VOC Measurements at Thompson Farm and Appledore Island during ICARTT 2K4

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A suite of hydrocarbons, halocarbons and alkyl nitrates were measured during the ICARTT 2004 campaign at two AIRMAP monitoring sites (Figure 1). Appledore Island (42°09’N, 093°44’W), 8 miles off the coast of NH and Thompson Farm (43°11’N, 070°55’W), 10 miles inland in Durham, NH. An automated GC system equipped with two electron capture detectors (ECDs) and two flame ionization detectors (FIDs) was used at Thompson Farm to sample ambient air at the top of a 60’telescoping tower (20 m) July 1 through August 13, 2004. Canister samples were returned to the laboratory for analysis by gas chromatography using FID and ECD in conjunction with mass spectrometry. Two proton transfer reaction mass spectrometers (PTR-MS) were deployed for VOC measurements at both sites.

**Urban Influence and Hurricane Charley**

On August 10th Appledore Island was influenced by a polluted air mass laden with black smoke and elevated levels of alkyl nitrates and halocarbons. The air mass was further characterized by high CO and O3 mixing ratios with peak values of 4000 and 100 ppbv, respectively. Back trajectory analysis indicates that the air mass traveled from the mid west to the east coast and up to the Mid-Atlantic US Coast (Figure 9a) and the residence time of the air at the site is less than 8 h. The PTR-MS data indicates that the elevated levels of alkyl nitrate and halocarbon concentrations were due to the presence of VOs in the air mass. The air mass was sampled on August 13th, 10 days after the event occurred. The lower CO mixing ratio of 1200 ppmv and lower elevated levels of halocarbons (Figure 9b) indicate that the air mass had been diluted and dispersed over a larger area.

**High Ozone at Thompson Farm**

On August 10th, ozone mixing ratios at Thompson Farm were 90-100 ppbv, close to peak values observed during the major high ozone event at Thompson Farm in 1997 (Figure 10a). During the peak ozone event, the air mass was transported from the midwest to New England in about 3 days. The air mass remained over Thompson Farm for 3 days, with peak ozone mixing ratios of 100-150 ppbv. The high ozone event at Thompson Farm was associated with a large high-pressure system that formed over the central US and moved east, bringing in air masses from the midwest that were rich in hydrocarbons and halocarbons.