

Measuring Nonpoint Source Nutrient Reductions in the Mississippi River Basin: Lessons Learned in Arkansas and Indiana

The project team piloted the Conservation Tracking Framework in Arkansas and Indiana. These states were selected because of their eagerness to work with us, their differences in agriculture, climate, and ecoregion, and their current tracking efforts. Arkansas is in the process of establishing a tracking system and Indiana has a pre-existing tracking system, making each state a great fit.

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LESSONS LEARNED

Though many lessons were learned while working with the pilot states, the primary take-away was that states can have vast differences in their conservation practice tracking mechanisms. For example, Arkansas tracks the state managed EPA 319 program and adds accompanying reductions, while Indiana uses federal and state program data and the EPA Region 5 Model to estimate reductions on a field-by-field basis. These two states developed their respective tracking mechanisms independent of one another and, thus, used methods that best fit their states' needs and limitations.

It is vital for states to have this autonomy to decide how to manage their conservation practice data. To help ensure this, the Conservation Tracking Framework guides tracking and reporting to ensure consistency while allowing for state-level flexibility.

Additional lessons learned include:

1. Working directly with the organization responsible for nutrient reduction strategy reporting in each state is essential to success.
 - a. Taking time to listen and understand a given state's challenges can help target work and ensure results from the framework can be useful for their respective reporting efforts. This includes working within existing rules, regulations, and laws which vary from state-to-state. For example, "the Arkansas Freedom of Information Act (FOIA) is one of the most comprehensive and strongest open-records and open-meetings laws in the country," which makes any data used for this effort subject to FOIA requests (Arkansas Attorney General's Office, para. 1).
2. The USDA NRCS EQIP and CSP annual practice data was immensely helpful for developing the Conservation Tracking Framework.
 - a. This data highlighted the importance of spatially distinguishing where practices were and helped us realize that extreme detail is unnecessary, and can even be burdensome, for regional efforts. This is particularly true when aggregating to the state level.
 - b. Even though the USDA NRCS annual practice data are the best available, as hand entered data they are subject to human error and require quality control checks. An example of this was found in Arkansas for "Structure for Water Control," where in 2016 there was one data point showing nearly 31,000 structures were implemented for just \$4,500. As compared to the rest of the data, this was an obvious outlier and the only obvious explanation was a miss-entry.

3. Some states do not have the bandwidth to dedicate substantial time into tracking efforts.
 - a. Due to state-level capacity restraints, it is debatable whether states should dedicate additional resources to consider sources of conservation data outside the USDA NRCS annual practice data. The USDA NRCS annual practice data requires little to no effort to report, however, this data may only be a fraction of the conservation activities in the state, resulting in underreporting.
4. A limitation of the Indiana conservation practice tracking mechanism is the lack of quantification of dissolved nutrient loss reduction. Information from Indiana has been shared at several levels and discussions are underway to modify their tracking effort to add dissolved nutrient loss reduction quantification for a few practices. A workshop to discuss strengthening Indiana's conservation practice tracking framework for load reduction estimation and determine next steps is planned for November 2018.
5. Information gathered from other data sources, such as satellite imagery, could fill some of the reporting gaps for specific conservation activities such as cover crops and tillage, though, to date, no consistent measurement procedure has been developed across the region. This type of imagery could also be applied to some structural conservation practices, such as terraces, water and sediment control basins, grassed waterways, and contour buffer strips.
6. If a state is going to rely on Farm Service Agency (FSA) reported information about conservation practice implementation, it is critical that FSA employees ask farmers questions directly.

Due to the many conversions and calculations required to extend the initial data parameters provided by NRCS, as suggested by the HTF Nonpoint Source Measures Workgroup (NPSMWG, 2018), a draft database has been developed in Microsoft Excel. Excel was used as an initial experimental platform during framework development and works well with the two pilot states. However, alternatives to provide a more permanent and scalable solution to house conservation practice data are being explored. One of these options includes housing data in conjunction with the data visualization efforts of the National Great Rivers Research and Education Center (NGRREC). Discussions are ongoing with NGRREC and initial trials of visualizations have been developed.

REFERENCES

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