

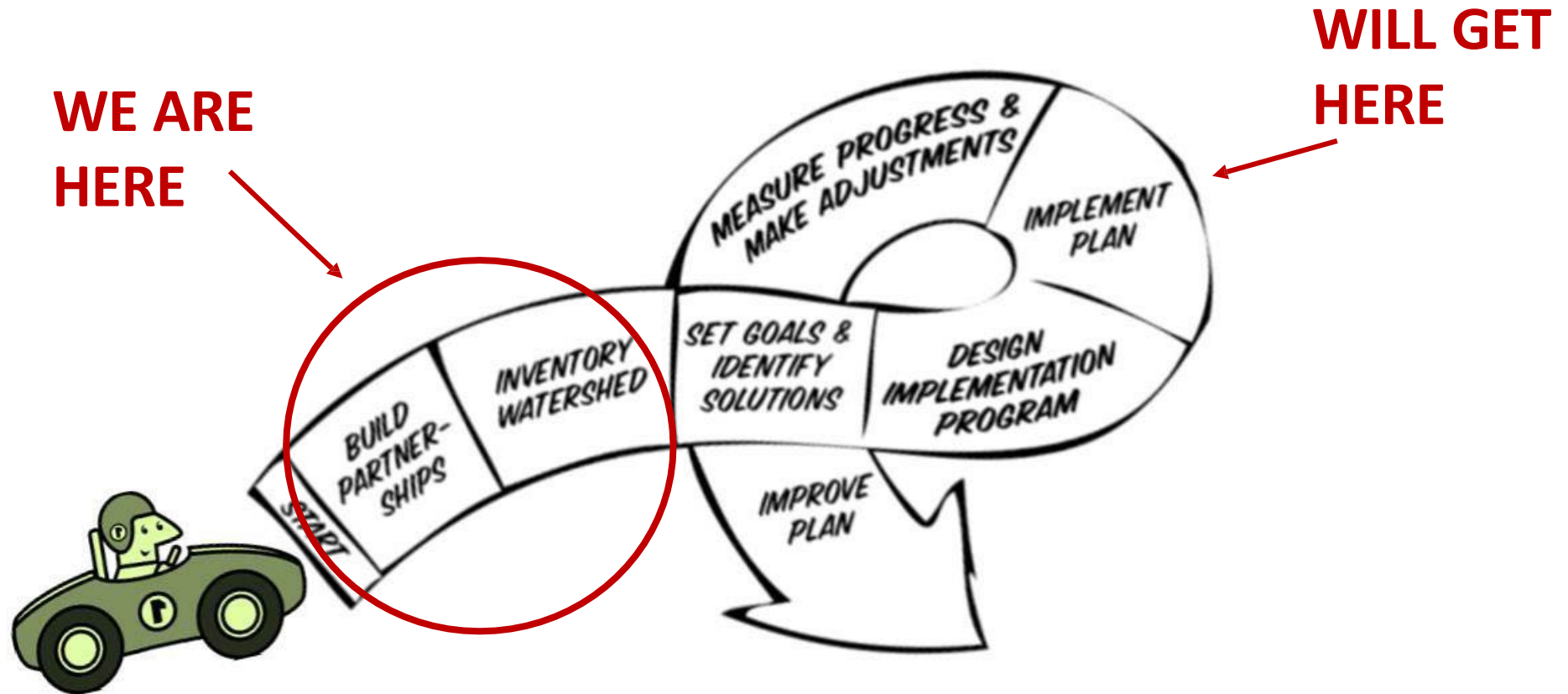
LTWMP TAG MEETING November 19, 2020

Welcome to the first Technical Advisory Group Meeting!



Today's meeting will be led by: Dr. Bob Pavlowsky, Missouri State University

ROAD MAP



...FINAL PLAN DELIVERED TO MDNR ON NOVEMBER 2022

Technical Components

- Review existing information and water quality data
- STEPL Modeling of NPS loads, including effects of land use, soil disturbance, and bank erosion.
- Assess shoreline erosion and tributary mouth sedimentation.
- Demonstration projects: (1) pervious pavement installation in Branson; and (2) Riparian tree plantings and other improvements at Lewis CA on Bull Creek.
- Water quality monitoring :
 - Review existing data
 - Baseflow monitoring of stream and lake sites (n=13 sites x 5 runs x TN, TP, TSS, DO, T, pH)
 - Review point source locations, discharges, and estimated loads for impact on baseflow water quality.
 - Load reduction monitoring/modeling for demonstration projects.
- Water quality concerns survey (Summer 2021...)



Polluted Runoff: Nonpoint Source (NPS) Pollution

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Polluted Runoff: NPS Pollution Home

Basic Information

Types of NPS Pollution

Success Stories

Resources for Using a Watershed Approach

Webinars

Technical Guidance and Tools

Nonpoint Source News-Notes

NPSINFO Discussion Forum

Spreadsheet Tool for Estimating Pollutant Loads (STEPL)

The Spreadsheet Tool for Estimating Pollutant Load (STEPL) employs simple algorithms to calculate:

- nutrient and sediment loads from different land uses, and
- the load reductions that would result from the implementation of various best management practices (BMPs).

On this page:

- [Overview](#)
- [Model Download and Documentation](#)
- [Input Data Server for STEPL](#)
- [Training Materials](#)

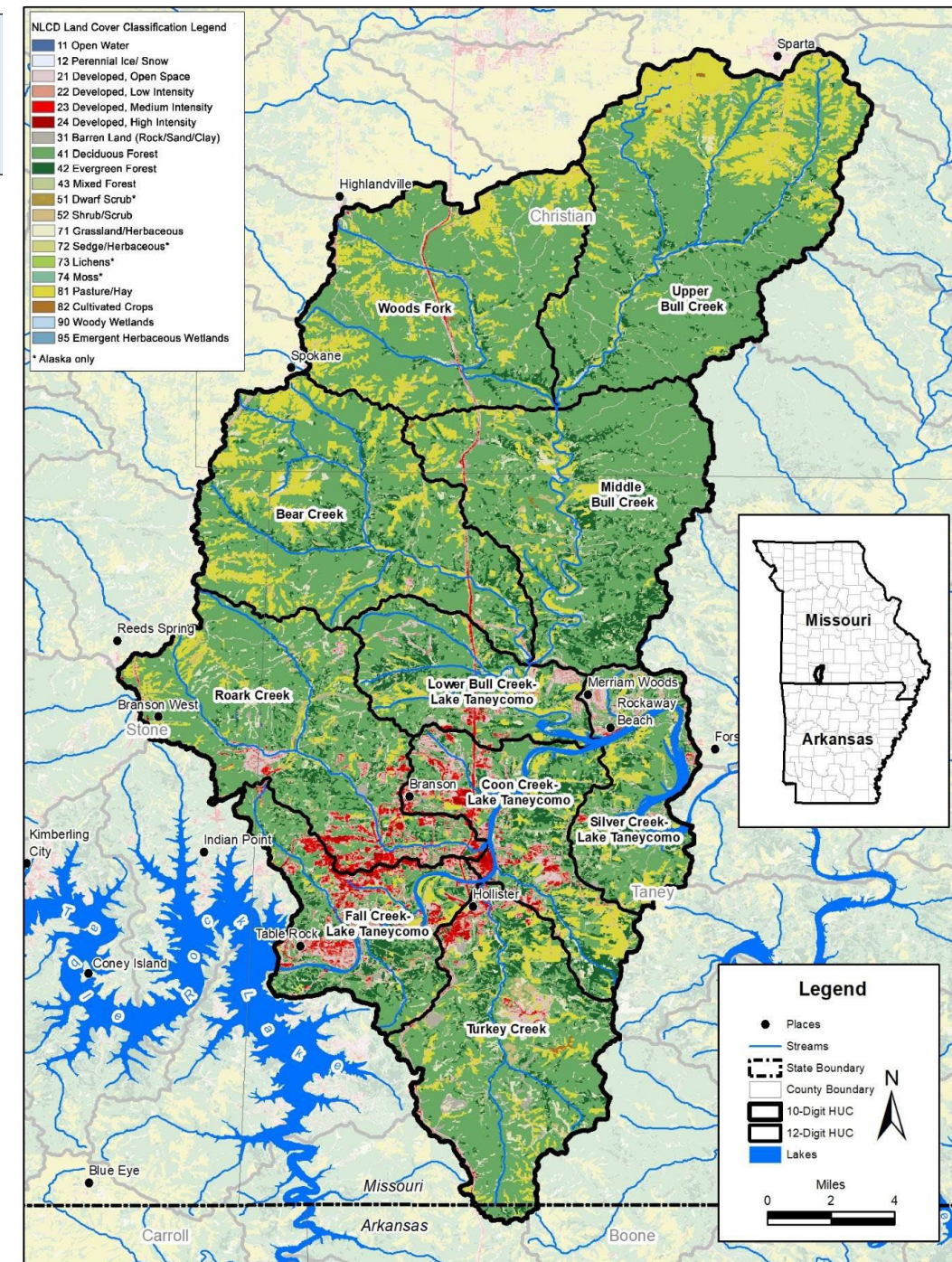
Questions or Comments?

- [View our questions and answers about STEPL and the Region 5 Model](#)
- [Contact email-based Help Desk for STEPL Model support.](#)

NPS= Land use runoff & inputs

Subwatershed	Watershed Area acres	Land Use %				
		Urban	Crops	Pasture	Forest	Water
Bear Creek	28,228	5.3	0.004	21.9	72.8	0.0
Coon Creek	14,404	28.2	0	16.0	52.5	3.3
Fall Creek	13,992	31.4	0	6.7	58.9	2.9
Lower Bull Creek	11,586	16.7	0.015	12.0	69.0	2.3
Middle Bull Creek	26,630	6.1	0	9.8	83.9	0.2
Roark Creek	24,221	19.8	0.005	9.7	70.2	0.2
Silver Creek	11,402	16.2	0	13.8	60.2	9.8
Turkey Creek	22,101	15.2	0	14.8	69.8	0.3
Upper Bull Creek	36,184	3.5	0	24.5	71.8	0.1
Woods Fork	26,281	6.5	0.020	22.0	71.5	0.0

- 1) >50% forest
- 2) Six subwatersheds >15% urban
- 3) Three subwatersheds >20% pasture/grazing



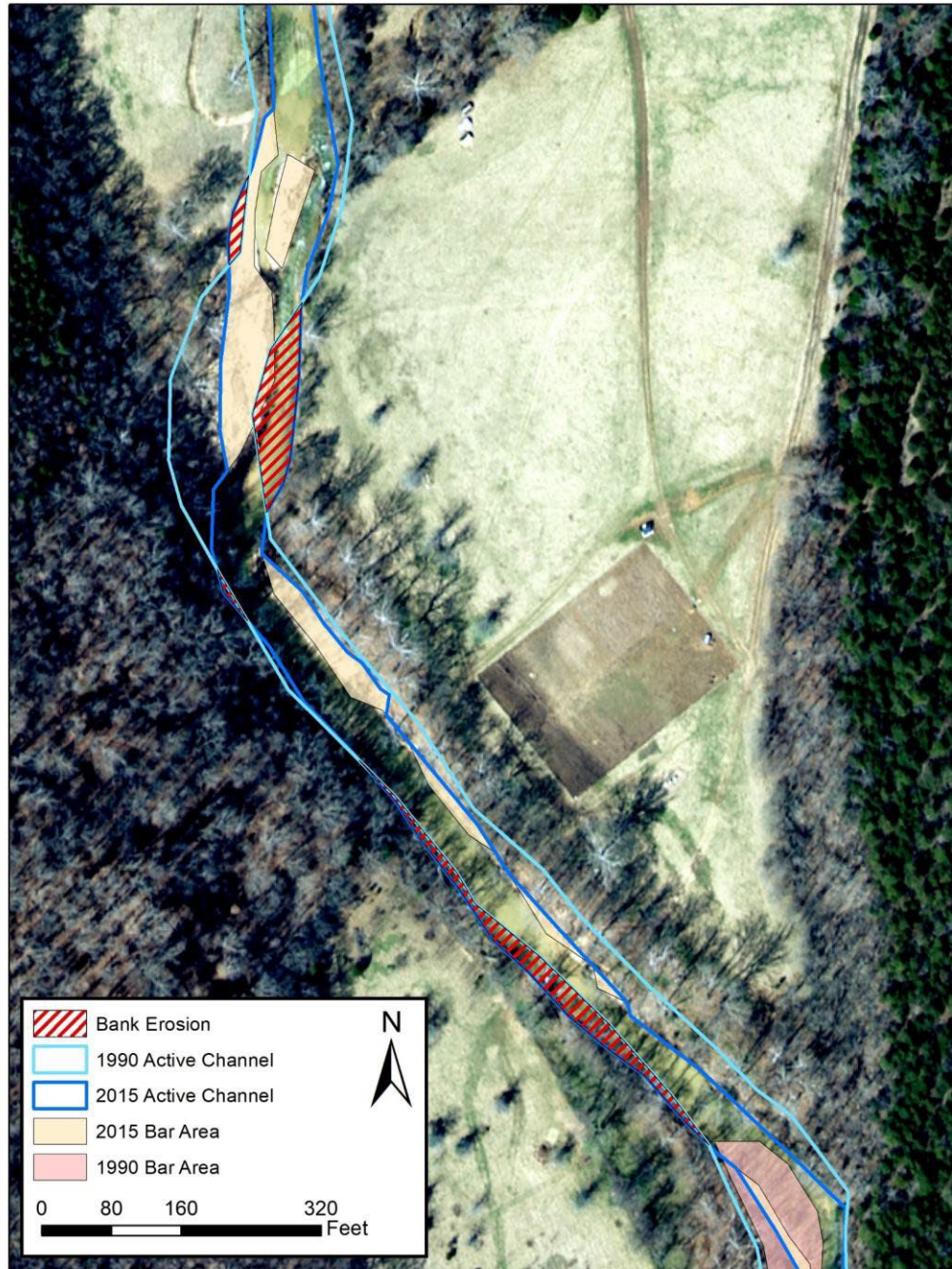
Preliminary STEPL NPS YIELDS

Subwatersheds (HUC-12)	Drainage Area (ac)	STEPL Yields (mass/area/year)			Nonpoint Input Ratio Present-day/Presettlement Yields		
		N (lb)	P (lb)	TSS (t)			
Bear Creek	28,243	5.09	1.46	1.08	3.8	2.7	3.0
Coon Creek	14,408	5.95	1.22	0.70	4.7	2.3	2.5
Fall Creek	14,010	5.89	1.37	0.83	4.2	2.3	2.6
Lower Bull Creek	11,586	5.42	1.45	1.01	3.5	2.3	2.7
Middle Bull Creek	26,648	4.28	1.30	1.03	2.6	1.9	2.6
Upper Bull Creek	36,221	5.00	1.53	1.16	3.5	2.7	2.9
Roark Creek	24,236	5.09	1.29	1.01	4.2	2.5	3.7
Silver Creek	11,420	5.61	1.55	1.01	4.5	3.0	3.4
Turkey Creek	22,129	5.42	1.42	0.96	4.3	2.7	3.5
Woods Fork	26,302	4.41	1.28	1.03	2.7	2.0	2.3

Preliminary Analysis

Contribution of bank erosion to NPS Loads

Suspended sediment: potentially 20 to >50% ???



Site	N	P	TSS	Stream Channels Assessed	
				Length (mi)	Total Length (%)
Bear Creek	8	11	22	26.9	49
Coon Creek	5	10	31	6.6	100
Fall Creek	4	6	19	6.9	93
Lower Bull Creek	8	12	27	11.1	36
Middle Bull Creek	16	21	39	29.9	48
Upper Bull Creek	3	4	9	36.1	32
Roark Creek Silver	12	18	44	16.9	96
Creek Turkey	0	0	0	0.0	0
Creek Woods Fork	5	7	16	20.7	41
	8	11	25	24.1	91

Water Quality Monitoring (2020)

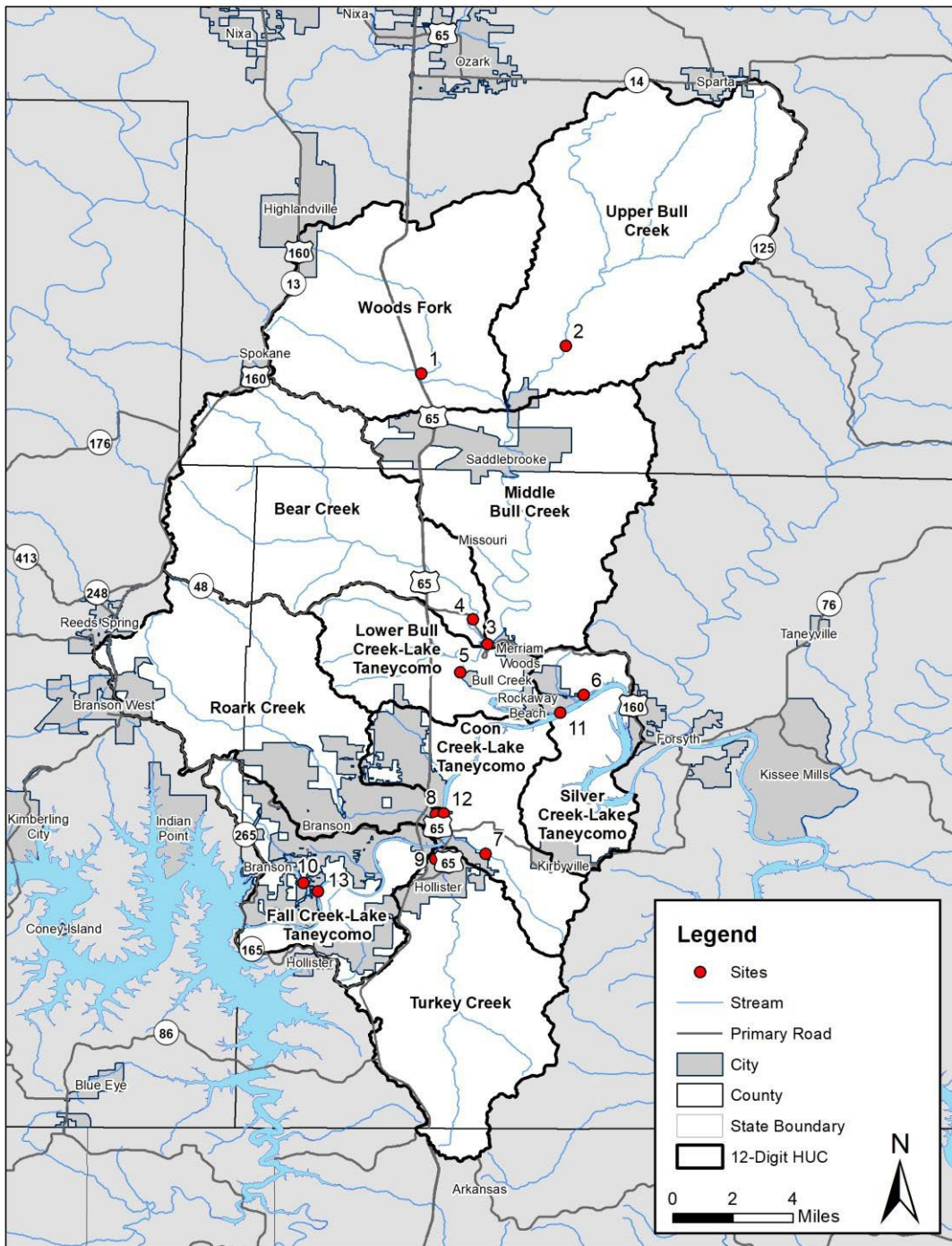
QAPP Submitted= Aug 11

First monitoring run= Sep 10

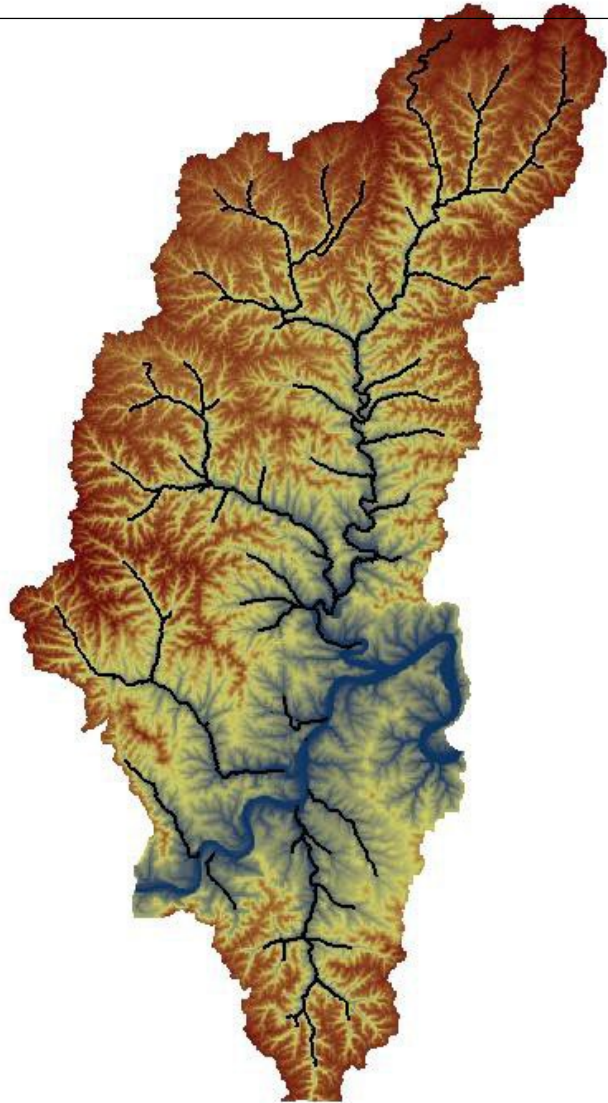
Nutrient Criteria (mg/l)	TN	TP
Table Rock Lake	0.25	<0.01
Lake arms-river mouths	0.5	0.02
James River TMDL	1.5	0.05

DO criteria (mg/l)	
cold water	6
cool/warm water	5

Sub-Watershed	Sampling Site	TP mg/l	TN mg/l	DO mg/l
Woods Fork	1	<0.01	1.5	4.6
Upper Bull Creek	2	<0.01	0.9	6.4
Middle Bull Creek	3	<0.01	0.9	7.6
Bear Creek	4	<0.01	1.1	8.7
Lower Bull Creek	5	<0.01	1.0	7.1
Silver Creek	6	0.01	1.3	3.0
Coon Creek	7	<0.01	1.0	6.2
Roark Creek	8	0.32	1.2	4.1
Turkey Creek	9	0.35	1.7	4.3
Fall Creek	10	<0.01	0.8	4.1
Lake- Rockaway Beach	11	0.01	1.5	6.4
Lake- Branson Landing	12	0.01	1.6	5.7
Lake- Fall Creek Marina	13	0.01	1.3	5.6

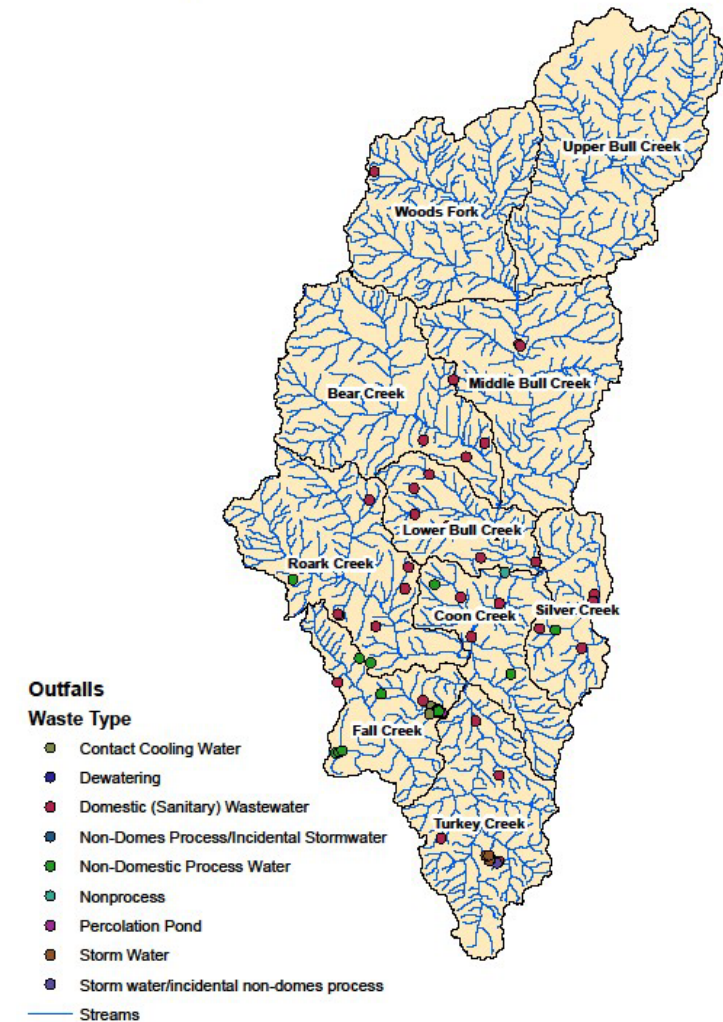


Reach-scale bank erosion evaluation

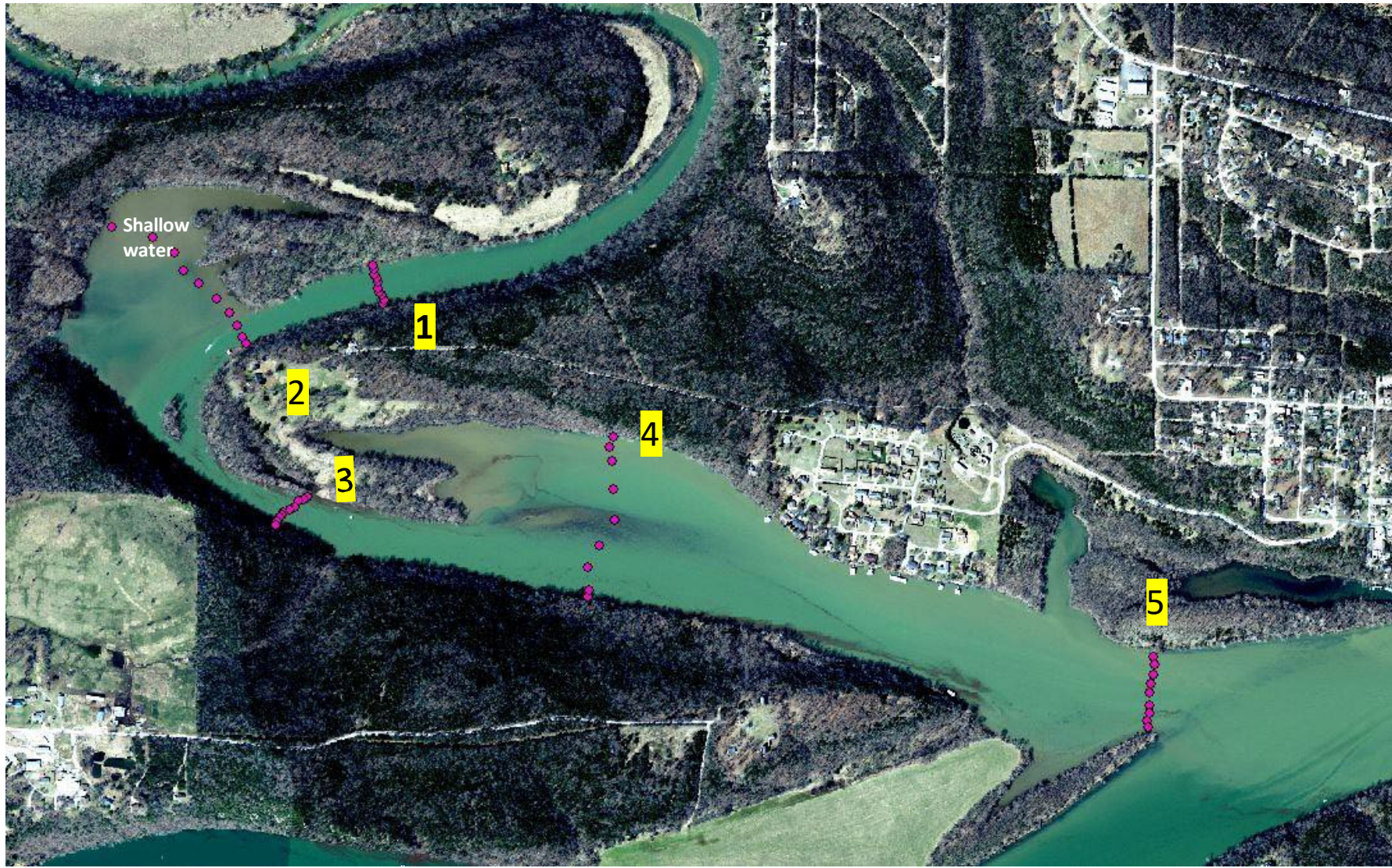


Point Source Effects

Lake Taneycomo-White River Watershed Outfalls (2015)

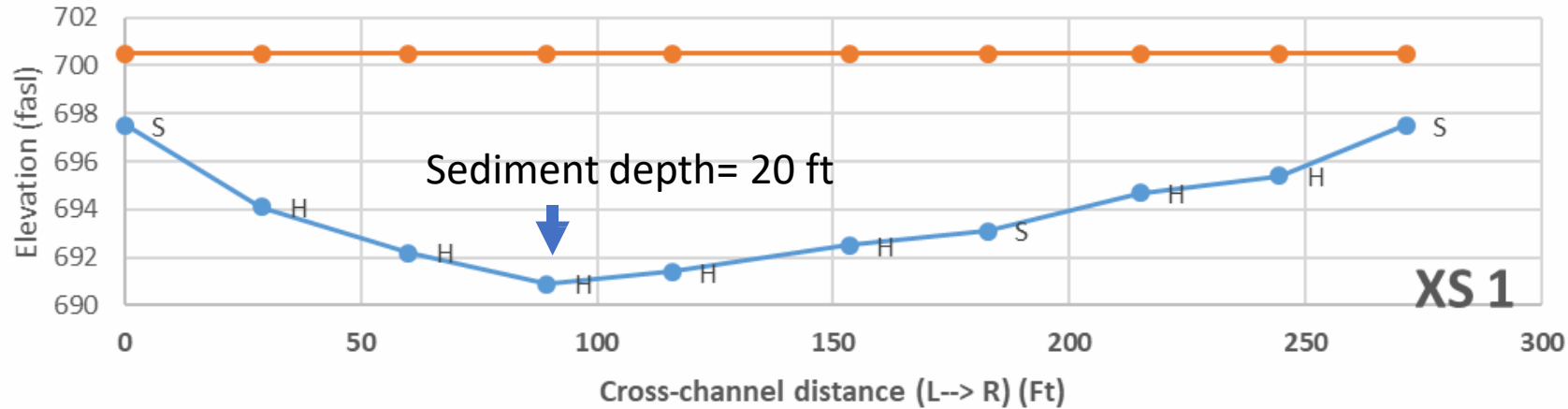


Field assessment: Lake sedimentation at mouth of Bull Creek

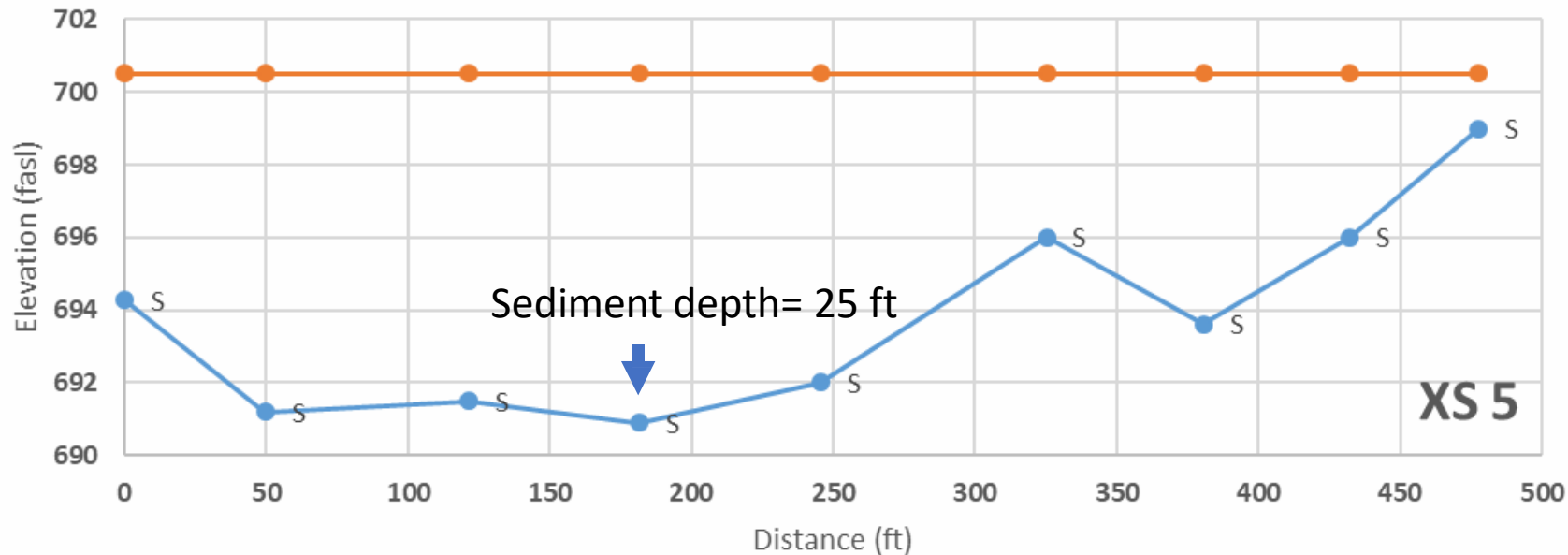


Bull Creek Mouth Channel Surveys by MSU-OEWRI

Depth of sediment compared to 1913 survey (Kesler, 1936)



Kesler, T.L., 1936. **Advance Report on the Sedimentation Survey of Laek Taneycomo, Taney County, Missouri: July 23-November 2, 1935.** Division of Research, Section of Hydrodynamic Studies, Soil Conservation Service, Department of Agriculture, Washington, D.C.



NEED LOCAL INPUT ON WHERE SEDIMENTATION IS CAUSING PROBLEMS.

Shallow clear water allowing vegetation to grow maybe indicating eutrophication.

However, sedimentation is an NPS & river dam effect, not source...

Upcoming deadlines

- 1) DEC 2020- NPS Load modeling and analysis
- 2) FEB 2021- Bank erosion hotspot assessment
- 3) WINTER-SPRING 2021- Shoreline and sedimentation assessment
- 4) Water quality sampling every 2-3 months
- 5) JAN 2021- Start to write the watershed plan...

Questions and Discussion

