Experimental Design

• Paired watersheds
• Year 1&2
  – Calibration period
• Year 3+
  – Treatment period
  – Conservation acceleration
• 10 years+ ?!!
CEAP: Paired Watershed Approach

Control Watershed
Sub-watershed of Little Otter Creek
- 22,000 ac
- Heavy clay soils
- ≈ 50% ag
CEAP: Paired Watershed Approach

Treatment Watershed
Sub-watersheds of Dead Creek
- 15,200 ac
- Heavy clay soils
- ≈ 75% ag
What is being Monitored?

- Automated sampling and flow measurement
  - Concentrations AND loads
- Water quality at the watershed outlet (3)
  - TP
  - TDP
  - TN
  - NO$_3$-N
  - NH$_4$-N
  - TSS
- Bi-weekly baseflow & storm events
Capturing the Elusive ‘New England Winter WQ Data’
Management and Landuse Data

• Documentation of landuse, management, and conservation practices on every farm and field in watersheds (!)
  – State programs
  – Federal programs
  – Self-funded
  – Private Consultants
  – One-on-one farmer meetings
Beginning in 2022

- Transitioning ‘Calibration’ to ‘Treatment’ period
- Focus on accelerated conservation in Dead Creek watershed, and business as usual in Headwaters Little Otter
- Leaning on partners for programs/targeting...
Soil Health in CEAP Watersheds

- NRCS and VACD supporting survey of soil health across watersheds
- Fall 2020 & Spring 2021: 70 fields
- Bulk density cores and carbon stocks w/ 2021 samples
- Data returned to farmers
CEAP Stacked Practices Study

- Occurs within CEAP treatment watershed
- Evaluates individual practices, as well as synergies obtained through ‘stacking’
- Focus on innovative P-removal practices
- Surface and subsurface P removal structures
- Paired watershed design (i.e., calibration and treatment years)
In-field management practices being ‘Stacked’

<table>
<thead>
<tr>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional tillage</td>
<td>No-till</td>
</tr>
<tr>
<td>Broadcast manure</td>
<td>Injected manure</td>
</tr>
<tr>
<td>No cover crop</td>
<td>Cover crop</td>
</tr>
</tbody>
</table>
Treated water outlet
Collection manifold for outlet
Downward flow through PSM
Distribution manifold for untreated water
Tile inlet: untreated water

Slide courtesy of Chad Penn, USDA-ARS
Paired Ditch Filter: To be filled with P filter media
Questions?