Sterling & Wolcott Creeks
Integrated Watershed Action Plan

Watershed Stakeholder Committee
Meeting #2
May 9, 2022
What is the most important thing that you think indicates the health of the Sterling and Wolcott Creeks watersheds?
Agenda

• Schedule and Progress
• IWAP Indicators
• Interactive Session
• Next Steps
IWAP Schedule and Progress

Tony Eallonardo, Ramboll

• Schedule

• Progress on the Sterling and Wolcott Creeks IWAP Project

• Recap IWAP Goals
Sterling and Wolcott Creeks IWAP

Purpose:
To identify, protect, and restore key aspects of the Sterling & Wolcott Creek watersheds that support human health and well-being

Vision:
An engaged and empowered community protecting and restoring the watershed based on actions identified through this project. A healthy watershed for families and communities into the future!

Approach:
Science-based, collaborative, focused on ecosystem processes

This meeting:
Review goals, encourage participation, and receive input on indicators
Schedule

- **Fall 2021**
  - WSC Meeting 1

- **Spring 2023**
  - Public Meeting 4 - Final IWAP

- **Winter 2022**
  - Public Meeting 1

- **Winter 2023**
  - Winter 2023
  
- **Spring 2022**
  - WSC Meeting 2

- **Fall 2022**
  - WSC Meeting 3
  - Public Meeting 2

- **Fall 2023**
  - WSC Meeting 4
IWAP Goals

**COASTAL**
**GOAL 01**
Manage coastal sediment erosion, deposition, and transport to protect natural features and habitat, sustain recreation and tourism, and help to protect public and private assets.

**FLOODPLAINS, RIPARIAN AREAS, & STREAMS**
**GOAL 03**
Enhance functioning of floodplains, riparian corridors, and streams to minimize infrastructure impacts from flood events, improve water quality, support aquatic habitat for fish and wildlife, and provide recreational access.

**WETLANDS**
**GOAL 02**
Restore and preserve healthy wetlands to support clean water, biodiversity, and opportunities for outdoor recreation.

**FORESTS & UPLANDS**
**GOAL 04**
Promote healthy and connected forests and upland communities to support clean air and water, biodiversity, opportunities for outdoor recreation, and sustainable use of natural resources.

**WATER QUALITY**
**GOAL 05**
Improve and maintain high quality surface and ground water resources to support aquatic habitat, drinking water supplies, and water dependent recreation.

**SUSTAINABLE WORKING LANDS**
**GOAL 06**
Promote, implement, and improve sustainable land uses to provide future generations with the ability to use and prosper from natural resources.

**HERITAGE & SENSE OF PLACE**
**GOAL 07**
Inspire and facilitate a connection with nature to support physical, social, and mental well-being.
Indicators

Andrew Brainard, Ramboll

- Development of Indicators
- Candidate List of Indicators
- Interactive Session: Breakout Rooms
Development of Indicators

What is the purpose of indicators?

- Status and trends of ecosystem!

- Key features:
  - Scientifically relevant
  - Sensitive to changes in the ecosystem
  - Holistic, comprehensive

How will the indicators be used?

- Link between desired outcomes (goals) to ecological processes
- Monitor trends and/or compare to threshold values

Example: Data are not real – illustration purposes only
Development of Indicators

Example – desired outcomes (goals) to ecological processes and indicators

Water quality

<table>
<thead>
<tr>
<th>Desired Outcome (Goal)</th>
<th>High quality surface water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Process</td>
<td>Forest growth and nutrient uptake</td>
</tr>
<tr>
<td>Indicator(s)</td>
<td>Surface water nutrient concentrations, Forest cover and regeneration</td>
</tr>
</tbody>
</table>
Development of Indicators

**Guidance:**
- Is the indicator directly observable?
- Is the indicator well-defined and understandable to the public?
- Is the indicator cost effective to measure?
- Is the indicator defined by historical data?
- Is the indicator responsive to management alternatives at the watershed scale?
- Is the indicator aligned with selected goals and targets?
Indicator Organization

Millennium Ecosystem Assessment (2005)
Candidate Indicators

### Human Well-Being

Potential IWAP Recommendation to survey values/well-being metrics and track over time

### Ecosystem Goals and Indicator Variables

**Goal 1: Coastal**
- Historical shoreline change (erosion, accretion)
- Barrier bar dimensions (length, width)
- Beach width
- Chemistry and grain size of sediment at ports, harbors, and outlets

**Goal 3: Floodplains, riparian areas, and streams**
- Stream flow
- Water cycle integrity (e.g., water percolation and plant use)
- Connectivity of stream network (length of streams uniqued)
- Fish population changes
- Breeding and migratory bird abundance/distribution
- Creel surveys
- Benthic macroinvertebrate Biological Assessment Profile (BAP) scores

**Goal 5: Surface and groundwater quality**
- Stream temperature
- Stream turbidity
- Surface water nutrient concentrations, DO
- Frequency of Harmful Algal Blooms (HABs)
- Benthic macroinvertebrate Biological Assessment Profile (BAP) scores
- Ground water nutrient and metal concentrations

**Goal 2: Wetlands**
- Water quality (turbidity, DO, temp, pH, chl-a, N, P, etc.)
- Anuran richness, community composition
- Bird richness, community dynamics
- Fish and turtle richness, community dynamics
- Macroinvertebrate richness, community dynamics
- Wetland vegetation richness, floristic quality index
- Overall wetland IBI scores

**Goal 4: Forests**
- Forest regeneration
- Forest size class distribution
- Deer browse intensity
- Abundance and diversity of bird species
- Abundance and diversity of herpetofauna species

**Goal 6: Sustainable working lands**
- Agricultural production (e.g., apples, corn)
- Timber production
- Soil erosion and loss
- Soil health
- Maple syrup production
- Pollinator populations

**Goal 7: Heritage and sense of place**
- Use and location of traditional use resources
- Number of park visitations and trail use (annual, seasonal)
- Use and location of traditional use resources
- Creel surveys
- Nature-based health, education, volunteer, or wellness programs

*Blue text denotes variable in more than one ecosystem goal, direct, or indirect driver of change*

### Indirect Drivers of Change

#### Demographics
- Total population
- Persons aged 65+
- Persons aged ≥ 17

#### Social Vulnerability Index

#### Environmental Justice

### Direct Drivers of Change

#### Precipitation
- Total annual, monthly, seasonal
- Annual snowfall/snowpack
- Anomalies
- Drought durations
- Ice patterns
- Nearshore ice extent
- Jams

#### Wind
- Seasonal speed and direction
- Anomalies (highs and lulls)

#### Temperature
- Annual, monthly, seasonal
- Anomalies
- Growing season length
- First, last frost dates

#### Invasive species
- Total no. of wetland-specific invasive species
- Total no. of floodplain-specific species
- Total no. of aquatic-specific species
- Total no. of agricultural pests/invasives
DIRECT AND INDIRECT DRIVERS OF CHANGE

Direct Drivers Indicators:
• Precipitation (annual, monthly, seasonal)
• Wind (speed and direction)
• Invasive species

Indirect Drivers Indicators:
• Environmental justice
• Social Vulnerability Index

• Temperature (annual, monthly, seasonal)
• Land use/cover
• Ice patterns (nearshore extent, jams)

• Economics (poverty, unemployment, per capita income)
• Demographics (total population, age 65+, < 17)
COASTAL

Indicators:

• Historical shoreline change (erosion, accretion)
• Barrier bar dimensions (length, width)
• Change in beach width
• Chemistry and grain size of sediment at ports, harbors, and outlets
WETLANDS

Indicators:

- Water quality
- Anuran richness, community composition
- Bird richness, community dynamics
- Fish and turtle richness, community dynamics
- Macroinvertebrate richness, community dynamics
- Wetland vegetation richness, floristic quality index
- Overall wetland IBI score
FLOODPLAINS, RIPARIAN AREAS, & STREAMS

*Indicators:*

- Stream flow
- Water cycle integrity (e.g., water percolation and plant use)
- Connectivity of stream network
- Fish population changes
- Abundance and diversity of bird species
- Creel surveys
- Benthic macroinvertebrate Biological Assessment Profile (BAP) scores
FORESTS & UPLANDS

Indicators:

- Forest regeneration
- Forest size class and distribution
- Deer browse intensity
- Abundance and distribution of bird species
- Abundance and distribution of herpetofauna species
WATER QUALITY

Indicators:

- Stream temperature
- Stream turbidity
- Surface water nutrient concentrations, DO
- Frequency of Harmful Algal Blooms (HABs)
- Benthic macroinvertebrate Biological Assessment Profile (BAP) scores
- Ground water nutrient and metal concentrations
SUSTAINABLE WORKING LANDS

*Indicators:*

- Agricultural production
- Timber production
- Soil erosion and loss
- Soil health
- Maple syrup production
- Pollinator populations
HERITAGE & SENSE OF PLACE

**Indicators:**

- Use and location of traditional use resources
- Number of park visitations and trail use
- Creel surveys
- Number of nature-based health, education, volunteer, or wellness programs
Interactive Session

Breakout Room #1: Sustainable Working Lands Heritage & Sense of Place

Breakout Room #2: Coastal Wetlands

Breakout Room #3: Water Quality Floodplains, Riparian Areas, & Streams

Breakout Room #4: Direct and Indirect Drivers of Change Forests & Uplands
## Breakout Room #1
### Sustainable Working Lands, Heritage & Sense of Place

<table>
<thead>
<tr>
<th>Topic</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Other Candidate Indicators</strong></td>
<td>• Number of incentive programs for residents and farmers</td>
</tr>
<tr>
<td><strong>Potential Data and References</strong></td>
<td>• Chesapeake Bay data may be a useful reference for a Hedgerow policy</td>
</tr>
<tr>
<td><strong>Communication and Partnerships</strong></td>
<td>• Soil &amp; Water Conservation Districts</td>
</tr>
<tr>
<td><strong>Considerations</strong></td>
<td>• Corn and soy sometimes more focused on finances (price/commodity driven)</td>
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<td></td>
<td>• Incentive programs for members of the agricultural community</td>
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<td>• Health of the watershed is part of sense of place; categories are a “quilt”</td>
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<tr>
<td></td>
<td>• There are no policies or programs that focus on pollinator protection</td>
</tr>
<tr>
<td></td>
<td>• Explore a hedgerow policy</td>
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## Breakout Room #2
### Coastal and Wetlands

<table>
<thead>
<tr>
<th>Topic</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Other Candidate Indicators</strong></td>
<td>• Add “elevation” to the barrier bar indicator</td>
</tr>
<tr>
<td></td>
<td>• Volume of sediment that has been dredged</td>
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<td></td>
<td>• Opportunities for outdoor recreation (e.g., hunting, kayaking)</td>
</tr>
<tr>
<td><strong>Potential Data and References</strong></td>
<td>• Monitoring data sources/technology:</td>
</tr>
<tr>
<td></td>
<td>• Drones</td>
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<td></td>
<td>• LIDAR</td>
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<td></td>
<td>• Oblique imagery</td>
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<td></td>
<td>• Coastal processes model was completed last year</td>
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<tr>
<td></td>
<td>• National Wetland Condition Assessment</td>
</tr>
<tr>
<td></td>
<td>• Army Corp of Engineers (combination of LIDAR and oblique imagery)</td>
</tr>
<tr>
<td><strong>Communication and Partnerships</strong></td>
<td>• Rachel Shultz (Associate Professor of Wetland Science SUNY Brockport)</td>
</tr>
<tr>
<td><strong>Considerations</strong></td>
<td>• Water level will be a covariate for many of the coastal indicators that should be considered</td>
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<tr>
<td></td>
<td>• Shoreline condition (percentage of shoreline that is natural) will likely be included in land use/cover indicator</td>
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<tr>
<td></td>
<td>• Many coastal indicators lack historical data</td>
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### Breakout Room #3
Floodplains, Riparian Areas, & Streams, Water Quality

<table>
<thead>
<tr>
<th>Topic</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>Other Candidate Indicators</td>
<td>• Infiltration (relationship between precipitation and discharge as a time response curve)</td>
</tr>
</tbody>
</table>
| Potential Data and References        | • iMapInvasives  
• RIBs program  
• FEMA repetitive loss data  
• Bird Breeding Atlas  
• Cornell University Ornithology  
• Citizen Science – Backyard Bird Count  
• USGS gauges                                                                                               |
| Communication and Partnerships       | • Scott DeRue has historic water quality data for Wolcott Creek and Port Bay (nutrients and sediments)                                                                                               |
| Considerations                       | • Concern about water chestnut, frogbit, giant hogweed, Japanese knotweed  
• Tracking floodplains over time would be useful to discover trends, potential risk indicator  
• Flood damage to infrastructure  
• Climate change                                                                                               |
## Breakout Room #4

### Direct Drivers of Change, Indirect Drivers of Change, Forests & Uplands

<table>
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<tbody>
<tr>
<td><strong>Other Candidate Indicators</strong></td>
<td>• Insect populations&lt;br&gt;• Economics (environmental pressure if there are increased boats and ATVs)</td>
</tr>
<tr>
<td><strong>Potential Data and References</strong></td>
<td>• NYSDEC and local surveys, land monitoring&lt;br&gt;• SHAW linking gauge data&lt;br&gt;• Citizen Science – No Mow May</td>
</tr>
<tr>
<td><strong>Communication and Partnerships</strong></td>
<td>• NYSDEC&lt;br&gt;• Citizen Science</td>
</tr>
<tr>
<td><strong>Considerations</strong></td>
<td>• Existing historical data will be used to establish a baseline and understand trends&lt;br&gt;• Will recommend stream/water quality sensors to understand overall health of the watershed&lt;br&gt;• Climate change impacts&lt;br&gt;  • Identify unique species and locations that are impacted (e.g., chestnut trees, great blue herons, waterfall in Sterling)&lt;br&gt;• Economics should consider both poor and wealthy impacts on the environment&lt;br&gt;• COVID pandemic increased park usage&lt;br&gt;• Coastal areas and uplands have specific indicators that will be more important than others</td>
</tr>
</tbody>
</table>
Homework

- Complete or edit Google Form based on discussion today*

- Explore StoryMap and provide feedback
  - Link - Sterling-Wolcott Integrated Watershed Action Plan

- Check the NYSDEC IWAP website for updates
  - https://www.dec.ny.gov/lands/124314.html

* To update your response, please click “Edit response” button within email message that you received after initially submitting responses!
Next Steps

Upcoming Tasks:
• Ecosystem Assessment and Analyzing Uncertainty and Risk

Future Meetings:
• Watershed Stakeholder Committee Meeting 3: Fall 2022
• Public Meeting 2: Fall 2022

Sterling Nature Center. Photo by Jim D’Angelo
Thank you!
Final questions or comments?

Email: SterlingWolcott@ramboll.com
Website: https://www.dec.ny.gov/lands/124314.html
StoryMap Link: https://storymaps.arcgis.com/stories/7a4c9700cda1482e90adb6e795c3fed9

Emily Fell, NYSDEC
emily.fell@dec.ny.gov

Tony Eallonardo, Ramboll
tony.eallonardo@ramboll.com