SRA EUROPE-NORDIC Society for Risk Analysis

UNIVERSITY OF ICELAND

Risk analysis in the Nordic area in a time of transition

10th SRA-Europe Nordic Chapter conference • Edda – Institute for Icelandic Studies, Reykjavík

Programme – Thursday 1 October 2026

08:30-09:00 Registration and coffee on arrival

09:00-09:10 Welcome and opening

09:10-09:20 **SRA EUROPE – Tom Jansen**

RIVM, NL. A short introduction to SRA Europe and how to get involved

09:20-10:05 **KEYNOTE – Katherine McComas**

Professor, Cornell College of Agriculture and Life Sciences, US

"When the Earth Moves: Risk Perception and the Politics of Geothermal Acceptance"

10:05-10:30 Coffee

10:30-11:15 **PLENARY SESSION 1 – Whose acceptance? Publics, policy and the energy transition**

Chair: Gisela Böhm

10:30 Risk acceptance and tolerance of wind power: comparing Nordic and non-Nordic experiences, Frederic Bouder (University of Stavanger, NO)

10:45 Aligning public perceptions and national policy: a mental models approach to energy transition pathways in the Netherlands and Norway, Gisela Böhm (University of Bergen, NO)

11:00 Uncertainties and risks in the green transition: the role of civil society, Aistė Balžekienė (Kaunas University of Technology, LT)

11:15-12:10 **ROUNDTABLE 1 – Whose acceptance, whose transition? Energy, geothermal and public trust in the Nordic region**

Moderator: Þórhallur Halldórsson

Panel: Katherine McComas, Frederic Bouder, Gisela Böhm and Aistė Balžekienė.

12:10-13:20 Lunch

13:20-14:35

A1 – Sectoral systems under pressure: energy, maritime, markets and food

Chair: Gisela Böhm

13:20 Cross-sectoral energy system resilience, Kari Mäki (Tampere University, FI)

13:35 Wintertime maritime traffic and offshore wind farm interactions, Northern Baltic, Mojtaba Barzehkar (Aalto University, FI)

13:50 Emerging real estate investment risks under the green and digital transition, Dominykas Linkevičius & Laima Okunevičiūtė Neverauskienė (Vilnius Gediminas Technical University, LT)

14:05 Monitoring local digital currencies and managing emerging risks, Paulina Budrytė (Kaunas University of Technology, LT)

14:20 Collaborative risk governance in the dairy

B1 – Vulnerability-informed preparedness capacity

Chair: Kati Orru

13:20 Disaster preparedness capacity analysis: multi-hazard scenarios, Kati Orru (University of Tartu, EE)

13:35 Disaster preparedness education for children: a comparative framework, Sten Hansson (University of Tartu, EE)

13:50 Vulnerability assessment for people with physical disabilities, Ida Joao-Hussar (University of Tartu, EE)

14:05 Adoption of innovation in disaster risk management systems in Europe, Ahmed Atia Rezk (University of Tartu, EE)

14:20 Session discussion (15 min)

sector: trust and tension, Maija Nikkanen (University of Helsinki, FI)

14:35-14:55 Coffee

14:55-16:00

A2 – Perception, culture and communication

Chair: Frederic Bouder

14:55 Safe places? Rural imaginaries in risk biographies, Linda Kvarnlöf (Mid Sweden University, SE)

15:10 From sagas to cyberspace: a practitioner's view of Icelandic resilience, Sigurður Emil Pálsson (University of Iceland, IS)

15:25 Risk as range, Benjamin Scheibehenne (Karlsruhe Institute of Technology, DE)

15:40 Managing the expectation gap: psychosocial risk in ICE environments, Michael Stieber (Harz University of Applied Sciences, DE)

15:55 Session discussion (5 min)

B2 – Catastrophic risk, foresight and decision under uncertainty

Chair: Tom Jansen

14:55 Risk management under severe uncertainty, H. Orri Stefánsson (Stockholm University, SE)

15:10 Sufficient and satisfactory? A sufficientarian framework for civil protection, Mateusz Sosnowski (KTH Stockholm and Södertörn Fire and Rescue Service, SE)

15:25 Volcanic winter and famine: Tambora 1815 and statistical associations 1–1900 CE, Nick Wilson (University of Otago, NZ)

15:45 Strategic foresight in disaster risk management: practices across Europe, Ingeliis Siimsen (University of Tartu, EE)

16:00-16:30 Coffee

16:30-17:15

PLENARY SESSION 2 – Security, defence and democratic resilience in the Nordic-Baltic region

Chair: Aistė Balžekienė

16:30 Can protecting democratic values put them at risk? Security, risk and democratic values in Swedish total defence planning, Sara Bondesson (Lund University, SE)

16:45 Lost in transition? The (re-)construction of comprehensive defence in Sweden, Christine Große (Luleå University of Technology, SE)

17:00 Strategic islands as risk observatories: can Greenland and Gotland anticipate future systemic risks? Anna Moraczewska (Maria Curie-Skłodowska University, PL)

17:15-17:40

DISCUSSION – Whose security, whose resilience? Total defence, civic mobilisation and democratic values in the Nordic-Baltic region

Moderator: Aistė Balžekienė

Panel: Sara Bondesson, Christine Große, Anna Moraczewska, Kati Orru and Mateusz Sosnowski.

17:40-17:45 Closing of day 1

17:45-18:35

SRA-EUROPE NORDIC CHAPTER BUSINESS MEETING

Members and anyone interested.

19:30

Conference dinner

Forréttabarinn. Optional, separate booking.

SRA EUROPE-NORDIC Society for Risk Analysis

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Risk analysis in the Nordic area in a time of transition

10th SRA-Europe Nordic Chapter conference • Edda – Institute for Icelandic Studies, Reykjavík

Programme – Friday 2 October 2026

09:00-09:45 **KEYNOTE – Matthias Kokorsch**

Ph.D., University Centre of the Westfjords, IS

"From Emergency to Precedent: Grindavík and the Future of Climate Risk Governance in Iceland"

09:45-10:10 Coffee

10:10-11:25 **PLENARY SESSION 3 – Hazard, community and continuity in remote and island regions**

Chair: Paulina Budrytė

10:10 Children as a risk parameter: psychosocial consequence, rights as constraint, and continuity in recovery assessment, Adda Þóreyjardóttir Smáradóttir (ÖRUGG Consulting Engineers, IS)

10:25 When the community is the system: disaster risk management and climate adaptation in remote settlements in Iceland, Jóhanna Gísladóttir (Agricultural University of Iceland and University Centre of the Westfjords, IS)

10:40 From events to functions: a bottom-up societal continuity for national safety, Böðvar Tómasson (University of Iceland, IS)

10:55 The development of a methodology for risk and rescue capability assessment in the Baltic Sea Region and application to maritime rescue scenarios in the Nordic Arctic, Björn Karlsson (University of Iceland, IS)

11:10 From systemic risk to persisting nodes of complexity: islands as a hedge against global societal collapse, Matt Boyd (Adapt Research & Islands for the Future of Humanity, NZ)

11:25-11:55 **ROUNDTABLE 2 – From emergency to precedent: what does Grindavík oblige us to change, and what do other island societies already know?**

Moderator: Þórhallur Halldórsson

Panel: Matthias Kokorsch and the speakers of plenary session 3.

11:55-12:20 Closing discussion, remarks and group photo

12:20 End of conference. Light lunch

12:50-13:50 **POST-CONFERENCE ROUND TABLE (open to all) – What can small nations do to mitigate national and global risks? Examples from Iceland and New Zealand**

Hosted by Matt Boyd and Nick Wilson (NZ) with Icelandic colleagues. Main conference room.

Short introductions from New Zealand and Iceland, then open discussion: national risk and vulnerability assessment, anticipatory governance, deliberative approaches to resilience, catastrophic risk, regional cooperation and ideas for research. Open to all participants and invited guests.

See abstracts on the following pages

ABSTRACTS

Keynote speakers

When the Earth Moves: Risk Perception and the Politics of Geothermal Acceptance

Katherine McComas, Professor, Cornell College of Agriculture and Life Sciences, USA

Thursday 1 October 2026, 09:10

Katherine McComas is a risk communication scholar at Cornell University whose research examines motivations and barriers in communicating about scientific, technological, and environmental risk. Her current work focuses on public perceptions of new and renewable energy technologies, including the role of induced seismicity in shaping acceptance of geothermal energy, and on risk communication in "One Health" contexts linking human, animal, and environmental well-being. Her long-standing commitment to community-engaged research and teaching led to her current role as Cornell's Vice Provost for Engagement and Land-Grant Affairs, where she helps steward the university's public engagement mission.

Abstract: Geothermal energy holds enormous promise for the clean energy transition, yet questions remain about associated risks, such as the potential for induced seismicity. This presentation draws on a decade of cross-national research to examine why the same physical phenomenon, an earthquake, can signal danger in one context and energy abundance in another. Using experimental survey data, affective imagery studies, and word association methods across the US, UK, and Switzerland, I trace how attribution, moral belief, trust, and cultural context shape public perceptions of enhanced geothermal systems.

From Emergency to Precedent: Grindavík and the Future of Climate Risk Governance in Iceland

Matthias Kokorsch, Ph.D., University Centre of the Westfjords, Iceland

Friday 2 October 2026, 09:00

Matthias Kokorsch is a Research Specialist at the University Centre of the Westfjords in Ísafjörður and a human geographer specialising in disaster risk, community resilience and climate adaptation. His research focuses particularly on relocation, place attachment and recovery in remote and rural communities. He currently leads research on relocation within the Nordic ARCHAIC project and works on climate-related loss and damage in the project LostToClimate. His work in Iceland has included research on Grindavík, avalanche-affected communities in the Westfjords, early warning and evacuation, and the roles of emergency-management institutions, volunteering, and Search and Rescue organisations in disaster response and recovery.

Abstract: The evacuation and partial relocation of Grindavík following the volcanic unrest of 2023–2026 created a situation for which there was little precedent in contemporary Iceland. Beyond the immediate emergency response, it raises a wider question: what can be learned from Grindavík for communities facing future climate- and hazard-related risks?

This keynote reflects on lessons from evacuation, prolonged displacement, recovery and relocation, and on the difficult transition from emergency management to long-term governance. It asks whether relocation should remain a measure of last resort, or whether forms of voluntary and anticipatory relocation could become part of climate-change adaptation planning. If so, what would make such processes socially acceptable, and how can questions of place attachment, fairness, participation and community continuity be addressed before a crisis occurs?

Grindavík has created not a ready-made model, but an important precedent. The challenge now is to understand which lessons are transferable, which are not, and how they might inform more proactive and socially legitimate approaches to future risk.

Plenary session 1: Whose acceptance? Publics, policy and the energy transition

Thursday 1 October 2026, 10:30

P1.1: Risk acceptance and tolerance of wind power: comparing Nordic and non-Nordic experiences

Author: Frederic Bouder (University of Stavanger, Norway)

Abstract:

To meet the Paris Agreement, European counties are committed to massive cuts in CO2 emissions. For instance, both Norway and the Netherlands are committed to reduce emissions by at least 55% by 2030 compared to 1990 levels. The major transformation towards a carbon-neutral economy implies, among other things, to accelerate the transition towards renewable energy sources. Each energy source comes with specific technical pros and cons, as well as risks and benefits to health and the environment. The adoption of new energy sources requires, among other things, to conduct dedicated risk assessments, to study and characterise the nature of societal concerns, and to generate consensus about which risks are acceptable or tolerable. How do the Nordic experiences compare with other parts of Europe? And more specifically, what have been the key dynamics of risk acceptability and tolerability? Drawing on two case studies of wind power development in the Norway and the Netherlands the talk will explore key factors of success and failure with a focus on public acceptance and tolerance of risk and uncertainty. Both countries have been struggling with the development of wind energy, which was once seen as particularly promising and is now contested. The talk will also suggest policy lessons to address commonalities and differences between Nordic and non-Nordic situations.

P1.2: Aligning Public Perceptions and National Policy: A Mental Models Approach to Energy Transition Pathways in the Netherlands and Norway

Authors: Gisela Böhm (University of Bergen, Norway), Karlijn van den Broek, Lynn de Jager, Rouven Doran

Abstract:

This study aims to explore the alignment between citizens' mental models of the energy transition and national energy transition policies in the Netherlands and Norway. It also examines how these mental models correlate with perceived effectiveness and priority of various energy transition pathways.

The study employs a systems thinking approach to understand public perceptions of the energy transition in two European countries. It combines mental model data collected using the M-Tool from representative samples in the Netherlands and Norway with a content analysis of national policy reviews. The study investigates 16 energy transition pathways, analyzing their importance in mental models and national policies. Additionally, survey data on perceived effectiveness and priority of these pathways are analyzed to assess correlations with mental model characteristics.

The study finds strong correlations between mental models and national energy transition policies in both countries, particularly for pathways related to energy transition policy. Citizens' mental models tend to agree with national policies on pathways like wind farms and walking and cycling, while there is disagreement on the role of technologies such as carbon capture and storage. The mental models also strongly correlate with perceived effectiveness and priority of pathways, indicating that pathways perceived as more effective and higher priority are more central in citizens' mental models.

This study highlights the utility of mental models as diagnostic tools for assessing public alignment with national energy policies. It underscores the potential of integrating mental model approaches into policy design to enhance public engagement and support for sustainability transitions. By providing insights into how citizens conceptualize interconnected transition pathways, the study offers valuable implications for adaptive governance and policy strategies aimed at achieving long-term decarbonization goals.

P1.3: The Uncertainties And Risks in Green Transition in Baltic Sea Region and The Role of Civil Society

Author: Aistė Balžekienė (Kaunas University of Technology, Lithuania)

Abstract:

The green transition represents not only a technological and economic transformation but also a significant social and governance challenge. Transition processes involve uncertainties and risks, including distributional inequalities, contested priorities, institutional complexity, and potential legitimacy deficits if affected stakeholders are excluded from decision-making. Consequently, the participation of diverse stakeholders is essential to ensure that transition processes are just, transparent, and democratically legitimate. Civil society plays a central role in this regard by acting as an intermediary between citizens, government institutions and the private sector, fostering public deliberation, advocating for societal interests, and strengthening accountability within systems of multilevel governance.

This presentation will discuss the risks and concerns identified by civil society actors involved in the specific energy transition project in the Baltic Sea region countries: Latvia, Finland, Poland, and Norway. The presentation also explores the role of different levels and types of civil society actors in the green and digital transition.

The methodological approach of the study comprises a qualitative content analysis based on publicly available sources on Baltic sea region non-governmental organisations that operate at the transboundary or regional level and are involved in green transition.

Presentation is based on the Horizon Europe project DeCrises n. 101177807 (2025-2028).

Parallel session A1: Sectoral systems under pressure: energy, maritime, markets and food

Thursday 1 October 2026, 13:20

A1.1: Cross-sectoral energy system resilience

Author: Kari Mäki (Tampere University, Finland)

Abstract:

Changes in the geopolitical situation have underlined the need for resilience of the energy system. Energy system and especially electricity grid is the most critical infrastructure for the modern society. Where electricity supply fails, cascading impacts will rapidly manifest on different sectors like communication or water service. Modern resilience needs to be understood as a really wide term, including for instance cybersecurity and societal security but also soft values like citizen-level coherence and trust.

Energy transition advances fast and offers new possibilities for improving resilience across different energy system levels. New appliances such as batteries and other storage units, small-scale distributed generation and controllable loads provide new tools for improving resilience. Flexibility is widely applied on reserve markets, but its use for resilience is not fully defined yet. Digitalization offers connectivity and controllability, but also poses serious cyber risks.

At the same, different energy-related sectors are becoming more integrated, considering for instance electricity, heat, hydrogen, buildings, mobility, etc. This offers new possibilities for improving resilience across sector borders. It also necessitates considerations of which functions are most critical for the society, for instance heat or communication.

Future energy system should build more around clusters or nodes capable for independent operations. Such clusters can remain energized during disturbances and offer several different services to the energy system and customers. On lower system levels, solutions like microgrids and energy communities can be promising. It is important to consider how and where such new subsystems could be introduced within the existing energy system architecture.

Such bottom-up approach for building future cross-sectoral energy system is the main topic of this presentation. The topic will be addressed both from technical and societal viewpoints.

A1.2: Wintertime Risk Assessment of Maritime Traffic and Offshore Wind Farm Interactions in the Northern Baltic Sea

Authors: Mojtaba Barzehkar (Aalto University, Finland), Mahsa Khorasani, Reza Yeganeh Khaksar, Gabriel Chikelu, Arttu Polojärvi, Osiris A. Valdez Banda

Abstract:

The assessment of maritime risk in seasonally ice-covered seas is a significant challenge, particularly in regions where dense shipping activity, seasonal ice conditions, and expanding offshore wind infrastructure interact. This study develops a regional-scale framework integrating geographic information systems (GIS) and multi-criteria decision analysis (MCDA) to assess interaction risks between maritime traffic and offshore wind farms (OWFs) in the Northern Baltic Sea. The framework combines 17 hazard, exposure, and vulnerability parameters to generate composite maritime risk maps under baseline and extreme winter navigation scenarios. A scenario-based design compares the influence of ice-related parameters and OWF-related spatial constraints while maintaining consistent analytic hierarchy process (AHP)-derived weights across scenarios. The results show clear spatial variability in maritime risk. Under baseline conditions, elevated risk areas are mainly associated with dense vessel traffic, ice-related constraints, and OWF proximity, particularly in the Bothnian Bay, the Quark area, and along major shipping corridors. Under extreme ice-related conditions, existing risk patterns intensify, and very high-risk areas emerge where severe ice conditions, traffic concentration, and OWF-related constraints overlap. The scenario comparison confirms that ice-related parameters are the dominant drivers of regional-scale risk amplification,

while OWFs mainly intensify risk locally where they interact with shipping activity and constrained winter navigation areas. The accident-based interpretation supports the relevance of the risk maps, as collision records under ice conditions are mainly associated with areas classified as high or very high risk. The framework provides a decision support tool for identifying high-risk interaction zones and guiding proactive maritime spatial planning in semi-enclosed northern seas.

A1.3: Emerging Real Estate Investment Risks under the Green and Digital Transition

Authors: Dominykas Linkevičius (Vilnius Gediminas Technical University, Lithuania), Laima Okunevičiūtė Neverauskienė

Abstract:

The Green and Digital Transition is reshaping the risk environment of European real estate markets by introducing new sources of uncertainty alongside traditional macroeconomic factors. While investment risk has historically been assessed through indicators such as economic growth, inflation, interest rates, and labor market conditions, recent developments suggest that energy transition, environmental policies, resource dependency, and technological innovation are becoming increasingly relevant for investment decisions. This study presents an integrated assessment of emerging real estate investment risks based on a series of empirical studies conducted across European countries. The analysis draws on panel econometric models, machine learning methods, clustering approaches, and explainable artificial intelligence to examine how macroeconomic, energy-related, environmental, and technological factors influence investment risk. The results demonstrate that conventional macroeconomic indicators alone are insufficient to capture the complexity of contemporary real estate investment risk. Instead, investment risk is shaped by the interaction of multiple interconnected drivers, the importance of which varies considerably across countries and market environments. These findings highlight the need for more comprehensive approaches to risk assessment that account for structural changes associated with the Green and Digital Transition. By integrating evidence across multiple empirical studies, the paper provides a broader perspective on how the Green and Digital Transition is reshaping investment risk in European real estate markets and supports the development of more resilient investment and policy decisions under increasing uncertainty.

A1.4: Monitoring Local Digital Currencies and Managing Emerging Risks: The Case of Local for Local Project

Authors: Paulina Budrytė (Kaunas University of Technology, Lithuania), Lina Čeponienė, Nicolas Franka, Julia Barashkov

Abstract:

Local digital currencies (LDCs) are increasingly used to promote local economic development, strengthen community resilience, and support sustainable economic transitions. However, their implementation takes place within complex socio-economic and political environments where governance, regulatory, technological, and market participation risks continuously evolve. In the Local for Local project, we proposed a monitoring and evaluation methodology based on the Conceptual Framework for Structuring Political Engagement Strategy and Monitoring of Economic Impact.

The methodology combines quantitative and qualitative monitoring of LDCs. Quantitative assessment relies on transaction data, including transaction volumes, participant numbers, and graph network analysis. Qualitative assessment is supported by regular interviews with local currency managers and LDC supporting organisations.

While the primary goal of the methodology is to evaluate LDCs performance and economic impact, it also supports the identification and management of risks that may affect the long-term viability of local currency ecosystems. These include governance and transparency concerns, low user adoption, seasonal volatility in circulation, concentration on a few dominant accounts, dependence on intermediaries, and interoperability challenges. Research on complementary currencies highlights the importance of continuous monitoring, stakeholder engagement, viable business models and adaptive governance for maintaining resilience in local currency systems.

The proposed approach demonstrates how monitoring data and stakeholder feedback can provide early indications of emerging risks while supporting informed decision-making and timely interventions. As local digital currencies become a relevant tool for regional development and economic transition, systematic monitoring can contribute to both impact assessment and the sustainable management of uncertainty in local financial innovation.

A1.5: Collaborative risk governance in the dairy sector: trust and tension in a protein production system

Authors: Maija Nikkanen (University of Helsinki, Finland), Tuuli Parviainen, Reetta Mietola, Nina Janasik

Abstract:

Food production systems face a complex risk landscape in which biological, environmental, societal, and systemic risks interact. While climate change is expected to be a significant source of disturbances to food production in the near future, food systems are also increasingly challenged by animal and plant diseases, disruptions in the availability of energy and fertilizers, and the threat of zoonotic pandemics. These interconnected risks are increasingly addressed through cross-sectoral approaches such as One Health.

This study focuses on the Finnish dairy sector and examines collaborative risk governance among its actors. In Finland, the comprehensive security model emphasizes collaboration in preparedness, and actors within the food production system are expected to prepare collectively, share information, and cooperate during disruptions to ensure the continuity of primary production and food supply. However, it remains unclear how well this cooperation functions in practice. Previous studies have identified challenges such as differing risk perceptions, lack of communication and limited systemic understanding. The sector is also characterized by tensions and competing priorities, which may hinder trust-based collaboration.

This study examines how different risk perceptions and trust shape collaborative risk governance in the Finnish dairy sector. It asks (1) how different actors perceive their roles and risk-related responsibilities in the system, and (2) how trust and mistrust influence collaboration in preparedness and risk governance.

The study is based on an analysis of policy documents and semi-structured interviews (N≈15) with dairy producers, supervising veterinarians, industry representatives, and public authorities. The findings will contribute to a better understanding of collaborative risk governance in food production systems and provide practical insights for strengthening preparedness and resilience.

Parallel session B1: Vulnerability-informed preparedness capacity

Thursday 1 October 2026, 13:20

B1.1: Disaster preparedness capacity analysis: evidence from multi-hazard scenarios

Authors: Kati Orru (University of Tartu, Estonia), Kristi Nero, Sten Hansson, Matthieu Branlat, Nathan Clark

Abstract:

While disaster risk management capacity development should be evidence-based, institutional capacity building is rarely informed by systematic vulnerability analysis. This paper demonstrates how scenario-based disaster vulnerability analysis can identify critical capacity gaps in disaster governance, critical infrastructure and services, risk management, communication, and stakeholder engagement.

We applied social vulnerability triage (Orru et al, 2025) and disaster management capacity analysis to three disaster scenarios: a flood combined with a chemical spill in the Netherlands, an earthquake in Malta, and a tropical storm in La Réunion, France. The analyses revealed that dynamic vulnerabilities emerging from interactions between people, infrastructure, and institutions are often overlooked, while vulnerability is more commonly framed as an inherent characteristic of specific social groups, particularly those with health-related vulnerabilities. Across all three cases, preparedness capacities were more advanced in formalised and technical domains, while capacities for accessible communication, trust-building, and stakeholder engagement consistently lagged behind. Mismatches between identified vulnerabilities and existing capacities may reflect resource constraints or indicate lower prioritisation within disaster risk management systems.

By explicitly linking identified vulnerabilities to institutional responsibilities and capabilities, the approach provides a pathway towards more actionable risk assessments and targeted capacity development. Its participatory and deliberative design not only identifies priority vulnerabilities but also captures participants' reasoning, providing valuable contextual insights for disaster preparedness and institutional capacity development.

Orru, K., Hansson, S., & Nero, K. (2025). Social vulnerability triage: A dynamic scenario-based system for disaster planning and response. Journal of Risk Research, 28(6), 549-570.

B1.2: Disaster preparedness education for children: A comparative framework

Authors: Sten Hansson (University of Tartu, Estonia), Kati Orru, Oliver Nahkur, Matthieu Branlat, Nathan Clark

Abstract:

Researchers and policy makers are looking for novel ways to reduce social vulnerability to disasters by devising educational programmes that provide individuals and organisations with the knowledge and skills to effectively prepare for and cope with the impact of hazards (Guo et al., 2025; Lownsbery, 2025). Drawing upon recent theorisations of disaster vulnerability, communication, and preparedness (Hansson & Orru, 2026; Orru et al, 2025), we propose a framework for comparing preparedness education programmes for children. We apply the framework by comparing seven programmes based on qualitative case studies carried out in five countries: Japan, Italy, the Netherlands, Estonia, and Réunion Island.

In the analysed programmes, significant differences emerge along several analytical dimensions, such as the reasons for developing the programme, the intended outcomes, the types of hazard events addressed, the frequency of programme activities (regular vs one-off), level of institutionalisation (voluntary participation vs formal curriculum integration), the educational methods applied, and the stakeholders involved. The results provide a groundwork for future comparative studies and evidence-based policy making in disaster risk education.

Guo, L., Fang, M., Liu, L., Chong, H., Zeng, W., & Hu, X. (2025). The development of disaster preparedness education for public: A scoping review. BMC Public Health, 25(1), 1-14.

Hansson, S., & Orru, K. (2026). Reducing communication-related vulnerability to disasters: A framework for capacity development. International Journal of Disaster Risk Reduction, 142, 106233.

Lownsbery, D. S. (2025). A synthesis review of four literature reviews of disaster risk reduction education for children. International Journal of Disaster Risk Reduction, 125, 105555.

Orru, K., Hansson, S., & Nero, K. (2025). Social vulnerability triage: A dynamic scenario-based system for disaster planning and response. Journal of Risk Research, 28(6), 549-570.

B1.3: Estonian case study on the use of a vulnerability assessment model for people with physical disabilities

Authors: Ida Joao-Hussar (University of Tartu, Estonia), Oliver Nahkur, Kati Orru

Abstract:

People with physical disabilities (PPD) face increased risks during emergencies due to mobility limitations, communication barriers, dependence on assistive devices and the need for continuity of care (Nguyen-Trung et al., 2025; UNDRR, 2023). Although disability-inclusive disaster risk management is increasingly recognised, less is known about how patient vulnerability can be systematically linked with organisational preparedness and evacuation planning (Villeneuve, 2022).

This study examines the application of a vulnerability assessment model for PPD in Estonia, focusing on neurological rehabilitation patients and institutional evacuation preparedness. It is based on a scenario-based simulation exercise conducted at the Haapsalu Neurological Rehabilitation Centre in April 2026. The methodology combined the Functional Independence Measure with social vulnerability triage and capacity assessment frameworks (Orru et al., 2025, 2026). Participants from healthcare, social care, emergency management, local government and voluntary organisations assessed patient needs and organisational capacities across management, infrastructure, risk management, communication and inclusion.

The findings show that evacuation preparedness depends on the fit between patients' functional needs and the capacities of hospitals, nursing homes, evacuation shelters and home settings. Key systemic gaps included limited transport capacity, fragmented information sharing, non-interoperable data systems, workforce shortages, unclear roles and responsibilities, inconsistent triage terminology and weak integration of informal caregivers.

The study demonstrates the value of scenario-based vulnerability assessment for identifying system-level preparedness gaps and supports disability-inclusive strategies that strengthen coordination, information systems, standardised triage and cross-sector collaboration to ensure safe evacuation and continuity of rehabilitation services during crises.

B1.4: Adoption of innovation in disaster risk management systems in Europe: Case studies of the Rotterdam region, Southern Estonia, La Réunion, and Malta

Authors: Ahmed Atia Rezk (University of Tartu, Estonia), Sten Hansson, Kristi Nero, Kati Orru

Abstract:

Despite Disaster Risk Management (DRM) efforts over the past decades, societies still face increased climate-related and anthropogenic risks. Current DRM frameworks often follow rigid command-and-control approaches, leaving little room for innovative solutions to address emerging risks. However, little research examines the lock-ins or the adoption of innovation in DRM. In this article, we use multiple case studies to examine the factors that support and hinder the adoption of a novel

tabletop vulnerability assessment process in four European regions. Drawing on interviews and focus group discussions with crisis preparedness experts and stakeholders, our results show that increasing vertical and lateral coordination was the most significant factor in support of the adoption of innovation. Although the four case study systems had different organisational structures and procedures, stakeholders often relied on tacit knowledge. Therefore, innovative collaborative solutions (e.g., tabletop and simulation exercises) help them reach a comprehensive understanding of risks, social vulnerabilities and existing gaps in preparedness plans. Despite the agility and openness to innovation in small and island regions, the lack of human resources was a key barrier to adopting new solutions. In contrast, in larger regions, the complexity of DRM systems was the key barrier to adopting innovation, since it requires coordinating and training across a large network of stakeholders.

Parallel session A2: Perception, culture and communication

Thursday 1 October 2026, 14:55

A2.1: Safe Places? Rural Imaginaries in Risk Biographies.

Author: Linda Kvarnlöf (Mid Sweden University, Sweden)

Abstract:

This presentation offers a combined analysis of interviews (n = 56) from two closely related research projects that share an interest in how people in Sweden think about risk, crisis, and security. Drawing on theoretical inspiration from the concept of risk biographies, as developed within the sociology of risk, the paper analyses interview narratives as stories about risk embedded in individuals' life histories. A central contribution of the analysis is to highlight the role of place as both an interpretive anchor and a symbolic resource. Rather than serving merely as a backdrop, place actively structures how individuals understand and evaluate risk. Participants link abstract threats to concrete environments, grounding future-oriented imaginaries of crisis in lived experiences of particular locations. In this way, notions of safety are not only materially defined but also emotionally and socially constructed through biography.

The analysis pays particular attention to how certain places are narrated as safe. These place-based meanings are intertwined with individuals' past experiences, shaping their expectations and imagined responses to future crises or war. Two partially overlapping imaginaries stand out: the rural and "the North." These are constructed as spaces associated with distance from danger, self-sufficiency, stability, and social cohesion. As such, they emerge as imagined safe havens—places where one might either remain or which one might seek out in the event of crisis. By foregrounding the significance of place in risk biographies, the paper demonstrates how spatial imaginaries are central to everyday understandings of security. It argues that these narratives reveal not only perceptions of risk, but also culturally and biographically grounded visions of safety, resilience, and refuge.

A2.2: From Sagas to Cyberspace: A Practitioner's View of Icelandic Resilience, Viking Age to Today

Author: Sigurður Emil Pálsson (University of Iceland, Iceland)

Abstract:

This talk begins with the cultural characteristics of the Nordic countries, drawing on studies based on Mary Douglas' cultural theory, with particular attention to Iceland. Historical examples, from the Viking Age through modern times, illustrate how centuries of survival in a harsh environment may have shaped these cultural traits, and how they manifest today in a distinct culture of resilience. Drawing on my own experience, I will share examples from the last century and this one of how natural disasters and other challenges have been managed, both within formal structures and outside them, including brief reflections on how the 2008 financial crash reshaped Icelandic attitudes toward resilience. Finally, I will describe ongoing work adapting engineering approaches developed for natural and man-made disasters to the challenges of conflict-era threats, in collaboration with international colleagues from SRA and from Ukraine. I look forward to sharing these reflections and hearing the perspectives of fellow researchers and practitioners at the conference.

A2.3: Risk as Range

Authors: Benjamin Scheibehenne (Karlsruhe Institute of Technology, Germany), Tianwei Liu

Abstract:

Variance and standard deviation are common metrics of statistical variability. In everyday contexts however, information about sample range prevails. Range is arguably easier to comprehend and to compute than variance, yet it often yields

equivalent judgements about variability. Hence, we reason that decision makers often rely on range to judge variability. We test this hypothesis across four behavioral experiments (total n = 1,093). When comparing the variability of two number sets, decision makers predominantly based their judgments on sample range rather than sample variance when the two metrics disagree (Experiment 1). Sample range tends to increase with sample size, whereas sample variance does not. Consistent with the range as variability hypothesis, decision makers perceived distributions as more variable after observing larger samples (Experiment 2). This perceived variability in turn influenced risky decisions, as larger sample sizes led to decreased valuations of uncertain rewards for risk-averse decision makers (Experiment 3). In further support of the hypothesis, when asked to mentally simulate new samples from a previously experienced distribution, participants generated more numbers within the observed range and fewer numbers outside it than the true distribution implies (Experiment 4). To model the data, we propose a "cognitive fence" idea as a potential psychological explanation for how experience shapes subjective variability. We conclude by discussing implications for risk perception and -communication in the context of climate change.

A2.4: Managing the Expectation Gap: An Overlooked Psychosocial Risk in Antarctic Overwintering and Analog Space Missions

Author: Michael Stieber (Harz University of Applied Sciences, Germany)

Abstract:

Technical risks in isolated, confined and extreme (ICE) environments are extensively addressed through engineering, training and operational planning. In contrast, psychosocial risks often become apparent only with deployment, despite comprehensive preparation. One possible explanation lies in the discrepancy between anticipated and lived reality. This contribution argues that such expectation gaps may represent an overlooked psychosocial risk deserving greater attention within risk science.

Antarctic overwintering provides a unique natural analogue for investigating this phenomenon. Once the Antarctic winter begins, participants cannot withdraw. Expectations regarding leadership, teamwork, isolation and everyday life are confronted with an irreversible social reality that can only be anticipated to a limited extent.

The presentation draws on qualitative episodic interviews with five station leaders at the German Antarctic research station Neumayer Station III conducted between 2020 and 2024. The interviews reveal recurring processes of expectation adjustment, role ambiguity, leadership adaptation and psychological strain. Rather than isolated phenomena, these findings suggest that these processes may be interconnected and associated with discrepancies between anticipated and lived realities, with possible implications for leadership and team functioning.

Building on these findings, the presentation proposes considering expectation gaps as a potential psychosocial risk in ICE environments. It further discusses whether psychosocial redundancy—understood as overlapping interpersonal, organisational and emotional resources that may support team adaptation under prolonged isolation—may complement established concepts of technical redundancy in future risk management. Although grounded in Antarctic research, this perspective may also be relevant to analog space missions and other operational contexts characterised by limited possibilities to withdraw, high interdependence and uncertainty.

Parallel session B2: Catastrophic risk, foresight and decision under uncertainty

Thursday 1 October 2026, 14:55

B2.1: Risk-management under severe uncertainty

Authors: H. Orri Stefánsson (Stockholm University, Sweden), Joe Roussos

Abstract:

When it comes to many large-scale governmental policy decisions, there is some risk that the resulting outcomes will be catastrophic. Fortunately, the catastrophes in question are typically thought to be unlikely, but, unfortunately, no one can reasonably claim to know how unlikely. In such situations, it often seems reasonable to adopt some precautionary, or catastrophe-averse, risk-management strategy; taking actions that minimise the risk of the catastrophe, to the extent feasible. For instance, although a continuation of today's piecemeal responses to climate change—higher carbon taxes, incentives for renewable energy, etc.—will most likely result in merely 'moderately harmful' levels of global warming, there is increased recognition that the result could be catastrophic. Therefore, some have argued that it is time to abandon the risk-neutrality of risk-management strategies based on expected utility theory, and instead adopt a more precautionary approach.

The aim of this paper is to defend a moderate use of precautionary reasoning. We distinguish cases in which such reasoning is appropriate from situations in which it is not. The first type of case may involve probabilities provided by science but subject to doubt, for instance, since there are competing models of the target phenomena that differ when it comes to their verdict about the relevant probabilities. Examples include much of climate policy, for instance, decisions about solar goengineering. The second type of case is characterised by richer data and scientific models about which there is little uncertainty. Examples include much of public health policy, for instance, decisions about offering colorectal cancer screening. We explain how features of these situations motivate the risk-management strategies that we endorse for each, and propose a concrete and mathematically precise precautionary risk-management strategy to use for situations characterised by severe uncertainty.

B2.2: Sufficient and Satisfactory? - A Sufficientarian Framework for Civil Protection

Author: Mateusz Sosnowski (KTH Stockholm and Södertörn Fire and Rescue Service, Sweden)

Abstract:

Civil protection is often discussed in terms of preparedness, response, and resilience, but less often in terms of what it means for a society to provide *enough* protection. This presentation asks what civil protection requires when resources are limited and not every risk can be eliminated. The central idea is that the goal is not perfect safety, but a sufficient level of safety for everyone: ensuring that no one falls below a defensible minimum in access to warning systems, evacuation options, emergency support, and protection against foreseeable harm. This sharpens the familiar aim of "leaving no one behind," which broad agendas like the UN Sustainable Development Goals assert but do not spell out. Storm risk shows why this matters. Enough protection means attending not only to response after a storm or flood, but also to building standards, retrofitting, public drills, and communication systems that keep people from being left exposed in the first place.

A sufficientarian approach helps clarify priorities. Some inequalities matter because they leave people below the relevant threshold; others matter less once that threshold is secured. Purely equality-based or efficiency-based approaches are not always enough to guide difficult decisions in emergency management and disaster risk reduction, especially on outer island where flood risk creates recurring and uneven exposure. The aim is to connect philosophy to practice for policymakers, practitioners, and scholars alike, asking how civil protection can be organized so that everyone has a real enough chance of being safe, supported, and able to cope when emergencies occur.

B2.3: Volcanic winter and famine: statistical associations 1 to 1900 CE and a Tambora (1815) case study

Authors: Nick Wilson (University of Otago, New Zealand), Matt Boyd

Part 1: Major Volcanic Eruptions and Statistical Associations with Subsequent Famines Internationally (1–1900 CE)

Abstract:

Volcanic winter events such as the "year without a summer" after the Tambora eruption (1815), are a known catastrophic risk. Similar catastrophes could arise from nuclear war (nuclear winter) or solar geoengineering gone awry. The scientific evidence for the impact of large volcanic eruptions on climate perturbations is strong and there are statistical associations for eruptions: famines in China, dynastic collapses in China and revolts in Ptolemaic Egypt. We explored the famine association further using a published series of 38 major eruptions (volcanic stratospheric sulphur injection [VSSI] ≥6 Tg), analysed in conjunction with our compilation of 729 famine events (spanning 1388 famine-years for the 1–1900 CE period). Analyses included superposed epoch analysis (SEA), randomisation testing, and dose-response relationships. We found in the SEA that famine event frequency peaks occurred at post-eruption lags of −1 and +1 years. Also, in the primary randomisation test (10,000 permutations), famine events were 58% more likely in post-eruption compared to pre-eruption windows (117 vs 74; an incidence rate ratio (IRR) of 1.58; $p = 0.0032$). For famine-years the association was stronger (IRR = 1.72, $p = 0.0011$). Eruption sulphur loading (VSSI) showed a positive dose-response relationship with famine-year rates, as did post-eruption cooling per 0.1°C (events and famine-years all: $p < 0.01$). Multiple sensitivity analyses indicated a consistent pattern, including a particularly strong signal for Northern Hemisphere extratropical eruptions and famines in Europe (events: IRR = 5.33, $p = 0.0179$) and Asia (events: IRR = 2.10, $p = 0.0085$). In conclusion, these results collectively suggest an association between major volcanic eruptions and subsequent famines in the 1–1900 CE period, consistent with isolated regional findings. Given the modern-day vulnerability of hundreds of millions of people to food insecurity globally, regions of the world need improved local understanding of these dynamics and to strengthen their food systems.

Part 2: Famine Risk from Volcanic Winter: Case Study of the Tambora Eruption of 1815

Abstract:

Background: Massive volcanic eruptions on the scale of Mt Tambora (1815) have an estimated one-in-six chance per century of occurring and other sunlight-reducing catastrophes (eg, nuclear winter, misfiring solar geoengineering) pose analogous risks. In a comprehensive review of 103 publications on eruption impacts on human society, Büntgen et al (2025) reported 34 Tambora-related publications. Famine impacts were described in five jurisdictions. In this study we aimed to identify and detail the wider literature on the likely famine burden from the Tambora eruption.

Methods: A literature search used Google Scholar for sources with lists of famines and more specifically, Tambora eruption impacts (terms: Tambora AND famine/mortality/harvest failure).

Results: This review (n=49 publications) identified 22 modern-day equivalent jurisdictions with definite/probable famines in the post-Tambora period (1815-1819). These were in: Europe (n=13), Asia (China, India, Indonesia, both Koreas), North America (Canada, USA), and Africa (South Africa, Madagascar). Additional jurisdictions with likely subsistence crises were England, Finland, Iceland, Poland, Scotland and Spain; but there was evidence for no such crisis for six jurisdictions (eg, including Denmark, Norway, Russia, Sweden). Other likely contributing factors to famine risk included conflict (eg, Napoleonic Wars), trade barriers, the El Niño Southern Oscillation and other more minor volcanic eruptions.

Conclusion: For the most emblematic event in the volcano-climate-society nexus (the Tambora eruption), we were able to document 22 jurisdictions with definite/probable famines versus five in the prior review. Given the current vulnerability of global food systems (from climate change and geopolitical tensions impacting trade) and risk of sunlight-reducing catastrophes, improving the understanding of such major historical events should be a risk analysis priority.

B2.4: Strategic Foresight in Disaster Risk Management: Practices across Europe

Authors: Ingeliis Siimsen (University of Tartu, Estonia), Kati Orru, Sten Hansson, Tommi Asikainen

Abstract:

Strategic foresight – a systematic approach to exploring potential future states and anticipating change – can inform decision-making in disaster risk mitigation and preparedness. Our study aims to create an understanding of the uses of strategic foresight by exploring the existing practices and lessons learned across different European disaster risk management systems. We have done this by conducting semi-structured expert interviews with representatives from six European countries, holding an international webinar with risk assessment and foresight experts, and carrying out desk research on official reports and documents concerning strategic foresight and disaster risk. The interviewees included representatives of ministries or government agencies responsible for disaster risk management and civil protection in Finland, Ireland, Denmark, Norway, Luxembourg, and Romania.

Our results indicate that strategic foresight exercises in disaster risk management are largely embedded into existing risk assessment practices. Some of the more common methods used in such exercises are scenario-building and horizon scanning. The shift towards more forward-looking approaches, such as strategic foresight, has been influenced by the growing need to address emerging risks with no historic precedent. The implementation of strategic foresight methods in risk assessment is facilitated by cooperation between different stakeholders and an openness to new approaches. On the other hand, such processes are resource-intensive, which can impede their implementation.

Plenary session 2: Security, defence and democratic resilience in the Nordic-Baltic region

Thursday 1 October 2026, 16:30

P2.1: Can Protecting Democratic Values Put Them at Risk? Security, Risk, and Democratic Values in Swedish Total Defense Planning

Authors: Sara Bondesson (Lund University, Sweden), Misse Wester, Annick Wibben, Kerstin Eriksson

Abstract:

Over the past decade, Sweden has rebuilt its total defense planning. In addition to responding to Russian aggression in Ukraine, this is justified by the need to protect democratic values such as civil liberties, the rule of law, individual autonomy and equality. Previous research on Swedish total defense points to trade-offs between security and democracy, but systematic analysis is lacking. By way of a qualitative risk assessment, including participatory consultations with stakeholders, this project asks: (1) Can total defense measures undermine the very democratic values they aim to protect? (2) What risks do different policy choices pose to democratic values; and, finally, (3) How might these risks be mitigated? The project brings together an interdisciplinary team spanning Political Science, Risk Management, and War Studies, combining critical perspectives on security, democracy and risk with practical experience working closely with stakeholders in Sweden's total defense system. As a liberal democracy with high levels of institutional trust, strong rule of law, and explicit commitments to human rights, Sweden provides a relevant case for analyzing the relationship between democratic governance and societal resilience in a changing security environment. The project has long-term significance for democratic resilience since it seeks to understand whether the way we protect democracy may in fact undermine it.

P2.2: Lost in transition? The (re-) construction of comprehensive defence in Sweden

Authors: Christine Große (Luleå University of Technology, Sweden), Gertrud Alirani, Erna Danielsson, Sophie Kolmodin, Pär M. Olausson, Olof Oscarsson

Abstract:

Since Russia's invasion of Ukraine, the European security architecture has undergone profound transformation. In Sweden, this altered geopolitical context has triggered extensive changes across national, regional, and local levels. Due to the turbulence caused by these events, policy orientation has shifted from preventive measures targeting locally confined and specific crises towards a broader emphasis on societal resilience and total defence. We need therefore to understand more about the transition that accompanies policy implementation targeting a new state, which includes the recognition of the policy problem, the imagination of possible solutions and the transformation of identity at the individual, organizational and societal levels. This study particularly aims to enhance knowledge of multi-level governance from a liminality perspective, marking the transition from one (system) state to another. The analysis focuses on a county administrative board (CAB) and how they manage the double-double remit of addressing the transition of the crisis management system into a total defence authority while imagining a future transition whose circumstances are undecided. To explore how such institutional restructuring unfolds in practice, this case study presents one CAB's approach to internal reorganisation in response to governmental total defence requirements. It draws on interviews with managers from different levels and staff members responsible for security, total defence, and risk assessment. The findings emphasise that the transition of the Swedish crisis management system to a total defence system requires the various stakeholders to realign themselves with their roles in society, in order to enable the sustainable capacity building necessary for societal resilience. In addition, it must be emphasised that the liminal phase is lived through differently by the various actors in the multi-level system in terms of temporality, intensity and turbulence effects.

P2.3: Strategic Islands as Risk Observatories: Can Greenland and Gotland Anticipate Future Systemic Risks?

Author: Anna Moraczewska (Maria Curie-Skłodowska University, Poland)

Abstract:

Systemic risks are increasingly characterized by complexity, interdependence, cascading effects, and deep uncertainty. While extensive research explains how such risks propagate across societies, less attention has been devoted to identifying where systemic risks first become observable and which geographical spaces provide early signals of broader transformations.

This paper asks: Can strategically located islands function as risk observatories by revealing emerging systemic risks before they become evident elsewhere? It hypothesizes that Greenland and Gotland, owing to the interaction of climatic, geopolitical, infrastructural, and societal processes, constitute spaces where systemic risks become observable at an earlier stage than in broader European governance systems, creating opportunities for early warning and policy learning.

The study employs an exploratory qualitative comparative case study. Greenland and Gotland are selected because both occupy strategic positions where multiple global transformations converge. Rather than treating them as exceptional cases, the paper examines whether they perform a common analytical function within systemic risk analysis.

Inspired by the logic of sentinel systems, the paper proposes the SIRO Framework for Early Signal Detection of Systemic Risks, explaining how strategically located islands may function as risk observatories through four interconnected mechanisms: global transformations, risk concentration, early manifestation through weak signals, and policy learning supporting anticipatory risk governance.

The paper contributes to risk science by introducing a transferable conceptual framework linking geographical space with the early detection of systemic risks. It argues that strategically located islands may serve as natural observatories of emerging risks and provide a basis for anticipatory risk governance and future comparative research.

Plenary session 3: Hazard, community and continuity in remote and island regions

Friday 2 October 2026, 10:10

P3.1: Children as a Risk Parameter: Psychosocial Consequence, Rights as Constraint, and Continuity in Recovery Assessment

Authors: Adda Þóreyjardóttir Smáradóttir (ÖRUGG Consulting Engineers, Iceland), Böðvar Tómasson

Abstract:

Recovery decisions in hazard-affected communities are typically assessed against physical harm to a generic exposed population. This framing is methodologically inadequate, and three areas are highlighted where the risk assessment must be broadened. In Grindavík, where magma accumulation continues and renewed eruption remains the most likely scenario, opening of schools is planned, which illustrates the problem with particular clarity.

First, the consequence dimension must be extended. For children, the dominant harm is not injury alone but psychosocial damage. The 2023 evacuation was itself a traumatic event and a return can reactivate stress responses through the physical environment, with childhood adversity carrying lifetime effects. Consequences therefore accumulate over decades and are partly generated by the recovery process rather than by the hazard.

Second, rights function as constraints on acceptable risk rather than as preferences to be weighed. The UN Convention on the Rights of the Child, incorporated in Icelandic law, makes the child's best interests paramount. Where the state offers or requires schooling in a hazard area, it assumes responsibility for safety, a constraint not tradeable against economic or demographic recovery objectives.

Third, risk is distributed across exposure, vulnerability and response. Fissure repair and fencing address exposure; trauma-informed schooling, psychosocial support and child participation address vulnerability; evacuation planning addresses response. These risk elements interact and constitute a complex interconnected system.

Planned schooling therefore involves risks far beyond the direct physical consequences of identified hazards. Uncertainty across multiple consequence dimensions, physical and psychosocial, strongly affects the risk level and calls for precautionary measures. Decision-making under such deep uncertainty needs to accommodate these factors but requires substantial preliminary work.

P3.2: When the Community is the System: Disaster Risk Management and Climate Adaptation in Remote Settlements in Iceland

Authors: Jóhanna Gísladóttir (Agricultural University of Iceland and University Centre of the Westfjords, Iceland), Matthias Kokorsch

Abstract:

Disaster risk management in small and remote communities presents challenges that are distinct from those in urban and well-connected settings. Where institutional density is thin and geographic isolation shapes the conditions under which emergencies unfold, first response must originate from within the community itself. This paper examines how these conditions play out in practice through a qualitative case study of avalanche risk management in the Westfjords of Iceland, where small coastal settlements face significant avalanche risks and where geography makes isolation during an event a structural condition. Drawing on O'Brien et al.'s (2011) adaptation continuum as an analytical framework, we investigate what shapes disaster risk management capacity in remote Icelandic communities and what blocks the transition toward systemic resilience. We find that capacity in the Westfjords rests heavily on local volunteers whose informal labor sustains a system that formal institutions alone could not maintain. Learning from disaster events has been episodic and concentrated in post-event investment, and preparedness varies considerably across settlements. At the same time, recent institutional

developments, including improved cross-agency coordination and infrastructure mapping, point toward the conditions under which more anticipatory approaches become possible. These findings contribute to understanding how the partnership model central to transformative climate change adaptation takes shape in remote and geographically isolated contexts, where the community and the first response system are essentially the same people.

P3.3: From Events to Functions: A Bottom-Up Societal Continuity for National Safety

Author: Böðvar Tómasson (University of Iceland, Iceland)

Abstract:

This work introduces doctoral research on the methodological construction of national risk assessments and argues for a shift in theoretical approach towards national continuity of vital functions.

National assessments are conventionally built top-down and event-first: a set of national scenarios is selected, scored for likelihood and consequence. The results are arranged in a risk matrix of which a threefold critique has been put forward: (1) risk matrices suppress uncertainty, as results derived from strong vs. weak evidence are indistinguishable in general matrix format; (2) matrices handle low-frequency hazards poorly, since likelihood scoring limits the effects of probability distribution tails; (3) aggregation across scenarios obscures the coupling and cascading effects that dominate systemic risk.

Currently, the scope of civil protection is focused on certain infrastructures instead of the vital societal functions they support. As a result, interdependencies and supportive actions are often overlooked, as the scope is too narrow; it is difficult to define what is critical if we do not know what it is critical for.

This research develops a framework for continuity of societal safety that addresses the above issues. It is grounded in the consequence-uncertainty risk perspective and strength-of-knowledge judgments. It builds upon an existing Nordic practice of a bottom-up perspective of protection, where critical societal functions are based on societal values and basic individual needs. By defining objectives for functionality and setting time-related parameters for recovery, the framework provides a systematic structure for addressing vulnerabilities, managing resources, and enhancing the overall resilience of societal systems.

P3.4: The development of a methodology for risk and rescue capability assessment in the Baltic Sea Region and application to maritime rescue scenarios in the Nordic Arctic

Authors: Björn Karlsson (University of Iceland, Iceland), Bödvar Tomasson

Abstract:

The work presented here was partly carried out within the EU-funded project “Risk Management Capability Based on Gaps Identification in the Baltic Sea Region”, where the aim was to build knowledge on disaster risk management capability assessments and the development of a more common understanding of such assessments at national level in the Baltic Sea Region. This was a cooperative project with partners from Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland and Sweden. The project was coordinated by the Fire and Rescue Department under the Ministry of the Interior of the Republic of Lithuania, starting in January 2015.

Through a series of meetings and workshops, a methodology for risk and rescue capability assessments was formulated and developed by the project partners. The methodology was tested on a given, well-defined scenario focusing on extreme weather and storms. No single methodology for risk and capability assessments had previously been presented or agreed upon by rescue authorities within the Baltic Sea Region.

Currently, researchers at the University of Southern Denmark and the University of Iceland have been collaborating within the research project "Managing risk: Rescue Capabilities Assessment for Cruise Ship Accidents in the Nordic Arctic". One of the aims is to investigate the possible application of the above methodology regarding maritime rescue, focusing on cruise ships operating in the Arctic. The project is funded by the University of the Arctic and the Lloyds Foundation.

This work will present a methodology for assessing risk and rescue capability, focusing on cruise ship accidents in the Nordic Arctic.

P3.5: From systemic risk to persisting nodes of complexity: islands as a hedge against global societal collapse

Authors: Matt Boyd (Adapt Research and Islands for the Future of Humanity, New Zealand), Nick Wilson

Abstract:

Deteriorating geopolitical, energy, and ecological conditions load interacting stresses onto highly connected, fragile global systems. Under a stress–trigger–crisis dynamic, a single hazard: nuclear war, bio-engineered pandemic, large volcanic eruption, or catastrophic electricity loss, can propagate through networks of food, trade, energy, and communication, causing harm far beyond its origin. In tail cases, the cascading consequences of these events and processes threatens global systemic collapse.

However, evidence suggests remote, island nations may escape direct harm in many catastrophe scenarios. Empirically, we document substantially lower excess mortality during Covid-19, less climate stress following volcanic eruptions, and an island x democracy advantage in excluding cascading threats. In our reviews, islands recur as leading candidates for broad resilience to a range of global catastrophic risks.

Yet, trade-dependent island nations are vulnerable even as they may escape direct hazard impact. Our New Zealand case study, with parallels for Iceland, shows food self-sufficiency is necessary but not sufficient, as precarious fuel and energy supply, thin manufacturing, and sectoral interdependence can drive "ungraceful degradation" of complex systems even where food calories and renewable energy persist.

We argue that a robust hedge against irrevocable global collapse is to leverage the island advantages, while addressing the vulnerabilities, to prepare "nodes of persisting complexity": locations where diverse local populations could remain resilient, sustaining technological capability, information, institutional know-how, and templates for good societal functioning. This would protect island populations while serving as insurance for humanity to reboot societies elsewhere.

Realising this resilience requires anticipatory governance of systemic and catastrophic risk. We present concrete governance and resilience measures.