

ATTACHMENT A

Comments on the Amendments to Low Carbon Fuel Standard

Silvia Secchi

My name is Silvia Secchi and I am a professor in the Department of Geographical and Sustainability Sciences at the University of Iowa. I have a Ph.D. in economics from Iowa State University and have been studying the environmental impacts of Midwestern agriculture for over a quarter of a century, my google scholar profile shows see my record of peer reviewed publications¹. I have reviewed the Initial Statement of Reasons of the Proposed Amendments to California's Low Carbon Fuel Standard and associated Appendices. Based on my my professional expertise as an agricultural economist, I have several concerns about CARB's failure to adequately address the potential for changes in the Standard to encourage the development of concentrated animal feeding operations, both through the establishment of new dairies and the concentration of existing operations.

First, the ISOR offers no monitoring data showing whether the LCFS has caused, or the proposed amendments will cause, herd expansions at dairies or hog facilities located in California or outside of California. As a result, CARB cannot in good faith assert that the capturing of manure from CAFO is actually reducing methane emissions from dairy and/or hog operations, and that the LCFS will not result in rebound effect or Jevon's paradox: the technological improvement (in this case the biodigesters) change the behavior of consumers and producers so that the efficiency gains actually result in increased production and the net effects are not reductions but increases in resource use and – in this case – methane emissions. There is extensive evidence of this type of phenomenon in the agricultural sector².

CARB's lack of jurisdiction outside state borders exacerbates this problem by causing a "race to the bottom" in jurisdictions that build digesters as a way to attract new operations or allow existing operations to expand along with digester installation. Race to the bottom has been found to be a significant factor in determining location of Confined Animal Feeding Operations (CAFOs) for both dairy and hog operations³.

Here I detail recent trends in dairy production in Iowa and the increase in biodigesters, to show that the LCFS is already having an impact. The data I present here are the result of several hours of search on the Iowa Department of Natural Resources (DNR) website. I conducted this research in the course of a project in which I am examining the effects of lax environmental regulations in the expansion of CAFOs, in particular in association with "climate smart" policies. This data is important because the EPA Agstar database⁴ that experts like Prof. Aaron Smith at UC Davis have been using severely underreports the number of biodigesters compared to the Iowa DNR site. As a result, national level analyses are extremely likely to underestimate the rebound effect. This is likely to be compounded by the fact that the deployment of biodigesters and the expansion do not always occur in the same year, as evidenced in two cases reported in

¹ <https://scholar.google.com/citations?user=rXte6MIAAAAJ&hl=en&oi=ao>

² Paul, C., Techen, A. K., Robinson, J. S., & Helming, K. (2019). Rebound effects in agricultural land and soil management: Review and analytical framework. *Journal of cleaner production*, 227, 1054-1067.

³ Herath, D., Weersink, A., & Carpentier, C. L. (2005). Spatial Dynamics of the Livestock Sector in the United States: Do Environmental Regulations Matter? *Journal of Agricultural and Resource Economics*, 30(1), 45-68.

⁴ <https://www.epa.gov/agstar>

Table 1. In these cases, the impacts of the biodigesters on expansion will easily be underestimated.

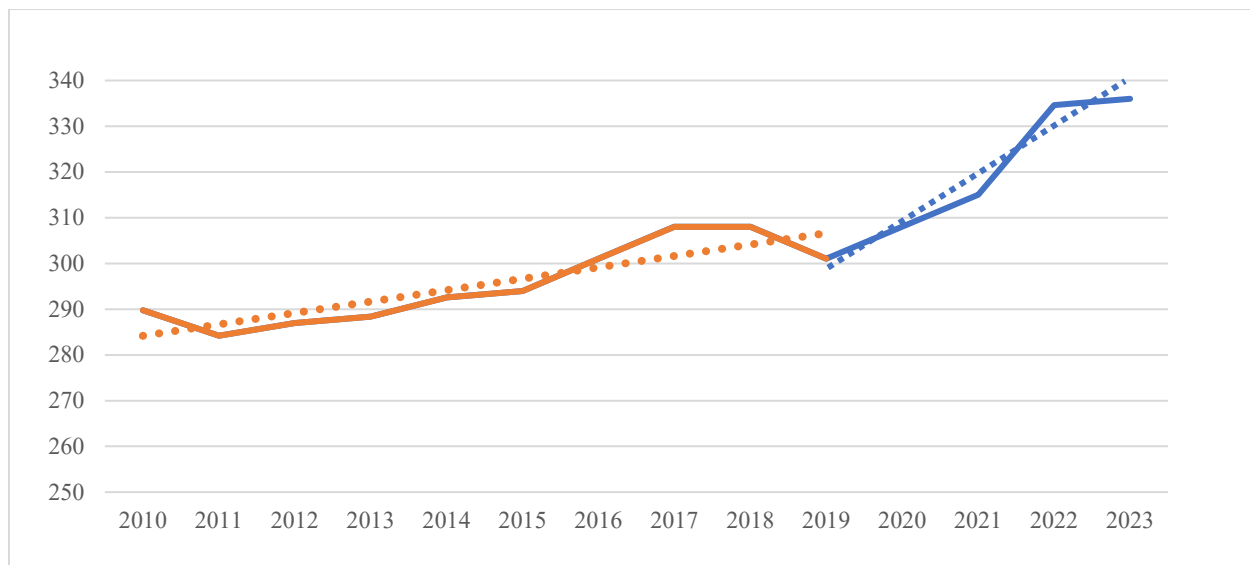
As Table 1 shows, there have been 15 digesters built in Iowa dairies since 2019. **The AgStar database only includes 4 of them.** These 15 digesters are associated with an increase of over 17,000 Animal Units (AUs). This corresponds to an increase of almost 20% in AUs. Milk production in Iowa had been growing, but it was doing so at a much slower pace before 2019 (Figure 1). Though it is not possible to formally attribute causality, it is notable that Iowa's dairy cows AUs increased by 35,000 between 2019 and 2023. **This means that a large portion of the increase in milk cows in the state is associated with biodigesters.**

Table 1 – Recent biodigesters installed in Iowa and associated capacity expansion

	Facility location	General Location	ID	Year	Initial size (AUs)	Final size (AUs)
Black Soil Dairy	Granville	North West	60565	2021	4,500	4,500
Geno	Blairstown	East Central	61209	2022	6,280	7,512
Kirkman Farms	Kirkman	West Central	64174	2021	8,500	11,900
Legacy Dairy	Sanborn	North West	60531	2022	3,920	6,160
Maassen	Maurice	North West	57177	2022	3,200	3,995
Marshall Ridge Farms	State Center	Central	60101	2020 digester 2023 expansion	8,499	11,425
Meadowvale Dairy North	Rock Valley	North West	62015	2021	20,300	20,300
Rock River Jerseys-Inwood Dairy	Doon	North West	66387	2019 digester 2022 expansion	8,499	14,000
Roorda Dairy	Paullina	North West	64981	2021	5,880	5,880
Salix Farms	Salix	North West	64623	2023	3,500	3,500
Sioux Jerseys	Salix	North West	62420	2023	6,300	6,300
Van Ess Dairy	Sanborn	North West	65143	2021	7,599	8,499
Winding Meadows Dairy	Rock Valley	North West	60218	2021	2,884	3,360

Source: Iowa DNR Animal Feeding Operation online application <https://programs.iowadnr.gov/afoemmp/>

Figure 1 – Iowa milk cow AUs (1,000s)



Source: USDA NASS Milk production reports

<https://usda.library.cornell.edu/concern/publications/h989r321c?locale=en#release-items>

Again, it is not possible to demonstrate unequivocally that this growth in dairy operations is directly linked to the expanded use of biodigesters. But two laws deregulating biodigesters were recently passed in Iowa. In 2019 SF 534⁵ repealed the statutory requirement for rulemaking for all waste control technology facilities, including biodigesters, and in 2021, HF 522⁶ allowed large dairies (over 8,500 AUs) to exceed confinement capacity if they install an anaerobic digester to treat all manure. There is a strong correlation between the deployment of biodigesters and the dairy expansions. As Table 1 shows, there were 3 such operations that expanded as they deployed biodigesters. In my professional opinion, this very strongly suggests that the increasing availability and decreasing regulation of biodigesters is contributing to dairy expansion and concentration.

And while the dairies in Table 1 are not currently associated with approved pathways, biogas companies have already indicated their intent to avail themselves of the LCFS to generate credits at several of these facilities. Specifically, Gevo has announced that BP Canada Energy Marketing Corp. and BP Products North America Inc. will market Iowa-produced natural gas in California on its behalf⁷. Gevo is contracting with three of the dairies in Table 1, Meadowvale, Rock River Jerseys and Winding Meadows, two of which have expanded⁸. Another of the dairies

⁵ <https://www.legis.iowa.gov/docs/publications/LGE/88/SF534.pdf>

⁶ <https://www.legis.iowa.gov/docs/publications/SOL/1224327.pdf#HF522>

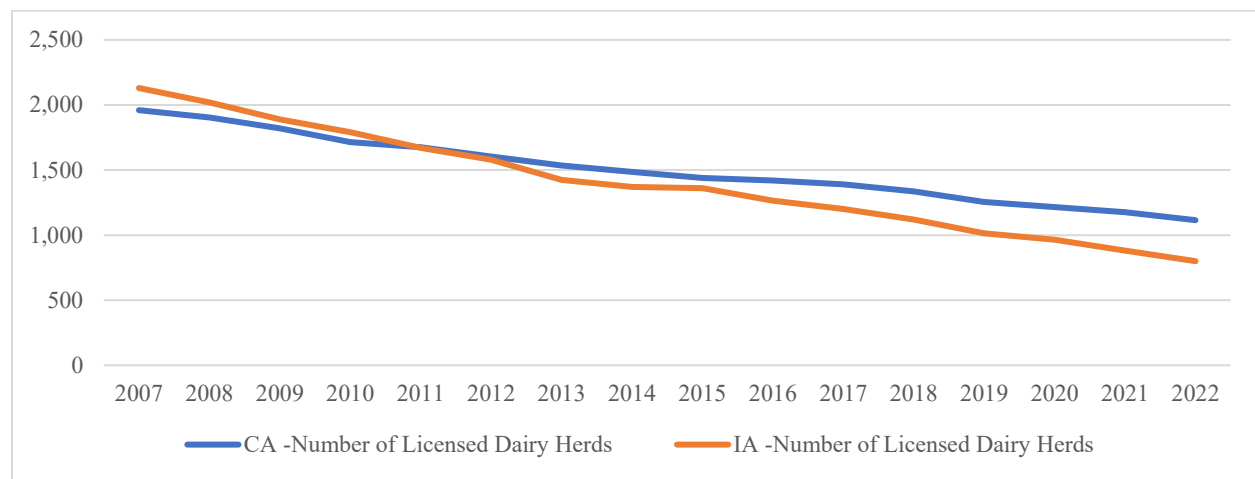
⁷ <https://investors.gevo.com/news-releases/news-release-details/gevos-northwest-iowa-rng-project-hits-major-milestone-begins>

⁸ Gevo appears as the common “cluster” for the dairies here: <https://www.epa.gov/sites/default/files/2020-10/agstar-livestock-ad-database.xlsx>.

expanding, Kirkman, is partnering with California's Brightmark RNG Origination LLC⁹, which sells RNG to U.S. Gain, which is active in the California LCFS market¹⁰.

Based on my study of the effect outside of California of policies to incentivize the use of biodigesters and my review of the literature, I believe similar expansion phenomena are likely taking place in California's dairy sector and elsewhere. The proposed LCFS amendments will increase expansion and concentration¹¹. For example, very recently, a local expert has argued that the flattening of the dairy herd in California in the last five years could be linked to biodigesters. Notably, both in California and Iowa, flat and increasing total herd sizes respectively have both been associated with a reduction in the number of dairies, as shown in Figure 1. Consolidation should be a concern for CARB, since there is extensive evidence that it is associated with more water quality problems, among other things¹².

Figure 2 – Number of licensed dairy herds in California and Iowa, 2007-2022



Source: USDA NASS Milk production reports

<https://usda.library.cornell.edu/concern/publications/h989r321c?locale=en#release-items>

The evidence strongly suggests that the rebound effect is already at work outside California's borders because of race to the bottom policies being enacted by other states. The current policy approach allows for negative crediting of biogas as a way to avoid leakage: the concern is that making California farmers pay for their methane emissions would cause milk production to move (leak) out of state, where emissions are unregulated. But while the approach ensures California farmers do not face an added burden, it does nothing to limit the expansion of dairies in and out of state. As a result, the proposed LCFS amendments likely will cause another type of leakage through the rebound effect: the expansion and concentration of dairy operations resulting

⁹ <https://www.iowafarmbureau.com/Article/Carbon-neutral>

¹⁰ <https://biomassmagazine.com/articles/us-gain-to-purchase-rng-from-brightmark-energy-16647>

¹¹ Smith, A. (2022). The Dairy Cow Manure Goldrush. Retrieved from <https://asmith.ucdavis.edu/news/revisiting-value-dairy-cow-manure>; Smith, A. (2024). Cow Poop is Now a Big Part of California Fuel Policy. Retrieved from <https://asmith.ucdavis.edu/news/cow-poop-now-big-part-california-fuel-policy>.

¹² See for example Bian, Z., H. Tian, Q. Yang, R. Xu, S. Pan, and B. Zhang. 2021. "Production and application of manure nitrogen and phosphorus in the United States since 1860." *Earth Syst. Sci. Data* 13 (2):515-527. doi: 10.5194/essd-13-515-2021.

from the economic incentives provided by the LCFS and the decreased regulation of dairy operations will likely cause increased methane emissions that are not currently accounted for.

CARB's proposal to increase the carbon intensity target and therefore increase the economic value of methane captured from dairy operations will likely result in the expansion of dairy operations inside and outside of California.

I also want to note that the rebound effect has other substantial negative environmental impacts. In particular, as Table 1 shows, the expansion is occurring largely in Northwest Iowa, where CAFO production is already extremely elevated and there is little if any extra land available for spreading additional manure or digestate. This expansion will likely have both water quality and water quantity effects, and no entity is monitoring or assessing them. Notably, one of the Gevo dairies already leaked an estimated 376,000 gallons of manure water and was fined \$10,000 in 2022. Another of the Gevo dairies started construction before receiving permission to do so¹³.

This is particularly a concern because in 2017 EPA signed a settlement agreement limiting access to whatever information EPA has at its disposal regarding CAFOs¹⁴. As a result, there is no national database that can be used to establish a national bottom-up¹⁵ baseline of GHG emissions and other forms of pollution from CAFOs. This makes national level tracing of net changes in pollution and emissions as a result of the deployment of biodigesters extraordinarily difficult. In Iowa specifically, the DNR lack of monitoring capacity resulted in a de-delegation petition with EPA in 2007. As a result of the subsequent work plan¹⁶, in 2017 the Iowa Department of Natural Resources identified 5,000 more animal feeding operations, some of which were CAFOs¹⁷. It is quite evident the Iowa DNR does not have the monitoring capacity to ensure compliance with the assumptions that CARB is making. CARB does not have that capacity either.

Recent changes to the USDA's Natural Resources Conservation Service (NRCS) list of practices eligible to receive subsidies under the Environmental Quality Incentive Program (EQIP) and substantial funding allocated to EQIP in the Inflation Reduction Act (IRA) also make it more likely that the rebound effect will increase in the United States. In particular, NRCS has added eligibility to receive subsidies to additional practices in their Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List for FY2024 through EQIP and the Conservation Stewardship Program (CSP)¹⁸. These activities now include roofs and covers used to cover a waste management facility to capture biogas and waste storage facilities. The increased funding for the EQIP and CSP programs is substantial: \$8.45 billion and \$3.25 billion respectively¹⁹. Therefore, there are now subsidies available that will further incentivize the deployment of biodigesters. It is also important to note that CAFO operations that receive both federal subsidies to deploy biodigesters and LCFS subsidies for their methane could legitimately be considered a

¹³ <https://iowacapitaldispatch.com/2022/07/22/company-with-major-manure-leak-didnt-get-permits-to-build-two-facilities-dnr-says/>

¹⁴ Miller, D. L., & Muren, G. (2019). *CAFOs: What We Don't Know Is Hurting Us*, retrieved from <https://www.nrdc.org/resources/cafos-what-we-dont-know-hurting-us>

¹⁵ Bottom up baselines include individual facilities and can trace aggregate changes to each of them.

¹⁶ https://www.iowadnr.gov/Portals/1/dnr/uploads/afo/epa_dnr_workplan.pdf

¹⁷ <https://publications.iowa.gov/33733/>

¹⁸ <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/climate/climate-smart-mitigation-activities>

¹⁹ <https://www.farmers.gov/loans/inflation-reduction-investments>

form of double dipping, that is paying twice for the same activity. This raises questions about the additionality of the GHG emissions that could occur.

In my professional opinion, California's ill-conceived policy is poised to trigger a new iteration of Cochrane's treadmill that will result in overproduction, further consolidation, and multiple negative environmental consequences²⁰. As in the past, landowners will be the main beneficiaries of the policy. Biodigesters' adopters will benefit from temporary increased profits, overproduction will ensue, and the government will be called in to address the fallout. The climate benefits of this approach are dubious at best.

In summary:

- a) CARB has not adequately included a full accounting of greenhouse gas emissions that properly considers the impact of biogas market prices and state-level regulatory settings on the US dairy industry. CARB is also ignoring the expansionary effects of the Inflation Reduction Act and the lack of additionality for methane reductions from digesters funded by the IRA. The information I have shown here regarding already occurring out of state effects illustrates that there does not exist at the moment a comprehensive inventory of biodigesters and it is therefore impossible for CARB to adequately consider national level impacts and back up any claims that the incentives included in the proposed LCFS amendments will not result in industry expansion and consolidation. I have in fact presented evidence that expansion is already occurring in Iowa, it is very strongly associated with the deployment of biodigesters, and an increased market signal to produce more credits will further exacerbate that expansionary effect;
- b) The economic incentive to monetize manure-methane emissions as proposed by CARB will likely lead to further expansion in the dairy sector in Iowa. If such expansion were to extend to hog CAFOs, given that Iowa already produces one third of US hogs, the environmental impacts could be devastating considering Iowa alone. The national level effects would be worse;
- c) The amendments do not just have the potential to result in direct and indirect environmental impacts in California and other states. Combined with federal policy and enhanced by race to the bottom state deregulation, they will substantially alter incentives and result in industry expansion.

²⁰Levins, Richard A., and Willard W. Cochrane. 1996. "The Treadmill Revisited." *Land Economics* 72 (4):550-553. doi: 10.2307/3146915.

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EDUCATION

1996 - 2000	Iowa State University	Ames, IA, USA
<i>Ph.D. in Economics</i>		
Concentrations: Environmental and Resource Economics, International Economics		
1994-1995	University of Reading	Reading, England
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4. Secchi, S., Gassman, P. W., Jha, M., Kurkalova, L.A., Feng, H. H., Campbell, T., & Kling, C. L. (2007). The cost of cleaner water: Assessing agricultural pollution reduction at the watershed scale. *Journal of Soil and Water Conservation*, 62(1), 10-21.
3. Herriges, J. A., Secchi, S., & Babcock, B. A. (2005). Living with hogs in Iowa: The impact of livestock facilities on rural residential property values. *Land Economics*, 81(4), 530-545.
2. Jha, M., Gassman, P. W., Secchi, S., Gu, R., & Arnold, J. (2004). Effect of watershed subdivision on SWAT flow, sediment, and nutrient predictions. *JAWRA Journal of the American Water Resources Association*, 40(3), 811-825. doi: 10.1111/j.1752-1688.2004.tb04460.x
1. Hurley, T., Secchi, S., Babcock, B., & Hellmich, R. (2002). Managing the risk Of European Corn Borer resistance to Bt corn. *Environmental and Resource Economics*, 22(4), 537-558. doi: 10.1023/a:1019858732103.

BOOKS

Kling, K.L., S. Secchi, and M. Peters. 2011. NRCS Environmental Credit Trading Reference. Washington D.C. U.S. Department of Agriculture. URL: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045650.pdf

REFEREED EXTENSION PUBLICATIONS

Schulte, L.A., H. Asbjornsen, R. Atwell, C. Hart, M. Helmers, T. Isenhardt, R. Kolka, M. Liebman, J. Neal, M. O'Neal, R. Schultz, S. Secchi, J. Thompson, M. Tomer, & J. Tyndall. 2008. Targeted Conservation Approaches for Improving Water Quality: Multiple Benefits for Expanded Opportunities. PMR 1002. Iowa State University Extension, Ames, IA.

REFEREED TEACHING MATERIALS

Cooke S.L., A.C. Lloyd*, A.D. Montebancho & S. Secchi. 2015. Moving to higher ground: Ecosystems, Economics and Equity in the Floodplain. National Center for Case Study Teaching in Science. URL:
http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=778&id=778

INVITED JOURNAL ARTICLES

6. Secchi S. Forthcoming. The Marginalization of the Environment in Agricultural Policy. Invited Forum. *Agricultural History*.
5. Secchi S. 2020. Response to Struckman – The political economy of unsustainable lock-ins in North American commodity agriculture: a path forward. “Political ecologies of inertia” Invited Commentary. *Nordia Geographical Publications* 49(5), 107–111.
4. Prokopy L, B. Gramig, A. Bower, S. Church, B. Ellison, K. Floress, P. Gassman, K. Genskow, D. Gucker, S. Hallett, J. Hill, N. Hunt, K. Johnson, I. Kaplan, P. Kelleher, H. Kok, M. Komp, P. Lammers, S. LaRose, M. Liebman, A. Margenot, D. Mulla, M. O'Donnell, A. Peimer, A. Reaves, K. Salazar, C. Schelly, K. Schilling, S. Secchi, A. Spaulding, D. Swenson, A. Thompson, & J. Ulrich-Schad. 2020. The Urgency of Transforming the Midwestern U.S. Landscape into more than corn and soybean. *Agriculture and Human Values* 37, 537–539. doi:10.1007/s10460-020-10077-x.
3. Secchi, S., Garvey, J., & Whiles, M. 2012. Multifunctional Floodplain Management: Looking Ahead From the 2011 Mississippi Floods. *National Wetlands Newsletter*, 34(5), 21-24.
2. Nassauer, J. I., Dowdell, J. A., Wang, Z., McKahn, D., Chilcott, B., Kling, C. L., & Secchi, S. 2011. Iowa farmers' responses to transformative scenarios for Corn Belt agriculture. *Journal of Soil and Water Conservation*, 66(1), 18A-24A. doi: 10.2489/jswc.66.1.18A
1. Secchi, S., Tyndall, J., Schulte, L. A., & Asbjornsen, H. 2008. High crop prices and conservation - Raising the stakes. *Journal of Soil and Water Conservation*, 63(3), 68A-73A. [2009 Editor's Choice Award].

BOOK CHAPTERS

11. Lauber K., V. Morris, J. Jacquet, P. Li, I. Moller, S. Secchi, A. Wijeratna, M. De Bona. Forthcoming. The Animal Agriculture Industry's Role in Obstructing Climate Action. In the First Global Assessment of Climate Obstruction (T. Roberts, C. Milani, J. Jacquet, and C. Downie eds.).
10. Varble S. & S. Secchi. 2018. Growing switchgrass in the Corn Belt: Barriers and drivers from an Iowa survey. In “Land Allocation for Biomass: Challenges and Opportunities” (R. Li and A. Monti eds.) Springer [peer reviewed]
9. Secchi S. & S. Soman. 2010. Mandatory and Voluntary Conservation Policies: Competing Visions or Complementary Approaches? In: Human Dimensions of Soil and Water Conservation: A Global Perspective. (T. Napier, ed.) Nova Science Publishers. [peer reviewed]

8. Kurkalova L.A., S. Secchi, & P. W. Gassman. 2009. Corn Stover Harvesting: Potential Supply and Water Quality Implications. In: Handbook of Bioenergy Economics and Policy (M. Khanna, J. Scheffran, & D. Zilberman, eds.) Springer. [peer reviewed]
7. Feng H. H., C. Kling L.A. Kurkalova, & S. Secchi. 2007. Subsidies! The Other Incentive-Based Instrument: the Case of the Conservation Reserve Program. In: Moving to Markets in Environmental Regulation: Lessons from Twenty Years of Experience (J. Freeman & C. Kolstad, eds.) Oxford University Press, New York. [peer reviewed]
6. Gassman P.W., S. Secchi, M. Jha & L.A. Kurkalova. 2006. Upper Mississippi River Basin modeling system part 1: SWAT Input data requirement and Issues. In: Coastal Hydrology and Processes (V.P. Singh & Y.J. Xu eds.) Water Resources Publications, Highland Ranch, CO.
5. Jha M., P.W. Gassman, S. Secchi, & J. Arnold. 2006. Upper Mississippi River Basin modeling system part 2: Baseline Simulation Results In: Coastal Hydrology and Processes (V.P. Singh & Y.J. Xu eds.) Water Resources Publications, Highland Ranch, CO.
4. Kling C.L., S. Secchi, M. Jha, H. Feng, P.W. Gassman, & L.A. Kurkalova. 2006. Upper Mississippi River Basin modeling system part 3: Conservation practice scenario results. In: Coastal Hydrology and Processes (V.P. Singh and Y.J. Xu eds.) Water Resources Publications, Highland Ranch, CO.
3. Secchi S., T. M. Hurley, B. Babcock & R. L. Hellmich. 2006. Managing European Corn Borer Resistance to Bt Corn with Dynamic Refuges. In: Regulating Agricultural Biotechnology: Economics and Policy (R. Just, J. Alston, & D. Zilberman eds.) Springer.
2. Secchi S., & B. A. Babcock. 2003. Pest Mobility, Market Share, and the Efficacy of Using Refuge Requirements for Resistance Management. In: Battling Resistance to Antibiotics and Pesticides: An Economic Approach (R. Laxminarayan, ed.), Resources for the Future, Washington DC. [peer reviewed]
1. Hurley T. M., S. Secchi, B. Babcock, & R. L. Hellmich. 2002. Managing the Risk of European Corn Borer Resistance to Bt Corn, In The Economics Of Managing Biotechnologies (T. Swanson, ed.) Kluwer: Dordrecht, The Netherlands. [peer reviewed article reprint]

GUEST EDITORSHIPS

Guest Co-Editor for *Economics Research International's* special issue on the economics of biofuels, <http://www.hindawi.com/journals/ecri/si/306959/>.

Guest Co-Editor for *Biomass and Bioenergy's* special issue on land use change – Vol. 35(6).

PAPERS UNDER REVIEW

Secchi S. 2023. Wither WOTUS? Understanding the Cost Benefit Analysis of the Waters of the US rule. Revise and resubmit at *Applied Economics Teaching Resources*.

GRANTS

31. USDA NIFA. #DiverseCornBelt: Resilient Intensification through Diversity in Midwestern Agriculture. (L. Prokopy project PI, Secchi UIowa PI). 2021-2026. \$10,000,000 (UIowa \$ 467,776).
30. Healthier Workforce Center of the Midwest (NIOSH funding). Agricultural production practices and stress: a pilot study of women farmers in Iowa. (with C. Nichols). 2020-2021, \$29,979.

29. NSF EAGER Germination - What we talk about when we talk about big ideas: Using case studies to train PhD students in ideation and questioning processes. Consultant (with A. Charles, N. Becker). 2018-2020, \$117,729.
28. UIowa CGRER. A river runs through it: Surveying Iowa City residents' on water use, water quality and flood management (with K.E. Dalrymple). 2018-2020, \$30,000.
27. Iowa State University - Land Use Impacts of RFS-Induced Agricultural Expansion 2018-2019, 71,540.
26. Walton Family Foundation - A Scorecard to measure States' Nutrient Reduction Strategies 2017-2019, \$19,585.
25. INTERNAL - SIUC Undergraduate Research Assistantship. Creating an Atlas of Southern Illinois' Ecosystem Services. 2015-2016, \$2,700.
24. USDA NIFA – Costs of continuous conservation tillage: estimation with incomplete data (with L.A. Kurkalova, T. Wade and R. Claassen), 2016-2018, \$499,995.
23. Argonne National Lab (DoE funds) – Landscape by Design – Valuation of Ecosystem Services, 2015-2017, \$49,736.
22. National Science Foundation - DYN COUPLED NATURAL-HUMAN. People, Water, and Climate: Adaptation and Resilience in Agricultural Watersheds (with D. Bennett, N. Basu, M. Muste, W. Gutowski) 2011-2017, \$1,011,832.
21. Illinois DNR – Training, Certification, Pilot Incentive, Marketing, And Removal Research Project for the long-term strategy in reducing and controlling Asian Carp populations (with J. Garvey), 2011, \$1,500,000.
20. National Science Foundation - DYN COUPLED NATURAL-HUMAN. Climate Change, Hydrology, and Landscapes of America's Heartland: A Multi-scale Natural-Human System (With C. Lant, S. Kraft, G. Misma, J. Nicklow, and J. Schoof) 2010-2014, \$1,430,000.
19. USDA ERS Cooperative Agreement 58-6000-0-0056. Estimating the costs of continuous conservation tillage. 2010-2014. \$30,887.
18. USDA CSREES AFRI Agribusiness Markets and Trade. An Analysis of the Impact of Biofuel Expansion through Linking of Agricultural and Energy Markets (With A. Elobeid and L.A. Kurkalova) 2010-2014, \$360,396.
17. The Nature Conservancy. Floodplain Restoration Strategies Integrating Biomass plantings and Ecosystem Service Payments (With S. Kraft) 2009-2013, \$112,536.
16. INTERNAL - SIUC Seed Grant. Economic And Environmental Assessment of the Use of Woody Biomass for Energy Production in Southern Illinois, 2009-2010, \$14,985 + 1 month of Summer support.
15. INTERNAL - SIUC Undergraduate Research Assistantship. The Role of Federal and State Policy in Promoting Renewable Energy Production. 2009-2010, \$5,400.
14. National Science Foundation Cyber-Enabled Discovery and Innovation Type II. Understanding Water-Human Dynamics with Intelligent Digital Watersheds. (with J. Schnoor, M. Muste, A. Kusiak and D. Bennett). 2009-2012, \$899,391.
13. EPA, Region 7. Biofuel Feedstock Landscape Coverage for Five Biofuel Industry Scenarios (with R. Cruse, A. Elobeid and S. Tokgoz) 2008-2010, \$150,000.
12. Iowa State University Agricultural Systems Initiative. Assessing alternative crop choices and environmental impacts of the bioeconomy: an integrated landscape approach (with M. Duffy and P.W. Gassman) 2007-2008, \$15,000.

11. Agricultural Marketing Resource Center. Helping Farmers Make Decisions in the Bioeconomy: Mapping the Potential for Switchgrass in Iowa Relative to Corn and Soybeans. 2007-2008. (with B. Babcock and P.W. Gassman), \$75,000.
10. Department of Energy-USDA. Expansion of ethanol production: evaluation of costs and benefits to rural communities in the Upper Mississippi River Basin. (with L. Kurkalova, C.L. Kling, P.W. Gassman, M. Jha, A. Carriquiry and D. Otto) 2006-2009, \$676,722.
9. USDA Natural Resources Conservation Service. Environmental Credit Trading Handbook. 2006-2007 (with C.L. Kling), \$84,150.
8. Prairie Rivers of Iowa R.C. & D and USDA Natural Resources Conservation Service. Rapid Watershed Assessment for the Boone River, the Upper Iowa and the South Skunk Watersheds (with T. Isenhardt, C.L. Kling, P.W. Gassman and M. Tomer) 2006-2007, \$72,500.
7. NASA and USDA Cooperative State Research, Education, and Extension Service. Interactive Drivers of Land Use/Land Cover Change in Agricultural Areas: Climate and Land Manager Choices. (with C.L. Kling, H. Feng, P.W. Gassman, and E. Tackle) 2006-2008, \$465,900.
6. Iowa Farm Bureau, Leopold Center for Sustainable Development, Iowa Soybean Association, Iowa Corn Growers Association. Assessment of Conservation Practices on Agricultural Cropland in Iowa (with C.L. Kling, H. Feng, P. Gassman, and M. Jha) 2006, \$72,500.
5. USDA CSREES Integrated Projects. Water Resource Degradation in the Boone Watershed: Integrating Stakeholder Knowledge and Preferences with Economic and Watershed Models (with C.L. Kling, M. Duffy, L. Kurkalova, H. Feng, P.W. Gassman, and J. Cooper) 2005-2008, \$590,000.
4. Prairie Rivers of Iowa R.C. & D and Leopold Center for Sustainable Development. Boone River Watershed and Gordon's Marsh Project (with C.L. Kling, and P.W. Gassman) 2005-2006, \$35,000.
3. Iowa State Water Resources Research Institute. Improving Water Quality in Iowa Rivers: Cost-Benefit Analysis of Adopting New Conservation Practices and Changing Agricultural Land Use (with C.L. Kling, H. Feng, P.W. Gassman, and L. Kurkalova) 2005-2006, \$39,600.
2. National Science Foundation. Biocomplexity of Integrated Perennial-Annual Agroecosystems (Senior Personnel. Principal Investigators: H. Asbjornsen, R. M Cruse, C.L. Kling, M. Z Liebman, J. D Opsomer) 2005-2007, \$ 99,998.
1. Iowa Department of Natural Resources. Costs of Adopting Conservation Practices on Agricultural Cropland in Iowa and Possible Nutrient Standards (with C.L. Kling, H. Feng, P. Gassman, and L. Kurkalova) 2004, \$53,360.

TEACHING EXPERIENCE

Introduction to Sustainability (GEOG 2013). Class for the University's Gen Ed sustainability requirement Average class size 65.

Environmental Economics and Policy (GEOG 3800/5800). Double listed class for undergraduate and graduate students. Average class size: 30.

Environmental Impact Analysis (GEOG 4750). Average class size: 11.

Contemporary Environmental Issues (GEOG 1070). Class for the University's Gen Ed sustainability requirement. Average class size: 370.

Environmental and Energy Economics (GENV 422). Double listed class for undergraduate and graduate students. Average class size: 20.

Geography, People and the Environment (GENV 300i). Class for the University's core curriculum social sciences and interdisciplinary requirement. Average class size: 70.

Environmental Decision Making (Environmental Resources & Policy 502). Core class for the interdisciplinary ER&P Ph.D program. Average class size: 12.

Interdisciplinary Approaches to Environmental Issues (ABE 470). Team taught class, capstone for the Minor in Environmental Studies.

GRADUATE STUDENT ADVISEMENT

MASTERS STUDENT ADVISER

Amy Kopale – Masters in Geography, UIowa, 2019
Aleesandria Gonzalez- Masters in Geography, SIUC, 2017
Daniel Fucik - Masters in Geography, SIUC, 2016
Andisiwe Stuurman - Masters in Geography, SIUC (Fulbright scholar), 2015
Mohamud Esmail – Masters in Agribusiness Economics, SIUC, 2011
Alison Britt – Masters in Agribusiness Economics, SIUC, 2011
Kent Rupp – Masters in Agribusiness Economics, SIUC, 2011

PH.D. STUDENT ADVISER

Austin Holland – Ph.D. in Geography, UIowa, 2022
Shanna McClain (with C. Bruch) – Ph.D. in Environmental Resources & Policy, SIUC (IGERT fellow), 2016
Mukesh Bhattarai – Ph.D. in Environmental Resources & Policy, SIUC, 2016
Awoke Teshager (with J. Schoof) – Ph.D. in Environmental Resources & Policy, SIUC, 2016
Tom Shaw – Ph.D. in Environmental Resources & Policy, SIUC, 2015
Sarah Varble – Ph.D. in Environmental Resources & Policy, SIUC, 2014

MASTERS STUDENT COMMITTEE MEMBER

Tracy Fidler – Masters in Natural Resources and Environmental Sciences, UIUC, 2017
Jodie Hancock – Masters in Forestry, SIUC, 2017
Ann Rushing – Masters in Geography, SIUC, 2015
Brent Ritzler – Masters in Public Administration, SIUC, 2015
Lance Odum – Masters in Public Administration, SIUC, 2012
Andrew Johnson – Masters in Geography, SIUC, 2012

PH.D. STUDENT COMMITTEE MEMBER

Asif Rahman – Ph.D. in Geography, UIowa, current
Enes Yildirim – Ph.D. in Water Resources, UIowa, current
Oronde Drakes – Ph.D. in Geography, UIowa, current
Rebecca Kauten – Ph.D. in Geography, UIowa, 2019
Clara Mundia – Ph.D. in Environmental Resources & Policy, SIUC, 2017
Amanda Marshall – Ph.D. in Environmental Resources & Policy, SIUC, 2017
Dat Tran- Ph.D. in Energy & Environmental Systems, NCA&T University, 2016
Ross Guida – Ph.D. in Environmental Resources & Policy, SIUC, 2016
Obad Quaiocoe- Ph.D. in Energy & Environmental Systems, NCA&T University, 2016
Artur Rombenso – Ph.D. in Zoology, SIUC, 2016
Wahid Rahman – Ph.D. in Environmental Resources & Policy, SIUC, 2014
Tim Stoebner – Ph.D. in Environmental Resources & Policy, SIUC, 2014
Steve Randall - Ph.D. in Energy & Environmental Systems, NCA&T University, 2012
Caroline Gottschalk Druschke – Ph.D in Rethoric, University of Illinois at Chicago, 2011

PROCEEDINGS

- Jones, C., & S. Secchi. 2019. Reconciling Climate Change with Nitrate Impairment of Drinking Water: Policies for Iowa's Largest City. SUS-RURI: Developing a Convergence SUS Agenda for Redesigning the Urban-Rural Interface along the Mississippi River Watershed, Iowa State University and NSF, August 12-13, Ames, Iowa.
- Kurkalova L. A., S. Secchi & P. W. Gassman. 2009. Greenhouse Gas Mitigation Potential of Corn Ethanol: Accounting for Corn Acreage Expansion. Proceedings of the 2007 National Conference on Environmental Science and Technology. G.Uzochukwu, Schimmel, K.; Chang, S.-Y.; Kabad, V.; Luster-Teasley, S.; Reddy, G.; Nzewi, E. (Eds.). Springer. p. 251-257.
- Secchi S., P. W. Gassman, M. Jha, L. Kurkalova, & C. L. Kling. 2008. Water Quality Effects of Corn Ethanol versus Switchgrass-Based Biofuels in the Midwest. Proceedings of the Farm Foundation Conference: "Transition to a Bioeconomy: Environmental and Rural Development Impacts", October 15-16, 2008, Hyatt Regency At Union Station, St. Louis, MO. URL: http://www.farmfoundation.org/news/articlefiles/401-Final_version_Farm_Foundation%20feb%2020%2009.pdf
- Secchi S. 2008. The Environmental Sustainability of Ethanol and Biofuels. Proceedings of the Iowa State University Extension and Town/Craft Roundtable: "Biofuels and the Rural Economy Roundtable", May 14, 2008, Perry, IA.
- Gassman, P.W., S. Secchi, & M. Jha. 2008. Assessment of bioenergy-related scenarios for the Boone River watershed in north central Iowa. In: Proceedings of the 21st Century Watershed Technology: Improving Water Quality and Environment Conference, March 29-April 3, American Society of Agricultural and Biological Engineers, Concepción, Chile.
- Gassman, P.W., S. Secchi, & M. Jha. 2007. An alternative approach for analyzing wetlands in SWAT for the Boone River watershed in north central Iowa. In: *4th International SWAT Conference Book of Abstracts*, July 3-7, UNESCO-IHE, Institute for Water Education, Delft, Netherlands.
- Gassman, P.W., S. Secchi, & M. Jha. 2006. Application of SWAT for the Boone River watershed in north central Iowa. Presented at the American Society of Agricultural and Biological Engineers Annual Meeting, July 9-12, Portland, OR. ASABE Paper 062234, St. Joseph, MI.
- Secchi S., H. H. Feng, L. A. Kurkalova, C. L. Kling, P. W. Gassman, & M. Jha. 2005. Nonpoint source needs assessment for Iowa part II: the cost of improving Iowa's water quality. Watershed Management to Meet Water Quality Standards and Emerging TMDL (Total Maximum Daily Load), Proceedings of the 3rd Conference 5-9 March 2005 Atlanta, Georgia. ASAE, St. Joseph, Michigan, pp.522-532.
- Gassman, P.W., S. Secchi, M. Jha, L.A. Kurkalova, H.Feng, & C.L. Kling. 2005. Nonpoint source needs assessment for Iowa part III: economic and environmental outcomes. Watershed Management to Meet Water Quality Standards and Emerging TMDL (Total Maximum Daily Load), Proceedings of the 3rd Conference 5-9 March 2005 Atlanta, Georgia. ASAE, St. Joseph, Michigan, pp.533-542.
- Gassman, P.W., S. Secchi, C.L. Kling, M. Jha, L.A. Kurkalova, & H.Feng. 2005. An analysis of the 2004 Iowa Diffuse Pollution Needs assessment using SWAT. *Proceedings of the SWAT 2005 3rd International Conference*, pp. 291-301 11-15 July, Zurich, Switzerland.
- Jha, M., P.W. Gassman, S. Secchi, J.G. Arnold, L.A. Kurkalova, H. Feng, & C.L. Kling. 2005. An assessment of alternative conservation practice and land use strategies on the hydrology and

water quality of the Upper Mississippi River Basin. In: *Proceedings of the SWAT 2005 3rd International Conference*, pp. 444-453, July 11-15, Zurich, Switzerland.

Takle, E. S., M. Jha, P. W. Gassman, C. J. Anderson, & S. Secchi. 2005. Climate change impacts on the hydrology and water quality of the Upper Mississippi River Basin. In: *Proceedings of the SWAT 2005 3rd International Conference*, pp. 599-608. July 11-15, Zurich, Switzerland.

Feng H., C. L. Kling, L. A. Kurkalova, S. Secchi, & P. W. Gassman. 2005. The Conservation Reserve Program in the Presence of a Working Land Alternative: Implications for Environmental Quality, Program Participation, and Income Transfer. *American Journal of Agricultural Economics* 87 (5).

Jha M., P. W. Gassman, S. Secchi, & J. Arnold. 2003. Configuration of SWAT for the Upper Mississippi River Basin: an application to two subwatersheds. Proceedings of the Total Maximum Daily Load (TMDL) Environmental Regulations II, 8-12 November 2003, Albuquerque, New Mexico.

Secchi S. & B. A. Babcock. 2002. Pearls before Swine? Potential Trade-Offs Between the Human and Animal Use of Antibiotics. *American Journal of Agricultural Economics* 84 (5).

WORKING PAPERS

Dodder R.S., A. Elobeid, T. L. Johnson, P. O. Kaplan, L. A. Kurkalova, S. Secchi, & S. Tokgoz. 2011. Environmental Impacts of Emerging Biomass Feedstock Markets: Energy, Agriculture, and the Farmer. CARD Working Paper [11-WP 526].

Secchi S. 2007. Watching corn grow: a hedonic study of the Iowa landscape. Working paper 07-WP 445, Center for Agricultural and Rural Development, Ames, Iowa.

Secchi S., P.W. Gassman, M. Jha, L.A. Kurkalova, H.H. Feng, T. Campbell, & C.L. Kling. 2005. The Cost of Clean Water: Assessing Agricultural Pollution Reduction at the Watershed Scale. Center for Agricultural and Rural Development, Ames, Iowa.

Secchi S., M. Jha, L.A. Kurkalova, H.H. Feng, P.W. Gassman, & C.L. Kling. 2005. The Designation of Co-benefits and Its Implication for Policy: Water Quality versus Carbon Sequestration in Agricultural Soils. Working paper 05-WP 389, Center for Agricultural and Rural Development, Ames, Iowa.

Kurkalova L.A., C. Burkart, & S. Secchi. 2004. Cropland Cash Rental Rates in the Upper Mississippi River Basin. Technical report 04-TR 47, Center for Agricultural and Rural Development, Ames, Iowa.

Secchi S. 2002. Patient Behavior and Antibiotic Prescriptions: the Equilibrium Level of Antibiotic Use and the Role of a Market Permit System. Center for Agricultural and Rural Development, Ames, Iowa.

Babcock B.A., J. Beghin, M. Duffy, H.H. Feng, B. Hueth, C.L. Kling, L.A. Kurkalova, U. Schneider, S. Secchi, Q. Weninger, & J. Zhao. 2001. Conservation Payments: Challenges in Design and Implementation. Working paper 01-BP 34, Center for Agricultural and Rural Development, Ames, Iowa.

Secchi S. & B.A. Babcock. 2001. Optimal Antibiotic Usage with Resistance and Endogenous Technological Change. Working paper 01-WP 269, Center for Agricultural and Rural Development, Ames, Iowa.

Hurley T.M., S. Secchi, B.A. Babcock, & R. L. Hellmich. 1999. Managing the Risk of European Corn Borer Resistance to Transgenic Corn: An Assessment of Refuge Recommendations. Staff Report 99-Sr 88, Center for Agricultural And Rural Development, Ames, Iowa.

OTHER PUBLICATIONS

Vasto A., & Secchi S., 2021, Rural Water Systems in Iowa: Analysis of Opportunities and Challenges. Iowa Environmental Council. URL: <https://www.iaenvironment.org/newsroom/water-and-land-news/council-releases-rural-water-system-report>

Secchi S., & D. Cwiertny. 2019. Iowa's Grants to Counties Program: A Valuable but Underutilized Program for Protecting the Public Health of Private Well Users. University of Iowa Center for Health Effects of Environmental Contamination Policy Report 2019-01. URL: https://cheec.uiowa.edu/sites/cheec.uiowa.edu/files/CHEEC-2019-01_Grants_To_Counties_3_.pdf

Healy M.*, & S. Secchi. 2016. A Comparative Analysis of Ecosystem Service Valuation Decision Support Tools for Wetland Restoration. A Report Prepared for the Association of State Wetland Managers. URL: http://www.aswm.org/pdf/lib/ecosystem_service_valuation_032116.pdf

Secchi S. 2015. Background paper on Economic Valuation of Ecosystem Services from Working Lands Conservation, prepared for USDA's ERA and NRCS Economic Valuation of Conservation Based Ecosystem Services Workshop.

Braden J. & S. Secchi, 2014, C-FARE and AAEA Webinar "Policy Innovations in Nonpoint Source Pollution-policy". Friday, March 21, 2014.

Cooke S. L., A. C. Lloyd*, A. D. Montebancho, & Silvia Secchi, 2013. Ecosystems, Economics, and Equity in the Floodplain. A case study developed for the National Socio-Environmental Synthesis Center Project Teaching Socio-Environmental Synthesis with Case Studies. URL: <http://www.sesync.org/ecosystems-economics-and-equity-in-the-floodplain-case-study-5>

Secchi S., 2009. Overview Presentation. NRCS and C-FARE Webinar "Environmental Markets: New Approaches for Natural Resources Management Webinar", February 23rd, 2009

Feng H., L. A. Kurkalova & S. Secchi. 2001. Multifunctionality: Market failure and options to internalise externalities: Applying the OECD framework - A review of literature in the USA, Consultant background paper for the OECD workshop "Multifunctionality: Applying the OECD Analytical Framework, Guiding Policy Design", July 2001.

INVITED CONFERENCE AND SEMINAR PRESENTATIONS

Invited plenary presentation, "Slaughtering Sacred Cows: Tech Fixes Won't Correct the Extractive Nature of US Agriculture", Sustainable Phosphorus Summit, November 1-2, 2022, Raleigh NC.

Invited presentation, Economic & Land Use Policies to Limit Nutrient Pollution: Perspectives from the Great Lakes and Beyond, Alliance for the Great Lakes, April 4, 2022, virtual event.

Seminar presentation, "A lonely stick amongst many carrots: The Conservation Compliance Program in the 21st Century", Paul H. O'Neill School, Indiana University, February 25, 2021, virtual event.

Seminar presentation, "The US census of agriculture as lens and mirror of long term changes in the rural Midwest", Faculty of Land and Food Systems, University of British Columbia, September 16 2020, virtual event.

Invited presentation "The role of policy in promoting sustainable floodplain management" at Emiquon Science 2015: River Floodplain Restoration and Connection, February 19th, 2015, Lewistown, IL

Invited Presentation “Understanding the links between humans, climate change, water and carbon in a Corn Belt Watershed”, at the AGU Fall meeting, December 15-19th, 2014, San Francisco, CA.

Invited presentation “Promoting Bioenergy Crops: An economic perspective on challenges and opportunities” at the workshop Incorporating Bioenergy in Sustainable Landscape Designs Workshop Two: Agricultural Landscapes June 24–26th, 2014, Argonne National Laboratory, IL.

Invited presentation “Increased Biofuel Production and Water Resources” at the National Academies Roundtable on Science and Technology for Sustainability, May 20-21, 2014, Washington DC. URL: http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_088191.pdf

Invited speaker at the Indiana University-Purdue University first “Rivers of the Anthropocene” conference, January 23-24th, 2014, Indianapolis, IN.

Invited speaker at the MISI-ZIIBI: Living with the Great Rivers, Climate Adaptation Strategies in the Midwest River Basins, co-sponsored by Washington University in St. Louis and the Royal Netherlands Embassy, March 23rd, 2013, St. Louis, MO.

Plenary speaker at the 2013 Missouri River Natural Resources Conference and BiOp Forum “Beyond the Banks” March 12th, 2013, Jefferson City, MO.

Luncheon speaker at the Soil and Water Conservation Society Modeling Summit 2011 - Advancing the Science of Modeling, March 30th, 2011, Denver, CO.

Invited lecture to the “Food, Energy, and Quality of Life in Iowa” graduate class at Iowa State University, on the difference between ecological and environmental economics approaches to agricultural policy, September 21st, 2009.

North Carolina A&T State University, Energy and Environmental Systems Seminar, April 12th, 2010.

Iowa State University Biobased Industry Center Energy Camp, May 21st 2010.

University of Minnesota, Applied Economics Department, Environmental and Resource Economics Seminar, April 26th 2010.

University of Illinois at Urbana-Champaign, Department of Agricultural and Consumer Economics Seminar, September 10th 2010.

University of Iowa, Department of Geography, Kohn Colloquium, October 29th 2010.

CONFERENCE PAPERS AND POSTERS

Secchi S. 2022. Water Quality and Adaptation to Climate Change. Iowa Organic Conference, November 20-21, Iowa City, IA.

Secchi S. 2022. Slaughtering Sacred Cows: Tech Fixes Won't Correct the Extractive Nature of US Agriculture. Phosphorus Week, November 1-4, Raleigh, NC.

Secchi S. 2020. Understanding the Cost Benefit Analysis of the Waters of the US rule. Presidential Session on Pedagogical Tools: Fundamental Concepts and Methods. Annual Meeting of the Southern Economic Association, November 21-23 (virtual).

Secchi S. 2020. Regulatory Environmental Cost-Benefit Analysis: A Case Study of the Waters of the United States Rule. Innovations in Teaching Environmental and Resource Economics ENV/TLC Track session of the Annual Meeting of the Agricultural & Applied Economics Association, August 5 (virtual).

- Secchi S. 2019. The State of Water Quality Strategies in the Mississippi River Basin: Is Cooperative Federalism Working? American Water Resources Association, Annual Water Resources Conference, November 3-6, Salt Lake City, UT.
- Secchi S. 2015. The push and pull of conservation, energy and climate mitigation policies on agricultural landscapes: the case of conservation tillage. Conference on Complex Systems, September 26-30, Tempe, AZ.
- Secchi S. 2015. The potential of conservation tillage payments as a climate mitigation strategy. AAG Annual Meeting, April 21-25, Chicago, IL.
- Eichholz M. W., R. T. Alisauskas, J. O. Leafloor, S. Varble, & S. Secchi. 2013. Feasibility of Commercial Wildlife Exploitation as a Management Tool: Snow Geese as a Case Study of Overabundance. 20th Annual Conference of The Wildlife Society, October 5-10, Milwaukee, WI.
- Secchi S. & S. Varble. 2013. We Can Beat Them If We Eat Them: Assessing the Marketing Potential of the Asian Carp in the US. Symposium on the Culture, Biology, and Management of Asian Carps in North America, 143rd Annual Meeting of the American Fisheries Society, September 8-12, Little Rock, AR.
- Wade T., L.A. Kurkalova, & S. Secchi. 2013. Estimation of Discrete Choice Models with Aggregate Data: An Application to the Adoption of Conservation Tillage. Presented at the USDA ERS and Farm Foundation workshop "Agricultural Markets for Ecosystem Services: Greenhouse Gases, Conservation Practice Adoption & Behavioral Responses", August 8th, Washington D.C.
- Secchi S. & L.A. Kurkalova. 2013. Estimating the Cost of Supplying Greenhouse Gas Offsets with Continuous Conservation Tillage. Presented at the USDA ERS and Farm Foundation workshop "Agricultural Markets for Ecosystem Services: Greenhouse Gases, Conservation Practice Adoption & Behavioral Responses", August 8th, Washington D.C.
- Varble S., & S. Secchi. The Role of Watershed Management Groups and Key Stakeholders in the Resilience and Sustainability on a Rural Iowa Watershed. SWCS Annual meeting, Reno, NV 21-24 July 2013.
- Varble S., D. Varble & S. Secchi. Potential for Perennial Crops for Bioenergy Production: Results of a Survey from an Iowa Watershed. SWCS Annual meeting, Reno, NV 21-24 July 2013.
- Smith S., S. Varble & S. Secchi. 2013. Fish Consumers: Purchasing Habits and Environmental concerns. Selected Poster for the 2013 Annual ICHRIE Summer Conference, July 24-27, St. Louis, MO.
- Wade T., L.A. Kurkalova, & S. Secchi. 2012. Using the Logit Model with Aggregated Choice Data in Estimation of Iowa Corn Farmers' Conservation Tillage Subsidies. AAEA Annual Meeting, August 12-14, Seattle, WA.
- Kurkalova L.A., S. M. Randall, & S. Secchi. 2012. The Impact of Energy Price Changes on Cropping Patterns in Iowa. 31st USAEE/IAEE North American Conference, November 4-7, Austin, TX.
- Kurkalova L.A., S. M. Randall, & S. Secchi. 2012. The Impact of Energy Price Changes on Cropping Patterns in Iowa. AERE Session at the Southern Economics Association Annual Meeting Nov 16-18, New Orleans, LA.
- Secchi S. 2012. Integrating Biofuel Production and Mitigation Strategies Into Agricultural Landscapes. Bioenergy and Biodiversity: Oxymoron or Opportunity? Symposium at the Ecological Society of America Annual Meeting, 5-10 August, Portland, OR.

- Kurkalova L.A., R. Dodder, A. Elobeid, T. Johnson, O. Kaplan, S. Secchi, & S. Tokgoz. 2011. Land-Use Impacts of Emerging Biomass Feedstock Markets: Accounting for Agricultural and Energy Market Interactions and the Variability of Local Conditions. Association of Environmental and Resource Economists' Inaugural Summer Conference, 9 - 10 June, Seattle, WA.
- Secchi S., S. Esling, C. Lant, & J. A. Koropchak. 2011. The Environmental Resources and Policy Ph.D. Program at Southern Illinois University Carbondale: a Success Story. Facilitating Interdisciplinary Research and Education Symposium, March 28-29, Boulder, CO.
- Secchi S., J. Fargione, J. Remo, B. Moseley, T. Strole & S. Kraft. 2010. Stacking Ecosystem Services in Reconnected Floodplains: Linking Socioeconomic and Biophysical Analysis to Improve Floodplain Management. Selected paper at the Soil and Water Conservation Society Annual Meeting, July 18-21, St. Louis, MO.
- Secchi S., P.W. Gassman, M. Jha, L.A. Kurkalova, & C.L. Kling. 2010. Potential Water Quality Changes Due to Corn Expansion in The Upper Mississippi River Basin. Selected paper at the 4th World Congress of Environmental and Resource Economists, June 28-July 2, 2010, Montréal, Canada.
- Kurkalova, L.A., S. Randall, & S. Secchi. 2010. Land-Use Implications of the Changes in Energy Prices. Selected Poster at the Agricultural and Applied Economics Association 2010 Annual Meeting, July 25-27, 2010, Denver, CO.
- Secchi S., P.W. Gassman, M. Jha, L.A. Kurkalova, & C.L. Kling. 2009. The Water Quality Effects of Corn Expansion in the Midwest. Selected poster at the USDA, USGS, EPA and SWCS "Science to Solutions (Gulf Hypoxia)" workshop on December 9-11, 2009 Des Moines, IA.
- Secchi S. 2009. Balancing Conservation Policy: Targeting Ecosystem Service Provision with Feedstock Production for the Bioeconomy in the Midwestern U.S. Invited presentation at the organized Symposium: "Integrating science and policy for watershed sustainability: Balancing hydrological services, quality of life, and economic vitality" (OOS #4185) at the Ecological Society of American Annual Meeting August 2-7 2009, Albuquerque, NM.
- Secchi S., L.A. Kurkalova P.W. Gassman, & B. Babcock. 2009. Land Use and Environmental Impacts of Corn Grain vs. Cellulosic Ethanol: Policy Implication. Selected paper at the 2009 SWCS Annual Conference July 11-15, Dearborn, MI.
- Secchi S. (Invited speaker). 2009. Ethanol Production and the Mississippi River, an Economic Perspective. 2009 Mississippi River Conference: "Visions of a Sustainable Mississippi River: Merging Ecological, Economic, and Cultural Values", organized by the National Great Rivers Research and Education Center and The Nature Conservancy, August 10 – 13, 2009, Collinsville, IL.
- Kurkalova, L.A., S. Secchi, & P.W. Gassman. 2009. Harvesting Corn Stover and Crop Residue Management: The Impact of Conflicting Economic Incentives, Selected Poster at the Annual AERE Workshop - 2009 Theme: Energy and the Environment, Washington, DC June 18-20, 2009.
- Kurkalova, L.A., S. Secchi, & P.W. Gassman. 2009. Effectiveness of Environmental Policies and Bioenergy Production Incentives. Selected paper at the SWCS Annual Conference July 11-15, 2009, Dearborn, MI.
- Kurkalova, L.A., S. Secchi, & P.W. Gassman. 2009. Effectiveness of Environmental Policies and Bioenergy Production Incentives. Selected Poster at the AAEE & ACCI Joint Annual Meeting in Milwaukee, WI, July 26–28, 2009.

- Secchi S., P.W. Gassman, M. Jha, L.A. Kurkalova, & C.L. Kling. 2008. Rotation and Water Quality Effects of Harvesting Corn Stover, Selected AERE paper at the AAEA & ACCI Joint Annual Meeting, July 27-29 2008, Orlando, FL (session 3059).
- Secchi S., P.W. Gassman, & B.A. Babcock. 2008. Land Use and Environmental Impacts of Corn Grain versus Cellulosic Ethanol: a GIS Approach, Selected paper at the 28th USAEE/IAEE North American Conference, "Unveiling the Future of Energy Frontiers.", December 3-5 2008, New Orleans, LA, USA.
- Secchi S., P.W. Gassman, M. Jha, L.A. Kurkalova, & C.L. Kling. 2008. Quality Effects of Corn Ethanol versus Switchgrass-Based Biofuels in the Midwest, Selected paper at the Farm Foundation Conference: Transition to a Bioeconomy: Environmental and Rural Development Impacts, October 15-16 2008, St. Louis, MO.
- Secchi S., L.A. Kurkalova, J.C. Tyndall, P.W. Gassman, & C.L. Kling. 2008. The Next Step for the Bioeconomy: Mapping the Impact of Corn Stover Use on Crop Choice, Land Use, and Environmental Quality". Selected poster at the AAEA & ACCI Joint Annual Meeting, July 27-29 2008, Orlando, FL (session M56).
- Secchi S. 2008. The Environmental Sustainability of Ethanol and Biofuels, Overview presentation at the Iowa State University Extension and Town/Craft Roundtable: "Biofuels and the Rural Economy Roundtable", May 14, 2008, Perry, IA.
- Secchi S., L.A. Kurkalova, C.L. Kling, J. Cooper, P.W. Gassman, & M. Jha. 2006. Water Resource Degradation in the Boone Watershed: Integrating Economic and Watershed Models. Soil and Water Conservation Society workshop "Managing Agricultural Landscapes for Environmental Quality: Strengthening the Science Base", Kansas City, MO, October 2006.
- Secchi S. 2005. Watching Corn Grow: a Hedonic Study of the Iowa Landscape, Eastern Economic Association Annual Conference, New York City, NY, March 2005.
- Secchi S. 2001. Models to Support TMDL Development Across the Midwest (Symposium), American Agricultural Economics Association Annual Meeting, Chicago, IL, August 2001.
- Secchi S., & B.A. Babcock. 2001. Optimal Pesticide Usage with Resistance and Endogenous Technological Change, American Agricultural Economics Association Annual Meeting, Chicago, IL, August 2001.
- Secchi S., T. M. Hurley, & R. L. Hellmich. 2001. Managing European Corn Borer Resistance to Bt Corn with Dynamic Refuges, 5th ICABR International Conference, Ravello, Italy, June 2001.
- Secchi S., & B.A. Babcock. 1999. A Model of Pesticide Resistance as a Common Property and Exhaustible Resource, American Agricultural Economics Association Annual Meeting, Nashville, TN, August 1999.
- Secchi S., & B.A. Babcock. 1999. Managing Pest Resistance: The Potential Of Crop Rotations And Shredding, American Agricultural Economics Association Annual Meeting, Nashville, TN, August 1999.

PROFESSIONAL ACTIVITIES

- Editorial Board of Conservation, Review Editor, Frontiers, 2019-present
- Editorial Board, Applied Economic Perspectives and Policy, 2015-present
- Oklahoma EPSCoR External Advisory Board Member 2017-2018

Participant at invitation-only Purdue University University of Illinois workshop “Scientific Challenges to Operationalizing Payments for Agro-Ecosystem Services (PAgES)” (organized by Ben Gramig and Sylvie Brouder). Indianapolis, IN, November 2017

Consultant, Walton Family Foundation – Developing a Score Card for Iowa and Illinois’ Nutrient Reduction Strategies. 2016-2017

Program Committee Member for the 6th World Congress of Environmental and Resource Economists, 2018

National Science Foundation, panelist, 2010, 2011, 2014, 2016, 2017, 2018, 2019 and 2023. Ad hoc reviewer, 2012, 2013, 2014, 2016, 2017

USDA – NIFA panelist, 2017 and 2018. Ad hoc reviewer 2014 and 2016

Reviewer for Selected Paper Sessions of the American Agricultural Economics Association meetings, 2002, 2003, 2008 and 2016

Author of working paper II for the USDA and C-FARE workshop, 'Economic Valuation of Conservation Based Ecosystem Services', July 21, 2015, Washington, DC

Participant, inaugural SESYNC short course, Teaching Socio-Environmental Synthesis with Case Studies, July 23-26, 2013, Annapolis, MD

Planning Committee Member, AWRA 2013 Spring Specialty Conference: “Agricultural Hydrology and Water Quality II”, March 25-27, St. Louis, MO

Participant, NSF workshop on Developing and Sustaining Interdisciplinary Graduate Programs, 7-8 October 2012, Coeur d’Alene, ID

EPA Star Fellowship Panelist, 2012

Program Committee Member for the 18th and 19th Annual Meetings of the European Association of Environmental and Resource Economists, 2011 and 2012

Member of the Middle Mississippi Wetland Field Station Advisory Committee Southern Illinois University, 2009- 2017

Rapporteur at the JRC/EEA/OECD Expert Consultation: “Review and inter-comparison of modeling land use change effects of bioenergy”, Paris, France, 29-30 January 2009

Reviewer for the National Institutes for Water Resource - U.S. Geological Survey Competitive Grants Program, 2009 and 2011

Reviewer for the Collaborative, Highly Interdisciplinary Research Program at the Swiss Federal Institute of Technology, Zurich Research Commission, 2009

Reviewer for Selected Paper Sessions of the 3rd World Congress of Environmental and Resource Economists, 2006

Reviewer for USDA-CSREES Conservation Effects Assessment Project, 2005 and 2006

Reviewer of the Union of Concerned Scientists’ report “CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations” URL: http://www.ucsusa.org/food_and_environment/sustainable_food/cafos-uncovered.html.

Reviewer for: Agriculture, Agricultural and Resource Economics Review, Agriculture and Human Values, Agronomy Journal, Appetite, American Journal of Agricultural Economics, Applied Economic Perspectives and Policy, Applied Geography, Biofuels, Biological Invasions, Biomass & Bioenergy, BioScience, Choices, Ecology, Ecological Applications, Ecological Economics, Ecosystem Services, Energy Policy, Environmental and Development Economics, Environmental and Resource Economics, Environmental Management, Environmental Research

Letters, Environmental Science & Technology, Frontiers of Ecology and the Environment, GCB Bioenergy, Intelligent Systems in Accounting, Finance and Management, International Journal of Digital Earth, Journal of Agricultural and Applied Economics, Journal of Agricultural and Resource Economics, Journal of Applied Geography, Journal of Environmental Economics and Management, Journal of Great Lakes Research, Journal of Soil and Water Conservation, Land Use Policy, Landscape and Urban Planning, Journal of Natural Resources Policy Research, Journal of Soil and Water Conservation, Nature Climate Change, PLoS ONE, SAGE Open (Article Editor), Science of the Total Environment, Society & Natural Resources, Sustainability, Proceedings of the National Academies of Science, Transactions of ASABE

UNIVERSITY SERVICE

2019 – current, Governmental Relations Committee
2019 – current, Office of Sustainability Advisory Board
2019 – current, Center for Global & Regional Environmental Research Executive Committee
2018 – current, Center for Health Effects of Environmental Contamination Executive Committee
2020 – 2021, Sustainability Investment & Purchasing Practices Subcommittee
2019 – 2022, Underrepresented Students in Sustainability Mentoring Program Mentor
2018 – 2022, Faculty Assembly

ACADEMIC HONORS AND AWARDS

Southern Illinois University Early Career Faculty Excellence Award, 2012 [inaugural winner].
Yellow Ribbon Poster Presentation, with L.A. Kurkalova, and P. W. Gassman, Agricultural and Applied Economics Association, 2009.
2009 Editor's Choice Award, Journal of Soil and Water Conservation: Secchi, S., J. Tyndall, L.A. Schulte, and H. Asbjornsen. 2008. High crop prices and conservation: Raising the stakes. *Journal of Soil and Water Conservation* 63(3):68A-73A.
Iowa State University College of Agriculture and Life Science Team Award, to the Resource and Environmental Policy Division. 2008.
Second Place Poster Presentation, with M. Jha, L.A. Kurkalova, C.L. Kling, H. Feng, P.W. Gassman, and T. Campbell, American Agricultural Economics Association, 2005 and 2006.
Second Place Poster Presentation, with C.L. Kling, H. Feng, L.A. Kurkalova, P.W. Gassman, M. Jha, T. Campbell, A. Bhaskar, C. Burkart, S. Sengupta and R. Olson, American Agricultural Economics Association, 2004.
First Place Poster Presentation, with C.L. Kling, L.A. Kurkalova, and P.W. Gassman, American Agricultural Economics Association, 2003.
Outstanding Ph.D. Dissertation (Honorable Mention), American Agricultural Economics Association, 2001.
Professional Advancement Travel Grant, Iowa State University, 1999.
Premium for Academic Excellence Award, Iowa State University, 1996.

OUTREACH PRESENTATIONS AND PODCASTS

- 2021-2023 – [We All Want Clean Water](#) – Podcast co-host and producer (31 episodes)
- 2023 - [The Power of Big Pork](#) – Foodprint podcast
- 2022 - [Iowa's Industrial Agriculture](#) – The Checkout podcast
- 2022 - “[Cows, Climate and Culture Wars: Putting Bad Policy Out to Pasture](#)” virtual panel, Center for Biological Diversity.
- 2022 - “[Human Rights and Climate Change: Iowa's Challenges & Opportunities](#)” virtual panel, UI Center for Human Rights and the Environmental Law Initiative.
- 2022 – “Celebrating 50 years of the Clean Water Act”, panel, Sierra Club, Waterloo, IA.
- 2020 – Webinars on Agriculture and Climate Change for the Iowa Farmers Union and Environment Iowa
- 2019 – Science Café, The current state of the Paris agreement, Fairfield and Mount Vernon, IA
- 2018 – Wonk Wednesday, America out of Paris: the current state of global climate change policy, University of Iowa, Iowa City, Iowa, United States
- 2018 – Rapid Response History, Liquid Gold or Fool's Gold? Biofuels in the US, University of Iowa, Iowa City, Iowa, United States
- 2011 – Carbondale Science Café’ – Presentation on Biofuels, March 24
- 2009 – Speaker, “No Silver Bullets: Unintended Consequences Of Oil And Water Solutions”, May 18, Indo-American Center, Chicago, IL
- 2008-2013 – The View: Expert opinions on a special series on energy for The Southern Illinoian newspaper. 22 short perspectives 2022

SELECTED MEDIA

- [Farmers Could Be the Nation's Leading Environmentalists](#) *Mother Jones* 2024
- [The myths we tell ourselves about American farming](#) *Vox* 2023
- [The Biden Administration Bets Big on 'Climate Smart' Agriculture](#) *FERN/Yale360* 2023
- [Opinion/Solutions: Ancient grain may help with climate change](#) *The Atlanta Journal Constitution*
- [Don't be fooled by exaggerated 'benefits' of carbon pipelines](#) *Des Moines Register Opinion* 2022
- [As Congress funds high-tech climate solutions, it also bets on a low-tech one: Nature](#) *The Washington Post* 2022
- [Expansion of a Lucrative Dairy Digester Market is Sowing Environmental Worries in the U.S.](#) *Inside Climate News.* 2022
- [Climate change is making it harder to provide clean drinking water in farm country](#) *NPR*
- [How Corn Ethanol for Biofuel Fed Climate Change](#) *Civil Eats* 2022
- [North Carolina's Department of Environmental Quality is facing its second complaint for permitting hog waste operations in poor communities of color](#) *The Counter* 2021
- [The USDA Wants to Make Farms Climate-Friendly. Will It Work?](#) *Mother Jones/FERN* 2021
- [Regenerative agriculture needs a reckoning](#) *The Counter* 2021
- [Tom Vilsack for USDA? Expect more inaction on hunger, discrimination, pollution and rural decline](#) *Des Moines Register Opinion* 2021
- [The Approaching Climate Crisis: What EPA Rollbacks Mean For Water And Air Quality In The Midwest,](#) *Iowa Public Radio River to River* 2020

- [Iowa scientists urge state leaders to use pandemic, derecho to prep for climate change, *Iowa City Press-Citizen*](#) 2020
- [Iowa's water quality strategy is not working. Here's what should be done instead. *Des Moines Register Opinion*](#) (with Neil Hamilton, Matt Liebman, and Chris Jones) 2020
- [Iowa Farmers Face Climate-Fueled Destruction, While the Industry Says it's 'Just Weather', *Civil Eats*](#) 2020
- [Democrats court Iowa farmers on climate, conservation, *E&E News*](#) 2020
- [Report: Many Iowa counties underusing private well testing funds, *The Gazette*](#) 2019

MEMBERSHIPS

Agricultural & Applied Economics Association
 Association of American Geographers
 Association of Environmental and Resource Economists
 Ecological Society of America