

ATMOSPHERIC CHANGE AND BIODIVERSITY: COMMUNITY-BASED MONITORING IN CANADA

Community-Based Monitoring of biodiversity

Canada and the Smithsonian Institution in 1994 engaged in a partnership to detect changes in biodiversity. Based on the Smithsonian's tropical one-hectare plot monitoring protocols biodiversity. Based on the Smithsonian's tropical one-hectare plot monitoring protocols (SI/MAB), Canada has now established more than 80 SI/MAB plots in forest habitats, as the first step. Monitoring of the forest habitats is followed by monitoring other taxa such as birds, amphibians, earthworms, butterflies, aquatic and marine species.

Biological diversity monitoring has become a community effort across Canada at schools, conservation authorities, universities, biosphere reserves, parks and other long term protected areas. Volunteers, using standardized protocols and training, provide scientifically sound and audited observations of changes in biological diversity across chemical, climate and ecological gradients.

Toronto: The Climate Change Laboratory

Some of the warming effects, analogous to climate change, are already being experienced in Toronto due to the combined warming effects of global air masses, lake effects and urban heat island. For example, the minimum temperature in Toronto has increased by 4 C over the last century, a change that is expected to occur in other parts of Ontario under climate change by 2100. This temperature increase is suspected to be responsible for changes in the over-wintering of animal species, which appear to be staying longer in the fall and arriving earlier in the spring. Examples of migratory birds that are arriving earlier or staying longer include species such as, American Robin and House Finch. The number of species in the Christmas Bird Count has increased by 22 from 1960 to 2000. In addition, recent warmer winters have resulted in a number of animals over-wintering in Toronto, such as, Opossums, Northern Mocking Birds, Long-tail Ducks and Warblers.

Climate Change Experimental Site

The Association for Canadian Educational Resources (ACER) is developing a climate change experimental site to monitor the impact of warmer urban temperatures on biodiversity. ACER's experimental site is located at the Humber Arboretum, in northwestern Toronto. Information gathered on this one-hectare biodiversity plot by trained volunteers will document the response of native and warmer forest and herbaceous species. The observations for this site will help develop new plantings protocols and adaptive management practices under climate change.

In addition, biodiversity monitoring programs, using Smithsonian Institution (SI/MAB) protocols, are underway in Toronto's green spaces, and urban valleys.

Conclusion

Community-based monitoring along with scientific protocols and models provide an effective interlink with policy to assess the impacts of future atmospheric change on biodiversity.

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