

NRPA Bulletin

The marine surveillance programme and sources of radioactive pollution

In 1993 the NRPA, financed by the Norwegian Ministry of Fisheries, initialised a systematic monitoring of Norwegian fish, as a response to available information regarding radioactive sources and potential pollution of the Northern Seas. This monitoring was extended to a marine surveillance programme in 1999, financed by the Norwegian Ministry of Environment. The purpose of the programme is to monitor trends in radioactive pollution of water, sediments, fish and other important marine species. Results from the surveillance programme are published in several NRPA reports.

In collaboration with the Norwegian Directorate of Fisheries and The Norwegian Food Control Authority, NRPA is monitoring the level of radioactivity in fish.

The Norwegian Directorate of Fisheries has a routine surveillance programme where 25 fish samples are collected each month. Samples are taken by the Norwegian Directorate of Fisheries' control in Tromsø.

The Norwegian Food Control Authority started the project "Identification and monitoring of radioactivity in salt-water fish from the northern areas" in 1993. Each year at regular intervals, samples of fish are collected along the Norwegian coast, the fishing grounds and in the Barents Sea. In all, 188 samples of fish and shrimps have been collected during the period 1993-1999. The Food Control Authorities in Salten, Tromsø, Hammerfest and East-Finnmark participate in the collection of samples and subsequent analysis. Measurements are mainly performed on cod, but samples of haddock, coalfish, herring, salmon, shrimps, smaller catfish, turbot, plaice and bream are also taken. The preliminary results show that the average level of caesium-137 is below 1 becquerel per kilo fresh fish (SNT-report 1-2000, NRPA report 1999:6). The intervention level of caesium-137 in food stuff is 600 becquerels per kilo.

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monitoring of Norwegian fish, as a response to available information regarding radioactive sources and potential pollution of the Northern Seas. This monitoring was extended to a marine surveillance programme in 1999, with additional finances from the Norwegian Ministry of Environment. The purpose of the programme is to monitor trends in radioactive pollution of water, sediments, fish and other important marine species. Results from the surveillance programme are published in NRPA reports (1995:1, 1997:3, 1999:6).



Figure 1: Overview of sea water, sediment and fish samples analysed for radioactive pollution. Sources: AMAP and NRPA.

The concentration of radionuclides in fish is to a large degree proportional to the concentration in the water. The highest concentrations of caesium-137 can be found in whiting and cod from Skagerrak with a level of around 1

bequerel per kilo fresh fish. The concentration in sea water and fish decreases to the north. Typical Arctic fish have a caesium-137 concentration of less than 1 bequerel per kilo.

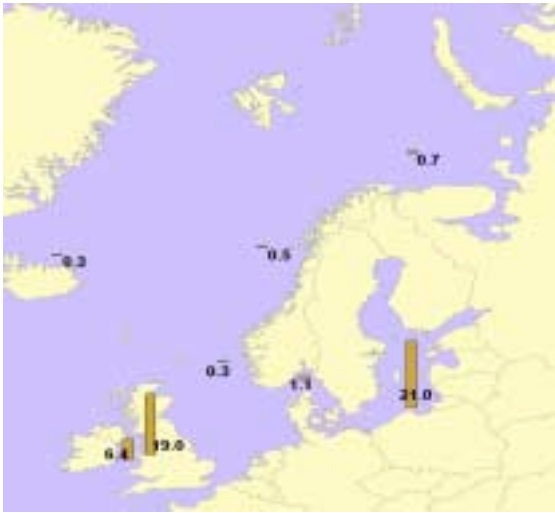


Figure 2: Concentration of caesium-137 in fish from different areas. Numbers given in bequerels per kilo fresh fish.

Table 1: Measurements on different species of fish

Fish species	Location	caesium-137 (Bq/kg)
Cod	Barents Sea	0.2-0.5
Saithe	Barents Sea	0.3-0.4
Cod	Norwegian Sea	0.2-0.7
Saithe	Norwegian Sea	0.4-0.6
Haddock	Norwegian Sea	0.3-0.6
Cusk	Norwegian Sea	0.4-0.8
Salmon	Norwegian Sea	0.8
Saithe	North Sea	0.1-0.4
Haddock	North Sea	0.1-0.2
Mackerel	North Sea	0.1-0.4
Cod	Skagerrak	1.0-1.1
Whiting	Skagerrak	1.2
Plaice	Skagerrak	0.5

The most important sources of radioactive pollution in the northern oceans are fallout from nuclear weapons tests conducted in the 50ies and 60ies, discharges from Sellafield in UK, and fallout from the Chernobyl accident.

The Kursk submarine

Saturday 12th of August 2000, a Russian submarine sunk in international waters northeast of Kola Peninsula. In collaboration with the Norwegian Defence, NRPA carried out measurements on sea water samples taken

near the submarine and in the surrounding area. Analyses of air filters, sea water and sediment carried out up to now, show no traces of radioactivity from the reactors on board Kursk. According to official Russian information, there are no nuclear weapons on board Kursk.

Several model calculations for the spreading of a potential radioactive leakage have also been conducted.

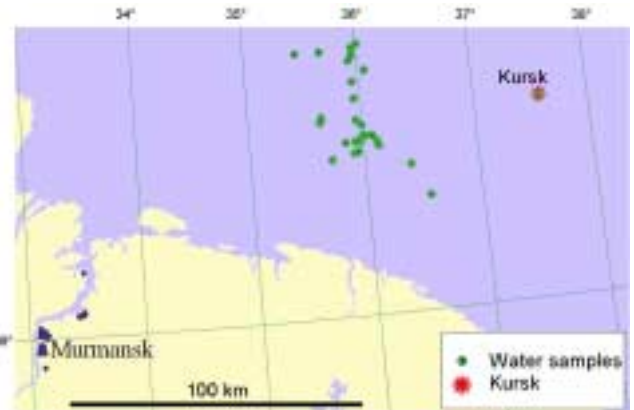


Figure 3: Overview of water samples taken during the first days after the accident (August 14th-20th).

Through the existing monitoring programmes, a good overview exists in relation to the presence and levels of radioactive substances in the Barents Sea and the sources contributing to those levels. In general, fish from the Barents Sea contain very little radioactivity. The monitoring must now be adjusted to allow the rapid detection of potential leakages from the sunken submarine Kursk.

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