WATERSHED CHARACTERIZATION: UNDERSTANDING AND SHARING YOUR WATERSHED'S STORY

Hudson River Watershed Alliance

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strong OUTCOMES

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Watershed Characterization & Planning Workshop | Vassar College | March 24, 2026

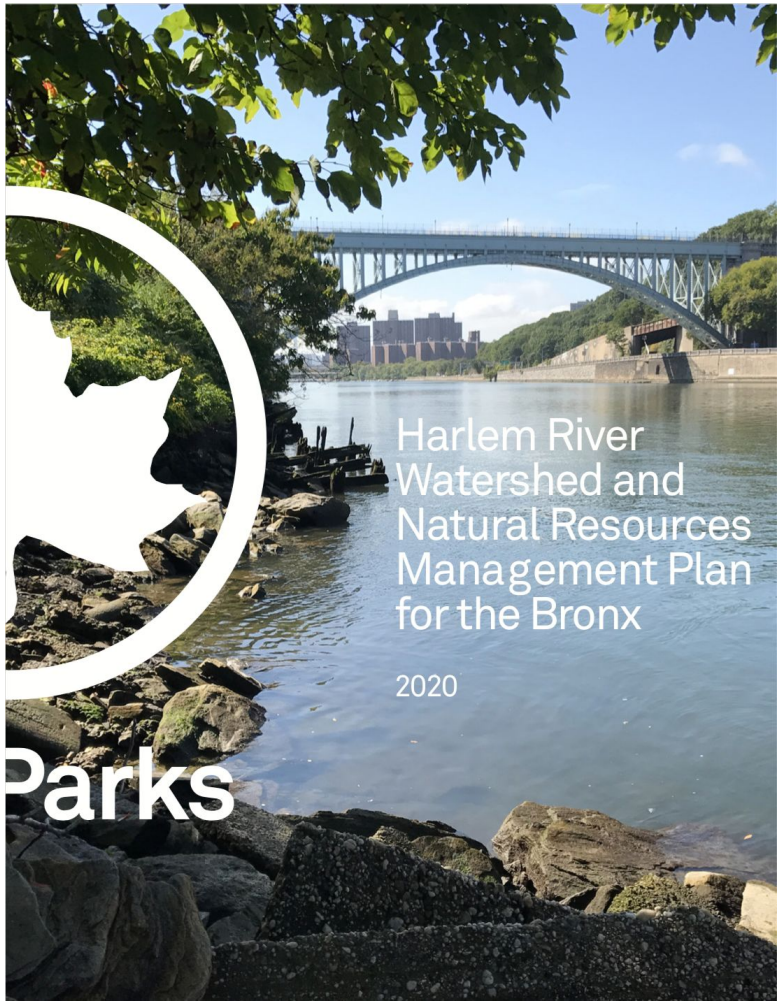
OUTLINE

- Frameworks for watershed characterization and planning
- What is a watershed characterization?
  - Motivations, project scope, outcomes, people & process, product
- Watershed characterization pilot project overview

Harlem River Watershed Plan

WHAT IS A WATERSHED PLAN?

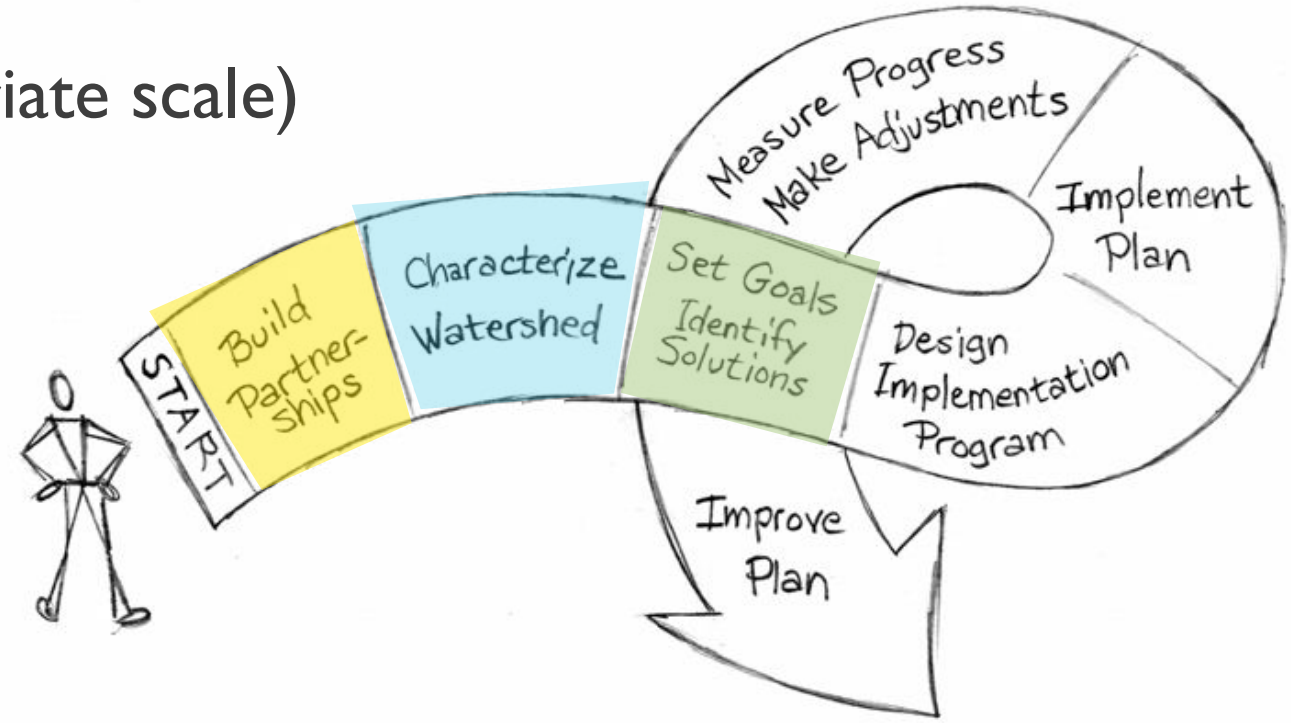
- Planning for future conditions, using a watershed framework and scale
- Traditionally have focused on water quality, can include other issues (flooding, habitat, ecology, and others)
- Process and product to bring people together, build consensus, and develop strategies
- Includes 1) compilation of existing information and 2) specific actions to meet goals



THE PLANNING PROCESS

WATERSHED PLANNING PROCESS

- Define goals
- Delineate a watershed (appropriate scale)
- Convene partners
- Compile existing data
- Identify gaps
- Prioritize issues, create targets
- Specify actions
- Implement the plan!
- Measure progress and adapt if necessary



from US EPA (2008)

WATERSHED PLANNING PROCESS

- Define goals
- Delineate a watershed (appropriate scale)
- Convene partners
- **Compile existing data**
- Identify gaps

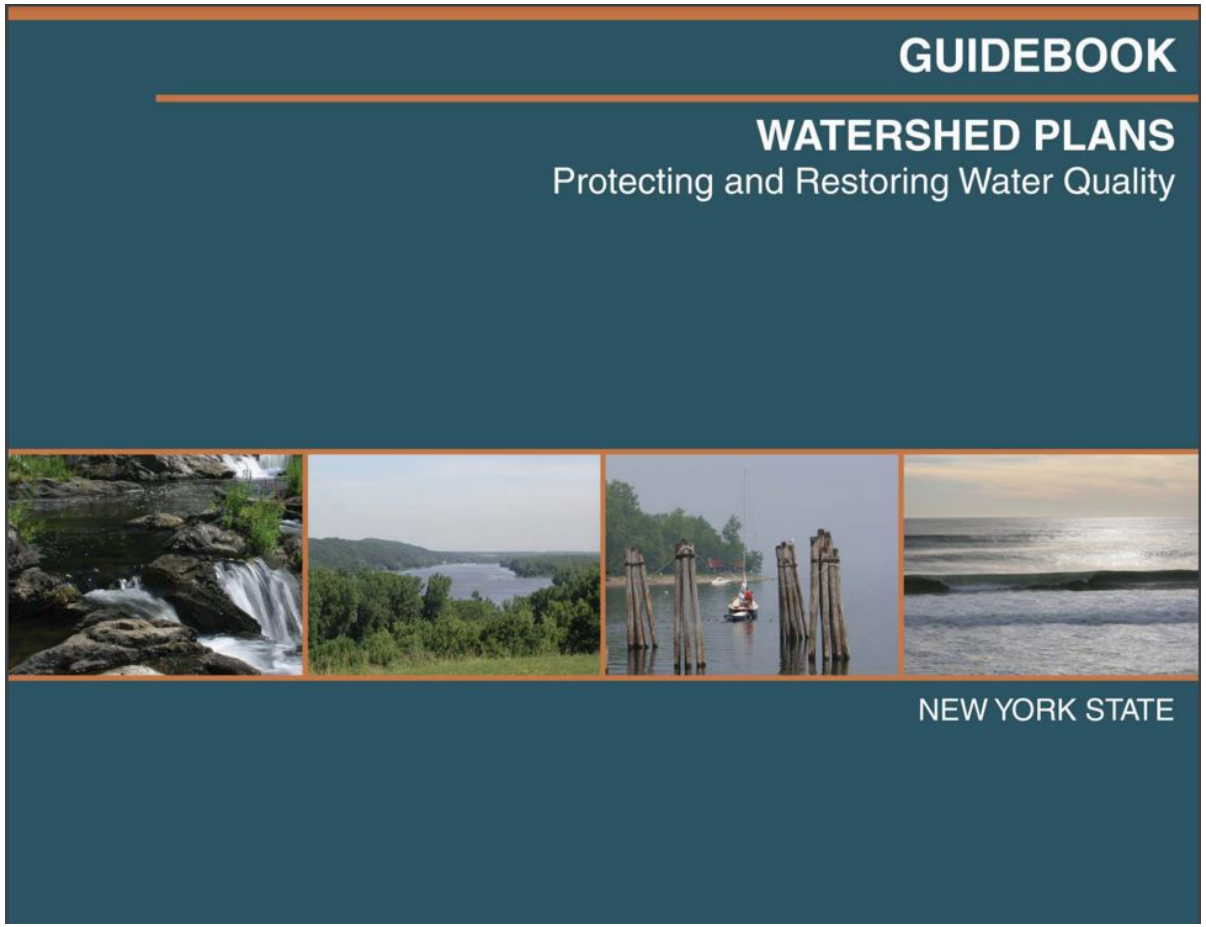
CHARACTERIZATION

- Prioritize issues, create goals
- Specify actions
- Implement the plan!
- Measure progress and adapt if necessary

PLAN

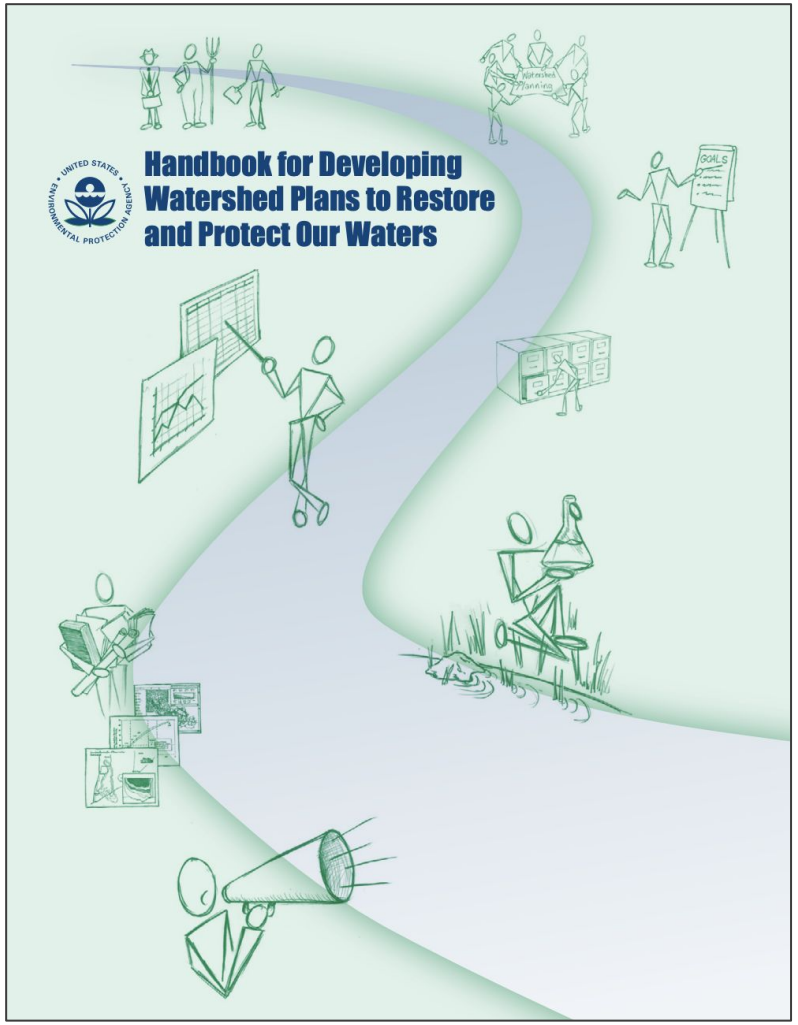
WATERSHED PLANNING FRAMEWORKS

- "DOS watershed plans"
- 2009: NYS Department of State (DOS) & Department of Environmental Conservation (DEC) *Guidebook on Watershed Plans*
- Framework for watershed planning in New York State
- Can be funded by DOS watershed planning grants



WATERSHED PLANNING FRAMEWORKS

- "9 Element watershed plans"
- 2008: US EPA *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*
- Framework for watershed planning across US, adapted by NYS DEC for use in NYS
  - 9 Element watershed plans (includes specific pollutant reduction targets, modelling)
- Can *also* be funded by NYS DOS watershed planning grants



WATERSHED PLANNING FRAMEWORKS

DOS watershed plan components:

- Community Outreach and Participation Plan
- **Watershed Characterization**
- Watershed Management Recommendations
- Implementation Strategy
- Monitoring and Tracking

9 Element watershed plan steps:

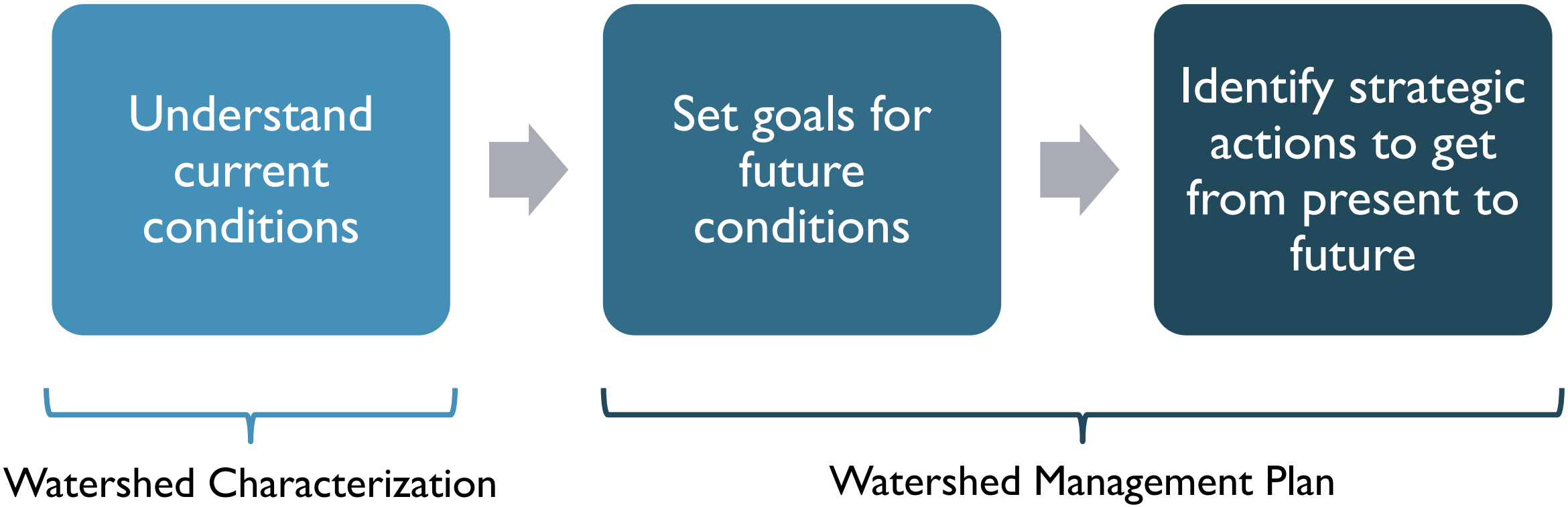
- Build partnerships.
- **Characterize the watershed to identify problems.**
- Set goals and identify solutions.
- Design an implementation program.
- Implement the watershed plan.
- Measure progress and make adjustments.

WATERSHED CHARACTERIZATION

- **Understanding current conditions**: focus of the watershed characterization process and product
- Compiles existing information from different sources together in one report, tells the watershed's story
- Supports understanding of local conditions for decision-making, actions
- Foundation for planning: identifies problems/gaps before potential solutions

Wappinger Creek Watershed Intermunicipal Council

WATERSHED PLANNING FRAMEWORK



WHY WATERSHED CHARACTERIZATION?

- **Watershed characterization** as focus of today's workshop
  - Part of watershed planning process, but also value in doing on its own
- Provides a place to start the process
- Disparate information becomes easy to find, reference, and cite
- Builds stronger cross-watershed relationships for future collaboration
- Can save time, money, resources

Punch Brook-Roeliff Jansen Kill Community Presentation

CHARACTERIZATION: GETTING STARTED

- The information we're sharing is guidance, and not prescriptive
- The process includes many "hidden" decisions that are best made by the people leading/participating in the process locally.
- Active decision-making → more intentional planning process → better outcomes
- Informs both process and product

Punch Brook-Roeliff Jansen Kill Watershed Characterization Advisory Committee

CHARACTERIZATION: GETTING STARTED

- Motivations
- Focus
- Outcomes
- People and Process
- Next steps
- Product

CHARACTERIZATION: MOTIVATIONS

- Reactionary: responding to a specific problem
- Anticipatory: preparing for a known change
- Exploratory: seeking to understand watershed conditions to inform next steps

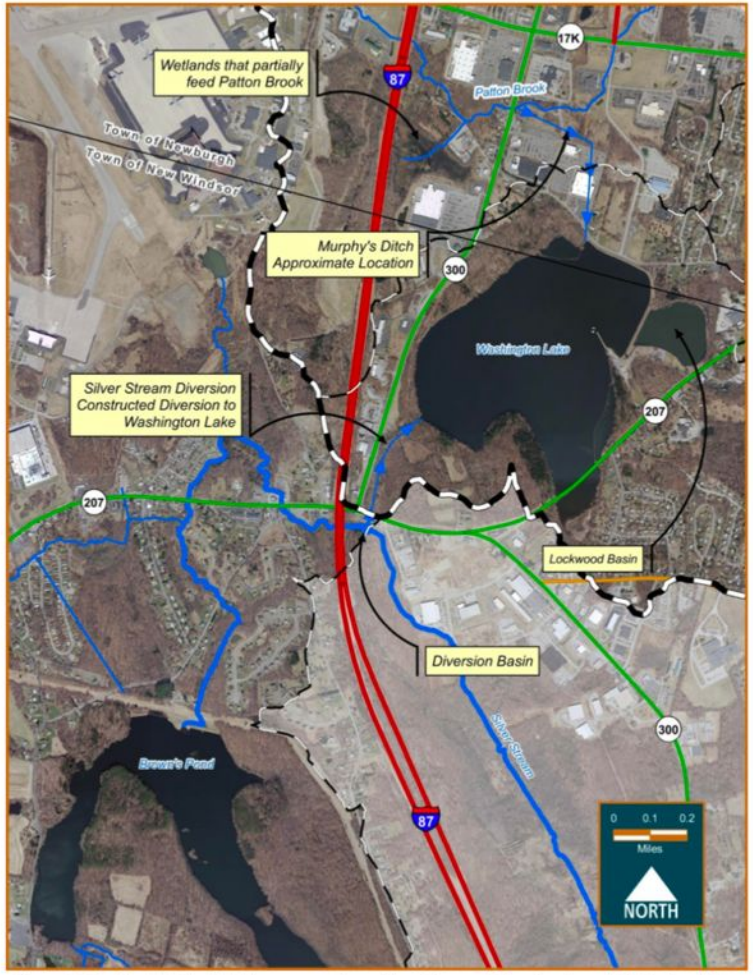


Figure 2. Graphic depicting hydrology among Upper Silver Stream, Patton Brook, and Washington Lake subwatersheds.

Washington Lake watershed, Newburgh's drinking water supply

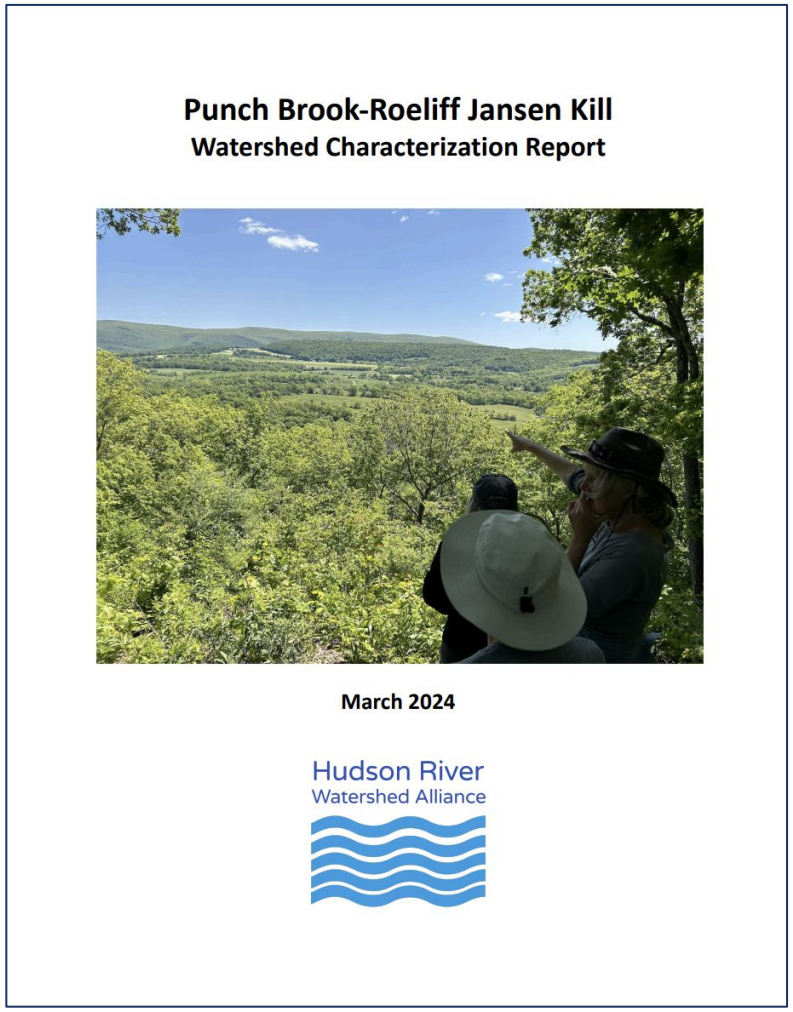
CHARACTERIZATION: FOCUS AND SCOPE

- Geographic extent
- Focus based on understanding of watershed conditions or issues
  - e.g., sediment, flooding, contaminants, nutrients, aquatic habitat, watershed restoration, environmental justice, climate
- Can be broad or narrow
- Helps you determine
  - Timeline/budget/funding
  - Expertise and experience needed

Punch Brook-Roeliff Jansen Kill Watershed Characterization Advisory Committee

CHARACTERIZATION: OUTCOMES

- Source of institutional memory
- Builds local capacity
- Increases legitimacy of local watershed work
- Can support other local plans, practices, and procedures
- Characterization → Plan



CHARACTERIZATION: PEOPLE & PROCESS

WHO:

Paid or volunteer experts offering specific skills

Interest in implementation

Local and regional partners

People who can provide context

People connected to different constituencies

Broader public (e.g., people affected by implementation, riparian landowners)

HOW:

Project Lead

Advisory Committee

Key constituencies (e.g., people to keep informed)

Community Engagement and Outreach

CHARACTERIZATION: NEXT STEPS

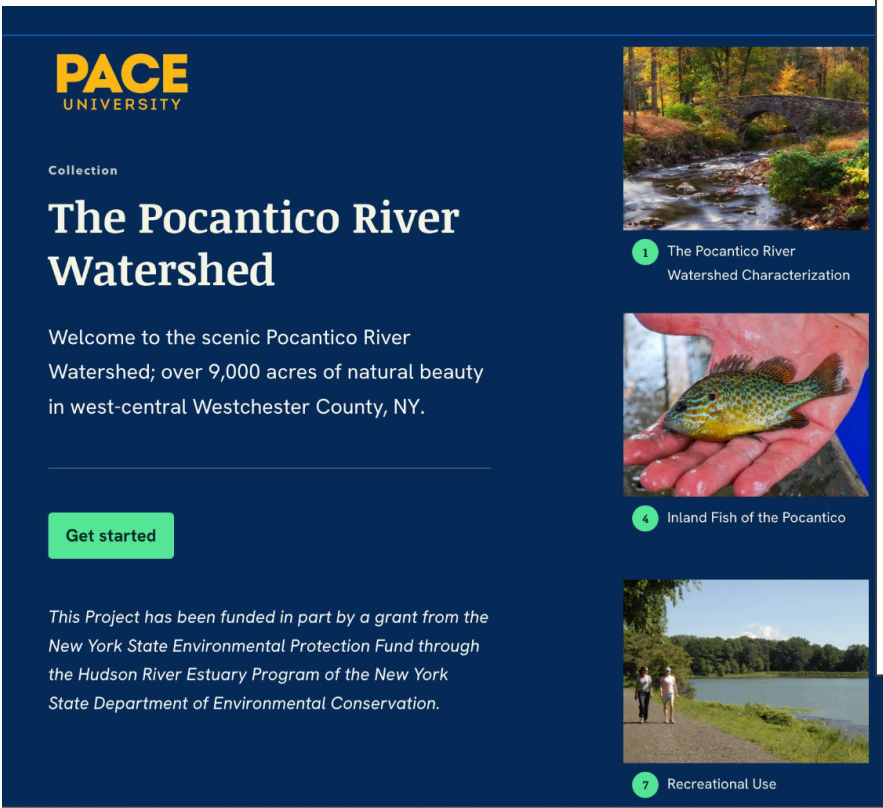
- Sharing the watershed's story
- Onboarding materials for new watershed group members
- Direct contact with local officials, etc. to use in local planning
- Community presentation to share project, gather feedback, identify next steps, build additional support

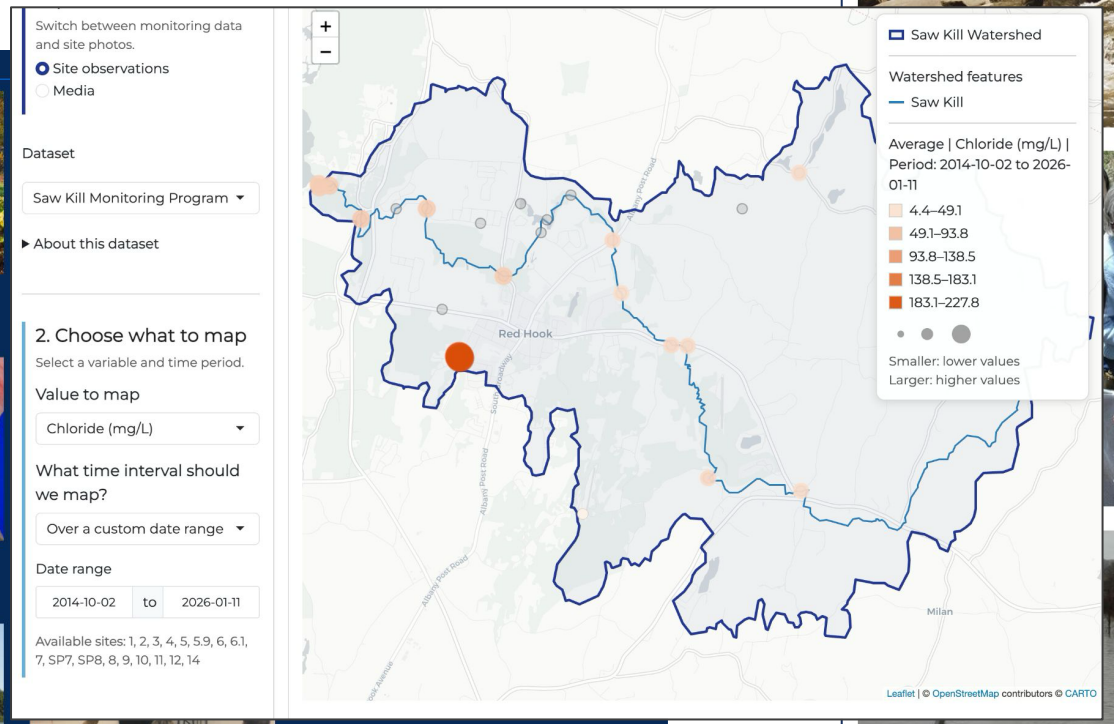
CHARACTERIZATION: PRODUCT

- What information goes into a watershed characterization?
- Outline:
  - **Introduction**: background on process, goals, etc.
  - **Physical Characteristics**: watershed delineation, regional context, geology, climate
  - **Lands of the Watershed**: land use, land cover, forests, wetlands, terrestrial habitats, and the built environment
  - **Waters of the Watershed**: waterbodies, floodplains, riparian areas, aquatic habitats, water quality, and water infrastructure
  - **People of the Watershed**: the people living in, caring for the watershed

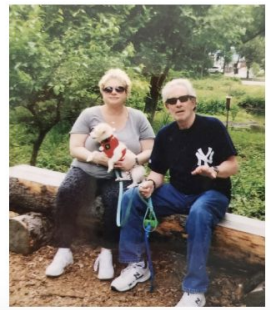
CHARACTERIZATION: PRODUCT

- Many different possible forms (PDF report, StoryMap, webmap, etc.) w/ maps, narrative, charts, links



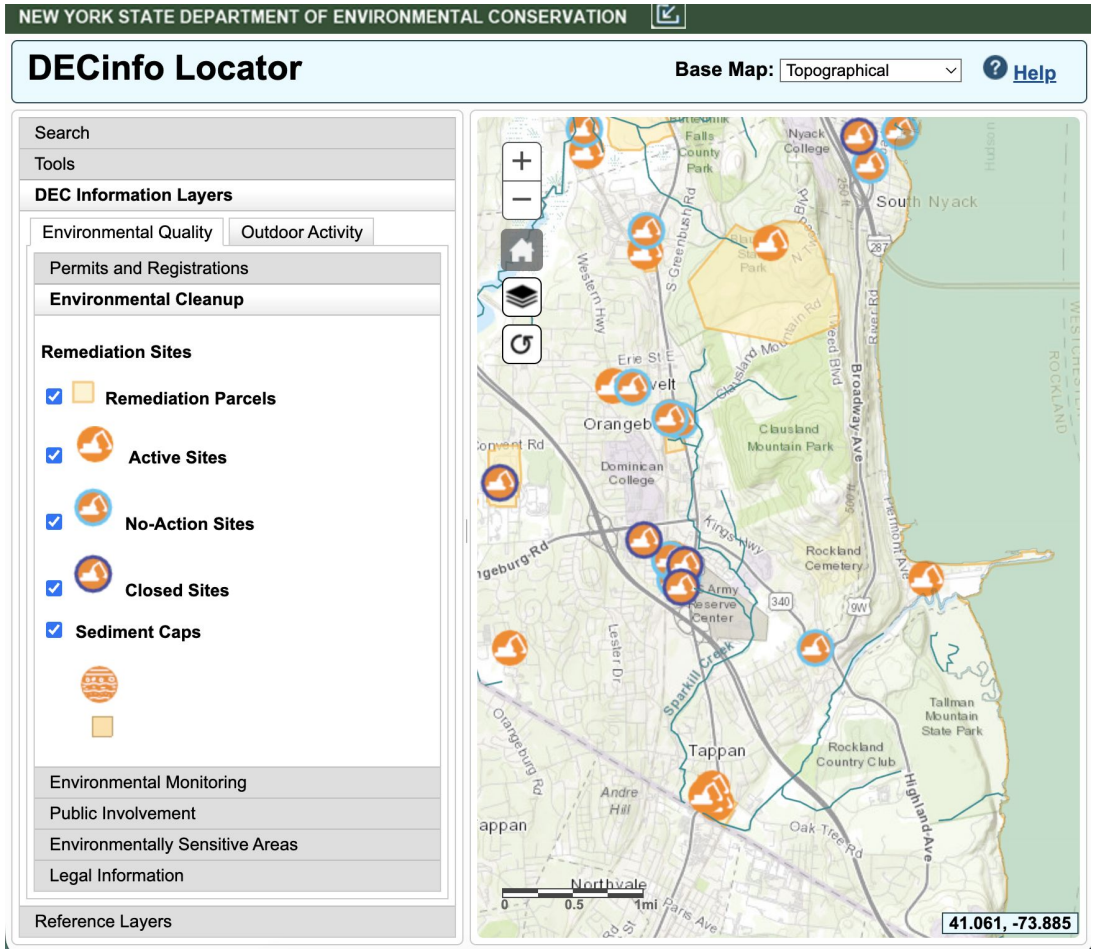


State of the Saw Mill River Watershed
2019
Westchester County, NY



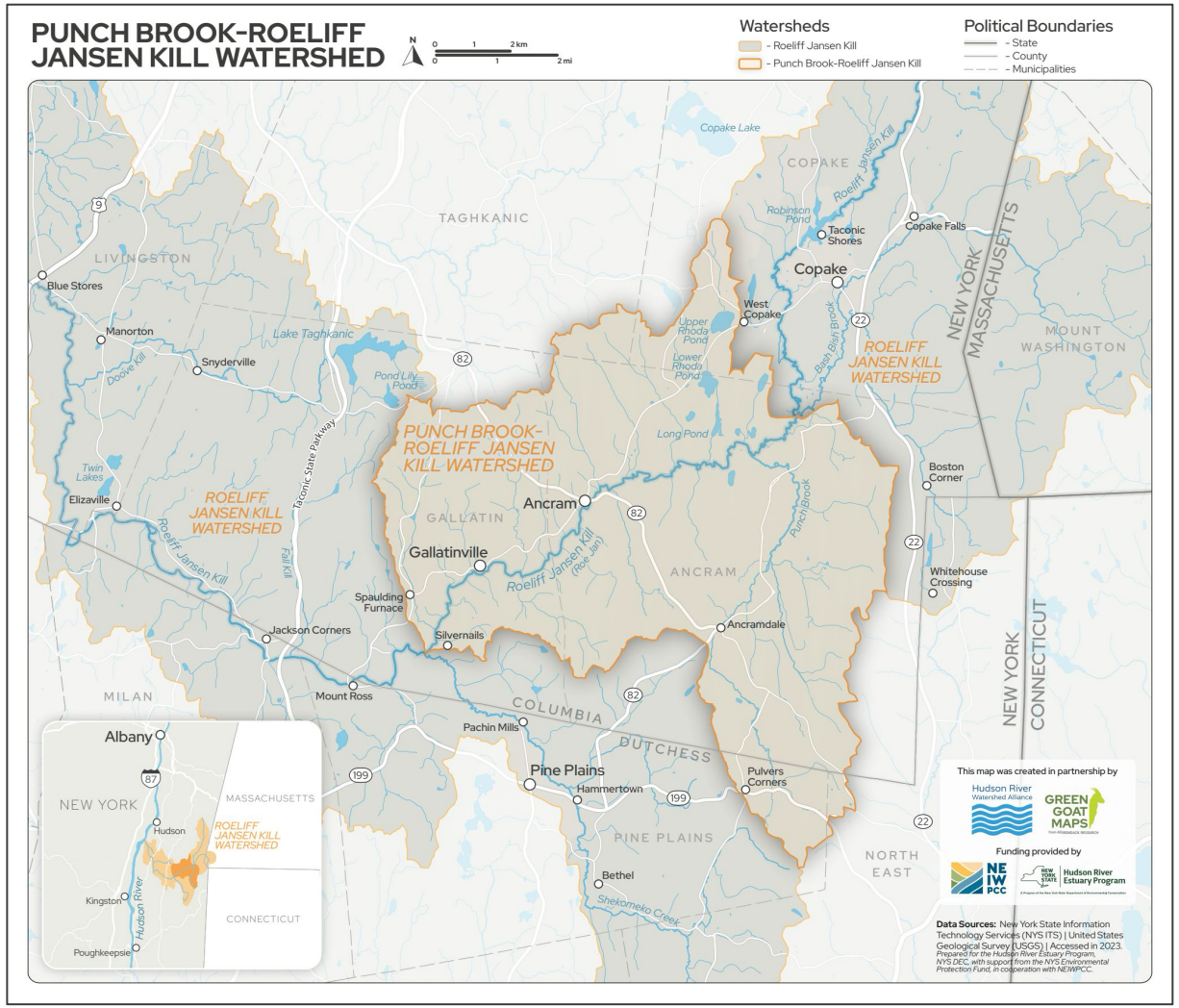
CHARACTERIZATION: WHERE TO GET INFO

- The right info to include depends on project focus/scope
- Can be helpful to start with broadly accessible information and mappers (federal, state, regional)
  - DECinfo Locator, Hudson Valley Natural Resource Mapper, USGS StreamStats, etc.
- Compile relevant reports, data, information (local, region)
  - Water quality monitoring, municipal plans, habitat studies, academic research, etc.



CHARACTERIZATION PILOT PROJECT

- 2022-2024: Hudson River Watershed Alliance pilot project in two small watersheds to develop guidance materials and share lessons learned regionally:
  - Punch Brook-Roeliff Jansen Kill watershed (rural)
  - Sparkill Creek watershed (urban)



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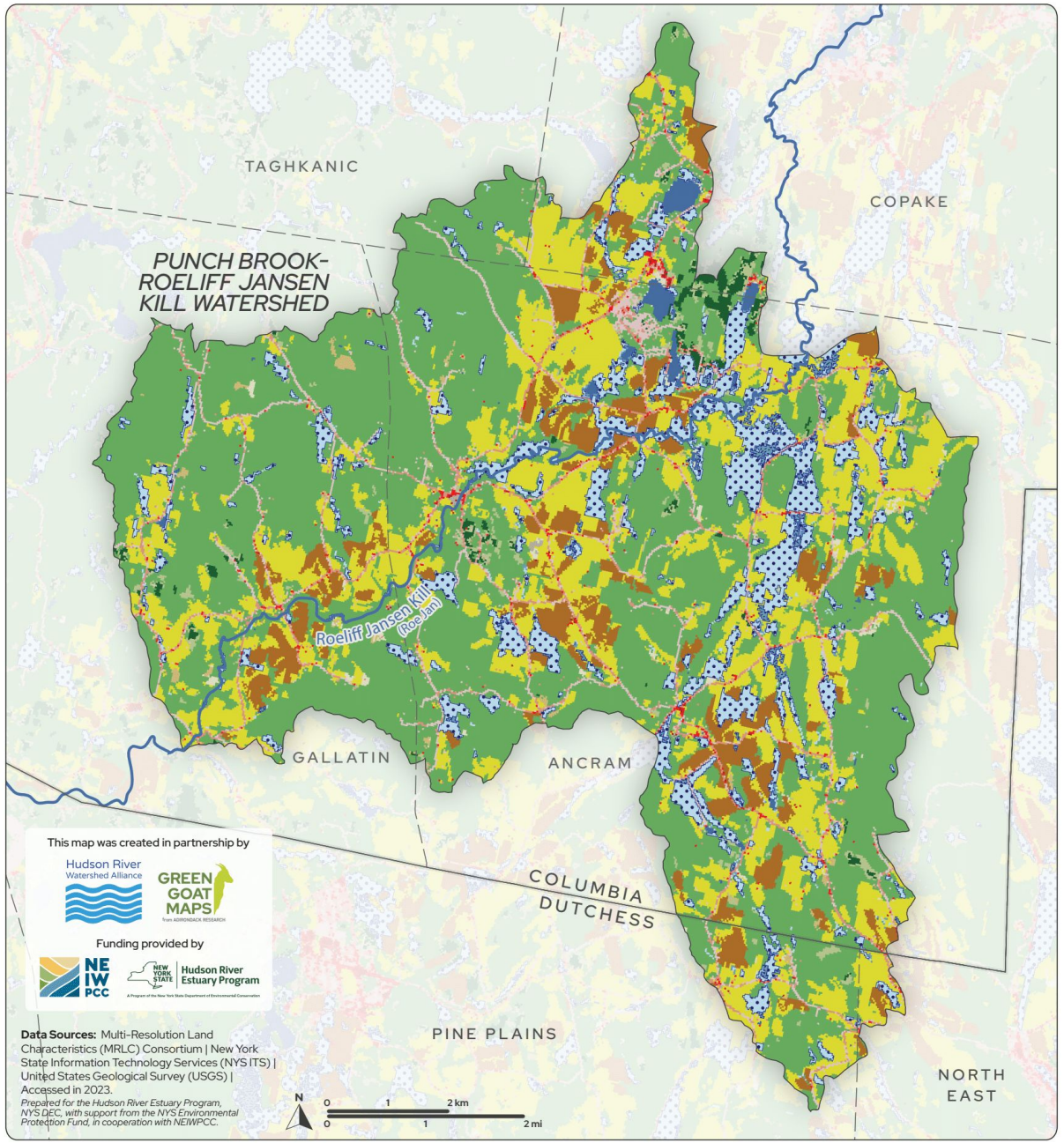
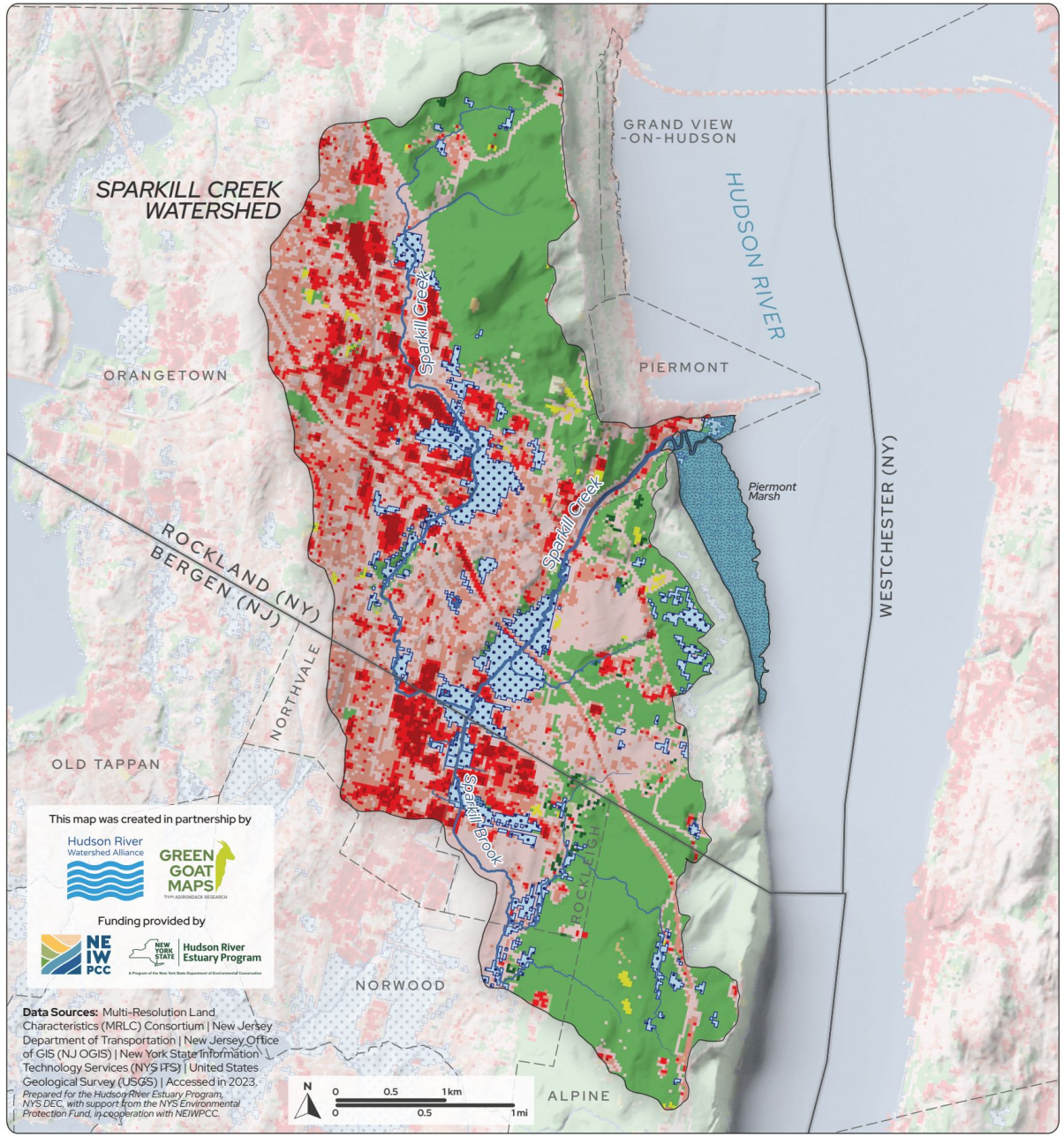
LAND USE AND LAND COVER
OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED



LAND USE AND LAND COVER
OF THE SPARKILL CREEK WATERSHED



PILOT PROJECT: PROCESS

- Watershed characterization process, highlight decision points:
  - Organize a watershed Advisory Committee
  - Delineate the focus watershed
  - Gather existing information
  - Summarize the information into a report
- Timeline: ~2 years

Punch Brook-Roe Jan Watershed Characterization Advisory Committee

PILOT PROJECT: ROLES

- Project management/meeting facilitation: Hudson River Watershed Alliance
- Local champion/point person: Colleen Lutz (Punch Brook-Roe Jan), Larry Vail (Sparkill)
- Advisory Committees: Local and regional reps
- Writing/organizing information: Hudson River Watershed Alliance, Strong Outcomes, Tracey Ledder (HRWA board)
- Maps: Adirondack Research, Kate Meierdiercks (Siena College)

ROEJ WATERSHED COMMUNITY

Hudson River Watershed Alliance

SPARKILL CREEK WATERSHED ALLIANCE

strong OUTCOMES

Another great map by GREEN GOAT MAPS from ADIRONDACK RESEARCH

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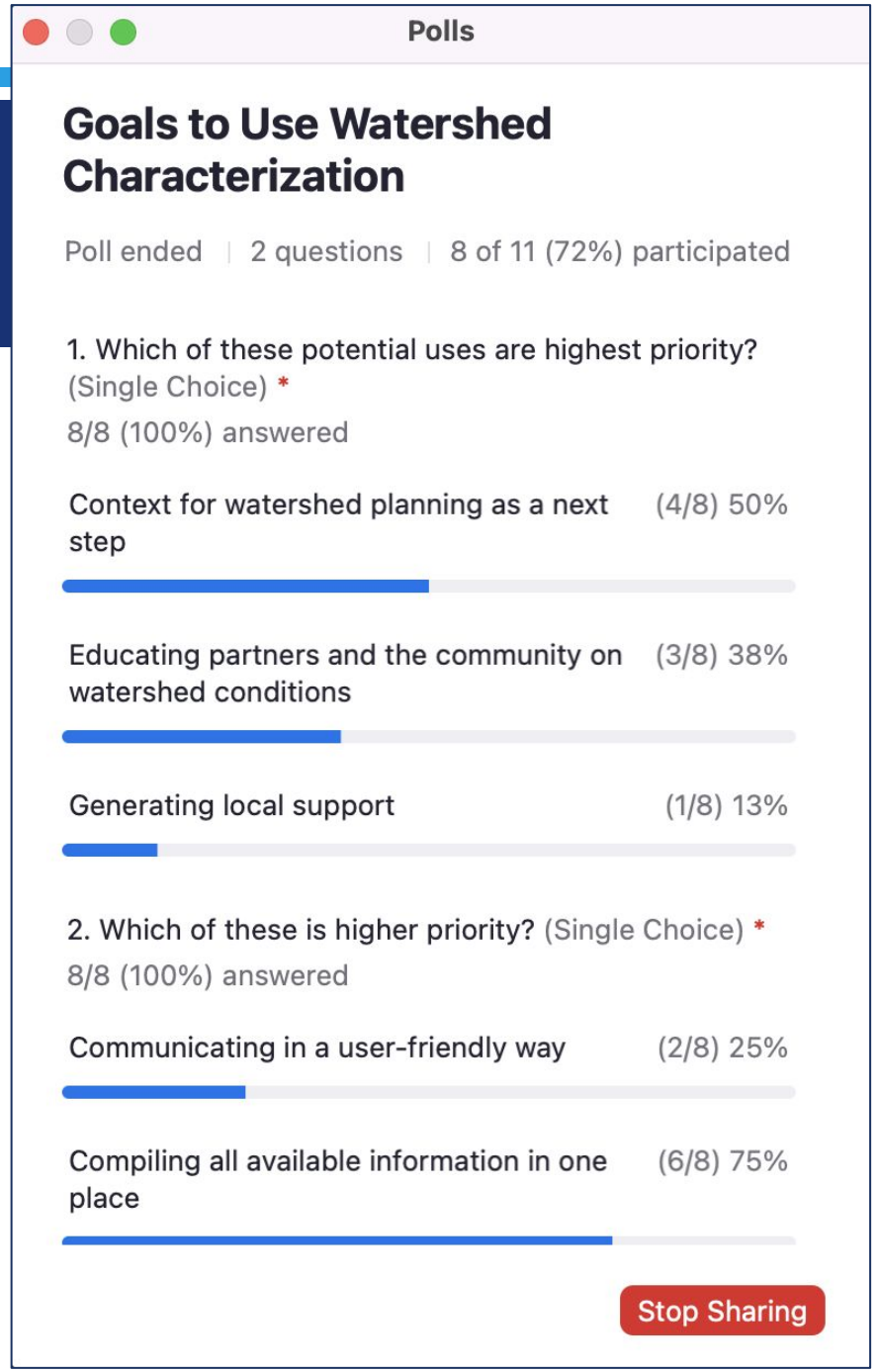
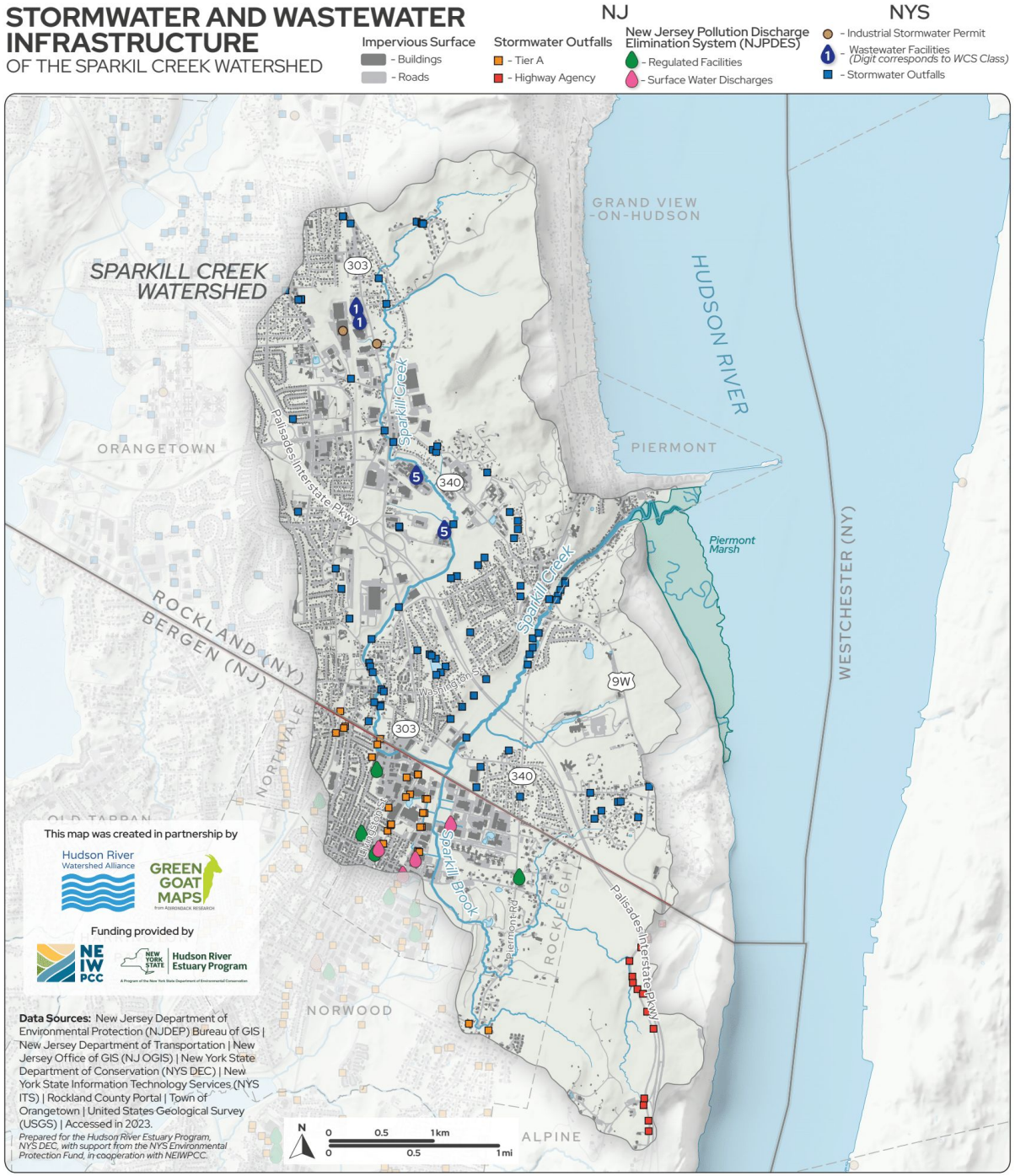
GETTING STARTED

- With Advisory Committee, developed priorities for the watershed characterization
  - Education tool? Compilation of information? Building local support?
  - Informed priorities for the process and product
- Watershed delineation
  - Punch Brook-Roe Jan: HUC 12
  - Sparkill: Used delineation from previous plan



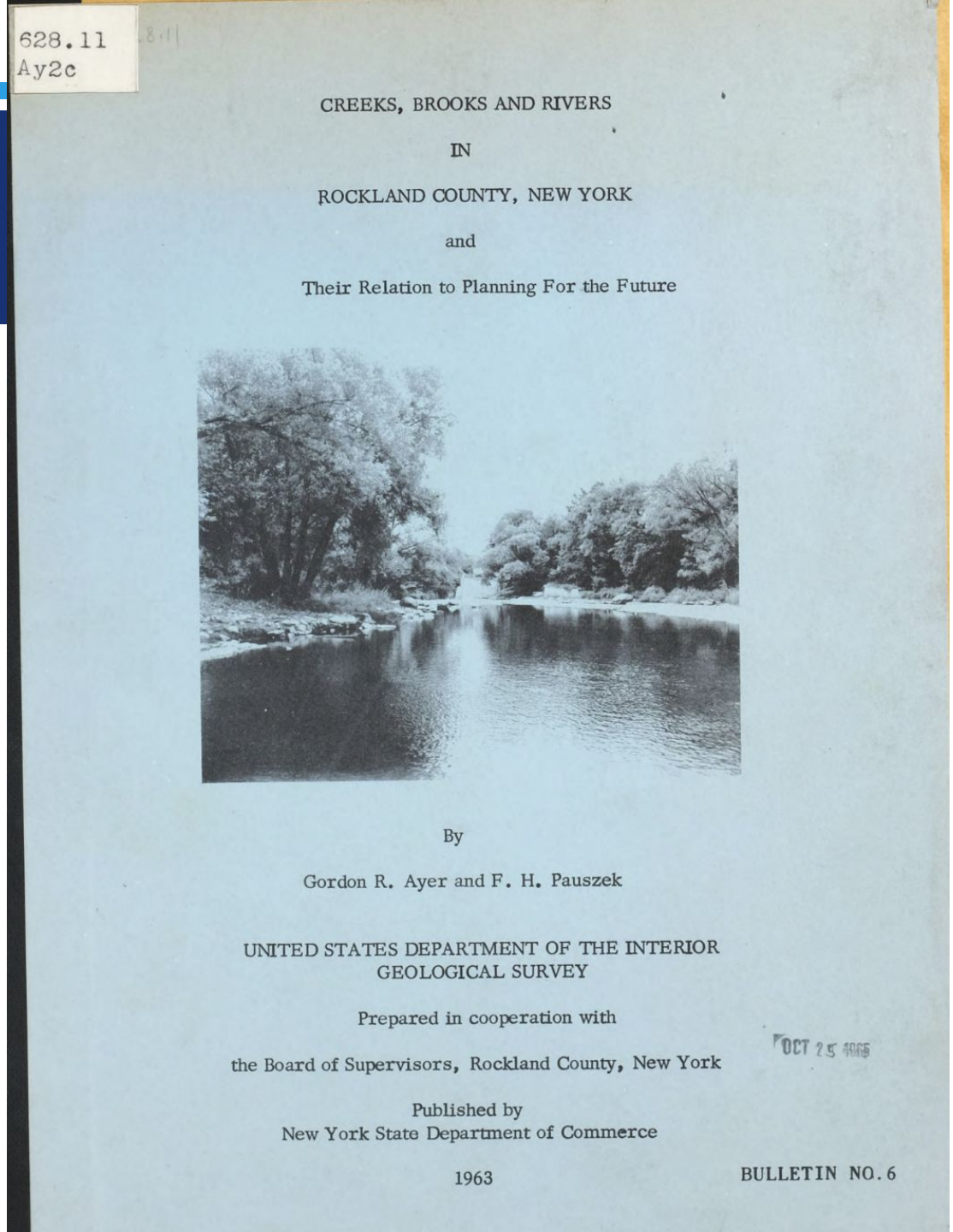
GATHERING INFO

- Compiled federal, state, publicly-accessible regional datasets for the first draft of report, maps
  - Set table of contents, structure for report, framework for maps
- Compiled locally available reports, data, information for report, and, where possible, maps



GATHERING INFO

- What information to include?
- Decision framework:
  - Is this information from within the focus watershed?
  - Does it inform an understanding of current watershed conditions?
  - Are there specific details about data collection and methodology?
  - How will information be used in the watershed characterization? (narrative, map, table, reference only, other)



CREEKS, BROOKS AND RIVERS

IN

ROCKLAND COUNTY, NEW YORK

and

Their Relation to Planning For the Future

By

Gordon R. Ayer and F. H. Pauszek

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with

the Board of Supervisors, Rockland County, New York

Published by
New York State Department of Commerce

1963

BULLETIN NO. 6

GATHERING INFO

- Each source entered into spreadsheet, filed in Google Drive, linked within the report
- Sparkill Creek watershed: 66 datasets for maps; 93 data sources for report

1	Data Title	Publication Date or Year	Author	Data Source (federal, state; regional, academic, county, municipal, local)	Data Type (report, publication, plan, dataset, GIS data, photograph, or other format)	Notes on data type (publication name, other format, etc. Are any other types included?) If relevant	Are there specific details about data collection and methodology? (yes, no, unsure)	Notes on data collection and methodology (Note if standard method or QAPP, peer review, methods section articulated, clear study design so it could be reproduced, etc.)	Is this informati within th watershe no, unsur
36	USGS 01376280 SPARKILL CREEK AT SPARKILL NY	1980	US Geological Surve	Federal	Dataset		Yes	USGS standard methods	Yes
37	Annual Drinking Water Quality Report for 2022	2023	Veolia	Regional	Report		Yes	NYSDOH regulatory standards	Yes
38	Former Materials Research Corporation Supplemental	2005	Leggette, Brashears,	Regional	Report		Yes	summary of relevant studies, sour	Yes
39	Water System Summary: Public Water Supply	2023	NYS Department of H	State	Dataset		Yes	list of permits	Yes
40	Danzig Groundwater Plume Fact Sheet	2020	NYS DEC	State	Report		Yes		Yes
41	Orangetown Commerce Center Brownfield Cleanup Pro	2019	NYS DEC	State	Report		Yes		Yes
42	REMEDIAL ACTION WORK PLAN FORMER MATERIA	2018	LBG ENGINEERING	Regional	Report		Yes	methods described throughout	Yes
43	Former Materials Research Corporation Brownfield Cle	2016	NYS DEC	State	Report		Yes		Yes
44	Groundwater Contour Map/VOCs in Groundwater	2022	Precision Environme	Regional	Report		Yes	sources cited	Yes
45	The Proposed Final New York State 2018 Section 303(	2020	NYS DEC	State	Report		Yes	within CALM	Yes
46	Information Request and Administrative Compliance Or	2017	US EPA	Federal	Report		Yes		Yes
47	Sewage Pollution Right to Know reports	various, acce	NYS DEC	State	Report		Yes	Sewage Pollution Right to Know L	Yes
48	Creeks, brooks, and rivers in Rockland County, New Yo	1963	Gordon R. Ayer and	Federal	Report	published by NYS Dept of Comr	Yes		Yes
49	Sparkill Creek Drainage Basin: Recommended Classifi	1951	NYS Department of H	State	Report		Yes	methods pg. 6-7	Yes
50	River Herring Volunteer Monitoring Program 2008	2008	Larry Vail, Sparkill Cr	State	Dataset	NYS DEC community science pr	Unsure	Monitoring lasts for two months fro	Yes
51	LENS Sparkill	2023	Anna Palmer, Hudso	State	Report	phosphorus loading model outpu	Yes	https://drive.google.com/file/d/1lt2	Yes
52	Taxonomic Profiling of Microbes in Glyphosate-Treated	2023	Madison R. Newman	Academic	Publication	*Microbiology Resource Announc*	Yes	method pg. 1	Yes
53	Surface water quality at the Hudson River National Estu	1995	William C. Nieder, Hu	Federal	Report		Yes	methods pg. 3-9	Yes

SHARING THE WATERSHED'S STORY

- Complete watershed characterization report: narrative, maps, interpretation
- Feedback from Advisory Committee: ground in local priorities, fact check
- Community presentation to share project, gather feedback, next steps

Sparkill Creek Watershed Characterization Community Presentation

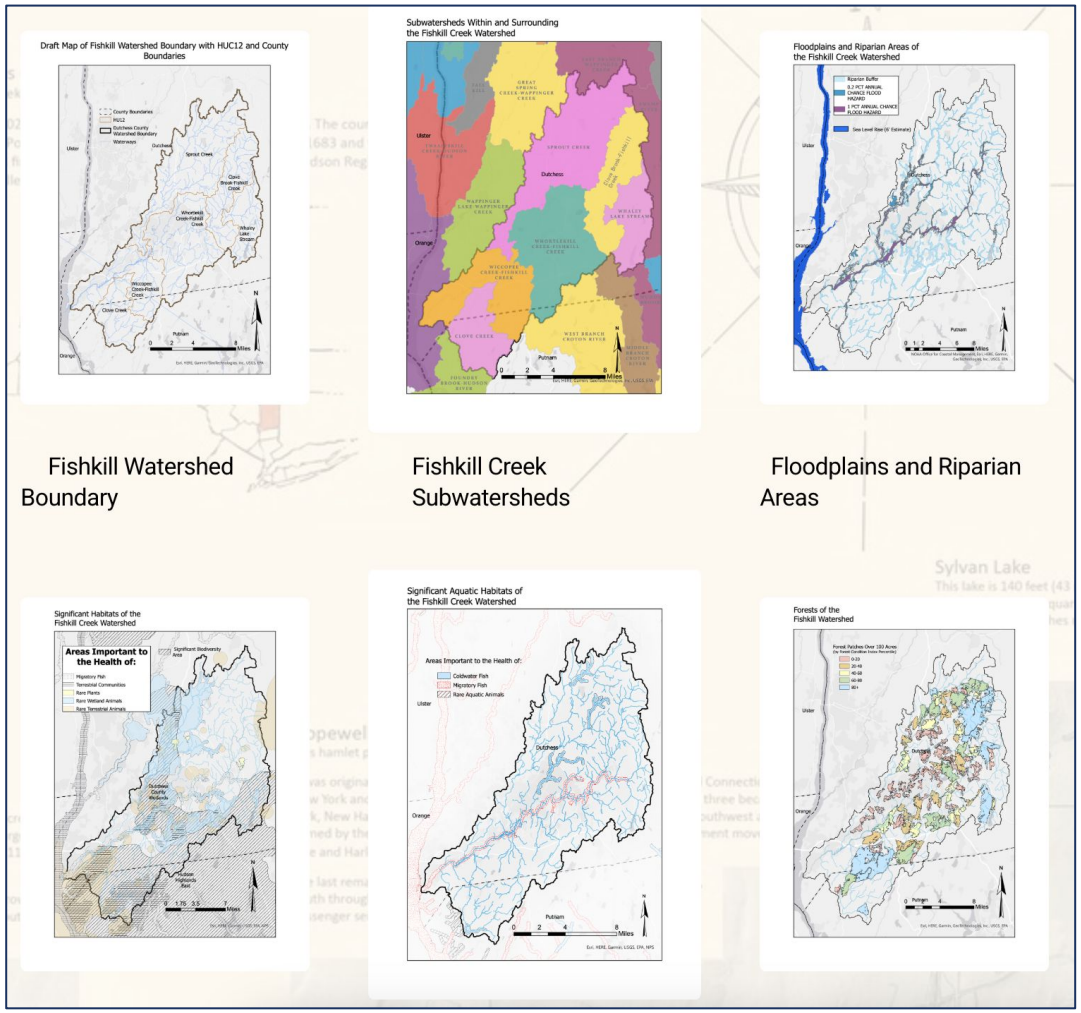
WATERSHED CHARACTERIZATION MAPS

- Maps provide important illustrations of watershed conditions
- We used maps as images within the report, rather than web maps
  - Decision-making around extent, layers, story to emphasize
  - Links to relevant web maps
- Maps connect people to their watershed and start conversations

Punch Brook-Roeliff Jansen Kill Watershed Characterization

WATERSHED CHARACTERIZATION MAPS

- Maps must be accurate, customized, and thoughtfully designed both with and for communities
- Opportunity to partner with academics/students to develop maps
- Journal article published: case study of summer 2024 collaboration with Fishkill Creek Watershed Alliance, Hudson River Watershed Alliance, and Siena College



OUR NEXT STEPS

- Watershed characterization pilot project reports and process as templates (online)
- Watershed Characterization Guidance
  - More details on frameworks, process
  - Lessons learned from pilot project, research on best practices, partnering with students
  - Data/information checklists
  - Links to more information
- Upcoming characterization projects for Fishkill Creek and Black Creek watersheds

Punch Brook-Roeliff Jansen Kill Watershed Characterization Community Presentation

THANK YOU!

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