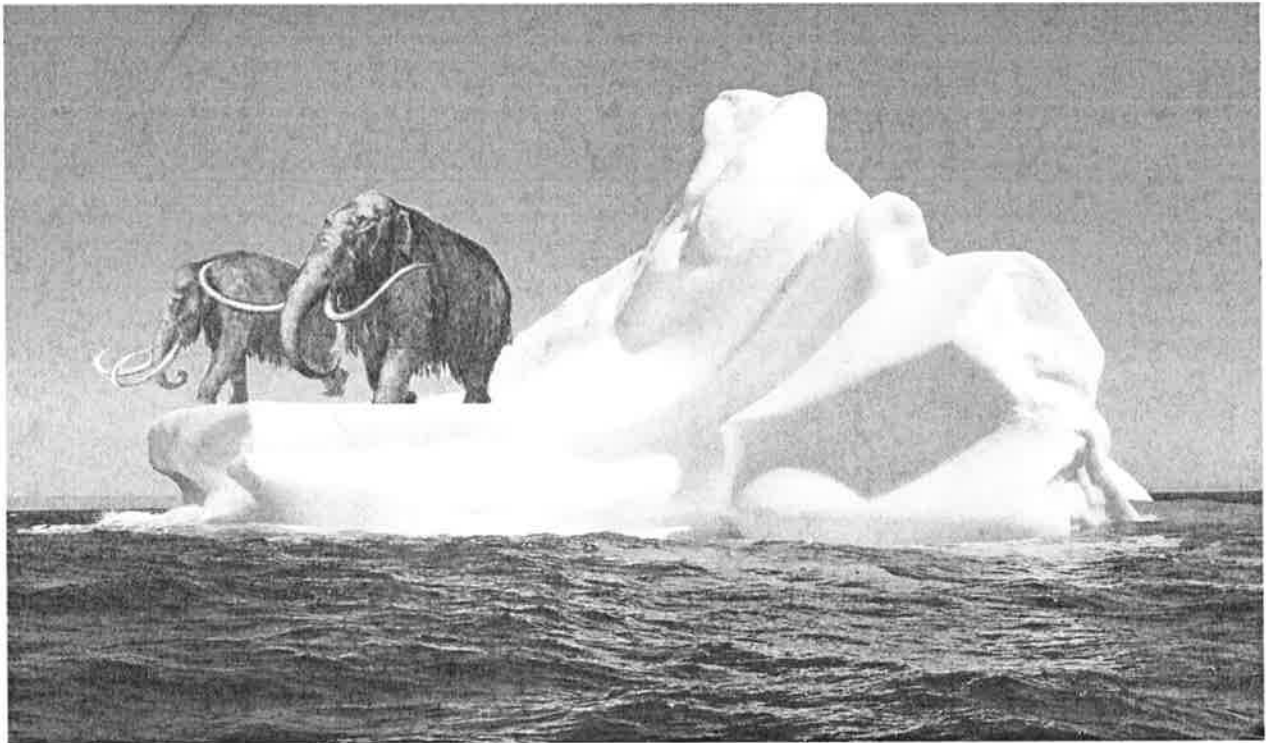


Geography 1: Global Environmental Change (4 units)



Scope of the Course

This course provides an introduction to one very important aspect of global environmental change: climate change. The nature and significance of climate change is often misunderstood by the general public, in large part because these topics are not covered in traditional high school courses. In fact, it has been only recently that climate change has been covered in university level courses. This recent interest is, of course, due to increasing concern about global warming and its possible consequences.

The course is organized in three parts. The first deals with basic controls of weather and climate; the second reviews the global pattern of present climate; and the third covers some examples of climate change during the recent geological past, the late Pleistocene and Holocene.

Instructor

Roger Byrne

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office hours: Mon 1:30 to 3:30 in 109 McCone, or by appointment

GSI's

Liam Reidy

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sections: Wed 2:00-4:00, Fri 8:30-10:30

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Andrew Friedman

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sections: Mon 3:00-5:00, Tue 2:00-4:00

office hours: Mon 12:00-2:00 in 575 McCone, or by appointment

Required Textbooks

Hess, Darrel and Dennis Tasa

2011 Chapters 1 through 11 from *McKnight's Physical Geography : A Landscape Appreciation*. Pearson, New York.

Roberts, Neil

1998 *The Holocene - An Environmental History*. Blackwell, Malden, Massachusetts.

Lab sections

Unless otherwise indicated, lab sections will meet in 535 McCone. Labs will review lecture material and will also involve written exercises and quizzes. Use of www resources will also be an integral part of labs. Attendance at weekly lab sections is a required part of the course. Students must receive a passing grade in lab to pass the course.

Course Grade

The course grade will be based on the midterm test (25 percent), the lab grade (25 percent), and the final exam (50 percent).

Lecture Outline and Chapter Readings

(M= McKnight's *Physical Geography*. H= Robert's *The Holocene*)

WEEK	DATE	LECTURE TOPIC	READINGS
1	18-Jan	Introduction to the Course	M1 + H1
		THE CONTROLS OF WEATHER AND CLIMATE	
1	20-Jan	The Spherical Earth, Earth-Sun Relationships	M1
2	23-Jan	The Structure and Composition of the Atmosphere	M3
2	25-Jan	Solar and Terrestrial Radiation	M4
2	27-Jan	Global and Latitudinal Heat Budgets	M4
3	30-Jan	Atmospheric Moisture and Precipitation	M6
3	1-Feb	Stability and Instability, Cloud Types	M6
3	3-Feb	Global Pattern of Precipitation, Hydrological Cycle	M6
4	6-Feb	Atmospheric Pressure and Winds	M5
4	8-Feb	The General Circulation of the Atmosphere	M5
4	10-Feb	The Secondary Circulation (1) Mid-latitudes	M7
5	13-Feb	The Secondary Circulation (2) The Tropics	M7
5	15-Feb	The Thermohaline Circulation of the Oceans	M9
5	17-Feb	Ocean-Atmosphere Interactions, El Niño – the PDO	5M
6	20-Feb	HOLIDAY	
6	22-Feb	Spare	
6	24-Feb	Midterm	
		THE GLOBAL PATTERN OF PRESENT CLIMATE	
7	27-Feb	Global Climate Classification	M8 to p.234
7	29-Feb	Equatorial Climates – The Amazon	M8 + M11
7	2-Mar	Summer Monsoonal Climates – Asia, West Africa	M8 + M11
8	5-Mar	Subtropical Winter-dry Climates –Mexico	M8 + M11
8	7-Mar	Subtropical Desert Climates – The Sahara	M8 + M11
8	9-Mar	Mid-latitude Climates – Maritime West Coast	M8 + M11
9	12-Mar	Mid-latitude Climates – Mediterranean-type	M8 + M11

9	14-Mar	Mid-latitude Climates – Continental Interior	M8 + M11
9	16-Mar	Mid-latitude Climates – East Coast	M8 + M11
10	19-Mar	High Latitude Climates – Ice Sheets and Permafrost	M8 + M9
10	21-Mar	Mountain Climates – the Sierra Nevada	M8 + M11
10	23-Mar	Spare	
		QUATERNARY CLIMATE CHANGE	
11	26-Mar	Proxy Records – Fossil Pollen, Tree Rings	M8 + H2
11	28-Mar	Proxy Records – Tree Lines, Stable Isotopes	H2
11	30-Mar	HOLIDAY	
12	2-Apr	Dating Methods – Radiocarbon,	H2
12	4-Apr	Glacial-Interglacial Cycles – Milankovitch	M8 + H3
12	6-Apr	Climate of the Last Full Glacial in the Tropics	TBA
13	9-Apr	Climate of the Last Full Glacial in California	TBA
13	11-Apr	Rapid warming at the End of the Pleistocene	H3
13	13-Apr	Strengthened Monsoons in the early Holocene	H4
14	16-Apr	Mid Holocene Drought in North America	TBA
14	18-Apr	Late Holocene Cooling in Western Europe - Ireland	H6
14	20-Apr	Late Holocene Drought in the Maya Lowlands?	H6 + TBA
15	23-Apr	The Medieval Climate Anomaly in California	TBA
15	25-Apr	Little Ice Age Cooling in Canada and Greenland	H6 + H7
15	27-Apr	Twentieth Century Droughts in Mexico and the US	TBA
16	30-Apr	Global Warming - Causes and Consequences I	M8
16	2-May	Global Warming - Causes and Consequences II	TBA
16	4-May	Global Warming - Causes and Consequences III	TBA