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A circumpolar snapshot of the Southern Ocean by animal-born sensors.

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One major goal of the International Polar Year is to obtain the first circumpolar snapshot of the Southern Ocean environment to observe the sub-ice ocean circulation and water mass properties. New instrumentation developed by Sea Mammal Reasearch Unit (SMRU) can provide an important observation technique that compliments more commonly used observational approaches. This instrumentation was tested during the recent SEaOS project (Southern Elephant Seals as Oceanographic Samplers), an international and inter-disciplinary program using unique CTD samplers linked to Satellite Relay Data Loggers (SRDL) attached to Southern elephant seals (*Mirounga leonina*). They provided conductivity, temperature and depth (CTD) profiles from key areas around Antarctica, such as the Antarctic sea ice zone and frontal systems. During two years of deployments (2004 to 2005) these sensors demonstrated convincingly that they can record hydrographic data at high frequency and in near real-time from remote, relatively inaccessible parts of the ocean collecting more than 21000 profiles. A remote quality control system has been set up to correct possible sensor drifts by using historical hydrographic data resulting in a circumpolar set of calibrated hydrographic data with corresponding uncertainties. Large-scale features of the ACC are described using Argo data and data obtained by SRDLs. Merging those datasets yields to gridded fields of hydrographic data with high resolution in space and time, allowing a more detailed view into the ocean. As this dataset were sampled within the last 5 years it is compared to gridded fields using only data before 2000. The SEaOS project has convincingly demonstrated the feasibility of the approach and its value as an ocean observation system in polar regions. This approach will be continued and extended in the Marine Mammal Exploration of the Oceans Pole to Pole (MEOP) activity within

the IPY.