

ASSIMILATIVE CAPACITY EXAMPLE
 TOTAL PHOSPHORUS IN LAKES: Perkins Pond
 April 6, 2006

I. Estimate the best possible condition for Phosphorus concentration [P] in a natural water. The best possible condition is that [P] is very low, ~ 0 mg/l

II. From the 2006 CALM, the chlorophyll a [cha] numerical criterion is <10% of sample results within a year's record > .015 mg/l

III. Use the relationship between [P] and [ch a] for NH lakes (from P. Trowbridge memo "Analysis of NHDES Data to Determine Preliminary Total Phosphorus Criteria for Freshwaters", August 5, 2005). The median [cha] for lakes that are impaired (> 10% of samples >.015 mg/l) for ch a is .008 mg/l. Using the regression relation:

$$\text{Log [cha]} = 0.925 * \text{log[TP]} - .532 \quad r^2 = 0.617 \quad \text{where [cha] and [TP] are in mg/l}$$

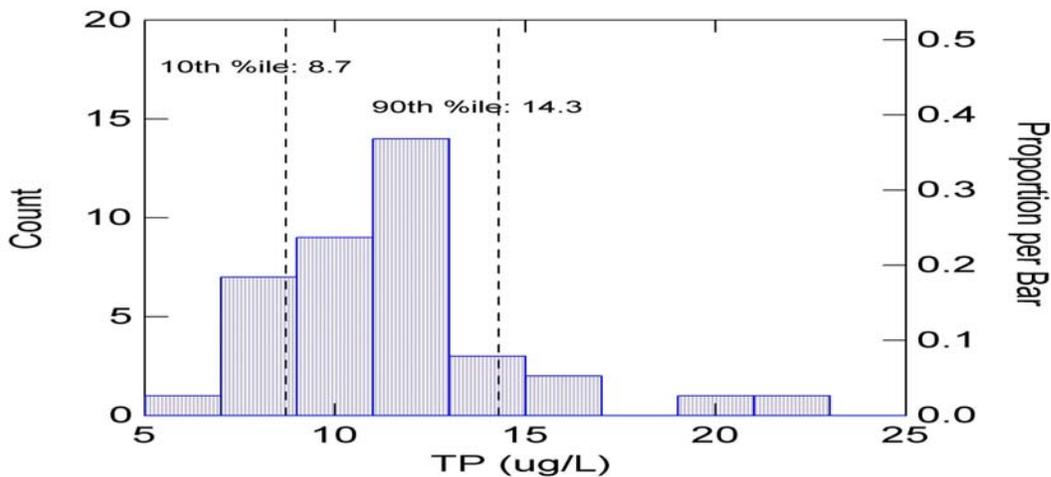
The median [TP] value corresponding to a median [cha] of .008 mg/l is .020 mg/l [P]

IV. So the total assimilative capacity of any lake is (.020 - ~0) = .020 mg/l of TP in-lake concentration

V. See the figure below for the [P] data for Perkins Pond, and the 90th %ile, for 2000-2005

2000-2005 Combined hypolimnion and epilimnion data

Histogram of TP in Perkins Pond



CONCEPTUAL DIAGRAM FOR TIER 1 AND TIER 2 WATERS ESTIMATION

(not to scale)

Perkins Pond
Phosphorus Example
rev 2
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