# UNRBA Nutrient Credit Development Project

BOD Meeting
February 2015

February 3, 2015

# Establishment of SME Contract

## Status of Contract Development

- Met with NCSU stormwater group to discuss the contract
- NCSU stormwater group submitted draft scope of work
- Forrest and Haywood have been reviewing the draft and discussing with the stormwater group
- Final contract is being generated
- We will likely need ~$1,050 from contingency to do the review of 10 practices
- May use contigency funds to cover next round of 5 practices

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# Budget Update

# Status of Budget for Credit Development (Dec 2014)

| Task 1 Activity | Status | Remaining Budget |
|---|---|---|
| 1.1 Identify potential measures and screening metrics; conduct the trapping analysis | Complete | $0 |
| 1.2 Conduct the screening analysis | Complete | $6,600 |
| 1.3 Develop the credits database; prepare for and attend PFC meetings; prepare for and attend meetings with with DWR and SME | Started | $25,000 |
| 1.4 Assess design criteria and effects on credits | Not started | $22,500 |
| 1.5 Analyze credits for priority measures | Not started | $29,200 |
| 1.6 Compile planning level costs and draft other sections of PS | Not started | $22,700 |

# Nutrient Credits

# Status of Credit Database Development

- Populate the database with literature valules for first batch of practices
  - Filter strips with design variants (90% complete)
  - Infiltration devices (5% complete)
  - Soil Amendment (30% complete)

# Credit Tool

# Unified Statement of Purpose for Credit Tool

**Estimate** the annual total nitrogen and total phosphorus **load reductions** achieved through implementation of nutrient reducing measures on existing development at the subwatershed-scale that **integrates output from the existing tools** and enables users to **facilitate development of the local programs** and assist local jurisdictions in compliance with the Falls Lake Rules **reporting requirements.**

# Status of Tool Selection and Development

- Drafted memo to evaluate four tools
  - Watershed Treatment Model
  - JFSAT
  - Storm-EZ
  - Wake County Hybrid Stormwater Design Tool
- Recommended an approach for the UNRBA Tool
- Goal is to get PFC approval on the conceptual approach
- Resolve any issues brought forward today to move forward with approval of model development and release of funds in Tasks 2.2 and 2.3

# Key features to assess the model capabilities to meet the Statement of Purpose

| **INPUT** data requirements | **OUPUT** for annual nutrient reductions and track compliance | **PRACTICES** include full suite of priority measures |
|---|---|---|
| **SCALE** of analysis | **CALCULATION METHODS** approved by NCDWR or NCDEMLR | **ADAPTABILITY** by user to incorporate new information |

Table 1.  Model Comparison (Blue shaded cells meet this component of the statement of purpose; yellow shaded cells partially meet the requirement in their current format)

| Component | WTM | JFSAT | Storm-EZ | Hybrid Tool |
|---|---|---|---|---|
| Output | Annual Nutrient Loads, Runoff Volumes, and TSS | Annual Nutrient Loads and Concentrations, Runoff Volumes | Runoff Volumes and Peak Discharges for Multiple Storm Events | Annual Nutrient Loads, Runoff Volumes; Peak Discharges and Runoff Volumes for the 1-yr, 24-hr design storm |
| Input | Watershed characteristics; Summary BMP Characteristics. | BMP and Drainage Area Characteristics. Sizing for individual practices. | Detailed Site Scale Design Information. | Site Scale Design Information. |

| Component | WTM | JFSAT | Storm-EZ | Hybrid Tool |
|---|---|---|---|---|
| **Practices** | Structural BMPs and Programmatic Measures | Structural BMPs only. | Structural BMPs only. | Structural BMPs only. |
| **Scale** | Watershed/ Community Scale | Site Scale | Site Scale | Site Scale |
| **Calculation Method-ologies: Hydrology** | Modified Simple Method/ User-Supplied Rainfall | Simple Method/ Rainfall by NC Region | NRCS Curve Number Methodologies | Simple Method/ Rainfall by NC Region as well as NRCS Curve Number |

| Component | WTM | JFSAT | Storm-EZ | Hybrid Tool |
|---|---|---|---|---|
| **Calculation Methodologies: Pollutant Concentrations** | National Average Data or Customized to Local Data | Regional Data | N/A | Regional Data |
| **Calculation Methodologies: Structural BMPs** | Calculated from Runoff Reduction and Filtering Efficiencies, as well as factors for maintenance and practice overflow. | Calculated based on Runoff Reduction, Overflow, and Effluent Concentrations. | Crediting for runoff reduction | Runoff reduction credits and JFSAT calculations for pollutant removal. |

| Component | WTM | JFSAT | Storm-EZ | Hybrid Tool |
|---|---|---|---|---|
| **Calculation Methodologies: Nonstructural Measures** | Model includes methodologies for nutrient management, as well as a number of source-reduction practices. | None | None | None |
| **Adaptability** | User has the ability to modify default values based on color code of cells; User has ability to define up to 2 new BMPs not included in the model | Each catchment limited to 3 different BMPs; User has ability to define up to 3 "custom" BMPs not included in the model (Version 3.0) | List of practices limited to drop-down menu | Similar to JFSAT and Storm EZ |

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# Model Comparison Summary

- WTM
  - Open-source code
  - Designed for subwatershed-scale analysis
  - Both programmatic measures and structural BMPs
  - Methodologies need to be aligned with those of models currently used in the Falls Lake watershed

# Model Comparison Summary, Continued

- JFSAT, Storm-EZ, and Wake County Hybrid Stormwater Design Tool
  - Approved tools/methods to provide volume and/or pollutant load reductions
  - Development-site specific
  - Developed for structural stormwater measures

# Key Features of the Recommended Modeling Framework

- Track progress toward goals for existing development
- Utilize output from State-approved tools
- Aggregate to subwatershed scale within a jurisdiction
- Account for non strucutural measures (e.g., programmatic)
- Transform edge-of-field estimates to loads delivered to Falls Lake

# Recommended Approach for the UNRBA-WTM

- Subwatershed Analysis
  - HUC-12 subwatersheds
  - Summarize data for jurisdictions based on location of practices within subwatershed

- Calculation Methods
  - Consistent with JFSAT

# Recommended Approach for the UNRBA-WTM, Continued

- Model Structure (Worksheets)
  - Pollution Sources (Watershed Information)
  - BMPs Implemented on Existing Development
  - BMPs Implemented on Rural Lands
  - Future Planned BMPs
  - Summary Report
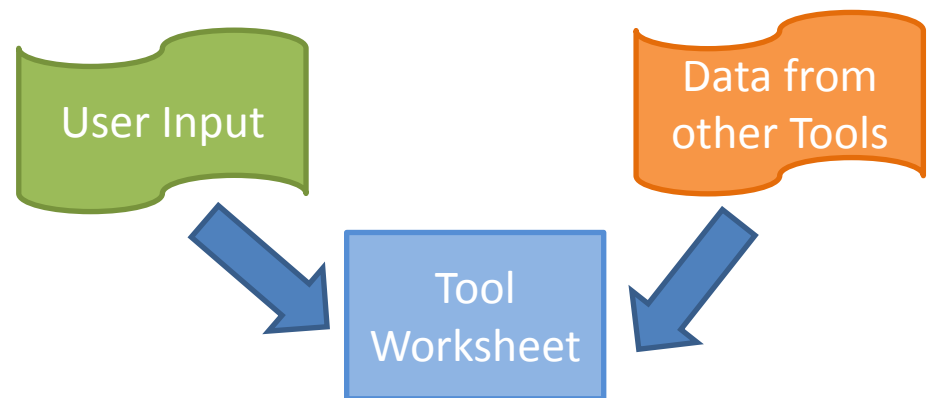
# Model Structure

- Pollutant Sources (Watershed Information)
  - Identify land area available to implement practices
  - This is not an allocation of pollutant sources

- BMPs Implemented on Existing Development
  - Calculating load reductions from individual stormwater practices including output from JFSAT and Wake County HST
  - Programmatic measures such as nutrient management will be described by community-wide parameters
  - The sheet will calculate the pollutant removal of each practice recorded

# Model Structure, Continued

- BMPs Implemented on Rural Lands
    - Rural sector practices
    - Within the proposed tool it will be possible to aggregate these type practices by subwatershed or county if the privacy of individual property owners needs to be protected

- Future Planned BMPs
    - Reflect future planning efforts and meet the reporting requirements that jurisdictions document the likely pollutant reductions from future practices planned in each subwatershed

# Model Structure, Continued

- Summary Report (Graphical and Tabular)
  - Area of land captured by each practice type
  - Number of practices in each practice type
  - Annual nitrogen and phosphorus reduction from each practice type
  - Additional information required for tracking compliance based on Model Program and Rules

# Reporting Requirements

# Reporting Requirements for Implemented Projects (Submitted Annually)

- Types and number of new activities implemented and any that were terminated

- Types and acres of existing development affected

- Estimated annual reductions from each activity (new and renewed from previous years)

- Costs and efficiencies of each activity

- Total annual expenditures including grants

- Stage I adjustments due to annexation

# Reporting Requirements for Implemented Projects (Submitted Annually), Continued

- Numbers of types of measures inspected
- Summary of maintenance and repairs performed
- Parties performing inspections, maintenance, and repairs
- Issues with implementation
- Actions taken
- Comparison of current reductions and planned reductions to overall reduction needs

# Reporting Requirements for Planned Projects (submit every 5 years)

- Implementation schedule

- Types of activities

- Types of existing development affected

- Prioritization of practices

- Magnitude of expected reductions from each practice (*requires an estimate of acres treated?*)

- Costs and efficiencies of each activity

- Duration of load reductions

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# Reporting Requirements for Planned Projects, Continued

- Owner type (private owner, local government, third party sellers)
- Extent of physical opportunities for installation
- Landowner acceptance
- Incentive and education opportunities
- Potential funding sources
- Practice cost-effectiveness
- Increase in per capita costs of the stormwater program
- Implementation rate without the use of eminent domain
- Need for and projected role of eminent domain

# Potential Input on Rules Review Process

- The required information for planned projects is rather extensive

- We encourage each local government to think about the feasibility and level of effort required to obtain the required information for these plans

- UNRBA may want to consider suggesting Rule revisions to simplify the implementation plans

# Reporting Requirements May Also Affect the Tool

- Local governments need to estimate the load reductions that will likely occur (types of measures, acres treated, etc.)

- Planners will likely not have all of the information needed for running JFSAT or the Wake County Tool

- We may need to code up the UNRBA WTM with planning level estimates (reduction efficiencies and costs) to provide some of this information

- This approach would diverge from the JFSAT methodology **for planning purposes**

# Discussion of the Tool

# Consensus on the Approach?

- Does the PFC approve the conceptual approach
  - Using the WTM to track credits and calculate credits from **implemented** measures that are not "stormwater measures"
  - Reading in output from JFSAT or Wake County HST for **implemented** stormwater measures
  - Coding up planning level information to assist with reporting requirements for **planned** measures

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