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International Specialists in the Environment

MEMORANDUM

TO: Stewardship Indicators Subcommittee Members

FROM: Susan Bloss *SB*

DATE: 3/13/92

SUBJECT: Minutes of February 20, 1992 Meeting

Enclosed is a summary of the notes I took from the February 20, 1992 Stewardship Indicators Subcommittee meeting. These minutes are in draft form. Any additions and/or corrections you wish to make to these minutes should be brought to the next Subcommittee meeting.

All additions are welcome so that we may have a complete record of the Subcommittee's efforts.

Remember that the next meeting is April 16, 1992, at the Airways Hotel in Buffalo. Details will follow.

MEETING SUMMARY

EOWG Stewardship Indicators Technical Subcommittee

Environment Canada
Toronto, Ontario
February 20, 1992

Participants: Joel O'Connor, Sally Lerner, Sam Sage, Sarah Miller, Louise Knox, Robert Boice

Clarifications to Minutes of January 9, 1992 Meeting:

Definition of Stewardship clarification (on p. 1): The last line of the section on definition of stewardship was changed starting with the word "duty." The new wording shall read, "desire to create conditions which enable people to exercise their judgement."

Clarification #1 (on p. 2): The group agreed that a "vision" for the lake is necessary, and that many groups have determined their individual visions for the lake. It is the group's recommendation that EOWG assist in a process that would allow stakeholders to come together and develop a common vision for the lake.

Clarification #2 (on p. 2): All group members feel comfortable that they understand the limitations of analysis of the indicators.

Clarification #3 (on p. 2): The group decided that the "existence" of an advisory group would be the indicator.

Discussion/Comments on Potential Indicator Materials:

James W. Ransom Letter on Stewardship Objective Wording -

While it is true that "management" of the environment may not be the most desirable wording, management and mismanagement of resources has occurred. The goal of stewardship is to correct those mismanagements.

The wording of the objective must be understood by the public and the word "stewardship" is well understood. The subcommittee should not be too academic in its wording.

The subcommittee may have to clarify that "stewardship" implies stewardship over other peoples' actions, as well as stewardship over the environment.

Recommendation:

The wording of the objective will remain as written; however, there will be accompanying text that reflects the sentiments expressed in Mr. Ransom's letter. Joel O'Connor will draft the accompanying text.

Sally Lerner Framework for Conceptualizing Indicators -

This framework uses "backcasting," determining the desired outcomes and working backwards. In our situation, the desired outcomes are changes in behavior by all actors, and a measurable improvement in environmental quality, e.g. drinking water. Once the outcomes have been determined, the group has to look at what activities will achieve the outcomes. Finally, the group must examine what decisions have to take place on public, private, and governmental levels to make the desired activities occur.

This framework can help us recommend priorities among the suggested indicators. For manageability, the group might keep the number of indicators to between six and eight.

EOWG's March, 1990 goals are fairly specific and should function as the group's vision for this work.

There may be some overlap between this group's work and the work of the human health indicators group since a "healthy system" implies healthy humans making good stewardship decisions.

John Maher and Sarah Miller Document on Indicators for Lake Ontario Municipalities -

Ideally, several of the indicators can be agglomerated, e.g. #5 on access in the introduction also speaks to participation.

The indicators should not be too "easy." Indicators that would allow a municipality to point to an existing plan on paper should be eliminated. The indicators should measure action.

The cost of water might serve as an aggregate for the indicators listed in the water conservation section. If the price of water is high, there is more likely to be efficient transport, restricted use, etc.

Increases in water cost will more heavily penalize the agricultural sector, a sector that is least able to pay.

An alternative might be to look at sustainable use of water as an indicator, however each municipality has its own definition of "sustainable."

Dividing the indicators by municipality may be an artificial distinction. The group may want to look at percentage of shoreline accessible as an indicator.

It may be useful to have a few indicators that embrace the whole lake and a few that address smaller spatial scales. Each municipality would receive a manual of indicators to guide them and an annual report card on its progress.

The indicators should be useful to all groups: politicians, so they know the appropriate place to allocate money; bureaucrats, so they can make appropriate action decisions; the public, so they can hold the other two groups responsible, and the scientists.

Sam Sage Document on Access Indicator -

The indicator would quantify community access to the Lake Ontario shoreline. Unfortunately, access does not speak to the character of the shoreline. Natural shoreline is preferable to cement or rubble.

In Toronto, connecting corridors to the lake are also considered. The concept is to protect headwaters, make linkages, and view the area as a basin and not just a lake. However, it is much more difficult to characterize access to the entire basin.

In some situations, land use dictates no access. An ideal "percentage accessible" is needed for our indicator since 100% access is not achievable or desirable.

An alternative goal statement might be that "when people want to use the lake, they can." This may be difficult to measure and the "steward" is not clearly identified.

General Indicator of Lake Level and Water Export as Proposed by Joel O'Connor -

An indicator involving a desired range of lake levels and a maximal acceptable rate of engineered water export from the Basin would provide legislators guidance when other regions seek to divert water from Lake Ontario.

Lake level and water export could serve as a federal stewardship indicator since the federal government makes water level decisions.

An overall water level indicator would not allow for identification of individual, non-steward municipalities.

Natural Lake water-level fluctuations may interfere with the usefulness of the indicator.

An alternate approach might be to monitor manmade imports and exports. The indicator goal would be a set lake level. The indicator would consider the trends over time and known information on natural lake fluctuations.

Sewage might be an import that would unrealistically offset water exportation and show a false indicator of positive stewardship.

Precipitation related to global warming is an input that cannot be altered by man within a basin framework and would become noise in

a Lake water-level indicator.

It might be appropriate to recommend that the Aquatic Communities Subcommittee develop an indicator which addresses consumptive use of water and water levels.

Potential Per Capita Water/Sewer Use Indicator -

An alternative to lake water levels might be per capita water/sewer use. A reduction of per capita use would be an indicator of good stewardship.

Rural, non-municipal users would not be included in the data. However, this should only be a very small percentage of the population.

This type of indicator might encourage municipalities to install meter systems if they do not now have them.

Industrial facilities should also be monitored by this indicator.

Potential Point Source Toxics Indicator -

As stated by the Toxics Management Plans, zero discharge would be the goal for this indicator.

The Toxics Release Inventory program could provide the indicator data in the U.S. However, Canada has no equivalent program. The indicator should be used to encourage Canada to develop a similar program.

George Werezak's Industry Indicators of Responsible Stewardship -

(#s refer to Dr. Werezak's white paper.) Trends in emission reduction (#10) could be a useful overall industry indicator.

The existence of education/outreach programs (#7) and community advisory panel (#8) could be grouped as one indicator.

Environmental audits (#3) could include a provision for opening the audit and the action implementation plans to public scrutiny.

For the indicator to be effective, guidelines must be developed to define a "meaningful" audit.

Joel O'Connor/Dennis King's Lake Ontario Regional Accounts Indicators -

A defense expenditures indicator would give people an idea of the economic cost of their actions, as part of the gross regional product.

Unfortunately, watershed economic data is not available. For the indicator to be effective, it is necessary to have data according to natural boundaries, not artificial political boundaries such as municipality and or state. Seeing the regional accounting "bankbook" will enable the region's citizens to be good stewards.

A decrease in "defensive" expenditures might not necessarily imply good stewardship since it could also mean that less is being spent to study and clean up problems. Defensive expenditures might be a good indicator in the future when existing problems have been addressed.

Expenditures in preventative programs might be an better indicator.

In terms of regional accounting, it might be useful to show where proceeds are going, e.g. is the money from a sewage treatment plant going back into treatment/cleanup and source control, or is it going toward other budget items, possibly promoting urban sprawl?

An expenditures indicator could be misleading in that companies that are spending money could be spending greater amounts not because they are good stewards but because they are having to remedy existing problems.

Sally Lerner's Environmental Volunteerism Indicator -

The numbers of volunteers and the number of hours they contribute may not be a clear-cut indicator of individual stewardship. Volunteers and hours could decrease because people feel they are ineffective and are not able to accomplish their goals, and not necessarily because problems have been solved.

Volunteerism may be an area for greater research.

Sally Lerner's Environmental Education Indicator -

England and France have developed extensive environmental education programs. Efforts on the part of school systems within the Great Lakes Basin to duplicate these kinds of efforts should be viewed as good stewardship.

It is difficult to predict how many education programs are the result of good stewardship and how many are the result of shock and fear on the part of the school system.

Again, this may be an area for research.

Summary of Potential Indicators (roughly in order of acceptance by Subcommittee):

1. Annual change in per capita water/sewer use (by municipality

and over the Basin).

2. Annual change in industrial water/sewer use (by municipality and over the Basin).

3. An increase in the percentage of accessible lake shore, working toward a set percentage access goal.

4. A reduction in toxics released as measured through the Toxics Release Inventory, working toward zero discharge.

5. An increase in the number of corporations conducting meaningful environmental audits, that, along with action implementation plans, are open to public scrutiny.

6. A reduction in human-engineered water export from the Basin to a level no greater than "X."

7. Human-engineered inputs to the basin that are at least "X", but no greater than "Y."

8. Trends in emission reduction such as the National Emission Reduction Master Plan of the CCPA that are shared with the public.

9. An increase in the number of corporations with employee education programs/public outreach programs on topics such as pollution prevention, recycling, etc., and the existence of a community advisory panel.

Other Recommendations:

1. The Aquatic Communities Subcommittee should develop an indicator that addresses consumptive use of water and lake water levels.

2. The areas of gross regional product, environmental volunteerism, and environmental education require additional research before they can become indicators.

3. Work group meeting summaries should be exchanged between work groups so that overlap can be avoided and better coordination of effort can be achieved.

The next meeting of the EOWG Stewardship Indicators Technical Subcommittee will be April 16, 1992, at the Airways Hotel in Buffalo, New York.

JAN 28 1992

Mr. James W. Ransom
Mohawk Council of Akwesasne
Box 204
Hogansburg, NY 13655

Dear Jimmy:

Ever since our Buffalo meeting I have been wrestling with the most appropriate words for our Subcommittee objective. The more I read and think about this, the more convinced I am that your suggestions would improve upon the "stewardship" objective and rationale crafted by EOWG. Since you (and Henry Lickers) seem to have a deeper perspective on this than most of us, I suggest that we collaborate on a revised objective statement for refinement by the full Subcommittee.

If I understood you correctly in Buffalo, your central concern about "stewardship" is the implication of supervising or managing the environment. (My Webster's definition of stewardship is, 'the duties of one who acts as supervisor or administrator, as of finances or property, for another or others.') I believe you suggested a much different emphasis: acting responsibly and respectfully toward the environment, so that the earth will continue to support and nurture life, and because we are thankful for the human and other life sustained by nature. Your view accords fully with the ecologist's notion of essential "life-support systems" which are too complex and too imperfectly understood to be responsibly managed, at least on large scales. Even well-intentioned "environmental management" has negative, counterintuitive results so often that it is seldom a credible strategy on large scales.

Also, I am not convinced that 'embracing environmental ethics' adds to our goal. It seems both vague and redundant if the goal outlines action upon a specific ethic.

So, assuming I understand you, I agree with your suggestion. How about:

5. Ecosystem Responsibility and Respect

Human values and actions shall again become consonant with our life-supporting environment.

Humans have not always and everywhere seen the environment as property to be exploited within a legal framework. Preindustrial cultures -- European and Native American -- recognized and reconciled themselves to their dependence upon finite ecosystems. These cultures respected, indeed revered, the earth which sustained them, and would assuredly sustain their children for generations. They felt a sense of community with their ecosystems. Such cultures persist today, and the germ of similar social values is evident in North American post-industrial society. So, recent dominant perceptions that society depends upon relatively unfettered environmental exploitation are not "human nature." These perceptions can change, as views have changed through history, when they conflict with new knowledge and experience.

The ability of our society to ensure a life-supporting environment for us and future generations requires that we respect the environment and act in accord with that respect. Our tendency to consider ourselves separate from the ecosystem has greatly contributed to the degradation of Lake Ontario. Because the Lake has long been taken for granted and exploited rather than valued, we must now do more than recognize our influence in the ecosystem. We must accept responsibility for maintaining the ecological processes and components of Lake Ontario, preserving its biologicval diversity and following the principles of sustainable use of resources. Increased acceptance of this responsibility by all sectors of society is required to ensure that future generations inherit a better environment. Increasing responsibility and respect for the environment will require: educating society about the fundamental importance of ecosystems and current resource uses and practices; changes in existing practices that are necessary to sustain ecosystem integrity; and advocating environmentally sound behavior in individuals, communities and governments.

Please consult with Henry in marking up this draft, and fax me your improvements (212-264-4690).

Sincerely yours,

Joel S. O'Connor
Ocean Policy Coordinator

cc: Henry Lickers

EOWG for Lake Ontario - Indicators of (stewardship)(ecologically responsible behaviour) sub-committee meeting Feb. 20/92

From: Sally Lerner

1. A possible general framework for conceptualizing our task

IF these are our ecosystem goals/vision for the Lake and Basin:

THEN what specific outcomes do we want?

OUTCOMES (derived from vision, goals)

changes in behaviours (all actors): ICI sector, households, municipalities, etc.
improvements in environmental quality (various indices)
etc.

IF these are the desired outcomes, what activities must occur?

ACTIVITIES (derived from desired outcomes)

investment of resources, including time, energy
audit programs (all actors)
legislation, regulations, enforcement
market, fiscal, monetary mechanisms
information generation, dissemination
changes in behaviours (all actors)
etc.

**IF these are the required activities, what decisions must be made?
by whom?**

DECISIONS (derived from needed activities)

decide on allocation of resources
decide on strategies of change
decide on allocation of responsibility

**This is a backcasting approach that identifies desired outcomes,
then looks at the steps required to make them happen.**

**Indicators of (stewardship) (ecologically responsible behaviour)
can be developed at each level: decisions, activities and outcomes.**

STEWARDSHIP INDICATORS FOR LAKE ONTARIO MUNICIPALITIES

Introduction

In drafting indicators of municipal stewardship for Lake Ontario, we have attempted to find measures of activities which:

- * minimize local pollution to Lake Ontario
- * restore and enhance natural habitat
- * promote water conservation
- * demonstrate co-operation with other jurisdictions who share responsibility for the Lake
- * encourage public enjoyment of the Lake and access to decisions influencing the Lake.

We have categorized our recommendations as follows:

- * municipal corporate behaviour
- * municipal operations
- * municipal parks, open space, and habitat
- * municipal communication, education, and public empowerment.

In our work we had the Royal Commission on the Future of the Toronto Waterfront's guiding principles in mind. These principles are that the waterfront be clean, green, usable, diverse, open, accessible, connected, affordable, and attractive.

John Maher

Sarah Miller

MUNICIPAL CORPORATE STEWARDSHIP INDICATORS
RE: POLICY AND PROGRAMS

Does the municipality have a special environmental department and staff? How many person-hours per year? If so, does their work include a mandate to conserve and protect Lake Ontario?

Does the municipality have a process to link the environmental work of all municipal departments in a way that promotes an ecosystem approach?

Is there a corporate understanding of the linkages between environmental and public health?

Water Conservation

Are all municipal water supplies metered?

Do they utilize water efficient devices?

Are there local restrictions on the sale of inefficient water use devices?

Is there a standard for per capita water conservation and a plan to reduce water use per capita?

Are funds raised from water and sewage charges dedicated to improvements in treatment, clean-up and source control rather than shifted to other budget expenditures?

Are there municipal codes that require water efficiency standards to be met in new development?

Municipal Planning

Is there a water and sewage master planning process in place? For how many years into the future are these plans made?

How many rivers and streams (in kilometres) with flows to Lake Ontario, have been "containerized", buried, or turned into sewers?

Are there plans to naturalize these waterbodies? Have any been restored?

Are there by-laws which exclude development in river valleys, wetlands, groundwater recharge areas and headwaters, and along the near shore and shoreline of the Lake?

Are there local erosion and sediment controls in place?

Do official plans have an environmental protection component? Do they protect historically significant waterfront heritage?

Are there planning provisions for non-structural storm-water management techniques (semi-permeable surfaces, rooftop storage, landscaping, and storm water detention)?

Are there local wetland protection initiatives? Are environmentally sensitive areas mapped?

Is there an official waterfront plan?

STEWARDSHIP INDICATORS
RE: MUNICIPAL OPERATIONS

In Ontario, have municipalities adopted the province's model sewer use by-law (which is voluntary)?

What is the level of enforcement of sewer by-laws: the number of prosecutions and enforcement staff on a discharge basis?

The number of persistent toxic chemicals that are controlled in sewer-use by-laws?

The number of "special arrangements" to exceed sewer use by-laws?

The level and frequency of monitoring combined and storm-sewer discharges in wet and dry weather conditions.

The percentage of combined sewers that have been separated within the local Lake Ontario watershed. Timetables for completing sewer separation.

Concerning the need for infrastructure repair: what percentage of flows in sewers is from inflow and infiltration?

How much of the infrastructure has been replaced since ??? (we need to ascertain a date, life expectancy for infrastructure here).

Re: Municipal Water and Sewage Treatment Plants (STPs)

The number, character, and frequency of audits of inflow and discharge of sewage in STPs?

Does the municipality have programs to prevent STP overflows and bypasses? Is there a target date to eliminate all such occurrences?

The number of STPs operating at or close to treatment capacity.

Are there programs to maximize removal of persistent toxics from sludge before discharge to the lake, incineration or sludge application to land?

Are there enforceable safe drinking water standards for local drinking water sources?

Are trihalomethanes and other persistent toxic chemicals controlled in drinking water standards?

Do measures to control zebra mussels minimize impacts on water quality?

Are there programs to prevent the introduction of invasive species?

**STEWARDSHIP INDICATORS FOR MUNICIPAL PUBLIC PARKS,
OPEN SPACE, NATURAL AREAS, AND HABITAT**

Re: Beaches

The number and percentage of days that public beaches have been closed because of bacterial contamination.

The frequency of testing and public notification of beach contamination?

The number of complaints of medical waste found on beaches?

Is the goal of swimmable beaches integrated in municipal clean-up plans? Is there a timetable to achieve this goal?

Re: Parks and green spaces

Do parks and planning policies encourage corridors, pathways and linkages along waterways and the lakeshore?

What is the ratio of green space to developed areas in the municipality?

What is the level of public use of parks? (Is use being measured?)

What active and passive recreational uses of the waterfront and watershed are available?

What is the measure of public versus private recreational facilities on the Lake and waterways? Are public facilities

affordable?

What percentage of the total shoreline is accessible to the public?

Are there physical and legal barriers to public access?

A measure of the use of pesticides and herbicides per hectare in parks and open spaces?

Are there programs reducing the use of herbicides and pesticides in parks?

Re: Natural Areas and Habitat

Are there municipal programs that encourage ecological diversity in the region and is it recognized in municipal goals?

Is shoreline and lake filling controlled and monitored? Is there an assessment and approval process for lake filling?

Do shoreline alterations encourage habitat creation? Is there an active wetland creation program?

Are the benefits of wetlands - in storm water management and in water quality and as educational resources - reflected in municipal initiatives?

STEWARDSHIP INDICATORS OF MUNICIPAL OUTREACH,
EDUCATION AND COMMUNICATIONS

Re: Outreach and Empowerment

Does the public have access to municipal decision making affecting the ecosystem?

Is there a "Citizens' Advisory Committee" to the municipality on environmental concerns?

Are there local citizens' groups who advocate for the improvement of the Lake Ontario ecosystem as their stated mandate?

Is the public involved in the municipal planning process?

Does the municipality fund citizen stewardship activities?

Does the public have access to information about municipal programs and activities impacting Lake Ontario? (I.e. beach bacterial monitoring results, sewer and STP discharges, monitoring results of

local polluting industries.)

Re: Educational

Do school boards have environmental mandates?

What is the local level of public understanding about the source of their drinking water? Is hydrology taught in the schools?

What percentage of schools have environmental improvement projects along waterways?

What educational materials are produced by the municipality to promote stewardship of Lake Ontario?

Is there a local municipal environmental library or resource centre?

What is the level of public awareness of local fish advisories? Are these advisories provided in the language of those fishing in the area?

Re: Networking

What formal networks are in place to confer with other municipalities who border Lake Ontario? How often do meetings happen?

Is there local watershed co-ordination between all agencies with jurisdiction over the Lake Ontario watersheds?

How often do these organizations meet?

Do they have common goals? Do they have formal agreements?

Are municipal activities evaluated on their impacts on adjacent municipalities and on Lake Ontario?

In conclusion, John has suggested that we might consider a rating system similar to this one he found in the Canadian Urban Institute's Special Report on Cities and Global Warming.

TABLE 1:
Styles of response by local
government to the environment

Styles (8 is strong)	Examples
1. Flout the law	Discharge raw sewage; use illegally polluting vehicles.
2. Merely obey the law	Do no more, or less, than is required.
3. Set a good example within administration	Intra-office recycling; use natural gas vehicles.
4. Advocate within jurisdiction	Encourage reduction, reuse, and recycling; promote transit and district heating.
5. Legislate within jurisdiction	Ban certain materials at landfill sites; local restrictions on automobile use.
6. Advocate outside jurisdiction	Push for tighter automobile pollution standards; promote inter-city rail.
7. Seek new legislative authority	To tax automobile ownership; to ban sale of items made with CFCs.
8. Legislate outside jurisdiction	Ban sale of items made with CFCs; ban use of many kinds of packaging.

Notes on Stewardship Indicators
Topic: Access

Based on access to Lake Ontario shoreline

- Valuable to see how concerned public(s) are with being at the Lake or able to be at the Lake.
- Will show in community values vs. individual greed
- Emphasis on water dependant use
- Access valuable to all; Indicator of access valuable to _____

Indicators will be:

- A. Percent of shoreline open to public access
 - 1. In public domain
 - 2. Easement

Define access as ability to reach public lands below high water mark. Access would be those points when public can reach public areas. Assuming a need of one access lane per mile.

Good = Approach to 100% (ie: each mile of shoreline has place where public can gain access to shore)

- B. People using Lakeshore
 - 1. survey of use of random access points
 - 2. Use of parks, reserves, etc.

Good = Increased visitation (as percent per year)

- C. Amount of land within coastal zone boundary (however defined) owned in fee simple and has public easement.

Good = Increase

Factors having an influence on access issues:

- Amount of shoreline needing protection from human use
- Projected impact of unlimited access on fragile areas
-

Related issues:

- Equity issues: Ability of people to GET TO the shoreline
 - includes mass transit issues



Dow Canada

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February 14, 1992

Fax to:

Joel S. O'Connor - EPA - 716-285-6788

xc by fax to:

J. Maher, Ontario Hydro - 416-978-0156
D. King, University of Maryland - 301-326-6342

Further to our meeting in Buffalo, I agreed to draft a definition of the Industry Indicators for our sub-committee. My thoughts are attached.

If either you or those copied have some suggested changes I can incorporate before our February 20 meeting, send them to me and I will make the changes.

Regards,

George N. Werezak
Manufacturing Manager.

Attach.

:mq

INDUSTRY INDICATORS OF RESPONSIBLE STEWARDSHIP FOR LAKE ONTARIO

PREAMBLE:

Based on the January 9, 1992 Buffalo meeting and my earlier submission of December 9, 1991 to Joel O'Connor, I would suggest the following thoughts are before this sub-committee on the subject of stewardship indicators for the industrial sector. While these are being produced with Lake Ontario in mind, they are, in all likelihood, applicable to all of the Great Lakes.

1. Indicators need to be measured and followed. It would be wrong to start with the premise that government monitoring alone is appropriate.
2. Indicators need to be clear and easily understood by all.
3. Indicators must have a use; decisions should be made on the basis of the information supplied.
4. Indicators must measure actions and behaviors. Note: my sense is that attitudes are also important but not by and of themselves.
5. Indicators must relate to the goals we are striving for; i.e. we want cleaner water. Evidence of reducing discharges produce cleaner water.
6. Where possible, indicators should come from an existing data set.
7. Indicators must be shared with interested members of the public.
8. It is less important where a given organization starts from, than to note their significant improvement.
9. Indicators chosen should be based on consensus.
10. No set of indicators is appropriate for all times.

Based on the above, I would offer the following list of indicators:

1. Visible commitment to environmental protection through policy statements and documented standards.
2. Number of corporations with a voluntary publicly announced emissions reduction program.
3. Number of corporations conducting environmental audits.
4. Capital spending and human resources commitments by corporations on environmental improvements.
5. Product replacements where alternates have less impact on the environment.

6. Corporations that can demonstrate they operate by the principles of Sustainable Development.*
7. Number of corporations with employee education programs/public outreach programs on topics such as pollution prevention, recycling, etc.
8. The existence of a community advisory panel.
9. Responsible Care or its equivalent in place.
10. Trends in emission reduction such as the National Emission Reduction Master Plan of the CCPA that are shared with the public.
11. Indicators offered to the public by a sector or corporation that they believe best demonstrates their stewardship commitment.

* At this stage #6 may be difficult to set up.

DRAFT

March 10, 1992

DRAFT

Lake Ontario Indicator of Responsible Stewardship:

Regional Accounts of the Basin

Joel O'Connor
U.S. EPA, Reg. II

Dennis King
U. of Maryland,
Int'l. Soc. Ecol. Econ.

Why are Regional Accounts Important?

The indicator quantifies dominant economic and resource stocks (capital) of the Lake Ontario basin. The principal purposes of these regional accounts are to (1) inform people and governments of how their regional capital is being used, and (2) stimulate reconsideration of today's stewardship. The importance of knowing the true bank account, including natural resources, of one's own community should not require lengthy rationales.

Where appropriate (for the Gross Regional Product), the indicator units are dollars (mean of \$ U.S. and \$ Canadian, 1990 value). Stocks not appropriately accounted in dollars (water, land use, etc.) are scaled as indicated below.

Description of the Indicator

Indicator 1: Gross Regional Product = conventional Gross Regional Product - "defensive expenditures"

As conventionally calculated, the gross regional product is

The recommended measure of gross regional product debits expenditures that are not truly productive. That is, costs that are "defensive," spent to protect us from our way of life, are not legitimate contributions to regional productivity. Such costs include, for example, pollution-control and environmental remediation expenditures.

for the Basin,
These costs, not now known, are readily calculable. These costs for the Basin must be consequential and growing. Total aggregate pollution control costs alone for the U.S. were estimated to be \$ 115 billion, or 2.1% of the GNP, in 1990¹. Even assuming that recent rates of increase continue, these costs would exceed 5% of the U.S. GNP well before most of today's workforce retires. Further, EPA's estimated pollution control costs do not capture all of the "defense expenditures" Another, partial, early and

(A) on p. 2

~~At~~

~~The U.S. EPA ~~estimates~~ that \$19 million~~
~~will be required to remove (and dispose of?)~~
~~PCB-contaminated sediments from Waukegan~~
~~Harbor, Illinois.~~ ³ The Toronto Harbor
Commission estimates that \$320 million will suffice to
"clean up" contaminated industrial lands of the Harbor,
and that the cleaned land can again be commercially
developed, "thus paying for remediation." ³, p. 38

3. IJC 1991. Cleaning Up Our Great
Lakes. A Report from the Water Quality
Board to the IJC on Toxic Substances in
the Great Lakes Basin Ecosystem. IJC
Waukegan and Detroit. 46 pp. ecology and environment

(15)

~~$I = f$ (L. Ontario lake level (m),
annual total input (mi^3 & km^3),
annual ~~Basin~~ export from Basin via
engineering structures (mi^3 and km^3))~~

~~Quantitatively,~~
~~Total~~

, on one figure,

Indicator 2 portrays the temporal changes in:

- (1) mean annual ~~to~~ Lake level (m),
- (2) annual total input of water (mi^3 and km^3), and
- (3) annual water export from the Basin via engineering structures (mi^3 and km^3).

The implications of these indicator values require succinct interpretation. Warning endpoints of the indicator are (1) annual mean fluctuations in Lake level of $> \text{--- m}$, (2) annual decrease of $> 5\%$ ~~to~~ from 1980-89 mean input and (3) annual increase of $> 5\%$ from 1980-89 mean export from the Basin.

"very conservative" cost estimate for cleaning up just 10 Great Lakes areas of concern ranged from \$2.9 to 3.4 billion.² ← (A)

Indicator 2: Care of Water

Standard The indicator tracks where water in the Basin comes from and where it goes, naturally and through human ~~feeding~~ engineering. Conventional water budgeting conventions are used in units of mi^3 and km^3 . Features of the indicator of greatest interest are (1) Basin input rates, ~~and~~ (2) human-dominated rates of export from the Basin, and Lake level (m),
(3) mean annual ← (B)

Literature Cited

1. U.S. EPA. 1990. Environmental Investments: The Cost of a Clean Environment. A Summary. EPA-230-12-90-084. (NTIS: PB91-153783) U.S. EPA, PPM-21, Washington, DC.
2. Leger, C. 1989. Cleaning up Great Lakes Areas of Concern: How Much Will It Cost? Northeast-Midwest Inst., Washington, DC. 45 pp.

file: INDREGAC

Environmental volunteerism

1. Topic of the indicator: Volunteer activity that aims at protection or remediation of (some aspect of) the natural environment. Arguably, the existence of such activity, which represents an investment of time and energy, indicates the extent to which people value the natural environment, are willing to contribute to its betterment and, probably, support/pressure for political and private sector action to ensure environmental quality. [Problem: it is also possible that volunteer activity might decrease in the future because the public perceives that environmental problems are being more adequately addressed by public/private sector efforts.]

The question of the outcomes or results of this volunteer activity is a separate one. It can be argued, as above, that the fact of people volunteering for these activities is itself an indicator of stewardship. Outcomes are less measurable, but can be described and sometimes quantified (e.g. number of trees planted, miles of beach or stream bed cleaned up, number of bluebird boxes constructed.)

2. Description of the indicator: several possible--

a. Number of volunteer environmental groups (with size) at the local/small regional level. This is relatively available in Canada and probably in US

b. Types of volunteer activities: also relatively available

c. Number of volunteer hours per year: not available but could be obtained when directories of groups are updated. Probably impossible to verify.

3. Reference of endpoint of indicator: Fluctuation in the number of volunteers or volunteer hours could be seen as an indicator of increase or decrease in the extent to which people value the natural environment, are willing to contribute to its betterment and, probably, support/pressure for political and private sector action to ensure environmental quality.

Environmental Education

1. Topic of the indicator: Any type of education about environmental concerns, issues, needed behaviour change and any other environment-related matters. This would include formal schooling pre-K through post-doctoral as well as media presentations and other means of delivering environmental education (e. g. Scouting, naturalist clubs, eco-tourism). The assumption here, without providing for evaluation of the effects of various types of environmental education, is that the more there is, the better it is, because it raises levels of awareness, knowledge and motivation re caring for the environment. [Problem: much more research would be needed to establish the effects of various types of environmental education.]

2. Description of the indicator: many possible--

a. Number of courses and/or hours, and specific departments/programs devoted to environmentally-relevant topics in pre-K through post doctoral.

b. Number of teachers/profs trained in environmental studies or joint program with a traditional specialization

c. Number of hours or column inches devoted to environmental material by the various media

d. Number of badges, etc. offered by Scouting for environmental topics and numbers of youth receiving them.

e. etc.

3. Reference or endpoint of indicator: Increase would be seen as good if it's assumed that all environmental education is good because it raises awareness, knowledge and motivation levels and therefore eventuates in more responsible ecological behaviours, including political.