San José State University
Department of Geography
Geog001: Geography of the Natural Environment, Section 80

Spring 2020

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Course and Contact Information

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Class Days/Time:	Online
GE/SJSU Studies Category:	Area B1

Course Format

This is an online course. Internet connectivity and a computer are required. Course materials (including this syllabus) can be found on the Canvas Leaning Management System course login website at http://sjsu.instructure.com, under **Files**. Assignments are all listed and described under **Assignments**. Additional guidance and discussion will be posted periodically under **Announcements**. You will generate documents and submit them online as homework assignments and a final paper.

Course Description

This course covers the basic sciences that describe the Earth's atmosphere, hydrosphere, biosphere, and lithosphere.

Course Goals and Learning Outcomes

This course is approved for General Education Core Physical Science area, B1. Upon successful completion of this course, students will be able to:

1: use the methods of science and knowledge derived from current scientific inquiry in life or physical science to question existing explanations.

Evidence-based learning and discovery form the basis of scientific inquiry. The focus of this class is therefore on evidence, rather than belief. Challenges to existing explanations are approached through examination of evidence.

2: demonstrate ways in which science influences and is influenced by complex societies, including political and moral issues.

The technical and cognitive methods of understanding used by researchers in physical geography are described throughout the course. The goal of achieving relative independence of the natural sciences from social belief systems is recognized, as is the influence of such belief systems on the process of achieving that goal. The influence of the resulting comprehension of natural systems on human societies is emphasized throughout the course, particularly with regard to natural disasters like earthquakes, as well as the complex impact of climate change on social systems.

3: recognize the methods of science, including quantitative, analytical reasoning techniques.

The tools and methodologies of the physical geographical sciences, as well as the analytical and algorithmic reasoning techniques, are studied in some detail. Students shall understand how knowledge is achieved and improved on an ongoing basis.gh time; systems of classification; and physical processes of the natural environment.

Textbook

The **Fundamentals of Physical Geography** (2nd edition) is a free online textbook with over 300 pages and 400 illustrations, photos and animated graphics. It is the work of two professors from the University of British Columbia Okanagan – Dr. Michael Pidwirny & Scott Jones. Important terms are hyperlinked to a glossary. There are links to study guide pages and additional reading within each chapter. Most importantly, 'weblinks' are provided for each chapter that provide a wealth of well-respected sources of additional data and social media. The textbook is accessible here:

http://www.physicalgeography.net/fundamentals/contents.html

Additional Readings

NCA4_Ch25_Southwest_Full.pdf
2018indicatorssummary.pdf
StayingSafeWhereTheEarthShakes_BayArea.pdf
PuttingDownRootsInEarthquakeCountry_BayArea.pdf

These files are all available from Canvas, under **Files**.

Other technology requirements

A device capable of streaming video from the Internet is required for this course. You should use a computer with a large screen if possible; I do not recommend that you watch the videos on your phone. Most of these streaming videos (including my own) are being offered in high definition. Your computer and Internet connection should be sufficiently powerful to portray them smoothly at the original resolution.

Videos

Online videos are a big part of this course, and much of the homework will be judged on the basis of how closely you considered them in your discussions. If you are accessing each assignment through Canvas **Assignments**, you might be given the choice of opening a video in a separate browser or of watching it within Canvas. I suggest you open videos in separate browsers and possibly take notes as you watch; that is why a bigger screen is preferable. Separate browsers often also provide additional information, as well as full access to other material on the author's channel. I encourage you to explore the work of any YouTube contributor whose work you appreciate.

However, you might want to open videos by clicking on the embedded option within Canvas (if access is offered), and read over the assignment as you watch. It's up to you. I've included some of my own videos in the homework, and I might provide links to others in the **Announcements**. I'm working on narration.

Some YouTube videos may be preceded by ads. Usually, these ads can be cut short after five seconds by clicking on 'Skip Ad' at the lower right of the screen. There are never ads on my videos, and I get no monetary benefit from YouTube.

Course Requirements and Assignments

Homework: Fourteen homework assignments must be completed on or before the due dates, as described in the course schedule below. Please submit these responses via Canvas. For each homework assignment, I would prefer you use primarily 10pt font with 1½ line spacing. Put your name, the homework number, 'Pereira', 'geog1-80' and 'Fall 2019', arranged at the upper right of the first page. Text, figures, and images lifted from documents or screenshots may be embedded in your homework, but these must all include full attribution. In other words, be honest about which words, figures and images are your and which are from other sources. It is often helpful to include this sort of material, but these should be explicitly cited. Habitual lateness in submitting assignments may result in a full grade change at the instructor's discretion.

Regarding the length in pages or word count expected for each assignment: this depends on the topic and your writing style. I'm looking for understanding, substance, and a willingness to sufficiently pursue each point you are making. It is perfectly reasonable to be unsure about topics that you are just beginning to understand. This is a course in science. Doubt and uncertainty are actually virtues. If your writing style is average, and you avoid redundancy, each homework assignment should run at least three pages.

You will be graded relative to the performance of your classmates in the current and former semesters. I may offer comments or advice in Canvas for each assignment. Check back on each assignment not only for your grade, but also for any comments I may have left. If you'd like to continue the conversation (which I welcome) please do so as a Canvas message to me independently of that particular assignment, which I am unlikely to check back on.

Announcements

Please check the **Announcements** tab every week. Discussions of homework results and expectations, current events, and other issues of interest to this class will be posted here. Your homework and any one-on-one discussions are kept private, although you are always free to make them public.

Final Evaluation

In at least four to five pages (10pt font, 1 ½ spaced as usual), you will be asked to describe steps that might be taken before, during, and after a major destructive earthquake, from the perspective of a family member, and/or neighbor, public servant, health care worker, business officer, planner, etc. in order to reduce suffering and loss. Hopefully, this will never happen to you. But living where we do, we all need to take this seriously. That's why I've chosen this topic in place of a comprehensive test. A full description is provided in the Course Schedule below.

Grading Information

Homework: Fourteen homework assignments and the Final Exam must be completed on or before the due dates, as described in the Course Schedule below. Please submit these responses via Canvas.

Determination of Grades

Homework assignments (6.5% each) x 14	91%
Final Evaluation	9%
Total	**100%**

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-
below 60%	**F**

University Policies

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.

Note that "All students have the right, within a reasonable time, to know their academic scores, to reWatch 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.

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/

Geog1-80 / Geography of the Natural Environment / Spring 2020

Course Schedule

Week	Due Date	Discussion, Readings, Videos, Assignments
1	**01/29/20**	**Topic:** The nature of the natural sciences **Watch:** Emergence [Systems Innovation] https://youtu.be/QItTWZc7hKs **Watch:** The Science of Patterns [Systems Innovation] https://youtu.be/kh6KMW8J3RQ **Watch:** Synergies [Systems Innovation] https://youtu.be/rsn5EQoAhUc Scenes may appear to be random or vague at one scale of observation can be shown to contain intricate patterns at another. The microscope and telescope gave us proof of this long ago. **Watch:** Powers of Ten Ultimate Zoom https://youtu.be/Fl6qnZzVRAU The spatial scales that will be relevant to this class range from the Earth-Sun system down to that of subatomic particles. Relevant time scales range from millions of years down to fractions of seconds. Consider for example the long timescales involved in the growth of lichen colonies and terracettes, to the short timescales involved in the analysis of birdsong. **Watch:** Pattern formation in Nature 2: lichens and terracettes [Gary Pereira] https://youtu.be/AZ14PyiqM28 **Watch:** Pattern formation in Nature 3: bird song [Gary Pereira] https://youtu.be/UvGue54F4lk **Homework 1:** 1. Describe the concepts of emergence, synergies, and pattern formation, and try to illustrate them in the context of the natural sciences with a few examples. 2. We human beings can see in only a short segment of the electromagnetic spectrum, we can hear only certain wavelengths of sound, and we are each alive and sentient only a certain number of years. We must therefore rely on our technologies, our representational methods, and our collective memory to expand our understanding of the world beyond what each of us can see individually. Give some examples of natural processes that require particular technologies, methods, and memories in order to understand them.

Week	Due Date	Discussion, Readings, Videos, Assignments
2		**Topic:** Sense and Representation Elaborating on last week's second question, it would be helpful take a week to to look more closely at some of the most important technologies available to us in the global search to understand and deal most effectively with a changing climate. **Watch:** What is Remote Sensing? https://youtu.be/xIsUP1Ds5Pg **Watch:** How Does LiDAR Remote Sensing Work? Light Detection and Ranging https://youtu.be/EYbhNSUnIdU **Watch:** Satellite Remote Sensing for Environmental Protection https://youtu.be/aKfsh2NAuR8 **Homework 2:** 1. What is remote sensing? What types of remote sensing instruments have been developed to monitor the Earth? What sorts of things do they measure? 2. How Does LiDAR Remote Sensing Work? 3. Describe some of the ways satellites are being used to observe and characterize the world's environments.
3	**02/05/20**	**Topic:** Energy **Watch:** A guide to the energy of the Earth https://youtu.be/fHztd6k5ZXY Access the text **Fundamentals of Physical Geography** http://www.physicalgeography.net/fundamentals/contents.html **Read** CHAPTER 6: Energy and Matter Each chapter of the online text **Fundamentals of Physical Geography** includes a Study Guide page. At the bottom of each Study Guide page is a list of Essay Questions. Responses to questions from the book may be partially copied and pasted from the text. Take your answers, at least in part, from the section of that chapter that discusses the topic at hand. Do NOT take them from the summary of the chapter. Use your own words most of the time, and incorporate what you learn from the videos. **Homework 3:** 1. Describe some internal and external sources of energy for the Earth. **CONTINUED ON NEXT PAGE**
	02/12/20	

Week	Due Date	Discussion, Readings, Videos, Assignments
		Chapter 6 Essay Questions 3, 4, 5, 6, 7, 9 , 10, 11, 12: 6.3. How do the three mechanisms of conduction, convection and radiation move energy from one place to another? 6.4. Outline the three laws of thermodynamics. 6.5. What is radiation? How is it created? What factors determine its quantity and quality? 6.6. Define the Stefan-Boltzmann Law. What does it describe? 6.7. Define Wien's Law. What does it describe? 6.9. How does the Sun create the energy that drives most systems on the Earth? 6.10. How does the tilt of the Earth's axis influence the annual solar insolation received at a site located at 50 degrees North latitude? 6.11. What influence does Earth rotation have on solar insolation received at the equator? 6.12. How does angle of incidence control the intensity of solar radiation received at the Earth's surface?
4	**02/19/20**	**Topic:** Endeavors in Science Let's take a break from the textbook this week. **Watch:** Look through the many pages of videos available at the following address. Use the 'next page' button at the bottom of each page to access additional pages. http://ww2.kqed.org/quest/tag/tag-video/ **Homework 4:** Choose any five videos, and (using at least ½ of a page per video), write a summary and brief discussion of what you found most interesting about each of them and any questions they bring to mind. Indicate the title of each video as subheadings. Make sure to look through a few pages before making your selections. Don't just stick with the first couple of pages.
5	**02/26/20**	**Topic:** The Atmosphere **Watch:** Careers In Atmospheric Science https://youtu.be/Fk-uqrXkkG8 Access the text **Fundamentals of Physical Geography** http://www.physicalgeography.net/fundamentals/contents.html **Read** CHAPTER 7: Introduction to the Atmosphere **Homework 5:** 1. Describe the career(s) in atmospheric science from in the video that you find most interesting. **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
		Chapter 7 Essay Questions 3, 4, 5, 6, 7, 10 7.3. Why is ozone important for life on Earth? Where is it found and how is it formed? How is human activity influencing this important atmospheric gas? 7.4. How is the incoming shortwave solar radiation from the Sun modified by the atmosphere and the Earth's surface? 7.5. Describe the difference between the following two terms: heat and temperature. 7.6. Describe the shortwave radiation cascade as it relates to the Earth's energy balance. 7.7. Discuss how the Greenhouse Effect works. How has human activity over the last few centuries enhanced this natural process? How will global warming change the environment of the Earth? 7.10. What is a hurricane? Where, when and why does it form? How is global warming likely to influence hurricane intensity and frequency?
6	**03/04/20**	**Topic:** The Atmosphere **Watch:** Water Vapor Fuels Hurricane https://ca.pbslearningmedia.org/resource/nves.sci.earth.hurricane/water-vapor-fuels-hurricanes/ **Watch:** NOVA: Earth From Space | Monitoring Earth's Water Vapor https://ca.pbslearningmedia.org/resource/nves.sci.earth.vapor/monitoring-earths-water-vapor **Homework 6:** 1. What is the primary function of the Aqua satellite? How does it monitor the production of water vapor? 2. Why might molecules of water vapor be described as "little mobile solar collectors"? 3. Describe the role of the Sun in the formation of thunderstorms. 4. What is a geostationary orbit? Why do you think it would be useful to have a satellite remain in orbit over one point on Earth? Why do scientists combine data from multiple satellites in geostationary orbit? 5. Explain how topography, latitude, and other factors combine to change the impact of water vapor regionally. Chapter 7 Essay Questions 13, 15, 21 7.13. Discuss the formation and characteristics of the various types of thunderstorms. 7.15. What factors are responsible for the altered micro-climate of urban areas? 7.21. Why do urban areas have more energy available for the creation of sensible heat than rural areas?
7		**Topic:** Climate **Watch:** NOVA: Extreme Ice | Ice-Core Record of Climate https://ca.pbslearningmedia.org/resource/nvei.sci.earth.climate/ice-core-record-of-climate/ **Watch:** NASA | The Ocean: A Driving Force for Weather and Climate https://youtu.be/6vgvTeuoDWY **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
	03/11/20	**Watch:** What is a Climate Model? https://youtu.be/bkcrH9tYv8g **Homework 7:** 1. What is an ice core? 2. What happened to the level of carbon dioxide in the atmosphere about 125,000 years ago? 3. What precisely is the relationship between greenhouse gases, global temperatures, and sea level? 4. Why would it be wrong to claim that the Earth's climate concerns the atmosphere alone? 5. How do climate models work?
8		**Topic:** The Hydrosphere **Watch:** Is the world's fresh water supply running out? https://youtu.be/iVcTQdOJMMw **Watch:** Water Resource Management https://youtu.be/odngssDFMrU **Optional:** The Three Gorges Dam [Gary Pereira] https://youtu.be/pPKV_GTI4gk **Optional:** The Three Gorges [Gary Pereira] https://youtu.be/yQ7lrqE_bKU Access the text **Fundamentals of Physical Geography** http://www.physicalgeography.net/fundamentals/contents.html **Read** CHAPTER 8: Introduction to the Hydrosphere I worked for a couple of years for the National Operational Hydrologic Remote Sensing Center, or NOHRSC: https://www.nohrsc.noaa.gov NOHRSC is NOAA's "source for snow information" and other hydrological data products and models. Every winter day, several satellite datasets are downloaded to this facility and analyzed, and by evening a variety of maps and graphs are generated and uploaded onto the Internet for use by regional hydrological agencies, businesses, and others to inform their own work and decisions. **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
		One important variable that has to be mapped is called 'snow water equivalent', or SWE: the liquid water equivalent of a given volume of snow. This can be checked on the ground at various points using automated 'snow pillows' and other devices, but it can also be checked from above. NOAA pilots run low altitude flight-lines over snow with instruments that estimate SWE by measuring the degree to which the natural radioactivity of the ground beneath is dampened, or attenuated by the snow.
	03/18/20	**Homework 8:** 1. What is an aquifer, and what is the current state of aquifers around the world? Where is the problem worst? 2. What are some of the careers described in the video on water resources management? Chapter 8 Essay Questions 1, 3, 4, 5: 8.1. What is streamflow? How can it be expressed in a mathematical model? Describe the effect of an intense 1 hour storm on streamflow over 24 hours using a hydrograph. 8.3. Discuss the movement of water into soils. How and why does infiltration vary with time? 8.4. Why does runoff occur? 8.5. What forces influence the storage of water in the soil matrix?
9		**Topic:** The Hydrosphere Access the text **Fundamentals of Physical Geography** http://www.physicalgeography.net/fundamentals/contents.html **Read** CHAPTER 8: Introduction to the Hydrosphere **Watch:** The Water Cycle https://youtu.be/al-do-HGuIk **Watch:** Calaveras Reservoir [Gary Pereira] https://youtu.be/_Eqehbxjf Uk
	03/25/20	**Homework 9:** 1. Describe the global water cycle in terms of flows and stores. 2. What are the sources of our local water? Details, please. You'll need to search online to find this. 3. Why was the new Calaveras Reservoir Dam designed to hold up to four times as much water as it is currently holding? **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
		Chapter 8 Essay Questions 7, 10, 12, 16 8.7. Describe the mathematical equation used to model stream discharge. 8.10. What is potential evapotranspiration and how does it differ from actual evapotranspiration? What factors control the rate at which water leaves the Earth's surface by way of evaporation and transpiration? 8.12. Explain how relative humidity is measured. 8.16. Discuss how tides form. What is the difference between a Neap and Spring tide? Explain diurnal, semidurinal, and mixed tides.
10	**04/01/20**	**Recess**
11	**04/08/20**	**Topic:** The Biosphere **Watch:** Plants Affect the Atmosphere https://ca.pbslearningmedia.org/resource/nves.sci.earth.atmosphere/plants-affect-the-atmosphere/ **Read** CHAPTER 9: Introduction to the Biosphere Most life on Earth gets its energy from the sun, either directly or indirectly, via an evolved set of processes called photosynthesis and respiration. Carbon dioxide is required, and water and oxygen are released, globally, on a massive scale. Living things therefore are key determinants of just how much carbon is in the atmosphere, and so they are largely responsible for the sort of climate that has evolved on this planet. In order to fully understand climate, we have to understand life. We can change the direction that the world climate takes in the future, one way or another, depending on how well we understand and treat living things. **Homework 10:** 1. What primary components of Earth's atmosphere do plants modify through photosynthesis and respiration? 2. How do photosynthesis and respiration relate to one another? 3. How have plants contributed to making Earth a habitable planet? 4. Describe how Earth's atmosphere changes over the course of 24 hours. 5. Why does the Amazon rainforest have such a dramatic impact on the atmosphere? Chapter 9 Essay Questions 2, 3, 5, 9, 10 9.2. Compare and contrast the function and structure of the grazing and detritus food chain. 9.3. What is an ecosystem? How does it differ from a community? What are some of its important components? 9.5. Explain in detail how energy moves through the grazing food chain and the detritus food chain. Also, discuss how these food chains are related to each other and are necessary for the cycling of nutrients in an ecosystem. 9.9. What are some of the major components of ecosystems? How are these components related to each other? 9.10. Describe how energy flows through ecosystems.

Week	Due Date	Discussion, Readings, Videos, Assignments
12	**04/15/20**	**Topic:** The Biosphere **Read** CHAPTER 9: Introduction to the Biosphere **Watch:** NOVA: Earth From Space | Lightning Produces Nitrates https://ca.pbslearningmedia.org/resource/nves.sci.earth.nitrate/lightning-produces-nitrates/ Besides a source of energy and water, life depends on the presence of a few other elements, particularly nitrogen. Most living things cannot get this nitrogen directly from the air; they get it indirectly from specialized microbes, as well as from lightning. Another direct link between the biosphere and the atmosphere that most of us are unaware of. **Homework 11:** 1. On average, how many lightning strikes occur on Earth each second? 2. How does lightning produce nitrate? 3. Why is nitrate important for living things? 4. How does nitrate produced in clouds end up in human bodies? Chapter 9 Essay Questions 11, 14, 4: 9.11. Discuss the term dispersal. Include in your answer an explanation of why organisms want to disperse, and how organisms accomplish this life-cycle strategy. 9.14. Compare and contrast the characteristics (climate, plant types, animal life, soil types, etc.) of the following biomes: Tundra, Temperate Deciduous Forest, Desert, and Tropical Rainforest. 9.4. Evolution describes the process by which species come to possess adaptations. In an essay, describe how evolution works through natural selection, spatial isolation, and gene mutation.
13	**04/22/20**	**Topic:** The Lithosphere **Access via CANVAS (Files):** StayingSafeWhereTheEarthShakes_BayArea.pdf PuttingDownRootsInEarthquakeCountry_BayArea.pdf **Read:** CHAPTER 10: Introduction to the Lithosphere **Homework 12:** 1. In an essay, describe steps that should be taken before, during, and after a major destructive earthquake, from the perspective of you as a family member and/or neighbor, public servant, health care worker, business officer, planner, etc. in order to reduce suffering and loss. In other words, I want to know more than just what you would do for yourself during and immediately after the earthquake. I also want to know about long-term planning, and about the long-term aftermath. Assume that the earthquake has caused casualties, and that people around you are in need of first aid, at the very least. Assume that gas lines are ruptured, that electricity is off, and that communications via cell phone is unreliable. Assume that you have the ability to move and do things. You may be at work, or school, at home or on the streets. You may fictionalize your account, with specifics, or you may write in the manner of the USGS documents. This essay should take at least a couple of pages. **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
		Chapter 10 Essay Questions 6, 12, 13, 14: 10.6. What geologic features are found at the boundaries of tectonic plates? Briefly explain how plate tectonics is responsible for their formation or occurrence. 10.12. Describe the various layers that make up the solid Earth. 10.13. Describe the various physiological features associated with the ocean basins. 10.14. What is a volcano? Where and why do they form? Describe the five different types of volcanoes.
14	**04/29/20**	**Topic:** The Lithosphere **Read:** CHAPTER 10: Introduction to the Lithosphere **Homework 13:** Essay Questions 17, 20, 21, 25, 28, 32, 33, 34 10.17. Outline the various processes of physical, chemical, or biological weathering. 10.20. Describe the physical characteristics of a location that would favor each of the following types of mass movements: rock fall, rockslide, mudflow, slump, and creep. 10.21. What is a glacier? What conditions are necessary for a glacier to form? Why did continental glaciers form over certain specific regions of the North American continent? 10.25. How do glaciers influence the surface configuration of the Earth by way of erosion and deposition? 10.28. How does beach drift and longshore drift move sediment along coastlines? 10.32. Describe some of the landforms common to environments influenced by eolian processes. 10.33. Describe some the important characteristics of soil. 10.34. What five factors are important in pedogenesis? Explain. Outline how the pedogenic processes operate.
15		**Topic:** The Oceans **Watch:** Nutrients from Deep-Sea Vents https://ca.pbslearningmedia.org/resource/nves.sci.earth.hydro/nutrients-from-deep-sea-vents/ **Watch:** Deep-sea mining could transform the globe https://youtu.be/IYKaKeJv2dQ **Watch:** The Next Frontier in Mining: Deep Sea Exploitation in the Pacific https://youtu.be/PuEXmFQEJpw Countries bordered by oceans often claim an exclusive economic zone that extends far out to sea. Many of these waters are disputed among various nations (e.g., the South China Sea). Fissures along plate boundaries and hotspots in the deep ocean bring minerals up from deep beneath the crust. Many islands and seamounts associated with such processes have abundant minerals in their seabed. Unknown forms of life, that we have barely begun to understand, exist in these environments as well. **CONTINUED ON NEXT PAGE**

Week	Due Date	Discussion, Readings, Videos, Assignments
	05/06/20	**Homework 14:** 1. What is a hydrothermal vent? 2. Describe the process by which hydrothermal vents produce nutrient-rich water. 3. What did scientists see in NASA's Aqua satellite data that indicated a phytoplankton bloom? **4.** What do you think could or should be done to regulate the exploitation of the seabed for minerals? Use Wikipedia to tell me about the history and possible significance of so-called exclusive economic zones (EEZs). What are their significance in this context? Should individual nations have such extensive rights? What about islands: should their nations own the rights to vast tracts of surrounding seabed much larger than the islands themselves? And what about international waters?
16	**05/13/20**	**Topic:** Final evaluation **Access via CANVAS (Files):** NCA4_Ch25_Southwest_Full.pdf 2018indicatorssummary.pdf **Watch:** Climate Change Formula: Rising Sea Levels + Coastal Megacities = Forced Migration https://youtu.be/s4UgekcYg2o Both the State of California and the Federal government have recently issued reports on current trends and expectations for the region and nation regarding climate change. The federal report is far more extensive. I've only provided the chapter on the Southwest region here for your consideration, but there are many other chapters of interest on their website. Additional relevant documents are available here The Fourth National Climate Assessment: https://nca2018.globalchange.gov/ California's Office of Environmental Health Hazard Assessment (OEHHA): https://oehha.ca.gov/climate-change **Final Evaluation:** Write an essay that lists and describes at least ten changes these documents list as taking place in California and the Southwest region of the United States that are being triggered or amplified by global climate change. I need to see a detailed discussion here.