Spring 2015 –

People, Land, and Food
Geography / Environmental Studies 309

LECTURES:	Mondays & Wednesdays 2:25-3:15pm
LOCATION:	L196 Education Building
CLASS WEBSITE:	https://learnuw.wisc.edu/
INSTRUCTOR:	Prof. Holly Gibbs
CONTACT:	hkgibbs@wisc.edu
WEBSITE:	www.gibbs-lab.com
OFFICE HOURS:	After class or by appointment (Rm 272 Enzyme Institute)
MAIN TA:	Mikaela Weisse
CONTACT:	mweisse@wisc.edu
OFFICE HOURS:	Thursdays 1:15-3:15 (Rm 175c Science Hall)
FOOD WASTE TA:	Tyler Lark
CONTACT:	lark@wisc.edu
OFFICE HOURS:	by appointment (Rm 264 Enzyme Institute)

COURSE OVERVIEW:

In this course we will examine how and why humans have transformed the global landscape and the consequences for biodiversity, climate, biogeochemical cycling and other ecosystem services needed to keep our planet habitable. We will explore these land-use tradeoffs between human necessities such as food production and unintended consequences such as habitat loss, floods, greenhouse gas emissions, and community displacement. We will study different agricultural systems in different regions and tackle topics such as food security, land scarcity, bioenergy and the impacts of agriculture on the environment. The drivers and pattern of tropical deforestation will also be a focus. We will examine a range of solutions from global policy to everyday decisions to feed and fuel the world without destroying the planet

LEARNING OBJECTIVES

The goal of this course is to provide an opportunity to learn about and understand the complex social and environmental processes governing global land use and agricultural production. Major aims are to acquire knowledge about a range of topics related to the people, land, and food and skill development, including:

- Gain knowledge on how and why humans have transformed land around the world and the associated environmental and social impacts
- Understand the global challenge of feeding and fueling the world while also protecting our environment and communities
- Investigate a range of solutions to increase food production and how they vary through space and time
- Identify opportunities and limitations of different farming and animal production systems
- Understand the impacts of globalization on land-use change
- Improve professional skills such as research, writing, & presentations

GRADING AND ASSIGNMENTS

Your course grade will be based on (out of 1000 points):

10% Discussion Participation (100 points)
10% Pop Quizzes & Reading Reflections (100 points)
20% Mid-term exam (200 points)
15% Commodity analysis project (150 points)
20% Food waste paper & presentation (200 points)
5% Food waste quantitative assignment (50 points)
20% End-of-term Exam (200 points)

*10% off per day for late assignments. No make-up exams or quizzes.

<u>MAJOR DEADLINES</u> (assignments expected by 12pm on due date):

- Feb 18: Food waste project idea due
- Mar 11: Mid-term exam
- Mar 18: One-pager on food waste project due
- Mar 25: Commodity analysis papers due
- Apr 17: Food waste paper draft due to peer reviewers
- Apr 22: Peer-review forms due
- Apr 27, 29, May 4: In-lecture presentations
- May 1: Food waste quantitative analysis due
- May 6: Final Exam
- May 13: Final food waste papers due

COURSE DETAILS

Attendance and Participation in Discussion Section (100 points) – Your participation grade will be determined by your engagement in the class discussion sections and contribution to each other's learning experience. We will have group exercises as well as whole-class discussions where you will have the opportunity to think, reflect and practice analytical skills. To be active learner you need to read and synthesize assignments before class and come prepared with discussion points and questions to enrich the classroom environment. Consistent attendance is expected.

Lecture slides – I will post slides on Learn@UW shortly *following* each lecture.

Required readings: I will post required readings on Learn@UW at least one week prior to class. Please read and synthesize all weekly readings before each Monday's lectures. I will occasionally announce that some readings can be skimmed or to focus on a specific section. Readings will consist of textbook chapters, scientific journal articles, reports, as well as popular books. Readings will be covered on exams and pop quizzes.

Pop Quizzes (100 points) –Quizzes will be cumulative and could cover material from lectures or readings in the previous weeks but will emphasize recent topics. The format will vary from short answer to multiple choices. NOTE that quizzes will be *given at the beginning of class*, so you will miss the opportunity to take the quiz if you are tardy. You can drop your lowest grade, but no make-up quizzes will be given under any circumstances. In some cases we will assign a brief reading reflection rather than a quiz.

Commodity Analysis Project (150 points)– You will each quantitatively analyze one agricultural crop's production system and trade patterns using FAOSTAT, USDA data, online reports, and academic literature. In a 4-5 page double-spaced paper, you will discuss your findings in the context of environmental and agricultural requirements for farming this crop, social concerns, and changing yield and trade patterns for the top three producing countries. More information will be distributed in class.

Food waste quantitative assignment (50 points)– You will each complete a short quantitative analysis of food waste, including calculating the environmental footprint of food waste and assessing disposal alternatives to understand the tradeoffs and impacts of each. You will start this assignment in discussion section and then be individually responsible for completing the remaining calculations on your own.

Food Waste Research Project and Paper (200 points)- You will each complete semester-long research project related to food waste and solutions for waste reduction. You will each select your own specific topic as well the type of project want to complete, culminating with writing a paper and presenting your projects to class at the end of the semester. Details to follow!

Exams (400 points total) – You will have a mid-term exam covering the material from the first half of class, and then an end-of-semester exam covering the second half of the class. The exams will have short-answer and multiple-choice questions. Exams will include material covered in lectures, discussion sections, readings, and group project final presentations. Exams will emphasize material covered in lectures, but readings will be needed to help deepen and clarify topics *discussed* in lectures or discussions (*not everything discussed in class will be shown on the slides). There will be no formal review sessions but time will be allotted in lectures and discussion sections throughout the semester to review challenging information and answer specific questions.

COURSE SCHEDULE AND POTENTIAL READINGS*

Week 1, Jan 21 - Introduction to the course

- Knox, Paul L and Sallie A. Marston. 2004, Chapter 8-Agriculture and Food Production. In Places and regions in global context: human geography. 3rd ed. Upper Saddle River, N.J.: Pearson/Prentice Hall. Pgs 299-315.

  No discussion sections this week

Week 2, Jan 26 & 28 – Ecosystem Tradeoffs and Intro to Land Use Change

- Jonathan A. Foley, et al, Global Consequences of Land Use. Science 309, 570 (2005).

- DeFries, R. et al. 2004. Land-use choices: balancing human needs and ecosystem tradeoffs. Front Ecol Environ 2(5):249-257.

- Ramankutty, N., L. et al. , Global Land Cover Change: Recent Progress, Remaining Challenges. In Land Use and Land Cover Change: Local Processes, Global Impacts, edited by E. F. Lambin and H. Geist, pp. 9-39, Springer Verlag, New York, 2006.

  Discussion section: Welcome & Draw flower Diagrams

* ***The schedule and readings will *likely* change over the semester as the course evolves; refer to learn@uw for the latest information***

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Week 3, Feb 2 & 4 - Agricultural Expansion in the Tropics

- Union of Concerned Scientists. 2010, Chapter 4 Soybeans. *From The Root of the Problem.*
- Union of Concerned Scientists. 2010, Chapter 5 Cattle and Pasture. *From The Root of the Problem.*
- Union of Concerned Scientists. 2010, Chapter 6 Palm Oil. *From The Root of the Problem.*
- Rudel, T.K. et al, Changing Drivers of Deforestation and New Opportunities for Conservation. Conservation Biology, Volume 23, No. 6, 1396-1405.

Discussion section: Intro to food waste project

Week 4, Feb 9 & 11 – Solutions to Deforestation & Bioenergy Intro

- Butler, R. 2010, "In the Battle to Save Forests, Activists Target Corporations". *Yale Environment 360*
- Gibbs et al. Soy Moratorium
- Naylor et al. 2007. The ripple effect: biofuels, food security, and the environment. *Environment V 49 (9): 31-43.*
- Gibbs, H. K., M. Johnston, J. A. Foley, T. Holloway. C. Monfreda, N. Ramankutty, and D. Zaks. 2008, Carbon payback times for crop-based biofuel expansion in the tropics: the effects of changing yield and technology. *Environmental Research Letters 3 034001.*

Discussion section: Intro to commodity analysis

Week 5, Feb 16 & 18 – Bioenergy and Global Commodity Trade…
Global Commodity Trade & Food for Water

- TBD- biofuels
- TBD – global commodity flows
- Lenzen et al. 2012. International trade drives biodiversity threats in developing nations. Nature. 486:109-112.

Discussion Section: Excel tutorial and progress on commodity analysis
**Food waste project idea due on Feb 18 by 12pm

Week 6, Feb 23 & 25 – Food & Water / Industrial Farming Systems

- Burney et al. 2010, Greenhouse gas mitigation by agricultural intensification. *PNAS.*
- Daline et al. 2012. Evolution of the global virtual water trade network. Proceedings of the National Academy of Sciences. 109(16):5989-5994.
- Brauman, K. 2013. Improvements in crop water productivity increase water sustainability and food security – a global analysis. Environmental Research Letters 8:024030.
- Pollan, M. 2006, Chapter 2 -- The Farm. *The Omnivore's Dilemma.*

Discussion sections: Food and water group discussion

Week 7, Marc 2 & 4 – Large-Scale Industrial & Organic Agriculture

- Pollan, M. 2006, Chapter 9 -- Big Organic. *The Omnivore's Dilemma. Penguin Press, New York, 450 p.*
- Badgley et al. 2006, Organic agriculture and the global food supply. *Renewable Agriculture and Food Systems 22(2): 86-108*
- Connor, D.J. Organic agriculture cannot feed the world. Field Crops Research. 106:187-190.

Discussion sections: Discuss Pollan chapters & other readings

Week 8, Mar 9 & 11 – Synthesis and Mid-term Exam

No readings
In-class Exam on Mar 11

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Week 9, Mar 16 & 18 – Small-Scale Traditional Agriculture

- Altieri, M.A. 2004, Linking ecologists and traditional farmers in the search for sustainable agriculture. *Front Ecol Environ 2(1):35-42.*

- Vandermeer, J. and I. Perfecto. 2005, 3: Farming on Rain Forest Soils. *Breakfast of Biodiversity: the Truth about Rain Forest Destruction. Oakland IFDP. Ch 3, p 35-46.*

- Reid et al. 2008, Global significance of extensive grazing lands and pastoral societies: An Introduction. *Fragmentation in Semi-Arid and Arid Landscapes: Consequences for Human and Natural Systems, 1-24.*

Week 10, Mar 23 & 25– Solutions - Increase Agricultural Yields and Area

- Foley et al. 2011, Solutions for a cultivated planet. *Nature. 478: 337-342.*

- Godfray et al. 2010, Food Security: The challenge of feeding 9 billion people. *Science 327. OR* Godfray, C. J. Tara Garnett. 2014. Food security and sustainable intensification. DOI: 10.1098/rstb.2012.0273Published 17 February 2014

- Lambin et al. 2013. Estimating the world's potentially available cropland using a bottom-up approach. Global Environmental Change http://dx.doi.org/10.1016/

  Discussion Sections: Present the of commodity analyses

  **Commodity analysis due on March 25 by 12pm

Week 11, Mar 30 & Apr 1 = HAPPY SPRING BREAK!

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Week 12, Apr 6-8 – Solutions - Food Waste & Diet Trends (possibly still finishing yield gaps)

- NRDC. 2012. Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill. NRDC Issue Paper: August 2012: 1-21.
- Gustavsson, J., et al. "Global food losses and food waste: extent, causes and prevention." (2011). Executive summary, figures, and conclusion section.
- Cassidy, Emily S., et al. "Redefining agricultural yields: from tonnes to people nourished per hectare." Environmental Research Letters 8.3 (2013): 034015.
- Marlow, H.J. et al. Diet and the environment: does what you eat matter? Am J Clin Nutr 2009;89(suppl):1699S–703S.

Discussion Sections: Quantitative analysis of food waste

Week 13, Apr 13 & 15 - Solutions – Food Waste & Integrated Agriculture

- Hinrichs, C. C. (2003). The practice and politics of food system localization. Journal of Rural Studies. 19(1): 33–45.
- Parfitt et al. 2010, Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B 3065-3081 (optional)*
- Kearney, J. 2010, Food consumption trends and drivers. *Philosophical Transactions of the Royal Society B 2793-2807.*

Discussion Sections: Push ahead on food waste assignments
**Draft of food waste papers due to peer reviewers by 12pm on Apr 17

Week 14, Apr 20 – 22 - Alternative Food Systems

- Berry, Wendell (1990) The pleasures of eating." Pp. 125-131 in Robert Clark (ed.), Our Sustainable Table. Essays, San Francisco, CA: North Point Press
- Lappé, Frances Moore and Anna Lappé (2002) "Taking off the cowboy hat." Pp. 244-274 in Hope's Edge: The Next Diet for a Small Planet. New York: NY: Tarcher/Putnam.

Discussion Sections: in-class peer review meetings

Week 15, Apr 27 & 29 –Student Presentations on Food Waste Projects (in lecture)

No readings
Discussion sections – Food waste & discussion of exam 2
**Food waste quantitative analysis due May 1 by 12pm

Week 16, May 4 & 6 – More student presentation & Second Exam

No readings
No discussion sections
**In-class exam on May 6
**Final food waste papers due on

OTHER DETAILS

Contacting Professor or TA
Your professor and TA are both glad to meet with you outside class. Please attend office hours or approach us after class. Common questions will be answered on our message board at our class's Learn@UW site, so frequently check for updates.

Electronic Devices
Electronic devices, such a laptops, phones, or tablets, are prohibited during lecture and discussion section. If you have specific needs that require you to use an electronic device, you must discuss it with the TA prior to class. Unauthorized use of an electronic device in class distracts you and other students, and thus will negatively impact your participation grade.

Religious Holidays
If you plan on missing class due to a religious holiday, please notify your TA by September 15.

Accommodations
If you have special concerns, needs, or a disability please see TA no later than September 15. We are happy to make accommodations and consult with you about the course, but you must come speak with the TA first. If you have a documented disability, and you need a reasonable accommodation in this course, please consult with TA immediately at the start of the course so we can design a solution that will help you be successful in the class.

Plagiarism and Academic misconduct
Section 14.03 of the University of Wisconsin System Administrative Code Defines academic misconduct as "an act in which a student: (a) seeks to claim credit for the work or efforts of another without authorization or citation; (b) uses unauthorized materials or fabricated data in any academic exercise; (c) forges or falsifies academic documents or records; (d) intentionally impedes or damages the academic work of others; (e) engages in conduct aimed at making false representation of a student's academic performance; (f) assists other students in any of these acts." If you have any questions about what constitutes academic misconduct generally, you must consult www.wisc.edu/students/amsum.htm before proceeding in this course.

Any form of cheating or plagiarism is absolutely unacceptable and intolerable in this class and in the entire UW System. If you are suspected of doing so, your TA and Dr. Gibbs will speak to the Dean and file a written report in your permanent academic file. You are expected to familiarize yourself with your rights and duties as a UW student, and about the consequences of cheating at: www.wisc.edu/students/saja/misconduct/UWS14.html. Lack of knowledge regarding these guidelines will NOT be accepted as an excuse.

Your TA is licensed to use anti-plagiarism software. This software is extremely accurate, comparing student work to a database of previously submitted work, on-line sources (including Wikipedia), and published academic materials. Be aware that your TA or professor may choose to run your intellectual journal entries and/or test answers through the software.