Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).

See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

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Prepared by	Laura Schne	ider		Phone					71
Email Contact	lllugar@alas	ka.edu		Faculty	Contact			Mar	ibeth Muri
1. ACTION DE	ESIRED (CHECK ON	<i>E):</i> Tria	al Course	e		New	Course		Х
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FISH F487 W, O Fisheries Management 3 Credits Offered Spring

Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0) **NORS 474** The Changing Arctic: The Changing Arctic: Scientific and Social Perspectives on Change, Adaptation, and Sustainability in the North 3 Credits Offered Spring An introduction to the Arctic System: atmosphere, ice, land surface, oceans and people, and iknown biological, chemical, physical and social interactions and controls. The Arctic is responding rapidly to globally driven environmental change. Ways researchers are working to understand environmental change in the arctic, ways northern people are responding to changes, and strategies for adaptation, mitigation and sustainability are considered. Links to global-scale environmental, political, social and economic drivers are explored and initiatives for assessing and addressing a changing Arctic are evaluated. Prerequisites: Junior standing or higher or permission of instructor. (3+0) 11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank. S = Social Sciences X H = Humanities Will this course be used to fulfill a requirement YES: NO: x for the baccalaureate core? If YES, attach form. IF YES, check which core requirements it could be used to fulfill: 0 = Oral Intensive, W = Writing Intensive, Natural Science, ("X" Format 6 Format 7 for Core) Format 8 11.A Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner. YES X COURSE REPEATABILITY: Is this course repeatable for YES NO credit? Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time). How many times may the course be repeated for credit? TIMES If the course can be repeated for credit, what is the maximum CREDITS number of credit hours that may be earned for this course? If the course can be repeated with variable credit, what is the CREDITS maximum number of credit hours that may be earned for this course? Specify only one. Note: Later changing the grading system for a 13. GRADING SYSTEM: course constitutes a Major Course Change. PASS/FAIL: LETTER: RESTRICTIONS ON ENROLLMENT (if any) PREREQUISITES Junior standing or higher or permission of instructor These will be required before the student is allowed to enroll in the course.

Reference the registration implications below due to Banner coding of terms:

Prerequisite: Course completed and grade of "C" (2.0) or higher prior to registration for the course that requires it.

Concurrent: Course may be taken simultaneously (and allows for a course to have been previously completed).

Co-requisite: Course MUST be taken simultaneously and does NOT allow for the fact that a course was previously completed!

15. SPECIAL RESTRICTIONS, CONDITIONS	
16. PROPOSED COURSE FEES Has a memo been submitted	ed through your dean to the Provost for fee approval? Yes/No
17. PREVIOUS HISTORY Has the course been offered as special topics or trial of Yes/No	ourse previously? No
If yes, give semester, year, course #, etc:	To be offered as NORS 493 spring 2013
	ON BUDGET, FACILITIES/SPACE, FACULTY, ETC. Dr. Murray's teaching workload in NORS
library/media collections, equipment, and services avai explain why not.	officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of lable for the proposed course? If so, give date of contact and resolution. If not,
	version of this class as an independent study was taught in spring surces are more than sufficient.
great interest to students in a variety of dis 21. POSITIVE AND NEGATIVE IMPACTS Please specify positive and negative impacts on other	er courses, programs and departments resulting from the proposed action.
No discernible impact on other programs, I Studies, but also in geography and other ar	but it's a great opportunity for students, not just in Northern reas with a focus on northern research.
applications to make sure that the quality of UAF e	ED arriculum committees is to scrutinize course change and new course ducation is not lowered as a result of the proposed change. Please to be self-explanatory. Use as much space as needed to fully justify the
This class represents an effort by NORS to e current issues in arctic research.	extend our curriculum to include interdisciplinary coverage of

APPROVALS: Add additional signature lines as needed.	
Wang 2. Ehrluder	Date 10-4-12
Signature, Chair, Program/Department of:	
See attached e-mail Signature, Chair, College/School Curriculum Council for:	Date 12-18-12
Signature, Chair, College/School Curriculum Council for:	CLA
Signature, Dean, College/School of: CLA	Date 12/23/12
CC/	
Offerings above the level of approved programs must be approved in	advance by the Provost.
	Date
Signature of Provost (if above level of approved programs)	
ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION	TO THE GOVERNANCE OFFICE
	Date
Signature, Chair Faculty Senate Review Committee:Curriculum ReviewGAAC	
Core ReviewSADAC	
ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stace	king)
	Date
Signature, Chair, Program/Department of:	
	Date
Signature, Chair, College/School Curriculum Council for:	
	Date
Signature, Dean, College/School of:	



Breehan Yauney

 boyauney@alaska.edu>

NORS 474

Siri Tuttle <sgtuttle@alaska.edu>

Tue, Dec 18, 2012 at 12:55 PM

To: Breehan Yauney

boyauney@alaska.edu>

Breehan,

I'm pretty sure I didn't see this revision. In any case, it looks to me as if all committee requests have been attended to. I consider it approved. Let me know if there's anything special we need to do to make the approval formal.

Siri Tuttle

[Quoted text hidden]

12/18/2012 1:24 PM

NORS 474

The Changing Arctic: Scientific and Social Perspectives on Change, Adaptation, and Sustainability in the North

Spring 2013 Class Time: TBD

Instructor: Maribeth Murray E-Mail: msmurray@alaska.edu

Phone: 907 474-6751 Office: Akasofu 204b Office Hours: TBD

Course Description

This class provides a comprehensive introduction to the Arctic System and all its constituent components: atmosphere, ice, land surface, oceans and people, and its known biological, chemical, physical and social interactions and controls. The Arctic is a regional component of the Earth System, which due to its unique physical conditions, is responding very rapidly to globally driven environmental change. Here, ways in which the academic community is working to better understand environmental change in the arctic, ways that northern societies are responding to these changes, and evolving strategies for improving various stakeholder collaborations that address adaptation, mitigation and sustainability are considered. The links to global-scale environmental, political, social and economic drivers of arctic change are explored and international initiatives for assessing and addressing a changing Arctic are evaluated.

Goals and Learning Outcomes

- To understand what comprises the constituent components of the Arctic System and how those components interact, force, and respond to natural and anthropogenic changes and global drivers.
- To explore the multiple ways that the research and stakeholder communities are working to observe, understand and respond effectively to a changing arctic.
- To develop analytical and critical thinking skills necessary to evaluate
 existing science and adaptive planning documents, and assessment and
 monitoring programs with respect to addressing scientific goals as well as
 objectives for adaptation to and mitigation of problems stemming from
 arctic environmental change.
- To explore new conceptual approaches, models and methods for collaborative research and problem solving among arctic research and stakeholder communities.
- To learn to assess evidence-based approaches to understanding system change and consider how these can further goals of sustainability and inform a diverse public.

Course Information

Program: Northern Studies Course Number: NORS 474 Number of Credits: 3

Contact Hours: 3 hours/week (lecture and seminar) and online delivery Prerequisites: Junior standing or permission of the instructor

Location: TBD Offered: Spring

Required Readings

ACIA (2005) Arctic Climate Impact Assessment. Impacts of a Warming Climate: Arctic Climate Impact Assessment, The Scientific Report. Cambridge University Press, Cambridge.

AHDR (2004) Arctic Human Development Report. Stefansson Arctic Institute, Akueyri.

AMSA (2009) Arctic Marine Shipping Assessment 2009 Report. Arctic Council, 2nd printing.

Antoff, D. et. Al. 2010. The economic impact of substantial sea level rise. *Mitigation and Adaptation Strategies for Global Change* 15: 321-335.

CAFF (Conservation of Arctic Flora and Fauna) 2010. The Arctic Biodiversity Trends – 2010: Selected

Evaluation

Letter Grades +/-

A range = 90-100 (A- = 91-93, A=94-96, A+=97-100), B range 90-80, C range 80-70, D range 70-60, F 60 or below

Weekly participation in seminar and discussion/discussion board 10%

Future Coasts/ArcticSmarctic/Greenify Interactive Gaming 20% 10% for participation, 10% from summative learning evaluation survey

Case Study – Oral Presentation

20%

Due weeks of April 9, 16, 23 as assigned during the first week of class. Grade based on presentation content, and preparation and clarity of accompanying visual material.

Case Study Summative Evaluation – Written, 15-20 pages. 30% **Due 27 April 2012** Grade based on content, clarity of discussion and analysis, grammar and spelling.

Final Exam 20%

Class Schedule and Readings

All readings will be placed on Blackboard or, in the case of books or sections of books, placed on reserve in the library. There is no textbook.

Ice Is Nice, ArcticSmartic and Greenify are interactive games designed to teach student and adult learners about the relationship between environmental change at the poles and issues of sea level rise, economic development and geopolitics. Student participation and learning outcomes are assessed through a series of question and answer session that follow completion of the game(s).

Week 1 23-27 January

- 1. Introduction, overview of syllabus and class policies.
- 2. Geographic and geopolitical boundaries
- 3. Introduction to the Arctic System Physical Components Sea Ice and Cryosphere
- 4. Introduction to Greenify

Readings

Dieckmann, G.S. and H.H. Hellmer, 2003. The importance of sea ice: an overview, in Thomas and Dieckman, Pp. 1-22.

Parkinson, C. L., 2006. Earth's Cryosphere: Current State and Recent Changes. *Annual Review of Environment and Resources* 31(1): 33-60.

Week 2 30 January-3 February

Arctic System continued – Physical Components
 Atmosphere and Ocean

Readings

Indicators of Change. Arctic Council, www.arcticbiodiversity.is/index.ph p/en/downloads
CRCC (Coastal Response Research Center) 2009. Opening the Arctic Seas: Envisioning Disasters and Framing Solutions. Coastal Response Research Center, University of New Hampshire, Durham.

Forbes, B. et al., 2009. High resilience in the Yamal-Nenets socio-ecological system, West Siberian Arctic, Russia. *Proceedings of the National Academy of Science* 106:22041-22048.

Forbes, B. and F. Stammler, 2009. Arctic climate change discourse: the contrasting politics of research agendas in the West and Russia. *Polar Research* 28(1): 28-42. DOI 10.1111/j.1751-8369.2009.00100.x

Gearheard, S. et al. 2011. The Igliniit project: Inuit hunters document life on the trail to map and monitor arctic change. *The Canadian Geographer* 55(1): 42-55. DOI: 10.1111/j.1541-0064.2010.00344.x

Grebmeier, J.M. 2006. A major ecosystem shift in the northern Bering Sea. Science 311: 1461-1464.

Hamilton, L.C. and R. Lammers, 2011. Linking pan-Arctic human and physical data. *Polar Geography* 34(1-2): 107-123.

Hinzman, L. et al. 2005. Evidence and implications of recent climate change in northern Alaska and other arctic regions. *Climatic Change* 72(3):251-298.

Keskitalo, E.C.H. 2009. New Governance" in the Arctic and Its Role for Supporting Climate Change Lutgens, F.K., E.J. Tarbuck, and D. Tasa, 2009. *The Atmopshere*. Prentice Hall, Upper Saddle River. Chapter 1, Pp. 3-29.

Walsh, J.E., 2008. Climate of the arctic marine environment. *Ecological Applications*, 18(2) Supplement, 2008, pp. S3–S22

Week 3 6-10 February

- Arctic System continued Biological Components
 Terrestrial and Marine Ecosystems
- 2. Ice is Nice

Week 4 13-17 February

Arctic System continued – Human Component
 Cultural Groups
 Economic Diversity
 Political Diversity

Week 5 20-24 February

 System Interactions and Systems Thinking Biological, Chemical, Physical and Social

Week 6 27 February - 2 March

1. Arctic System Change

Recent observations of change Linkages among changes Drivers of change Natural and Anthropogenic

Readings:

CAFF (Conservation of Arctic Flora and Fauna) 2010. The Arctic Biodiversity Trends – 2010: Selected Indicators of Change. Arctic Council, www.arcticbiodiversity.is/index.php/en/downloads

Grebmeier, J.M. 2006. A major ecosystem shift in the northern Bering Sea. Science 311: 1461-1464.

Hinzman, L. et al. 2005. Evidence and implications of recent climate change in northern Alaska and other arctic regions. *Climatic Change* 72(3):251-298.

Krupnik, I. and C. Jolly, 2002. *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Arctic Research Consortium of the United States, Fairbanks.

Overpeck, J.T., et.al. 2005. Arctic system in trajectory to new, seasonally ice-free state. *Eos Transactions* 86(34): 309.

Post, E., M. C. Forchhammer, et al. (2009). Ecological Dynamics Across the Arctic Associated with Recent Climate Change. Science 325(5946): 1355-1358.

Sommerkorn, M. and J. Hassol, 2009. *Arctic Climate Feedbacks: Global Implications*. WWF International Program, Oslo.

Adaptation. Special Issue, Climate Governance in the Arctic, *Environment and Policy* 50(1): 97-116. 10.1007/978-1-4020-9542-9 5

Krupnik, I. and C. Jolly, 2002. The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change. Arctic Research Consortium of the United States, Fairbanks.

Lutgens, F.K., E.J. Tarbuck, and D. Tasa, 2009. *The Atmopshere*. Prentice Hall, Upper Saddle River.

McGuire, A. D., F. S. Chapin, et al. (2006). Integrated Regional Changes in Arctic Climate Feedbacks: Implications for the Global Climate System. *Annual Review of Environment and Resources* 31(1): 61-91

Martello, M.L. 2008. Arctic indigenous peoples and representations and representatives of climate change. *Social Studies of Science* 38 (3): 351-376. doi: 10.1177/0306312707083665

Overpeck, J.T., et.al. 2005. Arctic system in trajectory to new, seasonally ice-free state. *Eos Transactions* 86(34): 309.

Parkinson, C. L., 2006. Earth's Cryosphere: Current State and Recent Changes. Annual Review of Environment and Resources 31(1): 33-60.

Pearce, T.D. et al. 2009. Community collaboration and climate change research in the Canadian Arctic. *Polar Research* 28(1): 10-27.

Post, E., M. C. Forchhammer, et al. (2009). Ecological Dynamics Across the Arctic Associated with Recent

Week 7 5-9 March

- 1. Research questions stemming from arctic change
- 2. Research strategies for observing and understanding change Discipline-based

Interdisciplinary
National, Pan-Arctic and International

Readings:

Hamilton, L.C. and R. Lammers, 2011. Linking pan-Arctic human and physical data. *Polar Geography* 34(1-2): 107-123.

McGuire, A. D., F. S. Chapin, et al. (2006). Integrated Regional Changes in Arctic Climate Feedbacks: Implications for the Global Climate System. *Annual Review of Environment and Resources* 31(1): 61-91.

Week 8 12-16 March SPRING BREAK

Week 9 19-23 March

1. Societal impacts and responses to arctic change

Economic development and impacts in the face of rapid change

Individual and community health and well-being
Interaction with and disconnection from the global system

Readings:

Antoff, D. et. Al. 2010. The economic impact of substantial sea level rise. *Mitigation and Adaptation Strategies for Global Change* 15: 321-335.

Forbes, B. et al., 2009. High resilience in the Yamal-Nenets socio-ecological system, West Siberian Arctic, Russia. *Proceedings of the National Academy of Science* 106:22041-22048.

White, D. et al. 2007. Food and water security in a changing Arctic. Focus Issue: Northern Hemisphere High Latitude Climate and Environmental Change. *Environmental Research Letters* 2(045018): 1-5.

Week 10 26-30 March

1. Improving knowledge through collaboration

Stakeholder communities
Strategies for building research/stakeholder partnerships
Citizen-science
Science for society in the north and beyond

Readings:

Gearheard, S. et al. 2011. The Igliniit project: Inuit hunters document life on the trail to map and monitor arctic change. *The Canadian Geographer* 55(1): 42-55. DOI: 10.1111/j.1541-0064.2010.00344.x

Huntington, H., T. Callaghan, et al. (2004). "Matching Traditional and Scientific Observations to Detect Environmental Change: A Discussion on Arctic Terrestrial Ecosystems." *Ambio*, Special Report Number 13:18-23

Martello, M.L. 2008. Arctic indigenous peoples and representations and

Climate Change. *Science* 325(5946): 1355-1358.

Powell, R.C. 2008. Becoming a geographical scientist: oral histories of Arctic fieldwork, *Transactions of the Institute of British Geographers*, 33(4): 548-565. DOI: 10.1111/j.1475-5661.2008.00314.x

Streever W., et al. 2011. Environmental change and potential impacts: applied research priorities for Alaska's north slope. *Arctic* 64(3): 390-397.

Sommerkorn, M. and N. Hamilton, (eds.) 2008. Arctic Climate Impact Science: An Update since ACIA. WWF International Programme, Oslo.

Sommerkorn, M. and J. Hassol, 2009. Arctic Climate Feedbacks: Global Implications. WWF International Program, Oslo.

Thomas, D.N. and G. Dieckmann eds. 2003. Sea ice: an introduction to its physics, chemistry, biology, and geology. Blackwell Publishing, Oxford.

Walsh, J.E., 2008. Climate of the arctic marine environment. *Ecological Applications*, 18(2) Supplement, 2008, pp. S3-S22

White, D. et al. 2007. Food and water security in a changing Arctic. Focus Issue: Northern Hemisphere High Latitude Climate and Environmental Change.

Environmental Research Letters 2(045018): 1-5.

representatives of climate change. *Social Studies of Science* 38 (3): 351-376. doi: 10.1177/0306312707083665

Pearce, T.D. et al. 2009. Community collaboration and climate change research in the Canadian Arctic. *Polar Research* 28(1):10-27.

Week 11 2-6 April

Knowledge to Action and the Science Policy Interface
 Stumbling blocks, disconnects, and barriers to communication
 Issues of scale – local to Pan-Arctic
 Competing interests
 ArcticSmartic

Readings:

Keskitalo, E.C.H. 2009. New Governance" in the Arctic and Its Role for Supporting Climate Change Adaptation. Special Issue, Climate Governance in the Arctic, *Environment and Policy* 50(1): 97-116. 10.1007/978-1-4020-9542-9_5

Week 12 9-13 April

1. Case Study I - Science Planning, Implementation and Application

Readings:

Streever W., et al. 2011. Environmental change and potential impacts: applied research priorities for Alaska's north slope. *Arctic* 64(3): 390-397.

Week 13 16-20 April

1. Case Study 2 - Regional and Pan-Arctic Assessments

Readings:

ACIA (2005) Arctic Climate Impact Assessment. Impacts of a Warming Climate: Arctic Climate Impact Assessment, The Scientific Report. Cambridge University Press, Cambridge.

AHDR (2004) Arctic Human Development Report. Stefansson Arctic Institute, Akueyri.

AMSA (2009) Arctic Marine Shipping Assessment 2009 Report. Arctic Council, 2nd printing.

Sommerkorn, M. and N. Hamilton, (eds.) 2008. Arctic Climate Impact Science: An Update since ACIA. WWF International Programme, Oslo.

Week 14 23-27 April

1. Case Study 3 – Anticipating the Future and Managing for Change, Adaptation, and Sustainability

Readings:

CRCC (Coastal Response Research Center) 2009. Opening the Arctic Seas: Envisioning

Disasters and Framing Solutions. Coastal Response Research Center, University of New Hampshire, Durham.

Week 15 30 April-4 May

1. Review and Preparation for Final

UAF Policies

You are expected to adhere to the Academic Code of Honor as outlined in the University of Alaska Catalog. A note on borrowing: remember that copying from an author without attribution is plagiarism; using the ideas and results of many with attribution and clear acknowledgement of the source(s) is the first step in research. If you are found to have plagiarized, failed to properly cite, reference and/or properly attribute the work of others, you will fail the class.

Attendance and Late Policy

Students are expected to attend class. This class involves extensive classroom/online participation, much of which cannot be made-up after the fact. Excused absences from class will not be factored into participation grades, unexcused absences will impact participation grades. Late assignments will be not be accepted, unless the student asks for permission well ahead of time (minimum two weeks) or has an understandable emergency during the week an assignment is due (illness, accident, etc.).

Disabilities

The University of Alaska provides equal access for all students with disabilities. The Office of Disabilities Services Implements the Americans with Disabilities Act (ADA) to ensure that all students have equal access to campus facilities and course material. Please advise in writing if you need special consideration. If you have questions, please contact the Office of Disabilities Services at (907) 474-5655.

Cell Phones and Computers in Class

In class, computer use is for class purposes only. Cell phones are not welcome and should be turned off and put away – no chatting and no texting. If you anticipate an emergency and need to have access to your phone, please let the instructor know in advance.



		Online Discussion Rubric	J	
		2	3	4
Promptness and Initiative	Does not respond to most postings; rarely participates freely	Responds to most postings several days after initial discussion; limited initiative	Responds to most postings within a 24 hour period; requires occasional prompting to post	Consistently responds to postings in less than 24 hours; demonstrates good self-initiative
Delivery of Post	Utilizes poor spelling and grammar in most posts; posts appear "hasty"	Errors in spelling and grammar evidenced in several posts	Few grammatical or spelling errors are noted in posts	Consistently uses grammatically correct posts with rare misspellings
Relevance of Post	Posts topics which do not relate to the discussion content; makes short or irrelevant remarks	Occasionally posts off topic; most posts are short in length and offer no further insight into the topic	Frequently posts topics that are related to discussion content; prompts further discussion of topic	Consistently posts topics related to discussion topic; cites additional references related to topic
Expression Within the Post	Does not express opinions or ideas clearly; no connection to topic	Unclear connection to topic evidenced in minimal expression of opinions or ideas	Opinions and ideas are stately clearly with occasional lack of connection to topic	Expresses opinions and ideas in a clear and concise manner with obvious connection to topic
Contribution to the Learning Community	Does not make effort to participate in learning community as it develops; seems indifferent	Occasionally makes meaningful reflection on group's efforts; marginal effort to become involved with group	Frequently attempts to direct the discussion and to present relevant viewpoints for consideration by group; interacts freely	Aware of needs of community; frequently attempts to motivate the group discussion; presents creative approaches to topic