



Serial No. 962  
(D.a. 61)

Document No. 24

ANNUAL MEETING -- JUNE 1962

German Research Report, 1961

2. Subareas 2, 3, 4: Fishing conditions and hydrography.  
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Field-work was restricted to one search-trip in March/April 1961. The main purpose of this trip was to examine the fishing conditions for cod and to find out if there are possibilities for a profitable commercial saltfish-fishery by German trawlers at that time of the year in the Gulf of St. Lawrence (4R, 4T) as well as off the south coast of Newfoundland (3P) and east and southeast off Cape Breton Island (4V).

During 1961 commercial fishery was carried out by German trawlers mainly off South Labrador (2J, Sundall and Hamiltonbank) and off the north-east coast of Newfoundland (3K, Ritubank). Some trawlers temporarily also fished on the north-east slope of Newfoundland-Bank (3L) and on Flemish Cap (3M). From these regions market samples have been taken.

Subarea 2

The main season for German trawlers fishing in the Northwest Atlantic waters extended from January till the beginning of March 1961 when an increased concentration of cod yielded good catches. During that time up to 20 trawlers were fishing off South Labrador, mainly in the Sundall-and Hamiltonbank area (2J). The proportion of cod amounted to 60-80% and in several cases to even more than 90% of the landings. In early April a scouting trawler visited the Sundall area but did not find the satisfactory fishing conditions. Experimental hauls yielded an average catch per trawling hour of about 2 t. Cod predominated in the catches with 70%, the rest consisting of redfish. The best catches were made in depths of 360 to 400 m, but the proportion of fish which were too small for the German market conditions was rather high. From April to June 1961 only few salting trawlers temporarily fished for cod off South Labrador, whereas no fishing at all took place in July and August 1961. During the last four months of the year German trawlers only occasionally visited the fishing grounds off South Labrador.

Subarea 3

Fishing conditions and-activities off the north-east coast of Newfoundland especially on Ritubank (3K) were almost the same as on the near-by fishing grounds off South Labrador (2J). Mostly there was no clear distinction between these two areas, and both often were reported as "Belle Isle".

Along the north-eastern slope of Newfoundlandbank (3L) some German trawlers fished successfully for redfish in January and February, and up to 9 vessels from end of August until middle of October 1961.

The Flemish Cap area (3M) was only occasionally visited by single fresh (iced)-fish trawlers. In the middle of March 1961 experimental hauls were carried out by a scouting trawler resulting in catches of 3-4 t redfish per trawling hour on the northern slope in depths of 400-500 m. The mean length of redfish was 35.6 cm. There was no remarkable by-catch of cod. Further experimental hauls in different depths (290-460 m) on the southern slope of Flemish Cap yielded neither remarkable catches of redfish nor of cod. During search-trips in September

and November 1959 average catches of 8.5 t cod (60%) and redfish per trawling hour have been made in the same area.

On the search-trip in March/April 1961 fishing conditions on the south-western slope of Newfoundlandbank (30) were found unsatisfactory. Experimental hauls on St. Pierre Bank (3P) were more successful. In depths of about 250 m maximum catches per trawling hour amounted to about 3 t of cod and 1 t of haddock and 0.5 t of coalfish. Additionally a relatively great number of large halibut (up to 8 fish per haul) were caught. Catches on Burgeo Bank (3P) also proved unsatisfactory: maximum catch 1 t cod in 190-250 m, and over 258 m mainly small redfish up to 1.5 t per trawling hour. Near Isle aux Morts (3P, North) one haul of 3.5 t cod per trawling hour was made but further hauls were by far less successful. The same instability of fish concentration and catches was observed on all fishing grounds off the south coast of Newfoundland (3P). Quite the same observation was made on the search-trip in April/May 1960. These conditions did not allow a profitable commercial fishery by German trawlers although in this area the length-composition of cod (average length 59.5 cm) was more preferable for the German market than for instance in Subarea 4.

#### Subarea 4

When the search-vessel arrived in the Gulf of St. Lawrence (4R) in the middle of March 1961 fishing conditions for cod were found quite good. The average catch per trawling hour amounted to 6.5 t. Only 5 hauls yielded 50 t of cod. The fishing depth was 230-285 m. The length-composition of cod, however, proved not so satisfactory as the quantity of catches. The average length of cod was only 56.7 cm. Thus a great proportion of fish was too small for the present German market conditions. The length-composition of cod in 4R was about the same as in April of the year before (1960). Already at the end of March 1961 the fishing season in 4R was nearly finished for the average catch per trawling hour had decreased to less than 1 t. At the same time the search-vessel met with rather dense cod concentrations in the area between St. Paul and the ice-limit west of Cape North (4T). Within 24 hours (11 hauls) a total of 83.5 t of cod was caught. The average catch per trawling hour was about 5 t. But with a mean length of only 54.9 cm these cod were still smaller than in 4R. Along the edge of Cabot Strait off Cape Breton Island (4V, North) fishing conditions were rather poor at the end of March. Experimental hauls yielded at the most about 1 t of very small cod per one hour (mean length 41.2 cm). In the second half of March 1961 rather good fishing conditions were also found in the area of Artimon Bank and especially on the northern edge of Banquereau (4V) in remarkably shallow water (80-100 m). The catches proved to remain rather constant over the examined period of about 10 days. At maximum 10 t of cod were caught after 2 hours trawling and the average catch per one hour was 1.5 t. With a mean length of 58.6 cm these cod were considerably larger than those of the Gulf of St. Lawrence. Therefore, a daily production of about 5 t salted fish could be achieved. Occasionally a by-catch of coalfish up to 1 t per trawling hour could be obtained, whereas haddock catches were very poor. No remarkable catches could be made on the southern slope of Banquereau.

#### Hydrographic observations

On the search trip in March/April 1961 a bathythermograph was used to get an impression of the water temperature conditions on the different fishing grounds. Measurements were taken in the following areas:

Flemish Cap - 3M

As expected water temperatures in this area were relatively high also in March. The lowest temperatures were measured on the shelf plateau in shallower water.

surface : 1.5°C  
bottom at 165 m : 2.0°C

Above the north-eastern slope of Flemish Cap there was already a considerable increase of temperatures.

surface : 2.7°C  
bottom at 200 m : 3.0°C  
" at 260 m : 3.7°C

Eastern edge of Newfoundlandbank - 3L

The central and northern part of the Bank was still more or less covered with ice.

surface : -1.5°C  
bottom at 120 m : -0.3°C

Southwest edge of Newfoundlandbank - 30

surface : between -0.5° and ±0°C;  
in shallower water decreasing temperatures until -1.0°C in 80 m depth; bottom water at 100 m again + 1.5°C. On the slope of the bank temperatures of bottom water were rising with increasing depth.

bottom at 150 m : 4.0°C  
" at 250 m : 5.0°C

Beyond the slope in deeper water maximum temperatures of about 8°C were measured already in depths of 100-150 m.

Southwest edge of St. Pierre Bank - 3P

surface : -1.5°C  
100 - 150 m : ± 0°  
bottom at 200 m : +2.5°C  
" at 250 m : 3.5°C

Gulf of St. Lawrence - 4R (in the ice-free part between Cape Ray and Cape St. George).

surface : about -2°C  
100-150 m : ±0°

With increasing depth temperatures were rising considerably. Bottom water at main fishing depth = 240-260 m : about +4°C.

Banquereau - 4V, South

surface : between -1° and -2°C  
90 m : ± 0°  
bottom at 100 m : until +1° (main fishing depth!)  
" at 200 m : +3.5°C

Shelf edge south of Sable Island - 4W

surface : between -0.5° and +0.5°C  
50 m : +1.0°C  
150 m : 3.0°C  
200 m : 4.0°C

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