

FOOD PRODUCTION FROM THE SEA AND ECOSYSTEM CHANGES

A joint report with G. Sharp provided a broad theoretical background for fishery ecosystems that has been widely used by developing country workers. A priority was given to the identification and sustainable use of marine resources: an area where a number of different hypotheses as to underlying mechanisms are in conflict between them. The broadly disseminated model, ECOPATH, produced by the University of British Columbia staff and distributed world-wide as a solution to the ecosystem management problem, has become proposed by its originators as the model which should be fitted to all marine ecosystems. Evidently top-down mechanisms apply in all food webs, and certainly, a reduction in the mean size of exploited species over time (commented on by fishery biologists since at least the 1940's) is inevitably a consequence of overfishing. All-in-all, the science article published with my FAO colleagues, came in for unfair criticism, when what it stated, was that it was unwise to push forward a single hypothesis for the overfishing problem, (which FAO had been the first to identify based on the wide geographical extension of our data sources). From experience in eutrophic environments for example, bottom-up mechanisms may predominate. Here it is nutrient enrichment rather than overfishing alone which contributes to a large biomass of small organisms. 'Wasp-waisted' ecosystems have also been postulated for upwelling systems, where the biomass of small pelagic fishes affects ecosystem components both above and below the trophic level of small pelagic fishes.

For demersal resources, the conclusion I have reached is that suitable cover is essential to most early life history stages. This was pursued in part, profiting from the extensive literature which showed that most colonial animals, and macrophytes show close correspondence to fractal expectation in the number of niches at size they provide. All-in-all,however no one single hypothesis is likely to be predominant for all ecosystems or life history stages. E21)_____ and Defeo, O. (2003) Enhancing or restoring the productivity of natural populations of shellfish and other marine invertebrate resources. FAO Fisheries Technical Paper. No. 448. Rome, FAO. 2003. 159p.

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