



CPAESS
Year In Review
2023

UCAR
COMMUNITY
PROGRAMS

 **CPAESS**
Cooperative Programs for the
Advancement of Earth System Science

From the Director

Dear Staff,

I trust that this Year in Review for 2023 will provide you with valuable insights into the remarkable achievements of both our scientific and business staff. It encapsulates your dedication to individual scientific endeavors, the development of new educational initiatives, engagement in public scientific outreach, and much more. Your accomplishments have been both exceptional and abundant. I am genuinely appreciative of your hard work and innovative spirit, which truly drive the success of our program.

Throughout the year, Cindy and I have had the pleasure of traveling to various work locations and conferences across the country to personally engage with many members of CPAESS' exceptional team. We eagerly anticipate reconnecting with many of you nationwide in the coming year.

Your tireless efforts and groundbreaking work have positioned us strongly as we venture into 2024. I am excited about our many continued collaborations and partnerships that lie ahead. Your innovation and hard work are the cornerstone of CPAESS' commitment to deliver top-tier scientific programming, and I truly appreciate it.

With gratitude,

Hanne Mauriello



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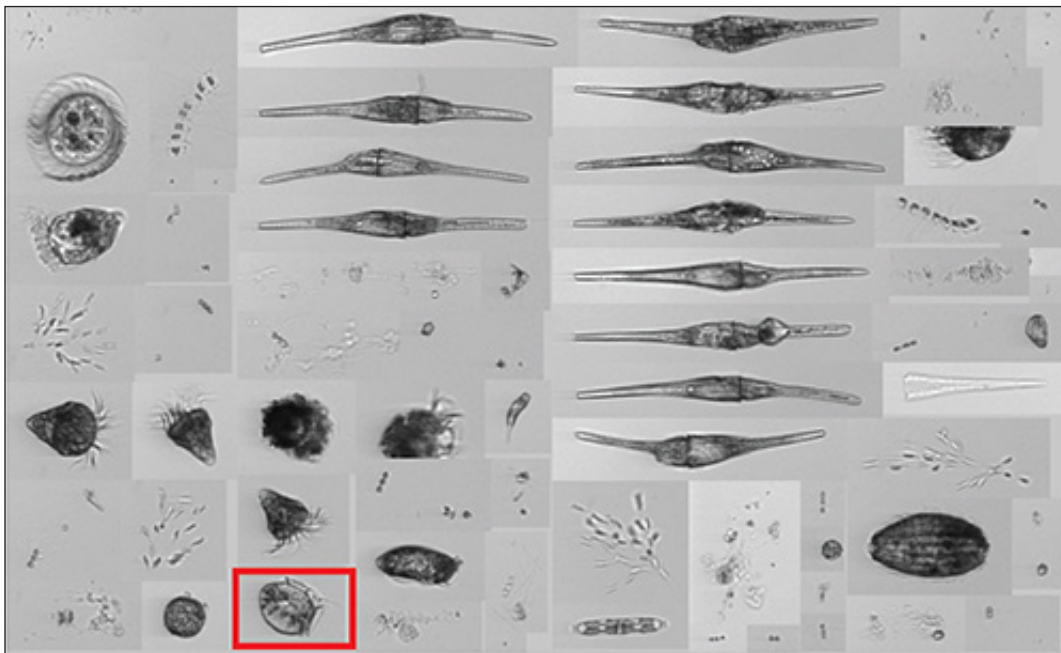
How to Monitor the Microscopic Community of Puget Sound

CPAESS Associate Scientist, Alexis Fischer joined us in 2021 to work with the NOAA Fisheries. They are a biological oceanographer and phytoplankton ecologist, and their work is instrumental in keeping folks healthy while they enjoy their seafood.

Most of Alexis' research involves the use of an ocean robot called the Imaging Flowcytobot (IFCB) that essentially makes it feasible to continuously monitor a phytoplankton community in marine environments. The IFCB "is a robotic microscope that automates the in situ monitoring of phytoplankton. The IFCB uses flow cytometric and video technology to capture high-resolution images of suspended particles and transmits them to onshore operators in near real-time." ([NOAA Fisheries](#)). "It's imaging all of the phytoplankton community so we can actually look at this whole food chain happening, which is pretty great use of this instrument," shared Alexis.



Dr. Alexis Fischer, CPAESS Associate Scientist who works at NOAA's Fisheries as a biological oceanographer and phytoplankton ecologist.



In the red square is a Dinophysis, and the picture is an example of IFCB data collected at Budd Inlet that Dr. Fischer utilizes in their research.

It collects about a five mill sample every 20 minutes capturing high resolution images of individual phytoplankton cells and colonies. This is coupled with the use of a machine learning image classifier which counts and identifies "phytoplankton to the genus level and sometimes species level from the images." These instruments can be deployed in the field for up to six months depending on the system.

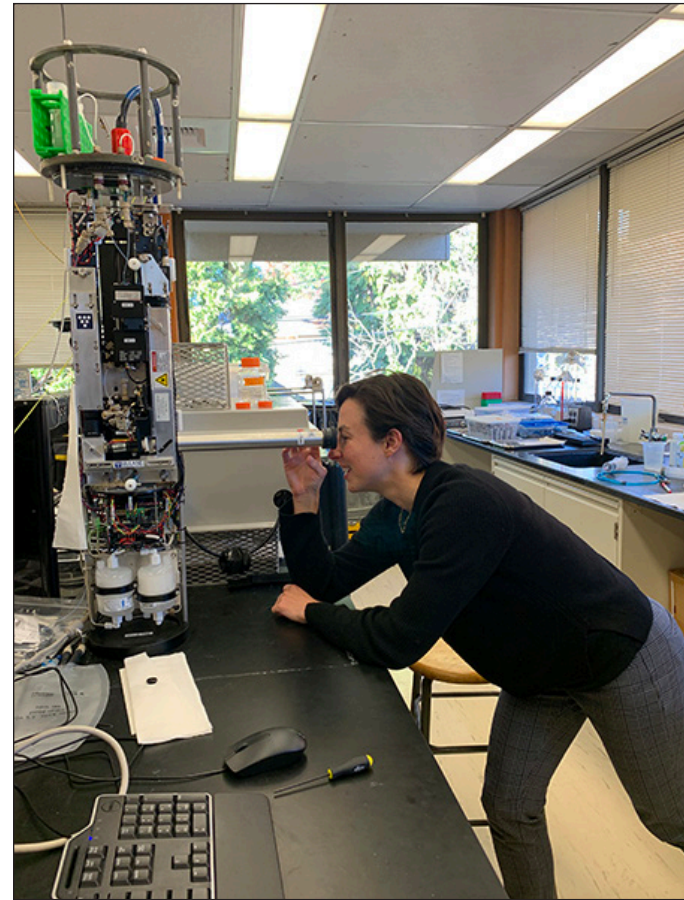
The main project Dr. Fischer is working on is in South Puget Sound at a site called Budd Inlet. It's purpose is to understand the environmental

factors driving harmful algal blooms (HABs) of the species of a genus called *Dinophysis*. While this type of algal bloom is not uncommon to the area, they can “cause diarrhetic shellfish poisoning (DSP) in humans” (NOAA). These toxic blooms can poison local seafood and cause consumers to get sick if they eat it. Fischer’s goal in studying this is to understand “the key environmental drivers of these blooms” to assist and “inform natural resource managers to protect public health.”

Through the use of the IFCB, both this year and last they have been able to record *Dinophysis* blooms, and have been able to gather some quality data. The IFCB itself is a large and heavy instrument that needs to be lifted up with a winch and is stored in a boat house. From this data stream Alexis is able to examine not only the community of other organisms that *Dinophysis* exists among, but important variables that could potentially influence algal blooms like water temperature, humidity, and time of the year. The data that Fischer collects from the IFCB [can be seen here](#) and can be sorted by many different factors noted in the sampling process.

This most recent data collection is being completed around now and Fischer explained that “We’re going to have two years of data... [and] then I can really start working with the data with the goal being to write a scientific paper based off of these two years of data and the environmental factors that led to the bloom last year.” With all the data, they will be able to ask themselves all kinds of questions such as whether ocean acidification appears to play a role in *Dinophysis* blooms. Also while warmer temperatures tend to help all blooms, there is a point where it stops being helpful for growth, so the questions of what cytoplankton will be winners or losers in a warming world may become clearer.

Dr. Fischer explained the challenge kind of going forward for monitoring as a whole is that the traditional way of looking for HABs is by people taking weekly water samples, which are then counted and they get results two days later. By then it’s “too late to actually let a resource manager, know about a



Alexis Fischer, CPAESS scientist with IFCB Fischer prepping their ocean robot, the Imaging Flowcytobot (IFCB), to take samples for their research.

bloom.” Additionally traditional methods can not easily track whether a bloom is migrating vertically, so you “have a higher potential to miss things with the traditional ways of sampling.” It is for this reason the IFCB method is great, although expensive. Alexis is hopeful the cost will come down for its use, so that it can be more broadly implemented in tracking HABs.

When asked if there was anything in their childhood that led them to this career path, Alexis answered “I’ve been always very fascinated with just the alienness of ocean life. Ever since I was a child...we used to go tide pooling and go to the beach pretty regularly. That was always just such a highlight for me. I even had a pet a nudibranch, which it’s like a

sea slug.” The various adaptations of ocean creatures and what qualities made them a successful species in what environment captivated them, so applying this same curiosity to the study of phytoplankton made sense. In order to predict these blooms “we need to understand the weirdness of these species” and in doing so we can then “protect public health...I think in a nutshell, this is why I was excited about [my field of research] why I’ve continued with it.”

We appreciate all of your fascinating work Dr. Fischer and look forward to your findings as you comb through your data. [Learn more about their work here.](#)

Trained to Mentor: USGS Water Mission Workshop

Our team at the [U.S. Geological Survey - Water Mission Area](#) has been hard at work training staff. This is a massive undertaking to develop a centralized training program for a staff of 4,000 people from different backgrounds, education levels, job categories, geographic locations, and expectations for training. In spite of how daunting this undertaking is, this team is doing a fabulous job.

At one of their trainings was held from September 19 - 21, 2023 in Columbus, Ohio. CPAESS Project Specialist Amy Barfield and Marissa Vara, who helps part-time with this effort in addition to her UCAR SciEd team duties, led a workshop for U.S. Geological Survey Water staff in-

terested in mentoring early career employees. The workshop included attendees from across the U.S. and focused on holistic mentoring skills. This is the first time this training has been done with U.S.G.S. and the participants created plans to apply the tools discussed in their technical environments.

One attendee said, “Privilege and compassion impact technical abilities, so holistic training is essential.” Julie Malmberg exclaimed that “Amy and Marissa did a fantastic job!” Support was provided by the entire Water Division team as well as CPAESS Program Specialists Kelly Davis, Tori Roy, Aiyana Spear, Grant Walters, and Julie Malmberg, CPAESS Sr. Learning & Development Officer who were also in attendance.

Check out Dr. Julie Malmberg’s CPAESS Seminar concerning her team’s work at USGS called [“Building a Comprehensive Workforce Development and Training Program.”](#)



CPAESS’s Amy Barfield leads a training with U.S.G.S. staff on mentoring.



Former Explorers-in-Training Kathrin Bayer and Daryin Medley process mapping data in the control room aboard NOAA Ship *Okeanos Explorer*. Image courtesy Caitlin Bailey, GFOE.

Exploration in Alaska Aboard the *Okeanos*

One of the many programs that CPAESS works on is the [NOAA Explorer In Training Internship](#). As part of its mission to train the next generation of ocean explorers, scientists, engineers, and communicators, NOAA Ocean Exploration hosts students in the Explorer-in-Training Program. These interns gain valuable, interdisciplinary experience in ocean exploration while collaborating on office projects and expeditions.

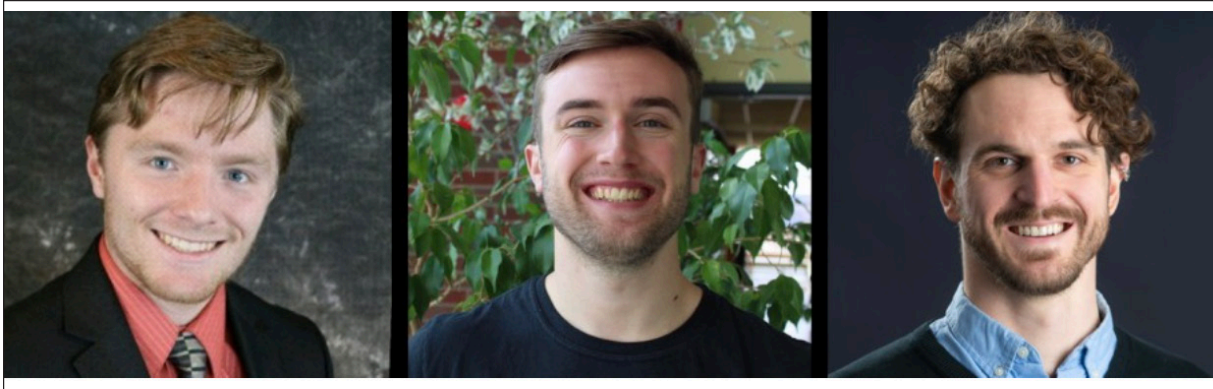
The program equips participants with skills to meet the current and future demands of the ocean exploration workforce, providing meaningful experiential learning opportunities that support NOAA Ocean Exploration’s mission and inspire ocean literacy for the next generation. The program features two internship options: (a) 2 to 4-week expedition-based opportunities and (b) 10-week summertime opportunities. The 10-week internships give students an opportunity to develop their skills and knowledge through long-term

projects supported by NOAA Ocean Exploration mentors. The 2 to 4-week expedition-based internships involve participation in specific NOAA Ocean Exploration-supported expeditions, giving participants the chance to contribute to mission efforts while gaining tangible skills that can benefit their future pursuits.

Some of these internships are aboard NOAA’s *Okeanos*, the only federally funded vessel used exclusively for scientific exploration. The 2-4 week Hydrography and Seafloor Mapping internship takes place aboard *Okeanos*. Students will provide critical bathymetric data needed to achieve a baseline understanding of previously unexplored areas. They will support mapping operations by collecting and processing these data with support from experienced map-

ping technicians. Beyond seafloor mapping, these interns will also participate in water column and sub-seafloor mapping, and gain tangible skills in the use of geographic information system (GIS) software, and data management.

This year three interns have been selected for this expedition and are Dana Carris, graduate of Texas A&M University; Brett Woodworth, graduate of SUNY Geneseo; and Cameron Kuhle, graduate of the University of Alaska. Of the opportunity Brett shared “In my future career, I aspire to conduct research for an organization, like NOAA, and the Explorer-in-Training Internship will allow me to gain tangible skills working with bathymetric tools and data to prepare me for a career in deep-sea research. I look forward to learning how to conduct at-sea research, add seafloor mapping to my researching repertoire, and make lasting professional connections for potential future collaborations and career opportunities.” While Cameron explained that a “lifetime in Alaska has made evident to me that our livelihood is intertwined with the ocean, and after I have explored and learned so much about terrestrial Earth environments it is now time



New 2023 Explorers In Training interns (left to right): Dana Carris, Brett Woodworth and Cameron Kuhle.

to expand my knowledge of marine systems, both physical and biological. I am looking forward to not just connecting with researchers and professionals to learn oceanography with state-of-the-art techniques and technology, but to have a personally-enriching oceangoing experience seeing a

part of the world near my home state that is inaccessible to even residents.”

They will be arriving in Seattle to head to Dutch Harbor, Alaska this May. “From the end of March through April, NOAA Ocean Exploration will conduct shake-down mapping and remotely operated vehicle (ROV) diving operations along the U.S. west coast before transiting to Alaska and spending the majority of the field season in Alaskan waters and throughout the Aleutian Islands (source [NOAA](#)).” Congratulations to each of you for securing this incredible opportunity. Learn more about [this program](#) and the [Okeanos](#).



CPAESS staff working at GFDL with Hanne and Cindy on their recent visit.

Traveling Cross Country for Staff

With COVID waning and the ability to travel and meet people in person now available, SPS | CPAESS Director Hanne Mauriello and Deputy Director Cindy Bruyère have been on the road connecting with CPAESS’ over 100 scientists and scientific staff across the country.

Among other things, discussions have included the CPAESS Supervisory Structure, UCAR Significant Accomplishment awards (and other awards), Diversity, Equity and Inclusion (DEI) and other opportunities available to them as UCAR staff, the upcoming Performance



National Hurricane Center Storm Surge Unit staff with NHC Deputy Director Jamie Rhome in the front and center.

Associate Scientist III; Liwei Jia, Project Scientist II; Feiyu Lu, Project Scientist II; Matthew Morin, Associate Scientist III; Hiroyuki Murakami, Project Scientist III; Matthew Thomas, Associate Scientist III; Hans Vahlenkamp, Software Engineer/Programmer III; He Wang, Project Scientist II; Baoqiang Xiang, Project Scientist III; and Liping Zhang, Project Scientist II.

From April 24-25th Hanne and Cindy visited staff and sponsors in Miami, Florida at the National Hurricane Center (NHC), where CPAESS employees are the bulk the NHC's Storm Surge Center staff including: Joshua Alland, Associate Scientist III; Jim Applegate, CPAESS | NHC Web Developer III; Lixion Avila, (Casual) Administration /Clerk III; William Booth, Associate Scientist IV; Luis Cortes-Her-

Evaluation process, and opportunities to share their science with the CPAESS Discovery Seminars. At the different visits, staff that typically work remotely are flown in to participate in person. So these are unique and fulfilling gatherings for everyone involved.

Thus far Hanne and Cindy have visited with CPAESS staff working at the Geophysical Fluid Dynamics Laboratory (GFDL) in Princeton, New Jersey. This visit occurred from March 7-11, 2023. Of the visit SPS | CPAESS Director Hanne Mauriello shared, "It is so wonderful to be able to see people in person again after the pandemic. There is just no replacement for shaking hands with people and watching their eyes light up as they share their work with us."

UCAR | CPAESS Staff members at GFDL include: Dennis Adams-Smith, Software Engineer/Programmer IV; Jason Alvich, Software Engineer/Programmer III; Jan-Huey Chen, Project Scientist II; Wenhao Dong, Project Scientist I; Raphael Dussin,



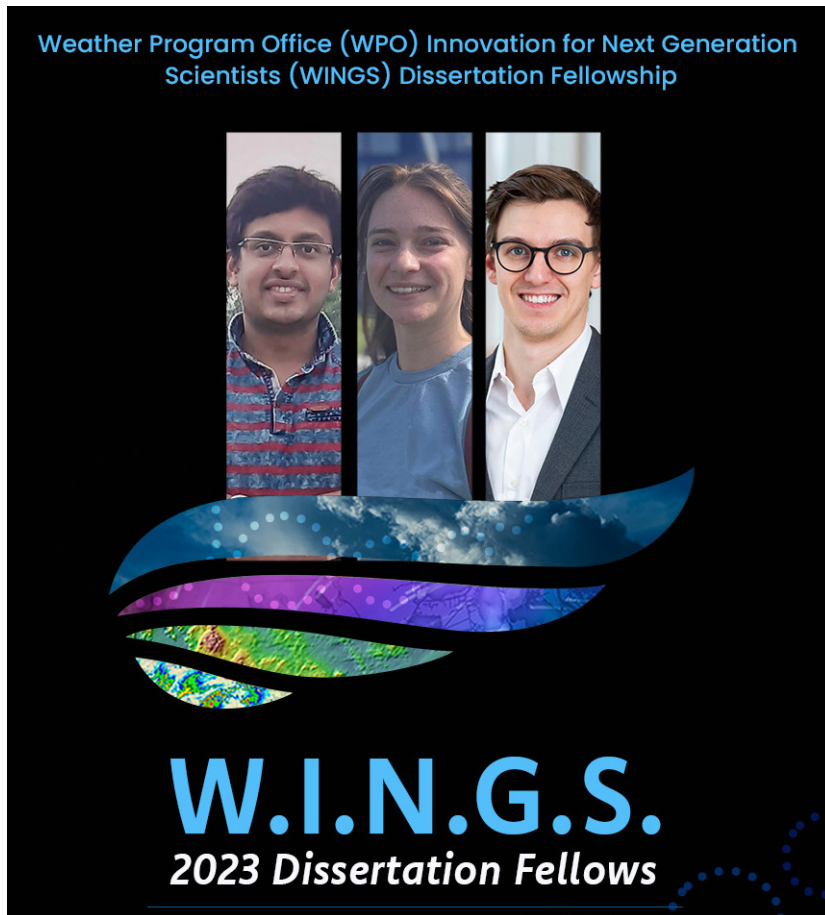
Visit with AOML's Research Division: from left to right Cindy Bruyère, Hanne Mauriello, Mark Franks (Director, AOML Hurricane Research Division) and Shirley Murillo (Deputy Director, AOML Hurricane Research Division). Thanks to Xuejin Zhang, IT Specialist for taking the picture.

nandez, Program Specialist I; Ethan Gibney, Associate Scientist IV; Andrew Penny, Associate Scientist IV; Tarah Sharon, Associate Scientist IV; and Ben Trabing, Associate Scientist III.

Also in Florida was a visit to sponsors and staff at NOAA’s Atlantic Oceanographic and Meteorological Laboratory (AOML) and NOAA’s Southwest Fisheries Science Center from April 26–27th. CPAESS’ staff at AOML include: Sean Casey, CPAESS Project Scientist I; Jakir Hossen, CPAESS Project Scientist I (Oceanographer); Benjamin Johnston, Project Scientist I; Mike Mueller, Project Scientist I; Connor Nelson, CPAESS Project Scientist I – Atmospheric Sci-

ence; and Christopher Riedel, Project Scientist I. CPAESS staff at NOAA’s Southwest Fisheries include both Alexis Fischer, Associate Scientist II and Lynne Hodge, Associate Scientist I. Both Hanne and Cindy had a wonderful time meeting and connecting with our co-workers in person, some for the first time.

Next on the travel agenda is a weeklong visit to Washington, D.C. from June 5–9th to meet with the extensive staff CPAESS has in both D.C., and the many NOAA offices in Silver Spring, Maryland and College Park, Maryland. Both Hanne Mauriello and Cindy Bruyère greatly look forward to meeting with everyone!



Welcome NOAA’s Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Fellowship Inaugural Class (left to right); Shreyas Rajendra Dhavale, Emily Faber, and Joey Knisely.

Welcome NOAA’s Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Fellowship Inaugural Class

UCAR | CPAESS and NOAA’s Weather Program Office are excited to welcome the inaugural class of the Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Dissertation Fellowship of 2023–2024. The purpose of this fellowship is to help Ph.D. students gain real-world, doctoral experience applying expertise in their field of study to weather model development with the Earth Prediction Innovation Center (EPIC). The WINGS Fellowship will develop and foster the next generation of science, technology, engineering, and mathematics (STEM) scholars, with the goal of bolstering the future workforce of America’s Weather Enterprise.

The WINGS Fellowship is designed for Ph.D. candidates who have completed their required coursework and are in the beginning stages of writing a dissertation. Fellows will work with their academic advisor and a mentor recommend-

ed by WPO and CPAESS, to provide guidance during the dissertation process. This inaugural award year will focus on research relevant to NOAA’s Earth Prediction Innovation Center (EPIC) Program mission – to serve as a catalyst for community research and modeling system advances that continually inform and accelerate improvements in the Unified Forecast System (UFS), spanning local to global domains and predictive timescales from sub-hourly analyses to seasonal predictions. It will be a pilot focused on scientific outcomes related to the EPIC program, which aims to improve operational weather and climate forecast systems through scientific and technical innovation via model co-development with the weather enterprise.

Future fellowship years will explore other aspects of the WPO’s research. “In pursuit of its vision and mission, WPO works closely with the National Weather Service (NWS) to help develop and transition weather research, including hurricanes, severe thunderstorms, heavy precipitation, and air pollution. Additionally, WPO utilizes social science to learn how to deal with the uncertainties weather presents and to inform its engagement and communication with researchers, funders, and the public” (NOAA).

Dorothy Koch, Director of NOAA’s Weather Program Office, is excited about the launch of this new weather educational program and community partnership. “WINGS is enabling NOAA to foster the education of scientists in areas most critical for improving weather research and forecasting, and I am looking forward to welcoming this first class of recipients to work with EPIC and the UFS!”



Left to right: SPS CPAESS Deputy Director Cindy Bruyère, NOAA EPIC Program Manager Maoyi Huang, NOAA EPIC Program Coordinator Jennifer Vogt, WPO Deputy Director John Ten Hoeve, WINGS Doctoral Fellow Emily Faber, WINGS Doctoral Fellow Shreyas Rajendra Dhavale, WINGS Doctoral Fellow Joey Knisely, WPO Director Dorothy Koch, CPAESS Program Specialist Kate Rodd, NOAA WPO Policy & Partnership Lead Tamara Battle, and SPS CPAESS Director Hanne Mauriello.

Hanne Mauriello, Director of UCAR’s Scientific Partnerships and Services Center (SPS) and CPAESS said of the program “We are honored to manage the new WINGS program. NOAA’s Weather Program Office is incredibly insightful to have created a fellowship to help students gain real world experience in the field while they are completing their dissertation. This combination of academic and experiential learning will uniquely enable these students to succeed in addressing the future needs of our nation with weather forecasting.”

The WINGS Dissertation Fellowship will be awarded for two years with a potential extension if approved. The WINGS Dissertation Fellowship is sponsored by NOAA’s Weather Program Office and selected by the University Corporation for Atmospheric Research (UCAR)’s Cooperative Program for the Advancement of Earth System Science (CPAESS).

WINGS will enable fellows to gain insights into their respective fields of study, support the fellows’ in-

tegration into the workforce, and offer a unique opportunity to contribute to forecast model development. Proposals on this following topics were considered for this inaugural FY23 WINGS cohort as follows:

- Data Assimilation
- Atmospheric Physics
- Systems Architecture (coupling, workflow, continuous integration and development)
- Machine Learning/Artificial Intelligence
- Software Engineering to advance numerical weather prediction

Welcome NOAA’s Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Fellowship Inaugural Class (left to right); Shreyas Rajendra Dhavale, Emily Faber, and Joey Knisely.

A sincere congratulations to our new fellows!

Shreyas Rajendra Dhavale

Host: Dr. Anantha Aiyyer
 PhD Institution: North Carolina State University
 Proposal: The origin and evolution of the Monsoon onset vortex and its subseasonal impacts: Integrating Theory and predictability studies using the UFS

Emily Faber

Host: Dr. Adriana Rocha-Lima
 PhD Institution: University of Maryland Baltimore County (UMBC)
 Proposal: Impacts of Surface Winds on Dust Emissions: Comparison of Measurements and Models to Improve Model Parameterization and Further Understanding of Sub-grid Processes

Joseph Knisely

Host: Dr. Jon Poterjoy
 PhD Institution: University of Maryland’s Department of Atmospheric and Oceanic Science (AOSC)
 Proposal: Exploring New Satellite Bias Correction Methodologies for Numerical Weather Prediction within Theoretical and Operational Frameworks

It was our sincere pleasure to be able to connect with these new fellows and our NOAA Weather Pro-

gram Office partners at the recent “Unifying Innovations in Forecasting Capabilities Workshop” CPAESS managed in Boulder, CO where our fellows shared their science with attendees.

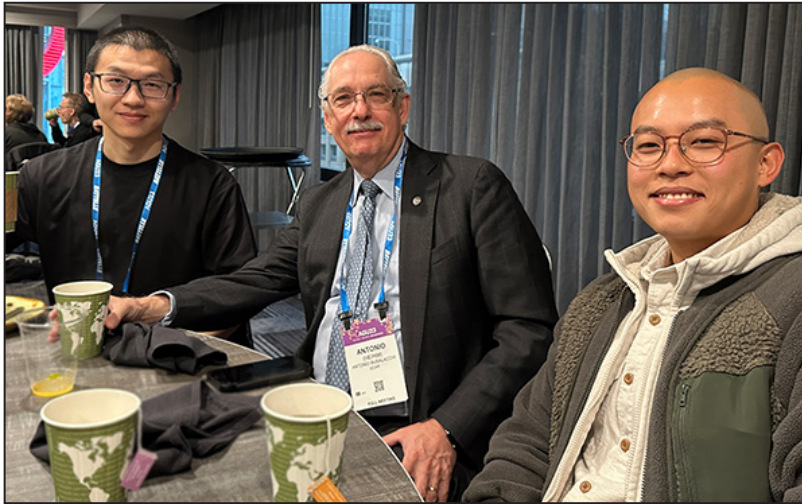
Gathering at AGU 2023

From December 11-15, 2023 the annual American Geophysical Union (AGU) convened in San Francisco, California. CPAESS staff were ready to make the most of this renowned opportunity by meeting with each other and presenting their work at the conference with 27,934 registered attendees from over 100 countries (Source).

The weekend prior to AGU, our partner NOAA’s Office of Ocean Exploration provided tours of their ship the *Okeanos* to the registered public. On this fascinating tour, they explained the many cooperative efforts that NOAA engaged in to optimally utilize this only federally funded vessel used exclusively for ocean exploration including the use of remote-operated vehicles (ROVs) to collect data, the execution of sea-floor mapping, cooperative marine archaeological research, and numerous biological and ocean life exploration and observation



CPAESS Communication Specialist Rachel Gulbraa who works with NOAA’s Ocean Exploration explains the varied important work that the *Okeanos* performs during each expedition.



CPAESS Researcher Peijin Zhang, NASA Jack Eddy Fellow enjoys breakfast and a friendly chat with UCAR President Tony Busalacchi and NCAR ASP Fellow Osamu Miyawaki.

on the vessel. CPAESS is proud to have eleven staff members working with NOAA’s Ocean Exploration as well as partnering with them on the NOAA Explorers-In-Training program. It was a thrill to meet with our NOAA colleagues and the ship that is so often integral to their work.

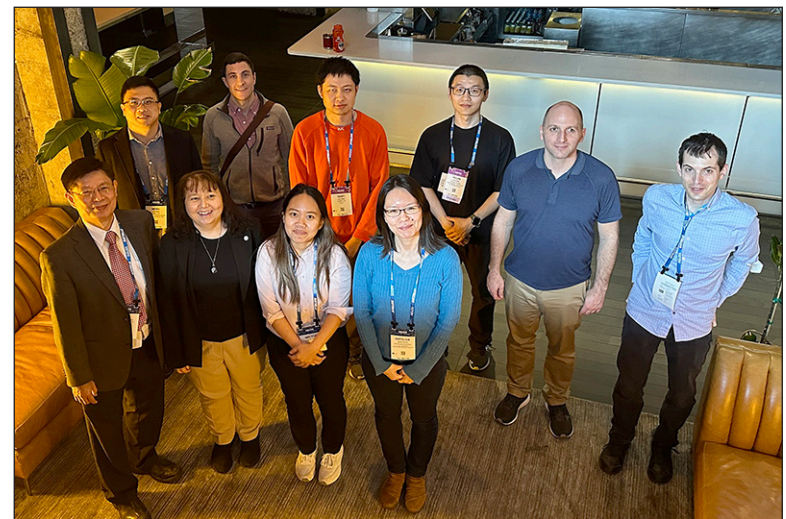
While the *Okeanos* was docked outside San Francisco’s Exploratorium Museum, CPAESS Communication Specialist Rachel Gulbraa who works with NOAA Ocean Exploration, gave a talk inside the museum about what happens on the ship and the nature of its ocean exploration work. Her talk was well attended and was included in Local News Matters – Bay Area coverage of the tour, her talk, and the tabling event at the Exploratorium. This unique work aboard the *Okeanos* is truly fascinating and uniquely valuable. For example, the mapping executed by the ship is critical as only 50% of the seafloor near the United States has been mapped. Worldwide the figure is only 25%.

During AGU, CPAESS staff gave seventeen different oral presentations and poster sessions. Some of our staff were also able to attend the UCAR | NCAR Presenters Breakfast on Tuesday morning including our NASA Jack Eddy Fellow Peijin Zhang. It was

a great opportunity for CPAESS staff, who are located all across the United States to meet with their UCAR and NCAR colleagues and leaders.

CPAESS took advantage of this conference gathering many of our staff together to hold two different luncheons with our postdoctoral fellows and alumni. On Tuesday, CPAESS Event Planning Lead Maggie Costley arranged a delicious and informative luncheon at Marlowe’s for our NOAA Climate and Global Change postdoctoral fellows and alumni. CPAESS Deputy Director Cindy Bruyère opened the luncheon up and we had with NOAA Climate Program Office Deputy Director Dr. Ben DeAngelo and Dr. Alicia Karspeck of [C]Worthy as guest speakers. We packed the restaurant and it was an excellent opportunity for current and past fellows to meet each other and network with NOAA and UCAR leadership.

On Thursday, another luncheon for the NASA Jack Eddy Postdoctoral Fellowship was held for alums and current fellows. In addition to our Madhulika “Lika” Guhathakurta, Senior Advisor at NASA Helio-physics; Simon Plunkett, NASA Program Scientist; John McCormack, NASA Program Scientist; and Bill Kuo, UCAR Community Programs Director numerous students and alumni were able to chat with



Dr. Bill Kuo and Dr. Cindy Bruyère gather with remaining NASA Jack Eddy fellows and alumni after the luncheon at AGU.



CPAESS Deputy Director Cindy Bruyère, NOAA Climate and Global Change Fellows Jhordanne Jones and Aaron Potkay, and CPAESS Program Specialist Kate Rodd at the UCAR NCAR Booth.

Colorado with the first snowfall of the season. This event continues the legacy of the frontier-thinking, cross-disciplinary gathering that the Eddy Symposia have come to define. The overarching theme of the 4th Eddy Symposium was “Why Grand Challenges in Solar Terrestrial Physics Require Open Science and How to Achieve It?”

The event was quite international with students from across the globe invited to present and participate. After an introduction from the symposium’s catalyst, Dr. Madhulika “Lika” Guhathakurta NASA Senior Advisor, the gathering was opened by Dr. Gavin Schmidt, Director of NASA Goddard Institute for Space Studies on “Progress in modeling solar-climate interactions.” Each day numerous presentations were given following themes, and each afternoon the assemblage was sorted into working groups. The working groups focused on the different themes and discussions focused on how to further the application of Open Science through the three focused areas:

each other, share their research, and learn about upcoming opportunities.

CPAESS staff Kate Rodd and Dawn Mulally shared the numerous educational opportunities we offer for students at the UCAR NCAR table. Additionally, Dr. Nicholas Gross gave heliophysics demonstrations with silly putty at the booth to illustrate the importance of this important emerging field and our NASA Heliophysics Summer School. We tried to meet as many staff people as possible to appreciate and learn about their studies, and you are a truly impressive lot.

Open Science Applied Across Heliophysics Disciplines

From October 29 - November 3, 2023 the 4th Eddy Symposium was held in Golden,



SPS | CPAESS Director Hanne Mauriello opens up the 4th Eddy Cross-Disciplinary Symposium.

- The Interconnection of Sun, Climate, and Society
- Risk and Resiliency to Space Weather Disruption
- (Exo)Planetary Atmosphere: the Impact of Stars and Solar Physics on Habitability & Life

A broad spectrum of issues were covered over the course of the week from “If It’s Not Open, It’s Not Science” from Greg Kopp, University of Colorado / LASP; to “The Power of Open Data – a Grid Hazard Analysis” from Jennifer Gannon, VP of R&D at Computational Physics, Inc.; to “CryoCloud: Accelerating scientific discovery for Cryosphere communities with the open cloud infrastructure” with Tasha Snow, Colorado School of Mines; and “The Sun-Earth System in Time: Searching For Habitable Earth-like Exoplanets” with Vladimir Airapetian, NASA Goddard Space Flight Center, Greenbelt, MD and American University, Washington, DC as some examples. On Wednesday evening a banquet was held with guest speaker Holly Gilbert, Director of the NCAR High Altitude Observatory (HAO) on “A Piece of the Space Weather Puzzle: Understanding Solar Magnetism.” Talks were filmed for future use and participants on Slack asked questions of the speakers. [See the agenda and videos do see the presentations.](#)

Our students were very excited to meet leaders in the many interdisciplinary fields touching these interconnected themes. Besides giving presentations to the group, these students were able to become integral to the working groups. Many were very excited to make this journey for the event. For several students, this was their first journey to the United States. Both Kalpesh Ghag and Omkar Dhamane were written up in their local papers for presenting at this symposium.

The 4th Eddy Cross-Disciplinary Steering Committee included Dan Marsh (co-chair), University



Graduate students from India who presented at the 4th Eddy Symposium. From left to right: Pawan Kumar, Kalpesh Ghag, Omkar Dhamane, Souvik Roy, and Vijayalakshmi Prakash.

of Leeds; Ryan McGranaghan (co-chair), NASA Jet Propulsion Laboratory; Erika Palmerio, Predictive Science, Inc.; King-Fai Li, University of California Riverside; Ankush Bhaskar, India Space Research Organization; Meng Jin, Lockheed Martin; Jim Colliander, 2i2c; Rajesh Gupta, Department of Energy Science and Engineering, IIT Bombay; and Madhulika Guhathakurta, NASA Senior Advisor. Your contributions and insight in directing to this cutting-edge symposium are greatly appreciated.

Work after the 4th Eddy Symposium is ongoing. The Working Groups are continuing with their brainstorming sessions and efforts to move science forward in the areas of: Exoplanets; Space Weather; and the Interconnection of Sun, Climate and Society with virtual meetings.

Borne from last year’s Eddy Symposium was a white paper on [“How Open Data and Interdisciplinary Collaboration Improve Our Understanding of Space Weather: A Risk & Resiliency Perspective,”](#) as well as [a new publication in Frontiers.](#) [Learn more](#) about this unique interdisciplinary symposium.



Some of the attendees of the 4th Eddy Cross-Disciplinary Symposium held in Golden, Colorado.

NOAA Climate & Global Change Postdoctoral Fellows: Class of 2023

Eight new postdoctoral fellows are commencing cutting-edge research projects that will contribute innovative climate science to the research community as well as NOAA’s mission.

These fellows are the new 2023-2024 class of [NOAA Climate and Global Change \(C&GC\) Postdoctoral Fellows](#), supported by NOAA’s Climate Program Office (CPO) and selected by the University Corporation for Atmospheric Research (UCAR).

“Since 1991, the NOAA Climate and Global Change (C&GC) Postdoctoral Program has been cultivating the next generation of climate and global change experts,” said Wayne Higgins, Director of NOAA’s Climate Program Office. “With this year’s class of eight talented fellows, the Program has now sponsored 263 fellows who are collectively helping to build a diverse community of experts in climate and global change research.

Chosen from 72 applications through a competitive review process, the fellows are promising early career scientists who are within five years of completing their PhDs. Over the next two years, the eight fellows will be hosted by mentoring scientists at universities and research institutions around the country to conduct projects focused on observing, understanding, modeling, and predicting climate variability and change.

“The C&GC fellowship provides early career scientists a unique opportunity to pursue cutting edge climate research questions at their institution of choice, while building a network that spans disciplines and geographies with current fellows, former alumni, and NOAA Research,” said Ginny Selz, the NOAA C&GC Postdoc Fellowship Program Federal Liaison and CPO Climate Variability and Predictability Program Manager.

Sponsored by NOAA’s Climate Program Office (CPO) and managed by UCAR’s Cooperative Programs for the Advancement of Earth System Science (CPAESS), the NOAA C&GC Postdoc Fellowship Program helps create and train the future leading researchers needed for climate studies. “UCAR | CPAESS is honored to manage the prestigious and critical NOAA Climate and Global Change fellowship. Great effort goes into creating a nurturing bridge between their academic work and that of a career scientist with extensive networking and career development opportunities.” said Hanne Mauriello, Director of UCAR’s CPAESS.

The Program was originally founded in 1990 by former CPO Director, Dr. J. Michael Hall, in response to the lack of trained climate scientists to analyze the massive quantity of data collected by the international Tropical Ocean Global Atmosphere Program (TOGA), which ran from 1985 to 1994. Over the past 30 years, the Program has developed an outstand-

ing reputation of attracting the best and brightest PhDs in the climate sciences.

This fellowship traditionally supports two forums where fellows can engage with NOAA and each other— a NOAA Summer Institute every other July, as well as an annual alumni luncheon at the American Geophysical Union (AGU) Fall Meeting in December. The global pandemic, however, required innovation for the Program to continue facilitating interactions between the fellows and the larger NOAA community. Since January 2021, UCAR has hosted monthly virtual seminars featuring presentations by two current C&GC postdocs along with an invited NOAA scientist, or special professional development guest.

During the NOAA Summer Institute program, fellows and alumni come together with the goal of building a stronger global climate change community. The postdoctoral fellows meet each other and more senior scientists in the field over a four-day period. Participants explore the breadth of climate and global change research problem areas, discuss the future directions of climate science research, and discuss the bridge between climate and global change scientific goals and public policy.

Fellows, alumni, and guest get a tour of the Storm Peak Lab about Steamboat Springs as Dr. Gannet Hallar and her husband explain the atmospheric science conducted at the lab.



NOAA C&GC Fellows – Class of 2023: Top Row – Aaron Potkay, Arianna Varuolo-Clarke, Clare Singer, Lilian Dove. Bottom Row – Lily Hahn, Makoto Kelp, Noam Vogt-Vincent, Ronnakrit Rattanasriampaipong

The postdocs' achievements after the fellowship continue to benefit NOAA and the larger scientific community. C&GC fellows go on to serve notable roles in climate science, from the first acting NASA Senior Climate Advisor to academic researchers investigating the submarine melting of glaciers, the atmosphere's self-cleansing capacity, or the role of atmospheric circulation in the prediction of El Niño and La Niña events.

Many former fellows credit the Program with expanding their independence as scientists as well as supporting their professional growth at a crucial time in their career. For the incoming class of fellows, this means being connected to a network of current and former NOAA postdocs and a community of scientists across a wide range of disciplines related to climate science.

2023 NOAA Climate & Global Change Postdoctoral Fellowship Awardees

Lilian Dove

Proposal Topic: Vertical Density Stratification and Spatial Variability of Submesoscale Carbon Fluxes across the Southern Ocean

Host: Dr. Mara Freilich, Brown University & Dr. Lia Siegelman, Scripps Institution of Oceanography
PhD Institution: California Institute of Technology

Lily Hahn

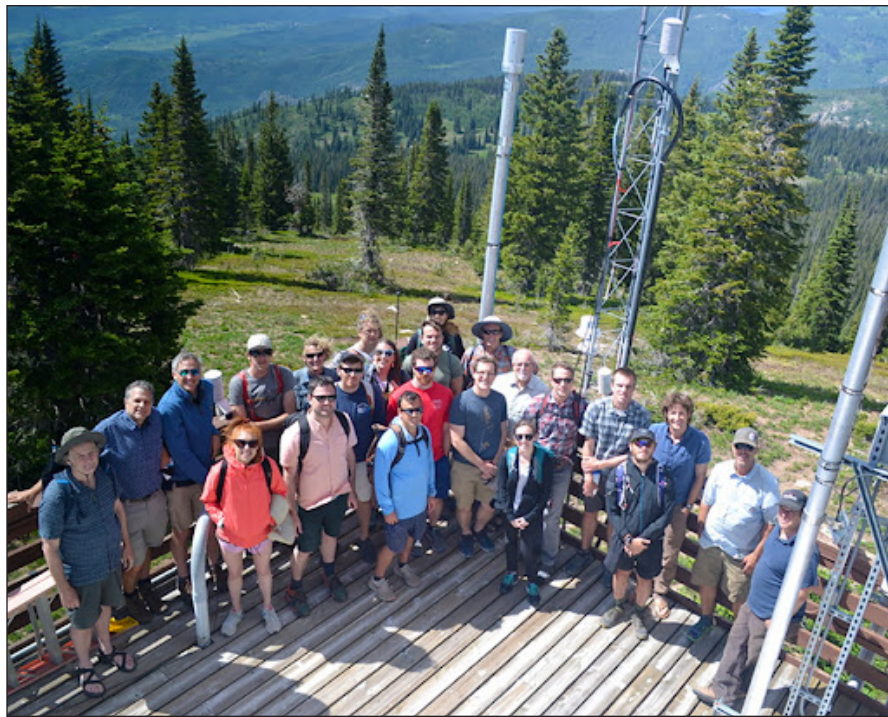
Proposal Topic: Impacts of the Atlantic Meridional Overturning Circulation on Global and High-Latitude Warming

Host: Dr. Nick Lutsko at Scripps Research Institution of Oceanography
PhD Institution: University of Washington

Makoto Kelp

Proposal Topic: PREscribed Fire Intelligent Recommendation System (PREFIRS): Uncovering the Climate Drivers of Smoke Exposure in the Western United States

Host: Dr. Noah Diffenbaugh, Stanford University



Fellows, alumni, and guest get a tour of the Storm Peak Lab about Steamboat Springs as Dr. Gannet Hallar & her husband explain the atmospheric science conducted at the lab.

PhD Institution: Harvard University

Aaron Potkay

Proposal Topic: Understanding and predicting forest dynamics under drought and heatwaves: Application of a novel growth maximization theory

Host: Dr. Xue Feng, University of Minnesota
PhD Institution: Rutgers University

Ronnakrit Rattanasriampaipong

Proposal Topic: TEXAS: Towards a full proxy system modeling of TetraEther index of Ammonia oxidizers and reanalysis of temperature trends for the past 100 million years

Host: Dr. Jessica Tierney, University of Arizona
PhD Institution: Texas A&M University

Clare Singer

Proposal Topic: Using observed hemispheric albedo symmetry to understand coupling between clouds and circulation

Host: Dr. Yi Ming and Dr. Pincus at Boston College and Lamont/Columbia
PhD University: California Institute of Technology

Arianna Varuolo-Clarke

Proposal Topic: Investigating drivers of midlatitude precipitation change in a warming world

Host: Dr. Jennifer E. Kay at University of Colorado, Boulder
PhD Institution: Columbia University

Noam Vogt-Vincent

Proposal Topic: The potential for coral reef range expansion

Host: Dr. Lisa McManus, University of Hawai'i at Manoa
PhD Institution: University of Oxford

A sincere congratulations to you all! Learn more about this program and the NOAA | UCAR 33-year-old partnership.



President Biden looking at a print out of products produced by CPAESS staff as he examines the progression of hurricane Idalia.

CPAESS at the National Hurricane Center

The National Hurricane Center’s job is to issue forecasts on all tropical cyclones in the North Atlantic and Northeast Pacific basins. An important part of the National Hurricane Center is the Storm Surge Unit. These scientists are “a small group of highly trained meteorologists and oceanographers specializing in predicting storm surge heights accompanying landfalling tropical cyclones using the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computer model” ([NOAA](#)).

CPAESS staff make up 11 members of this unit, which is the majority of this important team. Our co-workers at the Storm Surge Unit include: Joshua Alland, Associate Scientist III; Alexandria Andonian, CPAESS Associate Scientist III – GIS Specialist; Jim Applegate, Web Developer III; Lixion Avila, Casual – Administrative Clerical III; William Booth, As-

sociate Scientist IV; Allie Brannan, CPAESS Associate Scientist III; Luis Cortes-Hernandez, Program Specialist I; Ethan Gibney, Associate Scientist IV; Andrew Penny, Associate Scientist IV; Tarah Sharon, Associate Scientist IV; and Ben Trabing, Associate Scientist III.

This unit is particularly important because the impact of storm surge can be deadly. Intense storms like tropical cyclones, typhoons or hurricanes cause the sea level to rise. These storms then produce extremely strong winds which push water into shore, and can lead to flood-

ing, sometimes in the extreme. These floods or storm surge can cause considerable damage and loss of life. Our co-workers take their responsibilities to protect people’s lives and property very seriously.

The excellent work of this team has not gone unnoticed, even at the highest levels of government. During Hurricane Idalia, we have President Biden looking at a print out of products produced by CPAESS staff as he examines the progression of the hurricane. These products were created by CPAESS staff members Ethan Gibney, William Booth, and Laura Alaka (formerly of CPAESS). Congratulations to the three of you for generating such superb work that the president of the United States uses it. Thank you to the whole team for your wonderful life-saving efforts that safeguard the people of our country everyday.

Learn more about the [National Hurricane Center](#) and the [Storm Surge Unit](#).



A sampling of some of our new supervisors. Top Row: Mike Mueller, Sean Casey. Middle Row: Andrew Penny, Ethan Gibney, Luis Cortes-Hernandez. Bottom Row: Grant Walters, Akio Correll.

Welcome New CPAESS Supervisors

CPAESS has been busy modernizing our supervisory structure to better serve our staff members. As a result of this, we have a new set of people who have supervisory duties added to their positions. We are so happy to have you assisting in this critical role of supporting staff and ensuring clear communication between them, SPS CPAESS, and our sponsors.

The following are our new additions to the CPAESS Supervisory crew. At NOAA’s Quantitative Observing System Assessment Program (QOSAP) we have Mike Mueller and Sean Casey. At the National Hurricane Center’s Storm Surge Unit we have Andrew Penny, William Booth, Ethan Gibney, Joshua Alland, and Luis Cortes-Hernandez. At the Naval Research Laboratory we have Brian Flynt. At NOAA’s Geophysical Fluid Dynamics Laboratory (GFDL) we have Levin Carn and Ramachandran Nair. Lastly at the U.S. Geological Survey we have Grant Walters and Akio Correll. Congratulations to these staff members who are new additions to the CPAESS supervisory team!

Celebrating the Solar Eclipse

On Saturday, October 14, 2023 the Sun, Moon, and Earth align perfectly to create an annular solar eclipse. This eclipse created a path stretching from the Oregon coast to south Texas. “...the path of annulari-

ty is the best place to observe the eclipse. This is due to the Sun being almost completely covered by the Moon’s shadow. This phenomena will show a ring around the Moon, that some refer to as the ‘Ring of Fire’ ([Source](#)).”

To celebrate this annular eclipse, many organizations hosted in-person and virtual viewing events [including NOAA whom CPAESS assisted in Albuquerque, New Mexico](#). Of this eclipse viewing,



CPAESS Event Planner Shelley Rabern assisting with an Annular Eclipse event for the public in Albuquerque, New Mexico (photo courtesy of NOAA).

CPAESS event planner Shelley Rabern exclaimed “The Annular Eclipse event in Albuquerque was amazing. Could not have been better timing than to have it happen during the Balloon Fiesta!” NOAA interacted directly with over 7,000 people in Albuquerque and was joined by NASA, the National Science Foundation, Center of Science and Industry (COSI), and the Albuquerque Museum of Nature and Science to create an unforgettable experience for all attending.

At the Anderson Abruzzo Albuquerque International Balloon Museum, experts were available for the press to ask questions about this phenomenon and tables were set up for the public to get information, swag, and eclipse glasses. Speakers included: Michael C. Morgan, Ph.D., Assistant; Secretary of Commerce for Environmental Observation and Prediction, NOAA; Elysad Talaat, Ph.D., Director, NOAA’s Office of Space Weather Observations; Bill Murtagh, Ph.D., Program Coordinator, NOAA’s Space Weather Prediction Center; Doug Biesecker, Ph.D., Space Weather Scientist, NOAA Space Weather Fol-

low-On L-1; Alessandra Pacini, Ph.D., Space Weather Scientist, NOAA’s Center for Environmental Information; Peg Luce, Acting Director, Heliophysics Division, NASA; Kelly Korreck, Ph.D., Eclipse Program Manager, NASA; and Carrie Black, Ph.D., Program Director, NSF and Inouye Solar Telescope.

Shelley further shared “We also had ham radio operators on site. The ham radio transmissions were received in six out of seven continents and showed the impact of the eclipse on the ionosphere.” It was a remarkable event uniting people across many walks of life in learning about and witnessing the wonder of our natural world.

Another great solar eclipse is coming up on April 8, 2024 which can be seen in many parts of Mexico, the United States, and Canada. It will be the last solar eclipse visible from the contiguous United States until 2044. [Find out more about its path and safety considerations here.](#)

Social Science: Building the Bridge between Physical Science and the Public Understanding

One of CPAESS’ new hires is Senior Research Scientist Dr. Kim Klockow McClain who works in the National Centers for Environmental Prediction (NCEP) at NOAA’s National Weather Service (NWS) in Norman, Oklahoma. One of the unique things about Klockow McClain is that she is a social scientist who engineers bridges between physical science and the public. Her position will focus on social, behavioral, and/or economic sciences as they relate to the operational, organizational and communications challenges of the NCEP service centers, which include the Aviation Weather Center, Climate Prediction Center (CPC), National Hurricane Center (NHC), Ocean Prediction Center (OPC), Space Weather Prediction Center (SWPC), Storm Prediction Center (CPC), and Weather Prediction Center (WPC). In addition, this position would work with the Environmental Modeling Center (EMC) on



*CPAESS Senior Research Scientist
Dr. Kim Klockow McClain who works in the National
Centers for Environmental Prediction (NCEP).*

model post-processed products and their use by the NCEP service centers and external customers. Kim will engage with other NWS and NOAA offices and external stakeholders towards advancing greater communication and collaboration with all NCEP Centers. So the breadth of her job is great.

When asked about this unique role as a social scientist Klockow McClain shared, “social science research is an essential piece to include to be sure that we know that our science and services are making the difference for people that we want

them to make. I work in the weather community and... [NOAA’s] mission goals are really about preserving life and bolstering the economy. Those are implicitly social science objectives that a physical science agency has been charged to do. So you really need to bring in people who have that expertise in the human systems involved to help us understand how to achieve that mission.”

Kim has a unique background for this groundbreaking role. She studied both meteorology and decision science in economics as an undergraduate, not knowing exactly how she would connect them but pursuing them because of her love for both. In a research fellowship she pursued the economic impacts of tornadoes as she delved deeper into the connectivity of the two. When examining how weather impacted people’s decision making process she found that economics didn’t really answer the psychological questions of risk, time pressure, and uncertainty. This led her to see more keenly the need for solid social science to assist in communicating and working with physical scientists to apply their research in a meaningful way to the public.

Klockow McClain’s American Association for the Advancement of Science (AAAS) Congressional Science Fellowship helped her to better strategize how this bridge between physical science and people could be built with social science. She then worked in the NOAA Headquarters for several years as the first social scientist in what is now the Weather Program Office. Kim then went to the University of Oklahoma and the National Severe Storms Lab where she started the first “social science research team in the Weather Lab where it’s called the Behavioral Insights Unit.” Its purpose is to work alongside physical science developers and technology developers” so that the technology being developed is filling a clear need for emergency managers or the public.

Her position working with NCEP is a “first of its kind opportunity” and it’s specifically on the operational

side where she will enable the creation of an interpretive layer to the physical research so that it is clear how to best apply the research. She is “working to [create] that last mile bridge, bringing that knowledge in figuring out what to do with it, helping evolve our organizations so that they can better serve the needs of our populations who are at risk.”

As the Social Science Coordinator for NCEP’s operational centers, Klockow McClain is helping engineer better ways to communicate forecast uncertainty, and provide a practical lens to the vast amounts of predictive scientific information that has been created. The goal is to make sure communication is useful and not overwhelming, as well as relevant to the decisions users will have to make. To enable this, Kim is looking at how centers execute their science, seeing if they have user engagement processes, streamlining stakeholder engagement, evaluating these processes, and creating feedback loops within the community to continually improve processes that best serve everyone. As an example, she plans to utilize NCEP’s test beds with stakeholders to better find out what information is most useful to emergency management, the public, and anyone else who might use their information.

Dr. Klockow McClain’s position is unique but clearly one that will better enable the public to appreciate and utilize the potentially life-saving information generated by physical scientists. Enabling this information to be translated and framed into meaningful channels could make all the difference as to whether it is properly used or not. “What we really need to understand is our role in trying to help make things better and to come to a realistic appreciation for our goals and involve ourselves more with the society that we’re living and working in. That creating a better forecast is a part of that, and finding better ways to relate to our communities is another. So it’s really actually a very empowering path forward. We just have to build our social science capacity, bring in more people like me into all these organizations... I hope that over time, what you’ll see is around me a whole cadre

[of social scientists]. That will be how I know that I’ve succeeded.”

Welcome to UCAR | CPAESS Kim! We are delighted to have you and your unique skill sets onboard to better serve the Earth system science community and the public good.

SPS | CPAESS Deputy Director Recognized as 2024 AMS Fellow

We are thrilled to congratulate our own Dr. Cindy Bruyère for being acknowledged by the American Meteorological Society (AMS) as one of its 2024 Fellows. Cindy is the SPS CPAESS Deputy Director. This award is to recognize “outstanding individuals and organizations of the weather, water, and climate community” (AMS). Cindy will be acknowledged at the AMS Awards and Honors ceremony at the 104th AMS Annual Meeting in Baltimore, Maryland.

Dr. Cindy Bruyère’s skills spans both leadership and research. She was the Director for the Capacity Center for Climate and Weather Extremes (C3WE) at the National Center for Atmospheric Research (NCAR). She was the 2020–2021 Scientific and Engineering Leadership Fellow for the University Corporation for Atmospheric Research (UCAR), and she is a Research Fellow at the North-West University, South Africa. She holds a PhD in Environmental Management and an MSc in Dynamical and Numerical Weather Modeling.

Dr. Bruyère started her career as a researcher at the South African Weather Service. Prior to joining NCAR, she was the Assistant Director of Research Programs and Project Manager for Operational Systems at the South African Weather Service.

Her research focuses on the impact of weather and climate extremes. She has published nearly 50 papers on these topics and often presents her



work at conferences. As the nature of her is mostly convergent and actionable science driven, Dr. Bruyère is also responsible for fostering private/public partnerships. Over the last 15 years, she has successfully nurtured several international and national partnerships. These partnerships span government agencies, insurance and reinsurance agencies, water resource managers, The Nature Conservancy, the oil and gas industry, actuaries, and national and international universities. Besides strong national and international connections, she also has strong collaborations across NCAR. In her role as UCAR Leadership Fellow, she served as the Liaison for Strategic Partnerships. She also serves as Science Advisor for several groups – for example, Verisk, the Society of Actuaries, the Geneva Association Climate Change Forum, and the State of Colorado Climate Change Technical Advisory Group.

Dr. Bruyère has also been very active in the education space and have served as a mentor/advisor for numerous post-docs, PhD, Masters, and SOARS

students. Now she manages the SPS | CPAESS educational programs such as the NOAA Climate and Global Change Postdoctoral Fellowship, the NASA Jack Eddy Postdoctoral Fellowship, the NOAA Weather Program Office’s WINGS Doctoral Fellowship, and the NASA Heliophysics Summer School.

Of the award Cindy shared “I am feeling incredibly honored and very humbled by receiving the AMS fellowship.” We are delighted for this deserving acknowledgment of your work and sincerely congratulate you Cindy.

2023 NASA Jack Eddy Postdoctoral Fellows

UCAR | CPAESS and NASA are excited to welcome five new postdoctoral fellows who will be beginning their interdisciplinary research projects contributing to the field of heliophysics. These fellows are the new 2023–2024 class of [NASA’s Jack Eddy Postdoctoral Fellowship](#), supported by [NASA’s Living With a Star Program \(LWS\)](#) and selected by the University Corporation for Atmospheric Research (UCAR)’s Cooperative Program for the Advancement of Earth System Science (CPAESS).

Established in 2009, this prestigious fellowship program is named after pioneering solar researcher John A. “Jack” Eddy. The two-year fellowship is designed to train the next generation of heliophysics researchers. It matches early-career PhDs with experienced scientists at U.S. host research institutions.

Dr. Lika Guhathakurta, lead program scientist for NASA’s Living With a Star Program (LWS 2001–2016) worked with and admired Eddy for years. He had been a consultant to the LWS program, and both he and Guhathakurta championed interdisciplinary study of the Sun’s relationship to Earth. After his death in 2009, Guhathakurta paid Eddy tribute by naming the new LWS postdoctoral fellowship after

him. Of the fellowship, Lika shared “After a two year hiatus the Jack Eddy Fellowship Program is back in full force with the selection of five stellar candidates and new host institutions to chart the path of interdisciplinary science.”

“UCAR | CPAESS is honored to manage the NASA Jack Eddy Postdoctoral Fellowship. We have partnered with NASA since 2006 working to foster heliophysics as an integrated science, teaching a new generation of researchers to engage in cross-disciplinary research and communication. ” said Hanne Mauriello, Director of UCAR’s Scientific Partnerships and Services Center (SPS) and CPAESS.

Heliophysics embraces all science aspects of the Sun-Solar System, and includes many of the basic physical processes found in our solar system, the laboratory, and throughout the universe. These processes generally involve the interactions of ionized gases (plasmas) with electromagnetic and gravitational fields, and to some extent with

neutral matter. The physical domain of interest ranges from deep inside the Sun to the beginning of interstellar medium as well as planetary atmospheres including Earth’s upper atmosphere. Within this broad science discipline, LWS is a program designed to develop the scientific understanding required for the nation to address effectively those aspects of the Sun-Earth system that affect life and society. Two major topics of focus for LWS are the science of space weather and of the Sun-climate connection.

Each fellow will research at a host institution typically other than their Ph.D. university, with a mentor for two years. The goal of this postdoctoral program is to train Sun-Earth system researchers that cross the traditional Heliophysics subdomains of the Sun, heliosphere, magnetosphere, and ionosphere/upper atmosphere, as well as Sun-climate investigations.

A sincere congratulations to our new fellows!



Welcome 2023 NASA Jack Eddy Postdoctoral Fellows (left to right); Robert Jarolim, Devojyoti Kansabanik, Mei-Yun Lin, Charlotte Waterfall, and Peijin Zhang.

2023 NASA Jack Eddy Postdoctoral Fellowship Awardees

Peijin Zhang

Host: Dr. Bin Chen of New Jersey Institute of Technology, Newark, NJ

PhD Institution: University of Science and Technology of China (USTC)

Proposal: Radio Imaging Spectroscopy for CMEs and CME-driven Shocks

Charlotte Waterfall

Host: Dr Georgia deNolfo of Goddard Space Flight Center NASA

PhD Institution: University of Manchester, UK

Proposal: Bad news travels fast: energetic particle transport in the heliosphere

Robert Jarolim

Host: Dr. Matthias Rempel at NCAR | HAO

PhD Institution: University of Graz

Proposal: Physics-informed neural networks for the simulation of solar magnetic fields

Devojyoti Kansabanik

Host: Dr. Angelos Vourlidas at The Johns Hopkins University Applied Physics Laboratory

PhD Institution: National Centre for Radio Astrophysics, Tata Institute of Fundamental Research

Proposal: Remote Sensing of CME-entrained Magnetic Fields

Mei-Yun Lin

Host: Dr. Andrew R. Poppe at the University of California, Berkeley

PhD Institution: University of Illinois, Urbana-Champaign

Proposal: From Ionosphere or Moon? A Comprehensive Study of Metallic Ions in the Magnetosphere

Learn more about the [NASA Jack Eddy Postdoctoral Fellows and alumni](#) as

well as [the fellowship](#), and [NASA's partnership with UCAR | CPAESS](#).

International Collaborations in Rwanda

The World Climate Research Program Open Science Conference (WCRP OSC) was held in Kigali, Rwanda and online from October 23-27, 2023 and was hosted by the Rwanda Environment Management Authority (REMA) on behalf of the Government of Rwanda. "This once-in-a-decade conference brought together the climate, environment, and related communities to discuss the latest developments in climate science and explore the transformative actions urgently needed to ensure a sustainable future...the outcome of all confer-



CPAESS Staff at the WCRP Open Science Conference left to right top: Mike Patterson, Michelle McCambridge, Alyssa Cannistraci, Jill Reisdorf (UCAR President's Office), Jessica Martinez, and Alyssa Johnson.



From Left to Right at the WCRP OSC: CPAESS | US CLIVAR Program Specialist Alyssa Cannistraci; Dr. Jeanne d'Arc Mujawamariya, Rwanda's Minister of Environment; and CPAESS | US CLIVAR Program Specialist Alyssa Johnson.

ence sessions will culminate with the 'Kigali Declaration' ([Source](#))." The Conference highlighted challenges and advances regarding Earth system science research with themes including "climate research, human interactions with climate, and co-produced climate services and solutions. The conference included over 40 oral and poster sessions, as well as high-level Dome Plenary Sessions every morning."

UCAR | CPAESS assisted in the management of this important international meeting with CPAESS Event and Travel Team Lead Michelle McCambridge and Meeting Planner Jessica Martinez. Additionally, CPAESS hosts the [US CLIVAR program](#) and its Director Mike Patterson, along with CPAESS | US CLIVAR Program Specialists Alyssa Cannistraci and Alyssa Johnson were in attendance to moderate numerous talks. US CLIVAR's expertise is in understanding the prediction of climate variability and change on intraseasonal-to-centennial timescales, through observations and modeling with emphasis on the role of the ocean and its interaction with other elements of the Earth system.

We were honored to be a part of this important international conference. Find the [Kilgari Declaration](#), its international signatories, and other [important links](#) to presentation descriptions. UCAR and NCAR also had numerous staff attend the conference in support of this effort including the UCAR Community Program's Africa Initiative.

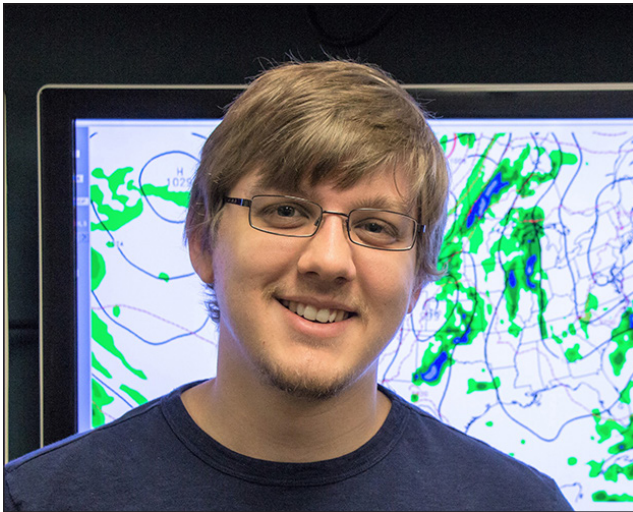
Perfecting Hurricane Communications

Dr. Benjamin Trabling is a CPAESS Associate Scientist working at the National Hurricane Center's Storm Surge Unit. The focus on the Storm Surge Unit is to accurately forecast how much storm surge will occur and where and when a hurricane makes landfall. This is very important as storm surge, which is

the "abnormal rise of water generated by a storm, over and above the predicted astronomical tides" ([NHC](#)). "Storm surge is often the greatest threat to life and property from a hurricane" ([NHC](#)), and can carry large volumes of water several miles inland. "The greatest threat to life actually comes from the water – in the form of storm surge" ([NOAA](#)). "Flooding from hurricanes and tropical cyclones accounts for nearly 90% of hurricane deaths – and about half of those are caused by the storm surge" ([Sofar](#)). So it is critical for the public to know where, when, and how much water will be coming into their neighborhoods due to the hurricanes that come to land.

The main forecasting model utilized to do this is the [Probabilistic Tropical Storm Surge](#) (P-Surge) which creates a probabilistic storm surge forecast. Benjamin's current job is to continue to expand upon its capabilities by developing forecasting capacity for Hawaii, the Samoan Islands, and Guam.

Ben Trabling has been working with CPAESS at the National Hurricane Center since November of

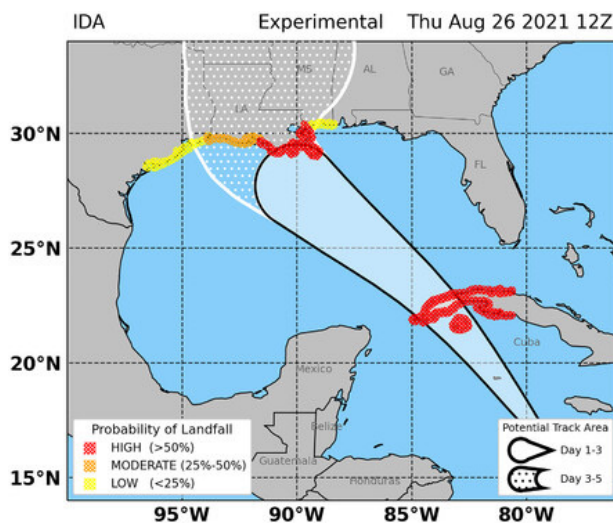


Dr. Benjamin Trabling, CPAESS Associate Scientist working at the National Hurricane Center.

2022. However, recently some of Ben’s past work has been recently published in Weather and Forecasting called the [“The Development and Evaluation of a Tropical Cyclone Probabilistic Landfall Forecast Product.”](#) Among other things it looks at the uncertainty concerning how strong the intensity of a storm might be, such as the probability of whether a hurricane will be considered a category 2 hurricane or a category 3, etc. Some of the chal-

lenges inherent in this type of forecasting is communicating “not only where the storm is going to go...how strong it’s going to be, and also how big it’s going to be” explained Trabling. So he and his colleagues sought to create a new tool designed to help someone answer the question “If this hurricane makes landfall where I am, how strong is it going to be?”

To visualize this information properly so that the public and emergency management could use it, this work was tested socially they found how to both simplify the visuals for optimum understanding, while still enabling access to statistical data if needed. This research has given birth to numerous products in development now to aid in the clarity of communication of this critical data. Essentially the National Hurricane Center is leaning into their probabilistic models (rather than deterministic) when it comes to the cone of uncertainty, or the area where a hurricane will most likely travel. This area is then fleshed out with data from products like the Windspeed Probability Model to help show where the highest winds will be. So for example in a storm you can show an area where there is a 50% chance that winds will be 30 knots or higher, or a 70% chance of 40 knots or higher in another area.



Tropical Cyclone Intensity Probabilities at Landfall

| Region | Probability of Landfall | Tropical Depression or Weaker (<39 mph) | Tropical Storm (39-73 mph) | Hurricane Cat 1-5 (>74 mph) | Major Hurricane Cat 3-5 (>110 mph) | Strongest Reasonable Landfall Intensity |
|---------|-------------------------|---|----------------------------|-----------------------------|------------------------------------|---|
| W CUBA | 82% | 7% | 75% | 18% | <2% | Cat 1 (80 mph) |
| East TX | 19% | <2% | 16% | 83% | 41% | Cat 4 (130 mph) |
| West LA | 48% | <2% | 9% | 91% | 50% | Cat 4 (140 mph) |
| East LA | 50% | <2% | 7% | 93% | 54% | Cat 4 (145 mph) |
| MS | 12% | <2% | 13% | 86% | 51% | Cat 4 (140 mph) |

Figure 9 from Ben’s paper showing the cone of uncertainty for Hurricane Ida.

Currently, there are numerous products like this under development and ultimately they will give the consumer a clearer visual and data rich view of various aspects of the storm and the likelihood of different critical components of the storm. Ultimately these products will all be on the [National Hurricane Center's website](#).

When asked how his career path led him here, Ben shared “I’ve always been fascinated by the weather. When I was a kid, I was always the one at the window looking outside, seeing the storms come in.” In 2003, Hurricane Isabel affected his hometown in Maryland. Seeing all the flooding and the effects of the hurricane really stuck with him. As a teenager, he moved to Florida and witnessed the annual speculation of the effects that hurricanes would have on them likewise affected him. The concern that people had for this extreme weather, and the damage that hurricanes cause inspired him to seek a job where he could help the public contend with these forces of nature. This journey began when he went to the University of Oklahoma and chased tornadoes, and has brought him to where he is today at the National Hurricane Center as a CPAESS scientist.

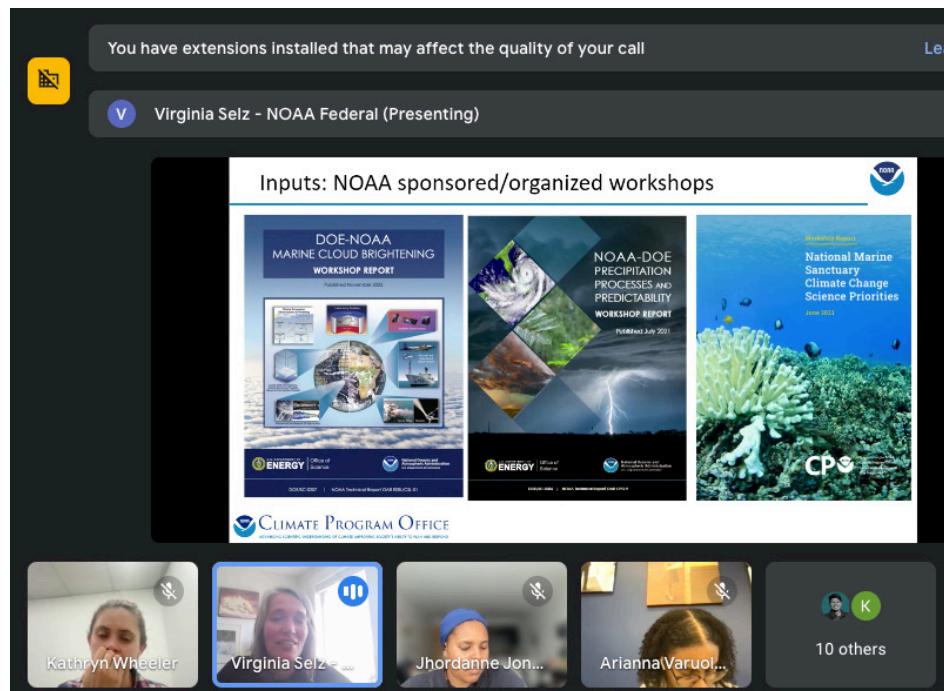
Thank you for sharing your recent publication with us. Please know that we truly appreciate your work, past and present, and that of your colleagues throughout the National Hurricane Center. Your collective life-saving work is truly admirable and deeply appreciated.

Fortifying the Fellowship Experience

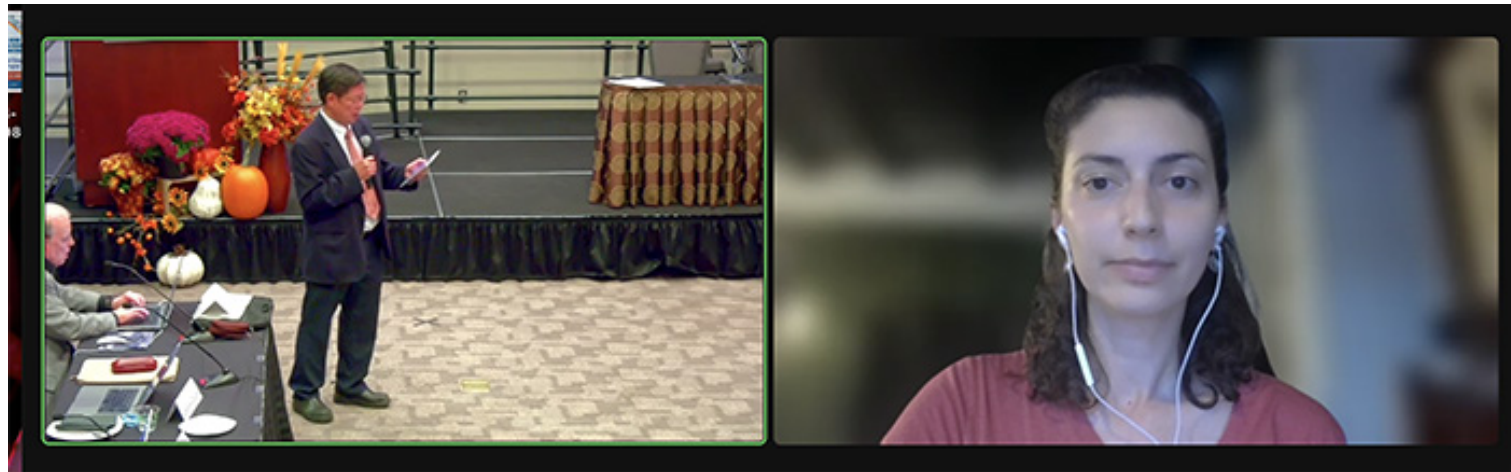
The overarching purpose of the [NOAA Climate & Global Change Postdoctoral Fellowship](#) is to help create and train the next generation of leading researchers needed for climate stud-

ies. This program focuses on observing, understanding, modeling, and predicting climate variability and change on seasonal and longer time scales and our scientists do so across a wide variety of Earth system science fields. To maximize their fellowship experience, CPAESS does its best to connect our fellows with early career-building opportunities. This goal has manifested itself in a couple of ways this year.

First, in conjunction with our NOAA Climate Program Office partners, we have created a seminar discussion series that provides our fellows with numerous opportunities to network, learn about each other’s research, and better understand the work and research that NOAA is executing across its many offices. This past January, Dr. Laura Larocca (Class 31) gave a presentation on her fellowship research “An Arctic-wide assessment of glacier and ice cap lifespans.” In March, we head a Fellow Meet and Greet for researchers to introduce themselves to each other. Then in May, Dr. Henri Drake (Class 31) spoke on “Parameterization of Bottom



Dr. Virginia Selz, Program Manager at NOAA Climate Program Office delves into some of the work and opportunities at this office.



UCAR Community Programs Director Bill Kuo introduces Katherine Siegel to the NCAR UCAR Board of Trustees during the Science Highlight portion of the meeting.

Mixed Layer Eddies and Their Impact on Climate.” Along with Dr. Letti Roach (Class 31) who shared her research on “Asymmetry in the seasonal cycle of surface air temperature.” During this May meeting, fellows were treated to guest speaker Dr. Gregory Johnson, of [NOAA’s Pacific Marine Environmental Laboratory](#) (PMEL) who explained his research on the “Argentine Basin, Warming and Circulation Seen by Deep Argo.”

In September, Postdocs were engaged by Dr. Virginia Selz with her “NOAA 101” presentation which shared information about the Climate Program Office (CPO) and potential work opportunities for fellows. In October, a three-speaker panel was assembled to help give fellows information on to apply for academic jobs. This panel included Dr. Valerie Sloan, UCAR | NCAR Lead for Lead for Early-Career Professional Development; Dr. Chijun Sun who was finishing as an NCAR Advanced Study Program Fellow and about to start as an Assistant Professor at the University of California Davis; and Dr. Allison Lawman who is a Professor at Colorado College. These seminars have provided the post-doctoral fellows a vehicle to meaningfully engage with each other and those who might help inform their futures.

In addition to sharing their research at these seminars, Katherine Siegel (Class of 31) presented at the UCAR | NCAR Board of Trustees Meeting. The UCAR | NCAR Board of Trustees has the primary responsibility for setting UCAR’s overall direction. Members are a representation of UCAR’s university consortium which includes 126 North American colleges and universities that offer research and education programs in Earth system science, ranging from meteorology to hydrology, oceanography, atmospheric chemistry, climate science, and beyond. During the Science Briefing of the Board of Trustees Meeting, Dr. Siegel shared her research on “Wildfires, Climate Changes, and the Future of Forests in the Western United States.” Additionally, We look forward to hearing from Dr. Jhordanne Jones (Class of 32) who will be sharing her research as a science highlight at the UCAR Community Programs All-Staff Meeting this month.

We are most appreciative of the fellows’ efforts to engage further with both UCAR and NOAA and get the most out of the professional development opportunities associated with this program. A special thank you to CPAESS Program Specialist Kate Rodd and Deputy Director Cindy Bruyère for creating these methods of engagement.

Firsthand Experience Onboard the *Okeanos* and Beyond

CPAESS is delighted to partner with NOAA's Office of Ocean Exploration for the Explorer's In Training program which provides summer internship opportunities to students to train the next generation of ocean explorers, scientists, engineers, and communicators. This summer the program hosted 15 more students with this exceptional opportunity.

Since 2009, NOAA Ocean Exploration and UCAR | CPAESS have hosted [195 Explorers-in-Training](#). This program equips participants with skills to meet the current and future demands of the ocean exploration workforce, providing meaningful experiential learning opportunities that support NOAA Ocean Exploration's mission and inspire ocean literacy for the next generation. The program features two internship options including 2 to 4-week expedition-based opportunities, and 10-week shore based opportunities. The 10-week internships give students an opportunity to develop their skills and knowledge through long-term projects supported by NOAA Ocean Exploration mentors. The 2 to 4-week expedition-based internships involve participation in specific NOAA Ocean Exploration-supported expeditions, giving participants the chance to contribute to mission efforts while gaining tangible skills that can benefit their future pursuits.

The 2-4 week Hydrology and Seafloor Mapping internship is aboard the

NOAA Ship *Okeanos* Explorer which is the only federally funded vessel specifically designated purely for ocean exploration. This summer's students included 12 students for the expedition based mapping internship: Dana Carris, Cameron Kuhle, Brett Woodworth, Rebecca Ruiz, Rose Leeger, Ranna Zahabi, Joseph Guzek, Brianna Gomez, Mary Ella Rinzler, Adrianna Ebrahim, Ingrid Martinson, and Jonathan Griffiths. Their internships focused on hydrography and seafloor mapping (offshore, expedition-based, 2-4 week internship). Mapping the seafloor via NOAA Ship *Okeanos* Explorer is an integral part of NOAA Ocean Exploration's mission, providing critical bathymetric data needed to achieve a baseline understanding of previously unexplored areas. Participants will support mapping operations by collecting and processing these data with support from experienced mapping technicians. Beyond seafloor mapping, these interns will also participate in water column and sub-seafloor mapping, and gain tangible skills in the use of geographic information system (GIS) software, and data management.



*Explorer In Training Cameron Kuhle who learned seafloor mapping aboard the *Okeanos* this summer.*

Among the interns who were able to learn aboard the *Okeanos*, Brett Woodworth explained “My specific duties on the ship were to utilize various software to collect and process different types of underwater data, including seafloor, sub-bottom, backscatter, and watercolumn data. I learned how to use the software’s Qimera and Fledermaus to collect and process multibeam sonar data. I cleaned the seafloor data, then one of the seafloor mapping coordinators would quality check the data. Every four hours, we launched an Expendable Bathythermograph (XBT) to measure temperature data throughout the water column to make sure we have accurate sound velocity readings for our sonars. Similarly, every day daily products were made for the previous day’s multibeam, backscatter, sub-bottom, and water column data. I made daily products for all these types of data during my internship.”

All of the data from mapping is open access and available to scientists. Even though Alaskan waters are well-mapped doesn’t mean it wasn’t exciting. “[N]ext to Semisopochnoi Island, we mapped an underwater volcano, Amchixtam Chaxsii, that hasn’t been mapped since the early 2000’s. Our data of this feature could be compared to previous maps to see what has changed in the structure of the volcano.” Cameron Kuhle added “We covered a transit swath across the Gulf of Alaska, discovering a new seamount and several seafloor seeps along the way, and then produced new bathymetry for a lengthwise section of the Aleutian Trench, near Bower’s Ridge, and surrounding an active volcano north of Unalaska. Despite occasional disruptions to data collection due to rough seas, the overall coverage was excellent. This data provides clarification for work done by previous researchers and mappers, and opens doors for many new projects related from seamounts to hydrothermal vents.”



*Jennifer Clifton, Explorer-in-Training, reloads an expendable bathythermograph (XBT) to collect ocean temperature data.
Photo courtesy of NOAA*

Of the experience, Dana Caris shared “Through this incredible experience I was able to work with technologies and people I may have never been exposed to otherwise. The excellent guidance of the mapping watch leads, and the welcoming attitude of the crew have reassured me in my goal to pursue a career in ocean science and exploration.”

Three additional students, Hannah Jarvis, Raymond Phipps, and Megan McDeavitt, were chosen for the Exploration Education, Media, and Science Communication shore-based, remote, 10-week summer internship. As NOAA Ocean Exploration strives to engage stakeholders and improve ocean literacy of learners of all ages



CPAESS Staff recognized with awards from NOAA's Oceanic and Atmospheric Research (OAR) office. From left to right: Courtney Witkowski, Matt Morin, Kathy Tedesco, and Bao Xiang.

through educational programming. To achieve the mission of community-driven exploration, the office employs a suite of communication strategies and media tools that bring discoveries to the public. Interns will work on cross-disciplinary projects to gain experience in scientific communication, ocean education programming, and the use of multimedia products. Themes for this internship included building upon previous work developing the “Deep Ocean Bites” video mini-series, that features “bite-sized” ocean facts using previously recorded footage of NOAA Ocean Exploration education team interviews with deep-sea scientists. Prospective interns should have basic skills in or comfort/familiarity with video editing and should have a foundational understanding of marine science concepts.

The other theme focused on exploration leading to discoveries that highlight areas, features, resources, and/or processes that are new to ocean science and need further study. To accomplish these discoveries, NOAA Ocean Exploration promotes the innovative use of existing technologies while investing in new technologies that will help to better understand deep-water areas and more effectively target future research efforts.

Congratulations to all the Explorers In Training in completing this unique internship experience.

CPAESS Staff Recognized at NOAA OAR Awards

On December 5, NOAA's Oceanic and Atmospheric Research (OAR) recognized staff for their outstanding contributions during the year of 2023. Steve Thur, Assistant Administrator for OAR explained “These awards recognize extraordinary achievements by individuals and groups and for making invaluable contributions to both our mission and OAR's workforce.” The recipients were recognized at the OAR All Hands Meeting & Recognition Ceremony in the NOAA Auditorium.

Among these recipients were 4 of our co-workers: Bao Xiang, CPAESS Project Scientist III at the Geophysical Fluid Dynamics Laboratory (GFDL); Matthew Morin, CPAESS Associate Scientist III at GFDL; Kathy Tedesco, CPAESS Program Manager at NOAA's Global Ocean Monitoring and Observing (GOMO) office; and Courtney Witkowski, CPAESS Program Specialist III at NOAA's Ocean Acidification Program (OAP). As these are federal awards it is a unique honor for staff who act as partners with NOAA offices to be acknowledged. SPS | CPAESS Director Hanne Mauriello said “I so appreciate OAR for being so inclusive in recognizing the hard work of our scientists and staff in their awards. We are grateful for NOAA's acknowledgment of these exceptional individuals.”

Courtney Witkowski received an award as a Team Member of the Year in Administrative and Technical Support for successfully scoping, drafting, revising, and shepherding through many layers of review and approval of three high-level Interagency reports for Congress. Of this Courtney shared “I am grateful to be recognized for leading the Interagency Working Group on Ocean Acidification in submitting three reports to Congress this past year, including the first national ocean acidification vulnerability assessment. Working in the interagency space has been a great learning experience and I am thankful to all the partners who contributed to these efforts.”

Both Baoqiang Xiang and Matthew Morin received awards for Team Members of the Year in Personal and Professional Excellence for exceptional collaborative development of frontier, unified weather-to-subseasonal prediction systems. Matt describes his work as “my particular role in this group effort was mainly to run the SHIELD models (including C-SHIELD, T-SHIELD, and Tele-SHIELD) in real-time and retrospectively to generate very large forecast data sets that are used to further model developments.”

Last but not least, Kathy Tedesco won a Team Member of the Year in Leadership for leadership in carbon cycle science leading to innovative products and services that allow the world to understand, predict, and combat climate change. Of Kathy’s contributions, Jess Snowden, Deputy Director of GOMO wrote “Dr. Tedesco’s work has advanced OAR and NOAA’s critical leadership role in carbon cycle science leading to innovative information, products, and services that allow the world to understand, predict, and combat climate change. She has done so through consensus building across a disparate community of scientists, co-development of research and observing priorities leading to strategic investments in impactful research, and steadfast leadership of US and international carbon cycle science in a rapidly evolving field of study. She is also a deeply respected and

exemplary supervisor who provides thoughtful mentorship of numerous GOMO employees.”

We are extraordinarily proud of each of you and greatly appreciate your successful efforts to advance Earth system science. A most sincere congratulations!

Building Success Through Education: CPAESS’ Team at USGS

One of CPAESS’ newer partnerships is with the U.S. Geological Survey (USGS). Among the many activities supported by this partnership is the creation of a team that produces critical educational content and supports training within the agency.

In November of 2021, Learning and Development Officer Julie Malmberg was hired by CPAESS to create a comprehensive course development and training system for [USGS’ Water Mission Area](#) staff. The group benefiting from this system includes about 4,000 USGS employees across the nation including scientists, administrators, IT personnel, engineers, and more. All of whom require consistent and equitable training. With this broad conceptual goal in mind, a wonderful team has been built to turn this vision into reality.

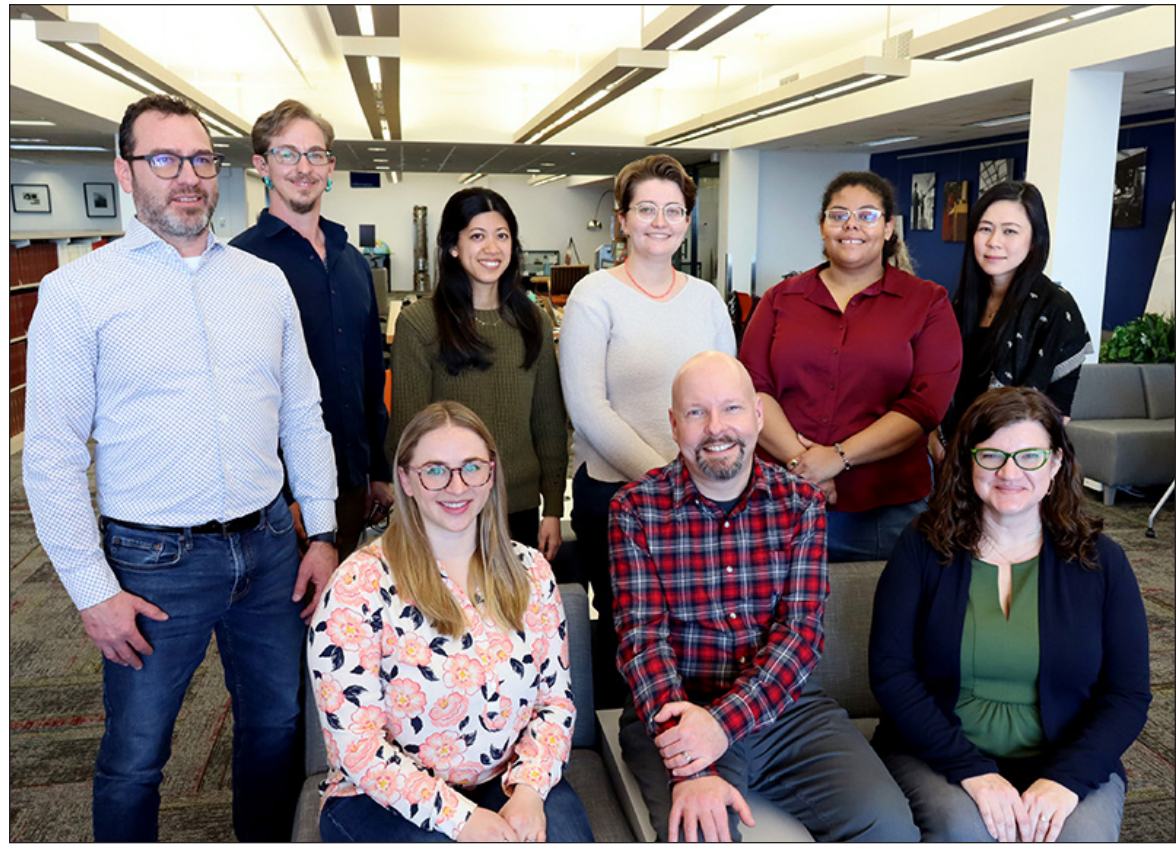
Today the CPAESS team at USGS is now quite robust including Julie Malmberg, Learning & Development Officer; Grant Walters, Program Specialist III; Amy Barfield, Program Specialist II; Wes Bonelli, Software Engineer II; Akio Correll, Educational Designer II; Jennifer Fong, Program Specialist III; Ryder Fox, Educational Designer I; James McCreight, Software Engineer III; Michael Reno, Software Engineer III; Elizabeth Rossi, Graphic Designer II (Casual); Tori Roy, Program Specialist I; Aiyana Spear, Program Specialist I; and Chad Weisshaar, Software Engineer III. Marissa Vara of UCAR’s SciEd program who works with SOARS, is also a regular part-time team member.

To launch this large effort, Julie Malmberg and her team have been assessing what training programs are in place at USGS already and what is needed. To facilitate this important stage, Julie Fong has been developing an All-Staff Survey to find out what the staff at USGS thinks about current training resources and what they feel they might need.

Generally, the team has also been creating processes for new people coming on board in the organization, and how that training can become modernized, made more inclusive, and how they can optimize the learning process.

They are creating learning modules, methods of integrating training within USGS, creating numerous partnerships to execute all this work, and preparing to launch an internship program.

The internship program being created is for early career staff, and is focused on hydrology technicians. Currently USGS has a Pathways internship that they may tap into for this effort. The overarching idea is to recruit from pools of people who may not have considered hydrotech as a career path, but who would excel in it. A hydrotech needs a high school degree, so they are creating partnerships with schools of all varieties – community colleges, tribal colleges, MSIs, colleges with no hydrology programs, and other institutions, particularly those working with marginalized and underrepresented populations. Amy Barfield and Marissa Vara are



Top Row: Wes Bonelli, Ryder Fox, Jennifer Fong, Aiyana Spear, Tori Roy, and Akio Correll Bottom Row: Amy Barfield, Grant Walters, and Julie Malmberg

helping USGS Science Centers connect with these communities, as well as teaching the centers how to recruit from them.

One of the unique features of the Pathways internship which they are likely to adopt is the non-competitive hiring process at its completion. What this means is that if someone goes through the internship and gets trained as a hydrological technician, they can then apply for a permanent USGS job without being penalized for not having higher education degrees. So this creates a path for competent, well-trained staff to become part of USGS much easier. In addition to the internship, Amy Barfield has been developing mentoring and community-building resources among the hydrotechs to enhance their sense of comradery among each other in an effort to raise retention rates of the profession at USGS.



Dr. Julie Malmberg, CPAESS Learning & Development Officer at USGS.

Diversity, equity and inclusion is a critical component of this program and they are sharing their efforts with other mentoring resources within the USGS Water Mission Area, so that they can potentially help those beyond their reach. Amy and Marissa also work with UCAR's internship resources and network.

A great deal of these training resources are being developed with the retention of USGS staff in mind. These resources are all-encompassing from the internships that will introduce and attract non-staff to USGS career paths, to "long term professional development and training that lasts from the time they come in...and maintaining their careers" explained Grant Walters.

Grant Walters and team members are creating a catalog with a repository of courses. An entire library of knowledge if you will. This will include a tracking system for these training classes and connect these educational resources with information on how people can leverage this education to gain further traction in their careers. They are setting up certifications, micro-credentialing, and a badging system to help support this goal. Because so much

of this training is voluntary, their efforts to coalesce and elevate the training will enable staff to utilize it to advance their employment goals in addition to shoring up a solid consistent educational framework.

This CPAESS team is working with USGS training staff, the U.S. Fish and Wildlife, various vendors, and COMET to create a holistic suite of educational training. These trainings vary greatly in their purpose and audience, but the new developments for staff are quite exciting. For example, the hydrotech training for a new employee can last up to 8 weeks, but is customizable based on each USGS' Science Center needs. "We have 27 USGS Water Science Centers" that we are serving, explained Malmberg. So the training is customizable based on location as processes will vary based on geology. This training includes fieldwork and an online component that COMET is creating for each specific area of training.

This team has lofty goals in serving both the employees of USGS and the agency itself. Right now their focus is on creating training for the many technical skills USGS staff need. However, they would like to eventually expand their learning tracks into areas like supervision, leadership, mentorship, and other workplace and professional development skills. Their plans are very holistic and will really serve USGS well.

Another important point that Malmberg made was how integral UCAR has been to this project and the layers of partnerships that are intrinsic to it. Besides this CPAESS team at USGS, they have been working with NCAR's Research Applications Laboratory (RAL), UCP's COMET program, Marissa who is part of UCP's SciEd, UCAR's Office of Diversity Equity and Inclusion team, and with Lorena Medina Luna of NCAR's Education, Engagement and Early-Career Development (EDEC) in addition to USGS and their teams.

This month a "Train the Trainers" session will take place with COMET educating trainers from USGS. COMET staff will be helping them by sharing the best approaches to impart information for the maximum benefit of the student and other professional development lessons. Additionally, they



2023 Leadership Academy Graduates: Tarah Sharon, Assoc Scientist IV at the National Hurricane Center; Gina Roberti, Budget Analyst III at the CPAESS Business Office; and Philip Hartmeyer, Assoc Scientist III at NOAA's Office of Ocean Exploration.

will be sharing with them the modules COMET created to assist them in training and assist them in integrating them into training. After receiving any input the trainers have on these modules, COMET will implement any needed perfecting so that the modules will be ready to be utilized in earnest.

"It's a big, big endeavor, but I feel like we have the right team," said Malmberg of her staff, which has an impressively diverse array of talents. There is palpable excitement from Julie and Walter, as this whole CPAESS team moves forward to successfully accomplish this grand undertaking. They have been entrusted to build something important, and it seems to delight them to be such a force for good with this opportunity. We are both proud and impressed with every member of this team, and are rooting for your continued progress in this worthy effort.

UCAR Leadership Academy

Congratulations to Gina Roberti, Budget Analyst III at the CPAESS Business Office; Philip Hartmeyer, Assoc Scientist III at NOAA's Office of Ocean Exploration, and Tarah Sharon, Assoc Scientist IV at the

National Hurricane Center for their nomination and acceptance into the UCAR Leadership Academy. "Since 2003, the award-winning Leadership Academy has been UCAR's premier leadership development program. Graduates of the Leadership Academy continue to inspire collaboration, create effective working relationships, bridge inter-program partnerships, and lead effective diverse teams and projects" (Source [UCAR](#)). We know you will each make the best of this opportunity. Congratulations!

Bright Minds Dazzle at the 2023 NASA Heliophysics Summer School

CPAESS has had the pleasure of partnering with NASA's Living With A Star program since 2007 to create the NASA Heliophysics Summer School. The Heliophysics Summer School focuses on the physics of space weather events that start at the Sun and influence atmospheres, ionospheres and magnetospheres throughout the solar system. In an effort to enable even more students to attend, CPAESS expanded the school into two sections.

From July 17-21, 2023 there was a remote phase; and from August 7-11, 2023 there was an in-person phase held at Center Green in Boulder, Colorado. The school is held annually and open to graduate students as well as first- and second-year post-doctoral fellows.

This year the theme was Observational Heliophysics. In the last two decades, observations of the space environment and the broader heliosphere environment has grown tremendously with dozens of spacecraft missions, and a full range of ground based efforts. Individual instruments use a variety of fundamental techniques and understanding the details of these measurements are important to interpreting the results and building a model of the space environment. This summer school reviews those techniques including: spectroscopy, plasma measurements, magnetometers, radio astronomy and ionosondes, energetic particle detectors, and energetic neutral atoms and others. During the summer school, participants learned about the fundamental physics of these measurements, how they are implemented in spacecraft and

ground based instruments, practice critical analysis of data with an eye towards uncertainties and errors, consider the stakeholders and consumers of the data sources, and discuss the tension between intellectual property and open science with respect to this data.

With this new expanded the version of the summer school, both virtual and in-person, we were able to execute the virtual session with a record 71 students who participated in 13 different time zones. It included office hours, lectures and presentations on Slack, in addition to group laboratory sessions within one's time zone. Lectures included talks about solar observing, energetic particles, plasma, and ground GPS. These topics were discussed with some depth and speakers included Lika Guhathakurta (NASA), Nick Gross (Boston University), Barbara Thompson (NASA), Enrico Landi (University of Michigan), Christina Cohen (California Institute of Technology), Mike Hartinger (University of California, Los Angeles), and Anthea Jane Coster (Massachusetts Institute of Technology). [Please find the agenda with links to curriculum resources here.](#)



A portion of the student pool who participated in the virtual portion of the 2023 NASA Heliophysics Summer School.

When asked about the virtual summer school, one respondent said “The inclusion of interactive group activities, including the timezone group work and daily activities, made it so much more of an interactive experience, and added a lot of value I believe other in-person summer schools are missing.” On the value of the lecture to their learning a student commented “These lectures were very helpful as they gave me an insight of how the measurements are made. I think it is important to



Group picture of the in-person class of the Summer School.

[Find the agenda and curriculum materials here.](#) Speakers included Lika Guhathakurta (NASA), Nick Gross (Boston University), Mark Moldwin (University of Michigan), Christina Cohen (California Institute of Technology), Stuart Bale (University of California, Berkeley), Allison Jaynes (University of Iowa), Stefan Eriksson (University of Colorado), Nick Arge (NASA), and Dan Welling (University of Michigan).

When students were asked about their summer school experience

learn about the observations, different levels of data and how the instruments work, when we analyze the data.” Lectures on The Solar Corona and Solar Wind - Barbara Thompson and Plasma Instruments and Magnetometers - Mike Hartinger; and Viewing the Sun Across the EM Spectrum - Enrico Landi were the class favorites.

The second portion of the summer school took place on UCAR’s campus with 26 students attending the in-person sessions. This portion included lectures, laboratory exercises, a career panel, and a tour of NCAR’s High Altitude Observatory - all while utilizing textbooks that this summer school program has created.

Lectures got into more depth concerning instrumentation tools, calculating quantities for plasm and field parameters as well as energetic particles, calculations using spacecraft constellations, model inputs for solar and magnetosphere models, and much more.



Students work together on a laboratory problem at Center Green.

overall one said “I found the summer school incredibly valuable, as I got to interact with many international researchers who I may not have met otherwise – now I feel like I have valuable and lasting connections across the globe. The summer school was very intense and therefore at times very tiring, but a complete and wholly worthwhile experience.”

Check out the 2023 NASA Heliophysics Summer School talks on the [CPAESS YouTube channel](#), and [Heliophysics resources](#) here and the [Heliophysics textbooks](#) and past summer school materials here. [Learn more about the summer school](#) and how to apply.

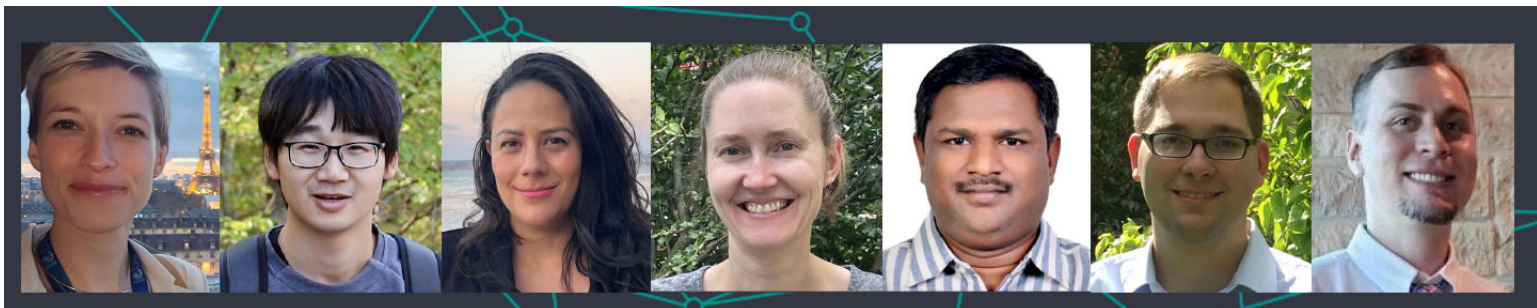
Share Your Science: CPAESS Discovery Seminars

While the entirety of UCAR | NCAR researches various aspects of Earth system science, no one does it like UCAR | CPAESS. The breadth and depth of the branches of science that we touch as a program is impressive. To share some of this science with others we have created the CPAESS Discovery Seminar Series which has been going wonderfully!

- **Mike Mueller and Ben Johnston**, CPAESS Project Scientists at NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML).

“An introduction to NOAA’s Quantitative Observing System Assessment Program (QOSAP)”
[Watch the video recording](#)

- **Lynne Hodge**, CPAESS Associate Scientist, Marine Mammal & Turtle Division, NOAA Southeast Fisheries Science Center.
 “Shipping Noise in the northern Gulf of Mexico between 2010–2021”
[Watch the video recording](#)
- **Murali Nageswara Rao Malasala**, CPAESS Associate Scientist at NOAA’s National Centers for Environmental Prediction – Environmental Modeling Center.
 “Prediction skill of GEFSv12 in depicting Monthly Rainfall and Associated Extreme Events over Taiwan during Summer Monsoon”
[Watch the video recording](#)
- **Marcela Ulate**, CPAESS Project Scientist, Naval Research Laboratory (NRL)
 “Impact of Stochastic Kinetic Energy Backscatter Scheme on the Navy Earth System Prediction Capability (Navy ESPC) in predicting the Madden Julian Oscillation during 2017”
[Watch the video recording](#)
- **Wenhao Dong**, CPAESS Project Scientist at NOAA Geophysical Fluid Dynamics Laboratory (GFDL)
 “Simulation Mesoscale Convective Systems Using GFDL’s New High-Resolution General Circulation Model”
[Watch the video recording](#)
- **Ann-Christine Zinkann**, CPAESS Program Specialist, NOAA’s Global Ocean Monitoring and Observing Program (GOMO)
 “International Collaboration: Why? Who? What?”
[Watch the video recording](#)



Some of the CPAESS Discovery Seminar Speakers from 2023.

- **Dr. Julie Malmberg**, CPAESS Sr. Learning and Development Officer (On Detail to USGS Water Mission Area)
“Building a Comprehensive Workforce Development and Training Program”
[Watch the video recording](#)
- **Dr. Baoqiang (Bao) Xiang**, CPAESS Project Scientist at NOAA’s Geophysical Fluid Dynamics Laboratory (GFDL)
“An emerging Asian aerosol dipole pattern reshapes the Asian summer monsoon and exacerbates northern hemisphere warming”
[Watch the video recording](#)

All of the recordings from past [CPAESS Discovery Seminar Series](#) can be found here. We have a truly unique and diverse team, and we’d love for you to consider sharing your science with your colleagues and the public. Please check out [next year’s schedule](#) and sign up to share your work.

NCAR & CPAESS Team Up: 2023 CEDAR Workshop

Each year CPAESS has the pleasure of managing the annual [Coupling, Energetics and Dynamics of Atmospheric Regions Program \(CEDAR\)](#) Workshop for our colleagues at NCAR’s High Altitude Observatory (HAO). Broadly, CEDAR’s purpose is to better understand the fundamental properties of the space-atmosphere interaction region; identify the interconnected processes that define the local and global behavior, the evolution, and influence on the Sun-Earth system; and to explore the ionosphere-thermosphere predictability.

The upper atmosphere plays a vital role in separating interplanetary space from the lower atmosphere and our biosphere and hosts many of our space assets for monitoring, com-

munication, and navigation. So understanding the coupled upper atmosphere on different spatio-temporal scales using ground-, space-based observations and numerical modeling play an important role in making progress towards predicting and potentially mitigating space weather and global change impacts on our society.

The annual CEDAR workshop, which started as a grassroots initiative in 1986, provides the community an opportunity to self-organize and exchange ideas. With CEDAR’s emphasis on fostering new ideas, providing a safe space for all participants, and a strong educational component, CEDAR has become the intellectual engine of aeronomy.

The workshop includes community organized breakout workshops as well as grand challenge workshops, poster session with a student poster competition, a student day, plenary sessions with science highlights, agency updates and tutorials, a distinguished lecture, and a prize lecture.

This year’s [CEDAR Workshop](#) was held in San Diego, California from 25 – 30 June 2023. There were 420 attendees, 144 students (100 US students and 44 international students from 19 countries). Each year extensive efforts are made to foster student educational opportunities, and this year was no exception with poster sessions, student day, early



This year’s CEDAR Workshop was held in San Diego, California from 25 – 30 June 2023



SPS | CPAESS Director Hanne Mauriello giving a presentation to help envision the future of CEDAR meetings.

career highlight presentations, and student luncheons; in addition to the plenary sessions, tutorial sessions, and much more. Find the [robust agenda here](#) and see the presentations, video recordings and posters from the [2023 Workshop here](#). It is always an honor to manage this workshop and support the research that the CEDAR team executes year round.

Studying the Sun’s Impacts: 2023 Space Weather Workshop

One of the many services that UCAR | CPAESS provides the Earth system science community is the convening of members from across the globe to gather and learn from each other, share information, and collaborate to move science forward. The recent Space Weather Workshop well represented these important goals. The workshop took place both virtually and in person in Boulder from April 17-21, 2023.

The [Space Weather Workshop](#) is an annual conference that brings industry, academia, and government agencies together in a lively dialog about space weather. What began in 1996 as a conference for the space weather user community, Space Weather Workshop has evolved into the Nation’s leading conference on all issues relating to space weather.

The conference addresses the remarkably diverse impacts of space weather on today’s technology. The program highlights space weather impacts in several areas, including communications, navigation, spacecraft operations, human space exploration, aviation, space traffic coordination, and electric power. The workshop will also focus on the highest priority needs for operational services that can guide future research and new high-value capabilities that can be transitioned into operations. The conference fosters communication among researchers, space weather service providers, and users of space weather services. Space weather is important because “disturbances can cause problems with radio communications, Global Navigation Satellite Systems (such as [Global Positioning Systems](#) or GPS), power grids, and satellites ([NOAA](#)).”

This workshop grows each year, and this year was no exception. We had a record-breaking 554 registrants and 128 virtual participants. 24 countries were represented at this conference, as space weather and its impacts are a matter of concern across the globe, with 64 international attendees in-person and 28 virtual.

The Space Weather Workshop kicked off with a talk by Bill Murtagh, NOAA Space Weather Prediction Center (SWPC) and Jinni Meehan, National Weath-



Pictured above (left to right) Bill Murtagh, NOAA Space Weather Prediction Center (SWPC); Dr. Jennifer Meehan, National Space Weather Program Manager, NOAA NWS; Dr. Howard Singer, NOAA Space Weather Prediction Center (SWPC); Lt. Frank Centinello III, NOAA; and Lt. Bryan Brasher, NOAA.

er Service (NWS) Headquarters on *Building National Resilience for Space Weather Storms* and continued with speakers from across NASA, NOAA, Southwest Research Institute (SwRI), Ball Aerospace, California Institute of Technology, and numerous other federal agencies, non-profits, businesses, and academic institutions. Find the [detailed agenda](#) for this workshop and discover the many plenaries, talks, working groups, and advisory committees activities.

Special attention was given to students during the Space Weather Workshop with a student program on Monday evening, as well as on Wednesday.

Twenty-one students attended and the National Science Foundation (NSF) sponsored 17 students with support for lodging, ground transportation & registration fees.

Another workshop highlight was the tours at NOAA's Space Weather Prediction Center (SWPC). Two different tours were available to registrants to get an insider look at their facilities on Tuesday and Thursday.

Additionally, 121 abstracts were submitted for this conference, of which 113 were in-person, including

26 students presenting posters in-person. There were lightning talks selected from the poster submissions which gave 2 slide presentations lasting 5 minutes each at the end of the days of Tuesday, Wednesday, and Thursday (8 each day). Please find [the booklet of poster abstracts here](#) and [view the posters here](#). There are 70 available online. Posters and abstracts were collected and organized into these categories: Solar and Interplanetary Research and Applications; Ionosphere and Thermosphere Research and Applications; Geospace/Magnetosphere Research and Applications; Aviation Radiation Research and Applications; and Space Weather Policy and General Space Weather Contributions.

A special thank you to our sponsors of the Space Weather Workshop Southwest Research Institute (SWRI) who sponsored the banquet on Wednesday evening, Ball Aerospace who sponsored the Networking reception on Monday evening, and of course NASA, NOAA, NSF & CPAESS. NSF also sponsored all travel and workshop fees for 17 students.

Additionally, a shout out to members of the CPAESS Travel and Event Team that managed and assist-

ed with the event: Michelle McCambridge, CPAESS Event & Travel Team Lead; Maggie Costley, Travel Team Lead for setting up the badging system, and Jessica Martinez, Meeting Planner for onsite support of the workshop, as well as Travel Coordinators Rebecca Cribelli and Sarah Herring who helped Jessica. Rebecca also arranged travel for many attendees; and lastly Alex Meyer, CPAESS Graphic Designer for capturing some great photos of the event.

Okeanos Marine Archeology: Search for the SS Larry Doheny

UCAR | CPAESS has a fabulous team at NOAA's Office of Ocean Exploration including Patrick Cooper, AI Architect; Sarah Groves, Associate Scientist; Rachel Gulbraa, Writer/Editor; Philip Hartmeyer, Associate Scientist; Ashley Marranzino, Associate Scientist; Nicole Miller, Program Specialist; and Christa Rabenold, Writer/Editor. NOAA's OE "is dedicated to exploring the unknown ocean, unlocking its potential through scientific discovery, technological advancements, and data delivery" ([NOAA](#)).

One of their efforts is leading expeditions on NOAA's ship, the *Okeanos Explorer*. Prior to the official field season, [NOAA executes a shakedown voyage](#) to ensure the proper operation of all technical equipment, and general preparedness for the upcoming voyage. This spring's shakedown explored the Pacific Ocean on the west coasts of Oregon, California, and Washington. Among the many efforts underway with this voyage was a possible dive off the Oregon coast in search of the wreck of "SS *Larry Doheny*, an American oil tanker sunk by a Japanese submarine on October 5, 1942" ([NOAA](#)).



Space Weather Workshop audience listening to a plenary talk.



CPAESS Marine Archeologist Phil Hartmeyer who works with NOAA's Ocean Exploration.

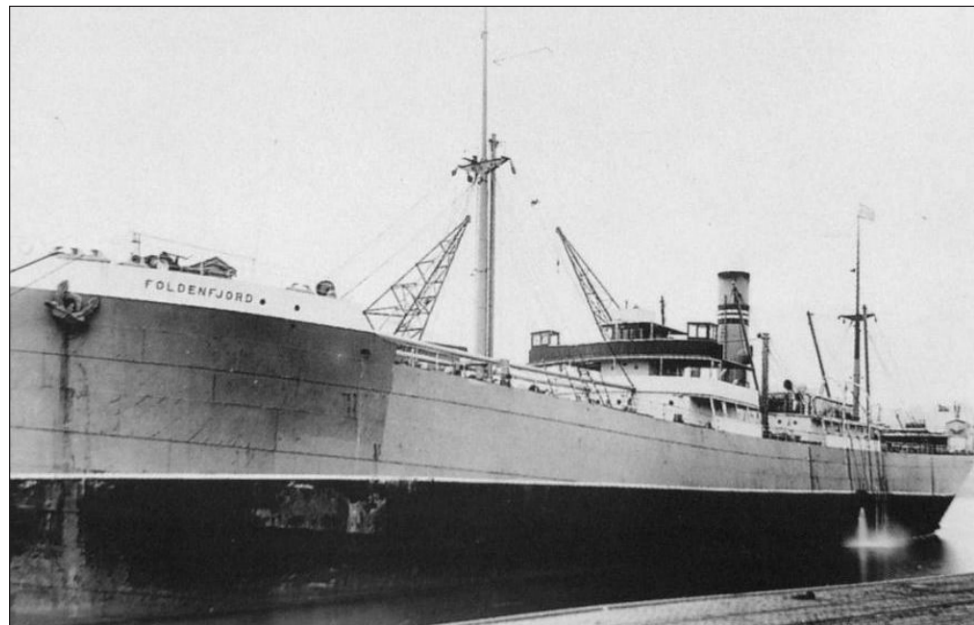
Of the search, CPAESS scientist and marine archaeologist Phil Hartman said "It was a long night working with the shipboard team to identify potential targets from the multi-beam sonar's backscatter. Backscatter is essentially

a raster display of the intensity of sound return. Its calculation incorporates the beam angle from sound leaving the transducer on the ship, the length of time it takes to reach the bottom (calibrated by the speed of sound through water), and the time it takes to travel back to the ship. In a silty, muddy bottom experienced in this area, a steel hulled ship should pronounce itself in this data. We thought we had two potential targets, and, to make sure, they ran a perpendicular pass over those targets to make sure they show up again in the data. Wind/wave direction, current, and surface weather can all play a factor in how any given multibeam data is collected, and after this 'cross line' was completed...the targets disappeared. They were artifacts in the data. We only had a few hours to search at that junction before the rest of the crew woke, and didn't find another promising site."

Phil continued, "It was an exciting hunt though, and I'm so proud of the care the ship's team took with the sensitivities involved when looking for archaeology sites, the attention to archaeology given by the office in silver spring and the mutual feeling of exploration that you can feel from every text, email, and phone call throughout that night. It's true exploration at its finest and by definition...in an incredibly unforgiving environment."

Ultimately Hartmeyer concluded "Larry Doheny is still out there, and we'll get back to it someday. This site selection was a direct result of the UCH prioritization analyses I've been writing for the office, and was encouraging to see it utilized in exactly the manner intended." Phil, we are so delighted to explore the ocean's secrets vicariously through you and the rest of the team. Thank you so much for sharing this aspect of the *Okeanos* shakedown. We look forward to learning about the many discoveries ahead of you.

Learn more about [NOAA's Okeanos ship](#), the coming [2023 Expedition](#), [see what the cameras cap-](#)



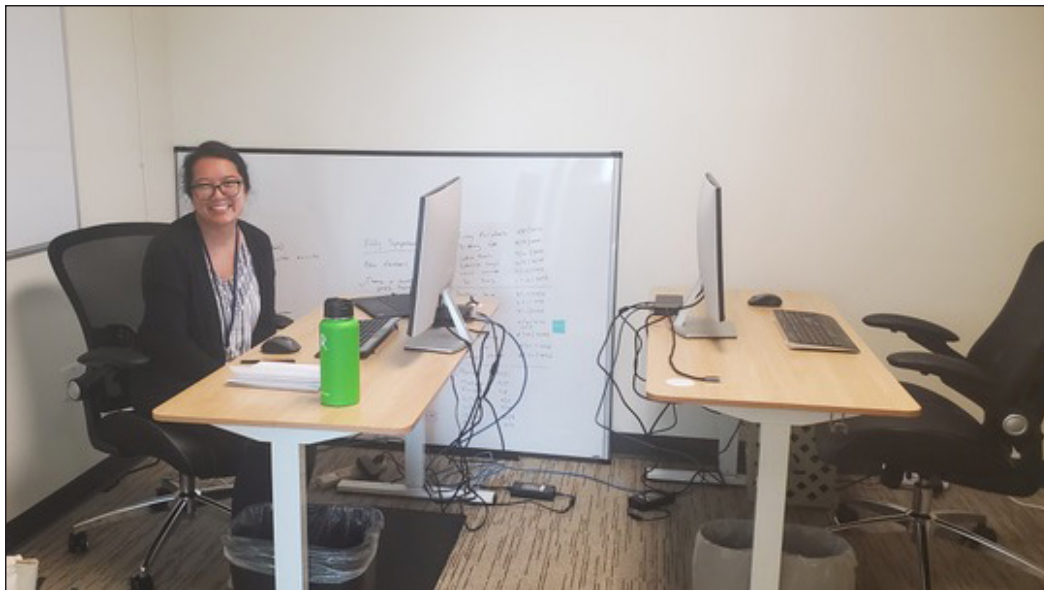
Larry Doheny, formerly known as Foldenfjord. Image courtesy of NOAA ONMS/ORR.

[tured](#) on the voyages, and discoveries from [past expeditions](#). Watch Philip Hartmeyer, CPAESS Discovery talk on [“The Marine Archaeology Portfolio of NOAA Ocean Exploration.”](#)

Hoteling in the CPAESS Business Office

We understand that much of the CPAESS staff either work from home or work in various offices across the country. To make sure you always have an office home away from home, CPAESS now has two hoteling spaces (3 desks) that our remote employees and visiting science staff can now reserve. The schedule is set up to reserve a desk in 4-hour blocks (morning and afternoon).

Recently, Tanya Chaisitti of the CPAESS Business Office Finance Department used this service and said, “Wonderful hoteling space! I really appreciated having a spot to set up my work away from home. There was a docking station, monitor, keyboard, mouse, and even a sit-stand desk! It was easy to get connected and continue my day on-site. Kudos to Kim for putting together this fantas-



Budget Analyst Tanya Chaisitti at a CPAESS hoteling office set up.

tic space!” For more information or assistance with scheduling, [please contact Kim Agado](#).

[Reserve a desk in FL4-2213](#)

[Reserve a desk in FL4-2235 \(Desk A\)](#)

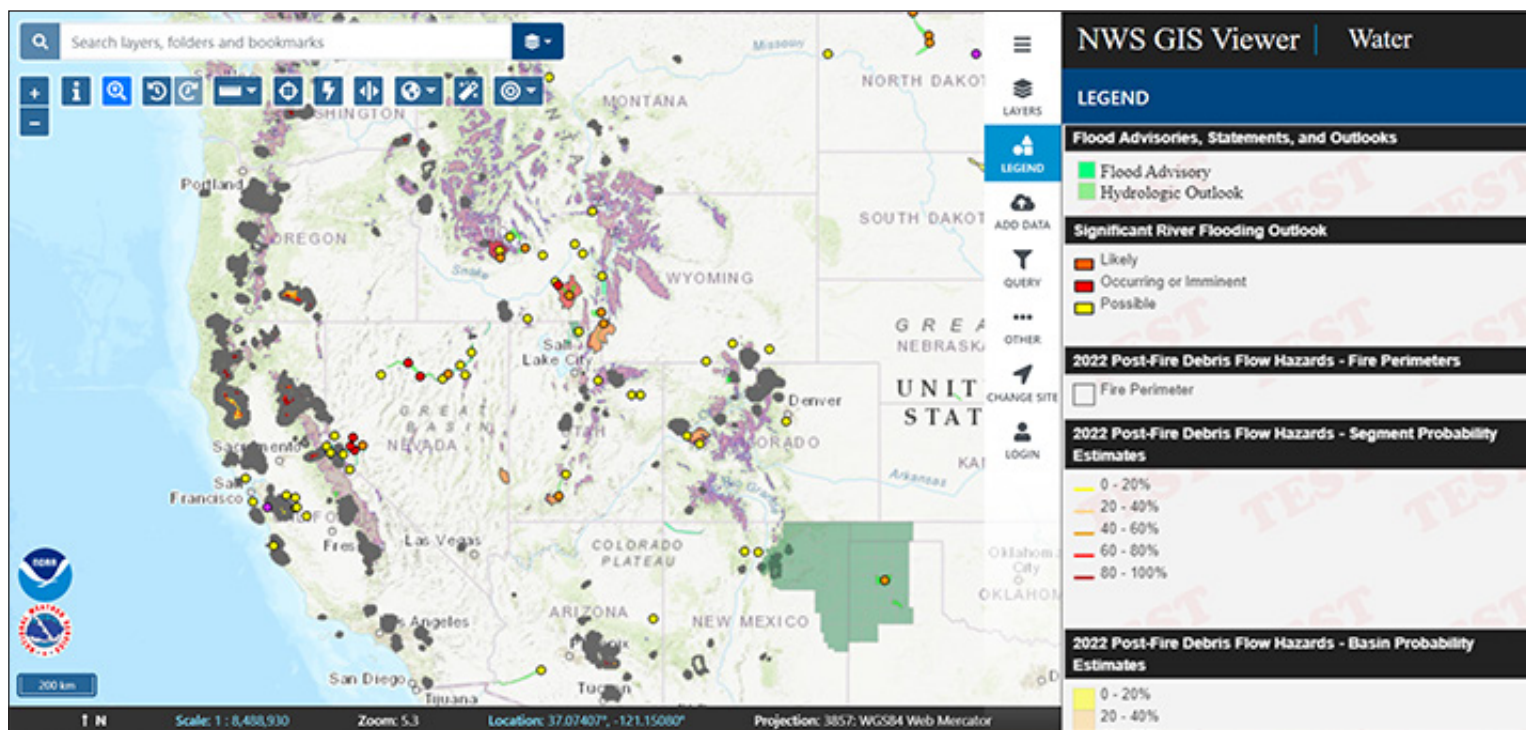
[Reserve a desk in FL4-2235 \(Desk B\)](#)

Whether you are a remote worker or someone visiting the CPAESS Business Office, please reach out to us so that we can help you comfortably work while you are away from your typical office.

The Viewer: Weather Data Visualized

CPAESS Associate Scientist, Christopher Ridener who works at NOAA’s Integrated Dissemination Program (IDP) has been busy perfecting the new version of the [National Weather Service’s \(NWS\) GIS Viewer application](#), which is now live. This and many other NOAA products are created to serve the NWS mission of providing “weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy ([NOAA](#)).”

According to NOAA, “In July of 2021, the NWS began an experimental phase of an Experimental National Geographic Information System (GIS) Map Viewer (“the Viewer”) web application...[which] provides capabilities to display, interrogate, access, and discover data and easily assimilates this information so that those familiar with geospatial data and technology can seamlessly access and



Screenshot of the NWS Viewer with many layers of GIS weather information available at one's fingertips.

digest it. The Viewer's data layers include everything from rapidly updating products (e.g. radar) to more traditional products (e.g. forecasts), and from watches and warnings to reference boundaries."

"[T]he Viewer now has a total of nine program sites accessible in the 'Change Site' menu. Work has begun to identify specific data to add to each of these sites. Tropical and Water have the most content at this time. Each of these program sites feature a collection of layers that are most relevant to that program. They include: Tropical, Water, Fire, Severe, Winter, Space, Climate, Aviation, and Marine. (NOAA)."

Christopher Ridener explained to us that "The new update included reconfiguring map feature layout, the addition of dynamic legends, and some bug fixes. We are continuously making/adding new datasets as they become available, or requested from NWS field staff." When asked who would pri-

marily be using this tool he shared that "The application is designed to be used by NOAA staff, emergency responders, and the general public, interested in visualizing weather data. It is a GIS application which hosts most U.S., federally-produced weather data, and makes it available for visualization and a small set of geoprocessing tools."

NWS provides a plethora of information and tools for the public to use from emergency alerts, weather radio, educational information and [so much more](#). The Viewer is an impressive and very robust tool that certainly adds to this library of information available to us all, and is definitely aiding NWS' goal of creating a "weather ready nation."

Ridener added "Since working in my current position with NWS, I have developed new insight as to what it takes to produce and maintain weather data on a federal scale. I have also gained new appreciation for the weather data I consume personally, knowing the process it takes to dissemi-



CPAESS Associate Scientist, Christopher Ridener who works with the NOAA's Integrated Dissemination Program (IDP).

nate from the network of Weather Forecasting Offices, to my local news." We are so glad you are on our team supporting NOAA's critical public service goals. Thank you so much for sharing your work Christopher.

New CPAESS Scientist Joins the GOMO Team

CPAESS is delighted to have a strong team of scientific staff working out of NOAA's Global Ocean Monitoring and Observing Office (GOMO) including GOMO Manager, Kathy Tedesco; and Program Specialists David Allen, Cheyenne Stienbarger, and Ann-Christine Zinkann. We are excited to welcome and introduce you to this team's newest member Alyse Larkin who will also serve as a Program Specialist.

As a CPAESS scientist, Alyse will be working with Kathy Tedesco on ocean carbon cycle measurements, as well as the marine carbon dioxide removal program. Of the latter, this work includes a spectrum of geoengineering possibilities from seaweed cultivation, to wetland restoration, and calcium carbonate ocean floor seeding as possible efforts to absorb more carbon dioxide from the atmosphere and contribute to the reduction of greenhouse gases.

Larkin is also working with NOAA's GO-SHIP ([Global Ocean Ship-Based Hydrographic Investigations](#)) Program to expand their biological measurements. The GO-SHIP program conducts ship-based hydrography for the purpose of "obtaining high-quality, high spatial and vertical resolution measurements of a suite of physical, chemical, and biological parameters over the full water column. Ship-based hydrography is essen-



Dr. Alyse Larkin-Swartout has recently joined the CPAESS team working at NOAA's Global Ocean Monitoring & Observation team.

tial for documenting ocean changes throughout the water column, especially for the deep ocean below 2 km (52% of global ocean volume not sampled by profiling floats). Global hydrographic surveys have been carried out approximately every decade since the 1970s” ([source NOAA](#)). Essentially the ships methodically measure many aspects of the ocean slice by slice, and Alyse will help support a new biological pilot program, Bio-GO-SHIP. Bio-GO-SHIP scientists will be examining imaging data to count plankton, chlorophyll measurements, the organic chemistry of marine particles, and environmental DNA (e-DNA) to name some of the types of new data that will be collected.



Alyse with penguins while researching in the Galapagos.

Lastly, Alyse will be working on the Global Sea Level Observing System ([GLOSS](#)) program which is an international effort to install high quality tide gauges in the world’s oceans to measure sea level rise. “GLOSS was established by the UNESCO Intergovernmental Oceanographic Commission (IOC) in 1985 and it is currently formed by over 90 nations across the globe...Tide gauge observations provide information on a wide spectrum of oceanographic processes, ranging from surface and internal tides to surface currents and ocean eddies. In situ observations of sea level are also needed to monitor and understand global sea level rise, as well as interannual to decadal sea level variations, which provide insight into ocean circulation changes on climate time scales. In addition, sea level observations are used to examine extreme events associated with tsunamis, storm surges, and other factors leading to short-term coastal inundation ([source NOAA](#)).”

Alyse explained that they are working to install these tide gauges in not only in “highly informative locations but in communities throughout the global south and the tropical Pacific to ensure that we are helping to provide these stations in countries

that might not have the resources to install them themselves.” These gauges have GPS coordinates to validate the sea level rise in conjunction with landmarks, which also rise and fall due to geological processes. This data is also used to calibrate satellite imagery as well, to get the best quality information from all the tools employed.

In addition to her ocean carbon, ocean biological research, and sea level rise work through CPAESS at GOMO, Alyse is the Executive Director of Scientific Research and Education Network ([SCIREN](#)), a non-profit she helped found as a graduate student. Its mission is “to connect local STEM researchers and educators to foster the dissemination of current research and ultimately enhance the science literacy of today’s youth” ([source SCIREN](#)). They create curriculum material to bring current research and researchers into communities and classrooms.

Dr. Larkin, we are genuinely happy to welcome a scientist with your expertise, both professional-

ly and in terms of sharing science with students, to our team. We are delighted to have you onboard.

US CLIVAR Summit and Upcoming Activities

One of the unique things that SPS | CPAESS does is host important scientific programs with critical focuses that are supported by numerous agencies. The [US Climate Variability and Predictability Program \(US CLIVAR\)](#) is one such program. US CLIVAR is a national research program with a mission to foster understanding and prediction of climate variability and change on intra-seasonal-to-centennial timescales, through observations and modeling with emphasis on the role of the ocean and its interaction with other elements of the Earth system, and to



CPAESS Staff from left to right: CPAESS | CLIVAR Program Specialist Alyssa Johnson, CPAESS | CLIVAR Program Specialist Alyssa Cannistraci, CPAESS Event Planner Jessica Martinez, CPAESS | CLIVAR Program Specialist Sam Coakley, CLIVAR Project Director Mike Patterson, CPAESS Program Specialist (at NOAA CPO) David Benson, SPS | CPAESS Director Hanne Mauriello, and CPAESS Project Scientist (at GFDL) Baoqiang Xiang.



2023 US CLIVAR Summit attendees in Seattle, Washington.

serve the climate community and society through the coordination and facilitation of research on outstanding climate questions.

Their research notes the critical role that the ocean plays in providing a major long-term “memory” for the climate system, and generating or enhancing variability on a range of climatic timescales. Understanding the ocean’s role in climate variability is therefore crucial for quantifying and harnessing the predictability inherent to the Earth system. US CLIVAR-led research has played a substantial role in advancing understanding of, and skill in predicting climate variability and change.

This summer, the [US CLIVAR Summit](#) was held in Seattle, Washington by invitation only. Its purpose was to bring together the members of the Scientific Steering Committee and its three implementation Panels, agency managers, and invited speakers to review progress, identify opportunities, and develop strategies to advance US CLIVAR goals under the direction of the Science Plan. About 60 people were in attendance, including approximately 30 virtual attendees.

Leading up to the Summit, a webinar series featured updates from the US CLIVAR working groups. The first day of the meeting had plenary sessions attended by panelists, the Scientific Steering Committee, and agency managers. The second and third days featured panel breakout sessions where each panel will discuss a different subject. Some of these sessions were held jointly between two panels. Each panel reported out on their discussions to the plenary group on the third day to close the meeting. These sessions and breakouts were broadcasted online for those invitees who are unable to attend in-person. The plenary sessions included: Climate and humans: Impacts of recent heat extremes in the Pacific Northwest; Addressing indigenous peoples’ climate information needs; and Persistent model biases in the Southern Ocean and their impacts.

It was an excellent summit which enabled participants to share their research and innovate together on potential future solutions. It also allowed CLIVAR colleagues to meet new CPAESS Program Specialists Alyssa Johnson and Alyssa Cannistraci; as well as send off Sam Coakley who has served US CLIVAR well for the past 2 years.

US CLIVAR has numerous opportunities to engage with them coming up. [Find them here.](#)

CPAESS Business Office Team – Who Are We?

As CPAESS employees are spread across the country, we wanted to take a moment to introduce the CPAESS Business Office team so you can see the face behind the email or phone call. Below is a sentence or two synopsis of what we do for CPAESS. Know that it is our pleasure to help you in any way we can.

Hanne Mauriello, SPS | CPAESS Director:

Hanne is our fearless leader managing both UCAR Community Program’s Scientific Programs & Partnerships Center and the CPAESS Program.

Cindy Bruyère, SPS | CPAESS Deputy Director:

I lead the CPAESS Partnership and Programs themes.

Whitney Robinson, Senior Administrator:

I provide oversight and leadership for all of our human resource (HR) activities, proposals, awards, and post-award management. I am also a part of the leadership team for our UCP Business Shared Services (BSS).

Kate Rodd, Project Specialist:

I am the program coordinator for the NASA and NOAA postdoctoral programs and the NOAA WINGS Ph.D. fellowship program.



Above (left to right): Hanne Mauriello, Cindy Bruyère, and Whitney Robinson.
Below (left to right): Kate Rodd, Heather Koch, Joel Lampe



**Heather Koch,
CPAESS HR Administration Lead:**

I provide comprehensive administration and employee lifecycle management to the CPAESS program and serve as the primary liaison between UCAR Human Resources and CPAESS representing our sponsor programs.

Joel Lampe, HR Administrator:

I support CPAESS staff throughout their employment life cycle within the program. This includes

anything, from creating job postings to onboarding to professional development.

David Stuebing, HR Administrator:

I support CPAESS through a variety of HR functions from creating job postings, to onboarding, professional development, and connecting anyone with questions to appropriate resources.

Kimberley Agado, CPAESS Administrative Assistant. Division Property Administrator, Purchasing and Procurement, and Administrative support.

**Michelle McCambridge,
Event & Travel Team Lead:**

I supervise the CPAESS event and travel team and sometimes act in the role of Meeting Planner.

Scott Robinson, Travel Team Lead:

I assign the submitted travel requests to the CPAESS Travel Team and also process travel requests and expense reports.

Maggie Costley, Meeting Planner Lead:

I get to work with the sponsors to help create a meeting where they can bring colleagues together to discuss scientific information to progress areas of their field.

Jessica Martinez, Meeting Planner:

Your one stop shop for all your successful meeting needs; venues, catering, lodging, travel and logistics.



Above (left to right): David Stuebing, and Kimberley Agado
Below (left to right): Michelle McCambridge, Scott Robinson, Maggie Costley





Above (left to right): Jessica Martinez, Shelley Rabern, Keri Dawn Solner.
Below (left to right) Sarah Herring, Rebecca Cribelli, and Kerri Parsley



Shelley Rabern, Meeting Planner:

Planning and execution of meetings and events from catering to venue sourcing to lodging and beyond.

Keri Dawn Solner, Meeting Planner:

I'm a new meeting planner II with CPAESS. I have an undergraduate degree in Atmospheric Science and am overjoyed to assist with events promoting the Earth Science Systems.

Sarah Herring, Travel Coordinator:

I process and coordinate travel for employees and guests for a number of different venues.

Rebecca Cribelli, Travel Coordinator:

I assist CPAESS employees in navigating the travel procedures by creating travel requests and ensuring they are approved, booking flights, and reconciling expense reports. I also work on group travel for visitors with the CPAESS Meeting Planners.



Above (left to right): Katy Lackey, Tania Sizer, Dawn Mullally
Below (left to right): Alex Meyer, Donna Cummings



Kerri Parsley, Travel Coordinator:

Kerri is part of the team that will help you arrange your travel.

Katy Lackey, Casual:

I create expense reports for Virtual Meeting Expenses, Honoraria processing, and various other items as needed.

Tania Sizer, Web Developer:

I build websites for CPAESS and the programs CPAESS manages, and I maintain these websites. These include the main CPAESS website, US CLIVAR website, the UCAR|CPAESS Proposal website, and three others. Please ask me if you have any questions!



Above (left to right): Julie Cross and Tanya Chaisitti

**Dawn Mullally,
Communications Manager:**

I manage our diverse communication channels and create content to show the Earth system science community the great work of the CPAESS team and its value to our world. It is a real pleasure to brag about your excellent work.

**Alex Meyer, Graphic Designer |
Website support:**

I produce graphics and website support for the many CPAESS scientific programs and events. I also manage the monthly CPAESS Discovery Seminar series which highlights the diverse science and research from our scientists.

Donna Cummings, Budget Analyst:

I work on conference workshops, as well as responsible for all subawards.

Tanya Chaisitti, Budget and Grants Analyst:

I handle the budgets of the Heliophysics program and provide financial reporting support to CPAESS.

Julie Cross, Budget Analyst: I support proposal development, budget and financial development and analysis of assigned awards, and reporting and documentation to internal and external entities. I also oversee the NOAA SCP Cooperative Agreement and the NRL Cooperative Agreement.

Please don't hesitate to reach out to any one of us, if you need our assistance. All of our emails can be found here.

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