Appendix 2 — Complete Listing of Indicators (entered into the database)

The attached table contains a listing of over 800 indicators that have been entered into the database. The table includes:

- the indicator name,
- the indicator number or code,
- what the indicator measures, and
- whether the indicator has been proposed for the SOLEC Indicator List (C.R. means Concept Retained in another indicator). *Note - those indicators that are included in the SOLEC Indicator List are shown shaded for ease of identification.*

Ind. code	Indicator name	Measure	SOLEC Indicator?
1	Lake herring	Rehabilitate to historical level of production	No
2	Lake trout	Restore self-sustaining stocks to historical abundance	C.R.(93)
3	Non-depleted native fishes	Maintain stable, self-sustaining status	No
4	Depleted native fishes	Restore stable self-sustaining stocks	No
5	Sea lamprey	Reduce population by 50% by 2000; 90% by 2010	No
6	Fish Habitat	1) Quality and area of aquatic habitat (e.g., shore, spawning shoals, tributaries, wetlands, etc.) and 2) population of sentinel fish species. For example, the measures for tributary quality could include the number of dams, number of miles of river channel that is impounded, number of miles of (formerly) high-gradient stream channel that is impounded, and the number of miles between the river mouth and the first dam. The number and location of fish passage facilities (up- and downstream) that could be used successfully by species or communities of concern (for example, lake sturgeon, or other anadromous fishes listed in FCGO) could also serve as measures.	Yes
7	Fish consumption advisories	Reduce level in fish below FCA action levels	No
8	Salmon and Trout	1) Productivity, yield, or harvest of Pacific salmon, rainbow trout and brown trout using abundance (e.g., catch of each species in a given unit of sampling effort), or biomass metrics; and 2) populations of these stocked and naturally produced fish.	Yes
9	Walleye and *Hexagenia*	Abundance, biomass, or annual production of walleye and burrowing mayfly (*Hexagenia* spp.) populations in historical, warm-coolwater, mesotrophic habitats of the Great Lakes. Presence or absence of a *Hexagenia* mating flight (emergence) in late June- July in areas of historical abundance.	Yes
10	Yellow perch	Maintain as top omnivore; 0.5Mkg/y	No
11	Northern pike	Maintain as prominent predator	No
12	Muskellunge	Manage to support trophy fishery	No
13	Lake Whitefishes	Quantify using either numbers or biomass.	No
14	Lake whitefish and lake herring	Maintain self-sustaining stocks yielding 3.8Mkg/y	No
15	Bass and sunfish	Maintain at recreationally attractive levels	No
16	Lake sturgeon	Rehabilitate populations; delist as T or E spp.	No
17	Preyfish Populations	Abundance and diversity, as well as age and size distribution, of preyfish species (i.e., deepwater ciscoes, sculpins, lake herring, rainbow smelt, and alewives) in each lake.	Yes
18	Sea Lamprey	Number of spawning run adult sea lampreys; wounding rates on large salmonids.	Yes
19	Native species diversity	Total number of different species in a collection (see features). Comparison of historical with present conditions.	No
20	Genetic diversity	Heterozygosity (allozyme, allelic);nuclear or mitochondrial DNA polymorphisms; population pairwise genetic distance; nucleon diversity/gene diversity; genetic variability; genetic uniqueness.	No
21	Habitat	No net loss; rehabilitate degraded habitats	No
22	Habitat	Reduce or eliminate contaminants	No
23	Salmon and trout	Establish diverse community yielding 6-15Mlbs/y	No
24	Planktivores (preyfish)	Match to primary production and predator demand	No
25	Inshore fish	Maintain self-sustaining stocks; yield >2-4Mlbs/y	No

Ind. code	Indicator name	Measure	SOLEC Indicator?
26	Benthivore (fish)	Maintain self-sustaining stocks	No
27	Benthivore (lake whitefish)	Maintain self-sustaining stocks; yield 4-6M lbs/y	No
28	Sea lamprey	Reduce to achieve other fish community objective	No
29	Other species (fish)	Protect diverse native fish community	No
30	Habitat	No net loss; restore riverine spawning habitat	No
31	habitat	Reduce or eliminate contaminants	No
32	Lake trout	Restore self-sustaining populations; 0.5-1 M adult	No
33	Warmwater fish	Maintain current complex; yield 1 kg/ha/y	No
34	Preyfish	Maintain major species; mean biomass 110 kg/ha/y	C.R.(17)
35	Salmon, trout, and whitefishes	Maintain diverse complex; yield 2.5 kg/ha/y	No
36	Sea lamprey	Limit lake trout mortality to<90,000 fish/y	No
37	Lake trout	Health indicator for coldwater fish community	No
38	Walleye	Health for mesotrophic ecosystem; yield .3 kg/ha/y	No
39	Hexagenia (burrowing mayfly)	Health indicator for mesotrophic ecosystem	No
40	Exotic species	Effects of	No
41	Native species and habitats	Status of	No
42	Persistent toxics	Levels in water and sediment	No
43	Persistent toxics	Levels in fish and wildlife	No
44	Nutrient loading	DO levels in bottom waters	No
45	Nutrient loading	Water clarity and algal blooms	No
47	Nutrient loading	Maintain mesotrophic conditions (10-20 ug P/L)	No
48	Nutrient loading	Manage loadings to yield 50-60 M lbs good fish/y	C.R.(111)
49	Habitat	Manage nearshore habitat for quality fisheries	No
50	Riverine habitat	Protect spawning habitat of anadromous fish	No
51	Western basin ecosystem	Manage for warm and coolwater fishes	No
52	Central basin ecosystem	Manage for warm, cool, and coldwater fishes	No
53	Eastern basin ecosystem	Emphasize management for coldwater fishes	No
54	Contaminants	Reduce levels to no effect on fish production	C.R.(112)
55	Habitat	Adequate habitat to support fish community goals	No
56	Genetic diversity	Conserve locally adapted strains	No
57	Rare, Threatened & Endangered species	Manage to preserve and protect	No
58	Preyfish	Manage as prey, baitfish, and human food (smelt)	No
59	Food web	Manage to meet fish community objectives	No
60	Diaporeia and Hexagenia	Manage as prey and indicators of habitat quality	No
61	Biomass/production size spectrum	Ecosystem structure	No
62	Yield of piscivores	Commercial and sport catch	No
63	Piscivore/prey biomass	Ecosystem health	No
64	Fraction of yield as native fish	Ratio of native to exotic species of fish.	C.R.(8)
65	Zooplankton size distribution	Ecosystem structure; predation, and productivity	No
66	Total P levels <= 10 mg/L	Baseline productivity	No
67	Small native bivalve presence	Ecosystem health	No
68	Native Unionid Mussels	Distribution and abundance, reported as number of individuals per unit of sampling effort; soft tissue weight; and reproductive output of the Native Unionid mussel.	Yes
69	Submersed aquatic vegetation	Condition of physical habitat; nutrient loading	No
70	Municipal discharges: BOD, TSS, Pf	Water quality	No
71	Petroleum industry liquid discharges	Water quality	No
72	Fish Entrainment	1) Water withdrawal rates in m^3/sec (gal/min) at once-through cooling at steam-electric and pumped-storage power plants in the Great Lakes; and 2) calculated total annual mortalities (losses) of sentinel species at each plant in each lake.	C.R.(6)
73	Fishability	Contaminant levels in fish; fish advisories	No
74	Biological community integrity and diversity	Multiple; biota and habitat	No
75	Virtual elimination persistent toxics	Multiple; mixed	C.R.(112)
76	Phosphorus	Multiple; mixed	C.R.(111)
77	Physical environment integrity	Multiple; mixed	No
78	Loss of native species	Number of species lost	No
79	Ecosystem imbalance	Lake trout dichotomous key	No
80	Reproductive impairment	EMS; female parent contaminant body burden	No
81	Nutrient stress	P level, DO level; Chlorophyll a	C.R.(111)

Ind. code	Indicator name	Measure	SOLEC Indicator?
82	Contaminant stresses	loadings, residues, body burdens	No
83	Lake trout	lake trout dichotomous key	No
84	Mesotrophic biological surrogates	Walleye and Hexagenia	No
85	Fish habitat--in 43 AOCs	Habitat supports fish community objectives	No
86	Fish community	Site specific; 43 sites	No
87	Habitat	Areas of aquatic vegetation and loose rock substrate	No
88	White sucker	Basin-wide toxics	No
89	Lake trout	Oligotrophic habitats	No
90	Walleye, Hexagenia	Basin-wide mesotrophic habitats	No
91	Brown bullhead, Hexagenia, benthic community	Toxics in AOCs	No
92	Walleye and Hexagenia	Walleye, 0.3kg/ha/y; Hexagenia, 200/m2/y/3y	No
93	Lake Trout and Scud (*Diporeia hoyi*)	Abundance, yield, or biomass, and self-sustainability of lake trout and scud (*D. hoyi*) in coldwater, oligotrophic habitats of the Great Lakes.	Yes
94	Fish community structure and function	Annual harvest of trout and salmon (M lbs)	No
95	Fish community structure and function	Annual harvest of planktivores (M lbs)	No
96	Fish community structure and function	Annual harvest of inshore fishes (M lbs)	No
97	Fish community structure and function	Annual harvest of benthivore fishes (M lbs)	No
98	Fish community structure and function	Annual harvest of other native fishes (M lbs)	No
99	Reproduction and self-sustainability	Lake trout	No
100	Fish habitat and spawning grounds	lake trout spawning habitat; coastal wetland sp. H	No
101	Deformities, Eroded Fins, Lesions and Tumours (DELT) in Nearshore Fish	Frequency of tumors and other related anomalies in nearshore fish.	Yes
102	Tainting of fish flavor	Annual number of complaints for sport fish	No
103	Exotics	lamprey wounding rates; presence of other species	No
104	Benthos Diversity and Abundance	Species diversity and abundance in the aquatic oligochaete community.	Yes
105	Tributaries	Macroinvertebrate community; IBI, MBI, etc.	No
106	Dredging activities	Contaminant level in sediments	No
107	Contaminant levels to protect aquatic life	Concentration of toxics in water column	No
108	Eutrophication	Total P and ammonia in water	No
109	Phytoplankton Populations	Phytoplankton biomass (species and size composition) and size-fractionated primary productivity (Carbon-14 uptake or photosynthesis) as indicator of microbial food-web structure and function.	Under Consideration
110	Zero discharge and emission of 9 toxic contaminants		C.R.(112)
111	Phosphorus Concentrations	Total phosphorus levels (ug/L).	Yes
112	Trends in Contaminant Concentrations & Loadings of Priority Chemicals in Abiotic Media: Water, Air, Soil, and Sediments	This indicator will use the contaminant concentrations and computational methodology to compute the loadings, trends, and exchanges of priority toxic chemicals between air, water, and sediment. Fugacity based approaches of intermedia transport will also be included as part of the indicator.	C.R.(117, 118, 119, 120)
113	Contaminants in Recreational Fish	Concentration of PBT chemicals in the catch-weighted average, edible tissue of recreational fish.	Yes
114	Contaminants In Young-of-the-Year Spottail Shiners	Concentration of PBT chemicals in young-of-the-year spottail shiners.	Yes
115	Contaminants in Colonial Nesting Waterbirds	1) Annual concentrations of DDT complex, PCBs/PCDFs/PCDDs and other organic contaminants and Hg and other metals in Herring Gull eggs from 15 sites from throughout the Great Lakes (U.S. and Canada). 2) Periodic measurement of biological features of gulls and other colonial waterbirds known to be directly or indirectly impacted by contaminants and other stressors. These include (but are not limited to): clutch size, eggshell thickness, hatching and fledging success, size and trends in breeding population, various physiological biomarkers including vitamin A, immune and thyroid function, stress hormone levels, liver enzyme induction, PAH levels in bile and porphyrins and genetic and chromsomal abnormalities.	Yes
116	Zooplankton Populations	1) Community Composition; 2) Mean Individual Size; and 3) Biomass and Production.	Yes
117	Atmospheric Deposition of Toxic Chemicals	Annual average loadings of toxic chemicals from the atmosphere to the Great Lakes, based on measured atmospheric concentrations of the chemicals, as well as wet and dry deposition rates.	Under Consideration
118	Toxic Chemical Concentrations in Offshore Waters	The concentration of toxic chemicals in the offshore waters of the Great Lakes.	Under Consideration
119	Concentrations of Contaminants in Sediment Cores	The concentrations of toxic chemicals in sediment cores at selected sites within the Great Lakes at ten year intervals.	Under Consideration

Ind. code	Indicator name	Measure	SOLEC Indicator?
120	Contaminant Exchanges Between Media: Air to Water, and Water to Sediment	Estimates of air to water and water to sediment loadings of toxic chemicals using fugacity based approaches of intermedia transport.	Under Consideration
1000	Biomass/Production Size Spectrum		No
1001	Excess Nutrients	Total Phosphorus and Nitrogen Levels	No
1002	Zooplankton Size Distribution	Mean Zooplankton Length	No
1003	Production or Yield of Piscivores		No
1004	Piscivore/Prey Fish Biomass Ratio		No
1005	Fraction Yield as Native Fish	Naturally Producing Fish to Salmonine Populations	No
1006	Contaminant Body Burdens	DDT, PCB, dieldrin concentrations in lake trout	No
1007	Burrowing Mayfly Nymphs	Easily quantified using either numbers or biomass	No
1008	Trends in Abundance of Key Species	Index Target Abundances (e.g. lake trout, diporeia	No
1009	Lake Herring Stocks	Annual Yields	No
1010	Salmonine Stocks	Annual Yields of Salmon and Trout	No
1011	Planktivore (prey) Species Biomass		No
1012	Rarity of Species and Communities		No
1013	Non-Native/Exotic Species		No
1014	Species Richness	Total number of different species in a collection	No
1015	Human Population Size	Population Size from census data	No
1016	Tern Populations	Common and Caspian Terns	No
1017	Herring Gull		No
1018	Bald Eagle/Osprey Populations		No
1019	Double-Crested Cormorant		No
1020	Contaminant Concentrations in Water	PCB, DDE, dieldrin, HCB, BaP	No
1021	Induction of Mixed Function Oxidase Enzymes	P450 1A1	No
1022	Inhibition of Amino Levulinic Acid Dehydratase		No
1023	Hepatic Porphyria		No
1024	Hepatic Vitamin A (Retinol)		No
1025	Thyroid Related Abnormalities		No
1026	Tumor Incidence		No
1027	Fin Ray Asymmetry		No
1028	Congenital Malformations		No
1029	Disease Incidence		No
1030	Parasite Incidence		No
1031	Walleye Abundance		No
1032	Exceedance of Water Quality Guidelines	Bacterial Contamination	No
1033	Total discharge via leakages	kg of pollutants and metals	No
1034	Contaminants discharged by STP in kg/day		No
1035	Industrial effluent discharged per day		No
1036	Zinc Loadings	Total kg per year	No
1037	Iron Loadings		No
1038	Phenols Loadings	Total kg per year	No
1039	TSS Discharge	Total kg/day	No
1040	Cyanide Loadings	Total kg/day	No
1041	BOD Loadings	STP effluent concentrations (mg/L)	No
1042	TSP Concentrations	mg/L	No
1043	Fecal coliform concentration	MF count/100 ml	No
1044	Chlorine Concentrations	mg/L	No
1045	Concentration of cadmium	mg/L	No
1046	Concentration of chromium	mg/L	No
1047	Concentration of lead	mg/L	No
1048	Concentration of aluminum	mg/L	No
1049	Concentration of Mirex	ng/L	No
1050	Concentration of copper	mg/L	No
1051	Growth rate of individuals		No
1052	Carcinogenesis		No
1053	Teratogenesis and Congenital Defects		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
1054	Susceptibility to Disease		No
1055	Behavioural Effects		No
1056	Morphological Changes	Algal cells, etc.	No
1057	Feminization		No
1058	Natality and Mortality		No
1059	Population Age Structure		No
1060	Number of Breeding Pairs		No
1061	Geographical Range of Population		No
1062	Decomposition		No
1063	Phosphorus Loadings	Chorophyte - Cladophora	No
1064	Fugacity	Partial pressure/escaping tendency of chemical	No
1065	Water Transparency		No
1066	Ratio of Specialist to Generalist Organisms		No
1067	Tainting of Fish Flavour		No
1068	Ammonia	Degradation of Phytoplankton and Zooplankton	No
1070	TKN	Degradation of Phytoplankton and Zooplankton	No
1071	Total Phosphorus	Degradation of Phytoplankton and Zooplankton	No
1072	Total Dissolved Si	Degradation of Phytoplankton and Zooplankton	No
1073	Total Organic Carbon	Degradation of Phytoplankton and Zooplankton	No
1074	Total Suspended Solids	Degradation of Phytoplankton and Zooplankton	No
1075	Chlorides	Degradation of Phytoplankton and Zooplankton	No
1076	Dissolved Oxygen	Degradation of Phytoplankton and Zooplankton	No
1077	Temperatures	Degradation of Phytoplankton and Zooplankton	No
1078	Secchi Depth	Degradation of Phytoplankton and Zooplankton	No
3500	Reinvestment in Natural Capital		No
3501	Citizen Involvement in Decision Making		No
3502	Per Capita Membership in Community Organizations		No
3503	Energy Consumption		No
3504	Waste Stream Loadings		No
3505	Political Pressure - Protect/Remediate Environment		No
3506	Diversity of Cultures		No
3507	Basin-Wide Sense of Identity		No
3508	General Participation in Environmental Programs		No
3509	Capacities of Sustainable Landscape Partnerships	Number of partnerships; basin location and geographic coverage; budgets, FTE staff; identification of major projects and initiatives	Under Consideration
3510	Organizational Richness of Sustainable Landscape Partnerships	The diversity of the members participating in partnerships measured on two axes: Horizontal Integration -- the diversity of local partners; and Vertical Integration -- the direct participation of federal and state/provincial actors in local partnership initiatives.	Under Consideration
3511	Integration of Ecosystem Management Principles Across Landscapes	Simple reporting of the adoption of ecosystem management as a guiding principle in place-based resource management programs by states/provinces and regional agencies and governments and budget allocations in support of ecosystem management programs and projects.	Under Consideration
3512	Integration of Sustainability Principles Across Landscapes	Simple reporting of the adoption of place-based sustainability as a strategic goal by states/provinces and regional agencies and governments and budget allocations in support of sustainability initiatives and projects.	Under Consideration
3513	Citizen/Community Place-Based Stewardship Activities	An enumeration and description of programs and projects that engage citizens in the stewardship of their landscapes / ecosystems and/or foster the ethic of stewardship; total number of identified programs, total number of participants, basin location.	Under Consideration
4078	Drinking Water Quality	Chemical concentration in finished drinking water	C.R.(4175)
4079	Drinking Water Quality	Microbial contaminants in finished drinking water	C.R.(4175)
4081	*E. coli* and Fecal Coliform Levels in Nearshore Recreational Waters	1) Counts of *E. coli* and/or fecal coliforms (FC) in recreational waters measured as number of organisms per volume of water (e.g., FC/ml); and 2) frequency of beach closings at specific locations.	Yes
4082	Contaminants in Air	Concentration of chemicals and particulates in ambient air	C.R.(4176)
4083	Contaminants in Edible Fish Tissue	Concentration of PBT chemicals targeted by the GLWQA in edible fish tissue	Yes
4084	Chemical Contaminants in Human Tissue 1	Breast milk: Concentration of PBT chemicals	C.R.(4177)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4085	Chemical Contaminants in Human Tissue 2	Blood lead concentrations in children	No
4086	Chemical Contaminants in Human Tissue 3	Geographic comparisons of chemical contaminants in human tissue (blood, milk and hair)	C.R.(4177)
4087	Chemical Contaminants in Human Tissue 4	Umbilical cord blood: Concentration of PBT chemicals	C.R.(4177)
4088	Chemical Contaminant Intake From Air, Water, Soil and Food	Estimated total daily intake of PBT chemicals targeted by the GLWQA from air, water, soil, and food sources.	Yes
4089	Radionuclides 1	Concentration of Cs-137 and Sr-90 in cow's milk	C.R.(4178)
4090	Radionuclides 2	Concentration of H-3 (tritium) and C-14 in surface water, drinking water, and air	C.R.(4178)
4091	Air Quality and Cardiorespiratory Health 1	Relationship between respiratory admissions to hospitals and ozone and sulphate levels.	C.R.(4176)
4092	Air Quality and Cardiorespiratory Health 2	Cardiorespiratory hospital admissions and sulfate levels	C.R.(4176)
4093	Cancer Risk and Chlorination Byproducts in Drinking Water	Correlation of THM levels in drinking water with cancer incidence	C.R.(4175)
4094	Cancer Incidence Rates	Geographic distribution of cancer incidence in the Great Lakes region	C.R.(4179)
4095	Birth Defects Incidence Rates	Geographic distribution of birth defect rates in the Great Lakes region	C.R.(4179)
4096	Social Indicators	Public knowledge, attitudes, and behaviors regarding use of Great Lakes resources	No
4102	Contaminants in Fish	Aldrin/dieldrin in Indicator Species	No
4103	Contaminants in Fish	Benzo(a)pyrene in Indicator Species	No
4104	Contaminants in Fish	Chlordane in Indicator Species	No
4105	Contaminants in Fish	DDT and metabolites in Indicator Species	No
4106	Contaminants in Fish	Hexachlorobenzene in Indicator Species	No
4107	Contaminants in Fish	Alkyl-lead in Indicator Species	No
4108	Contaminants in Fish	Mercury and compounds in Indicator Species	C.R.(4083)
4109	Contaminants in Fish	Mirex in Indicator Species	C.R.(4083)
4110	Contaminants in Fish	Octachlorostyrene in Indicator Species	No
4111	Contaminants in Fish	PCBs in Indicator Species	C.R.(4083)
4112	Contaminants in Fish	Dioxins and Furans in Indicator Species	C.R.(4083)
4113	Contaminants in Fish	Toxaphene in Indicator Species	C.R.(4083)
4114	Contaminants in Drinking Water	Lead in raw and treated water	C.R.(4078)
4115	Contaminants in Drinking Water	Mercury in raw and treated water	C.R.(4078)
4116	Contaminants in Drinking Water	Benzene in raw and treated water	No
4117	Contaminants in Drinking Water	Chlordane in raw and treated water	No
4118	Contaminants in Drinking Water	Dibromochloropropane in raw and treated water	No
4119	Contaminants in Drinking Water	Ethylenedibromide in raw and treated water	No
4120	Contaminants in Drinking Water	Toxaphene in raw and treated water	No
4121	Contaminants in Drinking Water	Hexachlorobenzene in raw and treated water	No
4122	Contaminants in Drinking Water	Benzo(a)pyrene in raw and treated water	No
4123	Contaminants in Drinking Water	PCBs in raw and treated water	No
4124	Contaminants in Drinking Water	2,3,7,8-TCDD in raw and treated water	No
4125	Contaminants in Drinking Water	Coliform in raw and treated water	C.R.(4079)
4126	Contaminants in Drinking Water	Fecal coliform in raw and treated water	C.R.(4079)
4127	Contaminants in Air	Ozone concentrations in air	C.R.(4082)
4129	Contaminants in Air	Particulate matter concentrations in air	C.R.(4082)
4130	Contaminants in Air	Carbon monoxide concentrations in air	C.R.(4082)
4131	Contaminants in Air	Volatile Organic Compounds concentrations in air	C.R.(4082)
4132	Recreational Water Quality	Enterococci concentrations in water	C.R.(4081)
4133	Recreational Water Quality	E. coli concentrations in water	C.R.(4081)
4134	Recreational Water Quality	Fecal coliform concentrations in water	C.R.(4081)
4135	Contaminants in Drinking Water	Viruses in raw and treated water	C.R.(4079)
4136	Radionuclides	XX concentrations in YY	No
4142	Organochlorines in human breast milk 01	Concentrations in breast milk of DDT	C.R.(4084)
4143	Organochlorines in human breast milk 02	Concentrations in breast milk of dieldrin	C.R.(4084)
4144	Organochlorines in human breast milk 03	Concentrations in breast milk of heptachlor epoxid	C.R.(4084)
4145	Organochlorines in human breast milk 04	Concentrations in breast milk of oxychlordane	C.R.(4084)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4146	Organochlorines in human breast milk 05	Concentrations in breast milk of transnonachlor	C.R.(4084)
4147	Organochlorines in human breast milk 06	Concentrations in breast milk of B-HCCH	C.R.(4084)
4148	Organochlorines in human breast milk 07	Concentrations in breast milk of HCB	C.R.(4084)
4149	Organochlorines in human breast milk 08	Concentrations in breast milk of PCB	C.R.(4084)
4150	Organochlorines in human breast milk 09	Daily intake of DDT by breast-fed infants	C.R.(4084)
4151	Organochlorines in human breast milk 10	Daily intake of dieldrin by breast-fed infants	C.R.(4084)
4152	Organochlorines in human breast milk 11	Intake of heptachlor epoxide by breast-fed infants	C.R.(4084)
4153	Organochlorines in human breast milk 12	Daily intake of oxychlordane by breast-fed infants	C.R.(4084)
4154	Organochlorines in human breast milk 13	Intake of transnonachlor by breast-fed infants	C.R.(4084)
4155	Organochlorines in human breast milk 14	Daily intake of B-HCCH by breast-fed infants	C.R.(4084)
4156	Organochlorines in human breast milk 15	Daily intake of HCB by breast-fed infants	C.R.(4084)
4157	Organochlorines in human breast milk 16	Daily intake of PCB by breast-fed infants	C.R.(4084)
4158	Organochlorines in human breast milk 17	Organochlorine pesticide index for breast milk	C.R.(4084)
4160	Geographic distribution of cancer	Cancer incidence	C.R.(4094)
4161	Birth defects in Ontario, 1978-1988	Birth defects incidence	C.R.(4095)
4162	Cancer risk/chlorination disinfection by-products	THM levels in drinking water + cancer incidence	C.R.(4093)
4163	Air pollutants affecting hospital admission rates	Daily respiratory admissions vs sulphate levels	C.R.(4091)
4164	Air pollutants affecting hospital admission rates	Daily respiratory admissions vs ozone levels	C.R.(4091)
4165	Air pollutants affecting hospital admission rates	Cardiorespiratory hospitalization rates vs levels of sulphates	C.R.(4092)
4166	Exposure to aldrin and dieldrin	Estimated daily intake	C.R.(4088)
4167	Exposure to benzo(a)pyrene	Estimated daily intake	C.R.(4088)
4168	Exposure to chlordane	Estimated daily intake	C.R.(4088)
4169	Exposure to DDT	Estimated daily intake	C.R.(4088)
4170	Exposure to dioxins and furans	Estimated daily intake	C.R.(4088)
4171	Exposure to PCBs	Estimated daily intake	C.R.(4088)
4172	Exposure to hexachlorobenzene	Estimated daily intake	C.R.(4088)
4173	Exposure to mercury	Estimated daily intake	C.R.(4088)
4174	Exposure to mirex	Estimated daily intake	C.R.(4088)
4175	Drinking Water Quality	Concentrations of chemical substances such as metals (e.g., lead, mercury) and other inorganic compounds, pesticides, radionuclides, and drinking water disinfection by-products (e.g., trihalomethanes) as well as microbial parameters such as bacteria, viruses and parasites in raw, treated and distributed drinking water.	Yes
4176	Air Quality	Concentration of chemicals and particulate matter in ambient air.	Yes
4177	Chemical Contaminants in Human Tissue	Concentrations of PBT chemicals targeted by the GLWQA in human tissues such as blood, breast milk, hair, urine and adipose tissues.	Yes
4178	Radionuclides	Concentration of Cs-137 and Sr-90 in cow's milk, gross beta activity in air and precipitation, and airborne and waterborne radionuclide emissions from nuclear power plants in the Great Lakes basin.	Yes
4179	Geographic Patterns and Trends in Disease Incidence	Disease incidence rate (rate = x disease incidences/ y population) of diseases that have a demonstrated environmental link, such as cancers and birth defects, in the Great Lakes basin.	Yes
4501	Coastal Wetland Invertebrate Community Health	Relative abundance of sensitive taxa (e.g., mayflies, caddisflies), tolerant taxa (e.g., Chironomini as a proportion of total Chironomidae abundance, Isopoda), richness of specific taxa, and functional feeding groups (e.g., herbivores, detritivores, carnivores), working towards the development of an Index of Biotic Integrity (IBI).	Yes

Ind. code	Indicator name	Measure	SOLEC Indicator?
4502	Coastal Wetland Fish Community Health	An Index of Biotic Integrity (IBI) will be developed based on measures of species richness and abundance, percent exotic species, percent phytophils and other appropriate parameters.	Yes
4503	Deformities, Eroded Fins, Lesions and Tumors (DELT) in Fish	Numbers and percent of DELT in coastal wetland fish.	Yes
4504	Amphibian Diversity and Abundance	Species composition and relative abundance of calling frogs and toads, based on evening surveys using protocol developed for the Marsh Monitoring Program (MMP) or modification of MMP protocol.	Yes
4505	Reptile Diversity and Abundance	Species composition and abundance of basking turtles and snakes, based on surveys using protocol similar to the Marsh Monitoring Program (MMP) protocols for amphibian and bird surveys.	No
4506	Contaminants in Snapping Turtle Eggs	Contaminant levels in snapping turtle eggs	Yes
4507	Wetland-Dependent Bird Diversity and Abundance	Species composition and relative abundance of wetland-dependent birds, based on evening surveys using protocol developed for Marsh Monitoring Program (MMP) or modification of the MMP protocol.	Yes
4508	Mink Populations	Estimate of numbers of mink	No
4509	Contaminants in Mink	Measure levels of contaminants in wild mink of Great Lakes coastal wetlands.	No
4510	Coastal Wetland Area by Type	Areal extent of coastal wetlands by type as a range (e.g., dry year/low water level area versus wet year/ high water level area).	Yes
4511	Gain in Restored Coastal Wetland Area by Type	Gain in restored wetland area by type.	Yes
4512	Chlorophyll a Levels	Chlorophyll a levels	No
4513	Presence, Abundance & Expansion of Invasive Plants	Presence, abundance, & expansion of invasive plants (both native and non-native), such as flowering rush, great hairy willow-herb, common frogbit, yellow iris, purple loosestrife, Eurasian water milfoil, curly pondweed, cattail, Phalaris, and Phragmites.	Yes
4514	Agricultural land use: risk of declining soil quality	Areas at risk of declining soil quality (primarily erosion) are calculated/estimated from their inherent soil loss (under natural cover), topography/slope, the type of crop grown, and agricultural management practices (e.g. conservation tillage).	C.R.(7007)
4515	Reported Toxic Releases	Total tons of reported toxic releases to water.	C.R.(4854,4855,4856)
4516	Sediment Flowing Into Coastal Wetlands	Suspended Sediment Unit Area Yield (tonnes/km^2 of upstream watershed) for a representative set of existing monitoring sites just upstream of coastal wetlands.	Yes
4517	Inflow Flow Alteration	Ratio of total high extreme flows to total low extreme flows for all existing monitoring sites just upstream of coastal wetlands.	No
4518	Water Level Fluctuations	Using IGLD 85 water levels and gauging stations best representing lakes and coastal wetlands: 1) Weighted 5-year moving average level index =[0.5 L(t) + 0.25 L(t-1) + 0.125 L(t-2) + 0.0625 L(t-3) + 0.03125 L(t-4)]/ 0.96875, where L(t) is the average lake level in year t (Busch, 1990). 2) Lake-wide annual range in monthly averages. 3) Lake-wide seasonal peak (days after January 1). 4) Lake-wide seasonal minimum (days after September 1). 5) Elevation Difference between Upper and Lower Emergent Extent based on Water Level model (Painter & Keddy, 1992). (Upper extent uses average water level surrounding seasonal peak of growing season (e.g., May, June, July average). Upper extent follows this value for rising levels and stays at the highest for 12 years after levels drop and then within 6 years meets the water level. Lower extent uses the mean water level in September. Lower extent follows mean September levels as they drop. As levels rise, it takes 3 years to move up to meet mean September levels.)	C.R.(4861)
4519	Climate Change: Number of Extreme Storms	For land areas adjacent to the Great Lakes, total number of “extreme storms”, per year during ice-free and ice-break-up periods on the Great Lakes.	Yes
4520	Development Adjacent to Representative Wetlands		No
4521	Buffers and Land Use Adjacent to Coastal Wetlands	Sum of a weighted score of adjacent land use using km perimeter x weighting factor divided by the total upland perimeter, where the weighting factors are: Built-up = -1; Row Crop = -0.5; Hay and pasture = - 0.2. Where buffers (idle or wooded): Buffer of >1000 m and Land Use beyond buffer: Urban = 1, Row Crop = 1, Hay and Pasture = 1. Buffer of 250 - 1000 m and Land Use beyond buffer: Urban = 0.25, Row Crop = 0.5, Hay and Pasture = 0.8. Buffer of 50 - 250 m and Land Use beyond buffer: Urban = 0.1, Row Crop = 0.2, Hay and Pasture = 0.5. Buffer of 20 - 50 m and Land Use beyond buffer: Urban = 0.05, Row Crop = 0.1, Hay and Pasture= 0.25.	C.R.(7054)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4522	Upstream Buffers and Agricultural Land Use		No
4523	Inflow Water Quality: Invertebrate Indices	Area-weighted total of each bioMAP for streams (river mouth wetlands) and Reynoldson's Nearshore Index (open shore wetlands), and possibly on-site turbidity.	No
4524	First Emergence of Indicator spp or Ice Duration	Average emergence of an indicator species; average duration of ice cover.	C.R.(4857,4858)
4525	Quantity and quality of wetlands		No
4526	Quantity and quality of wetlands		No
4527	Quantity and quality of particular habitat		No
4528	Quantity and quality of particular habitat types (e.g. wetlands and spawning beds for desirable native species)		No
4529	Areal Extent of Wetlands (meadow-emergent area)		No
4530	Wetland Extent & Type Diversity (C.2)	Changes in aerial extent and diversity of vegetation types using aerial photos	No
4531	Hexagon-wide Areal Extent of Wetlands		No
4532	Wetland size, abundance		No
4533	Wetland habitat	Number and area	No
4534	Size, Position, and Number of Great Lakes Coastal Wetlands		No
4535	Wetland Size, Abundance, and Susceptibility to Threats Along its Border		No
4536	Areal Extent of Wetland Type		No
4537	Acres of shoreline wetlands with diverse submergent and emergent macrophyte growth that can provide spawning habitat for fish		No
4538	Changes in Area of Habitats or Vegetation Types Over Time		No
4539	Average Area per Wetland		No
4540	Area of relative % area of physical features of watershed based on mapping		No
4541	Number of Wetlands/Unit Area		No
4542	Mapping: Wetland Spatial Configuration		No
4543	Patch Size and Perimeter-to-Area Ratio	Measurements of patch areas and perimeters from aerial photos (GIS for large areas)	No
4544	Fractal Dimension (index of complexity of shapes on the landscape)	Calculation involving perimeter and area for patches on a digitized map	No
4545	Shape Index (perimeter vs perimeter of circle the same area)		No
4546	Patton's Diversity Index	A measure of the amount of edge within an area of given size from aerial photos	No
4547	Compliance with protection of wetlands		No
4548	Number of regulations relating to habitat protection		No
4549	Protection of the Collingwood Wetland Complex		No
4550	Amount of protected spaces versus total area		No
4551	Percent of land covered by historical property protection		No
4552	Habitat loss or restoration		No
4553	Rates of loss of particular habitat types		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4554	Loss in habitat/wetlands quality & quantity		No
4555	Acres restored to wetland condition - net gain		No
4556	Amount of habitat enhancement remediation		No
4557	Gains in habitat/wetlands quality & quantity (areas protected)		No
4558	Range of expansion or reduction of exotic and native species		No
4559	A Habitat Index based on concept of IBI (Index of Biotic Integrity)		No
4560	Resilience - time of recovery of system health following an extreme event/occurrence		No
4561	Interspersion of wetland vegetation and open water (wetland spatial config. - interspersion & water depths)		No
4562	Habitat Proportions (Cover Types)	Mapping and determining proportions of various land use or vegetation cover types in a landscape using remotely sensed data	C.R.(4521)
4563	Fish and wildlife habitat		No
4564	Presence of suitable fish habitat		No
4565	Quantity and quality of habitat throughout the life cycle for critical components of the food web; information about productivity and submerged vegetation may be useful		No
4566	Quantity and quality of habitat throughout the life cycle for critical components of the food web		No
4567	Effect of exotic species		No
4568	Measure of habitat connectiveness (roads, fences, canals, etc.)		C.R.(4521)
4569	Gamma Index of Network Connectivity	Ratio of links in a network to the maximum possible number of links in that network from remotely sensed data	No
4570	Structural Diversity (# veg communities/unit area)		No
4571	Abundance, Diversity, & Species Composition of Vegetation (C.3)	Other metrics: aerial cover, species richness, relative abundance, relative dominance, importance values, diversity, presence/ absence of indicator species, & spatial patterning	No
4572	Extent of submerged aquatic vegetation (distribution)		No
4573	Vegetation Structure		No
4574	Linear Classification & Physical Structure of Habitat	Vertical vegetation profile	No
4575	Permanent vegetation plots		No
4576	Biomass (or production) size spectrum		No
4577	Plant community characteristics (dominance & diversity of indicator species)		No
4578	Changes in Plant Community Characteristics		No
4579	Status of plant communities		No
4580	Status of Plant Communities		No
4581	Productivity/ Population Viability - Plants:	Pitcher's Thistle in low dunes, Lake Huron Tansy	No
4582	Plant performance		No
4583	Status of individual plant species		No
4584	Status of Individual Plant Taxa		No
4585	Leaf Area, Solar Transmittance, & Greenness	Changes in canopy characteristics (e.g., premature leaf drop and yellowing of leaves) and solar transmittance	No
4586	Algae blooms		No
4587	August diatom to blue green algae ratio		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4588	Chlorophyll a (as indicator of nuisance algal growth)		No
4589	Number of species present from a selected list of conservative wetland obligate marsh species		No
4590	Floristic Quality Assessment		No
4591	Number of species present from a selected list of weedy marsh species	Selected list includes: flowering rush, great hairy willow-herb, common frogbit, yellow iris, purple loosestrife, Eurasian water milfoil, curly pond weed	No
4592	Index of amount and extent of plant detritus (depth of litter above soil)		No
4593	Marsh Monitoring Program (presence of indicator bird and amphibian species)		No
4594	Results of Breeding Bird Survey		No
4595	Biodiversity Measurements		No
4596	Biotic Community Indices		No
4597	Shannon and Simpson Index		No
4598	Changes in Richness - types of organisms with respect to air/water/land interfaces		No
4599	Species Richness and Berger-Parker		No
4600	Species richness (maintain healthy commercial and recreational fisheries)		No
4601	Species Diversity (alpha, community) (wildlife)		No
4602	Status of basin diversity		No
4603	Regional Diversity (Beta, ecosystem)		No
4604	Changes in Faunal Community Characteristics		No
4605	Integrity of biotic communities		No
4606	Percentage of optimum population density - specific species		No
4607	Presence and relative abundance of key aquatic species		No
4608	Change in keystone or unique species		No
4609	Changes in unique species		No
4610	Demographics: Animals	Age structure, sex ratio, fertility, mortality, survivorship, and dispersal of keystone species	No
4611	Presence and abundance of selected key species within the food web, including a top predator, a mid-trophic level species, and a species at the food base		No
4612	Productivity of certain species - bald eagle, black bear		No
4613	Trophic structures and flux / Number/abundance/status of species representing various trophic levels or guilds		No
4614	Wildlife populations	Species and population	No
4615	Self-sustaining indigenous species, survival, growth, and food habits		No
4616	Presence of Rare, Threatened, or Endangered Species	Selected list includes: Wood Turtle, Blanding's Turtle, W. and N. Ribbon Snake, Queen Snake, E. Massasauga	No
4617	Number and abundance of endangered native species, incl. fish, waterfowl, plants and invertebrates		No
4618	Threatened or endangered species or habitats		No
4619	Population density of provincially significant bird species		No
4620	Population Characteristics of Economically or Socially Valuable Wetland Species		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4621	Presence of Characteristic Species with Narrow Environmental Tolerances		No
4622	Status of Species Typical of a Great Lakes Wetland		No
4623	Detection of new species and establishment of self-sustaining populations		No
4624	Natural reproduction		No
4625	Costs of exotic species		No
4626	Presence and abundance of non-indigenous species		No
4627	Status of Exotic Species		No
4628	Native species loss (# native species)		No
4629	Rates of extinction		No
4630	Number and abundance of native species vs introduced or invading species		No
4631	Non-native species (stressor and effect)		No
4632	Cumulative number and abundance of exotic species introduced		No
4633	Presence and Abundance of Invasive Species		No
4634	Population densities of wildlife including waterfowl		No
4635	Relative Abundance: Animals	Presence of certain water bird species; usefulness of other classes of animals being evaluated	No
4636	Migrating waterfowl counts		No
4637	Number of pairs of colonial waterbirds		No
4638	Population size		No
4639	Reproductive potential (egg size, clutch or brood size)		No
4640	Productivity (young produced and raised to independence)		No
4641	Neotropical bird abundance and diversity		No
4642	Productivity Metrics - Birds	Bald Eagle, 1200 northern breeding pairs -- minimum production of 1.0 young per nest; terns, Black-crowned Night-Heron, cormorants -- nest production	No
4643	Stress Resistance - Birds	Bald Eagles (for northern Lake Michigan), terns, Black-crowned Night-Herons -- genetic diversity, disease incidence, immune function, stress biomarkers	No
4644	Age structure of the population		No
4645	Productivity Metrics - Insects	Biomass by species or guild (emergent, sediment-dwelling, surface, etc.)	No
4646	Amphibian abundance, species richness, and species composition		No
4647	Productivity Metrics - Amphibians	# of Mud Puppy egg masses and % hatching; # of larvae and survival, # of adults	No
4648	Stress Resistance - Amphibians	Mud Puppy -- genetic diversity, disease incidence, immune function, stress biomarkers	No
4649	Amphibian Assemblage Diversity		No
4650	Productivity Metrics - Reptiles	# of Snapping Turtle eggs and # of Painted Turtle eggs; # of adult Snapping Turtles and # of adult Painted Turtles; incidence of dead embryos and deformities	No
4651	Stress Resistance - Reptiles	Snapping Turtles and Painted Turtles -- genetic diversity, disease incidence, immune function, stress biomarkers	No
4652	Reptile Assemblage Diversity		No
4653	Productivity/ Population Viability - Mammals	Mink -- # of offspring and survival, incidence of dead embryos and deformities	No
4654	Stress Resistance - Mammals	Mink -- genetic diversity, disease incidence, immune function, stress biomarkers	No
4655	Ungulate range in the Lake superior basin		No
4656	Number and saturation of niches present		No
4657	Faunal indicators of disturbed habitat		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4658	Population Survival & Mortality		No
4659	Benthic invertebrates (avoid destructive land-water linkages)		No
4660	Shift in oligochaete assemblages & midges, fingernail clams, mayflies, amphipods, indicative of eutrophic environment to mesotrophic environment		No
4661	Benthos		No
4662	Acute and chronic toxic effects on benthic community absent		No
4663	Bioassay of benthic community show end points comparable to controls		No
4664	Benthic biomass ranging from 25 to 50 g/m wet weight of benthos		No
4665	Population densities of mesotrophic species		No
4666	Benthic community structure not significantly different from control sites of desirable physical and chemical characteristics		No
4667	Sediment Particle Size Distribution		No
4668	Aquatic Invertebrate community - multiple metrics		No
4669	Aquatic insect emergence rate (# tax & indiv. / unit time)		No
4670	Deviation from expected benthic community		No
4671	Paleoindicators		No
4672	Macroinvertebrate Abundance, Biomass, & Species Composition		No
4673	Soil & Aquatic Microbial Community Structure		No
4674	Reach specific & basin-wide fish assemblage assessment: species composition, relative abundance, movement, critical habitat identification		No
4675	Species: Northern Pike, Yellow Perch, Brown Bullhead		No
4676	Fish Community Stability		No
4677	Shift from a fish community indicative of eutrophic environment to a self-sustaining community		No
4678	Ratio biomass piscivores to prey fish biomass		No
4679	Proposed nearshore biomass (kg/ha): piscivores 40-60; specialists: 70-100; generalists 30-90		No
4680	Fraction of salmonine production comprising naturally produced fish		No
4681	Balanced fishery and nutrients		No
4682	Increase the (fish) species richness from 4 to 6-7 per transect		No
4683	Abundance/Biomass (fish)		No
4684	Species Abundance/Diversity (fish)		No
4685	Diversity (fish)		No
4686	Pelagic: Benthic Ratio (fish)		No
4687	Increase the native (fish) species biomass from 37% to 80-90% of the total biomass		No
4688	Percent Exotics (fish)		No
4689	Percent of Rough Fish (Biomass) in Community		No
4690	Percent Phytophils (fish)		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4691	Predator:Prey Ratio (fish)		No
4692	Percent of Turbidity tolerant species in community (fish)		No
4693	Production of yield piscivores		No
4694	Hatchery production		No
4695	Viable recruitment		No
4696	Attain a littoral fish biomass of 200-250 kg/ha		No
4697	Reduce the spatial variability in fish biomass		No
4698	Healthy fish communities present indicating a viable plankton community		No
4699	Fish harvest statistics vs spawning biomass levels		No
4700	Fish harvest statistics vs. spawning biomass levels		No
4701	Fish catch		No
4702	Total standing stock/secondary production (fish)		No
4703	Commercial Fish Catches of Wetland-dependent Species		No
4704	Changes in sediment budgets, nutrient enrichment, toxic chemicals (BioMAP stream benthic index, Reynoldson's nearshore benthic index, % upland-wetland interface that is buffered)		C.R.(4516,4854,4855,4856)
4705	Acid loadings		No
4706	Quality/quantity of dredged material		No
4707	Loss of habitat specific to persistent toxics		No
4708	Model fate and distribution of suspended sediment/contaminant		C.R.(4516)
4709	Contaminant fate model - TOXIWASP		No
4710	Develop/improve DO modeling capabilities - DOSTOC, WASP		No
4711	Bioassays	Laboratory testing of pollutant effects on organisms	No
4712	Fish and wildlife bioassays confirm no significant toxicity from the water column or sediment contaminants / Contaminant levels in wildlife		No
4713	Algal bioassays show no significant differences in toxicity between harbour and control samples		No
4714	Chemical Contaminants in Water & Sediments		No
4715	Field monitoring of water column contaminants		No
4716	Toxins		No
4717	Levels of nutrients and persistent toxic chemicals		C.R.(4854, 4855, 4856)
4718	Concentrations of Nutrients and Toxic Substances		C.R.(4854, 4855, 4856)
4719	Levels of Persistent Toxic Chemicals		No
4720	Concentration of Persistent Toxic Substances in Biota		No
4721	Concentration of persistent toxic substances in biota		No
4722	Chemical Contaminants in Tissues	Contaminant bioaccumulation in plant and animal tissues	No
4723	Contaminant Accumulation (wildlife)		No
4724	Contaminant levels in tissue population growth rates and density in most sensitive species equal to that of control areas		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4725	Toxic contaminants in aquatic organisms		No
4726	Tissue Concentrations of Toxic Chemicals or Malformation in Fish and Wildlife		No
4727	Concentration of contaminants in fish		No
4728	Levels of toxic contaminants in fish		No
4729	White sucker - population characteristics, reproductive success, tumors, EROD/AHH or Caffeine Breath Test, BROD/PROD, Vitamin A stores, DNA damage, Plasma ALAD		No
4730	Abnormalities/Pathology in Brown Bullhead		No
4731	Contaminant Load in Brown Bullhead Fillet		No
4732	Toxic contaminant levels in selected fish species and in selected fish-eating birds		No
4733	Productivity Metrics - Birds:	Herring Gull contaminant levels	No
4734	Bald Eagle abundance and contamination		No
4735	Bald Eagle - population characteristics, reproductive success, chick growth, congenital abnormalities, eggshell thinning, Caffeine breath Test, Vitamin A stores in plasma, Plasma Thyroxine, Plasma ALAD.		No
4736	Contaminant Metrics - Birds	Bald Eagle (for northern Lake Michigan), terns, Black-crowned Night-Heron, cormorants -- concentration of contaminants, enzyme induction assays	No
4737	Herring gull or Black-crowned night heron - population characteristics, reproductive success, chick growth, congenital abnormalities, EROD/AHH or Caffeine breath Test, PROD/BROD, Vitamin A stores, Plasma Thyroxine.		No
4738	Double-crested cormorant - population characteristics, congenital abnormalities, eggshell thinning		No
4739	Contaminants in Feathers		No
4740	Contaminant Metrics - Plants	Pitcher's Thistle in low dunes; Lake Huron Tansy	No
4741	Contaminant Metrics - Amphibians	Mud Puppy -- concentration of contaminants, enzyme induction assays	No
4742	Contaminant Metrics - Reptiles	Snapping Turtles and Painted Turtles -- concentration of contaminants, enzyme induction assays	No
4743	Snapping turtle - Population characteristics, Reproductive success, Congenital anomalies, DNA damage		No
4744	Contaminant Metrics - Mammals	Mink -- concentration of contaminants, enzyme induction assays	No
4745	Mink - Population characteristics, Reproductive success		No
4746	Acetyl Cholinesterase - AChE (sub-organism)		No
4747	ALAD (sub-organism) (blood enzyme)		No
4748	Species health		No
4749	Detoxifying Enzyme Systems (sub-organisms)		No
4750	Species Specific Individual Pathology		No
4751	Gene Frequency		No
4752	Genetic Damage		No
4753	Immuno Assay (sub-organism)		No
4754	species specific Individual Diet		No
4755	Species-specific Individual Body Weight / Condition Index		No

Ind. code	Indicator name	Measure	SOLEC Indicator?
4756	Species - specific individual behaviour		No
4757	Natural Biological Stressors (e.g. count # muskrat houses in sample area)		No
4758	Morphological Asymmetry: Animals	Morphological variability in structure such as teeth and bones of bilaterally symmetrical organisms	No
4759	Biomarkers (broad indicator covered more specifically in next 8 indicators)	Organism response to human-induced stresses at the biochemical and cellular level before the stresses produce a detectable response at the organism and population levels	No
4760	DNA Alteration: Adducts	Lab analysis for DNA adducts indicating exposure to chemical(s); with sufficient toxicological information and identification of particular adducts, data obtained may be a diagnostic screening technique for environmental genotoxicity.	No
4761	DNA Alteration:Secondary Modification	Lab analysis for strand breaks in DNA; screening technique for exposure to any genotoxic chemical.	No
4762	DNA Alteration: Irreversible Event	Lab analysis for irreversible DNA alteration; screening technique that indicates subclinical expression of mutagenic damage.	No
4763	Cholinesterase Levels	Lab analysis for neurotoxic chemicals such as organophosphates and carbamates (insecticides).	No
4764	Metabolites of Xenobiotic Chemicals	Lab analysis for certain metabolites of xenobiotic chemicals in animals; confirms that toxicants have ent.ered cells and interacted with molecular targets.	No
4765	Porphyrin Accumulation	Lab analysis of porphyrins; patterns of accumulation may be used to predict action of chemicals within the pathway of heme biosynthesis, which is vital for maintaining adequate blood cell count; PCBs, Pb may disturb porphyrin metabolism in mammals & birds.	No
4766	Histopathologic Alterations	Extensive methodology exists for determination of tissue, cellular and subcellular responses as an indicator of exposure to a variety of anthropogenic pollutants	No
4767	Fish Consumption Advisories for Wetland-dependent Species		No
4768	Certain Health Problems Associated with Consumption Rates of Plants, Fish, or Wildlife from Coastal Wetlands		No
4769	Macrophage Phagocytotic Activity	Lab analysis of uptake of formalin-killed E. coli by macrophages; indicator of immune system capacity to destroy foreign material can serve as a useful sentinel of the health status of environmentally stressed organisms	No
4770	Water column nutrient levels		C.R.(4855, 4856)
4771	Nutrients in Water & Sediments		C.R.(4855, 4856)
4772	Nutrient diffusing substrates/periphyton		No
4773	Field monitoring of water column SOD		No
4774	Algal blooms, which characterize excess nutrient condition		No
4775	Concentration of total phosphorus		C.R.(4856)
4776	Loadings of phosphorus		C.R.(4856)
4777	Changes in recreational activity due to excess phosphorus		No
4778	Ambient phosphorus concentrations		C.R.(4856)
4779	Ambient phosphorus concentration in selected areas of the Great Lakes		C.R.(4856)
4780	Tributary nitrates concentration		C.R.(4780)
4781	Ratio of nitrogen to phosphorus		No
4782	Dissolved oxygen standard (nearshore)		No
4783	Costs for additional mitigation of nutrient loadings for increased point and non-point source control		No
4784	Set initial and final goals of phosphorus, ammonia and suspended solids net loading targets (kg/d)		C.R.(4516, 4856)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4785	Nutrient balance (ratio of ammonia & nitrates to total N, of SRP to total P at outlet and inlet)		No
4786	Standing Stock of Major Nutrients (CNP analysis of biomass)		No
4787	Sediment Nutrient Constituents		No
4788	Turbidity		C.R.(4516)
4789	Water quality of harbour and tributary streams		C.R.(4516, 4854, 4855, 4856)
4790	Aquatic Conditions, Diurnal DO/pH, Alkalinity, Temperature, Turbidity & (P/R)		No
4791	Organic Matter & Sediment Accretion (C.1)	Accumulation of both mineral and organic matter in wetlands	No
4792	Drainage (% original wetland drained within 1 km of 1997 boundary)		No
4793	Filling (% of 1955 extent that is filled)		C.R.(4521)
4794	Land use adjacent to wetland		C.R.(4521)
4795	Adjacent Land Use		C.R.(4521)
4796	Land-use Characteristics in the Vicinity of Coastal Wetlands		C.R.(4521)
4797	Changes in land use		C.R.(4521)
4798	Percent Land Use Classes within Hexagon		No
4799	Land uses and land-use practices, including the nature and extent of riparian vegetation, and information about land use zoning and watershed management plans		No
4800	Land-use changes, encroachment, development		C.R.(4521)
4801	Land Use Changes Upstream in the Watersheds of Coastal Wetlands with Inflowing Tributaries		No
4802	Landscape patterns		No
4803	Landscape Pattern (broad indicator covered more specifically in next 6 indicators)	Landscape indicators, calculated from remote sensing, describing the spatial distribution of physical, biological, and cultural features across a geographic area	No
4804	Contagion or Habitat Patchiness	Land-use and vegetation-cover data to calculate this indicator would be provided by EMAP-characterization	C.R.(4521)
4805	Landscape Stressors		C.R.(4521)
4806	Land form and distributary sensitivities; satellite imagery of flooding extent		No
4807	Encroachment/development basin-wide		No
4808	Land-use Changes, Encroachment/ Development Basin-wide		No
4809	Non-point source urban stormwater best management practices		No
4810	Roads (length of roadside abutting wetland)		C.R.(4521)
4811	Hexagon-wide Road Density		No
4812	Non-point source agricultural best management practices		No
4813	Restoration of agricultural land to fallow land		No
4814	Measures of stream-side buffers		No
4815	Riparian vegetation response modeling		No
4816	Buffer zones/forestry clear cutting practices - implications for aquatic and riparian communities		C.R.(4521)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4817	Shoreline Modification (% of shoreline-wetland interface that is modified)		C.R.(4521)
4818	Diking (% of total wetland area that is diked)		C.R.(4521)
4819	Littoral shorelines development		C.R.(4521)
4820	Modified shorelines (to provide cover for fish and wildlife)		C.R.(4521)
4821	Number of engineering land/water interfaces, such as hardened shorelines, dams, weirs and diversions		C.R.(4521)
4822	Number and extent of engineered land/ water interfaces, such as hardened shoreline (breakwalls), dams weirs, and diversions		C.R.(4521)
4823	Human-Use (proximity to channel used by motor boats, existing visitor statistic)		No
4824	Recreational Opportunities		No
4825	Proximity to Navigable Channels		No
4826	Proximity to Recreation Boating Activity		No
4827	Proximity to Navigable Channels and Recreational Boating Activity		No
4828	Dredging (distance to nearest)		No
4829	Land-use planning zoning, re-zoning		No
4830	Amendment of Official Town Plan (for habitat restoration)		No
4831	Number of Employed Persons in Activities Directly or Indirectly Related to Coastal Wetlands		No
4832	Quantity/quality of stream base flows		C.R.(4516)
4833	Quantity and quality of stream base flow		C.R.(4516)
4834	Sediment Supply and Transport (local expertise rating relative levels at each site)		C.R.(4516)
4835	Sediment Supply Characteristics		C.R.(4516)
4836	Streamflow/sedimentation (avoid destructive land-water linkages)		C.R.(4516)
4837	Accessible stream length		No
4838	Hydrologic Connectivity		No
4839	Hydrologic Connectivity with the Lake as Determined by the Presence of Dike Structures or Continuous Natural Barriers		No
4840	Annual Mean Water Level (from nearest station / level at time of fieldwork)		C.R.(4518)
4841	Water Level Regulation (years since regulated)		C.R.(4518)
4842	Hydroperiod	Number of days of inundation per year	No
4843	Water level fluctuation		C.R.(4518)
4844	Water-level Monitoring		C.R.(4518)
4845	Flooding and Dewatering of Wetland		No
4846	Monitor representative flow discharge, depth and velocity		No
4847	Model flow discharge, depth and velocity		No
4848	Ice and Storms (local knowledge to rate conditions at each site)		C.R.(4519, 4858)

Ind. code	Indicator name	Measure	SOLEC Indicator?
4849	Climate change (water depth/from nearest climate station their annual trend indicator for temperature compared to historical standard)		C.R.(4857, 4858)
4850	Protection from erosive forces		No
4851	Protection from Erosive Forces		No
4852	Changes in the Status of Protective Barriers such as Sand Spits or Barrier Beaches		No
4853	Incidents of spills, accidents, releases relating to use and transport of human controlled and human synthesized products		No
4854	Water Quality: Chlorides Flowing Into Coastal Wetlands	Average concentration of chlorides in all existing monitoring sites just upstream of coastal wetlands	No
4855	Water Quality: Nitrates Into Coastal Wetlands	Concentration of nitrate in all existing monitoring sites just upstream of coastal wetlands. Add average atmospheric loading using LRTAP monitoring?	C.R.(4860)
4856	Water Quality: Total Phosphorus Flowing Into Coastal Wetlands	Concentration of Total Phosphorus in all existing monitoring sites just upstream of coastal wetlands.	C.R.(4860)
4857	Climate Change: First Emergence of Water Lilies in Coastal Wetlands	The number of days after January 1 of first sighting of white on a water lily blossom.	Yes
4858	Climate Change: Ice Duration on the Great Lakes	Maximum percentage of Great Lakes area covered by ice each year.	Yes
4859	Reproductive output of mink	Measure DNA of mink tissue and scats collected in spring and fall.	No
4860	Nitrate and Total Phosphorus Into Coastal Wetlands	Concentration of nitrate and total phosphorus just upstream from, or in a set of, Great Lakes coastal wetlands.	Yes
4861	Water Level Fluctuations	For each lake: 1) Mean lake level; 2) Lake-wide annual range in monthly averages; 3) Lake-wide seasonal peak (days after January 1); 4) Lake-wide seasonal minimum (days after September 1); and 5) Elevation Difference between Upper and Lower Emergent Vegetation Extent based on Water Level model.	Yes
7000	Urban Density	Human population per square kilometre of existing and proposed development areas. Total area is adjusted to exclude parks and other designated greenspace.	Yes
7001	Efficient urban density	Non-residential density	C.R.(7000)
7002	Land Conversion	Percent change in land use type, including agriculture, urban development, and forest, marsh or other natural cover.	Yes
7003	Non-Agriculture land conversion	acres of land converted annually	C.R.(7002)
7004	Economically viable communities - downtown	vacant commercial locations	C.R.(7000, 7043)
7005	Economically viable communities-rural	vacant buildings	C.R.(7043)
7006	Brownfield Redevelopment	Total acreage of redeveloped brownfields.	Yes
7007	Resource Use	Energy/water per capita	C.R.(7056, 7057)
7008	Solid waste generation	tons of waste per capita	C.R.(7007)
7009	Water use per capita	litres per day per capita	C.R.(7007)
7010	Wastewater discharge	litres of wastewater per capita	C.R.(7007)
7011	Pollution Prevention	# of waste reduction programs	No
7012	Mass Transportation	Percent of commuters using public transportation.	Yes
7013	Traffic Congestion - cost	Average commuting cost per capita	C.R.(7012)
7014	Mass Transit	% commuters on public transit	C.R.(7012)
7015	Efficient transportation	% of goods moved by fixed link or water	C.R.(7012)
7016	Health care expenditures	dollars spent per capita	No
7017	Pollution Levels	Air index, wastewater and solid waste per capita	C.R.(7058, 7059, 7060)
7018	Beach closings	% days that beaches are closed	C.R.(7017)
7019	Environmental land legacies	# landfills and other sites	C.R.(7006)
7020	Water discharge quality	concentration of contaminants	C.R.(7017)
7021	Environmental illness and mortality	% change in mortality and morbidity	No
7022	Fish advisories	number of restrictions	C.R.(7017)
7023	Outdoor recreation - opportunity	% developed land available for recreation	C.R.(7042)
7024	Outdoor recreation	average % hours spent on leisure	C.R.(7042)

Ind. code	Indicator name	Measure	SOLEC Indicator?
7025	Crime rate and social fabric	% change in crimes	C.R.(7042)
7026	Traffic accidents	% change in accidents	C.R.(7012, 7042)
7027	Loss of Natural Features	% of land protected, % forest change, status of breeding birds and other endemic species	No
7028	Sustainable Agricultural Practices	Number of Environmental and Conservation farm plans in place.	Yes
7029	Non-agriculture land loss	acres of natural land lost	C.R.(7027)
7030	Wildlife loss	population losses	C.R.(7027)
7031	Forest clearing	acres clear cut	C.R.(7027)
7032	Forest restoration	acres successfully replanted	C.R.(7027)
7033	Mineral extraction	new acres used for mining	C.R.(7027)
7034	Fisheries pressure	% of biomass harvested	C.R.(7027)
7035	Wildlife pressure	% of wildlife stock harvested	C.R.(7027)
7036	Land hardening	# acres paved or permanently covered	C.R.(7027)
7037	Chemical use - agricultural	Tons pesticide and fertilizer used	C.R.(7017)
7038	Chemical use - non-agricultural	Tons of pesticide and fertilizer use - non-agricultural	C.R.(7017)
7039	Conservation practices	number of acres using conservation	C.R.(7028, 7017,7027)
7040	Contaminated areas	acres contaminated by landfills and other sites	C.R.(7027, 7006)
7041	Cottage and second home development	# of new second homes	C.R.(7002, 7027)
7042	Aesthetics	Amount of waste and decay around human activities.	Yes
7043	Economic Prosperity	Unemployment rates within the Great Lakes basin.	Yes
7044	Public Infrastructure	Infrastructure and facility investments	C.R.(7043)
7045	Cultural Heritage	Preservation of cultural heritage resources	C.R.(7042)
7046	Population Change	Growth or decline in urban or rural areas	C.R.(7000, 7042,7043)
7047	Aboriginal Communities	Number and extent in the Basin	C.R.(7042)
7048	Biodiversity	Changes in areas of natural/semi-natural habitats	C.R.(7027)
7049	Beauty/Aesthetics	Number of comm. environment improvement schemes	C.R.(7042)
7050	Building Permits	Number of permits issued annually	C.R.(7000, 7002)
7051	Human Impact	Measure of damage or remediation	C.R.(7017, 7002,7007)
7052	Reinvestment of Natural Capital	Social resources to maintain natural resources	C.R.(7043, 7007)
7053	Green Planning Process	Number of municipalities with environmental and resource conservation management plans.	Yes
7054	Ground surface hardening	Percentage of land that is covered by buildings, roads, parking lots and other hardened surfaces.	No
7055	Habitat Adjacent to Coastal Wetlands	Land use within 1 kilometre (km) inland of a representative set of coastal wetlands, measured as a weighted score determined by multiplying the wetland perimeter (km) in each land use by an associated weighting factor and dividing by the total upland perimeter (km) of the wetland.	Yes
7056	Water Withdrawal	Water use per capita in the Great Lakes basin.	Yes
7057	Energy Consumption	Energy use in kilowatt hours per capita.	Yes
7058	Ground Level Ozone	Total number of days the ground level ozone standard is exceeded on an annual basis in the Great Lakes region.	C.R.(4176)
7059	Wastewater Pollution	Loadings of metals, phosphorus, BOD and organic chemicals that are released by municipal sewage treatment plants and industrial direct dischargers, into water courses in the Great Lakes basin.	Yes
7060	Solid Waste Generation	Amount of solid waste generated per capita (tons and cubic metres).	Yes
8000	Threatened species	% of known bird species threatened	No
8001	Threatened species	% of known mammal species threatened	No
8002	Threatened species	% of known reptile/amphibian species threatened	No
8003	Threatened Species	% of vascular plant species threatened	No
8004	Protected areas	number of sites	No
8005	Protected area	Total size	No
8006	Protected area	% of territory	No
8007	Protected area	Per capita: km2/1000 inhabitants	No
8008	Key species	Presence/abundance of key species	No
8009	Habitat types	Quantity and quality of habitat types	No

Ind. code	Indicator name	Measure	SOLEC Indicator?
8010	Endangered species	Number and abundance of endangered species	No
8011	Biological community integrity	Cumulative number and abundance of exotic species	No
8012	Contaminant levels	Toxic contaminant levels in selected species	No
8013	Habitat quality	Quantity/quality of habitat for critical food web	No
8014	Stream flows	Quantity/quality of stream base flow	No
8015	Engineered shorelines	Number/extent of engineered land/water edges	No
8016	Riparian vegetation	Nature/extent of riparian vegetation	No
8017	Land use	Land use zoning	No
8018	Exotic species	Range expansion or reduction of exotic/native spp.	No
8019	Exotic species	Establishment of new self-sustaining populations	No
8020	Biological community integrity	Rates of extinction of species	No
8021	Exotic species	Warning/prevention/control programs in place	No
8022	Productivity of selected species	Productivity of bears, bald eagles	No
8023	Habitat connectedness	Number of barriers - roads, rail, canals, etc	No
8024	Habitat restoration	Acres of habitat type restored	No
8025	Habitat disturbance	Quantity/quality of dredged materials	No
8026	Species richness	Changes in richness or types of organisms	No
8027	Change in keystone or unique species	Population change of selected species	No
8028	Optimum population density	% of optimum density for selected species	No
8029	Landscape patterns	Changes in patterns of land use in each ecoregion	No
8030	Integrity of biotic communities	Extent of community stability under stress	No
8031	Significant bird species	Population density of significant bird species	No
8032	Density of worms	Quantity/species diversity of earthworms	No
8033	Physical features distribution	Area or % of physical features	No
8034	Habitat index	Habitat index based on IBI concept	No
8035	Habitat regulations	Number of regulations for habitat protection	No
8036	Sensitive habitats	% of sensitive habitats protected	No
8037	Habitat enhancement	Amount of habitat enhancement or remediation	No
8038	Permanent vegetation plots	Changes in composition/health of vegetation	No
8039	Colonial waterbirds	Number of pairs of colonial waterbirds by species	No
8040	Wildlife reproductive potential	Egg size, clutch or brood size for selected spp	No
8041	Wildlife productivity	Number/% of young raised to independence	No
8042	Wildlife age structure	Age structure of selected wildlife populations	No
8043	Wildlife contaminants	Contaminant levels in robust wildlife species	No
8044	Wildlife niches	Number and saturation of niches present	No
8045	Native/exotic species	Number/abundance of native vs exotic species	No
8046	Bald eagle recovery	Abundance and contamination of bald eagles	No
8047	Fish-eating birds	Contaminant levels in young gulls and cormorants	No
8048	Ungulate range	Proportion of historical range or range shifts	No
8049	Amphibian populations	Status and trends of amphibian populations	No
8050	Marsh birds	Status and trends of marsh bird populations	No
8051	Mink contamination	Contaminant loads in mink carcasses	No
8052	Neotropical birds	Abundance and diversity of neotropical birds	No
8053	Streamflow/sedimentation	Trends in streamflow patterns/sediment discharge	No
8054	Benthic invertebrates	Density/richness of invertebrates in streams/lakes	No
8055	Forest fragmentation	% closed-canopy, mean patch size, variability	No
8056	Accessible stream length	Total length or % of streams below first barrier	No
8057	Forest diversity	% forest types/total area and historical extent	No
8058	Forest diversity	% and extent of forest type and age class	No
8059	Protected forest	Area, % and representation in protected areas	No
8060	Species decline	Number of species occupying <50% of full range	No
8061	Forest conversion	Area of forest permanently converted to urban, etc	No
8062	Vegetation structural diversity	# of habitat types/unit area	No
8063	Shape index	Perimeter of habitat/perimeter of same area circle	No
8064	Plant community characteristics	dominance/diversity of indicator/rare/sensitive sp	No
8065	Floristic Quality Assessment	Natural quality scores based on total species list	No
8066	BioMAP	Stream benthic invertebrates rated for sensitivity	No
8067	Retention of shoreline species/communities	Rate of loss of selected species/communities	No
8068	Wildlife population viability	Pitcher's thistle, L. Huron tansy, dwarf lake iris	No
8069	Wildlife population viability	Insect biomass by species or guild	No

Ind. code	Indicator name	Measure	SOLEC Indicator?
8070	Wildlife population viability	# turtle eggs, dead embryos and deformities	No
8071	Wildlife population viability	Nest production of eagles, gulls, night herons,	No
8072	Wildlife population viability	mink # offspring, survival, dead/deformities	No
8073	Wildlife contaminants	Concentrations in turtles, fox snake, mink	No
8074	Wildlife contaminants	Concentrations in osprey, eagles, cormorant, terns	No
8075	Wildlife stress resistance	Genetic diversity, disease incidence, in species	No
8076	Wildlife stress resistance	Immune function, stress biomarkers in species	No
8077	Wildlife population viability	Species richness and Berger-Parker	No
8078	Wildlife population viability	Shannon and Simpson index	No
8079	Wildlife population viability	Amphibian assemblage diversity	No
8080	Wildlife population viability	Swink and Wilhelm Native Index for plants	No
8081	Wildlife population viability	Results from breeding bird surveys	No
8082	Habitat distribution	Area of cropland/pasture, woodland/woodlots	No
8083	Habitat distribution	Area of urban/industrial, golf courses	No
8084	Significant habitat types	Area of habitats designated by gov'ts or NGOs	No
8085	Lichen distribution	# and types of lichen species present	No
8086	Shoreline development	% of shoreline developed/undeveloped	No
8087	Public access	% of shoreline length open to public access	No
8088	Degree of roadlessness	Total length of roads within 3 km of shore	No
8089	Small watershed quality	% imperviousness	No
8090	Small watershed quality	# of mature trees per acre	No
8091	Reptiles/amphibians	Population trends, species diversity	No
8092	Reptiles/amphibians	# of species with deformities over 10% population	No
8093	Threatened species	Species added/removed; up/downgraded	No
8094	Threatened species	Recovery plans completed/needed	No
8095	Threatened species	Species on track to recovery/getting worse	No
8096	Development pressure	# housing units, hotel rooms built	No
8097	Development pressure	Real estate land values	No
8098	Development pressure	Population density	No
8099	Development pressure	Trends in #, type of building permits	No
8100	Development pressure	Lot sizes along lakeshore	No
8101	Wildlife population viability	Density of deer populations	No
8102	Forest quality	% land base in conifer vs aspen	No
8103	Climate change	Changes in sand spit patterns on Apostles	No
8104	Special communities health	Heinz emerald dragonfly	No
8105	Special communities health	Eastern hemlock population trends	No
8106	Special communities health	Winter wren, veery, prairie warbler, wood pewee	No
8107	Agricultural land use	Area of farmland within 5, 10 km of shoreline	No
8108	Agricultural land use	Farmland as % of total land	No
8109	Agricultural land use	% of cropland receiving fertilizer	No
8110	Agricultural land use: cropland intensity	Cropland as percentage of total land area, and trends over time. An alternative measure is cropland as percentage of total farmland, which is the common practice of the agricultural community. But it is useless in this latter form unless indicator 8111 (farmland intensity) is simultaneously available.	No
8111	Agricultural intensity	Farmland as percentage of total land area, and trends over time.	No
8112	Land use cover	% land cover by land use category	No
8113	Similarity to climax vegetation	Degree of similarity to potential (climax) vegetation	No
8114	Habitat Fragmentation	The pattern of natural habitat remaining within ecoregions/subsections, as measured by 1) area to perimeter ratio; 2) habitat patch size; and 3) percent intact cover.	Yes
8115	Riparian integrity	Extent and distribution of riparian vegetation	No
8116	Ecosystem diversity	% composition by forest type	No
8117	Soil quality/condition	Soil conditions for forest, rangeland, farmland	No
8118	Species abundance	Relative population levels of common species	No
8119	Species condition	Tree stand condition - insects, disease	No
8120	Status of endangered and threatened species	Known presence/absence, population levels	No
8121	Status of unique ecosystems/habitats	Presence/absence, condition	No
8122	Status of vulnerable ecosystems/species	presence/absence, condition	No
8123	Ecosystem services	Timber, carbon sequestration, recreation	No

Ind. code	Indicator name	Measure	SOLEC Indicator?
8124	Available resources	land area available for recreation, hunting, etc	No
8125	Pollution of terrestrial ecosystems	Air pollution, accumulation of toxics	No
8126	Soil erosion	Soil erosion potential, rates	No
8127	Urban sprawl	Developed lands, nighttime lights	No
8128	Nearshore threatened species	Number and proportion of nearshore species ranked as GI-G3 or S1-S3 in the Biological Conservation Database.	C.R.(8161)
8129	Area, Quality and Protection of Lakeshore Communities	Area, quality, and protected status of 12 special lakeshore communities occurring within 1 kilometre of shoreline.	Yes
8130	Habitat distribution	% land cover by habitat type <1km from shore	No
8131	Extent of Hardened Shoreline	Kilometres of shoreline that have been hardened through construction of sheet piling, rip rap and other erosion control shore protection structures. (Does not include artificial coastal structures such as jetties, groynes, breakwalls, piers, etc.)	Yes
8132	Nearshore Land Use	Land use types, and associated area, within 1 kilometre (km) of shore. Land use types could include urban residential, commercial, and industrial, non-urban residential, intensive agriculture, extensive agricultural, abandoned agricultural, closed-canopy forest, harvested forest, wetland and other natural area.	Yes
8133	Lake Level Fluctuations	Range, frequency and seasonal pattern of fluctuations in water levels on each of the Great Lakes.	C.R.(4861)
8134	Nearshore Plant and Animal Problem Species	Type and abundance of plant and animal problem species, including white sweet clover, leafy spurge, spotted knapweed, garlic mustard, white-tailed deer, and Brown-headed Cowbird, within 1 kilometre (km) from shore.	Yes
8135	Contaminants Affecting Productivity of Bald Eagles	1) Concentrations of DDT Complex, PCB, PCDD, PCDF and other organic contaminants and mercury and other heavy metals in Bald Eagle eggs, blood, and feathers; 2) number of fledged young produced; and 3) number of developmental deformities.	Yes
8136	Extent and Quality of Nearshore Natural Land Cover	Percent of natural land cover types within 1 km of the shoreline that meet minimum standards of habitat quality.	Yes
8137	Nearshore Species Diversity and Stability	The type and number of plant and wildlife species, and vegetation regeneration rates within the nearshore area, defined as the area within 1 kilometre (km) of the shoreline.	Yes
8138	Expected diversity	% of sites with >90% expected diversity/population	No
8139	Community / Species Plans	Number of plans that are needed, developed, and implemented to maintain or restore high quality, natural nearshore communities — those within 1 kilometre (km) of the shoreline — and federally/nationally listed endangered, threatened, and vulnerable species.	Yes
8140	Financial Resources Allocated to Great Lakes Programs	The total amount of dollars spent on an annual basis by federal and state/provincial agencies and non-governmental organizations in each of four areas: Great Lakes research, monitoring, restoration, and protection (including within nearshore lands).	Yes
8141	Shoreline Managed Under Integrated Management Plans	Percent of shoreline managed under an integrated shoreline management plan. An integrated shoreline management plan is one that includes consideration of coastal processes, aquatic habitat, and designates appropriate setbacks, etc. and is incorporated into local planning documents (e.g. a municipal Official Plan).	Yes
8142	Sediment Available for Coastal Nourishment	Measure of stream flow and suspended sediments at the mouth of major tributaries and connecting channels.	Yes
8143	Interior species	Density of interior forest/grassland species	No
8144	Agricultural land use: Key Best Management Practices (BMP)	There are many BMPs. This indicator should be an aggregate of key desirable practices related to (i) cropping and tilling (conservation- or no-tilling, crop rotation, cover crops, grassed waterways, strip or contour cropping, shelterbelts), (ii) use of farm chemicals and manure (decreased use of pesticides and fertilizer per unit area, integrated pest and nutrient management, etc.). At present, the aggregate indicator will be limited to those practices for which adequate data are available. Others (e.g. integrated pest management) should be included as they become available (e.g. through the census). Measures (good, indifferent, bad) include expert value judgments on how to weight the individual practices in the aggregate, and on what constitutes good or bad.	C.R.(7028)
8145	Forest certification	Acreage managed under forest certification	No
8146	Artificial Coastal Structures	The number and type of artificial coastal structures (including groynes, breakwalls, riprap, piers, etc) on the Great Lakes shoreline. Artificial coastal structures include structures that extend into shallow waters at an angle from the shoreline, or are placed offshore for the purpose of breaking the force of the waves. They are distinct from the hardened shoreline works described in indicator 8131, Hardened Shoreline, which modify the shoreline edge itself.	Yes

Ind. code	Indicator name	Measure	SOLEC Indicator?
8147	Contaminants Affecting the American Otter	1) Concentrations of heavy metals (e.g., Hg, Pb, Cd) found in hair, blood, liver, and brain of the American otter; and 2) concentrations of DDT and metabolites, PCBs/ PCDFs/PCDDs, Dioxin, and other organic contaminants found in fatty tissues, liver, and blood of the American otter.	Yes
8148	Nearshore endemic species	Number, extent and viability of endemic species populations within 1 kilometre of shore.	C.R.(8161)
8149	Protected Nearshore Areas	The percentage of the Great Lakes shoreline under various levels of protection in six classes as defined by the International Union for the Conservation of Nature (IUCN). The six IUCN classes are 1) strict protection, such as nature reserves and wilderness; 2) ecosystem conservation and recreation, such as national parks; 3) conservation of natural features, such as natural monuments; 4) conservation through active management, such as wildlife management areas; 5) protected landscapes/seascapes; and 6) managed resource protected areas, such as sustainable use areas.	Yes
8150	Breeding Bird Diversity and Abundance	Diversity and abundance of breeding bird populations and communities in selected habitat types, and an avian index of biotic integrity.	Yes
8151	Number, extent and viability of endemic species	Number, extent and viability of endemic species populations basin-wide.	C.R.(8161)
8152	Threatened species	Number and proportion of Great Lakes basin species ranked as GI-G3 or S1-S3 in the Biological Conservation Database.	C.R.(8161)
8153	Areas of land under formal land management plan (not completed)		No
8160	Agricultural Land Use: Livestock density	Number of livestock per unit area, weighted by amount of manure-nitrogen produced per head.	No
8161	Threatened Species	Number, extent, and viability of species ranked as GI-G3 or S1-S3 in the Biological Conservation Database.	Yes
9000	Acid Rain	1) Levels of pH in precipitation in the Great Lakes Basin, and 2) the area within the Great Lakes basin in exceedance of critical loadings of sulphate to aquatic systems, measured as wet sulphate residual deposition over critical load (kg/ha/yr).	Yes
9001	Atmospheric Visibility: Prevention of Significant Deterioration	Percentage of daylight hours per year which have <10 km Visible Range (for relative humidity values < 80% and no observed weather codes from synoptic observations).	No
9002	Exotic Species	This indicator will assess the presence, abundance and distribution of invasive exotic species in the Great Lakes basin ecosystem and their impacts on ecosystem functioning. *This indicator is under development.*	Under Consideration