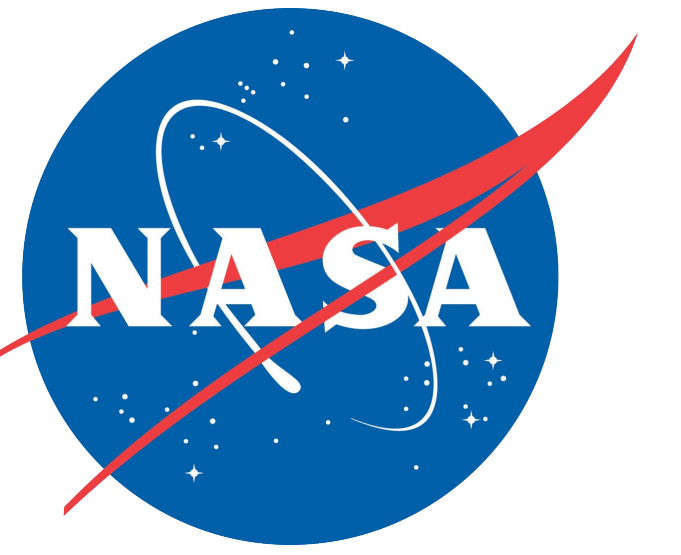


Closing the Gap Together - Connecting Communities with NASA Data through Earthdata Partnership

National Aeronautics and Space Administration



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User Needs Technical Interchange Meeting (UN-TIM) | November 20-21, 2024

Needs

Most environmental scientists don't have the data skills they need. (Littrell et al, 2023).

A 2023 survey of 700 National Science Investigators revealed this concerning trend, highlighting the urgent need for enhanced data literacy and analysis skills (Barone et al, 2017).

NASA, a major contributor to this data surge, is actively addressing this challenge. With over 100 petabytes of data currently and a projected increase to 250 petabytes by 2025, NASA recognizes the importance of equipping researchers with the tools and knowledge to effectively utilize this national resource.

Inspired by the 2023 UNTIM, the Earth Science Data Systems (ESDS) and Atmospheric Science Data Center (ASDC) have joined forces to bridge this gap. By providing targeted training and support, they aim to empower researchers to access and leverage Earthdata and ASDC tools and services more effectively.

Background

Dr. Hazem Mahmoud, ASDC's Project Scientist, is passionate about making Earth observation data more accessible. Together with Elizabeth Joyner's expertise in teaching and engagement, they've formed a dynamic duo to prepare and empower users of NASA Air Quality data.

Motivated by a 2023 UNTIM breakout session, they've joined forces and connected with over 75 individuals, across five events in 2024, including community college students, minority-serving institutions, DEVELOP NASA Interns, and planetarium visitors. Their goal is to bring valuable data from missions like TEMPO, CALIPSO, and MISR to a broader audience, tailoring their approach to meet users' specific needs and skill levels.

Key Events

Since the 2023 UNTIM, several key workforce development training events have been offered this year. Additionally, multiple events are projected for 2025.

- 2023:
- UNTIM Break out Group: Where ideas were shared and synergies were realized

- 2024:
- Air Quality Data Bootcamp, 20 participants (June)
 - Summer DEVELOP LaRC Air Quality Cohort, 10 participants (June)
 - Fall DEVELOP LaRC Air Quality Cohort, 9 participants (September)

- 2025:
- AMS Preconference Workshop @ XULA, 30 participants (January)
 - AMS IPMSI Data Training, 30 participants (January)
 - CAFE (Boston University, Harvard University), 250 Participants (March)
 - NASA Community College Network Data Trainings (TBD)
 - Peninsula Community College, Hampton, VA (TBD) - Course preparation
 - National Space Grant Network Cohort Training
 - **Beyond!**

Community Partnerships

Strategic partnerships are essential for maximizing the impact of Earth observation data. By leveraging existing NASA programs and collaborating with external organizations like the American Geophysical Union (AGU), the American Meteorological Society (AMS), and Old Dominion University's Michael and Kimthanh Lê Planetarium, this partnership has successfully reached new communities.

Additionally, collaborations with projects like NASA's Increasing Participation of Minority Serving Institutions in NASA Earth Science Surface-Based Measurement Networks and Space Grant Programs help the NASA funded programs achieve their project goals and objectives. This is demonstrated through efforts like the data training for Virginia Space Grant's STEM Takes Flight Program for Community College students in the summer, as well as the NASA Develop Program. These partnerships brings invaluable expertise, data and tools to a wider audience, including students, researchers, and educators, alike.



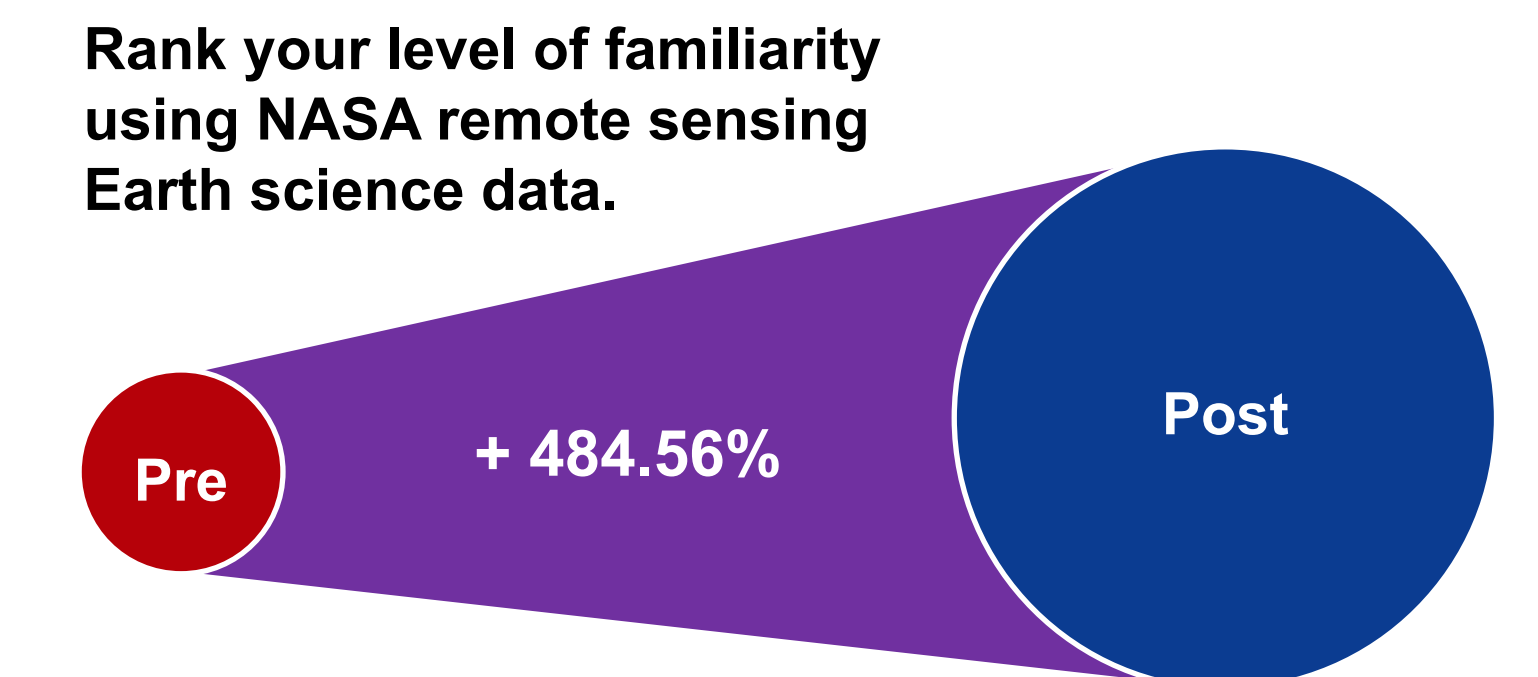
Air Quality Data Bootcamp for STEM Takes Flight Community College Interns from Virginia and Maryland at NASA LaRC.



Air Quality Data Bootcamp for STEM Takes Flight Community College Interns from Virginia and Maryland at NASA Langley Research Center.

Value Added

It is standard practice to distribute surveys to help inform presenters of the needs, backgrounds, and skills ahead of the workshop/presentation planning, as well as distributing similarly surveys afterwards to help presenters reflect on perceived growth of knowledge/skills, as well as opportunities for improvement in the future. Additionally, each workshop provides a dedicated DOI for users to access and refer to during and after the workshop.



Percent change from pre-survey to post-survey: 484.56%

STEM Takes Flight Pre/Post Evaluation Results, n=16

Question	Percent Change
Decrease in perceived challenges with using data	22%
Increase in experience with accessing and using TEMPO data	200%
Increase in experience with accessing and using TROPOMI data	200%
Increase in understanding Impact of Air pollution on Human Health	38%
Increase in understanding of Atmospheric Science Data Systems services	167%
Increase in understanding of Earthdata Search	150%
Increase in understanding of NetCDF / HDF formats	150%
Increase in understanding of TEMPO mission/data	400%
Increase in understanding of the topic of air pollutants	44%
Increase in understanding of TROPOMI mission/data	400%
Please rank your level of familiarity using NASA Earth science data.	-11%

Fall DEVELOP LaRC Air Quality Pre/Post Evaluation Results, n=10

Citations

Barone L., Williams J., Micklos D. Unmet needs for analyzing biological big data: a survey of 704 NSF principal investigators. PLoS Comput Biol 2017;13:e1005755

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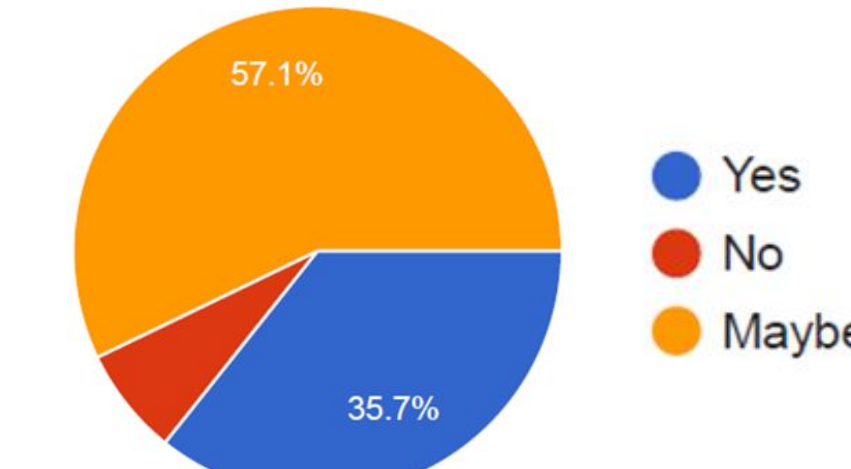
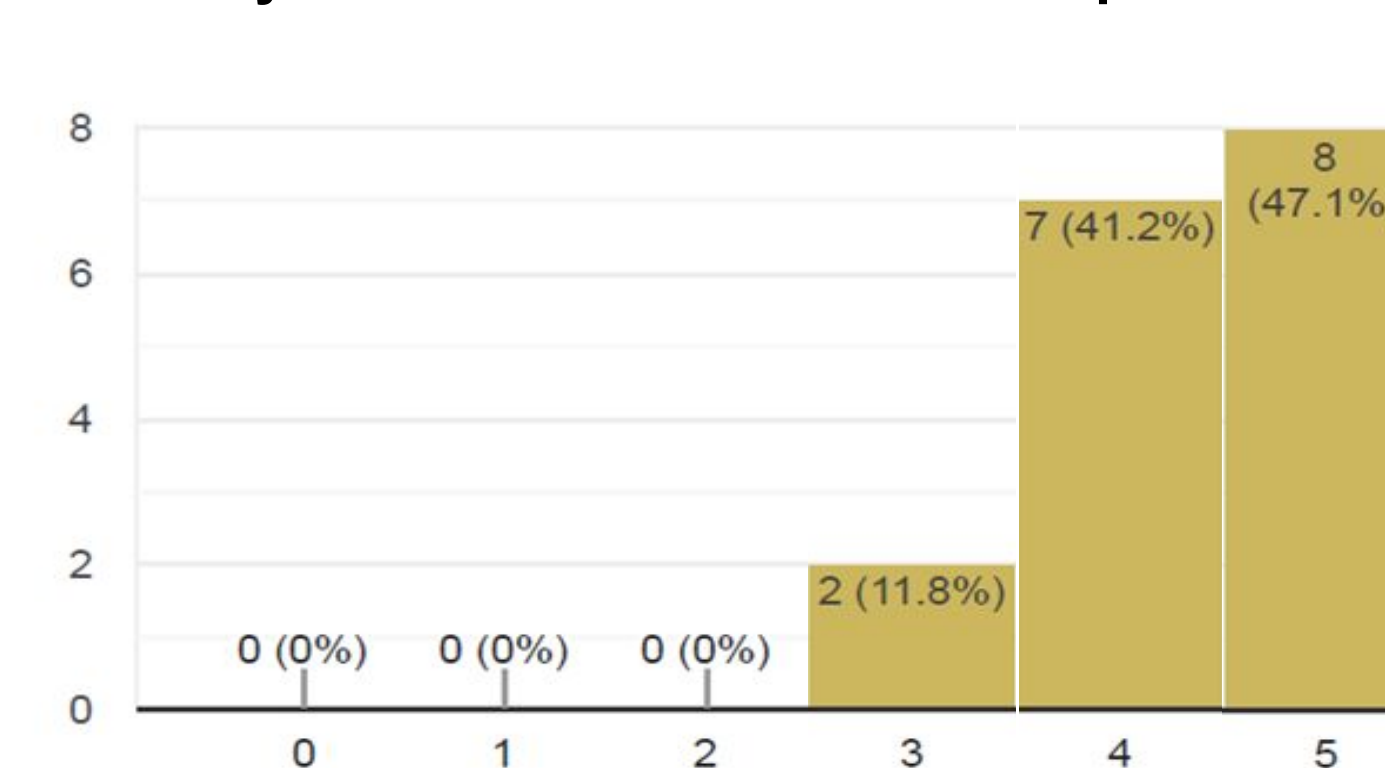
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Littrell, M., Gold, A., Johnston, K., & Ward, E. (2023). ESIL Environmental Data Science Needs Assessment Report. 2023 Environment Data Science Innovation & Inclusion Lab (ESIL) Innovation Summit, University of Colorado Boulder. Zenodo. <https://doi.org/10.5281/zenodo.10359954>

Would you recommend this Bootcamp for others?



Would you be interested in enrolling in accredited class of "Fundamentals and Applications of Air Quality Data Monitoring From Space" if it were offered?

STEM Takes Flight Pre/Post Evaluation Results, n=16



Elizabeth R. Joyner
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 Scan the QR code to access this Zenodo DOI

If you are interested in working with ESDS to offer experiences like this to users, please contact Elizabeth Joyner.



EARTHDATA