

## ARTICLE XXI

The Agreement is amended by adding a new Annex 17 entitled "Research and Development" as follows:

## "ANNEX 17

## RESEARCH AND DEVELOPMENT"

"1. *Purpose.* This Annex delineates research needs to support the achievement of the goals of this Agreement.

2. *Implementation.* The Parties, in cooperation with State and Provincial Governments, shall conduct research in order to:

- (a) determine the mass transfer of pollutants between the Great Lakes Basin Ecosystem components of water, sediments, air, land and biota, and the processes controlling the transfer of pollutants across the interfaces between these components in accordance with Annexes 13, 14, 15 and 16;
- (b) develop load reduction models for pollutants in the Great Lakes System in accordance with the research requirements of Annexes 2, 11, 12 and 13;
- (c) determine the physical and transformational processes affecting the delivery of pollutants by tributaries to the Great Lakes in accordance with Annexes 2, 11, 12 and 13;
- (d) determine cause-effect inter-relationships of productivity and ecotoxicity, and identify future research needs in accordance with Annexes 11, 12, 13 and 15;
- (e) determine the relationship of contaminated sediments in ecosystem health, in accordance with the research needs of Annexes 2, 12 and 14;
- (f) determine pollutant exchanges between the Areas of Concern and the open lakes including cause-effect inter-relationships among nutrients, productivity, sediments, pollutants, biota and ecosystem health, and to develop in-situ chemical, physical and biological remedial options in accordance with Annexes 2, 12, 14, and sub-paragraph 1(f) of Annex 3;
- (g) determine the aquatic effects of varying lake levels in relation to pollution sources, particularly respecting the conservation of wetlands and the fate and effects of pollutants in the Great Lakes Basin Ecosystem in accordance with Annexes 2, 11, 12, 13, 15 and 16;
- (h) determine the ecotoxicity and toxicity effects of pollutants in the development of water quality objectives in accordance with Annex 1;
- (i) determine the impact of water quality and the introduction of non-native species on fish and wildlife populations and habitats in order to develop feasible options for their recovery, restoration or enhancement in accordance with sub-paragraph 1(a) of Article IV and Annexes 1, 2, 11 and 12;