

Introduction:

The Indiana Conservation Partnership is comprised of eight Indiana agencies and organizations who share a common goal of promoting conservation. To that end, the mission of the Indiana Conservation Partnership is to provide technical, financial and educational assistance needed to implement economically and environmentally compatible land and water stewardship decisions, practices and technologies.

In 2013, members of the Indiana Conservation Partnership (ICP) began using the Environmental Protection Agency's (EPA) Region 5 Nutrient Load Reduction model to determine the impact of installed conservation practices implemented by the ICP Conservation Implementation Teams on Indiana's water quality. The ICP adopted the Region 5 Nutrient Load Reduction model to analyze conservation practices funded by state programs such as the Indiana State Department of Agriculture's Clean Water Indiana Program and the Indiana Department of Natural Resources' Lake and River Enhancement Program, as well as federally funded programs including EPA's Section-319 Program and USDA's Farm Bill Program.

For calendar year 2013, the ICP Conservation Implementation Teams installed 30,775 conservation practices. A total of 15,322 of those practices could be analyzed using the Region 5 Nutrient Load Reduction Model, which estimated annual reductions of sediment, as well as nitrogen and phosphorus tied to sediment erosion (brown, green and blue maps, respectively). These reductions continue for the life of the practices modeled (e.g., grassed waterways are designed to be 10-year practices, while cover crops are 1-year practices, established annually). Reductions in dissolved nutrients, such as dissolved reactive phosphorus (DRP) and nitrate (NO₃), are not accounted for by the Region 5 Model. The remaining ICP practices were not modeled because they were not associated with sediment loss or were not covered by the EPA Region 5 Model. This effort represents ICP-assisted conservation in Indiana.

Indiana is the only state in the country to adopt a model among so many partners to estimate conservation impact on a statewide scale. As part of Indiana's Nutrient Reduction Strategy, this modeling effort illustrates the continued success and challenges of conservation and serves as a tool to help set watershed priority and reduction targets, manage conservation resources, and to further stakeholder involvement at all levels of government within and across Indiana.

Methodology:

The Indiana State Department of Agriculture's (ISDA) use of the EPA Region 5 load reduction model to estimate Nutrient and Sediment load reductions in Indiana is part of a collective effort by the Indiana Conservation Partnership (ICP) <http://iaswcd.org/icp/> to generate a comprehensive statewide picture of voluntary conservation impact across the state. Cooperation in this effort by local, state and federal partners in the ICP allows for conservation tracking and load reduction estimation at an order of magnitude greater than any single agency or entity could achieve alone. The ICP utilizes the end products of this process to establish baselines and measure load reduction trends by watershed for each calendar year, allowing for prioritization of workload and staffing needs, all while serving as a tangible component of the Indiana Nutrient Reduction Strategy.

The collection of practice data for the model is the first step in this effort. Several members of the ICP participate on this front end, which makes the Division of Soil Conservation's (hereafter referred to as the Division) use of the model and subsequent mapping possible. Practice information from several sources is consolidated by our Accountability and Technology Program Manager and then run through the model by Division field staff¹. These data include Clean Water Indiana and CREP conservation tracking data in Microsoft SharePoint (ISDA, Soil and Water Conservation Districts), practice data from Farm Bill programs (NRCS/FSA), practice data from EPA-319 funded projects (IDEM) and practice data from the Lake and River Enhancement program (IDNR).² It should be noted that data not related to the Region 5 model is also consolidated in this way, though it is instead published in reports online.³ These include tillage transect data and ICP financial reports. For utilizing the Region 5 model, practice data from ICP partners is collated into an Annual ICP Conservation Accomplishments datasheet, which included Best Management Practice (BMP) types, practice locations, measurements and other necessary attributes to enter into the Region 5 model. Practice data are then divided up by county and assigned to Division staff (4-6 assigned counties each).⁴ By distributing workload on a county basis, practice data can be run through the model by Division staff on a manageable timeline. All practices within a given calendar year are modeled with maps and reports generated in March of the following year.

As practice reduction estimates are completed in the model by Division staff, the nitrogen, phosphorus and sediment load reduction numbers are entered back into the Annual ICP Conservation Accomplishment datasheet.⁵ Once completed, the Accountability and Technology Program Manager lays over watershed or county layers in GIS

¹ All Division staff are trained to use the Region 5 Model with initial instruction of the Model as well as refresher training and Q&A. A training webinar has been completed for new and existing users of the model, which illustrates examples and explains the equations behind the model's function(s). The Division of Soil Conservation Team Leaders also developed a guidance document for the Region 5 Model, which serves to maintain consistency in the Model's use and to reduce and avoid human error where possible. The guidance document includes specific practice notes and comments, and includes a tab to assist with the "coverage factor" in the model.

²This data collection process is represented with the green boxes at the top of the ICP Workload Accountability Data flow chart.

³ Represented in the yellow rectangular boxes in the Workload Accountability flow chart. These are published on ISDA and ICP websites (small purple rectangle, lower left quadrant of the Workload Accountability flow chart).

⁴ Represented in the two small orange circles on the Workload Accountability flow chart.

⁵ Represented in the two small orange circles on the Workload Accountability flow chart.

with practice locations and their respective nutrient and sediment reductions. In this way, a cumulative picture of conservation impact is created at watershed scales.⁶ Value ranges are assigned for load reduction to illustrate the load reductions across the state by watershed at the HUC-8 level.

Conclusion:

The primary value in partnership adoption of the EPA Region 5 model lies in benchmarking conservation impact and management of conservation resources across the state. As an additional result, the Indiana State Department of Agriculture has tied Key Performance Indicators and conservation goals to the Indiana State Office of Management and Budget. Use of the model for tracking impacts and goals has also had an internal benefit for ISDA; an atmosphere of healthy competition has arisen amongst field staff, who are eager to show positive water quality and sedimentation impacts in their respective watersheds. On a larger scale, The Indiana Conservation Partnership utilizes this model to set program/project goals, quantify impacts and estimate load reductions before a project ever begins.

Future plans include the addition of visual impacts of load reductions. For example, how many dump trucks of sediment were kept out of Indiana's waterways. Another goal is to place a dollar value on the amount of nitrogen and phosphorus kept on the land based on values provided by ongoing Water Quality Trading Projects and fertilizer costs. In addition, USEPA (Region 5) is currently updating the model to include fifteen more Best Management Practices (BMPs) as well as a water quantity component. In the future, estimates of water volumes kept on the landscape from various practices would help to assess and manage water quantity conservation efforts at county and watershed scales, both in times of drought and flooding. As these components of the model become available, ISDA and its partners intend to utilize them to their fullest possible potential within the partnership.

The Indiana Conservation Partnership plans to continue utilizing the Region 5 Model and methodology for future years to come. The partners encourage other organizations to share their data as well. With the goal to assemble similar reports in March of each year.

⁶ Represented in the small blue rectangle in the lower right quadrant of the Workload Accountability flow chart.