



**Science
Societies**

Crops and corridors: An illustrative approach to an agricultural–environmental symposium

By Joel I. Cohen

| May 25, 2022



Legend

- | | |
|------------------------|-------------------------------------|
| A Potomac River | F Edge rows around crops |
| B C&O Canal | G Crop field within forest corridor |
| C Canal towpath | H. Urban development |
| D Canal elevation lock | I. Riparian corridor |
| E Lockkeeper's house | |

Figure 1. Illustration of landscape surrounding, and part of, the Chesapeake and Ohio Canal National Historical Park and research findings as related to corridors, agriculture, and the Chesapeake Bay watershed featured in this symposium.

Restoring the environment, particularly those areas affected by humanity, is no longer a luxury, but rather a survival imperative. However, the means to accomplish such results becomes more often a source of debate than achievement. A symposium scheduled for this year's International Annual Meeting in Baltimore uses multidisciplinary approaches as an illustrative means of exploring one objective of this goal: enhancing environments and agricultural systems through conservation and nutrient management. This symposium, "Corridors and Crops: Communicating Benefits From Balancing Biodiversity, Productivity and Conservation," will take place over two days (8 and 9 November). Presenters will cover topics in five approaches to the objective, as detailed below, with a longer-term goal of improving health and viability of the Chesapeake Bay Watershed. Ideas conveying baseline assessments and ongoing work, prioritized after this symposium, will be collected and disseminated to effect broader public communication.

For this reason, an intentional, multidisciplinary method is used as a "first step" in testing such an approach for broader application within the Societies' Annual Meeting. It is recognized up front that any of the five approaches (Table 1) described here could form a full program in itself. Thus, this symposium seeks rather to identify how and if conservation approaches and agriculture might not do more for one another than initially considered. One such complex of interactions is represented by the Chesapeake Bay Watershed, which will serve as a "site-specific" place to evaluate

these ideas.

Table 1. Crops and corridors: symposium topics bearing upon conservation-agricultural approaches with relevance to nutrient loss and gains in the Chesapeake Bay watershed.

Approach	Approach title	Relation to landscape Figure	Presenter ¹	Primary focus ²
1.	Overview of Historical Versus Ecological Documentation	Historical: D, B, C, E Ecological: G, I	Cohen and Muller	Stages of development to change a waterway into a nation, ecological benefits to be derived by agriculture
2.	Conservation Corridors and Lessons Learned	I, A, B	Pimm Hilty	Effects of corridors (greenways, riparian, conservation) on surrounding environment
3.	Plant-Nutrient-Environment Interactions and Effects on Chesapeake Bay	Letters F, G, A, B	Furey Lynch Gaxiola McGee Dubin	Approaches to increase uptake and utility of fertilizers: root phenotype selection; applications of genetic resource and technologies

Approach	Approach title	Relation to landscape Figure 1	Presenter 1	Primary focus 2
4.	Chesapeake Bay Environmental Indicators	Tidewater area for A and B, and effects of cover crops in F, G	McGee and Dubin	Trends in presence of fertilizer runoff in the Chesapeake Bay
5.	Diversity in Cover Crops and Other Conservation Data	F and G	Dubin	Discussion of buffer crop trials incorporating diversity of cover crops, conservation tillage
6.	Effecting Greater Cooperation	All	Post-symposium summation	To be determined
7.	Communication Strategy	A – I and interactions	Cohen and Muller	Distilling key messages from presentations to reach larger audience

For greater detail, see presenters and topics in Table 1.

Approach 1: Orientation, Possibilities, and Clarifying Objectives

The symposium begins by describing steps taken to, over much friction and contradiction, change an abandoned canal system into what became the Chesapeake and Ohio Canal National Historical Park (Figure 1), totaling more than 20,000 ac, including areas reserved for agriculture. Here, field crops abut riparian or wetland corridors. The presentation begins with the canal's development, starting prior to the park's induction, and concludes with work that began in 2001 to catalog species, thus

marking the start of efforts in biodiversity.

This combined work in natural resources is poised to make the canal a place where species census can be maintained, crucial soil/water measurements taken in and around agricultural acreage, and centers of biological diversity monitored to accompany records on agricultural productivity. Such benefits could include cleanup of excess or unused fertilizer, minimizing runoff into the Potomac River and Chesapeake Bay watershed. In this sense, the canal could provide long-term data on how nature conservation could help with environmental restoration.

Finally, opportunities for agricultural farms and crops in general to benefit from conservation corridors will be addressed in the symposium. This information will later be related to other relevant presentations with beneficial practices identified.

Approach 2: Applications and Corridors

Efforts to explore and explain how modern corridors could do more environmentally and combat fragmentation will be explained by Drs. Pimm and Hilty. Examples of corridors and the types of benefits derived thus far will be presented. These benefits and impact could then be considered in how such corridors could mitigate environmental losses in relation to agriculture.

Approach 3: Plant Productivity Factors

For this approach, the work of Drs. Furey, Lynch, and Gaxiola is presented, most directly covering plant–nutrient–environment interactions. This will include approaches being evaluated at the molecular, genetic resource, and root phenotypic architecture level. Selection of beneficial traits will also include source material derived from genetic diversity and nitrogen uptake efficiency.

Approach 4: Environmental Indicators

Dr. McGee will provide an overview of the Chesapeake Bay Foundation's efforts in combatting runoff, and Dr. Dubin will speak on broader cultural practices, including monitoring bay nutrient levels and effects of diverse cover crops. Each speaker will close with points of interest and recommendations to reach the public.

Approach 5: Cultural Practices

Dr. Dubin will consider cultural practices as one means of combatting nutrient runoff. This includes selecting for cover crops that can positively affect row crops and searching among diverse types of cover crops for improved options, based on research through University of Maryland and USEPA Chesapeake Bay Program Office.

In Summary

In summary, the objectives are to (i) enhance understanding of biodiversity and corridors on crop management and conservation, (ii) collect and communicate expected benefits of the above to the public and for publication of proceedings; and (iii) clarify benefits to/from biodiversity to reduce nutrient runoff to the Chesapeake Bay.

Additionally, it is planned to have two publications from this symposium: first, a book of proceedings, reports, and summaries addressing each of the three objectives above, and second, a special report for broader dissemination of results to the public. In closing, I wish to extend personal thanks and appreciation to our moderator, Dr. Jane Devers; each of our speakers; and my co-author, Ms. Sue Muller.

[More news & perspectives](#)

[Back to issue](#)

[Back to home](#)

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.