IRO-2 Ice Forecast and Route Optimization

Adriana Huerta-Casas [1],

in co-operation with Rüdiger Gerdes [1] , Alexander Beitsch [2], David Bröhan [2], Mikhail Dobrynin [2], Björn H. Fock [3], Andrea Gierisch [3], Georg Heygster [7], Jürgen Holfort [8], Peter Jochmann [4], Thomas Kaminski [5], Lars Kaleschke [2],Frank Kauker [6], Christian Melsheimer [7], Gerd Müller [3], Nils Reimer [4], K. Heinke Schlünzen [3], Jochen Segschneider [6], Joachim Schwarz [9], Klaus Strübing [9], Jan Tegtmeier [8]

[1] Alfred-Wegener-Institut für Polar- und Meeresforschung, Bremerhaven, [2] Institut für Meereskunde, Universität Hamburg, [3] Meteorologisches Institut, Universität Hamburg,
[4] HSVA Hamburgische Schiffbau-Versuchsanstalt GmbH (Gesamtprojektleitung: Peter Jochmann), [5] FastOpt GmbH, Hamburg, [6] O.A.Sys - Ocean Atmosphere Systems GmbH, Hamburg,
[7] Institut für Umweltphysik, Universität Bremen, [8] Bundesamt für Seeschifffahrt und Hydrographie, Hamburg/Rostock, [9] JSC - Joachim Schwarz Consulting, Großhansdorf

Abstract

The extent, volume, and thickness of sea ice in the Arctic is decreasing due to climate change. This development favours the use of the northern sea routes, the North-West Passage and the Northern Sea Route, as the shortest link between Europe and East Asia. It also benefits the extraction and transportation of raw materials from the Arctic. To support economical and safe maritime activities, the German Federal Ministry of Economics and Technology (BMWi) funded the project IRO-2. In this project a sea ice forecasting system, which includes a ship routing scheme will be modelled.

The components of the system include remote sensing, an arctic wide ice/ocean data assimilation system, a regional atmosphere - sea ice - ocean - model and a ship routing module. For the last project year, a system test is planned with an observational campaign in the Barents Sea.

The planned prediction is based on the improvment and optimization of available oceanographic and meteorologic forwards models; and their combination for a comprehensive ice forecast system.