

# EWC Allocation Process

As the Dissolved Oxygen TMDL was based on the reduction of ambient TN concentrations to the chosen reference site TN value, no modeling of loading sources was accomplished. It was, therefore, difficult to assign allocations on load reductions. To redress this issue, it was decided that initially to use simplified runoff and loading calculations to estimate the land based TN concentration and reduce this value to the ambient TN concentration. It should be recognized that this is a temporary solution to get a start on TN load reductions while the TMDL is re-evaluated to more specifically address dissolved oxygen and DO consumption by biological and nitrogenous demanding materials.

## Model Development

Initially, the loading model was developed based on the draft statewide stormwater rule modeling concepts<sup>1</sup>, including runoff coefficients and loading factors. However, based on input from the stakeholders, these coefficients and factors were modified to those recommended in documents prepared for the Charlotte Harbor National Estuary Program (CHNEP)<sup>2</sup>. The model development is described below.

The raw data (entity, land use, soil type, area) was derived from GIS analysis of each. Loadings per acre and runoff coefficients were taken from the CHNEP report, with the following exceptions:

- (1) Loadings per acre for those water-related categories for which the CHNEP report had zero values were assigned the loadings from FDEP's model, consistent with FDEP's approach of assigning loadings to water and wetlands. If the CHNEP report included loadings per acre for any given category, however, the CHNEP values were used.
- (2) Loadings for agriculture were taken from the FDEP model, as the CHNEP report did not provide definitive loading rates for different agricultural categories.
- (3) Runoff coefficients were based on "D" soils, the predominant soil type in both basins, and were weighted by the length of the wet (4 months) and dry (8 months) seasons.

The Florida Land Use, Cover and Forms Classification System (FLUCCS) codes in the raw data were converted to the categories in the CHNEP report by assigning each FLUCCS code in the raw data to a single CHNEP report category. These categories were then used to select appropriate loading rates and runoff coefficients. The resulting land use categories and loading factors are listed in Table X.

Yearly total nitrogen loadings were calculated by multiplying each polygon's acreage by its appropriate loading rate. Yearly runoffs were calculated by multiplying each polygon's area (in square meters) by rainfall (52 inches) by the appropriate runoff coefficient. Results were converted to cubic meters by multiplying by 0.0254 (meters per inch). Loadings and runoff volumes were then summed for each stakeholder for each basin.

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<sup>1</sup> *Evaluation of Current Stormwater Design Criteria with the State of Florida, Final Report*. Prepared for FDEP, Contract No. SO108, by Environmental Research & Design Inc., June 2007.

<sup>2</sup> *Final Water Quality Target Refinement Project, Task 4: Pollutant Loading Estimates Development, Interim Report 4*. Prepared for CHNEP, by Janicki Environmental, Inc., June 2010.

Background loadings were calculated by substituting the “Rangeland” loading per acre for each polygon in a “Built-up” land use category and recalculating the loadings. Table X shows the land uses identified as urban or agricultural (i.e., those with “1” in the Build-up column).

| Key  | Category                               | Included FLUCCS                    | Loading #/ac | Built-up | Runoff Coefficient (Appendix E) |
|------|----------------------------------------|------------------------------------|--------------|----------|---------------------------------|
| 1100 | Single Family Residential              | 1100s                              | 3.27         | 1        | 0.270                           |
| 1200 | Medium Density Residential             | 1200s                              | 6.55         | 1        | 0.430                           |
| 1300 | Multifamily Residential                | 1300s                              | 10.37        | 1        | 0.640                           |
| 1400 | Commercial                             | 1400                               | 12.87        | 1        | 0.850                           |
| 1550 | Industrial                             | 1550                               | 12.15        | 1        | 0.830                           |
| 1610 | Mining                                 | 1610, 1620, 1630, 7400, 7430       | 1.72         | 1        | 0.500                           |
| 1660 | Mining - Holding Ponds                 | 1660                               | 7.13         | 1        | 0.830                           |
| 1700 | Institutional/Transportation/Utilities | 1700, 1710, 8140, 8310, 8320       | 3.60         | 1        | 0.580                           |
| 1800 | Golf Courses and Parks                 | 1800, 1820, 1850                   | 2.27         | 1        | 0.250                           |
| 1900 | Rangeland                              | 1900, 1920, 3100, 3200, 3210, 3300 | 1.53         | 0        | 0.250                           |
| 2000 | Agriculture                            | 2000s                              | 10.35        | 1        | 0.288                           |
| 4000 | Upland Forested                        | 4000s                              | 0.41         | 0        | 0.210                           |
| 5000 | Freshwater - Open Water                | 5000s                              | 7.13         | 0        | 0.830                           |
| 6120 | Forested - Freshwater Wetlands         | 6120-6300                          | 4.30         | 0        | 0.680                           |
| 6410 | Non-forested Freshwater Wetlands       | 6410, 6430, 6440                   | 3.47         | 0        | 0.630                           |
| 6420 | Saltwater Wetlands                     | 6420, 6510                         | 0.00         | 0        | 0.000                           |

**Figure 1x - Summary of Land Uses, FLUCCS Code Assignments, Loading Factors and Runoff Coefficients**