

Building a culture of safety and trust in team science

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Director of NGEE Arctic
On Behalf of the NGEE Arctic Team

2023 Fall BERAC Meeting
19 October 2023



Demonstrate respect for all.
Communicate openly, listen well.
Value different opinions.
Critique ideas, not people.
Consider power differentials.
Report concerns.

NGEE Arctic is a **MODEL-DRIVEN, MULTI-SCALE** research project that builds on a foundation of model–data integration from a decade of observations in Arctic Alaska to predict climate-ecosystem feedbacks across the Arctic.



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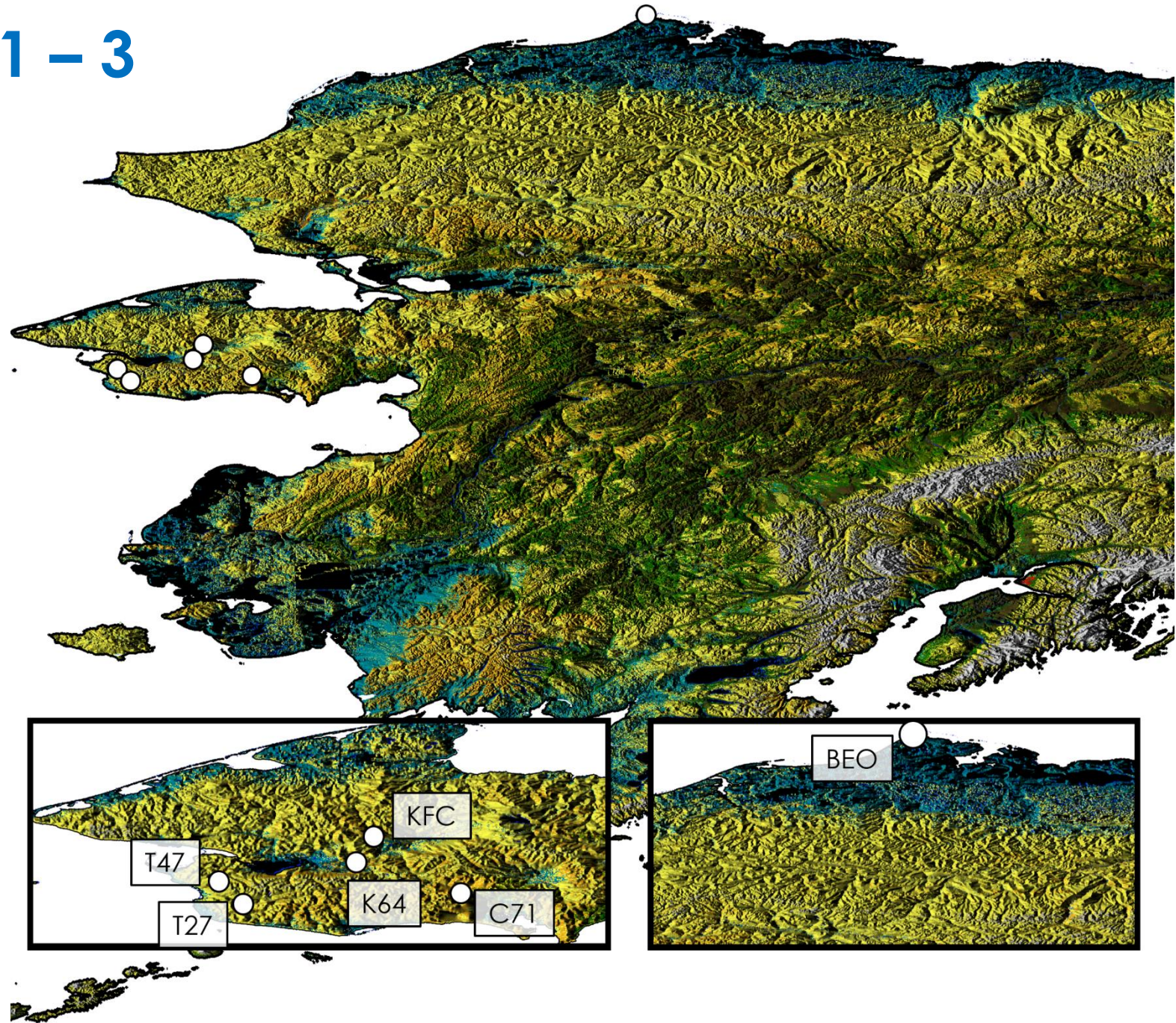


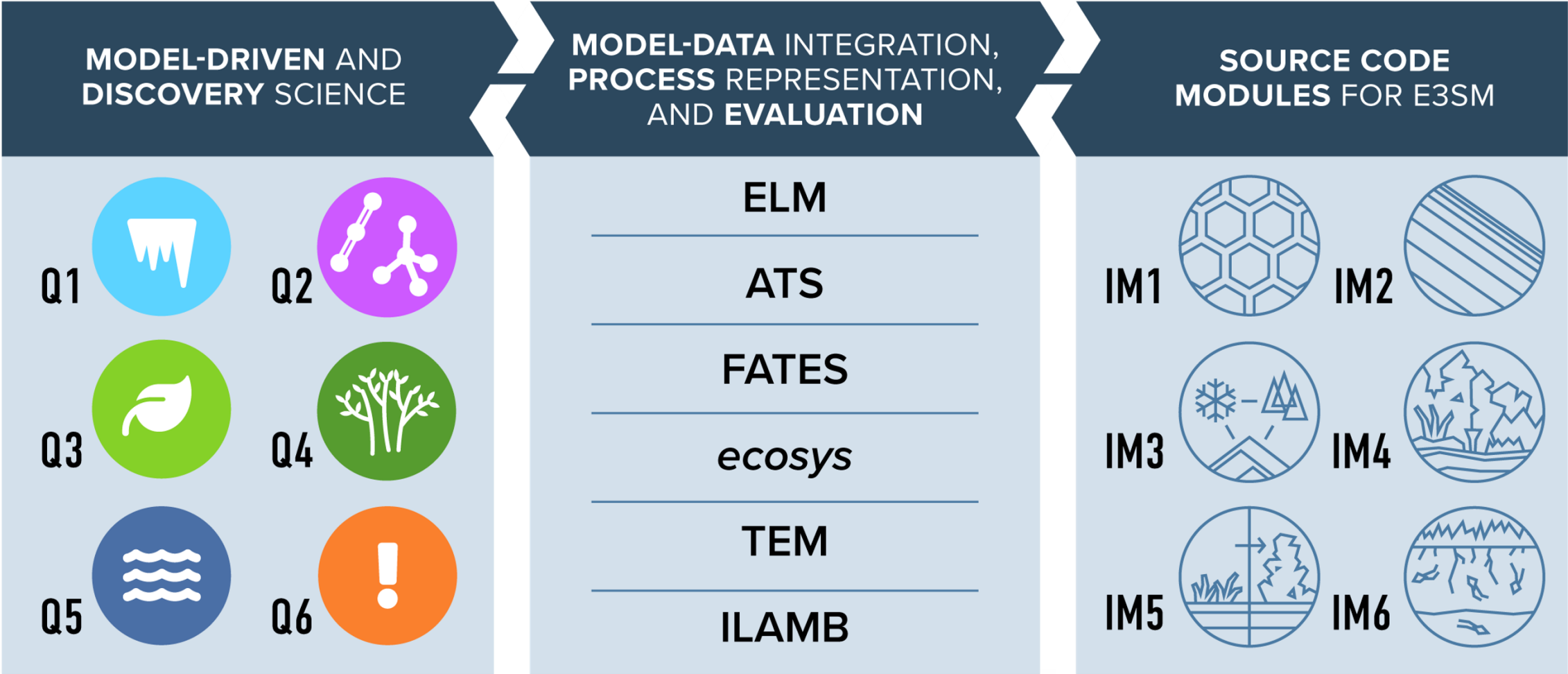
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NGEE Arctic Phases 1 – 3

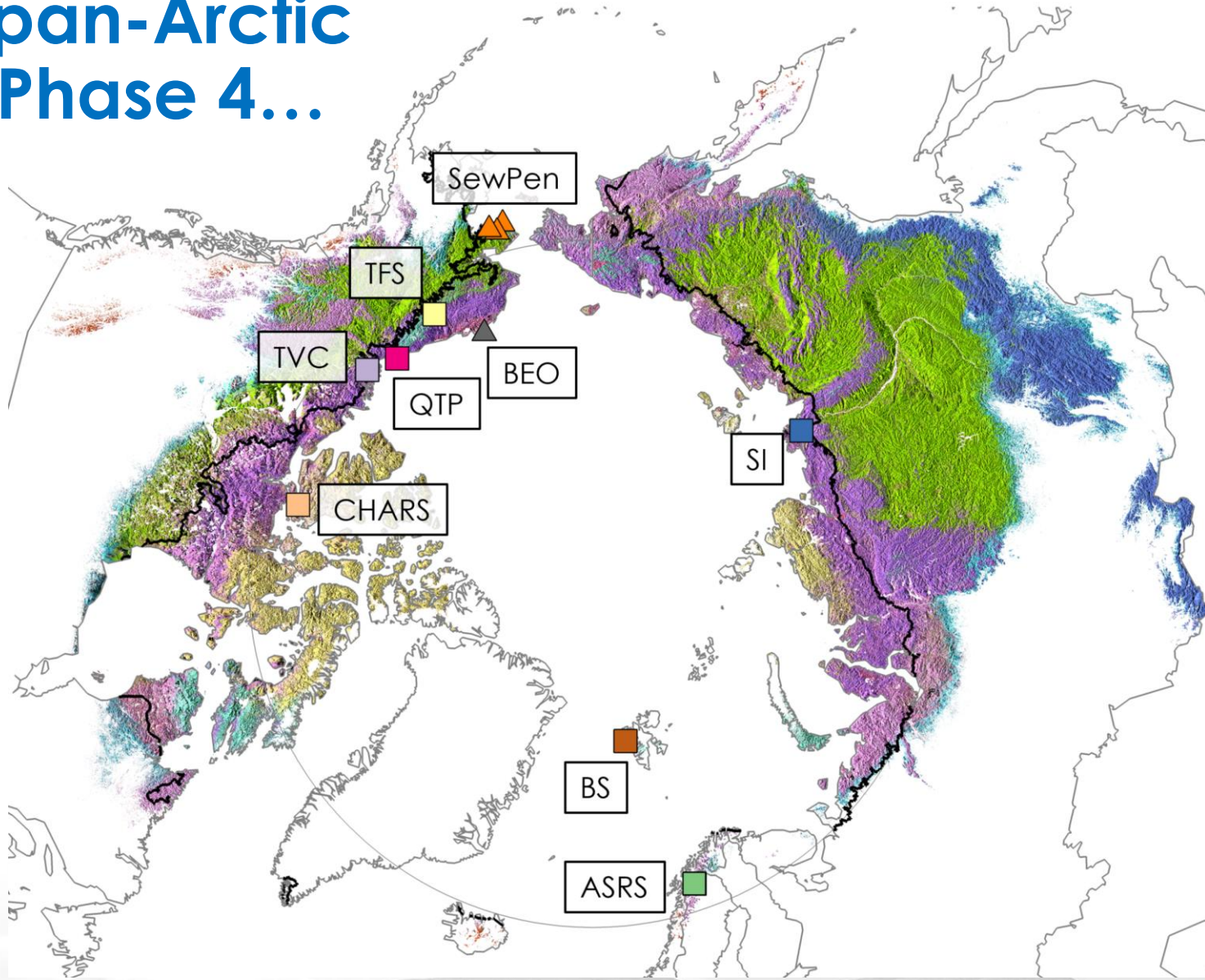
NGEE Arctic emphasizes iterative collaboration among interdisciplinary teams of empiricists and modelers to incorporate observations and experiments into models (i.e., a ‘Mod-Ex’ philosophy).





DATA ARCHIVED AT ENVIRONMENTAL SYSTEM SCIENCE DATA INFRASTRUCTURE FOR A VIRTUAL ECOSYSTEM

A proposed pan-Arctic NGEE Arctic Phase 4...



There are **UNIQUE CHALLENGES** to understanding processes that span scientific disciplines and institutions in remote locations often under harsh environmental conditions.

High expectations for project safety...from DOE BER ESS, from project leadership, from DOE SC.

Over Phases 1–3, expectations for safety increasingly emphasized psychological safety—the shared expectation of an inclusive environment where it is safe to learn, safe to contribute, and safe to challenge ideas.



Summarized, NGEE Arctic **VALUES**
promote secure and harassment-free
work environments, respect for local
culture and knowledge of the
environment, and collaboration and
open science.

We have learned several lessons over a decade-long, multi-institution project focused on remote AK.

Building a Culture of Safety and Trust in Team Science

An Arctic research team of 150 members that implemented a culture of safety, inclusion, and trust as the foundation for cross-disciplinary science shares lessons from its experiences.



Members of the Next-Generation Ecosystem Experiments–Arctic (NGEE Arctic) unmanned aerial laser altimeter team (Christian Andresen, Lauren Charstey-Groffman, Adam Collins, and Erika Swanson) take a break on a portable drone landing pad at a field site outside Nome, Alaska. Credit: Christian Andresen, University of Wisconsin, Madison

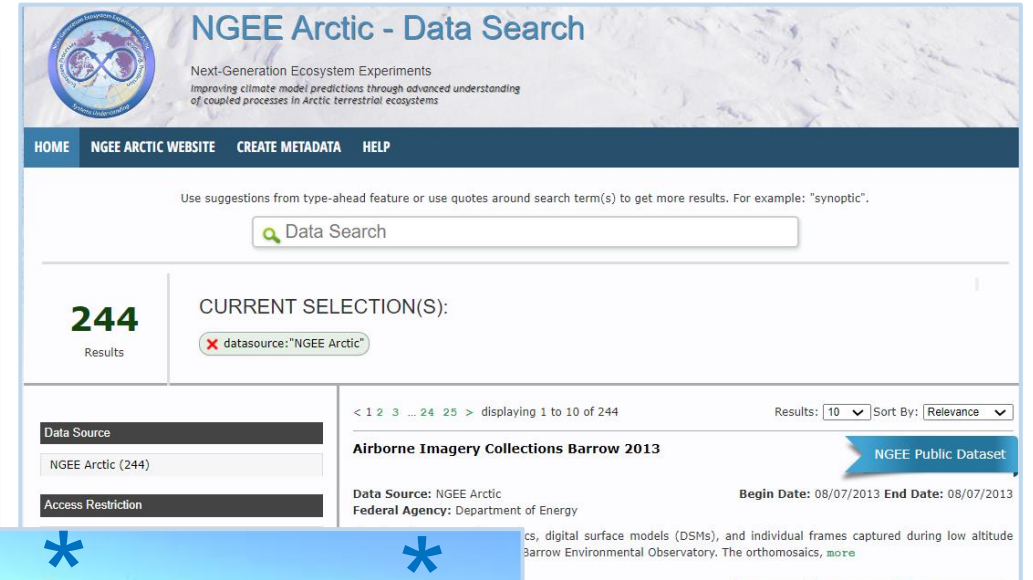
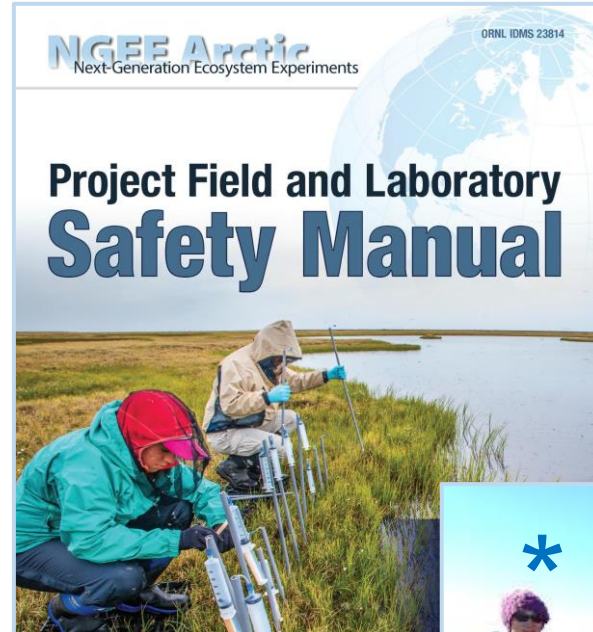
By Colleen M. Iversen, W. Robert Bolton, Alistair Rogers, Cathy J. Wilson, and Stan D. Wullschlegel © 21 April 2020

‘As scientists become part of larger teams and join broader and more diverse scientific endeavors, they must all become leaders in creating cultures of safety, inclusion, and trust.’

Iversen *et al.* 2020 (*Eos*)

Lessons underscore importance of project culture for collaboration – across disciplines, institutions.

1. Intentional Culture Development
2. Respect for Communities
3. Cross-Disciplinary Collaboration
4. Open Data Sharing
5. Importance of Expectations



Culture is something that we can and should **CONTINUALLY IMPROVE**. The DOE SC PIER plan framework allows us to propose **NEW OPPORTUNITIES** to develop project culture...

Safety and Inclusion are Key to Scientific Success

In Phases 1–3, we developed extensive physical safety documentation and training, with an increasing emphasis on psychological safety.

‘Everyone has the right to feel safe and secure...everyone is valued and has opinions that matter...everyone deserves to be heard...everyone is responsible for ensuring a respectful workplace.’



Project Field and Laboratory Safety Manual



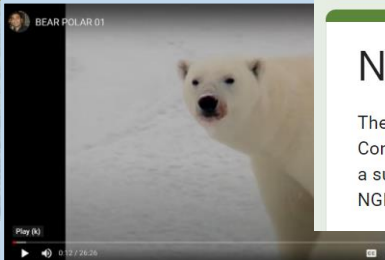
The Culture We Want - Where we've been and where we want to be

Colleen Iversen
21 October 2022



NGEE Arctic - Safety in Field Sciences

The Workshop to Promote Safety in Field Sciences was held March, 2021, by the Consortium for Ocean Leadership. The NGEe Arctic Leadership team would like to translate a subset of relevant recommendations, resulting from the workshop, for applicability to the NGEe Arctic project.



Tabletop Exercises Safety Scenarios and Lessons Learned



Safety and Inclusion are Key to Scientific Success

In Phase 4, we will...

Formalize our Project-Wide Code of Conduct

- Clear expectations for behavior
- Clear reporting, consequences
- Leadership support, enforcement

Re-Evaluate Data Sharing, Authorship

- Emphasize cross-disciplinary collaboration
- New, international collaborations

Continue Preparedness Exercises

- Team building
- Bystander intervention training and refreshers

Demonstrate respect for all.
Communicate openly, listen well.
Value different opinions.
Critique ideas, not people.
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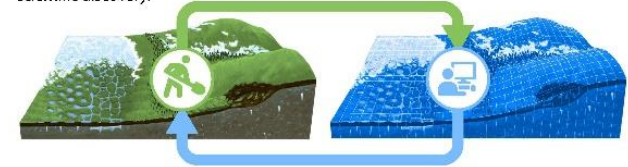
Communication and Engagement Keep Promises

In Phases 1–3, we engaged with (and listened to) local communities, the broader scientific community, and the public to share science and give thanks.



Field to Model WORKSHOP
 An intro to the **E3SM Land Model** for experimentalists
 October 17-19 • Doubletree Hotel • Chattanooga, TN

Over the course of BER projects, modelers have had opportunities to participate in field work, and a group of modelers is now returning the favor! This bring-your-own-laptop workshop is designed for scientists with limited or no experience running models to gain familiarity with the E3SM Land Model, using NGEF Arctic as a test case. Learn how simulation skills and a ModEx approach can inform experimental design and sharpen scientific discovery.



- | Activities | Takeaways |
|--|--|
| <ul style="list-style-type: none"> Run the E3SM Land Model (ELM) Visualize and interpret ELM simulation output | <ul style="list-style-type: none"> Your own copy of ELM in a format that is compatible with personal computers running Windows, Mac, or Linux operating systems |



NGEE Arctic
 Next-Generation Ecosystem Experiments

NGEE Arctic Science Activities at Kougarok Hillslope MILE MARKER 64

Report prepared for Mary's Igloo Native Corporation
 Los Alamos National Laboratory, Brookhaven National Laboratory, Berkeley National Laboratory, Oak Ridge National Laboratory, and the University of Alaska Fairbanks

November 2022

and how to use project data M and identify opportunities : more model-relevant data nce questions using ns of NGEF Arctic sites rking groups to advance M and ModEx for led science

United States Permafrost Association

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 Benjamin Sulman (ORNL) Katrina Bennett (LANL)
 Verity Salmon (ORNL)

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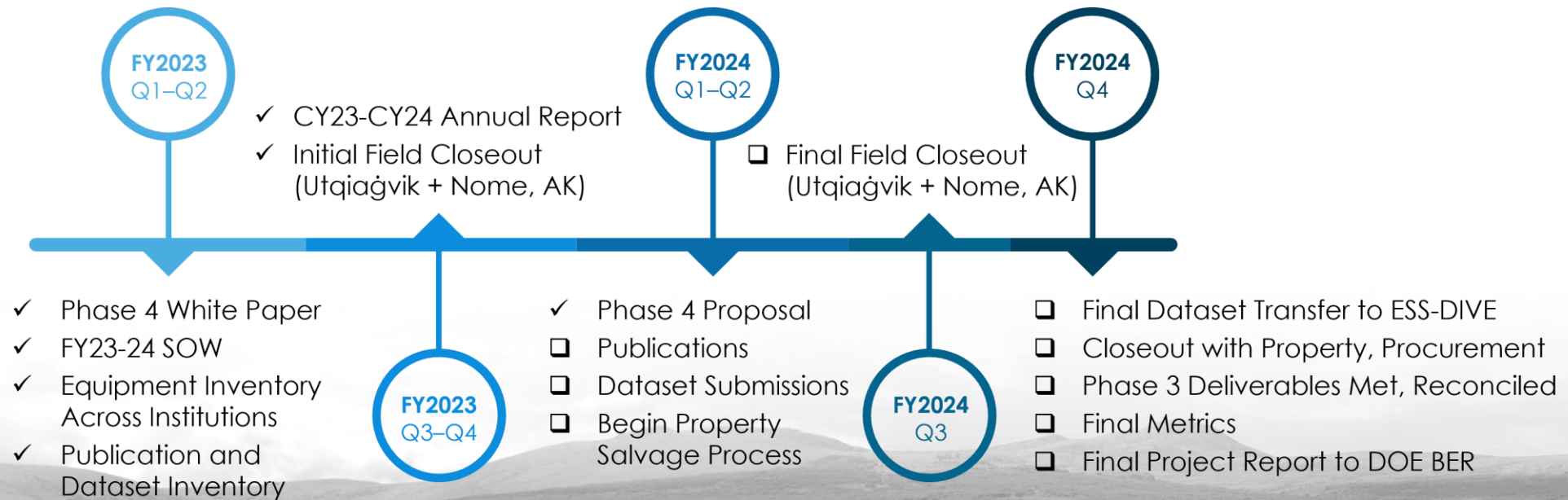
August 31 at ngee-arctic.ornl.gov/modex

NGEE Arctic
 Next-Generation Ecosystem Experiments

U.S. DEPARTMENT OF ENERGY | Office of Science

This workshop is sponsored by the Biological and Environmental Research program in the Department of Energy's Office of Science.

Promises kept include removal of equipment in a manner respectful of Native community guidance.



Communication and Engagement Keep Promises

In Phase 4, we will...

Facilitate Knowledge Exchange

- New, project-funded NGEE Arctic engagement coordinator
- Ask a local community member to join our SAB

Communicate Scientific Findings

- Radio broadcasts, podcasts targeted to local communities
- GIS Story Maps



We Intentionally Develop the Next Generation of Scientific and Arctic Leaders

In Phases 1–3, we emphasized recruitment and retention of diverse scientists, intentional leadership development and succession planning.

LABORATORY RESEARCH DIRECTOR

Colleen Iversen (ORNL)

TECHNICAL PROJECT MANAGER

Sue Heinz (ORNL)

DEPUTY OF OPERATIONS

Bob Bolton (ORNL)

SPECIAL PROJECT ADVISOR

Stan Wullschleger (ORNL, retired)

INSTITUTIONAL LEADERS

Katrina Bennett (LANL)
Baptiste Dafflon (LBNL)
Eugenie Euskirchen (UAF)
Alistair Rogers (BNL)

SCIENCE TEAM LEADERS

Baptiste Dafflon (LBNL)
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Ben Sulman (ORNL)
Neslihan Taş (LBNL)
Katrina Bennett (LANL)
Daryl Yang (BNL)
Forrest Hoffman (ORNL)
Alistair Rogers (BNL)
Peter Thornton (ORNL)

RISING LEADERS

Chuck Abolt (LANL)
Eugenie Euskirchen (UAF)
Charlie Koven (LBNL)
Michele Thornton (ORNL)
Terri Velliquette (ORNL)
Ryan Crumley (LANL)
Jennifer Holm (LBNL)
Hannah Mevenkamp (UAF)
Fernanda Santos (ORNL)
Daryl Yang (BNL)



We Intentionally Develop the Next Generation of Scientific and Arctic Leaders

In Phase 4, we will emphasize...

Developing Leaders

- Rising Leaders on Phase 4 proposal, Leadership Team
- Updated succession plan from each institutional partner

Mentoring Program

- Formalize project-wide mentoring program
- Mentoring awards



FIELD SAFETY WORKSHOP

The United States Permafrost Association Diversity, Equity, and Inclusion Committee is hosting a virtual roundtable workshop for participants to practice their field safety skills. USPA members and non-members are welcomed and encouraged to join this workshop.

WHAT WE WILL DISCUSS

- Wildlife encounters
- Interpersonal conflicts
- Injuries or illnesses

MORE INFORMATION & ZOOM REGISTRATION

-   @uspermafrost
-  www.uspermafrost.org/
-  knbraun@wisc.edu
-  [Registration link](#)

Search...



**IARPC Collaborations Mentorship Program:
2023-24 Session**

We welcome your
insights and
feedback as we
continually
develop the
CUTTING-EDGE CULTURE
needed for
CUTTING-EDGE SCIENCE.





NGEE Arctic Web Site:
<https://ngee-arctic.ornl.gov/>

The Next-Generation Ecosystem Experiments (NGEE Arctic) project is supported by the Office of Biological and Environmental Research in the DOE's Office of Science.

NGEE Arctic is underscored by a foundation of open science and data sharing and a safe, inclusive project culture.

We would like to thank the Atmospheric Radiation Measurement (ARM) user facility and their staff for providing advice and assistance as we established field sites on the North Slope of Alaska.

We also thank the following Native Corporations for allowing us to conduct our research on the traditional homelands of the Iñupiat people: UIC Science – Mary's Igloo Native Corporation – Council Native Corporation – Sitnasuak Native Corporation.



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