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Report on

ELEVENTH MEDITERRANEAN CLIMATE OUTLOOK FORUM (MedCOF-11)

November 26-29, 2018

EMA, Egyptian Meteorological Authority, Al Khalifa El Maamoun St., Kobry
ElQubba, Cairo, Egypt





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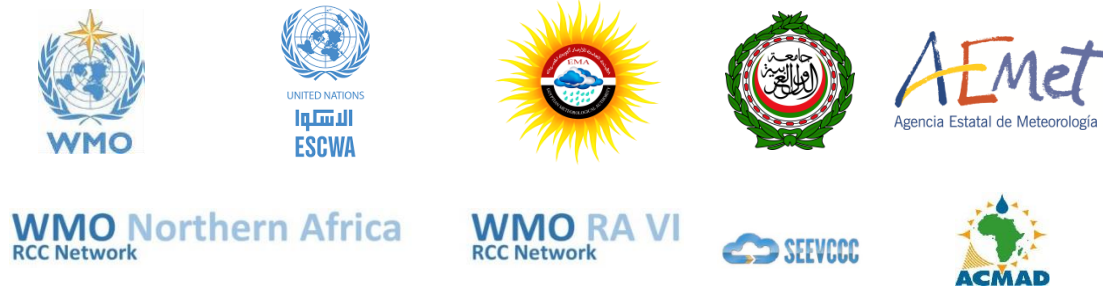
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Executive Summary

The MedCOF-11 forum was held in Cairo from 26 to 29 November 2018 hosted by the Egyptian Meteorological Authority (EMA). The MedCOF-11 forum was held jointly with SEECOF-20, PRESANORD-13, and ARABCOF-3. The coordination of all events has been essential to distribute tasks and avoid overlaps. The MedCOF-11 forum was mainly focused on the production of the consensus large scale climate outlook for the winter 2018-2019. MedCOF-11 has finally released a large scale seasonal forecast for the whole Mediterranean region which was further refined by sub-regional COFs (PRESANORD, SEECOF) and ARABCOF for their respective areas. Following discussions have also allowed agreeing on some topics relevant for the functioning of MedCOF.



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, MeteoFrance, 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 a deep review process started in 2017, RCOFs are transitioning to a more homogenized way of functioning based on extensive use of objectives products combining all sources available of information at seasonal time scale. Also a closer relationship with users and stakeholders is promoted.

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 34 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 1 day of MedCOF session, followed by 1 day of parallel sessions for SEECOF and PRESANORD and MedCOF plenary and 1 final day of a joint session with stakeholders and users

The MedCOF3 (November 2014) plenary decided that training activities -usually organized as a pre-COF session- were separated from the more operational Forum sessions aiming at developing a consensus for the regional climate outlook in order to avoid excessively long MedCOF events which may interfere with domestic responsibilities.

However, due to financial constraints, such specific training event was not possible to arrange back to back with MedCOF-11. Instead, an additional day was added at the beginning of MedCOF-11 as a pre-COF day focused on information of projects and initiatives relevant to the MedCOF community. This short pre-COF day brought together experts participating in the MEDSCOPE-ERA4CS project and from NMHSs of the Mediterranean region. It was mainly devoted to drivers and mechanisms that has an important role for seasonal forecasting over the Mediterranean area, and advances linked to MEDSCOPE project in our understanding of them.

MedCOF-11 is composed as usual of 3 steps; the first one will be devoted to verification of the MedCOF-10 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 AEMET for the North African participants (through the ACMAD Trust Fund established in WMO) and from WMO for the rest of participants requesting financial support.

1.2 Date and Venue

The event was initially being held at Tunisia, but after not having approval from the ministry responsible, Egyptian Meteorological Authority (EMA) offered kindly to organize the event, jointly with ArabCOF-3. These events were co-organized too by the World Meteorological Organization (WMO), the Economic and Social Commission for Western



Asia (ESCWA), EMA, the League of Arab States (LAS), and the State Meteorological Agency of Spain (AEMET). So, the 11th session of the Mediterranean Climate Outlook Forum (MedCOF 11), the 20th session of the South East European Climate Outlook Forum (SEECOF 20) and the 13th session of the Northern African Climate Outlook Forum (PRESANORD 13) were held from 26 to 29 November 2018 in Cairo, Egypt.

The meeting venue was headquarters of Egyptian Meteorological Authority, Al Khalifa El Maamoun St., Kobry ElQubba, Cairo, Egypt (more details on local arrangements in http://medcof.aemet.es/images/doc_events/medcof11/docMedcof11/InformationNote.pdf)

1.3 Participants

MedCOF brought together representatives from all countries involved in South Eastern Europe Climate Outlook Forum (SEECOF): Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Moldova, Montenegro, the Former Yugoslav Republic of Macedonia, Romania, Serbia, Turkey, Ukraine; and in North African Climate Outlook Forum (PRESANORD): Morocco, Algeria, Tunisia, Libya and Egypt; as well as France, Italy, Spain, and Jordan. Resource persons from Meteo France, ECMWF, DWD, Roshydromet, AEMET, as well as representatives from WMO, ESCWA and ACMAD have attended MedCOF. Some resource persons were attending either to the pre-COF MedCOF Training Workshop on Seasonal Forecasting or to the RCOF sessions (MedCOF 11, SEECOF 20, PRESANORD 13) or both. Most climate experts were invited to attend all consecutive events. A list of participants is available in Annex III.

1.4 Programme

The 11th session of the Mediterranean Climate Outlook Forum (MedCOF 11), 20th session of the South East European Climate Outlook Forum (SEECOF 16) and 13th session of the Northern African Climate Outlook Forum (PRESANORD 13) were held from 27 to 29 November 2018. MedCOF-11 was organized in a way to accommodate six sessions:



Opening Session

Session I – Pre-COF Training

Session II – Verification

Session III – Climate monitoring

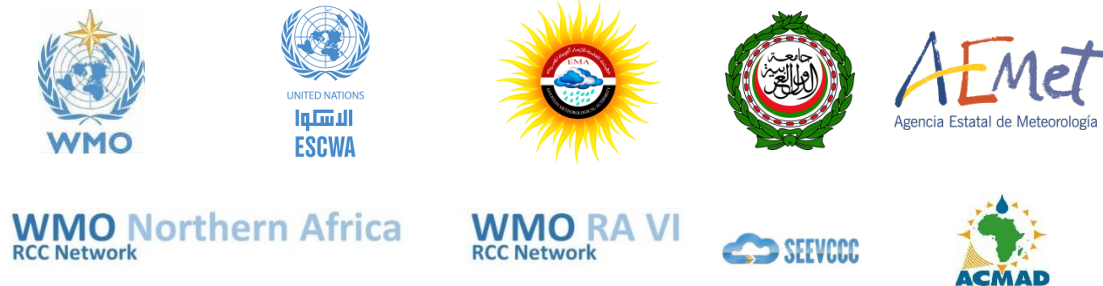
Session IV – Production of large scale climate outlook for winter (DJF) 2018-2019

Session V - Joint session with users and stakeholders

Session VI - Discussion on MedCOF matters

The formal opening session started on Monday 26 November with speeches from Milan Dacic (on behalf Secretary-General of WMO), Tarek Sadek (United Nations Economic and Social Commission for Western Asia (ESCWA, Lebanon) and Ashraf Zakey (on behalf of Mt Ahmed Abd Aal, Chairman Board of directors, EMA) welcomed participants.

Session I consisted of the pre-COF training, with a series of lectures about preliminary results from sensitivity experiments conducted by the MEDSCOPE project aiming to explore relevant drivers and teleconnection mechanisms for the Mediterranean. Session II focused on verification of the previous summer 2018 seasonal forecasts. Session III provided climate monitoring information whereas session IV were devoted to the production of the climate outlook for winter 2018-2019. All these sessions started with presentations from representatives of Global Producing Centers, Regional Climate Centers and climate experts of the Mediterranean countries serving as introduction for discussions. Session V was dedicated to users, and finally, session VI was devoted to discussions on MedCOF matters, as well as to summarize a list of conclusions. Annex II summarizes the programme of MedCOF-11. All presentations and working material are available in <http://medcof.aemet.es/index.php/events/medcof11/medcof11-agenda>



1.5 Working Language

The working language of the meeting was English.

2. Development of the MedCOF-11 meeting

2.1 Pre-COF training

Pre-COF day focused on drivers and mechanisms relevant at seasonal timescales over the MedCOF domain. Most of the pre-COF day was based on preliminary results from the MEDSCOPE project. Silvio Gualdi (CMCC, Italy), introduced the project objectives and progress of different sensitivity experiments within the project. Then, Roxana Bojariu (ANM, Romania), introduced the main drivers relevant to the Mediterranean, and their state for this winter. Then, again Silvio Gualdi presented the preliminary results of sensitivity experiments specifically designed to explore sources of predictability for the Mediterranean region. Javier Garcia Serrano (BSC/UB, Spain) talked about the role of sea-ice and snow cover over northern Asia and the relationship between ENSO/PDO and winter season predictability over the Mediterranean. Esteban Rodríguez Guisado showed the preliminary version of an empirical model for seasonal forecasting over the Mediterranean, based on climate indices. Next release of the model will incorporate the findings introduced in previous talks.

The afternoon session was devoted to new products and techniques for seasonal forecasting. Christian Viel (MeteoFrance) introduced new products related to heat waves and cold spells. Carmen Álvarez-Castro (CMCC, Italy) showed tools based on dynamical proxies and bias correction for statistical downscaling of seasonal forecasts.. Ernesto Rodríguez-Camino (AEMET, Spain) showed a method for combining and weighting of ensemble members based on canonical patterns. Finally, Christian Viel stepped in for Anca Brookshaw to present current state of C3S developments on seasonal forecasting.



Last session was mainly devoted to the WMO infrastructure for operations in seasonal forecast. Ernesto Rodríguez Camino showed new products from the LC-LRFMME, Anahit Hovsepyan presented the outcomes of the Second WMO Workshop on Operational Climate Predictions and the future of RCOF operations and procedures, and Milan Dacic talked about seamless GDPFS.

2.2 Session II: Verification of MedCOF-10 summer seasonal forecast

The first intervention on “*Verification of MedCOF-10*” was presented jointly by Ernesto Rodríguez-Camino (on behalf of Peter Bisolli (DWD, Germany)) and Salah Sahabi Abed (Algeria). The previously prepared verification document was discussed, amended and finally approved.

For temperature in Europe/RA VI, the MedCOF-10 outlook favored the upper tercile for the whole domain except westernmost parts (northwestern half of France and Iberia without the east). In the latter areas the lower or middle tercile was equally preferred. The warm scenario was predicted correctly for most of the domain. Some areas close to the Mediterranean basin, however, had seasonal averages in the middle or lower tercile, which were not captured by the outlook. The reason might be frequent low pressure areas over the warm Mediterranean water, which produced cooling. The cold or normal scenario for the westernmost parts of the domain was well predicted for Iberia but not further north in western France, where it was warm instead. A reason might be subsidence warming due to an anomalous extension of the Azores High, which was underestimated in the outlook in its spatial extension.

For Northern Africa, the MedCOF-10 climate outlook for the 2018 summer season favored above-normal temperature over the North Africa region with probability of 70% at the coastline east of Tunisia, the north of Libya and the north of Egypt, and with 50% probability elsewhere. In fact, in almost all regions of North Africa, temperature anomalies were normal to above normal. Maximum anomalies were recorded over the south and west of Algeria, most of Libya and Egypt. Normal to below-normal anomalies were observed



over Morocco except some stations. Elsewhere temperatures were in their normal tercile. This indicates that the MedCOF-10 climate outlook for the summer season temperature has correctly predicted positive anomalies, although some different temperature detail aspects were observed over the North Africa region.

For precipitation over Europe/RA VI MedCOF-10 outlook favored a dry scenario (lower tercile) over most of the domain. For western and southern Iberia, Greece, most of Turkey (except Black Sea coast), South Caucasus, Middle East, Cyprus no signal was given, which means climatology was recommended. The outlook failed in most of the domain. The dry scenario was correctly predicted only for some of the northern parts, particularly in France, northern Italy and the Ukraine. In contrast, much of the domain, especially the southern parts had above-normal precipitation, which was not predicted by the 25 outlook. A reason might be that the dry area due to high pressure influence was shifted further to the north than expected and precipitation in Mediterranean cyclonic systems over warm water was more intense than expected. However, it has to be considered that the given probability was relatively low with 45% for the dry scenario, which implies uncertainty due to model disagreement. Also especially in some drier regions in the south, the deviations from normal were very small.

Over the North African region, there was no preference category. Summer 2018 was wetter than normal over most of Algeria, Libya and Tunisia, at some stations in the east of Morocco and northeast of Egypt. Precipitation was below normal over west of Libya and most of Egypt. MedCOF-10 precipitation prediction didn't give valuable information.

2.3 Session III: Climate monitoring

Christian Viel (Meteo France, France) and Soumaya Ben Rached (INM, Tunisia) presented the MedCOF-11 climate monitoring draft.

Oceanic analysis shows significant SST warming along the equatorial Pacific, together with the eastward propagation of a Kelvin wave in subsurface. SSTs in the Niño 3.4 box have exceeded the "El Niño" threshold, to reach 0.7°. In the rest of the Northern



Hemisphere, globally warmer than normal over the tropics, cooler in the mid-latitudes, warmer to the North, especially near the Bering Strait. No significant PDO signal. Neutral conditions over the Maritime Continent. Over the Indian Ocean, cooling to the West, leading to a neutral DMI (still positive anyway) over Northern hemisphere. Over the Southern hemisphere, cold anomalies to the East and warm anomalies to the West. Over the Atlantic Ocean, still persists a horseshoe structure with a strong cold anomaly from Canada to South Greenland, Iceland and the British Isles, extending southward to western Portugal, Canary Islands, and eastern tropical Atlantic. In-between, a warm area is spreading from the Caribbean to the Azores. Over the Tropics, there are neutral SSTs on TNA area, and warmer than normal along the Equator, especially over the gulf of Guinea. Mediterranean Sea is globally warmer than normal.

With regard to the atmospheric analysis, the velocity potential anomaly field in the high troposphere show patterns quite similar to those of September. Main anomalies are upward over the Atlantic, downward over the Maritime Continent and Western Pacific. There was active MJO over the Atlantic up to western Indian Ocean (phase 1 and 2). It explains the main upward anomaly centered over the Gulf of Guinea, and the main downward anomaly over the Maritime Continent. Over the Indian Ocean, VP200 anomaly dipole was present, consistent with a positive DMI. Only small anomalies were present over the rest of Pacific Ocean. Typical "El Niño" atmospheric response was absent.

Regarding Stream Function anomalies in the high troposphere, there is a cyclonic anomaly dipole on both sides of the equator over Eastern Indian Ocean, related to the large downward anomaly centered near the Maritime Continent, there was already in place last month. It extends up to Middle East and the Eastern Mediterranean. There are no other significant anomalies in the inter-tropical band.

With respect to geopotential height at 500 hPa and sea level pressure over Europe, the Azores High is shifted far to the north and a long high pressure zone extended from the North Atlantic over Central Europe to the Balkans and Eastern Europe. The Icelandic Low

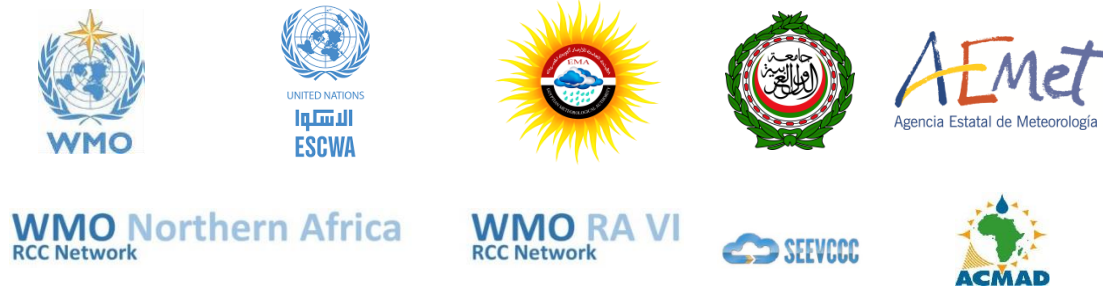


is stronger than normal, causing a well-established NAO+ phase, but the frontal zone is quite far in the north over northern Europe. Especially the Western Mediterranean and the Middle East were affected by cyclonic influence. Sea ice was in very strong deficit in the Arctic, and in a strong deficit in Antarctica.

Over Europe, temperature was above normal over much of France, Italy, the Balkans and further to eastern parts of the domain, all in the upper tercile. On the other hand, it was colder than normal in western France in much of Iberia. In Iberia, even the lower tercile was reached. Over North Africa, the month of October 2018 was characterized by a negative anomaly of temperature over Tunisia, most parts of Algeria and the Eastern Morocco. Warmer than average mean temperatures prevailed over most parts of eastern countries of North Africa region (Libya and Egypt) except for the extreme northwest of Libya which recorded less than average temperatures.

For precipitation, over Europe, dry situation over Northern, Western and Central Europe, due to the predominance of anticyclonic circulation. These dry conditions have been persisting for several months, and enforced the drought. Northern Portugal and much of France, especially the eastern parts were particularly dry. Dry conditions were also over south-east Europe. Places in the Balkans and Romania/Moldova/Ukraine received less than 10mm of precipitation in the whole month. At the contrary, wet conditions over Western Mediterranean with several high precipitation events, locally more than 300mm precipitation totals in southern France and flooding, related to cyclonic anomalies, and also in parts of Turkey and the Middle East.

Over North Africa, total precipitation is mainly expected over the northern sector. Most parts of North Africa region received between 20 mm to 60 mm or less than 20 mm except North-western Tunisia, North-Eastern Algeria and the extreme North-western Morocco, which received between 100 mm to above 200 mm of precipitation. During this month, all Tunisia, west of Libya, north and southeastern Algeria, all Morocco and the south-eastern Egypt recorded above-normal totals of precipitation. In some regions rainfall amounts were greater than 250% of rainfall normal amounts and reached locally 600% of normal. Below



normal conditions occurred over the center and south of Algeria, Eastern Libya and western Egypt. These regions received less than 40% of 1981-2010 average precipitation.

The previously prepared monitoring document using information from the corresponding RA VI and RAI RCCs was discussed, amended and finally approved.

2.4 Session IV: Production of large scale climate outlook for winter (DJF) 2018-2019.

The Session III started with a presentation from Anca Brookshaw (ECMWF, UK), delivered by Christian Viel (Meteo France), summing up the output from ECMWF and Exeter models, and discussing the different responses to the forecasted El Niño event and PNA pattern. Both models show certain tendency to NAO-, but with different responses over northern Europe: ECMWF showed strong positive z500 anomalies over northern Europe and GPC Exeter showed negative z500 anomalies over this area. After that, Valentina Khan (Hydrometeorological Research Center, Russia) presented the seasonal forecast from GPC Moscow, and the relevant drivers and patterns they looked at for Asia. Pierre Etchevers (Meteo France) showed the proposal from GPC Toulouse, with a clearer PNA response. After that, Silvio Gualdi (CMCC, Italy) showed the advances on CMCC model and the outcome for this winter, which showed the stronger NAO- signal of the different models exposed.

After lunch, Esteban Rodríguez-Guisado (AEMET, Spain) presented the outcomes from empirical systems: SPECS, Ibimet and AEMET. Three systems proposed higher probabilities of warm winter for the eastern part of the domain, and normal or event slightly cold winter for the westernmost part of it, which is in rough agreement with the results from dynamical models. With respect to precipitation, propose trend to wet winter over Europe/northwest of the domain and dry for northern Africa an Eastern Mediterranean and Arabian Peninsula.



After all information were examined, Christian Viel (Meteo France) and Wafae Badi (DMN, Morocco) presented summaries for RA VI and North Africa, and an initial large scale proposal for 2018-2019 winter outlook. For temperature, warm tercile was proposed for Northern Africa and SouthEastern Europe, with higher probability for the eastern part of northern Africa and Eastern Mediterranean. For precipitation, agreement among dynamical models suggested wet winter for the westernmost part of the Mediterranean. Response to El Niño event should come through PNA pattern and NAO-, consistently (with different intensity) with models simulations. Drivers doesn't show a clear tendency, but they suggest higher tendency to sudden warming events in the stratosphere, what is usually linked too with certain trend to NAO-. So, with models proposals and a NAO- pattern, a wet area is proposed for Iberian Peninsula, southern Europe and Mediterranean Sea.

Then, discussions about details started, and continued in the parallel sessions for regional COFs: SEECOF on one side, and PRESANORD and ARABCOF on the other one. Both groups worked in parallel sessions and at the end proposed some consensus seasonal forecasts for their respective sub-regions. The final joint plenary resumed discussions and a final consensus seasonal forecasts was produced for the whole MedCOF domain (see Annex III). The MedCOF consensus seasonal forecast is coherent with the more detailed solutions proposed by SEECOF and PRESANORD for their respective regions.

2.5 Session V: Joint session with users and stakeholders

One important aspect of the Forums in general, and of MedCOF in particular, is the facility to bring together experts in various fields and end users of forecasts in an environment that encourages interaction and learning. The joint session with users and stakeholders allowed to cover a wide variety of sectors sensitive to climate conditions (see Annex II including the presentations by users). Here is the list of sectors identified as potential users:

- Civil defence and other disaster and crisis response authorities
- Aviation
- Media



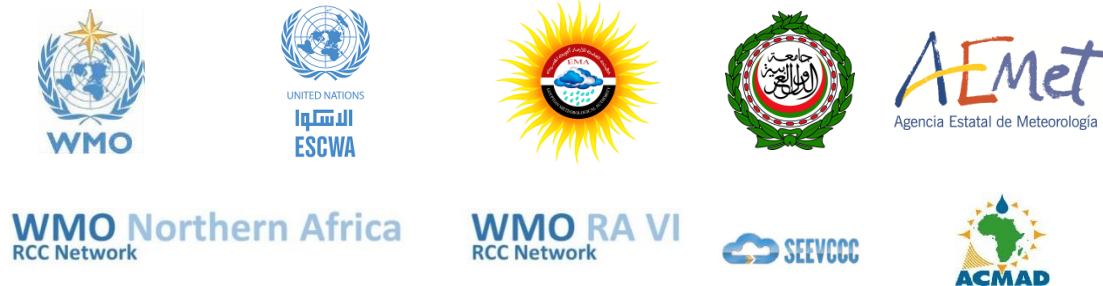
- Public (e.g. through social media, e.g. Twitter, Facebook)
- Agriculture
- Water authorities
- Health sector
- Municipalities, local governments incl. police
- Power providers
- Transport/traffic authorities
- Industry incl. food production, construction sector, oil companies
- Environmental agencies
- Labour (regulating of work hours e.g. during heat waves)
- Marine authorities

There were specific presentations on needs for Hydrological and Agriculture sectors, and for media, highlighting the importance on how information is presented and the definition on new variables specific for every sector, as well as ways to presents uncertainties and verification scores specific for every sector. Presentations are in:

<http://medcof.aemet.es/index.php/events/medcof11>

Some product needs identified and highlighted by users:

- Sand and dust storms
- Precipitation (extreme rainfall and produced flash floods)
- Temperature [extreme cold spells and heat waves (duration), frost, high variability of daily temperature]
- Hail
- Strong winds (e.g. related to meso-scale phenomena)
- Thunderstorms
- Droughts
- Fog
- Visibility (dust, haze)
- Humidity (esp. in coastal regions, potentially causing human discomfort and health problems)



Apart from new products, media presentation showed the importance of how current products are presented to general public. Suggestions of examples for presenting probabilities were made, and to make the outlooks comparing not only with reference periods, but with previous years.

2.6 Session V: Conclusions

After discussions with users, several key needs were assessed:

- Capacity development of professionals and communities on production and effective application of climate services
- Improved, standardized, and quality controlled sector monitoring data that is compatible with meteorological information
- Monitoring and evaluation of cost-effective use of weather and climate data for sector decisions
- Sustainable financial and technical support to Met. Offices to cope with the large number of sector requests and needs

2.7 Session VI: Discussion on MedCOF matters

The 6th session of MedCOF-11 chaired by Ernesto Rodriguez (AEMET) covered the following topics:

- Final approval of documents
- Verification
- Election of new vice-chair
- Joint Training activities with MEDSCOPE
- Rethink RCOFs after the operational implementation of C3S, MEDSCOPE
- Next MedCOF



Final approval of documents

All documents (consensus outlook, monitoring, verification) are shared for final comments, and will be uploaded on the website with possibility of further update afterwards. There was certain discussion about percentages of the outlook and slight changes over certain borders. The documents were approved and updated with the minor changes proposed, to make MedCOF and ArabCOF outlooks more consistent. Discrepancies up to 10-15 % were considered acceptable.

Verification

It was agreed to update verification tables with most recent scores of models (upgraded versions) performance (monthly values for each variable), including all models run by relevant RCCs.

Election of new vice-chair

According to the MG ToR approved by MedCOF5, “the MT will elect a chair and a vice-chair, each for an alternating two-year period, one year the chair is to be elected for 2 years, and next year the vice-chair for 2 years, to ensure regional balance and an optimum of experience transfer. Reelection can be envisaged. Last vice-chair (Fatima Driouech) is no longer in the project. The election of a new vice-chair is discussed, but no candidates are found. The matter will be assessed in the next meeting of the MG, where a new vice-chair will be nominated. Ernesto.Rodríguez will continue as a chair for one more year with support of Esteban Rodríguez. In one year the new vice-chair will take over the responsibility as a chair.

Joint Training activities with MEDSCOPE

After a positive pre-COF session, it’s agreed that is a good idea to continue involving MEDSCOPE project partners to communicate results and help with capacity development activities

Rethink RCOFs after the operational implementation of C3S, MEDSCOPE

It will be a matter to consider moving towards more objective forecasting approach, following the guidance document developed by CBS/CCI

Next MedCOF

The representative of Armenia offered to organize next session in Yerevan, Armenia



2.8 Session VI: Conclusions

- The verification and monitoring documents have been discussed and approved by the participants.
- The consensus-based climate outlook for winter 2018/2019 has been produced.
- All presentations are already in the MedCOF web page
- All documents will be available at MedCOF, SEECOF and EMA website
- In the discussion session on MedCOF issues a number of actions were agreed:
 - Nominating new vice-chair in next MG
 - Updating verification tables with new versions of models
 - Keep joint training activities with MEDSCOPE
 - Tentatively agreed to conduct the next face-to-face sessions in November 2019, in Armenia, subject to formal confirmation by the host Institution.



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Annex I

ELVENTH MEDITERRANEAN CLIMATE OUTLOOK FORUM



November 26-29, 2018

Cairo, Egypt

DAY 1: MONDAY, 26 NOVEMBER

08:30 – 09:00 Registration

09:00 – 09:30 Opening & Working arrangements

Welcome remarks:

- **Mr Milan Dacic** on behalf of the Secretary-General of the World Meteorological Organization (WMO, Switzerland)
- **Mr Tarek Sadek** United Nations Economic and Social Commission for Western Asia (ESCWA, Lebanon)
- **Mr Ahmed Abd Aal** Chairman Board of Directors (EMA, Egypt)
- Information on logistical arrangements during the sessions (host)

Pre-COF Session

09:30 - 10:30 Session I (chair: Ashraf Zakey)

- **Silvio Gualdi** (CMCC, Italy): "Progress of MEDSCOPE project"
- **Roxana Bojariu** (ANM, Romania): "Introduction to drivers at seasonal scale relevant to the Mediterranean"



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- **Silvio Gualdi** (CMCC, Italy): "Preliminary results from the sensitivity experiments exploring the sources of predictability for the Mediterranean region at seasonal time scales"
- Q&A

10:30 - 11:00 Coffee break/ group photo

11:00 – 13:00 Session I (cont.) (chair: Ashraf Zakey)

- **Javier García-Serrano** (BSC//UB, Spain): "Role of sea-ice and snow cover extent over northern Asia on predictability of the NH cold season. MEDSCOPE sensitivity experiments"
- **Javier García-Serrano** (BSC/UB, Spain): "Role of ENSO/PDO at seasonal time scale over the Mediterranean region. MEDSCOPE sensitivity experiments"
- **Esteban Rodríguez-Guisado** (AEMET, Spain): "Development of an Empirical Seasonal Forecasting System for the Mediterranean"
- Discussion

13:00 - 14:00 Lunch

14:00 – 15:30 Session II (chair: Milan Dacic)

- **Christian Viel** (MF, France): "New products for heat waves and cold spells at seasonal time scale"
- **Carmen Alvarez-Castro** (CMCC, Italy): "Dynamical proxies, bias correction and statistical downscaling as tools for seasonal forecast"
- **Ernesto Rodríguez-Camino** (AEMET, Spain): "Combination and weighting of seasonal forecasting information"
- **Anca Brookshaw** (ECMWF, UK): "Recent developments of C3S on Seasonal Forecasting" (*remote presentation*)
- Discussion

15:30 - 16:00 Coffee break



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16:00 - 17:30 Session II (chair: Milan Dacic)

- **Ernesto Rodríguez-Camino** (AEMET, Spain): "Update on the LC LRFMME operations".
- **Anahit Hovsepyan** (WMO, Switzerland): "Summary of Second WMO Workshop on Operational Climate Prediction"
- **Anahit Hovsepyan** (WMO, Switzerland): "Moving forward in RCOF operations and procedures".
- **Milan Dacic** (WMO, Switzerland): "Towards seamless GDPFS: Weather and Climate marriage".
- Discussion

17:30 Adjourn day 1

DAY 2: TUESDAY, 27 NOVEMBER

09:00 – 10:00 Session I – Verification of previous outlooks - Step 1 (chair: Silvio Gualdi)

- **Ernesto Rodríguez** (for Peter Bissolli, DWD, Germany) and **Salah Sahabi Abed** (Algeria): Presentation of MedCOF-10 verification (draft)
- Discussion and approval of Step 1 MedCOF-11 document

10:00 – 11:00 Session II – Climate monitoring – Step 2 (chair: Silvio Gualdi)

- **Christian Viel** (Meteo-France) and **Soumaya Ben Rached** (INM, Tunisia): Presentation of MedCOF-11 climate monitoring draft.
- Discussion and approval of Step 2 MedCOF-11 document.

11:00 – 11:30 Coffee break

11:30 – 13:00 Session III - Production of large-scale climate outlook for winter (DJF) 2018-2019 (chair: Branko Bijelic)



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- **Anca Brookshaw** (ECMWF, UK): Seasonal forecast from GPC ECMWF and GPC Exeter (remote presentation)
- **Valentina Khan** (Hydrometeorological Research Center, Russia): Seasonal forecast from GPC Moscow.
- **Pierre Etchevers** (Meteo-France, France): Seasonal forecast from GPC Toulouse
- **Silvio Gualdi** (CMCC, Italy): Seasonal forecast from CMCC

13:00 – 14:00 Lunch

14:00 – 15:30 Session III - Production of large-scale climate outlook for winter (DJF) 2017-2018 (cont.) (chair: Roxana Bojariu)

- **Esteban Rodríguez-Guisado** (AEMET, Spain): Seasonal forecast from statistical systems
- **Christian Viel** (Meteo-France, France): Summary from RA VI RCC-LRF
- **Hubert Kabengela Nyamabu** (ACMAD, Niger): Summary from RA I RCC-LRF
- **Wafae Badi** (DMN, Morocco): Summary from North African RCC-LRF
- **Arjan Zamreeg & Mr. Said Al Sarmi** (GCC) (tbc) (GAMEP, Saudi Arabia): Summary from GCC
- Discussion

15:30 – 16:00 Coffee break

16:00 – 17:30 Session III - Production of large-scale climate outlook for winter (DJF) 2018-2019 (Chair: C. Viel/W. Badi) (cont.)

- Editing the provisional MedCOF-11 climate outlook statement (Step 3 document)

17:30 Adjourn day 2



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DAY 3: WEDNESDAY, 28 NOVEMBER

09:00 – 11:00 Parallel sessions SEECOF-20, PRESANORD-12, ArabCOF-

3

SEECOF-20	
<p>Session 2: Climate monitoring and verification of previous climate outlooks (SEECOF-18 and -19) <i>Chair: Ms. Roxana Bojariu (tbc)</i></p> <ul style="list-style-type: none"> • Verification of the SEECOF-18 Climate outlook for 2017/2018 winter season, • Verification of the SEECOF-19 Climate outlook for 2018 summer season, • Climate outlook for 2018 summer in the SEECOF member states: • Verification of the SEECOF-19 Climate outlook for 2018 summer season in Croatia • Verification of the SEECOF-19 Climate outlook for 2018 summer season in Georgia • Verification of the SEECOF-19 Climate Outlook for 2018 summer in Bulgaria, • Discussion and approval of the draft documents of the verification of the SEECOF-18 and SEECOF-19 Climate Outlooks 	<p><i>Mr. Branko Bijelic, RA VI RCC-SEEVCCC/RHMSS (30 minutes)</i></p> <p><i>Ms. Ana Savovic, RA VI RCC-SEEVCCC/RHMSS (30 minutes)</i></p> <p><i>Ms Dunja Placko-Vrsnak, Croatia(10 minutes) (tbc)</i></p> <p><i>Ms. Khatuna Kokosadze, Georgia (10 minutes)(tbc)</i></p> <p><i>Mr. Ilian Gospodinov, Bulgaria (10 minutes) (tbc)</i></p>



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PRESANORD-12	
<p>Session 2: Climate monitoring and verification of previous climate outlooks (PRESANORD-11)</p> <p><i>Chair: Mr Salah Sahabi Abed (tbc)</i></p> <ul style="list-style-type: none"> • Verification of the PRESANORD-11 outlook for 2017/18 winter season. • Verification of PRESANORD-11 climate outlook over : <ul style="list-style-type: none"> -Algeria -Egypt -Lybia -Morocco -Tunisia • Discussion and approval of PRESANORD-11 verification 	<p><i>Mr Salah Sahabi Abed (tbc)</i></p> <p><i>Mr Salah Sahabi Abed (tbc)</i></p> <p><i>Ms Awatif Mostafa (tbc)</i></p> <p><i>Mr Eshtewi Rabha (tbc)</i></p> <p><i>Ms Wafae Badi</i></p> <p><i>Ms Rabeb Selmi (tbc)</i></p>

ArabCOF-3	
<p>Session 2: Climate monitoring and verification of previous climate outlooks (ArabCOF-1 and -2)</p> <ul style="list-style-type: none"> • Verification of ArabCOF -2 outlook for spring 2018 • Presentation of ArabCOF-3 climate monitoring draft. • Discussion and approval of Step 2 ArabCOF-3 document. 	<p><i>Mr Sahabi Abed (tbc)</i></p> <p><i>Mr. Tariq Joumah Abid</i></p> <p><i>Sharaan(Jordan) (tbc)</i></p> <p><i>Mr. Said Al Sarmi (GCC) (tbc)</i></p> <p><i>Mr. Awatif Mosftfa (Egypt) (tbc)</i></p> <p><i>Ms Soumaya Ben RACHED</i></p>



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11:00 – 11:30 Coffee break

**11:30 – 13:00 Parallel sessions SEECOF-20, PRESANORD-12, ArabCOF3
(cont)**

SEECOF-20	
<p>Session 3 - Production of regionalized climate outlook for winter (DJF) 2018-2019 over SEECOF domain (continuation) <i>Chair: Ms. Mirjana Ivanov</i></p> <p>Short review of Global and regional Inputs</p> <p>Global Inputs:</p> <p>Regional inputs:</p> <ul style="list-style-type: none"> • MedCOF input • SEEVCCC input • Climate predictive signals for the SEECOF region <p>National inputs:</p> <ul style="list-style-type: none"> • Climate outlook for winter 2018-2019 in Bulgaria, • Discussion • Editing and production of SEECOF-20 Climate Outlook bulletin 	<p><i>Mr. C.Viel (RA VI RCC on LRF Meteo-France) (tbc)</i></p> <p><i>Mr. E. Rodriguez Camino (AEMET)</i></p> <p><i>Mr. Branko Bijelic RA VI RCC-SEEVCCC/RHMSS</i> <i>Ms. Roxana Bojariu (National Meteorological Administration, Romania) (tbc)</i></p> <p><i>Mr I. Gospodinov, NIMH, Bulgaria (tbc)</i></p> <p><i>Mr. Branko Bijelic, RA VI RCC-SEEVCCC/RHMSS</i></p>



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ArabCOF-3	
<p>Session 3 - Production of regionalized outlook for winter (DJF) 2018-19 over ArabCOF domain (cont.)</p> <p>Short review of Global and regional Inputs</p> <p>Global Inputs:</p> <p>Regional inputs:</p> <ul style="list-style-type: none"> • MedCOF input • ArabCOF input • Climate predictive signals for the ArabCOF region <p>National inputs:</p> <ul style="list-style-type: none"> • Discussion • Editing and production of ArabCOF-3 Climate Outlook bulletin 	<p><i>Ms. Awatif Mosftafa(tbc)</i> <i>Mr. Arjan Zamreeg(tbc)</i> <i>Ms. Samia Al- Zakwani (tbc)</i> <i>Ms. Wafee Badi(tbc)</i> <i>Ms. Rabeb Selmi(tbc)</i> <i>Mr, Salah Shabi(tbc)</i></p>
PRESANORD-12	
<p>Session 3 - Production of regionalized climate outlook for winter (DJF) 2018-2019 over PRESANORD domain (continuation) <i>Chair: Ms Wafae Badi</i></p> <p>Short review of Global and regional Inputs</p> <p>Global Inputs:</p> <p>Regional inputs:</p> <ul style="list-style-type: none"> • MedCOF input • PRESANORD input • Climate predictive signals for the PRESANORD region <p>National inputs:</p> <ul style="list-style-type: none"> • Discussion • Editing and production of PRESANORD-12 Climate Outlook bulletin 	<p><i>Mr. Ernesto Rodriguez Camino</i></p> <p><i>Mr. Ernesto Rodriguez Camino</i> <i>Ms. Wafae Badi</i></p> <p>All participants</p>



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13:00 – 14:00 Lunch

14:00 – 15:00 Parallel sessions SEECOF-20, PRESANORD-13, ArabCOF3 (cont)

SEECOF-20	
Session 3 - Production of regionalized climate outlook for winter (DJF) 2018-2019 over SEECOF domain (continuation) <i>Chair: Mr Branko Bjelic</i> <ul style="list-style-type: none"> • Discussion • Editing and production of SEECOF-20 Climate Outlook Bulletin 	<i>All participants</i>

ArabCOF-3	
Session 3 - Production of regionalized climate outlook for winter (DJF) 2018-2019 over ArabCOF domain (continuation) <i>Chair: Mr Ashraf Zakey</i> <ul style="list-style-type: none"> • Discussion • Editing and production of ArabCOF-3 Climate Outlook Bulletin 	Ms. Awatif Mosftafa(tbc) Mr. Arjan Zamreeg(tbc) Ms. Samia Al- Zakwani(tbc) Ms. Wafee Badi(tbc) Ms. Rabeb Selmi(tbc) Mr, Salah Shabi(tbc)

PRESANORD-12	
Session 3 - Production of regionalized climate outlook for winter (DJF)	



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**2018-2019 over PRESANORD domain
(continuation)**

- Discussion
- Editing and production of PRESANORD-12 Climate Outlook Bulletin

15:00 – 16:00 Session IV - Production of large-scale climate outlook for winter (DJF) 2018-2019 (Chair: E. Rodríguez-Camino)

- **Branko Bijelic:** Brief report back from SEECOF-20
- **Wafae Badi:** Brief report back from PRESANORD-12
- **Ashraf Zakey:** Brief report back from ArabCOF-3
- Discussion

16:00 – 16:30 Coffee break

16:30 – 18:00 Session IV - Production of large-scale climate outlook for winter (DJF) 2018-2019 (Chair: E. Rodríguez Camino) (cont)

- Discussion and approval of MedCOF-11 climate outlook statement (step 3 document)

18:00 Adjourn day 3

DAY 4: THURSDAY, 29 NOVEMBER

09:00 – 13:00

Opening Remarks

Plenary session with users and stakeholders (Chair: Tarek Sadek)

- **Dunja Mazzocco Drvar** (Croatia): Climate information communication aspects, good practices



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- **Hesham Abdel Ghany** (WMO, Bahrain): Seasonal forecasts importance to economic sectors
- **Stakeholder representatives:** statements/presentations on the current status of utilization of climate information and products provided by EMA, and their needs and requirements of tailored products for decision making in agriculture and water management

11:00 – 11:30 Coffee break

- Open discussions (Moderated by Chair)
- Concluding remarks of the session with users and stakeholders

13:00 – 14:00 Lunch

14:00 – 16:30

Plenary discussion on MedCOF/SEECOF/ArabCOF/PRESANORD internal matters (Chair: E. Rodríguez Camino)

- Discussion on gaps, constraints, proposal for improvement of sessions
- Conclusions and Recommendations for way forward

16:30 Closure



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Annex III:

Step 3 of the MEDITERRANEAN CLIMATE OUTLOOK FORUM (MedCOF-11) Last updated 28th November 2018

SEASONAL OUTLOOK FOR THE WINTER SEASON 2018-19 FOR THE MEDITERRANEAN REGION

Climate experts from WMO RA VI RCC Network Node on long-range forecasting (Meteo France and Hydrometeorological Centre of Russia), WMO RA VI RCC Network Node on climate monitoring (Deutscher Wetterdienst, Germany), WMO Northern Africa RCC Network Node on long-range forecasting (Directorate of National Meteorology, Morocco), WMO Northern Africa RCC Network Node on climate monitoring (National Institute of Meteorology, Tunisia), South East Europe Virtual Climate Change Centre (SEEVCCC, Serbia), Euro-Mediterranean Center on Climate Change (CMCC, Italy), Istituto de Biometeorología (IBIMET CNR, Italy), National Hydrometeorological Services and Research Institutes of MedCOF region provided their valuable contribution to the successful implementation of MedCOF-11 by developing the relevant documents and providing scientific guidance and recommendations.

The MedCOF-11 session comprised of the following steps:

- Step 1: verification of the MedCOF-10 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 2018-19 winter season.

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

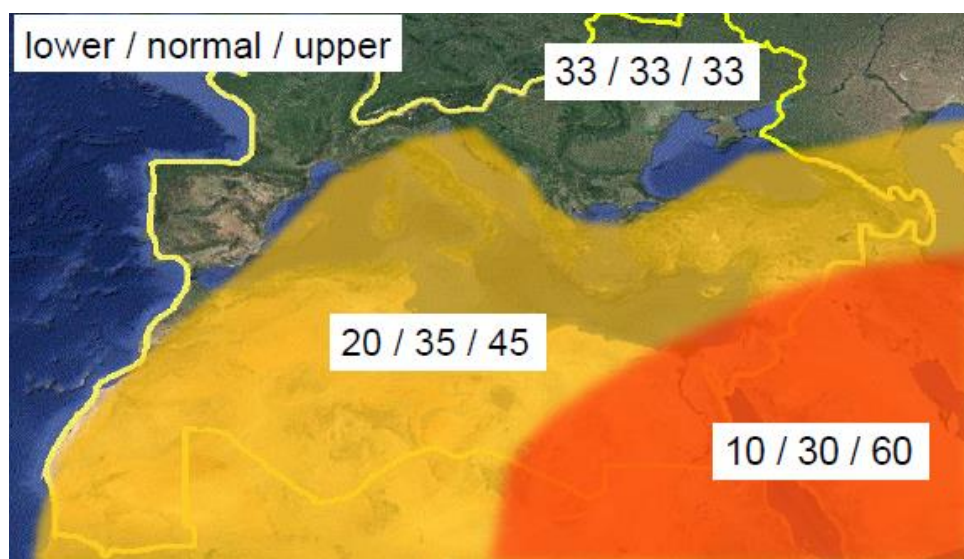


MedCOF- 11 CLIMATE OUTLOOK

FOR THE 2018-2019 WINTER SEASON¹

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

The tropical Pacific reflects weak El Niño conditions in terms of SST indices. The latest ENSO predictions indicate that a moderate El Niño event will continue throughout the winter. Some influence of El Niño on general circulation at midlatitudes is expected by the canonical response of positive PNA and the potential teleconnection up to the Atlantic Ocean. Most dynamical models and drivers suggest that El Niño conditions would favor negative North Atlantic Oscillation (NAO).



¹The 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.

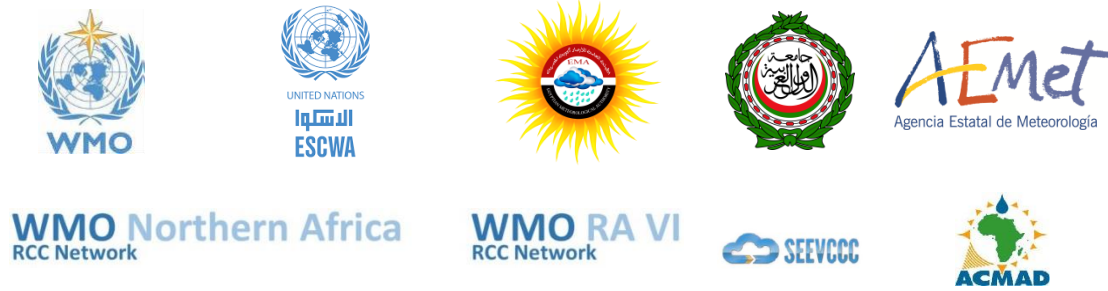


Figure 1. Graphical presentation of the 2018-19 winter temperature outlook. The maps show the probabilistic consensus forecast for tercile categories of anomalies for seasonal mean temperature, relative to the period 1981-2010. Due to the climate warming trend anomalies are affected by the selected reference period.

A tendency for above-average temperatures the main feature over most of the southern part of the region, including northern Africa, Middle East and the Mediterranean Sea. The highest probability for above average temperatures is expected over the southeastern part of the domain (see figure 1)

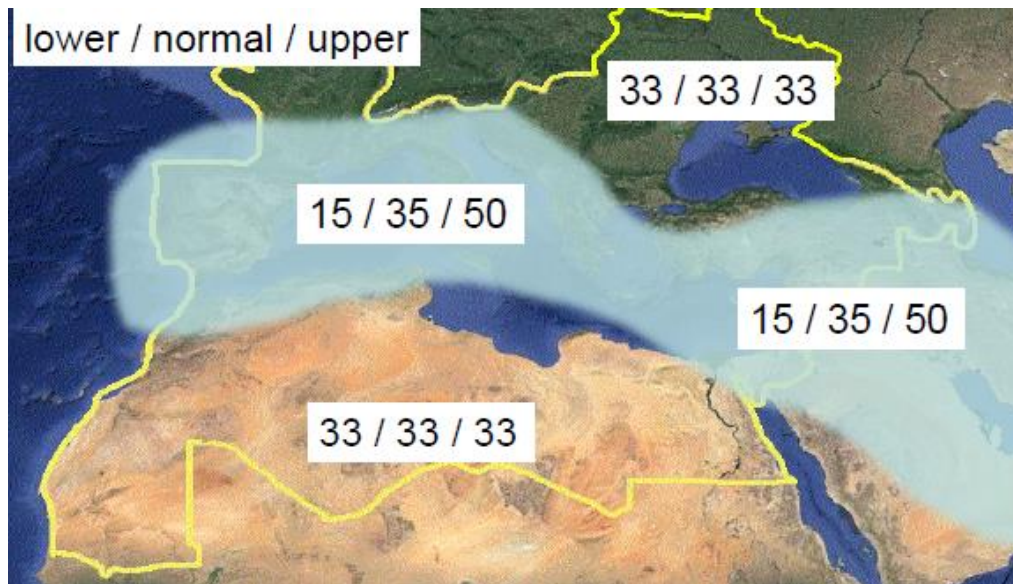


Figure 2. The same as figure 1 but for precipitation.

Although precipitation uncertainties are generally larger than for temperature, additionally the uncertainty related to the predominance of negative NAO may shift the precipitation distribution over the Mediterranean Sea. The negative NAO pattern will favor wetter-than-normal conditions over most of the Mediterranean Sea, including most of southern Europe, northern Morocco, Anatolia, Caucasus and Middle-East (see figure 2). In addition, local factors (for example SSTs in the smaller basins of the region) may shape local variability at a regional level.



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.



APPENDIX: Contributors to MedCOF-11

- World Meteorological Organization
- European Centre for Medium Range Weather Forecast, United Kingdom
- Météo France, Republic of France
- Roshydromet, Russia
- African Centre of Meteorological Application for Development, Niger
- Agencia Estatal de Meteorología, Spain
- Deutscher Wetterdienst, Federal Republic of Germany
- National Centre of Meteorology and Aeronautical Climatology, Italy
- Euro-Mediterranean Center on Climate Change, Italy
- Institute of Biometeorology, Italy
- South East European Virtual Climate Change Center hosted by Republic Hydrometeorological Service of Serbia, Republic of Serbia
- National Meteorology Office, Algeria.
- Egyptian Meteorological Authority, Egypt
- National Institute of Meteorology and Hydrology, Republic of Bulgaria
- Meteorological and Hydrological Service, Republic of Croatia
- Meteorological Service, Republic of Cyprus
- Meteorological Service, Israel
- Meteorological Department, Jordan
- Meteorological Department, Lebanon
- National Environmental Agency of Georgia, Georgia
- Hydromet Service, Armenia
- Republic Hydrometeorological Institute, Former Yugoslav Republic of Macedonia
- Ministry of Transport, National Office of Meteorology, Mauritania
- Institute of Hydrometeorology and Seismology of Montenegro, Montenegro
- National Centre for Meteorological Research, Directorate of National Meteorology, Morocco
- National Meteorological Administration, Romania
- Republic Hydrometeorological Service of the Republic of Srpska, Bosnia and Herzegovina
- Federal Hydrometeorological Institute, Bosnia and Herzegovina
- Hydrometeorological Center, Ukraine
- Slovenian Environment Agency, Meteorological Office, Slovenia
- State Hydrometeorological Service, Republic of Moldova
- Palestinian Meteorological Department
- Republic Hydrometeorological Service of Serbia, Republic of Serbia
- National Institute of Meteorology, Tunisia
- State Meteorological Service, Turkey



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