



## **An inventory of chemical-species emitted from human and natural sources in Antarctica, and its inclusion in REMOTE to understand the transport patterns of these species.**

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A temporal record of human presence in Antarctica is assessed to understand the growth in traffic of activities. The flux-rate of species from human sources (power/heat generation, vehicles and ships) is computed using available fuel consumption estimates, and an extrapolation technique is applied to those sources whose fuel consumption estimates are not available. Depending on their operations, a separate emission inventory is prepared for each human source and for each month of year 2004. An emission inventory for natural volcanic (Mt.Erebus) for the year 2004 is also obtained through literature survey. However, only SO<sub>2</sub> inventory from natural and human sources, together with the meteorological data is included in the regional model (REMOTE) for simulations for December 2004. The total SO<sub>2</sub> emitted from research stations (power/heat generation & vehicles), shipping and Mt.Erebus activity in Antarctica for December 04, is approximately 23 Mg/month, 2030 Mg/month and 2229 Mg/month, respectively. A weekly evolution showing the transport patterns of SO<sub>2</sub> (from ships and Mt.Erebus) from model simulations is obtained for December 2004. The patterns of SO<sub>2</sub> obtained due to shipping indicate higher concentration of SO<sub>2</sub> at coastal and peninsular sites of Antarctica due to significant activity occurring in the vicinity, and consecutive transport of the specie to inner continental areas. The transport patterns of SO<sub>2</sub> from Mt.Erebus indicate higher concentration of the specie near the source and later, dispersion of the specie towards peninsular sites due to the effect

of wind. SO<sub>2</sub> from both these sources is found to be transported to relatively cleaner continental sites due to the effect of wind during a period of month.