

The logo for SEEVCCC is a horizontal banner with a light blue background and a yellow chevron pointing to the right. The text is centered within the banner.

SEEVCCC
Soth East European Virtual Climate Change
Center
Goran Pejanović
Republic Hydrometeorological Service of Serbia
RHMSS, Belgrade

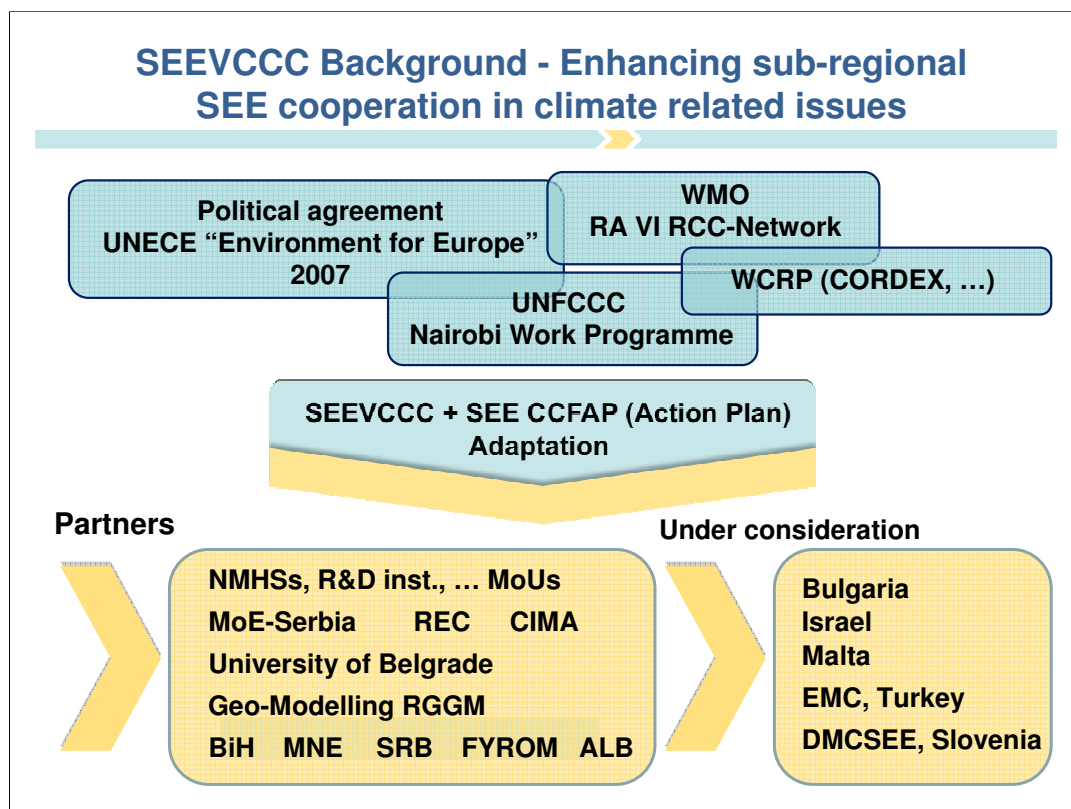
South East European Virtual Climate Change Center - roles and responsibilities -

OUTLINE

SEEVCCC Crew

- ▶ **SEE VCCC
Earth Modeling System
within the UN**
- ▶ **IPCC Scenarios
downscaling in SEE**
- ▶ **HYPROM
Hydrology Prediction Model**
- ▶ **Capacity building as part of
CCFAP - UNFCCC and WMO
frameworks**

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Eszter Reka Mogyorosi, REC-SEEVCCC, Szentandre-Belgrade
Slobodan Ničković – ICoD, Malta [now with WMO, Geneva]
Goran Pejanović – RHMSS, SEEVCCC
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As you well know, the Rep. Hydromet Service of Serbia is hosting the vCCC and on this slide you see historical developments in adopting Belgrade initiative on enhancing sub-regional cooperation in climate change.

UNECE box represents kind of a political agreement for the Belgrade initiative, whereas the other box represents the WMO route that we have followed in order to become recognized by RA VI.

Serbia recently joined WCRP (World Climate Research Program) and intending to participate to the CORDEX experiment. The UNFCCC box represents the Nairobi Work Programme on impacts, vulnerability and adaptation to climate change.

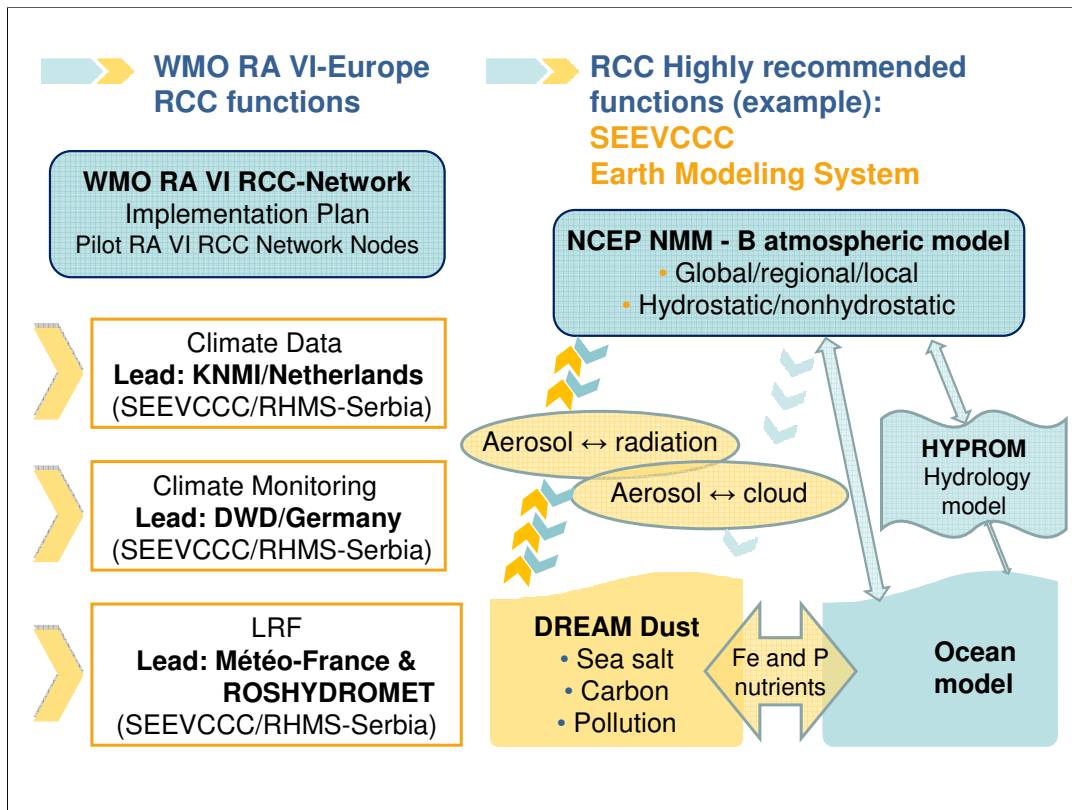
Our work will be guided by above mentioned structures and also the local SEE Climate Change Framework Action Plan for Adaptation.

In order to achieve the ambition to coordinate these activities, the Center is envisaged to be formed as a network of partners:

NMHSs (BH, MNE, SRB, FYROM, ALB), Research and Development Institutions, Regional Climate Environmental Center (REC), CIMA research foundation...

Under consideration to become partners:

EMC, DMCSEE (Drought Management Center SEE), ...



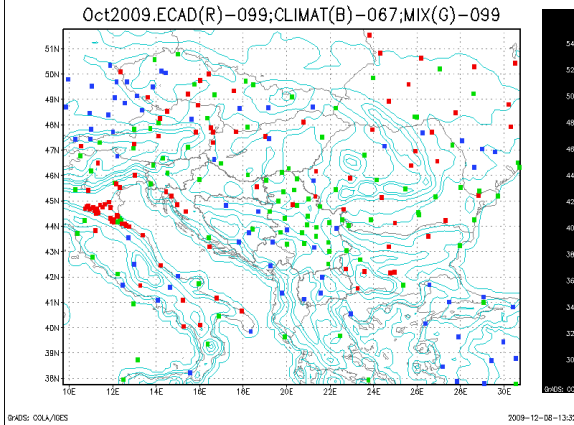
You already know the structure of the WMO RA VI RCC-Network which consists of three nodes: Climate data, Climate monitoring and Long Range Forecasting. These nodes are led by Netherlands, Germany, France and Russia. Together with other partners SEEVCCC participates in all three nodes with the responsibilities in SEE region.

As we stated many times before, we advocate for the integrated Earth modelling system able to present interactively all important components of the climate system.

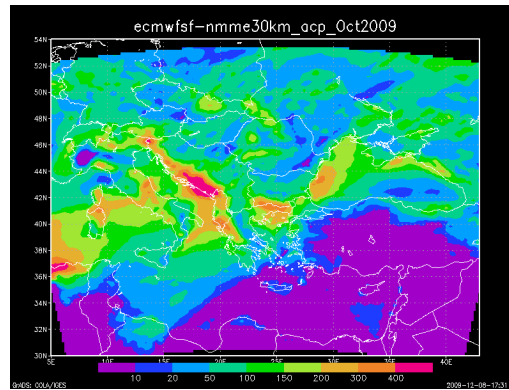
Unique feature of our Long Range Forecasting system is that we use the interactively (on-line) coupled atmospheric-ocean modeling system for which we claim that can produce generally better results.

Examples for some of the RCC functions

Observations



Seasonal Forecast



- WEB products ... We have agreed with the ECMWF to install the MARS archive software on our computer system at the SEEVCCC. This process lasted a little bit longer than we expected. We believe that it will be done by the end of January 2010. (pre operational phase to be deployed in early February). with this software we will have all products of SEEVCCC easily accessible through the web interface ecmwf-like.

- Monthly and seasonal forecasts are presently done using the NMM-E model. This version is not interactively coupled with the ocean model and use the SSTs from ECMWF seasonal forecasts. Very soon we will implement the EBU-POM coupled modeling system for LRF predictions. We will freeze this modeling system and invest further effort in developing the NMMB - HYCOM system and as soon as it is ready for production it will run along with the EBU-POM operational suit.

With this regard I would like to inform you that the SEEVCCC web site is at present in hidden mode but will become visible as soon as we implement the EBU-POM seasonal downscaling forecast system and MARS web accessible data base.

SEEVCCC Earth Modeling System

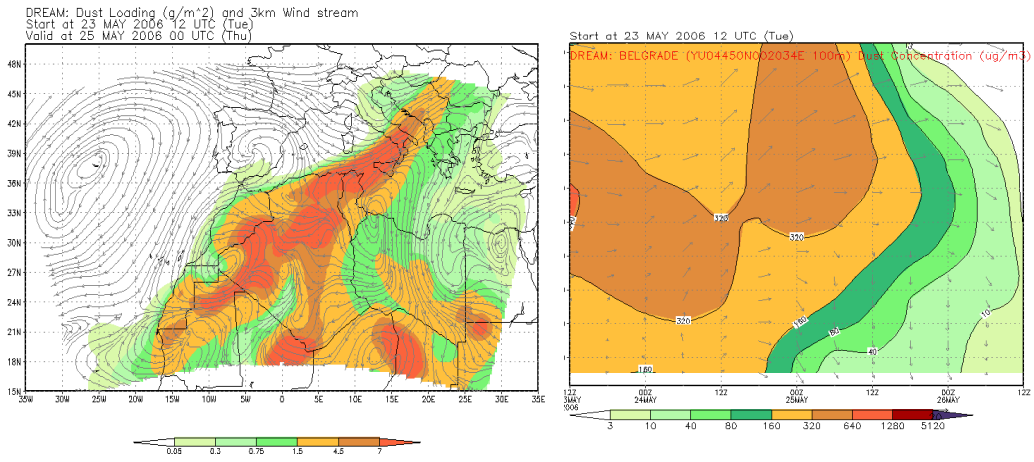
- Adverse impact of CC in SEE sub-region (IPCC AR4); The need to have a science to policy interface enabling informed decisions by the governments with respect to present and future climate commitments.
- Integrated Earth modeling system includes all important climate system components.
- The VCCC Center was particularly interested for the unified nonhydrostatic multiscale NMM-B model of US-NWS/NCEP, designed by **prof. Zaviša Janjić**. NMM-B is designed for a broad range of spatial (global to sub-regional and local) and temporal scales. This model is considered well suited for the mission of the Center. SEEVCCC established links with the NCEP and shall invest effort in further development of the model in collaboration with prof. Janjić.
- In the following we will hear about the different model components and the present results, including future plans that might be of particular relevance for the energy sector in our region. Furthermore we will hear about the role of the Center in terms of Capacity building under the UNFCCC and WMO.

From this slide onwards I am going to speak a little about highly recommended functions of SEEVCCC that are related to the modeling of climate system.



DREAM model

Example from the routine dust forecasts during SAMUM



DREAM routine forecast - 23 May 2006

Left: dust concentration at 3 km on 12 UTC

Right: Dust concentration in Belgrade on 23 May 06 in the time-height section

SAMUM geman-funded project (Saharan mineral Dust Experiment);

SINTA - PROJECT: joint project between Italian and Serbian governments
(Simulations of climate chaNge in the mediTerranean Area)

Italian Partner:

- National Institute of Geophysics and Volcanology/Mediterranean center for climate change (INGV/CMCC).
- *global climate change experiments with global model SINTEX-G.*

Serbian Partners:

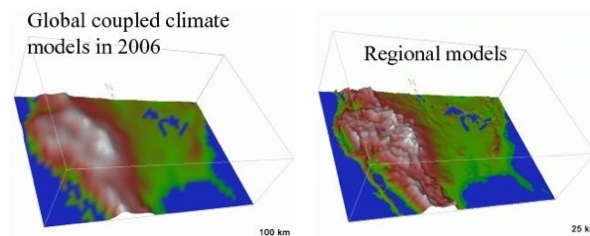
- Institute of Meteorology, Belgrade University (BU).
- Republic Hydrometeorological Service of Serbia/South East European Virtual Climate Change Center (RHMS/SEEVCCC).
- *Dynamical downscaling with coupled regional model EBU-POM, using initial and boundary condition from global model.*

COVERED EXPERIMENTS AND PERIODS

- *Present climate: **1961-1990***
- *A1B experiment (moderate): **2001-2030 and 2071-2100***
- *A2 experiment (strong): **2071-2100***

2010: SINTA-2 (CAPMED)

- old partners - new goals!



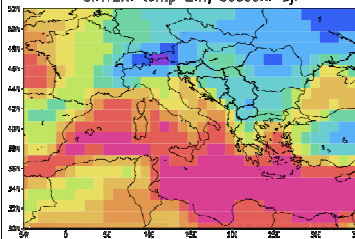
REGIONAL DYNAMICAL DOWNSCALING

- **Regional dynamical downscaling** provide us **information with more details** about present climate and future climate changes
- Detail information is **very important for different impact studies**, specially on regional level
 - energy
 - hydrology
 - agriculture
 - environmental protection
 - industry ...

1961-1990: MEAN SURFACE TEMPERATURE FOR WINTER SEASON

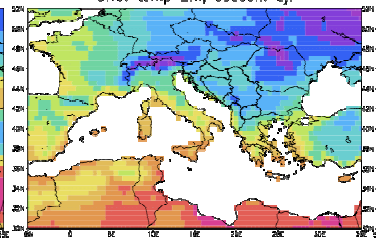
GLOBAL MODEL

SINTEX: temp 2m; season: djf



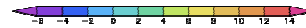
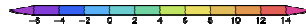
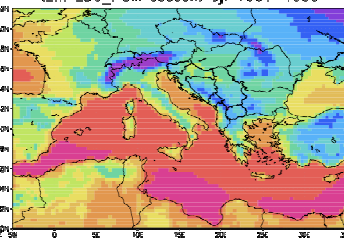
OBSERVATIONS

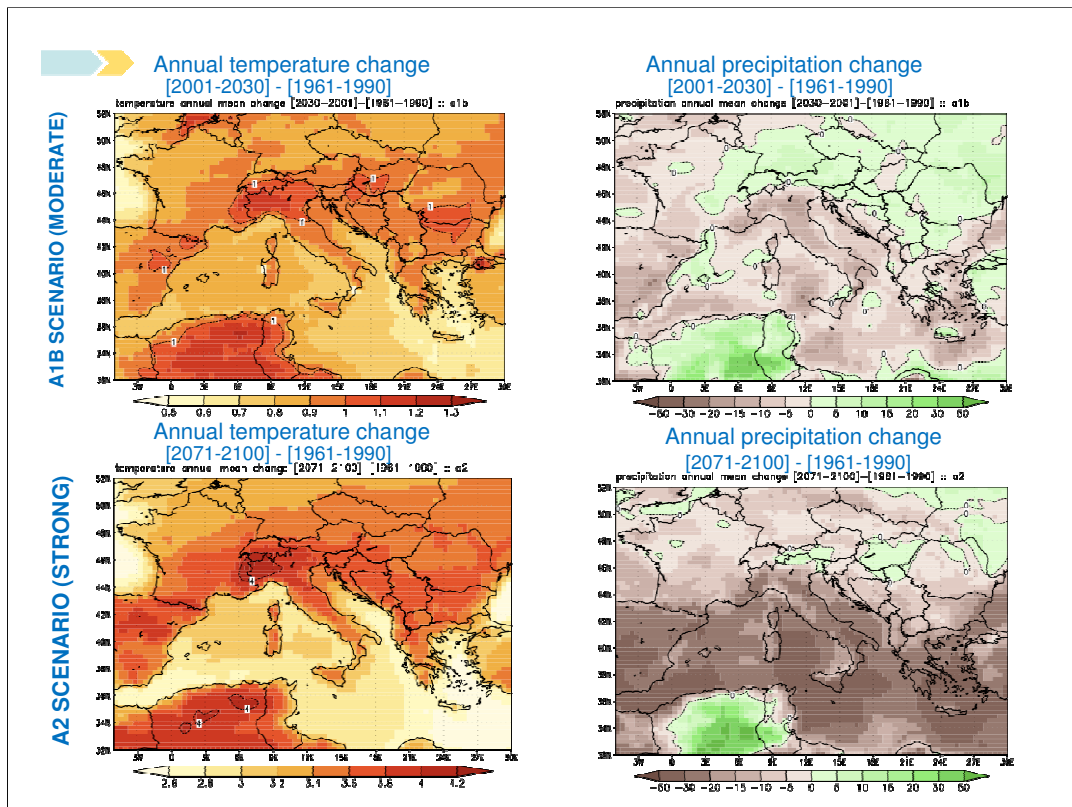
CRU: temp 2m; season: djf



REGIONAL MODEL

t2m EBU_POM season: djf 1961-1990



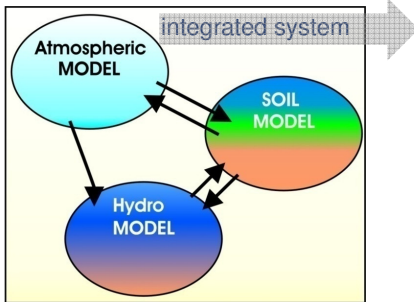


We have already produced what we call the SEEVCCC first generation of our downscaled regional climate data sets. pejo ovde moze neki opis obavezno geografski domen,, ovi podaci ulaze kao 61-90 u RCC node on climate data

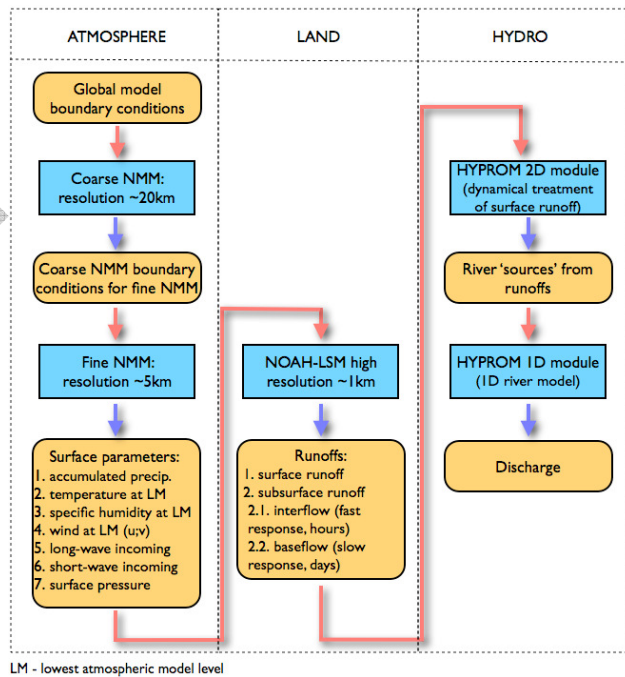
- we presently aim at delivering the second generation of our data sets, this time using the interactively coupled NMM-B and Ocean model HYCOM (US). In these runs we are going to broaden the geo domain in order to cover and overlap with different data producers in the region (WMO RA Regional Association VI East Mediterranean Climate Center hosted by Turkey, Drought Management Center for SEE DMCSEE hosted by Slovenia, and other potentially interested NMHSs). In particular we will run the model covering extended domain including the Middle East and part of Turkey ako turcin pita da pokrijes i celu tursku onda mu kazemo da mozemo to da uradimo, ali da nam je i ovaj domen na granici CPU resursa koje posedujemo pa bi u tom smislu bilo lepo da se uspostavi direktna saradnja dva centra, i da se pokusa fund raising radi obezbedjivanja sredstava za jedan takav poduhvat.

Coupled Atmospheric-Hydrology Model **HYPROM**

➤ Precipitation and river discharge forecast at flash floods events and for regional climate simulations



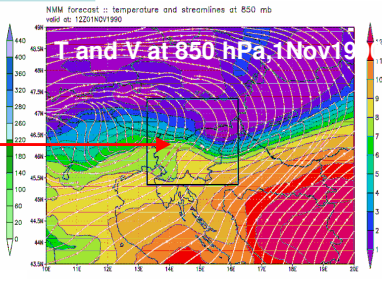
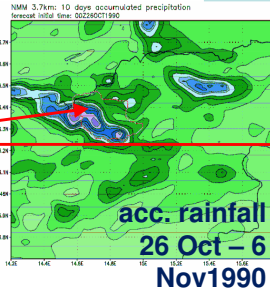
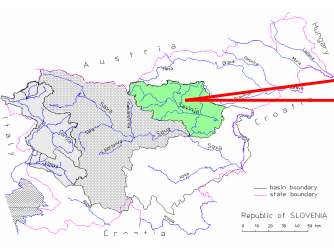
S. Ničković, G. Pejanović,
V. Djurdjević, M. Vujadinović



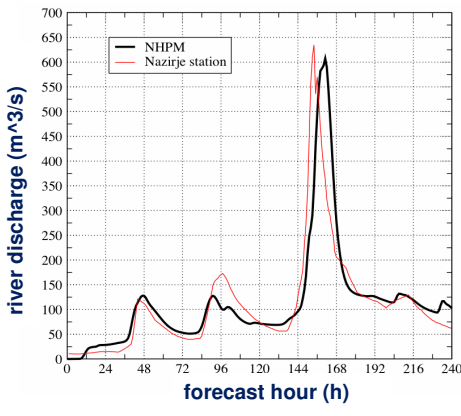
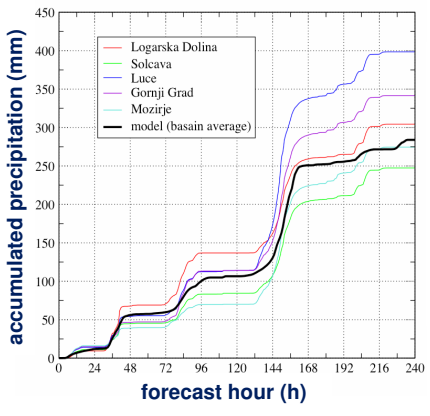
Savinja (Slovenia)

26/10 – 6/11 1990

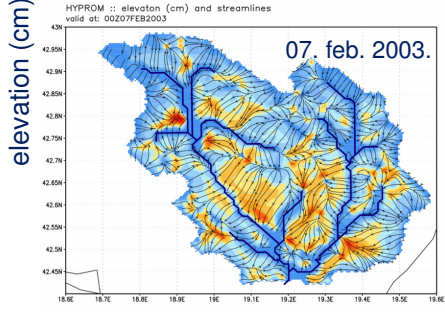
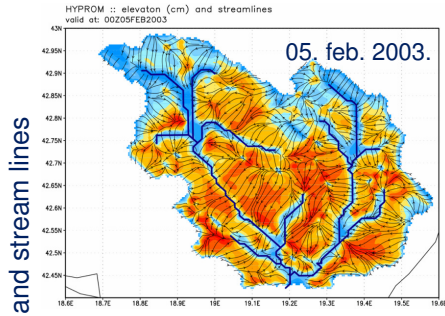
NMM model



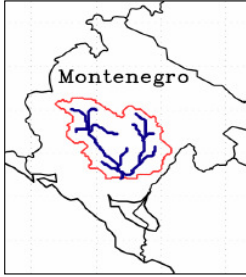
model vs. observations



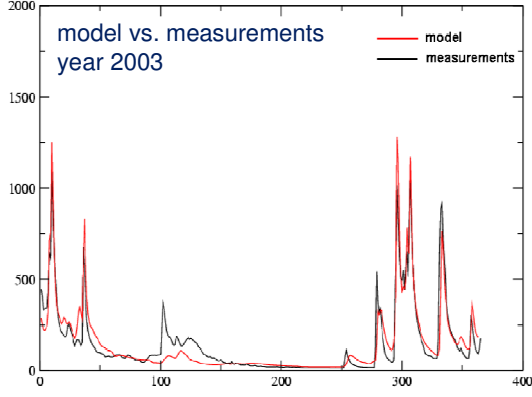
Morača (Montenegro)



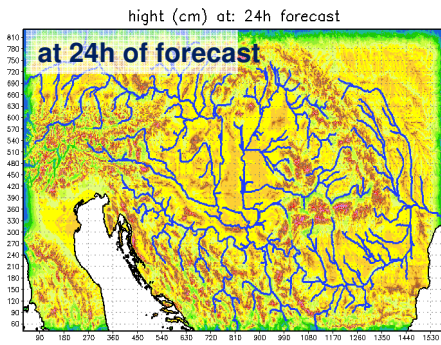
HYPRM - example of dynamical treatment of surface runoff after heavy rains



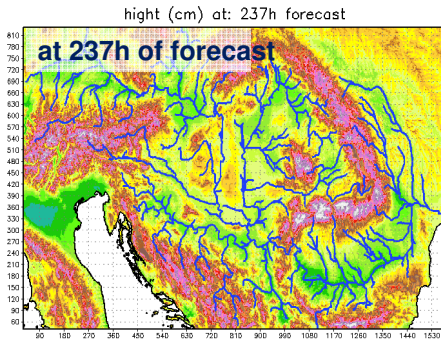
discharge (m³/s) at Podgorica measuring point



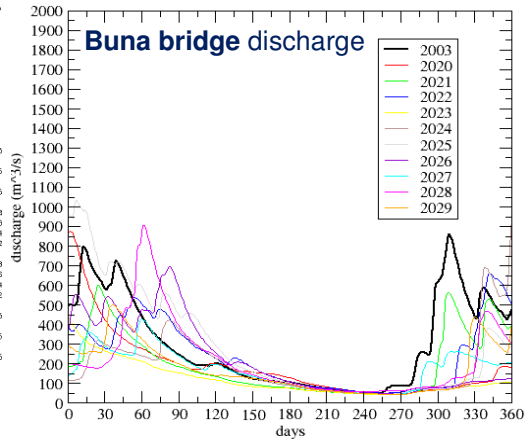
Extension of HYPROM to large basins and climate assessments



Danube basin experiment:
first 24h 1inch precipitation
over the whole domain



Climate simulations for Morača river 2020-2029



SEE countries limitations and needs to deal with climate change

- All countries in the SEE region are the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and have certain commitments to UNFCCC.
- WMO as the United Nations Specialized Agency with a mandate for weather, climate and water and its Member NMHSs are committed to supporting the UNFCCC by providing pertinent scientific information through climate observations and monitoring, studies of climate variability and climate change, natural disaster prevention and mitigation, the protection of life and property, hydrology and water resources, food security, scientific atmospheric and environmental research, and uncertainty reduction.
- SEE countries face twofold problems with responding to the obligations under the United Nations Framework Convention on Climate Change; they are faced with growing damage caused by meteorological, hydrological and climate related extremes and catastrophes, and on the other hand, faced usually with poverty and necessity for development. In addition, the most of the SEE countries, which are the candidate and potential candidate for EU memberships, **have limited access to knowledge, technology and financing, and have a** great need of capacity building and development (systemic, institutional and individual), that has to be coupled with the requirements of the Stabilisation and Association process to the EU.

In next several slides you will see the rationale for having the capacity building as one of the principle functions of the SEEVCCC. I will not elaborate much on that, but just mention that within this activity we will strictly follow the UNFCCC and WMO capacity building frameworks.

Capacity-building initiatives under UNFCCC and WMO (1/2)

- The UNFCCC Framework for capacity building in developing countries (provisions contained in its decisions 2/CP.7 and 2/CP.10 on capacity building in developing countries (non-Annex I Parties), and decisions 3/CP.7 and 3/CP.10 on capacity building in countries with economies in transition) sets out the scope of, and provides the basis for action on, capacity building related to the implementation of the Convention and preparation for the effective participation of developing and countries with economies in transition in the Kyoto Protocol process that will, in a coordinated manner, assist them in promoting sustainable development while meeting the objective of the Convention.
- The UNFCCC *Invites* the Global Environment Facility within its mandate, Parties included in Annex II to the Convention (developed countries), and multilateral, bilateral and other international organizations that are in a position to do so, to provide financial support for capacity-building activities in developing Parties and Parties with economies in transition, as outlined in above mentioned decisions.

Capacity-building initiatives under UNFCCC and WMO (2/2)

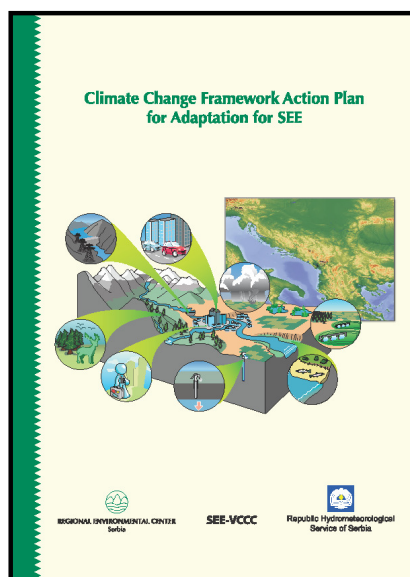
- Considering the importance and role of the National Meteorological and Hydrological Services (NMHSs) in the implementation of WMO Programmes, the Sixth WMO Long-term Plan (2004–2011) sets out as a priority the strengthening of efforts to bridge the gap between NMHSs of developed and developing countries.
- In order to meet the increasing demands for more comprehensive services across the European Region, in 2007 WMO Regional Association VI (Europe) adopted STRATEGIC PLAN FOR THE ENHANCEMENT OF METEOROLOGICAL AND HYDROLOGICAL SERVICES IN THE REGION (2008-2011), which was supported **the establishment of specialized sub-Regional Centres where Members identify a need (e.g. Drought Monitoring Centre in Slovenia, Sub-regional South East European Climate Change Centre in Serbia, North EurAs Regional Climate Centre (NEACC) of CIS, etc.**
- **The WMO Regional Association VI (Europe) at its Fifteenth Session held in Brussels, 18 to 24 September 2009**, adopted the Resolution 4.2/1 (XV-RA VI) on Establishment of a Regional Climate Centre-Network in RA VI (Europe), and support Capacity Building through Strategic Partnerships and cooperation, basic infrastructure and human capacity development; and enhancing resource mobilization in the Region.
- The SEEVCCC is participating in implementation of the WMO RA VI RCC Implementation Plan within the RCC node on climate data, RCC node on climate monitoring, and RCC node on Long Range Forecasting.

SEEVCCC priorities in addressing capacity building in climate change

Under South East European Climate Change Framework Action Plan for Adaptation and WMO RA VI RCC Implementation Plan the following common priorities have been identified:

- Improvement of collection, management, exchange, access to, and use of the observational data and other relevant information on current and historical climate and its impacts to SEE;
- Development the capacity to produce climate forecast and climate watch through humane resources development, training activities, education and training events organized by the SEVCCC in cooperation with the WMO and partners, national and international institutions;
- Promotion of the climate research and development/application of climate models, access to and use of information and data on projected climate change for SEE;
- Promotion of the understanding of the impacts of climate change, vulnerability and adaptation to climate change;
- Development and implementation of sub-regional and bilateral programmes for research, education and training and other forms of capacity building under the existing international framework and the development of regional partnerships proposed by the SEE/CCFAP-A;
- Capacity building activities undertaken within these international frameworks should maximise synergies between the World Meteorological Organisation, other international organisations and Conventions, and global environmental agreements aiming at strengthening the capacity of existing national and sub-regional institutions dealing with climate change.

SEEVCCC/CCFAP-A in support of UNFCCC implementation



Both SEEVCCC functions, under WMO and UNFCCC, may be considered as follow-up actions of WCC-3 which are in line with further development and implementation of the Global Framework for Climate Services established by the WCC-3



Thank you!