

EXECUTIVE SUMMARY

Offshore oil and gas exploration, development, and operations as well as other marine activities are significantly affected by the environmental and climate conditions. With an accurate description of the operating environment, drilling rigs, ships, production platforms, and other marine structures can operate safely in these areas of interest. For offshore exploration and development, an environmental baseline is needed as well as extensive engineering data. These projects require vast multi-dimensional, geospatial, and long temporal data coverage with easy access to interested parties.

In 2013, Nalcor announced the mapping of three newly defined sedimentary basins off the Labrador coast (the Henley, Chidley, and Holton Basins) as well as the extension of the previously defined Hawke Basin. This mapping was based on the regional 2D seismic surveys conducted by Nalcor, Petroleum Geoservices (PGS) and TGS Geophysical in 2011 and 2012. These newly defined sedimentary basins are located primarily in deep water in the Labrador Sea, off the east coast of Newfoundland and Labrador, Canada. To date, there has been no regional study of the metocean conditions offshore Newfoundland and Labrador. As part of Nalcor's exploration strategy, a metocean study would be considered a crucial piece of information in an area of frontier exploration. Nalcor commissioned C-CORE to provide the most comprehensive and accurate meteorological and oceanographic data set to characterize the metocean environment, covering topics such as winds, waves, currents, vessel icing, visibility (fog), pack ice, icebergs and ice islands, changes in conditions expected due to climatic change, and comparisons with other frontier regions. Various data sources were reviewed, evaluated, and verified for their suitability, coverage (spatial and temporal), accuracy and reliability. Only the most suitable data sets have been selected in this study.

The study area extends from 45.5° N to 63° N latitude, and from 42° W to 65° W longitude, covering the entire Labrador Sea and Northern Grand Banks, Flemish Pass, and Flemish Cap areas. The study area is divided into 391 grid cells, mostly one degree longitude by half degree latitude blocks, with each cell covering an average area of 3,760 square kilometres. Data summaries for metocean parameters are available for each cell and for the region.

There is a significant amount of data associated with each of the metocean parameters covered in this study. To facilitate the use of such vast data sets, Nalcor developed a web-based, interactive Database Management and Geographic Information System (DBM&GIS), called NESS (Nalcor Exploration Strategy System), which includes the above referenced metocean data as well as other geographic and geophysical information of the Newfoundland and Labrador offshore. The NESS program allows scientists, engineers, managers, and operators easy access to, and use of, the geospatial data for exploration, planning, design, production, and operations of offshore oil and gas resources with reduced risk and uncertainties.

This report (Volume 1) provides detailed descriptions of the metocean data sources, data process and analyses, and statistical summaries. Volume 2 provides regional metocean climatological summaries and trends, as well as comparisons with other frontier exploration regions of similar characteristics. More details and statistical summaries for each of the 391 cells are provided in separate cell reports. These reports are also available in NESS as PDF files, which can be viewed or downloaded from NESS as needed.