Pilot Study on Reconciling Supply and Demand:

Assessing demand for information on the North American Carbon Balance

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Outline

- Motivation
- Why information isn't automatically "useful"
- The theory of reconciling supply and demand
- Assessing demand in the NACP context
  - Consumers, context, and scale

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Motivation

- NACP explicitly seeks scientific understanding to "…meet societal concerns and to provide tools to policy makers" (2002); and "decision support" (2004)
- Providing useful knowledge is not a given
- NACP offers a fertile test-bed and opportunity
- To be successful at providing useful information to decision-makers requires research and a deliberate approach

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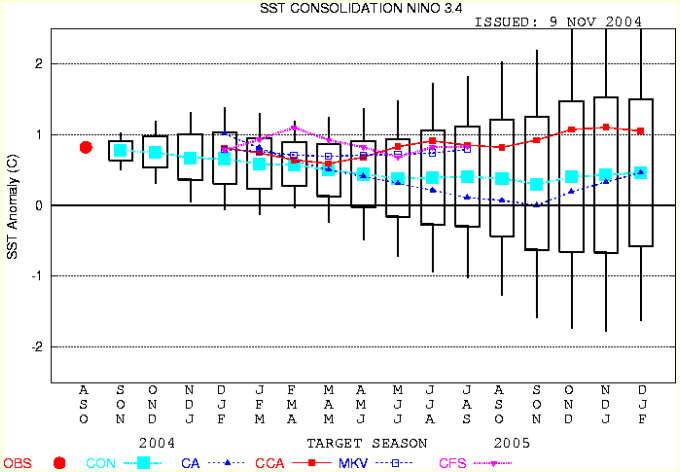
Introducing SPARC…

Science-Policy Assessment and Research on Climate (SPARC)

SPARC will conduct research and assessments, outreach, and education aimed at helping climate science policies better support climate-related decision making in the face of fundamental and often irreducible uncertainties.

Providing "useful" information:

The case of climate forecasts



Not as useful as expected to farmers, water managers and so on because of a variety of reasons:

- Information provided often not what was most needed
- Lack of regional specificity, scale mismatch
- Inaccessible presentation, poor communication
- Not presented with accompanying info. more important to decision-maker, such as market and policy information
- Decision-makers incapable of responding to information--institutional constraints
- Lack of trust in information
- Uneven delivery to affected constituents

..... And so on

(Pagano et al. 2002, Eakin and Conley 2002, Pulwarty and Redmond 1997, Letson et al. 2001, Pielke Jr. and Conant 2003, Lemos et al. 2002)

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- Overall, these studies demonstrate that scientists lacked an understanding of the context in which their climate forecasts would be used => a mismatch of **supply** and **demand** for information

- As part of **reconciling** supply and demand, the NRC suggested: "the utility of forecasts can be increased by systematic efforts to bring scientific outputs and users' needs together" (Stern and Easterling 1999)

- As an **institutional** response, NOAA created the Regional Integrated Sciences and Assessment (RISA) program–experimental projects where scientists worked directly with users to understand needs and create and disseminate climate variability information accordingly.

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Reconciling Supply and Demand

Borrowed from classical micro-economic theory

- "product or service" in this case is scientific knowledge
- Supply = research activities as decided by science policies
- Demand = potential or actual societal need for knowledge

Overall goal: to ensure that "use-inspired" scientific efforts meet their societal objectives.

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“Missed Opportunities”

		Demand: Can user benefit from research?	
		Yes	**No**
Supply: Information being produced?	**Yes**	Sophisticated users taking advantage of well-deployed research	Unsophisticated users, institutional constraints, or other obstacles prevent information use
	No	Opportunity to shape research agenda to meet needs	Non-user

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Method: Reconciling Supply and Demand

- Assess demand – focus of this talk
- Characterize supply – what science is being done, how priorities are being set
- Overlay supply and demand- identify missed opportunities
- Institutional analysis and response
  - Ongoing, mediated feedback mechanisms to support effective meeting of demand for information; e.g. RISA program

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Assessing demand

- How to select potential users to study? Some sample criteria:
  - By magnitude of atmospheric C contribution? e.g. fossil fuel sectors (transportation, industry, utilities, residential) and land use change (agriculture, timber, residential and commercial development)
  - By economic importance? e.g. by Gross Domestic Product categories, exports and imports, by # of jobs in the economy
  - By current practice? e.g. companies and sectors that have a stated interest/investment in C management/sequestration
  - By societal priority? e.g. contributing to national security, food production, availability of jobs
- A continuous, iterative process

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Assessing demand for NACP research

A wide array of potential users at a variety of scales:

- Land users (agriculture, forestry, urban development)
- Energy providers (utilities, fuel producers)
- Policy makers (local, state, federal)
- Specialized sectors (carbon traders, NGOs)

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Working with potential end-users

- NOAA-sponsored Workshop in Ft. Collins, CO in Sept. 2004
  - Brought together scientists and decision-makers in agriculture and urban planning along with agency representatives.
  - Productive dialogue on unmet demands, the role of carbon cycle science, issues of scale and capitalizing on “missed opportunities”
- SOCCR (State of the Carbon Cycle Report) process
  - Workshop Nov. 16-17, 2004. 27 Stakeholders from industry, environmental NGOs, academia, carbon traders, and government provided input on SOCCR outline. Outline now revised. Ongoing stakeholder interaction process planned.
- SPARC (Science-Policy Assessment and Research on Climate) workshops and case studies.

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Characterizing actual and potential demand

Sample questions:

- What can we learn about their needs, concerns and interests– what drives their decision-making?
- What sources of information do they typically rely on? Why do they trust them?
- How do their activities currently affect the carbon balance and why?
- How does the scale of information needed match up to the scale of information available?

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Example: Individual farmer

- Concerns: Markets for produce, prices for goods, costs of operation, labor, fertilizer, pesticides, transportation, US Ag policy/incentives, soil quality, water availability, local climate

- Information sources: private consultants, in-house research, neighbors, Agricultural Extension Service, experience

When characterizing the demand for carbon cycle science information, must recognize that users will make decisions in the context of primary needs (profitability, protection from volatility, prior investment, regulatory environment, etc.)

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Implications

- Resources are never managed solely for carbon purposes
- “Use” is not obvious – research necessary
- “Supply and demand” are dynamic – ongoing effort required
- Science may not always be able to “supply” a demand, e.g. separation/additionality argument in Kyoto formulation
- New mechanisms and institutional arrangements are necessary to facilitate meeting user needs

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Conclusions

To “meet societal concerns and provide tools to policy makers” NACP should:

- Include a focus on understanding the demand side for information
- Work directly with users to understand context of their decisions
- Create appropriate feedbacks so that program is responsive to needs
- Co-evolve this component as part of the NACP, not an afterthought

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Next steps…

- Research on supply and demand:
  - "Map" scales of decision-making for land use in 2 U.S. states and compare to scales of carbon cycle measurements and modeling (with Easterling)
  - Understanding supply and demand through the experience of the Agricultural Research Service (Logar)
  - Additional cases under SPARC
- Continue decision-maker/scientist dialogue through SOCCR and SPARC workshops
- Explore possibility of institutional frameworks to support this approach (A "decision support" working group; a carbon-related "RISA"?)

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Thank you!

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