Title
Impact of Sea Ice Thickness and Freeboard Products on Forecast
Performance
Last Name of PRESENTING Author
Kauker
Middle Name or initials of PRESENTING Author
First Name of PRESENTING Author
Frank
Email of PRESENTING Author
frank.kauker@awi.de
Country of PRESENTING Author
Germany
Institution, organization or general address
Alfred Wegener Institute
Theme
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System
Author list (in order)
Kaminski, Thomas; Kauker, Frank*; Pedersen, Leif Toudal; Vossbeck,
Michael; Haak, Helmuth; Niederdrenk, Laura; Hendricks, Stefan; Ricker,
Robert; Karcher, Michael; Eicken, Hajo and Grabak, Ola
Poster title (brief)
Impact of EO products on sea ice forecasts

Abstract - text box
The A+5 project of ESA's Arctic+ initiative has constructed a flexible
system for Arctic Mission Benefit Analysis (ArcMBA) that evaluates in a
mathematically rigorous fashion the observational constraints imposed by
individual and groups of EO data products in using the quantitative
network design (QND) approach. The assessment of the observation
impact (added value) is performed in terms of the uncertainty reduction in
a four-week forecast of sea ice and snow volumes for three regions along
the Northern Sea Route. The assessments covered seven EO products,
three real products and four hypothetical products.
The real products are monthly sea ice thickness (SIT), sea ice freeboard
(SIFB), and radar freeboard (RFB), all derived from CryoSat-2 by AWI.
These are complemented by two hypothetical laser freeboard products
and two hypothetical snow depth products.
On the basis of the per-pixel uncertainty ranges that are provided with the
CryoSat-2 products, the SIT achieves the best performance for SIV

forecasts. For SNV, the performance of RFB is better. A hypothetical laser freeboard (LFB) product with low accuracy has a similar impact as RFB on both SIV and SNV. A reduction in the uncertainty of the LFB product yields a significant increase in performance. Combining with a hypothetical snow depth product achieves a significant performance.