Agenda: Spring 2024 Users Committee Meeting

NSF Unidata, UCAR Foothills Lab 1, EOL Atrium

(Times are Mountain Daylight Time)

Monday, 13 May 2024

08:30 – 09:00 Doors Open

09:00 – 9:30 Welcome and Administrative Items (Casey Davenport & Alex Davies / Tanya Vance)

- Date for Fall Joint Committee meeting
- Updates from Members (Committee)
- Updates from UsersCom Chairs from Spring SAC Meeting

09:30 – 10:30 Staff Status Reports (All)

- Visualization Software/Tools
- Data Access/Formats/Dissemination
- Community Services/Educational Efforts

10:30 – 10:45 Break

10:45 – 11:00 UPC Share Out

11:00 – 12:00 Director's Report (Mohan Ramamurthy)

12:00 – 13:30 Lunch at the Foothills Lab Cafeteria

13:30 – 14:00 NCEP Report and Questions (Tony Salemi)

14:00 – 15:30 Interactive Committee Brainstorming Session

- Primer
- Break
- Increasing Committee Engagement
- Broadening Community Participation
- Reconvene for Share Out and Next Steps

15:30 – 16:00 Wrap-up Day One

16:00 Adjourn

18:30 Dinner at Avanti F&B Boulder A Collective Eatery, 1401 Pearl Street, Boulder, CO 80302 (map).

The restaurant will provide validated parking for the privately-owned parking lot at the 1434 Spruce St Garage. (Note that the entrance to this garage is on 15th street, which is one way going north.)

Tuesday, 14 May 2024

08:30 – 09:00 Doors Open

09:00 - 09:15 Convene and Outstanding Items from Previous Day

09:15 – 09:45 DeSouza Award. Discuss Candidates for the 2024 Honor (Committee)

09:45 – 10:30 Equipment Awards Expansion and Reporting

10:30 – 10:45 Break

10:45 – 11:00 Establishing an Ad-hoc Committee on NSF Unidata-AMS Ed Guidelines (Casey Davenport)

11:00 – 11:45 NSF Unidata Committee Member Project Shareout (Alex Davies)

11:45 – 12:30 All Other Business

- Any Items from Previous Day
- Action Items, Fall Meeting Dates

12:30 Close Meeting

Status Report: Users Committee Actions

November 2023- April 2024

Unidata Program Center Staff

Actions from the Previous Meeting (November 2023)

Action 1

Alex Davies will discuss options to add oceanographic data to data feeds with Mike Zuranski.

Result

This has not yet happened.

Action 2

Alex Davies will discuss WRF applications for the Naval Academy and Ocean Community with Jeff Weber.

Result

Channel of communication open between Alex and Jeff. Alex and Jeff will present at the upcoming Spring meeting.

Action 3

Todd Murphy and Aaron Kennedy will share information and syllabus for basic computer course information with the committee.

Result

This has not yet happened.

Action 4

Adding an agenda item for the Spring meeting to discuss Learner Profile and Learning situations when designing learning services (Tanya Vance, Nicole Corbin, Casey Davenport).

Result

This agenda item will be part of the 2024 Fall Users Committee meeting to better align with availability and the launch of the beta release of the NSF Unidata Educational Hub.

Action 5

The committee will engage their communities to seed and capture thoughts on the community hubs concept and increasing MSI partnerships.

Result

This has not yet happened.

Action 6

Mohan Ramamurthy will discuss opportunities to expand the resource allocation types for the Equipment Awards with NSF such as funding workshops and Train the Trainers, building cloud resources, etc. Tanya Vance will follow up with the committee.

Result

The discussion and opportunities to expand allocation types of the Equipment Awards is an item on the Spring 2024 agenda.

Status Reports Executive Summary

This summary is compiled from the full status reports, available online:
[Staff Status Reports: November 2023 - April 2024](#)

Visualization and Analysis Software and Tools

AI/ML

Unidata ML Staff have been working on educational materials, Jupyter Notebooks, and blog posts. The Cybertraining Award from NSF is a focus moving forward with our colleagues at MSU Denver for in classroom AI/ML content and materials. **This no-code module is ready to be shared at other institutions**, please get in touch if you are interested. The module is designed to be dropped into an upper level earth systems science course. Short course / workshop curriculum is also in development, to be delivered both in person and virtually.

AWIPS

Since the last status report, the team has successfully completed beta development of AWIPS version 20.3.2 and released a production build in December, 2023. Up until now, the team has also supported a v18 EDEX in case of emergencies for academic institutes that were dependent on the previous version. Immediately following the production release the team began development on version 23.4.1 of AWIPS which will migrate us from RHEL7 (and CentOS7) dependencies to RHEL 8. This is especially pressing because CentOS7 has an EOL for June 30th. The AWIPS team is aiming to put out a beta release of v23.4.1 by the time you are reading this report.

Aside from software development, the team had a presence at AMS 2024, with Tiffany Meyer hosting an AWIPS Student Workshop and a talk highlighting the updates of NSF Unidata's developments. Thank you to our friends at Texas A&M and Dr. Nowotarski for putting us in touch with meteorology student Victoria Elliott who also presented at our AMS student workshop!

Finally, the AWIPS team has been involved in some work to try and develop funding opportunities from the private and commercial sectors that are interested in using our software and services. The team hopes to make a bit of progress on this venture to help ease our upcoming budget concerns.

IDV with RAMADDA

We continue to support, update, and enhance the 3D data visualization and analysis tool IDV for our community. Our current activities include: coordinating with netCDF-Java group to add new data formats, collaborating with the SSEC developers to enhance the VisAD library, and working with our community to promote the usage of the IDV in research and education.

Python

Unidata's Python efforts continue to encompass: training on the use of Python for the community; development and maintenance of several tools for the community (most notably MetPy but also Siphon and data processing scripts); and participation within the broader scientific Python community. We continue to lead and support a variety of educational efforts, including our first collaboration with the USGS on a training session. We are also furthering development of asynchronous training materials through Project Pythia, where we are working to migrate our existing workshop and gallery materials into a so-called "cookbook" within the broader project. MetPy development continues with the 1.6.0 feature release (largely calculation additions and standardization of relative humidity definition) and 1.6.1/1.6.2 bugfix releases. We are in the early planning stage for a 1.7 release which will center around min/max identification and S3 cloud data clients. Community use of the library is proving extensive, with 90 theses and peer-reviewed publications mentioning or citing MetPy in 2023; this brings the total count to over 300. We continue to assist the broader community with participation within matplotlib, cartopy, and conda-forge, though it has become increasingly difficult to dedicate time to these efforts given the full portfolio of responsibilities.

Questions for the Committee

1. What are the biggest challenges to incorporating AI/ML into curriculum and research?
2. What python packages are the biggest source of frustration in your teaching?
3. Please let us know if you use AWIPS in the classroom, if not, what's the biggest obstacle keeping you from doing so?
4. We have noticed that many advanced features of the IDV, such as formulas and trajectory displays, have not been widely used in the community and many data servers that the IDV can directly access are less well known to IDV users. We would like to provide help to classes, research groups and project teams to use these resources. Can committee members help to establish such connections?

Data Access/Formats/Dissemination

Community Data Standards

Unidata's netCDF teams continues to engage with the Zarr community on:
1) Zarr support in both the netCDF-C and netCDF-Java libraries;
2) the development of the Zarr version 3 specification; and
3) the development of the GeoZarr convention.

Unidata continues to be active in efforts to advance the Climate and Forecast (CF) Conventions for netCDF.

Unidata continues to be active in several international standards bodies and other communities focused on data and technology including the World Meteorological Organization (WMO), the Open Geospatial Consortium (OGC), and the Earth System Information Partners (ESIP).

Data Services

Progress on ~~the RTSTATS Revamp~~ RTSTATS-NG has resumed. Deployment of an early release is underway and additional features are being developed.

Revising how we collect data metrics: Improving consistency and confidence in our reporting. A focus will be on our IDD and ADDE statistics collection process as a result of a recent analysis highlighting challenges & opportunities for improvement.

User support of course continues to be a primary focus. See the **Status Report: Support** for inquiry metrics.

GOES

NSF Unidata continues to operate satellite downlink facilities for the NOAAPort Satellite Broadcast Network (SBN) and GOES-East and GOES-West rebroadcast services on behalf of UCAR/NCAR and the NSF Unidata community. All received products are then provided via the Internet Data Distribution system (IDD) in various feeds and via remote access provided by AWIPS EDEX, McIDAS ADDE and THREDDS Data Servers.

IDD

Unidata continues to support, update, and enhance the data available via the IDD for the benefit of research and education. Included but not limited to adding new data formats, bridging the knowledge gap in newly introduced data, and providing statistics of data flow and composition.

IT

Our role is to maintain and enhance the productivity of the staff and assist with the resolution of issues in service to the community. Primarily, that consists of keeping end-user and developer systems secure, and keeping servers and services highly available, patched, and operational for the community. This report is informational and there are no pressing issues.

LDM

Unidata's LDM team continues to update source code and operating paradigms with ever-changing user demographics and user requirements, particularly in the area of security and inclusiveness of data.

NetCDF

The netCDF team continues to work towards maintaining the reliability of the netCDF libraries, while keeping one eye forward as to the future needs of our community. We have continued our community engagement efforts and collaborations whenever and wherever possible; examples of this include our involvement with the Zarr Community meetings and our membership on the Zarr Enhancement Protocol (ZEP) committee. We have also continued conversation with the HDF group and other community groups working on similar efforts.

We continue to address the issues associated with the proliferation of new mainstream architectures (Apple Developed M1/2/3/ARM), evolving compilers and standards, and

extending our collaborations with tangential, but related, projects (conda-forge libnetcdf feedstock, for example).

In the past several months, the NetCDF team has participated in a developer exchange program with the Atmospheric Chemistry Observations & Modeling (ACOM) at NCAR. The ACOM developer, Kyle Shores, was able to significantly modernize the build infrastructure for netCDF-C, freeing up resources for the core development team to work on ncZarr and S3 support, as well as user support and general quality-of-life technical improvements.

THREDDS

The deprecation of the Spring 5.x library sets a hard deadline for a significant number of upgrades in the TDS by December 2024. We plan to, at that time, release a long-term maintenance version of the TDS, before shifting focus to a replacement data service system.

Questions for the Committee

None at this time.

Community Services and Educational Efforts

Science Gateway & Cloud Computing Activities

- LROSE collaboration with CSU and NCAR
- WRF on Jetstream2 for classrooms and TCUs
- Development phases of Science Gateway Re-Imagined outlined
- Enhanced AWIPS EDEX servers on Jetstream2 Cloud
- JupyterHubs for atmospheric science education including GPU and Dask Hubs
- Maintained NEXRAD THREDDS server
- Updated and streamlined Docker image deployments for LDM, RAMADDA, THREDDS
- Strengthened cloud security
- Presented at Science Gateways Conference, 2023

Community Services

In addition to "normal, day-to-day" activities of communication and coordination with community members, the Community Services group's efforts in the past six months have been focused on:
- Outreach and engagement with historically marginalized and underrecognized communities, including activities with tribal colleges and universities and the Sovereign Data Network project partners.
    - Some notable activities include live data streaming and data access from SIPI and NTU, collaborating with Lamont-Doherty Earth Observatory (LDEO) on the Hydrogeologic Impacts of Terrestrial Expressions of Mesozoic Perturbations (HI-TEMP) drilling project on the Navajo Nation, and working with The Haskell Foundation, Nebraska Indian Community College, Oglala Community College, Aaniiih Nakoda College, and Rising Voices Changing Coasts Hub to expand the Sovereign Data Network
- Outreach to the Earth System Science community through participation at the following:

- - Conferences: AMS, AGU, AIHEC, Rising Voices, and Environmental Data Science Innovation & Inclusion Lab (ESIIL) Innovation Summit
  - Workshops and Events: MSU Career Day, SciEd Career Highlights, the NSF NCAR Earth System Science and Technology hubs (NESTs) Community Workshop on Conceptualization and Coastal Resiliency, A New Lens for Community Engagement Workshop, and the Exploring Data Sovereignty and Sovereign Data Network Workshop
  - Working Groups: NSF NCAR Convergence Science Community Network, NSF NCAR-MSI Collaborators Community of Practice, NSF SOARS, NSF Earth Data Relations, and NSF ESIIL
- Expansion of learning materials, resources, and offerings
- Progressing the Reimagined Science Gateway and integrated Education Hub to make our educational services more discoverable on the web as well as promoting the variety of educational services we are able to provide, including updating our website and community requests
- Development and delivery of the first module on Machine Learning Foundations in the Earth Systems Sciences at Metropolitan State University of Denver for NSF Award #2319979
- Facilitating a MetPy AMS Short Course, Python and AWIPS Student Conference sessions, and an AMS oral presentation on data readiness microlearning
- Partnering with COMET and USGS on the development of a series of NetCDF/CF microlearning resources and delivery of the Metpy for Quantitative Analysis training Spring - Summer 2024
- Providing coordination for the 2024 NSF Unidata Community Equipment Awards
- Supporting submission and post-submission actions of NSF Unidata's next core funding award proposal
- Leading the planning and development of UCAR Community Programs (UCP)'s Strategic Plan and supporting the review of UCAR's Strategic Plan

Support

Unidata staff have started vetting replacement packages for our current eSupport system. We hope to have a new support package in use by the end of Spring 2024.

The AWIPS and THREDDS developers have performed a staggering amount of support for their packages this past year (820 and 549 support replies respectively). 🙌

Questions for the Committee

1. What new or existing software are you excited to use or teach in your research? Does the installation process pose a barrier to entry, and can the Unidata Science Gateway team help you?
2. Are you interested in being a beta tester of the Re-Imagined Science Gateway?
3. Are there any specific case studies or success stories we should highlight?
4. What feedback do you have on the phased SGRI development approach?
5. What changes/recommendations would you like to see in Unidata support or how Unidata conducts support? Are you subscribed to any of the unidata software package mailing lists?

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