

Course Syllabus
Our Changing Climate: Past, Present, Future
Spring 2022

Course Number: HONR F125/NRM F125/ACNS F125

Prerequisites: Placement in WRTG F111X

Credits: Lecture + Lab + Other: 3 + 0 + 0

Class Time and Location and associated CRN:

Online Asynchronous

- 38523 - ACNS F125 - 002
- 38519 - HONR F125 - 002
- 38868 - NRM F125 - 002

Instructors

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Course Catalog Description

Examines the intersecting physical, social, ecological, economic, political, and cultural dimensions of climate change in Alaska and the Arctic, including both Indigenous and Western science perspectives. Includes project-based experiences in observation, data collection and analysis, assessment, planning, communication to shape the future in a time of unprecedented change.

Course Purpose

This course examines how the biophysical impacts of climate change define and intersect with the social, ecological, economic, political, and cultural dimensions of our lives. We will investigate the multiple dimensions of global climate change, with a focus on the ways climate change affects the interconnected physical, biological, and human systems in Alaska and the Arctic. Through activities, guest speakers, readings, and lectures, it provides a

foundation in both Indigenous and Western science perspectives of the causes, impacts, and feedbacks of a changing climate. We will critically examine scientific claims and the processes of generating climate science, developing an understanding of the scientific method through observation, data collection and analysis. We will also explore the ways in which climate change is shaped by history and presently shapes our culture. By looking at research from communication, human behavior, and social movements, we will investigate the multiple pathways of social change, with an emphasis on our own vision and agency to shape the future in a time of unprecedented change.

Required Readings and Videos

You will be responsible for reading, watching, or listening to assigned materials prior to class on all days that readings are assigned.

The book *Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World*, by Dr. Katharine Hayhoe, is required reading for this course and available at the UAF bookstore or [through major book vendors](#).

All other required readings and course materials will be provided through Canvas.

Learning Goals & Objectives

Course Big Idea: We can listen, inquire, observe, and act to make a difference on climate change.

Enduring Understandings:

1. Climate change influences each of us personally.
2. Climate change influences earth systems at multiple interacting scales.
3. Climate change influences all dimensions of our lives- social, economic, cultural, and biophysical.
4. We can help our communities to respond to climate change and shape the future.

Unit Level Essential Questions and Learning Objectives

Unit 1. What is our individual or personal connection to climate change and how does it connect with broader systems?

Students will be able to:

- Conduct elder visits following local protocol in a respectful manner
- Reflect on and articulate their personal observations of environmental change in place special to them
- Establish a baseline of individual and collective (i.e. across course students) prior knowledge on the topic of climate change

Unit 2. How do we know the climate is changing?

Students will be able to:

- Describe causes of climate change and key amplifying and stabilizing feedbacks (with emphasis on Arctic feedbacks)

- Identify key indicators and sources of evidence that form the baseline of evidence to understand climate change (including Indigenous and Western science knowledge)
- Collect and interpret ecological and social science data
- Understand mathematical models and projections of climate change

Unit 3. What are the impacts and feedbacks of a warming climate?

Students will be able to:

- Identify reputable sources of climate change information for a region
- Articulate key changes in disturbance patterns, livelihoods, species distributions and phenology influenced by a changing climate
- Describe the interactions and feedbacks between the above changes across local to global scales, and natural and social processes.

Unit 4. What are the solutions to climate change?

Students will be able to:

- Understand that human behavior is the product of individual actions, shaped by local context
- Articulate the pathways and levers that could be used to reach drawdowns and the pros and cons of each “lever”
- Identify the pathways by which societal change occurs in the U.S.

Unit 5. How do we make decisions in the face of climate change?

Students will be able to:

- Synthesize evidence to identify social and biophysical factors that influence local vulnerabilities to climate-related risks
- Take a scenario and describe the actions they would take using the RAD framework or other decision-making framework (e.g. adaptation toolkit)

Unit 6. What can I do about climate change in my community and how do we prepare for change?

Students will be able to:

- Understand and articulate a personal climate action plan
- Synthesize multiple lines of evidence to create a future scenario
- Apply theories of transformation to create a vision and action plan for the future

Our Teaching Philosophy

- Each of you brings valuable personal observations and knowledge with you to this class.
- We are partners and collaborators in the learning process, each responsible for sharing what we know with each other
- Our job as educators is to activate your personal connection and prior knowledge and challenge each of you to continue to build your understanding, advance your ability to apply and synthesize new scientific knowledge and skills, and identify pathways to solve the problems you care about most

- Our assignments are challenging, creative, and nurturing spaces to test your ideas and sharpen your skills. Problems like climate change never have one right solution, and you'll be assessed for engaging deeply versus finding a single, correct answer.
- We care deeply for your success in this class and beyond, and as such we expect you to bring equal energy to that goal, by being responsible for your own learning before, during, and after class.

Diversity and Inclusion

- People of color have been leaders in the movements for environmental justice and climate change, but are often not recognized for their contributions to this effort. We strive to provide opportunities to hear the voices of people of color in 50% of our weekly assignments and activities.
- The richness of this class would not be possible without Alaska Native Knowledge holders. We are grateful for the time they spend sharing their knowledge with us.
- We honor that students have a variety of skills, gifts, and abilities when it comes to learning, and we aim to provide resources that meet a variety of learning preferences (i.e. reading, watching, listening, experiencing, etc.)
- We acknowledge our positions of privilege as white, cis-gendered women in our society and we are actively learning and working towards creating an environment where we can listen and learn together. We aim to acknowledge and address issues of diversity, inclusion, and power within this class and the context of climate change.

Course Policies

Participation and attendance- Success in this course is dependent on your active participation and engagement. It is good practice to login to online courses several times a week to stay informed of news, announcements, grades, assignments, and other important course information. Students are required to participate in course related activities that may include, but not limited to reading announcements, participating in online discussions, submitting assignments, and joining other asynchronous online class activities.

Technical Requirements - Students must have regular access to a computer and internet to access course materials on Canvas and upload assignments.

Plagiarism/Academic Integrity Policy- Acts of academic dishonesty include cheating on exams, using data or words of other students without permission, helping others to dishonestly cheat, plagiarizing, feigning illness to obtain an extension, and turning in work that was written for another class without permission. Plagiarism includes overt or covert use of other people's work, ideas or words without acknowledgement or quotation. Please read the UAF Code of Conduct in the UAF Catalog. Any person enrolled in the course who behaves dishonestly will receive an F for the class and the case will be presented to the University Disciplinary and Honor Code Committee for review.

Email Policy- In order to ensure that your email does not get sent to the spam folder, please use your University of Alaska-assigned email address for all email correspondence. We will respond to emails within 24 h Monday thru Friday between 9 am and 5 pm. All emails sent

after 5 pm on Friday will be replied to by Monday 5 pm. Please use the course number in your email subject line so that we can better identify and respond to emails regarding this class. We may not see an email that does not contain this subject line.

UAF Wide Course Policies

Disabilities Services- The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials. Students and the instructor of this course may work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities.

Student Protections Statement- UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: <https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/>.

Courses in the Time of COVID

These are uncertain times, and we understand that you may experience unexpected challenges during the semester. Please communicate with us if you are having challenges related to health, technology, caregiving responsibilities or work responsibilities. We know it can be difficult to ask for help, but we will find a way to help you be successful in this course while maintaining the care for yourself and your loved ones during this semester. Please email us and we will respond in accordance with the Email Policy previously stated.

We also ask you to be patient with us if there is a need to make changes to the syllabus or the weekly course plan in response to the evolving situation with COVID19. We will strive to communicate any changes to the course to you as soon and as clearly as possible.

Assignments

All assignment descriptions, grading rubrics, and due date for recurring activities are on Canvas. All assignments must be submitted on Canvas by 11:59 PM on the day they are due. Note: All class due dates fall on Tuesdays or Thursdays.

Assignment Name	Points	Due Date
Start of Semester Activities - Start of Semester Survey (1 point) - Meet your Classmates Discussion (2 points) - Syllabus Scavenger Hunt (2 points)	5	Due: 1/13
Participation and Discussion (2 points per week) Read assigned readings (or watch or listen to assigned videos/audios) and discuss them in the specified activities on Canvas. Actively participate in discussions on Canvas as assigned.	28	Tuesdays and Thursdays

<p>Reading Reflection/Guided Notes (1 point each) Read assigned readings (or watch or listen to assigned video/audio) and submit a “circle-square-triangle” reading reflection or submit the guided notes.</p>	22	Tuesdays and Thursdays
<p>Personal Observations of Change Map Draw and annotate a map of a place you know well and the social or ecological changes you have observed in that place.</p>	10	Due: 1/13
<p>Elder Visit Reflection Essay Write a brief reflection on the experience of listening to an Alaska Native elder.</p>	10	Due: 1/20
<p>Arctic Climate System Concept Map Draw connections between the climate change impacts and feedbacks and describe the potential influence on each other. Connect these impacts to the ones you have observed in your own personal map from a place special to you. Look for key feedback loops in the system.</p>	10	Due 1/18
<p>Personal Action Essay Use calculators to investigate your personal environmental impact, choose a personal behavior to change for the semester, and write an essay to reflect on your experience.</p>	Part 1: 10 Part 2: 15	Part 1 Due: 2/1 Part 2 Due: 4/12
<p>Citizen Science Project Collect 3 river or lake ice observations OR make weekly observations of clouds for 3 weeks through the GLOBE Observer app. Analyze your data as a part of a global dataset at GLOBE.gov, and practice writing a scientific report on your data.</p>	25	Due: 2/24
<p>Interviews with Climate Leaders Choose two experts to interview and take notes. Write a 2-3 page essay to summarize what you learned from the interviews.</p>	25	Due: 3/3
<p>Climate Impacts and Feedbacks Presentation Research and create a presentation on an assigned climate change impact and its influence on the social or biophysical elements of a region or community.</p>	25	Due: 3/17
<p>Final Paper/Project Write a final paper, or create a video, audio, or multimedia expression that is a “Postcard from the Future.” Prepare a 5 minute in-class presentation about your project.</p>	25	Due: 4/21
	210	

Grading Scheme: >90% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F

Course Schedule

This schedule may be subject to change.

Date	Topic	Assignment Due Today
Week 1		
Jan 11 (Tues) Both	What are we going to do in this course? What are my personal connections to climate change?	Start of Semester Survey
Jan 13 (Thurs) Katie	What are my personal connections to climate change? <ul style="list-style-type: none"> • Personal observations maps • Analyzing maps, sorting by lenses (economic, cultural, biological, hydrological, etc) 	Saving Us, Chapter 2, Who I Am Saving Us, Chapter 3, Who You Are Personal Map: Finish your map and post it to canvas. Write a short narrative or record an audio/video of your explanation of the map. Post an additional copy to the discussion board and follow discussion instructions.
Week 2		
Jan 18 (Tues) Katie	What do Alaska Native Elders say about climate change? <ul style="list-style-type: none"> - What other prominent issues intersect Alaska Native experience with climate change in the examples? Learning from Elders through Project Jukebox.	Read Guidelines for Respecting Cultural Knowledge by the Alaska Native Knowledge Network and complete a reading reflection Watch the assigned Elder videos and recorded interviews posted in Canvas as a virtual Elder Visit. Elder Visit Reflection Essay Due. 1 page minimum reflection on what the elders have shared.

<p>Jan 20 (Thurs) Katie</p>	<p>How are climate impacts connected to each other? What are the changes in key global indicators and feedback loops?</p> <ul style="list-style-type: none"> ● Personal connection related to broader system ● Systems diagram of the Climate Impacts in your place that you know well. ● Key feedback loops <ul style="list-style-type: none"> ○ Ocean circulation ○ Atmosphere / clouds ○ Ice/ Albedo ○ Methane / permafrost 	<p>Arctic Climate System Concept Map Due - Create a systems diagram of the place you drew in your map. Include key changes observed and illustrate the linkages between these changes. Post a screenshot of your diagram to the discussion board in Canvas.</p> <p>Provide a constructive review for two of your peer's diagrams in the discussion board. What linkages can you see that they might have missed? What revisions or fine tuning would you suggest. Due next Tues.</p>
<p>Week 3</p>		
<p>Jan. 25 (Tues) Katie</p>	<p>What are the causes of climate change?</p> <ul style="list-style-type: none"> ● Flows of energy at household, national and global scales ● Greenhouse effect ● Climate vs. weather/weather cycles ● Simulation 	<p>Saving Us, Chapter 4 The Facts are the Facts</p> <p>Read Chapter 2, Key Message Sections 1, 2, and 10 of the 4th National Climate Assessment</p>
<p>Jan. 27 (Thurs) Katie</p>	<p>What are the main lines of evidence that climate is changing? Why should we trust this evidence?</p> <p>https://gml.noaa.gov/ccgg/trends/history.html</p> <ul style="list-style-type: none"> ● Paleorecords of climate change ● Indigenous Knowledge ● Keeling curve ● Climate change indicators (sea ice, phenology, pollen records, tree rings) 	<p>Watch Why We Should Trust Science Most of the Time by Naomi Oreskes</p> <p>Complete Discussion Board Assignment</p> <p>Saving Us, Chapter 8- A Faraway Threat & Chapter 9- Here and Now</p>

Week 4		
Feb. 1 (Tues) Katie	<p>How are biophysical climate change data collected?</p> <ul style="list-style-type: none"> ● Framing the questions ● Study design (experimental vs. observational, controlling for bias) ● Introduce monitoring project, data collection and report 	<p>Personal Action Essay Part 1 due</p>
Feb. 3 (Thurs) Katie	<p>How is biophysical data analyzed in climate change research?</p> <ul style="list-style-type: none"> ● Making sense of data ● Where do trendlines come from? ● How is variation described? ● What is a climate model? 	<p>Read “Science isn’t just for Scientists - we can all take part” by Madeline Ostrander</p> <p>Read “How reliable are climate models?” and watch embedded videos in https://skepticalscience.com/climate-models.htm</p> <p>Make a GLOBE Observer cloud or ice observation using the app</p>
Week 5		
Feb. 8 (Tues) Kristin	<p>What do we [physically in the atmosphere] need to do to solve climate change?</p>	<p>Read Global Warming’s Terrifying New Math by Bill McKibbon</p> <p>Read The New Climate Math: The Numbers Keep Getting More Frightening by Bill McKibbon</p> <p>Saving Us, Chapter 10, No Time to Waste</p> <p>Saving Us, Chapter 17, Time to Speed Up</p>

<p>Feb. 10 (Thurs) Kristin</p>	<p>What are the solutions to climate change?</p>	<p>Saving Us, Chapter 12, Why We Fear Solutions</p> <p>Saving Us, Chapter 13, Carbon and the Common Good</p> <p>Saving Us, Chapter 14, The Climate Potluck</p> <p>Make a GLOBE Observer ice or cloud Observation</p>
<p>Week 6</p>		
<p>Feb. 15 (Tues) Kristin</p>	<p>What needs to happen to limit warming to 2 degrees?</p> <ul style="list-style-type: none"> • EnRoads Simulation: conduct a climate change solutions negotiation simulation 	<p>Saving Us, Chapter 15, Everyone Needs Energy</p> <p>Saving Us, Chapter 16, Cleaning Up Our Act</p> <p>Review the preparation materials for EnRoads (on Canvas) and familiarize yourself with the EnRoads platform with this video.</p>
<p>Feb. 17 (Thurs) Katie</p>	<p>How do we make decisions in the face of climate change?</p> <ul style="list-style-type: none"> • RAD decision making framework <p>Preliminary discussion of Citizen Science data project data analysis</p>	<p>Read As Warming Alters Alaska, Can a Key Wildlife Refuge Adapt? by Miranda Weiss</p> <p>Make a GLOBE Observer ice or cloud observation</p>
<p>Week 7</p>		
<p>Feb 22 (Tues) Kristin</p>	<p>How do we respectfully engage and collaborate with communities?</p>	<p>Read Understanding Our Environment Requires an Indigenous Worldview by Raychelle Daniel</p> <p>Read Guiding Principles for Working in Northern Communities 2020 by Darcy Peter (on Canvas)</p>

		<p>Read a summary of the Alaska Native Claims Settlement Act (ANCSA)</p> <p>Watch a short video about ANCSA by Kendra Remsen</p> <p>Watch This Is The Story Of Alaska Natives' Fight For Their Land by Al Jazeera News</p>
<p>Feb 24 (Thurs) Kristin</p>	<p>What does it mean to adapt and build resilience to climate change?</p>	<p>Citizen Science data project report due</p> <p>Read Fourth National Climate Assessment - Ch. 28 Reducing Risks Through Adaptation Actions</p> <p>Unequal Impact: The Deep Links Between Racism and Climate Change by Beth Gardiner</p> <p>Read ‘What choice do we have?’ As the Arctic warms, Alaska Inupiat adapt by Jenna Kunze</p>
<p>Week 8</p>		
<p>Mar. 1 (Tues) Kristin</p>	<p>What do Americans think about climate change?</p> <ul style="list-style-type: none"> ● Global Warming's Six Americas ● Role play conversations with each of the groups 	<p>Saving Us, Chapter 1, Democrats and Dismissives</p> <p>Saving Us, Chapter 20, Why Talking Matters</p>
<p>Mar. 3 (Thurs) Kristin</p>	<p>How do human thoughts, feelings and behaviors relate to climate change?</p> <ul style="list-style-type: none"> ● Thoughts, feelings, and behaviors and why they matter ● The “dragons of inaction” 	<p>Saving Us, Chapter 5, The Problem with Facts</p> <p>Saving Us, Chapter 6, The Fear Factor</p> <p>Saving Us, Chapter 7, The Guilt Complex</p>

Mar. 8 (Tues)	SPRING BREAK - NO CLASS	
Mar. 10 (Thurs)	SPRING BREAK - NO CLASS	
Week 9		
Mar. 15 (Tues)	Regroup and Refresh!	
Both	<ul style="list-style-type: none"> ● Debrief on interview assignment ● Update concept map ● Model presentations ● Get help/catch up on work 	
Mar. 17 (Thurs)	Transition to climate impacts and feedbacks student presentations	Climate Impacts/Feedback Presentation Due
Week 10		
Mar. 22 (Tues)	How is the marine environment changing?	Watch short lecture and post guided notes in Canvas
Katie	<ul style="list-style-type: none"> ● Ocean Temperature ● Ocean Acidification, ● Sea level rise, ● Marine life 	
Mar. 24 (Thurs)	How is the hydrosphere changing?	Watch short lecture and post guided notes in Canvas
Katie	<ul style="list-style-type: none"> ● Deeper dive into precipitation change (timing, type) ● Changes in rivers and lakes (dissolved oxygen, temperature, ice seasonality) 	
Week 11		
Mar. 29 (Tues)	How is the pedosphere changing?	Watch short lecture and student presentations, contribute to discussion board.
Kristin	<ul style="list-style-type: none"> ● Soils ● Permafrost ● Chemical and biological processes 	
Mar. 31 (Thurs)	How is the cryosphere changing?	Watch short lecture and student presentations, contribute to discussion board.
Kristin	<ul style="list-style-type: none"> ● Sea Ice ● Glaciers ● Snow and ice 	
Week 12		
Apr. 5 (Tues)	How is human health affected by climate change?	Saving Us, Chapter 11, The Sickness and the Cure
Kristin	<ul style="list-style-type: none"> ● Heat and the body ● Extreme events 	

	<ul style="list-style-type: none"> ● Vector borne disease ● Food security ● Mental health 	Watch short lecture and student presentations, contribute to discussion board.
Apr. 7 (Thurs) Katie	How is the biosphere changing? <ul style="list-style-type: none"> ● Phenology shifts ● Changes in biodiversity (range shifts, biological invasions, etc.) ● Changes in primary production (greening and browning) and feedbacks to climate system 	Watch short lecture and student presentations, contribute to discussion board.
Week 13		
April 12 (Tues) Kristin	Can our personal actions help address climate change? <ul style="list-style-type: none"> ● Discuss personal action plans ● If there is one, what is the role for individual action in our climate future? ● How do personal actions connect to broader changes and make a difference? 	Personal Action Essay Part 2 Due Saving Us, Chapter 18, Why You Matter Saving Us, Chapter 19, What I Do I work in the environmental movement. I don't care if you recycle by Mary Annaise Heglar Read <i>A Field Guide for Transformation</i> by Leah Caramore Stokes (on Canvas)
April 14 (Tues) Kristin	How can we scale up collective action? <ul style="list-style-type: none"> ● How does a movement happen? ● How do ideas and behaviors spread in society? ● What have other movements done? ● How should this shape our advocacy on climate change? 	The Environmental Movement Needs to Reckon with Its Racist History by Julian Brave NoiseCat Read The 25% Tipping Point New research reveals how to make social change by Tracy Matsue Loeffelholz Read <i>Beyond Coal</i> , by Mary Anne Hitt (on Canvas)

Week 14		
Apr. 19 (Tues) Both	How do we find hope and courage to solve the climate crisis? <ul style="list-style-type: none"> • Discuss hope and courage • Course evaluations 	Saving Us, Chapter 21, Bond, Connect, and Inspire Saving Us, Chapter 22, Finding Hope and Courage
Apr. 21 (Thurs) Both	Course wrap up: <ul style="list-style-type: none"> • Revisit the concept maps and the guiding questions for the course • Summarize what we have learned (Jamboard activity) 	Final Paper/Project & Presentation due (upload on Canvas)
Week 15		
	Final Student Presentations: Postcards from the Future <ul style="list-style-type: none"> • 5 minute presentation or show video 	