

CLIVAR science

Identify priorities:

Overall scientific guidance and the long-term direction of the CLIVAR project are provided by the sponsors of the World Climate Research Programme (WCRP).

WCRP's mission is to facilitate analysis and prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society.

The two overarching objectives of the WCRP are to determine the:

- * Predictability of climate
- * Effect of human activities on climate.



CLIVAR science

The WCRP science is implemented through four core projects:

- * CLIVAR (ocean and atmosphere interactions)
- * CliC (climate and cryosphere interactions)
- * GEWEX (land and atmosphere interactions)
- * SPARC (stratosphere and climate interactions)

The WCRP has identified six current Grand Challenges:

- * Clouds, circulation and climate sensitivity
- * The cryosphere in a changing climate
- * Changes in water availability
- * Regional climate information
- * Regional sea level variability
- * Science underpinning the prediction and attribution of extreme events



CLIVAR science

These Grand Challenges represent major areas of scientific research, modelling, analysis and observations for WCRP and its core projects in the ensuing decade.

The WCRP intends to promote these Grand Science Challenges through community organized workshops, conferences and strategic planning meetings to identify high priority and exciting research that require international partnership and coordination, and that yield “**actionable information**” for decision makers.

The **CLIVAR SSG** has recognized the need for the programme to remain flexible and responsive to such new scientific developments and approaches while maintaining the coordination of core research areas central to its mission.



CLIVAR Research Opportunities

At its 19th Session in 2012 the SSG adopted the principle of “**research opportunities**” and identified an initial, non-exhaustive list of five fundamental research areas where enhanced international CLIVAR coordination in support of the research community will lead to significant progress over the next 5-10 years:

- * Intraseasonal, seasonal and interannual variability and predictability of monsoons
- * 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 rise.



CLIVAR Research Opportunities

This year two more topics for “research opportunities” were proposed and adopted:

- * ENSO in a warmer world
- * Planetary heat balance and ocean heat storage

Since the SSG-19 meeting **Tiger Teams** of volunteers from the CLIVAR community have developed documents that outline the research priorities and begin to discuss implementation strategies of these research priority topics.

In parallel the JSC of WCRP at JSC-33 identified a number of Grand Science Challenges are to be addressed by the WCRP family. The lead on two was assigned to CLIVAR. Additionally, CLIVAR will be expected to make contributions to each of the other topics



Strategy and Evolution of CLIVAR (2013)

Co-design of Research Priorities and Implementation Strategy

The interdisciplinary nature of the climate system and the increasing need for actionable, integrated climate information by a wide range of users and stakeholders drives the adoption of a co-design principle in developing the CLIVAR research priorities and their implementation strategy.

Co-design increases the synergy between different research disciplines and between researchers, funders and users.

A synergistic approach to setting the priority research, capacity development and outreach activities will lead to actionable science.

It depends on close collaboration between different communities within the CLIVAR network (observations, process studies, modeling) and between CLIVAR and its research (WCRP, GFCS, Future Earth, etc), its funders (IGFA, regions, nations) and socio-economic sectorial partners



Strategy and Evolution of CLIVAR (2013)

Timeline for the next 12 months:

- **October** – ICPO to create online forum for each RO
- **1 November** – Status report on each RO to SSG chairs and ICPO
- **November** – ICPO prepares a brief CLIVAR prospectus (or framework document) including outline of ROs for distribution at Fall AGU etc.
- **December** – Fall AGU – opportunity for RO and WCRP GC teams to meet informally and expand outreach to other potential collaborators and partners; participate in (US)CLIVAR town hall mtg



Strategy and Evolution of CLIVAR (2013)

Timeline for the next 12 months:

- January – AMS - opportunity for RO and WCRP GC teams to meet informally and expand outreach to other potential collaborators and partners; ?CLIVAR event
- February – Ocean Science meeting – RO representatives to present at CLIVAR Town Hall
- Jan- June 2014 – ICPO to work with RO teams to prepare draft implementation plans that address all aspects as identified in the TOR (science, co-design, Implementation, governance and funding)



Strategy and Evolution of CLIVAR (2013)

Timeline for the next 12 months:

- July – pan-CLIVAR meeting – discussions with Panels and GEWEX to further refine RO implementation plans
- Autumn 2014 - CLIVAR SSG meeting to adopt RO plans
- Dec 2014 - CLIVAR publishes (on line) implementation plan (?and science plan)



CLIVAR Research Opportunity Team

* Terms of Reference

1. To co-design the research opportunity science questions and activities through consultation with research and user stakeholders (science community including early career scientists, user community, funders/national bodies)
2. To deliver:
 - A. Refined science questions and priorities => *elements of CLIVAR science plan*
 - B. Recommendations and steps => *contribution to Implementation strategy*
 - C. Governance/management needs => *CLIVAR organization*
 - D. Funding prospects
 - E. Information Exchange with users

