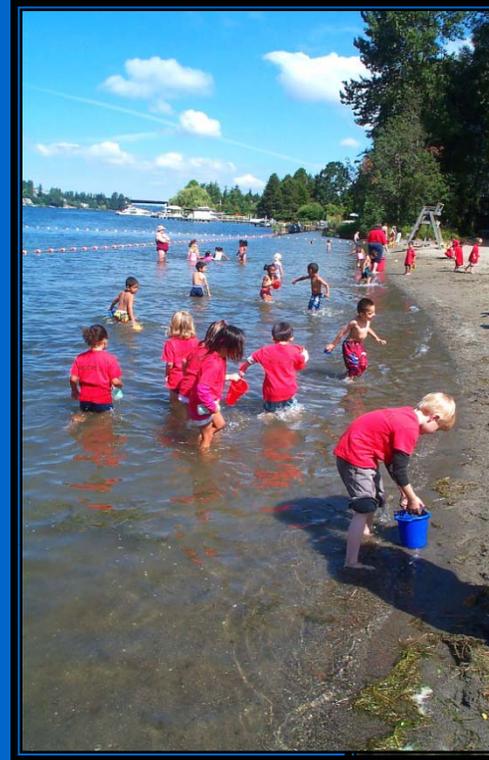


# Regional Examination of Harmful Algal Blooms (REHAB)



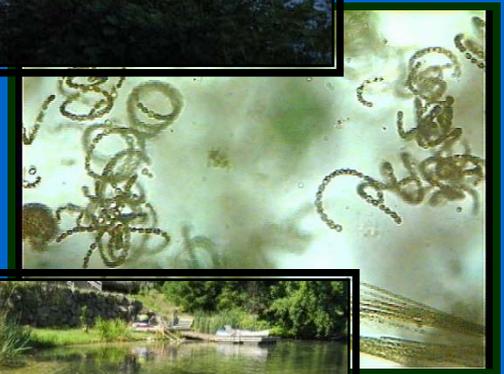
# REHAB Collaborative Players

- ◆ Washington State Department of Health
- ◆ Washington State Department of Ecology
- ◆ Three Counties
  - King County - Science Section
  - Snohomish County - SWM
  - Pierce County - TPCHD
- ◆ KCEL Aquatic Toxicology
- ◆ Seattle University
- ◆ VOLUNTEER Monitor network

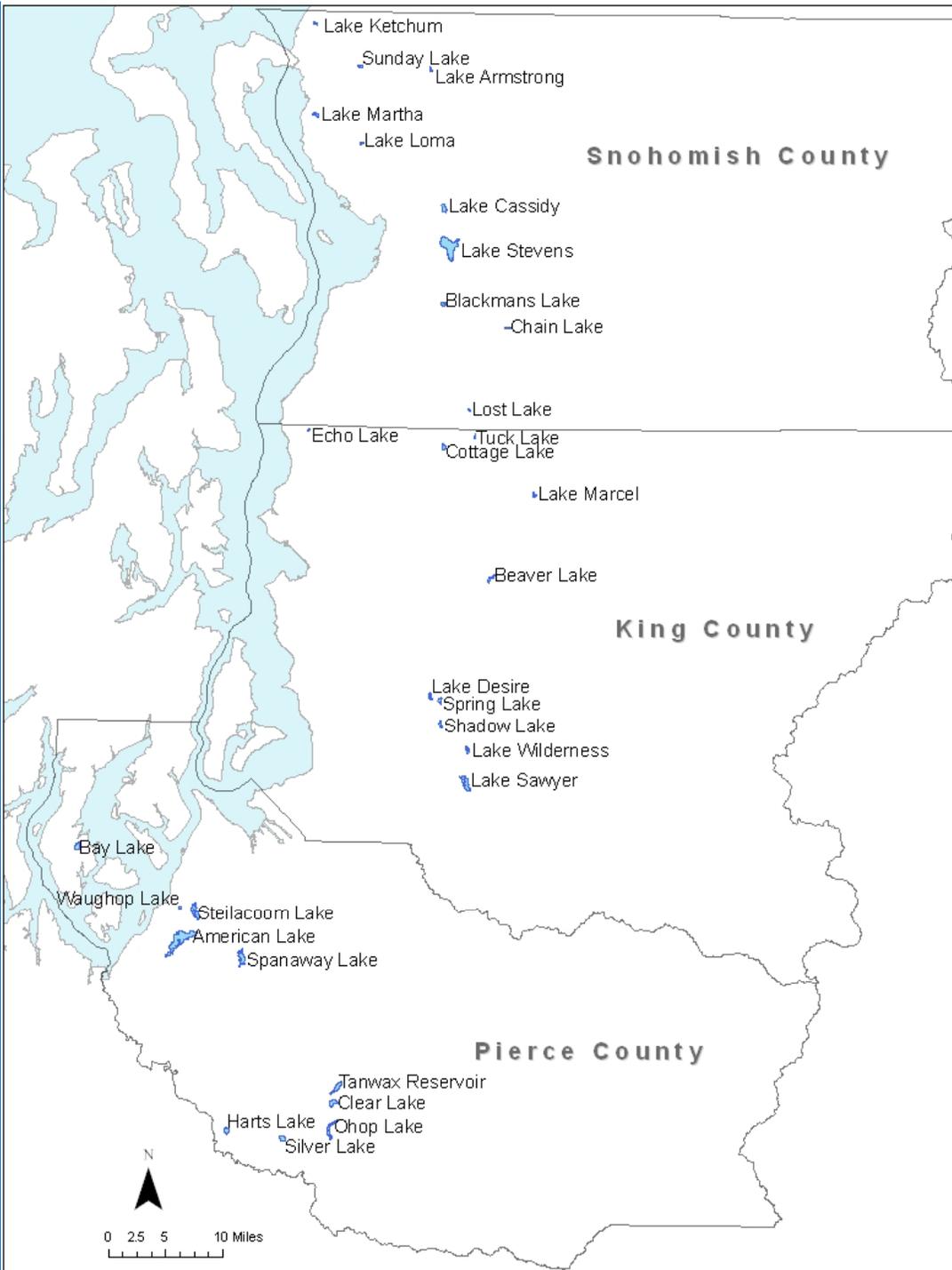


# What is the REHAB project?

- ◆ 30 lakes – 3 counties
- ◆ Identifying the presence of cyanobacteria and cyanotoxins on a regional scale
- ◆ Increasing awareness of public health concerns linked to environmental hazards
- ◆ Creating a comprehensive approach to cyanobacteria monitoring in WA state



*Tuck Lake on good and bad days*



# Volunteers

- ◆ Every two weeks starting in June through October.
- ◆ Lakes chosen based on public access and lakes with known history to produce blue-greens.
- ◆ County staff drive to 10 lakes and pick samples up to deliver to KCEL.



*Lake Wilderness Volunteer*



# Data Entry

- ◆ All REHAB environmental, toxicity and phytoplankton data is entered into databases maintained by King County.
- ◆ All data associated with a toxic event is entered into CDC HABISS database. This includes DOE freshwater algae data.



*Cottage Lake, King County*



*Spanaway Lake, Pierce County*



## Lake Hicks

KING COUNTY REHAB STATS Results for 2009	
7	lakes produced measurable toxicity (Wilderness, Echo, Shadow, Tuck, Cottage, Marcel, Desire)
Routine Samples	
100	routine samples taken
32	produced measurable toxins
31	produced microcystin
3	produced levels above recommended state guidelines of 6 ug/L (Tuck, Echo and Wilderness)
2	produced anatoxin-a at Lake Marcel
Bloom Samples	
9	bloom samples taken
3	samples on 2 lakes produced above recreational guidelines for microcystin
4	samples on 4 lakes produced below recreational guidelines for microcystin
2	samples on 2 lakes produced <MDL
Highest Numbers	
161 ug/L	Microcystin - Tuck Lake
0.0327 ug/L	Anatoxin-a - Lake Marcel



## Lake Ketchum

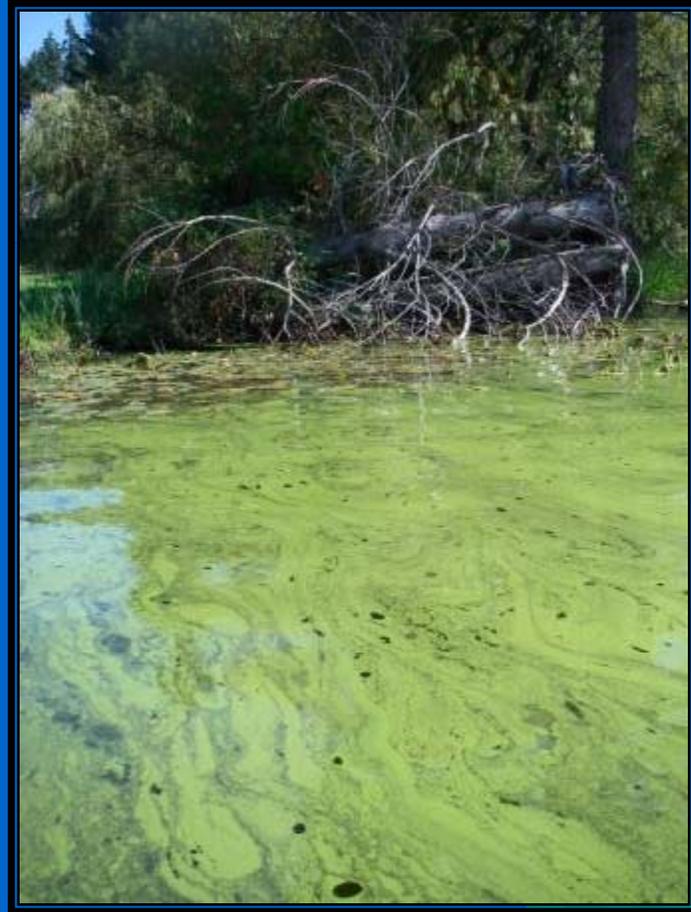
REHAB STATS As of May 2010	
Routine Samples	
300	routine samples taken
120	samples on 21 lakes produced measurable toxins
116	produced microcystin
37	samples in 8 lakes produced levels above recommended state guidelines
11	produced Saxitoxin (10 from Waughop, 1 from Cassidy)
5	produced anatoxin-a
1	produced cylindrospermopsin
Bloom Samples	
18	bloom samples taken in 13 lakes
8	produced above recreational guidelines for microcystin ( 5 lakes)
10	produced below recreational guidelines for microcystin
0	produced anatoxin-a
2	produced saxitoxin
Highest Numbers	
4600 ug/L	Microcystin (Lake Cassidy)
0.06 ug/L	Anatoxin-a (Clear Lake)
193 ug/L	Saxitoxin (Lake Waughop)
0.12 ug/L	Cylindrospermopsin (Lake Ketchum)

KING COUNTY REHAB STATS	
as September 2010	
4	lakes produced measurable toxicity (Wilderness, Echo, Cottage, Marcel)
Routine Samples	
80	routine samples taken
19	produced measurable toxins
17	produced microcystin
1	produced levels above recommended state guidelines of 6 ug/L (Wilderness)
2	produced anatoxin-a all at Lake Marcel
Bloom Samples	
6	bloom samples taken
0	samples produced above recreational guidelines for any toxins
6	samples produced below recreational guidelines for all toxins
4	samples of 4 lakes had some level of microcystin detected
2	samples on 2 lakes had detectable levels of anatoxin-a
Highest Numbers	
210 ug/L	Microcystin - Lake Wilderness
0.0768 ug/L	Anatoxin-a - Lake Marcel

REHAB STATS	
As of September 2010	
Routine Samples	
240	routine samples taken
79	samples on 18 lakes produced measurable toxins
72	produced microcystin
6	samples in 3 lakes produced levels above recommended state guidelines
8	produced Saxitoxin (all from Waughop in Pierce County)
8	produced anatoxin-a
1	produced cylindrospermopsin
Bloom Samples	
48	bloom samples taken in 19 lakes
15	produced above recreational guidelines for microcystin ( 5 lakes)
24	produced below recreational guidelines for microcystin
14	samples on 7 lakes produced <MDL
4	produced anatoxin-a,
1	produced saxitoxin
Highest Numbers	
760	Microcystin (Lake Waughop)
0.642	Anatoxin-a (Clear Lake)
0.405	Saxitoxin (Lake Waughop)
0.107	Cylindrospermopsin (Sunday Lake)

# Where has this lead us?

- ◆ King County definitely has lakes that go toxic.
- ◆ King County has lakes that seem that they “should” go toxic and don’t.
- ◆ King County does not have the same toxicity levels as neighboring counties.
- ◆ How do you manage for toxicity?



*Cottage Lake, King County*

# What do we know about toxicity

- ◆ Weather might have an influence – hot summers, mild springs vs. wet springs and cool summers
- ◆ Recently documented that microcystin was the cause for sea otter death off the coast of California. First documentation of toxin surviving in salt water.
- ◆ Other factors to consider – geology and land use.



# Where do we go from here?

- ◆ Forge new partnerships with cities, counties, universities, local public health, WDOH, WDOE, and NOAA.
- ◆ Link exposure to public health outcomes.
- ◆ Identify new and potential sources of funding for focused studies.
- ◆ How to manage lakes when testing for toxicity is complete.



*Lake Desire, King County*



Questions?