Presenter: Tatjana M. Trtić-Petrović

Background

Iron Gate I, situated in the Đerdap Gorge and extending over 117 km, stands as the largest hydropower dam and reservoir system along the Danube River.

The building of the dam has changed the hydrological regime of surface and groundwater, and sediment patterns.

The sedimentation rate within the Iron Gate I Reservoir is about 23.3 cm per year, suggesting a significant potential for accumulation and, consequently, the preservation of pollutants.

Methods

Sediments were collected at the locations along the Iron Gate I..

The concentrations of 36 major and trace elements were quantified by the INAA. Irradiations of the samples were performed at the pulsed reactor IBR 2 (Frank Laboratory of Neutron Physics-FLNP, JINR Dubna,) using thermal or epithermal neutrons.

The contamination factor (CF):

$$CF = \frac{C_i^D}{C_i^{RB}}$$

C_i^D - concentration of the target element

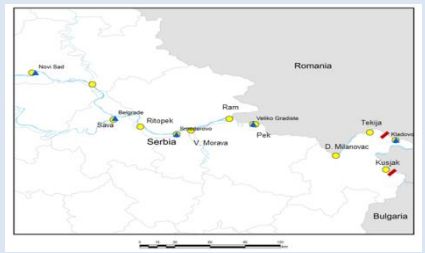
C_i^{RB} – sediment sample collected from the depths of the River Danube (at a depth of 7 m) served as the reference sample due the lowest concentrations of nearly all elements.

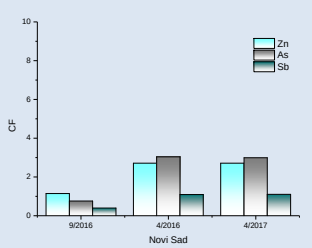
Objectives

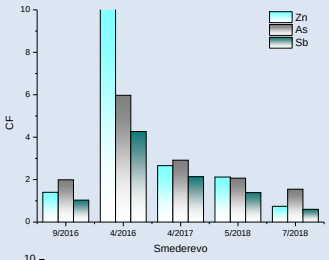
Determination of major and trace elements in Danube River sediments using instrumental neutron activation analysis (INAA) and identification of possible contamination source(s).

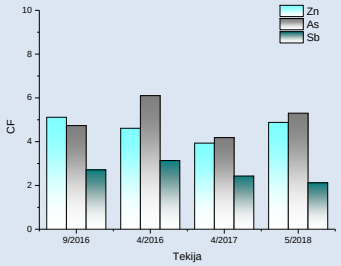
Main results

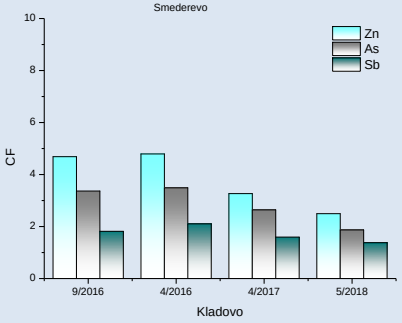
- CF values for Zn, As, and Sb varied between 2 and 6, indicating low to moderate contamination levels across all examined samples.
- $CF_{Zn} > 10$ signaling high levels of contamination in the sample.
- The sediment sample from the River Danube in Smederevo serves as a focal point for contamination with Zn, As, and Sb, possibly linked to a nearby steel processing plant in the vicinity of Smederevo.











Spatial and temporal variations in the distribution of multiple elements in sediments within the Iron Gate I Reservoir along the Danube River

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Frank Laboratory of Neutron Physics, JINR, Dubna, Russian Federation

Presenter: Tatjana M. Trtić-Petrović

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The concentrations of 36 major and minor elements were quantified by the INAA. Irradiations of the samples were performed at the pulsed reactor IBR 2 (Frank Laboratory of Neutron Physics-FLNP, JINR Dubna,) using thermal or epithermal neutrons.

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C_i^D - concentration of the target element

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Objective

This study aims to determine major and trace elements in Danube River sediment using instrumental neutron activation analysis (INAA) and to identify possible

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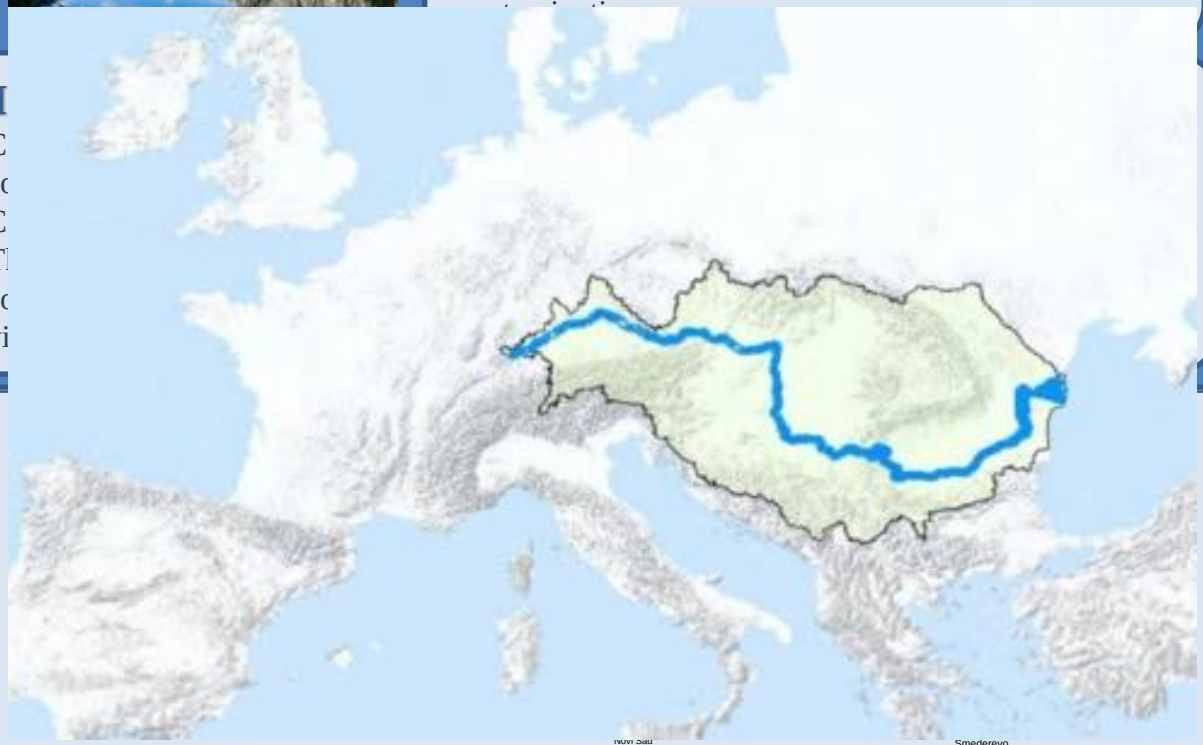

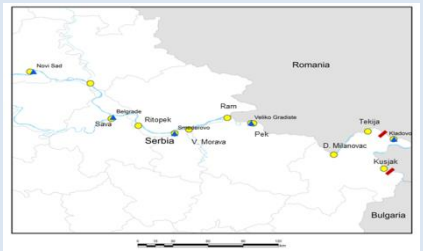

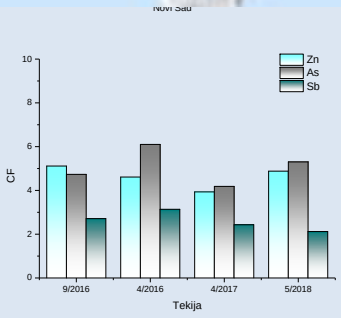

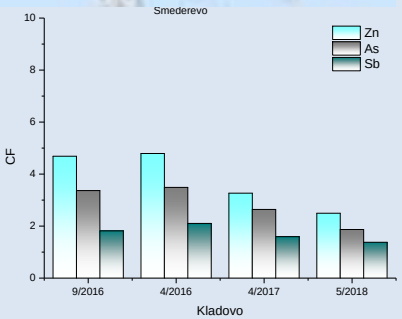

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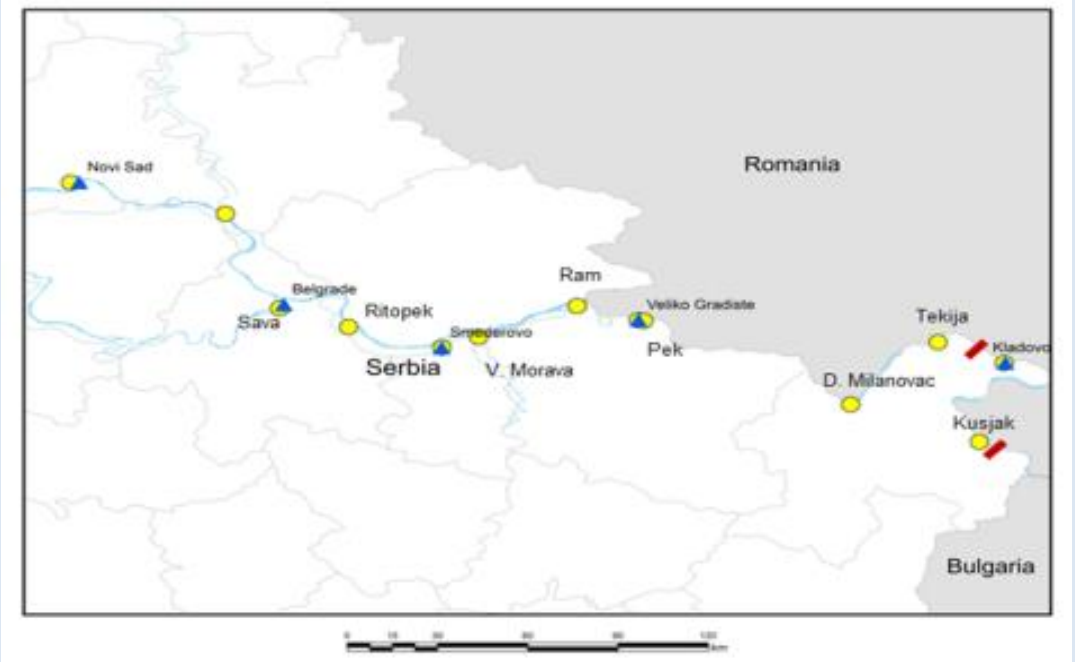

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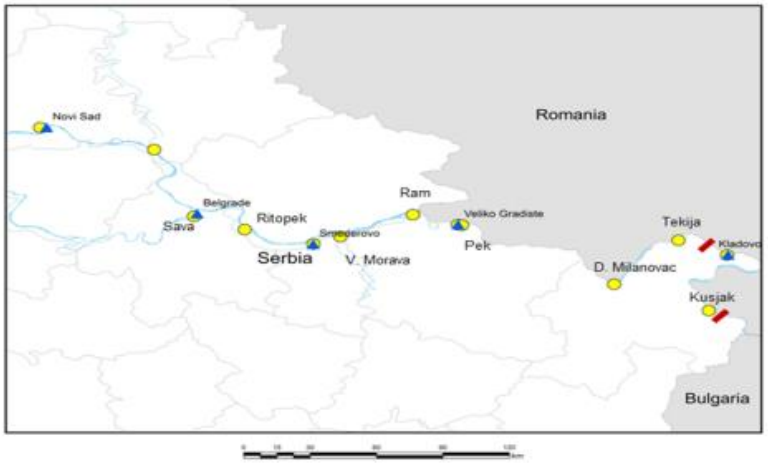

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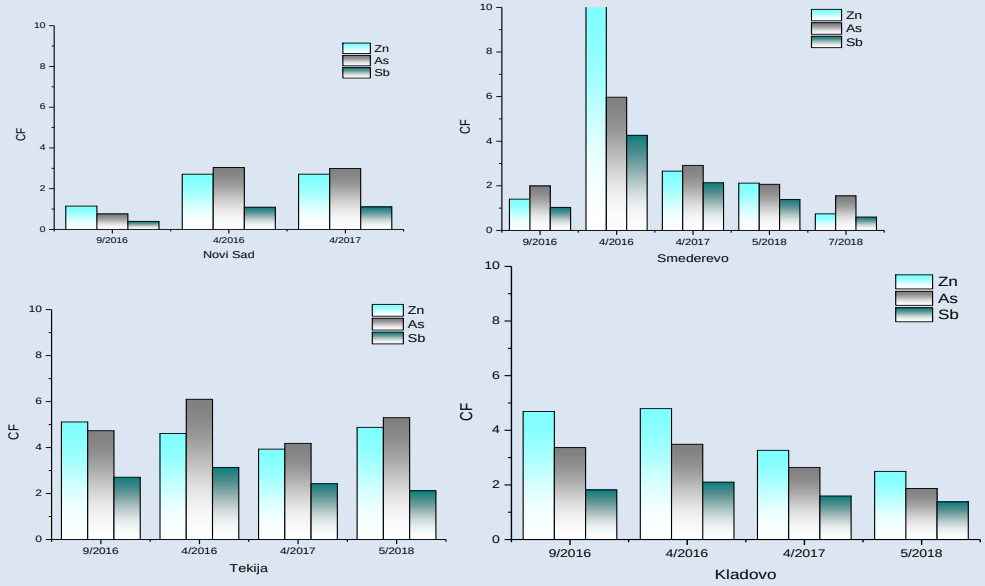

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