

Interactive comment on “Ice and AIS: ship speed data and sea ice forecasts in the Baltic Sea” by U. Löptien and L. Axell

Anonymous Referee #2

Received and published: 25 August 2014

This is an interesting paper that uses AIS data to test whether or not there is a relationship between predictions of various sea ice properties from an ice forecasting model and ship speed. There is the potential for the results to have a large impact on how sea ice forecasts are used and interpreted by the shipping industry. In general, more detail and discussion is required to support the approach used by the authors.

1. How well does HIROMB perform in the study area? For example, are forecasts of convergence/divergence, drift speed and ridge density realistic?
2. What is the rationale for determining which variables to include as fixed effects versus random effects? Ice drift, convergence and angle are only included as fixed effects, why?

C1655

3. In the discussion of Figure 3, I don't understand the references to non-linear relationships. Figure 3b looks similar to 2a-c?
4. I had a hard time following the discussion of Table 1 (page 3819). For example, where does it show that the strongest factor affecting ship speed is slow drift speeds with ice drift from the side of the ship? In general, I had a hard time linking most statements to the data shown in Table 1.
5. The variables in Figure 2 are tested for correlation, why isn't this done for the mixed effect variables and is there an implication to the validity of the model if two of the random components (ridges and level ice thickness) are highly correlated?

Minor comments:

1. The model is developed using data from only one year, 2011, are there any caveats applying it to other years?
2. In the discussion of Figure 2, I see the general decreases in the median and first quartiles but why are there general increases in the upper bound and extremes?
3. Figure 3c represents a known situation where ships tend to get stuck. What about convergence and high ice concentrations? Are there other combinations of sea ice variables that lead to besetting in this region?
4. In general for Figures 2 and 3, how many observations are in each category? A difference in means test could be used to test the statistical significance of the difference in means between each category.

Page 3814 Line 8: typo “was developed in the 90th “ Line 23: change to “regularly passed by ships” Line 24-25: awkward wording, maybe something like “The region consists of relatively narrow passages with little space to circumnavigate problematic areas”

Page 3815 Line 6: how many observations were excluded compared to the ~14,000

C1656

included in the analysis

Page 3818 Line 20 . . . Change to “Fitting statistical models . . .”

Page 3819 Line 1: How did you test the statistical significance? Was this significance test applied to all of the categories/variables in figure 2 and 3?

Interactive comment on The Cryosphere Discuss., 8, 3811, 2014.

C1657