

# Research and capacity building efforts in Marine Science in the Caribbean

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San Pedro, San José, Costa Rica

Regional Sensitization Seminar, Kingston, Jamaica 28-30.III.2011

# TOPICS

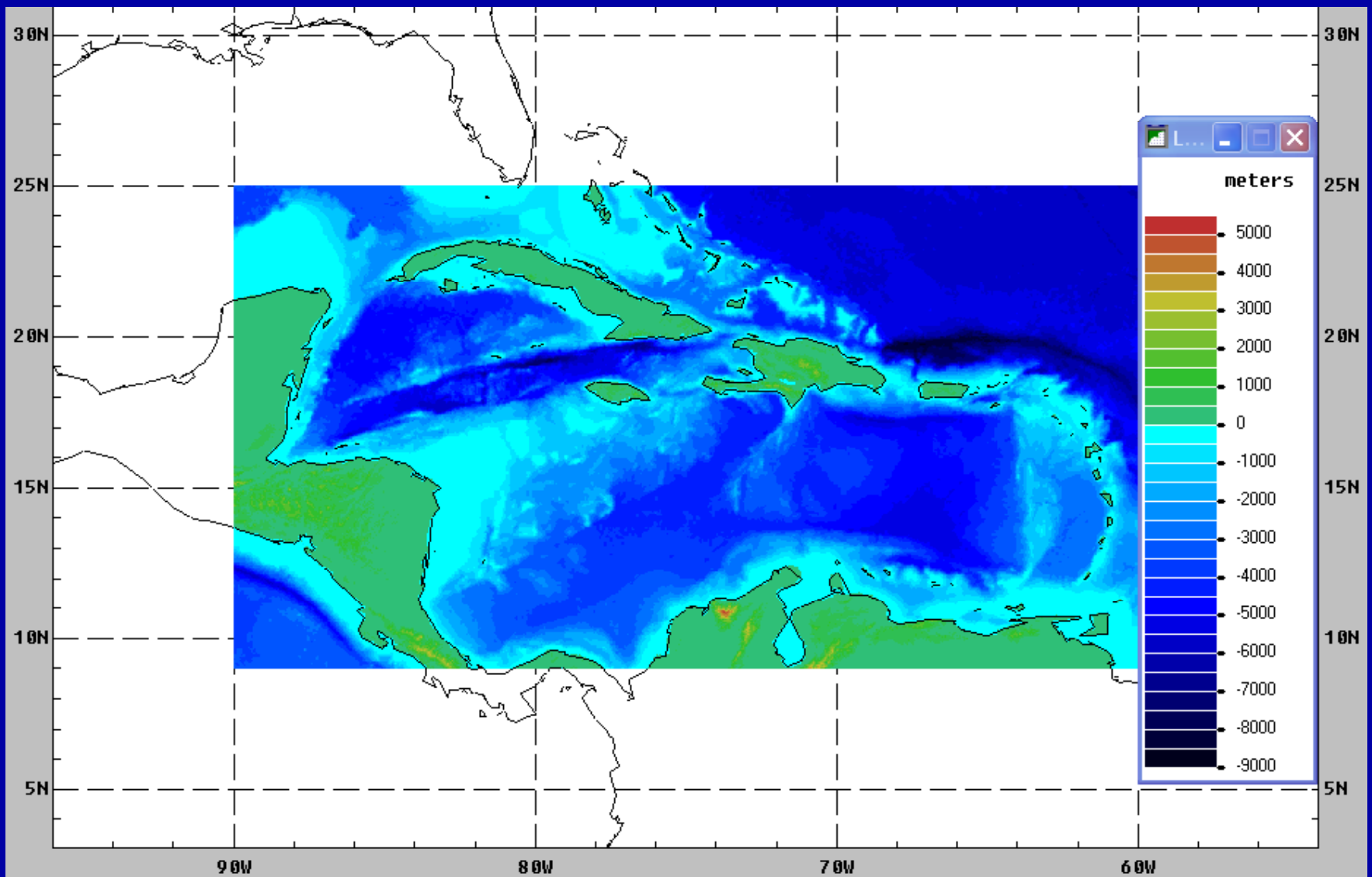
- The Greater or Wider Caribbean
- Marine research
- Capacity building
- Conclusions



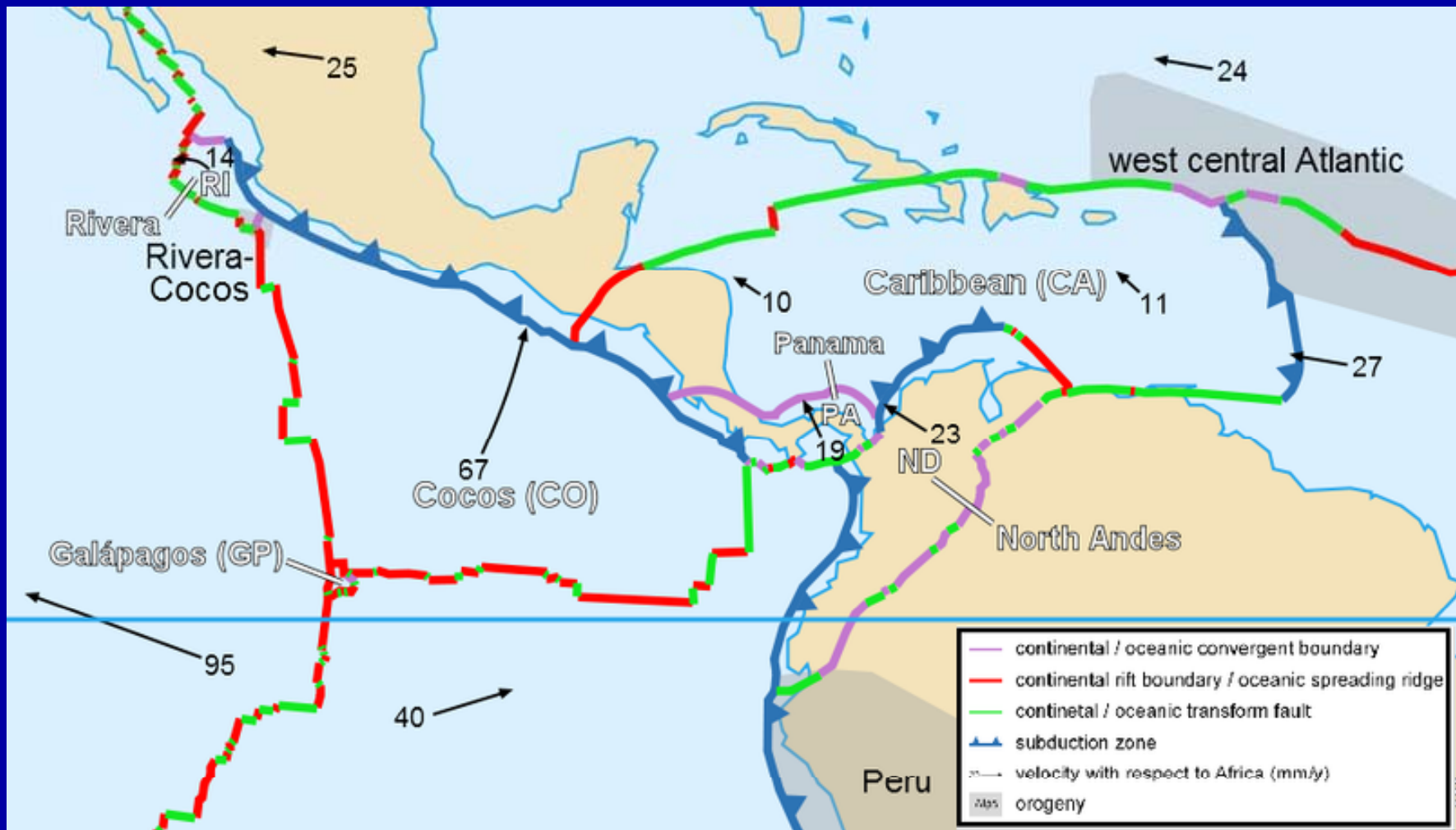


# Ecosystems





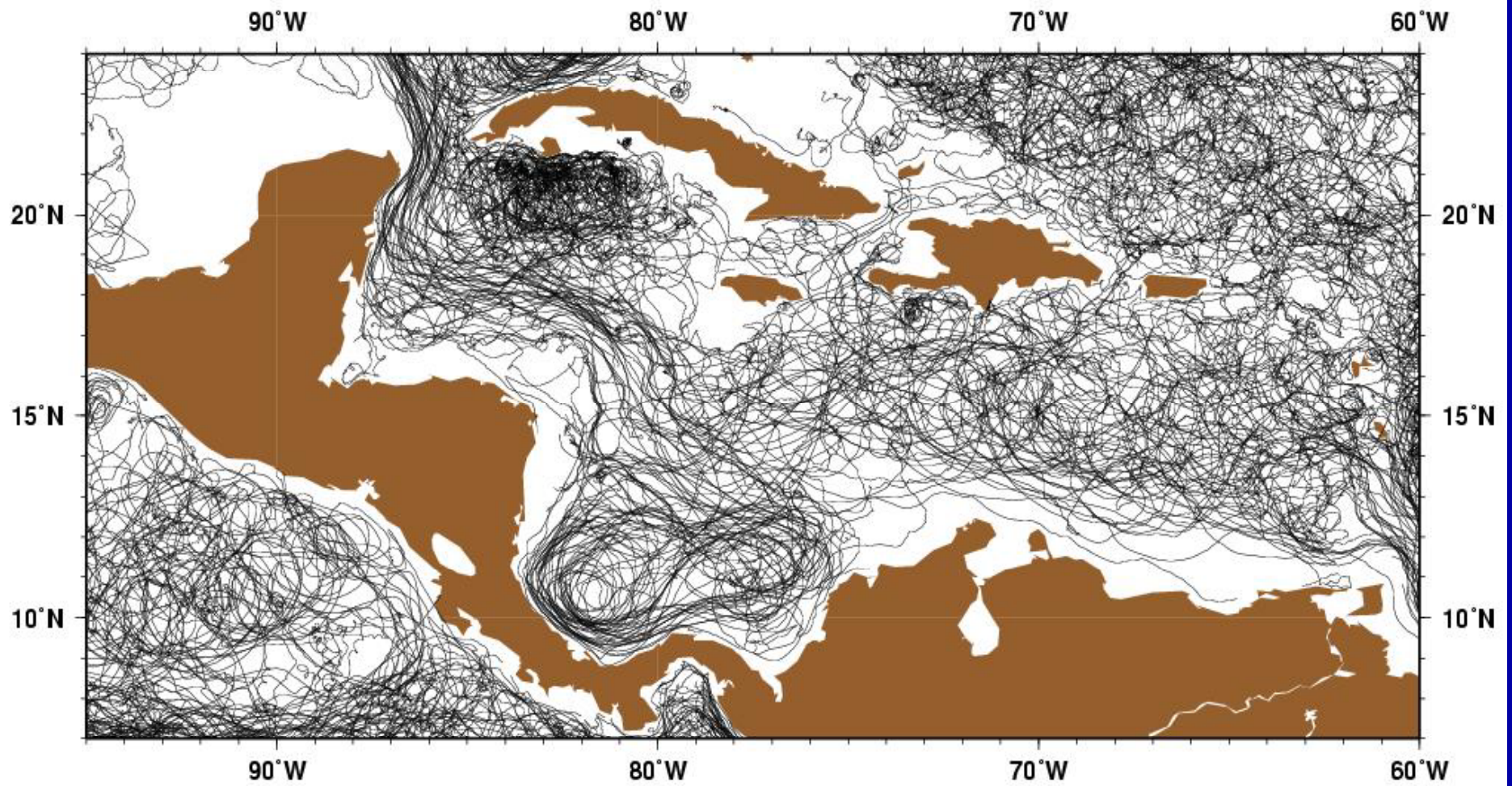
# Bathymetry



# Geology

Deepest hydrothermal vent, ~5,000 m

German et al. 2010. PNAS 107:1402-14025.



# Circulation



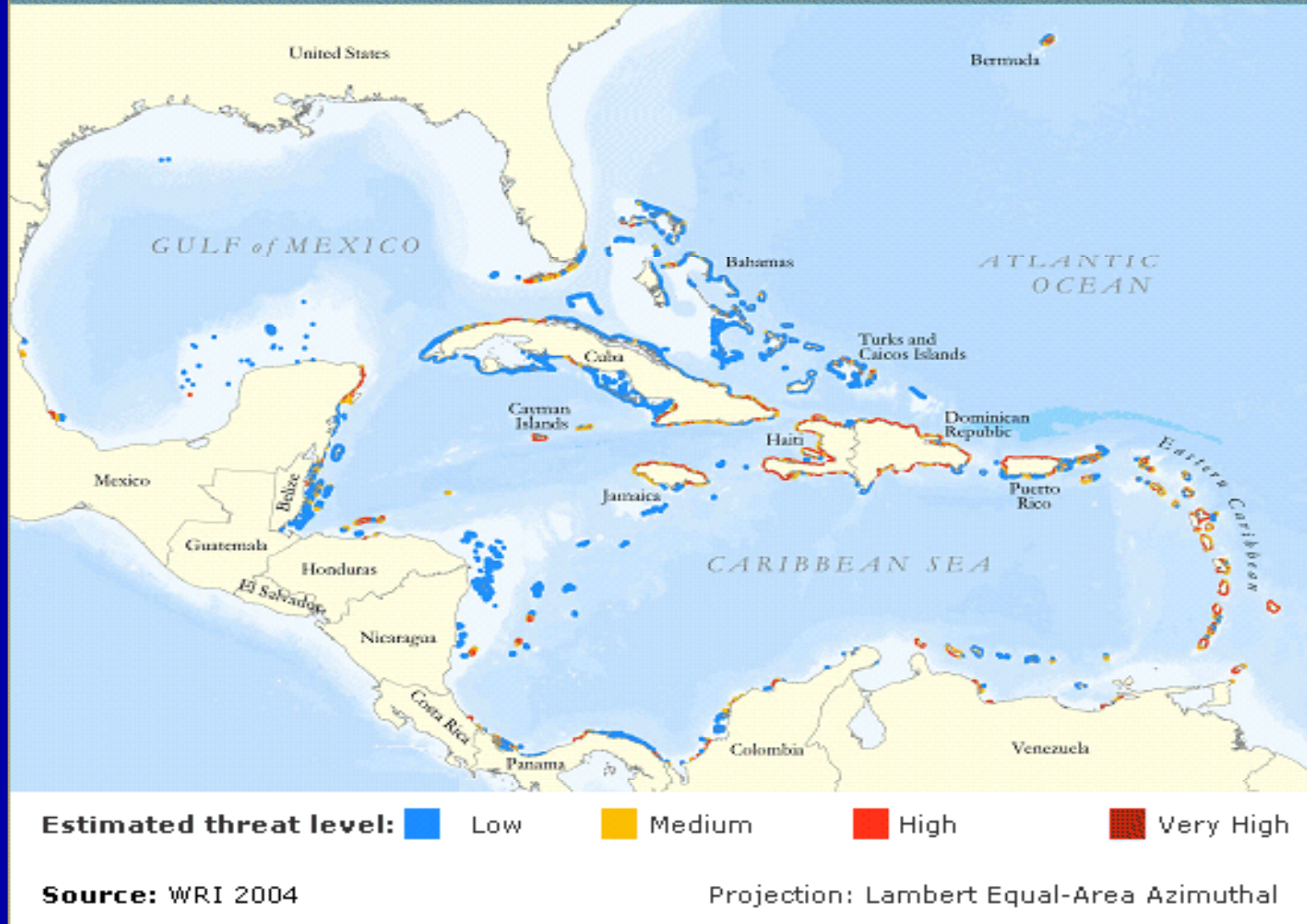
Culture





Politically

## Reefs Threatened by Coastal Development



# Environmental problems

# International and Regional Conventions and Initiatives

- United Nations Environment Programme in the Caribbean
- United Nations Development Programme in the Caribbean
- Global Environment Fund–Integrating Watershed and Coastal Areas Management in Caribbean Small Island Developing States

- Intergovernmental Oceanographic Commission for the Caribbean (IOCARIBE)
- Caribbean Large Marine Ecosystem (CLME)
- Caribbean Regional Fisheries Mechanism (CRFM)

# The 1983 Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region

## The Cartagena Convention

Three protocols:

Cooperation in Combating Oil Spills

Specially Protected Areas and Wildlife  
(SPA/W)

Pollution from Land-Based Sources and  
Activities

Marine research and capacity  
building in the Caribbean

# THE EARLY PERIOD



Christopher Columbus



William Dampier

# First local universities

- Universidad Autónoma de Santo Domingo (1538)
- Universidad de la Habana (1728)
- University of Puerto Rico, Río Piedras (1903)



# MID 19<sup>th</sup> TO MID 20<sup>th</sup> CENTURY

## Research and Capacity Building

- Expeditions

- Challenger (1872-1876)

- Blake (1877-1879)

- New York Zoological Society (1930s)

- Allan Hancock Foundation (1930s)

# MID 19<sup>th</sup> TO MID 20<sup>th</sup> CENTURY

- First field stations
- Expeditions
- Individuals

North of the region by northern scientists



Dry Tortugas Laboratory  
1904



Aerial view of Bermuda Biological Station

**Bermuda Biological Station  
1930's (Started in 1903)**



Woods Hole:  
Atlantis

Allan Hancock:  
Velero

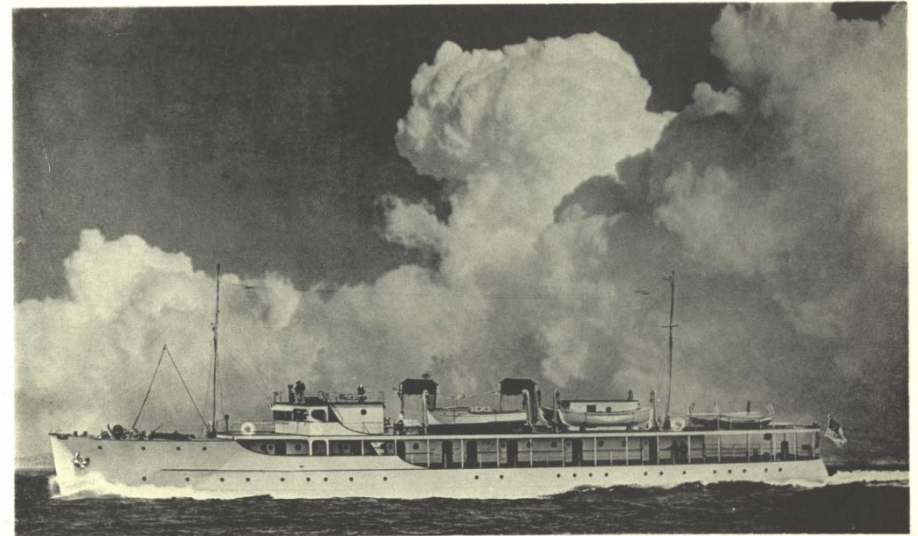


Fig. 7 *Velero III*

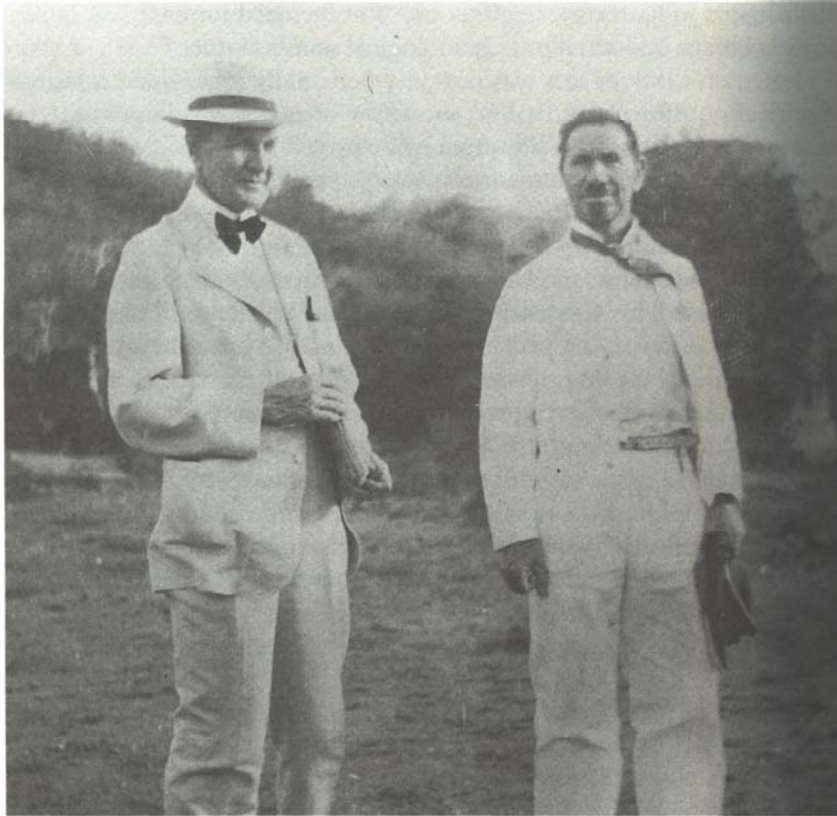
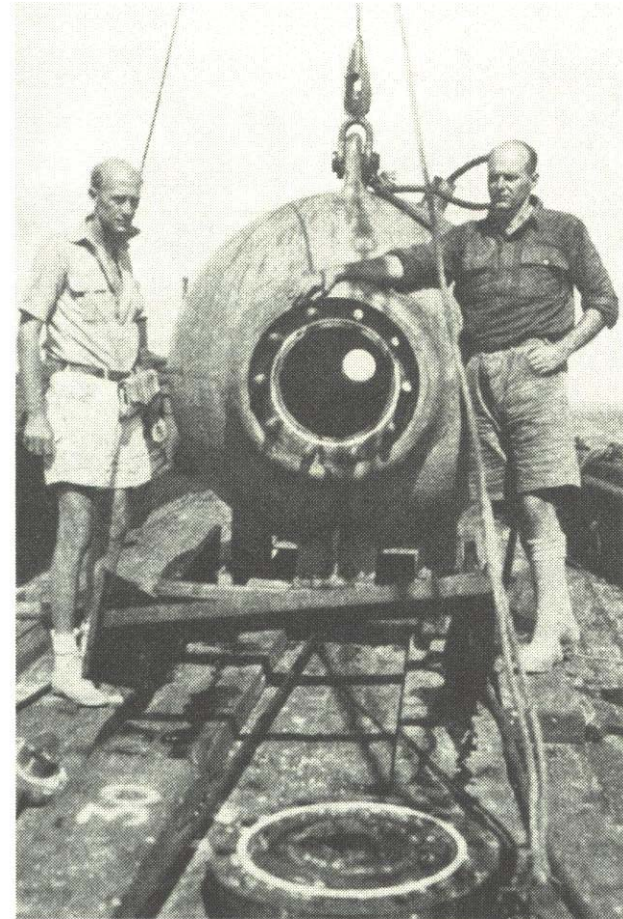


Figure 46. Two great echinologists, Hubert Lyman Clark and Theodor Mortensen, in the Caribbean. Clark was caught in the cross fire of a war between Mortensen and Alexander Agassiz. Clark and Mortensen did fieldwork together in Tobago in 1916, when this snapshot may have been taken. (By permission of the Museum of Comparative Zoology Archives, Harvard University)

Hubert Lyman Clark and  
Theodore Mortensens  
in Tobago (1916)



William Beebe  
1877-1962

# Many local universities

- University of the West Indies
- University of Puerto Rico, Mayagüez
- Other Universities

Marine programs

# MID TO LATE 20<sup>TH</sup> CENTURY

- Deep sea expeditions
  - R/V Gerda and R/V Pilsbury
  - Ocean drilling Project
- Local initiatives
- Individuals
- International collaborations



# International Programs

- **CARICOMP** = Caribbean Comparison of Marine Productivity
- **GCFI** = Gulf and Caribbean Fisheries Institute
- **CLME** = Caribbean Large Marine Ecosystem
- **AMLC** = Association of Marine Laboratories of the Caribbean

# CARICOMP

## Caribbean Comparison of Marine Productivity

To contribute to integrated coastal management by:  
determining the factors that regulate productivity of the three main coastal ecosystems in the Caribbean region: mangroves, seagrasses, and coral reefs; and assessing the nature and influence of land-sea interactions.

# Association of Marine Laboratories of the Caribbean (AMLC)

AMLC is a confederation of more than 30 marine research, education, and resource management institutions endeavoring to encourage the production and exchange of research and resource management information, advance the cause of marine and environmental education in the region, and facilitate cooperation and mutual assistance among its membership.

35th Scientific Meeting, 23-27 May 2001, Costa Rica

# Capacity building

- Foreign institutions
- Local Universities
- Studies abroad
- International organizations

# International programs

- AMLC = Association of Marine Laboratories of the Caribbean
- GCFI = Gulf and Caribbean Fisheries Institute
- ACTI: Association of Caribbean Tertiary Institutions

# THE PRESENT

- Excellent field stations
  - STRI's Bocas del Toro, Panamá
- Research oriented to local problems
- Regional cooperation
- Importance of local scientific communities

# Importance of local scientific communities

- Type of research
- Advisory group
- Capacity building
- Education in general
- Problem solving for decision taking
- Better evaluation of the internal situation
- Counterpart to foreign scientists



Instituto de Investigaciones Marinas y Costeras  
"José Benito Vives de Andrés"  
INVEMAR



# ÁREAS CORALINAS DE COLOMBIA







Workshop with Government Officials





4 12 2002

# Conclusions

- Local scientific capacity
- Local research and capacity building institutions
- Governmental structure and support
  - National educational programs
  - National monitoring programs
  - Continuous capacity building

# Conclusions

- Local and international funding
- Much more research on the deeper regions of the Caribbean Sea
- Regional cooperation



**Thank  
you**