

DMAG Minutes

10/27/2022

Attending:

Amy Mager, Zac Najacht, Dana Grabowski, Casey Lanham, Robert Larson, Tim Sharac, Greg Beachley, Mark Kuether, Greg Wetherbee, Nichole Miller, Chris Rogers

Network Summaries and Status

Zac has compiled an initial list of the number of sites and samples per month gathered for each network. These are approximations and he will gather more exact values for the Fall meeting. Meanwhile, he is sending out preliminary reports to the sites and publishing this data to the program office. Some site numbers changed throughout the year with new sites starting mid-year. Some networks can expect additional sites in the following year.

The rough numbers were:

Network	Approx Sites	Approx Samples per Month
NTN	258	1100
MDN	81	350
MLN	24 for 2022 season	Seasonal / Variable
AMON	90	250
AMNET	10 (only 9 active)	8640 – 5 min measurements each month from each site

Data to website

Mark's training is going well. He started with MDN network since that is a simpler case and has been processing samples since end of July. Now that mapping tasks have been completed Bob is going to train him on AMON, NTN, mapping, and other reports and tasks.

The labs have processed NTN data through June, AMON data through July, MDN data through July. MLN and AMNET are undefined at this point. MLN does not have a traditional processing cycle, and AMNET is heavily dependent on operators sending in data. The litterfall reports for 2019 and 2020 have been sent to the sites. The lab is finishing the analysis for the 2021 season.

The MDN and AMON data are posted on the website through June 2022. NTN is posted through Dec 2021. Litterfall data for 2019 and 2020 will be posted to the web site soon with metadata. Bob will be using the backlog of NTN data to train Mark on NTN.

SOPs

Bob and David had created a draft document documenting their annual review process. Mark has been taking notes of all the processes he is learning and creating stand-alone documents. He plans to produce two or more SOP documents for the Data Manager role. The first will be a high level and focus on the “What” aspect of the job. This will include information on where data or scripts exists. The second and others will be detailed instructions on different tasks and focus on the “How”. That is intended to allow someone to step in if needed.

Mark will try to have an initial draft of the high level document ready by the spring meeting. He is invited to use DMAG members for feedback on developing SOP's.

Sample Deploy / Hold Time Changes

Zac and Dana made some large changes with sample deployment and hold times. Out of a total of 9 conditions, they adjusted 7 of them so that longer hold times would invalidate samples. Although this seemed like it would be straight forward, the effort turned out to take longer than expected by the time all parties were involved with development changes, metadata changes, and web site changes. The amount of work involved with this impacted the data review turnaround times. Zac recommends that future changes be kept small and incremental to minimize the impact on normal work. We are also working to improve the data review process and that may also help.

It was decided that these changes would not impact historic data validity, and only affect data after January 1st, 2022. The change to the metadata document was kept minimal by the team. There continues to be a single metadata document where changes were appended as a table at the end. Historic values and references were maintained so users of older data would still be able to understand the code meanings.

Valid / Invalid codings to replace QR A-B-C codings

Bob and the team did not have updates at this time on this passed motion. Bob is working to complete this before the end of the year.

Amy would like to know if a specific answer for this is needed at the Fall meeting. She is unsure what actions were agreed upon in the Spring meeting / last Fall meeting on this topic.

Automating lab noted contamination for MDN

This was implemented in Jan 2022 and is a great help. This type of automation is the goal for the lab as it reduces labor and helps keep data reproducible.

Precip Management Program

While the original plan was to port the existing web code into a stand-alone application, this has evolved into a larger project. The OIS team needs to change the coding platform from VB.Net to Java since Java is a more current language. Fewer developers are versed in VB.Net, so moving to Java will allow OIS to better support the code.

With these rebuilds, Bob, Casey, and the OIS team have discussed a plan of how to proceed across the multiple pieces of code used for precip management. They decided it would be best to start with the ingest programs that write data to the database. This piece is straight forward and does not involve any GUI elements. The first step of this process will be a knowledge transfer from Bob to the OIS team. Bob and Casey need to lay out the functional specs of the existing code.

Casey will try to devote about half of his time to these updates. To facilitate Casey's time, the PO and HAL have agreed to only make requests through the formal ticketing system. Amy will review Casey's tickets and help him prioritize requests from the PO and HAL. Data change requests will now be directed to Mark via email. If Mark requires help from Casey, he will submit a ticket. Dave Odell, a coworker in the OIS, will also be assisting Casey in this rebuilding task. He will have some direct involvement but will primarily serve as a technical resource for the Java framework.

These updates do not include the AMNET ingest program. Bob was able to get some code running for Wyatt to use for the immediate time. That will need to be updated / addressed separately.

Updating NTN Precip Form

Dana processes precip data in a separate web app. That precip is then pulled into Data Review for Zac and Dana to use. The Data Review program was developed with the NTN network as it's primary use, then updated to provide a module for the MDN network. Some of the code handling precip was updated for the MDN portion.

Our goal is to update the NTN portion to match the MDN's functionality. Some of the NTN issues involve how NTN is updating and storing precip data. It's using its own database, so the precip data is not synchronized with MDN. This makes it difficult to synchronize precip data for collocated sites.

The NTN update will occur after the precip ingest code has been updated. Bob is unsure if this will require a full rewrite for NTN code. Other aspects also involve moving some of the data entry tasks to the Horizon system. Bob suggested that ONLY updating the precip form would not be a lot of work, but, if we are moving functionality to Horizon within a short time frame, it may not be worth making the change if it will need to be rewritten again in 6 months.

The time frame for the NTN review program to be written in Java, tested, and deployed is estimated to be about 18 months. While 12 months may have been feasible, it is very optimistic. With the Horizon updates, OIS has a lot of projects and is constrained on resources. Casey said that the MDN precip form updates took a lot of effort, so he is not optimistic about a quick turnaround.

The priority will be to complete the precip ingest program before Bob leaves. The ingest program should therefore be ready by the end of 2022, and Casey estimates that the precip review program can be completed during the first half of 2023.

Data Review

Background: Analysts from the lab sometimes make note of sample qualifiers. These include sample handling problems, sample conditions, etc. The HAL/CAL is tracking these qualifiers in a spreadsheet. Each month, Dana and Zac are pulling appropriate samples from the data set, applying the qualifiers, and determining if QR codes need to be changed.

The external audit emphasized the need to incorporate common spreadsheet operations into central applications where possible. While these seemed like it would be straight forward, earlier work always turned out to be more time consuming than expected. Zac suggests trying to coordinate efforts like this with larger development changes.

Casey was working on integrating this, but he ran into problems and got side tracked. He has completed most of the elements to this code but needs a little more work to integrate it with the application. He would like to make this a priority to complete this task.

This task ticket should be assigned to Nichole. Zac, Casey, and anyone else involved will need to discuss this with Nichole to determine its priority. Overall, Zac and Dana are always trying to make data review tasks more streamlined. They will try to come up with more ideas on how to streamline the process for the spring meeting. A mid-term DMAG meeting should be held on this topic.

MLN Metadata, Note Codes, and QR Codes

The PO has created metadata for MLN, which is based on the USGS metadata. This will be posted to the web site before the fall meeting. Since this is based on the 2019 and 2020 data, before the initiative was a formal NADP network, this includes latitude, longitude, and elevation fields for the sites (similar to the metadata produced by USGS). Since the NADP networks have these data separated from the periodic data, these fields will not be included for 2021 data and beyond. A note to this effect will be added to the metadata.

Going forward, the data review team is proposing a set of notes codes to use for the litterfall data. The proposed note codes are:

Note	Desc	QR code
d (or c)*	Debris (or contamination)*	B
f	Field Protocol Error	C
i	Low Mass	B
l	Lab Protocol Error	C
m	Missing Data	B
q	Minor Quality Issues	B

* The example for debris was insects. However, the discussion suggested that things such as bugs were naturally occurring. The group discussion noted non-naturally occurring contamination – possibly using a note of “c” for contamination instead of “d” for debris to emphasize the non-natural aspect of it. Another naturally occurring example was mold, where the lab had to discard some samples due to the high amount of mold.

The group decided to discuss this with MELD. With their experience working with mercury, they may be able to provide a sense of how much different types of contamination or debris affect mercury concentration. Christa is currently talking to MELD on this or other issues, so she is a good candidate for broaching this topic with them.

Update: We learned that Christa is not presenting in MELD. Dana is reaching out to Colleen Flannigan to get this topic added to the “roundtable “ section of MELD and Dana will present a slide with the proposed notes codes and ask for feedback/suggestions from others.

External PO Review

The key findings report has not been formally presented. However, based on feedback, Amy had these updates:

- NTN Precip data updates – kickoff date was 10/26/2022. An additional OIS resource, David Odell, was obtained. The first step will be for Casey and Bob to set up a functional spec.
- Initial LIMS portion being set up in Horizon – kickoff is in the first week of November.
- Staffing updates – Nichole and Amy both had promotions. There are transitioning out of their former roles into their new roles.
- The QA document for PO needs updating. Richard and David are discussing a plan to maintain this document.
- Central tracking system for network support – Richard has generated a set of Google sheets to document issues. Dana will work on maintaining these documents. Richard may

automate the document so it sends an email when a person is assigned to a task so they are notified automatically.

- DQO process reinvigoration – Martin Shaefer is working on this.
- Adding NADP presence to WSLH web site. Jan K. is working on this now.
- Amy / PO will create an official response to the report when it is received.

Chris advised that PO can expect the report by the fall meeting. He also reminded the group that one of QAAG's concerns was Bob spending sufficient time with Casey for adequate knowledge transfer.

Zac asked about the CAL/HAL review and our response. As far as the CAL/HAL audit, Camille has only discussed this with Nichole at a high level. They have discussed high level plans for future audits. Greg Wetherbee has the formal report on the last audit and will send it to Nichole and Amy so they can respond.

NADP Website Updates:

Casey and Bob have been working on PPT and PPT Plot improvements for the web site. However, the discovery of a problem with the web site has taken precedence. Casey discovered an issue on the NADP site with the code that is used to deliver end user data. Some functions were returning incorrect data. Casey is working to determine the extent and behavior of the problem so he can have the web developer, Justin with UW-Madison's DoIt, make corrections. These functions make a lot of API calls, so tracking down the calls for each function is a slow process.

As far as data access formatting, Bob will not be able to make forward progress until we create a new contract with Justin for his development time. Mike Anderson is the person who will work out the contract with Justin's time.

Bob and Mark are currently reviewing the python scripts used for producing the NTN and MDN maps so they can be simplified. It will make it easier to make the final maps that are used in the annual report and on the web. The maps have been completed mostly manually for the past couple of years.

Siting Criteria Updates

Tim discussed his plans for making the site reviews more visible to site operators. Currently, they exist in a large report that operators need to hunt through to find the information. Tim is looking to put the reviews in an Excel spreadsheet and post it on the NADP web site. A spreadsheet is ideal because it is easy for most people to read and review. This should only

require a single sheet for the updates. Every year, the sheet will be appended to contain the additional year's data. So, the sheet will contain the full history of the reviews.

Tim also had an update on reviewing the siting criteria based on precipitation-event and predominate wind direction. He discussed making a model using ERA5 data based on Muge Yasar's computer scripts. Muge said it might be feasible for a single year's worth of data. Tim was looking to have it go back 30 years. However, this involved terrabytes of data, which made that long of an analysis prohibitive. Tim will use Perdue's CLI-MATE wind rose plots where there's an option for filtering data when precipitation is measured above 0.01 inches. The URL is <https://mrcc.purdue.edu/CLIMATE/Hourly/WindRose.jsp>

DMAG going forward

Chris Rogers will be stepping down from the DMAG chair. We thank him for serving as interim chair. He has been successful in building a solid basis for this group going forward.

According to the governance documents, Mark Kuether would become the DMAG chair. Since Mark is new, Zac has agreed to co-chair this year while Mark comes up to speed.

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