



ICCRE 2024



**20TH INTERNATIONAL CONFERENCE
ON COLD REGIONS ENGINEERING**

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Welcome



Committees

Conference Chair:

Zhaohui (Joey) Yang, Ph.D., University of Alaska Anchorage

Technical Program Co-Chairs:

John Thornley, Ph.D., WSP USA

David Prusak, Stantec

Proceedings Co-Editors:

Jon Zufelt, Ph.D., HDR Inc.

Zhaohui (Joey) Yang,

University of Alaska Anchorage

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Steven Halcomb, Devise Engineering

Michelle Harrison, CRW Engineering Group, LLC

Jeremiah Holland, DOWL

Thomas Douglas, U.S. Army Corps of Engineers - Cold Regions Research and Engineering Laboratory

Donald Gregory Kinney, Alyeska Pipeline Service Company

Daniel Nichols, Kuna Engineering

Jacquelyn Overbeck, NOAA Office for Coastal Management

Wendy Presler, Shannon & Wilson

David Prusak, Stantec

Amy Steiner, Alaska District, U.S. Army Corps of Engineers (USACE)

John Thornley, WSP USA

Edward Yarmak, Jr., Arctic Foundations, Inc.

Hongyu Zhou, University of Tennessee, Knoxville

Olga Bannova, University of Houston

Christopher Dreyer, Colorado School of Mines

Jay Snyder, ASCE

Dan Walker, University of Maryland, College Park

Steering Committee:

Jeremiah Drage, WSP USA

John Hinzmann, Minnesota Department of Transportation

Hannele Zubeck (Emerita), Ph.D., University of Alaska Anchorage

Keynote Speakers



Dr. Peter Bieniek

**Research Associate Professor
International Arctic Research Center, University of Alaska Fairbanks**

Dr. Peter Bieniek is a Research Associate Professor at the International Arctic Research Center at the University of Alaska Fairbanks. He is an atmospheric scientist and his research focuses on Alaska regional climate variability and change. Recent projects have included evaluating seasonal forecasts of Alaska wildfires and producing high-resolution dynamically downscaled projections of climate for Alaska. His work has contributed to the National Climate Assessment and NOAA climate monitoring in Alaska and his downscaled Alaska climate data sets are in wide use. Peter graduated with a B.S. in Meteorology from Valparaiso University in 2005 and an M.S. and Ph.D. in Atmospheric Science from the University of Alaska Fairbanks in 2007 and 2012 respectively.



Topic: Data and tools that can support engineering solutions in the changing climate of Alaska. This presentation will provide a brief overview of climate change in Alaska with a discussion of some of the climate-related tools and data sets that are currently available and could be used to support Alaska engineering and other long-term planning projects.

Dr. Joseph L. Corriveau

**Senior Advisor for Cold Regions Research & Development
Cold Regions Research and Engineering Laboratory (CRREL)**

Dr. Joseph L. Corriveau serves as the Senior Advisor for Cold Regions Research & Development at the Cold Regions Research and Engineering Laboratory (CRREL) located in Hanover, New Hampshire and Fairbanks, Alaska. The mission of CRREL is to advance and apply science and research engineering approaches to solve interdisciplinary and strategically important challenges related to the Earth's cold regions. CRREL conducts research across a range of fundamental and applied sciences and engineering in polar regions and in temperate and mountain regions. Dr. Joseph L. Corriveau just completed serving six years as the Director of CRREL.



Topic: U.S. Army needs in the Arctic within our cold regions research and development mission, and CRREL capabilities and recent achievements.

Keynote Speakers

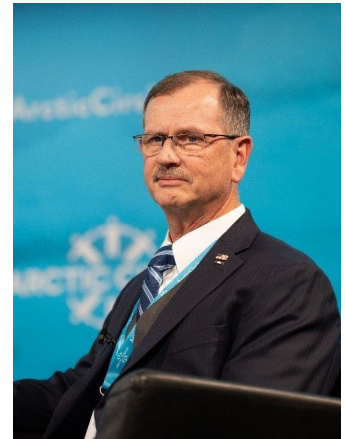
Randy “Church” Kee, Maj Gen, USAF (Ret)

Director

Ted Stevens Center for Arctic Security Studies

Maj Gen Randy “Church” Kee (Ret) is the inaugural Director of the Ted Stevens Center. Since September 2021, Maj Gen Kee has served as the Senior Advisor for Arctic Security Affairs for the Ted Stevens Center. Prior to his appointment with the Ted Stevens Center, he served as a Commissioner to the U.S. Arctic Research Commission and as the Executive Director of the Arctic Domain Awareness Center after his 30-year military career.

Topic: Geopolitics, Climate and Russia: Security in a Changing Arctic.



Tom Marchesani, P.E.

Vice President of Engineering, Risk, and System Integrity Alyeska Pipeline Service Company

Tom Marchesani is a licensed professional engineer who has been actively involved in engineering management, design engineering, project engineering, with a specialization in corrosion engineering. He serves as Vice President of Engineering, Risk, and System Integrity for Alyeska Pipeline Service Company. In this capacity, he is responsible for all technical aspects of TAPS.

Tom joined Alyeska in 2013 as a project engineer, but his work on TAPS dates back to 1992, when he moved from South Jersey to Valdez to oversee coating of the marine terminal loading berths. He has held many technical roles since, from field engineer and Flow Assurance Engineer to Operations Engineering Manager and Engineering Director, before becoming Vice President of Engineering. Prior to coming on with Alyeska, he founded and led a firm providing corrosion and project engineering services to owners of industrial infrastructure in the marine, petroleum, and bioremediation industries. He holds a Bachelor of Science in Mechanical Engineering from Villanova University and is licensed in Alaska and Washington. He lives in Anchorage with his wife, Courtney, and their two sons and daughter. He is an artist, alpinist, writer, and musician who still enjoys a good game of basketball.



Topic: Trans-Alaska Pipeline System: Past, Present and Future

Keynote Speakers



Dr. Michael Sfraga

Chair, U.S. Arctic Research Commission
Chair & Distinguished Fellow, Polar Institute, Wilson Center

Dr. Michael Sfraga was the founding director of the Polar Institute and served as the director of the Global Risk and Resilience Program at the Woodrow Wilson International Center for Scholars in Washington, D.C. He currently serves as chair and distinguished fellow in the Polar Institute, where his scholarship and public speaking focus on Arctic policy.

An Alaskan and a geographer by training, his work focuses on the changing geography of the Arctic and Antarctic landscapes, Arctic policy, and the impacts and implications of a changing climate on political, social, economic, environmental, and security regimes in the Arctic.

Sfraga served as distinguished co-lead scholar for the U.S. Department of State's inaugural Fulbright Arctic Initiative from 2015 to 2017, a complementary program to the U.S. Chairmanship of the Arctic Council; he held the same position from 2017 to 2019. He served as chair of the 2020 Committee of Visitors Review of the Section for Arctic Science (ARC), Office of Polar Programs, National Science Foundation, and currently serves on the Scientific Advisory Council of the Finnish Institute for International Affairs. Sfraga previously served in several academic, administrative, and executive positions at the University of Alaska, including vice chancellor, associate vice president, faculty member, department chair, and associate dean. Sfraga earned the first Ph.D. in geography and northern studies from the University of Alaska Fairbanks.



Topic: Current activities and international collaboration to address the challenges of a changing Arctic.

Dr. Hannele Zubeck

Professor Emerita of Civil Engineering
University of Alaska Anchorage

Dr. Hannele Zubeck is a Professor Emerita of Civil Engineering at the University of Alaska Anchorage. Her field of expertise is in Geotechnical Engineering, more specifically frozen ground engineering and pavement engineering in cold regions. She serves on several international committees, including the ASCE's Cold Regions Engineering Division, and is a member of the editorial board of the Elsevier Journal for Cold Regions Science and Technology. She and Dr. Guy Doré co-authored the Cold Regions Pavement Engineering book published by ASCE Press/McGrawHill.



Topic: Cold Regions Engineering Education, following in the steps of Dr. Eb Rice.

Overview

Monday, May 13

Time	Title	Location
8:30 a.m. - 4 p.m.	CRED Comm Meetings	UAA Engineering and Industry Building (2900 Spirit Dr.)
1 - 5:30 p.m.	Registration	Egan Center (555 W. 5th Ave.)
6 - 8 p.m.	Ice Breaker	Orso (737 W. 5th Ave.)

Tuesday, May 14

All events at the Egan Center (555 W. 5th Ave.)

Time	Title	Location
7:30 - 8:30 a.m.	Registration	Lobby
7:30 - 8:30 a.m.	Continental Breakfast	LaPerouse room
8:45 - 10:15 a.m.	Welcome and Keynote	LaPerouse room
10:15 - 10:30 a.m.	Coffee Break and Poster Session	Room E
10:30 a.m. - 12 p.m.	Parallel Technical Sessions	See page 10
12 - 1:30 p.m.	Lunch & Speaker	LaPerouse room
1:30 - 3 p.m.	Parallel Technical Sessions	See page 11
3 - 3:30 p.m.	Coffee Break and Poster Session	Room E
3:30 - 5 p.m.	Parallel Technical Sessions	See page 12

Wednesday, May 15

Time	Title	Location
7:30 - 8:30 a.m.	Continental Breakfast	LaPerouse room
8:45 - 10:15 a.m.	Welcome and Keynote	LaPerouse room
10:15 - 10:30 a.m.	Coffee Break and Poster Session	Room E
10:30 a.m. - 12 p.m.	Parallel Technical Sessions	See page 14
12 - 1:45 p.m.	Award Lunch	LaPerouse room
1:45 - 3:15 p.m.	Parallel Technical Sessions	See page 15
3 - 3:30 p.m.	Coffee Break and Poster Session	Room E
3:30 - 5 p.m.	Parallel Technical Sessions	See page 16
6 - 8:30 p.m.	Banquet at 49th State Brewing	717 W. 3rd Ave.

Thursday, May 16

7:30 - 8:30 a.m.	Continental Breakfast	LaPerouse room
8:45 - 10:15 a.m.	Welcome and Keynote	LaPerouse room
10:15 - 10:30 a.m.	Coffee Break and Poster Session	Room E
10:30 a.m. - 12 p.m.	Parallel Technical Sessions	See page 18
12 - 1:30 p.m.	Lunch with Exhibitors	Room E
1:30 - 2:45 p.m.	Parallel Technical Sessions	See page 19
2:45 - 3:30 p.m.	Coffee Break and Poster Session	Room E
12:45 - 5:30 p.m.	Field Trip: Whittier Tunnel (12:45 - 5:30 p.m.)	
3 - 5 p.m.	Field Trip: Salmon Hatchery, UAA, and Anchorage Museum (3 - 5 p.m.)	

Friday, May 17

8:15 a.m. - 2:30 p.m.	Post Conference Tour to Permafrost Tunnel, TAPS Viewpoint & Permafrost Experiment Station in Fairbanks (Coordinator: Greg Kinney)
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Tuesday Schedule

Room	Session #	Session Name	Chairs	Presenters
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10:30 a.m. - 12 p.m.

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A	1	Aerospace Engineering	O. Bannova, N. Zhou	Olga Bannova, Nick Zhou, Pooneh Maghoul, Nima Farzadnia
B	2	Pavement Design 1	Joel Ullring, Steve Kari,	Robert Halcomb, Manik Barman, Leo Liu, Ayyaz Fareed
C	3	Communities in Cold Regions	D. Nichols, V. Groeschel	Olaf Kuhlke, Matthew Joyner, Rosa Affleck, Michelle Michaels
D	4	Cold Regions Structures	S. Hamel, J. Langmann	Christopher Oreskovic, Scott E. Hamel, Maha Dabas

1:30 - 3 p.m.

Page 11

A	5	Ethics 1	D. Prusak	Wade Ellis, Ryan Anderson Rebecca Bowman
B	6	Laboratory, Geophysical, Remote Sensing	J. Thornley, E. Babcock	Joseph Vantassel, Molly Tedesche, Chuang Lin, Gienko, Gennady
C	7	Frozen Ground and Permafrost 1	H. Brooks, Z. Wang	James Frye, Rooney, James Connie Fortin, Xiangbing Kong,
D	8	Sustainable Infrastructure in Cold Regions 1	F. Zhang, L. Wang	Micheal Uduebor, Yue Zhao, Di Wang, Annika Goozen,

3:30 - 5 p.m.

Page 12

A	9	Pavement Design 2	H. Zubeck, D. Wang	Aritra Banerjee, Ali Raza Khan, Micheal Uduebor, Chuang Lin,
B	10	Cold Regions Construction 1	J. Holland, J. Vantassel	Il Sang Ahn, Barbara Frigo Brian Gastrock, Md. Fyaz Sadiq
C	11	Cold Regions Transportation	V. Vasudevan, Jie Zhou,	V. Vasudevan, James Arthurs, Feng Zhang,
D	12	Cold Regions Utilities	J. Drage, B. Barber-Wiltse,	Bridget Eckhardt, Kenneth Johnson, Boualem Ouazia, Xin Wang



Tuesday Overview

10:30 a.m. - 12 p.m.

Aerospace Engineering

Room A

- Planning and Design in Space and Extreme Environments on Earth, *Olga Bannova*
- Autonomous Construction (3D printing): From Ex-terrestrial to Terrestrial Applications, *Nick Zhou*
- Seismic Geophysics for Permafrost Characterization in Space and on Earth, *Pooneh Maghoul*
- Alkali Activation of Locally Sourced Alaskan Fly Ash for Arctic Construction, *Nima Farzadnia*

Pavement Design 1

Room B

- Alaskan Pavement Resilience: Navigating Climate Change in Cold Regions, *Robert Halcomb*
- Effective Mitigation Strategies for Tenting of Transverse Cracks in Asphalt Pavement, *Manik Barman*
- Model and Tool for Location-Specific Seasonal Load Restriction, *Leo Liu*
- Evaluating the Impact of Using Microencapsulated Phase Change Materials on Low Temperature Cracking Resistance of Asphalt Binder, *Ayyaz Fareed (S)*

Communities in Cold Regions

Room C

- Assessing the Use, Utility, and Spatial Accuracy of 3D Camera Tools for the Measurement and Visualization of Permafrost Thaw Impact on Road and Bridge Infrastructure in Rural Alaskan Communities, *Olaf Kuhlke*
- Accounting for Permafrost Degradation in Site-Specific Ground Motion Procedures for Building Design, *Matthew Joyner*
- Analytical Methodologies for Cold Regions Installations and Community Resilience, *Rosa Affleck*
- Analysis for Arctic Climatic Typing (ACT), *Michelle Michaels*

Cold Regions Structures

Room D

- Quantifying Structural Snow Loads Using the Finite Area Element Method: A Comparison between Physical Wind Tunnel and Computational Fluid Dynamics Input Data, *Christopher Oreskovic*
- Creep Performance of High R-value Structural Insulated Panels (SIPs), *Scott E. Hamel*
- Evaluation of the Impact of Weather Shocks on Roofing Materials Properties, *Maha Dabas*

Tuesday Overview

1:30 - 3 p.m.

Ethics 1

Room A

- *Wade Ellis*
- *Ryan Anderson*
- *The Ethics of Competence: A Moving Target, Rebecca Bowman*

Laboratory, Geophysical, Remote Sensing

Room B

- *Measuring Depth to Ice-Bonded Permafrost Using Surface Waves: Challenges and Recommendations from Field Measurements in Eagle Summit, Alaska, Joseph Vantassel*
- *Snowpack Strength and Micromechanics on Grand Mesa, Colorado via the 2017 NASA SnowEx Snow-MicroPen Dataset, Molly Tedesche*
- *3D Coordinates Determination for the Featured Points Based on Close-up Photogrammetric Method, Chuang Lin*
- *Mapping Coastal Bluff Erosion: Case Study at Pt. Woronzof, Alaska, Gennady Gienko*

Frozen Ground and Permafrost 1

Room C

- *Climate Change Impacts on Arctic Airfields, James Frye (S)*
- *Encounters with Relict Permafrost in the Anchorage, Alaska Area, James Rooney*
- *Designing a Lower Salt Future, Connie Fortin*
- *Case Study of the Thermal Regime of Permafrost underneath the Airstrips in Nunavik, Quebec, Canada, Xiangbing Kong*

Sustainable Infrastructure in Cold Regions 1

Room D

- *Impact of Engineered Water Repellency on Mechanical Properties of Frost-Susceptible Soils under Repeated Freeze-Thaw Cycles, Micheal Uduebor (S)*
- *Pile Pinning Effects in Ground Lateral Spreading: A Case Study of the Slana River Bridge, Alaska, Yue Zhao (S)*
- *Fabrication and Characterization of Multiphase Bituminous Materials for Cold Region Pavements, Di Wang*
- *Vibration Characteristics of Degrading Warm Permafrost from the Analysis of Ambient Noise Data: A Case Study from Bethel, Alaska, Annika Goozen (S)*



Tuesday Overview

3:30 - 5 p.m.

Pavement Design 2

Room A

- Uncovering the Impact of Freeze-Thaw Cycles on Resilient Modulus of Cement-Stabilized Sulfate-rich Subgrade Soil, *Aritra Banerjee*
- Thermal and Fatigue Cracking Performance of Fiber-Reinforced Asphalt Mixtures (FRAM), *Ali Raza Khan (S)*
- Impact of Engineered Water Repellency on Mechanical Properties of Frost-Susceptible Soils under Repeated Freeze-Thaw Cycles, *Micheal Uduebor (S)*
- Wicking Geotextile Application for Mudstone Solid Waste Utilization in Cold Regions, *Chuang Lin*

Cold Regions Construction 1

Room B

- Concrete Creep and Shrinkage at Cold Temperatures and Their Implications to PC Girder Design, *Il Sang Ahn*
- Forensic Engineering in Snow Avalanche Science, *Barbara Frigo*
- Sliplining a Failing 54-inch Stormwater with 42-inch FRP in Anchorage, Alaska, *Brian Gastrock*
- Effect of Salt Concentrations on the Freeze-Thaw Susceptibility of Soils, *Md. Fyaz Sadiq*

Cold Regions Transportation

Room C

- Life-Cycle Analysis of LED Traffic Lights in Alaska, *V. Vasudevan*
- Development of a Smart-Light System for Remote Rural Areas, *V. Vasudevan*
- Geotechnical Design of Permafrost and Wetland Mitigation for Colorado State Highway 5 (Mt. Evans Road), *James Arthurs*
- Identification Method of Permafrost Table Based on Ground-Penetrating Radar, *Feng Zhang*

Cold Regions Utilities

Room D

- History and Update of the Cold Regions Utilities Monograph: A Time-Honored Reference Manual, *Bridget Eckhardt*
- Emergency Water Reservoir Refill for Northern Village of Kangiqsualujjuaq, Nunavik Region, Northern Quebec, Canada, *Kenneth Johnson*
- Performance Assessment of a CO₂-Based Demand-Controlled Frost Resilient Dual Core Energy Recovery Ventilation System for Northern Housing, *Boualem Ouazia*
- Thermal-Stress Response Analysis and Applicability Study of Energy Shaft in Winter, *Xin Wang (S)*

Wednesday Schedule

Room	Session #	Session Name	Chairs	Presenters
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10:30 a.m. - 12 p.m.

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A	13	ASCE/NOAA Partnership	Dan Walker, Jaci Overbeck	
B	14	Cold Regions Oil and Gas	J. Rooney, H. Brooks	Gregory Kinney, John Thornley, Alexandre Lai
C	15	Coastal and Maritime Topics	B. Conner, T. Ravens	Virginia Groeschel, Nina Stark, Tom Ravens, Jasmine Langmann
D	16	Pavement Design 3	S. Kari J. Ullring	Md. Hasibul Hasan Rahat, Mohamed Saleh, Nader Ghafoori, D. Loaiza Monsalve

1:30 - 3 p.m.

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A	17	Natural and NBS in Alaska and the Arctic 1	J. Overbeck, T. Douglas	Taber Midgley, Kamil Biedka, Phil Osborne, KC Kent, Sean Ferguson,
B	18	Cold Regions Construction 2	A. Steiner, W. Presler	Yong Tao, Zakary Picard, Huade Zhou, Chao Ban
C	19	Frozen Ground and Permafrost 2	H. Zubeck, X. Kong	Nicholas Murray, Margaret Darrow, Steve Saboundjia, Ziyi Wang
D	20	Sustainable Infrastructure in Cold Regions 2	G. Kinney, D. Wang	Heather Brooks, Mulugeta Amare, Natalie Wagner, William Fraser

3:30 - 5 p.m.

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A	21	Natural and NBS in Alaska and the Arctic 2	J. Overbeck T. Douglas	Jaci Overbeck, Lauren Bosche, Ellen Jessup, Aaron Poe
B	22	Cold Regions Hydrology and Hydraulics	J. Zufelt, M. Harrison	Ed Zapel, Trung Le, Svetlana Stuefer, Zoe Li
C	23	Performance of Materials	S. Saboundjian, Ch. Lin	Hao Wang, Barbara Frigo, Shijun Wei, Subhabrata Dev
D	24	Frozen Ground and Permafrost 3	M. Darrow, N. Stark	Yue Zhao, Xiangbing Kong, Ziyi Wang, James Rooney



Weds. Overview

10:30 a.m. - 12 p.m.

ASCE/NOAA Partnership

Room A

Cold Regions Oil and Gas

Room B

- **Shallow Buried Fuel Gas Line: Stability Maintenance in the Arctic**, *Gregory Kinney*
- **Foundation Performance Evaluation of an At-Grade LNG Storage Tank on Warm Permafrost in Fairbanks, Alaska**, *John Thornley*
- **Slipstream Heat Addition on the Trans-Alaska Pipeline: Thermal Risk Mitigation Strategies and Lessons Learned**, *Gregory Kinney*
- **Impact of Glacier Outburst Floods on Stream Stability at the Tazlina River Trans-Alaska Pipeline Crossing**, *Alexandre Lai*

Coastal and Maritime Topics

Room C

- **Navigating the New Arctic: Advancing Research in Ice-Structure Interactions for Safer Marine Operations**, *Virginia Groeschel (S)*
- **Variability of Geotechnical Properties in Arctic Coastal and Shelf Regions with Regards to Sediment Dynamics**, *Nina Stark*
- **Controlling Arctic Coastal Erosion with Thermal and Mechanical Measures**, *Tom Ravens*
- **Preliminary Finite-Element Modeling of Floating Sea Ice Impacting Vertical Piles with Accreted Ice**, *Jasmine Langmann (S)*

Pavement Design 3

Room D

- **Investigating the Impact of Freeze-Thaw Damage on Chloride Ingress in Concrete**, *Md. Hasibul Hasan Rahat (S)*
- **Development of a High-performance Asphalt Concrete with Enhanced Low-Temperature Performance**, *Mohamed Saleh*
- **Role of Aggregate Type on De-Icing Salt Resistance of Ultra-High-Performance Concrete**, *Nader Ghafoori*
- **Quantification of Influence Factors in the Studded Tire Wear Using the Prall Device**, *D. Loaiza Monsalve (S)*

Weds. Overview

1:45 - 3:15 p.m.

Natural and NBS in Alaska and the Arctic 1

Room A

- Improving Coastal Resilience with Nature-Based Solutions in Point Hope, *Taber Midgley*
- Erosion Mitigation Design in the Arctic Considering Climate Change Impacts, *Kamil Biedka*
- Spit Recycling: The Default Nature-based Solution at Shaktoolik, Alaska, *Phil Osborne*
- Rock Solid: Engineering Coastal Structures in Ice-Prone Zones, *KC Kent*
- Towards Development of Guidelines for Nature-Based Solutions Using Findings from Several Pilot Projects in Canadian River Systems, *Sean Ferguson*

Cold Regions Construction 2

Room B

- Modeling a Composite Pore Model for Chlorinated Silty Clay under Load Influence during Freeze-Thaw Cycles Based on NMR Fractal Theory, *Yong Tao (S)*
- Preliminary Numerical Analysis of the Impact of Heterogeneity on Seepage in Frozen Soils, *Zakary Picard (S)*
- Quantitative Analysis of Unfrozen Water Content of Muddy Clay under Extremely Low Temperature Freezing Conditions, *Huade Zhou (S)*
- Shear Characteristics and Microstructure of Cemented Soil-Concrete Interface after Artificial Freeze-Thaw under Vibration Loading, *Chao Ban (S)*

Frozen Ground and Permafrost 2

Room C

- How Climate Change is Changing Bridge Design in Alaska, *Nicholas Murray*
- Can't Stop This: Documenting the Collision of Frozen Debris Lobe-A with the Dalton Highway, Alaska, *Margaret Darrow*
- Long-Term Performance of Permafrost Passive Cooling Systems in Interior Alaska, *Steve Saboundjian*
- Cryostructure and Uniaxial Compressive Strength of Ice-rich Permafrost in Northern Alaska, *Ziyi Wang (S)*

Sustainable Infrastructure in Cold Regions 2

Room D

- Conceptual Design of Quantitative Risk Algorithms for a Geohazard and Geo-asset Management System for Roadway Networks in Permafrost Regions, *Heather Brooks*
- Temperature Effects on CT in Un-Baffled Water Storage Tanks, *William Fraser*
- Funding for Sustainable Infrastructure Efforts in Alaska and Related Challenges, *Natalie Wagner*
- Predicting Long-term Performance of Vacuum Insulation Panels in Building Envelope Constructions, *P. Mukhopadhyaya*



Weds. Overview

3:30 - 5 p.m.

Natural and NBS in Alaska and the Arctic 2

Room A

- A Brief History of Federal Policy, Programs, and Guidance for Natural and Nature-Based Solutions Engineering with Applications to Alaska and the Arctic, *Jaci Overbeck*
- Engineering With Nature® and Progressing Natural and Nature-Based Solutions in Alaska and the Arctic, *Lauren Bosche*
- Nature-based Solution Design: The Value of a Process-Based Definition to Identify NBS in Any Environment, as Demonstrated by a Case Study to Enhance Coastal Resilience in Point Hope, Alaska, *Ellen Jessup*
- Building Connections and Capacity for Community-Led Coastal Resilience in Alaska, *Aaron Poe*

Cold Regions Hydrology and Hydraulics

Room B

- Small Scale Hydropower in Alaska - From Construction to Operations; Challenges in Harsh Conditions, *Ed Zapel*
- Estimation of Bed Shear Stress Distribution Using ADCP Data in Ice-Covered Streams, *Trung Le*
- Overview of NASA SnowEx Alaska Field Campaign in 2022-2023, *Svetlana Stuefer*
- Prediction of Mid-Winter Breakup of Ice Cover on Canadian Rivers, *Zoe Li*

Performance of Materials

Room C

- A Simple Technique for Measuring Soil Pore Structure in Frozen Soils Using the Nuclear Magnetic Resonance Method, *Hao Wang (S)*
- Temperature Effect on the Relationship between Flexural Strength and Compressive Strength of Ice, *Barbara Frigo*
- Freezing Mechanism of Water in Clay Nanopores Using Molecular Dynamics, *Shijun Wei (S)*
- Development of Biofiltration Process for the Treatment of Acid Mine Drainage in Cold Regions, *Subhabrata Dev*

Frozen Ground and Permafrost 3

Room D

- Seasonal Frost and Permafrost Impact in Liquefaction-Induced Lateral Spreading, *Zhao Yue (S)*
- Study on the Thermal Regime of Permafrost underneath the Tasiujaq Airstrip near Ungava Bay Coast, Northern Quebec, *Xiangbing Kong*
- Experimental Investigation of Thermal and Hydraulic Properties of Ice-rich Permafrost near Point Barrow, Alaska, *Ziyi Wang (S)*
- Personal Career Experiences with Permafrost, *James Rooney*

Thursday Schedule

Room	Session #	Session Name	Chairs	Presenters
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10:30 a.m. - 12 p.m.

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A	25	Arctic EDS	S. Rupp	Margret Darrow, Svetlana Stuefer, Charles Parr
B	26	UFC Manuals of Practice	R. Affleck, K. Bjella	R. Affleck, K. Bjella, M. Mark
C	27	AI in Cold Regions	J. Thornley, L. Liu	Scott Slone, Leo Liu, Md. Shohel Rana
D	28	Cold Regions Construction 3	E. Yarmak, Jr., X. Xiao	Austen Whitney, Kiera Towell, Alexandre Lai, Suguang Xiao

1:30 - 2:45 p.m.

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A	29	Community Engineering (Silver Jacket)	K. Bjella	B. Conner, P. R. Martinez, T. Holmes, M. Musial
B	30	Ethics 2	D. Prusak	Rebecca Bowman
C	31	Cold Regions Construction 4	Ch. Lin, L. Wang	Lei Wang, Jie Zhou Hanli Wu





Thursday Overview

10:30 a.m. - 12 p.m.

Arctic EDS

Room A

- *Scott Rupp*
- *Margret Darrow*
- *Sveta Stuefer*
- *Charles Parr*

UFC Manuals of Practice

Room B

- *Kevin Bjella*
- *Mark Musial*

AI in Cold Regions

Room C

- Improved Prediction of Frost Depth Penetration Using Recurrent Neural Networks, *Scott Slone*
- Data-Driven AI-Powered Snow and Ice Removal for Winter Road Maintenance, *Leo Liu*
- Advancing Cold Region Engineering through Machine Learning for Robust Infrastructure Resilience Based on Historical Weather Data Analysis, *Md. Shohel Rana*

Cold Regions Construction 3

Room D

- Retrofitting a Passively Cooled At-Grade Foundation at Nunam Iqua, Alaska, USA, *Austen Whitney*
- 3D Printing Ice Composites for Construction in Cold Regions, *Kiera Towell*
- Low-Impact Sustainable Gravel Mining on the Sagavanirktok River Floodplain, *Alexandre Lai*
- Laboratory Investigation on Load Transfer of Pile Foundations in Frozen Sandy Soils, *Suguang Xiao*

Thursday Overview

1:30 p.m. - 2:45 p.m.

Community Engineering (Silver Jacket)

Room A

- *B. Conner*
- *P. R. Martinez*
- *T. Holmes*
- *M. Musial*

Ethics 2

Room B

- *The Ethics of Competence: A Moving Target, Rebecca Bowman*

Cold Regions Construction 4

Room C

- *Discrete Element Modeling of Bio-Inspired Drilling for Optimal Design of New Drilling Tools into Lunar Regolith, Lei Wang*
- *Analysis on Pore-Fissure Extension and Evolution Mechanism of One-Dimensional Clay Column under Unidirectional Freezing Conditions, Jie Zhou*
- *Reasonable Height of Cellular Concrete Aggregate Interlayer for Air Convection Embankment in Alaskan Permafrost Regions, Hanli Wu*



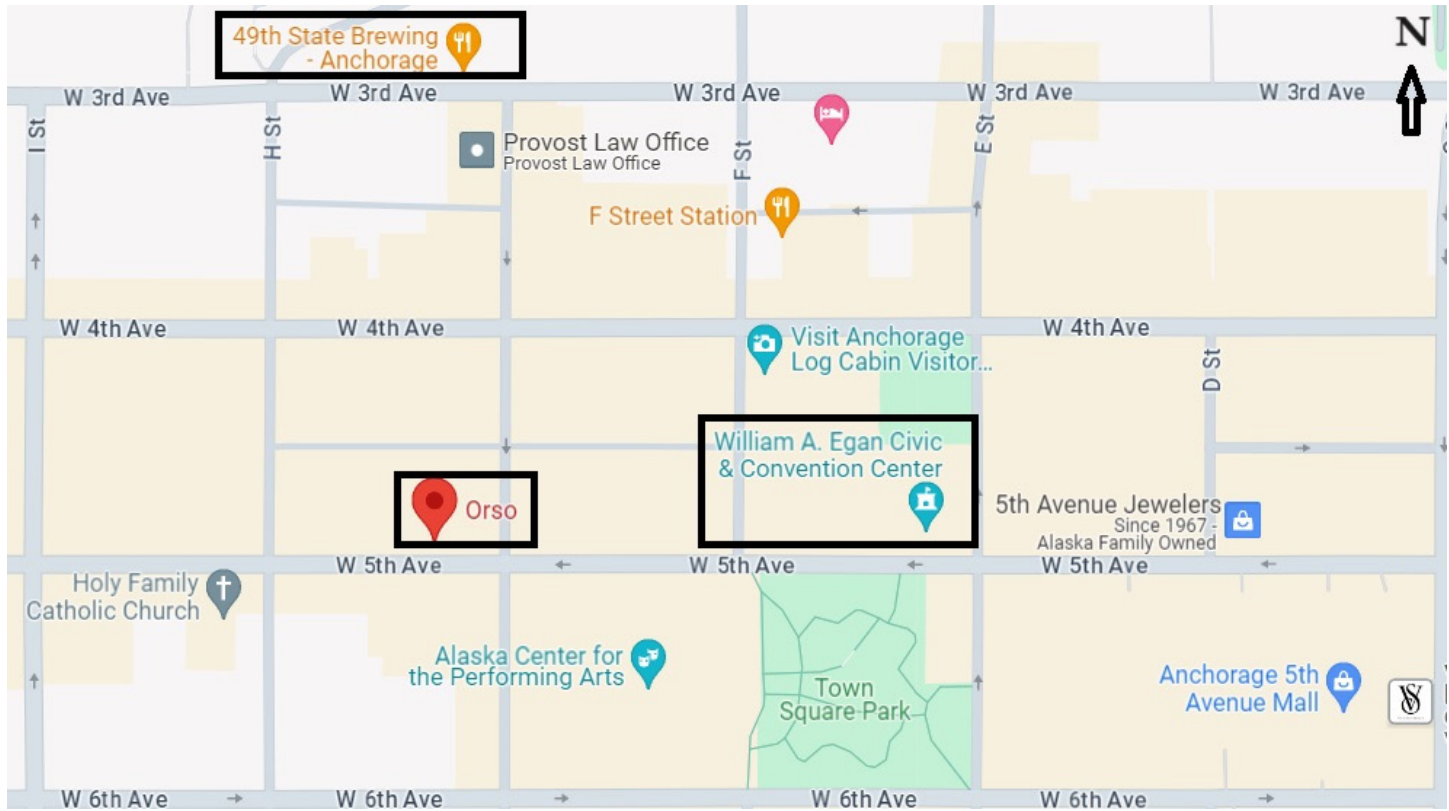
Poster Session



#	Author	Title
1	Padinhare Purakkal	Design of Electrically Conductive Asphalt Pavement for Self-Deicing Applications in Cold Regions
2	Matt Bray	Frost Susceptibility and Strength of Cement-Treated Fine-Grained Soils
3	Jianmin Ma	Multiscale Characterization of Cracking Resistance in Asphalt: Link between Binder and Mixture Tests
4	Jianmin Ma	Comparative Analysis of Tension-Compression and Shear Oscillatory Loading on the Rheological Response of Asphalt Binders from a Northern Ontario Pavement Trial
5	Yu Zhang	Investigation of Pavement Diseases and Pavement Structure Design for Urban BRT Lanes in Cold Areas
6	Yu Zhang	Analysis of Slope Stability and Evaluation of Reinforcement Effect under Seismic Forces
7	Zhenhao Zhang	Identification and Parameter Estimation of the Stochastic Process of Concrete Strength Degradation Caused by Freeze-Thaw Cycles
8	Xusheng Wan	A Theoretical Model on Unfrozen Water Content in Soils and Verification
9	Cooper Knarr	The Lone Peak Tram: A Heat Transfer Analysis
10	Chuanxin Rong	Laboratory Model Test Study on Formation Mechanism of Artificial Frozen Wall in Permeable Stratum with High Seepage Velocity
11	Zihao Shang	Volumetric Behavior of Unsaturated Silty Soil Subject to Freezing-Thawing Cycles
12	Bo Lin	Experimental Study on Structural Anisotropy of Subgrade Soil Induced by Freeze-Thaw Cycles
13	Qingsong Du	Acquisition of Mountain DEMs Using D-InSAR and Using for UAV Aerial Survey Route Planning
14	Dun Chen	Research on Permanent Strain of Frozen Soil under Traffic Loading
15	Yapeng Wang	Analysis and Control of Complex Cyclic Stress Paths for Frozen Soil
16	Pingbao Yin	Analysis of the Evolution Law of Hysteresis Curve Morphological Characteristics of Polyurethane-Bonded Rubber Particle-Sand Mixture under Cyclic Loading
17	Joseph Sopko	Ground Freezing for Deep Shaft Excavation in New York City
18	George Payne	Arctic Flume for Nature-Based Coastal Protection Experiments
19	Md. Fyaz Sadiq	Feasibility of SAA to Monitor Freeze-Thaw Performance of Pavement Foundations in Cold Regions

Maps

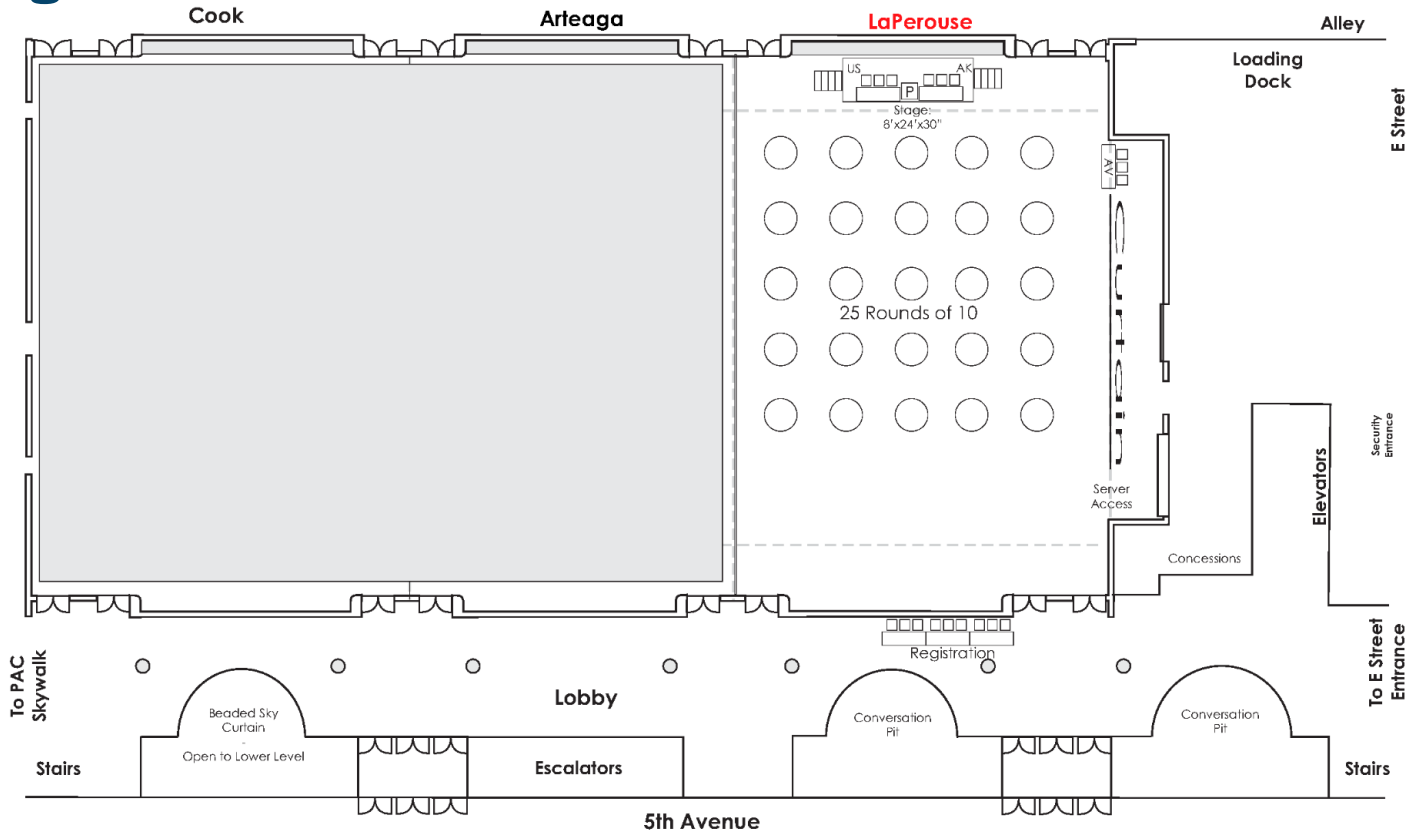
Downtown Anchorage



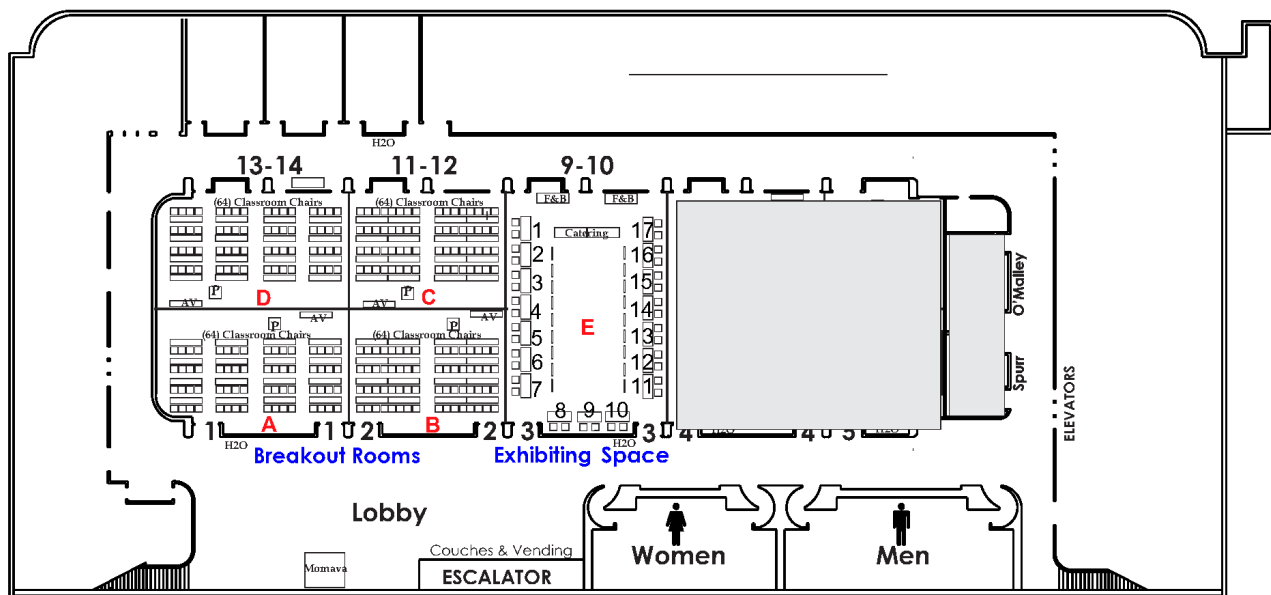
Maps



Egan Center - Street Level



Egan Center - Lower Level



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