

WE'VE GOT A HAB IN OUR LAKE,
NOW WHAT?

WHO GUIDANCE VALUES FOR RECREATIONAL EXPOSURES TO CYANOBACTERIA & MC

- Low risk: <20,000 cells/ml or <10 ug/l
- Moderate risk: 20,000-100,000 cells/ml or 10-20 ug/l
- High risk: 100,000-10,000,000 cells/ml or 20-2,000 ug/l
- Very high risk: >10,000,000 cells/ml or >2,000 ug/l

2005-08 MC SUMMARY

- 2005: 12 samples, 0.09-8.00 ug/l, avg=1.78 ug/l
- 2006: 10 samples, 0.15-8.20 ug/l, avg=2.35 ug/l
- 2007: 165 samples, 0.12-10.77 ug/l, avg=0.75 ug/l
- 2008: 179 samples, 0.15-17.47 ug/l, avg= 0.64 ug/l
- No big deal? No 2009 samples, 2010 Clinton L. false alarm, and then...

2012 MC HIGHLIGHTS

- L. Le-Aqua-Na: Scum, test kit >10 ug/l, MC=48 ug/l; DNR closes lake
- Candlewick L.: Lake Assn. sample=14,800 ug/l; Assn. closes lake
- Westlake: Lake Assn. sample=31,500 ug/l; Assn. closes lake
- USGS gets involved; 12 sites sampled, range <0.1-4,800 ug/l
- And then the questions began...

CAN I...?

- Swim in the water?
- Ski on the water?
- Eat the fish?
- Water my vegetables?

SWIM IN THE WATER?

- Even low MC concs. can cause sensitive people to have allergic response
- Increasing conc.=increasing symptoms (eye/nose irrit., rash/hives, blisters)
- Follow WHO Guidance of 20 ug/l to protect against symptoms
- Don't swim when scum/bloom present
- Wait 2 weeks after scum/bloom is gone

SKI ON THE WATER?

- Water sprays can produce toxin-containing aerosols if water conc. is high
- Inhaling &/or swallowing aerosols can cause headaches, nausea, sore throat, and respiratory problems
- Eye & nose irritation possible
- Don't boat, water ski, tube, etc. when scum/bloom is present
- Wait 2 weeks after scum/bloom is gone

EAT THE FISH?

- Poor database for uptake into fish
- Used data from 3 studies with measured MC concs. in water & fish to calculate “BCFs” (7 species total)
- BCF range 0.6-14.1 (ex., L. Erie water=1.3 ug/l, yellow perch=2.4 ug/kg, $BCF=2.4/1.3=1.85$)
- Then used Ohio “Do not eat” level of 28 ug/kg in filets as target to back-calculate water conc. corresponding to 28 ug/kg

EAT THE FISH? (contd.)

- Water conc. \times BCF=28 ug/kg
- For BCF=0.6, water conc.=49 ug/l
- For BCF=14.1, water conc.=2 ug/l
- Since WHO Guidance (20 ug/l) is in middle of water conc. range it was chosen as water conc. for “Do not eat” advice
- Wait 2 weeks after scum/bloom is gone before eating fish

WATER MY VEGETABLES?

- Few studies on uptake into vegetables
- Should be OK to water soil, studies suggest minimal uptake into plants
- If edible portions are recently watered they should be thoroughly washed
- Don't water recently planted vegetables/plants, MC shown to affect root & shoot growth

UNCERTAINTIES

- Guidance primarily for acute effects, long-term effects?
- Guidance for MC only, other toxins?
- Poor correlation between cell counts and toxin concs.
- “BCF” based on limited data
- Wait 2 weeks recommendation based on limited data