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Analysis of mean annual discharge trends on the Mura River

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The Mura River is a transboundary River, flowing from Austria to Slovenia, and then along the border between Hungary and Croatia to the Drava river. The Mura River is the largest tributary of the Drava River. The total area of the river basin is 14371 km2 out of which about 10200 km2 belongs to Austria, 1400 km2 to Slovenia, 590 km2 to Croatia and 2040 km2 to Hungary. The source of the river is in the Auistran national park Hohe Tauern at 1898 m above sea level. The river ends near Legrad, where it flows into the Drava River on altitude of about 130 m above sea level. The altitude of the river basin is between 130 and 3076 m above sea level.
Watershed is merged by four countries with very well developed hydrological services. Data from 24 hydrological stations, 99 rain gauge stations and 17 air temperature stations were collected and analysed for the uniform period from 1961 to 2005. GIS data of DMR and stream network were collected and watershed contour lines were constructed.
Statistical analyses of discharge data were made. Flood frequency analyses were made and low flows were analyzed. Discharge data homogenized in undimenzional form. There were significant differences in water regime between upstream Alpine part of the watershed and downstream sub watersheds on Pannonia plane. There were also significant impacts of water use on hydrological regime along the river stream.
Precipitation, temperature and discharge trends for all the available hydrological and meteorological stations were analysed. Precipitation trend line functions are statistical characteristically positive on north part and statistical characteristically negative on south part of the basin. Temperatures trend line functions are statistical characteristically positive on whole basin. Discharge trend line functions are statistical characteristically positive on north part and statistical characteristically negative on south part of the basin.