Permafrost and Pathogens II

18-19 September 2024

Introduction: The Why?

Planetary scale changes in climate are resulting in rapid arctic environmental change which includes the thawing of large tracts of permafrost soils. Permafrost is a reservoir of mostly uncharacterized microorganisms and viruses several of which carry the potential for pathogenesis through either direct or indirect pathways. Our current knowledge of permafrost-resident microbes is limited, and we lack a foundational basis on which to assess risks to operations in polar regions.

On November 2-3, 2023, the first Permafrost and Pathogens Workshop brought together military operators, medical professionals, academic scientists, and cold regions scientists and engineers to establish a knowledge baseline from which the implications for human health and the sustainment of operations in an evolving Arctic environment can be assessed and developed. Three dominant themes emerged from the workshop: there is a need for a coordinating authority; planning needs to start now to address accelerating, compounding processes; and a first step must be the aggregating and meta-analysis of existing data and samples.

This workshop, PnP-II, will focus on identifying government responses to emerging pathogenic threats from thawing permafrost, defining a state-of-the-art pathogen-permafrost-defense system, and ensuring resilience in food, water and energy in the changing circumpolar North.

This workshop is an unclassified working forum and will utilize the Chatham House Rule to protect participant identities. ***Discussion may be up to Sensitive but Unclassified (SBU), which includes Law Enforcement Sensitive but should NOT include classified information***.

Day 1 – AGENDA

Purpose of Day 1:

- Participant orientation.
- Identify and prioritize scenarios of concern.
- Identify and prioritize baseline data sources, partners, and development lead.

0800-0930	**Facility Access/Registration/Badging/Coffee** ***Please account for time to allow undergo facility access screening and badging.***	
0930-0950	**Welcome and Opening Remarks**	TBC: RSGIS Center Director Robyn Barbato, CRREL
0950-1000	**Logistics**	Jason Weale, CRREL
1000-1030	**PARTICIPANT ORIENTATION** • Introduction to Leads, Quadrants and Quadrant Facilitators. • Methodology of the Workshop (QED What is it?) — Rapid Q and A. • Ensure common understanding of lexicons. • Why PnP-II?	Lilian Alessa, UIdaho Sean Moon, DHS
1030-1045	***Break***	
1045-1115	**Overview of PnP-I**	Jill Brandenberger, PNNL/Lilian Alessa
LOE 2 – A Working Model (LOE-1, Strategic Communications, will be addressed at the end of the workshop.)		
1115-1200	**Facilitated Brainstorming:** **Part 1 - Scenarios to plan toward.** *Note: LOE-2 Part 1 brainstorming will not utilize quadrants*.	Central Facilitators; Lilian Alessa, Sean Moon
1200-1300	***Working Catered Lunch* - Pareto/N3 Prioritization Exercise**. What scenarios are most critical to address? In what time frame should the scenarios be addressed? ***Criticality***: *Red – Critical; Orange – Important; Green – Helpful.* ***Time frame:*** *Yellow – Immediate (Within 1 Year); Blue – Near Term (1-5 Years); Brown – Long Term (5+ Years).* ***Most critical scenario***: *Modified "fish eye" dot.*	
1300-1315	**Summary of Part 1 Results**	Central and Quadrant Facilitators

1315-1400	**Call Outs—Collective Brainstorming** **Part 2 - Working Model.** Quadrants to identify: • Microbial Reservoirs • Controlling Variables • Human Impacts • Permafrost/Pathogen impacts on missions in all domains.	Central and Quadrant Facilitators
1400-1430	**Pareto/N3 Prioritization Exercise –** What factors have the greatest impact on mission performance across domains (criticality)? How urgently (time scale) do the factors need to be addressed? ***Criticality***: *Red – Critical; Orange – Important; Green – Helpful.* ***Time frame:*** *Yellow – Immediate (Within 1 Year); Blue – Near Term (1-5 Years); Brown – Long Term (5+ Years).* ***Most critical factor***: *Modified "fisheye" dot.*	
1430-1445	**Summary of Part 2 Results**	Central and Quadrant Facilitators
1445-1500	***Break***	
LOE-3 - Establishing Baselines		
1500-1600	**Call Outs—Collective Brainstorming** **Establishing Baselines** Quadrants to identify: • Data *Sources* (International/National/Local) • National Data Sharing (Who/How) • International Data Sharing (Who/How) • Developing a Baseline Map (Who/How)	Central and Quadrant Facilitators
1600-1630	**Pareto/N3 Prioritization Exercise –** What are the most critical data sources to access? Who are the most important partners to share data with? Who is best able to develop a baseline map? ***Critical data <u>sources</u>***: *Red – Critical; Orange – Important; Green – Helpful.* ***<u>Partner</u> importance:*** *Yellow –Critical; Blue – Important; Brown – Helpful.* ***Who should lead development of a baseline map***: *Modified "fisheye" dot.*	
1630-1645	**Summary of Session Results;** **Summary of Day 1**	Central and Quadrant Facilitators
1645-1700	**Ad hoc issues addressed/Day 1 Wrap Up**	

Day 2 – AGENDA

Purpose of Day 2:

- Identify and prioritize monitoring and surveillance indicators.
- Identify and prioritize strategic communications needs (who/how).
- Identify next steps.

0800-0900	**Registration/Coffee**	0815-0900:	Optional - Tour of the Permafrost Microbiome Laboratory
0900-0930	**Review of Day 1 Results**	Central Facilitators	
LOE-4 - Monitoring and Surveillance Indicators for Early Detection			
0930-1030	**Call Outs - Collective Brainstorm Monitoring and Surveillance Indicators** Quadrants to identify: • Public Health – Clinical Indicators • Initial National Policy Needs • Physical conditions (e.g., thaw, ice content, carbon content, etc.) • Wildlife monitoring	Central and Quadrant Facilitators	
1030-1045	***Break***		
1045-1115	**Pareto/N3 Prioritization Exercise –** What are the most critical indicators? How quickly should monitoring be established for them? ***Indicator criticality – what must be monitored/surveilled****: Red – Critical; Orange – Important; Green – Helpful.* ***Timeline to establish monitoring:*** *Yellow – Immediate (Within 1 Year); Blue – Near Term (1-5 Years); Brown – Long Term (5+ Years).* ***Most critical indicator****: Modified "fisheye" dot.*		
1115-1130	**Summary of Session Results**	Central and Quadrant Facilitators	
1130-1230	***Catered Lunch***		
Line of Effort (LOE) 1 – Requirements – Strategic Communications.			
1230-1330	**Call Outs—Facilitated Brainstorming Strategic Communications** Identification of: • Who needs to be educated? • What is important to them? • How to reach them?	Central Facilitators *Note: LOE-1 brainstorming will not utilize quadrants.*	

Permafrost and Pathogens II

1330-1400	**Pareto/N3 Prioritization Exercise –** Who is it most important to educate? How quickly should that occur? ***Criticality**: Red – Critical; Orange – Important; Green – Helpful.* ***Urgency for Action** – Yellow – Immediate (Within 1 Year); Blue – Near Term (1-5 Years); Brown – Long Term (5+ Years).* ***Most critical overall**: Modified "fisheye" dot.*	
1400-1415	**Summary of Session Results**	Central Facilitators
1415-1430	***Break***	
1430-1445	**Summary of Workshop Results.**	Central and Quadrant Facilitators
1445-1530	**Discussion/Brainstorming** **Next steps?**	Central Facilitators
1530-1600	**Closing Remarks**	Andrew Kliskey, UIdaho Lilian Alessa Jill Brandenberger Robyn Barbato Jason Weale