

Supplementary Information

**Are environmental factors responsible for changed breeding behaviour in emperor penguins?**

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Fig S1: Emperor penguins on shelf ice on 16. November 2013. Due to large snow accumulation, multiple gradual snow ramps emerged and abolished the drop-off from the shelf ice to the sea ice.



Fig S2: Satellite images of the Atka colony from 7. September 2013 (left) and 14. October 2013 (right). Faecal stains can be clearly identified on the ice shelf. After transitioning onto the shelf ice on 12. August 2013, the colony remained there in various locations until November.