

## SEASONAL VARIABILITY OF THE IONIC COMPOSITION IN THE NARIN RIVER

**Nazirkulova Muazzam Bakhodir kizi**

*(supporting doctoral student, Namangan State University)*

*Abstract: The article examines the changes in the perennial (1990-2019) ionic composition of the Narin River. During the winter period, the highest concentrations of anions and cations were observed with a maximum in February, during the spring and summer period, were observed with a lowest values in May and June.*

*Key words: Narin River, anions, cations, seasonal variability, observation points.*

## СЕЗОННАЯ ИЗМЕНЧИВОСТЬ ИОННОГО СОСТАВА ВОДЫ РЕКИ НОРЫН

**Назиркулова Муаззам Баходир кизи**

*(базовый докторант, Наманганский государственный университет)*

*Аннотация: В статье изучены сезонные изменения многолетнего (1990-2019 гг.) ионного состава воды реки Нарын. Установлено, что количество ионов в речной воде было высоким в феврале зимнего сезона и низким в апреле, мае и июне весенне-летнего сезона, что соответствует гидрологическим фазам.*

*Ключевые слова: река Нырын, анионы, катионы, сезонный ход, точка наблюдения.*

The Narin River is important for the water supply of the economy and agricultural sectors of Namangan region. River water is used for irrigation, production and communal household needs in the region. For this reason, the research of modern changes of the main hydro chemical parameters determining the quality of river water is considered urgent [1].

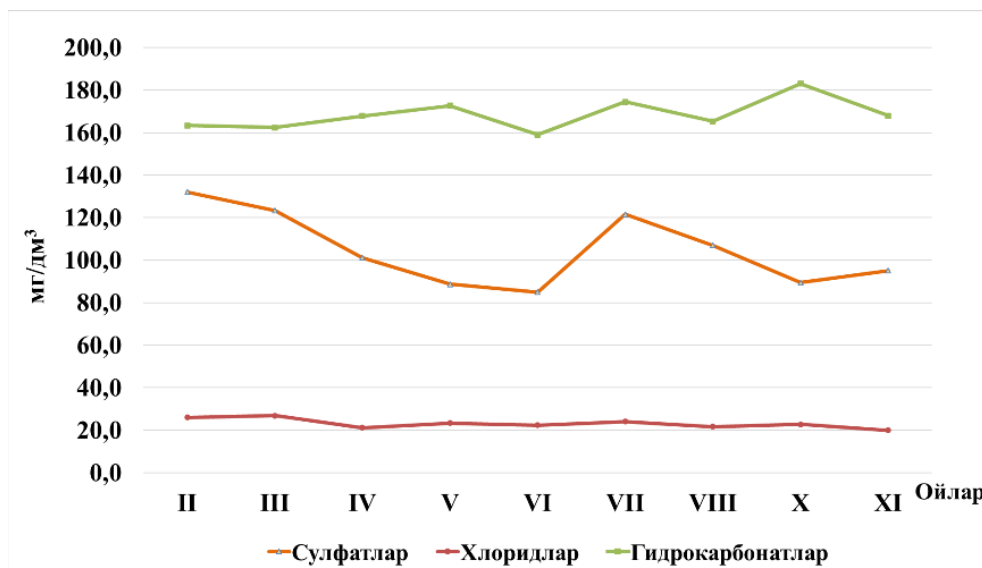
In this research, the seasonal changes of the ionic composition of the river water were studied based on the long-term (1996-2019) water quality monitoring data of the Narin River [2].

Monitoring of water quality in the Norin River began in 1984 at 4 observation points (Tashkumir, Uchkurgan (upper and lower), river confluence). For technical reasons, 3 observation points were closed in 1990, and only the point at the confluence of the gorge was operational. In 1992-1995, this single point was also closed and reopened in 1996. Currently, monitoring of the water quality of the river is carried out at this one observation point - 0.2 km above the confluence of the Narin River, 0.5 km below the village of Shamsiko'l. Since this observation point belongs to category 4 according to the category defined for observation points, observations are carried out only according to hydrological phases [2].

During the research, based on long-term (1996-2019) water quality data at one observation point in the lower part of the Narin River, long-term seasonal changes in the amount of main anions (sulfates, chlorides, bicarbonate) and cations (sodium, calcium, magnesium) in the river water were analyzed.

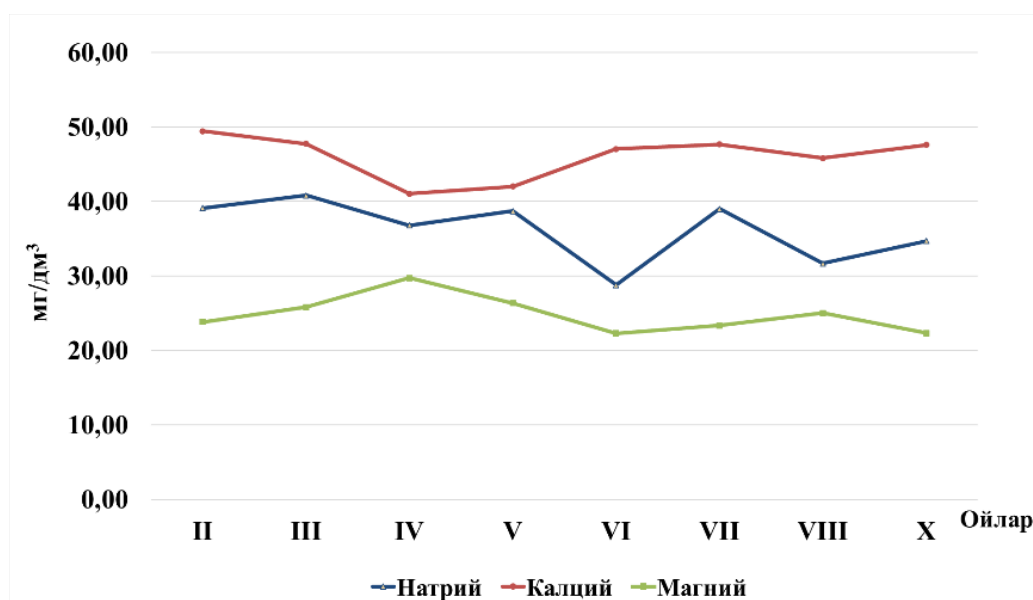
According to the results of the analysis, the average monthly amount of sulfates in the water of the Narin River during 1996-2019 is 85.0-132.0 mg/dm<sup>3</sup>, the average monthly amount of chlorides is 20.0-20.8 mg/dm<sup>3</sup>, and hydrocarbons are 159.0-183, 0 mg/dm<sup>3</sup> range was observed (Figure 1).

It was found that the content of sulfates from the main anions in the observed years was high and varied over the months, the highest amount was observed in February and the lowest amount was observed in June. The amount of chlorides did not change dramatically, the highest amount was observed in February. The highest amount of hydrocarbons was observed in September and the lowest amount was observed in June.



**Figure 1. Annual variation of the amount of main anions in the water of the Narin River (1991-2019)**

The average monthly amount of sodium in the water of the Narin River during 1996-2019 was observed in the range of 28.8-40.8 mg/dm<sup>3</sup>, calcium - 41.0-49.9 mg/dm<sup>3</sup>, and magnesium - 22.3-33.1 mg/dm<sup>3</sup> (Figure 2).



**Figure 2. Annual variation of the amount of major cations in the water of the Narin River (1991-2019)**

In the observed years, it was found that the content of calcium was higher than the main cations. The highest amount of calcium is observed in February, and the lowest amount is observed in April. The highest amount of sodium was observed in March, the lowest amount was observed in June, and the highest amount of magnesium was observed in April and the lowest amount was observed in June.

The amount of anions and cations in the water of the Narin River is observed in February in the winter season, and in April, May and June in the spring and summer season. River water is mainly of hydrocarbonate-calcium type.

#### **References:**

1. Б.Э.Нишонов, И.Р.Разикова, М.Б. Назиркулова. Норин дарёси суви сифатининг замонавий ҳолати. Гидрометеорология ва атроф-муҳит мониторинги. 2022. №3. С.90-95.

2. Ежегодники качества поверхностных вод на территории деятельности Узгидромета за 1996-2019 гг.: Узгидромет, Ташкент.

3. Baratov, A. S., Nazirqulova, M. B., & Alimdjanov, N. N. (2020). ECOLOGICAL ANALYSIS OF THE MELIORATIVE STATE OF AGRICULTURAL FIELDS. *Theoretical & Applied Science*, (4), 119-122.

4. Kizi Nazirqulova M. B. et al. LEARNING THE HEAVY METAL POLLUTION OF TASHKENT REGION WATERBED SEDIMENTS //Scientific and Technical Journal of Namangan Institute of Engineering and Technology. – 2019. – Т. 1. – №. 9. – С. 33-39.

5. Inamov, A. N., Ergashev, M. M., Nazirqulova, N. B., & Saydazimov, N. T. (2020). The role of geo information technologies in management and design of the state cadastre of roads. *ACADEMICIA: An International Multidisciplinary Research Journal*, 10(11), 154-160.