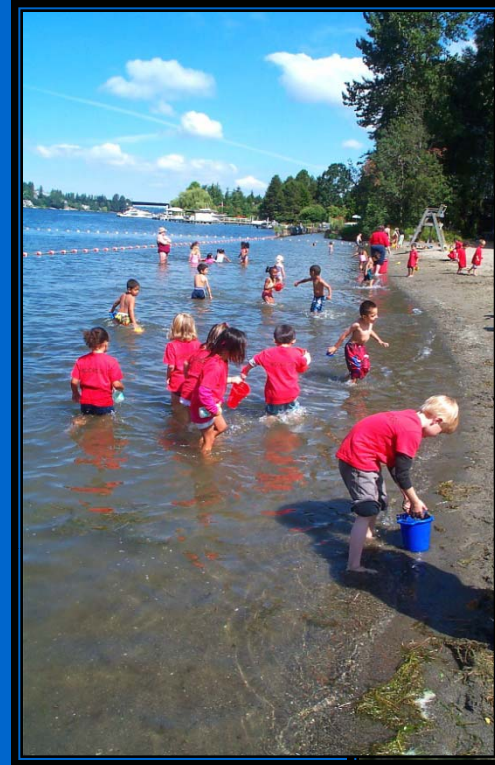


Regional Examination of Harmful Algal Blooms (REHAB)



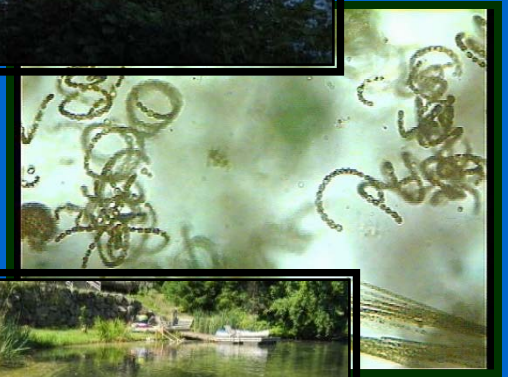
REHAB Collaborative Players

- ◆ 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

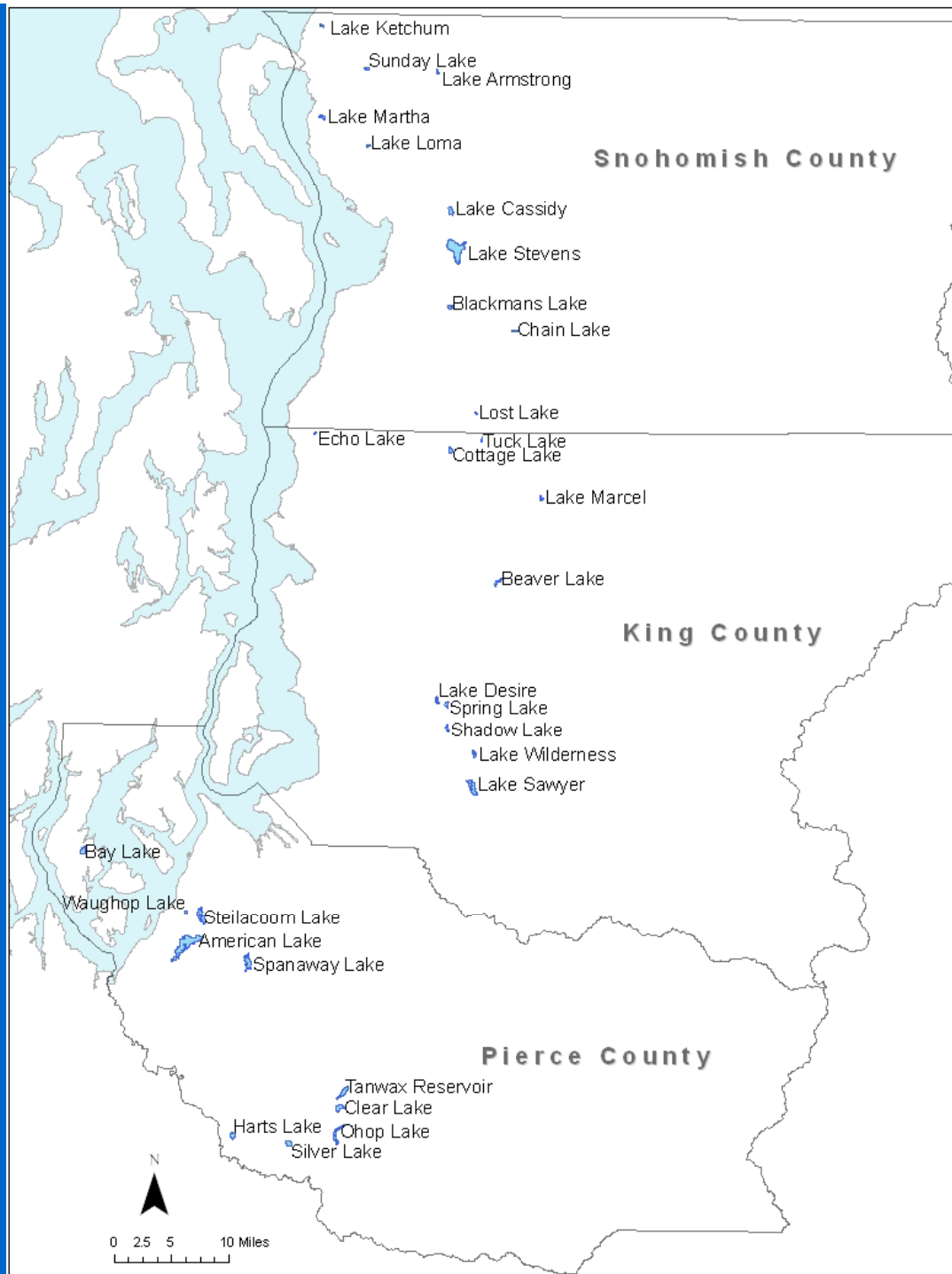


What is the REHAB project?

- ◆ 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?