Documentation of digital still picture camera loggers deployments during DRE2015

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Documentation of under ice shelf photographs and dive depth profile data from Drescher Inlet (Riiser Larsen Ice Shelf) taken by seal mounted cameras during expedition DRE2015

Instrumentation
Weddell seals were instrumented with Infrared digital still picture camera loggers (Type Digital Still Logger DSL2000-VDTII and LED Flash Light, LIT2000 - 2LED-IR, Little Leonardo, Japan; *cf*. Naito et al. 2013 http://doi.wiley.com/10.1111/1365-2435.12083) in order to document their foraging behaviour under the shelf ice. Seals were immobilized (*cf.* https://doi.pangaea.de/10.1594/PANGAEA.857918) to achieve a reliable attachment and retrieval of the archival tags. The still picture camera loggers provided a total of 3,454 (DRE2015_wed_a_f_01) and 15,027 (DRE2015_wed_a_m_04) images, in 15 and 5 s resolution respectively, as well as concurrent dive depth profile data in 1 s resolution.

Validation of image data
155 (DRE2015_wed_a_f_01) and 128 (DRE2015_wed_a_m_04) images were subject to objects exposed to infrared or ambient light and archived (see collections).

Processing of depth readings during exposure
Dive data recorded by seal mounted cameras revealed a visible short deviation during exposure every time a picture was taken. The outlying depth values were removed and replaced with interpolated ones based on the preceding and succeeding values of the respective depth recordings.

Processing of depth readings at sea surface
Dive data recorded by seal mounted cameras revealed a visible deviation at the water-air interface. A zero offset correction method was therefore applied to account for the deviation between the surface (i.e., 0 m) and the recorded deviated depth values, following Heerah et al. (2014) http://dx.doi.org/10.1371/journal.pone.0099329. For this, we created a running window of one hour and considered the modal depth of all depths less than 20 m within this window to adequately represent the sea surface. We then corrected all dive depths within the one-hour window by the modal depth surface value. Dives with a pressure transducer offset greater than 20 m were automatically removed from the dataset.