



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Water Use Advisory Council

November 10, 2022

WUAC Chair Order for 11/10/22

- Laura Campbell, Senior Conservation & Regulatory Relations Specialist
Michigan Farm Bureau (Items 1-6)
- Bryan Burroughs, Executive Director
Michigan Trout Unlimited (Items 7-11)

Water Use Advisory Council (WUAC) Meeting

Hosted by the Department of Environment, Great Lakes, and Energy (EGLE)

Tuesday, November 10, 2022

1:00 p.m.- 4:00 p.m.

Con Con Conference Rooms A and B, South Atrium, Constitution Hall
525 West Allegan, Lansing, MI 48933

Remote Option Available Via Teams

[Click here to join the meeting](#)

Or call in (audio only)

[+1 248-509-0316,288182520#](#) United States, Pontiac

Phone Conference ID: 288 182 520#

AGENDA

1. Welcome
2. Roll Call
3. Approval of Agenda-Roll Call Vote
4. Approval of Minutes-Roll Call Vote
5. Public Comment (3 Minute Limit)
6. Committee Chairs Reports
 - A. Data Collection Committee
 - B. Models Committee
 - C. New Topics Committee
 - D. Conservation and Efficiency Committee
 - E. Implementation Committee
7. 2022 WUAC Report Update: Content, Logistics and Timeline
8. EGLE Update—Discussion with Ohio DNR Regarding AquaBounty
9. Future
 - a. Remaining 2022 Meeting Dates
 - December 5 (Monday)
 - b. 2023 Meetings Dates
 - c. 2023 Call for Special Topics
10. Open Comments (3 Minute Limit)
11. Motion to Adjourn

1. Welcome



2. Roll Call



3. Approval of Agenda –Roll Call Vote



4. Approval of Minutes—Roll Call Vote

5. Public Comment

3 Minute Limit

6. Committee Chair Reports

A. Data Collection Committee

Bryan Burroughs

Megan Tinsley



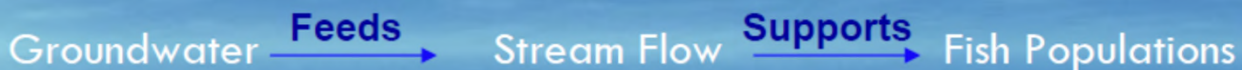
WUAC Data Committee

November 10 , 2022

1 New Recommendation

Inland Lakes Adverse Resource Impact
Framework Development

The Water Withdrawal Assessment Process

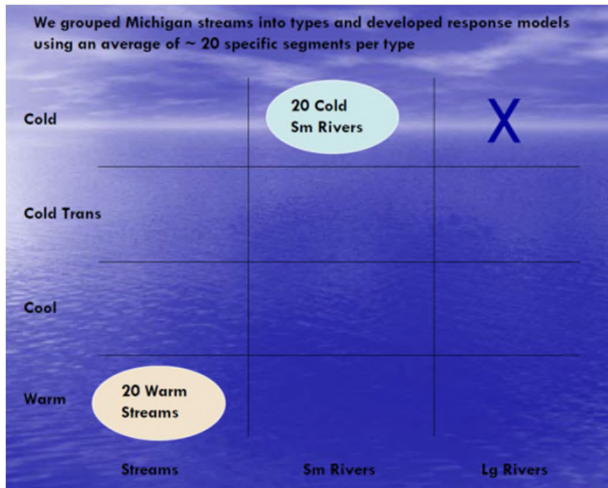


➤ Three Models Interact within the impact assessment model

Withdrawal Model - How much water is in the aquifer, is being withdrawn, and from where and how it will affect stream flow

❌ Streamflow Model - How much water is flowing in the stream during summer low flow periods

❌ Fish Impact Model - What fish are in the stream and what is the likely effect of removing water on those groups of fish



Lake Shape

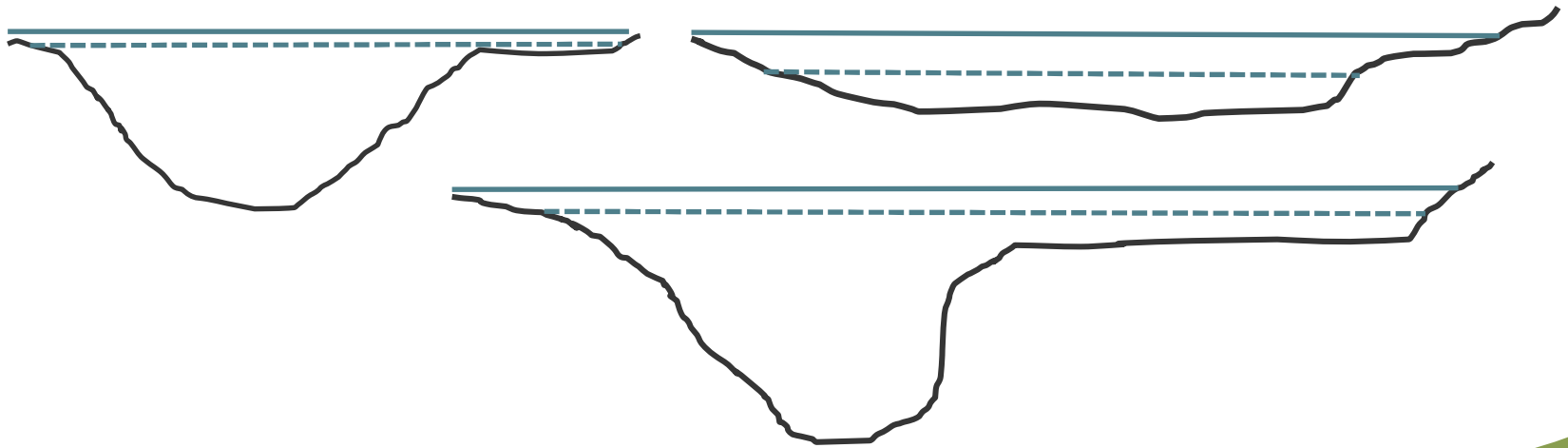
- Area or Volumes
- Bathymetry
- Littoral Zone

Impact Metric

- Human Uses
- Riparian Uses
- Ecological Impact
- Plants, Algae, Fish, Chemistry
- Direct vs. Indirect

Groundwater Contribution

- Relative Elevations w/ water table
- Water Chemistry - Isotopes



The Great Lakes Compact and Michigan's Part 327

Are predicated on the charge of protecting water-dependent natural resources from adverse impact.

The scope of this charge is broadly inclusive of water-dependent natural resources.

At the point of creation and adoption of Part 327, a framework was developed for predicting the impact of water withdrawals on water-dependent natural resources, using stream fish communities as the indicator metric, and the science available at the time supported this framework development for rivers and streams. An analogous framework for inland lakes or wetlands was not feasible at that time.

Due to this, Part 327 addressed impacts to inland lakes, not through predicted impact pathways to ecological components of those systems, but through general provisions focused on impacts to the human uses of inland lakes, through water withdrawals.

Ever since, previous iterations of the WUAC have discussed obstacles and needs for creating an assessment framework for inland lakes that would function similarly to the stream-based system the water withdrawal assessment process relies upon now; and be consistent with the scope and charges of the Great Lakes Compact.

Background

In recent years, new tools for efficient data collection regarding lakes have become available (e.g., lake level instrumentation and crowd-sourced data platforms, water penetrating LIDAR, lake source water isotope analysis), and new approaches to classifying lakes based on sensitivity to withdrawals (e.g., Wisconsin Central Sands Region Study) have developed making this effort more feasible.

The Data Committee also reviewed and had guest speakers from Wisconsin DNR present the findings of their approach for assessing impacts to inland lakes from water withdrawals. Further investigation on this topic is necessary, and several forms of support are now required in order to enable meaningful progress.

Background

The WUAC Data Committee, in order to continue productive investigations into Inland Lakes ARIs, needs:

- 1) Technical support from limnological experts, for assistance in identifying and developing mechanistic pathways of impact that tie lake inputs to meaningful indicator metrics, and for identifying viable data needs and collection strategies
- 2) Facilitative modeling expertise to aid in the development and assessment of viable classification strategies for inland lakes, and for conceptual model development to test validity of concepts
- 3) Targeted, pilot scale data acquisition, to allow assessment of the utility, reliability, and cost-efficiency of suspected strategic data needs (e.g., lake water level variability, lake bathymetry, surrounding hydro-geological data, water chemistry, ecological metrics), and assessing how much of these might be conducted by citizens, industry, governmental agencies, or academic institutions.

Background



These theoretical, modeling, and data investigations must go hand in hand, and be informed by each other iteratively.



A viable conceptual modeling framework cannot be developed without consideration of the types of data that are possible for use within it; and it is also impracticable to understand what types of data collection and what precision of data is needed without considering the intended uses of that data within the conceptual modeling framework.

Recommendation

Inland Lakes Adverse Resource Impact, Conceptual Framework Development and Pilot Data Acquisition Assessment.

Since the inception of the Great Lakes Compact and Michigan's implementation statute, Part 327, assessment of ARI effects for inland lakes has been hampered by the absence of an acceptable scientific conceptual framework for predicting withdrawal impacts to inland lakes, classification of lakes based on sensitivity to withdrawals, identification of mechanistic pathways linking withdrawals to meaningful components of inland lake resources, and by the absence of datasets suspected to be necessary.

The WUAC has continuously investigated this issue, and now recommends a first initial financial investment required for the WUAC to make meaningful progress on this topic.

This investment is not expected to produce a final acceptable framework for assessing ARIs for inland lakes, but rather is needed to accomplish meaningful progress in development of a first iteration conceptual framework and to conduct targeted data collection pilot projects, so that meaningful future progress and developments are possible, and this issue does not continue as unaddressed.

Recommendation

The WUAC recommends a one-time financial investment of \$200,000, that would be used over two years, to acquire technical support for the WUAC's committees to engage limnological expertise, facilitative modeling capacity, and to conduct multiple targeted pilot scale data acquisition assessments; continued review which the WUAC has deemed necessary to make progress on the inland lakes adverse resource impact assessment topic.

Projected Implementation Details:

Scope of work, RFPs and contracts should be developed jointly between WUAC and EGLE, to implement one-time funding request of \$200,000. Work conducted under contracts, would be expected to be performed over a 2-year period.

Phase 1, first year, would include work on conceptual framework development, (including \$50,000 for limnological and other technical expertise consulting; and \$75,000 for facilitative modeling consulting).

Phase 2, second year, \$75,000 would be used to conduct targeted data acquisition feasibility assessments for specific data needs identified in phase 1.

Phase 3, year 3, would include WUAC review of the work from phase 1 &2, and development of subsequent recommendations for this topic. One time funding request = \$200,000; Year 1 = \$125,000, Year 2 = \$75,000, Year 3 = \$0.

B. Models Committee

Dave Hamilton

Jim Nicholas

Water Use Advisory Council Models Committee

Revisiting the “Half Max Rule”
Streamflow Depletion
Apportionment

Proposed “Revised Methodology”

- “Analytical Depletion Functions” were developed by Zipper, et al, that consist of stream proximity criteria, depletion apportionment equations, and an analytical model to estimate streamflow depletion.
- Based on the above, the “Revised Methodology” is composed of:
 - The “adjacent” method, which uses Thiessen polygons, to identify nearby stream segments that should be depleted.
 - The “web squared” method to estimate the total depletion apportioned to each stream segment.
 - Continue to use the Hunt (1999) solution for calculating the streamflow depletion.

Recommendations to: Improve WWAT streamflow depletion allocations between WMAs



Determine the feasibility of using the revised methodology in the screening tool. Develop techniques that will allow timely calculations in the online use of the tool. And determine the feasibility of conducting a field investigation to show improvement of the revised methodology versus the half max rule.



Determine the results of applying the revised methodology to the entire data base of registered large quantity withdrawals. Evaluate what, if any, impacts there would be of water availability and potential ARIs. Identify possible measures to mitigate impacts on registered users while avoiding ARIs.



Prepare recommendations for the Water Use Advisory Council regarding the implementation of the revised methodology and any new or revised policies necessary for successful implementation.

Downstream Accounting with Return Flows

Downstream Accounting Research Recommendations:



Complete an exhaustive literature review of existing research on observed or modeled downstream propagation of streamflow depletions.



Examine relationships between long-term changes in index flows and index flow yield relative to climatic conditions at gaged streams throughout Michigan.



Conduct literature review and empirical analyses to identify and provide underlying support for the appropriate spatial scale for totaling cumulative withdrawals that potentially affect the index flow of each WMA.

Flow Rate Attenuation Study

Hypotheses:

1. Hydraulics of flow in the channel and stream network attenuate the stream depletion response leading to lower peak rates over longer periods such that, although mass is conserved, the peak depletion rate is not observed.
2. Exchange of water with groundwater allows the stream to access additional storage. This storage attenuates the peak depletion while lengthening the response time in the system. The mass removed is conserved, but peak rates are not observed.

Flow Rate Attenuation Study Summary:



The proposed study is designed to investigate how streamflow depletions might propagate downstream and combine to effect downstream reaches.



Mechanisms of attenuation will be modeled. Results of this testing will illustrate how in-stream processes may affect the propagation of peak streamflow depletion rates.



The effects of groundwater/stream exchange will be modeled. The initial testing will explore different combinations of aquifer and streambed characteristics representative of systems in Michigan. If accessing near-stream aquifer storage is determined to be a feasible mechanism through these simple models, coupled groundwater/surface-water models from areas in Wisconsin can be used to illustrate the effects using more realistic models calibrated with extensive field data.

Flow Rate Attenuation Study Recommendation:



Conduct a series of modeling analyses to test mechanisms that would lead to attenuation of the stream depletion.



These will test hypotheses 1 and 2. By isolating the mechanisms, key features of the surface-water/groundwater system that help propagate or attenuate upstream depletion response can be identified.



By better understanding these features, we may identify stream networks that are more susceptible to upstream withdrawal and those that may be more buffered from upstream withdrawals. Identification of potential mechanisms also can help inform analysis of existing data or design of future data collection.

C. New Topics Committee

Pat Staskiewicz

Jason Walther

D. Conservation and Efficiency Committee

Emily Finnell

Kelly Turner

Water Conservation and Efficiency Committee

- 2020 Recommendation 1. Advance Michigan's Water Conservation and Efficiency Efforts through State Climate, Energy, and Water Infrastructure Initiatives.
 - Continued discussions on funding review and update of water sector BMPs with focus on how climate migration/climate change may impact water sectors and how they are planning to mitigate and adapt
 - WCEC worked on project scope to establish which water user sectors would be included in the project
 - WCEC working on forming a subgroup to fully develop the concept with background and connections to existing project

Water Conservation and Efficiency Committee

2022 Recommendations Development

- Addressed comments gathered at the last WUAC meeting

Other committee business

- Reviewed committee report to be included in the WUAC biennial report
- Discussed Water Conservation and Efficiency Annual Program Assessment (GL Compact requirement)

E. Implementation Committee

Laura Campbell

Doug Needham

Co-Chair Bryan Burroughs

7. 2022 WUAC Report Update

Content, Logistics and Timeline

8. EGLE Update



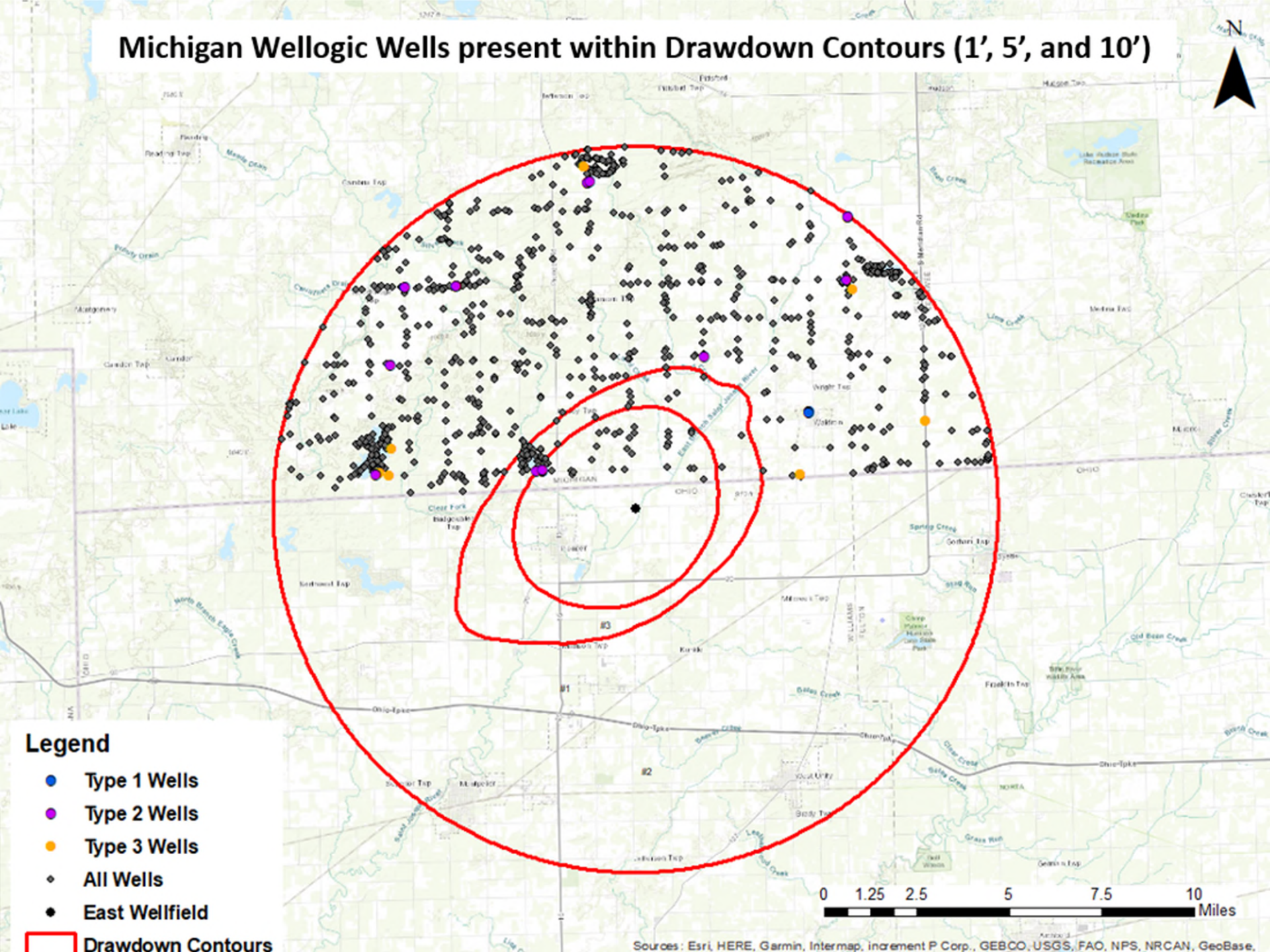
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AquaBounty Update

Water Use Advisory Council

November 10, 2022

Michigan Wellogic Wells present within Drawdown Contours (1', 5', and 10')



AquaBounty

- EGLE OGL & WRD met with ODNR
- Monitoring Plan
- Vertically Nested Observation Wells
- Sharing Groundwater Data
- Communication Plan

Next Steps

- Complaint Response Plan Development
- Possible USGS Observation Wells in MI
- AG to Advise EGLE on MI's Options
- USGS Modeling Michindoh Aquifer

Questions?

Jim Milne

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EGLE Water Resources Division

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9. Future

- a. Remaining 2022 Meeting Dates
 - December 5, 2022
- b. 2023 Meeting Dates
- c. 2023 Call for Special Topics

10. Open Comments

3 Minute Limit

11. Motion to Adjourn
