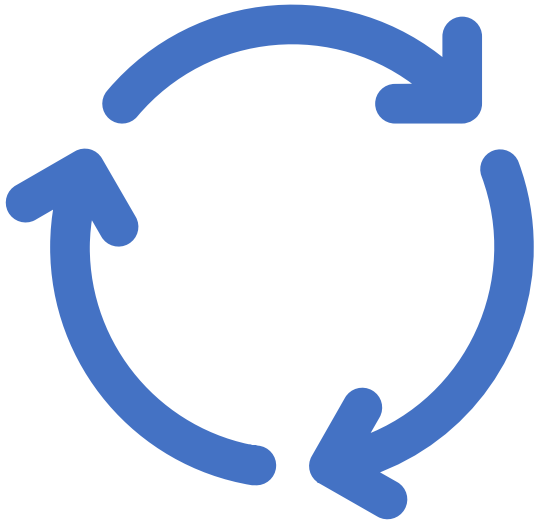
Past, Current and Projected Changes in Watershed Temperatures and Implications for Ecosystem Processes Influencing Stream and River Health

Nora Jackson, CRC

Monday, June 21, 9:30-4pm

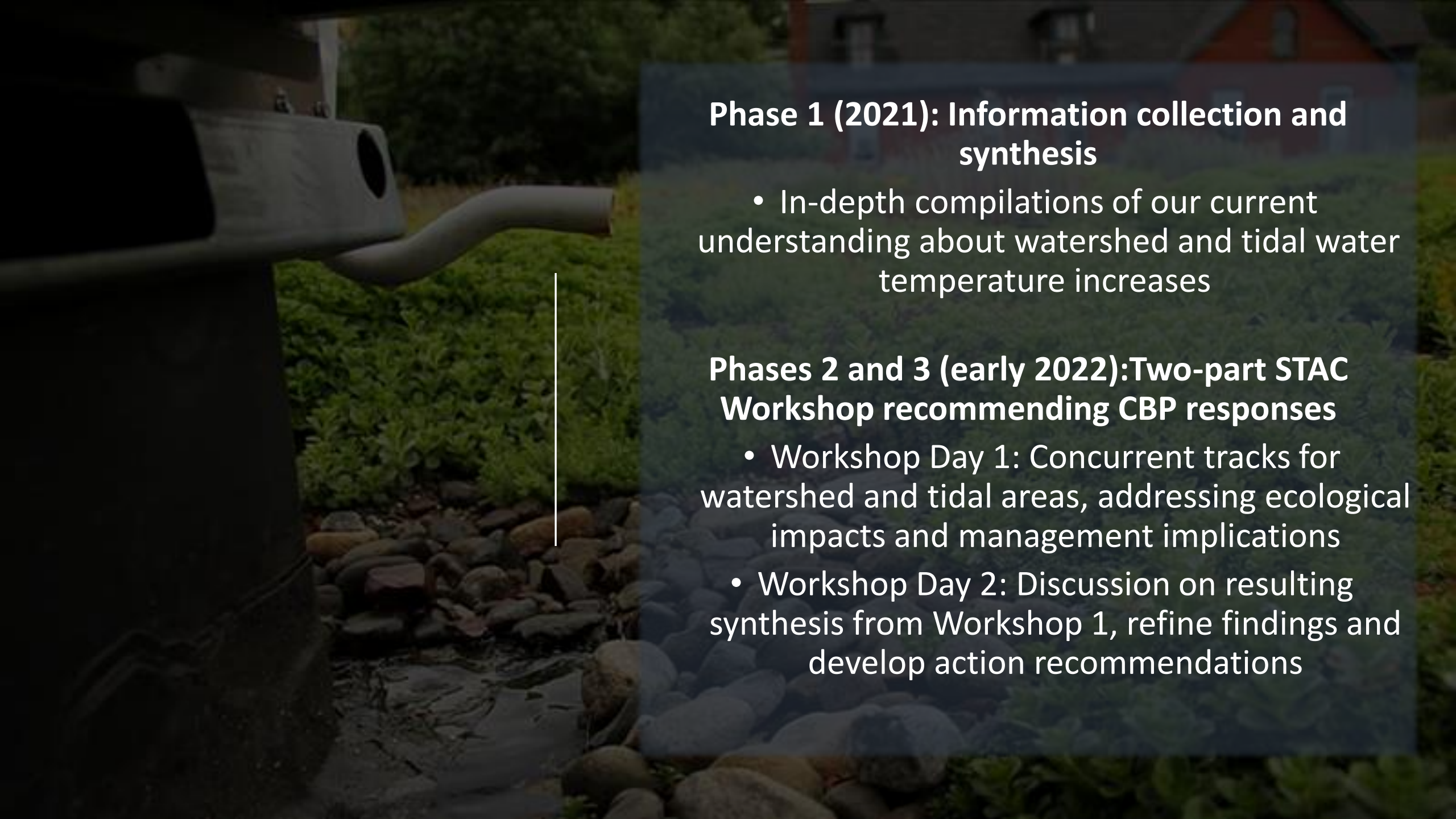


Special cross-workgroup meeting to share results from synthesis assignments in preparation for the Rising Water Temperature STAC Workshop.

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.



Phase 1 (2021): Information collection and synthesis

- In-depth compilations of our current understanding about watershed and tidal water temperature increases

Phases 2 and 3 (early 2022):Two-part STAC Workshop recommending CBP responses

- Workshop Day 1: Concurrent tracks for watershed and tidal areas, addressing ecological impacts and management implications
- Workshop Day 2: Discussion on resulting synthesis from Workshop 1, refine findings and develop action recommendations

Discussion Questions

- Is our current draft storyline 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?

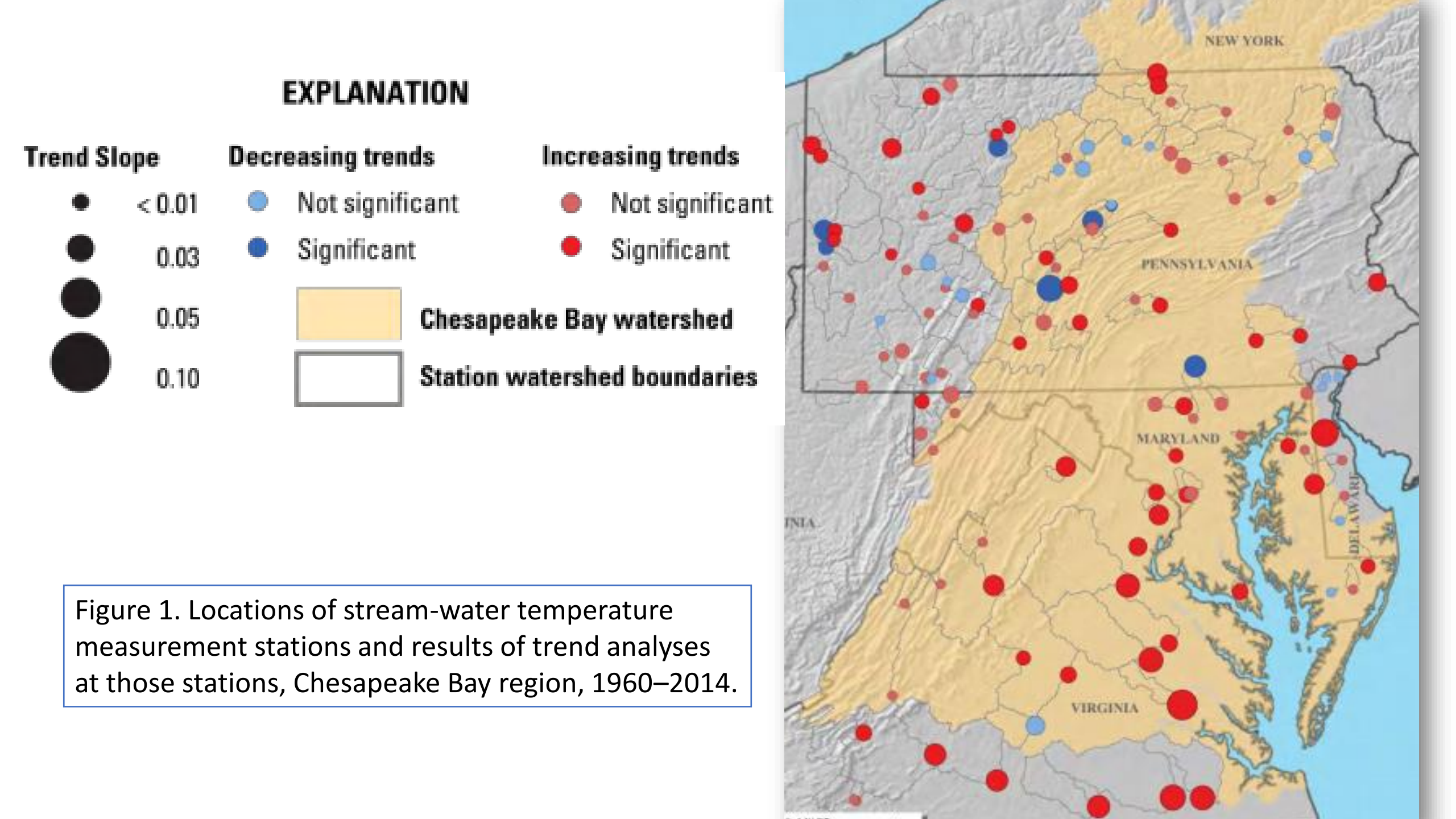
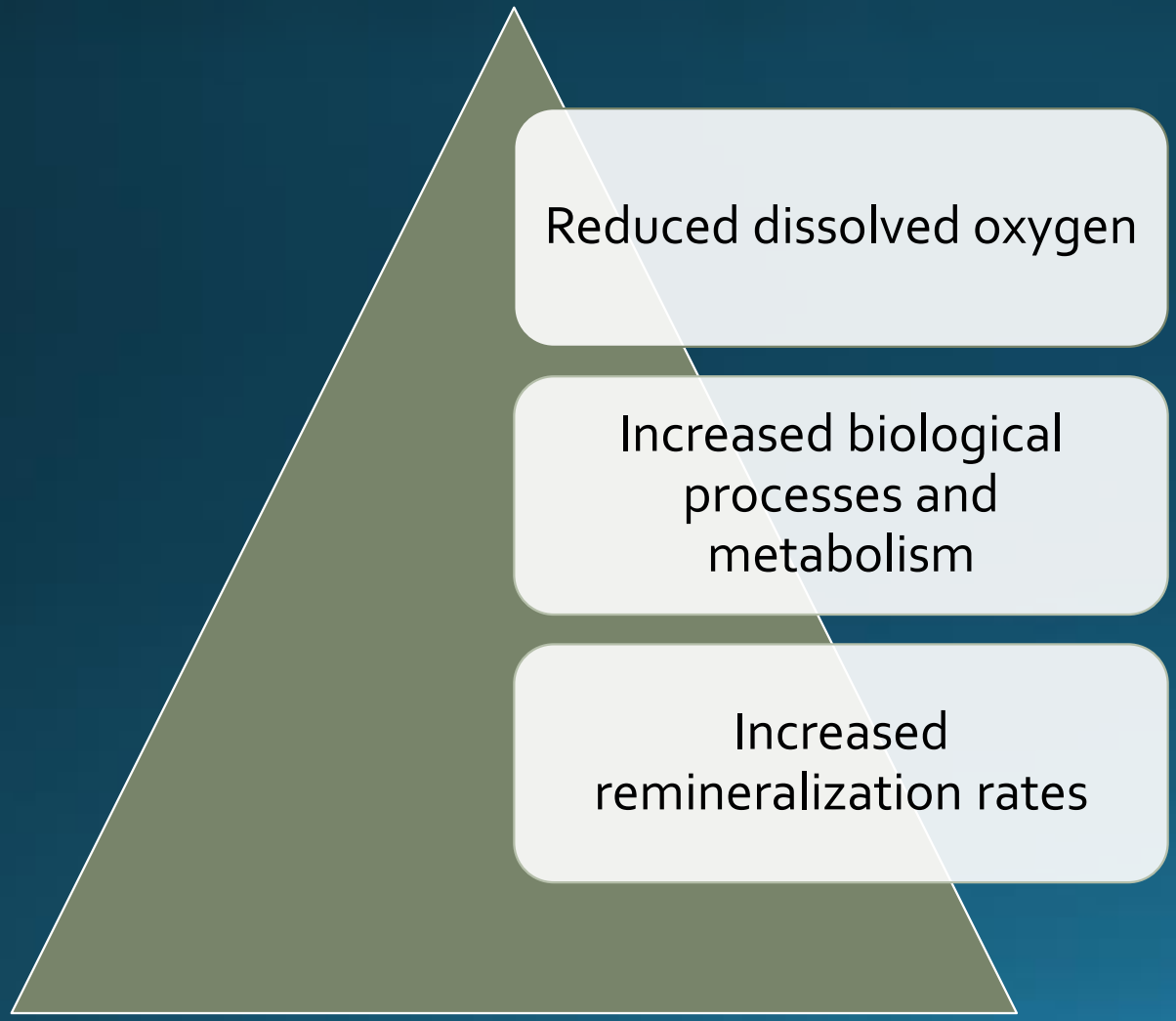


Figure 1. Locations of stream-water temperature measurement stations and results of trend analyses at those stations, Chesapeake Bay region, 1960–2014.

Implications for Ecosystem processes



Shifts in floral and faunal species

Increased invasives and pathogens

Spawning

Future Projections

Coming soon!

USGS is compiling publicly available water-temperature data from multiple monitoring groups/agencies across the bay watershed to…

(1) compute status of and trends in water temperature across a network of water-temperature data and

(2) identify the linkages between changes in water temperature and changes in fish and benthic-macroinvertebrate habitat and health.

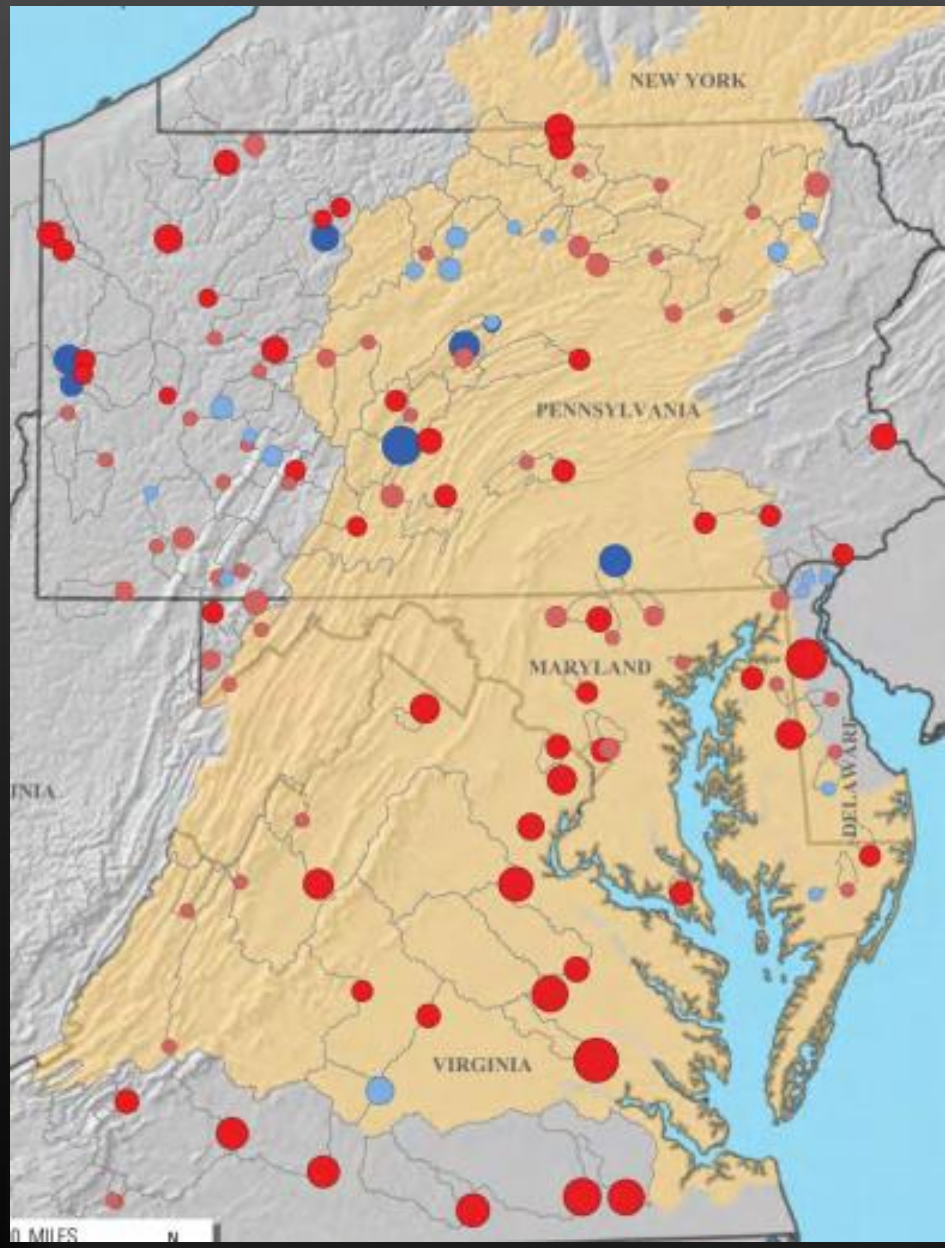
Stream temperatures increased from 1960-2014

An area's climate has the strongest natural influence on a stream's temperature

WT tends to increase more quickly than air temperature in agricultural areas without major dams

WT increases slower than AT in forested sites and in areas influenced by dams

Increases in WT occurred at the greatest rates in the southern part of watershed.




Discussion