Climate scientists agree virtually unanimously that climate change is occurring, and that it is caused by human activity. They also find that climate changes have already had significant and irreversible effects on Earth and its peoples, and that the intensity of effects are accelerating.

Yet societies appear unlikely to fix the problem. We are fast approaching a point of no-return, where bad outcomes cannot be stopped, and where what is now depicted as science-fiction may well become reality.
Who is helping? The Trump Administration has announced its intent to withdraw the United States from the most recent international agreement to curtail the worst effects of climate change, the Paris Agreement, negotiated just at the end of the Obama Administration. The US Environmental Protection Agency was to be a leading federal agency in this effort, but its work on climate change has now been curtailed. Some states such as California, New York, Pennsylvania, and Massachusetts are taking active measures, but most others are ill-prepared. Groups like the Rockefeller Foundation are helping, but many communities simply don’t have the capacity plan or implement adaptive changes. There is a large need for qualified policy, planning and implementation assistance.

It is no longer a question of if climate changes will happen, but rather what we can do about the changes that will happen and those that already are happening. So what can we do about it? John Holdren, President Obama’s science advisor, put it this way:

“We basically have three choices: mitigation, adaptation and suffering. We’re going to do some of each. The question is what the mix is going to be. The more mitigation we do, the less adaptation will be required and the less suffering there will be.”

This class will look at both mitigation and adaptation approaches. We will explore the implications of each in the real world.

**Mitigation:** Mitigating (reducing) greenhouse gas emissions slows global warming and its associated effects. It attracts a lot of policy attention, particularly in the energy sector, since carbon fuel combustion is a main cause of climate change. Carbon taxes and carbon markets are two prominent mitigation approaches, but they have only been weakly implemented in a few places.

Other strategies may be more feasible; a detailed examination of a suite of them will be the subject of the first writing assignment for this class. Specifically, we will look at the implementation potential of proposals in Paul Hawken’s *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. We will also use sophisticated but accessible simulation software to explore policy options for international negotiations, and for energy investment and policy options to limit climate change.

**Adaptation:** The real effects of climate change are felt at the local and regional levels. Cities, states and regions bear the brunt of climate changes, but most are already fully engaged with their current missions. They have few resources to take on new and complex responsibilities. But the longer the issue is neglected the more difficult it will be to address. More needs to be done to help leaders, planners and infrastructure system and service program operators adapt to the changes that are coming.

But what can communities realistically do to adapt? And what are the obstacles to action? Responses will require technological, social and policy creativity to improve our collective adaptive capacity and our ability to manage in the face of the changes that are coming. The second major writing assignment will be to do a simple climate risk assessment of a single community – your own hometown – and explore how local officials see the challenges of responding to climate change.

Students interested in public administration, public policy, political science, environmental science and policy, sociology, conflict resolution, disaster management, and engineering, are especially invited to join this interdisciplinary class.

**Requirements**

- Class participation: 10%

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<thead>
<tr>
<th>Assignment</th>
<th>Description</th>
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<tbody>
<tr>
<td>1 (major)</td>
<td>Assessing climate risks and adaptation challenges</td>
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<tr>
<td>2 (minor)</td>
<td>Stay below 1.5° C., avoid dangerous anthropogenic climate change, win a prize!</td>
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<tr>
<td>3 (major)</td>
<td>Assess the institutional implications of “Drawdown” climate mitigation solutions</td>
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<td>4 (minor)</td>
<td>What technology and policy mix will get us out of danger? Use En-ROADS to find out</td>
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<td>5 (minor)</td>
<td>Watch at least three of several climate change documentaries, feature films or works of graphic or musical art, and consider: From a policy and communications point of view, what works? What doesn’t? What strategies can environmental advocates use to improve their messaging? Can communications -- factual, fictional or artistic -- help solve climate politics and policy problems? What else is needed?</td>
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**Grading criteria**

For purposes of this course, the grades of A or A- are reserved for sustained excellence and outstanding performance on all aspects of the course. The grades of B and B+ are used to denote mastery of the material and very good performance on all aspects of the course. The grade of B- denotes marginal quality work that is not quite up to graduate level standards. The grade of C denotes work that may be adequate for undergraduate performance but is not acceptable at the graduate level. The grade of F denotes the failure to perform adequately.
Disabilities

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS.

Missed class sessions

Missing class is strongly discouraged, and I will not admit students who do not attend the first session, even with notice. More than one absence may jeopardize your grade, if not your ability to keep up. If for some reason you cannot attend a class, your participation grade can be maintained by providing me a 750-word summary and analysis of the week’s reading, with special attention to the critical questions they raise. This is to ensure that you have dug into the material and can continue to support the collective reading and research the class is doing.

Essential news and information sources: you are required to subscribe to these climate and environmental newsletters.

<table>
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<tr>
<th>*InsideClimate News</th>
<th><a href="https://insideclimatenews.org/">https://insideclimatenews.org/</a></th>
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<td>Account Type: “Not sure what type of account I have”</td>
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<td>E-mail: “[@gmu.edu]” email address</td>
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<td>Organization “[George Mason University] [Division]”</td>
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<tr>
<td>*Daily Climate</td>
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<tr>
<td>Real Climate: rich resource by climate scientists</td>
<td><a href="http://www.realclimate.org">http://www.realclimate.org</a></td>
</tr>
<tr>
<td>Climate Central: great data graphics, stories</td>
<td><a href="http://www.climatecentral.org/">http://www.climatecentral.org/</a></td>
</tr>
<tr>
<td>Skeptical Science: resource for opponents of climate skeptics</td>
<td><a href="http://www.skepticalscience.com/">http://www.skepticalscience.com/</a></td>
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Access to issues of Environment & Energy through the Library

Go to the E-journal Finder: http://library.gmu.edu/phpzone/ej.php and search for Environment & Energy Daily by title. Three different databases with full-text access to E&E will pop up, but the Environment & Energy Publishing database option is the most user-friendly interface for accessing issues. If you are accessing this off-campus, you’ll be asked to log into the proxy system with your Mason email ID and password before being granted access to the database. You can then browse for issues by date or search issues by keyword.

Getting Email Updates:

Once you have accessed the Environment & Energy Publishing database, click on the "Get E-mail Alerts" link at the bottom of the page. Filling out the corresponding form will allow you to receive email alerts anytime E&E is updated. You will have to sign up with your Mason email account (no outside email providers). Under "Account Type," select "I have IP Access."
Class participation

Participation in class discussion is essential. You will be expected to review carefully in advance the material assigned for each class and be prepared to discuss the important aspects of the readings in class (see “Blackboard Reading Discussion” section below). Your goal each week should be to understand the key claims of the reading, and to raise critical questions about those claims.

My role in this process will be to get the discussion started, assist the class in laying out the facts of the case, pose questions, and help the class to discover general principles running through the case that might be applicable in other situations.

Blackboard posting and reading discussions

We will use the public Discussion Board function on Blackboard to jumpstart class discussions of weekly readings. Comments and critiques online will give you time to consider what your classmates have to say about the readings, and help us focus on core issues more quickly.

There are two kinds of comments: Start-off Comments and Response Comments. The class will be divided into two groups of roughly the same number of students. **People whose last names begin with letters A through J are in Group A, everyone else in is Group B.**

Everyone in each group will post Start-off or Response Comments on alternate weeks, i.e, Group A will post Start-off Comments on weeks 1, 3, 5, etc., and Group B will post Response Comments in those weeks. Group B will post Start-off Comments on weeks 2, 4, 6, etc., and in those weeks, Group A will post Response Comments.

**Start-off Comments** are to be posted to Blackboard no later than 6 pm, 48 hours before class. Your contribution should be about 300-400 words, in which you:

1. Articulate any special insight or inspiration that week’s reading has given you, or any issues or problems you are having with it;
2. Raise and give initial thoughts on one or two questions the readings suggest that you would like your classmates to reflect on and discuss in class
3. Begin to analyze and synthesize the readings, both within a session (i.e. discuss how readings relate to one another) and across the whole course (i.e. discuss how your view of the general themes and issues of the course are shaped by the readings and class discussions).

**Response Comments** are to be posted by the group that has not posted Start-off Comments that week. They must be posted no later than 6 pm, 24 hours before class, and should also be about 300-400 words. Response Comments respond to the Start-off Comments and begin (not end!) discussion on the topics raised.

Please do not post attachments of documents; cut and paste from documents into Blackboard directly, so we can all read discussion threads without leaving the Discussion Forum area.

**Posting weekly is required.** You will be assigned to a comment group on the first day of class. **Late comments are not accepted. I will not give credit for late postings.**

No laptops or mobile phones in class

Laptops and mobile phones are not welcome in class. Despite our heavy reliance on them, electronic devices turn out to be detrimental to learning in classrooms for two reasons:
1. Devices impede knowledge acquisition by turning note-taking into unreflective information transcription rather than concept synthesis (Dynarski, Mueller and Oppenheimer).
2. “Always connected” devices divert attention whenever they ping or buzz, regardless of our best efforts to ignore them (Barnwell).

When devices are present grades are lower by a full point for every person in the class, not just their owners. Here are links to the research:


The only exception to this policy is if you have permission from the Office of Disability Services.

Plagiarism

All work must be your own. In general, where the work of others is used, even in paraphrased form, it must appropriately referenced. When in doubt, cite! Plagiarism is an Honor Code violation: http://www.gmu.edu/facstaff/handbook/aD.html

The main things to keep in mind:

- Know your sources and what they say.
- Keep track of your sources when you copy and paste, and cite them accurately.
- If you quote a key source, explain what the author says in your own words.
- Avoid the temptation to simply change a few words or sentence order in a copied text. This is not original writing, but instead is incorrect paraphrasing, which is a form of plagiarism.
- If deadline pressure leads you to even consider passing off others’ work as your own, DON’T DO IT. Contact me to discuss your situation. There are better ways to deal with stress that don’t risk expulsion.

If you have any questions about correct citation, paraphrasing and writing, let me know. The following resources will also help:

GMU University Writing Center: Plagiarism http://writingcenter.gmu.edu/?p=499

Here follows the official Schar School Policy on Plagiarism:

The profession of scholarship and the intellectual life of a university as well as the field of public policy inquiry depend fundamentally on a foundation of trust. Thus any act of plagiarism strikes at the heart of the meaning of the university and the purpose of the Schar School. It constitutes a serious breach of professional ethics and it is unacceptable.

Plagiarism is the use of another’s words or ideas presented as one’s own. It includes, among other things, the use of specific words, ideas, or frameworks that are the product of another’s work. Honesty and thoroughness
in citing sources is essential to professional accountability and personal responsibility. Appropriate citation is necessary so that arguments, evidence, and claims can be critically examined.

Plagiarism is wrong because of the injustice it does to the person whose ideas are stolen. But it is also wrong because it constitutes lying to one's professional colleagues. From a prudential perspective, it is shortsighted and self-defeating, and it can ruin a professional career.

The faculty of the Schar School takes plagiarism seriously and has adopted a zero tolerance policy. Any plagiarized assignment will receive an automatic grade of “F.” This may lead to failure for the course, resulting in dismissal from the University. This dismissal will be noted on the student’s transcript. For foreign students who are on a university-sponsored visa (eg. F-1, J-1 or J-2), dismissal also results in the revocation of their visa.

To help enforce the Schar School policy on plagiarism, all written work submitted in partial fulfillment of course or degree requirements must be available in electronic form so that it can be compared with electronic databases, as well as submitted to commercial services to which the School subscribes. Faculty may at any time submit student’s work without prior permission from the student. Individual instructors may require that written work be submitted in electronic as well as printed form. The Schar School policy on plagiarism is supplementary to the George Mason University Honor Code; it is not intended to replace it or substitute for it.

Getting your mind in shape: How to read in graduate school

This will be (I hope) a fascinating but (I know) demanding class. There is a large reading load. Video and audio programs are also required from time to time; they break up the routine of readings. The material itself is, I hope, compelling: time flies when the reading is good. Group work is strongly encouraged as a way to manage the workload, as well as to connect with fellow classmates. If you have concerns about the time required to get all this done, please let me know.

But there is a larger issue here: graduate school should be thought of as a way of getting your mind in shape. It is more about learning how to pose cut-to-the-core questions than it is about finding specific answers. It is more about learning to learn, a skill that never loses its currency, and less about learning concrete but often time-limited information. It is more about making an investment in critical thinking than it is about the consumption of entertaining stories or factoids.

Getting in shape intellectually takes a lot of work. Some activities help, others get in the way. Things that help include:

Read hard copies of the best daily newspapers. Digital editions are great, but they risk allowing you to over-tailor your exposure to the specific slants or issues news, which can contribute to intellectual myopia. There is nothing like flipping through actual pages of the New York Times, the Wall Street Journal, or the Economist, glancing at stories you thought you’d never be interested in, and finding something that grabs your attention.

Read books and long-form journalism, not just summaries or newsfeeds. Reading sustained treatments of arguments, ideas or stories exercises the mind by exposing it to nuance, subtlety, and complexity. Thinking critically depends on knowing more, and more deeply, than thin or hypertextually-linked articles that give you little context or depth. Serious professionals don’t ignore less-demanding media, but they limit its reach. Skim the book review pages of the Times or the Journal, and make it a point to read the New Yorker or the Atlantic Monthly. Visit a good bookstore, sign up for their newsletter and attend author events from time to time. Frequent the University or your community library, and browse widely and borrow frequently.
Sign up for electronic newsletters for publications in your field. Every profession or occupation has a trade publication specializing in news and analysis pertinent to the field. Make it a point to subscribe and at least skim the contents on a regular basis. Watch for conferences or reports on specific topics that interest you, and develop an understanding of what experts consider the pressing issues of the day. This is the best route to becoming a leading participant yourself. The librarians here at GMU can help you identify which publications to subscribe to, and in many cases can provide access for free.

Use libraries and other professional research assistance and resources rather than relying too heavily on straight Internet search. The Internet has revolutionized access to information, but has not yet solved the problem of acquiring knowledge or, even more difficult, wisdom. Google searches are so convenient that most of us indulge ourselves with snippets of instantly-discovered information, but put off doing real research using vetted, peer-reviewed or otherwise well-chosen sources that often reside in library databases. The temptation to do a quick search online is like the challenge to public health posed by junk food: the fat, salt, and sugar are so attractive and the marketing is so overwhelming that it is difficult to resist. But a healthy intellectual “diet” should also seek out the fruits and vegetables of critical analytical thinking, and is necessary to give your mind a vigorous mental workout.

Talk about what you are reading and thinking about with family, friends and classmates. Most of what you will actually learn you will learn from people you interact with. Teachers can serve as guides to what to learn, and can provide some feedback on how you are doing.

But by and large it is your classmates and friends that provide the best sounding board for what you think about what you are reading. Explaining new ideas to others is a form of teaching and learning: by talking to others, by teaching them, you are learning the material yourself. Doing so helps you see how new information fits with what you already know, and helps you find gaps in your knowledge. Talking about what you’re reading helps you to think more critically about it, and ultimately enables you to master the material.

And things that hurt:

Avoid substituting commercial television for serious journalism or academic writing. Commercial television is a wonderful medium in its place and time, but is a serious impediment to improved understanding of public issues. It attracts and distracts viewers by raising anxiety levels by surrounding news and reporting about ideas with sensationalist techniques, compresses information into extremely short sound and image bites, and tailors its coverage to the implicit, and sometimes explicit, interests paying advertisers.

Avoid excessive Web-reading, both on a computer and on mobile devices. It is all too easy to give into the temptation of click-bait, sensational news and entertainment on the Web, and the endless short-term satisfaction of dopamine. In the information economy, attention is the scarce resource, perhaps even more than money. Content providers have spent billions of dollars engineering their content to keep you distracted reading their websites, and their advertisements, for as long as possible. The commercial structure of the Internet poses serious challenges for personal health and social relationships, political discourse and democracy.
Numbers on left y-axis depict quantities of glacial melt and sea level rise, and suns across the horizon contain numbers that represent global increase in temperature, coinciding with timeline on lower x-axis.
COURSE SYLLABUS

All reading and all postings are to be completed before class meetings
= Required reading.

Unmarked readings will be divided up among class members who will be responsible for posting about them on Blackboard and discussing them in class.

Session 0: Before first class

1. **Films to watch: Required:** Watch at the first episode of the 2014-present documentary series, *Years of Living Dangerously*, a Showtime production, listed below. If you have time, take a look at the other films listed as well. We will revisit the subject of climate and communications later, but these films are worth watching as we kick off the semester. Al Gore’s 2006 film *An Inconvenient Truth* is still worth watching, as it effectively set the terms of the policy discussion, for good and ill, for the next decade.

   **Documentary**
   
   *Years of Living Dangerously* (2014-) [http://yearsoflivingdangerously.com/watch-years/] or [https://www.youtube.com/watch?v=brvhCnYvxQQ](https://www.youtube.com/watch?v=brvhCnYvxQQ)
   *Chasing Ice* (2012) Netflix
   *Chasing Coral* (2017) Netflix

2. **Subscribe to professional newsletters on climate science and policy**

   In addition to *InsideClimate News*, E&E newsletters, and *Climate Daily*, all of which are required (see above), I strongly recommend taking advantage of the free or reduced student subscriptions to the *New York Times*, the *Washington Post* and *The Economist* magazine.

3. **Readings required for first class**


4. **Climate primers, if needed, before the first class:** If you are really unfamiliar with the main scientific and policy issues surrounding climate change, one of these primers is for you.


5. Discussion questions for our first class, be prepared to discuss:

McKibben argues societies need to keep in the ground a large quantity of already-discovered fossil fuels if the planet is to avoid a climate catastrophe. In other writing he has argued that humankind has irrevocably changed Earth, that our traditional reliance on economic growth is a source of our environmental problems, and that we need new ways to think about the place of humans on it.

Subramanian’s series of articles from Inside Climate News shows how in some areas a traditional understanding of weather conflicts with scientific explanations. This article on how some rural West Virginians interpret natural disasters highlights the challenges of finding common ground on the issue, a prerequisite for more effective response.

Finally, we have to recognize that since the election of 2016, the country has been riven by political conflict, on many fronts, not least of which concerns environment and climate matters. How we engage with others with whom we profoundly disagree is of utmost importance if democratic norms are to be preserved, and important public problems are to be solved, if not in the immediate present, then in the near future. David Smith’s posting on talking through outrage outlines the struggle many of us face.

So, let’s get started with some questions arising from these introductory, and provocative, pieces:

1. What are McKibben’s conclusions about climate change and human involvement? Does he make a persuasive case? Why or why not? What, in your opinion, will it take to achieve the goals McKibben lays out? 
2. What aspects in the stories from West Virginia, and the interview with the evangelical climate scientist did you find the most interesting? Most surprising? 
3. Finally, is Smith on the right track, about meeting and listening with people with whom you may disagree? How can we bring ourselves to act on his advice?

Session 1: Introduction: Setting the Stage

In this first session, we discuss the main themes of the course. We’ll get the conversation started with some introductory films, videos and class discussion about what we know about climate change, and the effects of it that we’ve recently experienced, such as Superstorm Sandy.

We’ll also present an overview of the writing assignments and begin to set up themes and teams. We’ll talk about what’s involved, why it’s useful, how to do it. We’ll also discuss the main pedagogical method we’ll be using in the class: hands-on fieldwork. We’ll begin to hone our research skills in a real-world setting, including institutional analysis, interviews with key informants.

Session 2: Human impacts on the environment and climate

Session 3: Assessing climate change

Authoritative empirical information is crucial to decision-makers and program operators. Much information is available from government sources, and it pays to become familiar with them, with how their information is prepared, and what their limitations are. The most substantial and authoritative international data and scientific findings come from the Intergovernmental Panel on Climate Change (IPCC), beginning in 1988. Since 1989, the U.S. Global Change Research Program (USGCRP), a U.S. Government entity, has synthesized climate science and human implications for the United States every five years. The report relies heavily on input from all relevant agencies. Both reports assemble the best available science and undergo exhaustive peer review.


**Begin Assignment #1: Assessing climate risks and adaptation challenges**

Using the National Climate Assessment (https://nca2014.globalchange.gov/) as a framework, prepare a brief climate assessment for your hometown, where you live, or a place you cherish. From the report’s regional chapters, assemble all available data on climate history, risk and impacts for that place. Then provide a narrative discussion of climate adaptation challenges in that community for use by local organization leaders. Examples include: mayor, town council, city manager, public health officials, emergency services managers, water district supervisor, roads and transportation manager, flood and sewer district official, major businesses and employers, and the like. Once your draft is complete, send it to two or three such officials for their information, comment and further discussion. Use the NCA’s structure and data as a general guide, supplemented with local information about extreme weather, infrastructure, planning, etc.

**Session 4: Climate politics in the Trump administration: The story so far**

The story of climate politics in the last decade has been one of increasing polarization. Efforts to pass a cap-and-trade greenhouse gas bill in Congress failed in 2009; shortly thereafter, Republicans gained control of the House of Representatives, and all future legislation to address climate change was stymied.

The main locus of action shifted to the executive branch, with President Obama issuing several Executive Orders, and his Environmental Protection Agency issuing the Clean Power Plan, which itself depended on convincing the courts that carbon dioxide is a pollutant under the terms of the Clean Air Act. The Trump Administration is endeavoring to reverse Obama’s climate and environment legacies through executive action as well; while actions have been many, a number have been overturned by the courts.

This session brings us up to date with recent climate politics and policy and helps us to understand the political context of future activity.


Session 5: Climate change, responsibility and ethics

Considerations of ethics and justice, as well as costs and economics, underlie a good deal of climate politics. The two domains, ethics and economics are, in fact, inextricably linked. Ethical issues are about fairness: the developed countries produced nearly all the greenhouse gas emissions as they industrialized, yet the burden of global warming falls mostly on poor countries that have historically produced nearly no carbon pollution. Moreover, limitations on energy use to limit global warming would fall most heavily on the poor, who need energy to improve the welfare of their people.

What role should ethics play in shaping the politics and policy of energy and climate? What principles of climate justice should we use rely on to guide individual and collective action? If ethical principles on their own are difficult to agree on, does religion offer an answer to politics?

Garvey outlines the major arguments arising from an ethical consideration of climate and energy. Maniates raises questions about individual responsibility for addressing a global problem. Loy’s classic article discusses the conflicts between economics and ethic in environmental affairs. Finally, Bill Moyers examines climate change from the perspective of Christian religious leaders, including Pope Francis, whose encyclical on the subject is linked here.


Session 6: Climate skepticism and denial

Early bipartisan political support for climate change policy eventually shifted to a far more contentious politicized relationship between conservatives and liberals, and between the business community and supporters of strong public health and environmental policies. Opposition to climate policies, even to climate science, by components of the business community has broadened to encompass a host of other groups with stakes in the outcome of multiple “culture war” issues, including abortion, vaccination, science education, religion, freedom of speech and the like.

How this happened is a fascinating story about political economy and the intersection of technical expertise, democratic governance and business interests. Rich and Steinmetz write compellingly about this history in a very recent multimedia piece. Historians Oreskes and Conway also tell the story of climate skepticism but highlight its roots in earlier controversies such as asbestos and smoking. Brulle is the leading sociologist studying the organization of the “denial machine,” which he traces to organized business interests with deep pockets and hidden donor networks, while Jerving and colleagues report on the role that Exxon is alleged to
have played in climate denial politics. *InsideClimate News*, which has won a Pulitzer for its work, reports more generally on the role of business in energy and climate policy.

Rich, Nathaniel, photos by George Steinmetz, “Losing Earth: The decade we almost stopped climate change,” *New York Times Magazine*, August 1, 2018, 


**Documentary film**

*Climate of Doubt*, Frontline, Public Broadcasting Service, Catherine Upin, director, October 23, 2012, 
https://www.pbs.org/wgbh/frontline/film/climate-of-doubt/ or
https://www.kanopystreaming.com/product/climate-doubt (53:47)

**Homework assignment:** Use the website Skeptical Science (http://www.skepticalscience.com) to make list of five climate denial claims you have heard from personal acquaintances or public figures, and the scientific responses to them to share in this class session.

**Session 7: The economics of climate change**

Much of the case for action on climate change rests on economic costs. What will climate changes cost, and over what time scale? What measures would be most cost effective in avoiding harm, and how should they be financed? How should those most affected by climate change be compensated? The path-breaking Stern Report provided the first comprehensive statement of climate costs and benefits; the findings in that report, that societies can easily afford to pay for climate change mitigation, turns on getting a basic assumption about discount rates, a contested value in this important case.

But a more fundamental aspect of the economics of climate change is the nature of market failures, and how “normal” economics contributes to large-scale ecological harm through un-internalized economic costs. Ecologists have long understood the interconnected nature of human affairs, but contemporary political economics often neglects climate externalities. And to some, relying on markets at all requires something like religious faith.


Forget Shorter Showers, Derrick Jensen, writer, Jordan Brown, director,  
The Corporation, Mark Achbar, director, Zeitgeist Films, 2004,  
https://gmu.njvid.net/show.php?pid=njcore:103447  
Click links for clips to be discussed:  
Externalizing Machines (18:10)  
Environmental Dilemmas (3:03)  
Spear to the Chest (2:52)

The Eiffel Tower lights up in December 2015 with an advocacy message for the United Nations Climate Change Conference in Paris. (Michel Euler/AP)

Session 8: Governance of climate change

Since climate change is a global problem arising from unrestrained and uncoordinated national activities, it makes sense that the only way to curb greenhouse gas emissions is to secure a strong if not binding international agreement, particularly among the principal emitting countries. Despite the flurry of activity at the United Nations, beginning in the early 1990s, and the promulgation of the Kyoto Protocol, international efforts have been halting and largely ineffectual.
With President Trump’s decision to withdraw from the Paris agreement, there is growing uncertainty about how the world will proceed. In the United States, the action has shifted to states and localities, which may signal a deeper and more complex recasting of way governments pursue international agreements.

Gupta reviews the history of international climate change policy. He shows how the policy dynamics have dramatically changed since global warming was shown to be occurring. Haas, a noted scholar of international relations and the environment, suggests that the nature of global environmental problems makes them difficult to address at the nation-state level, but that new multi-level governance mechanisms are likely to be more successful. Finally, in view of the Trump Administration’s pledge to withdraw the United States from the Paris climate agreement, Tollefson

Betsill and Rabe dig deeper into the notions of governance, showing that while national governments may be having difficulty orchestrating and negotiation policies at the international level, states and local governments are having more success.

Shogren, Elizabeth, “As Trump retreats, states are joining forces on climate action,” *Yale Environment 360*, October 9, 2017, [https://e360.yale.edu/features/as-trump-retreats-states-are-stepping-up-on-climate-action](https://e360.yale.edu/features/as-trump-retreats-states-are-stepping-up-on-climate-action)

“How Paris is different from past climate change negotiations,” [https://www.youtube.com/watch?v=Aj3Kr8odxns](https://www.youtube.com/watch?v=Aj3Kr8odxns) (8:33)
“The inside story of the Paris Climate Agreement,” [https://www.youtube.com/watch?v=MlA_1xQc7x8&t=2s](https://www.youtube.com/watch?v=MlA_1xQc7x8&t=2s) (14:50)

**Assignment #2: Stay below 1.5° C., avoid dangerous anthropogenic climate change, win a prize!**
Use C-LEARN climate simulation software to experiment with different scenarios for greenhouse gas emission reductions, and deforestation and afforestation rates, [http://www.climateinteractive.org/tools/c-learn/simulation/](http://www.climateinteractive.org/tools/c-learn/simulation/)

What rates are required to achieve CO₂ levels below 550 ppm? Can CO₂ levels be driven lower? If so, how? If not, why not? And if not, what year do we hit the tipping point? What challenges for negotiators does this model point to?

**Session 9: Sure-fire solutions to climate change… or are they so sure?**
Begin Assignment #3: Assess the institutional implications of “Drawdown” solutions

Playing the role of planning agency staffers, you and one other class member will be assigned one of the climate solutions proposed by the team led by Paul Hawken in Drawdown. Your task is to evaluate it rigorously for feasibility, particularly in terms of organizational and institutional aspects. This means looking at not just technical and economic, but especially organizational, legal, social and cultural perspectives.

Session 10: Technology to the rescue? Why energy system transitions are so hard

Often we think of social and economic problems in terms of technological fixes: “why can’t someone just invent a gadget that will solve the problem?” … whatever the problem is. Technical fixes are fine when the problem is small and bounded. But “fix” thinking is less helpful when problems are rooted in economic, political and societal structures, and supported by extensive, and well-heeled, economic and political interests.

This session will examine technological solutions to climate change through the lens of “socio-technical transitions,” a perspective that looks at the dynamics of systems such as fossil-fuel carbon-based energy systems, and how they can (and sometimes cannot) change over time.


Session 11: Climate policies: Mitigation through regulations, taxes, incentives

Economic instruments will likely play a key role in reducing carbon pollution and thereby mitigate, even if they do not eliminate the threat of climate change. Carbon markets, carbon prices, and carbon taxes are all potentially powerful policy instruments to effect change – yet there is still little agreement on the feasibility, design, implementation or consequences of such policies.

In addition, many observers see an important role for business in mitigating climate change, and advocate for approaches that enlist businesses support, rather than alienating them. Some go so far as to worry that the United States is losing the potentially lucrative, and inevitable, race to provide low- or no-carbon technologies and services to an energy hungry planetary market.


**Assignment #4: What technology and policy mix will get us out of danger? Use En-ROADS to find out**

As in Assignment #2, Use En-ROADS energy and climate policy simulation software ([https://www.climateinteractive.org/tools/en-roads/](https://www.climateinteractive.org/tools/en-roads/)) to experiment with different scenarios for energy technology and greenhouse gas emission policies to avoid dangerous climate change outcomes. What are the main challenges to meeting global carbon reduction targets? Where does the model suggest policy might be most effective? Least effective?

**Session 12: Climate change communication strategies**

Communications strategies are key to changing public attitudes, and social and political movements are key to changing laws and social structures. These two domains are especially pertinent in the case of climate change. We’ll be closing out the semester with a look at key issues of communication and social movement organization, and with a debate about what future approaches to climate might entail.

Maibach, et al. describe their work analyzing the audiences for climate messages; Maibach along with colleagues has already begun to apply insights from this research in applied settings. Moser and colleagues are prominent researcher on climate communications and provide a good overview of the field.

Despite the success (or partial success) of Al Gore’s film *An Inconvenient Truth* (2006) climate and environment are difficult subjects to dramatize in popular media. Yet art and film could be powerful tools in raising awareness and mobilizing public action. The Cape Farewell project is an example of alternative ways of communicating the urgency of responding to climate challenges. The films listed below are among the best examples of climate change movie-making.


Maibach, E. W., Roser-Renouf, C. and Leiserowitz, A., “Global warming’s six Americas.” Yale Project on Climate Change and George Mason University, most recent update, http://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/

Also: Anthony Leiserowitz, Global Warming’s Six Americas, video:
http://www.youtube.com/watch?v=2I5u9rfUSLA.


**Documentary**
- **Chasing Coral** (2017) Netflix
- **Carbon Nation** (2011) Amazon, iTunes
- **Merchants of Doubt** (2014) Amazon, YouTube
- The Age of Consequences (2016) Starz

**Fiction**
- **Hell** (2011) https://www.dailymotion.com/video/x3joroa
- **The Arrival** (1996) Various streaming services
- **The Day After Tomorrow** (2004) Various streaming services
- **Beasts of the Southern Wild** (2012) Various streaming services

**Assignment #5:** Watch at least three of these popular media productions and consider: What works? What doesn’t? What strategies can environmental advocates use to improve their messaging? Can communications on its own solve climate politics problems? What else is needed?

**Session 13 Mobilizing a climate change social movement**


Session 14: Future of climate policy: how should climate be governed?

The future of climate policy seemed to be coming into focus with the signing of the Paris Agreement in December 2015. The agreement struck was hard-fought but was broadly considered insufficient to stave off dangerous temperature increases. Even so, 195 countries have signed the Agreement and 179 have become a party to it.

But the Trump Administration is doing about-face on climate policy. Nevertheless, there are some bases for optimism. This session will address prospects for climate governance, as discussed in the following readings, but also building on the work we’ve done throughout the semester.

Speth, James Gustave, The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability, (New Haven: Yale University Press, 2008), chs. 5-6, pp.107-146.

Session 15: Wrap-up and Reflection

In this final session, we’ll present our case studies, discuss what worked and what didn’t, and wrap up the course.

Supplementary readings: Adaptation

Supplementary readings: Climate action and adaptation planning in practice

Browse the sites below with an eye to the variety of actors and agencies, on the processes utilized to produce this information, the range of activities. Take note also of the focus on state-level science, and emphasis on adaptation: see in particular the state’s climate adaptation plan Safeguarding California, the visualization and data resource Cal-Adapt, and the Adaptation Planning Guide.

Preparing for Climate Change: A Guidebook for Local, Regional and State Governments (ICLEI and King County, WA, 2008), http://www.icleiusa.org/action-center/planning/climate-adaptation-planning-resources/adaptation-guidebook


California Climate Change, http://www.climatechange.ca.gov/

Safeguarding California, http://resources.ca.gov/climate/safeguarding/

Cal-Adapt, http://cal-adapt.org/