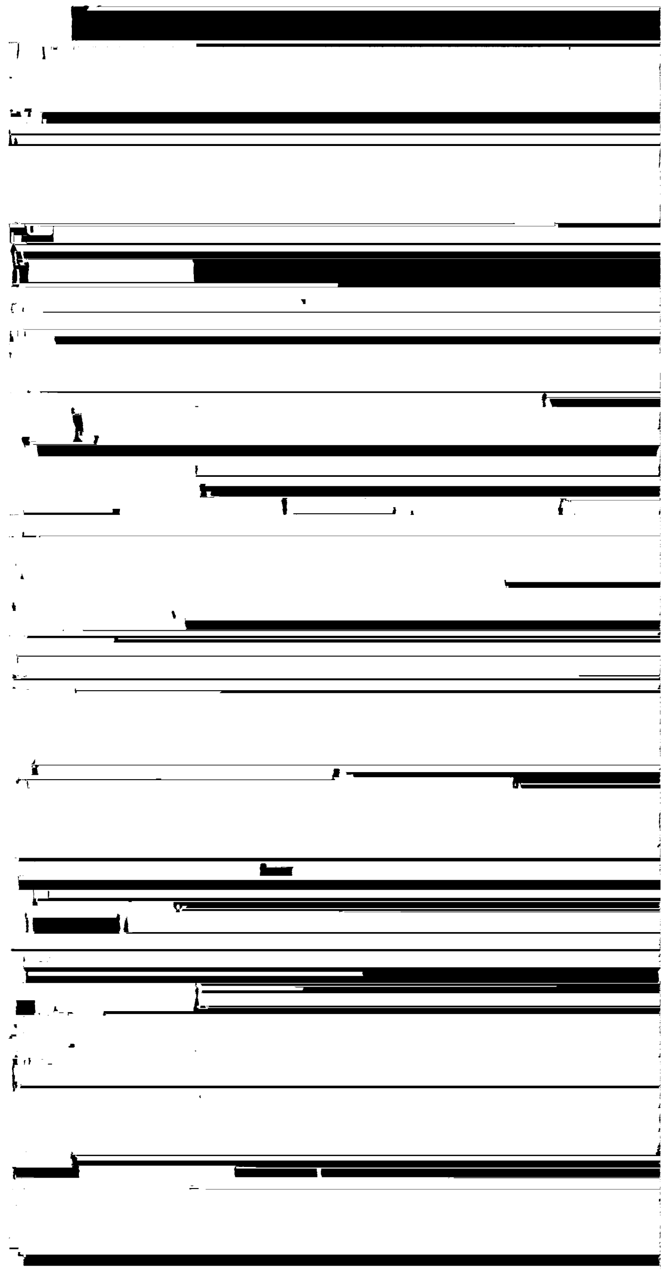

pletely mix because they have zones with limited water replacement (e.g., Thorp et al. 1998; Wehr and Descy 1998). Thus, allochthonous and autochthonous sources of C both should be considered, as well as inorganic and organic forms of nutrients such as N and P, when defining trophic status of lotic ecosystems.

Historically, trophic state in lakes was defined on the basis of clear delineation between anoxic hypolimnia and oxygenated waters (i.e., the difference between a mesotrophic and a eutrophic lake) and subsequent increases in the prevalence of cyanobacterial blooms, eutrophication- resistant animals, decreased water clarity, and taste and odor problems. Foremost, biogeochemical processes favor increased internal

Table 2. Lower one-third and upper one-third of the distribution of stream total N and total P pooled across 14 ecoregions according to reference values determined for each individual ecoregion by Smith et al. (2003), 13 ecoregions for total P, and 12 ecoregions for total N from Dodds and Oakes (2004) and the relationship of the boundary numbers from Smith et al. (2003) data to cumulative frequency distribution of benthic chlorophyll (Chl) as a function of total N or total P (Fig. 1) expressed as the percentage of benthic chlorophyll mean or maximum values exceeding 100 mg m^{-2} when nutrient values were less than the boundary value. For example, when seasonal mean of total N was <714 mg m^{-3}, then 10% of the streams had mean benthic chlorophyll values exceeding 100 mg m^{-2} and 29% had maximum values exceeding that amount.

Nutrient	Autotrophic state boundary	Concentration (mg m^{-3})

Table 4. Autotrophic state boundaries for suspended chlorophyll

and this was correlated with somewhat decreased dissolved O_2