

# Water Resources

## **Objective**

*To support Member States applying isotope hydrology techniques for assessment and management of their freshwater resources, including hydroclimatic change impacts on water resources distribution and availability.*

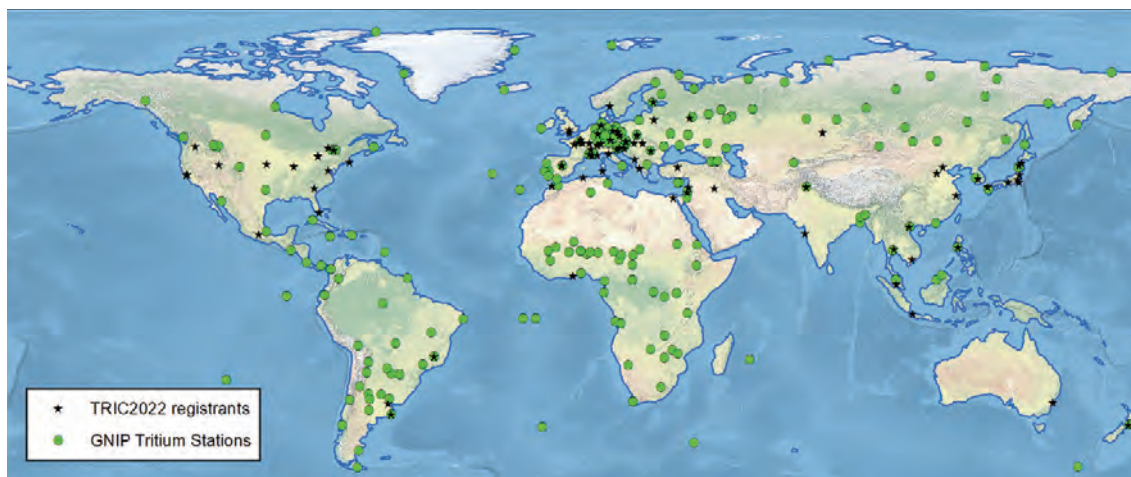
## **Addressing the Water Crisis**

Given the need for broad and dynamic collaboration to address the water crisis locally, regionally and globally, the Agency increased its engagement in global water-related activities and forums. During the 66th regular session of the General Conference, the Agency co-organized an event with the United Nations Educational, Scientific and Cultural Organization (UNESCO) on water security in a changing world, which highlighted how nuclear science can be used to make informed decisions on water preservation. At COP27, the Agency hosted four events in its #Atoms4Climate pavilion and contributed to three additional events with key partners (UNESCO, the World Meteorological Organization and the United Nations Environment Programme) in order to elevate discussions around water resources, security and adaptation and to highlight the role of nuclear and isotopic techniques in tackling a wide range of global water resource management issues, from protecting glaciers and wetlands to assessing groundwater in island States and the Sahel region.

At the regional level, the Agency supported the establishment of Djibouti's Regional Research Observatory on the Environment and Climate, inaugurated in October 2022. The Observatory will use isotope information to produce climate models and mapping tools in order to track the origins of air masses that bring rain, rates of groundwater replenishment and the movement of water through the hydrological cycle. Such information can be used by governments and aid agencies to assist in the management and prevention of water crises and other environmental crises.

## **Launch of New Isoscape Model**

The Agency's new Regionalized Cluster-based Water Isotope Prediction model of isoscapes for naturally occurring tritium in precipitation was published in 2022. The resulting maps depict the spatial distribution of present-day tritium in precipitation, following the dissipation of the thermonuclear emissions peak of the 1960s, by relating point-based isotopic information to climatic parameters to fill existing gaps. Such spatially contiguous information is a valuable baseline for the use of tritium as a natural tracer for waters of short residence time, which helps researchers and water professionals in Member States understand links between the atmosphere, surface water and groundwater systems.



*TRIC2022 registrants and GNIP tritium sampling locations in 2022.*

In 2022, the Agency compiled additional tritium data from Member States and made it available through the Global Network of Isotopes in Precipitation (GNIP) database. The Agency also assists in the quality control of tritium and other isotope analysis around the globe through training and interlaboratory comparison exercises. The Agency's 2022 Tritium Intercomparison (TRIC) exercise received 93 submissions from 80 laboratories in 40 Member States, an all-time record. Initial feedback has been sent to the participants and synthesis work will be carried out throughout 2023.