

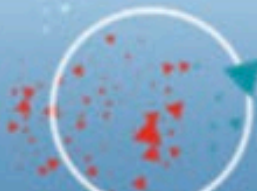


Norwegian
Environment
Agency

Environmental monitoring of plastics in Norway

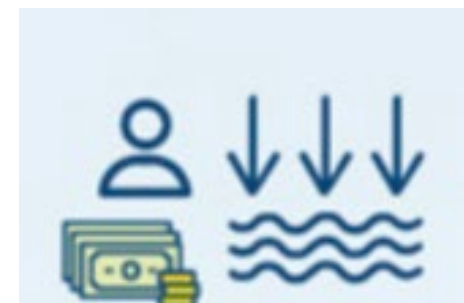
Inger Lise Nerland Bråte, Section for Waste and Contaminated soil

Norwegian Plastics Strategy



Key principles

- **Science-based approach.** Decisions affecting the environment should be based on the best available knowledge. A science-based approach to policymaking will ensure better decision and democratic processes.
- **Precautionary principle.** Where there is risk of harm or irreversible damage to the environment, interventions should not be delayed even if existing scientific knowledge is lacking.
- **Polluter pays.** Polluter pays principle state that those who produce the pollution should bear the cost of managing it and to prevent damage to human health or the environment.





Why do we need monitoring data?



To understand the extent of the problem and to implement effective measures such as regulations, guidelines, and action plans and follow our obligations to reduce plastic pollution

- UN Sustainable Development Goals (SDG)
- The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- The Regulation on the registration, evaluation, authorisation and restriction of chemicals (REACH)
- Regional Action Plan on Marine Litter in the Arctic (PAME)
- Upcoming UN Treaty
- National laws and regulations



Guidelines/manuals



- **SDG 14.1.1b indicator**
- Arctic Monitoring and Assessment Programme (**AMAP**)
- **OSPAR guidelines**
- **“Joint list”** - The Joint List of Litter Categories for Macrolitter Monitoring by the MSFD Technical Group on Marine Litter (MSFD TG ML)
- UN Group of Experts on the Scientific Aspects of Marine Environmental Protection (**GESAMP**)
- ...



Indicator SDG 14.1.1b



- **Plastic debris density:** “..measurement of plastics washed onto **beaches or shorelines, floating on the water or in the water column, deposited on the seafloor/seabed**, as well as **ingested by biota..**”
- Two mandatory levels
 - Level 1:** Global Data Products (globally available data from earth observations and modelling)
 - Level 2:** National Data, which are collected from countries (through the relevant Regional Seas Program)

Table 2: Monitoring parameters for marine plastic litter to track progress against SDG Indicator 14.1.1b.

Monitoring parameters (and methods)	Level 1	Level 2
Plastic patches greater than 10 meters*	X	
Beach litter originating from national land-based sources	X	
Beach litter (beach surveys)		X
Floating plastics (visual observation, manta trawls)		X
Water column plastics (demersal trawls)		X
Seafloor litter (benthic trawls (e.g. fish survey trawls), divers, video/camera tows, submersibles, remotely operated vehicles)		X

AMAP priority recommendations for monitoring

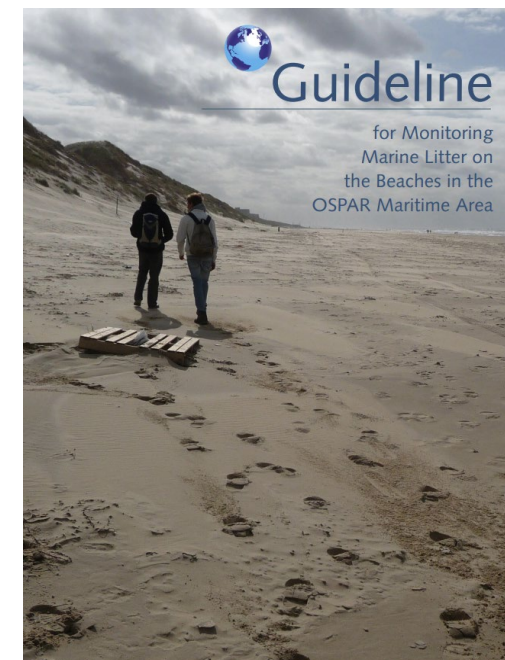
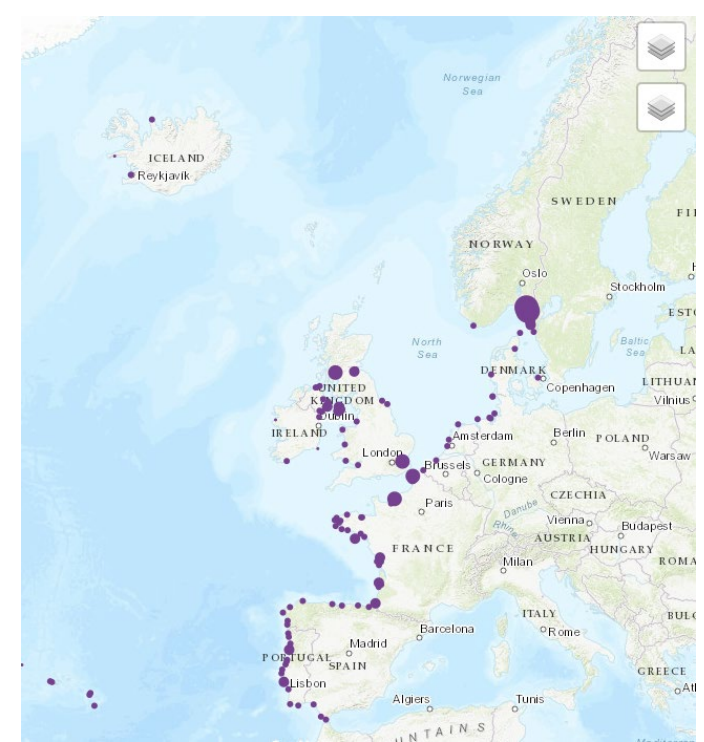
Priority 1 Immediate trend monitoring	Water	Sediments	Beaches/ shorelines	Seabirds
Priority 2 Initial baseline mapping and future trend monitoring	Air	Invertebrates	Fish	
Compartments to be further developed for source/surveillance and effects monitoring	Seabeds	Snow/Ice	Soil	Mammals



Ongoing monitoring

Beach litter

- Reports to OSPAR yearly
- 70 beaches from the North-East Atlantic
- Registration of items per 100 m into ~ 112 categories according to the OSPAR guideline
- Norway monitor 7 beaches (2 at Svalbard)
- Recommendation of 3-4 registrations per year



Guideline
for Monitoring
Marine Litter on
the Beaches in the
OSPAR Maritime Area



MARFO
Norwegian Centre
against Marine Litter

Experiences



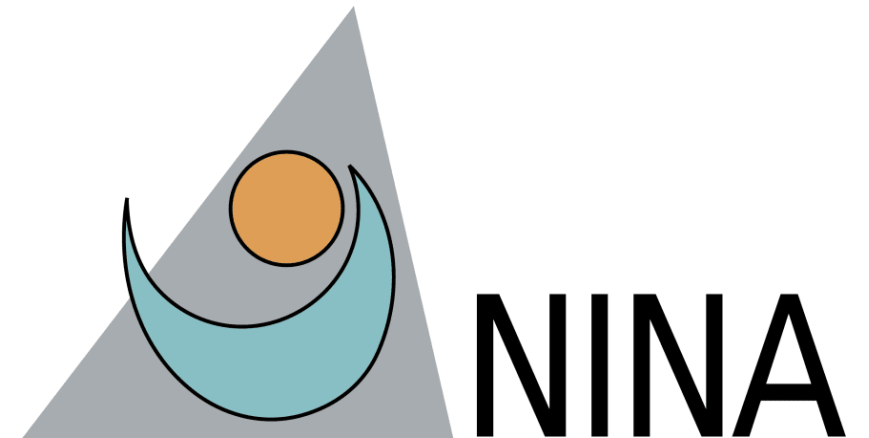
Beach Litter in Norway © Bo Eide

- Most of the litter is plastic based
- Differences between beaches:
 - Further south → *“Unrecognizable pieces of plastic smaller than 2,5 cm”* and consumables
 - more from fisheries further north (incl. Svalbard)
- Litter is likely to be from sea areas close to Norway, such as the North Sea, Barents sea, Skagerrak and Baltic Sea
- Issues with registration frequencies. Will increase frequencies to at least 3 registrations where possible
- Will increase from 7 to 13 beaches
- Accumulated litter of influx due to low frequencies?
- Challenges with source identification



Northern fulmars

- Plastics in stomachs of dead fulmars
- Registration of plastics larger than ~ 2mm
- Started in 2002, managed by NINA
- A total of 133 individuals from southern Norway (Rogaland)
- Ecological Quality Objectives (EcoQO) threshold: > 0.1 g of plastic. Goal that less than 10% of individuals have levels above EcoQO
- Represents both floating plastics and ingestion by biota
- Reports to OSPAR



Experiences

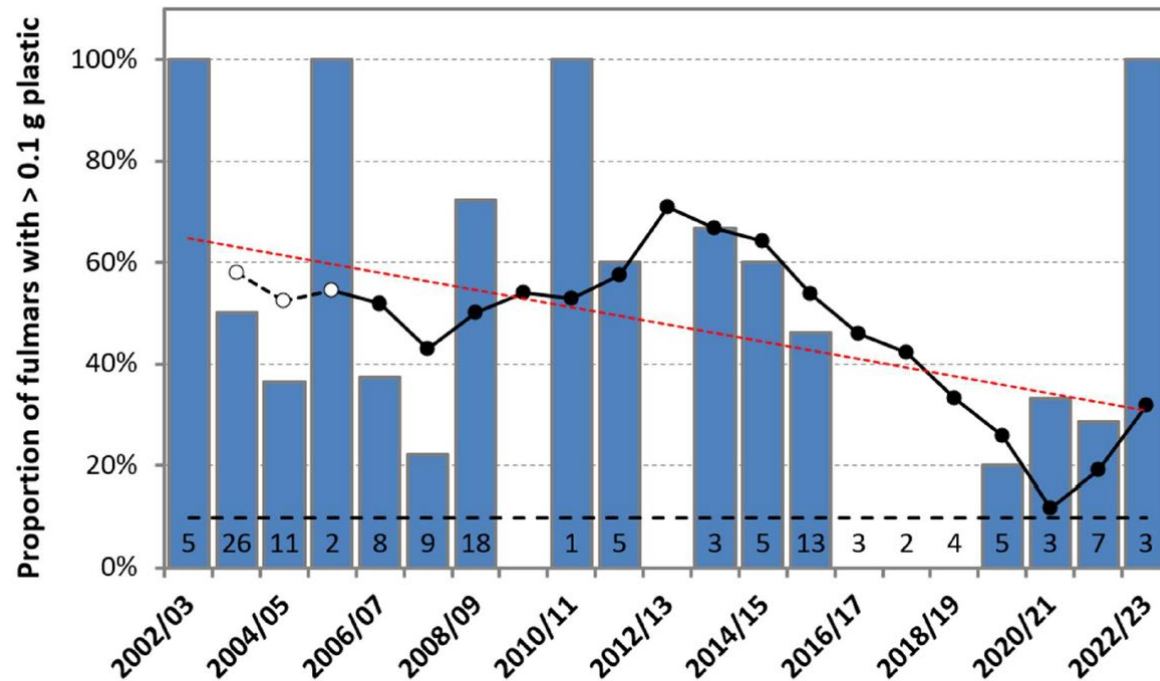


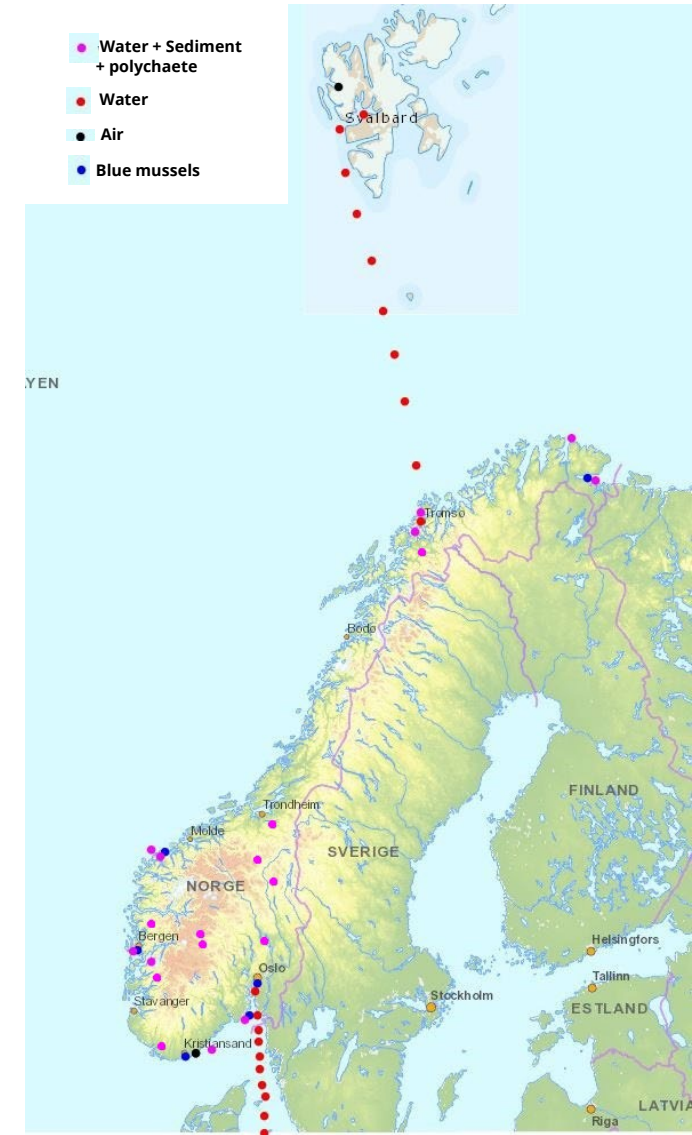
Figure 1. Proportions of fulmars with more than 0.1 g plastic in their stomach, among those found dead on beaches in South Norway in 2002-2021. The EcoQO threshold level (black dashed line) and annual sample sizes are indicated. The black line and scatter plot shows the 5-year running mean centred over the last year in each period. The red dashed line indicates the long-term trend over the entire study period.

- Around 50% of the birds in southern Norway for all years exceed the EcoQO threshold
- A possible downward trend, but must be interpreted with caution!
- Need to increase the number of individuals
 - By-catch from fisheries improves the data, but is not in accordance with the guideline
- Ongoing Research and Development (R&D) projects on
 - other none-invasive methods (ultrasound etc.)
 - Alternative seabirds (e.g. kittiwake)



Microplastics monitoring program

- [Microplastics in Norwegian coastal areas, rivers, lakes and air \(MIKRONOR\)](#)
- Microplastics between 50 μm to 5 mm (incl. pyrolysis)
- Using pre-existing monitoring programs to collect samples
- Started in 2021, ~ 4 MNOK yearly, performed by NIVA
- Levels and types of microplastic in water, sediment, biota and air - freshwater and marine
- Differences between geographical areas over time
- Gather experience for future monitoring
- Reports to ICES dome and the national database "Vannmiljø"





Experiences

- Broad approach to gather experience from many matrices and sampling techniques for further monitoring
- Cost-efficient to use established programs to gather samples, but requires effort to coordinate across monitoring programs and may lead to contamination
- Relative low levels in water samples from vertical plankton net samples (50 to 0 meters), near detection limits and issues with background contamination
- Higher levels in air from southern Norway (Agder) compared to Svalbard (Zeppelin-observatory)
- Report published later in 2023
- Many questions; Which matrices to include? Replication? Sample equipment and volumes? Frequencies? Analysis? ++ → Being evaluated based on current experiences and latest R&D

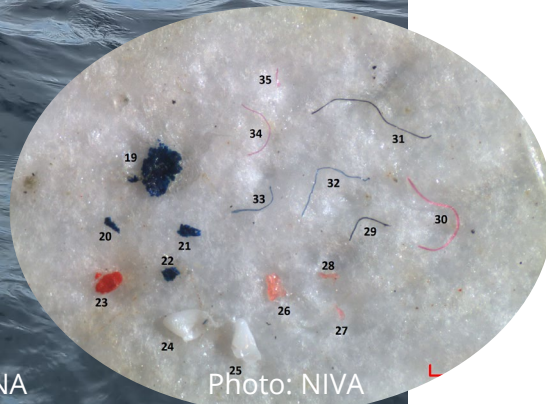


Photo: NINA

Photo: NINA



Other data sources

- Waste statistics from Statistics Norway (SSB)
- Fishing for Litter data
- Directorate of Fisheries yearly clean-up expeditions of lost and abandoned fishing gear
- Litter on the seabed through the MAREANO program
- Keep Norway beautiful
- National cleaning portal - Rydde.no
- Several research activates and projects



Statistisk sentralbyrå
Statistics Norway



MARFO
Senter mot marin forurensning



DIRECTORATE OF FISHERIES



mareano
samler kunnskap om havet

**HOLD
NORGE
RENT**



Summary and way forward

- Monitoring is important to implement effective measures against plastic pollution and to follow our obligations to reduce plastic pollution – e.g. polluter pay principle
- Monitoring data is valuable for stakeholders, but challenges remains e.g. related to source identification and risk assessment
- Norway monitor plastics through beach litter and ingestion by Northern fulmars - reports to OSPAR
- Improvements by increasing the number of beaches incl. frequencies for registrations, as well as increasing the number of Northern fulmars individuals
- Sector cooperation to ensure harmonized monitoring
- Norway has an ongoing monitoring program for microplastics that are used to gather experiences for further monitoring





Thank you!

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