The Community Foundation *for* Greater New Haven

QUINNIPIAC RIVER FUND FINAL REPORT- 2017

Date: March 31, 2017

Group/Organization Name: Quinnipiac University

Address: 275 Mount Carmel Ave
City, State, & Zip: Hamden, CT 06518

Telephone #:203-582-6420

Project Name: The determination of plasticizers and other chemical pollutants, from industrial point sources in Wallingford and North Haven with an emphasis on the pollutant's impact to indigenous fish populations in the Quinnipiac River

Grant Number: 20160130

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1. Brief summary of the 2016 project:

This study aims to determine the effects of phenothiazine, a chemical pollutant found in the Quinnipiac River in 2015, on markers for stress and endocrine disruption in the indigenous fish species, Fundulus heteroclitus (commonly known as mummichog). Gene expression changes for seven hormone receptors and serum cortisol levels will be assessed to determine the impact of phenothiazine on the local fish. Additionally, the study will attempt to identify organic chemical pollutants found in the Quinnipiac River via GC-MS.

2. Objectives/outcomes achieved:

- Collect and analyze water from the Quinnipiac River at the industrial discharge points at Toelles Road, and at other predetermined locations in Wallingford, North Haven, Hamden, and the River's tidal marshes, in order to identify the presence of chemical pollutants.

    - Water samples were collected and analyzed from ten distinct sites throughout the Quinnipiac River on at least four separate occasions. In addition, the discharge pipe was sampled another three times on three separate occasions.

    - There have been no major findings of phthalates or other plasticizers as evident via GC-MS.

- Assess the impact of phenothiazine on a local fish species.

    - *Fundulus heteroclitus* (mummichogs) were treated with environmentally relevant concentrations of phenothiazine and tissue from brain, liver and gonad were analyzed for changes in mRNA levels.

    - Results demonstrate a tissue-specific response, as well as significant differences between some of our control fish and our highest concentration of phenothiazine for several of the hormone receptors, including androgen receptor, estrogen receptor beta a, estrogen receptor beta b.

    - Blood collected from control and treated mummichogs were assessed for the impact of phenothiazine on serum cortisol levels, as a marker for stress. Results indicated that there were no significant differences between control and phenothiazine treated fish.

- Measure water quality and climatic parameters, primarily water temperature, at sample sites during collection.

    - Water temperatures were taken at the collection sites.

- Communication to the community-at-large, our results will be disseminated by the Public Relations Department at Quinnipiac University to local newspapers like the New Haven Independent.

    - Preliminary data was presented at the ENEBC Conference on April 16, 2015 and NACRW on July 17, 2016.

    - Data will be presented at the Experimental Biology Conference in Chicago, IL on April 23, 2017.