

Water Matters

Making a Difference with Nuclear Technology



IAEA
International Atomic Energy Agency

In water resource management, nuclear techniques are used to map and better assess groundwater resources to adopt better management strategies. Nuclear techniques are also used to enhance the efficiency of water use in agriculture.

Nuclear techniques also provide researchers with tools to study the ocean's past and predict its future, and are used to monitor and assess the effects of climate change, such as ocean acidification, and to validate global climate models and ocean circulation models.



More than 3.5 billion people depend on the ocean for their primary source of food.

The oceans absorb 2 billion tonnes of carbon dioxide every year and are a key defence against global warming, but ocean acidification – a change to seawater chemistry caused by the absorption of CO₂ that has negative effects on biodiversity – is increasing.

Only 2.5% of all the water on earth is fresh water. 30% of this is stored underground in the form of groundwater.

Less than 1% of all freshwater is available for ecosystems and humans.

More than 1 billion people in developing countries still do not have access to safe drinking water.

Many women and children in sub-Saharan Africa walk more than 20 km to retrieve water.

70% of the world's freshwater is used for agriculture, but inefficient water management is resulting in considerable wastage.

Nuclear techniques and the use of radionuclides, isotopic tracers and stable isotopes help us to understand marine processes and the path of ocean currents.

Radioisotopes are used to study bioaccumulation in organisms and the food chain, and to track signals of climate change through history.

Ocean currents can be tracked using natural and artificial radionuclides.

The IAEA Environment Laboratories help countries to understand the impact of ocean acidification on marine species, including commercial fish stocks.

Nuclear technology can help fishing communities to identify harmful algal blooms early and accurately.

Concentrations of oxygen, hydrogen and other isotopes such as tritium and carbon-14 can be used to characterize water from different environments, or to estimate the age of water.

Using scientific methods based on isotope tracing leads to better knowledge of the size, origin, flow and age of water sources, supporting improved management of freshwater resources.

IAEA drip irrigation projects help communities to grow foodstuffs and cattle fodder, thereby improving income, nutrition and educational opportunities.

Isotope hydrology laboratories established through IAEA technical cooperation projects help countries to address hydrological problems that affect water availability for domestic, agricultural and industrial uses.

The IAEA develops and transfers nuclear technology to Member States through coordinated research activities, the sharing of good practices and technical cooperation projects that support sustainable socioeconomic development. For more information, please visit www.iaea.org, www.facebook.com/iaeaorg or follow @iaeaorg on Twitter.