



MONTANAView 2023 - 2024

AmericaView
Empowering Earth Observation Education
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MONTANAView 2023 - 2024 ACTIVITIES

MontanaView awarded five remote sensing fellowships (\$1,667 per student) to students at four institutions across the state of Montana.

The following is a list of the students and their institutions, project titles, and faculty mentors (in parentheses):

- Kyla Christopher-Moody, Montana State University, Snow Accumulation and Ablation Pattern Changes impacted by Canopy Cover Alteration in Sourdough Canyon (Dr. Eric Sproles)
- Bianca Giunti, University of Montana, An Analysis of the Transformations of Laguna Melincué Wetland (Dr. Sarah Halvorson)
- Riley Henson, University of Montana, Assessing hydrogeomorphic change in East Rosebud Creek from the June 2022 flood in northern Yellowstone National Park using field measurements and UAV imagery (Dr. Andrew Wilcox)
- Samantha Haak, University of Montana Western, Brine Infiltration into the McMurdo Ice Shelf, Antarctica (Dr. Neil Foley)
- Mohammad Masood, Montana Tech, Estimating Carbon Storage and Vegetation Regrowth Monitoring in Forests Affected by Prescribed Fires Using Hyperspectral and LiDAR Data (Dr. Xiaobing Zhou)

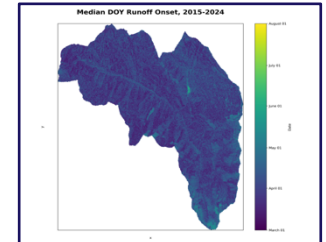


Figure from Kyla Christopher-Moody of Montana State University, depicting the median day of runoff onset melt in Sourdough Canyon, Montana from 2015 to 2024 as estimated from C-band SAR from Sentinel-1.

MontanaView also continued to investigate drivers of methane flux variability in boreal wetlands by means of a partial graduate research assistantship for PhD candidate Mary Farina of Montana State University (advisor Dr. Scott Powell).

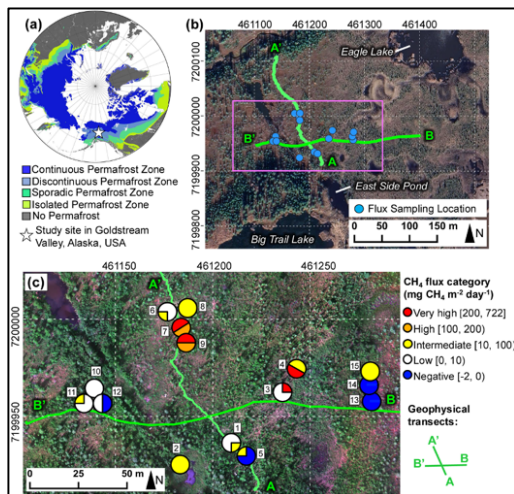


Figure from Mary Farina of Montana State University, depicting arctic permafrost zones and methane flux field sampling observations from Big Trail Lake, near Fairbanks, Alaska.

- The study objectives are to assess spatial variation in methane flux and identify key surface, near-surface, and subsurface drivers in a transitioning boreal forest-fen ecosystem underlain by thawing discontinuous permafrost. We combined *in situ* observations of chamber fluxes and soil conditions; analysis of soil microbial communities; terrain modeling; and geophysical characterization of permafrost structure.
- One key study finding is the observation of methane emission hotspots on relatively dry, moss-dominated escarpments, likely due to deeper subsurface methane contributions, demonstrating that spatial mismatches between surface and subsurface processes can lead to unexpected methane fluxes.
- Such spatial discrepancies pose a challenge for remote sensing-based approaches to modeling methane fluxes, which rely on surface and near-surface datasets.

MontanaView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state. AmericaView is funded by USGS grant agreement G23AP00683.

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BENEFITS TO MONTANA

The MontanaView High Impact Activity “Fellowships for undergraduate and graduate students conducting applied remote sensing projects” has several direct benefits to the state of Montana, namely:

- Supporting students and providing encouragement and resources for them to pursue a career in geospatial sciences and remote sensing.
- Providing information, data, and analysis that will improve the management of Montana’s natural resources.

The MontanaView investigation of methane flux variability in boreal wetlands has several direct benefits to the state of Montana, namely:

- Improving understanding of greenhouse gas fluxes, including in ecosystems that are similar to those found in Montana.
- Enhancing graduate education and research opportunities and providing future workforce training.
- Developing strategic partnerships across state, national, and international levels.

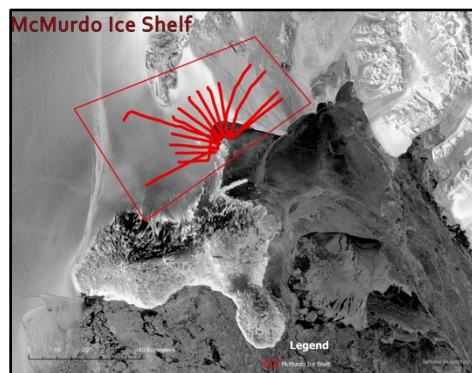


Figure from Samantha Haak of the University of Montana Western depicting a radar image of the McMurdo Ice Shelf in Antarctica along with aerial electromagnetic resistivity surveying locations.



Photograph of Mary Farina of Montana State University and her field research team conducting methane flux measurements at Big Trail Lake, Alaska.

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