

Ocean life revolves

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Ocean productivity is often driven by long-range cyclical events that we don't readily understand and can't reasonably hope to control, according to several recent studies.

Jeff Polovina, chief of ecosystem and environmental investigation for the National Marine Fisheries Service in Honolulu, noted, for example, a marked decline in fishery production at French Frigate Shoals in the northwestern Hawaiian Islands.

The drop has occurred over the last 15 years. It is believed to be responsible for the decline in the number of Hawaiian monk seals at this collection of shallow reefs and sandbars, 400 miles west of Kauai. There's less food for them, so many of the newborn seals are starving.

It would be easy to attribute

Hawaii's Environment



By Jan TenBruggencate

the decline to recent fishing pressures or other man-induced problems, but it's more likely the result of a long-term change in ocean productivity in the region.

Polovina said his research suggests lower productivity may be the norm at the shoals, but that there are cyclical spikes that allow production of fish, lobsters and other species to bloom, and as a result, allow the populations of predator species like seals and seabirds to increase temporarily. Such a

around long-term cycles

spike occurred at the shoals in the late 1970s and early 1980s.

The dynamics of these cycles aren't well understood, but Polovina figures, based on historical data, that the cycle lasts about 60 years. That means that since production of food was high in about 1980, it won't be as high again until about the year 2040.

In a related study, Polovina found that if migratory fish don't show up in their normal numbers, it might not be the result of local conditions at all. He studied the migration of Pacific bluefin tuna, a popular species in Japan, but one that's not much fished by Hawaii commercial anglers.

California fleets that target the bluefin have complained in recent years that the numbers

of the big tuna have been down. Polovina said evidence suggests that it's an abundance of food in the western Pacific that's keeping them on that side of the ocean.

"These fish are going to go where the food is most available. Normally, they spawn in a restricted area off Japan, and go all the way across the Pacific (passing a few hundred miles north of Hawaii) to California. The speculation is that it's a foraging migration.

"The recent declines in California may be due to an enormous increase in sardine availability in the western Pacific. But now it looks like that sardine population is going down," meaning the tuna could reappear in the eastern Pacific as they look for food, he said.

The sardine populations have

been high since about 1977, when the Japanese sardines became unusually abundant. That's part of a cycle, too, and with them declining, it's likely some other species will increase to take up the slack, he said.

But Polovina said that with wide-ranging open-ocean species, vast cyclical changes, involving the related issues of ocean currents, nutrient availability and global climate, may have the greatest impact on populations.

Human activities, notably fishing pressure, can affect fishery stocks, of course. "High fishing pressure can keep a species from recovering as quickly as it might, or it can accelerate the decline" of a species being impacted by cyclical patterns, he said.