International Council for
the Exploration of the Sea

C.M. 1977/K:19
Shellfish and Benthos
Committee

Growth and Utilization of Cockles (Cardium edule L.) on the North Sea Coast of Schleswig-Holstein, Federal Republic of Germany

by

Georg Kühlmorgen-Hille

Bundesforschungsanstalt für Fischerei
Institut für Küsten- und Binnenfischerei
Aussenstelle Kiel
Seefischmarkt, 2300 Kiel 14
Federal Republic of Germany

Abstract:

Cockle fishery has been practised in Germany from 1973. Landings fluctuate especially due to the export-markets changes of capability. Growth varies with bottom and water conditions. Cockles at the coast of Schleswig-Holstein seem to become not much older than 4 years. Damages done by cockle-dredging have so far not been observed.

I. Introduction

Utilization of cockles on the German North Sea coast on a commercial scale is rather new. Though the species is wide-spread in the area it was so far only of local importance during war or other times of food shortage. In normal times cockles were only preyed upon by oyster-catchers or other birds. At the end of the 1960s, after the cockle beds along the Dutch coast were over-exploited, resp. partly destroyed by severe winters interest in German cockles arose. In 1970 a British-Dutch company made a successful 7-day fishing experiment on the coast of East Frisia. In order to gain some knowledge of the so far unknown cockle population along the German coast annual surveys were made each summer on the coast of Lower Saxonia from 1970 and on the coast of Schleswig-Holstein from 1972 on. The investigations were carried out in cooperation between the Institut for Coastal and Inland-Fishery and the regional Fishery Offices in Bremerhaven and Kiel. So scientists could use fishery patroll-vessels and the assistance of crew members for their work. The author is responsible for cockle investigations along the west coast of Schleswig-Holstein.

II. Biological Data

The first survey in 1972 was laid out to find and map as many cockle beds as possible. These beds were visited annually during low tide, their extensions measured by steps and samples taken of 0.25 m^2 each. On board the samples were divided into age-groups, weighed and the shell length was measured by callipers. A place near the fishing port of Büsum was sampled more frequently because it could be reached from the coast on foot and no boat was necessary. The total amount of mature cockles was then estimated to be about 30 000 t.

After five years of sampling it can be said that the growth of Cardium edule is quite different from location to location. The best growth was observed in off-shore beds with clean water on sandy ground. Close to the coastline on muddy ground covered by turbid water growth was at a minimum. So far cockles older than

5 years have not been found along the coast of Schleswig-Holstein. Most of them seem to die after four years. Spawning starts mostly at the age of one year and takes place during late spring to early summer. The distribution of spat is rather irregular. It depends very likely on the tidal currents during their setting. Some places are repopulated every year others only once within several years. The density of spat is rather high, about 20 000 individuals per m^2. This number is reduced in the first year to 4000-5000, to about 1000 in the second year and later to a few hundred.

Figures 1-3 show the growth of cockles on different locations as registered during the annual surveys. Though the cockle-beds shown in Figures 1 and 2 are located only about 1 nautical mile from each other on the northern bank of the same tideway and both on sandy ground the animals on the more easterly situation show a distinctly better growth. Within their fourth year of life (age-group III) they reach a mean length of 28.6 mm whereas at the westerly place the one year older cockles (agegroup IV) reach only 27.5 mm. At his age the neighbour-population had already a mean length of 31.3 mm.

Fig. 3 shows a cockle population at Kleine Vollerwiek Plate, a sandbank within the estuary of the river Eider. The year-chlass 1972 could be followed until summer 1975, when it reached a mean length of only 23.4 mm. A new recruitment, year-class 1975, could be observed between the older animals. Unfortunately the whole population was destroyed by storm and flood during the winter 1975/76.

An example of several age-groups living together is shown in Fig. 4. The place is near Büsum and near the shore-line. The bottom consists of mud and growth was very poor. The graphs for October 1973 and January 1974 show that there is no growth at all during late autumn and winter. An increase in length takes place during spring and summer only. In November 1975 a new recruitment appeared, very weak in number. The whole place was more and more covered by seaweeds (especially Enteromorpha spec.) which settled on the cockle-shells and the cockles died

and disappeared. So sampling at this place was discontinued.

III. Cockle Fishery

Commercial cockle fishery on the German coast started in 1973, in Schleswig-Holstein 1974. Table 1 shows the development of landings in t of freshweight. During the first years most of

Table 1: Landings of cockles in t freshweight

Year	Fed.Rep.of Germany Total in t	Schleswig-Holstein in t
1973	750	--
1974	5500	838
1975	4500	1111
1976	2800	1831

the cockles were cooked on board the special catch and processing vessels imported from Holland by Dutch partners of German mussel-farmers or fishermen. The fishermen then had the duty to grind the shells before giving them back into the sea, in order not to disturb the shrimp fishery. In agreement to the regulations of other European countries the minimum-size was primarily set to 600 pieces of meat per kg. Cockles in Schleswig-Holstein, however, are smaller than in western Europe and most of the fishermen changed into landing the cockles raw and ship them by lorry to Holland for processing. So the minimum-size was changed into a length-measurement: 25 mm shell-length. A closed season was set during the spawning-time and time of low meat-content from March to June. The best meat-content with 20% or more is reached during September. Not more than 5 licences have so far been given out at the same time along the coast of Schleswig-Holstein.

Up to now no serious or lasting damages to the cockle-population, other animals or the bottom of the waddensea itself caused by cockle-dredging has been observed. Destruction by storm, flood and ice plays a far greater role.

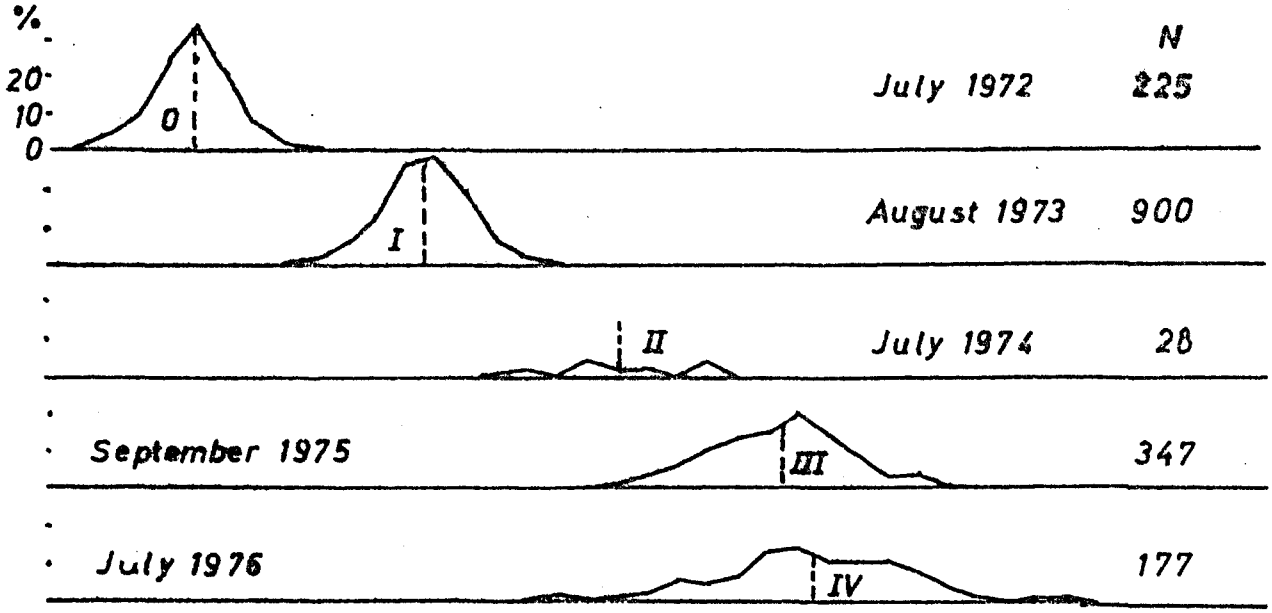


Fig.1 : Cockles of the year-class 1972 at the station Wesselburener Loch West

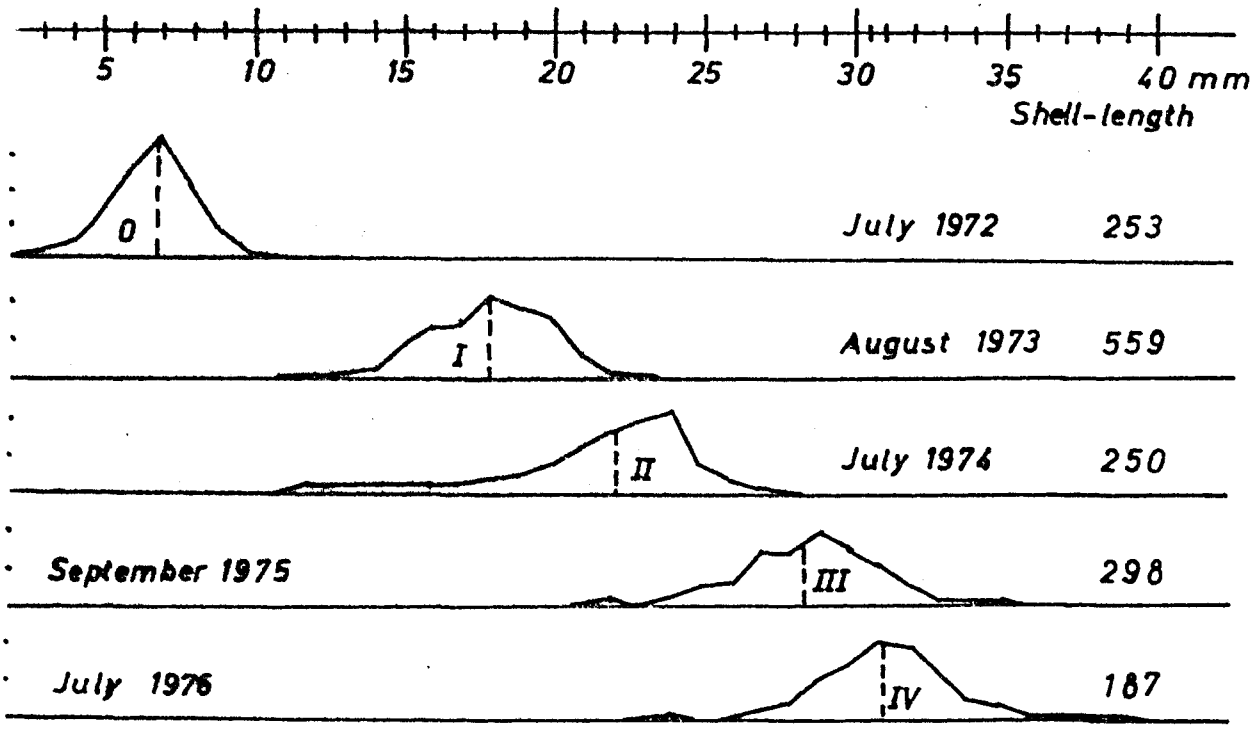
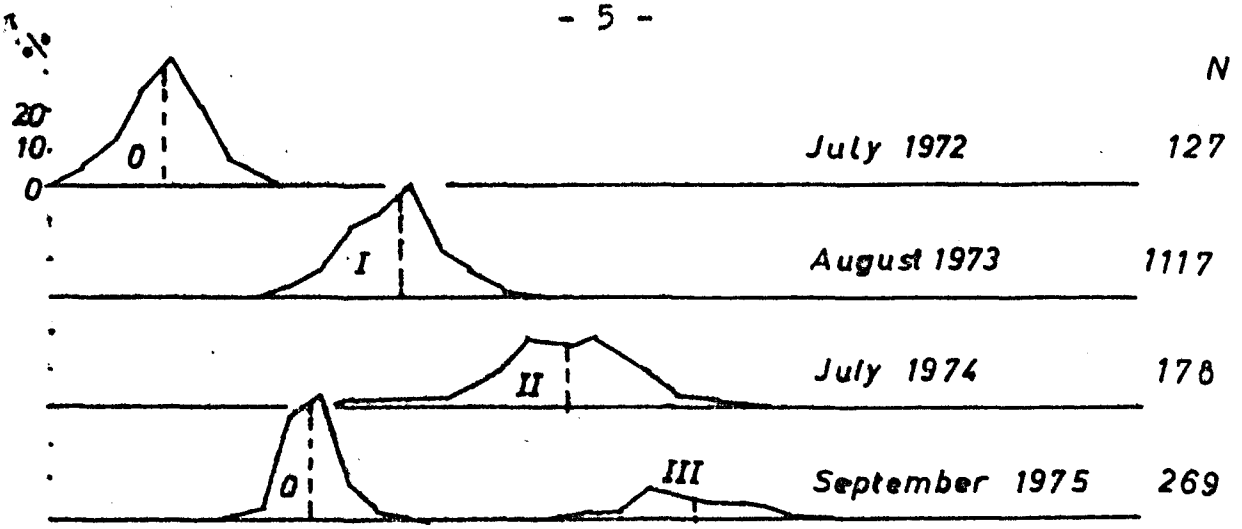


Fig. 2 : Cockles of the year-class 1972 at the station Wesselburener Loch East



July 1976: The bank was found to be destroyed

Fig.3 : Cockles at the station Kleine Vollerwiek-Plate

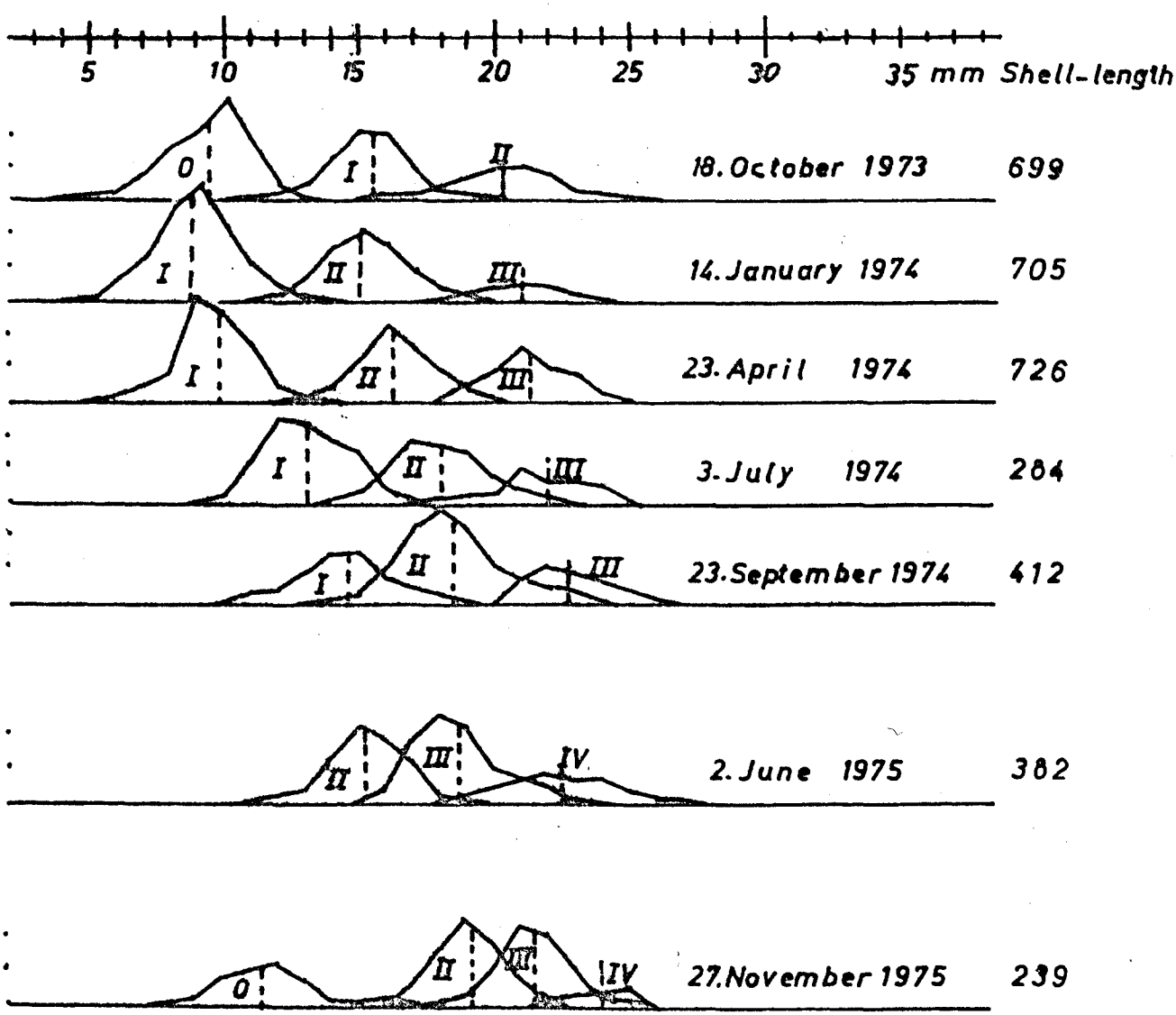


Fig. 4 : Cockles at a station near Büsum

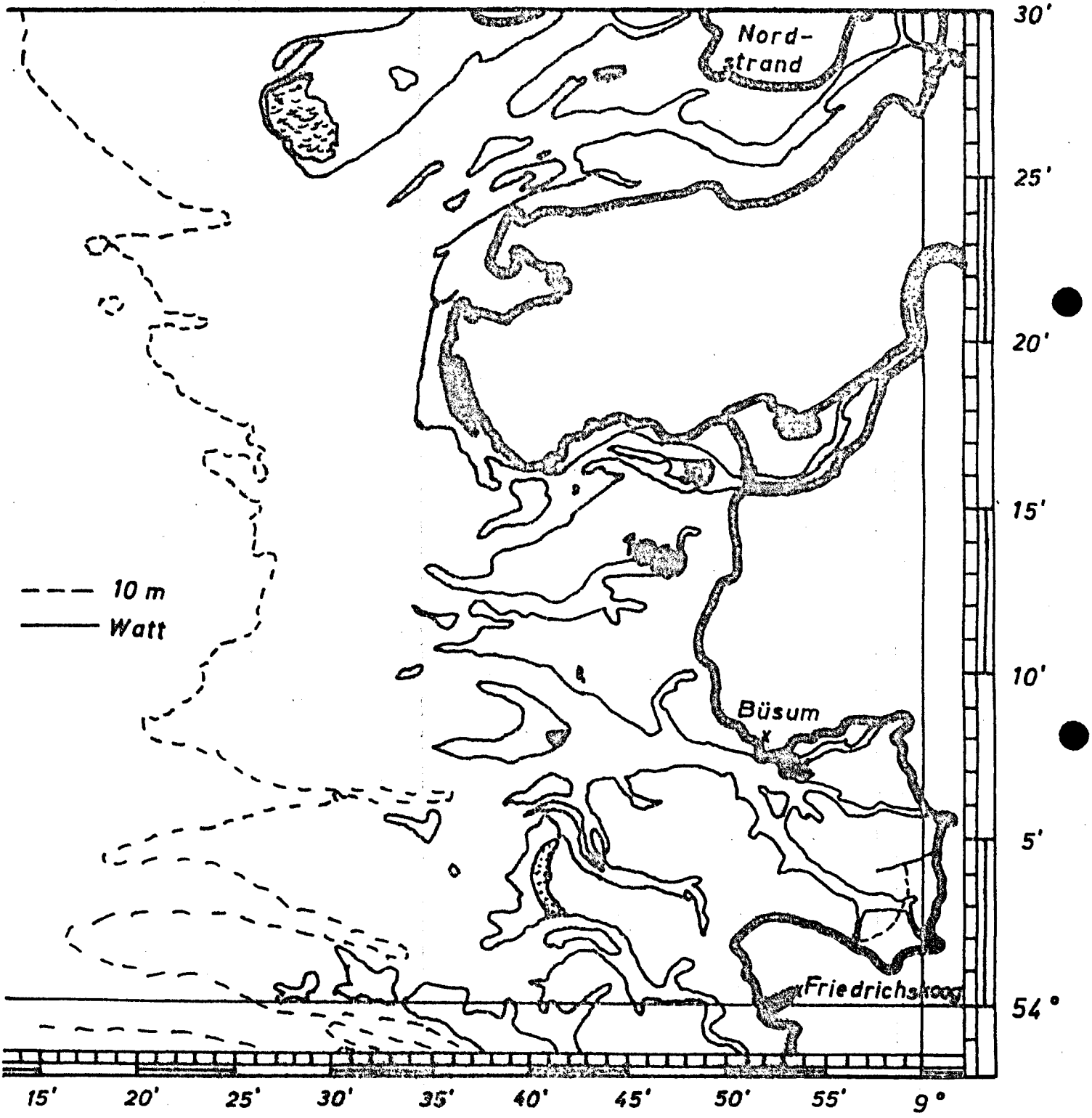


Fig. 5 Orientation chart for control stations