



2019 was Notable for Flooding



Harmful Algal Blooms in Kansas: 2019 Statistics

2019 was Notable for Flooding

- Flooded Sampling Sites
- Closed Boat Ramps

- Rapidly changing conditions
- Changes in fertilizer application
 - Effect on harmful algal blooms?



Marion Reservoir

| | | | | | | | |
|--------------------------------------|------------|-------|-------|-------|-------|-------|-------|
| Lake Shawnee (25%) LM0122 | Central | | Watch | Watch | Watch | Watch | Watch |
| Lakewood Park Lake (75%) LM0698 | NC | | | | | | |
| L (Lebo City Park Lake) (25%) LM0656 | SE | | | | | | |
| Lovewell Reservoir (75%) LM0150 | NC | | L | L | | W | W |
| Loess Gyrene Wildlife Area LM0522 | SE | | | | | | |
| Marion Co. Lake (25%) LM0121 | NC | Watch | Watch | Watch | Watch | W | W |
| Marion Reservoir (25%) (PWS) LM0200 | NC | Watch | W | W | W | Watch | Watch |
| Meadowbrook Park Lake LM0767 | Central/NE | | | | | | |

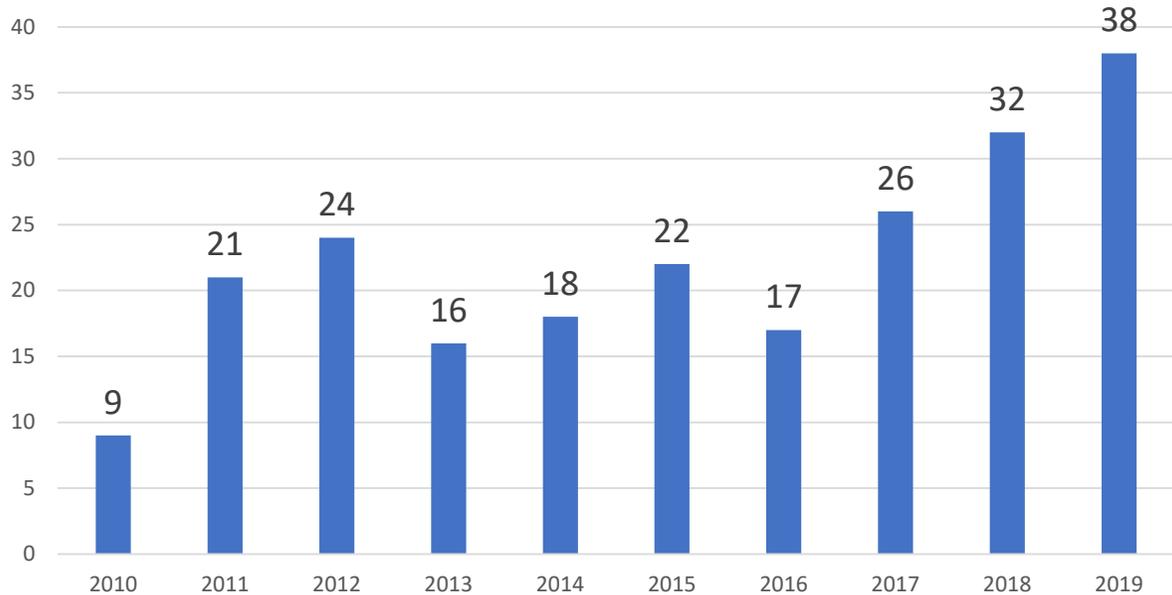
What else happened in 2019?

- Three federal reservoirs were affected
 - Lovewell Reservoir
 - Marion Reservoir
 - Webster Reservoir
- Gathering Pond pilot project
- Marion Reservoir pilot project
- PWS Voluntary Monitoring Program

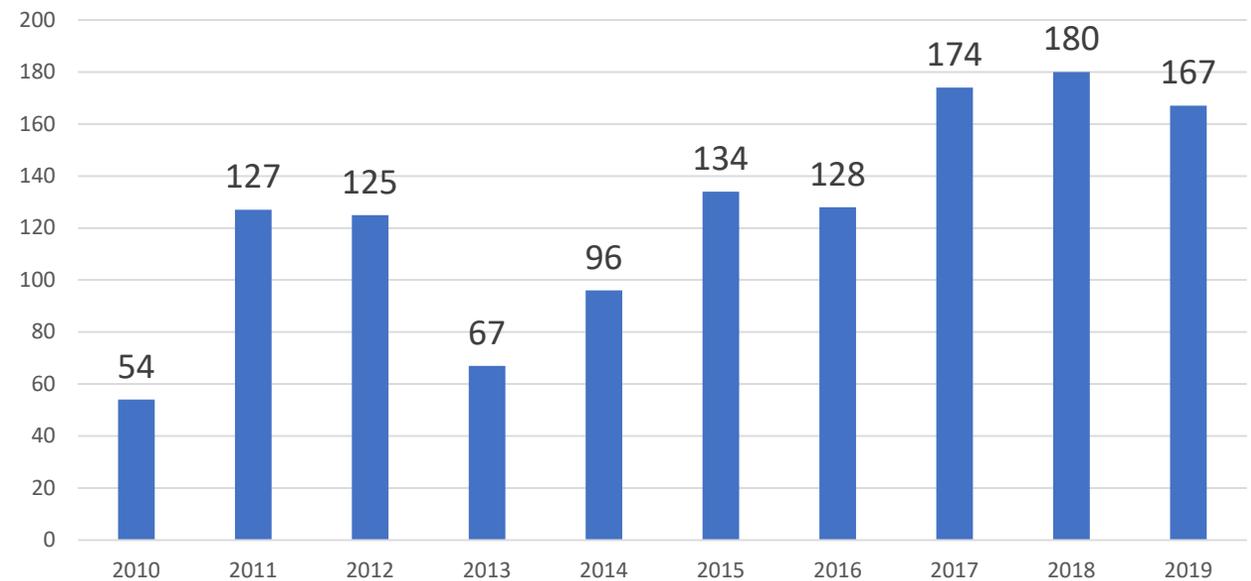


HAB Events Increasing Through Time

Lakes Affected

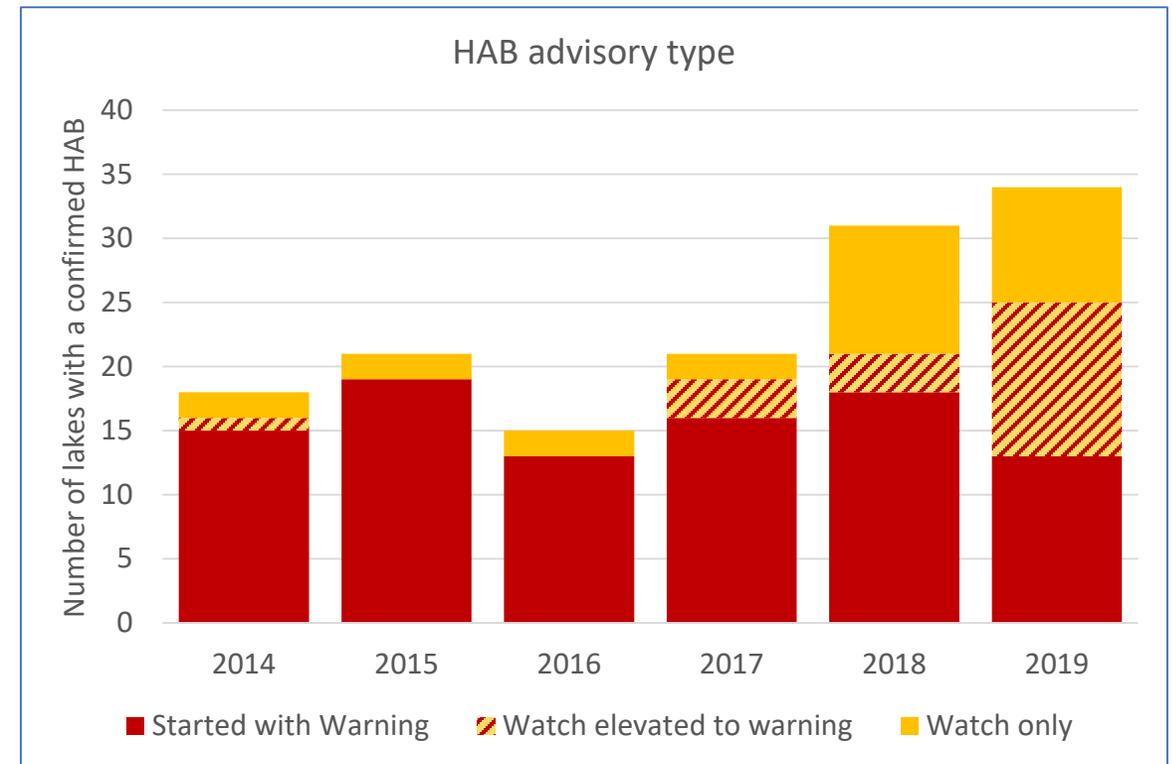
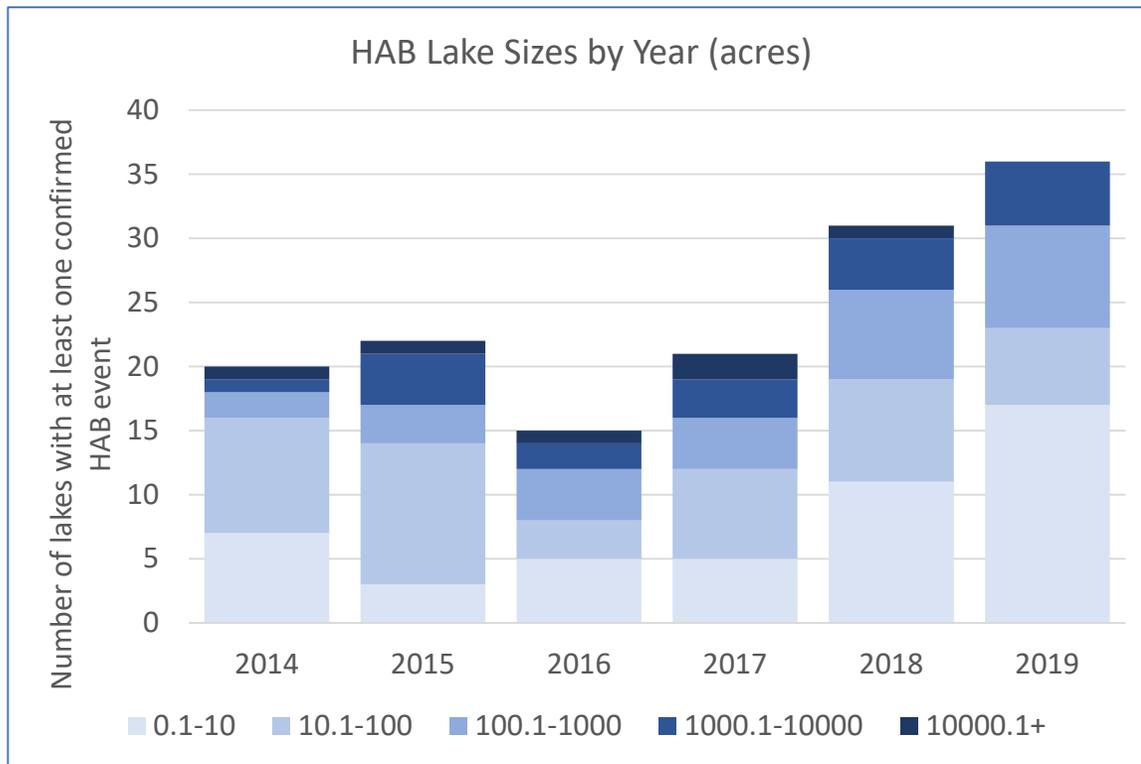


Sampling Events



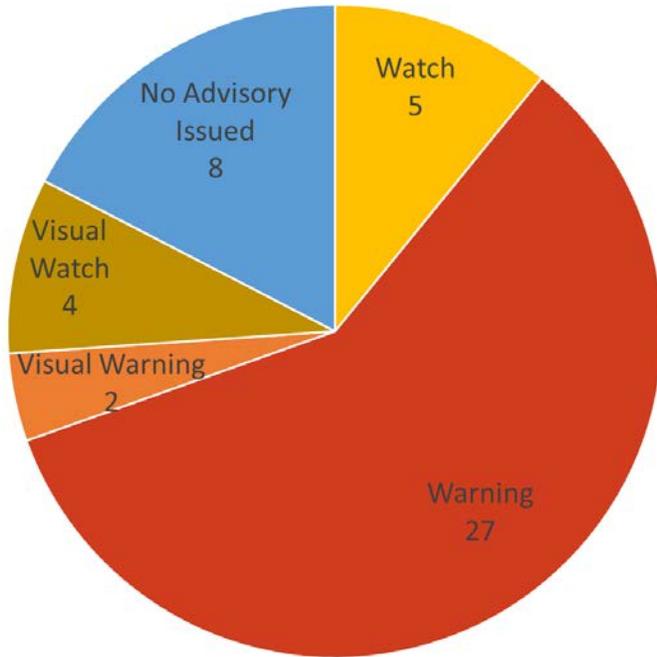
Harmful Algal Blooms in Kansas: 2019 Statistics

HAB Events Increasing Through Time



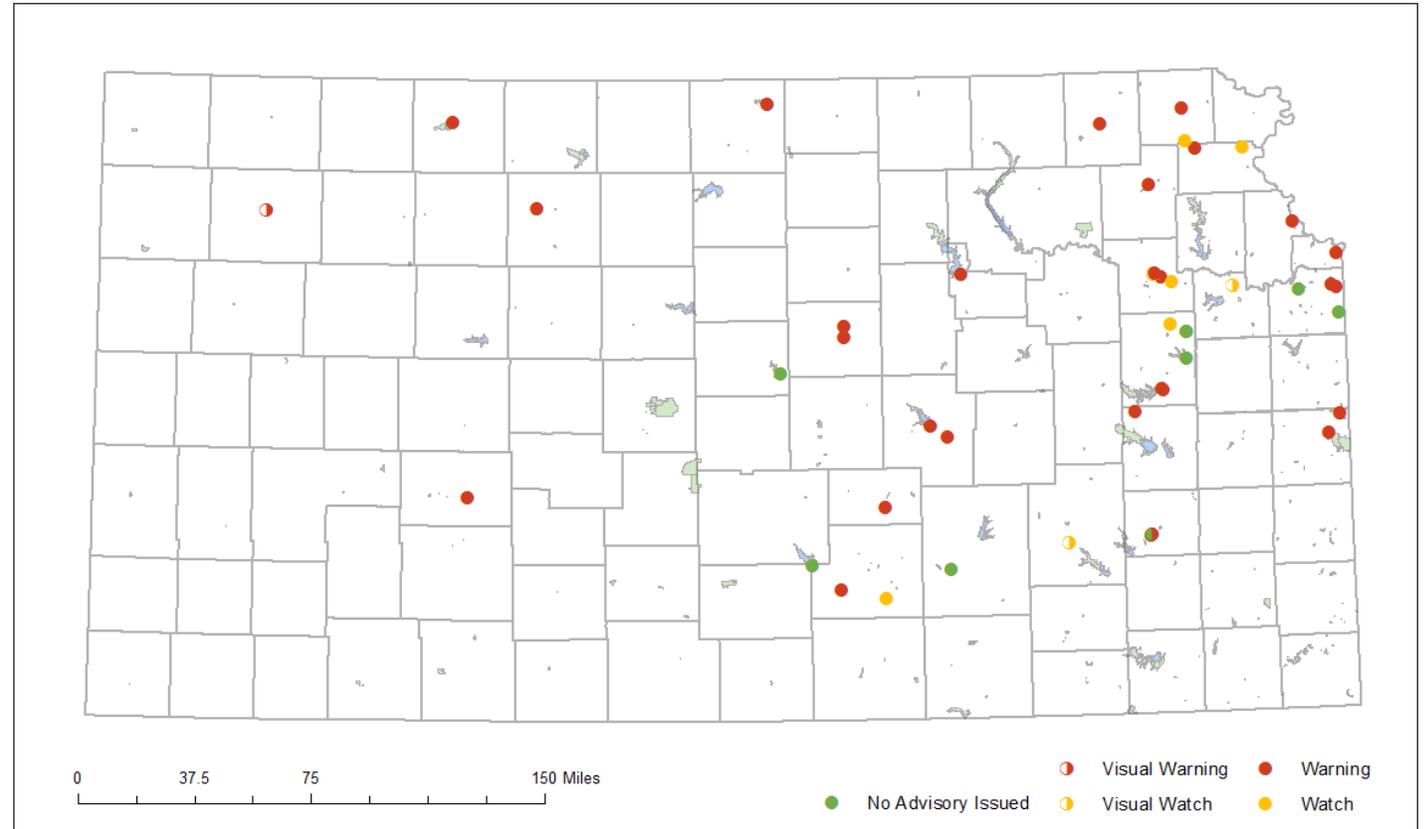
Harmful Algal Blooms in Kansas: 2019 Statistics

2019 Lakes Tested for HABs
Highest Advisory Level Shown



- 38 lakes affected
257 samples taken from 167 sampling events
- 172 cell count analyses
 - 257 toxin analyses

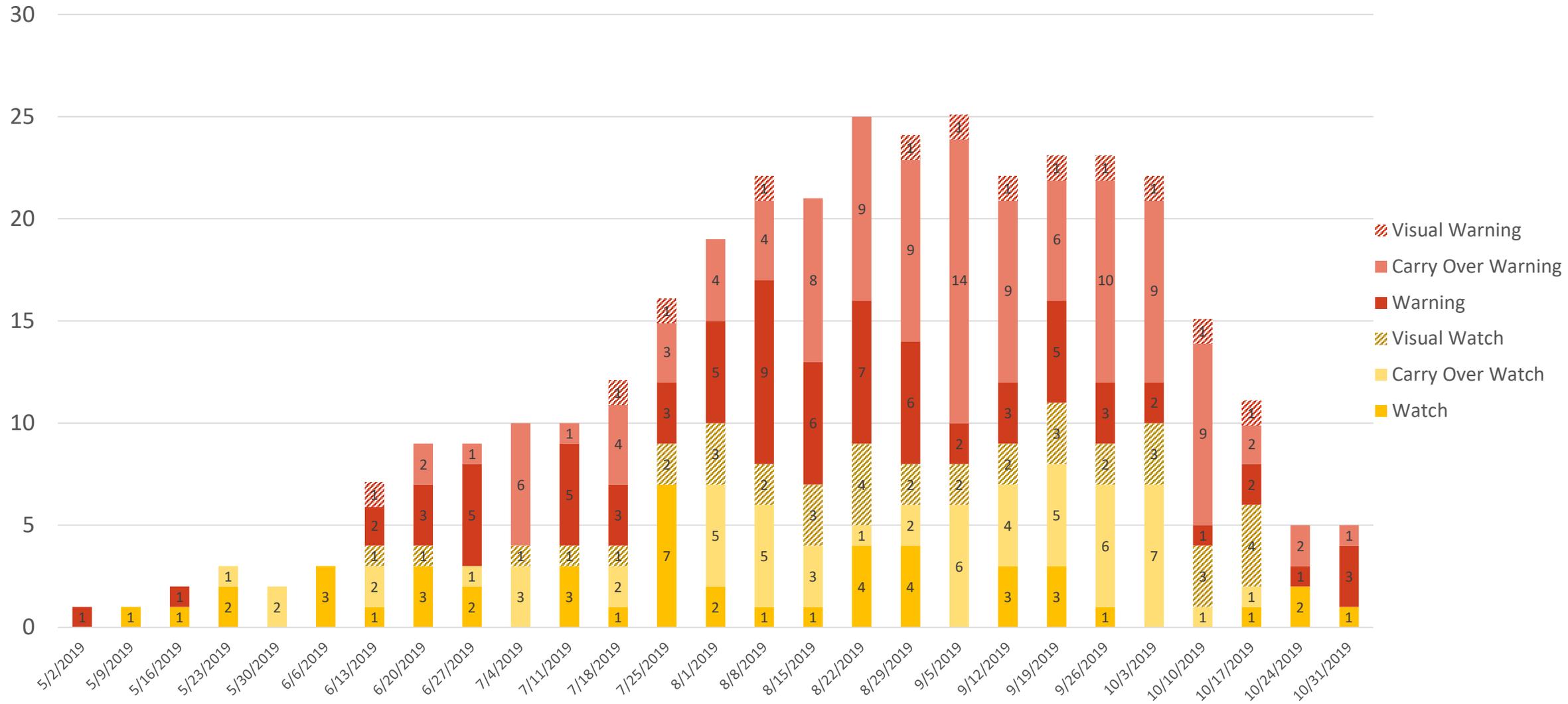
2019 Harmful Algal Blooms
Highest Level of Advisory per Lake



Harmful Algal Blooms in Kansas: 2019 Statistics

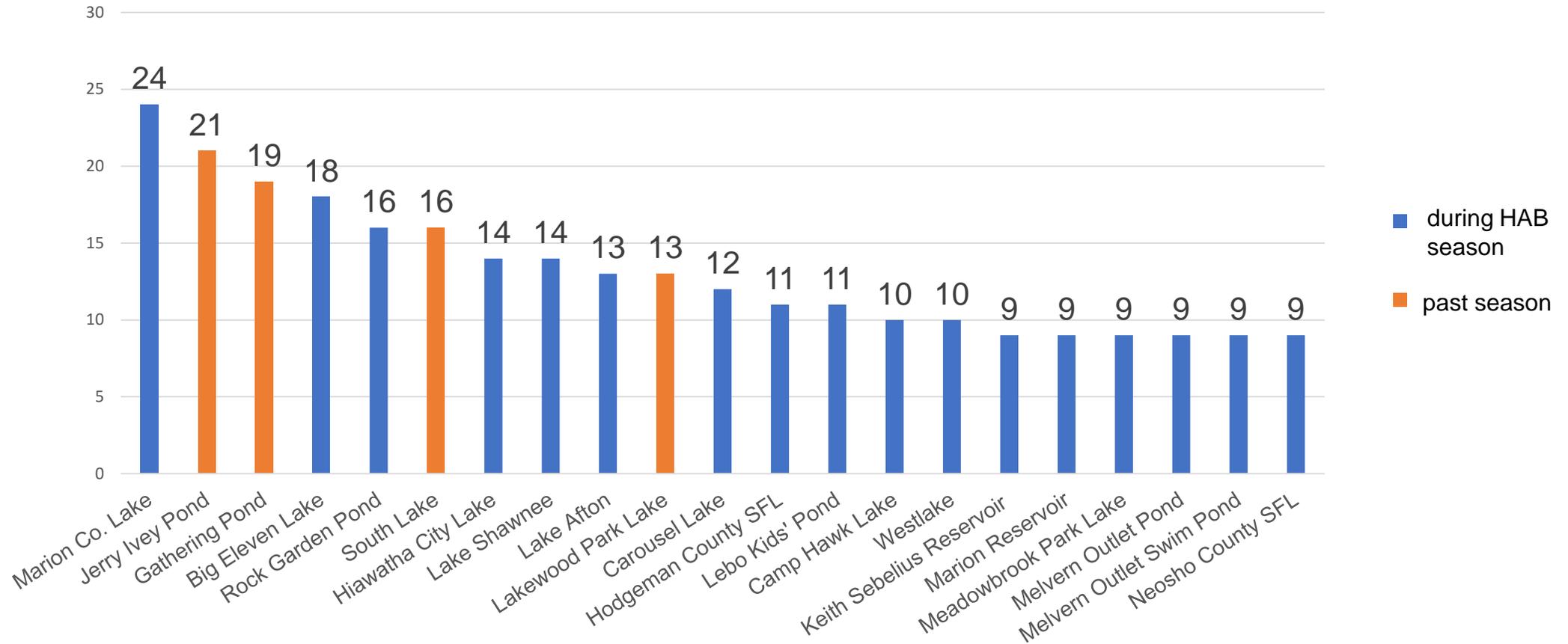
| Waterbody and ID | Sampler | 4/29 | 5/6 | 5/13 | 5/20 | 5/27 | 6/3 | 6/10 | 6/17 | 6/24 | 7/1 | 7/8 | 7/15 | 7/22 | 7/29 | 8/5 | 8/12 | 8/19 | 8/26 | 9/2 | 9/9 | 9/16 | 9/23 | 9/30 | 10/7 | 10/14 | 10/21 | 10/28 |
|--|------------|------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 5/2 | 5/9 | 5/16 | 5/23 | 5/30 | 6/6 | 6/13 | 6/20 | 6/27 | 7/4 | 7/11 | 7/18 | 7/25 | 8/1 | 8/8 | 8/15 | 8/22 | 8/29 | 9/5 | 9/12 | 9/19 | 9/26 | 10/3 | 10/10 | 10/17 | 10/24 | 10/31 |
| Atchison Co SFL (25%) LM0126 | Central | | | | Watch | Watch | Watch | Watch | L | | | | | | | | | | | | | | | | | | | |
| Atchison County Park Lake (75%) LM0606 | NE | | | | | | | | | | | | | | | | | | | | | Watch | W | W | W | L | | |
| Augusta City Lake (25%) (PWS) LM0400 | SC | | | | | | | | | L | | | | | | | | | | | | | | | | | | |
| Big Eleven Lake (75%) LM0671 | Central/NE | | | | | | Watch | W | W | W | W | W | W | W | W | W | W | W | W | W | W | Watch | Watch | Watch | Watch | L | | |
| Camp Hawk Lake (75%) LM0634 | SC | | | | | | | | | | | | | | Watch | | | | | | | | | | | | | |
| Carbondale East (Strowbridge) (25%) (PWS) LM0512 | Central | | | | | | | | Watch | Watch | Watch | L | | | | | | | | | | | | | | | | |
| Carousel Lake in Gage Park LM0769 | Central | | | | | | | | | | | | | | Watch | L | |
| Central Park Lake (75%) LM0609 | Central | | | Watch | Watch | L | | | | | | | | | | | | | | | | | | W | W | W | L | |
| Cheney Lake (25%) (PWS) LM0710 | SC | | | | | | | | | L | | | | | | | | | | | | | | | | | | |
| Elk Horn Lake (75%) LM0610 | Central/NE | | | | | | | | | | | | | | | | | Watch | Watch | Watch | Watch | W | W | W | W | L | | |
| Fall River at State Street, South of Eureka | SE | | | | | | | | | | | | | | | | | Watch | L | | | | | | | | | |
| Gathering Pond (Hatchery Supply Pond) LM0764 | NC | | | | | | | | | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Hiawatha City Lake (75%) LM0116 | Central/NE | | | | | | | | | | | | | Watch | Watch | Watch | Watch | W | W | W | W | W | W | W | W | L | | |
| Hodgeman County SFL (75%) LM0742 | SW | | | | | | | | | | | | | Watch | Watch | | | | | | | | | | | | | |
| Jerry Ivey Pond (75%) LM0760 | NC | | | | | | W | | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Kanopolis Lake (25%) (PWS) LM0160 | NC | | | | | | | | | L | | | | | | | | | | | | | | | | | | |
| Keith Sebelius (Norton) Reservoir (75%) (PWS) LM0100 | NW | | | | | | Watch | | W | W | W | Watch | Watch | Watch | Watch | Watch | L | | | | | | | | | | | |
| La Cygne Lake (25%) LM0440 | SE/NE | | | | | | | | | | | | | | | | | | | | W | L | | | | | | |
| Lake Afton (25%) LM0492 | SC | | | | | | | | | | | | | Watch | Watch | W | W | W | W | W | W | Watch | Watch | Watch | Watch | L | | |
| Lake Jeanette LM0768 | Central/NE | | | | | | | | | | | | | | | | | | | | | W | W | W | W | W | W | W |
| Lake Shawnee (25%) LM0122 | Central | | | | | | | | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | Watch | L | | | | |
| Lakewood Park Lake (75%) LM0698 | NC | | | | | | | | | | | | | | | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Lebo Kids' Pond (Lebo City Park Lake) (25%) LM0656 | SE | | | | | | | | | | | | | | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Lovewell Reservoir (75%) LM0150 | NC | | | | | | | | L | L | | | | | | | | | | | | | | | | | | |
| Marais des Cygnes Wildlife Area LM0532 | SE | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Marion Co. Lake (25%) LM0121 | NC | W | Watch | W | Watch | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | L |
| Marion Reservoir (25%) (PWS) LM0200 | NC | | | | | | | Watch | W | W | W | Watch | Watch | Watch | Watch | Watch | L | | | | | | | | | | | |
| Meadowbrook Park Lake LM0767 | Central/NE | | | | | | | | | | | | | | | | Watch | Watch | Watch | Watch | W | W | W | W | W | W | L | |
| Melvern Outlet Pond (25%) (PWS) LM0271 | Central/NE | | | | | | | | | | | | | | | W | W | W | W | W | W | W | W | W | L | | | |
| Melvern Outlet Swim Pond (25%) LM0272 | Central/NE | | | | | | | | | | | | | | | W | W | W | W | W | W | W | W | W | L | | | |
| Mission Lake (75%) (PWS) LM0136 | Central/NE | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mize Lake LM0766 | Central | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Neosho County SFL (25%) LM0446 | SE | | | | | | | | | | | | | | | W | W | W | W | W | Watch | Watch | Watch | Watch | L | | | |
| New Yates Center Lake (25%) (PWS) LM0538 | SE | | | | | | | | | L | Test T/O | | | | | | | | | | | | | | | | | |
| Overbrook City Lake (75%) LM0205 | Central | | | | | | | W | W | L | | | | | | | | | | | | | | | | | | |
| Overbrook City Kids Pond LM0763 | Central | | | | | | | | | L | | | | | | | | | | | | | | | | | | |
| Pomona Lake (25%) (PWS) LM0280 | Central | | | | | | | | | | | | | | | L | | | | | | | | | | | | |
| Riggs Park Lake (75%) LM0224 | SC | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rock Garden Pond in Gage Park LM0761 | Central | | | | | | | | | | | | | | | | | Watch | L |
| South Lake (75%) LM0675 | Central/NE | | | | | | | | | | | | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| Villa High Lake (Colby City Pond) (75%) LM0713 | NW | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Webster Reservoir (25%) LM0120 | NW | | | | | | | L | Watch | W | W | L | | | | | | | | | | | | W | W | L | Watch | L |
| Westlake (Gage Park Lake) (75%) LM0611 | Central | | | | | | | | | | | | | | Watch | W | W | W | W | W | W | W | W | L | | | | |
| Wilderness Lake LM0765 | Central | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yates Center Kids' Fishing Pond LM0770 | SE | | | | | | | | | | | | | | | | | | | W | W | W | W | W | W | W | W | L |
| Yorkshire Channel E. of N. Crestline Dr | NE | | | | | | | | | | | | | | | | | | | | | | | Watch | L | | | |

Harmful Algal Blooms in Kansas: 2019 Statistics



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2019 Weeks on Advisory

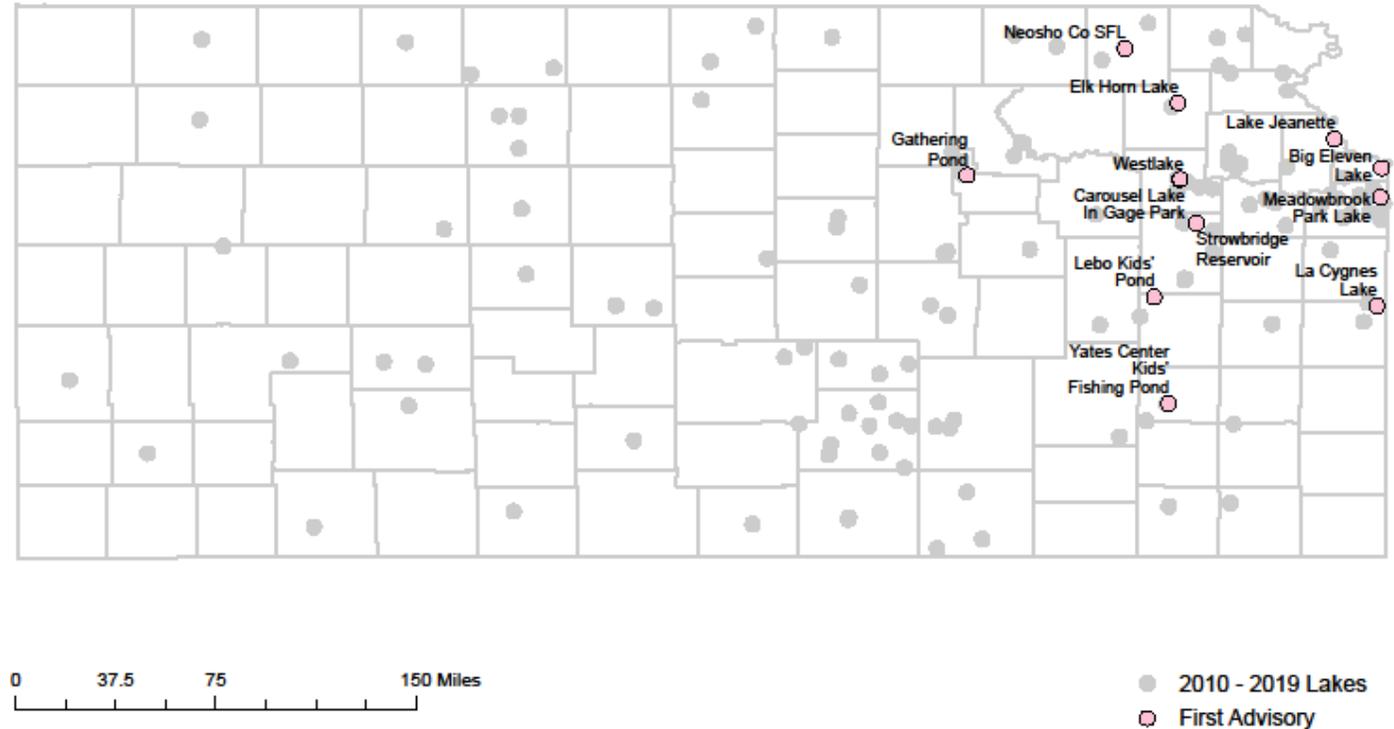


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First Time Advisories – 12 Lakes

- Big Eleven Lake
- Carousel Lake in Gage Park
- Elk Horn Lake
- Westlake in Gage Park
- Gathering Pond (Milford Hatchery)
- La Cygnes Lake
- Lake Jeanette
- Lebo Kids' Pond
- Meadowbrook Park Lake
- Neosho County SFL
- Strowbridge Reservoir
- Yates Center Kids' Fishing Pond

New HAB Advisories in 2019

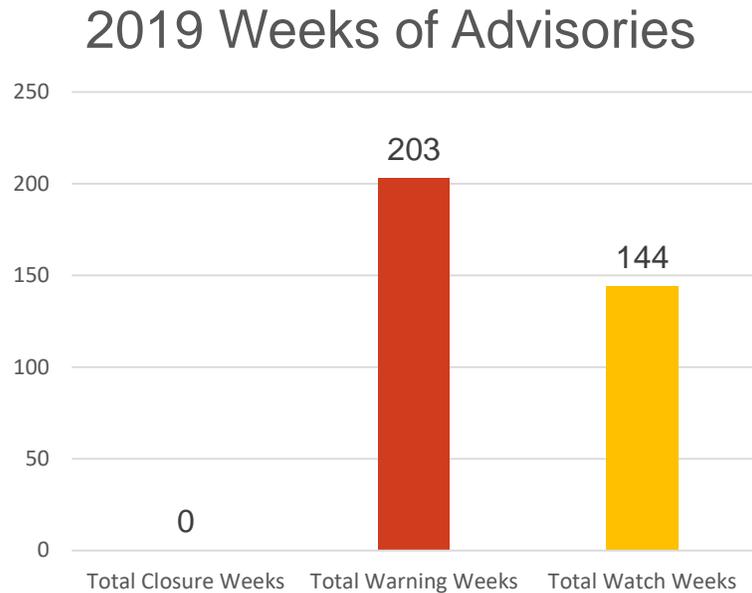


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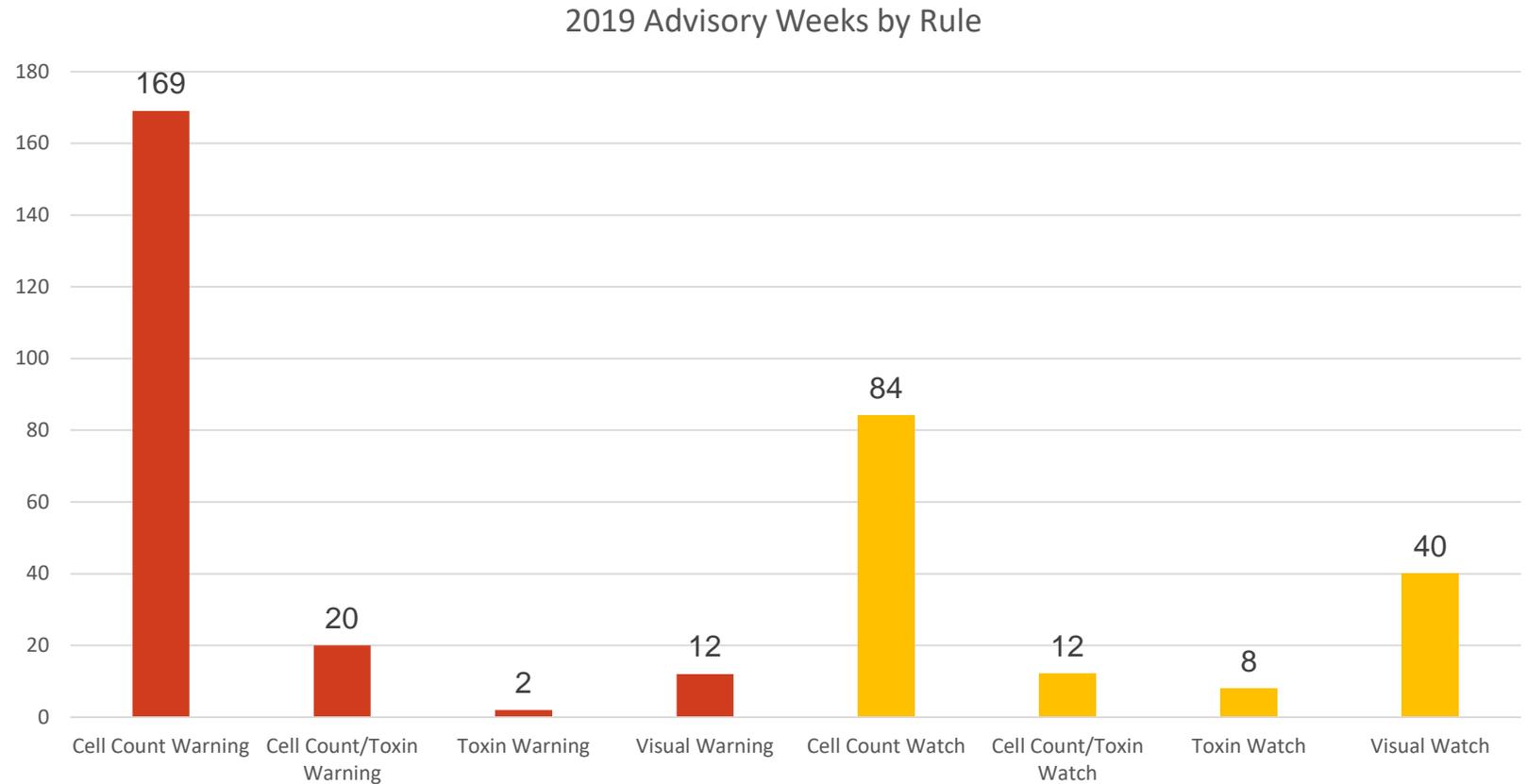
| Threshold Levels | | | |
|--|---------------------|---|------------|
| | Watch | Warning | Closure |
| <i>blue-green cell counts (cells/mL)</i> | 80,000 | 250,000 | 10,000,000 |
| or | | | |
| <i>microcystin toxin level (µg/L)</i> | 4 | 20 | 2,000 |
| or | | | |
| <i>visual identification</i> | visual confirmation | significant blue-green algae surface scum | |

Harmful Algal Blooms in Kansas: 2019 Statistics

HAB Weeks

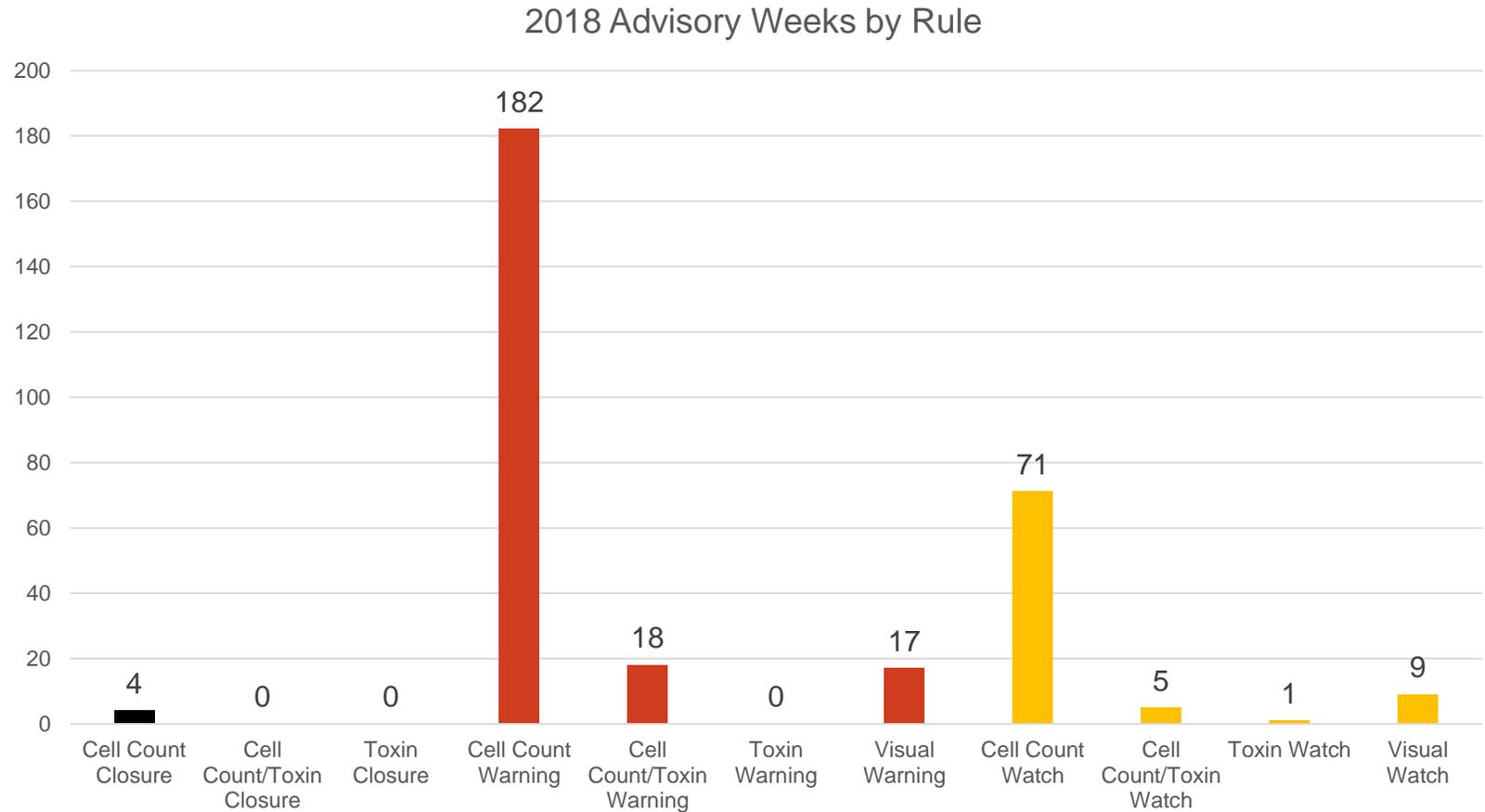
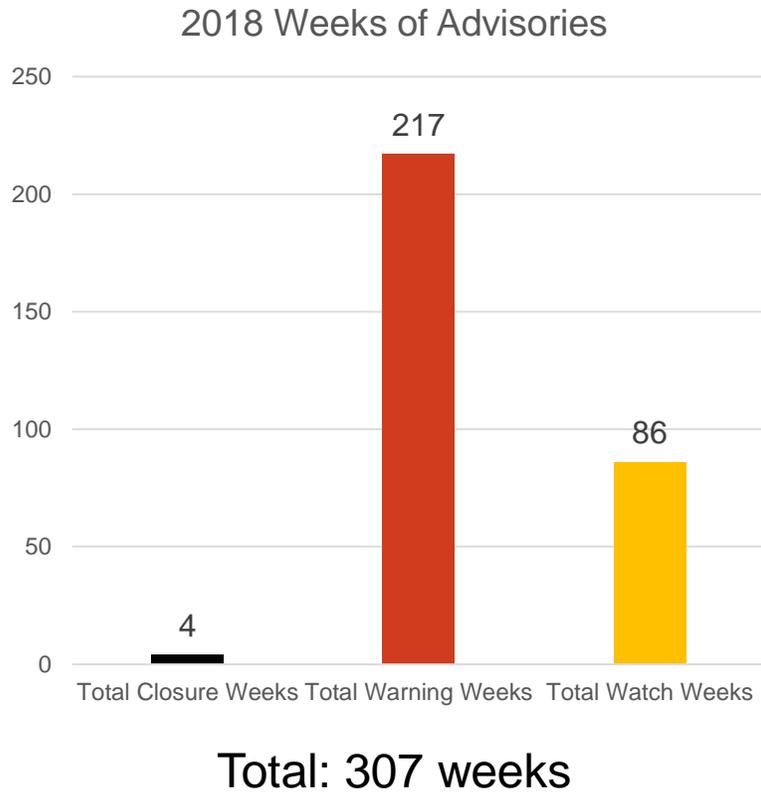


Total: 347 weeks



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HAB Weeks: 2018



2019 Statistics

Highest Level of Toxin:

>400 ppb at Gathering Pond on 6/25/2019

Highest Blue-Green Cell Count:

~8,000,000 cells/mL at Lovewell Reservoir on
7/8/2019



Thank you/Questions?

