



NOTE FOR NATIONAL DEFENCE:

Security and Geopolitical Concerns over Irkutsk; Climatic Instigation

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Summary

- ✚ The purpose of this report is to highlight the important environmental implications of climate change in Irkutsk and within its ecosystem incentivizing security, and geopolitical concerns on both the national and international levels.

CONTEXT AND BACKGROUND:

Natural climatic sensitivities of regions in higher latitudes; continental subarctic, boreal, and arctic environments, experience climate anomalies due to perturbation to the slow adaptational energy flow.¹ Methods and models, namely the *Köppen Climate Classification* and the *General Circulation Models* (GCMs), conjunctively estimate, based on air-ocean indicators, a uniform warming of higher latitudinal regions, within 70 ° and 60 °N regions.² The latter strongly influences the climate system, revealing a link between changes within high-latitude ecosystems, and global climate change.³ Regions such as Irkutsk, serving as a historical trade route to China and Mongolia and as an industrial zone producing hydroelectricity and the extraction of raw lucrative materials, such as liquified natural gas (LNG), risks geopolitical and security safety under unprecedented climate anomalies. Irkutsk's political importance resides in its geopolitical and economic influence, and its ecosystem service from Lake Baikal, supporting sustainable development in neighboring Serbian regions.⁴ Thus, with unprecedented climate variabilities in Irkutsk and the strategic and environmental importance of Lake Baikal, there is a need to assess the environmental and geopolitical implications, incentivizing security concerns for the Russian Federation and the Arctic Circle.

THE ISSUE

The largest reserves of minerals and combustibles found in Irkutsk account for 2.5 billion tons of oil; 8.4 trillion m³ of gas; and 96% of the coal reserves is strategically precedent to the international energy market and its role within Irkutsk's geopolitics. The loss of permafrost, instigated by global warming, threatens the energy market's export rates by engendering recurrent natural disasters such as floods and wildfires. Despite efforts made by Putin's government for the underground extraction of LNG through

¹ E. F Roots, "Climate change: High-latitude regions", *Climatic Change* 15, no. 1 (1989): 223. <https://link.springer.com/content/pdf/10.1007/BF00138853.pdf>

² Gorlenko, N. V., and M. A. Murzin, "Comparative assessment of occupational risks at enterprises of oil production and coal industries in the Irkutsk region," in *IOP Conference Series: Earth and Environmental Science* 408, no. 1 (2020): 2.

³ F.S Chapin III et al., "Arctic and Boreal Ecosystem of Western North America as Components of the Climate System", *Global Change Biology* 6 (2000): 211. <https://escholarship.org/content/qt4m48z1dn/qt4m48z1dn.pdf>

⁴ Karsten Frotscher, Carolin Thiel & Christiane Schmullius, "The Irkutsk Regional Information System for Environmental Protection (IRIS)", *Report Series in Aerosol Science* 130 (2007): 23.

pipeline construction, existing infrastructure loss is estimated at a \$67 billion by 2050.⁵⁶ Factors such as occupational risks arising from climate-migrants, diseases' migratory patterns, demographic changes of human and non-human species, etc. threatens the economic, social, and political security of Irkutsk.⁷ The issue rests on the ambiguous climate scenario projections, and the multifaceted and inadequate security precautions undertaken by the Russian Federation over territorial borders, altering economic competition and foreign infiltration within the energy market extending to the Arctic Circle. Consequently, the latter affects existing treaties and diplomatic ententes made on international grounds. Therefore, the Canadian government should consider the emerging socio-economic and geopolitical implications engendered by climate change within Irkutsk to alleviate the spread of the latter's consequences to the Arctic Circle. Moreover, focusing on regions with similar climates enables for better government preparedness strategies especially with IPCC's recent 'Code Red for Humanity' declaration.⁸

CLIMATIC IMPLICATIONS

The International Panel for Climate Change (IPCC)'s release of the AR6 WGI report confirms climatic changes in the Russian Arctic (RAR), the Russian Far East (RFE), East (ESB), and West Siberia (WSB).⁹ All regions confirmed increased occurrences of hot extremes and heavy precipitations from anthropogenic activities. Given neighboring economic decline and Irkutsk's continuous extraction of natural resources affecting the topography and the species living within Baikal's ecosystem, anthropogenic impacts worsen and yield more drastic socio-ecologic and infrastructural problems.¹⁰ Rail tracks, pipelines, and roads risk collapsing under soil warming, distorting the thawing permafrost and the ground's layers, impeding on energy assets.¹¹

Climate change foments multifaceted oscillatory patterns within ecosystem services and functions, resulting in a cycle of anthropogenic and ecological complications. Ecological implications within a proximate location transcends to the other; this is the case of Irkutsk and Lake Baikal's ecosystem. Warmer air temperatures alter patterns of thermoinsulation provided by snow cover, paramount for the protection of tree roots; ensuring prompt thawing; prohibiting the deceleration of tree growth; and reducing lethal consequences on biota species.¹²¹³ Changes in snow coverage influences the thermal regimes of soils, affecting the entire climate system given the ecosystem services provided by the boreal and Arctic grounds.¹⁴ In the Arctic and subarctic regions, changes in summer rainfall engender a cooling impact on soil temperature, causing climate anomalies.¹⁵ Irkutsk, from 1890-1990, experienced greater precipitations occurring during colder winters, and during warmer winters, drier summers, and colder soil.¹⁶ For Russian, Canadian, and Alaskan soil, results show a decadal cooling of -0.02 °C in soil temperatures impeding on agricultural activities.¹⁷ Decrease in snow depths and ice-thickness result in higher water flow engendering floods with an expected 15% to 55% increase in precipitations and a 26% increase in winter precipitations by the end of the century.¹⁸¹⁹ Resources extraction, under growing climatic implications, threatens the Russian Federation's geopolitical influence in Irkutsk, accounting for 20% of regional investments.²⁰ Thus, ecological consequences result in socio-economic losses affecting Irkutsk's geopolitical influence in the Far East.

⁵ "Melting Permafrost Could Cost Russian Economy \$67Bln by 2050", *The Moscow Times*, May 28, 2021. <https://www.themoscowtimes.com/2021/05/28/melting-permafrost-could-cost-russian-economy-67bln-by-2050-a74043>

⁶ Paul Belkin, Michael Ratner, Cory Welt, "Russia's Nord Stream 2: Continued Uncertainty", *Congressional Research Service* (June 2021): 1. <https://crsreports.congress.gov/product/pdf/IF/IF11138>

⁷ Gorlenko, N. V., and M. A. Murzin, "Comparative assessment of occupational risks at enterprises of oil production and coal industries in the Irkutsk region," in *IOP Conference Series: Earth and Environmental Science* 408, no. 1 (2020): 3-5.

⁸ United Nations, "IPCC Report: 'Code Red' for human driven global heating, warns UN chief", *UN News: Global Perspective Human Stories*, August 9 2021, <https://news.un.org/en/story/2021/08/1097362>

⁹ IPCC, *Climate Change: The Physical Science Basis, Summary for Policymakers*, (2021). https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

¹⁰ Tatianna Garmaeva, "Lake Baikal: Model for sustainable development of the territory." *Lakes & Reservoirs: Research & Management* 6, no. 3 (2001): 255.

¹¹ https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

¹² Samuli Helama, Heikki Tuomenvirta, Ari Venäläinen, "Boreal and Subarctic Soils Under Climatic Change", *Global and Planetary Change* 79 (2011): 46.

¹³ Marianne V. Moore et al., "Climate Change and the World's 'Sacred Sea'—Lake Baikal, Siberia", *Bio Science Magazine* 59, no.5 (2009): 406.

¹⁴ *Ibid.*, 38.

¹⁵ *Ibid.*, 44.

¹⁶ T. Zhang, Roger G. Barry, D. Gilichinsky, S.S. Bykhovets, V.A Sorokovtsov, and Jinping Ye., "An Amplified Signal of Climate Change in Soil Temperatures During the Last Century at Irkutsk, Russia", *Climate Change* 49 (2001): 70.

¹⁷ *Ibid.*

¹⁸ *Ibid.*

¹⁹ *Ibid.*, 407.

²⁰ N E Krasnoshtanova, "New Economic Development of the North of Irkutsk Regions: Socio-Ecological Consequences", *IOP Conference Series: Earth and Environmental Science* 381 (2019): 2. doi:10.1088/1755-1315/381/1/012048

SECURITY CONCERNS

Projections anticipate the emergence of climate migrants in northern latitudes due to energy assets investment attractiveness and comfortable living environment, engendering demographic and economic changes.²¹ Security concerns derive from low population density totalling less than 10% of the Russian population residing in Siberian and Far East territories; with 2 412 000 people living in Irkutsk in 2017.²² An important implication of climate change is the notion of cultural eutrophication of Irkutsk and its relationship with Lake Baikal. Warmer weather instigates changes in activities such as transport and land-use in Irkutsk, requiring accommodating infrastructure development to support emerging economic activities in the region.²³ The energy sector aside, the substantial expansion of Russian grain exports to East Asia requires domestic infrastructural investment, independent from Japanese companies and their farmlands in Siberia calling for new port facilities, to reduce the negative implications of foreign agricultural investment.²⁴ The latter gains precedence with anticipated food security scenarios, transitioning the market from the South to the North. Concerns derive from domestic Russian investment and sovereignty over the region with growing threat of foreign settlement and investment, and weak Russian institutional intervention and demographics. With the continuous climatic oscillations, territorial and maritime transportation becomes more challenging, requiring road development to enable transport of primary goods and sustainable economic prosperity.

Foreign investment in the agricultural and energy sector, highlighted by foreign involvement, such as the Chinese's presence expanding from Irkutsk to the Arctic Circle, with increase demographic changes, creates economic imbalances that threatens Russia's national and strategic security.²⁵ Japanese, Korean, Mongolian and Gulf countries' growing presence instigate security concerns given the lack of institutions and policies. Russian reliance on Chinese investment and workforce contribute to security concerns in terms of economic stability and independence. Consequently, local resentments increased with growing foreign land purchases and Chinese companies' settlements near Lake Baikal.²⁶ The warming of the Russian Far East and the Arctic instigate local tensions threatening Sin-Russian diplomatic partnerships. Vladimir Putin's approval of *Power of Siberia* pipeline led to further Sinophobia in regions surrounding Irkutsk and Lake Baikal with over 39% Russian approval over Chinese settlement restrictions.²⁷ Local Chinese scandals in Lake Baikal such as the bottling incident, in which a Chinese company bottled water from the Lake, resulted in a 52% approval denying Chinese entry into Russia, hindering Sino-Russian ententes.²⁸

GEOPOLITICAL CONCERNS

Geopolitical concerns derive from the energy sector; its socio-economic potential with growing Asian Pacific influences requires strong government strategies safeguarding national and Arctic security; and its economic relation with the Arctic states.²⁹ To reiterate, changes in temperature lead to ecological problems that, then, hinder anthropogenic activities. The Russian government risk the loss of geopolitical influence with reoccurring climatic anomalies impeding on energy and capital assets, as well as the pipelines' infrastructures.³⁰ Stipulations over the rise of economic opportunities with the opening of new Arctic routes for liquified natural gas (LNG) reserves and its growing significance, with its sustainable and

²¹ Lilia Rudykh and Olga Shilova, "Analysis of the socio-economic indicators of the Irkutsk region, Buryatia, and the Far East in 2016-2017: investments and prospects", *MATEC web of Conferences* 212 (2018): 2. <https://doi.org/10.1051/mateconf/201821208014>

²² Lilia Rudykh and Olga Shilova, "Analysis of the socio-economic indicators of the Irkutsk region, Buryatia, and the Far East in 2016-2017: investments and prospects", *MATEC web of Conferences* 212 (2018): 2. <https://doi.org/10.1051/mateconf/201821208014>

²³ Marianne V. Moore et al., "Climate Change and the World's 'Sacred Sea'—Lake Baikal, Siberia", *Bio Science Magazine* 59, no.5 (2009): 413.

²⁴ Oane Visser & Max Spoor, "Land Grabbing in post-Soviet Eurasia: The World's Largest Agricultural Land Reserves at Stake", *The Journal of Peasant Studies* 38, no. 2 (2011): 308. <https://doi.org/10.1080/03066150.2011.559010>

²⁵ Alexander Naumov, "Baikal Sinophobia: A Threat to Russo-Chinese Strategic Partnership", *IUCJ*, no.1 (2021): 23.

²⁶ *Ibid.*

²⁷ *Ibid.*, 24.

²⁸ *Ibid.*

²⁹ Yury Darman et al., *Environmental Risks to Sino-Russian Transboundary Cooperation: From Brown Plans to a Green strategy. WWF's Trade and Investment Programme Report* (WWF-Russia, 2011), 43.

³⁰ N E Krasnoshtanova, "New Economic Development of the North of Irkutsk Regions: Socio-Ecological Consequences", *IOP Conference Series: Earth and Environmental Science* 381 (2019): 2. doi:10.1088/1755-1315/381/1/012048

confirmatory sulphur and CO₂ emissions, leads to geopolitical and national security concerns with expected bunkering of LNG reserves.³¹ The *Power of Siberia* and the newly announced *Nord Stream 2* pipelines, and their export to Europe and China, entice tensions with the United States as LNG exports have risen to 45% in 2019 and 18% annually during the first quarter of 2021.³² With newfound markets for the exploitation of natural resources in the Far East and in Irkutsk, the region's geopolitical influence expands. However, Irkutsk's demographic and infrastructure underdevelopment poses national and regional security threats by enabling foreign capital involvement and investment.³³ The continuation of Chinese capital investments in Russian oil and gas stakes, enabled companies such as the CNPC direct participation in Russia's Arctic regions' extraction of liquefied natural gas (LNG).³⁴ Transition from Western European to Asian companies in the Russian energy sector raises geopolitical concerns over the Arctic states and Chinese progression into the Arctic Circle.

The bunkering of LNG reserves incentivizes land grabbing opportunities under infrastructural diplomacy methods; a strategic pathway from Irkutsk to the Arctic Circle, given substantial land-related investments.³⁵ Climate change's threat on food and water security further instigates foreign investment and acquisition of sustainable lands for security measures. National involvement in infrastructural projects focusing on exportation routes from foreign parties, particularly China, engender sovereignty issues. The *Belt and Road Initiative* generates a multilateral pathway for Chinese socio-economic and political entanglement, especially around Lake Baikal's ecosystem, imposing indirect influence over environmental and political policy decisions.

SOLUTION

Redirect focus on transboundary pacts in regions with transboundary ecosystems as changes in patterns of ecological corridors weaken natural buffer zones, therefore hindering national security. Transboundary pacts will reduce the instigation of political conflict by enticing political and environmental cooperation, mainly within economic powerhouses such as Irkutsk.³⁶ Amendment to pre-existing international agreements over water management and geopolitical interests for environmental preservation and economic development is required to preserve diplomatic relations. A transboundary judicial board, such as the *Center for International Environmental Law* (CIEL), will hold states legally accountable and hold precedence by restricting foreign anthropogenic involvement within climate-sensitive regions. Emphasis on the regions from the center of Eastern Europe and Central Asia to the Arctic states is required to ensure national and international security and sovereignty with growing climatic implications.

Consider Canadian involvement and participation within the economic diversification in Irkutsk by simultaneously promoting Russian sovereignty and independence of the region. The current Russia-China model is environmentally devastating and accelerating environmental degradation; China's northern area is in ruins.³⁷ Importance must be drawn on Arctic state cooperation with growing foreign involvement in the Arctic region.

³¹Dimitrios Dalaklis, Aykut Ölçer, Fabio Balini, Lcdr Jarrod Dewitz, "CHAPTER 24 - Protecting the Arctic Environment: Challenges and Opportunities for Liquefied Natural Gas", in *Economic challenge and new maritime risks management: What blue growth? Challenge économique et maîtrise des nouveaux risques maritimes : Quelle croissance bleue?* (2017): 469. <https://hal.archives-ouvertes.fr/hal-01792953/document>

³² Paul Belkin, Michael Ratner, Cory Welt, "Russia's Nord Stream 2: Continued Uncertainty", *Congressional Research Service* (June 2021): 1. <https://crsreports.congress.gov/product/pdf/IF/IF11138>

³³ Rensselaer Lee, "The Russian Far East: Opportunities and Challenges for Russia's Window on the Pacific", *Foreign Policy Research Institute* (2013): 315. doi: 10.1016/j.orbis.2013.02.006.

³⁴ Felix K. Chang, "Friends in Need: Politics of china-Russia Energy Relations", *Foreign Policy Research Institute: E-Notes* (May 2014): 3. https://www.files.ethz.ch/isn/180528/chang_-_china_russia_energy_relations.pdf

³⁵ Fanqui Jia and Mia M. Bennett, "Chinese Infrastructure Diplomacy in Russia: The Geopolitics of Project Type, Location, and Scale", *Eurasian Geography and Economics* (2019): 1. <https://doi.org/10.1080/15387216.2019.1571371>

³⁶ Yury Darman et al., *Environmental Risks to Sino-Russian Transboundary Cooperation: From Brown Plans to a Green strategy. WWF's Trade and Investment Programme Report* (WWF-Russia, 2011), 56.

³⁷ Ibid, 50.

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