BIENNIAL STRATEGY REVIEW SYSTEM
Chesapeake Bay Program

Logic and Action Plan: Post Quarterly Progress Meeting

Toxics Research – 2018-2019

*[NOTE: make sure to edit **pre**- or **post**- in the text above, to tell the reader whether this logic and action plan is in preparation for your quarterly progress meeting or has been updated based on discussion at the quarterly progress meeting.]*

Long-term Target: Develop a research agenda and further characterize the occurrence, concentrations, sources and effects of toxic contaminants of emerging and widespread concern.

Two-year Target: Completion of performance targets related to key actions

Instructions: Before your quarterly progress meeting, provide the status of individual actions in the table below using this color key.

Action has been completed or is moving forward as planned.

Action has encountered minor obstacles.

Action has not been taken or has encountered a serious barrier.

Additional instructions for completing or updating your logic and action plan can be found on ChesapeakeDecisions.

Factor	Current Efforts	Gap	Actions	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential (to help fill this gap) to achieve our outcome?*	*What will we measure or observe to determine progress in filling identified gap?*	*How and when do we expect these actions to address the identified gap? How might that affect our work going forward?*	*What did we learn from taking this action? How will this lesson impact our work?*
Communicating the potential impacts of consuming contaminated fish and addressing their	Tracking of impairments, which lead to fish consumption advisories based on jurisdictional		Interaction between jurisdictions to ensure there is consistent efforts to reduce contaminants, which contribute to			

causes. The jurisdictions have different assumptions about human exposure through fish consumption, which can limit comparability across the watershed	reporting of PCB impairments.		fish consumption advisories.			
Multiple factors affecting health and mortality of fish and wildlife. There are multiple contaminants and additional factors are causing the degradation (and mortality) of fish so trying to identify specific causes is extremely difficult.	Studies addressing the multiple causes of factors affecting fish and shellfish, including EDCs and fish health; surveys of toxic contaminants and oysters. Limited information on wildlife;	Evolving towards a more geographic approach to focus in areas where fish health issues are most prevalent. Greater emphasis on linkage between factors affecting fish habitat and health, including toxic contaminants	More integrated studies to address the topic. Increase collaboration with academic institutions conducting research. Working with partners to plan potential studies to address selected topics.			
Lack of data on the occurrence and trends of toxic contaminants. There is no watershed-wide monitoring program on the condition of fish and wildlife that is integrated with water and sediment sampling.	Jurisdictions have monitoring programs for selected toxic contaminants, but mostly not adequate for trends.	Longer-term, and comparable monitoring for selected toxic contaminants through design of an integrated monitoring network. Data synthesis to improve current understanding of sources, status and trends of toxic contaminants, and their relation to nutrients and sediment.	Better utilize jurisdictions monitoring that is used for biannual integrated reports; Design an integrated monitoring network to improve long-term information			
Limited information of the practices to mitigate	Some academic partners looking at contaminant mitigation from	Increased interaction with WQ GIT to develop and promote joint	Focused source-sector approach with emphasis on agricultural and			

contaminants, and their potential co-benefits with nutrients and sediment reductions	selected BMPs. Fact sheets on potential co-benefits between toxic contaminants, nutrients, and sediment. Developed reports on ag and urban contaminants.	approaches to reduce toxic contaminants, nutrients, and sediment.	urban settings; Generate more information on potential co-benefits and explore use of CBP decision tools (such as CAST).			
Resource constraints. The constraints include (1) minimal capacity within the CBP to address contaminants; (2) an emphasis on nutrients and sediment that limits the opportunity for increased CBP focus on toxic contaminants; and (3) minimal funding opportunities to conduct additional studies.	Coordination of efforts between members of the Toxic Contaminant WG.	Expand capacity through increased coordination with ongoing academic research, state, and federal efforts. Increase emphasis on toxic contaminants within CBP monitoring and modeling teams. More focus on co-benefits.	Invite more partners to the TCW. Have more focused interaction between researchers and stakeholders such as through workshops (such as STAC, ChesRMS) and GIT WGs.			
Synthesis. This is a new factor which recognizes the findings from technical articles and reports need to be summarized and communicated to be used effectively by resource managers	Very little current effort	Summarize existing information and provide implications for better management of contaminants	USGS is considering more resources towards synthesis. TCW needs to consider other possibilities (such GIT funding, etc.).			

ACTIONS – 2018-2019

Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline
Management Approach 1: Supply information to make fish and shellfish safe for human consumption					
1.1	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.	Summarize existing impairments in the watershed through the creation of a story map for mercury. Jurisdictions supply information and the CBP GIS team and Monitoring team integrate into a story map.	TCW; MDE, PA DEP, VA DEP, DOEE, WV DEP, DNREC. CBP GIS team and monitoring team.		2018-19
		Inventory available mercury monitoring data (water, sediment, fish tissue) to inform status or trends. Have CBP Monitoring team lead the inventory and assessment of data.	TCW; MDE, PA DEP, VA DEP, DOEE, WV DEP, DNREC. CBP monitoring team.		2018-19
		Communicate information from ongoing study of mercury and fish consumption advisories in the watershed.	USGS and partner states		2019-2020
		Conduct sampling of mercury in young of the year fish. Results will eventually be used to assess trends. Reported annually.	MDE and MD DNR		Ongoing; annual sampling and reporting
		Review and obtain information documented during the establishment of Maryland's proposed Mercury TMDL. Additional fish tissue collections are planned in 2018 to determine if the remaining waters listed for mercury are impaired. Hg TMDL development will be delayed in Maryland until listing reassessment is completed.	MDE		MDE information will not be available until early 2019.
1.2	Inventory any ongoing progress of regional PCB models within the Chesapeake Bay.	Stay informed on progress of models in James River, Anacostia, upper Potomac, any others as they may inform adaptive management decisions/areas of focus for others in the watershed. Assess if information could be used to inform co-benefits and CBP tools (such as CAST), (see Management Approach 4).	TCW partners constructing models and USGS.		2018-2020
	Science to support PCB Policy and Prevention	Complete information gathering and develop a guidance document on best practices for	TCW		

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1.3	(Please see the Toxic Contaminants Policy and Prevention Strategy and Workplan for further details).	effective implementation of PCB track down studies in the TMDL context			
		Communicate results of completed research study investigating the PCB content of WW biosolids and effluent in an urban WWTP. Ongoing studies of fat-oil-grease deposits as potential sources of PCBs in aging infrastructure	UMBC USGS		
		-Improve understanding of sources and fate of PCBs in the environment to inform mitigation options [includes summarizing best practices for PCB track down studies, informing stakeholders of results of atmospheric deposition studies, WWTP biosolids and effluent loads as well as reporting of other potential sources such as demolition/construction, dredged sediments], -Status and change in environment through the more prevalent use of the 1668 congener based analytical method, communicate lessons learned from innovative monitoring approaches, and gather data from TMDL implementation plan progress to assess changes over time, and -BMP effectiveness for removal of PCBs, including co-benefits from nutrient and sediment BMPs and explore use in CBP decision tools (such as CAST). (Please see the Toxic Contaminants Policy and Prevention Strategy and Workplan for further details).	(See Toxic Contaminants Policy and Prevention Workplan)		(See Toxic Contaminants Policy and Prevention Workplan)
Management Approach 2: Understanding the influence of contaminants in degrading the health, and contributing to mortality, of fish and wildlife					
	Assess the effects of contaminants on fish and shell fish in tidal waters	Inform presence of select UV filters, hormones, and antibiotics in eastern oysters	UMBC, USDA FS		2018-2020

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2.1		and hooked mussels in urban streams and the Chesapeake Bay mainstem.			
		Inform presence of select CECs in bivalves in the estuarine waters investigated as part of NOAA Oxford study.	NOAA Oxford		2018-2020
		Communicate results of Bullhead catfish tumor study, which showed a dramatic decrease in the tumor prevalence in the Anacostia River.	FWS		2019
		Continue study and evaluate findings from condition of Yellow Perch in urban areas. Specifically, FWS and UMD conducted yellow perch sampling in Fall 2017-Winter 2018 in the Severn, Choptank, and Mattawoman. The sampling will be repeated in Fall 2018-Winter 2019. The goal is to determine whether the findings of abnormal yolk and abnormal chorion about ten years ago in the Severn are still apparent. FWS will update those findings with new data, with additional molecular analysis, analyzing lesions and movement over time.	FWS, MD DNR, USGS		2018-2020
2.2	Generate information to document fish health conditions in the Bay watershed.	Report and communicate results of study to understand the influence of contaminants and other factors degrading the health and contributing to mortality of fish. The final publication on the retrospective analysis of the relationships between fish health, estrogenicity and land-use will be completed. Final outcomes will be communicated to the TCW.	USGS		2019
		Report and communicate results of study examining the influence of endocrine-disrupting compounds (EDCs) and their effects on fish conditions. The data collected at the integrator sites (2013-2017) is being	USGS		2019

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		compiled, analyzed and published as a series of journal articles. The first is compiling long term, integrative indicators at the South Branch Potomac site, which could be a template for subsequent information. This information will be summarized with other data collected by the USGS into a series of synthesis PowerPoint presentations.			
		Continue monitoring of and communicating results of fish conditions in areas of concern within jurisdictions. Specifically, USGS is working with PA, MD and WV. One summary paper on disease issues and potential immunosuppression was published in 2018. In addition, WV and PA are collaborating with USGS to assess the immune response of wild smallmouth bass.	PA DEP, MD DNR, WV DEP		2018-2020
		Communicate results of risk assessment study of EDCs compounds with occurrence of intersex and other fish health conditions. Young of the year fish data and model results from PA are being used in this investigation, as well as long-term historical trend data.	USGS		2019
		Continue studies and evaluate the relationship between the amount of impervious surface and the impact on fish conditions. During 2014 – 2018 the MBSS is re-sampling streams that were sampled 20 and 14 years ago. The data will be used to examine for potential change over time in stream biological, physical habitat, and chemical conditions.	MD DNR		2018-2020
		Continue stream IBI studies as part of the Maryland biological stream survey to evaluate health of fish communities in 2019-2020.	MD DNR		2019

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2.3	Assess the effects of toxic contaminants on wildlife	Publish results of study examining EDCs found in wildlife within the Chesapeake watershed.	USGS		2019
		Interact with state federal wildlife service agencies to assess priority needs related to contaminant effects on wildlife	TCW; DE, MD, PA, VA, WVA, working with Habitat Goal Team.		2019-2020
Management Approach 3: Document the occurrence, concentrations, and sources of contaminants in different landscape settings					
3.1	Better define the sources and occurrence of EDCs and other toxic contaminant groups in different landscape settings	Communicate results of study to identify the sources and occurrence of toxic contaminants contributing to degraded fish health. Chemistry data collected at the integrator site is being compiled into a data release. These data will be summarized is at least one journal article and will be added to the synthesis efforts.	USGS		2019
		Communicate results of study of sources and occurrence of EDCs in agricultural watersheds (same locations as USGS fish health studies). Initiate planning for study of urban watersheds, focusing on impact of BMPs on EDCs in the environment.	USGS		2018-2020
		Communicate GIS analysis to identify toxic contaminant "hotspots" based on land use. Vulnerability metrics are being detailed and will be communicated in the synthesis reporting.	USGS		2019
		Continue Pennsylvania studies on occurrence of pesticides and hormones and other toxic contaminants in surface water.	PA DEP USGS		2018-2020
		Inform presence of select CECs in sediment, water, and bivalves.	NOAA Oxford		2018-2020
		Inform presence of select UV filters, hormones, and antibiotics in eastern oysters and hooked mussels in urban streams and the Chesapeake Bay mainstem near both agricultural and urban landscapes.	UMBC, USDA FS		2018-2020

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		Inventory jurisdiction toxic contaminant monitoring efforts by individual groups	TCW and states, DOEE		2018-2020
		Evaluate outcomes from Anacostia River sediment investigation to improve understanding of contaminants other than PCBs in urban environments.	TCW, DOEE, USGS, UMBC, FWS		2018-2020
3.2	Examine the co-occurrence of toxic contaminants with nutrients and sediments to inform co-benefit analysis (see MA 4)	Inventory co-located data, spatially analyze to evaluate possible contaminant associations and source, and use results to inform co-benefit understanding (also see MA4)	TCW; USGS, MDE, VDEQ, DOEE, DNREC, PA		2018-2020
3.3	Loading rates of toxic contaminants for use in CBP models	Interact with CBP Modeling group to assess data needs required to inform loading rates of toxic contaminants in various landscape settings	TCW		2018-2020
Management Approach 4: Science to help prioritize options for mitigation to inform policy and prevention					
4.1	Summarize further information about direct and co-benefits for mitigation of toxic contaminants, and nutrient and sediment reductions. (also see Science portion of the Policy and Prevention Strategy and Work Plan)	Inventory case studies where innovative remediation of sediments/water have occurred in the watershed and evaluate how they could be adapted or implemented for TMDL compliance.	USGS, working with academic and state partners		2018-2020
		Investigate the impact of Stormwater Best Management Practices (BMPs) on PCB loadings to waterways.	MDE funded study.		2018-2020
		Further evaluate findings from the CSN literature review on the potential toxic contaminant reductions provided by traditional stormwater BMPs and Ag BMPs. Decide on most appropriate findings for additional outreach from these and CBP fact sheets.	TCW partners, USGS		2018-2020
4.2	Monitor/survey efficiency of BMPs to remove toxic contaminants (mostly PCBs) (also see Science portion of the Policy and Prevention Strategy and Work Plan)	Bioretention efficacy and optimization for removal of toxic contaminants	UMCP		2018-2020
		Design/testing of enhanced media in stormwater control structures for degradation of toxic contaminants	UMCP		2018-2020

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		Riparian forest buffer removal of toxic contaminants	PSU		2018-2020
4.3	Explore use of CBP decision tools to include selected contaminants	Prepare a matrix of information needed for inclusion of selected contaminants (begin with PCBs) in CAST and assess availability of information.	EPA and TCW		2018-19
4.4	Interact with source teams to communicate and apply findings on the co-benefits for mitigation of nutrients, sediment, and toxic contaminants	Communicate with agricultural, stormwater, and wastewater source teams to identify synergies with nutrient/sediment and toxic contaminant mitigation options	TCW chairs with selected investigators.		2018-2020
4.5	The Chesapeake Bay Commission will work collaboratively with the Bay Program partners to identify legislative, budgetary and policy needs to advance the goals of the Chesapeake Watershed Agreement.	CBC will, in turn, pursue action within our member state General Assemblies and the United States Congress. See CBC Resolution #14-1 for additional information on the CBC's participation in the management strategies.	CBC		2018-2020
Management Approach 5: Gather information on issues of emerging concern.					
5.1	Continue to investigate previously identified issues of emerging concern including contaminant toxicity to pollinators, microplastics and UOG.	Attend, summarize microplastics workshop	STAC, TCW		2018-2020
		Track progress USGS NE region microplastics study and identify relevance to CB.	USGS, TCW		2018-2020
5.2	Prioritize new issues of emerging concern and identify tasks to complete	Track research progress by USGS and NOAA on the toxins that are produced from algal blooms	USGS, NOAA, TCW		2018-2020
		Aggregate and analyze recent regulations and management approaches related to UV filters, hormones, and antibiotics in other states to help outline possible strategies for CB	UMBC, TCW		2018-2020
		Determine the nature and extent PFAS data in CB watershed, track progress fish consumption advisories neighboring watersheds (DRB) to help outline possible strategies for CB	USGS, TCW		2018-2020

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Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline
		Provide technology Transfer from MD, VA, and DC to other jurisdictions on successful efforts to reduce chloride impacts due to road salt application while maintaining public safety.	MDE, TCW		2018-2020
		Provide technology transfer from MD to other jurisdictions on successful efforts to find beneficial reuse of fly ash produced from coal combustion and minimize disposal in CCR facilities.	MD DNR, TCW		2018-2020