

Progress and Prospects for Connecting Predictions, Applications, and Decision Making in the United States



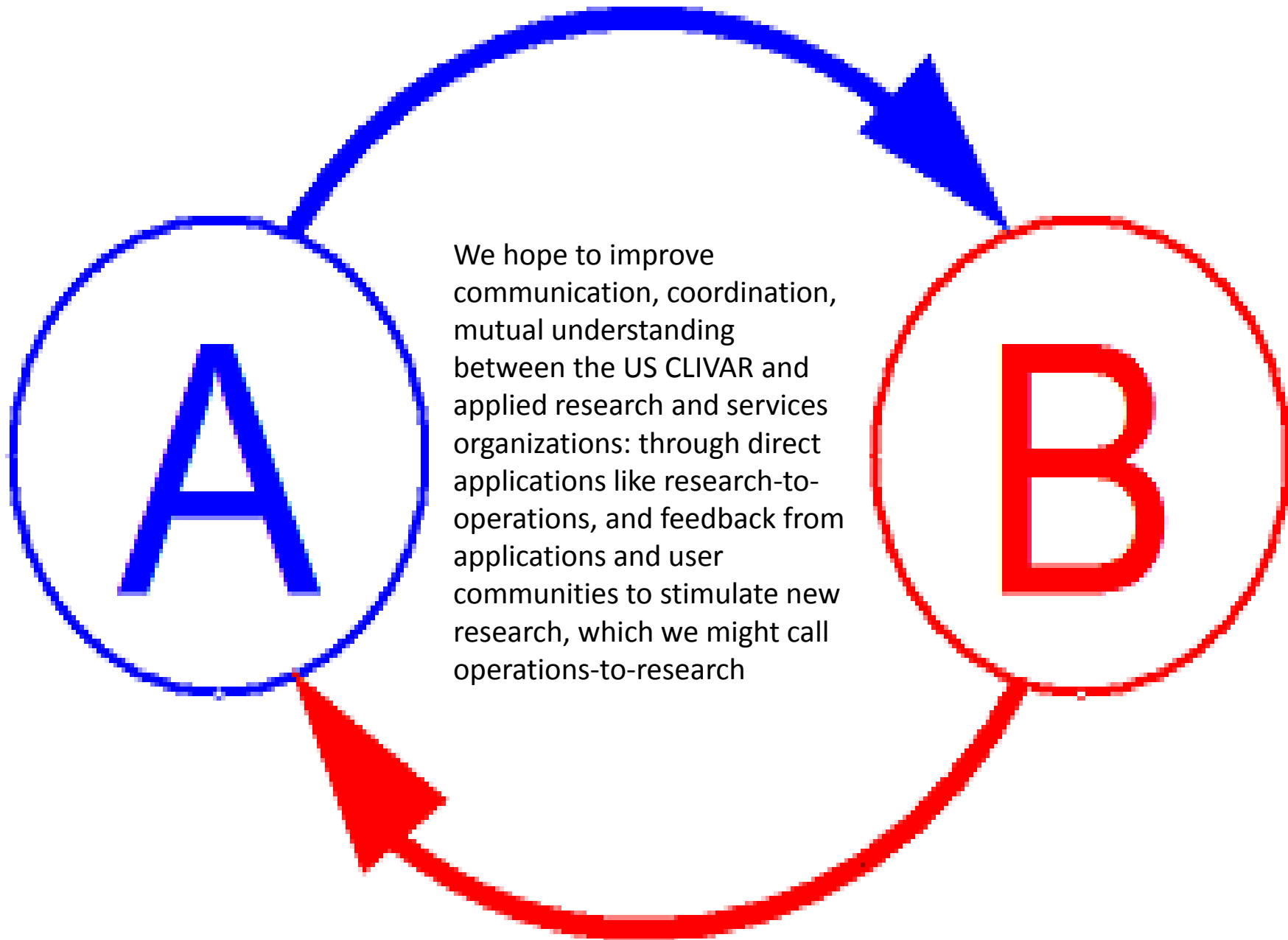
**US CLIVAR Summit
PPAI Special Session
July 9, 2014**

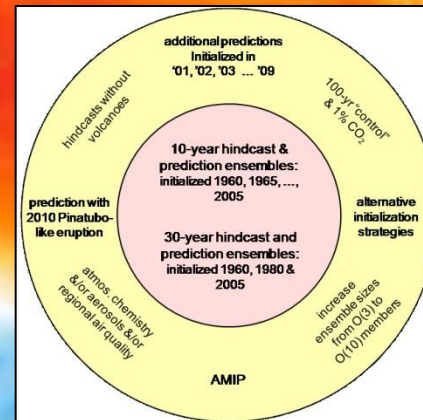
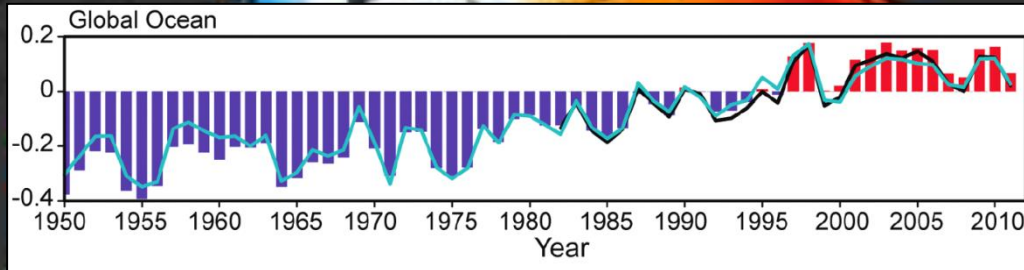
**Gregg Garfin, US CLIVAR Panel on Predictions, Predictability
and Applications Interface**



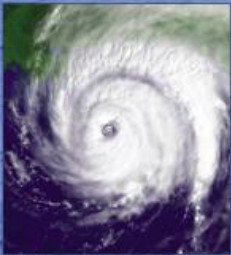
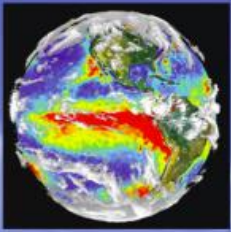
Purpose. This plenary session aims to initiate dialogue with the U.S. applied climate sciences and services communities, in order to better connect research, applications, and services, and increase mutual understanding between the US CLIVAR research community and the representatives of the organizations that will be joining us.







We aim to exchange knowledge about state-of-the-art understanding of the prospects and limits of climate science from our three panels, focusing on key climate science research challenges, and learning about the applied climate research and services community's concerns and questions that relate to US CLIVAR research and their needs from the research community. These may include: new needs for observations, process studies, understanding of climate phenomena, improvements in predictions and projections, characterizing an interpreting uncertainty



US Climate Variability & Predictability Program Science Plan

Motivation. One of the five goals articulated in the US CLIVAR Strategic Plan is “[c]ollaborate with research and operational communities that develop and use climate information.” This goal is closely aligned with the World Meteorological Organization’s Global Framework for Climate Services (GFCS), which aims to enable better management of the risks of climate variability and change, through the development and incorporation of science-based climate information and prediction into planning, policy and practice on the global, regional and national scale. By improving understanding of physical climate and ocean phenomena, we want our research to benefit society. And we have an obligation to do as much on our end to make that understanding relevant and easy for fellow scientists—applied science researchers—to interpret and use, as they take the baton and work directly with decision-making communities.

By analogy, when we produce scientific papers, it is akin to a baby being born...and as we all know you cannot simply leave the hospital and say "OK baby born. Job done. Let's move on to the next project." There is not a little care and nurturing necessary to help that baby, in our case an idea, method, or understanding of a scientific process, to become mature and useful to the world. A key focus for this session is actionable climate science, knowledge, and information, which has been raised time and again, notably at the 2011 WCRP Conference, here in Denver.



Cross-Cutting Strategies⇒ Goals ↓	Sustained and new observations	Process studies	Model development strategies	Quantifying improvement in predictions and projections	Communication of climate information
Understand the role of the oceans in observed climate variability on different timescales	Document variations	Data to evaluate and improve models	Improve modeling of climate across processes and timescales	Understand limits of climate predictability	Prioritize observing network and predictability studies and improve predictions of ocean and climate variability
Understand the processes that contribute to climate variability and change in the past, present, and future	Document climate-critical processes	Investigate processes to help explain variations	Property conserving climate reanalyses	Quantifying importance of model uncertainty in projections	Set priorities for observations and predictability studies; communicate about confidence and predictability
Better quantify uncertainties in the observations, simulations, predictions, and projections of climate	Initialize and evaluate model simulations	Model assessment	Improve models	Quantify model, intrinsic and scenario errors	Address needs for predictability and sensitivity studies
Improve the development and evaluation of climate simulations and predictions	Initialize and evaluate climate models	Provide data to develop and test model process representation	Reduce biases in climate models	Quantify importance of model physics errors	Determine key targets for model development across communities
Collaborate with research and operational communities that develop and use climate information	Provide multi-disciplinary datasets	Provide process understanding and opportunity for collaboration across disciplines	Communication between observational and model communities	Improved communication across disciplinary boundaries	Provide information on dominant climate phenomena and predictability

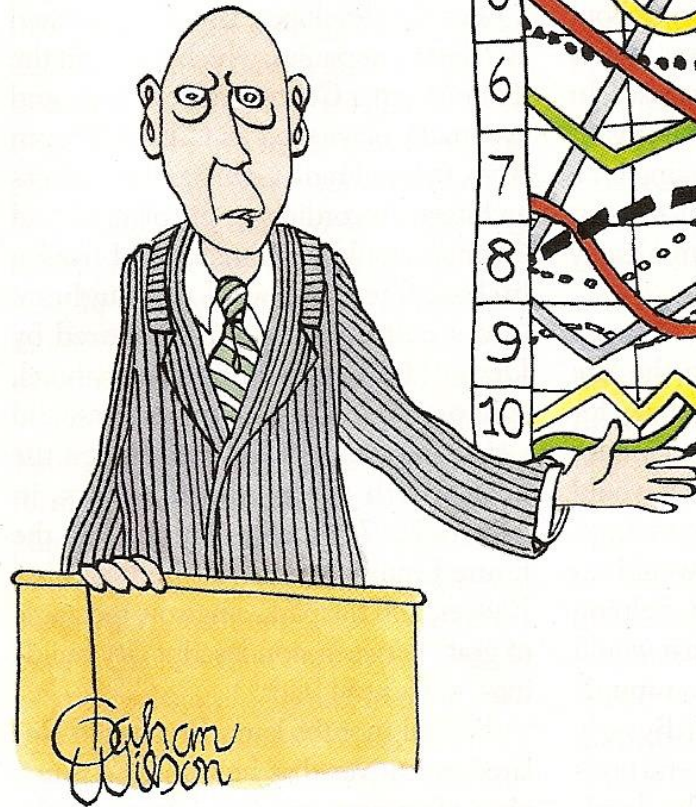
Collaborate with research communities that develop and use climate information

- **Sustained and new observations:**
 - Provide multi-disciplinary datasets
- **Process studies:**
 - Provide process understanding and opportunity for collaboration across disciplines
- **Model development strategies:**
 - Strengthen communication between observational and model communities
- **Quantifying improvement in predictions and projections:**
 - Improve communication across disciplinary boundaries
- **Communication of climate information:**
 - Provide information on dominant climate phenomena and predictability

Plan for the Rest of this Special Session

- **Overview of key US CLIVAR science challenges**
- **Perspectives from invited panelists**
- **Facilitated discussion**
- **Charge to the breakout groups**

“I’ll pause for
a moment,
so you can
let this
information
sink in.”



Brief Overview of Science Challenges

- POS: Phenomena, Observations and Synthesis
- PSMI: Process Study for Model Improvement
- PPAI: Predictions, Predictability and Applications Interface

PANEL BREAKOUT QUESTIONS

- Of the climate phenomena, observational data, forecasts, and projections that are most important to decision making and operations, which show the greatest promise of a US CLIVAR research community response in the next 1-2 years? 3-5 years? Beyond 5 years?
- How can input from the user community, as mediated by climate applications science and services organizations, benefit the research, initiatives, and efforts of your Panel?

PANEL BREAKOUT QUESTIONS

- What are the specific capacities, foci, and practices that US CLIVAR panels, working groups, and process teams can develop, in order to mainstream results through applied climate science and services organizations, to end user communities.
 - *In other words, how can US CLIVAR best make the handshake with climate applications, operations, and services, given the usual limitations of resources and time?*

PANEL BREAKOUT QUESTIONS

- What capacities do applied climate science and services organizations have to use and/or promote research-quality observations, results, models, and predictions?
- How can we best sustain an ongoing dialogue between the research and applications science communities?