

Kansas Update on HABs



Tom Stiles, Bureau of Water; Kansas Department of Health & Environment
WSWC Water Quality Committee; October 13, 2020

Backstory and History.



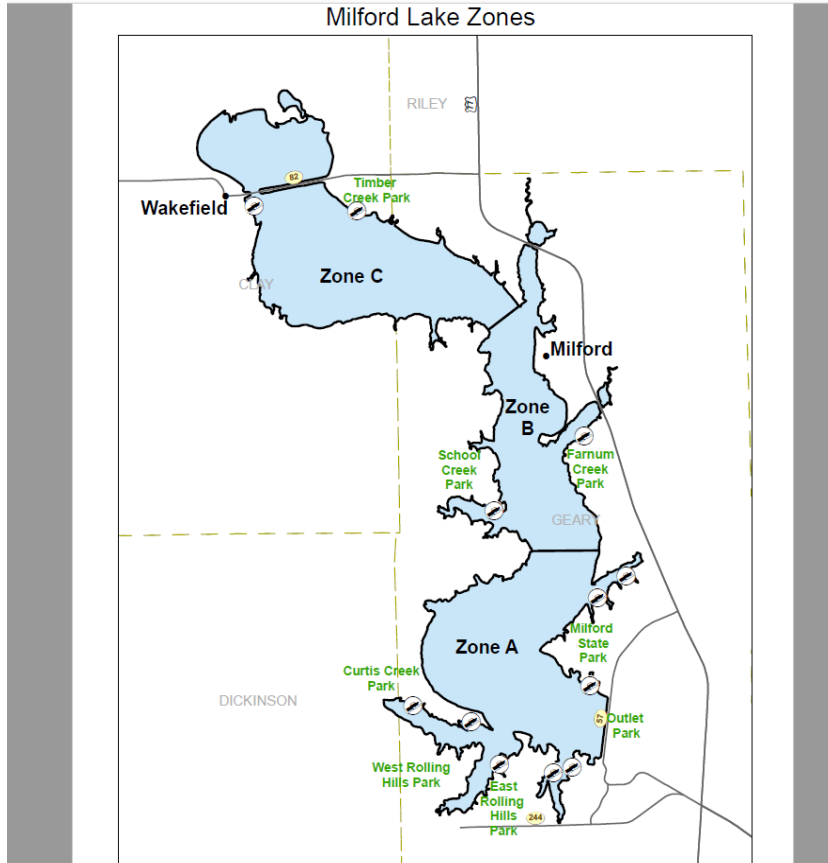
- Program began in 2010 with 9 lakes sampled.
- 32 lakes in 2019
- Complaint-based system
 - Complaint from lake manager or public
 - Jar test to assess presence of BGA
 - Monday sampling
 - Wednesday analysis
 - Thursday announcement
- Typically *Microcystis* dominates Kansas lakes

Criteria and Advisories



- **Set by toxin levels and cell counts**
- **Advisories categorized as Watches and Warnings**
- **Originally based on WHO guidance**
 - **Watch (Advisory): 2 ug/l microcystin or 20K/ml BGA counts**
 - **Warning: 20 ug/l microcystin or 100K/ml BGA counts**
- **Currently revised to reflect Kansas conditions**
 - **Watch: 4 ug/l toxin or 80K BGA counts**
 - **Warning: 8 ug/l toxin (updated EPA health advisory value) or 250K/ml BGA counts**
 - **Hazard (Closure): 2000 ug/l toxin or 10M cells/ml**
- **Some lakes are zoned to isolate impacted areas**

Lake Zoning



- **Large reservoirs with distinct morphometry**
- **3 reservoirs: Milford, Tuttle Creek & Perry**
- **Each zone treated independently**
- **Signals impacted vs open areas of lake for recreating public**
- **Mixed response from lake vendors and marinas**

2020 HAB Season



- **First complaint came in April, earliest ever**
- ***Aphanizomenon* at Lake Shawnee**
- **COVID complicated sampling and analytics**
- **Went to emergency plan which emphasized photographic evidence and weekly conversations with lake managers**
- **Occasional cell counts and toxin analysis**

2020 HAB Season

KDHE HAB event tracker

Week of year		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Waterbody and ID	Co.	4/20	4/27	5/4	5/11	5/18	5/26	6/1	6/8	6/15	6/22	6/29	7/6	7/13	7/20	7/27	8/3	8/10	8/17	8/24	8/31	9/8	9/14	9/21	9/28	10/5
Lake Shawnee (25%) LM0122	SN	Central	W	W	Watch	Watch	Watch	L																		
Council Grove City Lake (25%) LM0430	MO	Central		Watch	Watch	L																				
Marion Co. Lake (25%) LM0121	MN	Central					Watch	Watch	Watch	W	W	W	W	W	W	Watch	Watch	Watch	Watch	Watch	L					
Kanopolis Reservoir (25%) LM0160	EW	Central					Watch	Watch	Watch	Watch	Watch	L								Watch	Watch	L				
Perry Lake Zone A (25%) LM0290	JF	Central																		Watch	Watch	L				
Perry Lake Zone B (25%) LM0290	JF	Central																		Watch	Watch	L				
Perry Lake Zone C (25%) LM0290	JF	Central																		Watch	Watch	L				
Perry Lake Zone D (25%) LM0290	JF	Central							Watch	Watch	Watch	Watch	L													
Gathering Pond LM0764	GE	Central							Watch	Watch	Watch	Watch	L													
Rock Garden Pond LM0761	SN	Central							Watch	Watch	Watch	Watch	Watch	W	W	W	W	W	W	W	W	Watch	L			
Cheney Lake (25%) LM0170	RH	Central							Watch	Watch	Watch	W	W	W	W	Watch	Watch	Watch	Watch	L						
Marion Reservoir (25%) LM0200	MN	Central							W	W	Watch	Watch	Watch	W	Watch	Watch	Watch	Watch	Watch	L						
Lowmell Reservoir (25%) LM0190	JW	Central																								
Mission Lake (Horion) (25%) LM0136	BN	Central																								
Peter Pan Lake (25%) LM0689	LY	Central																								
Washington SFL (75%) LM0109	HS	Central																								
Newton Lake (75%) LM0100	NT	Central																								
Atwood Township Lake (75%) LM0712	RW	Central																								
Brown SFL (75%) LM0103	BN	Central																								
Ford SFL (75%) LM0708	FD	Central																								
Herington Reservoir (25%) LM0472	DN	Central																								
Lebo City Park Lake (75%) LM0656	CF	Central																								
Melvorn Outlet Pond LM0271	OS	Central																								
Melvorn Outlet Swim Pond LM0272	OS	Central																								
Miford Lake Zone A (25%) LM0190	GE	Central																								
Miford Lake Zone B (25%) LM0190	GE	Central																								
Miford Lake Zone C (25%) LM0190	GE	Central																								
Unit G Marais des Cygnes WA LM0532	LN	Central																								
Rooks SFL (75%) LM0119	RO	Central																								
Webster Reservoir (25%) LM0120	RO	Central																								
Overbrook City Lake (75%) LM0205	OS	Central																								
Elkhorn Lake (75%) LM0610	JN	Central																								
Tornahawk Park Lakes LM0417	JO	Central																								
South Lake Park (75%) LM0675	JO	Central																								
Wilderness Lake LM0765	JO	Central																								
Plainville Township Lake (75%) LM0700	RO	Central																								
Agra Lake LM0771	PH	Central																								
Harvey Co. Camp Hawk Lake LM0634	HV	Central																								
Delaware River between Valley Falls and Perry Lake	JF	Central																								
Yates Center Kids Pond LM0770	WO	Central																								
Horseshoe Reservoir (75%) LM0550	HG	Central																								
El Dorado Reservoir (25%) LM0330	BU	Central																								
Prairie Center Park Pond LM0772	JO	Central																								
Roses Pond (75%) LM0625	JO	Central																								

Key	
W	Warning due to cell count
W	Warning due to microcystin
W	Warning due to cell count and microcystin
W	Warning due to "fleshy" clause
W	Carry Over Warning
P	Pending on lab
L	Lifted
WC	Lake Warning / Beach Closure
C	Closure
Watch	Watch due to cell count
Watch	Watch due to microcystin
Watch	Watch due to cell count and microcystin
Watch	Watch due to "fleshy" clause
Watch	Carry over Watch

- 43 lakes w/ HABs
- 35 lakes lifted & now clear
- 7 lakes with multiple, separate HABs
- Currently
 - 1 Warning,
 - 7 Watches

2020 HAB Season – look at additional toxins

ANALYTICAL RESULTS

Submitter: BOW Watershed Planning

Report to: Tom Stiles
BOW Watershed Planning
1000 SW Jackston, Suite 420
Topeka, KS 66612

Client ID: BOW001

State ID:

Collector: STILES AND NICHOLS

Collection ID/Chain #: 57751

Location Desc: MILFORD

Lab ID: **1460657**

Matrix: Water

Sample ID: **MILFORD TRANSITION 1**

Date Collected: 7/28/2020 12:24

Description

Date Received: 7/28/2020 16:10

Parameters	Results	Units	RDL	DF	Uncertainty	Prep	By	Analyzed	By	Qual	RegLmt
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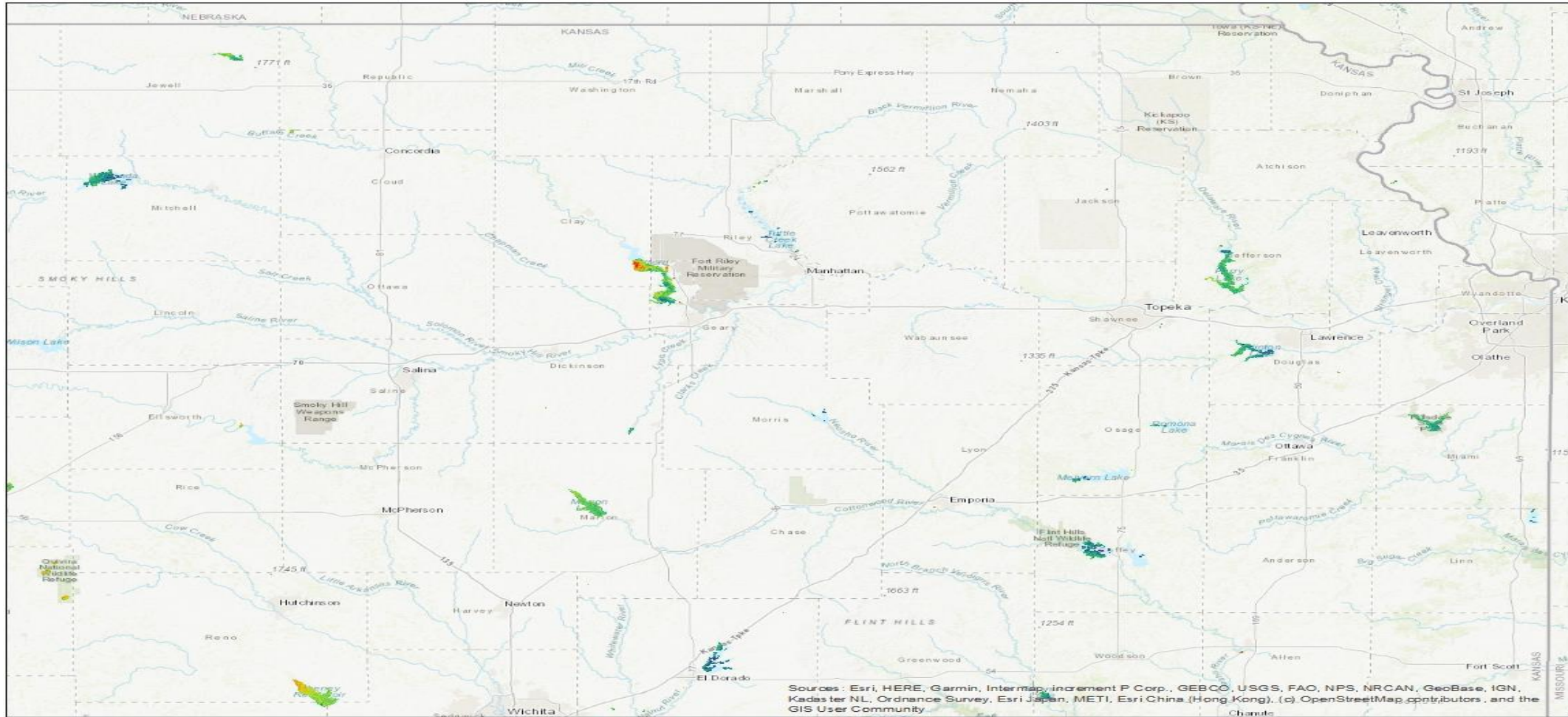
Analysis Desc: EPA 546

Preparation Method: EPA 546

Analytical Method: EPA 546

Cylindrospermopsin	<0.15	ug/L	0.15	1		8/12/2020 13:22	MAH	8/12/2020 13:22	MAH		
Total Microcystins, Nodularins	190	ug/L	0.15	1		8/12/2020 15:19	MAH	8/12/2020 15:19	MAH		
Saxitoxin	<0.15	ug/L	0.15	1		7/30/2020 15:55	MAH	7/30/2020 15:55	MAH		
Anatoxin	0.17	ug/L	0.15	1		8/20/2020 10:29	MAH	8/20/2020 10:29	MAH		

2020 HAB Season – increasing use of imagery

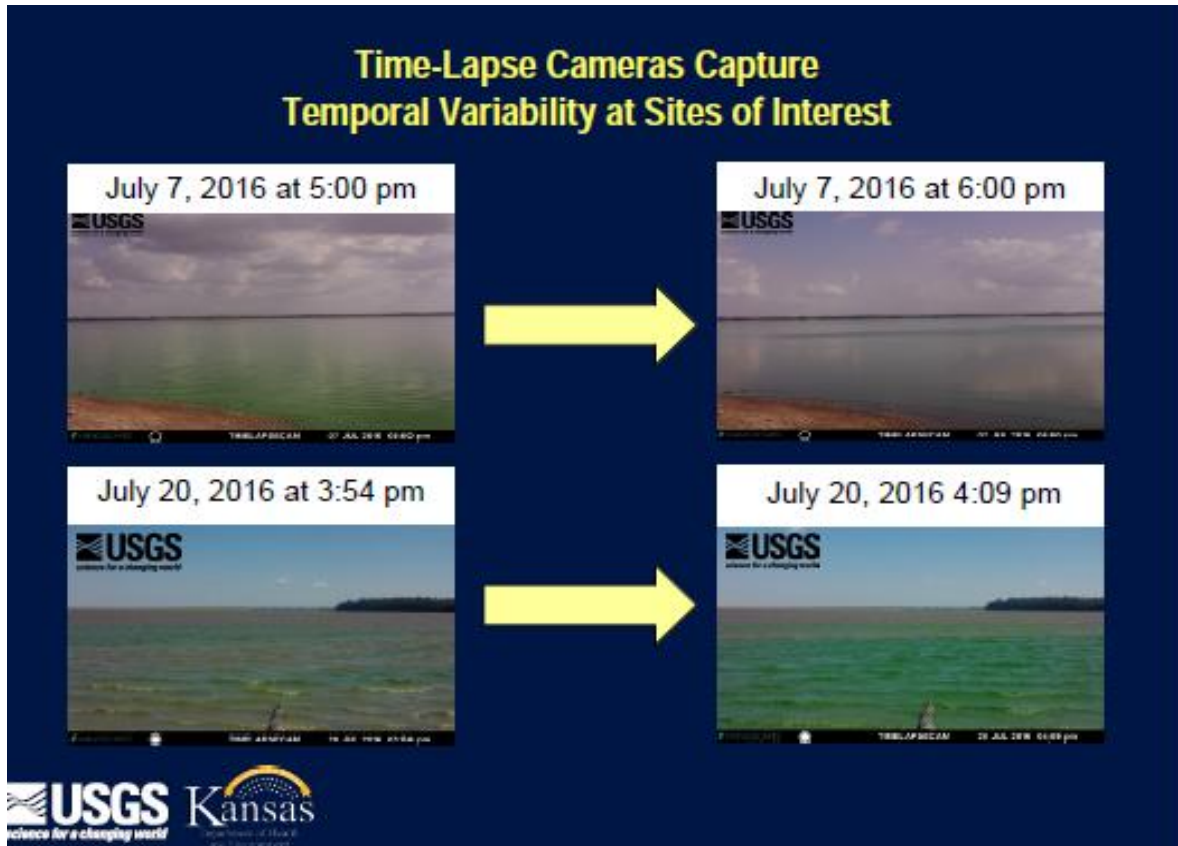


HAB Treatment



- **PWS**
 - Voluntary Monitoring of microcystin and cylindrospermopsin in raw and finished water
 - Multiple detects of microcystin in raw water, all below the 0.3 ug/l health advisory
 - No detects of any toxin in finished water
- **Recreation**
 - Peroxide treatment at Milford Lake
 - Ultrasound
 - Rough fish harvest
 - Barley Straw
 - Ozone Nanobubblers
 - Avoiding copper sulfate
 - Lake level management might be most effective in mitigating blooms

Challenges



• Nutrients

- These are reservoirs, not lakes; built to retain water
- Urban and cropland land use in watersheds
- Legacy sourcing from sediments

Scale

- Milford treatment was 275 acres; < 2% of reservoir
- \$138K
- Look for isolated coves; beaches, marinas

Wind

- Here this morning, gone now, back tonite

Messaging

- Toxin presence does not make a lake “toxic”
- Emulating Weather Service; still a portion of public scared off
- Balancing act between protecting public (and pet) health and being “chicken little”
- Assumption of some risk by public – inform, not dictate

Thank you/Questions

