Scientific, Technical Assessment and Reporting (STAR) Team Meeting
10:00AM – 1:00PM February 28th, 2013
http://www.chesapeakebay.net/calendar/event/18395/

NEXT MEETING

Date: Thursday March 28th, 2013 10AM – 1PM
Location: Joe Macknis Memorial Conference Room (Fish Shack) CBPO Annapolis, MD
Event Calendar: http://www.chesapeakebay.net/calendar/event/18837/

MINUTES

Welcome Introduction and Updates – Bill Dennison (STAR Chair), Mark Bennett (STAR Vice Chair), Peter Tango (STAR Coordinator)

- New STAR Monitoring Staffer: Lea Rubin
- Christina Lyerly will be working at the CBPO to help complete the Lessons Learned Report.
  - Liza Hernandez and Christina Lyerly will update STAR on the progress of the report at the March and April STAR Meetings.

Communications Discussion – All

STAR discussed communication ideas including upcoming reports, studies, and videos to recommend to the Communications Workgroup.

Discussion and Questions

- This will be a standing agenda item in order to give suggestions to the Communications Workgroup.
- Bay Barometer was released. Some of the changes STAR Leadership suggested were incorporated. STAR will work to be more proactive with the Communications Workgroup in the future.
- Exploring the Environmental Effects of Shale Gas Development in the Chesapeake Bay Watershed – STAC Report
- Recommended Best Management Practices for Marcellus Shale Gas Development in Maryland – Co-authored by Keith Eshleman and Andrew Elmore (UMCES Appalachian Laboratory)
- Toxic Contaminants – potential actions may include: future video for Communications support? Developed a write-up about the topics heard today?
  - Negative Messages get a lot of attention (ex. Fish Kills Video)
  - Many success stories as well negative stories (ex. Elizabeth River)
  - Contact – Greg Allen

Overview of Toxic Contaminant Report – Scott Phillips (USGS) and Greg Allen (EPA)
Attachment A

Scott Phillips and Greg Allen gave an overview of the Toxic Contaminant Report, which was released in early January, and lead an initial discussion of next steps. Scott and Greg went over the objectives of the report, contaminant groups covered, assessment approach, severity, biological effects, monitoring and research gaps, need for partnership goals, concept for goal types and examples, and next steps.

Discussion and Questions

- Note: There is no current decision that the Chesapeake Bay Program will adopt goals regarding toxic contaminants, but the discussions are happening now.
    - Slides 10 – 13 summarize some of the reasons why the Chesapeake Bay Program would be a great organization to set these goals, concept for goal types and examples, and next steps. These slides are a draft for discussion purposes. Final goal decisions TBD.

- Are there any other groups other than STAR that are discussing the goals needed to fulfill the Executive Order requirement? Or is it being tasked to STAR?
    - WQGIT had some initial discussion and is one of the key groups involved in this topic. The Fisheries GIT also has interest in toxic contaminants.

- CBP resources are focused on the nutrient and sediment TMDL. What other resources are available to meet the Executive Order requirement?
    - Want to rely and coordinate with existing national and jurisdictions resources, regulations, and organizations.
        - Better coordinate the jurisdictional and national work for toxic contaminants.
    - Take advantage of the effort under the Sediment and Nutrient TMDL.

- Two ideas for future collaboration were:
    - Linking PCBs and increase in fracking and sedimentation.
    - Evidence that Blue Catfish are consuming mud and therefore are high in PCBs.
        - This is an invasive species that will prove hard to control through sport or commercial fishing because the high amount of PCBs make them unsafe to consume beyond a certain, relatively small size. Also, sport fishermen like to catch them and frequently perform catch and release fishing.

- Ecological toxins are also important, for example, algae toxins. They should be included unknown or upcoming?

- PA has PCBs impairments, but has already established TMDLs to address the issue. A partnership effort would require more staff.
    - Since PA has been working on PCBs and is learning management approaches (which ones work and which ones don't), collaboration between the jurisdictions in the partnership could be beneficial.

- Status of toxics discussion at the WQGIT:
    - MD, DE, DC – Would like to pursue partnership goals.
    - PA, NY – Would not like to pursue partnership goals.

- VA/WV – unreported at this meeting time.

Toxic Contaminants: Fish and Wildlife – Fred Pinkney (USFWS)
Attachment B

Fred Pinkney discussed the key finding about fish and wildlife and relation to toxic contaminants.

Discussion and Questions

- What is known about chronic vs. acute conditions?
  - Timing is critical, especially for conditions such as intersex. The toxin has to be introduced at a critical stage of development, which may produce an acute affect. Tumors seem to be a chronic effect, but the timing is still critical. One of the best cause affect studies was at Black River, Ohio where a source industrial plant was shut down, loadings were reduced and fish health improved (i.e. tumor rates declined). The waterway was dredged in 1990 and a plum of contaminated sediment went into the waters as a result. Year one or young of the year developed tumors 3 years later in response to the exposure.

- Do toxins from harmful algae blooms bio-accumulate like some of the other toxins?
  - It is not normal thought to bio-accumulate, but there is new evidence building, therefore more research is needed.

- Is it possible that the intersex conditions are due to natural conditions, or are there declines in the smallmouth bass populations due to intersex conditions?
  - Not sure whether that has been measured or connected with the intersex conditions. As far as a natural condition, the background is probably low. Studies are being conducted suggesting less than 10% incidence of intersex conditions is typical of background levels, so the background seems to be lower than what is being seeing.
  - Decline in bass populations?
    - In general, there could be population effects. (No data shown for actual population effects).
    - This study began because of fish kills and then a high level of intersex conditions was discovered. Is the intersex condition killing the fish or is the intersex condition and other contaminants suppressing the immune system and something else is killing them? More research is needed.

Mixtures and Sublethal Effects – Mike Focazio (USGS)
Attachment C

Mike Focazio discussed key findings about contaminants of emerging concern and reviewed research and monitoring needs stated in the report.

Discussion and Questions

- Note: The focus of the report was impairments and compiling information that has already been reported, but it also covered contaminants of emerging concern highlighting the work that is being done and needs to be done with these toxins.

- Are there human impacts?
    - The concentrations that we find hormones in drinking water, they are certainly at levels high enough to show intersex in lab tested animals. But although many municipal drinking water treatment plants are not designed to target removal of estrogenic compounds, many of the advanced oxidation processes remove a lot of estrogenicity.
    - Research is still needed.

- **ACTION**: For science coordination, follow up with EMAP National Coastal Assessment and Databases.

- Climate change effects?
    - There are many hypotheses about how climate change will affect these toxins. Some of the theories:
        - This will definitely manipulate the hydrologic cycle.
        - Some speculate that we will need different drugs for different reasons, so the toxic contaminants will change.

Science and Monitoring: Formulating Toxic Contaminants Goals – Greg Allen (EPA)
Attachment D

Greg Allen discussed science and monitoring needs to help formulate toxic contaminant goals for the Chesapeake Bay.

Discussion and Questions

- What does the science and monitoring tell us about needed changes to strategies? There is potential for collaboration among the jurisdictions, certainly the jurisdictions that already have TMDLs in place for toxic contaminants. What models have they been using? What science and monitoring have they already been using? What have they learned and changed already? How are they dealing with any particular TMDLs that they have? Contact the jurisdiction to collect information about the work that is already being done in the watershed.
    - Delaware River Basin Commission – PCBs
        - There is a lot of learn from the Delaware River and Delaware Bay effort.
        - **ACTION**: Could have someone from the Delaware River Basin Commission come to CBP for a presentation and discussion.
    - Met with Citizen's Advisory Committee and the question were asked: Should additional information gathering precede goal setting? Or do we have enough information to reasonably set a goal and use that to strategically coordinate and increase the rate of improving conditions?
        - It is important to make sure all jurisdictions aware of the work that is already being done.

Addressing Research, Monitoring, and Goal Setting Science Needs – Greg Allen (EPA) and Scott Phillips (USGS)

Greg Allen and Scott Phillips led the discussion of STAR and other CBP possibilities to address research, monitoring, and goal setting science needs.

Discussions and Questions

- How does this relate to the monitoring and modeling efforts here at the Chesapeake Bay Model?
    - Gary Shenk – Modeling the effects – No. Modeling delivery could be done.

- Are we able to model toxic contaminants at CBP?
    - Modeling the effects would be difficult to impossible considering the current information. Modeling delivery of toxic contaminants would be a new and significant effort, but we wouldn't be starting from scratch.

- What is the process going to be for developing these goals?
    - Is the WQGIT taking this issue on? Much of the experts that are needed are not in the WQGIT, so are they creating a Workgroup or Action Team?
    - Should it be under the WQGIT? Many other GITs would have a stake in the topic, i.e. Fisheries, Habitat, and Watershed.
    - STAR doesn't typically set goals for the Chesapeake Bay Program.
    - WQGIT is discussing reforming the "Toxics Subcommittee," which, if formed, will likely be under the WQGIT as the "Toxics Workgroup."

- **REQUEST**: STAR has information to help determine how and how difficult it would be to bring this into the Chesapeake Bay Partnership.
    - Level of effort:
        - Types of goals.
        - Monitoring and metrics needed for the types of goals.
    - Use examples:
        - Delaware – PCBs.
        - Great Barrier Reef – Pesticide monitoring and goals.
        - Great Lakes – PCBs.
    - Choose which toxic contaminants to target.
    - Look across the process other organizations have gone through.
    - This is a significant issue and worth investigation.

- The Fisheries GIT is looking with VIMS researching contaminant loading in blue catfish. Must not forget other sources of mitigation, such as communication, outreach, and education.

- There is no single WG that will be able to cover all of the toxic contaminants. Might need to parse these out to different WGs.
    - Each contaminant has a different source, environmental be, risk profiles, etc.
    - For example, the Agricultural Workgroup could take on pesticides.

- Toxic Contaminants could be a great STAC Workshop.

- The insecticides listed in the presentation are no longer legally used due to their half-life. A management strategy of products that are no longer used doesn't seem feasible.
    - Must be very careful when discussing toxic contaminants because the story is different for each one. Organic chlorine pesticides are banned and new inputs are very limited. PCBs are still in service and there is a variety of different sources. Although PCBs were banned from use in new equipment, the story is not the same as the story with organic chlorine pesticides.

- The herbicides that are currently used could be targeted with management strategies for limited exposure effects.
    - Research scientists in Beltsville that are studying the effectiveness of agricultural practices in place of herbicides and could be brought into the discussion.

- There is a USDA NRCS assessment of the effect of conservation practices on cultivated crop land published in February 2011 (pesticide BMPs, pesticide uses and extent of their use). There is a re-survey that covers through 2012 practices and will be published in May 2013. It is worth noting that the number 1 strategy that is highlighted is erosion control, which is directly related to current CBP goals.

- Communication and outreach is extremely important.
    - There is a potential role of EcoCheck
    - CBP Communication WG
        - Work with the states to communicate key messages since they are also having issues in communicating this issue to the public.
        - Possibilities discussed:
            - Positive light – What a healthy fish consumption diet would look like instead of what you can't eat.

- **ACTION**: Bill Dennison will draft a letter of behalf of STAR to the Communications Workgroup.
    - The letter will be circulated through STAR being sending it to the Communications Workgroup.

Seminar: Atmospheric Mercury (Hg) Deposition Trends – Mark Castro
Attachment E

Mark Castro is an associate professor at University of Maryland Center for Environmental Science Appalachian Laboratory. His areas of expertise are environmental science, atmospheric-biosphere interactions, and impacts of land use on water quality. He gave a presentation on atmospheric mercury deposition trends followed by a group discussion.

Discussion and Questions

- Is there a trend in ambient air concentrations of gaseous elemental mercury (GEM)?
    - No trend analysis has been done at the lab.
    - Variability does seem to be decreasing.

- Why doesn't GEM react the same as the other compounds?
    - It is very inert in the atmosphere. What we see here is probably not from a local source. It is transported globally. It has a much broader airshed than that of the Bay airshed boundaries. There are different airsheds for different forms of the same compound.

- Are there any thoughts as to why GEM has decrease both seasonally and episodically in GEM?
    - At our site there seems to be a strong sink in the east, but winds are dominantly from the west. This isn't just seen at our site, but also a network of sites.
    - There are many different drawn down events and the lab is working on a paper to describe some of the possible mechanisms that are creating these events.

- Have you looked into trends of methylmercury?
    - In everything that has been measure there has been mercury (hair, nail, benthic marco invebrated).
    - Mark's lab isn't conducting those trends at this time. The records are not long enough in any one organism to do this.
    - There is a project at MDNR that examines 1 year old fish, which started in 2000.
    - MDE is conducting a young of the year study at 10 sites, which started 5 years ago.

- Gaseous elemental mercury, gaseous oxidized mercury, and fine particulate bound mercury are not the forms that bio-accumulate. They must be converted to methylmercury before they can bio-accumulate. There needs to be the right type of environmental conditions to create methylmercury, such as wetland type conditions.
    - The Piney Creek Reservoir was expanded in 1990's to increase the drinking water supply. In doing so, many wetland acres were destroyed and they replaced them in the reservoir and now we have some of the highest methylmercury levels in our fish.
    - Rocky Gap has a high deposition of mercury, but they have low concentrations of mercury in the fish. One thing to note is that they do not have yellow perch, and therefore the bass are not living off of the yellow perch. It would be interesting to see if the levels changed with the introduction of yellow perch. (i.e. does food web structure affect mercury uptake through the balance of predator and prey species composition)
    - Manipulating the manmade lakes to learn more about the food web and how it affects these systems would be useful.

- Some quick modeling a couple years ago, showed that 2/3 of the loads from air were from outside of the watershed and 1/3 from within the watershed. This doesn't seem to be consistent with your research. Would you shed some light on this?
    - The research consisted of back-trajectory analysis.
    - The mercury airshed is extremely large.
    - There are new techniques using isotopes to determine where the loads are coming from.

- Would have a mercury issue if we switched from coal to natural gas?
    - Although natural gas still contains mercury, burning natural gas is much cleaner than burning coal. There would be improvements in air quality in general.

- There are new controls on toxic air pollution called Mercury and Air Toxics Standards (MATS) for Power Plants.
    - In 4 years, we could see a 90% reduction in the emissions from US power plants.
        - That could lower the deposition around some of the sites in gaseous oxidized mercury and fine particulate bound mercury. But gaseous elemental mercury will probably not decrease. Globally, the USA is a small part of emissions to the atmosphere.

- The US is shipping high sulfur coal to Indonesia and importing cleaner coal from other parts of South East Asia.

- Regulations can be seen in the data. For example, the Maryland State regulation through the Maryland Healthy Air Act

- A company in Canada called Tekran makes a "real time" mercury analyzer. Every 5 minutes for gaseous elemental mercury and every 2 hours for gaseous oxidized and fine particulate bound mercury. It is "automated," but it goes down and you must be on sight to repair and check on it. This is still labor intensive.

- Mark Castro listed 3 sources of mercury in the meeting room alone.
    - The fluorescent light blubs
    - Mercury fillings called amalgam fillings
    - The thermostat

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