

The Bacteria Source Load Calculator: Tool for use in watershed planning

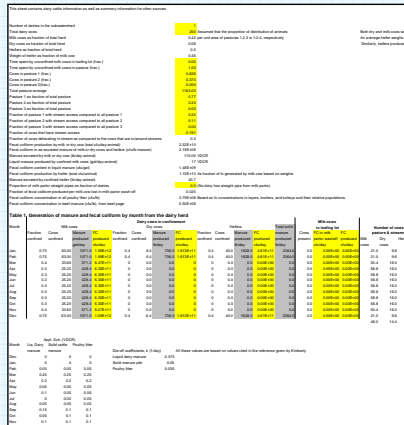
Rebecca W. Zeckoski and Brian L. Benham
Center for TMDL and Watershed Studies and Biological Systems Engineering

Abstract: Watershed-scale simulation models can be used in a “what-if” scenario evaluation mode to assist stakeholders and watershed planners in making informed watershed management decisions that control bacterial contamination and improve water quality. The Center for TMDL and Watershed Studies has developed a software tool, the Bacteria Source Load Calculator (BSLC), that aids in the

bacteria source characterization and pollutant load allocation process. The BSLC uses externally generated inputs such as land use, livestock, wildlife, and human population estimates and the spatial distribution of these sources to calculate monthly bacterial land loadings and hourly bacterial in-stream loadings, simplifying data file creation and providing consistent data development and processing.

Motivation:

- Watershed models require detailed data about fecal bacteria sources to accurately simulate in-stream bacteria concentrations.
- Need: a simple method to translate animal (livestock and wildlife) and human population estimates and land use information into model inputs.



Our Solution:

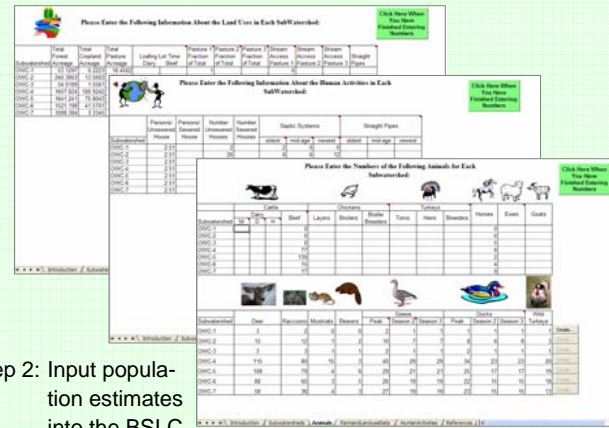
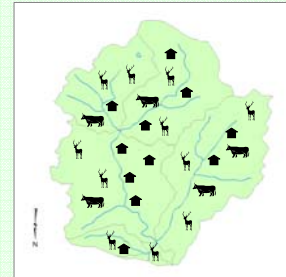
- The Bacteria Source Load Calculator (BSLC)
- Allows input of human and animal population estimates for all sub-watersheds in a single workbook and provides defaults for parameters like bacteria production rates and manure application
- Intuitive, user-friendly interface



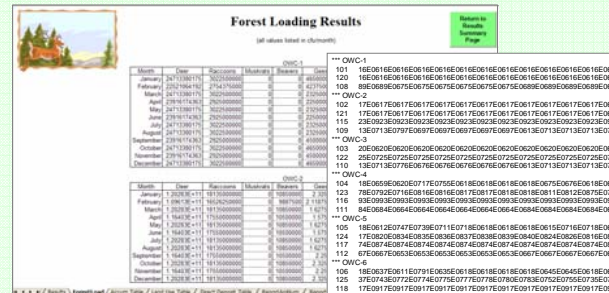
BSLC opening screen

BSLC Steps:

Step 1: Use GIS, permit data, personal observations, and stakeholder input to estimate population and spatial distribution of bacteria sources (human, livestock, wildlife) within each sub-watershed.



Step 2: Input population estimates into the BSLC.



Step 3: Use output from the BSLC to model watershed.

Highlights:

- Modeling Benefits:**
 - Creates timeseries files containing hourly values of bacteria loads deposited directly in the stream (direct-deposit).
 - Creates tabular files containing monthly values of fecal bacteria loads deposited on the land surface.
- Report Writing Benefits:**
 - Summarizes all loading-related information.
 - Creates source-specific bacteria load tables in Microsoft Word.

Application:

- Aids with set up of input files for water quality model calibration.
- Aids in developing alternative pollutant-load allocation scenarios.
- Used in 20 TMDL studies in Virginia.
- Available free at the Center for TMDL and Watershed Studies website. Users must accept and open-source license.
- Downloaded from Center's website 54 times to-date. Users include academia, state agencies, engineering consulting firms.



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