Technical Fact Sheet on *Lyngbya* (Blue-Green Alga)

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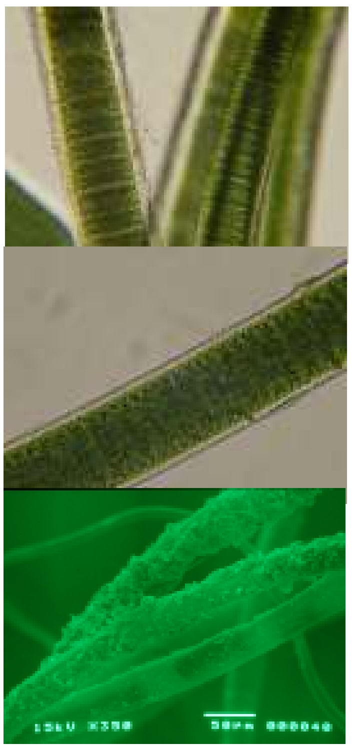

What is Lyngbya?

The filamentous cyanobacterium (blue-green alga), *Lyngbya*, forms dense benthic and surface mats with cells protected by an external sheath comprised of polysaccharides, peptidoglycans and minerals such as calcium carbonate. *Lyngbya* can thrive at extreme temperatures ranging from melt-water lakes and streams to hot springs. This alga also contains photosynthetic accessory pigments (i.e. phycobilins) that permit growth in low light conditions (i.e. < 2% incident photosynthetically active radiation). *Lyngbya* can grow in waters with low nitrogen concentrations (≤ 0.07 mg NO_3-N / L) due to its ability to fix atmospheric nitrogen. *Lyngbya* can achieve densities of > 4000 Kg / acre dry weight with ~ 40-100% of this biomass existing as benthic mats.

What does *Lyngbya* do?

Excessive growths of algae can cause significant disruption of water resource usages. In freshwater reservoirs throughout the United States, benthic, mat-forming algae, such as *Lyngbya*, have caused problems ranging from eroding property values, and production and release of taste-and-odor compounds, to avoidance behavior demonstrated by some fish species. If benthic algae interfere with critical water resource usages and problems become severe, water resource managers often are compelled to intervene with management techniques.

How can *Lyngbya* be managed?

Several approaches have been used to manage excessive growths of *Lyngbya,* including chemical (algaecides), harvesting and benthic barriers. Based on economic and environmental considerations, copper algaecide formulations are often used (Mastin et al. 2002). Previous studies have involved laboratory algaecide exposures of algae in site waters to predict efficacious treatments (form and treatment concentration) to achieve control of target algae (Mastin et al. 2002; Murray-Gulde et al. 2002). For copper-containing algaecides, water characteristics and other site parameters influence the speciation of copper and thus the bioavailability and efficacy of an algaecide application (Erickson et al. 1996; Haughey et al. 2000). Use of site water with associated algae in the laboratory algal toxicity tests minimizes the potential for ambiguity in applying laboratory results directly to a field situation (Fitzgerald and Jackson 1979). From site to site, *Lyngbya* varies widely in responses to algaecide exposures. This plasticity in responses is likely due to genetic variation as well as environmental conditions such as water characteristics that influence the bioavailabilty and efficacy of algaecides. Laboratory studies can decrease uncertainties in algaecide applications for *Lyngbya* control as well as maximize margins of safety for non-target species.