Eagle Mountain Lake Watershed Protection Plan Stakeholder Meeting Agenda

July 9, 2025 | 10:00 am | Online via Microsoft Teams

TRWD and Watershed Protection Planning Overview *Katie Myers, TRWD*

- Brief recap of what a WPP is and where we are in the process

Watershed Modeling Overview *Aaron Hoff, TRWD*

- Tools and models used for the EML WPP: SWAT, HAWQS, SELECT, and LOADEST
- Questions

EML Watershed Modeling for Loads and Load Reductions *Katie Mendoza, Texas A&M AgriLife Research*

- SWAT: input parameters, LDC analysis, and load reduction strategies
- SELECT: input parameters, potential load sources, and load reduction strategies
- Questions and discussion

Guided Review of EML WPP Chapters *Katie Myers, TRWD*

- Recap of changes made to Ch 1 and 2 based on January meeting
- Discuss questions, concerns, edits, or questions about Ch 3 through 5
- Pollutant source prioritization by stakeholders

Wrap-up and Adjourn *Katie Myers, TRWD*

- Preview of next chapters and next steps
- Adjourn

Please direct questions regarding this meeting or the Eagle Mountain Lake Watershed Protection Plan to Katie Myers, Rural Programs Coordinator at katie.myers@trwd.com or 817.253.3342*

From June 30 – July 5, Katie will have limited email and phone access; please copy watersheds@trwd.com on all email communications for expedited response.

Eagle Mountain Lake Watershed Protection Plan Stakeholder Meeting

Katie Myers, TRWD, Rural Programs Supervisor

Aaron Hoff, TRWD, Watershed Programs Manager

Katie Mendoza, Texas A&M AgriLife Research, Research Specialist III

What is a WPP?

Watershed Protection Plan: A strategy that provides assessment and management information for a defined watershed.

- Clean Water Act §319 → EPA Framework
  - TCEQ Integrated Report (303(d) List)
- Stakeholder involvement
- Actions supported by sound science
- Technical expertise from diverse sources
- Diverse skills & knowledge
- Focus on water quality goal

Water Quality: Designated Uses

Aquatic Life	Protect aquatic species *Dissolved Oxygen, Toxic Chemicals, Total Dissolved Solids*
Recreation	Estimates the relative risk of swimming and other water recreation activities *Bacteria*
Drinking Water	Indicates if water is suitable as a source of drinking water *Metals, Pesticides, Toxic Chemicals, Total Dissolved Solids, Nitrates*
Fish Consumption	Protect public from consuming fish that may be contaminated *Metals, Pesticides, Other Toxic Chemicals*

EPA Nine Elements of a Successful Watershed Plan

a. Identify causes and sources of pollution
b. Estimate pollutant loading into the watershed and the expected load reductions
c. Describe management measures that will achieve load reductions and targeted critical areas
d. Estimate amounts of technical and financial assistance and the relevant authorities needed to implement the plan
e. Develop an information/education component
f. Develop a project schedule
g. Describe the interim, measurable milestones
h. Identify indicators to measure progress
i. Develop a monitoring component

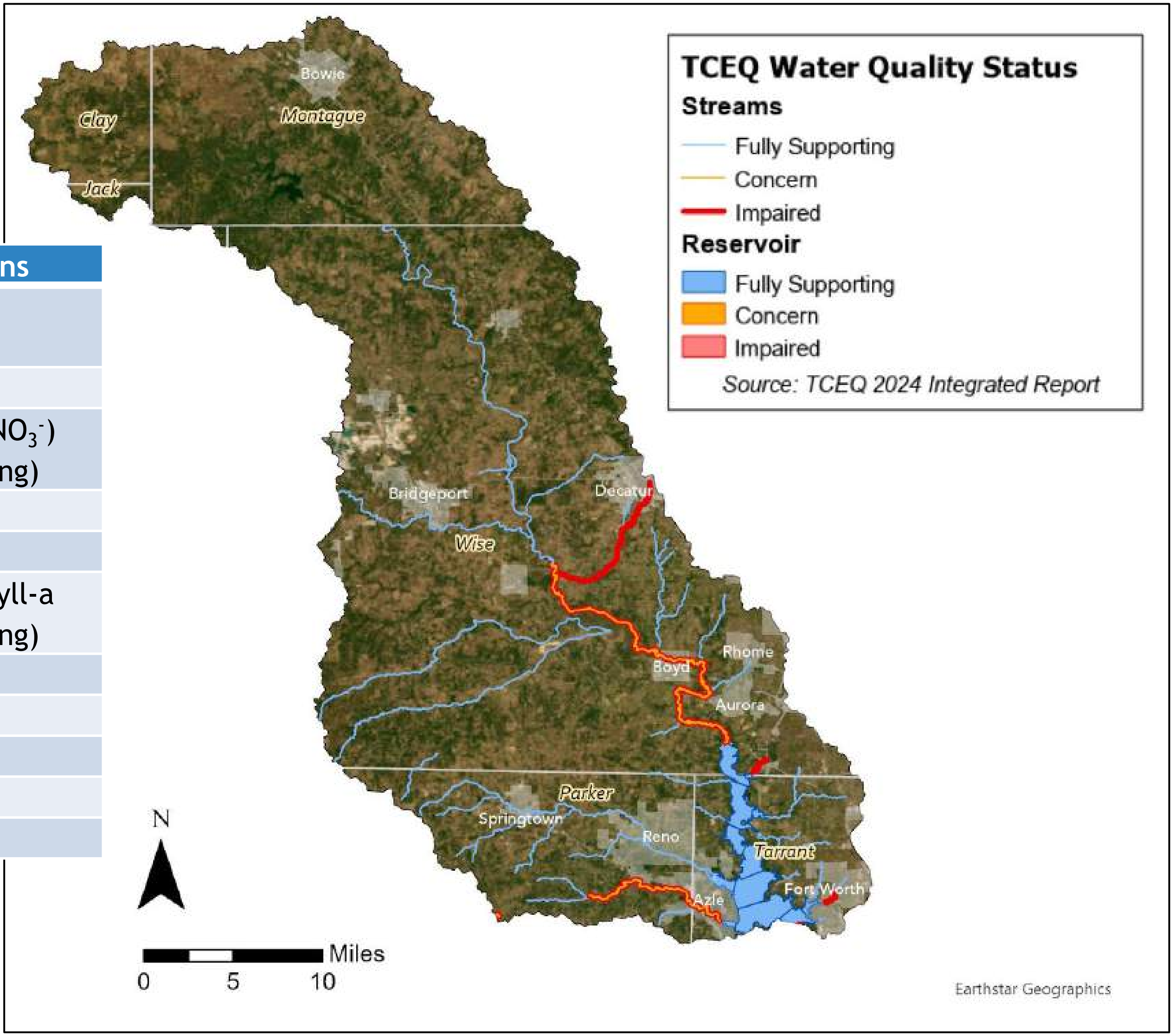
WPP Process Overview

We are here

Phase I: Watershed Characterization & Planning				Phase II: Implementation
Public Education Data Collection Data Analysis and Modeling Stakeholder Meetings • Priority Selection • Recommendations for WPP	Writing WPP Document Review Watershed Modeling	Informal Review • NRCS/ SWCD • Partners (you!) Formal Agency Review 1) Send draft to state agencies 2) Respond to agency comments 3) 45-day Public Comment Period 4) Respond to comments 5) Re-submit to state agencies	Agency Approval Process	Federal Grant Funds Available for Project Submittals

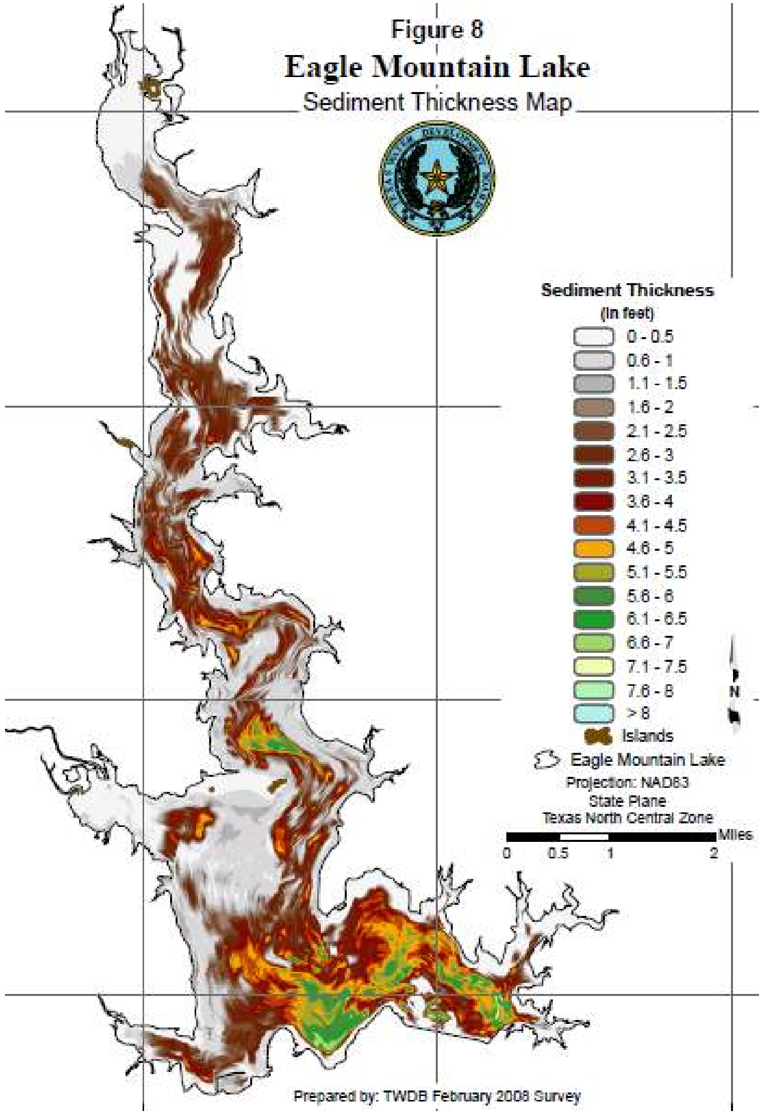
Water Quality Issues

Name	Segment(s)	Impairments	Concerns
Eagle Mountain Lake	0809_01 - 0809_14		
Walnut Creek	0809A		
Ash Creek	0809B	Bacteria (E. coli)	Nitrate (NO_3^-) (screening)
Dosier Creek	0809C	Bacteria (E. coli)	
Derrett Creek	0809D	Bacteria (E. coli)	
West Fork Trinity River Below Lake Bridgeport	0810_01	Bacteria (E. coli)	Chlorophyll-a (screening)
	0810_02		
Big Sandy Creek	0810A		
Garrett Creek	0810B		
Martin Branch	0810C	Bacteria (E. coli)	
Salt Creek	0810D		

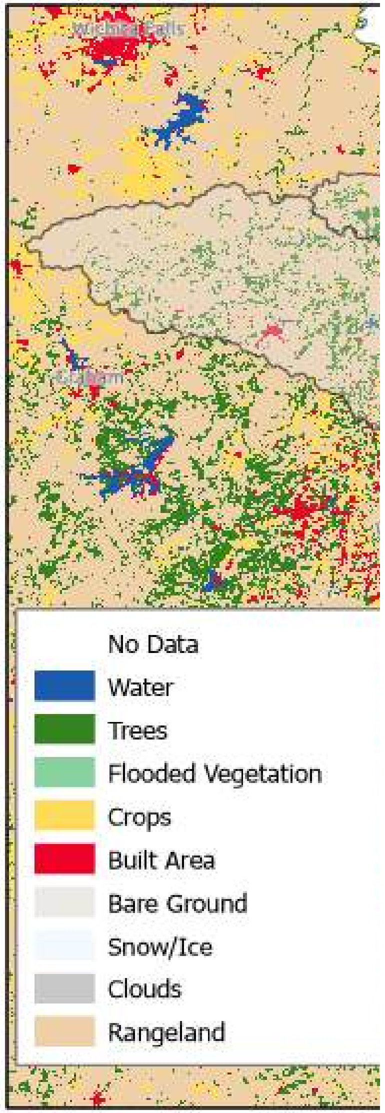


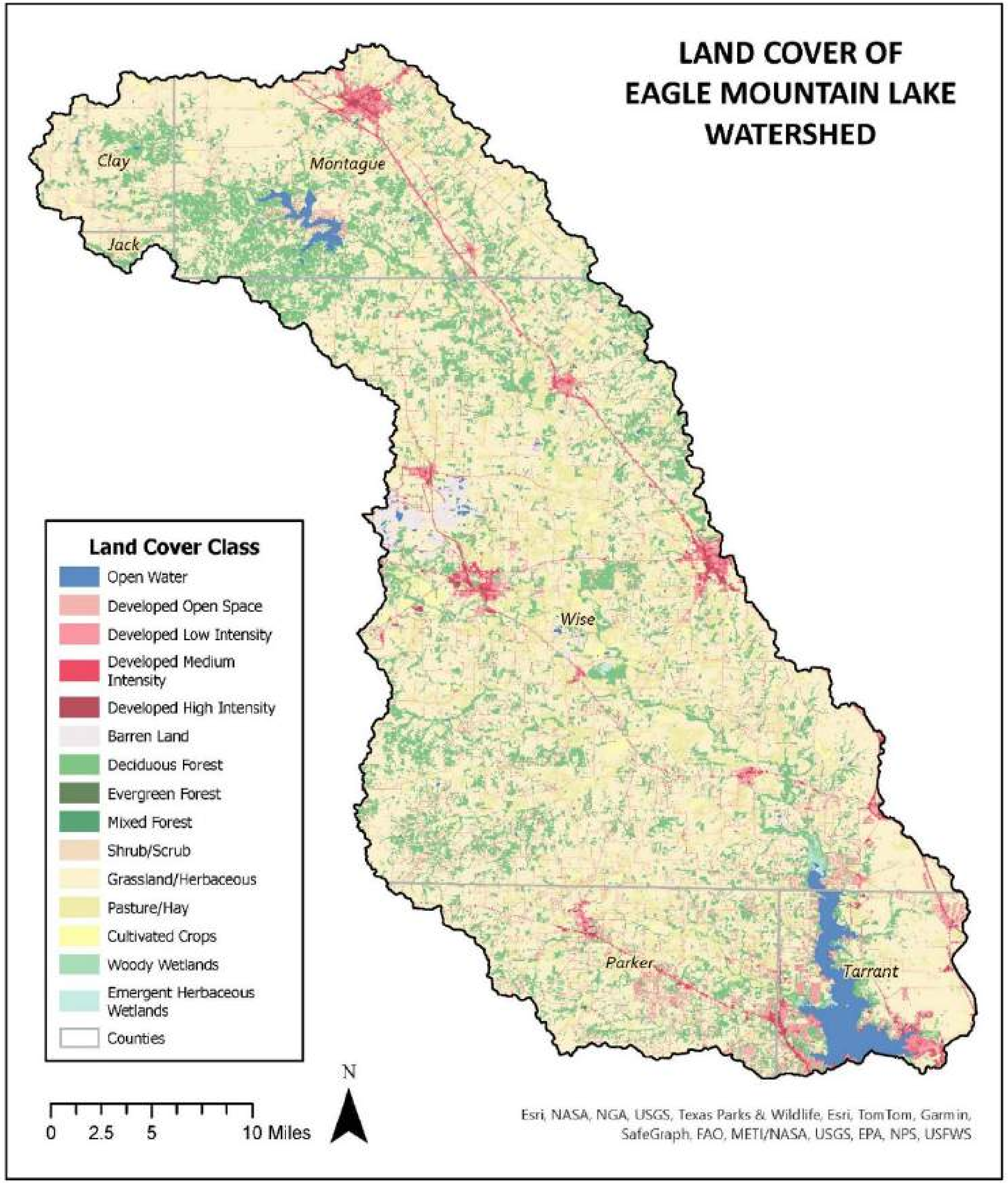
Water Quality Issues

- Sediment: Quality and Supply issue
- State Volumetric Survey 2008
  - >15,000 ac-ft of sedimentation since 1934



Water C





- Rapidly urbanizing NW fringe of DFW metroplex
- Still a large amount of rural and agricultural land

Watershed Modeling Overview

Aaron Hoff

Eagle Mountain Lake WPP Meeting

July 9, 2025

watershed protection

Tarrant Regional Water District

trwd Tarrant Regional Water District

Watershed Data Models & Tools used by TRWD

- Why do we use watershed models?
- LDCs/LOADEST
- SWAT/HAWQS
- WASP
- SELECT

Watershed Modeling basics

Targeted Implementation

30% TP Reduction Target

Cropland
- Grassed Waterways
- Cropland Conversion
- Terracing
- Nutrient Management
- Filter Strips

Pasture
- Prescribed Grazing
- Pasture Planting
- Critical Area Planting
- Grade Stabilization
- Prescribed Burning
- Brush Management

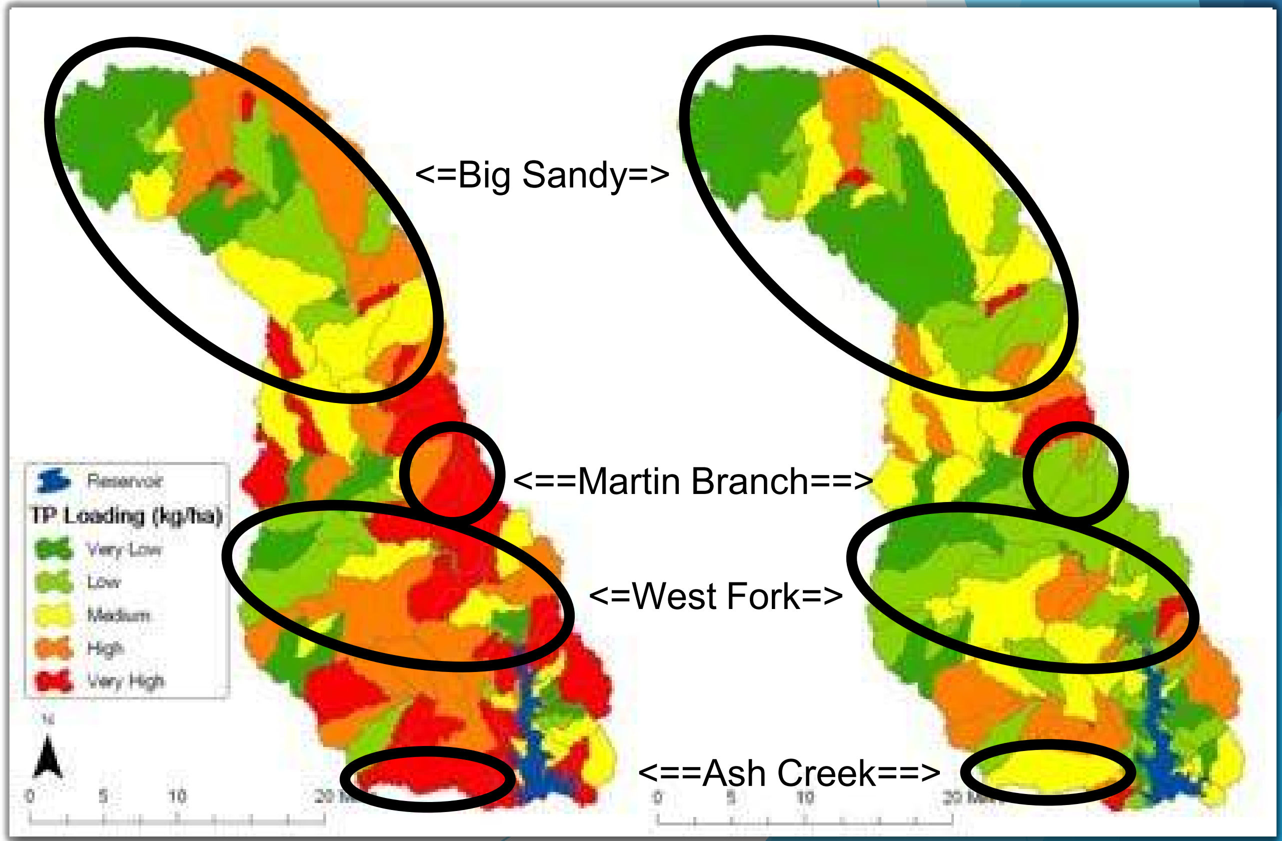
Watershed
- Flood Protection Structures

Urban
- Phase II Storm Water Control Measures
- Urban Nutrient Management
- Wastewater Treatment Plant Upgrade

Riparian
- Brush Management
- Wetland Development
- Buffer Strips

In-Lake
- Hypolimnetic Aeration
- P-Inactivation

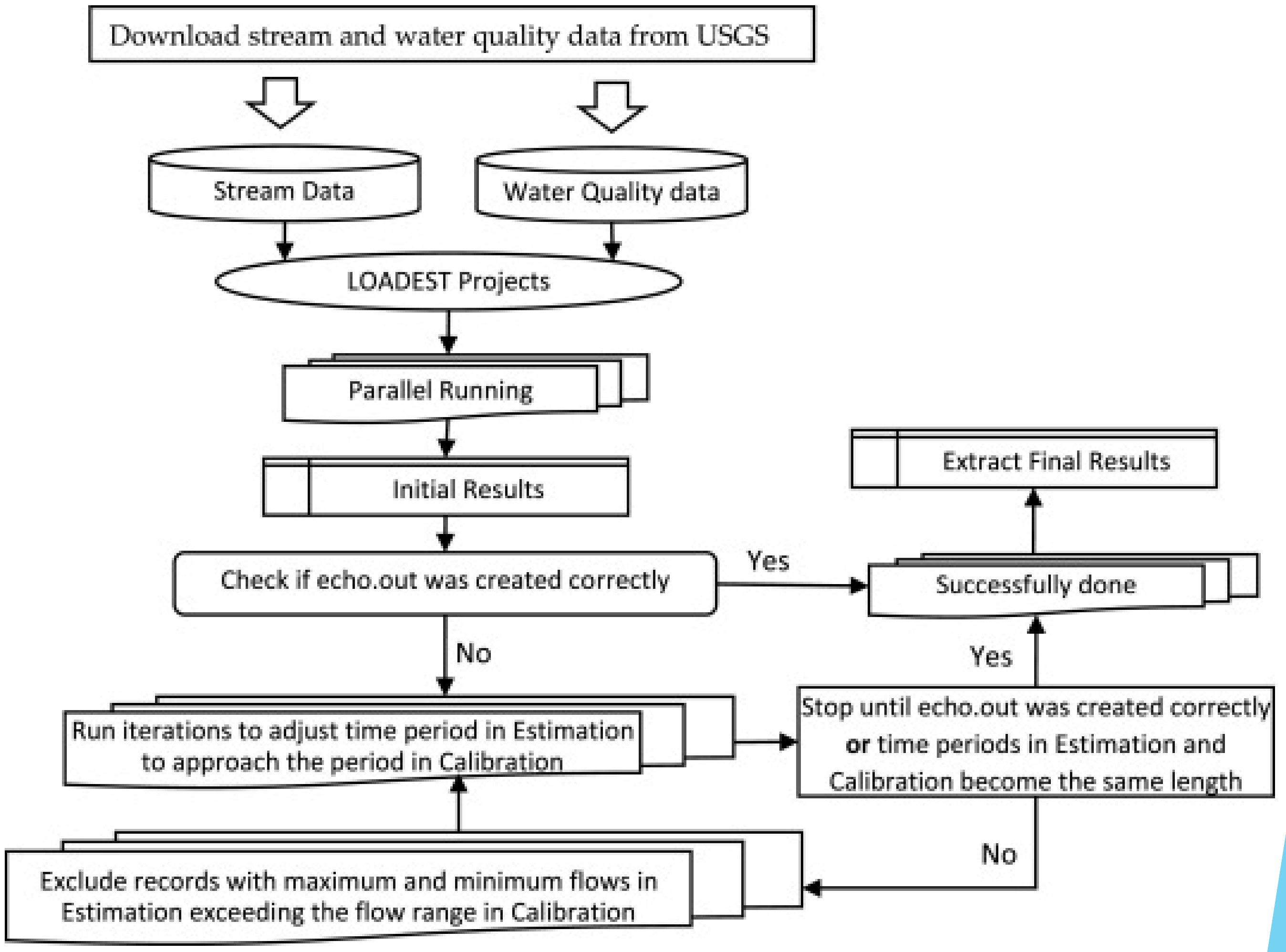
TP Reductions by Subwatersheds
Pre- and Post-Implementation



Load Duration Curve (LDC) Analysis

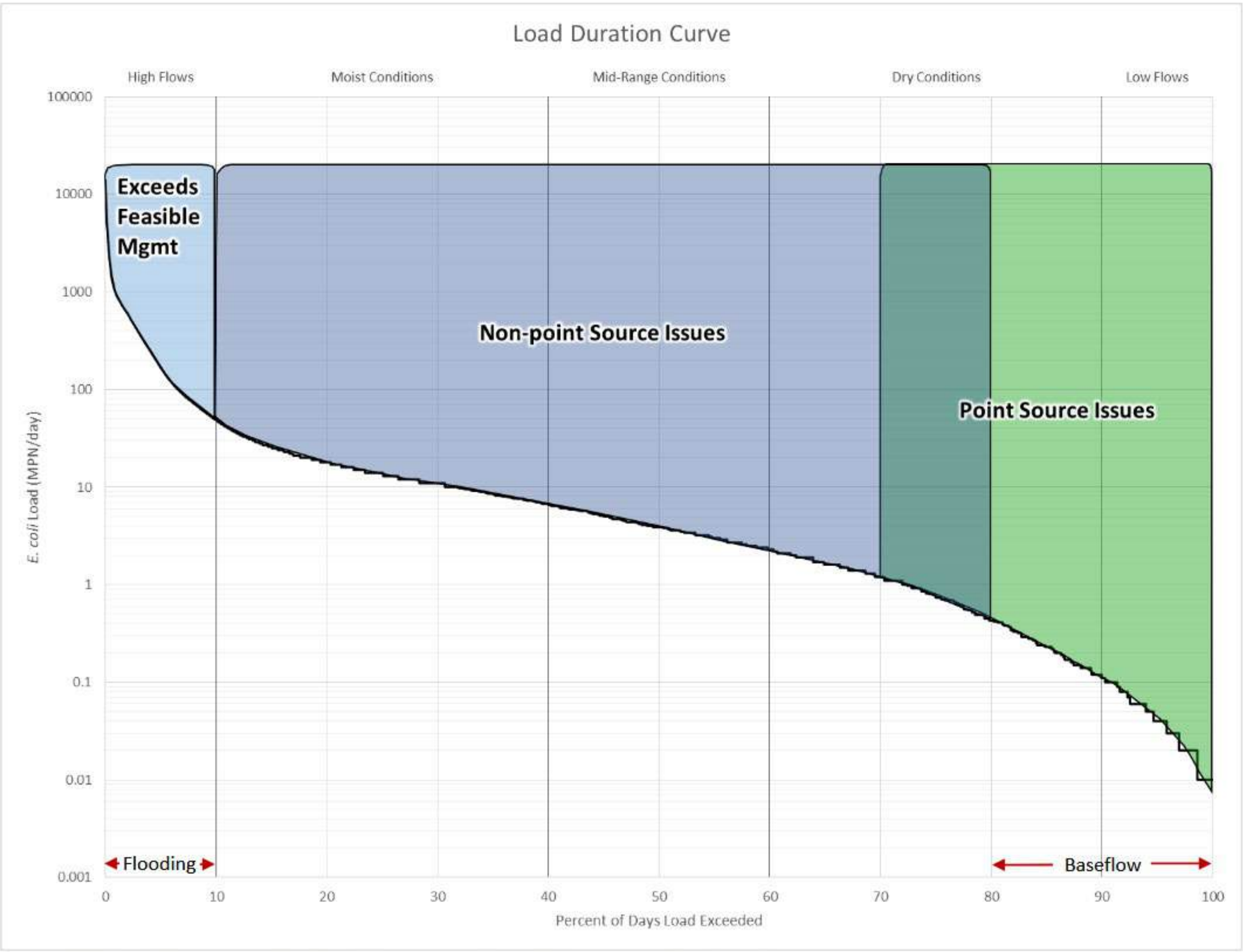
LOADEST - working behind the scenes

- No acronym here – literally just stands for "LOAD ESTimator"
  - Height of USGS creativity
- Requires paired data points
  - Measured pollutant concentration
  - Observed streamflow at same time
- Generally need at least 12 paired points for a reliable data set
  - LOADEST won't run if it doesn't have enough data



Visualizing loads with LDCs

- Comparing data within a station
  - How do points compare to the max allowable load?
  - Problems at high flow or low flow?
- Comparing different stations
  - Worth our time to focus on subwatersheds that correspond to specific stations?
  - Substantial increases between two stations?



Regions of likely pollutant sources along load duration curve (log scale Y-axis, normal scale X-axis).

Characterizing Watershed Pollutant Sources with SWAT/HAWQS

Reviewing Pollutant Source Inputs

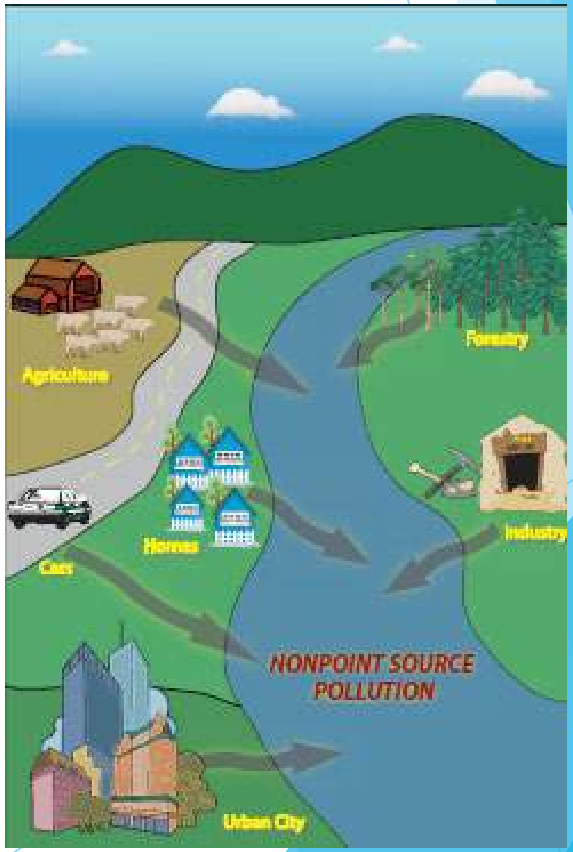
Human Impacts

Point Source Pollution

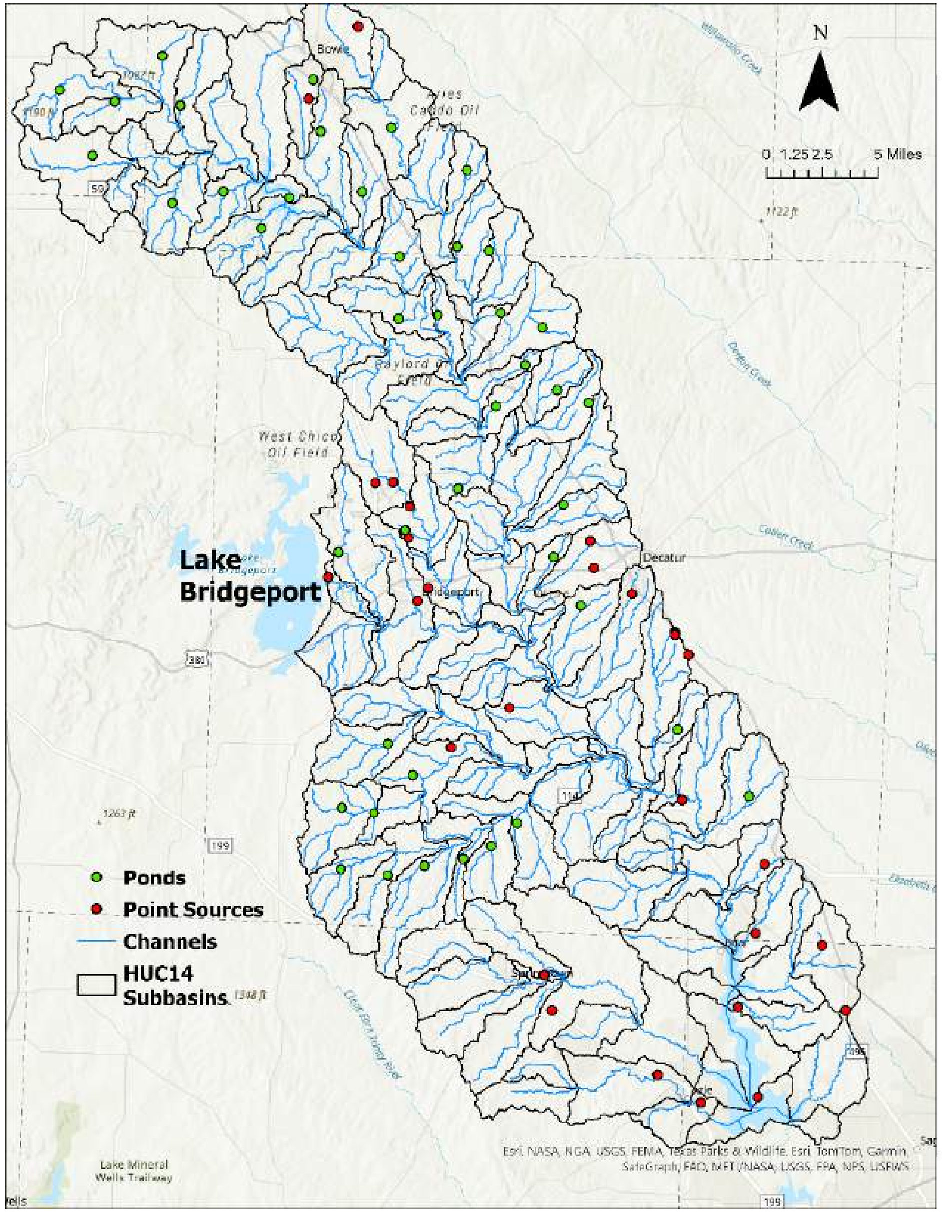
discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer or tunnel

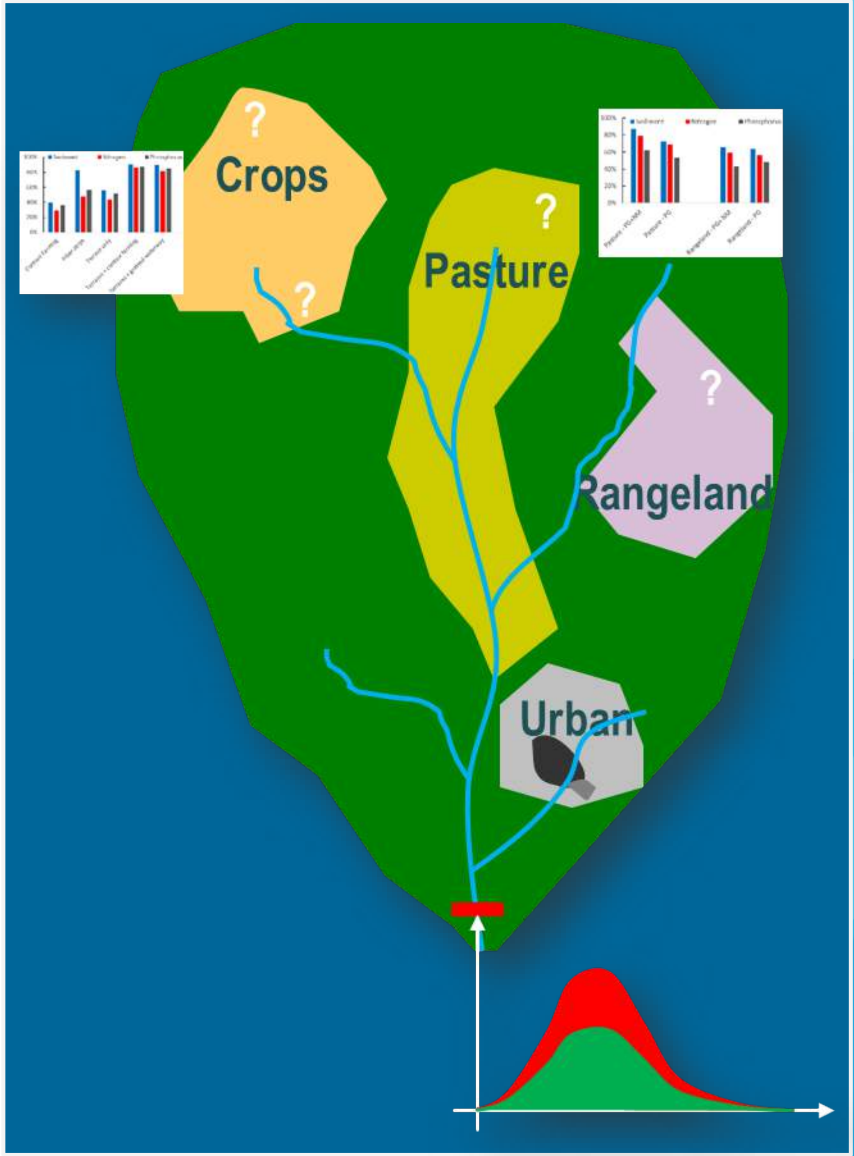
Non-Point Source Pollution

originates from many different places across the landscape, most of which cannot be readily identified.



Let’s talk inputs





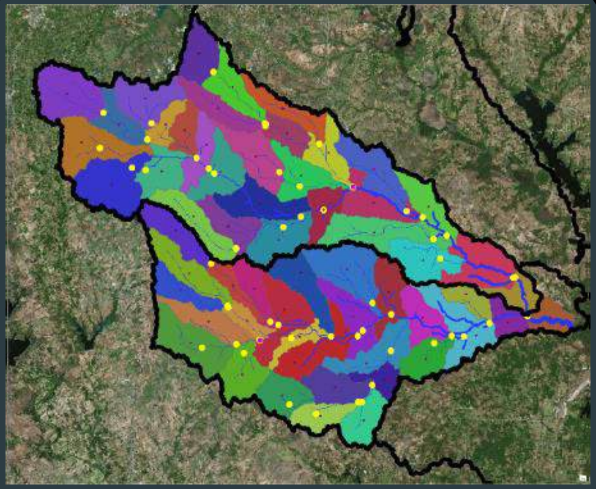
Characterizing Sources

Soil & Water Assessment Tool (SWAT)

Input

- Topography
- Land Use
- Soil
- Observations
- …

SWAT



Output

- Runoff/Sediment/ Nutrient for HRU
- Runoff/Sediment/ Nutrient for WS
- Runoff/Sediment/ Nutrient for Rch

Daily

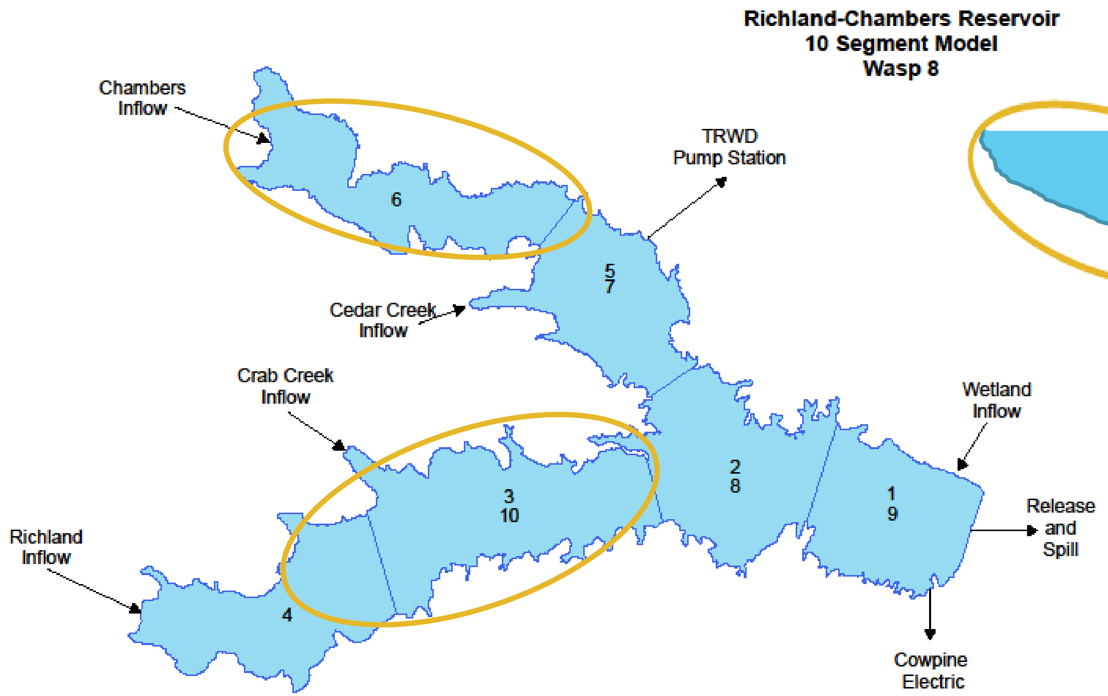
Monthly

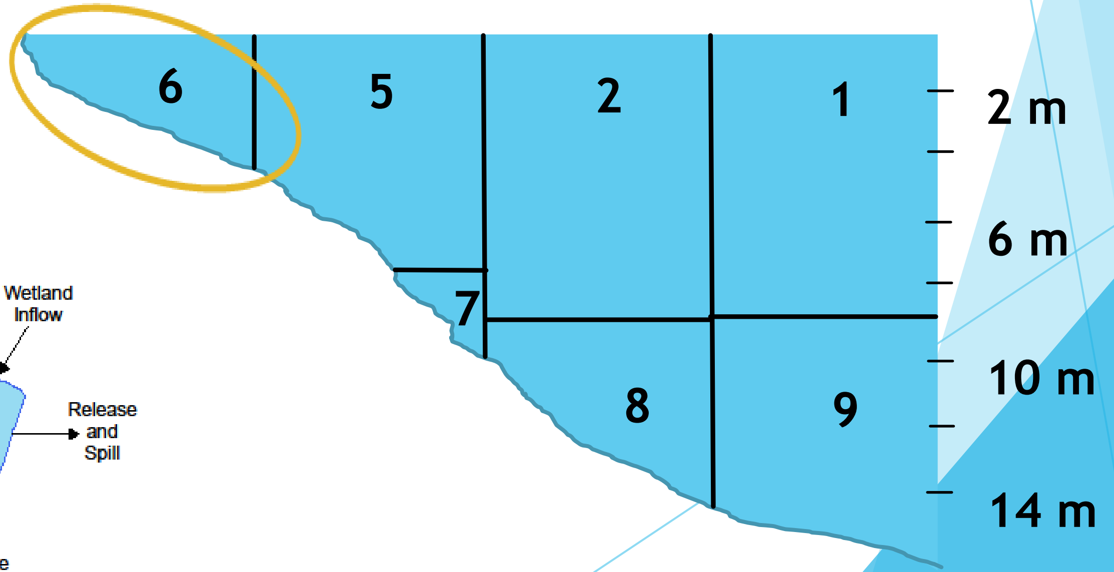
Yearly

Lake Analysis with the Water Quality Analysis Simulation Program (WASP)

WASP Lake Modeling

- Simulates the processing and cycling of nutrients (N, P) in a lake.
- Estimates water quality response, in all or part of the lake, to nutrient inputs from the watershed.





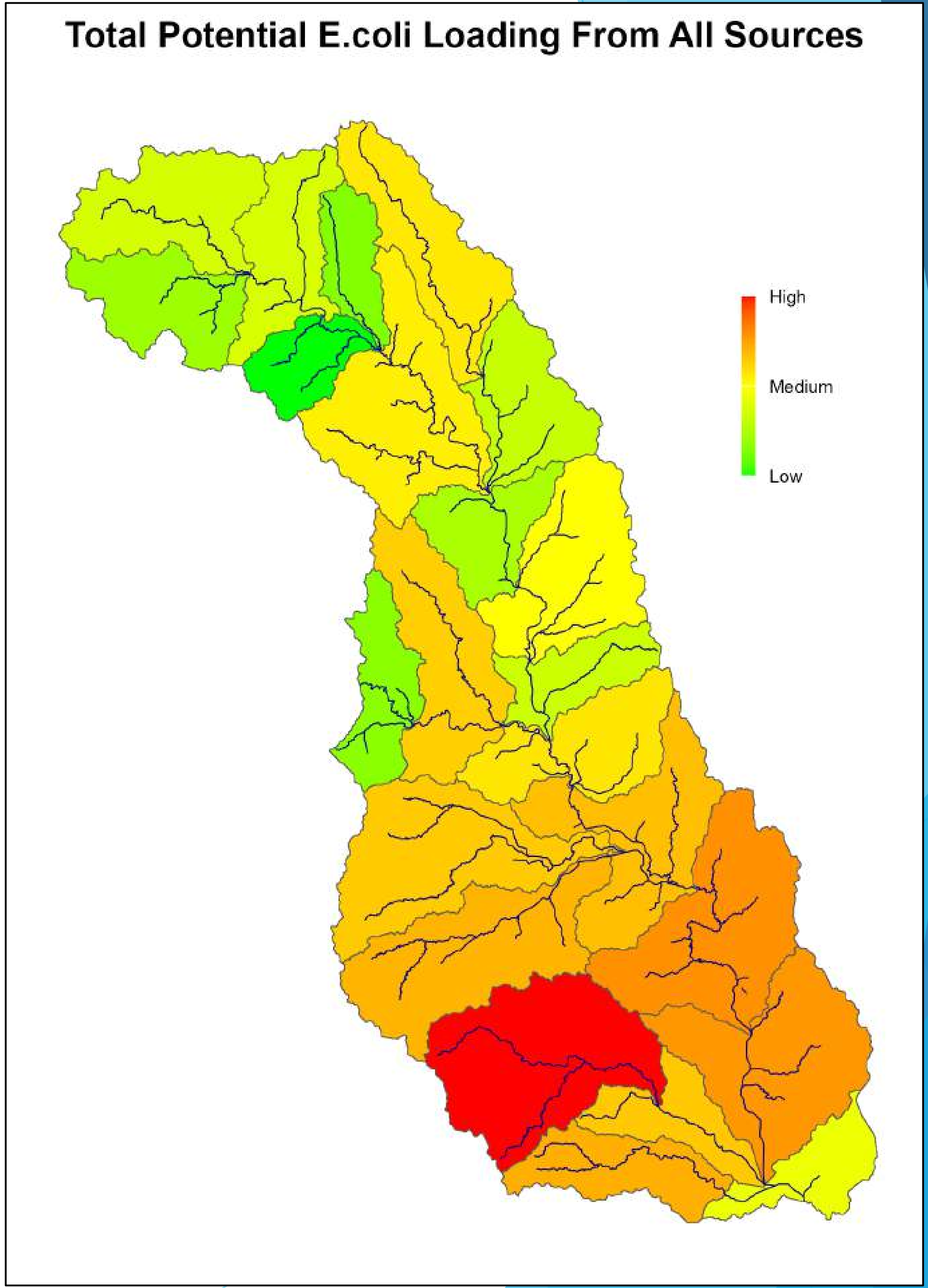
Calculating *E. coli* loads with the Spatially Explicit Load Enrichment Calculation Tool (SELECT)

SELECT basics

- Analytical approach for determining potential bacterial loads in specific areas of a watershed
- Spatial data inputs
  - Land use data
  - Population data (human and animal)
- Literature values for fecal production rates
- SELECT does *not* account for any natural or anthropogenic mitigation processes
  - Results in an overestimation of potential sources
  - Provides a “worst-case scenario”

Visualizing loads in SELECT

- Determines which "catchments" have the greatest contribution to the overall pollutant load
- Targets areas for potential management practices



Bringing "Worst Case Scenario" into focus

- Logic follows – sources further from stream will have less influence on load
- Distance from E. coli source (the "poop point") to stream isn't taken into account automatically
- Artificially account for this to a small degree by using a stream buffer
  - Within buffer zone = more influence (90% reaches stream)
  - Outside buffer zone = less influence (50% reaches stream)

Contact Us

- Watersheds@TRWD.com
- Aaron.Hoff@TRWD.com

Eagle Mountain Watershed

Modeling of Nutrient and *E.coli* Loading

Commissioned by Tarrant Regional Water District

Provided by Texas A&M AgriLife Research

SWAT

- Model Set-up
- Calibration
- Load Duration Curves
- Nutrient Load Reduction Strategies

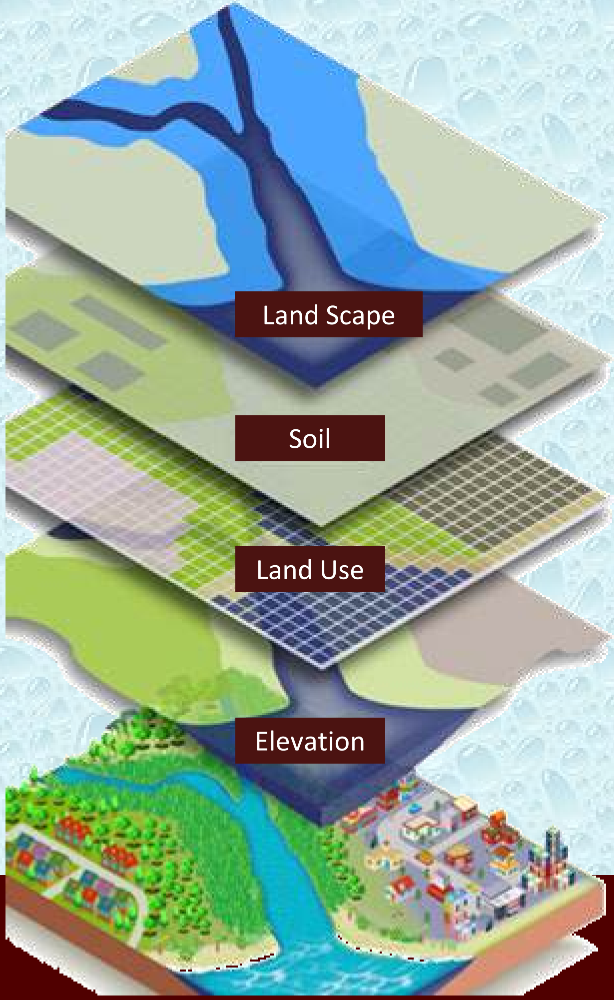
SELECT

- Model Set-up
- Potential Loading
- E.coli Load Reduction Strategies

SWAT- Soil and Water Analysis Tool

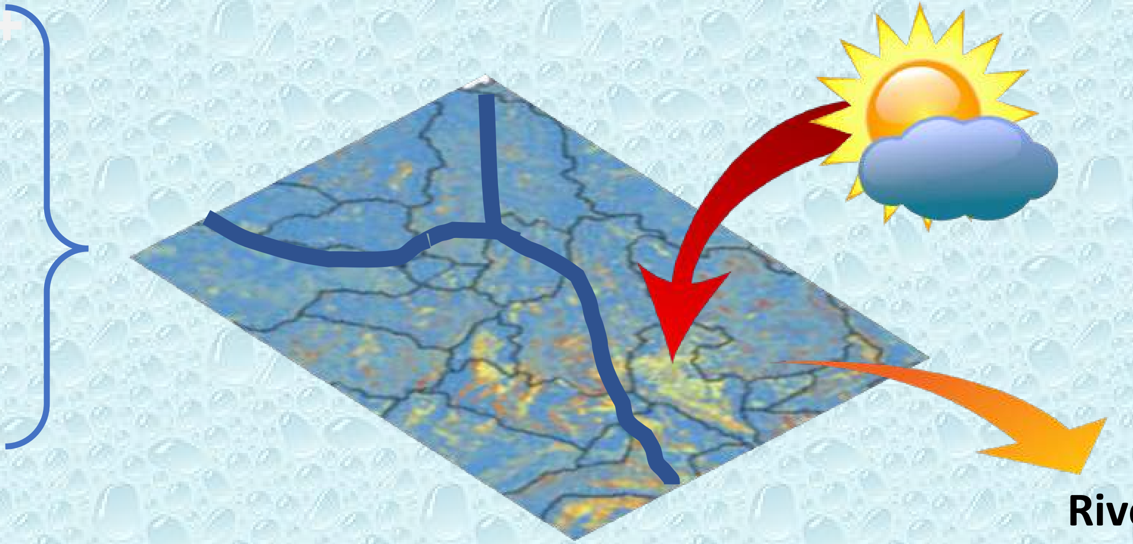
Semi-distributed watershed scale ecosystem model

Soil & Water Assessment Tool SWAT



Watershed → Subbasins → HRUs

Areas of unique properties



River flow
Sediments
Evapotranspiration

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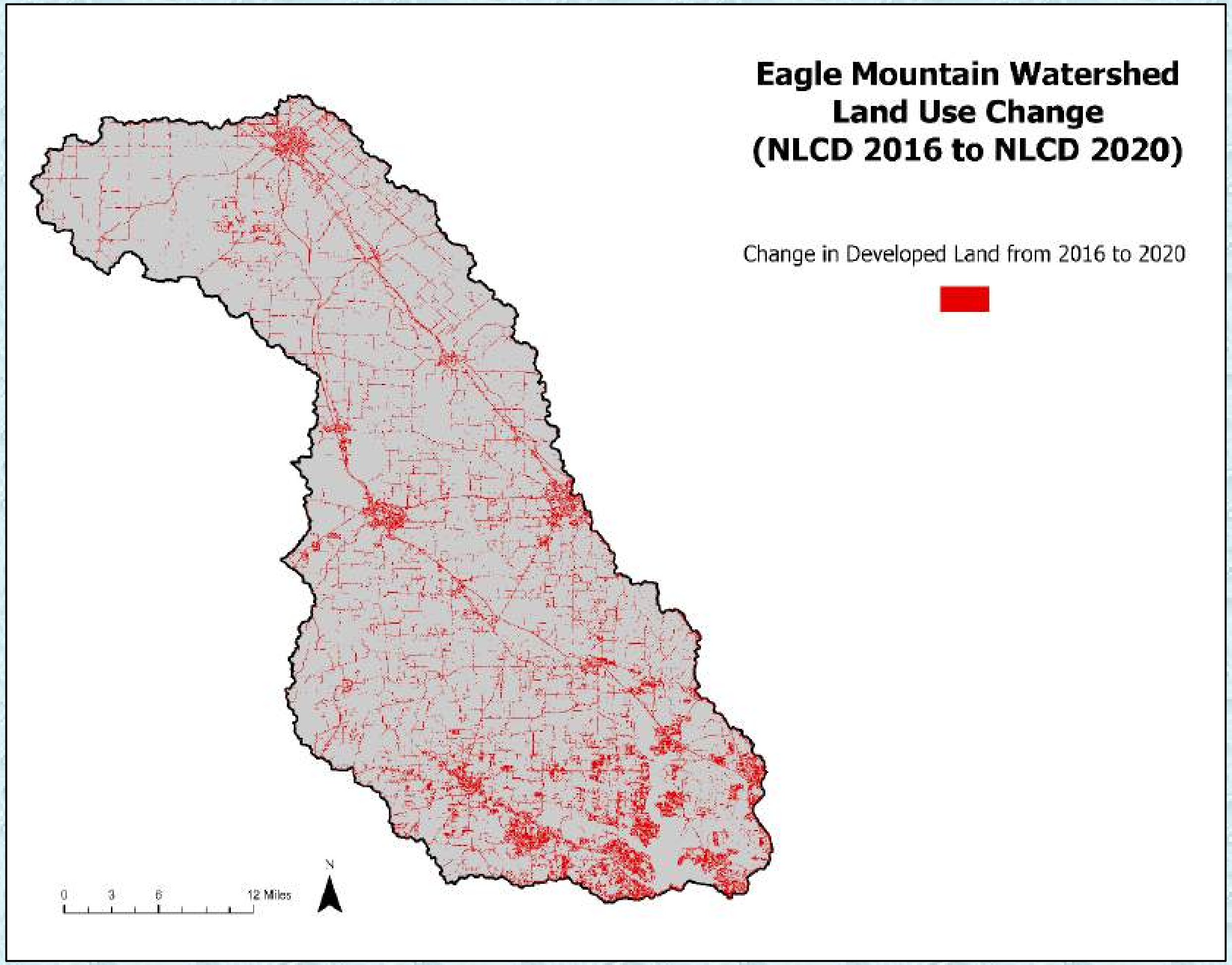
SWAT Model Set-up

9.7% (53,223 acres) increase in developed area since 2016

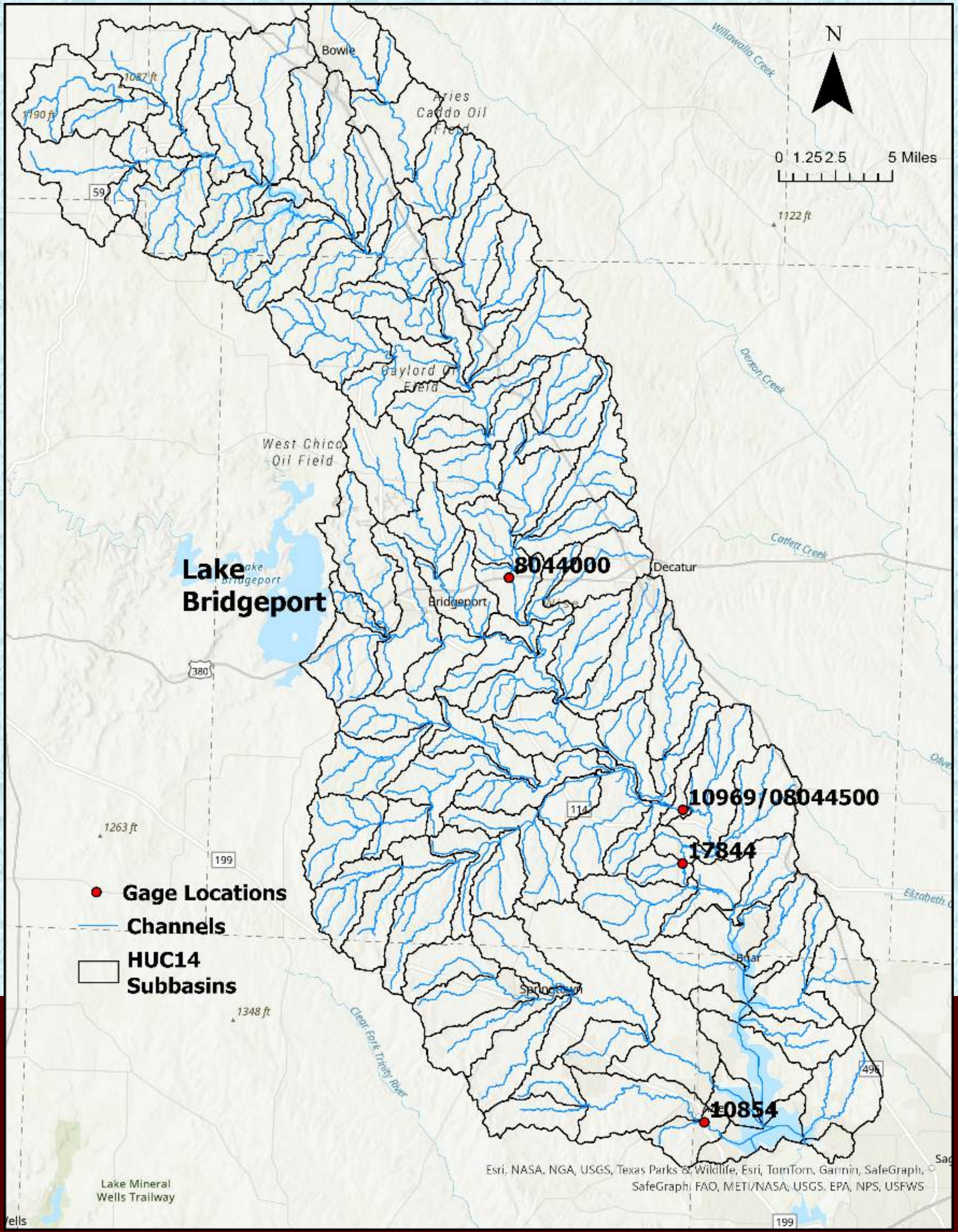


SWAT Model Set-up

Management Practices implemented between 2008-2023 from Natural Resources Conservation Service (NRCS)

Management Practices	Available Acres	Applied Acres	Percent of Land Applied
Grade Stabilization Structure		14*	
Brush Management	8,376	609	7.3%
Cover Crop	25,045	2,584	10.3%
Pasture Hay Planting	250,209	733	0.3%
Range Planting	159,429	381	0.2%
Prescribed Grazing	350,329	267,766	76.4%

* For grade stabilization structure, there were 14 different structures applied in the watershed.



SWAT Model Calibration

Monthly Flow Calibration

- USGS Gages from 2005-2020
  - USGS 08044000 on Big Sandy Creek
  - USGS 08044500 on West Fork Near Boyd

Gage ID	NS	PBIAS	KGE	Simulation Mean (cms)	Observation Mean (cms)
USGS 08044000	0.8	-68.4	0.31	3.56	2.12
USGS 08044500	0.56	3.1	0.56	8.19	8.46

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SWAT Model Calibration

Gage ID	Constituent	NS	PBIAS	KGE	Simulation Mean	Observation Mean
10969	TSS (tonnes)	0.63	2.9	**0.7**	10,095.86	10,394.62
10969	NO3 (kg)	0.36	-9.1	**0.65**	13,425.61	12,311.01
10969	NH3 (kg)	0.5	37.6	**0.35**	3,273.16	5,243.13
10969	PO4 (kg)	0.64	-4.8	**0.66**	5,727.16	5,464.76
10969	TN (kg)	0.52	31.5	**0.44**	42,854.48	62,547.68
10969	TP (kg)	0.54	-19.7	**0.7**	13,308.03	11,116.98
17844	TSS (tonnes)	0.75	9.6	**0.83**	6,125.54	6,773.68
17844	NO3 (kg)	-1.08	-98.4	-0.15	12,100.86	6,100.37
17844	NH3 (kg)	-5.47	-133.3	-1.21	3,323.82	1,424.43
17844	PO4 (kg)	-5.8	-184.5	-1.61	4,499.02	1,581.26
17844	TN (kg)	-0.28	-21.7	**0.3**	37,132.2	30,509.19
17844	TP (kg)	0.46	-26.4	**0.6**	9,134.45	7,226.91
10854	TSS (tonnes)	0.28	**52.1**	0.04	407.52	851.42
10854	NO3 (kg)	0.37	**-52**	0.23	1,508.92	992.53
10854	NH3 (kg)	-2.52	-305.6	-2.15	382.12	94.22
10854	PO4 (kg)	0.26	-13.8	**0.63**	153.21	134.65
10854	TN (kg)	**0.5**	-105.7	-0.06	3,945.85	1,918.03
10854	TP (kg)	0.16	**-70.3**	0.19	526.17	308.88

Monthly Water Quality Calibration

- **TRWD Gages**
  - **10969 West Fork @ FM730**
    - **2011-2020**
  - **17844 West Fork @ Bobo/4668**
    - **2005-2020**
  - **10854 Ash Creek**
    - **2005-2020**

Grab sample data and calibrated flow data was processed using LOADEST to create monthly time series

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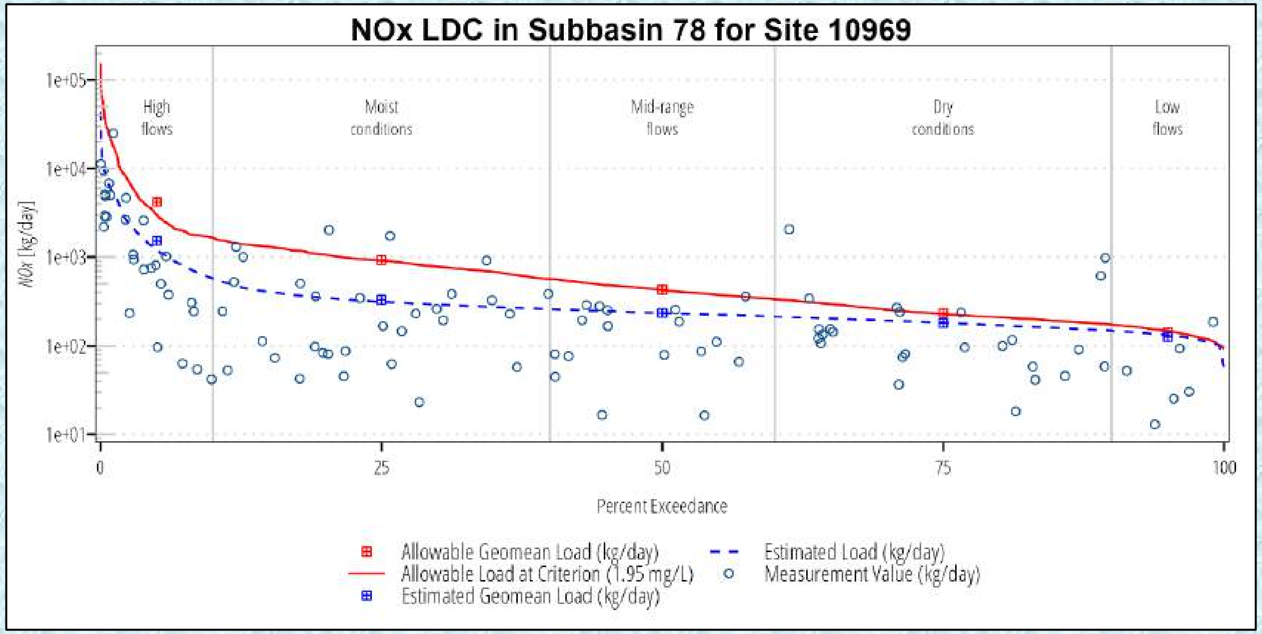
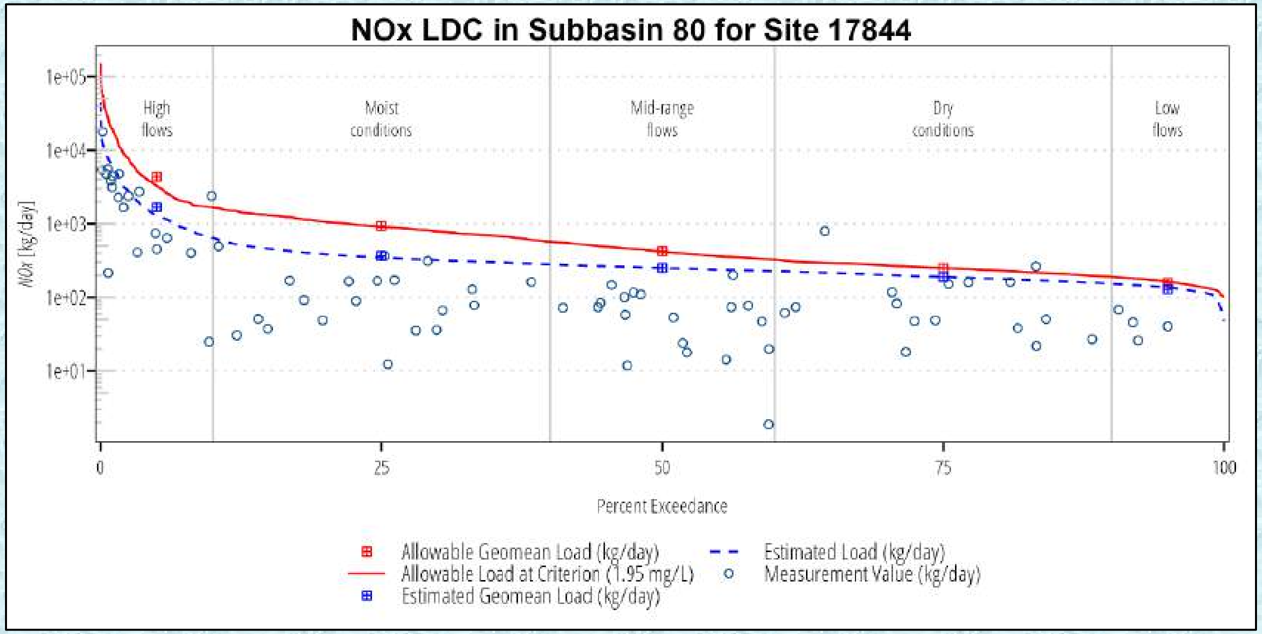
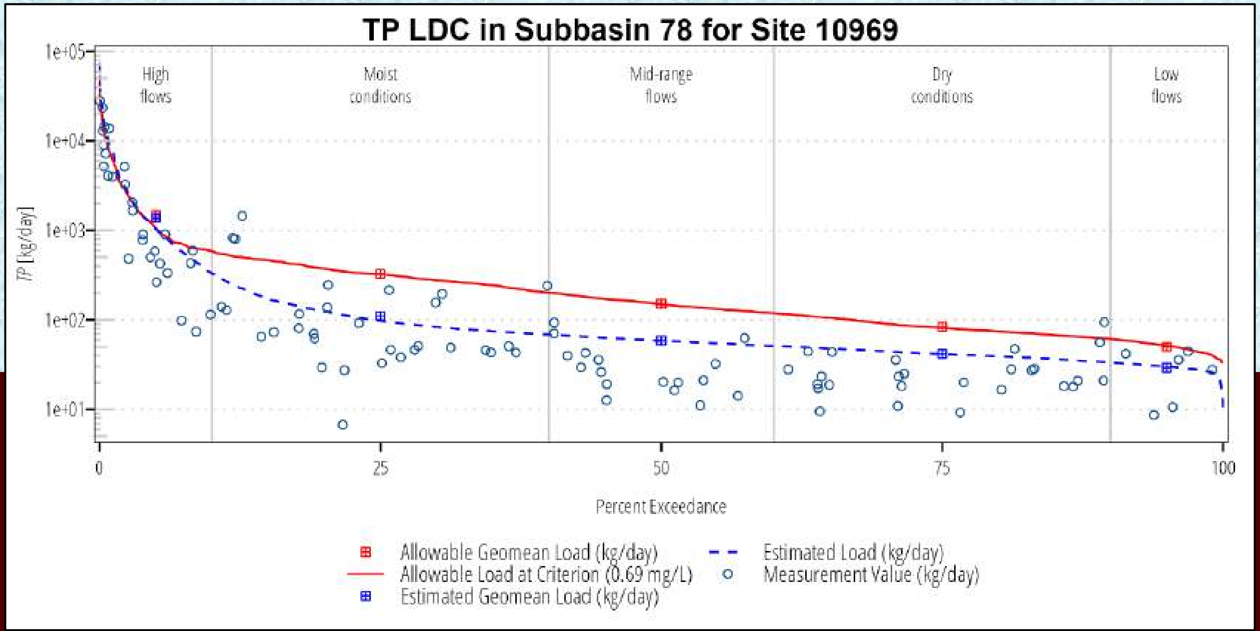
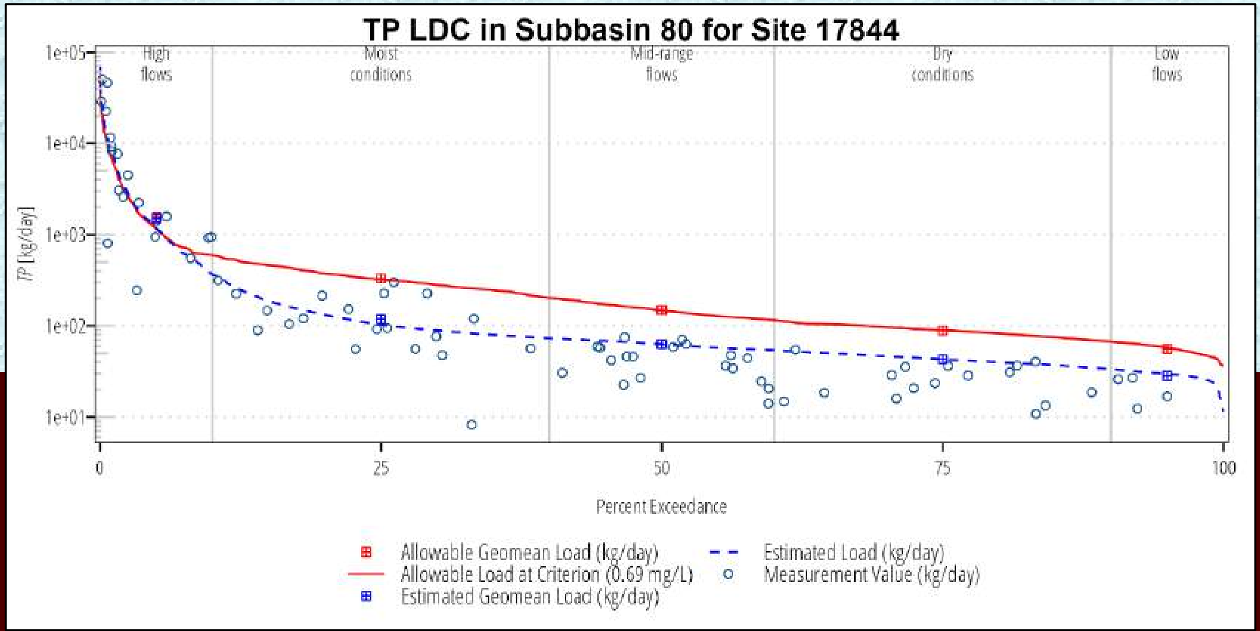
Load Duration Curves: Nutrients

Gages on WF did not Exceed Allowable Load for NOx and TP



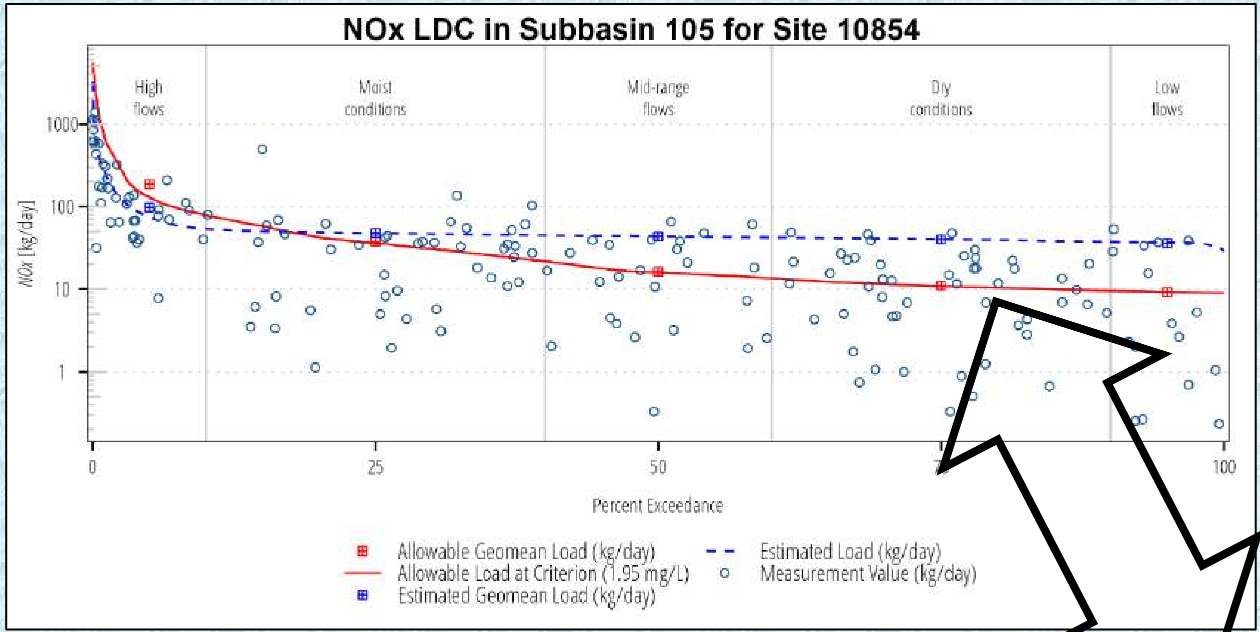


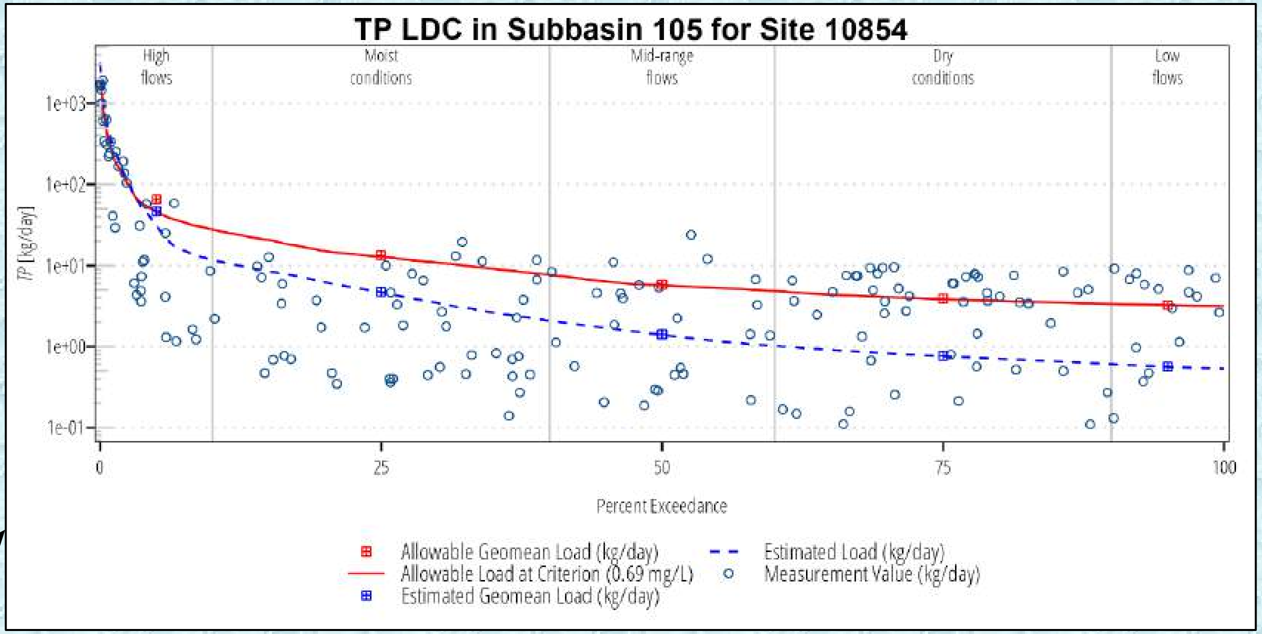




Load Duration Curves: Nutrients

NOx exceeded allowable loading in Ash Creek during Moist to Lowest Flow conditions





Flow Condition	Median Flow (m^3/day)	% of Time Flow Exceeds	Allowable Geomean Loading (kg/day)	Estimated Geomean Loading (kg/day)	Reduction Needed (kg/day)	% Daily Load Reduction Needed
Highest Flows	74,451	0-10	186.4	97.6	0.0	0.0
Moist Conditions	20,485	10-40	37.7	48.0	10.4	21.6
Mid-range Conditions	9,150	40-60	16.4	43.6	27.2	62.3
Dry Conditions	6,178	60-90	11.0	40.1	29.1	72.5
Lowest Flows	5,238	90-100	9.2	36.1	26.9	74.5

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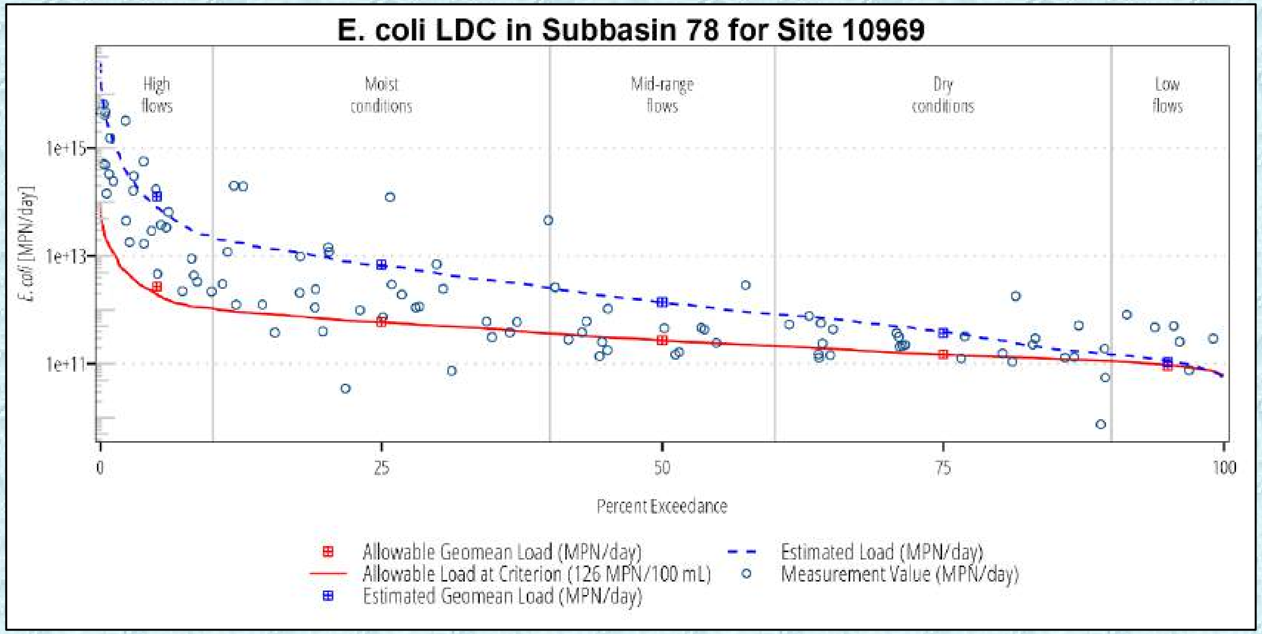
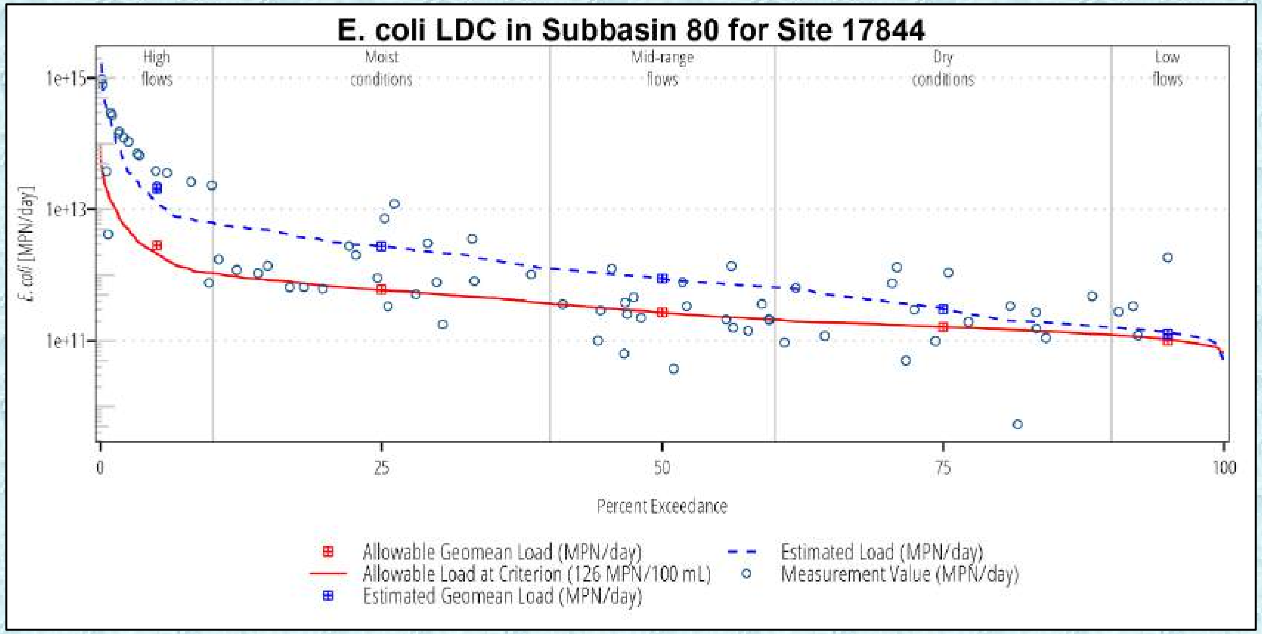
Load Duration Curves: *E.coli*





Flow Condition	Median Flow (m^3/day)	% of Time Flow Exceeds	Allowable Geomean Loading (MPN/day)	Estimated Geomean Loading (MPN/day)	Reduction Needed (MPN/day)	% Daily Load Reduction Needed
Highest Flows	1,723,680	0-10	2.71E+12	1.28E+14	1.26E+14	97.9
Moist Conditions	522,374	10-40	6E+11	6.88E+12	6.28E+12	91.3
Mid-range Conditions	241,402	40-60	2.77E+11	1.4E+12	1.12E+12	80.2
Dry Conditions	131,242	60-90	1.52E+11	3.71E+11	2.19E+11	59.0
Lowest Flows	84,033	90-100	9.17E+10	1.07E+11	1.53E+10	14.3

on	Median Flow (m^3/day)	% of Time Flow Exceeds	Allowable Geomean Loading (MPN/day)	Estimated Geomean Loading (MPN/day)	Reduction Needed (MPN/day)	% Daily Load Reduction Needed
s	1,882,656	0-10	2.82E+12	2.08E+13	1.8E+13	86.5
ions	518,400	10-40	6.05E+11	2.75E+12	2.15E+12	78.0
nditions	237,082	40-60	2.73E+11	8.91E+11	6.18E+11	69.4
ns	143,770	60-90	1.62E+11	3.05E+11	1.43E+11	47.0
	93,442	90-100	1.02E+11	1.27E+11	2.48E+10	19.6

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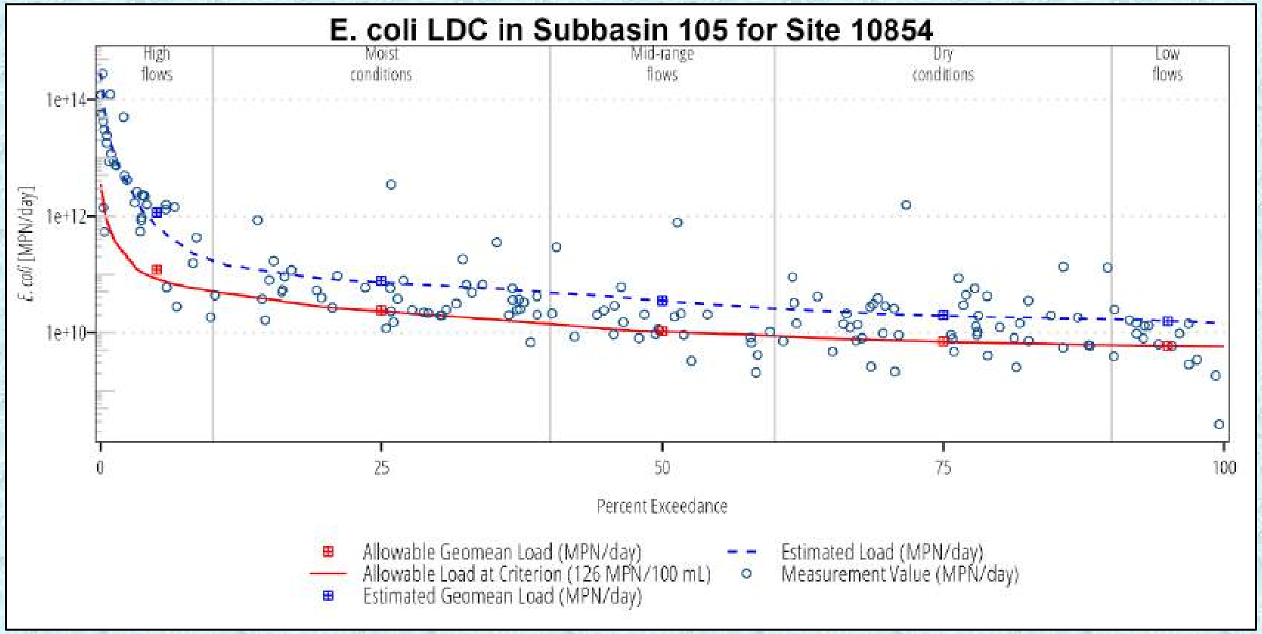
Load Duration Curves: *E.coli*



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Highest Flows	74,451	0-10	1.2E+11	1.15E+12	1.03E+12	89.5
Moist Conditions	20,485	10-40	2.43E+10	7.75E+10	5.31E+10	68.6
Mid-range Conditions	9,150	40-60	1.06E+10	3.54E+10	2.48E+10	70.1
Dry Conditions	6,178	60-90	7.12E+09	2E+10	1.29E+10	64.4
Lowest Flows	5,238	90-100	5.94E+09	1.58E+10	9.82E+09	62.3

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Load Reduction Strategies: Nutrients

1) Cover Crops

Increase	Area (acres)	NO_3 % Change	TP % Change	SYLD % Change
15%	2,996	3.63%	-20.64%	-55.39%
25%	3,281	5.23%	-27.95%	-71.10%
40%	3,680	7.29%	-35.57%	-74.49%

Nutrient Management

2) Hay Planting

N Reduction	NO_3 % Change	TP % Change	SYLD % Change
15%	-10.68%	1.73%	5.64%
25%	-17.20%	2.53%	9.40%
40%	-26.77%	3.62%	15.30%

3) Range Planting

N reduction	NO_3 % Change	TP % Change	SYLD % Change
15%	-4.37%	1.69%	2.92%
25%	-10.06%	3.13%	5.67%
40%	-17.80%	5.12%	9.82%

4) Cattle Stocking Rate Modification

% Modification	Stocking Rate (acres/head)	NO_3 % Change	TP % Change	SYLD % Change
15%	8.7	-5.54%	-12.49%	-0.84%
25%	9.9	-8.91%	-20.71%	-1.76%
40%	12.4	-13.56%	-32.98%	-4.04%

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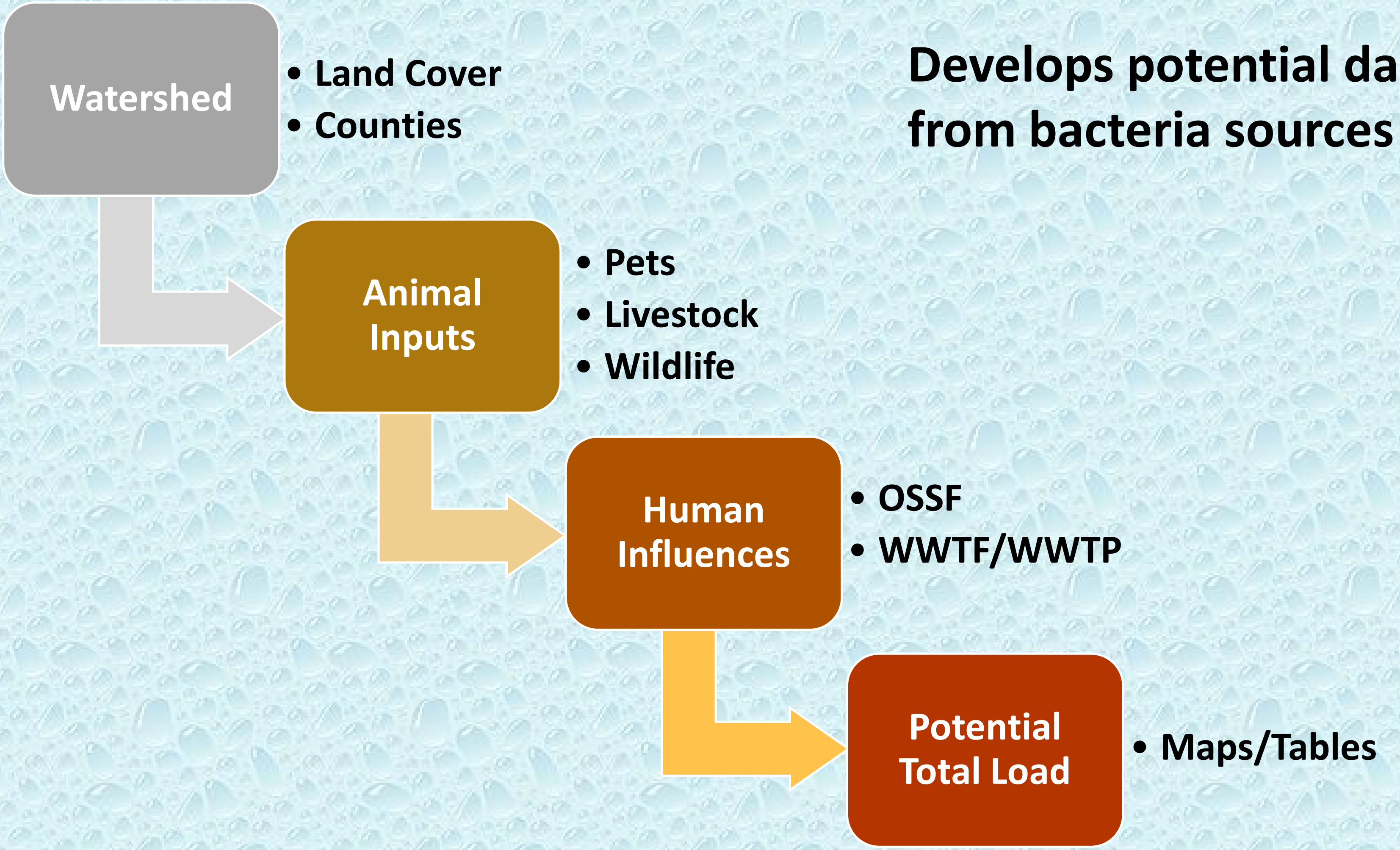
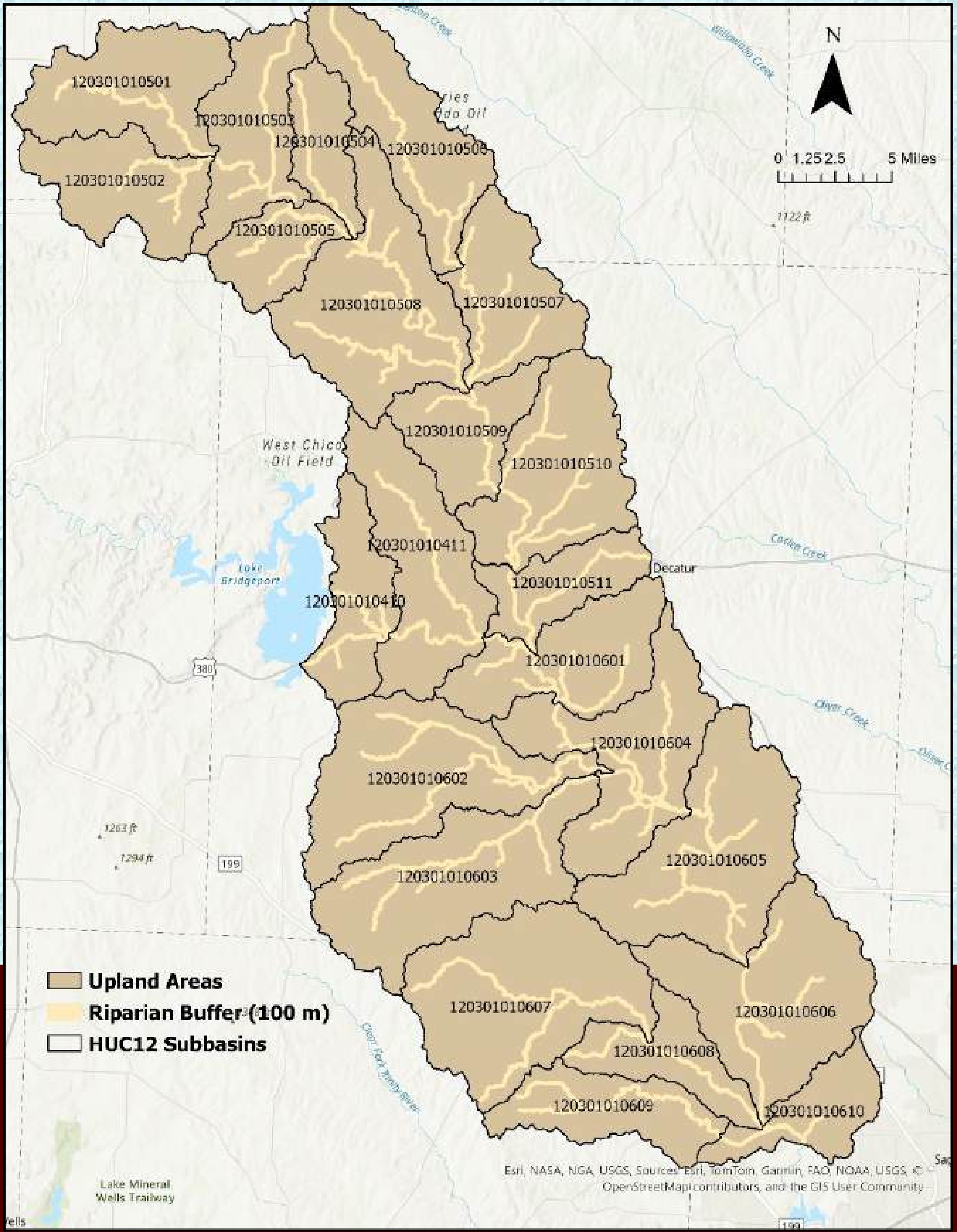
SELECT- Spatially Explicit Load Enrichment Calculation Tool

Develops potential daily *E. coli* loads from bacteria sources for a watershed



SELECT Model Set-up



Defined a 100m (330ft) riparian buffer around each stream

LULC Category	Acres	
	Riparian	Upland
Barren land (Rock/Sand/Clay)	93	3,357
Cultivated Crops	755	10,116
Deciduous Forest	8,087	77,796
Developed, High Density	29	1,863
Developed, Low Density	323	17,834
Developed, Med Density	116	6,335
Developed, Open Space	695	26,039
Emergent Herbaceous Wetlands	558	3,810
Evergreen Forest	8	206
Grassland/Herbaceous	10,415	304,477
Mixed Forest	10	247
Open Water	2,598	10,484
Pasture/Hay	3,397	41,370
Shrub/Scrub	785	8,935
Woody Wetlands	4,694	5,857
Total Composite Acreage	32,563	518,728

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SELECT Model Set-up

Pets, Wildlife, and Livestock

- 90% contribution from riparian
- 50% contribution from uplands

WWTFs (18 facilities)

- 100% contribution

OSSFs (~27,000 facilities)

- Failure rate of 15%
- 100% contribution

Average Watershed Stocking Rates

Animal	Stocking Rate (acre/head)
Cattle	7.4
Sheep	173.2
Goats	110.5
Horses	123.2
Feral Hogs	50
Deer	39.4

Fecal Coliform Production Rates

Source	Fecal coliform production rate	Reference
Cattle	8.55×10^{9} cfu/head/day	Wagner and Moench 2009
Sheep	5.8×10^{10} cfu/head/day	
Goats	4.32×10^{9} cfu/head/day	
Horses	3.64×10^{8} cfu/head/day	
Deer	1.68×10^{9} cfu/head/day	
Feral Hogs	1.51×10^{8} cfu/head/day	
Dogs and Cats	5.0×10^{9} cfu/head/day	USEPA 2001
OSSFs	10×10^{6} /100 ml	

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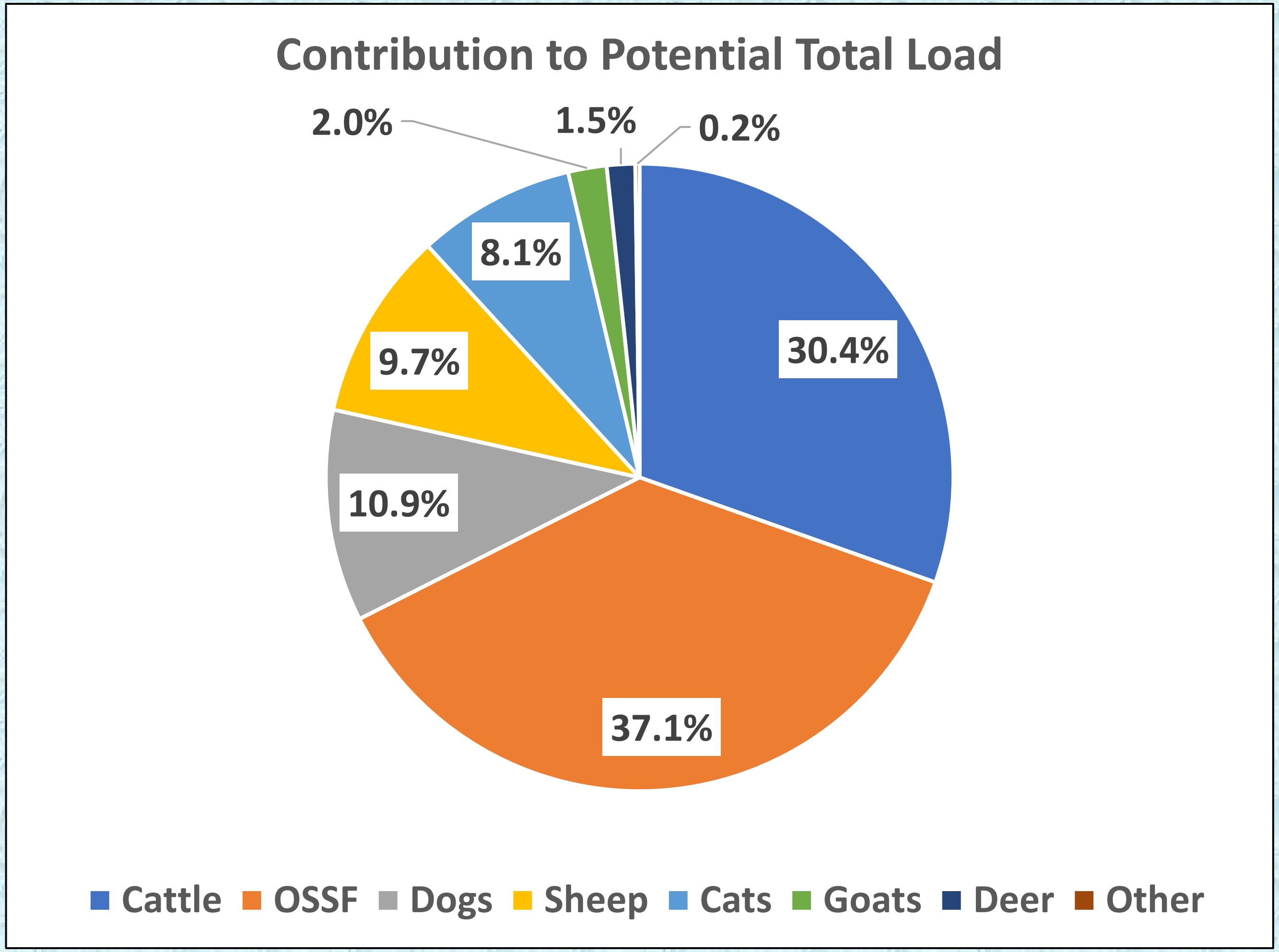
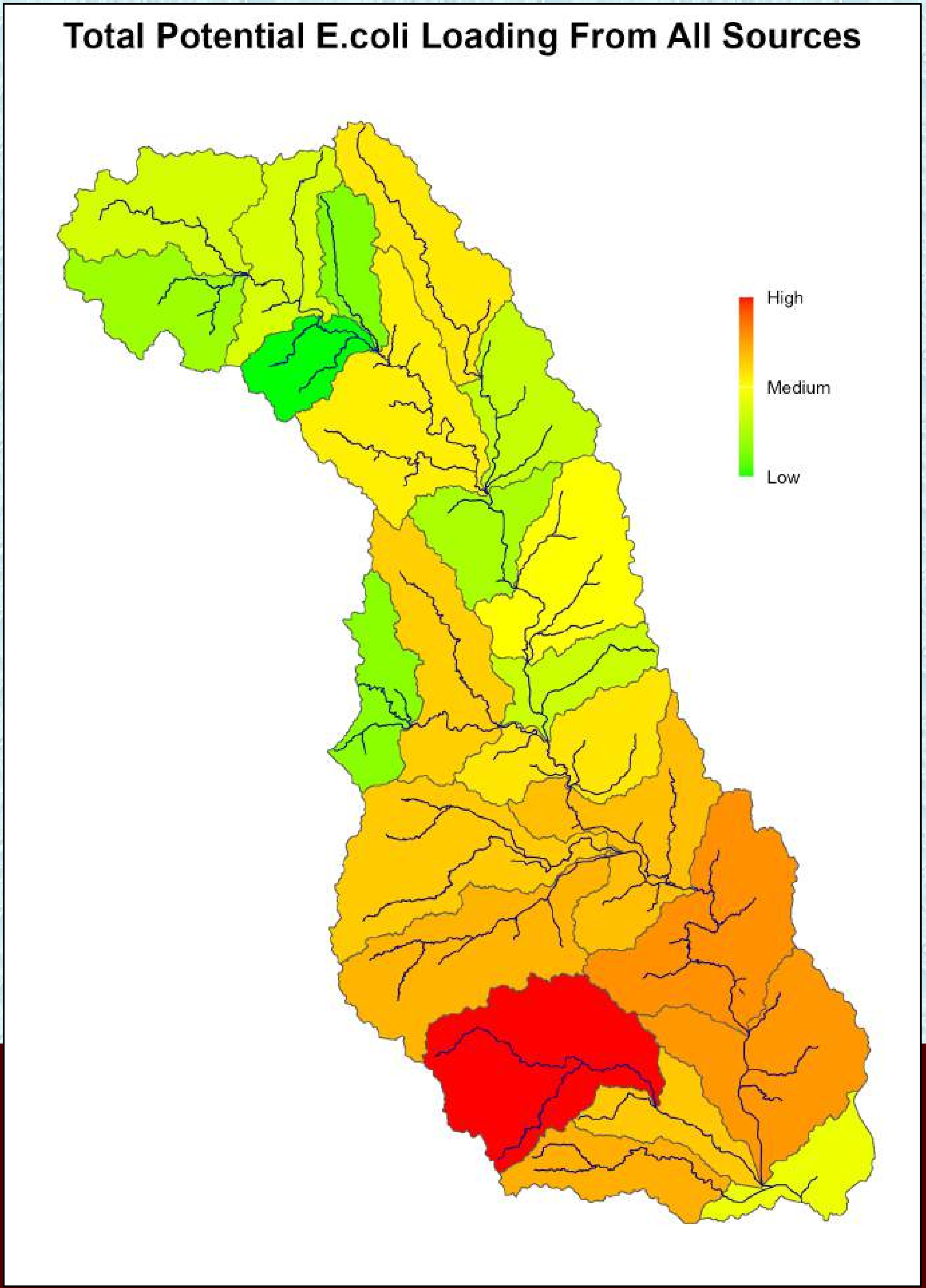
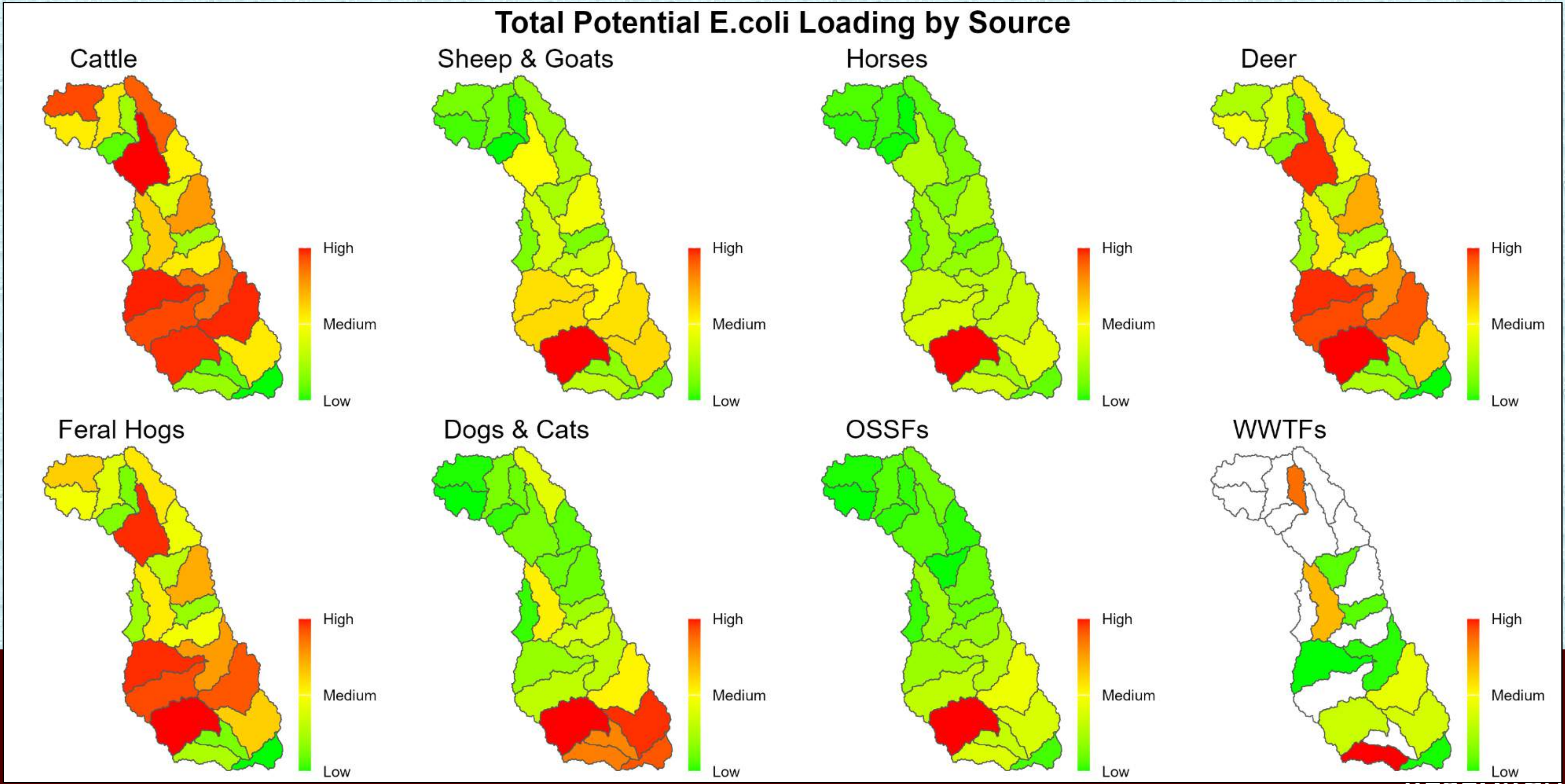
SELECT Potential Loading





SELECT Potential Loading



Load Reduction Strategies: *E.coli*

Average Stocking Rate		E.coli Reduction			
	Acre/Head	WF Trinity River Near Boyd	WF Trinity River Near Bobo	Ash Creek	Watershed
Baseline	7.4				
25%	9.9	10.7%	10.2%	2.6%	7.6%
50%	14.9	21.4%	20.3%	5.1%	15.2%
75%	29.7	32.1%	30.5%	7.7%	22.8%

OSSF Failure Rate Reduction	E.coli Reduction			
	WF Trinity River Near Boyd	WF Trinity River Near Bobo	Ash Creek	Watershed
10%	9.3%	10.1%	17.0%	12.4%
5%	18.5%	20.2%	34.0%	24.8%

Pet Reduction			E.coli Reduction			
	Dog	Cat	WF Trinity River Near Boyd	WF Trinity River Near Bobo	Ash Creek	Watershed
50%	0.307	0.1228	6.7%	6.8%	15.2%	9.5%
80%	0.2285	0.0914	10.7%	10.9%	24.2%	15.2%

1) Cattle Stocking Rate Modification

2) OSSF Failure Rate Improvement

3) Pet Reduction

Comments or Questions?

Guided Review: Chapters 3-5

- **General readability**
  - Clarity (weird wording, technical information not explained well)
  - Grammar (hopefully not, but I’m not perfect)
- **Content**
  - Anything questionable or that might be incorrect
  - Anything potentially useful that’s missing
- **Visuals**
  - Size, colors, legibility
  - Additional maps you’d like to see

<table>
<tr><th>Source</th><th>Management Practices/Behavior Concerns</th><th>Potential Impacts</th><th>Rank[1]</th><th>Priority[2]</th></tr>
<tr><td rowspan="4">Livestock (Cattle, Sheep, Goats)</td><td>Increased runoff from overgrazing of upland areas</td><td rowspan="4">1. Direct or indirect bacterial loading; 2. Loss of natural pollutant mitigation</td><td rowspan="4">1</td><td rowspan="4"></td></tr>
<tr><td>Manure transported to water body by runoff</td></tr>
<tr><td>Direct manue deposition in water body</td></tr>
<tr><td>Riparian buffer degradation/trampling</td></tr>
<tr><td rowspan="3">OSSFs</td><td>Straightpipes" and other illegal wastewater discharges</td><td rowspan="3">1. Direct or indirect loading of untreated wastewater (bacteria, nutrients); 2. Groundwater quality degradation</td><td rowspan="3">2</td><td rowspan="3"></td></tr>
<tr><td>Improperly treated aerobic effluent applied to land</td></tr>
<tr><td>Failure due to age, design, or lack of maintenance</td></tr>
<tr><td rowspan="3">Pets (Dogs and Cats)</td><td>Improper disposal of pet waste</td><td rowspan="3">1. Indirect bacterial loading from yards, parks, and pet facilities; 2. Spread of disease</td><td rowspan="3">3</td><td rowspan="3"></td></tr>
<tr><td>Disease trasnmission and public safety</td></tr>
<tr><td>Lack of education on impacts of proper disposal</td></tr>
<tr><td rowspan="3">Wildlife</td><td>Manure transported to water body by runoff</td><td rowspan="3">1. Direct or indirect bacterial loading; 2. Loss of natural pollutant mitigation</td><td rowspan="3">4</td><td rowspan="3"></td></tr>
<tr><td>Direct manue deposition in water body</td></tr>
<tr><td>Riparian buffer degradation/trampling</td></tr>
<tr><td rowspan="4">Feral Hogs</td><td>Manure transported to water body by runoff</td><td rowspan="4">1. Direct or indirect bacterial loading; 2. Loss of natural pollutant mitigation; 3. Loss of biodiversity</td><td rowspan="4">*</td><td rowspan="4"></td></tr>
<tr><td>Direct manue deposition in water body</td></tr>
<tr><td>Displacement/predation of native species</td></tr>
<tr><td>Riparian buffer degradation/trampling</td></tr>
<tr><td rowspan="2">WWTF</td><td>Failure due to age, stormwater inflow and infiltration, or lack of maintenance</td><td rowspan="2">1. Direct or indirect loading of untreated wastewater (bacteria, nutrients)</td><td rowspan="2">*</td><td rowspan="2"></td></tr>
<tr><td>Overloads from population growth or illicit connections</td></tr>
<tr><td rowspan="2">Yard Waste and Residue</td><td>Improper disposal of yard waste/clippings</td><td rowspan="2">1. Direct or indirect bacterial, nutrient, and hazardous chemical loading; 2. Impacts to aquatic wildlife</td><td rowspan="2">-</td><td rowspan="2"></td></tr>
<tr><td>Excessive fertilizer, herbicide, or pesticide application</td></tr>
<tr><td>SSOs</td><td>Failure due to age, stormwater inflow and infiltration, erosion, or construction damage</td><td>1. Direct or indirect bacterial loading; 2. Human health hazards</td><td>-</td><td></td></tr>
<tr><td rowspan="3">Illegal Dumping</td><td>Household/construction waste disposal in/near water body</td><td rowspan="3">1. Direct or indirect bacterial, nutrient, and hazardous chemical loading; 2. Human health hazards; 3. Flow obstruction/alteration</td><td rowspan="3">-</td><td rowspan="3"></td></tr>
<tr><td>Animal carcass/hunting remains disposal in/near water body</td></tr>
<tr><td>Disposal of large items (furniture, applicances, tires, vehicles)</td></tr>
<tr><td rowspan="2">Sediment and Flooding</td><td>Sediment loading and increased flooding in developing areas</td><td rowspan="2">1. Impact to aquatic life; 2. Impact to water supply capacity and flood capacity in EML; 3. Direct or indirect bacteria and nutrient loading from reunoff/erosion events; 4. Human health and safety hazard; 5. Infrastructure damage</td><td rowspan="2">-</td><td rowspan="2"></td></tr>
<tr><td>Loss of natural areas/green spaces</td></tr>
</table>

Poll: Pollutant Source Prioritization

- Link is in the chat or scan the QR code
- Take about 3-5 minutes to rank pollutant sources to focus on
  - Feel free to ask questions
  - We will discuss afterward
- Link will be sent out in a meeting recap for all EM MailChimp subscribers (that includes you if you're here) to garner more input
  - Final ranking from all voters will be discussed and finalized at the next meeting

EML WPP Pollutant Sources
Stakeholder Rankings

EM WPP – What's up next

- Next up:
  - Chapter 6: Management Strategies for Load Reductions
    - BMPs by pollutant source
  - Chapter 7: Plan Implementation
    - Schedule, estimated costs, financial and technical assistance, education and outreach
  - Chapter 8: Measuring Success
    - Monitoring, progress indicators
- Hoping to hold another meeting in August
  - Will frame out 6-8, but these will need some substantive stakeholder input on priorities and feasibility – will likely take multiple meetings to flesh this out and continue to refine WPP

Land Use Type: Agricultural and Rural	
Problem:	Overgrazing, invasive species, and soil amendments that result in landscape and riparian erosion which increases sediment and
Goal:	Strategically apply practices in ... nutrient runoff across landscap
Objectives:	AVOID soil and nutrient loss ... and amendments, and increasi
Location:	
Critical Areas:	
Priority Rang	
Practice	
Prescribed Gra *(Avoid)*	
Nutrient Manag *(Avoid)*	
Brush Manager *(Avoid & Cont*	
Critical Area Planting *(Control & Tra*	
Upland Wildlif Habitat Manag *(Control & Tra*	
Range Planting *(Trap)*	
Application Pr	
Effectiveness:	
Certainty:	landowner willingness to part
Needs:	Financial assistance through i ... demonstration projects, and w

USDA. NRCS. (2015) Field Office Technical Guide: Conservation Practices
USDA. NRCS. (2017) Conservation Practice Physical Effects on Soil, Water, Air, Plants, Animals, Energy, People; National Summary Tool

Management Measure	Responsible Party
Pet Waste	
Pet waste disposal ordinances/bylaws	
"Water Wise" lawn care training	Residents, landscapers
Education & outreach - direct marketing	Cities, counties, regional entities
Education & outreach - general	

Unit Cost	Units Implemented (by year) 1	2	3	4	5	6	7	8	9	10	Total Cost	Funding Source
N/A	As early as feasible										N/A	L, F3
$3,500	1			1							$10,500	F8,N1,N3
$17,000	1	1	1	1	1	1	1	1	1		$153,000	F8,N1,N3
$17,000	Assistance/input as needed										$17,000	F8,N1,N3

Management Measure	Responsible Party	Total Cost	1-3	4-6	7-9	10-12	13-15
General Watershed Awareness							
Multimedia information campaign	TRWD/Texas A&M AgriLife	$1,756,250	3	3	3	3	3
Texas Watershed Stewards Program							
Texas Riparian Workshop	Texas A&M AgriLife Extension	N/A[1]	1	1	1	1	1
Public School Education Program							
Nonpoint Source Pollution Educational Program	Texas A&M AgriLife	$150,000	3	3	3	3	3
Community Outreach Events – Display/handouts	TRWD/Texas A&M AgriLife	$ 3,000	3	3	3	3	3
Community Stream Cleanups	TRWD	$ 75,000	3	3	3	3	3
Installation of BMPs for educational purposes	TRWD/Texas A&M AgriLife	$ 25,000	1	1	1	1	1
Watershed Signage							
Education Coordinator/Watershed Coordinator	TRWD/Texas A&M AgriLife	$1,425,000[2]	3	3	3	3	3
Agricultural Programs							
Producer educational workshops – Nutrient Management, Crop Management, Grazing Management, Riparian Management	Texas A&M AgriLife	$ 2,500	4	4	4	4	4
Soil Testing Campaign	Texas A&M AgriLife	$ 67,000	3	3	3	3	3
Producer Education – Ag BMPs and SWCD/NRCS Technical Assistance	Texas A&M AgriLife	$ 3,500	1	1	1	1	1
BMP demonstration sites	Texas A&M AgriLife	$ 20,000					
Urban Programs							
Workshops and information for municipalities on storm water management, urban landscape management, soil testing, low impact development	Texas A&M AgriLife	$ 90,000	4	4	4	4	4
Program to promote neighborhood association recognition for environmentally friendly landscaping	TRWD/Texas A&M AgriLife	$ 12,000	3	3	3	3	3

Management Measures[1]	Anticipated *E. coli* Load Reduction	Other Management Goals
Pet Waste		
Pet waste disposal ordinances Supplemental pet waste stations Bioswale/raingarden projects Backyard pet waste digesters	2.30E+15 MPN/yr	-
Lawn Residue and Waste		
Illicit discharge surveys Lawn waste management ordinances Permeable paver sidewalks/driveways, rain barrels, low-water plantings, bioswale/rain garden projects, bio retention ponds	*1.86E+01 Ton/yr (Nutrients)*	Nutrient reduction to remove existing concerns
Livestock		
WQMPs and CPs	1.08E+15 MPN/yr	-
OSSFs		
Incentivized OSSF inspections/pumpouts HOA/NA-coordinated OSSF cleanout events Practice-focused OSSF training Septic-to-sewer initiatives OSSF inspection ordinances for property transfers	4.71E+12 MPN/yr	-
Illegal Dumping and Litter Accumulation		
Illegal dumping surveys Rural home hazardous waste pickup/dropoff days JPL cleanup events	-	15% of sites shift to lower impact category
SSOs		
Support for interdepartmental reporting network for SSO locations Stormwater infrastructure assessments Permeable paver parking lots	-	Reduce instance of SSOs in watershed by 10%
Sediment and Flooding		
Riparian, wetland and/or stream restoration projects Stormwater infrastructure assessments Identify and install green infrastructure	-	-
Feral Hogs		
Trap share program Establish regional feral hog resource and support network Feral hog removal and/or exclusion from attractive nuisances Riparian buffer restoration/extension	1.20E+13 MPN/yr	-
Total Anticipated *E.coli* Load Reductions	3.40E+15 MPN/yr	
Anticipated Nutrient Load Reductions	1.86E+01 Ton/yr	

(1) Note that all management measures categories include education and outreach components.

Contact Info

- Katie Myers, Rural Programs Coordinator
  - Katie.myers@trwd.com
- General watershed inquiries: watersheds@trwd.com
- Our website: https://www.trwd.com/watersheds/