Five years after its conception in Prague during ASSW2017, T-MOSAIC is now coming to a close. This IASC program has been an opportunity to connect Arctic scientists around the globe to better understand the impact of climate change on northern terrestrial systems, and to benefit from the MOSAiC program as a catalyst for international collaboration in polar science.

Now it is time to wrap up T-MOSAiC and consider future opportunities to build on the accomplishments of the program. We would like to thank all of you for your commitment, involvement and friendship, with special thanks to the chairs of each of the Action Groups, and to Scott Zolkos and Ivan Alekseev for representing early career researchers on the program. We are pleased with the diverse outputs from T-MOSAiC, and these many accomplishments and connections now provide a solid foundation for ongoing and future collaborations.

From Lisbon and Quebec City, we send you our very best wishes,

João, Warwick and Diogo

T-MOSAiC in Numbers

12 Action Groups, more than 150 participants, from 15 countries.

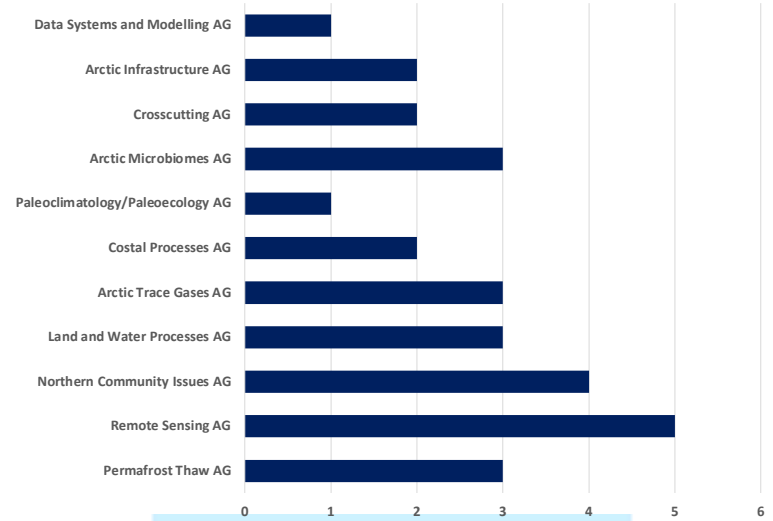
71 Activities, including…

16 Workshops

12 Scientific Sessions

> 150 Abstracts

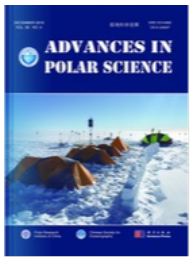
29 Endorsed Projects

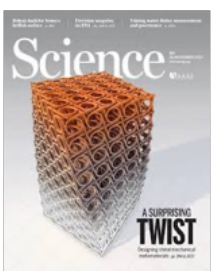


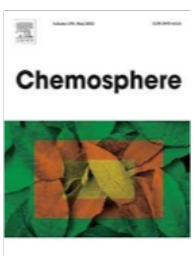
Projects by Action Group

14 Newsletters

48 published research articles (with many more submitted and in preparation)







5 Special Issues (published and in press)

(*Arctic Science* papers and updates are available at: https://cdnsciencepub.com/topic/as-terrestrial)

frontiers in Microbiology

remote sensing
an open access journal by MDPI

1 MoU (signed at ASSW2021 Lisbon)

ArcticNet
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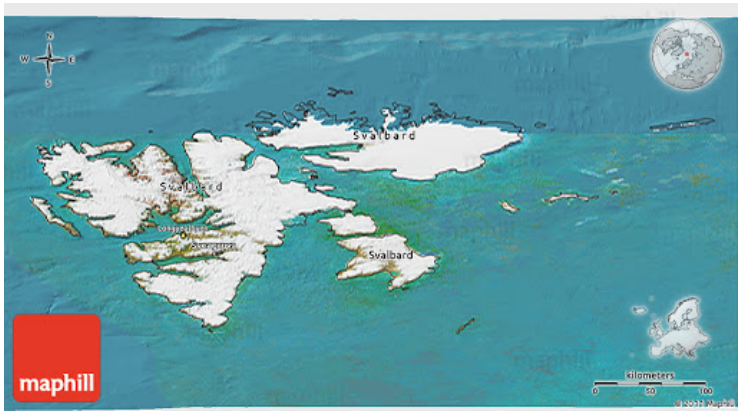
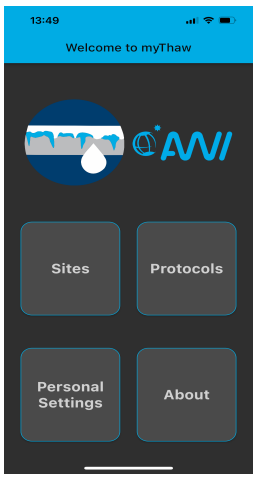
Plus synthesis articles (some still under review); data publications; and field protocols, notably:

Boike, J., Chadburn, S., Martin, J., Zwieback, S., Althuizen, I.H., Anselm, N., Cai, L., Coulombe, S., Lee, H., Liljedahl, A.K. and Schneebeli, M., 2022. Standardized monitoring of permafrost thaw: a user-friendly, multiparameter protocol. *Arctic Science,* 8: 153-182. https://cdnsciencepub.com/doi/full/10.1139/as-2021-0007





REPORT OF ACTION GROUP ACTIVITIES

Arctic Infrastructure T-MOSAiC–RATIC AG

- **ASSW 2023 RATIC Arctic infrastructure cross-cutting proposal**
  Submitted to IASC cross-cutting call, TWG, SHWG, CWG
- **Science sessions at Arctic Change 2020 & ASSW 2021**
  Northern Roads and Railways: Social and Environmental Effects of Transport Infrastructure
- **ASSW 2019, 2021, and 2022 RATIC/ T-MOSAiC Workshops**
- **T-MOSAiC Special Issue of Arctic Science**
  Four papers, 1 in prep, 1 under review, 2 Just In

  ◊ The shifting mosaic of ice-wedge degradation and stabilization in response to infrastructure and climate change, Prudhoe Bay Oilfield, Alaska. Mikhail Kanevskiy, Yuri Shur, D.A. (Skip) Walker, Torre Jorgenson, Martha K. Raynolds, Jana L. Peirce, Benjamin M. Jones, Marcel Buchhorn, Georgiy Matyshak, Helena Bergstedt, Amy L. Breen, Billy Connor, Ronald Daanen, Anna Liljedahl, Vladimir E. Romanovsky, and Emily Watson-Cook (Just In)

  ◊ Cumulative impacts of a gravel road and climate change in an ice-wedge polygon landscape, Prudhoe Bay, AK. Donald A. Walker, Martha K. Raynolds, Mikhail Z. Kanevskiy, Yuri S. Shur, Vladimir E. Romanovsky, Benjamin M. Jones, Marcel Buchhorn, M. Torre Jorgenson, Jozef Šibík, Amy L. Breen, Anja Kade, Emily Watson-Cook, Georgy Matyshak, Helena Bergstedt, Anna K. Liljedahl, Ronald P. Daanen, Billy Connor, Dmitry Nicolsky, Jana L. Peirce (Just In)

  ◊ Arctic roads and railways: social and environmental consequences of transport infrastructure in the Circumpolar North. Olga Povoroznyuk, Warwick F. Vincent, Peter Schweitzer, Roza Laptander, Mia Bennett, Fabrice Calmels, Dmitrii Sergeev, Christopher Arp, Bruce Forbes, Pascale Roy-Léveillée and Donald A. Walker (in press).

  ◊ Quantifying the spatial and temporal influence of infrastructure on seasonal snowmelt timing and its influence on vegetation productivity and early season water cover in the Prudhoe Bay. Helena Bergstedt, Benjamin Jones, Donald Walker, Jana Peirce, Annett Bartsch, Georg Pointner, Mikhail Kanevskiy, Martha Raynolds, Marcel Buchhorn (under review)

- **Arctic Infrastructure Science Talk series (Apr 2021 – present)**
  Monthly cross-disciplinary presentations related to Arctic infrastructure
- **Infrastructure mapping/monitoring framework WG**
  4 meetings, morphed into ongoing monthly science talk series
- **Boosting Indigenous/industry participation in research WG**
  3 meetings, resulted in ASSW 2021 workshop proposal

NEW ARTICLES RELEVANT TO T-MOSAiC THEMES

- Zolkos, S., A.V. Zhulidov, T. Yu. Gurtovaya, V.V. Gordeev, S. Berdnikov, N. Pavlova, E.A. Kalko, Y.A. Kuklina, D.A. Zhulidov, L.S. Kosmenko, A.I. Shiklomanov, A. Suslova, B.M. Geyman, C.P. Thackray, E.M. Sunderland, S.E. Tank, J.W. McClelland, R.G.M. Spencer, D.P. Krabbenhoft, R. Robarts, R.M. Holmes. (2022) Multidecadal Declines in Particulate Mercury and Sediment Export from Russian Rivers in the Pan-Arctic Basin. Proceedings of the National Academy of Sciences, 119: e2119857119. *https://doi.org/10.1073/pnas.2119857119*

- Shakil, S., S.E. Tank, J.E. Vonk, S. Zolkos. Low biodegradability of particulate organic carbon mobilized from thaw slumps on the Peel Plateau, NT, and possible chemosynthesis and sorption effects. (2022). Biogeosciences, 19: 1871–1890. *https://bg.copernicus.org/articles/19/1871/2022/*

- Scheller, J.H., Mastepanov, M. and Christensen, T.R. (2022). Toward UAV-based methane emission mapping of Arctic terrestrial ecosystems. Science of the Total Environment 819: 153161. *http://dx.doi.org/10.1016/j.scitotenv.2022.153161*

- Curasi, S.R., Fetcher, N., Hewitt, R.E., Lafleur, P.M., Loranty, M.M., Mack, M.C., May, J.L., Myers-Smith, I.H., Natali, S.M., Oberbauer, S.F. and Parker, T.C. (2022). Range shifts in a foundation sedge potentially induce large Arctic ecosystem carbon losses and gains. Environmental Research Letters, 17: 045024. *https://iopscience.iop.org/article/10.1088/1748-9326/ac6005/pdf*