

## **Marine litter shoreline clean-up in Norway's arctic regions – extended abstract**

Author: Mr. Odd Gunnar Jørgensen, CEO, NovuMare AS **Contact: [ogj@novumare.no](mailto:ogj@novumare.no)**

Since March 2021 NovuMare have been working with collecting plastic pollution and marine litter on the western coast and arctic regions of Norway.

The work is funded by Norwegian Retailer's Environment Fund which has an ambition of cleaning 40% of the remote and outer coastline of Norway and Svalbard Island before end 2023.

NovuMare has so far been assigned with areas in 4 counties: Vestland, Rogaland and Agder, all on the western and southwestern coast, and Finnmark in Arctic Norway. The areas in Finnmark totals approx. 1100km.

We were assigned areas in Finnmark in early July 2021 and started working in mid-August. We halted the operations in late September due to harsh weather conditions. 6 weeks of operations resulted in approx. 25 metric tonnes (and 150m<sup>3</sup>) collected marine litter. We plan to start up the operations again end May 2022.

**Working in arctic regions of Norway** brings some unique challenges to the table, especially keeping in mind that our team is working in the most exposed outer area of the coast; the transition between land/shoreline and the sea.

These areas, bordering the Norwegian Sea and the Barents Ocean, are notoriously known for harsh weather conditions, cold, waves and wind. And even though our working season is from May to September, we can still counter fierce conditions. We therefore have performed a very thorough and detailed risk assessment before starting the work. And of course, follow-up during the season.

The findings in the assessment were translated to risk mitigation measures and risk understanding. We gather the team on board, and conduct a thorough run-through of the analysis, findings, and how we work to reduce the operational risk for the team members. Including appropriate work clothing, PPU, First Aid training, various equipment, and others. The paper will detail this process.

Our ambition was always to support a continuous operation. We have established a 14 days on/14 days off-rotation for the 2 teams. Each team consists of 7 persons, 2 of them being the vessel crew (Captain and engineer/able body). We have one of our own employees as foreman on board, so we needed 2 x 4 operators to complete the teams.

Recruiting the right operators is also an interesting task. Indeed, the interest in joining this work has been surprisingly high, many very well qualified individuals has voiced their interest. However, as the teams are living in very closed quarters for a fortnight at the time, we have put a lot of effort in composing well-functioning teams that can thrive together and motivate each other. The hours are long, and the work is physically hard, it is vital that the team functions well otherwise it can easily be counterproductive. The paper will address the recruiting process.

Another interesting challenge is the vast distances involved that is stretching the project when it comes to safe operations, waste storing and handling on board, unloading waste, personnel facilities, general provisions, etc.

For example, our “logistics” harbour for crew change, bunkering, loading provisions, unloading containers with waste, and loading empty ones, is 50 nautical miles to the north of our southernmost area, and 70 nautical miles to the south of our northernmost area. The vessel we have contracted for the work is travelling at 8-9 knots, so good planning is essential. We do not want to waste time transiting unnecessarily from A to B.

The paper will go more into detail on this.

It is also vital that the operation is autonomous as far as possible, and that we can have an undisturbed operation for several days or even weeks. Thus, we needed a vessel with cabins for the operators and crew. The cabins needed to have individual toilets and showers. The vessel needs a well-equipped galley and mess room. All to keep the operators motivated.

In addition, we wanted generous deck/cargo space, minimum 1 hydraulic crane and sufficient freshwater/greywater/bunker capacity to keep the operation going unsupported.

The paper will address more on how we defined necessary capacities and narrowed down potential vessels.

During the operations we are documenting our progress as we move forward, close to real-time. Our client has designed a web-portal where we report and document every step of the way, including area covered and collected litter (an estimate, later corrected when weighed numbers arrive from the waste handling facility).

Here we also keep track on our real progress measured against our plan. For the weeks in 2021 we see that we are cleaning approx. 3km/day. And we have collected approx. 200kg of litter per kilometre. We cannot keep up with the planned speed, but we are finding a lot more litter than what was expected.

The paper will elaborate this in more detail + we will have some weeks of operations in 2022 to analyse.

If we are accepted to deliver a paper, we would like to further detail the following (not complete) bullet points:

- How the project came about, the story behind the Norwegian Retailer’s Environment Fund, and their ambitions with the project.
- NovuMares approach to the RFQ, how our prior experience with OSR was important and relevant.
- After winning the project;
  - Planning
  - Inspection and assessment
  - Resources
  - Personnel
  - Vessels
  - Equipment
  - Sub-contractors
  - Safety for operators
  - Wildlife and environmentally sensitive areas
  - Communication with client
  - Establishing check lists, procedures, and routines
  - Reporting and documentation

- What do we find on the beaches and the shoreline? Where does it come from, who's the culprit?
- How much do we find? Weight, volume and size, and degree of weathering.

This work brings a lot of the same challenges to the table as an oil spill response and beach cleaning operation; logistics, HSE-issues, dangerous substances, vessels, equipment, personnel, competence, management, assessment techniques, reporting, wildlife, media attention, waste handling, and others.

Our paper aims to present and visualize the specific challenges in this work, fundings, effectiveness, lessons learned, and the way forward in the project.

