

# Assessment and Management of Marine and Terrestrial Environments

## Objective

*To enhance the capability of Member States in the identification and mitigation of environmental problems caused by radioactive and non-radioactive pollutants using nuclear techniques.*

## From Measurements to Environmental Impact Assessments

Developing and implementing a regulatory regime requires that information be collected and interpreted. This can involve a complex set of actions, such as collection of samples, carrying out measurements in the field and laboratory, data evaluation and environmental modelling. To address these issues, the Agency organized a conference in April on 'Environmental Radioactivity: From Measurements and Assessments to Regulation', which brought together experts involved in assessments for both routine and accident situations.

As a part of its activities to provide Member States with recommended methods for the

measurement of radionuclides, the Agency published a comprehensive review of methods for the measurement of polonium-210 (Po-210) in the journal *Applied Radiation and Isotopes*. The Agency also organized a proficiency test on the rapid measurement of Po-210 in water samples, primarily for member laboratories of the network of Analytical Laboratories for the Measurement of Environmental Radioactivity, which is coordinated by the Agency. In November, the second worldwide open proficiency test for radionuclides in environmental samples was undertaken.

## Nuclear Techniques to Study Air Pollution

The Agency helped Mexico, through the technical cooperation programme, to identify the main sources of air pollution in Mexico City. The Mexican capital is located in a valley and has a population in excess of 20 million, besides a number of industries located within the city's limits, and is visited each day by some 3.5 million vehicles. Together, these factors contribute to deterioration of the air quality, making



FIG. 1. New facility to study the impacts of ocean acidification on the larvae of commercial fish.

it one of the most polluted urban centres in the world. With Agency assistance, air sampling using state of the art air particulate filters was conducted: the particulate matter obtained was analysed using the proton induced X ray emission technique, resulting in a more thorough identification of air pollution sources.

## Impacts of Climate Change on Marine Biodiversity

A new facility to study the effects of ocean acidification on the early life stages of commercial fish and polar molluscs was established in the IAEA Marine Environment Laboratories, Monaco (IAEA-MEL), in November (Fig. 1). In response to calls for more knowledge of climate change impacts on marine biodiversity, radiotracers will be used in this experimental facility to examine the metabolism of essential elements and contaminants in these marine biota under different future climate scenarios for ocean acidity.

## Environmental Contaminants, Seafood and International Trade

Determination of the physical and chemical state of an element is fundamental to understanding the

behaviour of pollutants in any given environment. In October, IAEA-MEL co-hosted a radionuclide speciation workshop in Jackson Hole, Wyoming, in the USA, at which the latest developments in this discipline were revised and discussed. The rapid development of new technologies enables scientists to obtain more reliable and precise data on the way radionuclides disperse in the environment.

A new CRP on applications of radiotracer and radioassay technologies to seafood safety assessment was initiated. The major objective of the CRP is to promote international trade in seafood, particularly from developing countries, through better knowledge of background contaminant levels and bioaccumulation processes that are relevant for aquaculture farms. The research is focused on the biotoxins paralytic shellfish poison and ciguatoxin, and also on cadmium in seafood such as

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scallops, oysters and squid, for which there is inadequate information to establish international standards for trade.

Proficiency tests of organic pollutants and trace metals in sediment and biota reference materials were carried out for marine laboratories in the Yellow Sea region. Five laboratories each from China and the Republic of Korea participated in the proficiency tests organized by IAEA-MEL.