2024 Season Plan for Battelle ARO Support
Mack / 2224776

This plan is an agreement between Battelle Arctic Research Operations (Battelle ARO) and the research team, documenting the logistics support that will be provided. Battelle ARO has developed this plan under the direction of the US National Science Foundation (NSF).

PROJECT INFORMATION

Lead Principal Investigator	Michelle Mack
Institute	Northern Arizona University
Project Title (Grant #)	LTER: Changing Disturbances, Ecological Legacies, and the Future of the Alaskan Boreal Forest (2224776)
Funding Agency and NSF Program Manager	US\Federal\NSF\BIO\DEB; Francisco Moore
NSF Approving Program Officer / COR	Renee Crain
Battelle ARO Project Manager	Rachel Murray

LOGISTICS SUMMARY

The Bonanza Creek Long-Term Ecological Research (BNZ LTER) program will advance understanding of the impacts of changing climate and disturbance regimes on the Alaskan boreal forest and explore associated regional consequences on feedbacks to the climate system. In collaboration with Alaska Native communities, as well as state and federal land management agencies, the BNZ LTER program will identify vulnerabilities and explore adaptation opportunities to environmental change. This project will combine continued collection of long-term data with data from new sites, experiments, and surveys that expand research to new axes of disturbance impacts. Fieldwork involves expansion of the Regional Site Network (RSN+) via helicopter into roadless areas of Interior Alaska over a period of six years (2023-2028). Four types of sites will be established and sampled: thermokarst areas, wetlands, and recent fire scars. Thermokarst sites (near the Toklat River) will be accessed from the Denali or Healy airports via helicopter access each year in the July to August timeframe. Wetland sites (Minto Flats and Tanana Flats) will be accessed from the Fairbanks airport via helicopter each year in late August to mid-September. Recent fire scar sampling sites will be established each year (three new fire scars from the previous year, six sites at each scar), and will be within 100 miles of Fairbanks, Manley or Central depending on the fire activity. Established sites will be revisited three and six years after the fire.

In 2024, the project will have four campaign groups working at different field sites in July, August, September and October. One campaign group will access sites via helicopter in Denali National Park, where they will survey thermokarst sites and collect water samples and site characteristics. The other three campaign groups will fly out of Fairbanks and will survey (1) the sites of new 2024 wildfires, (2) the sites of previous wildfires, and (3) wetlands that have and have not experienced wildfires. These sampling sites are within the Fairbanks, Manley, or Central vicinity. Each campaign group has three researchers flying in the helicopter; in some campaigns different researchers will rotate through the flight roles.

Battelle ARO will provide helicopter support, and safety and communication gear from Battelle ARO inventory. All other support and logistics will be arranged and paid for through the grant.

For the complete Battelle ARO online project record for this grant, including science objectives, go to:
https://api.battellearcticgateway.org/v1/reports/grant?proposal_number=2224776

PLANNING MILESTONES AND NOTES

Item	**Responsibility**
Review Season Plan for accuracy and distribute to all field team members.	PI
Obtain all necessary permits for fieldwork.	PI
Visit all hyperlinks and review all documents referred to in the Season Plan.	Entire Field Team
Identify a person to review the Risk Assessment with the entire field team.	PI
Know the grant terms, and discuss with the institution risk management office to understand policies on medical evacuation, liability, workers' compensation insurance, etc.	PI
Provide institution emergency contact information.	PI
Specify the critical success factors.	PI
Researchers are responsible for abiding by all federal, regional, and local COVID-19 guidelines and requirements.	Entire Field Team

Item	Responsibility
The institution is responsible for medical costs and medical evacuation in the event that participants become sick or injured; medical evacuation insurance is an allowable grant cost and is strongly encouraged.	PI
Researchers are responsible for abiding by the NSF OPP Polar Code of Conduct.	Entire Field Team

FIELD PARTICIPANT CONTACTS AND ITINERARY

Denali National Park Thermokarst field campaign participants

Name	Institute	Email	Phone
Ted Schuur*	Northern Arizona University	ted.schurr@nau.edu	342.275.1869
Emma Lathrop*	Northern Arizona University	el498@nau.edu	505.695.6395
Julia Warren	Northern Arizona University	jaw845@nau.edu	920.639.0278
Megan McGroarty	Northern Arizona University	mm5349@nau.edu	267.222.2405
Justin Ledman	Northern Arizona University	justin.ledman@gmail.com	651.895.0474
Ariella Thompson	Northern Arizona University	at2785@nau.edu	623.734.4477

* Research team point of contacts (POC)

Denali National Park Thermokarst field campaign itinerary

Date In	Date Out	Location	Activity
July 17		Denali National Park area	Schurr, Lathrop, and TBD arrive in the Denali National Park area via field team travel arrangements.
July 18		Fairbanks > Denali National Park area	Helicopter mobilizes in Denali National Park area.
July 18		Denali National Park area	Schurr, Lathrop, and TBD participate in a pre-flight briefing with helicopter pilot.
July 18	July 27	Denali National Park area	The field team takes helicopter-based day trips out of Denali Park Airport to survey thermokarst sites, to collect water and soil samples, and to document site characteristics.
July 27		Denali National Park area > Fairbanks	Helicopter mobilizes to Fairbanks to support Wildfire Sites Field Campaign (see below). Schurr, Lathrop, and TBD depart Denali National Park area via field team travel arrangements.

Prior wildfire sites field campaign participants

Name	Institute	Email	Phone
Weronika Konwent*	Northern Arizona University	weronika.konwent@nau.edu	325.451.7724
Anastasia Pulak	Northern Arizona University	ap3475@nau.edu	857.869.6313
Isabel Andrade Munoz	Northern Arizona University	ia398@nau.edu	480.252.5546

* Research team point of contact (POC)

Prior wildfire sites field campaign itinerary

Date In	Date Out	Location	Activity
July 28		Fairbanks	Konwent, Pulak and Munoz participate in pre-flight briefing with helicopter team
July 28	Aug 7	Fairbanks > wildfire sites > Fairbanks	Konwent, Pulak and Munoz take helicopter-based day trips out of Fairbanks Airport in a 100-mile vicinity, limited based on helicopter fuel capability, to survey recent fire scars and collect soil samples
Aug 7		Fairbanks	Konwent, Pulak and Munoz remain in Fairbanks to complete other unsupported field research.

2024 Season Plan for Battelle ARO Support
Mack / 2224776

Active wildfire sites from 2024 field campaign participants

Name	Institute	Email	Phone
Weronika Konwent	Northern Arizona University	weronika.konwent@nau.edu	325.451.7724
Rebecca Hewitt*	Amherst College	rhewitt@amherst.edu	413.542.5869
Jorda Kovash	University of Alaska	jkovash@alaska.edu	406.560.1677

* Research team point of contact (POC)

Active wildfire sites from 2024 field campaign itinerary

Date In	Date Out	Location	Activity
Aug 8		Fairbanks	Hewitt, Konwent and Kovash participate in pre-flight briefing with helicopter team.
Aug 8	Aug 10	Fairbanks > Active wildfire Sites 2024	Hewitt, Konwent and Kovash take helicopter-based day trips out of Fairbanks Airport, in a 100-mile vicinity, limited based on helicopter fuel capability, to survey new sites for 2024 Wildfires and collect soil samples
Aug 10		Fairbanks	Hewitt departs Fairbanks. Konwent and Kovash remain to complete other field research.

Wetlands and Burned Wetlands field campaign

Name	Institute	Email	Phone
Catherine Dieleman*	University of Guelph	cdielema@uoguelph.ca	TBD
TBD participant #1	TBD	TBD	TBD
TBD participant #2	TBD	TBD	TBD

* Research team point of contact (POC)

Wetlands and Burned Wetlands field campaign itinerary

Date In	Date Out	Location	Activity
Sept 26		Fairbanks	Dieleman and two TBD participants participate in pre-flight briefing with helicopter team.
Sept 26	Oct 7	Fairbanks > Wetlands and Burned Wetlands	Dieleman and two TBD participants take helicopter-based day trips out of Fairbanks Airport to visit Minto Flats area, limited to helicopter fuel capability.
Oct 7		Fairbanks	Dieleman and two TBD participants depart Fairbanks

ALLOCATIONS AND SERVICES

Equipment Allocations from NSF Inventory

Item	Description	Unit	Quantity
Satellite Phone	Iridium	ea	1
Medical Kit	First responder kit	ea	1
Survival bag	2-person, summer helicopter. See Appendix B for details.	ea	2
Radio	VHF, 2-way, handheld	ea	2
Radio	Basic walkie-talkie	ea	2
Safety	Inert bear spray – inactive practice-only unit	ea	1

2024 Season Plan for Battelle ARO Support
Mack / 2224776

Gear provided by Battelle ARO will be issued at the following location:

Issuing Address:
Battelle ARO Fairbanks Office
2325 King Road
Fairbanks, AK 99709

The same field equipment will be used during all campaigns, and will be issued and returned two times as follows:

- Gear will be picked up on July 16 (Denali National Park – Thermokarst field campaign) and transferred by the science team until August 10.
- Gear will be picked up September 25 (Wetlands and Burned Wetlands field campaign) and returned to Battelle ARO October 8.

Other Services coordinated by Battelle ARO

Service	Comments
Aircraft charter	Battelle ARO will provide helicopter support. The contracted vendor is Alpha Aviation LLC. Science support: 144 hours spread out over 36 days (not consecutive) July 18 – July 27: Denali National Park Thermokarst Field Campaign July 28 – August 7: Wildfire Campaign Field Campaign August 8 – August 10: Active 2024 Wildfire Sites Field Campaign September 26 – October 7: Wetlands and Burned Wetlands Field Campaign See Appendix C for flight plans and notes on science team safety responsibilities. The science team should review these responsibilities to avoid disruption to planned work.
Field safety training	In-person Arctic Field Training (AFT) was provided by Battelle ARO in Boulder, Colorado and in Flagstaff, Arizona.

Other Services coordinated by Research Team

Service	Comments
Permitting	The research team is responsible for obtaining all necessary permits required for their field activities. One of the project campaigns takes place within Denali National Park. The science team continues permitting discussions with Denali National Park representatives. As of 2024-06-27, neither a permit for science activities or nor any conditions regarding aircraft access have been provided by the National Park Service. If permits are not secured, the campaign based in Denali National Park could not take place as planned.
Cold weather clothing and sleep gear	The research team is responsible for outfitting their field team with appropriate cold weather clothing and sleeping gear and any field equipment that is not specified as part of this Season Plan.
Field food	The research team is required to supply all field food.
Bear deterrent	The research team is responsible for purchasing personal bear deterrents if needed, such as bear spray or bear flares.
Ground Transportation	The research team is responsible for all ground transportation in conjunction with helicopter logistics

2024 Season Plan for Battelle ARO Support
Mack / 2224776

PROJECT CONTACT INFORMATION

Research Team

Role	Name	Email	Phone
PI	Michelle Mack	michelle.mack@nau.edu	928.523.9415
Co-PI	Todd Brinkman	tjbrinkman@alaska.edu	907.474.7139
Co-PI	Theresa Hollingsworth	tnhollingsworth@alaska.edu	907.474.2424
Co-PI	Jeremy Jones	jay.jones@alaska.edu	907.474.7972
Co-PI	Christa Mulder	cpmulder@alaska.edu	907.474.7703

Health and Safety Emergency Contact

The safety of team members working on a grant is the responsibility of the PI and their institution. In the event of an incident in the field, the project emergency contact named below will be notified to lead coordination of resources, insurance, etc. This person should be affiliated with the university or organization (such as a health and safety, risk management, or human resources officer), should have awareness of the fieldwork that is being conducted, should have access to the grantee emergency action plan (EAP) if created, and should be available 24-hours-a-day during fieldwork. This person should be aware of their role and will receive a copy of this plan. For projects with participants from multiple institutions, a lead point-of-contact would initiate the response among the participating institutions.

Role	Name	Email	Phone
Co-PI, Northern Arizona University	Xanthe Walker	xanthe.walker@nau.edu	928.637.5642
Field Manager, Northern Arizona University	Helena Kleiner	helena.kleiner@nau.edu	415.577.8872
Site Manager, University of Alaska, Fairbanks	Jamie Hollingsworth	jhollingsworth@alaska.edu	907.322.2846
Information Manager, University of Alaska, Fairbanks	Jason Downing	jpdowning@alaska.edu	907.322.2837

Battelle ARO Team Members

Role	Name	Email	Phone
Project management and planning *	Rachel Murray	rachel@polarfield.com	Cell: 720.545.7170
Alaska field operations	Patrick Proden	patrick.p@polarfield.com	Cell: 907.460.1974
	Molly Timm	molly@polarfield.com	Cell: 907.328.3719
	Daniel Pyle	daniel@polarfield.com	Cell: 530.313.8763
	Justin Hill	justin@polarfield.com	Cell: 712.635.7809
On-call contact, Fairbanks **	After hours Fairbanks contact number		907.455.4214
Satellite phones and communications	IT support	pfs-itc-support@polarfield.com	Cell: 303.807.1596 Office: 303.984.1450
Medical kits and service	Greg Huey	greg@polarfield.com	Cell: 505.670.1878

***** In the event of a non-emergency support request or scope change, contact the Battelle ARO project manager during standard U.S. business hours (Monday – Friday, 9-5 MT).

** In the event of an emergency, contact the Home Institution Health and Safety Emergency contact, In addition, contact this 'on-call contact' number for a calling service that will page a Battelle ARO staff member, available 24/7.

Battelle ARO Offices

Fairbanks	Denver
Battelle ARO / Polar Field Services 2325 King Road Fairbanks, AK 99709 Tel: 907.455.4214 Fax: 907.455.4126	Battelle ARO / Polar Field Services 861 SouthPark Drive, Suite 400 Littleton, CO 80120 Tel: 303.984.1450/1439

Other

Organization	Contact	Internet	Email
NSF Arctic Research Support and Logistics (RSL)	Renee Crain	NSF RSL Website	rcrain@nsf.gov
NSF Arctic Research Support and Logistics (RSL)	Dr. Frank Rack	NSF RSL Website	frack@nsf.gov
NSF Arctic Research Support and Logistics (RSL)	Kate Ruck	NSF RSL Website	kruck@nsf.gov

CRITICAL SUCCESS FACTORS

Factors
Provision of helicopter support for work in Denali National Park
Provision of helicopter support for work in and around Fairbanks
Provide satellite phones, medical kits and survival bags for all deployments

GOVERNMENT AND PERFORMANCE REPORTING ACT OF 1993 (GPRA)

NSF/OPP requires assistance from the research team in complying with the Government Performance and Reporting Act of 1993 (GPRA). One measure of Battelle ARO performance is a "facility-performance metric" which counts the number of productive days the project has in the field while relying on the Battelle ARO facilities or support. At the end of the season, the research team needs to report any "lost days" to the Battelle ARO project manager.

PERMITS and ENVIRONMENT

Permits: The research team is responsible for all permits required to conduct fieldwork. For information on Alaska permitting, visit https://battellearcticgateway.org/hse/permits.

Endangered Species: Researchers working in locations potentially occupied by Steller's eiders, spectacled eiders, or polar bears (species listed as threatened under the Endangered Species Act) must follow the Interaction Plans developed by Battelle ARO and the NSF.

Marine Mammals: Researchers working in areas where they may come into contact with marine mammals (e.g. whales, seals, walruses, etc.), incidental to their research either in the water or on land, must follow the Marine Mammal Avoidance Plan developed by Battelle ARO and the NSF which outline requirements of the Marine Mammal Protection Act.

Cultural Resources: All researchers working in areas that have the potential to encounter historical, archaeological, and cultural resources must follow the Inadvertent Discovery Plan developed by Battelle ARO and the NSF which outlines identification, avoidance, and reporting guidelines.

HEALTH and RISK

CU Anschutz / Wilderness Medicine: If medical advice/assistance is needed while in the field, contact CU Anschutz using the information below. For further information on CU Anschutz, visit: www.coloradoWM.org

CU Anschutz 24/7 Telemed service contact information:
Phone #: 844.285.4555 or 720.848.2828 (both numbers go to the same line)
Member ID: ARCTIC FIELD SUPPORT
Website: www.coloradoWM.org

Medical Kits: Standard kits with first aid and over-the-counter drugs are available upon request. Medical kits do not include prescription drugs; PIs who want to include prescription drugs must contact their personal physicians. The kit will be issued to the PI or lead field team member and will become their responsibility for use in the field. The kit must be returned to Battelle ARO at the end of each field season.

2024 Season Plan for Battelle ARO Support
Mack / 2224776

Risk Assessment: The Battelle ARO developed risk assessment is intended to assist the research team with planning. It lists potential hazards and provides suggestions for how to minimize or manage them. It is not a complete list of the hazards that researchers may be exposed to but is intended as a starting point for hazard analysis. The entire research team should review the risk assessment, brainstorm other potential hazards, and take action as needed. The PI and/or research team should consult with their institution risk management office; it is important that institutions involved in the grant understand the risks of the project and contribute to the process.

The PI and their institution are responsible for the safety of team members conducting field work on the grant. NSF Grant General Conditions (GC-1) provides specific language regarding responsibility and liability. Visit the Battelle ARO website for additional information on field risk management, including information on workers' compensation, insurance, and emergency contacts: https://battellearcticgateway.org/for-researchers/know-before-you-go..

Battelle ARO will host a Risk Assessment meeting, including discussion of both risks and suggested mitigations. The call is scheduled for June 26. Anticipated participants include research team members and Battelle ARO Project Manager Rachel Murray**.** Topics expected to be covered during the risk assessment meeting will include field experience level, Covid tolerance, prepare for inclement weather conditions, helicopter operations, brown bear safety, and other hazards the team might encounter while working in Alaska.

John Stoddard Field Risk Technician conducted in-person Arctic Field Training for two groups supported under this grant: one at CU-Boulder, Boulder, Colorado and one at Northern Arizona University, Flagstaff, Arizona. While the groups selected different areas of emphasis, both teams identified common curriculum. Specific topics covered included communications gear, cold and heat injuries and responses, clothing for the environment, patient assessment and first aid contents, Emergency Action Plans, repair kits, wildlife awareness and responses, teambuilding, communications plans, incident and near miss reporting, safe and respectful working environments.

Factor	Suggested Mitigation and Control
Wildlife	• All participants should be diligent in watching for and communicating the presence of potentially dangerous wildlife. • Participants should preserve space between themselves and wildlife and avoid actions that may habituate animals. • Large animals may defend their territory, food, or young; they may charge without warning. Participants should avoid startling wildlife and give them plenty of space. • Participants should be aware of animal body language; for example, a bear, muskoxen or moose that has stopped feeding, walking, or resting likely recognizes human presence and may become agitated. A stressed muskox group may form a defensive line. Even small and medium sized animals who are stressed or agitated present significant threat. • If the animal is fearless but not aggressive, back away cautiously; rabid animals may behave unexpectedly. • If any animal is approaching fast, participants should form a group and retreat as fast as prudent. If attacked, fight back and use any means for protection. • Sled dogs are working dogs, not pets. Dogs have attacked humans in some villages. • Polar, Black and Brown bears pose specific hazards; bear awareness and defense strategies should be addressed for researchers working in bear habitat. • Several bird species will become aggressive when threatened, including Arctic terns, gulls, raptors, and nesting geese and swan. Some species are large enough to cause harm.
Cold weather	• Participate in a cold weather injury prevention and treatment training which is part of the Wilderness First Aid and Wilderness First Responder curriculum. • Wear proper clothing and/or extreme cold weather gear and bring extra items (socks, gloves, etc.). • Travel with a partner. Watch other participants for signs of cold injury; they may not be aware of it themselves. • Choose appropriate camping gear, adequately rated sleeping bags, and/or emergency gear; ensure emergency gear is available in the field. • Check the forecast and watch for changing weather conditions; share travel plans with the team and develop an emergency plan for bad weather. • Stay hydrated and carry sufficient food.

	• Batteries for electronic devices should be kept warm and insulated to ensure proper function. Lithium batteries perform better in cold temperatures than alkaline batteries. • Know if there are any cold-weather limitations or cut-off temperatures for the equipment being used.
Darkness / limited visibility	• Use headlamps and supplemental lighting; consider additional work lights for general work areas. • Be organized and abide by planned schedules in order to maximize short daylight hours and consider flagging or wanding routes traveled in low light conditions.
Wildland fire	• Forest and tundra fires are possible during summer months. Be prepared to adjust the field plan when working in areas prone to wildland fires. • Prior to deployment, check to see if any active wildland fires are near the field site; maintain situational awareness while in the field. • Develop an exit plan for the fieldwork area and identify external resources such as air support and vehicle support. • Research teams should be aware of participants with a history of respiratory problems (i.e., asthma) that may be exacerbated by smoke or particulates and have a response plan.
Insects	• Know what insects are likely to be found and if they could be a significant issue (e.g., mosquitoes, black flies, or biting gnats). • Consider wearing specific clothing such as bug shirts, head nets, wind gear, etc. to reduce exposure. • Consider a bug shelter (e.g., screen tent) if working in an exposed area for long periods of time. • Procure sufficient supplies of insect repellant and consider carrying diphenhydramine (Benadryl) to reduce irritation from insect bites.
Poor weather conditions	• Develop a plan to receive weather forecasts for the area or region of fieldwork. • Select camp locations that are sheltered from weather events. • Prioritize maintaining a "storm-proofed" camp and anticipate harsh weather arriving with no warning. • Determine safe operating parameters ahead of time and shut down operations if conditions exceed determined limits for heat, cold, wind velocity, and precipitation rates.
Village / base road hazards	• Maintain clean windows and good visibility when driving and constantly monitor for hazards in the right-of-way. • Limit number of passengers to the number of seat belts in the vehicle; seatbelts must be worn by all occupants at all times. • Drive defensively and at a speed appropriate for the road conditions; be aware of surroundings and be ready to avoid unexpected obstacles. • Passengers are not permitted to ride in the truck bed or on towed trailers.
Power tools and equipment	• Power tools: follow manufacturer instructions for use and review operations with Battelle ARO before going into the field. • Generators: follow manufacturer instructions for use and review operations with Battelle ARO before going into the field. • Drills/augers: participate in drill / auger training and review manufacturer instructions. • Chainsaws: participate in chainsaw training and review manufacturer instructions; always wear personal protective equipment. • Participants may request training for use of power tools and equipment from the Battelle ARO project manager. • Inspect tools / equipment before use and use the appropriate tool for the job. • Don appropriate personal protective equipment specific to the equipment and the task. • For electrically powered equipment, confirm that the power supply voltage is appropriate and follow recommended duty cycles.
All remote travel	• Carry a compass and physical maps or charts of the area traveled in addition to GPS or other digital files. • Identify potential problems and hazards along a route and have a contingency plan for how to deal with them. • A travel plan (field itinerary) should be documented and the research team must adhere to the defined check-in / check-out procedures. • Carry appropriate first aid, survival gear, and repair equipment specific to the modes of travel used.

	• Avoid traveling alone; maintain a buddy system and consider using a guide, mountaineer, or other specialist as necessary.
Knife use	• Use fixed blade knives when possible. • Consider using cut resistant gloves.
Helicopter travel	• Consider attending an aviation safety course. • All passengers must attend a preflight briefing to discuss flight specifics, science requirements, landing sites, in-flight measurements, pick-up and drop-off times, and contingency / emergency plans with the pilot; physical weigh-ins may be required prior to departure. • Hazardous materials (e.g., bear spray, equipment fuel, fertilizers, etc.) must be identified to the pilot and the Battelle ARO project manager prior to field deployment. • Passengers must supply their own survival gear on the aircraft and be ready for emergency landings. • If appropriate, the research team may request an air-to-ground VHF radio from Battelle ARO for communication with the pilot. • Passengers should be familiar with hand signals for communicating with the pilot. Prior to approaching the helicopter, passengers must wait for the pilot signal to approach; only approach the helicopter from the front, and carry loads low and level to the ground. • Researchers must follow pilot instructions for sling loads; the pilot is responsible for directing assembly and inspection of loads prior to lifting. • The research team is responsible for ensuring ground personnel are briefed on flight plans. • Defer to pilot on all matters of aircraft and aviation safety (e.g., weather, visibility limitations, cargo loading). Passengers must notify the pilot and Battelle ARO of any safety risks or concerns.
Heavy lifting / body strains and sprains	• Warm up prior to performing physical labor; use proper lifting techniques and avoid pinch points; team lift when appropriate. • Ask for help if needed.
Truck travel	• Review the planned use of trucks and trailers with the Battelle ARO project manager prior to arrival. • Participate in truck orientation at the Battelle ARO logistics hub and review the information provided. • Before driving, the operator is responsible for ensuring a complete vehicle check, damage inspection, and inspection of fluids, lights, and tires. • Consider options for stowing and securing of gear before driving. • Use of cell phones by operators is forbidden. • Passengers are not permitted to ride in the truck bed. • The operator must notify Battelle ARO if any warning lights come on. • Adjust driving to accommodate for local conditions (visibility, road surface, residential areas, etc.) and adhere to all local laws. • Plug in and warm up vehicles during winter months or below +20F. • Some trucks have hubs that can be locked to provide 4WD traction; operators should review the issued truck and 4WD use during orientation.

APPENDICES

Appendix A: Satellite phone mini-guide
Appendix B: Survival bag contents
Appendix C: Flight plan for helicopter support

Appendix A: Satellite phone mini-guide

<table>
<tr><th>Calling to / from satellite phones</th><th>Texting to / from satellite phones</th></tr>
<tr><td colspan="2">For full user instructions refer to the printed guide located inside the satellite phone case.</td></tr>
<tr><td>Test the satellite phone before leaving to ensure calling is turned on:
To test voice calls, turn on the phone and call 1-480-752-5105
To direct call a satellite phone from a landline or cellphone:
Dial 011 followed by satellite phone number (e.g., 0118816########)
There is ~$5/minute charge to the cellphone or landline.
Calling between satellite phones:
Dial 00 followed by satellite phone number (e.g., 008816########).
Calling the US and international phones (if outside of the US):
Dial 00. Enter the Country Code, Area Code, 7-digit phone number. Press OK.</td><td>Test the satellite phone before leaving to ensure texting is turned on:
To send SMS messages, enter and save the number for the SMS Service Center into satellite phone (Iridium 9505A):
- Press the Envelope key
- Scroll to Message Settings and press OK
- Compose a message using the keypad and press OK
- Enter 00881662900005 and press OK
Texting to satellite phone:
Visit http://messaging.iridium.com and enter the satellite phone number and follow instructions for 160-character text.
To send email to the satellite phone, send message to “number”@msg.iridium.com (e.g., 8816########@msg.iridium.com).
- Keep it short, there is a 160-character limit
- Subject line is not transmitted
Texting from satellite phone (Iridium 9505A):
Scroll through the menu to message editor. Type email address of recipient, space, and then message. Send message to number 00*2. Wait for confirmation that message sent.</td></tr>
</table>

Appendix B: Survival bag contents

1 2-person tent
2 Ensolite pad
2 Sleeping bags
4 MRE
1 Bottle of potable water tablets
1 Signal mirror
1 Compass
2 Boxes of waterproof matches
2 Space blankets
50’ Parachute cord
1 Magnesium fire starter tool
1 Pocket knife
1 Field manual
1 First Aid Kit

Appendix C: Flight plan for helicopter support

Information	Phone
Alpha Aviation LLC – Contact Blake Wangberg	Office: 907.759.7016 Cell: 907.982.3117

Field Team POC – July 18-July 27

Name	Phone
Emma Lathrop	505.695.6395
Ted Schuur	342.275.1869
Sat Phone Number	88.162.146.3074

Field Team POC – July 28 – July 7

Name	Phone
Weronika Konwent	325.451.7724
Sat Phone Number	88.162.146.3074

Field Team POC – July 8 – July 10

Name	Phone
Rebecca Hewitt	413.542.5869
Sat Phone Number	88.162.146.3074

Field Team POC – September – 26 – October 7

Name	Phone
Catherine Dieleman	TBD
Sat Phone Number	88.162.146.3074

Hazardous Cargo

Note for researchers: All hazardous materials need to be packaged appropriately in USDOT certified containers, have accurate haz mat shipping paperwork, and be identified to the pilot upon request.

Item	QTY
Lithium batteries for sat phone & spare	1
Bear spray	3

Non-hazardous Cargo – Of note

Item	QTY
Soil samples	TBD – see weight restrictions
Water samples	TBD – see weight restrictions

2024 Season Plan for Battelle ARO Support
Mack / 2224776

Schedule

Period of Performance:
144 hours spread out over 36 days.

1. July 18 – August 10; 24 days (approx. 96hrs flying)
2. September 26 – October 7; 12 days (approx. 48hrs flying)

Date	Departure	Destination	Passenger list	Notes
July 18	Denali National Park Airport	Denali National Park		Mobilization to Denali National Park Airport
July 18 – July 27	Denali National Park Airport	Denali National Park Thermokarst Field Campaign	Emma Lathrop, Ted Schuur, Julia Warren, Megan McGroarty, Ariella Thompson, Justin Ledman	Helicopter picks up three of the passengers from the identified researchers each morning. Survey thermokarst sites and collect water samples and site characteristics. ~ 2.2 hrs flying time ~ 6 hrs ground time. Cargo: 10 kg/person. Return flight add ~20kg samples.
July 27	Fairbanks Airport	Fairbanks Airport		Mobilization to Fairbanks Airport
July 28 – August 7	Fairbanks Airport	Wildfire Field Campaign	Weronika Konwent, Anastasia Pulak, Isabel Andrade Munoz	Helicopter picks up passengers at Fairbanks airport each morning, then visits 2-3 sites a day. Science team to work closely with pilot to route and return to Fairbanks Airport in the evening. Cargo: No more than 600 lbs total, pax and cargo.
August 8- August 10	Fairbanks Airport	Recent 2024 Wildfire Field Campaign	Rebecca Hewitt, Weronika Konwent, TBD	Helicopter pick up passengers. Survey wildfires active in 2024
August 10	Fairbanks Airport	Demobilization		Demobilization
September 26	Fairbanks Airport	Fairbanks Airport		Mobilization to Fairbanks Airport.
September 26 – October 7	Fairbanks Airport	Wetlands and Burned Wetlands Field Campaign	Catherine Dieleman, TBD, TBD	Helicopter picks up passengers at Fairbanks airport each morning and visits 2-3 sites a day. Science team to work closely with pilot to route and return to Fairbanks Airport in the evening. Cargo: No more than 600 lbs total, pax and cargo.
October 7	Fairbanks Airport	Demobilization		Demobilization

Safety

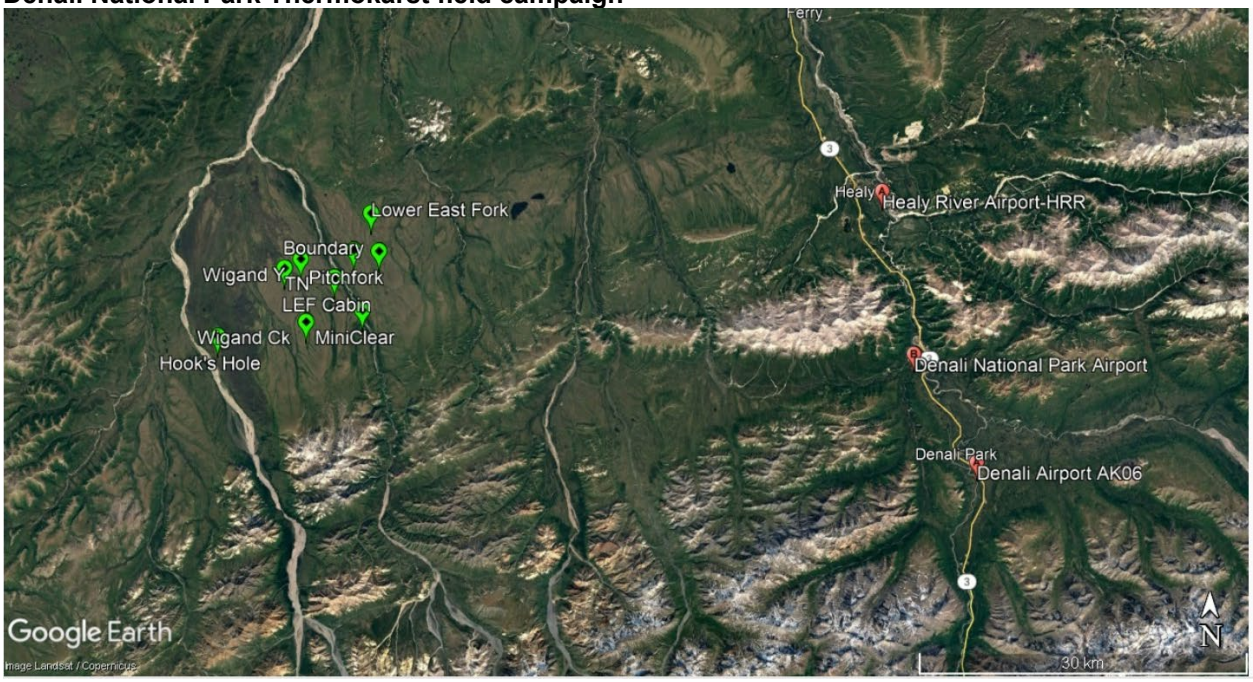
- Battelle ARO requires all researchers to participate in a thorough FAA safety training before first flight. Daily safety briefing is recommended.
- Battelle ARO requires all researchers follow helicopter contract hours, days, and fuel constraints.
- Batelle ARO requires that all researchers using aircraft have emergency survival gear and a satellite phone on board. Emergency gear should include additional dry warm clothing, food, water, and bear spray. If helicopter will be leaving any participants in the field, shelter and a stove/fuel should be included in emergency gear.
- In the event of a non-emergency support request or scope change, contact the Battelle ARO project manager during standard U.S business hours (Monday-Friday, 9-5MT)
- In the event of an emergency, contact the Home Institution Emergency Contact and the Battelle ARO Fairbanks field operations at 907.455.4214, available 24/7.

Samples

- Soil and water samples will be collected in the field and transported via helicopter back to the heli base.
- Science team must have appropriate permits for all selected sites.

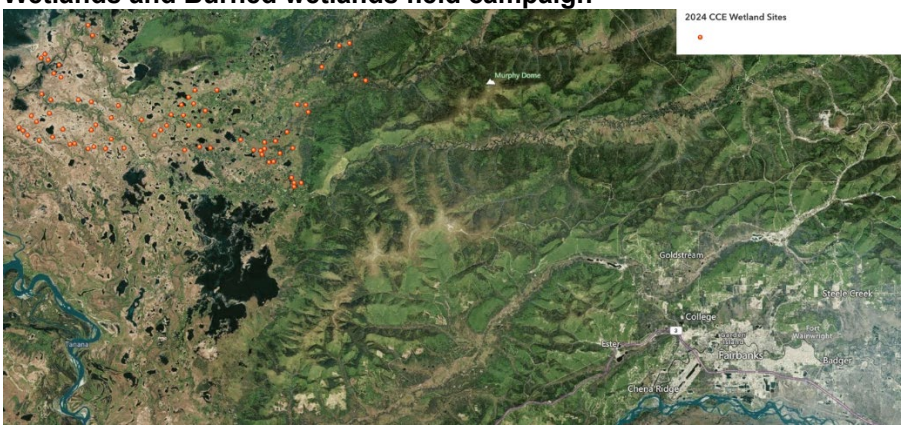
Field Location Maps

Denali National Park Thermokarst field campaign



Wildfire field campaign

Wetlands and Burned wetlands field campaign



Field Location Coordinates:

Denali National Park Thermokarst field campaign –
Base from Denali National Park vicinity

- Location: Denali (previous sites visited in 2023 – all approximate)
- Dates: July 18th – July 27th (10 Helicopter days)

Potential Sites:

Site Name	Latitude	Longitude
Wigand Creek	63.741252	-150.034697
LEF Cabin	63.77785	-149.98401
Wigand Weather Station	63.814385	-150.106263
Boundary	63.800066	-149.90239
Lower East Fork	63.83112	-149.918379
Pitchfork	63.800488	-149.949335
MiniClear	63.75146	-149.93103
TN	63.78493	-150.07703
Hook's Hole	63.728084	-150.197856
Wigand Y* collect samples 3’ diameter SIPRE	63.79261	-150.04723
Denali National Park Airport (DNPA)	63.732255	-148.911246

The science team continues their permitting discussions with Denali National Park representatives. As of 2024-06-27, neither a permit for science activities or nor any conditions regarding aircraft access have been provided by the National Park Service.

Wildfire field campaign:
Base from Fairbanks

- Location: Fairbanks - 100-mile vicinity
- Dates: July 28th – August 7th (11 Helicopter days)

Potential Sites

Site Name	Latitude	Longitude
* NuggetCreek_H1	64.8948534	-146.4387687
* NuggetCreek_H2	64.8845607	-146.542075
* MunsonCreek_H1	64.9740132	-146.1207651

* MunsonCreek_H2	64.9766731	-146.0821375
McCoyCreek_H1	64.4966928	-146.4971592
McCoyCreek_H2	64.4901167	-146.3462422
Teklanika_H1	64.3749733	-149.3250557
Teklanika_H2	64.3625384	-149.3241574
ShoresLanding_H1	64.450627	-149.2567838
ShoresLanding_H2	64.484313	-149.2747501
DryCreek_H1	64.924185	-150.8944125
DryCreek_H2	64.8986645	-150.8423102

* For four sites (NuggetCreek_H1, NuggetCreek_H2, MunsonCreek_H1, MunsonCreek_H2), permitting requirements from the Alaska State Parks may prevent aircraft landings. The science team is consulting internally regarding alternative science sites without this restriction.

Recent 2024 Wildfires field campaign:
Base from Fairbanks

- Location: Fairbanks – 100-mile vicinity
- Dates: August 8th – 10th (3 Helicopter days)

Potential sites:

Site Name	Latitude	Longitude
TBD – sites will be selected based on the 2024 wildfire season	TBD	TBD

Wetlands and Burned wetlands field campaign:
Base from Fairbanks

- Location: Fairbanks - 100-mile vicinity
- Dates: September 26 – October 7 (12 Helicopter days)
- Sites will be surveyed aerially for suitability. If deemed suitable, a ground survey will be done, and if conditions are met, sampling will be conducted.

Potential sites:

Site Name	Latitude	Longitude
1981_1	65.02169	-148.926
1981_2	65.02321	-149.055
1981_6	65.02681	-149.17
1981_18	65.04195	-149.278
1981_19	65.04375	-148.895
1981_29	65.103	-149.216
1981_36	65.04872	-149.017
1981_43	65.06674	-149.152
1981_45	65.06947	-148.917
1981_50	65.13395	-149.131
2023_2	65.02092	-148.764
2023_10	65.08455	-148.539
2023_17	64.99199	-148.692
2023_21	65.06232	-148.667
2023_23	65.11538	-148.595