IAEA

Nuclear Sciences and Applications

Securing A Better Future For All

Nuclear Techniques for Global Development and Environmental Protection

Environment Laboratories

Protecting the Environment

According to the Millennium Development Goals, managing the environment is considered an integral part of the global development process. The main purpose of the IAEA's environment laboratories is to provide Member States with reliable information on environmental issues and facilitate decision making on protection of the environment. An increasingly important feature of this work is to assess the impact of climate change on environmental sustainability and natural resources.

The IAEA's environment laboratories use nuclear techniques, radionuclides, isotopic tracers and stable isotopes to gain a better understanding of the various marine processes, including locating the sources of pollutants and their fate, their transport pathways and their ultimate accumulation in sediments. Radioisotopes are also used to study bioaccumulation in organisms and the food chain, as well as to track signals of climate change throughout history. Natural and artificial radionuclides are used to track ocean currents in key regions. They are also used to validate models designed to predict the future impact of climate change and ocean acidification.

The laboratories study the fate and impact of contamination on a variety of ecosystems in order to provide effective preventative diagnostic and remediation strategies. They enhance the capability of Member States to use nuclear techniques to understand and assess changes in their own terrestrial and atmospheric environments, and adopt suitable and sustainable remediation measures when needed.

Since 1995, the IAEA environment laboratories have coordinated the international network of Analytical Laboratories for the Measurement of Environmental Radioactivity, providing accurate analysis in the event of an accident or an intentional release of radioactivity.

In addition, the laboratories work alongside other organizations, such as UNESCO, the IOC, UNEP and the EC. The laboratories collaborate with Member States through direct involvement with their national bodies, scientific institutes, international and regional organizations, and through technical cooperation projects. They also disseminate knowledge by organizing international meetings, releasing publications, fostering e-learning and organizing training courses for students and scientists. By promoting excellence in environmental nuclear applications, the IAEA hopes to create a better understanding of the impact human activities have on the environment.

Providing Research and Analytical Services

The IAEA's environment laboratories are the only facilities of their type in the United Nations system. Their role is to address the environmental issues on land, in the atmosphere and at sea.

Three of the laboratories are located in Monaco and were established in 1961 to provide research and analytical services related to oceans, coastal areas and marine ecosystems.

A fourth laboratory, based at Seibersdorf in Austria, focuses on the assessment and protection of the terrestrial, atmospheric and freshwater environments.

Providing Reference Materials

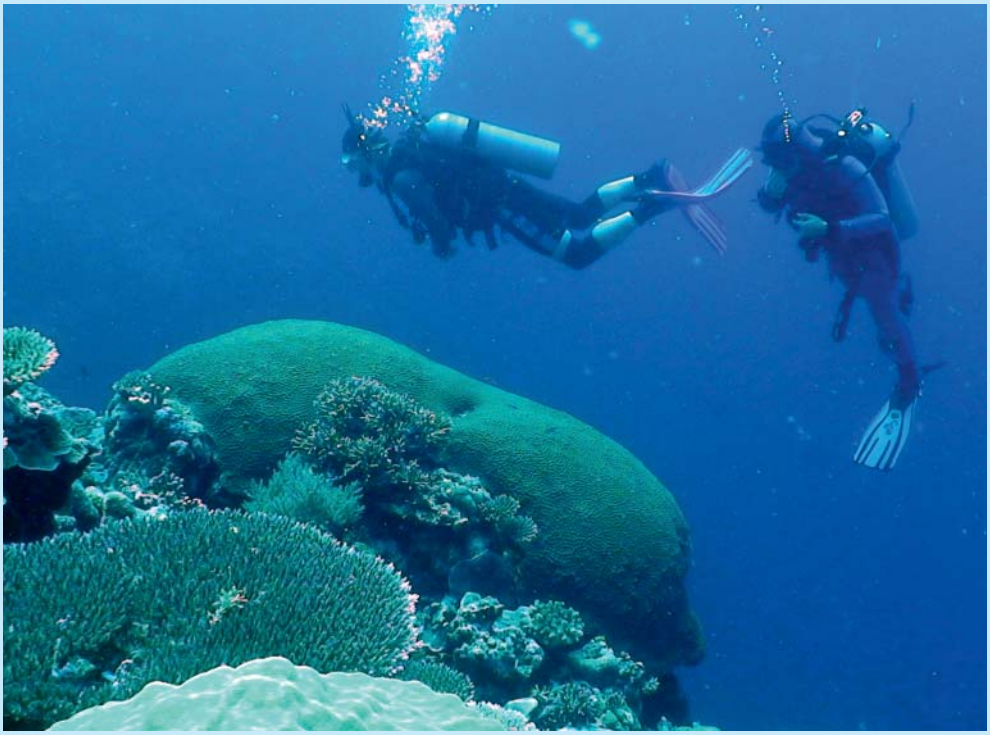
IAEA reference product services are provided by the environment laboratories to support Member States' own laboratories in conducting quality of environmental sample analyses, interlaboratory comparison exercises and analytical quality control. Reference materials are available on-line via a webshop, allowing customers to know, in real time, what is in stock and how to obtain and track their order. In addition, proficiency tests allow Member States to receive performance assessments for their laboratories.

IAEA activities take place around the world and address terrestrial, atmospheric, freshwater and marine environments in a variety of ecosystems.

The environment laboratories assist in developing tools and in finding solutions for all types of environmental issue by providing reliable, comparable and 'fit for purpose' environmental assessments. In the case of global assessment, where decisions are made based on the information produced by different laboratories, these requirements are even more pronounced. The laboratories also help build capabilities at a regional level to reduce the anthropogenic and natural degradation of coastal ecosystems.

With an ongoing, three decade long relationship with the Mediterranean Long-Term Pollution Monitoring and Research Programme, the IAEA has a long record of close collaboration with numerous United Nations and regional organizations. In this particular project, the IAEA has been assisting national and regional laboratories to improve their analysis of trace metals and organic compounds in marine samples.

In one instance, the laboratories successfully developed a new analytical method to detect the presence of radionuclides in environmental samples, such as those that may occur during a nuclear accident. The method included a rapid and accurate determination of radioactive strontium in milk, one of the key pathways for human contamination. The test will be especially helpful in avoiding health risks to infants during cases of emergency.



Success Stories from the Field

A current project in the Arctic aims to assess the effect of climate change by conducting field observations that monitor the complex and rapidly changing Arctic environment and by providing data for modellers. Since 2009, the IAEA environment laboratories have been collaborating with Norway to conduct annual studies of the transportation of radionuclides into the Arctic sea.

Over the last three years, the laboratories have also assisted in establishing a nuclear analytical laboratory in Doha for the Qatar Ministry of Environment, where they installed the necessary equipment and trained the laboratory technicians.

Furthermore, the IAEA assists Member States around the world in protecting the quality of their seafood from increasing toxic algal blooms in coastal areas (southeast Asia, Latin America and southern Africa). In Argentina, for example, the laboratories were involved in an independent assessment of possible uranium contamination of soil, surface water and groundwater.