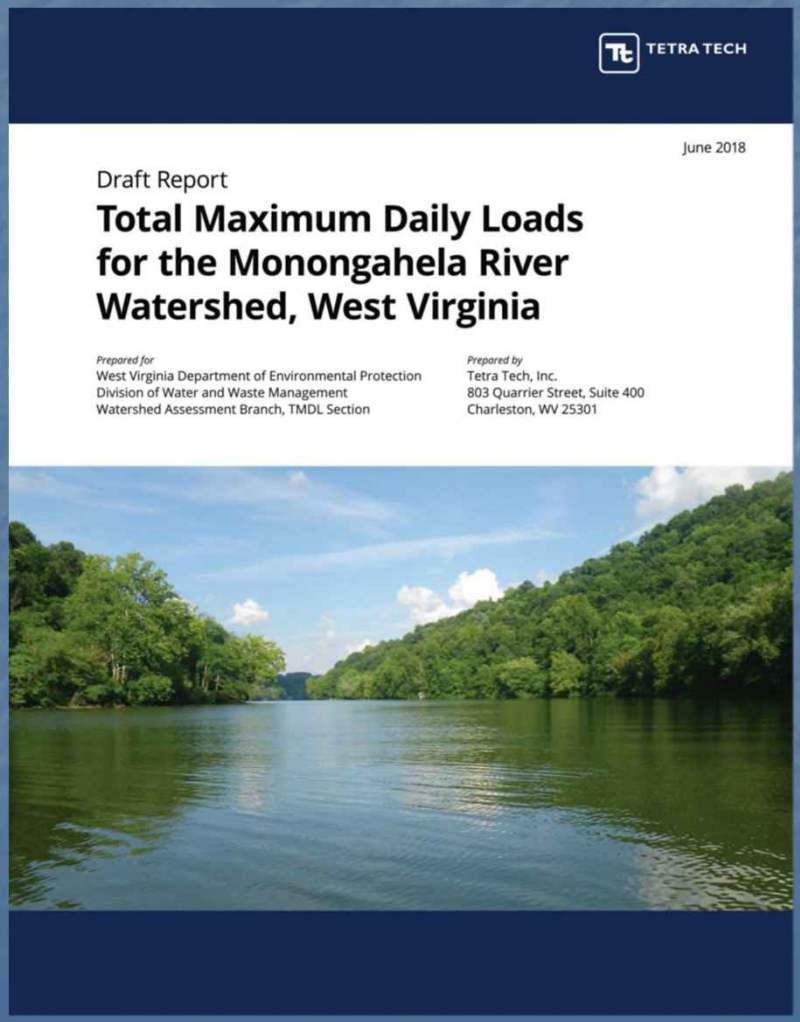
West Virginia Department of Environmental Protection



Draft TMDLs for Monongahela River Watershed

June 7, 2018

Agenda

- Project Timeline/History
- TMDL/Water quality standards recap
- Overview of TMDL effort
- Explanation/demonstration of electronic documents, spreadsheets, tools
- Questions and answers

WVDEP TMDL Process (4 yrs)

- Stream Selection - (2/2014)
- Pre-TMDL monitoring, source identification and characterization - (7/2014 – 6/2015)
- Contract to model water quality and hydrology – (7/2016)
- Determine baseline condition and allocate pollutant loads
- Draft Report comment period – (**5/24 – 6/25**)
- **Draft TMDL Public Meeting – 6/7**
- Finalization and EPA approval

What's a TMDL?

- "Total Maximum Daily Load"
  - (1) How much pollutant a stream can receive and remain healthy
  - (2) Pollution Budget - prescribes reductions (where needed) of pollutants that result in the restoration of an impaired stream
- TMDL development required by Clean Water Act for streams impaired by a pollutant

TMDL = Σ WLA + Σ LA + MOS

- Σ = "sum of"
- WLA = "wasteload allocations"
- LA = "load allocations"
- MOS = "margin of safety"

- WLAs - pollutant loads from "point sources"
  - Discharge from point
  - Need NPDES permit
- LAs - pollutant loads from "nonpoint sources" and background
  - Precipitation/runoff driven
  - No permit required

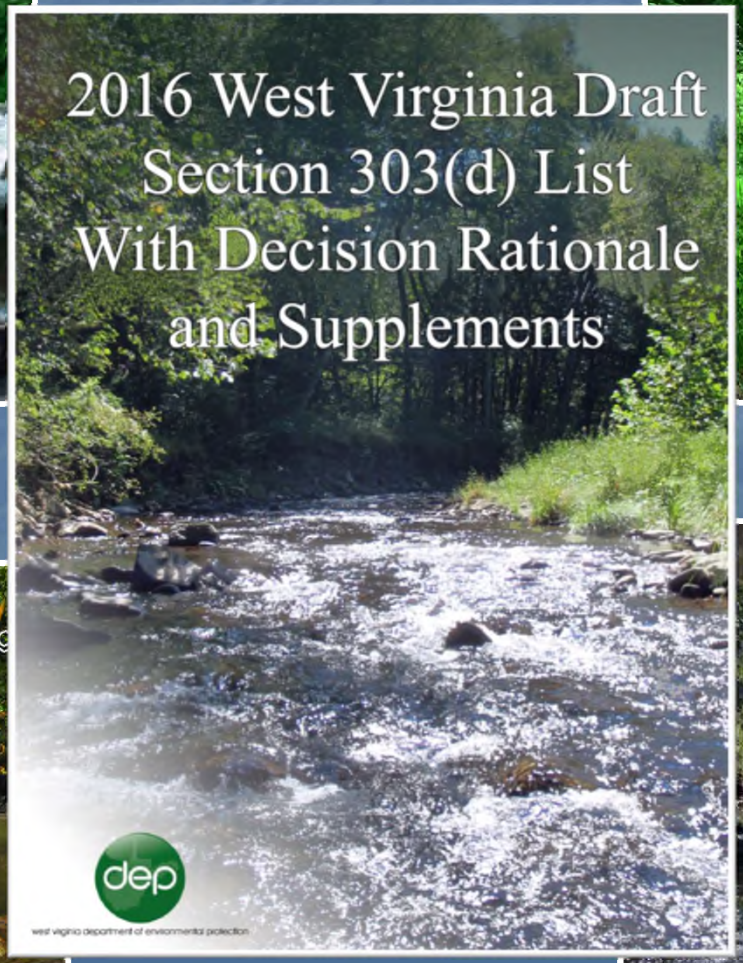
What's an impaired stream?

- Stream that doesn't meet ***water quality standards***
- West Virginia Water Quality Standards are codified in 47 CSR 2
  - http://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=27572&Format=PDF
- Standards include "Designated Uses" for WV waters and "water quality criteria" to protect those uses
- Criteria can be numeric or narrative

- Impaired streams are enumerated on the 303(d) list

LJC1

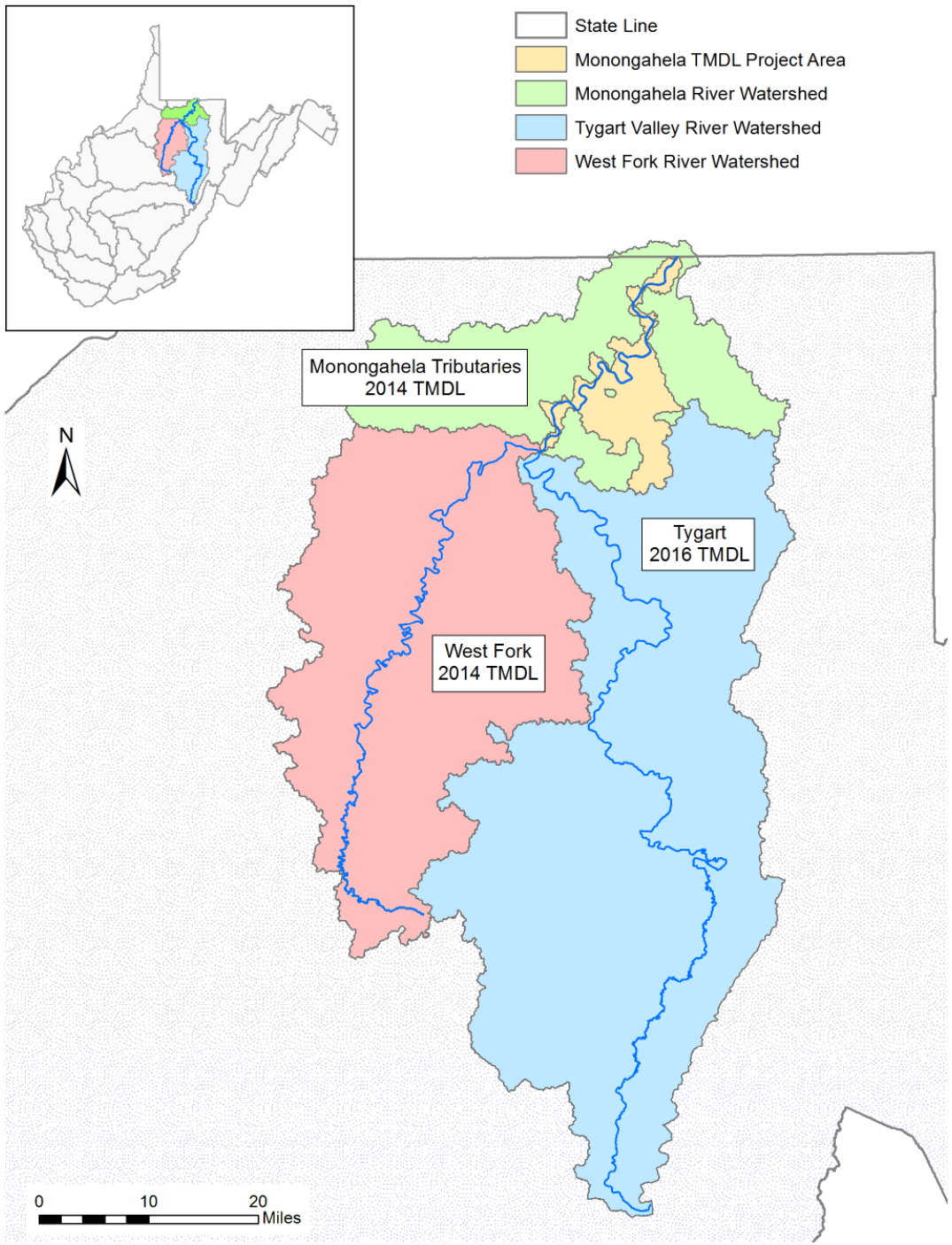
West Virginia Section 303(d) List / Integrated Report



Numeric Criteria of Concern

- Fecal Coliform

  - Water Contact Recreation/Public Water Supply
  - Shall not exceed 200 counts/100ml as a monthly geometric mean (5 samples/month)
  - Nor to exceed 400 counts/100 ml in more than 10% of samples in a month



Mainstem Monongahela River – Project Area

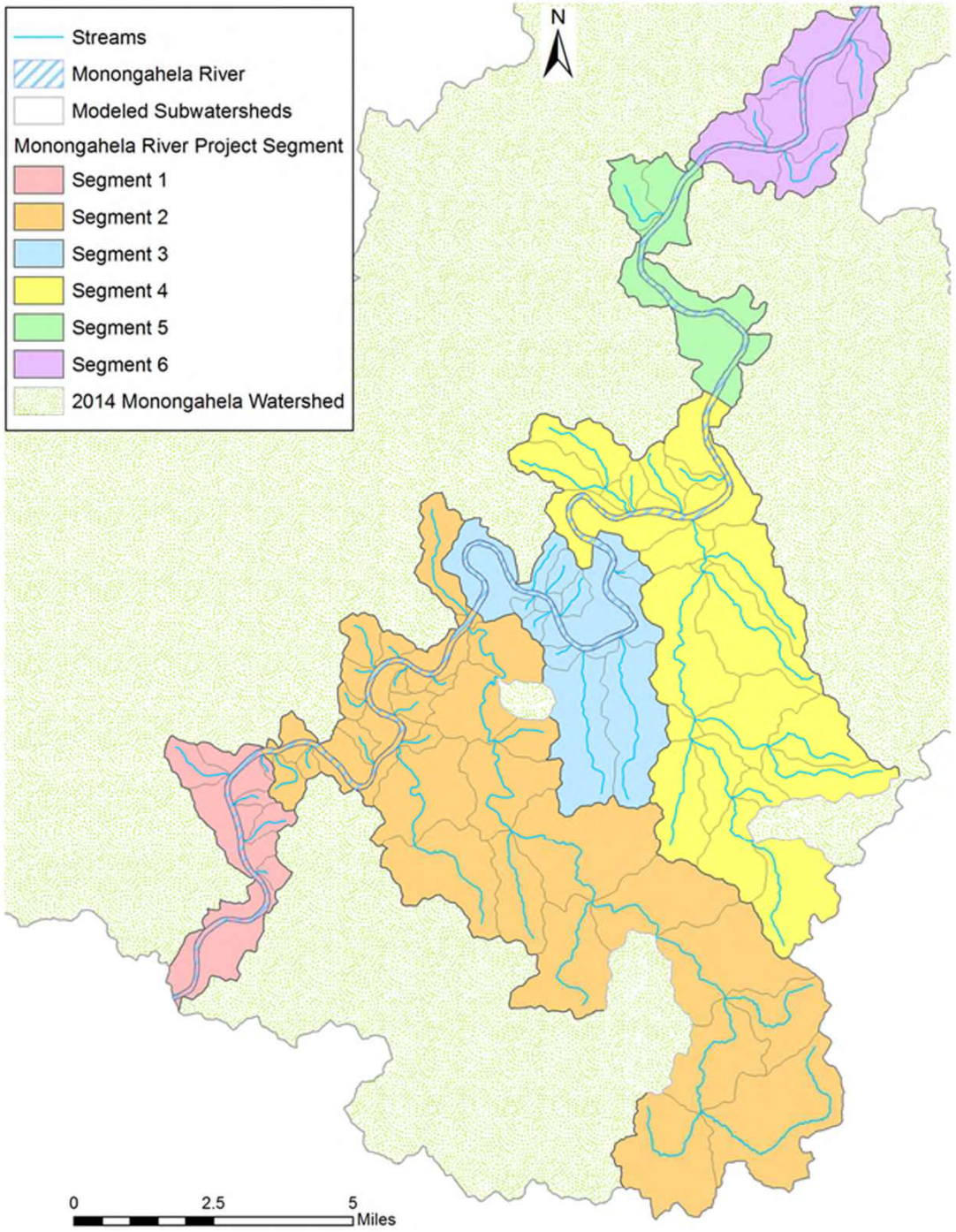
The 2014 Monongahela tributary, 2014 West Fork, and 2016 Tygart Valley allocations are included in this effort

MDAS Model

- Watershed Model
- Runs dynamically on a 1-hour time step
- Represents land use (hydrologic processes) and river processes
- Recognizes exposure duration and exceedance frequency components of criteria
- Can include nonpoint and point sources

Modeling Approach

- Segment watershed
  - Tributaries not in 2014 Mon River TMDL for fecal coliform
  - Land area draining directly to Mon with no NHD channel
- Configure model to represent all sources
- Use the historic TMDL model setup and calibration for 2014 Mon tribs, Tygart and West Fork
- Use output from MDAS as inputs to EFDC
- Run MDAS for Baseline conditions (existing)
- Run MDAS for TMDL scenario(s)

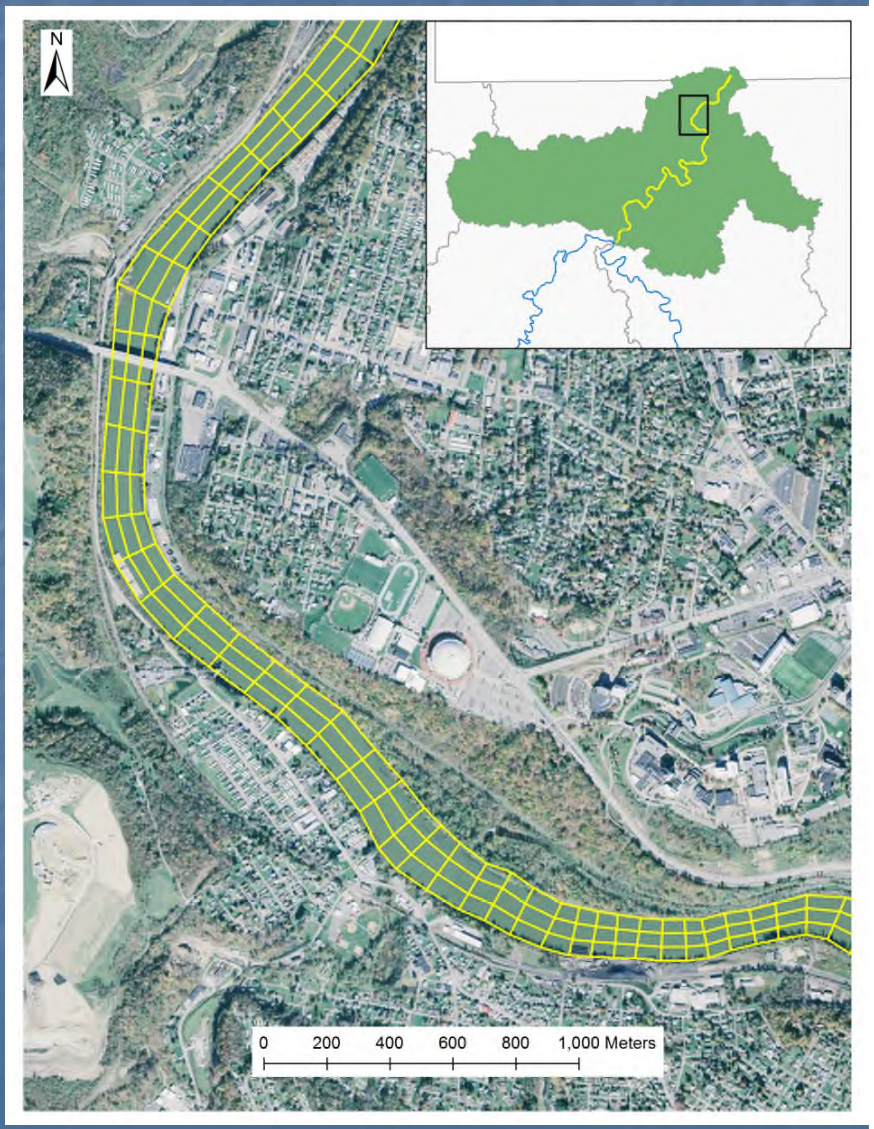


Impaired Waters

116 subwatersheds flowing into six mainstem project segments (Fig. 3-2)

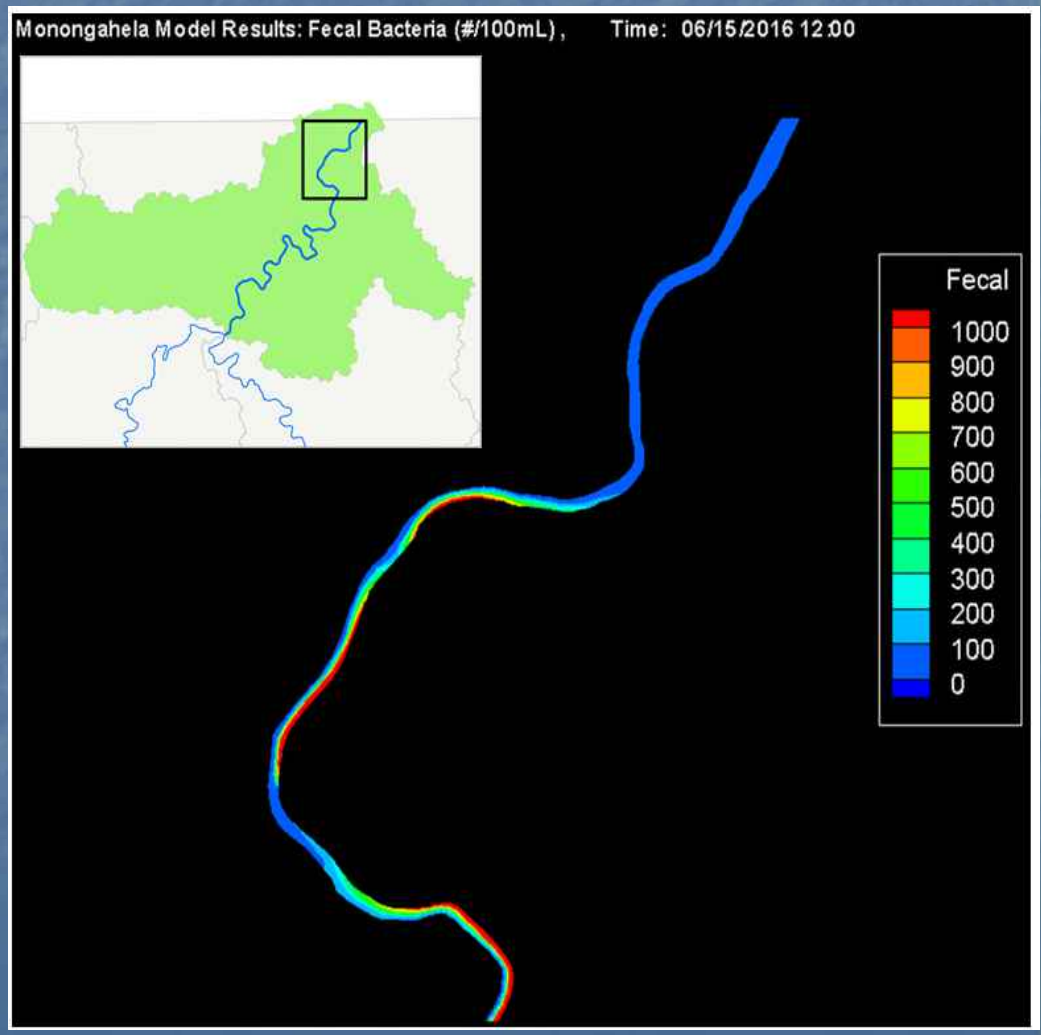
EFDC Model

- Receiving Streams Model incorporate MDAS output
- Hydrodynamic model – used in 2-D to simulate flow and water quality (temperature and pollutants)
- 3 lateral grids, longitudinal grid cells range from 45 m-150 m



EFDC Model Calibration

- Processes impacting fecal coliform: transport and die-off
- Flow calibrated accounting for pools
- Fecal coliform calibration compared to field data and goodness of fit statistics

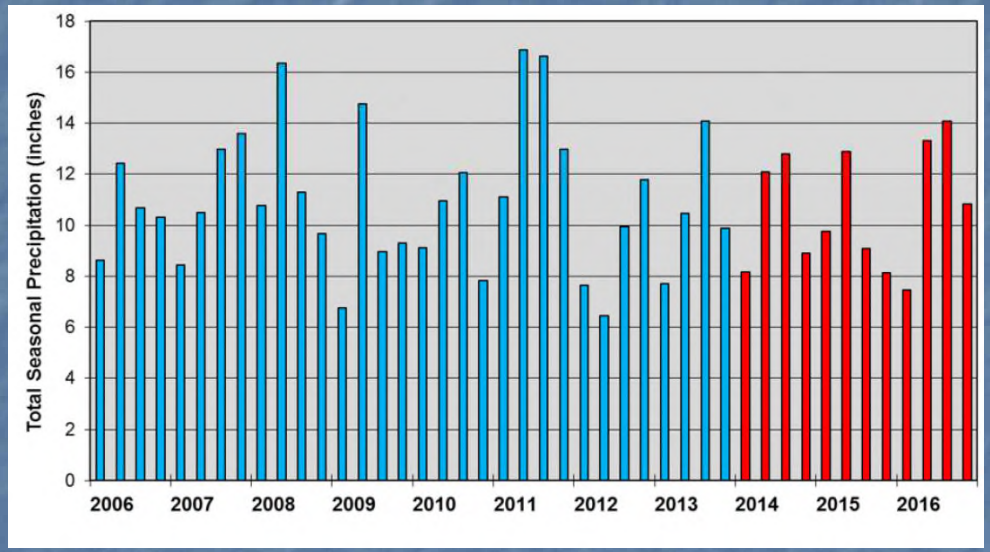


Fecal Coliform Sources

- Point sources
  - HAUs
  - Package Plants
  - Municipal Sewage Plant
  - Combined Sewer Overflows
  - MS4 areas (Municipal Separate Storm Sewer System)
- Nonpoint source
  - Failing septic systems and/or straight pipe illicit discharges
  - Stormwater runoff from urban/residential lands outside of MS4 areas
  - Stormwater runoff from agricultural lands

Baseline Condition

- Design precipitation period
  - Hourly precipitation data for a six-year period
  - Design period includes wet and dry years
- Applied to land uses identified in earlier TMDLs and that in the calibration period
- Permitted discharges equal to permit limits



Seasonal precipitation totals for the Morgantown Hart Field (WBAN 13736) weather station

TMDL Condition

- Existing pollutant sources reduced such that TMDL endpoints are achieved in each modeled subwatershed and grid recognizing
  - Criteria value, duration and exceedence frequency
  - Margin of safety

Margin of Safety

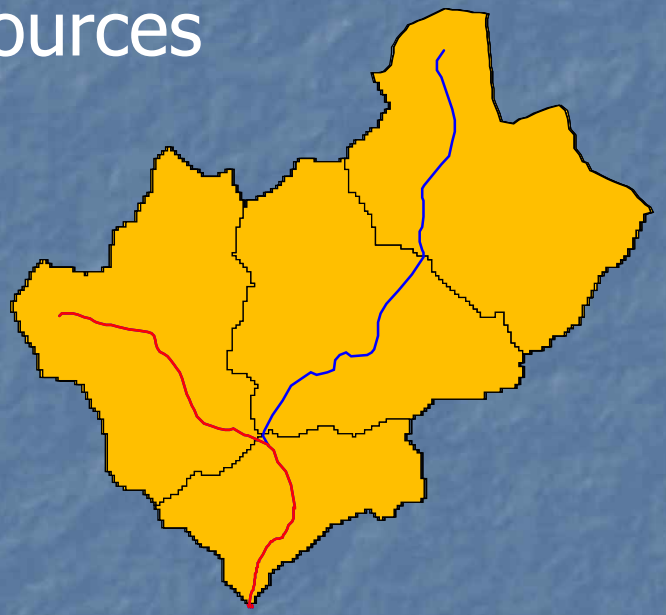
- Required component of TMDLs
- Explicit 5% used in most TMDLs
- TMDL endpoints for numeric criteria are 95% of criterion value

(ex. 380 cts/100 ml for 400 cts/100 and 190 cts/100 ml for 200 cts/100 ml Fecal coliform criteria)

MDAS Allocation Methodology

- Universal Reduction of targeted sources
  - Failing Septics
- Top-down approach
  - Headwater subwatersheds

  analyzed first
- Allocation strategy dictates order and magnitude of reduction
- If necessary, loads are reduced then routed to downstream subwatershed



Allocation Methodology

- WVDEP priorities:
  - Ensure criteria compliance at all sws outlets
  - Target the primary causative sources
- Strategy in general
  - Critical conditions must be considered
  - Sometimes only one significant source in sws
  - Always some amount of professional judgement

EFDC Allocation Runs

- Run 1: Study sensitivity to sources
  - Point source - baseline
  - non-point source - baseline
  - Tributaries - baseline
  - CSO reduced to 200 counts/100 mL
- Run 2: Study sensitivity to sources
  - Point source - baseline
  - non-point source - baseline
  - Tributaries - baseline
  - CSO reduced to 200 counts/100 mL
  - Tributaries near CSOs eliminated

EFDC Allocation Runs

- Run 3: Test trib impact
- tributaries -TMDL conditions
- point sources - permit limits (baseline/TMDL conditions)
- non-point - baseline
- CSO - baseline (100,000 counts/ 100 mL)

- Run 4: TMDL scenario
- tributaries -TMDL conditions
- point sources - permit limits (baseline/TMDL conditions)
- non-point – baseline
- CSO – 200 counts/100 ml Wasteload Allocation (not daily max)

Fecal Coliform Strategy

- 100% reduction of all untreated sewage discharges (failing septics, straight pipes) as required by WV Bureau for Public Health regulations
- Permit limits on point sources
- No reductions to non-point or MS4
- CSOs in to protect local water quality

Future Growth Highlights

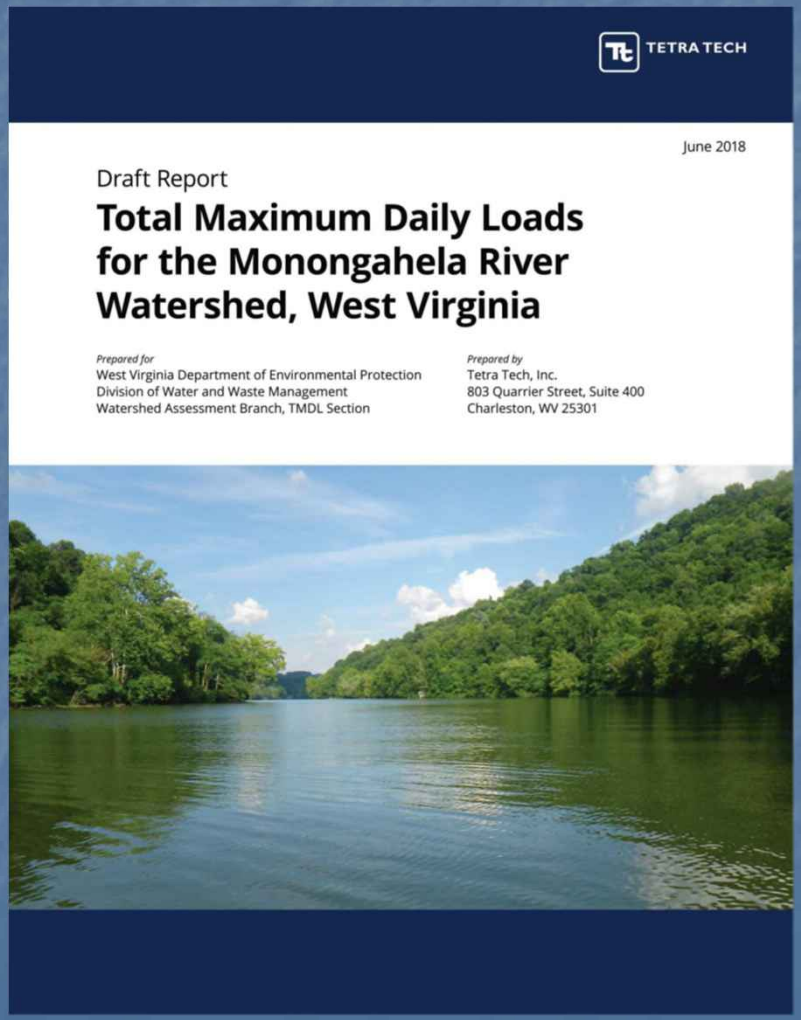
- New facility anywhere in watershed if meeting water quality criteria end of pipe
- Further details on Future Growth can be found beginning in Section 8 of the Draft report

Monongahela River Watershed TMDL Path Forward

- Formal public comment period ends 6/25/2018
- Address comments, prepare final draft and submit to EPA for approval (final draft will include Response Summary)

TMDL Products

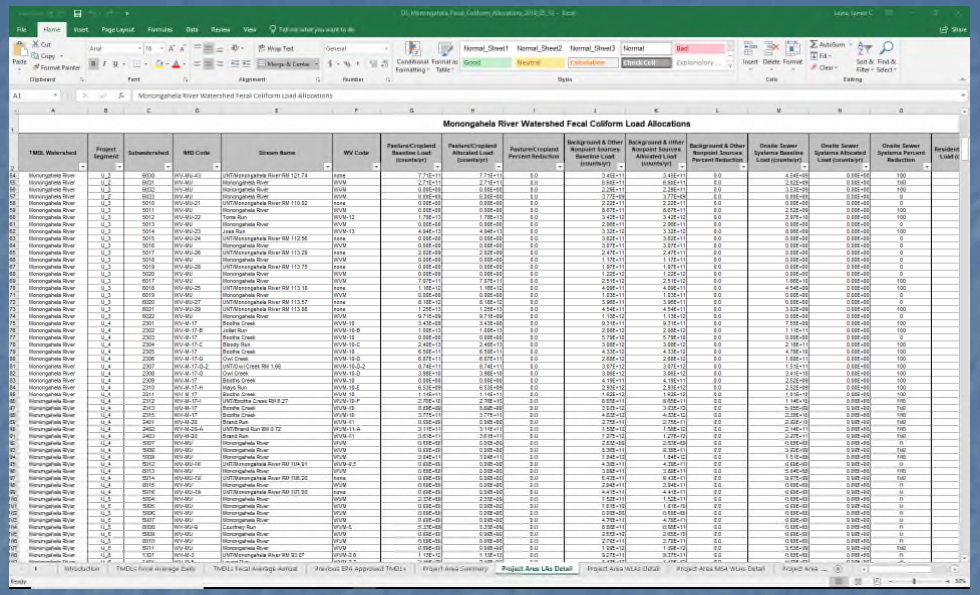
- Main Report – Overall description of the TMDL development process for the Mainstem Monongahela River watershed
- Technical Report with detailed appendices

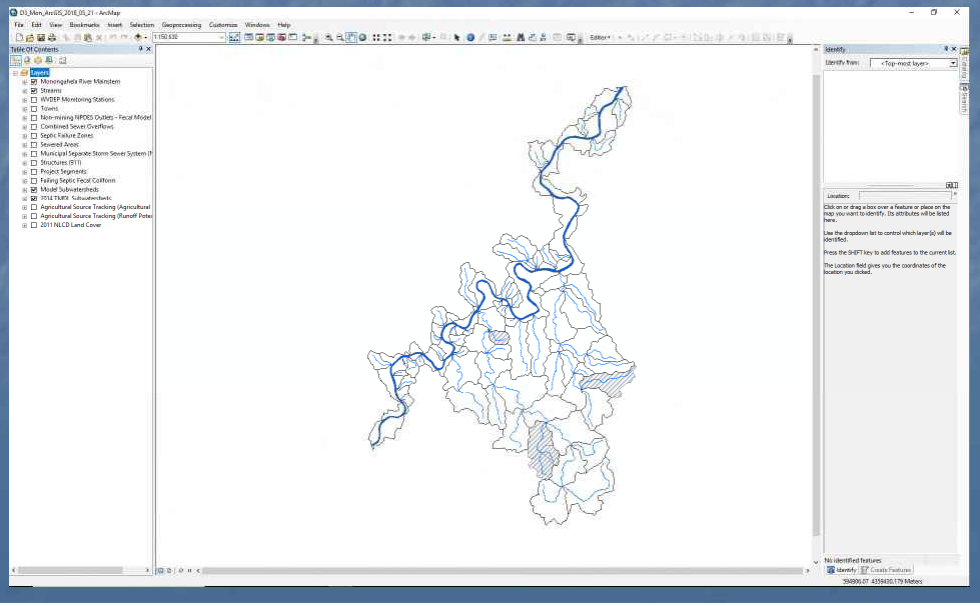


TMDL Products

- Allocation spreadsheets:
  - Fecal Coliform
  - TMDL for each stream,

    WLAs and LAs by SWS
  - Filterable
- GIS shapefiles, along with Technical Report and Appendices, available on CD





Public Comment

- Public Comment period ends 6/25/2018
- Documents may be reviewed/downloaded from DEP webpage: **www.dep.wv.gov/tmdl**
- CD available upon request – ***CD includes GIS Shapefiles and Technical Report***
- Comments should be submitted to Mindy Ramsey at **Mindy.S.Ramsey@wv.gov**
- Questions - contact Mindy Ramsey, Jim Laine, Mike McDaniel
- **(304) 926-0499 (Ext 1063, 1061, 1055)**
  - **Mindy.S.Ramsey@wv.gov**
  - **James.C.Laine@wv.gov**
  - **Michael.L.McDaniel@wv.gov**

Spreadsheet/GIS Demonstration

Discussion/Questions