These data were collected on the CCGS Louis St. Laurent during **Beaufort Gyre Observing System (BGOS)** research cruises in 2014 in the Beaufort Sea area. The underway pCO_2 data collected using an equilibrator-infrared method (SUPER CO_2 system from Sunburst Sensors). Ancillary data for calculation of air-sea CO_2 fluxes include temperature, salinity, atmospheric CO_2, wind speed, and gas transfer velocity (calculated from Wanninkhof et al. (2009). Fluxes are not corrected for fractional ice-coverage.

The Shipboard Underway pCO_2 Environmental Recorder (SUPER-CO_2) utilizes a LICOR NDIR (non-dispersive infrared) analyzer coupled to a membrane contactor to equilibrate a gas stream to a flowing seawater sample stream. The membrane equilibrator was tied into the ship's seawater line at a set flow rate of ~1.0 liters/min. The SUPER-CO_2 uses a Windows based tablet; running custom software, developed by Sunburst Sensors, for instrument control, real-time data display and data collection. Two calibration standards (zero CO_2 and 740 ppm CO_2) were ran at least once per day for the duration of the cruise. The raw collected SUPER-CO_2 data was processed using a custom written Matlab QC program. The Matlab program calibrates the SUPER-CO_2 values to the CO_2 standards as well as temperature correcting the SUPER-CO_2 to the seawater surface temperature (Dickson, 2007). The reported data is interpolated at 5 minute intervals.

Identification of data columns:

SST (Sea Surface Temperature, Unit: Celsius, Precision: 0.000001): The temperature at the sea's surface.

SSpCO2 (SUPER CO_2, Unit: microAtmosphere, Precision: 0.0000001): Partial pressure of CO_2 at the sea's surface.

atmpCO2 (Atmospheric pCO_2, Unit: microAtmosphere, Precision: 0.0000001): The pressure of CO_2 in the atmosphere.

Flux (Unit: millimolesPerMeterPerDay, Precision: 0.0000000001): The flux across the air-sea surface.

Latitude (Unit: degree, Precision: 0.0000001): The latitudinal coordinates of the observation.

Longitude (Unit: degree, Precision: 0.0000001): The longitudinal coordinates of the observation.

Salinity (Unit: practicalSalinityUnit, Precision: 0.000001): The salinity at the coordinates.

Wind (Unit: metersPerSecond, Precision: 0.00000001): The velocity of the wind.

DateTime: The date and time.