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Survey report

from the joint Norwegian/Russian ecosystem Survey in the Barents Sea and adjacent waters, August – October 2013

Editor: Tatiana Prokhorova
Polar Research Institute of Marine Fisheries and Oceanography

Institute of Marine Research - IMR

Polar Research Institute of Marine Fisheries and Oceanography - PINRO

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from the joint Norwegian/Russian ecosystem Survey in the Barents Sea and adjacent waters, August – October 2013

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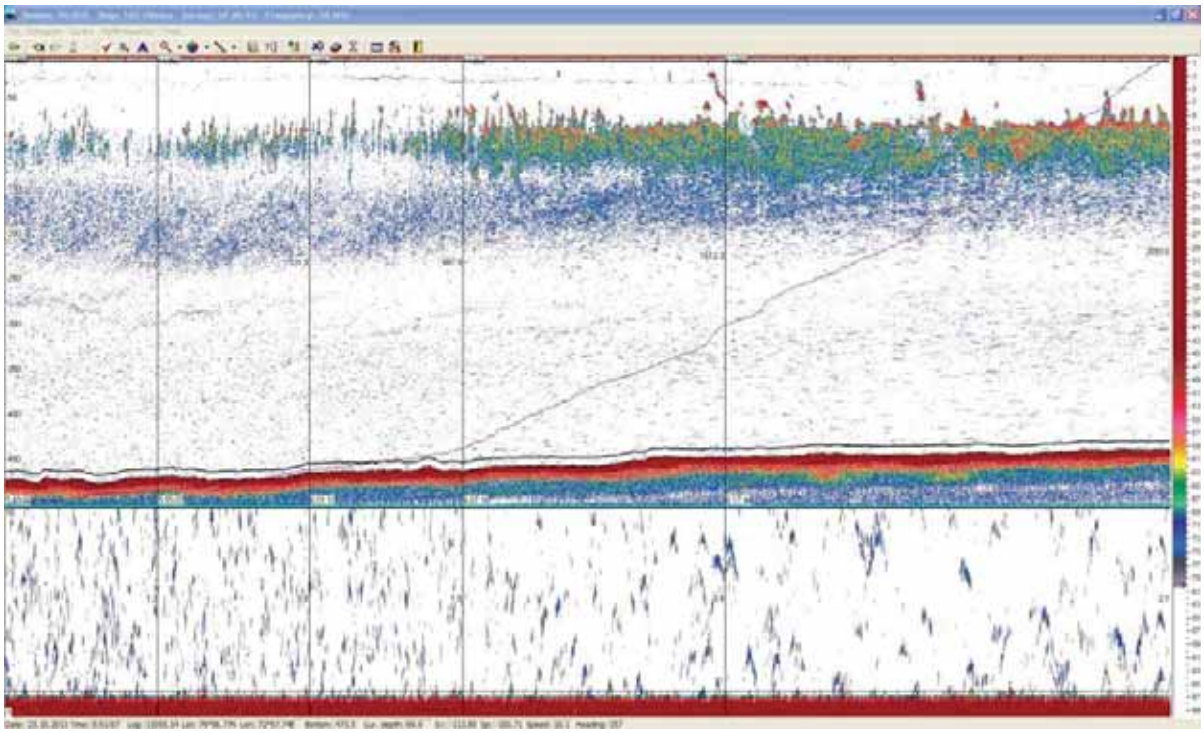
Authors in alphabetical order:
Aasen, A., Alvarez, J., Dalpadado, P., Dolgov, A., Engås, A., Eriksen, E., Fosså, J.H., Gjøsæter, H., Ingvaldsen, R., Johannesen, E., Jørgensen, L.L., Klepikosky, R., Knutsen, T., Krivosheya, P., Lubin, P., Mashnin, A., Mauritzen, M., Nesterova, V., Orlova, E., Pavlenko, A., Prokhorova, T., Prokopchuk, I., Prozorkevich, D., Rønning, J., Trofimov, A., Wenneck, T., Øvredal, J.T.



Mixed concentration of the Barents Sea capelin and polar cod (79°57'N 72°58'E, 23 October 2013). The World has changed…

Murmansk, December 2013

Polar research Institute of Marine Fisheries and Oceanography (PINRO)

HAVFORSKNINGSINSTITUTTET
INSTITUTE OF MARINE RESEARCH

Content

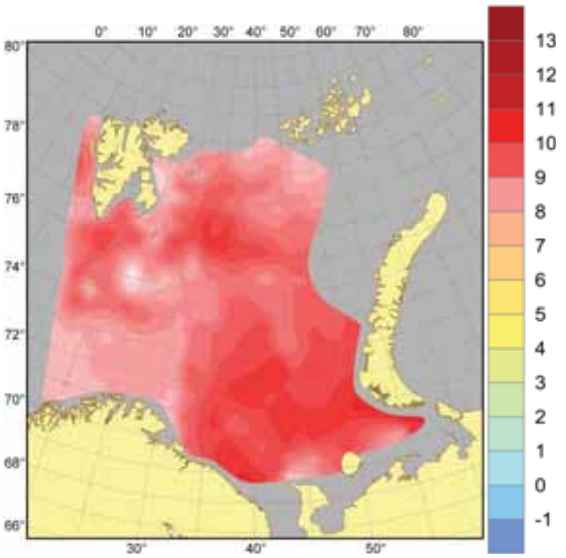


Figure 3.1.10. Surface temperature anomalies (°C), August–September 2013

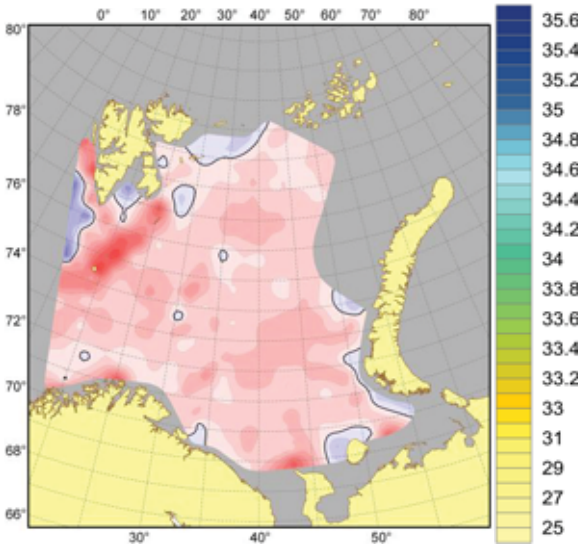


Figure 3.1.11. Temperature anomalies (°C) at the bottom, August–September 2013

3.2 Pollution

3.2.1 Anthropogenic matter

Text by T. Prokhorova
Figures by P. Krivosheya

As in the previous years, surface investigations and trawl catches demonstrated that the areas of intensive fishery and navigation were the most polluted.

Plastic prevailed among floating man-made garbage and distributed along the main currents (Figure 3.2.1.1). These pollutants were probably brought into the Barents Sea by ocean currents. So, the main plastic concentration in the surveyed area was observed between 69° and 74°N and between 25° and 45°E – the area being under the influence of the North Cape and Murman Currents. Plastic might be brought further northwards and eastwards by the Novaya Zemlya and Kolguev-Pechora Currents. Floating timbers were observed in all investigated areas. Metal, rubber and paper were observed among floating garbage sporadically.

As in 2010-2012, plastic prevailed among man-made garbage in trawl catches (Figure 3.2.1.2). Matter was observed in bottom trawls more frequently than in pelagic trawls, where garbage occurred mainly in the central Barents Sea. Moreover, pelagic trawl catchability is low for small density polymer materials so the amount of the anthropogenic garbage in the Barents Sea may be larger than that observed.

The occurrence of plastic in the bottom trawl catches increased in the northwest and southeast, which correspond to the directions of the main currents. It should be noted that a small amount of plastic was in trawls in the northeast, where wood prevailed. The wood might be brought to the area by ocean currents from the eastern seas because of the timber-rafting

from the Siberian rivers, as well as it might be lost from ships. The wood was also observed in the southwest Barents Sea. This phenomenon is observed annually.

Other types of anthropogenic matter (metal, paper, rubber, textile, glass) were observed in the trawl catches sporadically.

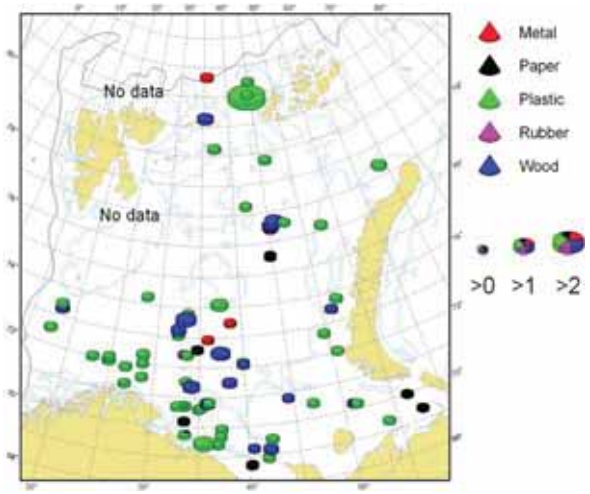


Figure 3.2.1.1. Type of observed anthropogenic matter (m3) at the surface in the Barents Sea in 2013.

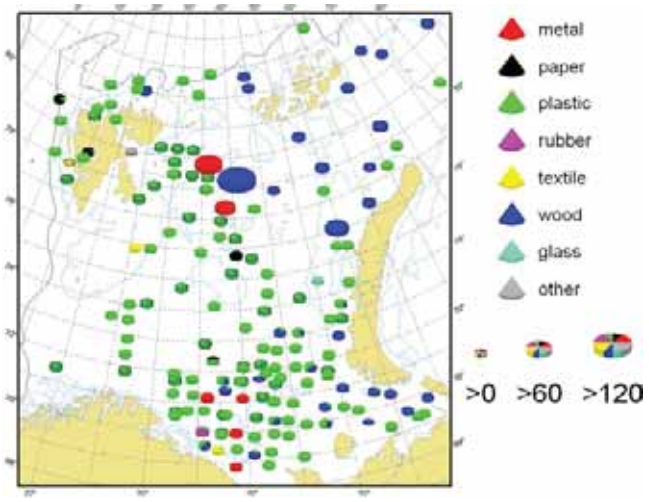


Figure 3.2.1.2. Types of garbage collected in the pelagic and bottom trawls (g) in the Barents Sea in 2013. Legend: symbols with contours show garbage in pelagic trawls, symbols without contours show garbage in bottom trawls.

Potential dangerous for the environment objects were seldom presented in the observations (Figure 3.2.1.3). In the majority of cases only inactive objects were found, which do not effect on the environment directly harmful. On the other hand, big lumps of threads, lines and nets, which might be dangerous for sea organisms, were found (Figures 3.2.1.4, 3.2.1.5).

Figure 3.2.1.3. Potential dangerous for the environment objects were seldom presented.

Figure 3.2.1.4. Lump of thread which cod was tangled in.

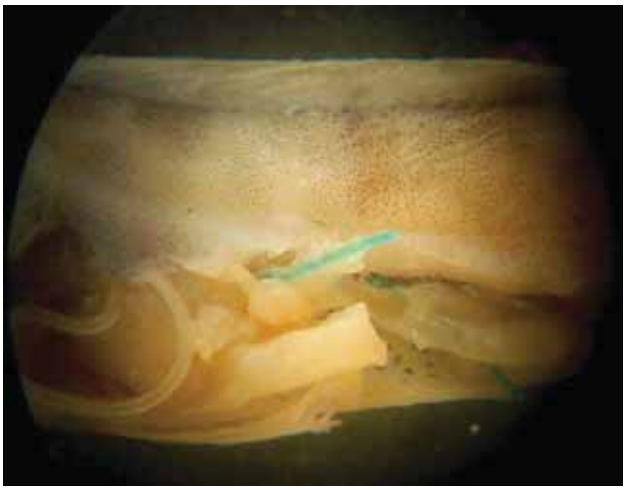


Figure 3.2.1.5. Fishing line in the intestines of 0-group Atlantic wolfish.

4 Monitoring the plankton community

4.1 Zooplankton

4.1.1 Calanus composition at the Fufløya-Bear Island (FB) transect

Text and figures by P. Dalpadado and J. Rønning

The stations in the FB transect are taken at fixed positions located at the western entrance to the Barents Sea. The numbers of sampled stations are normally 5 to 8 depending on weather conditions. In this report, four stations, representing different water masses (coastal; Atlantic; and mixed Atlantic/Arctic Water) from 1995 to 2012, have been analyzed for species composition of the two most abundant species C. finmarchicus, and C. glacialis.

C. helgolandicus is quite similar in appearance especially to C. finmarchicus, but is a more southerly species with a different spawning period. C. helgolandicus has in recent years become more frequent in the North Sea and southern parts of the Norwegian Sea (Svinøy transect), and it is expected that it could potentially increase its abundance in the western part of the Barents Sea in the years to come. Results so far seem to indicate that the abundance of C. helgolandicus at the western entrance to the Barents Sea is rather low and has remained more or less unchanged during the study period (not shown).

Though C. finmarchicus display inter-annual variations in abundance, comparison of abundance during three periods shows that there no marked changes in abundance over time (Figure 4.1.1.1, Table 4.1.1.1). The highest abundances of C. finmarchicus were recorded in 2010 over the whole transect except for the northernmost locality at 74º00’N, where the abundance was considerably lower (Figure 4.1.1.2). On average over all years since 2004, it is the locality at 73º30’N that shows the highest number of individuals. As expected C. glacialis has its highest abundance at the two northernmost stations, localities that are typical of a mixture of Atlantic and Arctic waters. The highest mean abundance (ca 15000 no.m-2) was observed for the year 1997(not shown). The most stable occurrence and the highest average abundance are found at the northernmost locality a 74º00’N having a mixture of Atlantic and