

U.S. CLIVAR Perspective

International GRISO Workshop

June 7, 2013

Beverly, MA

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usclivar.org



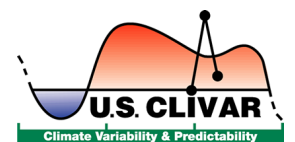
Charge to this Session

1. Initial reactions to what you've heard/learned at the workshop
2. Programmatic challenges and coordination challenges across disciplines, agencies, countries
3. Issues of how to fund work or major programs to get the science done
4. Other things that you think would be important

1. Initial Reactions

Workshop has well addressed its objectives of:

- Promoting a deeper shared understanding of physical processes and research approaches
- Highlighting impediments e.g., observing system limitations; basis for parameterization and modeling of processes
- Promoting dialogue among observationalists and modelers
- Beginning to build a problem-centric cross-disciplinary community



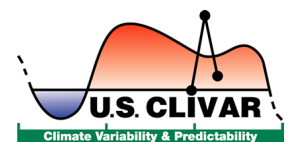
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Workshop has yet to:

- Identify priorities science needs
 - Be specific, e.g., identify observing and data system requirements, process study foci, modeling experiments, coordinated analyses efforts, etc.
 - Think big; don't be constrained yet by budget realities
 - Delineate near-term vs. long-term priorities
 - Consider community and multi-PI efforts beyond individual PI projects



2. Programmatic Challenges

- Which programs?
- How do they coordinate?
- How well do they coordinate?
 - Within agencies
 - With other agencies
 - With other interagency programs
 - Internationally

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- Which programs?
 - In U.S.: U.S. CLIVAR, SEARCH/IARPC
 - Internationally: CLIVAR, Climate and Cryosphere (CLIC), ...

U.S. CLIVAR Mission & Goals

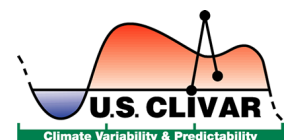
The U.S. CLIVAR mission is to foster **the understanding, modeling and prediction of climate variability and its impacts** on intraseasonal-to-centennial timescales, with emphasis on the **role of the ocean and its interaction with other elements of the Earth system**, and to serve the climate community through **the coordination and facilitation** of research on outstanding climate questions.



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- 1) Understand the **role of the oceans** in climate variability on different time scales.
- 2) Understand the **processes** that contribute to climate change and variability in the past, present, and future.
- 3) Better **quantify uncertainties** in the simulations and projections of climate variability and change.
- 4) Improve the **development and evaluation of climate simulations**.
- 5) **Collaborate with research communities** that develop and use climate information.



U.S. CLIVAR Research Challenges

Timely, Complex, and Societally-relevant Issues

- 1) Decadal variability and predictability
- 2) Climate extremes
- 3) Polar climate
- 4) Climate and carbon/biogeochemistry

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For each of these challenges...

- Understand processes.
- Recommend/prioritize improvements in *climate* obs. network and models.
- Estimate predictability and develop prediction-ability.

Research Challenge: Polar Climate

Context:

- Climate–change signals are amplified in polar regions, and their manifestation there (e.g., the disintegration of ice shelves and glacial melting) can also have a profound influence at lower latitudes (e.g., sea level rise, and changes in global ocean circulation).
- Despite their importance, polar regions are inadequately observed, hampering our ability to understand, model, and predict the influence of polar climate change on the overall Earth system.

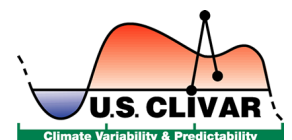
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Key Science Challenges:

- What processes affect sea-ice conditions and **ice-shelf stability**?
- What are the large-scale polar/subpolar/subtropical interactions and processes involved in affecting polar climate variability and change?
- What processes are involved in the exchange of polar (and subpolar) water masses with lower latitudes?
- Do we have the proper tools to simulate polar climate and realize the predictability?



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- Which programs?
 - In U.S.: U.S. CLIVAR, SEARCH/IARPC
 - Internationally: CLIVAR, Climate and Cryosphere (CLIC), ...
- How do they coordinate?
 - Interaction of Scientific Steering Committees (U.S. CLIVAR and SEARCH SSCs)
 - Interagency Groups of program managers (U.S. CLIVAR IAG, IARPC)

Interagency Group

Comprised of U.S. funding agency program managers who meet regularly to coordinate implementation of research activities in support of U.S. CLIVAR goals.



NASA Physical Oceanography (Eric Lindstrom, Peter Hacker)
NASA Modeling, Analysis & Prediction Program (David Considine)



NOAA Climate Variability & Predictability (Sandy Lucas, Jim Todd)
NOAA Modeling, Analysis, Pred. & Proj. (Annarita Mariotti, Don Anderson)
NOAA Climate Observations (David Legler)



NSF Physical Oceanography (Eric Itsweire)
NSF Climate & Atmospheric Dynamics (Eric DeWeaver, Anjuli Bamzai)



DOE Global & Regional Modeling (Renu Joseph)
DOE Earth System Modeling (Dorothy Koch)

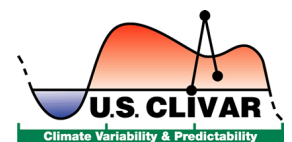


ONR Physical Oceanography (Scott Harper)
ONR Earth System Prediction Capability (Daniel Eleuterio)



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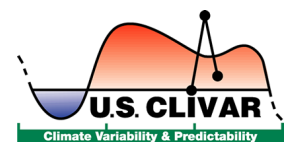


3. Funding, the good news

- U.S. agency programs have strong history of investing in:
 - Measurement technique development and observing system implementation
 - Data set development and archiving
 - Process studies and field campaigns
 - Model development, coordinated simulation experiments and analyses
 - Multidisciplinary research projects

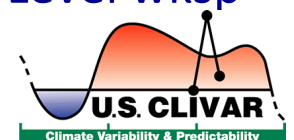
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 - Model development, coordinated simulation experiments and analyses
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- U.S. agency programs have strong record of collaboration
- U.S. agency programs have signaled interest in GRISO
 - U.S. CLIVAR sponsorship of WG
 - U.S. CLIVAR and NSF Arctic Pgm sponsorship of GRISO workshop
 - U.S. CLIVAR (NASA and DoE) sponsorship of CLIVAR Ice Sheet & Sea Level wksp
 - IARPC 5-year research plan identifies Greenland Ice Sheet research



3. Funding, the rest of the news

- U.S. agency budgets are constrained (increasingly?)
- Resources are always constrained; yet new activities are started; the importance of “churn”
- Budget reductions require focus on core priorities/mission and sustaining commitments
- Impact often on timing of implementation; slower rate
- Advantages of multi-agency coordination and leveraging
- Well-conceived and prioritized plans are key to funding

4. Other Considerations

Future planning beyond the U.S. CLIVAR WG

- Organize sessions at AGU & EGU, with side-meetings

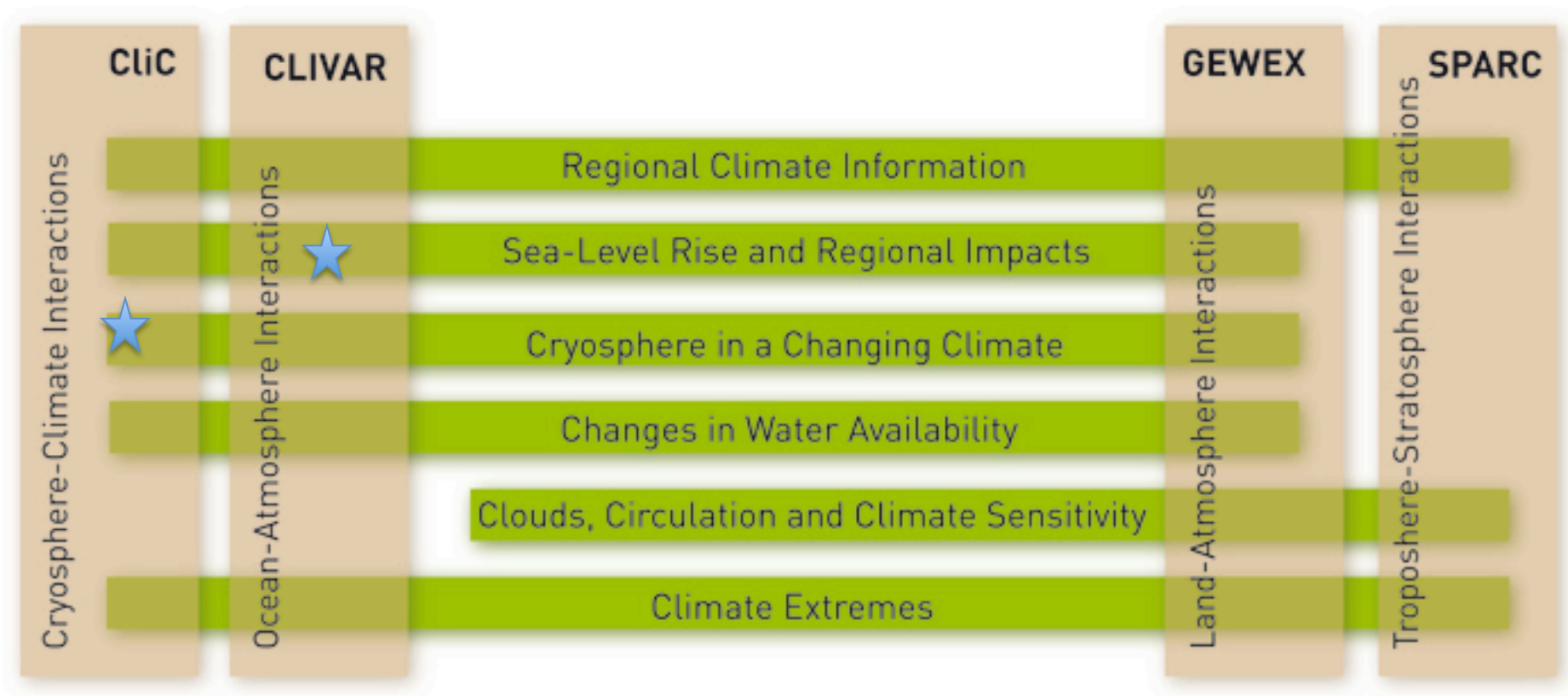
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- Seek to establish an International WG to support implementation planning

World Climate Research Programme

Grand Challenges



Other

Future planning beyond the U.S. CLIVAR WG

- Organize sessions at AGU & EGU, with side-meetings
- Seek to establish an International WG to support implementation planning
- In the U.S., consider establishing a Science Team – a ~10-year PI group comprised of funded project PIs from participating agencies.



Thank You