

Danube Water Balance

Danube Water Balance Periodic newsletter Nr. 2

One of the main steps in the implementation of the Danube Water Balance project is to test the water balance model developed by CWatM on pilot catchments. In the next newsletter, we will briefly present the modeling activities carried out in one of the project's pilot areas, the Drina catchment.

The Drina River Basin (DRB) covers approximately 20,000 km², shared among Montenegro (31.5%), Bosnia and Herzegovina (37%), and Serbia (30.5%), with less than 1% in Albania. The Drina River, stretching 335 km, originates from the confluence of the Piva and Tara rivers on the Montenegro-Bosnia and Herzegovina border and flows northward to meet the Sava River.

The average annual precipitation is around 1,100 mm, while the mean discharge at the Drina-Sava confluence is about 380–400 m³/s. Precipitation is highly variable, exceeding 3,000 mm/year in the mountainous south, resulting in significantly higher runoff compared to the central and northern lowland areas. Approximately 60% of the total river flow originates in Montenegro.

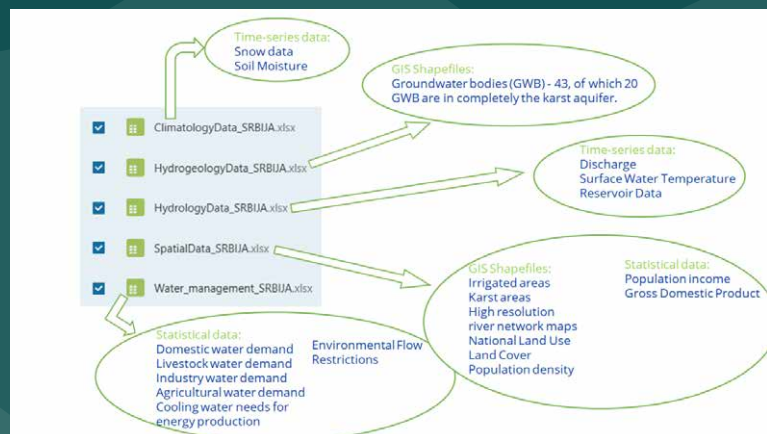
Within the Danube Water Balance (DWB) Project, the Public Water Management Company "Srbijavode" coordinated meetings and data harmonization among partners from Serbia, Bosnia and Herzegovina, and Montenegro. A shared cloud-based data platform was established for storing and exchanging hydrological, climatological, and spatial datasets.

Project project representatives of PWMC Srbijavode (PP13, RS) organized several meetings with projects partners from Serbia (RS) and Bosnia (BA): Institute for Water Management, PP9, BA), University of Sarajevo (PP10, BA), University of Novi Sad Faculty of Agriculture (PP11, RS), PP12 Jaroslav Cerni Water Institute (PP12, RS) and with associated partners from Serbia, Bosnia and Montenegro: Sava River Watershed Agen-

cy (ASP6, BA), Ministry of Agriculture, Forestry and Water Management (ASP13, ME), Republic Hydrometeorological Service of Serbia (ASP10, RS), Public Water Management Company of Vojvodine (ASP11, RS).

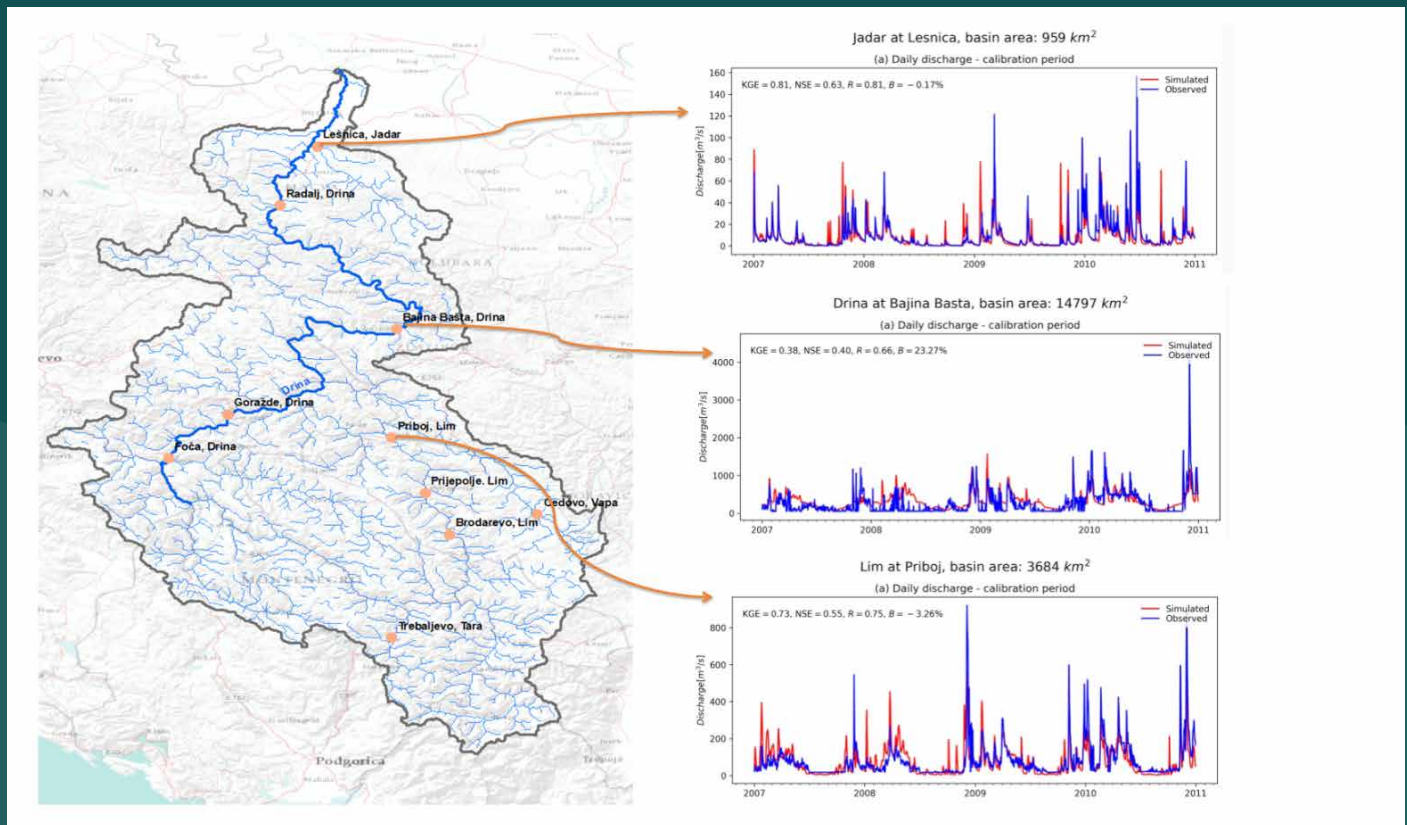
Main goal of those meetings was to comment template for hydrology, climatology, hydrogeology, spatial data, as well as data related to water management data and to collecting needed data.

Overview of the collected datasets



The hydrological model was calibrated at 77 stations across the Sava River Basin, including 10 in the Drina sub-basin. Simulation periods included a dry period (1990–1995) and a wet period (2000–2005). Results from key locations—Radalj, Bajina Bašta, and Goražde on the main Drina course, and Brodarevo and Trebaljevo on tributaries—were validated against observed flows using indicators such as Kling-Gupta Efficiency (KGE), Nash-Sutcliffe Efficiency (NSE), Bias, and R².

Simulation periods:
1990-1995 (dry period)
2000-2005 (wet period)



Results of model calibration

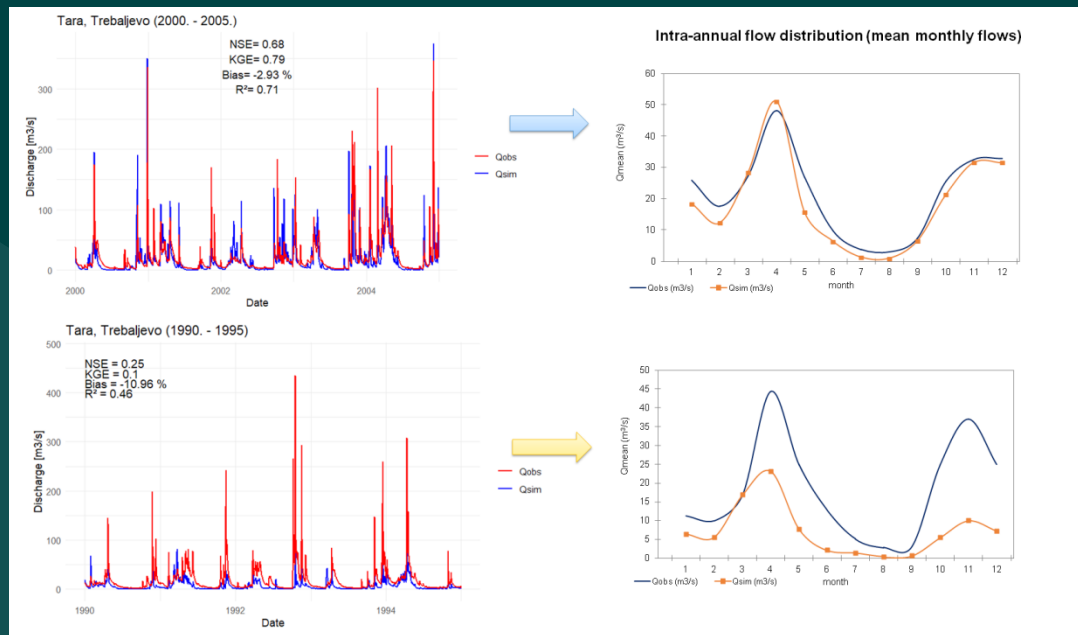
These results contribute to improving the understanding of hydrological behavior in the Drina Basin and strengthen the foundation for a comprehensive, transboundary water management model within the Danube region.

Simulation was performed for 5 selected locations: Radalj, Bajina Bašta and Goražde on the main course of Drina river, Brodarevo on one of major tributaries Lim river and Trebaljevo on river Tara, one of constituent rivers in the headwater part of the basin. Simulation results were compared with the observed flow values for selected stations.

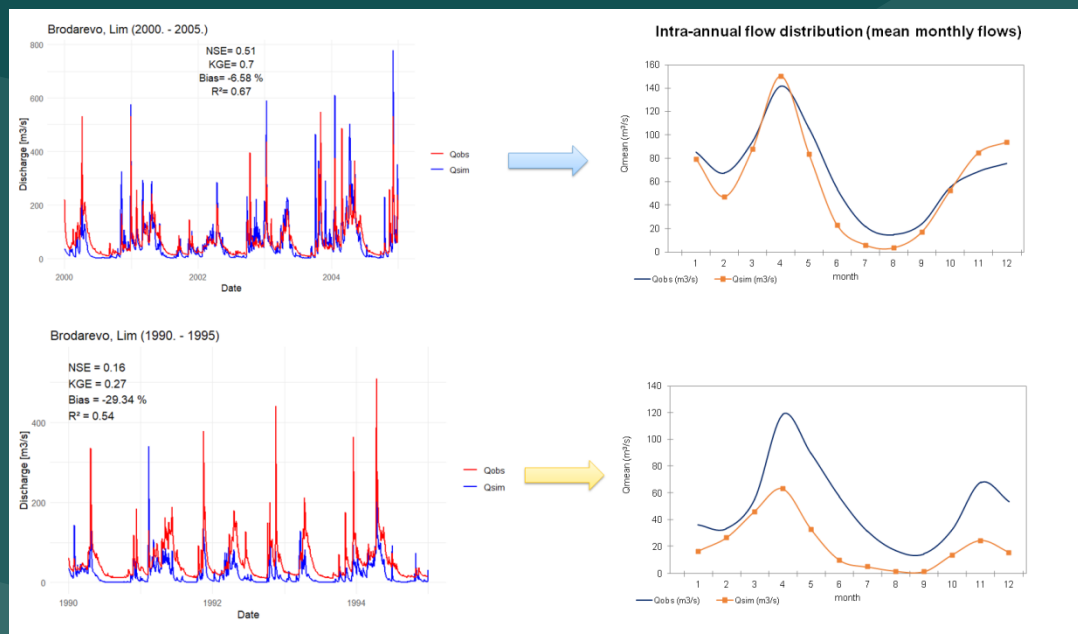
Results interpretation:

- Visual inspection (volume, runoff dynamics, seasonality)
- Numerical performance indicators: KGE (Kling-Gupta Efficiency), NSE (Nash-Sutcliffe Efficiency), B (Bias), R² (Coefficient of Determination)
- Intra-annual flow distribution charts

Results overview – Trebaljevo, Tara



Results overview – Brodarevo, Lim



Results overview – Goražde, Drina

