

PRIKAZ OCJENE KEMIJSKOG STANJA POVRŠINSKIH VODA KOPAČKOG RITA NA TEMELJU ANALIZE ODABRANIH TEŠKIH METALA KROZ JEDNOGODIŠNJE VREMENSKO RAZDOBLJE

EVALUATION OF CHEMICAL STATUS OF KOPAČKI RIT SURFACE WATER BODIES THROUGH ANALYSIS OF SELECTED HEAVY METALS THROUGH ONE-YEAR PERIOD

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Introduction

Wetlands are the most productive ecosystems on Earth. Due to the undergoing wet – dry cycles, they ensure the diversity of ecological conditions in the same habitat and support high biodiversity. The dynamics of the Kopački rit wetland floodplain water regime is a consequence of its geographical location in the area of the Drava – Danube confluence. Hrvatske vode, legal entity for water management in Croatia, as part of the project "Naturavita" in the area of Kopački rit, began the implementation of analysis of the heavy metals of surface water.



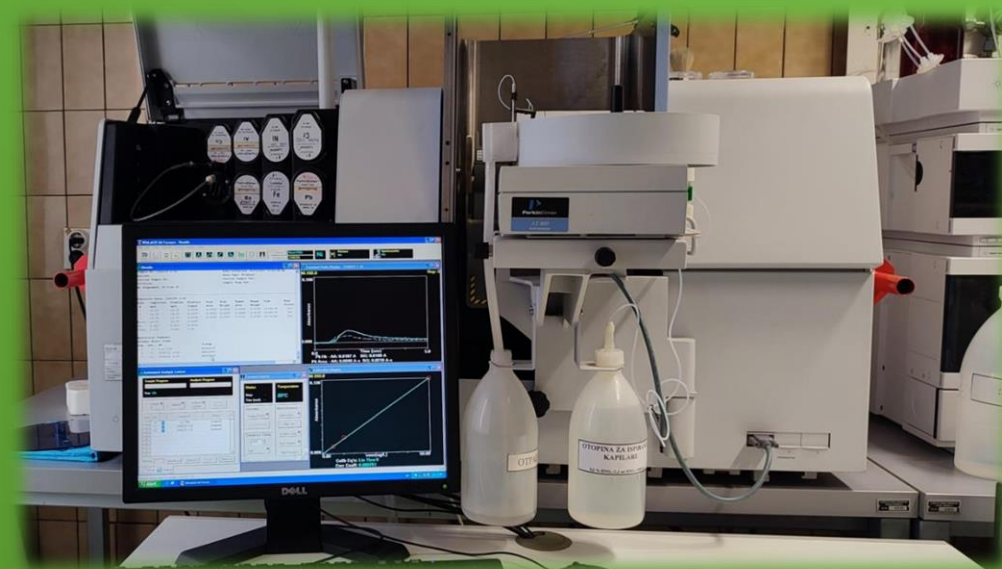
Picture 1. Sample location at Kopački rit

Materials and Methods

The chemical status of surface water is based not only on the annual average concentrations (AAC) of the substances, but also on the maximum annual concentration (MAC). Heavy metals are among the most dangerous inorganic pollutants due to biodegradability, bioaccumulation, toxicity at low concentrations and due to incorporation into food chains. Dissolved in water, they are in ionic form and non-biodegradable and tend to accumulate in living things in the process of bioaccumulation. As part of the Naturavita project in the Nature Park Kopački rit, sampling and analysis of mercury, nickel, cadmium, lead and their compounds were carried out at 19 locations through one-year period of 12 field survey cycles.



Picture 2. Laboratory analysis



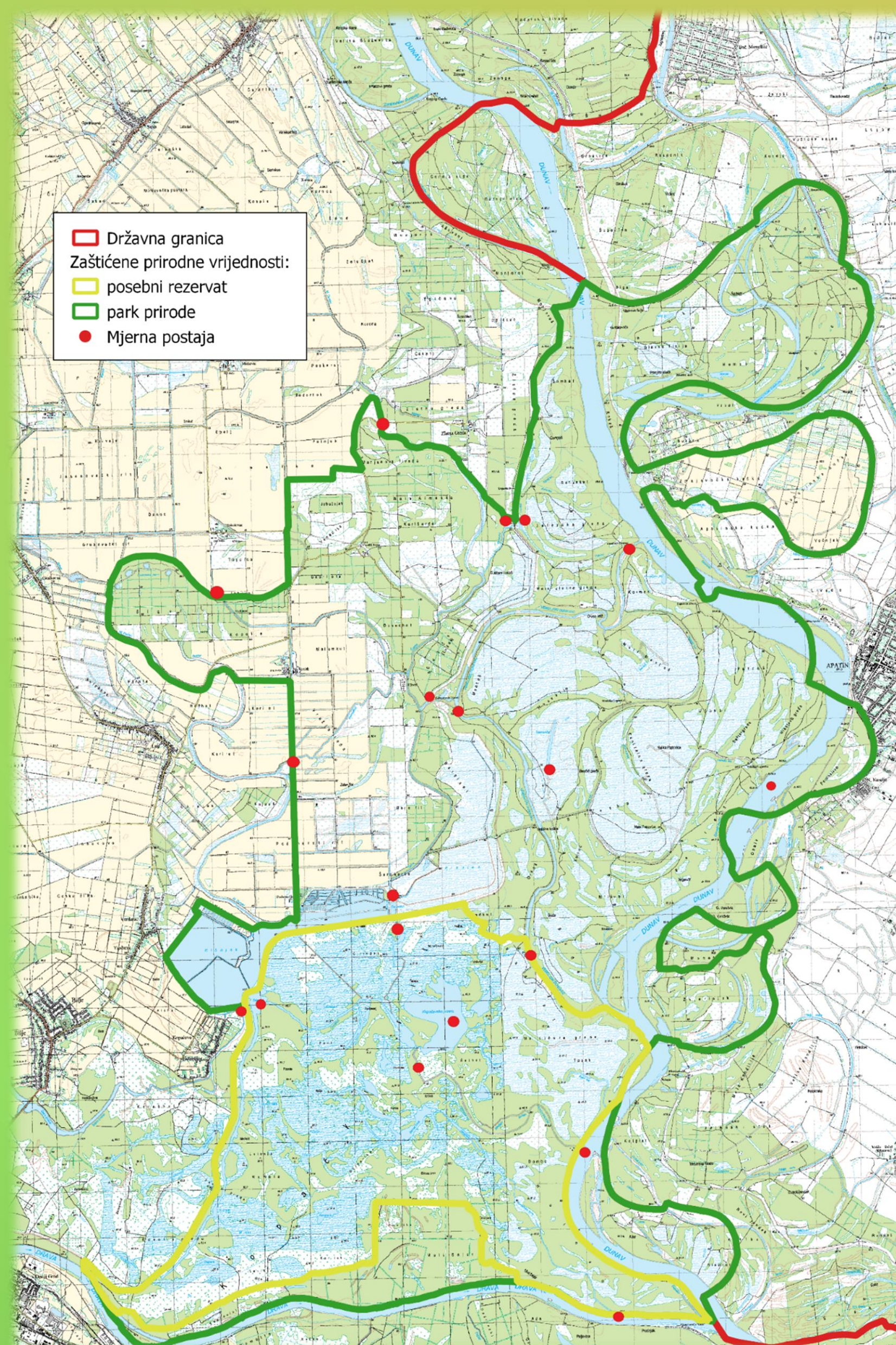
Picture 3. AAnalyst 800 graphite furnace atomic absorption spectrometer



Picture 4. Sample location no. 17 Vemeljski dunavac – Nadhat fok

Research goals

The aim of this paper is to evaluate the chemical status of surface water bodies through analysis of selected heavy metals.



Map 1. Sampling locations



Picture 5. Field work at lake Veliki Sakadaš



Picture 6. Field work at Hulovo canal and Danube

Table 1. AAC and MAC (µg/l) of indicators of the chemical status at all locations with an evaluation of the chemical status according to the current Regulation on water quality standards (OG 96/2019)

S No	Location	lead and its compounds		mercury and its compounds		nickel and its compounds		cadmium and its compounds		Evaluation of chemical status
		AAC	MAC	AAC	MAC	AAC	MAC	AAC	MAC	
1	Kanal Čarna most	0,28	0,82	<0,02	0,03	0,67	1,31	<0,02	0,03	good
2	Crpna stanica Zlatna greda	0,33	1,04	<0,02	0,02	0,52	1,23	<0,02	0,02	good
3	Crpna stanica Tikveš	0,27	0,84	<0,02	0,02	0,55	0,95	<0,02	0,03	good
4	Kanal Mali Dunav (šuma Siget)	0,23	0,69	<0,02	<0,02	0,70	0,99	<0,02	0,03	good
5	Kanal Podunavlje most	0,43	2,64	<0,02	0,02	0,58	0,97	<0,02	0,04	good
6	Crpna stanica Podunavlje	0,24	0,62	<0,02	0,03	0,70	1,21	0,02	0,04	good
7	Ustava Kopačevo - Stara Drava	0,38	1,52	<0,02	0,03	0,57	0,83	<0,02	0,04	good
8	Dunav - ušće kanala Petreš u Dunav	0,32	0,64	<0,02	<0,02	0,74	1,21	0,02	0,06	good
9	PZR Četverokut	0,18	0,46	<0,02	0,03	1,52	2,64	0,02	0,03	good
10	Kopačko jezero	0,28	0,44	<0,02	<0,02	0,96	1,29	<0,02	0,03	good
11	Kanal Hulovo	0,27	0,57	<0,02	<0,02	0,91	1,39	<0,02	0,03	good
12	Kanal Zlatna Greda	0,31	0,82	<0,02	<0,02	0,99	1,29	<0,02	0,04	good
13	Vemeljski Dunavac Tikveš - kompa	0,33	1,14	<0,02	0,02	0,88	1,11	0,02	0,03	good
14	Bara Semenča	0,24	0,45	<0,02	0,02	1,17	2,22	0,03	0,13	good
15	Jezero Veliki Sakadaš	0,29	0,88	<0,02	<0,02	0,79	1,10	<0,02	0,04	good
16	Vemeljski Dunavac - Ulaz	0,28	0,71	<0,02	<0,02	0,77	2,15	0,03	0,11	good
17	Vemeljski Dunavac - Nadhat fok	0,25	0,46	<0,02	0,02	0,78	1,20	<0,02	0,03	good
18	Hulovski kanal - ušće u Dunav	0,41	1,81	<0,02	<0,02	0,83	1,47	0,02	0,07	good
19	Renovski kanal - ušće u Dravu	0,32	1,14	<0,02	<0,02	0,77	1,70	0,04	0,13	good
Legend:										
		good chemical condition								
		good chemical condition has not been achieved								

Results and Conclusion

According to the obtained results, at all sampling locations, the measured average (AAC) and maximum annual concentrations (MAC) do not exceed allowable concentration according to Regulation on water quality standard (OG 96/2019). Good chemical status has been achieved at all sampling locations.