

Solomon Republican RAC Surface Water Update July 2018



Our Mission: To protect and improve the health and environment of all Kansans.

KDHE

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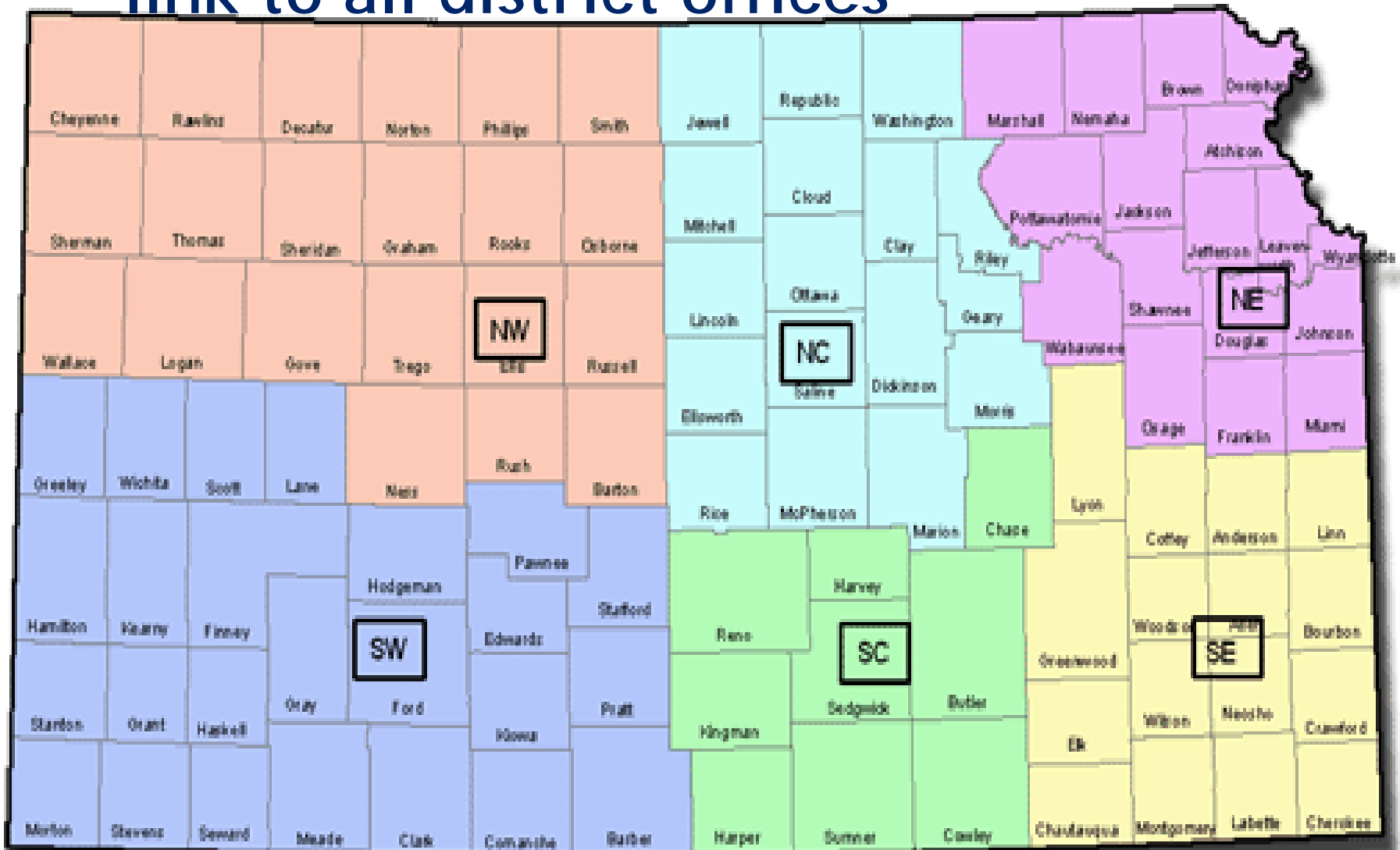
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An aerial photograph of a dam and reservoir. The dam is a long, low structure made of dark rocks, with a concrete spillway on the right side. The water in the reservoir is a deep green color, indicating a blue-green algae bloom. In the background, there are green fields, trees, and a few buildings. The sky is clear and blue.

What is Blue-Green Algae?

Despite their name, blue-green algae are a type of bacteria known as Cyanobacteria.

Milford Lake Algae Bloom 2011



Are Blue-Green Algae The “Enemy?”

- ▶ **Blue-green algae are not “evil”**
- ▶ **They are a natural component of aquatic systems, provided they are at “normal” background levels**
 - ▶ **88% of lake samples have blue-greens present**
 - ▶ **74% have blue-greens as the primary component of the phytoplankton community**

When Are Blue-Greens A Problem?

- ▶ Blooms are problems when they impact beneficial uses by being...
 - ▶ 1) Big-enough in magnitude
 - ▶ 2) Long-enough in duration, and/or
 - ▶ 3) Frequent-enough in their recurrence
- ▶ Those blooms are a water quality problem, not natural, and we see them in systems with pollution impacts

Articles About Blue-Greens

- ▶ **Three things are often cited as “causes”**
 - ▶ **Nutrients**
 - ▶ You can’t grow algae without the “building blocks”
 - ▶ **Temperature**
 - ▶ Blue-greens have optimal growth at higher temperatures
 - ▶ **Water Column Stability**
 - ▶ Buoyancy adaptation can be better utilized

Kansas Lake Status Determination

Recommended Level	Cyanobacteria conc. Cells/mL	Microcystin toxin conc. ug/L
Watch	80,000 to < 250,000	< 4
Warning	≥ 250,000 to ≤ 10,000,000	≥ 4 to ≤ 20
Closure	> 10,000,000	> 2,000

Drinking Water and HABs

10-DAY HEALTH ADVISORIES	LEVEL
Microcystins	
Children pre-school age and younger (under 6 years old)	0.3 µg/L
School-age children (6 years and older)	1.6 µg/L
Cylindrospermopsin	
Children pre-school age and younger (under 6 years old)	0.7 µg/L
School-age children (6 years and older)	3.0 µg/L

Table 1. U.S. EPA's National 10-Day Health Advisories

Kansas Lake Status Determination

- ▶ **Based on State's specific data accumulated over 35 years**
- ▶ **Biggest difference –cell count/ microcystin used in an either/or fashion**
- ▶ **≥ 90% of our alerts are triggered by cell counts rather than microcystin, especially early in the season**

*World Health Organization

2017 Impacted Lakes

- ▶ **KDHE collected and analyzed 160 samples**
- ▶ **28 lakes**
- ▶ **24 lakes were on watch, warning, or closure status at least once during the year**
- ▶ **Does not include private water bodies**

Solomon Republic RAC Lakes 2017

	# Weeks Sampled	Warning Status	Cell Count trigger	Microcystin trigger
Webster	14	6	6	2
Kirwin	4	2	2	-
Sebelius	4	2	2	-
Rooks Co. Lake	1	-	-	-

Solomon Republic RAC Lakes 2018

	# Weeks Sampled	Warning Status	Cell Count trigger	Microcystin trigger
Webster June 18 th start	5	5	5	3
Kirwin	1	-	-	-
Sebelius June 11 th start	3	2	2	-
Rooks Co. Lake	1	-	-	-



Public Water Supply Event

- ▶ **June 18th Monday Sampling**

Bloom observed across the lake and heavy on the northeast side of lake near water intake.

- ▶ **June 19th algae drawn into plant**



Public Water Supply Event

- ▶ **Water Source Affected**
- ▶ **Water Emergency- conservation implemented**
- ▶ **Governor Declared Emergency**



Public Water Supply Event

- ▶ **Wells limiting –aquifer declined over 5 day event**
- ▶ **Conservation in place used 404,000 gallons on 21st**
- ▶ **Available water on 22nd 400,000 gallons**



Public Water Supply Event

- ▶ **Water Plant Cleaned and Disinfected**
- ▶ **Activated Carbon Treatment Field System Implemented**
- ▶ **Extensive Testing, 'All Clear' June 23rd**
- ▶ **Weekly sampling continued**
- ▶ **Plant needs to add Carbon Treatment Permanently**



2018 Rain Events

- ▶ **Heavy Rains**
- ▶ **12” of rain S/SW of Hill City, Graham County May 28th**
- ▶ **Primary flooding in area immediately south of the Solomon River and west of Hwy 283**



2018 Rain Events

- ▶ **Heavy Rains**
- ▶ **6” of rain in Hill City, 8.5” W of town June 30th**
- ▶ **Flow reaches Solomon although primary flooding on different drainage**



Private Pond Concerns

- ▶ **Jar Test – low cost**
 - ▶ Relies on buoyancy of most Blue Green algae
 - ▶ Not 100%, most ponds have some Blue Green
- ▶ Hazard determined by the amount of blue green and species capable of generating toxins



Private Pond Concerns

► Jar Test – Visual Test



Photo 2- No Blue-Green



Photo 3 – Positive for Blue Green

Questions



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