Geoscience Canada

Introduction — Interaction Between Terrestrial and Aqueous Systems

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Volume 3, numéro 3, august 1976

URI : https://id.erudit.org/iderudit/geocan03_03sym01

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Éditeur(s)

The Geological Association of Canada

ISSN

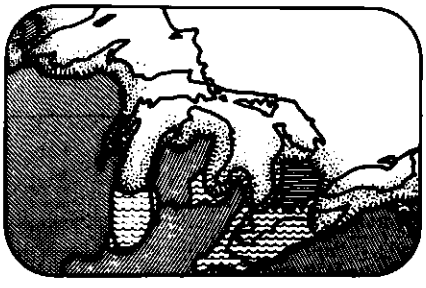
0315-0941 (imprimé)
unknown (numérique)

Découvrir la revue

Citer cet article

Sly, P. G. (1976). Introduction — Interaction Between Terrestrial and Aqueous Systems. *Geoscience Canada*, *3*(3), 157–157.

Great Lakes Symposium



Introduction—Interaction Between Terrestrial and Aqueous Systems

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The following collection of papers reviews our understanding of sediment related processes, within the Great Lakes Basin. The papers were presented at the Great Lakes Basin Symposium held as part of the joint Geological Association of Canada, Mineralogical Association of Canada, and Geological Society of America Meeting, at the University of Waterloo, Ontario, in May 1975.

The Great Lakes Basin covers an area of 777,000 km² (299,000 sq. miles), of which lake surface represents about one-third of the area. Some 32 million people live in the Basin (25.5 U.S. and 6.5 Canada) and estimates show that the population is increasing by about one per cent annually.

Activities are associated with industry, urban development, agriculture and resource utilization and, from this, it may be appreciated that environmental impacts resulting from the continuing effects of natural processes or events represent situations of major importance to human settlement in the region.

The contributions to the Symposium focus, firstly, upon the temporal patterns of erosion and fluvial sedimentation in the watershed, and this is followed by a discussion of the trends and patterns of sediment and nutrient yield. Next, consideration is given to the Great Lakes shoreline, with particular emphasis on the susceptibility to erosion of the unconsolidated materials which border much of the lower Great Lakes; this is complemented by a review of historic data and other complementary evidence. A separate discussion of nearshore lake processes follows, again with particular reference to the lower lakes. The final contribution in this series considers the integrative nature of mid-lake processes, and in particular expresses the significance of cultural impact in comparison to background rates of sediment accumulation and general composition.

It is apparent that although sediment erosion, transport, and depositional regimes are broadly understood within the Basin, there are considerable differences not only in the depth and confidence of data base, but also in the ability to interpret it. However, despite short-comings in available data, every attempt should be made to utilize existing stream flow and watershed records to the full. Further, it is essential to refine the data form required to quantify watershed inputs within the Basin and, in particular, to accommodate variations in flow regime and significance of events. In addition, it will be necessary to develop further verification of input loadings based upon more precise measurements of sediment accumulation in the lakes.

In the Great Lakes Basin useful recorded data extends back only a few years or at most a few decades and, as such, it provides an inadequate base for differentiating lake responses to changes in loadings due either to land-use practices or climatic fluctuations. Because of the increasing population and associated demand on natural resources it is essential to develop the best possible estimates of the growth of cultural loadings and, by use of recent "fossil" core data, to assess other geologically recent changes in the region.

Due to an unfortunate illness a contribution covering part of the Lake Michigan Basin could not be prepared for inclusion in this overview of basin processes. However, my thanks and appreciation go to all the authors who participated in the Symposium, and who prepared the contributions which follow. Hopefully, this material forms an effective review of our existing state of knowledge, and a source of useful references.

MS received May 31, 1976.