<u>Marine litter study in the</u> <u>estuary of the River Neva</u>: results of monitoring and mathematical modelling

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- Marine litter pollution a global problem:
- Sources land-based (rivers), tourism, household-wastes, fisheries.
- Over 60 % plastic (European seas)

Main tasks for 2018:

- 1. Preliminary study of marine litter accumulation in the Neva estuary
- 2. Identification of suitable beaches for monitoring
- 3. Identification of litter pollution "hotspots"
- 4. Define the basis of a mathematical model of litter distribution in the Neva estuary

rspectives of research



Background

- St.Petersburg 5,2 mln + Leningrad Oblast 1,9 mln.
- Metropolitan area: annually about 112 000 tons of plastic wastes
- No centralized system of plastic litter separation all goes to landfills (overloaded)
- Neva river draining large territory

- A Trans

- Dredging works in the Neva Bay (land-reclamation)
- Enclosed lagoon-type Neva bay + Flood Protection Barrier = accumulation zone for litter.

The plastic litter problem has <u>never</u> been investigated for the Russian sector of the Gulf of Finland and the Neva River estuary



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The Eastern Gulf of Finland coastline

Most typical coast type:

erosion coasts with bays and sand accretion areas with wide (50-150 m) stable <u>sandy beaches</u>.
But! A lot of vegetation! (very shallow, southern coast, inside the bay)

Recreational potential (most visited beaches):

- Northern coast Kurortny District (12 most popular public beaches)
- Southern coast Peterhof and Lomonosov area

<u>Public beaches</u>: regularly cleaned by the municipal services,

<u>"Wild" beaches</u>: cleaned randomly (once in spring by locals and volunteers)





Data by VSEGEI (Karpinsky All Russian State Geological Institute)



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Beach monitoring methods

OSPAR, MSFD – Guidelines for NE Atlantic

1. Sand Rake method:

covers at least 50m² of the sandy beach between the water line and the vegetation line

2. Frame-method:

applied locally in the lagoon-type bays along the wave wreck-line

Focus on large-micro (2-5 mm) and meso-litter (5–25 mm) in the 30–50 mm upper sediment layer.

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Both methods are suitable for sandy beaches, even if they are regularly cleaned

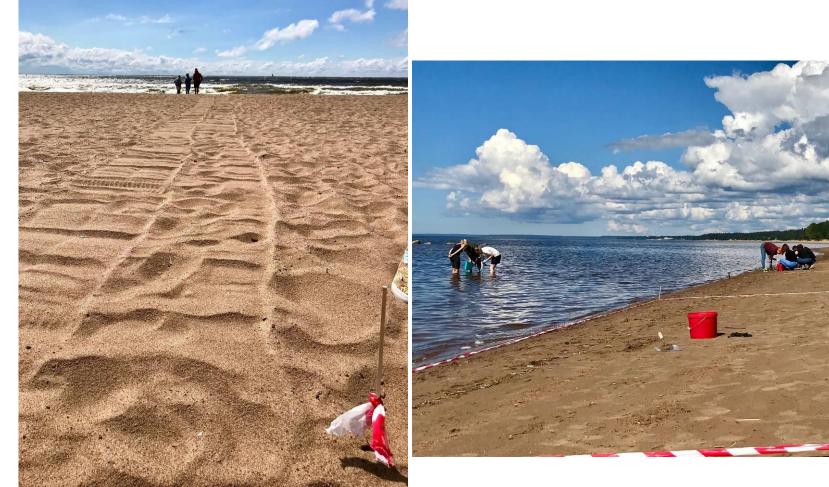
* Adaptation for the Baltic coasts by the Leibniz Institute for Baltic Sea Research (Leibniz-Institut für Ostseeforschung Warnemünde, IOW)



100m OSPAR Method 100m OSPAR Method rological. University of Institute of Oceanology, RAS // Scientific Forum Vater Liceul enic impact", 17-18 Oct. 2018. St.Petersburg, Russia

GPS Coordinates

Ideal beaches





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Typical beaches

KEAHO





Results: micro- and meso-litter

(plastic pellets, glass fragments, cigarette butts, metal)





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Future perspectives

Beach monitoring Monitoring **Bottom** of water sediments (sea and river) **Marine litter** monitoring Chemical Sources from composition land and sea of litter

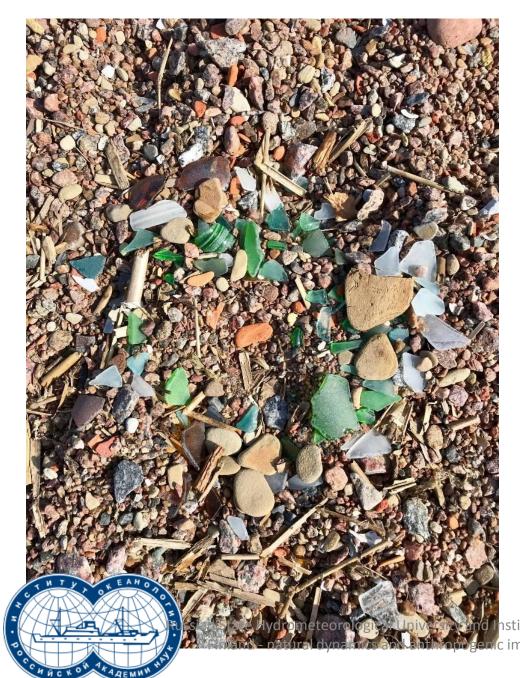
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