

Cadmium in the Cove

How did Foundry Cove get to be “the most cadmium polluted site in the world”?

A. Introducing the Marathon Battery Story

The Marathon Battery Factory used to sit at the edge of Foundry Cove, a small inlet on the east shore of the Hudson River, about 54 miles (90 kilometers) north of New York City. Foundry Cove has a long history as a manufacturing site. In the mid-nineteenth century, the cove was home for the West Point Foundry, which made, among other items, Parrott guns that were used in the Civil War. In 1952, Marathon Battery factory began the production of nickel-cadmium batteries on the site. Metal-laden waste from this manufacturing process was dumped into Foundry Cove.

Within a few decades Foundry Cove had the unfortunate honor of being “the most cadmium-polluted site in the world.” Cadmium and the other metals settled into cove sediments and were consumed by organisms. Hudson River tides carried metals in and out of the cove as well as up and down the river. Cadmium and other heavy metals are toxic to people and other animals.

Metal pollution, especially cadmium contamination, changed the environmental conditions in and around Foundry Cove. Cadmium was found in plants and animals, and entered the human food chain. Human health concerns led the Department of Environmental Conservation in New York State to set limits on how much blue crabs and fish from the Hudson could be eaten.

Foundry Cove contains freshwater marshes and mud flats. There are two tidal cycles that enter and leave the cove each day, since it is part of the Hudson River estuary. This estuary extends from New York City to the Troy Dam near Albany, New York. The water in Foundry Cove is generally fresh, but may become slightly saline (salty) during dry periods when the freshwater flow is low.

The Marathon Battery Company in Cold Spring, New York was located near the edge of Foundry Cove. From 1952 – 1979, nickel cadmium (Ni-Cd or Ni-cad) batteries were manufactured there, initially for the military and later for general use. Both nickel and cadmium were used in large quantities, and for a short time, cobalt was used as an additive. Over 100,000 pounds of cadmium were dumped into Foundry Cove by the time it was closed in 1979.

Metals and other pollutants are often reported in parts per million (ppm). Some parts of the cove reached levels of over 50,000 ppm of cadmium in the sediments, an extremely high level. During the years that the Marathon Battery Factory operated, there was no regulation of cadmium levels in the environment or in food. Currently, the U.S. Environmental Protection agency has set a limit of one ppm of cadmium in the environment.

Animals in the Foundry Cove and the Hudson River have been tested for cadmium levels, and many species showed concerning levels of the metal. In the 1980's, muskrats in Foundry Cove had an internal level of 15 ppm of cadmium and blue crabs had cadmium levels of 12 ppm in their hepatopancreas. (Cadmium levels in blue crabs and fish are much lower now. You'll learn more about how this happened in future lessons.) At very high levels of exposure, cadmium can cause severe health problems for people, including cancer and itai-itai (which means ouch-ouch in Japanese) a disease that causes painful damage to bones. It is important to note that these effects have not been found in people in and around Foundry Cove.

This unit will focus on cadmium. Cadmium is known to be more toxic than nickel and cobalt, and much more of it was dumped by Marathon Battery. Scientists focused their research on cadmium, so we can use scientific data to understand the history of cadmium and its effects in the Foundry Cove and Hudson River area.