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Allanach SC*, Baird D, Monk W. February 2024. Thermal Ecology of Freshwater Benthic Macroinvertebrates in Canadian Maritime Rivers. Society of Canadian Aquatic Sciences (Poster Presentation: Fredericton, New Brunswick).

Thermal-ecology thresholds of benthic macroinvertebrate genera and communities in Maritime Canadian rivers

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Samuel C. Allanach

in the Department of Biology

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

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11:30 a.m.

Forestry & Env Mgmt, Room FG306

Examining Committee

Dr. Donald Baird	co-Supervisor
Dr. Wendy Monk	co-Supervisor
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Abstract

Aquatic invertebrates face many environmental pressures which threaten community diversity and distribution, resulting in direct risk to the health of freshwater ecosystems worldwide. These taxa are the foundation of freshwater biodiversity, and challenges to their existence must be understood. The natural and anthropogenic influences on the habitats of freshwater benthic macroinvertebrates threaten the integrity of both freshwater and adjacent terrestrial food webs, climate change buffering, and ecosystem services. Natural freshwaters are continually disturbed through factors such as hydroelectric dams, forestry, agriculture, and climate instability. This thesis analyzes benthic macroinvertebrates in lotic (running) freshwater systems and the effects of temperature on commonly occurring taxa in Maritime Canadian streams. Temperature change points for abundance shifts in aquatic genera were identified using data collected by Canadian Aquatic Biomonitoring Network from 2002-2022. These genera-specific temperature change points were used to build the River Invertebrate Thermal Index. This index was used to describe site-specific community tolerances to determine potential benthic macroinvertebrate community and food web resilience. Increased understanding of the thermal tolerances of foundational biota in Maritime Canadian streams can inform management decisions and predictions on future community compositions and food web effects from climate and land-use impacts.