



# REPUBLIC HYDROMETEOROLOGICAL SERVICE OF SERBIA



***MEDARE 3<sup>rd</sup> Expert Group Meeting  
Istanbul, Turkey 27 – 28 September 2012***

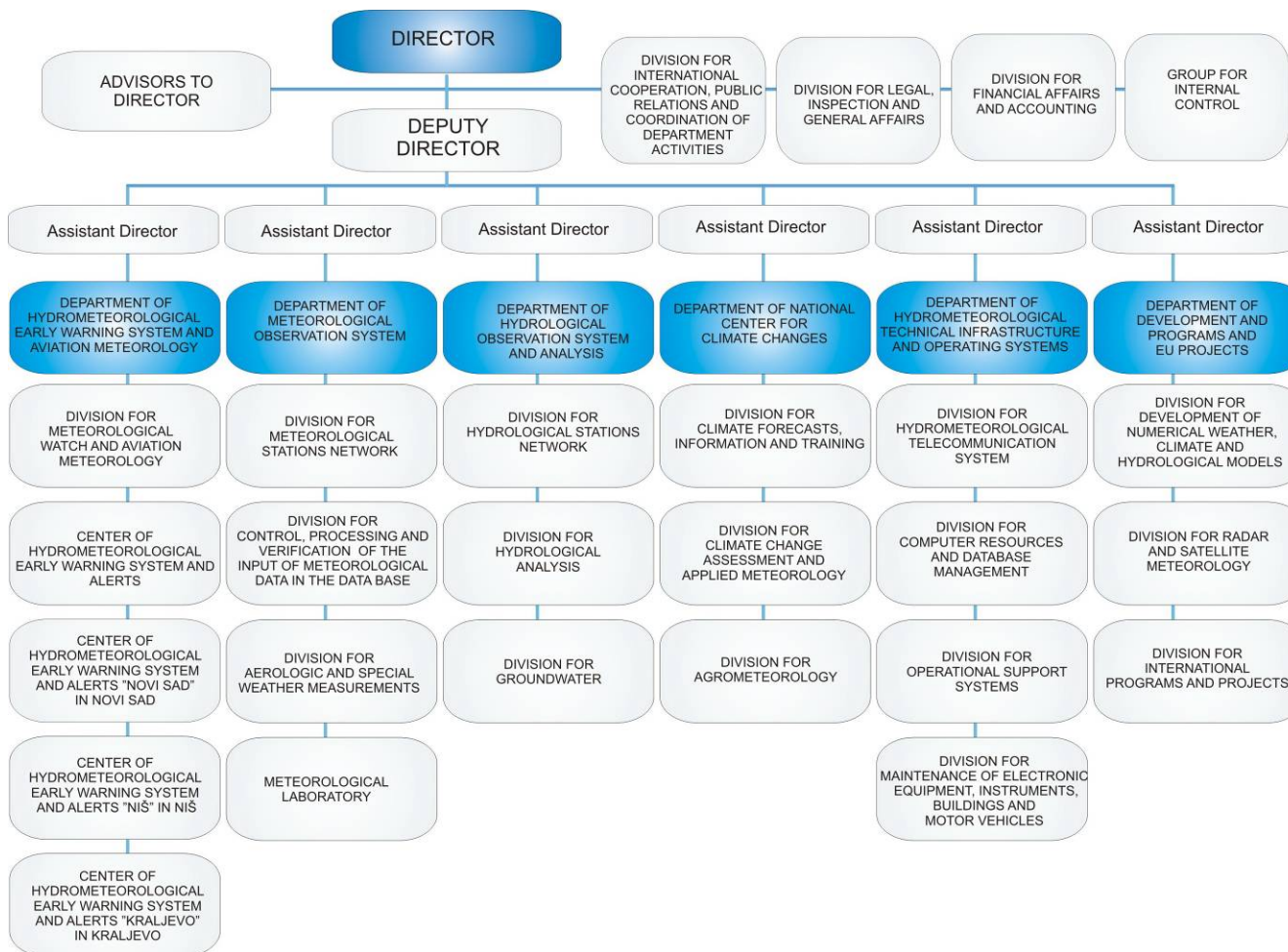


# BRIEF HISTORY

- Meteorological and hydrological activity in the territory of Serbia has a long tradition. Systematic hydrological observations started in 1812 (Danube, Novi Sad) and meteorological activity started on 1st January 1848, when Professor Vladimir Jaksic (1824-1892) introduced the first meteorological observations in Belgrade
  - Meteorological Observatory Belgrade was established in 1887 and soon after, on 27th September 1888, the Ministry of Education of the Kingdom of Serbia adopted a decision to set up a network of meteorological stations in Serbia.
  - This date is the day of the official establishment of the National Meteorological Service of Serbia
  - The Republic Hydrometeorological Service of Serbia (RHMSS) was established in 1947. In this way, all meteorological and hydrological activities in Serbia were integrated, excluding those carried out at the University
  - The Republic Hydrometeorological Service of Serbia (RHMSS) is a special organisation within the state administration, reporting to the Government of the Republic of Serbia
  - RHMSS as a NMHS fulfils the international obligations of the Republic of Serbia in the field of meteorology and hydrology and actively participates in various programs and projects of the World Meteorological Organisation (WMO) and other relevant international organisations
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# NEW ORGANIZATIONAL STRUCTURE OF THE RHMS OF SERBIA



484 posts



# METEOROLOGICAL OBSERVING SYSTEM

Synoptic/ Principal Climatological/ Agrometeorological Stations (in parallel 28 AWS)	<u>32</u>	<u>hourly observations</u>
Ordinary Climatological stations	97	3 times per day
Precipitation stations	558	daily measurements
Air quality stations	26	
Ordinary Agrometeorological stations	35	
Phenological stations	52	
Upper air observations	1	
Meteorological Radar Centers 1+13		





# DATA PROCESSING

- Manual digitalization of climatological data
  - Complex QC procedures, logical and critical control, crosschecking different parameters and phenomena
  - Importing into database
  - Calculation of indices, publication of climatological yearbooks
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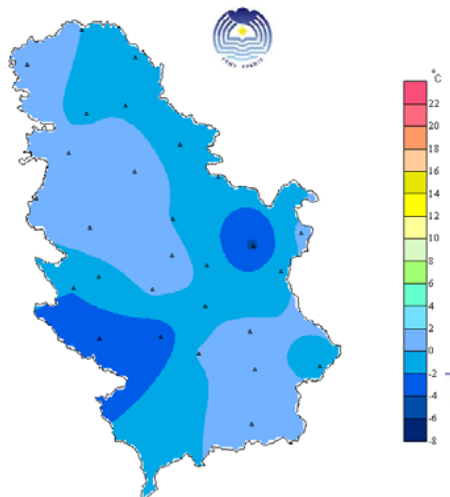


# CLIMATE MONITORING RELATED ACTIVITIES AND SERVICES

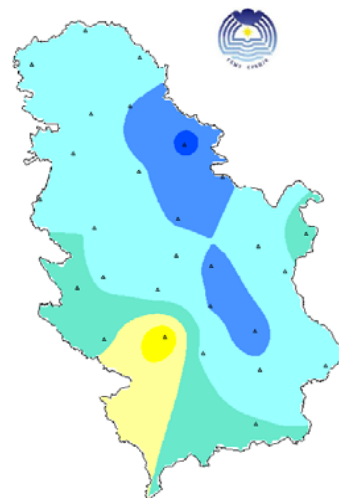


- The analysis of climate elements and their anomalies in relation to multi-annual mean values (RHMSS Weekly, Monthly and Annual bulletin); **MONTHLY TEMPERATURE AND PRECIPITATION** and their anomalies are regularly submitted to DWD – ECSM (European Climate System Monitoring)
- Update of climate maps
- Trend analysis of observed climate change
- Statistical analysis of extremes
- Climate services for users
- These products are available on RHMSS web-site [www.hidmet.gov.rs](http://www.hidmet.gov.rs)

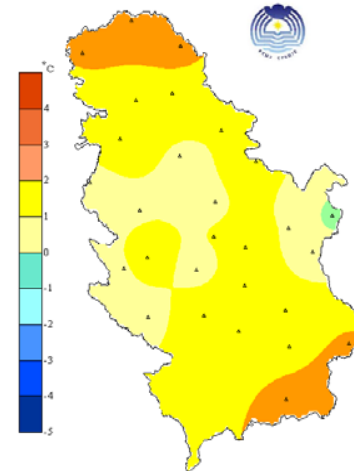
Temperature February 2011



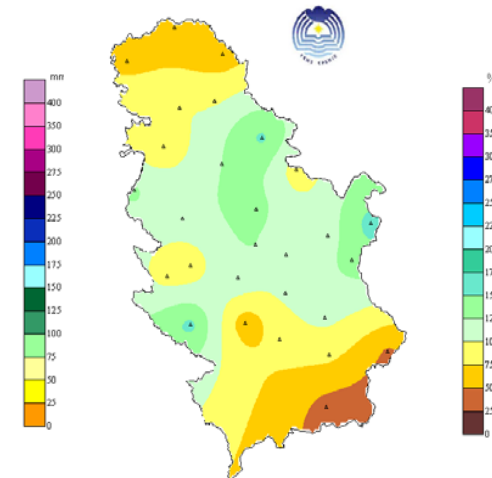
February 2011  
Temperature anomaly  
(Reference period 1961-1990)



Precipitation February 2011



February 2011  
Precipitation in percent of normal  
(Reference period 1961-1990)





## MAJOR CLIMATOLOGICAL STATIONS (part)

Station Name	WMO Code	Latitude	Longitude	Altitude	BegMonYr
Palić	13067	46.0972	19.7640	102	01.1936
Sombor	13160	45.7670	19.1431	87	01.1884
Novi Sad	13168	45.3222	19.8300	86	01.1860
Zrenjanin	13173	45.3987	20.3760	80	01.1879
Kikinda	13174	45.8426	20.4646	81	01.1875
Vršac	13183	45.1441	21.3055	85	01.1879
Loznica	13262	44.5411	19.2269	121	06.1901
Sremska Mitrovica	13266	45.0094	19.5550	82	05.1881
Valjevo	13269	44.2755	19.9125	176	01.1896
Surčin	13272	44.8242	20.2911	96	01.1964
Beograd	13274	44.7985	20.4648	132	09.1887
Kragujevac	13278	44.0272	20.9278	185	11.1889
Smederevska Palanka	13279	44.3696	20.9421	121	01.1901
Veliko Gradište	13285	44.7526	21.4984	82	09.1895
Negotin	13295	44.2392	22.5363	42	01.1891
Zlatibor	13367	43.7378	19.7130	1028	07.1941
Požega	13370	43.8431	20.0295	310	05.1895
Kraljevo	13376	43.7089	20.6998	215	01.1890
Kruševac	13383	43.5641	21.3400	166	06.1890
Ćuprija	13384	43.9406	21.3806	123	01.1896
Zaječar	13392	43.8831	22.2886	144	06.1895



# HISTORICAL DATA PROCESSING

- Database mainly of climatological data; monthly since 1920s, daily since 1940s, daily QC since 1961
  - Manual digitalization, complex QC procedures – time consuming, lack of trained personnel
  - Pilot project: automatic input into database from scanned data sheets using character recognition software (more than 92% of data transferred correctly)
  - Students, volunteers, enthusiasts
  - Homogenization
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# PROPOSAL

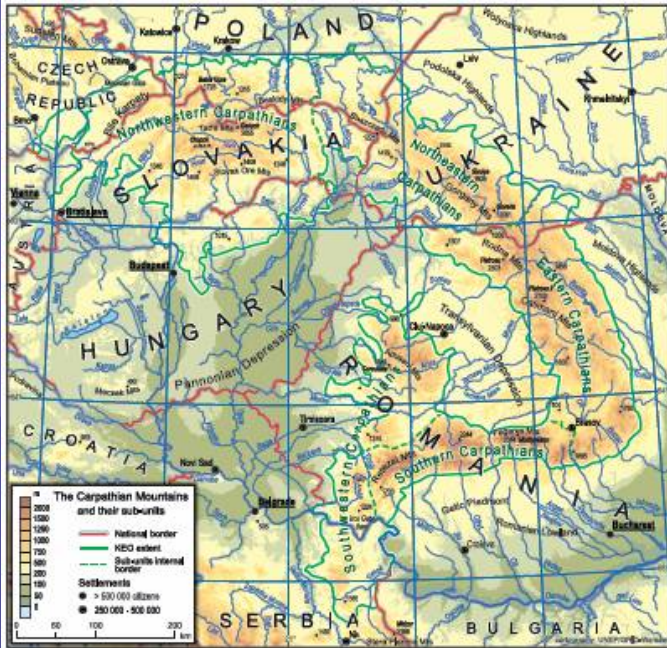
- Focus on 3 major climatological (regional) stations, “simple” QC
    - Novi Sad           1961/1949/1860
    - Beograd           1961/1936/1887 (1848)
    - Nis                 1961/1941/1889
  - Estimation: ~ 10 years for digitalization and QC
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# CLIMATE RESEARCH ACTIVITIES WITHIN PROJECTS



## Climate of the Carpathian Region – Digital Climate Atlas - *CARPATCLIM* project



**Module 1:** Improve the availability and accessibility of a homogeneous and spatially representative time series of climatological data for the Carpathian Region through data rescue, quality control, and data homogenization. (lead by the Slovak Hydrometeorological Service)

**Module 2:** Ensure Carpathian countries data harmonization with special emphasis on across-country harmonization and production of gridded climatology per country. (lead by the Hungarian Meteorological Service)

**Module 3:** Develop a Climate Atlas as a basis for climate assessment and further applied climatological studies as well as for drought monitoring in the Carpathian Region (lead by The Republic Hydrometeorological Service of Serbia)



# RHMSS AS A HOST PROVIDES TECHNICAL INFRASTRUCTURE FOR OPERATIONS AND RESEARCH ACTIVITIES OF THE SOUTH EAST EUROPEAN VIRTUAL CLIMATE CHANGE CENTER

## WWW.SEEVCCC.RS



The screenshot displays the SEEVCCC website interface. At the top, there is a navigation menu with links for Operational Products, Climate Change, Research & Devel., International Collab., Events, and About SEEVCCC. Below the menu is a large banner image showing a satellite view of the Balkans region. Three main product highlights are featured: Dust Forecast, Seasonal Forecast, and SEECOF, each with a 'More Details' link. The 'Dust Forecast' section is currently selected, showing a sub-header 'OPERATIONAL PRODUCTS' and a description of the Dust Regional Atmospheric Model (DREAM8). Below the text are two identical maps of the Balkans region, showing surface dust concentration in  $\mu\text{g}/\text{m}^3$  and wind speed in  $\text{m}/\text{s}$ . The maps are for the date September 17, 2010, with a forecast base time of 12Z17SEP2010 and a valid time of 12Z17SEP2010 (+00). The maps use a color scale from green to red to indicate dust concentration levels, with a prominent red area over the Balkans region. Wind vectors are shown as small arrows across the map.



**THANK YOU**

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