

Natural Resource Conservation and Policy

-OR-

How can humans survive without trashing the planet?

**The Stone Age came to an end,
but not because we ran out of stones.*

— Sheikh Yamani, former OPEC oil minister

**Conservation, viewed in its entirety, is the slow and
laborious unfolding of a new relationship between people
and land.*

—Aldo Leopold,
Wisconsin Wildlife Chronology (1940)

**If we draw on the resources in our minds,
we won't have to rely on resources that we mine.*

—Stan Oshinsky, Inventor

**Tell me the landscape from which you come,
and I will tell you who you are.*

— Jose Ortega y Gasset

**The king who cannot take good care of the mountain,
forest, lake and meadow, will not be able to rule the nation.*

—Guan Zhong (645 BC)

**A nation deprived of its liberty may win it, a nation divided
may unite, but a nation whose natural resources are
destroyed must inevitably pay the penalty of poverty,
degradation, and decay.*

—Gifford Pinchot, founder, U.S. Forest Service

**Despite our artistic pretensions,
sophistication and accomplishments—
we still owe our existence*

to a six-inch layer of topsoil and the fact that it rains.

—Chinese Proverb

Instructor: Dr. Susan Todd

Associate Professor of Conservation Planning

Email: susan.todd@alaska.edu (email is best way to reach me)

Office Location: 349 O'Neill Bldg

Office Hours: Fridays 1-3 and by appointment

Teaching Assistant: Josie Sam

Graduate Student in Natural Resource Management
specializing in soils and waste management

Email: josie.sam@alaska.edu

Course Description:

The course examines the conservation of natural resources, including its history and ecological, economic and social foundations. First we discuss the basic principles of resource management including sustained yield, ecology, conflict resolution, and the effects of world population growth. With this foundation, we take a more detailed look at the management of specific resources, including soils, agriculture, rangelands, forestry, wildlife, and fisheries, then fossil fuels and renewable energy.

The course attempts to take the LONG view. Many of our resource problems have been caused because people put short-term interests over their own best interests over the long run. In addition to that, the history of natural resource management is a key part of the last 10,000 years of human history. As poet Gary Snyder put it, resource management began when we "stopped chasing our food and started growing it." All of civilization is based on natural resource management. NRM has greatly increased the carrying capacity of the Earth for humans, but often at the expense of other species. Throughout its history, NRM has put people first and short-term over long-term goals. We need to change that. We need to take a long view toward the future and think of many generations down the road. What will we leave for them?

In addition to taking the long view, the course takes a GLOBAL view. Since the days of the spice trade, natural resource management has had global implications. Now there are so many humans on the planet that we are having global impacts. Again, human ingenuity will hopefully come to the rescue to reduce these.

The Goal of Resource Conservation:

"To learn to live on a piece of land without spoiling it."

—Aldo Leopold

Resource conservation is about survival—survival of both our planet and ourselves. Over the long-term, human welfare and environmental quality are inseparable. Resource conservation is about working *with* nature to provide what we need while trying to minimize our impact on the environment. We cannot “lock up” *all* of Earth’s natural resources. People are consumers—when we stop using the Earth’s bounty, we die.

We must try to limit our population and stop consuming far more than we need. But even if we succeed in doing so, the remaining humans will still need food, water and shelter. We will still need to obtain everything we require from the Earth. And as Leopold said, we must learn to do so without spoiling the very source of our livelihood.

Themes

- Natural resource conservation is about supplying what humans need while trying to minimize the impacts of this on the environment.
- Natural resource conservation has greatly increased the carrying capacity of the Earth for humans.
- Much of natural resource management has involved domesticating the plants, trees, mammals, birds and fish that humans favor. There is a spectrum of domestication, from plants and animals that cannot live without human assistance to plants and animals that survive with little or no assistance from us.
- We have faced serious environmental impacts in the past and in most cases (though not all) human ingenuity saved the day. Life has gotten better and better in terms of human life expectancy, child survival and education. And in many places, the environment is in better shape than it was 50 years ago.
- We now face environmental challenges on a global scale
- Most resources are *limited* in supply and/or growth rates, but the ability of humans to learn and adapt seems virtually *unlimited*. This is good, because we are always facing new problems and challenges and the best minds are needed to overcome them.

Course Objectives:

Upon completion of this course, the student should:

- Recognize that the history of resource management is one of turning an increasing amount of the world’s biomass into humans and the things humans want and need. This is having major impacts on other species.
- It is also a history of increasing domestication. We started with grass seeds and small livestock, then other plants, trees, and finally fish. Will there be anything wild left?
- Recognize our total dependence on natural resources and our own *personal* impacts on them. All of us “live off the land,” though for most of us, this link is so remote that we are no longer aware of it. *All* of us are consumptive users of the environment and reducing impacts must begin on a personal level.
- Recognize the complexity of our resource problems; that there are often no simple answers and there is no free lunch—*all* decisions have consequences.
- Recognize the importance of our philosophy in determining both the types of environmental problems we are likely to confront and the types of solutions we are willing to consider.
- Recognize that *everything is connected*. Resources are not separate entities, but communities of living, interacting organisms and their abiotic environments.
- Recognize that both optimistic and pessimistic perceptions play important roles in our survival. Pessimists sound the alarm about problems and optimists go to work to solve them. We need both.
- Be able to explain what sustained yield is and why it is important in resource management.
- Consider both human needs and the needs of ecosystems.
- Know where much of our food, shelter and clothing come from and understand the ancient history of these products.
- Be able to tolerate, and even appreciate, diverse viewpoints.
- Recognize that few disciplines are more controversial than resource management—and few are more important.
- Recognize that in today’s world, most issues and impacts are global.

- Know the Three Principles of Sustainable Resource Mgmt:

1. Reduce dependence on non-renewable, non-recyclable materials, as these will run out.
2. Harvest renewable resources no faster than they can be renewed, or they will also run out.
3. Produce wastes no faster than nature can absorb or break them down, or we will poison our environment—and ultimately, ourselves.

Required Text:

For those of you on a tight budget, copies of the text will be on reserve in the Bioscience Library and an eBook is available online.

Natural Resource Conservation: Management for a Sustainable Future, 9th or 10th Edition by Daniel D. Chiras & John P. Reganold,. This book provides vital background and supplementary information that we don't have time to cover in lecture: You can order a new or used hardcopy at <http://www.UAFText2U.com>

Here is a link to a cheaper textbook on Amazon, and a link for students to sign up for a free six months of Amazon Prime (free 3-5 business day shipping). It should be noted that if your subscription to Prime has not been cancelled by the end of the six month period, you will be charged the yearly rate of \$39 - which is half that of the non-edu membership.

Book: <http://amzn.com/0132251388> - \$35.59.

Amazon Prime: http://www.amazon.com/gp/student/signup/info?ie=UTF8&refcst=5XKG22R4TR7TTEDSD5OOGSTS2Y&ref_type=generic

Learning Disabilities:

If you have a learning disability that may interfere with your ability to perform the work in this course, I am happy to make any necessary accommodations. However, it is the student's responsibility to obtain an Accommodation Letter from the Disabilities Office of the Health Center (ext.6158). This letter **MUST** be presented to Dr. Todd **within the first two weeks** of class. No accommodations will be made until this letter is given to the professor. Accommodations will **NOT** be made retroactively (i.e. if you have a spelling disability, you must present the letter **before** any points are deducted for spelling).

Attendance

Students are expected to attend all classes. If it is necessary to miss a class, contact the instructor beforehand to inform them of your plans and request guidance on how to make up missed classroom learning. **Research has shown that students who attend classes do much better and are FAR more likely to graduate.** The US has dropped from 1st to 12th in the number of students who start college and actually manage to finish, so professors are urged to take attendance, as this has been shown to increase graduation rates.

TAKE NOTES

Research also makes it clear that students who take notes do better in classes and again, are more likely to graduate. Note taking helps keep your mind from wandering; it helps you concentrate on the class.

Conduct in Class

- **CELLPHONES ARE NOT ALLOWED.** Anyone caught with a cellphone will be asked to leave immediately. They are an enormous distraction and will not be tolerated.
- **COMPUTERS ARE NOT ALLOWED.** Computers distract other students.
- Do NOT put books away or zip backpacks until class is over (i.e. NOT ONE MINUTE BEFORE 11:30).
- If you arrive LATE, please sit in the back.
- If you MUST leave early, please sit in the back and depart quietly.
- If other students are disturbing or distracting you, please let me know.

Email: always include a subject & your name

If you send an email to me or to the TA, please put "NRM 101" and your name at the start of the subject line. Most faculty get over 50 messages/day. If you want us to read your email, **ALWAYS include a subject and your name.** Otherwise, it could be considered spam and deleted.

Only those with active UAF accounts are allowed to use our “online classroom” called Blackboard. Your UAF email account will be created automatically. If you have any questions about email or Blackboard, contact the Computing Help Desk at helpdesk@alaska.edu.

How to forward your UAF gmail account to your personal email account

Click Settings at the top of any Gmail page, and open the Forwarding and POP/IMAP tab.
From the first drop-down menu in the Forwarding section, select 'Add new email address.'
Enter the email address to which you'd like your messages forwarded.
For your security, they'll send a verification to that email address.
Open your forwarding email account, and find the confirmation message from the Gmail team.
Click the verification link in that email.
Back in your Gmail account, select the 'Forward a copy of incoming mail to...' option and select your forwarding address from the drop-down menu.
Select the action you'd like your messages to take from the drop-down menu. You can choose to keep Gmail's copy of the message in your inbox, or you can send it automatically to All Mail or Trash.
Click “Save Changes.”

Blackboard

We use the online course center called “Blackboard” (I abbreviate it BB) for many things in this class. It allows us to post copyrighted material (since only those with a password can access it), most of the gradebook is kept online, and you can access lecture notes, announcements, handouts, etc. It will also be the place to take quizzes and submit some assignments.

Go to <http://classes.uaf.edu/> and log in using your UA username (eg. sktodd). Don't know it? Go to: https://uaonline.alaska.edu/banprod/owa/bwggk2gid.P_DisplayID_Request.

First time users of BB should use their student ID number (without any dashes) as their password. Once logged in, you can change your password by going to “TOOLS” and then to “PERSONAL INFORMATION” where you can click on “CHANGE PASSWORD.”

Academic Honesty:

The UAF Student Code of Conduct requires that collaboration among students will not be allowed on essays, tests, exams and online quizzes. Copying or paraphrasing another student's writing is a violation of the Student Code. Evidence of academic dishonesty (either copying anyone else's work or allowing someone to copy yours) will be presented to the Director of Judicial Services and may result in an F for the course and possible expulsion from the University.

Discussion Forum Etiquette

The best posts are constructive, thoughtful and respectful.
Participate. You will get out what you put in, so be active.
Before posting, search the Discussion for similar ideas. Your contribution will be most valuable if you add to an existing thread.
If you disagree with a post, respond using evidence and reasoning obtained from this course or reputable sources.
Use your own words. If you include a quote or reference, when possible also provide a citation.
Slang words and abbreviations vary across cultures, so please avoid whenever possible.

Quizzes

There is at least one quiz due by 11:59 pm almost every Monday!!

You cannot pass this course without doing the quizzes.

QUIZZES count for over 30% of the points in this course. There is a quiz on every lecture topic, such as agriculture, forestry, wildlife, fisheries, etc. Quizzes on one week's topics are due by 11:59 the following Monday. You do not need to wait till the last minute; the quizzes are available any time. Some weeks there can be 3 quizzes due Monday night, so I would encourage you to work on the quizzes as soon as possible after the lecture on the topic. Quiz questions come from both the readings and the lectures. You have two chances to get a perfect score on each quiz. There are also practice quizzes that do not count toward the grade; they are just there for review and practice.

I am required to give an ENTRY QUIZ. Questions on the quiz are taken from final exams and the quiz is worth BONUS POINTS! Do not expect to ace it; but every point you get will boost your overall score. The quiz is due early in September.

Tests & Final Exam

There will be two tests and one comprehensive final exam. Each of these will include about 30 true/false questions, several multiple choice and a few short answer questions. Dates for tests and the exam are given on the attached course schedule.

Questions on Test Scores

An opportunity for students to discuss questions regarding a test score will be provided, subject to the following guidelines. Please do **not** discuss the score after class. I can be surrounded by a dozen students pleading for points and this isn't fair to any of us. Instead, do the following:

Write the number of the question on the back of the test and explain why you feel you deserve more points for it, then turn it in.

I will look these over and correct any problems. When you get your corrected test back, if you still have concerns, please make an appointment to discuss it with me. However, **an appointment to discuss a particular test must be made within one week after I have returned it.** Do NOT wait until the end of the semester to bring such problems to my attention.

No Early Final Exams

Early final exams are not allowed (an airline ticket is not an excuse for missing the final exam). However, if you have more than 2 exams in one day, provide proof and if possible, we will allow you to take the final exam at a different time.

Don't Miss a Test!

Missed Test Policy

If you are delayed for any reason, remember that arriving late to a test is preferable to missing it altogether!!

This policy is an effort to be fair to those who did take the test on time and who have complained in the past that they, too, would have liked extra time to study (or sleep, etc...).

Sports Teams. If you are on a team that requires you to miss a test, you must have an excuse signed by your coach and make arrangements with me to take the test as soon as you return.

Illness. Anyone absent due to *severe* illness must write me an email as soon as possible (preferably before the quiz) and make it up as soon as possible.

Grading Policy

Zeros are very bad for your final grade! Try hard not to get a single ZERO! Each year, 15% of the students in this course receive an F, and inevitably they have several zeros on the grade sheet. This is NOT a difficult course—unless you fail to do the work. It is always better to turn in something rather than taking a zero. Grades will be based on the percentage of points earned in the course.

Responses to and comments on 9 Discussion Board Questions	135
Summary of 3 History Films	45
Online Quizzes on the readings and lectures	847
Attend 2 Commons Game Sessions at 50 pts each	100
Reflection on Commons Game	50
Attend 2 Climate Change Negotiation Sessions at 50 pts each	100
Reflection on Climate Change Game	50
Fisheries Readings Summary and Response	80
Two tests at 300 each	600
Final Exam	450
Participation: a) 20 points for responding to other students' posts on discussion board; b) 100 points for attendance	120
Total Points	2,577

WHAT DO THE LETTER GRADES MEAN?

A = Exceptional – The work is of “*professional*” quality, demonstrating originality, independence, and a thorough mastery of the subject matter. This not only means fulfilling the requirements, but doing it in a way that *goes beyond* the basic expectations of the assignment.

B = Very Good – Work does not have all the *refinements* that could give it real polish, but also didn’t have any significant problems. Work is accomplished on time and presented neatly and thoroughly but does not have the depth and originality for an “A.”

C = Acceptable – The work fulfills the *minimum* requirements with only a few notable errors. The student grasps the essential information; but work is not consistently thorough and does not demonstrate mastery. BTW, if this course is required for your major, you must get a C or better (even a C- is not adequate).

D = Unacceptable – The work demonstrates a lack of understanding of the fundamental nature of the assignment or material.

F = Complete lack of understanding of the fundamentals of the course.

Anyone who has less than 51% of the points possible after the first test will be withdrawn from the course. It is better to receive a W than an F. You will be sent an email if this is the case.

Approaches to Management: A Prologue by Kenneth Boulding

A Conservationist's Lament

The world is finite, resources are scarce,
Things are bad and will be worse,
Coal is burned and gas exploded,
Forests cut and soils eroded.
Wells are dry and air's polluted,
Dust is blowing, trees uprooted.
Oil is going, ores depleted,
Drains receive what is excreted.
Land is sinking, seas are rising,
Man is far too enterprising.
Fire will rage with Man to fan it,
Soon we'll have a plundered planet.
People breed like fertile rabbits,
People have disgusting habits!

Moral: The evolutionary plan
went astray by evolving Man.

The Technologist's Reply

Man's potential is quite terrific,
You *can't* go back to the Neolithic!
The cream is there for us to skim it,
Knowledge is power, and the sky's the limit!
Every mouth has hands to feed it,
Food is found where people need it.
All we need is found in granite,
Once we have the men to plan it.
Yeast and algae give us meat,
Soil is almost obsolete.
Men can grow the pastures greener,
Till all the Earth is Pasadena.

Moral: Man's a nuisance, Man's a crackpot
But only Man can hit the jackpot.

1. Thoreau tried growing a bean patch, but he felt guilty destroying weeds and fighting woodchucks. He concluded that farming should be condemned as discrimination against innocents. Thereafter, he obtained his beans from his mother's garden.
2. A timber harvesting protest is held in lovely *log* home; dozens of flyers printed on *paper*, protesters hold *paper* placards on *wooden* stakes. Are they aware of the paradox?
3. New Alaskan: "You know, when I came to Alaska from Baltimore, I was totally opposed to cutting trees. But since I got here, I've realized something. I—well, I *like wood!* "
4. A woman at a public meeting tells the group that she is strongly opposed to mining of any kind and to gold mining in particular. While she talks, she runs her fingers along the long strands of a gold necklace around her neck.
5. Leslie: "My mother always bought chicken drumsticks in packages of four. As a result, my sister was 12 years old before she discovered that chickens don't have four legs."
6. A Native woman describes how she was sad when she caught a mother lynx with two kittens on her 50-mile trapline. The kits would surely die. Asked how she dealt with that, she said, "Well I know that someday it will be my turn. It's like they say, 'First the salmon feed me, then I feed the salmon.'"

Role-play Exercise: Parrot Conservation in the Amazon

Negotiations are a huge part of NRM. Here is an example, based on a real case...

There are only 450 birds left of a stunning species of parrot and all of them live along a 20 mile stretch of a small tributary of the Amazon River, where they nest in cliffs. The pet trade is particularly eager to have these specimens and will pay \$30,000 for one bird that they can sell for \$100,000 in the US.

Parrots live up to 80 years, mate for life and are difficult to keep, so many of these “pets” end up abandoned or repeatedly sold. With a small population to start with, this population risks extinction if it can't be protected.

You will play the following exercise in groups of 2-4 people.

Role A. Parrot Conservation International (1-2 people on a negotiating team)

You work in Brazil for Parrot Conservation International and part of your job is to protect a very rare species that lives in the Amazon. Your bosses back in the states want you to purchase the land from the local tribe, then post armed guards who will stop and search all boats coming up and down the tributary to make sure no one smuggles birds out of the area. Tourists will be allowed in, though they will also be searched and must have one of your employees accompany them at all times.

Your bosses are opposed to trusting the local people. They are convinced that the local tribesmen, who are very poor, will be sorely tempted to sell the birds. While the elders might not, young people want cell phones and modern things and they might not abide by any agreement.

You would prefer to work with the local people rather than locking them out of this traditional area, even if you buy the land. But you know that this small population of birds could be wiped out in one season if someone got greedy.

You and your assistant decide to meet with two Elders from the local tribe to see if something could be worked out. Will you buy the land and post your own employees to guard it? Or could the local people keep the land and be compensated for protecting the parrots?

Try to work out an agreement with the Elders. Make sure to provide provisions to monitor the parrot population and to renegotiate if something changes.

Role B. Elders of the Local Tribe (1-2 people on a negotiating team)

Your tribe firmly believes they can protect this area. Why can't they be paid to guard the area? You could also lead guided trips for tourists and strictly control where the tourists go. You do not want to sell this area, which is part of your traditional territory. Point out that you have never been caught selling the birds, and that you are good stewards of your lands, which are still heavily forested though many lands around you have been deforested for farms.

Try to work out an agreement with the conservation organization. You far prefer to control your own land and resources rather than having strangers moving in. Surely since both of you want to protect the parrots, something could be worked out. Make sure to provide provisions to monitor the parrot population and to renegotiate if something changes.

NRM 101 TENTATIVE schedule FALL 2015. All Discussion Board Assignments are net yet listed.

WK	DATE	LECTURE TOPIC	READINGS DUE	QUIZZES & PAPER DUE DATES It's best to take the quizzes right after the lecture. Try NOT to leave them all until Monday. Some take TIME to do!
PART 1: BACKGROUND. The terminology, history, basic concepts and impacts of natural resource management				
0	F	4-Sep	Course Logistics, Requirements & Themes. Resource management in action: Role play on the case of the Amazon Parrot.	
1	M	7-Sep	LABOR DAY—NO CLASS	
	W	9-Sep	Essential terminology	Read Chapters 1 and 2 in Chiras.
	TH	10-Sep	Picnic at the Farm on campus for all students in NRM classes. 5:30-7 pm	See map on Blackboard for directions to the farm on campus
	F	11-Sep	HISTORY—Recent history of the conservation movement. Dr. Glenn Juday	VIEW ON BB: Films <i>Earth Day</i> , <i>Silent Spring</i> , and <i>The Wilderness Idea</i> .
2	M	14-Sep	HISTORY of the conservation movement, PART 2. Dr. Glenn Juday	Submit (1) Chapters 1 & 2 Quiz, ; (2) Terminology Quiz; and (3) 1-2-page summary of <i>Earth Day</i> by 11:59 pm Monday.
	W	16-Sep	Commons Game in Globe Room? (wait for confirmation), ATTENDANCE WILL BE TAKEN. Bring Commons Game Instructions and a Calculator	
	F	18-Sep	Commons Game in Globe Room? , ATTENDANCE WILL BE TAKEN. Bring a Calculator!	
3	M	21-Sep	Discuss the Tragedy of the <i>UNMANAGED</i> Commons in Elvey Auditorium.	History Quiz and 1-2 page Reflection on the Commons Game Due by 11:59 pm
	W	23-Sep	Tragedy of the Commons: "Taking Stock" on the Collapse of the Newfoundland Cod Fishery	What are the implications of this film for other resources? How is climate change similar to Taking Stock?
	F	25-Sep	RESOURCE SUPPLY: Principles of Ecology	READ Chiras Ch.3: Lessons from Ecology.
4	M	28-Sep	RESOURCE SUPPLY: Principles of Ecology	Common Property Quiz & Ecology Quiz due by 11:59 pm
	W	30-Sep	RESOURCE SUPPLY: Sustained Yield (SY)	
	F	2-Oct	RESOURCE SUPPLY: Sustained Yield & Sustainability.	Sustained Yield Quiz due EARLY by 11:59 on SUNDAY Oct 4. Leave extra time as SY Quiz is longer.
5	M	5-Oct	TEST 1 in class (will cover all the topics through Sustained Yield)	
PART 2: IMPACTS: Some of the effects of human use of natural resources				
	W	7-Oct	RESOURCE USE IMPACTS—CLIMATE CHANGE, The Evidence	Read Chiras Ch.19: Global Warming
	F	9-Oct	RESOURCE USE IMPACTS—CLIMATE CHANGE: What can we do to mitigate and adapt to climate change? Nancy Fresco	In class: assign roles for the Climate Summit exercise next week. You represent the US, China, the EU, developing countries, other developed countries, environmental groups, or the fossil fuel industry. Roles will be assigned randomly.
6	M	12-Oct	Climate Change: Alaska State Legislature Representative David Guttenberg's advice on "How you can influence public policies on climate change & other issues."	
	W	14-Oct	MOCK UN CLIMATE SUMMIT: ROLE PLAYING EXERCISE.	Read your briefing material BEFORE class.
	F	16-Oct	MOCK UN CLIMATE SUMMIT: ROLE PLAYING EXERCISE.	
7	M	19-Oct	RESOURCE USE IMPACTS—CLIMATE CHANGE: Discuss the CLIMATE SUMMIT in Elvey Auditorium.	Climate Change Quiz Due by 11:59 pm on Monday
	W	21-Oct	RESOURCE USE IMPACTS: Extinction	Turn in 1-2 page Reflection on the Climate Summit IN CLASS
	F	23-Oct	RESOURCE USE IMPACTS: Ecosystem Services	
8	M	26-Oct	DEMAND FOR RESOURCES—Human Population Growth (the larger our population, the bigger the impacts we have on resources)	READ Chiras Ch.4: Population
	W	28-Oct	DEMAND FOR RESOURCES—Human Population, continued	Extinction & Ecosystem Services Quizzes due by 11:59 pm on Monday
				Discussion Board on people moving to the coast
PART 3: RENEWABLE RESOURCES A closer look at individual resources, keeping in mind that they are all connected				
	F	30-Oct	The "Agricultural Revolution" (~10,000 ybp), The "Green Revolution" of 1960-2000 and How do we feed 9 billion people??	READ Chiras Ch. 5: Hunger & Ch.7: Agriculture
9	M	2-Nov	Soils: The Foundation of Terrestrial Ecosystems	Chiras Ch.6: Nature of Soils & "Soil Biodiversity" on BB.
	W	4-Nov	Rangeland Management	Read Chiras Ch.13: Rangeland Mgmt and "Where Bison Once Roamed" on BB
	F	6-Nov	TEST 2 (cumulative—it will cover everything from the beginning of the semester through range/land mgmt, but not watersheds)	
10	M	9-Nov	Watershed Management—Jackson Fox	Population Quiz and Agriculture quiz due at 11:59 pm
	W	11-Nov	Watershed and Stormwater Mgmt in the Fairbanks Area—Jackson Fox	
	F	13-Nov	Forests and forest products	Read Chiras Ch.14: Forest Mgmt
				Soils & Rangeland Quizzes due by 11:59 pm

11	M	16-Nov	Forestry & Silviculture		Watershed Quiz
	W	18-Nov	Video: Fire Wars		
	F	20-Nov	Wildland Fire Management—Dr. Hollingsworth		
12	M	23-Nov	World Fisheries: Empty Oceans, Empty Nets		Forestry Quiz (a long one!) & Wildland fire quiz due by 11:59 pm.
	W	25-Nov	Fisheries Management, Dr. Andrew Seitz, School of Fisheries & Ocean Sciences	Read Fisheries Packet and watch videos on fishing gear online	
	F	27-Nov	THANKSGIVING BREAK		
13	M	30-Nov	The Salmon Project, Erin Harrington		Fisheries Quiz
	W	2-Dec	The Good News about Marine Protected Areas		
	F	4-Dec	Nonrenewable resources: Fossil Fuels	Read Chiras Ch.22: Nonrenewable Energy & Ch.23: Sustainable Energy	
14	M	7-Dec	Dr. SineAnehitā on Social Change for conservation		Fossil Fuels Quiz due by 11:59 Mon
	W	9-Dec	Dr. Glenn Juday on the climate talks in Paris		
	F	11-Dec	Summary & Evaluation		
	W	16-Dec	FINAL EXAM , WEDNESDAY, Dec 16, 10:15 to 12:15 a.m. in regular classroom. NOTE: EARLY EXAMS ARE NOT AN OPTION		