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Development and Use of the Eastern Mud Snail (*Tritia obsoleta*) as a sentinel species to detect endocrine disruptors in Charleston Harbor – perhaps in your subtitle you can be more specific to contaminants associated with dredging

Charleston, SC is one of the oldest cities in the South and attracts tourists from all over the world. As a coastal city, part of its charm is access to the Charleston Harbor for recreational activities and fresh seafood but it is equally important as an industrial port. In the fall of 2018, dredging of the harbor will begin to make way for large supertankers and ocean cruise liners.

The harbor will be dredged 40- 50 feet deeper than present and there are concerns that harmful chemicals (which are now banned) buried in the sediments will be brought up into the water as a result of the dredging. Particular chemicals of interest include heavy metals that can be detected in organisms sensitive to chemical changes in the environment, such as TBT (tributyltin), which is composed of tin. TBT is a compound that was previously used in antifouling paints on ships and wood preservatives. It was later discovered that this compound was detrimental to marine life so in the 1980's restrictions were placed by the Marine Protection Committee to discontinue the use of TBT in paint coatings. However, TBT is able to bond with particles in the water column and settle onto the sediment floor. This means that TBT can still possible still be found on the channel floor of the harbor.

Another concern is that oil spills associated with increased vessel traffic will become more common and involve the release of poisonous cleanup compounds into the water column, including Span 80 and dioctyl sodium sulfosuccinate (DOSS). These three compounds and others are known to act as endocrine disrupting compounds (EDCs). EDCs are known for interfering/altering hormone production in the endocrine system. Endocrine disruptors are known to have lasting effects on: development, reproduction, neurology, and immunity in both humans

and other organisms. Even though our current scientific knowledge on the effects of endocrine disruptors on humans are limited, there have been many laboratory experiments completed that have confirmed that they have detrimental effects on wildlife.

The eastern mud snail is a marine gastropod species usually found in intertidal and subtidal waterways. They are usually found on mudflats (such as the one in Grice Cove). The Eastern mud snails were the chosen species of study because it is a sentinel species that will undergo imposex once introduced to endocrine disruptors. Imposex is when female mud snails develop male sex traits (such as a penis and vas deferens). Imposex in snails is one of the greatest examples of the effects of endocrine disruptors on other species

Samera Mulatu, an intern with Dr. Demeteri Spyropoulos is working with the Medical University of South Carolina (MUSC) to study the use of the Eastern mud snail (*Tritia obsoleta*) to harmful endocrine disrupting compounds through the expression of imposex.

The results from this study will hopefully show that mud snail imposex is a sensitive indicator of endocrine disruptors in the environment which may impact human health and the health of other organisms in the ecosystem. I am hypothesizing that high imposex rates in molluscan species will be linked to high levels of contamination found in that site within the Charleston Harbor – again what does this mean. Going back to what I mentioned previously about how Charleston, South Carolina is known worldwide for how the Charleston Harbor provides recreational activities and fresh seafood to many people, the results retrieved from this study will not only bring insight into the contamination levels of the harbor, but will also can also put the city’s recreational activities and seafood reputations at risk. Hopefully however, the results from this project will shed light onto the harmful side effects associated with dredging, and will close off any future plans of dredging of the harbor.

