ADVANCING CLIMATE SECURITY TOGETHER

WE NEED TO ADAPT
WE NEED TO MITIGATE OUR IMPACT

CCASCOE
NATO **Climate Change and Security** Centre of Excellence

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The NATO Climate Change and Security Centre of Excellence (CCASCOE)

Photo Credit: Combat Climate Change, Reuters

Director's Welcome

It is my privilege to welcome you to the first publication of the NATO Climate Change and Security Centre of Excellence (CCASCOE), the newest addition to the family of Centres of Excellence within NATO. This important centre is dedicated to understanding and addressing the multifaceted security challenges posed by climate change. NATO Centres of Excellence have proven to be a successful and enduring model for fostering strong multinational solutions, being managed and funded collectively while remaining open for participation by both NATO and Partner Nations.

CCASCOE aims to develop shared knowledge regarding the security impacts of climate change, enabling Allies to acquire the capabilities required in future security environments and establish best practices to mitigate the climate impact of military activities. I am proud to lead the multi-national team in this vital initiative, working alongside esteemed colleagues from Canada, Denmark, France, Germany, Greece, Italy, Latvia, Luxembourg, Norway, Romania, Türkiye and the United Kingdom. Together, we strive to enhance NATO's resilience and readiness in the face of an evolving climate landscape, ensuring that our collective security is strengthened for the challenges that lie ahead.

Mr. Mathieu Bussières
CCASCOE Director

Purpose of the Publication

The purpose of this publication is to celebrate the establishment of the CCASCOE, highlighting its mission to advance understanding and action on climate-related security challenges.

By providing a platform for research, collaboration, and innovation, CCASCOE aims to enhance NATO's ability to address the multifaceted impacts of climate change on security. Written with contributions from other Centres of Excellence, sponsoring nations, and active stakeholders, this publication reflects the collective insights of leading voices in climate security. In this spirit, CCASCOE aims to serve as a hub and convener, welcoming diverse perspectives and fostering cross-sectoral collaboration.

HIGHLIGHT

"This Centre serves as a critical research platform to ensure that NATO Allies and partners are equipped with the information they need to succeed in a climate-changed world. To plan for, adapt to, and mitigate the security risks and impacts caused by climate change."

Right Honourable Justin Trudeau
Prime Minister of Canada
Keynote Address, NATO Climate Change[2]

[2] **Prime Minister's remarks** at a celebration event for the NATO Climate Change and Security Centre of Excellence | Prime Minister of Canada (pm.gc.ca)

Photo Credit: PM Trudeau, @oskardap

HIGHLIGHT

"Climate change matters for our security, and therefore it matters to NATO"

Jens Stoltenberg
NATO Secretary General
UNFCCC COP28, Dubai 2023[1]

[1] **NATO - News:** Secretary General at COP28: climate change matters for our security, and therefore it matters to NATO, 01-Dec.-2023

Photo Credit: Reuters/Alexandros Avramidis

Context and Relevance

The growing recognition of climate change as a critical security threat is reshaping global security dynamics, with NATO increasingly acknowledging its implications for stability and defence. As extreme weather events, resource scarcity, and mass displacement become more prevalent, the Alliance recognises that climate change exacerbates existing threats and creates new vulnerabilities. This evolving perspective highlights the necessity for integrated responses that consider environmental factors in military planning and strategy.

By prioritising climate security, NATO aims to enhance its resilience and operational effectiveness while fostering collaboration among member states to address the multifaceted challenges posed by a changing climate.

Photo Credit: Latvian Ministry of Defence / Armins Janiks

Overview of CCASCOE

The NATO Climate Change and Security Centre of Excellence (CCASCOE) was established to enhance NATO's understanding of environmental challenges and their implications for global stability. CCASCOE serves as a focal point for research, knowledge sharing, and collaboration among member states. Its strategic importance lies in its ability to provide evidence-based insights that inform military planning and policy development in the context of climate-related risks. By integrating climate considerations into security frameworks, CCASCOE not only strengthens NATO's operational resilience but also promotes a proactive approach to mitigating the threats posed by climate change, thereby reinforcing global security efforts in an increasingly uncertain world.

Joint message from the Honourable Bill Blair, Minister of National Defence and the Honourable Mélanie Joly, Minister of Foreign Affairs

Climate change is redefining the global security landscape in unprecedented ways. Whether through human mobility, changes to energy security, rapid coastal erosion, supply chain impacts or shortages of food and water, the effects of climate change have direct implications for our militaries and societies at large. Recognizing the need for coordinated action, Canada has taken the pivotal step of establishing the NATO Climate Change and Security Centre of Excellence (CCASCOE) in Montreal, Quebec.

In Canada, natural disasters are occurring more frequently, leading to increasing requests to conduct domestic disaster response. The Arctic is also warming at about four times the rate of the global average, impacting essential defence infrastructure. As highlighted in our defence policy update, Our North, Strong and Free, changes to the physical environment are having profound effects on the strategic environment. Melting sea ice and permafrost degradation are leading to increased accessibility and navigability, attracting new actors to the region and heightening competition. Indigenous Peoples and Northerners, and Canadians more broadly, are actively looking for reassurances that they and their interests are well-defended. With open dialogue, we remain committed to continuing to regularly engage Indigenous and Northern partners as we work to address the security effects of climate change.

Building on Canada's leadership in rallying partners, the CCASCOE will serve as a central hub for exchanging knowledge, fostering cooperation, and devising effective strategies to respond to climate change-related security risks. It will not only support NATO's ongoing work on climate change and security, but also serve as a platform to engage international partners. The CCASCOE will promote a multi-sectoral approach and strive to use a gender and diversity lens in its work, recognizing the interconnected aspects of human security affected by climate change.

Since its announcement by Canada's Prime Minister at the 2021 NATO Leaders' Summit, the CCASCOE has garnered strong support from NATO Allies, including Denmark, France, Germany, Greece, Italy, Latvia, Luxembourg, Norway, Romania, Türkiye, and the United Kingdom, who all stepped forward to become the founding, Sponsoring Nations of the CCASCOE. They have each committed to contributing personnel and expertise to the Centre, ensuring a robust, collaborative, and dynamic operation. The Centre opened its doors in October 2023 with an international and Canadian team in Montreal. The North Atlantic Council granted CCASCOE accreditation as an official NATO Centre of Excellence in May 2024.

The CCASCOE's mission is to effectively identify and address the security challenges posed by climate change, contributing towards a safer and more resilient world. The CCASCOE embodies a strategic commitment by Canada and fellow Sponsoring Nations to international collaboration and proactive engagement on climate change. As we celebrate 75 years of NATO's legacy of peace and security while confronting a future marked with unprecedented threats, the establishment of the CCASCOE marks a significant milestone in our collective efforts to safeguard our people and our planet. Together, we are stronger. Together, we are NATO.

Hon. Bill Blair
Minister of National Defence

Hon. Mélanie Joly
Minister of Foreign Affairs

Message conjoint de l'honorable Bill Blair, ministre de la Défense nationale, et de l'honorable Mélanie Joly, ministre des Affaires étrangères

Le changement climatique redéfinit le contexte mondial de la sécurité de manière sans précédent. Qu'il s'agisse de la mobilité humaine, des modifications de la sécurité énergétique, de l'érosion rapide des côtes, des incidences sur les chaînes d'approvisionnement ou des pénuries de nourriture et d'eau, les effets du changement climatique entraînent des répercussions directes sur nos armées et nos sociétés dans leur ensemble.

Conscient de la nécessité d'une action coordonnée, le Canada a pris la décision cruciale de créer le Centre d'excellence OTAN pour le changement climatique et la sécurité (CECCS) à Montréal (QC).

Au Canada, les catastrophes naturelles sont de plus en plus fréquentes, ce qui se traduit par une augmentation des demandes d'intervention en cas de catastrophe nationale. Par ailleurs, l'Arctique se réchauffe environ quatre fois plus vite que la moyenne mondiale, ce qui entraîne des répercussions sur les infrastructures de défense essentielles. Comme le souligne notre mise à jour de notre politique de défense, Notre Nord, fort et libre, les changements dans l'environnement physique ont des effets profonds sur l'environnement stratégique.

La fonte de la glace de mer et la dégradation du pergélisol se traduisent par une accessibilité et une navigabilité accrues, ce qui attire de nouveaux acteurs dans la région et intensifie la concurrence. Les peuples autochtones et les habitants du Nord, et plus largement les Canadiens, cherchent activement à obtenir l'assurance qu'eux-mêmes et leurs intérêts sont bien défendus. Dans le cadre d'un dialogue ouvert, nous restons déterminés à continuer d'associer régulièrement les partenaires autochtones et nordiques à nos efforts pour faire face aux effets du changement climatique sur la sécurité.

S'appuyant sur le leadership du Canada dans la mobilisation des partenaires, le CECCS servira de plaque tournante pour l'échange de connaissances, la promotion de la coopération et l'élaboration de stratégies efficaces pour faire face aux risques que pose le changement climatique sur le plan de la sécurité. Il soutiendra non seulement les travaux en cours de l'OTAN sur le changement climatique et la sécurité, mais servira également de plateforme pour associer les partenaires internationaux. Le CECCS favorisera une approche multisectorielle et s'efforcera d'utiliser dans ses travaux le prisme de l'égalité des genres et de la diversité, en reconnaissant les aspects interdépendants de la sécurité humaine touchés par le changement climatique.

Depuis l'annonce faite par le premier ministre canadien lors du sommet des dirigeants de l'OTAN de 2021, le CECCS a bénéficié d'un solide soutien de la part des alliés de l'OTAN, notamment l'Allemagne, le Danemark, la France, la Grèce, l'Italie, la Lettonie, le Luxembourg, la Norvège, la Roumanie, la Türkiye et le Royaume-Uni, qui se sont tous portés volontaires pour devenir les pays fondateurs et parrains du CECCS. Ils se sont tous engagés à fournir du personnel et de l'expertise au Centre, garantissant ainsi un fonctionnement solide, collaboratif et dynamique. Le Centre a ouvert ses portes en octobre 2023 avec une équipe internationale et canadienne à Montréal. Le Conseil de l'Atlantique Nord a accordé au CECCS l'accréditation en tant que Centre d'excellence OTAN officiel en mai 2024.

La mission du CECCS est de déterminer et de résoudre efficacement les problèmes de sécurité posés par le changement climatique, en contribuant à un monde plus sûr et plus résilient. Le CECCS incarne l'engagement stratégique du Canada et des autres pays parrains en faveur d'une collaboration internationale et d'un engagement proactif sur le changement climatique. Alors que nous célébrons les 75 ans de l'héritage de paix et de sécurité de l'OTAN tout en affrontant un avenir marqué par des menaces sans précédent, la création du CECCS marque une étape importante dans les efforts que nous déployons collectivement pour protéger nos populations et notre planète. Ensemble, nous sommes plus forts. Ensemble, nous sommes l'OTAN.

L'hon. Bill Blair
Ministre de la Défense nationale

L'hon. Mélanie Joly
Ministre des Affaires étrangères

Photo Credit: Affaires publiques de l'Armée canadienne / Caporal-chef Louis Brunet

Message from General Jennie Carignan, Chief of the Defence Staff and Stefanie Beck, Deputy Minister of National Defence

We are honoured and proud to contribute to Montreal's NATO Climate Change and Security Centre of Excellence's (CCASCOE) first official publication. As the world navigates the complex challenges of the 21st century, few are more pressing than the intersection of climate change and security.

Climate change is not only reshaping our physical landscape – from permafrost melt and rising sea levels to unprecedented natural disasters – it is also contributing to resource scarcity, loss of livelihoods, and human migration. Combined, these geopolitical shifts are resulting in a fundamental security challenge. The CCASCOE will serve as a hub of collaboration and expertise, a testament to the commitment of NATO and its member nations to address this challenge head-on.

As highlighted in Canada's defence policy update, Our North, Strong and Free, announced in April 2024, one of the most urgent and important tasks Canada faces is asserting its sovereignty in the Arctic and Northern regions, where the changing physical and geopolitical landscapes have created new threats and vulnerabilities to Canada and Canadians. A more open and accessible Arctic and Northern region requires greater investment to protect Canada, continued work with Allies and partners – including Northern and Indigenous partners – and rigorous defence of the rules and principles that govern a peaceful and prosperous international order.

In Canada, climate change is projected to lead to more frequent and intense rainfall events, and therefore an increased risk of flooding. We are already seeing wildfire intensification and prolonged wildfire seasons. Like many NATO Allies, Canada's Department of National Defence is committed to adapting to a future security environment impacted by climate change, including reducing the environmental impact of its own activities.

The establishment of the CCASCOE underscores the collective determination of the Alliance to confront these challenges with resolve and ingenuity. By harnessing the expertise of the 12 sponsoring nations and fostering international collaboration, we will strengthen our capacity to anticipate, mitigate, and respond to the security impacts of climate change.

As we continue this pivotal journey, we want to reaffirm Canada's commitment to the principles of cooperation, innovation, and resilience. We are confident that we will rise to the challenges of the future, safeguarding peace and security for generations to come.

General Jennie Carignan
Chief of the Defence Staff

Stefanie Beck
Deputy Minister of National Defence

Message de la générale Jennie Carignan, chef d'état-major de la Défense, et de Stefanie Beck, sous-ministre de la Défense nationale

Nous sommes honorées et fières de contribuer à la première publication officielle du Centre d'excellence OTAN pour le changement climatique et la sécurité (CECCS) de Montréal. Alors que le monde est confronté aux défis complexes du 21e siècle, peu d'entre eux sont plus urgents que l'intersection du changement climatique et de la sécurité.

Le changement climatique ne se contente pas de remodeler notre paysage physique - de la fonte du pergélisol à la montée du niveau des mers en passant par des catastrophes naturelles sans précédent - il contribue également à la raréfaction des ressources, à la perte des moyens de subsistance et aux migrations humaines. Ensemble, ces changements géopolitiques posent un problème de sécurité fondamental. Le CECCS servira de centre de collaboration et d'expertise, et témoignera de l'engagement de l'OTAN et de ses pays membres à relever ce défi de front.

Comme le souligne la mise à jour de la politique de défense du Canada, Notre Nord, fort et libre, annoncée en avril 2024, l'une des tâches les plus urgentes et les plus importantes auxquelles le Canada est confronté consiste à affirmer sa souveraineté dans les régions de l'Arctique et du Nord, où l'évolution des paysages physiques et géopolitiques a créé de nouvelles menaces et vulnérabilités pour le Canada et les Canadiens. Un Arctique et un Nord plus ouverts et plus accessibles exigent des investissements plus importants pour protéger le Canada, un travail continu avec nos alliés et partenaires – y compris nos partenaires nordiques et autochtones – et une défense rigoureuse des règles et des principes qui régissent un ordre international pacifique et prospère.

Au Canada, le changement climatique devrait entraîner des précipitations plus fréquentes et plus intenses, et donc un risque accru d'inondations. Nous constatons déjà une intensification des incendies de forêt et une prolongation de la saison des incendies. À l'instar de nombreux Alliés de l'OTAN, le ministère de la Défense nationale du Canada s'est engagé à s'adapter à un futur contexte de sécurité marqué par le changement climatique, notamment en réduisant l'impact de ses propres activités sur l'environnement.

La création du CECCS souligne la détermination collective de l'Alliance à relever ces défis avec fermeté et ingéniosité. En mobilisant l'expertise des douze pays parrains et en stimulant la collaboration internationale, nous renforcerons notre capacité à anticiper et à atténuer les incidences du changement climatique sur la sécurité, et à y répondre.

Alors que nous poursuivons ce parcours décisif, nous souhaitons réaffirmer l'engagement du Canada en faveur des principes de coopération, d'innovation et de résilience. Nous sommes convaincues que nous saurons relever les défis de l'avenir, en préservant la paix et la sécurité pour les générations futures.

La générale Jennie Carignan
Chef d'état-major de la Défense

Stefanie Beck
Sous-ministre de la Défense nationale

The Formation of CCASCOE

Photo Credit: CCASCOE Banner, CCASCOE/LtCol Cristian Ciulean

Background

At the NATO Summit in Brussels in 2021, Allies adopted the NATO Climate Change and Security Action Plan, recognising that climate change is one of the defining challenges of our times.

In response to one of the recommendations of this Plan, 12 NATO Allies came together to establish the Climate Change and Security Centre of Excellence (CCASCOE). Canada, the framework nation, was joined in this effort by the sponsoring nations Denmark, France, Germany, Greece, Italy, Latvia, Luxembourg, Norway, Romania, Türkiye and the United Kingdom.

Representatives of each nation signed the founding document at the NATO Summit in Vilnius in July 2023 and the Centre opened in Montreal, Quebec, in the fall of the same year. On 28 May 2024, CCASCOE was formally accredited as a NATO Centre of Excellence, officially joining the family of 30 NATO Centres of Excellence across the Alliance.

Photo Credit: NATO reps and flags, NATO

Remarks by Deputy Secretary General, Mircea Geoană
At the signing ceremony of the Operational Memorandum of Understanding of the NATO Climate Change and Security Centre of Excellence. 12 Jul. 2023

Thank you so much. It's a great pleasure to be here with all our colleagues.

I would like to thank Canada for being such a staunch ally in our great Alliance. Canada contributes to our operations and missions, soldiers, foundation in the battlegroup in Latvia. They play a role, which is vital in NATO. And I'm also very happy that you will be hosting the DIANA North America headquarters.

Merci infiniment à vous et à tous les collègues qui sont présents et présentes ici. Today we are adding yet one more Canadian contribution to the security of NATO's 1 billion citizens, a new Centre for Excellence on Climate Change and Security in Montreal.

We sometimes still get asked, why NATO when it comes to climate change and security? And the answer is quite simple.

Climate change is an existential threat to the future of our planet, and therefore, it matters to our security. NATO is not and should not be absent from any new facets of the new definition of security, and this is the case in point today.

NATO has three strands of work when it comes to climate change and security.

First, we must understand the problem. Changing weather patterns will mean we have to fight differently. We have to know what changes are coming.

Second, we must mitigate from NATO Mission Iraq where our soldiers and trainers need to cope with temperatures over 40 degrees Celsius, to changing the way we build our bases to protect against climate change.

And third, we must adapt and adaptation is in the gene of this Alliance. And this is what makes this Alliance so successful over time, over and over again. NATO cannot remain a fossil fuel Alliance in a renewable age, whereas military Alliance must prepare for a future where our capabilities from fighter jets to tanks need to operate in a greener way without ever compromising on military effectiveness, of course.

In all these tests, our new Center of Excellence on Climate Change Security in Canada will be an essential part of the solution.

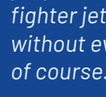
I hope that this initial group of Allies joining the center will be just the first part of this exercise.

We encourage other Allies, we encourage our partners to join in. And to make this wonderful centre and again, Merci infiniment Madame la Ministre,

Thank you so much, Canada, for taking up this challenge.

We look forward to visiting and hope we'll be invited also to the opening together with my colleagues from the Emerging Security Challenges division.

Thank you so much.
Good luck.



Mircea Geoană
Deputy Secretary General

Strategic Vision

CCASCOE's mandate is to support the integration of climate security into NATO's military operations, planning, and facilities, ensuring that the Alliance is prepared to address the growing security risks posed by climate change. This involves enhancing resilience, by incorporating climate considerations into training, infrastructure, missions and operations. Therefore, CCASCOE will help NATO adapt to and mitigate climate-related threats, strengthening collective security while contributing to global efforts to combat the impacts of climate change. This integration is vital for the long-term sustainability and operational effectiveness of NATO forces in an increasingly unpredictable environment.

Photo credit: Leadership on Energy Security CCASCOE/Martin Aarnaes

Partnerships

CCASCOE aims to be an internationally recognized hub of expertise on climate change and security for military and civilian experts and decision-makers, working with governmental and non-governmental organizations, think tanks, academia and industry to stimulate innovative solutions, encourage closer collaboration among NATO Allies and partners. Working across different types of organizations, CCASCOE can gather and streamline knowledge and expertise in one dedicated hub, and increase the awareness of decision-makers and the broader public on the pressing need of taking concrete actions to preserve Allied security.

Photo Credit: Conference of Americas CCASCOE / Martin Aarnaes

HIGHLIGHT

Director Mathieu Bussières represented the CCASCOE for the first time at the NATO Public Forum in Washington D.C. As a relatively new NATO Centre of Excellence, we are building the network to make our efforts align with NATO's priorities. A more robust, resilient and secure Alliance must transform to deter and defend in a climate changed world.

HIGHLIGHT

The CCASCOE attended the Climate and Defense Summit of the Americas hosted by the United States Department of Defense, with Deputy Assistant Secretary of Defense Iris Ferguson and Acting Assistant Secretary of Defense Rebecca Zimmerman at the United States Naval Academy.

The Summit is the culmination of a series of regional conferences supported by the William J. Perry Center for Hemispheric Defense Studies, RAND Corporation, and the Pacific Disaster Center - PDC Global. The series has gathered experiences, outlined challenges, and moved towards actionable solutions to climate-induced risks and security challenges across the hemisphere.

Learning from senior military and civilian practitioners across the Americas and how they cooperate with the U.S. Government on addressing climate security is important for CCASCOE. Exploring how to join forces to address local, national, regional, and global security implications from climate change will inform our Centre's efforts moving forward. It was also particularly interesting for a NATO-accredited organization to learn more from Caribbean as well as North, Central, and South American leaders.

What is Climate Security?

Photo Credit: Op IMPACT, Caméra de combat des Forces canadiennes

Definition and Scope

At the most basic level, climate security is a concept that expresses the consequences of climate change on issues and practices related to security. How it translates into precise action, activity, or policy is context-dependent, but all assessments of the impact of climate change on security need to start with what the climate sciences know about the magnitude, inevitability, and uncertainty that climate change brings. Climate change is much more than another variable to be added to an expanding security agenda, more than another "thing" to do or tackle by the military. It is all-encompassing and all-transforming as it reconfigures the physical world, and thus impacts every sector of human activity. Climate change is the ultimate systems-level challenge—highly complex, non-linear, and multidimensional. Its challenges hold the potential for structural transformation, cooperation, and progress, but also for competition and conflict, both within and between states.

For NATO and military organizations, climate change has numerous consequences for force readiness and the projection of force as climate hazards and extreme weather events like heat domes, drought, wildfire, storms, coastal or inland flooding, land degradation, ocean anomalies, and sea ice retreat increase in number and intensity. Furthermore, militaries will need to manage their 'carbon bootprints' at the same time as the evolution of international relations and of the strategic environment become increasingly tied to climate change, as environmental strains and constraints become more impactful, as climate adaptation and mitigation gain urgency, and as the world goes through unequal socio-technological transformations.

As such, climate security requires new ways of thinking and acting, notably decision-making processes and planning mechanisms that incorporate a long-term perspective and that can manage the deep uncertainties of climate change. Not everything is about climate change, but it is analogous to a tsunami whose waters infiltrate and affect everything. There is no scenario in which security, defence, and military policy and actors can avoid the climate crisis.

Climate security is the ultimate systems-level challenge, which is highly complex, non-linear, and multidimensional. While climate change impacts are global, its effects on food security, water scarcity, energy security, infrastructure, rising sea levels, and extreme weather events cause security risks to vary significantly across different regions.

These challenges necessitate NATO to lead as the foremost international organization – in understanding and implementing clear adaptation and mitigation measures, developing and managing diverse risk profiles, and enhancing outreach – to ensure a credible deterrence and defence posture that upholds the rules-based international order in an increasingly multipolar world challenged by climate change.

Threat Multipliers

The Intergovernmental Panel on Climate Change (IPCC) predicted more heatwaves, heavier rain events, rising sea levels, and more severe damage to agriculture. These trends represent a security risk for the entire world, however their consequences are felt more in regions that are already vulnerable, where climate change and extreme weather compound existing grievances and threats.

The relationship between climate related risks and conflict are complex and often intersect with political, social, economic, and demographic factors. Climate change is a threat multiplier, as it affects peace and security in indirect but, nonetheless, serious ways. Looking at these issues as interconnected systems rather than as isolated problems, necessitates climate change to be viewed as a threat multiplier among an array of emerging threats that compound existing security challenges.

Sherri Goodman
Secretary General, International Military Council on Climate & Security and Senior Fellow, Wilson Center

The creation of CCASCOE is, in many ways, a celebration and recognition of my life's work to connect climate change and security. As the first US Deputy Undersecretary of Defense (Environmental Security) in the 1990s, I worked to strengthen US and transatlantic security while addressing the environmental risks of that era, including nuclear and hazardous waste contamination and early awareness of how global environmental change can destabilize our security.

As the founder of the Centre of Naval Analysis (CNA) Military Advisory Board, in 2007, I organized the first group of generals and admirals to address the national security implications of climate change, for which I coined the term "threat multiplier," to characterize how climate acts to increase instability around the world.

Today, as Secretary General of the International Military Advisory Council on Climate & Security, I work with military and national security leaders around the world to advance awareness and action on the unprecedented risks of climate to the geostrategic landscape of the 21st century. At the NATO Summit in Washington in July 2024, I was honored to follow Canadian Prime Minister Trudeau's remarks and moderate the high-level panel of foreign and defense ministers, and military leaders launching NATO's CCASCOE.

My new book, Threat Multiplier: Climate, Military Leadership and the Fight for Global Security Is the story of how militaries around the world are confronting climate risks. Drawing on my own experience and that of many military leaders, I take readers inside the Pentagon and onto the battlefield to show how militaries, are confronting one of humanity's biggest challenges, climate change. Readers embark on a global journey from the Middle East, where military leaders confront extremists who weaponize water scarcity, to the Arctic where retreating sea ice has opened a new ocean of competition for resources, along with Russian nuclearization of the region. In the Indo Pacific, climate stress from rising sea levels put island nations at existential risk and terrifying typhoons; put disaster risk on the front line.

In Latin America, where already fragile states are pushed to the brink by extreme and unpredictable changes in both climate and weather, leaders are building partnerships for climate and environmental resilience. The book examines the geostrategic challenges we face in a world changed by climate and grappling with the energy transition.

The book reveals how climate change is impacting military bases and weapons systems, even as the military works to improve its climate resilience and transition to lower-carbon energy. The onslaught of extreme weather has shifted military planning to respond to rising sea levels, intensifying storms and raging wildfires. Today's military is a global 911 force for disaster response, both at home and abroad. At the same time, the military must climate proof its bases and work with surrounding communities, also rooting resilience in nature-based solutions.

Reducing reliance on fossil fuels while maintaining and even improving military effectiveness is the key challenge of the energy transition. Threat Multiplier shows how the U.S. military is tackling the immense strategic, logistical, and economic potential of reducing its reliance on fossil fuel. The DOD is the nation's single largest energy user, accounting for about 1% of all US energy use and 93% of all US government fuel consumption.

The energy lesson from Iraq and Afghanistan is that trucking fuel to the front lines put soldiers at risk of deadly IED attacks, as most military convoys carry fuel and water. Disentangling the military's tether to fuel is an enormously complex undertaking, requiring significant investments and technological advancements. Today, NATO militaries are not only reducing their energy demand; they are also improving military effectiveness with technologies such as hybrid vehicles that not only save energy but are also quieter on the battlefield. Threat Multiplier examines how advanced energy technologies enable strategic advantage and improved military capability that also allow the defense sector to lead by example in its transition to a more sustainable energy future.

Securing our climate future has four elements: improving awareness through climate prediction to prepare for and prevent future disasters; adapting to the unavoidable impacts of climate change through education and climate literacy, more humanitarian assistance and disaster relief missions, and sustainable infrastructure; creating a net-zero military to reduce emissions and gain a strategic advantage in combat power and military capability; and strengthening global alliances to reimagine climate cooperation and competition.

Photo Credit: U.S. Air Force / Staff Sgt. Daniel St. Pierre

The Center for Climate and Foreign Policy at the German Council on Foreign Relations (DGAP)

Droughts, storms, floods – climate impacts are occurring worldwide and the major societal, political, and economic challenges that they pose need addressing. Therefore, a focus of our research and policy advice at the Center for Climate and Foreign Policy is the link between climate impacts and security risks. Climate change affects different areas of traditional concepts of security, such as the integrity of state's territory, as well as multiple dimensions of human security, including the destruction of livelihoods and identities.

People whose source of income is directly linked to healthy ecosystems, for example through fishing or agriculture, can face severe hardship due to climate change. One consequence of this is climate displacement or the need for migration as adaptation. Thus, another of our cross-cutting themes is the study of these interrelationships and possible humanitarian emergencies. While many developing countries are particularly affected, they have contributed least to causing climate change through greenhouse gas emissions.
The other dimension of the broader concept of climate security is planetary security which links to the question on how to maintain the earth system's suitability for human development and habitation. Analyzing and communicating this emerging risk landscape which goes beyond managing specific extreme events, is also part of the center's work. It moreover links to the questions of implementation of climate protection which can bear consequences for international relations and existing trade partnerships. We therefore also work together to assess geoeconomic dimensions of climate action. The geopolitics of resource flows for transformative technologies play an increasingly important role here, especially in terms of implementing the European Green Deal.

At the Center for Climate and Foreign Policy, we pursue an interdisciplinary research approach. Experts with backgrounds in the natural sciences, political science, energy and law work together to develop foreign policy recommendations that are as holistic as possible and do justice to the cross-disciplinary nature of the climate crisis. In addition, we use synergies with other program areas to strengthen DGAP's research on global climate policy issues.

Dr. Kira Vinke
Head of Center for Climate and Foreign Policy, German Council on Foreign Relations

	CLIMATE IMPACTS	PLANETARY SECURITY
WHAT ARE THE SECURITY THREATS? (SECURITY FROM WHAT?)	Escalating resource conflicts, local climate-related loss and damage, climate-related displacement, food insecurity	Global warming resulting in a worldwide increase in extreme weather events, ocean acidification, biodiversity loss, etc.
WHO AND WHAT IS AT RISK? (SECURITY FOR WHOM?)*	Vulnerable groups in regional and local contexts, especially in the Global South	The population worldwide, prosperity and security within nation states
HOW CAN SECURITY BE INCREASED?	Building resilience in the face of existing climate impacts, reducing and managing climate risks	Respecting planetary boundaries, fostering an intact Earth System with predictable and limited climate impacts, preserving biodiversity, etc.

Photo Credit: Bundeswehr

Impact on Conflict and Stability

Climate change has worsened access to natural resources, with some communities experiencing higher volatility in the availability and distribution of resources on which their livelihood and coping strategies depend. This often results in greater competition over limited resources and increased social tensions and disputes. Global food insecurity reached record levels due to conflicts, the COVID-19 pandemic, and worsening weather extremes. In 2022, the UN reports that nearly 260 million people in 58 countries faced acute food insecurity, and 35 million people faced starvation.

Across the Horn of Africa in 2022, 20.9 million people were left highly food-insecure due to the longest and most severe drought in recent history. By 2050, the UN estimates that climate change could force 216 million people in six world regions to move within their own countries due to water scarcity, low crop productivity, and rising sea levels. This insecurity is associated with political polarization, political instability, displacement, and extremism, as climate change can worsen inequalities, disproportionately affecting vulnerable communities and exacerbating social grievances.

The Global Water Security Center

Though all militaries are prepared to operate in a range of environments, climate change presents a unique challenge, because known environments will shift. Militaries are already responding to existing tactical changes such as rising seas eroding naval bases and increasing black flag days curtailing training. But while the new normal will have many similarities to the known – temperature, rainfall, and storms mostly experienced before, but intermittently and perhaps far away – the compound impacts of climate change are likely to be profound.

Training regimes can account for intermittent black flag days but must be rethought completely when most days are too hot. Militaries can flex to support civilian disaster response every year or two, but when deadly fires and storms become more frequent, personnel and logistics will be stretched beyond their ability to accommodate, and new military-civilian approaches must be developed.

And just as militaries must respond to changing circumstances, so will civilian organizations, sometimes in ways that will undermine state stability. For example, in the face of weakened government disaster response, non-state actors may step in, providing aid and sowing division. In sum, strategic planning for climate change is particularly challenging.

The Global Water Security Center (GWSC) seeks to inform strategic planning for both direct and indirect impacts of climate change. We have developed a Pathways to Impact Framework to organize, categorize, and simplify the complex bio-social interactions that climate change will bring.

This Framework illuminates causal pathways from climate shock to instability and highlights key mediating factors that are likely to either moderate or exacerbate conflict outcomes. GWSC uses this framework as a guide for analysis, then provides clear graphics illustrating change by comparing the future to the past and highlighting historic analogue events that mirror likely futures. We then extrapolate biophysical impacts through to likely human outcomes, illustrating for the decisionmaker why specific elements of climate change matter.

GWSC operates from a theory of change that military planners know the significance of climate change and want to do something about it, but that for non-experts, digging through climate data and linking it to human outcomes is too cumbersome and time consuming to undertake regularly. As such, GWSC serves as a translation organization, identifying and applying the best science to operational questions to get at key impacts.

Global Water Security Center

Michael S. Gremillion
Director, Global Water Security Center
(Colonel, USAF Ret)

Kate A Brauman
Deputy Director Global Water Security Center

A Framework for Improving Predictive Capabilities for the Security Risks Posed by Climate Change

For 30 years, the Wilson Center's Environmental Change and Security Program (ECSP) has been a premiere forum for assessing global risks, identifying nontraditional security threats, and sharing local resilience strategies. ECSP examines the connections between climate and environmental change, global health, and population dynamics, and explores the impacts of these trends on political stability, human security, and foreign policy. Through research, public and private dialogues, and our award-winning blog, New Security Beat, ECSP analyzes how these global challenges can spur conflict and increase insecurity, and how effective responses can encourage cooperation and build peace across borders.

In partnership with the National Oceanic and Atmospheric Administration and University Corporation for Atmospheric Research, ECSP developed a framework to improve predictive capabilities for security risks posed by a changing climate.

Through a series of case studies focused on Pakistan, the Horn of Africa, the Caribbean, the Pacific, and Central America, ECSP and its partners brought together a diverse group of stakeholders, including government representatives, civil society, NGOs, security and development practitioners, and subject-matter experts to better understand the pathways between climate change, conflict, and peace. Through the series, ECSP identified four dynamic nodes through which climate change can interact with existing vulnerabilities to compound insecurity. Notably, these dynamic nodes also offer a pathway for investments that strengthen climate resilience and build peace. In short, they provide a way to better understand how climate change is altering the very context in which policy decisions and investments are being made.

The four dynamic nodes are as follows:

- Physical and natural systems vulnerabilities, such as ongoing food insecurity in the Horn of Africa.
- Transboundary and regional dynamics, such as the fragility of the Indus Basin water Treaty between Pakistan and India.
- Political and social instability, such as farmer-herder violence in East Africa.
- The scales of decision-making, recognizing that each of the other dynamic nodes, and responses to them, can impact governance at all scales, from the very local to international, and understanding the risks and points of resilience along the scales of decision-making is important to, at a minimum, avoid unintended consequences.

Wilson Center | Environmental Change and Security Program

Note: Wilson Center

ECSP is working to update the case studies to improve and build upon the framework and will continue to work with partners, including government representatives, development and security practitioners, and researchers, to better inform decision-making at the intersection of climate change and security.

We hope that the framework can help inform the CCASCOE climate security knowledge hub and spark new approaches to understanding, assessing, and addressing climate-related risks, including the potential for unintended consequences stemming from climate responses that neglect security risks.

Photo Credit: Romanian Air Force

CCASCOE's Mission

CCASCOE's mission is to provide knowledge, analysis and products on the nexus of climate change and security, and constitute a bridge between NATO and all relevant national and international organisations from various sectors (defence, civil, industry, academia and research), thereby supporting NATO's transformation and the enhancement of NATO's capabilities in the face of climate change.

The CCASCOE Mission[3] is to:

1. Enhance knowledge and understanding of the ways that climate change will affect the security interests of NATO, Allies, Partner Nations and other partners through research, experimentation, doctrine and concept development, education, and training as well as analysis in support of developing lessons learned.
2. Help NATO and Allies to adapt and build resilience to the security impacts of climate change with particular focus on military operations, missions and tasks, including the future operating environment.
3. Develop and share best practices and expertise to improve operational effectiveness and to reduce the climate and environmental impact of the military and defence sectors, moving towards climate neutrality, while maintaining and enhancing the core mission and functions of the Alliance.
4. Serve as a platform for cooperation, knowledge partnerships and mutual information exchange on Climate Change and Security (CCS) within and outside the NATO Alliance, including international and regional organizations, the private sector, academia, and other elements of the civil society.

[3] [HA SACT accreditation assessment report, p. A-2]

Operational Support

The focused mission of CCASCOE is to enhance knowledge and understanding of the ways climate change affects the security interests of NATO and Allies and serve as a platform for cooperation and sharing validated mutual information on climate change and security, thereby improving NATOs operational effectiveness[4].

Although CCASCOE does not envisage regular direct support to operations, the expertise of the centre in climate change and security will be an instrumental resource to NATO organizations and member nations.

From a strategic point of view, the centre will directly support the Alliance through: 1) the development of new concepts and doctrine; 2) the creation and facilitation of new training and education resources; 3) the research and analysis support to functions and organizations; and 4) the convening capability to effectively link the different communities actively involved in the field of climate change and security.

As CCASCOE matures, it is expected that operational support capability will be developed both by supporting the planning and assessment of Operations, Missions and Activities, as well as playing a role in key exercises.

[4] [Enclosure 1 to NATO accreditation letter (MCM-0098-2024), para 2.]

Our Strength in Community

NATO Association of Canada, NATOassociation.ca

Many organizations can act as a force multiplier for the NATO Climate Change and Security Centre of Excellence. With a clear demonstration of the power of unity from NATO itself, the international ecosystem of organizations discussing the importance of climate change and security includes NGO's like the NATO Association of Canada. The NATO Association is dedicated to informing Canadians about the value of security and the importance of NATO.

Considering that most Canadians have the luxury of not needing to think about security, the NATO Association concentrates much of our efforts on raising consciousness about the direct connection between security and all aspects of Canadian life. The parallel to the impact of climate change on every level of society is clear. NATO and the NATO CCASCOE can raise awareness and consciousness on the essential best practices and standards for multilateral mitigation of climate change and our responses to its effects.

The NATO Association of Canada has participated in discussions and hosted events on climate security for years and is eager to work with the CCASCOE to improve public understanding about the tools at our disposal through multilateral action. A true sense of community is at the heart of NATO – it is also at the heart of so many organizations across Canada and the world, dedicated to engaging the public in constructive discussions about how to lessen and react to climate change. Multilateral and collaborative problem-solving tools like NATO and the NATO CCASCOE are our best hope for peace, prosperity and security in the face of the instability and entropy of a dynamic world.

The NATO Association of Canada will work to continue to engage and educate our community about climate change and security and look forward to working with the NATO CCASCOE to this end.

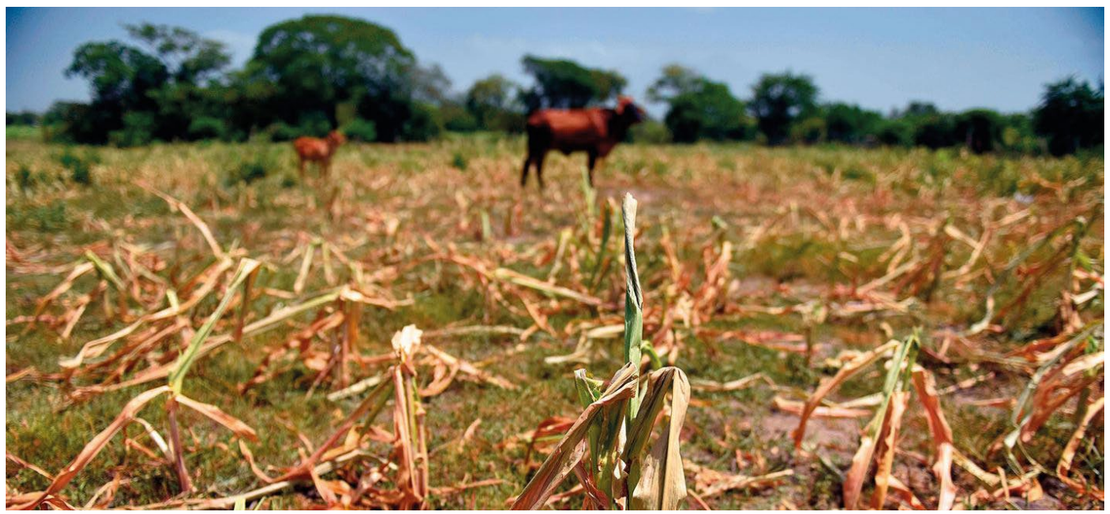


Photo Credit: Getty Images

NATO Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence

The climate significantly influences the CBRN domain. Successful deployment of CBRN weapons often depends on weather conditions to achieve the desired results. Factors such as stability, dispersion, and movement of the contaminated cloud and ground or air contamination in the target area are all influenced by weather parameters. This is equally true for CBRN defence and countermeasures. By understanding the current weather or weather forecast, we can assess the potential impact of a CBRN attack and take suitable measures for protection and recovery.

Weather conditions directly affect force protection and the ability to wear protective gear and masks. In hot climates, the capacity to wear protective equipment for extended periods is considerably diminished. Overheating can lead to fatigue, dehydration, and operational incapacity for personnel wearing such equipment. High temperatures also pose challenges for wet decontamination. Evaporation disrupts the decontamination process, requiring more water and adjustments to the decontamination procedures. The same considerations apply to cold weather, particularly in relation to the wet decontamination.

Changes in the frequency and severity of extreme weather events such as hurricanes, heatwaves, wildfires, droughts, and floods are also noteworthy. All these events might consequently cause incidents involving the release of toxic industrial material, including radiological or biological agents, or deteriorate biological or sanitary situation after such incidents.

Rising temperatures, resulting in ice loss at the Earth's poles and thawing permafrost, heighten the risk of new bacteria or microbes with pandemic potential. Even though this scenario is not classified as a CBRN attack but rather an environmental one, it is possible to manage the consequences within the framework of CBRN defence. The aforementioned points underscore the need to consider all potential impacts of climate change on CBRN defence. It is crucial to comprehend these impacts and devise solutions to tackle the challenges.

The link between climate change and CBRN Defence is clear. The NATO CBRN defence community of interest, as well as the Joint Chemical, Biological, Radiological and Nuclear Defence COE (JCBRN Defence COE), recognize the need to discuss and devise solutions to mitigate these impacts. This issue was brought up and discussed at the JCBRN Defence COE Annual conference last year and we plan to continue this discussion at this year's conference on 22-23 October 2024 in Brno, Czech Republic. The discussion will focus on how climate change affects CBRN defence and capability development, the impact on procedures, and how new technology can aid these processes. JCBRN Defence COE members also participate in conferences on the bio threat of global warming.

COL David MARTINEK

NATO JCBRN Defence COE Director

The Carnegie Endowment for International Peace

The Carnegie Endowment for International Peace, as our name suggests, is concerned with advancing world peace. In the 2020s, that inescapably means analyzing how climate impacts and the energy transition contribute to tension and conflict. We've been researching how climate change creates opportunities for violent non-state actors, how mineral shortages could hamper NATO militaries, and how climate impacts could threaten NATO nuclear bases—on these latter issues, we had the honor of presenting to colleagues NATO headquarters in Brussels.

The establishment of CCASCOE is another sign that more and more top policymakers are recognizing how climate change is as serious a risk to human security as enemies with guns. The new Center for Excellence is taking this forward with partners from across the Alliance. There is an exciting opportunity also to focus on second- and third-order impacts of climate change that will occur in coming decades: will militaries shift to alternative proteins to reduce emissions and shorten supply lines? How will militaries handle their growing responsibilities to help recovery from extreme weather events—or perhaps even their responsibility to protect geoengineering initiatives, should they become necessary? These are some of the questions facing the new center in Montreal. The Carnegie Endowment is grateful to be able to play its part as a partner.

Noah Gordon
Acting Co-Director, Sustainability, Climate, and Geopolitics program

Photo Credit: Forces armées canadiennes / Caporal Alexandre Brisson

NATO Explosive Ordnance Disposal Centre of Excellence

Impact of Climate Change on the Explosive Ordnance Disposal

The impact of climate change on explosive ordnance disposal (EOD) is becoming an increasingly significant concern for EOD teams around the world. As global temperatures rise and weather patterns become more erratic, the conditions in which EOD missions occur are changing, presenting new challenges and risks. Climate change is also causing increasingly unpredictable and extreme weather events, such as hurricanes, floods, and wildfires, amplifying hazards where Explosive Remnants of War (ERW) are present.

ERW becoming more unstable and hazardous due to changing environmental conditions is an example of a significant risk created by climate change. Erratic temperatures and changes to humidity and groundwater levels may destabilize explosive chemical compositions, increasing their volatility and the likelihood of accidental detonation. Changing precipitation patterns may displace ERW, making their detection and removal more challenging. Additionally, while extreme weather events similarly impact the volatility of explosives and ERW mitigation, they also pose a direct risk to EOD personnel and missions, further complicating disposal efforts and increasing the overall hazard.

Climate change concerns extend to coastal areas as well. EOD operations are exacerbated underwater. Where sea level rise and ocean acidification impact the stability and integrity of underwater munitions disposal sites, materials can be expected to degrade, releasing hazardous materials into the marine environment. This presents a dual challenge for EOD teams, as they not only have to contend with the increasingly unstable munitions, but also with the environmental consequences of their disposal efforts.

Furthermore, the changing climate can also affect the capabilities and reliability of EOD equipment. High temperatures and extreme weather conditions can impact the performance of advanced technologies used in bomb detection and disposal. Explosive tools may not function as required, detectors may fail, and protective equipment may be unusable, all leading to operational inefficiencies and increased risks for EOD personnel.

In response to these challenges, EOD teams have to be actively working to develop adaptive strategies and technologies to mitigate the impact of climate change on their missions. This includes enhancing predictive modeling for the behavior of explosives and ordnance in changing environmental conditions, improving the capability of EOD equipment to withstand a wider range of climatic challenges, and implementing refined protocols for munitions disposal to minimize environmental impact.

Lajos Zsolt SZILAGYI
OF-5

Blake Zenteno
OF-4

Denmark

Climate change is a severe global challenge with adverse security policy consequences and consequences for emergency management. It affects the geostrategic landscape and poses risks to the safety and security of Danish Defence, as well as to the infrastructure, supply chains and environment on which they are dependent – at home and abroad.

As a result, it is important to prepare the Danish Defence and the Danish Emergency Management Agency (DEMA) for the potential impact of climate change by adapting to and mitigating these effects in the short and long term.

The Danish Ministry of Defence (MoD) is already committed to climate change adaptation and mitigation efforts. Preparing Danish Defence for climate change is thus a priority for the MoD. This reflects the Danish government's "A green and sustainable world" from 2020, NATO's "Climate Change and Security Action Plan" from 2021 and EU's "Strategic Compass" from 2022.

It is a priority for the Danish government that all government agencies, including the MoD and its agencies, take lead in the green transition by e.g. improving climate adaptation efforts and assuming greater responsibility for the development of green technologies. This includes an ambition to reduce carbon emissions by 70% by 2030.

The MoD has already set out ambitious efforts towards reducing emissions in "the Green Action Plan 2021-25", including 46 individual short and long-term initiatives within seven focus areas. In addition, the Danish government launched "The Climate Partnership for Defence" in 2021 to provide input to a further reduction of the Danish Defence's climate footprint.

At the core of the MoD's approach to climate security is the overarching guideline that all efforts to realise our green ambitions should support operational effectiveness and not compromise the ability of Danish Defence and the DEMA to conduct military or emergency management operations and activities. At the same time, new green technologies also provide opportunities to improve operational capability, military and civilian effectiveness and resilience.

Denmark will continue to cooperate closely with allies, partners and like-minded countries on the climate security agenda, especially within organizations such as the UN, the EU and NATO. This includes coordinating our adaptation and mitigation efforts to ensure that Danish military capabilities are compatible with the capabilities of allies and partners.

In 2024, the Danish MoD launched a new policy to prepare the Danish Defence for climate change. This policy includes five lines of effort in the Danish MoD's approach to climate security: Improve knowledge and competencies to predict and act on challenges associated with climate change and enhance coordination across the MoD and beyond, Initiate efforts to take into account the potential for adaptation and mitigation efforts during operational planning, Enhance adaptation and mitigation efforts in capability development and in the Danish defence industry, Continue the MoD's efforts to reduce emissions and our climate footprint, Promote awareness on climate security related risks in international fora such as the UN, EU & NATO.

Danish Ministry of Defence

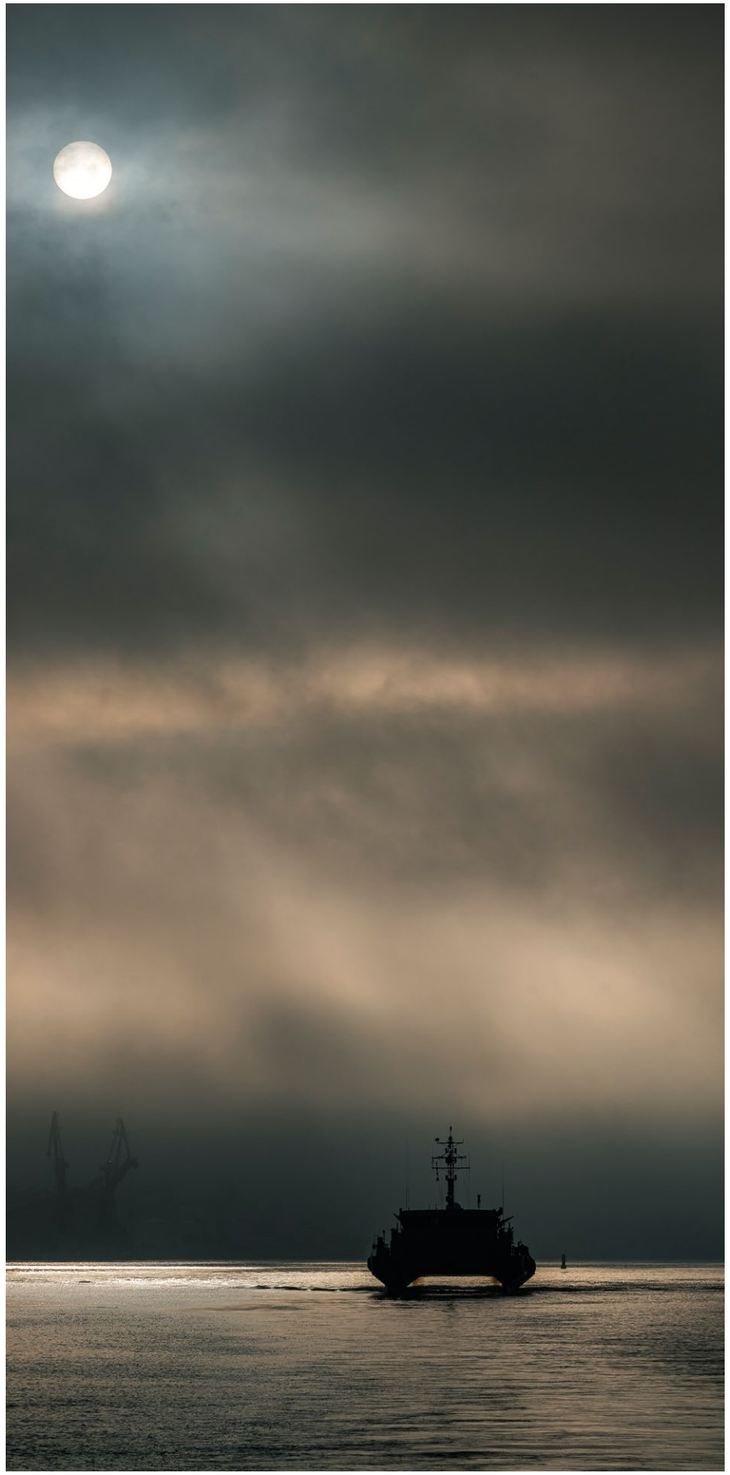


Photo Credit: Ministry of Defence of Latvia/srž. Ēriks Kukutis

HIGHLIGHT

NATO and Partners Unite at the 3rd Allied Land Climate and Energy Conference

CCASCOE had the privilege of presenting and moderating at the 3rd Allied Land Partners Conference, which focused on Climate and Energy. This significant event brought together experts and leaders to address why climate security matters, the implications of resource scarcity and instability, energy security, associated challenges, and the necessity of addressing climate security collaboratively. Speakers from organisations such as DRDC, Naval Postgraduate School, NATO MGEOMETOC COE, ENSEC, NATO HQ, IOM, SHAPE, and the UN Security Council provided valuable insights, fostering a robust and enlightening dialogue. The impact of this conference lies in its ability to bring together diverse perspectives, fostering cooperation and shared strategies to address the global threat of climate change, ultimately strengthening our collective security and resilience.

"As the Deputy Commander for LANDCOM and on behalf of General Daryl Williams, I would like to extend my heartfelt thanks to all of you for your invaluable contributions to our conference. Your presence here in Antalya, your thoughtful discussions both inside and outside the sessions, and your representation of your nations have been truly appreciated.

Our partnerships are everything. Cooperative security is one of NATO's three core tasks, and for us at LANDCOM, this is fundamentally about military cooperation. There is no better example of this than our gathering here, where we have engaged in meaningful discussions, shared our cultures, and strengthened our relationships.

It is these strong bonds that enable us to face and overcome our challenges. Climate change is a global threat that requires a global response, and I am so glad that we are working together as partners to address it."

Lieutenant General Zanelli
Deputy Commander LANDCOM

HIGHLIGHT

It has been a pleasure and privilege for the NATO Climate Change and Security Centre of Excellence (CCASCOE) to participate in and contribute to the inaugural NATO Climate Change and Security Course at the Naval Postgraduate School. This first-of-its-kind course, dedicated to the increasingly central topic of climate security, marks a significant step in advancing NATO's capability to address climate-related security risks.

The students, an exceptionally diverse group from across the Alliance and several partner countries, brought invaluable experience and perspectives, enriching the course's focus on the intersection of climate change, national security, and military operations. Through case studies, scenario-based learning, and expert-led discussions, participants explored climate change threats, adaptation strategies, and the critical role of militaries in responding to these challenges.

CCASCOE extends its deepest thanks to the outstanding teams at the Naval Postgraduate School and NATO's Science and Technology Organization – Centre for Maritime Research and Experimentation (STO-CMRE) for their hard work and commitment. Their expertise made this course possible, providing participants with the knowledge and tools to make strategic decisions on mitigating and adapting to climate threats.

Looking forward, CCASCOE is excited to continue building on this course, expanding NATO's climate security training and outreach in partnership with these exceptional organizations. This week marked an important milestone in the collective effort to ensure that NATO and its partners are prepared to face the evolving security landscape shaped by climate change.

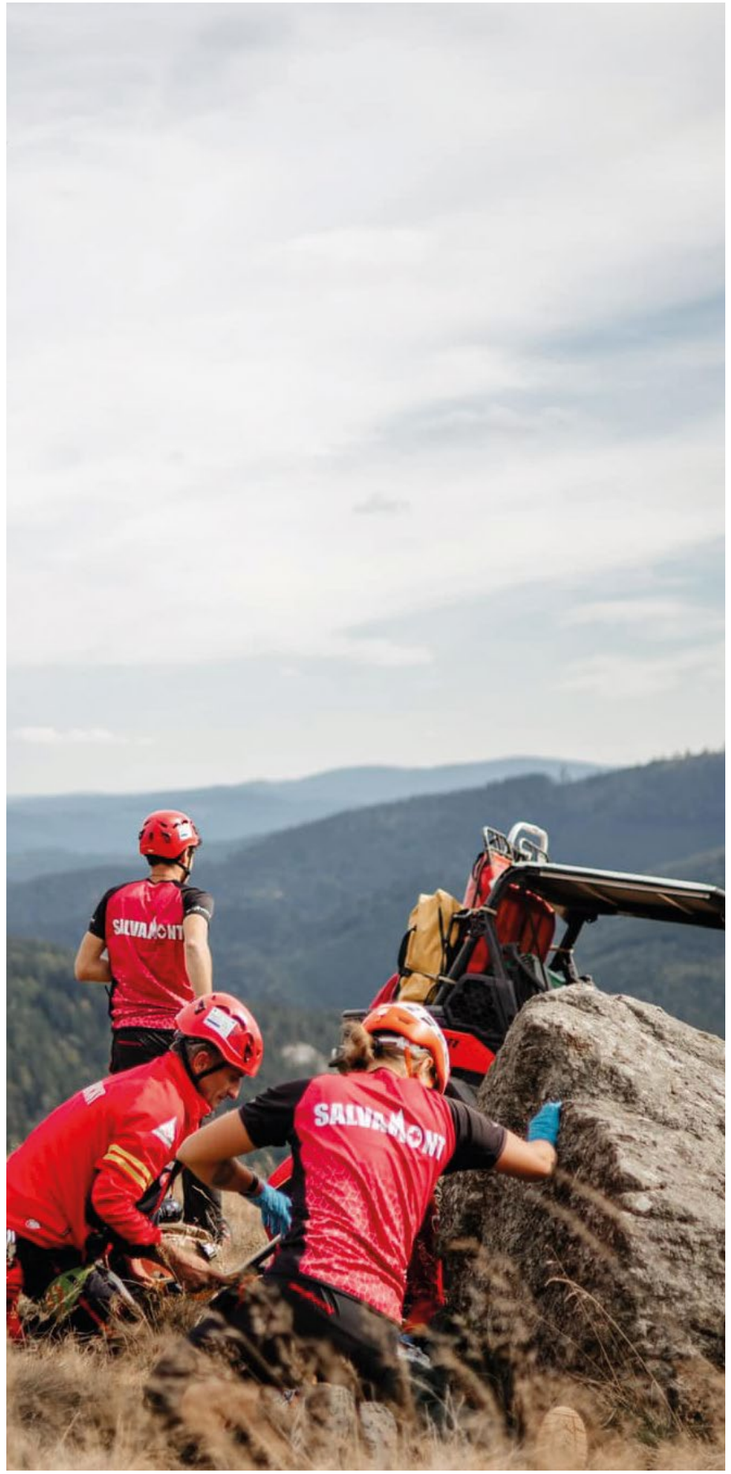


Photo Credit: Romanian Air Force

Training and Education

CCASCOE can play a role in providing training expertise for Allied organizations and member nations. As the field of climate security evolves, encompassing the latest realities of climate change and the resultant security implications for military organizations, it remains crucial that personnel keep up to date with relevant information in order to better inform their duties. As a priority, CCASCOE will continue to highlight elements of the NATO Climate Change and Security Action Plan, encouraging the adaptation to climate change realities, the awareness of the effect of climate change on local/regional security situations and the mitigation where possible of climate change effects.

The centre will continue to pursue engagement with staff officers as well as senior personnel through the offering of accredited courses, convening of conferences and workshops, and novel initiatives like wargaming and analysis exercises. Collaboration with renowned experts from academia, military colleges and industry will facilitate the design and delivery of these initiatives and CCASCOE will continue to strive in its commitment as an important training and education resource for NATO in the field of climate change and security.

Photo Credit: Institute of Security Governance

HIGHLIGHT

The NATO Climate Change and Security Centre of Excellence (CCASCOE), in partnership with the Institute for Security Governance (ISG), participated in the inaugural "Climate and Environmental Security" Regional Course in Quito, Ecuador. This course was conducted alongside several leading organizations in the climate security field, including the William J. Perry Center for Hemispheric Defense Studies, adelphi, the United Nations Office of Drugs and Crime, and the Pacific Disaster Center Global. The course brought together over 30 participants from agencies, ministries, and militaries in Ecuador, Argentina, Colombia, Paraguay, and Uruguay.

Participants engaged in discussions and exercises focused on critical themes such as the security impacts of climate change, disaster management, environmental protection, and strategies for building climate-resilient militaries. The course aimed to equip emerging and current leaders with the knowledge and skills necessary to make strategic decisions at the intersection of climate change and national security. It also provided an invaluable platform for learning and coordination, fostering enhanced climate security efforts across South America.

The course achieved several key objectives:

- Examination of emerging climate threats and their implications for national security.
- Improved understanding of the role of armed forces in addressing climate and environmental risks.
- Identification of shared climate and environmental security challenges.
- Development of knowledge on approaches to building climate-resilient societies and ecosystems.
- Strengthening of professional networks across diverse communities.

FRANCE

Climate & Defence: Adapt today to success tomorrow

Climate change is one of the major challenges facing humanity this century and beyond. Its consequences for the physical environment, the biosphere and human societies will be considerable, with rising temperatures, changes in precipitation patterns, and rising sea levels worldwide. Overall, climate disruption will be a "catalyst for chaos[1]", amplifying risks and threats of all kinds, and will contribute increasingly to international insecurity and instability.

As one of the main actor of international relations disposing of active operative armed forces, France has concretized its climate assessment and political will through a Climate & Defense Strategy adopted in April 2022[2]. Built on four pillars, it can be summarized in one sentence: adapt smartly and efficiently the whole military today to fulfill entirely and successfully our duties tomorrow.

Through Anticipation, the first pillar, France intends to update constantly its science-based assessment of the climate situation and all related strategic challenges. It means both to understand the complex interactions between climate change, security and the implications for defense, and to train all relevant personal from the ministry to raise the awareness level (via serious games like the Climate & Defense Fresco).

Adapt, core of the strategy, is the second pillar. Coming with the idea of assessing all the ways climate change is going to impact our civilian and military staff, our equipment's and platforms, our infrastructures and missions to build our resilience. To achieve this, France develops for instance a detailed exposure and vulnerability assessment of all its key assets, inland and overseas. She has also published a Joint Staff Special Report gathering contributions from all armies, directorates and services that will be used to draft adaptation roadmaps with concrete objectives, measures and indicators by the end of 2025.

Mitigate, the third pillar of the strategy, urges us to reduce our carbon footprint while never compromising our operational capabilities. The privileged approach is to combine these two objectives through, for instance, the implementation of EcoCamp[3], a projected basecamp using solar panels and recycling water technologies. By improving its self-sufficiency and reducing the supply convoys, highly vulnerable to attacks, it will reduce significantly all GHG emissions.

Finally, the fourth pillar deals with cooperation that could be one of the greatest challenges. Coping with climate change, our aptitude to share our assessment and good practices, mutualize our capabilities and efforts to cover all risks in all regions will be absolutely crucial. That can be done through intense bilateral dialog with partners and multilaterally, using existing frameworks like EU or NATO which successfully positioned itself as the first security organization addressing climate issues.

If platforms or soldiers must contribute to mitigation efforts, priority must be given to their adaptation and resilience, to be certain that we will continue to operate efficiently and successfully in more hostile environments due to heat, moisture, extreme weather events, etc.

[1] Expression used by the French Chief of the Defence Staff, General Thierry Burkhard, during MEDEF speech on August the 24th 2024.

[2] Climate & Defence Strategy, 2024.

[3] https://www.youtube.com/watch?v=B3ynMTh7R5o

We must put this goal high at the agenda to secure both the existing capabilities performance until the end of their life cycle and the relevance of new design warfare systems to post 2050 climate conditions. This could be the only path to maintain an advantage over our strategic competitors.

The Permanent Secretariat for Climate and Defence
Joint Defense Staff
Ministry of Armed Forces

Photo Credit: Media Coulibaly / Reuters

NATO StratCom COE and Climate Security: Integrating Climate Considerations into Strategic Communications

The NATO Strategic Communications Centre of Excellence (StratCom COE), recognizes that climate change poses both environmental challenges as well as significant security risks, which highlights the need for strategic communication frameworks. Adversarial state actors, such as Russia and China, are already using climate narratives to shape global perceptions and advance their geopolitical interests. [1] Climate change is a prime target for disinformation as it is complex, contested, and existential. It is therefore necessary to integrate climate considerations into defence and security discourse.

Both Russia and China have framed their climate narratives in ways that are portraying themselves as responsible actors, while minimizing the environmental risks of resource exploitation, thus challenging Western efforts to address climate change (for example, in the Arctic). [2] In response, NATO StratCom COE has developed recommendations to challenge these narratives, emphasizing the need for transparent and fact-based communication about the true environmental impacts of Arctic activities. The StratCom CoE has recently concluded research on climate- and environment-based information activities by Chinese and Russian media. Further, since 2018, the NATO StratCom COE has produced research on how Arctic states, China, and NATO perceive themselves, other actors, and the Arctic as a distinct geographical region, which also touches upon climate-related strategic narratives. The research underscores the importance of exposing the inconsistencies in Russian and Chinese messaging, particularly their divergence between rhetoric and actions on sustainability. [3] [4]

Photo Credit: Scott Olson / Getty Images

A key initiative of StratCom COE is analyzing climate-related disinformation and strategic narratives employed by state actors in the Arctic and Nordic-Baltic regions. Since 2016, through the ongoing Nordic-Baltic project, we have mapped and analyzed Russian and Chinese influence operations in this information space. Notably, from 2019 onwards, the Kremlin's communications about Nordic countries increasingly featured climate change narratives aimed at belittling the 'green agenda' promoted by activists like Greta Thunberg, introducing conspiracy theories about environmental activists being manipulated for political goals, and dismissing climate change as 'climate hysteria' that contradicts science.

The StratCom COE is also working on collaborative efforts to address climate security within a broader defence and security context. By integrating climate considerations into strategic communication initiatives, the Centre aims to foster a more coordinated response to the environmental challenges facing the Arctic, which are exacerbated by both geopolitical competition and the tangible effects of climate change.[5]

Looking forward, the StratCom COE envisions further collaboration with other COEs to develop joint strategies that enhance resilience against climate-related security threats. One potential area for collaboration is the creation of a cross-COE working group focused on climate disinformation, allowing for the exchange of best practices and the development of unified responses to state-driven climate narratives. Additionally, the Centre sees an opportunity to work together on sharing expertise and insights, for example, when organising seminars and conferences where the effects of climate change will be discussed. In addition, the potential for public communication campaigns can be explored: this would promote accurate and transparent information regarding climate security, both within NATO member states and to global audiences.

The StratCom COE's work on Arctic narratives and climate-related disinformation demonstrates the critical role that communication plays in addressing the security risks posed by climate change. By continuing to collaborate with NATO COEs and developing innovative strategies, the StratCom COE aims to enhance the Alliance's ability to respond to the complex and evolving challenges of climate security, and to demonstrate the Centre's commitment to integrating climate considerations into the broader strategic communications landscape.

Yukai Zeng

Senior Expert, NATO Strategic Communications Centre of Excellence

Contributing Authors

Aron Bonanno, Sanda Svetoka, Elina Lange

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[5] Mackenzie Allan, I. (2021). Arctic Narratives and Political Values: Arctic States, China and NATO. Riga: NATO Strategic Communications Centre of Excellence.

Archipelago of Design

Mobilizing the Promise of Serious Games for Climate Change and Security

The Archipelago of Design (AOD), a global not for profit organization empowers leaders in shifting mindsets to set conditions for evolution and address complex situations across NATO members and partners. The AOD takes climate change seriously for security. For AOD, challenges driven by climate change demands humility since the shift of mindsets required not only to address them, but to fully comprehend them is not yet imaginable for most security organizations including ourselves. For the AOD, developing transformative serious games collaboratively will contribute to accelerating the transition towards people and organizations that are climate change ready at scale. Most importantly, the creative and experimental aspects of this project will have the potential to push boundaries in the way leaders and organizations think about climate change and security.

With these objectives in mind, AOD will organize a "Game Jam" Workshop, to be held during the St. Petersburg Conference on World Affairs on February 4-5, 2025 in collaboration with the Global and National Security Institute (GNSI) and CCASCOE.

This workshop aims to equip defense professionals with a deeper understanding of the geopolitical and security implications of climate change, thereby enhancing their preparedness for climate-related emergencies domestically and internationally. Participants will collaborate in teams to develop playable analog game prototypes centered on the theme of climate change and security. The workshop format fosters creativity, collaboration, and innovation through structured activities emphasizing problem-solving and rapid prototyping. The event will culminate in a showcase of prototypes, judged by a panel to select the top three winners. By co-hosting this event with GNSI, we hope to attract a diverse group of participants, including junior and senior defence professionals, climate and security experts, and students and academics from University of South Florida and abroad.

The project's outputs will include a summary report of workshop activities, a game design document based on the winning prototype, and a playable analog prototype. These will be accessible to the Department of National Defence (DND), Canadian Armed Forces (CAF) members, CCASCOE and the public. We hope to further develop the prototype into a video game in partnership with CCASCOE, which will be widely accessible to DND/CAF and NATO members/partners, demonstrating a commitment to innovative solutions in addressing climate change's geopolitical and security implications.

The primary objective of the workshop is to develop a game prototype that enhances training and education on climate-related security issues. The game will complement existing planning, operations, and readiness approaches, ensuring defence organizations and professionals are equipped to anticipate and respond to climate-related emergencies. Building on previous projects, including supporting the launch of NATO CCASCOE and organizing other game design workshops, this initiative will advance understanding of the geopolitical and security implications of climate change in an engaging format that can speak to different audiences and stakeholders.

We will work with CCASCOE to define key themes for the workshop to explore to ensure CCASCOE's goals and objectives are met. Participants will develop game scenarios and mechanics to address these themes, with the intent of aiding military personnel in understanding how climate change impacts security, planning, operations, intelligence, and logistics.
More information on this project will be available soon on our website at www.aodnetwork.ca

ARCHIPELAGO

Photo Credit: Archipelago of Design

Photo Credit: Archipelago of Design

Germany

Germany's Approaches and Initiatives in the Field of Climate Security

The climate crisis is a defining challenge with profound impacts on our security and defense. By exacerbating existing crises and creating new ones, climate change adversely affects global peace and stability. We believe that the key for a more secure future is for the world to transition away from fossil fuels in energy systems in a just, orderly and equitable manner to achieve net zero by 2050. At the same time, we will have to adapt to harsher conditions. These changing climatic conditions will also affect our armed forces' operational environment. NATO has recognized these challenges and has been increasing its efforts to better understand and adapt to the effects of climate change.

Extensive research has been done on the overall effects of climate change. What we still need to build is specific expertise with regards to the scientific, technical and security policy implications of climate change on our armed forces and future areas of operation.

Against this background, Germany very much welcomes the establishment of CCASCOE as a dedicated Center of Excellence for Climate Security, which will develop expertise on how to improve operational effectiveness, how to reduce climate and environmental impacts of the military sector and how to better react and adapt to climate-induced risks. In doing so, CCASCOE will not only build on existing work on climate and security, but also benefit from close cooperation with partners. As a Center of Expertise, CCASCOE will significantly contribute to strengthening NATO's analysis and evaluation capabilities in this field. As a scientific anchor for sponsoring nations and NATO, it will enable the alliance to prepare for future scenarios in a climate-changed world.

As a leader in advancing the climate, peace and security nexus in the past years, and having recognized the key role of climate change in its National Security Strategy, Germany looks forward to future collaboration with CCASCOE.

Germany has expanded its engagement on climate and security both on the national and international level. On the national level, the Federal Foreign Office launched its Climate Foreign Policy Strategy in 2023. The Federal Ministry of Defence has published two trend-setting documents in the past 12 months. While the Sustainability and Climate Protection Strategy (2023) aims at establishing sustainability as a guiding principle of action, and lays out efforts to mitigate the armed forces' greenhouse gas emissions, the Strategy on Defence and Climate Change (2024) lays the groundwork for adapting our armed forces to the effects of climate change.

At the UN, Germany has focused on climate and security in past Security Council Presidencies. It supports the UN Climate Security Mechanism, and serves as a co-chair of the UNSC Group of Friends on Climate and Security. Both within NATO and the EU, Germany is a founding member of Groups of Friends that aim at strengthening the climate and security nexus. The Berlin Climate and Security Conference has become a central global platform for addressing security-related aspects of climate change. Furthermore, the Federal Foreign Office and the Federal Ministry of Defence have jointly commissioned the forthcoming National Interdisciplinary Climate-Security Risk Assessment (NiKE) which analyses climate-induced risks for Germany's national security.

Federal Ministry of Defence

Federal Foreign Office

Concept Development and Experimentation

Climate change has been increasingly analyzed as a threat multiplier for security, and due to its nature as an indirect threat or risk, this concept requires new development, explication and doctrine formulation. In this area, CCASCOE is a natural organization to play a leading role in guiding NATO organizations and member nations through these considerations.

The centre's work aims to bring climate security considerations to the mainstream, adapting and incorporating existing NATO doctrines and concepts to be applicable to this new challenge. As the Alliance continues to respond to the realities of climate change and the resultant security landscape, CCASCOE will provide expert guidance on how military organizations can better adapt to and mitigate the effects of climate change. Furthermore, experimentation using technological advances (e.g., AI) will serve to maintain the relevance and urgency of the topic and better inform the new concepts and doctrine whose development CCASCOE will champion.

Photo Credit: CCASCOE / LtCol Cristian Ciulean

HIGHLIGHT

Resilience in a NATO context refers to the capacity, at national and collective levels, to prepare for, resist, respond to, and quickly recover from strategic shocks and disruptions, across the full spectrum of threats.

Climate change will challenge military resilience by increasing the frequency and severity of natural disasters, disrupting supply chains, and exacerbating geopolitical instability.

This is why, alongside NATO STO-CMRE – Centre for Maritime Research and Experimentation and UK Ministry of Defence, we were honoured to deliver a 'deep dive' workshop into climate change impacts with the Military Infrastructure Thematic Working Group to inform the development of the NATO Layered Resilience Concept due in 2025.

We're committed to supporting NATO in integrating and mainstreaming climate security and this deep dive exploration was a good example of how we can collaborate to build a resilient future for military infrastructure. The insights and recommendations from this initiative will play a pivotal role in shaping the Alliance's approach to climate resilience and the development of the NATO Layered Resilience Concept in 2025.

HIGHLIGHT

In August, CCASCOE had the privilege of hosting Philippe Beaulieu Brossard, Director of Archipelago of Design, for a pre game design workshop as part of our innovations in enhancing training and education for DND/CAF and NATO.

This workshop focused on preparing the ground for the future development of a wargame prototype to address climate-related security issues. Philippe also shared the Shadows of Byzantium Game, which provided valuable insights into using strategic games as tools for climate security education.

We are excited to support this MINDS funded project (Mobilizing Insights in Defence and Security) *https://www.canada.ca/en/department-national-defence/programs/minds.html* efforts and look forward to the impact this initiative will have on shaping future policy and strategy.

HIGHLIGHT

CCASCOE were delighted to participate in the Advanced Research Workshop: Unravelling the Cyber-Physical-Social Infrastructure Climate Change (CPSICC) Nexus, that take place from July 29, 2024, to August 1, 2024, in Washington, DC.

Supported by NATO's Science for Peace and Security Programme and co-funded by the DHS Science and Technology Directorate (S&T), this workshop brought together experts from academia, government, industry, and policymaking from NATO member and Partner countries.

This highly interactive workshop aimed to:

- Identify the building blocks of risk at the nexus of climate change, cybersecurity, and critical infrastructure.
- Develop a roadmap for securing the future and minimizing compound risks to national security and defence.
- Formulate recommendations and foster international partnerships to address these multifaceted threats.

We look forward to collaborating with global experts to set an agenda for research and development in this vital area.

Research and Innovation

CCASCOE, has been distinctively organized according to a principle of prioritizing research and innovation.

With dedicated staff working on research and analysis in the field of climate security, the centre is well-placed to act as a reputable, knowledgeable and accessible organization supporting NATO groups as they begin to account for climate security considerations in their exercise/mission planning.

One priority support function includes contributing to academic literature highlighting considerations for NATO as an actor in this field, particularly within the context of a broader landscape which includes the informed perspectives of academic, industry and nongovernmental organizations. Additionally, CCASCOE aims to draw on the expertise of the wider community in order to capably and authoritatively inform on NATO activities, whether in support to exercise planning or advising on climate security considerations in active missions or operations.

Such a "reach back" link is established via links and networks to CCASCOE's Framework/Sponsoring Nations, and a broader climate change and security community of interest researchers can be drawn upon when more specific support of niche expertise is required. Under this mandate and throughout the early initiatives of CCASCOE, the centre will accrue the expertise necessary to become a reliable source for NATO, serving as a convener of technological innovation efforts in this field and leading the efforts toward a more climate-resilient Alliance.

Photo Credit: Bundeswehr

NATO Energy Security Centre of Excellence

Interlinking Energy Security and Climate Change: NATO's Strategic Imperative

This outreach explores the intersection between energy security and climate change from the North Atlantic Treaty Organization (NATO) vantage point. Against evolving geopolitical dynamics and environmental challenges, NATO's strategic imperative encompasses a nuanced understanding of how energy security and climate change intertwine and affect global security dynamics.

The analysis draws upon 2022 NATO's strategic concept and recent pronouncements from key stakeholders during the last NATO summit in Washington, within the alliance to delineate the fundamental areas of cooperation between energy security and climate change.

NATO's strategic concept emphasizes the inseparable linkages between energy security and climate change, recognizing them as pivotal elements shaping contemporary security paradigms. Energy Security, defined within NATO's strategic discourse, transcends mere access to energy resources to encompass resilience against disruptions, diversification of energy sources, energy efficiency and mitigation of vulnerabilities arising from energy dependencies. Concurrently, climate change poses multifaceted security challenges, including exacerbating geopolitical tensions, humanitarian crises, and the proliferation of non-traditional security threats.

The need for collaboration between energy security and climate change stems from NATO's commitment to ensuring its member states' and partner nations' stability, sustainability and resilience including military forces. Recent statements from NATO's leadership highlight the need for a comprehensive approach to address the link between energy security and climate change, recognizing them as interconnected and complementary challenges that require collective action. By prioritizing resilience-building, NATO underscores the importance of strengthening energy infrastructure, promoting energy efficiency, and supporting the use of renewable energy as key elements of climate adaptation and mitigation strategies.

Furthermore, NATO's strategic approach emphasizes the importance of harnessing emerging technologies and fostering innovation to tackle energy security and climate change challenges effectively. Recognizing the transformative potential of alternative energy technologies and energy transition initiatives, NATO advocates for increased collaboration with industry stakeholders, academia, and international organizations to facilitate technology transfer, interoperability and capacity-building efforts.

The convergence of energy and climate security represents a defining feature of contemporary security frameworks, necessitating concerted action and strategic cooperation among NATO member states and partners. By embracing a comprehensive and common approach that integrates energy security considerations into climate change mitigation and adaptation strategies, NATO seeks to enhance the resilience and sustainability of allied nations, thereby reinforcing collective security and stability in an era of unprecedented global challenges.

Climate Security Association of Canada

The Climate Security Association of Canada (CSAC) is a community of interest and expertise on climate security that brings together academics, students, policymakers, practitioners, journalists, and other professionals. First established by a group of Canadian university professors in 2022 and centred at the Raoul-Dandurand Chair in Strategic and Diplomatic Studies at the University of Quebec in Montreal (UQAM), CSAC works to build and consolidate a wide-ranging and diverse climate security community. It promotes communication, networking, and the mobilization of knowledge and research about climate security across different sectors. It strives for collaborative and evidence-based responses to the security risks of climate change. CSAC approaches the relationship between climate change and security in broad terms, considering challenges to national and international peace and security as well as its impact on human well-being, ecosystems, and global justice. Effectively addressing these issues requires interdisciplinary theorization, analysis, and policy development, and CSAC was conceived as a platform to encourage and support such thinking, discussions, and collaboration.

CSAC has held three international conferences to date: two annual conferences in Montreal in March 2023 and April 2024, and a meeting in Victoria, BC in February 2024. These meetings have attracted a diverse range of scholars, policymakers, and practitioners from across Canada, the United States, Europe, Africa, and South Asia, exploring a range of contemporary issues and concerns in the field of climate security, such as the transformation of international relations, emerging regional challenges, civil-military coordination for climate-related disasters, policy coordination challenges for climate security policymakers, the transition to low-carbon military forces, and NATO's climate security challenges. The Victoria meeting focused on regional issues in Western North America and the Pacific. Future meetings include workshops on the Arctic in December 2024 and on the Indo-Pacific in early 2025, and the annual CSAC Montreal meeting that will be held in May 2025.

Most importantly, CSAC is committed to fostering and mentoring the next generation of climate security leaders in Canada. CSAC established a fellowship program in 2023 to support emerging climate security experts. Five fellowships were awarded in 2024 to graduate students and young scholars for a range of climate security research projects: on Canada's defence posture in the Arctic; on gender and disaster response operations in South and Southeast Asia; on Canadian policy regarding the energy transition; on the global governance of geoengineering; and on climate change and civil disobedience. The first cohort of CSAC Fellows presented their work plan at the Pacific Climate Conference and Career Development Workshop in February 2024. Their research projects will be published at the end of the fellowship through various platforms.

CSAC activities and meetings have also been opportunities to work and engage with Canadian officials from Global Affairs Canada, from the Department of National Defence, and from the Canadian Armed Forces. In 2024, CSAC welcomed to its annual event several members of the NATO Climate Change and Security Centre of Excellence (CCASCOE), including a keynote speech from its director, Mathieu Bussières. It also hosted the annual workshop of the NATO Research Task Group SAS-182, 'The Effects of Climate Change on Security', to which several members of CSAC and Canadian and NATO officials contributed. Such meetings foster networking, information exchange, and collaborative opportunities for academics and policymakers, thus building bridges and platforms for a stronger climate security community. Beyond community-building, such activities are also contributing to the conceptualization and implementation of evidence-based policy and Canada's and NATO's climate security action plans.

Lastly, CSAC supports and participates in ongoing climate security research projects. CSAC is part of the Coordinating Group leading the project on "Civil-Military Cooperation in Climate-Related Emergencies" (CASA). With funding from Canada and NATO, Project CASA is assessing the extent to which national militaries, especially in the EU and at NATO, have the necessary financial resources, experts, training, equipment, and facilities to effectively prepare for and respond to the increased occurrence of climate-related emergencies.

In the coming months and years, CSAC will consolidate and expand its fellowship program and research output. It looks forward to years of continuing engagement with CCASCOE and its allies, friends, and partners.

Bruno Charbonneau
President of CSAC

Tom Deligiannis
Vice-President of CSAC

Photo Credit: Affaires publiques de l'Armée canadienne/ Caporal-chef Louis Brunet

GHGSat Inc., Montreal, QC

Established in 2011, GHGSat operates a constellation of 12 satellites designed for the remote sensing of greenhouse gas emissions from industrial and military facilities worldwide. GHGSat is capable of detecting methane and carbon dioxide emissions greater than 100 kg/hr with a surface spatial resolution of less than 30 metres. (Figure 1) shows an onshore (land) observation of a methane plume in Ukraine. GHGSat is also capable of observing greenhouse gas emissions from offshore (ocean) facilities. On September 30, 2022, GHGSat made the only satellite observations of methane emissions from the Nord Stream 2 pipeline leak in the Baltic Sea (Figure 2).

GHGSat's satellite technology is highly relevant to the NATO Climate Change and Security Centre of Excellence (CCASCOE). Analogous to national technical means of verification during the Cold War, GHGSat's satellites offer a contemporary method for verifying compliance with climate treaties such as the Paris Agreement. Transparent, verifiable, and comprehensive data on greenhouse gas emissions is crucial for assessing whether emission reduction targets are being met and for supporting global climate security efforts. Ultimately, this capability could contribute to a strategic detection and alerting system in partnership with CCASCOE, helping to identify rogue emitters and providing actionable data for diplomatic follow-up.

GHGSat's global monitoring capabilities are closely aligned with CCASCOE's goal of enhancing international collaboration on climate security. Since 2019, GHGSat has been collaborating with the European Space Agency's Sentinel-5P satellite team through which methane enhancements detected by TROPOMI (Tropospheric Monitoring Instrument) are followed-up with high-resolution GHGSat imagery. GHGSat's data is available to climate researchers through NASA, ESA, and the U.K. Satellite Applications Catapult.

GHGSat's extensive global perspective on greenhouse gas emissions could present an opportunity not only for identifying potential climate-related flashpoints but also anticipating and addressing emerging threats. For example, GHGSat's timely response to the 2023 earthquakes in Türkiye, by monitoring gas pipelines, demonstrates how satellite data can support disaster management and security efforts. This capability facilitates the development of targeted strategies to address natural disasters, conflicts, or political instability exacerbated by climate change, thereby contributing to more robust climate security measures.

Lastly, integrating greenhouse gas emissions data with geopolitical information from CCASCOE could offer valuable insights, particularly in using emissions as a proxy of industrial activity. This approach could help assess the effectiveness of sanctions and embargoes. For instance, elevated emissions might suggest that factories are operating at higher capacity due to the illicit availability of fuel and other resources. Moreover, combining greenhouse gas data with additional intelligence sources, such as visible and infrared imagery or synthetic aperture radar, could provide unique strategic insights and enhance the understanding of global climate security dynamics.

Olympe Durrenberger
Corporate Development Analyst, GHGSat

Eric Choi
Director of Business Development, GHGSat

Observation ID:	DZu05ry
Satellite:	GHGSat-C3 (Luca)
Trigger Time (UTC):	2022-06-20 10:55:46
Location:	Luhansk Oblast, Ukraine
Coordinates (Lat/Lon):	48.637708, 39.360933
Source Rate:	5,500 kg/hr
Plume Assessment:	YES

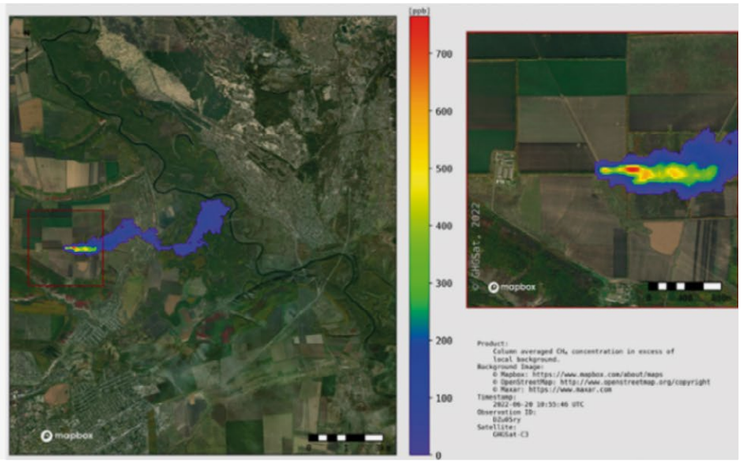


Figure 1: Satellite, GHGSat Inc

Figure 2: Satellite, GHGSat Inc

HIGHLIGHT

From July 16-18, 2024, we had the privilege of remotely attending and presenting at the Advanced Research Workshop on Climate and Security Action: The Role of Civil-Military Cooperation.

This event, organized by the Crisis Management and Disaster Response Centre of Excellence (CMDR COE) and the Geneva Centre for Security Policy, was held under the NATO Science for Peace and Security (SPS) Programme.

The workshop was part of the "Climate and Security Action through Civil-Military Cooperation in Climate-Related Emergencies" (Project CASA).

Security experts from 20 NATO Allied and Partner countries met with active discussions to analyze the nature, extent, and effectiveness of civil-military cooperation in climate-related emergencies and aimed to enhance understanding of the climate and security nexus.

Data Collection and Analysis

CCASCOE aims to be a hub and convener for accessing data and information related to climate security. Certainly, there are many stakeholders working in the field, and accordingly many avenues to find, access and interrogate relevant data. In general terms, academia, think tank organizations and military groups affiliated with NATO continue to identify data, develop methodological practices and report on resultant analyses. CCASCOE, in its unique position as an interface to these organizations, can thus play a role in curating the outputs produced by this broad landscape of contributors and act as a reliable source for NATO partners. Early plans include the development of a data and information hub for users to access reputable, cutting edge and informative sources for data and analysis related to climate security.

In particular, the distinctive research capability of CCASCOE (as evidenced by its organization structure and member nation personnel commitments) can better facilitate these cross-cutting sharing efforts and provide a useful resource for practitioners from the diverse groups of stakeholders working in the field of climate security. The ready availability of important, topical and relevant data and analysis tools from the broad community will hopefully lead to strong collaborations, streamlined access and ultimately more informed decision making.

Photo Credit: CMDRCOE

Photo Credit: Norwegian Ministry of Defence

Greece

The Hellenic (Greek) Armed Forces are at the forefront of combating the effects of climate change. The battle is two-front: First, adaptation to climate change—second, climate change mitigation.

In institutional framework, the Ministry of National Defence (MNoD) of the Hellenic Republic issued in December 2020 the revised "Environmental-Energy & Climate Change Adaptation Policy." This policy describes how the Greek Armed Forces adapt to climate change and sets out the areas of environmental interest. Also, in March 2023, the MNoD issued the "Climate Change Adaptation & Mitigation Roadmap of the Armed Forces,"[1] which defines the priority axes of the Armed Forces in addressing the adverse effects of climate change and strengthening their resilience.

In an international setting, Greece uses NATO's and the EU's toolbox to address the effects of climate change. In that regard, Greece has incorporated the relevant NATO initiatives into its domestic institutional framework. The participation as a founding member-state to the newly founded CCASCOE underlines Greece's importance to climate change-related issues. Greece has also undertaken initiatives under the Permanent Structure Cooperation (PESCO) and the European Defence Fund (EDF), which are under the general framework of the Common Security and Defence Policy of the European Union.

Cross-cutting initiatives in the aspect of adaptation include the operational area (climate change impact assessment & risk analysis, integration of environmental parameters on the planning-execution phase, review of procedures, intelligence collection), the support area (vulnerability assessment of the protection of critical infrastructure and sites of significant cultural & environmental interest, driving safety, enhancing vehicle fleet, strengthening the supply chain, retaining 'sustainable' water supply, waste management, and ensuring healthy working conditions), and the area of training and partnerships (research, innovation, and funding/resource allocation).

Relevant initiatives in the aspect of mitigation include operations ("green" operations), security, support (infrastructures' energy upgrade, reduction of the carbon footprint, water supply maintenance, transportation: electromobility, and promoting alternative modes of transport, logistics: control of energy and fuel consumption, use of renewable energy sources for self-consumption or net-metering, procurement based on Life Cycle Analysis, waste management: restriction, and biological water treatment), training (environmental modules), and partnerships (through synergies with international organizations, or bilaterally).

Let us give you some examples of how the Greek Armed Forces fight climate change: The installation of photovoltaic panels, generators, and accumulators on micro-islands in the Aegean Sea, the energy upgrade of the 1st Army Corps HQ (Larissa), and the 115 Combat Wing (Chania, Crete). Current efforts include the energy upgrade of 401 Military Hospital (Athens), the 424 Military Hospital (Thessaloniki), the Hellenic Tactical Air Force HQ (Larissa), the Hellenic Military Academy of Combat Support Officers (Thessaloniki), the Hellenic Academy of Nursing Officers (Vironas), and the Hellenic Army Academy (Vari).

Captain (HE N) Sarantis GIANNOUTSOS
Head of Environmental Policy, Hellenic National Defence General Staff

LT COL (HE AF) Nikolaos STRATIKIS
Head of Co-founded Projects, CCASCOE National Representative, Hellenic National Defence General Staff

[1] https://www.greenarmedforces.mil.gr/en/prosarmogi-ed-klimatiki-allagi-en/

Photo Credit: Ministry of Defence of Latvia/ srž. Ēriks Kukutis

Pacific Disaster Center Global

Safer and More Secure Together: PDC Global and CCASCOE

From the team at the Pacific Disaster Center (PDC Global) in Hawaii, aloha and congratulations to the NATO Climate Change and Security Centre of Excellence (CCASCOE) on its accreditation and its significant strides toward becoming a globally recognized hub of expertise at the intersection of climate change and security for both military and civilian practitioners.

PDC Global eagerly anticipates our collaboration with CCASCOE as we confront the slow onset mega disaster that is one of the most defining challenges of our time. Together, we aim to enhance the availability of anticipatory data on climate change and deepen the understanding of its impacts, advancing our shared mission of promoting climate awareness, mitigation, and adaptation.

PDC Global, a University of Hawai'i applied science and research center, stands as a global leader in disaster management science, early warning systems, advanced data science, and risk analytics.

The recipient of the 2022 United Nations Sasakawa Award for Disaster Risk Reduction, PDC's mission is to build safer, more disaster-resilient communities worldwide by equipping decision-makers and the public with the essential tools and information needed to protect lives and livelihoods, both now and in the future.

Over its 25-year history, PDC has partnered with numerous regional and international organizations, including NATO. It has supported NATO's interoperability exercises, Crisis Management and Disaster Response conferences, and disaster early warning capacity development across NATO member states in the Balkans, including Albania, Bulgaria, Montenegro, North Macedonia, and Kosovo (a non-member state).

About PDC: Capabilities and Resources

PDC also extends its support to countries across the Asia-Pacific region, North America, Latin America, and the Caribbean, enhancing disaster resilience and early warning capacities. In 2024-25, PDC will extend its climate and environmental security analyses to Europe and the Caucasus. The Center's DisasterAWARE platform remains the only global technology offering early warning for all, providing pre- and post-impact analysis for 28 different hazard types within minutes. Additionally, DisasterAWARE hosts the only global inventory of climate change hazard impact estimates for the year 2050.

Our Passion for Innovation: Building Climate Change Resilience through Actionable Insights

Climate change is the most complex and destabilizing issue of our time. The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) projects a temperature rise of 2.5°C by 2050, underscoring the global challenge that we need to work together to address. The sheer volume and complexity of scientific data on this topic can be overwhelming and difficult to distill, making it difficult to identify the most crucial actions within the appropriate timeframes.

To address this challenge, PDC has synthesized large volumes of complex scientific data into actionable insights that matter most to decision-makers across the disaster management and security spectrum. The analysis is scalable and available under two climate model and phase scenarios (RCP 4.5 SSP2 and RCP 8.5 SSP5). The results of the analysis inform adaptive measures and pinpoint investments and strategies that lead to greater resilience.

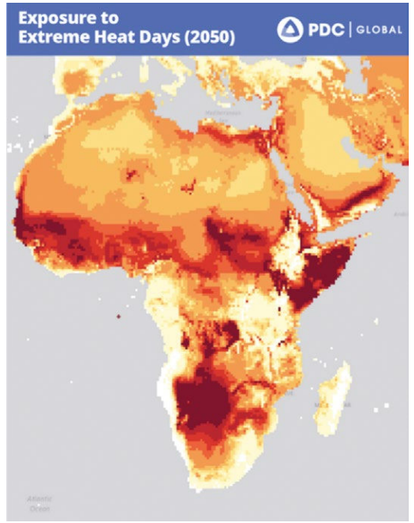
The Center's innovative new 2050 Global Climate Change Impact Analysis visualizes and quantifies climate change impacts, addressing critical questions such as:
What will sea-level rise look like at a local scale by 2050, and how will it impact critical infrastructure, military assets, and installations?

How will NATO's strategic environment, military assets, installations, missions, and operations be affected by the increase in extreme weather events? How will individual NATO members' ability to perform under increasingly challenging conditions be impacted?

How will extreme heat affect military forces, their performance, mission readiness, and the functionality of equipment?

How will civil society preparedness, existing vulnerabilities, and resilience be affected, particularly in areas of communications, energy, transportation, healthcare, and food supply chains?

Where is agricultural production and water supply most vulnerable, and where is resource scarcity likely to occur, leading to further instability, competition, and conflict?



Looking forward, the results of PDC's 2050 Climate Change Impact Analysis will be published later this year and made available to CCASCOE and all of our partners through the Center's DisasterAWARE platform and a digital data dashboard on PDC's website at www.pdc.org.

CCASCOE is poised to take a lead role in climate and environmental security for NATO and beyond. The partnership between PDC and NATO's newest Center of Excellence will be mutually-beneficial in advancing both understanding of and identifying responses to the accelerating impacts of a changing climate.

DisasterAWARE Pro® Access
https://disasteraware.org/register

DisasterAWARE Tutorials
https://disasteraware.org/tutorials

Advanced Analytics and Data Science
https://analytics.pdc.org

PDC Reports
https://www.pdc.org/reports-and-publications

National Disaster Preparedness Baseline Assessment (NDPBA)
https://www.pdc.org/ndpba

Training and Exercises
https://www.pdc.org/training-and-exercises

Photo Credit: PDCGlobal

The Canadian Defence and Security Network

Established in 2019, the Canadian Defence and Security Network (CDSN) is a NATO-relevant research community of interest comprised of over 40 partners mobilizing over 100 scholars uniting academics, policy-makers, military officers, and civil society. Anchored with several broad themes such as civil military relations, military personnel, operations, and security alongside directed themes covering climate security and NATO, global health, nature-triggered emergency response and domestic operations, and supply chain security, the CDSN focuses on developing the next generation of scholars, practitioners, and experts emphasizing equity, diversity and inclusion. It fosters future experts through education and training with methods workshops, its annual Summer Institute, post-doctoral opportunities, and book workshops. The network advances the body of scholarly knowledge through tailored research initiatives with the goal of informing policy making, communicating information to electorates as well as advancing public discussion on defense and security issues within Canada and its NATO partners.

It links research dissemination and consumption partners to facilitate cross-sector information transfer to capacity building and research production stakeholders through a formalized agreement structure to secure funding. It has obtained over $3 mil CAD in research funds. CDSN researchers have contributed 7 edited volumes, 16 scholarly books (plus 14 Book chapters), 75 policy papers, 37 peer-reviewed articles and counting across its eight themes in the past half-decade. It's multi-podcast network includes its flagship contribution Battle Rhythm along with francophone Conseils de sécurité as well as SecurityScape, Resilience Plus, Blacktalk and the NATO Field School's, Field Report. Together the network offers over 186 episodes exploring security and defense issues for its audiences. The CDSN is partially supported by the Social Sciences and Humanities Council of Canada as well as the Canadian Department of National Defence MINDS program.

CDSN THE CANADIAN DEFENCE AND SECURITY NETWORK | RCDS RÉSEAU CANADIEN SUR LA DÉFENSE ET LA SÉCURITÉ

Anessa L. Kimball
Professor of political science in international relations and Director of the Centre for International Security at Université Laval, Québec, Canada

Melissa Jennings
Chief Operating Officer of the Canadian Defence and Security Network, headquartered in Ottawa.

Photo Credit: Canadian Armed Forces/ Cpl Laura Landry

HIGHLIGHT

Research and Innovation

CCASCOE having recently been stood up as a NATO Centre of Excellence, has been distinctively organized according to a principle of prioritizing research and innovation. With dedicated staff working on research and analysis in the field of climate security, the centre is well-placed to act as a reputable, knowledgeable and accessible organization supporting NATO groups as they [begin to, continue to] account for climate security considerations in their exercise/mission planning. One priority support function includes contributing to academic literature highlighting considerations for NATO as an actor in this field, particularly within the context of a broader landscape which includes the informed perspectives of academic, industry and nongovernmental organizations.

Additionally, CCASCOE aims to draw on the expertise of the wider community in order to capably and authoritatively inform on NATO activities, whether in support to exercise planning or [informing mission advice, advising on climate security considerations in active missions or operations]. Such a "reach back" link is established via links and networks to CCASCOEs Framework- and Sponsoring Nations, and a broader climate change and security community of interest researchers can be drawn upon when more specific support of niche expertise is required.

Under this mandate and throughout the early initiatives of CCASCOE, the centre will accrue the expertise necessary to become a reliable source for NATO, serving as a convener of technological innovation efforts in this field and leading the efforts toward a more climate resilient Alliance.

HIGHLIGHT

We were proud to have CCASCOE represented at the Security Implications of Climate Change (SICC24) Symposium in Abidjan. The symposium was organized by U.S. Africa Command (AFRICOM) and the United States Institute of Peace in collaboration with the Armed Forces of Côte d'Ivoire.

The CCASCOE is honoured to have been invited to this important forum as it gave us a unique opportunity to engage with NATO partners, but also with countries beyond NATO, civil society organizations, and African regional organizations.

The positive feedback and interest in CCASCOE from various stakeholders, including the U.S. government, AU, IGAD, academia, and African countries, are truly encouraging. We look forward to building on these connections and advancing our shared goals for a secure and resilient future.

Enhancing Monitoring, Evaluation and Learning MEL for Conflict And Climate Resilience: Lessons from the Weathering Risk Peace Pillar

Over the past two decades, adelphi has built up a strong, global evidence base of how climate and environmental change links with conflict, compounding factors that drive insecurity such as lack of social cohesion and livelihood options. Our work, especially with implementing partners in fragile contests, also shows however how climate and environmental action also offer entry points to foster cooperation. The Weathering Risk Peace Pillar integrates climate and environmental security into peace programming in Iraq, Yemen, Somalia, Nigeria and the Bay of Bengal.

To better understand the value of integrated peace programming—how interventions can simultaneously build climate and environmental resilience and peace—monitoring, evaluation and learning (MEL) is a key focus of the initiative. As knowledge in this emerging field is still limited, it is crucial to build MEL expertise within project teams. Preliminary learnings from establishing and implementing individual project MEL plans include:

1. MEL approaches for integrated programming should prioritise climate and environmental security in order to measure outcomes across the different climate, environment, peace and security (CEPS) dimensions and capture their linkages. For this, it is important to overcome sectoral biases, such as an over-focus on peace indicators, to ensure that climate and environmental dimensions are sufficiently considered, for example through evaluating climate resilience with perception-based indicators.

2. The complex linkages of the CEPS nexus can lead to highly complex theories of change. Simplifying problems into manageable components, including sub-theories, enhances more systematic programming and communication.

3. Classic rigorous impact evaluations are often unfeasible in conflict contexts due to security, logistical and ethical challenges. MEL approaches must adapt to these conditions by using mixed-methods and qualitative approaches. Climate security assessments can help identify indicators, build a database and determine entry points for intervention and risk management. Focusing on "contribution to" rather than "cause of" peace and climate resilience is key, especially in people-to-people interactions, using methods like outcome harvesting, process tracing and perception surveys.

4. Shifting from proof of concept and data extraction to stakeholder dialogue to understand the impact of work in complex climate security contexts is vital. Storytelling can broaden MEL approaches, overcoming the challenge of collecting data on peace and climate resilience, while centring the impact stories around people and their security.

5. There is a gap between funding and project realities of integrated programming, particularly in terms of funding periods and donor requirements versus the time needed to see the impact of peace programming. By emphasising intermediate outcomes, impact stories and learnings can showcase progress in shorter periods. Working with learning questions and indicators ensures that more long-term and ambitious impacts are targeted without promising unrealistic project outcomes.

The Peace Pillar's ongoing lessons learned will be shared with practitioners and policymakers through a climate security M&E learning lab to promote learning and transparency and develop a growing evidence base to enable more targeted and systematic integrated peace programming. This work can also feed into the CCASCOE climate security knowledge hub and inform collaboration among NATO Allies and partners. Exploring approaches to MEL in CCASCOE's work would support continuous learning and improvement of strategies, adaptation to changing climate security conditions, knowledge sharing and awareness raising, and risk management of unintended consequences of climate security interventions.

adelphi
WEATHERING RISK PEACE PILLAR
Alina Viehoff
Mary Potts

Photo Credit: US AFRICOM

Italy

Carabinieri's Army and the Smart Forest Monitoring Program

The Carabinieri Command for Forests, Environmental and Agribusiness Safeguard Units carries out, through its numerous departments, highly specialized tasks in the field of environmental, land and water protection, as well as in the field of safety and controls in the agri-food sector, all aspects that impact on the climate and, consequently, the military organization and the stabilization of crisis areas.

In climate change mitigation strategies, forests represent a strategic resource: they are natural carbon sinks that actively contribute to the efforts aimed at combating climate change, but feel the effect the double pressure of the impacts of human activities (including military ones) and global warming. Forest protection is essential for the prevention of desertification which, among others, can encourage migratory flows and affect the stability of certain regions.

In this context, the Smart Forest Monitoring (SFM) program has been developed, in which the Carabinieri - in collaboration with the Massachusetts Institute of Technology (MIT) in Boston, the European and Italian Space Agencies, Universities and research bodies – monitors Italian forest change through remote sensing from satellite platforms. SFM, in fact, exploits the satellite platforms of the European and Italian Space Agencies, respectively the 1st and 2nd generation Copernicus and Cosmo Sky Med constellations and, as soon as they are available, will also use those of the IRIDE constellation, in addition to Artificial Intelligence (AI) algorithms, CLOSINT/OSINT activities and advanced visualization solutions of the data of interest.

The analysis of change detection information, through early warnings, specifically guides control activities run by Carabinieri, who verify and validate, by technological tools [1], the warnings received and allows to identify nearly real-time the main types of spectral anomalies concerning the forests of the territory. Smart Forest Monitoring, therefore, allows us to revolutionize the control system of the territory and the potential impacts on the climate, since the strategy is based on the inversion of the information flow: from bottom-up, based on reports collected on the ground, to top-down, with the SFM system providing the military with the geographical coordinates of forest disturbances due to legal and illegal forest exploitation, extreme weather, parasitic infections and plant diseases, fires, hydrogeological instability and unlawful building, to be assessed in the field.

SFM currently simplifies the Carabinieri's control activity to ensure compliance with Regulation (EU) 2023/1115 of 05/31/2023 - and to combat the phenomenon of "Timber Conflict". The aforementioned European Regulation regulates the placing on the EU market and the export of raw materials and products associated with deforestation and forest degradation, providing that cattle, soya, cocoa, rubber, wood, palm oil, coffee and their derivatives are produced and placed on the markets only if they are deforestation-free. The "Timber Conflict", however, mainly affects African countries and concerns those armed conflicts fueled or financed by the exploitation of forests and the trade of wood, or those conflicts that have been caused for the control of timber resources management.

Colonel Giancarlo Papitto
Head of CUFA's Projects, Conventions, Environmental Education Office

[1] TreeTalker, Greenery scanner, Remotely Piloted Aircraft Systems (RPAS), mobile monitoring stations and helicopters with hyperspectral sensor on board.

The Hague Centre for Strategic Studies (HCSS) approaches and initiatives in climate security

HCSS is a leading think tank on climate security issues based in the Netherlands. As one of the initial consortium members of the Planetary Security Initiative (PSI) in 2015, co-founder of the Water, Peace and Security (WPS) partnership in 2018, and co-founder of the International Military Council on Climate and Security (IMCCS) in 2019, HCSS has engaged on the climate and security nexus with a wide variety of actors for nearly a decade. Partners and clients include national governments and agencies, international agencies, think tanks and knowledge institutes and NGOs/Foundations.

HCSS Climate and Security Programme
In 2020, HCSS launched a dedicated Climate and Security Programme (CASP). Its threefold mission is to: (1) develop and operationalise a realist framework and approach to climate action; (2) raise awareness and understanding about the nexus between climate- and resource-related risk, instability and conflict; (3) provide data-driven assessments and early warning support to policy makers, program officers, and practitioners. The CASP offers a comprehensive framework that integrates early warning systems, adaptation strategies, mitigation efforts, and decision-making support to address climate security challenges at the strategic, operational, and tactical level. We have a data lab and media facility that supports the development and publication of all our materials into different formats (E.g. dashboards, monitors, videos, podcasts) so that they can be digested by a broad audience, including the general public. Typical outputs include: in-depth research reports; policy briefs; case study analyses, risk and impact assessments; serious gaming and training programmes; data collection systems; AI-based and advanced statistical data analytics; policy dashboards; and predictive, causal and forecasting models.

Thematic areas of research cover a broad spectrum of issues, including, but not limited to: the geopolitics of climate change and the energy transition, climate change and defence, military innovation and technology trends, climate- and water-conflict dynamics, the water-food-energy nexus, natural resource management, climate migration and displacement, critical minerals supply chains.

Examples of Existing and Future Initiatives
HCSS is engaging with a diverse range of stakeholders on the topic of climate security, bringing together experts from the diplomacy, defence, development, and disaster-relief sectors. HCSS is currently working on a number of global initiatives including: the International Military Council on Climate and Security; the Water, Peace and Security (WPS) Partnership; and the IFRC Global Water and Peace Programme. We are also active at the regional and national levels. For WPS, we lead the partnership work in the MENA region and support activities of our partners active in the Sahel en East Africa. In addition, we are supporting the Institute for Security Governance (US DoD) with the implementation of a multi-year climate security training programme for defence and military personnel in different regions. At sub-national level, we are engaged in a multi-year programme with the National Red Cross and Red Crescent Societies operating in the MENA region. Aim is to train and develop the capacities of their teams and help them integrate relevant knowledge and tools into their operations. The plan is to expand these activities to other climate-vulnerable regions where the red cross operates, based on a recently agreed 5-year MoU with the IFRC.

Laura Birkman
Head HCSS Climate and Security Programme

Latvia

Climate change mitigation and adaptation to the current and future climate change plays a crucial role in national and regional security. Although Latvia has not developed specific initiatives around climate security issues, the ongoing efforts to transition towards low carbon economy, to reduce the greenhouse gas (hereinafter – GHG) emissions and strengthen Latvia's climate resilience and adaptation are contributing to the national security.

Latvia is currently finalizing work on the Climate Law which inscribes GHG emission targets into Latvia's legislation and establishes the framework for their implementation, including, the sectoral responsibility principle. Latvia's Climate Law will be the backbone of the national climate policy and will enable Latvia to achieve climate goals and net zero by 2050.

Additionally, Latvia recently submitted to the EU Commission its updated National Energy and Climate plan that will enable the achievement of Latvia's GHG reduction target by 2030.
In the area of climate change adaptation, in 2019 Latvia's National Adaptation Plan for 2030 was adopted. The main objective of the Plan is to reduce the vulnerabilities of the population, national economy, infrastructure, buildings and nature of Latvia to climate change impacts. The plan directly contributes to the strengthening of Latvia's climate resilience.

Ministry of Climate and Energy of the Republic of Latvia in partnership with the Central Statistical Bureau of Latvia, the Latvian Environment, Geology and Meteorology Centre and the Norwegian Environment Agency has implemented the project "Integration of climate change policy in sectoral and regional policies" funded under the Norwegian Financial Mechanism Programme "Climate Change Mitigation, Adaptation and Environment".

The Project has developed 6 regulatory recommendations, improved the capacity of 59 public institutions and 578 experts to integrate climate change mitigation and adaptation aspects into sectoral and regional policies and activities, developed 3 additional tools for improving climate change policy planning and implementation and developed 5 new meteorological warning criteria for meteorological phenomena etc.

Latvia is among the first countries which within the Project has calculated the future climate change scenarios for 2100 based on the newest Intergovernmental Panel on Climate Change 6th Report. Assessed current climate change and calculated future climate change scenarios are necessary information basis for policy planners and municipalities providing support for decision-making and climate change policy planning.

To support national authorities regarding integrating climate change aspects into sectoral policies, within the Project comprehensive studies into such sectors as investment projects, building construction, insurance, sustainable financing, sustainable transport infrastructure planning, and territory development planning have been carried out.

Some developed recommendations have already been taken up to improve sectoral policies. For example, the study on the development of the green budget framework has been used as a base for the Ministry of Finance to prepare the informative report on the labelling of the "green budget" in Latvia. It is approved that until the beginning of 2026, the Ministry of Finance in cooperation with other sectoral ministries is going to develop an evaluation methodology of the "green budget" labelling and submit it to the Cabinet of Ministers. Performed "Study on the improvement of the insurance sector to reduce losses caused by climate change" has contributed to wider discussions in the Latvia sectors such as agriculture, forestry, and energy, about insuring risks caused by climate change and creating new insurance services.

As a result of the Project, all 43 municipalities and 5 planning regions of Latvia were provided with 22 regional indicators about their GHG emissions, produced renewable energy, land use, and zero-emission transport infrastructure. The performed indicators are already in use by municipalities in their regional energy and climate change policy planning and development of individual GHG emission and energy profiles.

Klimata un enerģētikas ministrija

Photo Credit: Latvian Ministry of Defence/Gatis Dieziņš

HIGHLIGHT

The NATO Climate Change and Security Centre of Excellence (CCASCOE) is proud to have hosted a team of scientists from NATO Science & Technology Organization (STO) as they worked on the crucial NATO SAS-184 project: *"Carbon Footprint Assessment of Military Organizations and Operations and related Logistics."*

This activity, initiated in June 2023, is focused on understanding and reducing military emissions. The team will be categorizing emissions into three key areas:

- Emissions not linked to mission-critical capabilities that can be reduced.
- Emissions linked to mission-critical capabilities that can be addressed without affecting the mission.
- Emissions that are essential to mission-critical capabilities where reductions could impact these capabilities.

The outcomes of this study, due for completion in January 2025, will assist NATO Allies in aligning their national strategies with the broader security implications of climate change. This includes energy efficiency measures and integrating climate change considerations into the policy landscape.

We are pleased to have welcomed experts from across the Alliance, including colleagues from the UK, USA, Italy, Sweden, Norway, and Germany.

This project is another step forward in NATO's commitment to addressing climate security and sustainability. We look forward to the insights and innovations that will emerge from this collaboration.

The Alliance of Bioversity and CIAT approaches and initiatives on the climate, land, water, food systems, and security nexus

The Alliance of Bioversity and CIAT leads the CGIAR climate action research area in fragile and conflict-affected settings through the CGIAR FOCUS Climate Security Team (CG-CS Team). Born as a spin-off of the Climate Change, Agriculture, and Food Security (CCAFS) research program, the team has rapidly expanded, with a current project portfolio of more than 10 Million USD per year and more than 60+ researchers working in more than 25 countries and based in 7 regional hubs (Addis Ababa, Cali, Cairo, Dakar, Hanoi, Nairobi, Pretoria). To better capture demand, for more effective scaling for impact, and to directly inform emergency, humanitarian, and peacebuilding interventions, the CG-CS team matched the location of its regional hubs to humanitarian and peace actors' presence and seconded CGIAR staff to UN regional and country bureaus (e.g. WFP, UNHCR, IOM).

The CGIAR FOCUS Climate Security (CG-CS) team provides a unique set of multidisciplinary expertise including migration and displacement; peace and conflict; policy and governance; geospatial, remote sensing; early warning, early action, anticipatory action; systems and complexity thinking; climate risk and vulnerability assessments; spatial–econometric; digital platforms and news media analysis; machine learning, natural language processing, and other big data approaches. Specifically, the CG-CS team research focuses on the following:

- Mixed-method, cutting-edge research on the Climate, Food, Land, and Water Systems, Conflict, Fragility, and Security Nexus collated in the flagship innovation: The Climate Security Observatory (CSO).
- Compound Risk Frameworks to inform the planning of timely emergency and food security interventions (e.g. UNHCR).
- Tools and methodologies, such as the Climate Security Sensitivity Tool, for implementing peace-positive food, land, and water systems transformations across the climate, conflict, fragility, and displacement nexus.
- Design of peace-positive climate adaptation approaches: the Climate Smart Village Plus (CSV+) approach.
- Policy and governance analyses for mainstreaming peace and security into key policies and programs (e.g. Schapendonk et al, 2024).
- Contribute to United Nations conventions frameworks, conferences, and mechanisms (such as the UNFSSS- HDP Coalition, Climate Security Mechanism, UN Security Council) to collate evidence and support national governments in building climate-resilient livelihoods in conflict-affected areas (e.g. Kenya, Somalia).
- De-risk climate adaptation investments in high-risk areas, through the development of tools, such as the Climate Security Programming Dashboard 4 Climate Finance (CSPDxCF), that can increase the conflict sensitivity of global climate funds.
- Integrate climate and peace into social protection approaches and across the humanitarian-development-peace (HDP) nexus.
- Localize and de-colonize research through the Climate, Peace, and Displacement Partnership.

The team work across the full fragility and conflict continuum, including relatively stable and less fragile countries such as Kenya, Senegal, Mauritania, Benin, Zambia, Madagascar, Vietnam, The Philippines, India, and Guatemala, to more fragile, conflict-affected and displacement hotspots such as Sudan, South Sudan, Jordan, Mali, Burkina Faso, Nigeria, Niger, Libya, Benin, Côte d'Ivoire, Ghana, Guinea, Togo, Somalia, Ethiopia, DRC, Zimbabwe, Mozambique, Pakistan, Bangladesh, Honduras, Haiti, Papua New Guinea.

The CG-CS's research and advocacy efforts have landed at the top of national, regional, pan-African, and Central American policy agendas. Specifically, this research has informed: 1) the African Union Africa Climate Risk Assessment report; 2) IGAD-CAEP Regional Adaptation Strategy; 3) the launch of a new Climate Smart Agriculture Multi-stakeholders' platform in the Laikipia county in Kenya; 4) Kenya's National Climate Change Adaptation Plan; 5) Zambia's Green Growth Strategy and 6) the CCAD Regional Strategy on Climate Change (ERCC). It has also provided evidence, data, and insights to support UNHCR to mitigate the vulnerability of 110 million refugees, displaced people, and their hosts, and to influence policies in 135 countries and 585 offices across the globe. Notably, the CG-CS research helped inform UNHCR's new Strategic Plan for Climate Action, provided evidence to optimize ongoing humanitarian assistance, developed analyses needed to build enabling policies and secure funding, and raised awareness internally and externally. Our research also contributed critical evidence on displacement and conflict tipping points released for the first time in the Global Tipping Points Report at COP28.

More information:
https://climatesecurity.cgiar.org/

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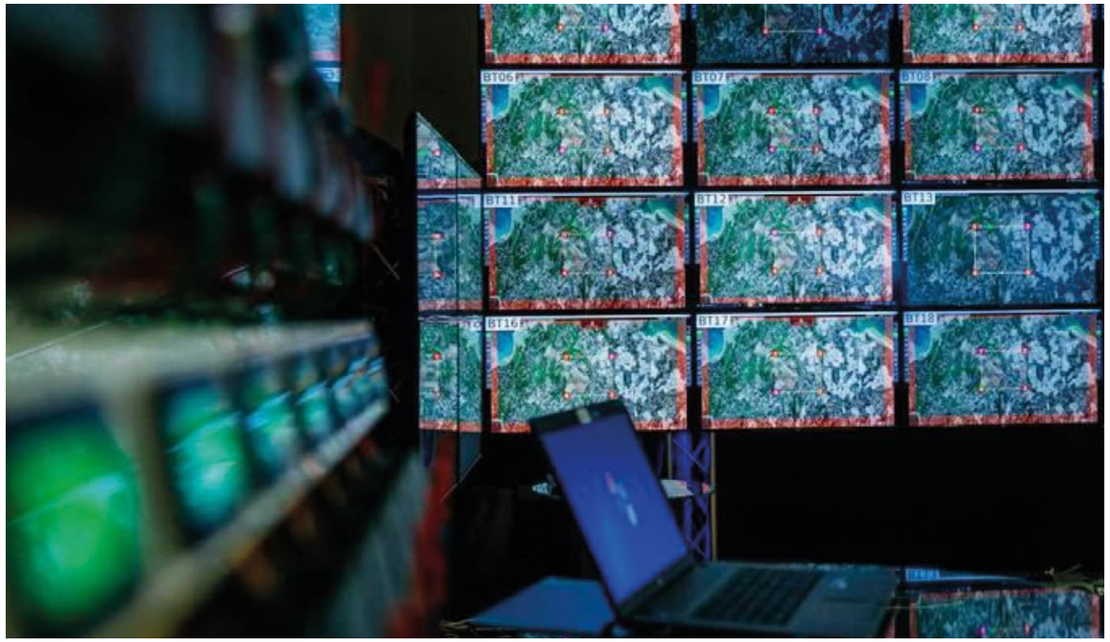

Article source: https://www.nato.int/docu/review/articles/2019/02/12/natos-role-in-cyberspace/index.html
In-article caption: "Every year, Cyber Coalition, NATO's biggest and most important cyber defence exercise, involves more than 700 participants from NATO Allies, partner countries, the European Union, industry and academia. © NATO"
Article info: "NATO's role in cyberspace", Laura Brent, NATO Emerging Security Challenges Division

Photo Credit: NATO

Luxembourg

In the framework of preventing security risks related to environmental changes, Luxembourg believes Defence has a role to play in the global response to climate change. Furthermore, the Grand Duchy believes that CCASCOE's work and research will contribute to the country's response to this threat multiplier impacting Allied security. The EU and NATO have taken into account the major challenge that constitutes the security impact of climate change in their strategic documents; and so has Luxembourg Defence at a national level - as described in "Luxembourg Defence Guidelines 2035" - with the following four strategic axes:

1. Within the EU and NATO, understand, anticipate, and adapt to the security and defence implications of environmental change
2. At national level, support civilian actors in rescue, first aid, civil protection, and crisis management operations as needed
3. Monitor Defence's greenhouse gas emissions and environmental footprint while ensuring operational efficiency
4. Through international partners, prevent conflict and build climate resilience

Photo Credit: Luxemburg Army

Munich Security Conference, Sustainability Program

The Munich Security Conference is the world's leading forum for debating international security policy. In addition to its annual flagship conference, the MSC regularly convenes high-profile events on particular topics and regions, issues the annual Munich Security Report (MSR) , and other publications on current security challenges.

As part of its Sustainability Program, the MSC hosts a variety of formats on climate and energy security, including a number of high-level discussions at the main conference in Munich each February, in-depth roundtables at smaller international MSC events such as the Munich Leaders Meetings, and discussion sessions at the margins of other international fora, such as the ONS Conference in Stavanger, the NATO Public Fora, and the United Nations Climate Change Conferences (COP). These activities include a strong focus on the multifold security implications of climate change, the geopolitical dimensions of the energy transition, and the intersections of governance, the environment, security, and prosperity.

The MSC has been at the forefront of raising awareness for the dire human and security implications of climate change. By bringing together senior decision-makers and experts from different sectors, including politics, business, the armed forces, and civil society, the MSC aims to drive the debate on climate security and facilitate policy responses that reach beyond geopolitical divisions, and inspire joint climate action. At COP28 in Dubai, the MSC curated a Climate Security Moment together with the COP28 Presidency, convening climate security leaders like NATO Secretary General Jens Stoltenberg, then Prime Minister of Estonia Kaja Kallas, UNEP Executive Director Inger Andersen, and U.S. Special Presidential Envoy John Kerry, and representatives from across sectors to spark momentum for addressing the interlinked challenges of climate change, peace, and security.

The events cover aspects from climate governance to crisis prevention and conflict management, food security and climate finance. Discussions therefore focus on both: climate change as a threat multiplier that jeopardizes peace and stability, as well as the aspect that conflictual environments render governments unable to tackle climate challenges. At the same time, MSC events and publications also address the geopolitical challenges of the energy transition, aiming to advance the debate on how to prepare for and manage new vulnerabilities, including in critical mineral and clean tech supply chains – while simultaneously boosting climate action.

The MSC's cooperation with key partners and institutional stakeholders, such as CCASCOE, UNFCCC and the COP Presidencies, NATO, or the PIK Institute, plays a crucial role in shaping these efforts, enabling the MSC to foster meaningful dialogue and action on the most pressing challenges for climate and energy security and beyond.

msc

Norway

The Norwegian Defence Pledge - approach to Climate Change and Security

The Norwegian long-term plan for defence, "The Defence Pledge" was unanimously approved by Parliament in June 2024 and outlines a new strategic direction for the defence of Norway, which is first and foremost to prevent conflict, in cooperation with allies, and to still be prepared if conflict occurs. The plan commits to an increase in real term defence spending by 80% by 2036. This underscores the importance placed on relevant capabilities and military readiness in the years to come.

Climate change has long been considered a threat multiplier, affecting factors that can expand or complicate existing threats. The Norwegian government now states that climate change is increasingly becoming an independent security challenge and a threat to national, regional, and global stability, and can influence military installations, capacities, and operations.

Climate change will reshape the security landscape, necessitating new approaches to defence. This includes preparing for unpredictable conflict patterns and developing infrastructure and capabilities that can withstand factors such as more extreme weather, greater temperature variations, melting sea ice in the Arctic and less permafrost.

The plan sets an ambition for higher levels of military activity and continuous presence in our areas of interest – activities with a direct negative impact on the climate and environment, particularly through emissions from aircraft, ships, and vehicles. The Norwegian Government is committed to minimising the negative environmental impact of these activities. Climate and environmental considerations shall be integrated into all aspects of defence planning, management, and investment.
The goal is to adopt climate-friendly solutions without compromising operational capability.

The plan includes significant investments to enhance Norway's military capabilities, with the renewal of the naval surface fleet as the most substantial investment. The most ambitious climate-statement in the plan is the development and acquisition of 28 new standardised vessels for the Navy and the Coast Guard, that will be designed to transition away from fossil fuels during their life span. The vessels will be developed in close cooperation with the maritime industry, to facilitate for the best possible technical solutions.

The defence sector is encouraged to leverage its purchasing power to promote climate-friendly solutions, influencing suppliers to meet operational needs while minimising environmental impacts. Procurement regulations are being updated to include stronger climate and environmental considerations.

The use of simulators is emphasised to maximise efficiency, and reduce carbon emissions and costs associated with operating combat platforms - aircrafts, ships and vehicles. Simulators will supplement traditional training, providing a cost-effective and environmentally friendly alternative.

Climate transition and adaptation is one of four prioritised topics for research and development. The Government aims to foster collaboration between the military and civilian sectors, and research and development relevant to the High North should be emphasised. Special funds have been allocated to support innovation on climate and environmental measures in the short term.

The Norwegian Defence Pledge recognises climate change as a security challenge and integrates climate transition and adaptation into military planning. The plan balances military strength with sustainability, emphasising collaboration and innovation to ensure the defence of Norway and our allies in the years to come.

Julie Fossem
Commander, Norwegian Ministry of Defence

Photo Credit: Norwegian Ministry of Defence

U.S. Foreign Affairs Training: Climate Security as National Security

When training U.S. foreign affairs professionals, climate security is national security. During the July 2024 NATO Summit, U.S. Deputy Secretary of State for Management and Resources Richard Verma noted that at the State Department, "Climate is now one of our six critical mission areas[1]. We've created 20 new climate foreign service officer positions. We've created six new climate training courses at the Foreign Service Institute (FSI)." He further underscored that "our climate adaptation investments are ultimately a direct investment in U.S. national security." One [2] of these courses is the U.S. State Department's first ever dedicated training on climate security.

The 2022 U.S. National Security Strategy articulated that "of all of the shared problems we face, climate change is the greatest and potentially existential for all nations." Climate change is an issue that cuts across organizational charts, and the Department of State's training approach for the climate security course reflects this. In prioritizing enrollment from across the Foreign Service, Civil Service, Locally Employed staff, and the U.S. interagency, participants can all increase their ability to explain the impact of climate change on traditional and human security issues including resource scarcity, ethnic conflict, migration, and great power conflict.

The unique nature of FSI's virtual and campus-based learning environments allows students to better understand the thinking behind the current U.S. climate security strategy and any likely impediments to implementation. Connecting theory to on-the-job practice through a combination of subject matter expert lectures and crisis simulation, students are better able to demonstrate the ability to clearly and convincingly problem-solve for climate security challenges and organize impactful investments and interventions. Student feedback underscores this, with one alumnus noting that "as a bureau climate coordinator this course helped me understand the intersection between climate and security and enabled me to apply strategic foresight to anticipate potential climate security crises. The interactive exercises and expert insights have been invaluable in shaping my approach to climate diplomacy."

Climate security considerations are also being integrated across our diplomatic training. FSI is currently developing new modules for multilateral diplomacy courses to address cross-cutting critical mission areas, including climate security in the context of multilateralism. Climate security concerns are also addressed in numerous courses on economics to better understand and analyze macroeconomic policy choices. Sector-specific courses address the impact of industrial policy and energy policy, along with courses on environment, science, technology, and health issues, which directly address climate issues for personnel serving in related positions. Several energy courses train officials to master the diverse and complementary challenges of energy access, energy security, and energy transition globally. In addition, a dedicated climate tradecraft course provides the spectrum of skills and knowledge for climate policy leads at posts to advocate for and advance climate action with partners around the globe.

Looking to address the challenges of an uncertain future in a warming world, CCASCOE's founding vision recalls the words of NATO's first Supreme Allied Commander Europe, Dwight Eisenhower. Eisenhower noted that "whenever I run into a problem I can't solve, I always make it bigger. I can never solve it by trying to make it smaller, but if I make it big enough, I can begin to see the outlines of a solution." In expanding the scale, scope, and audiences of climate change training, U.S. diplomatic education joins the effort to both see the outlines and act on the solutions.

[1] 1) Cyberspace and emerging technologies — 2) Climate, environment, and energy — 3)Global health security and diplomacy — 4) Strategic competition with the People's Republic of China (PRC) — 5) Economic statecraft 6) Multilateral diplomacy

[2] Climate Finance, Climate Security, Climate Technologies, Climate Communications, Climate Resilience, Climate Ambition

Adrian Secter
Climate Project Manager for FSI's School of Professional and Area Studies

Yan Chang Bennett
Deputy Chair of the Global Issues program within FSI's School of Professional and Area Studies, Area Studies division

Photo Credit: Opération IMPACT, Caméra de combat des Forces canadiennes

Romania

Romania understands that climate change isn't just an environmental issue, it's a threat to national and regional security. Given our strategic position in Southeast Europe, we are particularly vulnerable to the risks that climate change poses to both our security infrastructure and regional stability. Recognizing these challenges, Romania has initiated a series of efforts aimed at enhancing climate resilience, strengthening defense capabilities, and extending our cooperation within NATO.

In recent years, climate change and its impact on security has emerged as a major issue on the Allied agenda. NATO's Strategic Concept reflects the major challenge of climate change on the security environment, acting as a multiplier of security threats and risks and affecting the way in which the Allied armed forces operate.

The ambitious actions carried out at NATO level in this area have given impetus to similar approaches at national level and, against this background, to Romania's alignment with the processes carried out in the European and Euro-Atlantic context.

Romania supported Canada's initiative to host the Centre of Excellence on Climate Change and Security and the valuable contribution made in this area at allied level, and the interest in this field is reflected in the national programmatic documents.

Romania's participation in the CCASCOE, on the basis of the document signed last year in Vilnius, will contribute to improving the level of situational awareness and to developing actions and initiatives to mitigate the impact of climate change and to adapt to it.

Romania appreciates the Alliance's joint efforts to manage the effects of climate change and the fact that the participating states will be engaged in a constant dialog and exchange of examples of good practice. These can be implemented at national level and will help to formulate recommendations for future activities of international organizations.

A significant step in our climate security journey was the approval of the National Strategy on Climate Change Adaptation (SNASC) for 2024-2030, which looks ahead to 2050. Adopted on August 14, 2024, this strategy reflects Romania's strong commitment to undertaking the complex threats posed by climate change, ensuring that both civilian and military sectors are ready to respond effectively.

The SNASC takes a wide approach to climate adaptation, focusing on key areas like water resources, forestry, energy, and public health. It highlights the need to integrate climate adaptation into our national security strategies, recognizing how climate variability can impact critical infrastructure, food security, and public safety. Some key elements of the strategy include advanced risk assessment tools, ecosystem-based solutions, and incorporating climate adaptation into our energy policies.

Romania's climate security efforts are also tied by our commitment to achieving carbon neutrality by 2050, in line with the European Green Deal. This commitment is reflected in our energy sector, where more than half of our electricity is now generated from green sources. Between 55-65% of Romania's electricity comes from hydropower, wind, solar, biomass, and nuclear energy, reducing our dependence on fossil fuels and moving us closer to a sustainable and secure energy future.

Our National Recovery and Resilience Plan (PNRR) plays a crucial role in supporting Romania's climate and defense strategies. By investing heavily in renewable energy and energy efficiency, the PNRR helps ensure that our military and civilian infrastructures are resilient to the growing challenges posed by climate change.

Romania is also pushing forward with key projects that underscore our proactive approach to climate security, especially in the defense sector. One of these projects is the modernization of the Mihail Kogălniceanu Air Base, which officially began on June 11, 2024. This project is transforming the air base into a model of green military infrastructure, integrating renewable energy sources like solar and wind power, along with advanced energy-efficient technologies, to reduce the base's carbon footprint. These upgrades are essential for enhancing the base's resilience to climate-related challenges, ensuring that our military operations remain sustainable and effective in an increasingly unstable world. The success of this project sets a new standard for future military infrastructure across NATO, making Mihail Kogălniceanu one of the most strategic military installations in Europe.

Moreover, Romania has developed the Black Sea Security Strategy, which weaves climate resilience into regional security planning. This strategy focuses on ensuring energy security, tackling hybrid threats exacerbated by climate change, and reinforcing the resilience of our military infrastructure. Aligning with NATO's broader goals, this strategy highlights Romania's commitment to securing our defense capabilities against evolving environmental threats.

Romania's contribution to the NATO Climate Change and Security Centre of Excellence (CCASCOE) demonstrates its commitment to fostering deeper partnerships and knowledge sharing among alliance's members. By integrating climate resilience into national defense strategies, Romania not only ensures its preparedness for the challenges posed by a rapidly changing global environment but also strengthens its commitment to NATO's collective security.

Col Adrian ANTIP PhD
Deputy Chief of Control and Inspections Corps, Romanian Ministry of National Defense

Photo Credit: Romanian Air Force

Key Challenges Facing Climate Security in the Future

Photo Credit: UK MOD / Angie Pearce

NATO Allied Command Transformation (ACT)'s Strategic Foresight Analysis 2023 (SFA23) assesses key trends and drivers shaping NATO's security environment until 2043. It updates the previous SFA17 and focuses on the enduring challenges posed by strategic competitors amidst global disruptions. The analysis aims to align the diverse futures thinking of NATO members, providing a shared baseline for understanding the implications on the Alliance's Military Instrument of Power. SFA23 is based on extensive research and collaboration with Allies and Partners. It serves as a foundation for the Future Operating Environment Study 2024, which will further explore modern warfare dynamics. Climate change's pervasive influence on military operations is a key theme throughout this edition.

"Climate breakdown and loss of biodiversity should be considered as the primary structural force that will have a profound impact on every aspect of the Evolving Security Environment. If unchecked, it will act as a threat multiplier, accelerating disruption and pervasive competition and causing further fragmentation. Societal instability, displacement and essential resource insecurity will pose a significant challenge to military operations across all domains as impacts escalate. This is an existential challenge for humanity" (SFA 2023)

HIGHLIGHT

NATO's Climate Change and Security Centre of Excellence (CCASCOE), in collaboration with Dstl and the University of Cambridge, hosted an innovative workshop that gathered policymakers, government researchers, and academics to explore critical, alternative perspectives on climate security.

This event challenged conventional research, embracing interdisciplinary approaches to address future climate-driven security threats.

The workshop emphasized how traditional security strategies often neglect cultural, historical, and social contexts, leading to unsustainable outcomes.

Recent conflicts highlight the need for holistic, long-term approaches that consider human behavior, biodiversity, and broader environmental factors.

Participants engaged in discussions on how to integrate non-traditional elements—like cultural connections and biodiversity—into climate security frameworks. This interdisciplinary thinking, including insights from the humanities, is essential for developing more nuanced and sustainable policies.

By fostering collaboration and innovative thinking, the workshop set the stage for reshaping NATO's climate security efforts, ensuring resilience and sustainability remain central to future security strategies.

CCASCOE, Dstl, and the University of Cambridge will continue to lead this critical dialogue, building partnerships and advancing research that challenges conventional thinking and prepares the NATO alliance to navigate the evolving security landscape shaped by climate change.

Resource Scarcity and Water Conflicts

The availability of clean water is vital for human and environmental health, poverty alleviation, gender equality, economic resilience, and promoting peace and stability. However, 40% of the global population does not have access to sufficient clean water, and by 2025, 1.8 billion people will be living in countries with absolute water scarcity according to the United Nations Environment Programme. The lack of fresh water endangers numerous critical areas — notably food security, given agriculture's reliance on approximately 70% of the world's available fresh water, and public health, where up to 80% of diseases in developing regions are caused by poor water and sanitation access.

Water and climate change are inextricably linked, as climate change affects the world's water in complex ways, resulting in more frequent floods and droughts, unpredictable rainfall patterns, shrinking ice caps, melting ice sheets, and rising sea levels. The danger posed by the myriads of factors contributing to water scarcity triggers human insecurity, which can potentially intensify tensions among neighbouring countries or regions.

Climate-Induced Migration

In certain world regions, climate change effects such as rising sea levels, desertification, and extreme weather events result in water and food insecurity and loss of livelihood, compounding the effects of structural risk factors such as lack of strong governance, existing conflicts, social inequality, poverty and violence, and lead to displacement and mass migration. These movements within and across boundaries can lead to competition over available resources and create new tensions between migrant and host communities.

Photo Credit: University of Cambridge

Geopolitical Tensions

Climate change effects can heighten geopolitical tensions as exemplified by the Arctic where the rising temperatures and the receding sea ice have created new navigation routes which can become critical supply routes connecting East Asia, Northern Europe and North America.

This situation has rendered the natural resources of this region, such as fish stocks, fossil fuel, key metals and minerals, including rare earth elements needed for the Green Energy Transition, more easily accessible, giving rise to a situation of competition among Arctic and 'near-Arctic' nations in a challenging security environment that is already under political and military tension.

Increased competition over water, food and energy supplies, and population displacements linked to climate change effects will give rise to or worsen geopolitical tensions in nearly all regions of the globe.

The Risk of Inaction

Failing to integrate climate considerations early into military and strategic planning will make it more challenging and costly to find adequate solutions.

Climate change is expected to drive increased mission demands and contingencies in new regions (such as the Arctic) in response to resource competition, geopolitical instability and regional conflicts, forced migration and displacement, threats to critical infrastructure and a growing need for humanitarian assistance and disaster response to recover from climate-related events.

In addition, the impacts of emerging and accelerating climate-related events (including forest fires, hurricanes, higher temperatures, coastal erosion, high tides and sea level changes) on military infrastructure, materiel, personnel and operations can put military forces under a lot of pressure.

Finally, looking at ways to reduce overall military-related emissions while maintaining combat capabilities requires thoughtful planning, which must begin sooner rather than later.

Photo Credit: Norwegian Ministry of Defence

NATO Civil-Military Cooperation Centre of Excellence
The Hague, The Netherlands

Climate change is increasingly recognised as a critical global issue with significant implications across various sectors, including military operations, resilience and the ability of nations to maintain security and freedom of action. The CIMIC Centre of Excellence (CCOE) as one of NATOs Centres of excellences family recognises the importance of its implications for NATO's strategic environment and military preparedness.

The accelerating impacts of climate change like for instance: —rising sea levels, extreme weather events and shifting climate patterns—are reshaping the security landscape, leading to resource scarcity, forced migration, social instability and by that to more instable overall security situations inside and between nations. These challenges underscore the need for a better understanding of the climate change implications and a subsequent coordinated and comprehensive approach. The CCOE, with CIMIC at the forefront, is instrumental in ensuring NATO's readiness and adaptability through its training, research, and operational support initiatives.

NATO's ability to holistically respond to climate-related challenges significantly depends on cooperation with non-military actors. As the scale, scope, and frequency of disasters increase and might acceleratingly interdependent with security crisis, the need for more response operations where civilian and humanitarian actors and militaries operate in the same space becomes apparent. In this context, coordination among military, police, civilian actors and humanitarian agencies is not just important but critical. Climate change implications stretches resources beyond capacity and renders current capabilities less effective, making this collaboration essential. This can enhance disaster response capabilities, improve tructural resilience, and ensure that military and civilian actors are prepared for various climate-related scenarios.

CIMIC, as a joint function, integrates the understanding of the civil factors of the operating environment. It enables, facilitates, and conducts civil-military interaction (CMI) to support the accomplishment of missions and military strategic objectives in peacetime, crisis, and conflict. CIMIC's exploration, with a focus on integrating civil factors such as infrastructure, societal stability, movement of population and resource management, ensures that NATO is well-informed and prepared for a range of climate-related scenarios on each of its operating domains, as well as on its missions and operations, resilience, and civil preparedness.

CCOE Activities and Program of Work

In this fast-changing and turbulent environment, CIMIC's role in predicting, preparing for, and enabling the military reaction to the negative effects of environmental change is essential for the stability and success of the Alliance. In response to the growing threats posed by climate change, the CCOE has integrated climate considerations into its activities and Program of Work (PoW). The CCOE CIMIC course program includes topics such as disaster response, environmental protection, and civil factor integration (CFI) into all military activities. The CCOE is dedicated to enhancing the understanding and effectiveness of CIMIC in operations and missions.

Through training, research, and expertise, CCOE provides a forum for exchanging ideas and best practices. In June 2022, CCOE hosted a seminar series on "Climate Change and its Implications for Military Operations" that explored the vocabulary, mechanics, causes, and effects of climate change. By analysing climate-related trends and risks, the CCOE provides NATO with critical insights that improve operational readiness and resilience. The CCOE's PoW addresses security implications and helps NATO adapt to a rapidly changing security environment.

Impacts on Military Operations

Extreme weather events will impact military infrastructure, logistics, and personnel readiness, and this will affect military operations across all of NATO operational domains. Sea level rise and coastal erosion, strong winds and storm surges, floods and wildfires all pose serious risks to military infrastructure. Land degradation, caused by drought in dry regions or by loss of permafrost in high altitudes fragilize the military installations and roads built on top of them.

Severe heat not only damages road and runway pavements but can decrease military platforms' performance and incur additional energy demands for cooling them, not to mention the negative impacts on military personnel's health. Climate change will test the resilience of military installations and critical infrastructure, impair the effectiveness of capabilities, increase threats to defence supply chain security, and will create harsher conditions for military operations and missions.

The military will also have to intervene in different regions of the world where climate change hazards aggravate human insecurity, economic instability and lack of governance, leading to migration, social unrest and competition for land and resources. As such, climate change has an impact on all of NATO's core tasks: Deterrence and Defence, Crisis Prevention and Management, and Cooperative Security.

While Deterrence and Defence focused on military operations will require NATO to adapt its strategies, infrastructure, and logistics to withstand climate-induced disruptions, Crisis Prevention and Management and Cooperative Security influenced by the socio-political impacts of climate change, will require NATO to engage in coordinating civil preparedness and disaster response.

Photo Credit: Forces armées canadiennes/ Caporale Angela Gore

Türkiye

Adaptation to Climate Change

Environmental management activities in Turkish Armed Forces are carried out in coordination with the Ministry of Environment, Urbanization and Climate Change (MoEUCC) and the Ministry of Defence (Department of Environmental Management and Inspection).

Regulations related with the environmental protection (waste management, air/water/soil quality control, green house emissions etc.) are integrated into all military procedures as possible. Awareness raising and training activities on climate change and waste management are carried out.
Climate change concerns (risk management, emergency action plans etc.) and regulations related with the climate change (air quality, green house emissions etc.) are integrated into all military operations as possible.

Energy and water saving infrastructural models are taken into account, especially during the planning of the new buildings. Reduction of the energy consumption and green energy options are encouraged. Projects on renewable energy production especially on solar energy, are studied. Electrical and lighting equipment, providing energy savings are preferred.

Turkish Armed Forces being conscious of the fact that climate change is a multidimensional and complex challenge which poses serious environmental and socio-economic consequences and threatens national securities. Turkish Armed Forces also recognizes the importance of national and international cooperation to reduce green house gas emissions leading to climate change. Accordingly, Turkish Armed Forces is a sponsoring member of the NATO Climate Change and Security Center of Excellence (CCASCOE) and also participates all national studies related with the climate change. Information/experimentation exchange and cooperation on climate change and security via CCASCOE platform has a great importance in terms of climate change adaptation.

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Environmental Engineer

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NATO, Climate Change, and the MENA Region

This essay explores the intersection of NATO's strategic interests, climate change impacts, and security dynamics in the Middle East and North Africa (MENA) region, one of global climate change 'hotspots'. The MENA region suffers from extreme temperatures, extreme weather events, sea surface warming, water scarcity, desertification and food insecurity[2]. Such environmental stressors exacerbate socio-economic challenges, political instability and state fragility.

They create fertile ground for extremist groups. Environmental stressors drive migration both directly, as people seek viable living conditions, and indirectly, by destabilizing and weakening states and communities and fueling conflicts and wars. For instance, the prolonged drought in Syria contributed to the civil war by displacing rural populations and increasing urban tensions[3].

Climate change impacts the MENA region and NATO allies and can be exploited by strategic competitors, such as Russia and China. For example, Russia has instrumentalized irregular migration -likely to increase due to climate change and related destabilization - against NATO countries. NATO will increasingly be called upon to support allies dealing with irregular and instrumentalized migration flows through the Mediterranean Sea and elsewhere[4].

NATO's strategic interests in the MENA region are centered on regional stability. Due to Russia's war against Ukraine, NATO allies are currently more focused on the Eastern flank and defence, and are consequently divided on whether NATO should be engaging more in the context of cooperative security outreach to MENA countries. Moreover, the complexity of the MENA region and its diffuse problems make it difficult for NATO to find leverage.

The CCASCOE's involvement can thus contribute in several ways. It can act as a knowledge and research hub on climate change related security risks and threats in the MENA region. It can initiate a regional contact point network to enhance collaboration and partner with MENA's regional organizations, the UN and the EU to offer targeted training programs aimed at enhancing local capacities to address climate-related security risks and threats. It can support regional governments and international bodies in efforts to establish basic early warning indicators for such threats. Additionally, the CCASCOE can raise awareness among decision-makers and the public, including in NATO countries, in order to generate broader support for action.

In conclusion, NATO's recognition of climate change as a security issue is a key step. As climate change alters the security landscape, the CCASCOE can provide insights, foster collaboration, and support resilience-building efforts in the MENA region amid rising strategic competition.

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[1] The views expressed in this article are those of the author and do not represent the positions or opinions of the GCMC, the US Department of Defense, or the U.S. or German Governments.

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Center for Naval Analyses (CNA) Climate Security Alert Tool

Though often spoken of in the abstract, climate change is already impacting individuals and communities around the globe. From an increase in extreme weather events to food systems and water access—climate change continues to upend lives, systems, and relationships in ways that further complicate risks and hazards. As such, research and analysis on climate as a national security issue has been steadily growing over the past several years, as has a concern about the potential for climate to exacerbate or increase conflict risk, particularly in fragile or conflict-prone areas. As climate change continues to alter the delicate balance between the environment and security in complex ways, a team of environmental, national security, regional, and conflict experts identified the need for additional tools and resources to better understand and conceptualize how climate change is impacting security risk. To that end, a multi-disciplinary team led by the United States Institute of Peace and CNA, in partnership with the U.S. Africa Command, have developed a new tool to explore the potential pathways of how climate is increasing conflict and security risk.

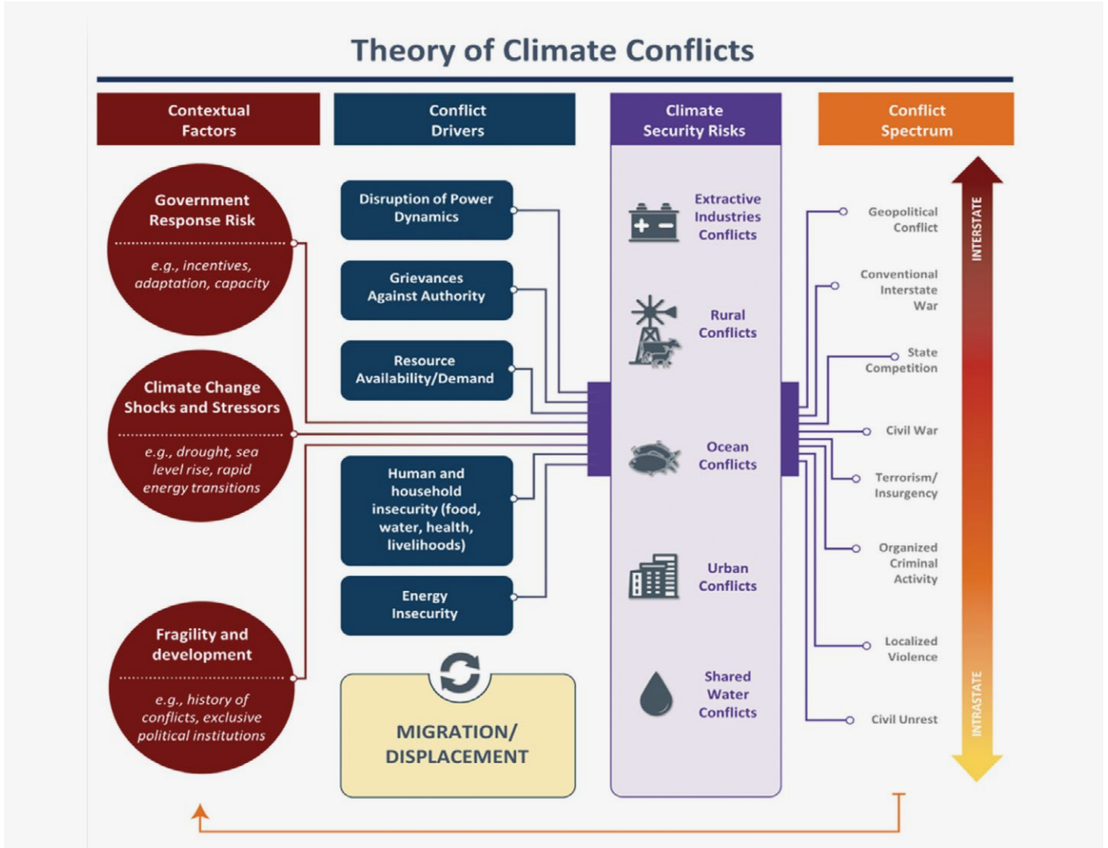

Figure 1. Theory of Climate Conflicts, CNA

Conceptualized, researched, and developed over a two-year period, the Climate Security Alert Tool (CSAT), is a new interactive dashboard which explores pathways for the interlinked and cascading impacts of climate change, primarily in Africa, and how climate can amplify critical security issues. While the overarching goal of CSAT is provide a strategic terrain analysis for decision-makers to help identify and illuminate the potential risk from climate change, the tool aims to serve a wide variety of end-users by facilitating the exploration of the multi-factorial and multi-layered dynamics behind climate and security. Grounded in social science theory and key informant interviews, CSAT's team of experts worked to codify a climate security framework, potential climate-related conflict pathways, and, finally, a comparative assessment of five key climate security risks.

In the initial research and development stages, CSAT's team of experts identified both the contextual factors and conflict drivers which can coalesce to increase conflict risk—independent of climate change. The three primary contextual factors, supported by a robust literature review are: climate change shocks and stressors; fragility and development; and government response risk, which relates to how effectively government is or is not responding to climate change. These factors were then juxtaposed and explored through their interaction with five primary conflict drivers: disruption of existing power dynamics; grievances against authority; resource availability/demand; human and household insecurity; and energy insecurity. Through this exploration, the team identified five security risks which may increase due to climate change: extractive industries conflicts; rural conflicts; ocean conflicts; urban conflicts; and shared water conflicts. Migration and displacement were also considered in each risk category, but ultimately were included both as an outcome of and potential contributor to or mitigator of the conflict drivers.

This framework can be viewed in Figure 1

Using this framework, the team developed CSAT—an open source, transparent tool to help inform decision-makers, stakeholders, and researchers about how climate change is impacting climate conflict risk. CSAT is not predictive, but rather a qualitative interpretation of risk, which allows users to deep-dive into some of the myriad ways in which climate change interacts and exacerbates the conditions for heightened security risk.

The tool relies exclusively on open-source data from trusted, verifiable sources to ensure transparency and accountability, and leverages both historical data as well as predictive climate data to provide an enhanced understanding of climate security risk. Additionally, CSAT's unique climate conflict typology allows users to explore the nuanced pathways in which climate exacerbates conflict risk via toggles which can be layered to create a "heat map" to inform conversations and decisions about the interplay between climate, conflict, and risk.

Though not intended to be exhaustive or exclusive, the launch of CSAT, the Theory of Climate Conflicts Framework, and its terminology is a significant step forward for stakeholders to understand some the many dimensions of climate security and conflict risk on the African content. It does not narrowly define climate security or prescribe definitive actions needed and is currently limited to Africa and some parts of the Indo-Pacific. However, it allows for a variety of stakeholders from the political, economic, military, and humanitarian domains to understand potential climate risks more analytically. As the tool fully comes online for the Africa region and feedback is implemented, the CSAT development team is already working on expanding the tool to include the Indo-Pacific.

For questions or additional information, please contact the team at csat@cna.org

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Research Scientist, CNA

No climate security without a military energy transition

Researchers from Loughborough University are at the forefront of attempts to think through how the climate crisis might shape the future character of war. More specifically, funded by the United Kingdom's Economic and Social Research Council (ESRC), principal investigator Dr Duncan Depledge and research associate Dr Tamiris Santos have been investigating how climate change and net zero targets are driving new thinking with the UK Ministry of Defence regarding how to retain and enhance strategic advantage in an increasingly low-carbon world, including implications for operational concepts and capabilities (www.net-zero-military.org). Central to this work is an understanding that the world's militaries cannot address climate insecurity and adapt to a climate-changed world without also making their own energy transition away from fossil fuels.

Three reasons why NATO needs to remain at the forefront of a 21st century military energy transition are: first, the growing expectation that climate breakdown will lead to increasing instability and insecurity, and possibly more armed conflict around the world. If so, any sector – including defence – that fails to substantially reduce their greenhouse gas emissions will carry growing responsibility for increasing globally insecurity and its consequences. Second, military and civilian energy systems are fundamentally interconnected. Attempting to maintain a separate 'fossil-fuelled' military as the civilian energy system decarbonises is likely to prove prohibitively costly. Moreover, without a military energy transition, the imperatives of maintaining national security in the face of other non-climatic related threats could block wider transition efforts, increasing climate insecurity for all. Third, the cohesion and interoperability of the NATO alliance is uniquely threatened (compared to its main competitors and adversaries) by the prospect of 'decarbonisation gaps' opening between member states as they engage with and harness the benefits of new energy systems at different rates. NATO political and military structures therefore have an essential role to play ensuring that no member state is left behind.

Close coordination and cooperation between the Climate Change and Security Centre of Excellence (CCASCOE) and the Energy Security of Excellence (ENSEC) will be crucial for amplifying the work on climate change and energy ongoing at NATO HQ and delivering outgoing Secretary General Jens Stoltenberg's call for a "military energy transition by design". As the effects of the climate crisis grow, public pressure will likely increase on NATO and other military organisation to be held to account for their emissions. However, what will ultimately drive the military energy transition is not calls to 'green defence'. Rather it will be the need to adapt militaries to operate not only in a climate-changed world, but also an increasingly low-carbon world. In the future, the most effective military forces will be those that stop debating the relative merits of adapting to and/or mitigating climate change, and simply acknowledge that being able to meet the security demands as the climate crisis progresses will, in the end, require a fundamental rethinking of how the military sources and uses energy. The best means for achieving this is for CCASCOE, together with ENSEC, NATO HQ, defence ministries, industry, and the wider expert community, to keep testing the deeply-held assumption that just because fossil fuels may have been one of the most effective ways to power militaries in the past, does not mean that they will remain so in the future.

Duncan Depledge
Loughborough University, UK

Tamiris Santos
Loughborough University, UK

Embedding and Embodying a Systemic Approach to Climate Security

The Environmental Security Research Group (ESRG) was founded in 2020 in King's College London. Its aim was to increase the – previously minimal – support available for educators, policymakers and practitioners across the security sector, who wanted to research and integrate environmental issues within their work. Since its inception the group has expanded rapidly, including in its membership (with over 70 expert scholars, practitioners and policymakers), its projects (covering education, research and practice), and its impact (from policy change to educational democratization). It is now expanding into a global Climate, Environment and Resource Security Network, serving to empower different researchers, organisations and interest groups (see www.environmental-security.org).

This evolution has not been neat or orderly. It has required passionate people working with an understanding that resources and rewards will always be scarce, a belief that failure is a necessary part of progress, an attitude of stubborn perseverance, and a shared commitment to driving societal change. As well as generating purposeful outputs, this process has helped reinforce some key factors and principles that should inform CCASCOE's goals and evolution.

Things to Avoid. Protectionism, vested interests, the tyranny of urgency and risk aversion are disproportionately significant inhibitors to equitable progress. Cultivate and reward stakeholders, partners and employees who are willing to take risks and are uninterested in squabbling over who gets the most credit, ownership or return on investment. Avoid overclassification or overinflation of intellectual property concerns, as these can result in critical resources languishing in limited distribution groups. Give your people support and space to deprioritise the constant influx of 'urgent, not important' requests and emails (including from their superiors), lest your most critical outputs be transmogrified or deprioritised.

Things to Prioritise. The integration of equity, diversity and inclusivity in organisational structures, cultures, inputs and outputs is critical. In particular, it enables timely, holistic and innovative solutions, rather than maladaptive, skewed and path-dependent ones. Focus on building self-sustaining systems that enhance the capacity, opportunity and motivation of historically disenfranchised, seldom heard or misunderstood voices. Gain inputs from those who face the highest burdens from climate risk, and those who can creatively challenge the assumptions that underpin Defence's ends, ways and means. These systems must be built both within the organisation (e.g. mentoring, education, and decision-making autonomy), and beyond it (e.g. democratizing and localizing resources, information and services).

These principles are not radical or new. Yet they often fall victim to the daily grind of urgent, tactical-level requirements. To truly help NATO member nations and partners (and the societies they protect) deal with the systemic risk of climate insecurity, CCASCOE cannot simply advocate for a systemic approach. Instead, it must embody this approach. This may feel like a major undertaking, but significant gains can be made through the cumulative impact of 'quick wins' (e.g. diversifying one's CRM database, making resources open-access, reducing bureaucracy). Furthermore, by embodying this goal, CCASCOE can demonstrate that a systemic approach is not just a means to an end, but an end in itself.

Dr. Duraid Jalili
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Photo Credit: Forces armées canadiennes / Taylor Congdon

Goals for the Next Decade

As we look toward the next decade, the NATO Climate Change and Security Centre of Excellence (CCASCOE) is committed to establishing itself as a leader in climate security by pursuing several strategic goals that will enhance NATO's capabilities in this critical area.

First and foremost, CCASCOE aims to innovate and advance climate security research and methodologies, ensuring that NATO remains at the forefront of understanding and addressing climate-related risks. This includes enhancing predictive modeling and risk assessment frameworks to better anticipate the impacts of climate change on security.

In addition, the Centre seeks to expand its network of partnerships with academic institutions, think tanks, and other stakeholders globally. By fostering interdisciplinary collaboration, CCASCOE will enrich its research outputs and provide NATO with diverse perspectives and solutions to complex climate security challenges.

Strengthening capacity-building initiatives is also a priority. CCASCOE plans to develop tailored training and education programs for NATO personnel and member nations, focusing on integrating climate security considerations into military planning and operations. These initiatives will empower decision-makers to effectively incorporate climate risks into their strategic frameworks.

Furthermore, CCASCOE will work closely with NATO leadership and member states to support policy-making processes related to climate security. By providing evidence-based recommendations and best practices, the Centre will support the integration of climate considerations into NATO's strategic priorities and operational plans.

Finally, CCASCOE aims to raise awareness of climate security issues within NATO and beyond, advocating for a holistic approach that considers both environmental and security dimensions. By hosting events, workshops, and conferences, CCASCOE will facilitate dialogue among key stakeholders and highlight the urgency of addressing climate-related threats.

Photo Credit: U.S. Navy/Air Crewman 2nd Class Darien Durr

United Kingdom

Climate change is a threat multiplier, guaranteed to worsen over the next decade and beyond. Changing climate conditions will amplify many traditional security challenges and give rise to new ones, including through the implications of a rapidly shifting energy transition landscape.

NATO Allied Command Transformation recently described climate breakdown and loss of biodiversity as 'the primary structural force that will have a profound impact on every aspect of the Evolving Security Environment'. As highlighted by the MoD's recent assessment of Global Strategic Trends: Out to 2055, this threat assessment is shared by the UK.

Climate change is already a driver of increased threat and real impacts on military capability and deployments. Between June 2022 and January 2024, militaries were deployed in 68 countries to support climate hazards; extreme weather contributed damage to bases and disrupted defence output; and there were 117 recorded instances in the first half of 2023 alone where water resource was either a driver of conflict or was weaponised or targeted.

UK Defence recognises that our ability to understand the impact of climate change across Defence – and adapt to it – will be key to strategic advantage. Building resilience and improving operational advantage are objectives at the centre of the UK's approach. In doing so we will benefit from UK expertise across academia, research, and industry.

We are committed to accelerating work to future-proof our capabilities, embed climate risks to secure resilience, and strengthen joint approaches with our Allies. We will maximise operational advantage through our energy choices, through innovation, through working with our industrial base, and through ensuring that interoperability with Allies is at the centre of our thinking.

In 2024 we held our first climate security wargame, exploring the interaction between climate change and systemic competition. Further wargaming is planned in 2025, adding depth to findings and demonstrating proof of concept.

We have also made a Defence Climate Risk Assessment Methodology (DCRAM) available across Defence to aid departmental climate adaptation activity. The methodology enables the identification and subsequent management of climate related risks and opportunities, through suitable governance.

Projects are also underway across our Front-Line Commands to harness technological innovations for operational advantage while reducing emissions:

Air: Over the last 12 months, more than 9 million litres of sustainable aviation fuel has been delivered to the Royal Air Force. Using blended SAF can cut aircraft carbon emissions by up to 80%. This is a significant step towards bolstering both operational capability and climate change and sustainability efforts.

Army: Battlefield Electrification is a key focus in the Land domain. The Army's Technology Demonstrator 6 programme is looking at Hybrid Electric Drive (HED) technologies. Underpinning this is research and experimentation into resilient and free-standing tactical microgrids.

Navy: The Royal Navy is building adaptable pathways into platform designs, ensuring maximum flexibility for insertion of future fuel sources and technologies.

We have made good progress and will build on this to strengthen international cooperation with partners and allies, build resilience and maximise opportunities for operational advantage. Our membership of CCASCOE is a key pillar in our approach. We look forward to contributing to and benefiting from workstreams and cutting-edge research that supports our strategic objectives and ensures interoperability across the Alliance.

Luke Pollard MP
Parliamentary Under-Secretary of State (Minister for the Armed Forces)

Photo Credit: UK MOD/ AS1 Jake Hobbs RAF

Photo Credit: OpLentus CANWildfire

Collaboration and Leadership

International cooperation is critical in tackling the complex challenges posed by climate change, and the CCASCOE is at the forefront of these efforts within the Alliance. By facilitating collaborative research, analysis, concept development, experimentation, and training among NATO member states, partner nations, and diverse stakeholders, CCASCOE aims to establish a comprehensive approach to climate security.

This approach focuses on enhancing resilience and adaptability within military operations through evidence-based insights. The Centre's commitment to rigorous research and innovative concept development will set a standard for global military adaptation to climate change, enabling the dissemination of best practices and the implementation of cutting-edge solutions.

Through its analytical initiatives and practical training programmes, CCASCOE will not only bolster NATO's ability to address climate-related risks but also encourage military organisations worldwide to integrate climate security considerations into their strategic planning and operational frameworks.

A Global Leader in Climate Security

The CCASCOE supports NATO's ambition to be the leading international organisation in addressing the intersection of climate change and security. This COE not only strengthens NATO's operational readiness but also establishes a framework for best practices that can be emulated by military organisations worldwide. Through strategic partnerships and a dedication to knowledge sharing, CCASCOE amplifies NATO's influence on the global stage, ensuring that climate security is embedded within national and international defence strategies.

Photo Credit: Bundeswehr

Advancing Strategic Dialogue with a Climate Change and Security Workshop Toolkit

The Archipelago of Design (AOD) is a global not for profit that empowers leaders to shift mindsets to set conditions for evolution and to address complex situations across NATO members and partners. The AOD is currently developing a toolkit to assist leaders in facilitating conversations expanding thinking on climate and security to inform any deliverable related to this focus area.

This comprehensive toolkit assist in developing creating climate change and security scenarios, and integrating strategic foresight and futures methodologies into strategic planning, decision making, and policy implementation. These methodologies are vital for navigating complex security challenges, as they encourage strategic reflection, challenge conventional thinking, and open new avenues for dialogue and learning. By focusing on scenarios that speak to capacities for adaptation and enable users to identify opportunities for organizational transformation, the project seeks to enhance anticipatory thinking and strategic planning capabilities.

The toolkit is designed to cater to a wide range of audiences within the security and defense sectors, including different regional focus areas and domains. It includes resources such as a facilitator guide, prompting cards, and scenario generation worksheets. The toolkit is designed to provide a structured process for generating collective intelligence by sharing diverse perspectives on climate change, security, and plausible future scenarios related to both. This inclusive approach fosters a deeper understanding of the potential impacts of climate change on different regions and domains and enables a comprehensive examination of strategic measures for mitigation and adaptation.

A key component of the project was a workshop conducted in collaboration with the NATO Climate Change and Security Centre of Excellence (CCASCOE) in June of 2024. This workshop presented an opportunity to engage intended end users of the toolkit, test the scenario co-creation process, and gather feedback for refining the deliverables. Participants were able to collectively employ the toolkit components in the workshop activities, contributing direct feedback to ensure the toolkit meets stakeholder needs.

Workshop activities were designed to encompass data collection on climate-related vulnerabilities, impacts, uncertainties, assumptions, and signals of change. This kind of information is vital for research, analysis and decision-making on the challenges posed by climate change and its impacts on security.

Looking forward, we see potential for CCASCOE to play a pivotal role in fostering international cooperation and innovation in climate security. This initiative aligns with the growing emphasis on climate security within NATO. Future partnerships could explore expanding the toolkit's applicability, enhancing cross-sectoral collaboration, and integrating emerging technologies to better predict and respond to climate-related threats. Through these efforts, we aim to contribute significantly to shaping future policies and strategies in the face of evolving climate and security challenges.

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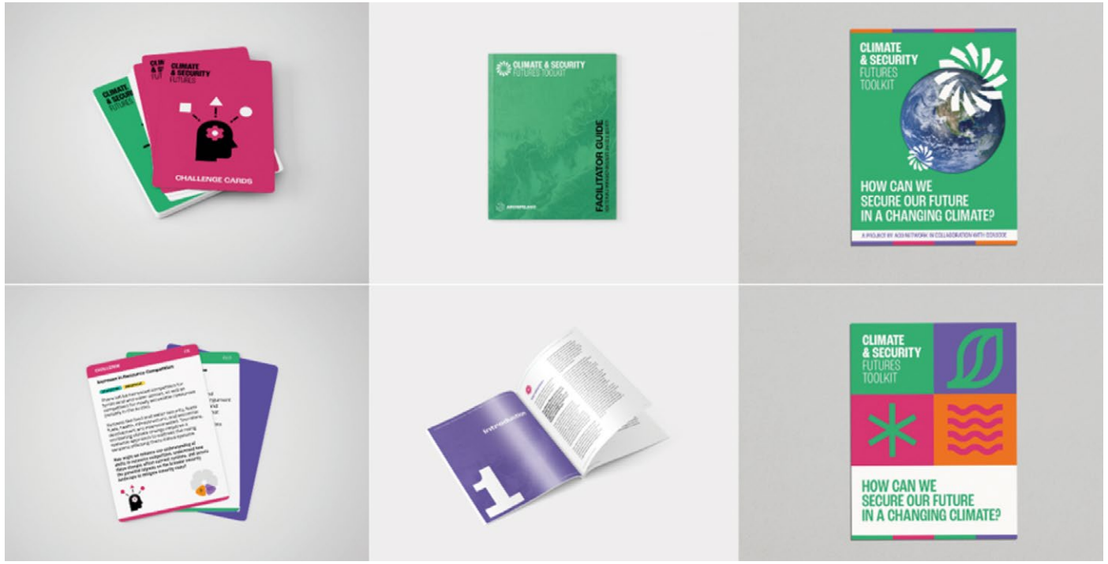

NATO Cooperative Cyber Defence Centre of Excellence

The Intersection of Cybersecurity and Climate Change

Climate change, one of the defining challenges of our time, impacts all operational domains, including cyberspace. As the world becomes increasingly interconnected and digitized, the potential for malicious cyber activity also rises. It is crucial to understand and adapt to the accelerating impacts of climate change and mitigate these risks. Whether these include cyberattacks targeting environmental monitoring systems to manipulate data or attacks on critical infrastructure impacting its safety and functionality, the risks are significant and can have great impact on the environment. For example, there have been several cyberattacks disrupting energy systems and attacks on water treatment facilities.

At the NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE), 39 member nations are working together to be able to face emerging cyber threats as a coalition, thereby also minimizing risks coming from the cyberspace to the physical environment. As a NATO-accredited cyber defence hub we offer a unique interdisciplinary approach to the most relevant issues in cyber defence with our research, trainings and exercises, which also include defending critical infrastructure. We support the process of integrating cybersecurity into NATO and national governance and capabilities within our focus areas of technology, strategy, operations and law. Additionally, we are responsible for identifying and coordinating education and training solutions in the field of cyber defence operations for all NATO bodies across the Alliance.

CCDCOE has unique expertise of cyber defence and cyber threats and we look forward to cooperation possibilities to ensure climate security together.

Photo Credit: Archipelago of Design

Advancing Climate Security Together

Climate change is a global challenge, with effects shaping our geophysical and geopolitical landscape with far-reaching security implications. Climate trends deeply impact the physical environment as well as worldwide economic, security, and health outcomes. Not only are food, environmental, and human security being held at risk, but militaries must adapt to the new tactical, operational, and strategic realities that impact national, regional, and global security.

The George C. Marshall European Center for Security Studies (GCMC) is integrating climate literacy across its curriculum. GCMC is a unique German-American partnership and trusted global network promoting common values and advancing collaborative geostrategic solutions. Our comprehensive approach to security cooperation includes professional education, research, and dialogue tailored to strengthen our collective approach to security challenges.

Partnering with other U.S. Department of Defense Regional Centers, NATO, think tanks, and other climate-focused organizations has been essential in strengthening GCMC's innovative approach to climate security. This includes a multi-faceted process that both weaves climate security awareness into resident courses, while also hosting tailored workshops that focus specifically on climate matters. Further, GCMC subject matter experts participate in an array of conferences, events, and external courses in order to enable greater understanding and planning for the implications of climate change on security cooperation and the broader security environment.

In particular, GCMC hosted a Climate Security workshop in 2023 designed to bring experts together to enhance awareness of the immense challenges posed by climate change and how it will affect the greater security environment. Workshop findings focused on security implications of climate change for NATO's Northern and Southern Flanks. Resident courses ranging from the Program on Applied Security Studies (PASS), Program on Regional Security Studies (PRSS), and the European Security Seminar-North/High North Security Dialogue (ESS-N/HNSD) have incorporated foundational aspects of climate change and challenged participants to better understand the climate security impacts of warming trends.

In the future, GCMC envisions continuing this focus, looking particularly to strengthen:

- Systematic cooperation across DoD's Regional Centers, USG, and German FMOD
- Systematic cooperation with NATO's CASSCOE (exchanging teaching personnel, development of curriculum, etc), with the climate security unit at NATO HQ, and the EU
- Cooperation and partnerships with Europe's leading think tanks/institutes that translate climate change into security and military studies
- Explore co-hosted climate security workshops or a resident course for security professionals from Europe and beyond, focusing on regional dimensions – especially Europe's Northern and Southern Flanks

Focus on climate security is an increasingly essential aspect of security studies. Climate change is a tremendously destabilizing force and it exacerbates other national security concerns, while posing additional challenges to readiness. We recognize that it is critical to continue to cooperate on matters on climate security in hopes of developing collective understanding and collaborative solutions to common challenges.

CDR Rachael Gosnell

Dr. Katrin Bastian

Photo Credit: Norwegian Ministry of Defence

Conference of Defence Associations Institute

The Conference of Defence Associations (CDA) Institute has recently entered into a cooperation agreement with the CCASCOE on hosting major joint events and fostering thought leadership in the field of climate security. The Conference of Defence Associations is a leading defence and security think tank founded in 1932, which brings together 45 member associations representing over 400,000 active and retired members of the Canadian Armed Forces and Canadians with a close connection to national defence and security.

The Montreal Climate Security Summit

The highlight of the CDA Institute's partnership with the CCASCOE will be the annual Montreal Climate Security Summit, which this year will take place on October 29th-30th, 2024. The Montreal Summit is an annual international meeting at the intersection of climate change and security, which brings together participants from across the NATO Alliance and beyond.

This year, the Montreal Summit is expected to have an audience of 200 guests including high-level civilian and military practitioners, policy makers, and seasoned researchers hailing from NATO member countries, multilateral and regional organizations, industry, think tanks, and civil society. The event will feature speakers from Canada, Norway, Denmark, Germany, the United Kingdom, the United States, South Africa, Finland, Italy, Kuwait, the Netherlands, India, as well as NATO HQ, the European Union and the United Nations. Discussions will be action-oriented and explore the following central themes: current and future climate security threats and the role of NATO; resilience of military infrastructure and institutions; greening defense; regional and Indigenous outlooks; Arctic security; strategic foresight; human security; data-sharing; and others.

The CDA Institute's Climate and Security Programme

The CDA Institute has been at the forefront in Canada among defence and security think tanks to raise awareness on and study the issues surrounding climate and security. It has published numerous peer-reviewed articles on topics such as arctic security and the impacts of climate change on domestic military operations.

The objective of the CDA Institute's Climate and Security Programme is to advance informed debate and dialogue on the multiple ways in which climate and environmental change interact with Canadian national security issues, particularly as it relates to national defence and foreign policy. Through activities promoting expertise, research and analysis on the climate and security nexus and its implications for Canada, the Institute contributes to informing Canada's climate security priorities and Canada's role in global climate security efforts; strengthens the Canadian community of practitioners, scholars and policymakers on climate and security; and contributes to the development of tangible solutions to current and emerging security and defence challenges relating to climate change.

The programme's activities are currently articulated around five key areas central to Canada's national interests: Arctic security; human security and access to food and water; disaster prevention and response; infrastructure resilience; and decarbonizing defence.

Beyond the Montreal Summit, the CDA Institute's Climate and Security Programme features the publication of in-house research and external contributions, such as Threat Assessments and Policy Papers, and special editions of the Expert Series podcast.

The CDA Institute looks forward to advancing and strengthening its partnership with the CCASCOE and engaging with the expanding global climate security community on these topics.

CDA INSTITUTE

Photo Credit: Caméra de combat des Forces canadiennes/ Cpl Jennifer Kusche

Conclusion

Photo Credit: Romanian Air Force

The establishment of the NATO Climate Change and Security Centre of Excellence represents a significant milestone in the Alliance's efforts to integrate climate security into its operational framework. This pivotal initiative underscores NATO's recognition of climate change as a critical factor influencing global security dynamics. By prioritising climate-related risks and fostering innovative strategies, CCASCOE positions NATO to effectively address the pressing challenges posed by climate change, ultimately enhancing the security of its member states and global partners.

The significance of CCASCOE extends beyond merely assessing risks; it serves as a hub for research, analysis, and training, enabling the development of adaptive strategies to confront emerging threats. Its collaborative approach fosters engagement among NATO member states, military leaders, and international stakeholders, encouraging the sharing of best practices and lessons learned. This collective effort is essential for strengthening resilience across military operations and ensuring a coordinated response to the multifaceted challenges that climate change presents.

It is imperative for NATO member states, military leaders, and global partners to actively support and engage with CCASCOE's mission. By committing to this vital cause, we can enhance our capabilities to respond to climate-related risks and develop robust frameworks for cooperation. Collaboration is key, by pooling resources and expertise, we can ensure that our responses are not only effective but also sustainable, thereby safeguarding our shared security interests.

As we look ahead, the importance of climate security will continue to grow, fundamentally shaping military and geopolitical strategies in the years to come. The implications of climate change will touch every aspect of security, from resource management to humanitarian response, requiring a comprehensive and integrated approach. By actively engaging with CCASCOE, you can ensure that NATO remains at the forefront of addressing these challenges, setting a precedent for effective climate action on the international stage. Together, through collaborative efforts and a commitment to proactive adaptation, we can navigate the complexities of a changing world and secure a safer future for all.

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