

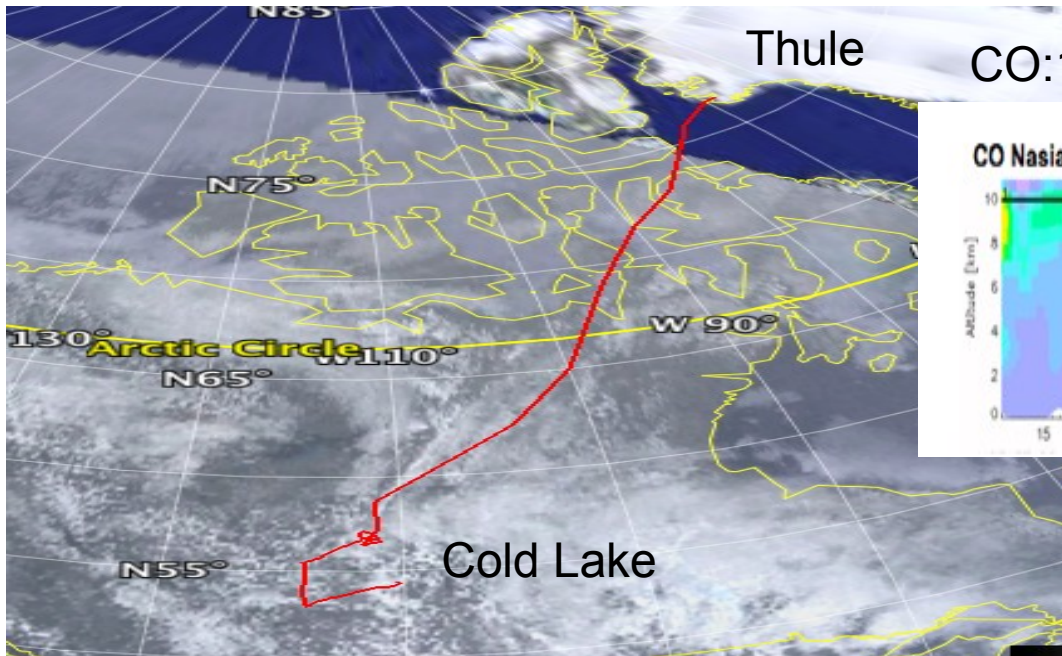
## **ARCTAS DC-8 Science Flight 23- (July 10, 2008; Thursday)**

This was the seventh ARCTAS DC-8 science flight that originated in Thule, Greenland and terminated in Cold Lake, Canada. The main objectives were to perform an inter-comparison with the P-3 and sample the air over Fort McMurry and Tar Sands area. The flight plan and a model forecast is shown in slide 2. Take off time was 1430 UT and the flight duration was 5.5 hours.

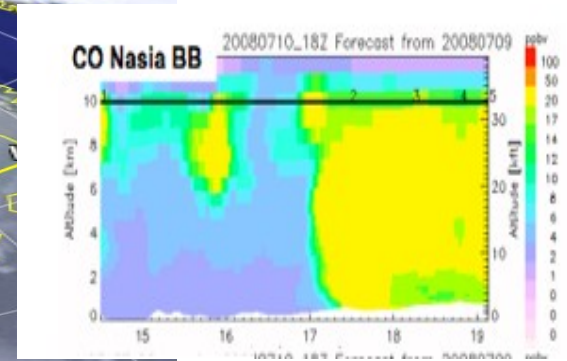
This was a successful flight that achieved all its objectives. Most instruments (except SP2) aboard the DC-8 performed normally and collected data. Major flow features at the surface included an occluded low off the southwest coast of Greenland and a series of weaker lows and frontal systems oriented east to west from just north of Saskatchewan to Alaska. The middle and upper tropospheric flow was quite complex due to numerous low pressure centers and a general lack of high pressure. Much of the eastern half of the flight track had only broken low level clouds. However, as we came closer to Cold Lake, the clouds became more convective in nature, and cumulonimbi were located over portions of Saskatchewan and Alberta, some producing severe weather.

After takeoff from Thule, the DC-8 headed in the southwesterly direction sampling and profiling between 20-30 Kft with occasional excursions to 10 Kft. The air in the initial leg was relatively clean with stratospheric influences at all levels down to 15 Kft (slide 3). Occasionally pollution was sampled between 20-30 Kft but CO almost never exceeded 160 ppb and smoke tracers (e. g. CH<sub>3</sub>CN) were minimally elevated. As per plan, the DC-8 met up with the P-3 at 1740 UT at 18 Kft to start the intercomparison leg for 15 minutes and then both platforms descended to 1 Kft AGL in formation. The DC-8 then circled Fort McMurry and the Tar Sands area and after completion of this loop both DC-8 and P-3 completed the 15 min surface (1 kft agl) intercomparison leg in formation. The intercomparison with P-3 was quite successful but air was generally clean and the dynamic range of constituents relatively modest. Over the Tar Sands area, not part of the inter-comparison, the DC-8 measured large concentrations of CH<sub>4</sub> (1900 ppb), SO<sub>2</sub> (70 ppb), NO<sub>y</sub> (10 ppb) as well as a number of highly reactive organics such as Xylenes. Both CO and O<sub>3</sub>, however, were only minimally elevated. After completion of the Fort McMurry run and P-3 intercomparison the DC-8 returned to Edmonton and subsequently to Cold Lake.

# Flight 23 July 10 Thule to Cold Lake



CO:160; O3: 40-100

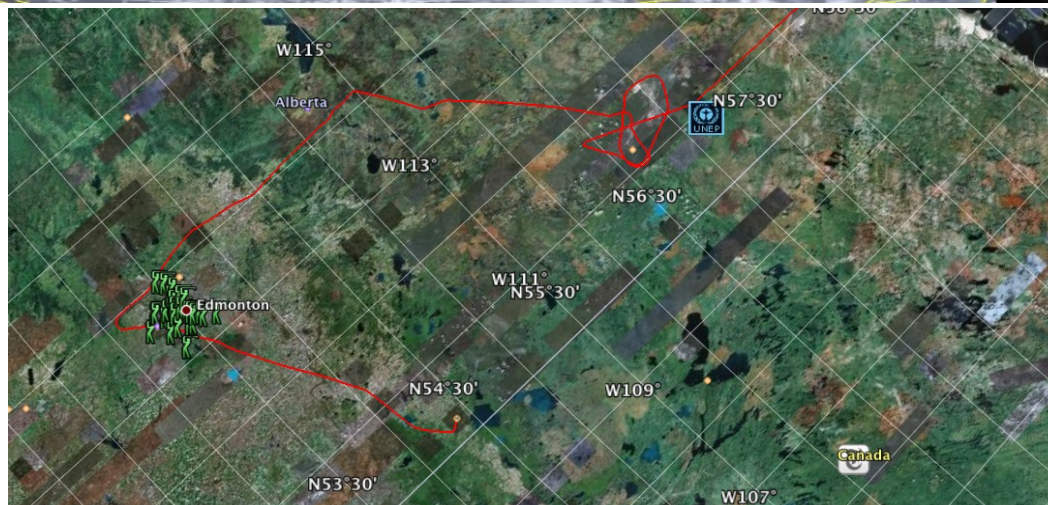


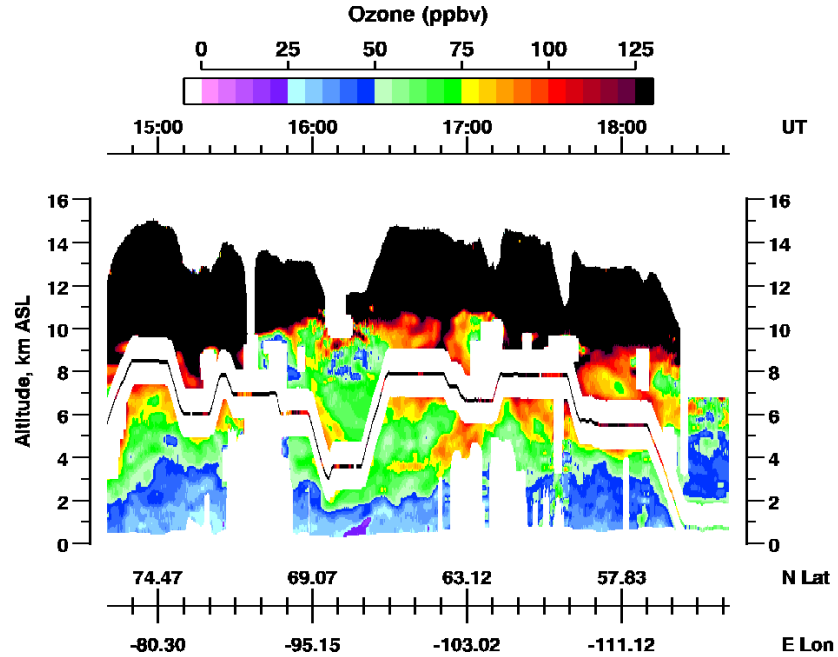
Model curtain

DC-8/P-3  
Inter-comparison

Fort McMurry/  
Tar Sands

Reactive HCs;  
SO<sub>2</sub>>50 ppb





## Thule to Cold Lake / DC8 Flight 23 / 10 July 2008

