

US CLIVAR Decadal Predictability Working Group (DPWG) Report

US CLIVAR Summit 2010

Co-Chairs:

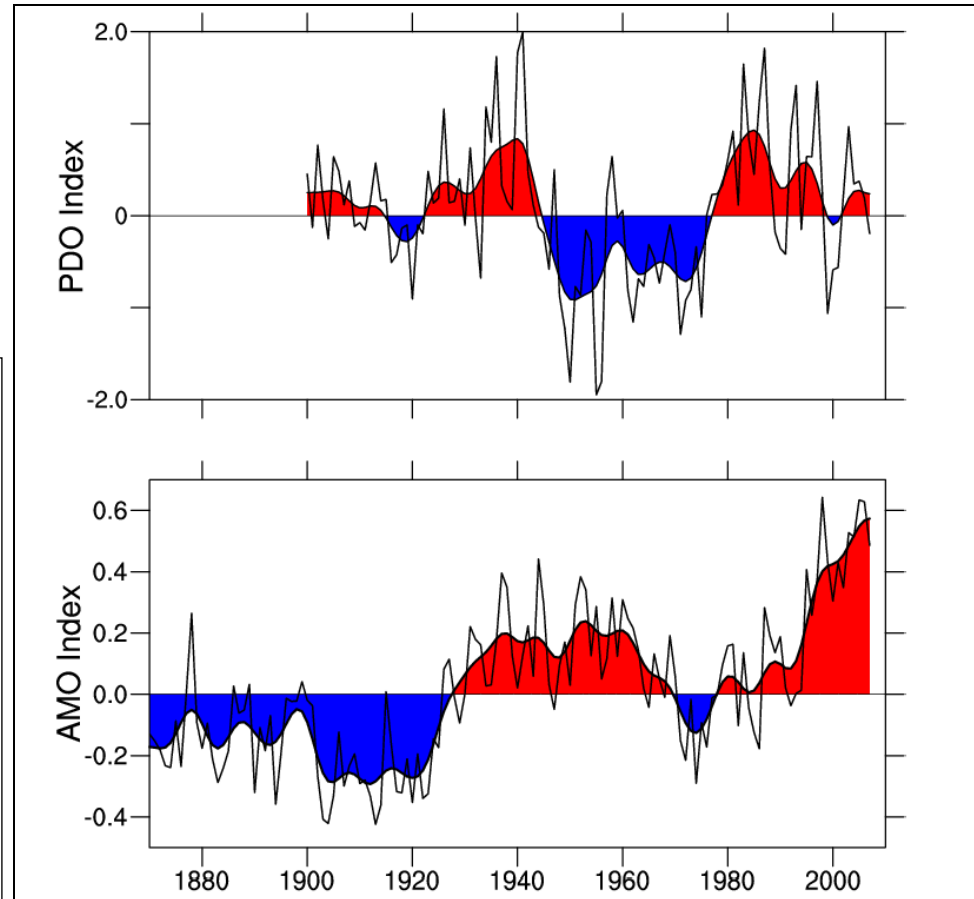
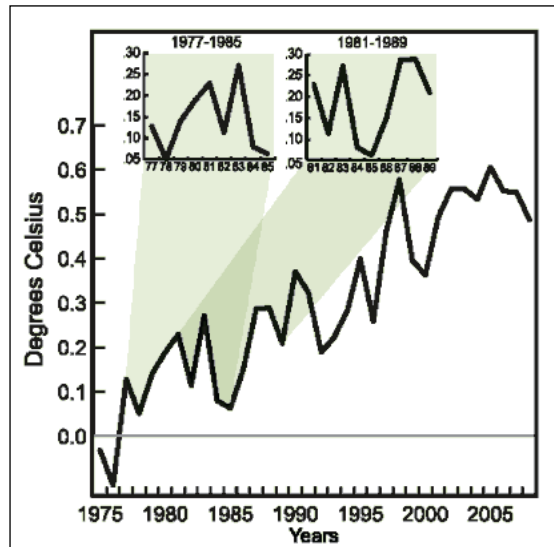
Amy Solomon - CIRES/ University of Colorado & NOAA/ESRL

Lisa Goddard – IRI / Columbia University

Arun Kumar – NOAA / Climate Prediction Center

Background to the DPWG

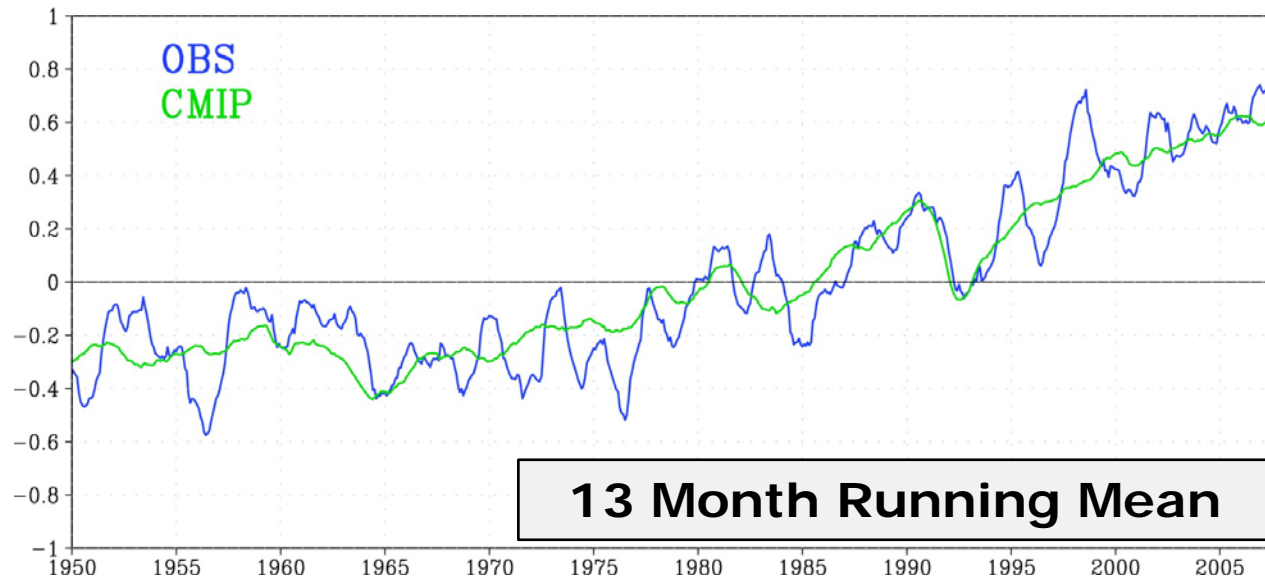
- There is considerable low-frequency variability (with societal consequences) in the Earth system, and which
- Can temporarily *mask* or *enhance* externally forced variability



Background to the DPWG

- The “natural” low-frequency variability **cannot** be captured/predicted as a **response** to external forcing in coupled integrations (e.g., like **CMIP**)

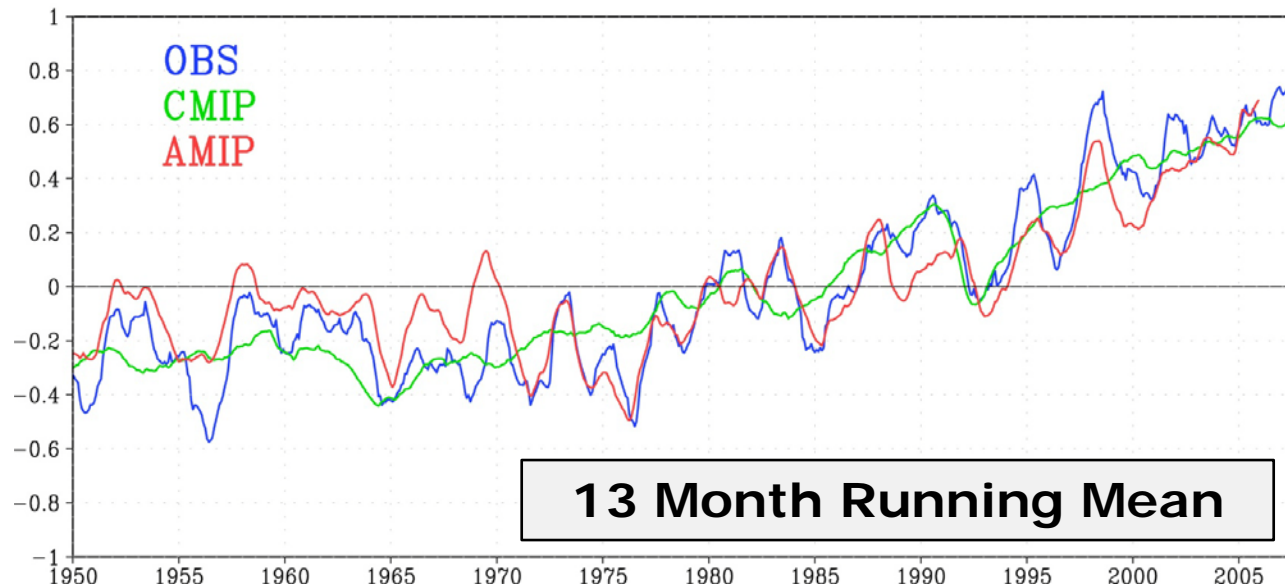
Global Land Temperatures (1950–2007 reference mean)



Background to the DPWG

- But may be captured if the near-time trajectory of some of the slowly evolving components of the natural variability (e.g. SST) can be predicted

Global Land Temperatures (1950–2007 reference mean)



Background to the DPWG

- To further the understanding of some of the issues related to the (decadal) prediction of the LF natural variability, e.g.,
 - *what is the decomposition of low-frequency variability into the externally forced and natural components?*
 - *what are the prospects of decadal predictability as an initial value problem?*
 - *how much skill of initialized decadal predictions may improve on other baseline methods? etc.*
- **A Decadal Predictability Working Group (DPWG) was approved in January, 2009, under the US CLIVAR**

Objectives of the DPWG

- **Objective 1:** Define a framework to distinguish natural variability from anthropogenically forced variability on decadal time scale for the purpose of assessing predictability of decadal-scale climate variations
- **Objective 2:** Develop a set of metrics that can be used to assess and validate initialized decadal climate predictions and simulations

DPWG Progress Report

- Operating structure
 - *Monthly telecons that include invited speakers*
 - *Face-to-face meetings*
 - **June 2009** in conjunction with the “Advances in Decadal Climate Predictions” at the CCSM workshop
 - **January 2010** together with the workshop on “Predicting the Climate of the Coming Decades” in Miami
 - **Next meeting**: September 2010 with the “Workshop on Decadal Variability, Predictability, and Prediction: Understanding the Role of the Ocean” in Boulder

DPWG Progress Report

- First paper related to “objective 1” of the DPWG **is under review** in BAMS: *Distinguishing the role of natural and anthropogenically forced decadal climate variability: Implications for predictions* Soloman et al. 2010
- Discussions are under way on synthesizing the framework for “objective 2” of the DPWG, i.e., development of metrics for the assessment of the initialized decadal prediction efforts

DPWG Progress Report

- **Participation by the DPWG members in organizing recent meetings on decadal variability and predictability**
 - *St. Michaels, October 12-15, 2009: Decadal Climate Predictability and Prediction: Are We Ready?*
 - *Utrecht, November 4-6, 2009: Earth-System Initialization for Decadal Predictions*
 - *Miami, January 11-14, 2010: Predicting the Climate of Coming Decades*
 - *Boulder, September 20-23, 2010: Workshop on Decadal Variability, Predictability, and Prediction: Understanding the Role of the Ocean*
- **Participation of DPWG members in recent summary papers on decadal variability and predictability (e.g., Meehl et al., 2009, BAMS)**

DPWG Progress Report

- **Next steps**

- ***Synthesize a framework for assessing model simulations/predictions of decadal variability. Along this line, the current discussion among the DPWG members includes***

- What should the focus for the metrics be ?
 - *Assessing simulation skill / characteristics of modes of variability of relevance (PDO, AMOC, AMO,...)?*
 - *Assessment of prediction skill against other baseline measures of skill (e.g., persistence; CMIP simulations)?*
- What measures?
- Should the synthesis define best practices for evaluating initialized decadal predictions?

DPWG Progress Report

- **Next steps**

- *Continue assembling (and analyzing) relevant databases*
- *Encourage a small grants program (similar to the CMEP) – DECPREP (DECadal PREdictability Project)?*
- *Co-ordinate participation in the “WCRP Open Science Conference, 24-28 October, 2011”*

Membership:

Jim Carton (University of Maryland)

Tom Delworth (NOAA/GFDL)

Clara Deser (NCAR)

Ichiro Fukumori (JPL/NASA)

Lisa Goddard (IRI/Columbia University)

Ben Kirtman (University of Miami)

Arun Kumar (NOAA/CPC)

Yochanan Kushnir (Columbia University)

Matt Newman (CIRES/NOAA)

Amy Solomon (CIRES/NOAA)

Dan Vimont (University of Wisconsin)

Ex-officio Members

Arthur Greene (IRI/Columbia University)

Gabi Hegerl (University of Edinburgh)

Jerry Meehl representing WGCM (NCAR)

Doug Smith (UK Met Office)

Tim Stockdale representing WGSIP (ECMWF)