Holding back the Water:
Kansas Federal Reservoir Conditions Surrounding the Spring 2019 Floods

Jude Kastens | Chris Shultz
Kansas Dam Safety Conference
Topeka | March 11, 2020

Clinton Lake breaks record for highest water level; Kansas River expected to flood
MAY 30, 2019 - 11:49AM

Two Kansas City area reservoirs at full capacity; more levee breaches expected
Post: 5:37 PM, May 27, 2019  Updated: 11:30 AM, Jun 05, 2019

Tuttle Creek Reservoir, May 24
Credit: Manhattan Mercury
There are >150,000 water bodies in Kansas
Includes private farm ponds, state & local lakes, federal reservoirs, other

Source: USGS National Hydrography Dataset (count includes water bodies > 0.25 ac)

24 Federal Reservoirs in Kansas
Size Range (surface area):
1100 ac (Big Hill) to 16,500 ac (Milford)
Federal Reservoir Storage in Kansas (est. 2019)

2.7 million ac-ft of storage (conservation pool)

Federal Reservoir Storage in Kansas (est. 2019)

7.7 million ac-ft (additional storage in flood pool)

Data Source: KWO
Kansas Flooding Spring 2019

- May 2019 was the second wettest month on record for the conterminous U.S. in 125 years (for May and for all months)
- With an average of 10.26” received statewide, May 2019 was the wettest month ever for Kansas (previously June 1951)
Meanwhile...

Flood Storage Filled

Source: Kansas Water Office (Chris Shultz)
2019 Flood Storage Max

Percent of Flood Pool Used - 10 lakes in the Missouri River Basin

Missouri River – KC
USGS gage height (flood stage 32ft)
January 1, 2019

Total flood pool used: 4%

February 1, 2019

Total flood pool used: 0%
March 1, 2019

Total flood pool used: 2%

March 13: Bomb cyclone hits Nebraska

Yutan, NE
Spencer Dam (Niobrara) fails on March 14

March 15, 2019

Total flood pool used: 10%
April 1, 2019  Total flood pool used: 23%

April 15, 2019  Total flood pool used: 26%
May 1, 2019
Total flood pool used: 29%

May 10, 2019
Total flood pool used: 43%
First real-time flood map, Lower Neosho (5/18)

First flood map, Salina area (5/20)
May 20, 2019

Total flood pool used: 48%

Kansas River at Lawrence
41,000 cfs
First flood map, Emporia area (5/21)
Map update for Lower Neosho around Burlington, including planned release from John Redmond (5/22)
Corps of Engineers to release water from Perry Lake as flood pool reaches capacity

KANSAS CITY DISTRICT

May 26, 2019

May 30, 2019  Clinton Lake
June 1, 2019

Total flood pool used: 75%

June 1, 2019

Perry Lake, 10000 cfs
June 10, 2019

Total flood pool used: 68%
June 20, 2019

Total flood pool used: 64%

July 1, 2019

Total flood pool used: 69%
Clinton Lake - Bloomington State Park

July 2, 2019

July 2, 2019
July 10, 2019  Total flood pool used: 63%
**July 20, 2019**

Total flood pool used: 53%

- Harlan: 37%
- Wilson: 17%
- Milford: 68%
- Tuttle: 67%
- Perry: 61%
- Clinton: 64%
- Pomona: 43%
- Melvern: 42%
- Hillsdale: 57%

**August 1, 2019**

Total flood pool used: 40%

- Harlan: 35%
- Wilson: 12%
- Milford: 50%
- Tuttle: 49%
- Perry: 54%
- Clinton: 55%
- Pomona: 24%
- Melvern: 23%
- Hillsdale: 38%
October 25, 2019
Milford Lake

November 1, 2019
Total flood pool used: 30%
December 1, 2019

Total flood pool used: 7%

- Harlan: 10%
- Wilson: 0%
- Tuttle: 8%
- Perry: 12%
- Clinton: 9%
- Milford: 5%
- Pomona: 5%
- Melvern: 5%
- Hillsdale: 5%
- Kanopolis: 0%

Mapping Inundation Duration

- Collaboration with Kansas Forest Service
- Plan to map all KS federal reservoirs that experienced sustained high water
Tree Height (from LiDAR) in purple

Days Underwater
Jan 1 - Sep 30, 2019

- 1 - 40
- 41 - 80
- 81 - 120
- 121 - 160
- 161 - 200
- 201 - 240
- 241 - 273
Thanks for Listening...
Any Questions?

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