Collaborative Community Engagement Strategies to Achieve Healthy Watersheds

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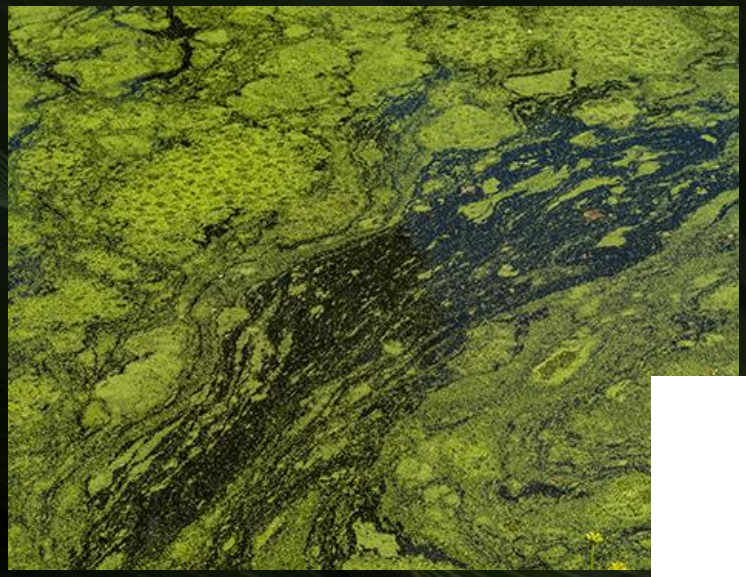
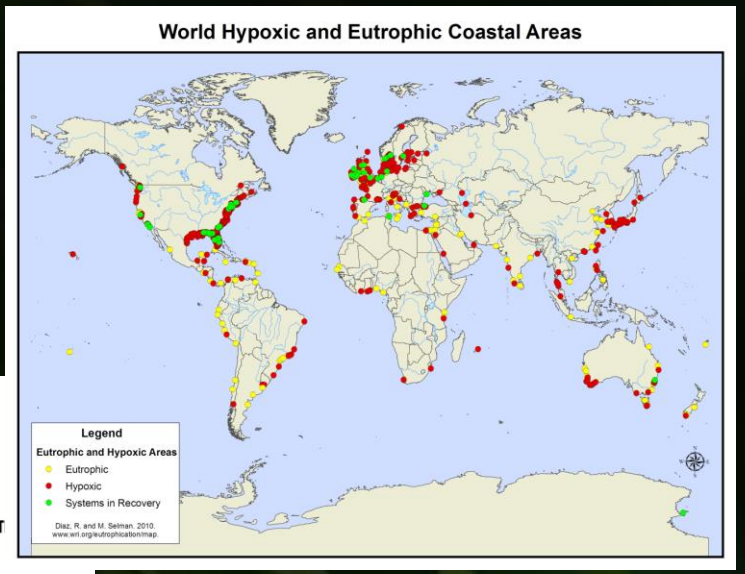
Charting the Course

- The Challenges of Addressing Nonpoint Source Pollution
- The Need for Implementation Innovations (Chesapeake Bay)
- Collaborative Community Engagement Strategies as Necessary Innovations: Conewago Creek Case Study

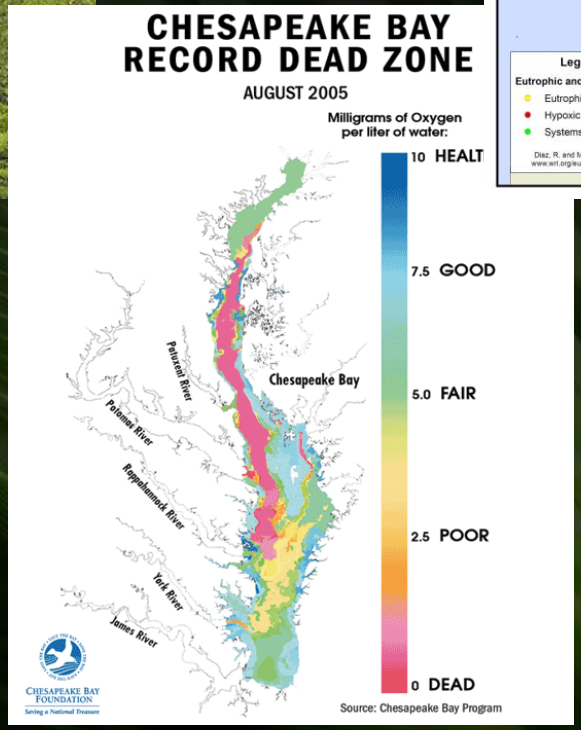
The Problem

Nutrients: too much of a good thing





Map by World Resources Institute



Map by Chesapeake Bay Foundation

NPS Pollution as a "Wicked" Problem

Patterson et al. (2013)

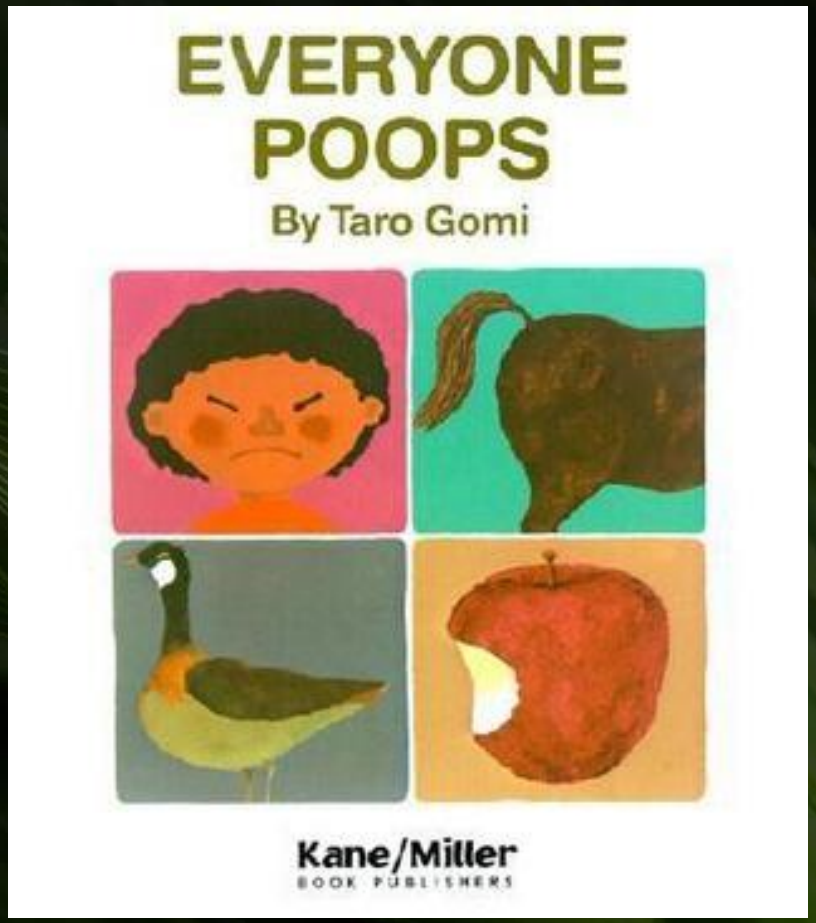
- Multiple, diffuse pollution sources
- Multiple drivers of nonpoint source pollution, with complex human and societal factors
- Many actors across many sectors
- Varied and uncertain pollution impacts and outcomes

Another Complication; Another Opportunity
The Invisible, “Everyone Pollutes” Dynamic

- The signs of environmental pollution that drove the “birth” of environmental law looked like this….


LOVE CANAL RECIPE:
1. MIX 82 CHEMICALS
2. PLACE IN CANAL FOR 25 YRS.
YIELD: SICKNESS + DEATH
PLEASE HELP ME

The Invisible “Everyone Pollutes” Dynamic



Addressing Nonpoint Source Pollution
A “Wicked” Problem (Patterson et al 2013)

- Requires a multi-disciplinary approach to problem solving
- Highly collaborative
- Building locally led, community based approaches is critical

Addressing Nonpoint Source Pollution
The Conventional Approach

Federal Clean Water Act

- Purpose of Act:

"To restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point *and nonpoint* pollution sources . . . ."

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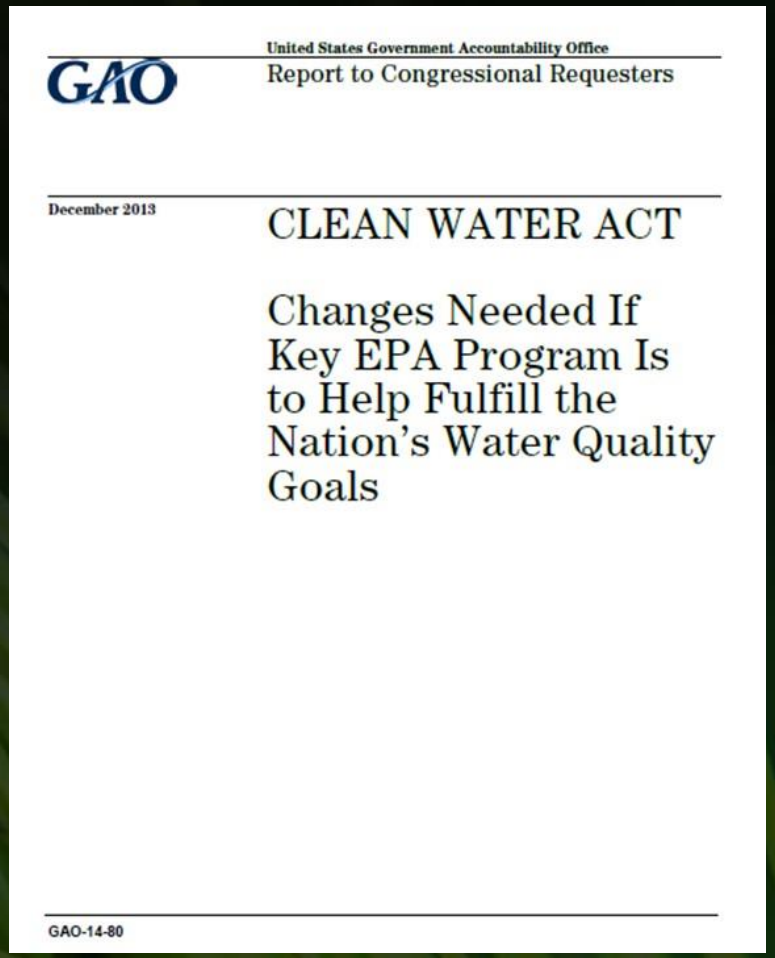
Clean Water Act
Addressing Nonpoint Sources

- States submit NPS management plans
- EPA approves, provides $$
- Priority for implementing “TMDLs”
  - State establishes Water Quality Standards
  - Assess waters; list impaired waters
  - Develop TMDLs for impaired waters



United States Government Accountability Office

GAO

Report to Congressional Requesters

December 2013

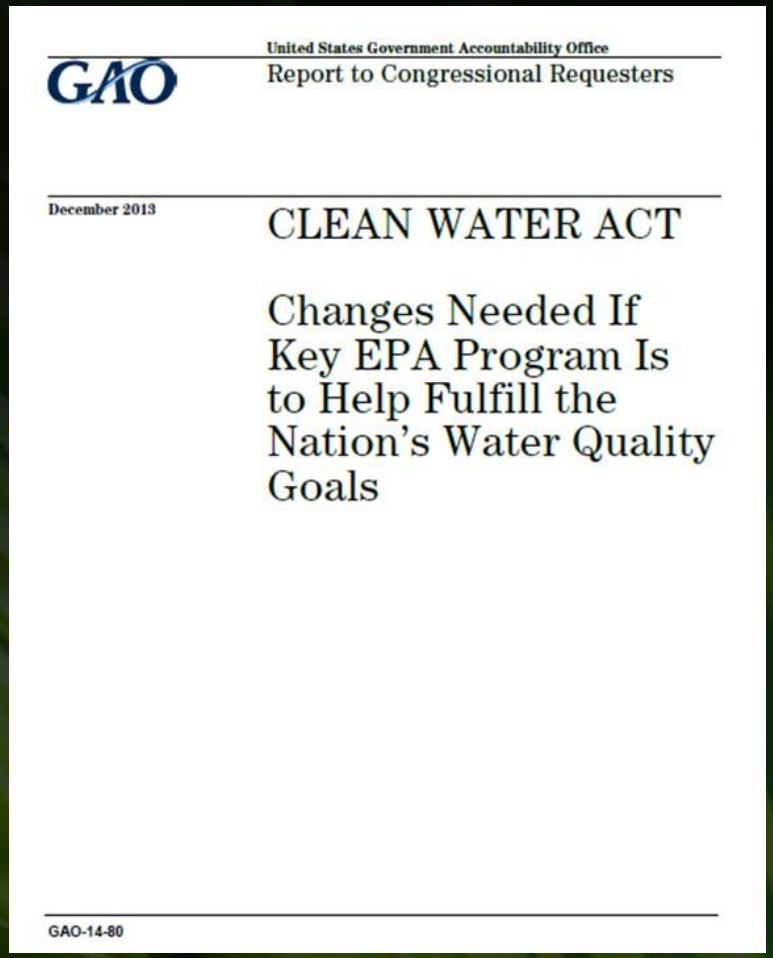
CLEAN WATER ACT

Changes Needed If Key EPA Program Is to Help Fulfill the Nation’s Water Quality Goals

GAO-14-80

GAO TMDL Report (2013)

- "Changes Needed if Key EPA Program is to Fulfill the Nation's Water Quality Goals"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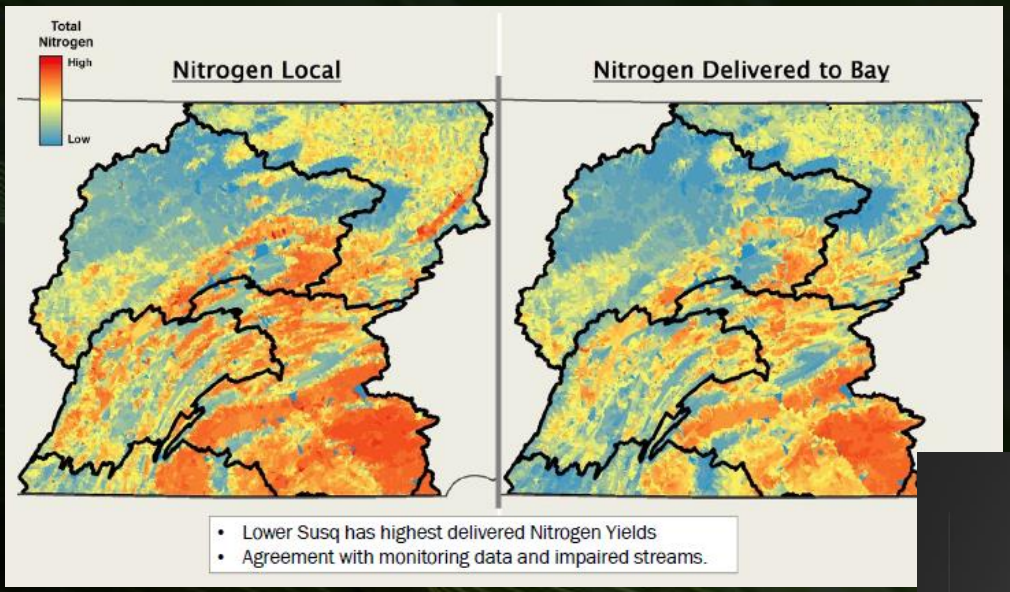
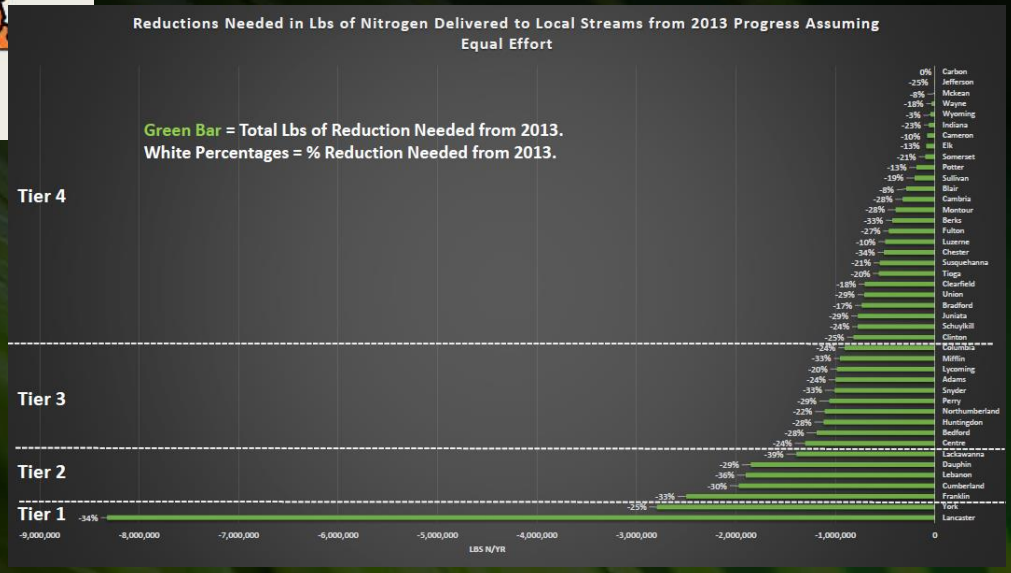
Meeting the Chesapeake Bay TMDL: Innovations in Implementation Needed

	Agriculture	Urban/Suburban	Wastewater	Trading/Offsets
Delaware	Enhanced Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
District of Columbia	Not Applicable	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
Maryland	Ongoing Oversight	Enhanced Oversight	Ongoing Oversight	Ongoing Oversight
New York	Ongoing Oversight	Ongoing Oversight	Enhanced Oversight	Ongoing Oversight
Pennsylvania	Backstop Action Levels	Backstop Action Levels	Ongoing Oversight	Enhanced Oversight
Virginia	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
West Virginia	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight

From EPA website:
https://www.epa.gov/chesapeake-bay-tmdl/epa-oversight-watershed-implementation-plans-wips-and-milestones-chesapeake-bay

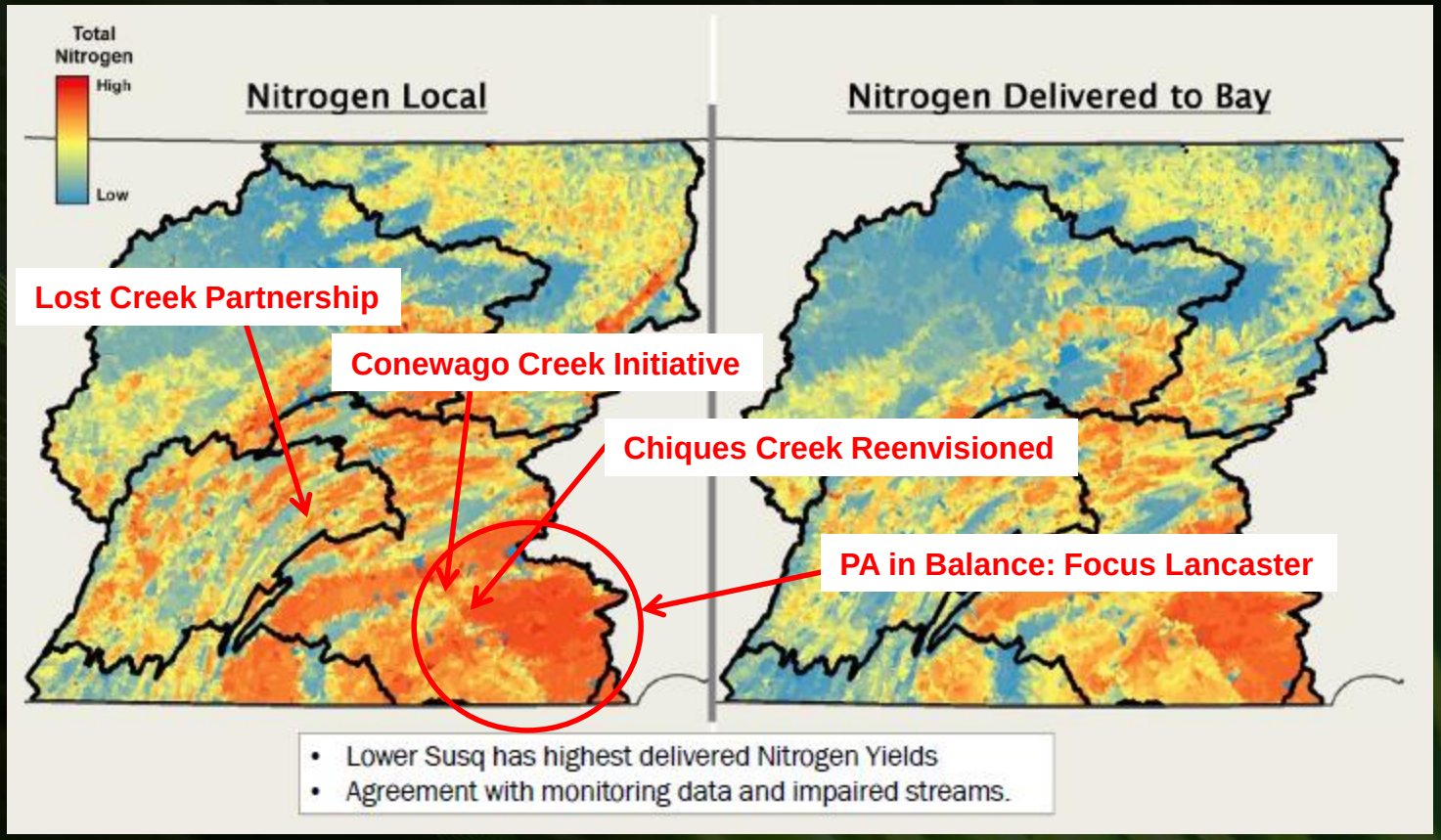
Phase 3 Watershed Implementation Plan (WIP): Local Engagement Strategies in High Priority Areas





Slides from SRBC presentation at 8/24/17 Phase 3 WIP Steering Committee meeting and L Schaefer & M Johnston presentation at 11/30/17 Phase 3 WIP Steering Committee meeting (all data draft and for hypothetical purposes only)

AEC's Community Watershed Engagement
Facilitating Collaboration in Priority Watersheds



Slide from SRBC presentation at 8/24/17 Phase 3 WIP Steering Committee meeting (data draft and for hypothetical purposes only)

NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

Community Watershed Engagement
The Conewago Creek Initiative

- A model for community watershed engagement
- Integrating research, extension, outreach and education
- Can a diverse, locally led partnership restore a watershed?

CONEWAGO CREEK
INITIATIVE

Conewago Creek Initiative
The Partnership

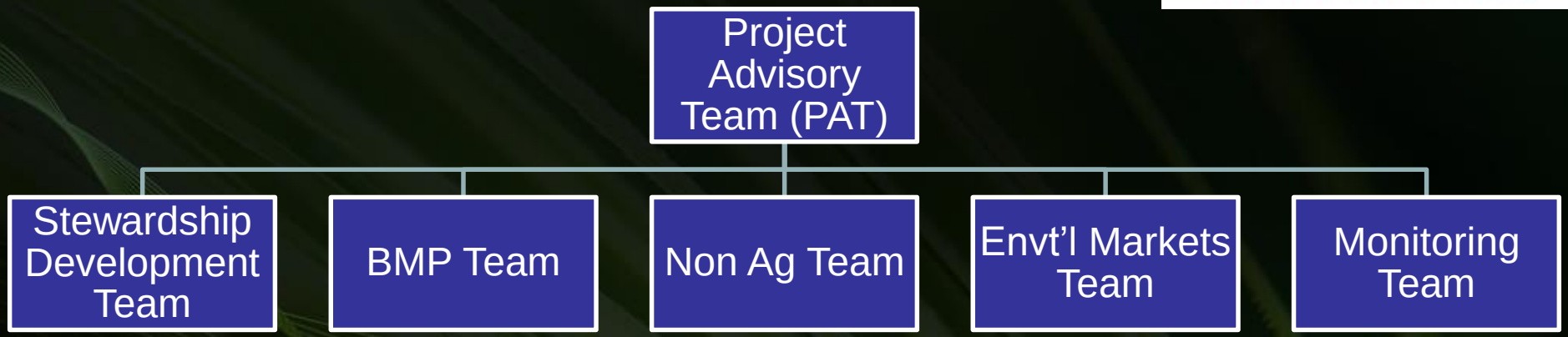
CONEWAGO CREEK INITIATIVE

Alliance for the Chesapeake Bay
Aquatic Resource Restoration Co.
Capital Area RC&D
Chesapeake Bay Foundation
Chesapeake Commons
Dauphin County Conservation District
Elizabethtown Area Water Authority
Elizabethtown College
HRG, Inc.
Lancaster County Conservation District
LandStudies, Inc.
Lebanon County Conservation District
Londonderry Township
Lower Dauphin High School
Milton Hershey School
PA DEP
Penn State Public Media
Penn State University
Red Barn Consulting
RGS Associates
South Londonderry Township
Stroud Water Research Center
Susquehanna River Basin Commission
TeamAg, Inc.
Tetra Tech
Tri-County Conewago Creek Association
USDA ARS
USDA NRCs
US Fish and Wildlife Service
US Geologic Survey
Viable Industries, LLC
Wild Resources, Inc.
ZedX, Inc.

NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

Foundation for Pennsylvania Watersheds

Conewago Creek Initiative
Organizational Structure



Staff support provided by
Penn State Agriculture and Environment Center

- Project Coordinator (M. Royer)
- Assistant Project Coordinator (K. Kyler)
- Student Interns

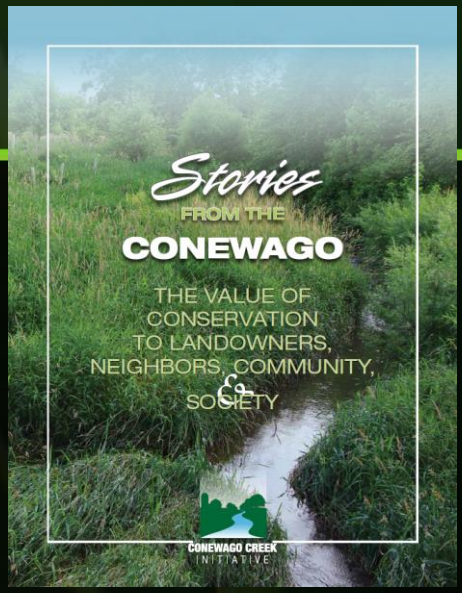
Conewago Initiative
Our Approach

People

Increasing Outreach and Engagement

- Over 100 residents engaged to create a “Vision for the Conewago”
- Over 40 community events engaging 1,300 participants
- 135 “Stream Team” volunteers trained, 3,400 youth involved
- Website (conewagoinitiative.net), e-newsletter, Facebook

Communicating the Value of Working Lands



- Communicating value of ecosystem services: *Stories from the Conewago*

IVAN HANSON
BUILDS LEGACY OF CONSERVATION ON HIS WORKING FARM

"Nature is amazing. We take it for granted. I feel lucky that I got to grow up outside," says Ivan.

"Being aware of your land and how it interacts with water and the environment as a whole is important for making management decisions, especially when it comes to managing renting farmers. We cannot continue to take nature for granted." – **Ivan Hanson,** a retired farmer who has thoughtfully farmed his land in balance with the environment for more than seven decades.

Ivan Hanson learned about conservation just as he learned farming — as a child from his father, who first established conservation practices on the Hanson Farm because they "made sense." Ivan's father planted more than 3,000 evergreens on the family dairy farm.

In the 1940s, Ivan worked alongside his father to "create less work and take care of the land" by strip cropping, maintaining grassed waterways and building terraces.

Before farming equipment had hydraulics, harrows had to be picked up manually when crossing over ditches. The Hansons decided to avoid the consistently wet ditches, reducing the time it took to prepare the fields, while also allowing grass to grow and reducing the soil runoff into the Little Conewago Creek.

Even when the technology was available to put those ditches back into production, the Hansons kept them as grassed waterways because they saw the benefit to water quality and decided that was more important to the long-term health of the farm.

Today, on the 114-acre Hanson Farm, Ivan and the farmers who lease his land to grow crops still practice those traditional practices plus conservation tillage, fencing that excludes livestock from the creek, riparian buffers and crop rotation. Conservation practices like no-till require careful watching of the weather and waiting to apply manure until the forecast is clear of rain that will wash the nutrients away. On the other hand, no-till creates less soil runoff and reduces the time it takes to prepare a field for planting, saving gas and labor costs.

The Hansons in 2007 planted a riparian buffer through the USDA's Conservation Resource Enhancement Program, adding 7.7 more acres of woodland to their property. To keep excess nutrients in cow manure from entering the stream, cows are fenced away from the stream and the manure is stored in a roofed storage facility to prevent a rainfall from washing it into the stream. When the weather looks good, the manure is ready to spread on the fields to nourish the crop.

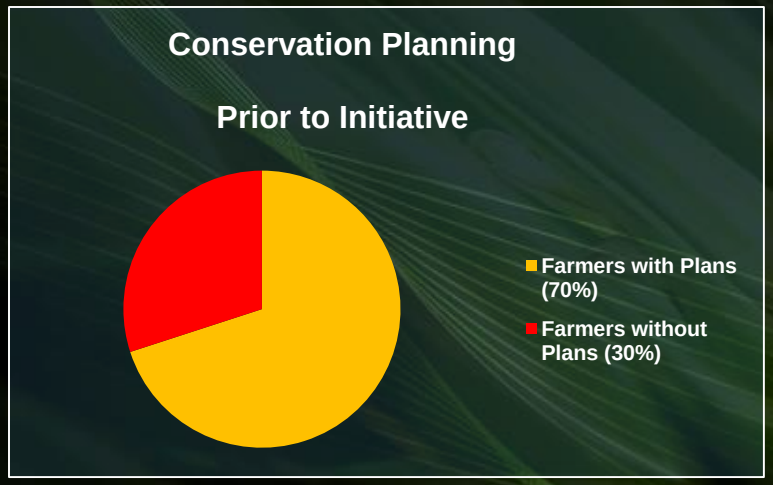
Ivan's son-in-law keeps several honeybee colonies to help pollinate local crops and produce honey, sold from a small stand by the door to their house. All of these practices and management decisions work together to create a productive farm and ecosystem.

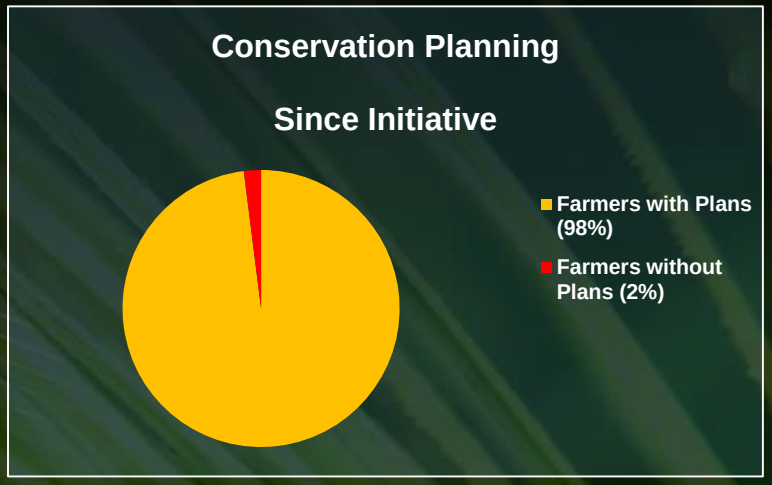
Ivan understands that conservation practices, while benefiting soil and water health also have the potential to improve farming productivity. He is pleased with his decisions and every year adds new conservation practices.

Practices

Helping Implement Conservation

Conservation Planning





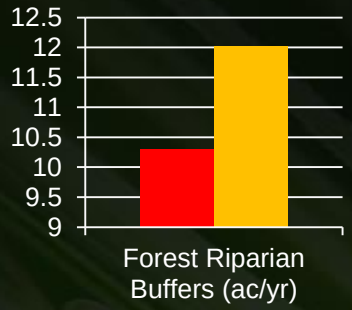
Practices

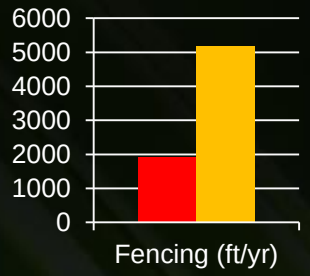
Implementing BMPs

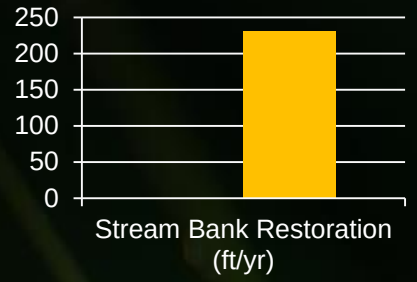
- 7,602 acres of BMPs
  - cover crops, conservation tillage and forest riparian buffers, etc.
- 105,308 linear feet (20 mi) of BMPs
  - fencing, terraces and stream bank restoration, etc.
- 60 additional BMPs
  - stream crossings, waste storage facilities, and off stream watering, etc.

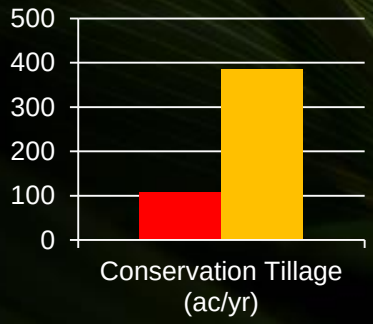
Practices

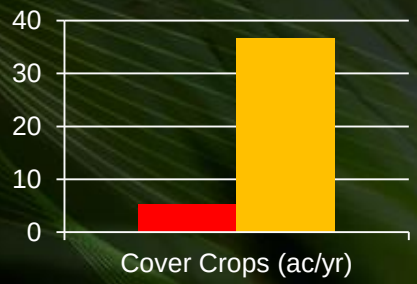
BMP Implementation Rates

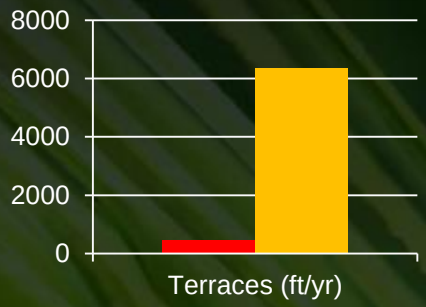


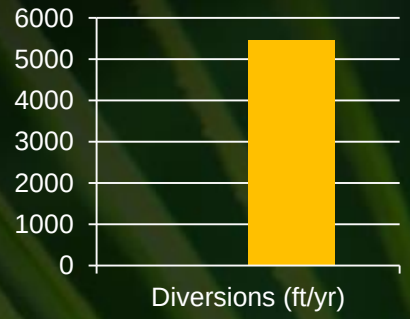










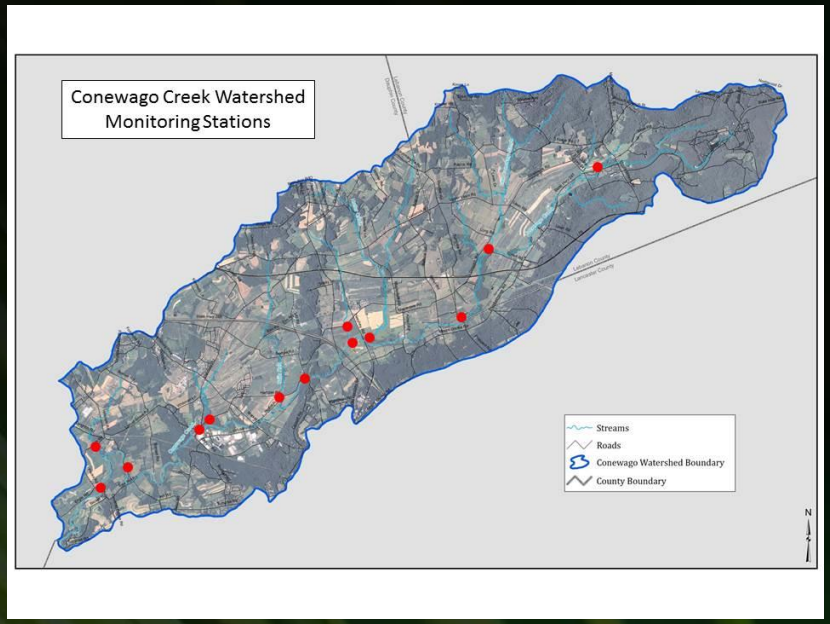


Pre-Initiative (2006-09)

During Initiative (2010-12)

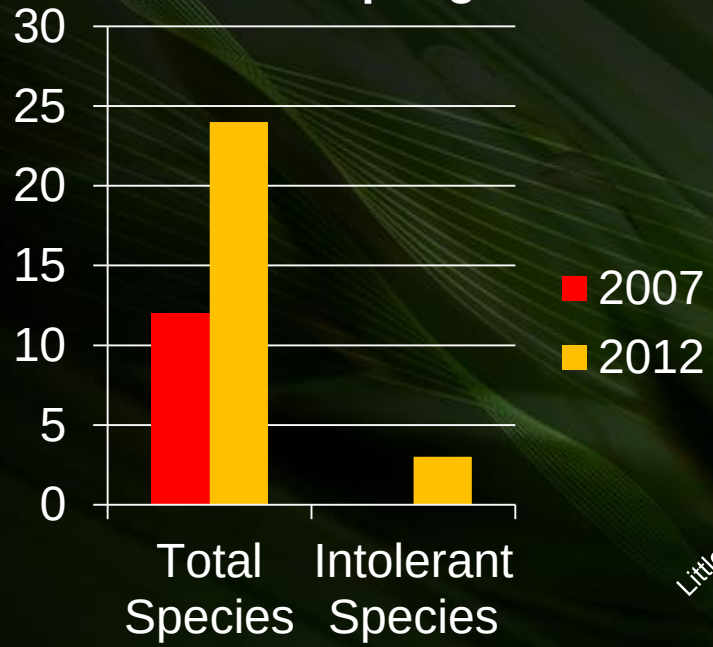
Monitoring the Results

- Comprehensive monitoring plan
  - 13 stations (2 USGS gage stations)
  - Water chemistry bimonthy
  - Macros every 3-5 years
  - Fish every 3 years

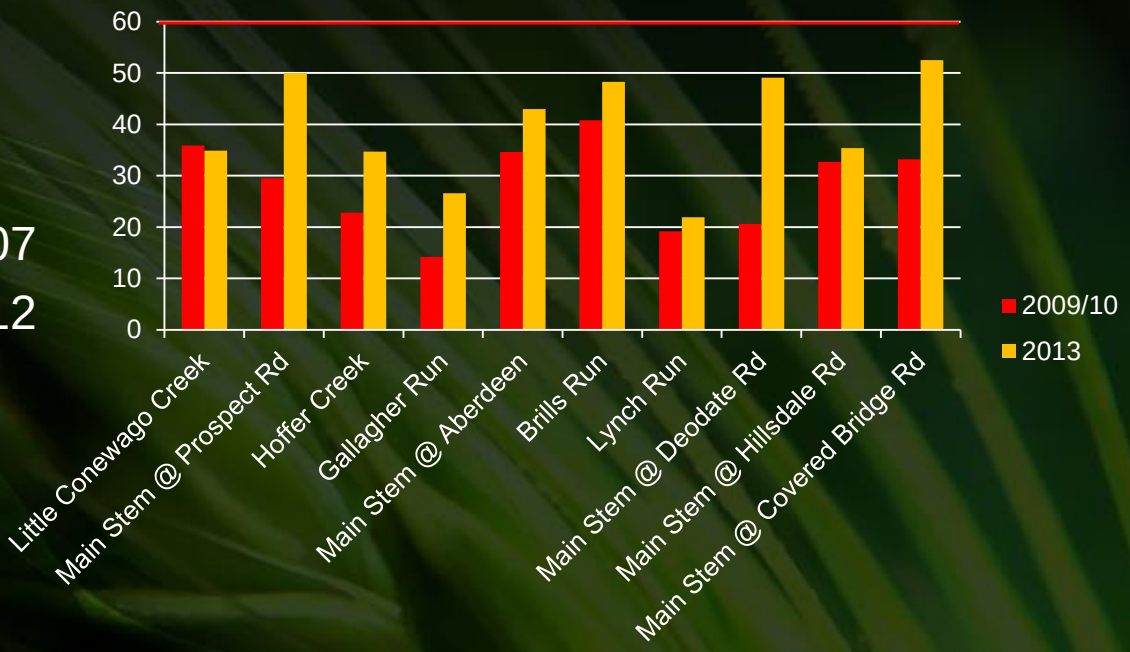


Impact

Hershey Meadows Fish Sampling



Macroinvertebrate Sampling (IBI Scores)




Pennsylvania Chesapeake Bay Program
CLEAN WATER FARM AWARD
Presented by
the Commonwealth of Pennsylvania
FOR PROTECTING AND CONSERVING
SOIL AND WATER

Thank you!

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