

Ice Transit Simulation Model under development

Aker Arctic is currently in the process of developing a new simulation model to improve its capability to perform feasibility studies involving ice transits.

The objective of the new model is to efficiently provide accurate information on vessel transits in ice infested waters. For destination shipping, the model will be capable of providing statistics such as transit times, distances, and fuel usage, along with representative routes for transiting through ice, which can be further used to determine the optimal number of vessels to maintain shipping schedules.

At the core of the model is a route-finding algorithm, allowing for the efficient calculation of an optimal route through the ice in varying environmental conditions, while allowing for the avoidance of unsafe ice features, sensitive ecological zones, shallow waters, and other 'no-go' zones. The route can be optimized based on a variety of measures including the shortest distance, the fastest transit

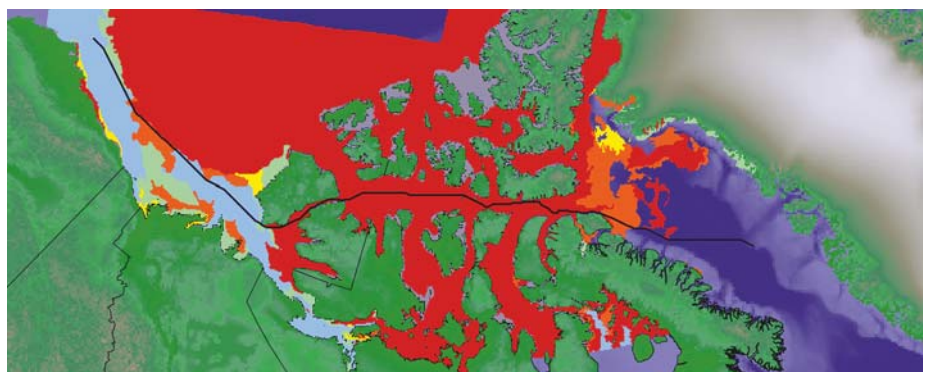


Figure 1. Sample Routing through the North-West Passage during October

In addition to destination shipping, the model is capable of determining ship operational regions based on specified criteria such as ice class, icebreaking capability, and/or draft limitations. One such application of the model is to allow Aker Arctic to assist in the development of Polar Water Operations Manuals by developing guidelines for allowable operating regions based upon the Polar Code's Maximum expected time of rescue criteria. Based on the location of potential rescue assets, the model will be capable of generating maps showing the expected time for the rescue assets to arrive.

times, or optimal fuel usage. Project specific criteria can be developed as required to meet client needs.

The model has been developed using a modular approach, which will allow Aker Arctic to interface with a wide variety of data sources, including ice data, weather data, bathymetry, etc. The model can be easily extended to include new data sources through the introduction of plug-and-play modules.

The new transit model will reduce the overhead time in extracting ice and environmental conditions, allowing Aker Arctic to produce results for a wider variety of scenarios in less time. Hence, clients will be able to receive more

comprehensive results earlier in their planning process.

The model will draw upon Aker Arctic's extensive background in model testing and full-scale trials to provide reliable estimations of performance in ice, combined with modular support for interfacing with a wide array of data input sources.

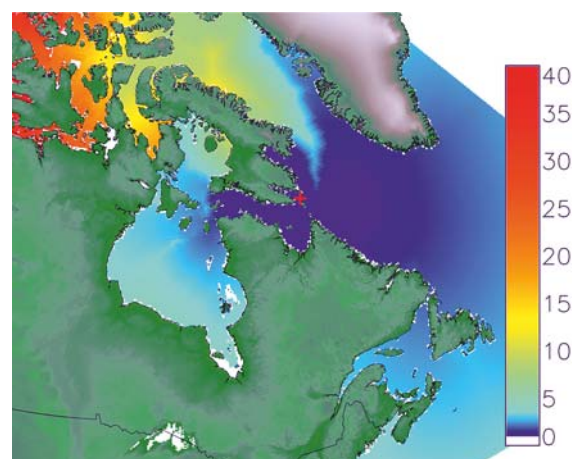


Figure 2. Sample transit time (in days) for a vessel originating from Iqaluit, Canada during May.