

**San José State University  
Department of Geography and Global Studies  
Geog130: Natural Resources, Fall 2015**

**Course and Contact Information**

**Instructor:** Gary M. Pereira

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**Office Hours:** Tue 9:00 – 10:00 AM; Thurs 3:00 – 4:15 and 9:15 – 10:00 PM

**Class Days/Time:** Tuesday / Thursday 1:30 – 2:45 AM

**Classroom:** Clark 310

**Course Description**

The purpose of this course is to achieve comprehension of those aspects of the natural world that provide resources for human beings. We shall concentrate on energy, material, and biological resources, including food and water. Readings, discussions, and films are the means of achieving this purpose.

Each week may represent a different theme, although some themes may extend for more than one week. These themes are as follows:

An overview of resource consumption patterns (**Consumption and sustainability**).

The results of local and regional resource extraction (**Is there a 'resource curse'?**)

An overview of world, regional, and national energy trends and developments (**Energy**).

Coal, oil, and natural gas at all scales (**Fossil fuels**).

Nuclear fission and its material requirements (**Nuclear**).

Biologically generated hydrocarbons (**Biofuels**).

Hydropower and solar energy resources (**Hydropower and solar**).

Wind, wave, tidal, and developing energy resources (**Additional sources of energy**).

The extraction and use of metals and minerals, including 'rare earths' (**Metals**).

The oceans as a source of mineral resources (**The seabed**).

The availability, distribution and use of potable water (**Fresh water**).

Soil as a natural resource (**Soil**).

Aspects of the Earth's biodiversity that provide ecosystem services (**Biodiversity**).

'How might the relationship of human behavior to natural resources change to make it healthier?' - the role of complexity sciences (**Management**).

### **Learning Outcomes and Course Goals**

Each week, as we discuss the topics indicated above, you will need to take notes. We will use the screen to project each listed document, and discussions are supplemented with films, maps, graphs, images, etc. In addition to taking notes, you may be asked to provide a one-page response to a question posed by the instructor, which is handed in at the end of the class period. In order to achieve the learning outcomes and fulfill course goals, therefore, you should attend class as often as possible and take notes.

The goal is simple: to achieve an accurate professional understanding of the current state of the human relationship with natural resources, by examining recent publications on these topics in journals like *Science*, *Nature*, the *Proceedings of the National Academy of Sciences (US)*, and others. These are all well-vetted, and many of them are surveys of the current state of understanding. Together they provide a comprehensive rich and diverse set of source material that no textbook could duplicate.

Learning is measured in terms of how well you reflect comprehension of the ideas present in this material, not in terms of what you've memorized. You will always have access to your notes. Written responses compiled over the course of a class period can often reflect more than the oral discussion. However, your participation in this oral discussion is likely to improve your written responses, as well as those of others. Participation in discussion is therefore well-rewarded and can improve your final grade.

## Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be:

1. well versed in the relative magnitudes and flows of natural resources within and between the Earth's various regions;
2. able to competently describe the current state of energy use at all scales on Earth;
3. aware of the importance of the seafloor and of the biological world in providing raw resources and ecosystem services.

## Readings

Approximately fifty readings are provided on Canvas, under FILES. These readings will be discussed in class as listed in the schedule below. They should be examined **before** the start of the class period to which they correspond. Along with the discussion, they form the basis of comprehension required for your in-class written responses described below.

## Assignments and Grading Policy

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Approximately once per week you shall be asked to write your thoughts on a question of the day. Your best twelve in-class written responses to questions related to each week's readings shall total 50% of the grade. A formal term paper on a relevant topic of your choice is due at the end of the semester. It must contain at least four pages of text. Normal margins, 10 or 12 pt. font, 1 ½ line spacing. Must contain and refer to a sufficiently comprehensive list of references. An oral presentation on the topic is required of graduate students, and is optional for undergraduate students. Any questions regarding topic, early drafts, etc. can be discussed at any point during the semester. A final exam comprised of a single written essay on a topic previously decided on as a class rounds out the semester at accounts for the final 10% of the grade.

In-class responses	50%
Term paper	40%
Final exam	10%
<b>Total</b>	<b>100%</b>

**a. Grading information:**

98% and above	A+
94% - 97%	A
93% - 90%	A-
89% - 87%	B+
86% - 84%	B
83% - 80%	B-
79% - 77%	C+
76% - 74%	C
73% - 70%	C-
69% - 67%	D+
66% - 64%	D
63% - 60%	D-
<b>below 60%</b>	<b>F</b>

Note that “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.” See University Policy F13-1 at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

**Classroom Protocol**

Students are required to take notes and participate in discussion, so regular attendance is crucial. Technologies for taking notes are allowed. Small devices like cell phones and mp3 players are discouraged.

**University Policies**

**General Expectations, Rights and Responsibilities of the Student**

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arise. See University Policy S90–5 at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the SJSU catalog, at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such

conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

### **Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Information on add/drops are available at <http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-324.html>. Information about late drop is available at <http://www.sjsu.edu/sac/advising/latedrops/policy/>. Students should be aware of the current deadlines and penalties for adding and dropping classes. Information about the latest changes and news is available at the Advising Hub at <http://www.sjsu.edu/advising/>.

### **Consent for Recording of Class and Public Sharing of Instructor Material**

University Policy S12-7, <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

"Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material."

In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.

"Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."

### **Academic integrity**

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at <http://www.sjsu.edu/studentconduct/>.

### **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

## Geog 130 Fall 2015 Course Schedule

*Please note that the course calendar is subject to change with fair notice.*

Week	Date	Topics. Readings.
1	8/20	<b>Introduction.</b>
2	8/25  8/27	<b>Consumption and sustainability.</b> (Wiedemann) The material footprint of nations. (Huang) The transition to an urbanizing world and the demand for natural resources. (Griggs) sustainable development goals for people and planet
3	9/01  9/03	<b>Is there a 'resource curse'?</b> (Sachs) The curse of natural resources. (Auty) Natural resources, capital accumulation and the resource curse. (Brunnschweiler) linking natural resources to slow growth and more conflict
4	9/08  9/10	<b>Energy.</b> (Williams) Technology Path to Deep Greenhouse Gas Emissions Cuts. (Chow) Energy Resources and Global Development. (Hoffert) Advanced Technology Paths to Global Climate Stability. (Jakob) Unburnable fossil-fuel reserves.
5	9/15  9/17	<b>Fossil fuels.</b> (Maggio) When will oil, natural gas, and coal peak? (Steckel) Drivers for the renaissance of coal. (Palmer) Mountaintop Mining Consequences. (Joye) Deepwater Horizon five years on. (Wu) China's energy security - Oil and gas.
6	9/22  9/24	<b>Fossil fuels.</b> (Allred) Ecosystem services lost to oil and gas in North America. (Gautier) Assessment of Undiscovered Oil and Gas in the Arctic. (Kerr) Natural Gas From Shale Bursts Onto the Scene. (Inman) The fracking fallacy. (Motomura) Japan's need for Russian oil and gas
7	9/29  10/01	<b>Nuclear.</b> (Vujic) Environmental impact and cost analysis of coal versus nuclear power. (Len) Nuclear Versus Natural Gas. (Marshall) Is the Friendly Atom Poised for a Comeback? (Valle) Diffusion of nuclear energy in some developing countries.
8	10/06  10/08	<b>Nuclear.</b> (Poinssot) Assessment of the environmental footprint of nuclear energy systems (Hayashi) The Fukushima nuclear accident. (Yidong) Asia's Demand for Electricity Fuels a Regional Nuclear Boom (Clery) new dawn for the nuclear industry. (Stone) Iran nuclear deal holds 'goodies' for scientists
9	10/13  10/15	<b>Biofuels.</b> (Liao) Natural resource demand of global biofuels (Goldemberg) Ethanol for a Sustainable Energy Future. (Richard) Challenges in Scaling Up Biofuels Infrastructure. (Shinnar) A Road Map to U.S. Decarbonization.

<b>Week</b>	<b>Date</b>	<b>Topics. Readings.</b>
10	10/20 10/22	<b>Hydropower and solar.</b> (Qiu) trouble on the Yangtze. (Widen) Variability of solar, wind, wave and tidal resources. (Service) Is It Time to Shoot for the Sun? (Ganesh) electricity generation from sunlight.
11	10/27 10/29	<b>Additional sources of energy.</b> (Turner) Sustainable Hydrogen Production. (Whitesides) Don't Forget Long-Term Fundamental Research in Energy. <b>Metals.</b> (Gordon) metal stocks and sustainability. (Wall) Don't stop using rare earths.
12	11/03 11/05	<b>The seabed.</b> (Rona) resources of the sea floor. (Halfar) danger of deep-sea mining. (Gramling) seafloor mining plan advances. (Wedding) managing mining of the deep seabed.
13	11/10 11/12	<b>Fresh water.</b> (Gleeson) Water balance of global aquifers. (Schoups) Sustainability of irrigated agriculture in the San Joaquin Valley. (NRDC) stormwater capture potential in urban and suburban California.
14	11/17 11/19	<b>Soil.</b> TBA <b>Biodiversity.</b> Virunga (film). (Douglas) Linking wildlife conservation to international conflict, insecurity, and development.
15	11/24 11/26	<b>Biodiversity.</b> (Cardinale) Biodiversity loss and its impact on humanity. TBA <b>Thanksgiving – no class.</b>
16	12/01 12/03	<b>Management.</b> (Rammel) Managing complex adaptive systems — A co-evolutionary perspective on natural resource management. (Williams) Adaptive management of natural resources.
17	12/08	<b>Wrap-up. Term paper final submission</b>
<b>Final Exam</b>	<b>Thurs 12/10</b>	<b>12:15 – 2:30</b>