

## ***Enhanced management of water resources through better evaluation of coastal aquifers in Latin America***

### ***The challenge...***

Groundwater from coastal aquifers is a strategic resource for the development of coastal areas in most countries in Latin America. However, coastal aquifers are complex and often fragile hydrological systems. Intensive extraction of groundwater can seriously affect the delicate freshwater–saltwater balance, leading to seawater intrusion in many cases. Groundwater extraction can also cause changes in flow pattern and water quality. Several countries in Latin America have reported falling water tables and a deterioration of water quality due to salinization and pollution.

A lack of technological information and knowledge of the hydrological characteristics and properties of coastal aquifers is limiting the adoption of sound management practices. More detailed understanding of the basic hydrogeological features of complex aquifer systems is needed for their sustainable management.



### ***The project...***

Through a regional technical cooperation project, the IAEA has helped Latin American countries to improve their capabilities to evaluate aquifers using isotope tools, thus supporting improved sustainable water resource management. Isotopic techniques allow the identification of processes and mechanisms of salinization – both natural and anthropogenic – and their effects on the water resource. Seven coastal aquifers and their characteristics have been investigated by the authorities dealing with water resources, nuclear institutions and universities in Argentina, Costa Rica, Cuba, Ecuador, Peru and Uruguay.

Laboratory and field capabilities have been created and upgraded in all participating institutions. Training was carried out at IAEA headquarters and in several Latin American countries, and conferences, workshops and multilateral meetings were organized to further knowledge transfer and experience sharing among countries participating in the project.



### ***The impact...***

As a result of the regional project, specific management actions based on the technical results of this project have been implemented at the national level. For example, in Argentina, the numerical model produced by the regional project was used to develop scenarios of expanding water demand versus the available recharge, and for delimiting areas for drilling production wells up to 2030.

Over 420 counterparts from the participating countries have received training for the first time on the use of isotope techniques for water resource investigations, numerical modelling and analytical techniques. In addition, four laboratories in the region are now equipped with liquid water isotope analysers (laser spectroscopy), facilitating the use of isotopic techniques in hydrological investigations.

Recommendations on basic quality assurance and quality control actions were provided to the participating laboratories, and all have implemented corrective actions to improve sample analysis.