Sea Grant Project Summary Form 90-2

Institution: New York Sea Grant Institute
Project Title: Deep Core Analysis of Historical PCB and Mirex Sediment Flux

Initiation Date: 02/01/2020 **Completion Date:** 01/31/2022

Principal Investigator: Boring, Isaac M.		**Effort:**	**Match Effort:**
Affiliation:	Department of Chemistry, Stony Brook University	**Year 1:** 1.5 months **Year 2:** 1.5 months	**Year 1:** 0.5 months **Year 2:** 0.5 months
Co-Principal Investigator: Mudd, Harry		**Effort:**	**Match Effort:**
Affiliation:	Department of Natural Resources, Cornell University	**Year 1:** 1.0 months **Year 2:** 1.0 months	**Year 1:** 0.5 months **Year 2:** 0.5 months
Associate Investigator: Brown, Andrew C.		**Effort:**	**Match Effort:**
Affiliation:	Department of Chemistry, Stony Brook University	**Year 1:** 0 months **Year 2:** 0 months	**Year 1:** 0.25 months **Year 2:** 0.25 months

Proposed Sea Grant Funds:	**Proposed Match Funds:**
Year 1: $100,000	**Year 1:** $50,000
Year 2: $100,000	**Year 2:** $50,000

Keywords: PCB, Mirex, Contaminants, Sediment Dynamics, Pollutant Modeling, Hudson River, Lake Ontario

Objectives:
1. To identify historical changes in contaminant loads through analysis of deep core samples.
2. To quantify fluxes in contaminant loading through time and space.
3. To produce a 3D map of PCB and Mirex in Lake Ontario and Hudson River sediments.
4. To provide a predictive tool for future contaminant release from sediments in different areas.

Methods:
1. Obtain random deep sediment cores in the Hudson River and Lake Ontario in regions of known contamination with PCB and or Mirex. Freeze samples and transport to lab for analyses.
2. Analyze sediment cores by sectioning and measuring contaminant concentrations using HPLC, mass spectrometry, and gas chromatography.
3. Use GIS software to map contaminant levels in the sediments.
4. Perform time series analyses and modeling.

Rationale:
Contamination of benthic sediments is of serious concern to environmental and resource managers, sport fishermen, and coastal communities. Benthic contaminants can enter the food web through benthic feeding organisms, which then are biomagnified up the food chain to apex predators, which are often consumed by humans. Contaminants can also enter the water column, and the pelagic food web, from

sediment storage by storm scour or dredging. Analyses of deep sediment cores over a suitable area provides a clear picture of past contaminant sediment loading and potential future releases. Knowledge of potential contaminant inputs into the environment from the sediment in regions of previous contaminant loading will be useful in estimating resources needed for mitigation.