



Project Report

Report of the 6th Global Synthesis & Observations Panel Meeting

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CLIVAR is a component of the World Climate Research Programme (WCRP). WCRP is sponsored by the World Meteorological Organisation, the International Council for Science and the Intergovernmental Oceanographic Commission of UNESCO. The scientific planning and development of CLIVAR is under the guidance of the JSC Scientific Steering Group for CLIVAR assisted by the CLIVAR International Project Office. The Joint Scientific Committee (JSC) is the main body of WMO-ICSU-IOC formulating overall WCRP scientific concepts.

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ACTION ITEMS

- ACTION: Suggest to CLIVAR SSG to include ENSO diversity in one of CLIVAR's research challenge themes (e.g., theme I) (co-chairs)
- ACTION: GSOP letter talking about OHC to Data Council (co-chairs)
- ACTION: Request Data Council to link the CLIVAR/GSOP intercomparison activity to their website (ICPO)
- ACTION: Contact NOAA Program Manager David Legler to explore a possible coordinated OSE effort with the support of funding agencies such as NOAA (T. Lee)
- ACTION: GSOP to request NWP centres to write a statement on the need of high-quality Argo data (M. Palmer, co-chairs)
- ACTION: Request flux community to develop a recommendation for a standard set of calculations so that data could be submitted to OceanSITES servers (co-chairs, L. Yu, U. Send)
- ACTION: Panel to suggest names for members of the Indices Task Team (all)
- ACTION: Liaise with ocean synthesis groups to ensure data is submitted for this activity (M. Palmer)
- ACTION: Renew request to CLIVAR basin panels to provide comments to GlobCurrent User Requirements (ICPO)
- ACTION: Propose names to the SSG as replacement for Toste Tanhua and Toshiyuki Awaji. (co-chairs, ICPO)

Report of the 6th Global Synthesis and Observations Panel Meeting

1. Welcome and charge to the meeting

The co-chairs, Keith Haines and Tony Lee welcomed all participants to the meeting. Apologies have been sent by Bernard Barnier and Mike McPhaden.

Keith Haines briefed the group on the discussions of the last SSG's meeting in La Paz, Mexico, in May 2012 and of the last WCRP Joint Scientific Committee (JSC), in Beijing, China, in July 2012. After 2013, links between WCRP projects will be focused and based on fundamental interactions of the Earth system. More details about the discussions on the evolution of WCRP can be found on the report of the JSC meeting (http://www.wcrp-climate.org/documents/JSC33_Report_Final.pdf). Regarding the organisational structure of CLIVAR, some panels will now report directly to the JSC. VAMOS, AAMP and ACP have been asked to interact more with a view of joint sponsorship with GEWEX. The SSG has also proposed topics which will guide CLIVAR science in the next 10 years. These Research Challenges - (a) Intraseasonal, seasonal and interannual variability and predictability of monsoon systems, (b) Decadal variability and predictability of ocean and climate variability, (c) Trends, nonlinearities and extreme events, (d) Marine biophysical interactions and dynamics of upwelling systems, and (e) Dynamics of regional sea level variability - will be further developed by white papers, which will then be open for public comment. The panel has been tasked to comment on the CLIVAR structure and feedback at the next SSG meeting in 2013.

The group discussed these Research Challenges. For climate sensitivity, ocean heat uptake is important and should be taken into consideration when issues are discussed. Also important is that any activity related to these research challenges should take into consideration societal benefit. The research challenge "Intraseasonal, seasonal and interannual variability and predictability of monsoon systems" only mentions monsoons. This excludes ENSO, a dominant mode of coupled ocean-atmosphere climate variability on interannual time scales. If the focus of CLIVAR for the next decade will be focused on variability and predictability of the coupled ocean-atmosphere system, ENSO should not be excluded, especially in light of the recently discovered ENSO diversity (e.g., central- vs. eastern-Pacific El Nino) and its teleconnections and impact that are very active areas of investigation by the CLIVAR community. Perhaps a better way to define would be **"Intraseasonal, seasonal, and interannual variability and predictability, including ENSO and monsoon systems"**.

ACTION: *Suggest to CLIVAR SSG to include ENSO diversity in one of CLIVAR's research challenge themes (e.g., theme I) (co-chairs)*

Another issue discussed was the implementation of the new CLIVAR structure, with potentially new panels being formed to accommodate activities related to the research challenges. These meetings could be done, for example, as AGU or EGU sessions or Town Halls, for example, which would lead to more integrative approach, without the need to form a new panel.

The group also reviewed action items from SSG-19 for GSOP:

Action item 28: "WGOMD to discuss jointly with GSOP how to strategically advance 'ocean downscaling' or regionalization of ocean system models". Keith Haines informed the group that some discussion has taken place with Gokhan Danabasoglu, WGOMD co-chair. A suggestion would be to use ocean synthesis data as boundary conditions in models using nesting. Important to note that MyOcean has a regional ocean reanalysis activity.

Action item 29: "WGOMD and GSOP jointly explore why data assimilation and free-running forward models produce significantly 'different' ocean initial states. This is important for several reasons, including the use of these states to initialize decadal prediction simulations." This needs to be further discussed with WGOMD.

Pierre Philippe Mathieu gave a brief overview on WCRP Data Advisory Council (WDAC). The group, which will focus on data aspects for all WCRP projects, has had its 1st Session in July 2012, in Beijing,

China. One of the activities will be an inventory of Essential Climate Variables (ECVs), initially done by satellite based ECV, and subsequently extended to others. Intercomparison activities are also being proposed, and the CMIP framework is a good example to follow. Satellite groups are taking this forward with Obs4MIPS, which is a pilot activity to make observational products more accessible for climate model intercomparisons. Data producers need to submit their data with a consistent format (e.g., CF-compliant format) to that repository if they want to be part of the project. Data have been served via Lawrence Livermore National Laboratory servers. In situ data could be the next step. A closer collaboration between Obs4MIPS and the international community is something that is necessary.

Ocean Heat Content (OHC) is an important variable that should be included in these inventories. However, one issue to be aware of is that the original data used to derive ocean heat content should also be part of the inventory. Also, it would be useful if the WDAC promote the CLIVAR/GSOP intercomparison activity by providing a link on their website.

ACTION: *GSOP letter talking about OHC to Data Council (co-chairs)*

ACTION: *Request Data Council to link the CLIVAR/GSOP intercomparison activity to their website (ICPO)*

2 Observing System Updates

Tony Lee provided updates of some ongoing and upcoming US satellite missions. One update is the status of the Aquarius/SAC-D satellite mission. Active cal/val effort has been undertaken to improve the quality of the Aquarius-derived sea surface salinity (SSS) products by correcting for various effects such as radio-frequency interference, antenna pattern correction, significant wave height, and galactic effects. Science applications of the Aquarius data were highlighted with an example of using Aquarius data to identify new features of tropical instability waves that cannot be identified well by other satellite data such as sea surface temperature and height. Relative biases of Aquarius SSS with respect to Argo SSS in some regions are noted, such as the tropical Pacific under the ITCZ rain band. A working hypothesis is that there is a skin effect under rainy conditions in Aquarius SSS that Argo data cannot resolve because Aquarius sees the top centimeter of the ocean whereas the first depth of Argo measurements is 5 m. NASA will fund specific process studies to examine near surface salinity stratification. Tony Lee also reported that NASA has a new mission called RapidSCAT that will put a QuikSCAT-like scatterometer on the International Space Station (ISS) in 2014. The RapidSCAT will use spare parts from QuikSCAT with a reduced antenna to fit into a module of the ISS. The lower orbit of the ISS and the reduced antenna size gives the RapidSCAT a similar coverage as the QuikSCAT.

Pierre Philippe Mathieu briefed the group on some European satellite missions. SMOS has a new level 3 product launched, which provides a better dataset. CryoSat data has been used recently to give a better estimate of reduction of ice caps. Altimetry data have also been assimilated by the GODAE community, with large international cooperation. At ESA the Explorer Mission have made a funding announcement to member states for missions involving snow, water and biomass. Regarding the Sentinel missions, the European Space Agency pays for the production of the satellite and delivery of good data, and the European Community pays for the operation of the satellite. However, there have been some issues with funding for operations. Sentinel-1 will be launched in September 2013, with Sentinel 2 and 3 under construction. An open data policy has been implemented with free data for all. The issue is the large size of the dataset, so new infrastructure is needed. Synthetic data are available to be used and a call for proposals for CalVal has been launched.

Ken Ando gave a talk on the status of the Tropical array. The TAO array is experiencing significant degradation. It is necessary to enhance international collaborations to sustain it. The current efforts to sustain the array only by two countries, is not a good scheme. It is also necessary to start a discussion for improving measurements on the Pacific TAO/TRITON array to further advance the science. An intercomparison of instruments due to changes in technology and type of buoys should also take place. New technology, new requirements, and new scientific insights will improve the current array. The continuity of the TAO dataset is important from the climate perspective, including ENSO forecasting. A coherent effort with multiple systems (MetOffice, JMA, NCEP, BoM) producing Observing System Experiments (OSE)

analysis should provide some answers to optimize the design and to sustain the system. International coordination is needed in this respect. GSOP can work with OOPC to help coordinate these activities.

It is important to realize that a coordinated OSE is not a trivial exercise and a considerable amount of resources (financial and human) would be necessary. Therefore such activity would only be justified if the activity is coordinated by potential funding agencies to have an impact on planning.

GSOP should contact NOAA Program Manager David Legler to explore a possible coordinated OSE effort with the support of funding agencies such as NOAA (T. Lee). Pending the outcome, GSOP may send a letter to operational ENSO forecasting centers to encourage a coordinated OSE analysis of the impact of the tropical array (or the impact of its degradation or further potential reduction).

ACTION: *Contact NOAA Program Manager David Legler to explore a possible coordinated OSE effort with the support of funding agencies such as NOAA (T. Lee)*

Dean Roemmich gave an overview on the Argo programme. Argo has been a huge success, with the array already fully implemented. Some issues in the past have been the discovery of the micro-leak, a problem in the pressure sensor, which affected 30% of the floats in 2008 and 2009. This has now been corrected. The release of delayed mode data takes around 2 years and there is no way to speed this up. There is a financial reason for that, and also a long cycle of observations is necessary. Remaining challenges for the programme is that there has been a 25% budget reduction for Argo, which was counteracted by longer lifetime of floats. However this budget reduction has impacted the programme as a whole. In addition to that, non-standard measurements (e.g., biogeochemistry) have been trialed and extra-funding is needed so the data becomes part of the array and can be released with the same QC standards.

Weather/climate Prediction Centres and the operational oceanography community need these observations, so they should help advocate to sustain the Argo system. OSE analysis would also be a useful approach. Magdalena Balmaseda mentioned that data from OSEs are available at ECMWF but additional manpower is necessary to analyse these experiments. Some studies have shown the impact of coupling the ocean to the atmosphere in improved predictions of MJO, and there is potential for the ocean coupling to improve the 10-days weather forecast. WGSIP should be able to provide some of the science facts for sustaining the observing system with direct economic impact.

ACTION: *GSOP to request NWP centres to write a statement on the need of high-quality Argo data (M. Palmer, co-chairs)*

U. Send presented an update on the OceanSITES programme. One of the main activities of OceanSITES is to support the "deep ocean observing strategy", as it has been recognized as an important gap in the global ocean observing system. It was decided to make use of the many existing OceanSITES platforms in deep water to make an "instant" contribution towards this need and goal. The aim is to deploy 50 deep ocean sensors within a year, which requires 50 sensors for the initial deployments and another 50 for swapping out and calibrations. This will be done by creating a pool of 50 matching sensor for the swap-outs via donations from institutions, agencies and companies. Several moorings now have BGC sensors, and those have a direct impact on ocean acidification studies. Some sites like Bermuda or HOTS need to reprocess the data due to changes in sensors. SeaBird is interested in working long term on sensor calibration and development.

As part of the discussions during the surface fluxes workshop, computed surfaces fluxes from data collected by moorings from the OceanSITES network, or by the moorings part of process studies, should be available from the programme's servers. The group discussed the value and effort needed to have the computed fluxes on OceanSITES. Raw data and derived products could be served by OceanSITES Data Centres but someone would have to calculate the derived products and submit it to OceanSITES. As it is of interest to have a uniform dataset, data would have to be formatted in the right format. OceanSITES can provide the CF compliance for the metadata. It is important to note that enough metadata should be made available with the dataset so users can make their own judgment.

ACTION: *Request flux community to develop a recommendation for a standard set of calculations so that data could be submitted to OceanSITES servers (co-chairs, L. Yu, U. Send)*

Catia Domingues briefed the panel on the plans for the “Global Ocean Sub-Surface Climate Data” project and workshop. The overall aim is to deliver the highest quality historical subsurface ocean temperature (salinity) data set – along with the most complete metadata information and formal error measurements – to meet increasing requirements for climate change science underpinning 21st century decision and policy-making assessments. Although much has been done over the years to retrieve original ocean subsurface temperature (salinity) data/metadata information and improving quality control procedures, more is clearly needed to fully accomplish the changeover of the historical subsurface ocean observations (originally designed and funded with a focus on short term forecasting) into a seamless record for climate monitoring and prediction. The specific objective of the workshop is to facilitate the coordination of a collaborative project proposal that will help to establish an international community of practice (similar to the Argo data team) who will be at the core of the development of a universal framework to streamline the quality control and data management system of the historical subsurface temperature (salinity) record. Quality control of ocean subsurface temperature (salinity) data is surprisingly uncoordinated between international research institutions with different groups following their own quality control procedures on the same data record; despite the longevity and extent of the record and its importance, particularly now in the context of climate change. The international community needs to move from the currently independent, often duplicated and not so effective automated quality control practices into a more effective and unique system based on semi-automated practices. This new path is only possible if there is a coordinated effort among major data centres around the world. No single group has the manpower and resources to perform this massive job in a timely fashion.

Some suggestions made by the panel were the need to involve more researchers who are examining the need to enhance in-situ systems, as well as IFREMER colleagues. An IFREMER representative, Dr. Karina von Schuckmann, presented an interesting analysis showing areas where the Argo array needs to be enhanced in order to improve the accuracy of the global heat content estimate. Ocean synthesis group, perhaps as the main users, need to be involved in those discussions, and understand how the data is treated so this can have an impact on the assimilation. As a generic point, there is a real need to involve users and to ask for feedback. A comparison of the data with models/synthesis in a regular manner is also an important exercise.

3 Ocean Climate Indices

Karina von Schuckmann gave a talk on ocean climate indicators from in situ measurements. One of the Argo Program’s most important contributions to climate science is an improvement in estimations of heat stored by the oceans and its associated volume changes, which is a key factor for the Earth’s energy budget, to gauge global warming and to gain a better understanding of the mechanisms behind rising mean sea level. Global ocean indicators (GOIs) from Argo are hence a useful benchmark and an important diagnostic to monitor climate related changes. The planetary energy imbalance is an important measure of the changes of Earth’s climate with 90% of the increased heat flux going into the ocean to increase global ocean heat content. Global sea level rise, since it is directly related to ocean thermal expansion and the melting of glaciers and ice caps, is another important GOI. To close both, the energy and sea level budgets, one needs accurate estimations of all terms, especially the ocean component, since it is by far the largest sink of heat in the entire climate system. Observations during the era of Argo have a high potential to deliver accurate data and are used for such analyses. Updated estimation of Argo GOIs for the period 2005 to 2011 reveal a 7-year rate of 0.5 ± 0.1 W/m² (1-standard error) for global ocean heat content, 200 ± 50 km³/year for Global Ocean Freshwater Content and (OFC) 0.4 ± 0.2 mm/year for global steric sea level (SSL). The global sea level budget during the years 2005-2010 is closed within uncertainties, but regional issues remain. We identify a systematic bias introduced by sparse Argo sampling in some parts of the tropical ocean sector, in particular in the Indonesian Archipelago region. However, using sampled altimeter data allows us to reduce this bias and close the regional sea level budget for the tropical ocean. In addition, the development of other potential ocean climate indicators are discussed, including the description of dominant climate modes derived from the vertical hydrographic field, or the estimation of Merdional Overturning Ciruclation variability from the Argo observing system.

Ed Harrison led the panel's discussion on ocean climate indices. There are many reasons to seek to agree, produce and disseminate ocean climate indices. One key issue from the perspective of the global ocean observing community is the need to create a broader awareness of oceanic variability and its impact on society. There could be substantial scientific benefit to increased awareness/understanding of linkages between oceanic anomalies and existing climate indices. There has been much emphasis on 'world ocean' averages for IPCC, but regional signals are larger and merit study. Also, low frequency signals as well as interannual and multi-annual variability can be identified in most familiar climate index time series. Can Ocean Synthesis products contribute to understanding and prediction of these modes of variability? Assuming useful ocean indices can be identified from ocean synthesis products, can we use operational ocean analyses to track these indices to societal advantage?

There are several issues that pose a challenge for the definition of which climate indices would be part of an initial suite. The observing system is still evolving and global data sets may not be complete and 'clean' enough for links to be identified with Climate Modes. A good way forward would be the production of maps of signal/noise ratio, and analysis of these maps could be used to support the decision of which climate indices would be suitable for a more in-depth analysis. The CLIVAR SSG has requested that an ocean indices task team is setup, and a proposal of members and terms of reference are due by the next SSG meeting in May 2013. Some suggested names were Tony Lee and Magdalena (GSOP members), Fabrice Hernandez (link with GODAE community), Yan Xue, Richard Wood and Nathan Bindoff.

ACTION: *Panel to suggest names for members of the Indices Task Team (all).*

One of the tasks for this group should be the identification of what studies have been done and to provide clear definitions of a proposed list of indices. This has to also take into account specific regions like ITF and Southern Ocean. Upwelling is an issue that should be further discussed, although it is not easy to propose a suitable definition for upwelling indices, it is very important due to connections with IMBER and also for the potential societal impact.

However, there is also a strong need of a common dataset, located at a common repository so that data can be easily retrieved and used by different communities. The CMIP process is a good example to follow but it is very work intensive.

Matt Palmer presented some results of the intercomparison of ocean heat content generated by ocean synthesis products, as part of the GSOP/GODAE intercomparison activity. The key objectives are to determine the degree of consistency among the analyses and identify key differences, and to compare the analyses to conventional ocean heat content change estimates that use statistical infilling methods. Analyses show good consistency for the 0-100m layer. This is a useful check and re-assures that there are no gross errors. For deeper layers the analyses begin to diverge. Some products appear to show a large ocean heat content gain (ARMOR3D, ECDA, MOVEC, MOVEG2), perhaps an issue with model "spin-up". It is important to note that not all ocean synthesis groups have submitted their data so this analysis is based only on the data submitted for this activity.

ACTION: *Liaise with ocean synthesis groups to ensure data is submitted for this activity (M. Palmer)*

Magdalena Balmaseda reported to the panel the outcomes of the on-going ocean reanalysis intercomparison project session that happened during the CLIVAR-GSOP workshop on air-sea interaction. The intercomparison project has been organized by the GSOP/GODAE OceanView communities. It was the first time that preliminary results of the intercomparison were presented since the new global-synthesis evaluation initiative started in 2012. The discussion identified the objectives, the methodology, actions and recommendations. The reanalysis intercomparison has three different objectives targeting different audiences, for which different approaches should be used.

- Real time monitoring of climate indices: the first stage is to use an ensemble approach to quantify the signal to noise ratio of selected variables at different time scales (seasonal/interannual/decadal/trends). Knowledge of the spatial distribution of the signal to noise ratio is the first step to define relevant regional indices for climate monitoring. The audience for

these indices could be scientists, government agencies, and commercial enterprises with regional interests.

- Longer-term climate variability and change: The different reanalysis products have different strengths and weakness. For instance, high resolution ocean reanalysis may be more reliable at representing regional aspects and western boundary currents, while high resolution may not be so essential to represent large scale signals. For this reason, the relevant climate questions should be addressed using the most suitable reanalysis products rather than the grand ensemble. A prior validation of a product is recommended before it is used to address questions about the real world. Publicly available objective validation of individual reanalysis products is encouraged, preferably within the peer-reviewed literature. Some of the questions identified include: (i) Global sea level change, especially prior to the altimeter era; (ii) Trends in the vertical distribution of heat and salt; (iii) Transports. The representation of the Atlantic MOC is a good starting point; and, (iv) Water formation (relevant diagnostics to be identified).
- Reanalyses Methodology: The intercomparison should aim at assessing the benefits of high resolution ocean models, the added value of altimeter data, and in-situ quality controlled data sets. It should also aim at identifying dominant sources of uncertainty among the different elements in the reanalysis production (model, forcing, assimilation method, observational data set). It is acknowledged that to achieve this objective additional controlled sensitivity experiments are needed

To carry out a meaningful and efficient intercomparison, interaction between different processing groups is needed, so as to facilitate the exchange of software tools, data, and results. To this end, it is encouraged to have the data in a common repository in CF-complaint format. The existing EasyInit repository can be used to begin with. Ultimately groups are encouraged to share the data with other international projects such as AR5/CMIP5 and Obs4MIPs.

Several recommendations have been made:

1. Coordination with the WGCM/CLIVAR Working Group on Ocean Model Development (WGOMD) on metrics and processes.
2. Intercomparison of results should lead to recommendations as to how to improve the:
 - Observing System
 - Assimilation methods
 - Models and/or surface fluxes
3. Document on the strengths and weakness of each product. Publicly available objective validation of individual reanalysis products is encouraged, preferably within the peer-reviewed literature.
4. Need to identify the sources of uncertainties by conducting controlled experiments: one system but different observational data base, OSEs, CORE-II experiment with/without assimilation, one data assimilation system with different forcing fluxes.
5. Another Intercomparison workshop during 2013. This is vital to maintain momentum as early intercomparisons need to be checked for inconsistencies. Sustained intercomparisons with consistent metrics are needed.

Tony Lee reminded the group that the Integrated Climate Data Centre of the University of Hamburg hosts the EasyInit Project, which contains the Ocean Synthesis/Reanalysis Directory. All groups who are involved with the ocean synthesis intercomparison activity are encouraged to submit their data in there, preferably as CF complaint. MRI data cannot be distributed widely so it would need to be password protected. An

important point made by the group was that Obs4MIPS should be linked to the ocean synthesis activity so that this project can be used to help the intercomparison. The Ocean Indices Task Team requested by the CLIVAR SSG should strongly engage with the synthesis activity. Tony Lee also mentioned the GODAE OceanView Symposium in November 2013 (Washington, DC). The symposium has a heavy emphasis on short-term ocean forecasting and analysis. GODAE OceanView has been collaborating with GSOP on intercomparison, OSEs, and has ongoing discussions with GSOP on developing ocean indices. Some of these elements will be presented in the symposium.

Lisan Yu gave a brief report on some of the outcomes and recommendations of the surface fluxes workshop that preceded the GSOP meeting. Full details will be available in the workshop report to be finalized in 2013. One of the recommendations was to establish a working group to develop the strategy for regional heat/salt budget analysis and regional flux assessment. The flux community does not have a set of metrics and this group would be tasked with proposing regions of interest and timescales to be analysed. This working group should make sure to include members of the ocean synthesis community. There is strong interest from NOAA and NASA that clear activities are defined so perhaps these could be funded.

4. Links with programmes

Toshiyuki Awaji briefed the group on Japan Data Assimilation Activities, including observational topics. One important activity is the analysis of the impact of Argo data towards enhanced climate research. In order to increase the understanding of the dynamical state of the ocean within the present regime of climate change, an adjoint sensitivity analysis with a 4D-var DA system has been used, aiming at identifying key regions for intensive monitoring, thus maximizing the observational resources. The adjoint analysis has enabled to determine an optimal instrumental configuration for the detection of important aspects associated with subsurface water temperature changes. The results have important implications for the application of adjoint data assimilation techniques to the optimal design of global ocean observing systems including Argo deployment. Further work along these lines will enable the design of more effective monitoring networks, and will also enable the identification of optimal requirements for future observing instruments. Another activity developed in Japan was the hindcast/nowcast/forecast of the 2011 March tsunami debris trajectories. The purpose was to construct the most reliable time-series of debris cloud location associated with the tsunami, i.e., reanalysis, nowcast, and forecast data for the debris pathway, by using the leading-edge data assimilation systems, and verify the potential with satellite imagery and in-situ observational reports.

Keith Haines reported on the European COST Action that has been submitted for funding. It is a proposal of a four year project led by Aida Alvera Azcarate from Université de Liège (Belgium). The project has been approved in the first to next stage. If funded, there is potential for results of the intercomparison activity to be assembled. Climate indices and OSE results should also be included in the proposal. One objective would be the publication of white papers that would show the importance of such products. This could lead to more funding for activities.

Pierre-Phillipe Mathieu talked about the GlobCurrent mission. It is part of ESA's Data Exploitation initiative, but size of the budget allocated to it has not been defined. User Requirements are necessary and CLIVAR should provide some comments. Nico Caltabiano has informed all CLIVAR basin panels requesting comments to the GlobCurrent User Requirements.

ACTION: *Renew request to CLIVAR basin panels to provide comments to GlobCurrent User Requirements (ICPO)*

Two topics that have been given high priority by the CLIVAR SSG are knowledge transfer and capacity building. All panels and working groups have been tasked in identifying those activities and proposing new ones on related science issues to the panel. Pierre-Philippe Mathieu is vice-president of the COSPAR Capacity Building Working Group and advised the panel that there is support via COSPAR for training workshops in developing countries, although it would need to include use of satellite data in the training programme. Regarding knowledge transfer, we need better mechanisms to engage more with CLIVAR basin panels in order to provide more insight on GSOP activities, e.g., ocean synthesis intercomparisons.

The panel has also discussed its membership. Toste Tanhua and Toshiyuki Awaji have both resigned from the panel. The panel will discuss names for replacements and suggest to the SSG. One important issue to be considered is that a balance in expertise between Synthesis and Observations is necessary.

ACTION: *Propose names to the SSG as replacement for Toste Tanhua and Toshiyuki Awaji.*

Appendix 1: Agenda

Friday 30 November 2012

Afternoon

- 13:30 Welcome (L. Yu)
Agenda and Charge to the meeting (K. Haines)
- 13:45 Review of GSOP-5 action items (N. Caltabiano)
- 14:15 SSG-19 report and WCRP/CLIVAR re-structure (K. Haines)
- 15:00 Break
- 15:20 Report and summary of surface fluxes and ocean synthesis workshop (L. Yu / K. Haines)
- 15: 50 Report of reanalysis workshop in May 2012 (TBD)
Observing system updates:
- 16:20 Satellites (T. Lee / P-P. Mathieu)
- 16:30 Tropical Array (K. Ando)
- 16:40 Argo (D. Roemich)
- 16:50 OceanSITES (U. Send)
- 17:00 Coordination of a Framework to assess **impact of the observing systems on important climate research, modeling, prediction, and assessment activities**
- 17:30 End of day

Saturday 1 December 2012

- 8:30 Science talks on GSOP foci topics
Science talk 1: ocean climate indices (K. von Schuckmann)
Science talk 2: TBD
- 9:00 Discussion on Ocean climate indices (E. Harrison/K. von Schuckmann)
- 10:00 CLIVAR/GODAE OceanView synthesis product intercomparison: the way forward (M. Balmaseda)
- 10:30 Break
- 11:00 Interaction with Integrated Climate Data Center (ICDC) Ocean Synthesis directory (EasyInit) (T.Lee)
- 11:15 Interaction with other programs:
GODAE OceanView (including the 2013 coupled assimilation workshop)
IMBER
Others?
- 12:00 Knowledge Transfer and Capacity building (INCOIS example)
- 12:30 Panel Business – Membership, Future meetings.
- 13:00 End of Meeting

Attendees:

Keith Haines

Tony Lee

Toshiyuki Awaji

Magdalena Balmaseda

Catia Domingues

Pierre-Philippe Mathieu

Matt Palmer

Lisan Yu

Dean Roemmich

Uwe Send

Ed Harrison

Karina von Schuckmann

Ken Ando

Nico Caltabiano