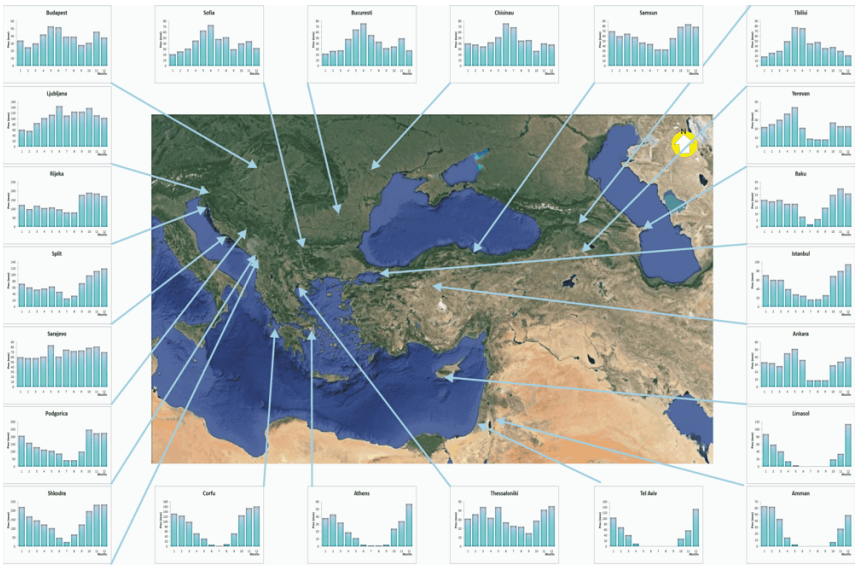
Climate Features of the SEECOF region

The South-Eastern Europe region covers highly varied territories, ranging from the lowland plains in the Pannonia plain through the alpine Dinaric, Carpathian and Rhodope Mountains in the western, central and northeastern Balkans to the mountains in Turkey and south Caucasus region in the east and to the desert areas in Israel and Jordan. Thus, the climate is also very varied. Mediterranean climate prevails along the coasts of the Adriatic, Ionian, Aegean, Black and Mediterranean Sea and belonging hinterlands, while on the other hand the desert areas in the inland of Israel and in Jordan predominately have desert climate. In the inland of the SEECOF region a humid continental climate prevails, while even Alpine climate is present on the high mountains.

In most of the South-East European and South Caucasus region two seasons could be marked off: a dry season, which in most of the region lasts during the period June-August, and in the southern parts of the region even in September, and a wet season, which is well defined in most of the region during the period November-February, while in the continental parts of the Balkan Peninsula and of the South Caucasus region the second interval with maximum precipitation quantity occurs in the period May-June.



Monthly precipitation sums for different locations in the South East European and South Caucasus region during 1981-2010 referent climatological period.

Communities in Bosnia and Herzegovina, Croatia and Serbia were struck by a devastating flood in May 2014, triggered by cyclone Tamara, the worst flood in the last 120 years, provoking mudslide and landslide and leading to the collapse of infrastructure and home.

The main sources of predictability in the South East European and South Caucasus region could be:

- Sea-Ice and Snow-Cover,
- North Atlantic Oscillation,
- Sea Surface Temperatures (SSTs) with Ocean-Atmosphere connections, especially the influence of the El Nino Southern Oscillation,
- Volcanic aerosols,
- Stratospheric Connections,
- Atlantic multidecadal Oscillation,
- Local factors such as the effect of soil moisture on local climate.

The region of South-Eastern Europe is not spared from climate change. Identified as one of the most vulnerable areas to climate change in Europe by the Intergovernmental Panel on Climate Change (IPCC), the projections and future scenarios seem to be harboring a worsening of climate conditions.

The region is frequently plagued by harsh weather conditions like floods, earthquakes, extreme temperatures, landslides and wildfires.

The disaster with natural hazards led to the implementation of a Regional Climate Outlook Forum (RCOF) in South-Eastern Europe.

The SEECOF background

In 2008, the RCOF process has been launched by establishing the South-Eastern Europe Climate Outlook Forum (SEECOF), the first RCOF on the RA VI territory. The SEECOF is funded by the European Commission's Directorate General for Enlargement and is conducted in cooperation with the South East European Virtual Climate Change Centre (SEE-VCCC). The SEE-VCCC, hosted by the Republic Hydrometeorological Service of Serbia (RHMSS), has taken the responsibility to support the RCOF process by organizing, coordinating and monitoring the future SEECOF meetings.

The forum has been established within the Action Plan of the World Meteorological Organization (WMO) Regional Association VI (RA VI) Strategic Plan.

The SEECOF covers the South East Europe and Caucasus region. It involves Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Greece, Hungary, Israel, Jordan, Moldova, Montenegro, the Former Yugoslav Republic of Macedonia, Romania, Serbia, Slovenia, Turkey and Ukraine.

The first SEECOF was organized in June 2008, in Zagreb, Croatia. At the SEECOF-2 in November 2009 in Budapest, Hungary, it was decided to organize two meetings per year. The first one is focusing on the summer season while the second one deals with the winter season. Due to resource limitations and significant efforts needed to prepare the meetings, one of them is conducted online. Physical meetings have been held in the third decade of November, while on-line meetings have been organized in the period April-May.
The first virtual SEECOF (SEECOF-3) was organized and moderated from April to May 2010 on the SEE-VCCC website with a precious support of the RA VI Regional Climate Center (RCC) Nodes on Climate Monitoring (Deutscher Wetterdienst) and Long-Range Forecast (Météo-France and Roshydromet).

SEECOF partner institutions are:

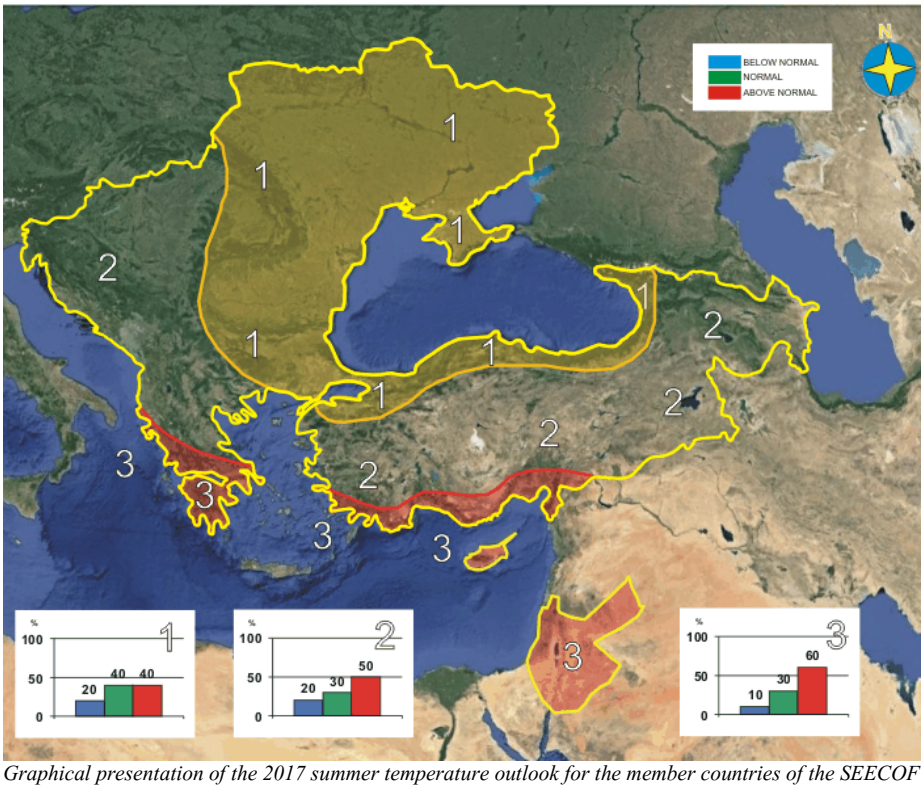
- GPC ECMWF (Reading),
- GPC Meteo-France (Toulouse),
- GPC UKMO (Exeter),
- GPC NCEP (Washington),
- WMO Leading Centre for Long Range Multi-Model Ensemble (WMO LRF MME) (www.wmolc.org) together with 12 cooperating GPCs,
- RA VI RCC LC on LRF Bulletins (MF),
- RA VI RCC LC on CM Bulletins (DWD),
- RA VI RCC-SEEVCCC/RHMSS member of the RA VI RCC Networks (LRF, CM, CD)
- International Research Institute for Climate and Society, Columbia University, USA,

During the SEECOF meetings the following material has been used for the assessment of the current state of the climate, including large-scale climate patterns worldwide, and for the preparation of consensus statements on the climate outlook for the following season:

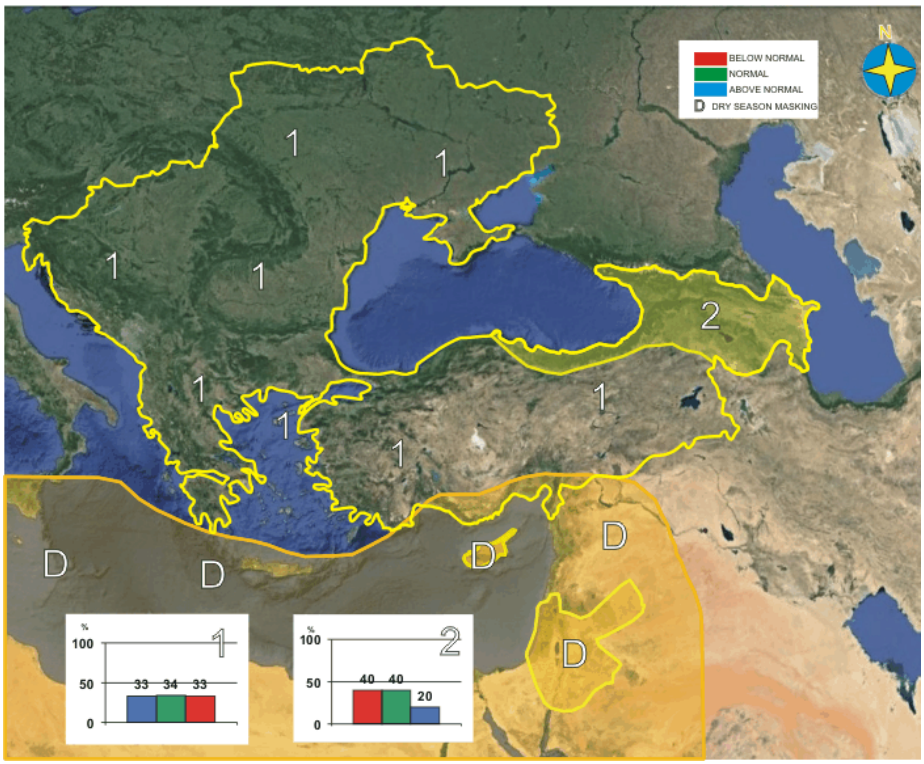
- Bulletins from the RA VI RCC LC nodes of CM and LRF;
- CPC NCEP ENSO diagnostic discussion.

SEECOF Consensus statements for forthcoming seasons (DJF or JJA) are issued based on the harmonized attitudes of the SEECOF members using seasonal forecasting maps for meteorological parameters: T2m, Temperature on 850 hPa, MSLP, 500 GPH, precipitation, SST in terms of:

- Ensemble mean;
- Probability: for most likely category, by tercile categories, of outer quintiles;
- Anomaly correlation, ROC scores and reliability for tercile categories;
- Simple composite map anomaly;
- Composite MME Forecast from all 12 GPCs from the WMO Leading Centre for LRF MME (www.wmolc.org);
- Consistency map of all 12 GPCs (www.wmolc.org).

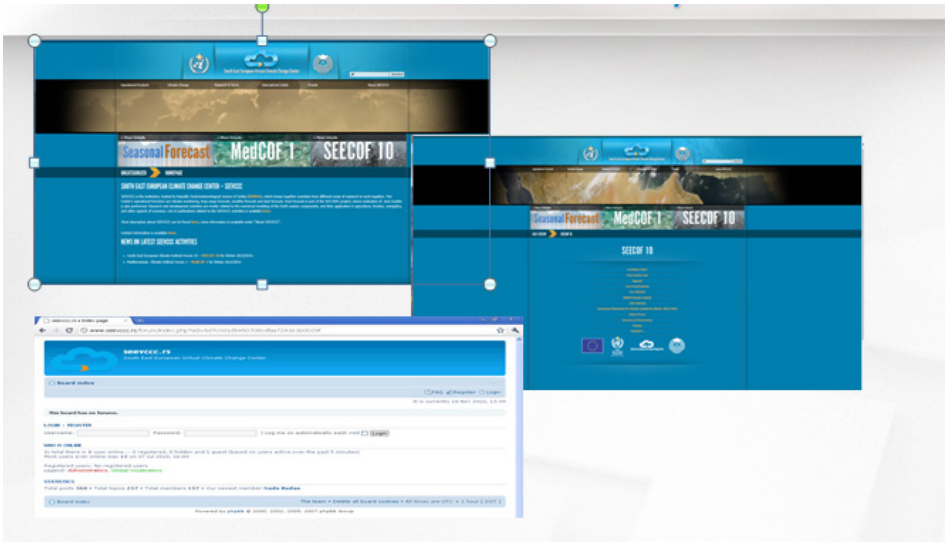


Graphical presentation of the 2017 summer temperature outlook for the member countries of the SEECOF (source: http://www.seevccc.rs)



Graphical presentation of the 2017 summer precipitation outlook for the member countries of the SEECOF (source: http://www.seevccc.rs)

RA VI RCC-SEEVCCC/RMHSS is hosting and supporting the SEECOF process through its website: www.seevccc.rs, on the page: http://www.seevccc.rs/forum/



Evaluation of the SEECOF products

Evaluation of the recent SEECOF meeting was prepared at the start of the current SEECOF meeting on the basis of the National Climate Reports for the previous season delivered by the participants, but also based on the materials of the RA VI RCC on Climate Monitoring (Deutscher Wetterdienst) and RA VI RCC SEEVCCC/RHMSS, member of the RA VI RCC Networks.

At the first SEECOF meeting the referent climatological period was 1961-1990, but during last several meetings the referent climatological period was 1981-2010.

In addition to a usual verification of the issued Climate Outlooks, the RA VI RCC-SEEVCCC/RMHSS started to evaluate Climate Outlooks for the period of last 5 years using bias and ROC parameters. This evaluation was presented to the SEECOF participants and end-users during SEECOF 14 meeting held in November 2015.

The RA VI RCC-SEEVCCC/RMHSS, as a representative of the SEECOF Forum, as well as, the NHMS's from the SEECOF region, take part in the Climate Watch System leaded by RCC on CM (DWD).

Moreover, starting from the begging of 2013, RA VI RCC-SEEVCCC/RMHSS has been operationally issuing CWS bulletin on a weekly basis, that is, every Monday, only for the participants of the SEECOF Forum. The RA VI RCC-SEEVCCC/RMHSS CWS bulletin includes monitoring of the mean temperature and weekly precipitation sums from the previous week, forecasts for the 2 following weeks, and for 1 and 3 months ahead, as well as information on potential warning in case there is a need for it.

Each NHMS, like NHMS of Serbia, delivers additional climatological information to the stakeholders and public (link of the NHMS of Serbia for additional climatological information, available together with the Climate outlook for the summer season 2017: http://www.hidmet.gov.rs/podaci/novosti/1496860575_doc2_eng.pdf http://www.hidmet.gov.rs/podaci/novosti/1496860575_doc1_eng.pdf).

User involvement

Users from different state authorities and economy sectors (forestry, agriculture, insurance, electric power companies and water management) were participants of the last 8 face to face SEECOF meetings. They have been presenting their work, as well as the needs for the future climate outlooks. The end users from the previous face-to-face SEECOF meetings were also successively included into the SEECOF online forum on the website: www.seevccc.rs hosted and supported by RA VI RCC-SEEVCCC/RMHSS.

Way forward

During the SEECOF-11, face-to-face meeting participants accepted the suggestion for closer cooperation among them through the topic dedicated to scientific cooperation in the field of climate research, as well as the topic intended for the discussion about different themes, such as: future physical meetings; density of exchanged climatological data used in climate monitoring; influence of different teleconnection patterns in different parts of the SEECOF region and the future training courses. Both of the above mentioned tasks related to the SEECOF have been successfully completed and opened to SEECOF participants.

It is expected to continue the fruitful cooperation of the SEECOF with the neighboring RCOFs (PRESANORD and MedCOF), as well as with WMO in improving the NHMS capacities for the Long Range Forecasts through the workshops within face-to-face meetings.