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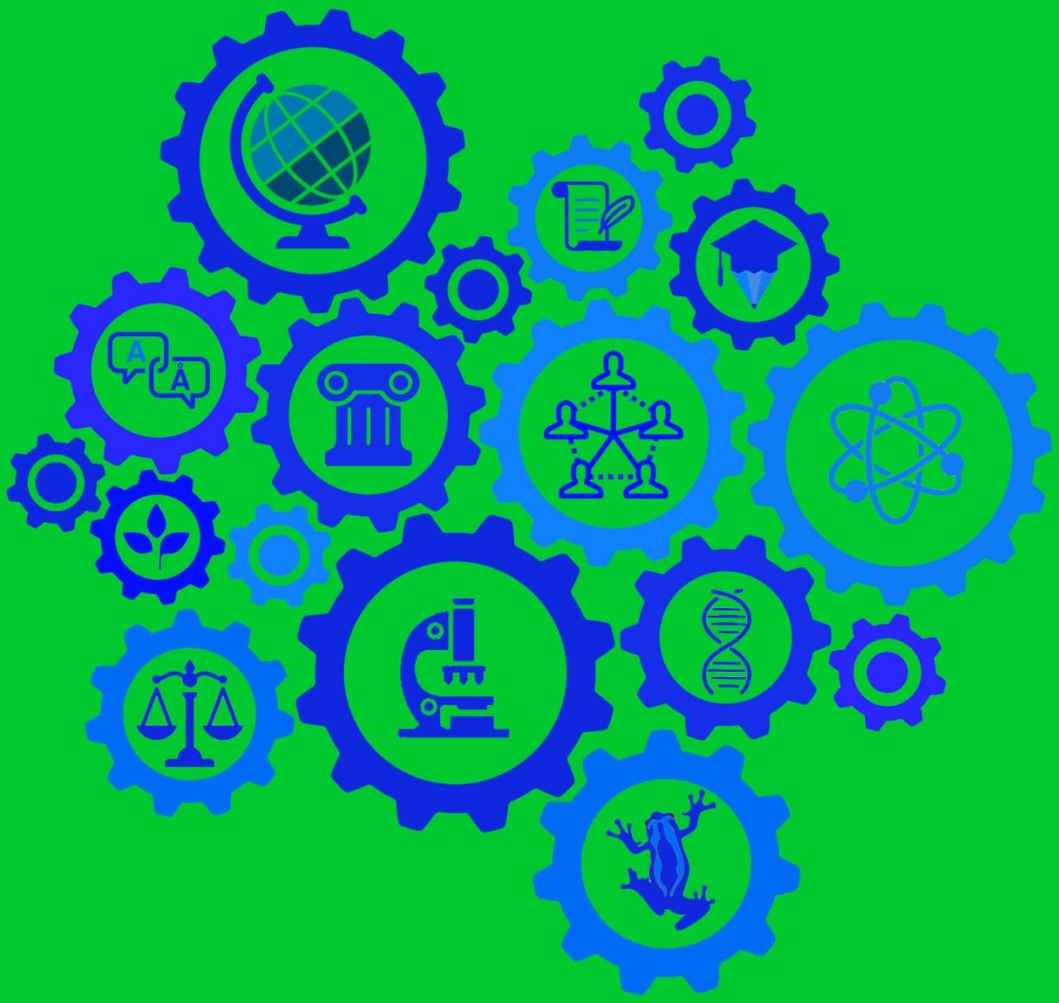

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USING GIS IN HYDROMODULATION IN THE SOUTHERN PART OF THE REPUBLIC OF KARAKALPAKSTAN

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Abstract: With climate change and increasing demand for water resources, effective water management has become critical. The southern part of Karakalpakstan, where arid climate and limited water resources pose special challenges, is especially in need of modern technologies to solve these problems. Geographic information systems (GIS) are a powerful tool that can significantly improve hydromodulation in a region.

Introduction . Geographic information systems (GIS) have become an integral part of natural resource management and spatial planning. Particular attention is paid to the application of GIS for hydromodulation , that is, water resource management, especially in regions with limited water resources, such as the southern part of Karakalpakstan. This literature review examines key studies and publications related to the use of GIS in fluid modulation .

The use of GIS in water resource management has become widespread due to its ability to integrate spatial data, analyze and visualize information. For example, in the work of Burrough and McDonnell (1998) emphasizes the importance of GIS in creating detailed maps and models of water systems to improve planning and decision making.

One of the main applications of GIS is the monitoring and modeling of water resources. A study by Maidment (2002) examines the use of GIS for monitoring hydrologic processes and modeling watersheds. The author emphasizes that GIS allows for the integration of different types of data, such as topography, climate, and soil characteristics, to create comprehensive watershed models.

GIS is also actively used to optimize irrigation systems. At work Allen et al . (1998) discusses the use of GIS to develop irrigation models that take into account the spatial distribution of water resources and irrigation demands. This improves water use efficiency and reduces irrigation losses.

Studies such as McBratney's work et al . (2003) show that GIS can be used to analyze soil characteristics, including soil composition, water retention properties, and drainage capacity. This is especially important for agricultural planning and water management in dry regions.

The specific use of GIS in southern Karakalpakstan has been examined in several studies. In work Mustafayev and Sadykov (2009) discusses the creation of models of irrigation systems using GIS to optimize water distribution in the region.

The authors show that the use of GIS can significantly improve water management and increase crop yields.

FAO (2011) provides examples of successful applications of GIS for water resource management in various countries. In particular, projects implemented in Central Asia are described that demonstrate the effectiveness of using GIS to optimize irrigation systems and water resource management.

Conclusion . The literature shows that GIS plays a key role in hydromodulation and water resource management. The technology allows you to integrate different types of data, create detailed models and maps, which significantly improves planning and management. Research conducted in southern Karakalpakstan confirms the effectiveness of using GIS to optimize irrigation systems and improve the sustainability of water resources in the region. In the context of climate change and growing demand for water, GIS is becoming an indispensable tool for sustainable development and rational use of natural resources.

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