

Supporting Information for "Predicting Geothermal Heat Flow in Antarctica with a Machine Learning Approach"

M. Lösing¹ and J. Ebbing¹

¹Institute of Geosciences, Kiel University. Email: mareen.loesing@ifg.uni-kiel.de

Contents of this file

1. Figures S1 to S5

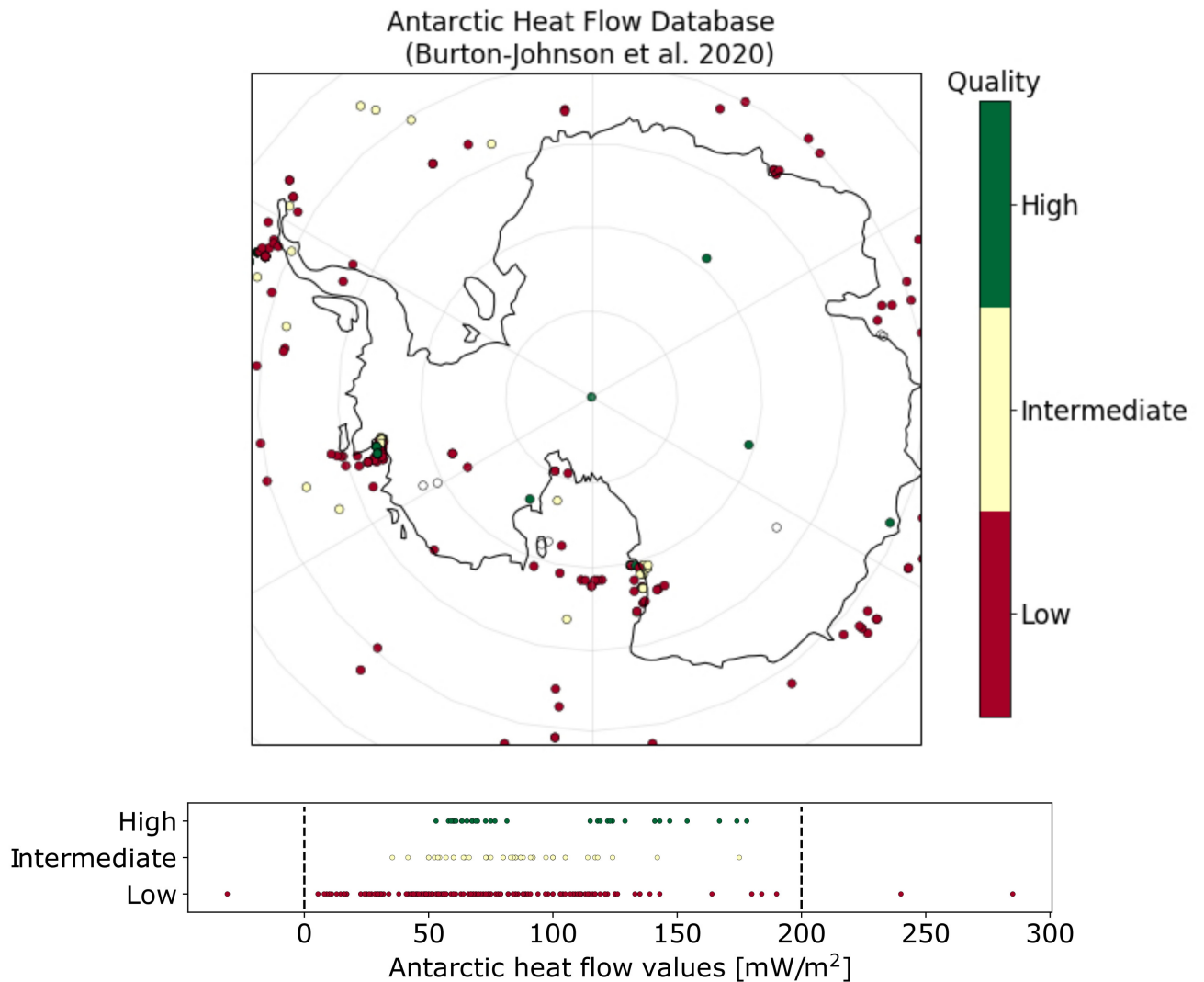


Figure S1. All Antarctic heat flow measurements from Burton-Johnson et al. (2020) and associated quality (only latitudes below 63°S). White circles indicate measurements without information. Dashed lines indicate the chosen range for filtering.

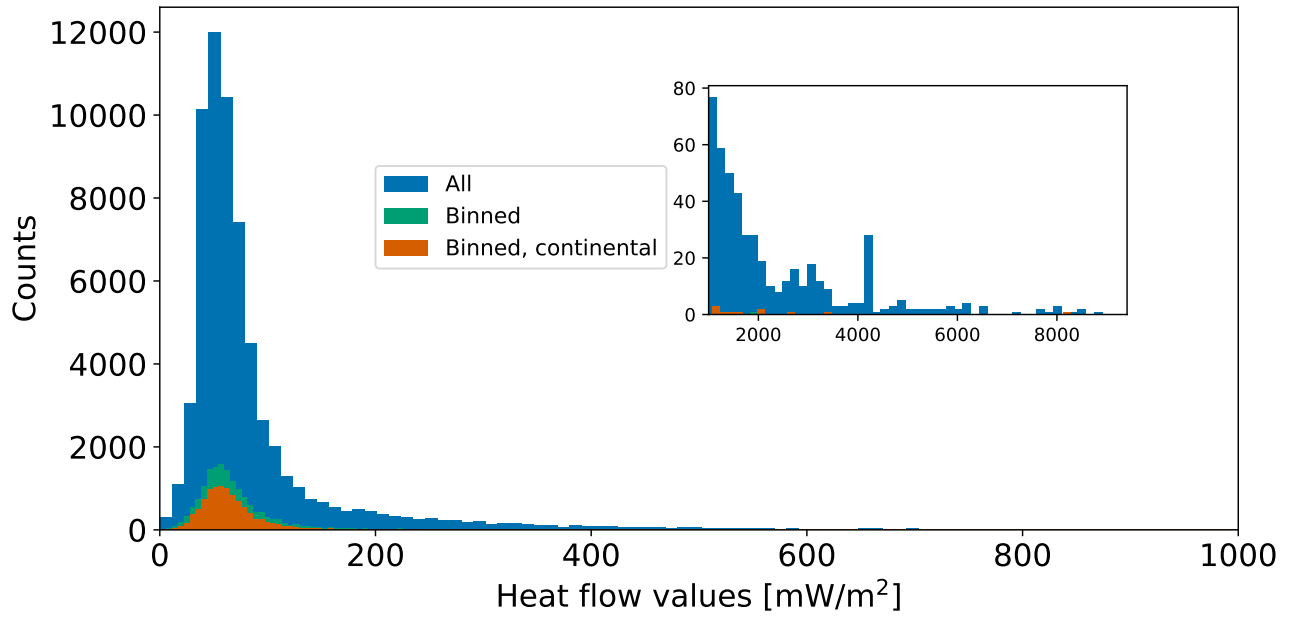


Figure S2. Number of heat flow values within the compiled data set (see section 3.1, Hasterok (2019); Lucazeau (2019); Burton-Johnson et al. (2020)). No modification has been applied to the data before binning to 0.5 degree. The amount decreases significantly when the values are binned and decreases slightly further when only continental values are counted.

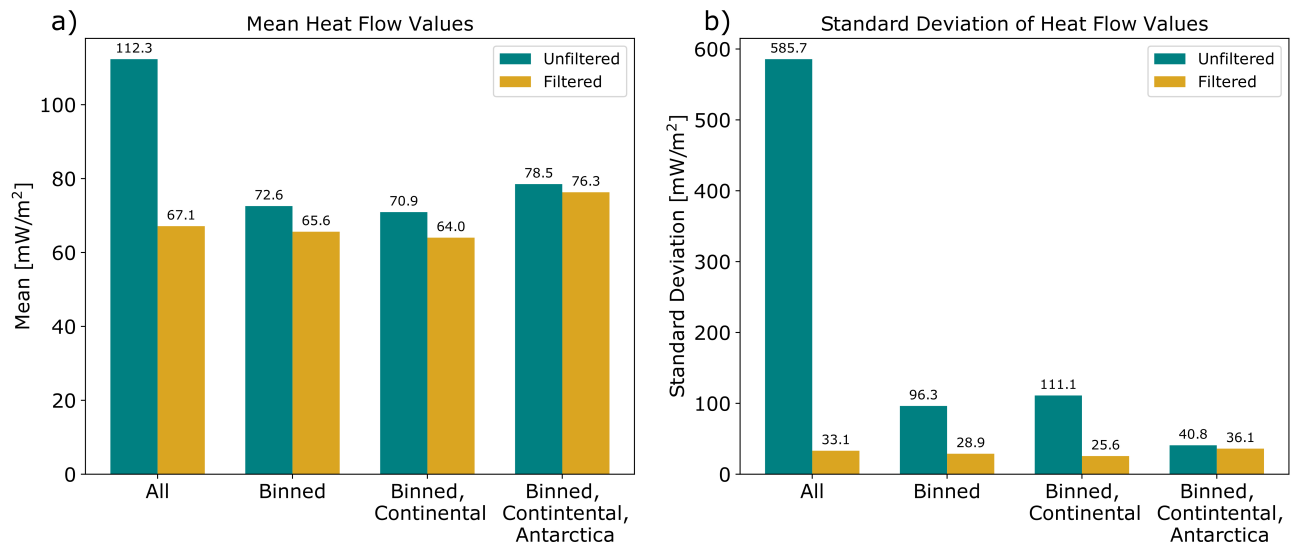


Figure S3. a) Mean and b) standard deviation values of compiled heat flow data set (see section 3.1, Hasterok (2019); Lucazeau (2019); Burton-Johnson et al. (2020)). Values are calculated for unfiltered and filtered data meaning that for the latter, values above 200 mW/m² and with quality mark 'D' are deleted.

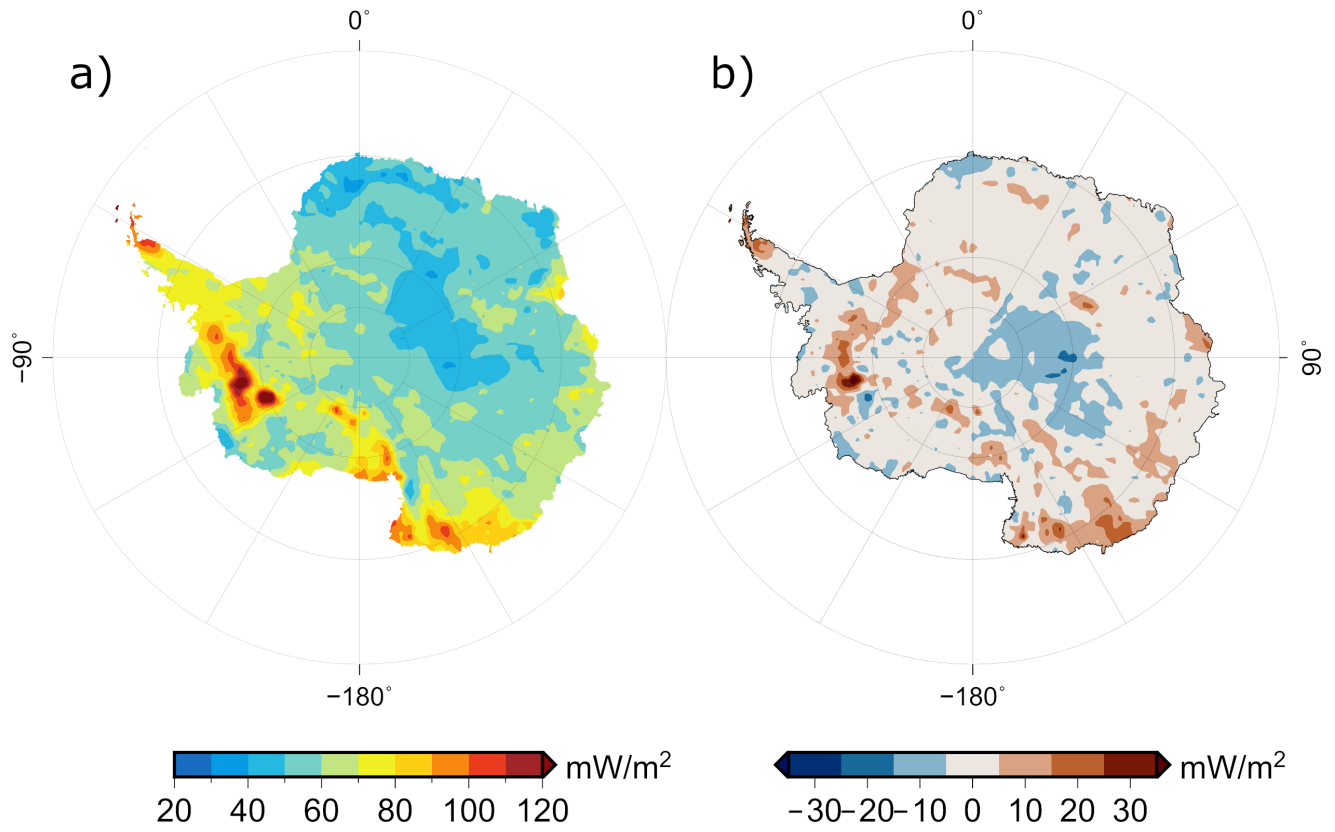


Figure S4. a) Predicted Antarctic Heat Flow after including all heat flow measurements up to 400 mW/m² for model training. b) Difference to heat flow prediction in section 4.3 (by subtracting the latter from a)).

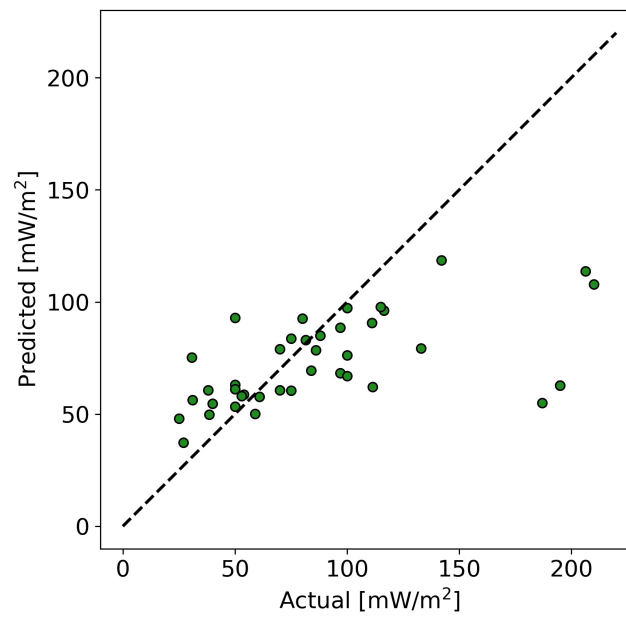


Figure S5. Fit between actual and predicted heat flow values in Antarctica after including all heat flow measurements up to 400 mW/m² for model training.

References

- Burton-Johnson, A., Dziadek, R., & Martin, C. (2020). Geothermal heat flow in antarctica: current and future directions. *The Cryosphere Discussions*, 2020, 1–45. Retrieved from <https://www.the-cryosphere-discuss.net/tc-2020-59/> doi: 10.5194/tc-2020-59
- Hasterok, D. (2019). Website. (Online database <http://www.heatflow.org>; last accessed: 10.02.20.)
- Lucazeau, F. (2019). Analysis and mapping of an updated terrestrial heat flow data set. *Geochemistry, Geophysics, Geosystems*, 20(8), 4001–4024. doi: 10.1029/2019GC008389