

Patuxent Wildlife Research Center

Contaminant Exposure, Food Web Transfer and Potential Health Effects on Chesapeake Bay Waterbirds



The Challenge: Agricultural, industrial and urban activities have had major effects on waterbird populations in Chesapeake Bay. Pharmaceuticals, personal care products, and endocrine disrupting compounds have been detected in the water column and fish tissue, yet knowledge of their occurrence and effects in wildlife is limited. Some legacy pollutants (PCBs, organochlorine pesticides, and metals) continue to pose a potential threat to wildlife in some locations.



The Science: Measurement of contaminants in water, the concentration in fish, and biomagnification in higher trophic level species (predatory fish, ospreys), will enhance our understanding of the fate, effects, and food web transfer of emerging and legacy contaminants. A suite of indicators will be used to evaluate health and reproductive fitness of fish (in collaboration with USGS-Leetown Science Center). Molecular and genetic endpoints, condition indices, and reproductive success will be monitored in ospreys. As laid out in the Chesapeake Bay Executive Order, this integrated effort will focus on the Potomac, Susquehanna and James Rivers, and Regions of Concern. PCB residues in osprey eggs remain high in some locations, and brominated flame retardants were elevated near wastewater treatment plants.



The Future: This study will expand the geographic scope of our knowledge, document spatial and temporal trends of contaminant exposure in fish and wildlife, and may have implications for human health. These data will be used by regulatory and resource management agencies to prioritize contaminants of concern, and develop management actions to mitigate pollution. Ultimately, findings will contribute to the improvement of environmental quality, ecosystem integrity, and sustainability of the Chesapeake Bay.