

# ***Interactive comment on “Circumpolar polynya regions and ice production in the Arctic: Results from MODIS thermal infrared imagery for 2002/2003 to 2014/2015 with a regional focus on the Laptev Sea” by Andreas Preußner et al.***

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## General comments

This work gives a comprehensive description of Arctic polynyas based on high resolution surface temperature (MODIS) data. This data set has the advantage of a higher spatial resolution compared with satellite products used in earlier investigations. It gives a 22 % higher total polynya ice production than recent results which shows that the development of satellite products, algorithms and analyses is still an important issue in order to follow the past and future development of the Arctic Ocean ice cover.

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It reveals significant positive trends of the polynya ice production in the eastern arctic which can be further utilized for analyses of the effect on dense water mass formation on the shelves which likely have influence on shelf circulation, shelf basin interaction and water chemistry. The paper is generally of a high quality in language and analyses and is therefore well suited for publication.

#### Specific comments

I'm not perfectly happy with the sentence starting on line 6 page 3 ( "A regular monitoring..."). It appears to be somewhat a repetition of the sentence on page 5 line 8 ( "Hence an accurate...").

Page 9 Table1 text. I miss some more explanation of what the "interannual average coverage" means. Coverage of what? It is hard to understand as it stands now.

Page 9 Line 2 and before. It is hard to follow the logic why fixed values for ice and Lf are used. The arguments regarding frazil ice crystals are not clear to me.

Page 12 Line 2. It is interesting to see persistent leads well off the shelf in the Beaufort Sea. These must be related to the large scale ice circulation in the area and it is remarkable that they are so persistent that they show up as well defined bands in this type of data (most notable in Feb-Mar). I wonder if this structure has been described before or if it is a new finding. It is worth some more comment anyhow.

Page 12 Line 3. I can't see the leads along the Transpolar drift in figure 4. The central area around the North Pole appears to be without leads in the figure.

Page 15 Line 8. Suggestion: "is especially large " instead of "increases".

Page 19 Line 13. Sentence starting with "A pronounced seasonal..." is unclear. I can see that the seasonal variation is largest in the late half of the period, but the last part is confusing.

Page 19 Line 18. I think the reader needs some more help to identify the fast ice edge

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in figure 11 and also in earlier figures. It is not clear to me since there are several bands of high ice production from the coast and outward in most of the fields.

P21 Line 9. IAE need to be defined better. Is it the export just outside the Laptev Sea or what?

Technical corrections None

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