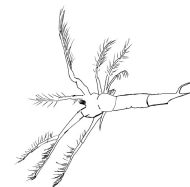
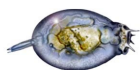
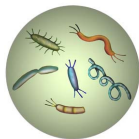


Hudson Food Webs

The Hudson is a constantly changing river, and along its length you will find a number of different food webs, depending on such factors such as salinity, depth, and temperature. On the Changing Hudson Project website, you will find four different drawings that illustrate the following food webs: Freshwater Shallows, Brackish Channel, Freshwater Channel, and Marsh. Along with the information below, these food webs should help you think about the complex nature in which the composition of a food web changes based on the addition or removal of a single species.

General composition: In the Hudson, the majority of the phytoplankton community is made up of diatoms, followed by green algae and blue-green algae. The Hudson is not limited by nitrogen or phosphorous; instead, due to its turbid nature, the limiting factor is light. The planktonic community of the Hudson is dominated by freshwater species, although there are a number of estuarine species as you move downriver.

Size of zooplanktonic community:



Smallest: 2-20 μm in diameter .
'nano' =
flagellates, ciliates

20-200 μm in diameter
Microzooplankton:
rotifers, tintinnids,
copepod nauplii

200-2000 μm
Meso-zooplankton: includes
mostly crustaceans (adults) such
as *Daphnia* and *Bosmina*, small
copepods and cladocerans

Largest: macrozooplankton
more than 2000 μm ; includes
predatory zooplankton such as
ctenophores, *Leptodora*
(shown above), and mysids.



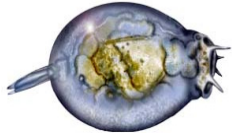
Pelagic fish: These fish, which include American shad (shown at left), blueback herring, alewife, white perch, and striped bass, live in open water, and feed mainly on zooplankton, especially as larvae. However, many of the juveniles of these species are benthic, or bottom, feeders.

Littoral fish: Fish that live in vegetated shallows, where they eat mainly benthic invertebrates but also plankton. Includes redbreast sunfish, smallmouth bass, pumpkinseed, tessellated darter (shown at right), common carp, spottail shiner.



Unionids: Unionid clams are a family of native freshwater clams, often called 'pearly mussels' for their pearl-like shells. They are important suspension feeders and their larvae have a symbiotic relationship with fish. An amazing example of co-evolution, the pearly mussel adult releases the larvae (called glochidia), which then attach to the gills of the fish. The larvae then spend a few days to several weeks attached to the fish gills while they metamorphose into a juvenile mussel. They depend on plankton for their food.

Sphaeriids: Another family of freshwater clams, these are extremely small. They are often called fingernail or pea clams. They are filter feeders and eat the smallest of the zooplankton as well as phytoplankton.



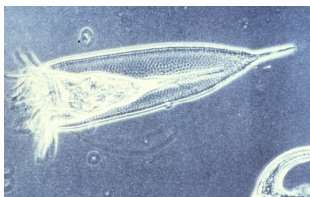
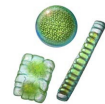
Rotifers: These tiny zooplankton (at left) are an important food source for Hudson river animals. They are some of the smallest zooplankton in the river, but are an important part of the food web. The population was drastically reduced by the zebra mussel.

Copepods: Zooplankton are the second leg of the Hudson food web, after phytoplankton, with copepods (at the right) being the most numerous crustacean. Although they are small, they are an important food source for many young fish. The larval stage of copepods, called copepod nauplii, are similar in size to the rotifers and are eaten by zebra mussels.



Cladocerans: Also called water fleas, these crustaceans are an important food source for young fish. Although we often use the term 'daphnia' to describe the cladocerans (left) they find in the water, most cladocerans in the Hudson are actually part of the Family Bosminidae (often called *Bosmina*), not the Family Daphniidae. Cladocerans are larger than rotifers or copepod nauplii.

Phytoplankton: These are microscopic and autotrophic, meaning they make their own food, like plants. However, they are not plants, but include diatoms, single-celled algae, and cyanobacteria. They float, suspended in the water column. In the Hudson, the primary type of phytoplankton are diatoms. Many animals feed on phytoplankton.



Tintinnids: Like other protists, tintinnids are single-cell organisms. The cell of a tintinnid is encased in a test or shell that looks like a vase. Tintinnids feed primarily on algae and bacteria, and are part of the microzooplankton between 20 and 200 μm in size. Tintinnids are found in marine and freshwaters.

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Images are by Jan Porinchak for the Changing Hudson Project.