



Supplement of

Summertime sources of dimethyl sulfide in the Canadian Arctic Archipelago and Baffin Bay

E. L. Mungall et al.

Correspondence to: J. Abbatt (jabbatt@chem.utoronto.ca)

The copyright of individual parts of the supplement might differ from the CC-BY 3.0 licence.

Contents of this file

Text S1 to S2
Figures S1 to S5

Introduction

This supporting information includes extra details on how the HR-ToF-CIMS data were collected (Figures S1 to S4) and processed (Text S1). Also included are supporting figures for discussion and interpretations (Figures S5 and S6).

Text S1.

HR-ToF-CIMS data processing

In the TofWare software (in Igor Pro), peaks were fit for the reagent ion, DMS and surrounding peaks (to account for isotope peaks). This was done on a daily basis both for the calibration files and the data files. Then, peak intensity as a function of time was exported to a new Igor Pro experiment.

Calibration files were put in their own Igor Pro experiment. At the end of the campaign, a linear interpolation of each day's sensitivity was made.

Each day of data was processed in a separate Igor file due to the large volumes of data (~1 GB per day). The background times, representing five minutes of every hour, were removed using an array generated during data collection indicating whether it was a background period or not. The five minute spaces were then filled in using the median of the surrounding values, and the backgrounds were interpolated between five minute periods. This allowed point-by-point background subtraction. The background subtracted array was then normalized point-by-point by the reagent ion intensity (divided point-by-point and multiplied by the mean value for that day).

At this point, the arrays for each day of the cruise were concatenated in another Igor experiment. The linearly interpolated calibration factors were applied point by point, generating an array of DMS mixing ratios in pptv.

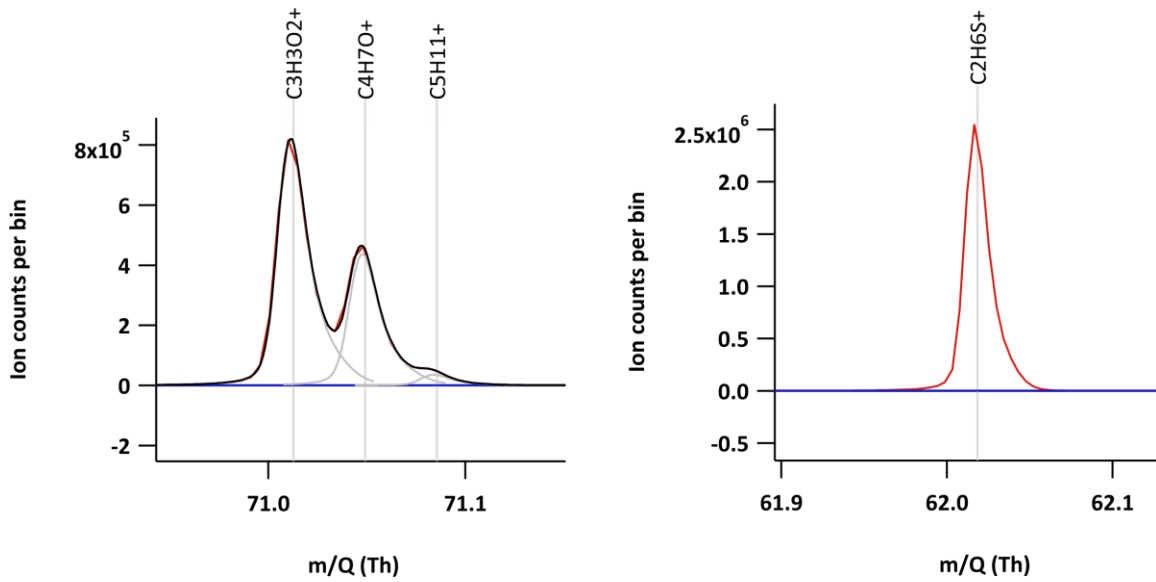


Figure S3. On the left, m/z 71 showing the high res peak fitting allowing separation of interfering masses. On the right, m/z 62 (DMS) showing that typically the DMS peak was free of interfering peaks. This was partly due to the large intensity of this peak (it was consistently one of the most intense peaks in the spectrum).

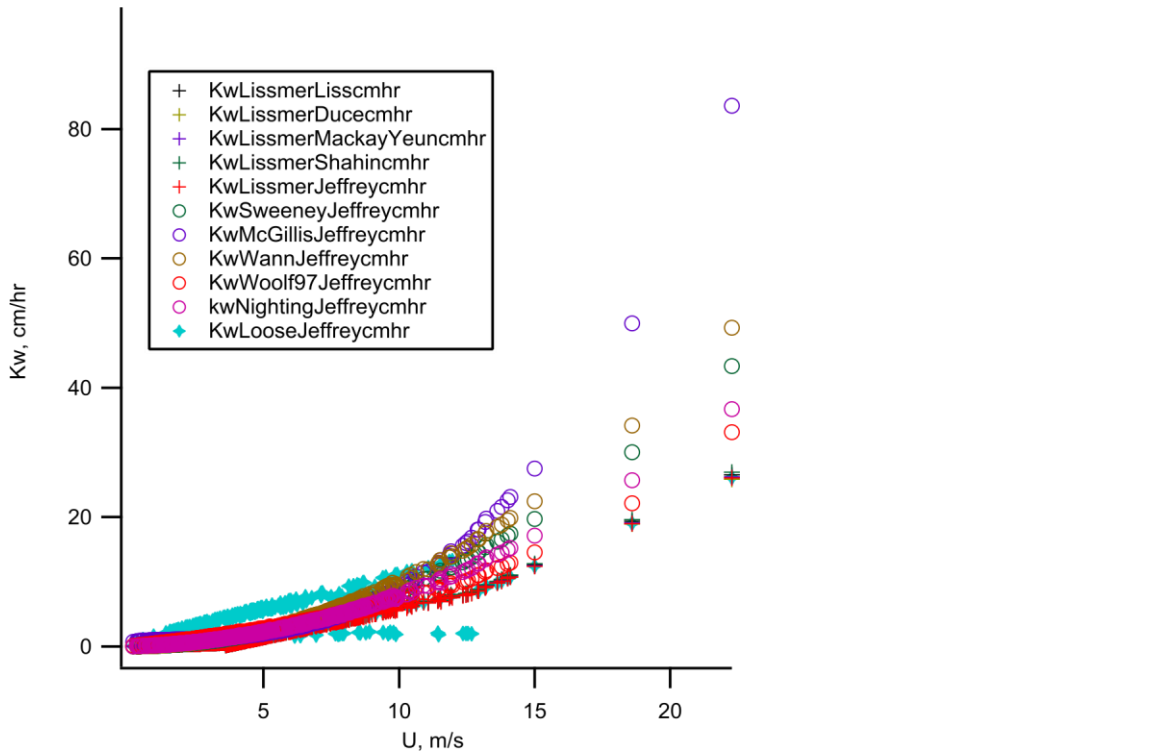
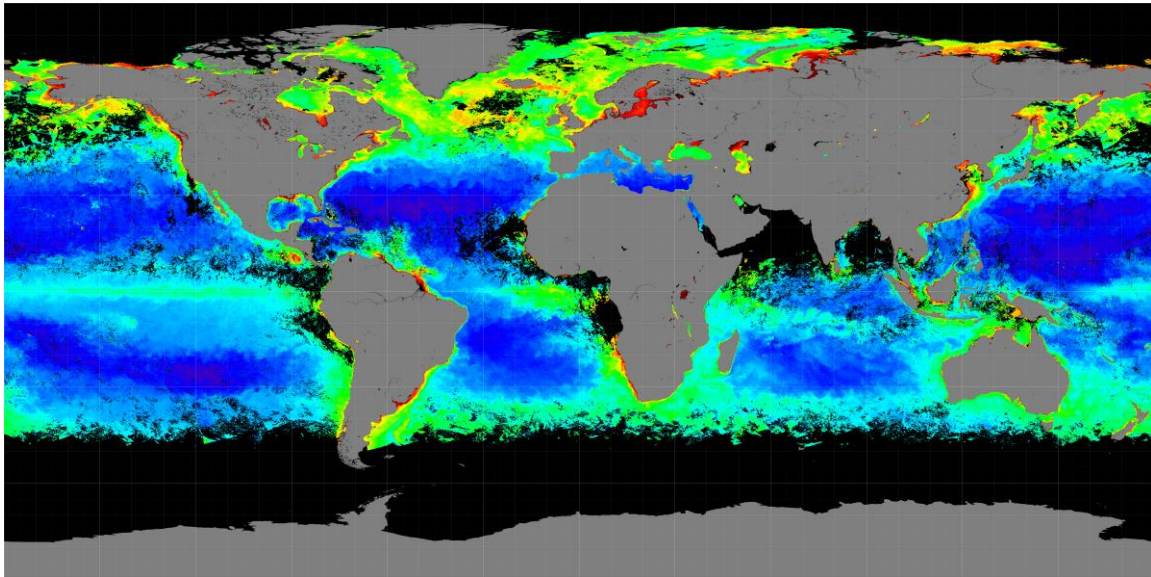


Figure S4. Air-water transfer velocities as a function of wind speed for all wind speeds observed during the cruise for each parameterization.



Figure S5. Melt ponds covered a large percentage of the sea ice to the west of the ship. This photo was taken on 23 July 2014 from the bridge of the CCGS Amundsen in Resolute Bay (facing Cornwallis Island).



Chlorophyll a concentration (mg / m³)

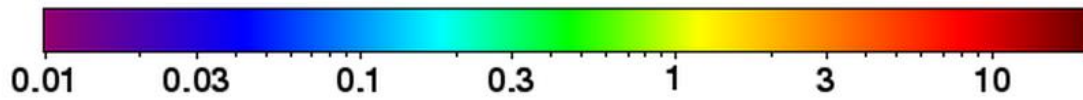


Figure S6. Global chlorophyll a concentration showing high chlorophyll a in lakes in Northern Canada. From the NASA Ocean Colour Web tool; monthly composite for July 2014. (<http://oceancolor.gsfc.nasa.gov>)