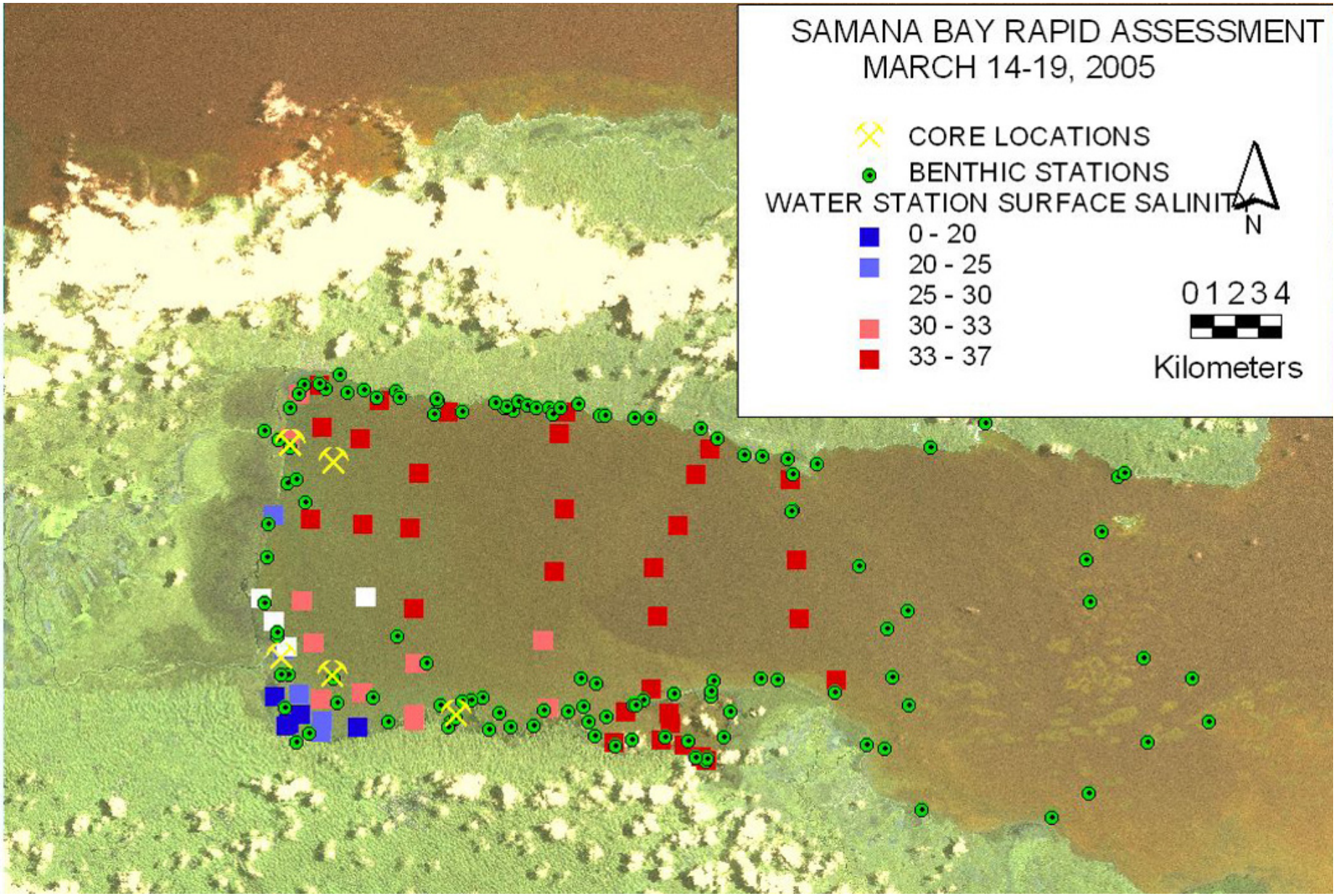
Río Yuna
Río Barracote
Area de deposición intensa frente a la desembocadura
Cuenca fangosa profunda (hasta 33 m)
Samaná
Los Haitises
Bahía de San Lorenzo
Río Yabón
Area de desarrollo de fondos arrecifales
436000
438000
440000
442000
444000
446000
448000
450000
452000
454000
456000
458000
460000
462000
464000
MODELO BATIMETRICO DIGITAL
Región Occidental/ Bahía de Samaná
Mapa tridimensional/ Coordenadas UTM WGS-84
Digitación sobre Carta Náutica Escala 1:30,000
Modelo Kriging en Programa Golden Surfer 8
Cartografía del Programa EcoMar, Inc.

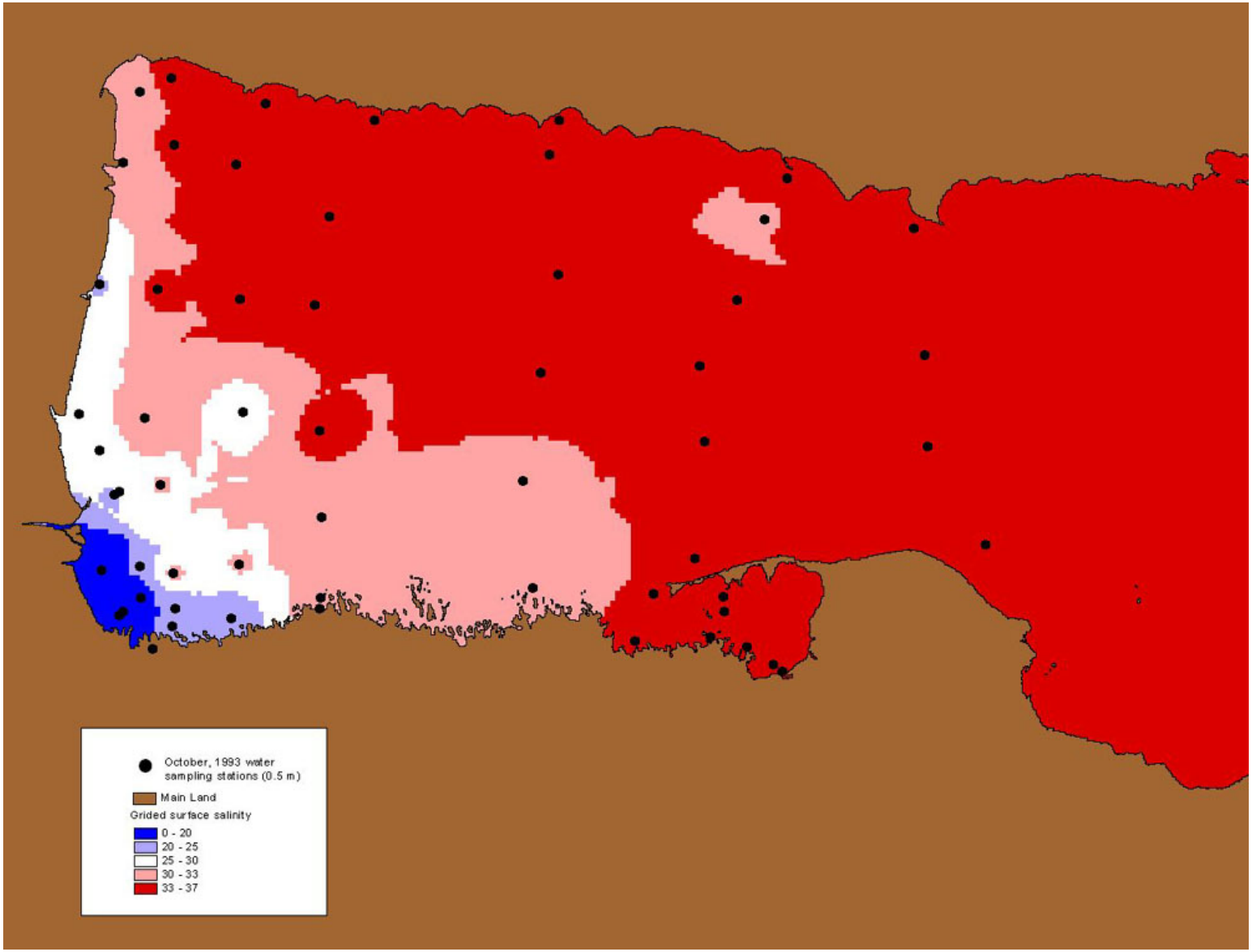

Nagua
Samana
Target
Eye

SAMPLING DESIGN FOR BENTHIC ASSESSMENT (grts)

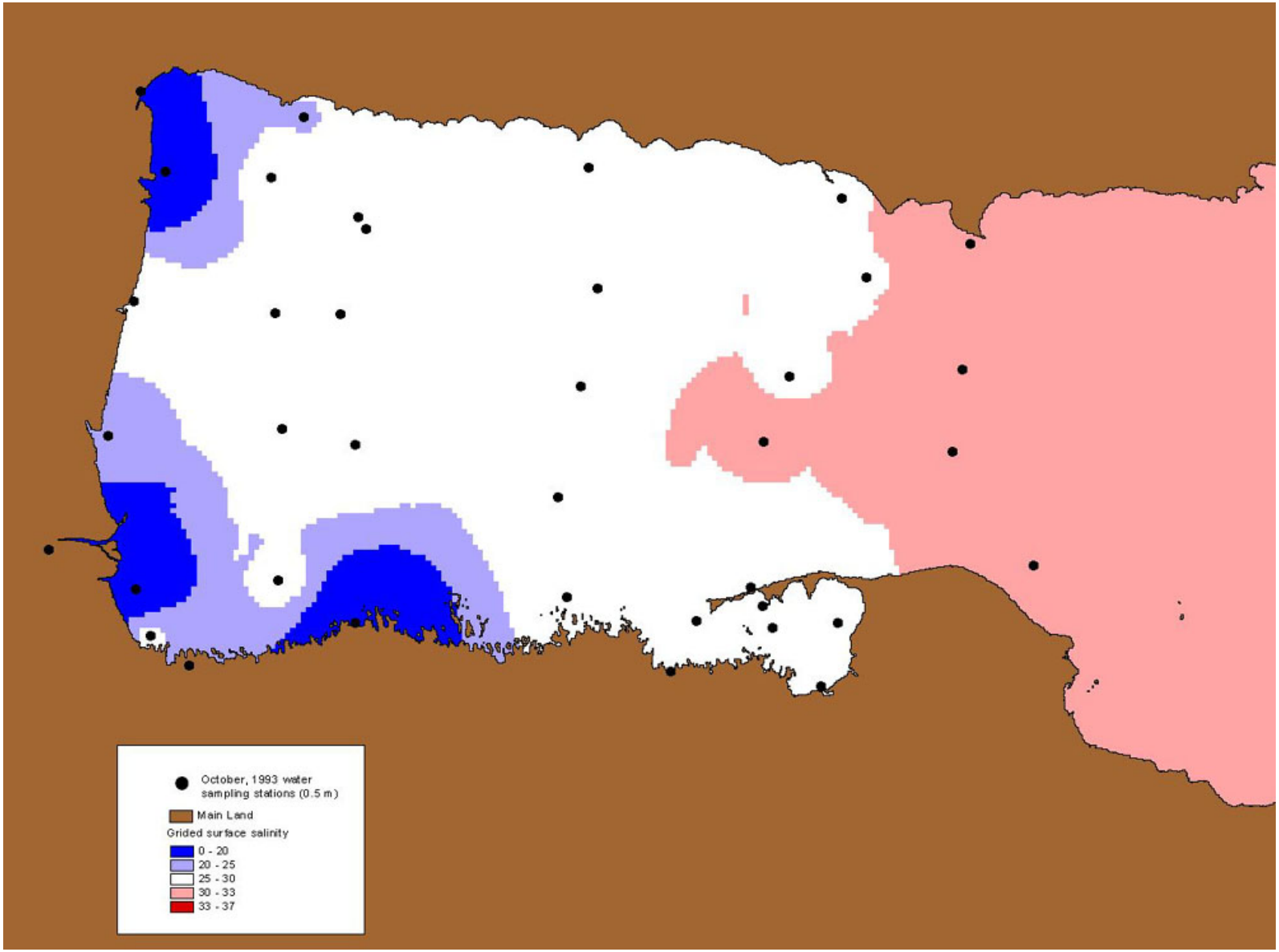



SAMANA BAY RAPID ASSESSMENT
MARCH 14-19, 2005
CORE LOCATIONS
BENTHIC STATIONS
WATER STATION SURFACE SALINITY
0 - 20
20 - 25
25 - 30
30 - 33
33 - 37
N
0 1 2 3 4
Kilometers

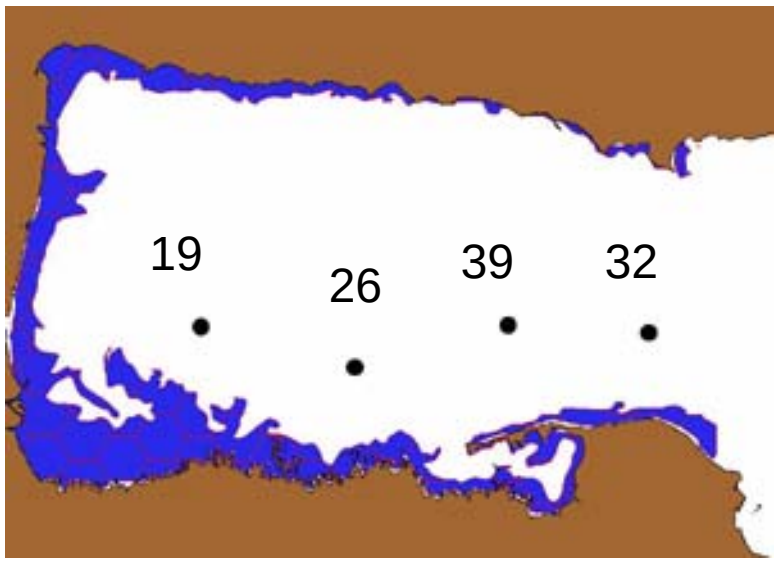
Hydrography results

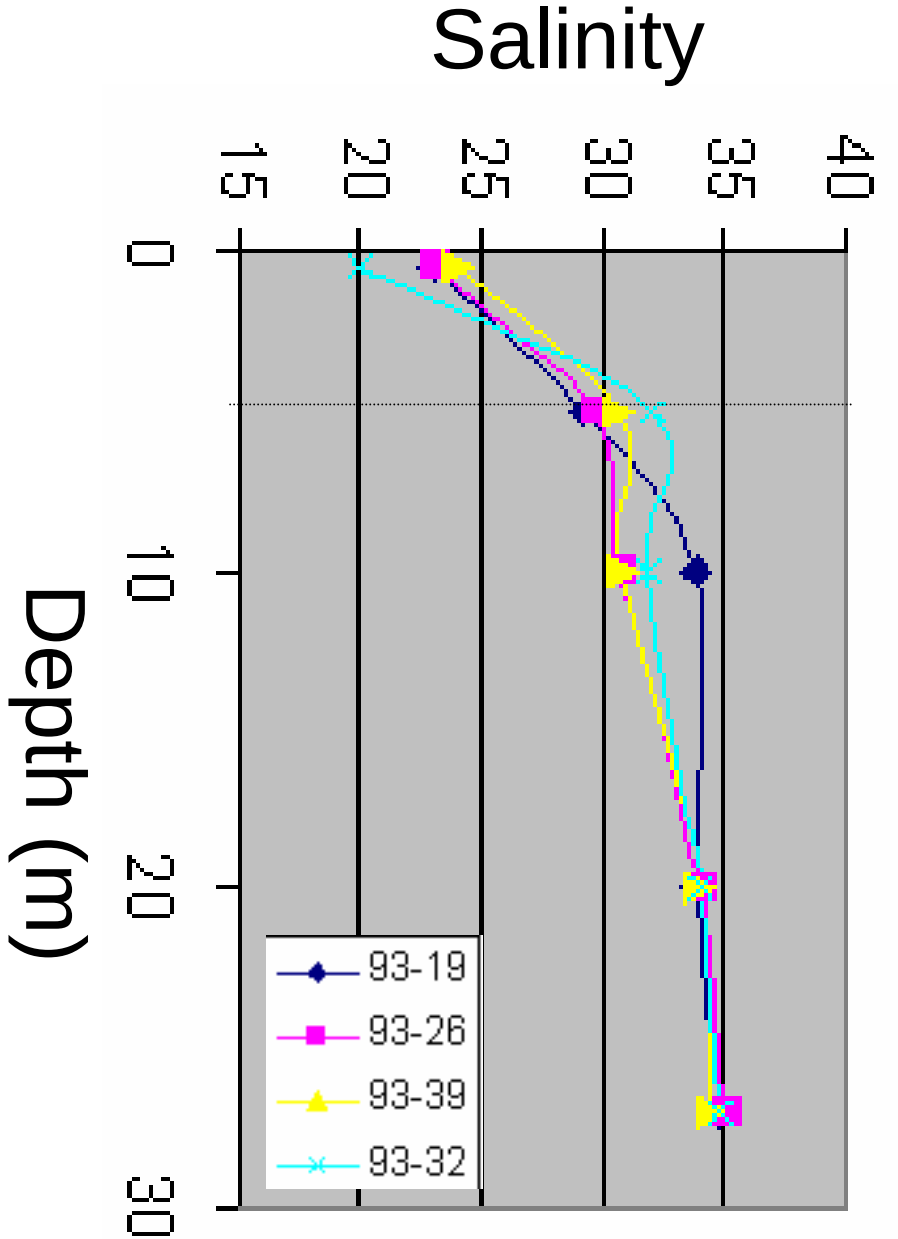

October, 1993 water sampling stations (0.5 m)
Main Land
Grided surface salinity
0 - 20
20 - 25
25 - 30
30 - 33
33 - 37

October, 1993 Water Sampling effort (wet season conditions)

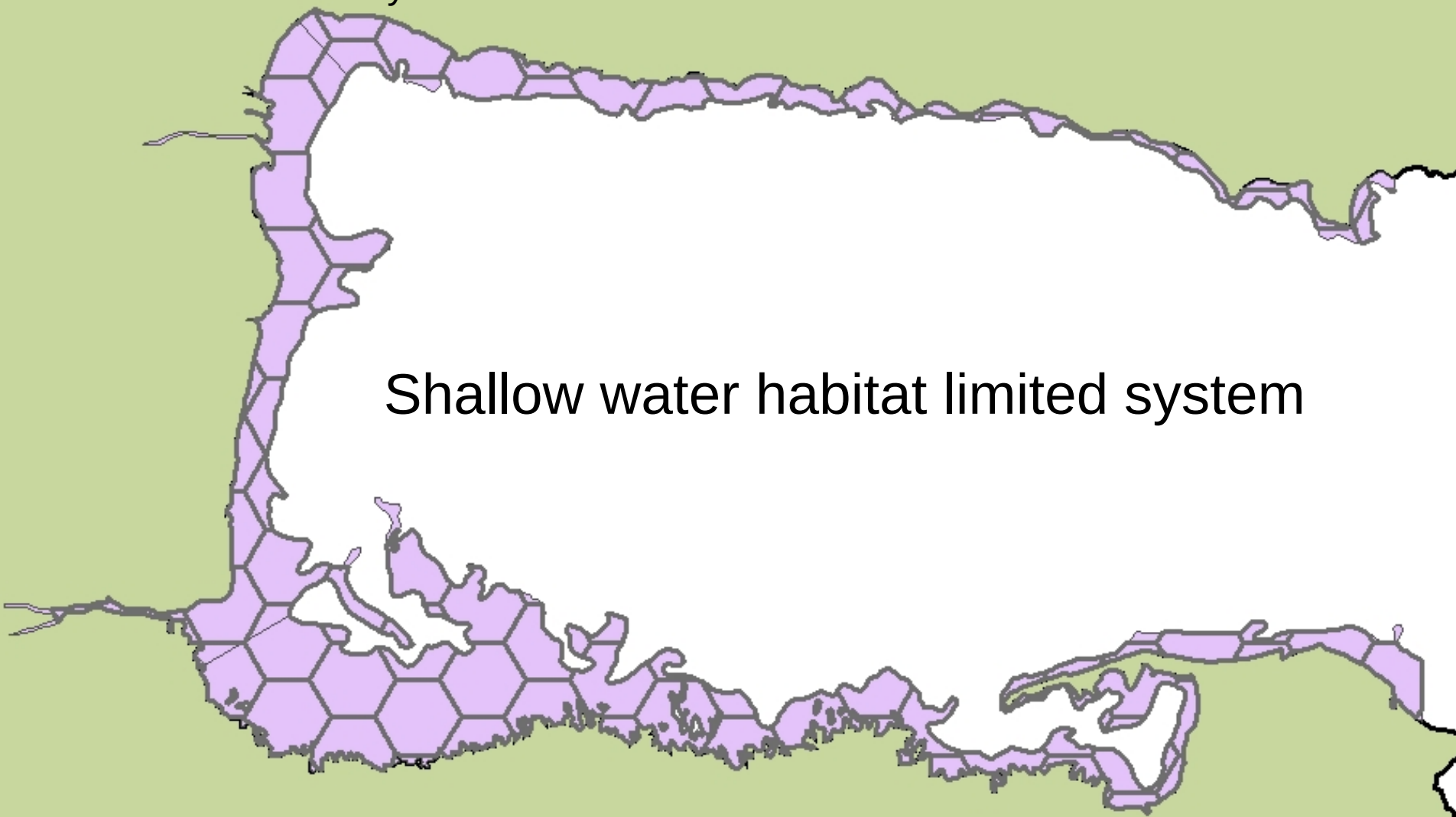


Select sampling stations – Oct, 1992

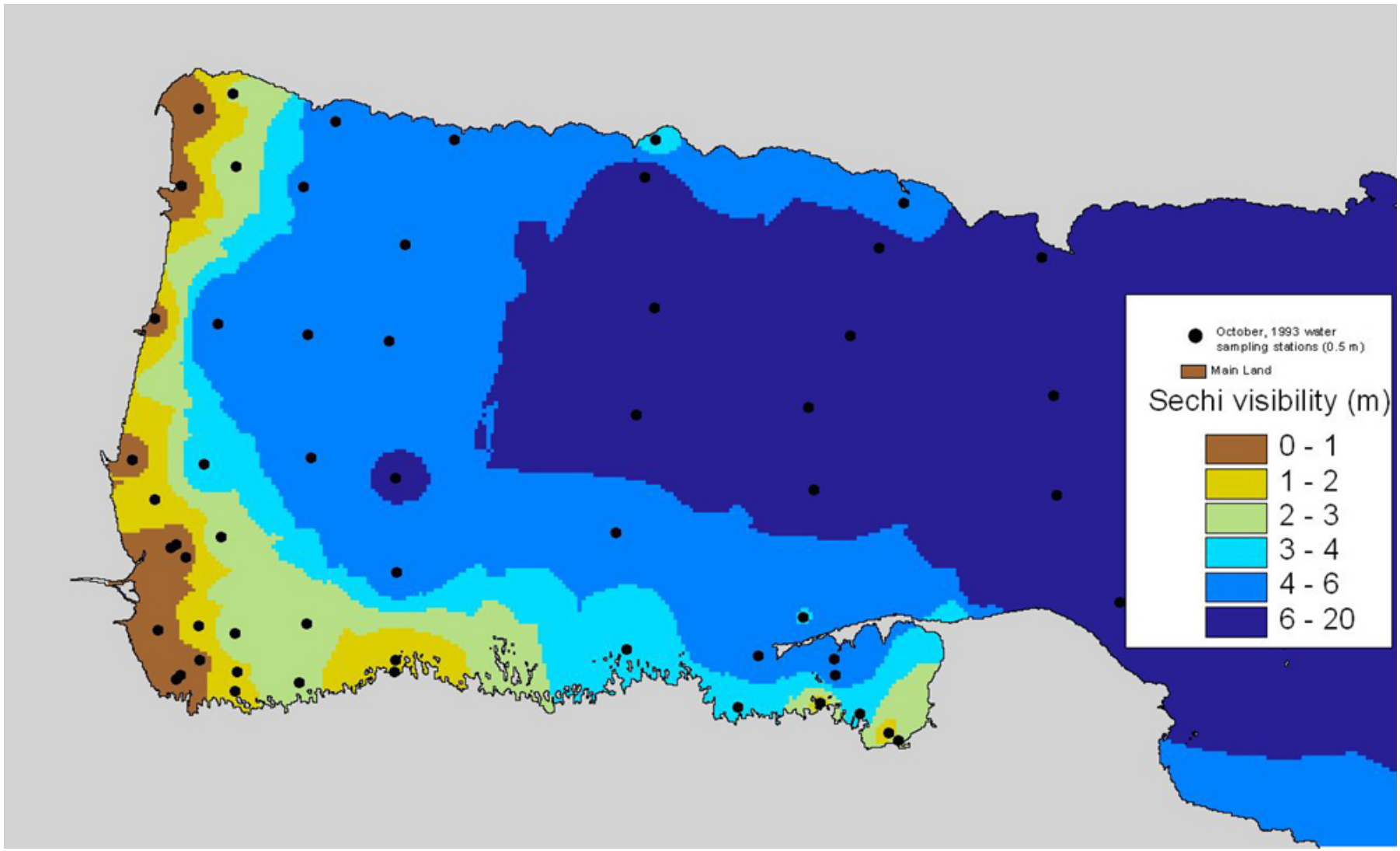




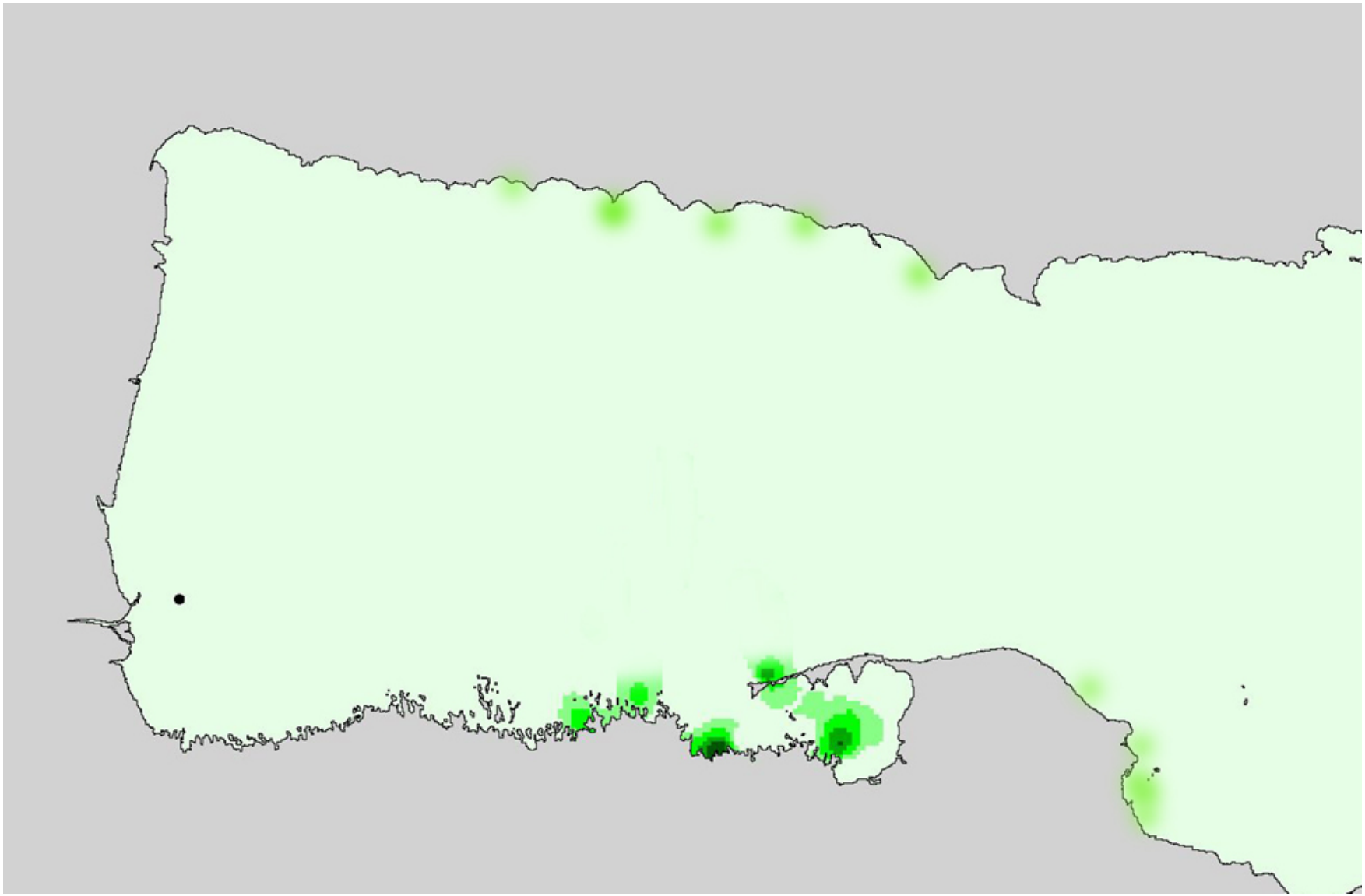
Shallow area: 300 km^2
Shallow mixed layer Volume: 1.3 Km^3



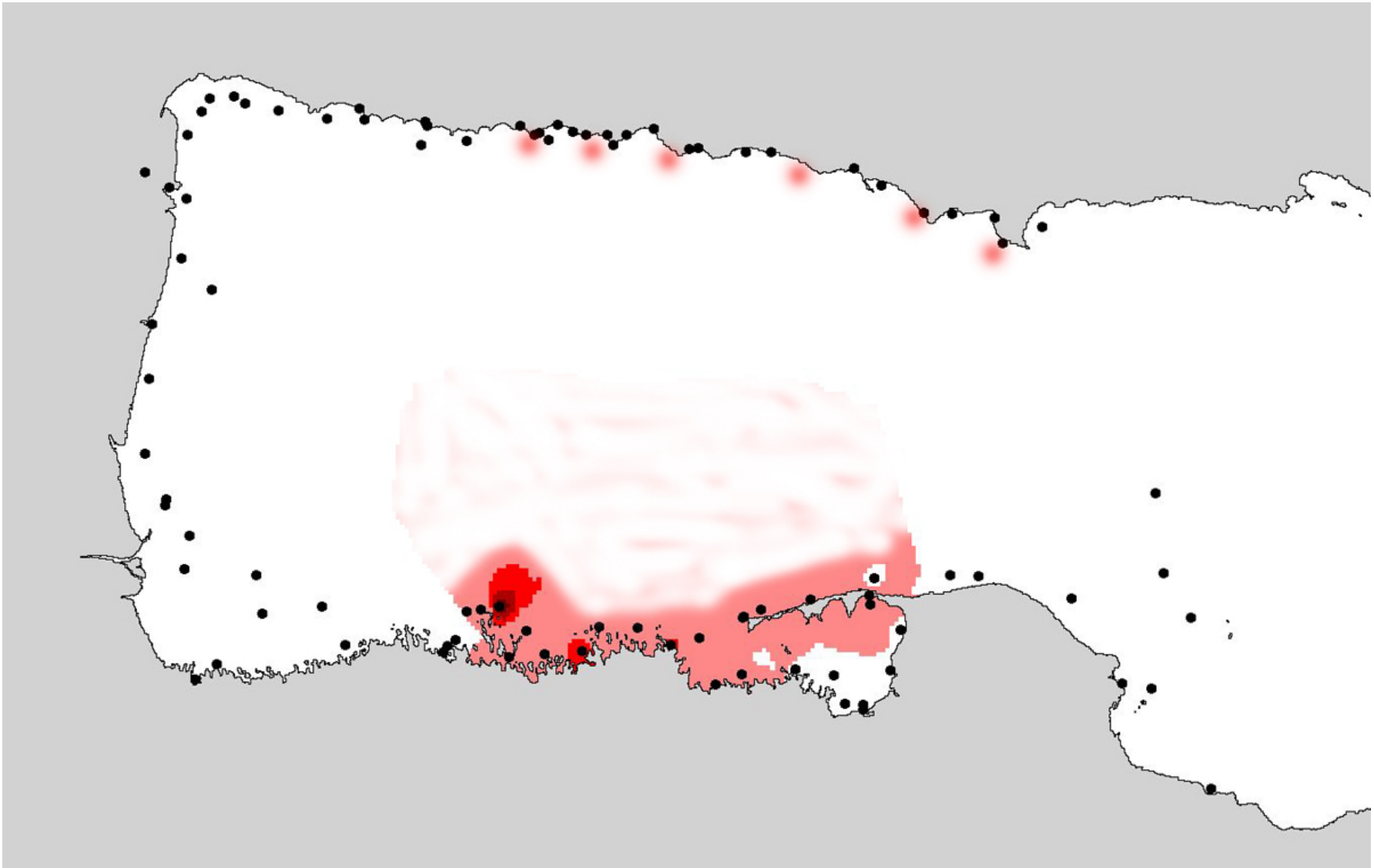
Water Clarity (turidity)- March, 2005



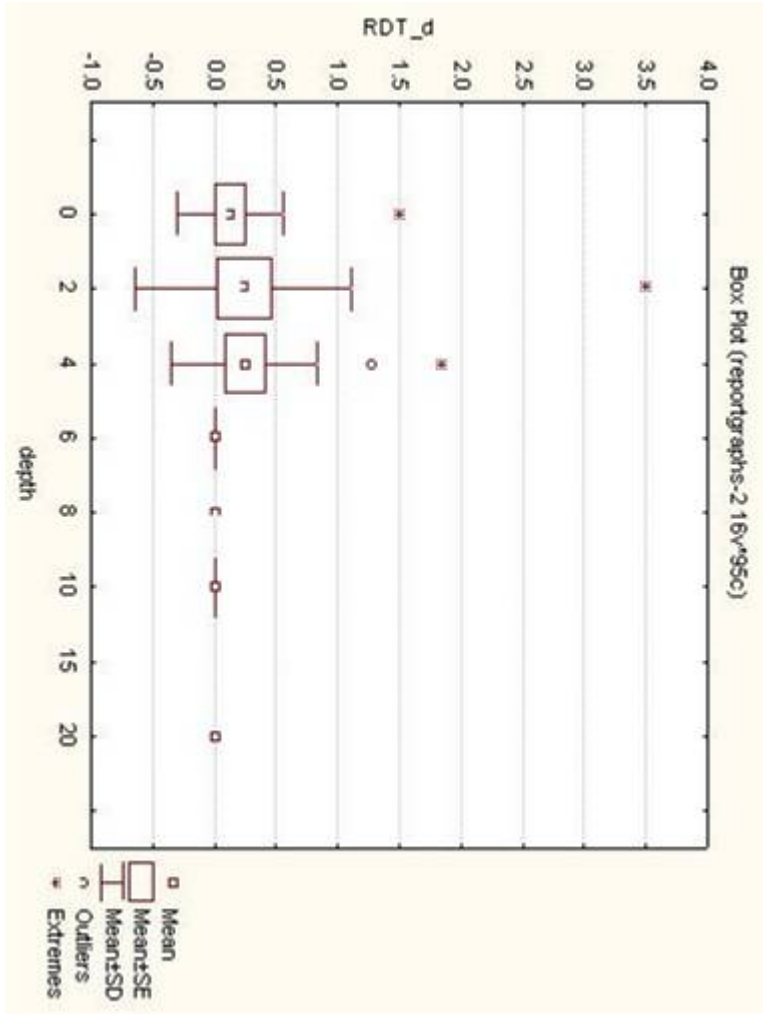
SEAGRASS DISTRIBUTION



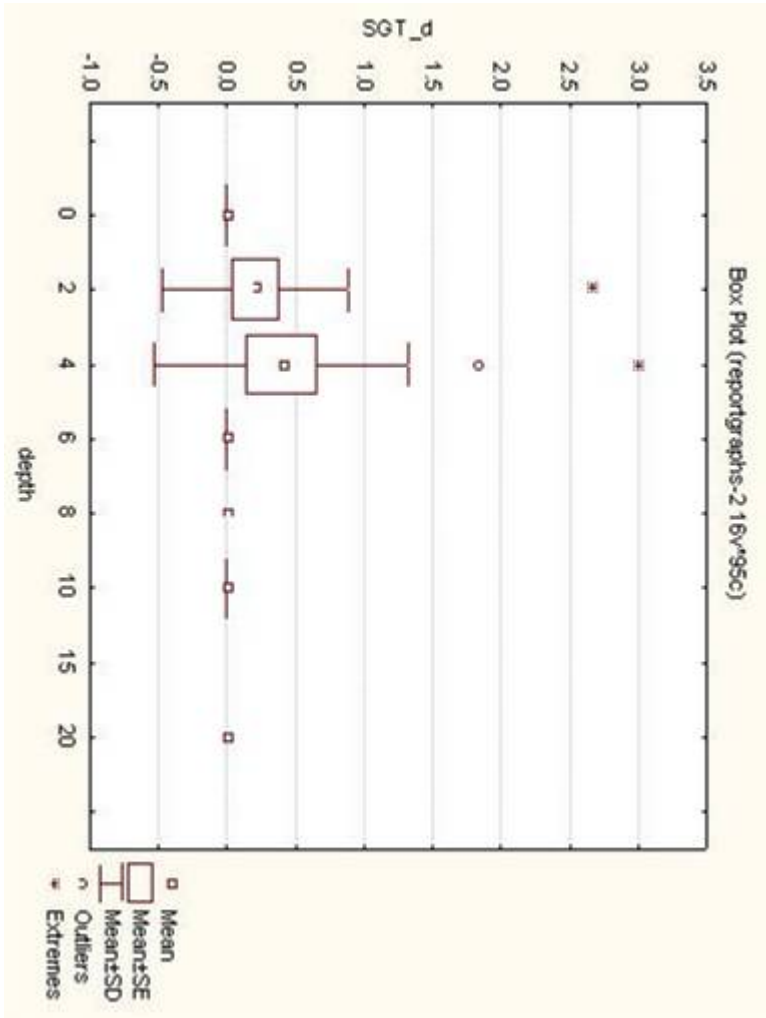
Red fleshy algae DISTRIBUTION

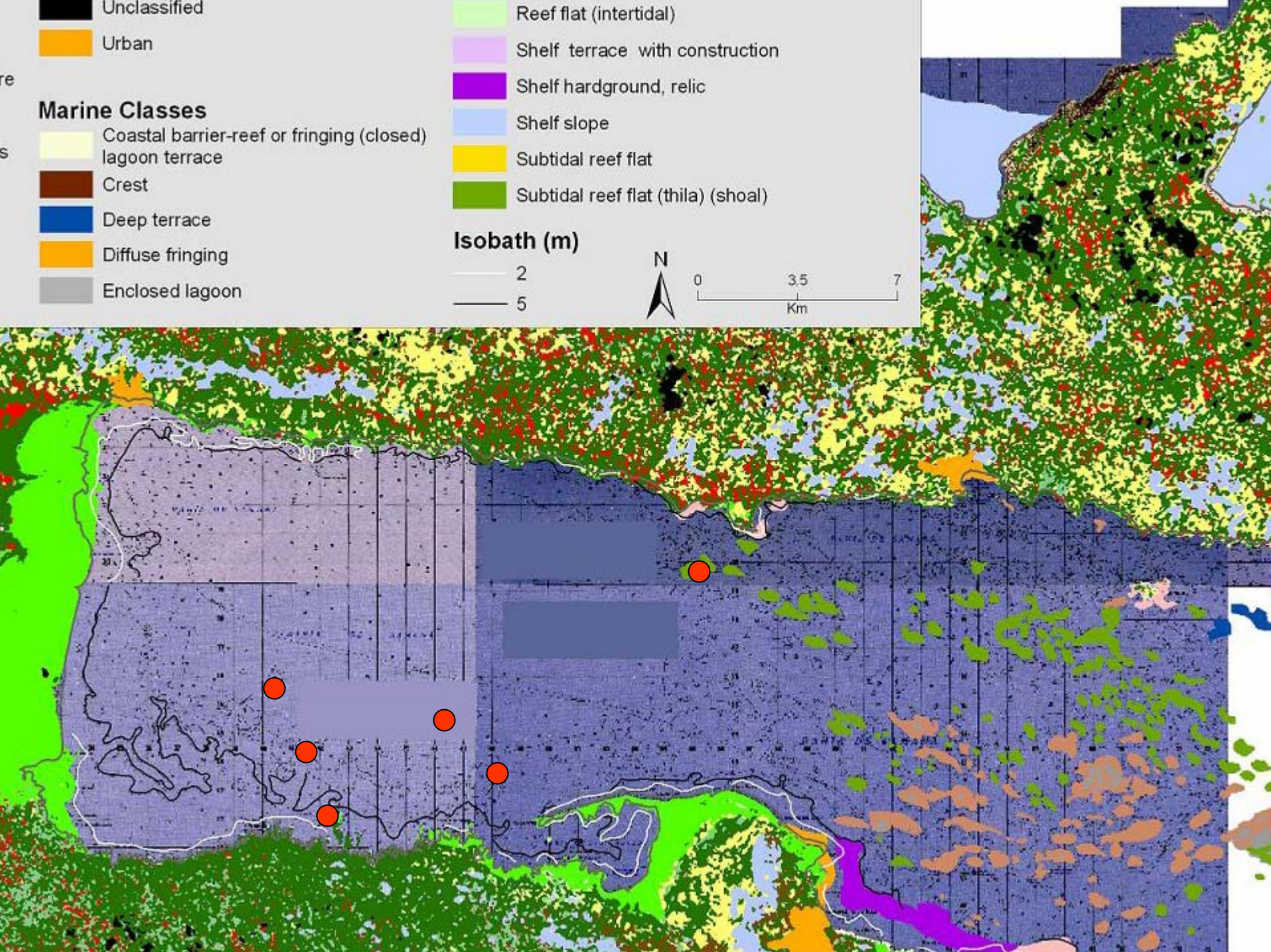


Red Algae

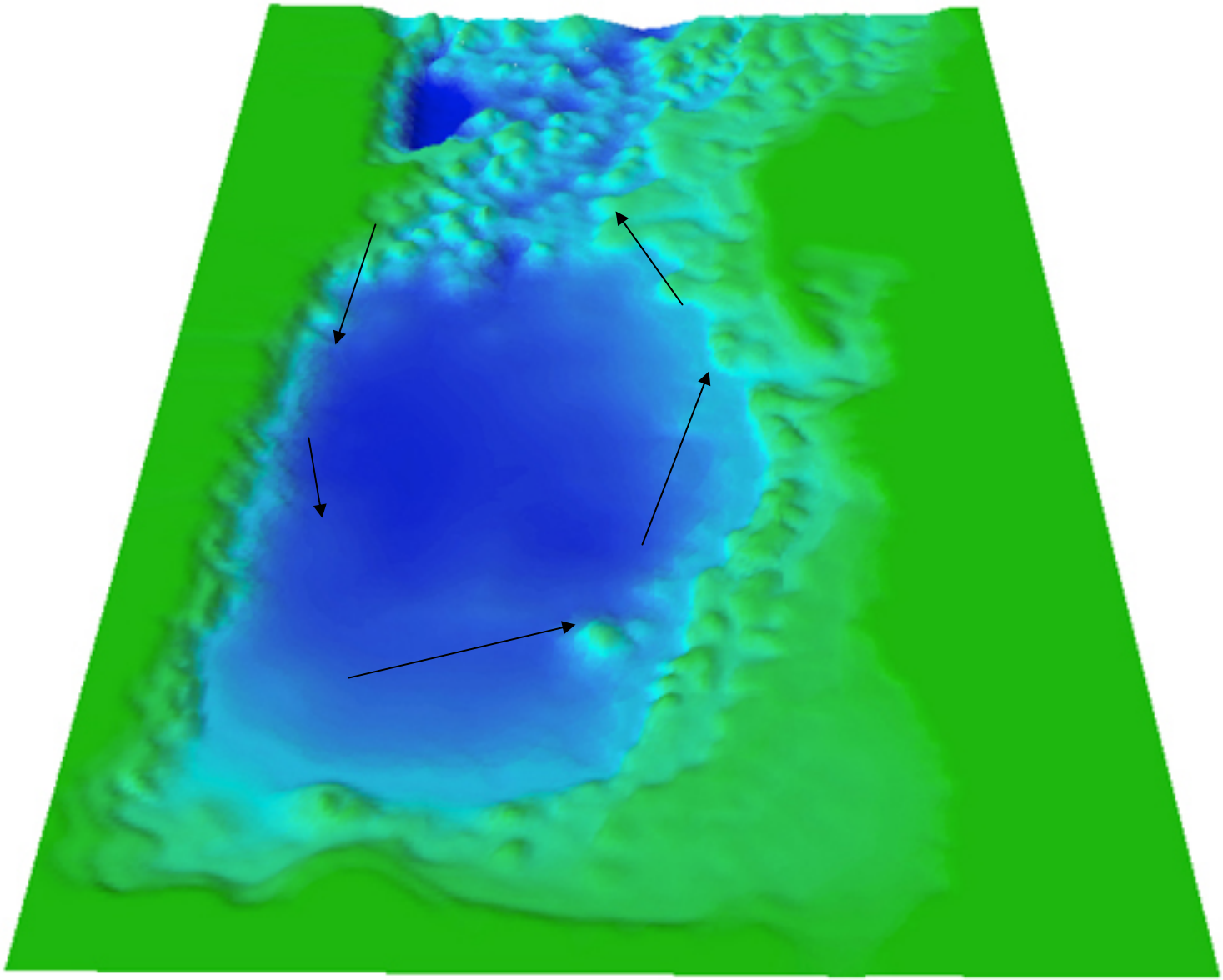


Seagrass




Unclassified
Urban
Marine Classes
Coastal barrier-reef or fringing (closed) lagoon terrace
Crest
Deep terrace
Diffuse fringing
Enclosed lagoon
Reef flat (intertidal)
Shelf terrace with construction
Shelf hardground, relic
Shelf slope
Subtidal reef flat
Subtidal reef flat (thila) (shoal)
Isobath (m)
2
5
N
0
3.5
7
Km

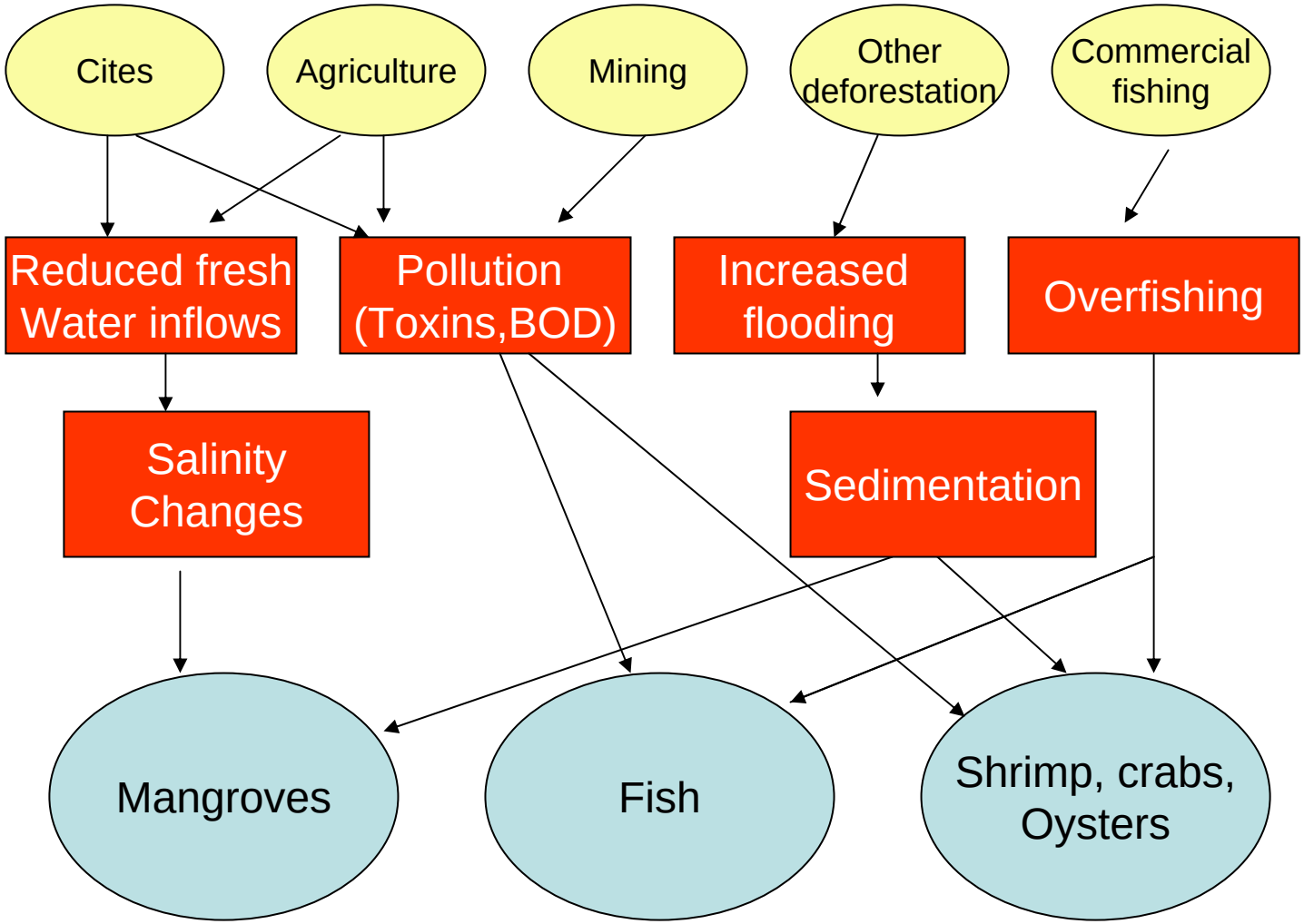
Perspective looking east of Samana Bay



Conclusions

- Fresh water flows (salinity, nutrients) mainly tied to Shrimp and estuarine fish production.
- Fresh water flows (sedimentation) probably do limit seagrass, macroalgae, oysters in the bay by affecting turbidity, depth and substrate factors (more flow = less SAV).
- Linkages strongly influenced by longer-term underlying geological process taking place in the bay.
- Water levels in lower flood plain may be an important factor for productivity of bay (research need)
- .Freshwater flows in excess for avail habitat??

SAMANA BAY MODEL OF STRESSORS (FROM SITE PROFILE)



SUGGESTED CHANGES BASED ON REA)