
# THE CRANEY ISLAND CONNECTION

CRANEY ISLAND EASTWARD EXPANSION NEWS AND INFORMATION

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THE CRANEY ISLAND CONNECTION IS PUBLISHED MONTHLY UNDER THE AUSPICES OF THE VIRGINIA PORT AUTHORITY AND THE U.S. ARMY CORPS OF ENGINEERS, TO PROVIDE READERS WITH REPORTS RELATED TO THE DEVELOPMENT OF THE EASTWARD EXPANSION OF CRANEY ISLAND. ARTICLES PRINTED HEREIN ARE FOR INFORMATIONAL PURPOSES ONLY. WE INVITE READERS TO COMMENT ON ARTICLES AND SUGGEST FUTURE TOPICS FOR CONSIDERATION.



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# OYSTER REEFS FOUND ON THE WESTERN BRANCH

Oyster reef construction is one component of the Craney Island Eastward Expansion mitigation plan. Oysters are a keystone species, meaning they are crucial species of their ecological community. Therefore, oysters reefs are critical to supporting diverse river life. Oysters provide significant ecological services. Over 300 aquatic species including snails, worms, crabs, and sponges live and hide within the structure of the oyster reef. In addition to providing a habitat for commercially and ecologically important species, oysters act as a natural water filtration system. Oysters can filter up to 60 gallons of water daily, which works to reduce sediments and pollutants in the water.

The Craney Island Eastward Expansion mitigation plan will create 15 acres of restored oyster reefs in the Elizabeth River. Restored reefs are created by placing multiple piles of old oyster shell on hard bottom areas of the river allowing, young oysters to settle, grow, and reproduce. A team of scientists, including, Craig Seltzer and Dave Schulte, U.S. Army Corps of Engineers Norfolk District, and Russ Burke with the Virginia Institute of Marine Science (VIMS), led the field investigation to gather site specific data and to address issues of reef survivability and constructability.


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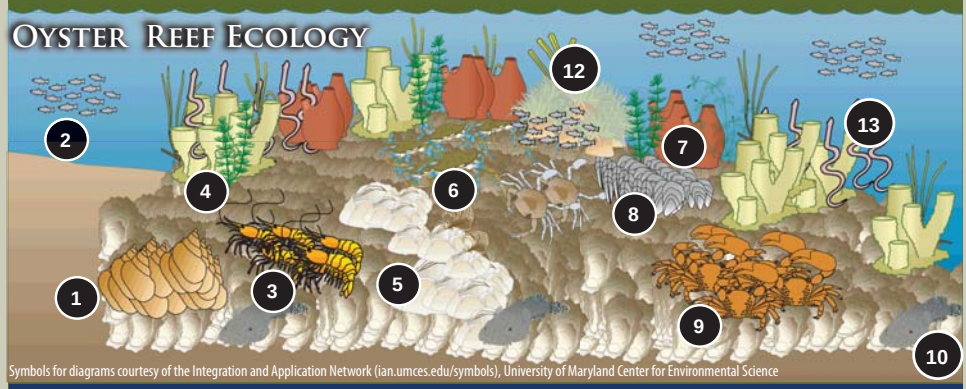


Symbols for diagrams courtesy of the Integration and Application Network (ian.umces.edu/symbols), University of Maryland Center for Environmental Science

**Oyster reefs can provide habitats for a tremendous range of other animal species. Oyster bar species include some of the following animals: 1. Snails 2. Small Fish 3. Shrimp 4. Sponge 5. Barnacles 6. Juvenile Blue Crabs 7. Sea Squirt 8. Mussels 9. Mud Crabs 10. Skillet Fish 12. Sea Anemone 13. Worms**

*Typical oysters discovered on natural reef in Elizabeth River are over 6 inches (150 mm) in size. Photo courtesy of U.S. Army Corps of Engineers Norfolk District*

*Typical Oyster Reef*
*Photo Courtesy Of*
*Virginia Department Of Environmental Quality*

*Oyster Shells For Restoration*
*Oyster shells are cleaned and dried in preparation for setting oyster larvae for restoration as part of the oyster restoration project in conjunction with the Horn Point Laboratory oyster hatchery.*

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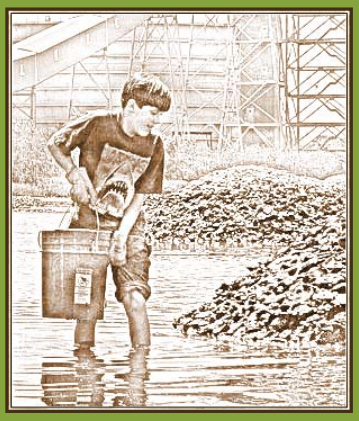
The field investigations included looking at the performance of previously constructed oyster reefs in the river, identifying sites where natural oyster populations may be developing, and examining the stability of bottom sediments for reef construction. During these investigations, a surprising and unprecedented discovery was made. A subaqueous natural reef was found in the river's Western Branch.

This newly discovered reef is very large and contains thousands of oysters in the 5 to 6 inch range (many at least 5 years old). Two prominent diseases MSX, and Dermo, typically kill vulnerable oysters before they reach 3 inches. But disease studies conducted at VIMS on these oysters indicate that they remain healthy despite the presence of marine disease. The oysters showed resistance to MSX and Dermo doubling to the size in which mortality is typically seen. This discovery provides clear evidence that certain oysters in the population can resist disease in the Elizabeth River. These large oysters will be used as broodstock (specialized aquatic breeding species) to provide spat-on-shell for constructed reefs as part of this mitigation plan. The spat-on-shell oyster restoration technique has demonstrated an effective process for growing healthy and harvestable oysters in Virginia's waters.

*Oyster Float*

## Get Involved
## Grow an Oyster Garden



With a longstanding farming and growing community, gardening is a favorite pastime in Hampton Roads. As you have likely harvested the last of your fall vegetables, many Hampton Roads educational and environmental organizations are encouraging private citizens to grow oysters to help in river/bay restoration. Oyster gardening involves growing oysters in local rivers and streams. As discussed above, oysters provide important habitats to river/bay species. Moreover, they serve to filter the waters of Hampton Roads. Growing oysters in a float at a dock provides an educational opportunity, as a variety of species will reside in the mini-oyster reef. Oysters can also be grown in support of oyster reef creation initiatives in the region. Growing oysters provides the perfect opportunity to help with river restoration efforts. To grow oysters, you must obtain a permit from the Virginia Marine Resources Commission. To get an application, contact the VMRC Habitat Management Division at (757) 247-2252. For support, consider joining a local oyster gardening association.

# Sediment Restoration Sampling Operations

In 1993, the Chesapeake Bay Program identified the Elizabeth River system as one of the most highly polluted bodies of water in the entire Bay watershed. The Southern Branch has been identified as having a severe sediment problem, which left the river bottom unable to support aquatic life. In March 1995, the Commonwealth of Virginia entered into an agreement with the Elizabeth River Project (ERP) to recommend actions toward an Elizabeth River Regional Action Plan for Toxics Reduction. The plan identified sediment remediation as a high priority for the clean-up of the Elizabeth River watershed. Therefore, sediment remediation was elected as one component of the mitigation plan for the Craney Island Eastward Expansion project, along with wetlands restoration and oyster reef creation. This landscape approach will restore this section of the river to a healthy and productive aquatic ecosystem. Sediment restoration, combined with the construction of wetlands and oyster ground components, will result in the restoration of several acres of river bottom. Moreover, water quality will likely improve in both the adjacent areas and downstream from the remediated river bottoms.

Sediment sampling has begun in three areas of the Southern Branch of the Elizabeth River, including: Paradise Creek (29 acres); Republic Creosote (21 acres); and Republic South (30 acres). The objective of this work is to collect data to identity the chemical characteristics of the sediments that will be removed to provide aquatic habitat and benthic (river bottom) habitat restoration. Remediation and restoration of river bottom sediments is accomplished by a combination of removing and isolating the identified sediments. Sediment will be dredged, isolated, and transported to approved placement/treatment sites. The dredged areas will be filled with clean sand material. These improvements, along with the creation/restoration of wetlands and oyster reefs, will accommodate increased diversity, abundance, and productivity of bottom dwelling organisms in the river.

*Sediment Restoration Sampling Operations*

# CIDMMA Customer Spotlight:

## Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT)

As home to the world's largest Navy Base, the U.S. Military is a major driver of the region's economic engine. One third of the Navy's ships and one fourth of its sailors and aircraft are based in Hampton Roads. As part of the Craney Island Dredged Material Management Area (CIDMMA) Customer Spotlight series, the Craney Island Connection spoke to Steven M. Lantz P.E., Chief of Project Management & Engineering at Little Creek Naval Amphibious Base for Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic (MIDLANT). The region's Naval installations rely on Craney Island Dredged Material Management Area (CIDMMA) for maintenance of their channels and berths.

The Navy conducts dredging operations at Norfolk Naval Station, Norfolk Naval Shipyard, Craney Island Fuel Facility, Little Creek Naval Amphibious Base, and Yorktown Naval Weapons Station. In particular, ship berths channels and channel approaches are maintained to specified depths to accommodate safe transit, berthing, and mooring of naval vessels.

According to Lantz CIDMMA provides low cost dredged material placement for the benefit of the U.S. Navy. He states, "If the Navy could not hydraulically pipe material from the Norfolk Naval Station directly to Craney Island, or tow scows to the convenient Craney island rehandling basin, the material would have to be barged many miles off shore to open-ocean disposal areas at a much higher cost per cubic yard."
In an average year, annual maintenance dredging at Norfolk Naval Station yields 500,000 - 750.000 CY, plus approximately 750,000 - 1,000,000 CY every three to four years from dredging associated with new pier construction. The other regional Naval installations can go 3-5 years between maintenance dredging.

Lantz summarizes one the key benefits of the Craney Island Eastward Expansion, saying "By expanding CIDMMA, the Navy will be able to continue to dredge its Hampton Roads facilities with very economical disposal rates, and utilize the savings for other Navy facility needs." Moreover, the Navy's use of CIDMMA also benefits dredging contractors and local fuel, materials and maritime support vendors. The Craney Island Eastward Expansion supports low cost dredged material placement, allowing for growth in the Hampton Roads maritime-based economy.

# Fun Facts: What Moves In a Box?

Port capacity and productivity is often measured in TEUs. TEU stands for "twenty foot equivalent unit". Today most cargo is moved in 40' containers. Containers are specifically designed to be craned straight on and off containerships and onto the back of trains or trucks for quick and easy distribution. The average containerships are built to carry upwards of 4000 containers, but the largest containerships can carry 10,000. These containers are used to ship a large variety of consumer goods, including: electronics, textiles, toys, beverages, food, and raw materials. Almost anything can be shipped in a container. Below you will find a table describing a number of items that can be shipped in one 40' container.


| # of Items | Item | Unit Value | Total Value |
|---|---|---|---|
| 163,840 | Apples | $.30 | $49,152 |
| 6264 | Wii Consoles | $250 | $1,566,000 |
| 143424 | Ipod Touch | $399 | $57,226,176 |
| 12,160 | Men's Shoes | $70 | $851,200 |
| 385,985 | Compact Disc (CDs) | $10 | $3,859,850 |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