

Vita

Candidate's name: Hannah Elizabeth Sharpe

Universities
Attended: University of New Brunswick (2021)
Bachelors of Science Honours

University of New Brunswick (2023)
Masters of Science
Earth Science

Conference Presentations:

Sharpe H, Limoges A, Gosselin M, Lalande C, Normandeau A, Montero-Serrano J-C, Sherwood O. 2022 (Poster) Seasonal variations in export of biogenic matter in the subarctic St. Lawrence Estuary. ArcticNet ASM, December 4 to 8. (refereed)

Sharpe H, Limoges A, Gosselin M, Lalande C, Normandeau A, Montero-Serrano J-C, Sherwood O. 2022 (Oral) Seasonal variations in vertical export of primary production tracers in the subarctic St. Lawrence Estuary. MEOPAR ANM, November 22 to 30. (refereed)

Sharpe H, Limoges A, Gosselin M, Lalande C, Montero-Serrano J-C, Sherwood O. 2022 (Oral) Seasonal and spatial changes in vertical export and deposition of productivity tracers in a submarine canyon system of the Lower St. Lawrence Estuary, Eastern Canada. Atlantic Geoscience Society Colloquium, February 11 to 12. Virtual Meeting. (refereed)

Sharpe H, Limoges A, Gosselin M, Lalande C, Montero-Serrano J-C, Sherwood O. 2022 (Oral) Seasonal and spatial changes in vertical export and deposition of productivity tracers in a submarine canyon system of the Lower St. Lawrence Estuary, Eastern Canada. MEOPAR ASM/ATM, February 1 to 9. Virtual Meeting. (refereed)

Seasonal and spatial changes in the export and deposition of biogenic matter in a submarine canyon system of the Lower St. Lawrence Estuary, Eastern Canada

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Hannah E. Sharpe

in the Department of Earth Science

U.N.B., Fredericton, N.B.

Thursday, August 31st, 2023

10:00 a.m.

Forestry/Geology Bldg, Rm 23 & via MS TEAMS

Examining Committee

Dr. Audrey Limoges

Dr. Owen Sherwood

Dr. Chris McFarlane

Dr. Brian Hayden

Dr. Karl Butler

Co-Supervisor

Co-Supervisor

Internal Examiner

External Examiner

Chair of Oral Examination

Abstract

The Pointe-des-Monts coastal shelf, located on the northern shore of the Lower St. Lawrence Estuary, hosts active submarine canyons. This work documents seasonal and spatial variations in biogenic matter export, inside and outside the canyon system, based on the analyses of 69 sequential sediment trap samples (November 2020 to September 2021) and 29 surface seafloor sediment samples. Our data reveal that small sediment resuspension events in the canyon impact biogeochemical cycling in the deep water-column layer. Sinking phytoplankton fluxes and deposited microfossil abundances were lower in the canyon system, providing no evidence that canyon processes enhance primary and secondary production at Pointe-des-Monts. The potentially harmful taxa *Pseudo-nitzschia seriata*, *Dinophysis acuminata*, and *D. norvegica* were observed in the sediment traps while cysts of cf. *Alexandrium* spp. were preserved in most surface sediment samples. The sediment trap samples cover an anomalous nearly ice-free

winter, providing insight into future climate-related trends in biogenic export.