

Strategy and Evolution of CLIVAR

Towards a Science Agenda and Implementation Strategy



14 Sep 2012



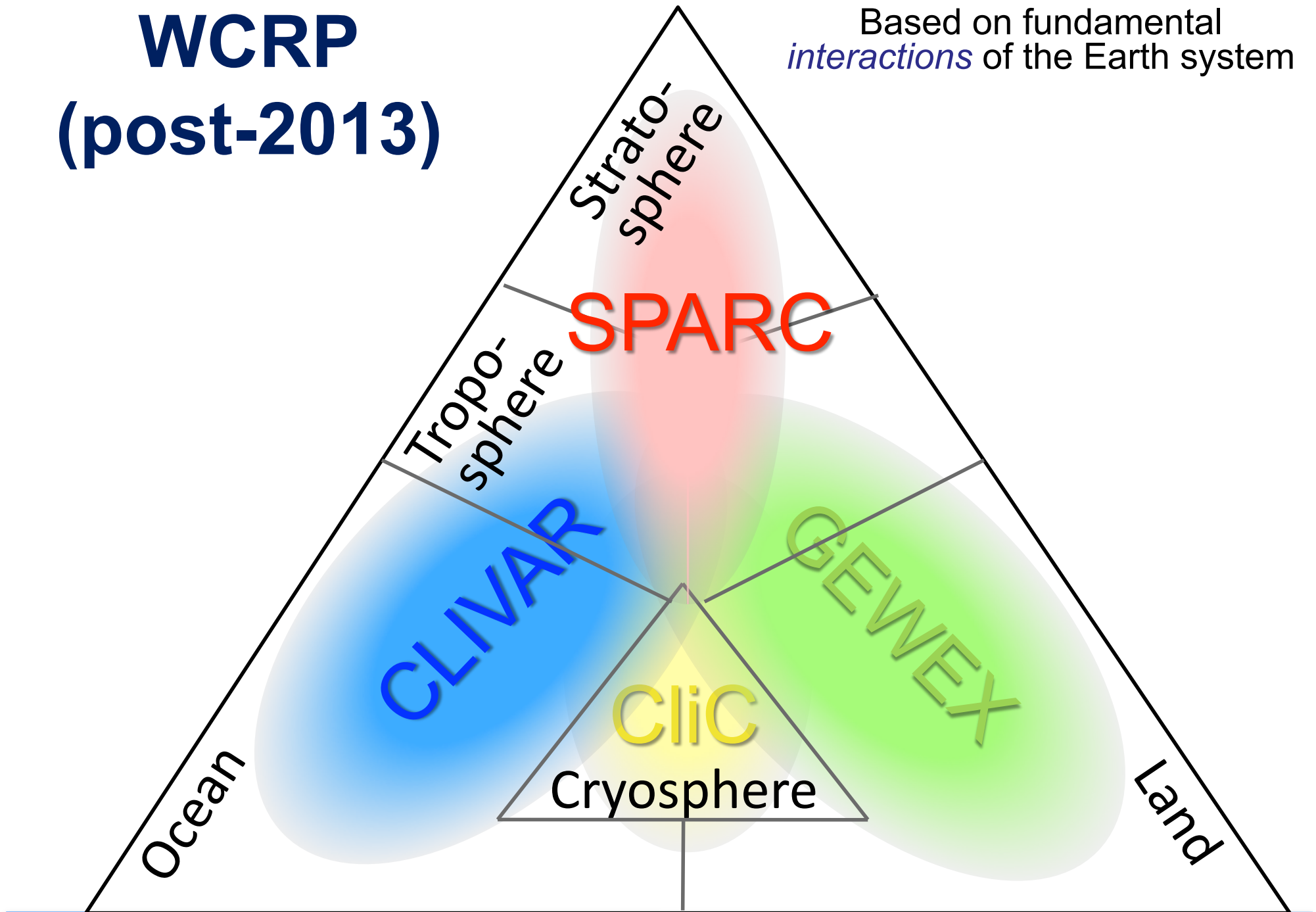
CLIVAR AIP
Sept. 2012 Kiel



Martin Visbeck and Jim Hurrell
Co-Chairs, CLIVAR SSG

WCRP (post-2013)

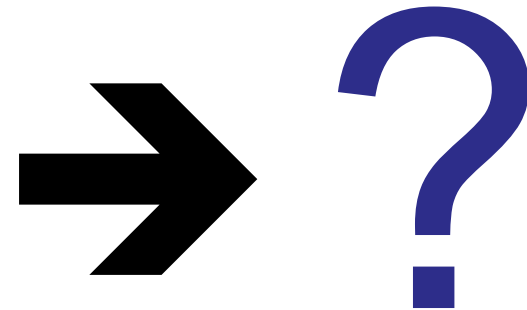
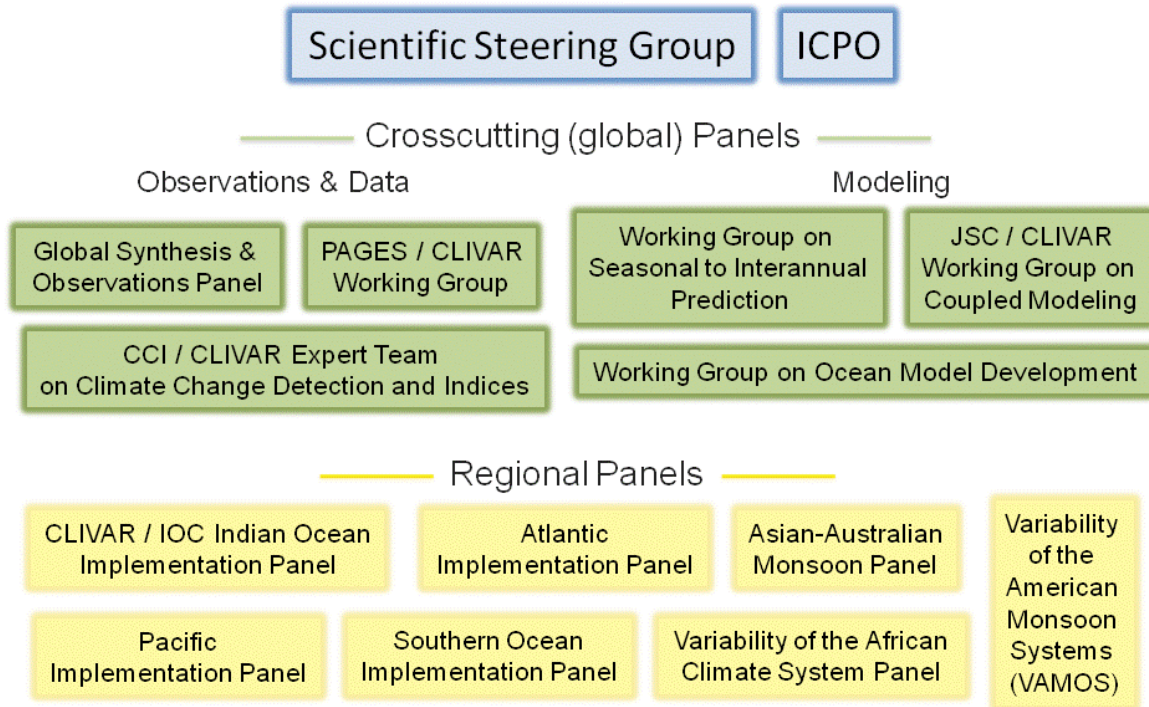
Based on fundamental
interactions of the Earth system



WCRP Evolution

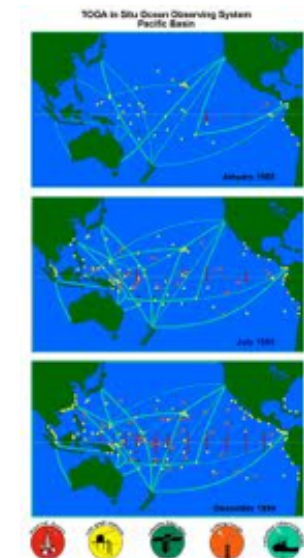
What does it mean for CLIVAR?

CLIVAR Organization



CLIVAR Research and Imperatives

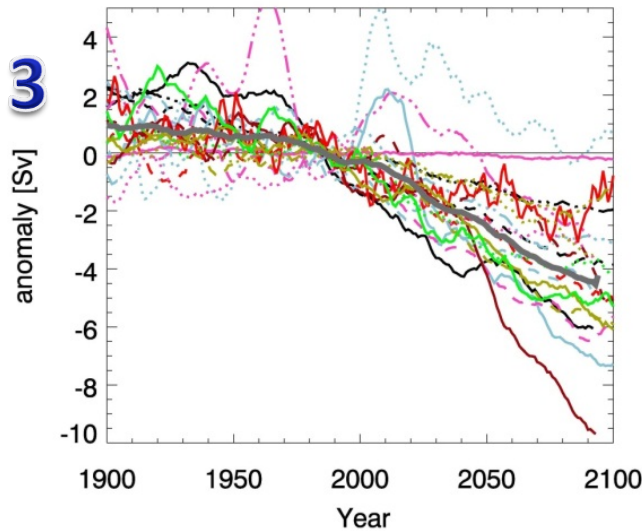
- Anthropogenic Climate Change
- Intra-to-Seasonal Variability, Predictability and Prediction
- Decadal Variability, Predictability and Prediction
- Improved Atmosphere and Ocean Components of ESMs
- Data Synthesis and Analysis
- Ocean Observing System
- Capacity Building



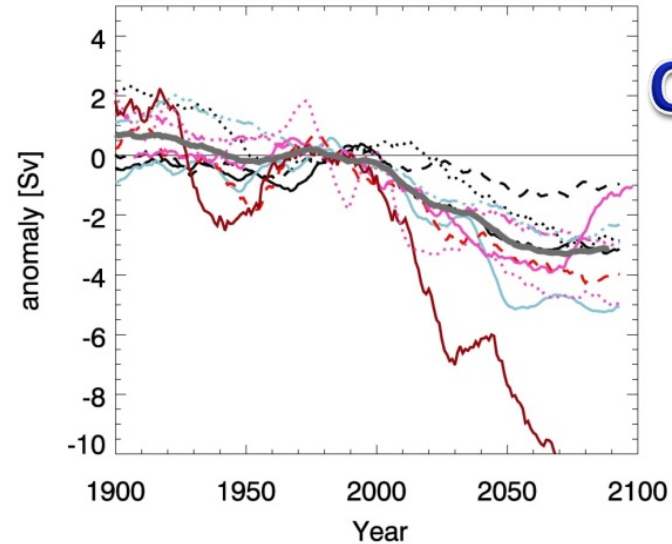
All Must Remain WCRP Priorities

Atlantic Implementation Panel: Prediction of Atlantic Meridional Circulation

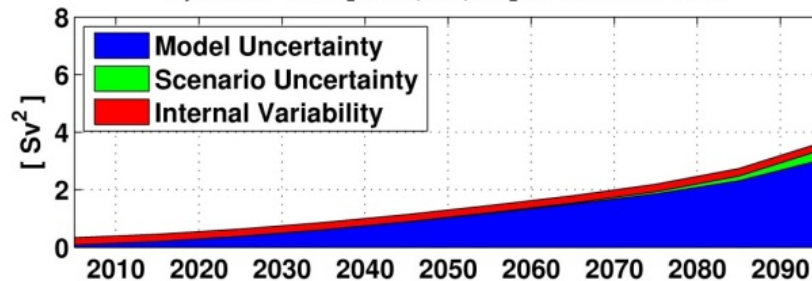
CMIP 3



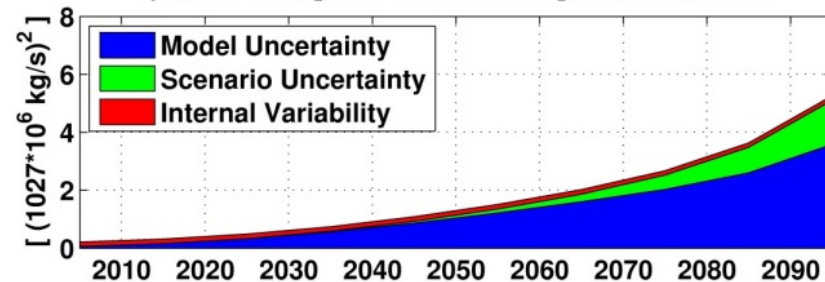
CMIP 5



a) MOC 30N [A1B,A2,B1]: Uncertainties



a) MOC 30N [RCP45 & RCP85]: Uncertainties



Martin, GEOMAR (pers. com.)

WCRP Evolution

What does it mean for CLIVAR?

Default Structure

CLIVAR Organization

Scientific Steering Group

ICPO

Crosscutting (global) Panels

Observations & Data

Global Synthesis & Observations Panel

PAGES / CLIVAR Working Group

CCI / CLIVAR Expert Team on Climate Change Detection and Indices

Modeling

Working Group on Seasonal to Interannual Prediction

JSC / CLIVAR Working Group on Coupled Modeling

Working Group on Ocean Model Development

Regional Panels

CLIVAR / IOC Indian Ocean Implementation Panel

Atlantic Implementation Panel

Asian-Australian Monsoon Panel

Variability of the American Monsoon Systems (VAMOS)

Pacific Implementation Panel

Southern Ocean Implementation Panel

Variability of the African Climate System Panel

current CLIVAR Organization

Scientific Steering Group

ICPO

Crosscutting (global) Panels

Observations & Data

Modeling

Global Synthesis & Observations Panel

PAGES / CLIVAR Working Group

Working Group on Seasonal to Interannual Prediction

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Working Group on Ocean Model Development

joint with 

Regional Panels

CLIVAR / IOC Indian Ocean Implementation Panel

Atlantic Implementation Panel

Asian-Australian Monsoon Panel

Variability of the American Monsoon Systems (VAMOS)

Pacific Implementation Panel

Southern Ocean Implementation Panel

Variability of the African Climate System Panel

joint with 

What's in a name?

Should CLIVAR become
CLIVAR?



Climate variability and change in the
atmosphere - ocean system

(just a proposal)



CLIVAR Planning Process

Timeline

- **SSG-19 (11-14 June 2012)**
 - Update on WCRP evolution and charge to CLIVAR
 - Develop first draft science agenda and implementation strategy
 - Discuss and debate
- **JSC-33 (17-20 July 2012)**
 - Consultation with other core projects and JSC
- **Debrief from JSC-33 (late July/early August)**
 - Teleconference(s) with Panel/WG Co-Chairs & SSG
- **Leading to SSG-20 (May 2013, Kiel Germany)**
 - Develop Research Challenge position papers
 - Panel and WG discussions of implementation framework
 - Refine and put plans in place for 2014 transition

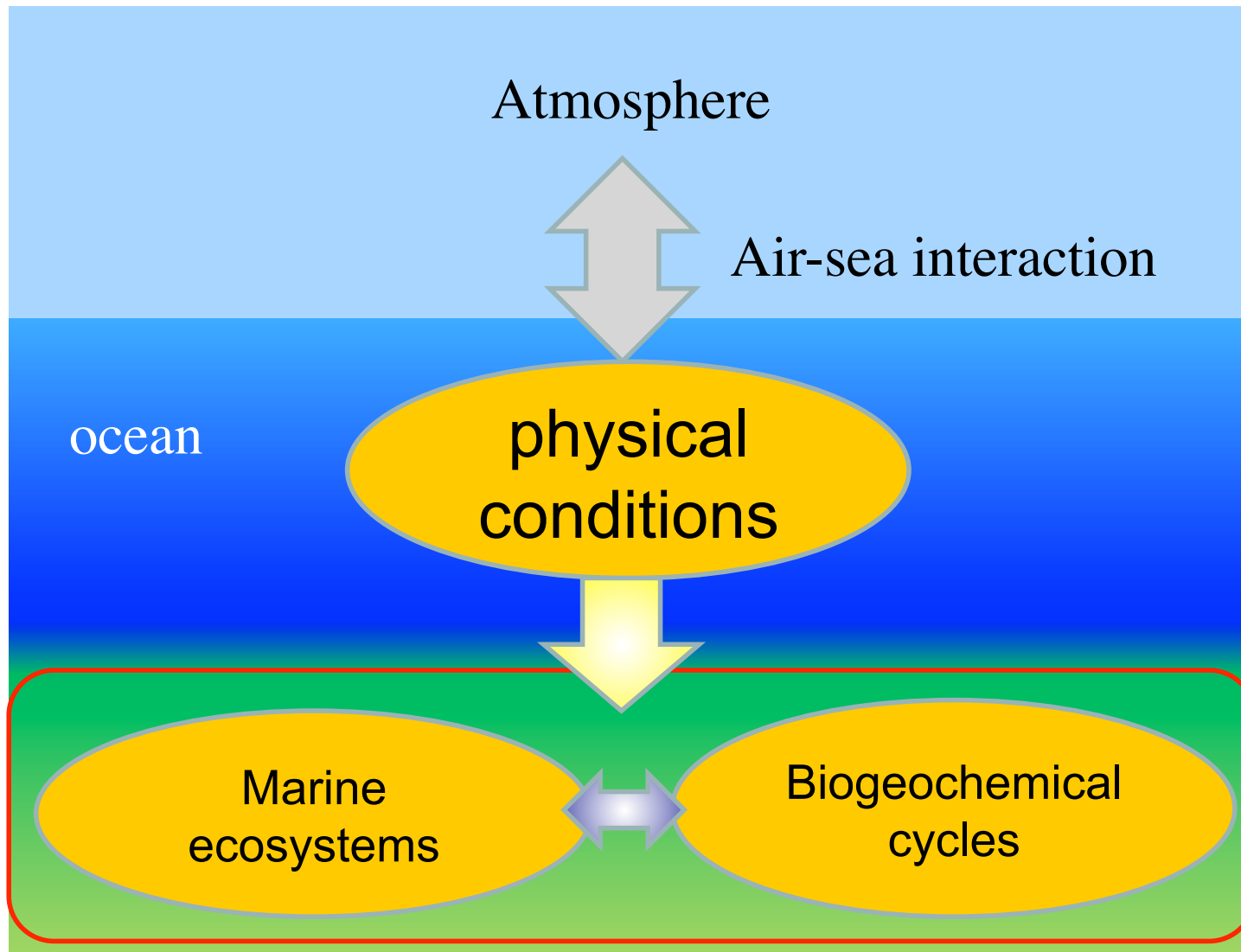
CLIVAR Research Challenges

- What should they be?
 - How do they relate to existing CLIVAR Research Challenges/Imperatives
 - Preliminary discussion at SSG-18; panel input and good discussions at CLIVAR SSG-19
 - Further community input at Ocean Sciences (Feb 2012, Salt Lake City)
 - US CLIVAR and other National Themes
- WCRP Grand Challenges and the role for CLIVAR

CLIVAR Research Challenges

- Intraseasonal, seasonal and interannual variability and predictability of monsoon systems
- Decadal variability and predictability of ocean and climate variability

Two directions of importance of climate variability in conjunction with the physical ocean



CLIVAR Research Challenges

- Intraseasonal, seasonal and interannual variability and predictability of monsoon systems
- Decadal variability and predictability of ocean and climate variability
- Trends, nonlinearities and extreme events
- Marine biophysical interactions and dynamics of upwelling systems
- Dynamics of regional sea level variability
- ...

New CLIVAR Research Challenges & Capabilities

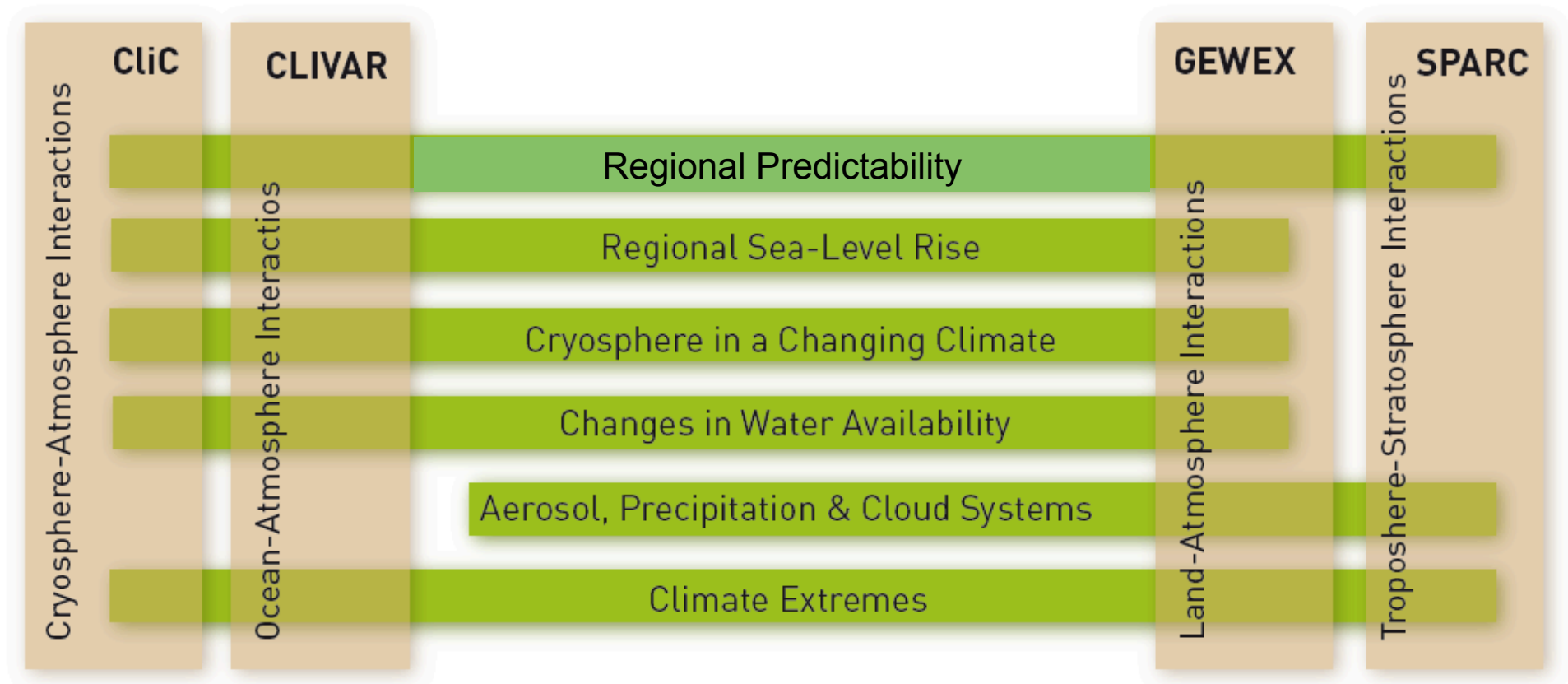
Research Challenges

- I-S-I variability and predictability of monsoon systems
- Decadal variability and predictability of ocean and climate variability
- Trends, nonlinearities and extreme events
- Marine biophysical interactions and dynamics of upwelling systems
- Dynamics of regional sea level variability
- ...

Capabilities (Imperatives on global and regional scales)

- Improving Ocean system models
- Implementing ocean observations
- Access to ocean data, synthesis and information
- Knowledge transfer and stakeholder feedback
- Education, capacity building and outreach

WCRP proposed Grand Challenges



WCRP/CLIVAR Research Challenges

- Intraseasonal, seasonal and interannual variability and predictability of monsoon systems
Lead the WCRP Grand Challenge 'regional predictability'
Contribute to GEWEX lead Grand Challenge 'water'
- Decadal variability and predictability of ocean and climate variability
Lead the WCRP Grand Challenge 'regional predictability'
- Trends, nonlinearities and extreme events
Contribute to GEWEX lead Grand Challenge 'extreme events'
- Marine biophysical interactions and dynamics of upwelling systems
- Dynamics of regional sea level variability
Lead the WCRP Grand Challenge 'regional sea level'

Proposed
(2014 -)

CLIVAR Organization

Scientific Steering Group

ICPO

Core capabilities

Working Group on
Ocean Model Development

CLIVAR Synthesis and
Observations Panel

Atlantic Implementation Panel

Pacific Implementation Panel

Indian O. Implementation Panel

Southern O. Implementation Panel

Knowledge Exchange and
Capacity Building

Research challenges

I-S-I variability and predictability
of monsoon systems

Decadal climate variability
and predictability

Marine biophysical interactions and
dynamics of upwelling systems

Dynamics of regional
sea level variability

Trends, nonlinearities and
extreme events



Draft Implementation Framework

CLIVAR+ research challenge panels (odd year)

CLIVAR implementation panel (even year)

	I-S-I Monsoons	Decadal Variability	Sea Level Regional	Upwelling Ecology	Extremes Trends	...
Atlantic	X	X	X	X	X	
Pacific	X	X	X	X	X	
Indian	X	X	X	X	X	
Southern		X	X	X	X	
Model	X	X	X	X	X	
Data	X	X	X	X	X	
Transfer	X	X	X	X	X	
GEWEX	X	X			X	
SPARC	X	X			X	
CLIC		X	X		X	
WGSIP	X	X		X	X	
WGCM	X	X	X	X	X	
IMBER		X		X		

Evolution of CLIVAR Panel Structure

Matrix advise to the SSG on implementation issues.

- regional/technical implementation

- science issue implementation

CLIMAR+ research challenge panels (odd year)

	I-S-I Monsoons	Decadal Variability	Sea Level Regional	Upwelling Ecology	Extremes Trends	...
Atlantic	X	X	X	X	X	
Pacific	X	X	X	X	X	
Indian	X	X	X	X	X	
Southern		X	X	X	X	
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SPARC	X	X			X	
CLIC		X	X		X	
WGSIP	X	X		X	X	
WGCM	X	X	X	X	X	
IMBER		X		X		

CLIMAR implementation panel (even year)

Need JSC advice on this fundamentally different management of the CLIMAR portfolio with impact on WCRP partners

Draft Implementation Framework

CLIVAR+ research challenge panels (odd year)

CLIVAR implementation panel (even year)

	I-S-I Monsoons	Decadal Variability	Sea Level Regional	Upwelling Ecology	Extremes Trends	...
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Southern		X	X	X	X	
Model	X	X	X	X	X	
Data	X	X	X	X	X	
Transfer	X	X	X	X	X	
GEWEX	X	X			X	
SPARC	X	X			X	
CLIC		X	X		X	
WGSIP	X	X		X	X	
WGCM	X	X	X	X	X	
IMBER		X		X		

I-S-I Monsoon Panel

A single panel focused on Monsoon Research Challenge:

What are the physical mechanisms responsible for modulating predictability of the global monsoon on subseasonal to interdecadal time scales?

- What is the relative role of the oceans and land in contributing to predictability as a function of time scale?
- What is the role of the oceans for interannual to interdecadal variability, especially related to ENSO and its teleconnections?
- What is the role of aerosols for monsoon variability, predictability, and change?

Initial implementation:

- Members from AAMP, VAMOS and VACS
- Also GEWEX, SPARC, WGSIP, WGCM, and other CLIVAR regional panels
- Would thus oversee current AAMP activities, MAHASRI, IASCLIP, AMMA ...
- Would foster workshops and other targeted (limited lifetime) projects

Knowledge Exchange and Capacity Building Panel

Standing CLIVAR panel focused on:

- Developing scientific capacity in climate research, model development, and climate services in order to meet societal needs from regional to local spatial scales
- Within the context of the GFCS, ensuring CLIVAR research is informed by and responsive to the needs of climate service providers and the users they serve.
- Providing advice regarding prioritization of research activities directed at supporting and improving regional climate science and prediction
- ...

Initial implementation:

- Led by members from existing CLIVAR panels engaged in such activities (e.g., AAMP, VAMOS, VACS, basin panels ...)
- Would thus oversee current capability development and outreach activities, VAMOS Extremes Atlas, African climate atlas, CLIVAR summer school etc.
- Planning of workshops (as currently proposed by VACS and VAMOS for 2013) and directed efforts that emerge from them
- ...

VACS/VAMOS and new WCRP Structure

VACS: Panel members suggest VACS should be renamed **African Climate Panel (ACP)**. Also propose ACP would report to CLIVAR recognizing, however, that a strong interaction with GEWEX is necessary for the accomplishment of the science priorities.

VAMOS: Panel members suggest VAMOS has been and should remain a **WCRP cross-cut program**, having only “lived” in CLIVAR. To enable optimal linkages to relevant WCRP programs (e.g., CLIVAR, GEWEX, WGSIP, WGCM) VAMOS views itself needing to be outside of existing programs.