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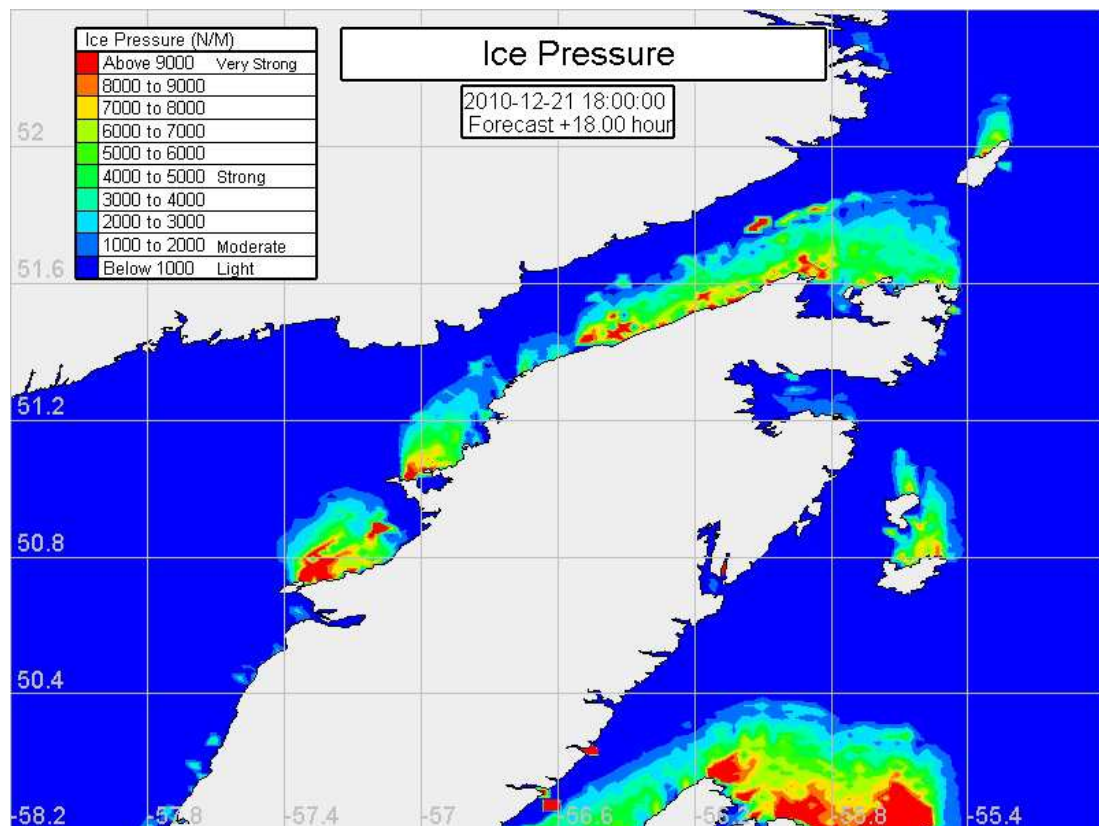
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Pressured Ice Model v1.0 - Short User Manual

Philippe Lamontagne



Technical Report CHC-TR-076

January 2011

Canadian Hydraulics Centre – Pressure Ice Model

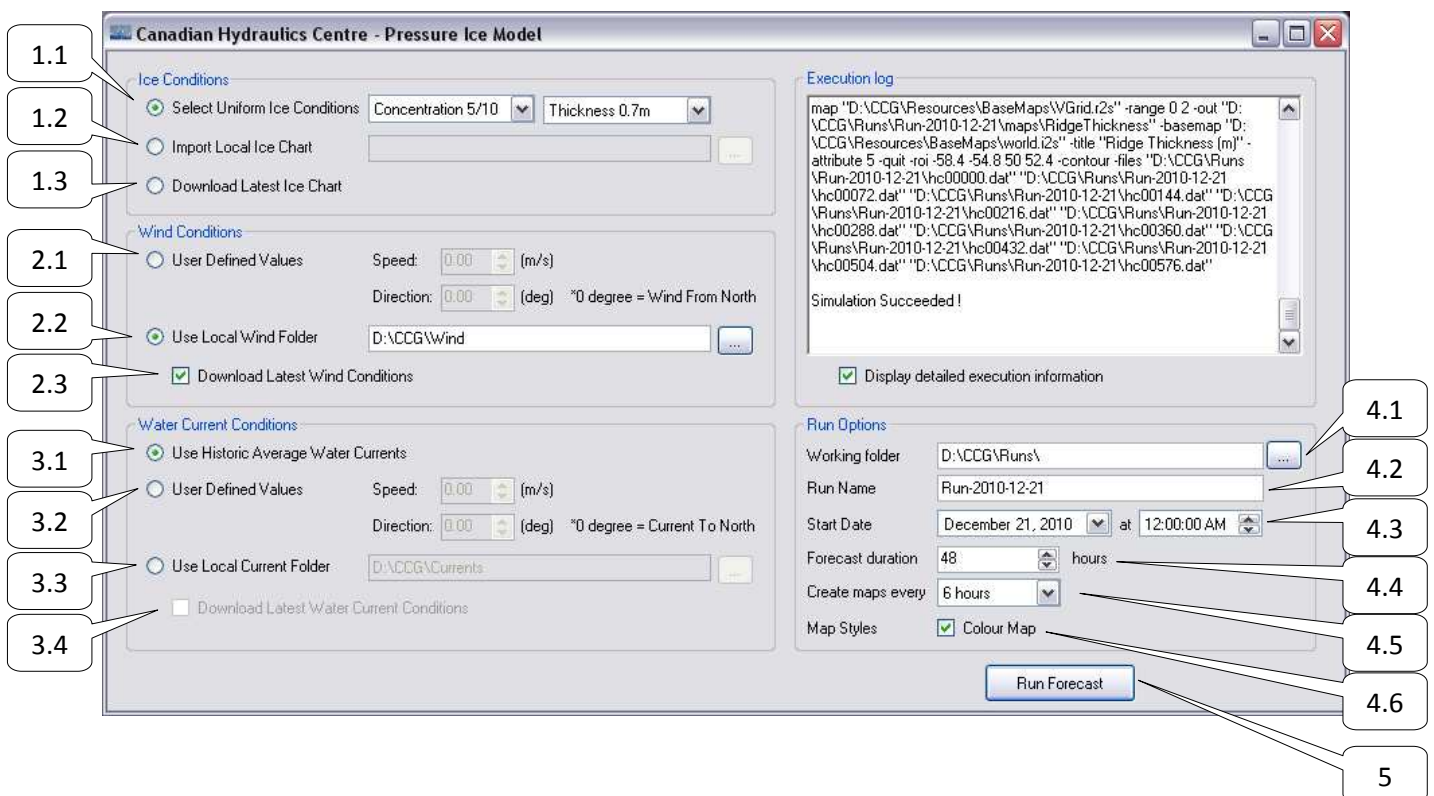
User Manual

Introduction

The purpose of this model application is to forecast ice pressure build-up in the Strait of Belle Isle. It combines a leading edge ice forecast model developed by the Canadian Hydraulics Centre (CHC) in collaboration with the Canadian Ice Service (CIS) with the most accurate ice and environmental forecasts provided by Environment Canada (EC) and Department of Fisheries and Oceans (DFO).

The model interface has been designed to be both intuitive and simple to use. To run the model, the user is required to follow the six step process which is briefly described below:

1. Define the initial ice conditions
2. Define the wind conditions
3. Define the water currents
4. Set the model forecast options
5. Launch the model forecast
6. Interpret the model output maps



1. Define the Initial Ice Conditions

To initialize ice conditions at the beginning of the forecast, an ice chart is recommended. If an ice chart is not available, the model interface allows for the selection of uniform ice conditions. However, to obtain the most accurate forecast, we recommend importing the latest daily DEX file or the weekly E00 file.

1.1. Select Uniform Ice Conditions

The interface allows for the selection of uniform ice conditions. For the purpose of the model, the initial ice concentration and thickness are uniformly distributed across the whole area.

Concentration	(Tenth)
Low	2/10
Medium	5/10
High	9/10

Thickness	(Metre)
Thin	0.3m
Medium	0.7m
Thick	1.2m

1.2. Import Local Ice Chart

The interface can import a local ice chart previously downloaded. The ice chart may be either DEX (daily ice chart) or E00 (weekly ice chart) files. You can download the latest E00 file from the “Weekly Regional Ice Charts - Black and White and E00” section at:

<http://ice-glaces.ec.gc.ca/app/WsvPageDsp.cfm>

1.3. Download Latest Ice Chart

This option automatically downloads the latest e00 ice chart from the Environment Canada web site. The file is downloaded to the local folder “*PressureIceModel\Resources\IceCharts\Downloader*” and previous ice charts are moved to the folder “*PressureIceModel\Resources\IceCharts\Archive*”.

2. Define the Wind Conditions

The interface allows for running the ice model with either user defined or dynamic wind conditions over the forecast time span. We recommend downloading the latest files to obtain the most accurate forecast.

2.1. User Defined Values

This option allows the user to define a uniform wind speed and direction to be used for the duration of the forecast.

2.2. Use the Local Wind Folder

This option directs the model to use wind forecast files from the Environment Canada CMC model as input. The user must specify the local drive folder containing the GRIB files previously downloaded from CMC at: http://www.weatheroffice.gc.ca/grib/index_e.html

2.3. Download Latest Wind Conditions

This checkbox automatically downloads the latest files from the Environment Canada web site. It contains the forecast for the next 48 hours. Files are copied to the local folder specified at section 2.2.

3. Define Water Current Conditions

The interface allows for running the ice model with historic average, user defined, or dynamic currents over the forecast time span. We recommend manually downloading the latest water current files to obtain the most accurate forecast.

3.1. Use Historic Average Values

This option sets the model to use historic average currents provided by DFO as input. We recommend using this option if you don't have access to the latest currents forecast at section 3.3.

3.2. User Defined Values

This option allows the user to define a uniform water current velocity and direction to be used for the duration of the forecast.

3.3. Use the Local Currents Folder

This option directs the model to use the water currents forecast from the CECOM BIO model as input. The user must specify the folder containing the GRIB files previously downloaded.

3.4. Download Latest Water Current Conditions

This checkbox automatically downloads the latest files from BIO. Files are copied to the local folder specified at section 3.3.

4. Define Run Options

4.1. Working Folder

The working folder must be an existing directory and will contain all forecast run outputs.

4.2. Run Name

This is a unique label used to identify each run. A new folder with the run name will be created in the working directory.

4.3. Start Date and Time

This is the initial date and time of the model forecast

4.4. Forecast Duration

This is the duration of the forecast. The maximum value is 48 hours.

4.5. Create Maps Every

Output maps will be generated at the output frequency specified.

4.6. Map Styles

Output maps can be generated as either colour or black and white bitmaps.

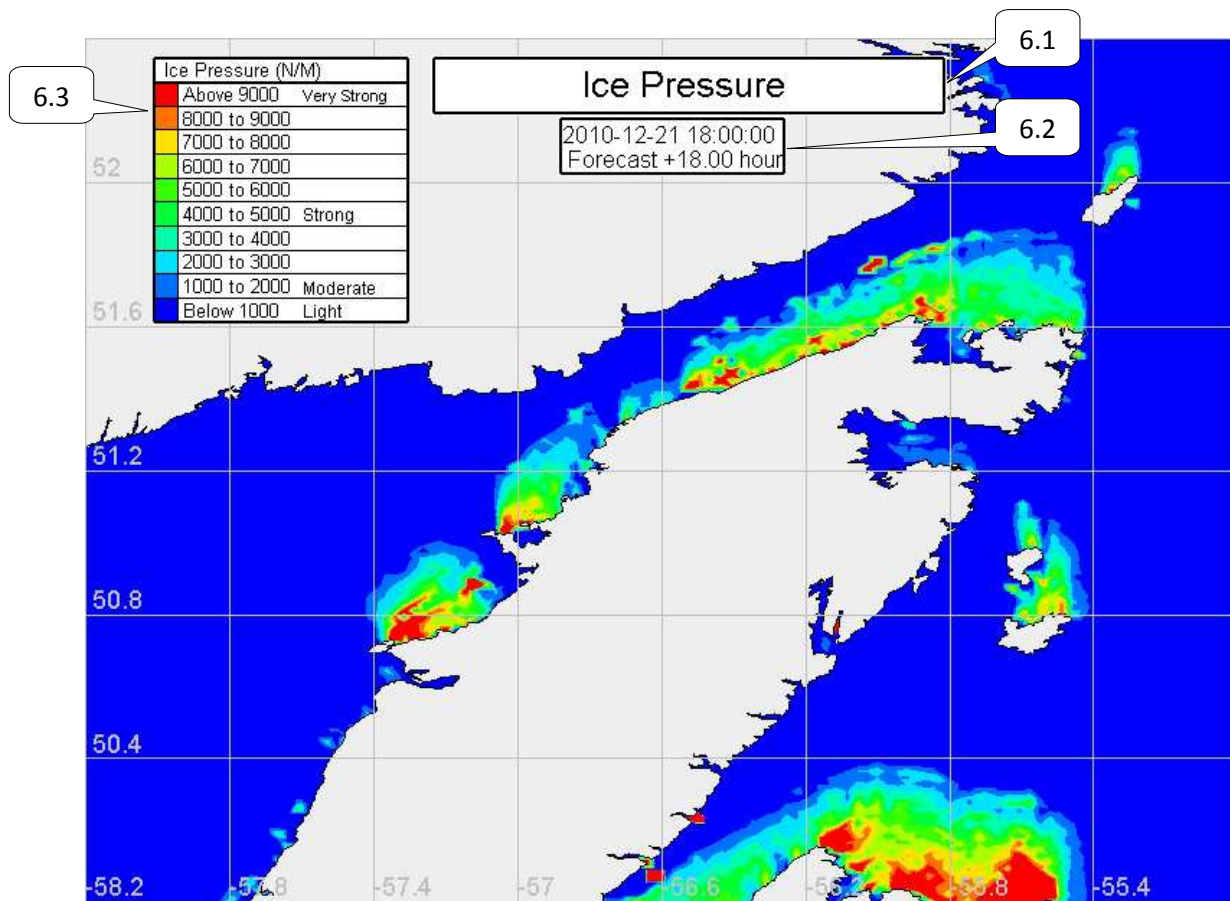
5. Run Forecast

Finally, the "Run Forecast" button starts the forecast process. It initially imports ice, wind and currents conditions to the model working folder. Then, the model is executed and output maps are generated. On completion of the model run, the folder containing the final maps will automatically display.

6. Interpret Maps

Five maps are generated at the output frequency specified at step 4.4. All maps are located in the folder “WorkingFolder/RunName/Maps/”.

Map	Unit	Description
Pressure	N/M	Ice pressure
Ridge thickness	Metre	Maximum ridge thickness
Ice Thickness	Metre	Average ice thickness
Ice Concentration	%	Average ice concentration
Ice ConcThick	Metre	Ice concentration * ice thickness (Multiplication)



6.1. Map Title

The forecast generates several maps with similar look but completely different output. The title the model output displayed within the map.

6.2. Map Subtitle

The first subtitle line contains the date and time that this forecast represents. The second line specifies the model duration used to generate the output displayed within this map.

6.3. Map Legend

The legend contains a brief description of the map output and the units.