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## ABSTRACT

### Sea ice cover in Isfjorden and Hornsund 2000 - 2014 by using remote sensing

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A satellite database including 16555 satellite images and ice charts displaying the area of Isfjorden, Hornsund and the Svalbard region has been established with focus on the time period 2000-2014. 3319 manual interpretations of sea ice conditions have been conducted, resulting in two time series with almost daily resolution dividing the area of Isfjorden and Hornsund into 'Fast ice', 'Drift ice' and 'Water'. The maximum fast ice coverage of Isfjorden is >40% in the periods 2000-2005 and 2009-2011 and stays <30% in 2006-2008 and 2012-2014. Fast ice cover in Hornsund reaches > 40 % in all considered years, except for 2012 and 2014, where the maximum stays < 20 %. The error estimation of the daily values varies between several 1\,\% up to more than 10\,\% depending on sun light, cloud cover, availability and quality of the satellite data. The mean seasonal cycles of fast ice in Isfjorden and Hornsund show monthly averaged values of close or equal to 0 % between July and November and maxima in March (Isfjorden, 35.7 %) and April (Hornsund, 42.1 %) respectively. A new concept, called 'days of fast ice coverage' (DFI), is introduced for quantification of fast ice cover, allowing comparison between different fjords and seasons. Considering the time period 1st of March until end of sea ice season, the mean DFI values for 2000 - 2014 are  $33.1 \pm 18.2$  DFI (Isfjorden) and  $42.9 \pm 18.2$  DFI (Hornsund). A distinct shift to lower DFI values is observed in 2006. Calculating a mean before and after 2006 yields a decrease from 50 to 22 DFI for Isfjorden and from 56 to 34 DFI for Hornsund.