The U.S. Climate Variability and Predictability Research Program (CLIVAR)
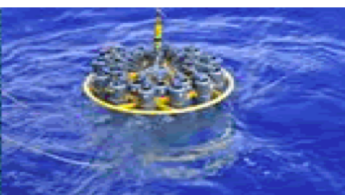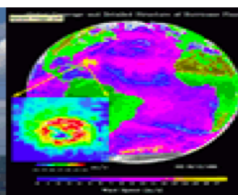
The Process Study and Model Improvement Panel's (PSMI) mission is to reduce uncertainties in the gernal circulation models used for climate variability prediction and climate change projections through an improved understanding and representation of the physical processes governing climate and its variation.

Process Study Model Improvement Panel last updated March 7, 2011		
Lisa Beal	RSMAS - University of Miami	Dec 2011
Baylor Fox-Kemper	University of Colorado	Dec 2013
Michael Gregg	University of Washington	Dec 2013
Meibing Jin	University of Alaska, Fairbanks	Dec 2013
Igor Kamenkovich	RSMAS - University of Miami	Dec 2013
David Lawrence	NCAR	Dec 2012
Joel Norris	University of California, San Diego (Scripps)	Dec 2012
Joellen Russell	University of Arizona	Dec 2012
Joao Teixeira, co-chair	NASA JPL	Dec 2011
Rob Wood, co-chair	University of Washington	Dec 2012
Sukyoung Lee	Pennsylvania State University	Dec 2013

CPT: Representing internal-wave driven mixing in global ocean models

http://www-pord.ucsd.edu/~jen/cpt/

The Team:

Matthew Alford (UW)

Brian Arbic (U Michigan)

Frank Bryan (NCAR)

Eric Chassignet (FSU)

Gokhan Danabasoglu (NCAR)

Peter Gent (NCAR)

Mike Gregg (UW)

Steve Griffies (GFDL)

Robert Hallberg (GFDL)

Steve Jayne (WHOI)

Markus Jochum (NCAR)

Jody Klymak (UVic)

Eric Kunze (Uvic)

William Large (NCAR)

Sonya Legg (GFDL/Princeton)

Jennifer MacKinnon (SIO)

Rob Pinkel (SIO)

Kurt Polzin (WHOI)

Harper Simmons (UAF)

Lou St. Laurent (WHOI)

Goal: Development of ocean mixing parameterizations for use in representing internal wave driven mixing in climate simulations.

1) Near-field parameterizations accounting for mixing processes at internal wave generation sites

2) A new parameterization for the mixing resulting from the breakdown of near inertial energy transported in the wave field

3) Parameterization for the breakdown of internal wave energy in the ocean interior far away from sources.

Assessing ocean mixing under heterogeneous sea ice cover and subgrid-scale brine rejection parameterization in climate models

Meibing Jin

International Arctic Research Center (IARC)
University of Alaska Fairbanks

Collaborators:
Kaiguo Fan, Jennifer Hutchings, Igor Polyakov, Dapeng Qu (IARC),
Marika Holland, Gokhan Danabasoglu (NCAR),
Yusuke Kawaguchi and Takashi Kikuchi (JAMSTEC, Japan)

Unresolved leads in ocean grid is a subgrid scale problem

Utilization of high-resolution models

Cloud Macrophysical Parameterization and Aerosol Indirect Effects

Supported by

Stratocumulus to Cumulus Transition CPT

Main Goal: To improve the representation of the cloudy boundary layer in global weather/climate models with a focus on the subtropical stratocumulus to cumulus (Sc-Cu) transition

NOAA funded, 1 August 2010 - 31 July 2013

(with additional internal JPL and DOE funds)

NCEP Hua-Lu Pan (PI), Jongil Han, Ruiyu Sun

NCAR Sungsu Park (PI), Cecile Hannay

JPL Joao Teixeira (PI), Marcin Witek

U. Washington Chris Bretherton (PI), Jennifer Fletcher, Peter Blossey, Matt Wyant

UCLA Roberto Mechoso (PI), Heng Xiao

LLNL Steve Klein (PI), Peter Caldwell

'Best Practices' for Parameterization Development and CPT Discussions

Best practices are generally-accepted, informally-standardized techniques, methods or processes that have proven themselves over time to accomplish given tasks
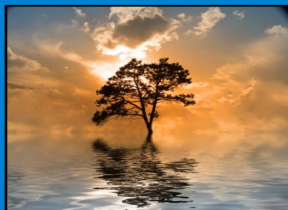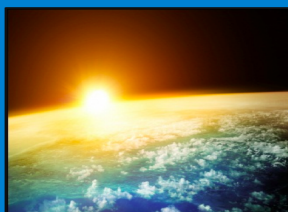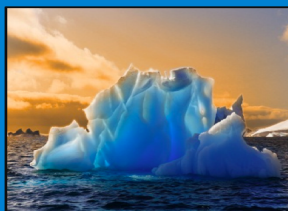
COMMON ISSUES:

- Identification of key climate prediction problem
- Utilization of high-resolution modeling
- Operational implementation of parameterizations
- Detailed evaluation of improved models

Are these issues common (universal) enough for parameterization development and implementation that lead to clear and concise 'best practices' recommendations?

Workshop on the Physics of Climate Models

DATES: 20-23 March 2012
Beckman Institute
Caltech, Pasadena, California

Core organizers: J. Teixeira (JPL), C. Jakob (Monash), P. Siebesma (KNMI)

GOAL: To focus on key problems in the representation of physical processes in weather/climate models and to develop scientific and programmatic strategies for their solution.

Workshop Structure

Three multidisciplinary thematic sessions — one per day:

§ Mornings dedicated to presentations
§ 3 invited one-hour presentations
§ Afternoons: break-out sessions + poster sessions
§ 4th day: break-out presentations, plenary session, recommendations

- **Day 1 — Tuesday: Tropical Weather and Climate**
- **Day 2 — Wednesday: High-latitude Climate Physics**
- **Day 3 — Thursday: Clouds and Climate Physics**
- **Day 4 — Friday: Plenary session + recommendations**

JPL Center For Climate Sciences

Co-organized with WGNE, a working group of the World Climate Research Programme and WMO Commission for Atmospheric Science.

BEST PRACTICES FOR PROCESS STUDIES

BY MEGHAN F. CRONIN, SONYA LEGG, AND PAQUITA ZUIDEMA

PROCESS STUDY "BEST PRACTICES"

- Modelers and observationalists should be integrated in the study from the planning stage onward.
- Integrated and synthesized datasets should be generated from the process study observations to provide model-comparable data that can be used as benchmarks for assessing and validating models. Furthermore, diagnostics shown in much-cited published figures should be provided in digital format as "synthesis products."
- Broad use of the data should be encouraged through
  - open data policies;
  - centralized access to all components of the experiment; and
  - data archiving in a user-friendly format, and with sampling information ("metadata") that is necessary for understanding the measurement.

OBSERVATIONAL PROCESS STUDY REVIEWS: VOCALS, SPURS, DYNAMO, KESS, CLIMODE, DIMES, Atlantic workshop, IASCLIP

There are still issues with the availability of field experiment data

'Best practices' are relatively well established (e.g. BAMS paper)

Field experiment data policy should follow what is done by satellite observational community

Atmospheric community follows better data availability 'best practices'

KEY QUESTIONS:

Should agencies establish a way of enforcing/facilitating field experiment data availability?

Should US CLIVAR / PSMIP go beyond encouraging best practices to facilitating?

POSSIBLE NEW WORKING GROUPS:

- Southeast Atlantic
- Southern Ocean

SABLE
Spaceborne Atmospheric Boundary Layer Explorer