MASS BALANCE STUDY OF THE ZNOSKO GLACIER, ANTARCTICA, USING REMOTE SENSING AND IN SITU MEASUREMENTS

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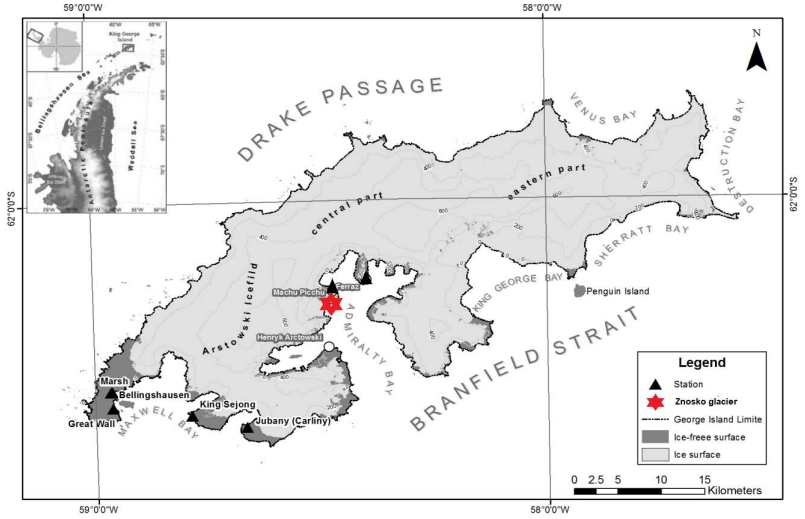
Background



Data

Remote Sensing

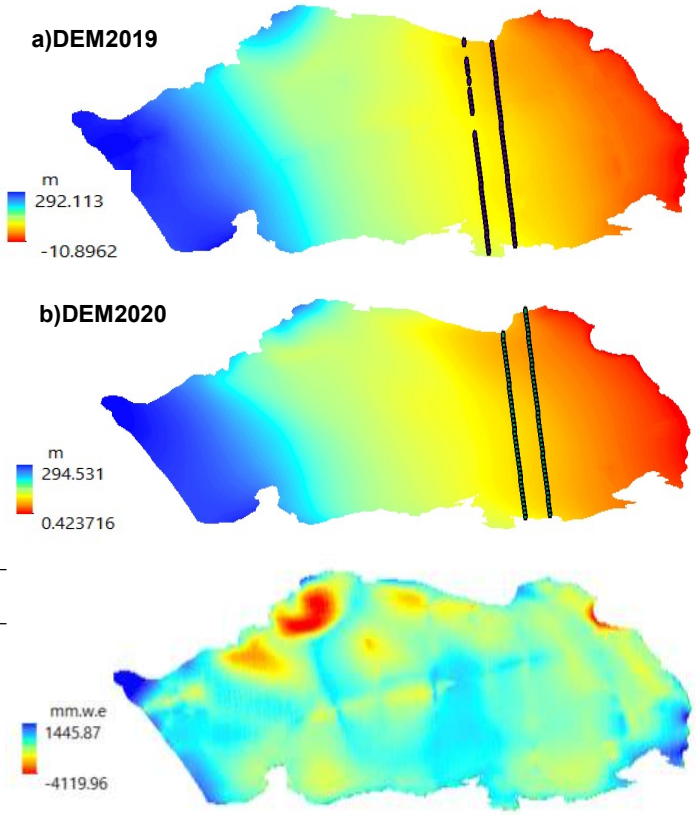
Instrument	Pixel Resolution	Captor Resolution	Date	Objective
UAV	< 1m	RGB	jan 2019	DEM and glacier delimitation
UAV	< 1m	RGB	feb 2020	DEM, snow line position and glacier delimitation
ICEsat2		Laser altimeter	dic 2018	DEM
ICEsat2		Laser altimeter	mar 2020	DEM

In situ Measurements

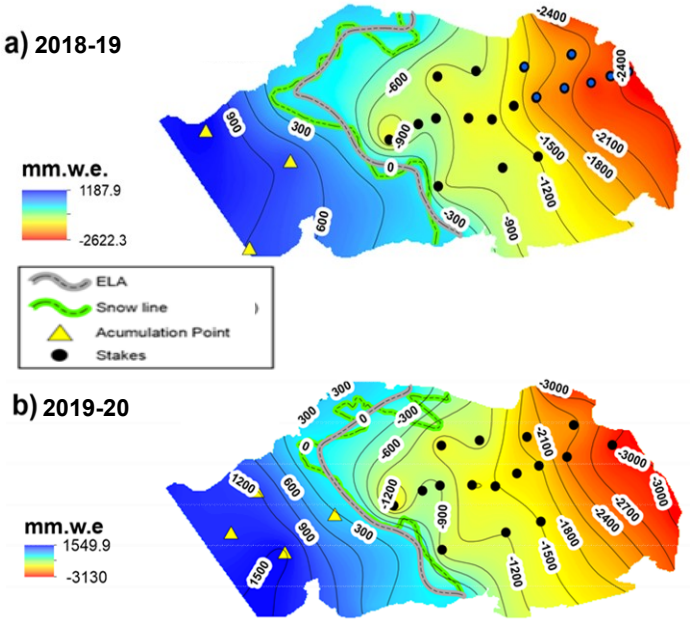
19 stakes fixed on the glacier surface, in situ mass balance data were collected from yearly stake measurements (austral summer 2018/19 and 2019/20).

Results

Geodetic method



Glaciological method



Conclusions

- RMSE between ICEsat2 vs. UAV-DEM was less than 25 m. Potential of application in other areas.
- Glacier mass changes obtained using the two independent methods agree with each other within the range of associated uncertainties. The cumulative mass change is –307.2 mmw.e. (2019-20) for the geodetic method, and –590.7 mm.w.e (2018-19) and -686.7 mm.w.e (2019-20) mmw.e. for the glaciological method.