The Spreadsheet Tool for Estimating Pollutant Load (STEPL)

Introduction to STEPL
March 20, 2018

Webinar Logistics

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The Spreadsheet Tool for Estimating Pollutant Loads (STEPL)

Introduction to STEPL
March 20, 2018

Speakers

- Aileen Molloy, Tetra Tech, Inc.
- Mustafa Faizullahbloy, Tetra Tech, Inc.
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<td>• Overview of STEPL</td>
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STEPL OVERVIEW
What is STEPL?

<table>
<thead>
<tr>
<th><strong>What is STEPL?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>• STEPL– Spreadsheet Tool for Estimating Pollutant Load - an EPA model</strong></td>
</tr>
<tr>
<td><strong>• A customized MS Excel spreadsheet model designed to support planning level decision-making</strong></td>
</tr>
<tr>
<td>▪ What are the average annual pollutant loadings from the non-point sources?</td>
</tr>
<tr>
<td>▪ How effective are BMPs in reducing pollutant loadings?</td>
</tr>
</tbody>
</table>

What is STEPL?

<table>
<thead>
<tr>
<th><strong>What is STEPL?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>• Calculates nutrient (N, P, and BOD pollutants) and sediment loads by land use type and aggregated by watershed</strong></td>
</tr>
<tr>
<td><strong>• Calculates load reductions as a result of implementing BMPs</strong></td>
</tr>
<tr>
<td><strong>• Data driven and highly empirical</strong></td>
</tr>
<tr>
<td><strong>• Simple and easy to use</strong></td>
</tr>
<tr>
<td><strong>• Formulas and default parameter values can be modified by users (optional) with no programming required</strong></td>
</tr>
</tbody>
</table>
Who are STEPL Users?

- Basic understanding of hydrology, erosion, and pollutant loading processes
  - Hydrology -> Curve Number approach
  - Erosion -> USLE and sediment delivery ratio, urban runoff concentration
  - Pollutant load -> runoff concentration
- Knowledge of environmental data (e.g., land use, agricultural statistics, and BMP efficiencies)
- Familiarity with MS Excel and Excel Formulas

How is STEPL Used?

- Originally developed to assist State NPS project managers report load reductions to EPA
  - Performance measures for N, P, and Sediment
  - Data entered into the Grant Reporting & Tracking System (GRTS)
- Also used by other federal/state/local partners, environmental consultants, researchers, etc.
  - Primary model used for NPS project planning
Progression of STEPL Prior to v.4.4

• First release Oct 2001
• Enhancements over the years
  ▪ BMP calculator
  ▪ Ability to add custom BMPs
  ▪ Groundwater
  ▪ Gullies & streambanks
  ▪ Puerto Rico data
  ▪ LID practices

STEPL v.4.4 updates

• Expanded and updated weather data
• Added Manure application for pasture land
• Added tool for calculating average number of months for manure application
• Added reporting function (Export Input/Output Option)
• Expanded agricultural BMPs and updated pollutant efficiencies
• Added flow volume reductions for urban LID and infiltration practices
• Added Combined BMP Efficiency worksheet
• Added customized STEPL spreadsheet model for 10 watersheds with ability to determine size of BMP treatment area to meet load reduction target
• Added E. coli placeholder for possible future release
### STEPL Basic Tools

- **STEPL**
  - Calculates load for different sources at source and watershed level
  - User can specify and update BMP list
  - Urban BMP Tool for stormwater BMPs

- **BMP calculator**
  - Calculates the “combined efficiency” of multiple BMPs use when more than 1 type of BMP is applied on a single land use type

- **Input Data Server**
  - Map interface to generate input data for the model at the HUC12 level

### STEPL Input Data Requirements

- **Watershed-level data**
  - County & Weather Station
  - Land use distribution
  - Agricultural animal population and number of months manure applied
  - Septic system information

- **Land cover specific**
  - BMP type and % area applied
  - Urban Land use types for urban BMPs
STEPL System Defaults

- Derived from user inputs, but can be modified
  - Soil information (based on county)
  - Curve Numbers (land use/soil group)
- Urban land use distribution
- Nutrient concentration in runoff/shallow groundwater

STEPL Process Steps

- Sources: Cropland, Urban, Pasture, Forest, Feedlot, Others
- Groundwater → Runoff → Load before BMP → BMP → Load after BMP
- Erosion

STEP 1 → STEP 2 → STEP 3 → STEP 4
System Requirements

- Windows operating system
- MS Excel 2010, 2013 or 2016
  - Not Compatible with Windows 7 operating system and MS Excel 2007 combination
- At least 30 MB hard disk space and memory >8GB RAM preferred

STEPL Website

Download the latest STEPL program file from: http://it.tetratech-ffx.com/steplweb/models$docs.htm
Alternate STEPL Access

STEPL Installation

- Run the `STEPLSetup.exe` to install
  - must have admin rights
  - Important: install STEPL in a folder you have write access to
Customized Spreadsheet Model

- Alternative to STEPLSetup.exe
  - Download STEPL 4.4 Spreadsheet Model for 10 Watersheds, which does not require admin rights
- Allows user to start working in STEPL without using installation package
- Provides ability to populate the model with up to 10 watersheds and 100 gullies and streambanks

STEPL Resources

- STEPL Installation Package includes:
  - STEPL User Guide
  - BMP Definitions
  - Sample Worksheets
  - Release Notes
  - BMP Calculator Guide
  - Support Worksheets contain input reference data
STEPL Resources

- Also on the website:
  - Frequently Asked Questions
  - STEPL Slide Shows & Tutorials
  - Alternative Models Document
  - Region 5 Model and documentation

- STEPL Support:
  stepl@tetratech.com

How to use STEPL
Running STEPL

- Know before you begin:
  - Number of watersheds
  - Number of gullies/streambanks
  - Tip: enter more than you need as placeholders

- Enable Macros
  - In Excel 2010, 2013 or 2016, Click on File menu > Options > Trust Center > Trust Center Settings > Macro Settings
  - Select “Enable all macros”
STEPL Main Program

- Run STEPL executable program STEPLSetup.exe to create and customize spreadsheet dynamically.

STEPL Spreadsheet

Composed of four worksheets.
Default File Location

Data Input

- Type over Red text only
- Do not type in cells with black text
Notes on Input Data

- Land use distribution is critical
- Modify inputs with current, local data where available
- Focus on sources being addressed by project
  - For example, agricultural data will not impact results for urban BMPs
  - Will affect total loads but not the load reduction
BMPs Worksheet

- Each land use type within each watershed can have one BMP
- % Area BMP Applied: calculate the proportion of acreage treated by the BMP for that land use

Total Load Worksheet

Each row of results corresponds to a different watershed or project
Graphs Worksheet

N, P, and BOD Load by Watersheds with BMP (lb/yr)

Sediment Load by Watersheds with BMP (t/yr)

Total N Load by Land Uses (with BMP) (lb/yr)

Total P Load by Land Uses (with BMP) (lb/yr)

Questions

??
STEPL Input Data Server

STEPL Model Input Data Server

Data is available at HUC 12 watershed

Generate data summaries
STEPL Model Input Data Server: Basic Report

- Data is summarized by HUC12 watershed

Manure Application
Manure Application

• STEPL v4.4 allows application of manure on Pasture land (Table 2)

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Beef Cattle</th>
<th>Dairy Cattle</th>
<th>Swine (Hog)</th>
<th>Sheep</th>
<th>Horse</th>
<th>Chicken</th>
<th>Turkey</th>
<th>Duck</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>W2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

• A new table provides EMCs for pastureland based on six groups of livestock density (with and without manure)
  - Default values for all six categories are average EMC values from previous version STEPL 4.3
  - Will be updated on a later date based on the published literature and after review/approval by EPA

Manure Application

• STEPL v4.4 includes a new worksheet called **ManureApplication**

• Worksheet is accessed via the Manure Application button next to the weather selection pull down menu in the **Input** worksheet

• The worksheet can be used for both cropland and pastureland calculations of months of manure application

• Allows calculation of average number of months for manure application per year
Manure Application

- Can specify treatment subareas within a watershed in the `ManureApplication` worksheet
- Each subarea can have a specific number of months where manure is applied
- Calculates an area-weighted number of months when manure is applied across the watershed

Urban BMP Tool
Urban Land Use Distribution

• STEPL automatically applies a default urban land use distribution to identify the % commercial, % industrial, etc. (Table 8 on “Input” sheet)

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Urban Area (ac)</th>
<th>Commercial %</th>
<th>Industrial %</th>
<th>Institutional %</th>
<th>Transportation %</th>
<th>Multi-Family %</th>
<th>Single-Family %</th>
<th>Urban Impervious</th>
<th>Vacant Developed</th>
<th>Cultivated</th>
<th>Open Space %</th>
<th>Total % Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>1,763.9</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>W2</td>
<td>836.62</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>

• Modify these values with local data when using STEPL to model results of urban BMPs

• The urban land use distribution (acres) will appear in Table 2 of the Urban worksheet

Urban BMP Tool
Urban BMP Tool

- Select the watershed
- Select an urban land use to apply the BMP
- Select the BMP
- Enter the drainage area to the BMP

Flow Volume Reductions

- STEPL can now estimate flow volume reductions for Urban LID and Infiltration BMP practices
- The user enters the design runoff captured depth, percent imperviousness of the BMP drainage areas and BMP drainage area
- Pre-populated design storage depths for each of the available infiltration BMPs are included in the BMPList Worksheet
- Flow volume reductions represented as gallons/year by urban land use type in each watershed
Flow Volume Reductions

- **Urban** worksheet showing volume reductions from urban infiltration BMPs (Table 5 of *Urban* worksheet)
- Table 6 provides the BMP surface area of number of units (e.g. rain barrels)
- Urban LID and infiltration practices in STEPL version 4.4 with flow volume reductions

<table>
<thead>
<tr>
<th>Land Use</th>
<th>BMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>Infiltration Basin</td>
</tr>
<tr>
<td>Urban</td>
<td>Infiltration Devices</td>
</tr>
<tr>
<td>Urban</td>
<td>Infiltration Trench</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Cistern</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Cistern+Rain Barrel</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Rain Barrel</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Retention</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Dry Well</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Infiltration Swale</td>
</tr>
<tr>
<td>Urban</td>
<td>LID*/Infiltration Trench</td>
</tr>
<tr>
<td>Urban</td>
<td>Porous Pavement</td>
</tr>
<tr>
<td>Urban</td>
<td>Sand Filter/Infiltration Basin</td>
</tr>
</tbody>
</table>

LID* BMPs

- For LID BMPs marked with an asterisk (*), STEPL calculates Runoff Volume (ac-ft/yr) reduced by the practice
  - LID*/Cistern
  - LID*/Cistern+Rain Barrel
  - LID*/Rain Barrel
- STEPL calculates the baseline runoff
  - If percentage runoff volume reduction is known, can apply this to determine runoff volume reduction amount
  - Load reduction efficiency = % runoff volume reduced
Gullies and Streambanks

Gullies and Streambanks
STEPL Gully Stabilization

• Load
  Average annual erosion during the life of the gully (ton/yr)
  \[ \frac{\text{Volume} \times \text{Soil Weight}}{\text{Years}} \]
  Nutrient load
  \[ \text{Annual Erosion} \times \text{Soil Nutrient Conc.} \times \text{Correction Factor} \]

• Load reduction after implementing gully stabilization
  • Specify reduction efficiency (95% efficiency by default)
  • Reduction is equal to annual erosion x user-specified efficiency

Volume = (Top Width +Bottom Width) / 2 x Depth x Length

Gully Stabilization

• Nutrient Correction Factor
  • Smaller soil particles -> larger aggregated surface area -> more nutrients attached

<table>
<thead>
<tr>
<th>Soil Texture</th>
<th>Nutrient Correction Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>1.15</td>
</tr>
<tr>
<td>Silt</td>
<td>1.00</td>
</tr>
<tr>
<td>Sand</td>
<td>0.85</td>
</tr>
<tr>
<td>Peat</td>
<td>1.50</td>
</tr>
</tbody>
</table>
Streambank Erosion

- Load (Channel Erosion)
  \[ \text{Load} = \text{Length} \times \text{Height} \times \text{Lateral Recession rate} \times \text{Soil weight} \]
- Load Reduction
  \[ \text{Load Reduction} = \text{Load} \times \text{Load reduction efficiency} \]

**Determining Lateral Recession Rate by Field Observation**

<table>
<thead>
<tr>
<th>Lateral Recession Rate (ft/yr)</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 - 0.05</td>
<td>Slight</td>
<td>Some bare bank, no exposed roots</td>
</tr>
<tr>
<td>0.06 - 0.2</td>
<td>Moderate</td>
<td>Bank is mostly bare</td>
</tr>
<tr>
<td>0.3 - 0.5</td>
<td>Severe</td>
<td>Bank is bare with exposed roots</td>
</tr>
<tr>
<td>0.5+</td>
<td>Very Severe</td>
<td>Bank is bare with fallen trees</td>
</tr>
</tbody>
</table>

Questions

??
Combined BMP Efficiency – Pasture and Cropland

- Tool calculates a combined BMP efficiency from multiple types of parallel management practices on the same land use category across the watershed.
- The user selects total treated area by land use and BMP types and acreage of treatment for each treatment area in the watershed.
Combined BMP Efficiency – Pasture and Cropland

- The resulting area-weighted values in blue color should be added to Table 7 in the BMPs worksheet.

- Combined BMPs Calculated should then be used in Tables 1 and 2 on the BMPs Worksheet.

Saving Combined BMP Scenarios

- The “Copy to Log” allows the user to keep a record of the various combination of the combined BMP efficiencies scenarios that are evaluated.

- Creates a Word document (bmplog.docx) in the same location where the STEPL spreadsheet is located.
Use the BMP Calculator for Multiple BMPs
BMP Calculator

- Calculates combined efficiency of a BMP treatment train for a given land use
- The use of BMP calculator requires the understanding of BMPs and their placement in the watershed

![Diagram showing parallel, series, and combination configurations for BMPs](image)

- **Parallel**
  - Conventional tillage
  - Reduced tillage

- **Series**
  - Filter strip
  - Reduced tillage

- **Combination**
  - Conventional tillage
  - Reduced tillage
  - Settling Basin

**When is BMP calculator needed?**

- **Not needed** - No combined efficiency calculation
- **Needed** - Each land use type uses more than one type of BMP
STEPL BMP Calculator

- Describe schematically the BMP configuration
  - Number and linkages
  - BMP type and efficiency
  - Land use area

- Calculate combined efficiency

BMP Calculator Example 1

Each box represents 100 ac
BMP Calculator Example 2

Each box represents 100 ac

Forest Road
Grass Planting

Forest No On-site
Road BMP

Filter Strip

Load

BMP Calculator Example 3

Each box represents 100 ac

Crop Regular
Tillage

Crop Reduced
Tillage

Filter Strip

Load
Questions

Adding or Modifying BMPs
Ability to Add BMPs

- In STEPL customized menu, click “View/Edit BMP List”
- **BMPList** worksheet is shown, add or delete BMPs

Add New Data to BMP List

- New BMP added!
Update BMP List

New BMPs and Updated Pollutant Efficiencies

- New BMPs for cropland and pastureland have been added to STEPL version 4.4
  - The cropland BMP list has been expanded from 6 BMPs to 17
  - 17 pastureland BMPs added (previous versions of STEPL did not have pastureland BMPs)

- Pollutant efficiency numbers for some existing cropland BMPs have been updated

- All the efficiencies are summarized in the **BMPList** worksheet

- Click “Save Updates” to save changes to the BMP List (will be available to any STEPL project)
- You can also modify these spreadsheets manually

C:\\Step\\Support\\AllBMPstepl.csv
New BMPs available in STEPL version 4.4 for Cropland and Pastureland

<table>
<thead>
<tr>
<th>Land Use</th>
<th>BMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cropland</td>
<td>Bioreactor</td>
</tr>
<tr>
<td>Cropland</td>
<td>Buffer - Forest (100 ft wide)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Buffer - Grass (50 ft wide)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Combined BMPs Calculated</td>
</tr>
<tr>
<td>Cropland</td>
<td>Conservation Tillage 1 (30-50% Residue)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Conservation Tillage 2 (equal or more than 60% Residue)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Contour Farming</td>
</tr>
<tr>
<td>Cropland</td>
<td>Control Drainage</td>
</tr>
<tr>
<td>Cropland</td>
<td>Cover Crop 1 (Group A Commodity) [High Till only for Sediment]</td>
</tr>
<tr>
<td>Cropland</td>
<td>Cover Crop 2 (Group A Traditional Normal Planting Time) [High Till only for TP and Sediment]</td>
</tr>
<tr>
<td>Cropland</td>
<td>Cover Crop 3 (Group A Traditional Early Planting Time) [High Till only for TP and Sediment]</td>
</tr>
<tr>
<td>Cropland</td>
<td>Land Retirement</td>
</tr>
<tr>
<td>Cropland</td>
<td>Nutrient Management 1 (Determined Rate)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Nutrient Management 2 (Determined Rate Plus Additional Considerations)</td>
</tr>
<tr>
<td>Cropland</td>
<td>Streambank Stabilization and Fencing</td>
</tr>
<tr>
<td>Cropland</td>
<td>Tamaux</td>
</tr>
<tr>
<td>Cropland</td>
<td>Two-Stage Ditch</td>
</tr>
<tr>
<td>Pastureland</td>
<td>30m Buffer with Optimal Grazing</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Alternative Water Supply</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Combined BMPs Calculated</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Critical Area Planting</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Forest Buffer (minimum 35 feet wide)</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Grass Buffer (minimum 35 feet wide)</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Grazing Land Management (rotational grazing with fenced areas)</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Heavy Use Area Protection</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Litter Storage and Management</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Livestock Exclusion Fencing</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Multiple Practices</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Pasture and Hayland Planting (also called Forage Planting)</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Prescribed Grazing</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Streambank Protection w/o Fencing</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Streambank Stabilization and Fencing</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Use Exclusion</td>
</tr>
<tr>
<td>Pastureland</td>
<td>Water Feeding Facility</td>
</tr>
</tbody>
</table>
Weather Station Updates

• Increased spatial and temporal resolution of weather stations
  ▪ updated to increase the number of weather stations in STEPL from 493 to 4,998
  ▪ Each stations has at least 30 years of data

• Quality controlled data from BASINS

• Includes data from NOAA – NCDC’s
  ▪ Summary of the Day (SOD)
  ▪ Hourly Precipitation Data (HPD)
  ▪ Integrated Surface Hourly (ISH)
Export Input/Output Option

- An Export Data button has been added to the **Input worksheet**

```
Export Input/output data: [Export Data]
```

- Allows four options to generate summary report into a MS Word Document for Input and/or Outputs

```
Export Options
Select Export Options
- Output Only
- Output with Graphs
- Input and Output Only
- Input and Output with Graphs
```

Customized Spreadsheet Model Solver

- A simple optimization algorithm (Run Solver) is now included in the customized spreadsheets model
  - Need to activate Excel Solver Add-In (follow instructions in the **BMPs** worksheet to activate Excel Solver Add-In)
  - Optimization is not available in the STEPL installation file version
- Allows the user to identify the extent of treatment areas to meet a load reduction target from the user selected BMP types
- The optimization algorithm only solves for non-urban BMPs
- The optimizer is intended to maximize the load reduction and minimize the treated land use area based on the suite of BMPs provided
Customized Spreadsheet Model Solver

- Example land uses with BMPs selected and constraints set

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Cropland</th>
<th>BMPs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% P</td>
<td>% Sediment</td>
</tr>
<tr>
<td>W1</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>W2</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>W3</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>W4</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>W5</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>W6</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>W7</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>W8</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>W9</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>W10</td>
<td>0.50</td>
<td>0.50</td>
</tr>
</tbody>
</table>

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<thead>
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<th>Watershed</th>
<th>Pastureland</th>
<th>BMPs</th>
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<td></td>
<td>% P</td>
<td>% Sediment</td>
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</tr>
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<td>W2</td>
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<tr>
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</tr>
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<td>W10</td>
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</tr>
</tbody>
</table>

Summary

- STEPL is a simple model for estimating long term average pollutant load reductions to support watershed planning
- Can be applied at various scales from individual farm to large watershed or multiple watersheds
- STEPL is flexible but requires your input and judgment to apply it to your project
  ▪ Easy to add new data and to customize for site specific needs
- Seek assistance from your colleagues
- Questions & suggestions for improvement are always welcome
## Contact Information

To access STEPL, visit [http://it.tetratech-ffx.com/steplweb/](http://it.tetratech-ffx.com/steplweb/)

STEPL assistance – [STEPL@tetratech.com](mailto:STEPL@tetratech.com)

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