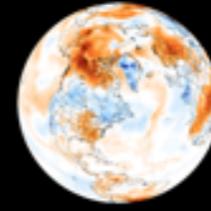
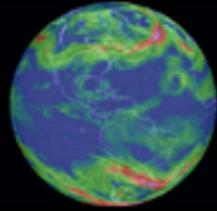


Climate Science for Nonscientists

Experiences and Experiments



Frank D. Granshaw
Portland State University



Global Environmental Change

**A Sophomore Inquiry in the University Studies Program at
Portland State University, Portland, Oregon**



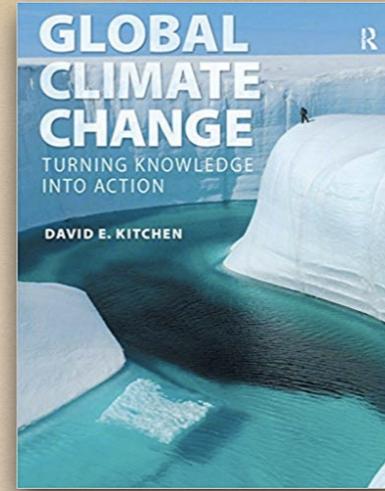
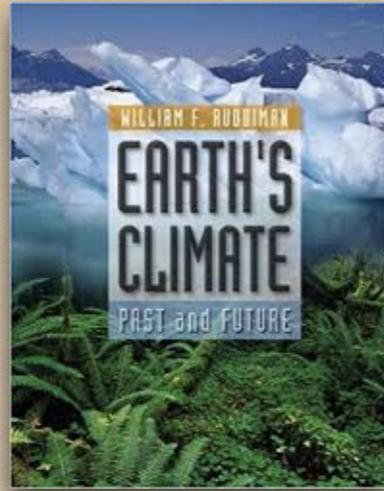
History of GEC

- **Origin 1998**
- **Taught largely by PSU geology faculty**
- **Morphed from environmental issues to a focus on climate**
- **Often taught as a historical geology / climatology course**



Current Status

- **An elective option for the students' SINQ requirement**
- **Four sections a year meaning nearly 150 students**
- **Majors include the full range of the sciences, mathematics, social sciences, humanities, and business**



Course Structure

- **Lecture and mentor sessions**
- **Content generally determined by individual faculty but has been moving towards a common framework**

The two textbook covers are for the two texts that have been used for most of the time this course has been taught.

Common Framework

- **Climate present:**
Climate systems and recent change



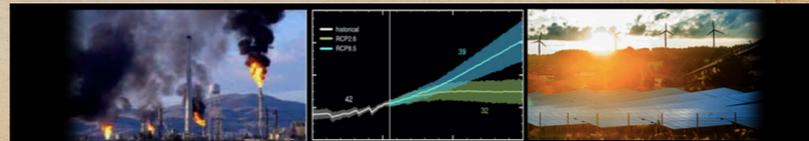
- **Climate past:**
Strategies, trends, and highlights



- **Climate future:**
Modeling and projected changes



- **Moving forward:**
Options for mitigation and adaptation





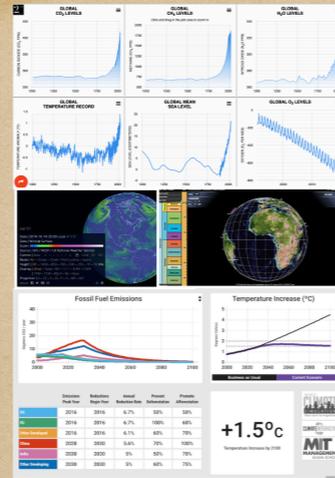
What the students have been doing

- **In-class and in-mentor session activities mixed with lecture**
- **Traditional textbook readings and quizzes**
- **A major writing or poster project**



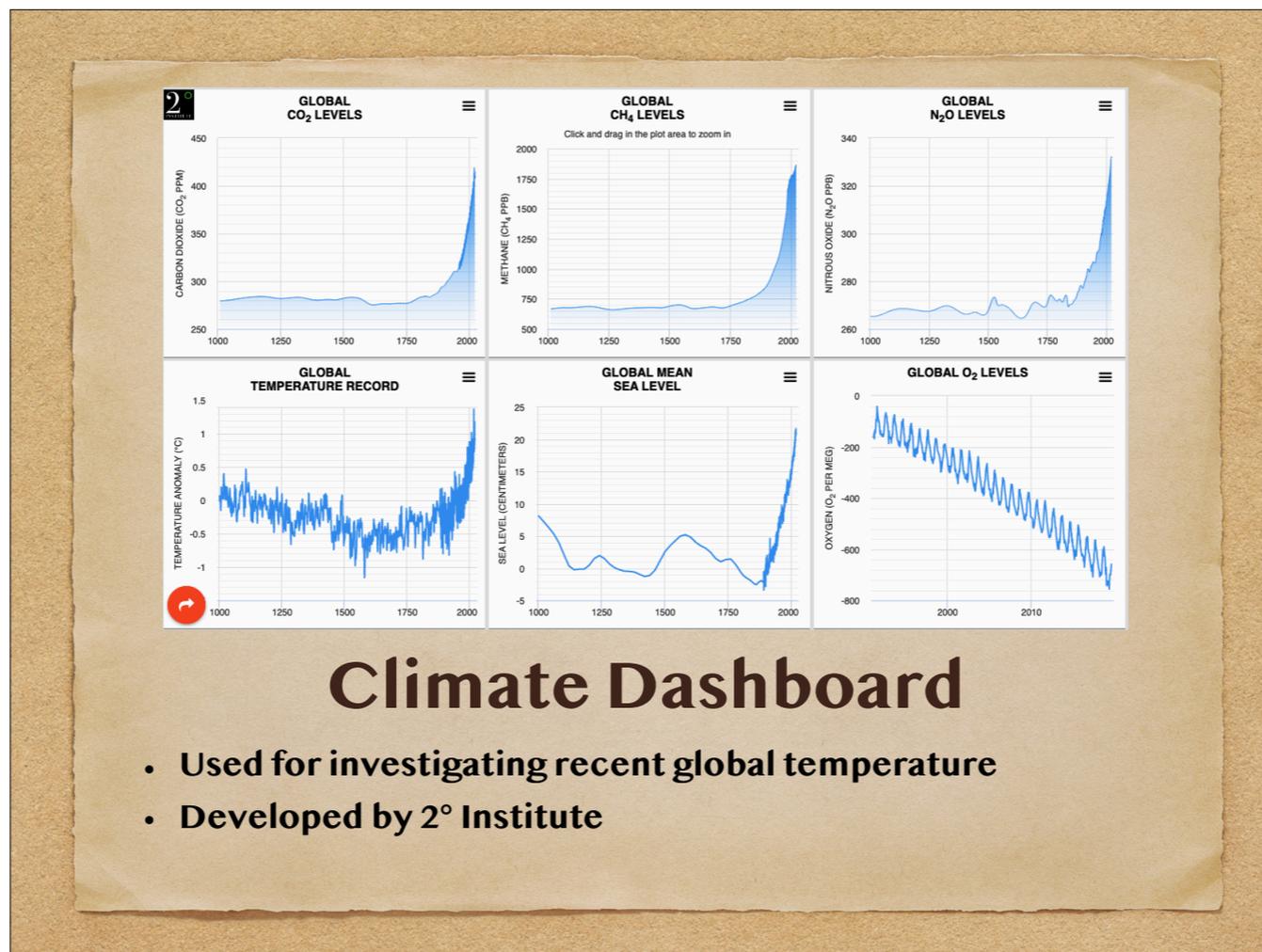
New Directions

- **Transforming lecture to workshop**
- **Linking the students to the international process**
- **Engaging students in writing for real audiences about both climate problems and solutions**

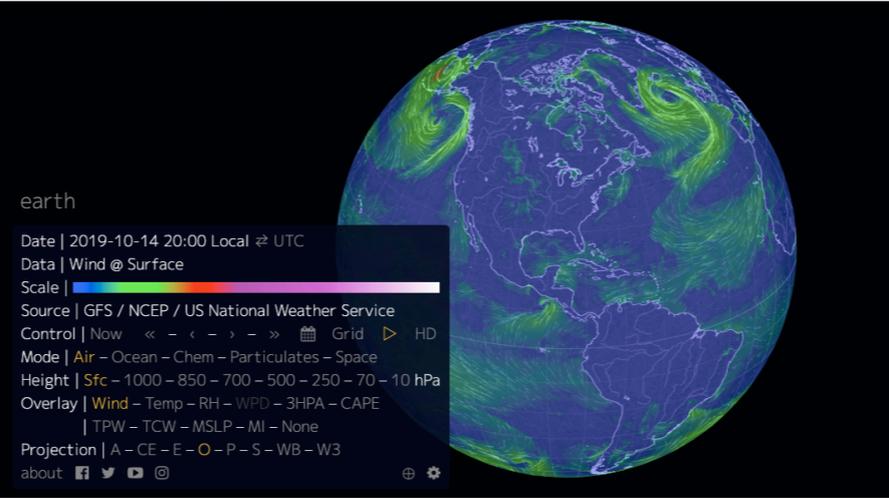


Transforming Lecture

- Developing a set of guided inquiry activities utilizing data-rich on-line resources
- Developing cooperative learning structures that best utilize these activities



Climate Dashboard from the 2° Institute



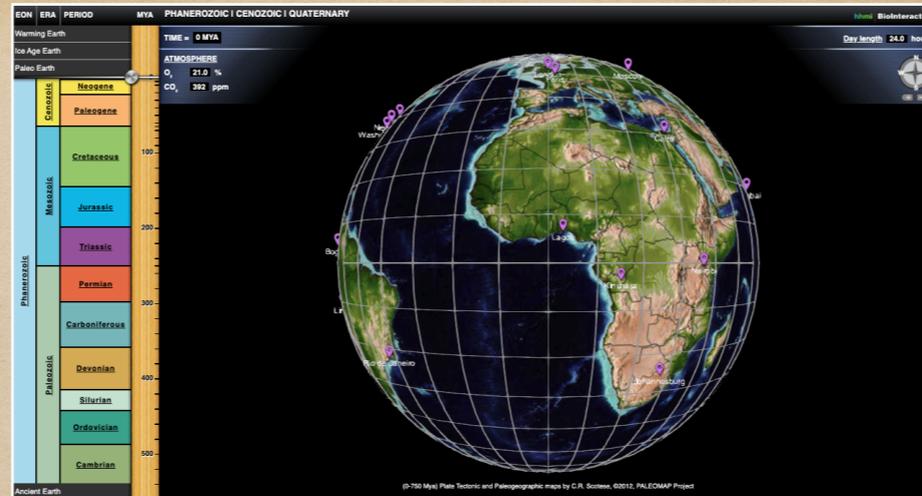
The image shows a screenshot of a web application titled 'earth'. The main visual is a globe with wind patterns overlaid, showing swirling green and yellow lines against a dark blue background. To the left of the globe is a control panel with the following settings:

- earth
- Date | 2019-10-14 20:00 Local ⇌ UTC
- Data | Wind @ Surface
- Scale | [Color scale bar]
- Source | GFS / NCEP / US National Weather Service
- Control | Now « - < - > - » Grid ▷ HD
- Mode | Air - Ocean - Chem - Particulates - Space
- Height | Sfc - 1000 - 850 - 700 - 500 - 250 - 70 - 10 hPa
- Overlay | Wind - Temp - RH - WPD - 3HPA - CAPE
| TPW - TCW - MSLP - MI - None
- Projection | A - CE - E - O - P - S - WB - W3
- about [Facebook icon] [Twitter icon] [YouTube icon] [Instagram icon]

Below the screenshot, the word 'earth' is written in a large, bold, sans-serif font. Underneath that, there are two bullet points:

- Used for atmosphere/ocean circulation activities
- Developed by null school.net

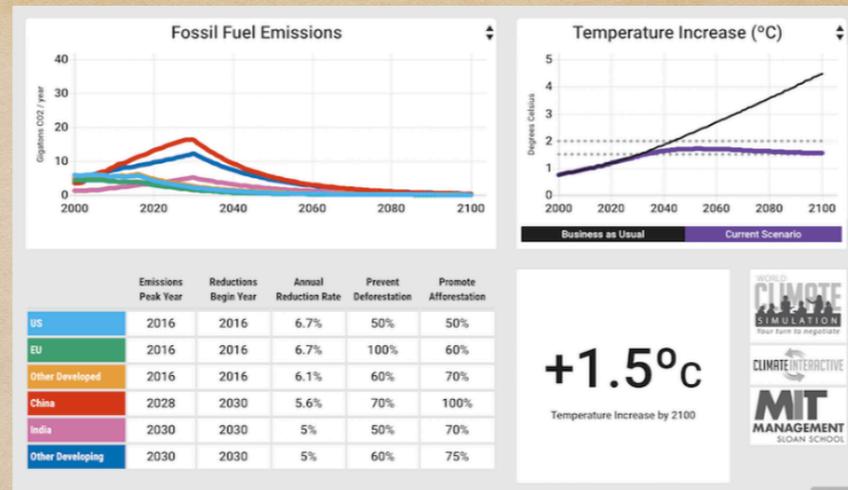
Earth from null [school.net](https://null.school.net)



Earth Viewer

- Used for paleoclimate activities
- Developed by HHMI BioInteractive program

Earth Viewer from HHMI BioInteractive



C-Roads

- Used for climate / sustainable development activities
- Developed by Climate Interactive

C-Roads from Climate interactive



United Nations
Framework Convention on
Climate Change



Students and the International Process

- **Setting up a digital bridge with UNFCCC and other international conferences**
- **Preparing students for the experience**



Students and Real Audiences

- Having students research communities that have climate mitigation and adaptation measures in place
- Having them tell their stories in a web-ready way
- Developing an audience and creating a way for students to talk with them

State of the experiment

- **The manual is being tested in three different settings**
Stayed tuned for version 2.0
- **Opportunities for using the manual in community / non-academic settings being sought.**
- **The bridge is being organized and expected to take place during the final two weeks of class**
- **The student virtual poster session is being organized**
This is also expected for COP25

Questions, comments, and assistance welcome

The manual is being tested in three different settings. Stayed tuned for version 2.0

What's happening now is that the manual or parts of it are being used in several college courses throughout the Portland metro area. The major challenge in implementing it is developing a cooperative learning structure that fits in the limited time frame of lecture.

Major tasks involved in moving on to version 2.0 are incorporating lessons learned to refine the existing activities and deleting or adding new ones as appropriate. An additional challenge is to ascertain the stability of the on-line resources referred to in the manual. Connections webcasts participants may have with the developers of these resources would be helpful here.

Opportunities for using the manual in community / non-academic settings being sought.

I have been asked numerous times in the past about senior audits in GEC. Because the course is a SINQ this is not possible. However, it does raise the question about creating a community education version of the course. A precedent for this is that one of the reviewers recently completed teaching climate science for activists series. The manual was structured with this possibility in mind.

Thoughts from webcast participants welcome here.

The bridge is being organized and expected to take place during the final two weeks of class

A small group of climate and sustainability educators here in Portland has convened to organize a series of events to make use of webcasts and other programming

developed by Citizen's Climate, BlueCOP25.org, and UNFCCC. Quite soon we will be meeting with a local science museum to discuss their being a hub for these events.

The student virtual poster session is being organized. This is also expected for COP25

The students are still in the preliminary stages of their projects, the mentor is working with them to have all their work done on Pebble Pad, and virtual conduits to the COP are still being sought. There is a possibility that these posters will be showcased at one of the bridge events.