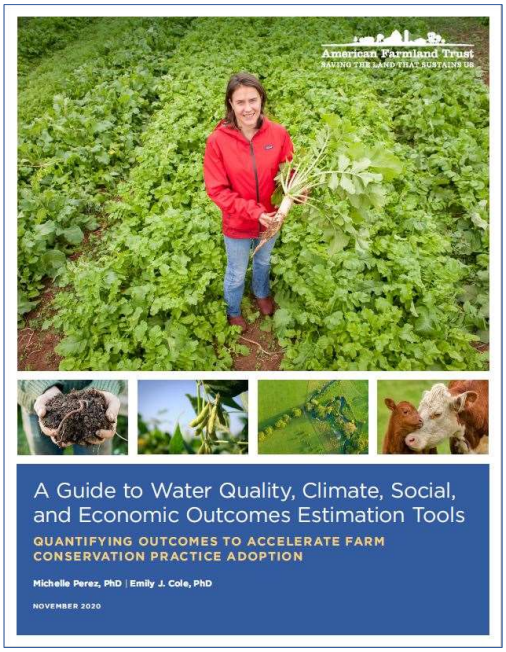


# A Guide to Water Quality, Climate, Social, and Economic Outcomes Estimation Tools

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January 26, 2021

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SAVING THE LAND THAT SUSTAINS US

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Hello and welcome to American Farmland Trust's webinar on our "Guide to Water Quality, Climate, Social, and Economic Outcomes Estimation Tools" presented by the authors, Michelle Perez and Emily Cole. Thank you for joining us today. My name is Ellen Yeatman and I'm the new Water Resources Specialist at AFT and your host today. American Farmland Trust is a national nonprofit founded in 1980. We here at AFT believe that saving the land that sustains us means 1) protecting farmland, 2) promoting sound farming practices, and 3) keeping farmers on the land. First, we want to thank our funders of this project, the Walton Family Foundation, the Mosaic Foundation, and the McKnight Foundation. Next, I'd like to introduce our presenters.

## About Michelle Perez, PhD

- AFT Water Initiative Director
- Formerly with World Resources Institute and Environmental Working Group
- PhD in Environmental Policy from University of Maryland: 3-state comparison of nutrient management plan regulations

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- Dr. Michelle Perez is AFT's Water Initiative Director and lead author of this Guide. Michelle leads AFT's efforts to achieve better water quality and reduce agricultural nonpoint source pollution through a comprehensive water initiative with an emphasis on outcomes quantification.
- Before joining AFT, Michelle worked at World Resources Institute and the Environmental Working Group where she produced analyses on nutrient trading, cost effectiveness of conservation programs, and the importance of geographic targeting in water quality projects.
- Michelle has a PhD in Env. Policy from the Univ. of Maryland where her dissertation was a three-state comparative study of farm nutrient mgmt. regulations.

## About Emily J. Cole, PhD

- AFT New England Climate and Agriculture Program Manager
- Formerly Assistant Professor of Environmental Science, Westfield State University
- PhD in Plant & Soil Science from University of Massachusetts Amherst:
  - Soil Physiochemical and Ecological Responses to Hardwood Biochar Application in Agricultural Soils

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And both authors join us today!

- Dr. Emily Cole is AFT's New England Climate and Program Manager.
- Since joining AFT in 2019, Emily works both to improve and advocate for the integration of climate-smart management practices into New England's productive farming communities. She also leads AFT's Smart Solar Siting Partnership.
- Before joining AFT, Emily was an Assistant Professor of Environmental Science at Westfield State University. She earned her Ph.D. in Plant and Soil Science from UMass-Amherst, where her research focused on improving soil health and carbon sequestration though the application of biochar and implementation of climate-smart management practices.

And now, with no further ado, I will pass the mic to Michelle to kickoff the heart of this presentation.

# Agenda

Provide an overview of Guide

Compare & contrast tools & methods

Share tips to select a tool or a method that might work for you

Review recommendations to further our collective outcomes quantification journey

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Michelle:
Thank you, Ellen and thank you to everyone for joining us today.

- I'll start off by providing an overview of the new Guide and share some definitions to get everyone on the same page, and explain why we undertook this research.
- Then I'll walk you through a few of the key tables listing the water quality, climate, and economic tools and compare and contrast a few tool features.
- Emily will share a few tips with you on how to use the Guide to identify a tool or a method that might work for you.
- And then I'll wrap up by sharing recommendations we think will further us all along our collective outcomes quantification journey.


So just what are project-level outcomes & why should we try to quantify them?

## Outcomes defined by "RCPP Expectations" (NRCS, 2020)

"Outcomes are the measurable environmental, economic and social impacts of RCPP project activities. Examples of outcomes are pounds of nitrogen runoff avoided, tons of carbon sequestered, cost savings to producers, number of neighboring producers adopting a practice, decision factors leading to producer adoption of a soil health management system, etc."

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In our Guide, we featured this definition of outcomes associated with farm conservation practice adoption, which was provided by the five-page "RCPP Expectations" document from the Natural Resource Conservation Service Regional Conservation Partnership Program in 2020. I'm going to read it out as it's a nice way to get us all on the same page . . . Pretty good right? Note that Emily and I did not endeavor to provide our own definitions of outcomes in the Guide.

## Outcomes quantification is required for RCPP & EPA 319 projects

### 2014 RCPP Announcement for Public Funding

"…generate near-term results that are measurable from environmental, economic, and social perspectives."

### Excerpt from 2018 Farm Bill

(E) conduct an **assessment of**—

(i) **the progress made by the project in achieving each conservation benefit** defined in the partnership agreement, including in a **quantified form** to the extent practicable; and

(ii) as appropriate, **other outcomes of the project**; and

(F) at the **conclusion of the project, report to the Secretary on its results** and funds leveraged.

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Now on to the question of why quantify outcomes.

- Well first of all, it is required by the RCPP in the 2014 and 2018 Farm Bills and its required by the EPA's Clean Water Act Section 319 projects.
- The Announcement for Public Funding in 2014 said NRCS would prioritize project selection for the new RCPP program to those projects that promised to, quote, "…generate near-term results that are measurable from environmental, economic, & social perspectives."
- The 2018 Farm Bill refined statutory language further by requiring RCPP projects to conduct an assessment of the progress being made to achieve conservation benefits and report on the outcomes at the conclusion of the project.

## How many farm conservation projects are there?

| Federally-funded projects | |
|---|---|
| **Estimated #** | **Types of project** |
| 600 | EPA 319 |
| 400 | RCPP |
| 47 | MRBI (implementation phase) |
| 19 | MRBI (planning phase) |
| ? | NWQI |
| **1066** | **Estimated Total** |

**How many others?**

- ❑ State?
- ❑ County?
- ❑ Corporate?
- ❑ Overlap?

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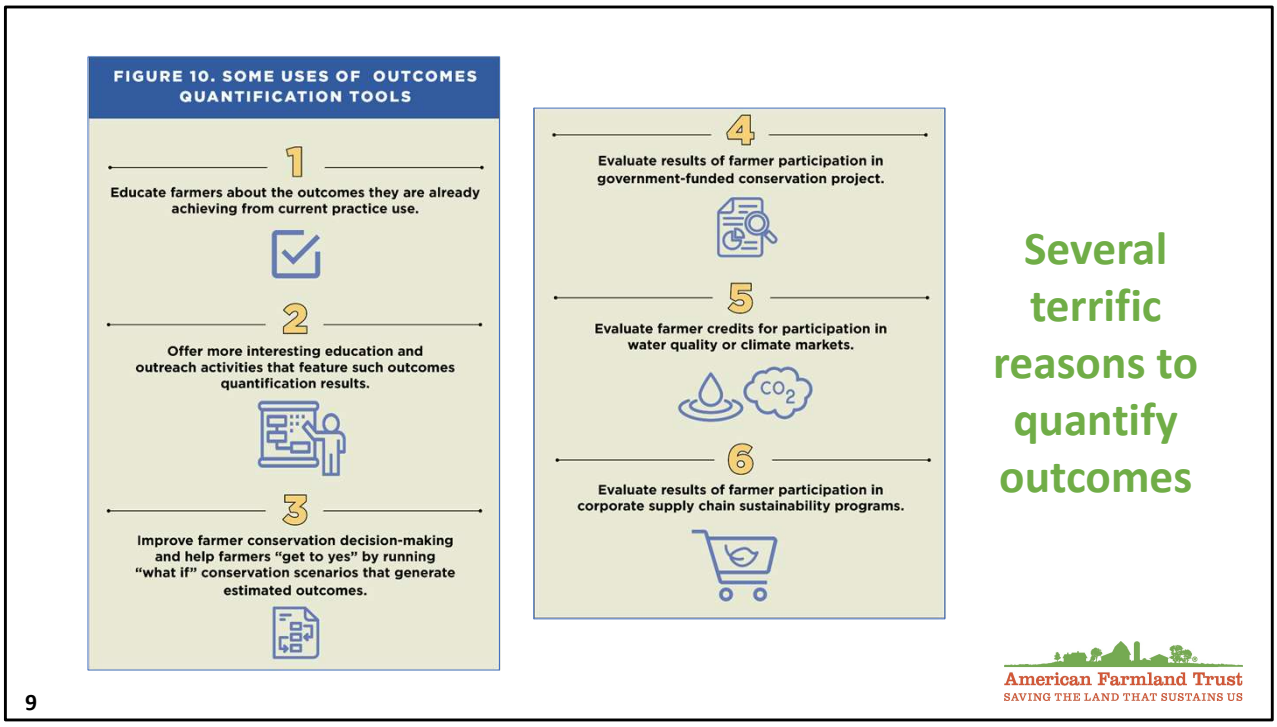
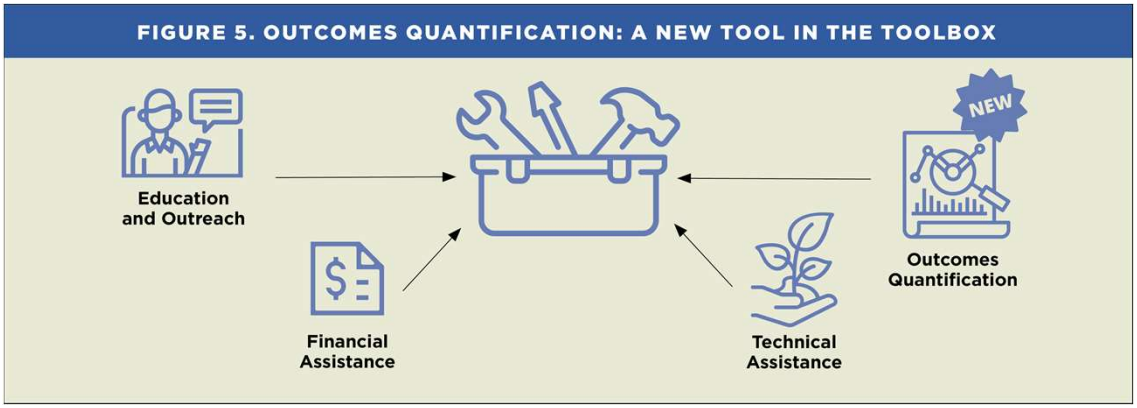
And it's not just the RCPP and EPA projects that are important here. We tried to come up with an estimate of how many farm conservation projects are out there and one low-ball estimate of mostly water quality-oriented projects is 1,000. Topping the list are the 600 ag-oriented EPA 319 projects, 400 RCPP projects and about 60 Mississippi River Basin Healthy Watersheds Initiatives or MRBI projects. But who knows how many other projects are out there that are primarily state-led, county-led, or corporate-led. And of course, a lot of these project may be double-or-even triple counted as they receive funding from multiple sources. The bottom line is, there is a lot of project-level farm conservation effort going on that could be doing more on outcomes quantification.




So with a lot of different project underway, aside from the regulatory drivers associated with some of the projects, there are many good reasons to quantify outcomes.

- First, conservationists can provide farmers who are already using conservation practices with quantitative estimates of the environmental and economic outcomes they are already experiencing.
- Second, with that information, conservationists could infuse their existing education and outreach activities aimed at farmers-on-the-fence about conservation, with the quantitative findings about the farmers already using the practices, likely making those events even more exciting and more effective.
- Third, once interest has been piqued, conservationists may be able to work with those on-the-fence farmers to improve conservation decision-making and help "get them to yes" faster by running "what if" conservation scenarios that generate estimates of potential future outcomes associated with investment in conservation.
- Fourth, we believe conservationists should produce aggregated and cumulative estimates of the environmental results being achieved by farmer participation in their government-funded conservation projects and report those results to the public.
- And fifth, conservationists can assist farmers in evaluating credit generation opportunities for participation in emerging water quality or climate markets.
- And though this is not an exhaustive list of terrific reasons to quantify outcomes, our last item points to the importance of evaluating individual and aggregated environmental and economic results of farmer participation in corporate supply chain sustainability programs.

## Goal of the Guide: Enable conservationists to add outcomes quantification to their conservation toolbox

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So one primary goal of this Outcomes Estimation Tools Guide is to empower and enable our fellow conservationists to add outcomes quantification to their conservation toolbox. Already in the toolbox are education and outreach events and materials, financial assistance, and technical assistance. Just imagine how much more effective we might all be if we added outcomes quantification to the toolbox, as well?


## Envisioning a Self-Strengthening Cycle:

Outcomes quantification will lead to more conservation adoption, which will lead to more outcomes quantification, which will lead to more conservation adoption

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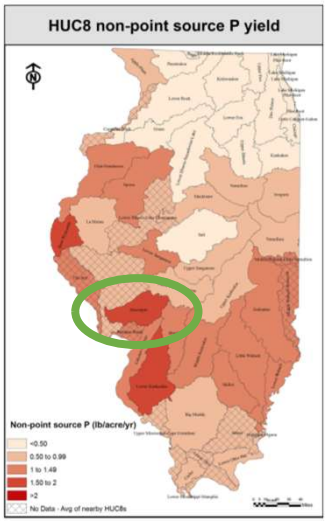
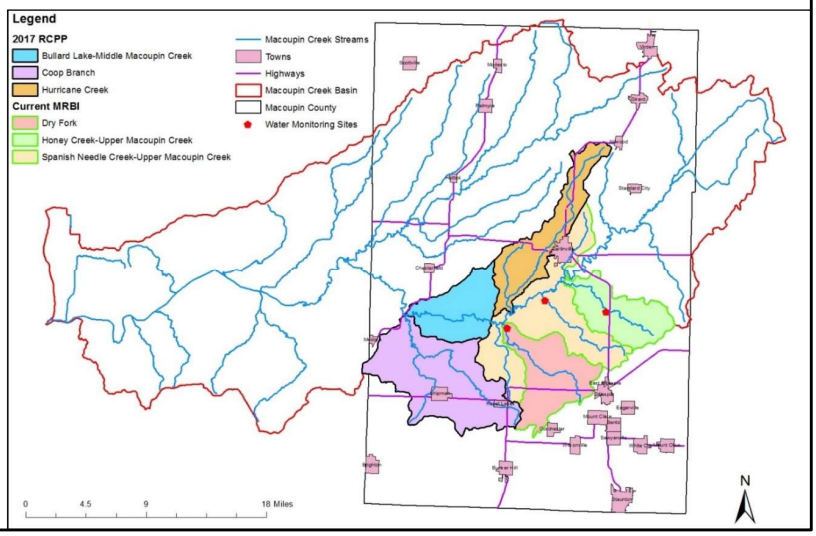
Well, we're envisioning a self-strengthening cycle, where outcomes quantification leads to more conservation adoption:

- In this self-strengthening cycle, farm conservation project managers provide FA, TA, education, *and* outcomes quantification services to farmers in their project area.
- Farmers respond favorably by adopting conservation practices promoted by the project managers
- More quantification and dissemination of the envtl, social, & economic, outcomes of those practices occurs
- This inspires more farmers and gives them the confidence they need to adopt more conservation practices
- And over time, land-scale scale improvements begin occurring such as improved water quality, greater resilience to climate change, and more prosperous farms

## AFT's IL Upper Macoupin Creek RCPP Project : 6 HUC12s within Macoupin Watershed (HUC8)

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This guide began in earnest more than three years when AFT landed an RCPP project in the Illinois Upper Macoupin Creek Watershed. We took the requirement to quantify outcomes seriously and conducted a review of a handful of models and tools that might work for us, our staff, our partners, and our budget, in that watershed. As we detail in the report, our experience learning even how to define outcomes, let alone, how to quantify and report on them, has been painful. Other colleagues at AFT encouraged me to share what we learned from our internal exercise with others so as to help minimize the pain and suffering of our fellow conservationists and, with the help of Dr. Emily Cole, we cast the net wider than my initial effort and we are pleased to share our findings with you today.

## Scope, Methods, & Resources

### Scope & Methods of the Report

- Focused solely on water quality, GHG, social, & economic outcomes
  - Excluded water quantity, air quality, & wildlife
- Focused on options for modeling
- Limited evaluation
- Extensive research
- Tool developer interviews
- See Acknowledgements for reviewers

### Resources in the Appendix

- See Appendix A for additional papers reviewing models & tools
- See Appendix B for resources on monitoring, in-stream, edge-of-field, tile drain, & soil health
- See Appendix C for summaries of 18 excluded tools
- See Appendix D for summaries of 17 excluded models

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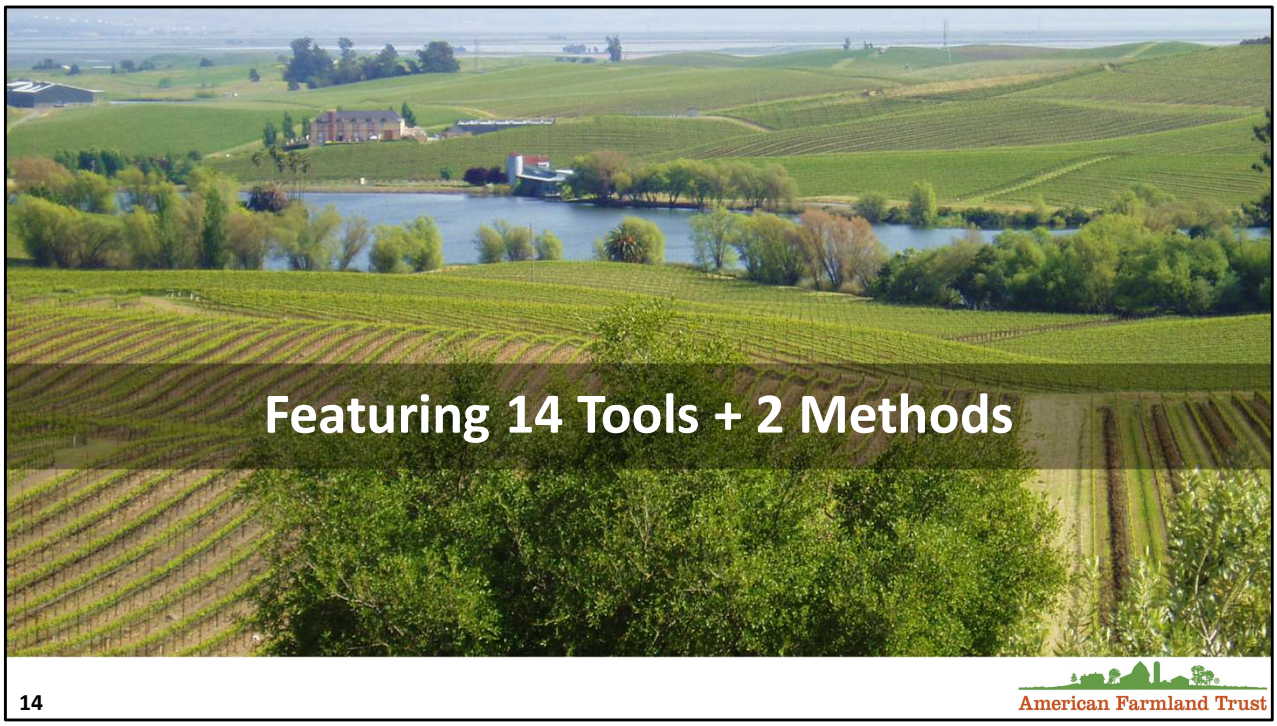
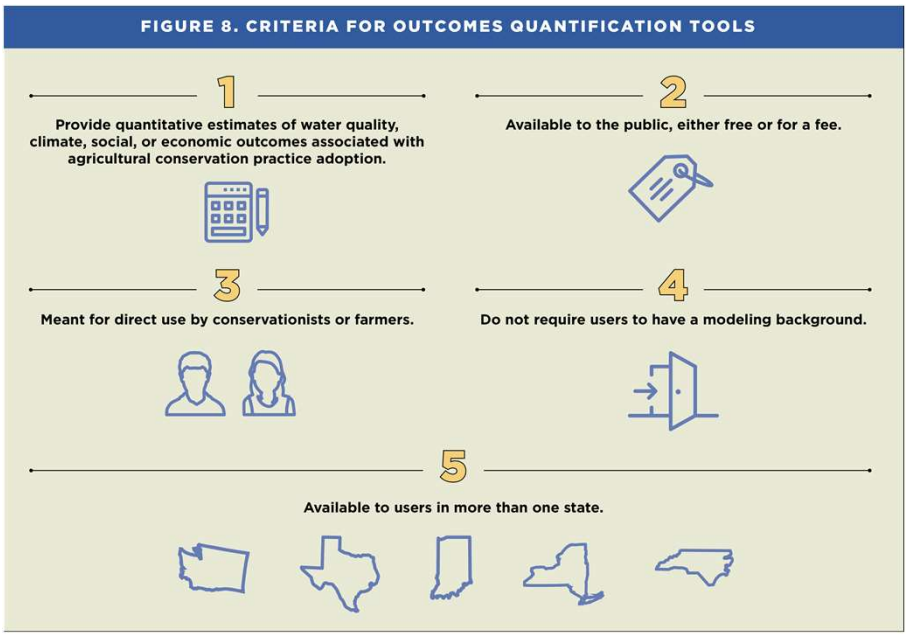
- Regarding the scope and methods of our effort, we focused solely on water quality, GHG, social, and economic outcomes. We chose to exclude tools and methods that enable outcomes quantification for water quantity, air quality, and wildlife.
- We also restricted our analysis to modeling estimation approaches for outcomes quantification rather than direct monitoring approaches.
- We stopped short of a full-fledged evaluation of the tools and methods because neither Dr. Cole nor I are modelers ourselves.
- To find models, tools, and methods to review, we cast the net wide by conducting literature searches in peer-reviewed journals, we asked friends and colleagues at NRCS, EPA, and other institutions, and we conducted an informal survey of watershed project managers to find out which tools or methods they were using to conduct outcomes quantification.
- Its important to note that we focused our interviews on tool developers rather than searching for and interviewing tool users.
- Please see the Acknowledgements section of the report for a list of the many wonderful persons that reviewed our report and made it stronger.
- For links to papers we reviewed that conducted comparative analyses of models and tools, see Appendix A.
- We share a good number of resources in Appendix B for projects interested in conducting monitoring in streams, at the edge-of-the field, in tile drains, and conducting soil health monitoring.
- And in Appendix C, you'll see summaries of the 18 *tools* we reviewed but did not satisfy all our criteria -- nevertheless – may be perfectly valid tools for other project needs.
- And in Appendix D, you'll find summaries of the 17 *models* we excluded because they did not satisfy our criteria and again, may be perfectly useful models to quantify outcomes if you have the staff expertise on hand or a budget to hire partners to do the outcomes quantification for your project.




So without further ado, here are the 14 tools and two methods that we selected amongst 51 models, tools, and methods that we reviewed last year, because they satisfied our criteria.

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What criteria you may ask? We established five criteria to help us figure out which tools to feature and which ones to mention in the Appendices.

- 1st and foremost, we wanted tools that generate quantitative estimates of water quality, climate, social, or economic outcomes associated with ag conservation practice adoption. So index tools were excluded.
- 2nd, the tools or methods needed to be available to the public, either for free or for a fee.
- 3rd, we wanted tools that were built for use by conservationists or farmers
- 4th, we wanted to make sure that our fellow conservationists leading these many RCPP, and other projects did not have to be computer modelers to use the tools.
- And finally, simply for expediency's sake, we decided to exclude tools that are only available for use in one state, even if they satisfied all the other criteria, just so we could finish the report.

| TABLE 1. FEATURED OUTCOMES QUANTIFICATION TOOLS AND METHODS | |
|---|---|
| **Seven Water Quality Tools and One Method** | |
| EPA's STEPL—Spreadsheet Tool for Estimating Pollutant Load | MN BWSR's PTMApp-Web—Prioritize, Target, & Measure Application Tool (MN & ND) |
| EPA's Region 5 Tool | EPA & CBP CAST—Chesapeake Assessment Scenario Tool (Chesapeake Bay Watershed) |
| USDA's NTT—Nutrient Tracking Tool | The Common's FieldDoc (Chesapeake Bay & Delaware River Watersheds) |
| Stroud Center's ModelMW—Model My Watershed | S.T.A.R.—Saving Tomorrow's Agricultural Resources Method |
| **Three Climate Tools** | |
| USDA's COMET-Farm | USDA's COMET-Planner |
| Field to Market's Fieldprint Platform | |
| **One Social Tool and One Method** | |
| SIDMA—Social Indicators Data Management and Analysis Tool | SIPES—"Social Indicator Planning and Evaluation System (SIPES) for Nonpoint Source Management: A Handbook for Watershed Projects" Method |
| **Three Economic Tools** | |
| NRCS's Cover Crops Economics Tool | LSP's Cropping Systems Calculator (MN & IL) |
| AFT's R-SHEC—Retrospective Soil Health Economic Calculator | |

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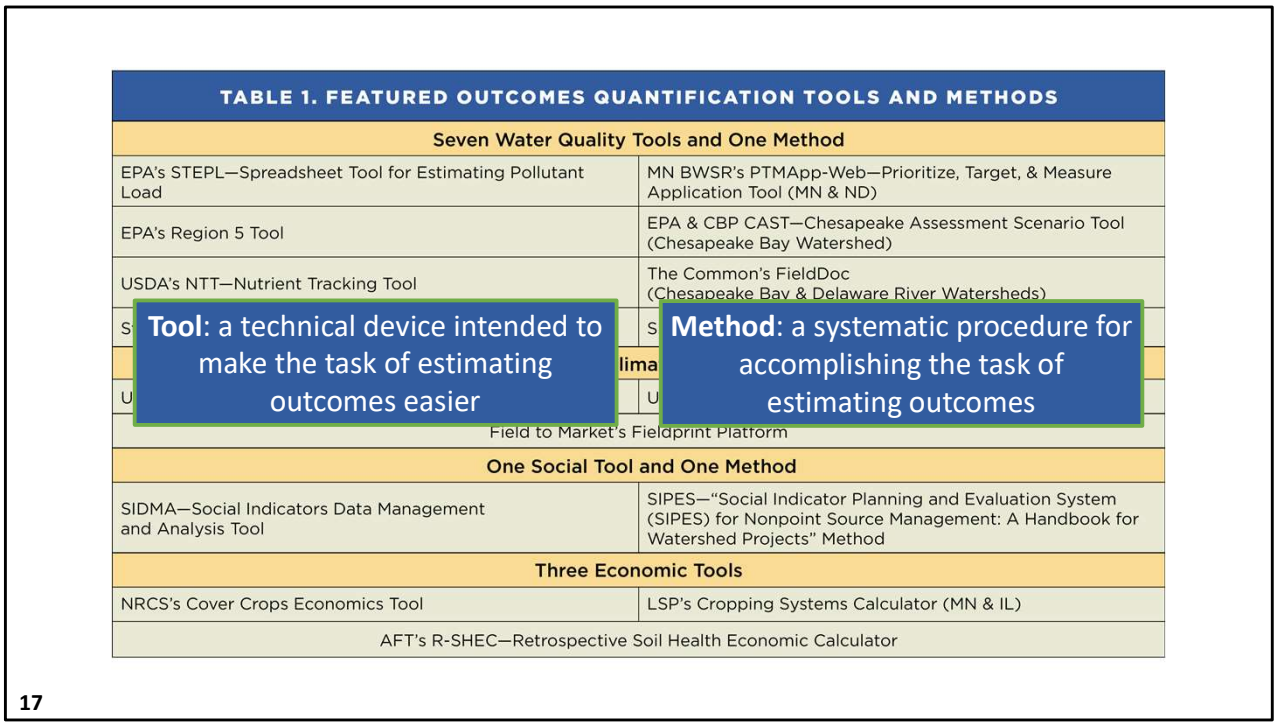
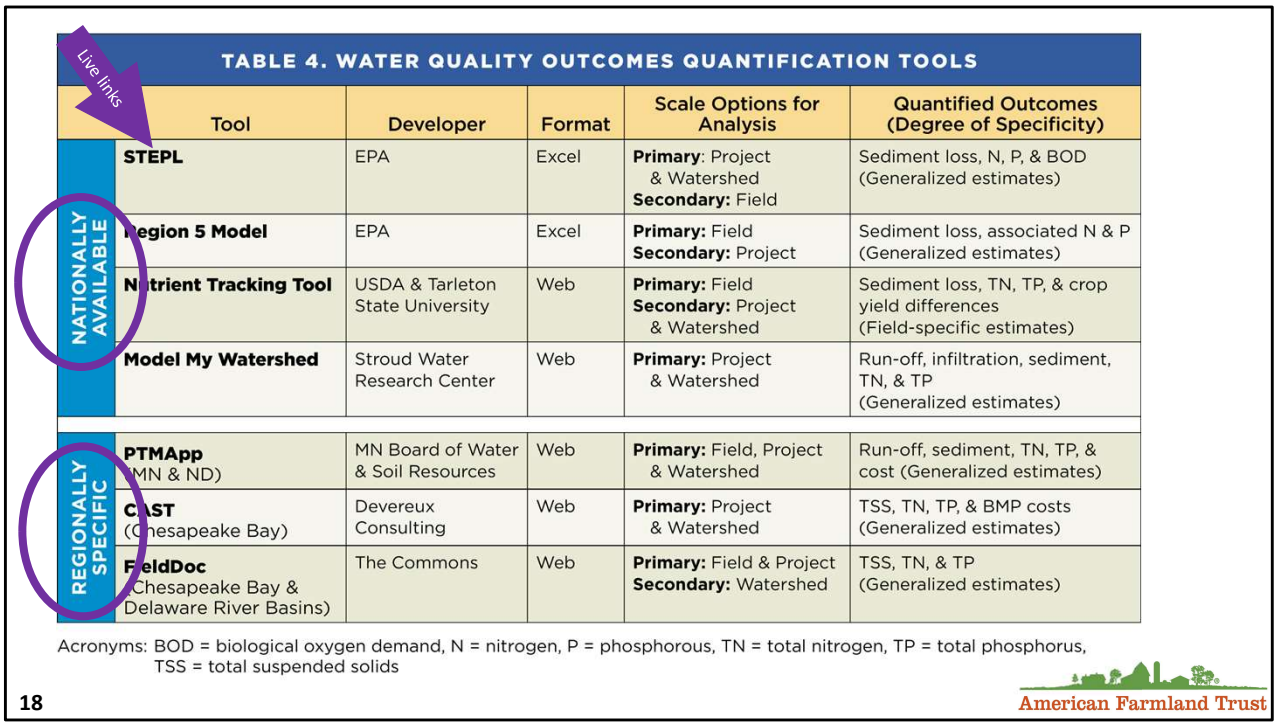
So here we are, Table 1 featuring all 14 tools & 2 methods – 7 water quality tools and one method, three climate tools, one social tool and one methods, and three economic tools.

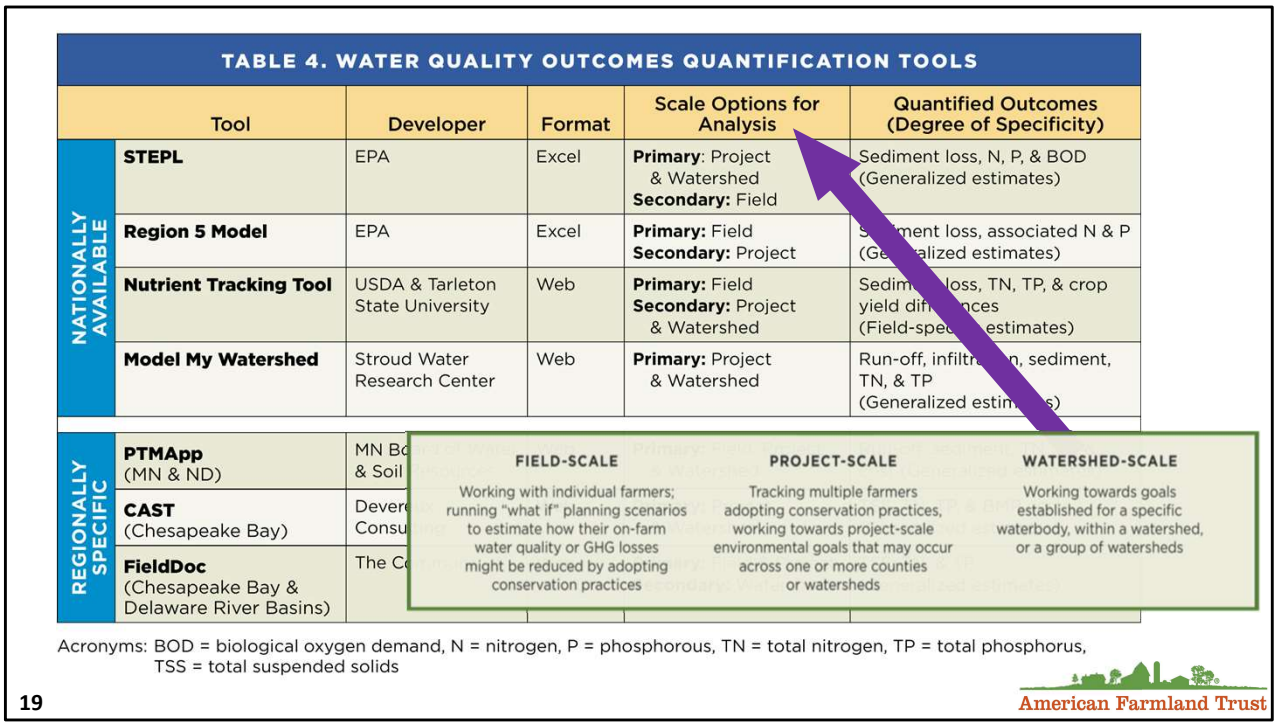



You may be wondering what the difference is between a tool and a method. We defined a tool as a technical device intended to make the task of estimating outcomes easier. In contrast, we defined a method as a systematic procedure for accomplishing the task of estimating outcomes.




Let me ease you into this table featuring 7 water quality outcomes quantification tools. I'll spend the most time on this table explaining the

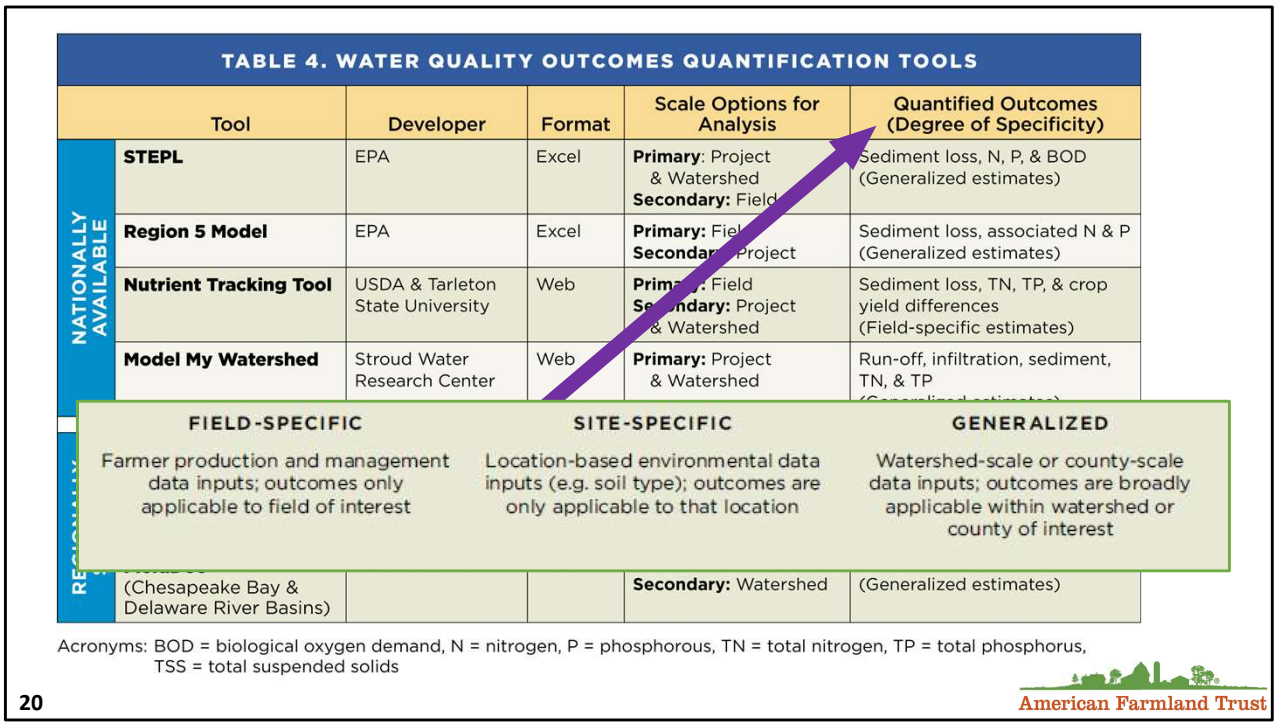
- First, we display the four tools that are available for use nationally: STEPL and Region 5 by EPA which are both excel-based tools, Nutrient Tracking Tool and Model my Watershed which are both web-based tools.
- Then, we display three regional tools that are all web-based. PTMApp is available for use in MN & ND, the CAST tool is available in the Chesapeake Bay, while FieldDoc is also available in the Chesapeake but also Delaware Bays and western Pennsylvania.
- One tip to point out is that the names of all the tools in this and similar tables are hot links so if you click on say STEPL, it will take you to the STEPL tool website where you can start exploring the tool and all the associated resources offered there.
- Now on to the Scale Options column. We categorized "primary" as the scale at which each tool was initially built to work at and "secondary" as an additional scale at which the tool can also be used.




- We used the term "field-scale" for tools built to work with individual farmers to analyze their current or future adoption of conservation practices. "Project scale" refers to tools that estimate outcomes associated with for the project boundary which could be a county or a watershed. And the term, watershed-scale, is used for projects attempting to improve water quality of a specific waterbody within a watershed.

**ANIMATE**

- STEPL was built to help 319 projects assess their project-scale water quality outcomes that are watershed-based. Users can also use STEPL to estimate generalized field-scale outcomes by starting a new tab in the excel tool and treat the 10 data entry cells as though they represented fields.
- In contrast, Nutrient Tracking Tool was developed primarily to assess individualized farm field water quality losses before and after conservation practice adoption, but it can be used to as a project or watershed scale tool.
- Model My Watershed by the Stroud Center offers water quality analysis at the project and watershed scale.




- Now the final column lists the water quality outcomes that are quantified by the tool & the degree of specificity with which the tool estimates those outcomes. We used the term field-specific for tools that require farmer production & management data inputs & generate outcomes applicable to the field being analyzed. Tools with site-specific analytical capabilities offer location–based environmental datasets for soils, slope, and weather, and generate outcomes applicable to only that location. The majority of tools require watershed-scale or county-scale data inputs to produce generalized estimates of outcomes applicable to that watershed or county of interest.

**ANIMATE**

- So, Nutrient Tracking tool is the only water quality tool that provides field-specific and site-specific water quality outcomes estimates because it requires farmer management information and it benefits from the location-specific environmental data built into its underlying model.
- The rest of the water quality tools yield generalized estimates of water quality outcomes because they do not ask for field-specific data inputs from farmers and most rely on larger-scale environmental datasets.

## "Back-of-the-Envelope" Water Quality Estimation: Try the S.T.A.R. Method

**FIGURE 12. THE S.T.A.R. METHOD**

In addition to the quantification tools we have featured, there is a back-of-the-envelope method developed by AFT as an option for a coarse yet reasonable approach to quantifying project-scale water quality and climate outcomes, which may be modifiable for application to projects. Originally developed to quantify our Illinois Upper Macoupin Creek RCPP project outcomes, our Midwest Science Director Dr. Emily Bruner further developed this methodology to quantify the outcomes associated with practice adoption tracked by the statewide Illinois Saving Tomorrow's Agriculture Resources (S.T.A.R.) Initiative.

This method can easily be applied at the project scale (defined by either county or watershed boundaries) to estimate outcomes and "provide an estimate of practice level performance" (S.T.A.R., 2020). The S.T.A.R method uses total acres enrolled in the program; GHG reductions using COMET-Planner; BMP efficiencies from the Illinois Nutrient Loss Reduction Strategy; Illinois HUC8 nonpoint source (NPS) nutrient loading data; HUC8 and county boundaries using geospatial data; 2017 Census of Agriculture information; and the average annual sediment load per county to calculate nutrient and sediment load reductions.

While this method may be less sophisticated than site-specific, online dynamic modeling tools, it does incorporate recent regionally specific and watershed and county-level NPS data. Thus, it may provide a realistic picture of what is going on across the landscape. It should be pointed out that before project leaders can use this method, they must first ascertain whether the county or watershed level baseline nutrient and sediment loss information and reduction efficiencies for conservation practices are available.

The S.T.A.R. Method is published in the report listed below (on pages 13–15):

S.T.A.R. (2020). *S.T.A.R. Annual Report. Crop Year 2019. Improving Conservation One Field At A Time.* Saving Tomorrow's Agriculture Resources. img1.wsimg.com/blobby/go/45c3f789-47fb-40df-9bb7-3dc4d7bf6c2f/downloads/Star%20report%20FINAL%202020.pdf?ver=1597671964705

- Attain baseline nutrient & sediment loss data for your watershed or county
- Attain reduction efficiency values for conservation practices

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When AFT was exploring three years ago how we were going to quantify our RCPP project water quality outcomes, we developed a method we lovingly referred to as "a back-of-the-envelope" method. Our own Dr. Emily Bruner, AFT's Midwest Science Director then formalized the method for use by the Illinois STAR Initiative (which stands for Saving Tomorrow's Agriculture Resources) and she produced a 3-page methodology. Projects that want to estimate project-scale, aggregated water quality outcomes can check this method to see if it will work for you.

Two requirements for use of this method include the need to attain baseline nutrient and sediment loss information for your county or watershed and reduction efficiency values for the conservation practices your project farmers are adopting. And then with a little bit of multiplication and addition, voila, you'll have a reasonable estimate of your project's nutrient and sediment reduction outcomes.

**TABLE 5. GREENHOUSE GAS OUTCOMES QUANTIFICATION TOOLS**

| Tool | Developer | Format | Scale Options for Analysis | Quantified Outcomes (Degree of Specificity) |
|---|---|---|---|---|
| **COMET-Farm** | NRCS & Colorado State University | Web | **Primary:** Field<br>**Secondary:** Project | Soil organic carbon, biomass carbon, CO, $CO_2$, $N_2O$, and $CH_4$, all presented in metric tons of $CO_2$ equivalents per field (or parcel) annually<br>(Field-specific estimates) |
| **COMET-Planner** | NRCS & Colorado State University | Web | **Primary:** County & State-level | $CO_2$, $N_2O$, $CH_4$, and total $CO_2$ reduction estimates are all presented in metric tons of $CO_2$ equivalents annually<br>(Generalized estimates) |
| **Fieldprint Platform** | Field to Market | Web | **Primary:** Field<br>**Secondary:** Project | $CO_2$, $N_2O$, and $CH_4$ emissions presented in lbs. of $CO_2$ equivalent per acre annually<br>(Field-specific estimates) |

Acronyms: CO = carbon monoxide, $CO_2$ = carbon dioxide, $N_2O$ = nitrous oxide, and $CH_4$ = methane

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Here are the three climate outcomes estimation tools that satisfied our criteria:

- COMET-Farm and COMET-Planner are tools developed by NRCS and Colorado State University while Fieldprint Platform is developed by Field to Market.
- All three are web-based tools.
- COMET-Planner offers the quickest, generalized estimates of GHG reductions from conservation practice adoption at the county or the state-level as results can be produced in just a few minutes with as little as 4 or 5 clicks to respond to the required four questions.
- COMET-Farm and Fieldprint Platform provide field-specific and site-specific estimates of the GHG outcomes listed in either metric tons or pounds of CO2 equivalent but that requires interest and cooperation from farmers to share their production and management data in order to generate the field-specific estimates of outcomes.

## Excerpt of economic outcomes definition from 2020 NRCS "RCPP Expectations"

"Economic indicators can quantify the financial impacts of conservation practices on a farm, ranch or forestland." (Three examples include:)

- **Conservation cost effectiveness**
- **Economic/financial benefits**
- **Valuation of ecosystem benefits**

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Now moving on to economic outcomes, here is an excerpt of the definition for economic outcomes provided by the NRCS RCPP Expectations document. It stated that "economic indicators can quantify the financial impacts of conservation practices on a farm, ranch, or forestland." And the document provided the following three examples:

- Conservation cost effectiveness
- Economic or financial benefits
- Valuation of ecosystem benefits

**TABLE 6. ECONOMIC OUTCOMES QUANTIFICATION TOOLS**

| Tool | Developer | Format | Conservation Practices | Quantified Outcomes |
|---|---|---|---|---|
| **Cover Crops Economics Tool** | NRCS | Excel | Cover crops | Total costs, total benefits, and net benefit for short-term and long-term analysis ($/ac) of cover crop use |
| **Retrospective—Soil Health Economic Assessment Calculator** | American Farmland Trust | Excel | No-till, reduced till, cover crops, conservation cover, nutrient management, mulching, and compost application | Partial budget analysis table showing benefits, costs, impact on net income, and return on investment of already adopted soil health practices |
| **Cropping Systems Calculator** | Land Stewardship Program | Excel | Conservation crop rotation, cover crops, and grazing options | Average yearly costs and returns on a per acre and total basis to compare the original crop rotation to the alternative crop rotation |

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- Here are the three economic outcomes estimation tools we found that satisfied our criteria. All are excel-based tools and the first two by NRCS and AFT, the Cover Crops Tool and the Retrospective-Soil Health Economic Calculator are available for use nationally while the third tool, the Cropping Systems Calculator by the Land Stewardship Program is restricted to use in Wisconsin and Illinois.
- All three economic tools provide analysis of the costs and benefits associated with cover crops while the AFT R-SHEC tool can analyze additional practices such as alternative tillage and nutrient management for row crops plus mulching and compost application for almond production. The LSP CCS tool can analyze conservation crop rotation and grazing practices as well.
- As stated in the final column, the quantified economic outcomes are similar amongst the three tools though a little different as well.

# Social Tool & Method

Social Indicators Data Management & Analysis (SIDMA) Tool

- Developed by Purdue & Michigan State Universities + EPA Region 5
- Aids in water quality project managers in survey generation & results coding & analysis
- Tool is based on the SIPES Handbook
- Alternatives to SIDMA: MS Forms & Google Forms though no guardrails

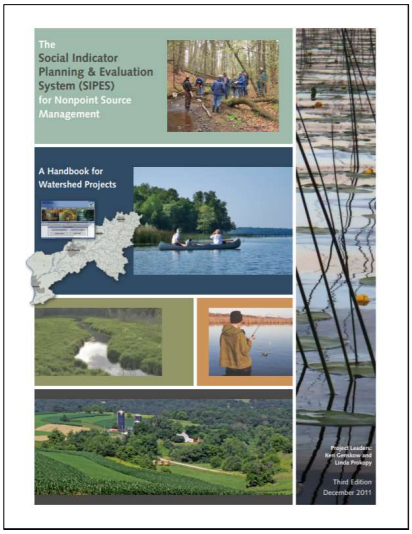


**FIGURE 13. SIPES METHOD HANDBOOK SECTIONS**

A. Steps for Using the SIPES
   1. Review Project Plan
   2. Collect & Enter Pre-Project Survey Data
   3. Review Data & Refine Social Outcomes
   4. Monitor Social Data Throughout Project
   5. Collect & Enter Post-Project Survey Data
   6. Collect & Enter Additional Post-Project Data
   7. Review Data & Use Results

B. NPS Project Planning: Setting the Stage for Working with Target Audiences

C. Getting Started with SIDMA—the Online Social Indicators Data Management & Analysis Tool

D. Choosing a Survey Method & Sample Size

E. Developing Your Social Indicators Questionnaire

F. Administering the Social Indicators Questionnaire

G. Features of SIDMA

H. Using Survey Results to Develop Education and Outreach

I. Evaluating Outreach Activities During Project Implementation

J. Collecting & Analyzing Data at the End

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- And last but not least, we come to the Social Tool and Method. The Social Indicators Data Management & Analysis Tool or SIDMA was developed by Purdue & Michigan State Universities in collaboration with EPA Region 5 staff. The tool assists watershed project managers in survey generation & helps them code the results & conduct analysis of the social indicators that can be collected at different phases of the project. The tool is based on the SIPES Handbook – which stands for Social Indicators Planning and Evaluation System (SIPES) for Nonpoint Source Management; A Handbook for Watershed Projects.
- We refer to the SIPES Handbook as the social methodology in our report as it offers guidance to project managers on how to plan projects and evaluate the effects the project interventions, such as outreach activities, are having on important social indicators.

## Excerpts of definition of social outcomes from 2011 SIPES Handbook

"Social outcomes are broadly defined as the social changes needed to bring about and sustain the environmental conditions you are trying to achieve in your project area." (Examples include:)

- **Increased awareness**
- **Changed attitudes**
- **Reduced constraints**
- **Increased capacity**
- **Increased adoption of practices**

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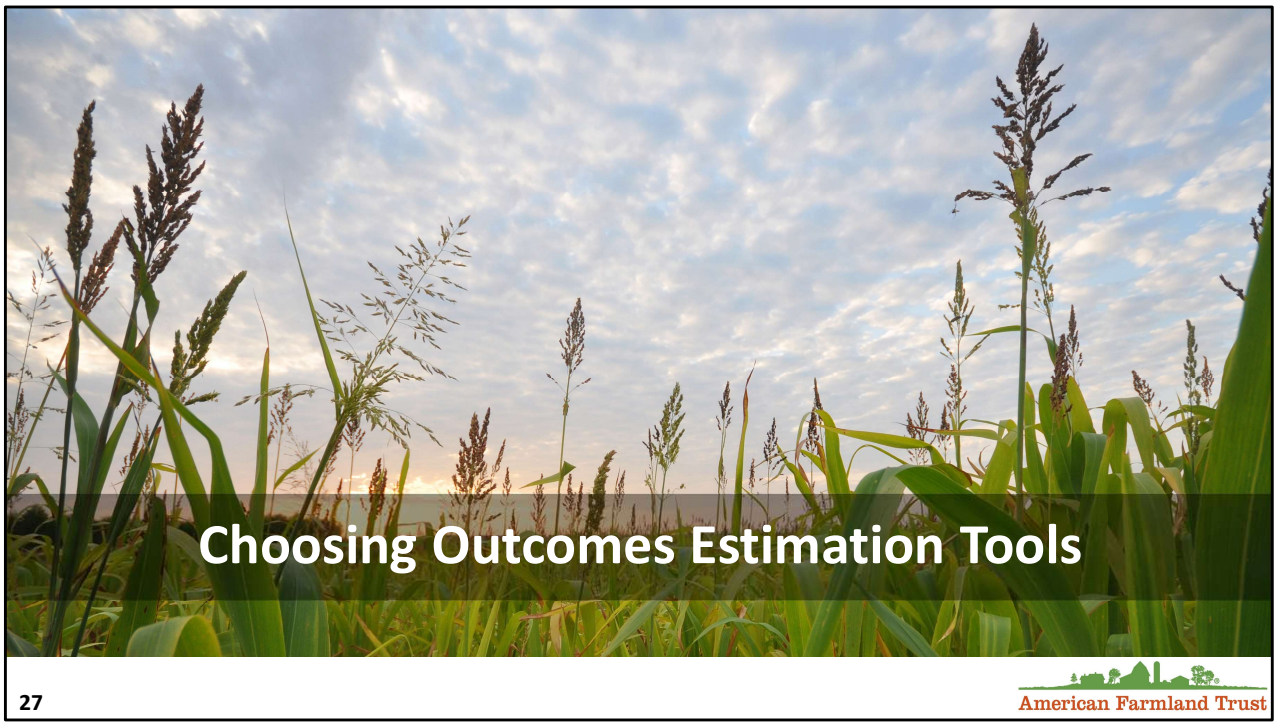
And here is a definition of social outcomes that we feature in the report from the 2011 SIPES Handbook: Social outcomes are social changes needed to bring about and sustain the environmental conditions you are trying to achieve in your project area. Examples of social outcomes provided by SIPES includes:

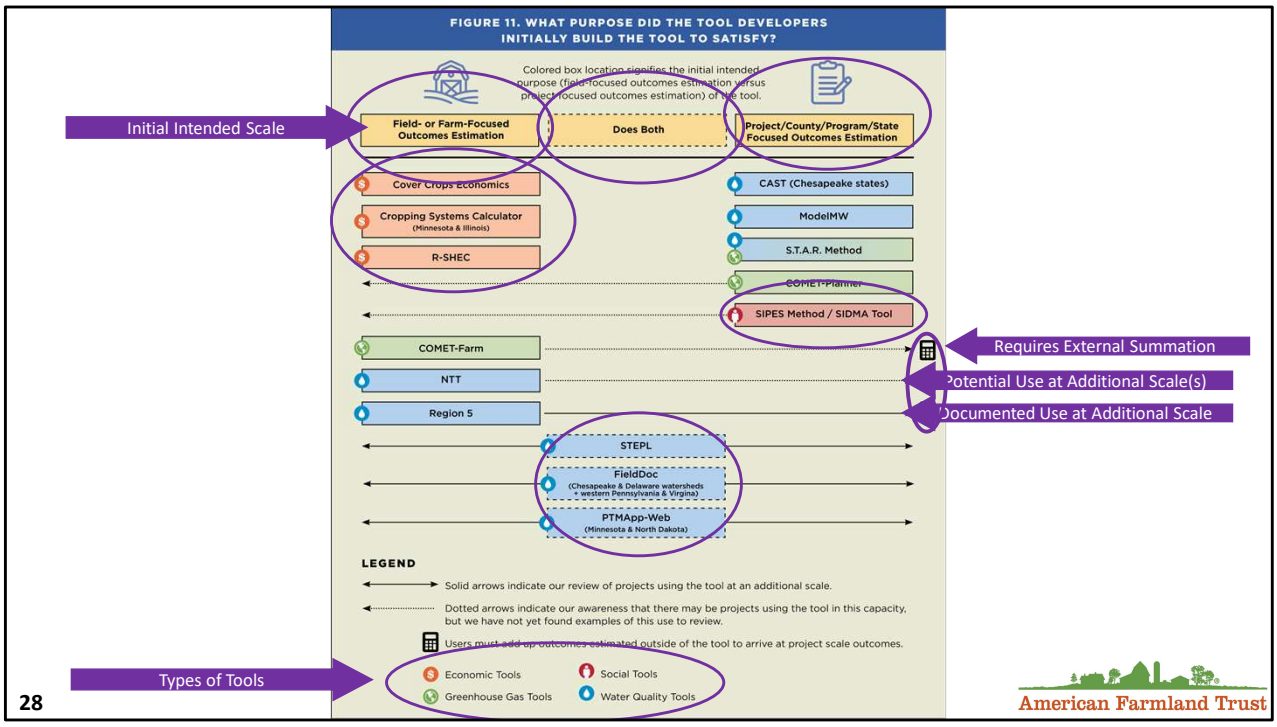
- Increased awareness
- Changed attitudes
- Reduced constraints
- Increased capacity
- Increased adoption of practices

You can read more about these social outcomes and how to quantify them on page 55 of the SIPES Handbook.

And now it's my great pleasure to turn you over to Emily.




Emily:
Thanks, Michelle. One difficulty that Michelle already highlighted – IS HOW TO WHITTLE DOWN the many options available in order to then evaluate a few options more closely. I'm going to take a few minute now to walk you through some schematics and tables from the guide that compare and contrast key tool characteristics to help you narrow down your options.




The first of which is - Figure 11: titled “What purpose did the tool developer initially build the tool to satisfy?”. This schematic was designed to help users distinguish the *where* and *what* these tools are used for.

**Initial intended scale arrow:** Then moving to the top of this figure - The position within the figure indicates the scale the tool was designed for

**Top left circle:** the left-hand side indicates that these tools were developed for the field/farm level

**Top right circle:** vs larger and project-scales on the right-hand side.

**Center top circle:** And those in the center can do both.

**Bottom circle:** First - If you look below to the legend - The colors indicate what the tool quantifies - economics, GHG, social or water quality outcomes”

**Econ tool circle:** You’ll notice that all three economic tools are field/farm focused.

**Social tool circle:** the social tool/method are project focused – however they are collecting individual farm/farmer information.

whereas

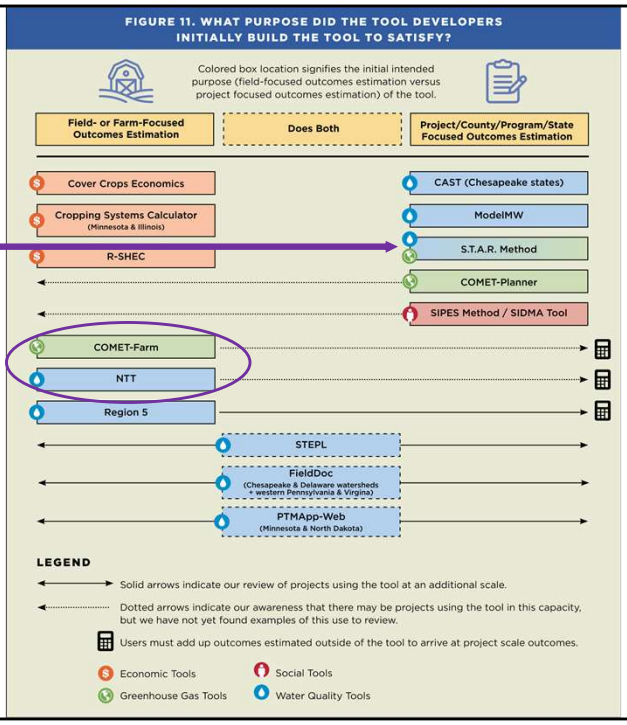
**Center bottom circle:** STEPL, FieldDoc and PTMApp all, located here in the middle of the schematic, all have the capability to estimate a single project location, AND compile outcomes of multiple locations.

**Potential and Documented use arrows:** There are two additional features to point out – first – the long arrows indicate either documented use, the solid arrow, or potential use, the dotted arrow, of this tool at additional scales.

**Requires External Summation arrow:** And lastly, the calculator symbol indicates that in order to track project outcomes, external summation by the user is required.

Are water quality or GHG outcomes quantification (or both) needed?

Does this project expect to quantify economic or social outcomes?




Does quantification need to be at the field, whole farm, watershed scale, or project scale?

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I'd like to take a moment to refer you another helpful aspect of Choosing Tools section of the guide, in this section - we share some key questions that project leaders may want to ask themselves to help identify which tools or methods might fit the project's needs. Those questions and Figure 11 can help you to start narrow down your tool options.

First and foremost – what are you quantifying?

Are water quality or GHG outcomes quantification (or both) needed? If both are needed you might consider using the STAR method,

OR you might consider using a pair of tools that may require similar input data – such as NTT and COMET Farm.

Does this project expect to quantify economic or social outcomes?

Does quantification need to be at the field, whole farm, watershed scale, or project scale?

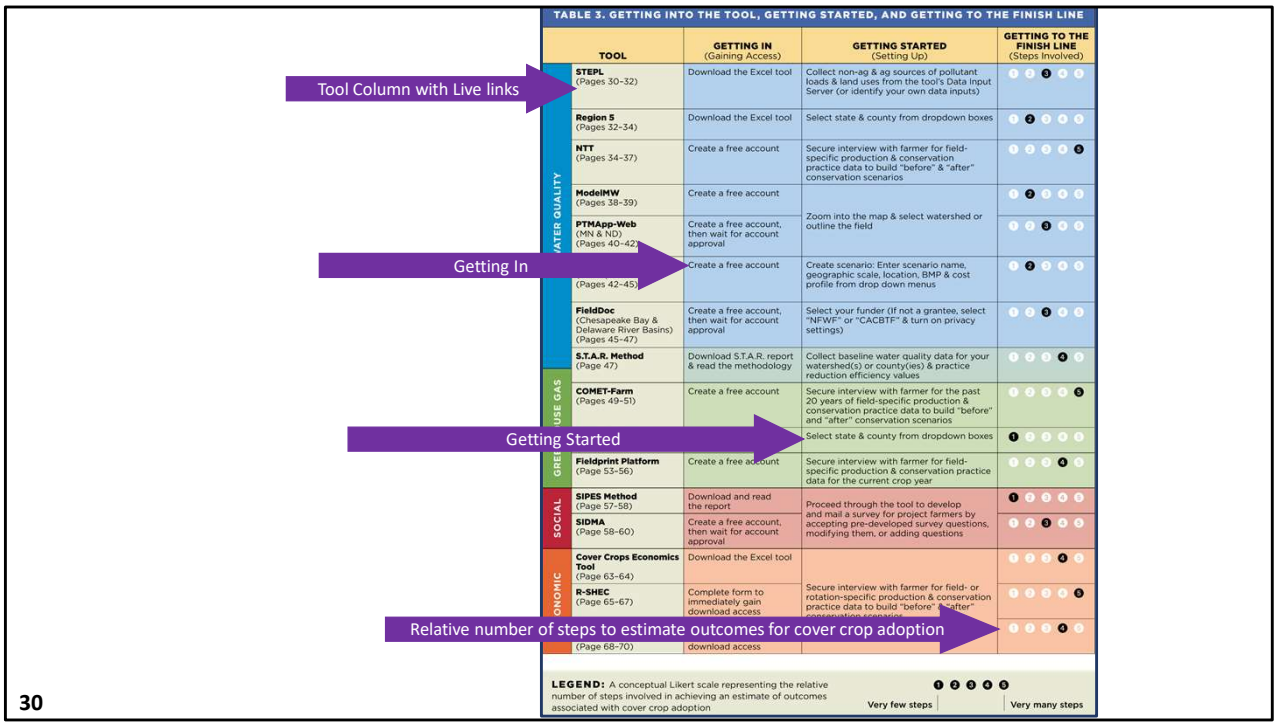


TABLE 3. GETTING INTO THE TOOL, GETTING STARTED, AND GETTING TO THE FINISH LINE

| | TOOL | GETTING IN (Gaining Access) | GETTING STARTED (Setting Up) | GETTING TO THE FINISH LINE (Steps Involved) |
|---|---|---|---|---|
| WATER QUALITY | **STEPL** (Pages 30–32) | Download the Excel tool | Collect non-ag & ag sources of pollutant loads & land uses from the tool's Data Input Server (or identify your own data inputs) | 3 |
| | **Region 5** (Pages 32–34) | Download the Excel tool | Select state & county from dropdown boxes | 2 |
| | **NTT** (Pages 34–37) | Create a free account | Secure interview with farmer for field-specific production & conservation practice data to build "before" & "after" conservation scenarios | 5 |
| | **ModelMW** (Pages 38–39) | Create a free account | Zoom into the map & select watershed or outline the field | 2 |
| | **PTMApp-Web** (MN & ND) (Pages 40–42) | Create a free account, then wait for account approval | | 3 |
| | (Pages 42–45) | Create a free account | Create scenario: Enter scenario name, geographic scale, location, BMP & cost profile from drop down menus | 2 |
| | **FieldDoc** (Chesapeake Bay & Delaware River Basins) (Pages 45–47) | Create a free account, then wait for account approval | Select your funder (If not a grantee, select "NFWF" or "CACBTF" & turn on privacy settings) | 3 |
| | **S.T.A.R. Method** (Page 47) | Download S.T.A.R. report & read the methodology | Collect baseline water quality data for your watershed(s) or county(ies) & practice reduction efficiency values | 4 |
| GREENHOUSE GAS | **COMET-Farm** (Pages 49–51) | Create a free account | Secure interview with farmer for the past 20 years of field-specific production & conservation practice data to build "before" and "after" conservation scenarios | 5 |
| | | | Select state & county from dropdown boxes | 1 |
| | **Fieldprint Platform** (Page 53–56) | Create a free account | Secure interview with farmer for field-specific production & conservation practice data for the current crop year | 4 |
| SOCIAL | **SIPES Method** (Page 57–58) | Download and read the report | Proceed through the tool to develop and mail a survey for project farmers by accepting pre-developed survey questions, modifying them, or adding questions | 1 |
| | **SIDMA** (Page 58–60) | Create a free account, then wait for account approval | | 3 |
| ECONOMIC | **Cover Crops Economics Tool** (Page 63–64) | Download the Excel tool | Secure interview with farmer for field- or rotation-specific production & conservation practice data to build "before" & "after" conservation scenarios | 4 |
| | **R-SHEC** (Page 65–67) | Complete form to immediately gain download access | | 5 |
| | (Page 68–70) | download access | | 4 |

**LEGEND:** A conceptual Likert scale representing the relative number of steps involved in achieving an estimate of outcomes associated with cover crop adoption — 1 2 3 4 5 — Very few steps … Very many steps

Next, I'll walk you through Table 3 – getting into the tool, getting started, and getting to the finish line. This table provides some foundation information regarding the access and data requirements for the featured tools and methods.

First is the Tool column – below each tool name is a live links that will move you to the write up for that tool.

Next Getting in – this is how to access this tool or method – whether you need to download a program, sign up for an account, or access via web.

And next is Getting started – this column provides a snapshot into the first few steps that a user will have to complete to begin quantifying desired outcomes

And last the getting to the finish line column shows a qualitative scale representing the relative # of steps it would take start to finish, to quantify outcomes based upon the adoption of cover crops as an example.

Do project staff and farmers have the time to gather and process data?

Do project staff have access to additional necessary data?

How experienced are project staff at using models and tools and in interpreting input and results data?

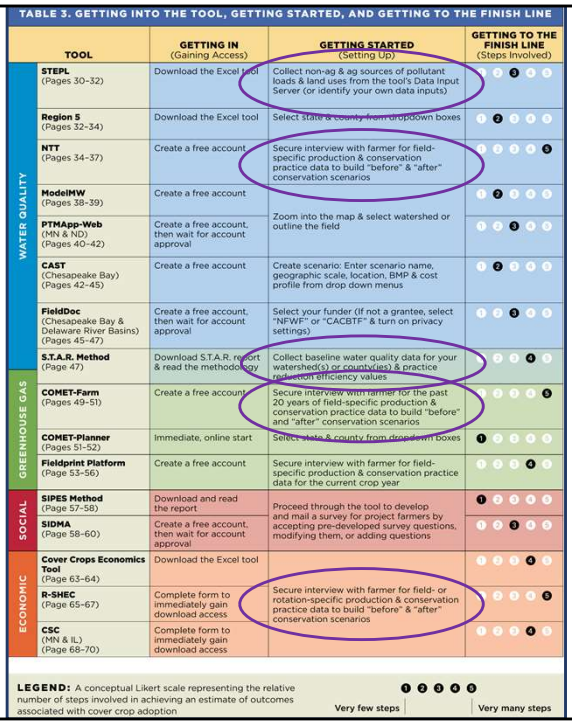

**TABLE 3. GETTING INTO THE TOOL, GETTING STARTED, AND GETTING TO THE FINISH LINE**

| | TOOL | GETTING IN (Gaining Access) | GETTING STARTED (Setting Up) | GETTING TO THE FINISH LINE (Steps Involved) |
|---|---|---|---|---|
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| | **Region 5** (Pages 32–34) | Download the Excel tool | Select state & county from dropdown boxes | 2 |
| | **NTT** (Pages 34–37) | Create a free account | Secure interview with farmer for field-specific production & conservation practice data to build "before" & "after" conservation scenarios | 5 |
| | **ModelMW** (Pages 38–39) | Create a free account | Zoom into the map & select watershed or outline the field | 2 |
| | **PTMApp-Web** (MN & ND) (Pages 40–42) | Create a free account, then wait for account approval | | 3 |
| | **CAST** (Chesapeake Bay) (Pages 42–45) | Create a free account | Create scenario: Enter scenario name, geographic scale, location, BMP & cost profile from drop down menus | 2 |
| | **FieldDoc** (Chesapeake Bay & Delaware River Basins) (Pages 45–47) | Create a free account, then wait for account approval | Select your funder (If not a grantee, select "NFWF" or "CACBTF" & turn on privacy settings) | 3 |
| | **S.T.A.R. Method** (Page 47) | Download S.T.A.R. report & read the methodology | Collect baseline water quality data for your watershed(s) or county(ies) & practice reduction efficiency values | 4 |
| GREENHOUSE GAS | **COMET-Farm** (Pages 49–51) | Create a free account | Secure interview with farmer for the past 20 years of field-specific production & conservation practice data to build "before" and "after" conservation scenarios | 5 |
| | **COMET-Planner** (Pages 51–52) | Immediate, online start | Select state & county from dropdown boxes | 1 |
| | **Fieldprint Platform** (Page 53–56) | Create a free account | Secure interview with farmer for field-specific production & conservation practice data for the current crop year | 4 |
| SOCIAL | **SIPES Method** (Page 57–58) | Download and read the report | Proceed through the tool to develop and mail a survey for project farmers by accepting pre-developed survey questions, modifying them, or adding questions | 1 |
| | **SIDMA** (Page 58–60) | Create a free account, then wait for account approval | | 3 |
| ECONOMIC | **Cover Crops Economics Tool** (Page 63–64) | Download the Excel tool | | 4 |
| | **R-SHEC** (Page 65–67) | Complete form to immediately gain download access | Secure interview with farmer for field- or rotation-specific production & conservation practice data to build "before" & "after" conservation scenarios | 5 |
| | **CSC** (MN & IL) (Page 68–70) | Complete form to immediately gain download access | | 4 |

**LEGEND:** A conceptual Likert scale representing the relative number of steps involved in achieving an estimate of outcomes associated with cover crop adoption

1 2 3 4 5

Very few steps | Very many steps

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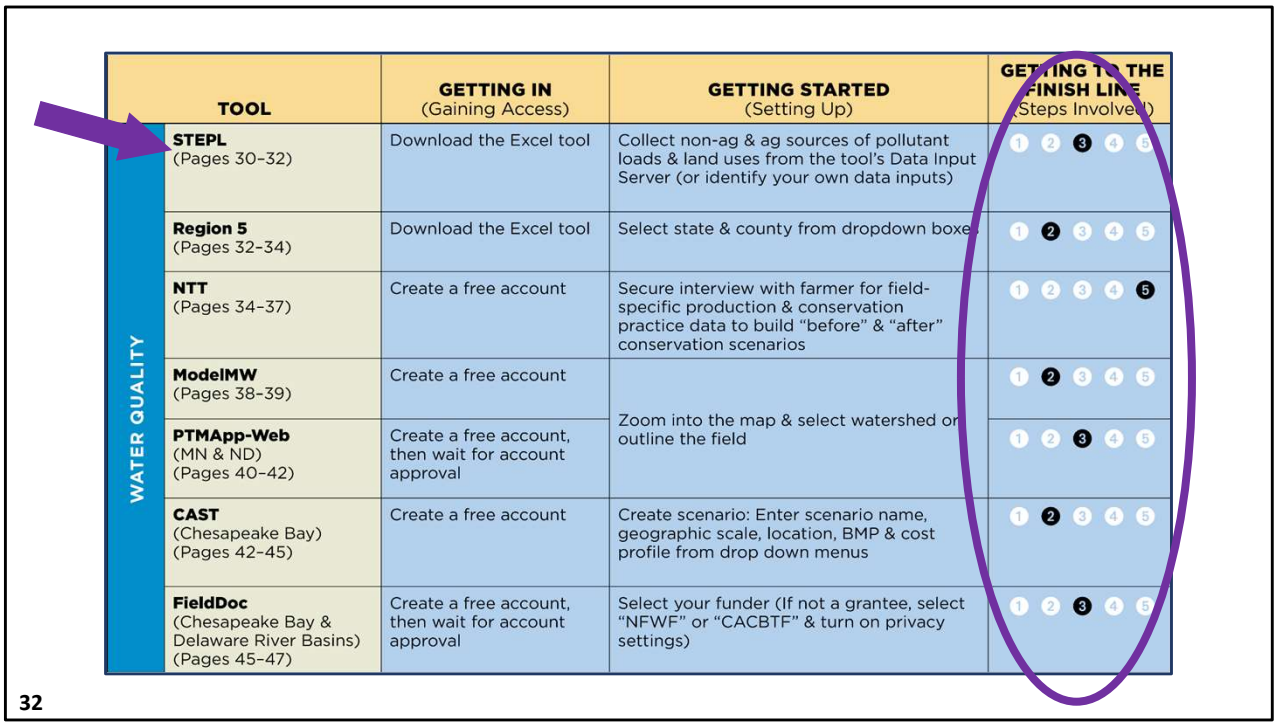
Again, I would suggest reviewing the guiding questions in the choosing tools section of this guide, to assist in planning your outcomes quantification journey.
Do project staff and farmers have the time to gather and process data? – some tools require a significant amount of data and that may not be a possibility for your project.

Do project staff have access to additional necessary data? Tools such as STEPL have an input data server ACCESSIBLE ONLINE to provide access to LOCATION-BASED INPUT data, while others require that data be sourced by the user - understanding what data is required for each tool will also help you find one best suited to the projects needs.

How experienced are project staff at using models and tools and in interpreting input and results data?

To reinforce something that Michelle spoke of earlier on – WE WANTED TO ENSURE THAT OUR fellow conservationists did not have to be computer modelers to use the tools FEATURED in this guide. If you do HAVE staff with that expertise, or if you have funding for external consultants to work on quantification, then there are additional options you could consider, many of which can be found in appendix C or D.




Zooming in on the top of this table, you can see the range of relative steps involved just within the WQ tools. You'll notice that the one field-specific water quality tool, NTT, is rated as a 5 because it requires the highest number of steps in the process to achieve a farmer-specific and site-specific water quality outcome estimate. In contrast, we rated the other tools as 2s and 3s as they do not require attainment of farmer-specific information. Tools such as Region 5, Model my watershed, and CAST tool require fewer steps, but keep in mind will provide generalized outcomes estimation.....

These schematics provide some important tool characteristics, but once you are ready to learn more about a specific tool – you can use the live links to take you directly to the more in-depth write-ups. I am going to walk you through one now.

# 14 Featured Tool Write-ups

## 1. Spreadsheet Tool for Estimating Pollutant Load (STEPL)

### A. ABOUT THE TOOL

The Spreadsheet Tool for Estimating Pollutant Load (STEPL) is a project-scale spreadsheet tool that estimates average annual phosphorus (P), nitrogen (N), the 5-day biological oxygen demand (BOD), and sediment load reductions associated with adoption of farm conservation practices. STEPL was originally developed by the USEPA to replace the Region 5 spreadsheet tool (which is described in the next write-up) and to serve as a more robust planning and reporting tool to help 319 project managers. STEPL can be used at the beginning of a project to gain a rough sense of the types and numbers of practices that, in combination, could achieve a project's pollution load reduction goals. The tool can also be used to report on the pollutant load reductions associated with practices that are being adopted during the course of the project. STEPL has four main tabs and an additional 11 hidden tabs that may be accessed as the user proceeds through the tool. STEPL is also linked to an online Input Data Server and to a best management practices (BMP) calculator to aid data entry and analysis.

STEPL operates by estimating baseline pollutant loading in a watershed from various agricultural and non-agricultural sources and then by providing loading reduction estimates based on a single conservation scenario or a suite of BMPs applied to a watershed. The tool uses county-level soils and weather data and static equations to estimate reductions in sediment and nutrient loads associated with implementation of practices. Practice adoption occurring within up to 10 different watersheds can be modeled simultaneously. The tool is publicly available and has an online user guide. STEPL can be used by any project, not just 319 projects, in all 50 states and counties, to estimate pollutant reduction from practices applied to the following five land uses: cropland, pastureland, feedlots, urban land, and forests. It can also be used at the field scale to generate "what-if" BMP conservation scenarios for engaging with farmers one-on-one or in a group setting.

### B. SITE-SPECIFIC INPUTS AND BMP ANALYSIS OPTIONS

Users begin by populating the STEPL Input tab with watershed data by clicking on the state, county, and appropriate local weather station. Doing so automatically pulls in the required datasets, such as historic precipitation averages and the Universal Soil Loss Equation (USLE) factors. The remaining necessary data to set up the STEPL tool can be easily compiled using STEPL's online input data server, which is available to all users. This online database provides, among other items, the sources of pollutant loads in the watershed. The input data server walks the user through a series of dropdown menus with state, county, and subwatershed (HUC12) options to identify the user's project area. The information generated by the input data server can be exported and compiled in an external spreadsheet, which can be a useful interim step when there are multiple watersheds within the project. Users then input the data retrieved from the input data server into the STEPL input tab. Instructions for accessing and using the input data server can be found in Appendix D of the STEPL user guide.

Up to 10 different locations can be analyzed simultaneously by the tool, which can be defined by the user to mean 10 watersheds, 10 subwatersheds, or even 10 individual farm fields. This feature of the tool provides flexibility in estimating outcomes at varying scales, while also providing project-level outcome quantification. Should the user need more than 10 locations, they can use the tool again and add results together, outside of the tool.

The BMP tab is where the user inputs information about the types of practices and numbers of acres being adopted in the project area by each location. The BMP tab offers the Run Solver button that allows users to explore what combinations of practices can be found to maximize load reductions and minimize the needed acres. Though this feature does not account for cost, it can give users a sense of the scale of the needed practice solutions to attain the project's pollutant reduction goals.

The BMPs that can be evaluated in STEPL include those that apply to the following types of farmland:

- **Cropland**: bioreactor, buffer-forest (100 feet wide), buffer-grass (35 feet wide), conservation tillage, contour farming, controlled drainage, cover crop, land retirement, nutrient management, streambank stabilization and fencing, terrace, and two-stage ditch.
- **Pastureland**: 30 meter buffer with optimal grazing, alternative water supply, critical area planting, forest buffer (minimum 35 feet wide), grass buffer (minimum 35 feet wide), grazing land management (rotational grazing with fenced areas), heavy use area protection, litter storage and management, livestock exclusion fencing, multiple practices for pasture and hayland planting (also called forage planting), prescribed grazing, streambank protection without fencing, streambank stabilization and fencing, use exclusion, and winter feeding facility.

Default pollution reduction efficiencies for these BMPs are sourced from the literature by EPA and its contractors and are embedded in the STEPL spreadsheet. However, users can input their own efficiency values, if available. More than one BMP can be evaluated at a time using the tool's BMP Calculator feature, which can be downloaded from the same EPA site as the STEPL. See the next section for more details.

### C. WHICH OUTCOMES ARE QUANTIFIED?

The STEPL tool quantifies annual N, P, and BOD load in pounds per year and estimates sediment load in tons per year. STEPL estimates annual nutrient loading for the baseline scenario and each entered BMP scenario. In the Total Load tab, STEPL provides all of the results in tabular form. It also presents amount of pollutant load reduction and associated percent reductions for each land use such as cropland, pasture, etc. The Graphs tab generates easy-to-interpret bar and pie charts of the results.

Users who wish to evaluate multiple types of BMPs can do so in the BMP Calculator. The calculator aids evaluation of BMPs adopted in parallel (e.g. cover crop acres on Field A and conservation tillage on Field B), in series (grassed buffers *and* conservation tillage used on the same field), and in combination (reflecting both parallel and series BMP scenarios). The calculator adjusts the BMP efficiencies to reflect the scenarios defined by the user.

### D. TOOL STRENGTHS AND LIMITATIONS

One strength is that STEPL was developed for project-scale planning and reporting by 319 watershed projects, but it can be used by any project to plan and report on field scale practice adoptions as well. STEPL includes all functionality also available in the Region 5 Tool, its precursor, but does so with greater accuracy given the many underlying datasets that account for the different sources of pollutant loads in a project area, updated and enhanced equations, and additional features, such as the BMP Calculator. STEPL does not require significant training, and with the more recent release and updates, the tool has been expanded to include additional land uses and additional BMPs. STEPL has been peer-reviewed, and "can be used to evaluate relative contribution of different land uses to overall pollution load" (Nejadhashemi et al., 2011).

One limitation is that users must gather significant data prior to using the STEPL tool. If projects have locations within multiple watersheds, and many different land uses, data collection may be onerous. During a recent training, Tetra Tech consultants copied and pasted data into the tool from another spreadsheet that they had assembled prior to the webinar, highlighting how users might prepare their input data for easy copying and pasting themselves (See those training materials on the main STEPL home page here: epa.gov/nps/spreadsheet-tool-estimating-pollutant-loads-stepl).

### E. WHO'S USING THIS TOOL?

The STEPL Manager, Colin Geisenhoffer (National Project Lead for the Spreadsheet Tool for Estimating Pollutant Loads (STEPL)), said that STEPL has been used in all but 12 states and territories (including Puerto Rico and D.C.) by state agencies, EPA staff, local watershed groups, academia, and other stakeholders to report on the outcomes associated with practice adoption occurring in EPA 319 projects (Personal communication, C. Geisenhoffer, 10/2/20). These 319 project reports can be viewed at this site, although many do not mention what technique they used to estimate their project outcomes, let alone specify STEPL: epa.gov/nps/319-grant-reports-and-project-summaries.

In the state of Wisconsin, STEPL was used to model loading from agriculture in the Lower Fox River Mainstem (City of Green Bay-Fox River and Garners Creek Fox River) as part the Nonpoint Source Watershed Implementation Plan (WIP) (Outagamie County Land Conservation Department, 2019) developed by conservation departments in Outagamie, Calumet, and Brown County.

According to the Lower Fox River Mainstem WIP:

The Lower Fox River Mainstem watershed contributes an estimated:

- 127,130 lbs of phosphorus and 6,128 tons of sediment to the Bay of Green Bay per year.





a. About the Tool
b. Site-specific Inputs & BMP Analysis Options
c. Which Outcomes Are Quantified?
d. Tool Strengths and Limitations
e. Who's Using This Tool?
f. Supporting Information

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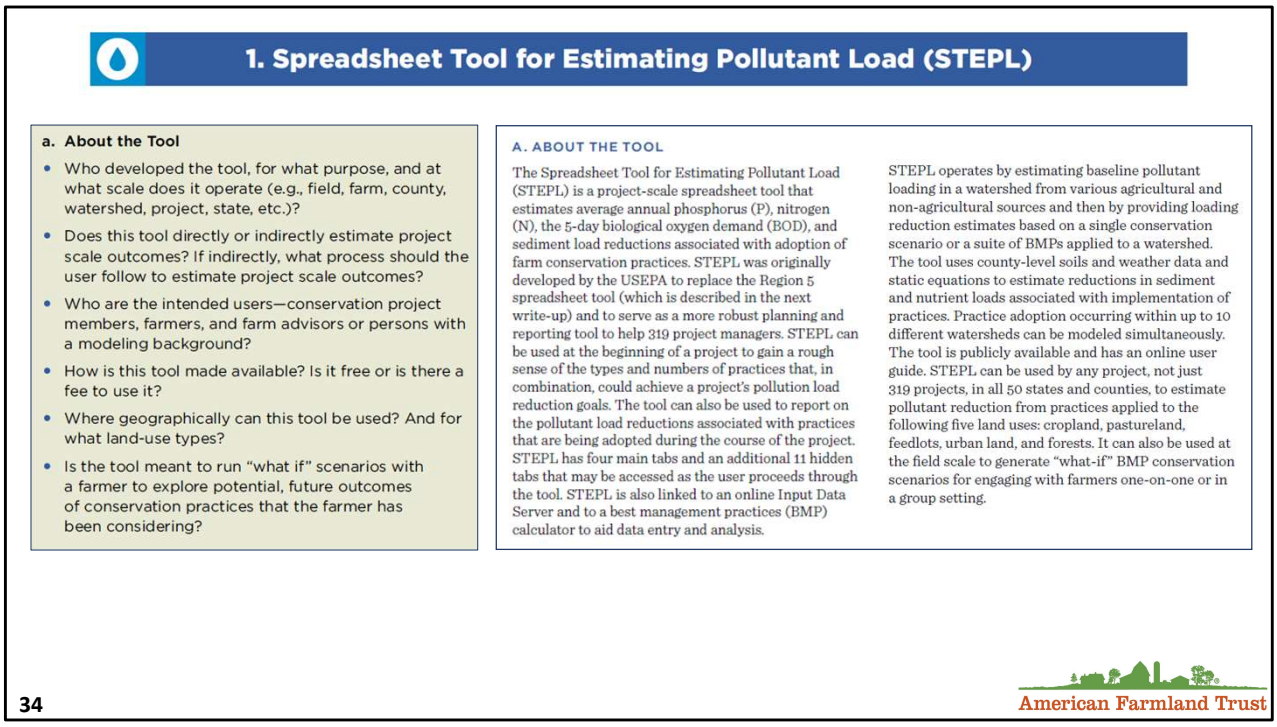
The 14 tools and 2 method descriptions begin on page 29 of the guide. With each of the 14 tool descriptions following the same format that is noted here.

Beginning in section a with an overview and tool background, then section b describes the required inputs and analysis options of each tool. Next in C it details the specific outcomes quantified by the tool, and D highlights strengths and limitations. In E we provide examples of other conservation projects that have used this tool for quantifying project outcomes, and then each write-up ends with additional supporting and logistical information.

I'll walk you through these sections in a little more detail now.



## 1. Spreadsheet Tool for Estimating Pollutant Load (STEPL)

**a. About the Tool**

- Who developed the tool, for what purpose, and at what scale does it operate (e.g., field, farm, county, watershed, project, state, etc.)?
- Does this tool directly or indirectly estimate project scale outcomes? If indirectly, what process should the user follow to estimate project scale outcomes?
- Who are the intended users—conservation project members, farmers, and farm advisors or persons with a modeling background?
- How is this tool made available? Is it free or is there a fee to use it?
- Where geographically can this tool be used? And for what land-use types?
- Is the tool meant to run "what if" scenarios with a farmer to explore potential, future outcomes of conservation practices that the farmer has been considering?

**A. ABOUT THE TOOL**

The Spreadsheet Tool for Estimating Pollutant Load (STEPL) is a project-scale spreadsheet tool that estimates average annual phosphorus (P), nitrogen (N), the 5-day biological oxygen demand (BOD), and sediment load reductions associated with adoption of farm conservation practices. STEPL was originally developed by the USEPA to replace the Region 5 spreadsheet tool (which is described in the next write-up) and to serve as a more robust planning and reporting tool to help 319 project managers. STEPL can be used at the beginning of a project to gain a rough sense of the types and numbers of practices that, in combination, could achieve a project's pollution load reduction goals. The tool can also be used to report on the pollutant load reductions associated with practices that are being adopted during the course of the project. STEPL has four main tabs and an additional 11 hidden tabs that may be accessed as the user proceeds through the tool. STEPL is also linked to an online Input Data Server and to a best management practices (BMP) calculator to aid data entry and analysis.

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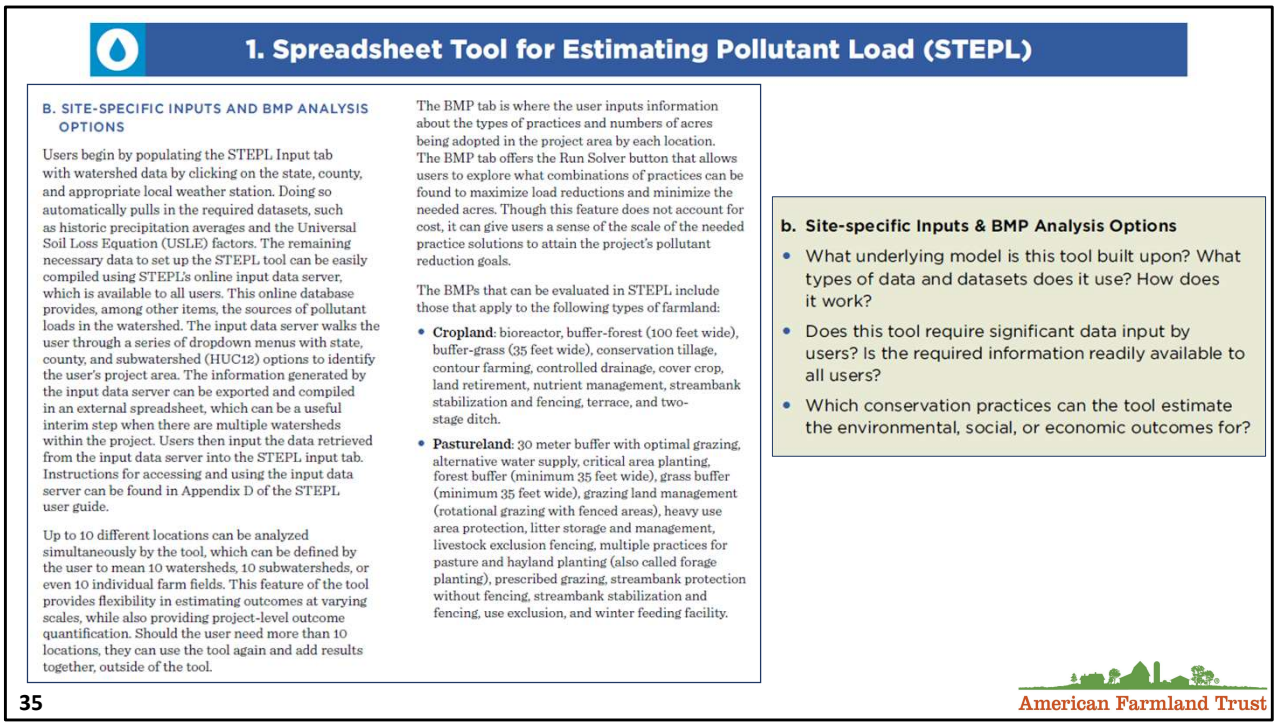
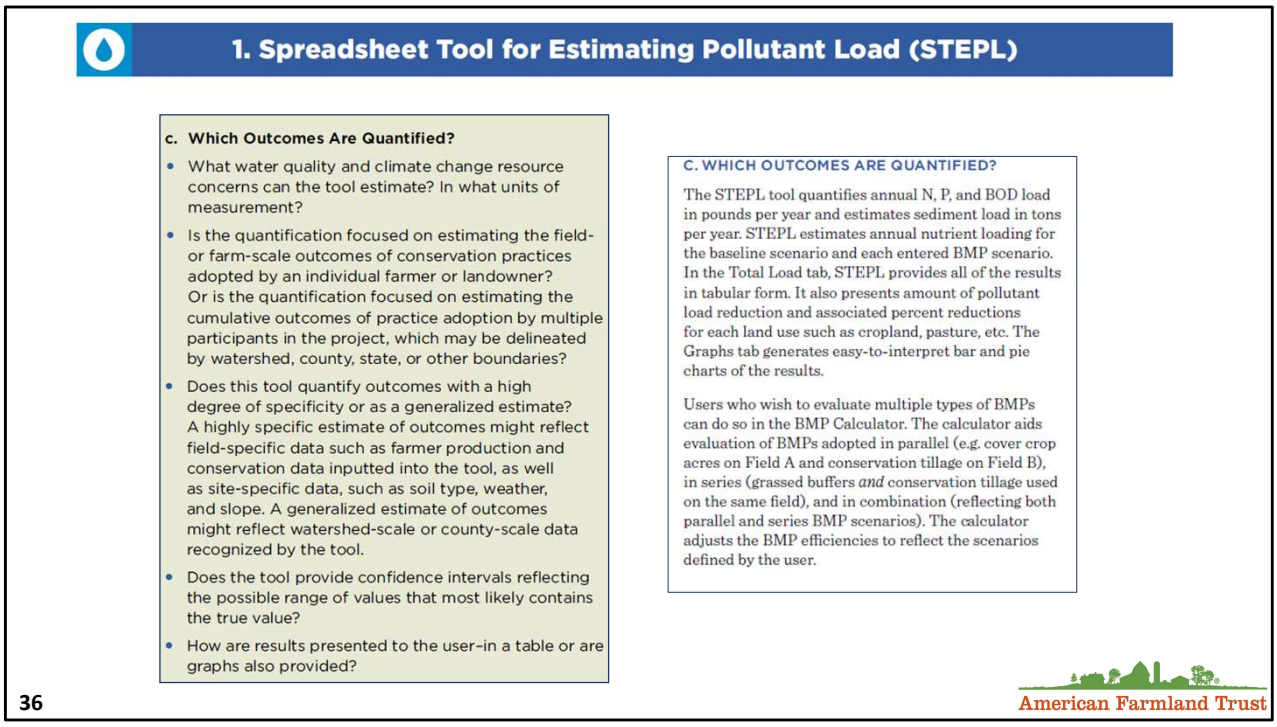
Each tool write-up begins with a summary description. This section answers the set of questions on the left – including background on the tool, who developed this tool and for what purpose and scale. the developer/developers, tool availability, and intended users. Also - Does this tool quantify project scale outcomes?

How do you access it, where geographically can it be used and can you use this for "what-if" scenarios.

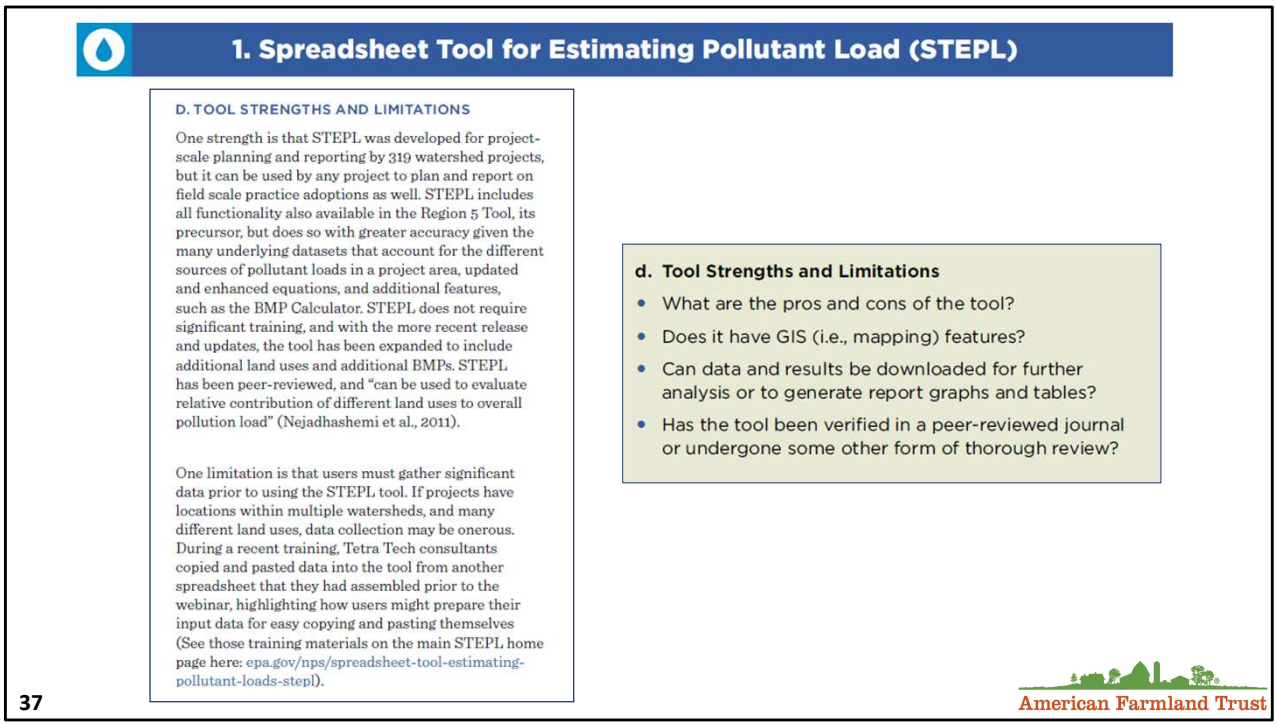



Then in section b – there are more tool specifics, such as what is the underlying model that this tool is built upon, what data and/or datasets does it use, and is that data readily accessible to the user.

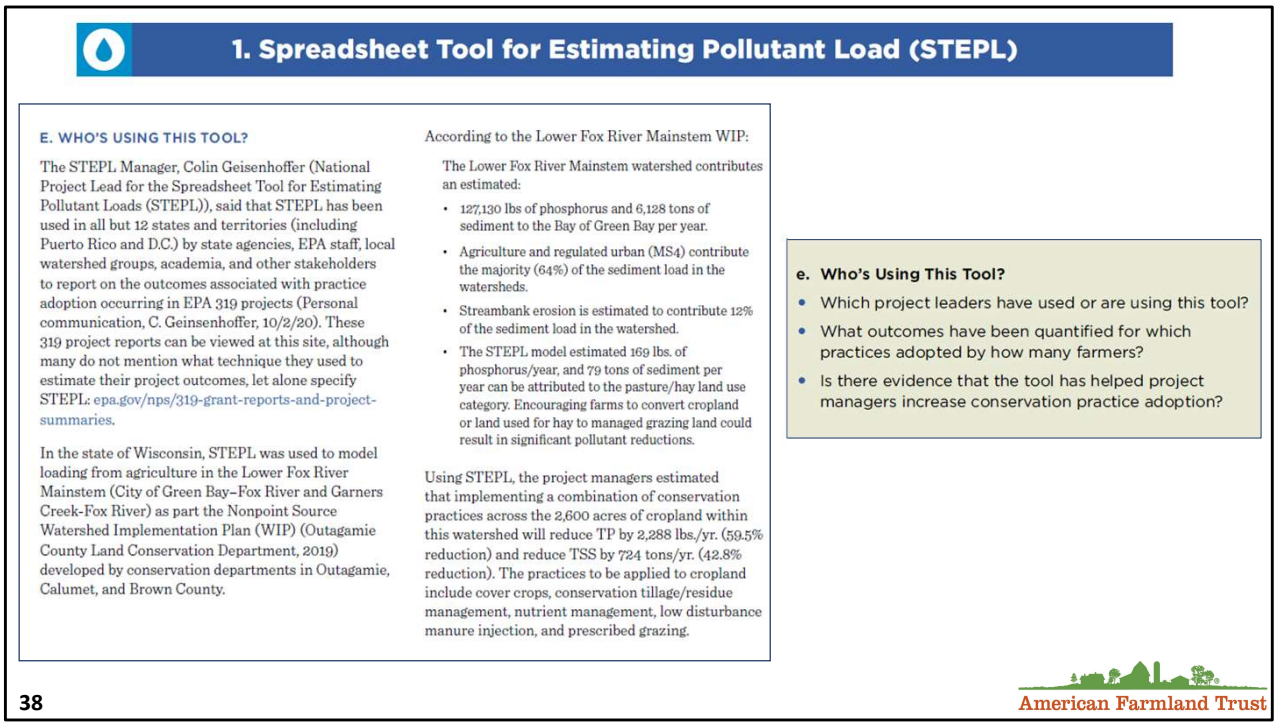
This section also describes the conservation practices that this tool can estimate outcomes for. If your project is focused on the adoption of BMPs within animal agriculture, section B is a great place to ensure that a tool will work for your project.




Moving along to section c – here you will find descriptions of the outcomes that are quantified by each tool, such as N and P loading for the WQ tools, along with the specificity of those outcomes, and if confidence intervals are provided by the tool. Also - the units and how the tool presents these outcomes to the user –in tabular form , graphical, or both are detailed here.

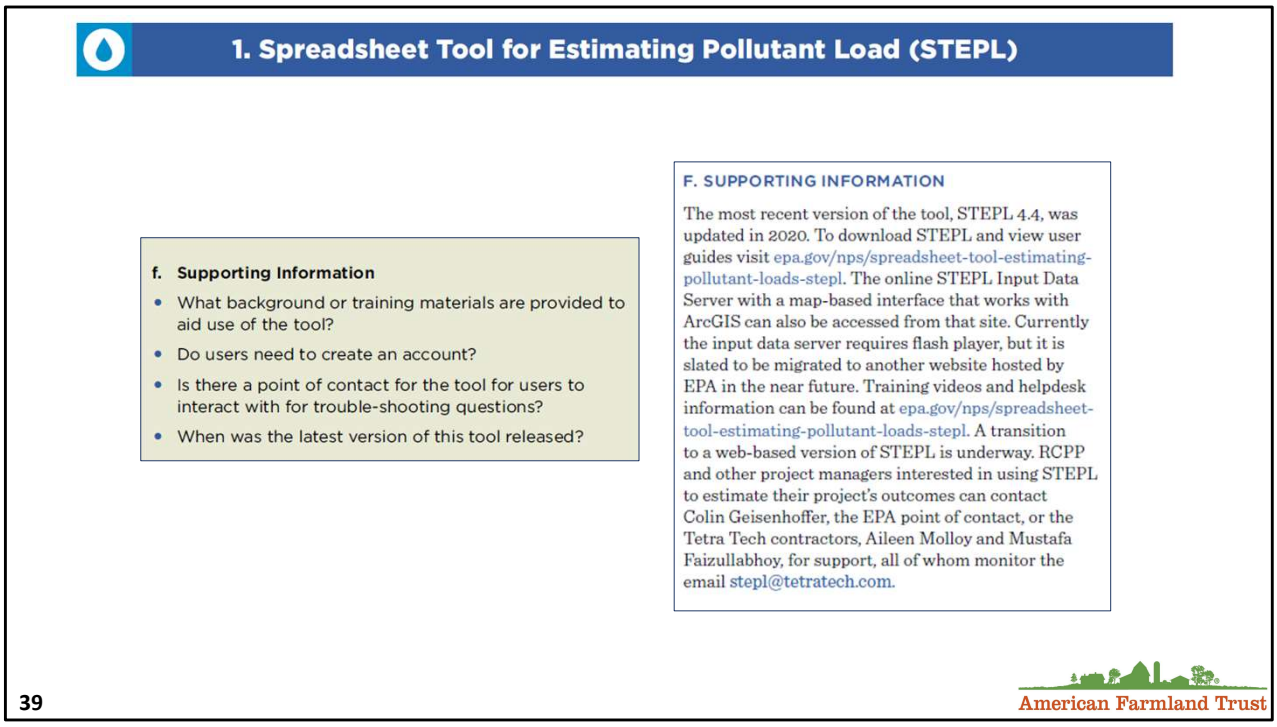



Now in section D we highlighted some of each tool's strengths and limitations – including helpful features such as a map-based interface like several of the included tools have. This section may also note when there may be a significant amount of external data collection required to use the tool, if the user can download the results easily, and if this tool have been reviewed in some manner.




Through our own research or through our conversations with the developers, we described other projects that have used this particular tool in their own outcomes quantification. Here in section E. Highlighting project partners, location, and the estimated outcomes of their project that were quantified with this tool. As we only included tools that were meant for use by conservationist and/or farmers – we worked to include examples of our fellow conservationist using them and their project result where available.

For example – STEPL was used to estimate that the adoption of CP across 2600 acres of this project in Wisconsin, which they estimated will result in a reduction of 2288 lbs P and 724 tons sediment annually.




Finally, in section f you will find logistical information such as the most recent version or updates to the tool, web links to the tools' home pages, user guides, training and any other relevant materials. Also included in this section is a point of contact for each tool, so that users or potential users can have a first point of contact if so needed for questions or etc.

## Trade-offs and Considerations

Field-specific data availability

Farmer time commitment

Project staff tool training or experience

**For field- or farm-specific outcomes**

- NTT (WQ)
- COMET-Farm (GHG)
- Fieldprint Platform (GHG)

**For generalized quantification**

- COMET-Planner (GHG)
- STEPL (WQ)
- PTMApp-Web (WQ/regional)
- FieldDoc (WQ/regional)

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It is important to point out that the tools and methods we've included in this guide have varying strengths and limitations – we hope this guide assists project leaders review and evaluate the different features and weigh the trade-offs that may occur when deciding upon a tool.
For instance - If you have access and the farmer and staff the time required to input field-specific data, then tools such as NTT, Comet farm and the Fieldprint Platform might work for your project needs.
If you do not access or don't have a need for site-specific outcomes then you could consider COMET-planner, STEPL, PTMAPP, or field doc – however these tools will provide more generalized outcomes estimations

## Trade-offs and Considerations

Project location & tool availability

Quantifying project outcomes

Additional features

**For watershed-specific water quality quantification**

- Model My Watershed (nationwide, geographic targeting)
- STEPL (nationwide)
- CAST (Chesapeake states)
- FieldDoc (Mid-Atlantic)

**For project-scale quantification**

- COMET-Planner (GHG)
- STEPL (water quality)
- Both project- & field-scale analyses:
  - STEPL (water quality)
  - PTMApp-Web (water quality MN & ND)
  - FieldDoc (water quality Mid-Atlantic)
  - Fieldprint Platform (GHG)

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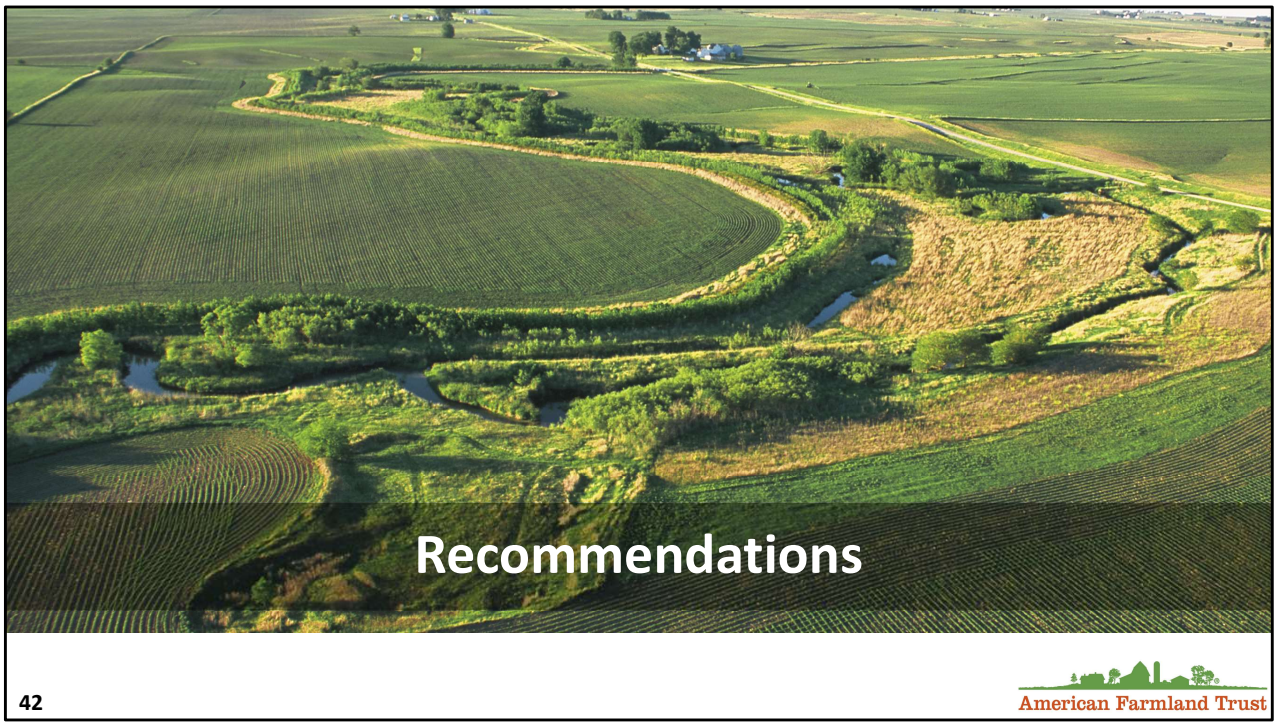
OTHER CONSIDERATIONS include the project location and availability of each tool – and additional trade-off may include the ability to track project outcomes, the user-interface experience, and additional mapping or GIS integration.
For instance - Model my watershed and FieldDoc both quantify watershed-specific outcomes, and both have mapping capabilities, however, MMW it is not designed for project-scale quantification, whereas Field-doc, on the other hand = can quantify outcomes at multiple scales but is regionally limited to the mid-Atlantic. Another regional tool - PTMApp operates in Minnesota and North Dakota and offers geographic targeting capabilities to identify “hotspots” which can aid watershed planning. Each of the tools and methods featured in this guide have strengths and provide some great features – but each tool also has its limitations. You may be searching for the perfect tool for your project, we all know that THERE IS NOT SUCH THING AS A PERFECT TOOL – THEREFORE but more likely than not, Project leaders may need to prioritize those tool features that support project goals and outcomes quantification needs.This guide can help inform that process. With that said, I am going to turn it back over to Michelle – who will share some of our recommendations for the many stakeholders in the conservation community




Michelle:
Well thank you Emily for sharing those great tips.
Now we round the bend of our presentation by sharing some key recommendations.

## Recommendations for Tool Developers

Who can help with these "asks"?

- Provide more helpful guidance & instructions for project managers
- Include a list of projects that have used your tool
- Expand the geographic accessibility of your tool
- Signal to NRCS, EPA, states, the foundations, & the corporations that you need support to improve and expand your tools

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- We are so grateful to the many tool and method developers that engaged with us during our research.
- We offer recommendations that might make developers of outcomes estimation tools more successful at supporting the possibly 1,000s of project managers to become users of their tools. We recommend tool developers:
    - Provide more helpful guidance & instruction for those project managers
    - Include lists of projects using the tools to inspire confidence in other potential users
    - Expand the geographic applicability of the tool to more states, for more practices, and more production systems
    - And because all of that takes resources, we recommend they advocate for more support for these activities from NRCS, EPA, state agencies, research and charitable foundations and corporations with sustainability goals.

## Recommendations for Project Managers

Who can help with these "asks"?

- Seek confirmation, training, & coaching from tool developers to make sure tool is right for you
- Use back-of-the envelope & other simple outcomes estimation methods
- Signal to NRCS, EPA, states, foundations, & corporations that you need more guidance & support to quantify outcomes

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- For project managers trying to figure out your outcomes quantification plan, we feel your pain.
- To set up for success, reach out to the tool developer to confirm the tool you're considering will work for your project. Review all the existing training resources on their websites & ask for more training & coaching to oversee your initial use of the tool..
- If you find you the featured tools don't work for you, try using the back-of-the-envelope methods like the STAR Method to estimate water quality outcomes or MS or Google Forms to help quantify social outcomes.
- And because all of these outcomes quantification activities take a lot of effort, signal to those who can provide you with support that you need more guidance and help to quantify outcomes and ask for tools to become useable in your neck of the woods.

## Recommendations for NRCS

Who can help with these "asks"?

- Develop an outcomes quantification handbook for RCPP
- Facilitate social outcomes training & coaching
- Facilitate frequent & on-going training on existing outcomes estimation tools & offer coaching

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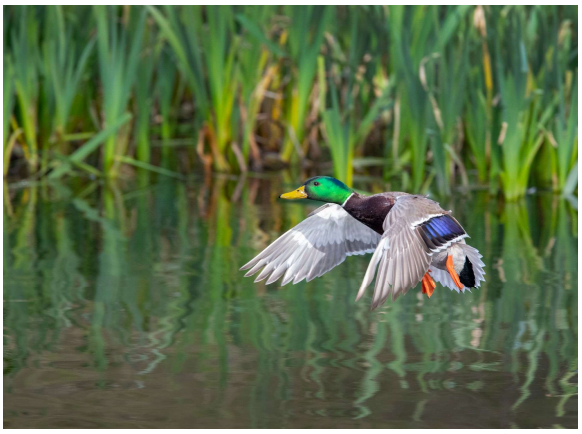
- For NRCS, we recommend that the agency develop its own outcomes quantification handbook for RCPP & other project managers. We're happy to report that NRCS said they would disseminate this Guide to RCPP, MRBI, and NWQI project managers.
- We also recommend NRCS facilitates social outcomes training and offer coaching during design of RCPP and other projects as we believe social science is the cornerstone of effective conservation adoption efforts.
- And we encourage NRCS to facilitate frequent and on-going training sessions on existing outcomes estimation tools and offer coaching services to the RCPP and other project managers over the life of the project.

## Recommendations for Congress, USDA, EPA, States, Academics, Foundations, & Corporations

? Who can help with these "asks"?

- Support the tool developers & tool users to implement the activities recommended in this Guide
- Support additional research on measuring outcomes beyond this initial assessment
- Establish a nationwide dataset for calibrating outcomes quantification tools



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And finally, for Congress, USDA, EPA, State agencies, academics, research and charitable foundations, and corporations with sustainability goals, we recommend:

- You support the tool developers and tool users to implement the many challenging activities recommended in this Guide
- We encourage you to support additional research on measuring outcomes beyond this initial assessment.
- And we call for establishment of a nationwide dataset for calibrating all outcomes quantification tools so they generate even more accurate results, can analyze more conservation practices, applied to more farm production systems, in more states. This dataset would lift all tool boats and make them work better for tool developers and tool users, alike.


We hope those recommendations made sense and resonated with many of you.
Alright, we've got one more slide to outline options for what's next.

## Next steps in our outcomes quantification journey

- ❑ AFT can offer tools training webinars by developers of the tools – do you want that?
- ❑ **5-question online SURVEY post-webinar**
- ❑ We can offer free "coaching" services to 10 farm project managers
  - ❑ **Email mperez@farmland.org, RE: Coaching Request**
- ❑ We welcome your help to make the recommendations a reality

*Please keep in touch: mperez@farmland.org*

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Here are some ideas for next steps in our collective outcomes quantification journey.

- In addition to NRCS or other institutions, AFT can organize tools training webinars by the developers of the tools for RCPP and other project managers, would you like that? That question and 4 others are in a one-page survey that will appear as a new tab in your internet browser when the webinar ends. Please take just few minutes to share your feedback.
- AFT can also offer free "coaching" services to 10 farm project manages to help you figure out which tools or methods are right for your project. If you're interested, just email me and in the subject line, write: Coaching Request).
- And we welcome your assistance in helping make some or all of these recommendations a reality. Just email me to let me know if and how you can help.


Thank you for your attention, let's hear from you now. Please type your questions and comments in the Question box.