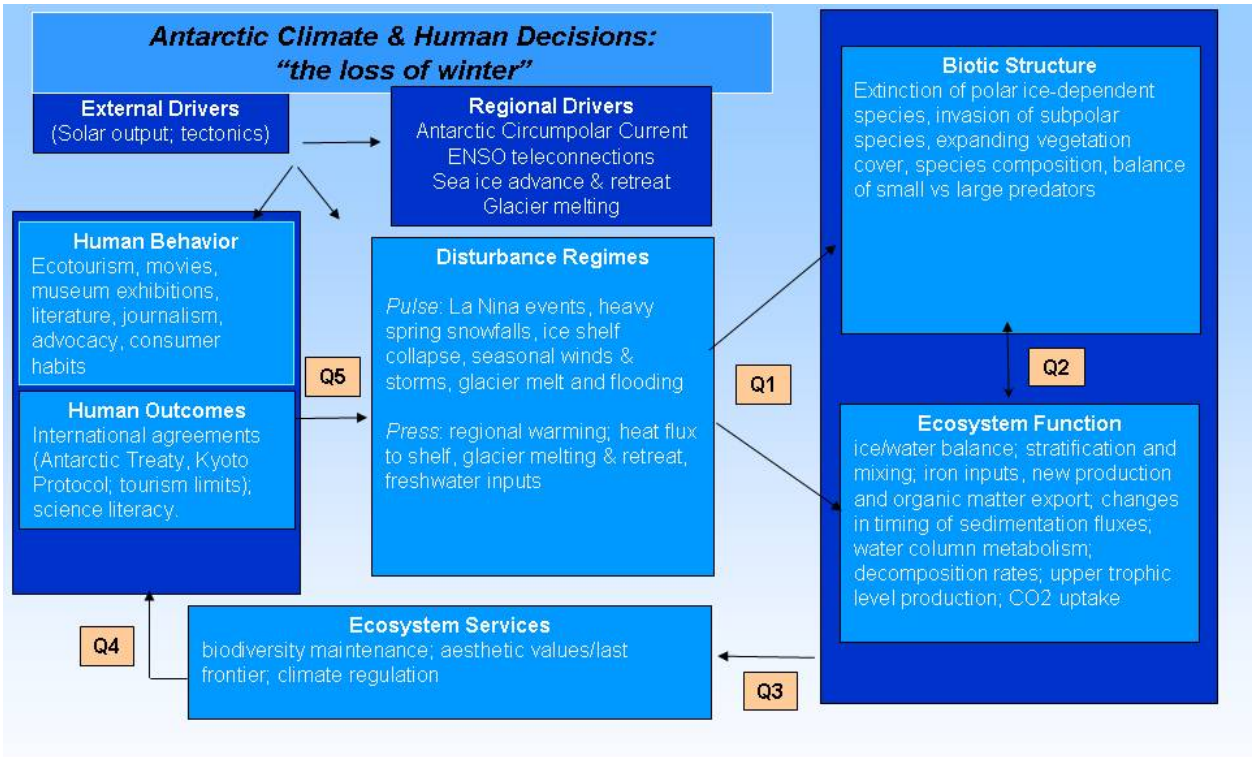
Antarctic Sociology: Workshop Report

Baltimore, MD 5-6 May, 2008

Attendees:

Hugh Ducklow	Palmer LTER	Bill Fraser	Palmer LTER
Diana Wall	McMurdo LTER	Berry Lyons	McMurdo LTER
Tom Cioppa	McMurdo LTER	Terry Chapin	Bonanza Creek LTER
Gary Kofinas	Bonanza Creek LTER	Ted Gragson	Coweeta LTER
Mark Williams	Niwot Ridge LTER	Roberta Marinelli	NSF – Polar Programs
Polly Penhale	NSF – Polar Programs	Henry Gholz	NSF – DEB/LTER
Dan Childers	NSF – DEB/LTER		



Q1: How do long-term climate warming and short term weather, sea ice and oceanographic events influence life history adaptations of ice-dependent and independent species and lower trophic level dynamics?
Q2: How are feedback interactions between upper trophic level predators (top-down controls) and biogeochemical functions (bottom-up) affected by changing climate and sea ice over the long and short term?
Q3: How will loss of typical polar species (e.g., penguins) affect tourism and cultural values of Antarctica?
Q4: How does the human population (tourists, students, moviegoers, policy makers) respond to warming-related changes in the Antarctic environment?
Q5: How do human decisions and actions (more or less tour business; Treaty structures, pressure to control carbon emissions) affect pace and results of climate change?

This figure is modified from the LTER ISSE Report (see below). It illustrates natural and social feedbacks involving Antarctica in the socio-ecological system. These diagrams were produced by each LTER site as a way of framing research questions within the ISSE research program.

Background and Objectives.

Over the past two years the LTER network has produced a new Decadal Plan emphasizing the pervasive role of human actions and institutions in ecosystem processes. No ecosystem on the planet escapes human impacts. It follows that Ecology must include human activities and trends as important parts of its research agenda. To meet this challenge LTER issued Integrative Science for Society and Environment: A Strategic Research Initiative (ISSE; http://www.lternet.edu/decadalplan/). As part of this initiative, LTER scientists identified priorities for research in socioecology, the study of humans and their societies as integrated components of ecosystems. Many LTER sites now have established social science components. The two Antarctic sites do not.

To address this shortcoming and bring the Antarctic Sites up to speed as the LTER research agenda moves forward, Palmer and McMurdo-Dry Valleys LTERs jointly convened a Workshop on Antarctic Socioecology May 5-6 in Baltimore, MD in conjunction with the LTER Science Council meeting. The workshop was supported by a supplemental award to Palmer LTER from NSF-OPP.

The objectives of the meeting were to bring together natural and social scientists to identify social science research issues pertinent to Antarctica, and explore potential collaborations with the other cold-region LTER sites, as a starting point for fuller participation in the wider network of socio-ecological research in LTER. The two Antarctic sites, with no indigenous population and no natural human communities have tended to regard themselves as anomalous or exceptional within the LTER Network. We have taken the view that social issues involving Antarctica can only be viewed in a wider, reciprocal context. Drivers like tourism, base construction, fisheries and climate change have remote effects that are imposed on Antarctica from the outside world. In turn, the resulting responses of the Antarctic climate-ecological system impose other forcings on world societies (**Cover Figure**). Terry Chapin's presentation was very illuminating in this regard: he showed that the Arctic, with indigenous societies, has many of the same issues and concerns as we do in the Antarctic: climate change is imposed by social and economic drivers which are largely operating outside the Arctic, but they have important consequences in the region. Furthermore, people around the world perceive these impacts and act in response to them. Mark Williams noted the same processes happening at Niwot Ridge, a site expressly selected because it has no human residents. One important outcome of the workshop was to correct our sense of being outsiders to the global socio-ecological system. Another was our growing recognition that Antarctica has the potential to alter all aspects of human society on a scale that we are only now beginning to appreciate, and with which the public, including policy makers, are only vaguely familiar, or not familiar at all.

Some of these interactions are illustrated in **Figure 1** below. Here we outline some general scientific themes and then specify next steps for initiating socio-ecological research in the Antarctic LTER Sites. It is important for the Antarctic LTER Sites to become active participants in the LTER-ISSE research agenda.

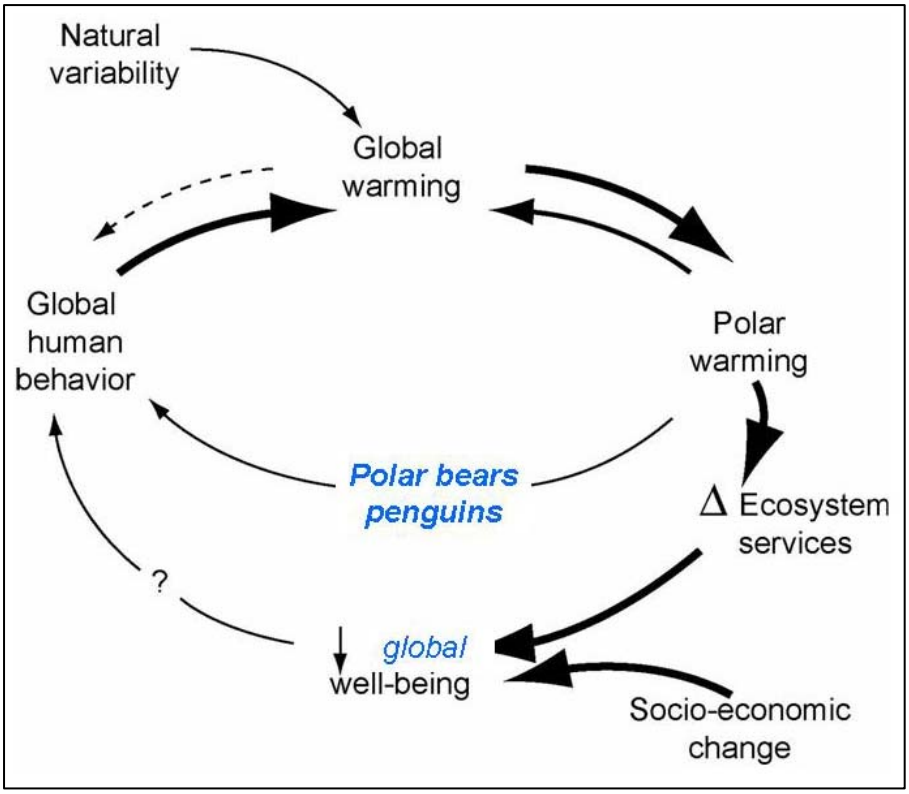


Figure 1. A general polar example with incomplete feedbacks (symbolized by "?") in the global socio-ecological system, modified with additions to the text (in blue italics) from a figure by Terry Chapin shown at the workshop. The main point is that perceptions of climate change in polar regions leads to changes in human behavior elsewhere. Concerns about iconic species like polar bears and penguins may be particularly effective in linking actions to change.

Themes identified during the meeting

1. Socioeconomic impacts of Antarctic climate change. Identify and analyze **global risks and vulnerability** to climate change in Antarctica. What kind of economic and social consequences would come from the loss of the West Antarctic Ice Sheet? The impact is clearly dependent on how fast this might happen. Can we generate scenarios for use by policy-makers or that can galvanize public opinion? How well have scientists prepared society for climate surprises that might come from Antarctic-related sequences of events?

2. Impacts on Antarctic fisheries. Antarctic fisheries such as the Patagonian Toothfish, *Dissostichus eleginoide*, are harvested entirely by an external, multinational fleet, including "bandit" fishermen operating without regard to any regulating conventions. Antarctica's fisheries are scientifically managed through the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The interaction between the unique example of CCAMLR and the multinational bandit fishery has clear socio-ecological relevance. To what extent has scientific fisheries management worked, and if it hasn't, why not?

3. Ecosystem Services. Antarctica provides global society with a range of essential services such as climate regulation (including atmospheric CO_2 storage) and water storage (maintaining sea level). The continent also provides important cultural services such as inspiration and tourism. Gaining a better, more detailed inventory of ecosystem services supplied by Antarctica, and their value and status is urgently needed. Now under discussion are Payment for Ecosystem Services (PES) schemes, in which those whose lands provide these services would be rewarded with subsidies or market payments from those who benefit. Payments to Antarctica could go to support scientific research, conservation, fisheries management or the Antarctic Treaty system, but first we need to identify what the services are. We also need to know what type of climate or land or other global change mitigation is necessary to maintain these for the future.

4. Climate and ecosystem scenarios. LTER scientists are well-equipped to construct future scenarios (20, 50, 100-year) of global changes based on current knowledge of alterations to biodiversity and ecosystem processes and services including effects and feedbacks to society on global, regional (e.g., roving bandits) and local (scientists) scales. This is also a good area for comparative study of the Arctic and Antarctica.

5. Patagonia / New Zealand social sciences. LTER scientists and support personnel travel through Patagonia (Chile) and New Zealand every year. As Gateways to Antarctica, these nations have an economic interest in their regional climate and ecosystems. Both countries also have glaciers that are receding in response to climate change. Research into attitudes and actions in local communities would be an effective way to expand our social science reach and international collaboration.

6. Antarctic Treaty. Antarctica is governed by the Antarctic Treaty system, a unique instrument in global-scale governance. As such, it is a legitimate object for study in itself: is it a good model for other areas? For example, would the pan-Arctic benefit from an Arctic Treaty? What is the role of science and scientists in creating and maintaining the treaty? The Treaty is a consensus instrument (like IPCC!): does it lead to watered-down policy outcomes? What is the history of environmental stewardship in Antarctica? Does the Antarctic Treaty provide a model for adaptive governance? In the future, with climate change and increasing human impacts, ecosystems will evolve in as yet undetermined ways – will the Treaty still be the right instrument for governing how we use them sustainably?

7. Antarctic Tourism. The number of tourists visiting Antarctica has grown from about 5,000 in the early 1990's to nearly 30,000 today. There have been some studies of the direct impacts of tourists on animals, plants and ecosystems, but in most places tourism is self-regulated and not well-monitored. Antarctic tourists are the affluent tail of the global tourist population and potentially an influential group. What is their role in the global socio-ecological system? What are their perceptions of Antarctica and attitudes about climate change? Studies of tourist attitudes ("exit polls") would be useful for gauging the impact of this phenomenon.

Next Steps:

We spent some time discussing our next steps toward initiating social sciences research components based at (or in conjunction with) the 2 LTER sites.

1. The **top priority** is to identify and recruit interested social scientists to work in close conjunction with our two sites. One need is for colleagues who can help us frame the right questions, in the right language, so we can begin to carry on a meaningful dialog with the LTER Network. At this point we are dependent on engaging social scientists at other sites, with their own agendas and priorities, in their spare time. To build indigenous social science capacity we need support built into our core budgets. We cannot keep depending on the Supplement process if we are to develop a sustainable program in Antarctic Socioecology.

2. Research Coordination Networks in Biological Sciences (RCN). Henry Gholz raised the possibility of a proposal to the RCN Program (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=11691&org=NSF&sel_org=NSF&from=fund). One idea would be to support the creation of a cold regions research network through which natural and social scientists and policy specialists study the social-ecological interaction in cryosphere ecosystems. The next feasible target date is June, 2009. To justify RCN support, our proposed network would have to be distinct from, or extend beyond the LTER Network.

3. Targeted workshops. Seek support from LTER or NSF (or outside funds) for a series of small, targeted workshops or think tanks for which we pick social science topics (eg., Antarctic ecosystem services, invite the "best and the brightest" to discuss them and, importantly, produce at least 2 papers as a workshop product. One paper would be led by one of the experts on the topic and targeted towards a scientific journal, while the other would be led by an invited journalist and targeted towards a quality magazine, an op-ed or other suitable outlet, such as the new Yale environmental online magazine (http://e360.yale.edu/).

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