

Leading at the Edge: Advancing Edge of Field Practices Webinar Q&A

The [Edge of Field Roadmap](#) launched on February 5, 2021, with a 1-hour webinar featuring a diverse panel of experts: Kris Johnson, The Nature Conservancy; Clare Lindahl, Soil and Water Conservation Society; Keegan Kult, Agricultural Drainage Management Coalition; Scott Berry, U.S. Water Alliance; Leonard Jordan, LJ Conservation Matters, LLC; and Kristen Weeks Duncanson, Highland Family Farms.

The webinar recording can be viewed [here](#). Attendees asked many questions, but, unfortunately, time ran out and some questions were left unanswered. Below, find those questions and the answers from our panel of experts. If you have additional questions about the Edge of Field Roadmap, please email soil@tnc.org.

Q: I'm interested in hearing the panelists' thoughts on scaling up in-field and edge-of-field solutions, particularly in terms of enabling policies, given the opportunities of the UN conferences this year across the biodiversity, climate and lands conventions, as well as the UN Food Systems Summit and the kickoff of the UN Decade for Ecosystems Restoration.

A: Thanks for the connection to that important UN dialogue on food systems. We focused our work on the US so haven't explicitly talked about international policy related to Edge of Field (EoF), but clearly these practices are an important part of the solution in a wide variety of production systems, climate zones, growing regions etc. Please let us know of ideas for how to bring discussion and consideration of these practices into that dialogue!

Q: What do you consider to be a suitable acreage for these EoF practices? Keegan Kult noted ADM has identified 30 million acres of land in the Midwestern United States that has a high probability of being suitable for controlled drainage. How was the 30 million acres identified?

A: The [Controlled Drainage Suitability Tool](#) identified soils that are likely to be or have been drained for crop production. And for economic feasibility, the identified land is relatively flat to maximize the spatial area controlled by each water control structure. The query data sources are the United States Department of Agriculture: 2017 gSSURGO data from the Natural Resources Conservation Service (USDA-NRCS) and the 2015 Cropland Data Layer from the National Agricultural Statistics Service (USDA-NASS), and employed the following parameters:

- Flat topography (1% slope or less)
- Soils that have a seasonal high water table (saturated to within 18 inches (46 cm) of the surface during the growing season)
- Cropland land use
- 15 acres or more of contiguous surface area (to represent economic feasibility)

Q: There is strong evidence of the effectiveness of EoF practices in reducing nitrogen runoff; does the Roadmap offer additional practice recommendations to address phosphorus management (particularly dissolved phosphorus)?

A: The Roadmap process included a detailed literature review where we evaluated the effectiveness of many practices. The report includes a discussion and a summary table of practices showing their estimated

reductions of nitrate-nitrogen (NO₃-N), total phosphorus (TP) and dissolved reactive phosphorus (DRP). See the report here for more detail: nature.org/EdgeofField

Q: Are there plans to develop a peer reviewed publication on the Roadmap's analysis of EoF practices? Can you speak to the current availability and summarization of the references that speak to the scientific support for this work?

A: Currently, we don't have the capacity to pursue a peer reviewed publication. This effort is really focused on putting this information in the hands of our public and private partners who can act to increase implementation of these practices. The science review in the report provides a solid foundation and we plan to focus on how to use that info to make changes happen on the landscape. A longer, comprehensive version of the literature review on practice effectiveness, costs, and co-benefits is referenced in the report and available as a [supplement to the Roadmap](#).

Q: Do you host this webinar for other groups?

A: This is our first webinar and serves as our public launch of the Edge of Field Roadmap. TNC is happy to share this information in other venues. Contact us at soil@tnc.org.

Q Was the selection of these practices based on cost effectiveness, or only on effectiveness? Are there associated data on costs to install?

A: The Roadmap does consider cost effectiveness in addition to practice efficacy. There is summary of cost information included in the practice table in the report.

Q: Has the group considered policies that permit commercial collection of milkweed pods/seed from USDA-funded pollinator restorations to provide added income/incentive to help encourage producers to maintain practices into the future/beyond the contract or drive adoption?

A: The Roadmap process did not consider that policy; however, in general, what you'll find as you go through this report is that it is meant to "set the table" for further action. It doesn't provide all the answers. The most powerful thing about the Roadmap is that readers see themselves and their priorities in its recommendations. They'll see ideas for specific projects, specific tactics, and specific policies that we as authors didn't get the chance to fully elaborate in its development. This document should help foment that discussion and that next step of getting specific and tactical.

Q: In the economic portion of this effort, is there analysis of the business economic impact (separate from environmental impacts) of incorporating these practices on the farm, to help the farmer better understand how it will affect their bottom line and make better decisions about whether or how much financial assistance is needed to make these practices make financial sense?

A: It's important to note that there are multiple ways to think about the economic impact of EoF practices. Edge of field practices are important for water management within the field which, in some cases, have also produced yield benefits. Depending on the practice, some drainage systems have shown up to a 20% increase in production from having a properly drained field. With practices like control drainage and drainage water management, that yield bump can help pay for itself. Current literature reports about a 5-10% increase in yield for drainage water management and control drainage systems -- this bump is even greater when farmers

experience wet springs followed by the dry summers. With the advent of automated control structures and more prescriptive drainage management plans, we might even see the yield increase approach 10-20%.

Additionally, precision agricultural information can help identify spots within fields where profitability tends to be lower over time because of highly erodible soil, sensitive lands --places that tend to collect rainwater. One of our Roadmap collaborators, Ryan Heiniger, from Pheasants Forever, Quail Forever is working on a body of work to train precision ag and conservation specialists to run EFC Systems' Profit Zone Manager; a computer program that combines yield map data with input costs and grain prices to generate profitability maps. The program identifies areas that are under-performing in terms of profitability thereby offering opportunities for producers to manage marginal acres differently, such as installing edge of field practices that may ultimately boost the profitability of their farm.

In cases where that approach doesn't work, there is an opportunity for continued public investment in practices that provide strong off-farm benefits to communities.

And, finally, these practices are also great candidates for emerging carbon and ecosystem service markets because, acre for acre, these perennial systems, prairie strips, restored wetlands buffers, they provide really solid benefits in terms of reducing nutrient and sediment loss and also storing carbon in soils and in biomass. There are other resources that touch in more detail on the economic impact. The body of work led by AGree through Meridian on the financing of practices, is one example.

Q: Is there any interaction with regulatory agencies about collaborating on these voluntary efforts to reduce loss of nutrients and sediment to waterways? Perhaps as alternatives to TMDL or other state or local regulatory approaches?

A: The Roadmap development process included a fantastic partner from the water utility in the City of Cedar Rapids. Cedar Rapids has really done some really innovative, forward-looking things to build collaborative approaches between the city, the water utility, and upstream ag partners to address issues managing nutrients, wastewater and drinking water. One of the Roadmap recommendations focuses on identifying and strengthening enabling conditions to build and foster strong, collaborative models like the one in Cedar Rapids. This is certainly not easy to do; there's not often one single thing that you can point to that makes those productive collaborations unfold; however, recognizing the potential of collaborative integration between regulatory agencies, water utilities, and agricultural communities is a key opportunity for success.

To build on that, there are lots of states like Iowa or Wisconsin where the regulatory agency is considered a partner to the utilities because they've set up a regulatory structure that enables the creation of partnerships like the example in Middle Cedar. That said, in Oregon we experienced the opposite; the utility had to go through something like a year or 14-month long permitting process to get a special waiver from the Department of Natural Resources. So, the role of the regulatory agency in being either a barrier or an enabling condition for these kinds of things really can't be understated. So, it's super important to emphasize what the role of the regulatory agency is outside of the utility itself or its desire to participate in those kinds of collaborations.

Q: Is this program targeted geographically (i.e., Upper Midwest)?

A: The Roadmap is a national report focusing on U.S. programs, policies, and conditions. That said, there are less scientific data and case studies available outside of the Upper Midwest row crop system for many of these practices. We hope that we can learn, adapt, and expand in other U.S. geographies like the Great Lakes,

the Southeast and Florida, the Chesapeake Bay, and California where there are great practices and projects underway, but lack robust representation in the literature. Nevertheless, many of the same economic and biophysical performance features highlighted in the Roadmap apply regardless of location.

Q: Does the framework include opportunities to adjust management of EoF practices (maybe waterways or saturated buffers) to provide wildlife habitat?

A: This is exactly the kind of thing that we need to think about in the next phase. We know that that the habitat piece is key for a lot of these practices, not all of them, but a lot of them. Of course, that's going to vary from place to place, depending upon the region, the farming system, and the context in the landscape. In the implementation phase of the Roadmap recommendations, we have to get a lot more tactical about how to design these so that they have the greatest wildlife and habitat benefits as possible.

Q: Do the practices highlighted target tile-drained landscapes or were irrigated landscapes included in the review as well?

A: The Roadmap does not only target tile drained landscapes. We made the distinction between a suite of practices that are applicable in tile drained landscapes that won't work in landscapes without and other practices that are applicable regardless of whether tile drainage was present or not. Unfortunately, the Roadmap lacks a focus on dry land, irrigated agriculture --not to say there aren't real opportunities in the corners of fields around pivots for targeted restoration, but not the focus of this report.

Q: I work directly with growers and landowners to encourage adoption of conservation practices. One of the difficulties of getting EoF practices off the ground is the lack of clear funding avenues and engineering availability. Regarding funding, unless there is a dedicated RCPP or watershed demonstration project in an area, you may not get 100% funding for an EoF (if you're working through state or federal agencies). Regarding engineering, often the wait is so long (1 year+) that landowners back out (again, this assumes you're working with state or federal agencies for cost-share funding.) Is there any work being done to streamline funding and engineering requirements at the policy-making level?

A: Soil and Water Conservation Society (SWCS) and Agricultural Drainage Management Coalition (ADMC) are working on developing multi-state process models that provide a graphic visualization of the steps necessary to implement these practices at scale. These models aim to identify potential efficiencies that can be duplicated in other geographies, and where there's a need for more or broader technical assistance based on common pain points and opportunities with the ultimate goal of sharing this information with decision-makers that can advocate for change.

Additionally, the National Land Improvement Contractors of America (LICA) has signed a Memorandum of Understanding with NRCS to start providing technical service provider certifications. ADMC is working with LICA to help conduct the trainings so we can get more people out there that have job approval authority to write plans and design these practices.

From a farmer's perspective, one of my EoF projects was developed as a larger collaboration that included contributions from both the state of Minnesota and other farmers in the watershed – it's not a bad idea for farmers to have a little skin in the game, too. I know there's always tough push back for that, but the modelling that's available now is helpful for building confidence in the success of a project. Plus, engineers are doing a much better job of talking to each other and sharing learnings about the projects they've done in specific areas.

So, we're making strides. It's not going to happen overnight, but you just hang in there and ask for help from local experts.

Q: How much technical assistance for these practices comes from the Natural Resources Conservation Service (NRCS) and conservation districts? How much from the private sector?

A: Currently, the majority is coming from NRCS but, to scale these practices, we also need to make the framework attractive for the private sector to contribute.

Q: Is there an environmental modeling program specifically designed to analyze EoF practices? Most modeling apps are not designed or cannot accurately predict the effect of implementing EoF practices. The ability to target areas on large scale for the best ROI is key to saving time in planning, money, and return on investment for future water quality projects.

A: There are a variety of modeling and analytic approaches used in agricultural watersheds that can simulate the functions and performance of some edge of field practices. But it is challenging to accurately simulate both cultivated fields and edge of field features and structures accurately, especially when some edge of field practices are fairly new and there are not as many long-term empirical data available about how certain practices perform. There are some very useful approaches that can help guide and target implementation of EoF; for example, the USDA's [ACPF](#) tool uses high-resolution topography, soils and land use data to identify appropriate sites for interventions that can help address soil and water conservation issues.

The Roadmap also identifies a need for long-term investments in science, technology, and data, including to develop improved predictive models that can aid in the placement of conservation practices and provide accurate estimates of potential water quality and ecosystem benefits associated with implementation of in-field, edge-of-field, and downstream practices.

Q: Why can't we tie conservation practices to government subsidies?

A: The conservation programs supported by the federal Farm Bill are the major source of incentive payment available to farmers who choose to install edge of field practices. There are conservation compliance requirements for producers receiving a variety of USDA commodity subsidies, including premium subsidies under the federal crop insurance program. However, these requirements do not extend to the point of requiring installation of edge of field practices, and different federal, state and local policies and programs do in some cases offer contradictory and competing incentives to producers. For this reason, one of the core recommendations in this Roadmap is to "harmonize and coordinate national agricultural policy" so that we reduce the redundancy, inefficiency and competing purposes of various programs oriented toward US agriculture.

Q: Is there a coordinated effort to reach out directly to drainage system installers and farmers to have new drainage systems include control structures?

A: The short answer is not yet. But representatives of the Agricultural Drainage Management coalition and Land Improvement Contractors of America participated in the development of the Roadmap and have been sharing the ideas and information with their members and colleagues. Ultimately, we need to simultaneously build up the incentives for these practices with public and private payments, create more interest among

farmers in installing EoF, and also support greater technical capacity and buy-in among drainage installers and other professionals.