
Hugh F. Clifford passed away at the age of 87 in Calgary, Alberta (Canada) on Easter Sunday, April 21, 2019. Hugh worked as a Fisheries Biologist in Columbia, Missouri from 1960 to 1962 after graduating with an MSc from Michigan State University in 1960. He earned a PhD from Indiana University in 1965, then began his career at the University of Alberta (Edmonton, Canada). Hugh taught Invertebrate Zoology and other courses from 1965 to 1995, retiring from the Department of Biological Sciences to become Professor Emeritus. Hugh is survived by his wife Joan, daughter Marie Clifford and her husband Rick Laughlin, son John Clifford, granddaughter Jacqueline Clifford and her partner Jamie Huff, sister Josie Fraser and her husband Don, two nieces and two nephews.

Hugh had a particular interest in stream ecology, and made many significant contributions to the life histories and basic biology of stream invertebrates in addition to his role as a mentor to scores of students. An article written following his nomination for the Rutherford Teaching Award at the University of Alberta noted:

His years of familiarity and fondness for the subject rub off on his students. “He illustrated almost every group of invertebrates with anecdotes of personal encounters with the creatures, and spoke of their lives with evident enthusiasm and affection,” one student remembers. “It was this enthusiasm that fired my own interest in invertebrates.”

Much of Hugh’s research focussed on the Bigoray River, a brown-water stream in the boreal natural region of the Athabasca River basin in north-central Alberta, although he and his students also published on many other aquatic habitats in the region. Their studies ranged from examining the life histories, drift, and colonization of benthic macroinvertebrates on natural and artificial



V. Gotcellias

**Hugh F. Clifford
(1931–2019)**

substrata, as well as habitat features and limnology of Alberta aquatic habitats, to studies on zoobenthos sampling methods. His academic publications included key papers on the ecology of an aquatic isopod and amphipod in an intermittent stream in Indiana (based on his PhD), papers focused on the Bigoray River and other habitats, and papers on the life history and ecology of Ephemeroptera and other aquatic species. Several of his papers have been cited over 70 times in scientific publications; of note, *Life cycles of mayflies (Ephemeroptera), with special reference to voltinism*, has been cited almost 200 times (Google Scholar). He was also an author on numerous papers by his graduate students on the life history, behaviour and ecology of a wide diversity of aquatic invertebrates in streams, ponds and lakes. His former students went on to successful careers as university professors (across Canada and in the USA), college instructors, and scientists in government and the private sector.

In addition to his publications, Hugh's pioneering work on the diversity of invertebrates in Alberta's sloughs, lakes and streams has left two enduring legacies. One is his 1991 book "*Aquatic Invertebrates of Alberta*", published by the University of Alberta Press and much beloved for its user-friendly flowchart keys. Hugh's book is still used to teach Zoology 351, "Freshwater Invertebrate Diversity", a course that he ran for many years and that continues to act as a training ground for young freshwater ecologists. The second is the University of Alberta Freshwater Invertebrate Collection. The collection houses more than 4500 accessioned specimens ranging from rotifers to crayfish, mostly from Alberta and adjacent provinces and territories. Among its most important components are the Alberta Oil Sands Environmental Research (AOSERP) specimens. These were collected in the late 1970s, and serve as testament to the biodiversity in northern Alberta prior to the major oilsands developments in this region.

Aside from his academic research, Hugh was deeply committed to the teaching of undergraduate courses. In particular, he was renowned and praised by students for his approach to teaching, not using lecture notes, and his ability to remember the names of all students in very large classes.

Hugh received the Science Award for Excellence in Undergraduate Teaching in Science (1980), the Rutherford Award for Excellence in Undergraduate Teaching (1993), and the Dr E.E. Ballantyne Award for Excellence in Environmental Research (1992).

Richard Casey (Edmonton), Heather Proctor (Edmonton), Jan Ciborowski (Calgary) and Donna Giberson (Sechelt)

(This tribute was first published in *The Mayfly Newsletter*, 22[1], Summer 2019.)



A larval alderfly (Megaloptera: Sialidae), prepared by Hugh Clifford as part of his work constructing keys and guides to Alberta aquatic invertebrates.