GEM - JUNE 14, 2025

- UPDATE OF KTLB PROJECT
- BRIEF SUMMARY OF MAY 30, 2025 "ADAPTIVE MANAGEMENT MEETING"

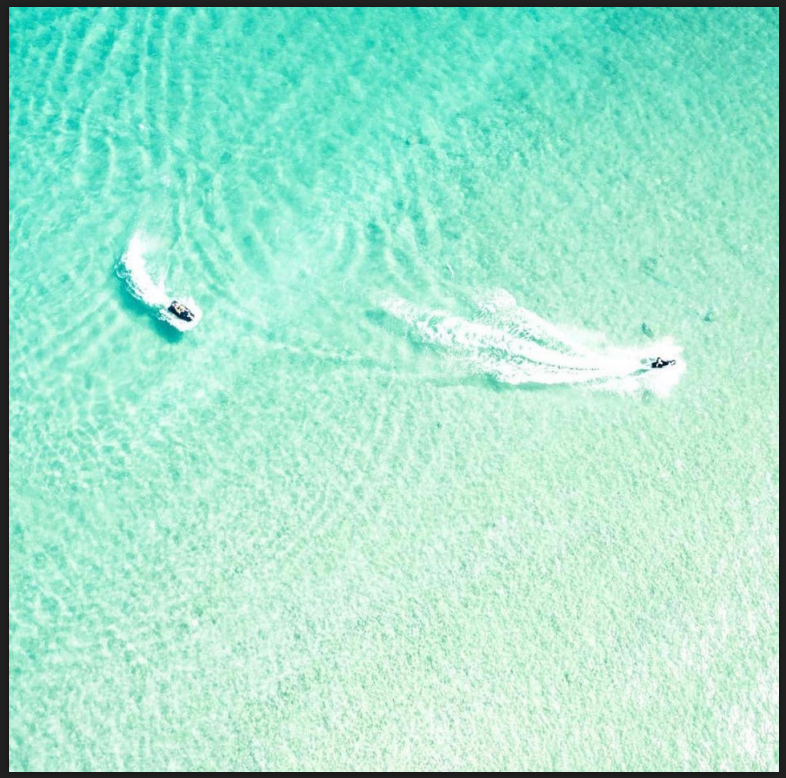
Tom Joseph,

KTLB Project Manager

TORCH LAKE AT A TURNING POINT?

- IN THE PAST 25 YEARS WE'VE SEEN A PROGRESSIVE TRANSITION OF THE CRYSTAL CLEAR WATER IN TORCH LAKE TURN MORE GREEN IN COLOR AND THE GROWTH AND PROLIFERATION OF "GOLDEN BROWN ALGAE"

Referred to as: “The Caribbean of the North” & Worthy of the Tale: “The third most beautiful Lake in the WORLD”



This is Torch Lake today !

The Journey - Now is the Time

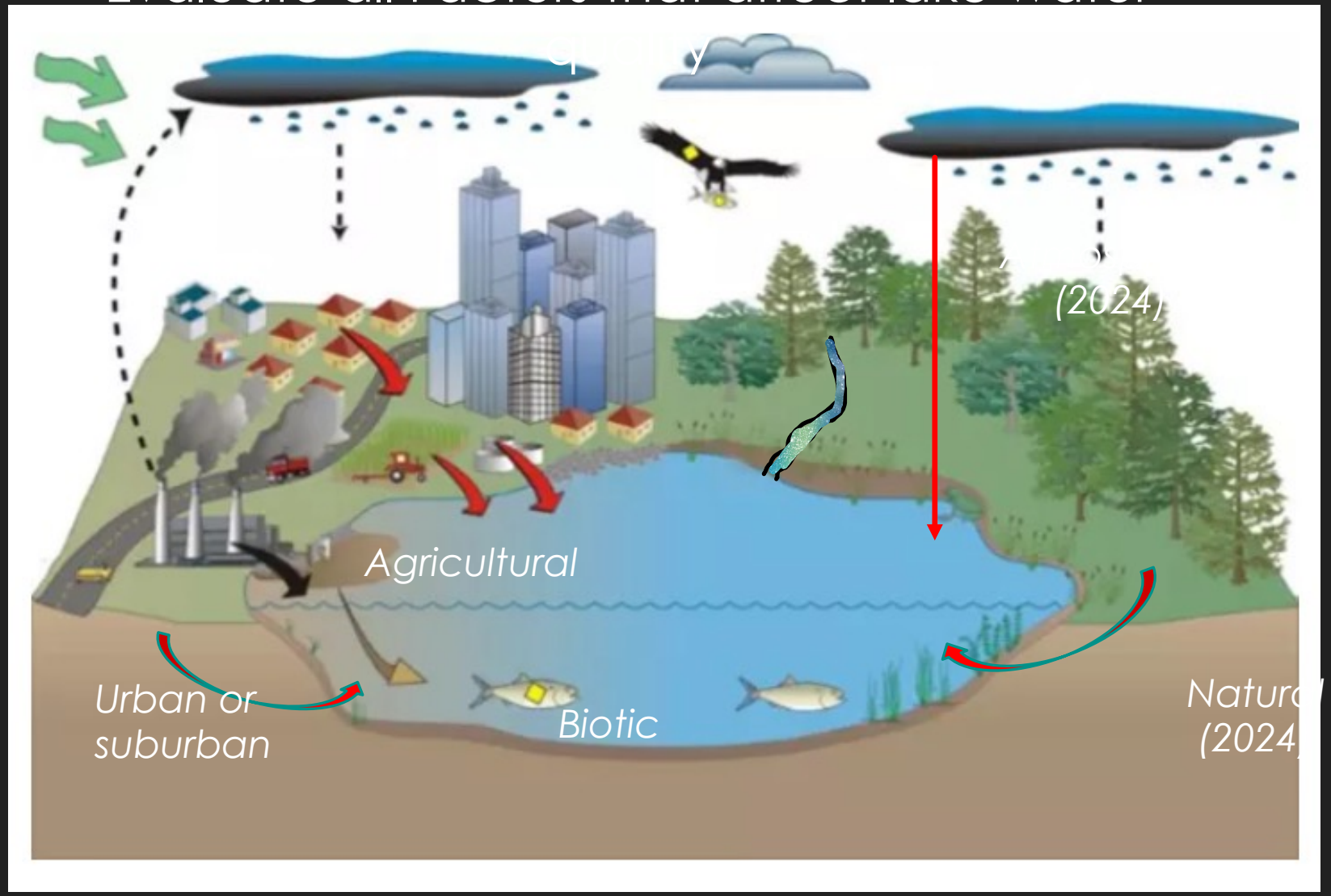
- When we met for our "first" Adaptive Management Meeting on June 10, 2022 **we stated the event was not the destination, but simply a part of the Journey. This Journey continues with a vision. That vision is to ensure the protection of this precious resource for generations to come.**
- The "*Keep Torch Lake Blue*" Project is the most Comprehensive study ever conducted on Torch Lake. The Project is intended to supplement the work done in the past, build on that work, and develop a **sustainable monitoring plan well into the future.**
- We hope to better understand the health of the Lake, refine the plans to increase that understanding, and move forward to make this a better place for generations to come.
- There is simply too much at stake to fall short of our goals

The Journey – So now what ?

- Study and Learn from the Past
- Investigate all historical data and look for trends / changes
- Build a Team with a Plan

- 2021 – Established "Steering Committee" –TLA,TCC, and TLPA. Established "Adaptive Management" Process
- 2022 – Contracted with USGS to conduct Comprehensive Study of Torch Lake, per a detailed plan / capable of "adapting"
- 2023 – Established "KTLB" Campaign to raise Funds; First Year of USGS sampling

KTLB Project Approach –
Evaluate all Factors that affect lake water



Credit : USGS

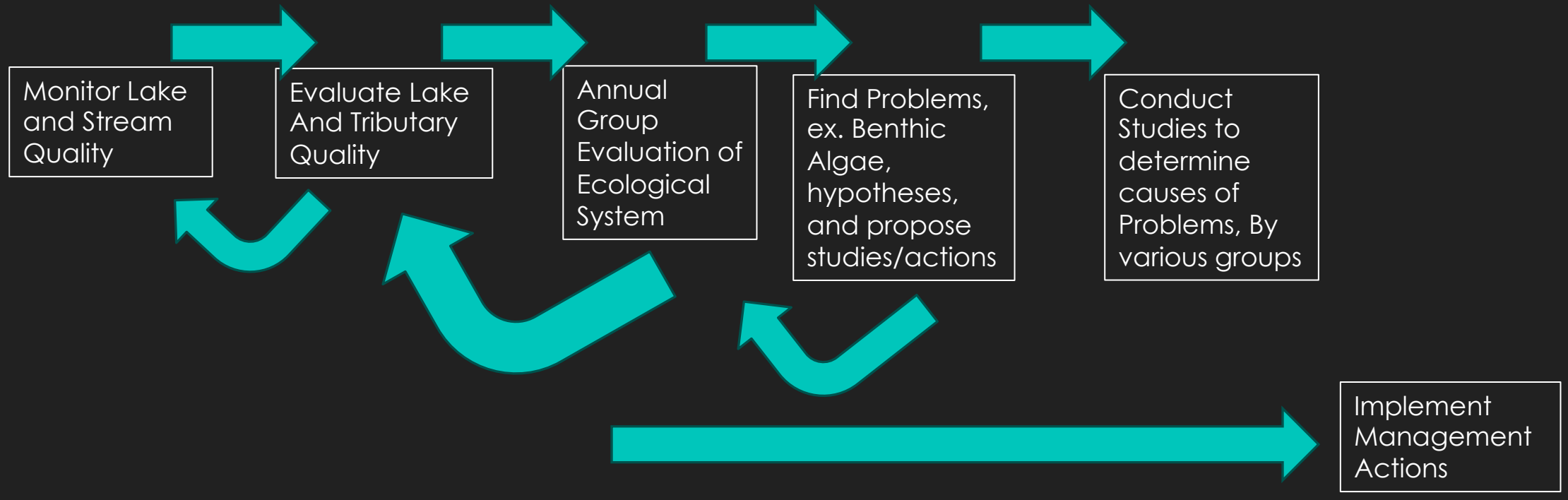
KTLB Project –

Where we are/
Where we are
going

- 2024 Plan Highlights
  - Continued 2023 sampling and monitoring –Deep sites and Near shore Water Quality, Clam and Torch Rivers
  - Expanded Tributary inlet monitoring to include Spencer, Eastport, Wilkinson, A-Ga-Ming Creeks
  - Added Atmospheric Deposition
  - Added Vertical Mixing
  - Added 12 Groundwater sample collection sites
- 2025 Plan Highlights
  - Maintain desired 2024 activities, adjust as developed through Adaptive Management Process
  - Expanded efforts on Groundwater sample collection and modeling; adjusted Near Shore sites to coincide with GW sites
  - Developed and implemented a Mussel Survey project
  - Added dry sampling to Atmospheric Deposition
- 2026 Plan Highlights
  - Transition to long Term Monitoring level of sampling
  - Complete and publish "Final Report" and Lake models

The Journey – Adaptive Management

- Adaptive Management Approach with USGS



May 30, 2025 – Adaptive Management Meeting

- This Year's meeting was again very well attended with 50 key representatives from area Associations, scientific experts, and world class presenters.
- Review of extensive data and discussions of every aspect of Torch Lake health, and comparative data of other Regional lakes
- The entire 8 hour meeting is available to view on YouTube

  https://youtube.com/live/mTt02prGbog?feature=share
- Attached is a copy of the Meeting Agenda and brief outcome of the meeting.

Agenda – morning session

1.	**REGISTRATION-** Coffee, Tea, Muffins, Fruit, Nametag / Attendee Survey		8:30 - 9:30
2.	**Introductions, Meeting Logistics, Background**	Thomas Joseph	9:30 – 9:50
3.	**Torch Lake and Tributary Water Quality Summary, 2023-2025**	Dr. Dale Robertson	9:50 - 10:45
4.	**Groundwater Input to Torch Lake**	Dr. Sherry Martin	10:45 - 11:15
5.	**Water and Nutrient Budgets for Torch Lake**	Dr. Dale Robertson	11:15 - 11:45

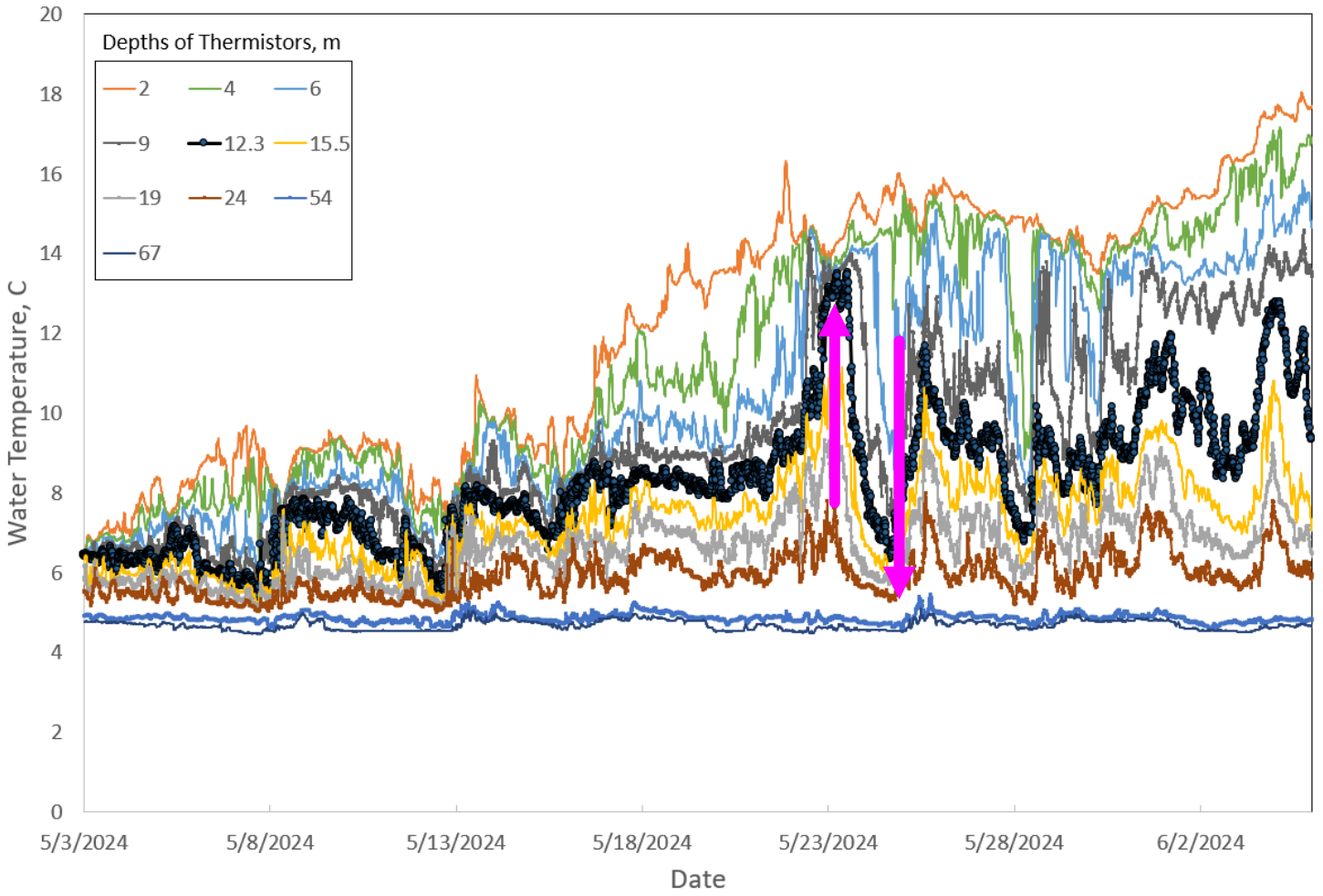
LUNCH BREAK / Survey **All Participants** **11:45 – 12:15**

TORCH CONSERVATION CENTER

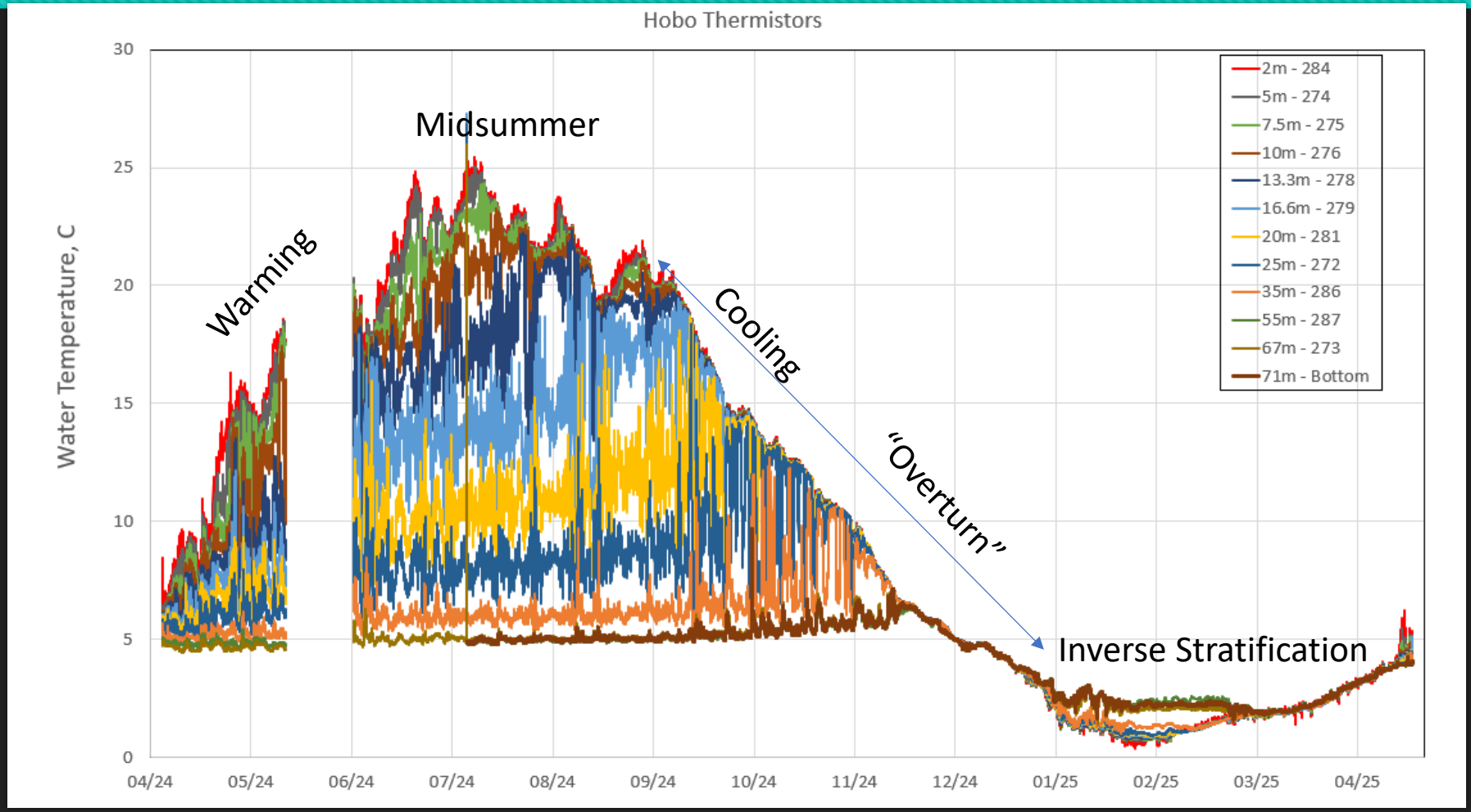
TORCH LAKE PROTECTION ALLIANCE

Vertical Mixing - Buoy

Vertical Mixing - Strong Wind



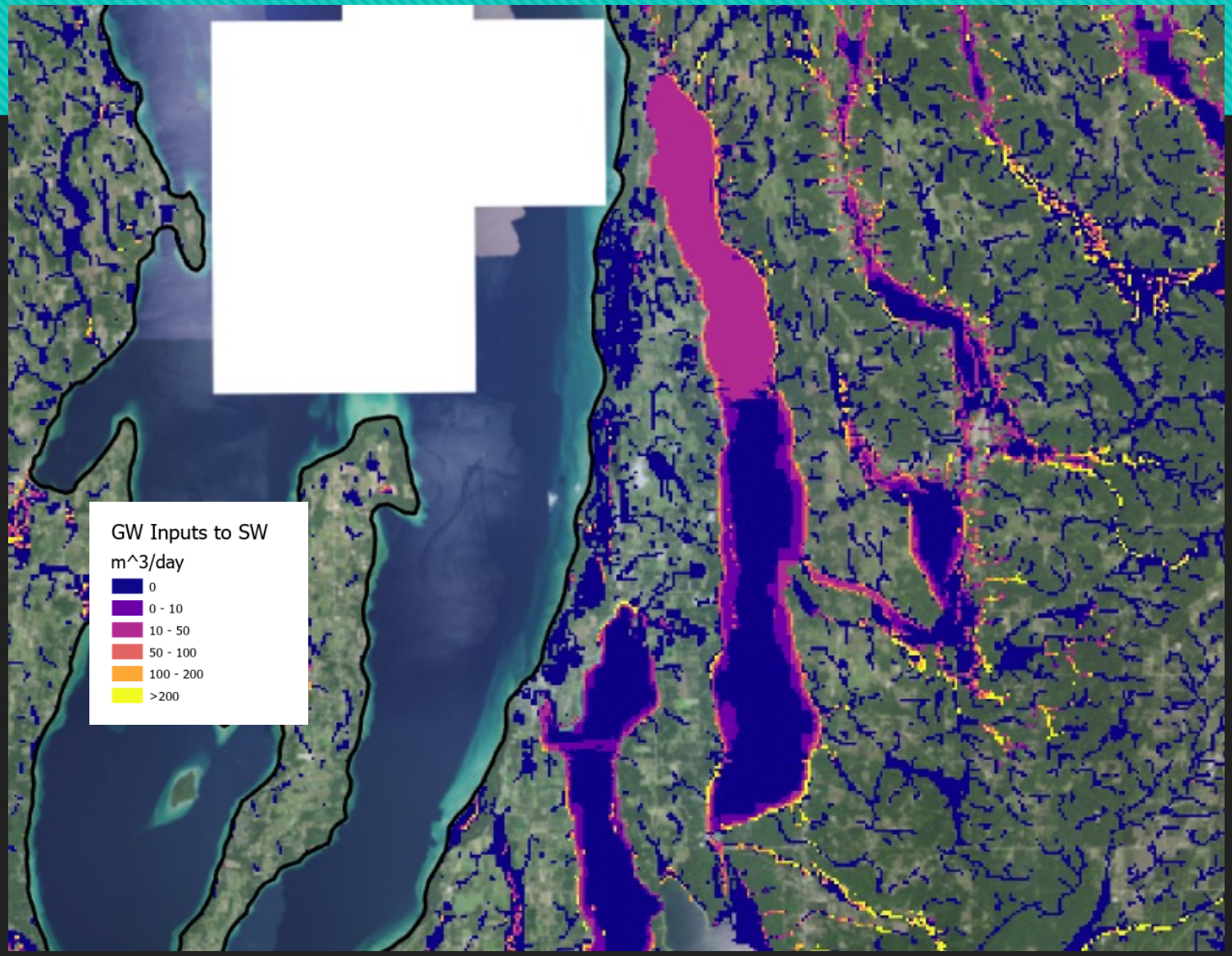
Vertical Mixing - Ice Coverage



Groundwater Sampling

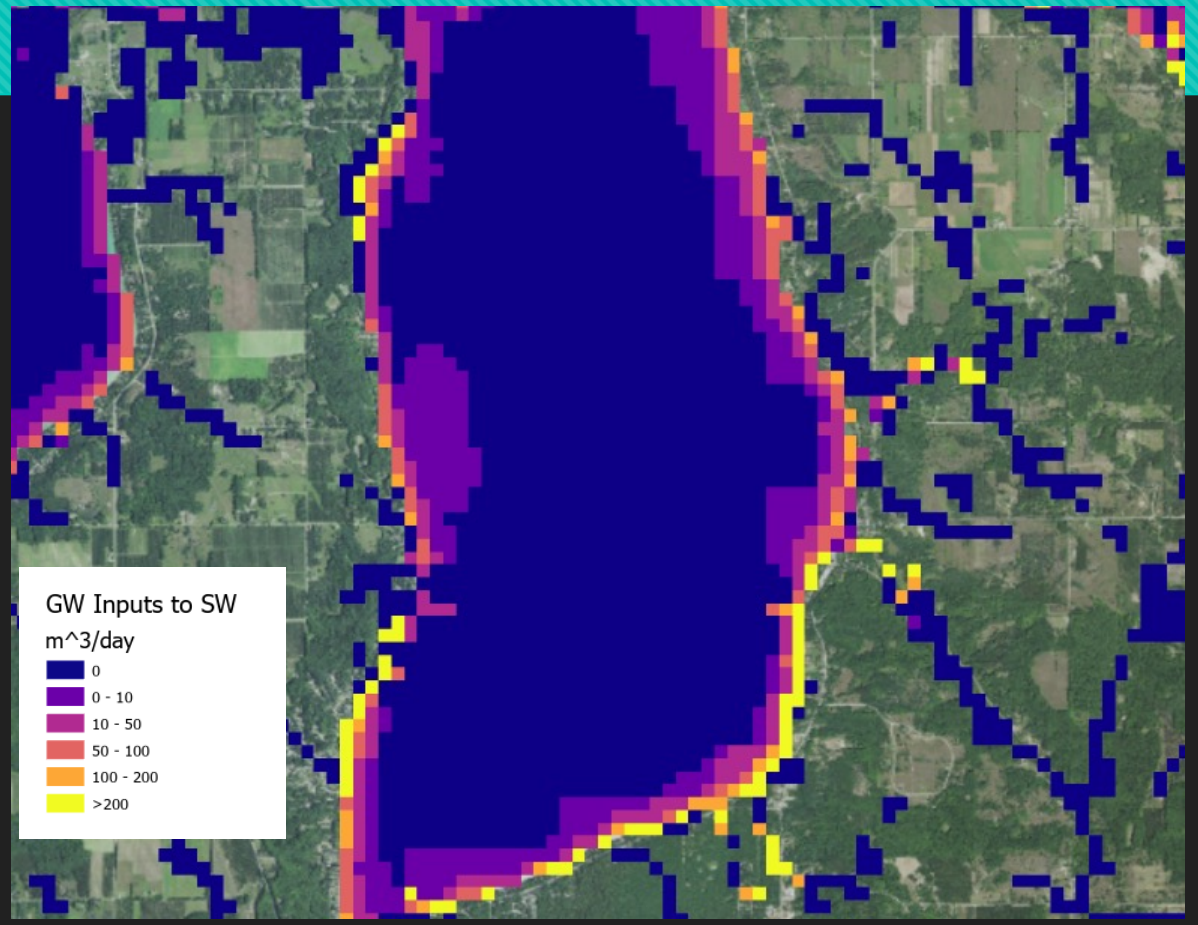
Improved regional model: GW inflow

- Lots to see here!
- Brighter colors = more input
- North basin has input throughout
- South basin not so much
- Inputs across the shelf
- A lot of variability across the chain of lakes



Objective: Guide shoreline GW sampling sites

- South basin, south end
  - This is the most intense area of GW input across the entire lake
  - High GW input area on west shoreline
  - South shore has large area of high input
- Model suggests areas that might not have been anticipated as high GW inflow areas.
- Informed sampling strategy



Agenda –Mid Day

6. GBA Studies – What we have learned and Studying Now	Dr. Jan Stevenson	12:15 - 1:15
7. Long-term trends in water quality in Leelanau County lakes	Dr. Stephen Hamilton	1:15 - 1:30
8. Torch Lake Fishery Report (MDNR Fisheries)	Heather Hettinger	1:30 - 2:00
9. Impact of invasive Mussels	Dr. Ashley Elgin	2:00 – 2:30
Break / "Working Session Instructions	Dr. Dan Sajkowski	2:30 - 2:40

TORCH CONSERVATION CENTER

TORCH LAKE PROTECTION ALLIANCE

Agenda – Afternoon session

10. Sub-Group discussion/ Answer Three questions	ALL	2:40 - 3:20
How is Torch Lake Changing ? *What factors are causing the changes ?* *What data are needed to quantify the factors causing the changes?*		
11. Sub-Group Report-out (answers to 3 questions)	ALL	3:20 – 4:00
12. Brief preview of TLPA Mussel Survey Project	Wayne Lancaster	4:00 - 4:10
13. Wrap – up and summary, Project Plans 2025-2026	Thomas Joseph	4:10 – 4:30

TORCH CONSERVATION CENTER

TORCH LAKE PROTECTION ALLIANCE

(Preliminary) Summary of 2025 Meeting

- A nutrient balance was done in 2005. This was prior to GBA . We hope to identify what has changed with the current study..
- Extensive groundwater sampling is now showing the water is anoxic (low oxygen levels) which means the capture of phosphorus and nitrogen by the soil/sand around septic fields is lower than hoped for. This is of concern
- Several hypotheses are under study for the cause of GBA. Work is underway in parallel to the lake wide USGS effort to test those hypotheses. The hypotheses that are consistent with the data and observations have in common that they are complex with multiple contributing causes. This is the reason why silver bullet fix is unlikely
- We have a much better understanding of the vertical mixing in the lake that occurs with the change of seasons. This is important because it impacts the concentration and distribution of nutrients in the lake
- We are improving on the measurement of quagga mussels in Torch Lake and working to incorporate their impact in the models USGS will be reporting on. We have engaged world class experts on quagga mussels to aid this work. Quagga mussels were not thought to be present in Torch when the USGS work was started. They may now be present in very large amounts
- We need a long term monitoring plan for Torch Lake. The lake has changed and we need to adapt too. We had inadequate leading indicators for the onset of GBA and now quagga mussels. We need to learn from that. The drivers of change to Torch Lake have not stopped. What will come next?

What's Next ?

- 2025 is our third and final year for extensive sampling and analysis. Fortunately, we've experienced a variation in weather, ice coverage, and storms. We've captured the effects of those events to expand our knowledge of the Ecosystem.
- As we gather the data this year, we will conduct an in depth analysis of the all the inputs to the Lake, build a mathematical model to predict responses to various inputs, and develop specific recommendations for local government agencies and residents to protect and preserve the health and quality of Torch Lake and the Chain of Lakes.

QUESTIONS ?


Help Keep
TORCH LAKE
Blue
TORCH LAKE
PROTECTION ALLIANCE
DO YOUR PART —
JOIN US AT TLPA.CO