

General Information

Department of Environment & Geography

**Course Name: Field topics in Arctic systems: Snow-covered sea ice
Feb. 12-20, 2016**

Instructor: Dr. C.J. Mundy

Co-organizers: Dr. Nicolas-Xavier Geilfus and Ms. Karley Campbell

Office Address:

582 Wallace Bldg.

Centre for Earth Observation Science

University of Manitoba

Winnipeg, MB, Canada

R3T 2N2

Email: cj.mundy@umanitoba.ca

Telephone Number: 1-204-272-1571

Course Information

Sea ice is a critical factor in our global climate, of which its current change represents the most globally recognized signal for our warming climate. Sea ice also provides habitat for a unique flora and fauna, influences exchange of gases across the ocean-ice-atmosphere interface and remains a challenge for industrial development in the Arctic Ocean. The goal of this course is to provide participating graduate students with a strong background on the importance and current knowledge of Arctic sea ice. To attain this goal, the course will combine field safety training, classroom lectures and direct field experience pertaining to physical and biogeochemical processes of the snow-covered sea-ice environment.

Main Text

Thomas, D.N. and Dieckmann, G.S. 2010. Sea Ice (2nd Edition). West Sussex, United Kingdom: Wiley-Blackwell.

Tentative Outline & Recommended Reading(s)

Sea ice - introduction

- Importance
- History
- Arctic *versus* Antarctic

Readings:

Chapter 1 - Sea ice book

Sea ice - structure and types

- Growth and melt, structure, types and properties of sea ice

Readings:

Chapter 2 Sea ice book

Sea ice - snow

Readings:

Chapter 5 Sea ice book

General Arctic oceanography and the influence of sea ice

- Surface temperature, salinity, density, and currents in the world's oceans

- Alpha vs beta oceans

- Arctic water masses - focus on Pacific, Atlantic, and Polar water

- the influence of sea ice on oceanography

Readings:

Chapter 2 of: Lalli, C.M. and Parsons, T.R. 1997. Biological oceanography, an introduction (2nd Edition), pp16-32.

Jackobsson, M. et al. 2004. The Arctic Ocean: Boundary conditions and background information. In Stein, R. and Macdonald, R.W. (eds) The Organic Carbon Cycle in the Arctic Ocean, pp. 1-32.

Carmack, E.C. (2007), The alpha/beta ocean distinction: A perspective on freshwater fluxes, convection, nutrients and productivity in high-latitude seas

Chapter 3 Sea ice book

Sea ice - Biology

Readings:

Chapters 7-10 Sea ice book

Sea ice - biogeochemistry

Readings:

Chapter 12 Sea ice book

Referencing Style Guide(s) – APA

Method of Evaluation

Value Contributing to Final Grade:

GEOG 7400

Class participation during field work	20%
Sub-group summary presentations (Feb. 20)	10%
Research paper	
presentation (April 1)	30%
paper (April 1)	40%

The Grading Standard for this course is as follows:

A+ (90-100%)	B (70-74%)	D (50-59%)
A (80-89%)	C+ (65-69%)	F (0-49%)
B+ (75-79%)	C (60-64%)	

Miscellaneous Information Required by Senate Regulations
--

Policy regarding late assignments: Students will not be permitted to write make-up tests or hand in assignments late, except for documented medical or compassionate reasons.

Evaluative feedback: Marks will be given by .

Academic Dishonesty: Students should acquaint themselves with the University's policy on plagiarism and cheating and examination impersonation (see University of Manitoba General Calendar).