

# LEE KRUMHOLZ

- Department of Microbiology and  
Plant Biology
- University of Oklahoma

11/13/2017

## OU Researchers Harness Methane Consuming Microbes



NORMAN —A University of Oklahoma research team, led by OU Professor Lee Krumholz, is studying methane-consuming microbes from extreme environments that can be re-engineered for industrial applications, such as biodegradable plastics and electricity. OU's role in the collaborative study with South Dakota School of Mines and Technology and Montana State University is to collect microbial samples from extreme environmental sites and to extract DNA and RNA to determine the microbial community composition and the microbial activities that pertain to methane consumption.

# OU Collaborators on These Projects

Andy Madden CP SG&G

Amy Callaghan – MPB

Krithi Sankaranarayanan –MPB

Patrick McCann – ECE

Xiaolei Liu – CP SG&G

Other Universities

South Dakota School of Mines & Technology

Montana State University

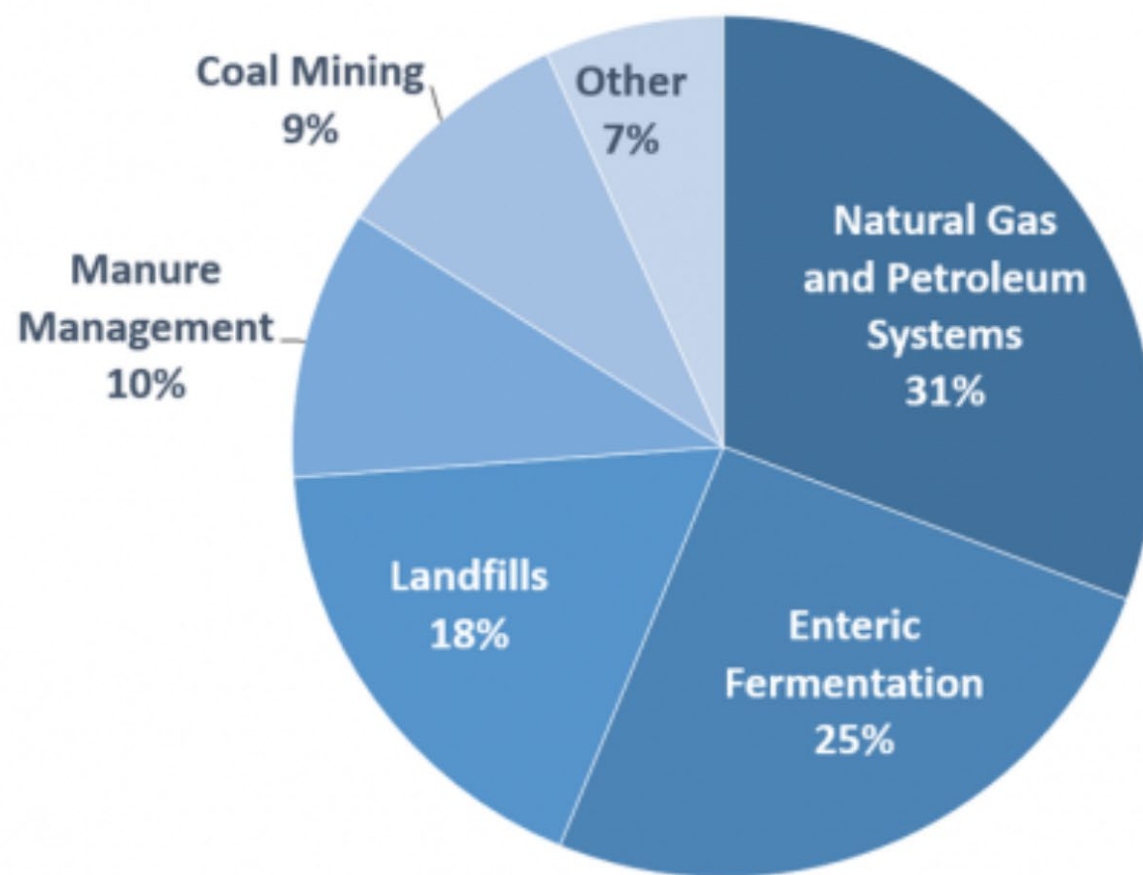
# Goals:

---

- Determine the microbial community composition of methane oxidizing microbial systems.
- Isolate novel methane oxidizing bacteria.

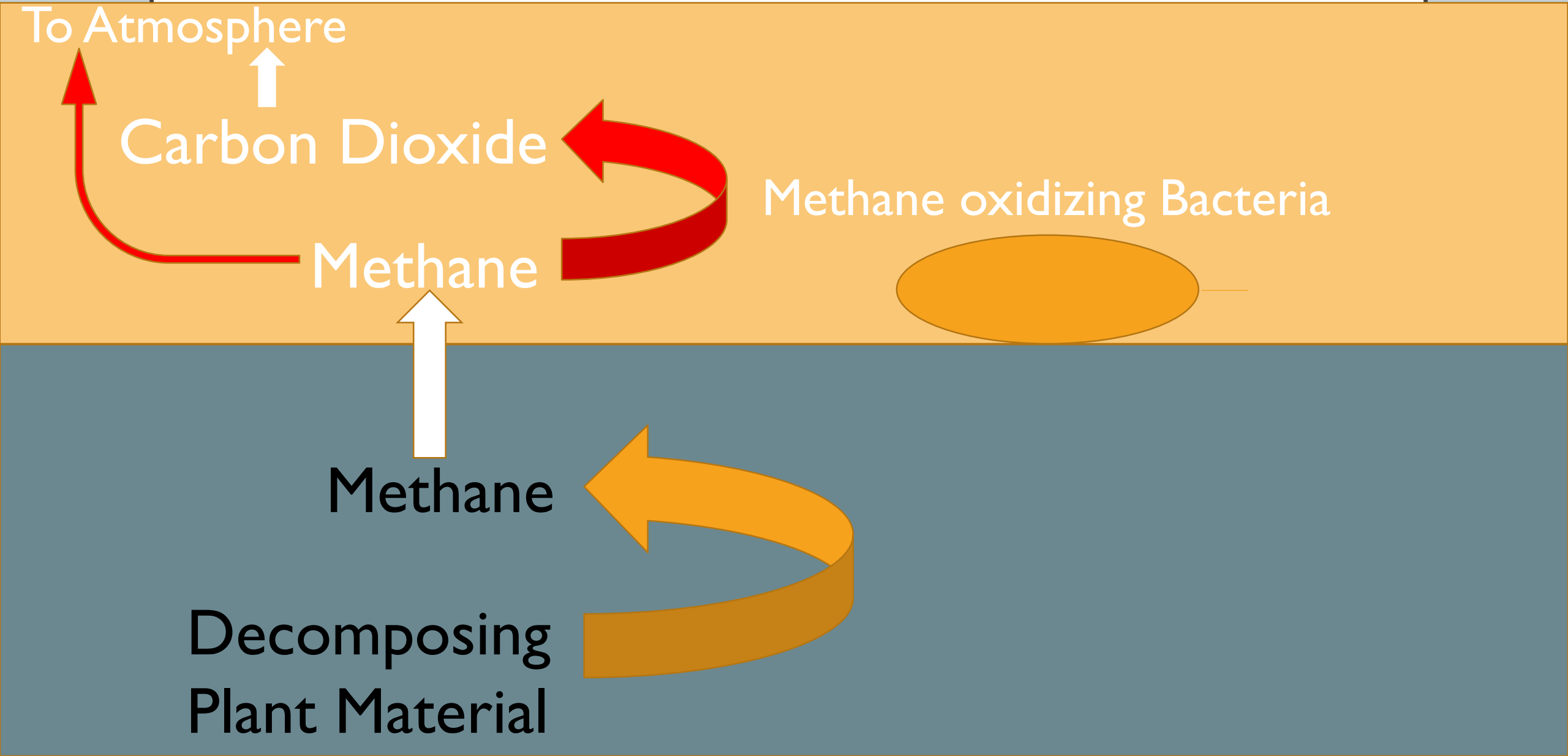


## 2015 U.S. Methane Emissions, By Source



U.S. Environmental Protection Agency (2017). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015.

# METHANE MOVEMENT IN AQUATIC AND TERRESTRIAL SYSTEMS







Duck Pond



Honey Creek



Lake Thunderbird





Norman Landfill



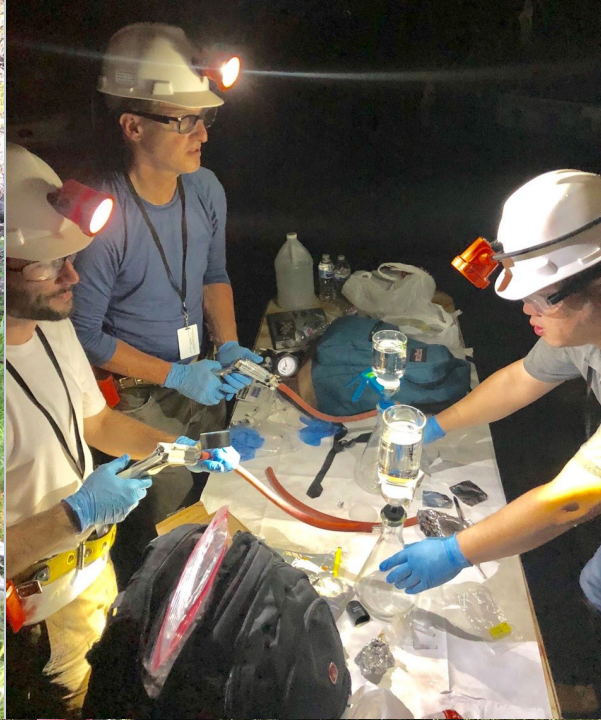
Great Salt Plains





Zodletone Spring:  
near Mountain View, OK





# Sanford Underground Research Facility: SD Yellowstone National Park





## OU Professors to Lead Global Research on Bluegreen Algae in Freshwaters

*By Jana Smith*

*OU professors will lead a global research team to study freshwater toxic bluegreen algae blooms, which threaten freshwater lakes and pose substantial health risks to humans, pets, livestock and wildlife.*

10/26/18

**NORMAN**—University of Oklahoma professors, Karl D. Hambright and Lee R. Krumholz, will lead a global research team to study one of the most common environmental problems—freshwater toxic cyanobacteria (bluegreen algae) blooms, which threaten freshwater lakes and pose substantial health risks to humans, pets, livestock and wildlife. The group will address the fundamental interactions between cyanobacteria and other bacteria co-occurring with the blooms.

# OU Collaborators on These Projects

---

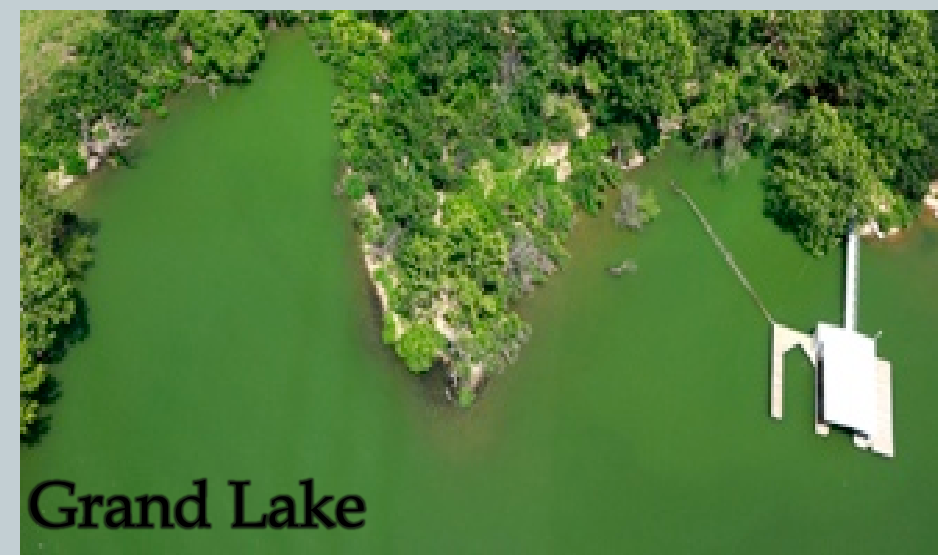
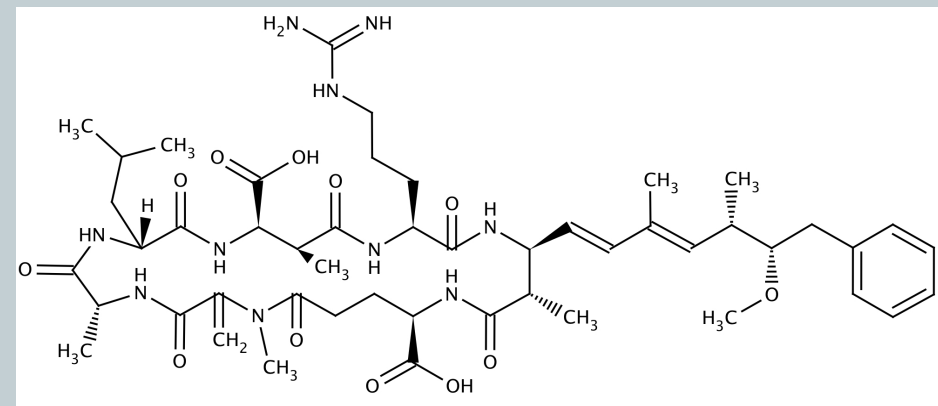
K. David Hambright –Biology

Other Universities

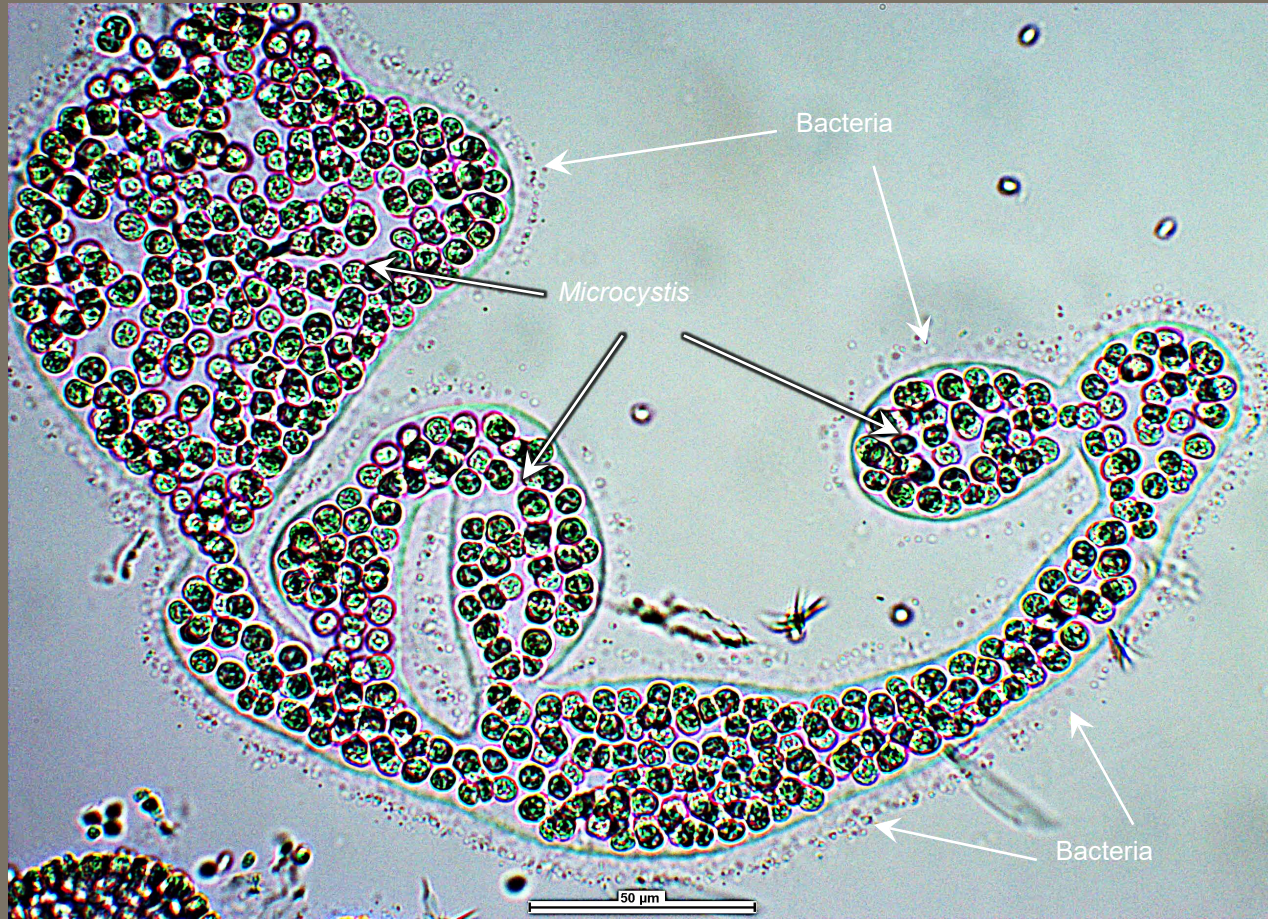
Auburn University

University of North Carolina

James Madison University

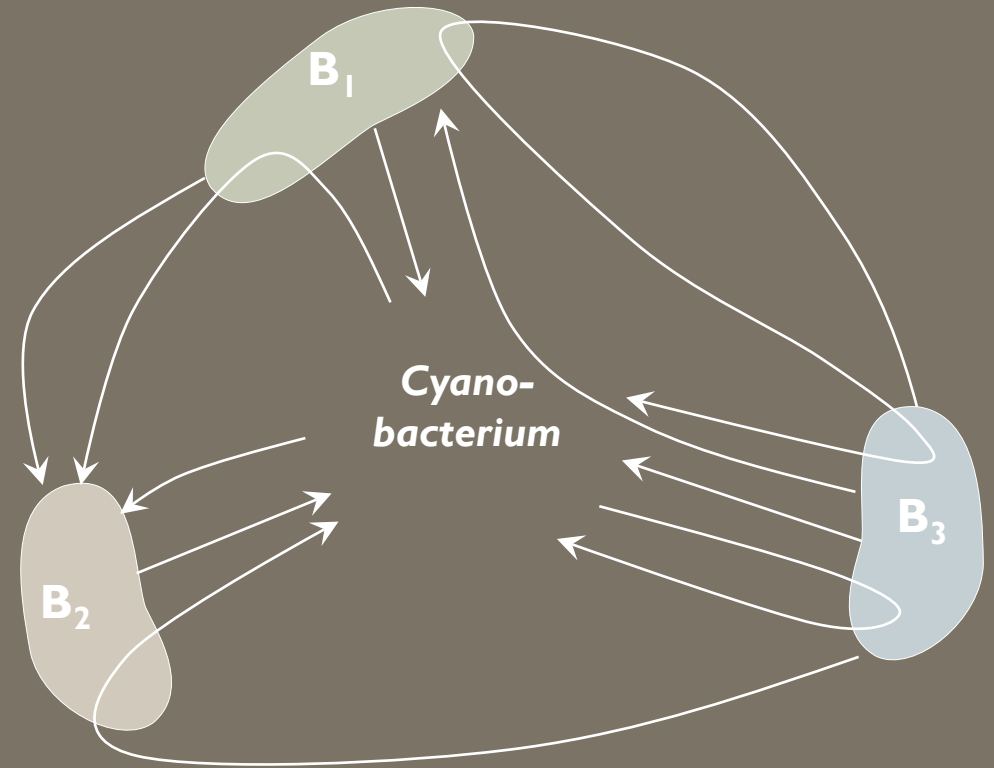


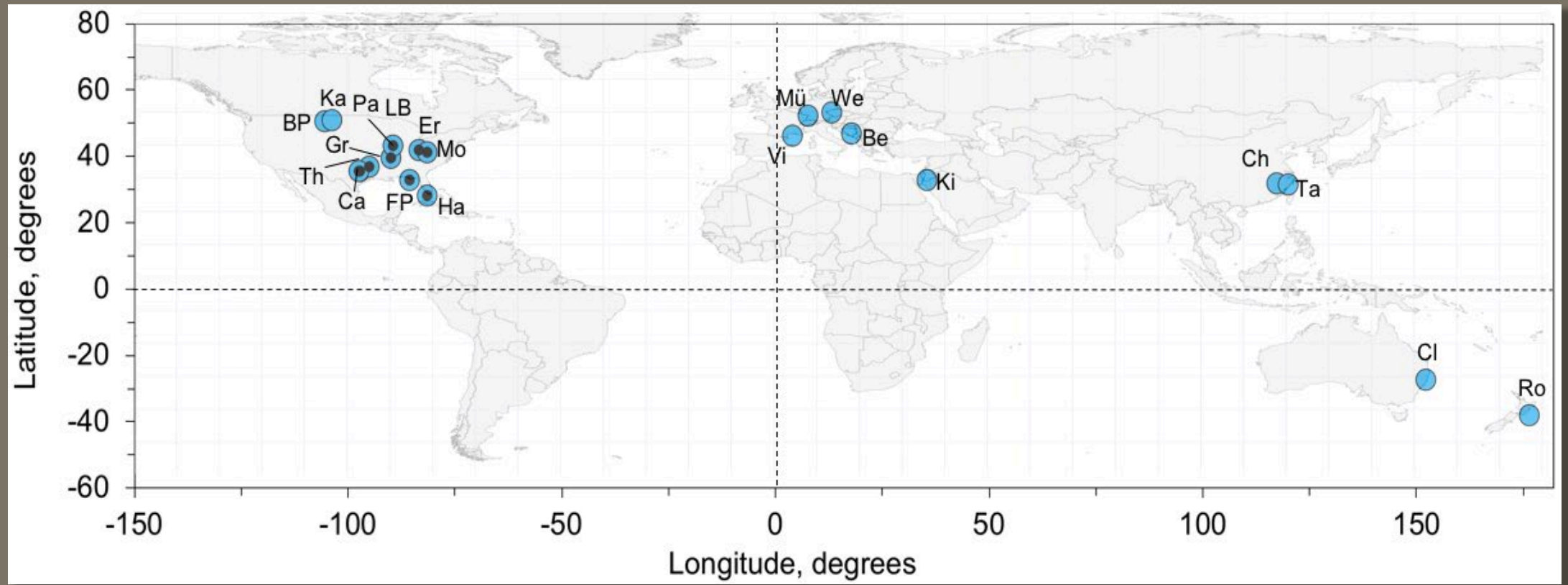




Microcystis Aggregate

## Hypothesized Cyanobacterium Interactome





BP – Buffalo Pound  
 Ka – Katepwa  
 Ca – Castlerock Pond  
LT – Lake Thunderbird  
 Gr – Grand Lake;  
 Pa – Palmyra-Modesto Lake  
 LB – Lake Barney  
FP – Fish Pond 23  
Er – Lake Erie  
 Ha – Lake Hatchineha  
 Mo – Mogadore Reservoir

Vi – Lac de Villerest  
 Mü – Münster  
 We – Wentowsee  
 Be – Belső-tó  
 Ki – Kinneret  
 Ch – Chaohu  
Ta – Taihu  
 Cl – Clarendon  
 Ro – Rotoehu  
Unidentified Auburn Fish Pond (not shown)





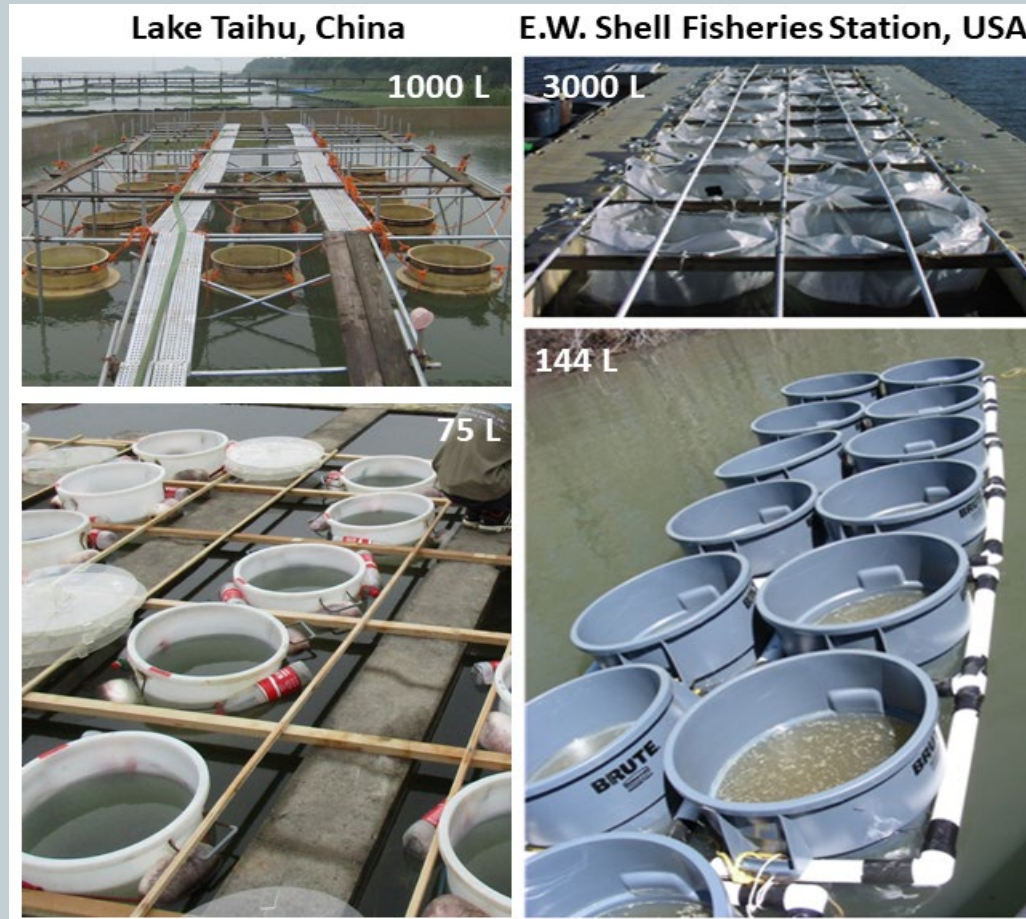


Fig. 6. Mesocosm facilities at Lake Taihu (Paerl) and Auburn's E.W. Shell Fisheries Station (Wilson).