East River Estuary



Guide




EAST RIVER CREW

New York City always has something happening. And these days, most of it is on land. That makes it easy to forget sometimes about the rivers that surround it.

Even harder to remember is that they're not all rivers, but estuaries–fish nurseries–made of both salt and fresh water and part of the larger Atlantic Ocean.

An **estuary** is a water passage where the tide meets a river current, especially an arm of the sea at the lower end of a river.

While inland rivers travel in only one direction, the East River's current changes with the time of day.

www.rpa.org/maps/pdf/HISTORIC_POSTER_V3.pdf

Sometimes it heads north-east to Connecticut and at other times the water flows south to New Jersey.

This is because of the way the tides flow through the strait coming at certain times of day from the Long Island Sound and at other times from the New York Bight.

Knowing the tides is an important part of boating on the East River!

Example of a nautical chart (from www.noaa.gov)

A **bight** is a bend in a coast forming an open bay; also: a bay formed by such a bend.

The water itself is not the only thing that travels both north and south through the estuary. The East River is also home to a number of traveling fish species.

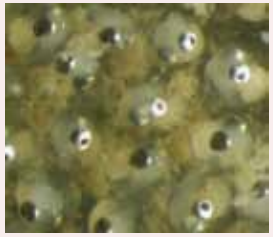
Grubby, Hake and Winter Flounder travel south from Maine and Canada during the colder months.

Grubby (sculpin)

Winter Flounder

In the summer, these winter fish return home and are replaced by Bluefish, Porgy and Fluke from the south.

Some fish also migrate through estuary waters in order to lay eggs, either in the strait itself or on their way inland to fresh water.



Fish eggs

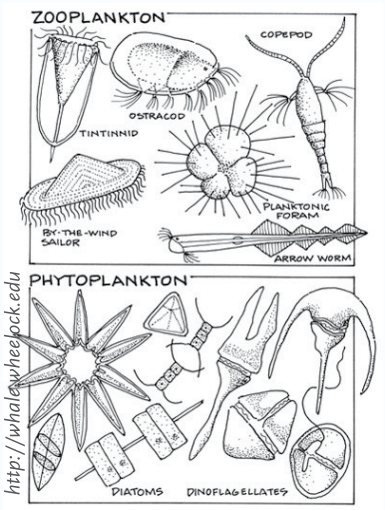
Other animals live in the East River all year long.

Herring Gull

White Perch live their whole lives in estuary waters, as do a number of smaller creatures, called **benthos**.

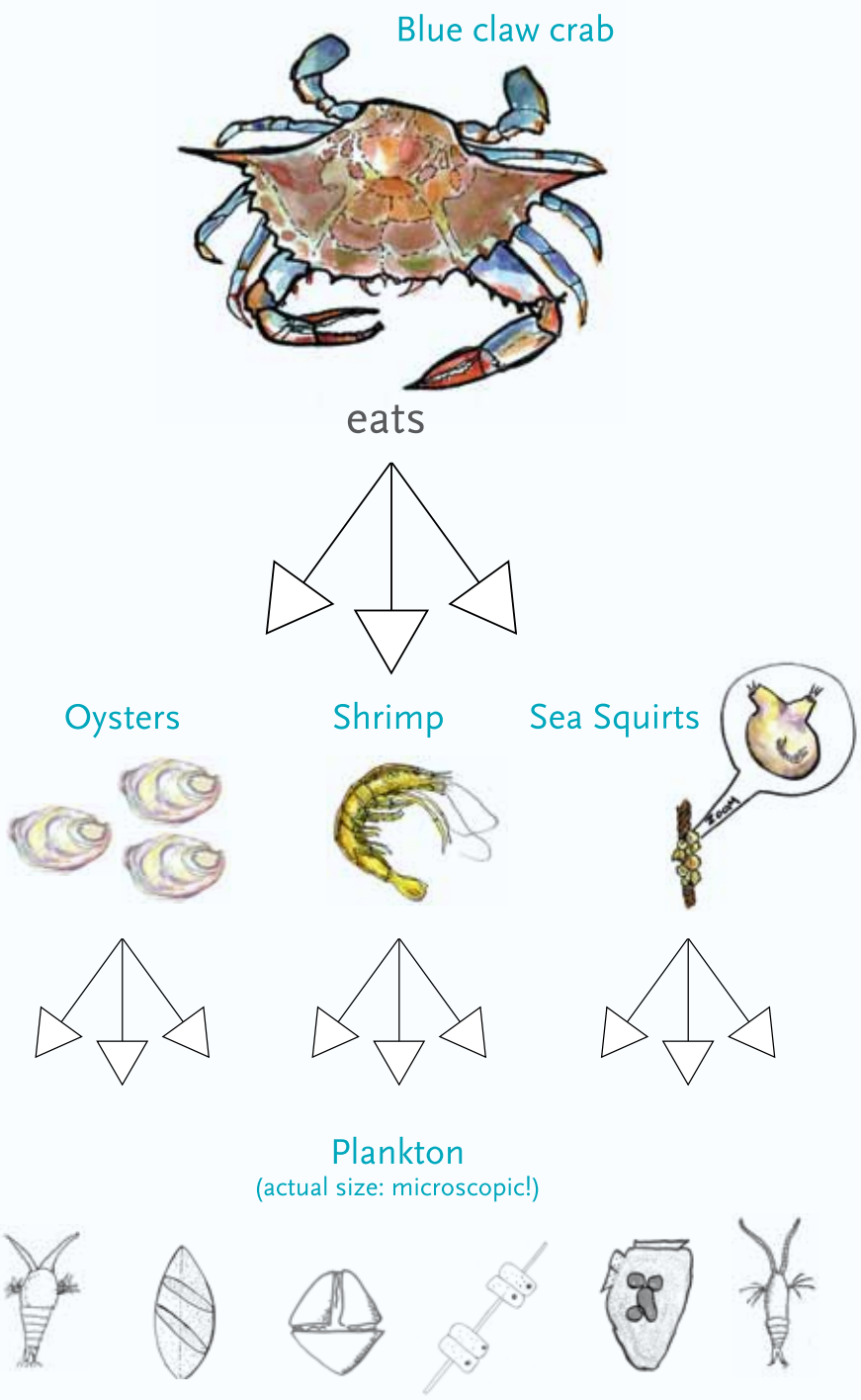
> **Benthos** are the organisms that live on or in the bottom of a body of water.

The health of the entire estuary rests on these smaller creatures. Tiny **plankton**, plants and animals feed the clams, shrimp, crabs, mussels, and oysters that both filter pollution and provide food for larger fishes, birds, and other animals.



> **Plankton** is the passively floating or weakly swimming usually minute animal and plant life of a body of water.

Example of a food chain:



Of all the animals that use the East River, humans have had the biggest impact–even changing the shoreline!

The smaller freshwater streams that crossed Manhattan are gone, as are most of the sandy and marshy areas along its shore.

Cars and trains cross over the river on bridges and under through tunnels and places have been filled in with dirt, concrete and buildings where formerly there was no land there at all!

http://welikia.org/wp-content/uploads/lesson_3_water.zip

Humans have also changed more than just the coastline.

For over a hundred years, New Yorkers dumped sewage and waste into the river without filtering. That's water from their toilets, and trash from their houses, flowing directly into the estuary.

Photo provided courtesy of the Bronx River Alliance, 2001.

Photo provided courtesy of Con Edison and Waterways & Trailways, 2000.

Fertilizer from farms and gardens outside the city also added to the problem. Even though they weren't in Manhattan or Long Island, anything that is dumped or drained into the watershed eventually winds up in the estuary as well.

Watershed: a region with boundaries that drains into a particular body of water.

City waste and fertilizer runoff doesn't just bring harmful bacteria such as e.coli It also creates powerful algae blooms That can devastate an **ecosystem**.

An **ecosystem** is everything that exists in a particular environment it includes living things (animals, plants)and things that are not living (buildings, air, water).

In normal amounts, algae is a necessary part of the estuary food chain. But too much of it causes a lack of sunlight to the water underneath and limits the amount of oxygen in the water.

Without oxygen, very little can survive.

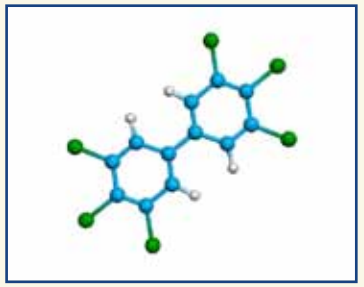
Photo provided courtesy of the Bronx River Alliance, 2001.

Eutrophication the process by which a body of water becomes enriched in dissolved nutrients (such as phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen.

Companies have also had a huge impact on the health of the East River.

Historically, many factories lined the river and drained byproducts they produced into the estuary.

Some of the byproducts were toxic chemicals with long names that are hard to pronounce and side effects that are still being discovered.



PCB molecule

http://www.hudsondredgingdata.com

Removing contaminated soil with dredgers.

Oil runoff, too, from spills and cars is another dangerous chemical in our estuary. It does not mix with water, and sits on the surface in a glassy sheen. It is both dangerous to wildlife and also flammable, sometimes even causing fires on the river itself!

http://www.co.thurston.wa.us

http://www.brownstoner.com

Oil on the Gowanus Canal, Brooklyn.

Other elements, like mercury, are natural in small quantities, but human pollution creates toxic levels that increase up the food chain, and can stay in an ecosystem for a long time, threatening wildlife diversity, and making activities like fishing unsafe for generations.

The last thirty years have seen drastic cleanup efforts for many of these environmental problems.

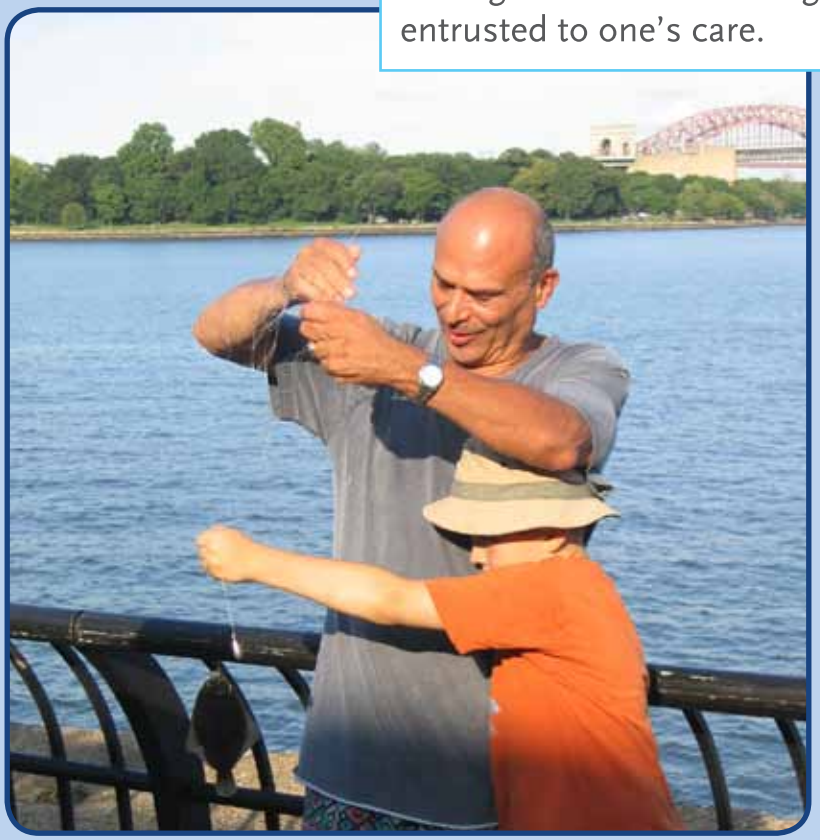
New sanitation plants filter city wastewater and better regulations work to control chemical waste and other industrial and rural runoff.

Newtown Creek Sewage Treatment Plant, Brooklyn.

And while problems remain in the sediment of the estuary, a cleaner attitude is paying off. The water of the East River is much cleaner and safer, and animals that had vanished are now returning.

But individual help and stewardship are important too.

Stewardship is the careful management of something entrusted to one's care.

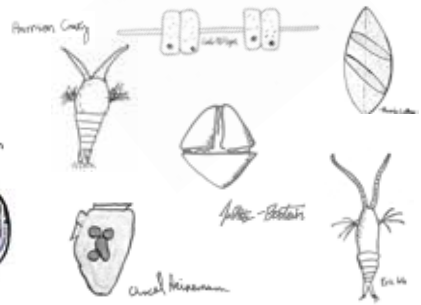


Remembering not to litter and educating others about abandoned waste, as well as getting involved in local activities like oyster gardening, all help to improve the ecosystem of the East River.

Getting involved can also be as simple as a boat ride,

Or a walk along the river's edge, and remembering that there's always something happening in New York– in the water, as well as on the land!

To find out more about the organisms you see here or contribute an illustration to our on-line version, email tgilbert@eastrivercrew.org



The East River Estuary Guide is produced by East River Community Recreation and Education on the Water.

For information on an accompanying coloring book and teacher resource packet, contact
tgilbert@eastrivercrew.org

Text Cait Stuff *Design* Anne LaFond
Illustrations East River C.R.E.W. & The River Project 2010 Interns:
Mayra Alvarracin, Chastity Bowman, Javier Carrillo, Rebecca Dinhofer, Jonathon Lopez, Christopher Lorient, James McCollough, Fitzgerald Robertson, Ramses Sanchez, Laura Singleton, Jennifer Soto, Cecily van Buren-Freedman, Alex Wainger
Plankton drawings by Saint David's students: Davis Colley, Harry Craig, Axel Heineman, Colin McVeigh, Joni Otto-Bernstein, Eric Wu
Photos contributed by Mary Nell Hawk, Phil Yee
Definitions of terms www.merriam-webster.com

Dedicated to Mike Levandowsky, who first showed us how alive the East River is and Mike Davis, for showing us how to build boats to access it.

Publication funded by
PARTNERSHIPS *for* PARKS
City of New York Parks & Recreation
CityParks Foundation