

Julie Malenfant-Lepage

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EDUCATION

Doctorate degree in Civil Engineering (Université Laval, Canada) 2014-2023

Thesis: Development of a methodology for the design of low-impact drainage systems along transportation infrastructure in permafrost environments

*Please note that I was on maternity leave in 2015, 2018 and 2020

Master's degree in Civil Engineering (Université Laval, Canada) 2010-2013

Thesis: Thermal effectiveness of the mitigation techniques tested at Beaver Creek Experimental road site on the Alaska Highway, Yukon

*Finished with mention of excellence on the Board of Honor of Université Laval

Bachelor degree in Geological Engineering (Université Laval, Canada) 2005-2009

Geology and Geological Engineering Department, Québec, Canada

Additional courses relevant to my academic background:

Mai 2011 Glaciologie, géomorphologie glaciaire et environnement périglaciaire – Glacier Matanuska, Alaska
 GEO6041 Département de géographie, Université de Montréal

Autumn 2014: Infrastructure in a changing climate / Building on Permafrost – Longyearbyen, Svalbard
 AT 301/801 Arctic Technology Department, The University Centre in Svalbard

Autumn 2023: Arctic and Marine Civil Engineering – Trondheim, Norway
 TBA4265 Department of civil and environmental engineering, Norwegian University of Science and Technology

RESEARCH AND RELEVANT WORK EXPERIENCE

Postdoctoral researcher 2023-2027

Norwegian University of Science and Technology, Trondheim, Norway

Project: Data driven diagnostic to solve road drainage issues

Research program: SMARTer maintenance of road infrastructure

Course coordinator and lecturer 2019-2027

Department of civil and environmental engineering, NTNU, Trondheim

Planification and teaching in the international course *Design of roads and railways in cold climate*

Lecturer 2026-2027

Technical University of Denmark, Arctic Campus in Sisimiut Greenland

Course development and teaching in the international course *Permafrost in Arctic Societies*

NU-COAST project 2024-2027

UQAR University, Rimouski, Quebec, Canada

- Partner / Locally-based coastal adaptations strategies in Nunavut. Climate-Resilient. Coastal Communities Program. Funded by Natural Resources Canada NRCAN (2 285 370\$CA)

RESEARCH AND RELEVANT WORK EXPERIENCE

Co-supervision of Master's students

2025-2027

- 1) Tora Langballe - Assessment of the state condition of the road drainage system along the E14 using surface profilometry and ground-penetrating radar methods (NTNU, Norway)
- 2) Thea Malin Wessel Rognes - The importance of the terrain for the development of rutting (NTNU, Norway)
- 3) Benedikte Hoel - Operation and maintenance of road drainage systems: a qualitative study of current practices and challenges (NTNU, Norway)
- 4) Félix Mormino - Mapping and Characterization of Permafrost Conditions in the Polar Desert of Grise Fiord, Canadian Arctic Archipelago (University of Montreal, Canada)

POLAR International Partnership Research Development Program

2026-2027

University of Montreal, Quebec, Canada

- Partner / Response of saline permafrost to climate change and impacts on permafrost stability of Arctic coastal communities. Freezing tests on soil samples from Grise Fiord are being conducted at NTNU in Norway to examine how salinity, temperature, and soil type influence freezing behaviour. Funded by Polar Knowledge Canada (100 000 \$CA)

NORDEC network

2026-2027

- Leader / The Nordic Road Design and Construction (NORDEC) is a new collaborative initiative involving the Norwegian University of Science and Technology (NTNU), the Technical University of Denmark (DTU), Luleå University of Technology (LTU), and the Swedish National Road and Transport Research Institute (VTI). The network vision's is to educate a new generation of highly skilled students and professionals capable of addressing the pressing challenges of carbon reduction and climate change adaptation in the transport infrastructure sector in the Nordic countries. Funded by Nordplus (36 500 Euros)

PermaEduGR project

2024-2027

Technical University of Denmark (DTU), Copenhagen, Denmark

- Steering committee member / Developing interdisciplinary permafrost higher education in collaboration with Greenlandic communities. Funded by UArctic (1 000 000 DKK)

PermaHydro project

2026

Technical University of Denmark (DTU), Arctic Campus in Sisimiut, Greenland

- Leader / Development of an energy-focused module for the new course *Permafrost for Arctic Societies* introducing hydropower development in the Arctic and the associated challenges faced by critical infrastructure in permafrost regions. Funded by the Nordic Energy Research Mobility Programme Nordforsk (32 000 NOK)

PermaIntern project

2022-2026

University of Copenhagen, Denmark

- Leader / Project: Design and development of an international permafrost internship service Funded by UArctic (500 000 DKK) (www.permaintern.org)

SEDNA project

2024-2026

University of Sherbrooke, Quebec, Canada

- Steering committee member / Student Education, Development of professional skills and Networking across the Arctic (SEDNA) - Permafrost Networking Platform. Funded by UArctic (40 000\$CA)



RESEARCH AND RELEVANT WORK EXPERIENCE

Guest Editor <i>Journal of Cold Regions Science and Technology</i> - Special issue on permafrost: <i>Permafrost degradation and its impact on building environment in a changing climate.</i>	2024-2026
Permafrost Education Action Group <i>Canadian Permafrost Association</i> - Leader / Developing a permanent training program to support member and partner organization needs for scientific and engineering activities in permafrost regions.	2024-2026
Frozen Canoes Inpart project <i>The University Center in Svalbard, UNIS, Norway</i> - Steering committee member / Development of a joint research and educational field-based program, combining geoscience and engineering addressing perennially and seasonally frozen ground undergoing climate change, using innovative educational knowledge from Norway and Canada. www.ntnu.edu/ibm/frozen-canoes Funded by the Norwegian Research Council and the Centre for Internationalization of University Studies in Norway (4 500 000 NOK).	2018-2022
Tundra Trails Action Group <i>Canadian Permafrost Association</i> - Member / Developing technical guidelines for the construction and the management of low-impact trail structures for sensitive tundra and permafrost conditions.	2024-2026
Researcher <i>Department of civil and environmental engineering, NTNU, Trondheim</i> Project: Erosion of partially frozen silts Research program: Sustainable Arctic Marine and Coastal Technology (SAMCoT)	2017-2019
Teaching assistant <i>Yukon College, Whitehorse, Canada</i> Graduate course: <i>Advanced Seminar on Permafrost Engineering Applied to Transportation Infrastructure</i> Professors: Guy Doré (Laval University) and Chris Burn (Carleton University)	2011-2016
Research Assistant <i>Civil and Water Engineering Department, Université Laval, Québec, Canada</i> - Responsible for the course Soils Mechanics I (laboratory tests) - Assessment of the Nunavik airstrips and access roads with the Quebec Ministry of Transport. - Mentoring of students from the Technical University of Denmark (DTU) during their laboratory tests	2009-2012
Junior Geologist <i>Virginia Mines, Baie-James, Quebec, Canada</i> - Prospecting the territory for massive sulphides and rock core logging. - Supported the management of a rock drilling campaign	2007-2008



PUBLICATIONS

Peer reviewed papers (journals and conferences)

[1] **Malenfant-Lepage, J.**, Loranger, B., Fortier, D., Lubbad, R. and Doré, G. (manuscript in preparation, expected submission fall 2026). *Erosion of frozen fine-grained soils*.

[2] Weber, C., **Malenfant-Lepage, J.**, Alzaki, Z, Scibilia, E., Hoff, I. (manuscript in preparation, expected submission fall 2026). *Management practices of roads culverts under a changing climate: A review from a Norwegian Perspective*.

[3] **Malenfant-Lepage, J.**, Bouchard, F., Sjöberg, Y., Christiansen, H.H., Coulombe, S., Zweigel, R.B., MacLean, T.J.R., Martens, I., Ruiz-Pereira, S. and Pino-Rivas, C. (2026 under review). *Achieving large-scale knowledge mobilization in a niche field - How to develop and operationalize an international permafrost internship program*, Journal of Arctic Science.

[4] **Malenfant-Lepage, J.**, Doré, G. and Fortier, D. (2026). *Mitigating the adverse impact of heat advection by water flow on embankment built on permafrost: using the Peclet and Nusselt numbers as a key design parameters*, Journal of Cold Regions Science and Technology 250: 1- 10. <https://doi.org/10.1016/j.coldregions.2026.104999>

[5] Weber, C., **Malenfant-Lepage, J.**, Langballe, T., Klein-Paste, A. (2026). *Assessment of the state condition of the road drainage system along the E14 using surface profilometry and ground penetrating radar methods*, IOP Conference Series: Earth and Environmental Science 1615: 1-10. Trondheim, Norway (SBE25 Trondheim) 24/11/2025. <https://doi.org/10.1088/1755-1315/1615/1/012012>

[6] Christiansen, H. H., Sjöberg, Y., Blume-Werry, G., Dorrepaal, E., Etzelmüller, B., Farnsworth, W. R., Hjort, J., Ingeman-Nielsen, T., **Malenfant-Lepage, J.**, Petterson, R., Sannel, A. B. K., Siewert, M., Tomaskovicova, S. and Väiliranta, M. (2024). *A Roadmap for Developing Higher Permafrost Education in Norden*, Nordic Journal of STEM Education 8 (2):18-44. <https://doi.org/10.5324/njsteme.v8i2.5127>

[7] Stephani, E., **Malenfant-Lepage, J.** and Doré, G. (2022). *An Overview and Assessment of Major Engineering Challenges in Canada's North and Near North*, SPP Research Papers, The School of Public Policy, University of Calgary, Canada. <https://doi.org/10.11575/sppp.v15i1.73187>

[8] Sjöberg Y, Siewert MB, Rudy ACA, Paquette M, Bouchard F, **Malenfant-Lepage J**, Fritz M., (2020). *Hot trends and impact in permafrost science*. Permafrost and Periglacial Processes. 2020;1–11. <https://doi.org/10.1002/ppp.2047>

***Student paper award of merit**

[9] **Malenfant-Lepage, J.** and Doré, G. (2019). *Laboratory Assessment of a New Road Permafrost Mitigation Technique: The Half Pipe Cover*, Proceedings of the 18th International Conference on Cold Regions Engineering & 8th Canadian Permafrost Conference, August 18-22, Quebec City, Canada, 625–633. <https://doi.org/10.1061/9780784482599.072>

[10] Bouchard, F., Sansoulet, J., Fritz, M., **Malenfant-Lepage, J.**, Nieuwendam, A., Paquette, M., Rudy, A.C.A., Siewert, M.B., Sjöberg, Y., Tanski, G., Habeck, J.O., Harbor, J., (2019). *“Frozen-Ground Cartoons” : Permafrost comics as an innovative tool for polar outreach, education, and engagement*. Polar Record 54, 366-372.

[11] Fritz, M., Deshpande, B. N., Bouchard, F., Höglström, E., **Malenfant-Lepage, J.**, Morgenstern, A., Nieuwendam, A., Oliva, M., Paquette, M., Rudy, A. C. A., Siewert, M. B., Sjöberg, Y., and Weege, S. (2015). Brief Communication: Future avenues for permafrost science from the perspective of early career researchers. The Cryosphere. 9: 1715-1720.



PUBLICATIONS

[12] **M-Lepage, J.**, Doré, G. & Fortier, D. (2012). *Thermal effectiveness of the mitigation techniques tested at Beaver Creek Experimental road site based on a heat balance analysis (Yukon, Canada)*, 15th International Conference on Cold Regions Engineering, Quebec, Canada, 42-51.

***Award for outstanding oral engineering presentation**

[13] **M-Lepage, J.**, Doré, G., Fortier, D. & Murchison, P. (2012). *Thermal Performance of the Permafrost Protection Techniques at Beaver Creek Experimental Road Site, Yukon, Canada*, Tenth International Conference on Permafrost, Salekhard, Yamal-Nenets autonomous district, Russia, Volume 1: 261-266.

[14] Jorgensen, A. S., Klemmensen, R. L., Ingeman-Nielsen, T., Doré, G., **Malenfant-Lepage, J.** (2012). *Assessment of different heat drain materials for protection of permafrost under road and airfield embankments*, Tenth International Conference on Permafrost, Salekhard, Yamal-Nenets autonomous district, Russia, Volume 4: 243-244.

[15] **Malenfant-Lepage, J.**, Doré, G., and Fortier, D. (2010). *Experimentation of mitigation techniques to reduce the effects of permafrost degradation on transportation infrastructures at Beaver Creek experimental road site (Alaska Highway, Yukon)*, 63rd Canadian Geotechnical Conference and the 6th Canadian Permafrost Conference, Calgary, Canada, 526-533.

Abstracts/extended abstracts (conferences)

[1] **Malenfant-Lepage, J.**, Bouchard, F., Christiansen H. H., and Sjöberg, Y. (2026). *The PermaIntern and SEDNA UArctic Projects: Challenges and Key Outcomes in Building an International Platform for Permafrost Internships*, Arctic Frontiers 2026: Turn of the Tide, Tromsø, Norway, 2-5 February.

[2] **Malenfant-Lepage, J.**, Christiansen H. H., Scibilia, E., Aga, J., Etzelmuller, B., Luetzenburg, G., Djurhuus Poulsen, M., Ingeman-Nielsen, T., Skar Christiansen, A., Skursch, O., Ren, C., Oberborbeck-Andersen, A., Jiao, Y., Westergaard-Nielsen, A., Shestov, A. (2026). *Establishing a Nordic Thawing Permafrost Network: A Necessity*, Arctic Frontiers 2026: Turn of the Tide, Tromsø, Norway, 2-5 February.

[3] **Malenfant-Lepage, J.**, Doré, G. and Fortier, D. (2024). *Use of the Peclet number in design of road drainage systems in permafrost*, *Proceedings Volume II: Extended Abstracts*, 12th International Conference on Permafrost, Whitehorse, Canada, 527-528.

[4] Sjöberg, Y., Sannel B., Christiansen H. H and **Malenfant-Lepage, J.** (2023). *Promoting real-world working-life permafrost competence through internships*, 6th European Conference on Permafrost (EUCOP6), Puigcerda, Catalonia, Spain, 57. DOI: 10.52381/EUCOP6.abstracts.1

[5] **Malenfant-Lepage, J.**, Doré, G., Lubbad, R. and Fortier D. (2019). *Erodibility of the active layer and permafrost*, 18th International Conference on Cold Regions Engineering & 8th Canadian Permafrost Conference, August 18-22, Quebec City, Canada.

[7] **Malenfant-Lepage, J.**, Doré, G., Ingeman-Nielsen, T., Fortier, D. & Loranger, B. (2016). *Using ERT to characterize water flow patterns in permafrost environment (Ilulissat, Greenland)*. ICOP 2016 – 11th International Permafrost Conference, 20-24 June, Potsdam, Germany, Abstract p. 952.



AWARDS

- ❖ **Student Paper Award of Merit** for outstanding paper with high impacts, given by the Cold Regions Engineering Divion of the American Society of Civil Engineers, 18th International Conference on Cold Regions Engineering & 8th Canadian Permafrost Conference, August 18-22, 2019, Quebec City, Canada
- ❖ **W. Garfield Weston Award** for Northern Research (Doctoral), 50,000 \$, Association of Canadian Universities for Northern Studies, (2016-2017)
- ❖ **Award for Excellence** (Master's), Université Laval, (2014)
- ❖ **Pavel I. Melnikov Award** for outstanding oral engineering presentation , given by the International Permafrost Association, 10th International Conference on Permafrost, Salekhard, Russia, (2012)

SCOLARSHIPS/GRANTS

- ❖ Mobility funding - Nordic Energy Research Mobility Programme – Nordforsk, 32 000 NOK (2026)
- ❖ Nordisk vegforum (NVF), 38 000 NOK, (2020)
- ❖ Marthe-et-Robert-Ménard Scholarship (Doctoral), 10,000\$, Université Laval, (2016-2017)
- ❖ Northern Scientific Training Program, Mobility Fellowships in 2013, 2014 and 2016, Canadian Polar Commission
- ❖ Mobility DK - 1,500 (Euro), University of the Arctic, (2014)
- ❖ EnviroNorth, Mobility Fellowship to Greenland, 2,000\$, (2014).
- ❖ EnviroNorth, Interdisciplinary Research Fellowship (PhD), 21,000\$, NSERC CREATE training Program in Northern Environmental Sciences, (2014)
- ❖ International Internship Fellowship (Denmark, Greenland and Svalbard), 15,000\$, Fonds de recherche du Québec - Nature et technologies *FRQNT*, (2014)
- ❖ AQTR Fellowship - 2,000\$, Transportation Association of Quebec, (2012)
- ❖ EnviroNorth, Interdisciplinary Research Fellowship (Master's), 17,300\$, NSERC CREATE training Program in Northern Environmental Sciences, (2011-2012)
- ❖ TAC foundation - Golder Associates Fellowship - 5,000\$, Transportation Association of Canada, (2011)
- ❖ Internship Fellowship at the Yukon Research Center- 10,000\$, Natural Sciences and Engineering Council of Canada (2011)