San José State University
Department of Geography and Global Studies
Geog120: Food supply and agricultural systems, Section 80, Fall 2018

Course and Contact Information

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Class Days/Time: Online course.

my garden

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 term paper.

Course Description

Many different approaches can be taken to the study of food and agriculture, and each is bound to leave something out. Agriculture has always been intimately tied to culture, politics, and economics. Academic theorists, activists, and revolutionaries have always claimed to have great advice for the rest of us regarding the growth and distribution of food. And they have often been shown to be entirely wrong. History is littered with many millions of human corpses resulting from the repeated failure of collectivized agriculture, for example. Few professors or teachers seem to have learned very much from this history. I take an unapologetically pragmatic and scientific approach to food and agriculture as described by real practitioners and experts. This course aims at achieving an introductory understanding of human nutritional needs, the production and distribution of food at all spatial scales, the diversity of practices that have been used to produce that food, how

these have been changing, and what the future may have in store. It also aims at achieving a goal that I set in all of my courses: to improve your ability to write and think coherently and competently about aspects of the real world, in order to help you to achieve and sustain a lasting career. The home page of our primary text, the *Encyclopedia of Agriculture and Food Systems*, lists some important issues that we will consider:

Will we be able to produce enough food to meet the increasing dietary needs and wants of the additional two billion people expected to inhabit our planet by 2050?

Will we be able to meet the need for so much more food while simultaneously reducing adverse environmental effects of today's agriculture practices?

Will we be able to produce the additional food using less land and water than we use now?

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to understand the basic nutritional needs of human beings; describe the various components of food chains worldwide; understand US agricultural policy and practice; understand and appreciate the influence of climate change and of other external factors; appreciate and understand the technologies that are being developed to improve agricultural practices; understand the requirements for future agriculture, given demographic trends; and understand and appreciate more benign, ecologically sound agricultural methods of producing more healthful food.

Required Texts/Readings

The following readings have been uploaded to CANVAS.

Textbook

The *Encyclopedia of Agriculture and Food Systems*, 2nd Edition, will be used throughout this course. Five chapters have been downloaded for use in selected assignments; these are available under **Files**. Additional chapters that are not assigned here can be downloaded through the SJSU library system as pdf files. You will need to log on to access them if you are off campus.

https://www-sciencedirect-com.libaccess.sjlibrary.org/referencework/9780080931395/encyclopedia-of-agriculture-and-food-systems

W. J. Armbruster and M. C. Ahearn, 2014. Changing Structure and Organization of US Agriculture

K. A. Havas and C.S. Watts, 2014. Food Chain: Farm to Market

J. L. Slavin, 2014. Human Nutrition: Malnutrition and Diet

C. W. Stofferahn, 2014. Industrialized Farming and Its Relationship to Community Well-Being.

J. H. Trienekens et al., 2014. Global Food Supply Chains.

Other Readings

The following required readings are also available under **Files**.

Atzberger, 2013. Advances in Remote Sensing of Agriculture: Context Description, Existing Operational Monitoring Systems and Major Information Needs. Remote Sensing 5, 949-981.

W. Berry, 1989. 'Introduction' and 'Nature as Measure', from *Bringing It to the Table*, 7 – 23.

D. Ding, 2018. The new urban agricultural geography of Shanghai, *Geoforum* 90, 74–83

ESRI, 2013. Farming the Future: GIS for Agriculture, vol. 2.

N.V. Federoff et al., 2010, Radically Rethinking Agriculture for the 21st Century, *Science* 327

T. Garnett et al., 2013. Sustainable Intensification in Agriculture: Premises and Policies, *Science* 341.

J.D. Glover et al., 2007. Future Farming: a Return to Roots? *Scientific American*, August 2007.

G.C. Nelson et al. 2009. Climate change impact on agriculture and costs of adaptation. *International Food Policy Research Institute*, Washington, D.C.

W. Jackson, Tackling the Oldest Environmental Problem: Agriculture and Its Impact on Soil, from *The Post Carbon Reader: Managing the 21st Century's Sustainability Crises*, R. Heinberg and D. Lerch, eds. (Healdsburg, CA: Watershed Media, 2010).

A. King, 2017. The Future of Agriculture. *Nature*, 544.

N. Pelletier and P. Tyedmers, 2010. Forecasting potential global environmental costs of livestock production 2000-2050. *PNAS* 107(43), 18371-18374.

J. P. Reganold et al., 2011. Transforming U.S. Agriculture. *Science* 332, 670-671.

J. Schmidhuber and F. N. Tubiello, 2007. Global food security under climate change. *PNAS* 104(50), 19703–19708.

S. Searcy, 2014. Precision Farming: A New Approach to Crop Management. *Texas Agricultural Extension Service.*

Union of Concerned Scientists, 2012. The healthy farm - a vision for US agriculture.

W. Wu et al., 2014. How Could Agricultural Land Systems Contribute to Raise Food Production Under Global Change? *Journal of Integrative Agriculture* 13(7), 1432-1442

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week) for preparation/studying or course related activities.

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, use primarily 10pt font with 1 ½ line spacing. Put your name, the homework number, 'Pereira', 'geog120-80' and 'Fall 2018', 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.

Final Evaluation

A term paper will serve as the final evaluation. You will pick the topic yourself; please consult me earlier in the semester if you are unsure of your topic. The term paper should be at least five pages long (10 point font, 1 ½ spaced) and contain a formal list of references. The result should become and entry into your undergraduate portfolio.

Determination of Grades

14 Homework assignments (6% each)	84%
Term paper	16%
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**

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 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.

University Policies

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/"

Geog120-80: Food supply and agricultural systems, Spring 2018

As a reminder, please submit your homework responses as Word or pdf files by the due date indicated. Use 10 point font, with 1 ½ line spacing and normal margins. Put at upper right on the first page of each submission your name, the homework number, Pereira, geog120-80, Fall 2018.

Figures, images, and quotations from the references listed here or from other sources may be embedded in your response, but you must provide attribution. Citations should be explicit and complete.

Course Schedule

Week	Due Date	Topics, Viewings, Readings, Assignments
1	**8/24/18**	Topic: **The big picture** **Read:** https://www.nationalgeographic.org/encyclopedia/agriculture/ **Homework1:** Using these (or other) encyclopedic descriptions, write an essay that would describe to me what you would hope to get from this course. Tell me what you would probably like most to investigate. Are you for example interested in better understanding any of the following topics, or any others that you can describe to me? • the importance of nutrition to individual human and social health • the changing spatial patterns of agricultural resources: water, soil, pests, disease, pollinators, etc. • whether and how agriculture can meet the needs of a growing world population; • controlling the use of pesticides and chemical fertilizers; • farm workers: family and community relationships in agricultural settings; • using geospatial technologies to assist farmers; • maintaining healthy soil ecosystems • maintaining healthy microbiomes • the pros and cons of genomic technologies • the relationships of agriculture with the natural world and to human health; • alternative methods of farming that might make those relationships less problematic; • aquaculture, fisheries, timber, ranching, and other activities that might not be explicitly discussed in this schedule Look through the articles (chapters) contained within the Encyclopedia of Agriculture and Food Systems. The chapters that I've uploaded to CANVAS are listed above, but pick at least one other chapter interests you, download it and tell me what it is. If you let me know generally what your primary interests are, I can try to respond personally over the course of the semester with materials, websites, or activities that I think you might appreciate. You are more likely to get a better grade from me if I get the impression that you are genuinely interested in at least some of these topics in a **professional** manner that goes beyond casual interest. This is not going to be an easy three credits. At the end of the semester, you will be asked to submit a term paper. This first homework assignment may actually be the first step along that path: at least some of what you discuss here would hopefully generate in your mind the topic that you will end up choosing for the term paper.

Week	Due Date	Topics, Viewings, Readings, Assignments
2	**8/31/18**	**Topic: Diet and nutrition** **Read:** J. L. Slavin, 2014. Human Nutrition: Malnutrition and Diet. (slavin) human nutrition- malnutrition and diet.pdf **Homework2:** The author states that, "according to the Food and Agriculture Organization of the United Nations (FAO) food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life." He goes on to say that "one of the challenges in discussing food insecurity is the lack of a standardized measure which works in all settings and cultures" but that "any individual that has micronutrient deficiency is food insecure." Review what he has to say about the many kinds of micronutrient deficiencies that can arise. Write an essay on the topic of food insecurity. Within that essay, I want you to address the following question. Although food insecurity is assumed to arise because of a lack of **access**, according to the UN, micronutrient (and macronutrient) deficiencies (and food insecurity itself) can also clearly arise due to individual, family, and cultural choices. So with whom does responsibility lie? Recently, in my neighborhood Safeway, I was approached by a woman with a young boy in a stroller. She asked me whether I would buy *for her child* some cookies and a big bottle of soda that she had already picked out; 'God will reward you' etc... Since it was my birthday and I'm a little superstitious and wasn't thinking straight, I reluctantly agreed (as probably would most of you, since you are kind people) to buy her son the cookies and soda. She picked up a few other junk food items, a toy, and instant coffee on the way to the checkout. I refused to pay for the coffee, so she set it aside. I had to buy her a bag as well. She had found her mark. Was this woman 'food insecure'? How about her son? This adult woman, this mother, could easily have picked out something other than cookies and soda to ask a stranger to pay for. She could have provided her son with some actual nutrition that afternoon. Before assuming that responsibility should be placed in the hands of government, ask yourself this: how much 'food insecurity' might just be the result of human ignorance? A little? A lot? None at all? To what degree can illness and rising health costs by avoided with proper nutrition? Is healthful food really so unavailable or unaffordable in the US? It has often been pointed out that fresh groceries are harder to find than fast food in high crime neighborhoods. But grocers might just be reluctant to expose themselves to theft, violence, and higher insurance rates. Might this be true: that nutritious food is affordable and, with just a bit of effort, available to nearly all citizens of any stable society in the modern world, including our own, and that many cases of malnutrition within the developed world might result from personal choices? I am not discounting the effects of conflict, poverty and discrimination, particularly in underdeveloped nations. Give me your objections, but justify your position. Oh, by the way, food is *healthful*. People and living plants, animals, and ecosystems are (potentially) *healthy*. I learned that in 7th grade.
3	**9/7/18**	**I will be in China for the next two weeks. In 1968, young people of my wife's generation were sent to work on farms throughout China. This year is the 50th anniversary of those events. Along with a few of her fellow students from that time, Cheri and I will be visiting the farm where she lived and worked for 3 ½ years. I will try to document this on video, and if successful I will upload segments to YouTube. It will not be possible to communicate with me while I am abroad, and you can expect some delay in grading your homework.** **Topic: Food chains** **Read:** K. A. Havas and C.S. Watts, 2014. Food Chain: Farm to Market (havas) food chain- farm to market **Homework3:** This article actually covers a range of topics, some of which you should find interesting. Write an essay that describes (and elaborates upon) what you found most interesting or surprising about

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		contemporary food chains. In addition, address the following questions. How might international trade, transnational corporations, and food processing have changed the food chain in the US over the past few decades?
4	**9/14/18**	**Topic: Food chains** **Read:** J. H. Trienekens et al., 2014. Global Food Supply Chains (trienekens) global food supply chains **Homework4:** How and why might food chains differ in different regions, nations, and cultures? The author discusses the case of India. Tell me something about food chains elsewhere, for example regional food chains that might exist within the US. Think about specialty foods that may be produced or consumed locally or regionally. You may need to do some Internet research.
5	**9/21/18**	**Topic: US agriculture** **Read:** W. J. Armbruster & M. C. Ahearn, 2014. Changing Structure and Organization of US Agriculture (armbruster) changing structure and organization of US agriculture J. P. Reganold et al., 2011. Transforming U.S. Agriculture. Science 332, 670-671. (reganold) transforming US agriculture **Homework5:** What have been the principal drivers of change in US agriculture? What factors may drive future change? What are some of the transformative changes in science, markets, and policy that Reganold et al. recommend?
6	**9/28/18**	**Topic: Global considerations** **View:** The Future of Agriculture https://youtu.be/uAM4Si_WhDk This video, prepared for the OECD Meeting of Agriculture Ministers 2016, hits some of the main points for consideration with regard to global agriculture. It presents the mainstream, globalist interpretation of the future of agriculture. **Read:** N. Pelletier and P. Tyedmers, 2010. Forecasting potential global environmental costs of livestock production 2000-2050. PNAS 107(43), 18371-18374. (pelletier) forecasting potential global environmental costs of livestock production 2000-2050 **Homework6:** Summarize the main points outlined in the video. Note that there is no mention of diet and nutrition, other than to briefly indicate that consumers want more healthful, nutritious foods. There is no breakdown in the video regarding these nutrients, but you have already read the Slavan article on nutrition, so you know that such a breakdown is important. Several of these readings point out that that the set of macronutrients with the highest growth in demand are proteins, particularly animal proteins. Although it is a relevant topic, I will not ask you to weigh in on the discussion of animal versus vegetable sources of protein. I want you to recognize that globally various types of livestock are and have been significant sources of healthful food and other products, which improve in quality and availability as social development proceeds. However, livestock carries certain challenges that may differ from other forms of agriculture. The Pelletier article is a long read, packed with information. I want you to pick out and discuss a few points that seem most interesting or important regarding current and future environmental challenges. You need not comment on their methods or conclusions.

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7	**10/5/18**	**Topic: Climate change** **Read:** J. Schmidhuber and F. N. Tubiello, 2007. Global food security under climate change. *PNAS* 104(50), 19703–19708. (schmidhuber) global food security under climate change G.C. Nelson et al. 2009. Climate change impact on agriculture and costs of adaptation. *International Food Policy Research Institute*, Washington, D.C. (nelson) climate change impact on agriculture and costs of adaptation **Homework7:** Local, regional, and global climate patterns significantly influence agricultural activities. Great civilizations have risen and fallen on long-term fluctuations and permanent changes in climate regimes. There is a great deal of science here that you should try to educate yourself about; I discuss some of it in my other classes. In this class, we will concentrate on the discussion around food production and global food security. Summarize what you see to be the most significant climate-related challenges to food security. These might include pests and diseases, drought, flooding, salt water intrusion, and disruptions to the reproductive cycles of plants and animals involved with agriculture, including pollinators. There are many other potential effects on agriculture at the local, regional, and global level, both known and unknown. Therefore, the task of forecasting (and hopefully overcoming) the combined influence of these potential changes on natural and agricultural ecosystems and on human societies is complex, difficult, and maybe even impossible. That doesn't mean we should just carry on as usual and begin thinking about problems only when they are imminent. Nor does it necessarily mean we should impose and enforce policies based on political theories that are themselves highly questionable. History is littered with the corpses of people who were forced to change their practices based on unproven theories and unjust authority. Schmidhuber points out that "of the four main elements of food security, i.e., availability, stability, utilization, and access, only the first is routinely addressed in simulation studies." This I think is important. Think about food security in any large disaster; think about the large numbers of economic or environmental migrants crossing borders in increasing numbers. In such situations it is not only the (global) availability of food, which may appear sufficient at any particular time, but whether the availability of that food (and water) remains stable, whether it is being utilized most efficiently, and whether it is being distributed fairly. All too often, black markets appear in donated food, or it is left to rot in warehouses, while water and sanitation facilities break down and contagious diseases begin spreading in the affected population. The UN and NGOs in fact have a dismal track record in this regard. Nelson's document is typical of reports published by non-governmental organizations (in this case, the International Food Policy Research Institute) or by world bodies like the Food and Agriculture Organization, etc. I have downloaded many such documents but have not included them in your readings; they are easy to find. This particular food policy report is relevant, so I have included it here. However, I caution you to keep in mind the difference between scientific documents (like most of the articles included in your readings) and policy reports or discussions. Policy reports generally refer to good science or valid statistics (as does this one) but they may also present conclusions or make recommendations that are based on assumptions (often political) that are not adequately supported or addressed. In this case, a rather pessimistic conclusion regarding the effects of climate change of agriculture generates recommendations are vague and hard to argue with, except maybe for the last one. What do you think? I sometimes consider hopefully that the natural resilience and flexibility of natural ecosystems introduces a currently unnoticed capacity not only to adapt, but to eventually guide global change in such a way as to allow evolutionary change to catch up. The question is, can a human population of 9 or 10 billion coexist with such a world?

Week	Due Date	Topics, Viewings, Readings, Assignments
8	**10/12/18**	**Topic: Sustainable intensification?** **Read:** N.V. Federoff et al., 2010, Radically Rethinking Agriculture for the 21st Century (federoff) radically rethinking agriculture T. Garnett et al., 2013. Sustainable Intensification in Agriculture: Premises and Policies (garnett) sustainable intensification in agriculture W. Wu et al., 2014. How Could Agricultural Land Systems Contribute to Raise Food Production Under Global Change? Journal of Integrative Agriculture 13(7), 1432-1442 (wu) agricultural land systems and food production under climate change **Homework8:** Now let's get to the heart of the question of whether world agricultural production can keep pace with rising demand in a sustainable manner. Barring catastrophic reductions, human world population is likely to rise to around 10 billion before leveling off. These people will require not only more food, but also more agricultural fuel and materials products. The question is therefore whether the presumed intensification of agriculture can be accomplished in a sustainable manner that promotes both human and environmental well-being. The Federoff article is short, but it makes some important points, some of which we shall return to when we discuss ecological farming practices. Please read it carefully. The Garnett article critiques the idea of 'sustainable intensification' and makes the important point that sustainability is not synonymous with food security. I include the Wu article in this week's readings because it is rather well-written and very informative. Here for example is a portion of a paragraph denoting the importance of agricultural land systems: "Land systems represent the terrestrial component of the earth system and encompass all processes and activities related to the human use of land… Among the global land system, agricultural land systems provide the major biogeophysical basis for sustaining food production. Within it, croplands take a central role and, by producing food and feed crops, they currently provide the lion's share of the global food supply: more than 90% of all food calories and approximately 80% of all food protein and fats available in the globe were derived direct or indirect from croplands…" In an essay, discuss at minimum the following questions: what are yield gaps and harvest gaps, and how do Wu et al. suggest they be addressed? Besides intensification, what other methods do these articles suggest might be applied to agriculture to address future human needs? Is 'sustainability' always consistent with environmental health or ecological and human well-being? Why or why not? Of course, I encourage you to think independently, but please occasionally at least cite these articles in your discussion, so that I know you've read them.
9	**10/19/18**	**Topic: Technology** **Read:** ESRI, 2013. Farming the Future: GIS for Agriculture, vol. 2. (esri) farming the future- GIS for agriculture A. King, 2017. The Future of Agriculture. *Nature*, 544. (king) the future of agriculture S. W. Searcy, 2014. Precision Farming: A New Approach to Crop Management. *Texas Agricultural Extension Service* (searcy) precision farming **Homework9:** Now we get to some fun stuff. You can probably imagine the benefits that mobile phones with Internet access provide farmers in even poor countries around the world. For some time now, rural farmers have been able to access data in real time regarding market prices and demand, affording them

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		greater awareness of their financial choices and better compensation for their products. Improvements in farm machinery have for some time had a positive effect on production, but they have also been problematic because of their expense and complexity. What I am asking you to read about here are different sets of technologies that generally help farmers understand and quantify the land's strengths and weaknesses in a spatially explicit manner. If you intend to pursue a professional career involving geography, you should become aware of, and capable of using, these technologies. Fortunately, educational resources are now available at little or no cost that can help you to understand and use GIS and remote sensing in a professional capacity. I suggest you avail yourselves of these resources. The brochure from ESRI provides some examples of using GIS in agriculture; I include it here as a sort of introduction. The King article concentrates on robotics and mobile and distributed sensors to monitor crops and livestock, and the Searcy document provides a good introduction to precision farming, which combines the use of GIS, remote sensing, GPS, distributed sensor webs, automated metering and robotics to better manage farm operations, resulting in the use of fewer pesticides and other amendments, in a very precise, spatially explicit manner. In fact, most agricultural use of GIS also involves some degree of remote or distributed sensing. Several recent graduate masters theses that I supervised contained elements of both GIS and remote sensing. These are all available through the library website. For example, Tapasi Barman in in 2008 successfully completed a thesis on 'Tea bush health determination and yield estimation' in India, using Landsat satellite data, economic data from the Indian government, and ground observations, all within a GIS environment. Governments, markets, agriculturalists worldwide are using remote sensing and GIS to estimate agricultural production and to help them make better decisions. If you become competent in the use of these technologies, I can pretty much guarantee you a successful career as a working geographer. I am actually curious about what you all think of these sorts of topics. Write an essay describing to me your impression of GIS and related technologies, any experience you may have had with these technologies, and whether you expect to use them in the future. Include a discussion of what you've learned from these readings. If you do not think that these topics should necessarily be included in a university program in geography, global studies, or environmental studies, please tell me why. I am genuinely curious and will grade you on the amount of thought you've put into this, not on what those thoughts have led you to believe.
10	**11/2/18**	**Topic: Technology** **Read:** Atzberger, 2013. Advances in Remote Sensing of Agriculture: Context Description, Existing Operational Monitoring Systems and Major Information Needs. *Remote Sensing* 5, 949-981. (atzberger) advances in remote sensing of agriculture **Homework10:** This week we concentrate exclusively on remote sensing. In the Atzberger article, "five different applications have been selected, which are illustrated and described: (1) biomass and yield estimation, (2) vegetation vigor and drought stress monitoring, (3) assessment of crop phenological development, (4) crop acreage estimation and cropland mapping and (5) mapping of disturbances and land use/land cover (LULC) changes." In an essay, describe how these determinations are generally made using remotely sensed data. And by the way, if you'd like to see the department reinstate one or two semesters of a remote sensing lab course, which used to be offered under continuous rotation, please let the department Chair and Dean of the College of Social Sciences know of your feelings. My background in these technologies was the primary reason that I was hired 17 years ago. Unfortunately, some rather absurd attitudes toward these technologies, voiced by certain members of the department and of the College of Social Sciences faculty, have led to their being removed from the schedule some years ago. Of all the technologies available to us to understand and guide the course of climate change, remote sensing is at the top of the list.

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11	**11/9/18**	**Topic: Ecological farming practices** **Read:** J.D. Glover et al., 2007. Future Farming: a Return to Roots? *Scientific American*, August 2007. (glover) future farming a return to roots W. Jackson, Tackling the Oldest Environmental Problem: Agriculture and Its Impact on Soil, from *The Post Carbon Reader* (jackson) agriculture and its impact on soil **Homework11:** If this course had concentrated primarily on the physical, biological, and ecological aspects of agriculture, we would have been discussing soil 'in depth' early on. In any case, we can't ignore it. If you've ever tried your hand at gardening, you know how important the soil itself is. And how difficult it can be to improve. The extent of desertification worldwide reflects the poor relationship we have with soil. The Glover article is an excellent introduction to aspects of soil ecology important to agriculture, and it introduces the revolutionary idea (promoted by Was Jackson of the Land Institute and others) that we ought to develop a perennial agriculture, which allows the soil to develop properly and maintain its health. Write an essay on the topic of soil health and the possibility of perennial crops. What are the pros and cons?
12	**11/16/18**	**Topic: Ecological farming practices** **Read:** UCS, 2013. The healthy farm - a vision for US agriculture. Union of Concerned Scientists (UCS) The healthy farm - a vision for US agriculture D. Ding, 2018. The new urban agricultural geography of Shanghai, *Geoforum* 90, 74–83 (ding) agricultural geography of shanghai **Homework12:** The article or policy brief issued by the UCS in 2013 is one of the better summaries of recommendations along the lines discussed last week. The article by Ding (finally, something from a Geography journal) is a particularly interesting study of a region unique in the sort of changes it has been experiencing over the last couple decades.(I've done some work with Landsat data examining these changes to Shanghai, which I will put online when I get a chance). The emerging culture of small scale ecological farming in Shanghai is something you might not expect to see if you buy into the typical Western impression of life in China. In an essay, tell me whether you think that these new ways of farming, as described in both the US and PRC, are now or are likely to growing and become economically dominant. If not, what would need to change for these recommendations to be adapted and succeed?
13	**11/23/18**	**Thanksgiving**
14	**11/30/18**	**Topic: Farming and community** **Read:** C. W. Stofferahn, 2014. Industrialized Farming and Its Relationship to Community Well-Being. (stofferahn) industrialized farming and community well-being **Homework13:** We finally come to the topic of industrialized (or corporatized) versus family farming. Here in the US, this goes to the heart of the topic of community. I have seen tremendous changes in my lifetime, and I first saw farming being done on truly industrial scales in the Midwest when I drove cross-country. Endless miles of grains, irrigation, machines, and very few people. As Stofferahn, this process began, and people started worrying about it, for a long time. Next week, you will read from one of the most well-known voices here in the US critical of this trend. It also goes to the heart of one of the most important demographic trends worldwide: the move from rural to urban (or the direct conversion of rural to urban). Geographers are presumably concerned with the relationship of people and landscape, but

Week	Due Date	Topics, Viewings, Readings, Assignments
		there has been precious little insight from this discipline (with few exceptions; look up fo example the work of one of my former teachers from Minnesota, John Fraser Hart). It seems to me that most academics are unaware of the impact on community, and are fully on board with neoliberal trends in agricultural globalization and industrialization. I want you to write an essay on the industrialization process from the point of view of a farming family in the US that has felt unrepresented by government. All their neighbors have moved away. Farm equipment has become unaffordable, and Monsanto and other seed/pesticide suppliers have them by the throat. Why have we neglected these people? Or have we? I don't expect you to have answers, but you should provide examples or data that reflect your growing understanding of the issues.
15	**12/7/18**	**Topic: Farming and community** **Read:** 'Introduction' and 'Nature as Measure', from Bringing It to the Table, edited by W. Berry, 7 – 23. (berry) bringing it to the table **Homework14:** The last reading is from a book by one of my favorite authors on the topic of agriculture (as well as a novelist, poet, and farmer), Wendell Berry. Please read the introduction by Michael Pollen and the first essay by Berry. You may be tempted to read more. You have the whole book. Consider this quote from Wendell Berry's 1989 essay, 'Nature as Measure'. (page 19): "The singular demand for production has been unable to acknowledge the importance of the sources of production in nature and in human culture. Of course agriculture must be productive; that is a requirement as urgent as it is obvious. But urgent as it is, it is not the first requirement; there are two more requirements equally important and equally urgent. One is that if agriculture is to remain productive, it must preserve the land, and the fertility and ecological health of the land; the land, that is, must be used well. A further requirement, therefore, is that if the land is to be used well, the people who use it must know it well, must be highly motivated to use it well, must know how to use it well, must have time to use it well, and must be able to afford to use it well. Nothing that has happened in the agricultural revolution of the last fifty years has disproved or invalidated these requirements, though everything that has happened has ignored or defied them." In your essay, tell me whether this message seems (to you, or to our society) reasonable, trivial, profound, wrong, right, etc. Does it seem to conform with how we think of our farmland? As you drive I-5, does it seem to you that each of those acres under cultivation are being cared for properly by identifiable human beings? For sure, there are farms everywhere in California that have been farmed by families for generations; I had the privilege of meeting an almond and raisin farmer near Modesto whose family home was smack in the middle of the almond orchards; their kids owned the farm nearby, and they used buggies to get around. When you see people living this way, you might think to yourself: why the rush to the city? If farming were an occupation that could support networks of families for generations in comfort and love throughout the world, as it still does in many places, would we still be seeing this rush to the cities? If farming weren't broken, would people abandon it? What do you think?
16	**12/14/18**	**Topic: Term paper (Final Exam)** In place of a final exam, I want you now to submit a paper on a topic of your choice, expanding on one of the topics we've already covered, or introducing something new. The listed in the very first homework assignment at the top of this schedule contains some possible topics. Provide at least three citations, including one that you have found yourself. I am giving you free reign, so choose a topic about which you are interested in educating yourself further. The resulting paper should be at least five pages long, easily more. No upper limit. This, along with at least a couple of your earlier essays, should qualify as entries into your undergraduate portfolio, which your undergraduate advisor has hopefully spoken with you about.