Community Conservation Assistance Program (CCAP)

Water Quality Calculations Spreadsheet Tool

Background

- A standard methodology for calculating the water quality benefits of CCAP was needed.
- A workgroup was formed by the CCAP Advisory Committee to develop this tool.
- This tool is ONLY for calculating water quality benefits per BMP – not for designing BMPs.
- Another spreadsheet tool for NRCS-comparable BMPs will be developed this fall.

This tool works for the following BMPs:

- Backyard rain gardens
- Bioretention
- Backyard wetlands
- Stormwater wetlands
- Grass swales
- Impervious surface conversion
- Riparian buffer (50 feet or wider)

Tool References

- Uses the Simple Method for calculating runoff volume
- Builds on the existing DWQ export calculation worksheets for the Tar-Pamlico River Basin.
- The percent removals for total nitrogen, total phosphorus, and total suspended solids are based on approved rates NCDENR's Stormwater Best Management Practices Manual.

Format

- Contains two worksheets
  - Watershed details
  - BMP details
- Enter data into the **green cells**
- **Blue cells** will automatically calculate
- Results clearly labeled in **red**

Watershed details worksheet

Type of Land Cover		Catchment Acreage (ac)
Transportation impervious	Acreage in watershed of roads, driveways, sidewalks, etc.	0.00
Roof impervious	Acreage in watershed of rooftops from houses, buildings, etc.	0.00
Managed pervious	Acreage in watershed of maintained vegetation such as lawns or landscaped areas, etc.	0.00
Wooded pervious	Acreage in watershed of forests areas.	0.00
Area taken up by BMP	Acreage in watershed that will be taken up by the BMP.	0.00

More watershed details needed

- **Enter P = annual rainfall in inches**
  Can be found in CCAP Design Manual (pg 16-17)

- **Enter ponding depth in inches**
  - For stormwater wetlands, backyard wetlands, backyard raingardens, and bioretention areas use the average design depth of these BMPs
  - For grassed swales, use the design depth of the swale.
  - For buffers and impervious surface conversion to grass and/or trees, use the value “1” for one inch.

BMP Details: BMP Assumptions

BMP Type:

BMP Type	CCAP BMPs
Wetland	Stormwater wetlands Backyard wetlands
Bioretention	Bioretention Backyard rain gardens
Swale	Grass swales
Impervious conversion	Impervious surface conversion
Buffer	Riparian buffer (50 ft or wider)

More BMP details needed

•If the size of the BMP is the same as the recommended design size, enter 100 in the green box below.

•If the size of the BMP is different than the recommended design size, enter the appropriate percent in the green box below.

This percent is essential for calculating the water quality benefits of the BMP, because the worksheet uses proportional values of percent reduction based on the size of the BMP.

Percent Size Relative to Recommended Design Size:	

Impervious Surface Conversion ONLY

•Considers the volume both before and after the conversion to calculate the water quality benefits of this practice.

•Complete the Watershed Worksheet twice, and entering the data output from row 19 (volume).

- •For the volume pre-conversion, complete the watershed worksheet using the current state of the watershed.
- •For the volume post-conversion, complete the watershed worksheet using the future state of the watershed (after the impervious surface conversion has occurred).

For impervious conversion only	
Volume Pre-Conversion (ft3):	
Volume Post-Conversion (ft3):	

Results

RESULTS		
Total TN Removed :	#VALUE!	lbs/year
Total TP Removed:	#VALUE!	lbs/year
Total TSS Removed:	#VALUE!	lbs/year

Acknowledgments

- Kathy DeBusk, NCSU
- Robert Patterson, DWQ
- Jennifer Brooks, Durham SWCD
- Teresa Furr, Wake SWCD
- Tom Hill, Wake SWCD

Cisterns

- Use Rainwater Harvester output for Annual N Removed (pounds)

BMPs NOT Requiring WQ Benefits

- Marsh Sills
- Pet waste receptacles
- Abandoned well closures
- Permeable pavement