# Agenda: Spring 2025 Users Committee Meeting

Virtual Meetings (All times are MDT)

## Wednesday, 2 April 2025, 10:00 – 12:00 MDT

10:00 – 10:05  Welcome and Admin Items (Casey Davenport, Alex Davies, and Tanya Vance)

10:05 – 10:20  Around-the-table Reports (Committee)

10:20 – 11:05  Director's Report (Mohan Ramamurthy)

11:05 – 11:25  Science Gateway Reimagined Update (Nicole Corbin, Julien Chastang, and Ana Espinoza)

11:25 – 11:55  Emerging Languages and Data Stream/Products Discussion (Staff/Committee)

11:55 – noon  All other Business and Close Session

## Friday, 4 April 2025, 09:00 – 11:30 MDT

09:00 – 09:05  Convene and Outstanding Items (Casey Davenport, Alex Davies, and Tanya Vance)

09:05 – 09:15  Community Assessment Effort Update (Tanya Vance)

09:15 – 10:15  NSF Unidata Lightning Portfolio Presentations (Staff)
- Community Services
- Data Access, Dissemination, and Management
- Data Visualization

10:15 – 11:00  Portfolio Discussion (Staff/Committee)

11:00 – 11:30  NOAA Agency Report (Margaret Curtis)

11:30  Close Session

## Wednesday, 9 April 2025, 10:00 – 12:00 MDT

10:00 – 10:05  Convene and Outstanding Items (Casey Davenport, Alex Davies, and Tanya Vance)

10:05 – 10:50  AI/ML CyberTraining Project Update and Q&A (Nicole Corbin, Thomas Martin, and Keah Schuenemann)

10:50 – 11:55  Data/AI in the Classroom (Committee/Staff)

- NSF Unidata GenAI collaboration group update (10 min)
- Open discussion

11:55 – noon  All other Business and Close Session

# Friday, 11 April 2025, 12:30 – 15:00 MDT

12:30 – 12:35  Convene and Outstanding Items (Casey Davenport, Alex Davies, and Tanya Vance)

12:35 – 12:45 Equipment Awards Update (Alex Davies)

12:45 – 13:15 DeSouza Candidate Discussion and Selection for 2025 Honor (Committee)

13:15 – 14:15  Committee Model Discussion

14:15 – 14:45  Open Forum - Follow up on other Agenda Items (Alex Davies and Casey Davenport)

14:45 – 15:00  All other Business and Close Meeting

# Status Report: Users Committee Actions

*September 2024 - March 2025*

*Unidata Program Center Staff*

## Actions from the Previous Meeting (September 2024)

### Action 1

Committee Model Structure Revamp — Send straw poll to move forward for Spring semester adoption – iterative process to bring NSF Unidata leadership in and for committee to produce something to present to NSF Unidata. [Tanya Vance and Alex Davies]

**Result**

In progress. The NSF Unidata committee chairs, Alex Davies, Casey Davenport, and Kevin Goebbert have been progressing discussions related to the committee model structure revamp in collaboration with committee members. A Committee Model discussion is on the agenda for the Spring Meeting.

### Action 2

Alex Davies to send email/solicit input on bullets of special consideration and 2025 solicitation – potential implementation for next year. Consider adding language for preferences. Scope of funding amount? Scope of reach and efforts? Review process? Grade special considerations? Weighted? Timeline given new subaward process? NSF considerations/requirements? [Alex Davies]

**Result**

Complete. The Equipment awards subcommittee (Alex Davies, Todd Murphy, Jennifer Oxelson Ganter, Tanya Vance)  met and drafted a suite of recommendations for consideration to be implemented for the 2026 cycle. These were reviewed for feasibility by Mohan Ramamurthy and iterated based on review. An update and the recommendations will be shared to the committee at the Spring meeting.

### Action 3

Solicit members to support Community Assessment development and execution [Tanya Vance]

**Result**

Complete. A Community Assessment subcommittee was formed to progress the NSF Unidata Community Assessment initiative. The subcommittee members include Tanya Vance (lead)

Nicole Corbin (instructional design expert), Alex Davies (Users Committee advisor), and Brian Tang (Users Committee advisor). The subcommittee has outlined the goals, outcomes, scope, structure for input gathering, the delivery strategies, and questions. The first phase for data collection, an ESS community survey, is scheduled for delivery to the community late April.

## Action 4

Student engagement — format for solicitation vis or story and what could look like (Tanya to add agenda item). Could committee members put forward a student for the following academic year? [Tanya Vance and Doug Dirks to report out from this]

### Result

Pending. A separate agenda item was not feasible this Spring cycle. This action will be raised during the Open Forum time during the Spring meeting.

## Action 5

Next meeting (March to early April); poll committee for dates and times [Tanya Vance and chairs]

### Result

Complete.

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Prepared *March 2025*

# Status Report: AI/ML

*September 2024 - March 2025*

*Thomas Martin, Nicole Corbin*

## Executive Summary

Unidata ML Staff have been working on educational materials, Jupyter Notebooks, technical work, and blog posts. The Cybertraining Award from NSF is wrapping up with our colleagues at MSU Denver for in classroom AI/ML content and materials. **The first module is available today, with the remaining two modules will be available by the end of April. All three modules with learning objectives, and activities will be available for use this fall.** Please get in touch if you are interested in implementing these modules in your classroom.

Recently, we won an internal grant to do a needs assessment on AI/ML training in the classroom, and barriers to teaching AI/ML. Expect a survey link this fall, but feel free to reach out before then if you have questions or feedback on how better to have AI/ML in the classroom or training for your students.

## Questions for Immediate Committee Feedback

- For future Unidata AI/ML training efforts, should it focus on direct to student instruction or train-the-trainer (faculty education and support)?

## Activities Since the Last Status Report

- Continued working on CyberTraining projects ( see Community Services update for more in depth information)
- Working 1 on 1 with many students to answer specific ML related questions
- NCAR project work is now open sourced, happy to discuss methane tracking ML approaches that uses a transformer model
- Worked closely with the Science Gateway Team on AI-NWP technology and workflows
- Compiled online AI/ML training [here](here)

## New Activities

The President's Strategic Initiative Fund around a needs assessment in AI/ML is starting up. This project is slated to finish by December 2025.

This summer will have increased project work using deep learning workflows. Get in touch if you have a paper or workflow that you would like to see in an open source repository and blog post!

Prepared *March 2025*

# Status Report: AWIPS

*September 2024 - March 2025*

*Tiffany Meyer*

## Executive Summary

We currently have one build (version 23.4.1) available to support RHEL/Rocky 8 that was released back in June 2024. We have decommissioned all older builds due to running on old RHEL7 systems. EDEX, CAVE, and python-awips are available for install, but source code cannot yet be released. The National Weather Service still has not released this version operationally, so we are limited in what we can release to the public, but we wanted to make sure we had something out there to address the RHEL7 EOL. A new release of python-awips has been made available via pip/conda and source code. The notebooks have been updated to be able to run with the latest packages (ex. Numpy > 2.0, shapely > 2.0).

Based on feedback from Universities running a Windows Lab, we've created a CAVE installer for Windows that installs at the admin level. This way, CAVE only needs to be installed once, but all users on that machine can use CAVE.

## Questions for Immediate Committee Feedback

## Activities Since the Last Status Report

### AWIPS

Our EDEX servers have been continuously running on the new Jetstream2 platform. There have been numerous issues (from Jetstream or their vendors) that we've encountered on the new platform that have caused some outages. The AWIPS team has worked closely with Unidata IT, Science Gateway coworkers (Ana and Julien) and the Jetstream staff to troubleshoot and resolve issues that arise. In January we set-up a local EDEX system at Unidata while Jetstream2 was down for maintenance.

Since the last status report, one beta release of version 23 has been made as well as a new release of python-awips. All python-awips notebooks were updated to work with the latest packages and dealt with all depreciation warnings and errors.

Unfortunately, version 23 is still considered in beta because the National Weather Service has yet to release version 23.4.1 operationally which limits our ability to fully release the source code. However, the beta EDEX server is available to the public for all CAVE OS's (Windows,

Mac, and Linux) as well as a VM running Rocky8. Additionally we have a beta version of EDEX for install and a new version of python-awips. Anyone experiencing issues can report [here](#).

All previous versions of AWIPS prior to version 23 have been made unavailable due to the baseline operating system (RHEL7) reaching end of life in June of 2024. We provided our version 20 through the end of 2024 to give the University community time to upgrade.

A couple new products have been added to AWIPS:
- mPING
- CIMSS GOES Lightning Cast
- CIMSS GOES Turbulence Probability
- HiResW-CONUS gridded model data
- FV3 gridded model data

Our blog series, [AWIPS Tips](#), successfully ran every other week for just over three years. The breakdown of all the entries can be found on our [documentation website in the Educational Resources page](#). Announcements and important information is shared through our mailing list ([awips2-users@unidata.ucar.edu](#)), and our social media accounts (Facebook, Bluesky, LinkedIn, and YouTube when applicable). However, due to reduced staffing levels blogs are only released on certain occasions.

We have asynchronous training available for both CAVE and Python-AWIPS on the Educational Resources website. We encourage everyone to check out both courses regardless of your experience level or familiarity with python or CAVE. Our courses can be accessed from [our elearning website](#).

The AWIPS team has started tracking the number of users that are connected to our public EDEX. These numbers are likely an underestimate because any user who uses our Virtual Machine option comes across as "awips@localhost" which is only counted once. In addition to tracking the number of users, the team hopes to gain a better understanding of who is connecting by tracking IP addresses and mapping them to Universities, private or government entities, or the general public.

## Daily AWIPS Users Connected to Public EDEX
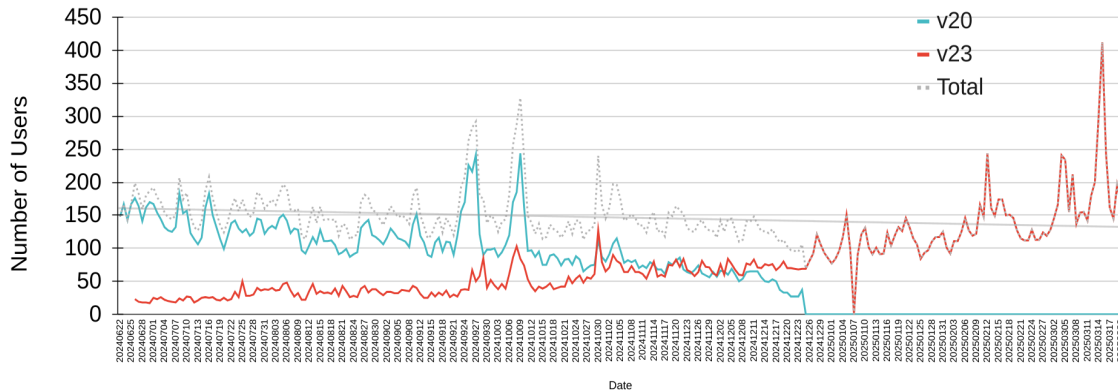


The AWIPS group typically has quite a bit of interactions with users via our support email. Through our support signatures we still have an active support evaluation survey. The majority of our feedback has been overwhelmingly positive, and the graphic below is a summary from all responses we've received regarding the quality of service we provide:

## Service Quality
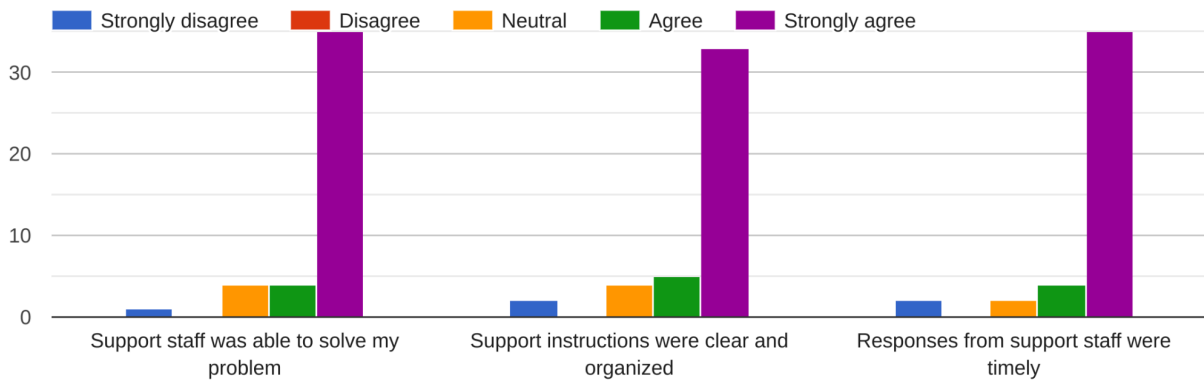


Some of the latest open-ended feedback from the support evaluations includes the following:

- *The support received was very good.*
- *Great job and much appreciated!*
- *Absolutely amazing response and the issues were resolved.*

Tiffany attended the 2025 AMS Conference where she was available during the Student Career Fair and throughout the conference for discussions. She also presented on the latest Unidata AWIPS updates as well as chaired multiple AWIPS sessions.

## Software Releases

| AWIPS | Date | EDEX | Win | Mac | Linux | VM | python-awips |
|---|---|---|---|---|---|---|---|
| 23.4.1-0.4 | Oct 23, 2024 | X | X | X | X | X | |
| 23.1 | Feb 13, 2025 | | | | | | X |

Since the last status report, one beta release of version 23 has been made for EDEX and CAVE. Additionally a new release of python-awips (v23) is available via Conda, pip, and the source code.. All python-awips notebooks were updated to work with the latest packages and dealt with all depreciation warnings and errors.

The naming convention the AWIPS Team follows for AWIPS releases tries to follow/reference the NWS. For example, version 23.4.1-0.4 is based off the NWS 23.4.1 code base where:

23 - is the year the NWS planned on releasing (although this is typically delayed)
4 - is the fiscal quarter the NWS planned on releasing
1 - is the major version
0.4 - is the subversion that Unidata uses for releases. If there is a preceding "0" that means the release is in beta. Each release made we will increase this number.

# Activities Ongoing/In-Progress

AWIPS development activities are constantly ongoing. Currently the following activities are in progress:

- looking into users of AWIPS (number of users, University vs public vs government vs private, etc.)
- actively developing new content to incorporate into v23
- maintaining EDEX builds on the Jetstream2 platform, with the help of the Science Gateways team
- responding to all AWIPS support questions from the community and striving to provide realistic solutions in a timely manner
- actively updating and refining our online documentation to be as accurate and useful as possible

# Future Activities

Future plans are constantly evolving to meet the needs of our users. The AWIPS team is focused on developing and releasing a production version of AWIPS on RHEL8 (Rocky 8) once the okay comes from the NWS. In the meantime updates will continually be made and looking into adding new products and displays to AWIPS. I am actively participating in conferences, workshops, and virtual message boards (blogs) to expand our user base.

## Metrics

Downloads November 1, 2023 - March 31, 2024

AWIPS downloads: 3,482

Prepared *March 2025*

# Status Report: IDV with RAMADDA

*September 2024 - March 2025*

*Yuan Ho, Julien Chastang*

## Executive Summary

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.

## Questions for Immediate Committee Feedback

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?

## Activities Since the Last Status Report

### IDV Releases

IDV 6.3 was released in December 2024 as the final version based on Java 1.8. Starting with the nightly release IDV 6.3u1, the IDV has been in the process of migrating to Java 21. This upgrade enhances performance, security, and compatibility with modern Java features, ensuring that the IDV remains robust and aligned with current development standards.

### IDV System Changes

__IDV Certificates__

Java Windows app and MacOS certificates have been renewed and will be valid until at least May 30, MacOS certificate is valid until 2026). Moreover, as properly signing the IDV under these different environments can be an involved process, this information has been thoroughly [documented here](#).

__Changes to nightly release that will eventually be incorporated into into stable version__

- IDV uses the latest Java 21 AdoptOpenJDK

The IDV upgrade from Java 1.8 to Java 21 marks a significant transition that brings improved performance, enhanced security, and access to modern language features. However, this upgrade presented several technical challenges. Many deprecated libraries and APIs had to be updated or replaced to ensure compatibility with Java 21. The removal of certain legacy features required rewriting portions of the codebase, particularly around graphical components, file handling and security management. Additionally, the updated Java module system introduced stricter encapsulation, which necessitated restructuring parts of the IDV's architecture to avoid illegal reflective access warnings. The shift also required updating the build environment, including adjusting dependencies and upgrading the Apache Ant library. Despite these difficulties, the upgrade enhances the IDV's stability and long-term maintainability, ensuring it remains compatible with future Java updates and modern development practices.

- IDV employes latest Java3D (1.6.2)

 With the upgrade to Java 21, the removal of the jre  lib/ext structure presented a challenge for integrating Java 3D libraries, which were previously placed in the lib/ext directory for automatic loading. To resolve this, we now explicitly include the Java 3D JAR files in the classpath during runtime. This required modifying the IDV's install4j configuration. Additionally, some adjustments were necessary to address compatibility issues with the newer Java module system, as Java 3D relies on reflective access to internal APIs. By directly including the Java 3D libraries in the classpath, we ensured that the IDV's 3D visualization capabilities remain functional and compatible with the latest Java version.

- New installer for MacOS Arm64 (M1, M2 and later)

We have introduced a new MacOS ARM installer to support the growing number of Mac users with Apple M1, M2, and later processors. This required adjusting the IDV build process to create a native ARM-based installer, ensuring optimal performance and compatibility with the latest MacOS architecture. The transition involved updating the Java runtime environment to support ARM-based execution and resolving dependency issues specific to the ARM platform. With this new installer, users can now experience improved performance and stability on MacOS devices, while maintaining full compatibility with IDV's existing features and functionality.

## IDV Display Changes

 __Gemini AI process IDV integrated 3D displays__

Using Gemini to analyze the 3D IDV visualization output of weather data offered a powerful and intuitive experience. By feeding Gemini the integrated display of specific parameters such as temperature, wind vectors, and geopotential height at pressure surfaces, radar reflectivity,

and satellite imagery rendered by the IDV, I could ask questions about current weather, local weather and atmospheric dynamics. Its ability to process visual information alongside contextual weather knowledge allowed for a deeper and faster understanding of complex meteorological phenomena depicted in the IDV's spatial representation, far surpassing simple observation.

__Pre/Post process data for ML applications __

The IDV offers a range of statistical analysis formulas, encompassing area averages, level averages, maximum, minimum, mean, percentiles, and summations. The results of these analyses can now be produced as non-geolocated data and exported in formats such as CSV or netCDF. This newly introduced feature empowers users to leverage the IDV's versatile access to multiple data servers, enabling them to preprocess data for applications including machine learning and other scientific uses.

__ More with Level II Radar Grid Displays __

With the newly developed Level 2 radar grid display feature, we've expanded its capabilities by incorporating derived formulas to calculate radar precipitation rates. These calculations are based on two key approaches: the Marshall-Palmer drop size distribution and dual polarization radar data. The Marshall-Palmer method provides a traditional estimate of precipitation rates using reflectivity, while the dual polarization approach enhances accuracy by factoring in both reflectivity and differential reflectivity. These advancements allow for more precise and varied precipitation rate calculations, improving radar data interpretation and weather analysis.

## IDV Community Support

With the tightening of computer system security, it has become more challenging for our community to host data and bundles on their own systems. As a result, UNIDATA RAMADDA is now hosting the IDV LMT Lab Manual, which is widely used in university weather teaching and laboratory settings.

https://ramadda.unidata.ucar.edu/repository/entry/show?entryid=fa7adc01-66a4-40ad-a89f-ec38be50e935

Yuan conducted a successful remote IDV training session with Maria Rizou and her students at Hellenic Mediterranean University (HMU) , focusing on accessing and analyzing large datasets from NASA and NOAA servers, including IPCC report data. The session covered both basic and advanced IDV features, improving participants' ability to visualize and interpret complex

weather and climate data. The training was well-received, and follow-up support is planned to reinforce the newly gained skills.

## MSU IDV Project

This collaboration with Metropolitan State University (MSU) of Denver exemplifies a commitment to cross-disciplinary education and research, promising to contribute valuable insights to both meteorology and education. Together, we anticipate achieving impactful outcomes that advance the understanding and application of scientific principles in the dynamic field of weather data analysis.

## IDV Publication Highlights

[Synoptic–Dynamic Meteorology in 3D: Introducing an IDV-Based Lab Manual](#) by Gary Lackmann, B. Mapes and K. Tyle

A [Google Scholar Search](#) reveals a number of publications that cite use of the IDV ([doi:10.5065/D6RN35XM](#)).

## IDV and RAMADDA Training, Conference Attendance and Presence

__2025 AMS Annual Meeting__

- Scientific Visualization and Mathematical Modeling of Weather Data: An Interdisciplinary Approach to Learning with IDV (InterdisciplinaryIDV)

# Ongoing Activities

## We plan to continue the following activities:

__Experimenting  IDV 3D output with Gen-AI Gemini__

- Staying updated on new features and capabilities.
- Exploring different ways to integrate Gemini into IDV workflows
- Verifying the information provided by Gemini.
- Learning effective prompting techniques to get the best results.

The future with Gemini holds potential and transformation across geo sciences. We should stay informed with evolving capabilities and embrace the new levels of productivity and creativity.

# New Activities

**Over the past few months, we plan to organize or take part in the following:**

We have been in the process of upgrading the version of OPenJDK Java 21. This change will necessitate in depth testings and the IDV building and distribution workflow.

# Relevant Metrics

__E-Support__

The IDV team continues to provide the geoscience community with high-quality support through e-support software and idv-users mail list. In the last half year the IDV team has closed ~40 e-support tickets.  Each individual ticket may and often does involve many back-and-forth messages. There is an especially large number of support requests coming from international users.

Top ten universities running IDV are: Millersville, Oklahoma, University of Utah, St Cloud state, Plymouth, NC State, West Kentucky, Lyndon State, University of Illinois, and San Francisco State.

__GitHub Pull Requests__

In the area of greater collaborative development, since the migration of the IDV project to github, we have closed a total of 125 "pull requests" or code contributions from internal and external collaborators.

__Youtube IDV Instructional Videos__

In the area of online IDV training, the Youtube IDV instructional videos have been viewed thousands of times.

Prepared *March 2025*

# Status Report: Python

*September 2024 - March 2025*

*Ryan May, Drew Camron, Julien Chastang, Ana Espinoza, Nicole Corbin, Thomas Martin*

## Executive Summary

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 have offered fewer synchronous training events in this period, instead focusing our limited resources on authoring high quality asynchronous online examples and prioritizing our presence at the American Meteorological Society (AMS) Annual Meeting. Unfortunately the AMS 2025 Short Course was preemptively cancelled due to low registrations; given past success, this is likely due to the 2-day nature. Siphon saw a 0.10.0 release in December 2024, incorporating some bug fixes as well as some needed maintenance for the library as well as supporting infrastructure. MetPy development continues with 1.7.0, released Spring 2025, which centers around min/max identification and S3 cloud data clients, updated calculations for saturation vapor pressure and an analytic LCL calculation, as well as incorporating some community contributions. This release's time frame was delayed due to the work on Siphon. MetPy's impact on science continues to grow, with 372 theses and peer-reviewed publications mentioning or citing MetPy, including 13 so far in 2025.

## Questions for Immediate Committee Feedback

Nothing at this time.

## Activities Since the Last Status Report

### Python Training

**Our AMS 2025 Short Course offering was preemptively cancelled for low registrations, and we traded our energy towards supporting a successful open source/open science workshop session at the Student Conference. In 2025, we will build on the prepared material and lessons learned to focus upcoming training opportunities.** We are still primary contributors to the learning material and supporting infrastructure of Project Pythia. In both realms, we are adopting opportunities for faster cycles of community feedback <-> developer time. For our synchronous training, we will be prioritizing a more focused and useful year-over-year AMS 2026 Short Course proposal OR a recurring Unidata-focused Student Conference session (TBD before Summer 2025), and we are working closer with the Unidata Community Services Group to offer specific training to academic departments that balance our existing resources with their needs. We are planning multiple short-form in-person offerings at a local institution this Spring, and soon will start looking for another department to explore virtual training offerings starting Fall 2025. We have begun planning the 2025 Project Pythia Summer Hackathon, delivering Aug 5-8 2025, and signups will be

available shortly. A summary of Project Pythia, its existing resources, and more about the Hackathon will be available on the Unidata Blog during the Users' Committee meetings.

**Progress has been made on the following:**

- Though the short course was not delivered, content was developed in partnership with DOE ARM for *MetPy and Machine Learning* which we will be repurposing for use
- Project Pythia's *MetPy Cookbook* has been published to the cookbook gallery for use
- Unidata continues technical, educational, and community leadership on Project Pythia
- The high-impact *MetPy Mondays* YouTube series has resumed under John Leeman's directorship, and we will be supporting MetPy v1.7.0 with new video content

# MetPy

Development continues to be driven by requirements for our dedicated awards, in addition to responding to community issues and contributions. MetPy 1.7.0, released in Spring 2025, includes a wide array of enhancements:

- Clients to access NEXRAD Level 2 and 3, GOES, and Machine Learning Weather Prediction products hosted on AWS S3
- Tools to automatically identify field maxima and minima, as well as plotting them
- Support in declarative plotting interface for surface analysis plots
- Updated calculation of saturation mixing ratio for water and ice (Ambaum 2020)
- Analytic LCL calculation (Romps 2017)
- Shear and curvature vorticity calculations (community contribution)

Beyond this, much of the development time goes to maintenance of the project and its associated infrastructure. While this infrastructure has proven critical to the on-going stability of the project within a relatively chaotic scientific Python ecosystem, its ongoing upkeep does have its own associated cost.

**Progress has been made on the following:**

- MetPy 1.7.0 released Spring 2025
- 372 total theses or peer-reviewed publications citing or mentioning MetPy, with 13 so far in 2025.

# Siphon

Some effort was put into some needed Siphon maintenance, addressing a few issues:

- Updating GitHub Actions infrastructure to fix issues and sync with MetPy
- Fixes to address changes in upstream dependencies
- Updates to latest Python versions
- Miscellaneous bug fixes, including fixing parsing Hyrax catalogs

These updates were released in December 2024 in Siphon 0.10.0. So far the infrastructure updates have eased the burden of on-going maintenance. It should be noted that the time taken to update Siphon did come at the cost of slowing MetPy work.

# Ongoing Activities

**We plan to continue the following activities:**

- Engage in support of Project Pythia and adjacent UCAR Python education efforts
- Engaging in synchronous Python teaching opportunities, virtual or otherwise
- Making progress towards the goal of MetPy's dedicated award to address big data challenges
- Maintaining Siphon as a tool for remote data access across a variety of services
- Growing and developing MetPy as a community resource for Python in meteorology
- MetPy Mondays for engaging the community

# New Activities

**Over the next three months, we plan to organize or take part in the following:**

- Attend SciPy 2025
- Propose a MetPy short course for AMS 2026
- Deliver our recurring UCAR Summer Internship programs Professional Development workshop on data and programming
- Deliver a MetPy basics training session for a local university program (in-scheduling)

**Over the next twelve months, we plan to organize or take part in the following:**

- Offer a MetPy short course at AMS 2026 Annual Meeting
- Plan and facilitate the 2025 Project Pythia summer hackathon
- Explore offering synchronous virtual workshops to university partners in Fall 2025
- Release MetPy 1.8.0

# Relevant Metrics

Siphon Downloads
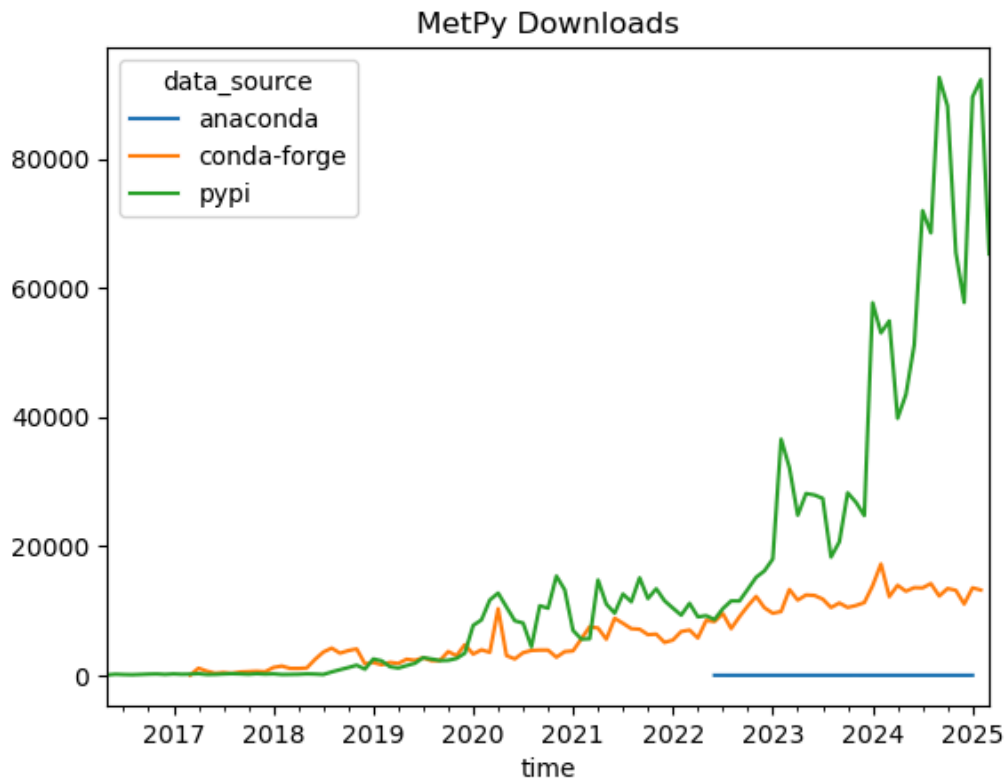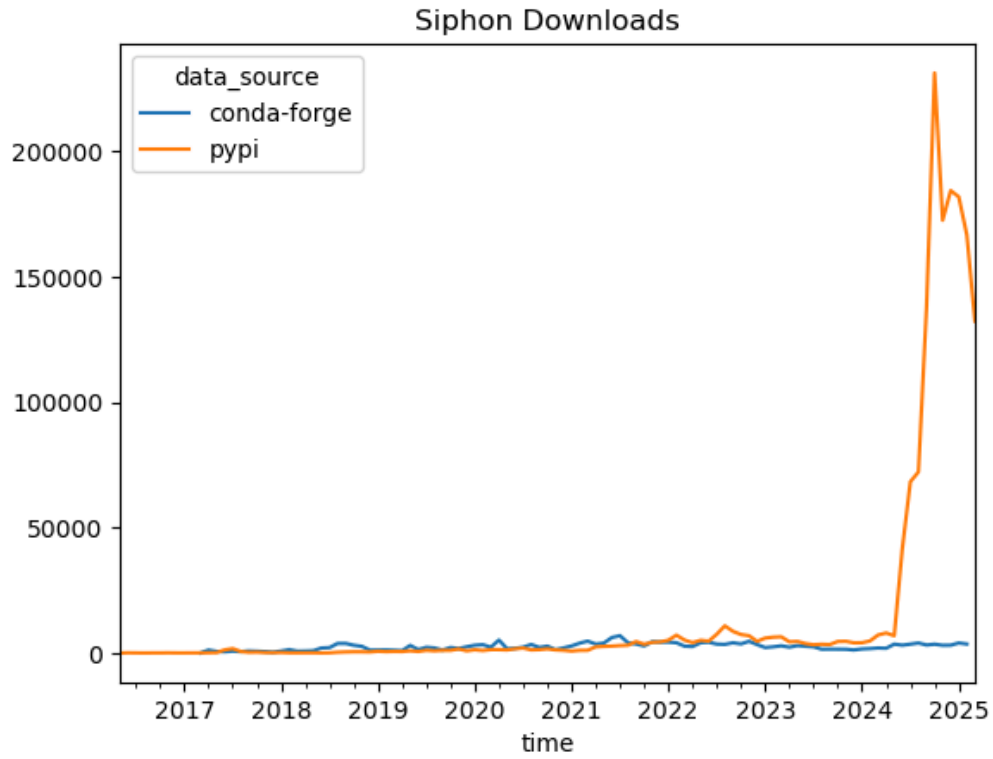


MetPy Downloads

- MetPy
  - According to GitHub, 689 repositories and 78 packages depend on MetPy

- 13 citations/mentions in 2025, 372 total
- Downloads for the releases made in the last year (Conda + PyPI)-- these seem much larger than expected
    - 1.6.2: 501859
    - 1.6.3: 250277
- Siphon
    - According to GitHub, 256 repositories and 30 packages depend on Siphon
    - Downloads for releases during the last year (Conda + PyPI):
        - 0.9.0: 1273748 (Unclear what's going on with size of number)
        - 0.10.0: 25057

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Prepared *March 2025*

# Status Report: Data Standards and Technical Engagement

*September 2024 - March 2025*

*Ethan Davis, Ward Fisher, Sean Arms, Stonie Cooper, and Ryan May*

## Executive Summary

Engage with federal science agencies, international standards bodies, and other communities focused on data and technology including NASA, NOAA, USGS, World Meteorological Organization (WMO), Open Geospatial Consortium (OGC), Earth System Information Partners (ESIP), CF Conventions for netCDF community, OPeNDAP, and the Zarr (and GeoZarr) community.

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's LDM team has begun running a WIS 2.0 Node using the WMO's [wis2box](#) package with the goal of better understanding how WIS 2.0 might impact the community and our data distribution infrastructure.

## Questions for Immediate Committee Feedback

No questions at this time.

## Activities Since the Last Status Report

### WMO WIS 2.0

For the last several years, Unidata has been tracking the development of the WMO Information System 2.0 ([WIS2](#)) and discussing, internally and with WIS2 developers, how it might interact with Unidata technologies like LDM and THREDDS. Moving forward (2-6 years) WIS2 will be the framework for WMO data sharing, eventually replacing the GTS. WIS2 is built on modern messaging standards (e.g., MQTT) and OGC metadata, catalog, and data standards.

The LDM team is running a WIS 2.0 Node, using the wis2box package ([docs](#))([GH](#)), to experiment with and better understand WIS 2.0 technologies.

### NCZarr/Zarr Specification Efforts

As part of implementing Zarr support in both the netCDF-C and -Java libraries, the NCZarr

convention/extension has been developed to provide a clean and complete mapping between the netCDF and Zarr data models. During this work, the netCDF developers have been participating in discussions around clarification and evolution of the Zarr (version 2 and 3) specifications.

**Progress has been made on the following:**

- Members of Unidata's netCDF teams have membership on the Zarr Implementation Committee and the Zarr Enhancement Protocol (ZEP) Committee and regularly participate in the bi-weekly Zarr Community and ZEP calls.
- Members of Unidata's netCDF team participated in discussions around the GeoZarr convention. GeoZarr builds on the Climate and Forecast (CF) Conventions for netCDF and will be developed within the OGC community standards process.
- Members of Unidata's netCDF team are assisting with GeoZarr interoperability testing of netCDF-C and -Java libraries.

## CF Conventions for netCDF activities

Unidata has a long history of involvement in the development of the [Climate and Forecast (CF) Conventions for netCDF](). These efforts continue with ongoing participation in development conversations on the [CF GitHub repositories](), participation in and help in organizing the annual CF Workshops, and participation in the governance of CF.

**Progress has been made on the following:**

- The 2024 CF workshop ([website]()) was held at SMHI, Norrköping, Sweden on 17-20 September 2024.
- Ethan Davis continues serving as chair of the [CF Governance Panel]().

## OGC activities

Planning continues for UCAR to host the Oct 2025 OGC Member Meeting.

## OPeNDAP activities

Unidata and the OPeNDAP groups have been working together to strengthen the DAP4 specification. Part of this effort has been to bring the  behaviours of the Hyrax and TDS implementations of DAP4 into better alignment using PyDAP as an independent client. These efforts have been fruitful in identifying various bugs across all three platforms involved.

# Ongoing Activities

**We plan to continue the following activities:**

- Track and engage in WMO data standards efforts
- Continue efforts to update and reorganize the NetCDF User's Guide (NUG)
- Represent Unidata in Earth System Information Partners

- Represent UCAR and Unidata in OGC and various OGC working groups
- Organize regular meetings of the OGC netCDF SWG.

# New Activities

**Over the next three months, we plan to organize or take part in the following:**

- Continue conversations with CF, WMO, and others on the development of mappings between CF Standard Names and GRIB/BUFR variable names.

**Over the next twelve months, we plan to organize or take part in the following:**

- Deploy a draft version of the new, library independent, NetCDF User's Guide (NUG).
- Submit request for full registration of the netCDF media type with IANA

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Prepared *March 2025*

# Status Report: IDD, LDM, and WIS 2.0

*September 2024 - March 2025*

*Stonie Cooper, Jennifer Oxelson Ganter, Sean Arms, and Mike Schmidt*

## Executive Summary

NSF Unidata's LDM developer and IDD maintainer continues to update LDM source code and operating paradigms with ever-changing computing implementations and user requests.  The IDD continues to be enhanced with data redundancy and inclusion of new data.

## Questions for Immediate Committee Feedback

Not at this time.

## Activities Since the Last Status Report

Although not the only technology for distributing data, the IDD is the preferred source for automatically streaming environmental data in real-time. The service-level software for streaming data across the IDD is LDM, and as such, emphasis is placed on maintaining the source code for stability and efficiency.

**Progress has been made on the following:**

- IDD: continued work on migration from GOES 16 to GOES 19 as primary GOES East satellite..
- IDD: return to original rtstats as new development found to be server-processing adverse..
- IDD: initiating data cataloging to give users web interface to construct pqact.conf entries from menu driven data desires.
- LDM: additional identified build-time vulnerabilities and removed.
- LDM: established source code inclusion paradigm for community supplied source.
- WIS 2.0: working in partnership with THREDDS team, investigating the utility as an additional or replacement data distribution mechanism:

  https://community.wmo.int/en/activity-areas/wis/wis2-implementation

**Dependencies, challenges, problems, and risks include:**

- Ever changing landscape of new data types, adjustments from data source paradigms.

- User hesitation to upgrade to current versions, but indicating issues resolved in current versions.
- Reduction in developer and maintainer resources and multitasking across multiple responsibilities.

# Ongoing Activities

**I plan to continue the following activities:**

- Supporting and maintaining LDM and ancillary software.
- Supporting IDD data sourcing with new opportunities and operational observation platforms.
- Implementing data bandwidth metrics to provide real-time data usage accounting.
- Supporting users of the LDM and IDD with quick and professional responses.
- Migration of LDM training to on-demand video/wiki training sessions.

# Relevant Metrics

- The LDM software provides the streaming technology for the NSF Unidata IDD network. Metrics on that program are available upon request.
- Number of LDM package downloads immediately following latest version releases.
- Number of support tickets and training requests, views, or downloads.

Prepared *March 2025*

# Status Report: Information Technology

*September 2024 - March 2025*

*Mike Schmidt, Matt Perna, & Jennifer Oxelson*

## Executive Summary

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.

## Questions for Immediate Committee Feedback

Unless committee members or the community are experiencing performance issues that we could help resolve, no other feedback is requested.

## Major Activities

- At UCAR's behest, Unidata IT staff have been migrating hosts and services to meet security requirements on a very short deadline.
- UCAR continues to migrate select services to a centralized model and Unidata is involved in implementing the service(s) for our systems and users. Recently competed and/or anticipated are;
  - centralized backups (CrashPlan, complete)
  - centralized end-user security agent (Palo Alto Cortex XDR, complete)
  - staff net deployment (all office networks, complete)
  - corporate device management (in progress)
  - centralized access and identity management (in progress)
  - All systems have Disk Encryption enabled (Mac and Windows - Complete)
  - Working with help@ucar.edu to obtain systems for our staff to migrate to, and awaiting a timeline on this from them.

As of writing this, we have implemented 2 MDM solutions to manage our Macbooks as well as our remote Windows clients. Firewalls, antivirus, and overall configurations are monitored constantly and report back when there is an anomaly on both Operating systems. Cloud backups have been implemented on all Unidata client workstations for the past year and we see a foreseeable upgrade in the way we back up clients to the cloud in the coming year. Disk encryption will be enforced across the board on all client operating systems. Unidata IT can remotely manage any Unidata client workstation if it is connected to the internet.

UCAR's Mesa Lab Data Center (MLDC) co-location facility upgrade is complete, and Unidata is participating in staged moves rack-by-rack and are currently about 90% complete. There may be the need to roll some of our Internet-based services to the NWSC in Cheyenne to avoid community visible service outages.

Daily, we continue efforts to keep services and systems secure which takes consistent attention and occasional herculean efforts (to patch everything all at once).  UCAR continues to embark on new initiatives to segment the network into smaller and smaller zones and gain a more dynamic inventory of assets on the network. Unidata continues to play a role in these efforts.

## Ongoing Activities

**We plan to continue the following activities:**

- Day-to-day system and network support to the community as needed
- Resolve daily staff help desk issues
- Maintain security profile and exceed UCAR security standards
- Following UCAR directives regarding cybersecurity initiatives

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Prepared *March 2025*

# Status Report: netCDF

*September 2024 - March 2025*

*Ward Fisher* , *Ethan Davis*

## Executive Summary

The netCDF team continues to work towards maintaining the sustainability and viability of the netCDF libraries. While facing challenges when prioritizing work against the resources available, we are fortunate to have an engaged community of users and developers.

The status of the netCDF team can be summarized as follows:

**NetCDF is healthy and remains viable, thanks to the engagement and support of our community.**

Our efforts to serve the community are reciprocated, through high levels of engagement and contributions, for which we are immensely grateful.  The netCDF team lacks the resources to quickly evaluate every potentially useful emergent technology or address every bug report, and we  must therefore triage based on what best serves our communities interests at large. We continue to advocate for our community through participation in external data-oriented/focused groups.

## Questions for the Committee

How can we encourage additional community engagement, from students and/or faculty? We benefit greatly from the involvement of our community, making netCDF truly a collaborative effort.  How can we encourage/expand this collaboration? What makes it rewarding to engage with the netCDF developers?

## NetCDF Project Status

### Team Status

With the retirement of Dennis Heimbigner, the active team is composed of the technical team lead, Ward Fisher, Sean Arms as the lead developer on netCDF-Java, and our community of developers.  Work continues apace, but is largely focused on community building and bug fixing.

### Status of Community Relationships

**NetCDF User and Developer Community**

NetCDF continues to enjoy a high amount of community engagement, for which we are very grateful. The primary avenues of engagement with the netCDF community are as follows:

- Committee Meetings (always a pleasure, you're all great).
- Github (issues, conversations)
- Email - Direct, or through the NSF Unidata eSupport system
- Professional events - AGU, RMCC HPC Symposium, etc.

**Broader Community Engagement**

The netCDF team continues to represent the netCDF community in the following areas:

- Zarr Community Meetings: The Zarr implementation council has reorganized, and while NSF Unidata no longer represents a seat on a committee, we continue to represent our community via engagement in the community meetings and through the established relationship with the developers behind Zarr.
- Renewed collaboration with the HDF Group; we have revived an older tradition of having regular, informal meetings where we discuss the work each team is doing, consult on roadblocks, and consider the bigger picture re: the NSF Unidata community.
- Working, ongoing collaboration with developers at the German Climate Computing Center (DKRZ) to enhance `ncZarr`.
- Various one-off symposia, conferences, workshops, etc, focused on data formats and data standards.

## Short-Term Priorities

With the release of netCDF `netCDF-C v4.9.3`, we have turned to revitalizing our infrastructure, so that the work we do can be accomplished more effectively and efficiently. This has included revitalization of our `docker`-based regression testing, [docker.unidata.ucar.edu/nctests](docker.unidata.ucar.edu/nctests) (image) (configuration files here: [https://github.com/Unidata/docker-nctests](https://github.com/Unidata/docker-nctests)). These have been integrated into netCDF-Fortran, and we are working to integrate them into the `4.10.0` release of `netCDF-C`. This will help improve the speed of our development cycle, and help us avoid situations where we have to fix interface-library-breaking bugs that inadvertently made their way into a release.

## Areas of Concern

Lack of resources refers to "Not having enough developer hours to address all of the issues which need to be addressed, in parallel". This leads to triaging issues and figuring out which issues need to be addressed in what order. Even assuming perfect efficiency, the overhead of this sort of project management is in-and-of-itself requires an allocation of resources which would otherwise be spent addressing said issues. The netCDF team does not enjoy perfect project management efficiency.

The reduced resources limit the amount of effort that can go into directly implementing new features in netCDF. Furthermore, time is spent between purely technical tasks and other, equally important but nebulous tasks such as community maintenance and support, project

management, and research into emergent technologies and how they can be used to meet the needs of our community.

## Roadmap

The following items are prioritized in the medium-to-long term:

- Documentation
  - NetCDF has added a lot of functionality that has not been documented as well as we would like.
  - The documentation organization isn't very good.
- More reliable Amazon AWS access via ncZarr + documentation.
- Integration of cloud-HDF functionality.
- Continued bug fixes, optimization.
- Evaluation of the next generation of emergent technologies; we have had great success in the past anticipating what will be useful to our community. We want to continue this success.

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Prepared *March 2025*

# Status Report: THREDDS

*September 2024 - March 2025*

*Sean Arms, Jennifer Oxelson, Ryan May, Ethan Davis*

## Executive Summary

New versions of netCDF-Java and the TDS were released in January. As was the case last report, there is currently one developer working on the THREDDS projects (up from zero). The next year will be focused on moving towards a more sustainable, cross-language architecture for the TDS while maintaining as much backwards compatibility as possible.

## Questions for Immediate Committee Feedback

We are actively creating a requirements document for the next generation THREDDS Data Server, and your input is critical. When thinking about accessing data from thredds.ucar.edu, what are your most important features? Does that look different when considering other TDSs?

## Activities Since the Last Status Report

### General

- The last year has been very difficult across Unidata. Tara Drwenski bid farewell to Unidata in October, and for a short bit the THREDDS projects did not have any dedicated resources within Unidata. In November, Unidata welcomed back Sean Arms, a previous lead for the THREDDS projects.
- We are currently investigating options for moving netCDF-Java and the TDS to a more sustainable, cross-language architecture while maintaining as much backwards compatibility as possible.

### NetCDF-Java

- Version 5.7.0 was released. This contained a number of bug fixes, security updates, and improvements. See also: https://github.com/Unidata/netcdf-java/releases/tag/v5.7.0.

### TDS

- Version 5.6 was released. This contained a number of bug fixes, security updates, and improvements. See also: https://github.com/Unidata/tds/releases/tag/v5.6.

## Ongoing Activities

# Server management

- Unidata hosts and maintains the following THREDDS servers:
  - thredds.ucar.edu always runs the latest stable release of the TDS (unless a quick security update is required)
  - thredds-test.unidata.ucar.edu always runs the latest development version
  - Additionally, the Cloud Activities group manages cloud-hosted TDS instances (see cloud activities report for details).
- Dataset updates:
  - A few datasets have been removed from thredds.ucar.edu as the data feeds backing them have not received data in quite some time.
  - New addition: Environment Canada (EC) / Canadian Meteorological Centre (CMC) 10km Regional Deterministic Prediction System (RDPS)



2 meter Temperature (Celsius) - 2025-03-22 06:00:00Z
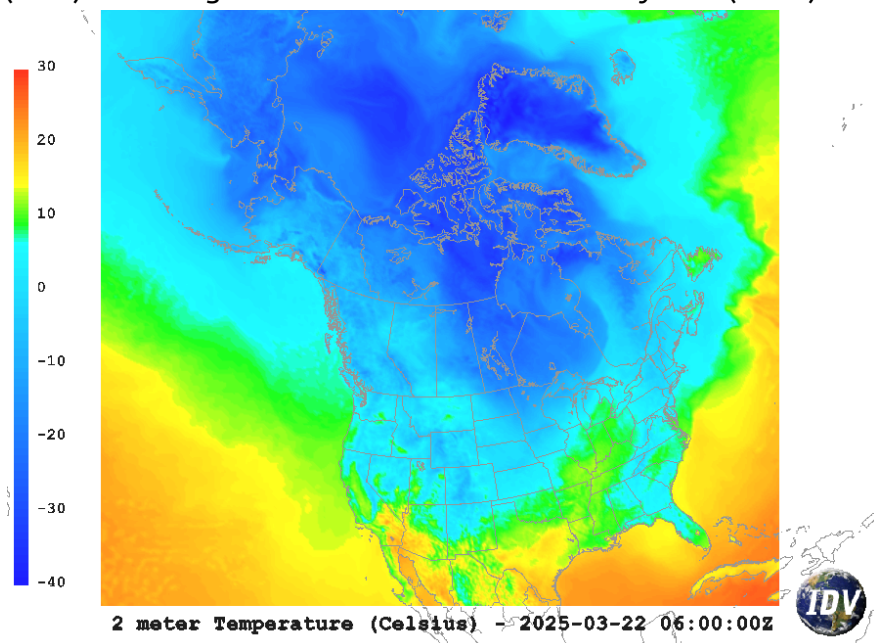
# Development

- Closely monitor the security status and update dependencies or fix issues as needed
- Continue to  help users  with upgrades to TDS 5.x
- Respond to user issues and fix bugs
- netCDF-Java now supports writing netCDF-4 files using more recent versions of netCDF-C (previously the use of v4.9.0 and newer was severely limited).
- Add support for CCSDS Compression for GRIB2. ECMWF is planning to migrate all its production GRIB messages to GRIB2, and plan on using this compression scheme. There are no native Java bindings to support this (the libaec library is the only game in town), so we will be calling native code. In some ways, this is like using netCDF-C for write support, but way more critical. Therefore, we will be providing native code that can be distributed with netCDF-Java (optional for those who cannot install libaec), and will support 64-bit windows, and both 64-bit and arm64 mac and linux as "out of the box" as possible.

- Improving WMS and DAP4 support in the TDS (working with the OPeNDAP group on the latter using PyDAP as an independent client for testing TDS an Hyrax)

## The following active proposals directly involve THREDDS work:

- None at this time.

# New Activities

We are actively creating a requirements document for the next generation THREDDS Data Server, and your input is critical. We will be evaluating several other technologies in light of this document as we chart a course forward.
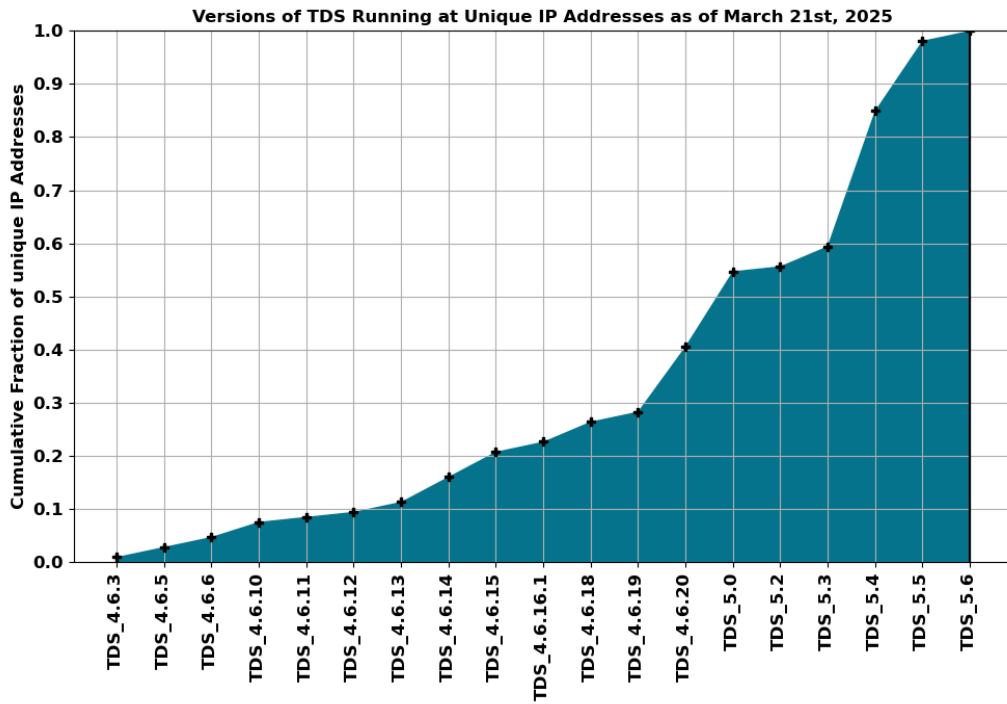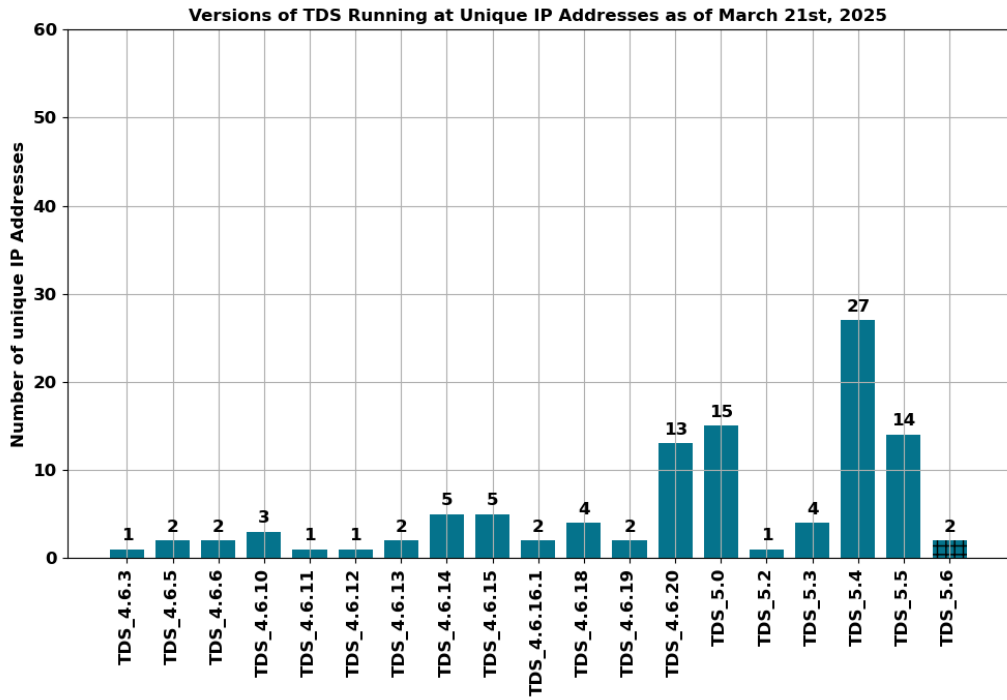
# Relevant Metrics

## THREDDS Startup Metrics

|  | 2024-09 — 2025-03 | 2014-08 — 2025-03 |
|---|---|---|
| TDS Startup (unique IP address count) | 1939 | 46,464 |

|  | Total Servers | Information page updated |
|---|---|---|
| Publicly Accessible[1] TDS count | 106 | 63 |

Over the past 7 months, **1,939** unique IPs started up the TDS (September 2024 through March 2025). Since we've started tracking these metrics (v4.5.3, August 26th, 2014), we've seen the TDS startup from **46,464** unique IP addresses. There are currently **106** publically accessible TDSs running "in the wild". Of the **106** publically accessible servers, **63** have updated the name of their server in their server configuration file (taken as a sign that they are maybe, possibly, intended to be used by others…maybe…).

The figures below show the distribution of TDS versions (top), and the fractional share of servers running version X or older (bottom). Each labeled version includes betas and snapshots, not just the official release of that version, for presentation simplicity. TDS v5.4 is the dominant specific version running in the wild (although more have migrated to TDS v5.5), and we have 2 using the latest v5.6 which was released in January 2025.

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[1] "Publicly accessible" means we could find a top-level THREDDS Client Catalog. We checked <server>/thredds/catalog.xml (version 4), <server>/thredds/catalog/catalog.xml (version 5), including the most common ports of 80, 8080, 443, and 8443.

Versions of TDS Running at Unique IP Addresses as of March 21st, 2025



Versions of TDS Running at Unique IP Addresses as of March 21st, 2025

Prepared *March 2025*

# Status Report: Science Gateway and Cloud Computing Activities

*Sean Arms, Julien Chastang, Nicole Corbin, Ethan Davis, Doug Dirks,
Ana Espinoza, Ward Fisher, Thomas Martin, Ryan May, Tiffany Meyer, Jennifer Oxelson Ganter,
Mike Schmidt,  Tanya Vance*

## Executive Summary

- Provided cloud-based PyAOS JupyterHub resources to 416 students across 17 universities and workshops.
- Development of new administrator documentation for NSF Unidata PyAOS JupyterHubs.
- We are testing autoscaling JupyterHub clusters on Jetstream2 for more efficient use of resources and enabling new technologies.
- We are testing and experimenting with virtual desktops with JupyterHub environments to run legacy desktop applications such as IDV and AWIPS CAVE.
- We tested and experimented with NVIDIA's AI-driven weather models (earth2mip) on Jetstream2.
- Collaboration with CSU and NCAR EOL continues to integrate both desktop and command-line LROSE radar meteorology tools into their science gateway.
- Science Gateway Re-Imagined project progressing through phased development with new features.
- Hosting of AWIPS EDEX servers on Jetstream2 continues for real-time atmospheric data distribution.
- Continued support for NOAA Big Data Project with THREDDS-based Nexrad radar data server.

## Questions for Immediate Committee Feedback

NSF Unidata Science Gateway staff maintain a THREDDS Data Server (TDS) on Jetstream2 ([https://tds.scigw.unidata.ucar.edu](https://tds.scigw.unidata.ucar.edu)) that largely mirrors the datasets available on https://thredds.ucar.edu, but with a shorter archive. This TDS serves as an experimentation and  staging ground for thredds-docker, which sees significant community adoption. Moreover,  while it does receive some use—such as by Daryl Herzmann at Iowa State, who notes when it is unavailable—overall, its utilization appears to be limited. Do you have any suggestions for how we might enhance the value and impact of this TDS? Are there particular datasets or services that would make it more useful to the broader atmospheric science community?

# Activities Since the Last Status Report

## JupyterHub Activities

### PyAOS JupyterHub and Magnum Autoscaling on Jetstream2

In collaboration with Andrea Zonca (Jetstream2/SDSC) and Julian Pistorius (Jetstream2), NSF Unidata Science Gateway staff have made significant progress in launching OpenStack Magnum autoscaling JupyterHub clusters. Although still in the experimental and testing phase, this approach is expected to optimize Jetstream2 resource usage by dynamically scaling clusters based on student demand, rather than provisioning for peak usage and leaving resources underutilized. To explore this capability, we have begun testing it on an internal JupyterHub server at https://unistaff.ees220002.projects.jetstream-cloud.org.

### JupyterHub Virtual Desktop Technology for Legacy Applications

NSF Unidata Science Gateway staff is exploring the deployment of JupyterHub virtual desktop technology to enable the integration of legacy UI-based applications within modern JupyterHub environments. While we have experimented with similar approaches over the past decade, recent advancements—particularly in autoscaling—represent a significant leap forward, bringing this technology closer to practical usability.

This work supports our efforts to deploy Cloud IDV and Cloud CAVE as part of the Science Gateway Reimagined initiative. Given IDV and CAVE's computational demands, autoscaling is crucial, allowing resources to dynamically scale based on user needs, thereby improving UI responsiveness within science gateway workflows.

Moreover, these advancements foster a more seamless transition between traditional interactive visualization tools and modern notebook-based analysis pipelines. The integration of JupyterHub with Magnum, Cloud IDV, and Cloud CAVE has the potential to create a powerful NSF Unidata-enabled ecosystem that enhances the accessibility and usability of complex scientific workflows. We look forward to making these capabilities available to the community in the near future.

### Exploring AI-NWP Models with earth2mip on Jetstream2

In collaboration with Thomas Martin, we experimented with running pre-trained AI-based Numerical Weather Prediction (AI-NWP) models using NVIDIA's earth2mip(https://github.com/NVIDIA/earth2mip) package on Jetstream2. Our goal was to deploy this technology on a GPU-enabled JupyterHub for hands-on exploration and testing. We successfully demonstrated that models such as FourCastNet and Pangu can be executed on standard GPU hardware, highlighting their potential for advancing AI/ML-driven weather

modeling research within the NSF Unidata community. A blog post detailing our findings and experiences is currently in preparation.

## Kubernetes Fluent Bit Logging for PyAOS JupyterHub Clusters

To improve collaboration with NSF Unidata system administrators, we have implemented Fluent Bit for log aggregation on PyAOS JupyterHub clusters running on Kubernetes. This technology ensures that all relevant logs are collected and stored on a dedicated virtual machine within the local network, providing system administrators with the necessary logs for monitoring and troubleshooting.

## Dask Cluster for University of Wisconsin

During the fall semester of 2024, we worked with Professor Hanna Zanowski from the University of Wisconsin-Madison to establish a JupyterHub Kubernetes Dask cluster for her earth system science class of 22 students. Dask, a Python library, facilitates the scaling of Python code for parallel computing on distributed clusters.

## WRF Single Column Model in JupyterHub

During the fall 2024 and spring 2025 semesters, we continued our work with Greg Blumberg from Millersville University and deployed an idealized single-column WRF model in a JupyterHub environment for undergraduate instructional objectives.

## New JupyterHub Administrator Documentation

Each semester, we work with professors who serve as JupyterHub administrators, ensuring they can effectively manage their course environments. To streamline the onboarding process, we have developed new administrator documentation. The new administrator documentation is available at: https://github.com/Unidata/science-gateway/blob/master/user-docs/admin-docs.md.

## JupyterHub Servers for Workshops, Fall and Spring Semesters

NSF Unidata is employing our Jetstream2 resource allocation for the benefit of students in the atmospheric science community by providing access to customized JupyterHub servers at a steady pace. NSF Unidata tailors these servers to the requirements of the instructors so they can accomplish their Earth Systems Science teaching objectives. Since the fall semester of 2024 encompassing the length of this status report , 416 students at 17 academic institutions and various workshops have used NSF Unidata JupyterHub servers running on Jetstream2.

Notably, we provided JupyterHub resources to:

- University of North Dakota fall 2024 Python workshop
- New Institutions:
  - University of Massachusetts, Lowell
  - Naval Postgraduate School

## Jetstream2 TDS, TDM, and LDM Modernization

We have undertaken a modernization effort for the THREDDS Data Server (TDS), THREDDS Data Manager (TDM), and Local Data Manager (LDM) services running on Jetstream2 (https://tds.scigw.unidata.ucar.edu). These data distribution components had become outdated. In collaboration with Sean Arms, we have worked to update these configurations. For example, we incorporated Canadian Meteorological Centre (CMC) model data, which is now available at
https://tds.scigw.unidata.ucar.edu/thredds/catalog/grib/CMC/RDPS/NA_10km/catalog.html

## LROSE Collaboration between Colorado State University and NSF NCAR EOL

The NSF Unidata Science Gateway team continues its collaboration with Professor Michael Bell's group at Colorado State University and NSF NCAR's Earth Observing Laboratory (EOL) to enhance their science gateway for radar meteorology. This gateway features a JupyterHub environment integrated with LROSE (Lidar Radar Open Software Environment) to support advanced data analysis and visualization.

Recent efforts have focused on adapting SAMURAI (Spline Analysis at Mesoscale Utilizing Radar and Aircraft Instrumentation) for use within JupyterHub. Additionally, we are leveraging JupyterHub Virtual Desktop technology—the same approach used for Cloud IDV and Cloud CAVE—to integrate legacy LROSE tools such as HawkEye into this gateway, ensuring continued usability of established analysis workflows.

Our team brings expertise in JupyterHub, OpenStack, and Jetstream2 to support this initiative. As part of this collaboration, we presented the paper "A Lidar and Radar Meteorology Science Gateway for Education and Research on the NSF Jetstream2 Cloud" at the Science Gateways 2024 conference and assisted an LROSE workshop for the AMS 2025 meeting in New Orleans.

To support this work, NSF Unidata secured $70,000 in funding for contributions from Ana Espinoza and Julien Chastang.

## NSF Unidata Science Gateway Re-Imagined

The Science Gateway Re-Imagined (SGRI) team–consisting of Nicole Corbin, Ana Espinoza, and

Julien Chastang with managerial support from Ethan Davis and Tanya Vance—convenes regularly to move the project forward. We are synchronizing our efforts with Doug Dirks and the NSF Unidata web group to ensure our initiative moves in harmony with NSF Unidata's overall web strategy.

The SGRI team has completed Phase 1 with the completion of the JupyterHub requests and Education Hub beta periods. Feedback from these periods have been incorporated and are ready for deployment with the new NSF Unidata website.

Phase 2 (on-demand notebooks, data integration, and community forums) began in early 2025. The team is working collaboratively with other NSF Unidata staff in the Systems and Community Services group to design the capabilities, scope, and user experience for these deliverables. With on-demand notebooks, visitors to the science gateway will be able to launch notebooks without the need for requesting dedicated JupyterHub resources. In addition to enabling users to demo existing or new NSF Unidata authored notebooks, the work done to bring users on-demand notebooks can be applied in the future during Phase 3 of the project—Community Contributions. On-demand notebooks will be made possible with BinderHub, although this is subject to change pending a more thorough investigation of potential security concerns and exploration of other technologies. Expect the next beta period for these features to begin in early 2026.

**Phased Approach to Development Summary**

*Phase 1 (Jan 2025 Release): Requests and Education* – Users can request both compute resources (in the form of JupyterHubs) and educational resources (trainings, modules, etc.) and browse existing educational resources

*Phase 2 (Apr 2026 Release): On-Demand Notebooks, Data Integration, and Community Forums* – Users can interact with NSF Unidata curated "on-demand" notebooks without the need for a JupyterHub request, access data which is proximate to the computational environment, and share and develop ideas with colleagues in a community forum

*Phase 3 (July 2026): Community Contributions* – Users can contribute to the content (educational materials, notebooks, workflows, etc.) found on the Science Gateway according to written guidelines for the management and maintenance of this content

*Phase 4 (Jul 2027 Release): App Streaming & Fully Re-Imagined Science Gateway* – Users can "test-fire" NSF Unidata products such as the IDV or NSF Unidata's version of AWIPS CAVE in their browser as a substitute for or prior to a local installation

# Ongoing Activities

## NOAA Big Data Program

- NSF Unidata continues to manage the NEXRAD level 2 archive in Amazon S3, ensuring that realtime data are successfully delivered to the noaa-nexrad-level2 bucket. LDM is employed to deliver these data.
- Public Bucket for level II NEXRAD: https://s3.amazonaws.com/noaa-nexrad-level2/index.html
- NSF Unidata also continues to deliver NEXRAD level 3 products to the NSF Unidata-nexrad-level3 bucket, part of the AWS public datasets program.
- TDS on Jetstream2 for level II NEXRAD: https://tds-nexrad.scigw.unidata.ucar.edu/thredds/catalog/catalog.html

# University of Oklahoma REU Program Support

NSF Unidata Science Gateway staff collaborate each semester with Ben Schenkel (University of Oklahoma) to provide a JupyterHub environment for NSF Research Experience for Undergraduates (REU) students. When needed, we also host datasets on the Science Gateway RAMADDA server, ensuring seamless access to data from within the students' JupyterHub environment.

# Jetstream2 Allocation Management and Collaboration

NSF Unidata staff continue to actively manage our Jetstream2 allocation and collaborate with the Jetstream2 team. We closely monitor our allocation and decommission outdated resources to prevent allocation exhaustion. In preparation for a Jetstream2 planned outage (Jan 6–9), we took steps to mitigate disruptions to NSF Unidata services. Additionally, we occasionally work with Jetstream2 staff to resolve disk attachment issues that impact users. We also set up a VM on Jetstream2 for Stonie Cooper and Sean Arms to support a WMO Information System 2.0 (WIS 2.0) node. WIS2 enables WMO members to efficiently publish, exchange, and access standardized weather data, and will gradually replace the Global Telecommunication System (GTS). The UPC is evaluating WIS2 as a potential data source as well as for possible direct use by the community. Finally, our disk quota increase request from 50 TB to 70 TB was approved to better meet our needs for AWIPS.

### Jetstream2 and Science Gateway Security

We continually work with NSF Unidata system administrator staff to ensure that our web-facing technologies and virtual machines on Jetstream2 adhere to the latest security standards. This effort involves such tasks as ensuring we are employing HTTPS , keeping cipher lists current, ensuring docker containers are up-to-date, limiting ssh access to systems, etc. It is a constantly evolving area that must be addressed frequently.

### Collaboration with Andrea Zonca on Jetstream2

The ongoing collaboration between NSF Unidata Science Gateway staff and Andrea Zonca continues to expand into new areas. Together, we have made significant progress in porting the OpenStack Magnum Kubernetes-as-a-Service "Zero to JupyterHub" workflow to Jetstream2. Andrea publishes these workflows on his blog, and we actively test them, providing feedback to refine and enhance their functionality.

## Docker Containerization of NSF Unidata Technology

We continue to employ Docker container technology to streamline building, deploying, and running NSF Unidata technology offerings in cloud-based environments. Specifically, we are refining and improving Docker images for the LDM, RAMADDA, THREDDS (TDS), and the THREDDS Data Manager (TDM). Most recently, we released thredds-docker 5.6 in conjunction with the 5.6 release of the TDS. In addition, we also maintain a security-hardened NSF Unidata Tomcat container inherited by the RAMADDA and THREDDS containers. Independently, this Tomcat container has gained use in the geoscience community. To keep our containers up-to-date, especially with respect to security, we programmatically monitor and respond to upstream updates by automatically building and deploying the refreshed containers to DockerHub.

## AWIPS EDEX in Jetstream2 Cloud

NSF Unidata continues to host our publicly accessible EDEX servers on the Jetstream2 cloud platform where we serve real-time AWIPS data to CAVE clients and the python-awips users. We've had upwards of 300 clients connecting to EDEX in a single day. The distributed architectural concepts of AWIPS allow us to scale EDEX in the cloud to account for the desired data feed (and size). We continue using Jetstream2 to develop cloud-deployable AWIPS instances as imaged virtual machines (VMI) available to users of OpenStack CLI.

Unfortunately, our systems have had quite a few issues on Jetstream2 and both the AWIPS team and the Science Gateway team have spent significant time troubleshooting and repairing machines to keep our servers operational. In January, Jetstream2 told us about a maintenance downtime that was supposed to last multiple days. Because we knew ahead of time, we were able to spin up a local set of EDEX machines at NSF Unidata.

Because we are needing to spin up new machines fairly often, we have simplified and streamlined this process by creating custom Rocky 8 images that can be used for deployment on Jetstream2. We have successfully created and launched a Rocky 8 EDEX system which the AWIPS team has been using to develop the latest version of AWIPS.

EDEX is designed so different components can be run across separate virtual machines (VMs) to improve efficiency and reduce latency. Our current design makes use of three VMs: one large instance to process most of the data and run all of the EDEX services including all requests, and two other ancillary machines which are smaller instances used to ingest and decode radar and satellite data individually.

We are currently supporting 2 sets of servers as described above: one set has been running our v23 production software, another running v23 development software. We may be looking to add an additional 2 back in the mix (running Rocky 8) for future development and beta builds.  Having backup/development  servers allows us to be able to patch, maintain, and develop our servers while still having a functional server for our users and to minimize any down time. In January we decommissioned the v18 and v20 systems since they were running CentOS7 which was end of life back in June 2024.

## Nexrad AWS THREDDS Server on Jetstream2 Cloud

As part of the NOAA Big Data Project, NSF Unidata maintains a [THREDDS data server](#) on the Jetstream2 cloud serving Nexrad data from Amazon S3. This TDS server leverages Internet2 high bandwidth capability for serving the radar data from Amazon S3 data holdings. TDS team and science gateway staff collaborate to maintain this server.

## NSF Unidata Science Gateway Website and GitHub Repository

### Website

The [NSF Unidata Science Gateway web site](#) is regularly updated to reflect the progress of what is available on the gateway. The news section is refreshed from time-to-time for announcements concerning the gateway. The conference section and bibliography is also maintained with new information. We are in the process of redesigning this web site. See "NSF Unidata Science Gateway Re-Imagined" section above.

### Repository

All technical information on deploying and running NSF Unidata Science Gateway technologies is documented in the [repository README](#). This document is constantly updated to reflect the current state of the gateway.

## Presentations/Publications/Posters

- DeHart, J., Javornik, B., Chastang, J., Espinoza, A., Dixon, M., and Bell, M. (2024), A lidar and radar meteorology science gateway for education and research on the NSF Jetstream2 cloud, Gateways 2024, Bozeman, Montana, USA, 8-10 October.
- Chastang, J., and Espinoza, A. (2025), Expanding access to advanced scientific workflows: The NSF Unidata Science Gateway leverages innovative capabilities of the NSF Jetstream2 cloud for atmospheric science education, in Proceedings of the 41st Conference on Environmental Information Processing Technologies, 105th AMS Annual Meeting, New Orleans, Louisiana, USA, 13–16 January.
- Del Moral, A., DeHart, J., Javornik, B., Cha, T.-Y., DesRosiers, A. J., Chastang, J., Espinoza, A., Dixon, M., Bell, M. M., and Lee, W.-C. (in preparation), The Lidar Radar Open Software Environment (LROSE): An open-source community-based tool for the research and operational community, 2025 First Joint Conference of the African Meteorological Society and the World Meteorological Organization, Addis Ababa, Ethiopia, 27–30 April.

- DeHart, J., and Espinoza, A. (in preparation), Improved accessibility and community knowledge of lidar and radar data analysis, 2025 Improving Scientific Software Conference, Boulder, CO & Virtual, 7–10 April.

# New Activities

## Over the next three months, we plan to organize or take part in the following:

### Forthcoming conference participation

The LROSE collaboration has submitted abstracts to the following conferences:
- 2025 Improving Scientific Software Conference, Boulder, CO & Virtual, April 7–10, 2025.
- The First Joint Conference of AfMS-WMO, Addis Ababa, Ethiopia, April 27–30, 2025.

## Over the next twelve months, we plan to organize or take part in the following:

- Continue testing Magnum autoscaling clusters alongside virtual desktop technology for legacy applications (e.g., CloudDV, Cloud AWIPS Cave) with limited beta deployments.
- Seeking DockerHub alternatives due to low download quotas.

# Relevant Metrics

## Fall 2024 / Spring 2025 JupyterHub Servers

Since spring of 2020, NSF Unidata has provided access to JupyterHub scientific computing resources to about 2300 researchers, educators, and students (including a few NSF REU students) at 28 universities, workshops (regional, AMS, online), and the UCAR SOARS program. Below are the latest metrics (institution, number of active users, point of contact) since the last status report.

| **Fall 2024** | | |
|---|---|---|
| UND Fall Workshop | 34 | David Delene |
| Florida Institute of Technology | 23 | Steve Lazarus |
| Florida Institute of Technology B | 13 | Milla Costa |
| Southern Arkansas University | 36 | Keith Maull |

| | | |
|---|---|---|
| Seoul National University | 24 | Duseong Jo |
| University of Florida | 7 | Stephen Mullens |
| University of Wisconsin | 22 | Hannah Zanowski |
| University of Wisconsin B | 1 | Hannah Zanowski |
| University of Wisconsin Dask | 22 | Hannah Zanowski |
| Vermont State University | 8 | Andrew Westgate |
| SUNY Oswego | 13 | Scott Steiger |
| Colorado School of Mines | 28 | Thomas Martin (NSF Unidata Staff) |
| University of Alabama Huntsville | 13 | Sean Freeman |
| Millersville University | 2 | Greg Blumberg |
| University of Oklahoma | 3 | Ben Schenkel |
| University of Oklahoma B | 3 | Ben Schenkel |
| | | |
| **Spring 2025** | | |
| CUNY | 37 | Bill Spencer |
| Florida Institute of Technology | 10 | Milla Costa |
| Florida State University | 34 | Christopher Homles |
| Millersville University | 33 | Greg Blumberg |
| Seoul National University | 1 | Duseong Jo |
| Southern Arkansas University | 27 | Keith Maull |
| University of Massachusetts Lowell | 1 | Mathew Barlow |
| University of Louisville | 18 | Jason Naylor |
| University of Northern Colorado | 0 | Wendilyn Flynn |
| University of Oklahoma | 3 | Ben Schenkel |
| SUNY Oswego | 0 | Scott Steiger |
| Naval Postgraduate School | 0 | Derek Podowitz |

**Note**: Some entries in the table above indicate zero or one user. These are recently launched Hubs and the instructors have not yet had a chance to complete their setup and launch the coursework for students to access.

## Jetstream2 Allocation Usage Overview

In addition to service units (SUs) used for running various kinds of virtual machines–"regular"

CPU and GPU instances–NSF Unidata was also granted a limited number of compute, storage, and network resources to carry out Jetstream2 operations. These three kinds of resources are ephemeral, being created and destroyed as necessary. Thus, metrics regarding these resources are representative of short-term utilization, while SU usage is a metric that can be representative of our long-term Jetstream2 utilization.

Following NSF Unidata's 8M+ SU grant renewal, which went into effect October 2023, NSF Unidata staff has been proactive in ensuring Jetstream2 resources are being used effectively in a non-wasteful manner. The Science Gateway team has automated SU usage data collection through interactions with the JS2 API. This data is extrapolated forward in time to predict future SU usage, allowing us to make meaningful decisions about the science gateway's capabilities. The scripts have been shared with our LROSE collaborators.

SU usage and resource metrics, current as of March 12, 2025, are presented below.

## SU Usage

| Type | SUs Used | SUs Allocated | % Usage * |
|------|----------|---------------|-----------|
| CPU | 3,079,650 | 8,191,300 | 38 % |
| GPU | 59,194 | 672,768 | 9 % |

## Resource Metrics

| Compute | | | |
|---------|------|-------|---------------|
| Type | Used | Total | Percent Usage* |
| Instances | 103 | 150 | 69 % |
| vCPUs | 1003 | 4185 | 24 % |
| RAM | 3.7 TB | 16.4 TB | 23 % |

| Storage | | | |
|---------|------|-------|---------------|
| Type | Used | Total | Percent Usage* |
| Volumes | 254 | 400 | 64 % |
| Volume Snapshots | 0 | 50 | 0 % |
| Volume Storage | 20.1 TB | 58.6 TB | 34 % |

| Network | | | |
|---|---|---|---|
| Type | Used | Total | Percent Usage* |
| Floating IPs | 40 | 320 | 13 % |
| Security Groups | 69 | 100 | 69 % |
| Security Group Rules | 229 | 300 | 76 % |
| Networks | 2 | 100 | 2 % |
| Ports | 139 | 250 | 56 % |
| Routers | 2 | 15 | 13 % |

* Percent Usage is rounded to the nearest whole number


## Github Statistics*

| Repository | Watches | Stars | Forks | Open Issues | Closed Issues | Open PRs | Closed PRs |
|---|---|---|---|---|---|---|---|
| science-gateway | 6 (-1) | 19 | 13 | 5 | 167 | 19 (+3) | 819 (+45) |
| tomcat-docker | 10 (-1) | 65 | 70 | 0 | 42 | 0 | 97 |
| thredds-docker | 12 (-3) | 38 (+5) | 29(+1) | 4 (+1) | 124 (+4) | 0 | 188 (+4) |
| ramadda-docker | 3 (-1) | 0 | 2 | 1 | 10 | 0 | 38 |
| ldm-docker | 8 (-1) | 12 | 14 | 1 | 40 | 0 | 70 |
| tdm-docker | 4 (-1) | 4 | 7 | 0 | 10 | 0 | 29 (+2) |

* Numbers in parentheses denote change from last stat report

Prepared *March 2025*

# Status Report: Community Services

*September 2024 - March 2025*

*Doug Dirks, Nicole Corbin, and Tanya Vance*

## Executive Summary

In January, our group experienced a shift in some of our community activities and focus to be compliant with the Presidential actions and executive orders, including ending all diversity, equity, inclusion, accessibility, and justice related projects and activities. This compliance also resulted in updates and changes to our current webpages and documentation.

The group has predominantly focused progress around four major projects or initiatives including: the Science Gateway Reimagined and Integrated Educational Hub Project, the CyberTraining Project, the Community Assessment Initiative, the new NSF Unidata Website launch.

We also participated in outreach to the Earth System Science community at conferences, workshops, and working groups. We also facilitated the 2025 NSF Unidata Community Equipment Awards, supported NSF Unidata UsersCommittee and SAC activities and communications, progressed NSF Unidata's reporting, worked to advance cross-program and cross-organization collaborations and activities, and expanded learning and development materials, resources, and offerings.

## Activities Since the Last Status Report

### Community Outreach and Services

**Community Communications:**

- Posts to the News@Unidata blog appear regularly, but not on a specific schedule. Some highlights:
    - [NSF Unidata Staff Honored with AGU Open Science Recognition Prize](#)
    - [netCDF vs Zarr, an Incomplete Comparison](#)
    - [NSF Unidata Welcomes New committee Members](#)
    - [Reflections on the 2024 Emerging Pedagogies Summit](#)
    - [Jim Steenburgh Receives 2024 DeSouza Award](#)
    - [2024 Community Equipment Awards](#)
    - [Call for Proposals: NSF Unidata 2025 Community Equipment Awards](#)
    - [NSF Unidata Staff at AGU Fall 2024 Meeting](#)
    - [NSF Unidata Staff at AMS 2025 Meeting](#)
    - [NSF Unidata Summer Student Internships Available!](#)
    - [2025 DeSouza Award Nominations](#)
    - [AMS 2025 Conference Highlights from the NSF Unidata Staff](#)

- - [FireWxPy: A Python Package For Fire Weather Analysis And Forecasting](#)
    - [Are We Preparing Earth Systems Science Practitioners for the Future?](#)
  - Community meetings and other announcements
  - Updates to NSF Unidata's social media channels (Facebook, Bluesky, LinkedIn)
  - Continue to publish short videos on the Unidata YouTube channel

## Outreach to the Earth System Science community at conferences, workshops, events, and working groups

### Conferences, Workshops, Events
- Presented Science Update to UCAR President's Council (NC, March 2025)
- Coordinated and supported AGU (December 2024) and AMS (January 2025) outreach materials and program participation
- Participated Duke Emerging Pedagogies Summit (NC, October 2024)
- Presented and facilitated UCAR Members Meeting Breakout Session, members poll, and engagement events (TV, October 2024)
- Participated Interagency Arctic Research Policy Com (IARPC) CARE-ing for the Arctic Data & Indig Data Sovereignty Series: Ethical Stewardship in Research Data, Sea Ice, Permafrost Joint Meeting (TV, October 2024)

### Working Groups:
- Ambassador - NSF NCAR Convergence Science Program and member of Convergence Science Data Outputs group (TV)
- NSF NCAR/UCP/UCAR Community Engagement Group (TV)
- UCAR Exhibit Working Group (TV)

## NSF Unidata Community Awards

- Finalized 2024 Community Equipment Awards; award recipients: Northern Illinois University (Building Capacity and Reducing Barriers for Geoscience Students at Northern Illinois University) and University of Wisconsin-Madison (Upgrading the community THREDDS data server and LDM/IDD relay infrastructure at UW-Madison AOS)
- Readying and facilitating the 2025 Community Equipment Awards, including Executive Order compliance
- Participated on and progressed recommendations from the Equipment Awards Subcommittee (Alex Davies, Todd Murphy, Tanya Vance, Jennifer Oxelson Ganter) to be reviewed for implementation in 2026

### 2025 Awards Community Equipment Awards

- As of this report, the review panel is scheduled to convene in April to select awardee(s) for the 2025 cycle

### DeSouza Award

- Jim Steenburgh from the University of Utah was awarded the 2024 Russell L. DeSouza Award by the NSF Unidata Users committee at the fall meeting.

## Community Engagement Initiatives

### Community Assessment Initiative

- Spearheaded NSF Unidata Community Assessment Initiative to develop a comprehensive understanding of the community's needs, interests, and challenges to ensure alignment with the portfolio of tools, services, and support services offered by NSF Unidata
- Formed subcommittee (Tanya Vance (lead), Nicole Corbin (instructional design expert), Alex Davies (UsersCom advisor), Brian Tang (UsersCom advisor))
- Established assessment goals, outcomes, scope, structure, delivery strategies, and methodologies to drive strategic refinements, prioritize high-impact project initiatives, and strengthen connections between community needs and NSF Unidata capabilities
- Developed actionable questions for the community survey phase and initiated survey development

### Engagement Plan

- Progressed draft internal engagement plan for program goals and objectives, incorporating implementation input from the Users Committee Brainstorming Workshop outcomes for community and committee engagement

## Supported Users and Strategic Advisory Committee activities and communications

- Facilitated Spring Committee planning  and delivery with members, representatives, and NSF Unidata program center staff
- Facilitated communications and documentation for Joint Fall committee meeting actions including the committee model revamp, SAC Decision-making framework, and awards

## Progressed NSF Unidata's Core Award Reporting

- NSF1901712 Final and Outcomes reports (February 2025)

## Cross-program and cross-organization collaborations and activities

- Co-authored the Center for Ocean Leadership (COL)-hosted forum report, Fostering a Diverse and Inclusive Ocean Workforce https://doi.org/10.5065/dn0a-pe98
- Provided consultation support for UCP revised goals and implementation planning, and provided oversight advice on UCAR's Strategic Plan as well as co-hosting interviews for the UCP Director search
- Ongoing strategic engagement with the UCAR Director of External Engagement and Business Development
- Provided formal mentorship for the 2025 UCAR UCAR Mentorship Program (NC)

### Learning Services

### Web presence

- Science Gateway Reimagined project –  a community-directed virtual hub to enable learning and support research for current and future earth systems students, educators, and professionals.
    - Education Hub beta released in November 2024. The full version will launch with the release of the new NSF Unidata website.
    - Next phases: data catalogs, community forums
    - See Cloud Computing Activities report for more details.

### New learning offerings

- [NSF #2319979](#) "Machine Learning Foundations and Applications in the Earth Systems Sciences" (Nicole Corbin, PI and Thomas Martin, Co-PI) in collaboration with Dr. Keah Schuenemann (MSU Denver) and Dr. Karen Kortz (Community College of Rhode Island)
    - [Module 1 is live for public enrollment](#)
    - Modules 2 and 3 (low-code Jupyter Notebooks) will be available for public enrollment mid-April 2025.
    - The award ends this summer, but work to develop additional AI/ML learning resources will follow a community survey led by Thomas Martin with support from the UCAR President's Strategic Initiative Fund.
- COMET has released three lessons in collaboration with the NetCDF project team, available on MetEd
    - [Reading NetCDF Metadata](#)
    - [Visualizing NetCDF Data](#)
    - [Subsetting and Appending NetCDF](#)

# Ongoing Activities

### We plan to continue the following activities:

- Ongoing activities related to above (community communications, support for governing committee activities, facilitating awards, outreach and engagement, supporting cross-program, cross-organization, and external collaborations, learning services, etc.)
- Participation in Working Groups:
    - Serve as Ambassador on NSF NCAR Convergence Science Program Ambassadors Community of Practice and Community Interest Network and Data Outputs Working Group (TV)
    - Participate on the NSF NCAR/UCP/UCAR Community Engagement Group (TV)
    - Participate on the UCAR Exhibit Working Group (TV)
- Seeking partnerships to build and deliver community learning and development
- Ongoing work to transition NSF Unidata's website to new UCAR-system

- Support the pursuit of funding and bringing greater public awareness to NSF Unidata

# New Activities

**Over the next three months, we plan to organize or take part in the following:**

- Facilitate review panel and progress 2026 NSF Unidata Community Equipment Awards
- Potential delivery of learning experience requests for University of Northern CO and MSU Denver
- Delivery of all three Machine Learning in the Earth Systems Sciences learning modules
- Delivery of NSF Unidata Education Hub website
- Execute Community Survey phase of Community Assessment Initiative
- Finalize Engagement Plan
- Follow up proposals and collaborative activities
- Supporting the machine learning training community survey.
- Migrate phase two content for NSF Unidata's new website
- Submit annual NSF2403649 Report

**Over the next twelve months, we plan to organize or take part in the following:**

- Continued maintenance of the reimagined NSF Unidata Science Gateway, including community contributions and adding resources to the Education Hub
- Complete data analysis for the first phase of the Community Assessment Initiative: Community Survey results and create outcomes report
- Implement downstream phases of the Community Assessment Initiative such as interviews and other data collection opportunities

**Areas of opportunity and challenge:**

- Diverse and sufficient pool of committee nominees and community award proposals
- Broadening our applications, reach, and impact across new Earth System Science communities with varying resources, capacities, and expectations
- Resources to develop new learning experience and engagement materials

# Relevant Metrics

Statistics from the Community pages on the NSF Unidata web site. Comparisons are made with statistics from the previous six-month period.

**All community pages**

Most recent six months (September 1, 2024 - February 28, 2025)::

- 31,163 unique pageviews (30,191 in previous period)
- 19.6% of total unique pageviews (17.3% in previous period)

## Top community pages

1. All blog pages
   25930 unique pageviews (25571 in previous period)
   83% of total community pageviews (85% in previous period)
2. www.unidata.ucar.edu/community
   3061 unique pageviews (2113 in previous period)
   10% of total community pageviews (7% in previous period)
3. www.unidata.ucar.edu/about
   645  unique pageviews (1374 in previous period)
   4% of total community pageviews (5% in previous period)
4. www.unidata.ucar.edu/events
   782  unique pageviews (782 in previous period)
   2% of total community pageviews (2% in previous period)

## Social media statistics, March 18, 2025

1. # of Bluesky followers: 225 (up from 0)
2. # of Twitter/X followers: 1974 (down from 2083) (stopped posting to X this cycle)
3. # of Facebook followers: 925 (up from 913)
4. # of YouTube subscribers: 4178 (up from 3960)
5. # of LinkedIn followers: 308 (up from 210)

## Unidata eLearning statistics, September 3, 2024

1. Total unique users: 386 (up from 300)
2. Enrolled users in Machine Learning Foundations in the Earth Systems Sciences: 11 (up from 7, not including MSU participants)
3. Enrolled users in Learn AWIPS CAVE: 320 (up from 256)
4. Enrolled users in Learn Python-AIPS: 43 (up from 35)
   - Note that microlearning courses are available without an account and are unable to be tracked

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Prepared *March 2025*

# Status Report: Support

*September 2024 - March 2025*

*Jennifer Oxelson, UPC Staff*

## Executive Summary

Unidata has been looking at improving online sef-support services for our community.

## Questions for Immediate Committee Feedback

- When seeking information or support about Unidata software, data, or projects from **online** sources, which of the following do you use?
  - Software documentation
  - Support archives
  - Mailing list archives
  - Don't know, I just use a search engine or ChatGPT
  - None of the above
- Do you find the information that you are looking for?

## Activities Since the Last Status Report

### Improving online self-support availability

The next phase of revamping Unidata support is to make finding online information easier. The current repositories for this information are:
- Software documentation
- Support archives
- Mailing list archives

The support archives and mailing list are voluminous, crufty, and practically unusable unless using a search engine or an LLM.   Both are currently populated programmatically, which while convenient for the staff developers, it has become unwieldy for the user.

We have been looking at this current system and exploring alternatives that are more user-friendly and discoverable.

**Note:** compiling of support metrics for staff is on hold while we conduct a comprehensive review of our metrics gathering process.

### Training

Unidata training/workshop information can be found in the [Community status report](#).

# New Activities

**In order to fulfill our objectives articulated in the Unidata 2018 Proposal, focused efforts are needed in two major areas:**

- Enhance electronic support offerings
- [Create instructional materials for online virtual training](#)

Prepared *March 2025*