WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Current status of MedCOF operations

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WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

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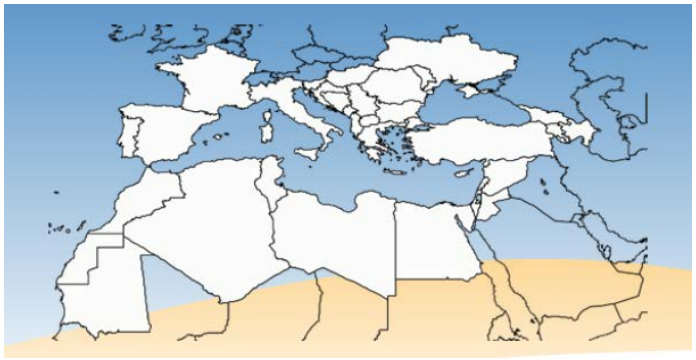
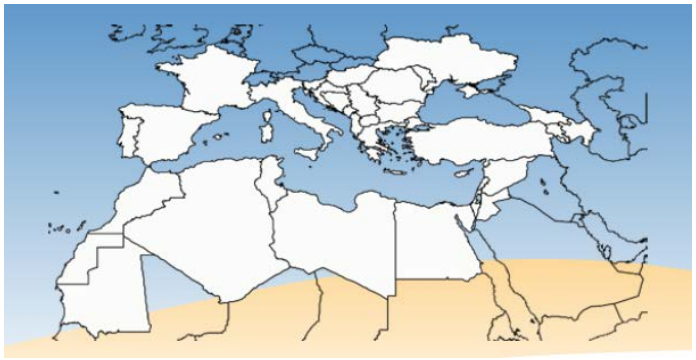
MedCOF background (1)



- Complex morphology, due to the presence of many sharp orographic features: high mountain ridges surrounding the Mediterranean Sea on almost every side, distinct basins and gulfs, and islands and peninsulas of various sizes. These characteristics have important consequences on both sea and atmospheric circulation because they determine a large spatial variability and the presence of many sub-regional and mesoscale features.
- Droughts and floods are among the most dangerous meteorological hazards affecting the Mediterranean countries, followed by windstorms and hail. Floods affect the entire Mediterranean region but their frequencies and impacts are not homogeneous over the entire area.
- Highly vulnerable and prone to significant economic losses, given the economic and cultural differences and the demographic contrasts, with high population densities in eastern Spain, southern France, Italy, the west of the Balkan Peninsula and Egypt.
- Major stakes in water management, agriculture, energy, tourism, …

MedCOF background (2)

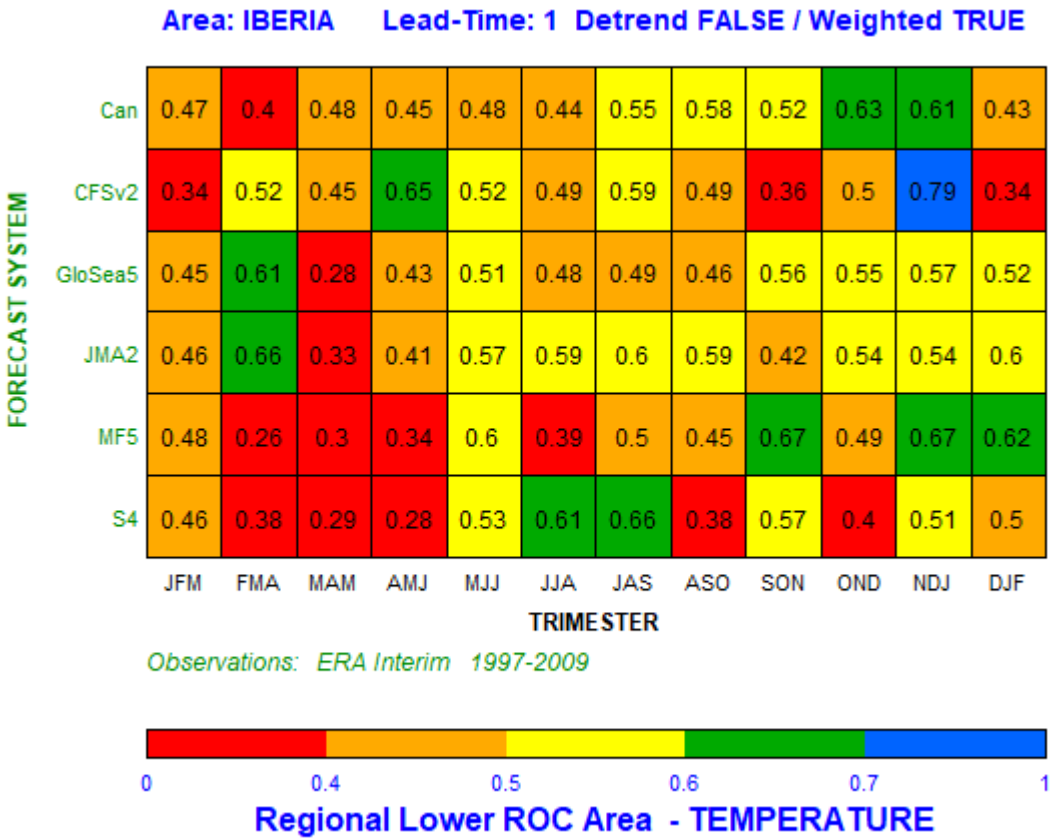


- Scoping Meeting in June 2013 at the AEMET, MedCOF cutting across RAVI and RAI. AEMET coordinates and facilitates MedCOF activities..
- MedCOF operates as an overarching entity in support of two other RCOFs existing in the region (SEECOF and PRESANORD) with the addition of France, Italy, Lebanon, Malta, Mauritania, Portugal, Spain and the Syrian Arab Republic.
- The RA VI RCC and Northern Africa RCC networks play a paramount role supporting MedCOF activities. Other WMO institutions, likewise ACMAD operating as RA I RCC and the South East European Virtual Climate Change Center (SEEVCCC), also support MedCOF activities. Other partner institutions, as e.g. IBIMET, CMCC, etc. also collaborate with and contribute to MedCOF.
- MedCOF sessions focus on the large-scale forcings (e.g., NAO), that are shared by the whole basin, the subregional RCOFs focus on smaller-scale forcings refining and adapting the consensus forecasts provided by MedCOF.
- Training workshops conducted for MedCOF participants contribute to developing capacities.
- MedCOF is currently focusing on the non-negligible task of coordinating the region for the production of a coherent, consistent and agreed message on probabilistic seasonal forecast.

The MedCOF process

- Capacity development plays a central role within MedCOF. These training activities have payed special attention to practical sessions aiming to provide tools for operational tasks and to enhance the transfer of knowledge within the region. Along the last three years, training workshops have been organized focused in thematic areas of knowledge relevant mainly for operational seasonal forecasting duties.
- Evaluation of the previous season's consensus outlook is always conducted in each MedCOF exercise. This evaluation starts with the verification reports provided by the participating countries that are invited to provide national reports including information on: a) high-impact events during the last forecasted season; b) brief assessments of the correctness of the last outlook, and c) comments on user perceptions of the outlook. The skill is evaluated by looking at the verifying tercile maps for temperature and precipitation, then this information is integrated and complemented with global and regional monitoring databases. The low number of consensus outlooks carried out so far has not allowed the computation of the usual probabilistic verification scores.
- Information updates between RCOF events are produced and disseminated only at national level. Climate Watch is routinely done by RCCs and alerts/warnings (if any) are disseminated through national focal points and using a dedicated web page.

Sistematic verification of SFSs as basic element for «weighting» models



For different models, multimodels, variables, domains, scores, hindcast periods, strategies for combining models, …

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Empirical predictors at seasonal timescale for the region

Correlation between teleconnection indices and lagging precipitation

Domain: Egypt

Zone	Predictor	MAM				JJA				SON				DJF			
		1 ml	4 ml	7 ml	10 ml	1 ml	4 ml	7 ml	10 ml	1 ml	4 ml	7 ml	10 ml	1 ml	4 ml	7 ml	10 ml
Pacific	WP						■		■			■				●■	
	PNA	■															
	NINO							■	■								●
	nino1+2															●	●
	nino3															●	●
	nino4	●	●														
	EMI	●	●											●	●		
	SOI								■	■					■		
	PDO	■						■									
	NPGO											●■	●■				
Indian	IOD									●■							●
Atlantic	NAO				●■	■						●			■		■
	EA			●							■			■		●■	
	EA-WR			●							■			■		●■	
	AMO					■	■	■								■	■
	AT *		●	●						●■	●■	●					
	SCAND				■								■				●
	TNA					■		■		●■	■	●					■
Arctic	AO	●			●■										●		●
Mediterranean	WEMO		●■		●			■			●	■					
Snow Indexes	SAI-d **		■				■								■		
	SAI-w **		■				■								■		
	SAI-w-ext						■										
	SVI **		■				■										
QBO	QBO		■		●												

Figure X: Number of stations (or gridpoints) over the Egypt domain (expressed in percentage) with significant correlation coefficient (at 95% confidence level) between a selection of teleconnection indices and lagging precipitation from ERA-Interim (circle) and GPCC (square). Three colors (red, yellow and green) are used to represent the average value of the correlation coefficient (● ■ 0-30%, ● ■ 30-60%, ●■ +60%). Correlation coefficients are computed for the period 1981-2010. Snow indexes are referred to different periods: (*) 1961-2000, (**) 2000-2010. 1 ml, 4 ml, 7 ml and 10ml correspond to teleconnection indices leading 1, 4, 7 and 10 months respectively.

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The MedCOF consensus process

- The assessment of **current state of the climate**, including the relevant large-scale climate patterns, is the starting point for the consensus process.
- Then presentations and discussions on the main **relevant drivers and model outputs** allow to reach to a common view in terms of **evolution of climate variability patterns (VP)** affecting the region.
- Once the evolution in terms of VPs is agreed, **probability for temp/prec terciles** is assigned seeking consistency with the VPs and with the most trusted models.
- MedCOF consensus process pay **special attention to the large scale forcings and the consistency of the large scale picture in terms of VPs**, leaving smaller scale refinements to subregional (SEECOF, PRESANORD) and national COFs.

MEDSCOPE (MEDiterranean Services Chain based On climate PrEdictions) in support of MedCOF

- MEDSCOPE is a 3 years ERA4CS (Joint Call on Researching and Advancing Climate Services Development, Topic B: Institutional Integration) Project (starting in Sept 2017) mainly funded by institutions (CMCC, MF, BSC, AEMET, CNR, …) from 3 MedCOF countries (It, Fr, Sp) with additional support from EC.
- MEDSCOPE will cover the following topics:
  - **Processes and Sources of Predictability in Mediterranean**
  - **Forecast Calibration, Verification and Information Synthesis.**
  - **Sectoral Climate Services**
- Cross fertilization between MEDSCOPE and MedCOF.

Capacity Development activities

- MedCOF 2015 Training Workshop on Seasonal Forecasting . Madrid, Spain, 26-30 October 2015 (http://medcof.aemet.es/index.php/events/training1)
- MedCOF 2016 Training Workshop on Verification of Operational Seasonal Forecasts in the Mediterranean region. Rome, Italy, 15-18 November 2016 (http://medcof.aemet.es/index.php/events/training2)
- MedCOF 2017 Training Workshop on Sources of Predictability for the Mediterranean region. Zagreb, Croatia, 16-18 November 2017

User Involvement

Water and energy sectors, both from the production and demand sides, were initially indicated as major stakes for a number of Mediterranean countries. Efforts are currently conducted in conjunction with research projects to demonstrate the benefits of seasonal forecast in both targeted sectors. User involvement is mainly conducted at national level. Certain sectors, as e.g. water management, renewable energy, etc., are closely collaborating in the exploitation of seasonal outlooks not only coming from MedCOF but from the national services.

Funding scheme

- So far the main funding mechanism for MedCOF was based on **WMO and AEMET** support. Western European countries have always funded their own expenses. AEMET also contributes with manpower for basic coordination (e.g., web page development and maintenance, verification, administrative tasks, …)
- **New possibilities** of funding are envisaged based on agreements with C3S, MEDSCOPE and other EU initiatives.

SWOT analysis

- Strength: i) harmonization of seasonal forecasts within the region; ii) help to develop operational seasonal activities in the less advanced countries within the region.
- Weakness: i) low predictability/model scores over the region; ii) need of demonstration of the value added by the consensus exercise to the final products.
- Opportunities: start of activities and projects aiming to develop tools helping to the decision making process in specific sectors.
- Threat: uncertain sustainability of MedCOF activities.

Way Forward

- Improvement of **evaluation and verification procedures** pointing to the implementation of objective verification methods, following the recommendations of the WMO Commission for Climatology (CCl);
- Development and implementation of **tools for online working** to facilitate the organization of remote MedCOF sessions;
- Development of **tools** (toolkit) for Forecast Calibration, Verification and **Information Synthesis.**
- Special stress will be put on **capacity building and transfer of knowledge**, as big differences in expertise among countries in the region still exist;
- Progress on **user involvement** remains a standing item and a challenge. Sectoral Climate Services (MEDSCOPE).
- Close link with the **MEDSCOPE (ERA4CS) project** aiming to produce tools and support MedCOF activities

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Thank you
Merci
Gracias

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