

## ***Interactive comment on “Opportunistic evaluation of modelled sea ice drift using passively drifting telemetry collars in Hudson Bay, Canada” by Ron R. Togunov et al.***

**Ron R. Togunov et al.**

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Received and published: 4 April 2020

### **We thank the reviewer for their quick response and helpful feedback.**

Togunov et al., 2020 In general: This paper evaluates the bias/accuracy of the NSIDC sea ice motion product via comparisons with drifting GPS collars in Hudson Bay. The paper is well-written and referenced, and uses a robust set of statistics to evaluate the product. The discussion details the characteristics of Hudson Bay, which likely affect the performance of the motion product in this region. However, the authors note that their findings are not divergent from other evaluations of this product in the Arctic Ocean. I recommend publication of this paper, with minor edits as indicated below.

C1

Line # Comment

1 Needs indent

**Line 1 is the title and must be left-justified. If the reviewer was referring to the first line of abstract (14) or introduction (28); The Cryosphere format requires the first paragraph of each section to be left-justified.**

64 NSIDC model?

**Change made.**

66 I would argue that satellite- based estimates are not validation data, rather, inter-comparison data, since they are estimates with their own set of biases. The in situ (2) and (3) obs are suitable for validation.

**We agree with this. Sentence now reads:**

**“There are two types of data that can be used to cross-validate ice drift: (1) other telemetry-based estimators including moored Doppler-based velocity measures and other high resolution satellites (e.g., Advanced Very High Resolution Radiometer (AVHRR) or Synthetic Aperture Radar (SAR)), and (2) in situ drifters, including buoys, ships, and manned stations.”**

72 What studies? Reference(s)?

**Reference added. Sentence now reads:**

**“Since there are few sources of in situ sea ice drift data, at least one study quantifying NSIDC drift accuracy used the same IABP data that are integrated into NSIDC model for validation, which may underestimate bias (e.g., Sumata et al., 2014).”**

74 I’m not certain that the more recently deployed IABP buoys have these types of errors. The ref was published in 2013, and there have been improvements to these buoys since then.

**This is true. Sentence now reads:**

**“Further, IABP buoys have historically used ARGOS location estimates, which**

C2

**have spatial errors up to tens of kilometres and may be unsuitable for validation of drift during the periods/areas they were deployed”**

166 Interesting. NSIDC ice motion does incorporate a turning of the sea ice left, so here it appears the angle of turn may be too high in this region

**No comment necessary.**

205 Okay, and the turning angle is discussed here

**No comment necessary.**

210 melt ponds

**Change made.**

405 I think you used Version 4, so need to update this reference

**We do cite version 3 in the text so this citation will be kept, however, we have added an additional reference to the version 4 data set where applicable.**

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-26>, 2020.