Indiana Mesonet Advisory Body (IMAB) Regular Meeting Notes

Date: December 3, 2025, 9:00 AM – 12:00 PM

Location: MADE@Plainfield, 1610 Reeves Rd, Plainfield, IN 46168, Room 237

Attendance:

- **In-person –** Don Cummings, Garth Lindner, Tony Bailey, Sam Lashley, David Beachler, Breegan Anderson, Mike Nichols, Beth Hall, Shawn Naylor, Austin Pearson, Sam Stroebel
- **Virtual –** Dave Lampe, Robin Tanamachi, Stu Foster

Officers (effective January 1, 2026):

- **Chair –** Don Cummings
- **Vice Chair –** Garth Lindner
- **Secretary –** Austin Pearson

New Business:

- **Nominations and voting for the new chair, vice-chair, and secretary of IMAB (effective January 1, 2026)**
    - Chair
        - Garth Lindner nominated Don Cummings, seconded by Shawn Naylor.
        - There were no additional nominations.
        - There was no discussion.
        - Vote passed unanimously, confirming Don as chair of IMAB.
    - Vice Chair
        - Garth Lindner self-nominated for this role. Mike Nichols seconded.
        - There were no additional nominations, along with no other discussion.
        - Don led the vote, which passed unanimously, confirming Garth as Vice Chair of IMAB.
    - Secretary
        - Beth Hall nominated Austin Pearson as secretary. Shawn Naylor seconded.
        - There were no additional nominations, along with no other discussion.
        - Vote passed unanimously, confirming Austin as Secretary of IMAB.
- **IMAB Resolution December 3, 2025**
    - The group has not yet formally adopted the application process for other mesonets to be admitted into the Indiana Mesonet Consortium. The

American Association of State Climatologists (AASC) has not released its final recognition document, though it is expected soon. The Indiana State Climate Office has prepared an updated version based on the draft, but is awaiting the official release before moving forward.

- The Purdue Mesonet was formally adopted into the Indiana Mesonet Consortium with the adoption of the bylaws effective November 17, 2025.
- Don suggested that the Indiana Water Balance Network (IWBN) may be considered "grandfathered" into the Consortium based on IMAB's prior knowledge of the network.
- It was recommended to develop, during the meeting, a formal resolution and establish an effective date for IWBN's membership in the Indiana Mesonet Consortium. This action requires an official vote. This resolution is provided below.
    - IMAB Resolution – December 3, 2025
        - The IMAB hereby resolves that the Indiana Water Balance Network (IWBN), with IMAB's prior knowledge of IWBN's existing means and methods, is grandfathered as a member of the Indiana Mesonet Consortium, with the understanding that the IWBN will supply all information required of Consortium applicants under Article 10 of the IMAB bylaws. Documentation will be archived at the Indiana State Climate Office.
            - **Action Item: Discuss deadline at the March 2026 meeting.**
- Breegan Anderson motioned to adopt the IMAB Resolution – December 3, 2025, and was seconded by Garth Lindner.
- There was no additional discussion.
- Don Cummings called for a vote, which passed unanimously.
- The finalized IMAB Resolution – December 3, 2025, will be archived at the Indiana State Climate Office and made publicly available on the Indiana Mesonet website, and will be maintained by Austin Pearson.
    - **Action Item: Austin archive the signed IMAB Resolution – December 3, 2025, and post it to the Indiana Mesonet Website by the March 2026 meeting.**

Reports:

- **IWBN – Ginger Davis (not present), email update on November 19, 2025**

- Network expansion plans (still):
  - **Crane NSA base installation**: Working with the military is always about playing the long game, real estate approvals were received, still waiting on technical hardware specification approval for base installation of any transmitting and receiving devices, all sensors and hardware have been purchased and set up for easy installation once approval is received, we conducted a field study of soils and shallow water table and are looking forward to instrumenting this area as a great water balance study site.
  - **DNR abandoned mine land study site (East of Vincennes**): Final funding is in process of approval, scoped siting requirements to align with methane project and conduct preliminary soil, and shallow water table assessments. Plans for sensors are still being conducted as monitoring background methane at site is a priority along with side by side assessment of methane. This station is funded more for research of methane than water balance, but are going to dual purpose the site.
  - **Versailles State Park**: Waiting on final MOU signatures for this station installation, have the sensors and plans in place to install as soon as we have a signed agreement.
- Personnel updates:
  - Still just the 2 of us. Connor Miller our technician is conducting on site maintenance and side by side QC measurements 3 x per year and on-demand when problems arise. I am on this project at 10% as funding opportunities keep us from funding a manager full time.
- Website updates:
  - The IWBN server is now being hosted on a cloud-based platform. This change has restricted our prior ability to host our data on the IGWS website. As time marches on that capability may change. Our data is still readily accessible through Synoptics's data viewer tool.
  - We lost our web developer at the survey recently, so plans to put up derivative products on our website is halted for this replacement. We are supporting the Indiana Mesonet site as requested and making sure our Synoptic data is flowing to NOAA as used by them and the Indiana Mesonet. We have suggestions for improving the website based on feedback by users, but are waiting for funding opportunities to help drive these changes
- Sensor testing:
  - We have started a new out of box testing protocol after receiving some sensors that seemed to be off calibration. This is now standard practice for new sensors purchased.
  - A snowfall adapter installed by our team at the Brownsburg_N1 site this fall will help us collect information on frozen precipitation. This is

a new step for the current IWBN team and a good exercise for installing more in the future.

- **IMAB Discussion and Questions Related to the IWBN Report:**
  - Archived Data Availability:
    - Questions were raised about where archived data are stored, how far back records extend, and how to handle data from periods when network quality did not yet meet current standards.
      - Purdue Mesonet: Data extend back to 1999, though they do not consider the data "quality data" until 2002.
      - Indiana Water Balance Network (IWBN): According to Shawn, IWBN's quality data began with an IFA project. IWBN joined the National Mesonet Program in 2019/2020 and should have approximately four years of high-quality records since joining NMP.
      - Tony Bailey noted that data quality evolves over time and should simply be annotated to reflect those changes.
  - Recommendation on Bylaws and Membership Requirements:
    - The Body recommends amending both the bylaws and the membership requirements document to ensure that joining networks grant the Indiana State Climate Office access to their complete historical data archive.
      - **Action Item: Austin to draft and propose amendments to bylaws and membership requirements document to include complete historical data-access requirement by the March 2026 meeting.**
  - Snowfall Adapter:
    - The Body expressed interest in learning more about the snowfall adapter.
      - **Action Item: IWBN team provides a summary of the snowfall adapter and performance plans.**
  - Data Transparency, Calibration, and Manufacturing Guidelines:
    - Discussion emphasized the need for greater clarity regarding calibration procedures and sensor validation from IWBN.

- The Body would like documentation outlining how each network calibrates and maintains its sensors, including information on calibration accuracy and any known biases.
- While QA/QC is mentioned in the application process, formal documentation of calibration procedures should also be required.
    - **ACTION ITEM: Austin, add calibration procedures as a requirement for the application process by the March 2026 meeting.**
- Networks sharing calibration practices among each other would be beneficial. It was noted that IMAB will assess networks based on membership requirements aligned with the AASC recognition document.

- Purdue Mesonet (Beth Hall, Austin Pearson, and Sam Lashley)
    - Network expansion plans: (Sam)
        - Overview of Site Map: https://app.atlas.co/shared/msO1k4p4JTi18BBuwusg?loc=-85.5271%2C39.6901%2C6.3747z&public=true
            - Sam presented a map showing potential, contracted, and installed Mesonet sites. Green markers represent current stations. Fifteen stations have been installed statewide. Four additional sites (i.e., Decatur, LaGrange, Montgomery, and ??) have signed land-use agreements but remain unfunded (i.e., no current funds for equipment purchase and installation). Several other promising locations have been identified.
        - County-by-County Updates:
            - Montgomery County: First newly added site location with a signed contract. Pending funding for station and installation funds.
            - Decatur County: Contracts are in hand with local partners.
            - Johnson County:
                - Greenwood (Endress+Hauser):
                    - Thanks to Don and the Johnson County Community Foundation, a site at Endress+Hauser is ready for installation. The location received a grade of "B" and offers sufficient distance from buildings and roads. No

development is planned for at least 10 years, and the site is representative of the local environment.

    - Southern Johnson County
        - Johnson County EMA expressed interest in supporting a station in southern Johnson County.
- Warrick & Vanderburgh Counties – Bluegrass Fish & Wildlife Area:
    - Although located on reclaimed coal mine land, Garth noted that soil moisture and temperature measurements remain valuable if properly documented. Soil Explorer indicates a significant portion of the parent material is disturbed soil, a dominant feature of the area. Meteorologically, Sam believes the site is excellent.
    - Stu added that several western Kentucky stations sit on reclaimed strip mine soils and provide meaningful data. These soils heat and dry faster during drought, which can produce valuable insights.
    - Allison Curry mentioned that IDHS has maps of former mining tunnels due to recent ground subsidence issues that could be referred to.
        - **Action Item: Allison, provide Sam with IDHS maps of former mining tunnels in Warrick County.**
- Clay County – Chinook Fish & Wildlife Area:
    - Sam identified a promising site on state-owned prairie land with open exposure in all directions. The site is also a former mining area, but it appears to have been reclaimed.
- Newton County:
    - Multiple encouraging DNR sites exist; local property managers must still be consulted. Two managers are competing to host the station.
- Noble County:
    - A CoCoRaHS observer with 67 acres near Chain O' Lakes State Park expressed interest in hosting a station.
- Henry County:

        - Garth has a local contact interested in siting a Mesonet station.
    - Marion County:
        - Sam met with the county emergency manager, who is enthusiastic about installing a weather station and distributing outreach materials.
- Brookville Reservoir:
    - A potential site has been identified; Garth will accompany Sam on a future visit.
- Assistance with Landowner Connections:
    - Breegan Anderson offered to help connect with landowners.
    - Tony Bailey mentioned contacts within Beck's and other agricultural networks.
        - **Action Item: Breegan and Tony provide Sam with contacts to pursue for site host opportunities.**
- Additional outreach opportunities include:
    - Hosting a booth at the Indiana Farm Bureau conference (December 2025)
        - Recommendations:
            - Communicating Mesonet benefits for irrigation and farm decision-making (raised by Mike Nichols)
            - Engaging with the Michiana Irrigation Association (Beth presented this year)
            - Reach out to Basin Commissions
        - Sam encouraged the group to send him dates of local meetings or events where contacts could be made.
        - If IMAB members are advocating for the Mesonet site host and costs, go to indianamesonet.org. Under About, you'll find Costs & Site Requirements.
- Site requirements on undisturbed soil… some conversation that it is hard to find truly undisturbed soils. Walmart construction site vs farm plowed fields. Also have this question about E+H. May need to have state soil scientists or the web soil survey.
    - Stripping off topsoil is not good. But plowing is less disturbed.

- <u>Funding Updates: (Sam & Beth)</u>
    - Community Foundations:

        - Sam continues to pursue support from Community Foundations, emphasizing STEM engagement. Bob (technician) coordinated installation assistance from the Crawford County Schools shop class. Similar opportunities exist elsewhere; for example, Endress+Hauser is located across from a school that could assist with station footings. Many foundations reported difficulty distributing funds this year, which could work to the Mesonet's advantage. Industry Partnerships (IMAB Recommendation):
        - Wind and solar companies have expressed interest in local investment. Mike will share names of potential partners, including a solar developer in Elkhart County known for providing funding to local governments.
            - **Action Item: Mike, send a list of wind/solar company contacts to Sam.**
        - It may be advantageous to encourage solar companies to sponsor installations on DNR property.
    - Executive Order 25-63:
        - This order emphasizes the need for improved monitoring to support a range of water-related objectives. Mesonets represent one component of this broader effort. The Indiana Finance Authority (IFA) has provided funding to purchase and install four stations across the state. As part of this initiative, IN-SCO is also tasked with developing an API and enhancing the PET tool. Although a PET tool exists, the goal is to enable comparisons with historical data.
        - Siting for the four Purdue Mesonet-owned, IFA-funded stations:
            - The selected locations align with preferred areas identified in IFA studies. Because the funding originates from IFA, siting efforts are focused within those regions with priority on IDNR property. These installations will use 30-foot towers.
- <u>Personnel Updates: (Beth)</u>
    - Austin is now officially the Assistant State Climatologist!
    - Sam has been hired as the part-time Site Host & Outreach Coordinator. His responsibilities include building relationships with site hosts, drafting land-use contracts, and securing new installation

locations. Sam brings strong statewide connections and an ideal personality for this work. He began the role on September 3.

- Question: What will Sam's role look like once all sites are acquired?
    - Sam will continue to support the network through ribbon-cutting events, media engagement, podcast outreach, and other public-facing activities. The group expressed interest in holding recognition ceremonies at key milestones, something that could begin now to highlight important anniversaries and increase media visibility.

- Network Logistics: (Austin)
    - Updating Maintenance and Calibration Protocols:
        - Continued work is underway to update and standardize site maintenance and calibration procedures across the network.
    - Streamlining Station Specifications:
        - Efforts are being made to refine and unify station specifications and installation diagrams to ensure consistent installation practices, especially important as many new stations will be added over the next two years.
        - This effort will lay the foundation for our 'Standard Station,' which will be replicated at all future stations. This will include wiring diagrams, site layouts, and other key information to ensure our sites are identical going forward.
        - A 10% backup inventory was suggested as a target for spare sensors and components.
            - The group discussed potential sensor-sharing arrangements among states in the event of equipment shortages, as well as better coordination among in-state networks.
- Snow Depth Sensor Testing: (Austin)
    - Testing three sensors
        - SDMS40 – a laser-based sensor
        - SnoVUE10 – an acoustic-based sensor
        - SOMMER USH-9 – an acoustic-based sensor
    - Results
        - SDMS40 didn't perform adequately… consistent 0s

- SnoVUE10 and SOMMER USH-9 within the ballpark of the actual measurement. Measurements can be ±1 inch.

- R&D: (Austin)
  - Windshields surround rain gauges
    - Some networks have one, others have two, and a few have none.
    - Recommendation based on a literature review is at least one windshield. Two are best, but expensive. The new rain gauges at sites will have one Alter shield.
    - Robin Tanamachi said that there's a mega site that she visited in Canada (CARE) recently that had single, double, and triple fenced rain gauges… maybe you could ply them for some data?
  - Cameras
    - Cameras have been purchased, and discussions with Verizon are ongoing to establish a private network capable of transmitting data back to Purdue. Firewall permissions are required before testing can resume. Once the appropriate equipment is installed and firewall access is approved, camera testing can continue. The primary technical hurdle is configuring the camera system to transmit via FTP protocol.
    - Purdue IT and Verizon are continuing to coordinate to determine the correct networking and security pathways to ensure successful operation.
    - Two cameras will be installed facing each other. The system can be configured for either live video or static images and can be programmed to increase transmission frequency during threshold exceedance scenarios (e.g., high-wind events (e.g., winds > XX mph)).
    - The group discussed whether there is value in providing on-demand video access or on-demand still-image retrieval for users.
    - Camera Discussion: Examples from other Agencies
      - INDOT:
        - Uses three types of camera systems:
          - Pole-mounted cameras

- Non-public-facing cameras (internal access only; no archiving due to storage cost and public records constraints)
- Plow cameras, active during winter, providing public still images every few minutes via 511in.org
- Mike offered to provide technical support contacts.
- Texas flood monitoring camera systems were referenced as an example of weather and safety applications.
    - A recommendation for Mesonet expansion is expected to be included in the governor's task force report – Allison Curry

- Kentucky Mesonet:
    - Previously captured photos every 30 minutes with archiving; current operations may differ.
    - KY Mesonet has begun producing time-lapse videos, reportedly at 5-minute intervals.
- USGS:
    - Uses HiVis (https://apps.usgs.gov/hivis/) with 15-minute still images and archived data.
    - Photos can be linked to various site parameters. Initially tied to stream gauge height, but expandable to other variables.
    - Users can download time-lapse sequences or individual stills depending on available data.
    - Current system relies on satellite transmission; transition to cellular modem will likely be required for camera integration.

- Camera Discussion Continued:
    - Robin Tanamachi suggested time lapses. Time lapses are excellent teaching resources – what better way to visualize a frontal passage?

- Sensor Colocation Opportunities

        - There is strong support for allowing other networks or agencies to co-locate sensors with Purdue Mesonet tower infrastructure.
        - This approach enhances interagency collaboration, supports statewide monitoring goals, and strengthens long-term sustainability of the Mesonet.
- 10-meter towers
    - Montana uses UT30 towers mounted on ground screws with a custom baseplate and three guywires, eliminating the need for excavation or concrete. This method withstands Montana's high winds, allows installations to be completed within a few hours, and—given their pace of installing roughly 38 stations each summer—has justified purchasing a skid steer and screw-driving equipment.
    - However, this "Montana Method" may not be well suited to Indiana's geology. USDA NRCS soil surveys indicate that sites such as LaSalle and WS may be too sandy to adequately support ground screws. Our technician, Bob Autio, is conducting additional research into the method's feasibility.
    - There has also been considerable interest on the AASC Listserv, suggesting this could be an excellent topic for a future webinar.
- Website Dashboard Redesign
    - The Purdue Mesonet team reviewed dashboards from other mesonets—including Nebraska, the New York State Mesonet, Kentucky, and Ohio—as well as tools such as Looker Studio, to identify potential models or alternatives to Tableau for the new Indiana Mesonet Data Hub. The NYS Mesonet stands out as a strong example to emulate.
    - Meetings were held with both the Kentucky Mesonet and the NYS Mesonet to discuss their website architectures and data-delivery systems. Based on these discussions, the team plans to move forward with developing a new, custom Indiana Mesonet Data Hub.
    - The current system is increasingly obsolete and does not support the capabilities needed for our planned tools, products, and network expansion.

- API & PET tool
    - IFA funding is in place for a two-year effort to build an Application Programming Interface (API), with work beginning in October 2025.
    - Although an API does not currently exist, we have one software engineer assigned to the project and are working with Purdue Research and Computing to identify an additional engineer. The new website dashboard will rely on this API to retrieve and display data. The system will also have the capability to pull from other network APIs or ingest data from Synoptic/NMP.
    - An existing PET tool is available on the Purdue Mesonet website, but it will be redesigned and updated with new features as part of the transition to the new data-hub environment.
- Indiana Mesonet Consortium Membership Requirements
    - Indiana has drafted its own version of membership requirements, modeled after the AASC Mesonet Recognition Standards. However, the release of Indiana's requirements is currently on hold until AASC publishes its final documentation; we do not want to publish ahead of the national standard.
    - In the meantime, IN-SCO has updated our site requirements across fact sheets, the website, and the Membership Requirements document. Key criteria include:
        - Located on relatively flat, open terrain (~1 acre) representative of the surrounding area
        - Free of obstructions (e.g., bushes, fences, tree rows, or structures) within a distance of at least 10× their height in all directions
        - No pavement, crops, or tree lines within 100 ft (30 m); ideally in natural vegetation or grass
        - Soil should be typical of the area and historically undisturbed
        - Not situated in a topographic low or high point that may bias temperature or wind
        - Not near irrigation systems, ponds, or lakes that could affect humidity or soil moisture
        - Accessible year-round by vehicle
    - Discussion

- Tony noted that he is not familiar with the various weather networks and is unsure which ones consistently provide reliable data. Weather Underground was mentioned as an example where station siting issues and broken sensors can compromise data quality.
- The group discussed which datasets feed into numerical weather models—primarily ASOS and AWOS, with mesonet data potentially included if it is properly distinguished and quality-controlled. Any mesonet data incorporated into models would need to be parsed as it arrives, then formatted and processed through the modeling system.

Upcoming Engagement Opportunity:

- IN AWSoME – Feb 11
  - Historically, IN-SCO would try to have a climate services meeting every so often. They felt that a statewide meeting on monitoring would be more timely given mesonet interests across the state. Schedule to coincide with the legislative session. Encouraged legislators and staffers to attend. On Feb 10, meeting planning team members will be in the statehouse.
    - **Action Item: Register for IN AWSoME.** **https://ag.purdue.edu/indiana-state-climate/2026-in-awsome/**

Other news:

- ISDA is adding language to a new bill that designates mesonet installation and maintenance as allowable expenses—excellent news for future funding and support.

Dates for Next Meetings:

- The group agreed that the next meeting should be scheduled after AWSoME
- Proposed date and time: Wednesday, March 4, from 9:00 AM to 12:00 PM. The proposed timing worked for everyone
  - Allison will book the room at MADE, but may charge. If they charge…
    - Possible meeting locations include:
      - INDOT's conference room on the east side of Indianapolis
      - The USGS auditorium, which is available and commonly used by the Silver Jackets

- **Action Item: Allison, book a room at the MADE facility. Communicate with Austin and IMAB if we are unable to get the room for free. Austin will find another facility.**

The meeting adjourned at 12:00 PM.

Minutes submitted by: Austin Pearson (Secretary)

Minutes Approved by: IMAB on _____

_____ _____

Don Cummings (Chair) **Austin Pearson (Secretary)**

Date: _____ **Date:** _____