**Forestry Workgroup 11-7-2012**

**Briefing Paper**

New Land Use Modeling

This briefing paper concerns the overall CB Model. We will discuss where forest practices fit in and how developments at CBP may impact how forests are modeled. It is an update on what is happening with the 2017 Mid-Point Assessment especially with regard to mapping Land Use and Crediting BMPs. The main idea is to improve spatial, temporal, and categorical representation of urban, agricultural, federal, and natural land uses and, to the extent possible, assign separate loading rates.

 **[**See *Proposed Land Use Classification* appended to this document**]**

Considerations for adding new land uses to the Phase 6.0 suite of models

Consider the following criteria when deciding whether or not to recommend new land use classes for inclusion in the CBP watershed and land-change models. These criteria are provided for guidance purposes only. Not all criteria need to be met to justify inclusion.

1. Does the new land use have unique nutrient or sediment loading characteristics?
2. Is the new land use needed for planning, tracking and reporting of BMPs and/or regulatory actions?
3. Will the new land use help inform management decisions and implementation at the local level for any other reasons?
4. Would the (can the) proposed land use be better served as a BMP?

**\*\*The FWG will decide on whether to recommend proceeding with the proposed Land Uses by December 10, 2012.\*\***

Current List of BMP Credits Under Review

The following BMPs are planned or underway. Other than the ones with Forestry as the sector lead, the FWG will be consulted on a number of these.

|  |  |  |
| --- | --- | --- |
| Best Management Practice (BMP) Under Review | Sector Workgroup | Status |
| Nutrient Management  | Agriculture  | Panel developing recommendations |
| Conservation Tillage  | Agriculture  | Panel developing recommendations |
| Cover Crops  | Agriculture  | Panel developing recommendations |
| Poultry Litter  | Agriculture  | Panel developing recommendations |
| Stormwater Retrofits  | Urban | Pending WQGIT approval |
| Stream restoration (incl. Regenerative Conveyance Systems) | Urban | Panel developing recommendations |
| New State Stormwater Performance Standards (for development and redevelopment) | Urban | Pending WQGIT approval |
| Urban Fertilizer Management  | Urban | Panel developing recommendations |
| On-site wastewater treatment systems (septic), Part 1 (review of efficiencies) | Wastewater | Panel developing recommendations |
| Riparian Buffers (grass and forest) | Forest | Panel developing recommendations |
| Urban Tree Planting  | Forest | Panel developing recommendations |
| Erosion and Sediment Control (as proposed by WV) | Urban | Panel convened (July 2012) |
| Illicit Discharge Elimination | Urban/Wastewater | Panel convened (July 2012) |
| Septic, Part 2 (more broad view of systems) | Wastewater | Planned (Fall-Winter 2012) |
| Manure Treatment Technologies  | Agriculture  | Planned (Fall-Winter 2012) |
| Impervious Disconnect | Urban | Planned (Fall-Winter 2012) |
| Animal Waste Storage Systems | Agriculture  | Planned (Fall-Winter 2012) |
| Liquid Manure Injection/Incorporation | Agriculture  | Planned (Fall-Winter 2012) |
| Forest Management  | Forest | Planned (Fall-Winter 2012) |
| Urban Filter Strips and Upgraded Stream Buffers  | Urban/Forest | Planned (Spring 2013) |
| Floating Wetlands | Urban | Planned (Spring 2013) |
| Cropland Irrigation Management | Agriculture  | Planned (FY2013-2014) |
| MS4 Minimum Management Measures | Urban | Planned (FY2014) |
| Algal Turf Scrubbers | Watershed | Planned |

Other planned activities involving the FWG in Mid-point Assessment work:

**Ongoing:** Modeling Baseline/Input Data and Assumptions (permitted data e.g., MS4 and forest harvest data)

**January 2013:** Revisit Watershed Model calibration methods with goal of improving local watershed results, including revisiting regional factors

**Summer 2013:** Improved modeling accuracy of hydrologic networks, land use characteristics, phosphorus and sediment

**TBD:** The CBP is considering a new modeling framework called PQUAL. The idea is to simplify the model (no more “black box”) without losing the scientific rigor involved.

**Initial DRAFT Land Use/Wastewater Classification for 2017 Mid-point Assessment** (from Land Use Workgroup)

1. **Developed**
	1. Impervious developed
		1. Connected vs. Disconnected (connection via storm drain or proximity to waterway)
			1. Regulated vs. Unregulated (inside vs outside MS4/CSO)
				1. Open space, Low-density Residential, High-density Residential, Mixed Commercial/Industrial/Residential, Institutional
	2. Pervious developed (e.g., turf grass, landscaped areas, and woodlands)
		1. Connected vs. Disconnected (connection via storm drain or proximity to waterway)
			1. Regulated vs. Unregulated (inside vs outside MS4/CSO)
				1. Open space, Low-density Residential, High-density Residential, Mixed Commercial/Industrial/Residential, Institutional

Turf vs Wooded

Turf fertilizer leaching and runoff risk categories (unfertilized, low risk, high risk based on soil and slope characteristics)

Urban tree canopy vs Rural woodlands

* 1. Roads
		1. Urban/Suburban vs Rural
			1. 1-lane, 2-lane, 4-6 lanes, 8+ lanes (to infer impervious area and size of medians and shoulders)
		2. Federal vs. state vs. other (to assign responsibility)
		3. Traffic volume ranges (linked to dry atmospheric deposition)
	2. Construction

Note: Analyze sediment/erosion control permits and revisit current approach using annual change in impervious cover \* factor representing disturbed acreage that is permitted.

1. **Extractive**
	1. Disturbed permitted acreage
	2. Distinguished by type: quarries/gravel pits, surface coal mines, and reclaimed mines
	3. Shale gas pads and associated infrastructure
2. **Natural**
	1. Upland Forests (with unmanaged understory- differentiated by species/age/”health”)
		1. Floodplain forests
		2. Riparian forests
		3. Harvested (undergoing managed succession)
	2. Lowlands/ wetlands (currently considered “Woody/Open” in Phase 5.3.2)
		1. Floodplain wetlands
		2. Forested wetlands
		3. Emergent/tidal wetlands
	3. Water (all non-tidal water area)
3. **Agriculture**

Note: The classes below represent what is currently used in Phase 5.3.2. The Ag Workgroup is considering decoupling management systems from the crop types in the land use data. This would result in a simpler land use classification and just reflect major crop types derived from the NASS Cropland Data Layer and annual NASS reported acreages.

* 1. High Till (i.e., conventional tillage)
		1. Manure (e.g., corn, soybeans, wheat, barley, dry beans, and more)
			1. Nutrient management (request to drop this distinction)
			2. No nutrient management
		2. No manure (e.g., cotton, tobacco, Irish potatoes, orchards, and vegetables)
			1. Propose revising this land use (VA comments)
			2. Nutrient management (request to drop this distinction)
			3. No nutrient management
	2. Low Till (i.e., conservation tillage)
		1. Manure (e.g., corn, soybeans, wheat, barley, dry beans, and more)
		2. Nutrient management (request to drop this distinction)
	3. Hay
		1. Nutrients applied (e.g., tame and small grain hay, failed cropland)
		2. No nutrients (e.g., wild hay, idle cropland, fallow land)
		3. Nutrient management (request to drop this distinction)
		4. Alfalfa
			1. Nutrient management (request to drop this distinction)
			2. No nutrient management
	4. Pasture
		1. Nutrient management (request to drop this distinction)
		2. No nutrient management
		3. Degraded riparian (i.e., unfenced riparian pasture)
	5. Nursery (separate in-house production from field rows)
	6. Animal Feeding Operations (converted to acres based on animal density assumptions)
		1. Regulated (CAFOs)
		2. Unregulated (AFOs)
1. **Wastewater**
	1. Population on Sewer
		1. Improve maps of areas served by sewer and relate areas to individual plants and their efficiencies.
	2. Households on septic
		1. Distinguish different types of systems: commercial/retail, mass drain fields, failing systems, and direct discharges
		2. Adjust soil attenuation rates based on distance to waterways
		3. Examine relationship between household size assumptions, # of systems, and loads.