INTRODUCTION: REGIONAL SCIENCE AND FISHERIES ANALYSIS IN THE CANADIAN CONTEXT*

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Of the 54 papers on the program at the 1983 Annual Conference of the Canadian Regional Science Association, 21 related to fisheries topics. This special issue of the Canadian Journal of Regional Science carries several of those fisheries papers. Underlying all of this interest the influence of the conference program chairman, a fisheries economist, may be suspected. But, as will be related below, there are other cogent reasons why one may expect fisheries questions to appear with increasing frequency on the conference programs and in the literature of regional science.

The Social Science Interest in Fisheries

Fisheries analysis, which once was almost exclusively the preserve of biologists, has become an increasingly important area of investigation for social scientists, among whom economists have been the first to develop an effective research effort. In conceding the economists' lead Maiolo and Orbach [7: 13] commented:

As in so many cases when social science breaks through, the discipline of economics has had greater success than other social sciences in permeating the management arena, and has done so more

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quickly. Economics has a language, a method and, for many, a track record that are more impressive to the nonsocial scientist and [sic] sociology, anthropology or other social science disciplines.

Canadians have played an exceptionally strong role in developing the social science analysis of fisheries. The foundation of fisheries economics as a subdiscipline is usually traced to a seminal article written by the Canadian H. Scott Gordon [5] in 1954, which was followed closely by another important article on fisheries economics from the pen of compatriot Anthony D. Scott [8]. Ever since, Canadians have been prominent contributors to the world literature on fisheries economics.

The fisheries research of economists focused on the peculiarities of common-property resource exploitation and bio-economic interaction. Inevitably, economists (including economic geographers) were also drawn into applied research and policy prescription. Indeed, one may speculate that the early interest of Canadian economists in fisheries questions was stimulated by the challenge of solving the evidently severe fisheries problems of this country. The persistence of these problems in Canada, as elsewhere, suggests that the solutions offered by economists have been politically or socially unacceptable or that, where they have been tried, they have been flawed in design or application.

More recently, the chronic problems of the fisheries, and of the communities they involve, have become an important focus of attention for social scientists from disciplines other than economics, particularly from sociology and anthropology, but also from political science, business administration and law. Here again, Canadian academics have been prominent. It is interesting to note that a significant proportion of the growing volume of Canadian fisheries research in the fields of sociology and anthropology has developed a distinctive analytical approach that is neo-marxist in content. It forms part of the new-styled "political economy" and borrows much from "dependency theory". Illustrations may be found in a volume of papers edited by Brym and Sacouman [1] and in a special issue of the *Journal of Canadian Studies* (Vol. 19, Spring 1984) with an introduction by Patricia Marchak. The latter, interestingly, consists of papers presented at a series of sessions sponsored by the Canadian Sociology and Anthropology Association and the Canadian Political Science Association at the 1983 Learned Societies Meetings. The scheduling of these sessions was coordinated with that of the fisheries sessions of the Canadian Regional Science Association to allow interested individuals to attend both sets of sessions.

**Fisheries and Regional Science**

Economists and economic geographers specializing in natural resource questions have long been at home in the regional science community. Natural resource industries, of necessity, are location-specific. Moreover, the structure of regional economies is often uniquely influenced by the natural resource base and its development. Conversely, the state of resource industries tends to be strongly constrained by the condition and character of the regional economy. In consequence, research in natural resource economics and regional analysis is often intertwined. Papers in the natural resource area are routinely accepted for presentation at regional science conferences. Specifically, fisheries papers are now a common occurrence at these conferences.

In Canada, applied research in the area of fisheries economics has a particularly strong interconnection with regional economics and especially so in regard to the Atlantic region, for here regional economic and fisheries problems are literally inseparable. Research on Atlantic coast fisheries problems is never free of regional economic content and a strong mix of the two is sometimes reflected in research titles [3; 6]. In no province has the inseparability of the fisheries problem and the regional economic problem been more evident than in Newfoundland. This was cogently recognized in the early 1970s when federal political responsibility for fisheries development (involving also the resettlement of many fishing communities) was moved from the Department of Fisheries to the Department of Regional Economic Expansion.

While papers in the area of fisheries economics are an increasingly common feature of regional science conferences, it is still relatively rare for these papers to appear in regional science journals. The publication of fisheries economics articles has been scattered among a variety of journals. These have included many standard economics journals, as well as those specializing in natural resource questions, such as the *Journal of Environmental Economics and Management* and (ironically) *Land Economics*. Some biologically oriented fisheries science journals have also welcomed fisheries articles with economic content. Most notably and successfully this has been the case with the Canadian Journal of Fisheries and Aquatic Sciences (and its predecessor, the *Journal of the Fisheries Research Board of Canada*). Some other specialized journals - such as *Marine Policy, Ocean Management* and *Canadian Public Policy* - draw fisheries economics articles of appropriate content.

In 1984 a new journal appeared that at last offered a distinct fisheries economics focus - the *Journal of Marine Resource Economics*. Undoubtedly it will attract a significant proportion of the articles...
written in the area. However, the volume of articles in fisheries economics is now so substantial that many papers will remain available for other journal outlets that have an appropriate appeal. Given the substantive relevance to regional economics of so many fisheries economics studies, there will remain an excellent opportunity to develop a significant fisheries component in regional science journals. The *Canadian Journal of Regional Science* ventured into the area of fisheries economics with an article last year [2], and with this special issue is showing a willingness to develop this field in greater depth. Considering the strength of fisheries economics research in Canada, in conjunction with the particularly strong link between regional problems and fisheries problems in this country, the development of a significant fisheries presence in the *Canadian Journal of Regional Science* would appear to be a distinct possibility. If the journal then also succeeds in drawing articles from non-economics social scientists involved in fisheries analysis, it may establish itself as a central publication outlet for the analysis of fisheries problems in Canada.

The Papers in this Issue

The five fisheries articles published in this issue offer a wide array - though by no means a full spectrum - of social science fisheries topics. The majority are of the discipline of economics, which is appropriate in view of that discipline’s dominant impact in fisheries research. But the demographic paper by Poetschke is more sociological in character, while Kendall’s contribution draws on management theory.

The Kendall paper and the one by Gillen and McGaw are primarily theoretical, though the latter also offers a practical application for illustrative purposes. The other three papers are straightforward examples of applied research. The Schwindt paper concerns the fishing industry on our Pacific coast, while the other applied papers deal with Atlantic coast fisheries questions.

The Kendall and Gillen/McGaw articles both offer innovative adaptations of important theoretical constructs hitherto not used in fisheries analysis. Kendall explores the usefulness of “multiple criteria decision making” in fisheries management planning. Gillen and McGaw utilize “hedonic” price functions to estimate the value of salmon in the sport fishery on New Brunswick rivers. The Schwindt paper also draws on an outside analytical framework - that of industrial organization - to throw light on developments in the B.C. fishing industry.

Poetschke in his paper explores the population distribution and dependence on fishing of coastal communities in the Atlantic Provinces, with their implications for government policy. Gardner analyzes the chronic problems of the lobster fishery in Prince Edward Island and proposes a novel guild structure to help secure a solution.

If there is an underlying theme common to most of these papers, it is that solving the problems of the fishing industry calls for the novel application of analytical devices drawn from various areas in the social sciences. Fisheries economics is a relatively new subdiscipline. While it has developed a distinct and useful theory of its own, focusing on the common-property phenomenon, it apparently is in need of more widely based theoretical underpinnings.

Marine Fisheries Extensions of Regional Science

Regional science and fisheries analysis may be integrated in two ways. Some projects may use data from fishing communities or fishing activities as subject material in conventionally structured regional science research. An article of H. Craig Davis on employment multipliers resulting from the Salmon Enhancement Program in British Columbia, that appeared in this journal, may serve as example [4]. Such research may be extended in a number of directions. On the one hand, the findings in respect of regional economic impacts may be used to re-evaluate and determine desirable modifications in fisheries projects. On the other hand, the implications of many other fisheries developments may also be researched in terms of their spatial distribution and regional impact, thereby greatly expanding the scope of fisheries management analysis.

The other way in which regional science and fisheries research may mesh is by the direct application of regional science analytical techniques and operational models to fisheries problems. This offers novel prospects. So far regional science essentially has been land bound. This was understandable in the days when all of the oceans beyond narrow territorial limits were outside the jurisdiction of national law and not subject to the pattern and structure of land-based economic activity. But the status of the oceans has changed drastically since 1977, when extended national jurisdictions of 200 miles became an accepted feature of international law. Whereas previously most marine fishing activity was conducted on the uncontrolled and uncontrollable high seas, about 95 percent of the world’s marine fish catch now is taken within nationally administered zones. Vast fishing areas have been enclosed by coastal states and subjected to their land-based systems of regulation and management.
There is a challenge now for regional scientists to extend their analysis to the controlled fishing activity in the new “extended economic zones” of coastal states, for the establishment of government authority has allowed the introduction of regimes of regulation and management that are area-patterned, both within and among national zones. No doubt, application of the analytical techniques of regional science to fishing operations will require modification and adaptation of existing theory, for even with enclosure the fisheries resource has remained largely fugitive in nature. Yet, with the spatial discipline that may now be exerted over the fishing operations themselves, there is opportunity for control of a variety of the negative externalities from which the fisheries have suffered. Regional science should have insights to offer in determining optimal gear composition of fleets and spatial/temporal distribution of their operations in relation to the distribution of fish stocks.

Many of the adverse externalities of fishing may be related to aspects of interception - the taking of fish from one another. The analysis of interception patterns requires a framework of space and time which, one would think, regional science methodology should be able to provide. The articulation of regulatory solutions to the problems of interception externalities may be achieved with the help of the same analytical framework. There are intriguing prospects. Can regional science, for instance, contribute to the design of optimal resolutions for the inshore/offshore contest for cod off Newfoundland and the Canadian/U.S. contest for salmon on the Pacific Coast? The world of fisheries is waiting for an answer.

References