

Report and Community Statement

Global Long Term Human Ecodynamics Conference

Eagle Hill Maine October 14-18th 2009

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<http://www.nabohome.org/meetings/glthec2009.html>

The Global Perspectives on Long-term Human Ecodynamics Conference at Eagle Hill Maine was sponsored by the US National Science Foundation Office of Polar Programs Arctic Social Sciences Program through a conference grant to the international interdisciplinary research cooperative NABO (*North Atlantic Biocultural Organization* www.nabohome.org) and an international organizing team (Andy Dugmore, Sophia Perdikaris, Astrid Ogilvie, Tom McGovern). The meeting was hosted by the *Humboldt Research Foundation* at Eagle Hill Maine, who provided an excellent venue and memorable hospitality (<http://www.eaglehill.us/>). A total of seventy one participants from a wide spectrum of backgrounds and disciplinary affiliations (including students from the CUNY Macaulay Honors College, CUNY Research Experience for Undergraduates program, and graduate students from CUNY, U Washington, Washington State, and U Chicago) met for four days of intensive discussion, group breakout sessions, and collective presentations. The meeting was termed “an historic moment” by Dr. Anna Kerttula (NSF OPP Arctic Social Sciences Program) and there was great enthusiasm generated for more interaction and collective action in furthering genuinely interdisciplinary Global Human Ecodynamics research.

Objectives of the Conference

The main purpose of this initial workshop is to begin a global (especially North-South) discussion of human ecodynamics operating in different areas (and on different time scales) with the objective of getting a better comparative handle on the interaction of climate change, human environmental impacts, and human-human interaction with a long term perspective on sustainability, adaptation, resilience, spread of pathogens¹, and threshold crossing changes. The recent NSF *Biocomplexity* competition, the ongoing NSF *Human and Social Dimensions of Global Change Program*, the *International Polar Year*, and major European initiatives

¹ Stirling University researchers are developing an *epiystem concept* (holistic epidemiology systems) to handle this issue, and analogous to social – ecological systems - SES.s. Contact : *Ian Simpson* i.a.simpson@stir.ac.uk for more information.

(ARCHAEOMEDES, several major Leverhulme Trust grants, BOREAS) have provided major new resources to interdisciplinary teams working in many parts of the world. These major initiatives in the past decade have supported regional-scale projects integrating multiple disciplines in a coordinated investigation of human-landscape-climate interactions over the century or millennial scale that can help separate genuine sustainability from short term adaptation and better understand the interactions of processes operating at different spatial and temporal scales. In many cases, the lead investigators have been archaeologists, paleoecologists and climate historians whose longstanding interest in interdisciplinary integration has served to springboard a new investigation of global change which has sought to integrate the best of processual, post-processual, historical- ecological, and socio-natural systems research into a models-rich, increasingly quantitative, fully interdisciplinary cooperative study of human Ecodynamics. One objective of the 2009 meeting was to harvest and spread new insights gained and simultaneously widen the pool of participants.

While no prior meeting duplicates the objectives of the Maine meeting, we drew upon several recent conferences for results and inspiration. These include the 2003 "Long Term Demographic Evolution in the Pacific Islands" conference, Mo'orea (which produced Kirch P.V. & Jean-Louis Rallu ed. 2007 *Growth and Collapse of Pacific Island Societies* U Hawaii), the 2004 School of American Research meeting at the Santa Fe Institute on "Modeling Long-Term Culture Change" (which produced Kohler T. & Sander van der Leeuw ed. 2007 *The Model-Based Archaeology of Socionatural Systems*, SAR press Santa Fe), a session at the 2005 Society for American Archaeology meetings which produced a special volume on the "Archaeology of Global Change" in *American Anthropologist* (2007, McGovern editor), the 2008 NABO general meeting hosted by Bradford University, and the 2007 and 2008 NABO International Polar Year Workshops (Edinburgh). Archaeology has become a surprisingly effective facilitator of successful interdisciplinary investigations in many parts of the globe, and this is an opportunity to add disciplines, scholars and perspectives to begin to explore these new connections of the past, present, and future together.

Conference Organization

The working conference was preceded by several months of interaction by email and posting on a special section of the NABO website (<http://www.nabohome.org/meetings/glthec/>) run by our U Edinburgh webmaster Dr. Anthony Newton. Participants were asked to post a short bio and any papers in pdf that they felt would characterize their research areas or raise questions of broader significance, and to use the website to post comments, draft power point presentations, and working papers of all kinds. The website will also present all power points used at the actual meeting and will serve as an ongoing resource for post-conference work and the integration of the many active and interested scholars not in physical attendance at the Eagle Hill meeting.

Participants were grouped into seven teams intended to recognize particular strengths and to cover emerging major topics but also to deliberately mix research teams and different levels of

seniority. The teams formed break out working groups at the meeting and presented both individual and collective power point presentations that stimulated very active discussions.

The teams and chairs were:

- **Methods, Data and Tools** (chairs Doug Price and Tina Thurston): new analytic tools allow transformation in our abilities to trace migration, reconstruct diet, and reconstruct settlement. Some specialties and approaches are very recent in origin (stable isotopes, aDNA), others have recently been able to significantly upgrade their general utility through expanded data resources (archaeobotany, zooarchaeology, geoarchaeology)
- **Who Cares Wins** (Shari Gearheard & Christian Keller): education, community involvement, policy connections and interdisciplinary engagement. Moving beyond outreach to mobilize TEK and local knowledge and expertise for global science. Engaging under- represented sources of innovation and expanding human resources. Connecting science to the public and providing diversity to policy makers.
- **Hazards and Impacts** (Payson Sheets and Jago Cooper): Recurring hazards, differential impacts, long term lessons for vulnerability and resilience, successful and unsuccessful models of response and adaptation.
- **Climate Change** (Socorro Lozano and Lisa Kennedy): Climate change impacts, threshold crossings, adaptation vs. resilience, past lessons for future impacts.
- **Models and Visualization** (Shripad Tuljapurkar & Tiffany Vance): Digital resources for education, data integration & dissemination, integrative modeling and exploration of complex causality and complex self-organizing adaptive systems.
- **Coping & Scale** (Tate Paulette & Jeff Quilter) societies of different scales have produced cases of both failure and long term sustainability in balancing demands of specialization, short term efficiency and long term flexibility in the face of discontinuous but often rapid changes in natural and social environments.
- **Ecodynamics of Modernity** (Steve Mozorowski & Jim Woollett): past “world system” impacts since 1250 CE, commoditization, repeated pandemic impacts, climate change, Columbian exchange, mass migration, cross-scale integration and linkage, maximum potential for integration of history, ethnography, archaeology, and multi-indicator environmental science.

Common Themes and Community Concerns

Discussions were diverse, intense, and highly productive, and any summary will inevitably be incomplete, but several major recurring themes clearly emerged.

Productive Engagement with Global Change and Challenges of Sustainability: All participants shared a determination to make their specialist information contribute more significantly to our common attempt as a species to survive and prosper in a healthy planet over the next few centuries. Long term perspectives on human ecodynamics provide many cautionary tales, and we are all aware that sustainability is a difficult goal, and that global long term survival of modern civilization is only one of multiple potential future states. Our discussions were thus focused on how we can together pool individual research projects, multi-investigator local case studies, combine long term collaborative international partnerships and forge new alliances to better use our special perspectives to address the problems of present and future.

Promoting Diversity of Knowledge Sources: Today (perhaps especially after the 2008 world economic shock) there is widespread concern that current global management is afflicted by a lack of diversity, artificially restricted options, and unhealthy narrow management culture and that we are currently in danger of falling into multiple “rigidity traps” just as we enter into a period of rapid environmental and social change. Calls for *adaptive management* strategies that better integrate modern understanding of complex self-organizing systems are part of a worldwide interest in Human Ecodynamics research (Gunderson et al. 2008). However, efficiency, specialization, resilience, flexibility, and economic integration are all factors which can be mutually exclusive, and many participants flagged the need for diversity (in cultural experience, temporal and spatial scale, and disciplinary perspectives) in informing managers confronting hard choices. As the quotation below suggests, diversity of information and knowledge source is a key concern:

“Options or alternatives are fundamental requirements for change. Without them there can be no change or learning. Options and alternatives however come at a cost. The presence of too many alternatives may decrease efficiency through the expense of maintaining them, their influence on transaction or information-processing costs. Under a world-view of short-term profit maximization and a predictable or stable future, such costs are seen as unnecessary and easily become a target of sanitation efforts to increase short term efficiency. As a consequence, options and alternatives are being lost globally in such ecosystem components as species and genotypes (FAO 1993) as well as in such social system components as languages, institutions (Ostrom 2005), local knowledge and information, and sets of actions that agents might take (Fardon 1995; Folke, Colding & Berkes 2003). However, there is a growing recognition that diversity is a key requirement for long term (sustainable) functioning of systems- biological and social (Lowe et al. 2003). “ (Norberg et al in Norberg & Cumming 2008:46).

Diversity in this sense is clearly what our broad group can offer to modern planners, going beyond unhelpful overly specific scenarios from the past (modern societies cannot survive as hunter-gatherers) or simplistic case studies (we are not all Norse Greenlanders) to contribute more broadly a diversity of knowledge that can provide vital breadth of understanding of modern problems which in many cases can be seen to be recurring variants upon a theme (as the 1929 crash informed managers responding to 2008 and the 1918-1919, 1661-62, and 1340-50 pandemics have informed H1N1 global response). Several participants pointed out that modern industrial society is already footing the bill for specialists (most of us) in what has been seen as pure research (archaeology, history, ethnology, paleo-environment) that is in fact producing a great deal of important diversity data and practical examples of great relevance to the modern world. Thus the costs of researching past and present diversity are already being paid through grants and intuitional commitments: our job is to see that modern society gets full value for this existing investment as well as to provide concrete reason for additional support. One of our collective aims is thus to better deliver our own products (cultural enrichment, including improved public engagement with science and research; progress towards sustainable development; social cohesion; better informed public policy-making) more widely and effectively to enhance diversity of knowledge and options for action.

Integration of Policy, Education, Outreach, Community Participation in Global Science: Pure research is the fuel for all applied engagement, and we clearly have need for both more specialized work at the cutting edges of our particular disciplines and for more effective communication with members of other disciplines, members of the general public, and policy makers. Sabloff's articulate plea a decade ago for better communication of our data has been followed with extensive outreach and community involvement work in archaeology, much coordinated through the *Society for American Archaeology* (Sabloff 1998; www.saa.org). At present most modern archaeological projects have a community outreach component, and some (like the *Fornleifaskóli barnanna/ Kid's archaeology* initiative of the Icelandic International Polar Year program) represent a major project objective on a par with research. As the remarkable arctic programs run by Shari Gearheard illustrate, the collection and integration of TEK (Traditional Environmental Knowledge) has gone beyond community outreach to active involvement of the specialized knowledge and expertise of northern native people in the production of scientific knowledge that could not be collected in any other way (see also Peloquin & Berkes 2009, Roba and Oba 2009). The impact of hands on direct participation in lab and field science on undergraduate students in urban settings in the US and Canada is also well illustrated by both Shari's projects connecting Calgary student engineers with Inuit hunters and by Sophia Perdikaris' *Islands of Change* program connecting schools and scientists in Barbuda, NYC, and Iceland with Anthony Newton's map based web data

management system.² New digital resources in modeling and visualization have huge potential (already being realized) for organizing and presenting masses of science data in formats that are attractive and compelling, and clearly this is an area seeing rapid expansion in both content and technical expertise. These high quality products (and their rapid and wide electronic dissemination) have multiple applications beyond education and outreach.

Affecting policy was correctly viewed as often problematic for individual researchers, though scholars in government service (as noted by Ian Simpson) may have special opportunities. As Peggy Nelson, Tim Kohler, and Andy Dugmore illustrated, participation in existing networks (like the SAA Legislative Affairs Committee, the *International Human Dimensions Program on Global Environmental Change* {IHDP}, the *Resilience Alliance*, IHOPE program of NCAR, and *Global Environmental Change and Human Security* {GECHS} program) seems a way forward for more effective contribution to efforts to aid policy makers. These networks increasingly share a common vocabulary and set of iconic metaphors (like the resilience loop featuring in many power points), and it seems productive to try to engage these groups using the language of complexity and resilience, despite some of the well-remembered excesses of the old processual archaeology. Effective interdisciplinary communication can require careful translation of terms and concepts, but the effort seems worthwhile. Several presentations (such as Jago Cooper's on contrasting prehistoric and modern hurricane threat vulnerability) have immediate planning relevance, and these findings will be showcased in an edited volume produced from this conference.

Spatial patterning, Place Based Learning, Longitudinal Research Programs:

Many presentations and discussions stressed the importance of getting temporal and geographic scale right in interdisciplinary collaborations, and certainly some of the most impressive integrative projects in recent years have made use of an increasing ability to zoom in and out to engage processes taking place on several levels. As better models fed with more detailed data (climatic and cultural) on the "human scale" of seasons, years, and decades become more widespread, some of the impressive demonstrations seen at the Maine meeting will become standard rather than state of the art. In many areas of the world we are today reaping the benefits of multiple scholarly generations of field and lab work that has produced

² It was notable that Sophia's three undergraduate Barbuda and Iceland veterans (Marissa Gamiliel, Jessica Vobornik, and Reaksha Persaud) were very actively participating in all phases of the Maine workshop. They went on to join with Cory Look, George Hambrecht, and 20 other students in a remarkably successful January 2010 *Islands of Change* field season in Barbuda that involved several other Eagle Hill conference participants and connected Icelandic Kids' Archaeology activists with their counterparts in Barbuda and Antigua. For more on the Icelandic Kids' Archaeology / Fornleifaskóli barnanna project see:

<http://www.nabohome.org/projects/kap/fornleifaskolibarnanna1.pdf>

critical mass of data density in multiple disciplines at once. Integration and connection of disciplines and data sets on different scales was thus seen by all participants as timely, productive, and vital.

Also notable were the number of long term research programs following Carole Crumley's call for a *Longitudinal* strategy of multi-period study of the same landscape changing through time (Crumley 1994). This approach provides a solid basis for integrating disciplinary studies (often with different scales of resolution) and leaves no "pre-interesting" or "post-interesting" blind spots. Such place-focused research strategies also tend to create good conditions for student training, community involvement, and more effective use of available funding. Place-based learning (much fueled by *Google* Initiatives in recent years) is rapidly expanding in multiple academic programs internationally, and the use of new and enhanced map-based information delivery systems was showcased by Anthony Newton's demonstration of the VISQUE system (<http://www.nabohome.org/visque/>) developed by Andy Henry for NABO. Map based systems of information delivery seem promising tools for interdisciplinary communication, data presentation and accessibility, education and outreach applications, and in making the larger community aware of our resources and contributions.

Critical Times and Places: thresholds, tipping points, regime shifts:

As the *Annales* school of Marc Bloch and Lucien Febre noted in the last century, time does not come in equally significant chunks, but seems to be characterized by sudden transformations of long periods of apparent stability, conjunctures of forces operating at different scales, and accidents of time and place that sometimes seem to have disproportionate impact. The systems ecologists of the *Panarchy* movement seem to have independently reached some similar conclusions about time and process, and much of their adaptive cycle metaphor can easily be labeled in French historical terms. Our view of earth history has been transformed by multiple high resolution proxy climate indicators and these have caused concern that sudden and catastrophic change can be simply planetary business as usual in the long term. Current rapid environmental change (felt particularly strongly in the Polar Regions) has raised widespread concerns about sudden and abrupt transitions in the near future, and several excellent discussions centered on thresholds, tipping points, and instances of rapid change in the past. Tim Kohler, Payson Sheets, Peggy Nelson, and Jeff Quilter noted both positive and negative impacts of rapid environmental change in the past in both suppressing and perhaps sometimes stimulating formation of social complexity. Rapid change is not necessarily disaster, nor will change affect all members of the same society alike. Tipping points need not be climate related, as Steve Mozorowski and his group demonstrated in their discussion of the rapid and often massively disruptive impacts of the progressively expanding globalization events of the past 900 years relating to broadening connections between cultures and bio-zones (with both negative

and positive demographic effects worldwide see Hornberg et al. 2007), and Christian Keller's comments remind us that some of these processes are much older, extending into what Abu-Logoud (1989) has termed a thirteenth century world system.

Statement of Community Interests and Concerns

The conference discussions and responses to a pre-circulated talking points list produced a series of broad "sense of the community" responses and recommendations.

- **Need for a continued and expanded dialog:** The Eagle Hill meeting was successful in demonstrating wide interdisciplinary interest in the common themes raised and in stimulating and promoting new and intensified collaboration between disciplines, world areas, and research groups. We need to do more such integrative work together.
- **Need for a broadened base of participation:** The seventy one participants in the Eagle Hill meeting represented a wide range of natural, physical, and social sciences, but we fully recognize the need to involve many key scholars, institutions, and research teams not involved in the initial meeting. We need some better frameworks for continued communication and expansion of participant pool.
- **Need for continued and expanding creative use of digital resources:** for visualization, modeling, data dissemination and more effective curation of records and results. Technology is providing multiple breakthroughs which enable new collaboration and more effective outreach and dissemination, but there needs to be close connection between content providers, tech centers, public outreach specialists, and field workers.
- **Need for engagement with existing outreach and policy efforts** and a fuller mobilization of our common resources and contacts to better communicate our findings to the public, to educators, and to policy makers. Collective action making use of existing organizations and frameworks is desirable, but special effort needs to be made to present the long term perspective to debates about sustainability, resilience, and survival.

Conference Products

The Eagle Hill meeting provided a stimulating forum for planning and facilitating the creation and delivery of specific products. In the weeks since the meeting this list has grown, but as of this report these products can be identified:

- Payson Sheets and Jago Cooper and the rest of the Eagle Hill Hazards group have formed the core of a book project based on the results of their conference working group(which

has already attracted several additional authors) which is moving rapidly forward and appears headed for publication in early 2010. For more information on this contact Payson and Jago.

- NABO International eMuseum project is being organized through the cooperation of Amanda Thompson (U Birmingham), Alan Craig, Andy Dugmore, Jette Arneborg, Julie Bond (U Bradford) and Anthony Newton. This project will combine US and European resources to provide high quality 3 D images of objects from (initially) the N Atlantic that can be easily accessed and delivered to individual researchers, small museums and heritage centers and educators. This program is aimed at using cutting edge digital technology to aid education, outreach, data dissemination, and research across a wide region and may provide the basis for further expansion. A working meeting at U Edinburgh is planned for March 2010.
- STERNA / CAFF/ NABO collaborative bird biology and zooarchaeology project: a collaboration led by Aevor Petersen combines ornithology, conservation biology, and an EU Funded program(<http://www.sterna-net.eu>) with NABO zooarchaeological data on bird remains found in archaeological contexts and a digital bird identification manual (being developed by Dr. Dale Serjeantson and CUNY doctoral student Seth Brewington). Seth is now (November 2009) working in Iceland at Aevor's Natural History Institute in Reykjavik collecting additional digital images and we hope to demo the package at the 2010 International Council of Archaeozoologists meeting in Paris.
- GPS + Camera = Empowerment Project: This program combines inexpensive hand held GPS and weather-resistant digital cameras with a user friendly uploading program that will enable local school groups to collect and report place-based information (place names, archaeological features, historic landmarks, biological information) through interaction with elders and science teams as school-supervised projects. The resulting information will be displayed on a Google Earth map with balloons providing access to a wide range of digital data (images, sound, text, downloadable pdf reports). Successive classes will be able to see their work accumulating on the digital landscape, and schools as distant as N Iceland, Barbuda, and New York will be able to share projects and ideas. Orkney College is also participating, and will be using some of their kits to document rapidly eroding archaeological sites endangered by sea level rise and increasing storminess. This map based data dissemination and management system is the same system demonstrated by Anthony Newton at the Eagle Hill being used by the IPY science projects, so the GPS + C=E project will be another means of engaging local communities and institutions in making real and direct contributions to the global scientific effort. The initial stages of this project are already funded and six kits were distributed to two school systems in N Iceland in October 2009. In January 2010 additional kits will be distributed to the Barbuda High School science program and representatives of the local Icelandic school will meet with their Barbudan

counter parts. Lessons learned through this initial GPS+C=E program will be assessed and disseminated for consideration in other areas.

Proposal for a *Global Human Ecodynamics Alliance (GHEA)*

In response to the broad community concerns and common themes emerging from the Eagle Hill Conference, many participants have expressed an interest in forming an international and interdisciplinary ***Global Human Ecodynamics Alliance (GHEA)***. Ben Fitzhugh has agreed to take the lead in organization, and we welcome suggestions from all for potential members and institutional contacts. A new GHEA website will be developed over the next few months, and the Eagle Hill Conference materials now available on the NABO website (<http://www.nabohome.org/meetings/glthec/participants.html>) will be transferred to the new website which we hope will provide a forum for collective discussion of aims and goals and act to recruit new participants.

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