COOPERATION IN THE CHU AND TALAS RIVER BASINS IN THE FRAMEWORK OF THE WORKING GROUP ON ENVIRONMENTAL PROTECTION

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- 2000: Agreement between the Government of the Kyrgyz Republic and the Government of the Republic of Kazakhstan on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas
- 2006: Establishment of the Commission of the Kyrgyz Republic and the Republic of Kazakhstan on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas
- 2015: The 20th meeting of the Commission, creation of the Working Group on Environmental Protection (WG EP) under the Secretariat of the Commission (Kyrgyzstan, Issyk-Kul, 18 September 2015).
- The WG EP held 10 meetings during the reporting period.
- Decisions of the WG EP are advisory in nature.

Implementation of the basin principle in the surface water quality assessment in the Chu and Talas River basins

- The Chu and Talas River basins are conditionally divided into three sections: the upper, middle, and lower reaches of the rivers. In the upper and middle reaches of the river basins, water sampling and analysis were carried out by the laboratories of Kyrgyzhydromet, the State Agency for Environmental Protection and Forestry Management, the Land Reclamation and Hydrogeological Expedition, and the Department of State Sanitary and Epidemiological Supervision of the Ministry of Health of the Kyrgyz Republic. In the lower reaches of the Chu River basin, as well as in the middle and lower reaches of the Talas River basin, water sampling and analysis were performed by specialists of the laboratory of the Kazhydromet RSE branch for Zhambyl region.

- The laboratory of the Land Reclamation and Hydrogeological Expedition measured the following indicators: sodium cation (Na), potassium (K), calcium (Ca), magnesium (Mg) and bicarbonate anion, sulphate anion (SO4), chloride anion (Cl), POPs, total hardness, hydrogen ion pH, electrical conductivity of water, and total mineralisation.
- The laboratories of Kyrgyzhydromet and the State Agency for Environmental Protection and Forestry Management measured indicators of the nitrogen group.
- The Chemical Analysis Laboratory of the Department of State Sanitary and Epidemiological Supervision conducted bacteriological examinations and measured indicators of pollutants: total iron, chromium, manganese, oxygen, BOD5, phenols, and the group of pesticides.
- The quality of return water was assessed pursuant to Resolution of the Government of the Kyrgyz Republic No. 128 dated 14 March 2016. Return water is seen as a source for water management reservoirs and irrigation of farmland.

- Until 2019, water samples had been taken by each Party within its own territory at different points of time.
- Members of the WG EP came to the conclusion that it was essential to develop a coordinated surface water quality monitoring programme for the Chu and Talas River basins.
- In accordance with the decision of the 25th meeting of the Commission, the Secretariat requested the OSCE support to develop and implement a coordinated surface water quality monitoring programme for the Chu and Talas River basins; since 2019, the OSCE has provided financial support to all activities aimed at implementing the coordinated monitoring programme in the Kyrgyz Republic and the Republic of Kazakhstan.
- A mechanism for transboundary monitoring has been proposed to perform coordinated monitoring in the main hydrological phases 4 times a year. Parallel sampling should be carried out at the same points time in accordance with the requirements of GOST 31861-2012. The results will be used for data exchange between the two countries.

- Since 2019, 4 seasonal coordinated sampling campaigns have been performed annually.
- In 2021, water sampling was carried out three times on the territory of the Kyrgyz Republic: in April, July, and October.
- Samples were taken by specialists of Kyrgyzhydromet in parallel with those of the Kazhydromet RSE branch for Zhambyl region at cross-border points at the same point of time, taking into account the time of water travel to the sampling point on the territory of Kazakhstan.
- A total of 57 water samples were taken and 1,976 tests were done to measure 34 indicators of physical and chemical water properties.
- The sampling points were selected and the list of indicators to be measured was agreed by WG EP members in its 4th meeting (April 2017, Bishkek).

The level of pollution of inland surface waters was assessed by comparing water quality indicators in mg/l with the MACs in accordance with the list of fisheries standards – MACs and the maximum safe level of exposure to harmful substances for fishery water bodies (Resolution of the Government of the Kyrgyz Republic No. 128 dated 14 March 2016). The expedition sampling and chemical analysis of water were performed with technical assistance of the OSCE. Sampling, transportation, and analysis of physical and chemical water properties were performed in accordance with current standards.

WATER QUALITY INDICATORS OF THE CHU RIVER

- The Chu River is the largest transboundary water body flowing across the territory of Kyrgyzstan and Kazakhstan. The chemical composition of the Chu River water is formed under the influence of both natural factors and anthropogenic activities.
- The natural regime of the river is distorted by water intakes and is regulated through a reservoir. Water sampling points are located in the upper and middle reaches of the Chu River.
- In terms of its chemical composition, the river water belongs to the bicarbonate class, group of calcium.
- The medium reaction (pH) is on average 8.29.

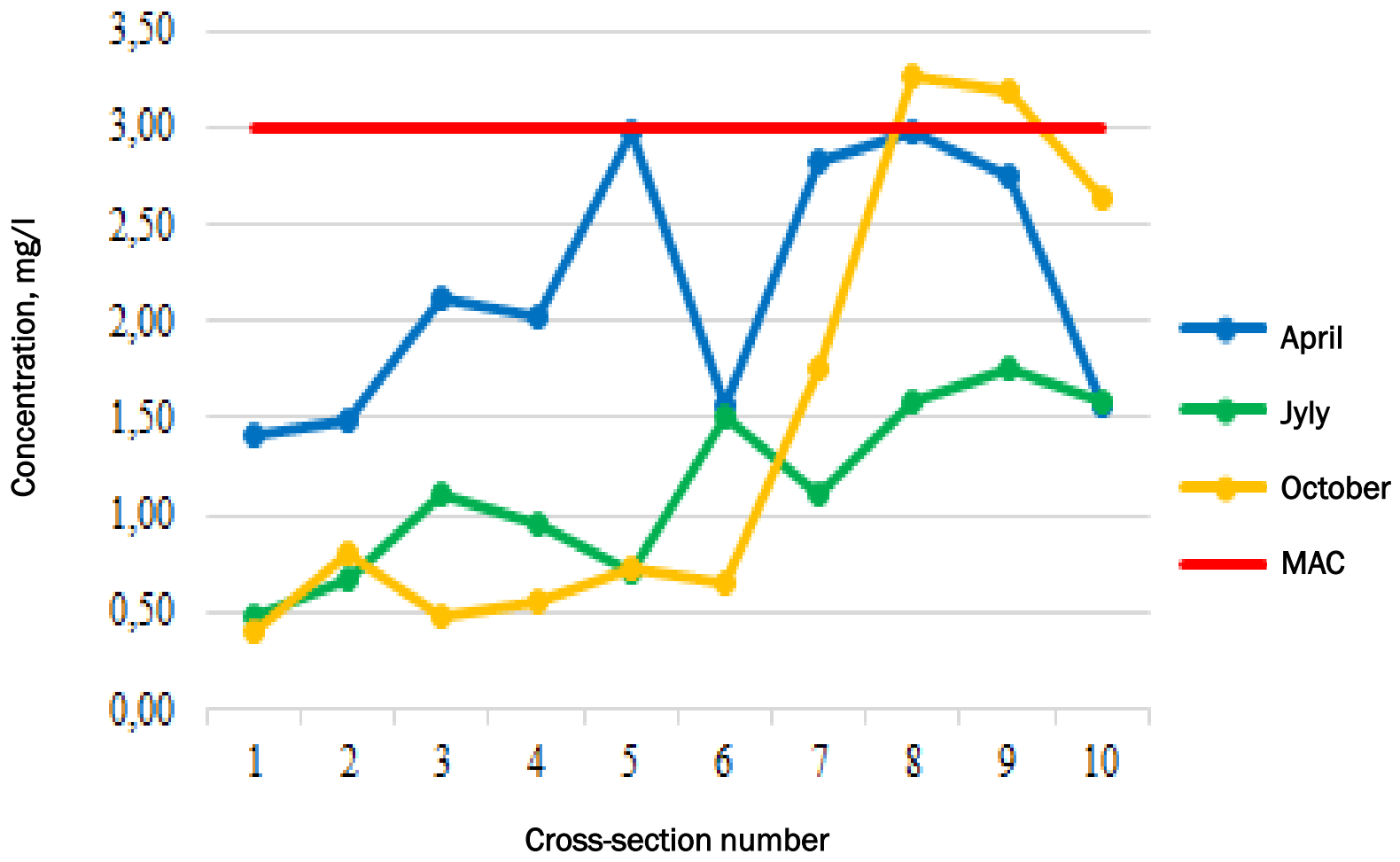
- In 2021, the lowest water temperature of 11.5°C was registered in the Chu River at the cross-section of the Boroldoy bridge in October. The highest temperature of 26.9°C was registered at the cross-section in the village of Kamyshanovka in July.
- The total suspended solids averaged 73.04 mg/l.
- The oxygen regime of the Chu River is satisfactory, the concentrations of dissolved oxygen on average did not fall below 9.65 mg/l (0.62 MAC) in 2021.
- An increase in the sum of ions is observed downstream.
- On average, the water mineralisation was 374 mg/l

WATER QUALITY INDICATORS OF THE CHU RIVER

- The average water hardness along the river was 4.61 mEq/l. The lowest hardness of 2.51 mEq/l was registered at the background cross-section at the Boroldoy bridge in April, the highest hardness of 6.0 mEq/l – at the cross-section upstream the village of Nizhne-Chuisky in July.
- The concentrations of fluoride ions along the Chu River averaged 0.42 mg/l in 2021, which corresponds to 0.56 MAC. There were no cases of the fluoride concentrations exceeding the allowable concentrations.
- Silicon concentrations ranged from 2.1 mg/l at the cross-section at the Boroldoy bridge in October to 6.2 mg/l at the cross-section downstream the village of Nizhne-Chuisky in July.

- The content of different forms of nitrogen was quite varied. The allowable concentrations were exceeded mainly in spring and autumn.
- The concentrations of heavy metals (copper, zinc, lead, cadmium, hexavalent chromium), petroleum products, and synthetic surfactants did not exceed the allowable concentrations.
- There were no significant changes in other water quality indicators in the Chu River.
- High and extremely high concentrations of pollutants in the water were not recorded during the observed period.

DYNAMICS OF CHANGES IN CONCENTRATIONS OF MAJOR POLLUTANTS IN 2021 ALONG THE CHU RIVER



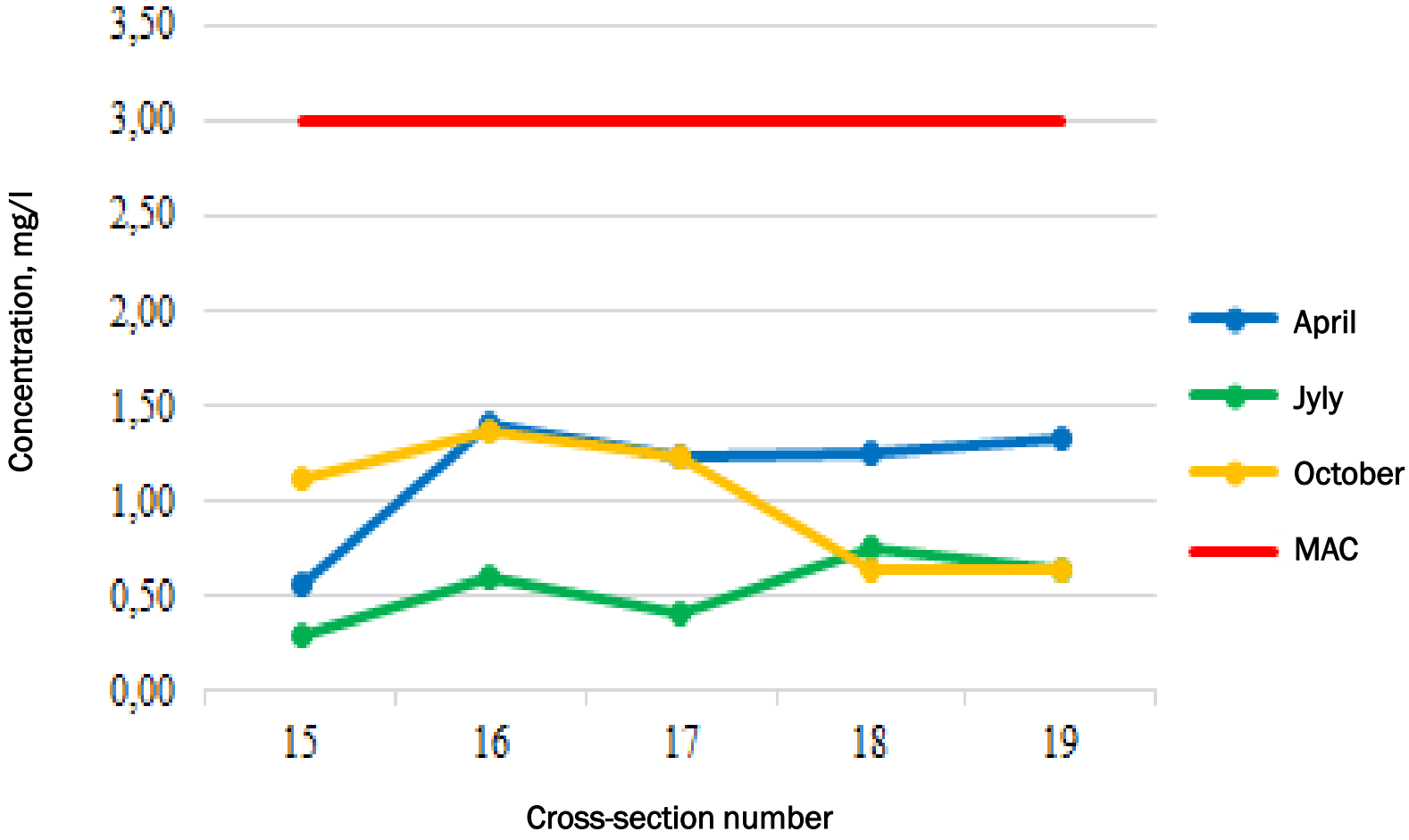
Note: Cross-section numbers

1. Boroldoy bridge (background cross-section);
2. Tokmok city, upstream the wastewater discharge by the municipal sewage lines;
3. Tokmok city, downstream the wastewater discharge by the municipal sewage lines;
4. Milyanfan village, upstream drainage collector No. 17;
5. Milyanfan village, downstream drainage collector No. 17;
6. Vasilievka village, upstream the wastewater discharge by the municipal sewage lines of the city of Bishkek;
7. Vasilievka village, downstream the wastewater discharge by the municipal sewage lines of the city of Bishkek;
8. Nizhne-Chuisky village, upstream the Novotroitsky collector;
9. Nizhne-Chuisky village, downstream the Novotroitsky collector;
10. Kamyshanovka village, old bridge on the border with the Republic of Kazakhstan.

WATER QUALITY INDICATORS OF THE TALAS RIVER

- In terms of its chemical composition, the water of the Talas River is hydrocarbonate with calcium ions predominating in the cationic composition.
- The water of the Talas River is soft and characterised by low mineralisation in all phases of the hydrological regime. On average, the water mineralisation was 297 mg/l.
- The hardness ranged from 2.40 mEq/l at the Uch-Koshoy cross-section in July up to 5.44 mEq/l at the Uch-Korgon cross-section in October.
- The pH is within the normal range of 8.04-8.72. The total suspended solids range from 0.4 to 80.8 mg/l.
- The water transparency is 3–25 cm.
- The dissolved oxygen content was within the range of 7.78–10.69 mg/l.
- The oxygen saturation of water ranged from 95 to 114%.
- The presence of organic matter as indicated by BOD5 was 0.29–1.41 mg/l (0.1–0.5 MAC).
- There were almost no cases of concentrations of main pollutants exceeding the allowable concentrations.
- The concentrations of heavy metals (copper, zinc, lead, cadmium, hexavalent chromium), petroleum products, and synthetic surfactants did not exceed the allowable concentrations during the observation period.

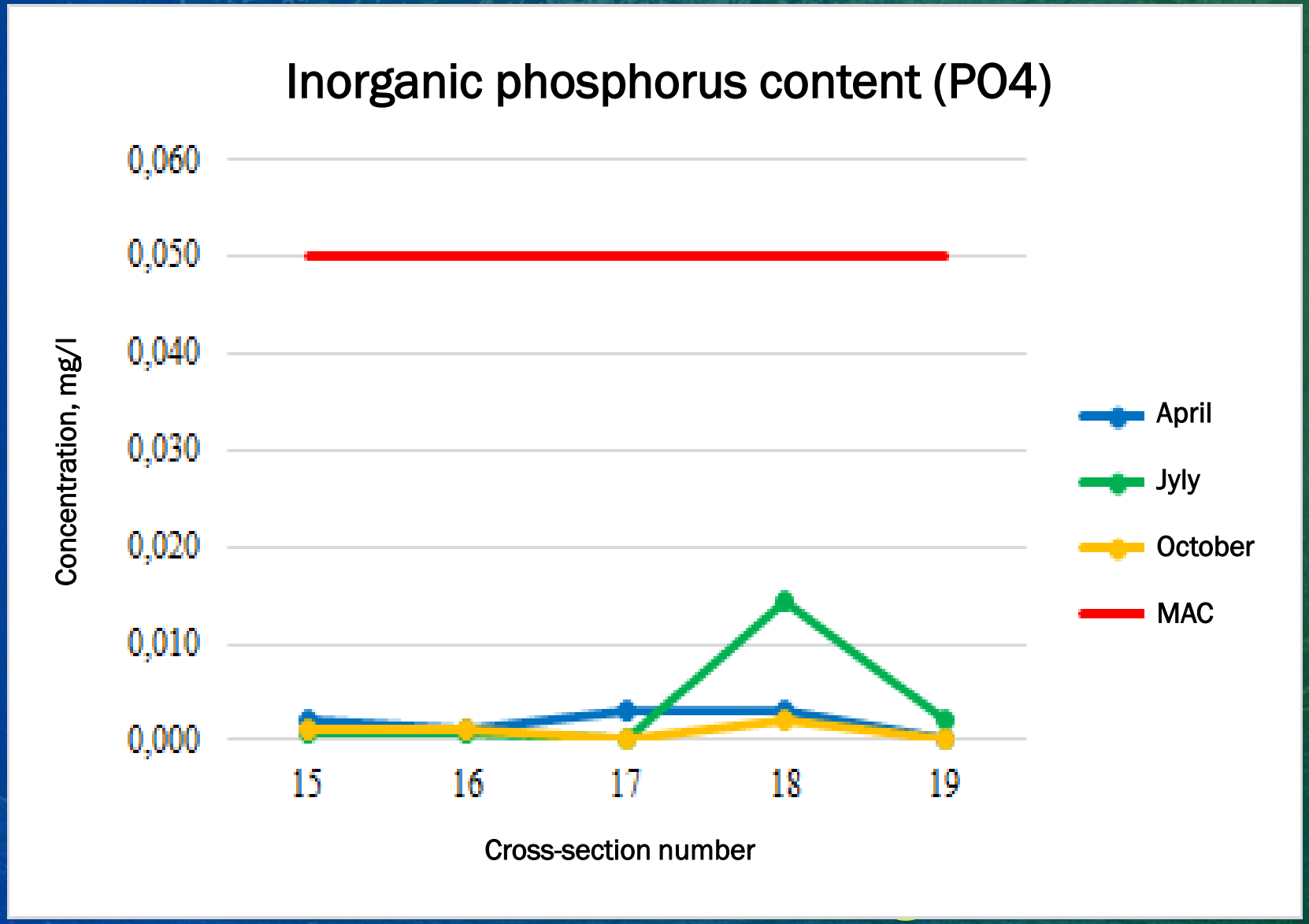
DYNAMICS OF CHANGES IN CONCENTRATIONS OF MAJOR POLLUTANTS IN 2021 ALONG THE TALAS RIVER



Note: Cross-section numbers

15. Manas village – 2.6 km downstream the mouth of the Uch-Koshoy River (background);
16. Talas – upstream the city;
17. Talas – downstream the city;
18. Klyuchevka village – gauging station;
19. Uch-Korgon village, 2 km from the border with the Republic of Kazakhstan;

DYNAMICS OF CHANGES IN CONCENTRATIONS OF MAJOR POLLUTANTS IN 2021 ALONG THE TALAS RIVER



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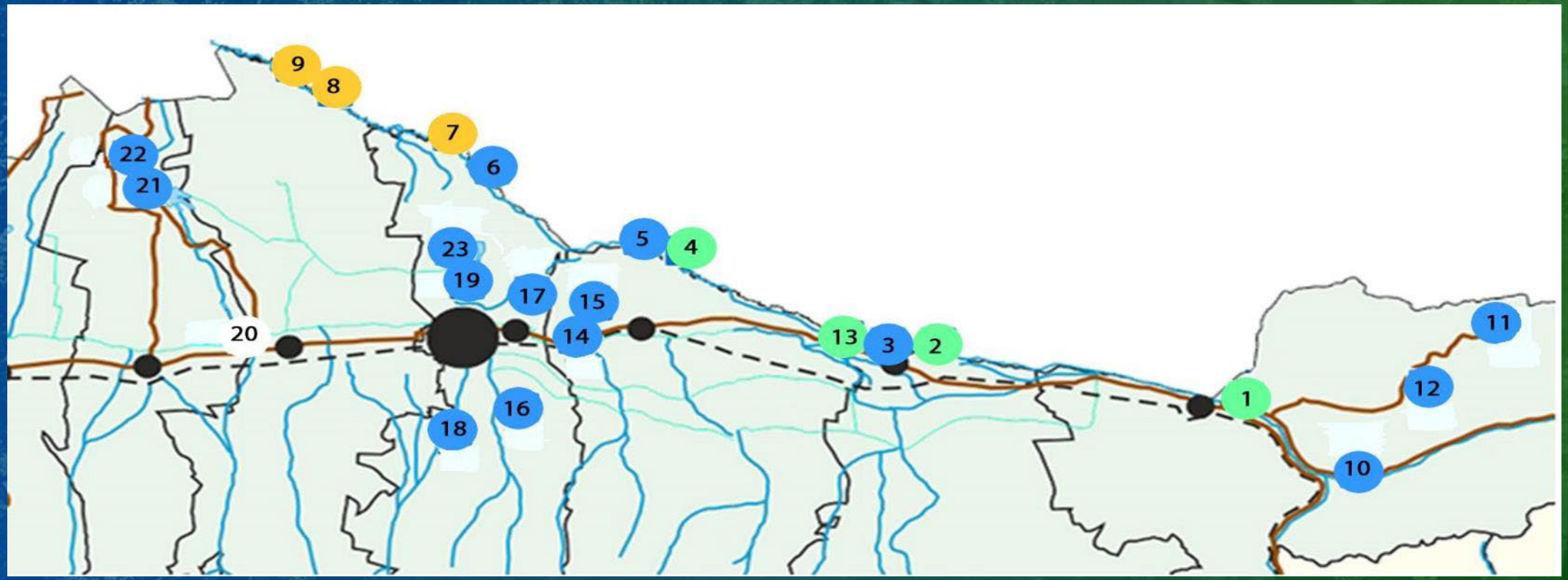
Assessment of the water quality of the Chu River basin using complex indicators in 2015



1 – Chu River, Boroldoy bridge

2–3 – Chu River, Tokmok city (upstream/downstream)

4–5 –Chu River, Milyanfan village (upstream/downstream)

6–7 – Chu River, Vasilievka village (upstream/downstream)

8–9 – Chu River, Nizhne-Chuisky village (upstream/downstream)

10 – Chon-Kemin River, estuary of the Krasnaya River, Tokmok city

14–15 – Nouruz River, Novopokrovka village (upstream/downstream)

16–17 –Alamedin River, Bishkek city (upstream/downstream)

18–19 –Ala-Archa River, Bishkek city (upstream/downstream)

20 – West Big Chu Canal, Sokuluk village

21–22 – Ak-Suu River, Tyulek village (upstream/downstream)

23 – Nizhne-Ala-Archa reservoir, Mayevka village

- Class I < 0.3 very clean
- Class II 0.3–1 clean
- Class III 1–2.5 moderately polluted
- Class IV 2.5–4 polluted

CONCLUSIONS:

- A joint platform has been created to assess the quality of surface waters using a large number of observation points and ensuring complete coverage of intra-annual and seasonal changes in the quality of surface waters in the Chu and Talas River basins;
- It is essential to ensure further operation of the Working Group on Environmental Protection under the Secretariat of the Commission;
- To make coordinated and effective decisions on surface water quality management, it is necessary to switch to the basin principle of surface water quality monitoring and assessment, taking into account the specifics of water uses in the upper, middle, and lower reaches of the rivers;

CONCLUSIONS:

- To improve the quality of surface water, it is necessary to address the problems of upgrading wastewater treatment facilities and ensuring additional wastewater treatment in the cities of Bishkek, Tokmok, Kara-Balta, and building a new wastewater treatment facility (Taraz);
- It is essential to introduce advanced irrigation techniques to reduce the volume of polluted return water coming from irrigated farmland.
- The practice of sampling shows that the results of tests done by Kyrgyzhydromet and Kazhydromet are almost identical in many respects. Differences in sampling methods were also noted, but basically all the techniques are identical.
- The waters of the Chu and Talas Rivers can be used for irrigation and industrial needs without any restrictions.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