

**International Atomic Energy Agency (IAEA)**  
**IAEA Input to 2022 SG report on oceans and the law of the sea (RES 77/248)**

**Second part**

Through its Marine Environment Laboratories in Monaco, the International Atomic Energy Agency (IAEA) continues to provide support to its Member States, in implementing and developing nuclear and isotopic tools and techniques for monitoring coastal and marine environments and assessing impacts of human activities on marine ecosystems and resources. Additionally, the IAEA provides guidance based on its Safety Standards for the regulatory control of releases of radioactive effluents into the marine environment, for the environmental monitoring and surveillance of nuclear facilities and for the assessment of radiological impacts on members of the public and marine flora and fauna.

The IAEA Marine Environment Laboratories are unique to the UN system. As the only Agency in the system to have marine laboratories, the IAEA provides support to Member States in addressing a range of marine environmental issues, including relevant nationally identified targets under Sustainable Development Goals 13 (Climate Action) and 14 (Life Below Water) and the SAMOA Pathway for Small Island Developing States (SIDS). This support includes assisting Member States in their work towards the implementation of the 2030 Agenda with a focus on specific SDG targets, including 14.1 on pollution and 14.1.b on plastic pollution. The Marine Environment Laboratories also focus on SDG 14.3 on ocean acidification, through the IAEA Ocean Acidification-International Coordination Centre (OA-ICC), which is an official partner of the UN Decade of Ocean Science for Sustainable Development. The IAEA further supports Member States in fulfilling their obligations under relevant global Conventions, including the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury, and the Basel Convention to set controls on the transboundary movements of hazardous wastes.

The IAEA launched the NUClear TEChnology for Controlling Plastic Pollution (NUTEC Plastics) initiative in 2021 to support its Member States in integrating nuclear techniques into their efforts to address challenges posed by plastic pollution. In 2022, NUTEC Plastics continued to contribute to the global effort to address these challenges, in line with the ongoing negotiations to establish an international legally binding instrument on plastic pollution, including in the marine environment. NUTEC Plastics supports research, development, capacity building and implementation of nuclear techniques to tackle upstream and downstream aspects of plastic pollution. Upstream aspects are addressed by reducing plastic waste volumes through the use of radiation technologies to improve plastic recycling methods and to develop bio-based alternatives to single use petroleum-based plastics. Downstream aspects are addressed by using nuclear techniques to assess, monitor and better understand the abundance and impact of marine plastic pollution.

**Related to §§ 10, 11, 12, 13, 14, 15 of resolution 77/248.**

The IAEA, through its Marine Environment Laboratories in Monaco, builds capacity in its Member States to address a range of issues affecting the marine environment, including Seafood Safety, Marine Plastics, and Climate Change. Several mechanisms are used, including the IAEA Technical Cooperation programme (TCP), Coordinated Research Projects (CRPs), and Peaceful Uses Initiative (PUI) projects.

Through capacity building projects, the IAEA Marine Environment Laboratories support developing Member States to address and mitigate their most pressing coastal and marine challenges using nuclear

and isotopic techniques, and to enhance their expertise and capability to develop science-based strategies, to address UN SDG 13 and 14. Currently, 72 national, regional and interregional projects are active, with participation from 120 Member States including 17 Small Island Developing States (SIDS).

Since its inception in 2012, the Ocean Acidification International Coordination Centre (OA-ICC) and its global partners have been involved in more than 900 capacity building opportunities with 800 scientists from more than 90 Member States. These efforts are helping Member States to build, strengthen, and maintain human expertise and institutional capacities to define national needs, to make informed decisions on action plans and measures to protect the oceans, to deliver sustainable ecosystem services, and to ensure sustainable socio-economic development.

The IAEA continues to coordinate the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) network, a collaboration of 197 analytical laboratories from 90 countries that work together to encourage and support standardization and validation of radioanalytical methods. The network is supported through proficiency tests, interlaboratory comparisons, training, and coordination. The capacity of network laboratories to report timely and reliable measurement results in the event of a radiological or nuclear emergency is thus enhanced and maintained.

The IAEA Marine Environment Laboratories are supporting the Barcelona Convention UN Environment Mediterranean Action Plan (MAP) Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL) through the harmonization and coordination of quality assurance for contaminants monitoring in the Mediterranean Sea. Bi-annual training courses are provided to experts in laboratories in MED POL member countries (the 21 countries bordering the Mediterranean that are Contracting Parties to the Barcelona Convention), on the determination of trace metals and organic contaminants. Technical evaluations, specifically tailored to each individual laboratory participating in the IAEA Proficiency Tests organised in 2022, have also been provided. These communicate key findings on each laboratory's performance and aspects to address in relation to measurement quality.

#### **Related to §§ 203, 211, 379 of resolution 77/248.**

The IAEA Marine Environment Laboratories continued working closely with UNEP within the framework of several conventions including the Minamata Convention on Mercury, the Stockholm Convention on Persistent Organic Pollutants, and the Barcelona Convention UN Environment Mediterranean Action Plan (MAP) Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL). A formal agreement exists with the latter for capacity building and quality assurance of monitoring data, obtained by laboratories in the Contracting Parties.

Cooperation between the IAEA and the UNEP Minamata Convention Secretariat, specifically for evaluating the effectiveness of its implementation with respect to the marine environment have been maintained. The IAEA has been a member of the UNEP Environmental Global Mercury Partnership since 2020.

Linkages between the IAEA and the UNEP Chemicals and Health Branch were fostered with a view of finding synergies in capacity building activities for the design of a new phase of the Global Monitoring Plan of the Stockholm Convention on Persistent Organic Pollutants. This is a major pillar for the evaluation of the effectiveness of the Stockholm Convention on POPs

The IAEA has also continued to provide analytical quality assurance services through the production of Certified Reference Materials and the organization of worldwide interlaboratory comparison (ILC) exercises and proficiency tests. These services have assisted Member States in producing verified, quality-assured data on the levels of radionuclides, inorganic and organic hazardous contaminants in diverse marine samples. The IAEA achieved accreditation for reference material production under

ISO17034 for specific marine matrices containing selected gamma-emitting radionuclides. The accreditation provides added value for users of these Certified Reference Materials and supports Member States' laboratories own accreditation of testing services according to ISO/IEC 17025:2017, in validation or verification of methods and in continuous quality control of measurement results. This is essential for accurately assessing the status and trends of these pollutants in coastal and marine environments and for facilitating comparisons of pollution monitoring data worldwide. The IAEA also provided analytical quality control services for the measurement of radionuclides in marine samples, supporting capacity for monitoring and assessment of marine radioactivity in routine and emergency situations.

Since 2014, under a project entitled 'Marine Monitoring: Confidence Building and Data Quality Assurance', that was initiated as a follow-up activity to recommendations related to the decommissioning of the Fukushima Daiichi nuclear power plant in Japan, the IAEA Marine Environment Laboratories have conducted 11 ILCs based on sampling missions to collect seawater, sediment and fish samples jointly undertaken alongside Japanese scientists. The results of these ILCs confirm that the Japanese sampling methods are consistent with relevant methodological standards and best practice. The results also demonstrate a consistently high level of accuracy and reliability by Japanese laboratories involved in the analyses of radionuclides in marine samples. In response to a request for assistance from Japan, the IAEA formed a task force to conduct a review to assess the Government of Japan's plan to discharge Advanced Liquid Processing System (ALPS) treated water against relevant IAEA safety standards, beginning in September 2021. The IAEA's work on the plan will take place before, during and after its implementation. Reporting of the first ILC for corroboration of ALPS treated water prior to discharge with participation from IAEA, ALMERA and Japanese laboratories has been published. The report demonstrated that Japan's Tokyo Electric Power Company (TEPCO) maintains the capabilities for accurate and precise measurements of the radionuclides present in the treated water stored on site.

The IAEA is supporting the work of OSPAR's Radioactive Substances Committee (OSPAR-RSC) and that of the Contracting Parties of the OSPAR (Oslo-Paris) Convention for the Protection of the Marine Environment of the North-East Atlantic in the areas of analytical quality assurance of marine radioactivity monitoring data and marine environmental radioactivity database development.

Through its Marine Environment Laboratories, the IAEA continues to support the Helsinki Commission's Expert Group on Monitoring of Radioactive Substances in the Baltic Sea (HELCOM MORS EG) and the Contracting Parties to the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area. The IAEA provides analytical quality support for the Baltic marine environmental radioactivity monitoring programme and disseminates the results through IAEA's MARIS database. The HELCOM-MORS EG collaborates in the production and characterization of IAEA reference materials of marine origin, which are subsequently made generally available to laboratories in all the IAEA's Member States.

The IAEA is the lead sponsoring agency of a new Working Group on Climate Change and Greenhouse Gas Related Impacts on Contaminants in the Ocean, co-sponsored by UNEP, IOC-UNESCO, WMO and IMO, within the framework of the Group of Experts for the Scientific Aspects of Marine Pollution (GESAMP). The Working Group is critically reviewing existing knowledge on the effects of climate change on the behaviour of radioactive and non-radioactive contaminants in coastal and open ocean environments and will issue recommendations for future research.

#### **Related to §§ 229, 231, 232, 233 of resolution 77/248.**

Through its recent initiative 'NUclear TEChnology for Controlling Plastic Pollution (NUTEC Plastics)', the IAEA is supporting Member States in integrating nuclear and isotopic techniques into their efforts to address plastic pollution. NUTEC Plastics builds on the IAEA's work addressing plastic pollution through recycling, using radiation technology, and marine monitoring, using isotopic tracing techniques. NUTEC

Plastics is closely aligned with other UN organizations tackling this problem, including the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization of the United Nations (FAO), and will contribute to global efforts and initiatives. The IAEA's NUTEC Plastics is accelerating the development of nuclear and isotopic techniques for assessing the abundance, distribution, and characteristics of marine plastics in order to better understand their origin, transport, fate and impact. Included is the establishment of harmonized, standardized protocols to identify microplastics in environmental samples, state-of-the-art analytical techniques that are in line with best practices and training for scientists and technicians.

The IAEA is supporting Member States in developing a toolbox of harmonized methods for marine microplastic analysis that are internationally comparable, which is key for reporting progress on decreasing plastics pollution as envisioned by the upcoming legally binding instrument on plastic pollution, including in the marine environment, and for reporting on progress towards the achievement of the United Nations Sustainable Development Goals. As such, IAEA is contributing to the International Negotiation Committee for the upcoming legally binding instrument on plastic pollution.

**Related to §§ 257 of resolution 77/248.**

The IAEA is providing support to its Member States for emergency oil spill response, by building capacity and assessing impacts related to the accidental discharge of hydrocarbons into the marine environment. In collaboration with OSINet, the Oil Spill Identification Network of experts, the IAEA has developed new analytical methods for identifying the potential source of contaminants following an oil spill. Through the procurement of laboratory equipment and training of staff, the Agency is helping laboratories in its Member States to enhance their capacity to monitor the effects of oil spills as well as hazardous contaminants in the marine environment and to assess potential short- and long-term toxicological impacts.

In January 2022, upon the request of the Government of Peru, the IAEA provided emergency assistance to this Member State to address the environmental consequences of a marine oil spill on the Peruvian coast.

**Related to §§ 214, 215, 218 of resolution 77/248.**

The ocean plays a major role in absorbing CO<sub>2</sub> from the atmosphere, thus regulating climate. In 2020, the IAEA started efforts on assessing the capacity of both open ocean and coastal areas to sequester organic carbon (Blue Carbon). In 2022, the IAEA Marine Environment Laboratories, jointly with international scientific partners, advanced scientific knowledge on the capacity of coastal vegetated ecosystems (mangroves, saltmarshes, and seagrasses) to sequester carbon as a nature-based solution to mitigate climate change. A large number of research studies are being conducted in more than 20 countries worldwide, and, in parallel, the IAEA is assisting Member States to establish this capacity via national and regional technical cooperation programs. In 2022-2023, IAEA had projects on Blue Carbon in 30 countries jointly with research institutes, using radionuclides to assess the rates of carbon sequestration in vegetated coastal areas and aiding Member States in data collection, for the evaluation of the capacity of these ecosystems to long-term store carbon. On the African continent alone, the IAEA is working with 16 countries on capacity building on Blue Carbon.

**Related to §§ 23, 24, 223, 224, 225, 226, 227, 228, 294, 297 of resolution 77/248.**

Since 2012, the International Atomic Energy Agency (IAEA) has hosted the Ocean Acidification-International Coordination Centre (OA-ICC), which facilitates global collaboration around and communicates on the topic of ocean acidification, including through capacity building and targeted research activities that advance knowledge of ocean acidification impacts. The OA-ICC co-organizes and

participates in several high-level symposia and events every year and with its global partners has facilitated capacity building opportunities for 600 scientists from more than 90 Member States.

The OA-ICC continues to serve as a global information hub, providing open access to ocean acidification publications and information on relevant events and opportunities, as well as to unique resources such as: 1) a bibliographic databases centralizing all existing knowledge in the field of OA in the form of more than 10,000 references with citations and abstracts; 2) a data portal on the biological response to ocean acidification, containing datasets from over 1,100 research articles.

Since the 2022 report, the OA-ICC has organized and supported a total of 12 events counting technical and consultancy meetings, as well as training courses and side events within the framework of high-level UN conferences. By the end of 2022, more than 50 early-career scientists, representing more than 35 IAEA Member States, benefited from robust capacity building exercises involving hands-on experimental work with the use of nuclear and isotopic techniques. The OA-ICC had a robust presence at COP27, with three side events addressing regional aspects of ocean acidification research, policy and governance, as well as cross-sectoral and interdisciplinary approaches to adaptation and mitigation, including nature-based solutions for ocean-climate action.

The IAEA is co-focal lead of the UN Communities of Ocean Action on Ocean Acidification, a process to facilitate progress on more than 250 Voluntary Commitments that have been submitted by various stakeholders across the globe on SDG 14.3. The Community of Ocean Action on Ocean Acidification is directly aligned with the goals and objectives of the UN Decade of Ocean Science for Sustainable Development (2021-2030).

#### **Related to §§ 25 of resolution 77/248.**

The IAEA supports its Member States by providing technical expertise on the processes and mechanisms that may lead to marine biodiversity loss, such as pollution, climate, and ocean change impacts. Research and development efforts focus on the effects of multiple stressors, such as ocean acidification and deleterious trace elements on the biological response in marine species. Such research helps Member States determine the vulnerability of oceanic resources, such as coral reef habitats and important seafood species, and thus can help evaluate the potential biological and socio-economic impacts of changes in ecosystems and ecosystem services (sustainable food security). Through its work on Blue Carbon, the IAEA supports Member States in their contributions to the restoration of coastal vegetated ecosystems and their biodiversity.

#### **Related to §§ 356 of resolution 77/248.**

The IAEA is supporting Small Island Developing States (SIDS) on issues resulting from Ocean Acidification through the Ocean Acidification International Coordination Center (OA-ICC). In 2022-2023, the OA-ICC held a series of meetings on Designing Climate Adaptation Pathways for Atoll Islands, where SIDS researchers participated in a series of training courses on ocean acidification. The workshops and trainings were carried out both at the IAEA Marine Environment Laboratories and on-site.

As part of the Subregional Approach to the Pacific Islands (SAPI) for Fiji, Marshall Islands, Palau, Papua New Guinea, Samoa and Vanuatu, the IAEA is supporting development in the areas of water resources and coastal zone management. This is in line with the need recognised in the SAMOA Pathway requirement, to support Member States in developing institutional and human capacities for the effective and sustainable implementation of integrated management of water resources and related ecosystems. The project is building capacity in isotopic and complementary techniques to tackle the integrated management of water resources and coastal ecosystems. The project is also encouraging and

IAEA

supporting education, training and development of networks and partnerships among SIDS and with regional and international collaborators in relevant topical areas.

**Related to §§ 383 of resolution 77/248.**

As a member of the UN-Oceans mechanism, the IAEA attends coordination meetings and contributes to outreach activities to strengthen UN coordinated action for Ocean conservation. The Agency contributed to the UN-Oceans side event on the management of the Ocean-Water continuum held at the UN Water Conference in March 2023 in New York.

**Related to §§ 382 of resolution 77/248.**

Through its Marine Environment Laboratories, the IAEA contributes to effective coordination between UN Agencies through its participation in the Environment Management Group (EMG). The IAEA attends the annual Senior Officials Meeting and the EMG Mid-Term Technical Segment. The Agency is also an active member of the EMG Task Team on Marine Litters and Microplastics and contributed to the preparation of a UN Common Approach towards a Pollution-Free Planet as part of the Consultative Process and the Small Drafting Team coordinated by the Environment Management Group (EMG). The common approach aims to help the UN align its efforts and mobilize the entirety of its relevant expertise and mandates to accelerate the sustainable, inclusive, and just transition towards a pollution-free economy, building on existing efforts undertaken by various UN and related entities.