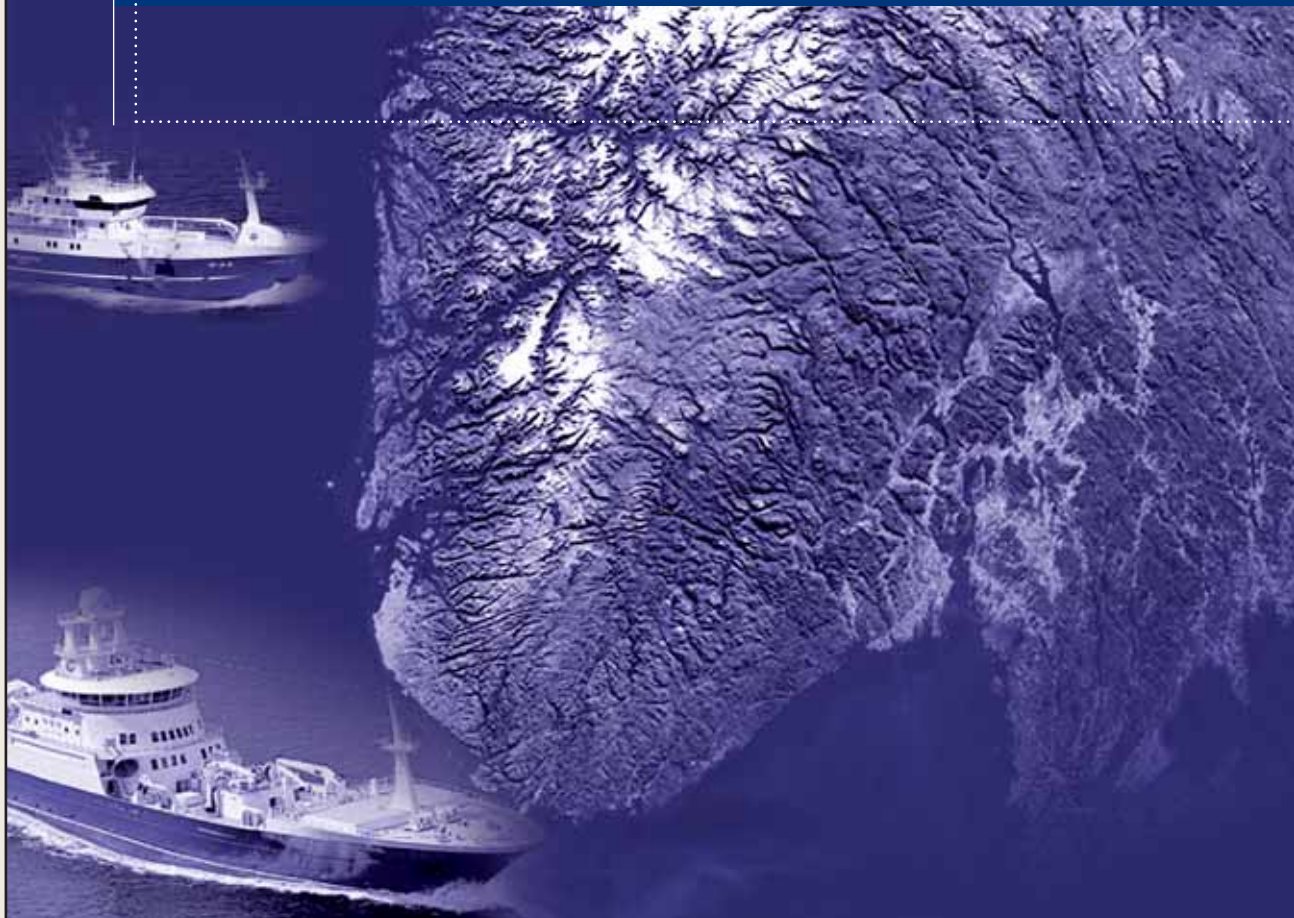




THE INSTITUTE OF MARINE RESEARCH'S REFERENCE FLEET PROGRAM

– Trust based co-operation between fishermen and scientists



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It is very important that research scientists who give advise on fisheries management issues have sound knowledge about the different fisheries; how and where the different fleets operate during the season, and what and how they fish. It is especially important to know how each age group is harvested since this is basic and necessary input data for many of the assessment models currently used to estimate fish stock sizes.

The Institute of Marine Research has always had a close and good co-operation with fishermen and the fishing industry. These contact and information flows have occurred by having institute personnel collect scientific samples on board fishing vessel or at ports, and on board commercial fishing vessels chartered for conducting scientific research surveys. A disadvantage of this method of data collection is that sampling is opportunistic. The Reference Fleet is a rather new project that aims to improve data collection and information flows both from and to the fishermen.

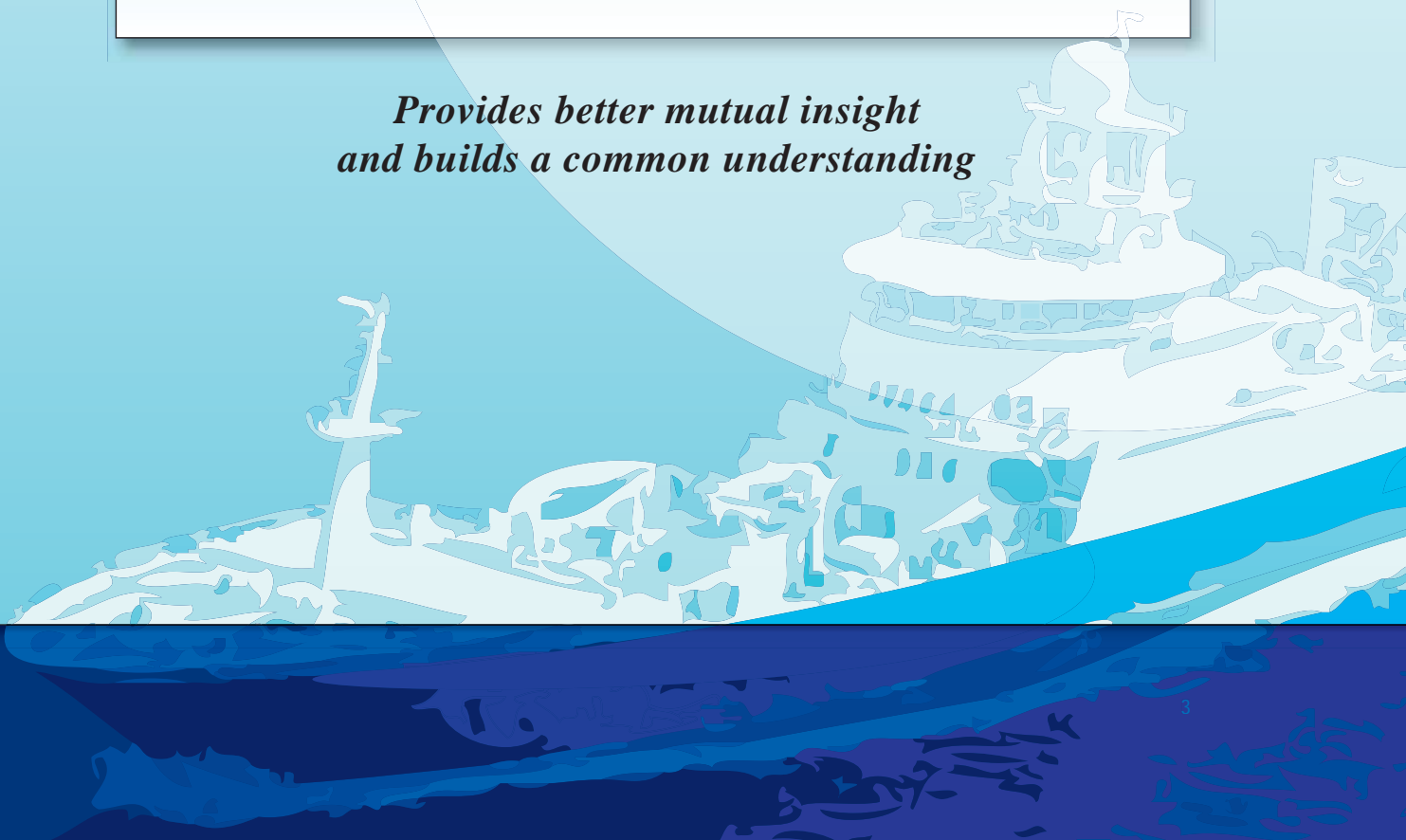


WHAT IS THE REFERENCE FLEET?

The Reference Fleet is a small group of Norwegian fishing vessels that are paid to provide the Institute of Marine Research (IMR) with detailed information about their fishing activity and catches on a regular basis. The sampling and data management procedures are similar to the system used on board IMR's research vessels.

A high-seas Reference Fleet was established in 2000 and consists at present (2007) of 16 vessels (see illustration). In autumn 2005 a similar coastal Reference Fleet was established along the entire Norwegian Coast from Varanger to Oslofjord. Presently this fleet is composed of 18 vessels (8-16 m long). The administration and work done by the Reference Fleet is self-financed by the allocation of a minor part of the Norwegian fish quotas for research purposes. In 2006, the running costs of the Reference Fleet was financed by catching and selling 800 tons of cod, 500 tons of Greenland halibut, 600 tons of Norwegian spring spawning herring, and 700 tons of mackerel. The research catch is sold in the name of the IMR in accordance with strict procedures set by the Norwegian fishing authorities. It was agreed that 60% of the value of this research catch is immediately paid back to the fishermen to cover the vessel's expenses in catching, producing and selling the fish. The other 40% covers the administration costs, and payment to the fishermen to take biological samples and data deliveries.

*Provides better mutual insight
and builds a common understanding*





Prestfjord – Bottom trawl



K.Arctander – Bottom trawl



Utflesa – Purse seine



Geir – Longline



Skagøysund – Danish seinel/
purse seine



Varegg – Bottom trawl



Nybo – Purse seine



Atlantic – Longline



Kato – Gillnet



Skjongholm – Gillnet



Hauge Senior – Longline



Libas – Pelagic
trawl/purse seine



Leinebris – Longline/gillnet



Hargun – Pelagic
trawl/purse seine



Nesebuen – Gillnet



Cetus – Industrial trawl



THE HIGH SEAS REFERENCE FLEET 2007

Name	Owner	Address	Vessel length (m)	Reg. no	Call sign	Gear
Atlantic	Atlantic Longline AS	Måløy	44,9	SF-9-B	LIVX	Longline
Cetus	Cetus AS	Vedavåg	41,8	R-94-K	LLYM	Industrial trawl
Geir	H.P. Holmeset AS	Vatne	45,6	M-123-H	LJPZ	Longline
Hargun	KS Hargun	Lepsøy	68,1	H-1-0	LJVB	Pelagic trawl/purse seine
Hauge Senior	Hauge & Hauge AS	Gursken	43,2	M-6-S	LJQG	Longline
K. Arctander	Nordland Havfiske	Stamsund	53,1	N-7-W	LHMF	Bottom trawl
Kato	Partrederiet Kato ANS	Myklebost	38,2	M-192-SØ	LLJC	Gillnet
Leinebris	Leinebris AS	Fosnavåg	44,8	M-505-HØ	LIWR	Longline/gillnet
Libas	Libas AS v/Liegruppen AS	Straume	94,0	H-5-F	LMQI	Pelagic trawl/purse seine
Nesebuen	Nesefisk AS	Sprangereid	27,9	VA-90-LS	LDUR	Gillnet
Nybo	Nybo Holding AS	Midsund	69,5	M-56-MD	LJBD	Purse seine
Prestfjord	Prestfjord AS	Sortland	56,9	N-200-Ø	JXNA	Bottom trawl
Skagøysund	Skagøysund AS	Sommarøy	27,5	T-23-T	LMUR	Danish seine/purse seine
Skjongholm	Skjongholm AS	Barekstad	26,6	SF-13-F	JWZZ	Gillnet
Utflesa	Utflesa Kystfiske AS	Leines	21,3	N-505-SG	LLOX	Purse seine
Varegg	AS Varegg c/o Vartdal Fiskeriselskap AS	Ålesund	62,9	M-11-VD	LAOW	Bottom trawl



Gullholmen



Thor-Arild



Stein Jimmy



Odd Yngve



Snarsetværing



Vågøybuen



Haldorson



Oddson



Nimrod



Tramsegg



Rånes Viking



Haaværbuen



Tom-Robert



Elias



Vesleper



Repsøy



Heimdal



Thema

THE COASTAL REFERENCE FLEET 2007

Name	Owner	Address	Vessel length (m)	Reg. no	Call sign	Gear
Elias	Johannes Rottingen	Lepsøy	10,66	H-68-O	LK6828	Gillnet, purse seine
Gullholmen	Gullholmen AS	Havøysund	14,09	F-300-M	LK5775	Gillnet
Haldorson	Svein Tore Olsen	Lovund	12,44	N-163-L	LK3175	Gillnet, pot
Heimdal	Helge Husevåg	Sand	11,80	R-2-SD	LK4399	Gillnet, pot, trap
Haaværbuen	Haaværbuen DA	Sandøy	10,60	M-30-SØ	LM5498	Gillnet
Snarsetværing	Pr. Br. Olsen Da	Straumsjøen	14,98	N-171-BØ	LK3988	Gillnet
Nimrod	PR Brødrene Hansen ANS	Tranøy	12,34	N-10-HM	LM8020	Gillnet
Odd Yngve	PR Fagertun DA	Vannareid	14,97	T-44-K	LM2864	Gillnet
Oddson	Odd Lam	Varangerbotn	13,15	F-32-N	LK3860	Gillnet, longline, pot
Repsøy	Repsøy AS	Vedavågen	13,72	R-36-K	LM6877	Gillnet, handline
Rånes-Viking	Rolf Rånes	Landegode	12,32	N-300-B	LK5016	Gillnet
Stein Jimmy	Partsrederiet Thevik jr. ANS	Tromvik	14,95	T-98-T	LK3697	Gillnet, longline
Thema	Gunvald Aanensen	Mandal	10,60	VA-147-M	LK5874	Gillnet, handline
Thor-Arild	Skarsvåg Kystfiske AS	Skarsvåg	14,87	F-204-NK	LK2234	Gillnet, Danish seine, pot
Tom-Robert	Jan Ove Larsen	Rognaldsvåg	9,10	SF-47-F	LM7949	Gillnet, pot
Tramsegg	PR Gjetøyfisk	Vevang	12,98	M-20-EE	LK7141	Gillnet
Vesleper	Anders Paulsen	Tjodalyng	9,65	V-26-L	LM7915	Gillnet, pot
Vågøybuen	Tore Vågø	Rørvik	10,66	NT-58-V	LK8734	Gillnet, pot



SAMPLING AND EQUIPMENT

The data are collected and delivered to the IMR according to a contract that secures a proper statistical coverage for a defined number of species in time and by area. Each vessel in the high-seas Reference Fleet is equipped with an electronic fish sampling board (Scantrol), scales, otolith sampling equipment, a PC with specialized software for satellite communication, and other equipment for other research purposes such as genetics, stomach sampling, contaminant loads, and tagging. The smaller vessels in the coastal Reference Fleet have only been equipped with conventional fish-length measuring boards.

IMR personnel instruct the responsible contact persons on each vessel, provide training support, visit the vessels, and update the scientific equipment when necessary.

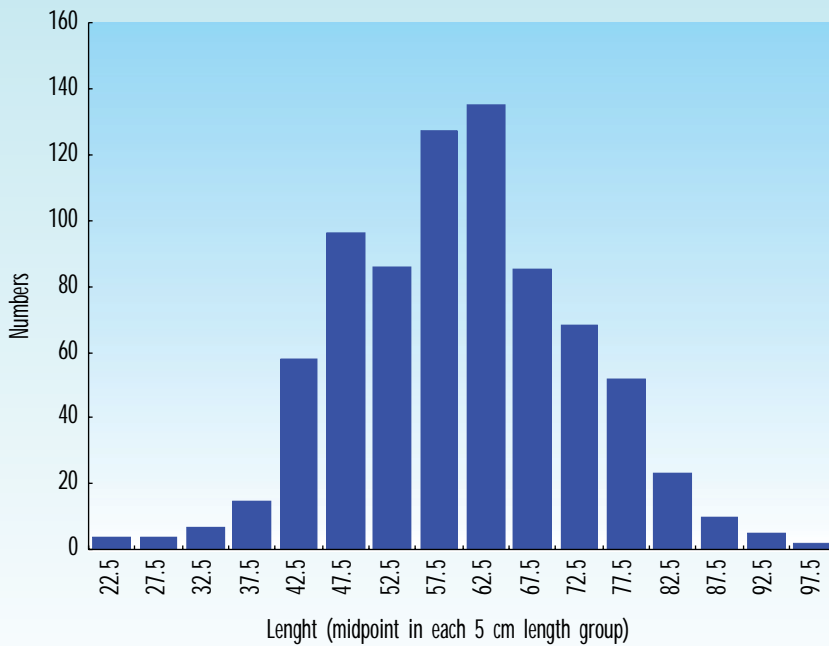
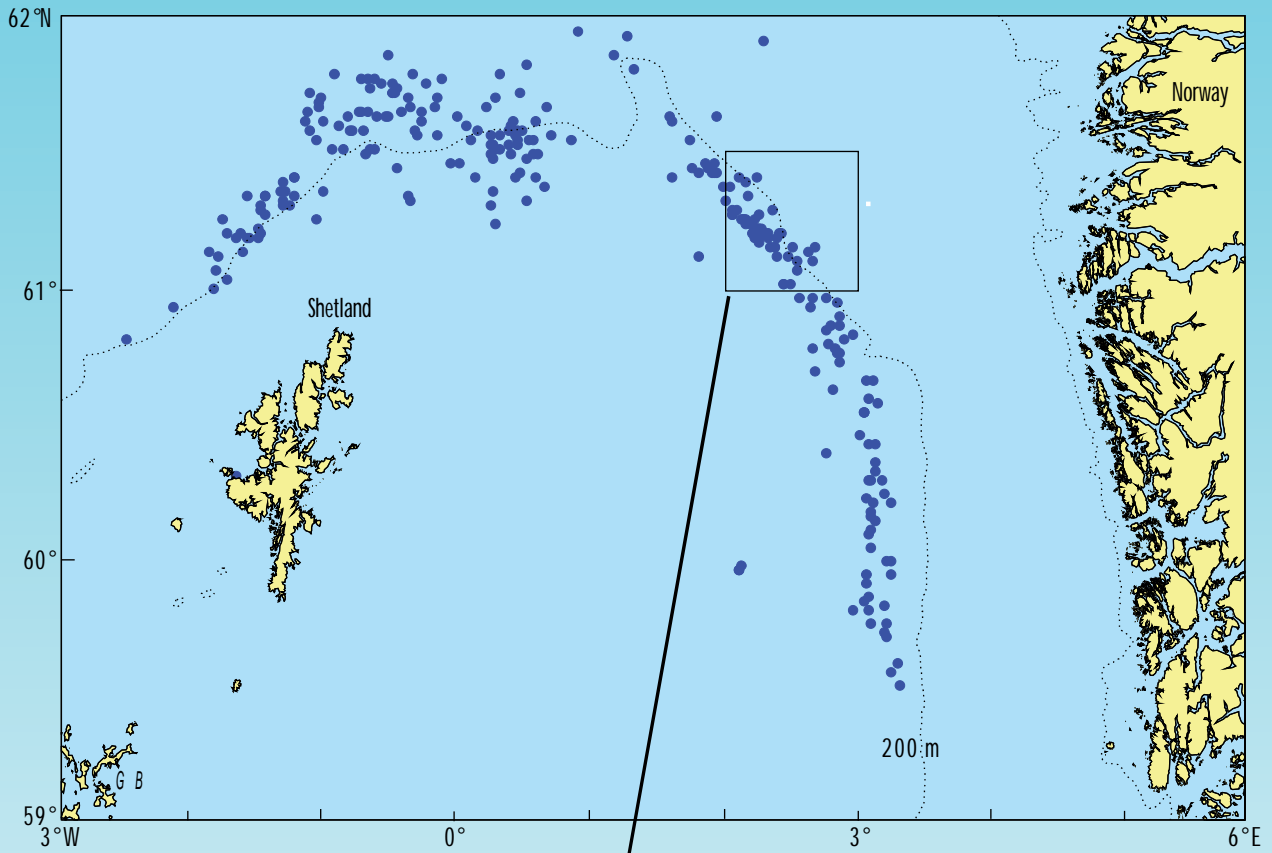
The agreement between IMR and the Reference Fleet includes an obligation for the vessels to record their catch logbooks electronically. Once a day a maximum of 60 individuals of each species (300 shrimp) are length measured. In addition, and upon request, otoliths are collected for age determination. Altogether, up to seven length samples per species per week are collected depending on the fishery.

The data are recorded electronically and transmitted to the IMR via a satellite link together with the electronic logbooks. This information is, after a standard quality check, continuously added to the IMR's research database. There is also a direct e-mail connection between each vessel and the IMR. In addition, the IMR has access to data from the vessel monitoring system (satellite tracking) operated by the Norwegian Directorate of Fisheries. The Reference Fleet may also be requested to make specific observations and collect urgently needed data. The Reference Fleet makes it possible for the IMR to be in the right place at the right time.



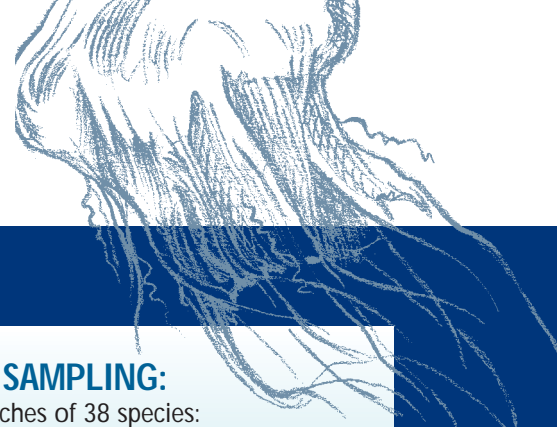
Length measurement of anglerfish on board MS "Utflesa"





Above: Trawl positions for vessels in the Reference Fleet with catches of saithe (*Pollachius virens*) in February 2003 in the North Sea.

Left: Length distribution of saithe caught by trawls within the statistical square marked in the figure above, and measured by the fishermen in the Reference fleet.



EXAMPLE OF THE VOLUME OF THE BIOLOGICAL SAMPLING:

In 2005, more than 8300 samples were collected from different catches of 38 species:

Species	Numbers measured	Numbers otoliths (age)
Cod	56 000	4 900
Haddock	53 000	600
Saithe	31 000	1 700
Deep-water shrimp	27 000	800
Tusk	26 000	120
Greenland halibut	24 000	900
Ling	23 000	600
Herring	5 000	
Mackerel	600	

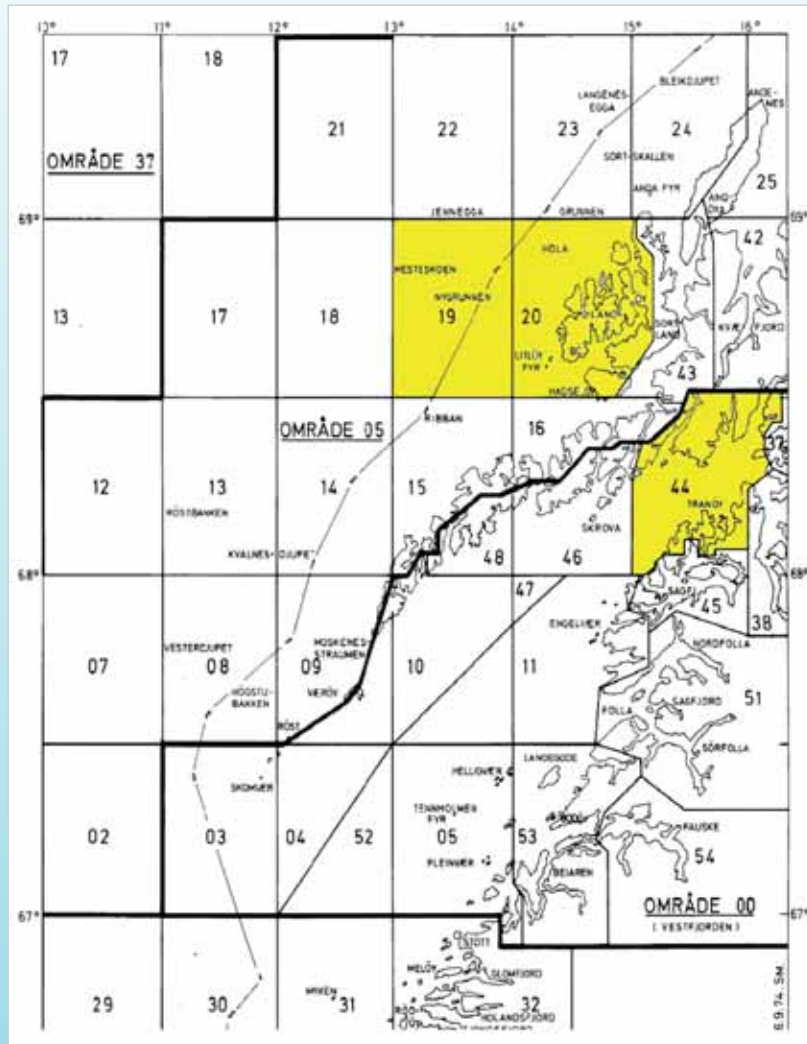


A VERY USEFUL DATA COLLECTION PLATFORM FOR MANY PURPOSES

- results are mainly used for assessment purposes, i.e., for estimating total catch in tons by length- and/or age groups in numbers, and hence improves stock assessments and fisheries management
- enables the IMR to allocate commercial catch sampling resources in time and space in a sound statistical way
- leads to improved and continuous biological sampling by area and season, and thus improves sampling protocols
- collects data and information about mixed fisheries, which also including noncommercial species
- contributes to determining the effects of regulations, which leads to more practical and purposeful regulations
- provides continuous information about species that are rarely covered by research vessels (e.g., deepwater species, near coast fish populations)
- provides observations of sea mammals, sea birds, crabs etc.
- updates scientists on technological developments in the fisheries
- a platform for testing official catch and data collecting systems and procedures (e.g., electronic logbooks, reporting- and grading systems)
- reduces controversies and fosters a joint “ownership” spirit for data and results



**TO BE AT THE RIGHT PLACE AT THE RIGHT TIME –
THE REFERENCE FLEET MAKES IT POSSIBLE!**



Urgent sampling of otoliths (and genetics) for determining cod type, e.g., on a specific day and in a specific area, how much of the cod catch is coastal cod.

MS Leirvåg Junior

Date	Area	NEA cod	Coastal cod
10.01.06	0519	3	10
21.01.06	0520	16	4
27.01.06	0520	15	5
Sum		34	19

MS Nimrod

Date	Area	NEA cod	Coastal cod
09.01.06	0044	2	30




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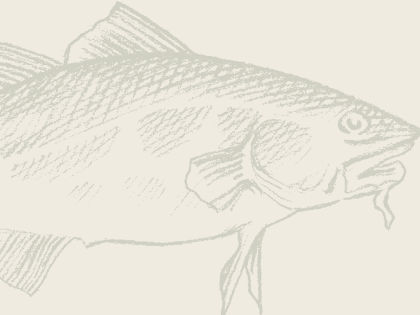
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