**General Attenuation Approach for NHD Catchments**

1) Distribute loads to each catchment as done previously (there is a slight change in how streambank-eroded loads are calculated – *see below*). In this case, the input loads are those passed to the API from MMW for each HUC12 basin.

2) For each catchment, calculate the “accumulated” load (i.e., “internal” load plus the “upstream” load). In this case, the “accumulated” loads have to be tracked by each “source” category (i.e., land cover type, groundwater, point source, etc.), and by each HUC12 basin.

3) At each catchment (within each HUC12), calculate the “attenuated” load as:

Attenuated Load = Accumulated Load \* (1 – (“ShedAreaDrainLake” \* “Retention” factor))

For example, if Accumulated Load for a given catchment = 100,000 kg of sediment, and ShedAreaDrainlake = 0.17, then:

Attenuated Load = 100,000 \* (1 – (0.17 \* 0.84)) = 100,000 \* 0.8572 = 85,720 kg

For the next downstream catchment, the “upstream” load is now the “attenuated” load (i.e., 85,720)

4) For the API, the “ShedAreaDrainLake” value will be calculated using “StreamCat” data associated with each NHD catchment. Specifically, this value (which ranges from 0-1) will be calculated as the total percentage of the catchment comprised of wooded wetland, herbaceous wetland, and water (i.e., ShedAreaDrainLake = PctWdWet2011Cat + PctWdWet2011Cat + PctOw2011Cat). For the initial API, use the default “retention” factors of 0.12, 0.29 and 0.84 for nitrogen, phosphorus, and sediment, respectively. These values will likely change through a process of testing and calibration done using about 100 basins around the country.

*Streambank Load Distribution*

For each NHD catchment, this is calculated as:

SL = (SBS \* 0.4 \* AreaFrac) + (SBS \* 0.6 \* PctImpervFrac)

NL = (SBN \* 0.4 \* AreaFrac) + (SBN \* 0.6 \* PctImpervFrac)

PL = (SBP \* 0.4 \* AreaFrac) + (SBP \* 0.6 \* PctImpervFrac)

Where:

SBS = Total streambank sediment load of watershed

SBN = Total streambank nitrogen load of watershed

SBP = Total streambank phosphorus load of watershed

SL = Streambank sediment load apportioned to a given NHD catchment

NL = Streambank nitrogen load apportioned to a given NHD catchment

PL = Streambank phosphorus load apportioned to a given NHD catchment

AreaFrac = Total area of the NHD / Total area of the HUC12 basin

PctImpervFrac = NHD impervious area / HUC12 impervious area