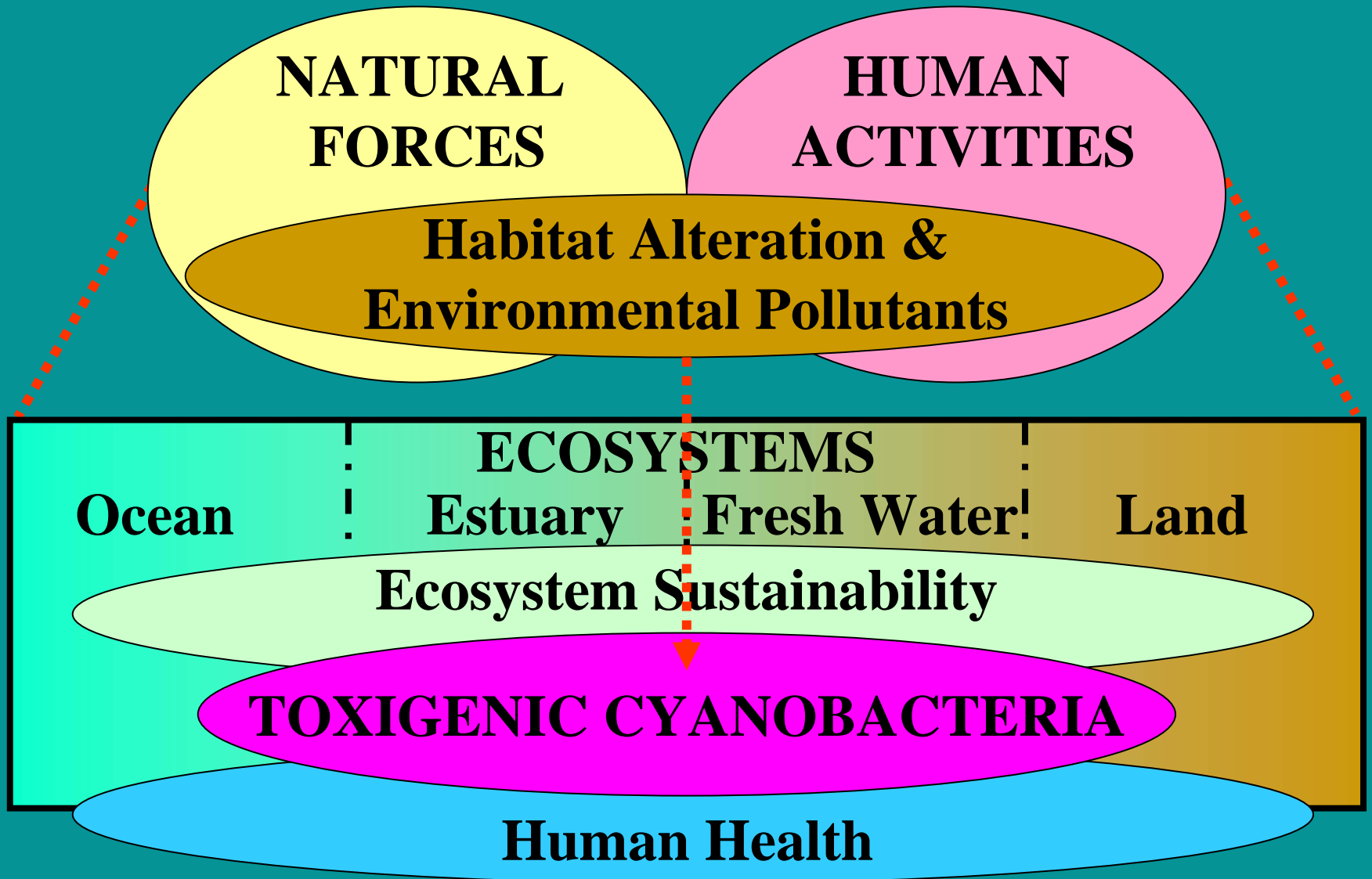


# The HAB Problem



# Systems Approach - CHABs Risk Management



Lake Mead, AZ

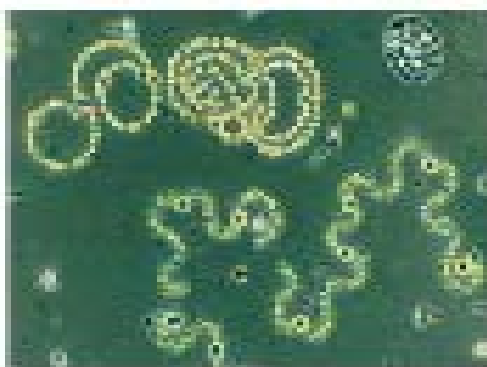
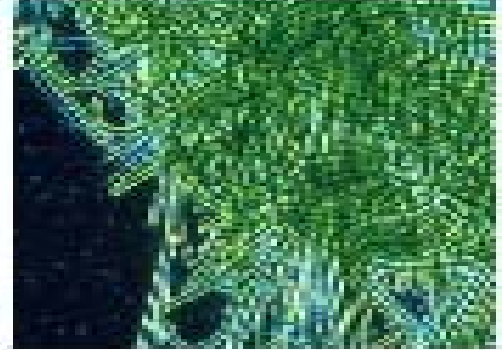
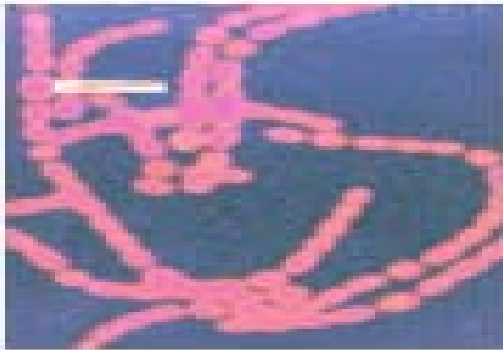
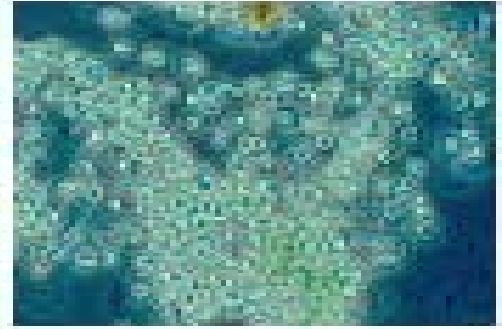
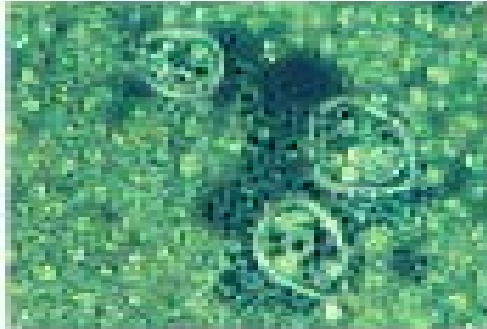
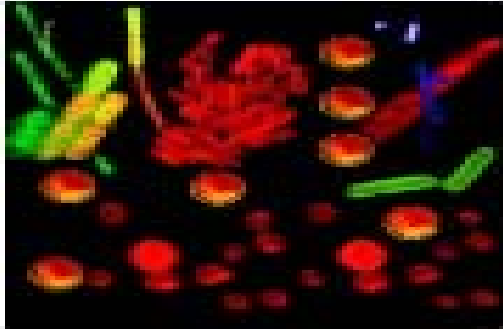
Hoover Dam





**St. John's River, FL - John Burns ISOC-HAB Ch. 5**

# Cyanobacteria





**St. John's River, FL - John Burns ISOC-HAB Ch. 5**



**St. John's River, FL**

# Pawnee Lake, NB, Steve Walker, ISOC-HAB Ch. 6







Tai Hu, China

# Florida Drinking Water Plant Shut Down



# Florida River

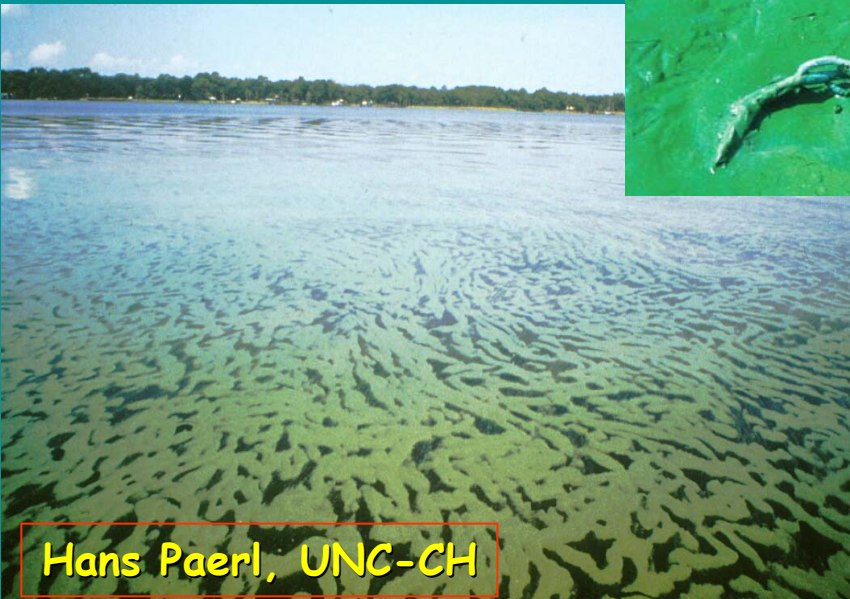


# Post Chloraminated Ground Water at FL WTP



**Home Filters**

# Harmful cyanobacterial blooms (CHABs) are symptomatic of nutrient over-enrichment in diverse aquatic ecosystems



Hans Paerl, UNC-CH

# Hamilton Reservoir, Platte River Power Authority, Fort Collins, CO



# Thunderbird Lake, Boulder, CO



# Orange, TX





# Myrtle Beach, SC



# Plaster Lake, Broomfield, CO

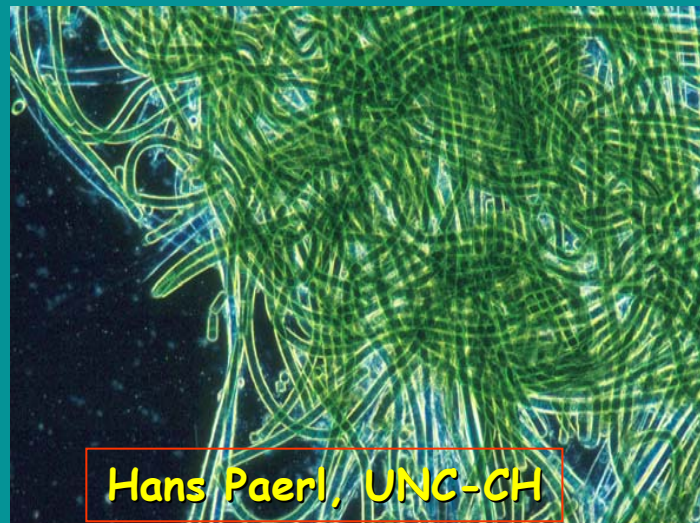
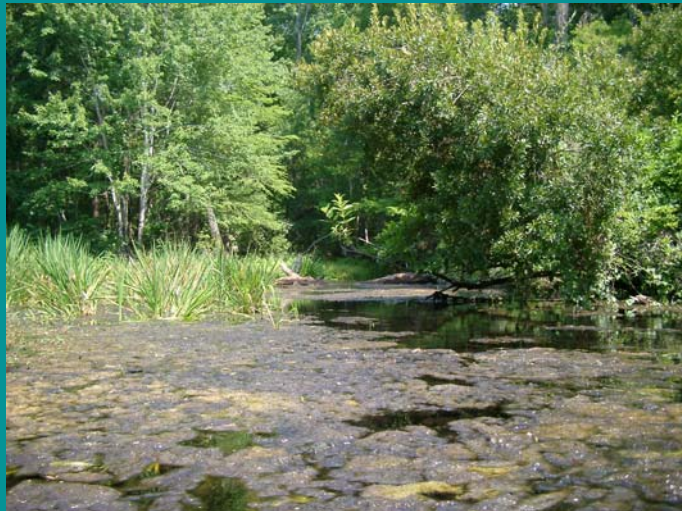


# Pelican Lake, CO



# The toxic filamentous cyanoHAB *Lyngbya*

A problem in nutrient-enriched freshwater and marine environments



# Discovery Bay, CA



# Kettle Falls, MI



# Lost Hills, CA



# Chinook, WA





# Twenty-Nine Palms, CA



# Grasmere Lake, CO



# Sacramento, CA



# Dufur, OR

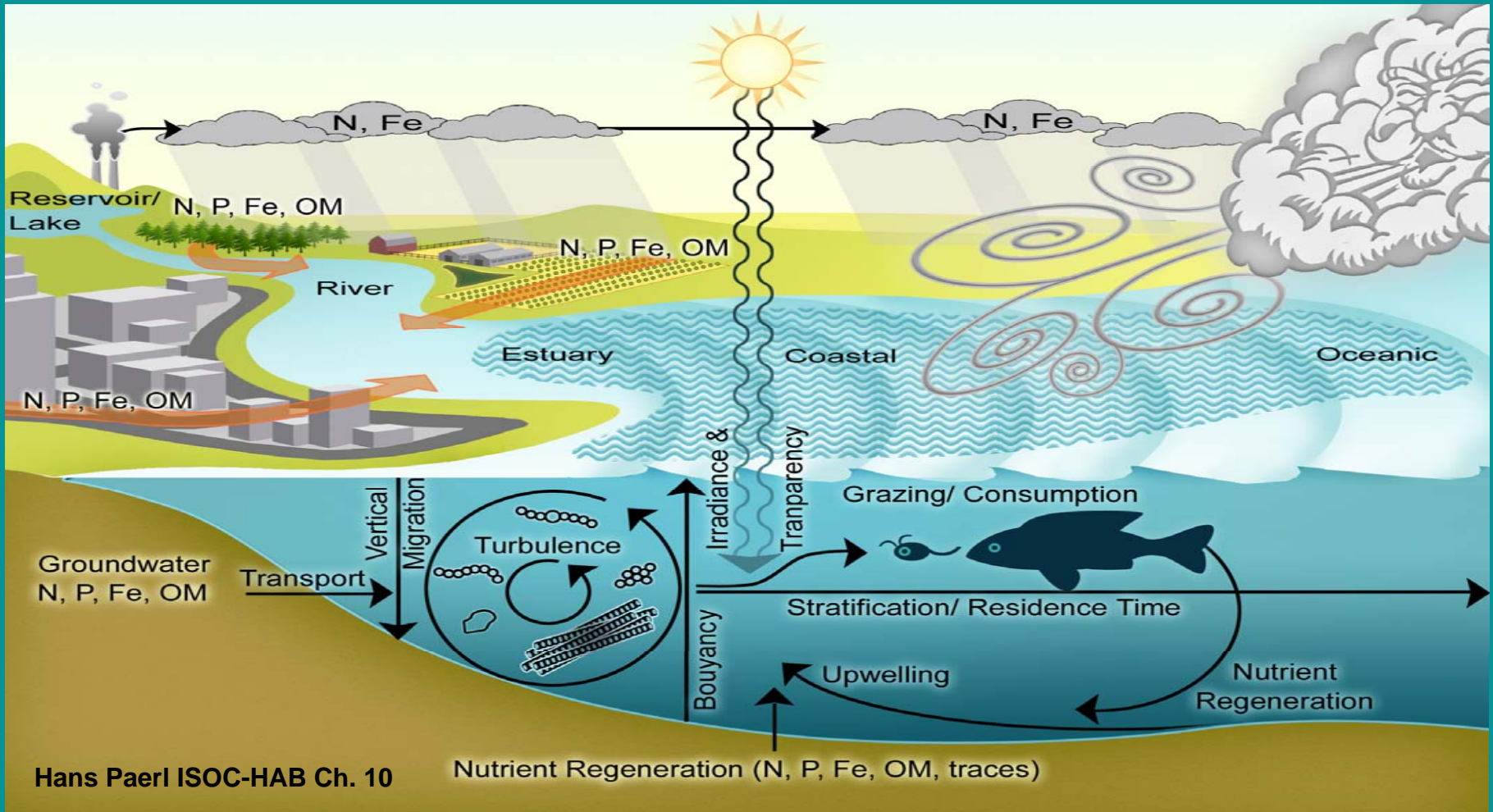


# Fairmont, MN



# Edgar, AZ





# Sparks Marina Lake, NV





# Duck Lake, Denver, CO



# Thornton, CO



# Clear Lake, Clearwater, MN



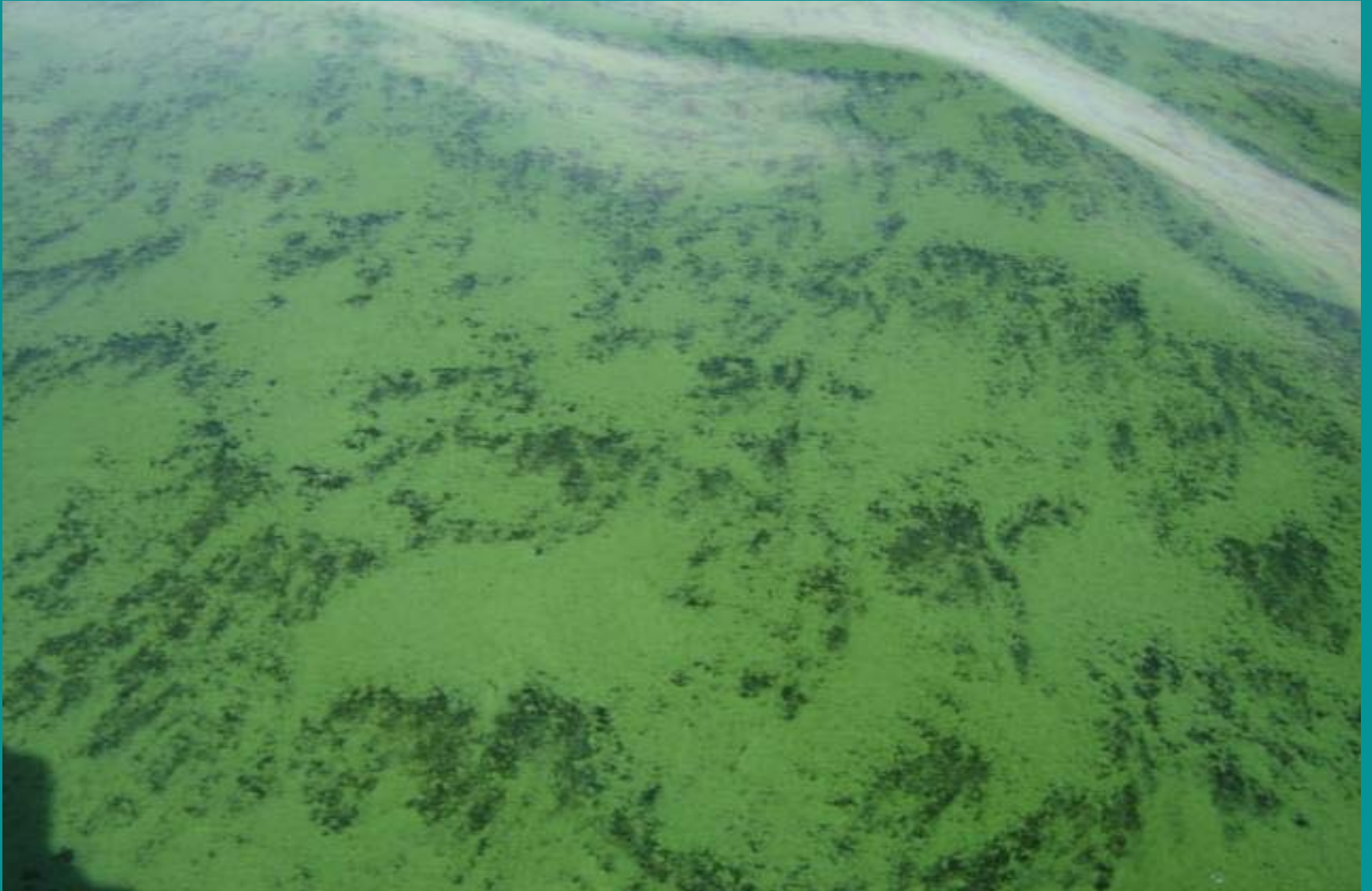
## Halsey Pond, Irvington, NY



# Glenn Dale, MD



# Platt River Power, CO



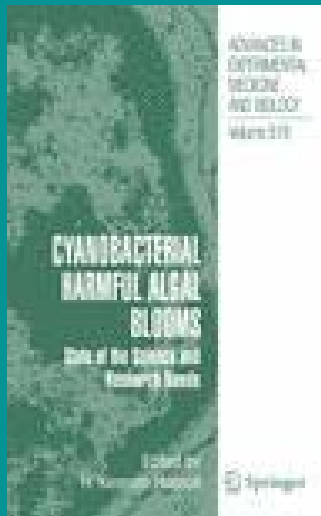
# Southside Park, Sacramento, CA



# Brawley City, CA







***Cyanobacterial Harmful Algal Blooms: State of the Science and Research Needs.* Series: Advances in Experimental Medicine and Biology , Vol. 619, Hudnell, H. Kenneth (Ed.) 2008, XXIV, 960 p. 80 illus., 17 in color., Hardcover ISBN: 978-0-387-75864-0**

# Bakersfield, CA



# Lake of the Pines, CA



# Union Springs, NY



# Ville De Montreal



# Cottonwood, AL



# Trinity Bay, TX



# Laguna West, Sacramento, CA



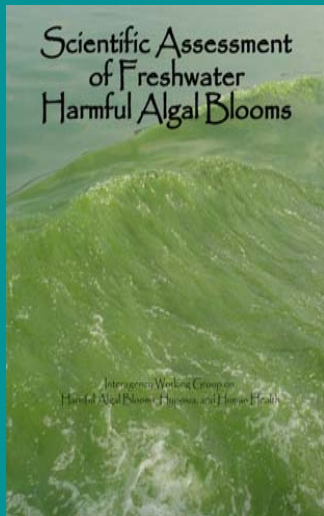


# Silver Lake, CO



# Ripley, TN





**Lopez, C.B., Jewett, E.B., Dortch, Q., Walton, B.T., Hudnell, K. 2007. Scientific Assessment of Freshwater Harmful Algal Blooms. Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, DC.**

# Dewar, OK



# Camp Pendleton, Oceanside, CA



# Bloomfield, MO



# Big Bear City, CA



# River Meadows, Bend, CO





# Batesville, MI



# Polk County Water, Onalaska, TX



# Ketchum, ID



# Perry, UT





*Harmful Algal Bloom  
Management and Response:  
Assessment and Plan*

*Draft Report  
December 2007*



**Calls for the creation of  
a competitive,  
interagency research  
grant program**

**MACHAB**

**Mitigation and control  
of harmful algal  
blooms**

# Ash Bar Reservoir, Grants Pass, OR



## Klamath River Delta, CA



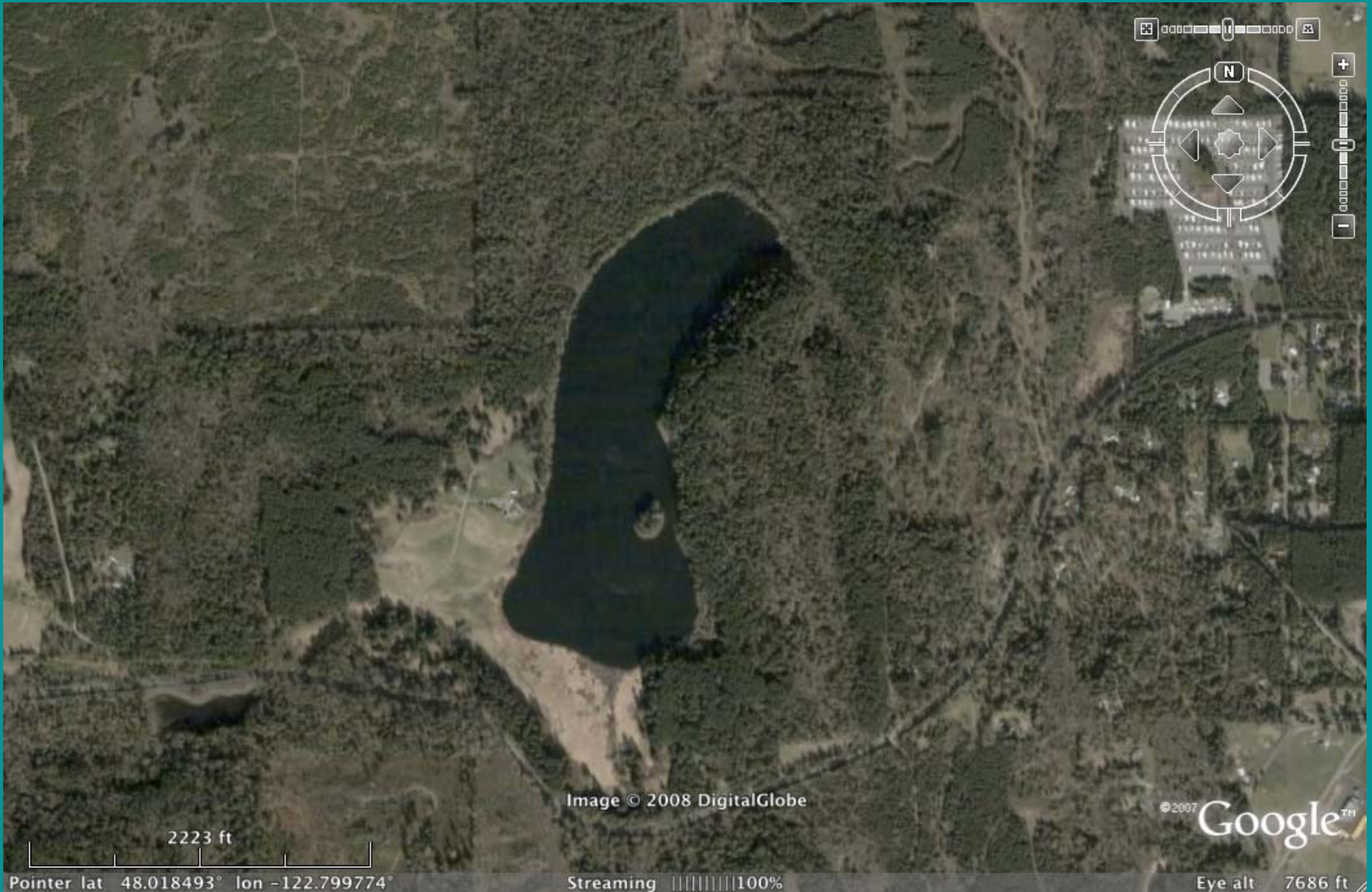
The mouth of the Klamath River

# Willow Creek Reservoir, OR





# Anderson Lake, WA



# Moses Lake, WA



Image © 2008 TerraMetrics  
Image © 2008 DigitalGlobe

©2007 Google™

5261 ft  
Pointer lat 47.125751° lon -119.312047°

Streaming 100%

Eye alt 18188 ft

# Lake Manatee, FL



## Lake Manatee, FL

