

Agricultural Policy for Climate and Environment [R516 (30446) / V450 (34904)]
Syllabus (SP25)

Tuesdays & Thursday 2:20-3:35 p.m.

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Course Description. This course explores the global environmental problems of biodiversity loss, water pollution, and climate change that have arisen from modern agriculture in the mid-20th century. The course is organized to first understand the types of challenges that farmers face to manage a successful business and the ways that current public policy shapes farming, both domestically in the United States and internationally. The course then looks at each of the three types of global environmental problems in turn, studying each one with respect to an important type of policy challenge. For biodiversity loss, the course looks at the role, strengths, and weakness of payments for ecosystem service programs. For water pollution, we focus on the opportunities and limitations of regulations that lead to the use of voluntary approaches to farm management. Lastly, we look at the role of carbon markets in shaping agriculture's emerging response to climate change.

Learning Objectives

- 1) *Environmental Science:* Students will be able to explain how modern agriculture contributes to environmental challenges and ways agriculture can be better managed to provide for a range of ecosystem services.
- 2) *Governance and Management:* Students will be able to recognize key factors that influence farmers' management and the role of government initiatives to provide information, training, and collaboration to promote sustainable agriculture.
- 3) *Policy Analysis:* Students will be able to diagnose the strengths and weaknesses of voluntary, regulatory, and collaborative policy mechanisms to promote sustainable agriculture.

Course Readings. There are no required texts for this course. Readings will be selected from a diverse set of academic disciplines and popular media. All readings will be posted in Canvas, available as eBooks through IUCAT, or available for free on the internet. A list of reading materials for the course is provided below. I reserve the right to revise the readings during the semester. Because this is a 400/500-level course, I will provide guidance during the first class on efficient and effective reading of academic journal articles to ensure that the reading load is manageable.

Professionalism. Students are expected to attend all classes and contribute regularly during class. Attendance and in-class contributions are part of each student's participation grade for the semester. While I am supportive of students using laptops/tablets in class to take notes and to access online

materials, it is equally important that students use these devices for class purposes during class. Checking social media, etc., undermines each student's ability to contribute their insights to the class and can diminish the quality of the classroom experience. Students should notify me before class if they will be unable to attend. Students are permitted to miss two classes without prior approval from the instructor (such as for job interviews, illnesses, child-care needs, etc.) without a reduction in their participation grade. Missing a third class *without prior approval* will result in a lower participation grade. Assignments must be submitted in advance of class unless given explicit permission by the instructor. Permission to turn homework in late must also be requested in advance of the due date. For unforeseen emergencies, students should notify the instructor as soon as possible. If you have a conflict with class or get sick, I consider those to be excusable absences. In the case of excused absences, I will ask you to provide a make-up assignment to earn the participation points for that particular class, as well as to ensure that you are understanding the material and ask any questions you have about the assigned material.

Course Organization, Assignments, and Grades. This course will provide you with a broad overview of agri-environmental challenges and policies that integrate social and environmental perspectives. The course is organized around three major environmental challenges facing modern agriculture: biodiversity loss, water pollution, and climate change. To begin the semester, we will start with an overview of basic factors shaping production risks and farmers' management choices, including weather-based risks, market risks, and common policy approaches. Following this first unit, we will proceed into units focused on each of the major environmental challenges. Each unit will include a group project focused around using existing policy approaches to address each respective challenge. While any problem can use a mix of policy tools, this approach will allow for greater depth on the opportunities and challenges associated with each approach, while also helping to illustrate the interconnectedness of management, markets, policies, and the environment. Each unit will conclude with a group assignment that helps to illustrate the challenges that farmers and policymakers face. Group projects will be graded individually to ensure that everyone contributes equally. We will wrap up the semester with an individual reflection paper.

Coursework will fall into four areas that will contribute to the overall grade in the course: Regular homework assignments that ask you to apply concepts or demonstrate retention of key concepts from the readings (40%); unit review quizzes and group projects to wrap up each unit, which will have individually assigned grades (40%); and class participation and an end-of-semester reflection paper (20%). Late submissions *without prior approval* from the instructor will lead to a 20% deduction from the total score for each day after the due date. Bottom line: submitting something one day late still earns 80% of the points—much better than failing to complete the assignment at all. Letter grades are assigned as follows and will be rounded up if the final grade is within 0.5% of the next letter grade.

A+ 97.0%	B+ 87.0%	C+ 77%	D+ 67.0%	F 0.0%
A 93.0%	B 83.0%	C 73%	D 63%	
A- 90.0%	B- 80.0%	C- 70%	D- 60%	

Academic Honor Code. The O'Neill School takes matters of honesty and integrity seriously because O'Neill is the training ground for future leaders in government, civic organizations, health organizations, and other institutions charged with providing resources for the public and for members of society who lack power and status. Precisely because O'Neill graduates tend to rise to positions of power and responsibility, it is critical that the lessons of honesty and integrity are learned early. Students should read and be familiar with the O'Neill Student Honor Code: <https://myspea.indiana.edu/doc/ugrad-doc/ugrd-student-honor-code.pdf>.

Note Selling: Several commercial services have approached students regarding selling class notes/study guides to their classmates. Selling the instructor's notes/study guides in this course is not permitted. Violations of this policy will be reported to the Dean of Students as academic misconduct (violation of course rules). Sanctions for academic misconduct may include a failing grade on the assignment for which the notes/study guides are being sold, a reduction in your final course grade, or a failing grade in the course, among other possibilities. Additionally, you should know that selling a faculty member's notes/study guides individually or on behalf of one of these services using IU email, or via Canvas may also constitute a violation of IU information technology and IU intellectual property policies; additional consequences may result.

Materials: The faculty member teaching this course holds the exclusive right to distribute, modify, post, and reproduce course materials, including all written materials, study guides, lectures, assignments, exercises, and exams. While you are permitted to take notes on the online materials and lectures posted for this course for your personal use, you are not permitted to re-post in another forum, distribute, or reproduce content from this course without the express written permission of the faculty member. Any violation of this course rule will be reported to the appropriate university offices and officials, including to the Dean of Students as academic misconduct.

Plagiarism: Plagiarism is defined as presenting someone else's ideas or work, including that of other students, as your own. *Anytime we use ideas or materials from another source, whether in a written assignment or presented orally, we must acknowledge from whom we got the idea or material.* While I expect that most students are familiar with what constitutes plagiarism and why it is unethical (and unacceptable) to plagiarize, I often encounter several instances of plagiarism each semester. Plagiarism is not only copying someone else's work and turning it in as your own—that is simply the most egregious version. When we discuss ideas in class, we must regularly refer to what other people have said (rarely are we inventing or discovering something for the first time). Sometimes we are using another person's arguments because we agree with them and sometimes because we disagree with them. In either case, we must make clear that we know which ideas or opinions are our own and which ones we are drawing on. There are two common ways of doing this. First, refer to the author (as Smith said in her book, ecosystem stressors occur when...). Second, when we want to use an exact phrase, we must put Smith's words in quotations to indicate that we didn't come up with this particular phrasing. Summarizing concepts and arguments in our own words is an essential skill, but make sure to provide credit to the author for the ideas. On Canvas, I use a tool called *turnitin*, which looks for plagiarism and shows where exact or similar phrases

in a student's submitted assignment overlap precisely with another author. In these instances, I look for whether the assignment uses quotations appropriately and/or recognizes from where the idea or argument is coming. If you have questions about this, please feel free to email me.

Use of AI: Using AI in this class to help with completing assignments is prohibited, with the exception of asking AI to conduct a search for research materials, such as references. I would discourage you from even this use of AI, since learning how and where to search for resources is a *valuable skill* that improves with practice and will be useful to you on the job market. The main purpose of mentioning the use of AI in the syllabus is that you may not use it to write answers for any assignment in this course. Submitting AI-generated content would be plagiarism unless fully attributed to the AI source. In this course I do not consider AI an acceptable reference for citation. There are differences across courses in determining what is common knowledge, in which case plagiarism is not applicable. A good rule of thumb is that if you need a citation/reference to back up a point, it is *not* common knowledge. You can read more in the Student Code of Conduct: <https://studentcode.iu.edu/responsibilities/academic-misconduct.html>.

Well-Being. O'Neill faculty care about the well-being of all students in our classes. If you need assistance, please ask me or another faculty member and we will do our best to guide you toward the resources that Indiana University has available for students, such as:

- **TimelyCare:** Indiana students have free, 24/7 access to virtual mental health care services with TimelyCare. Students do not need insurance to access TimelyCare services.
<https://www.iu.edu/mental-health/find-resources/timely-care.html#0>
- **Counseling and Psychological Services:** for information about services offered to students by CAPS, please visit: <http://healthcenter.indiana.edu/counseling/index.shtml>
- **Accessible Educational Services:** for information about support services or accommodations available to students with disabilities, and for the procedures to be followed by students and instructors, please visit: <https://studentaffairs.indiana.edu/student-support/iub-aes/index.html>
- **Food:** Did you know that the Crimson Cupboard is available to all in the IU community?
<http://crimsoncupboard.indiana.edu/home.php>
- **Financial planning assistance:** at <https://moneysmarts.iu.edu/>

Sexual Harassment

As your instructor, one of my responsibilities is to create a positive learning environment for all students. Title IX and IU's Sexual Misconduct Policy prohibit sexual misconduct in any form, including sexual harassment, sexual assault, stalking, and dating and domestic violence. If you have experienced sexual misconduct, or know someone who has, the University can help. If you are seeking help and would like to speak to someone confidentially, you can make an appointment with:

- The Sexual Assault Crisis Services (SACS) at (812) 855-8900 (counseling services)
- Confidential Victim Advocates (CVA) at (812) 856-2469 (advocacy and advice services)
- IU Health Center at (812) 855-4011 (health and medical services)

It is also important that you know that Title IX and University policy requires me to share any information brought to my attention about potential sexual misconduct with the campus Deputy Title IX Coordinator or IU's Title IX Coordinator. In that event, those individuals will work to ensure that appropriate measures are taken and resources are made available. Protecting student privacy is of utmost concern, and information will only be shared with those that need to know to ensure the University can respond and assist. I encourage you to visit <http://stopsexualviolence.iu.edu/index.html> to learn more.

Commitment to Diversity: Find your home and community at IU

Asian Culture Center

Address: 807 East Tenth Street, Bloomington, IN 47408
Phone: 812-856-5361
Email: acc@indiana.edu
<https://asianresource.indiana.edu/index.html>

LGBTQ+ Culture Center

Address: 705 E 7th St., Bloomington, Indiana 47408
Phone: 812-855-4252
Email: glbtserve@indiana.edu
<https://lgbtq.indiana.edu/contact/index.html>

First Nations Educational & Cultural Center

Address: 712 E 8th St., Bloomington, IN 47408
Phone: 812-855-4814
Email: fnecc@indiana.edu
<https://firstnations.indiana.edu/contact/index.html>

La Casa Latino Culture Center

Address: 715 E 7th St., Bloomington IN, 47408
Phone: 812-855-0174
Email: lacasa@indiana.edu
<https://lacasa.indiana.edu/>

Jewish Culture Center

Address: 730 E 3rd St., Bloomington, Indiana 47401
Phone: 812-336-3824
<https://iuhillel.org/iu-jewish-culture-center>

Neal-Marshall Black Culture Center

Address: 275 N Jordan Ave Bloomington, Indiana 47405
Phone: 812-855-9271
Email: nmgrad@indiana.edu
<https://blackculture.indiana.edu/index.html>

Course Schedule – Spring 2025 (Readings May Be Revised During the Semester)

Jan. 14 (Class 1): Governing Modern Agriculture

- Pre-semester survey

Jan. 16 (Class 2): Inputs

- Paarlberg, R. L. 2013. The Green Revolution controversy, *In Food politics: what everyone needs to know*, 64-80. Second Edition. New York: Oxford University Press.
- Tilman, David et al. 2002. Agricultural Sustainability and Intensive Production Practices. *Nature* 418(6898): 671–77.
- Erisman, J. W., M. A. Sutton, J. Galloway, Z. Klimont, and W. Winiwarter. 2008. How a century of ammonia synthesis changed the world. *Nature Geoscience* 1:636–639.

Jan. 21 (Class 3): Markets

- Blank, S. C. 2018. The profit problem of American agriculture: What we have learned with the perspective of time. *Choices* 33 (3):1–7.
- Andrew, N. 2022. Addressing consolidation in agriculture, 1-12. Center for Agriculture and Food Systems. Vermont Law School. Issue Brief. July.

Jan. 23 (Class 4): Risks

- Burns, K. 2012. The Dust Bowl: The Great Plow Up. Public Broadcasting Systems. 1 hour 51 minutes. (Access through IUCAT > *Films on Demand* library.)
- Optional: Egan, T. 2006. Introduction: Live through this. In *The Worst Hard Time: The Untold Story of Those Who Survived the Great American Dust Bowl*, 1-10. Boston: Houghton Mifflin Co.

Jan. 28 (Class 5): Farm Policy Overview

- Paarlberg, R. L. 2013. The politics of farm subsidies and trade, *In Food politics: what everyone needs to know*, 100-115. Second Edition. New York: Oxford University Press.
- Edwards, C. 2023. Cutting federal farm subsidies. The Cato Institute: Washington, DC. Briefing Paper No. 162. 31 August.
- Frayer, L., and M. Childs. India, farming, and the free market. *Planet Money*. 16 April 2021. (21 minutes)
- Optional: Griggs Farms LLC. 2024. How farm subsidies work. Youtube. 31 August. <https://www.youtube.com/watch?v=kRuXXuI2-uI>.
- Optional: Renton, C. A., C. H. Lafave, and K. Sierks. 2020. The case for crop insurance reform. *Conservation Finance Network*. 8 April.

Jan. 30 (Class 6): Land Tenure

- NFFC. 2012. Institutional investors and the great American farmland grab. July.
- Taber, S. 2019. America loves the idea of family farms. That's unfortunate. *New York Magazine*. 16 June.
- Castro & Willingham. 2019. Progressive governance can turn the tide for black farmers. Center for American Progress.

Feb 4 (Class 7): Farmer Decision-Making

- Pannell, D. J., G. R. Marshall, N. Barr, A. Curtis, F. Vanclay, and R. Wilkinson. 2006. "Understanding and Promoting Adoption of Conservation Practices by Rural Landholders." *Australian Journal of Experimental Agriculture* 46:1407–24.
- Burton, Rob J. F. 2004. "Seeing through the 'good Farmer's' Eyes: Towards Developing an Understanding of the Social Symbolic Value of 'Productivist' Behaviour." *Sociologia Ruralis* 44(2):195–215.

Biodiversity Loss Unit Begins

Group project: Proposal on how to design a payment for ecosystem services (PES) program to increase biodiversity (in some form) on farms.

Feb. 6 (Class 8): Agroecology, Monocultures, and Biodiversity Loss

- Altieri, M. 1999. The ecological role of biodiversity in agroecosystems. *Agriculture, Ecosystems and Environment* 74:19–31.
- Brown, H.C. 2021. Attack of the superweeds. *New York Times Magazine*. 18 August.
- Foley, J. 2013. It's time to rethink America's corn system. *Ensa*. 5 March.

Feb. 11 (Class 9): Payment for Ecosystem Services

- Costanza, R., et al. 1997. The value of the world's ecosystem services and natural capital. *Nature*, 387, 253–260.
- Zhang, W., et al. 2007. Ecosystem services and dis-services to agriculture. *Ecological Economics*, 64, 253–260.
- Naeem, S. et al. 2015. "Get the Science Right When Paying for Nature's Services." *Science* 347(6227):1206–7.

Feb. 13 (Class 10): PES Program Design

- Gaworecki, M. 2017. Cash for conservation: Do payments for ecosystem services work? *Mongabay*. 12 October.
- DeClerk, F.A., and A. Martinez Salinas. 2012. Measuring biodiversity. In *Ecosystem Services from Agriculture and Agroforestry: Measurement and Payment*, 65-89. London Washington, DC: Earthscan.
- San Miguel County. n.d. Payment for ecosystem services program: Financial benefits available for implementing best practices on farms and ranches in San Miguel County. San Miguel County, Colorado.

Feb. 18 (Class 11): On-Farm Diversification

- Wildlife Alliance. 2016. How to conserve biodiversity on the farm.
- Ignaciuk et al. 2017. *Is crop diversification a panacea for climate resilience in Africa?* Food and Agriculture Organization: Rome, Italy.
- Marinelli, J. 2020. A movement grows to help farmers reduce pollution and turn a profit. *Yale Environment* 360. 12 March.
- Blomqvist, L. 2017. Food production and wildlife on farmland. The Breakthrough Institute. 6 March.

Feb. 20 (Class 12): Landscape-Scale Diversification

- Franks, J.R. 2011. The collective provision of environmental goods: A discussion of contractual issues." *Journal of Environmental Planning and Management* 54(5): 637–60.
- Narloch, U. et al. 2012. Conservation tenders: Designing agrobiodiversity conservation programmes so as to minimise costs while maximising social equity. Biodiversity International: Rome, Italy.

Feb. 25 (Class 13): Group Work and Review Session

- Kerr, J.M., M. Vardhan, and R. Jindal. 2014. "Incentives, Conditionality and Collective Action in Payment for Environmental Services." *International Journal of the Commons* 8(2):595–616.

Feb. 27 (Class 14): PES Wrap-up and Discussion

- PES Program Proposals Due

Water Pollution Unit Begins

Group project: Review and advise the Indiana state legislature on its Nutrient Reduction Strategy to identify how best voluntary approaches can work to reduce fertilizer losses.

Mar. 4 (Class 15): Fertilizer, Tile Drains, and Nutrient Loss

- Katz, B.G. 2020. Exploring the widespread impacts of ongoing nitrogen pollution. *EOS*. 101. 23 September.
- Bundy, L. G. 1998. *Soil and applied nitrogen*. Madison, WI: University of Wisconsin-Extension.
- Jones, C. 2019. Iowa is hemorrhaging nitrogen. Chris Jones IIHR Research Engineer Blog. 7 November.

Mar. 6 (Class 16): State Nutrient Reduction Strategies

- Indiana State Department of Agriculture and Indiana Department of Environmental Management. 2016. Indiana's state nutrient reduction strategy: A framework to reduce nutrients entering Indiana's water.
- EPA Memo. 2011. Working in partnership with states to address Phosphorus and Nitrogen pollution through use of a framework for state nutrient reduction. U.S. Environmental Protection Agency: Washington, DC. 16 March.
- Optional to explore: Mississippi River / Gulf of Mexico Hypoxia Task Force website. <https://www.epa.gov/ms-htf>.

Mar. 11 (Class 17): Farm Management Options

- Iowa State University. 2017. Reducing nutrient loss: Science shows what works. Iowa State University Extension and Outreach: Ames, IA. (4 pages)
- Houser, Matthew. 2022. "Farmer Motivations for Excess Nitrogen Use in the U.S. Corn Belt." *Case Studies in the Environment* 6(1):1688823. doi: [10.1525/cse.2022.1688823](https://doi.org/10.1525/cse.2022.1688823).
- Myers, V., A. Weber, and S. Tellatin. 2019. *Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops*. College Park, MD: Sustainable Agriculture Research and Education.

Mar. 13 (Class 18): Why Not Regulations?

- National Agricultural Law Center. (n.d.). Clean Water Act – An overview. University of Arkansas: Fayetteville, AR.
- CRS. 2014. Clean Water Act and Pollutant Total Maximum Daily Loads (TMDLs). 17 January. Congressional Research Service: Washington, DC.

- Ribaud et al. 2011. Improving the effectiveness of agri-environmental policies for the Chesapeake Bay. *Choices Magazine*. 26(3):1-5.
- Kanter, D. 2019. A new way to curb nitrogen pollution: Regulate fertilizer producers, not just farmers. *The Conversation*. 17 January.

Mar. 18 & 20 (No Class): Spring Break

Mar. 25 (Class 19): Extension and Peer Learning

- Blackstock et al. 2010. Understanding and influencing behaviour change by farmers to improve water quality. *Science of the Total Environment* 408:5631–5638.
- Sutherland, L., and F. Marchand. 2021. On-farm demonstration: Enabling peer-to-peer learning. *The Journal of Agricultural Education and Extension* 27(5): 573–90.

Mar. 27 (Class 20): Motivating Behavior Change

- Burton, Rob J.F., and Upananda Herath Paragahawewa. 2011. Creating culturally sustainable agri-environmental schemes. *Journal of Rural Studies* 27: 95–104.
- Barnes, A. P., L. Toma, J. Willock, and C. Hall. 2013. Comparing a “budge” to a “nudge”: Farmer responses to voluntary and compulsory compliance in a water quality management regime. *Journal of Rural Studies* 32:448–459.

Apr. 1 (Class 21): Group Work & Review Session

Apr. 3 (Class 22): Nutrient Reduction Strategy Report Cards

- NRS Report Cards Due

Climate Change Unit Begins

Group Project: Farm plan to create a carbon-neutral farm.

Apr. 8 (Class 23): Agricultural Emissions and Adaptation Challenges

- Chrobak, U. 2021. Agriculture emits a ‘forgotten greenhouse gas.’ Scientists are looking for solutions in the soil. *PBS Newshour*. 26 May.
- Russell, S. 2014. Everything you need to know about agricultural emissions. World Resources Institute. 29 May.
- Dunne, D. (n.d.) What is the climate impact of eating meat and dairy? Carbon Brief.
- Bowling et al. 2018. *Indiana’s Agriculture in a Changing Climate: A Report from the Indiana Climate Change Impacts Assessment*. Purdue University.

Apr. 10 (Class 24): Carbon-Neutral Agriculture

- Blaustein-Rejto, D. 2024. Cover crops’ climate hype: Rethinking funding for climate-smart agriculture. The Breakthrough Institute. 1 August. <https://thebreakthrough.org/issues/food-agriculture-environment/cover-crops-climate-hype?ref=ambrook>

- Searchinger, T. 2021. How to make agriculture carbon-neutral: Lessons from Denmark. World Resources Institute. 7 May.
- Chandrasekhar, A., and G. Viglione. 2021. Q&A: Can ‘nature-based solutions’ help address climate change? *Carbon Brief*. 1 December.

Apr. 15 (Class 25): Carbon Farming

- Thompson, N. et al. 2021. Opportunities and challenges associated with “carbon farming” for U.S. row-crop producers. Purdue University.
- Wongpiyabovorn, O., and A. Plastina. 2023. Carbon farming: Stacking payments from private initiatives and federal programs. File A1-40. July.
- van der Pol, L., D. Manning, F. Cotrufo, and M. Machmuller. 2021. To make agriculture more climate friendly, carbon farming needs clear rules. *The Conversation*. 30 June.

Apr. 17 (Class 26): Net Emissions

- Explore Cool Farm and COMET Planner Calculator Tools

Apr. 22 (Class 27): REDD+

- Begert, B. 2021. When carbon credits drive people from their homes. *Sapiens*. 9 December.
- Nepstad et al. 2014. Slowing Amazon deforestation through public policy and interventions in beef and soy supply chains. *Science* 344 (6188):1118–1123.

Apr. 24 (Class 28): Group Work and Review Session

Apr. 29 (Class 29): Carbon-Neutral Farm

- Farm Plans Due

May 1 (Class 30): Semester Wrap-Up

- Reflection Idea Brainstorm

Final Paper (Finals Week): Tuesday, May 6 by 9:40 p.m.

- Final Reflection Paper