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Effect of wind on catches

by

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INTRODUCTION.

At the meeting of the Gear and Behaviour Committee in 1969 F.R. Harden Jones, P. Scholes and C. Cheeseman presented a paper on the relationship between weather and catch of a Low-stoft trawler operating near the British coast. Other countries, amongst Belgium, were invited to carry out similar investigations.

Log-sheets of a Belgian trawler fishing in the Icelandic waters could be obtained for the years 1963-1967.

In these log-sheets are entered, for each haul, the date, fishing ground, times of shooting and hauling, wind force and wind direction and total catch. The composition of the catch was not given, but landing figures indicated that cod and red-fish were the dominant species.

With these data the effect of wind on catches could be evaluated and the results of a preliminary analysis of the data are presented in this paper.

MATERIAL and METHODS.

The main characteristics of the trawler and the gear are given in table 1.

The analysis was carried out on 2.975 hauls. Hauls with damage to gear were eliminated.

The ship fished on different grounds which however could be grouped in two regions, i.e. north-west of Iceland (region 1) and west of Iceland (region 2). Figure 1 shows the distribution of the hauls over both regions.

The duration of the hauls ranged from 1 to 4 hours with a mean of 3 hours.

The catches were estimated by the skipper (in baskets of 50 kg) and a comparison between the estimates and the landings shows a deviation of no more than about 5 %.

Wind directions were grouped as follows (Harden Jones, Scholes and Cheeseman, 1969) : 1 : north to north-east ; 2 : north-east to east ; 3 : east to south-east ; 4 : south-east to south ; 5 : south to south-west ; 6 : south-west to west ; 7 : west to north-west and 8 : north-west to north.

Wind strength was recorded according to the Beaufort scale.

For the time being, no statistical analysis has been carried out, so that the results should be considered as a first approach.

RESULTS.

1. In both regions catches increase up to wind strength 4-5 Beaufort. Above this limit catches decrease (table 2).

2. Table 3 groups the catches (in kg) per hour fishing by wind sectors for all wind strengths.

In region 1 the better catches are recorded when the wind is blowing from northern and north-eastern directions (sectors 1, 2 and 8), while in region 2 fishing seems to be better by both northern and southern winds (sectors 1-8 and 4-5).

3. Table 4 gives the catches (in kg) per hour fishing in relation to the direction of the wind at wind strengths below and above force 4.

In region 1, for winds below force 4, catches in wind sectors 1, 2 and 5 are above the mean. The same is the case in wind sectors 1, 2, 6 and 8 for winds of force 4 and above.

In region 2, for winds below force 4, the wind sectors 1, 2 and 8 show the better catches, while for winds of force 4 and above the sectors 4, 5 and 8 are above the mean.

SUMMARY.

1. A first approach on the effect of wind on catches has been carried out on Icelandic fishing grounds.

2. Catches seem to increase up to wind strength 4-5 Beaufort.

3. The influence of wind direction and of wind direction combined with wind strength differ from area to area.

REFERENCES.

Harden Jones (F.R.), Scholes (P.) and Cheeseman (C.), 1969 - An apparent effect of wind on the catch of a Lowestoft trawler - I.C.E.S., C.H. 1969, B : 14.

De Veen (J.F.), 1969 - De invloed van de windrichting op de vangsten van de bodemtrawl - Visserij (10), 524-533.

Figure 1 - DISTRIBUTION OF HAULS

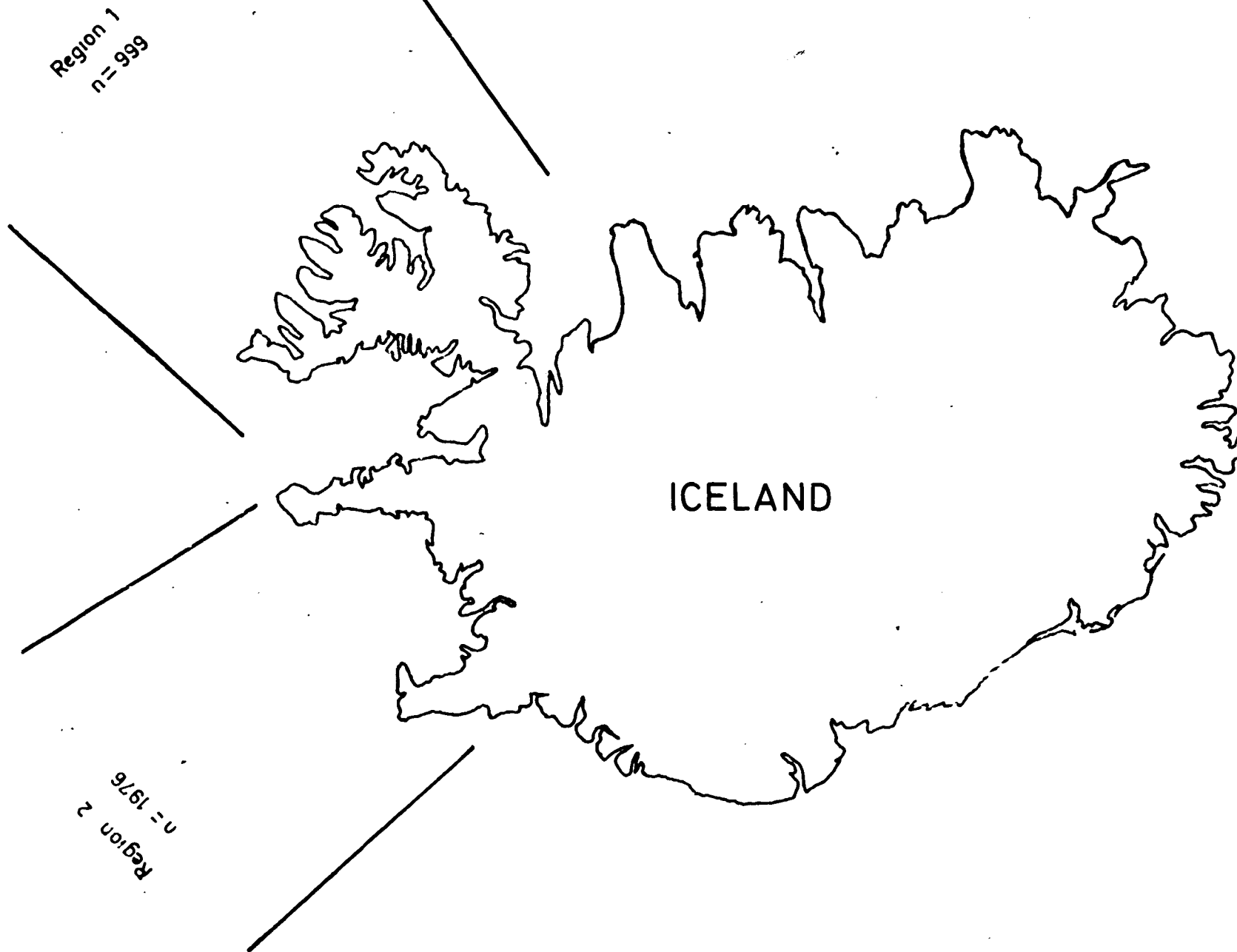


Table 1 - Characteristics of ship and gear

Ship		Gear
Date of construction	1960	<p>Headline : 46 m composed of 2 x 8 m legs wire \varnothing 14 mm between Danleno and wings and 30 m mixed \varnothing 22 mm.</p> <p>Groundrope : 55,5 m composed of 2 x 18 m standard wire \varnothing 26 mm between Danleno and wings and 19,5 m bobbins \varnothing 30 cm.</p> <p>Chain pennant of 2,5 m and \varnothing 25 mm between standard and bridle fixed to the otter board by 50 m bridle wire \varnothing 26 mm.</p> <p>Wire pennant of 6 m and \varnothing 26 mm between bridle and warps \varnothing 26 mm.</p> <p>The material of the net is courlene and polyamide yarn.</p> <p>Only the middle of the net has a polyamide netting piece of about 5000 R tex. The codend consists of double netting with a R tex of 5400. The other net pieces have a tex number of 3850 R tex.</p> <p>The wings are tapered by two ratios 1/1 and 1/5. The other taper ratios of the net are 2/3.</p>
Hull	steel	
Gross tonnage	693,57	
Engine power	1600 bhp	
Overall length	60 m	

Table 2 - Catch (in kg) in relation to the wind strength

Wind strength	Region 1		Region 2	
	Hours fishing	Catch per h.f.	Hours fishing	Catch per h.f.
1	292	436	293	330
2	639	468	965	386
3	510	497	982	379
4	426	464	1.067	401
5	334	551	967	386
6	339	431	926	350
7	274	410	814	309
8	233	401	560	314
Mean	-	461	-	364

Table 4 - Catch (in kg) in relation to the direction of the wind at wind strengths below and above force 4.

Wind sector	Region 1				Region 2			
	Winds below 4		Winds of force 4 and above		Winds below 4		Winds of force 4 and above	
	Hours fishing	Catch per h.f.	Hours fishing	Catch per h.f.	Hours fishing	Catch per h.f.	Hours fishing	Catch per h.f.
1	64	549	52	483	189	432	218	339
2	326	502	615	497	528	385	641	320
3	329	477	562	411	375	350	563	333
4	175	468	74	416	263	355	597	372
5	108	498	71	350	204	370	428	397
6	328	434	174	461	340	348	530	335
7	43	400	47	381	159	369	224	315
8	68	432	42	539	184	433	225	377
Mean	-	472	-	450	-	375	-	358

Table 3 - Catch (in kg) in relation to the direction of the wind

Wind sector	Region 1		Region 2	
	Hours fishing	Catch per h.f.	Hours fishing	Catch per h.f.
1	116	519	457	385
2	941	499	1.345	353
3	891	435	1.121	339
4	249	452	1.048	375
5	179	439	735	390
6	501	443	1.035	355
7	90	390	485	358
8	110	473	462	399
Mean	-	460	-	364