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

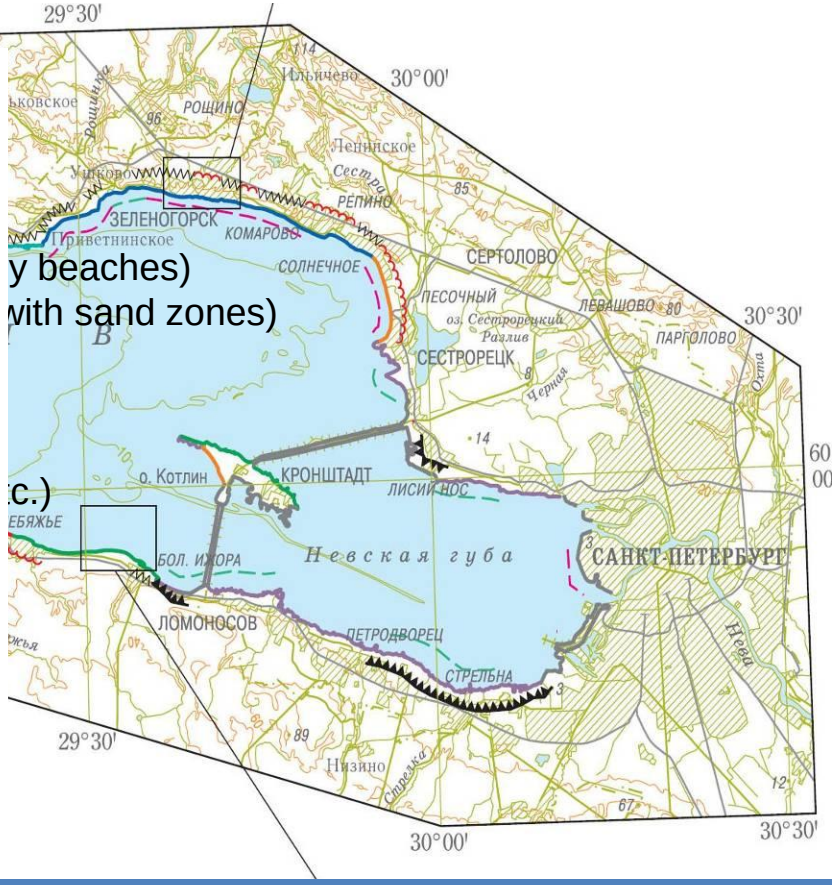
The plastic litter problem has never been investigated for the Russian sector of the Gulf of Finland and the Neva River estuary

The Eastern Gulf of Finland coastline

Most *typical coast* type:
- erosion coasts with bays and sand accretion areas with wide (50-150 m) stable *sandy beaches*.
- 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

Public beaches: regularly cleaned by the municipal services,
"Wild" beaches: cleaned randomly (once in spring by locals and volunteers)



Data by VSEGEI (Karpinsky All Russian State Geological Institute)

Beach monitoring methods

OSPAR, MSFD – Guidelines for NE Atlantic

1. Sand Rake method:

covers at least 50m^2 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.

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)*

Ideal beaches

Typical beaches

Results: micro- and meso-litter

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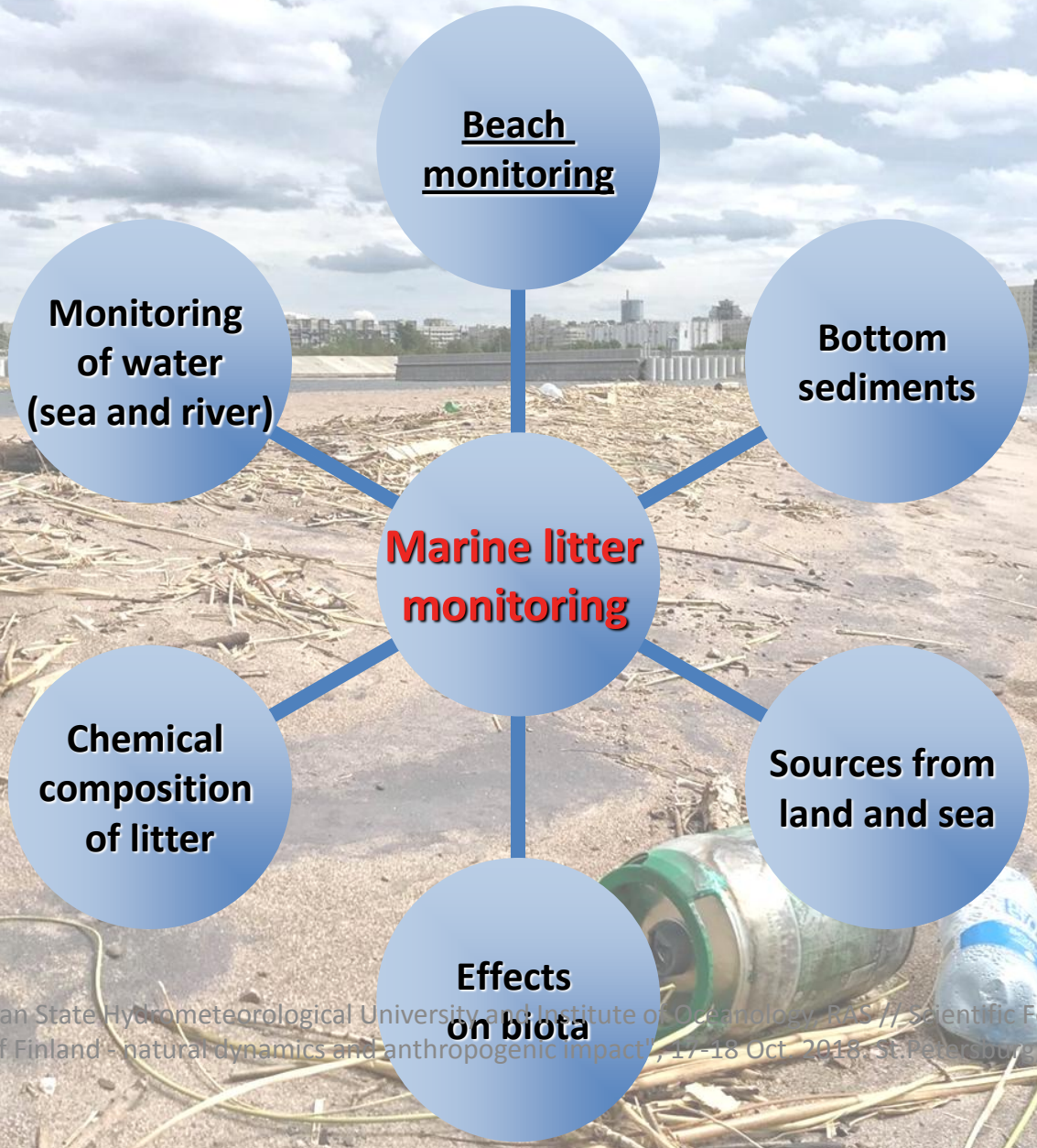
Future perspectives



Thank you!