Pennsylvania pilot study to develop and use FieldDoc for BMP planning, tracking, and reporting

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WQGIT Meeting
8/24/2020

BMP planning, tracking and reporting challenges

- Voluntary and non-cost share practices are difficult to track & report
- Many localities don’t have easy way to report practices
- Many different programs need to be tracked for contribution to goals, often have independently developed systems
- Tools useful for planning exist in different places than tools for tracking and reporting
- Need to communicate incremental progress to partners

Introduction to FieldDoc

- Web application developed for setting goals, tracking progress and mapping restoration projects
- Developed in partnership with NFWF and MD DNR to standardize grantee project reporting
- Allows for site-specific load reduction estimates based on CAST, customized metrics and analytics
- Adding functionalities: spatial data layers for planning, interoperability with other systems, custom dashboards for tracking

For today's discussion

We'd like your input on future directions!

- What functionalities would be useful in your jurisdiction?
- Do you see anything that could help improve your BMP planning, tracking or reporting?
- Any suggestions/feedback or next directions you'd interested in seeing?

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Chesapeake Bay Program Office

Pennsylvania Data Management: Reporting, Tracking and Verifying

Water Quality GIT

August 24, 2020

Tom Wolf, Governor

Patrick McDonnell, Secretary

Pennsylvania Data Management

- What data are we managing?
- How are we managing the data?
- How is FieldDoc integrated with existing state and federal data?
- How are we utilizing FieldDoc?
- Role of the Data Tools Review Team

Clean water:
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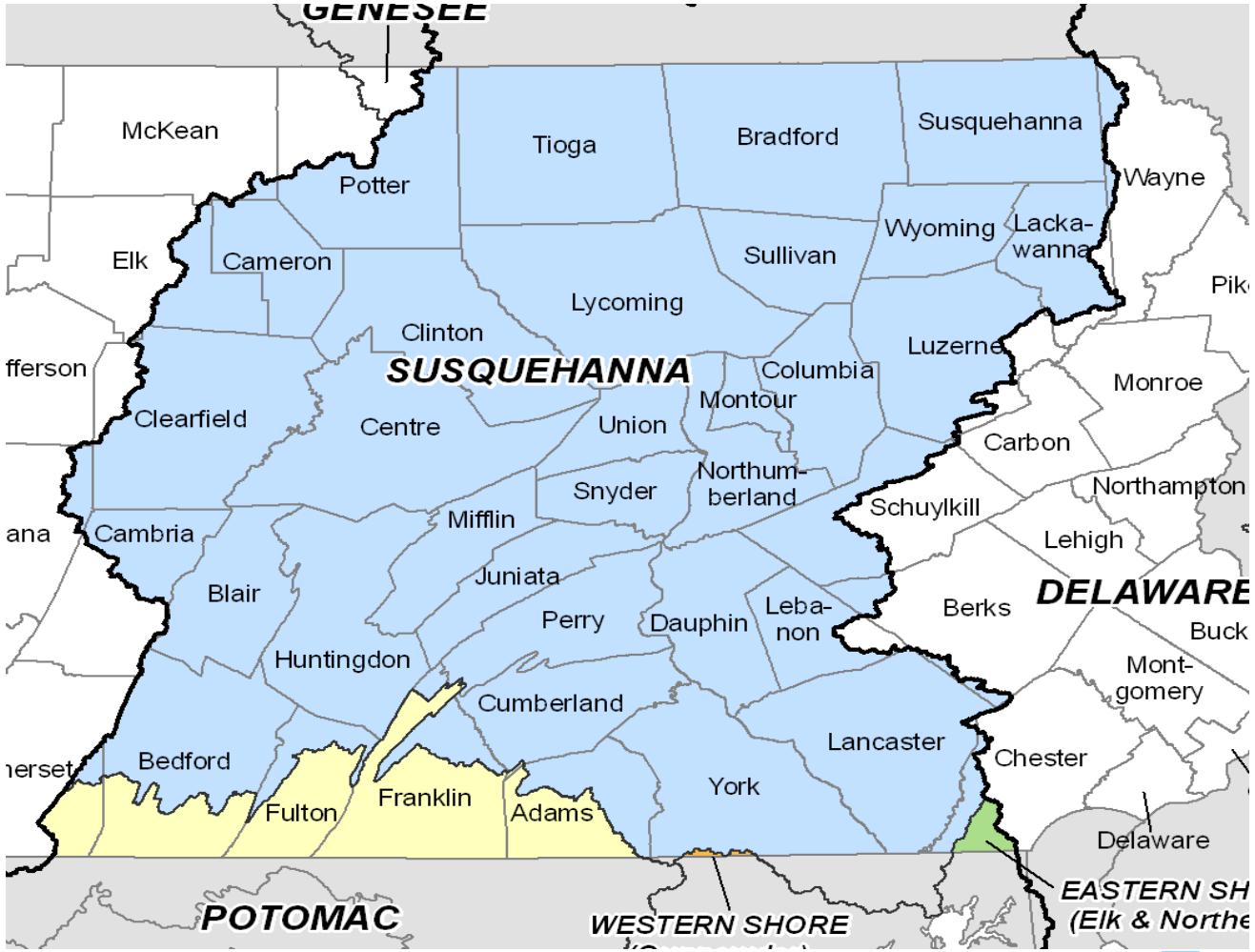
Good for the Bay

PA's Portion of the Chesapeake Bay Watershed

- Almost half the state
- Susquehanna River Basin and part of Potomac River Basin
- Over 49,000 miles of rivers and streams
- All or part of 43 counties
- About 33,000 farms
- About 1,000 boroughs, townships, and cities
- Home to approximately 4 million Pennsylvanians



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Current Flow - BMP Data

Progress – Existing Programs

Documented Programs	Programs To Be Documented
Capital Resource Conservation	Air
NRCS	Mining/Abandoned Mine Reclamation
Stream Fencing	Redevelopment/Brownfields Retrofits
REAP	Oil & Gas E&S Control Permits
Act 38/Inspection Program	Wetland Mitigation
PA Game Commission	Nutrient Trading Program
DCNR Bureau of Forestry	
Dirt and Gravel Road Program	
Chapter 102 Post Construction	
PENNVEST	
NFWF	
319 Non Point Source	
EPA Chesapeake Bay Grant	
Chapter 105 Program	
Growing Greener	

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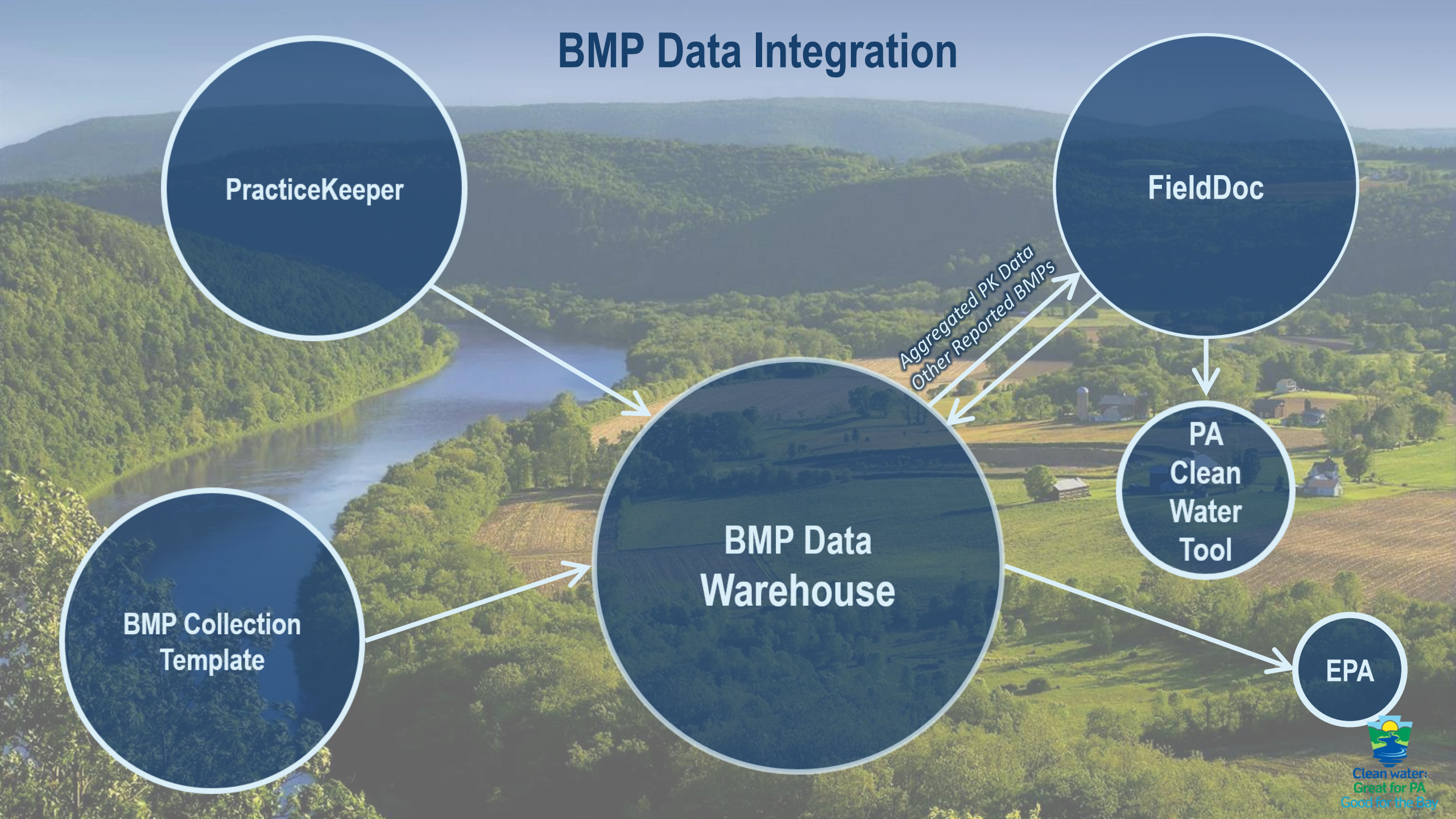
BMP Data Integration



BMP Collection Template

- USDA Data
- DCNR/PGC Forest Harvest Information
- Various DEP Programs
- PennVest
- SCC Dirt and Gravel Roads
- SCC REAP Program
- Urban Stormwater

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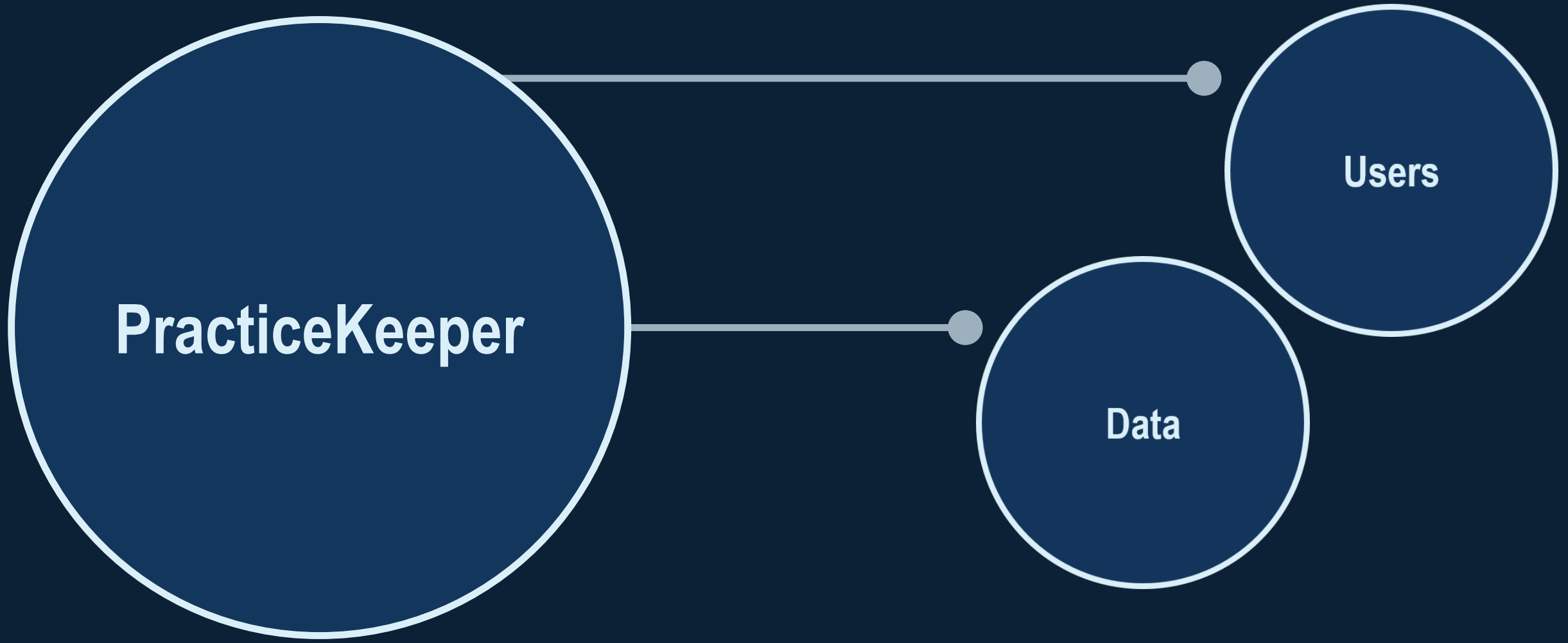

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Users

- CURRENT USERS
  - Conservation District Staff
    - Nutrient Management Specialists
    - Chesapeake Bay Techs
    - District Managers (Reports)
    - Other CD Staff
  - DEP Regional Office
  - DEP Central Office
  - SCC Nutrient and Manure Management

- NEW USERS
  - DCNR
  - Other Grantees

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Data

- CURRENTLY COLLECTED DATA
  - Nutrient & Manure Management
    - Approved Nutrient Management Plans
      - Act 38 Manure Transport Activities
    - Verified/Written Manure Management Plans
    - Outreach & Training Activities
    - Status Reviews
    - Complaints
    - NMP & MMP Related BMPs
    - Brokered Manure Transport Activities
  - CBP-23
    - Completed Agriculture Initial Inspections
    - Nutrient and Manure Management Planning
    - Conservation and Ag. E&S Planning
    - BMP Technical Assistance

BMP Data Warehouse

- Stores BMP data from all Pennsylvania data sources.
- Allows applications to push data to the Data Warehouse
  - PracticeKeeper
  - FieldDoc
  - BMP Collection Template
  - Others
- Allows applications to pull data from the Data Warehouse.
  - NEIEN Submission Tool (For Reporting to EPA)
  - FieldDoc
  - Others
- Performs duplicate checks prior to acceptance of data into the BMP Data Warehouse.

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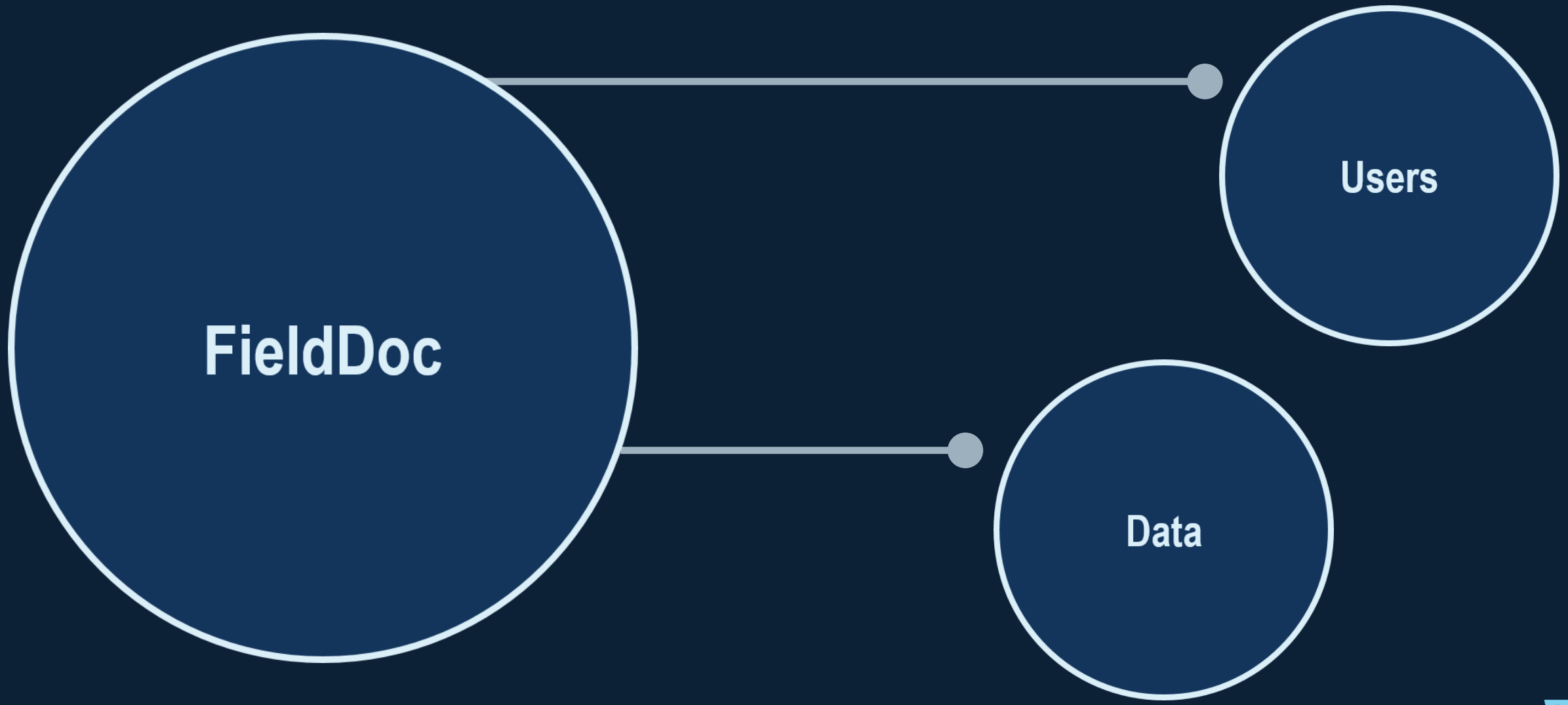

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Proposed Users

- County Coordinators
- County Coordinator Designees

- Initial Roll Out
  - All counties with completed CAPs

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Proposed Data

- All BMPs Excluding Agriculture and MS4
  - Non-cost shared buffers
    - Watershed groups
    - Others
  - Stormwater BMPs
    - Rain Gardens
    - Rain Barrels
    - Any stormwater BMPs not related to MS4 or 102 permitting
  - Urban Nutrient Management

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FieldDoc Interface

Home

Organization

Profile

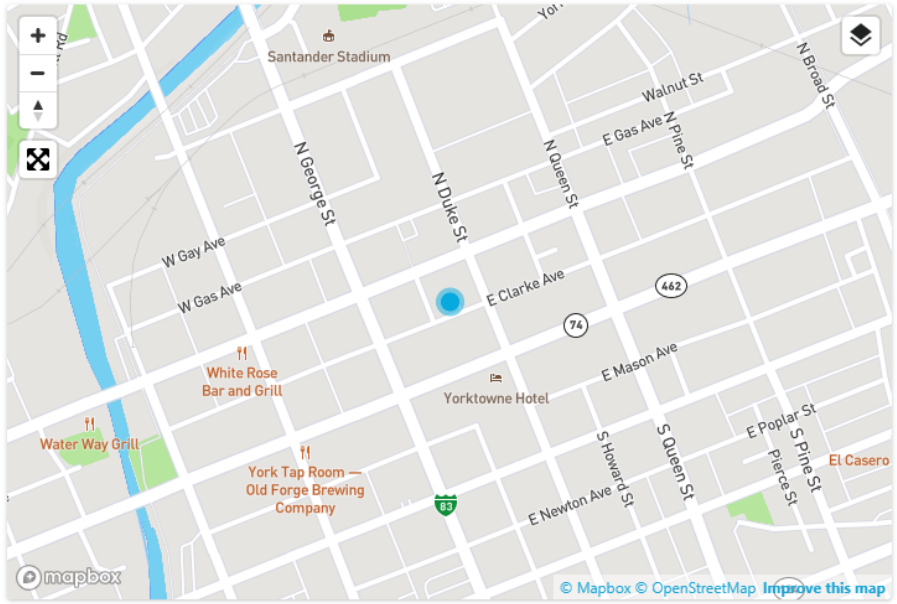
Projects

Dashboards

York Countywide Action Plan

Last modified by John Dawes on Wednesday, January 22, 2020 at 2:29pm

Program: Pennsylvania Watershed Implementation Plan



Metrics

	Installed To-Date	% Installed
Dirt & Gravel Road E&S (Feet)	70,998.59 of 303,319.00	23.4%
Conservation Tillage (Acres)	55,392.15 of 35,000.00	158.3%
Nutrient Application Management Core Nitrogen (Acres)	27,241.05 of 185,000.00	14.7%
High Residue Tillage (Acres)	24,988.08 of 90,000.00	27.8%

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The Pennsylvania Clean Water Tool

Users

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Proposed Users

- General Public
- County Coordinators
- County Coordinator Designees
- Initial Roll Out
  - All counties with completed CAPs

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The Pennsylvania Clean Water Tool

Pennsylvania's Phase 3 Watershed Implementation Plan

Approximately half of the land area in Pennsylvania lies within the Chesapeake Bay Watershed, including the Susquehanna and Potomac River basins, the main tributaries to the Chesapeake Bay. This watershed, which makes up over 49,000 miles of Pennsylvania streams and rivers, provides fresh water resources to millions of Pennsylvania residents, but also suffers impairment from decades of agricultural, industrial, and urban storm- and wastewater nutrient pollution. These pollutants are harmful to residents both in Pennsylvania's portion of the Watershed and our neighbors downstream. Local partner and statewide buy-in is essential to restoring the Pennsylvania's portion of the Chesapeake Bay Watershed.

Across Pennsylvania, residents in 43 counties in the Chesapeake Bay Watershed are working together to restore and protect streams in their backyard. Locally, these actions will improve quality of life and produce water quality benefits to the Susquehanna River Basin and even the Chesapeake Bay, such as:

- Clean drinking water
- Improved food and beverage production by farmers
- Improved public health

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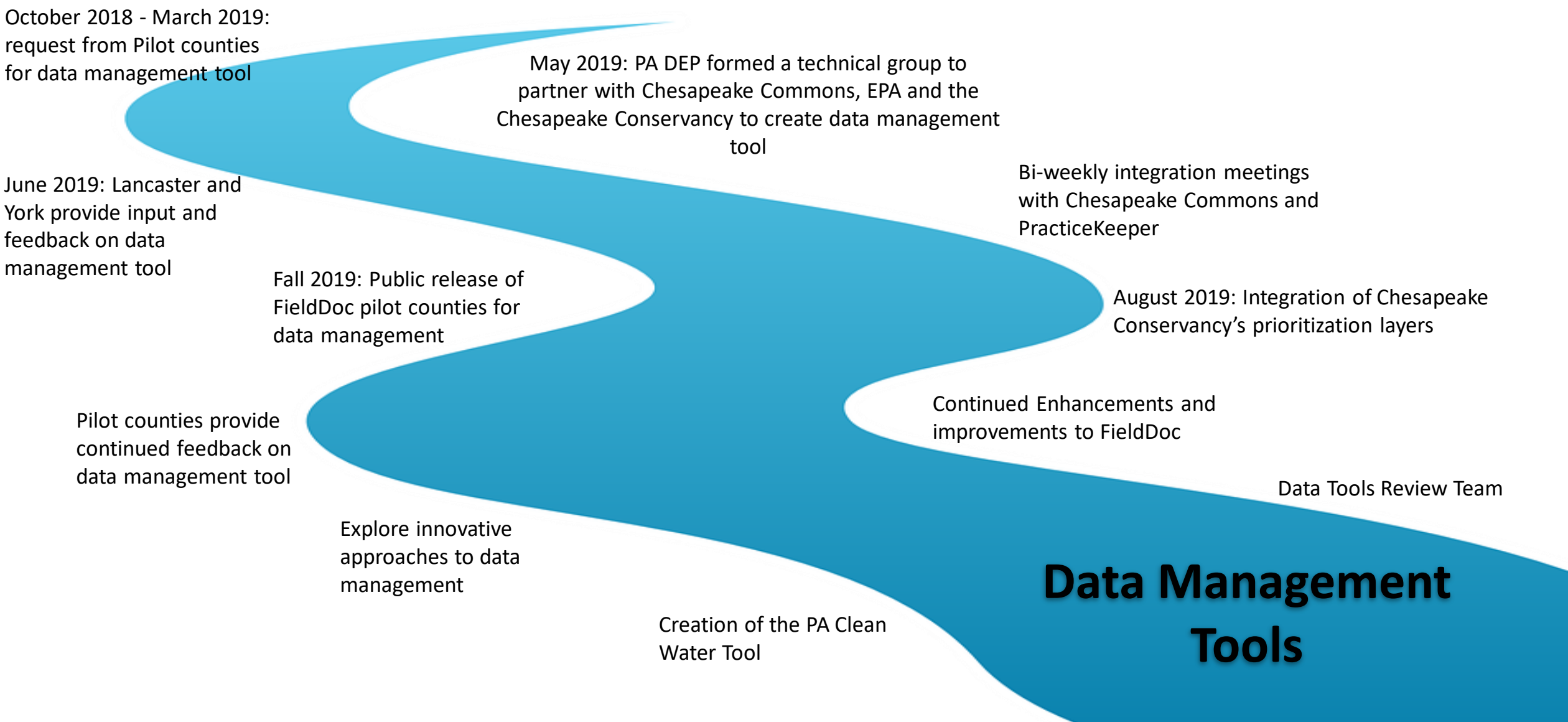
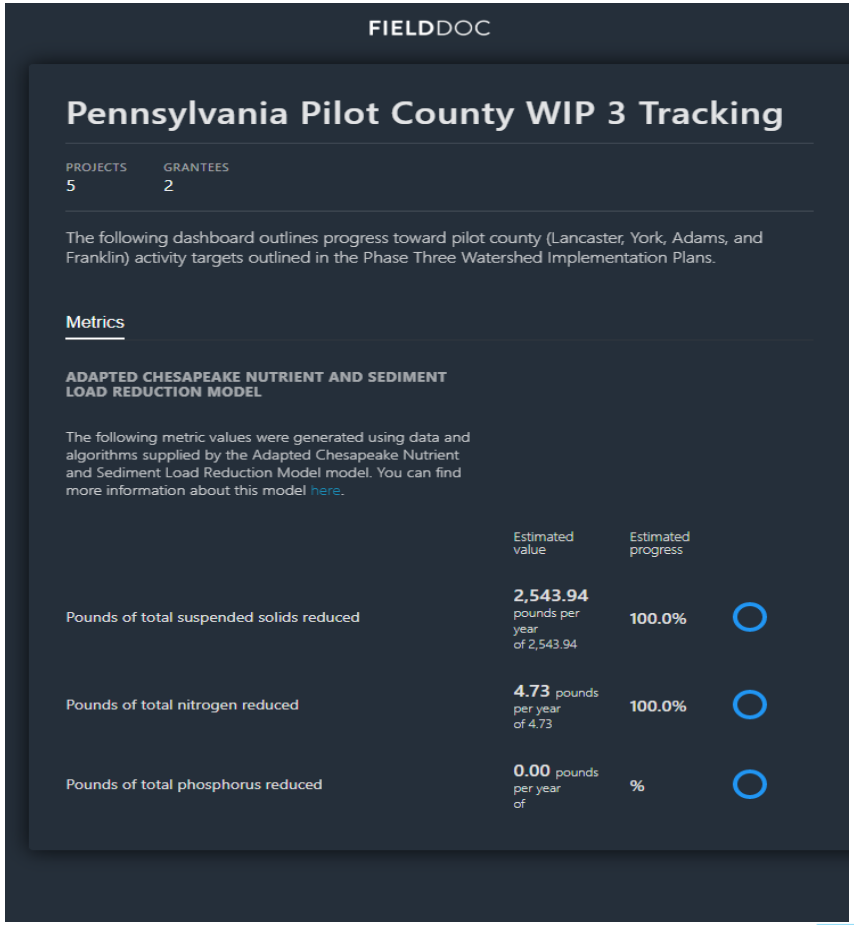
Journey to Success for Local Data Management



Data Tools Review Team

- Consists of five county coordinators, four county data action team members, Chesapeake Conservancy, Susquehanna River Basin Commission, PA DEP, EPA Chesapeake Bay Program Office.
- The purpose of this group was to generate recommendations on enhancements to FieldDoc provided by our local stakeholders.
- Solicited personalized feedback from each member on every step in the data entry process.
- Reviewed system limitations and took potential enhancements back to the group.
- Currently in the process of completing an active testing phase before the broader rollout.



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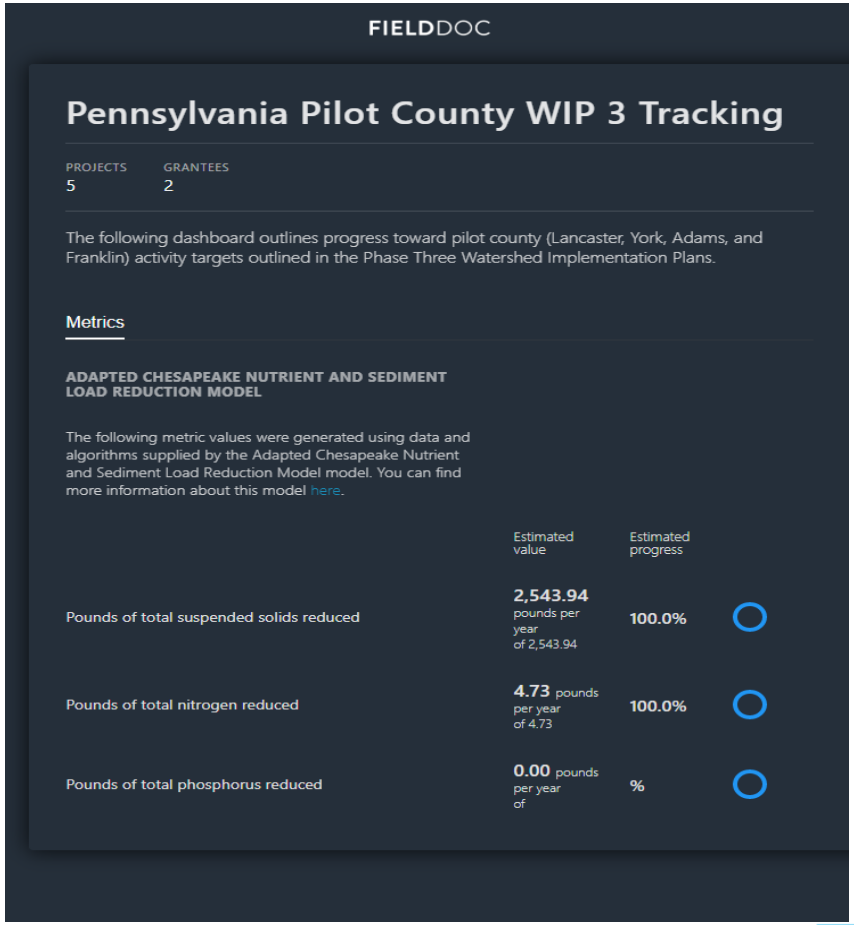
Continuation of Data Tools Review Team

- The Data Tools Review Team has identified ongoing recommendations for improvement beyond the initial rollout.
- The team will continue to meet on a limited basis to provide feedback and recommendations.
- We will continue to dedicate time and support to enhance FieldDoc to meet our data management needs.
- Integrating FieldDoc with the PA Data Warehouse for real-time data management.
- Finalizing the Pennsylvania Clean Water Tool.



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Summary: Data Management and Reporting

- Pennsylvania has been actively building out an integrated data management structure.
- PracticeKeeper geo-database is used for tracking, collecting, and reporting agricultural compliance and BMP implementation.
- FieldDoc will be used to track, collect, and report progress to and from our county stakeholders.
- The Data Tools Review Team is leading a grass roots effort to revise FieldDoc to meet the needs of our county stakeholders.

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Chesapeake Bay Program
Science. Restoration. Partnership.

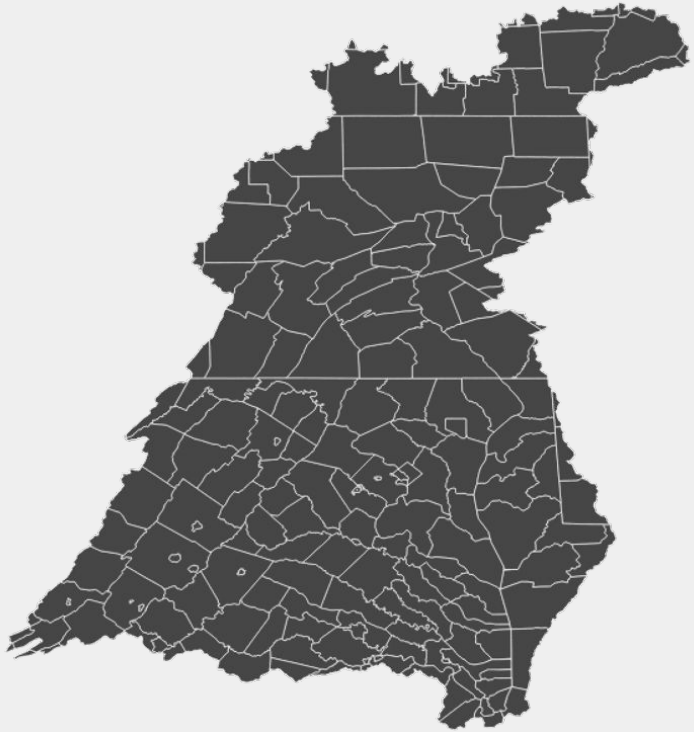
CONSERVATION INNOVATION CENTER
CHESAPEAKE CONSERVANCY

The COMMONS

The Commons Project Team: John Dawes, Brendan McIntyre, Zach Thrun, Erin Hofmann

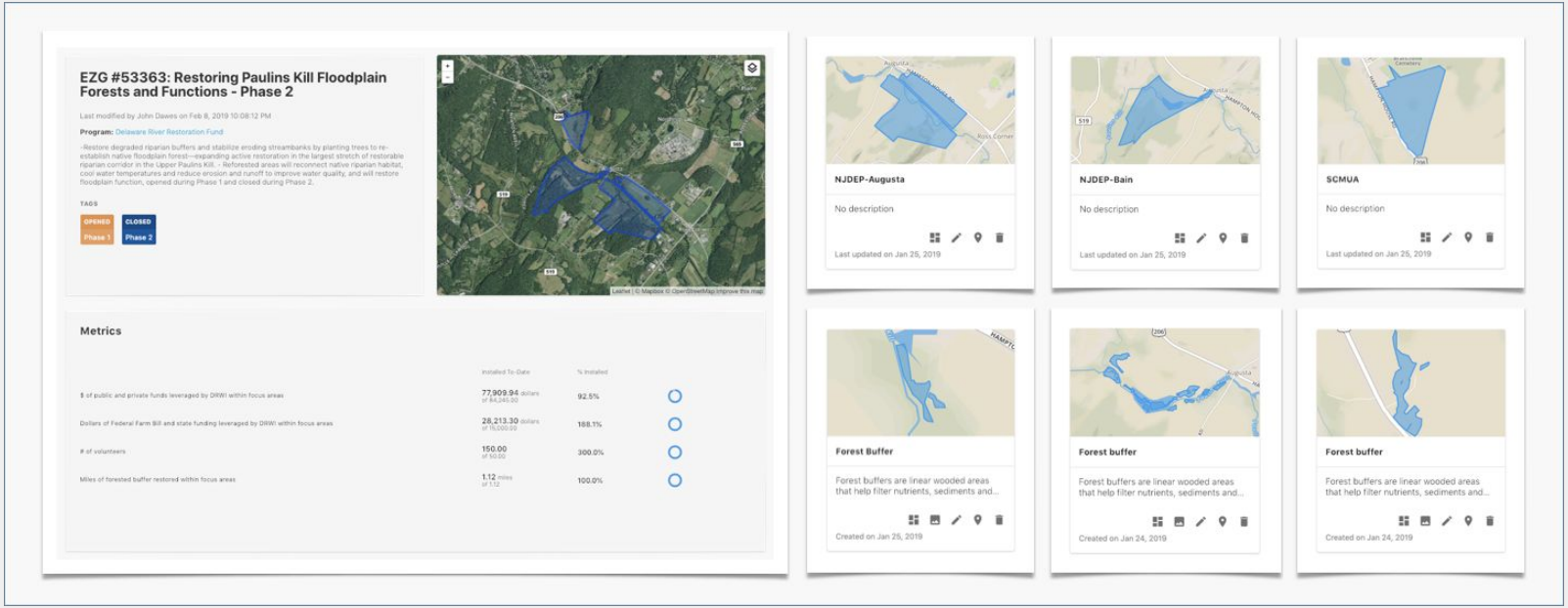
Challenges to Tracking Restoration in the Bay

- Centralized data and privacy
  - Competing systems
  - Differing data models
  - Differing functionality and user requirements
- Lack of spatial resolution
- Static or stale data
  - Data are passed via spreadsheet
  - Data are transposed by a human
  - Poor Documentation



FieldDoc

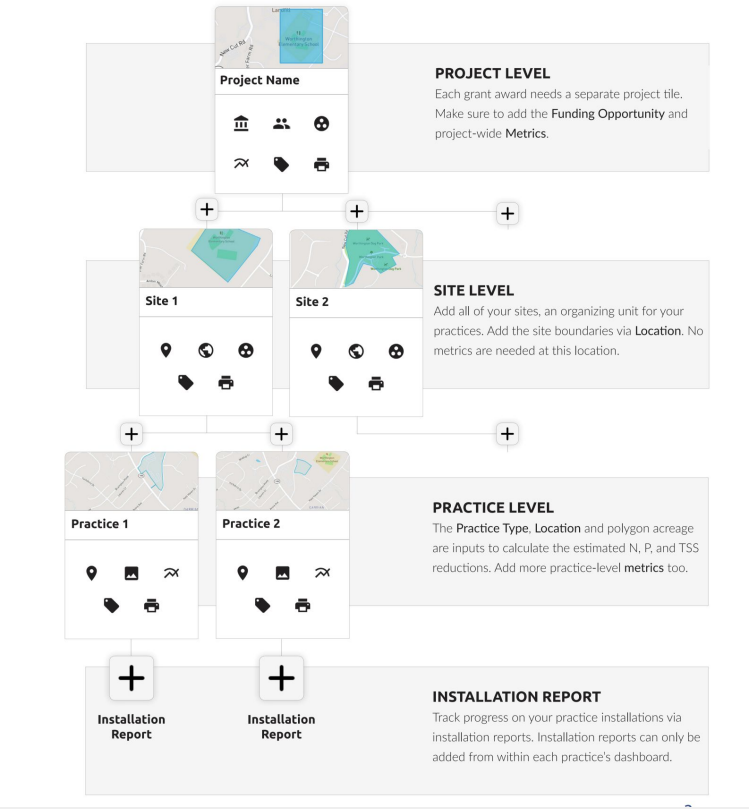
- Enables practitioners to:
  - Manage all facets of planning, reporting, and tracking BMPs
  - Supports users with an ontology that matches their workflow



Source: Chesapeake Commons

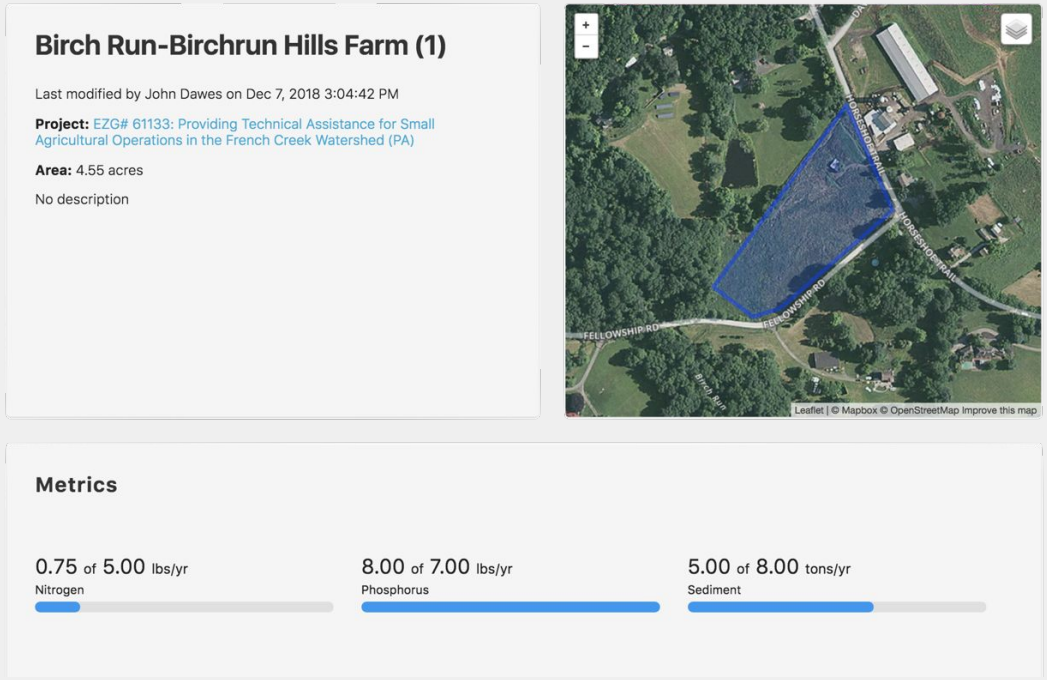
FieldDoc

- Projects - Group Sites, Practices and Reports.
- Sites group practices based on where work has occurred.
- Practices describe what is being done on the landscape
- Metrics give insight as to what is being measured and may possess targets
- Reports delineate work that is planned or implemented



FieldDoc

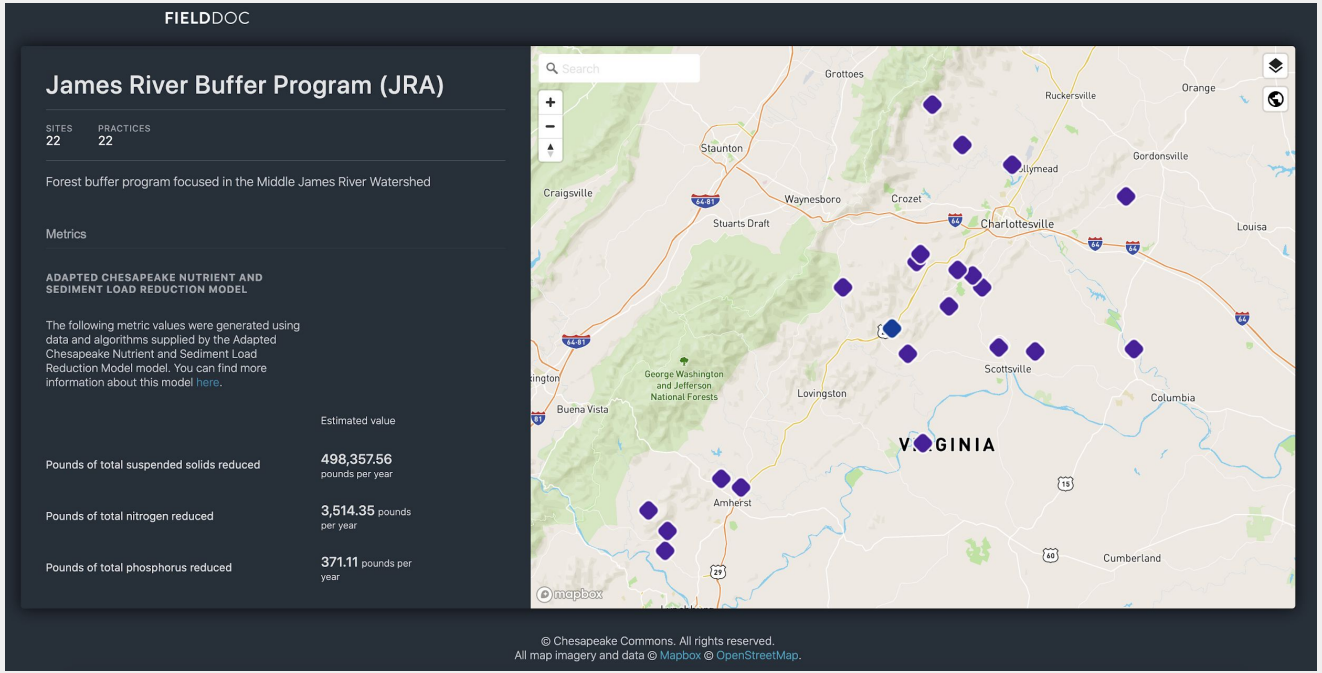
- On the fly modeling via analytical API's (application programming interface)
- Current N, P, TSS estimates are rendered using CAST Isolation Tables.
    - We have also integrated Drexel's site specific load reduction API on development.
- NEIEN Export and Formatting
- Open ledger change log



Source: Chesapeake Commons

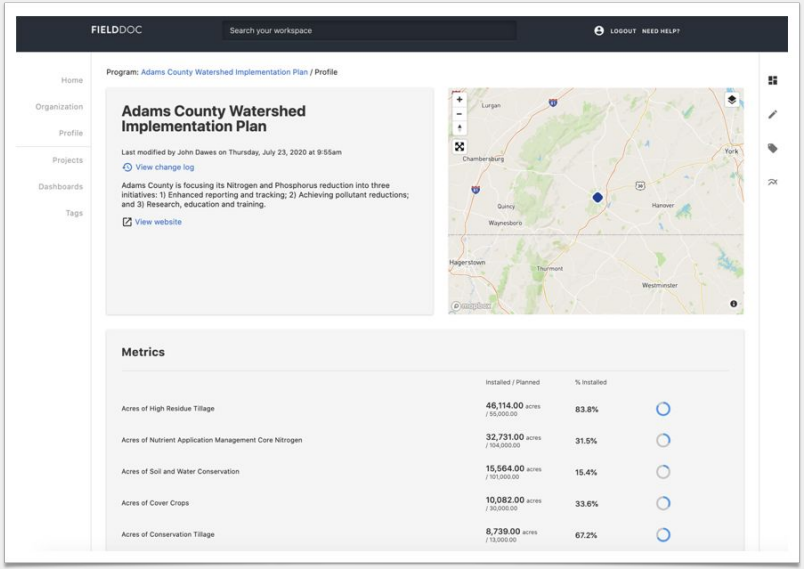
FieldDoc

- Enables program managers to:
  - Track “ground up” implementation based on practice reporting toward metric targets.
  - Look broadly across all practices, sites, and projects.



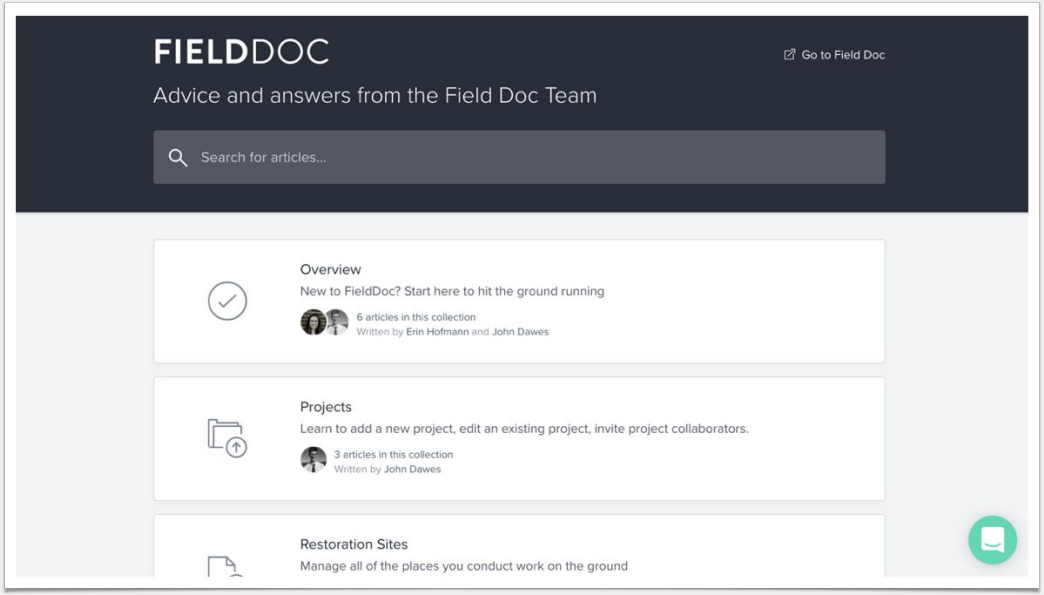
Pennsylvania Pilot and Year 2

- Worked with PADEP to iteratively develop software functionality based on the overlapping needs of WIP Coordinators and practitioners
- Began with FieldDoc's base tracking capabilities and iteratively deployed and validated feedback based on user needs.
- Key feature upgrades and user requirements included:
    - Rails: A clear and defined path where the FieldDoc walks the user through BMP reporting
    - Batch processes: Ability to upload multiple practice footprints for reporting
    - Administrative controls for reporting and tracking practice to metric targets.
    - Ability to embed dashboards into third party web properties

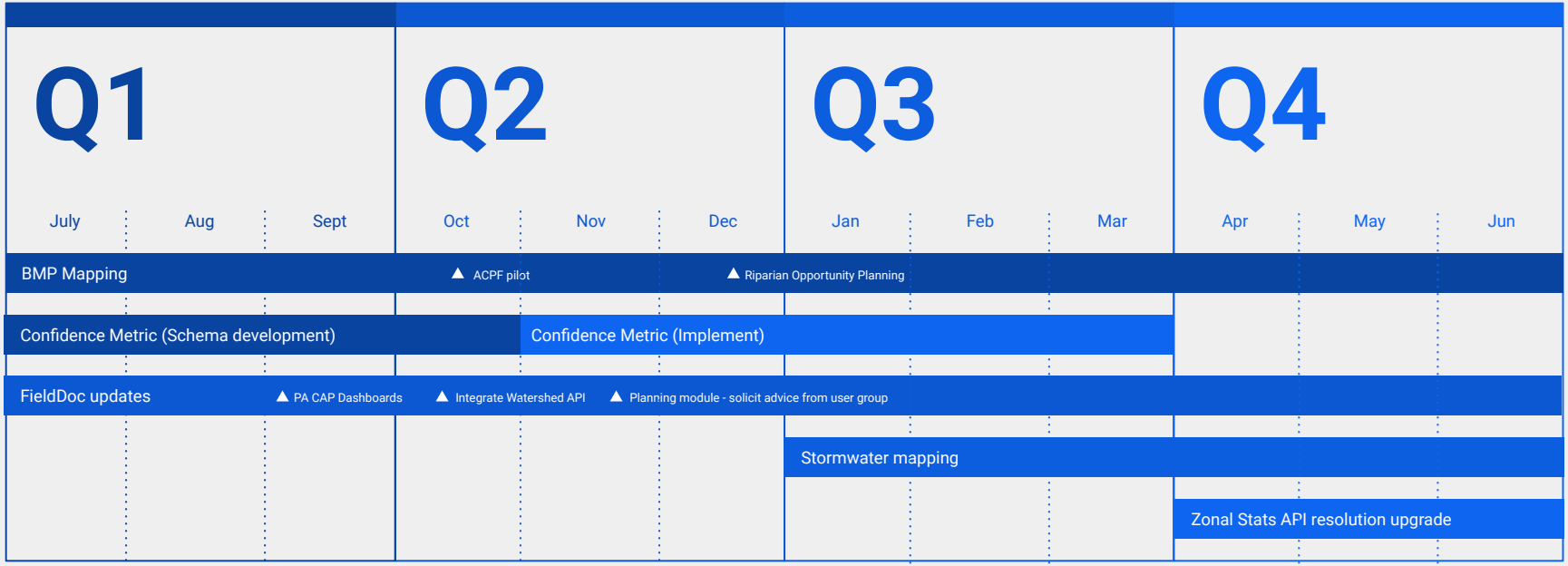


Pennsylvania Pilot and Year 2

- Designed, implemented, and deployed direct user support for all stakeholders reporting practices:
  - Helpful articles
  - Live chat
  - Data upload assistance



Year 3 Timeline

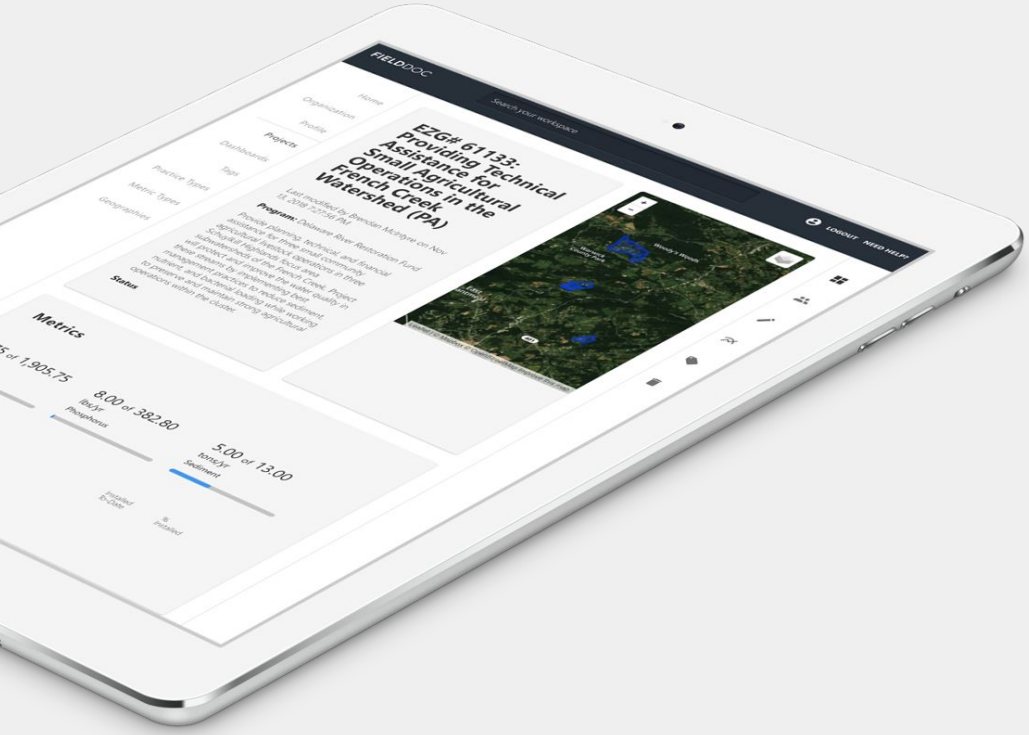


Looking Ahead: Year 3

- Development of prioritization module
  - Watershed delineation
  - Prioritization layers
- Confidence metric pilot and implementation
- Integration of third party data services for FieldDoc Dashboards
- Release of Multi Program Reporting
- API Development and Documentation

Source: Chesapeake Commons

Looking Ahead: Year 3



- FieldDoc will support in-field data collection for restoration practitioners

Source: Chesapeake Commons

Looking Ahead: Year 3

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example.json


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Source: Chesapeake Commons

Discussion

- Ability to integrate with existing programs
- Tracking and dashboard functionalities for customized metrics and geographic areas
- Planning platform using customizable data layers
- Co-benefit metric tracking
- Verification tracking capabilities

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