Environment Canada's Greenhouse Gases Measurement Program - Summary of Progress to 2014

D. Worthy, S. Racki, R. Kessler, M. Ernst, L. Giroux, E. Chan and D. Chan

Environment Canada, Toronto, Ontario M3H 5T4, Canada; 416-739-4683, E-mail: Doug.Worthy@ec.gc.ca

Environment Canada's (EC) atmospheric GreenHouse Gas (GHG) measurement program currently conducts on-going accurate atmospheric measurements of CO_2, CH_4 and other GHGs from coastal, interior and high Arctic regions in Canada (Figure 1). The primary aim of the program is to use measurements, along with modeling to independently estimate anthropogenic (man-made - such as fossil fuels) and natural GHG sources (i.e. wetland/arctic emissions) and sinks (i.e. uptake of CO_2 in forests) in Canada. With the recent site expansions to the sub-arctic regions, sites located in discontinuous permafrost regions and near the boggy tree-lined transitional zone, EC's atmospheric observational program has positioned itself to detect/observe changes in natural emissions of CH_4 and CO_2 but also emissions of CH_4 and CO_2 from planned fossil fuel exploration, including natural gas fracking, in the foreseeable future.

In this presentation, a number of examples will be shown on how these measurements, along with modeling, are currently being used to evaluate anthropogenic methane and carbon dioxide emissions from the largest emissions areas in Alberta and Ontario as well on preliminary arctic methane emission estimates for the north western subarctic region in Canada.

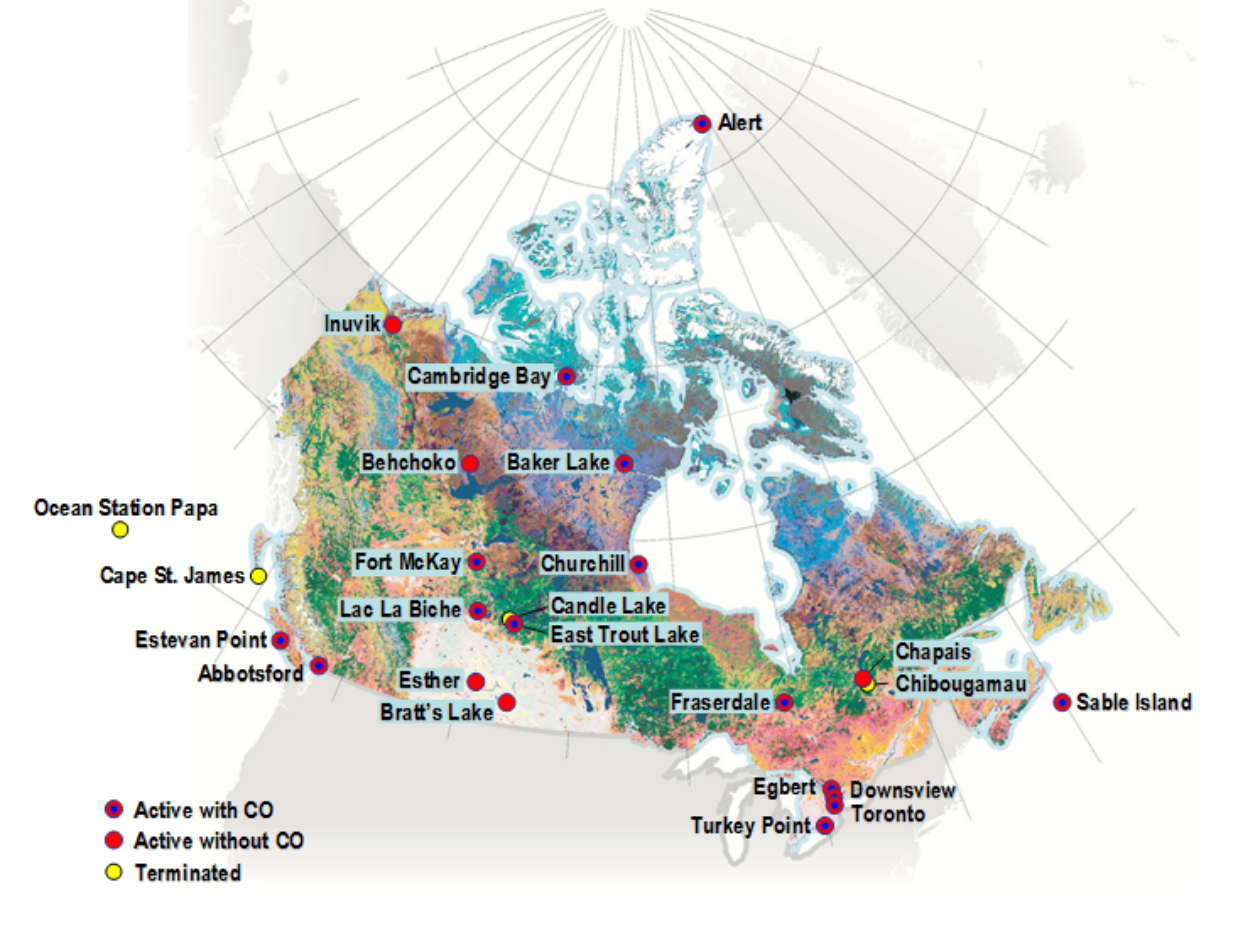

Figure 1. A map showing the location of the 20 *in situ* CO_2 and CH_4 observational stations in Canada, superimposed on a map of the vegetation eco-region distribution coverage in Canada. The 15 sites with blue dots have *in situ* CO_2, CH_4 and CO. Note sites shown in yellow were closed. Flask sampling for CO_2, CH_4, CO and N_2O and SF_6 is conducted at 14 sites.