



DREDGING

What is dredging?

Dredging is the process by which a water body is deepened. The shipping lanes of NY/NJ Harbor are currently being dredged or deepened to allow safe passage of large ships.

Why do parts of the NY/NJ Harbor Estuary need to be dredged?

One reason is excess sedimentation. Excess sediment flows into the Harbor from rivers, including the Hudson, which empty into it. Currents and tides also cause sediment to flow up into the Harbor. Both sources have caused sediment to become trapped in the Harbor area, filling in the shipping channels that lead to the Port.

Another reason is ships. They continue to get larger and wider to carry ever-increasing amounts of goods. As ships grow larger and wider, their draft or the depth of water in which they need to float, increases. The Port of NY/NJ has to be able to accommodate these larger ships to stay in business. The Port is now at a depth of 35-45 feet, however the newer classes of ships require a depths of up to 50 feet. If our Port is unable to host these ships, they will go to other, deeper ports. The Port of NJ/NY will lose business and BILLIONS of dollars. This would be devastating to the local economy, and to those trying to rebuild the waterfront of NY/NJ.

After 20 years of debate and planning, dredging is now in progress that will deepen ten (10) miles of channels in the Harbor down to 50 feet.

The channels in our harbor are our underwater highways for boats and ships, and just like the roads across our country the channels need to be maintained and improved as well to keep the ships coming into our harbor and commerce in our country alive.

Dredging is performed by the Army Corp of Engineers and managed by local state and city governments.

How is dredging done in the NY/NJ Harbor Estuary?

In areas with hard bottoms (rock), drilling and blasting must be done to deepen the channel. Dredging drill boats lower a large drill through a steel pipe down to the solid rock bottom. Holes are then drilled into the bottom down to a depth of about 15 feet. Explosives are used to finish the job. A detonator is placed at the bottom of the hole and a syrup-like explosive called Pourvex is poured down through a hose into the hole. A bag of gravel is placed over the Pourvex to hold the explosive components in place. The detonator is set off from the drill boat and the channel is blasted. As many as 100 holes are drilled for one excavated area.

After the explosions are complete, a huge backhoe dredge scoops out blasted material from the seafloor. The backhoes used for dredging the Harbor's channel are the largest in the world. Their buckets can hold up to 22 yards of dredges materials, and can hold more than a garbage truck in one scoop.

In areas where soft or loose material such as sand, mud or clay has collected, a clam shell dredge is used. No, it's not made of clams! It is in these areas where heavy metals, PCB's or dioxins (dangerous pollutants) may be present. The clamshell dredge is used to pick up and trap fine material without re-releasing them into the water column.

The dredged material is dumped into a vessel known as a dump scow. This boat can hold up to 5000 cubic yards (500 football fields of material). Two to three dump scows may be filled in a day by a dredge.

What is done with dredged material?

Sediments and material that are not contaminated are released into the ocean at a designated site called HARS (Historic Area Remediation Site). This area has been used for dredged material placement for decades, except now clean sediment caps off and traps the toxic sediment that were dumped there years ago. This will benefit the entire ecosystem around the site.

Dredging also helps improve the Harbor's water quality by removing toxic materials that pose a threat to local wildlife and humans. Once removed, these materials are put to better use where they cannot re-enter the water. The toxic materials are mixed with cement that helps detoxify it. This mixture is then used in landfills. Have you ever shopped at Jersey Gardens? What was once a contaminated landfill and health threat to humans was transformed into this space by using decontaminated dredged material. Dredged material has also been used to fill in abandoned coal mines in Pennsylvania, preventing acids from leaching into nearby streams and rivers.

Follow up Questions for Students:

1. State two reasons why we must dredge the NY/NJ Harbor?
2. What would be an effect if the Harbor is not dredged?
3. How deep does the Harbor need to be?
4. Name the two different pieces of equipment used to remove dredged material
5. How do these pieces of equipment differ in removing dredged material?
6. How does dredging help improve the Harbor's water quality?
7. What are two uses of dredged material?



This lesson plan was developed by the Education Program at the NJ Marine Sciences Consortium/NJ Sea Grant. For complete program information contact the NJMSC/NJSG at 732-872-1300 or www.njmssc.org