

## Introduction of WCRP-CLIVAR (Climate and Ocean - Variability, Predictability and Change)

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CLIVAR is one of the four core projects of WCRP, the first phase was implemented from 1998 to 2014, and from the year 2015 it has entered the second phase. Although the abbreviation for both Phase I and Phase II is the same, i.e., CLIVAR, the official name for the first phase is “Climate Variability and Predictability”, and that for the second phase is “Climate and Ocean - Variability, Predictability and Change”.

The organization of CLIVAR is as follows. The highest decision body is the Science Stirring Group (SSG). Researches are conducted by panels and research foci. The panel does not have a specific lifetime, while research foci are time-limited activity for 3-5 years. There are four global panels (ocean model, integration and observation, climate mechanics, monsoon) and five regional panels (Atlantic, Pacific, Indian Ocean, Southern Ocean, North Seas). Essentially all oceans are covered by regional panels, and this is an outstanding feature of CLIVAR. Administration is carried out by International CLIVAR Project Office, which has four members in China and two members in India. The fact that the project office members are in China and India and not in US nor Europe is another feature of CLIVAR, not found in other core projects. Panel meetings are held on a basic basis once a year and a half, and the SSG meeting is held approximately once a year. Unfortunately, there have been no SSG member from Japan for a while. Japan CLIVAR or CLIVAR Subcommittee in Science Council play a role in sharing information of CLIVAR within subcommittee members.

The cooperative relationship between CLIVAR and Future Earth is limited. The Indian Ocean Panel is in cooperation with IMBeR which is a project of Future Earth. In addition, “Eastern boundary upwelling systems” research focus seems to include ecosystem aspect at least at the beginning. Recently SCOR established a new working group, "Eastern boundary upwelling systems (EBUS): diversity, coupled dynamics and sensitivity to climate change". It is not clear to me what relation is held between CLIVAR's upwelling research focus and SCOR's upwelling working group.

Regarding the ocean, I think it is important for CLIVAR and projects of Future Earth to promote further collaboration, but this does not occur voluntarily. There may be two important points for promoting collaboration. One is money. If two projects seek collaboration, they need more money, because just attending the other project's meeting need money at least one or two people's international travel per year. The other is that it is important that WCRP really wants to have such a collaboration.

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