Estimating surface meltwater input to the ocean over the last 40 years from King George Island ice cap, Antarctica

Christian Torres¹; Wolfgang Gurgiser²; Jorge Arigony-Neto¹
¹Institute of Oceanography, Universidade Federal do Rio Grande, Brazil
²Department of Atmospheric and Cryospheric Sciences, University of Innsbruck, Austria

1. Introduction:
In the last four decades South Shetland Islands (SSI), located in Antarctica, have experienced statistically significant warming (1970-1998, +0.27 °C/dec.) and cooling (1999-2015; -0.69 °C/dec.) trends (see Fig. 1) (e.g., Turner et al., 2020).

2. Motivation:
Glacier mass balance has been positive some years in two glaciers (see Fig. 2) on the SSI. However it is not well-known if the temperature changes are sufficient to accelerate and decelerate mass loss and runoff glaciers in this region.

3. Methods:
- COSIPY model (Fig. 3) to estimate mass balance and runoff.
- ERA5 reanalysis and satellite dataset.
- Polar-WRF model to downscaling climate data.

4. Results:
- Analysis of temporal variability and trends mass balance and runoff over the last 40 years.
- Evaluation oceanic and atmospheric influences.

5. Acknowledgements:
This research is supported by Peruvian and Brazilian Antarctic Programs and Brazilian Ministry of Education through CAPES scholarships.

6. References: