

## **Statewide Stream and Wetland Mitigation Forecasting Modeling**

### **PID 119294**

Consultant/Researcher with advanced GIS modelling capabilities and wetland and stream assessment capabilities. Output will be a GIS database of potential stream and wetland assets that will be incorporated into TIMS and used for planning purposes of hard infrastructure.

Ohio receives approximately three feet of rain a year, which makes Ohio a rather wet state. This precipitation along with ground water creates an OEPA estimated 28,900 miles of larger stream channels and over 58,000 miles of headwater stream channels. This estimate is considered low as first order streams have often not been digitized for measurement. Further even though over 90% of Ohio's original wetlands have been destroyed, there still exists an estimated 480,000 acres of wetlands in Ohio. Again, this estimate is on the low end as smaller wetlands are often not detected or mapped in current databases. ODOT and all transportation developers in Ohio must account for the avoidance, minimization, and mitigation of impacts to these highly regulated and protected streams and wetlands. These highly protected yet ubiquitous and highly abundant resources exist under and immediately adjacent to existing infrastructure. Further, they present a challenge to the development of new corridors and enhancement areas. Not knowing in advance where these resources potentially exist on the ground presents a challenge to transportation developers. The impact to these resources can significantly delay development across the state and adds millions of dollars of mitigation costs to transportation programs. To complete hard infrastructure development in or near these highly protected resources can result in significant permit timelines and costs along with mitigation costs incurred by program developers. Having early knowledge of the potential location of these resources is critical to streamlining and reducing the costs of developing hard infrastructure for ODOT and other transportation developers.

This project involves the remote identification and mapping of potential streams and wetlands on a statewide scale using free, readily available, remotely sensed data along with the GIS tools created in the SPR Part B study "Stream and Wetland Mitigation Forecasting: Developing a Predictive Model for Faster Project Delivery and Cost-Savings". The final outputs will be the model, the process, and wetland and stream predictive asset layers. The proof-of-concept project was completed in the early 2022 and created a suite of GIS modelling tools for the prediction of stream and wetland locations at three levels of detail, essentially "best, better, good". That research created experimental data for four (out of a total 44) watersheds; HUC10: Little Darby (West Jefferson), HUC8: Little Miami (Cincinnati), HUC8: Blanchard (Ottawa/Findlay), HUC8: Mohican (Mansfield).

The resulting asset layers will be used by ODOT and others for long- and short-term planning studies, to predict mitigation needs, and the development of single user mitigation banks across the state. The early identification, during planning, of the location and potential size of these protected regulated resources will also be used by ODOT to improve corridor selection, minimization, and mitigation. The products of this project will allow early assessment of these protected and regulated resources while planning activities related to meeting critical success factors relative to Bridge, Safety, Congestion, and Reliability. Additionally, the resulting model products will be integrated into enterprise-wide GIS process (FHWA AGIST) and for ODOT TIMS.

Project proposers must have extensive experience in GIS modeling. The work must also include individuals qualified to conduct field verification or "ground-truthing" of wetland and stream features within a sub-sample of locations to improve the modelling output.