Research Brief

Micronekton and Areas of Ecological Significance

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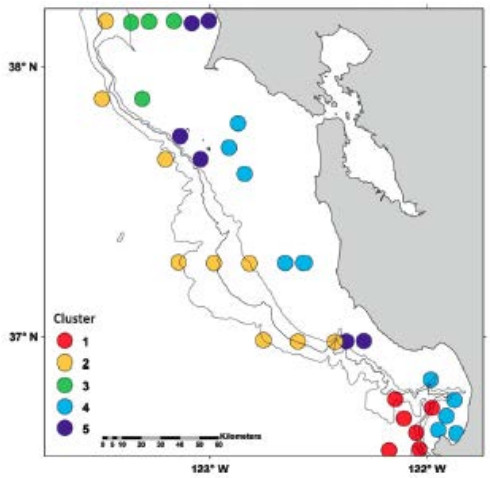
What is the importance of eastern boundary upwelling ecosystems?
Eastern boundary upwelling ecosystems are areas of high productivity and biodiversity, making them optimal for fisheries. This also means they are most heavily-impacted ecosystems in the world with exhausted fish populations, changing food web dynamics, and altered natural habitats. Off the California coast, the Gulf of the Farallones region is extremely important. There is high biological diversity despite the fact that in the past, marine species have seen tremendous exploitation. Today, this area continues to be heavily fished even though many species are depleted.

What are micronekton species?
Micronekton species include krill, forage fish, and squid between 2 and 10 cm that are prey for seabirds, marine mammals, and larger fish (e.g., commercially important salmon and rockfish). These species serve as a link between abiotic elements of an ecosystem and the success of predator species, so they are ideal indicators of the relationship between habitat characteristics and biota.



What did we do?
Using data from 20 years of shipboard surveys, we investigated the connection between the *seascape* (spatial organization of hydrographic conditions), micronekton productivity, and the abundance and spatial distribution of seabirds and mammals.

What did we conclude?
We found significant correlation between physical characteristics, primary productivity, and predators, and used this information to identify five areas of ecological significance in California. These areas, intended to be representative regions for ecosystem-based approaches to marine spatial management, share common characteristics such as being downstream from upwelling areas and having high chlorophyll *a* and krill concentrations.

Caveat
The ecologically important areas we defined should be used only for the specific seasons studied and should be applied only in a broad manner. Also, the significant seasonal and yearly variability in life cycle and migratory patterns of species must be considered.

-Brief by Marie M. Sydeman

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