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**The factors that influence the design of an underwater acoustic
modem for Arctic missions**

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As summer Arctic sea ice cover continues to reduce, there is a growing need to monitor the ice-ocean interface to aid in understanding and quantifying Arctic climate change. As part of the DAMOCLES EU 6th Framework programme, several subsea elements of a new Arctic Ocean observing system will be deployed in the Arctic Ocean during 2008.

To ensure that the observing system is effective, it is essential that measured data from the ocean environment be delivered in a timely fashion for assimilation with data sets from the ice surface and atmosphere. As several of the observing platforms are drifting freely in the water below the ice, there is a need to communicate data to the surface using underwater acoustic techniques.

We discuss the factors that influence the specification of an acoustic modem to achieve this data transfer. These include development of standards for data transfer and storage processes, standby power considerations, logistics of establishing a communication link, and under-ice acoustics.