South East European Virtual Climate Change Center

Overview on climate change adaptations initiatives in the region

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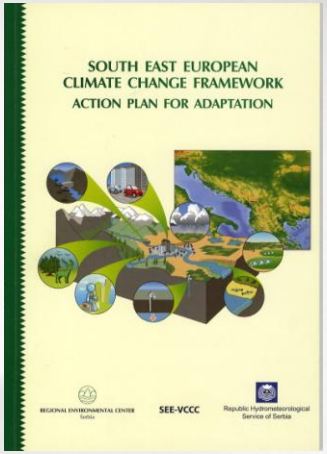
South East European Virtual Climate Change Centre

SEEVCCC/CCFAP-A in support of UNFCCC implementation GFCS



Overall objective

Establish a framework for current and future regional project initiatives in terms of adaptation to the impacts of climate change via the SEE/CCFAP-A.

Technical aspects of the implementation

The SEE/CCFAP-A runs from 2009 – 2015 and the overall coordination will be done by an ad-hoc working group comprising representatives from the interested SEE countries. Regional Environmental Center (REC) and SEE/VCCC will provide secretariat and technical support to this group. The coordination of the specific work under *Chapter 4* will be performed by SEE/VCCC. Different interested countries will direct the project and activities under *Chapter 5*.

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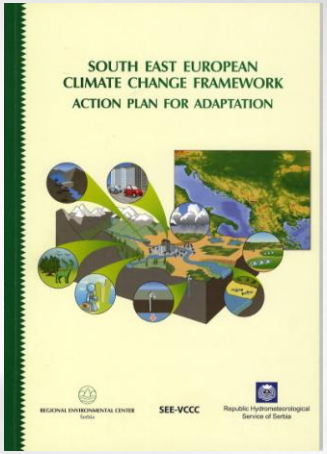


Description

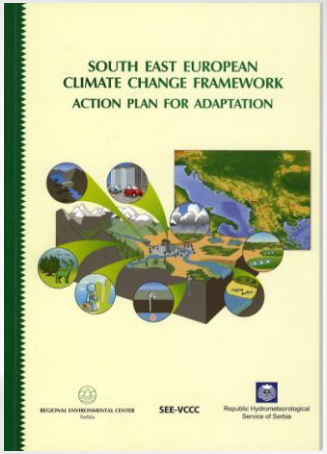
The SEE/CCFAP-A covers different sectors and priority for actions presented in Chapters 4-6.

Chapter 4 comprises (i) Climate Observations, Monitoring and Forecasting in SEE; (ii) Climate Modeling and Scenarios in SEE; (iii) Reduction of Climate Related Risks in SEE; and (iv) Socio Economic Information on Climate Impacts in SEE.

Chapter 5 consists of programmes focusing on the following sectors: (i) public health, safety and emergency preparedness; (ii) water resources management; (iii) agriculture and forestry; (iv) land use, buildings and transportation; (v) tourism; (vi) coastal zones; (vii) biodiversity and ecosystems; and (viii) energy (see Annex Table 2, Action Plan Part B).

Chapter 6 contains the important crosscutting issues: (i) SEE cooperation in adaptation; (ii) capacity building; education, training and public awareness; (iii) creation a roster of experts; and (iv) building partnerships in climate change.

SEEVCCC/CCFAP-A in support of UNFCCC implementation GFCS



General priorities for actions to support the implementation of the SEE/CCFAP-A:

- Joint activities to support the revision of the national development strategies, taking into consideration climate changes, vulnerabilities and adaptation; appropriate integration of climate change impacts should be made an obligatory standard requirement in regional development;
- Joint activities in capacity building and strengthening of meteorological and hydrological monitoring and forecasting systems both at the country and sub-regional levels;
- Joint activities in increasing data-gathering capacity and data quality, and enhancement of data-sharing between the countries of the SEE sub-region;
- Joint activities in the development, installation and maintenance of weather/climate/hydro early warning systems in the SEE region, as part of the EU early warning systems ;
- Sub-regional workshops to allow for knowledge dissemination and sharing and to encourage further sub-regional cooperation.

SEEVCCC Background - Enhancing sub-regional SEE cooperation in climate related issues

Political agreement
UNECE "Environment for Europe"
2007

WMO
RA VI RCC-Network

WCRP (CORDEX, …)

UNFCCC
Nairobi Work Programme

SEEVCCC + SEE CCFAP (Action Plan)
Adaptation

Partners

NMHSs, R&D inst., … MoUs

MoE-Serbia REC CIMA

University of Belgrade Oxford

Geo-Modelling RGGM

BiH MNE SRB MK ALB

Under consideration

Bulgaria
Israel
Malta

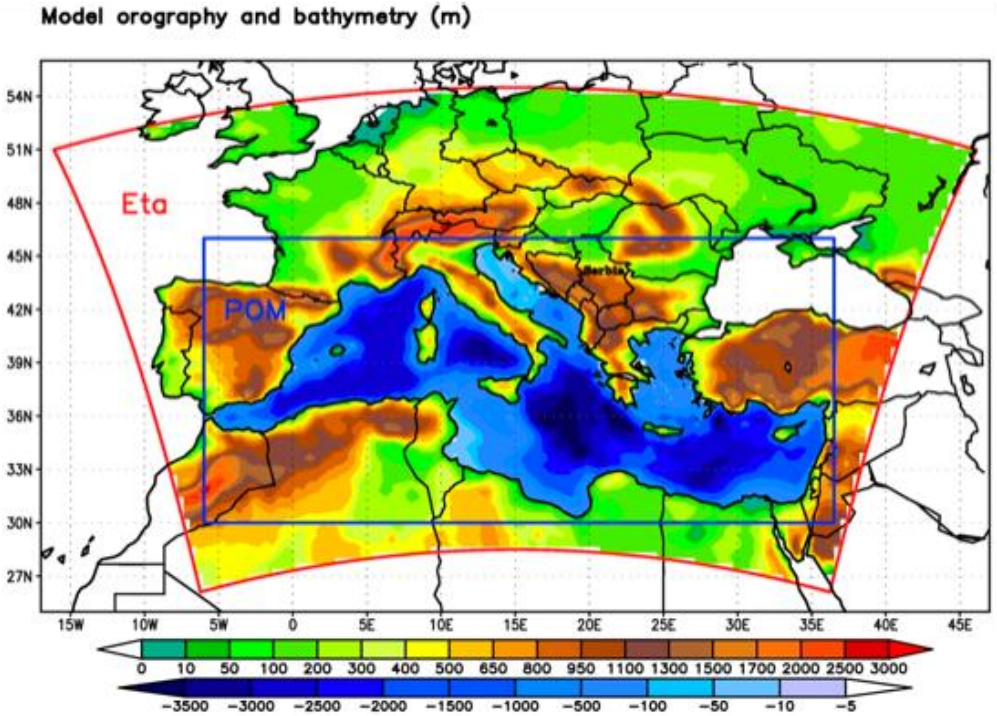
EMC, Turkey

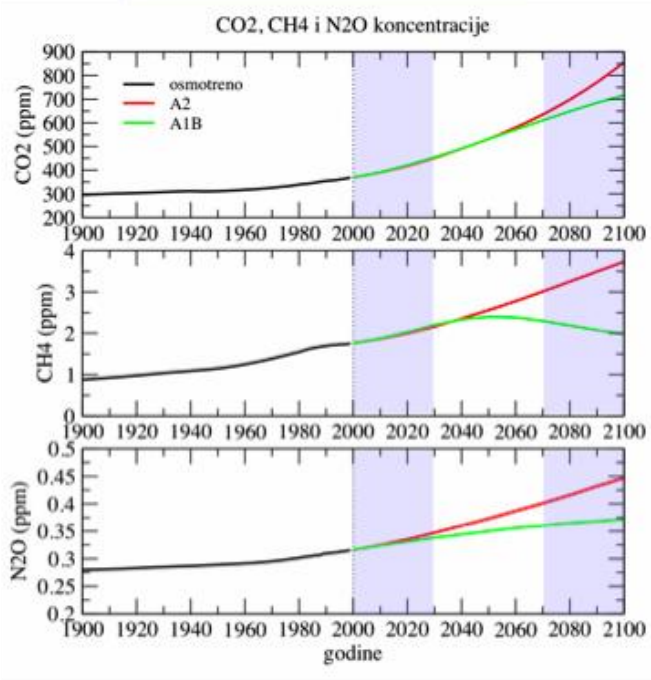
DMCSEE, Slovenia

Climate change scenarios:

- Downscaling of SINTEX-G (INGV)
- Coupled regional climate model EBU-POM (Eta Belgrade University – Princeton Ocean Model)

A1B: 2001-2030
A1B: 2071-2100
A2: 2071-2100

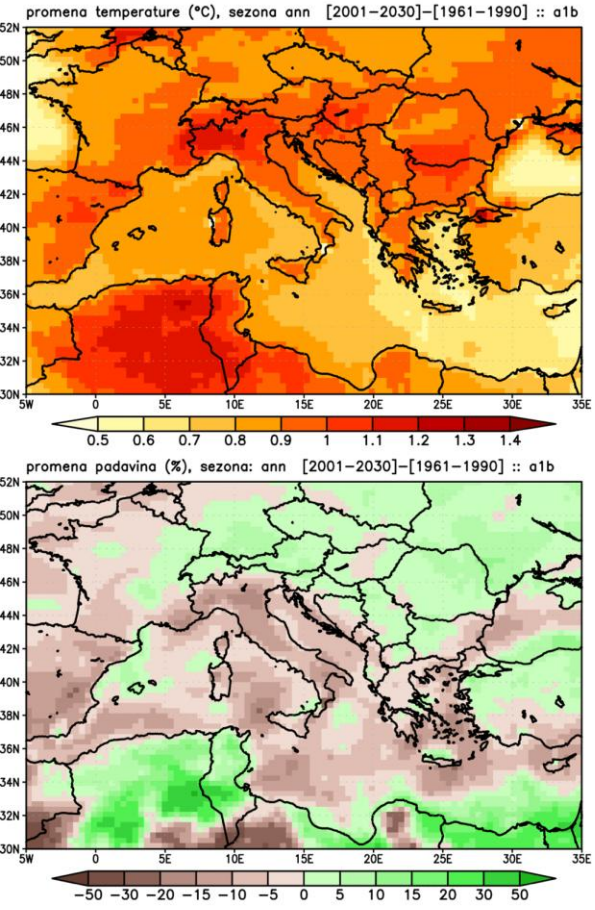




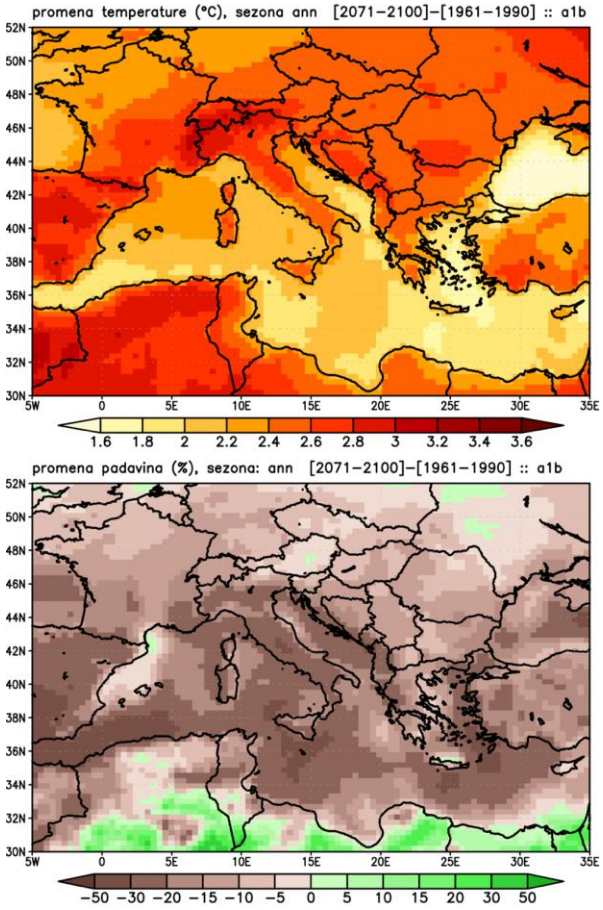
Climate change scenarios:

Annual temperature and precipitation change:

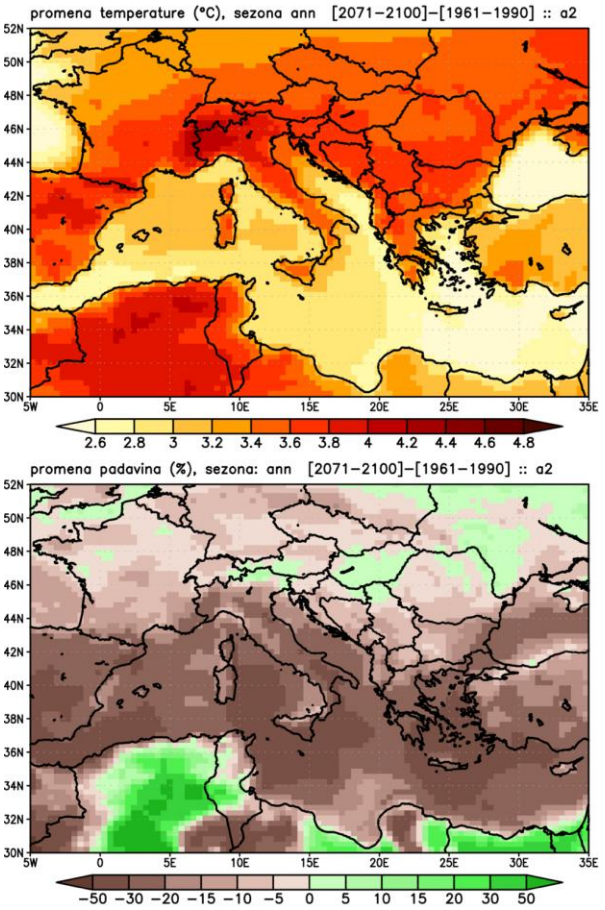
A1B: 2001-2030



A1B: 2071-2100

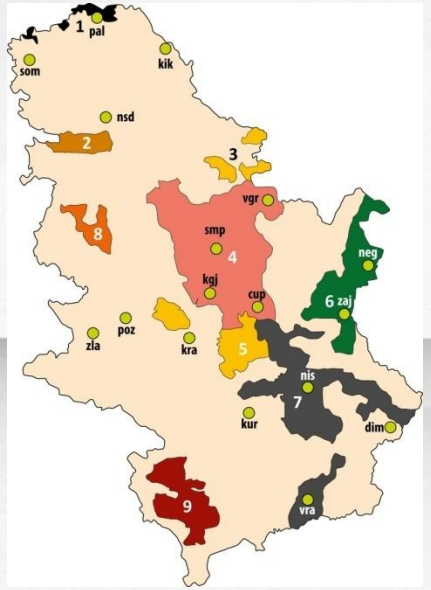


A2: 2071-2100



Example of RCM-SEEVCCC climate projections application

- Regional dynamical downscaling provides **information with more details** about present climate and future climate changes.
- **Important for different impact and vulnerability studies** especially on regional level: energy, hydrology, agriculture, environmental protection, industry,..
- **Summer Drying Problem** (CLAVIER project)
  It is well known that Climate models in region of Pannonian valley have significant BIAS, therefore it is necessary to apply more complex BIAS correction for climate change impact.
- Example: **Application of Climate Projections in Vineyard Regions in Serbia**



1. Subotica-Horgos
2. Srem
3. Banat
4. Sumadija
5. West Morava
6. Timok
7. Nisava-South Morava
8. Pocerac
9. Kosovo

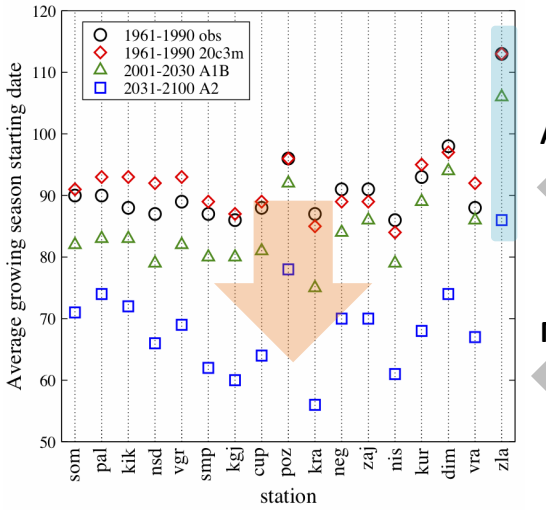
Results for 2071-2100 (A2):

- growing season:
  beginning April → March
  growing degree days 1440 → 2400
  duration 200 → 240 days
  above tolerable warmer and dryer
- rest season:
  beginning one month later
  first frost date ~15days later
  number of frost days 90 → 50
  no appearance of critical temp. <-15C

Climate in present vineyard regions (<400m alt.)
Shifts on ~1000m altitude

Some selected results…

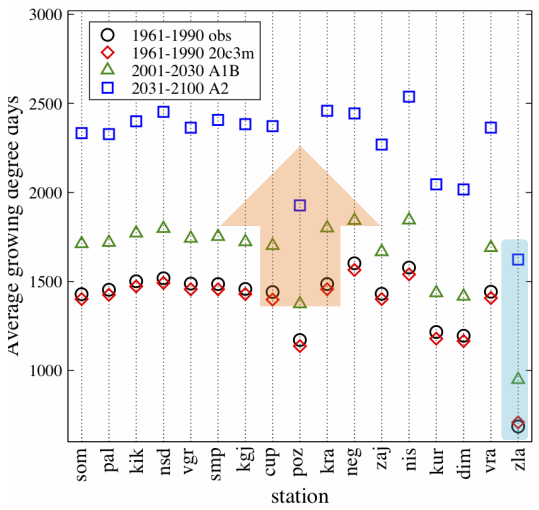
growing season start date



April

March

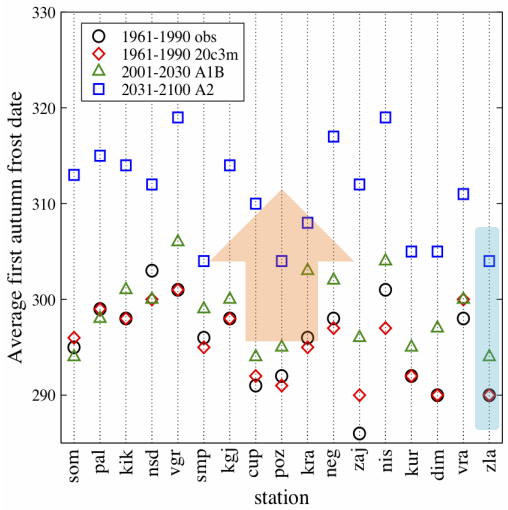
growing degree days



2400

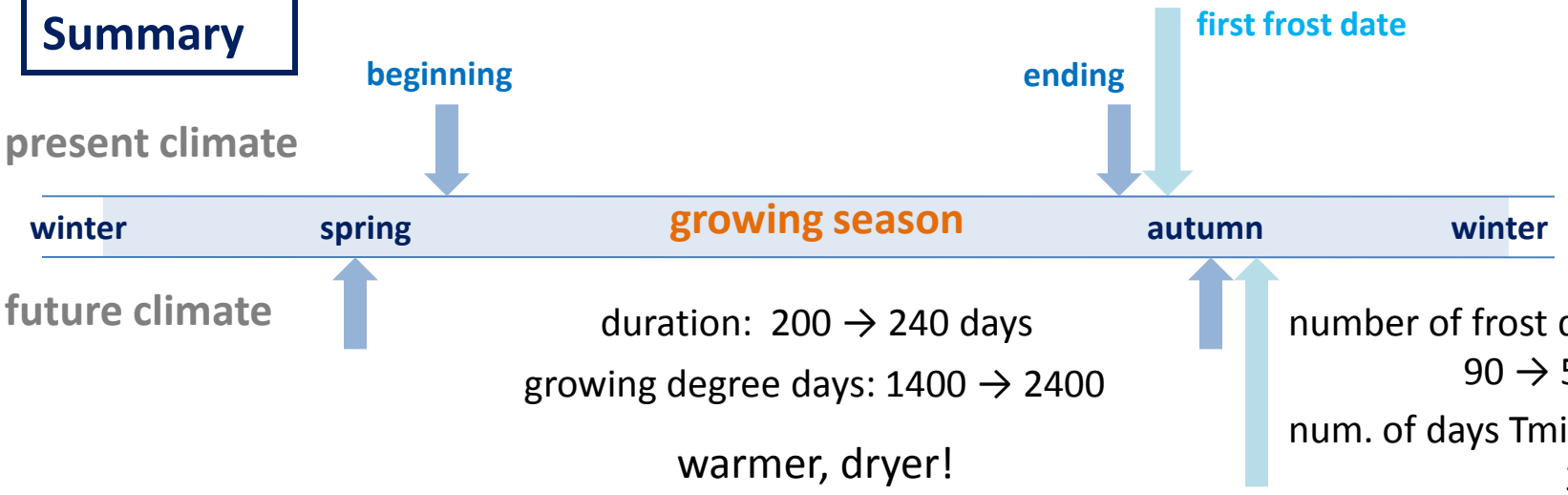
1400

first autumn frost date



1.Nov.

Summary



Mountain station ~1000m altitude enters the climate regime of present vineyard regions!

WMO RA VI-Europe RCC Network SEEVCCC :

- **Climate Data Node**

  Lead: KNMI/Netherlands (consortium member SEEVCCC/RHMS-Serbia)

  South East European gridded model datasets for 1961-1990 (ready)

- **Climate Monitoring Node**

  Lead: DWD/Germany (participate SEEVCCC/RHMS-Serbia)

  • collecting data from the stations (monthly, 400-500 stations; main source for data KNMI-ECA&D, other climate bulletins NCDC)
  • mean temperature and accumulated precipitation,
  • temperature anomaly and precipitation percent of normal,
  • all available monthly/three-monthly

- **Long Range Forecast Node**

  Lead: Météo-France & ROSHYDROMET (participate SEEVCCC/RHMS-Serbia)

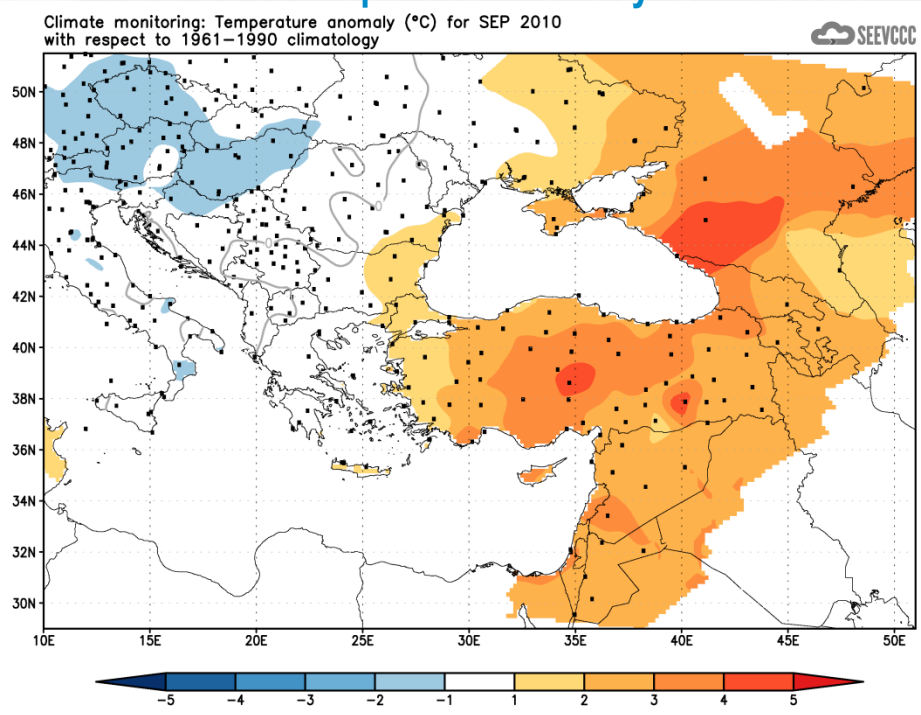
  Once a month ensemble run of a regional long range forecast - 7 months ahead: dynamical downscaling ECMWF 41 ensemble with RCM-SEEVCCC

Climate Monitoring Node

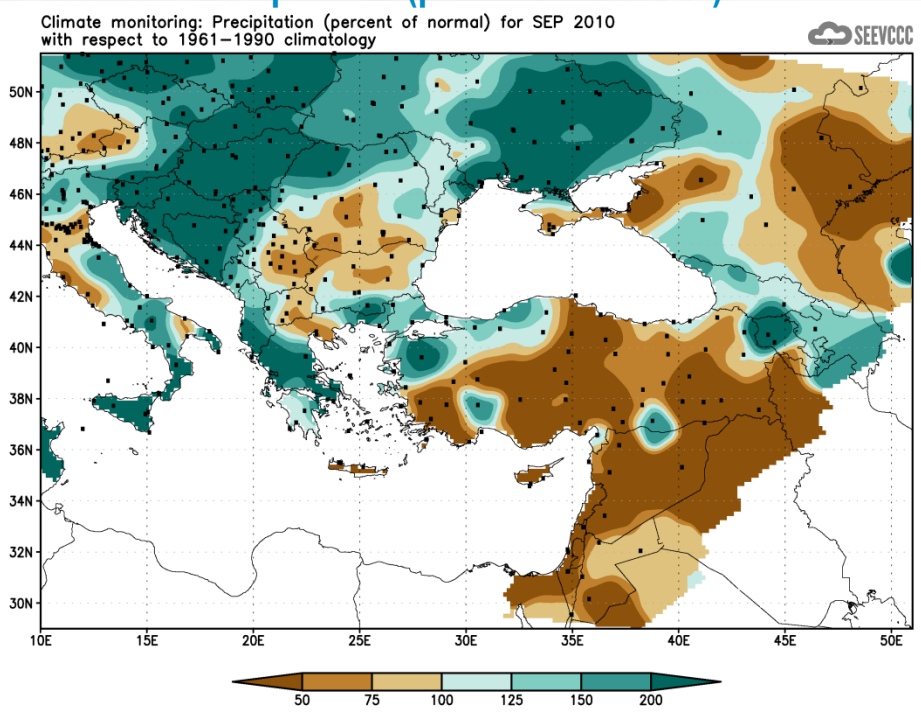
- Climate Watch Advisory for SEE -

- **Example of the product : September 2010**

Temperature anomaly



Precipitation (percent of normal)



- **available maps:**

  for each month and for 3 months:
  - mean 2m temperature, acc. precipitation,
  - temperature anomaly, precipitation percent of normal (with respect to 1961-1990)

Long Range Forecast Node

- Seasonal forecast for SEE -

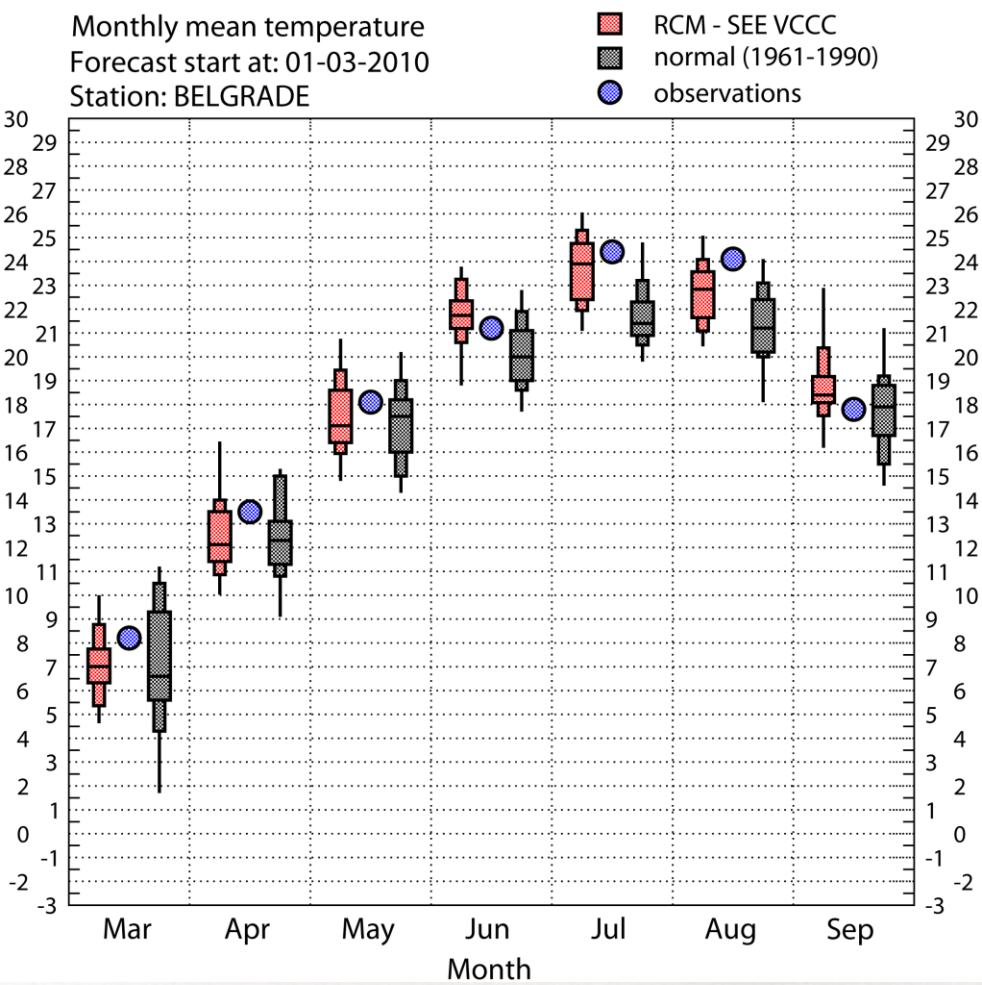
- **Probabilistic forecast**
  - provides statistical summary of the atmosphere and ocean state in coming season.
- **RCM-SEEVCCC LRF** (**L**ong **R**ange **F**orecast – Seasonal Forecast)
  - regional dynamical downscaling using fully coupled atmosphere-ocean Regional Climate Model
    - model start: 16th of each month
    - forecast duration: 7 months (~215 days)
    - model resolution: ~35km atmosphere ; ~20km ocean
    - model domain: Euro - Mediterranean region extended toward Caspian Sea
    - **51 ensemble members**
    - initial and boundary conditions: ECMWF, resolution:125km
    - results prepared for South East European region in form of:

      mean ensemble maps (mean 2m temperature, precipitation accumulation, temperature anomaly and precipitation anomaly with respect to CRU data 1961-1990) for month and three months (season)

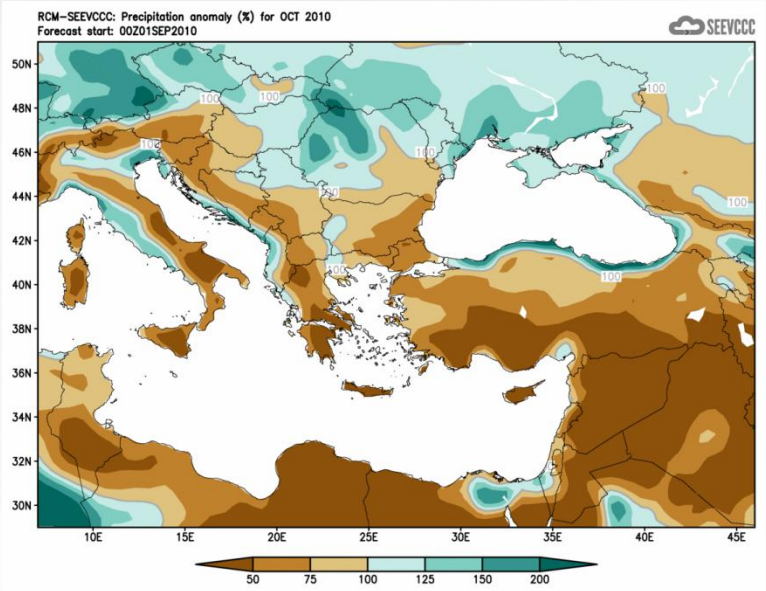
      diagrams (probabilistic forecast of mean monthly temperature and monthly precipitation accumulation for specific place)

- **Example for LRF products**

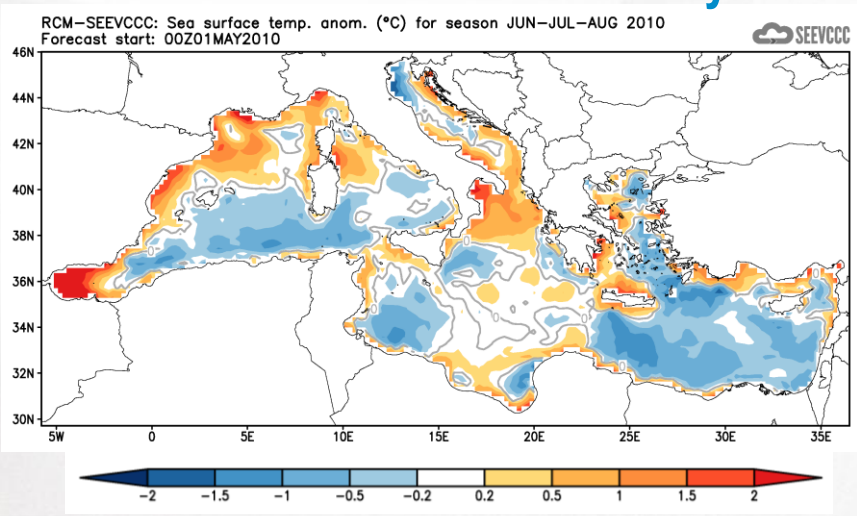
Probabilistic Long Range Forecast



Maps of ensemble mean



Additional: SST anomaly

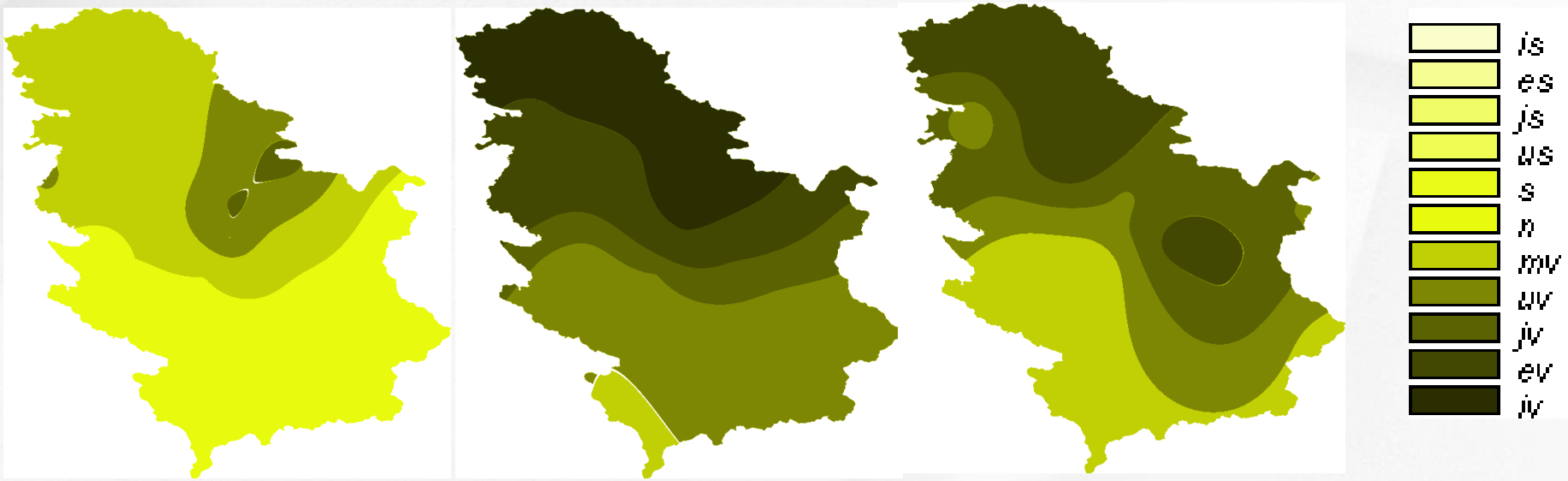


R&D: Earth Modeling System

Climate Watch example – precipitation anomalies and extremes

Example: Extremely wet SPI2 for February 2010, using LRF forecast (start January 1st 2010)

New! Under development

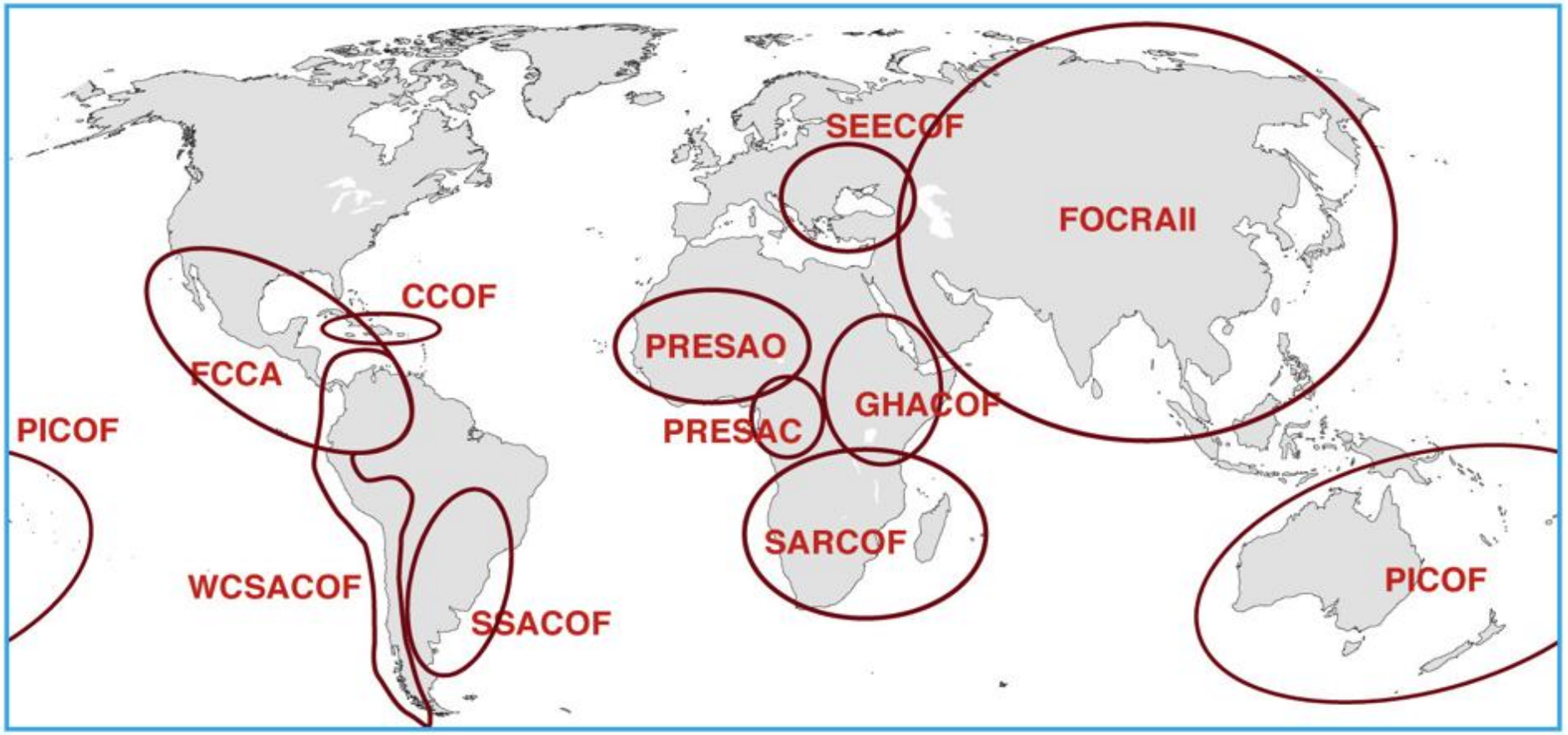


RCM-SEEVCCC ensemble forecast

corrected LRF RCM-SEEVCCC ensemble forecast

observed

SEE RCOF – SEECOF



- RHMS/SEEVCCC together with ARSO/DMCSEE + WMO: organization and implementation
- SEEVCCC ready for full support with all climate products to submit to DMCSEE for their drought advisories
- SEECOF-IV in November (22-26); preceded by on-line SEECOF (verification of consensus fcst)

On-line SEECOF

http://www.seevccc.rs/forum

Climate Watch System

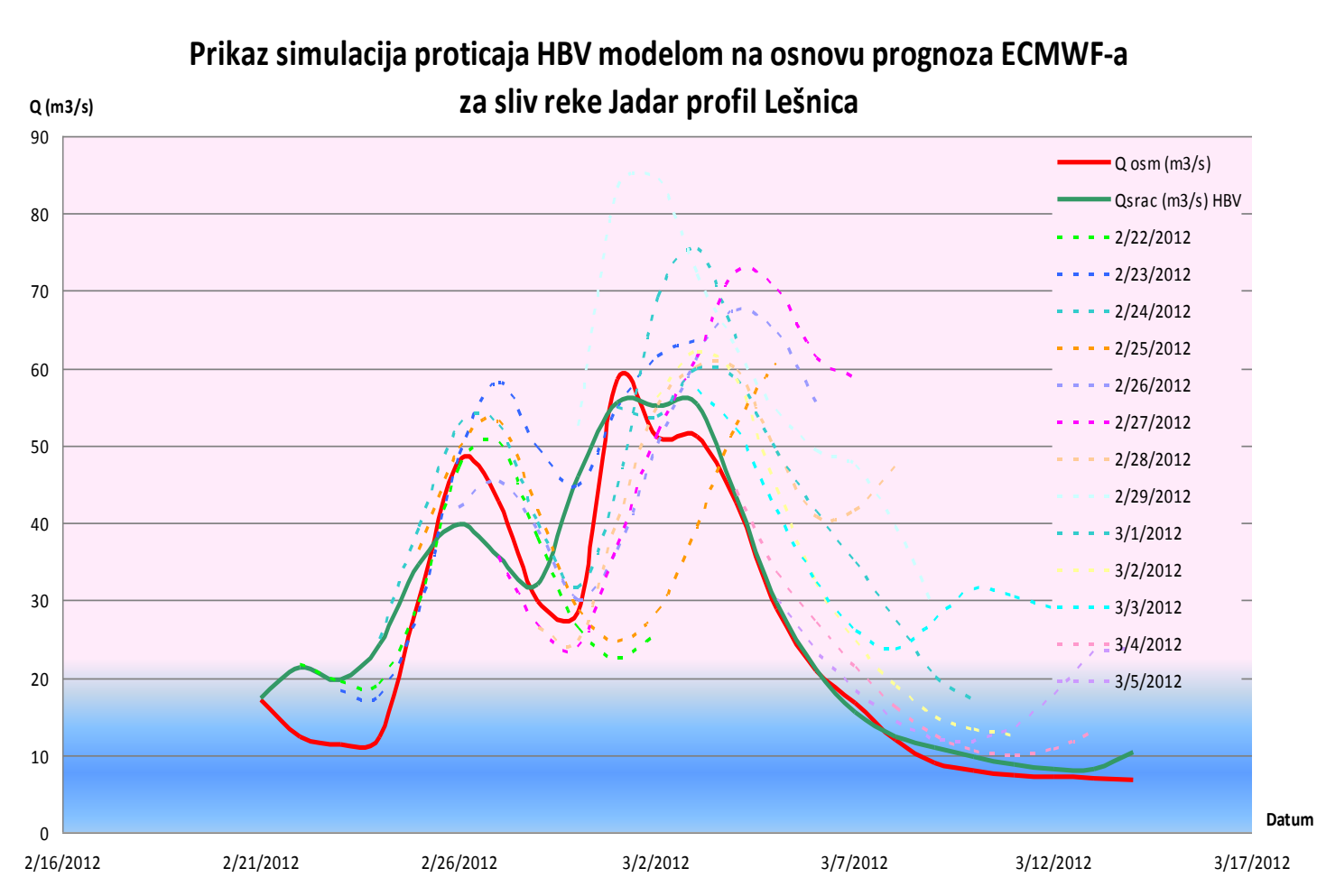
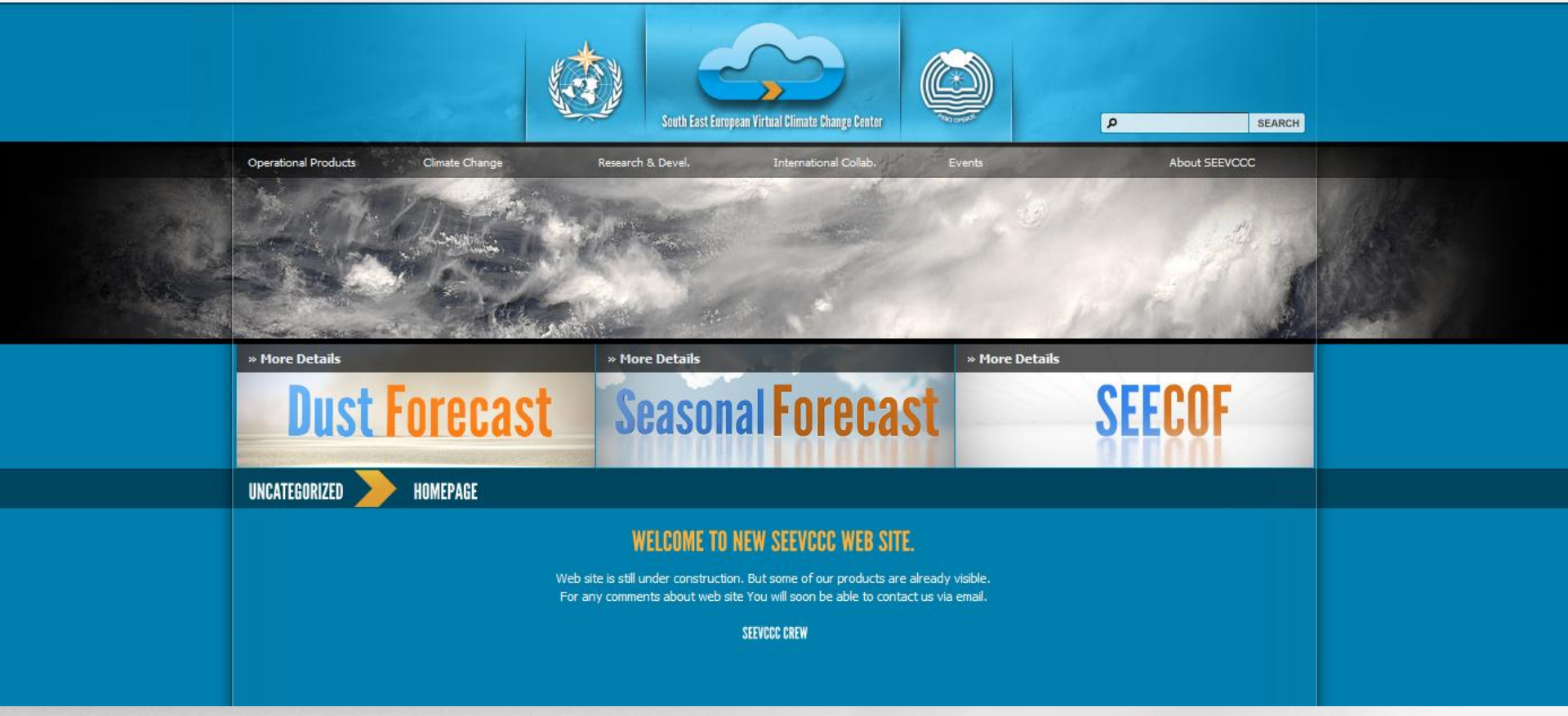
Early Warning against Climate Anomalies and Extremes

A climate watch system provides a proactive mechanism for interacting with users and alerting them to major climate anomalies and extremes. This mechanism adds value to existing climate monitoring and forecasting systems within the National Meteorological and Hydrological Services and should be developed with a view to fully involving users in providing the conditional elements ofhe system: thresholds, indices, criteria and databases.

- Provide timely observations of current climate conditions for their areas of responsibility and adequate historical climate data;
- Perform timely monitoring and analyses of current climate anomalies;
- Enjoy access to current global climate forecasts and possess the technical capabilities to interpret and downscale them to their region;
- Deliver probabilistic climate forecast products that the user community can understand;
- Regularly update records of past forecasts and analyses of past forecast performance;
- Employ effective methods for the routine dissemination of climate information to user groups and sectors;
- Develop active partnerships with the user community

Q Forecast based on ECMWF and HBV model

- February/March 2012
- Jadar, smaller watershed, 1000 km2
- HBV model hydrology forecast based on 10 days ECMWF forecast, 16 km resolution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