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Species Association in Commercial Catches

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For quantitative information on exploited fish stocks, we are forced to rely on our interpretations of commercial statistics. It is generally recognized, however, that the commercial landings depend to a large extent on fishing practices followed by fishermen, especially on the species and area selection they exercise. To study this effect we have calculated indices of what may be termed the "species association" among major commercial groundfish species as reported in otter-trawl landings. Especially we have chosen to calculate the rank correlation coefficient (Kendall's τ) for the groundfish data. Results for the 1957 and 1958 landings in ICNAF Division 4W by quarter years and by gross tonnage classes are shown in the table. Similar results have been obtained for other areas.

Most trips to offshore banks are mixed trips in that they represent results of fishing in several unit areas. This would have a tendency to reduce (negative or positive) correlations between species. Nevertheless the correlations are fairly high, although negative, indicating a strong tendency towards "dissociation" or separation among the main species landed. There is a tendency for the correlations to fluctuate from season to season and occasionally also to show significant differences among gross tonnage classes.

The significance of these findings can perhaps be interpreted by reference to the indices derived from research-vessel surveys carried out in the same areas. Initial comparisons indicate that correlations calculated from the research surveys tend to be rather lower than these given here. This would imply that commercial boat operators are capable of real selection of the species landed. Further study may serve to show to what extent this is due to commercial discarding of unwanted fish, or to selective fishing within restricted zones or on particular aggregations and schools.

Rank correlation coefficients between major groundfish species in the commercial otter-trawl landings.

1957		Haddock/Cod			Haddock/Flounder					
4W	<u>Gr.T.2</u>	<u>Gr.T.3</u>	<u>Gr.T.4</u>	<u>Gr.T.2</u>	<u>Gr.T.3</u>	<u>Gr.T.4</u>				
I	-.4643	-.6416	-.4410	-.7165	-.2369	-.3515				
II	-.6929	-.5114	-.7081	-.6530	-.4673	-.2000				
III	-.1347	-.4814	-.5822	-.5271	-.7793	-.3912				
IV	-.2523	-.4207	-.5021	-.4495	-.6785	-.5010				

1958		Haddock/Cod			Haddock/Flounder			Cod/Flounder		
4W	<u>Gr.T.2</u>	<u>Gr.T.3</u>	<u>Gr.T.4</u>	<u>Gr.T.2</u>	<u>Gr.T.3</u>	<u>Gr.T.4</u>	<u>Gr.T.2</u>	<u>Gr.T.3</u>	<u>Gr.T.4</u>	
I	-.48848	-.2332	-.3481	-.6125	-.6075	-.4668	-.1752			
II	-.4981	-.58565	-.4956	-.2647	-.3901	-.3424	-.2722	+.2679		
III	-.2034	-.2995	-.6956	-.5835	-.4949	-.2030	-.2305			
IV	-.08627	-.3761	-.3152	-.5653	-.6512	+.0895	-.3501		-.0897	