UPDATING OUR IDEAS ON THE NATURE OF THE INTERACTION BETWEEN FISHERY RESOURCES AND THEIR ENVIRONMENT

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Evidence is accumulating that many types of fish populations may change their locations of operation within their ocean habitats, not only in annually-repeated seasonal cycles, but also in an evolving progression over much longer multi-annual time scales. This has extremely important implications for the way that we may view marine resource stock assessment and population dynamics. It might also open opportunities for new ways for conceiving innovative adaptive management actions designed to properly balance fishing and environmental pressures so as to maintain the resource populations within, or return them to, their most productive geographical configurations (it might also conceivably be possible even to take deliberate actions to induce movements of the primary zones of operation of particular fish stocks in order to benefit one sub-region at the expense of another, e.g., by shifting the primary reproductive zone from one sub-regional "ocean triad" configuration to a different one, etc.).

In this introductory presentation, some newly formulated ideas regarding the relation between spatial dynamics and temporal variability in fish population abundance will be briefly outlined. These will include a brief simplified "cartoon" of a sardine-tuna interaction designed to illustrate the operation of a proposed mechanism underlying a hypothetical "school-mix feedback" process. A diagrammatic way to view the process will also be introduced in order to help illustrate how fish populations might act in an adaptive manner to defeat growth of intolerable levels of predation pressure or how they might withdraw themselves from locations of major fisheries, and how conservative fishery resource management might actually serve to keep a population trapped at a suppressed level of productivity, etc. An illustrative example will be shown which deals with the Benguela marine ecosystem off southwestern Africa. If time allows, a design will be presented for using comparative empirical retrospective analysis for identifying characteristic adaptive time scales.

The conclusion drawn from of all this will be that many of the same things we have always worried about (stock definition, identification of favorable reproductive habitats, annual estimates of relative reproductive success, information sharing among adjacent countries and regions, etc.) will continue to be vitally important – but even more so. Moreover, there may be promising new ways available to apply this information to the purpose of ensuring productive fisheries operating within a scientifically based framework for sustainable fisheries development.

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