CLIVAR: CLIMATE & OCEAN
variability, predictability and change

WCRP's core project on the
Ocean-Atmosphere System

OMDP Meeting, Yokohama, Jan 14-15, 2016
Annalisa Bracco (SSG co-chair)

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Happy Birthday CLIVAR!

- CLIVAR was established **20 years ago** as one of the core-projects of the World Climate Research Programme, building on WOCE and TOGA,
- The CLIVAR legacy includes the
  + implementation and development of major multinational observing networks in all the ocean basins;
  + the development of **ocean-climate models,** and
  + the development of **ocean re-analyses**,
  bridging observations and modeling through data assimilation.

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New CLIVAR Science

Motivating Science Questions:

- **What role does the ocean play in the climate systems?**
- **What climate processes are critical for global and regional climate variability?**
- **What role does the Ocean play in a warming climate?**
- **How predictable is the climate on different time and space scales**?

New CLIVAR Science Plan will be released in 2016

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Enabling Capabilities

International cooperation is critical:

- Climate and Ocean Process and Sustained Observations
- Global, Regionally Enhanced and Process Models
- Ocean Data, Synthesis and Assessment
- Capacity Development and Knowledge Exchange

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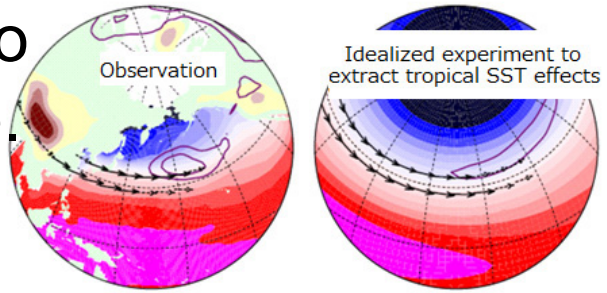
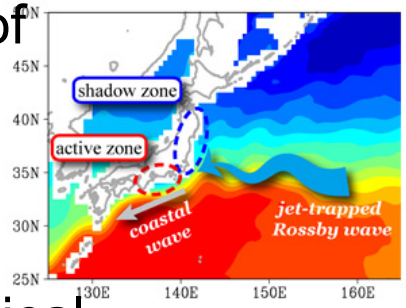
The role of the ocean in the climate system

- Climate dynamics provides the phenomenological understanding and context that can be used to characterize regional to hemispheric climate variability and change.



- To be studied:
  - Climate dynamics, feedbacks and regional modes of coupled variability
  - The ocean's role in climate variability at different timescales
  - The ocean's role in carbon uptake and biogeochemical cycles



Source: Minobe

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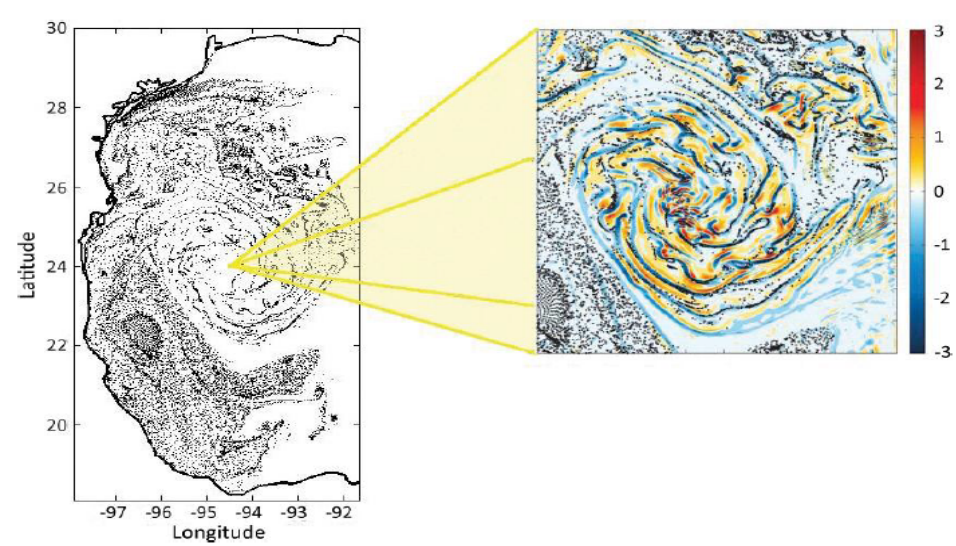
Critical Climate Processes

- Ocean energetics, tides, meso-submesoscale eddies, waves, and mixing
- Ocean and climate processes climate variability on seasonal, interannual, decadal, and centennial time-scales
- Boundary currents and frontal structures, coastal processes and upwelling systems



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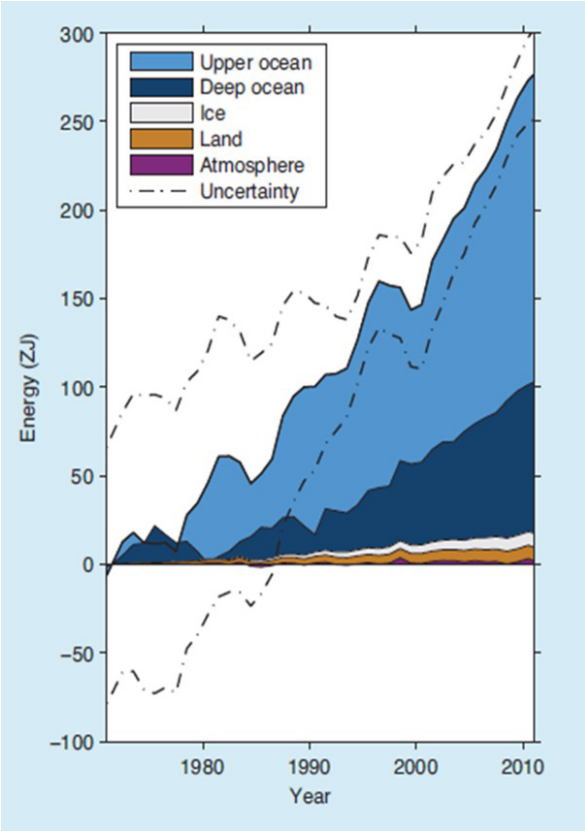
Ocean role in warming climate

- Ocean constraints on climate sensitivity, air-sea exchange and Earth's energy budget
- Regional impacts of the changing climate: sea level, ocean heat content, cryosphere and water cycle
- The changing ocean's role in CO_2 uptake



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Climate predictability

- Intra-seasonal to Interannual Variability, Predictability and Prediction

- Decadal Variability, Predictability and Prediction (multi-decadal variability and detection/attribution of changes)

- Extreme Weather and Climate and Ocean Extremes Pascale

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SP timeline

FEBRUARY 15 2016 writing assignments due

FEBRUARY 22 OSM CLIVAR Town Hall in New Orleans (meeting of editorial team)

MARCH 15 First draft to SSG and Panel/RF Chairs for comments (due April 15th)

APRIL 30- MAY 10, 2016 editorial team w/ ICPO creates new draft

MAY 10, 2016 - new draft posted on CLIVAR website and widely distributed (including WCRP, sister programmes) for comment/input

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MAY/JUNE, 2016 - further refinement of Plan

MID/END JULY, 2016 - new draft (ICPO w/ editorial team) prepared and published on CLIVAR website and advertised on CLIVAR OSC site

SEPTEMBER 2016- OSC - town hall for community input, comment

OCT/NOV- revisions to Plan based on OSC, produce camera-ready copy

DECEMBER 2016 - "final" Plan published

How CLIVAR works

CLIVAR is implemented through Panels that serve the needs of the international CLIVAR community.

- **Regional ocean basin Panels:**
  + Atlantic,
  + Pacific,
  + Indian and
  + Southern Ocean
- **Four global Panels:**
  + Ocean Model Development Panel,
  + Global Synthesis and Observations Panel,
  + Climate Dynamics Panel, and
  + CLIVAR-GEWEX Monsoons Panel.

Research Foci

The Research Foci (RF), launched in 2015, are focused limited-lifetime initiatives on topics of high priority in the climate research community, that would benefit from enhanced international coordination.

- Decadal Variability & Predictability
- Planetary Heat Balance & Ocean Heat Storage
- ENSO in a Changing Climate
- Eastern Boundary Current Systems
- Regional Sea Level Change & Coastal Impacts

THANK YOU

Get Involved!

Panel membership nominations

Research Foci

CLIVAR Open Science Conference
in Qingdao CHINA, Sept 2016

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OSC in 2016

"Charting the course for climate and ocean research"

18-25 September 2016, Qingdao, China

http://www.clivar2016.org/

January 2015 - Call for Abstracts,

Application for Early Career Scientists (ECS) Symposium and Travel Grants Open!

15 March 2016 – Abstract submission and applications for support and to attend the ECSS close

May/June – Notification of abstract acceptance, travel grants and ECSS participation

18 and 24-25 September 2016 – CLIVAR Early Career Scientists Symposium

19-23 September 2016 – CLIVAR Open Science Conference

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	CLIVAR2016 Early Career Scientists Symposium	CLIVAR 2016 Stakeholder Forum	CLIVAR 2016 Main Open Science Conference					CLIVAR2016 Early Career Scientists Symposium	
			DAY 1	DAY 2	DAY 3	DAY 4	DAY 5		
	Sunday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	18-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep
	FIO Registration	Hotel Registration	Registration & Transport to QNLM	Hotel	Hotel	Hotel	Hotel	FIO	FIO
AM	Opening session	Stakeholder Forum Plenary	Opening Session	Plenary 2	Plenary 3	Plenary 4	Plenary 5	Interactive workshop: Science frontiers	Working group sessions: science themes
	Introduction to the OSC			Climate Variability and Predictability	Understanding Ocean and Climate Processes	The Ocean in a Warmer World	Climate Information and Sustainable Develop-ment		
	Coffee/tea break		Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	Plenary session: " CLIVAR in the context of Major Climate Programmes		Keynote Group photo	Poster Session	Poster Session	Poster Session	Plenary 6 Future of Climate and Ocean Science	Working group sessions	Working group presentations and summary
	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Closing Ceremony	Lunch	Closure
PM	Meet-and-greet session and introduction to working groups	Stakeholder Forum Plenary	Plenary 1 Ocean's Role in Climate	Parallel 2.1 Intra-seasonal to Interannual	Parallel 3.1 Mixing& Stirring	Parallel 4.1 Modes		Working group presentations and workshop summary	
				Parallel 2.2 Decadal	Parallel 3.2 Ocean &Climate Dynamics	Parallel 4.2 Sea Level			
				Parallel 2.3 Centennial to Millennial	Parallel 3.3 Upwelling	Parallel 4.3 Boundary Current Systems			
	Coffee/tea	Coffee/tea	Coffee/tea	Coffee/tea	Coffee/tea	Coffee/tea		Coffee/tea	
	PICO-style short presentations	Panel discussion	Parallel 1.1 Energy Parallel 1.2 Carbon Parallel 1.3 Water	Poster Session	Poster Session	Poster Session		Science topics panel	
		Closure	Transport to hotel	Keynote	Keynote	Keynote			
Evening		Registration& Refreshment	Icebreaker Reception	Townhalls	Townhalls	Banquet			