



Flood Forecasting and Early Warning System in the Sava River Basin

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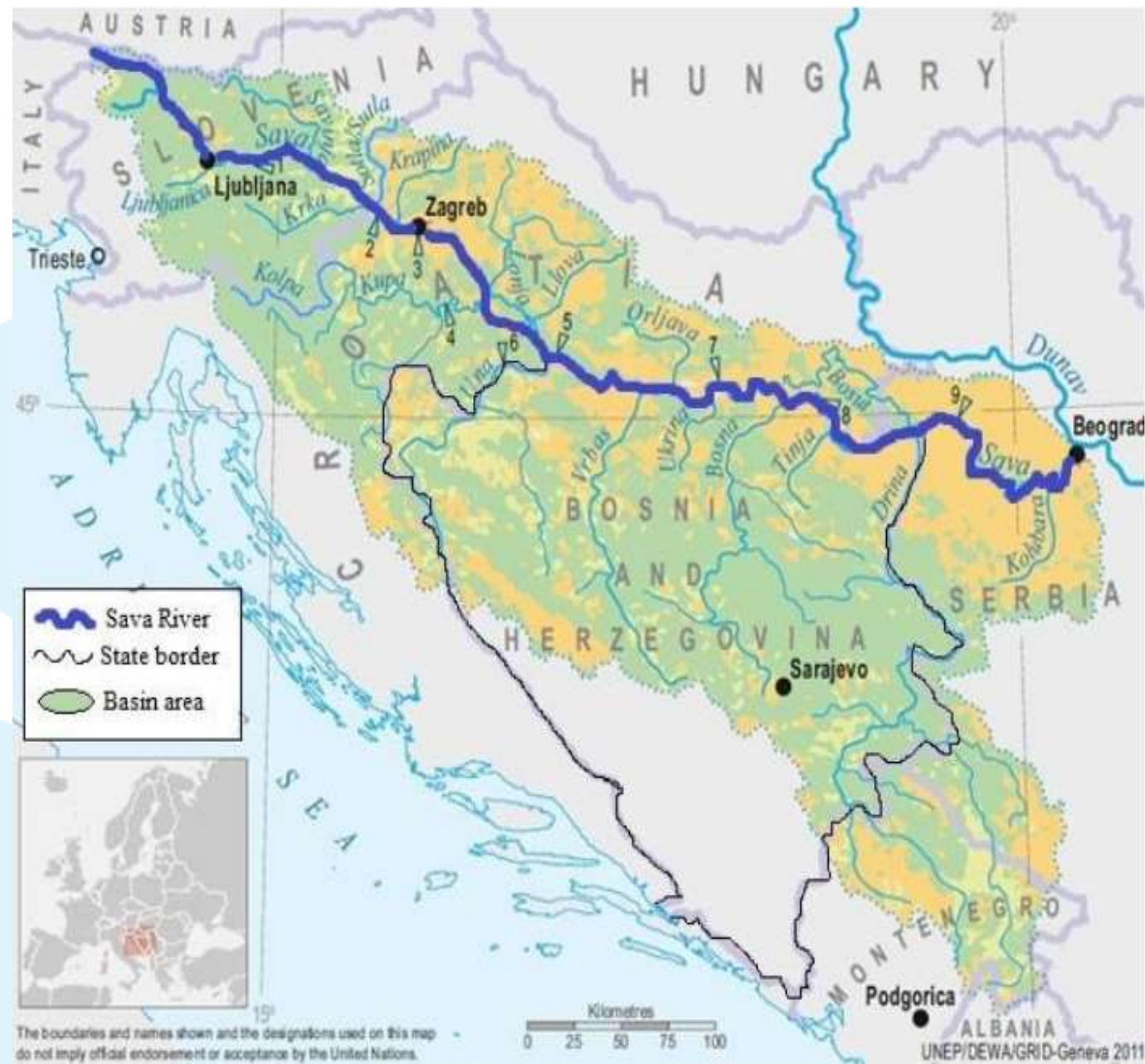
Ministry of Foreign Trade and Economic Relations of BiH

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The Sava River Basin

- ❑ The Sava River Basin is the major river basin of Southeastern Europe, represents the home for 8.1 million people, covers approx. 97,200 km², extending into the territory of the 6 countries, Slovenia, Croatia, Bosna and Herzegovina, Serbia, Montenegro and a small part of the northern Albania.
- ❑ The Sava River Basin is a vital source of water for its people, ecosystems, and economies, an integral part and prerequisite for the sustainable socio-economic development for all riparian countries and the whole region.
- ❑ Framework Agreement on the Sava River Basin (FASRB), signed by the Parties on the 3 December 2002 in Kranjska Gora, Slovenia and ratified in 2004, represents a foundation for a cross-border cooperation of governments, institutions and individuals towards sustainable development of the Sava River Basin.



Source: UNEP/DEWA/GRID

Floods in BiH

- ❑ Floods are the most frequent natural hazard in Bosnia and Herzegovina, occurring at least once a year and causing considerable damage to property. About 2500 km² of the country's territory is prone to flooding, in particular the River Sava and its tributaries.
- ❑ In 2009 and especially in May 2014, catastrophic floods were recorded in Bosnia and Herzegovina causing the total damage of over 2 billion euro, which equals to 15 % of GDP.
- ❑ With EU support the ACTION PLAN FOR FLOOD PROTECTION AND RIVER MANAGEMENT as recovery framework for flood protection and water management in BiH has been developed.



Establishing a Flood Hydrological Forecasting System in BiH-the main aim



After the catastrophic floods it is recognised that the hydrological forecasting system in BiH is not at a suitable level of development and cannot ensure development of reliable analysis and assessments which could be further used for making decisions in the flood protection system.



By improving flood forecasting and early warning systems, the governments of BiH and the local authorities of the Sava River Basin are able to establish climate resilient flood management, taking balanced decisions in emergency situation of floods and droughts, protecting families, properties and human lives and giving them confidence that future hazards won't arrive without warning.

Hydrological Flood Forecasting System in BiH



- ❑ 2016 – Pilot project Establishment of Real Time Flood Forecasting System on Una River Basin including Sana river in BiH. System was improved in 2020.
- ❑ 2019-2021 Establishment of a real time flood forecasting system for the Bosna, Ukrina, Brka and Tinja rivers in BiH
- ❑ 2020-2025 Technology transfer for climate resilient flood management in Vrbas River Basin
- ❑ 2019-2021 Platform establishment for Drina River Basin HEC-RTS software
- ❑ EU Technical assistance for development of the hydrological flood forecasting system for Sava River Basin (Phase 1. Bosna River)



Hydrological Flood Forecasting System in BiH



Forecasting models are installed in Water Agencies in BiH as part of the Water Information system

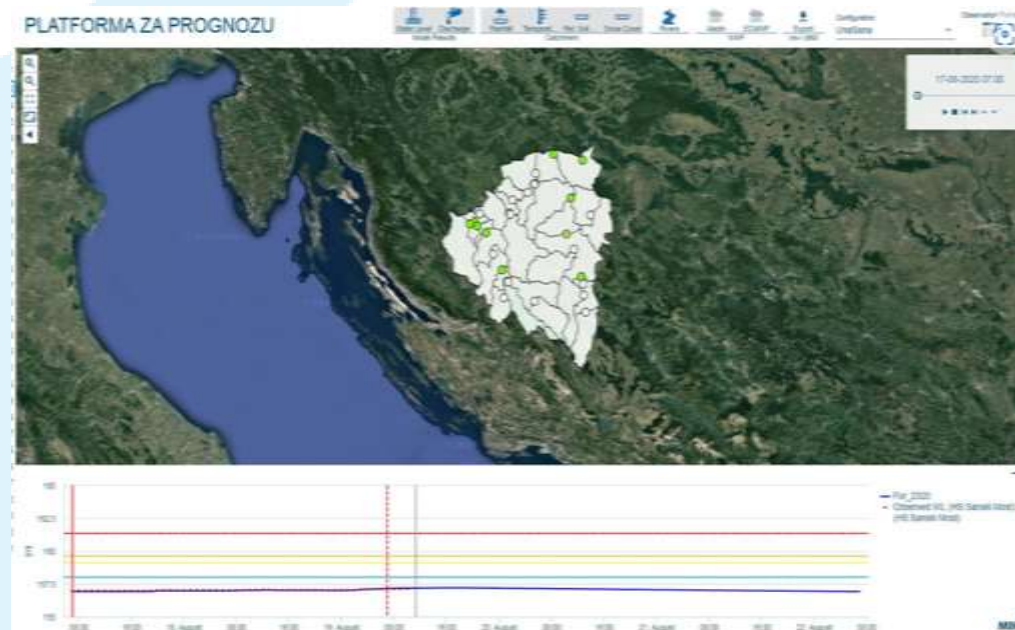
<https://www.voda.ba/>

<http://www.voders.org/>

The main stakeholders/users of flood forecasting system are four institutions in BiH:

- Sava River Watershed Agency, Sarajevo
- Public Institution “Vode Srpske”, Bijeljina
- Hydrometeorological Institute of Republika Srpska, Banja Luka
- Federal Hydrometeorological Institute, Sarajevo

Protocol on data exchange between WAs



Flood Forecasting and Warning System of the Sava River Basin (The Sava FFWS)



- ❑ Flood Forecasting and Warning System for the Sava River Basin operational since October 2018 (WBIF Project: Joint Flood management in Sava River Basin/Component 2)
- ❑ The Sava FFWS is jointly operated and maintained by the 5 Sava riparian countries (Bosnia and Herzegovina, Croatia, Montenegro, Serbia and Slovenia) in close cooperation, coordination and support of the Secretariat of the International Sava River Basin Commission (ISRBC)
- ❑ **Legal Framework**
 - Framework Agreement on the Sava River Basin (FASRB), signed by the ISRBC member countries Slovenia, Croatia, Bosnia and Herzegovina and Serbia, (signed on the 3 December 2002 in Kranjska Gora, Slovenia and ratified in 2004)
 - Protocol on Flood Protection to FASRB (entered into force on November 27, 2015)
 - Policy of the exchange of Hydrological and Meteorological Data and Information in the SRB
 - Memorandum of understanding on cooperation concerning regular functioning and maintenance of the flood forecasting and warning system in the Sava River Basin

<https://www.savacommission.org/>

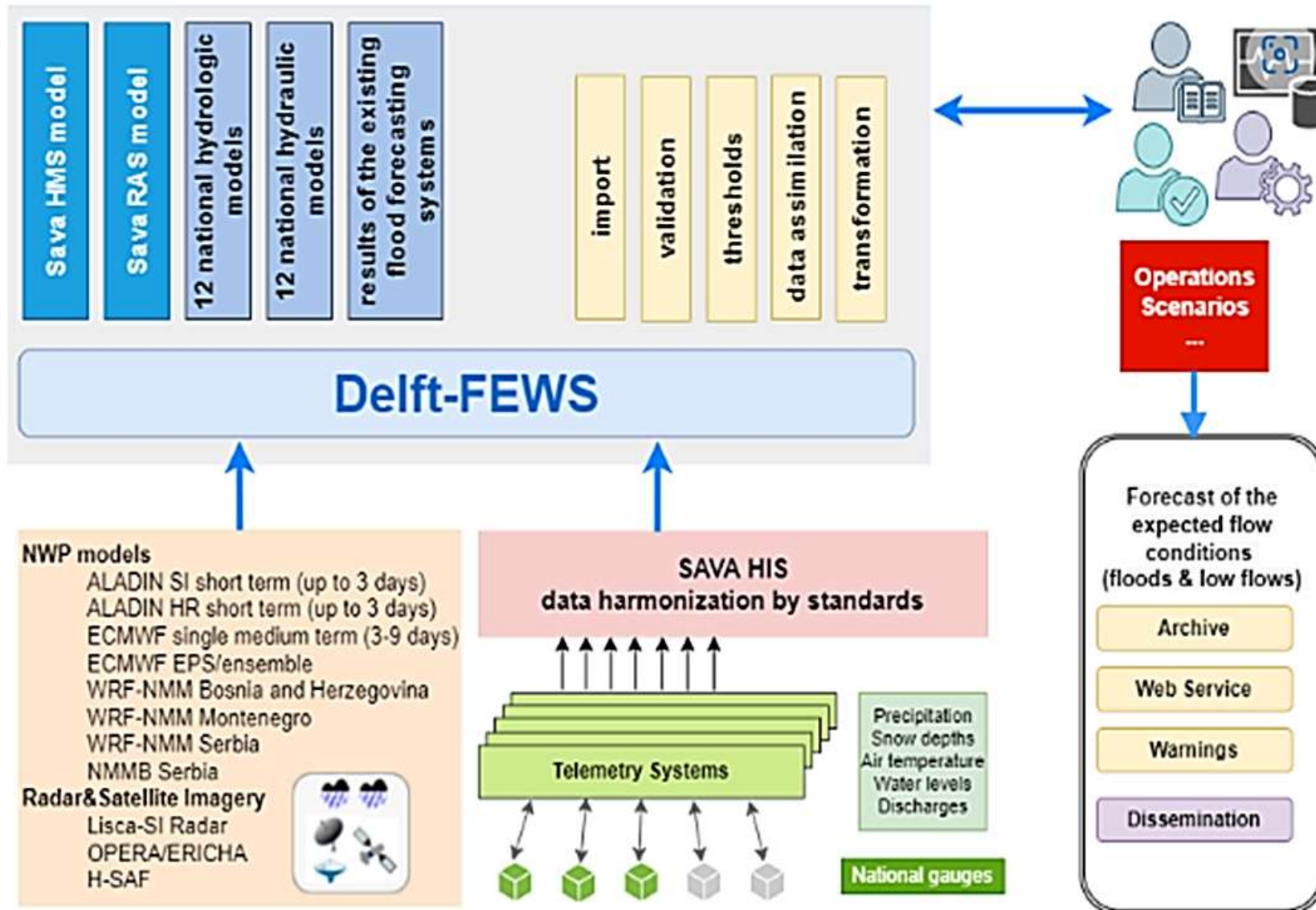
Flood Forecasting and Warning System of the Sava River Basin (The Sava FFWS)



- ❑ FFWS as a non-structural (soft) measure is included in
 - Outline of the CCA Strategy and
 - Flood Risk Management Plan for Sava River Basin
- ❑ Sava FFWS enables reliable flood forecasts with extended lead time
- ❑ The Sava FFWS supports stakeholders in taking balanced decisions in emergency situations of floods and droughts.
- ❑ Sava FFWS integrates:
 - Sava HIS for collection of real time meteorological and hydrological data
 - Numerical weather prediction models (ECMWF; ALADIN, WRF, NNMB)
 - Weather radar and satellite imagery (EUMETNET, EUMETSAT)
 - Outputs of the existing national forecasting system
 - A number of hydrologic and hydraulic models



Sava- DELFT FFWS Platform



Lessons learned

- Development of the Sava FFWS would not have been possible without assistance, active support and outstanding cooperation of all riparian countries and stakeholders in the region.
- Differences between the countries (i.e. EU membership, languages) is a challenge which has to be overcome.
- The joint flood forecasting system in the Sava River Basin is a unique solution at the international level and provides added value to the institutions of all five countries as an upgrade to the activities carried out by each country.
- The real result is protecting families, their lives and properties and giving them confidence that future hazards won't arrive without warning.
- The most common risks associated with flooding are the contamination of drinking-water facilities, damage to sanitation assets and infrastructure. This system ensures to implement preventive measures to reduce negative effect of floods and among the others to reducing risk of outbreaks of water-borne diseases.

Thank you!

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