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Beaufort Gyre Exploration Project: Dispatch 20: IBO Monday

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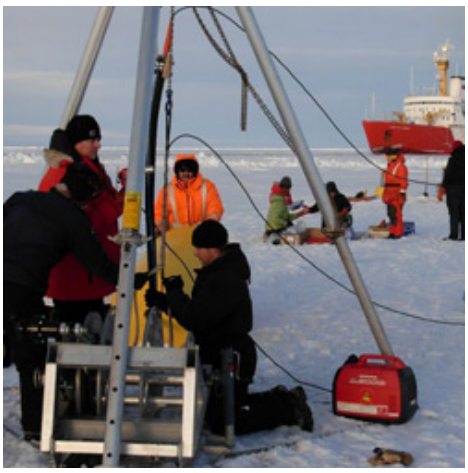

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An Ice-Based Observatory (or IBO) is a cluster of buoys deployed on the drifting sea ice that combined measure a variety of properties throughout the surface atmosphere, ice, and ocean. On this cruise, we will deploy two IBOs consisting of an ITP, Arctic Ocean Flux Buoy (AOFB), and Ice Mass Balance Buoy (IMBB). The second IBO will also include an O-Buoy (which will be addressed in a later dispatch). The ITP measures the seawater properties between 5 and 760 m below the surface. The AOFB measures turbulence between the ice-ocean interface, and the IMBB measures the ice properties, snow accumulation, and includes air temperature and barometric pressure sensors. All of these buoys transmit their information back via satellite telephone as they are unlikely to be recovered.

The first tricky part of deploying the IBO is finding an appropriate multiyear ice floe that is large enough so that the AOFB can be distributed away from ridges and the other buoys (for unpolluted turbulence measurements) and thick enough (1.5-3.5 m) to ensure longevity of the systems. However, the floe cannot be too thick either, due to the designs of the buoys and because we would be unable to auger the deployment holes through the ice. In August, identifying the proper floe is relatively easy as the bright sunshine, color of the melt ponds and lack of snow cover allow the thickness to be identified from the air. However, this time of the year this task becomes much more difficult, as the melt ponds are frozen and covered in snow, and visibility is poor in the dusky and snowy mornings. Global warming isn't helping either, as there is less and less multiyear ice to choose from each year. However, we have no choice but to fly, land, and auger holes until we find something suitable. We only have a couple of hours to work with, as the IBO deployments will take about 6 hours, and sunset is only 8 hours away. Today we were lucky, and found a decent site (1.8 m thick and approximately 300 m wide) on the second floe that we landed on.

While the IBO buoys are deployed, other scientists are on the ice floe measuring the ice thickness and properties of our chosen site. Passengers and cargo are transported to the ice by the helicopter, then the larger items are transported in sling loads. Six hours later, the operations are completed, and everyone is transported back to the ship. Just in the nick of time too, as the relatively nice afternoon turns bleak and cold.

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