

COLD WEATHER READINESS SUMMIT

Fargo, ND | Feb 5, 2025



ABOUT THE SUMMIT

Aurora Cold Weather Readiness summit is dedicated to bringing together commercial, military, and government partners to address the most pressing challenges in extreme weather conditions, including freezing temperatures, precipitation, and low visibility.



The Aurora Center for Extreme Weather Materials was created to provide laboratory testing, outdoor exposure and field trials, manufacturing, and technical support for materials in the most severe weather conditions. We ensure that unmanned aerial systems (UAS), ground vehicles, vessels, military equipment, and other critical infrastructure remain mission-ready in extreme cold environments by focusing on four essential areas: Performance, Application, Maintenance, and Supporting Readiness.



At Elinor Coatings, we provide novel solutions to corrosion, degradation and fouling. Our expertise in materials and coatings is used to develop products that aid in protecting natural resources. Elinor Coatings prioritizes diversity, as the best ideas are achieved with a team of individuals with different backgrounds and perspective.



**FARGO
MOORHEAD**
ECONOMIC DEVELOPMENT

The Fargo-Moorhead region is a hub for extreme weather technology, thanks to its harsh climate and strong research partnerships. With temperatures from -30°F to 100°F, it's ideal for testing aerospace and defense materials. The Greater Fargo Moorhead Economic Development Corp supports this growth by connecting businesses with resources and research institutions. The Aurora Center for Extreme Weather Materials is part of this ecosystem, advancing innovation in durable coatings. As Arctic trade routes expand, demand for extreme weather solutions continues to rise, solidifying Fargo-Moorhead's role in the industry.

<https://gfmedc.com/>

FEATURED TECHNICAL SPEAKERS



Dr. Raghu Srinivasan
*Director, University of Alaska
Environmental Degradation Lab*



Dr. Dave Sharman
*Kingfisher Business Solutions
Elinor Coatings*



Dr. Chad Ulven
*NDSU Mechanical Engineering
c2renew*

ND PROUD

We are proud to call North Dakota home, where the extreme temperature swings and harsh weather conditions give us a unique advantage in testing and developing durable coatings. From summer heat to extreme winter cold, our environment provides real-world challenges that push materials to their limits. This allows us to deliver proven solutions that perform in the most demanding conditions, ensuring reliability for various agencies.



CONTACT

Elinor Coatings

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SAVE THE DATE | FEBRUARY 3-5, 2026 | WWW.COLDREADYSUMMIT.COM

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AGENDA

Wednesday, February 5th

Riverhaven Event Center | Moorhead, MN

8:00 AM - 8:30 AM	Coffee & Light Breakfast Registration
8:30 AM - 9:00 AM	Welcome & Introduction to Aurora
9:00 AM - 10:00 AM	The Urgency for Arctic Readiness Advanced Material Development for Combat Operations in Low-temperature Domains
10:00 AM - 11:30 AM	Cold and Icing Extending Capabilities Through Control & Prediction
11:30 AM - 12:30 PM	Lunch 12:05 Featuring: Methods for Managing Extreme Climate Cities
12:30 PM - 1:30 PM	Tech Demo: Arctic Warriors - Considerations in the Field
1:30 PM - 2:00 PM	Hot Beverage Break
2:00 PM - 3:15 PM	Concealment and Camouflage Light, Snow, Surfaces, and Technology
3:15 PM - 4:30 PM	Corrosion Management Vehicles, Vessels, and Aircraft in Harsh Environments
4:30 PM - 5:00 PM	Wrap Up
5:00 PM - 6:00 PM	Social Hour
6:00 PM - 8:00 PM	Dinner Reception

Thursday, February 6th

Elinor Coatings | Fargo, ND

10:30 AM - 11:30 AM	Tour of Elinor Coatings
12:00 PM - 1:00 PM	Lunch
1:30 PM - 2:30 PM	Supplemental Presentation Dr. Raghu Srinivasan

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SESSION DESCRIPTIONS



The Urgency for Arctic Readiness Advanced Material Development for Combat Operations in Low-temperature Domains

*Holly Anderson, CEO & Dr. Dante Battocchi, CTO | Elinor Coatings
with remarks from Jessica Lee, representing Senator John Hoeven (ND)*

The Arctic is warming three times faster than the rest of the world, leading to significant impacts on local communities, ecosystems, and the U.S. Department of Defense's (DoD) operational landscape. With the possibility of an ice-free summer before 2030, increased maritime activity and resource access will heighten risks such as accidents, environmental degradation, and geopolitical tensions. Given the region's limited population and infrastructure, this is a key focus of the DoD's Arctic strategy. Today, we aim to gather local and national expertise to assess our impact on Arctic strategy and explore ways to enhance the performance of vehicles, equipment, and infrastructure in extreme cold. North Dakota's experience with harsh weather conditions will be invaluable in shaping the Aurora Center for Extreme Weather Materials.



Cold & Icing | Extending Capabilities Through Control & Prediction

Dr. Chad Ulven, Chair of Mechanical Engineering | North Dakota State University

Polymer matrix composites are beginning to find more prominence in their use to build the next generation tactical vehicles and personal protection equipment due to their lightweight and high performance attributes. However, information on their cold weather performance is largely unknown or undocumented, especially when considering thermoset versus thermoplastic matrices whose glass transition temperature vary tremendously based on polymer type. This presentation will outline the type of research that is currently being conducted at NDSU to fill in some of these cold weather performance knowledge gaps.



Andrew Holman | Fargo Hector International Airport

This presentation will discuss the de-icing strategies employed at Fargo Hector International Airport, including the products used to treat the airfield and their effectiveness in various winter conditions. It will also highlight the airport's approach to weather and temperature monitoring, ensuring precise application timing for optimal safety and efficiency.

Methods for Managing Extreme Climate Cities

with remarks from Tim Mahoney, Mayor | Fargo, ND

Running a city in a place where the climate swings from scorching summers to Arctic-level winters presents unique challenges. Infrastructure, public services, and community resilience must be managed with extreme temperature shifts in mind, requiring innovative solutions and strategic planning. From maintaining roads through brutal freeze-thaw cycles to preparing for floods and winter storms, Fargo faces obstacles that few other cities encounter. This session will explore how the city adapts, plans for the future, and ensures that residents and businesses can thrive—no matter the season.



Arctic Warriors – Identifying Issues in the Field

Bill Daggett & Will Daggett | Delta Advisory Group

This outdoor session offers a firsthand look at how extreme cold impacts drone operations. Attendees will experience the frigid temperatures while observing a drone in flight, highlighting real-world challenges such as battery performance, icing, and navigation in cold air. This demonstration provides valuable insight into the obstacles faced when operating unmanned aerial systems in harsh winter environments and the innovative solutions needed to ensure reliability in extreme weather.

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SESSION DESCRIPTIONS, CONT.



Concealment & Camouflage | Light, Snow, Surfaces and Technology

Dr. David Sharman, CEO | Kingfisher Business Solutions

This presentation introduces the concepts of camouflage, concealment and deception. Some examples of World War II deception are discussed highlighting the need for a multi-faceted approach. New capabilities in the electromagnetic spectrum have been developed in collaboration with Naval Surface Warfare Center Port Hueneme Division. Initially developed to protect equipment, the capability has also been found to be beneficial for military deception purposes. It concludes with a discussion on the requirements to remain undetected.



Corrosion Management | Vehicles, Vessels and Aircraft in Harsh Environments

Dr. Raghu Srinivasan, Director of Environmental Degradation Lab | University of Alaska Anchorage

Dr. Eric Theisen | Energy and Environmental Research Center



It is commonly assumed that there is very little corrosion in cold environments; however, previous studies have shown that metal alloys experience significant corrosion damage in arctic and sub-arctic environments. Despite this threat, there is currently very little corrosion data for these regions. In colder climates, factors like substantial snowfall, frequent freeze-thaw cycles, the use of de-icing salts, and increasing global temperatures add complexities to the established paradigms governing atmospheric corrosion. The combination of urbanization and proximity to marine environments make arctic and sub-arctic regions in North America, particularly Alaska, an important natural laboratory to study atmospheric corrosion. This presentation will discuss the establishment of a network of test sites around the state of Alaska to elucidate the mechanisms of atmospheric corrosion under colder temperatures. An initial attempt to develop a corrosivity map for the state of Alaska by monitoring the degradation of metal alloys that are widely used in land, sea, and aerospace transportation, the oil and gas, fisheries, and mining applications will be presented. The fundamental

knowledge on studying the basic atmospheric corrosion mechanisms in extreme cold conditions will result in better design practices for the built environment in the changing Arctic. As the Earth's climate continues to shift, environmental conditions in the arctic will evolve, and the strategic importance of arctic and sub-arctic regions will increase. The readiness of the United States' forces in the arctic hinges on the reliability of the specialized equipment and infrastructure used to operate in these regions. The relative lack of materials performance and degradation data under real (or simulated) arctic conditions presents a significant threat. Alaska's growing role as a key military, cargo, shipping, and refueling hub enhances its importance as an ideal natural laboratory for studying atmospheric corrosion in cold regions, as demonstrated by the developed test sites.

Extreme Weather Technology

Joe Raso, President & CEO | Greater Fargo Moorhead Economic Development Corp.

Ryan Aasheim, Chief Business Development Officer | Greater Fargo Moorhead Economic Development Corp.

The Fargo-Moorhead region is becoming a hub for extreme weather technology and advanced materials, thanks to its harsh climate and strong research partnerships. With temperatures ranging from -30°F in winter to 100°F in summer, it provides an ideal environment for testing materials used in aerospace, defense, and industrial applications. The Greater Fargo Moorhead Economic Development Corporation supports growth by connecting businesses with resources, research institutions, and workforce development programs. The Aurora Center for Extreme Weather Materials is part of this ecosystem, advancing research and innovation in durable coatings and materials. As Arctic trade routes expand, demand for extreme weather solutions is increasing, further strengthening Fargo-Moorhead's position in this industry.



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SPEAKERS



Holly Anderson, CEO
Dr. Dante Battocchi, CTO

Elinor Coatings

Holly Anderson, CEO, and Dr. Dante Battocchi, CTO, lead Elinor Coatings in its mission to develop cutting-edge protective coatings for extreme environments. Holly, with her strong background in business strategy, has been instrumental in driving innovation, expanding partnerships, and positioning Elinor as a leader in corrosion protection and cold weather coatings. Dr. Battocchi, with a PhD in Materials and Nanotechnology, leads Elinor's technical team in developing advanced coating technologies. His expertise in corrosion science, protective coatings, and cold weather performance has resulted in groundbreaking advancements in environmentally friendly and high-performance coatings. Under their leadership, Elinor Coatings has advanced its research and development capabilities to meet the rigorous demands of military, aerospace, and industrial applications.



U.S. Senator John Hoeven
(ND-R)

Senator John Hoeven has served as a U.S. Senator for North Dakota since 2011, working to advance policies that promote economic growth, energy development, and strong national defense. Prior to his time in the Senate, he was North Dakota's longest-serving governor, holding office from 2000 to 2010. During his tenure, he focused on expanding the state's economy, strengthening agriculture, and fostering innovation in energy production.

Senator Hoeven is a strong advocate for North Dakota's energy sector, supporting an all-of-the-above energy strategy that includes both traditional and renewable resources. He has played a key role in advancing infrastructure projects, rural development initiatives, and military support for the state.



Andrew Holmen

Operations Supervisor Fargo Hector International Airport

Andrew Holmen serves as the Operations Supervisor at Hector International Airport in Fargo, North Dakota, where he is part of the administrative staff. In this role, he oversees daily airport operations, ensuring safety and efficiency in all aspects of airport management.



Dr. Chad Ulven

Chair of Mechanical Engineering North Dakota State University, CTO c2renew

Chad Ulven is a Professor of the Mechanical Engineering at NDSU as well as CTO at c2renew Inc. He joined NDSU as faculty in 2005 and has been involved in the research of polymer matrix composites (PMCs) for various commercial and defense applications for the past 25 years. Ulven received his B.S. degree in Mechanical Engineering from North Dakota State University (2001) and M.S. and Ph.D. degrees in Materials Engineering from the University of Alabama at Birmingham (2003 & 2005).

He has served as the PI, Co-PI, or Senior Personnel on research grants at NDSU totaling over \$45M and involving over 50 outside companies. He has co-authored 9 book chapters, 87 journal articles, and over 100 conference papers related to PMCs. Ulven is the co-author of 7 patent applications which have led to 5 patents awarded and 3 spin-out companies, c2renew Inc., c2sensor Corp., and Dark Horse Technologies, Inc.



Tim Mahoney

Mayor of Fargo, ND

Dr. Tim Mahoney has served as mayor since 2015. Born in Devils Lake, ND, he is a native of the Plains and along with his wife Kathy raised four children in Fargo. The Mayor's priorities are permanent flood protection for the region, striving to become a technology center on the prairie, including drone technology, and partnering with other communities to achieve efficiency and effectiveness. As a leader in one of the most extreme weather cities in the world, he is giving us insight on challenges and solutions Fargo employs to manage infrastructure and safety in the most extreme conditions.

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SPEAKERS, CONT.



Bill Daggett

Delta Advisory Group

Bill Daggett is the Founder and Managing Director of Delta Advisory Group, based in Fargo, ND, where he leads a team of UAS experts to help organizations navigate the UAS ecosystem and uncover growth opportunities. With 24 years of service in the U.S. Air Force, including as an MQ-9 Pilot and C-21 Instructor Pilot, Bill brings extensive aviation experience, including working with government agencies on global missions. Bill combines his aviation background and industry expertise to drive success for clients in the UAS space.



Dr. David Sharman

Kingfisher Business Solutions & Elinor Coatings

Dr. David J. Sharman is the Chief Executive Officer of Kingfisher Business Solutions, LLC, where he provides strategic consulting in operations, production, R&D, business development, and marketing. He holds a PhD in Mechanical Engineering from UNSW Sydney and has over 15 years of experience helping businesses improve functionality, minimize risk exposure, and identify funding pathways for technology integration into government agencies.



Dr. Raghu Srinivasan

Director of Environmental Degradation Lab | University of Alaska Anchorage

Dr. Raghu Srinivasan is an associate professor and department chair in the Mechanical Engineering Department at the University of Alaska Anchorage. He received his MS and Ph.D. degrees in Mechanical Engineering at the University of Hawaii at Manoa in 2005 and 2010, respectively. He established the Environmental Degradation Lab at the University of Alaska Anchorage and serves as its director. He also serves as the vice-chair of the AMPP's Research Program Committee (RPC) and delegate of AMPP Alaska section. His research interests are in the field of corrosion (atmospheric and marine corrosion), materials characterization, materials compatibility, and Oil and Gas Corrosion.



Dr. Eric Theisen

Energy and Environmental Research Center

Dr. Eric Theisen is a Senior Research Engineer at the Energy & Environmental Research Center (EERC), where he collaborates with subject matter experts, principal investigators, and leadership to develop proposals and identify new business opportunities. He leads projects focused on energy production, CO2 capture, CO2 geologic storage, and natural resource systems. Before joining the EERC, Dr. Theisen served as Director of Research and Development at Metglas Inc. He holds a Ph.D. in Chemical and Biomolecular Engineering from Cornell University, an M.B.A. from the University of South Carolina, and a B.S. in Chemical Engineering from the University of Florida. His expertise includes scanning electron microscopy, x-ray analysis, microstructure analysis, and mechanical testing.



Joe Raso, President & CEO

Ryan Aasheim, Chief Business Development Officer

Greater Fargo Moorhead Economic Development Corporation



Joe Raso and Ryan Aasheim represent the Greater Fargo Moorhead Economic Development Corporation (GFMEDC), where they contribute their extensive experience to advancing the region's economic growth. Joe has served as President & CEO since July 2018 bringing nearly twenty-five years of experience in economic development across Iowa and Colorado. His expertise includes downtown, rural, and metropolitan development, workforce programming, business attraction, and entrepreneurship.

Ryan Aasheim, Chief Business Development Officer, focuses on primary-sector business attraction, retention, and expansion. With his leadership in business development, Ryan plays a key role in strengthening the region's economic landscape.

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ATTENDEES

SPEAKERS

U.S. Senator John Hoeven
Jessica Lee | Campaign Manager for Senator John Hoeven
Andrew Holmen | Operations Supervisor Fargo Hector International Airport
Dr. Chad Ulven | Chair of Mechanical Engineering North Dakota State University, CTO c2renew
Tim Mahoney | Mayor of Fargo, ND
Bill and Will Daggett | Delta Advisory Group
Dr. David Sharman | Kingfisher Business solutions & Elinor Coatings
Dr. Raghu Srinivasan | Director of Environmental Degradation Lab | University of Alaska Anchorage
Dr. Eric Theisen | Energy and Environmental Research Center
Joe Raso, President & CEO | Greater Fargo Moorhead Economic Development Corp.
Ryan Aasheim, Chief Business Development Officer | Greater Fargo Moorhead Economic Development Corp.

ATTENDEES

Jessica Lee | State Director for Senator John Hoeven
James Mitchell | USF Insitute of Applied Engineering
Jawad Khan | PetroND Energy Solutions
Andrew Hanson | Goldmark Commercial
Josh Gelinske | NDSU Research & Technology Park
Jolynne Tschetter | Birdsong Consulting LLC
Josh Klug | Aethero
William Daggett | Delta Advisory Group
Nicholas Crockett | CapGov Solutions
Brian Kalk | Energy and Environmental Research Center
Tim Bromelkamp | Bromelkamp Government Relations
Roger Brown
Cadi Zerr | ND APEX
Christopher Martin | Energy and Environmental Research Center
Joey Ness | Greater Fargo Moorhead Economic Development Corp
Brenda Wyland | NDSU Research & Technology Park
Samuel Verplank | Montana State University
David Cook | NDSU President

ELINOR COATINGS STAFF

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James Dravitz
Adrian Dawson-Becker
Marshall Piens
Megan Fillmore
Janice Lebga
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Luke Wiering

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Morgen Hagerott
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