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| **Toxic Contaminants Research Outcome** Effective date: 2016-2018    **Goal**: *Toxic Contaminants*  **Outcome**: Research  **Long term Target**: Develop a research agenda and further characterize the occurrence, concentrations, sources and effects of toxic contaminants of emerging and widespread concern.  **2 year Target**: Completion of performance targets related to key actions  **Partner contributions to 2 year target**: As-listed under performance targets | | | | | | | | |
| **Management Approach 1:** Supply information to make fish and shellfish safe for human consumption | | | | | | | | |
| **Key Action**  *Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.* | **Performance Target(s)**  *Identify incremental steps to achieve Key Action* | **Partners**  **Responsible**  *Identify responsible partner for each step.* | **Geographic Location** | **Timeline**  *Identify completion date (month and year) for each step.* | **Estimated Project Cost** *Best estimate total cost of project (need)* | **Available funding by Partner** | **Total**  **Available Funding**  *Roll up of estimated funding* | **Factors Influencing and/or Gap**  *ID related factor or gap in Mgmt. Strat* |
| 1. Use existing information to provide overviews of the effects of multiple toxic contaminants on shellfish and fisheries. | NOAA is preparing a National Bioeffects report that will contain a chapter on Chesapeake Bay. NOAA will present the Chesapeake summary to the TCW.  Other existing NOAA reports include:<http://ccma.nos.noaa.gov/publications/NCCOSTM47.pdf>)  <http://www.ccma.nos.noaa.gov/publications/nccoschesapeakebay.pdf> | NOAA | Tidal waters in MD and VA | 2016 |  |  |  |  |
| 1. Generate further information on mercury, focused on determining whether further Chesapeake Strategies are needed to supplement national efforts to reduce its impact on fish and associated consumption advisories. | Establish a Mercury Subgroup that would begin to summarize information to be considered by TCW to minimize effects of mercury. | TCW and MD Mercury working group | Watershed-wide | 2016-17 |  |  |  |  |
| Conduct sampling of mercury in young of the year fish. Results will eventually be used to assess trends. | MDE and MD DNR | Maryland |
| Review and obtain information documented during the establishment of Maryland’s proposed Mercury TMDL. | MDE |
| 1. Generate further information on selected pesticides to help TCW consider a future management strategy | Interact with MD Pesticide network and associated research WG (see Management Approach 4) | MD Pesticide Network | MD focused | 2016 |  |  |  |  |
| 1. Consider the development of a PCB mass balance model for the Chesapeake Bay. | Discuss utility, feasibility and practicality of developing a mass-balance model for PCBs. | TCW and science partners |  | 2016-17 |  |  |  |  |
| 1. Monitor levels of PCBs in fish and shellfish and move contaminated sites towards cleanup. | (Please see the Toxic Contaminants Policy and Prevention Workplan- Management Approach 1, Key Action 1) | (See Toxic Contaminants Policy and Prevention Workplan) | (See Toxic Contaminants Policy and Prevention Workplan) | (See Toxic Contaminants Policy and Prevention Workplan) |  |  |  |  |
| 1. Better delineate PCB sources from diffuse sources of land, release from deposits in stormwater pipes, and atmospheric deposition. | (Please see the Toxic Contaminants Policy and Prevention Workplan- Management Approach 1, Key Actions 6 and 10; Management Approach 4, Key Actions 1 and 5) | (See Toxic Contaminants Policy and Prevention Workplan) | (See Toxic Contaminants Policy and Prevention Workplan) | (See Toxic Contaminants Policy and Prevention Workplan) |  |  |  |  |
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| **Management Approach 2:** Understanding the influence of contaminants in degrading the health, and contributing to mortality, of fish and wildlife | | | | | | | | |
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| 1. Assess the effects of contaminants on fish and shell fish in tidal waters | Continue studies of tumors found in Bullheads catfish  Evaluate findings from condition of Yellow Perch in urban areas. | FWS  FWS, MD DNR, USGS | Tidal Potomac  Selected MD rivers | 2016-17 |  |  |  |  |
| 1. Generate information to document fish health conditions in the Bay watershed. | Summarize information from USGS and cooperator studies on the status of fish health over the last 10 years in the watershed (USGS). | USGS in partnership with MD, PA, and WV | Maryland, Pennsylvania and West Virginia | 2016-17 |  |  |  |  |
| Continue monitoring of fish conditions in agricultural areas (with companion studies on occurrence and sources of EDCs) (USGS with PA, MD, and WVA). Begin planning for studies in urban areas. | USGS with PA, MD, and WV | Susquehanna and Potomac watersheds |
| Expand activities to identify compounds causing the observed impacts on fish. | USGS | Susquehanna and Potomac watersheds |
| Evaluate the mechanisms involved in the development of testicular oocytes in male bass leading to intersex in the field and the lab | USGS | Susquehanna and Potomac watersheds |
| Provide information on the concentration of chemical residues (EDCs, legacy contaminants and Hg) in fish tissues to understand factors influencing accumulation | USGS |  |
| Continue studies on the relationship between the amount of impervious surface and the impact on fish conditions | MD DNR | Maryland |
| Continue stream IBI studies as part of the Maryland biological stream survey to evaluate health of fish communities and identify potential linkages to toxic contaminants. | MD DNR and MDE | Maryland |
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| 1. Assess the effects of toxic contaminants on wildlife by summarizing existing studies and considering additional research activities. | Complete review of toxic contaminants found in wildlife.  Present results to TCW and consider needs for additional studies. | USGS and FWS | Watershed wide | 2016 |  |  |  |  |
| Publish and present results from the recently published Chesapeake Bay osprey food study. | USGS | Baltimore Harbor, Anacostia, Elizabeth River |
| Assess results from the Delaware-based osprey food study currently underway and have the TCW consider results and implications for relative risk (see management approach 4). | USGS and TCW | DE |
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| **Management Approach 3:** Document the occurrence, concentrations, and sources of contaminants causing fish and wildlife degredation | | | | | | | | |
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| 1. Better define the sources and occurrence of EDCs and other contaminant groups that are affecting the health of fish and wildlife in the watershed. | Prepare initial summary of the occurrence and sources of contaminants based on information collected by USGS over the last 10 years in the Bay watershed. | USGS in partnership with MD, WV, and PA  USGS in partnership with MD, WV, and PA | Multiple locations, mostly in Susquehanna and Potomac | 2016-17  2016-17  2016  2016-17  2016-17 |  |  |  |  |
| Continue study of sources and occurrence of EDCs in agricultural watersheds (same locations as fish health studies). Gather information for GIS analysis of sources and occurrence of EDCs in the watershed. Begin planning for study of urban watersheds, focusing on impact of BMPs on EDCs in the environment. |  |
| Continue Pennsylvania studies on pesticides and hormones. | PA DEP | Susquehanna basin |
| Continue studies on the impacts of algal toxins on fish kills in West Virginia and identify potential links to toxic contaminants. | WV DEP and USGS | Upper Potomac basin, WVA |
| Evaluate outcomes from Anacostia River sediment investigation to improve understanding of contaminants other than PCBs. | DOEE | Anacostia River, MD-DC |
| 1. Identify settings where inputs of contaminants are expected to have the maximum impact on fish, amphibian, and other biological resources, as well as human health. | Conduct GIS projects to identify toxic contaminant hotspots in agricultural and urban watersheds. | USGS | Initial focus on ag settings | 2016-17 |  |  |  |  |
| 1. Better define sources and occurrence contaminant groups occurring in tidal waters | -use new Chesapeake bio-effects summary and Utilize information from existing NOAA documents <http://ccma.nos.noaa.gov/publications/NCCOSTM47.pdf> | NOAA | Tidal waters | 2016 |  |  |  |  |

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| **Management Approach 4:** Assess the relative risk of contaminants, and options for mitigation, to inform policy and prevention | | | | | | | | |
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| 1. Develop approaches to assess the relative risk of contaminants to help inform policy and prevention strategies. |  |  |  | 2016-17 |  |  |  |  |
| Develop approaches to assess relative risk to help inform policy and prevention strategies. | EPA Office of Water, Office of Science and Technology |  |
| Begin to develop methods for summarizing existing information on Hg, pesticides, PAHs, for future consideration within the Policy and Prevention Management Strategy. | TCW |  |
| 1. Share approaches for assessing relative risk with the TCW so that they can consider options for mitigating impacts of toxic contaminants. | Develop a lessons learned document based on the results from the Anacostia River study. | TCW, DOEE | Anacostia | 2016-17 |  |  |  |  |
| Begin a risk assessment study of EDCs compounds with occurrence of intersex and other fish health conditions | USGS | Focused on Susquehanna and Potomac basins | 2016-17 |  |  |  |  |
| Conduct GIS analysis to identify toxic contaminant “hotspots” based on land use. Relate to areas of nutrient loading | USGS | Watershed wide |
| Evaluate outcomes from the literature review on the potential toxic contaminant reductions provided by traditional stormwater BMPs, and conduct outreach efforts to share those results. | CSN and TCW | Watershed-wide |
| Have MD Pesticides share methodology for prioritizing pesticides. Work with them to assess use for TCW | MD Pesticide Network (research workgroup) | Mostly MD | 2016 |  |  |  |  |

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| **Management Approach 5:** Gather information on issues of emerging concern | | | | | | | | |
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| 1. Propose STAC workshops to address contaminant toxicity to pollinators, and microplastics. | Have STAC conduct a literature review on the effects of microplastics on fish and wildlife. | STAC | Watershed-wide | 2016 |  |  |  |  |
| 1. Better delineate potential impacts of UOG activities. | Conduct research on impacts of UOG activities (part of wider studies of UOGs) | USGS with partners | Upper Susquehanna River, Pennsylvania and NY | 2016-17 |  |  |  |  |