

## ***Interactive comment on “Northern Hemisphere Surface Freeze/Thaw Product from Aquarius L-band Radiometers” by Michael Prince et al.***

**Anonymous Referee #2**

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The authors present a new database of freezing/thawing state of the surface in the Northern High Latitudes. This product is derived from the satellite mission Aquarius. This database is of interest and is complementary to what already exists. Detecting soil state is difficult especially during the transition periods. Using remote sensing data acquired at various frequencies can help to better monitor these soil conditions.

My main comment concerns the definition of the thresholds. There are computed by Roy et al., and applied globally.

Detail comments:

Section 2.1: More details on the Aquarius mission are needed, such as orbits used (ascending, descending, both?)

C1

It would be interesting to discuss more the thresholds, the values and how they are computed.

Page 4, lines 8 to 14, what about the 1st radiometer? The authors mention that their method uses radiometer 2 and 3, and radiometer 1?

Page 14, paragraph 2.3: What about pixels that are heterogeneous, e.g. having one class covering 51% of the surface and another one 49%. Is the threshold of the main class adapted to these cases?

Which difficulties? It is not clear what the authors mean by difficulties. It is to be clarified and discussed.

Page 9, 3rd line : obvious false retrievals? Please clarify, why these false retrievals are obvious?

Page 10, 4th line: horizontal shift? Do the authors refer to the shift in Fall?

Figures 4 and 5 : Please add the name of database and the year along with the indices a) b) ... it would help the readers.

Figure 6: it is not convenient to have the figures on several pages, but it would definitely help if the authors could add the legend and the name of the station on each figures. Actually the legend is on page 17 whereas the name of the stations are described on page 21, which is a bit annoying.

Figure 6. It seems the time series depicted by bullets are not continuous. There are missing points, what happens there if the conditions are neither Thawed nor frozen.

The authors discuss in many occasions the use of NPR (its dynamic, seasonal range ..) and thresholds but it is difficult for a reader to evaluate their comments without illustrations to support their comments. Figures showing time series of NPR and thresholds are needed to help the discussion.

C2

Rowlandson et al. Is under review. Please update or remove if not accepted.

Abstract: Ration to ratio?

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