2.2.1 CTD and rosette deployments

Onboard the CCGS Amundsen, a General Oceanic rosette equipped with a CTD (Seabird SBE-911+) was deployed at each sampling station (Fig. 1). The rosette was equipped with twenty-four 12-liter Niskin bottles. It was also equipped with a transmissometer sensor (WetLab), a PAR sensor (Biospherical), an oxygen sensor (SBE-43), a pH sensor (SBE-18), a nitrate sensor (Satlantic ISUS), a fluorometer (Sea Point) and an altimeter (Benthos). A 300 kHz, downward-looking L-ADCP (Lowered Acoustic Doppler Current Profiler) and a UVP 5 (Underwater Vision Profiler) were also mounted on the rosette frame. A surface PAR (Biospherical) was installed on the roof of the rosette control laboratory. The CTD was calibrated before and after the 2009 legs. The sensor data was quality-controlled using water sample after each leg. On August 5th, the pH sensor was replaced by a CDOM sensor (Haardt), a special fluorometer. Then rosette was restricted to the first 100 m because of the depth limits of the pH, PAR and nitrates sensors. Therese sensors had to be removed for the deeper stations. The ship-board sampling was supplemented with a 150 kHz SM-ADCP (Ship-Mounted ADCP), a MVP (Moving Vehicle Profiler), and a thermo-salinograph (mounted on the ship water intake).

4.2 Physical variables (temperature and salinity)

The sampling stations were organized into sections in the general shore-open ocean direction, except for section 100 across the mouth of the Amundsen Gulf. The seven sections are identified with three digits: 100, 200, 300, 400, 500, 600 and 700. The order in which the sections were visited dependent on the ice cover. The shelf region was not ice-free before mid-August. Biological and optical sampling were almost always restricted to the first 400 m of the water column. In the nighttime, the same stations were visited again to sample the whole water column as full profiles are needed by physical oceanographers. The LADCP data was processed according to according to Visbek (2002): an example is presented in Figure YGLP1. The processed LADCP data was later detided using the Arctic barotropic tidal model of Padman and Erofeeva (2004).

The first 100 m of sections 600 and 300, the two sections originating from the Mackenzie delta, are presented in Figure 4. They confirmed what was found by the water mass analysis (section 4.1): most of the fresh water is coming from the western part of the Mackenzie delta. The signature of an eddy may be observed in the salinity data at 70 °N, approximatively 70 km from shore.

**References**

Padman, L. and S. Erofeeva, 2004: A barotropic inverse tidal model for the Arctic Ocean,

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**Figure YGLP1. Optionelle.**

From left to right: horizontal velocities (solid red: U eastward; dashed green: V northward), temperature, salinity, nitrates and dissolved oxygen at Station M-09 (cast R0902022, on July 26).