

Plankton type affects food webs

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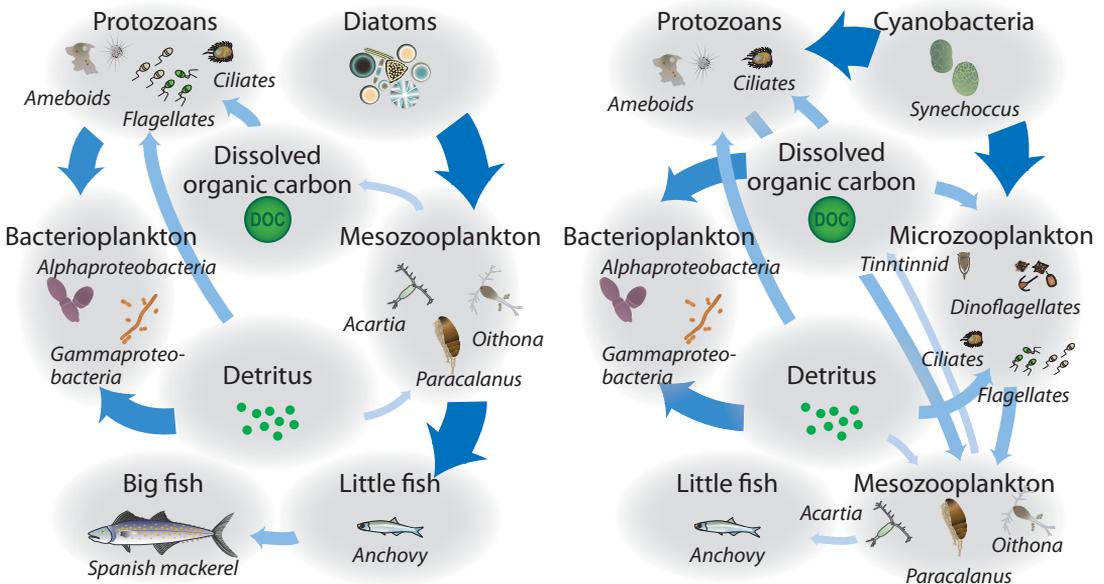
Plants are primary producers, capturing energy from the sun and converting that energy into biological materials. Thus, plants form the base of food webs. In coastal systems, free-floating microalgae (i.e., phytoplankton) and benthic vegetation (i.e., seagrasses and macroalgae) are the primary bases of food webs, and most other organisms in the ecosystem ultimately depend on them for energy.

The planktonic food web is greatly influenced by the size, chemistry, and physical characteristics of the dominant phytoplankton species. Therefore, the type of microalgae in an area can influence the type and quantity of higher level organisms, such as fish, that are found there. In general, smaller sized phytoplankton are eaten by smaller grazers (i.e., microzooplankton) and result in smaller top level predators. The nutrient quality of the phytoplankton is also important. In large, structurally complex

food webs there must be adequate quality of food in sufficient quantities.

In an ecosystem with “good” quality phytoplankton, the food web is generally less complex. The grazing community consists of larger zooplankton (i.e., mesozooplankton), sponges, and other filter feeding organisms that are then eaten by other organisms, which in turn may be eaten by larger fish. Such a “healthy” system supports larger and more diverse fish populations.

In south Florida, the dominant phytoplankton species in blooms, excluding harmful algal blooms, such as toxic red tides (*Karenia brevis*), are either small sized cyanobacteria, such as *Synechococcus*, or large diatoms. These two phytoplankton groups support significantly different food webs: the larger diatoms support healthy, large fish populations, and the cyanobacteria support a low quantity of smaller fish.



A healthy aquatic ecosystem (left) is based on a diverse mix of large phytoplankton that results in a healthy fish community. An aquatic ecosystem based on a single, overabundant species of smaller phytoplankton (right) results in a less diverse fish community dominated by smaller fish species.