

Policies to reduce climate and natural disaster water-related risks

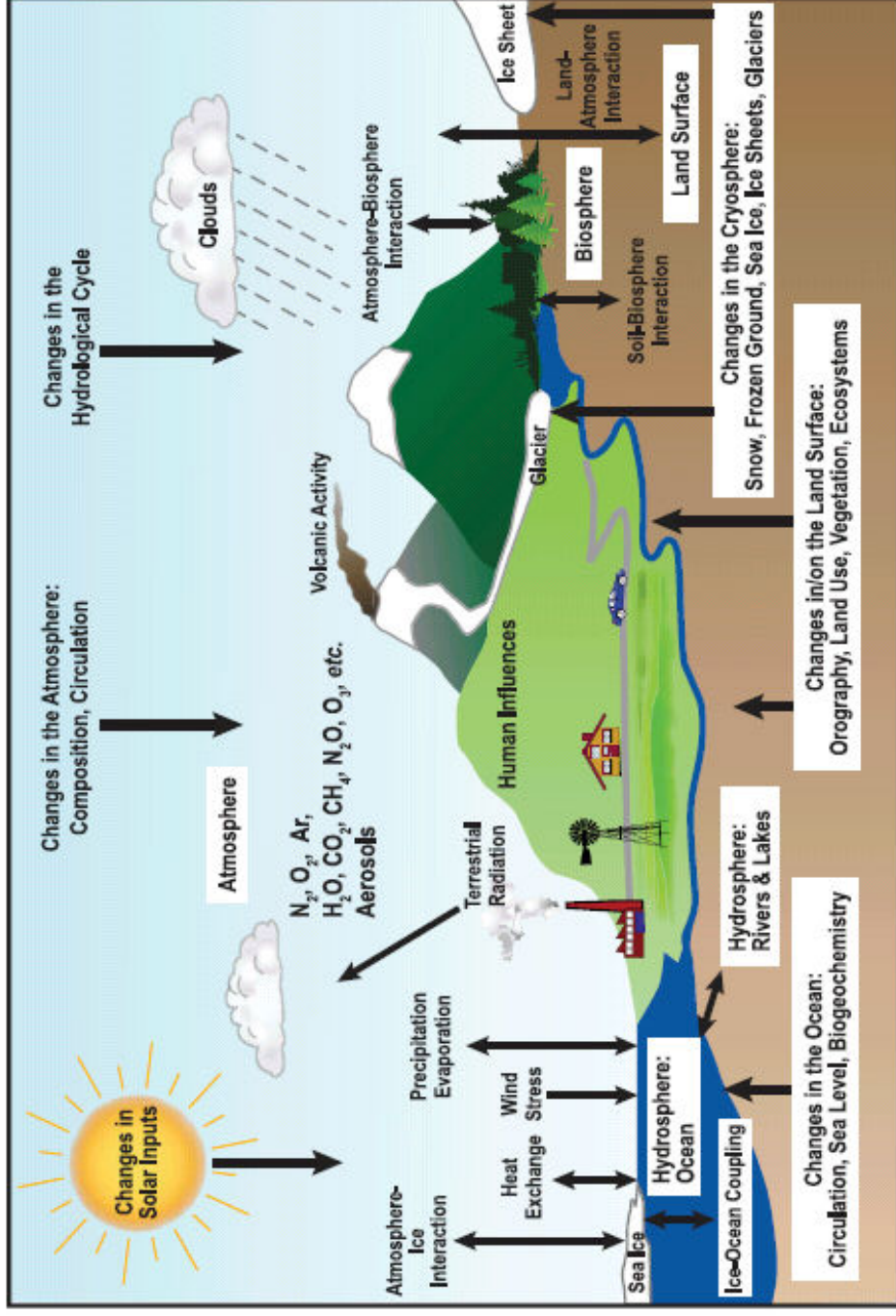
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Zagreb, Croatia

Content

1. Introduction
2. DRR Projects in South Eastern Europe (SEE)
3. Water-related DRR policies in Croatia
4. Conclusion

1. Introduction

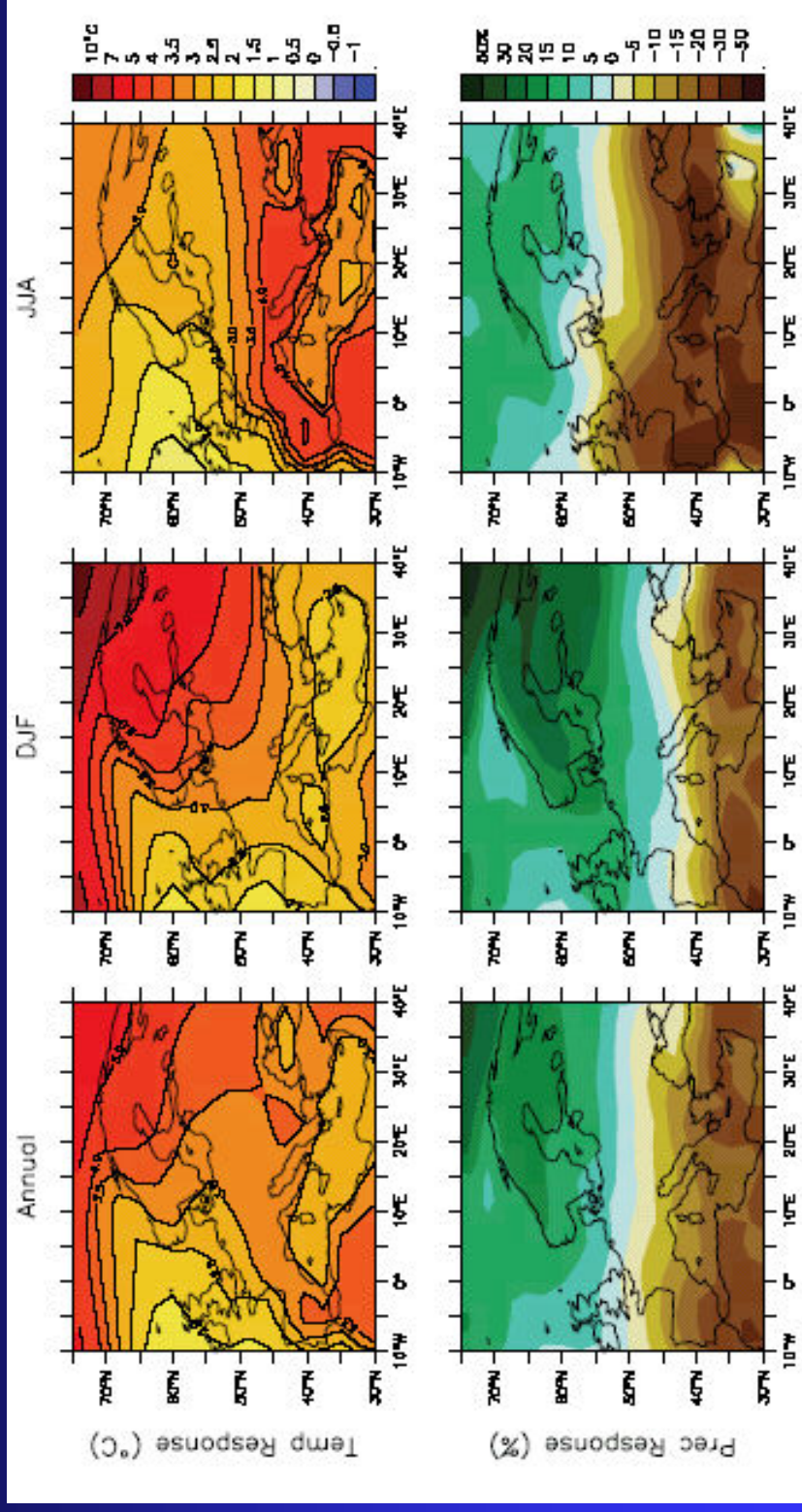
Climate System



FAQ 1.2, Figure 1. Schematic view of the components of the climate system, their processes and interactions.

1. Introduction

Climate Scenario for the Europe - IPCC?



1. Introduction

**What trends of water balance components
are in Croatia from the beginning
observation?**

1. Introduction

Meteorological data:



Zagreb-
Grič

1862-
2000,

other 23
stations

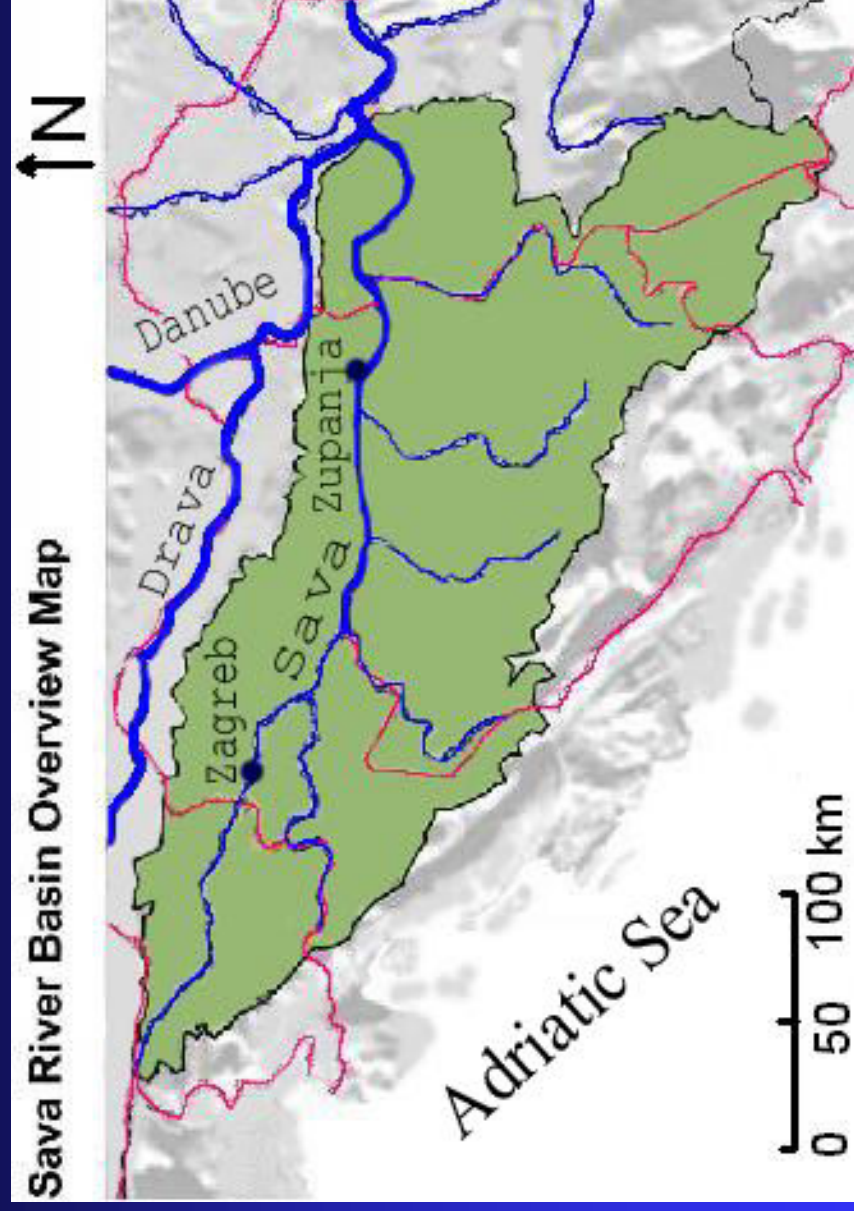
1951-
2000

Average monthly air temperature, precipitation amounts, relative humidity and field capacity of the soil

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1. Introduction

Hydrological data:



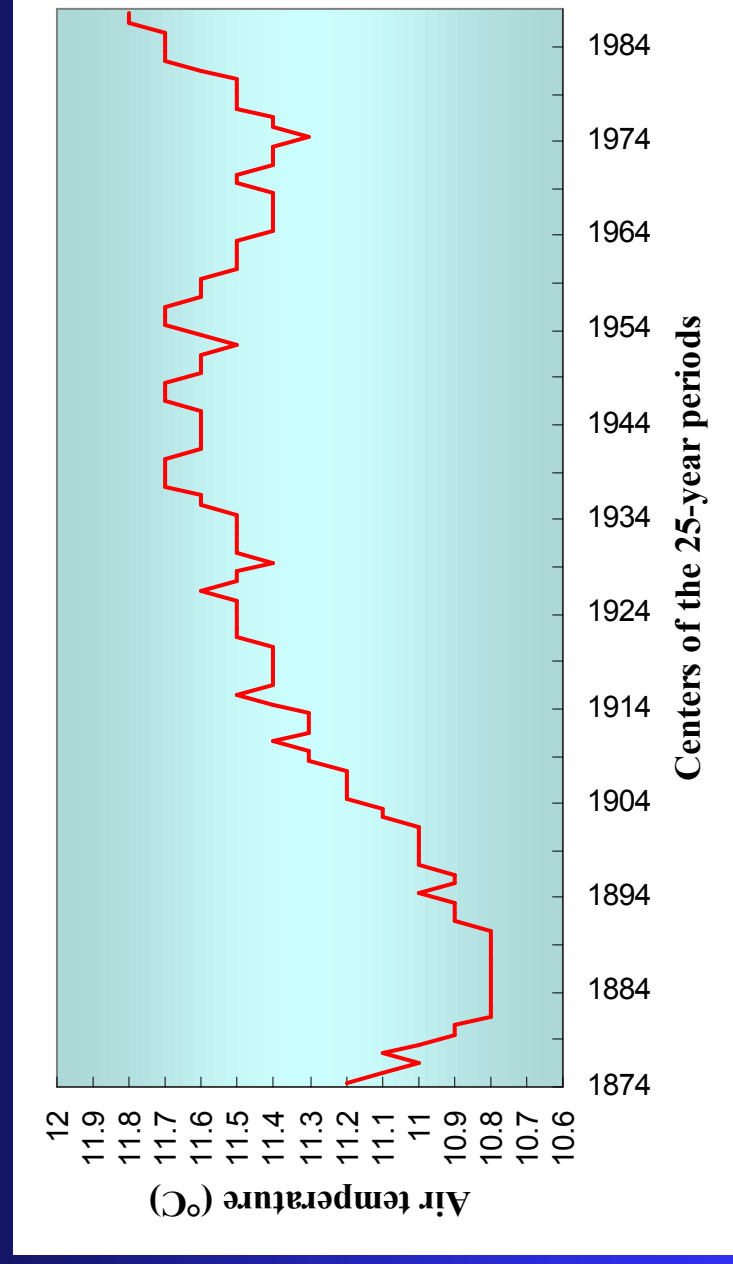
**Sava
River:
Zagreb i
Županija
1931-
2000**

Average monthly river discharge

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1. Introduction

Air Temperature:

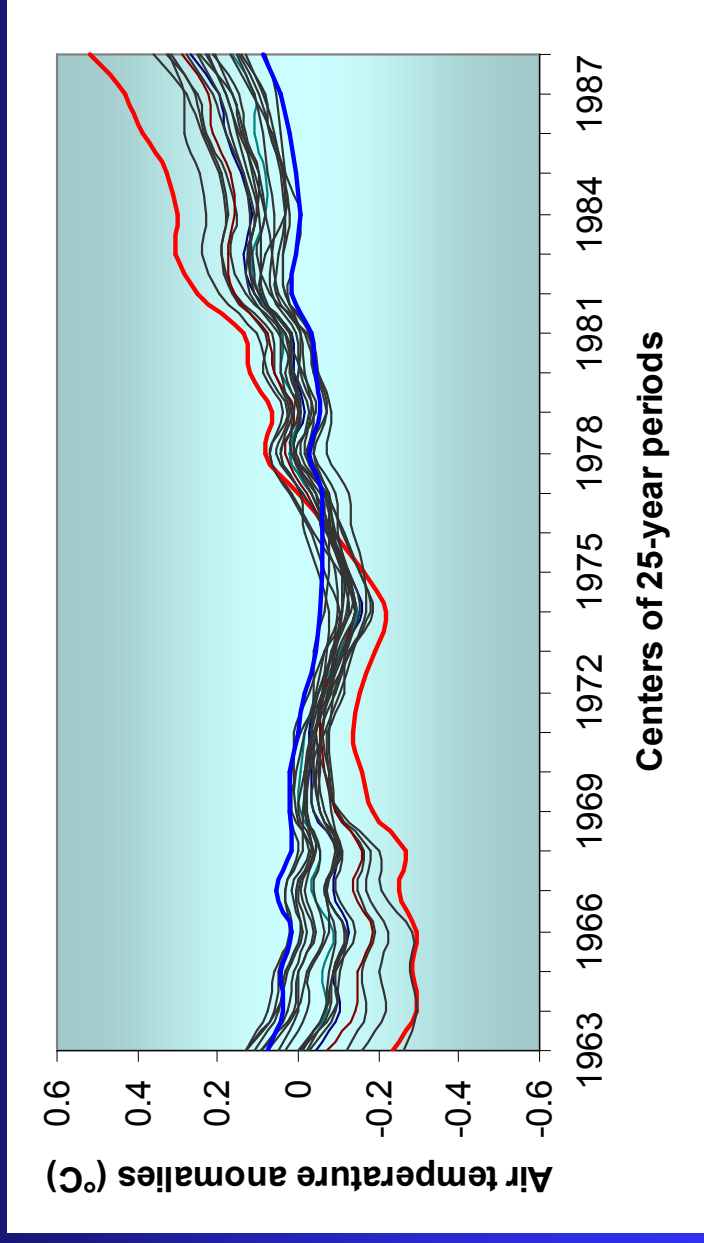


25-year moving averages of air temperature for Zagreb-Grič for the period 1862-2000

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1. Introduction

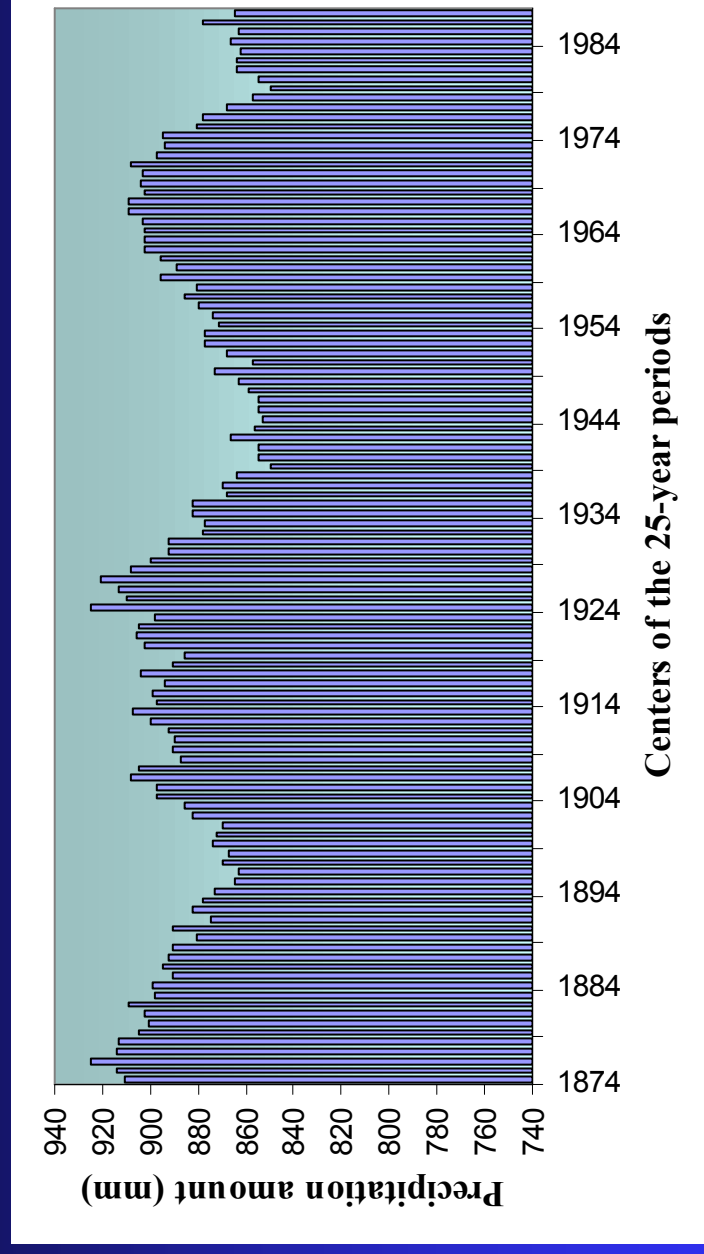
Air Temperature:



25-year moving averages of air temperature for 24 weather stations for the 1951-2000

1. Introduction

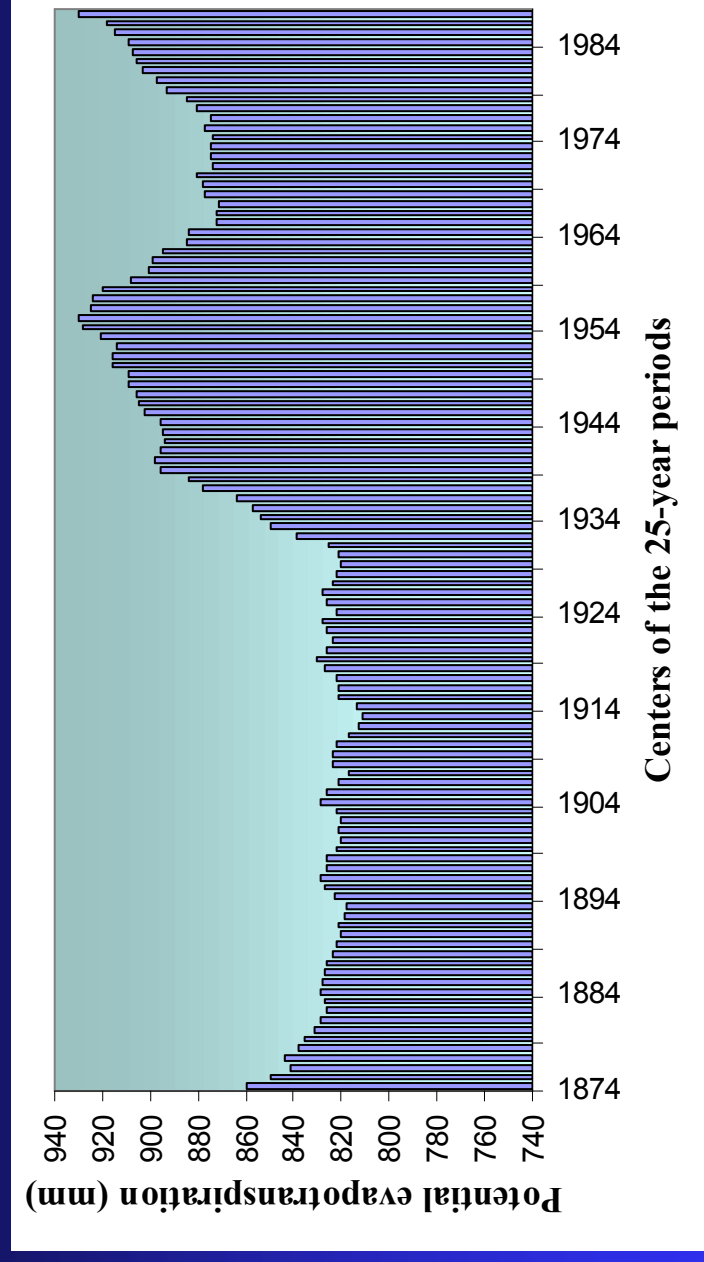
Precipitation Amounts:



25-year moving averages of annual precipitation amounts for Zagreb-Grič and the period 1862-2000

1. Introduction

Potential Evapotranspiration:

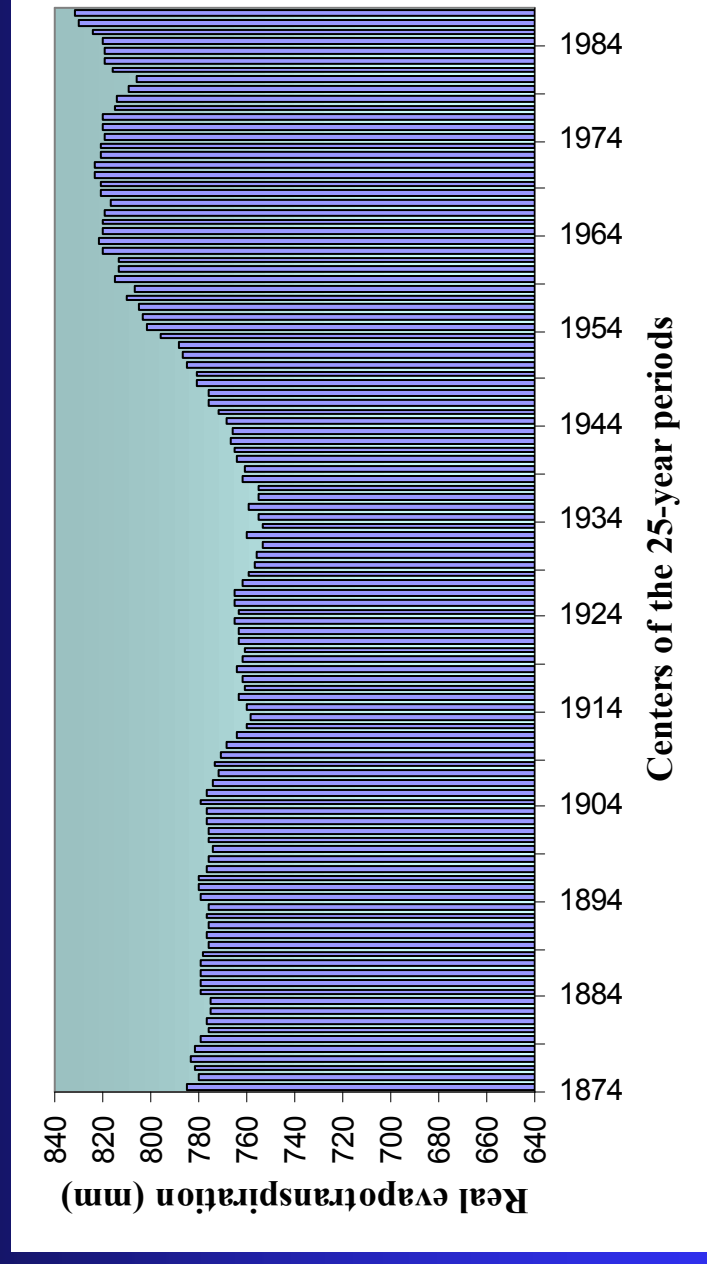


25-year moving averages of potential evapotranspiration
for Zagreb-Grič and the period 1862-2000

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1. Introduction

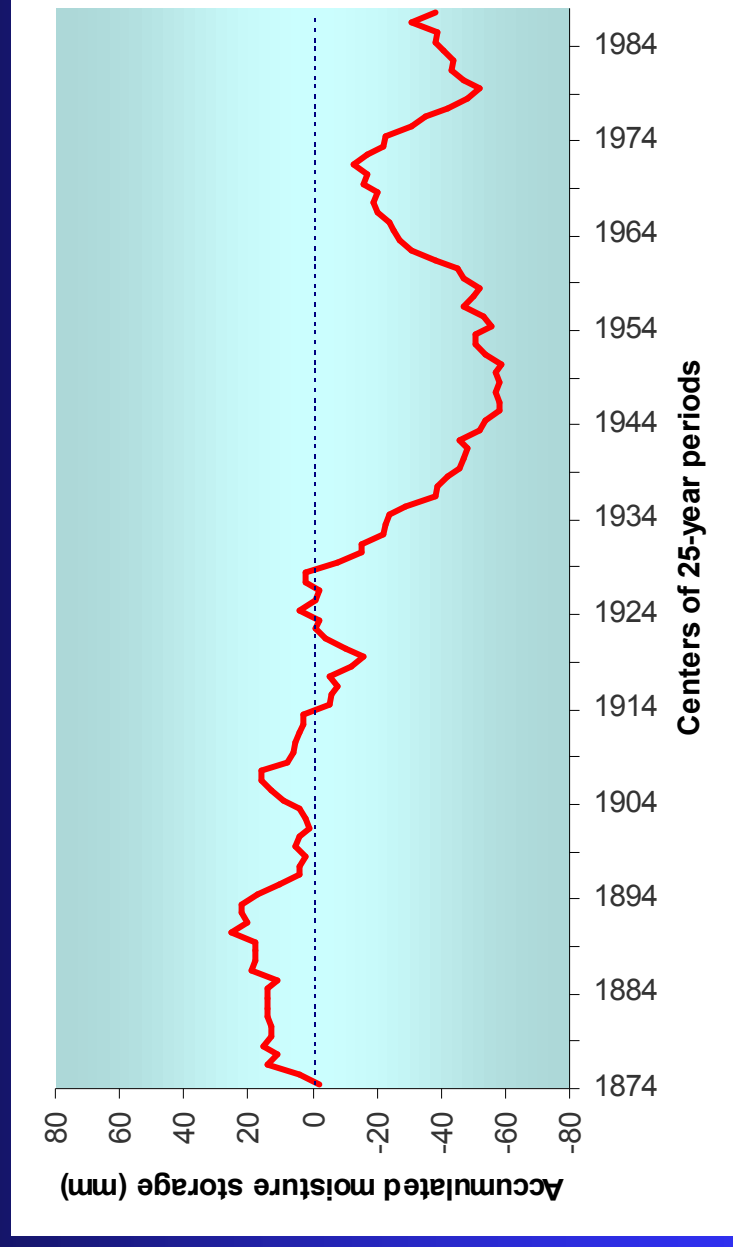
Real Evapotranspiration:



25-year moving averages of real evapotranspiration for Zagreb-Grič for the period 1862-2000

1. Introduction

Cumulative Soil Moisture Change:

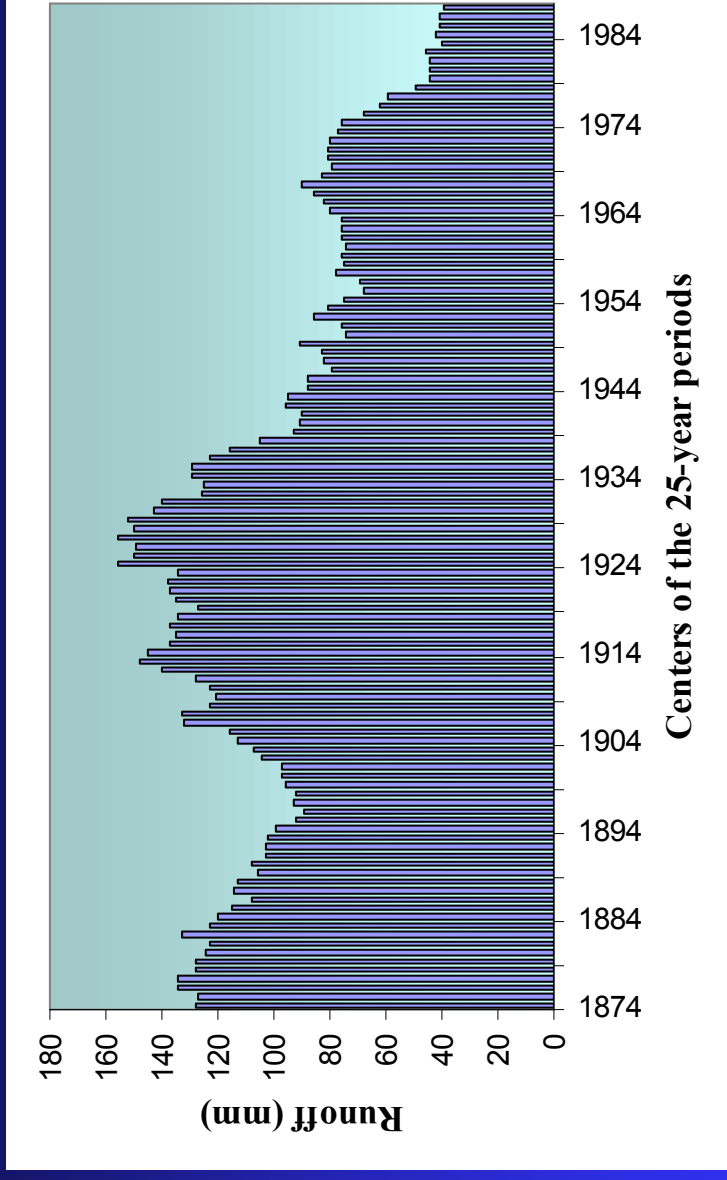


Cumulative change of difference between 25-moving average of recharge of moisture into the soil and its losses from the soil for Zagreb-Grič and the period 1862-2000

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1. Introduction

Surface run-off:

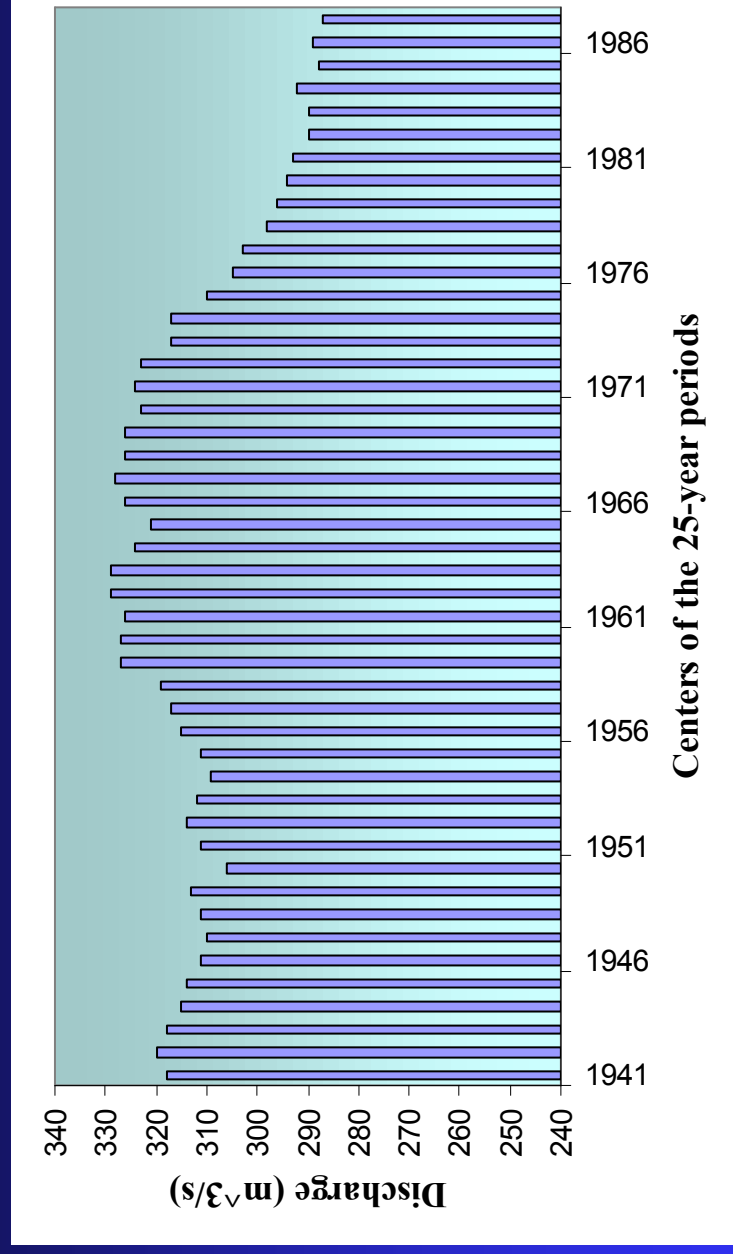


25-year moving averages of surface run-off calculated by
Palmer's procedure for Zagreb-Grič and period 1862-2000

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1. Introduction

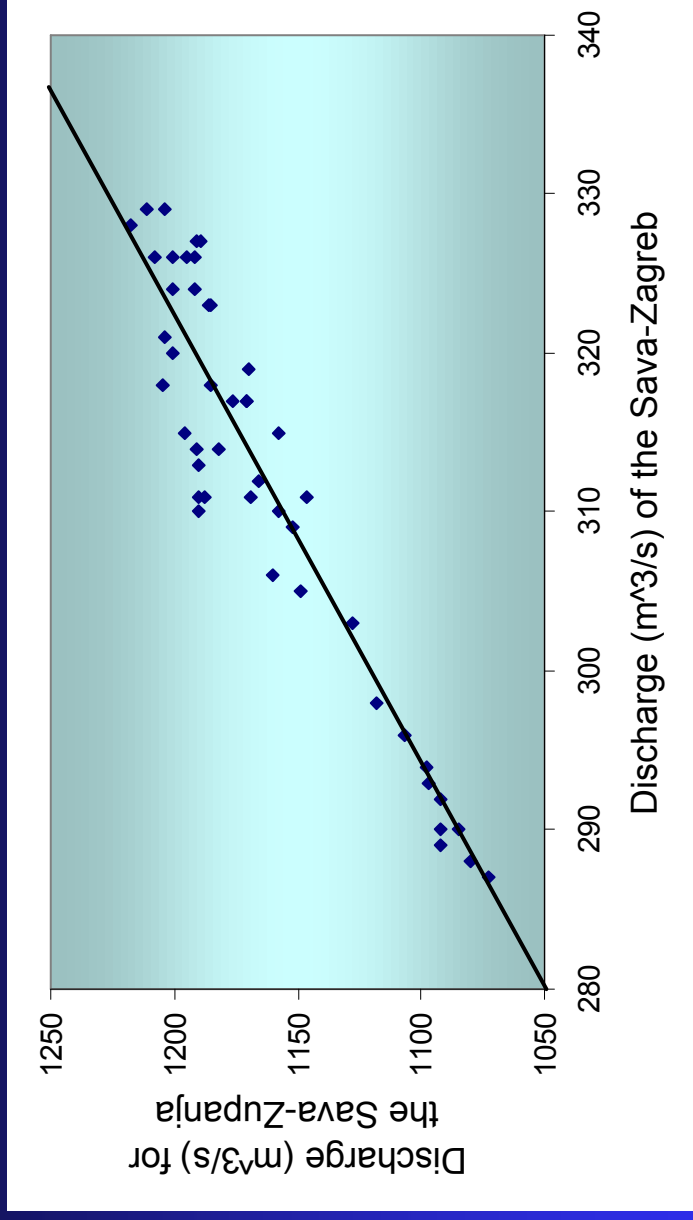
River Discharge:



25-year moving averages of river discharge for the Sava river at Zagreb and for the period 1931-2000

1. Introduction

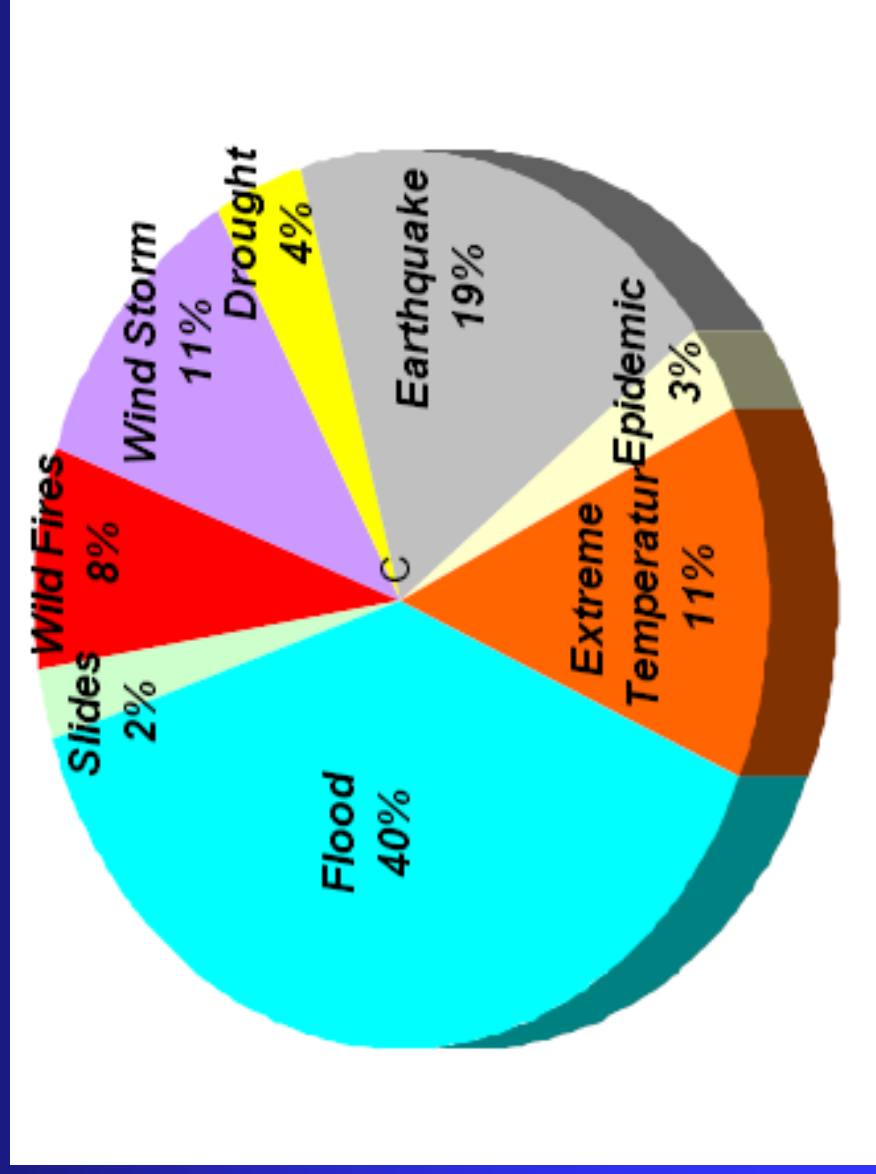
River Discharge:



Comparison of 25-year moving averages of river discharge for the Sava river at Zagreb and Županja for the period 1931-2000

2. DRR Projects in SEE

In south Eastern Europe, 80% of disasters events are related to hydro-meteorological hazards and conditions.



2. DRR Projects in SEE

1) 2007 – SEE Disaster Risk Mitigation and Adaptation Programme, the World Bank, WMO and UNISDR

Component 1a: Strengthening of Hydrometeorological Services in South Eastern Europe

Component 1b: Development and upgrading of hydrometeorological information & flood warning/forecasting system in the Sava River Basin

2. DRR Projects in SEE

Report I: Bengt Tammelin, Finnish Meteorological Institute

WB- UN/ISDR - WMO project:

1a) Strengthening of Hydrometeorological Services in South Eastern Europe

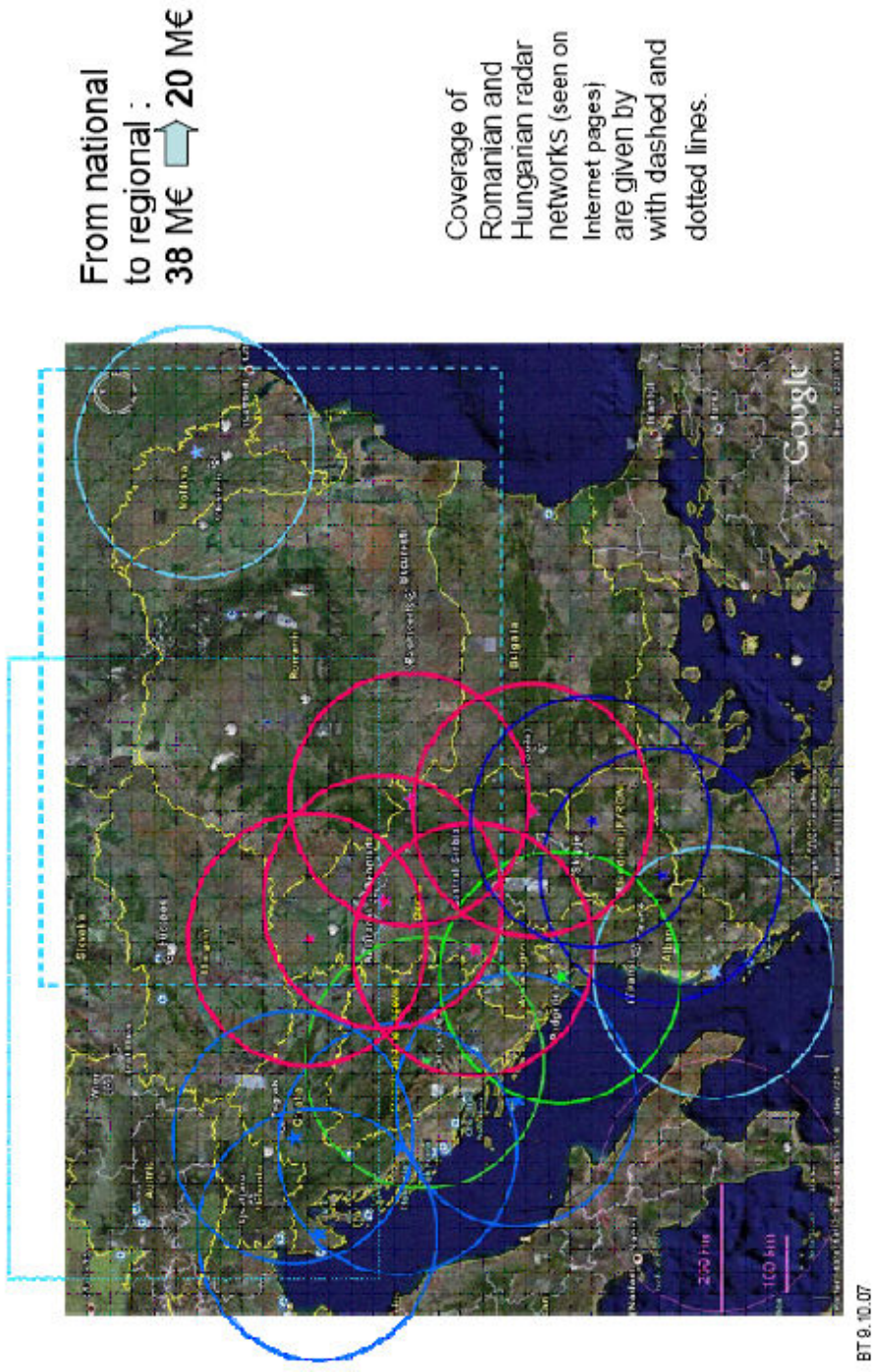
Target Countries: Albania, Bosnia and Herzegovina, Croatia, Montenegro, FYR Macedonia, Moldova and Serbia.

Our message to the governments:

“Strengthening of NMHSS must not be seen as an expenditure, but as an investment”

2. DRR Projects in SEE

Joint radar network among the SEE countries and Romania & Hungary reduces significantly the required number of radars compared to country-wise approach.



2. DRR Projects in SEE

Report II: Mihailo Anđelić, Republic Hydrometeorological
Institute of Serbia
Jožef Rožkar, Environmental Agency of the Republic
of Slovenia,

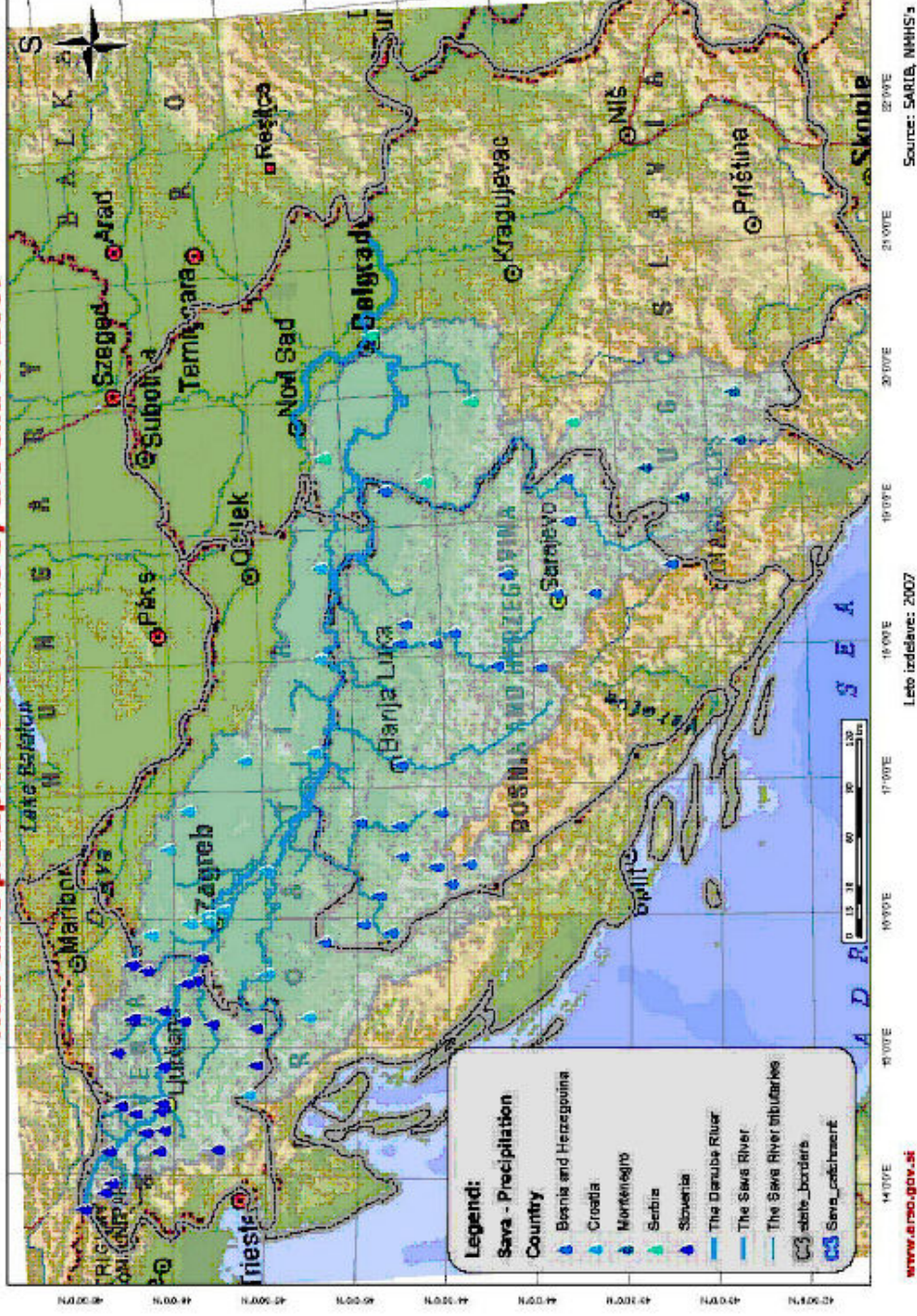
WB- UN/ISDR - WMO project:

**1b) Development and upgrading of
hydrometeorological information & flood
warning/forecasting system in the Sava River
Basin**

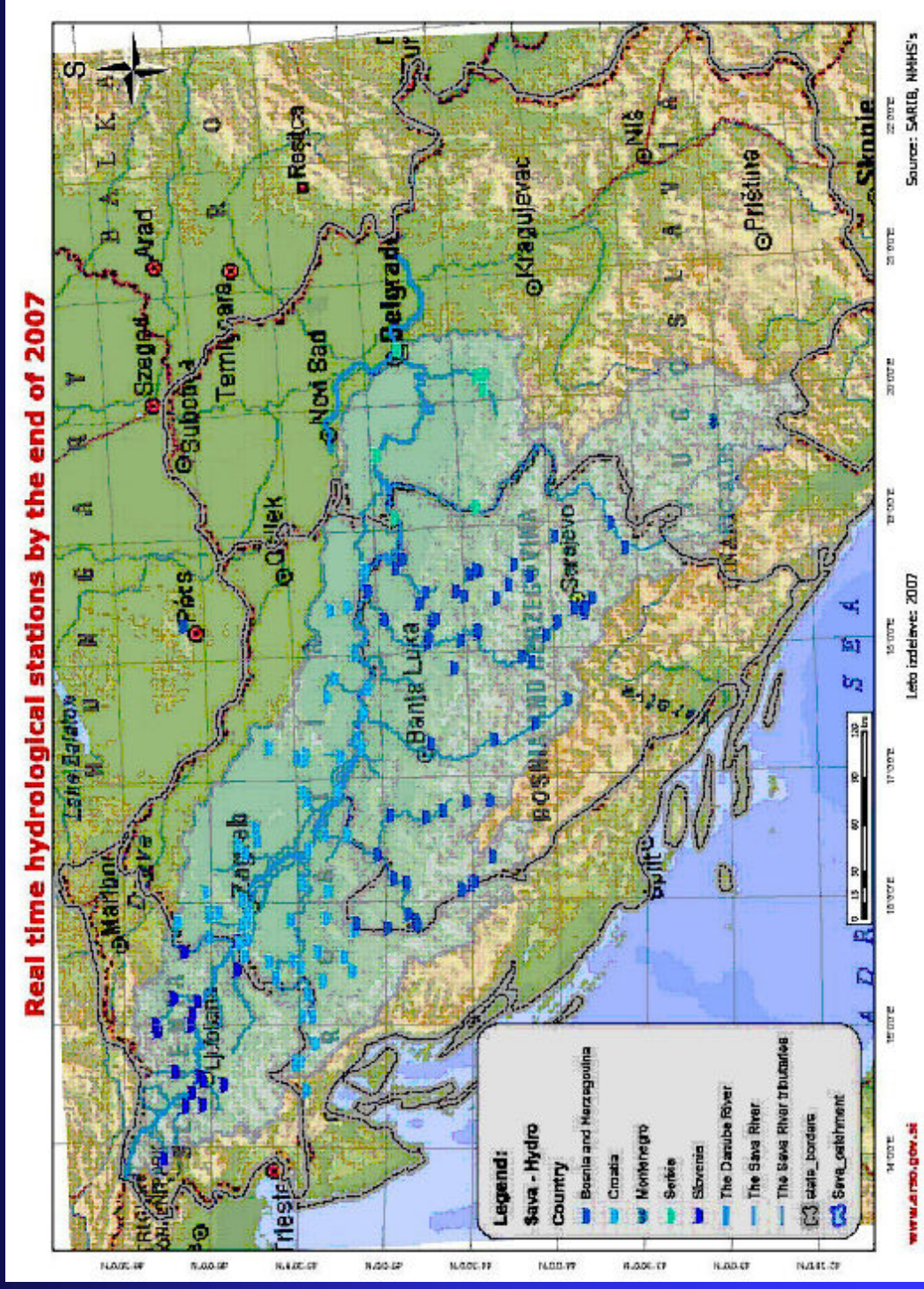
**Target Countries: Albania, Bosnia and Herzegovina,
Croatia, Montenegro, Serbia and Slovenia.**

2. DRR Projects in SEE

Real time precipitation stations by the end of 2007



2. DRR Projects in SEE



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2. DRR Projects in SEE

2) March 2009 – **Regional Programme on Disaster Risk Reduction in South Eastern Europe**, EC DG Enlargement, WMO and UNDP

Activity 1: “Building Capacity in Disaster Risk Reduction through Regional Cooperation and Collaboration in South East Europe” - UNDP

Activity 2: “Regional Cooperation in South Eastern Europe for meteorological, hydrological and climate data management and exchange to support Disaster Risk Reduction” – WMO

Target countries: Albania, Bosnia and Herzegovina, Croatia, The former Yugoslav Republic of Macedonia, Montenegro, Serbia, Kosovo (as defined by UNSCR 1244) and Turkey

2. DRR Projects in SEE



Regional Programme on Disaster Risk Reduction
in South East Europe



Draft National Report Croatia

National Policy Dialogue on Disaster Risk Reduction

Zagreb, Croatia
June 7-8, 2010

By Sergej Anagnosti, UNDP Consultant

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2. DRR Projects in SEE

Information collection and report development

Project is guided by the Hyogo Framework for Action

Focus is on natural hazards

Focus is on **disaster risk reduction**:

“The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.”

Information collection February – May 2010

Review and analysis of various documents, data and information

By Sergej Anagnosti, UNDP Consultant

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3. Water-related DRR policies in Croatia

Key disaster management laws in Croatia: the Protection and Rescue Law, the Fire-fighting Law, the Fire-protection Law, the Law on Protection from the Natural Disaster

Key disaster management authority – the National Protection and Rescue Directorate

Croatian National Platform for DRR – established in 2009

Main natural hazards affecting Croatia: floods, earthquakes and forest fires

Early Warning System – System 112 – established, fully functional in 2011

3. Water-related DRR policies in Croatia

Strategic documents addressing some elements of disaster management:

- Water Management Strategy (2008)
- Strategy of Governments Programmes for 2010-2012 (2009)

Mainstreaming DRR has commenced in education

Extensive regional and international cooperation

3. Water-related DDR policies in Croatia

Draft Recommendations – the way forward

HFA priority #1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Recommendation 1:

To strengthen coordination, strategic planning and management of disaster risk reduction at the national level through modifications of the existing institutional set-up by empowering, i.e. providing authority, accountability and responsibility to one of the existing national entities (the National Protection and Rescue Directorate or the National Platform or the Rescue and Protection Headquarters of the Republic of Croatia) to evolve into a multi-stakeholder national mechanism that serves as an advocate of disaster prevention and disaster risk reduction; provides coordination, analysis and advice on areas of priority; and undertakes strategic DRR planning and management.

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3. Water-related DDR policies in Croatia

Recommendation 2:

To facilitate and support establishment of mirrored/similar/same mechanisms at the county and local self-government levels through strengthening and reinforcing local capacities, institutions and governance capabilities.

Recommendation 3:

To encourage all existing disaster risk reduction actors in Croatia, e.g. the National Protection and Rescue Directorate, the Meteorological and Hydrological Service, the Republic Seismological Survey, line Ministries and respective public enterprises, the Croatian Red Cross, civil society and business community to work together and invest additional efforts in recognizing and fulfilling existing disaster risk reduction tasks and responsibilities.

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3. Water-related DDR policies in Croatia

HFA priority #2: Identify, assess and monitor disaster risks and enhance early warning

Recommendation 4:

To enhance the early warning system and interoperability of the System 112 through modernization of the continuous and real-time collection and information sharing by expanding the hydrological, meteorological and seismological monitoring networks, establishing integrated fire-protection system and ensuring functional horizontal and vertical links among all disaster risk reduction actors.

Recommendation 5:

To enhance technical and human resources of Meteorological and Hydrological Service in operational monitoring, warning, forecasting and mapping of hydrological and meteorological hazards.

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3. Water-related DDR policies in Croatia

Recommendation 6:

To further strengthen operational cooperation of the National Protection and Rescue Directorate and the Meteorological and Hydrological Service through joint training and improvements to the standard operating procedures across agencies linked to the different threat levels and lessons learnt from each disaster event.

Recommendation 7:

To enhance investments in climate modeling and forecasting and analysis to support sectoral planning for at-risk sectors.

Recommendation 8:

To increase the awareness of the citizens and media regarding the early warning system and the European Emergency Number 112.

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3. Water-related DDR policies in Croatia

HFA priority #3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels

Recommendation 9:

To include the Meteorological and Hydrological Service, the Republic Seismological Survey, other respective line Ministries, the Croatian Red Cross, expert organizations and individuals in the process of mainstreaming disaster risk reduction into national educational curriculum by establishing Curriculum Revision Working Group composed of the representatives from the Ministry for Science, Education and Sport, from the National Protection and Rescue Directorate and from institutions just mentioned.

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3. Water-related DDR policies in Croatia

HFA priority #4: Reduce the underlying risk factors

Recommendation 10:

To develop the disaster risk reduction Strategy and corresponding Implementation/Action Plan as a first mutual step undertaken by the key disaster risk reduction actors, e.g. the National Protection and Rescue Directorate, the Meteorological and Hydrological Service, the Republic Seismological Survey, line Ministries and respective public enterprises, the Croatian Red Cross, civil society and business community toward integration of disaster risk reduction in national operating programming, followed with the implementation of the said Strategy.

Recommendation 11:

To develop national capacities for climate services to support medium and longterm sectoral planning through strong collaboration and cooperation across many ministries and with the Meteorological and Hydrological Service, and through enhanced regional cooperation with other South Eastern European and EU countries.

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3. Water-related DDR policies in Croatia

HFA priority #5: Strengthen disaster preparedness for effective response at all levels

Recommendation 12:

To proceed with the establishment, in Croatia, of the Centre of Excellence for a training of fire fighters and coordination of response to forest fires in the countries of South Eastern Europe, including the harmonization of the development of fire-fighting brigades in the countries of the region through standardization of equipment and procedures, thus promoting regional cooperation and collaboration in disaster risk reduction in South Eastern Europe.

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4. Conclusions

- Follow the Hyogo Framework for Action, national and EU legislative
- Focus on natural hazards, including water-related disaster risk reduction
- Continue to collaborate on World Bank, WMO, UNISDR, EC Projects for South Eastern Europe
- Strengthen of capacities and collaboration of water-related institutions as Meteorological and Hydrological Services and Croatian Waters including collaboration with such institutions in SEE and EU
- Use the results of scientific projects like HyMeX



DHMZ

THANK YOU FOR ATTENTION

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