STUDYING THE SALINY CONDITION OF THE ARAL SEA BASED ON REMOTE SENSING OF THE EARTH

Iskandarov Behzod Qurol o‘g‘li
Teacher of NEI "Mamun-University" E-mail: iskandarov_behzod@mamunedu.uz
behzodiskandarov07@gmail.com

The problem of soil salinity poses a serious challenge for both forestry and the environment. Solving this problem plays a decisive role in ensuring the sustainable development of the region and its environmental sustainability. It is worth noting that soil salinity can be classified as mild, moderate, severe or very severe, depending on the level of salinity. It is generally accepted that saline soils can significantly reduce the yield of forestry crops, with reductions ranging from 25% on slightly saline soils to 100% on very highly saline soils. In Uzbekistan, salinity affects a large proportion of irrigated land: an estimated 52% of land is affected, and 40% of it is highly or moderately affected.

In Karakalpakstan, the situation is even more dire: 78% of the lands are affected by salinity, and 45-48% of them are severely or moderately affected. Including in the Aral Sea region, these values are much higher than those listed above.

The above factors can have a negative impact on the quality and ecological fertility of irrigated lands, which will ultimately lead to a decrease in the productivity of forestry crops. However, with proper management and attention to these factors, it is possible to mitigate their impact and increase the overall productivity of saxaul cultivation as well as for the creation of forestry enterprises .

In this regard, it is worth emphasizing the importance of conducting systematic research aimed at accurately determining the degree of soil salinization in the Aral Sea region. The relevance of this study is due to the need to develop information tools that can provide objective data on the condition of soils, which, in turn, is a key factor for making informed decisions in forestry and ecosystem management.

The objective of this study is to develop an effective method for estimating the degree of salinity using aerial imagery. This method should provide high accuracy and spatial resolution to obtain detailed information on the distribution of salts in the soil layer. This will not only allow us to better understand the scale of the problem, but also identify priority areas for action to prevent soil degradation and restore ecosystems.

The study focuses not only on the technical aspects of aerospace data analysis, but also on its interpretation in the context of environmental and forestry challenges facing the region. The results of this study are intended to be used as a basis for developing effective salinity management strategies and supporting sustainable development in the Aral Sea region.

Methodology

• Receiving Aerospace Images:

To analyze soil salinity in the Aral Sea region, aerospace images obtained using the Landsat satellite sensor were used . The choice of the study area was determined by geographical coordinates, namely latitude 44°40'07" north and longitude 58°57'09" east, which made it possible to cover the characteristic Aral Sea landscapes (Fig. 1)

The process of obtaining images was regulated taking into account the time of day, atmospheric conditions and internal characteristics of the sensor. To ensure high resolution and data accuracy, images with optimal shooting parameters were selected, excluding periods of cloudiness and other atmospheric interference.

As a result of the image acquisition stage, a data set was generated, which is multi-channel images with high spatial resolution. This data set became the basis for subsequent analyzes aimed at assessing the degree of salinity in the study area.

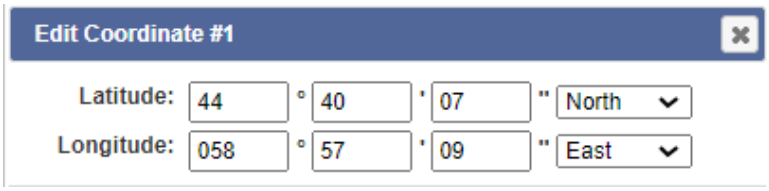

Fig.1 Covering zone of the Aral Sea region

Data analysis and assessment of soil salinity in the Aral Sea region: Satellite images were carefully analyzed to determine the degree of soil salinity in this region. Multi-channel image processing methods were used, including indices such as salinity index (SSI) and soil moisture index (NDWI). These indicators helped identify areas with high salt content and high moisture levels, which are associated with salinity.

The salinity index (SSI) was calculated based on the ratio of values in certain spectral channels, which allowed the identification of areas with high salt content. Soil

moisture index (NDWI) was used to identify areas with high moisture content, which is also an indicator of salinity.

LITERATURE:

1. Rustamovna, A. B., & Madirimovna, M. S. (2022). DISTRIBUTED PROCESSING MODELS AND ALGORITHMS OF SENSOR DATA. Galaxy International Interdisciplinary Research Journal, 10(11), 97-100.
2. Arturovich, X. T. (2022). IoT QURILMALARINING TURLARI, QO ‘LLASH SOHALARI VA ALOQA MUHITLARI. Komputer texnologiyalari, 1(10).
3. Gulhayo, O., & Barno, A. (2023). IOT SHLYUZINI YARATISHDA MIKROKONTROLLERLARNING AHAMIYATI. Innovations in Technology and Science Education, 2(8), 1299-1310.
4. Gulhayo, O. (2023). ESP8266 MIKROKONTROLLER ASOSIDA IOT SENSORLAR TARMOG ‘I UCHUN SHLYUZ YARATISH. Innovations in Technology and Science Education, 2(9), 544-554.
5. Анназарова, Б. Р. (2023). AHOLINI RO ‘YXATGA OLISH JARAYONLARIGA RAQAMLI TEXNOLOGIYALARNI JORIY ETISHNING JAHON TAJRIBASI. НАУЧНО-ТЕОРЕТИЧЕСКИЙ ЖУРНАЛ “MA'MUN SCIENCE”, 1(2).
6. Gulhayo, O., & Barno, A. (2023). IOT SHLYUZINI YARATISHDA MIKROKONTROLLERLARNING AHAMIYATI. Innovations in Technology and Science Education, 2(8), 1299-1310.
7. Annazarova, B. R. (2023). SENSOR MA’LUMOTLARINI QAYTA ISHLASHDA TAQSIMLANGAN TEXNOLOGIYALAR TAHLILI. Academic research in educational sciences, 4(5), 71-75.
8. Qurol o'g'li, IB, & O'rinboyevich, MM (2024). MATEMATIKA O 'QITISH METODIKASI VA TA'LIMDA ZAMONAVIY TEXNOLOGIYALARDAN FOYDALANISH. IJODKOR O'QITUVCHI , 3 (36), 1-4.
9. Qurol oʻgʻli, I. B. (2024). TELEKOMMUNIKATSIYA TARMOG ‘I MARSHRUTLASH MASALASINI GRAFLAR ORQALI IFODALASH VA YECHISH. PEDAGOG, 7(1), 129-136.
10. Urinboyevich, MM, Qurol o'g'li, IB, & Umarbek G'ayrat o'g, U. (2024). MENELAUS TEOREMASI UCHBURCHLAR HAQIDAGI VA ULARNING YANGI ISLOTLARI. SO 'NGI ILMIY TADQIQOTLAR NAZARIYASI , 7 (2), 1-5.
11. Хусаинов, Ш. М. (2023, June). АВТОМАТИЗИРОВАННЫЕ СИСТЕМЫ В ОБЛАСТИ БУХГАЛТЕРСКОГО УЧЕТА. In Proceedings of Scientific Conference on Multidisciplinary Studies (Vol. 2, No. 6, pp. 104-109).
12. Madaminovich, K. S., Ibragimovich, A. I., & Qurol oʻgʻli, I. B. (2023). Automated Systems in Accounting. Eurasian Scientific Herald, 20, 38-41.
13. Saidovich, R. B. ., Kabulovna, S. S. ., Madaminovich, X. S. ., & Bakhtiyarovich, S. A. . (2022). New Models and Analysis Solve Medical Problems with

Database Systems. Procedia of Engineering and Medical Sciences, 26–30. Retrieved from https://procedia.online/index.php/engineering/article/view/204

14. Saidovich, R. B. ., Bakhtiyarovna, R. F. ., Madaminovich, X. S. ., & Bakhtiyarovich, S. A. . (2022). Analysis Medical Problems with Database Systems and Create New Models. Procedia of Engineering and Medical Sciences, 31–36. Retrieved from https://procedia.online/index.php/engineering/article/view/205