

# ***Interactive comment on “Multibeam Bathymetry and CTD-Measurements in two fjord systems in Southeast Greenland” by Kristian Kjellerup Kjeldsen et al.***

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Received and published: 6 June 2017

This manuscript describes new bathymetric and oceanographic observations made in two previously uncharted fjords in southeast Greenland, Skjoldungen Fjord and Timmiarmiut Fjord. Bathymetric data were collected using a multibeam echo sounder temporarily affixed to the SS Activ. CTD measurements comprise the oceanographic data contribution.

The new bathymetric data show far deeper waters than previously provided in the 500 m gridded International Bathymetric Chart of the Arctic Ocean (IBCAO) product. The fact that the IBCAO product shows far too shallow fjord depths that have not been

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mapped using modern singlebeam or multibeam systems is well known at this point. Thus, cruises such as the one described here that collect these seafloor depth data are extremely important if we are to be able to identify which tidewater glaciers are vulnerable to melting from the warming of deep (> 250 m) subsurface Atlantic Waters.

In Timmiarmiut Fjord, the CTD data presented show warm Atlantic Water ( $T \sim 4$  C,  $S \sim 34.25$ ) to 700 m below a layer of cold Polar Waters ( $T \sim 0$  C,  $S = 33$ ). Similar vertical T and S structures are present in Sondre and Nondre Skjoldungesund although CTD depths are limited to the upper 400 m and shallower.

The text is well written. There are a few minor grammatical and spelling corrections (see attached PDF).

One request is for the authors to elaborate on the expected uncertainty in the multi-beam data arising from the system's collisions with the ice flow and other factors.

Another request is that the authors devote a few sentences describing the approach taken by IBCAO to generate their gridded values within fjords where little or no data exist so as to contextualize their comparisons with IBCAO.

-Ian Fenty

Please also note the supplement to this comment:

<http://www.earth-syst-sci-data-discuss.net/essd-2017-29/essd-2017-29-RC1-supplement.pdf>

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2017-29>, 2017.

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