44th Annual AGU Hydrology Days

April 16-17, 2024

ONE WATER
SOLUTIONS INSTITUTE
COLORADO STATE UNIVERSITY

hydrologydays.colostate.edu

SCHEDULE: At-a-Glance

Presentation Details: https://hydrologydays.colostate.edu/draft-schedule-2024/

Tuesday April 16, 2024

TIME	LSC Never No Summer Room	LSC Room #386	LSC Room #372-374
8:00 - 9:00 am	*Registration*		
9:00am - 10:30 am		Ecohydrology, Water, and Plants, Session 1 Chair: Tim Green	Climate & Meteorology Chair: Anna Pfohl
10:30 - 10:45 am	*Break*		
10:45 - 12:00pm		Ecohydrology, Water, and Plants, Session 2 Chair: Tim Green	Geoscience & Groundwater Chair: Ryan Bailey
12:00 - 1:00 pm	*Lunch*		
1:00 - 2:00pm	**Hydrology Days Award:** **Martha Anderson** *Taking the Earth's Temperature – Diagnosing Evaporative Fluxes Across Scales*		
2:15 – 3:45 pm		Hydraulics & Geomorphology Chair: Ryan Smith	

Wednesday April 17, 2024

TIME	LSC Never No Summer Room	LSC Room #386	LSC Room #372-374
8:00 - 9:00 am	*Registration*		
9:00am - 10:30 am		Urban Water Systems Chair: Sybil Sharvelle	
10:30 - 10:45 am	*Break*		
10:45 - 12:00pm		Hydrologic Systems Chair: Jeffrey Niemann	
12:00 - 1:00 pm	*Lunch*		
1:00 - 2:00pm	**Borland Hydrology Award:** **Christa Peters-Lidard** *Data-Driven Hydrology: From Assimilation to Digital Twins*		
2:15 – 4:00pm	Student Showcase and Competition Chair: Sarah Millonig		

MEETING INFORMATION

Location

The conference will be held on **level 3** of the CSU Lory Student Center. Technical sessions will take place in rooms 372-374, and 386 (see map). The Keynotes, lunches, and Student Showcase take place in Never No Summer Ballroom.

300 LEVEL

Parking

All vehicles parked on campus must have a valid CSU parking permit or park in designated hourly parking spaces and pay at a pay station!

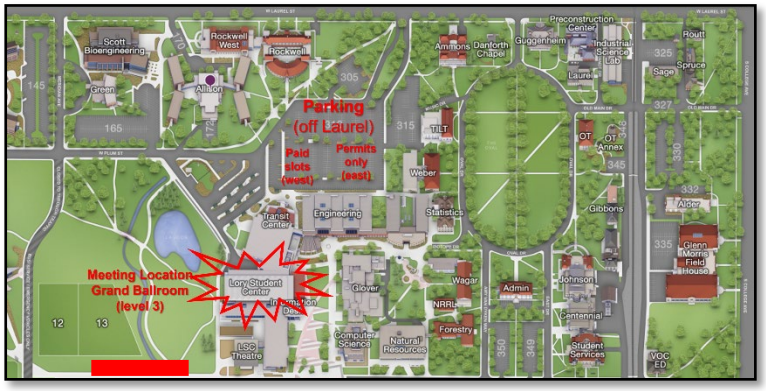
Parking Permits

- **Hourly permit:** Hourly parking on campus is $2. When you arrive in a lot with visitor parking, have your license plate number ready to enter into our hourly pay machines or you can download and use the Park Mobile app to pay by mobile phone. You can pay by credit card for the amount of time you wish to park. Your license plate number will serve as your permit. For more information visit short-term parking.
- **Daily permit:** A daily permit can be purchased online or at Parking and Transportation Services, located in the Lake Street Garage at 1508 Center Avenue.

Where is the easiest place to park on campus for visitors?

Visitor parking permits are available for the areas listed below, also noted on the university's parking map (PDF and online), and connect to Around the Horn to get you around campus:

- Moby Lot #195
- Green Hall
- Engineering #310 (recommended)
- Ammons Hall # 315
- Administration #349
- MAX at University Station #440
- Lake Street Garage
- Voss Veterinary Teaching Hospital
- Research Blvd #740



KEYNOTE SPEAKERS

AGU Hydrology Days Award

Dr. Martha Anderson – Research Physical Scientists, USDA Agricultural Research Center, Hydrology and Remote Sensing Laboratory

***Bio**:* Martha C. Anderson received a B.A. degree in Physics from Carleton College, Northfield, MN, and a PhD in Astrophysics from the University of Minnesota, Minneapolis. Presently she is a Research Physical Scientist for the USDA Agricultural Research Service in the Hydrology and Remote Sensing Laboratory in Beltsville, MD. Her research interests focus on mapping water and energy land-surface fluxes at field to continental scales using thermal remote sensing, with applications in water management, drought monitoring, and yield estimation. She has served on the Landsat and ECOSTRESS Science Teams.

Keynote Lecture: April 16th, 2024 at 1 PM – CSU Lory Student Center, Never No Summer Ballroom

Taking the Earth's Temperature – Diagnosing Evaporative Fluxes Across Scales

Abstract: *Thermal infrared (TIR) and visible/near-infrared (VNIR) surface reflectance imagery from remote sensing can be effectively combined in surface energy balance models to map evapotranspiration (ET) and vegetation stress, with broad applications in agriculture, forestry, and water resource management. In addition, diagnostic estimates of evaporative losses to the atmosphere can provide valuable information to prognostic land-surface modeling systems, revealing ancillary sources/sinks of plant available water (e.g., irrigation, shallow groundwater, deep rooting zones, tile drainage) that may be difficult to know in detail a priori but can have a notable impact on the land-surface temperature and on the system water balance. In this presentation we will discuss the unique information content conveyed by the land-surface temperature signal regarding the surface moisture status and vegetation health at field up to global scales. We will explore applications for temperature and ET retrievals in promoting sustainable water use and agricultural practices and for improving land-surface modeling systems used in hydrologic, weather, and climate forecasting system. Widespread and routine generation of ET data at field scale has been enabled by cloud computing technologies, with the OpenET ensemble modeling system as an example of collaborative geospatial information development. Looking forward, integration of Landsat with new sources of medium-resolution TIR imagery (e.g., ECOSTRESS, LSTM, TRISHNA, SBG, Landsat-Next, and Hydrosat), as well as all-sky microwave-based temperature retrievals, will improve ability to detect rapid changes in water use and availability – a key factor in decision making.*

Borland Hydrology Award

Dr. Christa D. Peters-Lidard– Director in Sciences and Exploration Directorate, National Aeronautics and Space Administration

***Bio**:* Dr. Christa D. Peters-Lidard is currently the Director in the Sciences and Exploration Directorate, where she has been Deputy Director since November 2021. She was Deputy Director for Hydrosphere, Biosphere, and Geophysics in the Earth Sciences Division from 2015-2021, and she was the Acting GSFC Chief Scientist from 2020-2021. She was a Physical Scientist in the Hydrological Sciences Laboratory from 2001-2015, and Lab Chief from 2005-2012. Her research interests include land-atmosphere interactions, soil moisture measurement and modeling, and the application of high-performance computing and communications technologies in Earth system modeling, for which her Land Information System team was awarded the 2005 NASA Software of the Year Award. She is a member of Phi Beta Kappa and was awarded the Committee on Space Research (COSPAR) Scientific Commission A Zeldovich Medal in 2004 and the Arthur S. Flemming Award in 2007. She was elected as an AMS Fellow in 2012, an AGU Fellow in 2018 and a member of the National Academy of Engineering in 2023. She has served as Chief Editor for the American Meteorological Society (AMS) Journal of Hydrometeorology and as an elected member of the AMS Council and Executive Committee. Her Ph.D. is from the Water Resources Program in the Department of Civil Engineering and Operations Research at Princeton University, and she holds a B.S. in Geophysics Summa Cum Laude from Virginia Tech.

Keynote Lecture: April 17th, 2024 1pm – CSU Lory Student Center, Never No Summer Ballroom

Data Driven Hydrology: From Assimilation to Digital Twins

Abstract: *Over the last thirty years, Land Data Assimilation Systems (LDAS; e.g., http://ldas.gsfc.nasa.gov; http://lis.gsfc.nasa.gov) have advanced from precipitation-driven systems at the Air Force Weather Agency (AGRMET) through community collaborations such as the North American (NLDAS), European (ELDAS), Global (GLDAS) and FEWS NET (FLDAS), and most recently the Global Hydro-Intelligence (GHI) system. As these systems developed, land data assimilation techniques have evolved from surface temperature-based nudging to filter-based approaches that assimilate satellite-based observations such as soil moisture, snow cover and snow water equivalent, terrestrial water storage, leaf area index, vegetation optical depth, and albedo. These systems are now widely used for multiple applications, including numerical weather prediction, sub-seasonal to seasonal forecasting, drought monitoring and forecasting, and hydrological forecasting. In this lecture, I will present examples of hydrologic data assimilation, which has led to a new "fourth paradigm" for hydrology with a focus on data-driven models including hydrology digital twins.*