Institute for Life, Environmental and Climate Sciences

The Impact of Climate Change on the Contemporary System of State Borders

Book of Abstracts of the International Scientific Conference hold on 31 March 2025



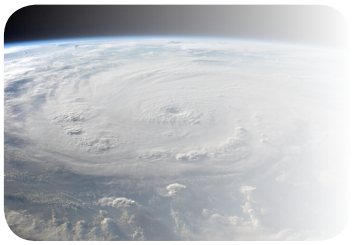

Prof. Dr. Kutluhan Bozkurt, LL. M. Eur. – Istabul Gedik University (Turkey)
Cross-border responsibilities of states in the context of ecocide crimes

Ke Tang, PhD - University of Birmingham Law School (United Kingdom)
Renmin University of China Law School (China)
The Legal Landscape of Carbon Credit Secured Financing: Comparative Insights into VCS and CCER Mechanisms

Prof. Nuray Ekşi - Marmara University (Turkey)
Climate-induced migrations and the land search of islands that will be submerged under sea waters

Toruń 2025

The Impact of Climate Change on the Contemporary System of State Borders




Book of Abstracts

Materials from the First International Scientific Conference on the Contemporarty System of State Borders

Institute for Life, Environment and Climate Science

Toruń 2025

Redakcja i tłumaczenie / Editorial and translation
Przemysław Osóbka

Opracowanie graficzne / Graphic design
Instytut na rzecz Nauk o Życiu, Środowisku i Klimacie

ISBN 978-83-974964-1-5

Instytut na rzecz Nauk o Życiu, Środowisku i Klimacie
Institute for Life, Environment and Climate Science
Rynek Staromiejski 36/38
87-100 Toruń
NIP 9562400376
REGON 540765322
http://www.ilecs.pl
e-mail: instytut@ilecs.pl

Toruń 2025

Contents

About Institute 5

Scientific Council 6

Scientific Committee of Conference 7

Przemysław Osóbka, ***Introduction: Impact of Climate Change on the Contemporary System of State Borders*** 9

Nuray Ekşi, ***Climate-Induced Migration and the Land Search of Islands that will be Submerged under Sea Waters*** 15

Kutluhan Bozkurt, ***Cross-border Responsibilities of States in the Context of Ecocide Crimes*** 16

Ke Tang, ***The Legal Landscape of Carbon Credit Secured Financing: Comparative Insights into VCS and CCER Mechanisms*** 17

Anna Mliczek, ***The impact of the difference between climate migrants and climate refugees on States' responsibilities*** 18

Marcelina Strzelczyk, ***Migration crises at national borders – the effects of climate change*** 19

Zuzanna Trybus, ***Climate change as a determinant of migration and the regulations of international law*** 20

Agnieszka Huczewska, ***Glacial melting and changes in land borders*** 21

About Institute

Institute for Life, Environment and Climate Science was established in 2025 for the purposes of conducting and supporting scientific research, research and development work and creating innovations in the field of life, environment and climate sciences, in particular:

- initiating and supporting scientific research to prevent the negative consequences of phenomena occurring in the environment and the effects of climate change,
- stimulating legislative processes at the international, national and regional levels to create and implement legal solutions in the field of protecting human health and life, the environment and climate,
- promoting rational and sustainable management of natural resources,
- initiating and supporting scientific research to increase the potential for the use and application of bottom sediments in energy, agriculture, construction and other sectors of the economy,
- disseminating knowledge and scientific achievements in the field of counteracting the consequences of climate change and environmental damage,
- promoting good practices in the field of protecting human health and life, the environment and climate.

Institute for Life, Environment and Climate Science has the status of an ordinary association. Institute is non-profit organisation and does not have legal personality. Institute conducts scientific activities independently and continuously.

The Institute acts on the basis of the provisions of:

- The Act of 7 April 1989 - Law on Associations (consolidated text: Journal of Laws of 2019, item 713),
- The Act of 25 September 2015 on amending the Act - Law on Associations and certain other acts (Journal of Laws of 2015, item 1923),
- Act of 20 July 2018 - Law on Higher Education and Science (consolidated text: Journal of Laws of 2024, item 1571),
- Act of 24 April 2003 on public benefit activities and volunteering (consolidated text: Journal of Laws of 2024, item 1491),

and in accordance with the provisions of the Institute's Rules.

The seat of the Institute is the City of Toruń. The income obtained by the Institute is used exclusively for the implementation of its statutory objectives.

You can support the Institute's activities by making a donation to the bank account:

- for **EURO** - BNP Paribas 16 1600 1462 1715 8792 3000 0003, BIC/SWIFT: PPABPLPK, IBAN: PL
- for **PLN** - BNP Paribas 70 1600 1462 1715 8792 3000 0001

Thank you!

Scientific Council

Scientific Council was established on according to §27.3 of the Reglament of Institute for Life, Environment and Climate Science

President of Scientific Council

Prof. Dr. Kutluhan Bozkurt, LL.M. Eur.
Istabul Gedik University (Stambul, **Turkey**)

Members

Prof. Dr. Nuray Ekşi
Marmara University, Faculty of Law (Stambul, **Turkey**)

Prof. Dr. Rebeka Kotlo
Dzemal Bijedic University of Mostar, Faculty of Law (Mostar, **Bosnia and Herzegovina**)

Prof. PhD Olena Snegova
State Institution "Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine" (Kiev, **Ukraine**)

Prof. PhD Agnieszka Szpak
Nicolaus Copernicus University, Faculty of Political Science and Security Studies (Toruń, **Poland**)

Prof. PhD Samanta Kowalska
Kalisz University, Faculty of Law (Kalisz, **Poland**)

Meljana Bregu, PhD
University of Tirana, Faculty of History and Philology (Tirana, **Albania**)

Marcin Łukaszewski, PhD
Adam Mickiewicz University, Faculty of Political Science and Journalism (Poznań, **Poland**)

Julia Kapelańska-Pręgowska, PhD
Nicolaus Copernicus University, Faculty of Law and Administration (Toruń, **Poland**)

Magdalena Micińska, PhD
Jagiellonian Academy (Toruń, **Poland**)

Przemysław Osóbka, PhD
Institute for Life, Environment and Climate Science (Toruń, **Poland**)

Scientific Committee of Conference

President

Prof. Dr. Kutluhan Bozkurt, LL.M. Eur.
Istabul Gedik University (Stambul, **Turkey**)

Members

Prof. Dr. Rebeka Kotlo
Dzemal Bijedic University of Mostar, Faculty of Law (Mostar, **Bosnia and Herzegovina**)

Prof. PhD Agnieszka Szpak
Nicolaus Copernicus University, Faculty of Political Science and Security Studies (Toruń, **Poland**)

Sobhan Tayebi, PhD
Canadian Institute of International Law Expertise (Toronto, **Canada**)

Binoy Kurian, PhD
Christukula Mission English Medium Degree College (Satna, Madhya Pradesh, **India**)

Ivan Tomić, PhD
Dzemal Bijedic University of Mostar, Faculty of Law (Mostar, **Bosnia and Herzegovina**)

Marcin Łukaszewski, PhD
Adam Mickiewicz University, Faculty of Political Science and Journalism (Poznań, **Poland**)

Julia Kapelańska-Pręgowska, PhD
Nicolaus Copernicus University, Faculty of Law and Administration (Toruń, **Poland**)

Magdalena Micińska, PhD
Jagiellonian Academy (Toruń, **Poland**)

Filip Tereszkiewicz, PhD
University of Opole (Opole, **Poland**)

Przemysław Osóbka, PhD
Institute for Life, Environment and Climate Science
Toruń, Poland
ORCID: 0000-0003-4632-840X

Introduction: Impact of Climate Change on the Contemporary System of State Borders

Climate change brings with it a variety of consequences of a natural, environmental, economic, ecological, political, social, psychological, ethical, as well as legal and international legal nature. Among the latter, the most important problems include the climatic deterritorialization of sovereign states and changes in borders between states.

While highly developed countries are able to bear the appropriate costs to effectively deal with the threats associated with climate change, including those of an international legal nature, developing countries, especially small island states, are rarely able to independently and effectively counter these threats.

The World Meteorological Organisation's (WMO) report entitled „State of the Climate in the South-West Pacific 2023" details how the sea level rise in the South-West Pacific region exceeds the global average. Furthermore, the report noted that the surface temperatures of the Pacific Ocean have been rising three times faster than the global average since 1980. In turn, the frequency of marine heatwaves has roughly doubled since 1980. They are more intense and last longer than in the past[1].

According to the U.S. National Aeronautics and Space Administration (NASA), Pacific island nations such as Tuvalu, Kiribati, and Fiji will experience at least a 15-centimeter rise in ocean levels within the next 30 years. This increase, according to NASA, will occur regardless of whether greenhouse gas emissions change in the coming years. NASA's sea level change team conducted the analysis at the request of several Pacific island nations, including Tuvalu and Kiribati, in close collaboration with the U.S. Department of State. In addition to the general analysis, the team developed high-resolution maps showing which areas of various Pacific island nations will be exposed to flooding during high tide - otherwise known as nuisance flooding or sunny-day flooding - by the 2050s. The maps, published on September 23, 2024, illustrate the potential occurrence of flooding depending on different levels of greenhouse gas emissions, ranging from the best-case scenario to the „business as usual" scenario and the worst-case scenario[2].

---

[1] WMO, *State of the Climate in the South-West Pacific 2023*, WMO-No. 1356, Geneva 2024, https://library.wmo.int/records/item/68995-state-of-the-climate-in-south-west-pacific-2023[access: 17.05.2025]; *Climate change transforms Pacific Islands*, Press Release, 27 August 2024, https://wmo.int/news/media-centre/climate-change-transforms-pacific-islands [access: 17.05.2025].

[2] *NASA Analysis Shows Irreversible Sea Level Rise for Pacific Islands*, https://www.nasa.gov/earth/climate-change/nasa-analysis-shows-irreversible-sea-level-rise-for-pacific-islands/ [access: 17.05.2025]; *Pacific Islands Flooding Analysis Tool*, https://sealevel.nasa.gov/data_tools/19/ [access: 17.05.2025].

The analysis conducted by NASA's sea level change team revealed that the number of high-tide flood days will increase by an order of magnitude annually for almost all Pacific islands in the second half of the 21st century. Areas of Tuvalu that currently experience fewer than five high-tide flood days per year could have an average of as many as 25 flood days annually during that time. Regions of Kiribati that currently experience fewer than five flood days per year could have an average of 65 flood days per year by the 2050s. When these projections are juxtaposed with the average elevation of these countries above sea level, which is only two meters for both Tuvalu and Kiribati[3], it becomes clear that the threat of climatic deterritorialization is extraordinarily high in these nations, especially given that, according to the United States Geological Survey (USGS), they quite often face the threat posed by ocean waves ranging from five to even seven meters in height[4].

The worst-case scenarios were analyzed by World Bank experts and published in a 2013 report. Even then, it was pointed out that sea level rise in the Pacific poses an existential threat to many island nations. The report predicts that it will be greater in the western Pacific than the global average and will have far-reaching negative consequences for small island states, especially when combined with the projected greater intensity of tropical cyclones, increased loss of protective reefs due to rising temperatures and ocean acidification, and other extreme phenomena resulting from climate change. The report cited the view that a possible consequence for small island states, even with a small increase in ocean level, due to their small populations and adaptation challenges, appears to be forced abandonment. There is also the possibility that the physical effects of climate change may exceed a threshold that forces social systems to completely abandon territory because institutions that could facilitate adaptation will collapse under the impact of the consequences of climate change[5].

An additional threat to small island states facing climatic deterritorialization, or even abandonment, is the fact that out of the 20 countries and territories with the highest average annual losses caused by natural disasters, expressed as a reduction in gross domestic product, eight are Pacific island states and territories: Vanuatu, Niue, Tonga, Micronesia, Solomon Islands, Fiji, Marshall Islands, and Cook Islands[6].

Small Pacific island states account for only 0.03 percent of global greenhouse gas emissions, yet they are the ones facing many of the threats resulting from climate change[7].

Of course, small island states in the Indian Ocean (e.g., Maldives, Seychelles, Comoros) and the Atlantic Ocean (including Cape Verde, São Tomé and Príncipe), particularly in the Caribbean Sea (e.g., Haiti, Saint Kitts and Nevis, Trinidad and Tobago), face similar problems, but it was the islands in the Pacific Ocean that were the first to be described as sinking[8] or disappearing[9].

---

[3] *Tuvalu*, https://www.cia.gov/the-world-factbook/countries/tuvalu/#geography [access: 17.05.2025]; *Kiribati*, https://www.cia.gov/the-world-factbook/countries/kiribati/#geography [access: 17.05.2025].

[4] USGS, *Low-lying areas of tropical Pacific islands*, https://www.usgs.gov/centers/pcmsc/science/low-lying-areas-tropical-pacific-islands [access: 17.05.2025].

[5] The World Bank, *Acting on Climate Change and Disaster Risk for the Pacific*, 2013, p. 9, https://www.worldbank.org/content/dam/Worldbank/document/EAP/Pacific%20Islands/climate-change-pacific.pdf [access: 17.05.2025].

[6] *Ibidem*, pp. 6-7.

[7] C. Parsons, *The Pacific Islands: The front line in the battle against climate change*, 20 May 2022, https://new.nsf.gov/science-matters/pacific-islands-front-line-battle-against-climate [access: 17.05.2025].

[8] K. Angel, *New territorial rights for sinking island states*, „European Journal of Political Theory", Volume 20 Issue 1, January 2021, pp. 95-115; T. Sparks, *Statehood in an Era of Sinking Islands* [in:] T. Jafry (ed.), *The Routledge Handbook of Climate Justice*, Routledge 2018, pp. 83-99.

[9] R. Rayfuse, S*ea Level Rise and Maritime Zones: Preserving the Maritime Entitlements of "Disappearing" States*, [in:] M. B. Gerrard, G. E. Wannier (eds.) *Threatened Island Nations*, Cambridge 2013, pp. 167-191.

Skeptics will ask whether climatic deterritorialization is a real problem? The answer is: unfortunately, yes. As early as June 1997, Tuvalu lost 0.5 sq km of its territory out of its total land area of 26 sq km as a result of the devastating impact of three cyclones: Gavin, Hina, and Helly[10].

Relatively recently, Australian researchers compared a series of photographs, including satellite images, taken between 1947 and 2014. As a result, they identified five coral islands belonging to the Solomon Islands archipelago that were submerged during this period by the ocean, and another six islands that are currently experiencing significant coastal erosion. It was confirmed that changes in the coastline led to the destruction of two villages that had existed since at least 1935. These changes forced the communities inhabiting them to migrate. The degree of coastal recession is significantly higher in areas exposed to ocean waves, which demonstrates the synergistic interaction between sea level rise and the force of ocean waves[11].

Climatic deterritorialization has also been experienced by Hawaii, which belongs to the United States. When Hurricane Walaka, a category three hurricane, struck the northwestern part of this archipelago on 4 October 2018, it was accompanied by a powerful storm surge and high waves. The small, low-lying East Island was completely destroyed, and the sediment that remained was scattered across the coral reefs in the north of the archipelago. The island was of great value from the perspective of biodiversity conservation. It was one of the main nesting sites for endangered green sea turtles and critically endangered Hawaiian monk seals. It is estimated that 19 percent of sea turtle nests in 2018 were lost[12].

The Japanese Coast Guard officially announced on 24 September 2019, that Esanbe Hanakita Kojima Island, which was located approximately 500 meters off the coast of Sarufutsu, the northernmost Japanese prefecture, had „disappeared" below the surface of the sea. It was suggested that the island may have disappeared due to erosion. This was the first time that one of Japan's remote border islands, of which there were previously 484, had completely disappeared. Services under the regional coast guard headquarters in Otaru, Hokkaido, measured the water depth and conducted other surveys of the island in April and May 2019. Researchers found that the island was nowhere to be seen and instead confirmed the existence of a shallow reef. The surface area of Japan's exclusive economic zone was not affected, but the country lost approximately 0.03 km2 of its territorial waters[13].

Deterritorialization (French: *déterritorialisation*) is a concept denoting the loss of connections between various social phenomena and a specific territory, as well as the decreasing significance of territory as a determinant of state power. The concept of deterritorialization is often associated with globalization due to the ties linking economy, culture, politics, and law with specific spatial configurations. I classify this threat as the so-called „*climatic 4D*"[14].

---

[10] D. Rajca*, Polityczno-prawne wyzwania wobec funkcjonowania Tuvalu w obliczu klimatycznej deterytorializacji państwa,* „Politeja" 3(21)/2012, p. 423.

[11] S. Albert et al., *Interactions between sea-level rise and wave exposure on reef island dynamics in the Solomon Islands*, „Environmental Research Letters" 11 (2016), IOP Publishing 2016, http://iopscience.iop.org/article/10.1088/1748-9326/11/5/054011 [access: 17.05.2025]; *Five Pacific islands disappear as sea levels rise*, https://www.bbc.com/news/world-europe-36255749 [access: 17.05.2025].

[12] S. Houston, T. Birchard, *Tropical Cyclone Report: Hurricane Walaka (CP012018) 29 September–6 October 2018*, Central Pacific Hurricane Center, 9 June 2020, https://www.nhc.noaa.gov/data/tcr/CP012018_Walaka.pdf [access: 17.05.2025]; P. Dockrill, *An Entire Hawaiian Island Has Just Vanished Off The Face of Earth*, https://www.sciencealert.com/entire-hawaiian-island-was-just-erased-by-hurricane-east-walaka-chip-fletcher-monk-seals-green-sea-turtles [access: 17.05.2025].

[13] N. Gemma, *Islet off Hokkaido vanishes: Japan Coast Guard probe*, „Mainichi Japan", 25 September 2019, https://mainichi.jp/english/articles/20190925/p2a/00m/0na/008000c [access: 17.05.2025].

[14] P. Osóbka, *The problem of "climate refugees" in view of international humanitarian law – selected issues*, „Studia z zakresu nauk prawnoustrojowych. Miscellanea", Tom VIII, z. 2, Bydgoszcz 2018, p. 165; P. Osóbka, *Zmiany klimatyczne - nowe wyzwania i zagrożenia dla instytucji państwa i obywatelstwa*, „Państwo i Prawo" nr 2019/8, p. 132; P. Osóbka, Ramowa konwencja Narodów Zjednoczonych w sprawie zmian klimatu z dnia 9 maja 1992 r. Komentarz, Bydgoszcz 2024, pp. 34-35.

This euphemism can be understood as the co-occurrence of physical phenomena such as deglaciation[15], deforestation[16], desertification[17], and deterritorialization, which pose a significant threat to the classic features of a state. Due to these phenomena, the state is increasingly becoming the subject of interest for international law specialists, who recognize the need to give it new meaning and adapt its functions to the realities of the „post-climate" era[18].

It's clear that deterritorialization as climate change negative effect will have direct impact on different territorial zones well know from international law of sea like territorial sea[19], contiguous zone[20] or exclusive economic zone[21]. In Arctic which is indirectly affected by ice sheet melting and changes in coastlines, the opening of new sea routes and access to natural resources is already leading to tensions and discussions about maritime borders and economic zones.

But there are also examples how it could change relations on land. There is well known concept of "mobile border" between Italy and Austria. According to treaty of 1 September 2006, if the national boundary, according to a clearly defined ridge line, is subject to the gradual, natural changes to which such lines are subject, sudden natural or artificial changes in the watershed line or ridge line shall not entail any change in the boundary line. In such cases, the contracting States shall proceed to verify the boundary agreement on the basis of its unequivocal recognition[22].

Similar solution was included in the Exchange of notes between Switzerland and Italy concerning the national border of May 2008 which stated that "gradual changes in the displuvial line or ridgeline means, in particular, a movement of the ridgeline as a result of erosion, or a movement of the displuvial line following changes in glaciers or snowfield; if a glacier or snowfield contracts, the boundary line shall stably coincide with the displuvial line or ridgeline of the emerging rocky terrain"[23].

---

[15] Deglaciation refers to the uncovering of land and water that was previously covered by ice, *2025 International Year of Glaciers' Preservation*, https://www.un-glaciers.org/en [access: 17.05.2025].

[16] Deforestation is the conversion of forest to other land use independently of whether human-induced or not, FAO, *Global Forest Resources Assessment 2020. Terms and Definitions FRA 2020,* "Forest Resources Assessment Working Paper". No. 188, p. 6.

[17] Desertification is land degradation in arid, semi-arid, and dry sub-humid areas, resulting from various factors, including climate change and human activities, *United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*, A/AC.241/27, 12 September 1994, art. 1.

[18] D. R. Bugajski, *Klimatyczna deterytorializacja państwa na przykładzie Tuvalu*, „Stosunki Międzynarodowe – International Relations", Nr 1–2 (t. 41) 2010, pp. 203-219.

[19] "Every State has the right to establish the breadth of its territorial sea up to a limit not exceed 12 nautical miles, measured from baselines determined in accordance with this Convention.", *United Nations Convention on the Law of the Sea*, art. 3 [in] *The Law of the Sea. United Nations Convention on the Law of the Seas with Index and Final Act of the Third United Nations Conference on the Law of the Sea,* New York 1983, p. 3.

[20] "The contiguous zone may not extend beyond 24 nautical miles from the baselines form which the breadth territorial sea is measured", *ibidem*, art. 33.2.

[21] "The esclusive economic zone shall not extend beyond 200 nautical miles from baselines from which the breadth of the territorial sea is measured", *ibidem*, art. 57.

[22] T*reaty between the Republic of Austria and the Italian Republic on maintaining border markings and on surveying and marking the common national border*, art. 3.2, United Nations Treaty Series, Vol. 2435, No. 43899, p. 258, https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280060f69&clang=_en [access: 21.05.2025].

[23] *Exchange of notes between Switzerland and Italy concerning the national border in the case of natural variation in the line of the watershed or of the ridgeline in correspondence of the glaciers. Rome, 23 May 2008 and 26 May 2008,* United Nations Treaty Series, Vol. 3249, No. 55174, pp. 6-7, https://treaties.un.org/doc/Publication/UNTS/No%20Volume/55174/Part/I-55174-080000028029638f.pdf [access: 21.05.2025].

Actually, Italian-Swiss border in the Matterhorn area has changed due to glacial melting. Traditionally, a significant portion of the border between Italy and Switzerland in the Alps ran along glacier ridges and the permanent snow line. However, as a result of ongoing climate warming and glacial melting, these natural boundary points have changed. Glaciers have decreased in volume and shifted, revealing new rocky areas. Case of the Italian-Swiss border change in the Matterhorn area is a concrete example of how the negative consequences of climate change, in this case glacial melting, can lead to the need for renegotiation and changes in the course of state borders. This shows that climate change not only affects the environment but also geopolitical and legal issues.

Case of the Italian-Swiss border near the Matterhorn isn't the only one, although it's one of the most widely reported and documented examples of border changes related to glacial melting[24]. But there are other regions where similar processes are occurring or may occur in the future.

In the high Andes, where borders between Argentina, Chile, Bolivia, and Peru often follow mountain ridges and the permanent snow line, the melting of Andean glaciers could create similar problems for precise border definition in the future. In the Himalayas and Karakorum, the highest mountain ranges in the world, where borders between China, India, Pakistan, Nepal, and Bhutan traverse vast glacial systems, climate change and ice melt could significantly impact border demarcation in the future.

However border changes due to glacial melting are usually small and relate more to the precise demarcation of the border line rather than significant territorial shifts, international law does not yet contain detailed regulations regarding border changes caused by climate change, which could pose a challenge in the future.

Reasons and problems described above are enough to start scientific discussion on impact of climate change on the contemporary system of state borders. That is why Institute for Life, Environment and Climate Science organized international scientific conference on this topic. This Book of Abstract which I would like hand over to readers should be a kind of encouragement to get to know on scientific views of the speakers from different parts of the world.

In this place, in the name of Institute I would like to say thank you very much to all speakers who took part in the conference. It was great honor to saw you in the number of participants of the conference. I am convinced your words help us to better understand problems with climate change influence on the contemporary system of state borders.

---

[24] J. Travers, *Glacier Melt Leads to Redrawing of the Italian-Swiss Border*, "State of the Planet. News from the Columbia Climate School", December 6, 2024, https://news.climate.columbia.edu/2024/12/06/glacier-melt-leads-to-redrawing-of-the-italian-swiss-border/ [access: 21.05.2025]; *Per un pugno di metri: Svizzera e Italia rivedono i confine*, https://www.swissinfo.ch/ita/soluzioni-climatiche/per-un-pugno-di-metri-svizzera-e-italia-rivedono-i-confini/487504 [access: 21.05.2025]; *Moving Borders. A cartographic and political enquiry*, http://www.italianlimes.net/project.html [access: 21.05.2025]; L. Paddison, *Italy and Switzerland have agreed to shift their shared border in the Alps. Here's why*, October 1, 2024, https://edition.cnn.com/2024/10/01/climate/melting-glaciers-border-switzerland-italy/index.html [access: 21.05.2025]; A. Boyd, *Switzerland and Italy redraw border due to melting glaciers*, 30 September 2024, https://www.bbc.com/news/articles/cgk7r0rrdnmo [access: 21.05.2025]; A. Giuffrida, *Melting glaciers force Switzerland and Italy to redraw part of Alpine border*, 29 September 2024, https://www.theguardian.com/environment/2024/sep/29/melting-glaciers-switzerland-italy-alpine-border-matterhorn [access: 21.05.2025]; *Why are Italy and Switzerland redrawing their Alpine border?*, https://www.aljazeera.com/features/2024/10/3/why-are-italy-and-switzerland-redrawing-their-alpine-border [access: 21.05.2025].

The first speaker **Professor Nuray Ekşi**, representing **Faculty of Law of Marmara University in Turkey** gave a lecture *Climate-Induced Migrations and the Land Search of Islands That Will Be Submerged Under Sea Waters*.

Our second guest **Professor Kutluhan Bozkurt** from **Istabul Gedik University in Turkey**, who also hold office of the President of Scientific Council of the Institute for Life, Environment and Climate Science, gave a speech *Cross-border Responsibilities of States in the Context of Ecocide Crimes*.

Next participant **Doctor Ke Tang**, doubly affiliated in **University of Birmingham Law School in United Kingdom** and **Renmin University of China Law School in China** gave presentation on *The Legal Landscape of Carbon Credit Secured Financing: Comparative Insights into VCS and CCER Mechanisms*.

Very special guest from the west hemisphere **Professor Josiah Heyman** from **University of Texas at El Paso in United States of America**, despite the difficulties of the time difference, gave a lecture *Challenges and opportunities for transboundary decision-making and governance of common resources*.

And of course Polish participants also took part in the conference. **Anna Mliczek** from **Nicolaus Copernicus University in Toruń** gave presentation on *The impact of the difference between climate migrants and climate refugees on States' responsibilities*.

Marcelina Strzelczyk from **Rzeszów University of Technology** gave a speech *Migration crises at national borders – the effects of climate change*.

Zuzanna Trybus representing **University of Silesia in Katowice** gave a presentation on *Climate change as a determinant of migration and the regulations of international law*.

Finally **Agnieszka Huczewska** from **State Academy of Applied Sciences in Włocławek** gave a speech *Glacial melting and changes in land borders*.

All the presented papers provided added value in understanding the complexity of the legal consequences of climate change. The emphasis placed on the issue of the impact of climate change on state borders paved the way for in-depth reflection on the role of the state in counteracting the negative consequences of this phenomenon. However, this discussion will be taken up during the next scientific meetings organized by the Institute for Life, Environment and Climate Science.

Prof. Dr. Nuray Ekşi
Faculty of Law of Marmara University
Stambul, Turkey

Climate-Induced Migration and the Land Search of Islands that will be Submerged under Sea Waters

There are three main legal questions concerning sinking islands:

I. What will happen to the populations of the sinking islands?

II. Whether islands that will be submerged under the sea can be accepted as states without having a piece of land of their own

III. Whether islands that will be submerged under the sea can continue to use their maritime zones

Under international law, other states are not obligated to provide shelter or territory to the citizens of sinking islands.

There are initiatives to draft an international convention to provide protection to climate-induced people, but it has not become a binding text.

Do climate-induced people qualify as falling under the scope of asylum? Some islands including five of the Solomon Islands, certain islands belonging to Papua New Guinea, and several islands in Micronesia have been submerged due to rising sea levels. In the near future, some islands, including the Marshall Islands, Maldives, Tuvalu, and Kiribati will also become uninhabitable. People living on islands that are sinking or being affected by rising sea levels are facing displacement. People living on these islands have already begun to move to neighbouring countries and apply for asylum there. The number of people in this group, referred to as „climate refugees," „ecological refugees," or „environmental refugees" is steadily increasing. That is why these people claimed refugee status in other countries. New Zealand and Australia have rejected applications from Tuvalu and Kiribati citizens, who claimed their lives were at risk due to climate change. This is because climate change, natural disasters, drought, hunger, poverty, and water scarcity are not currently recognized as valid grounds for granting refugee status under international law and in particular under 1951 Geneva Convention relating to the Status of Refugees.

According to the Montevideo Convention on the Rights and Duties of States of 1933, in order to mention a state, four elements should be present: (1) a permanent population; (2) a defined territory; (3) a government; and (4) the capacity to enter into relations with other states. It is a current issue whether the islands that will be submerged under the sea water can be recognised as states, since they will no longer fulfil the requirement of «having a definite territory» under Article 1 of the 1933 Montevideo Convention. Moreover, the territories of the island states in question do not completely disappear, but remain under the sea waters. The overwhelming opinion recognises the geographical disappearance of the territory of a state as a reason for the termination of that state. In other words, the conventional understanding is that «one cannot be a state without territory».

Island states also have continental shelves, exclusive economic zones, contiguous zones, and territorial waters. Another challenge for states whose territories will be submerged is whether they will retain their maritime zones. Whether the maritime zones will cease to exist if an island is submerged is a separate issue.

Prof. Dr. Kutluhan Bozkurt
Faculty of Law of Istabul Gedik University
Stambul, Turkey

Cross-border Responsibilities of States in the Context of Ecocide Crimes

Ecocide has emerged as an important phenomenon and concept in recent years. In the fight against global warming and climate change, the classical approaches and practices of international law run the risk of not being very successful. In this context, it is clear that there is a need for cross-border regulations and cross-border judicial decisions on the responsibility of states.

For this reason, the crime of ecocide, as a transboundary regulation at the universal level, has the potential to be an important instrument. Indeed, the adoption and implementation of the crime of ecocide as a jus cogens rule to protect the planet's own ecosystem would be an important step in the fight against climate change. It would also pave the way for cross-border international judicial decisions.

The ecocide regulation will be a cross-border regulation for the creation of the right to self-determination of the planet, the right to life of the planet, and universal declaration of the Planet Rights. These will be important milestones in creating an obligation for states to comply with this regulation, whether they are parties to it or not.

Ke Tang, PhD
University of Birmingham Law School, United Kingdom
Renmin University of China Law School, China

The Legal Landscape of Carbon Credit Secured Financing: Comparative Insights into VCS and CCER Mechanisms

This paper provides a comprehensive legal analysis of carbon credit-secured financing, focusing on a comparative study of the Verified Carbon Standard (VCS) and China Certified Emission Reduction (CCER) systems. Utilizing normative analysis and document research, it introduces a multidimensional framework to evaluate carbon credits' eligibility as debt securities. The analysis suggests that the market acceptance of VCS credits (VCUs) is strictly limited by Verra's terms of use, whereas CCER credits (CCERUs) offer investors greater autonomy and flexibility. The paper categorizes VCUs as contractual claims and CCERUs as general property rights under the Chinese Civil Code. It recommends using VCUs as debt security through a floating charge, while CCER credits, benefiting from greater market liquidity, are more suitable for a fixed charge. These findings provide practical guidance for stakeholders aiming to leverage carbon credits for financial security, contributing to optimizing both China's domestic and the global green financing system.

Anna Mliczek
Faculty of Law of Nicolaus Copernicus University
Toruń, Poland

The impact of the difference between climate migrants and climate refugees on States' responsibilities

In the current situation more of the displaced for climate reasons are crossing borders, making it a States' issue that needs to be addressed in more than just internal ways. Regardless of the necessity of programs and laws aiming at improvement and prevention of future consequences of climate induced disasters, it creates ignorance of issues that are already in motion. As climate change intensifies, it increasingly contributes to displacement due to factors such as rising sea levels, extreme weather, prolonged droughts etc.

Nevertheless, the concept of climate induced displacement does not neatly fit within traditional definitions, leading to gasps in protection and legal recognition. A key to different responsibilities on States' borders in context of climate changes is use of terminology and the consequences tied to it. The term 'climate refugee' raises multiple controversies as international organisations refuse to acknowledge it. However, the more used term 'climate migration' creates increased risks not only for people seeking refugee in the consequence of climate induced events but also for the stability of the States' borders.

The overall change in terminology from 'refugee' to 'migrant' is dictated by the elimination of any discrepancy that may arise in the scope of the 1951 convention. In response to these differences, this research seeks to assess the implication of recognising the victims of cross - border climate induced displacement as a distinct social group within both the United Nations and the European Union legal context, contributing to a more comprehensive approach to addressing the responsibilities of States'.

The research puts impact on the passage of time as a factor enabling modification in the form of introducing a qualitatively new content of the obligation as a result of a legal interpretation made by the control authorities that is binding on the State. It is crucial that in recent years the European Court of Human Rights recognizes climate - induced disasters as a violation to the right of life.

This implies that climate refugees met the conditions set up by the definition of refugees as part of a particular social group. The possibility of using the Geneva convention for protection sets the new responsibilities on the State in the context of managing climate refugees.

Marcelina Strzelczyk
Rzeszów University of Technology
Rzeszów, Poland

Migration crises at national borders – the effects of climate change

Climate change is increasingly leading to mass migrations of populations, causing crises at state borders and destabilizing migration systems. Extreme weather events, desertification, rising sea levels, and the degradation of natural resources are forcing millions of people to leave their homes, particularly in Africa, South Asia, and Latin America.

The presentation analyzes the impact of climate change on migration and its consequences for state borders and international security. Specific examples of migration crises will be discussed, including:

- USA-Mexico – migrations caused by droughts and hurricanes in Central America,
- EU and North Africa – increasing migration due to desertification and lack of access to water,
- India-Bangladesh – displacements related to the submersion of coastal areas.

The political and legal aspects of climate-induced migration will also be presented, including the problem of the lack of official „climate refugee" status in international law and the responses of states and international organizations to this growing problem. Possible future scenarios will be discussed, including population relocations, infrastructural adaptation, and changes in migration policy and international law.

The aim of the presentation is to answer key questions: Can climate change influence the redefinition of state borders? What strategies should states adopt to manage increasing migration waves? Is the world ready to recognize climate-induced migration as a global challenge requiring international cooperation?

Zuzanna Trybus
University of Silesia
Katowice, Poland

Climate change as a determinant of migration and the regulations of international law

Climate change is becoming one of the key challenges of the modern world, affecting the lives of millions of people and causing migrations on an unprecedented scale. As a result of rapidly progressing environmental changes, such as rising sea levels, floods, and droughts, communities around the world are forced to leave their places of residence. However, the traditional framework of international protection, based on the 1951 Refugee Convention, does not cover situations where migrations result from the negative effects of climate change, leading to a lack of adequate protection for these individuals.

In the face of a growing number of people forced to leave their homes due to extreme weather events and environmental degradation, it is necessary to develop comprehensive strategies for managing climate-induced migration. Many states, especially those most vulnerable to the effects of global warming, are calling for the creation of new legal frameworks that will provide adequate protection for environmentally displaced persons and enable them to legally settle in safe places.

Furthermore, increased cooperation between international organizations, governments, and the private sector is crucial for developing long-term solutions, encompassing both preventive actions and support mechanisms for communities already affected by the impacts of climate change. International initiatives, such as the Paris Agreement, while mainly focused on mitigation and adaptation, provide a framework for discussing the need to expand human rights protection to also include climate-induced migration.

The European Union, through its legal instruments and adaptation projects, plays a key role in supporting countries most vulnerable to climate change, implementing technical and financial solutions aimed at mitigating the effects of environmental degradation. In addition, the EU cooperates with countries outside its area, exchanging experiences and best practices in the field of adaptation.

To effectively counter this growing problem, it is necessary to broaden the definition of a refugee or develop a new legal instrument that will enable the protection of persons displaced for environmental reasons, which requires coordinated action on the international stage and the involvement of all stakeholders.

Agnieszka Huczewska
State Academy of Applied Sciences
Włocławek, Poland

Glacial melting and changes in land borders

The melting of glaciers due to climate change has a significant impact on land borders, which is linked to various geological and hydrological processes. As global temperatures rise, glaciers worldwide are shrinking at a rapid pace, and their melting leads to several important consequences.

Sea Level Rise – On the one hand, the melting of glaciers contributes to the rise in sea levels, which threatens the coastlines of many countries and leads to the flooding of low-lying areas. In the face of this phenomenon, national borders, especially on islands and in coastal regions, may shift. Changes in sea levels can also cause border disputes between countries, particularly in areas where land approaches the sea border.

Changes in Land Configuration – The melting of glaciers releases water, which then alters the course of rivers and lakes, leading to the formation of new geographical features. An example of this can be seen in the changes in the Arctic topography, where erosional processes are altering the shape of coastlines and shorelines. This also affects land borders, especially in regions that are the subject of international territorial disputes (e.g., the Arctic, Antarctica).

Transformations in Soil and Landscape – The increase in temperature also leads to the loosening of soil structure and the release of various greenhouse gases from it, which have an additional impact on climatic and environmental processes. Changes in land structure can cause landslides, altering the configuration of land borders in mountainous and highland areas.

Territorial Disputes – The melting of glaciers can lead to the exacerbation of territorial disputes, particularly in polar and coastal regions. The rise in sea levels or changes in coastlines can lead to disagreements between countries regarding the demarcation of new borders.

In a global context, changes in land borders caused by the melting of glaciers are not only a scientific issue but also a political and legal one. Contemporary scientific research and international agreements must take these changes into account in their analyses and decisions regarding environmental protection and international territorial boundaries.

"(...) *as long as the threats caused by global warming are not tangible, direct or visible in everyday life, then no matter how serious they may seem, people will sit on their hands and do nothing concrete about them.*"
Anthony Giddens, „The Politics of Climate Change"

First International Scientific Conference „The Impact of Climate Change on the Contemporary System of State Borders" was held on 31 March 2025 online on the MS TEAMS.

The aim of the conference was scientifically analyze threats resulting from the impact of climate change on the borders between states and to discuss the manifestations of this impact in law, politics and the economy.

The conference was attended by representatives of the scientific world from research centres from China, Poland, Turkey, United Kingdom and United States of America.

ISBN 978-83-974964-1-5