



MONITORING THE ENVIRONMENT

Our overuse of natural resources, pollution and climate change are weakening natural systems' ability to adapt to ever more sources of stress. The varied environments of our planet are interconnected and the pollution of one has ramifications across all. It is thus important to monitor the health of our environment to ensure a sustainable future.

Water covers 70% of our planet, yet reserves of drinkable freshwater are limited and precious. The IAEA uses isotopes to 'fingerprint' freshwater and understand its unique hydrological characteristics such as its age, movement, rate of recharge, and pathways. This information allows policymakers to use these reserves responsibly. Sources of pollution can be identified, helping guide policymakers in managing this precious resource.


Earth's greatest resource is its ocean, providing oxygen, food, and livelihoods for billions of people globally. The IAEA monitors its health extensively. Using radiotracers and other isotopic techniques, scientists trace the sources and fate of marine pollutants and are able to predict their future impact.

ONMENTS WE DEPEND ON

The IAEA, through its Environment Laboratories, Water Resource Programme, and technical cooperation programme, applies unique, versatile and cost-effective isotopic and nuclear techniques to understand many of the key environmental mechanisms needed to ensure a sustainable future. These monitoring systems help Member States make ecologically-responsible and scientifically-grounded development decisions.

Our atmosphere protects us from radiation, transfers heat globally, delivers vitally needed fresh water, and its chemical composition is a major driver of global climate change. The IAEA cooperates with the World Meteorological Organization using isotopes to track the movement of water in the atmosphere. The data gathered from tracking isotopes feeds a database that supports our growing understanding of precipitation and is an invaluable planning tool for drier regions of the world.

Among the most effective tools used in environmental impact assessment are advanced analytical techniques to understand radionuclide migration and radiation's effect on both terrestrial and marine ecosystems. The IAEA coordinates an international network of Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA), which provides Member States with accurate and fast radionuclide analysis in the event of radioactive releases or discharges. Key services of the IAEA include the provision of means for quality control and calibration to hundreds of analytical laboratories worldwide, to ensure reliability of their data for responsible decision making.

An illustration of a mountain landscape. On the left, a brown mountain peak is partially covered in snow. A blue river winds down the mountain slope, passing through a forest of green coniferous trees. To the right of the mountain, a large body of blue water contains several white icebergs. The sky is a light blue gradient.

Global climate change is transforming the polar regions and snow-covered mountain tops; these represent large and invaluable reserves of freshwater that hundreds of millions of people rely upon. The IAEA is contributing to global efforts by assisting its Member States in developing a project that uses isotopes to better understand permafrost loss, glacier retreat, and global mountain snow-cover reduction.

Global CO₂ emissions are currently causing the oceans to acidify, creating an enormous stress on marine life and threatening the future of marine food resources. The IAEA operates the Ocean Acidification International Coordination Centre (OA-ICC) that works to communicate, promote and facilitate global actions on ocean acidification.

Text: Michael Madsen, IAEA Division of Public Information; Photos: iStockphoto.com