Archaeology and Climate Change in the Caribbean

1. Climate Change

- Relative Sea Level Rise
- Precipitation
- Hurricane Activity

2. Archaeology

- Site Location
- Food Procurement Strategies
- Settlement Infrastructure

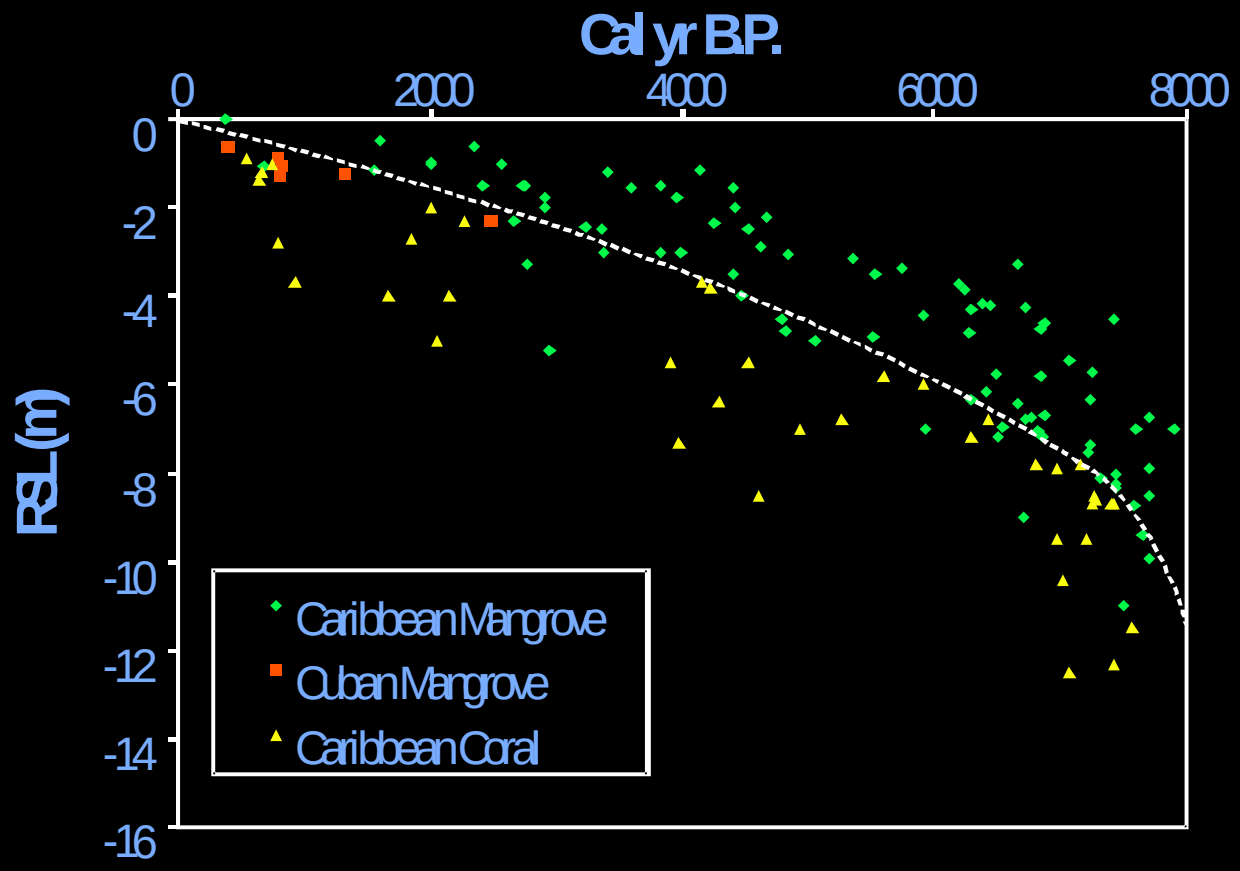
3. Caribbean

- Regional/National
- Local
- Site Specific

Regional Relative Sea Level Rise

Key Impacts

1) Coastal flooding
2) Changing coastal ecosystems



(Data from Toscano and Macintyre, 2003 and Peros, 2005)

Regional Changes in Rates of Precipitation

Key Impacts

1) **Droughts**
2) **Environmental instability**

Small sample of precipitation data in the pre-Columbian insular Caribbean

Lake Miragoane, Haiti broad scale evidence of three periods of broad rainfall variation

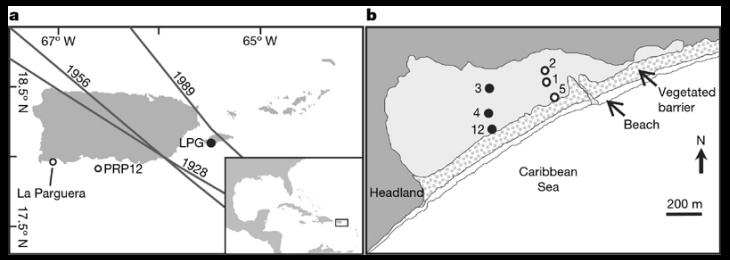
- **10300 – 7000 yr BP Cool dry conditions**
- **7000 – 3200 yr BP Moist warm conditions**
- **3200 – 1100 yr BP Reduction in rainfall**

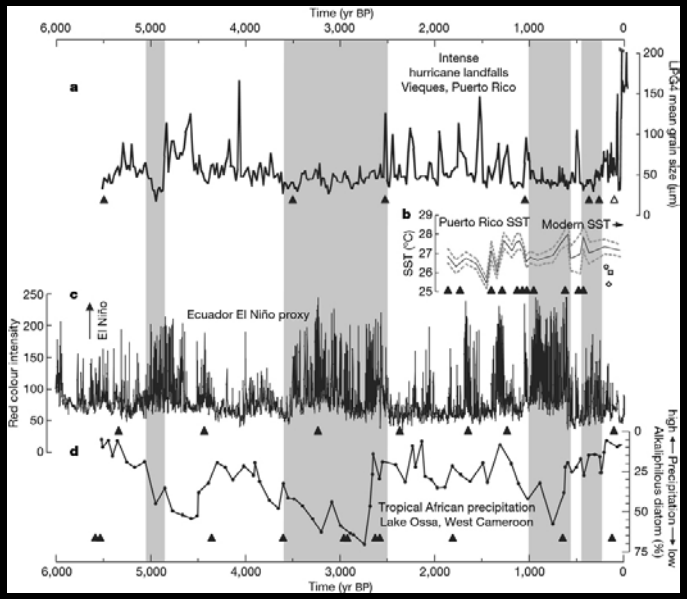
(Higuera-Gundy, A. et al., Quaternary Research, 1999)

Regional Hurricane Activity

Key Impacts

1) Wind Shear
2) Coastal storm surges
3) Flooding

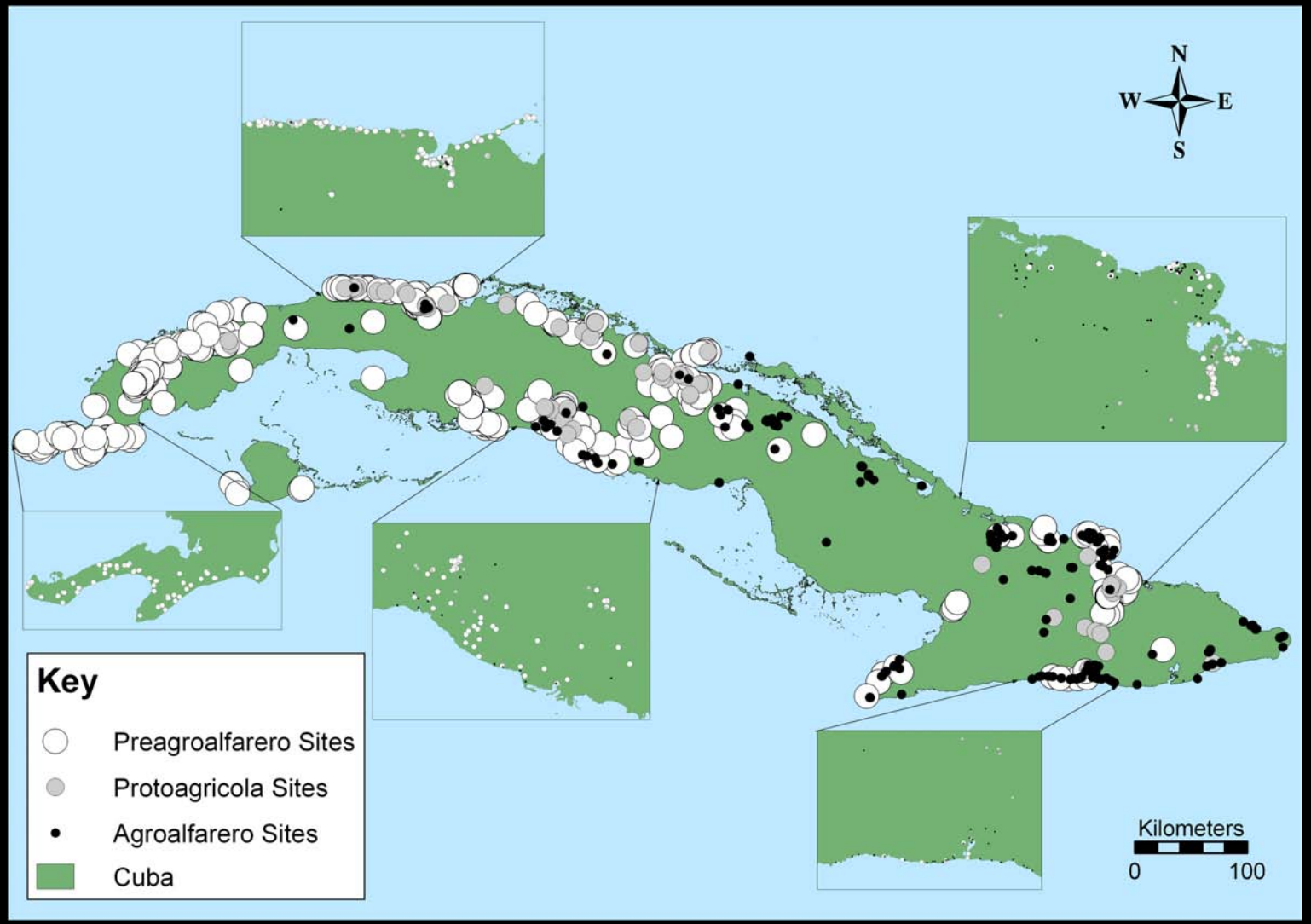




(Donnelly and Woodruff, Nature, 2007)

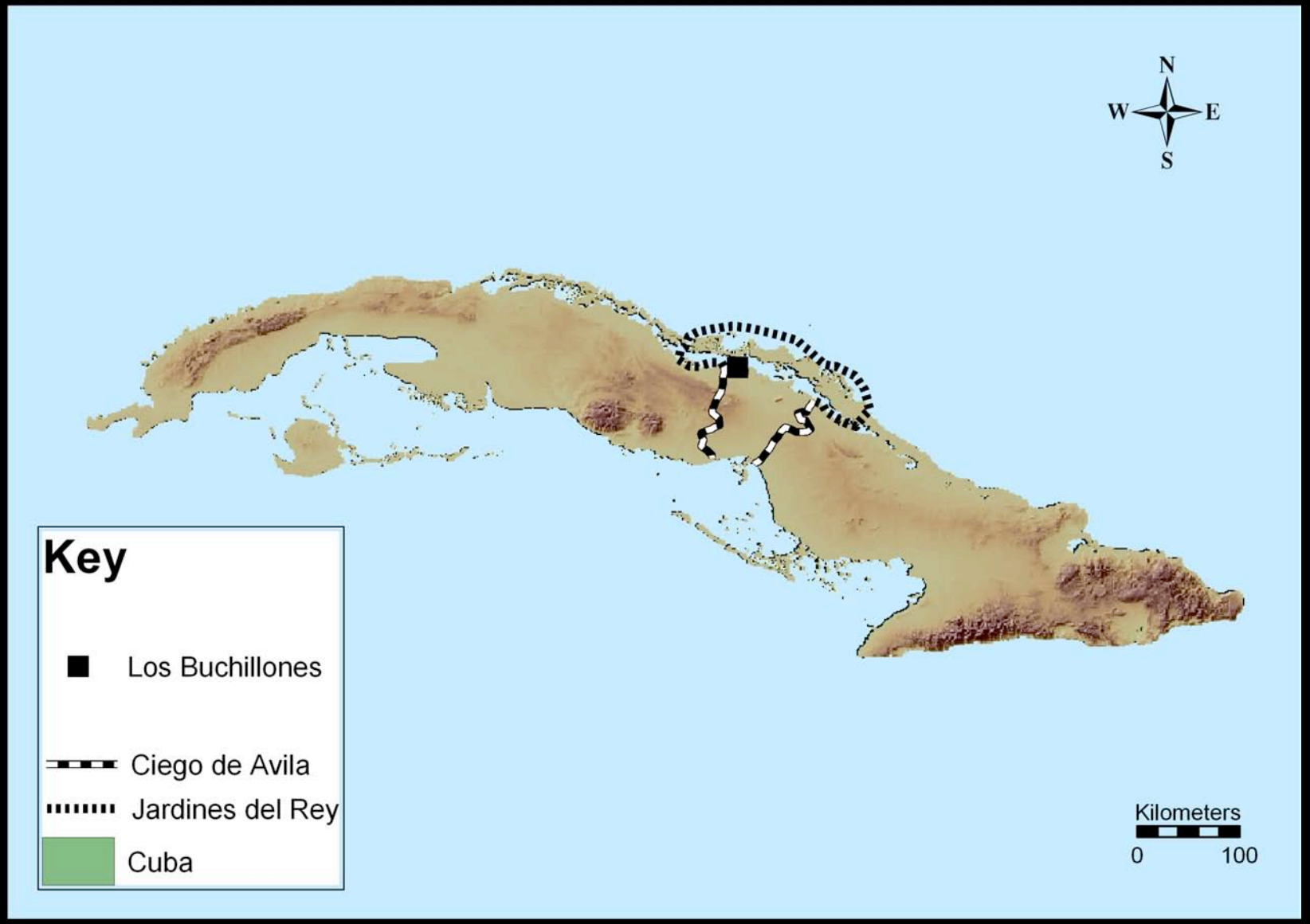
Cuban Archaeology

Creation of National Sites and Monuments Database



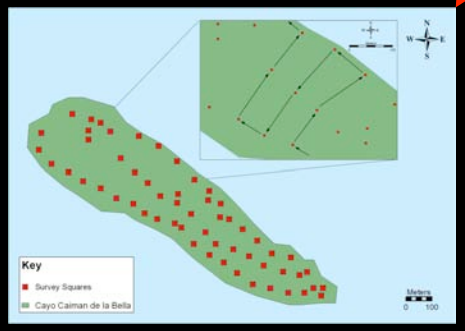
Cuba

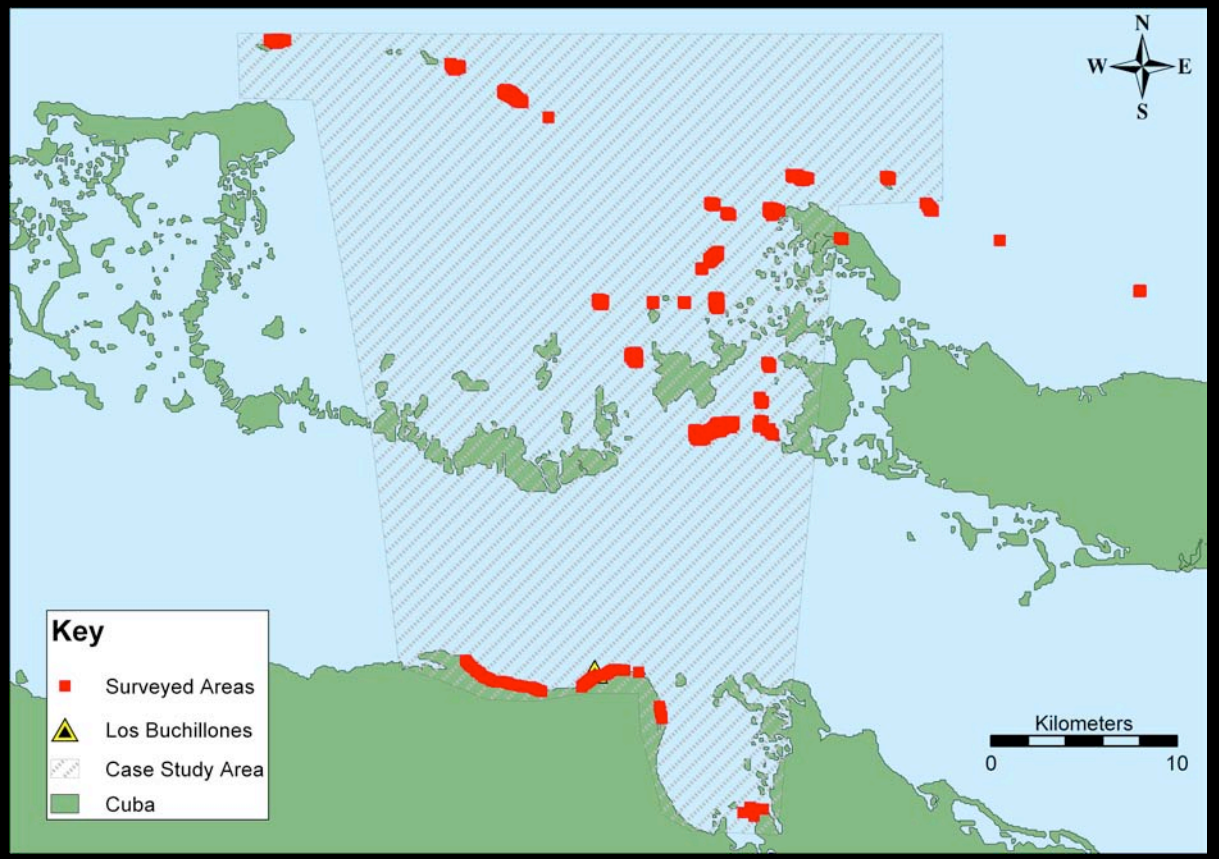
Case Study Area



Island Survey

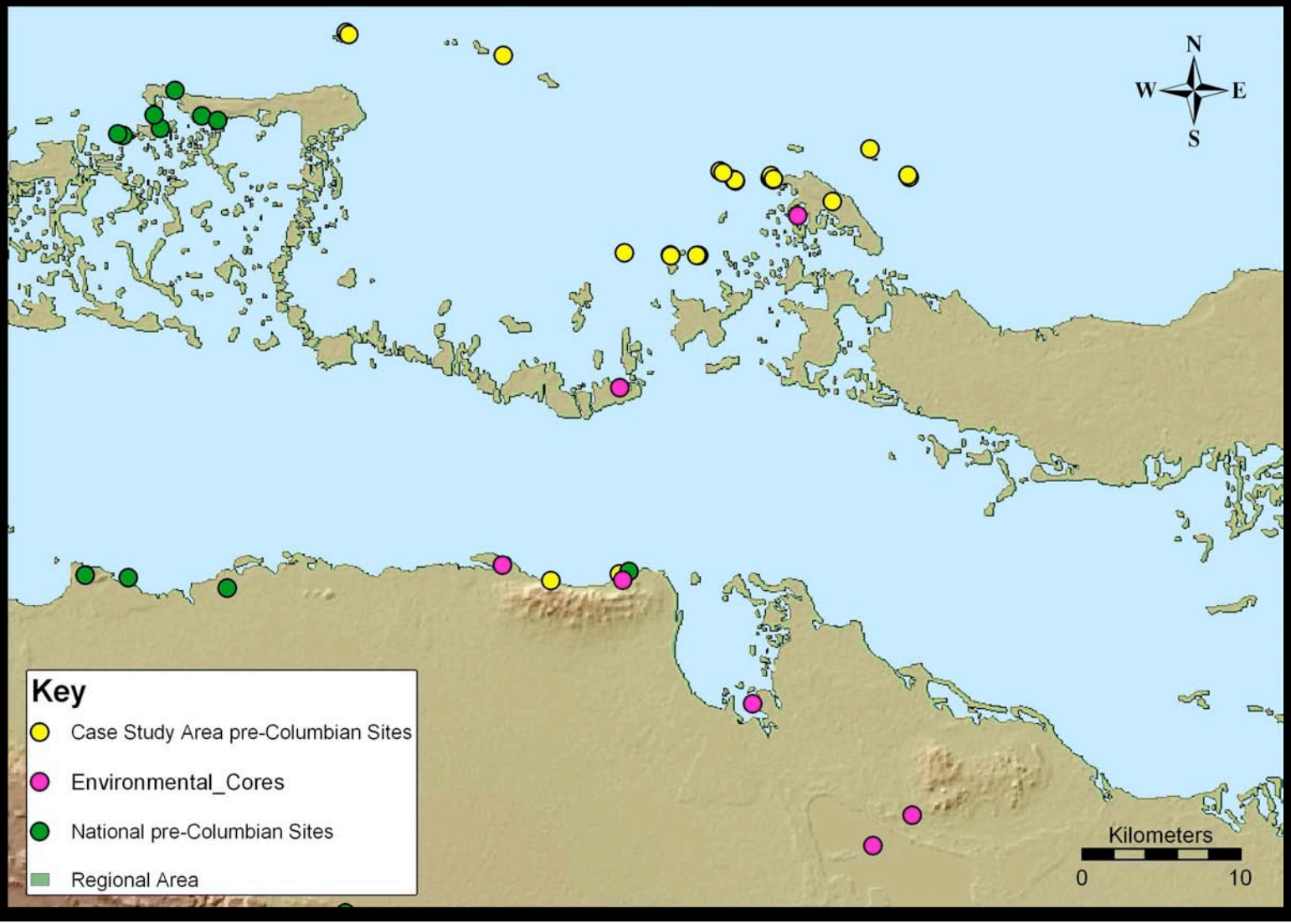
- **Archaeological survey of 1500 sq. km including 22 offshore islands and range of different environmental zones**





Local Case Study Area

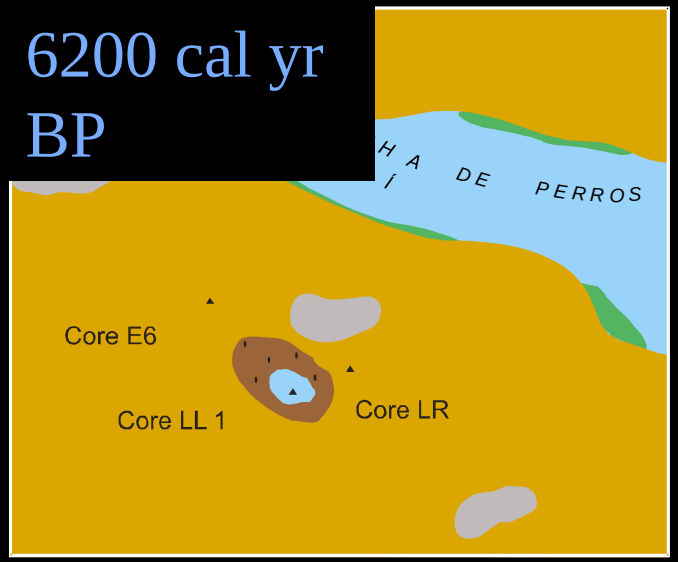
31 Pre-Columbian Sites with 7 local paleoenvironmental core sites



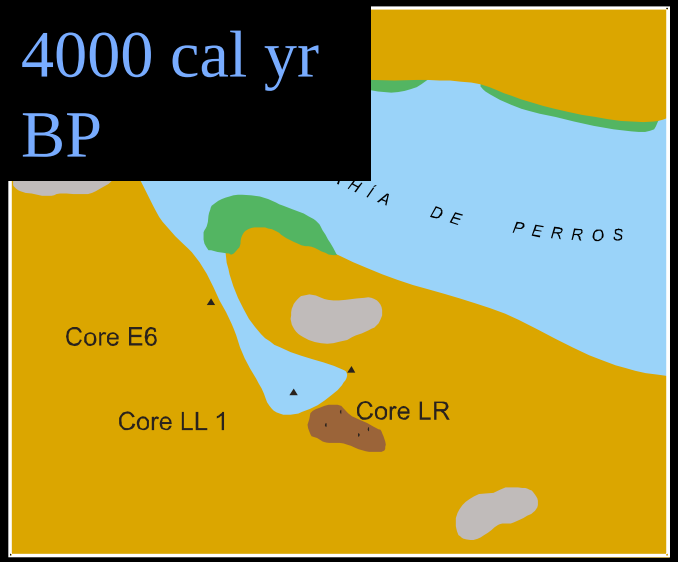
Local Case Study Area

Impacts of relative sea level rise on local case study coastal area

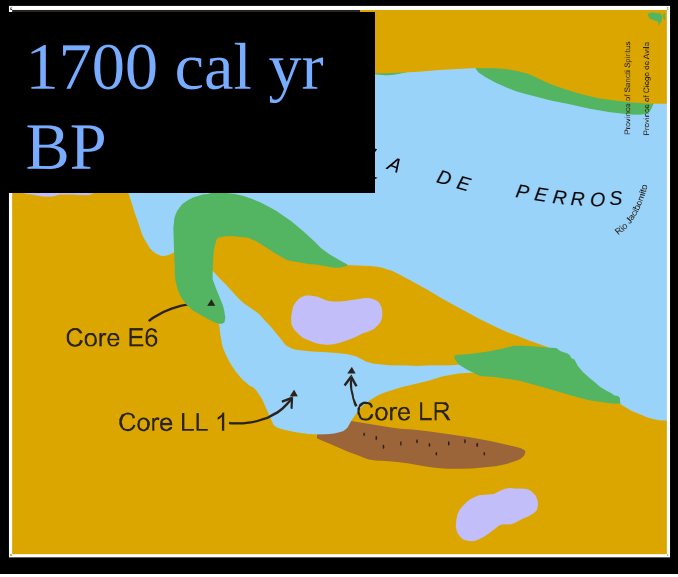
6200 cal yr BP



4000 cal yr BP



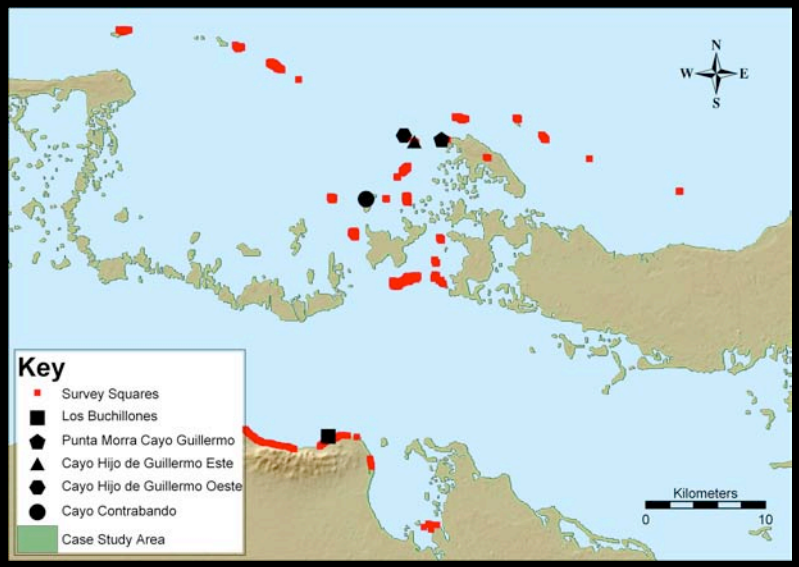
1700 cal yr BP

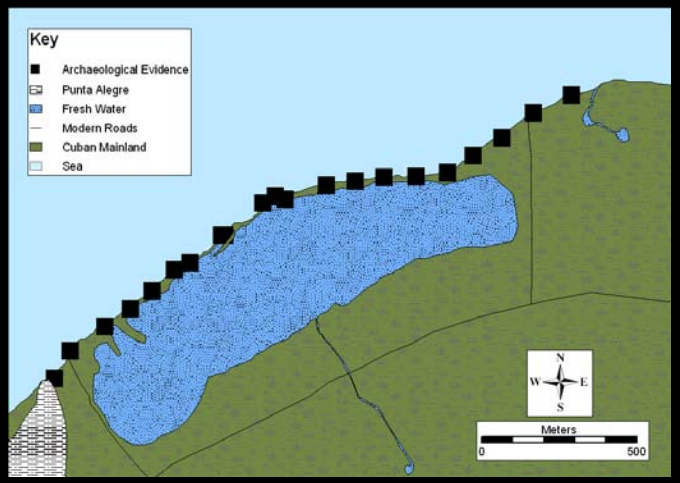


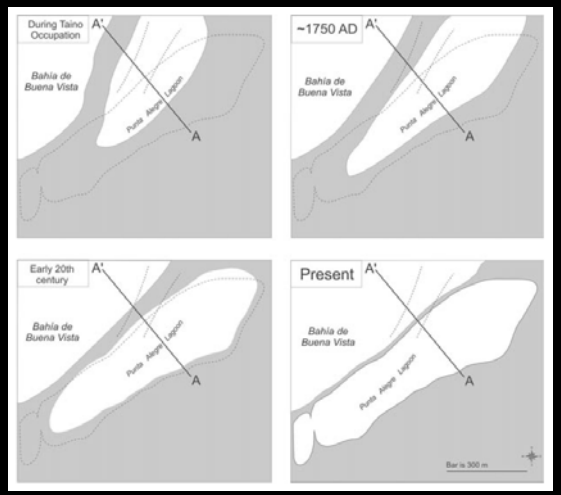
Present Day

Site Specific

Los Buchillones

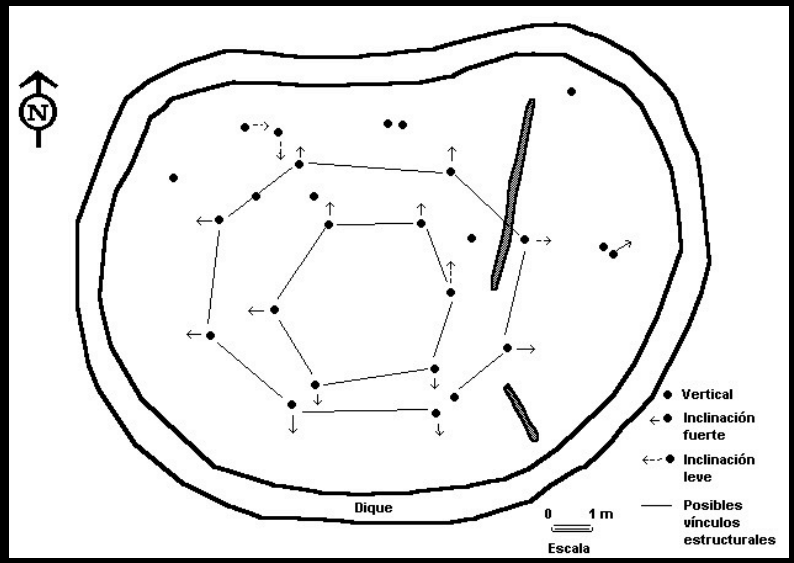






(Peros et al., Geoarchaeology, 2006)

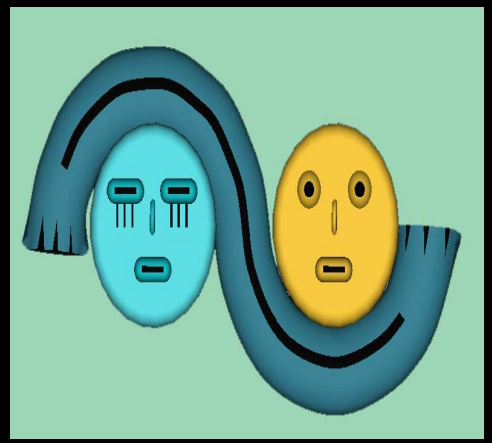
Los Buchillones (AD 1264-1667)



Lessons from the Past for Problems of the Future

Settlement Location

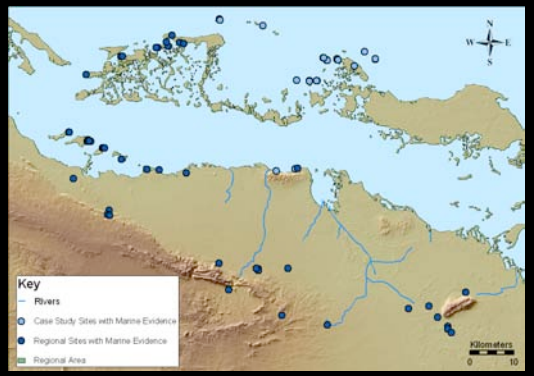
- Evidence of settlement locations in flood protected areas
- Settlement location in close proximity to cave systems that were used as hurricane shelters



Lessons from the Past for Problems of the Future

Food Procurement Strategies

- Increased diversity of environmental zones being exploited for resource and subsistence practices
- Evidence of long distance movement of food resources and social storage between communities living in different environmental zones



Lessons from the Past for Problems of the Future

House Structures

- Pre-Columbian stilted wooden house structures in coastal wetlands reduces impact of coastal flooding
- Substantive structural posts resilient to hurricane wind shear
- Lightweight superstructures easily reconstructed from locally available materials

Lessons from the Past for Problems of the Future

Summary

- Caribbean is a good area to study past human engagement with the impacts of climate change

- Comparative perspectives from different spatial and temporal scales facilitates analysis and strengthens basis for interpretation

- Archaeology can inform current strategies for dealing with the impacts of climate change in the Caribbean