

# FACTS ON THE TABLE

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Alf Oxem (photos)

The Norwegian Institute of Marine Research (IMR) used six vessels in the Norwegian Sea this summer to seek answers to a key question – are fish startled by seismic surveys, and for how long. We joined one of the boats involved. →

*SCIENCE AT SEA. Technician Tor Ivar Halland measures halibut, Tom Steffensen (back to camera) bleeds them and skipper Mikal Steffensen pulls more aboard Klotind.*

The *Klotind* fishing boat sets sail from Stø in north Norway's Vesterålen islands early one July morning. Its assignment – to determine how seismic shooting might affect catches.

Skipper Mikal Steffensen knows exactly where the Greenland halibut are to be found along Storegga, the steep



RETURNING HOME. Skipper Mikal Steffensen is strongly opposed to oil operations off Vesterålen. "They want to mess with the very cradle of the fish," he says.

outer edge of the NCS.

Home to large concentrations of fish, this part of the Atlantic margin lies in at centre of survey work to identify possible hydrocarbons in the Nordland VII area.

Seismic survey ship *Geo Pacific* can clearly be seen on the electronic chart in the wheelhouse of the 50-foot autoliner, which has been hired by the IMR for a project financed by the NPD.

Involving five fishing boats and a research ship, this programme has

aimed to chart how far seismic shooting drives away the fish. The boats accordingly fished both before and during the survey period, and until catches returned to normal.

*Geo Pacific* started work on 29 June, and has another 16 days to go when we arrive on the scene.

On the way out to the grounds, a flock of puffins flies across the bows and the backs of two minke whales emerge close to a shoal of herring whipping up the sea a few metres from us. Gulls form a living wake behind our stern.

Terje Hermansen starts to pay out the long line a couple of hours after the voyage starts, connecting up the 18 tubs of ready-baited line stacked on deck.

The full 10-kilometre line carries 5 500 hooks, each baited with a bit of herring. To take it to the bottom where the halibut live, a sinker is attached between every other tub. These are cobblestones weighing 3.8 kilograms each.

Fishing is rich along Storegga, where the water depth drops abruptly from 100-200 metres to roughly 900 metres. Halibut, ling and cusk are particularly plentiful.

Skippers familiar with these waters have no need of sonar. They know by experience where to fish, and *Klotind* sets its line as usual at a depth of 360-370 fathoms – almost 700 metres down.

This job has been completed by 10.00, and the boat returns to the line's starting point for a three-and-a-half-hour wait. The crew nap in their bunks or enjoy the sun on deck.

Only Capt Steffensen remains in the

wheelhouse, surrounded by instruments and computer monitors – echo sounder, electronic chart, radar, VHF radio and a separate emergency line directly to the joint rescue coordination centre in Bodø.

#### Chart

The electronic chart shows that *Geo Pacific* and its two support boats are five nautical miles away. It earlier fired its air guns only 0.6 nautical miles from our present position.

Capt Steffensen has spoken daily with the fishery expert on the survey ship by VHF since data gathering began, except for today. Their conversations largely involve

establishing the location of *Geo Pacific* and whether any delays have occurred.

The survey ship takes 10 hours to sail north but 13 hours on its southward leg because it is then running counter to the Gulf Stream. It also needs three hours to turn around.

Fishing boats are required to respect the safety zone around *Geo Pacific*, which extends for four nautical miles astern and two from its bows.

I take advantage of the wait to ask Capt Steffensen – who is 29 years old and has been fishing since he was 18

– how locals view the prospect of possible oil production in these waters.

"Opposition to oil is even greater now than it was before," he replies, and says that the majority are against in both Øksnes and Andøya.

#### Support

The local authorities where support is strongest are Bø and Hadsel – the first because jobs could reverse a sharp population decline, and the other because it has little near-shore fishing.

"They've mostly got ocean-going

trawlers," the skipper notes, and adds that he is personally a strong opponent of oil operations on this part of the NCS.

That is because the waters off Lofoten and Vesterålen contain the world's most prolific fishing grounds and host incredible numbers of fish – including cod, herring, haddock, saithe, halibut, ling and redfish.

Capt Steffensen believes it would be much too risky to chance these valuable resources. Far too little is known about the potential hazards of oil activity.

"They want to mess with the very



SHOOTING THE LINE. Skipper Mikal Steffensen has prepared 18 tubs of baited line, totalling 5 500 hooks.



CLEANING HALIBUT. Tom Steffensen bleeds a fish before sending it to the hold.

cradle of the fish," he says. "But nobody can say what'll become of larvae and eggs which drift past, or what might happen to herring stocks, for instance."

A member of the local executive for the Norwegian Fishermen's Association, he maintains that fishing on this part of the NCS is very different from activity in the North Sea.

"They use big sea-going vessels down south which can move. But we're tied to one spot, while processing plants and shops on land rely on our deliveries. The whole community depends on fishing."

#### Prepared

Capt Steffensen has been nevertheless prepared to participate in the NPD-funded research project, both because knowledge is important and because it is interesting work.

He also maintains that seismic shooting last year drove away the saithe and haddock, which did not reappear until November. These fisheries normally yield very good catches from August.

Capt Steffensen says the authorities only paid out for lost catches in the five days after shooting ended, which they justified by pointing to the IMR's North

Cape Bank trial in 1996.

This revealed a decline in cod and haddock catches as a result of seismic surveying, but was terminated five days after shooting ceased.

So it has been important for Capt Steffensen and the other fishermen to document how long it takes for the fish to return – if they do.

The skipper puts the cost of an outing – including bait, baiting and fuel – at NOK 10 000. In addition comes repayments and insurance for the boat, which he bought in May for NOK 4 million.

He normally makes three trips out a week, and is dependent on a regular income throughout the year in order to stay on the right side financially.

Four months without earnings last year were accordingly a heavy burden. It was also a difficult winter, with problems delivering fish because the processors could not sell it on.

Europeans were strapped for cash because of the financial crisis, while Iceland and Russia dumped cheap cod on the market. Average landing prices for this species have dropped from NOK 27 per kilogram to NOK 15 over the past year.

The only reason the fishermen consented to the NPD's plans for shooting seismic this year was that more than 100 boats were bought off, says Capt Steffensen.

"If we'd wanted to, we could have stopped them. They've forged ahead just as they liked. But when they start turning up on our beaches and potato fields, we have to growl a little."

#### Recovering

*Klotind* is back at its starting point, and the crew begin to haul in the line at 13.30 – starting with half-an-hour of recovering the rope end, anchors and floats.

The fulmars flap their wings and position themselves around us, while crew, skipper and Tor Ivar Halland, the IMR technician, take their places on deck.

At 14.00, Capt Steffensen gaffs the first halibut over the gunwale and into the tub alongside Mr Halland, who puts it on his measuring board to determine its species and size.

Pressing on the board at the point where the fish tail ends calls forth a beep which sounds just like the barcode reader at a shop till, and indicates that

the data have been stored.

Mr Hermansen and Tom Steffensen – the skipper's father, who is scheduled to take command when his son goes on holiday tomorrow – bleed and gut the fish before heaving them down a plastic chute to the hold.

The whole operation lasts only a few seconds, but is repeated time and again during the five-and-a-half hours it takes to retrieve the whole line.

Every single fish is registered, but skate and roughhead grenadiers are thrown back into the sea. Nobody wants to buy them, but the gulls greedily snap up any food they can get.

#### Swap

The crew swap between jobs, and Capt Steffensen takes over the measuring board when Mr Halland needs a break. Two technicians are normally aboard to relieve each other, but there is only one per vessel this week.

Eighteen tubs of long line are not much, Mr Halland says. *Klotind* normally sets 27 of them, but has cut back on this occasion since only one IMR person is aboard.

"This has been an easy day," he observes. "But if it's blowing anything

more than a breeze, standing there with the board can be hell."

The length of a fish provides an indication of age, and its weight can also be calculated when the landing docket is filled out at the reception station.

Stomach contents are sampled from time to time to see what the fish are feeding on and to determine whether they are just passing through.

With field work running from 15 June to 31 August, the project has also used the IMR's *Håkon Mosby* research ship to carry out a number of additional measurements.

These focus not only on the commercial species but also on the plankton and krill which provide food for fish and other marine fauna.

*Klotind* completes its work at 19.30. Mr Halland and the skipper agree that the catch is better than the day before, but the size of this improvement can first be determined when the technician transfers his data to a laptop PC in the wheelhouse.

On the way back to Stø, Capt Steffensen radios whaler *Uregutt* from Vestvågøy. His counterpart complains that the whales he has seen that day were too small to be worth shooting at.

Whaling remains fairly important for the Vesterålen economy, embracing not only those who catch and eat these marine mammals but also the tourist who pay well to look at them.

#### Visitors

Ninety visitors were taken out from Stø yesterday, for instance, and such whale safaris have become big business both in Øksnes local authority and in Andøya.

Mr Halland has finally calculated a total of 1 536 fish or 70 kilograms per tub. As he suspected, this is a little better than the day before. Capt Steffensen helps him to fill out the log, with time and position entered and checked. →



ONCE A FISHERMEN'S CABIN. Today a research station at Stø in Øksnes local authority.



SCIENTISTS AT WORK. Roar Skeide (left) and Are Salthaug from the Norwegian Institute of Marine Research study data gathered during the summer's expeditions.

SUMMER'S NIGHT AT STØ. The *Klotind* fishing boat has docked to deliver the day's catch.

On the way back to port, we run into the thick fog we have seen lying along the coast since the morning. I ask Capt Steffensen whether he often went fishing with his father when he was little, but he says seasickness put him off.

He admits that finding his sea legs remains a problem, particularly in the winter when he cannot see the horizon. We return to discussing oil production.

"Why start taking out the oil now?" asks Mr Steffensen senior. "We've got enough money. Why not in 10-20 years from now?"

He fears that the seismic surveying is only the start. "They've got hold of one finger now. Next time they'll take the whole hand."

### Berth

We berth just before 23.00 in the light north Norwegian night, which is fairly grey just now. The fog makes it cold enough to leave the fish in the hold until the reception station opens.

Capt Steffensen climbs into the station's crane and hoists the tubs ashore, where young Finns set to work cleaning the line and baiting the hooks for the next trip out.

The marine biologists have their base a little further south in the harbour, with 22 of them taking shifts in a red-painted house for as long as the fieldwork lasts.



MULTITASKING. Skipper Mikal Steffensen takes a turn with the measuring board.

They rest up between trips in this "rorbua" – the name given to most of the lodgings in the area. Their central computer is a fairly ordinary laptop on the dining table in the lounge.

Four scientists are resident in Stø this week, but only expedition leader Are Salthaug and Roar Skeide have returned from the fishing when I knock on the door in the late afternoon.

### Curves

They explain their work and show me charts and graphs on the laptop. Curves detailing catches for each fishing boat are attached to the cupboard doors in the adjoining kitchen.

Mr Salthaug and Mr Skeide explain that this project aims to establish how long it takes before the fishing returns to a normal level.

Also looking at how far away from the survey area the effect on the fish can be detected, the study is said to be the first of its kind in the world.

"It's essential that we accompany the active fishing boats," Mr Salthaug explains. "Their crew know a great deal and have many interesting observations about conditions in the sea."

Mr Skeide explains that the fishermen communicate a lot with the fishery experts on the seismic survey ships. They must take account of the safety zone, and delays can occur along the way.

The long-liners are more flexible, and have their gear out for shorter periods, while those fishing with nets take two-three days at a time and have greater problems adapting to the survey ships.

The two scientists provide some background on the various species, noting that the cod fishery was very good last winter and that stocks of haddock and saithe are healthy and sustainable.

Redfish has been heavily exploited, probably because much of the fry were caught by prawn trawlers in the 1980s, but stocks are recovering.

The halibut fishery is strictly regulated, with low quotas, and *Klotind* would have been unable to fish at this period were it not for the project.

"Halibut are so valuable that it's particularly interesting to see whether they're startled, because the conse-

quences for the fishermen are so great," says Mr Salthaug.

To ensure the best possible research data, the fishing must be conducted under strict rules. Each boat fishes in exactly the same place throughout the period, and with the same gear. The bait must also be identical, so a pallet-load has been purchased for Stø to be used throughout the duration of the project.

Mr Salthaug says that the research is being conducted under very realistic conditions and will have a high level of ecological validity. It is also highly specific and, in his view, very educational for the scientists. ❄

While *Klotind* catches its fish in the name of research, seismic survey ship *Geo Pacific* sails on indefatigably a few nautical miles further out to sea. No other fishing boats are to be seen on this July day.

The extensive array of streamers spread out astern give *Geo Pacific* the look of a big ocean-going trawler as it ploughs through the waves in a light mist.

Being towed at a speed of roughly three knots, these eight cables are 100 metres apart and more than five kilometres long. They carry the hydrophones which pick up seismic echoes from the sub-surface.

These signals will be processed and interpreted during the autumn and winter to help answer the key question – might

## Scary research

The research project on how much fish are scared by seismic shooting is being conducted in the northern part of the survey area on the NCS, off northern Norway's Vesterålen islands.

It aims to learn more about how much and over what distance the air-guns startle fish, and how long it takes for fishing to return to normal once surveying has ended.

With a budget of NOK 25 million,

this work is being conducted by the Norwegian Institute of Marine Research (IMR) in Bergen on behalf of the NPD.

A reference group which includes fishermen's representatives and local politicians has contributed suggestions on the design of the project.

Five local fishing boats were hired, and began test fishing on 17 June – five days before seismic shooting started in these waters. They continued through-

out the survey period and until catches had returned to normal levels.

The IMR's *Håkon Mosby* research ship has also participated in the project, and is due to submit its results some time next spring.

To ensure that its seismic survey could be conducted, the NPD also agreed to pay around 120 fishermen in the relevant areas to abstain from fishing when they might get in the way. ❄

All gathered in →

oil and gas be present off Vesterålen? Or, for that matter, off Lofoten to the south and Troms county further north, which are also covered by the three-year survey programme.

Viewed from the deck of rescue boat *Knut Hoem*, the seismic shooting looks peaceful enough. The noise of the airguns is inaudible above the waves, even when they are only a couple of hundred metres away.

The deafening silence of the sea is broken only by the sound of the boat's engine. How much the shots affect the fish, on the other hand, is probably a question which the research by *Klotind* and the other vessels in the project can help to answer. (Bjørn Rasen and Bjørn Erik Rygg Lunde, photo)



## Listening out for answers