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18th Conference on Great Lakes Research

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Thursday afternoon a special geophysical session was again dominated by discussions of seismic technology, with only one talk on another topic, that of gravity. The talks covered various aspects of the use of reflection seismic wave forms, particularly their attenuation and amplitude, in determining subsurface lithology. Two papers, however, had special reference to the investigation of permafrost.

Friday morning was devoted to sessions on Mining and on Environment. The mining session, held with the cooperation of the CIMM, commenced with two keynote papers, one on Geochemical Exploration '75 by R. W. Boyle, and the other on the Current State of Mining Geophysics by R. H. Pemberton. These papers reviewed the present "state of the art" in the two fields and were followed by four papers on specific Canadian mineral deposits. These were for the most part interesting and instructive, but apart from the keynote papers there was again a lack of relevance to the conference theme.

Of even less relevance to the theme, though certainly of great importance, was the session on environment. This got off to a good start with an excellent presentation on Industry-Environment Trade-Offs by R. R. Logie, who pointed out that both industry and government had a responsibility to cooperate in the adoption of acceptable compromises in the development of environmental constraints.

Subsequent papers dealt with such aspects as environmental regulations controlling short term exploration activities in the North, the role of the petroleum industry in the development of environmental studies in Northern Canada, and the effects of regulation on the mining industry in Northern America.

The quality of the talks throughout the meeting was varied. Some were well prepared and delivered with good illustrations; others seemingly were put together at the last minute and frankly were a waste of everyone's time. The promise of the conference theme was, for the most part, not attained; perhaps it was too ambitious in the first place and only some of the geophysical papers could be said to describe any recent advances in exploration technology. It is significant that many of the displays in the excellent exhibit section were of geophysical equipment.

Nevertheless, as a geologist, I welcomed the opportunity to hear from geophysicists some account of their work, and to gain an appreciation of some of the more recent ideas and techniques that have been developed. In this sense the conference was a success. I am not so sure that a geophysicist aware of developments in his own field would have gained an equal appreciation of geological advances.

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18th Conference on Great Lakes Research

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Introduction

The Great Lakes Conference is held annually and deals with all aspects of Great Lakes research, including geologically-oriented studies. Because of the complexity of the Great Lakes system, geoscientists working in this area must retain a broad interdisciplinary approach. This conference provides a unique opportunity not only to exchange ideas with scientists involved in geological problems but also to gain insight into other fields of research on the Great Lakes. For these reasons, one generally looks forward to this meeting.

The 1975 conference was held from May 20 to 23, at the State University of New York at Albany and was co-hosted by the University and the New York Sea Grant Institute under the general direction of the International Association for Great Lakes Research. Unfortunately, this was not a good conference. Local facilities and organization were poor. Particularly distressing was the unprecedented number of cancelled papers, leaving many sessions disjointed and poorly attended. We sincerely hope that this year's conference will prove to be an unfortunate exception to the previous high quality of these meetings.

Technical Sessions

Geological papers presented at the conference covered a variety of topics although continued interest in the problems of erosion along Great Lakes shorelines was reflected in a substantial number of papers on that topic. These are reviewed below by Dr. N. A. Rukavina of CCIW. Papers dealing with sedimentary processes and lake evolution are commented upon by Drs. A. L. W. Kemp and C. I. Dell of CCIW.

Shoreline Erosion and Nearshore Sedimentation (Rukavina). One complete session and portions of several others were devoted to various aspects of coastal erosion and sedimentation in the Great Lakes. The quality of papers was better than it has been in this field in past conferences and papers by Maresca and Seibel, Hands, and Liard and Lawson were particulary stimulating and useful contributions to the understanding of coastal processes.

Maresca and Seibel (Michigan) reported on the results of a spatial and temporal analysis of bluff recession in Lake Michigan. This provides for prediction of areas of potential recession given the distribution of storm energy and of beach storage along the shoreline. Beach storage was identified as an important factor in determining the erosion rate. Rhythmic patterns of high and low erosion appear to depend upon shifting sediment storage produced by rip-current migration.

Hands (C.E.R.C.) examined shoreline recession as the landward part of the total profile response to changing water levels. Because of the slower response of the exposed profile to level changes, adjustments are often considerably out of phase with existing water level. This can lead to the extension of abnormally high erosion rates well beyond the time at which the level has peaked.

Liard and Lawson (Waterloo) reported on a two-part study of nearshore sedimentation at Long Point, Lake Erie. Part one involved the derivation of the constant for the longshore transport equation from an analysis of hindcast wave energy and historical data on accumulation rates. Part two was a computer simulation of spit development based on the premise that with unlimited sediment supply the spit grows in the direction of maximum longshore energy. Results suggest that spit morphology is largely a function of the water depth into which it is extended.

Jolliffe (U.K.) compared shoreline resource use along the Dorset Coast of England with that of the Toronto region. Although the Dorset situation was well-handled, it accounted for 95 percent of the paper and the attempt to present it as relevant to the Toronto region was unconvincing.

Davis and Fox (South Florida / Williams) extended their earlier detailed work on eastern Lake Michigan beaches with a simultaneous process-response study of both east and west Michigan coasts during the passage of a single weather system. The system observed was of low intensity and only minor changes were noted on both coasts.

Van Tassell and Moore (Wisconsin) documented a very small-scale (too small?) beach nourishment experiment in Lake Superior which was useful mainly in confirming the local dispersal pattern.

Nugent and Stephens (S.U.N.Y.) presented preliminary results of what was to my mind a poorly-conceived study of erosion and deposition along the east coast of Lake Ontario. The emphasis was on detailed local observations and no attempt was made to integrate these into the regional sedimentation pattern.

Sedimentary Processes and Lake Evolution (Kemp and Dell). Most of these papers were interesting and well-organized, and are illustrative of the broad scope of geological research being carried out on the Great Lakes.

Walters and Herderdorf (Ohio) studied the influence of the Detroit and Maumee Rivers on sediment supply and dispersal patterns in western Lake Erie. The authors found that the sediment plume from the Maumee River was held close to the shore and extended Northeast to Monroe, Michigan. Similarly, the Detroit River plume moved Southeast from the mouth of the Detroit River towards Monroe, keeping close to the shoreline. Trace metal profiles (Hg, Cr and Ni) showed a minimum in concentration between 1950 and 1955, corresponding to abnormally high water levels and high shore erosion at that time.

Kemp and Harper (CCIW) reported on sedimentation rates in Lake Ontario. Sedimentation was found to be greatest in the eastern part of the lake (5 mm / yr), reflecting the eastward movement of suspended particles and their deposition in zones of decreasing water depth towards the outlet. It was not clear as to how the suspended materials were transported eastwards from the major source areas at the western end of the lake.

Dell (CCIW) discussed sediment distribution in the complex trough and shoal region of southeastern Lake Superior. Thick accumulations of fine-grained sediment occur at the bottoms of the troughs with evidence of erosion and sorting of sediment on the tops and sides. Although water depth is perhaps the primary factor governing sediment distribution, bottom slope, current action and the early history of the lake are also important.

Maher (Wisconsin) correlated six cores from western Lake Superior with pollen diagrams from small lakes in the region. Varves stopped forming in Lake Superior about 9000 years ago, with the retreat of the glacial ice cover north of the divide to Hudsons Bay. The sedimentation rate, which was one cm at this time, slowed to an average of 0.05 mm/yr until the time of settlement of the region in 1890. Modern sedimentation rates of up to 0.8 mm/yr indicate that man has greatly increased sediment yield to the lake in the last 80 years.

Bowlby (Queens) examined in detail acoustic features in the sediments of the Kingston basin in Lake Ontario which he proposed were fossil ice wedge casts. The ice wedge casts were believed to be relics of the periglacial environment that existed in the region about 11,000 years BP. Assuming that the casts gave the maximum water plane elevation during the low water level stage of the Admiralty Phase of Early Lake Ontario, Bowlby postulated a radically new geographic position for the Admiralty Phase beach line within the Lake Ontario basin. A lively discussion followed this excellent presentation where the author stoutly defended his interpretation of the acoustic record as ice wedge casts and the position of the Admiralty Phase beach lines.

Hughes and Kososki (Northern Michigan) described a study of a submarine channel on the floor of Green Bay, Lake Michigan. Morphological evidence indicates that the sub-Duluth stage of the Lake Superior basin was co-existent with the Chippawa and Stanley stages in the Michigan and Huron basins and that, with the possible exception of the Whitefish Bay area, no Huron-Michigan stages earlier than the Nipissing extended into the Superior basin.

Coakley, Winter and Zeman (CCIW) described and interpreted sediment cores from the Point Pelee shoal area of western Lake Erie. Surface desiccation of till from the bottom of the cores indicates a period of subaerial exposure. The till is overlain by clay-rich sediment deposited in a lagoonal environment. This sediment grades upward into laminated sands and pebbly sands reflecting present-day high energy conditions.

The remainder of the conference was composed mainly of papers on the physical, chemical and biological aspects of limnology. Readers interested in further details may refer to the Conference Abstracts. Although in previous years a Conference Proceedings Volume has been published, this has been superseded by the *Journal of Great Lakes Research*, published by the International Association for Great Lakes Research. It is expected that many of the papers presented at the annual Great Lakes Conference will now be submitted to this new journal. Next year's conference will be held at the University of Guelph, Guleph, Ontario, May 4-7.

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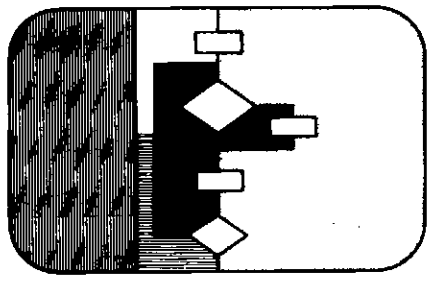

Workshop on Computer-Based Systems for Spatial Data in the Geological Sciences

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A two day computer workshop concerned with computer-based systems in the geological sciences was held at the University of Waterloo on May 13 and 14 immediately preceding the 28th Annual Meeting of the Geological Association of Canada. The workshop was arranged under the auspices of the Canadian Geoscience Council through an *ad hoc* organizing committee chaired by Dr. W. W. Hutchison. Since workshops of this nature had not been held previously in Canada, the aim was to disseminate information of the status and direction of development of computer-based filing systems in Earth Science fields in Canada. To this end the workshop was a definite success in drawing together representation from federal and provincial governments, industry and Universities from across the country. About 80 registrants attended.

A total of 13 oral presentations dealt with such diverse topics as: 1) managing data with a computer; 2) quality of input data; 3) an exploration-oriented file system (RT system); 4) general mineral deposit files for practical, academic and other applications (MINDEP system); 5) computer files in coal geology (DEEPCOAL, SASCODRIL, etc.); 6) an Earth Resources Data System for Canada; 7) digitizing oil well data; 8) machine-plotted lithological sample logs; 9) cartography and data base management; 10) computer graphics, a geological example; 11) interactive on-line mapping; 12) norm and correspondance analysis; 13) on-line access to documentation files.

Demonstrations formed an important part of the workshop, most of which illustrated various topics dealt with in the oral presentations. Of 13 specific demonstrations, two were by Industry representatives, three by University groups and the remainder from various provincial and federal government organizations.

Success of the workshop was due in large part to the cooperation of several members of the computing centre of the University of Waterloo, in particular Professor Jim Linders and Mr. Ken Hunt.

The general enthusiasm of participants was such that another workshop with a more specific theme is being considered to precede the 1976 GAC Annual Meeting in Edmonton.

MS received July 7, 1975.