



Protecting the seas

New reference material for monitoring seawater pollution

Protecting European seas from pollution

Since 2008, the European Commission has set up rules for the protection of the sea within the European Union, which are summarised in the Marine Strategy Directive (Directive 2008/56/EC). Furthermore, the Water Framework Directive (Directive 2000/60/EC) addresses the protection of EU water bodies, including coastal and transitional waters. According to these Directives, all Member States have to monitor the quality of the seawater within their territorial waters and take the necessary measures should the legal limits of, for instance, heavy metals, be exceeded.

The measures that a country may have to implement if the legal limits are exceeded can involve a significant cost. It is therefore of paramount importance that the measurement of seawater samples is highly accurate. Reference materials – materials for which the amount of certain constituents has been determined very accurately – are indispensable for this; they are the best means available to scientists for testing if the measuring equipment is working as it should and if the laboratory staff is sufficiently trained.

The JRC's Institute for Reference Materials and Measurements has provided reference materials based on seawater since the 1990s, but the stock is running out. At the same time, demand is increasing as a direct consequence of the new Marine Directive. There are now more metals in the regulatory focus, and the threshold levels are becoming stricter. For this reason, JRC-IRMM is developing a new reference material for seawater.



Seawater for the new reference material was collected by the "Belgica" – a research vessel operated by the Belgian Navy (photo © RBINS-MUMM).

Developing a new seawater reference material

A crucial step in the production of a reference material is the procurement of the base material, in this case a large quantity of seawater. This seawater has to fulfil stringent criteria, so that the reference material is representative of the open sea. Close to the coast, the composition of seawater is influenced by factors such as human activity and the natural discharge of rivers.

For this reason, JRC-IRMM contacted the Management Unit of the Mathematical Model of the North Sea (MUMM) in Ostend. In collaboration with the MUMM, JRC-IRMM had the opportunity to go to sea with the "Belgica", a research vessel operated by the Belgian Navy, and collect a large amount of seawater in open water.

Thanks to this collaboration, JRC-IRMM now has 1500 litres of Belgian seawater at its disposal, ready to be processed into a reference material that will be used all over Europe as a standard for the analysis of seawater.