



Summary and Conclusions

Summary

The MICRO2015 Seminar, organized within the DeFishGear project (www.defishgear.net) was held in Piran, Slovenia at the Marine Biology Station, May 4-6. The event brought together 82 participants from 10 countries. Six renowned scientists, Francois GALGANI, Gijsbert TWEEHUYSEN, Christian LAFORSCH, Hrisi KARAPANAGIOTI, Maria Christina FOSSI and Thomais VLACHOGIANNI contributed invited lectures that gave a start to the following sessions focusing on:

- Occurrence of microplastics in the environment
- Characterization of microplastics
- Microplastics as vectors for biological and chemical contaminants
- Impacts on biota
- Prevention and mitigation

In addition seventeen oral presentations were made and seven posters were exhibited.

The final session was devoted to drawing conclusions. Each invited speaker was asked to give their view of the state-of-the-art and the challenges that lie ahead, triggering a general discussion. A summary of the main conclusions is presented below.

Conclusions:

Microplastics a scientifically established fact

A succession of state-of-the-art scientific reports as well as all experiences from the field now show beyond doubt that seas and oceans worldwide are polluted by microplastics – small plastic particles that either result from fragmentation of larger litter items or the use of small plastic particles in products such as cosmetics or various industrial applications. Research results, including unpublished data presented during the Seminar, show that the Adriatic Sea – a largely enclosed inland sea – has some of the highest recorded concentrations of microplastics reaching the range of several hundreds of thousands to several million particles per square kilometer. It is also a question if protected areas differ from other areas.

Need for harmonized methodology

Results from the newest studies on microplastics occurrence show that with increasing sophistication of analytical methods more and smaller microplastics are detected. This suggests, on one hand, a need to

harmonize analytical methodology in order to obtain comparable results from different locations and groups, and on the other hand, that our understanding of the problem of microplastics is limited due to the deficiencies of analytical methods in place. In particular, improved analytical capability should be used to gain understanding regarding micrometer and sub-micrometer particles (commonly named "nanoplastics"). There are indications that nanoplastics are present in the environment in large quantities, however it is unclear if the smaller size affects properties such as adsorption of pollutants and chemical degradation.



Impacts on biota and human health - The next frontier

A key challenge is to improve our understanding of the impacts of microplastics on living organisms, including humans. It is necessary to establish whether ingestion, which is rapidly becoming confirmed, can lead to toxic effects due to pollutants transported by microplastics. Of prime interest is to understand the mode of ingestion – is it opportunistic or intentional, if pollutants translocate into the organisms, what stress this may cause, and how the pollutants move along the food chain, ultimately reaching humans at the top. We will need to understand variety by species, types of plastics as well as pollutants.

Environmental compartments need to be treated in an integrated fashion

For a full understanding of the dynamics and interactions of microplastics it is crucial to move beyond the current focus on limited environmental compartments such as marine, riverine, terrestrial etc. and integrate consideration of all environments. Conditions in each compartment may be specific affecting needed management measures but they are all connected. Special attention should be given also to the riverine compartment since rivers are a key source of microplastics pollution of seas and give better opportunity for microplastics removal than the much larger marine environment. As a specific action pollution by microplastics should be included into Water Framework Directive. At the moment we possess a very limited knowledge of sinks of microplastics in the environment.

Multi-stakeholder engagement and cooperation for effective decision making towards solutions

It is of key importance to target pollution prevention as our goal and not see end-of-pipe actions such as beach cleanups or other removal actions as a solution. This must be clearly communicated to all stakeholders. The microplastics issue, as part of the overall marine litter problem, is quite new and therefore all aspects and implications need to be communicated in order to take informed decisions towards addressing it effectively. It is essential that stakeholders from industry, tourism and maritime sectors, regional, national and local authorities as well as civil society are involved and engaged in finding viable and effective solutions. Meeting points such as events, conferences etc. are required to allow for interaction between stakeholders. To support communication and actions socio-economic consequences of marine must be further analyzed.

DERELICT FISHING GEAR MANAGEMENT SYSTEM IN THE ADRIATIC REGION

Coordinated actions for a litter-free Adriatic

PROJECT OVERVIEW

Marine litter - any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment - poses a major threat to wildlife and ecosystems, as well as, to humans and their livelihoods. Marine litter is a complex and multi-faceted issue with environmental, economic, safety, health and cultural implications. Marine litter knows no boundaries and represents a pervasive and persistent problem that expands beyond borders away from the source of origin. Coordinated and multi-sectoral action is key to combating marine litter.



Photo: Thomais Vlachogianni

The DeFishGear project aims to facilitate efforts for integrated planning to reduce the environmental impacts of litter - generating activities and ensure the sustainable management of the marine and coastal environment of the Adriatic Sea. Ultimately, the DeFishGear project will provide a strategic input to regional efforts in successfully achieving good environmental status in the Mediterranean Sea.

The DeFishGear activities are implemented by a multi-disciplinary team comprising academia, research institutes, national and local authorities and NGOs from all seven countries of the Adriatic Sea, reinforcing and strengthening cooperation and fostering joint and harmonized actions towards a litter-free Adriatic.

MAIN LINES OF ACTIVITY

- Carrying out a comprehensive assessment of the status (amounts, composition, impacts) of marine litter (macro-litter & micro-litter) in the Adriatic through harmonized and coordinated monitoring activities;
- Development of recommendations and policy options based on sound-scientific evidence and knowledge to meet regional and national objectives regarding marine litter (Marine Strategy Framework Directive, Regional Action Plan on Marine Litter Management in the Mediterranean, Ecosystem Approach, etc.);
- Establishment of a Regional Network of Experts on marine litter;
- Development of capacities to monitor marine litter in a harmonized way through reinforced exchange of experiences, techniques and know-how;

- Setting up of a system to collect and recycle derelict fishing gear and implementation of 'fishing for litter' activities, in an environment-friendly way;
- Targeted awareness raising for fishermen, policy makers, educational community and others on the impacts of marine litter and the types of action needed to effectively address this issue.



Photo: Ante Žužević

MAIN EXPECTED RESULTS

- Improved knowledge base on the occurrence, amounts, sources and impacts (including socio-economic impacts) of all types of marine litter including micro-plastics in the Adriatic;
- Harmonized marine litter monitoring activities in the Adriatic and enhanced collaboration as a building block for future actions;
- A strengthened & reinforced science-policy interface on marine litter;
- Joint, coordinated and/or complementary schemes to manage human activities generating litter in the Adriatic Sea and strengthened implementation of relevant policy frameworks (MSFD, ICZM, ECAP, MSP, etc.) at the regional level.



Photo: Mojca Trkaj

Project duration November 2013 - March 2016

Project value 5.353.756 €

PROJECT PARTNERSHIP

LEAD PARTNER

National institute of Chemistry, Ljubljana, Slovenia



Photo: Pierpaolo Giordano

PROJECT PARTNERS

- Italian National Institute for Environmental Protection and Research, Chioggia, IT
- Ca' Foscari University of Venice, IT
- Mediterranean Consortium, Rome, SI
- Regional Agency for Environmental Protection in the Emilia-Romagna Region, Cesenatico, IT
- Institute for Water of the Republic of Slovenia, Ljubljana, SI
- University of Nova Gorica, the Laboratory for Environmental Research, Nova Gorica, SI
- Institute for Oceanography and Fisheries, Split, HR
- Hydro-Engineering Institute of the Faculty of Civil Engineering, Sarajevo, BA
- Institute of Marine Biology, University of Montenegro, Kotor, ME
- Agricultural University of Tirana, Laboratory of Fisheries and Aquaculture, Tirana, AL
- Regional Council of Lezha, Lezha, AL
- Mediterranean Information Office for Environment, Culture and Sustainable Development, Athens, GR
- Hellenic Centre for Marine Research (with participation of the Institute of Oceanography and Institute of Marine Biological Resources and Inland Waters), Anavyssos, GR
- Public Institution RERA SD for Coordination and Development of Split Dalmatia County, Split, HR
- Euro-Mediterranean Centre on Climate Change, Lecce, IT

ASSOCIATES

- PlasticsEurope AISBL, Brussels, BE
- Ministry for Agriculture and Environment, Ljubljana, SI
- Italian Ministry of Environment, Land and Sea, Rome, IT
- Croatian Environment Agency, Zagreb, HR
- Fishing League, Rome, IT
- Agency for Watershed Area of Adriatic Sea Mostar, Mostar, BA



Photo: Ante Žuljević

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DeFishGear project map

