





Buffalo River TMDL Implementation Plan Development

First Public Meeting

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AGENDA

- Human health and water quality
- TMDL Review
 - Impaired Segments
 - Watershed Characterization
 - Source Assessment
 - TMDL Allocations
- TMDL Implementation Plan Process
- Public Participation Overview
- Implementation Plan Development Timeline



WHY DO WE NEED A PLAN FOR CLEAN WATER?

- **Too much *E.coli***
 - Human health concern
 - Risk based standard
 - Indicator of pathogens in the water (viruses, protozoans, bacteria)
 - Impacts on livestock
 - >50% of cattle diseases in mid-Atlantic transmitted through fecal oral pathway



WHERE IS THE BACTERIA COMING FROM?

- ***E. coli* is found in warm blooded animals**
 - Humans
 - Wildlife
 - Livestock
 - Pets
- **Some bacteria deposited on the land ends up in local creeks**
- **Impact of direct deposition of bacteria in the creek**



RELEVANT WATER QUALITY STANDARDS

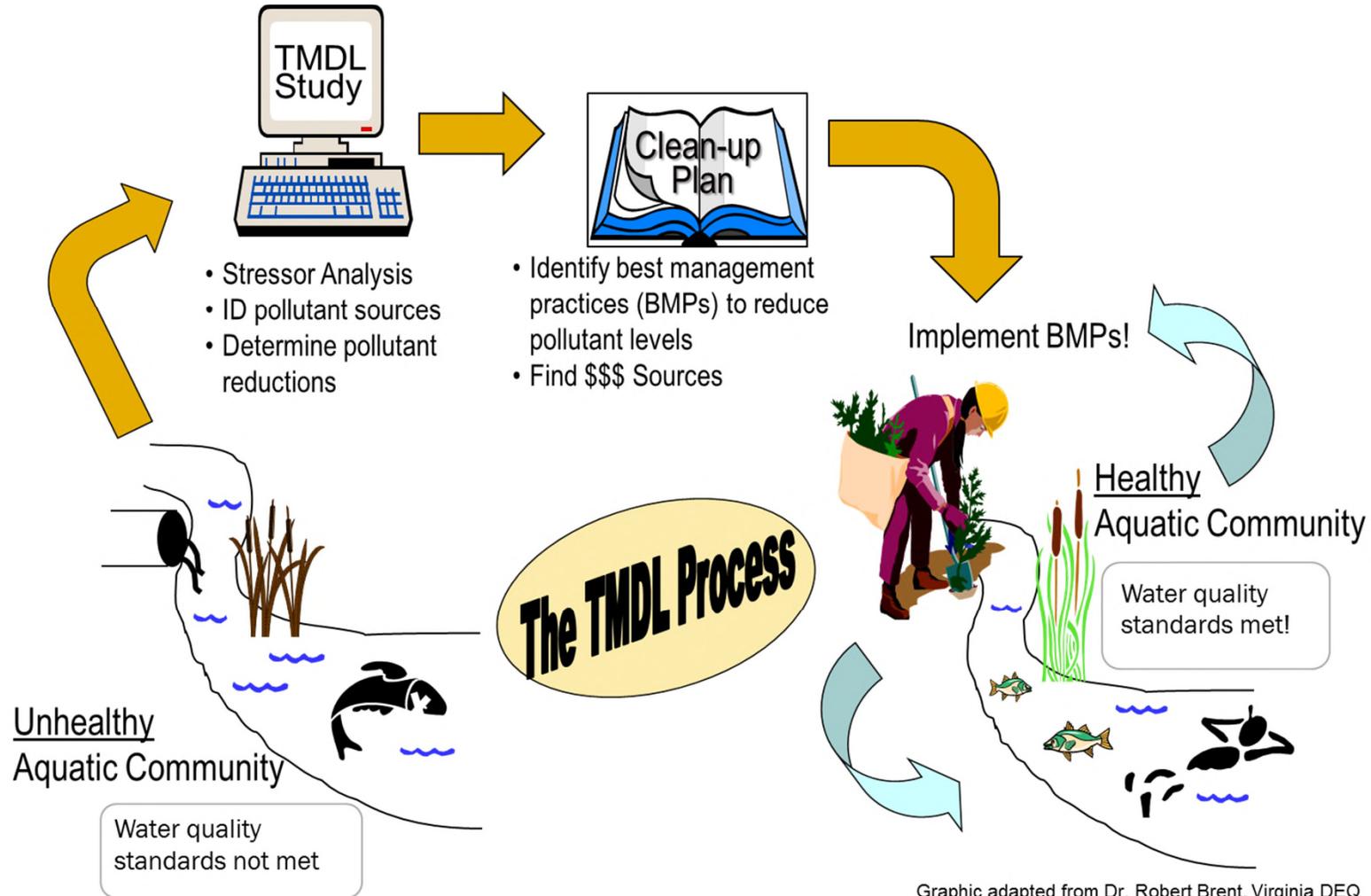
VADEQ specifies the following criteria (9 VAC 25-260-170) for primary contact recreational uses in Class III (non-tidal) freshwater:

Escherichia coli (E. coli):

- 126 CFU/100mL
 - (geometric mean: applies to 4 or more samples obtained in 1 calendar month)
- 235 CFU/100mL
 - (single sample maximum: no more than 10% of the total samples shall exceed)

If water quality standards are not being met, the waterbody is designated as impaired and in need of a TMDL.

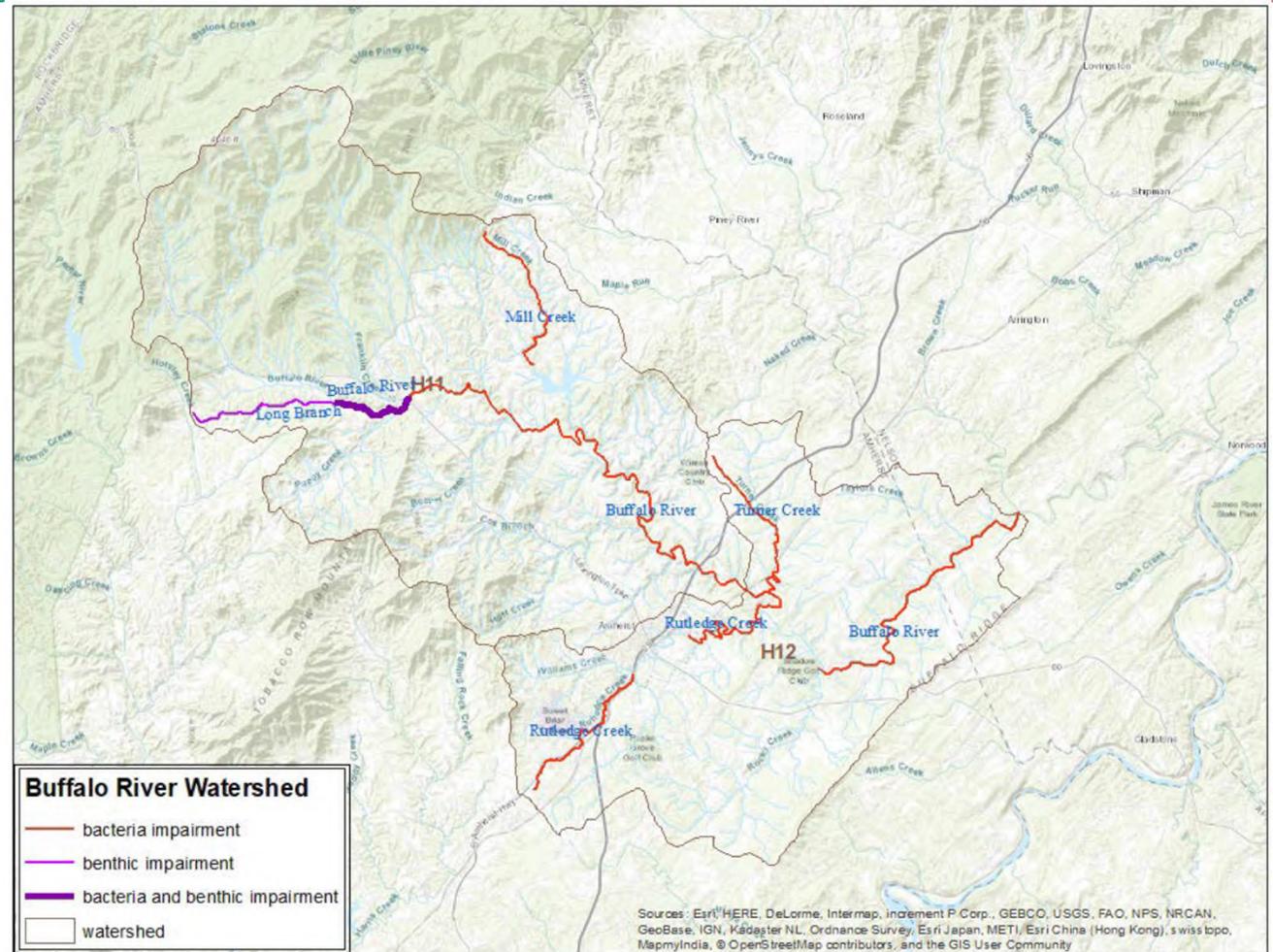
TMDL AND TMDL IMPLEMENTATION PLAN PROCESS



Graphic adapted from Dr. Robert Brent, Virginia DEQ

TMDL REVIEW

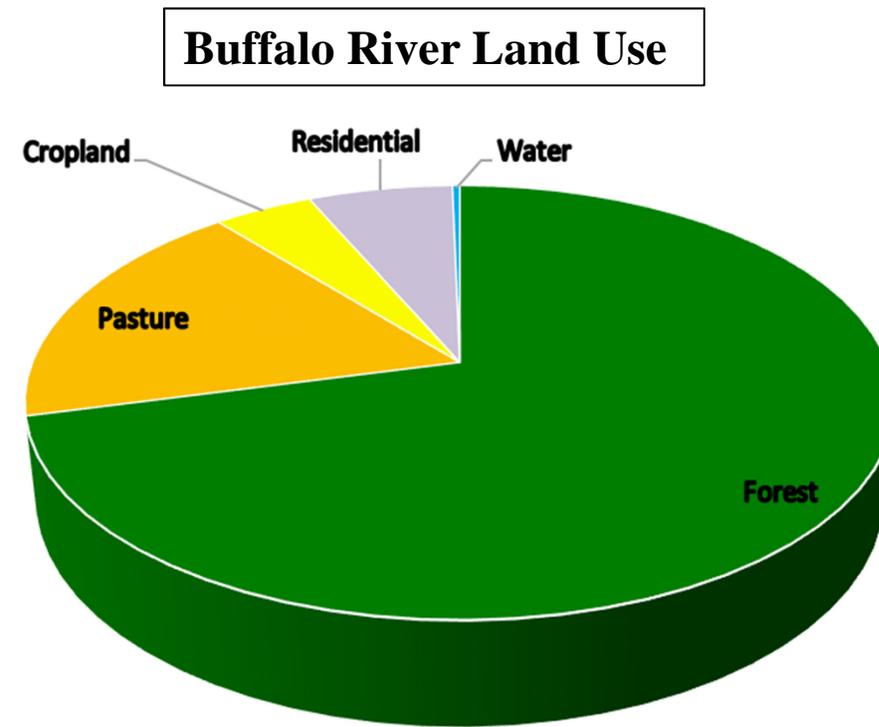
- Two TMDL reports:
 - **Bacteria Total Maximum Daily Load Development for Hat Creek, Piney River, Rucker Run, Mill Creek, Rutledge Creek, Turner Creek, Buffalo River and Tye River in Nelson County and Amherst County, Virginia (2013)**
 - **Sediment TMDL Development Report for Benthic Impairments in Long Branch and Buffalo River Amherst County, Virginia (2013)**



LAND USE

- Major driver of pollutant loading
- Since the development of the original TMDLs, there has been little change in land use

Land Use	Area (Acres)	% of Total
Cropland	4,333	4.4
Forest	69,767	71.1
Pasture	17,442	17.8
Residential	6,300	6.4
Water	324	0.3
Total	98,166	-





IMPAIRED SEGMENTS

- **Bacteria Impairments**

- Turner Creek – 4.49 miles impaired – headwaters to confluence with Buffalo River
- Mill Creek – 4.15 miles impaired – headwaters to Mill Creek Reservoir
- Rutledge Creek – 7.48 miles impaired – headwaters to Higginbottom Creek; Town of Amherst outfall to confluence with Buffalo River
- Buffalo River – 23.48 miles impaired – Franklin Creek to Rutledge Creek; Rocky Creek to confluence with Tye River

- **Sediment Impairments**

- Long Branch – 3.59 miles impaired – headwaters to confluence with Buffalo River
- Buffalo River – 2.09 miles impaired – Long Branch to Franklin Creek

BACTERIA REDUCTIONS NEEDED for DELISTING

Impaired Segment	Livestock DD*	Cropland	Pasture	Straight Pipes	Failing Septic Systems	Wildlife DD
Mill Creek	80	5	20	100	100	0
Turner Creek	65	5	30	100	100	0
Rutledge Creek	60	5	30	100	100	0
Buffalo River	10	5	5	100	100	0

*DD – direct discharge to stream

% reduction needed from existing bacteria loads

EXISTING SEDIMENT LOADS and ALLOCATIONS

Impaired Segment	Row Crops	Pasture/ Hayland	Forest	Harvested Forest	Residential	Channel Erosion	Permitted WLA*	Total Load	% Reduction Needed
	tons/yr								
Long Branch	18	832	109	9	25	1	16	1,010	52%
Buffalo River	125	4,653	1,782	142	664	134	342	7,842	45%

*WLA – waste load allocation

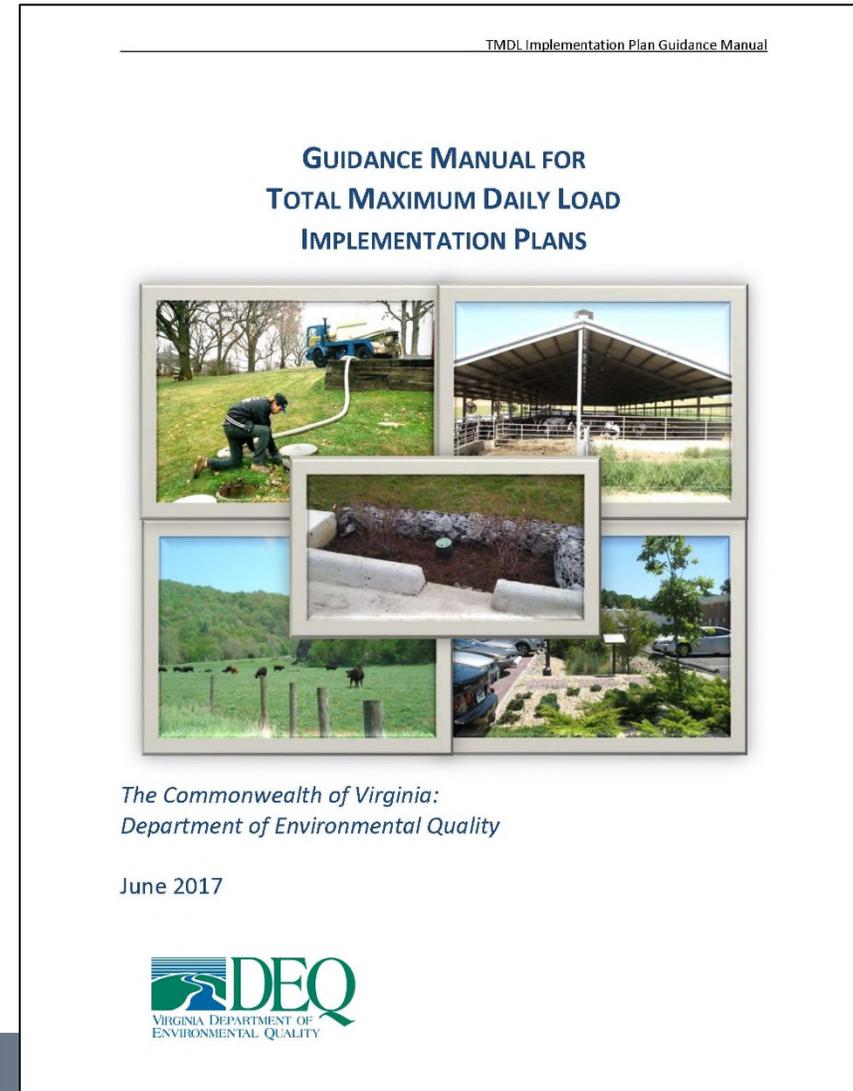


TMDL IMPLEMENTATION PLAN PROCESS

- TMDL identifies **what** we need to do to attain water quality standards
- Implementation plan tells us **how**
 - IP outlines and provides guidance on the actions necessary to improve water quality within the impaired watershed

TMDL IMPLEMENTATION PLAN

- Required by state legislation
- Procedures for development of implementation plans outlined in the *Guidance Manual for Total Maximum Daily Load Implementation Plans* (VADEQ 2017)



TMDL IMPLEMENTATION PLAN

Goals

- Reduce pollutant(s) to levels in TMDL
- Restore the waterbodies to conditions that support beneficial uses and attain use standard
- Ultimate goal is to delist the polluted waterbodies from the 303(d) list



TMDL IMPLEMENTATION PLAN

State Requirements

- Date of expected achievement of water quality objectives
- Measurable goals and milestones
 - Implementation milestones
 - Water quality milestones
- Necessary corrective actions
 - Types and numbers of BMPs
- Associated costs, benefits, and environmental impact of addressing the impairment

OTHER COMPONENTS

- Identify existing best management practices (BMPs) that reduce the pollutant of concern (bacteria)
- Public and stakeholder participation
- Cost estimates for proposed BMPs
- Technical assistance in outreach, education, and helping landowners design and construct BMPs
- Analyze benefits of implementing BMPs
- Targeting strategies to maximize cost effectiveness
- Potential funding sources
- Track BMP implementation and water quality improvement through surface water monitoring

DATA NEEDS: SOURCES INVENTORY AND ASSESSMENT

- Human – Failing waste disposal methods (septic systems, sewer, straight pipes)
 - Inventories, failure rates, spatial data
- Livestock – Direct deposition and nonpoint source from stream access and grazing, confined animal feeding facilities, manure management
 - Livestock inventory
- Wildlife – Direct deposition and nonpoint source
 - Wildlife inventories
- Pets
 - Pet inventories



PUBLIC PARTICIPATION

- Importance of local input
- Voluntary participation
- Opportunities to participate
 - **Public Meetings**
 - Informational
 - Solicit public involvement in the process
 - Provide a forum for public comments
 - **Working Groups**
 - Address community issues and concerns
 - **Steering Committee**
 - Direct overall process
 - Review input from working groups
 - Review future implementation



WORKING GROUPS

- Agricultural
 - Residential
 - Government
-
- Meet 1 to 2 times during development

AGRICULTURAL WORKING GROUP

- **Responsibilities:**
 - Identify potential constraints to implementation
 - Review implementation strategies from an agricultural perspective
 - Identify alternative funding sources/partnerships
 - Identify methods for engaging agricultural producers

RESIDENTIAL WORKING GROUP

- **Responsibilities:**
 - Identify potential constraints to implementation
 - Evaluate corrective actions and costs
 - Identify methods of outreach to homeowners with sewage problems
 - Review implementation strategies from a homeowner's perspective
 - Identify alternative funding sources/partnerships

GOVERNMENT WORKING GROUP

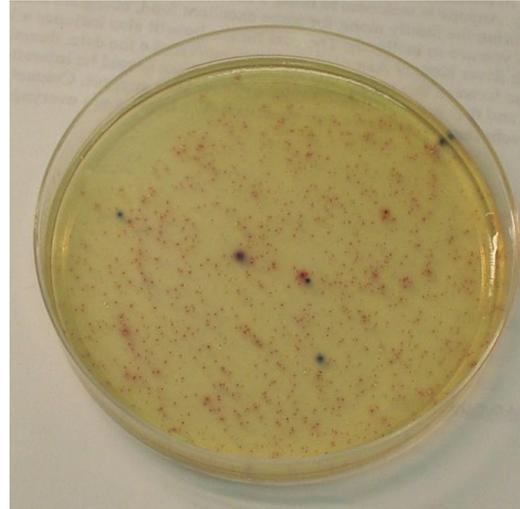
- **Responsibilities:**
 - Identify available technical resources
 - Identify regulatory controls currently in place
 - Identify appropriate “measurable goals” and timeline for achievement
 - Identify funding sources
 - Identify potential parties to be responsible for agricultural and residential implementation

STEERING COMMITTEE

- Representatives from each working group
- Local, state, and federal agency representatives
- Citizens within the watershed
- **Meet:** One time during plan development
- **Responsibilities:**
 - Review contractor's results
 - Assess input from working groups
 - Address community concerns/suggestions
 - Help guide the process
 - Are we getting “representative” input?
 - How can we do better?

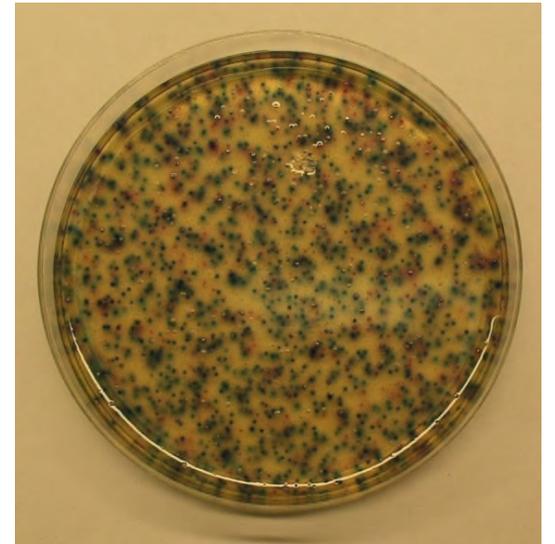
WHAT WILL BE THE CHALLENGES?

- Paying for the work
- A lot of fencing...
- Finding straight pipes and failing septic systems
- Working with “the government”
- Can’t “see” bacteria



Bacteria in sample upstream of livestock access point

Bacteria in sample downstream of livestock access point



THE GOOD NEWS...

- Over \$275,000 spent on agricultural BMPs in Buffalo River and Rutledge Creek since 2008.
- Nearly 10 miles of streamside exclusion fence
- 708 acres rotational grazing systems
- 12 acres of reforestation of erodible pasture
- 8 acres permanent vegetative cover on cropland
- 243 acres nutrient management planning

NEXT STEPS

- December 2020 – 1st working group meetings (Agricultural/Residential and Government)
- February 2020 – 2nd Agricultural/Residential working group meeting
- August 2020 – Draft TMDL IP Report
- August 2020 – Steering Committee Meeting
- September 2020 – Final Public Meeting
- September – October 2020 – Public comment period
- October 2020 – Final Public TMDL IP Report

CONTACTS



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