



Submitted : 11 September, 2026

Accepted : 24 September, 2026

Published : 25 September, 2026

***Corresponding author:** Olcay Akman, Professor of Mathematics, Illinois State University, USA,
E-mail: oakman@ilstu.edu

Keywords: Alaska; Salmon; Climate change; Migration timing; Phenology; Stream temperature; Yukon river; Southeast Alaska

Copyright License: © 2026 Akman O. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.agriscigroup.us>



Check for updates

Review Article

Climate-Driven Alteration of Salmon Migration Habits in Alaska

Olcay Akman*

Professor of Mathematics, Illinois State University, USA

Abstract

Climate change is altering the timing, duration, and environmental conditions associated with salmon migration in Alaska. Because salmon move between freshwater and marine environments during different life stages, they are exposed to warming rivers, changing streamflow, reduced snowpack, altered ocean conditions, and shifting food availability. Long-term observations from Southeast Alaska indicate that juvenile pink salmon (*Oncorhynchus gorbuscha*) now migrate to the ocean as much as 19 days earlier than they did in the 1970s, while adult coho salmon (*O. kisutch*) return to spawning streams approximately 17 days earlier. In the Yukon River, temperature and discharge influence the timing and duration of juvenile Chinook (*O. tshawytscha*), chum (*O. keta*), and coho salmon outmigration, although responses vary among species and populations. These changes may produce ecological mismatches between salmon and their prey, predators, and spawning habitats. Although some populations appear capable of adjusting their migration behavior, continued warming and increasing environmental variability may reduce survival when conditions change faster than salmon can adapt. New research suggests that thermal tolerance thresholds may differ significantly among populations, with some showing genetic adaptations to higher temperatures while others remain vulnerable even to moderate warming events.

Introduction

Alaska supports some of the world's largest and most diverse salmon populations, including Chinook, chum, coho, pink, and sockeye salmon (*O. nerka*). These species are anadromous: they hatch and develop in freshwater, migrate to the ocean to grow, and later return to freshwater to spawn. Their life cycles therefore depend on environmental conditions across rivers, lakes, estuaries, coastal waters, and the open ocean [1-3].

Salmon migration consists of several linked movements, including juvenile downstream migration, adult upstream migration, spawning-site selection, and movement among freshwater habitats. These processes are regulated by environmental cues such as water temperature, river discharge, daylight, food availability, and chemical signals associated with natal streams. Climate change can modify these cues, potentially causing salmon to migrate at different times, use

different habitats, or encounter less favorable conditions [4-6].

Recent observations indicate that climate change is affecting salmon migration phenology—the timing of recurring biological events—throughout Alaska. These changes are important because successful migration requires coordination with food supplies, suitable water temperatures, river flows, predators, and spawning conditions. Additionally, these phenological shifts have cascading effects throughout Arctic and sub-Arctic ecosystems, affecting nutrient transport from marine to terrestrial systems and influencing subsistence harvest patterns that are central to Alaska Native cultures [1,2,6,8].

Environmental drivers of migration change

Warming freshwater habitats

Alaska's rising air temperatures are contributing to

warmer streams and rivers. Reduced snowpack and increasing precipitation falling as rain rather than snow are also changing the seasonal pattern of river discharge. In some watersheds, these changes produce higher winter flows but less water during summer [3–5].

Warmer water can accelerate juvenile development and movement, but it can also reduce dissolved oxygen and increase physiological stress. Salmon generally require cool, well-oxygenated water, particularly during spawning and early development. Extreme heat events may create temporary thermal barriers that delay migration or force fish to seek cooler tributaries and groundwater-fed habitats [9]. Species-specific thermal thresholds vary, with Chinook salmon experiencing increased metabolic stress above 15°C, while pink and chum salmon can tolerate slightly elevated temperatures up to 18–20°C for limited periods. However, prolonged exposure to temperatures exceeding these thresholds significantly increases mortality risk across all species [7,10,11].

Long-term observations from Auke Creek in Southeast Alaska demonstrate that migration seasons have become earlier and shorter for several salmon species. Some pink salmon juveniles now migrate to the ocean as much as 19 days earlier than they did in 1974, while adult coho salmon return to spawn approximately 17 days earlier than they did in the 1970s. These changes are consistent with the effects of warming water and earlier seasonal development [9]. Regional variation is notable: Interior Alaska watersheds show faster warming rates compared to coastal regions, with some streams experiencing temperature increases of 1.5–2.5°C over the past five decades, creating differential pressures on salmon populations across the state [9,12].

Changes in river discharge

River flow is another important migration cue. High spring discharge can transport juvenile salmon downstream and influence the speed at which they reach estuaries. Conversely, unusually low flows may slow migration, restrict access to side channels, and expose fish to warmer water. Extreme floods can scour spawning gravels, damage stream habitat, and increase turbidity [5,13].

Research in the Yukon River system demonstrates that discharge affects salmon species differently. Juvenile Chinook salmon migration was most closely associated with maximum river discharge, which commonly occurred in June. Coho salmon showed a weaker relationship with discharge, partly because they spend more time in low-velocity pools and off-channel habitats before migrating downstream (Miller & Weiss, 2023) [13,14].

These differences demonstrate that there is no single salmon response to climate change. Migration behavior depends on species, life stage, watershed characteristics, population genetics, and the specific combination of temperature and flow conditions. Furthermore, glacial-fed versus rain-dominated watersheds exhibit distinct hydrological responses to climate change, with glacial systems initially experiencing increased

flow from ice melt followed by long-term decline as glaciers retreat, fundamentally altering migration corridors for dependent populations [2,4,10,15].

Changing ocean conditions

The ocean is critical during the period when juvenile salmon leave rivers and begin feeding in marine environments. Survival is generally higher when salmon enter the ocean at the same time that suitable prey are abundant. Climate change can alter the timing, distribution, and nutritional quality of marine plankton and other prey [8,16,17].

If warmer freshwater conditions cause juvenile salmon to migrate earlier but marine food resources do not shift by the same amount, salmon may encounter a phenological mismatch. In this situation, fish arrive in the ocean when prey are scarce or when ocean temperatures are unsuitable. Juvenile salmon survival is generally higher when river outmigration coincides with favorable ocean conditions and prey availability [23] [13]. Ocean acidification and deoxygenation are emerging as additional stressors that interact with temperature changes to affect salmon growth and survival during their marine phase, potentially compounding the challenges posed by altered migration timing [1,16–18].

Observed changes in salmon migration

Earlier adult returns

Observations from Southeast Alaska indicate that salmon migration timing has changed unevenly among species. Coho, pink, and chum salmon have generally exhibited earlier migration trends, whereas sockeye and Chinook salmon have shown more variable responses. In some Southeast Alaska populations, coho migration has shifted earlier by approximately 0.46 days per year [6,9,19].

Earlier migration may allow adults to reach spawning grounds before rivers become excessively warm or water levels decline. However, it may also expose fish to higher temperatures during upstream travel or cause them to arrive before optimal spawning conditions are available. Earlier returns can also affect fisheries management because harvest seasons are often based on historical run timing. Commercial and subsistence fishing schedules may require adjustment, with potential economic implications for fishing communities that depend on predictable run timing for planning and infrastructure deployment. Some Indigenous communities report traditional knowledge-based expectations no longer aligning with observed run patterns, complicating harvest management [2,4,14].

Earlier juvenile outmigration

Juvenile migration from freshwater to the ocean is especially sensitive to changes in temperature and discharge. In the Yukon River basin, researchers monitored more than 75,000 juvenile salmon between 2014 and 2021. Their results showed that environmental conditions affected the timing and duration of outmigration, although the response differed among species [5,13].

For Chinook salmon, higher July temperatures were associated with greater variability in migration timing and shorter migration durations. Chum salmon also migrated for shorter periods under warmer conditions, but their migration timing was less variable. These findings suggest that warming may compress the period during which juvenile salmon enter marine environments [4,13].

A shorter migration period could reduce the time available for fish to find favorable routes through a river system, concentrate large numbers of juveniles in estuaries, or increase competition for limited food. Conversely, rapid migration could reduce the time fish spend exposed to freshwater predators or unfavorable river conditions. The ecological outcome is therefore likely to vary among watersheds and populations. Migration velocity analysis indicates that juveniles are completing downstream passage 10–25% faster in recent years compared to baseline periods, though the fitness consequences of accelerated migration remain uncertain [5,15].

Changes in migration duration and concentration

Climate change may affect not only when migration begins but also how long it lasts and how evenly fish are distributed over time. A population that once migrated over several weeks may increasingly move in a shorter, more concentrated pulse. Such concentration can increase competition for food and habitat, influence predator–prey interactions, and complicate the timing of commercial, subsistence, and recreational fisheries [2,10,15].

The Yukon River study found that environmental conditions affected migration duration and distribution differently among Chinook, chum, and coho salmon. The study also emphasized that multiple genetically distinct populations migrate through the same river system. Therefore, a single annual migration pattern may conceal substantial variation among individual populations [13]. Recent genetic analyses reveal that even within species classified together in harvest management units, distinct populations may respond divergently to the same environmental conditions, suggesting that management based on species-wide averages may mask important vulnerabilities at finer scales [5,13].

Ecological consequences

Mismatch with food availability

One of the most important risks associated with altered migration timing is a mismatch between salmon and their food. Juvenile salmon depend on aquatic insects in freshwater and zooplankton, small fish, and other prey in marine environments. If salmon migrate before prey populations reach their seasonal peak, they may experience slower growth and lower survival [6,17].

Growth during the first weeks of marine life is particularly important because larger juveniles are generally better able to avoid predators and withstand periods of limited food. Climate-driven changes that disrupt the match between migration and prey availability may therefore affect survival

several months or years before adults return to spawn. Size-at-outmigration reductions of 5–15% have been documented in some populations experiencing phenological mismatch, which correlates with decreased marine survival rates of up to 40% in subsequent years [12,16,17].

Effects on predators

Salmon are important sources of food for bears, eagles, gulls, marine mammals, and predatory fish. Changes in salmon migration timing can alter when this food becomes available to predators. Some predators may adjust their own movements in response, whereas others may be unable to do so [20,21,22].

The ecological effects of migration change may extend beyond individual salmon populations. Salmon transport marine-derived nutrients into freshwater ecosystems when adults return and die after spawning. Changes in run timing, abundance, and spawning location may therefore influence nutrient availability and food-web processes in river systems. Terrestrial ecosystem impacts include reduced nutrient deposition in riparian zones, potentially affecting forest growth and soil fertility in areas where salmon runs have historically been abundant. Grizzly bear reproductive success and cub survival have been correlated with salmon availability timing in some Interior Alaska populations [20–22].

Spawning habitat and reproductive success

Adult salmon require suitable stream temperature, flow, gravel, and oxygen conditions for spawning and egg incubation. Warmer streams can reduce egg survival and increase physiological stress during upstream migration. In Southeast Alaska, pink salmon reproduction has been associated with declines when stream temperatures briefly exceed approximately 15°C during spawning [9,7,10,11,23].

Changes in flow can also affect where salmon are able to spawn. Low water levels may block access to side channels or shallow tributaries, while floods can displace eggs from gravel beds. As climate change modifies the availability of cold-water refuges and stable spawning habitat, salmon may shift their spawning locations toward higher-elevation, groundwater-fed, or less disturbed tributaries. Egg incubation success declines sharply when temperatures exceed thermal optima, with incubation periods shortened by 20–30% in warmed waters, potentially resulting in emergent fry that face suboptimal seasonal conditions [4,10,14].

Population-specific responses

Alaska salmon populations do not respond uniformly to climate change. Differences arise from several factors: [2,4,15].

- **Species-specific life histories:** Pink and chum salmon often migrate to the ocean soon after emergence, whereas sockeye and coho salmon may spend one or more years in freshwater.
- **Genetic adaptation:** Run timing and migration routes can be inherited and locally adapted [2,6,10].

- **Watershed characteristics:** Glacial, snow-fed, groundwater-fed, and rain-dominated rivers respond differently to warming and changes in precipitation [4,5,14].
- **Marine migration routes:** Salmon populations may encounter different ocean temperatures and prey conditions depending on where they travel [8,16,18].
- **Behavioral flexibility:** Some populations can alter migration timing or habitat use, whereas others have narrower environmental tolerances [2,10,11].

The Yukon River study highlights the importance of population-level variation. Chinook salmon in the system include multiple spatially distinct populations that migrate together but originate from different portions of the watershed. Chum salmon also include distinct summer and fall populations. These groups may respond differently to local temperature and discharge conditions [2,13].

This diversity may provide resilience because some populations may remain productive under conditions that are unfavorable to others. At the same time, population-specific responses make broad predictions difficult and demonstrate the limitations of managing salmon solely according to specieswide averages. Heritability estimates for migration timing range from 0.3–0.6 across species, indicating moderate to high potential for evolutionary responses. However, the pace of observed climate change may outstrip adaptive capacity in populations with smaller effective sizes or those already stressed by harvest pressure [2,6,15].

Implications for management and conservation

Effective salmon management will require incorporating climate-driven changes into monitoring, harvest regulation, habitat protection, and restoration. Historical averages may become less reliable as migration seasons shift and become more variable [3,4,8].

Several actions may improve salmon resilience:

1. **Protect cold-water refuges.** Groundwater springs, shaded tributaries, deep pools, and connected side channels can provide relief during heat events.
2. **Restore fish passage.** Removing or replacing culverts and other barriers can allow salmon to reach cooler and more diverse habitats.
3. **Maintain riparian vegetation.** Forested stream margins reduce solar heating, stabilize banks, and support aquatic food webs.
4. **Monitor juvenile migration.** Continuous measurements of water temperature, discharge, fish movement, and ocean entry can reveal emerging changes before adult returns decline [1,4,9].
5. **Use population-specific management.** Regulations should account for differences among stocks rather than

treating all salmon within a river basin as ecologically identical [2,14,15].

6. **Protect marine and estuarine habitat.** Conservation efforts must extend beyond rivers because salmon survival depends heavily on conditions encountered immediately after entering the ocean [16–18].
7. **Integrate Indigenous and local knowledge.** Long-term observations by Alaska Native communities and local fishers can complement scientific monitoring and identify changes in migration timing, habitat use, and run composition [21,22,24,].
8. **Develop adaptive harvest control rules.** Real-time monitoring data should inform in-season management adjustments to protect vulnerable early- or late-running stocks.
9. **Establish cross-jurisdictional coordination.** State, federal, tribal, and international stakeholders require integrated frameworks for managing shared salmon stocks across changing migratory corridors.

Improving water-temperature monitoring is particularly important in the Yukon River basin. Existing research has identified the need for more systematic temperature data and additional studies linking juvenile migration patterns to marine survival and adult returns [13]. Priority watersheds for immediate intervention include those supporting Chinook stocks designated as troubled or depressed, as well as systems where warming projections exceed 2°C by mid-century relative to historical baselines [3,9,13].

Limitations and research needs

Although evidence for climate-related changes in salmon migration is increasing, several limitations remain. First, long-term monitoring is concentrated in a relatively small number of watersheds, such as Auke Creek. Conditions in these systems may not represent the full diversity of Alaska's salmon habitats. Second, temperature, discharge, ocean prey, disease, predation, harvest, and bycatch can interact, making it difficult to attribute changes in salmon migration to climate alone [1,3,5,9].

Future research should combine long-term tagging, genetic stock identification, environmental DNA, remote sensing, and continuous temperature and flow measurements. Studies should also examine whether earlier migration improves or reduces survival at later life stages. In particular, researchers should evaluate the relationship between freshwater migration timing, ocean entry conditions, marine growth, and adult return rates [14,18,24].

Climate-informed forecasting may also improve fisheries management. Run-timing models can incorporate air temperature, sea-surface temperature, sea-ice conditions, river discharge, and historical catch data to estimate when salmon will reach important locations. Such forecasts can help managers adjust harvest timing and protect weak or unusually early populations [1,4,16].

Key knowledge gaps

Critical uncertainties remain that limit predictive capacity and management effectiveness:

- **Limited long-term ocean survival data** linked to juvenile outmigration timing prevents definitive assessment of whether phenological shifts result in net gains or losses for population productivity [5,16,18,].
- **Uncertainty about genetic adaptation potential** versus plasticity makes it difficult to project which populations can evolve rapidly enough to track changing conditions [2,10,11].
- **Insufficient integration of Indigenous knowledge systems** into mainstream monitoring networks means valuable observational data from Alaska Native communities may go untapped [21,22,24].
- **Inadequate understanding of cumulative stressors** including pathogens, contaminants, and synergistic interactions with multiple climate drivers [7,8,11,17].
- **Sparse data on Arctic and North Slope salmon populations** compared to Southeast and Interior regions creates geographic gaps in baseline information [1,3,9].

Conclusion

Climate change is altering Alaska salmon migration by shifting the timing, duration, concentration, and environmental context of both juvenile and adult movements. In Southeast Alaska, several salmon species now migrate earlier than they did decades ago, while Yukon River studies show that temperature and discharge influence juvenile migration in species-specific ways.

These changes may help salmon avoid some unfavorable conditions, but they can also create mismatches with marine prey, expose fish to warmer water, disrupt predator relationships, and reduce access to suitable spawning habitat. Existing diversity among salmon populations may provide some resilience, and certain populations may adjust their timing or habitat use in response to environmental cues. Nevertheless, rapid warming, extreme heat events, altered precipitation, and changing ocean conditions may exceed the adaptive capacity of some stocks.

Long-term monitoring, population-specific management, habitat restoration, and collaboration among scientists, resource agencies, Alaska Native communities, and local fishers will be essential for protecting salmon migration and the ecological, cultural, and economic systems that depend on it. Proactive investment in climate adaptation measures now may prevent irreversible losses to salmon populations and the human communities that rely on them, emphasizing the urgency of integrating climate science into contemporary fisheries management.

References

1. Rogers LA, Axler KE, Bigman JS. Widespread phenological shifts with temperature in Alaska's marine fishes. *Glob Chang Biol*. 2026;32(1):e70708. Available from: <https://doi.org/10.1111/gcb.70708>
2. Potapova A, Moore JW, Parken CK, Sloat MR, Atlas W, Jones LA. Range-wide life history diversity and climate exposure in adult Chinook salmon. *Ecosphere*. 2026;17(3):e70572. Available from: <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.70572>
3. Alaska Fisheries Science Center, Alaska Salmon Research Task Force, State of Alaska. Alaska Salmon Research Task Force report. Alaska Fisheries Science Center; 2024. Available from: <https://repository.library.noaa.gov/view/noaa/61603>
4. Moore JW, Ulaski ME, Wilson KL, Martin TG, Kuiper SD, Peacock SJ, et al. A safe operating space for salmon watersheds under rapid climate change. *Fish Fish*. 2025;26:1213-28. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.70027>
5. Wilson SM, Peacock SJ. Freshwater life-cycle timing of Pacific salmon and steelhead (*Oncorhynchus* spp.) in Canada. *Can J Fish Aquat Sci*. 2025;82:1-17. Available from: <https://cdnsiencepub.com/doi/10.1139/cjfas-2024-0213>
6. Wilson SM, Moore JW, Ward EJ, Kinsel CW, Anderson JH, Buehrens TW, et al. Phenological shifts and mismatch with marine productivity vary among Pacific salmon species and populations. *Nat Ecol Evol*. 2023;7:852-61. Available from: <https://doi.org/10.1038/s41559-023-02057-1>
7. von Biela VR, Regish AM, McCormick SD, Spaeder J, Whitworth K, Leon J, et al. Migration water temperature and heat stress assessments in western Alaska Chinook salmon overlapping the 2019 heatwave. *Can J Fish Aquat Sci*. 2026. Available from: <https://cdnsiencepub.com/doi/10.1139/cjfas-2025-0109>
8. Langan JA, Cunningham CJ, Watson JT, McKinnell S. Opening the black box: new insights into the role of temperature in the marine distributions of Pacific salmon. *Fish Fish*. 2024;25:551-68. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/faf.12825>
9. Vulstek SC, Russell JR, Cornett JC, Commings ME. Auke Creek Research Station report: data summary and historical trends from 1980 to 2025. NOAA Technical Memorandum NMFS-AFSC-521. 2026. Available from: <https://repository.library.noaa.gov/view/noaa/74163>
10. Lindley ED, Dunmall KM, Westley PAH. Assessing the role of incubation temperature as a barrier to successful establishment of coho salmon (*Oncorhynchus kisutch*) in a rapidly warming Arctic. *Ecol Evol*. 2025;15(1):e70797. Available from: <https://doi.org/10.1002/ece3.70797>
11. Mayer NB, Hinch SG, Eliason EJ. Thermal tolerance in Pacific salmon: a systematic review of species, populations, life stages and methodologies. *Fish Fish*. 2024;25:283-302. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12808>
12. Rallu De Malibrán MC, Kaplan CM, Di Lorenzo E. Marine heatwaves suppress ocean circulation and large vortices in the Gulf of Alaska. *Commun Earth Environ*. 2024;5:622. Available from: <https://www.nature.com/articles/s43247-024-01785-x>
13. Miller KB, Weiss CM. Disentangling population level differences in juvenile migration phenology for three species of salmon on the Yukon River. *J Mar Sci Eng*. 2023;11(3):589. Available from: <https://www.mdpi.com/2077-1312/11/3/589>
14. Lamborn CC, Westley PAH, Ohlberger J. A synthesis of factors related to trends in abundance and demography of Alaska Chinook salmon (*Oncorhynchus tshawytscha*, Salmonidae): implications for research, management, and policy. *Fish Fish*. 2025. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12895>

15. Baker HK, Obedzinski M, Grantham TE, Carlson SM. Variation in salmon migration phenology bolsters population stability but is threatened by drought. *Ecol Lett*. 2025;28(2):e70081. Available from: <https://doi.org/10.1111/ele.70081>
16. Connors B, Ruggerone GT, Irvine JR. Adapting management of Pacific salmon to a warming and more crowded ocean. *ICES J Mar Sci*. 2025;82(1):fsae135. Available from: <https://academic.oup.com/icesjms/article/82/1/fsae135/7816966>
17. Frommel AY, Akbarzadeh A, Chalifoux V, Ming TJ, Collicutt B, Rolheiser K, et al. High sensitivity to ocean acidification in wild out-migrating juvenile Pacific salmon is not impacted by feeding success. *Ecol Appl*. 2025;35(5):e70058. Available from: <https://doi.org/10.1002/eap.70058>
18. Lemagie E, Farley E, Langan JA, Stabeno PJ. Mapping suitable thermal migration corridors for western Alaska chum salmon in the North Pacific. *Deep Sea Res Part I Oceanogr Res Pap*. 2025;222:104531. Available from: <https://www.sciencedirect.com/science/article/pii/S0967063725000895>
19. Feddern ML, Schoen ER, Shaftel R, Cunningham CJ, Chythlook C, Connors BM, et al. Kings of the North: bridging disciplines to understand the effects of changing climate on Chinook salmon in the Arctic-Yukon-Kuskokwim Region. *Fisheries*. 2023. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1002/fsh.10923>
20. Connoy JWH, Rourke G, Knude S, Dewhurst R, Huot D, Vamosi SM. Studying Chinook salmon in northern river ecosystems through ecological methods and Indigenous, Teslin Tlingit knowledge. *Commun Biol*. 2024;7:1657. Available from: <https://doi.org/10.1038/s42003-024-07300-4>
21. Esquible J, Hoffman A, Lowrey D, Ropati D, Cleveland J, Williams M, et al. Aulukluki neqkat: centering care of salmon and relational research in Indigenous fisheries in the Kuskokwim River, Alaska. *Arctic Sci*. 2024;10(2):349-71.
22. Cannon SE, Moore JW, Adams MS, Degai T, Griggs E, Indigenous Data Sovereignty Workshop Collective. Taking care of knowledge, taking care of salmon: towards Indigenous data sovereignty in an era of climate change and cumulative effects. *FACETS*. 2024;9:1-21.
23. U.S. Department of Agriculture. Salmon and climate change in Southeast Alaska [Internet]. Climate Hubs; [cited 2026 Sep 10]. Available from: <https://www.climatehubs.usda.gov/hubs/northwest/topic/salmonand-climate-change-southeast-alaska>.
24. Lindley ED, Westley PAH. Methods and approach to the interdisciplinary and cross-cultural Arctic Alaska Salmon Workshop: critical self-reflections from fisheries scientists. *Arctic Sci*. 2025;11:1-11. Available from: <https://cdnsiencepub.com/doi/10.1139/as-2023-0054>

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services

<https://www.peertechzpublications.org/submit>

Peertechz journals wishes everlasting success in your every endeavours.