Caribbean Human Ecodynamics

Friday, 29th July	
8:00 – 10:00	**Caribbean Human Ecodynamics** (Chairperson: Sophia Perdikaris)
8:00-8:20	*The human experience of climate variability and environmental change in the Caribbean: a longue durée perspective* (Jago Cooper)
8:20-8:40	*Environmental archaeology, paleoecology and climate change: a multidisciplinary perspective from Antigua and Barbuda* (Allison Bain, Michael Burn, Lisa Kennedy, Sarah Metcalfe, Anne-Marie Faucher, Allison LeBlanc and Alex Berland)
8:40-9:00	*Looking back to look forward: using archaeological research to inform environmental policy* (Nigel Bardoe and Samantha Rebovich)
9:00-9:20	*La perception des aléas naturels aux Petites Antilles par les Amérindiens Kalinagos* (Guillaume Lalubie)
9:20-9:40	*Lives and archaeology of risk: diachronic land-use, settlement, and volcanic activity on Montserrat* (Krysta Ryzewski and John F. Cherry)
9:40-10:00	*Historical archaeology on Barbuda – Human ecodynamics in the Early Modern Caribbean* (George Hambrecht)
10:00 – 10:20	**Coffee Break – Poster session**
10.20 – 12.00	**Caribbean Human Ecodynamics, cont.** (Chairperson: Jago Cooper)
10:20-10:40	*Landscape change and human ecodynamics in pre-Saladoid Puerto Rico: the case of Angostura* (Isabel Rivera-Collazo)
10:40-11:00	*The wise man builds his house upon the rock: architectural resilience in the Pre-Columbian Greater Antilles* (Alice V. M. Samson)
11:00-11:20	*Predictive models, climatic fluctuations, and settlement systems in Pre-Columbian archaeology* (Cory Look)
11:20-11:40	*Paleoenvironmental investigations in Barbuda, West Indies* (Sophia Perdikaris, Reg Murphy, Thomas McGovern and William Patterson)

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Caribbean Human Ecodynamics

The human experience of climate variability and environmental change in the Caribbean: A longue durée perspective

Jago Cooper
jc329@le.ac.uk

Homage to France

Outstanding scholars in the Caribbean

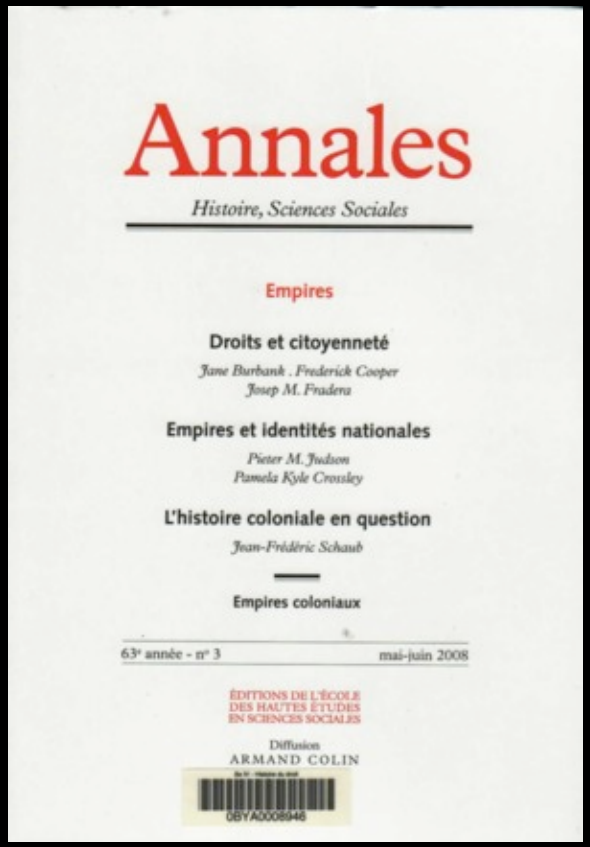
Bertran P, Bonnissent D, Imbert D, Lozouet P, Serrand N, and Stouvenot C. 2004. Paléoclimat des Petites Antilles depuis 4000 ans BP : l'enregistrement de la lagune de Grand-Case à Saint-Martin. *Geoscience* 336:1501-1510.

Delpuech A. 2004. Espaces Naturels et Territoires Amérindiens dans la Caraibe Orientale. In: Delpuech A, and Hofman CL, editors. *Late Ceramic Age Societies in the Eastern Caribbean.* Paris Monographs in American Archaeology 14: BAR International Series 1273

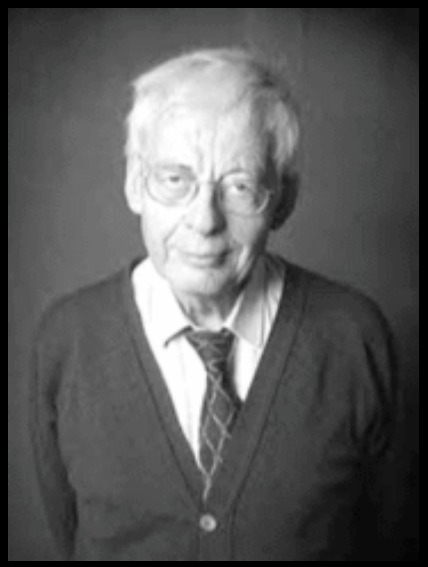
Petitjean Roget H. 2001. Contribution à l'Etude du Troumassoide et du Saladoide (600–1200 AD). Une hypothèse sur les causes de la regression du Saladoide aux Petites Antilles. In: Alofs L, and Dijkhoff RACF, editors. *Proceedings of the 19th International Congress for Caribbean Archaeology*. Aruba: Museo Arqueologico Aruba. p 227-238

Homage to France

"A remarkable amount of the most innovative, the most memorable and the most significant historical writing of the twentieth century has been produced in France." Burke 1990:1



Marc Bloch, Lucien Febvre, Fernand Braudel, et Emmanuel le Roy Ladurie et al.



Annales School

Trajectories:

1929-1937 - Annales d'histoire économique et sociale

1939-1941 - Annales d'histoire sociale

1942-1944 - Mélanges d'histoire sociale

1945 - Annales d'histoire sociale

1946-1993 - Annales. Économies, Sociétés, Civilisations

1994-... - Annales. Histoire, Sciences Sociales

An Annales framework for studies of past human experience

1. Problem orientated analytical approach to the past that attempts to develop multi-scalar techniques to understand long term trajectories over and above a reconstructed narrative of past events

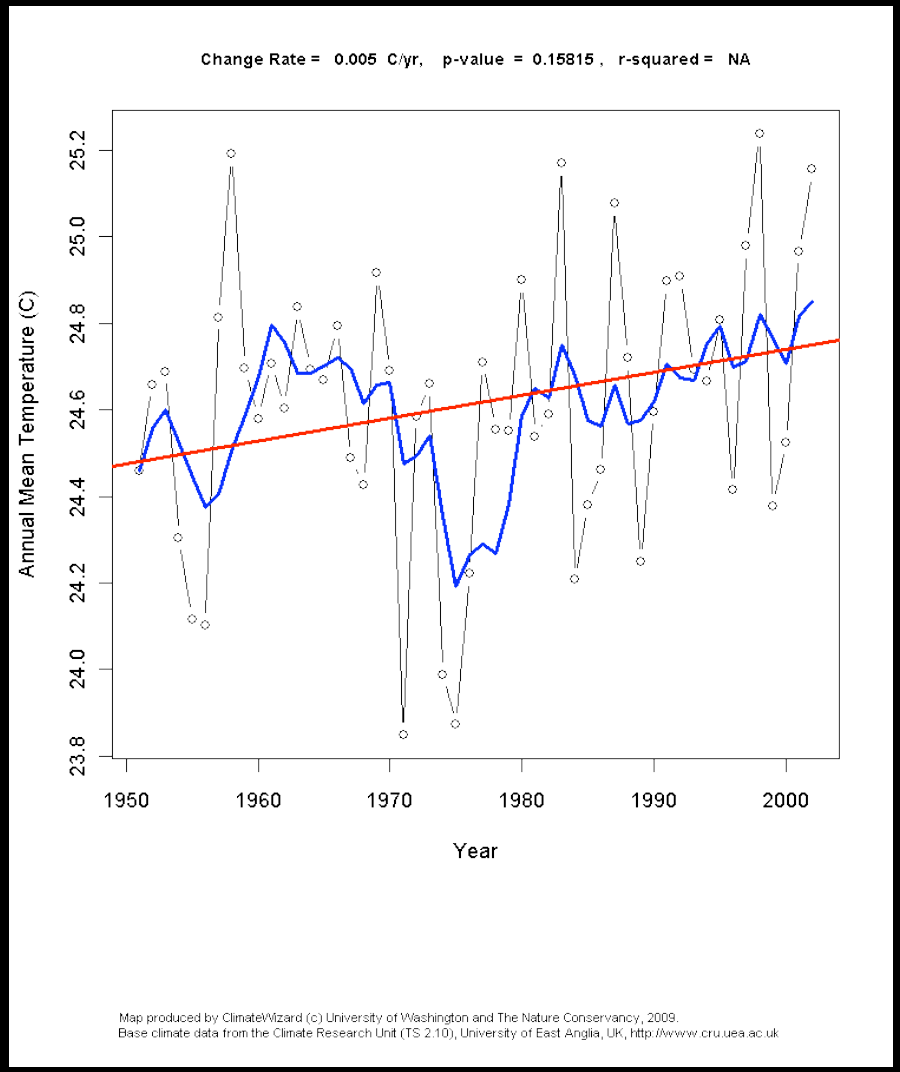
2. Inclusion of all aspects of past human lifeways and elements of society rather than a focus on elite centres or political histories

3. The importance of a multidisciplinary approach to achieve these first two that includes geography, geology, history, social anthropology, sociology, economics and archaeology

A Longue Durée Perspective

Climate as Embodiment of Longue Durée

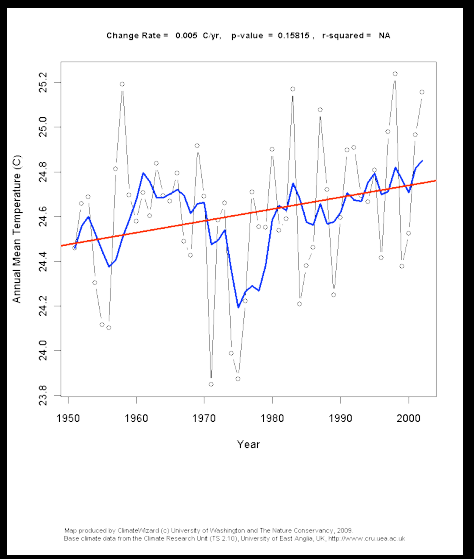
Climate is by definition averaged events



Climate as Embodiment of Longue Durée

Climate as averaged events:

1. Variability vs change
2. Parameters of scale
3. Integrated interdisciplinary interpretation



Archaeology as Time Averaged Data

Time averaged interpretations of material remains

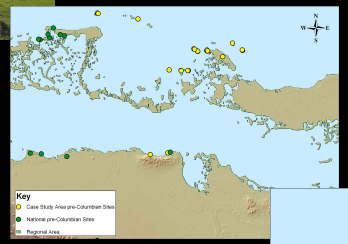
Artefact

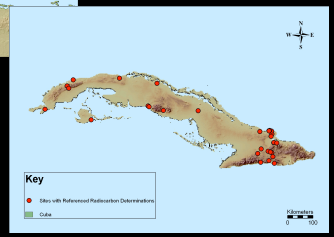
Context

Site

Inter-Site

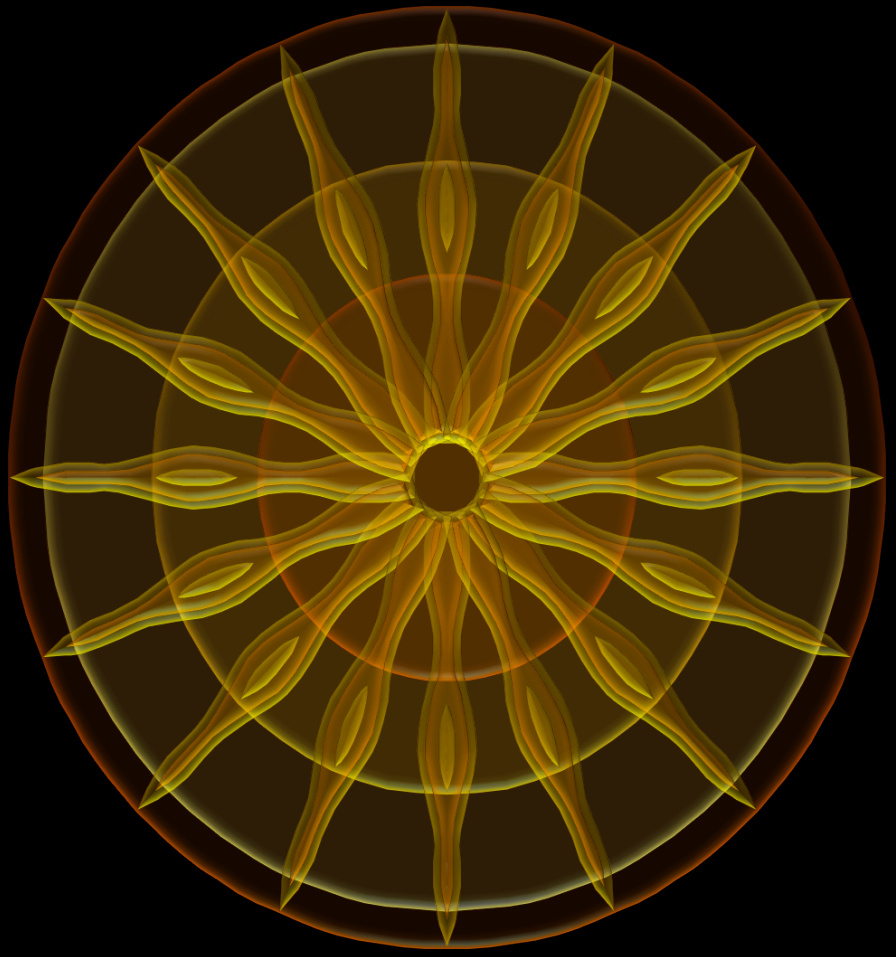
Region





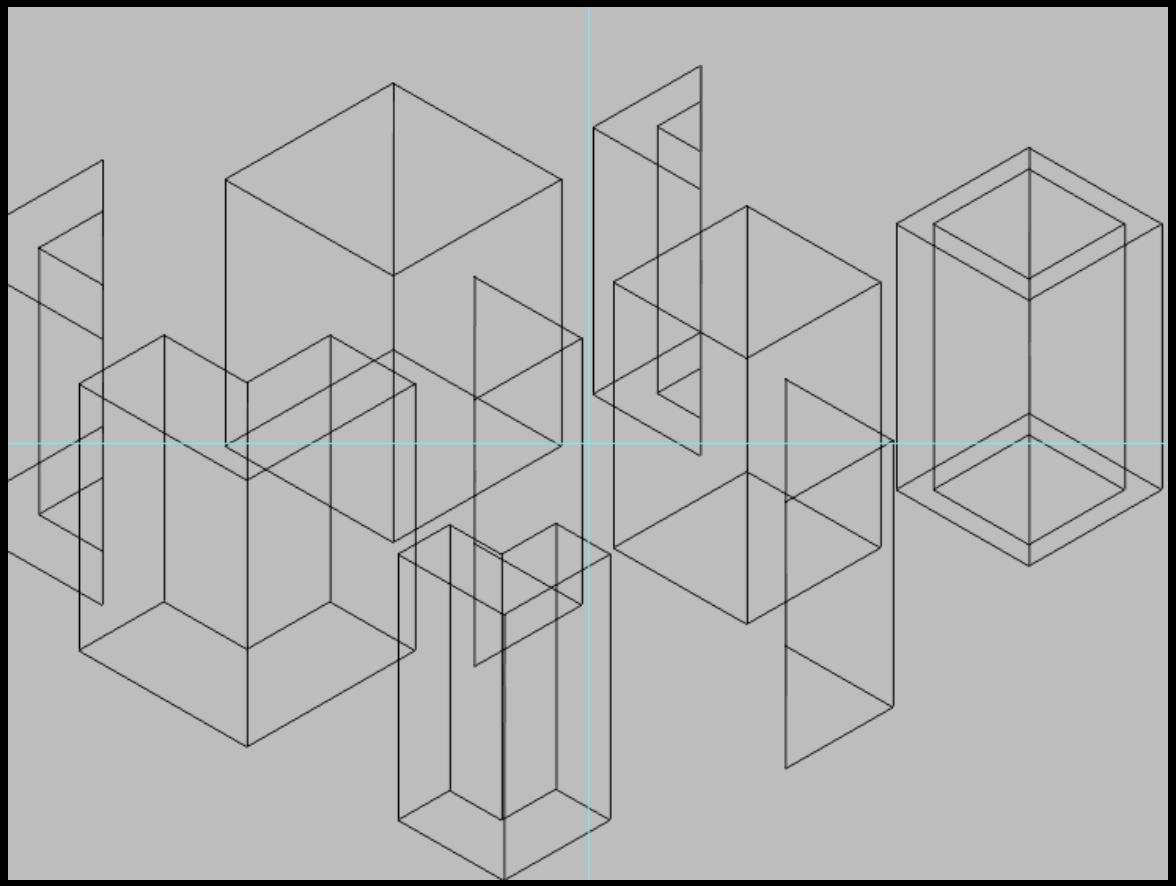
Framework for Interdisciplinary Integration

An Annales perspective for human experience



Addressing Annales Critiques

Is it possible to correlate multiple scales of interdisciplinary experience?



Hexter JH. 1972. Fernand Braudel and the Monde Braudellien. The *Journal of Modern History* 44(4):480-539.

Human Ecodynamics

As Archaeologists, yes we can……

Human Ecodynamics

Moving Theoretical Frameworks and Methodological Techniques Forwards

Past Human Ecodynamics

Integrated regional frameworks for understanding

Multi-Disciplinary Data

Capitalizing upon new techniques to refine temporal and spatial parameters of interdisciplinary data

Palaeoprecipitation and Palaeotempestology

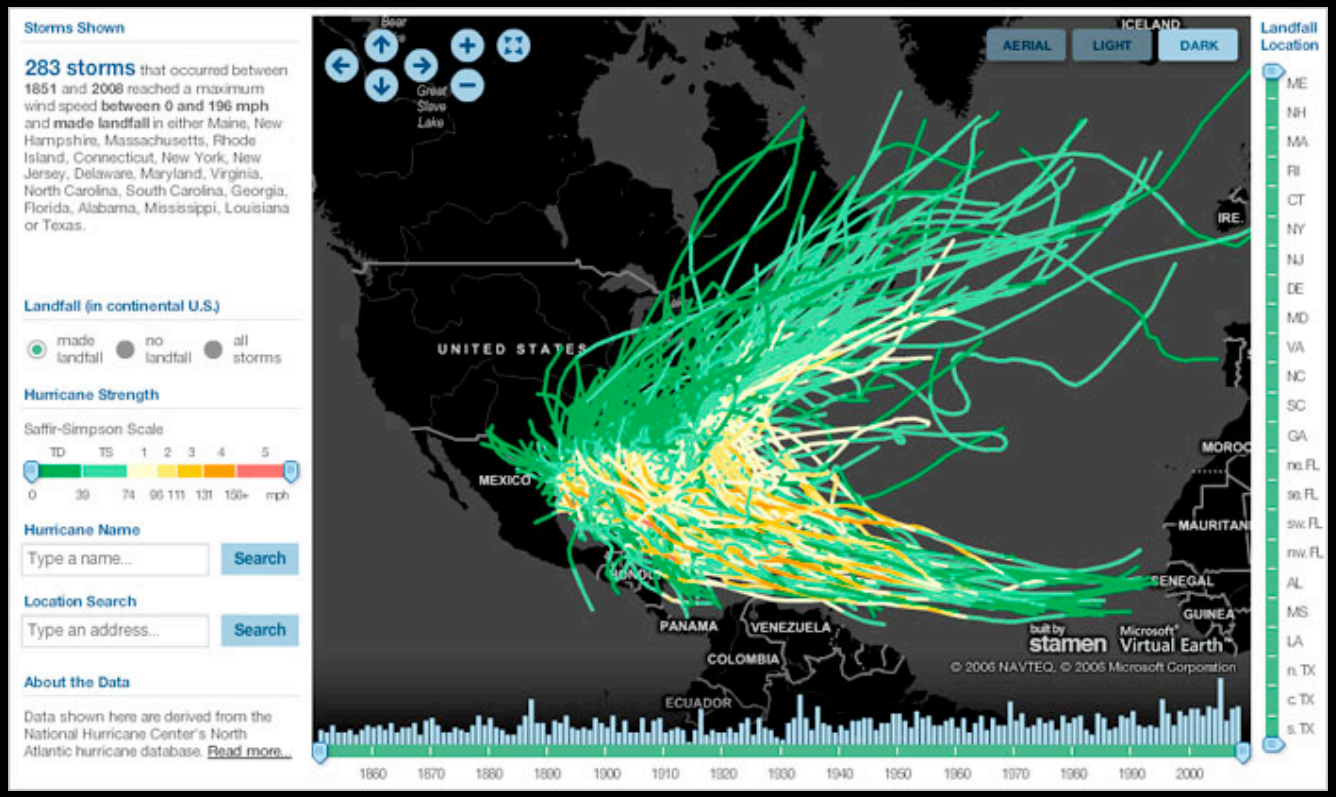
Bahamas (Bourrouilh-Le Jan 2007; Kjellmark 1996)
Barbados (Beck et al. 1997:705; Mangini et al. 2007)
Cariaco basin (Black et al. 2004; Tedasco and Thunell 2003)
Belize (Gischler et al. 2008; McCloskey and Keller 2009)
Cuba (Peros et al. 2007)
Dominican Republic (Greer and Swart 2006; Taggart 2006)
Haiti (Higuera-Gundy et al. 1999)
Jamaica (McFarlane et al. 2002)
Puerto Rico (Nyberg et al. 2001)
St Martin (Bertran et al. 2004; Malaize et al. 2011)
Venezuela (Curtis et al. 1999)
Vieques (Donnelly et al. 2007; Woodruff et al. 2008b)
US Virgin Islands (Jessen et al. 2008) among other locations.

Palaeoprecipitation and Palaeotempestology

Local Palaeotempestological Variation

Courtesy of Lisa Kennedy

Regional Palaeotempestological Change



Climate Change in the Caribbean

Trajectories of variability and change:

6700-3200 cal yr BP

3200-2500 cal yr BP

2500-1500 cal yr BP

1050-750 cal yr BP

750-475 cal yr BP

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience
		Seasonal		
		Annual		
		Decadal		
		Multi-decadal		
		Centennial		
		Millenial		

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience
	Rainfall	Seasonal		
	Temperature	Annual		
	Wind Speed	Decadal		
	Wind Direction	Multi-decadal		
	Atmospheric pressure	Centennial		
		Millenial		

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience
North Atlantic Weather Systems	Rainfall	Seasonal		
NAO	Temperature	Annual		
ENSO	Wind Speed	Decadal		
ITCZ	Wind Direction	Multi-decadal		
Dansguard Oscheuger Events	Atmospheric pressure	Centennial		
Heinrich Events		Millenial		
Solar Insolation				

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience
North Atlantic Weather Systems	Rainfall	Seasonal	Drought	
NAO	Temperature	Annual	Flooding	
ENSO	Wind Speed	Decadal	Wind Shear	
ITCZ	Wind Direction	Multi-decadal	Sea Level Rise	
Dansguard Oscheuger Events	Atmospheric pressure	Centennial	Famine	
Heinrich Events		Millenial	Seasonality	
Solar Insolation				

Caribbean Past Human Ecodynamics

Climate Drivers	Climate Impacts	Variability and Change	Human Experience	Social Resilience
North Atlantic Weather Systems	Rainfall	Seasonal	Drought	Ecological Knowledge
NAO	Temperature	Annual	Flooding	Memory
ENSO	Wind Speed	Decadal	Wind Shear	Social networks
ITCZ	Wind Direction	Multi-decadal	Sea Level Rise	Technology
Dansguard Oscheuger Events	Atmospheric pressure	Centennial	Famine	Language
Heinrich Events		Millenial	Seasonality	Demography
Solar Insolation				Mentalites

Past Human Ecodynamics in Action

Using the human experience of climate variability and environmental change to consider social resilience

1. Ecological knowledge
2. Collective memory
3. Social networks

Past Human Ecodynamics in Action

Using the human experience of climate variability and environmental change to consider social resilience

1. Pre-Columbian ecological knowledge

Guatauba

Guabancex

Coatrisque

Past Human Ecodynamics in Action

Using the human experience of climate variability and environmental change to consider social resilience

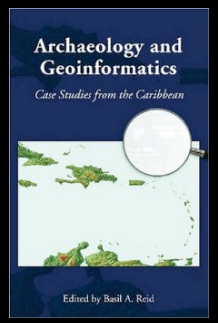
2. Collective memory

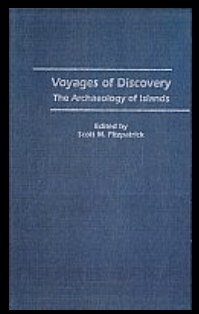
Drawings by Cuban school children in Holguìn on their thoughts about pre-Columbian mechanisms for collective memory

Past Human Ecodynamics in Action

Using the human experience of climate variability and environmental change to consider social resilience

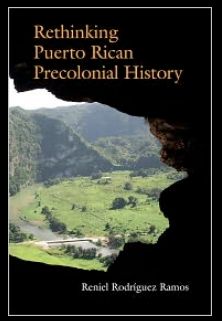
3. Social networks

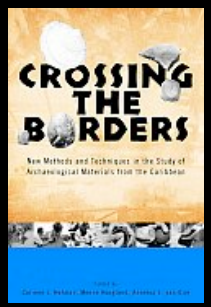




Journal of Caribbean Archaeology

SPECIAL PUBLICATION NUMBER 3: Mobility and exchange from a Pan-Caribbean perspective, edited by Corinne L. Hofman and Alistair J. Bright (2010)





Past Human Ecodynamics in Action

Social resilience depends not on the impact of climate events but on the social framework with which a human community prepares and responds to these events

Past Human Ecodynamics

Provides this human perspective of living with climate variability and environmental change

Impact: Expose and explain the multi-temporal nature of impact

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Impact: Expose and explain the multi-temporal nature of impact

Vulnerability: Reveal the divergent inter and intra-societal vulnerability of different social groups

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Impact: Expose and explain the multi-temporal nature of impact

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Resilience: Enable relative social resilience to be assessed over the long-term and inform mechanisms to develop community resilience capacity

Past Human Ecodynamics

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Impact: Expose and explain the multi-temporal nature of impact

Vulnerability: Reveal the divergent inter and intra-societal vulnerability of different social groups

Resilience: Enable relative social resilience to be assessed over the long-term and inform mechanisms to develop community resilience capacity

Demonstrable Data: Support arguments with robust data-sets, highlight the non-linear, dynamic and intrinsically unpredictable nature of human-climate-environment relationships

Related Discussion since IACA 2009

- Cooper, J. In Press. Fail to Prepare then Prepare to Fail: re-evaluating vulnerability, mitigation and resilience in the pre-Columbian Caribbean. In Cooper, J. & Sheets, P. (eds). *Living with the Dangers of Sudden Environmental Change: Past Lessons for Identifying Hazards, Mitigating Impacts and Avoiding Disasters.* University of Colorado Press, Boulder.
- Cooper, J. with editors. The Climatic Context for Pre-Columbian Archaeology. In (eds Keegan, B., Hofman, C. & Rodriguez, R.) *Oxford Handbook for Caribbean Archaeology*. Oxford University Press, Oxford.
- Cooper, J. & Boothroyd, R. 2011. Living Islands of the Caribbean: A view of relative sea level change from the waters edge. In (eds Hofman, C. & van Duijvenbode, A.) *Communities in Contact*. Sidestone Press, Leiden.
- Cooper J, and Thomas K. 2011. Constructing Caribbean Chronologies: comparative radiocarbon dating of shell and wood artefacts from pre-Columbian sites in Cuba. *Archaeometry.*
- Cooper, J. & Peros, M. 2010. The Archaeology of Climate Change in the Caribbean. *Journal of Archaeological Science.* 37:1226–1232.
- Cooper, J. 2010 Pre-Columbian Archaeology of Cuba: a study of national site distribution patterns and radiocarbon chronologies. In *Island Shores, Distant Pasts: Archaeological and Biological Approaches to the Pre-Columbian Settlement of the Caribbean*, edited by S. M. Fitzpatrick and A. H. Ross. University of Florida Press, Gainesville. Chapter 4. 81-107.
- Cooper, J. 2010. Modelling Mobility and Exchange in Pre-Columbian Cuba: GIS led approaches to identifying pathways and reconstructing journeys from the archaeological record. In (eds. Hofman, C. & Bright, A.). A special edition for the *Journal of Caribbean Archaeology.* 122-137.
- Cooper, J., Valcárcel Rojas, R. and Calvera Rosés, J. 2010. Recent Archaeological Fieldwork from the Region around Los Buchillones, an Indigenous Site on the north-central Cuban Coast. In *Beyond the Blockade: New Currents in Cuban Archaeology.* (eds. Kepecs, S., Curet, A. & de la Rosa, G.). University of Alabama Press, Alabama. 89-105.

Email jc329@le.ac.uk for pdfs

Caribbean Past Human Ecodynamics

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Solar Insolation				Mentalites

Methodological Constraints for Interdisciplinary Research

- Lack of respect
- Different research questions
- Incompatible temporal and spatial scales of data
- Semantic confusion
- Varied measures of success
- Solutions…….

Theoretical Constraints for Interdisciplinary Research

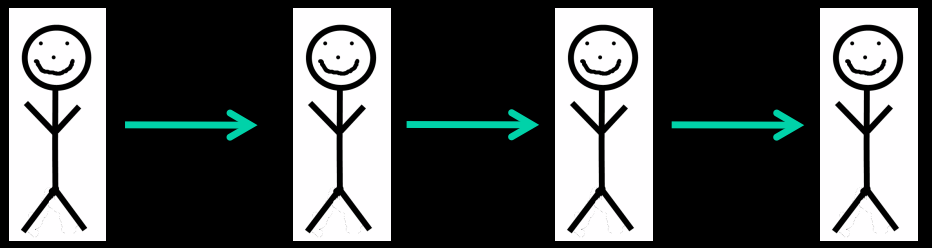
- Key problem is variation in theoretical trajectories between different disciplines
- Creates a major problem for communicating message and convincing audience
- Economic frameworks for archaeological research……
- People don’t think the past is relevant

The human experience of climate variability and environmental change in the Caribbean: A longue durée perspective

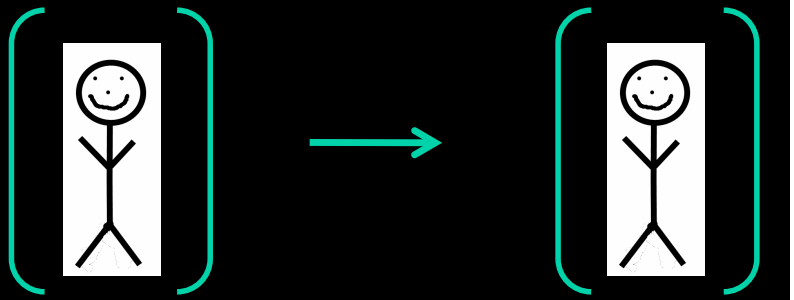
1. An Annales perspective of human experience
2. Past human ecodynamics and the Longue Durée
3. Reconstructing and re-thinking the human experience of climate variability

Making the Past Relevant for Human-Climate-Environment Dynamics

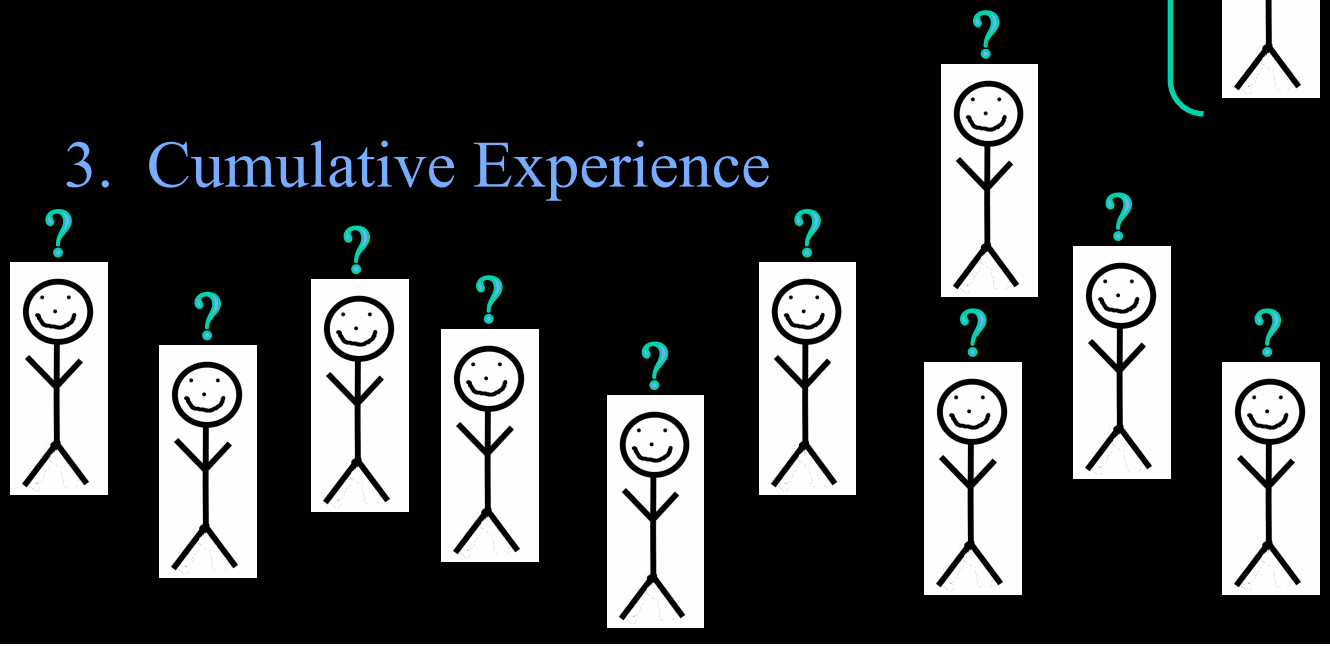
1. Historical Trajectories



2. Selective Direct Analogy

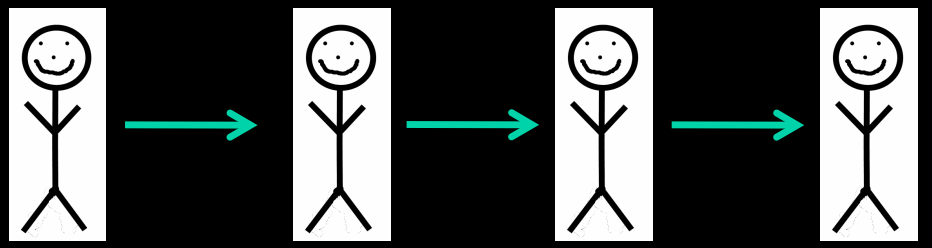


3. Cumulative Experience



Theoretical Frameworks for Human-Climate-Environment Dynamics

1. Historical Trajectories



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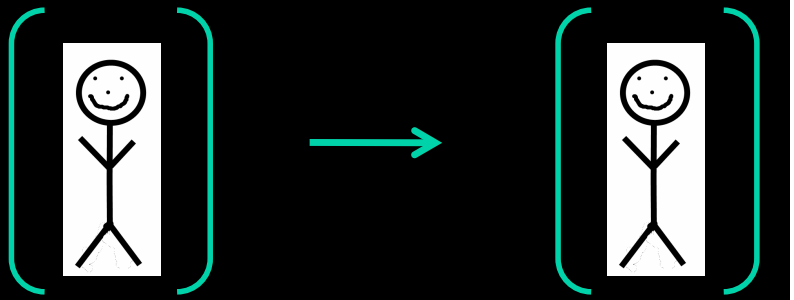

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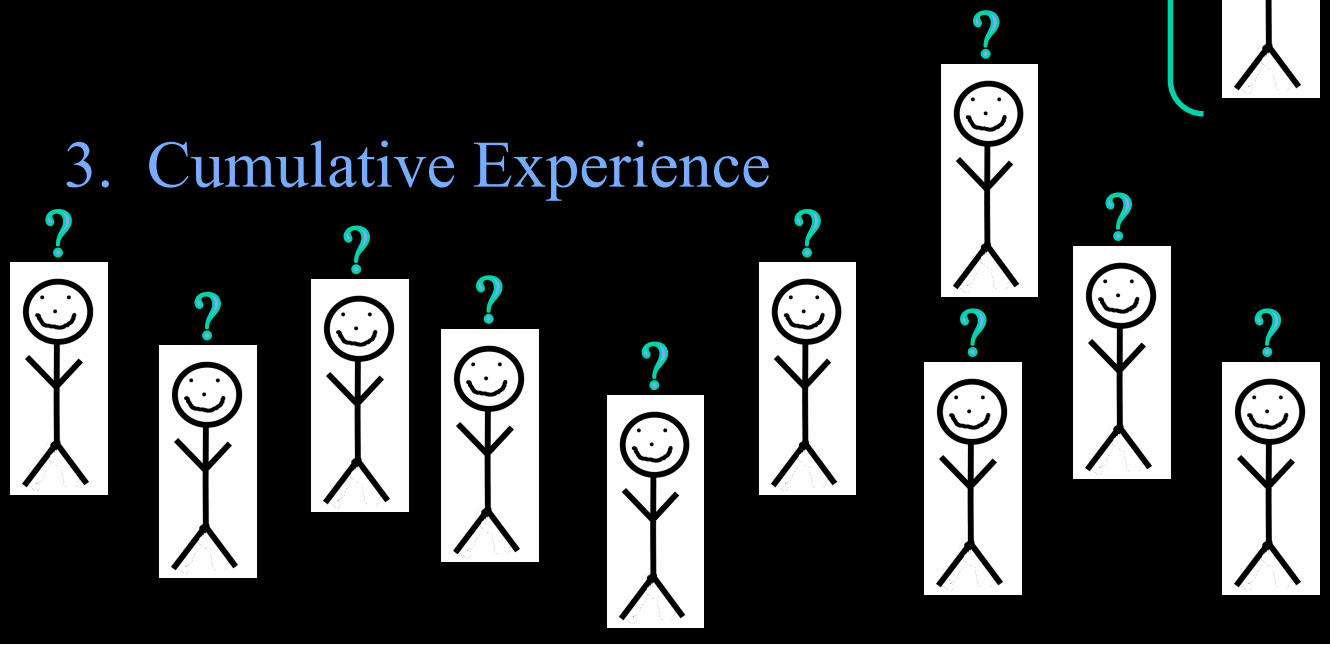


Theoretical Frameworks for Human-Climate-Environment Dynamics

Comparative thematic case studies centred on human perspective

Hazards

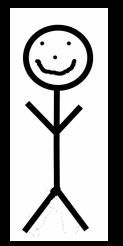
Risk

Vulnerability

Mitigation

Resilience

Sustainability

?

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