Resource Assessment Tools: COMET-Farm and Planner

Soil Health Stewardship
Session #7
Resource Assessment Tools
September 9, 2021
9:45 to 10:30 pm Eastern

Speaker
Aaron Ristow
New York Agricultural Stewardship Program Manager

American Farmland Trust
Genesee River Watershed Demonstration Farm Network

• Learn from local farmers with successful soil health implementation

• Learn about changes in economic benefits and costs from their real-life experiences

• Learn about observed changes in soil quality like erosion or water runoff

• Learn how to integrate into current system

• Share technology, information and lessons learned with stakeholders
9 AFT-NRCS SOIL HEALTH ECONOMIC & ENVIRONMENTAL CASE STUDIES
9 Soil Health Case Studies (front)

2 CA almond

2 IL corn-soybeans

2 OH corn-soybeans

3 NY diversified row crop systems
9 Soil Health Case Studies (back)

- 2 CA almond
- 2 IL corn-soybeans
- 2 OH corn-soybeans
- 3 NY diversified row crop systems
ENVIRONMENTAL ANALYSIS
Nutrient Tracking Tool – Water Quality
COMET-Farm Tool – GHGs
Thank you to the External Reviewers of the Case Studies!

▪ NRCS Economists
  • Lynn Knight, Economist, East Region
  • Bryon Kirwan, Illinois State Economist
  • Lakeitha Ruffin, Oregon State Economist
  • Richard Iovanna, FPAC Economist
  • Sophia Glenn, FPAC Economist
  • Sarah Cline, FPAC Economist

▪ NRCS Soil Health Specialists
  • Zahangir Kabir, West Regional SH Specialist
  • James Hoorman, NE Regional SH Specialist
  • Candy Thomas, NRCS SH Specialist
  • Justin Morris, NRCS SH Specialist
  • Barry Fisher, NRCS SH Specialist

▪ University Economists
  • John Hanchar, Cornell Cooperative Extension
  • Gary Schnitkey, University of Illinois
  • Brent Sohngen, Ohio State University

▪ NTT Reviewer
  • Mindy Selman, USDA Office of Ecosystem Markets

▪ COMET-Farm Reviewers
  • Matthew Stermer, Mark Easter, & Haley Nagle
    Colorado State University
Environmental Benefits of Soil Health Practices Across Three New York Farms

Water Quality Improvement
All 3 row crop farms observed reduced soil and water runoff
On selected field for the 3 NY farms, NTT estimated:
• Weighted average reduction in N losses were 49% (range was 40 to 70)
• Weighted average reduction in P losses were 80% (range was 39 to 92)
• Weighted average reduction in sediment losses were 83% (range was 29 to 99)

Climate Improvement
On same selected fields COMET-Farm estimated total GHG emissions
• Weighted average reduction of 366% (range was 69 to 476)
• Average reduction of 4 cars off the road annually

Average field size: 16 acres
Range: 10-25 acres
Practices should be suggested as a system-level approach
Soil Stores 2-3x More CO₂ than the Atmosphere
2-5x More than Vegetation
## Potential Target Areas for GHG Capture

### US Adoption of 4 Soil Health Practices

(29 recognized & funded by USDA-NRCS for reducing C emissions)

<table>
<thead>
<tr>
<th>Practice</th>
<th>Capacity (M ac)</th>
<th>Current Adoption (M ac)</th>
<th>Current Adoption (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Grazing</td>
<td>655</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Cover Crops</td>
<td>396</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>No Till</td>
<td>396</td>
<td>104</td>
<td>26</td>
</tr>
<tr>
<td>Nitrogen Management</td>
<td>396</td>
<td>138</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: US Ag. Census (NASS, 2019); ERS (2017) and the Soil Health Institute
Play Video:
COMET Farm & COMET Planner
Introduction Presentation

https://www.youtube.com/watch?v=UHL84S6knYs
COMET Planner Demonstration

Available at: https://www.youtube.com/watch?v=sC63SJ3LRM
COMET-Farm vs. COMET-Planner

<table>
<thead>
<tr>
<th>ANALYSIS LEVEL</th>
<th>COMET- FARM</th>
<th>COMET- PLANNER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed, field specific analysis</td>
<td>Regional average estimates tied to conservation practice adoption</td>
<td></td>
</tr>
<tr>
<td>Flexible</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Varies on project size</td>
<td>4-clicks to generate estimate</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BASELINE SCENARIOS</th>
<th></th>
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<table>
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<tr>
<th>TIME FOR RESULTS</th>
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</thead>
<tbody>
<tr>
<td>Varies on project size</td>
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</table>

<table>
<thead>
<tr>
<th>API ACCESSIBILITY</th>
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</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
COMET-Planner
Key Information

Step 1: Project Name and Location
• Project name, state, county

Step 2: Farming System and associated Conservation Practices
• Cropland Management
• Grazing Lands
• Wood Plantings
• Cropland to Herbaceous Cover
• Restoration of Disturbed Lands

Step 3: Select NRCS Practices and Implementation
• Several Practice Standards, depending on system
• Several Implementation levels of practices, depending on system

Step 4: Acreage Associated with Each Conservation Practice

Results are instant and displayed at bottom of page
COMET-Planner Results

- All estimates are presented as emission reductions relative to baseline management
- Positive values denote a decrease in GHG emissions and negative values denote an increase in GHG emissions
- Soil and biomass carbon stock increases in response to conservation practices are limited in duration
- The carbon dioxide reductions reported should be viewed as average values over a 20-year duration

The greenhouse gas equivalencies calculator can help you understand what reducing carbon dioxide (CO₂) emissions means in everyday terms: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
COMET-Farm Analysis

COMET-Planner Report

COMET-Planner Carbon Sequestration and Greenhouse Gas Estimation Report

Project Name: Swede Farm
State: New York
County: Livingston
Date Created: 09/08/2021 14:35:06

Approximate Carbon Sequestration and Greenhouse Gas Emission Reductions
(tonnes CO₂ equivalent per year)

<table>
<thead>
<tr>
<th>NRCS Conservation Practices</th>
<th>Acres</th>
<th>Carbon Dioxide</th>
<th>Nitrous Oxide</th>
<th>Methane</th>
<th>Total CO₂ Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residue and Tillage Management - No-Till (CPS 328) - Intensive Till to No Till or Strip Till on Non-Irrigated Cropland</td>
<td>25</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Cover Crop (CPS 340) - Add Non-Legume Seasonal Cover Crop (with 25% Fertilizer N Reduction) to Non-Irrigated Cropland</td>
<td>25</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Nutrient Management (CPS 590) - Improved N Fertilizer Management on Non-Irrigated Croplands - Reduce Fertilizer Application Rate by 15%</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>75</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

*Negative values indicate a loss of carbon or increased emissions of greenhouse gases.
*Values were not estimated due to limited data on reductions of greenhouse gas emissions from this practice.

For more information on how these estimates were generated, please visit www.comet-planner.com.
TIPS FOR CONDUCTING COMET ANALYSIS

Identifying farmers

- Farmers who have expressed an interest in environmental benefits
- Farmers with a good story/large contrasts between before and after
- Farmers with a history of practice
- Farmers with good records
- Farmer who have other conservation practices in place
- Farmers willing to put their business out there
- Farmers willing to travel and speak about their journey in front of peers
- Farmers respected in their community
Interviewing Farmers

- Schedule visits
- Timing the interview is important; likely only done during winter
- Show interest/be curious
- Identify farm type, practices
- Record interview
- Set aside up to an hour
- Give them an idea of the questions that will be asked before the interview
TIPS FOR CONDUCTING COMET ANALYSIS

Sharing results

- Have a compelling story, seek contrasts
- Must record interview
- Pick out great quotes from your interview
- Make stories as simple as possible
- Have a talented, expert team in place
Contact Info

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315.748.5029

Download the case studies at:
farmland.org/soilhealthcasestudies