

Review on the paper **hgss-2022-9** by de Vos et al. on the drift of Shackleton's Endurance

General comment.

The 20th century reanalyses by ECMWF (ERA-20C) and NOAA (20CR) provide detailed data on the structure of the atmosphere also for time periods, where global data are sparse, e.g. at the end of the 19th century and the beginning of the 20th century. With these datasets it is now possible to analyse historical meteorological events, as has been done e.g. by Brönnimann et al. (2012, DOI:10.1127/0941-2948/2012/0337) for several storms since 1871. The present paper uses ERA-20C data for the reconstruction of trajectories of ice drift during the final days of the famous Endurance expedition. Hence the paper fits quite nicely into the application of reanalysis data to historical events. Before publication (which is recommended), some modifications should be made according to the comments provided below.

Specific comments

Sec. 2.3:

1. According to Poli et al (2016), the horizontal resolution for ERA-20C is about 125 km. The area for the calculation of trajectories as shown in Fig. 1 is about 40x40 km. Hence the wind data are taken only from the grid point including the target area. Is this the case?

2. The wind observations by Hussey have been interpolated to hourly values (Sec. 2.2). Was the same interpolation also performed for the 3 hourly ERA data?

Sec. 2.4:

1. The drift trajectories are calculated from the wind data. But which method is used for the calculation, e.g. a simple Euler forward time step or a more advanced integration/interpolation method?

2. Which time step is used for integration?

Sec. 3.2: Positions of the Endurance were predicted for the entire period. Please provide the beginning and end of this period.

Sec. 3.3:

1. In this section the winds obtained by ERA-20C and Hussey are compared indirectly by comparing trajectories which are an integrated form of winds. But the reader has no idea about the original wind data. Hence it is suggested, that the authors provide figures showing time series of wind speed and wind direction from both datasets, which is much more instructive for the comparison.

2. When comparing wind data from different sources one has to make sure, that these are taken at the same height above ground or have been interpolated to the same height. At which heights are the winds from Hussey and ERA-20C taken?

A note:

Data from NOAA-20CR reanalysis have been used by Etling (2017, DOI: 10.1127/metz/2017/0853) for investigating the atmospheric conditions of another famous polar expedition, the balloon flight of Andre and his crew in order to reach the North Pole in 1897 (which failed).