

HMS CLIMATE RECORDS AS CONTRIBUTION TO MEDARE DATABASE



27-28 September 2012, Istanbul, Turkey



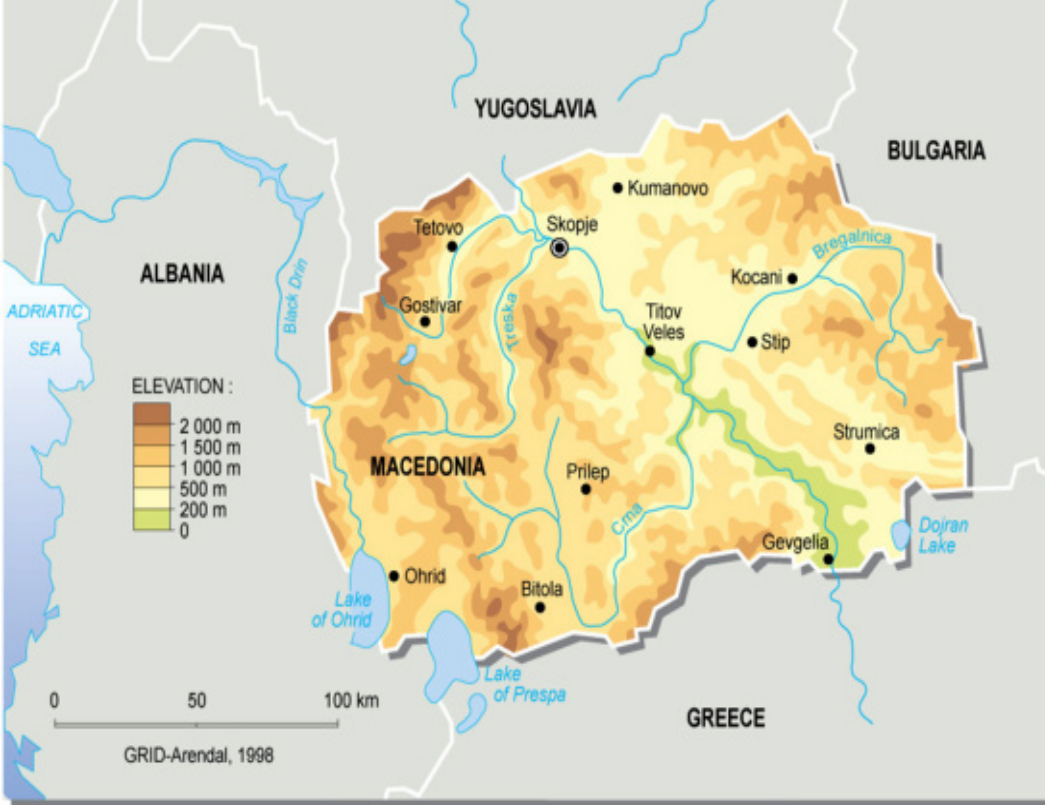


GEOGRAPHIC PROFILE OF THE COUNTRY

The Republic of Macedonia is situated in the southern Europe, in the central part of Balkan Peninsula, at latitude of approximately $42^{\circ}50'$ North and a longitude of $22^{\circ}00'$ East. Total surface area of Macedonia is $25,713 \text{ km}^2$.

Macedonia borders with Bulgaria, Serbia, Albania and Greece.

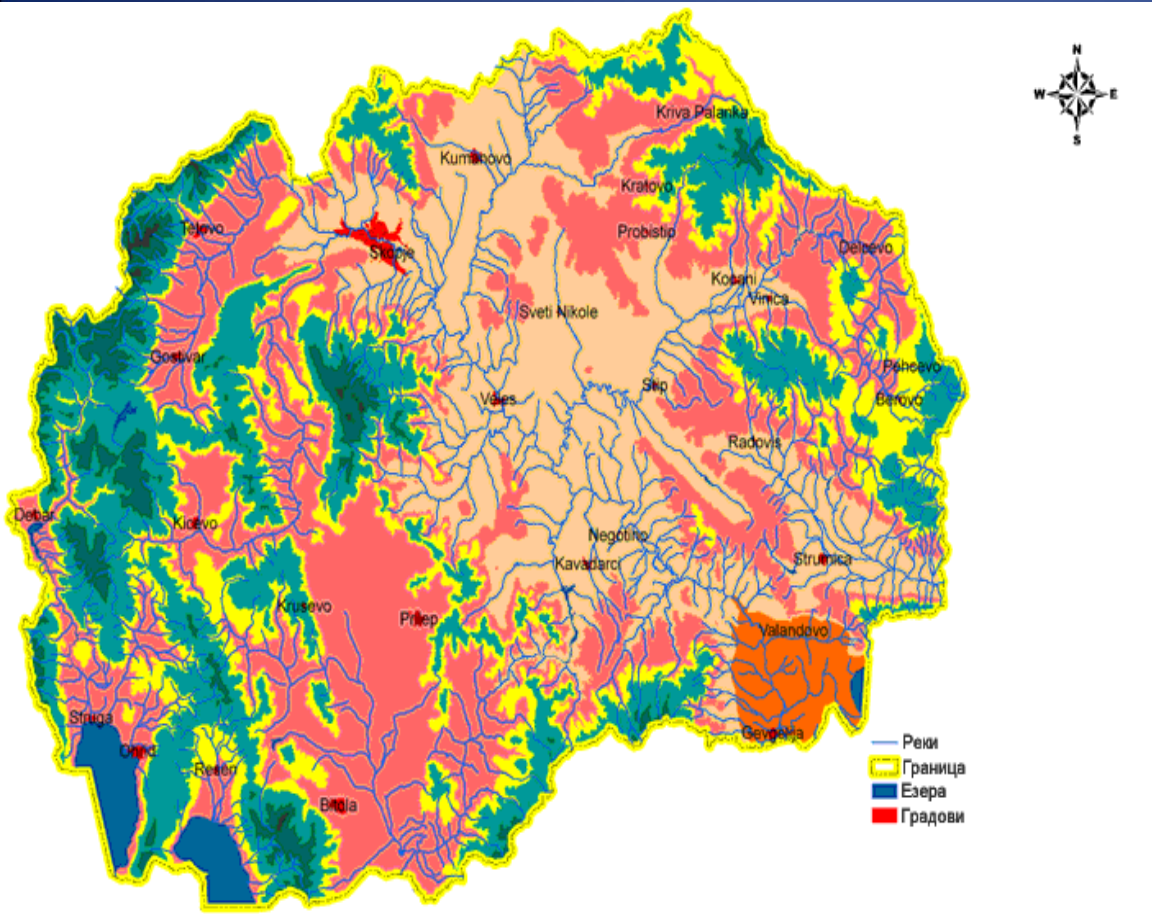




From the aspect of topography, Macedonia is mountainous country. Participation of plains in total surface area is 19.1%, the figure of mountain terrains is 79%, where water surfaces are 1.9%.

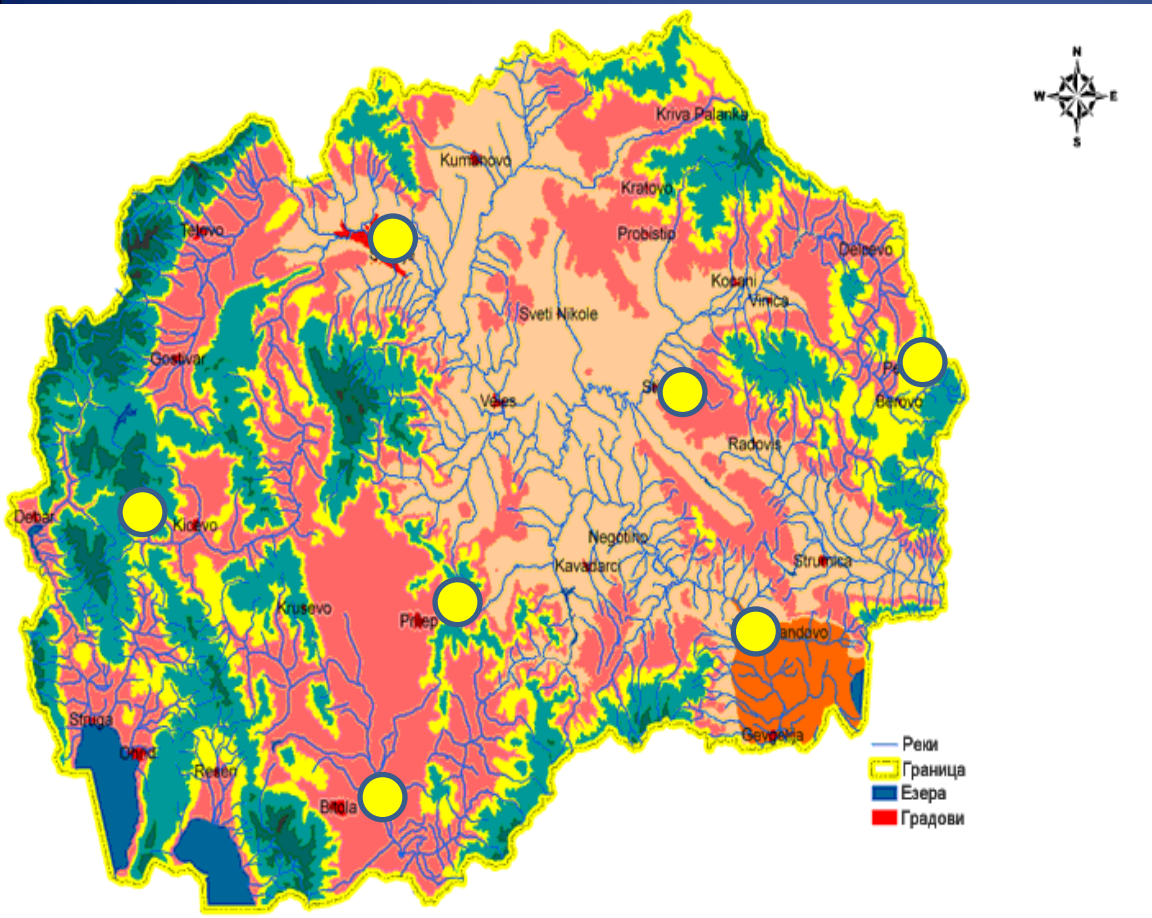
Forests cover one third of total territory of the country. Agricultural area cover 25%.





- 1. south-eastern part with sub-Mediterranean climate;
- 2. central part with combined sub-Mediterranean / continental climate;
- 3. southern part with continental climate;
- 4. south-western part with continental climate;
- 5. eastern part with continental climate;
- 6. north-western part with prevailing mountain / Alpine climate.





SELECTED METEOROLOGICAL STATIONS

- DEMIR KAPIJA (1932)
- STIP (1926)
- BEROVO (1950)
- SKOPJE star aerodrom (1924-66), SKOPJE-PETROVEC (1967-today), SKOPJE Z.Rid (1983- today)
- PRILEP (1923)
- BITOLA (1927)
- LAZAROPOLE (1948)



- Continuous measurements have been performed since 1947 at all these stations.
- Hourly measurements and observations of all meteorological elements and phenomena are performed.
- Standard met.elements and phenomena are measured by conventional instruments
 - Temperature
 - Relative humidity
 - Atmospheric pressure
 - Wind direction and speed
 - Precipitation quantity and intensity
 - Insolation
 - Evaporation
 - Soil temperature

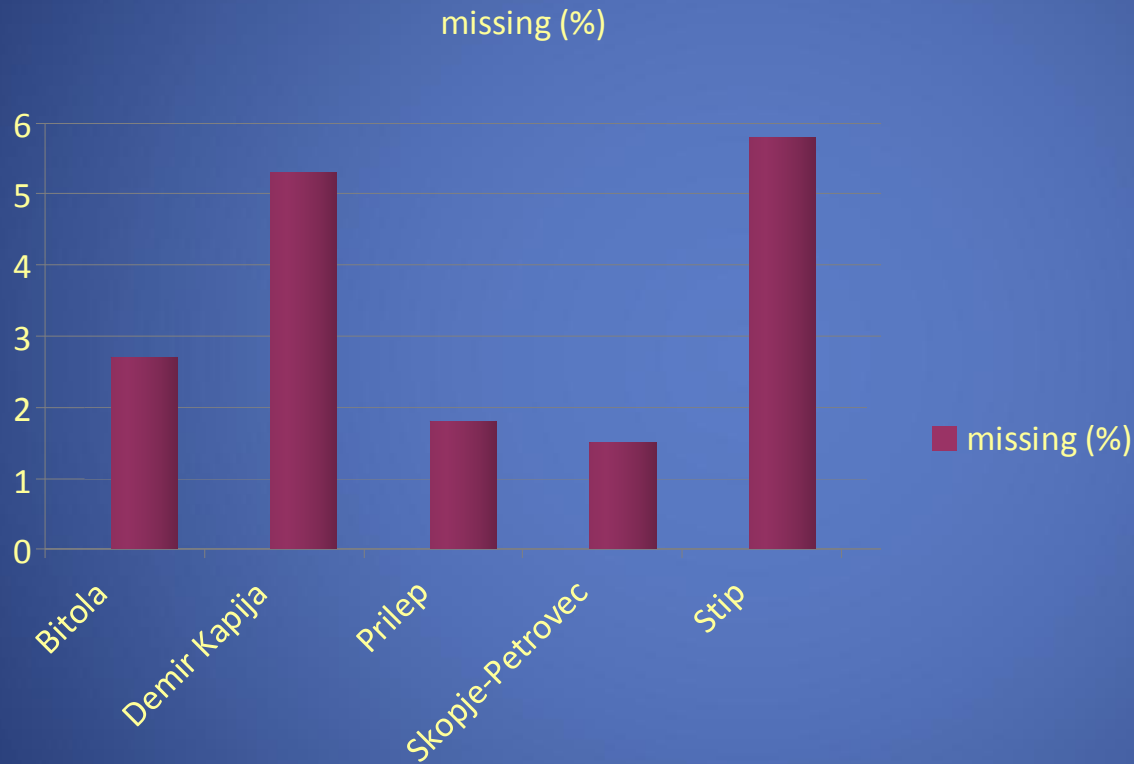


Digitalization procedures

- Improved status since last MEDARE meeting
- Completed digital input of daily data for period 1951 for proposed main met. stations



Temperature (max, min, mean)



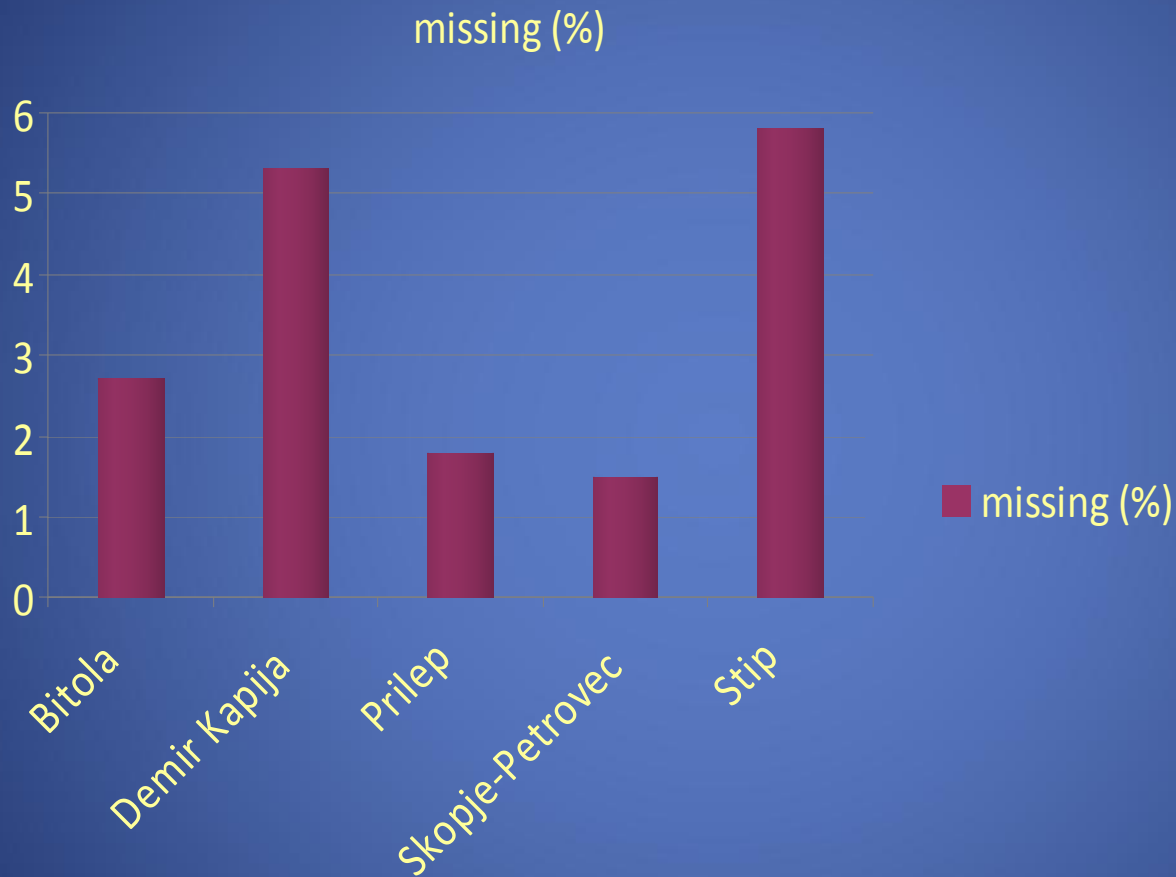
Bitola	2,7
Demir Kapija	5,3
Prilep	1,8
Skopje-Petrovec	1,5
Stip	5,8



Precipitation



Air Pressure



CDMS/QC

Quality control QC in two levels

- Input done through excel files for visual/ logical control
- Climate Data Management System – CLIDATA

The screenshot displays two overlapping windows from the CDMS/QC software. The left window, titled 'ELEMENTS', contains configuration fields for a data element. The right window, titled 'KEY ENTRY AND QC', shows a data entry grid for station 01PORU01 in 2005, month 2.

WINDOW 1: ELEMENTS

Abbreviation: TMA
Name: Temperature max
Definition: Maximum daily temperature
Scale: 0.1
Unit: °C
Upper and lower limit: 100, -100
Normal: Average

WINDOW 2: KEY ENTRY AND QC

Station ID: 01PORU01, Year: 2005, Month: 2

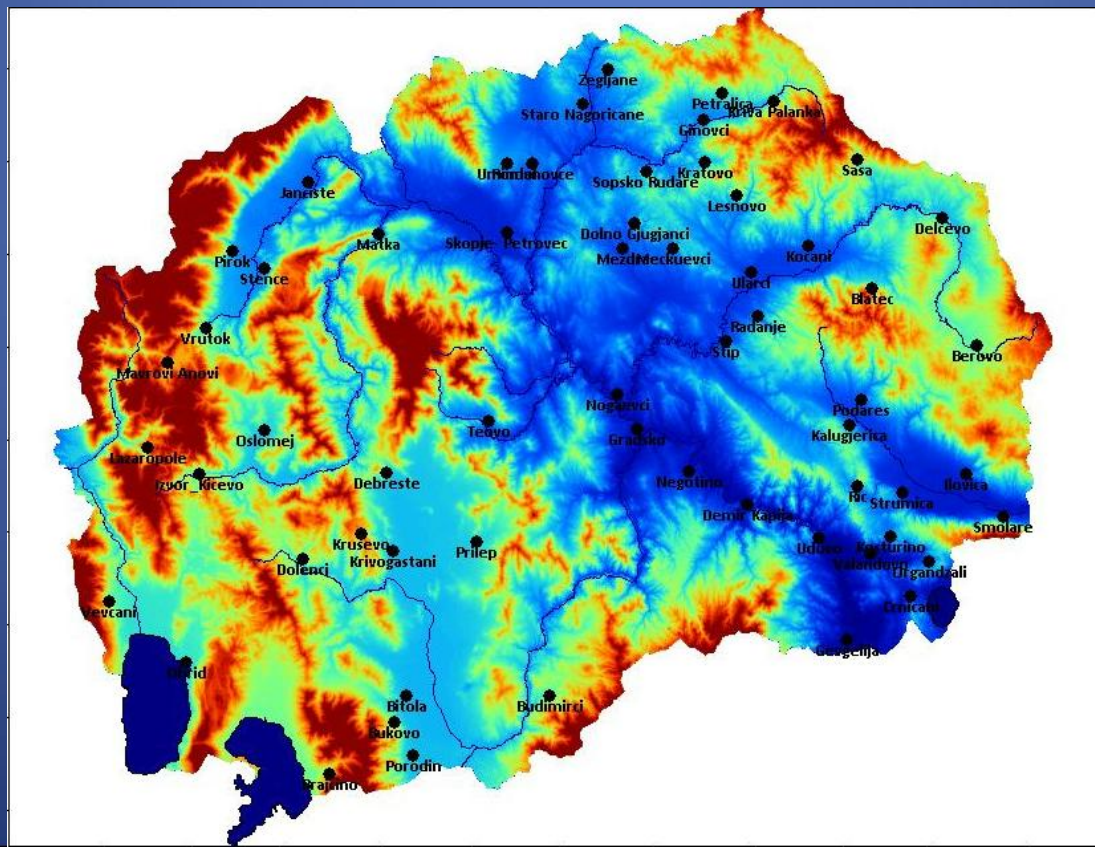
	TMA 21:00 [°C]	TMI 21:00 [°C]	TPM 07:00 [°C]	T 07:00 [°C]	T 14:00 [°C]
1	12	-31	-62	-27	4
2	18	-26	-60	-16	13
3	12	-22	-43	-7	11
4	6	-47	-17	-12	-15
5	-38	-130	-66	-66	-51
6	-24	-192	-221	-187	-43
7	-14	-216	-238	-214	-43
8	1	-193	-230	-127	-2
9	0	-198	-244	-162	-10
10	10	-86	-116	-80	3
11	22	-22	-22	-7	20
12	27	8	-5	14	8
13	61	10	16	27	30

Homogenization Procedures

- Not operationally established
- First step: South East Europe Program- Drought Management Center for South Eastern Europe, co-funded by the European Union and 15 partner countries



Data control and homogenization with MASH
homogenization method for monthly precipitation data
from 60 meteorological station (for calculation of
various drought indices) for period 1961-2010
MISH (Meteorological Interpolation based on Surface
Homogenized Data Basis)



- Manual of the MISH and MASH homogenization software on DMCSEE web site
- The software can be downloaded from:
<http://www.met.hu/pages/seminars/seeera/index.htm>



Work to be done

The image shows an open historical meteorological notebook. The left page is a table with columns for 'Дата' (Date), 'Величина давления (мм) барометра при 0°' (Pressure value in mm), 'Сила и направление ветра' (Wind force and direction), and 'Состояние неба' (Sky condition). The right page is titled 'МЕСЕЧНА ТАБЛИЦА МЕТЕОРОЛОГИЧКИХ ОСМАТРАЊА' (Monthly table of meteorological observations) for the month of October 1942. It includes a grid for recording observations and a list of instruments used, such as 'Термометар сува зидна' (Wall dry thermometer) and 'Термометар мокра' (Wet thermometer).

- Digitalization of data before 1951 to the beginning of measurements

- Homogenization and interpolation of missing data
- Research of historical data (Skopje 1891 – 1899, Bitola 1896 – 1911)



Thank you for your attention!

