#### US CLIVAR Decadal Predictability Working Group (DPWG) Report

**US CLIVAR Summit 2010** 

#### **Co-Chairs:**

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





 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)



 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)

- 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 <u>Decadal Predictability Working Group</u> (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

- 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
    - <u>Next meeting</u>: September 2010 with the "Workshop on Decadal Variability, Predictability, and Prediction: Understanding the Role of the Ocean" in Boulder

- 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

- 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)

#### 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?

#### • Next steps

- Continue assembling (and analyzing) relevant databases
- Encourage a small grants program (similar to the CMEP) – DECPREP (<u>DEC</u>adal <u>PRE</u>dictability <u>Pr</u>oject)?
- 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)