



NOTICE OF THESIS PROPOSAL PRESENTATION

Geodesy and Geomatics Engineering Doctor of Philosophy

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May 31, 2006

Head Hall – Room E-11 @ 2:00 pm

Co-Supervisors:

Dr. John Hughes Clarke, GGE

Dr. David Wells, GGE

Examining Committee:

Dr. Yun Zhang, GGE

Chair:

Dr. David Coleman, GGE

Usage of Oceanographic Climatologies in Support of Multibeam Mapping Operations in the Canadian Arctic Archipelago

ABSTRACT

In 2003, the decommissioned 1200 class icebreaker Sir John Franklin was brought back into service as a multidisciplinary science platform for research in the Canadian Arctic Archipelago (CAA). Renamed the CCGS Amundsen, one of the ship's many missions is to perform repeat bathymetric mapping of the Northwest Passage in the CAA using its EM300 multibeam echosounder. As each field season's ship-time is shared among 40 scientists, there is little time en route to collect sound speed profiles, leading directly to refraction biases in the echosounder data. It is proposed that oceanographic climatological grids of temperature and salinity can provide a reasonable approximation of actual watercolumn conditions in the absence of sound speed profiles. One such grid, the World Ocean Atlas of 2001 (WOA01, specifically the $\frac{1}{4}^\circ$ grid), is to be investigated in this work. As such grids are an approximation of average conditions (and suffer from spatial and temporal undersampling error in the source data used to derive the grids), it is necessary to validate the suitability of a grid before using it for refraction calibration of echosounder data. Errors incurred through the usage of WOA01 for refraction calibration can be forecasted using the few hundred sound speed profiles collected to date by the Amundsen. Sound speed profiles can be extracted from WOA01 and used for a comparative raytracing simulation in which the Amundsen's sound speed profiles provide a source of control. Through the raytracing simulation, estimates of errors may be generated and will serve to validate areas throughout the CAA where the WOA01 grid will suffice as a source of refraction calibration in the absence of sound speed profiles. Though this technique is to be developed to serve post-processing needs onboard the CCGS Amundsen in the CAA, it is easily extendible to other platforms and to other research areas.

Faculty Members and Graduate Students are invited to attend this presentation.