



**Northwest  
Pacific  
Action Plan**

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Northwest Pacific Action Plan  
Pollution Monitoring Regional Activity Center

The Sixteenth NOWPAP POMRAC Focal Points Meeting  
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**Report on the implementation of activity “Microplastics abundance in  
river runoff and coastal waters of the NOWPAP region with a case study  
in the Russian part of NOWPAP area”**

**Background.**

The land-based sources of plastic contamination of the marine environment require thorough consideration. It is widely known that basic sources of plastic entering the sea are improperly managed landfills, unauthorized dumping sites in the river basins and in the coastal areas, sewage and stormwater, and rivers. It is possible to discuss impacts of some point sources by analyzing morphological composition of microplastic particles in various segments of coastal water areas and learning some regularities of their distribution. However, it is difficult to assess share of each source in the total inflow of plastics to the ocean without more detailed data. POMRAC activity 'Microplastics abundance in river runoff and coastal waters of the NOWPAP region' was approved by the 21 IGM in 2017 as part of the activities on WG2 – River and Direct inputs of contaminants into the marine environment of the NOWPAP region. Its basic idea is to assess inflow of microplastic particles with rivers discharging into the marine area of NOWPAP and finding relations with plastic contamination in the adjoining coastal waters.

**Goal** of this activity is to obtain background information on the distribution of different kinds of microplastics in the some major rivers within Russian part of the NOWPAP region, and to trace possible impact of river runoff on microplastics quantity and composition in the coastal waters within the Russian part of the NOWPAP region.

**Tasks.**

The following steps were supposed to achieve the objective of this activity:

- 1) To obtain data on the concentrations of microplastics in the rivers of the Russian part of the NOWPAP region and try to assess the microplastics input to the sea with river runoff. Collecting similar existing data from other NOWPAP countries might allow to estimate the role of river runoff in the microplastics transport.
- 2) To assess and analyze current methods of sampling microplastics in the seawater and fresh water and the sample treatment protocols applied in NOWPAP countries, considering possible development of general guidelines/recommendations for microplastic monitoring in NOWPAP;
- 3) To compare existing data on microplastics quantity and composition in the coastal water within the NOWPAP region, including further collection of the background information on the quantity and composition of plastic particles in the coastal water of the Russian part of the NOWPAP region.

4) To assess the possible impacts of river discharge, urban areas, landfills, tourism, fishery, etc. on contamination of marine ecosystems with microplastics; to share national data and to carry out related survey in the Russian part of NOWPAP.

### **Activities.**

Rivers and coastal areas within Peter the Great area have been chosen for the study in this project due to maximal anthropogenic pressure compared with other NOWPAP areas within Russia. 8 typical rivers, including transboundary Tumen R. and Razdolnaya (Suifen) R. were studied.

Seasonal samplings (spring, summer, autumn) have been carried out in rivers in 2018-2019, and results of the previous studies 2016-2017 were used as well. Methods using plankton net with 0.1 mm mesh size were effective enough though additional works are needed for the intercalibration purpose.

Transboundary Tumen R. and Razdolnaya (Suifen) R. showed maximal level of microplastic abundance one order higher than in other rivers. High water regimes in spring and summer are accompanied by the elevated concentration of microplastic. 2-3 times enrichment of surface layer of river waters compared with subsurface one is a next feature of the spatial-temporal variability of microplastic quantity within the river.

Composition of plastic and forms of particles give information to highlight genesis and possible sources of microplastics in the rivers and tidal/coastal waters. The relatively high content of polymer fibers and microbeads in the water indicates the impact of domestic wastewater from settlements. Films and fragments can be transported by the rivers, including transboundary ones. Local sources like eroded landfill cannot be excluded also. Polyethylene, polypropylene, foamed polystyrene are the dominant plastics within Peter the Great Gulf, though all types of plastic were determined in this Gulf.

Surveys show that river runoff of microplastics is evidently an important factor in the land-based pollution and can be calculated, however more data is required to make detailed comparison to impacts of other land-based sources due to a number of reasons.

**Outcomes.** POMRAC secretariat will compile the draft version of the report before the 16<sup>th</sup> FPM and share it with Focal Points and experts for their consideration. After compilation the document will be circulated among POMRAC experts and POMRAC FPs for the comments. After amendment the document will be circulated among RACs and National Focal Points and uploaded to POMRAC web-site as a technical report..

**Budget**

<b>Contract</b>	<b>Timing</b>	<b>Output</b>	<b>To be completed</b>	<b>Counterpart</b>	<b>Budget (US\$)</b>
Regular sampling trips (surveys) to the selected sites of rivers downstream and sea coasts	2018, Q2-Q4	Monitoring data	2018, December 1	POMRAC	7,200
Processing of samples for microplastic concentration	2018, Q2-Q4 2019, Q1-Q3	Results of processing	September, 1, 2019,	POMRAC	1,800
Analysis of quantity and quality of microplastics particles by FTIR, Raman SC and other methods	2018, Q2-Q4 2019, Q1-Q3	Results of processing	2019, September, 1	POMRAC via National Scientific Center of Marine Biology FEB RAS	15,000
Organization of regional workshop back-to-back with NOWPAP POMRAC FPM*	2019, Q4	Report of the workshop	2019, November, 1		30,000*
Preparation of the report on microplastic quality and abundance in the Russian rivers and coastal waters	2019, Q4	Publication of the report	2019, November, 30	POMRAC	9,000

\* - through SSFA with DINRAC