

I50-101
Earth's Future: Causes and Consequences of Global Climate Change
Fall 2017
Time: T/Th 1:00-2:30
Hillman Hall 70

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Description: Climate change is said by many to be one of the most important issues of our time. Nine of the ten warmest years in the modern meteorological record (which goes back to the 19th century) have occurred since the year 2000, with 2015 and 2016 being the two hottest years to date (2017 is on track to be the second hottest yet). Today, the major political debates on the subject focus on whether climate is changing naturally, or if humans are causing climate change. The scientific reality, however, is that climates have changed through geological time, are changing now, and will continue to change in the future.

Earth's Future examines 1) **the physical basis for climate change**; 2) **how climates are changing and how we know and assess that climates are changing**; and 3) **the effects of climate change on natural and human systems**. The course is team-taught and will involve participation by scholars across the university with expertise in specific subjects. *Earth's Future* is a broad, introductory course for first year students. While this course presumes no special subject matter knowledge on the part of the student you will be exposed to a broad array of scholarship across the sciences, social sciences, engineering, and humanities.

Goals: Knowledge about climate change processes and its effects on human and natural systems can be used to shed light on the complex and contested scientific, political, economic, and social concerns of contemporary global warming and climate change issues. Students who understand the physical processes of climate change and who understand how we know about these issues should be able to reason well about climate change events and to understand their causes and consequences. By understanding how climate change influences human and natural systems, students are expected to make connections between climate change and a multitude of contemporary issues in the 21st century. A primary objective is to allow us to think about why climates change, what causes climates to change, how we know climates change, and how humans and natural systems respond (or perhaps do not respond) to changes in the earth's climate and climate systems.

Because climate change affects all humans and natural systems, every student is capable of gaining insight about his/her present-day circumstances and future life by careful and critical study of climate

change. Through lectures, readings, in-class assessments (quizzes/short written responses), discussions, and written presentations, we expect students should be able to undertake a critical analysis of arguments (including assessment of data sources and analytical methods) and that each student will finish the class with improved skills in critical thinking and analysis of complex arguments.

Requirements: The class will have regular lectures and discussions; student participation is required. Students are expected to regularly attend all classes, complete the assigned readings in advance of class, and come to class and to discussion sections ready to discuss readings or topics.

In addition to consistent classroom and discussion section attendance and active participation, each student must complete the following:

1. 6 in-section quizzes/short written responses
2. Weekly media submission (news report, article, video, or web site) about climate change
3. Three research assignments
4. Final take-home cumulative exam

Grades: The class will not be graded on a curve. It is theoretically possible for the whole class to get an A or an F.

- 5 of 6 quizzes: 30%; 6% for each quiz
- Weekly climate change news report/article/video/web site: 5% total
- Three research assignments: 45%; 15% for each assignment
 - Climate feedbacks
 - Climate stories
 - Carbon footprint
- Final cumulative exam: 20%

Note: There are no make ups for the quizzes. We will automatically drop the lowest quiz grade (including if you miss one quiz for whatever reason). If you miss more than one quiz you will receive a 0 for the second and any subsequent quiz you miss.

Every week you must submit (via Blackboard) the weekly news report, article, video, web site, etc., by Thursday evening at midnight. If you fail to submit 3 news pieces you will only receive 4%; failure to submit 4 pieces reduces the credit to 3% and 1% credit will be reduced for each subsequently missed submission (if you fail to turn in seven assignments you will receive a 0)

Readings: There is one course text: *Introduction to Modern Climate Change* (A. Dessler, Cambridge, 2012). This is a *required* textbook and is available in the campus bookstore and at the library. In addition, we will be reading two books for discussion: *Learning to Die in the Anthropocene* (R. Scranton, City Lights Books, 2015), and *This Changes Everything* (Naomi Klein, Simon & Schuster, 2014). Further readings assigned by each presenter will be posted on Blackboard and additional readings for discussion may be assigned by the discussion leaders. You are expected to complete assigned chapters or books before the class to which they apply. In class, we will highlight important concepts from the readings and expand on the material; to follow the discussion it will be important for you to be familiar with the readings that have been assigned.

Student Educational Services

Washington University provides academic resources for students at [Cornerstone: The Center for Advanced Learning](#). Located on the South 40 at Gregg Hall, the Center offers academic resources such

as study groups, peer mentors, academic mentoring, help desks, and course workshops. The Center also offers technological resources such as programs for web design and learning style assessments.

Students seeking disability information should contact Disability Resources at 935-5970 or link to Disability Resources from the Cornerstone website. Contact information for Cornerstone is 935-5970 or <http://cornerstone.wustl.edu>. Please let Professor Kidder know in advance of any learning accommodations that have been suggested by the Disability Resources office.

Class Etiquette

This course is based on a simple principle of mutual respect and politeness. Just as it is important for us to act in a courteous and respectful way toward you, it is equally important for you to extend the same courtesy to your fellow students and instructors. To make the classroom experience enjoyable for all, you are expected to comply with the following guidelines.

- **Students talking with their neighbor after the instructor has begun lecturing.** When surveyed, students rate this as extremely annoying because it interferes with their ability to take notes. It is also distracting to instructors. We will not repeat portions of the lecture because of others talking or because of other similar disruptions. Thus, when you talk to your neighbor you may well be hurting the grades of others around you (and your grade, too). Once we start class please stop talking.
- **Use of laptops/tablets in class.** Laptop computers or tablet devices are not permitted in class. If you need to or want to use a computer you must sit in the last row of the classroom. Research studies have found that (a) students report laptop use by their peers, as well as their own laptop use, as the most distracting aspects of class; and (b) there is a negative relationship between laptop use and course grade, student attentiveness, comprehension of lectures and discussions, and understanding of course material. (For further information on these studies see [here](#) and [here](#) and [here](#) and [here](#).)
- **Ringling/using cell phones.** Because they are distracting, do not use your smart phones during class. The same reasons for prohibiting laptops applies to cell phones. Please turn off or silence all phones before class begins.
- **Coming in late.** Class starts promptly 10 minutes after the hour. If you come to class late, please select a seat in the back; do not clamber over other students to find your usual favorite seat.
- **Audio/video/photo recording of class.** Please get our permission as well as the permission of the current guest lecturer if you would like to record any portion of a lecture.

Academic Integrity

As a member of the Washington University academic community you are bound by honor regarding your academic work. Academic dishonesty includes, but is not limited to, cheating on tests, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of or distributing examinations or examination questions, submitting work of another person or work previously used as your own, or tampering with the academic work of other students.

Plagiarism is another unacceptable practice. Plagiarism occurs when an individual uses the thoughts or words of another person as if they were their own. For example, we have borrowed much of the language for this section from the syllabus for the course: *When I'm Sixty-Four: Transforming Your Future: Interdisciplinary Studies 123*. We are thus bound to acknowledge this and give credit to

the original authors, Dr. Brian Carpenter, Dr. Nancy Morrow-Howell, and Dr. Suzy Stark.

In your written work, you must provide adequate citation of other people's work and identify where your ideas have come from when they are not your own. On examinations, answer questions for yourself rather than relying on information from other students.

Academic dishonesty on any assignment will result in written notification of the charge, a score of 0 on the assignment, and referral to the Dean. If you have questions about what might constitute academic dishonesty, please talk with one of the instructors or an administrator at the University. Additional information can be found in the [University Student Judicial Code](#) (scroll to section titled "students") or from the Academic Integrity Committee of the College of Arts and Sciences, <http://wustl.edu/policies/undergraduate-academic-integrity.html>

Accommodations based upon sexual assault:

The University is committed to offering reasonable academic accommodations to students who are victims of sexual assault. Students are eligible for accommodation regardless of whether they seek criminal or disciplinary action. Depending on the specific nature of the allegation, such measures may include but are not limited to: implementation of a no-contact order, course/classroom assignment changes, and other academic support services and accommodations. If you need to request such accommodations, please direct your request to Kim Webb (kim_webb@wustl.edu), Director of the Relationship and Sexual Violence Prevention Center. Ms. Webb is a confidential resource; however, requests for accommodations will be shared with the appropriate University administration and faculty. The University will maintain as confidential any accommodations or protective measures provided to an individual student so long as it does not impair the ability to provide such measures.

If a student comes to one of the instructors or to the class TAs to discuss or disclose an instance of sexual assault, sex discrimination, sexual harassment, dating violence, domestic violence or stalking, or if we otherwise observe or become aware of such an allegation, we will keep the information as private as we can, but we are required to immediately report it to my Department Chair or Dean or directly to Ms. Jessica Kennedy, the University's Title IX Coordinator. If you would like to speak with the Title IX Coordinator directly, Ms. Kennedy can be reached at (314) 935-3118, jwkennedy@wustl.edu, or by visiting her office in the Women's Building. Additionally, you can report incidents or complaints to Tamara King, Associate Dean for Students and Director of Student Conduct, or by contacting WUPD at (314) 935-5555 or your local law enforcement agency.

You can also speak confidentially and learn more about available resources at the Relationship and Sexual Violence Prevention Center by calling (314) 935-8761 or visiting the 4th floor of Seigle Hall.

Bias Reporting:

The University has a process through which students, faculty, staff and community members who have experienced or witnessed incidents of bias, prejudice or discrimination against a student can report their experiences to the University's Bias Report and Support System (BRSS) team. See: brss.wustl.edu.

Mental Health:

Mental Health Services' professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. See: shs.wustl.edu/MentalHealth

Career Center:

The Career Center has launched several “Career Interest Groups” that link academic interests and career fields. One of our Career Interest Groups focuses on Sustainability Careers, which focuses on helping students develop career planning strategies and employer connections in the broad array of sustainable career fields. To further explore your career interests in conservations, sustainability, or environmental opportunities make an appointment with Patty Katzfey at the Career Center, 314-935-5930.

Earth's Future: Class Schedule fall 2017

Disclaimer: *The Instructors reserve the right to make adjustments or changes to this syllabus throughout the semester.*

Introduction

1 [T., Aug. 29] Introduction— [T.R. Kidder](#) and [Brent Williams](#)

2 [Th., Aug. 31] Natural Climate Variability —[T.R. Kidder](#)

Part 1: The physical basis for climate change

3 [T., Sept. 5] Energy balance of the Climate System—[Brent Williams](#)

4 [Th., Sept. 7] Greenhouse gases and Aerosols – part I – [Brent Williams](#)

5 [T., Sept. 12] Aerosols – part II– [Brent Williams](#) and [Jay Turner](#)

6 [Th., Sept. 14] The carbon cycle; sources and sinks –[Alex Bradley](#)

7 [T., Sept. 19] Freshwater, oceans & carbon sequestration –[Dan Giammar](#)

Part 2: How climates are changing and how we know and assess that climates are changing

8 [Th., Sept. 21] Was there a consensus in the 70s on global cooling? – [Jen Smith](#)

9 [T., Sept. 26] Proxies and measures of climate change – [Alex Bradley](#)

10 [Th., Sept. 28] The PETM: What has happened before and can it happen again?— [David Fike](#)

11 [T., Oct. 3] Climate Modeling – [David Gustafson](#)

12 [Th., Oct. 5] Class review

13 [T., Oct. 10] sustainable Campus/Sustainable life— [Cassandra Hage](#) (& class discussion)

14 [Th., Oct. 12] Habitat change – [Kim Medley](#)

15 Sat., Oct. 14-Tues., Oct. 17- Fall Break

Part 3: The effects of climate change on natural and human systems

16 [Th., Oct. 19] leveraging Capitalism for environmental change – [Joe Steensma](#)

17 [T., Oct. 24] International environmental policy— [Michael Bechtel](#)

18 [Th., Oct. 26] Policy issues and climate change – [Bill Lowry](#)

19 [T., Oct. 31] Climate and water—[Heather O'Leary](#)

20 [Th., Nov. 2] Renewables and Green options—[Himadri Pakrasi](#)

21 [T., Nov. 7] Climate Change awareness- [Venus Bivar](#)

22 [Th., Nov. 9] Global energy: fossil fuels and alternatives – [Pratim Biswas](#)

23 [T., Nov. 14] Agriculture and Climate Change –[Glenn Stone](#)

24 [Th., Nov. 16] Built environment—[Derek Hoeflerlin](#)

25 [T., Nov. 21] Legal and regulatory structures—[Maxine Lipeles](#)

Wed., Nov. 22-Sun., Nov. 26- Thanksgiving Break

26 [T., Nov. 28] Effects of climate change on human health—[Rodrigo Reis](#)

27 [Th., Nov. 30] Congress of the Parties: global climate regulation ([Beth Martin](#); COP students)

28 [T., Dec. 5] Learning to Live in the Anthropocene—[T.R. Kidder](#)

29 [Th., Dec. 7] Review/Discussion

Take Home Final Exam must be submitted no later than 3 PM on December 19, 2017

Earth's Future: Readings/Assignments, fall 2017

Disclaimer: *The Instructors reserve the right to change, add to, or make adjustments to these readings throughout the semester. All readings, except the text books, will be available on the class Blackboard site; check the Blackboard site before every class for updated readings or links to web sites/resources.*

Assignments will be handed out & discussed in section. The information below on when the assignments are handed out and when they are due should be understood to be that the assignment will be handed out or due at the section that meets that week or the next section that meets after that week if fall break or thanksgiving is that week.

"Text" = Dessler, A., 2016 *Introduction to Modern Climate Change* (2nd edition). Cambridge University Press

Introduction

- 1 [T., Aug. 29] Text Chapters 1&2; **Scan carefully** [Beyond 2016 website](#) and [Climate Change indicators in the United States 2016](#) (pdf)
- 2 [Th., Aug. 31] **Scan carefully** IPCC 2013 Working Group I: Summary for Policy Makers ([pdf](#)) and IPCC 2014 Synthesis Report: Summary for Policy Makers ([pdf](#))

Part 1: The physical basis for climate change

- 3 [T., Sept. 5] Text Chapters 3 & 4 [**Assignment 1: Climate feedback assignment handed out**]
- 4 [Th., Sept. 7] Text Chapters 3, 4 & 7
- 5 [T., Sept. 12] Text Chapter 6
- 6 [Th., Sept. 14] Text Chapters 5 & 9
- 7 [T., Sept. 19] Text Ch. 5

Part 2: How climates are changing and how we know and assess that climates are changing

- 8 [Th., Sept. 21] Text Chapters 5 & 9
- 9 [T., Sept. 26] Text Chapter 8; [**Assignment 1 due**] [Switched to Oct. 3]
- 10 [Th., Sept. 28] to be assigned
- 11 [T., Oct. 3] [Th., Oct. 5]
- 12 [T., Oct. 10] look at the [Sustainability Office web site](#); read the [Strategic Plan](#) [**Discussion of Climate Stories project/assignment 2 handed out in sections this week**]
- 13 [Th., Oct. 12] to be assigned

Sat., Oct. 14-Tues., Oct. 17- Fall Break

Part 3: The effects of climate change on natural and human systems

- 14 [Th., Oct. 19] to be assigned [**Assignment 2, Part 1 Due in section this week**]
- 15 [T., Oct. 24] to be assigned
- 16 [Th., Oct. 26] to be assigned
- 17 [T., Oct. 31] Text Chapter 10
- 18 [Th., Nov. 2] text Chapter 11
- 19 [T., Nov. 7] IPCC 2014 Working Group II: Summary for Policy Makers ([pdf](#))

20 [Th., Nov. 9] Text Chapter 12 [**Assignment 2, Part 2 Due in section this week**]

21 [T., Nov. 14] IPCC 2013 Working Group III: Summary for Policy Makers ([pdf](#)) [**Assignment 3: carbon footprint assignment handed out**]

22 [Th., Nov. 16] to be assigned

23 [T., Nov. 21] Text Chapter 13

Wed., Nov. 23-Sun., Nov. 27- Thanksgiving Break

24 [T., Nov. 28] to be assigned

25 [Th., Nov. 30] Watch the [VIDEO](#)

26 [T., Dec. 5] to be assigned [**Assignment 3 Due**]

27 [Th., Dec. 7] Text Chapter 14