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PRESS RELEASE

Armed conflicts alter groundwater dynamics

Neuchâtel, May 18th, 2026. **Thanks to an approach combining satellite observations, statistical methods and machine-learning techniques, a hydrogeologist from the University of Neuchâtel (Switzerland) has reported an unexpected groundwater recovery in a river basin in Syria. These hydrogeological changes are linked to the massive population displacements caused by the war since 2011. Identifying these changes is one of the main results of Saeed Mhanna's doctoral research. His thesis earned him the first prize and the public award at the Neuchâtel round of the "My Thesis in 180 Seconds" competition on 7 May.**

Groundwater provides drinking water and enables the irrigation of agricultural land, which is crucial in arid and semi-arid regions. Because aquifers are invisible by nature, it is difficult in times of war to assess characteristics such as storage capacity, recharge, or the position of the water table, since it is impossible to access the affected sites.

To overcome this challenge, Saeed Mhanna combined several indirect measurement and calculation tools that are rarely used together to study the consequences of war on water supply in the Orontes River basin in Syria. "I didn't expect radar satellites to actually show groundwater recharge," he notes. "It was a risky and technically very difficult approach, especially with the complex processing of InSAR data that I had to learn to master."

But the gamble paid off. The researcher demonstrated that in areas where displaced populations were forced to abandon agricultural land, the cessation of irrigation allowed partial recharge of groundwater and an uplift of the land surface a, reaching up to 4 cm per year, as pressure increased in the underlying geological layers

Dam in Ukraine

Another major chapter of Saeed Mhanna's thesis focuses on the region of the Kakhovka Dam, located in southern Ukraine along the Dnieper River. He found that the collapse of the dam in June 2023 disrupted the entire hydrological system. The researcher was surprised that two years after the destruction of the structure, the amount of water lost from the continent to the Black Sea roughly corresponded to the volume of Lake Geneva, with an uncertainty of about 40%.

The hydrogeologist's work opens new perspectives by providing concrete information where data is lacking or arrives too late. Thanks to satellites, it is now possible to identify areas where hydraulic infrastructure has been damaged, where water resources are declining, or, on the contrary, where aquifer recharge is underway. In practice, these results can help better prioritize repairs, protect wells and networks, and direct aid to populations most affected by the loss of access to water.

More:

Video of Saeed Mhanna at the MT180 competition, May 2026 :
https://www.unine.ch/mt180

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