

## Estimation of Potential Non-Point Source Loadings

### Data Required:

- [Current SWFWMD Land Use/Land Cover GIS Layer Data](#) covering Basin Management Areas (1999 as of this writing)
- [Current SWFWMD Soil Coverage GIS Layer Data](#) covering Basin Management Areas
- [Current FDEP WBID Coverage GIS Layer Data](#) covering Basin Management Areas
- Aggregated Florida Land Use, Cover and Form Classification System Categories to a Coastal Land Use Code ([Poe et. al 2005, Appendix B](#))
- Land Use Specific Pollutant Load Concentrations aggregated to a Coastal Land Use Code ([Poe et. al 2005, Appendix C](#))
- Land Use Specific Pollutant Load Concentration for Open Water/Lakes ([Lin 2004](#))
- Land Use Specific Runoff Coefficients aggregated to both a Coastal Land Use Code and Hydrologic Soil Type ([Poe et. al 2005, Appendix D](#))
- [SWFWMD Monthly Rainfall Summaries](#) for each Basin Management Area

### GIS Steps:

For each basin management area (i.e. Northwest Hillsborough, Hillsborough River, and Alafia River), the SWFWMD land use/land cover layer was intersected with SWFWMD soil and FDEP WBID boundary layers and clipped to the appropriate basin management area. The Coastal Land Use Code (CLUC) was determined from the FLUCCSCODE attribute contained in the SWFWMD Land Use/Land Cover layer ([Poe et al. 2005](#)). For each WBID, the total area of each CLUC and hydrologic soil type combination (HYDGRP attribute in SWFWMD soil layer) was calculated.

Pollutant load concentrations [i.e. total nitrogen (mg/L), total phosphorus (mg/L), and BOD (mg/L)] from [Poe et al. 2005](#) were assigned to each CLUC to estimate potential loadings from terrestrial sources (i.e. lakes, saltwater features, and saltwater wetlands were excluded from initial estimates). Additionally, pollutant load concentrations from [Lin 2004](#) were assigned to CLUC 16 (Freshwater) and saltwater wetlands (CLUC 19) were assigned [Poe et al.'s 2005](#) concentrations for freshwater wetlands (CLUCs 18 and 20) to produce a second set of maps to estimate potential loadings from all terrestrial and wetland sources.

Dry season and wet season runoff coefficients were assigned to each CLUC/hydrologic soil type combination. For 'B/D' soil types, the dry season coefficient for a B soil was used while the wet season coefficient for a D soil was used for a particular CLUC. For 'undetermined' soil types, the resulting land areas were excluded from further analyses. For 'water' soil types, to determine potential loadings from terrestrial sources only, the resulting land areas were excluded from further analyses; however, to determine potential loadings from

terrestrial and wetland sources both the dry and wet season coefficients were assigned 1.

**Land Use/Soil Type Seasonal Loading Calculations:**

Both dry season and wet season potential loading concentrations were calculated by multiplying the appropriate runoff coefficient with the previously assigned pollutant load concentrations for each area-aggregated, WBID/CLUC/soil type combination. Next, an area-weighted mean concentration was calculated for both the dry and wet seasons in a particular WBID from all area-aggregated, CLUC/soil type combinations.

**Final WBID Potential Loading Calculations:**

Based on SWFWMD's long-term mean monthly rainfall estimates for each basin management area, the percentage of rainfall occurring in both dry (Jan.-May; Oct.-Dec.) and wet (Jun.-Sep.) months was calculated for a given year. These basin-specific seasonal percentages were multiplied by the seasonal loading concentrations and added together to produce an annual potential loading concentration for each WBID.

**Display of Potential Non-Point Source Loadings:**

Specifically for each basin management area, two sets of maps were created. One set included annual, area-weighted potential non-point source loading concentrations for each WBID boundary for terrestrial land uses only, and another set that included potential concentrations for terrestrial and wetland land uses. Color ramp display categories were assigned to ten, percentile rank categories. Meaning, that all WBIDs within a basin management area were assigned into a bin based on the range of potential loading concentrations over all WBIDs in a particular basin management area.

**References:**

- [Lin, J.P. 2004. Review of published export coefficient and event mean concentration \(EMC\) data. ERDC TN-WRAP-04-03. U.S. Army Engineer Research and Development Center, Vicksburg, MS.](#)
- [Poe, A., K. Hackett, S. Janicki, R. Pribble, and A. Janicki. 2005. Estimates of total nitrogen, total phosphorus, total suspended solids, and biochemical oxygen demand loadings to Tampa Bay, Florida: 1999-2003. Prepared by Janicki Environmental, Inc. Prepared for Tampa Bay National Estuary Program. St. Petersburg, FL. 374 p.](#)