

CLIVAR GLOBAL SYNTHESIS AND OBSERVATIONS PANEL (GSOP)

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1. OVERVIEW

The overall mission of CLIVAR, the Climate Variability and Predictability Project of the World Climate Research Programme (WCRP) is to observe, simulate and predict the Earth's climate system, with a focus on ocean-atmosphere interactions.

CLIVAR has established its Global Synthesis and Observations Panel (GSOP) to develop, promote, and seek to implement strategies for global ocean syntheses. Building on previous experience and developments, these will eventually contribute to fully coupled reanalysis with atmosphere, ocean, land and cryosphere models. The panel (in collaboration with relevant bodies) is also responsible for the definition and fulfilment of CLIVAR's global needs for sustained observations. To do this GSOP works closely with CLIVAR's regional ocean basin panels [1] and the Ocean Observations Panel for Climate (OOPC) in particular.

2. OCEAN SYNTHESIS EVALUATION, COUPLED DATA ASSIMILATION AND DECADEAL PREDICTION.

One of the main contributions of GSOP to CLIVAR science is the evaluation of current generation ocean synthesis/reanalysis products providing guidance on their use for study of the global ocean circulation (see Fig.1). This evaluation has led to several improvements in the synthesis/reanalysis products. Notably it has led to several papers comparing different ocean synthesis products and thereby to the first specifications of their uncertainties [2, 3]. A detailed list of existing syntheses/reanalysis efforts and links to their data has been placed on the "Ocean Synthesis Directory" at <http://www.clivar.org/data/synthesis/directory.php>.

Through its ocean synthesis project GSOP is linking to decadal forecast experiments. One key element is for ocean synthesis groups to provide updated datasets to be used for decadal prediction experiments. GSOP requests that the OceanObs'09 community keep this in mind when writing proposals and archiving data for synthesis, as this is a major science goal for input to the Intergovernmental Panel of Climate Change (IPCC) Fifth Assessment Report (AR5). GSOP is also currently in the process of providing all available ocean syntheses as initial conditions for decadal prediction model experiments. First such experiments are ongoing and

show some success. Possibilities of coupled data assimilation are also being explored. These efforts are only just spinning up and will mature over the coming years.

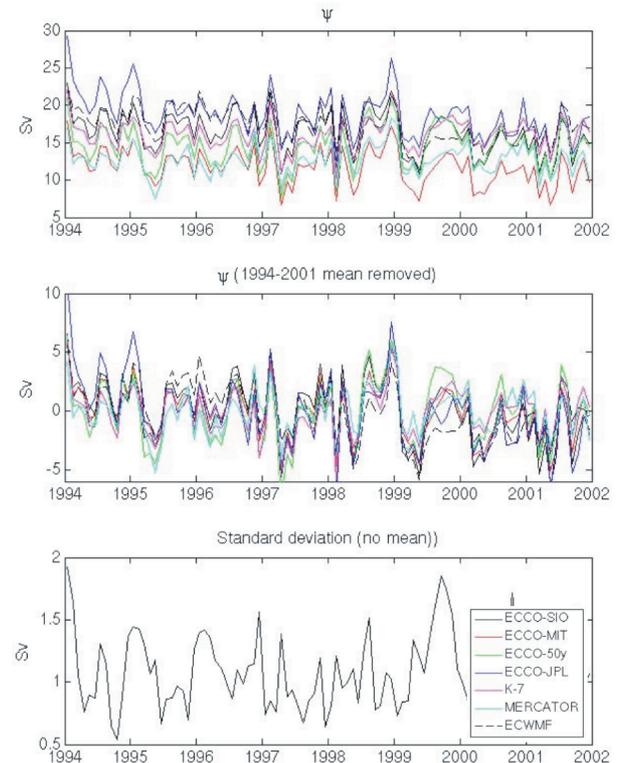


Figure 1. Comparison of the Atlantic meridional overturning circulation (AMOC) strength at 900 m (near the depth of maximum AMOC strength) from seven different products over 1994-2002. Top – individual product values; Centre – with mean removed; Bottom – Standard deviation (no mean).

GSOP has begun discussion with OOPC and the Joint WMO-IOC Technical Commission on Oceanography and Marine Meteorology (JCOMM) regarding the coordination and assessment of ocean climate data sets and the need to develop implementation plans to produce data sets in support of ocean synthesis and reanalysis projects.

3. GSOP LINKS TO OCEAN CARBON AND HYDROGRAPHY

With the International Ocean Carbon Coordination Project (IOCCP), and in collaboration with Surface-

Ocean / Lower Atmosphere Study (SOLAS) and Integrated Marine Biogeochemistry and Ecosystem Research (IMBER), the GSOP panel co-sponsors the Global Ocean Ship-based Hydrographic Investigations Panel (GO_SHIP). GO_SHIP brings together interests from physical hydrography, carbon, biogeochemistry, Argo, OceanSITES, and other users and collectors of hydrographic data. One of its activities includes the review of, and an update to, the WOCE hydrographic manual.

Global repeat hydrography has lacked formal overall global organization since the end of WOCE and this has led to a lack of visibility of this component in the global observing system and a significant decrease in the number of trans-basin sections carried out by some countries. More importantly, the lack of international agreements for implementation of hydrographic sections has led to disparate data sharing policies, duplication of some sections, and sections being carried out without the full suite of core variables.

Recognizing those concerns, IOCCP and CLIVAR organised an International Repeat Hydrography Workshop in Japan at the end of 2005. The workshop brought together experts on ocean carbon and biogeochemistry, physical hydrography, modelling and data assimilation, and the Argo program. The main task was to review the science framework and implementation status of post-WOCE hydrography, provide guidance for a more coordinated system of data and information management, and establish plans to begin data synthesis activities. An outcome of that workshop was the formation of GO-SHIP. The group developed guidelines and advice for the development of a globally coordinated network of sustained ship-based hydrographic sections that will become an integral component of the ocean observing system. The outcome was the strategy presented in the OceanObs'09 white paper [4].

4. NEW ACTIVITIES BEING PLANNED

In addition to the ongoing activities with ocean synthesis and initialization outlined above, GSOP is planning to organize activities to promote and provide impetus for production of a climate quality profile data archive for climate studies with an initial focus on temperature data. GSOP also plans to promote further discussion on data management, bringing together the CLIVAR Data Assembly Centres (DACs), jointly with other groups such as Argo, OceanSITES and Coriolis. The main objective of such activity is to provide data centres with requirements from the scientific community, particularly ocean reanalysis groups, in order to adopt best practices for standardization across those groups.

5. REFERENCES

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