PROJECT REPORT

Report of the seventeenth session of the Working Group on Seasonal to Interannual Predictions (WGSIP)

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SMHI

PRESENT: Adam Scaife (Co-chair), Francisco Doblas-Reyes (Co-chair), Swadhin Behera, George Boer, Mihaela Caian, Michel Deque, Ralf Doescher, Laura Ferranti, Kean Foster, Jaiho Ho, Jee-Hoon Jeong, Arun Kumar (remotely), Bill Merryfield, Ousmane Ndiaye (remotely), Yvan Orsolini, Andy Robertson, Ramiro Saurral, Akihiko Shimpo, John Shonk, Laurent Terray, Mickhail Tolstykh, Adrian Tompkins, Klaus Wyser, Tamaki Yasuda

WMO Secretariat: Michel Rixen

1. Introduction

a. Welcome, introductions, objectives of the meeting and approval of the agenda

Co-chairs welcomed all participants and thanked them for attending this joint session. A quick round table allowed everyone to introduce themselves. They recalled the primary objectives of this session to review progress on the sub-projects, to discuss WCRP decadal efforts and their relationship to WGSIP, and to review the future of WGSIP range of activities in that context. The agenda was adopted without any substantive changes.

b. Welcome address – SMHI

Ralf Doescher provided a short introduction to SMHI which has 6 research departments including climate research, highlighting the importance of seasonal to decadal predictions for Sweden which gets 50% of its energy from hydro-power. He noted that SMHI is contributing actively to EC-Earth and regional modeling.

c. WCRP JPS update

Michel Rixen provided a short update from the WCRP secretariat, highlighting a number of changes in the Joint Planning Staff, the current budget issues caused by decreasing national contributions. He briefly reported on the JSC36 session which decided to put on hold the Grand Challenge on Regional Climate until a clearer vision is being developed and to establish a Grand Challenge on Decadal Predictions. The JSC also suggested the development of a Data Prize. The WCRP Modeling Advisory Council (WMAC) initiated jointly with WWRP an International Prize on Model Development awarded annually (deadline 1 Oct 2015 this year) and a summer school on model development, help at MPI this year. WMAC encourages all WCRP Working Groups to meet jointly in 2017. WMAC recommended the WGSIP initial shocks initiative as the first steps of a possible Transpose-CMIP initiative in

the future. He concluded by outlining the priorities for this session and thanked SHMI warmly for hosting the meeting.

Attendees expressed concerns about the current WCRP funding situation and opportunities to tap into GFCS or Future Earth support. Alternate funding sources were briefly explored.

d. Review of WGSIP16 actions

WGSIP16 actions were reviewed and integrated were appropriate in the new WGSIP17 actions detailed in ANNEX B.

f. JSC36, Grand Challenge and WMAC4 updates

Adam Scaife presented a summary of outcomes from JSC 36. These include encouragement of the GC on extremes to make use of the CHFP database as it was felt that extremes analysis could make more use of ensemble forecasts. A second action was for WGSIP to engage more with WMO commissions such as the Commission for Climatology to formalize quasi-operational decadal forecasts and this is now a component of the forthcoming grand challenge on near term prediction. Finally there was much discussion about the JSCs request to consider combining DCPP with WGSIP and perhaps change the remit and name of WGSIP to reflect its agenda across timescales from sub-seasonal to decadal. The outcome was to keep the WGSIP acronym and maintain individual status for DCPP as it was felt the group would otherwise be too large.

It was agreed that WGSIP has a focus on seasonal stationary teleconnections whilst S2S has more start dates and can look at transient developments of teleconnections. It was suggested to increase the links between S2S and the Grand Challenge on Extremes.

g. Revised mission and name for WGSIP

As an introduction to further discussions at the end of the session, Francisco Doblas-Reyes outlined the rationale for revising the mission and name for WGSIP and respond to the JSC request to explore options for how decadal efforts (DCPP, DCVP, Grand challenge on Long-Term Climate Predictions), which have reached a critical mass, fit into the WCRP structure, stressing the need for a seamless approach across time scales, the emergence of GFCS, the current pressure on funding.

Several suggestions for new WGSIP names were made, including "WG on Climate Predictions" (but not recommended by WGCM), "WG on Initialized Climate Predictions", ...
Some concerns were expressed regarding a straight merge of WGSIP and DCPP, which would become too big. It was also proposed to clarify the mandate details of any new name in the ToRs and to ensure the structure of WCRP can be easily described by a block diagram. Some expressed a strong view for a new WG dealing with decadal time scales, others regarding the pre-mature nature of decadal predictions for climate services.

2. WGSIP Projects

Briefers were invited to include a review and progress to date as well as specifics on planned joint analysis with the aim to agree on multimodel diagnostics and timescale.

a. Drifts and shocks

The initial phase of the WGSIP Shock/Drift project and some first results were described. The co-leads of the project are W. Merryfield (focusing on seasonal and decadal predictions) and M. Tolstykh (focusing on subseasonal predictions including transient behavior in the first few days). It has been proposed to name this project "LRFTIP" for "Long-Range Forecast Transient Intercomparison Project". (Long-range forecasts are defined by the WMO to encompass ranges from 30 days to two years: http://www.wmo.int/pages/prog/www/DPS/GDPS-Supplement5-AppI-4.html ; here ranges up to year 10 are considered so as to include decadal predictions.) The project will encompass (i) development of a freely accessible archive of hindcast climatologies for a range of climate variables and timescales (annual, monthly, daily), (ii) related science investigations on the influence of different initialization methods on transient behavior of climate system components and any impacts of such on climate forecast quality. A possible additional stage will be (iii) hindcast experiments using the same model but different initialization methods that will contribute to (i) and inform (ii). The archive structure and file names will adhere to CMIP5 standards, and will include where available equivalent climatologies based on the model runs or reanalyses used to provide hindcast initial conditions, as well as freely running (ideally CMIP historical) simulations in order to establish the "endpoints" for forecast transient evolution. Some preliminary results were shown that included transient evolution of equatorial Pacific SST, Atlantic meridional overturning, and local daily precipitation for various forecast models.

M.Tolstykh discussed possible ways to study drift and shock problem at subseasonal scale. It is proposed to analyze daily data for selected fields during first forecast month produced by coupled models extracted from existing databases such as CHFP, ENSEMBLES, NMME Phase 2 and

ongoing S2S projects. The data for tropical Pacific, tropical Atlantic and North Atlantic can be studied. Some preliminary plots of daily precipitation and downward radiation flux components using the S2S database were shown.

Concerns about the different initial dates in the S2S protocol were expressed. IRI offered to contribute to the sub-projects but would need funding.

It was proposed to advertise the sub-projects in EOS, on the WGSIP web page, to present them at the next WGNE session and also at the next WGNE Systematic Error workshop.

b. SNOWGLACE

This initiative is co-lead by Y. Orsolini (Norway) and by J.-H. Jeong (South Korea). Recent observational and model studies on the influence of the autumn Eurasian snowpack on subseasonal-to-seasonal predictability and on forcing of atmospheric teleconnections have motivated the SNOWGLACE initiative. Following the highly successful international GLACE initiative aimed at assessing the soil moisture impact on subseasonal-to-seasonal forecasts in the warm season, SNOWGLACE aims to quantify the snow impact in the cold season. More precisely this initiative will evaluate how individual state-of-the-art dynamical forecast systems vary in their ability to extract forecast skill from snow initialization. Multi-model seasonal (about 3-month) simulations covering over a decade (2004-onwards), with either realistic or else climatological snow conditions, and start dates throughout fall to spring are planned. A potential important application is to determine how the snowpack contributed to maintain the exceptional negative NAO phase during the recent cold winters over Eurasia. Another potential important application is to assess the impact of springtime Eurasian snow on the summer Indian monsoon onset or on the East Asian monsoon. These experiments would be relevant both for the assessment of forecasting skill but also for attribution of climate variability and extreme events to snow forcing, and also for subseasonal-to-seasonal predictions during YOPP.

The impact of El-Nino on delaying the monsoon onset was discussed. It was mentioned that snow will be assimilated in some SPECS experiments. Jee-Hon mentioned that the October snow and ice cover can be used as a predictor for DJF Arctic Oscillation (and potentially NAO). The broader question of empirical forecasting in WGSIP and the risk of overtuning a method was raised. There are currently no plans to use the S2S database in SNOWGLACE.

c. Teleconnections

Adam Scaife presented some analysis of tropical rainfall, Rossby waves and teleconnections. Until recently there has been little success in predicting the extratropical atmospheric circulation on seasonal timescales. Improvements

in some climate prediction systems have recently lead to skillful predictions of winter circulation months ahead and Adam showed investigations of the role of the tropics in this new found predictability. He showed high levels of prediction skill in tropical rainfall, particularly in the Pacific but also in the Indian and Atlantic Ocean basins. Rainfall fluctuations in these basins drive clear signatures in tropical and extratropical atmospheric circulation that are approximately symmetric about the equator. He showed how these can be explained as steady poleward propagating linear Rossby waves and that tropical rainfall provides a sizeable fraction of the prediction skill in extratropical winter climate out to a season ahead.

Laura Ferranti then presented the concept note developed for the sub-project.

It was noted that many studies use similar approaches, e.g. via the divergence field and that identifying a list of essential variables for future databases could be useful. Summer teleconnections would be harder to investigate because of fewer rays available. Tropical rainfall forecast was suggested as another worthy case to investigate. Also relevant to the S2S teleconnection sub-project.

3. Modeling centers update

Briefers are invited to focus on updates since the last session and to cover Global Producing Centers and Lead Centers matters as applicable.

a. CIMA

Ramiro Saurral recalled that CIMA operates as the lead center on atmospheric and oceanic research in Argentina, and one of the top centers in South America. Currently, it hosts more than 25 scientists, 35 PhD students and Post-docs, and close to 10 technicians and IT. The main activities of the center rely on atmospheric and oceanic modeling, although CIMA is still limited in its computational resources to develop long-term coupled climate runs.

Research at CIMA close to the WGSIP area of interest includes sub-seasonal to seasonal climate prediction (particularly, precipitation and temperature) over South America, as well as the analysis of skill of decadal climate predictions and their potential utility in assessment of changes in water availability and supply. Both areas of research are very active at the center and include collaborations with other research centers around the world such as IC3, ICTP and IRI, among others.

Near-term improvements in the computational resources at the center are expected to permit developing climate predictions which would improve the center's visibility within the global climate community.

It was noted that CIMA still runs uncoupled runs and is not planning to submit contributions to CMIP6.

b. CNU/Korea

Jee-Hoon Jeong stressed that East Asia and North America experienced cold winters in recent years but were poorly predicted by dynamical models. The KMA-CNU-POSTECH team recently found that the harsh winters were associated with warm conditions over the Arctic Ocean; cold winter temperatures in East Asia and North America followed warm temperatures in the Barents-Kara Sea and East Siberian-Chukchi Sea region by a week or two, respectively. Climate models participated in CMIP5 and CHFP have the ability to capture this arctic-multitudes connection. This understanding may help to improve the seasonal prediction of winter weather in these regions.

The KMA- UK Met office Joint seasonal forecasting system, which is based on GloSea5 UKMO model, is being used for seasonal climate prediction of KMA. To improve relatively low skill over continental interior, the KMA-CNU-UNIST team tested the impact of soil-moisture initialization on GloSea5 by performing hindcast experiments with/without soil-moisture initialization. Considerable skill increase in SAT forecasts over Europe and North America was found when the model was initialized by the realistic soil moisture.
(APCC update) APCC began to produce monthly-rolling deterministic and probabilistic multi-model ensemble (DMME & PMME) predictions in 6 month lead from late 2013. The skill of APCC's DMME outperforms individual contributing model and PMME skill is comparable to WMO lead centers' MME. In July 2013, APCC started producing multi-model subseasonal forecasts of BSISO (Boreal Summer Intraseasonal Oscillation).

KMA does not have a decadal effort so far. The question of near real-time soil moisture initialization was posed and it was noted that ERA-Interim does not provide such operational field.

c. ECMWF

Laura Ferranti noted that research at ECMWF is focused on forecasting system development and on advances in science and innovation. These developments of NWP forecast models and assimilation methods have the overall goal of improving forecast skill for both weather and climate applications.

Forecasts for the extended range will be improved through a continued enhancement of the resolution in both atmospheric and ocean model components. A particular focus area for extended range forecasts is the lower stratosphere and upper troposphere region. The present modeling system appears to damp disturbances propagating from above and thus limit the forecast skill in the troposphere on monthly and seasonal time scales.

Nevertheless, we have seen considerable enhancements in the monthly forecasting skill over the past decade and there is ample evidence to suggest that further advances can be made with model and data assimilation improvements. In addition the ensemble estimation of forecast errors should be directed towards a better determination of those flow situations where the forecast model is likely to give a good forecast in the extended range compared to situations where the flow is inherently less predictable.
As a part of the ECMWF contribution to the FP7 SPECS project, specific attention will be devoted to the impact of changes in the formulation of land-surface and stratospheric processes, the uncertainty associated with the relevant parameterizations and the specification of the initial state. Aspects to be investigated under SPECS include soil moisture, snow cover, vegetation, solar variability, ozone, volcanic and tropospheric aerosols.
Another important area of investigation regards the alleviation of the systematic errors in tropical rainfall and low-level wind, which affect predictions of ENSO, monsoons and teleconnections from the tropics to the extratropics. Since these errors develop at a rather early stage of the coupled forecasts, and are already evident during the second month of the model integration, substantial benefit is expected from coordination of the experimental and diagnostic work performed on the sub-seasonal and seasonal scales.

Data assimilation to improve the stratosphere analysis at ECWMF is still a research activity and it is unsure when and how this could become operational.

d. Environment Canada

Bill Merryfield outlined the main characteristics of Environment Canada (EC's) Canadian Seasonal to Interannual Prediction System (CanSIPS) which remained unchanged from WGSIP16. It is a two-model system based on coupled climate models CanCM3 and CanCM4, with 10-member ensembles from each model. CanSIPS provides the GPC Montreal contribution to the WMO LRF MME, and also contributes to the North American Multi-Model Ensemble (NMME) and APEC Climate Center seasonal forecast compendia. Decadal forecasts from CanCM4 contribute to the UK Met Office decadal forecast exchange.
Current predictions indicate that this year's El Niño will likely peak slightly lower than the 1997-98 event, although there is some overlap between the two plumes. At longer range, ensemble mean SST indicates an initial onset of La Niña conditions by JJA 2016. New products include a range of SST and other climate indices recommended to be produced by GPCs at the March 2014 meeting of ET-OPSLS. Hindcast skills are relatively high for the Pacific Decadal Oscillation in all months, and for the Indian Ocean Dipole in fall when it is most active. Ongoing work on verification of snow water equivalent (SWE) indicates relatively high skills that are partly, though not entirely, attributable to anomaly persistence.
Two new models are currently under evaluation for inclusion in CanSIPS: CGEM, consisting of EC's GEM weather prediction model coupled to a

NEMO/ORCA1 ocean, and CCCma's CanESM4.1 Earth System Model. In addition, experimental downscaling of global forecasts to 25km horizontal resolution on the CORDEX North America grid is being undertaken using the CanRCM4 regional model.

It was noted that dynamical downscaling is performed on all ensemble members, and would be straightforward to implement in real time. SST is specified from the global model, whereas land variables including Snow Water Equivalent are initialized through the response of the CLASS land component to the assimilating RCM atmosphere.

e. IC3-BSC

Francisco Doblas-Reyes presented the Climate Forecasting Unit of the Institut Català de Ciències del Clima (IC3, Barcelona, Spain) which carries out work on climate prediction at sub-seasonal-to-seasonal time scales using the EC-Earth forecast system with a global resolution of around 25 km and the operational and quasi-operational datasets generated by many other centres. The research unit is merging in 2015 into the Department of Earth Sciences of the Barcelona Supercomputing Center (BSC) to create a structure that includes groups working on climate prediction, computational efficiency and Big Data, and climate services. Satisfying the requirements from a range of users is a main driver of the department activity.

It was noted that land surface initialization offers substantial and consistent improvements over Europe, but has no impact over Asia. Increased resolution improves ENSO prediction skill, irrespective of the verification data set.

f. ICTP

Adrian Tompkins provided a short update on recent and upcoming meetings and training events sponsored by ICTP, including:
- ICTP-CLIVAR workshop on decadal variability and predictability, 16-24 Nov 2015, ICTP
- S2S training school, ICTP Nov 23-Dec 7 2015
- Summer school on climate system prediction and the deliverable of actionable regional climate S2S and seasonal in Dakar, ANACIM, fall 2016

He then updated the WG on climate and health prediction efforts at ICTP in collaboration with JAMSTEC and IRI.

g. INM RAS

Mikhail Tolstykh gave an update on operational seasonal forecast system based on SL-AV model at Hydrometcentre of Russia since the previous

WGSIP session. The model with the horizontal resolution 1.125x1.4 degrees lat-lon and 28 vertical levels participates in the ongoing S2S project. Some improvement in error metrics was demonstrated. The next version of the SL-AV model for long-range prediction having higher horizontal resolution (0.72x0.9 degrees lat-lon) and more accurate shortwave and longwave radiation parameterizations undergoes preoperational tuning. The new version already shows positive results.
Plans for decadal prediction at the Institute of Numerical Mathematics Russian Academy of Sciences with the INMCM model participating in CMIP experiments were presented.

h. IRI

The update from IRI by Andy Robertson summarized real-time seasonal forecast system development, IRI Data Library map room development, and CPT development. A new 1-tier seasonal forecast system is being developed, based largely on the NMME. The Flexible Format seasonal forecast map room was highlighted as an innovative IRI product for communicating a probability forecast in a more user-tailored way, by allowing the user to specify a decision-relevant threshold of the forecast distribution. IRI has also been developing re-calibrated ENSO plumes. On the data front, the project "Enhancing National Climate Services (ENACTS) in Africa" is developing new satellite-gauge high-resolution rainfall datasets in partnership with individual National Met Services (Ethiopia, Rwanda and Tanzania so far). New features of IRI's Climate Predictability Tool (CPT) include a new data download interface for observations, reanalysis, GCM output.

The discussion noted that these products are limited by the quality of their ingredients and that skill may directly depend on ENSO on which skill may need to be normalized or segmented upon.

i. JMA/MRI

Tamaki Yasuda presented the new seasonal prediction system JMA/MRI-CPS2 (JMA/MRI-CGCM2) and new ensemble initialization system for seamless prediction

JMA operational seasonal prediction system has been updated in June 2015. The new system includes enhanced horizontal and vertical resolution both in atmosphere and ocean. New sources of predictability such as global ocean, stratosphere, sea ice, greenhouse gasses are incorporated. In the new system, initial conditions for atmosphere, land and ocean are upgraded. Many improvements of seasonal predictability skill have been achieved.

As one of activities of MIROC group which is another Japanese modeling group for CMIP6 (see slides from Masayoshi Ishii), a new ensemble Initialization system for seamless climate prediction is developing. The system

consists of CGCM and EnKF and is configured specifically for long-term climate reanalysis from 1850 to present. Some examples of preliminary run show that the new system can present similar patterns of atmospheric variables with ERA-Interim. This system will be used for seamless prediction at MIROC and JMA/MRI for CMIP6.

He subsequently indicated that skill plots for NAO predictions are not yet available.

j. JAMSTEC

Swadhin Behara noted that the SINTEX-F model predicted a strong El Nino in 2015. The model was predicting the El Nino event from the beginning of the year and the indications of a strong El Nino was clear from the predictions initiated in May. The impact of the El Nino on Indian summer monsoon rainfall is particularly pronounced in central and western parts of the country. The El Nino teleconnection is also seen to other parts of the world. In a process study it was found that the recent surge in number of Ningaloo Nino events (off Western Australia), perhaps associated with decadal changes in the tropical Pacific, helped to improve the dynamical predictions of rainfall over Western Australia. The decadal peaks in SST anomalies south of South Africa are also seen to be affecting the rainfall variability of southern Africa. It is found that the air-sea interactions in southern Atlantic and Indian Oceans are important to maintain those decadal peaks in southern Indian Ocean.
In a climate application study, WGSIP panel members Swadhin Behera and Adrian Tompkins are collaborating to develop an early malaria warning system for southern Africa based on the VECTRI malaria model and SINTEX-F climate model.

The discussion noted the IOD interference in the Indian Ocean, the cold SST bias over the Maritime Continent and the GLOSEA dry Indian monsoon bias.

k. NCEP

Global Producing Center (GPC) Washington's current dynamical seasonal prediction is based on the National Centers for Environmental Predictions (NCEP's) Coupled Forecast System (CFSv2). The CFSv2 is run operationally at the NCEP and has been operational since March 2011.

The atmospheric component of the CFSv2 is the NCEP Global Forecast System (GFS) with a horizontal resolution of T126 (~100 km) spectral truncation. There are 64 vertical levels in the atmospheric model with the top level at 0.26 hpa. The oceanic component of the CFS is the GFDL Modular Ocean Model V.4. The domain of MOM4 is almost global extending from 74S to 64N. The meridional resolution of the ocean model is 1/4 Degree between 10S and 10N, and gradually increases in the extratropical latitudes becoming fixed 1/2 degree poleward of 30oS and 30oN. The zonal resolution is ½ degree. The CFSv2 configuration of MOM4 has 40 layers in the vertical

with 27 layers in the upper 400 meters. The vertical resolution is 10 meters from the surface to the 240 meters depth.

Hindcasts and forecasts for CFS.v2 are initialized from the Climate Forecast System Reanalysis (CFSR). The CFSR is the latest version of the NCEP climate reanalysis with the first guess from a weakly coupled atmosphere-ocean model consisting of the NCEP global forecast system (GFS) for the atmosphere and the Geophysical Fluid Dynamics Laboratory Modular Ocean Model version 4 (MOM4) for the ocean (Saha et al. 2010). In the CFSR the atmospheric component (GFS) is run at a horizontal resolution of T382 (~38 km).

For calibrating real-time prediction, an extensive set of hindcasts is available. For CFSv2 seasonal hindcasts, four runs for nine target months were made every five days starting January 1st without considering Feb 29 in leap years. The real time forecast configuration includes four-daily runs for 10 months, and forecast is constructed based on a 40-member lagged ensemble comprising of latest seasonal forecasts from past 10 days.

The data from hindcasts and the real-time forecasts is freely available. Instructions for downloading the model data can be found at:

http://cfs.ncep.noaa.gov

Forecasts are displayed in real-time at:

http://origin.cpc.ncep.noaa.gov/products/people/wwang/cfsv2fcst/

l. NMME

The North American Multi-Model Ensemble (NMME) research initiative has been an ensemble forecast system to improve sub-seasonal-to-seasonal (S2S) forecasts based on major coupled global models from US and Canadian centers. Currently seven seasonal forecast systems participate in NMME. The NMME system has been providing real-time seasonal forecasts since August 2011. The NMME 30-year reforecast data are archived and available to the community for research and applications. After a positive project review in September 2014, NOAA is considering including the experimental NMME-Phase II seasonal forecast system as part of its operational suite starting summer 2015.

Important societal decisions rely on skillful forecasts on S2S timescales (i.e., lead times from 3-4 weeks to as much as 9-13 months) and require higher spatial and temporal resolutions than the current seasonal forecasts. The current NMME-Phase II system has been developed and tested as a seasonal forecast system providing forecasts on a monthly basis, although daily data are provided in order to examine higher order statistics. Preliminary research has been done to test an NMME protocol as applicable to

subseasonal probabilistic quantitative prediction. It is a natural next step to explore the potential design, benefits and feasibility of a subseasonal NMME-type prediction system.

Towards exploring the feasibility of an ensemble prediction system for weeks 3-4 time-scales, a workshop was organized was organized at NCEP, 30-31 March, 2015. The workshop brought together the research community, operational forecasters, and stakeholders to explore opportunities and feasibility to evolve the current seasonal NMME-Phase II system into a system able to meet operational requirements and user needs for shorter lead times of several weeks, and to design the protocol and experiments for a potential NMME subseasonal forecast system.

Further information about NMME is available at

http://www.cpc.ncep.noaa.gov/products/NMME/

m. Météo-France

Michel Déqué recalled that Météo-France has been involved in the EUROSIP consortium for more than 10 years, and has been running its system 4 since 2012. In the framework of FP6-SPECS we have tested various improvements in our system, and compared with our partners' results. We have defined a new system 5 with the following improvements:
- doubling horizontal resolution (from T127 to T255)
- tripling vertical resolution (from 31 to 91 levels) with inclusion of prognostic ozone and QBO parameterization
- improving the soil scheme
- replacing climatological sea-ice by GELATO sea-ice model, including initialization
- replacing lagged initial conditions over 10 days by stochastic perturbations (with two start dates separated by one week)

The new system is 20 times more expensive in computation time. The reward is that a majority of month 2-4 robust scores are (slightly) improved and a minority is (again slightly) degraded. Beyond month 4, the Nino3.4 correlation is improved in two seasons and not degraded the other two.
As far has decadal forecast is concerned, we have conducted recent researches on the benefit of an improved stratospheric resolution (with a positive impact till year 3), but this activity is diminishing at the expense of intraseasonal activities. We participate in the S2S grand ensemble since May 2015 with the same model as system 5 for EUROSIP, but with start dates on 1st and 15th of each month in the hindcasts, and start dates to be agreed upon for real time for the forecasts (for the moment, on 1st of each month)

It was suggested to try other ocean analyses too. NEMOVAR offers a slight advantage in SPECS simulations.

n. NILU

Yvan Orsolini presented some of recent research projects and activities in Norway that are relevant for seasonal-to-decadal prediction. A first project (EPOCASA) led by the Geophysical Institute at the University of Bergen aims to develop the Norwegian Climate Prediction model (NorCPM) (http://www2.bjerknes.uib.no/pages.asp?kat=186&lang=2). NorCPM is based on the Norwegian Earth System Model (NorESM), and in addition incorporate appropriate initialization techniques for the land, ocean, sea ice and atmospheric model components. The project main focus is the North Atlantic and Arctic regions.

Another project funded by the Research Council of Norway over the period 2012-2015 is NORINDIA, a joint project of bilateral collaboration between Norway and India, focusing on the monsoon prediction and its impact on the hydrological cycle. In particular, the impact of the springtime snowpack over the Himalaya-Tibet region onto the Indian summer monsoon onset was analyzed, and showed that a thick snowpack delays the monsoon by a week, and that appropriate initialization of the snow over the region accounts for half of the delay.
Other activities deal with the melting of Arctic sea ice and its links to the atmospheric circulation. Focusing on summer months with high sea ice melt rates, we demonstrated that, in these months, there are fewer storms, less precipitation and snowfall over the Arctic, and on the other hand, enhanced precipitation and cloudiness over northern Europe, bringing wet summer weather.
Another activity concerned subseasonal-to-seasonal prediction of summertime climate and precipitation over the far-east. It was shown that wave trains emanating from the North Atlantic and propagating eastward across Asia are important for summertime monthly forecast of precipitation over China, and that failures of forecast models to predict extreme precipitation events and floods partly arise from the inability to represent these wave trains beyond the medium-range time scale.

The importance of land in driving temperature gradient for storm track over the North Atlantic was discussed. It was recalled that the Blanford Hypothesis suggests that Winter/Spring snow cover in the Himalayas mountain region has an inverse relationship with June-September Indian rainfall.

o. SNWS (ANACIM)

Ousmane Ndiaye informed the group that ANACIM (SNWS) is hosting a Severe Weather Forecasting Demonstrating Project (SWFDP) meeting in Dakar during the first week of November. ANACIM is seriously considering hosting a West Africa SWFDP. This has been already expressed to the assembly of African region (AR-I) meeting in Praia, Cape Verde in early 2015.

p. UKMO

Adam Scaife presented an update on the Global Seasonal Forecast System 5 (GloSea5), a fully coupled model (Atmosphere-Land-Ocean-Sea Ice) benefiting from Met Office wide model development with KMA and BoM for weather and climate. He also presented the new Met Office Decadal Climate Prediction System (DePreSys3).

The discussion highlighted the need to back test a prediction system and to be cautious about announcing skill levels.

4. Decadal Climate Prediction Project

a. The Decadal Climate Prediction Project

G. Boer presented a review of the origin and current status of this Project. In particular, a decadal climate prediction Panel was the outgrowth of efforts associated with the CMIP5 decadal prediction component. The Panel organized the very successful International Workshop on Seasonal to Decadal Prediction (Toulouse, 2013) as well as a special session at the SPECS/MiKlip Workshop (Offenbach, 2015) and, most recently the "AGCI Workshop, Decadal Climate Prediction: Improving our understanding of processes and mechanisms to make better predictions" (Aspen, 2015). These and other efforts have led to the refinement of the DCPP which is concentrated around three themes:

- *Component A, Hindcasts*: the design and organization of a coordinated decadal prediction (hindcast) component of CMIP6 in conjunction with the seasonal prediction and climate modelling communities
- *Component B, Forecasts*: the ongoing production of experimental quasi-operational decadal climate predictions in support of multi-model annual to decadal forecasting and the application of the forecasts
- *Component C, Predictability, mechanisms, and case studies*: the organization and coordination of decadal climate predictability studies and of case studies of particular climate shifts and variations including the study of the mechanisms that determine these behaviours. Initial attention is paid to understanding accelerated and retarded rates of global temperature change as well as the effect of volcanoes on decadal predictions.

The DCPP is a "CMIP6-endorsed" project and the relationship with CMIP was reviewed. In particular the DCPP looks to CMIP to coordinate "infrastructure and standards" for data retention and provision, via the Earth System Grid, as well as the availability of historical and future scenario forcing data. Finally, the proposed timeline for the DCPP, in conjunction with CMIP6, was briefly reviewed.

The Component A and B decadal prediction experimental protocol is asking for a minimum of 5-year runs with 10-year runs as an option for those who can afford it. Approaches to initialization and ensemble generation are left to the choices of the modelling groups. The inclusion of anthropogenic aerosols in the experiments is based on the modelthe modeluns with 10-year run as an option for those who can afford it. Approaches to initialComponent C includes pacemaker runs where it is important to avoid possible unphysical/unrealistic states of climate which might compromise the use such experiments for detection and attribution. CMIP will rely on ESGF which is currently down. It was suggested that IRI could be a good platform to reach out to end-users, as this is already done for seasonal forecast.

b. Grand Challenge on Decadal Prediction

Adam Scaife presented an outline of a new Grand Challenge which he and Yochanan Kushnir are leading on behalf of WCRP into Near Term Predictions from a season to a decade ahead. The draft plan for this new grand challenge includes: Synthesis of background Research, Uncertainty and how to present it and the Communication and delivery of Near Term Climate Predictions. A group of international experts has agreed to form the panel for this Grand Challenge and the four activities identified so far are to: 1) Produce a white paper (in e.g. EOS, BAMS, Science overview etc.) that announces the creation of a WCRP GC on Near Term Climate Prediction, its motivation, aims and research activities. 2) Produce some standards for near term predictions in collaboration with WMO Expert Team and consider how to make it seamless with long-term projections. 3) Finalize and achieve WMO recognition for real-time decadal predictions. 4) Initiate and issue a real-time Global Decadal Climate Outlook once each year. A white paper is being written.

The discussion highlighted the general idea to initiate this pilot effort internally first, to test the procedure and see what value this effort can provide before any transition to a more operational effort. Attendees expressed contrasting views on the need to wait until better models are coming on-line. Some suggested masking out regions where hindcasts do not show any skill.

5. CBS/CCl/CAgM links

a. Introduction to CCl and Global Seasonal Climate Update

Akihiko Shimpo provided an introduction to the WMO Commission for Climatology (CCl) including its current structure decided at the 16th session of CCl held in 3-8 July 2014, Heidelberg, Germany, and briefed the Joint CCl-

WCRP Statement 2014 which is created at the joint session of WMO CCl and WCRP JSC organized in the WMO Technical Conference on Climate Services – Building on CLIPS Legacy, in conjunction with CCl-16 and WCRP JSC-35. He also introduced a current status of the development of Global Seasonal Climate Update (GSCU). WG members provided comments on the latest version of draft GSCU, which will be considered by the CCl Task Team on GSCU for its improvement.

The GSCU currently provides only 3 months averaged anomalies and is targeted at WMO members. Adam Scaife noted that the Grand Challenge on Long-Term Climate Prediction would like to develop something similar in pilot mode and welcomed CCl involvement. The Joint WCRP-CCl statement of 2014 could be referenced in this context. Some coordination would be necessary to avoid possible duplication of efforts. Concerns were expressed regarding the RCOFS/RCC access to GPC and Lead Center's platforms and possible contradicting services drawn from different access rights.

b. Subseasonal Forecast Exchange and ET-OPSLS update

Laura Ferranti updated WGSIP on the exchange of real-time sub-seasonal predictions: The XVI WMO congress (2011) requested the LC_LRFMME to explore the possibility of extending its role to include the sub-seasonal predictions. In order to develop a real-time multi-model pilot display at the LC-LRFMME, the CBS/CCl ET on operational predictions from sub-seasonal to long time scales (ET-OPLSL) in collaboration with the WWRP-THORPEX-WCRP research project S2S initiated an exchange of real-time predictions between the S2S archive and the LC-LRFMME. It was agreed that the operational centers participating in the S2S project would send their real-time forecasts to ECMWF, and ECMWF would impose the agreed 3-week delay on public release of the forecasts, but allow LC-LRFMME access to an agreed subset of the data for use in preparing a display of real-time forecast on their website. On the 6th May the S2S data portal was opened and since then ECMWF has supported the exchange of the real time data to LC-LRFMME.

ECMWF provides the infrastructure for the real-time exchange but the availability of data depends on the participating centers. So far, five centers (ECMWF, Exeter, Washington, Seoul, and Tokyo) have agreed to the data transfer from the S2S archive to LC-LRFMME without the 3-weeks delay.
It is the LC-LRFMME responsibility to access only the data provided by the participating centers. The data exchange includes: SST, T2m, precipitation, u200, v200, u850, OLR. The LC-LRFMME display will be reviewed by the ET-OPLSL and, depending on the outcome of the review, the LC-LRFMME will give access to WMO users (e.g. RCCs and RCOFs and NMHs).

The way to create optimal sub-seasonal products from single and multi-model systems is not yet well established. Therefore the synergy between the research and operational activities on sub-seasonal predictions is very important. The LC-LRFMME could benefit from closer collaborations with

S2S partners. As part of the S2S monitoring, ECMWF is also constructing S2S multi-model products (not in real-time) and it is interested in exchanging experience and opportunities for collaboration with the LC-LRFMME.

The discussion highlighted the wish to have more real-time contributors to the data base and the need for hindcast data as well as recommendations for a bias correction method. It was suggested to renew an invitation to producing centers. Andy Robertson recalled that the S2S SG meeting in Jeju in June suggested a closer collaboration between S2S and ET-OPSLS to align research and operational efforts.

c. Ultra-high resolution prediction for temperature and precipitation - application to early warning, S2S prediction and climate changes for a limited area

Jaiho Oh noted that the World Agrometeorological Information Service (WAMIS, http://www.wamis.org) has been proposed as one of future information system of CAgM, WMO, to provide tools and resources to the countries to improve their bulletins and services. K-WAMIS is one of pilot projects to demonstrate WAMIS in Korea to realize the idea of WAMIS on a single cloud computing platform. It can be possible through a collaboration work among interdisciplinary scientists including ICT specialists, meteorologists and agricultural scientists.

A wide range of future weather and climate information is necessary to operate WAMIS system, for example, it has been required a daily temperature and precipitation intensity information for the next 30 days at least to plant scientists to operate plant disease models to produce an information on a smart chemical use. Also it is requested a daily max., min. and average temperature, and precipitation data for a growing season to crop scientists to prospect the crop production and daily temperature and precipitation data for the 21st century to assess the food security. The common requirement of these weather and climate information is high resolution in time and space.

A sequence of downscaling system has been selected to generate an ultra-high resolution weather and climate information. A high-resolution GME atmospheric general circulation model (GCM) have been used for future weather (20 km mesh) and seasonal prediction and climate projection (40 km mesh) due to the global warming. Furthermore, the diagnostic quantitative temperature and precipitation model (QTM & QPM) have been used to generate 1 x 1 km mesh temperature and precipitation information on a limited target area (for example, 100 x 100 km) in the Korean peninsula and the AWASH river basin in Ethiopia. The results of proposed downscaling system from GCM to QTM and QPM have demonstrated a capability to generate a high resolution daily temperature and precipitation data to be used in flooding model, plant disease model and crop model of WAMIS properly.

CORDEX was highlighted as a good dynamical and statistical downscaling framework for this effort. Issues with the observing system over North Korea were noted.

6. Science talks

a. European projects – SPECS, EUPORIAS, EUCLEIA

Francisco Doblas-Reyes reported on 3 relevant EU projects:

* EUCLEIA: The Seventh Framework Programme (FP7) European project EUCLEIA aims at developing a quasi-operational system for event attribution using both empirical/statistical methods and the Met Office dynamical attribution system.

* EUPORIAS: The EUPORIAS FP7 project tries to develop methodologies to foster the use of climate information based on seasonal predictions among a range of sectors (transport, agriculture, energy, health, water management, etc) by identifying their common and individual needs and by developing a set of prototypes in collaboration with well-identified users. EUPORIAS is unique in that the users of the climate information are at the centre of the project development.

* SPECS: The SPECS FP7 project aims at developing a new generation of climate forecast systems in Europe. The project tries to bring together the expertise in developing climate models for the study of anthropogenic climate change with the groups performing operational climate prediction at seasonal and decadal time scales. The project is in its third year, is closely linked to EUPORIAS to ensure the applicability of its developments in the domain of climate services and has developed a number of products of interest to WGSIP: series of fact sheets about climate prediction, standard for encoding climate forecast data in NetCDF, linkages to portals and users' web sites, illustrations of the benefit of initializing different components of the climate system and of increasing the resolution.

b. Initial shocks, drifts in climate predictions

Laurent Terray presented a new protocol for ocean initialization aimed at minimizing the shocks and drifts in coupled models and investigations on physical processes involved in model drifts to understand and improve the model systematic errors or biases with a focus on the Tropical Pacific and the North Atlantic.

The first year of the forecasts is characterized by a quasi-systematic excitation of ENSO warm events. This can be viewed for the coupled model as an efficient way to rapidly adjust to its own biased climate mean state. The drift dynamics seems to be generated by ocean basin imbalance in MHT and does not always saturate in 10 years. Generally speaking, the influence on skill remains unclear.

c. Biases in seasonal forecasts

Jon Shonk (NCAS-Climate/University of Reading) with contributions from Eric Guilyardi (NCAS-Climate/University of Reading; LOCEAN-IPSL) and Steve Woolnough (NCAS-Climate/University of Reading) presented a new approach to finding root causes of biases in seasonal forecasts.

In the last few decades, there has been progress in the ability to forecast the El Niño Southern Oscillation. However, this progress is being limited by systematic biases in climate models, which are currently dealt with using bias correction methods.

Besides continuing to develop more sophisticated bias correction methods, the longer term goal of model developers is to eliminate the biases by finding out what process causes them to develop in the first place. A number of studies have looked at bias development in climate models, although there is no systematic approach to bias identification.

Vannière et al (2014) proposed a systematic approach to investigate the root cause of an SST bias in a climate model and applied it to several pervasive SST errors. The approach has five steps: (1) identify the location and seasonality of the SST bias; (2) examine the time scales over which errors develop in different variables and link them together to build a chain of causality; (3) find whether the origin of the bias is local or remote; (4) determine if an atmospheric field or an oceanic field is at fault; (5) investigate whether the error is caused by the direct effect of that field, or by coupled feedbacks. For each step, an experimental protocol is needed, including initialized simulations, partially coupled or ocean-only configurations.

The application of the first two steps of this method to a specific bias – namely, the tendency for the ITCZ in the ECMWF System 4 model to drift northwards was shown. Using a combination of fully coupled and atmosphere-only hindcasts, the chain of causality that led to this bias was identified, originating in the atmospheric wind fields in the western Pacific.

It was concluded that this approach could be used more systematically for identifying the root cause of biases in models and addressing them in a more targeted way, especially during the development phase of models. This approach can be extended to biases in other fields and its full potential still needs to be explored.

Attendees acknowledged the difficulty to isolate the cause of biases beyond the symptoms and the need to perform sensitivity tests in that context.

d. Using S2D data to predict spring flood volumes in selected Swedish rivers

Kean Foster presented a climate service prototype that uses S2D data to predict spring flood onset timing and volumes developed at SMHI. The prototype is a multi-model system with three modeling chains.
The first is an analogue approach where driving data is selected from historical precipitation and temperature observations by comparing the climate set up leading up to the forecast date with the same period in the historical data. Years where Artic Oscillation and Scandinavian Pattern indices were within 0.25 standard deviations of those leading up to forecast date are selected as analogues and the corresponding data used to force a hydrological model.
The second is to force the hydrological model with seasonal forecasts of precipitation and temperature form the ECMWF-SFS. The meteorological forecasts are bias corrected using quantile mapping before use in the hydrological model.
The third is a statistical downscaling approach that uses an SVD (singular value decomposition) approach to downscale ECMWF-SFS forecast fields directly to accumulated discharge or spring flood volume. The typical predictors used are pressure related variables (e.g. geopotential height, zonal- and meridional winds), radiation related variables (e.g. t2m and sshf), and moisture related variables (e.g. total precipitation, surface latent heat flux, and relative humidity).
These individual forecast ensembles are pooled, using equal weighting, into the multi-model forecast ensemble. The decision to use equal weighting was made due to the limited amount of hindcast data available on which to base the weights upon. Results show that the multi-model climate service shows improved skill over the operational system which is based on climatological ensemble forecasts. Additionally, although the skill for forecasting the onset timing is still low, changes in visualisation coupled with the limited skill gain has made the forecast information more actionable. The results are promising and the prototype is being tested in seven major hydropower producing rivers in Sweden.

It was suggested to also explore the use of the S2S database and the extended EPS as a substitute to IFS.

7. Dissemination and related initiatives

a. Polar Prediction Project (PPP) and potential WGSIP contribution to the Year of the Polar Prediction (YOPP)

Francisco Doblas-Reyes updated members on the Polar Prediction Project (PPP) which is a joint WWRP/WCRP initiative that aims at improving polar prediction and its linkages to lower latitudes at time scales that range from days to two months, to satisfy the needs of a range of users both at the polar regions and elsewhere. The PPP flagship initiative is the Year of Polar Prediction (YOPP), which aims at enhancing the observational capability to improve predictions at several time scales, including climate, with an observational campaign taking place in 2017 and 2018. There is a large ensemble of other initiatives linked to YOPP, including WGSIP.

SIPN is already in touch with PPP. It was suggested to expand the LC products to cover sea-ice and to consider DCPP products too, although they are not developed for a specific polar area.

b. Subseasonal-to-seasonal Prediction (S2S) project

Andy Robertson noted that the first S2S Newsletter was published in early September 2015 which summarizes recent progress on the project. Access to the S2S database was opened in May 2015 via the Data Portal and ECMWF Web API (Application Programming Interface). Seven models are now online (Sept 2015), with the aim of having all 11 models available by the end of 2015. The data is also being archived at CMA, and a data portal is being developed. The WMO Lead Centre for LRFMME is working to obtain the S2S data without the 3-week embargo, and to issue various real-time S2S products to NMHSs on its password protected site. In the discussion this "seamless" arrangement was seen as very encouraging, but the LC and S2S should coordinate their operational and research products closely. There is a new S2S sub-project on teleconnections, focusing on better understanding sub-seasonal tropical-extratropical interaction pathways and identifying periods and regions of increased predictability ("forecasts of opportunity"). The focus on sub-seasonal scales complements the seasonal focus of the WGSIP teleconnections project. An Advanced School and Workshop on S2S Prediction and Application to Drought Prediction will be held at ICTP in November, an S2S session at the AGU Fall Meeting in December, and a workshop on Maritime Continent (with MJO Task Force and YMC) in April 2016.

The S2S protocol poses some issues to demo multi-model ensemble because of different starting dates. Sub-projects are managed by co-leaders. It was recommended to make some pre-diagnostics available in near real-time.

c. CHFP database, Earth System Grid Federation and obs4MIPs requirements

Ramiro Saurral noted that outputs from 14 models are now available at CHFP, most of them having start times twice a year and a few of them up to 4 times a year. Recent changes in the database include the switch of former MPI-ESM-LR to MPI-ESM-MR, which has better horizontal/vertical resolution, as well as the inclusion of outputs from the Russian HydroMeteorological Centre model (RHMC SL-AV) and also start dates in 2009 and 2010 in the CCCma-CanCM3 and CCCma-CanCM4 models.

CIMA has already received model outputs from the ENSEMBLES project, and this data is already online. Regarding the conversion of the CHFP files to the SPECS format, this procedure is being carried out and expected to be finished by early 2016. Converted files will then be made available through the CHFP portal as well.

A noticeable increase in the number of users registered to CHFP has been observed during the last 18 months, moving from 59 in February 2014 to 93 in September 2015. However, activity (data download, page visits, etc) has been lower so far this year compared to last year.

The value of CHFP will increase with new versions of models showing increased skill over time, but there are concerns regarding decreasing use of the database and the new NMME will not be included for now.

The plan is to setup an ESGF node to distribute CHFP data and it was suggested to wait for this migration before developing the Nature paper. The open nature of ESGF was contrasted against the controlled access on CHFP, mainly used to track users and usage. It was also suggested to collect publications regarding CHFP and publish them on the web.

d. Copernicus Climate Change Services (C3S)

Laura Ferranti noted that Copernicus is the European Union (EU) flagship programme on monitoring the Earth's environment using satellite and in-situ observations. Copernicus will thus deliver operational data and information services on a range of topical areas. Based upon these baseline services, many other value-added products can be tailored to more specific public or commercial needs. Copernicus will also address policy objectives, bringing an essential contribution to the 7th EU Environment Action Programme, which was recently agreed with the aim of "living well, within the limits of our planet". The information services provided will be freely and openly accessible to users.

The role of ECMWF in the Copernicus Services:

ECMWF is operating two services on behalf of the European Union: the Copernicus Atmosphere Monitoring Service and the Copernicus Climate Change Service.

From the start, ECMWF has been strongly involved in the development of Copernicus information services. Currently, in addition to being the coordinator of the pilot atmosphere service (MACC-II) and of a precursor of the climate change service (ERA-CLIM2), ECMWF is also involved in the marine and emergency services, by running in particular the computational centre and hosting the information system platform of the European Flood Awareness System (EFAS). These services operate and are developed in a way complementary to the established range of meteorological and environmental services that are operated nationally. The strong involvement of current service providers as well as of key representatives from the relevant academic communities ensures that the Copernicus services can benefit most fully from existing infrastructure and knowledge, and that the Copernicus services are implemented in a manner consistent with the EU principles of complementarity and subsidiarity.

The added-values of the Copernicus Services are:

- Guarantee of service, providing global spatial coverage
- Near-real time data provided to end users
- Integration of the data (space and in-situ) and analyses
- Global/pan-European approach to Earth monitoring

Copernicus Climate Change Service

As part of the delegation agreement with the European Union, ECMWF is managing the Copernicus Climate Change Service. This Service, which cuts across all other Copernicus Services, will deliver substantial economic value to Europe by:

- informing policy development to protect citizens from climate-related hazards such as high-impact weather events;
- improving planning of mitigation and adaptation practices for key human and societal activities;
- promoting the development of new services for the benefit of society.

The Climate Change Service will combine observations of the climate system with the latest science to develop authoritative, quality-assured information about the past, current and future states of the climate in Europe and worldwide.

The Service will build upon and complement capabilities existing at national level and being developed through a number of climate-change research initiatives. It will become a major contribution from the European Union to the WMO Global Framework for Climate Services (GFCS) and its Climate Monitoring Architecture.

The Service will provide comprehensive climate information covering a wide range of components of the Earth-system (atmosphere, land, ocean, sea-ice and carbon) and timescales spanning decades to centuries (i.e. based on the instrumental record). It will maximise the use of past, current and future earth observations (from in-situ and satellite observing systems) in conjunction with modelling, supercomputing and networking capabilities. This conjunction will

produce a consistent, comprehensive and credible description of the past, current and future climate.

The portfolio of Service products will include:

- Consistent estimates of multiple Essential Climate Variables
- Global and regional reanalyses (covering a comprehensive Earth-system domain: atmosphere, ocean, land, carbon)
- Products based on observations alone (gridded; homogenized station series; reprocessed Climate Data Records)
- A near-real-time climate monitoring facility
- Multi-model seasonal forecasts
- Climate projections at global and regional scales

This wealth of climate information will be the basis for generating a wide variety of climate indicators aimed at supporting adaptation and mitigation policies in Europe in a number of sectors, such as water management, agriculture, energy etc. More information can be found at (http://www.ecmwf.int/en/about/what-we-do/copernicus).

The important emphasis on reanalysis in C3S was noted.

e. Summer school

Ousmane Ndiaye noted that in 2014, ICTP has allocated euros 10,000 to host a two weeks summer school. ANACIM has expressed the will to host at the same time or just before a WGSIP meeting. This would allow to have high profile researchers from WGSIP to teach during the summer school for the benefit of African participants. Targeted participants are young African researchers and professional from meteorological service. This meeting will allow them to get basis of climate services as well as hands on practical research exercises with direct impact on climate users' needs. Due to Ebola disease the training was postponed. Now ANACIM is considering having this meeting next year, in 2016, and wants to know the availability of WGSIP. ANACIM would like to have some experts in WGSIP acting as chair for a working group on some research subjects of common interest. We are looking for 4 groups of 10 students each. The training course will consist of theoretical classes in the morning and practicals during the afternoon. We expect that each practical exercise will lead on a publishable paper on the subject matter and students will continue their research on the subject.
To complete its budget ANACIM is counting on some internal resources and as well as other potential donors (CCAFS, WFP, …).

8. WGSIP Business

a. Proposal for new WGSIP name

Adam Scaife recalled the action from the JSC36 session to revisit the structure of WGs and explore ways to reduce them, in particular in the context of decadal efforts. A simple merger between WGSIP and DCPP was considered by many as too large a group. Other expressed a strong favor for a dedicated WG on Decadal activities and/or a stronger presence of the decadal community on WGSIP. Considerations about references to empirical/statistical predictions, and initialization were mentioned.
The name of WGCIP for WG on "Climate initialized prediction" was suggested. After a vote, the group finally proposed a revised WGSIP for "WG on Subseasonal to Inter decadal prediction" as the best suggestion at the time of the meeting.

b. Next session

Members considered favorably the offer made by Ousmane Ndiaye to host the next session at ANACIM, Dakar, Senegal around the 2016 Oct-Nov time frame and in conjunction with the school.

For 2017, WMAC is promoting the idea of a joint meeting between all WCRP WGs.

c. AOB

Laura Ferranti and Arun Kumar confirmed their intention to attend the ET-OPSLS workshop on operational prediction on 9-11 Nov in Pune. It was suggested to encourage WGSIP Asian members to attend the meeting.

d. Memberships

Michel Rixen recalled the general membership process Specifics issues were discussed off-line.

e. Review of Draft actions list

Draft actions were reviewed and are summarized in ANNEX B.

ANNEX A – Contact list

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ANNEX B – Action List

NB Subproject leaders:

- Drift/initial shocks: Bill Merryfield, Michael Tolstykh
- Teleconnections: Adam Scaife, Laura Ferranti
- SNOWGLACE: Yvan Orsolini, J-Hoon Jeong

ESGF, CHFP

- ACTION 1: check possible contributions from GPC including older versions to CHFP – Ramiro (Dec 2015)
- ACTION 2: check possible web link from ENSEMBLES data portal to CHFP – Laura (Dec 2015)
- ACTION 3: update and circulate CHFP flyer within community and add flyer to web page – co-chairs and Michel (Dec 2015)
- ACTION 4: collect publications on CHFP and publish on web – Ramiro (Dec 2015)
- ACTION 5: add date of creation on the data sets – Ramiro (Dec 2015)
- ACTION 6: check with NOAA Program Managers whether NMME hindcast data can be re-distributed – Paco (Dec 2015)

Grand challenges, S2S, PPP

- ACTION 7: liaise S2S and WGSIP with Grand Challenge on Extremes and encourage the exploitation of the databases – Andy and Paco (Dec 2015)
- ACTION 8: obtain feedback from PPP and SIPN – Yvan and Paco (Dec 2015)

Subprojects

- ACTION 9: sub-projects to engage with and seek active feedback from the community (WCRP core projects, PPP, S2S, EU projects, including PREFACE and “transpose-CMIP” for drift, S2S for teleconnections, PPP for snowglace) - sub-projects co-leaders (Dec 2015)
- ACTION 10: provide description for web site to Michel - sub-project co-leaders+co-chairs (Dec 2015)
- ACTION 11: develop single EOS article to promote sub-projects - sub-project co-leaders+co-chairs (Dec 2015)
- ACTION 12: present initial shocks project at next WGNE and talk to WGNE about possible joint meeting on systematic errors, noting the offer from Adrian Tompkins to host the event at ICTP in 2017 – co-chairs & Bill & Michael (April 2016, Dec 2015)
- ACTION 13: talk to WGNE and S2S about possible joint meeting on teleconnections – co-chairs & Ferranti (Dec 2015)

Summer school 2016

- ACTION 14: explore WMO and GFCS support for summer school 2016 at ANACIM – Michel /members to seek financial support for their own attendance to WGSIP18 (Dec 2015)

WMO Commissions

- ACTION 15: liaise with CCL to develop some collaboration on the GC Decadal – Adam (Dec 2015)
- ACTION 16: resend S2S request for real time transfer to LC-LRFMME – Laura (Dec 2015)
- ACTION 17: people attending RCOFS to provide feedback to WGSIP (e.g. ½ page summary) – ALL (when appropriate)
- ACTION 18: forward recommendation to ET-OPSLS to grant RCOFS the access to maps and data from LC – Laura (Dec 2015)

DCPP, WGSIP, GC Decadal : structures

- ACTION 19: prepare a recommendation to JSC in consultation with WGCM regarding new WGSIP name and / or WGDP – co-chairs, George, Bill (Feb 2016)

BUSINESS

- ACTION 20: Doodle for WGSIP18 ideally in Nov, and send Ousmane confirmation – Michel (asap)