Climate Resiliency Workgroup
Rising Water Temperature Cross-Workgroup Meeting

Monday, June 21, 2021; 9:30 AM – 4:00 PM

Webinar*:
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Meeting materials:
https://www.chesapeakebay.net/what/event/climate_resiliency_workgroup_crwg_june_2021_meeting

This meeting will be recorded for internal use to assure the accuracy of meeting notes.

AGENDA

9:30 AM **Welcome, Meeting Overview and Introductions, *Julie Reichert-Nguyen (CRWG Coordinator, NOAA) and Scott Phillips (STAR Chair, USGS)***

- Special cross-workgroup meeting to share results from synthesis assignments in preparation for the Rising Water Temperature STAC Workshop.
- Overall goal of meeting is to share and assess what we know and don't know about the effects of rising water temperatures on habitats and living resources and potential management strategies to reduce vulnerability and increase resilience.
- From our discussions, we will see if there are emerging storylines about the effects of rising water temperatures on non-tidal and tidal resources and identify strong and weak points in information.
- The morning sessions focus on non-tidal watershed topics and afternoon on tidal Bay topics.

Materials:

Summary of STAC Project Proposal

9:40 AM **Past, Current, and Projected Water Temperature Changes in the Watershed and Implications for Ecosystem Processes Influencing Stream and River Health (#5)**

Synthesis Element Lead(s): Rich Batiuk (CoastWise Partners) and Nora Jackson (CRC)

Session Goal(s):

To road test whether our draft storyline on the past, current, and projected water temperature changes in the watershed is understandable and fully supported by the available data and scientific findings; and ensure we have a comprehensive listing of implications for ecosystem processes influencing stream and river health.

Presentation(s):

- Past, Current, and Projected Water Temperature Changes in the Watershed and Implications for Ecosystem Processes Influencing Stream and River Health, *Nora Jackson, CRC*

Discussion Question(s):

- Is our current draft storyline, described in our draft synthesis paper and highlighted in our presentation understandable and fully supported by the available data and scientific findings?
- Are we missing any important implications for ecosystem processes influencing stream and river health from our draft synthesis paper?

Materials:

Synthesis Paper

10:05 AM **Water Temperature Effects on Fisheries and Stream Health in Non-Tidal Waters (#1)**

Synthesis Element Lead(s): Steve Faulkner (USGS) and Frank Borsuk (USEPA)

Session Goal(s):

Review current understanding of temperature sensitivities and vulnerabilities of key species/groups of species of watershed fish populations, macroinvertebrates, and mussels. Identify knowledge gaps, missing resources, and develop recommendations to mitigate detrimental impacts.

Presentation(s):

- Summary of our Synthesis approach and findings for fish populations, *Steve Faulkner, USGS*

- Summary of our Synthesis approach and findings for macroinvertebrates/mussels, *Frank Borsuk, USEPA*

Discussion Questions:

- Can we identify at-risk species and prioritize mitigation recommendations?
- Can we tackle both filling in knowledge gaps (e.g., better knowledge of temperature sensitivities for at-risk species/habitats) and mitigation actions or should we prioritize one over the other?

10:30 AM **Factors and Geographies Most Influencing Water Temperatures in Local Waters throughout the Watershed (#6)**

Synthesis Element Lead(s): Rich Batiuk (CoastWise Partners) and Gary Shenk (USGS)

Contributor(s): Lew Linker (USEPA), Guido Yactayo (MDE)

Session Goal(s):

Initiate discussions on what are the most critical management questions and needs for information about the factors and geographies most influencing water temperatures in local waters and what the scales of those management questions are and information needs.

Presentation(s):

- Current and Future Abilities to Understand Factors and Geographies Most Influencing Water Temperatures in Local Waters throughout the Watershed, *Rich Batiuk, CoastWise Partners*

Discussion Question(s):

- What are the most critical management questions and needs for information about the factors and geographies most influencing water temperatures in local waters?
- What are the scales of those management questions and information needs?

10:55 AM **Break**

11:00 AM **Watershed Characteristics and Landscape Factors Influencing Vulnerability and Resilience to Rising Water Temperatures (#4)**

Synthesis Element Lead(s): Renee Thompson (USGS) and Nora Jackson (CRC)

Session Goal(s):

Provide an overview of the current healthy watershed framework, developed by the Healthy Watersheds Goal Implementation Team and how it can be related to stream temperature. Identification of initial metrics and how they are related to stream temperature as well as the connection to conservation, vulnerability of land conversion and resiliency. Discussion of how this element can complement other elements and reduce any duplication.

Presentation(s):

- Watershed health and vulnerability and opportunities to related stream temperature, conservation and resilience. 10-15 minute presentation with time for discussion, *Renee Thompson, USGS, CBP*

Discussion Question(s):

- How is this element distinct from other elements?
- How can concepts of conservation of vital lands and healthy watersheds be woven into this framework?

11:25 AM **Influence of BMPs and Habitat Restoration on Water Temperature (#7/8)**

Synthesis Element Lead(s): Katie Brownson, USFS coordinating and Tom Schueler, CSN

Contributors: Matt Ehrhart, Stroud; Jeremy Hanson, VT; Lucinda Power, EPA CBPO; Anne Hairston-Strang, MD DNR Forestry; Iris Allen, MD DNR Forestry; Judy Okay, J&J Consulting; Mark Dubin, UMD; Stephen Faulkner, USGS; Frank Borsuk, EPA; Katie Ombalski, Woods & Waters Consulting

Session Goal(s):

- Understand which Bay restoration BMPs have the potential to cool or warm stream and near-shore tidal water temperatures in the watershed
- Identify the mechanisms through which these BMPs are influencing water temperature and opportunities to enhance the cooling benefits or mitigate the heating impacts
- Define some key take home messages for managers, planners, and policy makers regarding the key opportunities to use BMPs more strategically to mitigate rising water temperatures
- Highlight areas for further investigation; for example, determining the cumulative water temperature impacts of historic BMP implementation and opportunities to use a better mix of BMPs to mitigate future stream warming.

Presentation(s):

- Summary of our Synthesis approach and findings for urban BMPs. *Tom Schueler, Chesapeake Stormwater Network* (7 minutes)
- Special issues with forestry and habitat restoration BMPs. *Katie Brownson, US Forest Service* (7 minutes)

Discussion Question(s):

- What are some key opportunities to use BMPs more strategically to mitigate rising water temperatures?
- What are some messages we could use to communicate about these opportunities to managers, planners, and policy makers?
- How can we further enhance the cooling benefits of forestry and habitat restoration practices?

Materials:

Synthesis Paper

11:50 AM **Needs for Enhancing Monitoring Networks for Watershed Water Temperature Change Impacts (#10)**

Synthesis Element Lead(s): Scott Phillips and Peter Tango (USGS)

Session Goal(s):

The goals of this session are to (1) present progress in the USGS compilation of stream -temperature data, and (2) get feedback how these data can be used to address stream-temperature monitoring needs for the watershed synthesis elements above.

Presentation(s):

- Summary of the USGS compilation of stream-temperature data in the watershed, including efforts to quality-assure the data, construct a database, and ways to query the information, *John Clune, USGS*

Discussion Question(s):

- Does the presentation by John Clune provide the appropriate amount of detail needed for this synthesis topic?
- What are the primary stream-temperature monitoring needs of the other watershed synthesis elements?

Materials:

Information on monitoring network

12:15 PM **Wrap Up—Non-Tidal Watershed Synthesis Presentations**

Moderators: Bill Dennison (UMCES) and Rich Batiuk (CoastWise Partners)

Session Goal(s):

- Summarize emerging storyline about effects of rising water temperatures on non-tidal aquatic resources and habitat in the watershed and possible responses.
- Identify strong and weak points in the information to date.

Next Steps:

- Take what we learn today to finish information synthesis papers (turn in drafts by July 30th and finalize by early September)
- Based on information synthesis findings, structure questions for STAC workshop in January 2022.

12:30 PM **Lunch**

1:00 PM **Welcome and Review of Meeting Objectives, *Julie Reichert-Nguyen (NOAA) and Scott Phillips (USGS)***

1:10 PM **Tidal Bay Past, Current, and Projected Water Temperature Changes, Influencing Factors, and Implications for Ecosystem Processes, Estuarine Health, Vulnerability, and Resilience (#5/6)**

Synthesis Elements Lead(s): Rich Batiuk (CoastWise Partners) and Nora Jackson (CRC)

Contributor(s): Gary Shenk (USGS) and Lew Linker (USEPA)

Session Goal(s):

To road test whether our draft storyline on the past, current, and projected water temperature changes and factors influencing them in the tidal waters is understandable and fully supported by the available data and scientific findings; and ensure we have a comprehensive listing of implications for ecosystem processes influencing estuarine ecosystem health.

Presentation(s):

- Past, Current, and Projected Water Temperature Changes in the Tidal Waters, Factors Influencing Them and Implications for Ecosystem Processes Effecting Estuarine Ecosystem Health, *Rich Batiuk, CoastWise Partners*

Discussion Question(s):

- Is our current draft storyline, described in our draft synthesis paper and highlighted in our presentation understandable and fully supported by the available data and scientific findings?
- Are we missing any important implications for ecosystem processes influencing estuarine ecosystem health from our draft synthesis paper?

Materials:

Synthesis Paper

1:35 PM **Water Temperature Effects on Fisheries and their Habitats in Tidal Bay Waters and Management Considerations (#2, #7/8)**

Synthesis Element Lead(s): Bruce Vogt (NOAA) and Justin Shapiro (CRC)

Contributor(s): Emily Farr and Jay Lazar (NOAA) and Mandy Bromilow (NOAA Affiliate)

Session Goal(s):

Share information on the vulnerability and impacts for increasing temperatures on representative species and their habitats. Consider key factors when choosing representative species such as, ecological importance, economic value, cultural significance, biological diversity, and differing anticipated responses to increasing temperatures. Introduce the climate science and management frameworks NOAA has developed to reduce impacts and increase resilience.

Presenters: *Bruce Vogt and Emily Farr, NOAA*

Presentation 1: Species/Habitat

- Review vulnerability scores for species and habitats of interest.
    - Representative species: blue crab, oysters, striped bass, summer flounder, and forage fish (ex. anchovy, menhaden, polychaetes)

Presentation 2: Management Frameworks

- Review NOAA Climate Science Strategy and Climate Ready Fisheries as frameworks to help reduce impacts and increase the resilience of valuable living marine resources and the communities that depend on them.

Discussion Questions:

- Are there additional representative species or habitats that were missed in our presentation/synthesis?
- Are there other management frameworks that exist/or are being considered that could be applied to tidal systems?

2:10 PM **Water Temperature Effects on Submerged Aquatic Vegetation (#3)**

Synthesis Element Lead(s): Brooke Landry (MDNR)

Session Goal(s):

Provide a brief overview of the state of the science regarding water temperature effects on SAV communities in Chesapeake Bay, and the management implications associated with potential significant loss.

Presentation(s):

- Rising temperatures: what we know and what we don't know about how SAV in Chesapeake Bay will respond to this imminent threat, *Brooke Landry, MDNR*

Discussion Question(s):

Chesapeake Bay SAV can be divided into three main communities based on their salinity tolerance: the polyhaline community, the mesohaline community, and the tidal fresh/oligohaline community. It's likely that each community will respond to rising water temperatures differently (and that species within each community will respond differently as well).

- From a management perspective, looking at how integral SAV is to so many other systems, how do we prioritize research needs and management actions with limited time and funding?
- Which community type gets highest priority?
- How do we balance conservation and restoration?

2:40 PM **Break**

2:45 PM **Information Supporting the Development of and Options for a Tidal Bay Water Temperature Change Indicator(s) (#9)**

Synthesis Element Lead(s): Julie Reichert-Nguyen (NOAA)

Contributor(s): Breck Sullivan and Anissa Foster (CRC), Ron Vogel (NOAA) and Mandy Bromilow (NOAA Affiliate)

Session Goal(s):

Share information and discuss indicator concepts for a Bay Water Temperature Change Indicator, including available data sources, initial indicator considerations to connect with ecological impacts, and preliminary identification of data strengths and limitations.

Presentation(s):

- Overview of prior work by the Climate Resiliency Workgroup towards development of a Bay Water Temperature Change Indicator, *Breck Sullivan (CRC) and Julie Reichert-Nguyen, NOAA*
    - Identification of tidal water temperature data sources (e.g., satellite, buoy, monthly monitoring)
    - Preliminary big picture data considerations for connecting physical water temperature change to ecological impacts.
- Forage indicator efforts connecting with living resource abundance and habitat suitability, *Mandy Bromilow, NOAA Affiliate*
    - Forage fish springtime warming indicator effort
    - Habitat suitability index effort

Discussion Question(s):

- What are management applications that a Bay Water Temperature Change Indicator could be useful for related to the effects of changing temperature conditions on living resources and/or habitats?

3:15 PM **Needs for Enhancing Monitoring Networks for Tidal Bay Water Temperature Change Impacts (#10)**

Synthesis Element Lead(s): Peter Tango (USGS)

Contributor(s): Breck Sullivan (CRC) and Scott Phillips (USGS)

Session Goal(s):

- Share data sources commonly used to reflect temperature conditions and tracking change in the tidal waters of the bay and tributaries. A core set of data is being discussed within STAR-related workgroup activities of the Hypoxia Collaborative, Climate Resiliency Workgroup and the 4D Water Quality Estimator project.
- Discuss information needs for bay water temperature related to the other synthesis elements (e.g., fisheries and SAV impacts, habitat vulnerability, management applications).
- Begin discussion to help identify opportunities for use of existing data to improve analysis, recommending enhancements needed for tidal water temperature monitoring.
- Get input on the prioritization of monitoring/data investments.

Presentation(s):

- Summary of core bay monitoring networks used to inform the bay community on temperature conditions, temperature change and analyses of impacts, *Peter Tango, USGS*

Discussion Questions:

- For your changing temperature-related decision-support purposes, what data needs do you have, where, and for what purpose beyond the existing networks and programming?
- Do you need more data resources or do you need better tools for analysis and reporting using the diversity of existing data collections?
- If you are investing in enhanced information gathering, where do you need the most relevant monitoring information?

3:40 PM **Wrap Up—Tidal Bay Synthesis Presentations**

Moderator(s): Bill Dennison (UMCES) and Rich Batiuk (CoastWise Partners)

Session Goal(s): Summarize emerging storyline about effects of rising water temperatures on tidal resources and habitat in the Chesapeake Bay and possible responses. Identify strong and weak points in the information to date. Next steps for the STAC Workshop can be found in the project proposal.

Next Steps:

- Take what we learn today to finish information synthesis papers (turn in drafts by July 30th and finalize by early September)
- Based on information synthesis findings, structure questions for STAC workshop in January 2022.

Materials:

Information on monitoring network

4:00 PM **Adjourn**

Acknowledgements: A big thanks to all our session leads and presenters (see above) and to the meeting organizers: Breck Sullivan, Nora Jackson, Tom Butler, Anissa Foster, Meg Cole, Annabelle Harvey, Justin Shapiro, Jackie Pickford, Rebecca Hanmer, Scott Phillips, Rich Batiuk, and Julie Reichert-Nguyen

Next CRWG Meeting:

- Monday, August 16, 2021, 1:30 – 3:30 PM (No July Meeting)