

## Contaminant and Co-stressor Effects on the Early Life-Stages of Shortnose and Atlantic Sturgeons

Chambers, R.C.<sup>1</sup>, A.C. Candelmo<sup>1</sup>, E.A. Habeck<sup>1</sup>, K.M. Habeck<sup>1</sup>, and I. Wirgin<sup>2</sup>

<sup>1</sup>NOAA/NMFS/NEFSC Howard Marine Sciences Laboratory, 74 Magruder Road, Highlands, New Jersey 07732

<sup>2</sup>Department of Environmental Medicine, New York University School of Medicine, 57 Old Forge Road, Tuxedo, New York 10987

Shortnose and Atlantic sturgeons live in coastal and riverine waters along the Atlantic Coast and spawn in upper reaches of these estuaries. These habitats and their inhabitants are especially at risk to anthropogenic stressors including contaminants, low dissolved oxygen (DO), and elevated temperatures. We address the impact of these stressors on sturgeon early life-stages (ELS) by exposing embryos to graded doses of PCBs, Aroclor mixtures, and dioxin, then scoring survival to hatch, embryonic period duration, the size and condition of larvae at hatching, and persistence of larvae on maternal nutrition alone. After exposure to contaminants embryos were also incubated under three different temperature regimes and later, as feeding larvae, subjected to varying levels of acute hypoxia in order to evaluate the single and joint effects of contaminants and co-stressors of ELS responses. Survival decreased with increasing contaminant concentration. Sublethal effects observed included a shortening of larval size at hatching, yolk-sac edema, retarded eye development, and reduced lifespan on maternal nutrition alone. Larval activity and prey consumption rates were further compromised under increasingly hypoxic conditions. Results show these sturgeons to be at risk to direct effects of the contaminants tested with significant magnifications of effects by the presence of other co-stressors.