Kemmerer Water Sampling Bottles

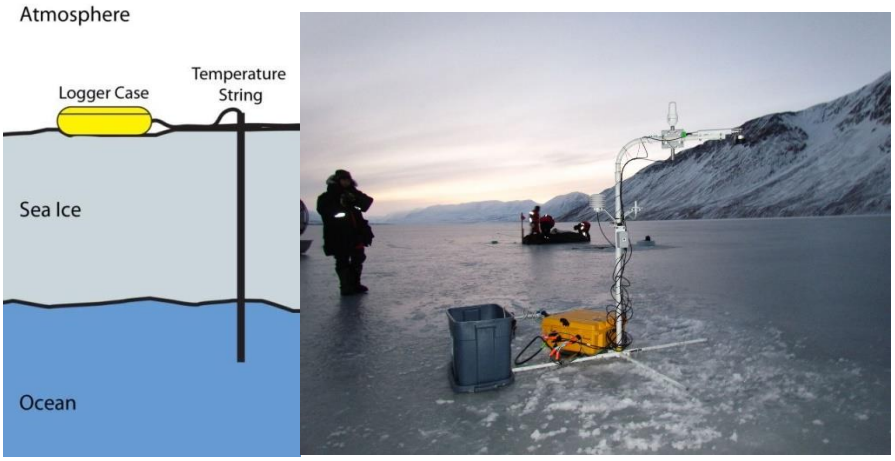
Water samples are collected from different layers of the water column using a Kemmerer bottle attached to a marked rope that is lowered into the ocean. Once the bottle reaches the desired depth, a messenger weight is dropped down the rope, closing the lid of the Kemmerer by tapping it on the top of the bottle. The Kemmerer bottle full of sample water is then pulled up to the surface and the water is subsampled into plastic bottles. These bottles are based on a design originally proposed by Arctic explorer Fridtjof Nansen over 100 years ago and first used in 1985 to sample water from different depths down almost 4 kilometers.

Ice Tethered Oceanographic Equipment:

Below provides a brief overview of the potential oceanographic mooring equipment that may be moored or attached to the land fast ice near the community of Chesterfield Inlet and Naujaat (**Note: the deployment of this equipment is dependent on consultations with the communities)

Ice Mass Balance (IMB) Buoys

An IMB measures thermodynamic ice growth and melt because of thermal gradients through the ice between the atmosphere and ocean. To do this the IMB consists of a temperature string that is frozen into the ice. This string of small temperature sensors measures the vertical temperature gradient from the atmosphere, through the ice and into the surface water. From this profile, you can infer ice growth when the temperature at a sensor of known depth falls below the freezing point. The system is also designed to be autonomous so it is powered by batteries and uses iridium communications to transmit data to an online data portal.



The schematic diagram (left) and photograph above shows the instrument frozen into the ice.

Conductivity and Temperature Probes:

Conductivity and temperature probes, such as the one shown in the picture below, are attached to a weighted rope and lowered into the water column and then the rope is secured to the ice. The sensors where remain in place until spring, measuring and recording the water temperature and salinity over the winter months. The location along the rope that each probe is attached to using hose clamps corresponds to a specific depth in the water column. The rope and instruments are secured to the landfast ice using ice screws and marked clearly so that 1) Local hunters are aware that there is something on the ice and 2) so that we can find the location of the instruments upon retrieval.

Above photograph of conductivity and temperature probes attached to a rope using hose clames, ready to be lowered into the water for the winter season.

Acoustic Doppler Current Profiler (ADCP)

An acoustic Doppler current profiler (ADCP) is a hydroacoustic current meter similar to a sonar, used to measure water current velocities over a depth range using the Doppler effect of sound waves scattered back from particles within the water column.

Above photograph of an ADCP attached to a mooring rope ready to be lowered into the water column through the sea ice.