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Research on Marine Pollution in Poland

by

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The protection of the marine environment against pollution in Poland is of many years standing. For many years, however, only the pollution of the littoral zone of the Baltic Sea has been considered.

A wide record covering many years of sanitary protection of beaches, seaside resorts and ports where the health stations are carrying out a systematic health inspection is available.

The investigations cover in principle the whole Polish coast of the Baltic Sea, but only within a small littoral zone of some hundred metres. During these investigations, special attention is paid to the quantitative distribution of pathogenetic micro-organisms, as for example Salmonella and also the typical pollution indicator Esherichia coli. In the littoral zone many summary investigations to determine the distribution, dilution and biologic decomposition of municipal wastes have also been carried out in more highly polluted waters of rivers flowing into the Baltic Sea. These investigations are conducted by the Water Protection Department of the Water Economics Institute at Gdańsk, and by the College of Agriculture at Szczecin in the zone of the Pomeranian Bay.

Some dynamic and technical pollution problems have been studied by the Marine Institute at Gdańsk, the Institute of Hydrotechnics at Gdańsk, the Marine Station at Sopot and also by other Polish scientific institutes.

In addition to the fairly well known littoral zone, Poland has started the investigation of the open Baltic Sea only this year. Nevertheless several environmental and biologic parameters, intended to determine the state of purity of the investigated waters, are being collected systematically in Poland for more than 20 years. Furthermore, some Polish investigations present the results of environmental and biologic changes since the beginning of this century and as far as the bottom fauna is concerned during the last hundred years, i.e. from 1871 to date. These records present very valuable comparative data, serving as a valuable reference for the present and future pollution situation.

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In the current year, independent of the continued hydrographic and fishery investigations programme, Poland has started a special programme aiming to investigate the purity of sea water and to prepare for eventual remedies.

To this end, a Marine Environment Protection Department has been organised in the Sea Fisheries Institute at Gdynia. This Department cooperates closely with the State Hydrological and Meteorological Institute at Gdynia. A mutually prepared programme covers long-term environmental and biological investigations at more than 50 stations located in the southern and middle Baltic and the Baltic sounds (a specification of stations is annexed to this paper.)

In selecting the location of the research stations, an equal distribution of the stations over the investigated region has been taken into consideration and whenever it was possible, the existing hydrographical stations have been preferred in order to facilitate the observation of long-term changes in the sea water pollution.

The programme started in the current year, includes a wide range of hydrographical and meteorological factors. In addition to the basic environmental parameters, it includes also elements as follows :

1. Radioactivity of the air;
2. Air pollution with dust;
3. Oxygen concentration of the different water layers;
4. Hydrogen sulphide content in deep water;
5. Phosphate content in the different water layers;
6. Nitrites content in the different water layers;
7. Nitrates content in the different water layers;
8. Chlorophyl content in the subsurface water;
9. Phytoplankton in the water column from bottom to surface;
10. Zooplankton in the water column from bottom to surface;
11. Phyto- and zoobenthos collected with a Van Veen bottom sampler and bottom dredge;
12. Humus content in the surface of bottom deposits.

The above parameters are investigated at all stations and in some selected station water samples are taken to determine the 5 day biochemical oxygen demand (BOD₅) and samples of surface bottom deposits are collected for radioactivity measurements and some heavy metals and DDT content.

It is planned that these investigations will be the beginning of a long-term research and they will be gradually enlarged by including other pollution factors, such as other pesticides with their bio-accumulation, oil pollutants, water-dissolved organic compounds, etc.

The investigations are carried out at present in the Baltic Sea and Baltic sounds only, but within the next years, they will also include some sea regions beyond the Baltic Sea.

Among laboratory research conducted in Poland the studies regarding the marine microflora suitable for decomposing the oil hydrocarbons, especially the fuel oils used by the Polish shipping must be emphasized.

Finally, it should be pointed out that a considerable contribution regarding the protection of the marine environment has been rendered by the Marine Boards which attend to the protection against pollution by oil. Furthermore, the Provincial People's Councils attend to the protection against pollution by oil with their Water and Wastes Investigating Laboratories surveying the waters flowing into the Baltic Sea.

Due to the practical actions mentioned above, the waters of the littoral zone along the coast of Poland belongs to the relatively clean ones in the Baltic, generally spoken.

Nevertheless a continued survey of the sea water purity conducted by Poland and other maritime countries is essential. The present investigations carried out by the respective countries should be closely coordinated in order to increase the efficiency of the investigations and surveys.

At the International Conference for Protection of Marine Environment and Biologic Resources, Rome, 1970, it was proposed to create regional international committees. This is especially important for the Baltic Sea which practically is a closed shallow sea with a restricted exchange of water.

Some contribution to the protection of the marine environment problem has been given by bilateral negotiations, as for example the Polish-Swedish ones, endeavouring to conclude an agreement regarding cooperation in preventing oil pollution in the Baltic region. Nevertheless, the desirability to conclude an agreement concerning a joint international investigation as well as practical actions to protect the Baltic environment is still pending and requires a quick solution.

TABLE 1. List of the Stations investigated by the Polish Expedition in the period 20 May to 18 June 1971

No	Region	Station-Symbol	Position	Depth m
1.	Kattegat	ZN - 18	57°43' 11°07'	42
2.	"	ZN - 17	56°52' 10°46'	14
3.	"	ZN - 19	57°01' 12°03'	50
4.	"	ZN - 16	56°10' 11°00'	19
5.	"	ZN - 20	56°22' 12°08'	33
6.	Belt Sea	ZN - 15	55°24,5' 10°56'	27
7.	"	ZN - 14	54°39' 10°20'	21
8.	"	ZN - 13	54°36,5' 11°15'	24
9.	"	P - 36	54°30' 12°13'	20
10.	"	ZN - 12	55°28' 12°33'	14
11.	Arkona area	P - 37	55°00' 13°18'	47
12.	"	P - 7 (A ₁)	55°00' 14°05'	47
13.	"	P - 38	54°38' 14°17'	29
14.	Bornholm area	P - 8	56°01,5' 15°03,5'	29
15.	"	P - 21	55°28' 14°15'	80
16.	"	P - 5	55°15' 15°59'	89
17.	"	P - 39	54°22' 15°15'	63
18.	"	B - 13	54°04' 14°15'	14
19.	"	K - 6	54°15,4' 15°32'	12
20.	"	P - 16	54°38' 16°48'	20
21.	"	Z - 7	54°50' 17°32'	20
22.	"	P - 3	55°13' 17°04'	90
23.	Gdańsk area	P - 2	55°17,5' 18°00'	72
24.	"	R - 2	54°53' 18°22'	15
25.	"	ZN - 4	55°40' 18°50'	69
26.	"	GD	54°32' 18°36,3'	14

continued

continued

1	2	3	4	5
27.	Gdańsk area	ZN - 1	54°22' 18°54'	14
28.	"	ZN - 2	54°23' 18°57,5'	14
29.	"	ZN - 3	54°22' 19°01'	14
30.	"	P -110	54°03' 19°06,8'	70
31.	"	P -116	54°39' 19°17,6'	85
32.	"	P - 1	54°50' 19°20'	107
33.	"	P - 25	55°12,5' 19°30'	102
34.	W-Gotland area	BY - 39	56°07' 16°32'	50
35.	"	ZN - 11	56°15' 18°00'	40
36.	"	BY - 38	57°07' 17°40'	110
37.	"	BY - 37	57°44' 17°05,5'	69
38.	"	BY - 31	58°35' 18°14'	459
39.	"	ZN - 22	59°00' 19°00'	79
40.	"	ZN - 10	59°43' 19°38'	73
41.	E-Gotland	ZN - 5	55°42' 20°37'	46
42.	"	ZN - 6	56°30' 20°30,5'	39
43.	"	P - 40	55°38' 18°36'	109
44.	"	P - 41	56°05' 19°10'	122
45.	"	P - 44	57°20' 20°03'	249
46.	"	P - 45	58°00' 19°54'	203
47.	"	P - 46	58°53' 20°19'	168
48.	"	ZN - 7	58°04' 21°36'	40
49.	"	ZN - 8	59°10' 22°10'	40
50.	"	ZN - 9	59°32,7' 21°35'	60
51.	Gulf of Finland	BY - 25	59°35' 23°18'	73
52.	"	ZN - 21	59°45' 24°25'	80
53.	"	BY - 22	59°36' 25°36'	73

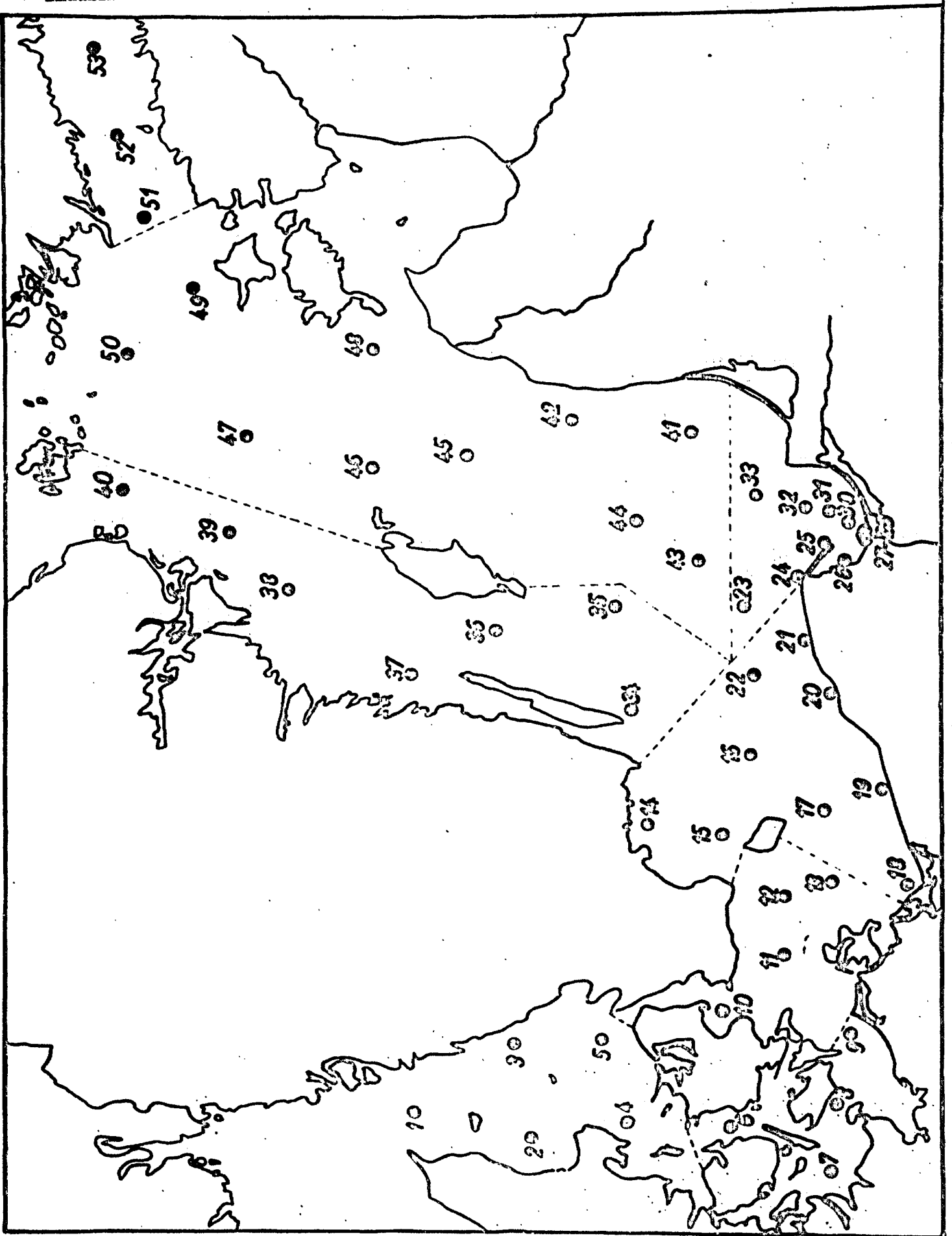


Fig. 1. Chart of the stations investigated in 1971.