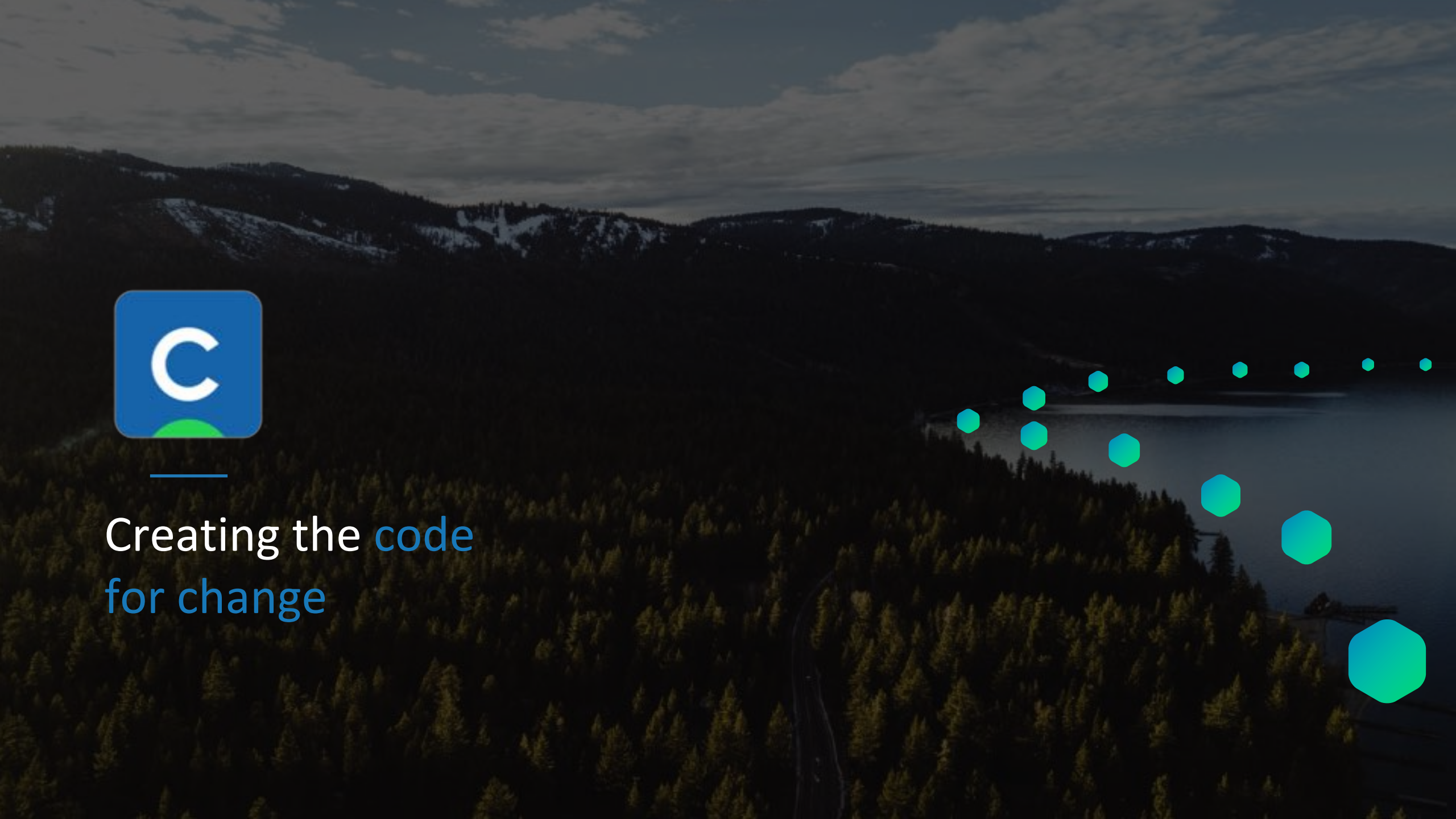

Creating the code
for change

Agenda

P1

Activity 3: BMP Tracking with FieldDoc

Functionality overview, use cases, and the road ahead.

Integration of BMP Blueprint Layers

P.3.a

Understanding project tracking and implementation in the context of opportunity areas

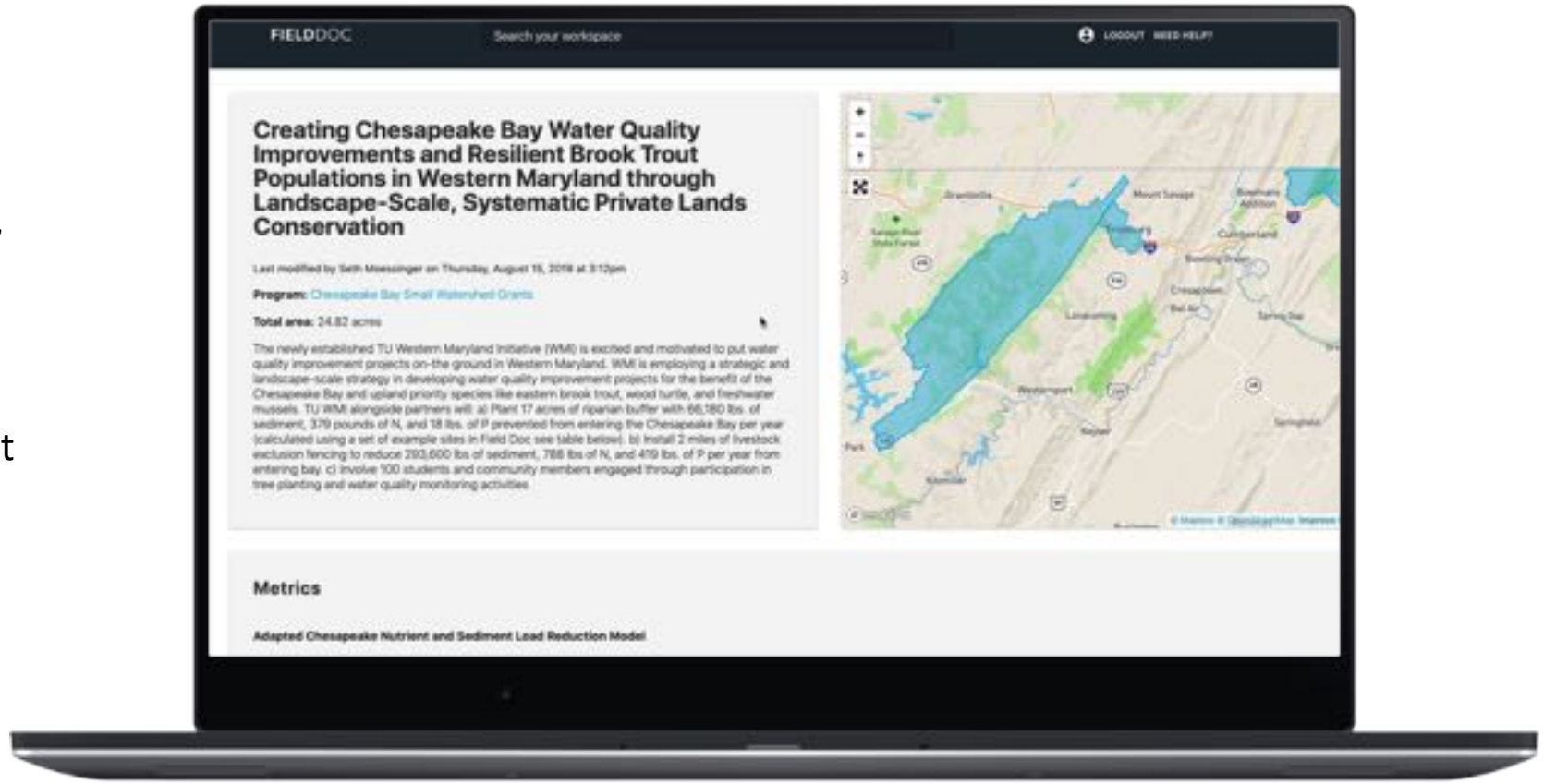
Strategic Partnerships

P.3.b

Building FieldDoc’s analytical engine with Fast Zonal Stats and Rapid Watershed Delineation

Supporting sub-parcel restoration tracking

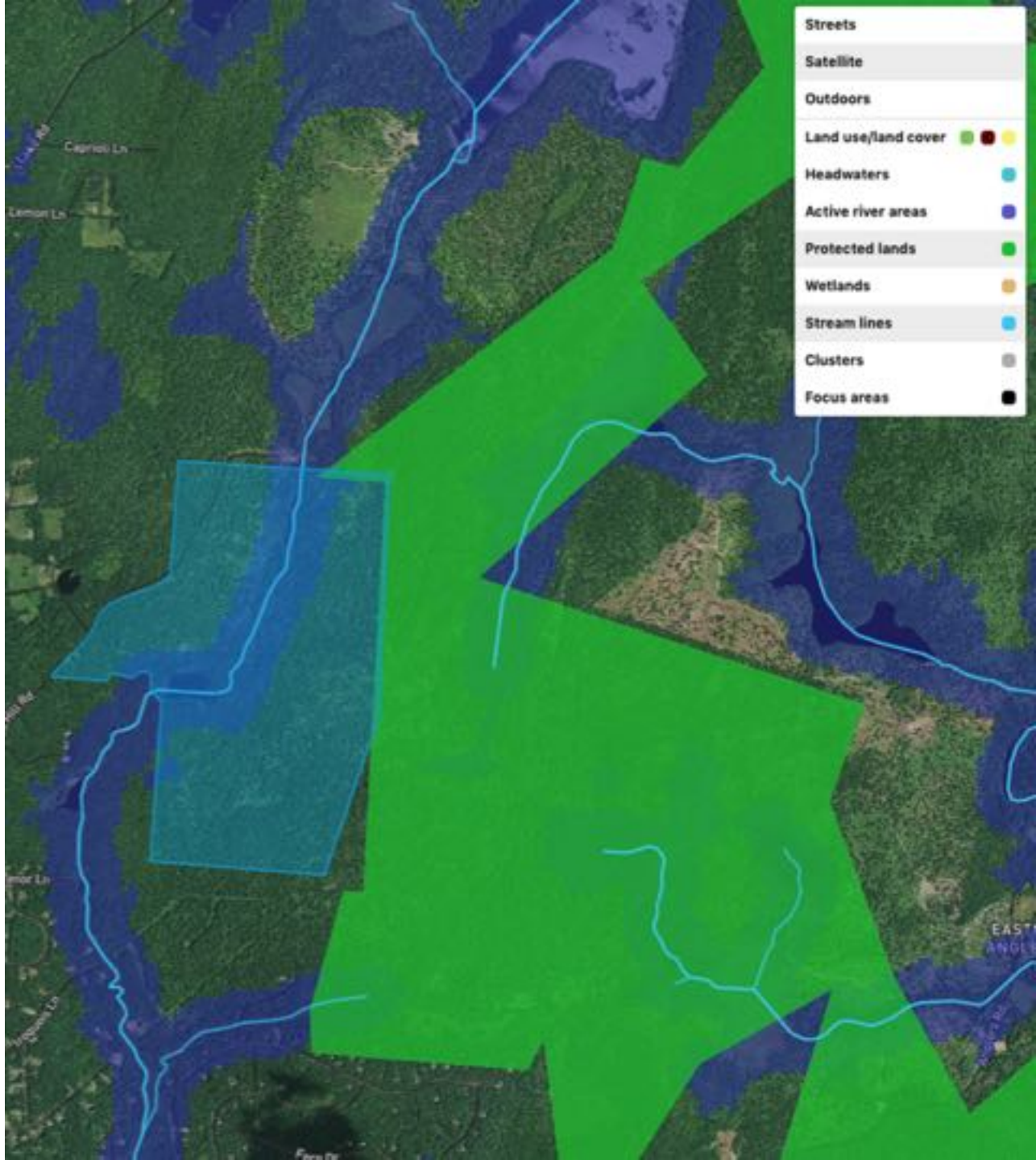
FieldDoc is enabling foundations, grantees, and individual land owners to track implementation progress in real-time and connect their efforts to water quality improvement targets.



Customizable Base Layers and Analytics

FieldDoc now supports the ability for users to provide their own GIS layers in order to see their project in the context of investment portfolio priorities and targets.

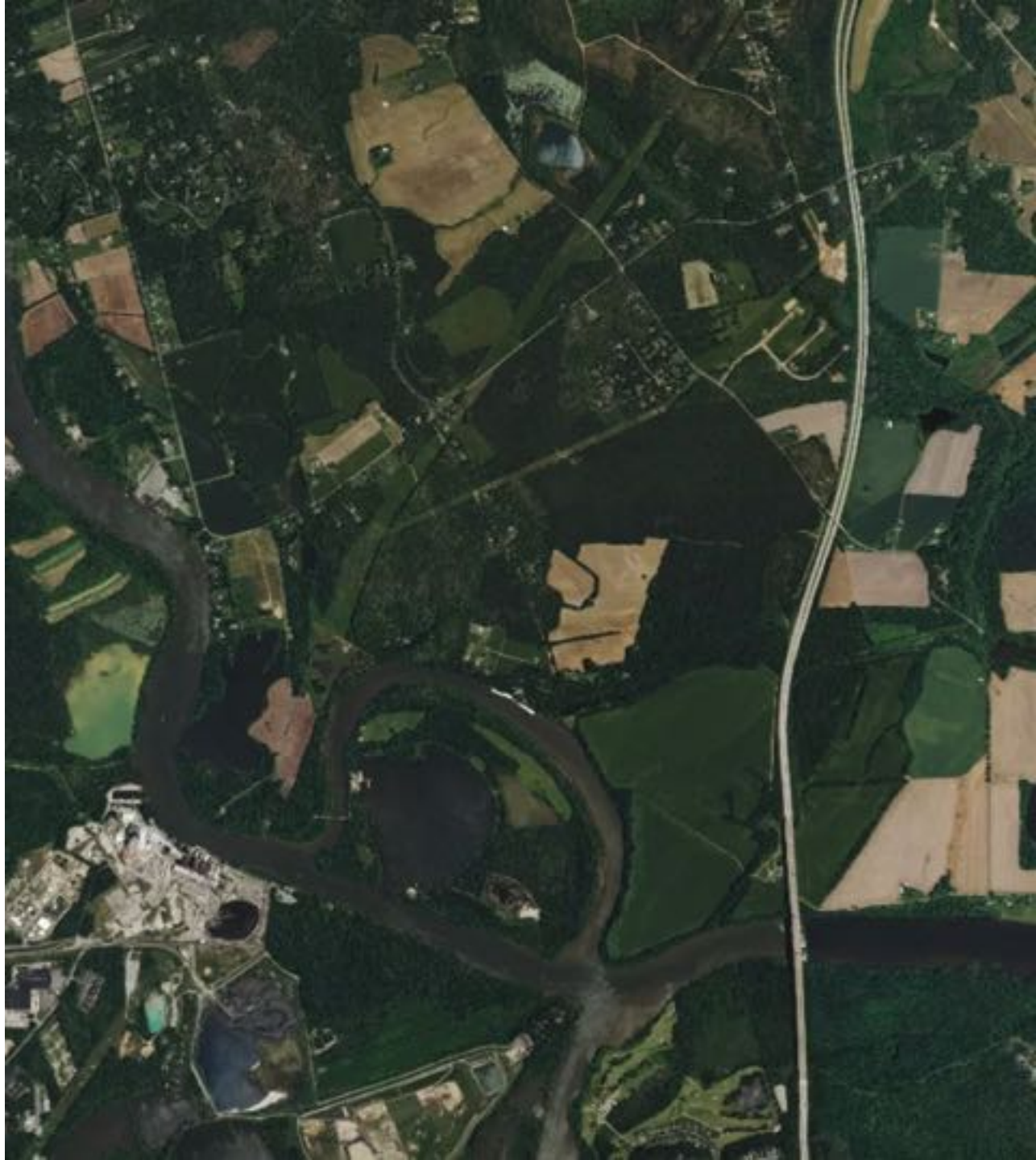
View Site



Prioritization in Use

- **Identification of priority buffers opportunities**
  - **Buffer opportunity area (100ft)**
- **Parcel prioritization**
  - **Tier 1 (Highest Priority)**
  - **Tier 2**
  - **Tier 3**
  - **Tier 4**
  - **Tier 5 (Lowest Priority)**

Data provided by Chesapeake Conservancy



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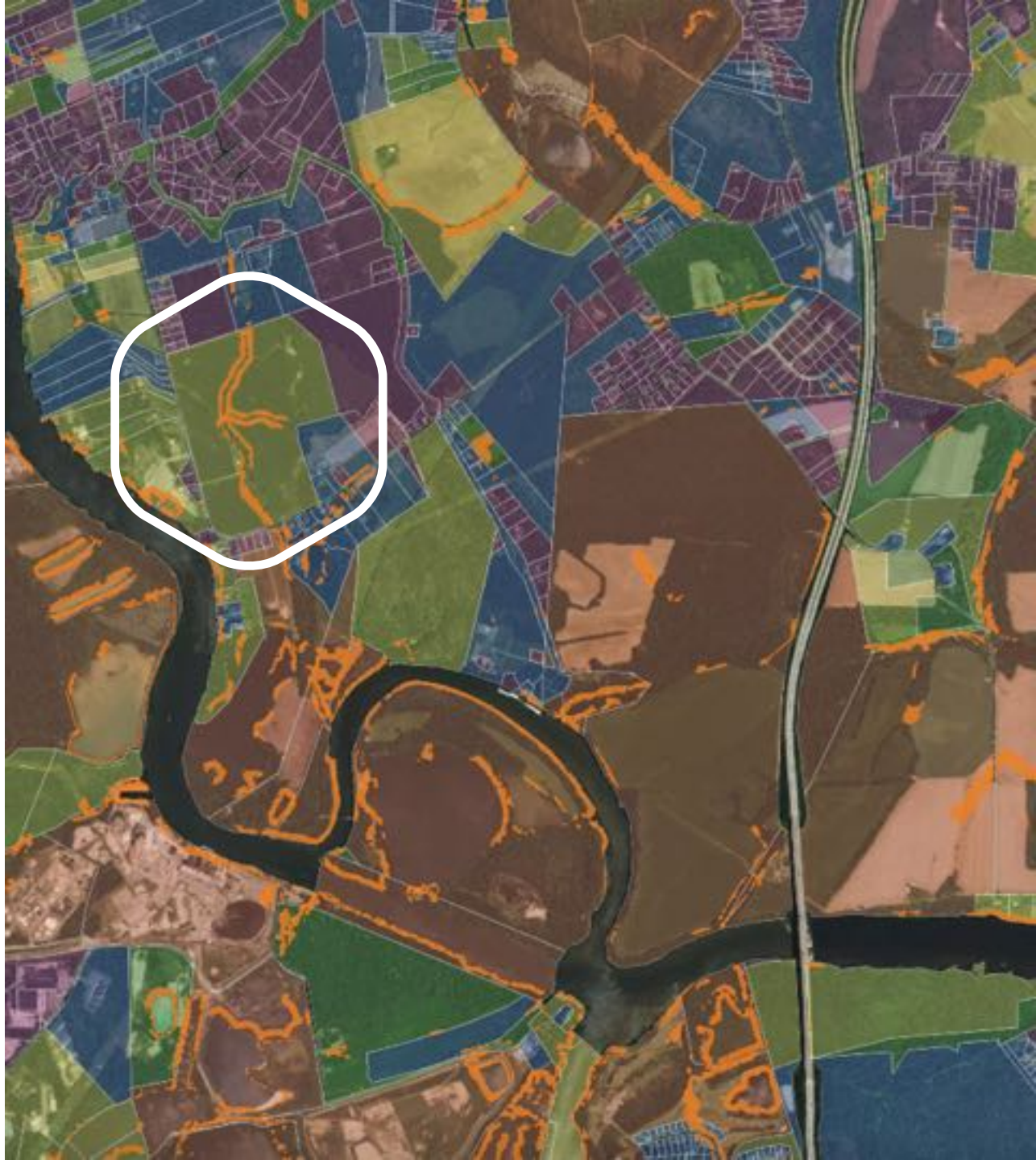

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Platform
Walkthrough

Strategic Partners & Multipliers

Academy of Natural Sciences

- Algorithm and model development
  - Load reduction modeling
  - Watershed Delineation
  - Fast Zonal Stats

Chesapeake Conservancy

- High resolution data provider
  - Normalized Difference Flow Index
  - Parcel Prioritization
  - Practice Prioritization

The Academy of Natural Sciences of DREXEL UNIVERSITY

Chesapeake Conservancy

EXPLORE. CONSERVE. INNOVATE.


Watershed
Delineation
Example
View Site

Rapid Watershed Delineation

Academy of Natural Sciences has developed a rapid zonal stats algorithm. We will be working to bring this service online to dynamically analyze an area draining to a specific BMP.

Environmental Modelling & Software
Volume 109, November 2018, Pages 420-428

A new rapid watershed delineation algorithm for 2D flow direction grids

Scott Haag, Bahareh Shakibajahromi, Ali Shokoufandeh
Show more

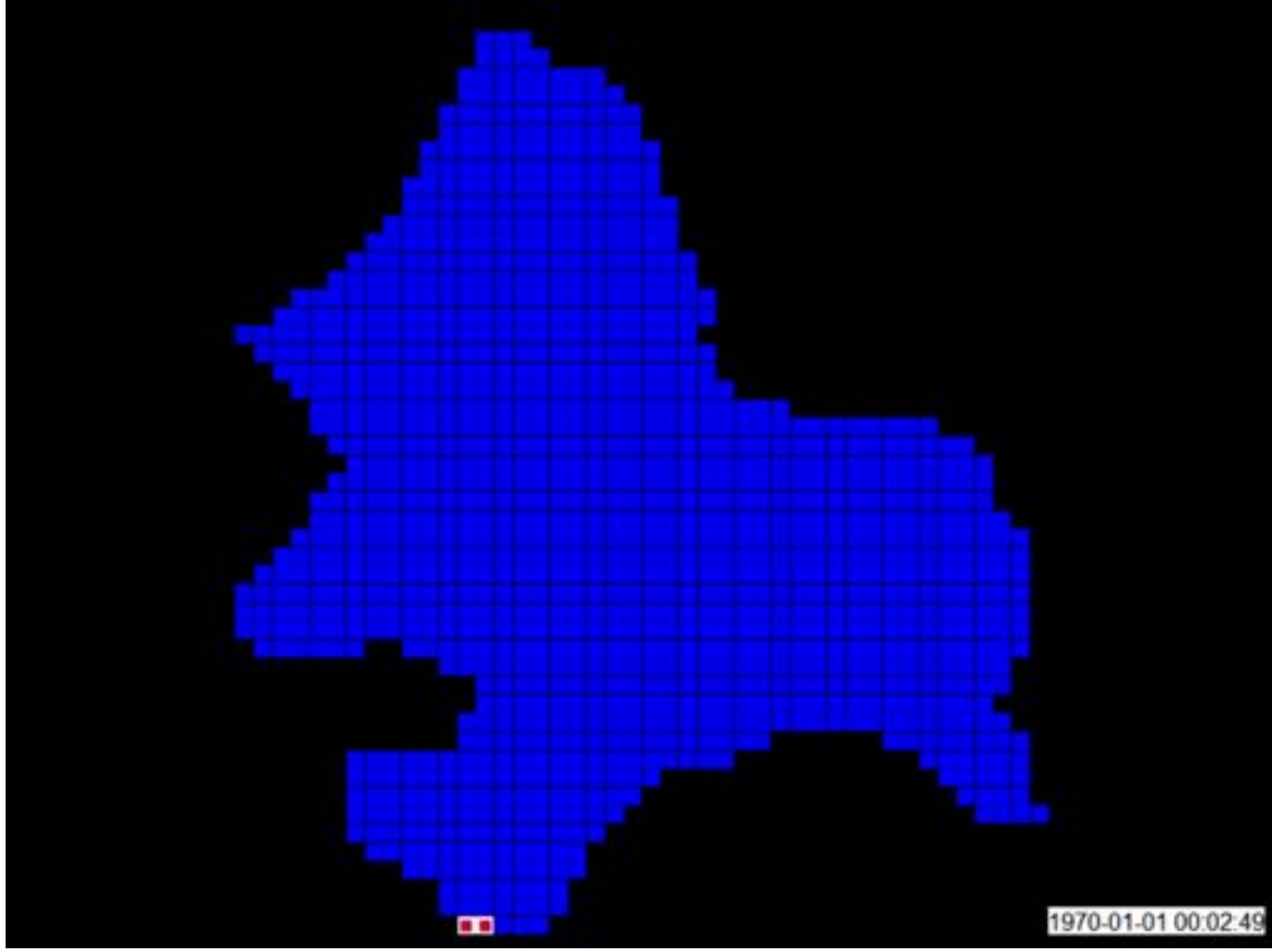
https://doi.org/10.1016/j.envsoft.2018.08.017

Abstract

In this paper we propose an algorithm for retrieving an arbitrary watershed boundary from a 2D Flow Direction Grid. The proposed algorithm and associated data model provides geometric speed increases in watershed boundary retrieval while keeping storage constraints linear in comparison to existing techniques. The algorithm called Watershed Marching Algorithm (WMA) relies on an existing data structure, the modified nested set model, originally described by Celko and applied to hydrodynamic models by Haag and Shokoufandeh in 2017. In contrast to existing algorithms that scale proportionally to the area of the underlying region, the complexity of the WMA algorithm is proportional to the boundary length. Results for a group of tested watersheds ($n=14,718$) in the $\approx 36{,}000\,km^2$ Delaware River Watershed show a reduction of between 0 and 99% in computational complexity using a 30 m DEM vs. existing techniques.

Delineation Pepsi Challenge

Comparison of ESRI watershed delineation algorithm to Academy of Natural Science algorithm

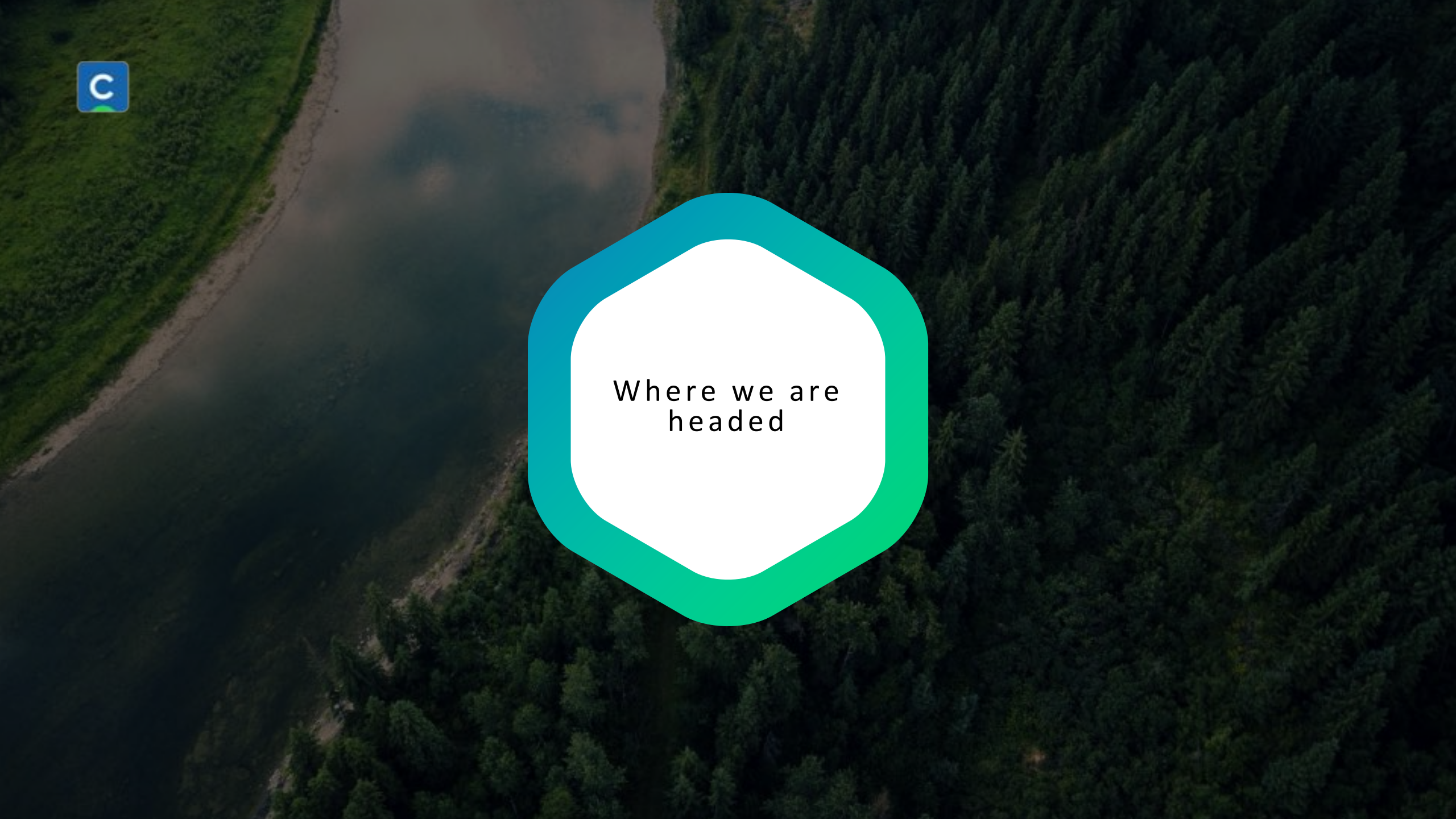


Delineation Pepsi Challenge

How much faster? Orders of magnitude faster.

Test ID	Polygon Size (km2)	Watershed Size (km2)	WMA-P Time (seconds)	ESRI Time (seconds)	WMA-P times faster (x)
0	1.96E-03	2.90E-03	0.50	372	706
1	8.13E-01	7.78E+01	1.2	394	324
2	1.96E+01	1.87E+02	4.2	474	114
3	6.49E+00	3.98E+01	0.80	384	461
4	2.43E+02	7.81E+03	6.2	4387	703
5	5.64E+01	2.84E+03	5.5	1173	212
6	1.25E+03	4.44E+03	6.6	2161	327
7	1.39E-01	6.98E+04	15	17890	1175
8	1.10E+02	8.84E+02	5.7	746	131
9	2.21E+00	6.68E+02	2.3	693	308
10	1.07E+02	7.37E+02	6.2	737	119
TOTAL			54.5	29410	540

Table 1: Results of timing comparisons between WMA-P and ESRI's batch watershed from polygons function on 11 test polygons.


Where we are
headed

FIELDDOC

NJDEP-Bain

PRACTICES
1

101.05 acres

Project EZG #53363: Restoring Paulins Kill Floodplain Forests and Functions - Phase 2

No description provided

Metrics

	Installed To-Date	% Installed	
$ of public and private funds leveraged by DRWI within focus areas	88,230.63 dollars of 84,245.00	104.7%	
Dollars of Federal Farm Bill and state funding leveraged by DRWI within focus areas	28,213.26 dollars of 15,000.00	188.1%	
# of volunteers	150.00 of 50.00	300.0%	
Miles of forested buffer restored within focus areas	0.80 miles of 1.12	71.4%	

FIELDDOC

NJDEP-Bain

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Project EZG #53383: Restoring Paulins Kill Floodplain Forests and Functions - Phase 2

No description provided

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FIELDDOC

NJDEP-Bain

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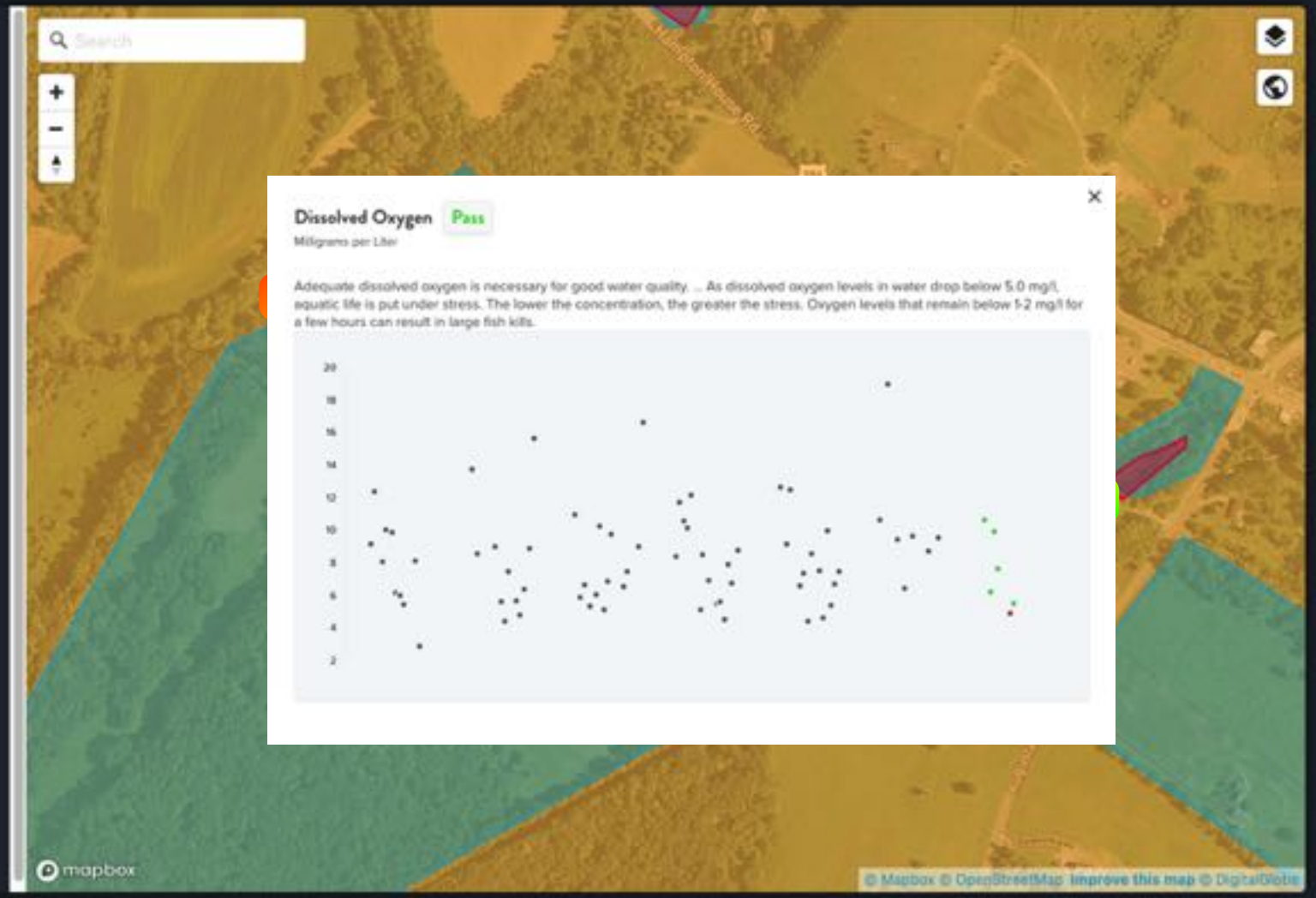


Questions/Discu
ssion