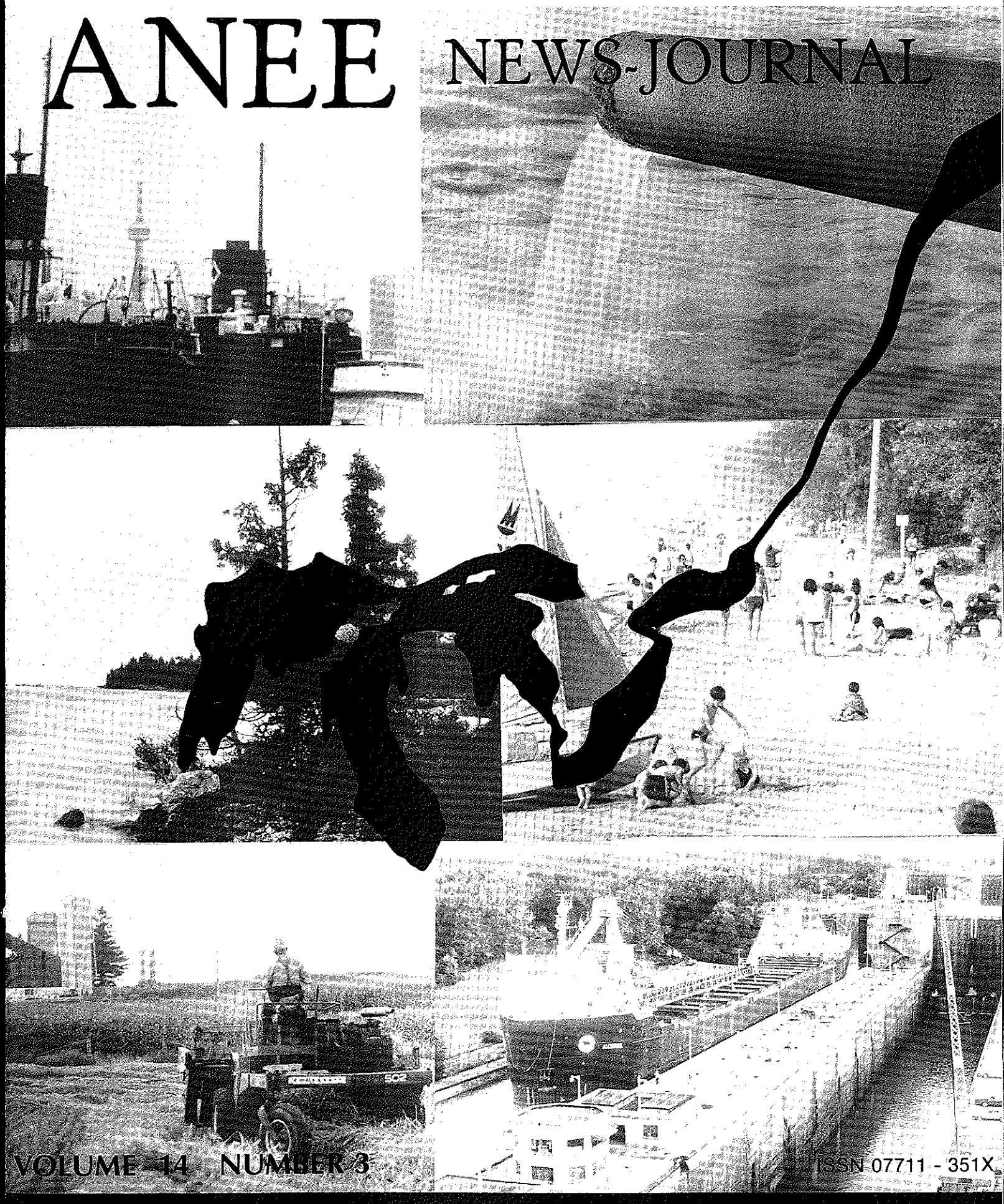
ANEE NEWS-JOURNAL



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The Council Of Outdoor Educators Of Ontario

The Council Of Outdoor Educators Of Ontario
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Contents

From The Editorial Desk

I am not sure how many of you read this part of ANEE, but I have a few items that I wish to pass along to you.

First, I am most grateful for the establishment of the Editorial Board. It is expected that with more people taking an active interest in the News-Journal that we will be able to make it responsive to your needs. All of the Editorial Board members have assisted in this issue and I'm thankful.

Secondly, the theme The Great Lakes has been and still is a major interest. I feel that we don't know enough and are not teaching enough about the Great Lakes Basin. Water quality and water quantity are significant concerns. Students today will be making crucial decisions about this continental resource. Their choices, I believe need to come from informed and appreciative minds. There is a very strong and urgent need for all of us to link together in an Information Network; on both sides of the border.

MERRY CHRISTMAS FROM ANEE!
THINK SNOW FOR JANUARY AND FEBRUARY.

The Council Of Outdoor Educators Of Ontario

Are You Interested In...

SHARING
- -your expertise,
- -with others, their expertise and experiences,
- -common concerns.

A RECOGNIZED JOURNAL,
Ours is called ANEE. Six issues per year bringing you up to date on:
- -current issues, problems, and concerns,
- -workshops, meetings and resource material,
- -teaching ideas with children,
- -fun social times with others of similar interests and skills.

TEACHING METHODS AND TEACHING OUT OF DOORS
Then join the network of interested active Teachers, Interpreters, Recreationists and Environmentalists.

PROFESSIONAL TRAINING
- -through university courses at the Post-Graduate Level (recognized by O.E.C.O. and most Ontario universities).
- -through regional workshops and conferences.
- -through workshops in conjunctions with O.T.F (during all seasons).

ENJOY THE BENEFITS OF C.O.E.O.

Upcoming Feature Topics

FEBRUARY	URBAN STUDIES IN ONTARIO PROGRAMS, ACTIVITIES AND RESEARCH SNOW AND WINTER ACTIVITIES PUBLICATION DEADLINE JAN 30 '85
APRIL	TRIPPING BY LAND AND WATER PLACES TO GO EQUIPMENT TO USE PREPARATIONS AND TRADE SECRETS. WE WOULD LIKE TO KNOW YOUR SUCCESSES AND PLEASURES TRIPPING.
JUNE	WE HAVE INVITED THE MINISTRY OF NATURAL RESOURCES TO BE OUR FEATURE. WE HOPE TO HIGHLIGHT THE OUTDOOR EDUCATION PROGRAMS AT M.N.R. FACILITIES AND THE CONSERVATION AUTHORITIES

PLEASE TAKE AN ACTIVE ROLL IN MAKING THIS NEWSJOURNAL A VITAL LINK IN THE PROVINCE.

News From The Chairman

Once again, the 1984-85 COEO year is off to a fast and exciting start beginning with the highly successful Pre-Conference "The Creativity Connection" and the main "Conference 84", in Sudbury in September.

Many thanks to all of you who supported COEO by attending and bringing your spirit(s), enthusiasm and ideas with you. A special congratulations to all conference organizers, committee members, speakers and resource people who worked so hard to provide interesting and unique program possibilities and professional development activities for the members.

The Advisory Board has also consolidated planning for the 1984-85 year by meeting November 2-4, 1984, at Sheldon Centre for Outdoor Education, (thanks to East York and Mark Whitcombe for their hospitality), to discuss the organizational goals and objectives to better serve the COEO membership. All of the executive members of COEO were present for the weekend to assist in the planning and goal-setting. In order to bring the membership up to date, for those who were not in attendance at the Annual Meeting, the new members of the Board include:

Bruce Hood - Member-at-Large. Bruce works at the Kortright Centre for Conservation, Kleinburg, as an Interpretor and also writes and illustrates curriculum guides.

Grant Linney - Treasurer. Grant is on staff at the Jack Smythe Field Centre, Peel Board of Education.

Penny Purcell - Co-Representative from the Eastern Region. Penny is a special education teacher at Colonel J.E. Farewell School, Whitby.

Brenda Steffler - Western Region Representative. Brenda is on staff at Laurel Creek, Waterloo County Roman Catholic Separate School Board.

Mark Whitcombe - Central Region Representative. Mark is the Director of the Sheldon Centre for Outdoor Education, East York Board of Education.

WELCOME AND THANKS FOR ALL OF YOUR EXTRA COMMITTMENT TO COEO AND THE WORK YOU'VE AGREED TO TAKE ON FOR ITS MEMBERS!!

Plans for 1985 for the Executive include work on:

- a slide show and display (including posters and photos)
- a new brochure for COEO
- a major planning proposal for the organization (long-range--see below)
- regional development--a resource manual for regional reps.
  --regional newsletters and programs
  --communications within the regions with school boards, and other organizations with environmental interests and outdoor education programs
- an Editorial Board for COEO--requesting input from all members
- the publishing of the revised Catalogue of Programs, Personnel and Facilities in Outdoor Education in Ontario.
- the publishing of a Conference Planning Guide for COEO events
- a major Constitutional Review project
- ongoing negotiations with Canadian Universities to offer outdoor education courses at the undergraduate and graduate levels, as well as continuing the N.I.U. professional development courses.

In addition to working on various committees involved with these projects, Advisory Board members continue to plan and lead workshops in their regions and on a provincial level. Watch for the many upcoming events sponsored by COEO and JOIN US!!

Some Environmental Effects of a Large Scale Water Transfer Scheme

Wm. Andrews

Further large-scale diversions of water into or out of the Great Lakes Basin could markedly disrupt ecological balance in the Great Lakes Basin eco-system. Scientific studies are urgently needed to ascertain the environmental impact of proposed diversions. These studies must be completed before engineering and political interests have invested significant capital in diversion plans, and they must be based on an ecosystem approach to management. This approach focuses primarily on ecological phenomena rather than on the traditional political, economic, engineering, and jurisdictional perspectives. While the studies are being conducted, every effort must be made to implement conservation measures which will lessen the demand for Great Lakes water. Such measures must give prime attention to the irrigation of agricultural lands, and should involve the evaluation of current land uses in agricultural regions of arid and semi-arid regions of North America.

INTRODUCTION

Canada appears to have vast water reserves, whether they be judged on the basis of per capita availability of water or on the basis of the magnitude of lake and subterranean storage areas and total discharge from rivers. Central to these reserves are, of course, the Great Lakes which we share with the United States. Vast though these lakes may be, they have shown for decades the symptoms of misuse and mismanagement that have arisen largely because utilization has been based on the assumption that their vastness permits almost limitless exploitation. Several events, however, are gradually bringing this important resource into its proper perspective. Among these events are the deterioration of the Great Lakes fisheries, contaminated swimming beaches, identification of hazardous wastes in municipal drinking water, abnormal water levels on the lakes, and indications that impending water shortages in parts of the United States may increase the demand for water from the Great Lakes.

These events are forcing us to acknowledge that water is our most valuable resource and that supplies are not endless. Further, many of us now concede that the Great Lakes Basin, like any ecosystem, has a finite carrying capacity which, in spite of the huge volume of water in the basisn, can be dramatically and dangerously altered by the imposition of undue environmental stresses. Large-scale diversions of water, into or out of the basin, constitute one such environmental stress. The major environmental consequences of such water transfers are the subject of this paper.

AN ECOSYSTEM APPROACH TO MANAGEMENT

Subsequent to the 1972 Great Lakes Water Quality Agreement, the governments of Canada and the United States have implemented programs to mitigate environmental damage in the Great Lakes and enhance water quality. The progress of these programs has been monitored by an extensive surveillance program which stresses predominately geophysical and chemical water quality parameters.

Conservation Council Of Ontario

Such studies have added immeasurably to our understanding of the Great Lakes. They are, however, only a small part of the understanding that is needed for effective management and restoration of the lakes. The International Joint Commission recognized this fact when it asked the Great Lakes Research Advisory Board in 1977 to prepare a statement on the scope and implications of an ecosystem approach to transboundary problems in the Great Lakes Basin. This report, titled "The Ecosystem Approach" was released in 1978.[1] It defines the Great Lakes Basis Ecosystem as follows:

> "... The Great Lakes Basin is an Ecosystem composed of interacting elements of the hydrosphere (natural waters), atmosphere, lithosphere (soils, rocks, sediments) and biota (encompassing man) in the drainage basin of the St. Lawrence River at or upstream from the point at which this river becomes the international boundary between Canada and the United States."

The ecosystem approach recommended in this document involves the examination of the basin as an Ecosystem, simultaneously relating events within the Ecosystem to those in surrounding areas in biospheric perspective. In the view of the Conservation Council of Ontario, this ecosystem approach must be the basis for the evaluation of all proposals for large-scale diversions of water into or out of the Great Lakes Basin. Simply stated, this approach has "a focus primarily on ecological phenomena, rather than on the conventional and historically dominant political, engineering, economic, or accounting perspectives,"[2] and it has a biospheric perspective which takes account of transport in and out of the ecosystem.

SOME POSSIBLE ENVIRONMENTAL EFFECTS OF OUT-OF-BASIN WATER TRANSFERS

The main large-scale uses of water in the Great Lakes Basin are clearly identifiable:

- Urban and rural domestic use
- Industrial uses (including mining and manufacturing)
- Agricultural uses (livestock and irrigation)
- Power generation
- Fish and wildlife production
- Recreation (including tourism)
- Navigation

Though diversions out of the Great Lakes may have positive values for some sub-sets of these seven major uses, overall, both the environmental and economic effects will be negative within the Basin for all seven uses. Much attention has been given recently to quantifying the effects of lower lake levels on power production and navigation, but a serious deficiency exists in Canadian knowledge about the effects of lower lake levels on environmental factors such as fish and wildlife habitat, human utilization of the shoreline for recreation, and water quality. Large projects such as trans-basin water transfer systems are, by their very nature, irreversible. Once they are operational, it becomes impossible to mitigate unforeseen environmental impacts. It is imperative, therefore, that scientific studies be conducted to ascertain the full environmental impact of proposed diversions well before significant capital has been invested in the projects. The following are some thoughts on two major areas which require detailed study:

1. Effects of Lower Water Levels on Fish and Wildlife

The shallow areas of the Great Lakes, the ones that will be most affected by lower water levels, are by far the most productive areas for fish. These shallows are generally associated with marshaes, and are the vital spawning and rearing habitat for small mouth bass, large mouth bass, northern pike, and muskellunge. They are also the natural habitat of many other species of fish. Desirable and badly needed fish habitat could be destroyed by a small decrease in water level.

A drop in water level of just a few centimetres will eliminate vast areas of the type of marsh which constitutes our most productive wildlife habitat. For example, calculations have shown that a 15 cm drop in Lake Huron would expose a strip of marsh over 300 m wide and 6.5 km long in Saginaw Bay[3]. Narrow though such strips of marsh may be, they support a great abundance of wildlife, both aquatic and semi-aquatic. Many species of birds and mammals are absolutely dependent upon marshes for their existence. The young require these wetlands for feeding, and for protection from enemies and the elements. Adult waterfowl use them for feeding, nesting, and resting. Many important game species and fur-bearers are among these marsh-dependent animals. Mink, muskrat, duck,s geese, shore-birds, and coots are examples.

2. Human Utilization of the Shoreline for Recreation

About 35,000 members of the Federation of Ontario Cottagers' Associations, Inc. reside on or near the Great Lakes, and they represent just a small portion of the total number that use the shores for recreational activities. Though lower water levels may enhance swimming beaches and lessen the erosion of shoreline properties, cottagers are concerned about possible negative impacts on boating and fishing opportunities. A small decrease in water level will greatly affect the traditionally shallow areas such as connecting channels, harbours, and bays. Although dredging may be used in deeper waters where commercial navigation is affected, this is not a feasible solution in the countless bays and inlets where sailing, canoeing, and water skiing are enjoyed. Further, existing docks may be rendered useless by lower water levels.

In addition to its negative effect on recreational boating, a decrease in water level will also affect those who enjoy the viewing of waterfowl and shore-birds, sports hunting, and sports fishing.

Summative Comment

Definite cost figures cannot be attached to the potential damage to docks, the loss of boating opportunities, the decrease in the enjoyment of fish and wildlife or the destruction of marsh habitat. Conservation is a state of mind, an intangible benefit. And who can give the real dollar value of a relaxing weekend at a cottage? Fortunately, an ecosystem approach to management is not based on such narrow considerations.

REPLENISH THE WATER BY DIVERSIONS INTO THE BASIN?

Many will argue, of course, that water levels in the Great Lakes Basin need not drop. Water diverted out of the Basin can be replaced by water diverted into the Basin from the Hudson Bay drainage system. Two such diversions already exist, at Long Lac and Ogaki. The Conservation Council of Ontario asks if the true environmental impact of those diversions has been adequately assessed and questions whether the north can sustain further projects of this type. The development of any scheme of dams, reservoirs, and channels implies that alternative uses of the resource have been forgone. The attendant water impoundments in storage and transfer systems may inundate valuable mineral reserves, destroy the spawning grounds for anadromous fish, eliminate vast tracts of boreal forest, dissect agricultural land, disrupt the habitat and migration routes of mammals, decrease recreational opportunities such as wild river canoeing and fishing, and displace native people from their lands. Further, have the long-term ecological consequences of the integration of the biota from the Hudson Bay drainage area and the Great Lakes Basin been thoroughly assessed? Have the possible consequences of extensive diversions on the microclimate and, indeed, on the mesoclimate in the region of export been assessed? And, had the potential impact on the ecology of James Bay and Hudson Bay been documented and evaluated?

Integration of water systems is not inherently good, and investigations and evaluation of the consequences of such action should be initiated on the basis of that fact. Though the north constitutes over 70% of the area of Ontario and holds about 10% of its population, we know little about it. After close to seven years of work and expenditures of nine million dollars, the Royal Commission on the Northern Environment has yet to release a final report. Until we know more about the north than we do now, diversion projects that tamper with its waterways should not even be considered.

IRRIGATION: IS IT WORTH THE PRICE?

Irrigation is the most demanding water use and, possibly, the most controversial. Half the water used in the United States each year goes for irrigation, and this water is lost to other users because of evapotranspiration. Taking this into account, about 85% of all the water used in the United States (rather than just "borrowed") goes for irrigation. Irrigation is used in arid and semi-arid areas to produce commercial crops of high monetary value. It is also used in non-arid regions to increase crop yields and to get better quality produce. About half the water directed into agricultural uses is wasted, says the United States General Accounting Office. Why is this so?

The price paid for irrigation water is normally far below its real cost or worth. The production of crops in arid regions is, strictly speaking, unprofitable. It is only possible because of direct or indirect subsidies. Water has traditionally been treated differently from other marketable commodities that are "directed to their highest and best uses by the price system. Historically, water's seeming abundance contributed to its allocation at prices reflecting the costs of capture and distribution, not its economic

value. Because of the 'water-is-different' syndrome, the solution to water shortages through time as need grows, has been to develop new water supplies rather than to raise prices - to increase the supply to meet the fixed demand."[4] And herein lies the reason for the lack of attention to water conservation and the current interest in the use of Great Lakes wtaer to irrigate the American Midwest and Southwest.

This paper discussed earlier some possible environmental effects of transbasin diversions on the Great Lakes Basin Ecosystem. Because we promote an ecosystem approach to management with a biospheric perspective, the Council is also concerned about possible environmental effects on the receiving ecosystem, the Americal Midwest and Southwest. What could happen if massive quantities of Great Lakes water are transferred to these areas of the United States? When this relatively cool water moves to southern latitudes, heat will be absorbed from the environment to warm this water to the ambient temperature. This absorption of heat and the resultant evapo-transpiration could significantly affect microclimates and even mesoclimates in the area. In addition ecological problems could arise from any mixing of the biota of the exporting and importing regions.

RECOMMENDATIONS

The conservation Council of Ontario offers the following recommendations for consideration before any large-scale trans-basin transfers of water are contemplated, in the belief that a continent-wide water conservation program could forestall and even make unnecessary such diversions.

- Reduce markedly the quantity of water used for agricultural irrigation, not just in the American Midwest and Southwest, but across the continent as a whole. The following are some possible ways to do this:

  a) Use less water on a given crop, with the understanding that yields may be lower and quality poorer.

  b) Update irrigation technology to minimize runoff and its attendant problems of soil erosion and water pollution.

  c) Irrigate mainly water-efficient crops.

  d) Use soil management techniques which increase the water-holding capacity of the soil.

  e) Reallocate land uses in order that water-demanding crops are not grown in areas with mounting water deficits.

- Reduce non-agricultural irrigation such as the irrigation of golf courses and lawn watering. Why, for example, are lawns in Toronto commonly planted with water-demanding Kentucky and Meridian blue grass, when native grasses would survive without irrigation?

- Encourage water conservation across the continent by realistic pricing that assesses the true cost of the water back to the user.

- Develop better methods for the impoundment of flood waters in order that they can be used subsequently for irrigation.

- Avoid water pollution which, in many instances, has rendered local waters unfit for irrigation.

CONCLUSION

The Conservation Council of Ontario recognized the need for long term planning for future water requirements and conservation in the continent as a whole, without regard to provincial, state, or international boundaries. This planning must revolve around an ecosystem approach with a biospheric perspective, and the conclusions of scientists must not be overriden by the demands of politicians who may be sensitive to the pressures of local, short-term interests. Short-term benefits (or seeming benefits) for a local region cannot be allowed to endanger the ecology of other regions of the continent. "Water is not only a resource commodity but also a key element of the environment, needed to support wildlife habitats and traditional ways of life."[5]

After a few thousand studies of acid deposition, we are still commissioning further studies, conducting "band-aid" treatments such as the liming of lakes, and accusing Americans of polluting our lakes, while our coal-burning power plants and smelters continue to pollute the earth's atmosphere and our automobiles emit over three times the nitrogen oxides concentration of comparable American models. Had acid deposition been approached three decades ago using an ecosystem approach with a biospheric perspective, the problem probably would not exist today. We should keep this thought in mind when we are confronted with proposals for trans-basin water transfer schemes.

NOTES

[1]Great Lakes Research Advisory Board, The Ecosystem Approach, special report to the International Joint Commission, Windsor, Ontario, 1978.

[2]Brenda J. Lee, Henry A. Regier and David J. Rapport, "Ten Ecosystem Approaches to the Planning and Management of the Great Lakes," Journal of Great Lakes Research," Vol. 8, No. 3 (1982), pp. 505-519.

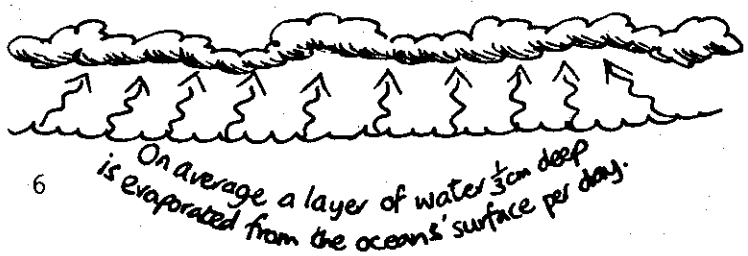
[3]Adverse Effects of Low Water Levels on Conservation Interests, Proc. of the Great Lakes Levels Conference, 28 July 1964, p. 95.

[4]Terry L. Anderson, Water Rights (Cambridge, Mass.: Ballinger Publishing Co., 1983), p. 85.

[5]Harold D. Foster and W. R. Derrick Sewell, Water: The Emerging Crisis in Canada (Toronto: James Lorimer & Co., 1981), p. 34.

The hydrological cycle

Every day, enough water is evaporated from Earth's oceans to fill well over 5 million Olympic-size swimming pools. At any one time, about 1% of Earth's total amount of water is on the move - through evaporation, rain or snow - and slowly finding its way back to the oceans.



Futures in Water

Cathy Erdle. MNR

THE GREAT LAKES ARE A VAST TREASURE. THAT'S WHY BOTH ONTARIO AND THE U.S. BORDER STATES ARE GETTING TOGETHER TO KEEP THIS PRECIOUS RESOURCE WITHIN ITS BANKS.

- by Cathy Erdle

"What few people realize is that only a small portion of the Great Lakes is truly renewable. The huge volumes of fresh water in the Great Lakes are the gift of the last glacier recession, laid down over several thousands of years as the glaciers melted and receded. So most of the water in the lakes cannot be replaced.

If we start removing water left by glaciation, lake levels will fall premanently. The only water we have to use is the renewable supply - the water that falls as rain and snow and passes through the system regularly. Our concern is that this renewable portion is now virtually fully utilized. In other words, we're close to the point where we're going to be taking more water out of the Great Lakes than is going back in."

- Tony Clarke,
Executive co-ordinator

Lands and Waters Group,
Ontario Ministry of Natural Resources.

It's hard to imagine water quantity ever becoming a problem in the Great Lakes. After all, it is the largest chain of the freshwater lakes in the world. Thousands of rivers, streams and other lakes drain into the system. And the Great Lakes contain about 18% of the total amount of fresh water on the planet's surface.

Seen from an aircraft, the Great Lakes seem incredibly vast. They are. The total surface area of the lakes is about three times the size of Nova Scotia. And the largest - Lake Superior - is up to 400 metres deep. In other words, if you placed Toronto's CN Tower in Lake Superior, the outdoor observation deck would still be about 60 metres under water.

Yet, as Tony Clarke says, the levels of the Great Lakes could drop as a result of growing demand for this water. Lower lake levels could be catastrophic for the entire Great Lakes region - especially for Ontario, which is the only province that borders on the Great Lakes. From the mining communities on the shores of Lake Superior to Canada's industrial heartland in southern Ontario, the province's economy has developed around and depends on the waters of the Great Lakes.

At present, one out of every three Canadians and one out of every seven U.S. residents depend on the Great Lakes for their water. Together they use up almost 140,000 litres of water a second. However, U.S. consumption is about four times greater than is Canada's. By 2035, this amount could grow to more than one million litres a second - simply because of growing demands by U.S. and Canadian citizens and industries in the Great Lakes region. And this water can only be replaced by nature.

With this level of demand, the levels of Lake Michigan, Erie and Huron could drop up to 34 centimetres by the year 2035. This projection was made by the International Joint Commission (IJC), a Canada/U.S. organization that monitors and resolves common water issues between the two countries. The IJC is made up of three members appointed by Washington, and three appointed by Ottawa. (Because Lake Superior is the highest of the lakes, and because the level of Lake Ontario can be controlled by dams at Cornwall, the levels of these lakes would likely not change due to increased demand.)

A permanent drop in the lake levels would mean less water power for hydroelectric generation, reduced commercial shipping and restricted access to docks at marinas and cottages. The economic losses could amount to hundreds of millions of dollars annually.

Yet steps are being taken now by governments on both sides of the border to try to find ways to reduce this growing demand. Governments are starting to study the biggest water consumers - thermal electric generating stations and industries - as well as other water users to try to find ways to conserve water.

On top of the growing demand for water within the region, pressure is mounting to divert water from the Great Lakes or other Canadian bodies of water to the water-short states of the American southwest.

Quite simply, the problem in the United States is that the east is humid, while the west is arid. About 60 per cent of the land in the United States is in this arid region, which receives only 25 per cent of the rainfall.

"Historically, that wasn't much of a problem," writes water authority Muriel Morrisette in the Journal of Freshwater. "The great centres of population grew up in those eastern areas where water for commerce and industry was plentiful. Agriculture flourished in the great river basins of the south and midwest. The limited water supply of the west was adequate for its scattered population.

Despite the water limitations, the population of the west and southwest was encouraged to grow by the development of massive water projects funded by the federal government. Agriculture now flourishes in once-arid regions. In fact, agricultural irrigation accounts for almost 80 per cent of all the water used for any purpose in the United States. Federal investment in dams and reservoir projects made the necessary water available, but the supply is running out," she says.

The mighty Colorado River, which is drained for irrigation by seven states, is little more than a trickle by the time it reaches the Mexican border. The San Joaquin Valley in California has sunk nine metres because of depleted under-ground water reserves. Many farms in the southwest have gone out of business as their wells have run dry.

The heart of the water problem in the United States is that its largest underground reservoir - the Ogallala Aquifer - is being depleted faster than nature can replenish it.

The Ogallala, the largest aquifer in the world, lies under an area that includes parts of Nebraska, Oklahoma, Colorado, Kansas, New Mexico and Texas. Irrigation wells began tapping the aquifer during the Dust Bowl in the 1930's and the water eventually turned 16 million acres of dry cropland and range into highly productive farmland.

This reservoir holds roughly the amount of water in Lake Huron. States at the aquifer's north end still have a thick water layer underground, but some water pumps in the south are now running dry. Estimates are that at current depletion rates, the Ogallala will be reduced 40 per cent further within the next couple of decades.

Farmers like Keith Farrar of Kansas, who is also a state representative, are trying to conserve water by doing such things as installing more efficient irrigation systems and switching to crops that require less water. Yet conservation, for all its merits, will only prolong the inevitable, he says. That's why he and others in the United States are starting to call for massive water diversions to replenishthe dwindling supply. By diversions, they mean siphoning water from the Great Lakes or damming Canadian and Alaskan rivers to make them flow south.

"I think people generally realize that the water crisis in the United States is getting worse day by day, and that pressures for diversion of Great Lakes' water will certainly increase over time," says Michael Donahue, a natural resource specialist with the Great Lakes Commission. The commission is a lobby group based in Michigan that speaks for Great Lakes states' interests in the United States.

Although many water authorities agree with Donahue that the pressure to divert water will increase, others feel that diversions will never be necessary if the United States learns to manage its water resources more efficiently. Better management includes such things as improved irrigation practices and crop planning, greater pollution controls, higher water pricing in the water-short states and repairing leaking, antiquated water supply systems.

The recently-formed National Water Alliance (NWA), based in Washington, is currently trying to find some nationwide solutions to the problems that threaten America's water supply.

"During the energy crisis we looked for and developed other sources of energy. But there is no alternative to water. The water we have today is all that exists. We cannot allow the nation's most precious resource to be wasted, mismanaged and taken for granted any longer," says former Arizona governor Dennis DeConcini, who is co-chairman of the NWA.

"Nobody is dying of thirst in the United States or Canada and nobody is going to die of thirst," says Canadian water planner Frank Quinn, who is currently working on a federal water policy for Canada.

"Everybody knows that adjustments have to be made. And there have been some adjustments in the U.S. In Arizona, for example, the state government is buying up farmland to remove it from production. As well, limits have been placed on the amount of ground water that can be removed."

Quinn thinks that changing some agricultural practices would help. California, Arizona or Texas might consider not producing cotton since it can be grown more easily in Georgia, South Carolina, Mississippi or other areas where they don't have the water problems.

"Australia is a pretty dry place," he adds, "And a continent unto itself. They have learned to adjust and live with their water problems. It can be done.

"As I said, eventually, we'll have to do just that."

Ralph Pentland, director of the Inland Waters Directorate of Environment Canada, says the biggest concern about any possible future diversion is that, "once that tap is turned on, you can't turn it off. If you start a diversion of water, you build up a whole economic infrastructure dependent on that source of wtaer. You can never stop. So you turn it on, and you're okay for 20, 30, 40 or 50 years, but then suddenly you realize we need that water. At that point, you can't stop. You've sold your sovereignty, your heritage and your future."

Indeed, some water experts say Canada is facing its own water shortages - particularly in large areas of the southern prairies - and that exporting water would only aggravate the problem.

A number of private schemes have been proposed to divert Canadian water southward. Most of these have been devised by private engineering firms, and none have been endorsed by any government in the United States.

Two of the most publicized projects are the North American Water and Power Alliance (NAWAPA) and the Grand Canal schemes. Environmentalists cringe at the thought of such massive water diversion proposals, yet others tout these projects as the answers to all of North America's water shortage problems.

NAWAPA is a $150-billion, 1963 plan to dam northern rivers and flood part of the Rocky Mountain Trench. Water would be pumped and channelled into the U.S. and the semi-arid southern Canadian prairies. A canal linking Alberta with the Great Lakes is also part of this mammoth scheme.

Thomas Kierans, a consulting engineer in St. John's, Newfoundland, is still promoting his 1959 Grand Canal idea. He has a plan to dike the 150-kilometre-wide mouth of James Bay, which would turn it into a fresh-water lake. The lake water would then be channelled and pumped through various Quebec and Ontario river systems down to the Great Lakes, which would become a great reservoir. This extra water coming in to the Great Lakes would enable water to be piped to southern states without affecting the level of the lakes. The scheme would cost an estimated $84-billion.

Another suggestion proposes pumping Lake Superior water through 984 kilometres of concrete-lined channels to the Missouri River in South Dakota. It would cost almost $27-billion to construct the project and another $15-billion annually to run it.

Other proposals for much smaller-scale diversions include the use of Great Lakes water in coal slurry pipelines. That's an inexpensive way to transport coal. The coal is crushed, mixed with an equal amount of water, and pumped through a pipeline at about a metre a second.

Despite all these proposals, however, the Canadian government opposes exporting water. And Ontario Natural Resources Minister Alan Pope has stated repeatedly that Ontario is against diverting any more water out of the Great Lakes basin.

The big question is, does Canada have the power to stop a diversion if Washington decides it wants one? Under the 1909 Boundary Waters Treaty, Canada and the United States have equal rights to use all boundary waters. Four of the five Great Lakes are boundary waters. The fifth - Lake Michigan - is solely within the United States, and therefore is not covered by the treaty.

Canada is protected against diversions by this treaty, which says that the International Joint Commission has to approve any diversions out of the boundary waters. However, because Lake Michigan is not covered by the treaty, the United States does have the power to decide unilaterally to divert water out of it.

In fact, water has been taken out of Lake Michigan via the Chicago Sanitary and Ship Canal, ever since the 1800's. Primarily a shipping channel, the canal was also designed to flush sewage effluent and other waste products from Chicago and downstream areas into the Mississippi River system. Approximatley 90,000 litres of water a second flow out of Lake Michigan through this diversion. The rate of flow has been controlled by decisions of the U.S. Supreme Court.

Although this water is permanently taken out of the Great Lakes, roughly an equal amount of water is diverted into the lakes from two previously north-flowing bodies of water in northern Ontario. Long Lake and the Ogoki River both used to flow northwards and eventually emptied into James Bay. Dams were built on both in the 1940's, which turned the flow towards Lake Superior to provide water for a series of hydroelectric stations.

Over the years, a number of attempts have been made in the United States to increase the rate of flow through the Chicago diversion. In each instance, the Government of Canada sent a note to Washington protesting the impact the increase would have in Ontario and Quebec.

"I think that these notes probably haven't been as effective as the solid opposition of the downstream states to these diversions," says Ralph Pentland of Canada's Inland Waters Directorate. "Those states are our biggest protectors."

Recognizing the strength in regional solidarity, the eight Great Lakes states and the governments of Ontario and Quebec produced a resolution at a Great Lakes' conference at Mackinac Island in June, 1982. The gist of that resolution was that no diversions outside the lakes' basin should take place without studies of all impacts and without agreement from all provincial, state and federal governments.

Five of the eight Great Lakes states have also either introduced bills or are planning to introduce legislation that would either ban or limit any out-of-state water diversions, says Michael Donahue of the Great Lakes Commission.

And in late 1983, he points out, "a series of bills were introduced into Congress that would specifically prohibit the diversion of Great Lakes water for use outside the Great Lakes states unless all of the states and the provinces of Ontario and Quebec agreed to it."

To learn more about expected water losses in the years to come, the federal governments of both Canada and the U.S. will soon ask the IJC to study water use practices further and determine future needs in the Great Lakes region.

In addition, the Ontario government is part of a recently-established task force - made up of representatives from all the Great Lakes' states and Quebec - that is looking at ways to tackle the problems associated with growing water consumption in the area.

MNR's Tony Clarke is obviously deeply concerned about growing demands for Great Lakes water. He says the Ontario government's Futures in Water conference in Toronto in June 1984 was an important forum to make Ontario residents more aware of this water quantity issue. But the conference was only the beginning, he says, because he sees MNR playing a "much more significant role" in water management in Ontario in the future.

"Water is a natural resource. It is a provincial resource. It has to be managed, and the Ministry of Natural Resources is the agency to manage it."

The ministry is responsible for controlling water levels in Ontario and for trying to "strike the balance between the competing users" of Ontario's water. These users include industry, thermal generating plants, hydroelectric installations, fishermen, boaters, swimmers, cottage owners, the tourism industry and commercial shippers.

"What we're trying to do is become a focus for all these water-quantity related issues, so that we can look at all points of view and try to strike a happy balance."

Clarke says the Ontario government will be working with the Great Lakes' states to attempt to "come to some sort of basin wide approach to water use.

We waste a lot of water, particularly in some industrial and municipal practices. So we're going to have to come up with a co-operative approach to reduce losses.

We also want to make the general public aware of the fact that though we don't have a problem now, we do have to start thinking now about water for the future."

From LANDMARKS, Summer 1984.
Ontario's Natural Resources Magazine.

The Infamous Great Lakes Trivia Quiz:

1. Which of the five central Great Lakes will most likely burst into flames before the year 2000?
2. Name the island in the Great Lakes that is farther south than the California-Oregon Border.
3. Name the world's largest freshwater island contained in the Canadian waters of the Great Lakes.
4. Nicholas Sanson's "Map of Canada" was the first to show all five central Great Lakes, even though two of the Great Lakes are open-ended. In what year was this map published?
5. Name the four rivers joining the five central Great Lakes.
6. Which of these rivers plays host to 261 chemical pollutants?
7. There are actually eight Great Lakes greater than 18,000 square kilometers (7,000 square miles). Name them in order of size from largest to smallest.
8. In which year did the St. Lawrence Seaway open?
9. Which Great Lake claimed the Edmund Fitzgerald?
10. Name the first sailing vessel built on the Great Lakes, and in what year was it constructed?
11. Which Great Lake is mentioned in the Dr. Seuss book, The Lorax?
12. Which Group of Seven artist captured the majesty of the Lake Superior islands and cliffs during his monumental "blue and white" phase?

-Skid Crease

photo contest
send c.o.e.o.
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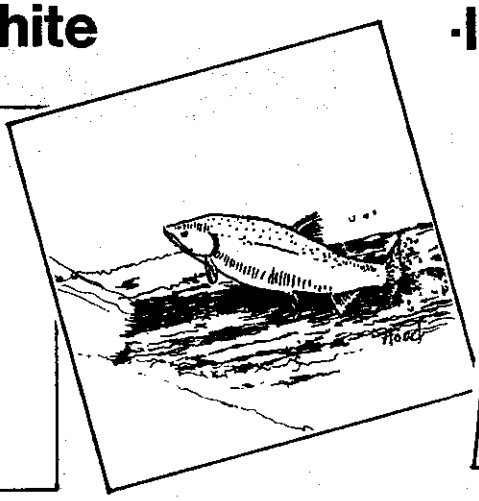
send in your best shots 9 categories

- colour slides
- colour prints
- black and white

X

- people in the outdoors
- wildlife
- landscapes



Winners names will be published in Anee.

- grand prize...free c.o.e.o. conference of your choice during 85/86
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Photos will be judged and may be used in Anee and other C.O.E.O. publications, with acknowledgements.

deadline february 28/85

What Is An "Ecosystem Approach" To Teaching About the Great Lakes

You and the air, water, minerals, plants, animals and human relationships you depend on make up your ecosystem. It's different from your environment, because you are an integral part of it.

An ecosystem can also be "spaceship earth", a river basin or a balanced aquarium in your living room - any interactive natural community of plants, animals, minerals and other nonliving forms.

The 1978 U.S.-Canada Great Lakes Water Quality Agreement defines The Great Lakes Basin Ecosystem as:

> "the interacting components of air, land, water and living organisms, including man (people), within the drainage basin of the St. Lawrence River at or upstream from the point at which this river becomes the international boundary between Canada and the United States."

"Our governments recognized that this politically-shared ecosystem cannot be managed by piecemeal actions any more than the liver, kidney and circulatory system can be managed independently of the body as a whole," writes Jack Vallentyne in "A Guide to the Great Lakes Water Use Map."

To follow this analogy, doctors treat their patients rather than disease symptoms. Relationships are inseparable and boundaries artificial. Or, as biologist Barry Commoner writes in The Closing Circle, one of the laws of nature is "Everything is connected to everything else."

Teaching an "Ecosystem Approach" to the Great Lakes involves all subject areas - from chemical, biological, physical and social sciences to 20,000 years of history.

Nearly 40 million people depend on the Great Lakes for drinking water. From 300,000 in 1809, those relying on Great Lakes water may increase to 54 million by 2020.

If you live near the lakes, you probably use Great Lakes water directly for drinking, cleaning, gardening and recreation, or indirectly for food, transportation or energy. Up to 25 percent of U.S. industries have used the Great Lakes.

Changing human population patterms and activities alter the natural supply of essential nutrients into the lakes, eroding both soil and water quality. Phosphorous from laundries and industries, sand from construction sites, fertilizer and manure from farms wash into the lakes. Augmenting lake nutrients, these become "too much of a good thing." Algae grows rapidly, decays and depletes oxygen necessary for lake animals. This process, called eutrophication, has been most severe in shallow lakes and bays.

Toxic metals such as lead and mercury and poisons from industrial processes, city wastes, agricultural insecticides and herbicides also threaten the Great Lakes ecosystem. Experts estimate the United States generates as high as 2,500 pounds of hazardous waste per person.

Not all problems are as visible as dirty foam on surface water or drain pipes spewing opaque water, nor do they all originate from Great Lakes industries, cities or farms. Some move through the earth and aquifers that provide drinking water. The pesticide chlordane drifts into the lakes from southern cotton fields. Acid rain may form from fuel burned hundreds of miles windward.

You can personally connect your students to the subject of water quality. You can begin by asking your students if they have had a glass of water today. You can remind them their bodies are 95% water and they need 8 glasses a day.

The largest source of Lake Michigan PCBs (poly-chlorinated biphenals) is from the air, according to William K. Reilly, who directs the Conservation Foundation in Washington, D.C. Among the warning signs you may have seen posted are those warning about eating Great Lakes fish. Many have become contaminated with PCBs, once used in electrical transformers and some paper processes.

Some health officials caution against eating any fish longer than 24 inches, since toxins such as PCBs, DDT, dieldrin, chlordane, toxaphene, mercury, dioxins and furans accumulate in fat of older fish.

Perhaps the closest way to connect children with their Great Lakes ecosystem is in their cups or on their plates.

From LAKE CONNECTION, Vol. 3, No. 1, Oct. '84.

People In The News

Welcome to Our Youngest COEO Member.

McLimmont - David Edward Mark
Born Oct. 29, 1984
21½" Long, 8lbs. 3oz.
Parents Dianne and Paul McLimmont
Congradulations to the proud parents!
Dianne was our western rep. on the advisory board.

Welcome Back

Don Morrison
Waterloo County Board of Education
After 3 profitable and rewarding years as an Administrative Assistant, Don is now back fulltime at the Blair Outdoor Education Centre.

Congradulations to:

Chuck Hopkins
As of Sept. 1 Chuck has been appointed as a Supervisory Officer with the Toronto Board of Education. Chuck leaves the Boyne River Natural Science School.

NAEE

COEO was very well represented at the North American Environmental Education Conference at Lake Louise Alberta in October. Those spotted enjoying the Western Hospitality and the great outdoors were Lloyd Fraser, Ralph Ingleton, Phyllis Hill, Chuck Hopkins, Brent Dysart, Jack Davis, Bill Andrews and Bob Henderson.

Alison Eagle

COEO's visitor from the U.K. has returned home after visiting Hamilton, Ottawa, Dorset, Shelburne, Waterloo, Alton (Peel Board of Ed.). Thanks for sharing your knowledge and your smiles.

Birth of the Great Lakes

The Great Lakes are natural wonders! There are five lakes: Superior, Michigan, Huron, Erie, and Ontario. They are connected by rivers. Water flows east from Lake Superior through the lakes. It flows down the St. Lawrence River and out to the sea. The whole trip covers 2,340 miles (3,767 kilometers)!

Together, the Great Lakes hold about 65 trillion gallons (250 trillion liters) of freshwater. If you spread that water over the United States, you'd be nine (2.7 meters) under water!

How were the Great Lakes formed? We must go back 600 million years to find out! The earth was still changing. Seas covered North America. As the earth shifted, the seas grew smaller. They left layers of rock behind. The layers formed basins (shallow areas). The basins covered the area where the Great Lakes lie today. Water began to flow through the basins. After a while, water erosion (EE-row-shun - carving) ahd cut a river around the land that forms Michigan's "mitten."

About one million years ago, glaciers (GLAY-shers) moved down across North America. Glaciers are large masses of ice and snow. The ice on the bottom of a glacier moves under the great weight. The glaciers moved south through the basins. They followed the river around Michigan. They carved deep valleys as they went. In some places, the rock was very hard. The glaciers couldn't cut through it. A lot of the shoreline of Lake Michigan and Lake Huron is made of this rock. The rock also forms the cliffs around Niagara Falls. About 6,000 years ago, the glaciers finally melted.

The water from the glaciers filled the basins and covered Michigan. But the water soon cut rivers between the lakes. The water began to flow to the sea. The level of the lakes began to drop. The water dropped a lot of sand in Lake Michigan. The sand washed up on shore. This formed the large dunes on the shore of Michigan When the water levels stopped dropping, the lakes were formed. They looked pretty much like they do today.

Of course, the Great Lakes never stop changing. Water, wind, ice, and people keep changing the shape of the lakes. It just happens very slowly. But if we are careful about how we use them, the Great Lakes will always be great!

From TRACKS, Volume 6, Issue 7, March 1984.

OUTDOOR EDUCATORS FOUND TO BE SHY, NOT ILLITERATE AS ORIGINALLY FEARED

The recent rumour that COEO members are illiterate and uninterested, is simply not true. Extensive research has shown that COEO members are simply shy, and are therefore reluctant to respond to ANEE articles, regardless of their outrageous content. Members' sensitivity to public exposure has prevented large numbers from submitting articles, lesson tips, jokes, and newsy information to their desperate ANEE editor. Well, the word is out! It's OK to get into print! After all, the pen is only mightier than the Love Canal if the nib is put to paper!

It's time for COEO members to rise up and write. You will have to adjust to the hordes of inspired readers following you about, eagerly waiting for you to outograph their copies of ANEE. But this loss of privacy should not deter you from contributing; most of our writers have adjusted well to receiving applications for the American Express Platinum Card, and some have even secured regular seats at Winston's.

The next issue of ANEE will address urban programs. Will you submit your ideas? Federal cutbacks this year will eliminate the Wye Marsh programs, and the monitoring of toxic chemicals in the Great Lakes. Will you react in writing?

We need your input. Write home soon.

Yours outdoors,

Skid Crease,
Vice-Chairman, COEO.

Imaginings

Imagine that a large bay on Lake Superior becomes badly polluted by runoff and sewage. Large lake fish begin to accumulate toxic chemicals in their flesh; algae becomes a problem; and the number of harmful bacteria increases. Describe how these changes would affect the following groups. Would dirty water cost them money? Why?

- An industry that requires clear, odor-free lake water for making fine papers
- A city that takes its drinking water directly from the lake
- Commercial fishermen who make their livelihood catching and selling large lake fish
- City people with summer cottages on the lake
- Resort and motel businesses that cater to sport fishermen and vacationers
- Business people who operate groceries, hardware stores, furniture stores, or sell real estate

SOURCE:

"Earthbeats: Great Lakes," Institute for Environmental Studies, UW-Madison, and the UW Sea Grant Institute, 1978, Madison, Wisconsin, p. 9.

M.O.E. Achievements and Future Directions in the Great Lakes Clean Up and Drinking Water Protection

M. O. E.

The Great Lakes are vital to the citizens of Ontario and are an important resource to all of Canada. More than six million Canadians live in the Great Lakes basin. Add this to the U.S. population in the basin, and there are nearly 37 million people dependent on this waterway as a major source of water supply, employment and recreation.

Recognizing their shared responsibility in the use and protection of the lakes, Canada and the United States created the International Joint Commission in 1909. Between 1912 and 1969, the IJC conducted several studies of Great Lakes pollution leading to the signing of the Great Lakes Water Quality Agreement of 1972. This marked the beginning of a major international clean-up of Lakes Erie and Ontario, the initiation of studies on pollution from land use activities and the introduction of new initiatives in toxic substances management.

Ontario has long been at the forefront in the assault on Great Lakes pollution and in the development and protection of drinking water supplies. Since 1972, the Ministry of the Environment and, for 15 years prior to that, the Ontario Water Resources Commission, have been instrumental in the funding, construction and operation of water and sewage treatment facilities, in the introduction and enforcement of environmental regulations, in the continued development and refinement of water quality objectives and in the assessment and resolution of water use conflict.

WATER QUALITY AND QUANTITY MANAGEMENT

The water quality management goal of the Ministry of the Environment is: "To ensure that the surface waters of the Province are of a quality which is satisfactory for aquatic life and recreation". The Provincial Water Quality Objectives (PWQO), a set of criteria designed to protect these uses, are published in the booklet "Water Management: Goals, Policies, Objectives and Implementation Procedures of the Ministry of the Environment". The Ministry achieves this goal through programs and actions provided for in the Ontario Water Resources Act, the Environmental Protection Act and other legislation. Ministry approval of wast discharges and of treatment works is required under these statutes.

On the water quantity side, the Ministry of the Environment goals are directed toward the fair sharing of the available supply to protect both withdrawal and in-place uses of surface water, and to ensure a fair sharing and conservation of ground water.

The permit to take water program, authorized under Ontario Water Resources Act, is the primary water quantity management tool employed by the Ministry of the Environment. All water users withdrawing or impounding over 50,000 litres on any one day of the year are required to obtain a Permit. There are currently approximately 6,000 Permits in force authorizing the withdrawal or impoundment of 14.4 billion litres per day.

The Provincial Water Quality Objectives ensure protection of other uses including potable water supplies. Drinking water quality is further protected through requirements for additional purification and disinfection of these supplies prior to delivery to the consumer.

CONTROLLING MUNICIPAL SEWAGE

PROGRAMS:

With the creation of the OWRC in 1956, Ontario launched a massive program to provide basic sewage services throughout the province. The program has continued under the direction of the Ministry of the Environment since 1972 and construction of new plants in Ontario is now virtually complete. Provision of these facilities has been instrumental in protecting the public from the outbreak of waterborne disease. Minor plant upgrading is ongoing and emphasis has switched to ensure existing plants meet Ministry effluent requirements through good operations and maintenance.

There are presently 308 sewage treatment plants in the Ontario portion of the Great Lakes Basin. With an approximate capacity of 5.2 million cubic metres per day these facilities serve 6.4 million people. This represents a 36% increase from the 4.7 million people serviced in 1970. Secondary treatment or better is now provided at 283 plants serving 88% of the total capacity. Total phosphorus inputs from Ontario plants have been reduced by 77% or 5400 tonnes since 1970. This constitutes a major step in the battle against the nutrient enrichment problem and resultant algal "blooms" which had plagued Lakes Erie and Ontario.

The total investment in the construction of municipal sewage collection and treatment facilities in Ontario has been in excess of $3.3 billion since 1968. Of this an estimated 80% or $2.7 billion was devoted to the Great Lakes Basin.

MUNICIPAL PHOSPHORUS LOADING REDUCTIONS

	1968	1983	Change
Population served	4.7 million	6.4 million	+36%
Phosphorus loan tonnes/yr.	7000	1600	-77%
Average effluent concentration mg/1	6	1.0	-83%

ENVIRONMENTAL IMPROVEMENTS:

Accomplishments over the past 15 years in upgrading sewage treatment facilities throughout the Great Lakes basin have resulted in significant environmental improvements. Recent investigations by the Ministry and other agencies show that:

- Shoreline bacterial levels adjacent to Ontario towns and cities around the Great Lakes are greatly reduced from levels observed in the 60's and in most cases comply with objectives.
- the median total phosphorus concentration in open waters of Lake Ontario has declined to 13.5% ug/L, the lowest reported in the last 13 years. Improvements are also reflected in nearshore areas such as Hamilton Harbour, Toronto Harbour and Bay of Quinte where phosphorus levels have declined by up to 50% over the same period.

- Improving conditions in Lake Ontario are also indicated by a shift toward healthier (less enriched) phytoplankton (algae) species composition.

- Measurable reductions in oxygen depletion problems have taken place in Toronto and Hamilton harbours and in the Bay of Quinte.

- Local water treatment plant efficiencies have improved because of reduced algal growth in the Bay of Quinte.

- Total phosphorus concentrations have declined 35% in western Lake Erie since 1974.

- Nuisance growths and shoreline accumulation of cladophora (algae) in eastern Lake Erie are down significantly.

- There is some evidence of a reduction in the severity of oxygen depletion in the deep portions of the central basin of Lake Erie.

- In Lake Huron and Georgian Bay, the total phosphorus concentrations (5 ug/L) have remained unchanged since 1971. Thus, the non-degradation objective of the 1978 Great Lakes Water Quality Agreement is being met. Phosphorus levels in some embayment areas of Georgian Bay remain higher than open water levels due to nearby municipal inputs and limited exchange with the open water. They have, however, been stable since 1973.

- In Lake Superior, the average total phosphorus level has stayed around 5 ug/L, providing a high level of protection against aesthetic deterioration and satisfying the non-degradation objective.

CONTROLLING INDUSTRIAL POLLUTION

PROGRAMS:

MOE initiatives have demonstrated that environmental improvement and industrial progress can be compatible. Significant reductions in waste discharges have occurred over the past fifteen years in spite of overall production increases by industry and recurring recessionary factors in the economy. This has been achieved through the construction of treatment facilities, through process changes and through replacement of older industrial production facilities with new "environmentally clean" plants incorporating the latest water re-cycling, material conservation and energy saving measures. Following are highlights of achievements made by three major industrial sectors from 1967 to 1981/82, at an estimated pollution control expenditure of $500 million. Similar overall progress and expenditures have been made in the other industrial sectors such as petrochemical, metal finishing and fabrication, and food processing.

PETROLEUM REFINERIES

Over the past 15 years, two new refineries have been constructed (start-up in 1977) incorporating state-of-the-art environmental controls, two older refineries have closed, and the other refineries have installed secondary (biological), and in some cases tertiary (carbon filtration) wastewater treatment systems. Together, these activities have resulted in large reductions in the discharges of oxygen demanding wastes, suspended solids, oil and grease, phenolics and ammonia even though production capacity has risen significantly over the period.

PETROLEUM REFINERIES

	1967	1981	Change
Number of Refineries	7	8	+ 1
Production 1000 bbls/day	403	633	+57%
Suspended solids kg/day	13,300	2170	-85%
Oil & grease kg/day	4,100	514	-88%
Ammonia - n kg/day	2,320	313	-87%
Phenolics kg/day	102	10.2	-90%

STEEL

There are 3 primary steel producers in Ontario, two in Hamilton and one at Sault St. Marie. Process improvements, better water management practices and waste treatment facilities have brought about significant reductions in the discharge of suspended solids, oil and grease, ammonia, phenolics and cyanide. The Ministry is requiring additional improvements to be made with programs at the Sault mill to be completed by 1990.

STEEL

	1967	1982	Change
Number of Mills	3	3	
Production tonnes/yr.	8 Million	10.7 Million	+34%
Suspended solids kg/day	126,000	35,000	-72%
Ammonia - n kg/day	23,880	8,280	-65%
Oil & grease kg/day	30,000	3,380	-89%
Phenolics kg/day	2,730	358	-87%
Cyanide kg/day	2,370	338	-86%

PULP AND PAPER

Substantial decreases in loadings of oxygen-demanding substances and suspended solids, along with reduced effluent toxicity to fish, have resulted from a combination of mill modernization, better water management practices, process changes and installation of waste treatment facilities. Existing MOE control orders require further improvements to achieve compliance with the Federal Pulp and Paper Effluent Regulations by 1987.

PULP AND PAPER

	1967	1982	Change
Number of Mills	22	22	
Production tonnes/day	7,350	8,540	+16%
BOD_5* tonnes/day	610	315	-48%
Suspended solids tonnes/day	375	82	-78%

*a measure of oxygen - demanding substances

ENVIRONMENTAL IMPROVEMENTS:

Achievements in reducing waste loads from these and other industrial sources along with controls on the manufacture and use of a number of chemical compounds in both Ontario and the Great Lakes States have resulted in corresponding improvements in the Great Lakes environment. Notable among the changes observed by the Ministry and others are:

- Declining levels of PCBs in sport fish from Lake Ontario, Lake Erie, Lake Huron, Georgian Bay and Lake Superior.

- Declining inputs of PCBs, mirex, DDT, chlorinated benzenes and mercury from the Niagara River to Lake Ontario since the mid 1970's as evidenced by sediment and fish data.

- Significant reductions in levels of phenolics, bacteria and phosphorus in the Niagara River.

- Improvements in species diversity and numbers of bottom dwelling organisms which are important to the fish community along the Ontario shoreline of both the St. Clair and Detroit Rivers as well as in the western basin of Lake Erie.

- Achievement of the water quality objective for phenolic substances and overall reduction in the zone of influence of petroleum refinery and petrochemical plant discharges on the St. Clair River.

- Elimination or reduction of aesthetic degradation, i.e. oil films, discoloration, and floating solids, adjacent to industrial plants.

- Reductions in mercury concentrations in fish to levels where commercial catches were resumed in the western basin of Lake Erie in 1975 and for certain species from Lake St. Clair in 1980.

- Declining phenol, cyanide and ammonia levels in the St. Marys River.

- Reductions in the zone of influence on water, sediment and biota of pulp mill discharges at all mill locations on Lake Superior.

DRINKING WATER SUPPLY AND PROTECTION

As a result of major program initiatives by the OWRC and MOE most of the population in the Ontario Great Lakes basin is now served by communal water treatment and supply systems. Extension of services to the few remaining serviceable communities is continuing. Emphasis has, therefore, shifted to the optimization of existing plant operations and the upgrading of sub-standard facilities.

All water supply systems in Ontario are required to have acceptable treatment processes which ensure that the potable water produced meets the intent and limits set out in the Ontario Drinking Water Objectives. For water works which utilize surface water as a source of raw water, the standard treatment processes consist of chemical coagulation-flocculation, filtration and disinfection. For water works which utilize ground water, the standard treatment consists of disinfection.

There are presently 428 water treatment plants in the basin with an approximate capacity of 9.1 million cubic metres per day, sufficient to serve a population of 7.4 million people. Eighty-eight percent of the population obtain their drinking water from surface water supplies. Total investment in the construction of municipal water treatment and distribution facilities in Ontario has been in excess of $1.5 billion since 1968. Of this, an estimated 80% or $1.2 billion was directed to Great Lakes basin communities.

Beyond these statistics, the real benefits of the provincial water supply and treatment initiatives have been maximum public protection from the transmission of waterborne disease and the assured availability of a high quality supply to meet all household and community needs.

FUTURE DIRECTIONS

The large scale programs of the 60's and 70's for basic water and sewage service to serviceable communities in Ontario are now virtually complete. Substantial progress has also been made in reducing conventional pollutant loadings to the Great Lakes from industry. While these major activities are winding down, heightened public awareness and concern about potentially hazardous contaminants in the Great Lakes and elsewhere must be addressed through program redirection. Ministry of the Environment policy and program directions have, therefore, increasingly been focussed on the "contaminants issue". Initiatives are being taken both to further reduce contaminant emissions, and to enhance the protection of drinking water. At the same time maintenance of high levels of control at existing water and waste treatment facilities is being encouraged.

CONTROLLING THE DISCHARGE OF CONTAMINANTS

Efforts are now being directed at ensuring that performance of existing facilities is maintained at a high level, and that avenues for further reducing the discharge of identified hazardous contaminants are explored and the necessary control measures taken.

New Ministry initiatives include:

- Intensified characterization of industrial effluents including the use of biomonitoring techniques to identify hazardous contaminants

- Enforcement of a strict manifest system to ensure the safe transport and disposal of hazardous wastes at approved facilities

- Promotion of industrial plant modernization, better water management practices, substitution of process chemicals and treatment systems to further restrict contaminant inputs

- Assistance to municipalities in finding cost-effective solutions in the area of combined sewer overflows, stormwater management and the control of industrial inputs to municipal systems.

- Continued research into improving treatment process efficiencies along with provision of technical support and training programs for treatment plant operators.

- Streamlining monitoring programs to speed the assessment of compliance with effluent requirements.

- Further controls on phosphorus inputs to the lower lakes as required under the new provision of the Great Lakes Water Quality Agreement.

PROTECTING DRINKING WATER QUALITY

The Ministry is currently updating its policy on treatment requirements for waterworks to conform with the revised Ontario Drinking Water Objectives. Implementation of these policies may mean retrofitting of water works at some locations in the Province to meet the new requirements. Other initiatives include:

- Participation on the Federal/Provincial Working Group on Drinking Water Quality to revise and add to the "Guildelines for Drinking Water Quality - 1978".

- Addition of new substances to the interim priority list of Hazardous Contaminants in Drinking Water which is used, along with the Ontario Drinking Water Objectives, to evaluate acceptability of water supplies.

- Continuing evaluation of improved treatment technology and the effects of this technology on contaminant removal and treatment product formation. Research is continuing in such areas as:
  a) The use of ozonation and other chemicals as alternative disinfectants to chlorine;
  b) Procedures to optimize conventional water treatment processes for the highest removal of trace organics;
  c) The use of granular activated carbon filtration as an add-on system (a pilot GAC facility has recently been installed at the Niagara Falls Waterworks).

- Expansion and updating of contaminant monitoring programs on drinking water. In 1984/85 thirty-five municipal waterworks (serving 70% of the Ontario population on municipal systems) will be examined, with monitoring for up to 110 parameters in the raw, treated and distributed water. This monitoring program will be continued and extended to other waterworks in future years and will incorporate new parameters as they emerge.

- Continued development of the best laboratory analytical methods for the quick and accurate determination of trace organics in drinking water. The Ministry's laboratory is widely recognized as a world class facility and leader in this area.

- Establishing protocols for the evaluation of alternate water treatment chemicals, coatings, linings and plastic pipes for use in contact with potable water.

CONSLUSION

Ontario is committed to the protection of the Great Lakes resource to meet the many and varied needs of its population. Progress is being made in reversing the degradation of these waters which had occurred through the middle of this century. While much remains to be done to safeguard the lakes for future generations, the Ministry of the Environment intends to meet this challenge.

Personal Philosophy of Outdoor Education

Outdoor Education is the development of a conservation ethic. People find peace, solitude, and wonder in the infinitism of the natural world.

The most important factor of Outdoor Education is people. To learn, people must feel comfortable and that is our responsibility. Learning in a fun, activity-oriented way, people forget their fears of the natural worlds.

Outdoor Education is especially important in our increasingly urban society. Growing up without wild places, people have an increasing apathy toward our connection with the natural community. Aldo Leopold says it well: "That land as a community is the basic concept of ecology, but that land is to be loved and respected as an extension of ethic". Henry Thoreau says, "In wildness is the preservation of the world".

People need time to explore and to find for themselves the beauty and importance of the natural world. For this reason Outdoor Education programs need to facilitate individual findings, learning and sharing rather than the traditional lead, show and identify approach.

Conservation is the care and protection of our natural resources. We all need to be responsible conservationists. The Chippewa Indians had a good understanding of conservation with their "Spirit of the Maise" legend. They knew that if they were wasteful, greedy or arrogant with their corn crops, then for one year they would have no crops and be unable to find any animals to hunt.

We too must understand that our life support systems are a fragile web of interdependence. Only through education of children and adults can we hope to pass on these ethics of environmental awareness.

"In wisdom thou hast made them all: the earth is full of thy riches." Psalm 104 vs. 24.

- Steve Sauder

You Know You Have Been Teaching Too Long When ...

While riding on the TTC you announce as you get off that "the left side was better behaved than the right side."

The new vice-principal says, "Hi, you taught me in Grade 3."

When the bank cashier points out that you printed your signature.

You tell your bridge partner to sit up straight.

The bank leader asks for requests from the audience and you yell out something by Sharon, Lois and Bram.

You tell your dinner guests to put their hands on their heads when they are ready for dessert.

Before dinner company comes, you sharpen all the pencils in the house and cut the serviettes in half.

You print the invitations to your daughter's wedding.

You don't begin speaking at a party until everyone is quiet.

People begin to finish your sentences for you because you can't think of a small enough word to use that everyone will understand.

You plan your March break around the report cards that you need to write.

You ask the people beside you at a movie theatre some questions about the movie to make sure they're watching.

Anytime you hear ex-student names like Jason, Jonathan or Jennifer, your blood pressure begins to rise.

Someone asks you the name of the person you admire most and you name a character from Winnie-the-Pooh.

One of your students mistakenly calls you Grandma, instead of Mommy.

While reading the latest novel, you make a list of good questions to ask.

The ditto ink on your fingers doesn't come off anymore.

- Joseph Paul

Mr. Paul is a teacher at Baycrest Public School in North York.

Spring '84 OPSMTF News

A Visual Model Of Pollution in the Great Lakes

Jack Vallentyne C.C.I.W.

One of the difficulties in outdoor education lies in trying to encapsulate long-term phenomena into a single outdoor experience. Frankly, except for feelings, it can't be done. Long-term knowledge has to come from the teaching place.

I was first confronted with this problem as a professor in charge of a limnology course. The difficulty was that the most interesting changes in Lakes take place in spring, summer and early autumn - when students are either ill-prepared in background or not around.

The solution was to bring the lake into the laboratory. I did this by creating a model that could be assembled from readily available parts. It consisted of an aquarium (corresponding to a lake basin), water (the lake), an infrared light (the sun), a fan (wind), a thermometer to follow temperature changes, and dyes to observe water currents and seiches. Annual patterns of thermal stratification and circulation could be set up and dismantled in less than an hour. With this as visual background a single trip to a lake became a meaningful experience. A detailed account of the model was published in 1967 (Journal of the Fisheries Research Board of Canada, Vol. 24: 2473-2479).

Here I describe another simple model used to illustrate the long water replenishment times of lakes as compared to rivers. The water replenishment time in years of a water body is its volume divided by mean annual rate of outflow. An even more meaningful index in terms of today's problems is the 95 percent removal time for a "conservative" pollutant. (Conservative in this sense means a pollutant that behaves like a water molecule; in other words, one that is not biologically accumulated, or removed by decomposition, sedimentation or evaporation to any greater or lesser extent that water.) The 95 percent removal times for lakes can readily be calculated by multiplying water replenishment times by three (see R. H. Raney (1967), Science 155: 1242-1243.).

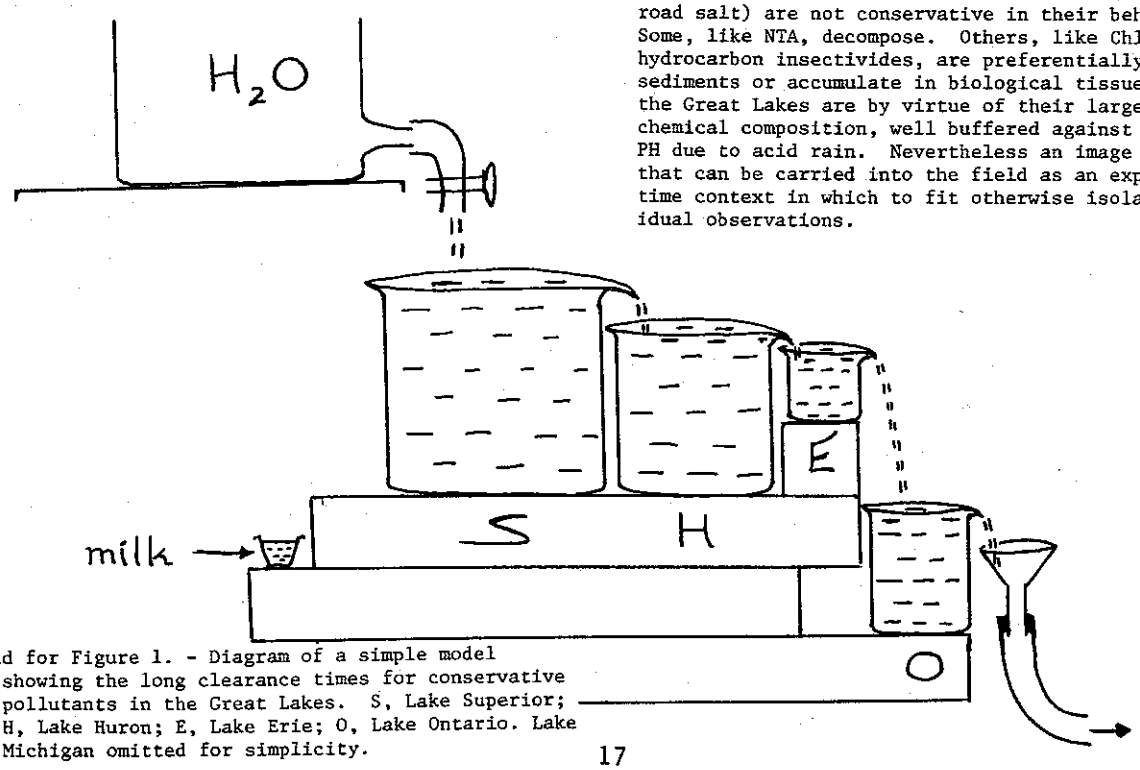
The 95 percent removal times for the Great Lakes vary with volume and outflow of the water body. Estimates for Lake Superior, the largest in volume of all the Great Lakes, are in the range of 500-600 years. Lake Michigan is next: 300-350 years. Then comes Lake Huron (60-70 years), followed by Lake Ontario (25-30 years) and finally Lake Erie (7-10 years), smallest in volume of all the Great Lakes.

A simple model to illustrate the long 95 percent removal time of the Great Lakes is shown in Figure 1. It consists of four beakers with volumes roughly proportional to those of Lakes Superior, Huron, Erie and Ontario. For simplicity in construction, Lake Michigan was omitted, and the inflow only delivered to Lake Superior. The water bottle above provides a gravity-controlled reservoir, equivalent to about three times the volume of the uppermost beaker ("Lake Superior"). The drop in height from Lake Erie to Lake Ontario, mimics Niagara Falls. The outflow to a bucket corresponds to the St. Lawrence River. To avoid spills the lips of the beakers were slightly extended by melting the glass.

To start the experiment the beakers are first filled with water. A screw-type pinch-cock on a rubber tube from the reservoir is opened, starting the flow of water into Lake Superior. At this point a conservative pollutant in the form of a few milliliters of milk is introduced into the flow of water into Lake Superior. The water of Lake Superior immediately becomes turbid, carrying over with continued flow into the lakes below. At the end of the experiment, when three volumes of water have been added to the beaker representing Lake Superior 500-600 years will have passed - yet the waters are still turbid, showing that some of the pollutant remains. In contrast to the lakes, the stream from the reservoir cleared itself instantly. (Rivers typically have 95 percent clearance times ranging from a few days to a few months, depending on length and time of year.)

The experiment lends itself well to TV, as was demonstrated on the Schulman File in 1978. Add a dash of acid rain from a spray bottle and you have a nicely encapsulated image of problems in the Great Lakes basin.

As a qualification, it should be pointed out that most pollutants other than chloride ions (e.g., from road salt) are not conservative in their behavior. Some, like NTA, decompose. Others, like Chlorinated hydrocarbon insectivides, are preferentially carried to sediments or accumulate in biological tissues. Also, the Great Lakes are by virtue of their large volume and chemical composition, well buffered against changes in PH due to acid rain. Nevertheless an image is created that can be carried into the field as an expanded space-time context in which to fit otherwise isolated, indidual observations.



Legend for Figure 1. - Diagram of a simple model showing the long clearance times for conservative pollutants in the Great Lakes. S, Lake Superior; H, Lake Huron; E, Lake Erie; O, Lake Ontario. Lake Michigan omitted for simplicity.

Wildlife centres facing axe

MIDLAND (CP) — Public awareness of environmental problems will suffer as a result of a $3.8 million cut in the budget of the Canadian Wildlife Service, says a government biologist.

Bob Whittam, who is among 84 employees — mostly biologists — who will be out of jobs next spring because of spending cuts announced by the federal government last week, said no reason has been given for the elimination of many programs, including the funding of five wildlife centres throughout the country.

"As far as I know, we are gone April 1 and we don't know how or why," said Whittam, chief biologist at the nearby Wye Marsh Wildlife Centre.

A member of the Federation of Ontario Naturalists also said he is concerned Environment Canada budget cuts are being made by "random hacking."

Arlin Hackman, an environmentalist with the citizens' group, said public interest groups should have been consulted before the government decided to drop a program which monitors the level of toxic chemicals in the Great Lakes waters through tests on herring gull eggs.

The decade-old program was instrumental in bringing to light the presence of dioxins and many other chemicals in Lake Ontario.

Whittam said this year more than 40,000 visited the Wye Marsh centre, which conducts tours and lectures in hundreds of hectares of marshland adjacent to Ste-Marie-Among-The-Hurons and the Martyrs' Shrine.

"It was the first of a chain of centres that were designed to give awareness of the environment to the public at large," he said.

Centres in Perce and Cap Tourment, Que., Webb, Sask., and Creston, B.C. are also scheduled to close in March, eliminating 32 full-time and dozens of summer jobs.

Steve Curtis, director of the wildlife service, said he was shocked and upset over the cuts and is "reasonably sure" neither the provinces nor private groups would be interested in taking over the centres.

OWEN SOUND SUN TIMES
NOVEMBER 12, 1984

Toxic chemical program killed

THANKS TO CLARKE BIRCHARD FOR BRINGING THIS TO OUR ATTENTION

By MICHAEL KEATING

Under budget cuts in the Environment Department, Canada will lose the program that detected toxic chemicals such as dioxin and mirex in the Great Lakes.

The 14-year-old project has tracked the toxic chemicals in herring gulls around the lakes as a means of spotting threats to humans who use the same water and eat fish from the lakes.

In an interview last night, D. V. Weseloh, chief wildlife biologist at the Canada Centre for Inland Waters in Burlington, Ont., said the project is to be killed at the end of March. A dozen people will lose their jobs.

In addition, he said, Canadians will lose a monitoring system that has tracked 20 toxic chemicals in the environment to see if they are increasing or if anti-pollution programs are bringing them under control.

The program is run by the Canadian Wildlife Service of the federal Environment Department. The service is hard-hit by the budget cuts introduced by the federal Government. The service is getting a $3.8-million budget chop and will lose about 70 of its 375 employees.

In addition to the chemical-monitoring programs, the Wildlife Service will lose the half-dozen centres across the country that offer public access to resource material on Canadian wildlife.

Mr. Weseloh said that, while Government spokesmen say that many jobs will be lost to attrition, the people he knows, including himself, will be fired.

Environment Canada will have its $742-million budget cut by 4.5 per cent — $33.6-million — and will lose 416 of its 10,000 employees.

The biggest cut in the department is in the National Parks Service, which will lose $19.5-million from its 1985-86 budget.

The service is also being required to raise $9.2-million by increasing fees in Canada's national parks.

Globe and Mail, 10 November 1984

Blind-eye budgeting

WHEN i) ENVIRONMENTAL EDUCATION
ii) RESEARCH
iii) MONITORING OF TOXIC CHEMICALS
ARE CHOPPED BY THE HIGHEST GOVERNMENT IN THE LAND
C.O.E.O MUST PROTEST

WE WILL PROTEST

There is no painless method for a government to chop back a $34.5-billion deficit; wherever the axe falls there will be anguished cries, indignant protests and, in some cases, real discomfort. Solace will come only from knowledge that the burden was intelligently spread and the loss of service something we could live with.

This will not be easy in the case of the Environment Department budget trims by which we will lose the program to detect toxic chemicals such as dioxin and mirex in the Great Lakes. Even with the program in place, a great many Canadian citizens felt vulnerable. With its removal — apparently to save $3.8-million — the dread can only deepen. Is the proposal based on the theory that what we don't know can't hurt us?

Globe and Mail, 12 November 1984

A Group of us Are Concerned -- Are You????????

The Canadian Wildlife Service (CWS), the federal agency responsible for administering, investigating and regulating wildlife in Canada, has been hit hard by budget cuts announced recently by the government. The facts of the cuts are as follows:

- The Wildlife Research and Interpretation Division of CWS, across Canada, has been eliminated (effective 1 April, 1985). Programs are to be cut and staff laid off in all regions: Atlantic, Quebec, Ontario, Western and Northern, Pacific and Yukon and Headquarters (Ottawa and Hull).

= CWS has been cut by approximately 22%. Eighty-four of its 375 staff positions have been eliminated. Seventy of these positions (83%) will be lost by firings and 14 (17%) will be lost through attrition.

In Ontario, the CWS programs that will be cut are as follows:

- Surveillance of Toxic Chemicals in Wildlife in the Great Lakes: This program, which began in 1974, has been responsible for monitoring levels of approximately 20 different toxic chemicals in wildlife, primarily Herring Gulls and other fish-eating birds, on the Great Lakes. It is also responsible for searching for new and previously unknown contaminants in the Great Lakes and for determining biological effects of contaminants upon wildlife. It was under these mandates that mirex and dioxin were discovered in Herring Gull eggs. The program is the oldest and most continuous of any of the toxic chemical surveillance programs on the Great Lakes.

- The Wye Marsh Wildlife Interpretation Centre at Midland, Ontario: This centre, which had over 40,000 visitors in 1984, is an integral part of the interpretation process. It teaches children and adults alike the importance of wetlands, the value of wildlife and how the natural process works.

- The effects of Timber Harvesting on Boreal Mammals: This project examines the broad scale impact of timber harvesting on boreal ecosystems and how these practices affect mammal populations. The project contributes significantly to the management plan for moose, caribou and fur-bearers in Pukaskwa National Park.

If you are concerned about these cuts, as well as the programs and jobs that will be eliminated, please write to:

- your Member of Parliament
- Dr. Suzanne Blais-Grenier, Minister of the Environment
- Mr. Brian Mulroney, Prime Minister of Canada
- Mr. Charles Caccia, Opposition Party Environment Critic

c/o House of Commons, Ottawa K1A 0A6 (no stamp necessary).

New Water Atlas Will Inform Ontarians About Their Water Resources

Ever wonder how many lakes there are in Ontario? Or how much of the province is covered with water? Or how much water it takes to make a tonne of steel?

Well, the answers to these and many other questions about Ontario's water resources can be found in a new 72-page book called Water Quantity Resources of Ontario, released by the Ontario Ministry of Natural Resources.

This is the first comprehensive look at the quantity of Ontario's water resources. With numerous color maps and diagrams, it examines the supply of surface and ground water in the province, as well as the many uses of water across Ontario.

"This document is designed to increase Ontario residents' understanding of the importance of our water resources," Ontario Natural Resources Minister Alan Pope said. "This is important at this time, with the anticipated increases in demand for water both within the province and particularly in the Great Lakes basin.

"Water Quantity Resources of Ontario will also be a useful planning document for resource-based industries, municipalities, engineers and planners. Without question, it will assist all of us in making the decisions that will ensure the wise use of our water resources for years to come," he said.

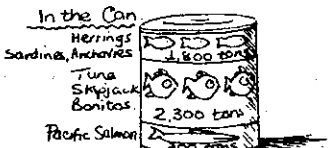
By the way, Ontario has about 228,000 lakes. About 470,000 square kilometres -- or about 17 per cent of Ontario -- is water. And it takes 250,000 litres of water to make one tonne of steel.

Water Quantity Resources of Ontario costs $24.95 and is available from the Ontario government book store at 880 Bay Street, Toronto. Telephone: (416) 965-2054. You can also get a copy by sending a cheque or money order, payable to the Treasurer of Ontario, for $24.95 to:

Publications centre
880 Bay Street, 5th Floor
Toronto, Ontario
M7A 1N8

Allow about two weeks for delivery.

From Ministry of Natural Resources,
Resources Report - June, 1984.



What's the catch ?

A fish half the weight of a sardine - that's what the world's daily fishing catch would amount to if divided equally among the entire population. Only 75% of the world's daily catch of 200,000 tons is eaten by people. The rest is used as fishmeal for livestock feeding. Peru, for instance, converts more than 90% of its haul into fishmeal.

Though the sea supplies only 2% of the world's daily food energy, it is an important source of protein, accounting for about 15% of the world total.

The Japanese are the world's biggest fish-eaters, consuming 90g a day per person, compared to 60g of meat. Americans, on the other hand, consume only 20g of fish per day.

Far from being a limitless source of food, the oceans have a strictly limited output. The total production of fish of the world's oceans and estuaries is estimated to be no more than 660, 000 tons per day. Ecologists believe that the maximum harvest available from the seas is about 250,000 tons per day, which is only 25% above current yields.

What's The Magic

James Raffan

While it's probably beneficial to play on the success of the old bag in the hamburger commercial and ask, "Where's the magic?" to sell next year's conference, it may be more appropriate at this point to ask, "What's the magic?" We all know that outdoor education has lots of educational plusses for kids, but it's time we articulated just what it is that is so wonderful about taking students outside.

For years, outdoor education has had to take a back seat in the educational journey because traditional educators have tended to despise the activities associated with it. For them, outdoor education is just some glorified kind of romp in the woods that, at the best of times, is of little educational substance. Unfortunately, outdoor educators have tended to get defensive in the face of such criticism and this posture only seems to bolster the skeptics' arguments.

In the United States the term "experimental education" encompasses just about everything Canadians call outdoor education and more. To our colleagues south of the border, experimental education (now EE) is an enterprise that includes just about every traditional and non-traditional incarnation of learning that solicits active student involvement. It's no big deal that the Yanks call outdoor education EE; the important point of departure is that those associated with experimental education have taken the time to put into words what it is about EE that is so attractive. One writer borrowed the words of Carl Rogers and came up with a definition of EE that I particularly liked; he said, "EE is self-initiated, pervasive, evaluated by the learner, and it's essence is meaning." I have a suspicion that in these few words is the "magic" of outdoor education.

Let's examine an imaginary day with a grade 8 class at an outdoor education centre where having arrived by bus in the morning, students are introduced to a teacher from the centre. It will be important, she tells them, that they be able to work together to allow them to make the most of their one-day visit. So she gets everyone to stand on a long plank in random order and to sort themselves into a line from tallest to shortest, without talking. Through subsequent tasks the students begin to show that they're feeling pretty good about what they're doing. They realize that they can trust each other, that they can be successful with difficult tasks and that the teacher in this new setting has given them a new sense of power that many of them had never before felt in the context of "school".

Later, moving into a contour mapping exercise, the teacher points out that the activity will familiarize them with the map that they'd be using to get to the pond in the afternoon. With that they review some points about coutour maps and move to the top of a hill behind the centre with measuring devices and paper to record the distance between one metre drops down the hill. Sketching the data collected by several groups, students draw contours on big sheets of graph paper and see that in fact, the contours on the topographic map have real meaning, they have real links to the land. For some, this is the best geography lesson ever.

After lunch the class follows the map to the pond. Standing at the edge of the water the group reviews how everything in the pond is related to everything else. In moments the entire class is hunched over, knee-deep in the pond, spellbound by the water critters. Later, when students have collections of animals captive in basins on the shore, the teacher asks questions that help students begin to make sense of what they've caught. No names, just queries about size, colour, movement and function. Through careful questioning, the students begin to see that the pond is full of organisms that seem to depend on each other for one think or another. Most of these kids have played in a pond before, but it's the teacher that makes this pond experience educational.

This fincitious class was exposed to EE, an approach to learning and teaching that put "magic" in the day. But where was the "magic" in lining up on a board, running up and down some hill, or grubbing around in muddy water for half a day?

For one think, the learning was done in the same environment in which kids live and function outside the school context; in this sense, what was being learned was relevent. More importantly, unlike typical schooling, which at it's worst was captured by Alfred Adler as "the process of transferring the notes of one teacher to the notebook of the pupil without passing through the head of either", students were actively involved in learning that was directly applicable to their non-school world. They had been exposed to three concrete experiences and they'd been helped to explore the consequences of these in a relevent context, and this, thinking bank to Carl Roger's definition of EE, made the day special.

The learning required personal involvement. The students were encouraged to investigate the consequences of co-operation, to interact with topography and to explore their environment by catching critters in a kitchen seive.

The learning was self-initiated meaning, that onus was put onto the students to interpret the experiences for themselves. For example, what students caught and examined in the pond study was a personal decision. Secondly, in the lineup task one student might be learning about balance, the next about communication, while the next might be concentrating on co-operation.

The learning was pervasive in that instead of being asked to file the information about contouring in the "geography" part of the brain, by working in the real world, students were implicitly asked to relate the exervise to their whole world. The contouring exercise had a purpose in making the map better known to them, but the exercise also gave them reason to trust the map as a took they would use again.

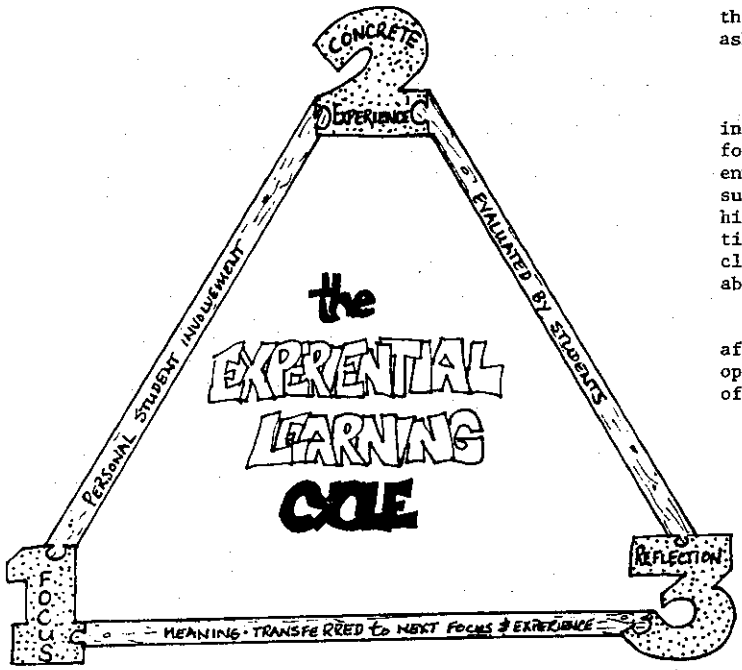
And the nature centre learning was evaluated by the students. By this I mean that students were expected to draw their own conclusions from the various experiences. The nature centre teacher was not interested in handing out "right" answers. It was important that students made sense of the outdoor activities in individual ways. There were clear teacher objectives in each activity, but there was also plenty of room for individual interpretation.

And finally, the learning resulted in meaning, because instead of learning about various subjects in some kind of isolated environment apart from the real world where most of their living and learning is done, students learned in a familiar environment where they saw the purpose in what they were doing.

The common thread that binds these three activities is the experimental education process, or cycle, which involves three essential aspects (see figure 1): a focus of student attention to prepare them for some concrete experience; the concrete experience itself; and finally, the EE cycle involves dome kind of reflection which, through the teacher, allows students to integrate what they've done into their world - to see how it fits now and to see the potential the experience offers, to help them cope with subsequent experiences. I suspect that it is this three part EE cycle that makes learning "self-initiated, pervasive, student-evaluated and meaningful" as one EE practitioner put it; the cycle brings what some might call "magic" to outdoor activities.

In fact, there is really nothing magical about it at all. Plain and simple, the EE cycle gives kids a chance to see relevence in what they're learning. Outdoor educators might dress up as magicians and probably should have special incantations and engenious teaching tricks, but there is no hokus-pokus in the substance of effective outdoor lessons. I'd argue that every practitioner who performs well is merely working within the context of as imminently un-magical educational formula called the experimental learning cycle.

Coming to terms with the magic in outdoor education can only help outdoor educators explain their point of view to doubtful colleagues. Better still, by looking at the experimental cycle, we begin to make links between cultural journalism, work experience, pond studies, contouring, co-operative games, language immersion, internships and adventure activities, links that allow us to explore the power of EE further. In the final analysis, outdoor educators have lots to throw at the doubting pundits of traditional teaching ways - including a way of teaching that can be used just as easily inside the school.



Magic Moments

If you were childlike enough to throw away your inhibitions, squint your eyes, and let your imagination flow, the woodlot form a distance looked like a "ball of fire". It was one of those hazy, warm, Indian summer days when no matter what your mood had been it was soon dominated by the prevailing, calm, reflective mood caused by the weather. On this day I was leading a group of grade four students through the meadow to the woodlot, and as we approached the edge of the woodlot I asked them to form a line, hand in hand, close their eyes (and mouths), and trust me.

I lead them to the centre of a long wooden bridge suspended over a clear bubbling creek, which was just inside the 'ball of fire'. Before they opened their eyes, I asked them to pause for a moment to listen to the sounds of the forest. Later when I asked them how many they heard, the typical response was 5 or 6 different "noises", 'an airplane, a blue jay, leaves falling, kids talking, coats rustling'. One answer however surprised me - 19 sounds! Naturally, I proceeded to question the validity of this child's response. He answered "listen to the water, it makes differnt sounds when it goes over the rocks, I can hear 5 different sounds just in the water".

So again we paused to listen. Soon the typical 5-6 initial 'noises' began to multiply as we strained our ears to listen to the different pitches, and tones of the running water.

Submitted by Brenda Steffler

"Do you remember me?" Big brown eyes pleading intently for special recognition.

"Of course I do." Well I did - but I couldn't recall the time or place. "What are you doing here again?" I asked groping for the key to unlock my memory bank.

"I'm with my regular class today". That was the key.

Throughout the day,I think I unconsciouly took special interest in this child as an act of reconciliation for forgetting his name. I watched him interact with his environment, and was astonished to learn from one of his supervisors that "Kevin was doing well if he could remember his phone number." Kevin was as a rolling snowball continuely gathering substance and growing. His regular classroom peers were astonished by his wealth of knowledge about the outdoors. I was dazzled.

My dedication to outdoor education was renewed. One afternoon visit to a field centre provided Kevin with an opportunity to gain confidence in himself,and the respect of his peers.

Conservation Council Of Ontario

Conservation - The Better Way

In the Spring issue of MNR's Landmarks, there is an article by free lance writer Ron Truman called "The Making of a Marsh". In true naturalist style he starts out: "The loss of wetlands has been one effect of progress in Ontario. The southern part of the province once had nearly 3 million hectares of bogs, fens, swamps, marshes and shallow open waters. Now, some estimates put the remaining wetlands at less than half a million hectares.

It's a lamentable loss. Wetlands help control floods by holding some of the spring runoff and releasing it slowly through the year. This helps reduce flood damage and provides continuing flows of water in dry months. Moreover, they are important recreation areas, favorite places of naturalists, hunters and fishermen.

Most important, though, wetlands are the nurseries and homes of a great variety of wildlife. And, while people can live with the loss of wetlands through environmental manipulation, wildlife cannot. As the habitat disappears, fish, birds and mammals diminish in numbers."

The article continues to document the commendable efforts of the Ministry and Ducks Unlimited (Canada) in designing and constructing a new 800 hectare wetland area near Clinton - Hullet Marsh.

Without wanting to dull the Ministry's enthusiasm for participating in such projects, it should be pointed out that this project was undertaken only after an euqally fine wetlands area wouth of Goderich, some 50 km away, was drained for farmland. The cost of acquiring farmland for the new Wildlife Management Area was approximately $825,000 for 2,100 hectares. Ducks Unlimited put up $1.5 million of privately raised funds to cover the cost of constructing dikes and enhancing the land's existing wetland areas.

Compare this strategy with the Nature Conservancy of Canada's program of land acquisition. Over the past 20 years, with $5.9 million in private funds, they have preserved 39,000 acres (approximately 15,800 hectares) of environmentally significant land across Canada. Here again the Ministry of Natural Resources has played a significant role in providing supplemental grants for the purchasing of land in Southern Ontario. The per-nectare cost of acquiring the land is comparable for both strategies. The obvious difference lies in the cost of enhancement.

There are, obviously, differences between the specific objectives of the two organizations, but in terms of a long-term strategy it would seem to make more economic sense to purchase and preserve existing wetland areas than to place the emphasis on building new wildlife areas. If it remains a more viable proposition to fundraise for the design and construction of a high profile Canada's Wonderland for waterfowl, then it's an indication that the spirit of conservation has yet to make a significant impact on our society.

From Conservation Council of Ontario
Volume 11, No. 6., April 1984

Amazing Algae

Have you ever seen a green slime on a pond or fish tank? You probably though, "Yuck"! Believe it or not, that slime is really made of wonder plants! They are called algae (AL-gee).

Algae are simple plants. Most of them have only one kind of cell. Most algae have no roots, stems, or leaves. They may look like they do, but they are just shaped that way.

Algae are plants because they make their own food. They do this through photosynthesis(FOH-toh-SIN-the-sis). Most algae are green. But algae can be red, brown, blue, pink, yellow, or black.

Algae are the oldest known plants on earth. They were growing over three billion years ago! Algae can live almost anywhere. They live in ice in Antarctica. They live in deserts and boiling springs. Most algae live in wet places. But algae can also survive for years without water!

Algae grow best in warm water with little oxygen. So they often grow in shallow ponds or polluted water. Because of this, some people think algae are a problem. But algae may be the answer to many of our problems!

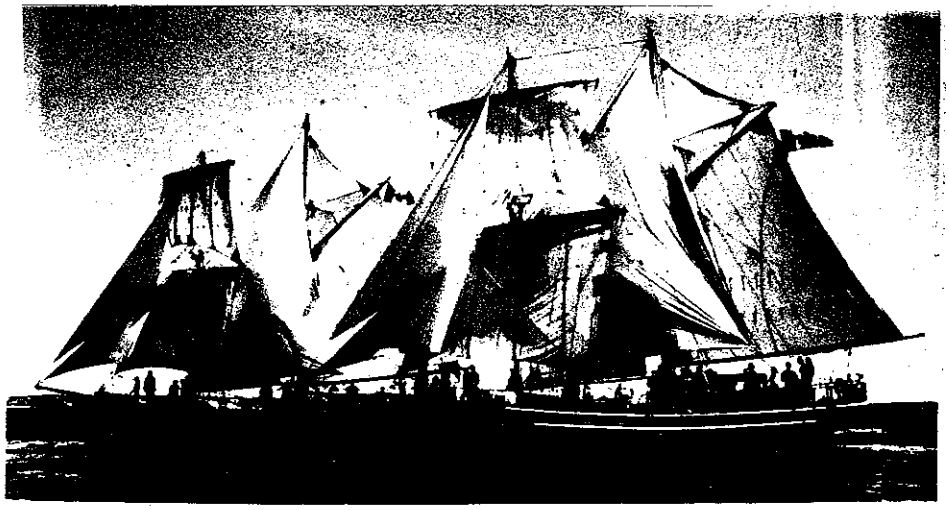
Someday, astronauts may use algae to produce oxygen on long space trips. Humans and animals breathe oxygen. They exhale (breathe out) carbon dioxide. Plants take in carbon dioxide. They give off oxygen. Large tanks of algae would use the carbon dioxide exhaled by the astronauts. Then the algae would produce oxygen for the astronauts to breathe. The algae could grow on and decompose the astronauts' body wastes. The algae could also be used for food!

Algae are used for food in many parts of the world. Algae contain lots of protein, vitamins, and minerals. They are also easy to raise. In fact, algae can be grown on sewage, chemicals, and oil sludge. At the same time, the algae can clean up pollution from these wastes! Algae are also used for fertilizer. Some dyes, perfume, and medicines are made with algae. Now scientists are studying how algae can produce fuel.

You may have already eaten algae. Algae are used to make ice cream and pudding smooth. Or you may have eaten seaweed, which is a type of algae. Algae can also be made into bread or flour. Someday algae may feed the starving people of the world!

The Great Lakes Brigantines

Bruce Macdonald



When you look at an old picture of a Great Lakes harbour, you are immediately struck by the number of sailing ships plying their trade. Weather-beaten timbers and masts towering over the water draws one back into an age where a life at sea was a challenging career. Their aesthetic qualities are readily evident and it is often hard to think that these were working ships.

The skills required to handle a square-rigger have all but been forgotten. Their rigging, portholes and anchors are now filed away in museums, basements and bars. The average sailor today -- an expert aboard his fiberglass racing yacht -- could be lost on an old windjammer. Yet the mystique of the vessels remains. They are our maritime heritage, and though they are rarely in evidence anymore, they cannot be replaced.

Allan Villiers wrote of them in his introduction to The Best of Sail:

> "So the square-rigged ship survives, evolved from the swift clippers and the great Horn-fighters of earlier years...and the interest of red-blooded men in them not only continues but is increasing. It is no mere nostalgia that stops grown men in their stride to admire some painting of a great square-rigged ship blending so perfectly in her natural environment...in any good sailing conditions the ship herself is an eyestopper."

The brigantines Pathfinder and Playfair from Toronto and the St. Lawrence II from Kingston are the only vessels on the Great Lakes which offer an authentic 19th century experience in sail. All three brigantines are run by non-profit organisations to promote leadership and sail-training for youth through adventure.

The ships are seventy-two feet overall and their masts tower fifty-five feet off the deck. They are very similar in size, design and rig to the war vessels Hamilton and Scourge of the 1800's, which now lie off Port Dalhousie. Their rig was a very common one on the Great Lakes at this time. They were used mainly for commerce, carrying passengers and bulk cargos such as iron ore, grain, coal and lumber. They were smaller than the ocean-going square-riggers due to the low water at the entrance to many of the ports.

The square-rigged design was chosen for the sail-training organisations due to the extreme demands and responsibility placed on the crew, as well as the chance to experience life aboard a windjammer. The vessels are manned by teenagers between the ages of thirteen and eighteen from the first mate on down. Those who have shown an interest in learning more about the program are chosen as permanent staff and given one of six officers positions. They are put in charge of training, navigating and providing a good role model to the new seamen. In return, they spend their summers sailing aboard the brigantines, visiting many of the ports on the Great Lakes and experiencing an important life-skills program. The old adage of sending Billy off to sea to become a man is revived onboard the vessels.

The ships, traditional in design, are also traditionally run. The orders from the quarterdeck are the same as they were one hundred years ago. This has proven to be the most efficient system, and so it has never been changed. Perhaps the only major changes are: the increased safety standards; the number of crew aboard; and the acceptance of young women into the program. The usual ship's complement totals twenty-nine, including the Captain, six officers and three petty officers. In the 1800's the same size cargo vessel would have been run by six to eight men.

As the seamen live and breathe the way it was, some events are planned to re-create the atmosphere of a 19th century sailing ship. Last summer, one of these was a re-creation of the landing of Governor Simcoe at York.

Every year the vessels participate in a re-enactment of a battle of the War of 1812 at Sacketts Harbour, N.Y. The townspeople all dress in period costumes and man the waterfront with muskets and cannons. As the first ship breaks the horizon, volleys of blanks are let loose and the mock battle begins. The smell of gunpowder fills the air as the ships fire back. More often than not on a hot July day, the blanks turn into water balloons and the cannons are replaced with fire hoses. The spirit of the age of fighting sail lives on, but now good clean fun is had by all.

This year the three brigantines hosted the Tall Ships sailpast in Toronto, Rochester and Kingston. Square-riggers from around the world travelled to Lake Ontario to form a flotilla which hundreds of thousands turned out to watch. Once again our harbours were filled with masts, yards and miles of rigging. It was a once in a lifetime event for all concerned. Not only did it give a chance for the public to view a magnificent panorama of sail, it also gave the crews of the ships a chance to compete against each other in a race. Some of the tall ships left Lake Ontario after the sailpast to continue racing across the ocean. Many stayed and participated in a bicentennial flotilla of sail around the lower lakes.

Toward the end of the summer, the majority of the vessels left the Great Lakes for their home ports. The memory of the tall ships in Lake Ontario is something that we can all be proud of.

The lure and romance of these vessels draws many. The sight of the billowing canvas stretched to the yardarms, the sounds of waves crashing, seagulls crying, makes one dream of faraway ports and thrilling adventures. To think of climbing the ratlines to battle a sail in the teeth of a gale, to pound through a raging sea or to drift into a beautiful sunset re-living the history of the Lakes...this dream can become a reality through Brigantine Inc. in Kingston, or Toronto Brigantine Inc.

For those interested in more information about youth programs or adult sails, or for those who wish to make a tax-deductible donation to either of these non-profit organisations, please contact:

Toronto Brigantine Inc.,
283 Queen's Quay West,
Toronto, Ontario, Ont.
M5V 1A2

OR Brigantine Inc.,
53 Yonge St.,
Portsmouth Olympic Harbour,
Kingston, Ont.
K7M 1E4

Curriculum Resources

Three curricula have been developed for elementary and secondary school students.

The Ohio Sea Grant Education Program
c/o Rosanne W. Frortner and Victor J. Mayer
59 Ramseyer Hall
29 W. Woodruff Ave.
Columbus Ohio 43210

The Great Lakes Connection, A School Curriculum
c/o Ellen Fisher
U. W. Extension
Environmental Resources Centre
216 Agricultural Hall
1450 Lindin Dr.
Madison W.I. 53706

Waterloo County Separate School Board
c/o Brent Dysart
Laurel Creek Field Centre
91 Moore Ave. Box 1116
Kitchener, Ont. N2G 4G2

These three groups have worked diligently to develop and test curricula aids. All have a multi disciplinary approach and offer both student and teacher background.

There is a strong desire for a basin approach to the study of the Great Lakes. This requires a strong network of communication among all interested parties.

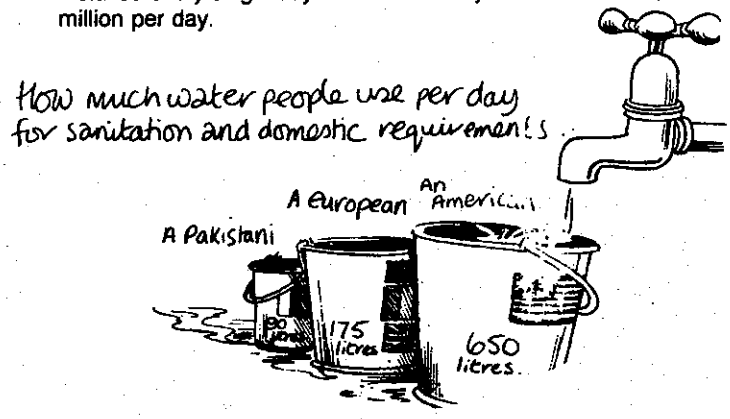
If you are interested in teaching developing materials, or evaluating curricula on the Great Lakes, please contact me. I'd be happy to share what is available.

Brent Dysart

The thirsty world

Enough rain falls on land to provide every person in the world with 31,000 litres per day. Spread over Earth's 510 million square km of surface, however, the average daily rainfall amounts to little more than 3mm. Variations are extreme - from 30mm a day in parts of Hawaii and India to zero in desert areas.

Over 80% of illness in the Third World is caused by 'water famine'. Every day, 30,000 people - half of them children - die from water-related diseases. A UN project to provide the whole world with safe water and proper sanitation calls for drinking water supplies and drainage facilities for 500,000 people to be installed every single day for the next 10 years at a cost of $10 million per day.



ORDER FORM

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_____ Lake Erie and Changing Lake Levels (EP-5) $1.00
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_____ We Have Met the Enemy (EP-21) $1.00
_____ It's Everyone's Sea: Or Is It? (EP-22) $1.00
_____ PCBs In Fish: A Problem? (EP-23) $1.00

_____ Middle Sea (Free)
_____ Middle Sea Index Issue (Free)
_____ Activities from Middle Sea $1.50
_____ Waterworks $1.50
_____ The Ohio Sea Grant Education Program $5.00
_____ Directory of Courses in Marine and Aquatic Topics in Ohio Institutions of Higher Education $3.00
_____ Environmental Education Occasional Paper #6: Marine and Aquatic Education (Free)
_____ Ohio Students' Knowledge and Attitudes About the Oceans and Great Lakes (Free)
_____ Marine and Aquatic Education in Ohio (Free)

Name _____ Amt. $_____

Address _____

City _____ State _____ Zip _____

Mail to:
Ohio Sea Grant Education Program, 59 Ramseyer Hall, 29 W. Woodruff Ave., Columbus, OH 43210

Oceanic Education Activities for Great Lakes Schools (OEAGLS)

Interdisciplinary classroom activities for grades 5-9. Each title consists of a student workbook plus teacher guide. $1.00 each title.

The Effect of Lake Erie on Ohio's Temperature (EP-1)
Differences in heat absorption and release by soil and water show how lakes and oceans moderate land temperatures. Laboratory and map activities. Science, geography.

The Effect of Lake Erie on Climate (EP-2)
Effect of temperature on movement of air; land and sea breezes and how they influence climate and economy near large bodies of water. Demonstration and graphing activities. Science and geography.

Ancient Shores of Lake Erie (EP-3)
Beach ridges along the lake are evidence of former lake levels related to glaciation. Characteristics of ridges make them valuable for human uses. Map study. Science, geography, history.

How to Protect A River (EP-4)
River characteristics are compared with standards for water quality and development. A decision is made about classifying the river as wild, scenic or recreational. Map study, data usage. Science, social studies.

Lake Erie and Changing Lake Levels (EP-5)
Causes and effects of lake level fluctuations lead to a study of problems involved in regulating lake levels. Laboratory and graph interpretation. Science, social studies.

Erosion Along Lake Erie (EP-6)
Determination of recession rate along a shoreline using maps and aerial photos. Effect of coastal erosion on property. Map study, calculations. Mathematics, science, social studies.

Coastal Processes and Erosion (EP-7)
Processes involved in coastal erosion and the effect of erosion on different shore materials. Shore protection devices and how they work. Laboratory. Science.

Pollution in Lake Erie: An Introduction (EP-8)
A 1970 essay is used to illustrate how to read skillfully and critically for facts about water quality in the lake. A current (1980) article updates and clarifies. Reading activity. Language arts, science.

The Great Lakes Triangle (EP-17)
Explores logical explanations for "mysterious" loss of the Edmund Fitzgerald and other crafts in the Great Lakes. Considers ship construction, storm tracking and uncharted reefs. Map study, weather station models, contour map construction. Geography, science, language arts, music.

Knowing the Ropes (EP-18)
How ropes are made, what makes them strong, how they are (and were) used on ships. Influence of the sea on language. Laboratory activities. Science, history, language arts, art.

Getting to Know Your Local Fish (EP-19)
Construction and use of a dichotomous key to families of fish in Lake Erie. Creative art and writing about the origin of fish names. Science, art, language arts.

Shipping: The World Connection (EP-20)
Countries represented by ships using the Port of Toledo indicate the Great Lakes' importance in world trade. How locks work to move vessels through the lakes. Laboratory, map study. Geography.

We Have Met the Enemy (EP-21)
The War of 1812 in the Northwest, its causes, the role of Lake Erie, and the factors important in winning the war. Board simulation, analysis of original documents. History (High School Level).

It's Everyone's Sea: Or Is It? (EP-22)
Characteristics of the ocean floor and how international boundaries are determined. Simulation of the Law of the Sea conference. Map study, role-play. Social studies, science, history.

PCBs In Fish: A Problem? (EP-23)
PCBs in Lakes Erie and Ontario and the degree to which they affect consumption of fish. Simulation of state health policies. Graph construction and laboratory-demonstration. Science, social studies.

Middle Sea
Quarterly newsletter for educators. Teaching tips, program activities, Lake Erie information and reviews of teaching resources. Free.

Middle Sea Index Issue
Listing of contents for the first five years of publications. Free.

Yellow Perch in Lake Erie (EP-9)
Introduction to fish life cycle and factors affecting population size, used as background for role-play of setting fisheries management policy. Extended to policies for 200-mile limit. Board game and simulation. Science, social studies, mathematics.

Evidence of Ancient Seas in Ohio (EP-10)
Ohio rocks and minerals give evidence of the seas that formerly covered the state. Locations of economic deposits of minerals are studied. Laboratory and map study. Science, geography.

To Harvest A Walleye (EP-11)
Basic concepts of food chains, webs and pyramids with environmental factors and energy transfer. Desirability of using lower trophic levels for human food. Board game and extensions. Science, mathematics.

Oil Spill! (EP-12)
Sources of oil in water environments and methods for oil spill clean-up. Effect of oil on aquatic life. Laboratory and graphing activities. Science, social studies.

Shipping on the Great Lakes (EP-13)
Commerce between lake ports illustrates regional products and needs. Cost and energy efficiency of cargo transport methods. Data analysis. Geography, mathematics.

Geography of the Great Lakes (EP-14)
Location and importance of Great Lakes areas. Distance-rate-time problems and area, perimeter, volume determinations. Map study and laboratory. Geography, mathematics, science.

Ohio Canals (EP-15)
Effects of canal building on the population and economy of cities. Canal routes are plotted and life on canal boats is revealed through a song. Map study, data interpretation. Geography, history.

The Estuary: A Special Place (EP-16)
Computer map shows land use around estuary. Stimulated sampling techniques reveal life forms in and around water. Influence of people's activities considered. "Dry lab" data analysis. Science, social studies, mathematics.

Activities from Middle Sea
Compilation of short classroom activities from past issues of Middle Sea. Learning centers to construct. 20 pp. $1.50

Waterworks
Compilation of the reviews of teaching resources (films, books, computer programs, etc.) that have appeared in Middle Sea. 20 pp. $1.50

The Ohio Sea Grant Education Program
Victor J. Mayer and Rosanne W. Fortner. Monograph describing six years of aquatic education in Ohio with model for curriculum development and dissemination. 1983. 142 pp. $5.00

Directory of Courses in Marine and Aquatic Topics in Ohio Institutions of Higher Education. Victor J. Mayer and Amy J. White-Predieri.
Interdisciplinary listing of courses in 51 institutions with contact personnel. 1981. 58 pp. $3.00

Environmental Education Occasional Paper #6: Marine and Aquatic Education. Diane Cantrell and the Ohio Department of Education.
Position statement on the importance of the oceans and Great Lakes in the history, culture, and economy of Ohio and the nation. Appendices list resource areas for teaching about these interdisciplinary topics. 1979. 24 pp. Free.

Ohio Students' Knowledge and Attitudes About the Oceans and Great Lakes. Rosanne W. Fortner and Victor J. Mayer. Ohio Journal of Science research article describing baseline evaluation of aquatic awareness in Ohio 5th and 9th graders. 1983. 7 pp. Free.

Marine and Aquatic Education in Ohio
Brochure with brief description of programs and services. Free.

From The Advisory Board

The Advisory Board has recently committed itself to develop a long term plan to better serve the needs of COEO members. A planning team will be working hard this year to collect background information, to survey past, present and potential members and to formulate their concerns and needs into an action plan for the next five years An annual operational plan will also be prepared.

This long term plan will be a first for COEO. It will enable the organization to more effectively promote the principles and practices of outdoor education and to provide better services and programmes for its members. The success of the plan depends on you. We need your help. We will be seeking your input throughout the planning process. Although a formal survey of the membership will be administered feel free to contact us at anytime to voice your concerns. If you wish to be considered for a position on the planning committee please notify us (see below) by January 6, 1984.

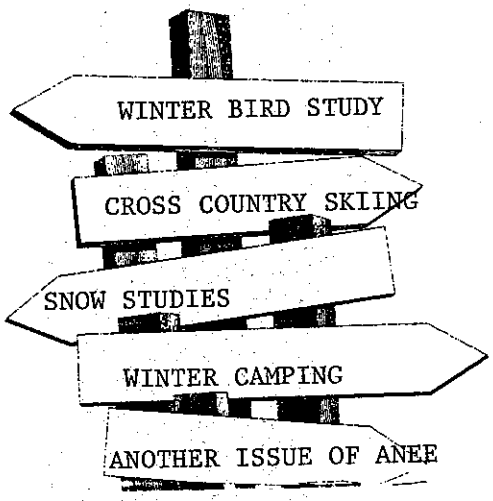
Barrie Martin
Leslie Frost Centre
Dorest, Ontario
P0A 1E0
705/766-2451 (B)
705/754-3436 (H)

Mark Whitcombe
34 Blind Line
Orangeville, Ontario
L9W 3A5
519/941-9966 (H)
705/435-4266 (B)

Calendar Of Events

JANUARY

Date:	Program:	Location:
Jan. 6	Winter is for the Birds Hikes at 11 am. & 2 pm.	Laurel Creek Nature Centre, Waterloo.
Jan. 6	Bird Feeder Workshop 1:00 - 3:00 pm.	Mountsberg Wildlife Centre, Campbellville
Jan. 13	Where have all the flowers gone? 11& 2:00	Laurel Creek Nature Centre
Jan. 13	Winter Wilderness Survival 1-3:00 pm.	Mountsberg Wildlife Centre
Jan. 19-27	National Ski Week	
Jan. 20	Winter Camping Workshop 10:00-3:00 pm.	Laurel Creek Nature Centre
Jan. 20	Cross Country Ski Workshop 1-3:00 pm.	Mountsberg Wildlife Centre
Jan. 20	Molstar	Glen Eden ski area
Jan. 20	Group Fun - Ski 11 1-4:00pm.	To be announced W.C.Board of Ed.
Jan. 23	Senior's Special Event Day	Glen Eden Ski Area
Jan. 25-27	MAKE PEACE WITH WINTER VI	Leslie Frost Centre Dorset, Ont.
Jan. 25	Owl Prowl 6-9:00 pm.	Mountsberg Wildlife Centre
Jan. 26-27	Wildlife Art Exhibition 11:00 am - 4:00 pm.	Mountsberg Wildlife Centre
Jan. 27	Tricky Tracks Hikes at 11 am & 2 pm.	Laurel Creek Nature Centre
Jan. 27	Nordica Challenge Giant Slalom	Glen Eden Ski Area



February

Date:	Program:	Location:
Feb. 2	VOLKS-SKILAUF Family snow fun.	Cedar Glen, Bolton
Feb. 3	Winter Camping Workshop 1 - 3:00 pm.	Mountsberg Wildlife Centre
Feb. 3	Open House- all day Owl Prowl 7 pm	Laurel Creek Nature Centre
Feb. 3	Molstar	Glen Eden Ski Area
Feb. 8	Valentine Ski 6-9 pm	Mountsberg Wildlfie Centre
Feb. 10	Walking in the Winter Wonderland 11 & 2:00pm	Laurel Creek Nature Centre
Feb. 10	Snow Snake Making 1-3:00 pm.	Mountsberg Wildlife Centre
Feb. 10	Corbett's Challenge Giant Slalom	Glen Eden Ski Area
Feb. 8-10	Winter Weekend Lorado Taft Field Campus	Lorado Taft Field Campus, Oregon, Illinios 61061
	For Further Info. contact Anee editor.	
Feb. 17	Taxidermy and Woodcarving 1-3:00 pm.	Mountsberg Wildlife Centre
Feb. 17	Winter is for the Birds Part2 11am& 2pm	Laurel Creek Nature Centre
Feb. 24	Hawk Walk 1-3:00 pm	Mountsberg
Feb. 24	Second Annual Snow Flea Hunt 11am & 2pm	Laurel Creek
Feb. 25	Outdoor Astronomy with John Percy	Erindale Planetarium Erindale College, T.O

FOR FURTHER INFORMATION CONTACT:

Laurel Creek Nature Centre, R.R. # 3 Waterloo Ont. N2J 3Z4 (519) 885-1368

Mountsberg Wildlife Centre c/o The Halton Region Conservation Authority 310 Main Street, Milton Ont. L9T 1P4 878-4131 (weekdays) 854-2276 (weekends)

W.C. Board of Ed. Laurel Creek Outdoor Ed. Centre, R.R.#3 Waterloo Ont. N2J 3Z4 (519) 885-1480 c/o Dennis Wendland

Glen Eden Ski Area c/o Halton Region Conservation Authority 310 Main Street, Milton, Ontario L9T 1P4

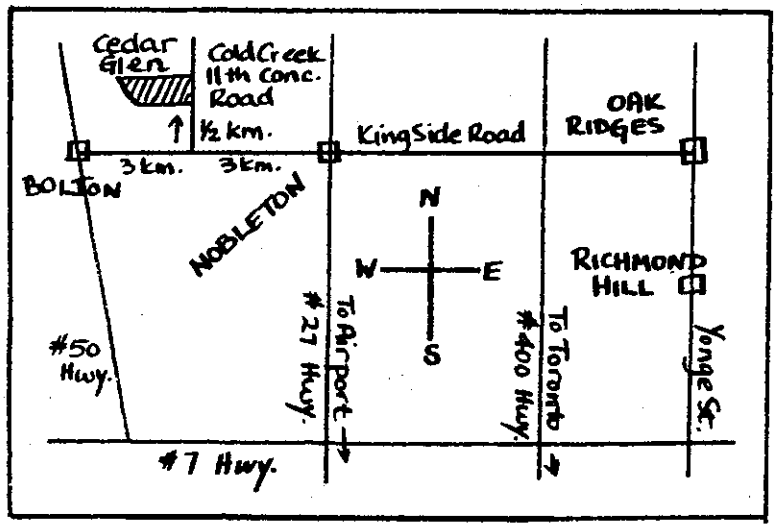
Spring Celebration

Plan to attend the "spring celebration" conference, May 10-12, 1985 at the Leslie M. Frost Natural Resources Centre. More details to follow.

Volks - Skilauf

The name "Volks-skilauf" is German, meaning "people's cross-country skiing. This is the winter variation of the better known activity called a "Volksmarch" or "people's walk." In Europe the very popular Vokksmarch takes place both days of most weekends in Germany, France, and Switzerland. People of all ages pay a registration fee to go on a hike of either 10 or 20 kilometres. Trails are set up by different towns in each of these countries and the profits go to a local charity. Check points throughout the walk provide assurance that walkers are going in the correct direction, as well as offering food and refreshments and a good chance to rest and talk with other walkers. At the end of the walk, participants receive a unique medal showing the location and date of their day's exercise. Music and refreshments complete the day's activities in a large hall or tent back at the starting point.

The first C.O.E.O. Volks-skilauf took place in 1981 and we are now in our third annual year for this event with its popularity growing each year. This family day of cross-country skiing is an adaptation of the European activity. As trails are marked, checkpoints will not be necessary. Buttons with ribbons will be included in the registration fee. A lunch will be served at noon and hot drinks will be available for participants throughout the day at the registration area. The popular activities of sleigh-riding and tubing will also be a part of this year's daylong C.O.E.O. event.



3RD ANNUAL VOLKS-SKILAUF

TRYING FOR THE THIRD AGAIN ANNUAL!

FEBRUARY 2, 1985

10 A.M. - 5 P.M.

CEDAR GLEN, BOLTON, ONTARIO

PLEASE PRAY FOR SNOW THIS YEAR!

Come and join us for a family cross-country ski day at the Glen. Groomed and marked trails lead skiers up and down the Caledon Hills, finishing off with a hot drink, a hearty meal, and friendly folks. Your registration fee includes equipment (if necessary), lunch, a button and ribbon, and a variety of hot drinks.

Due to their popularity last year, the sleigh ride and tubing will again be available to participants!

Mittagstisch

Bratwurst & Sauerkraut & Brötchen
Kartoffelsalat & Würstchen & Brötchen
Apfelstrudel
Heisser Apfelmost
Glühwein
Heisse Schokolade
Kaffee & Tee

B.Y.O.B. or WINESKIN

Luncheon Menu

Sausage & Sauerkraut & Bread
Potato Salad & Weiners & Beans
Apple Strudel
Hot Apple Cider
Hot Mulled Wine
Hot Chocolate
Coffee and Tea

COEO members:		Non-members:	
Adults	$ 12.00		$ 15.00
Children	$ 8.00		$ 8.00
Family Rate	$ 35.00	Family Rate	$ 40.00

Pre-registration is a must as numbers are limited.
Make cheques payable to: Central Region COEO
Address registration forms to: Judy Simpson
Forest Valley O.E.C.
60 Blue Forest Drive
DOWNSVIEW, Ontario

Names _____ COEO no. _____

Address _____ Phone (B) _____

(H) _____

No. of people attending: Adults _____ Children _____

Equipment required: Yes _____ No _____ Fee enclosed _____

In the event of cancellation due to inclement weather, a $2.00 administrative fee per person will be retained, and the balance refunded.

COEO COUNCIL OF OUTDOOR EDUCATORS OF ONTARIO

Membership Application Form

PLEASE PRINT COMPLETE AND SEND WITH REMITTANCE TO ADDRESS BELOW

NAME (mr.) (mrs.) (miss) (ms) _____

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If you are applying for Family Membership, please list persons who will be using the membership. _____

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I am in the _____ Region of COEO (see listing below)

FAR NORTH Patricia, Kenora, Thunder Bay, Algoma, Cochrane, Sudbury, Rainy River, Timiskaming.

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WESTERN Essex, Kent, Elgin, Middlesex, Huron, Bruce, Grey, Perth, Wellington, Waterloo, Oxford, Brant, Haldimand-Norfolk, Dufferin, Lambton.

CENTRAL Niagara South, Lincoln, Hamilton-Wentworth, Halton, Peel, York, Ontario, Metro Toronto.

EASTERN Victoria, Durham, Peterorough, Northumberland, Hastings, Prince Edward, Lennox and Addington, Renfrew, Frontenac, Leeds, Grenville, Ottawa-Carlton, Dundas, Russell, Stormont, Prescott, Glengarry,Lanark.

OUT OF PROVINCE Any area in Canada except Ontario

OUTSIDE CANADA

Please note: THE COEO MEMBERSHIP YEAR IS FROM SEPTEMBER 1 TO AUGUST 31. ANY MEMBERSHIP APPLICATIONS RECEIVED AFTER MAY 1 WILL BE APPLIED TO THE FOLLOWING YEAR.

Please check: NEW _____ RENEWAL _____ CURRENT MEMBERSHIP NO. _____

FEES: REGULAR $20.00 _____ STUDENT $15.00 _____

FAMILY $30.00 _____ INSTITUTIONAL $18.00_____

Make your cheque or money order payable to the COUNCIL OF OUTDOOR EDUCATORS OF ONTARIO and mail with this form to

JOHN AIKMAN
MEMBERSHIP SECRETARY
47 RAMA COURT,
HAMILTON, ONTARIO L8W 2B3