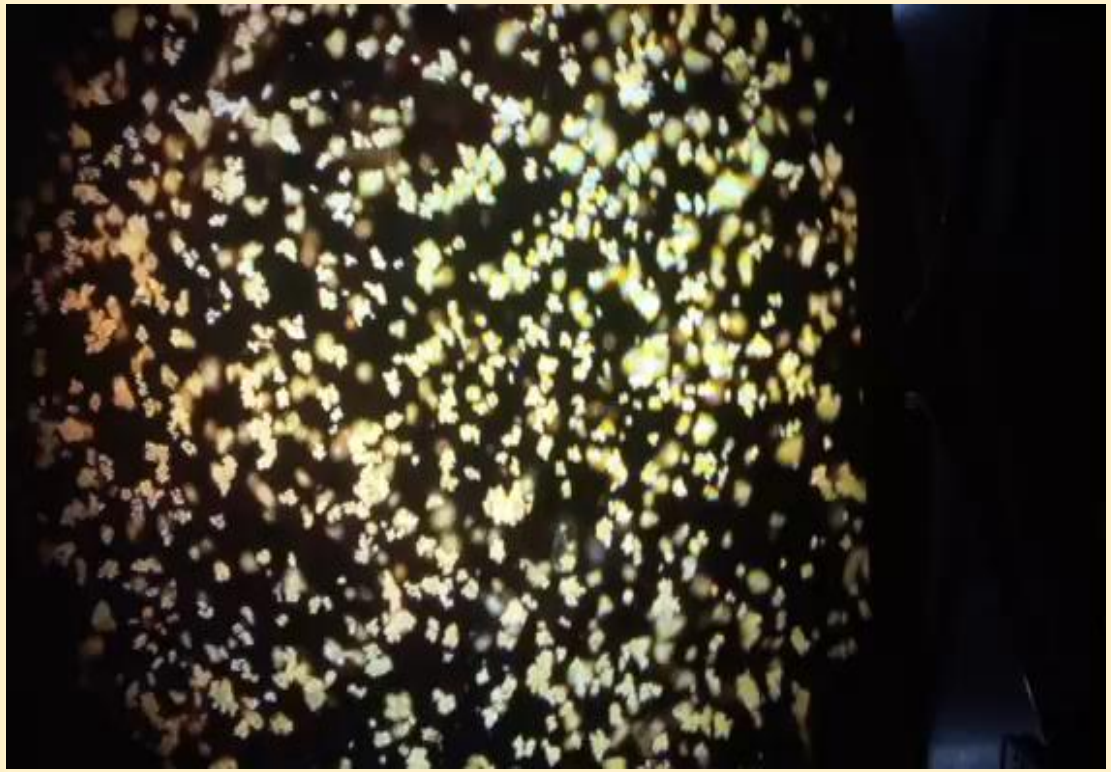


Who's at the Party?
Risk assessments using cyanobacterial population size structure analysis

Drinking Water Source Protection Conference May 16, 2019

Nancy Leland, MS nleland@lim-tex.com

Cyanobacteria Monitoring Collaborative

Proverbial Jim Haney quotes

"It's all about the science"

"Keep it simple"

"Support their decisions"

"Step in sooner rather than later"

Science

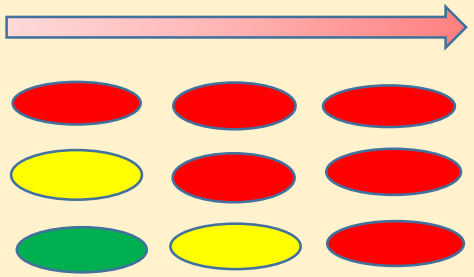
Simple

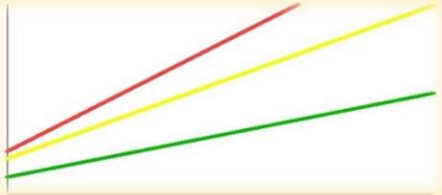
Support

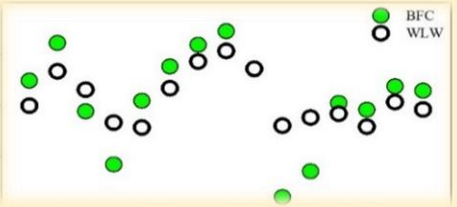
Who's at the Party?

Ecology of cyanobacterial populations
Size fractions: <50µm, WLW & BFC samples

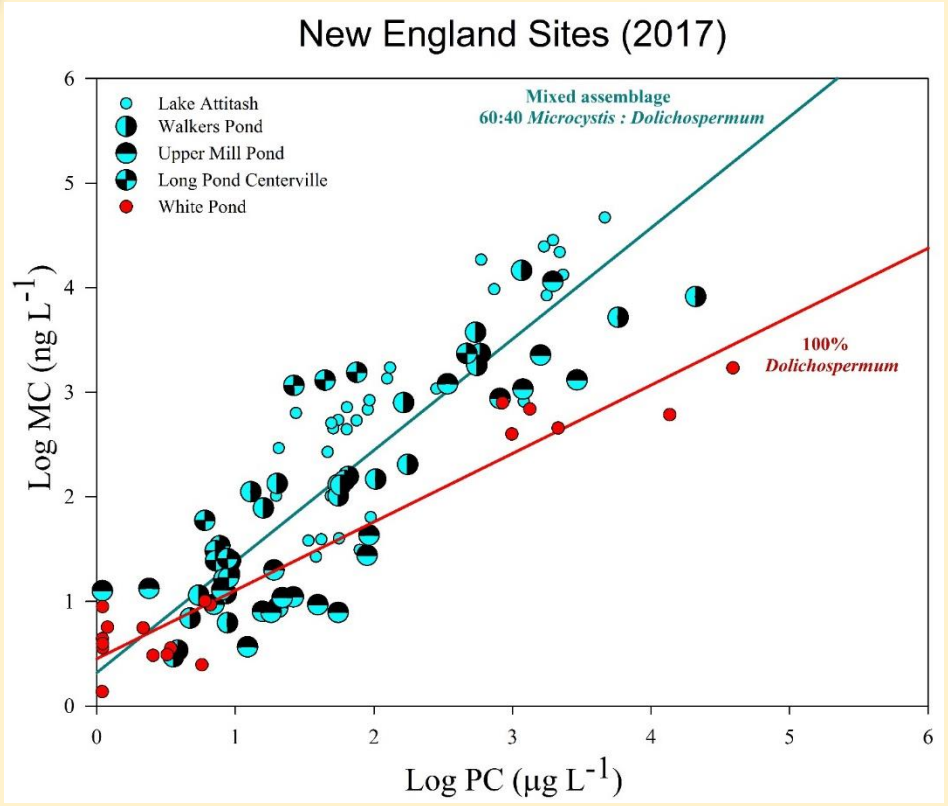
Timing and amplitude of growth
Toxigenicity
Specific toxins



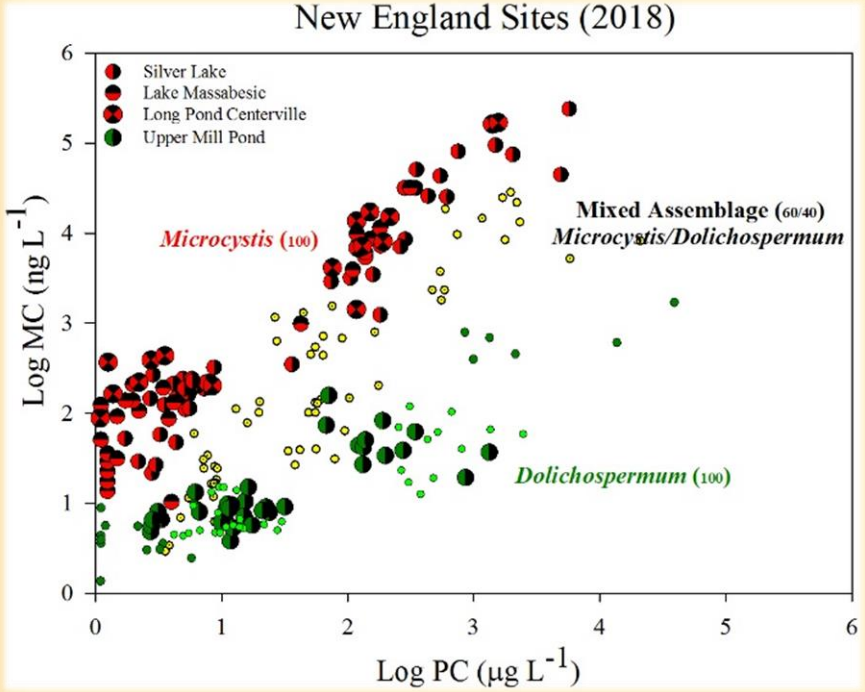




This is where we started
Composition



This is where we are
Composition and Dominance

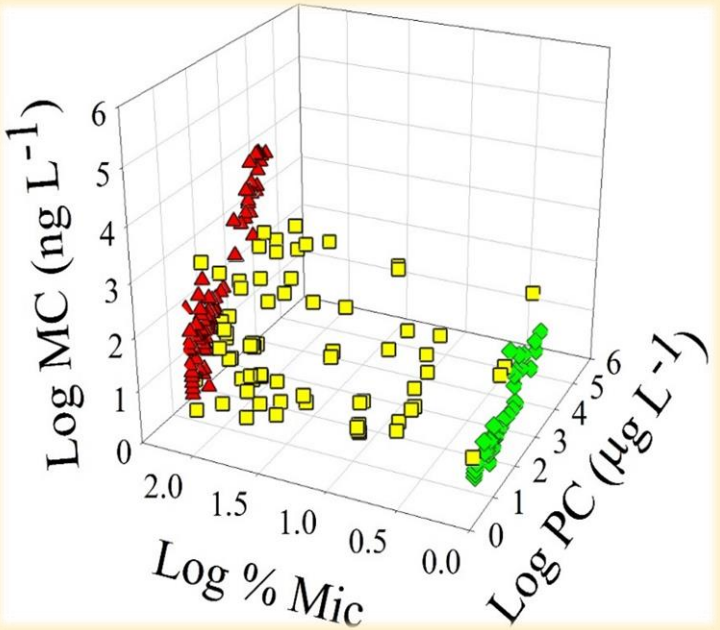


The BFC Data Sheet

Semi-Quantitative Analysis for Bloom Forming Cyanobacteria (BFC's)

Count (1st 100 observations)

Observed Dominance (%)



This is where we're going

Composition, Dominance and Growth

Growth Rate (GR) or Resilience Indicators (RI)

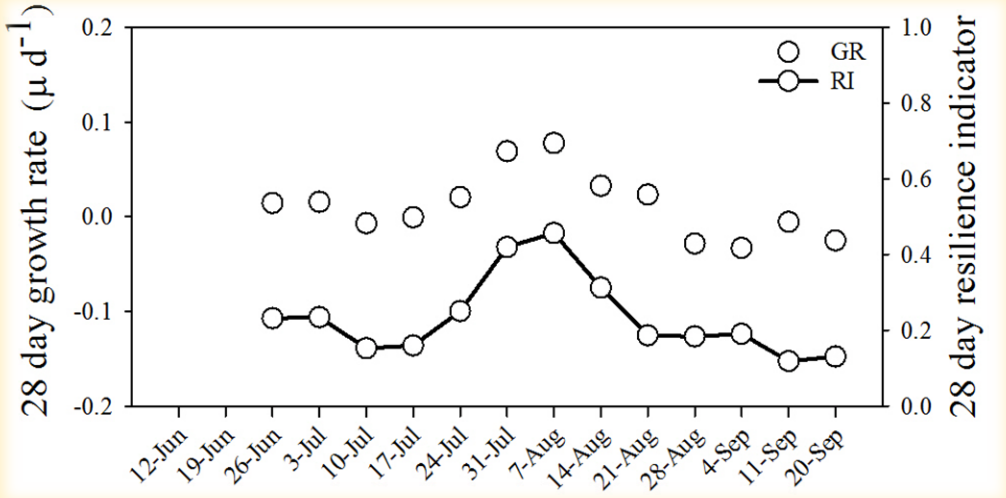
Variance of environmental indicator increases during critical transitions

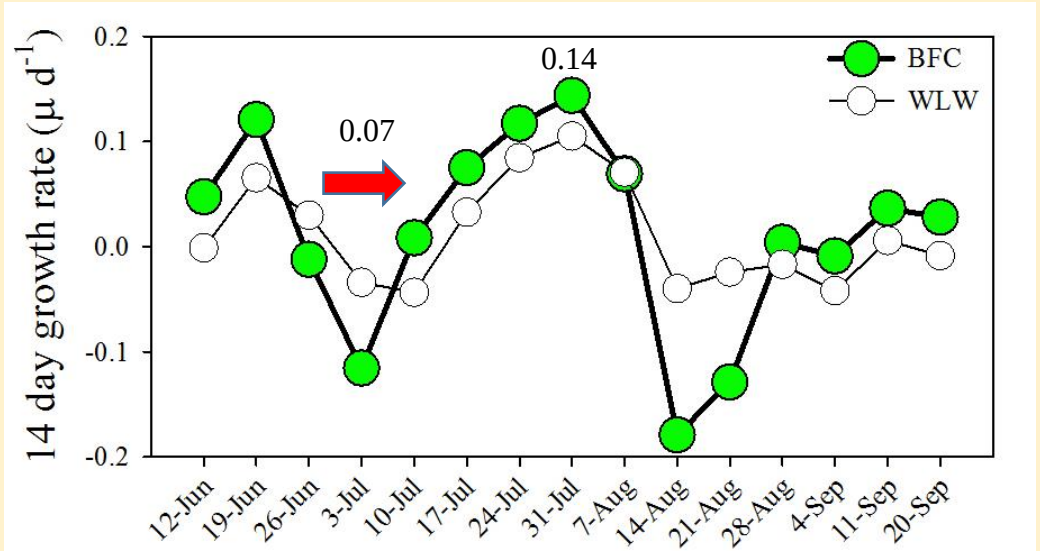
Growth rate

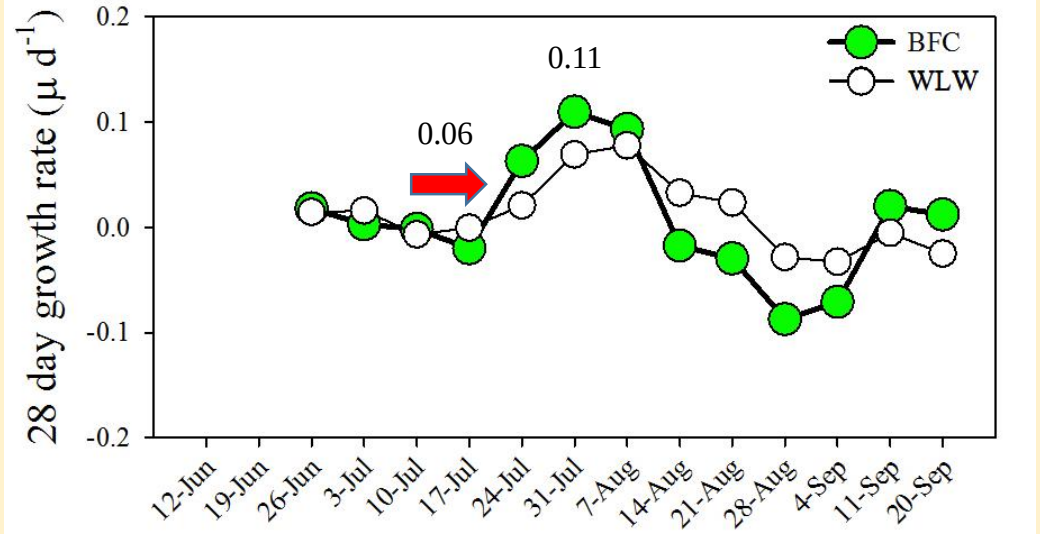
$\mu\ d^{-1} = \ln (PC_2) - \ln(PC_1)/t_2 - t_1$

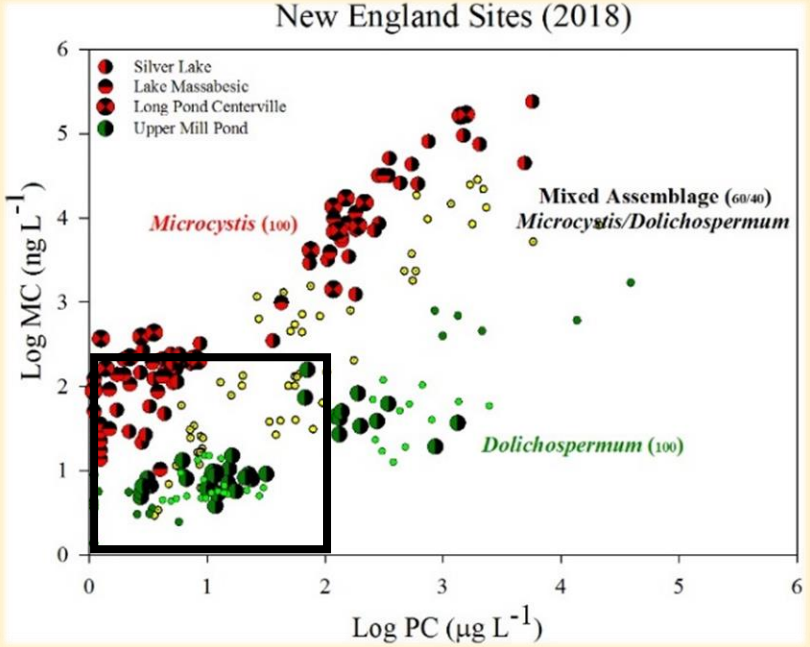
Resilience Indicator

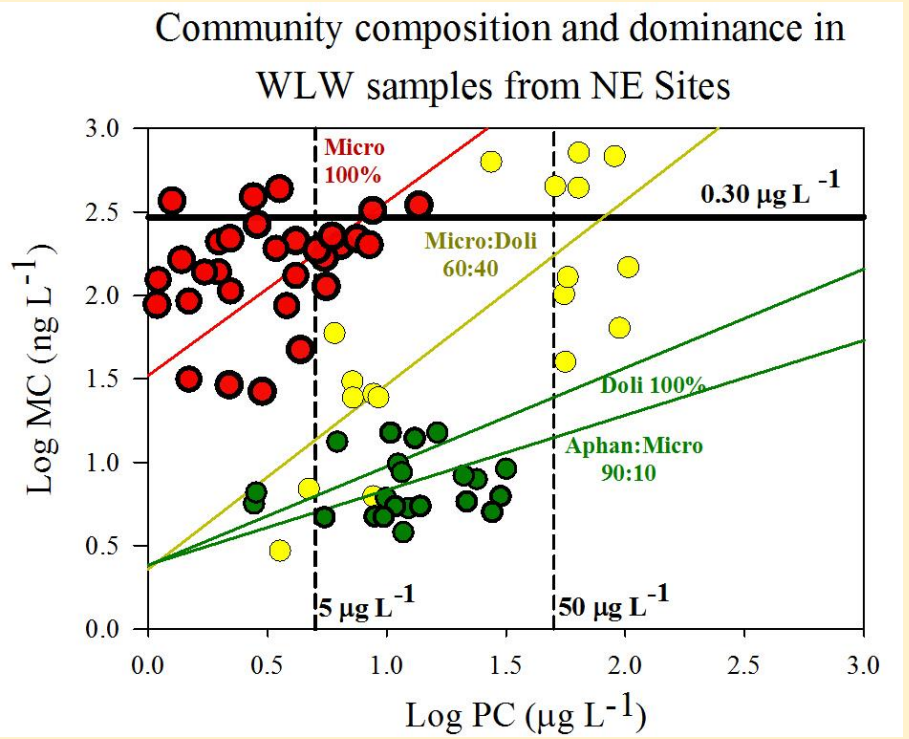
RI = 28 day PC SD



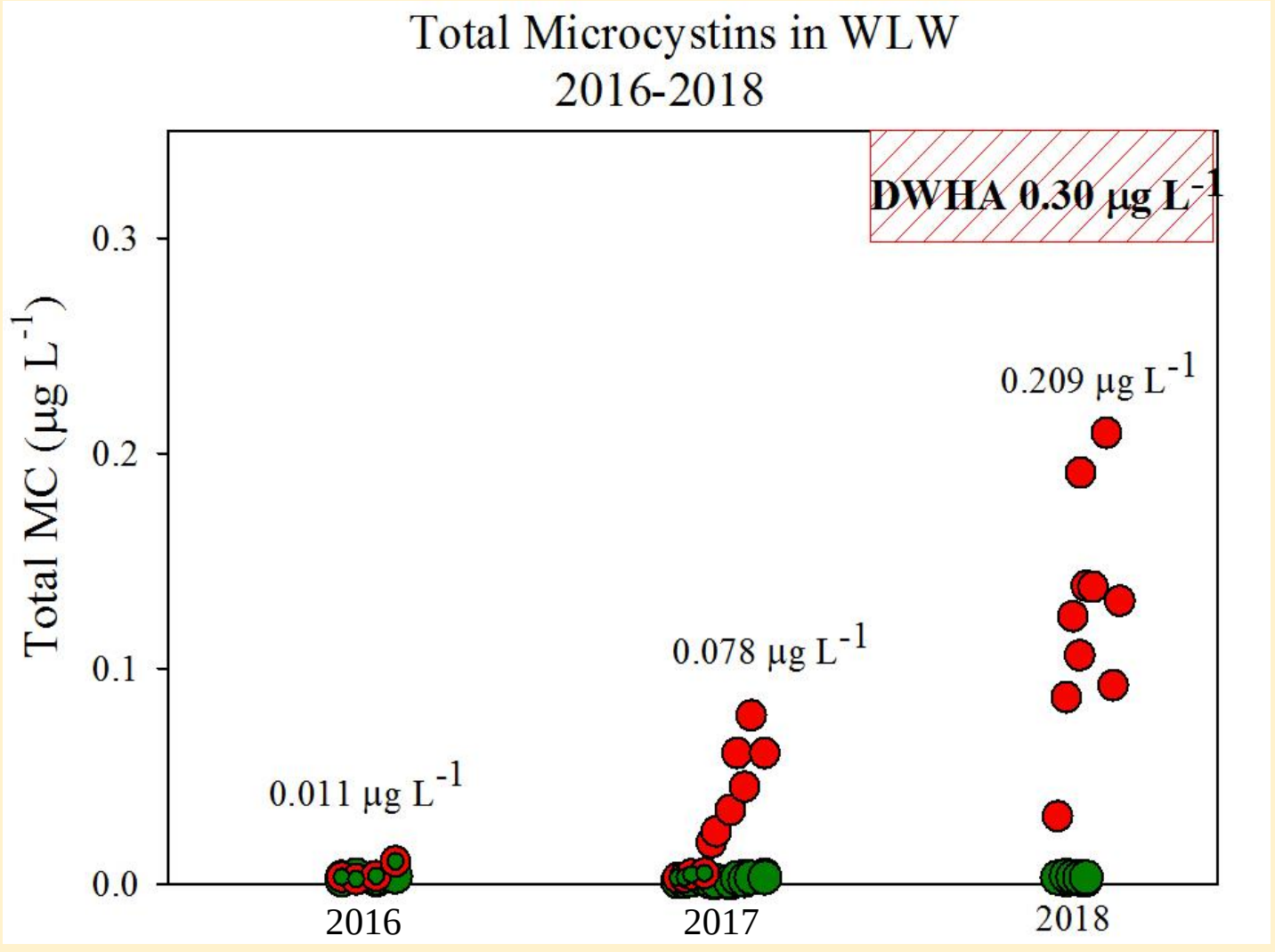





New England Sites (2018)
Silver Lake
Lake Massabesic
Long Pond Centerville
Upper Mill Pond
Microcystis (100)
Mixed Assemblage (60/40)
Microcystis/Dolichospermum
Dolichospermum (100)
Log MC (ng L-1)
Log PC (µg L-1)


Community composition and dominance in
WLW samples from NE Sites
Micro
100%
0.30 µg L -1
Micro:Doli
60:40
Doli 100%
Aphan:Micro
90:10
5 µg L-1
50 µg L-1
Log MC (ng L-1)
Log PC (µg L-1)

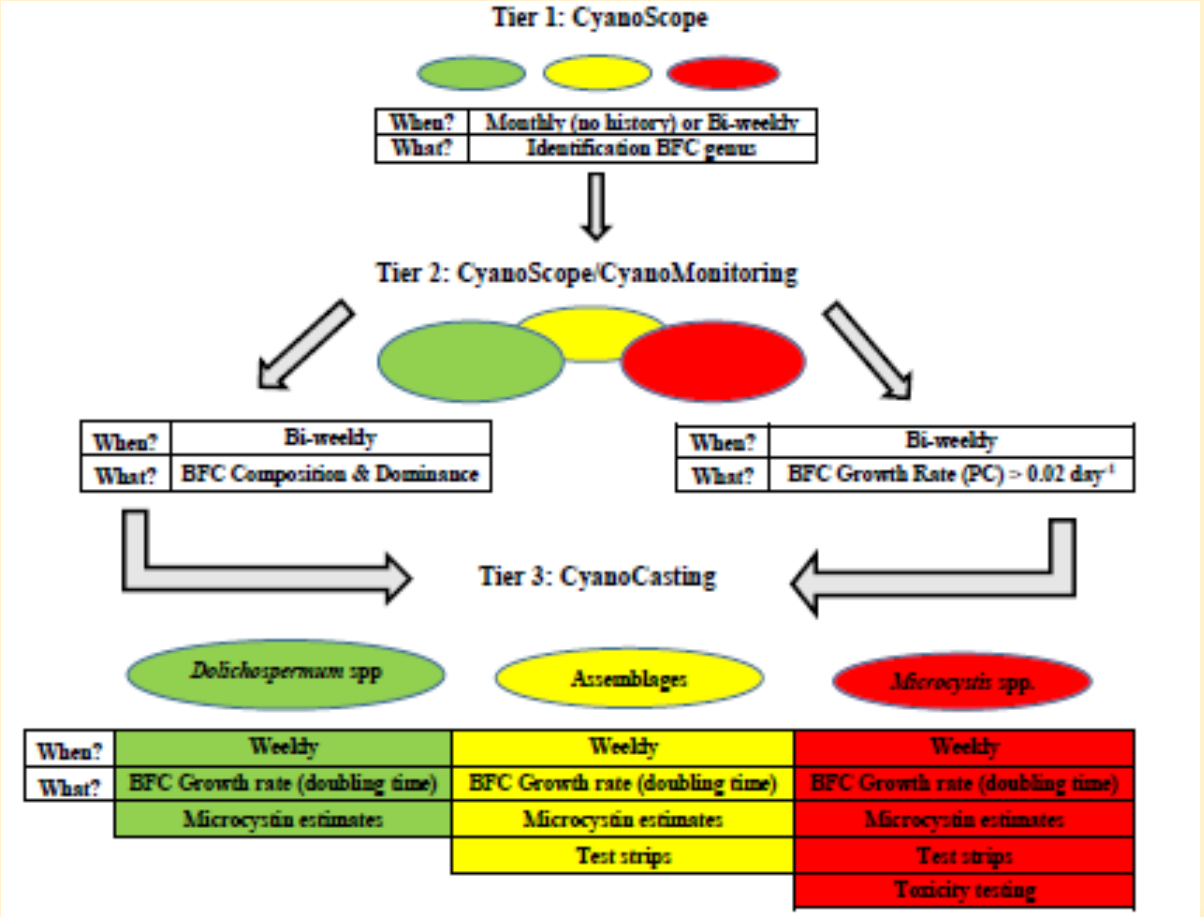
Who's at the Party?

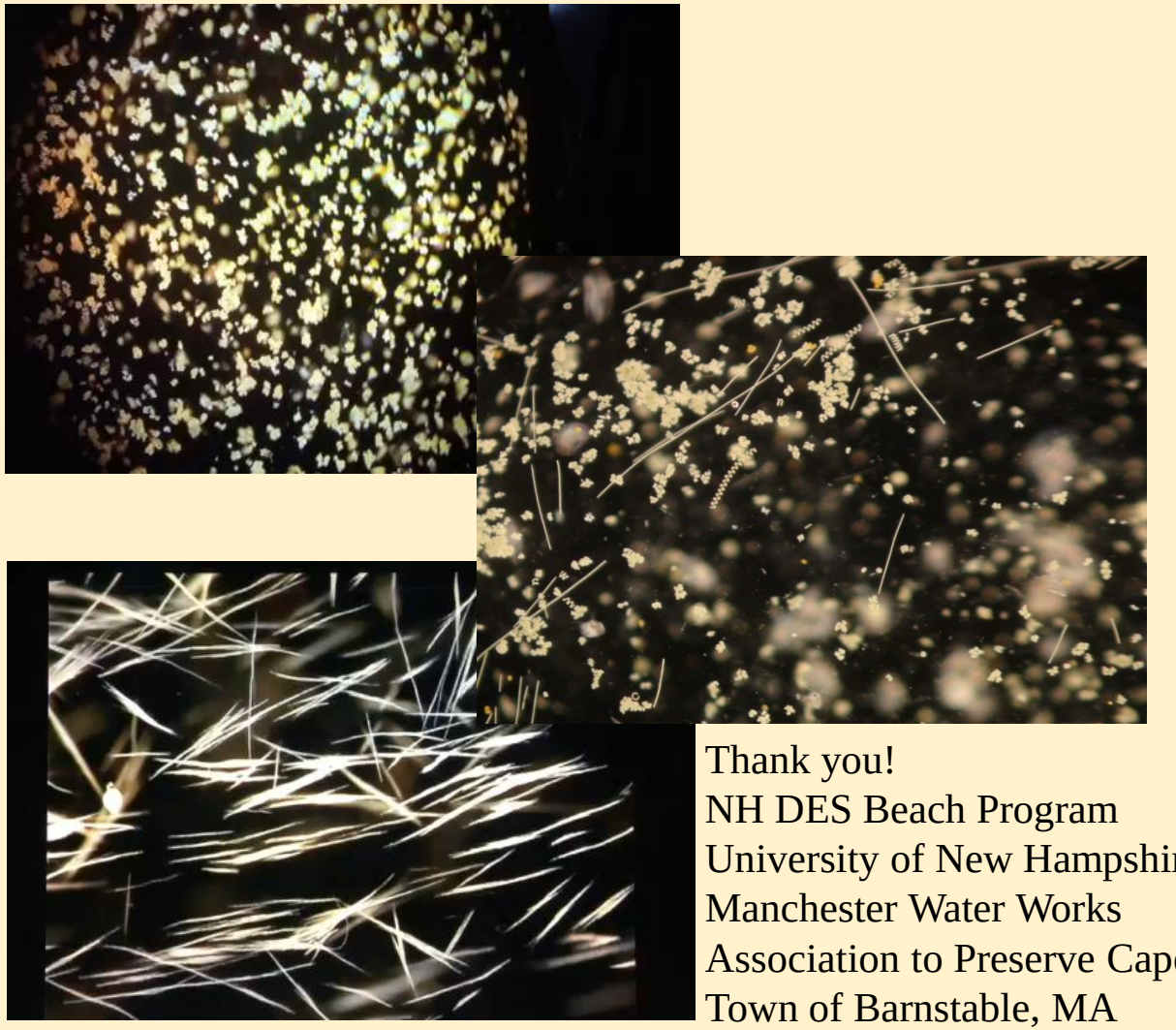


Composition & Dominance:
% Mic

Growth rate:
>0.02 d^{-1}

Toxin levels:
MC (ng μg^{-1})





Who's at the Party?

Expect constant change

Science
Simple
Support

Sooner
Secrets w/research

Thank you!
NH DES Beach Program
University of New Hampshire-CFB
Manchester Water Works
Association to Preserve Cape Cod
Town of Barnstable, MA

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