

Lesson 2 PowerPoint Notes Marathon Battery Factory & Cd Contamination

Slide	Notes	Additional Notes
1	Ask students to compare the photograph of Foundry Cove with the maps from Lesson 1. They should be able to point out Foundry Cove, the Hudson River (greenish water on the left) the location of the former factory (pushpin on the right), the marsh, some details of the cove's shoreline, and the railroad tracks. The train trestle is not visible, but they will be able to show the approximate location of it. The EPA superfund site is the cleared, rectangular, low-vegetation area northwest of the upper right pushpin.	
2	The northeastern portion of Foundry Cove is a historical site. The site of cadmium pollution is to the west of this. A foundry uses molten metals to cast machinery and other metal items. The cove gets its name from the West Point Foundry that manufactured parts for steam engines and Parrott guns, shown in the photo, were used by the Union Army during the Civil War. Relics from this era remain at the site, and archeological digs conducted during the summer continued to unearth more historical finds. Also shown in the photos: 2007 archeology crew from Michigan and furnace remnants uncovered – notice the shovel for scale. Initially, Marathon Battery Factory made batteries for Nike missiles, but later converted to making batteries for general use.	
3	Ni-Cad batteries continue to be used for some applications, though they are no longer manufactured at Foundry Cove. Some current uses are: cordless and wireless telephones, emergency lighting, remote controlled model airplanes, and cordless power tools. When the Marathon Battery Factory began dumping wastes in Foundry Cove (and for a short time into the Hudson through the Cold Spring sewage plant), the Clean Water Act and the Environmental Protection Agency did not exist. The EPA was established in 1970. The Clean Water Act was passed in 1972.	
4	Foundry Cove, foreground, with Constitution Marsh Audubon Sanctuary at center left. South Cove is at the rear. Even though South Cove is close to Foundry Cove, the	

	<p>cadmium levels remained fairly low because water flow between the two coves was minimal. South Cove was used as a control site for scientists investigating effects of cadmium on organisms.</p> <p>Between 1952 and 1979, over 112,000 pounds of cadmium was released and Foundry Cove became the most cadmium polluted site in the world.</p>	
5	<p>Blue crabs are caught for food by both commercial and recreational fishermen. Though the cadmium levels in blue crabs are much lower now due to the Superfund Cleanup in the 1990's, the NYS Department of Environmental Conservation continues to warn that people not eat the "green stuff", which stores cadmium, PCBs, and other toxins.</p>	
6	<p>Itai-itai illness first recorded in Japan in the 20th century in people who lived and farmed near a cadmium mine in Japan. Itai-itai, cancer, and other serious health problems are rare, but the risk to human health is great enough that sport and commercial fishing for blue crabs and fish in the Hudson was restricted due to contamination with cadmium and other toxins, notably mercury and PCBs.</p> <p>Muskrats were not studied at Foundry Cove, though data on ppm was tested and recorded. Anecdotal observations by scientists: they noticed that muskrats were rarely seen in Foundry Cove when it was highly contaminated, though they were seen at nearby, cleaner sites. Muskrats are more common in the cove today</p>	
7	<p>The EPA's actionable limit for cadmium in the environment is 1 ppm. Compare that to the sediment samples on the maps.</p>	
8	<p>1 ppm isn't visible in this graphic – it's 1/100th of one dot! Each visible dot = 100 ppm Each row in each square has 10 dots, with each representing 100 ppm, so each row represents 1000 One square = 1000 x 10 = or 10,000 50,000 = five squares of 10,000 250,000 ppm = one quarter of the large square. This was the highest ppm cadmium ever recorded in sediments, and was found right at the outfall site in the 1970's.</p>	