



THIRD MEDITERRANEAN CLIMATE OUTLOOK FORUM (MedCOF-3)

November 17-18, 2014
Antalya, Turkey



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Executive Summary

The MedCOF-3 forum was held in Antalya from 17 and 18 November 2014 hosted by the Turkish State Meteorological Service. The MedCOF-3 forum was held jointly with SEECOF-12 and PRESANORD-7. The coordination of all three events has been essential to distribute tasks and avoid overlaps. The MedCOF-3 forum was mainly focused on the production of the consensus climate outlook for the winter 2014-2015. MedCOF-3 has finally released a large scale seasonal forecast for the whole Mediterranean region which was further refined by sub-regional COFs (PRESANORD and SEECOF) for their respective areas. Following discussions have also allowed agreeing on some features relevant for the design of the future COFs.

1. Introduction.

1.1. Background

Regional Climate Outlook Forums (RCOFs) have been the major component of WMO Climate Information and Prediction Services (CLIPS) project activities and are widely recognized to be key elements in the implementation of GFCS at regional and national scale. First established in 1996 at a Meeting in Victoria Falls, Zimbabwe, RCOFs gained momentum as a regional response to the major 1997–1998 El Niño event, since then RCOF concept was spread worldwide. WMO and a number of national, regional and international organizations (e.g., NOAA, IRI, MétéoFrance, World Bank, etc.) have continuously supported their growth and expansion.

Built into the RCOF process is a regional networking of the climate service providers and user-sector representatives. Participating countries recognize the potential of climate prediction and seasonal forecasting as a powerful development tool to help populations and decision-makers face the challenges posed by climatic variability and change. Regional climate outlooks are based on input from NMHSs, regional institutions, Regional Climate Centers (RCCs), Global Producing Centers of long range forecasts (GPCs) and other climate prediction centers.

The RCOFs generally include pre-COF capacity development for the experts from NMHSs to improve their skills in long range forecasting and communicating the probabilistic information along with the uncertainties. It is followed by the Forum to interpret the available real-time seasonal prediction products from WMO GPCs and WMO RCCs, assess the skills of forecasting systems, develop the consensus seasonal climate outlook statement for the region, and discuss on the potential applications of RCOF products of the regional and international climate experts to develop a consensus for the regional climate outlook, typically in a probabilistic form. The RCOFs are widely recognized to be one of the key elements of GFCS implementation at regional level. The RCOFs then lead to national forums (NCOFs, NCFs) to downscale RCOF products and develop detailed national-scale climate outlooks and risk information including warnings for communication to decision-makers and the public.

Following the recommendations given by RA VI Task Team on RCOF and supported by the RA VI Working Group on Climate and Hydrology targeting South Western Europe/Mediterranean basin as suitable for a RCOF implementation and considering the recommendation by the Scoping Workshop on Seasonal Climate Prediction (Algeria, January 2012) of extending the existing RA I PRESANORD to the whole Mediterranean area involving thus RA I and RA VI;

AEMET jointly with WMO -and after conversations with many parties- convened a Scoping Meeting (SC) at AEMET headquarters in Madrid from 12 to 14 June 2013 to define the features and objectives of a future Regional Climate Outlook Forum encompassing among others National and Regional Services around the whole Mediterranean region. The first formal MedCOF meeting was held in Belgrade, Serbia, 18-19 November jointly with SEECOF-10.

The Mediterranean Climate Outlook Forum (MedCOF) covers the whole Mediterranean region, cutting across the two WMO Regional Associations (RAVI and RAI). MedCOF is aimed at developing consensus based seasonal outlook for the entire Mediterranean region, strengthening the NMHSs existing capabilities in seasonal forecasting, and promoting inter-regional cooperation and partnership. It has been agreed by the 31 participating countries that MedCOF will operate as an overarching entity in support of the South-East European Climate Outlook Forum (SEECOF) and the forum of Prévisions Climatiques Saisonnières en Afrique du Nord (PRESANORD). Therefore, it is a reasonable approach that these three RCOFs be organized

together, starting with 2 days of MedCOF sessions and followed by 2 days of parallel sessions for SEECOF and PRESANORD. These RCOFs were followed by a 2 days meeting of Regional Consultation on Climate Services at the National Level for South East Europe with the users of the GFCS priority sectors from South East Europe on 21 and 22 November 2014.

MedCOF-3 comprises 3 steps; the first one will be devoted to verification of the MedCOF-2 summer forecast; the second one to the assessment of current state of climate and, finally, the third one to the building of consensus statements.

Funding for this initiative comes from USAID through WMO, from AEMET through the ACMAD Trust Fund established in WMO for the North African participants and from the Turkish State Meteorological Service (TSMS) for the logistics expenses.

1.2 Date and Venue

Following the kind invitation of the Turkish State Meteorological Service (TSMS), the three meetings (MEDCOF-3, SEECOF-12, PRESANORD-7 and GFCS Regional Consultation with the South Eastern European Key Stakeholders) were held from 17 to 22 November 2014 in Antalya, Turkey.

The meeting venue was IC Hotels Santai Family Resort, Antalya, Turkey (more details on local arrangements in <http://medcof.aemet.es/Medcof/events/medcof3/medcof3.html>). The Hotel is 40 km away from Antalya City Centre and 30 km away from the Airport.

1.3 Participants

MedCOF brings together representatives from all countries involved in (SEECOF): Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Greece, Hungary, Israel, Moldova, Montenegro, the Former Yugoslav Republic of Macedonia, Romania, Serbia, Slovenia, Turkey, Ukraine; and in North African Climate Outlook Forum (PRESANORD): Morocco, Algeria, Tunisia, Libya and Egypt; as well as France, Italy, Spain, Portugal, Jordan, Lebanon, Malta, Mauritania and Syria. The resource persons from Meteo France, UK Met Office, ECMWF, DWD, AEMET, as well as representatives from WMO have attended MedCOF. Most climate experts were invited to attend the three consecutive events. A list of participants is available in Annex II and also in <http://medcof.aemet.es/Medcof/events/medcof3/medcof3.html>

2. Meeting Concept and Format

The MedCOF-3 was designed in a way to accommodate six sessions:

Opening Session

Session I – Climate monitoring

Session II – Production of large scale climate outlook for winter (DJF) 2014-2015 (I)

Session III – Production of large scale climate outlook for winter (DJF) 2014-2015 (II)

Session IV - Discussion on MedCOF matters

Session V - Conclusions and Recommendations

The Opening session started with a welcome speech by Mr. Erol Aydın, Regional Director of TSMS, on behalf of the host institution and with the words of the representative of the WMO Secretariat Mr. Omar Baddour.

The Session I provided climate monitoring information which also served as input for evaluation and verification of previous seasonal forecasts.

The Session II and III were devoted to the production of the climate outlook for winter 2014-2015. In these sessions all inputs received from the Global Producing Centers, the Regional Climate Centers and the climate experts of the Mediterranean countries were presented and discussed.

In Session IV features of MedCOF mode of operation were discussed as continuation of the preliminary design started during the Scoping Meeting in Madrid and MedCOF-1

2.1 Meeting Agenda and Programme

Agenda and Programme are available in Annex I.

2.2 Working Language

The working language of the meeting was English.

3. Development of the meeting

3.1 Opening

The opening session started with the welcome speech by Erol Aydın, Regional Director of TSMS, on behalf of the host institution. He welcomed all countries' representatives. He expressed his gratitude to the WMO, AEMET, USAID, ACMAD and SEEVCCC for facilitating the organization of the MedCOF. In his opening statement, he emphasized the regional climate studies and organizations held by TSMS. He also outlined the importance of SEECOF and MedCOF. After his speech, Omar Baddour from WMO was invited to make his opening speech. He expressed his gratitude to the TSMS for facilitating the organization of MedCOF, SEECOF, PRESANORD and GFCS. He also provided brief information on the meetings. After that Ernesto Rodriguez also added some of the lessons learned from past MedCOF experiences.

3.2 Session 1: Climate Monitoring

First session was chaired by Jean-Pierre Ceron from Meteo-France. 5 presentations were made in this session. The first presentation on "*WMO climate watch systems*" was presented by Omar Baddour from WMO. After the presentation, questions were addressed on what could be done for climate watch systems at regional level. According to Omar Baddour, Climate Watch comprises 3 steps: global region, sub-regional and national. After following these steps, the final product will be provided to the end users. He also stressed the importance of communication between these different levels. Participants addressed questions on providing and accessing to monthly forecasts. Participants also indicated that accessing the data from global producing centers was the main problem. Mr. Omar Baddour remarked that CBS system needs to be standardized and announced a joint meeting on how to benefit by sharing

experiences. After the presentation, some points such as the usage of different datasets for verification at regional and/or national scale promoting the quality of assessments and predictability of a region were pointed out. Comparison of verification based on national data was pointed out as a problem due to the different number and density of stations. For that reason it was mentioned as recommendable a comparison of verifications based on regional and/or gridded datasets such as. ECA&D, E-Obs, GPCC, Era-Interim, etc. In addition to that, linking MedCOF and MEDARE was also suggested.

The second intervention on “*Verification of MedCOF-2*” document was then presented jointly by Peter Bissolli from DWD (Germany) and Soumaya Ben Rached from INM (Tunisia). Peter Bissolli presented the verification report for summer 2014 for the RA VI part of the MedCOF region. He mentioned that the temperature prediction for the RAVI-MED part was more or less correct for most of the areas, although it did not reflect very well the large-scale differences between the western (cold to normal) and the eastern (warm) RA VI–Med region. For precipitation, the outlook had reflected the wetter-than-normal area in the northern part of the Mediterranean basin at least partly, although in reality the wet pattern in western parts of the region was shifted further to the north. There was also some failure in the eastern parts of the MedCOF region due eastward extension of the wet area of region 1, since the southern Caucasus was clearly dry.

Soumaya Ben Rached concluded in her presentation that the MedCOF-2 climate outlook for the 2014 summer season stated that the seasonal temperature over the most parts of the region would be above normal, in Libya and Egypt with probability of 50% and in Tunisia and Algeria with probability of 45%. In fact, these positives anomalies occurred. It was not possible to predict the summer season temperature in Morocco due to the equal probabilities for below-, near-, or above-normal conditions. This indicated that the climate outlook for the summer season air temperature was able to predict temperature anomalies registered for the most of North African region. For precipitation, according to MedCOF-2, it was predicted that the summer season precipitation would be above normal in northern Tunisia. This prediction turned out to be quite accurate. In the rest of the North African domain the prediction was accurate except in northern Morocco and northern Egypt where the amount of precipitation was above normal.

The third presentation on “*Climate monitoring from RA VI RCC-CM*” was represented by Peter Bissolli from DWD and he continued with a second presentation on “Climate monitoring information about the RA VI part of the MedCOF region for summer/autumn 2014”. In his presentations he indicated that globally, summer 2014 was one of the four warmest summers since at least 1880 according to datasets of NOAA NCDC and NASA. Also in Europe, summer and autumn 2014 were particularly warm. Although summer temperatures in western parts of the European MedCOF region were slightly lower than normal, they were still in the normal percentile range. There were heat waves with daily maxima above 40°C especially in the South Caucasus region. However, especially high minimum temperatures contributed to the mainly above-normal temperatures in the eastern part of RA VI. There was much above-normal precipitation in a large area from France to western Turkey with some heavy precipitation events included and locally enhanced soil moisture, whereas the northeast of the MedCOF region (Moldova, South Caucasus) was relatively dry. A climate watch advisory for heavy rain in large parts of southern Europe was distributed by the WMO RAVI RCC Offenbach Node on

Climate Monitoring at the beginning of November. After the presentation, participants raised questions on climate patterns, and also monitoring operation in North Africa.

The last presentation of the session on “*Climate Monitoring from RCC Demonstration Phase*” was made by André Kamga from ACMAD. His presentation started by describing the African Regional Climate Centre’s monitoring function products with emphasis on climate features over North Africa. 2013 was ranked as the second warmest year on record since 1950. It follows 2010 which was the warmest year on the 1950-2014 record. Namibia and southern Angola experienced drought in 2013. Summer 2014 was characterized by drought over Gambia, Senegal and Lake Chad region in the Sahel. Climate reports from Gambia indicates drought of moderate to severe intensity for 2014. Sea Surface Temperature (SST) of the Mediterranean Sea and Tropical North Atlantic has been above to well above average during the past few months. Over the ENSO region, near average SSTs had been observed. Near surface air temperature was well above average in September 2014 over much of Tunisia. Temperatures for the remaining parts of North Africa had been near average in September 2014 and during the past three months. Precipitation patterns from July to September 2014 over much of North Africa were near average. Climate assessment products for African synoptic stations were presented showing significant interannual variability in precipitation indices and warming trends on temperatures. Access to daily station datasets from the countries, adjustments of climate monitoring/assessment products to better meet user requirements under GFCS and expansion of partnerships for resource mobilization were the main challenges ahead.

3.2 Session 2: Production of large scale climate outlook for winter (DJF) 2014-2015 (I).

The Session 2 was chaired by Andre Kamga from ACMAD and started with the presentation by Roxana Bojariou (Romanian Met Service) on “*Climate predictive signals for the Mediterranean Region*”. She made an observational analyses of large scale drivers for winter predictability over the Mediterranean region: Arctic Oscillation/North Atlantic Oscillation (AO/NAO), El Nino/Southern Oscillation (ENSO), Arctic sea ice fluctuations. There were suggestions for positive AO/NAO in the next winter from May Atlantic sea surface temperatures (SSTs); however, other snow related signal due to advancement of snow cover in October suggests negative AO/NAO. The evolution of observed ENSO signal suggests a small impact on our region (now there were neutral conditions and odds were for rather weak El Nino in the next winter and spring). Positive SSTs draw the attention to extreme weather episodes in winter in Mediterranean regions when (if) atmospheric conditions were favorable, too (e.g. November medicane developed near Malta and Southern Italy). Also, the presentation highlighted challenges and opportunities of seasonal predictions. As challenges, the presentation indicated the fact that models show low skills over most of MedCOF and SEECOF regions, the great implication of the probabilistic essence to the communication of prediction results to the stakeholders. An opportunity was the fact that local and regional predictive signals had been identified in the observation and they could be exploited using statistical tools together with some model products. An opportunity but also a challenge is the fact that seasonal prediction is rapidly reaching and influencing society. Following of the presentation, subjects such as the snow advance index, QBO and their effect on the North Atlantic Oscillation were

pointed out. She emphasized the importance of North Atlantic Oscillation which explains 30% of total variability.

Damien Decremer (ECMWF) presented “*Seasonal forecast from System 4*”. He focused on the winter 2014/2015 forecast of ECMWF's operational model System characterized by:

- a weak warming signal with a large spread for surface temperatures over the whole MedCOF region,
- no clear signal for precipitation,
- mean sea level pressure patterns suggesting a mean zonal flow was to be expected, but the exact position of the flow was highly uncertain
- below-normal sea surface temperatures over the North Atlantic (weak positive NAO phase) and above-normal sea surface temperatures over the Eastern Mediterranean.

He also presented and commented some results on hydrologically relevant seasonal forecasted variables, such as soil moisture. The speaker pointed out the needs of an improvement in this area and the enhancement of interaction with users and stakeholders.

Anca Brookshaw (UK MetOffice) first introduced a brief presentation on “*Predictability and Chaos*” and continued later with “*Seasonal forecast from GloSea5*”. The presentation from GPC Exeter addressed the topic of predictability of European winter conditions and the outlook for winter 2014-2015. It started with a description of the forecasting system used operationally, including details of system components and technical implementation as well as the results of process-based validation. The focus was on the recently achieved significant advance in predictability of the winter North Atlantic Oscillation in this forecasting system. It followed with a summary of the known sources of large-scale variability (and a brief description of the known mechanisms), their phase observed ahead of or predicted for this year. Lastly, probabilities for temperature and precipitation categories for December 2014-February 2015, for the European/North African region, derived from the output of the dynamical prediction system were shown.

The last presentation on “*Summary from RA VI RCC-LRF*” was made by Jean-Pierre Ceron from Meteo-France. Despite a good consensus between models to forecast a weak El Niño event for this winter, the seasonal predictability over Northern hemisphere was low. In the equatorial Pacific the atypical SST anomaly pattern predicted by the models doesn't seem to significantly modify the Hadley-Walker circulation. Thus, no clear teleconnection was visible in the Northern Pacific. In the Northern tropical Atlantic, several models show a trace of teleconnection up to mid-latitudes, but with large uncertainty close to Europe concerning general circulation. That was why the positive anomaly forecasted by a great majority of models over Mediterranean area was certainly not only linked to circulation but also to the climate change. Concerning precipitation, we reasonably don't privilege any scenario. After his presentation, it was pointed out the lack of clear signal for precipitation and temperature in the eastern part of the region. The speaker also underline that there was some encouraging signal of North Atlantic Oscillation which could be captured within a few weeks and recommended its close monitoring.

After the coffee break, Atika Kasmi (DMN, Morocco) made a presentation on “*Summary from North Africa*”. She summarized the sources of predictability over North Africa for the winter season and presented results from statistical and dynamical models for the region.

Silvio Gualdi presented on behalf of Massimiliano Pasqui (IBIMET, Italy) “*Seasonal forecast from IBIMET statistical system*”. M. Pasqui excused his participation in MedCOF3 at the very last moment due to the flash floods taking place in Italy a few days before the meeting. S. Gualdi briefly described the IBIMET multi-regressive method based on physical atmospheric indices and sea surface anomalies, at monthly time scale. Then he presented its outlook for temperature with values warmer than normal for the Eastern part of the region and colder to normal for the Western part and for precipitation with wetter values for Eastern and Northern part and drier values around Tunisia and Morocco. Then S. Gualdi (CMCC, Italy) delivered his own presentation titled “*Seasonal Forecast from CMCC*”. He first described the CMCC seasonal prediction system (SPS) based on the CMCC climate model used for CMIP5 simulations. The forecast is produced every month using the 1st of the month as starting date. The initialization of the ocean is done with the CMCC ocean analyses performed with a 3D-VAR assimilation scheme, whereas the land and atmosphere were initialized using the ECMWF analyses. The forecasts consisted of a 9-member ensemble with 7-month long integrations. He also made a quick assessment of the skill of the CMCC SPS showing the correlation between the predicted and observed (ERA-Interim re-analyses) surface temperature at global scale. As in many SPSs, the largest correlations (larger than 0.8) were found in the tropical Ocean and especially Tropical Pacific. However, high values of correlations between observed and predicted anomalies were also found over the Northern Pacific and Northern Atlantic. Besides, the CMCC SPS shows some skill in predicting the interannual variability of Asian and African monsoons, at least when dynamical indices of the variability were used. Over the Mediterranean region, as generally occurs for most of state-of-the-art, SPSs correlation between predicted and observed near-surface temperature was much lower than in the Tropical region. However, some skill was visible over part of the basin in different season and over the portion of the Atlantic Ocean facing the European continent. At global scale, the CMCC forecast for next winter - DJF lead 0, with start date 1st of November, - indicates a tendency towards a relatively moderate El Nino condition in the tropical Pacific, with warm SST anomalies in the central-eastern equatorial Pacific of about 1°C. Importantly, in a contrast with a “normal” El Nino, the positive SST anomaly appears to extend also to a portion of the west Pacific, west to the date line. A large negative anomaly was found over the North Atlantic. In the Euro-Mediterranean region, the CMCC forecast shows a tendency for warmer temperature in the western part of the Mediterranean basin and, to a less extent, over western European countries. A large positive temperature anomaly was predicted over North-Eastern Europe, especially in the lead 0 (NDJ) forecast. NAO shows no preferred phase. Some indication of increased precipitation over the western part of the Euro-Mediterranean domain was found at lead 0. However, at lead 1, no clear signal in precipitation was found over most of the domain.

Hakan Aksu (General Directorate of State Hydraulic Works, Turkey) made the last presentation on “*Summary of Hydrological Inputs*”. He presented a variety of model approaches used to make hydrological forecasting in Turkey. The range of models run from simple water balance to statistical approaches based on observed data. His talk was mainly methodological covering time scale aspects, uncertainty issues and geographical aspects. He also presented some methods for seasonal hydrological modeling based on dynamic seasonal hydrological forecasting, stochastic approaches and scenario based models.

3.3 Session 3: Production of large scale climate outlook for winter (DJF) 2014-2015 (II).

Session 3 was devoted to the discussion of the material presented on the previous day aiming to produce the consensus large scale climate outlook for winter (DJF) 2014-2015. The session was conducted by Anca Brookshaw. Jean Pierre Ceron made a short introduction about the previous discussion and summarized presentations and comments. Session 3 was intended to present all relevant sources of information for the following session discussions aiming at reaching consensus for the climate outlook for the 2014/15 winter season. Session ended up with the production of the final outlook statement (see Annex I)

3.4 Session 4: Discussion on MedCOF matters

The 4th session of MedCOF-3 chaired by Ernesto Rodriguez (AEMET) covered the following proposed topics:

- Management Group renovation, ToR
- Web/Forum
- How to improve online MedCOF.
- Verification
- Communication and interaction with users
- Funding/ sustainability
- AOB

Management Group renovation, ToR.

Following the approval by MedCOF-1 of the inclusion of representatives of the RCCs Climate Monitoring, it was made effective with the incorporation of Peter Bissolli (DWD) and Soumaya Ben Rached (DMN, Tunisia) representing RA VI and I, respectively.

With respect to the renovation of the Management Group and the chair, it was agreed first to wait until the preparation and approval of the ToR. Most participants expressed their view that one year was a period too short for renovating either MG or the chair. With respect to the renovation of the chair, it was proposed as a compromise to nominate a vice-chair who would become chair after a certain transition period. Any decision on this point was delayed until the next meeting of the MG. It was also proposed and approved to incorporate two representatives from the hydrological community. It was proposed to consult with D. Berod, co-chair of the RA VI WG-CH, for the nomination of a representative from RA VI. The corresponding representative from RA I will be decided after the RA I meeting in February. It was also decided to formally incorporate to the MG -for one year period- one representative from the host country of the MedCOF winter meeting to facilitate the organizational and logistic aspects of the following meeting. It was also suggested and approved to allow everyone access to the MG minutes. The MG was assigned as a priority task with the preparation of a ToR draft - jointly with WMO and the RA VI Working Group on Climate and Hydrology and its counterpart at RA I - due to be approved in MedCOF-5..

Web/Forum

It was proposed and agreed to move the latest seasonal prediction to the home page in order to have it more easily accessible and to include a list of MedCOF participant countries.

How to improve online MedCOF

The first experience with online MedCOF, using the forum tool in the MedCOF web, was considered relatively successful by participants although some improvements were suggested for future editions. Among those improvements were mentioned the need to allow a second round of comments after the first discussion based on the preliminary drafts mainly provided by the RCCs. It was also mentioned the need to enhance the active participation of all partners. It seemed that still some participants showed certain reluctance to use the web forum and preferred the communication via email. Finally, it was suggested and agreed to approve the final consensus statement in a Webex teleconference session.

Verification

Discussion about WMO verification guidelines, verifying datasets and boxes and verification protocols, evaluation of the model responses to climate drivers, etc. did not arrive to any decision. Reference was done to the work so far conducted using different gridded verifying datasets. Clear distinction was also done during the discussion between verification of seasonal models and verification of the consensus forecasts. It was also pointed out the need of coordination between RCCs and RCOFs for the production of verification products. Finally, it was felt that more discussion was needed -both in MG and MedCOF meetings- about the verification of consensus forecast and the methodology for its interpretation.

Communication and interaction with users

Many participants underlined the importance of having an effective communication with users. However, it was also pointed out that considering the needed coordination between MedCOF and the subregional COFs (PRESANORD and SEECOF) it was reasonable to leave many of the issues related with communication and interaction with users under the subregional COFs responsibility due to their closest proximity to users. It also raised the case of those countries belonging to MedCOF and not to any of the existing subregional RCOFs, as e.g. the Western European countries. For those countries both the communication issues and the interaction with users were especially relevant. Some participants were in favour of some kind of integrated communication policy addressing the whole Mediterranean region and leaving some subregional or national aspects to SEECOF and PRESANORD. No decision was adopted and additional discussion was postponed until the next MedCOF.

Funding and sustainability

Sustainability was considered a critical issue for the continuity of MedCOF. In that sense it was reported on the different steps given by the MG pointing to secure stable funding and therefore sustainability of the MedCOF process. Massimiliano Pasqui (IBIMET) on behalf of MedCOF

prepared a proposal for the 2014 COST actions call. COST actions are mainly thought to enhance the creation of networks of researchers and funding is mainly aiming to facilitate organization of meetings and short term visits. Unfortunately the proposal was not selected and the intention is to go for another call with an improved proposal. Other sources of funding including a closer involvement of users and stakeholders were also discussed and explored. It was also pointed out that the expansion and improvement of the online tools would also facilitate the organization and increased frequency of MedCOF meetings and would be aligned with a higher sustainability. No decisions were taken about this point. The MG will continue working and will present proposals in the next face-to-face MedCOF meeting.

3.5 Session 5: Conclusion and Recommendations

Apart from the decisions taken during Session 4, the conclusions and recommendations were re-addressed to the corresponding sessions of SEECOF and PRESANORD.

The list of decisions taken in Session 4 includes the following actions:

- Incorporate to the MG two representatives from the hydrological community. It was proposed to consult D. Berod, co-chair of the RA VI WG-CH, for the nomination of a representative from RA VI. The corresponding representative from RA I will be decided after the RA I meeting in February.
- Incorporate to the MG for a year period a representative from the host country of the upcoming MedCOF face-to-face meeting to facilitate the organizational and logistic aspects of the following meeting.
- Allow everyone access to the MG minutes.
- The MG was assigned as a priority task with the preparation of a ToR draft - jointly with WMO and the RA VI Working Group on Climate and Hydrology and its corresponding WG for RA I - due to be approved in MedCOF-5.
- With respect to the web page, move the latest seasonal prediction to the home page and include a list of MedCOF participant countries.
- With respect to online fora, allow a second round of comments after the first discussion mainly based on the preliminary drafts mainly provided by the RCCs and approve the final consensus statement in a Webex teleconference session.

Finally, it was unanimously acknowledged by participants both technical and financial support without whom this meeting would have not been possible.

Annex I: Consensus Statement of MedCOF-3



Third Session of the MEDITERRANEAN CLIMATE OUTLOOK FORUM (MedCOF-3) (17-18) November, 2014

SEASONAL OUTLOOK FOR THE WINTER SEASON 2013/2014 FOR THE MEDITERRANEAN REGION

Climate experts from WMO RA VI RCC Network Nodes on long-range forecasting (Meteo France, France), WMO RA VI RCC Network Node on climate monitoring (Deutscher Wetterdienst, Germany), WMO Nord Africa developing RCC Network Nodes on long-range forecasting (Directorate of National Meteorology, Morocco), WMO Nord Africa developing RCC Network Node on climate monitoring (National Institute of Meteorology, Tunisia), WMO African Center of Meteorological Application for Development (ACMAD), European Centre for Medium Range Weather Forecast (ECMWF), Euro-Mediterranean Centre for Climate Change, UK Met Office, Institute of Biometeorology (Italy), South East Europe Virtual Climate Change Centre (SEEVCCC, Serbia) and National Hydrometeorological Services of MedCOF region provided their valuable contribution to the successful implementation of MedCOF-3 by developing the relevant documents and providing scientific guidance and recommendations.

The MedCOF-3 comprised of the following Steps:

- Step 1: verification of the MedCOF-2 seasonal forecast
- Step 2: assessment of the current state of the climate including large-scale climate patterns worldwide and assessments of its likely evolution in the course of the next months;
- Step 3: building the consensus forecast for 2014/2015 winter season.

All relevant documentation is posted and updated in MedCOF web site:
<http://www.medcof.aemet.es>.

MedCOF- 3 CLIMATE OUTLOOK FOR THE 2014/15 WINTER SEASON

This prediction is based on output from dynamical models, statistical models and known teleconnections of large-scale climate features.

Throughout the summer conditions in the equatorial Pacific have been ENSO neutral; recently SSTs in the region have increased close to El Niño thresholds and the atmosphere has shown weak response reflected in the values of the SOI index, though not all indicators are typical of an El Niño event, especially in the western part of the basin. Forecast models suggest current conditions will either persist or strengthen over the next three months. SST patterns in the North Atlantic may offer some predictability for this winter, especially due to the anomalously warm water in the tropical region. The QBO is currently and will remain in its negative phase during the next few months.

Since the large scale drivers are currently relatively weak, and their typical individual influences are in opposition, predictability for the whole season is low at present. Sub-seasonal variations, not predictable a long time in advance, may dominate at times, so regular updates to the forecast are strongly recommended. In addition, regional factors (for example SSTs in the smaller basins of the region) may shape local variability to a higher degree than usual.

The maps show the probabilistic consensus forecast for tercile categories of anomalies for seasonal mean temperature and precipitation, relative to the period 1981-2010. Due to the climate warming trend anomalies are affected by the selected reference period.

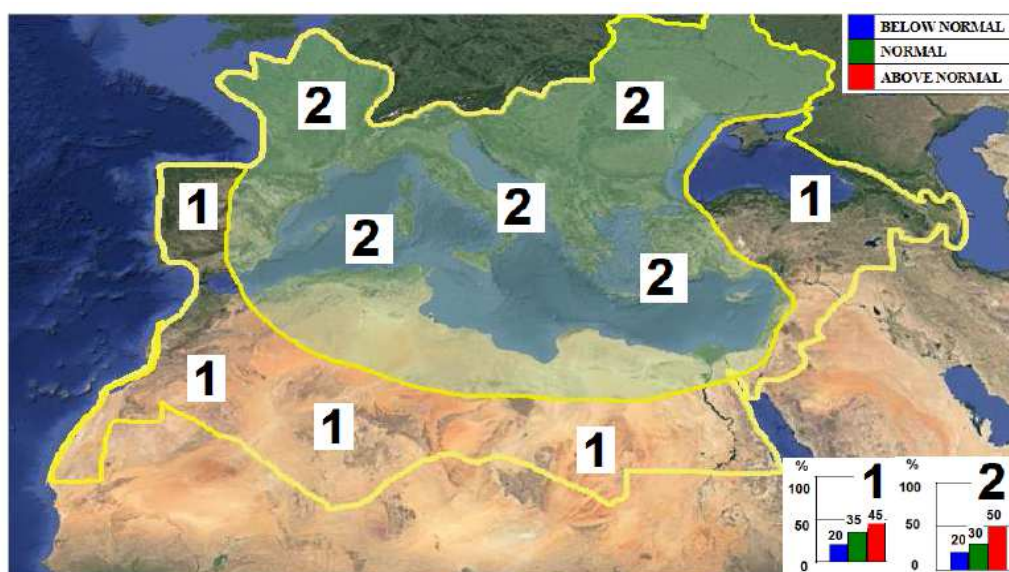


Figure 1. Graphical presentation of the 2014/15 winter temperature outlook

Although for most of the MedCOF domain the uncertainty for the temperature prediction is high, there is a tendency for the upper tercile over most of the domain being this preference more marked over the Mediterranean Sea and the Northern part of the domain (region 2).



Figure 2. Graphical presentation of the 2014/15 winter precipitation outlook

Precipitation in the whole MedCOF domain shows no preference for any climate defined categories.

Note that it is necessary to express seasonal forecasts in terms of probability due to inherent uncertainty. Any further advice on the forecast signals, smaller scales, shorter-range updates and warnings will be available throughout the winter from the National Meteorological Services, along with details on the methodology and skill of long-range predictions.

** The graphical representation of climate outlook in this statement is only for guidance purposes, and does not imply any opinion whatsoever concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

APPENDIX A: Contributors to MedCOF-3

- The Hydrometeorological Institute, Albania
- Armstatehydromet, Armenia
- Hydrometeorological Department, Azerbaijan
- Hydrometeorological Institute of Meteorology of RS, Bosnia-Herzegovina
- National Institute of meteorology and Hydrology, Bulgaria
- Meteorological and Hydrological service of Croatia, Croatia
- Egyptian Meteorological Authority, Egypt
- MeteoFrance, France
- The National Environmental Agency of Georgia, Georgia
- Deutscher Wetterdienst, Germany
- Italian Air Force Met Service, Italy
- Centro Euro-Mediterraneo sui Cambiamenti Climatici, Italy
- Jordan Meteorology Department, Jordan
- Libyan National Meteorological Service, Libya
- Hydrometeorological Service of The FYR of Macedonia
- State Hydrometeorological Service of Moldova
- Institute of hydrometeorology and Seismology, Montenegro
- Direction dela Meteorologie Nationale, Morocco
- National Meteorological Administration, Romania
- SEEVCCC/ RHMS of Serbia
- Agencia Estatal de Meteorología, Spain
- National Institute of Meteorology, Tunisia
- Turkish State Meteorological Service, Turkey
- General Directorate of State Hydraulic Works, Turkey
- Met Office, United Kingdom
- League of Arab States
- African Center of Meteorological Application for Development (ACMAD)
- European Centre for Medium Range Weather Forecast (ECMWF)
- World Meteorological Organization (WMO)

Annex II: Programme

THIRD MEDITERRANEAN CLIMATE OUTLOOK FORUM (MedCOF-3)

November 17-18, 2014

Antalya, Turkey

Programme

Monday 17 November

09:00 – 09:30 Registration

09:30 – 10:30 Opening

- Erol Aydin (Regional Director of TSMS)
- Omar Baddour (WMO)
- Practical arrangements

10:30 – 11:00 Coffee break (Group Photo)

11:00 – 12:30 Session I - Climate monitoring (Chair: J.- P. Cerón)

- Omar Baddour (WMO): WMO climate watch systems
- Peter Bissolli (DWD, Germany) and Soumaya Ben Rached (INM, Tunisia): Verification of MedCOF-2
- Peter Bissolli (DWD, Germany): Climate monitoring from RA VI RCC –CM
- André Kamga (ACMAD, Niger): Climate monitoring from RA I RCC Demonstration Phase
- Soumaya Ben Rached (INM, Tunisia): Climate monitoring from North Africa

12:30 – 13:30 Lunch

13:30 – 15:30 Session II - Production of large scale climate outlook for winter (DJF) 2014-2015 (I) (Chair: A. Kamga)

- Roxana Bojariou (National Meteorological Administration, Romania): Climate predictive signals for the Mediterranean region
- Damien Decremet (ECMWF, UK): Seasonal forecast from System 4.
- Anca Brookshaw (MetOffice, UK): Seasonal forecast from GloSea5
- Jean-Pierre Ceron (Meteo-France, France): Summary from RA VI RCC-LRF

15:30 – 16:00 Coffee break

16:00 – 18:30 Session II - Production of large scale climate outlook for winter (DJF) 2014-2015 (I) (cont.) (Chair: B. Bijelic)

- André Kamga (ACMAD, Niger): Summary from RA I RCC-LRF Demonstration Phase
- Atika Kasmi (DMN, Morocco): Summary from North Africa
- Massimiliano Pasqui (IBIMET, Italy): Seasonal forecast from IBIMET statistical system
- Silvio Gualdi (CMCC, Italy): Seasonal forecast from CMCC
- Hakan Aksu (Directorate Hydrology, Turkey): Summary of hydrological inputs

Tuesday, 18 November

09:00 – 11:00 Session III - Production of large scale climate outlook for winter (DJF) 2014-2015 (II) (Chair: A. Brookshaw)

- Discussion
- Editing and production of MedCOF-3 climate outlook statement

11:00 – 11:30 Coffee break

11:30 – 13:00 Session III - Production of large scale climate outlook for winter (DJF) 2014-2015 (II) (cont.) (Chair: A. Brookshaw)

13:00 – 14:30 Lunch

14:30 – 16:00 Session IV - Discussion on MedCOF matters (Chair: E. Rodríguez)

- MG renovation, ToR
- Web/Forum
- How to improve online MedCOF. Lessons learnt
- Verification
- Communication
- Interaction with users
- Funding/sustainability
- AOB

16:00 – 16:30 Coffee break

16:30 – 18:00 Session IV - Discussion on MedCOF matters (cont.) (Chair: E. Rodríguez)

18:00 – 18:30 Session V - Conclusions and Recommendations

Closure

Annex III: List of participants

MedCOF-3 Participant List (18 November 2014)

| Nr | Title | Name | Surname | Organization/Institute and Country |
|----|-----------|----------------------|------------------|--|
| 1 | Mr. | Gjergji | SHORE | The Hydrometeorological Institute, Albania |
| 2 | Dr. (Mr.) | Artur | GEVORGYAN | Armstatehydromet, Armenia |
| 3 | Mrs. | Kemale | HASHIMOVA | Hydrometeorological Department, Azerbaijan |
| 4 | Mrs. | Nada | RUDAN | Hydrometeorological Institute of Meteorology of RS, Bosnia-Herzegovina |
| 5 | Dr. (Mr) | Ilian | GOSPODINOV | National Institute of meteorology and Hydrology, Bulgaria |
| 6 | Mrs. | Dunja | PLACKO-VRSNAK | Meteorological and Hydrological service of Croatia, Croatia |
| 7 | Mr. | Fathy Mohamed | EL ASHMAWY | Egyptian Meteorological Authority, Egypt |
| 8 | Mr. | Jean-Pierre | CERON | MeteoFrance, France |
| 9 | Mr. | Christian | VIEL | MeteoFrance, France |
| 10 | Ms | Nato | KUTALADZE | The National Environmental Agency of Georgia, Georgia |
| 11 | Mrs. | Khatuna | KOKOSADZE | The National Environmental Agency of Georgia, Georgia |
| 12 | Dr.(Mr) | Peter | BISOLLI | Deutscher Wetterdienst, Germany |
| 13 | Dr.(Mr) | Filippo | MAIMONE | Italian Air Force Met Service, Italy |
| 14 | Dr.(Mr) | Silvio | GUALDI | Centro Euro-Mediterraneo sui Cambiamenti Climatici, Italy |
| 15 | Mr. | Hussein Farhan Hamad | EL MOMANI | Jordan Meteorology Department, Jordan |
| 16 | Dr. | Khalid Ibrahim | ELFADLI | Libyan National Meteorological Service, Libya |
| 17 | Mrs. | Nina | ALEKSOVSKA | Hydrometeorological Service of The FYR of Macedonia |
| 18 | Mrs. | Lidia | TRESCIO | State Hydrometeorological Service of Moldova |
| 19 | Ms. | Sanja | PAVICEVIC | Institute of hydrometeorology and Seismology, Montenegro |
| 20 | Mrs. | Atika | KASMI | Direction dela Meteorologie Nationale, Morocco |
| 21 | Dr.(Ms) | Roxana | BOJARIU | National Meteorological Administration, Romania |
| 22 | Ms. | Jasminka | SMILAGIC | SEEVCCC/ RHMS of Serbia |
| 23 | Mr. | Branko | BIJELIC | SEEVCCC/ RHMS of Serbia |
| 24 | Mr. | Ernesto | RODRÍGUEZ CAMINO | AEMET, Spain |

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|----|------|-----------|-------------|--|
| 25 | Mrs. | Soumaya | BEN RACHED | National Institute of Meteorology, Tunisia |
| 26 | Mr. | Erol | AYDIN | Turkish State Meteorological Service, Turkey |
| 27 | Mr. | Alper | AKÇAKAYA | Turkish State Meteorological Service, Turkey |
| 28 | Ms. | Başak | YAZICI | Turkish State Meteorological Service, Turkey |
| 29 | Mr. | Hüdaverdi | GÜRKAN | Turkish State Meteorological Service, Turkey |
| 30 | Mr. | Mesut | DEMİRCAN | Turkish State Meteorological Service, Turkey |
| 31 | Ms. | Nur | SÖĞÜTÇÜKLÜ | Turkish State Meteorological Service, Turkey |
| 32 | Mr. | Serhat | ŞENSOY | Turkish State Meteorological Service, Turkey |
| 33 | Ms. | Nur | SÖĞÜTÇÜKLÜ | Turkish State Meteorological Service, Turkey |
| 34 | Mr. | Murat | ALTINYOLLAR | Turkish State Meteorological Service, Turkey |
| 35 | Mr. | Hakan | AKSU | General Directorate of State Hydraulic Works, Turkey |
| 36 | Dr. | Anca | BROOKSHAW | Met Office, United Kingdom |
| 37 | Mr. | Hocine | SOUIDI | League of Arab States |
| 38 | Mr. | Andre | KAMGA | ACMAD |
| 39 | Mr. | Miambaye | MBAIGUEDEM | ACMAD |
| 40 | Mr. | Damien | DECREMER | ECMWF |
| 41 | Ms. | Anahit | HOVSEPYAN | WMO |
| 42 | Ms. | Natalia | BERGHI | WMO |
| 43 | Mr. | Omar | BADDOUR | WMO |
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