# TULSA DISTRICT
# US ARMY CORPS OF ENGINEERS

## 40TH ANNUAL OKLAHOMA GOVERNOR'S WATER CONFERENCE AND RESEARCH SYMPOSIUM: WATER MEANS BUSINESS

## RESILIENT PUBLIC WATER

COL Scott Preston
Commander, Tulsa District Corps of Engineers

December 4, 2019

Military

Multipurpose Reservoirs

Hydropower

Interagency and International Support

MKARNS

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*

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# Resiliency of Public Water

## Over-Arching Themes

- Aging Infrastructure and Budget Constraints
- Sedimentation within our Lakes
- Water Supply Storage availability
- Takeaways
- Examples

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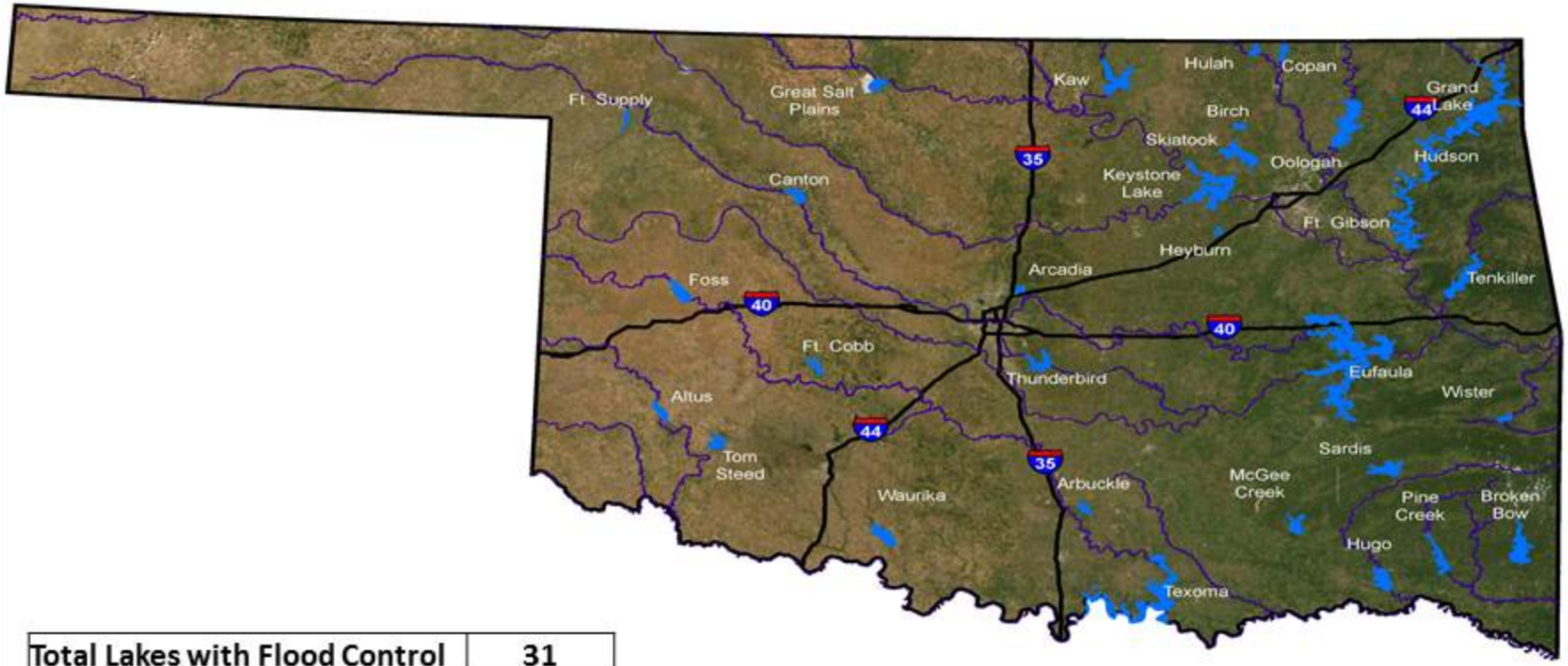
# Flood Control Lakes in Oklahoma




| | |
|---|---|
| Total Lakes with Flood Control | 31 |
| Corps of Engineers Lakes | 22 |
| Section 7 Reservoirs | 9 |

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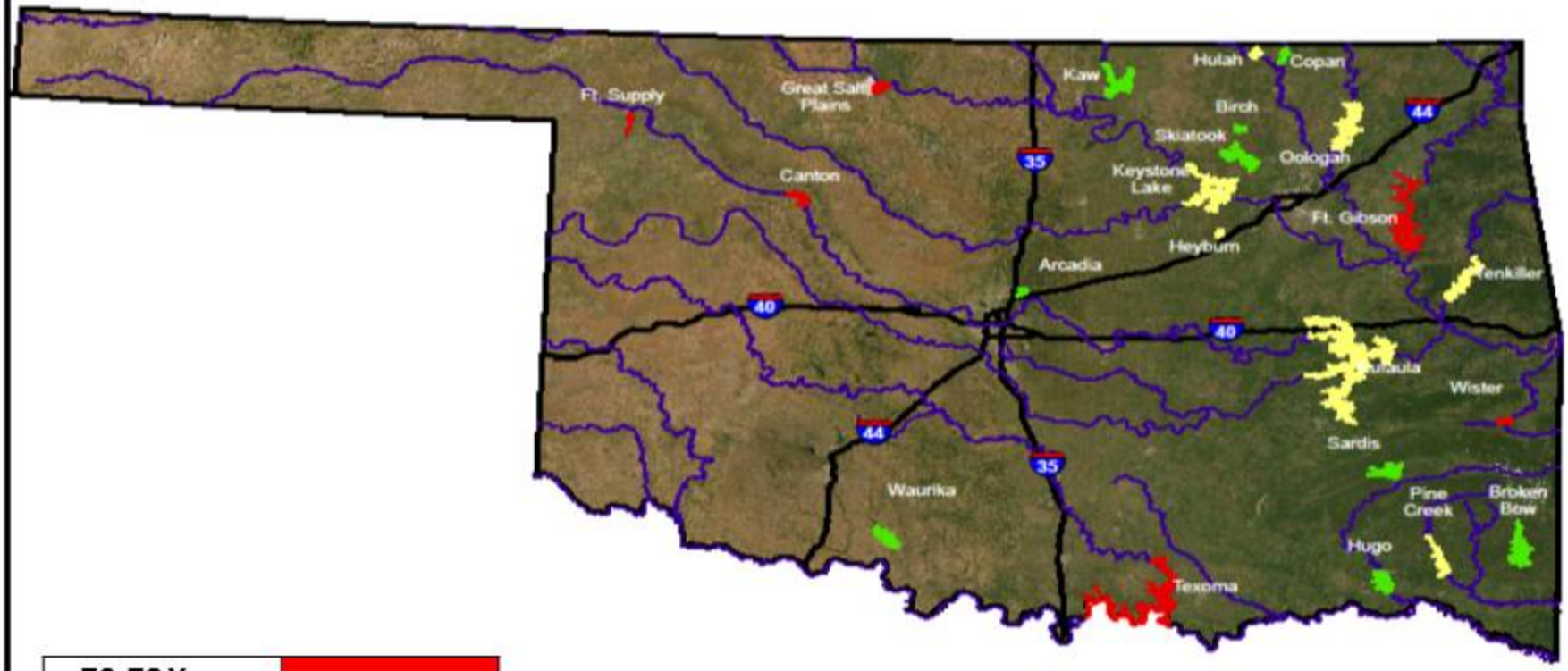
# Ages of Corps of Engineers Lakes in Oklahoma




| | |
|---|---|
| 70-78 Years | |
| 50-69 Years | |
| 33-49 Years | |

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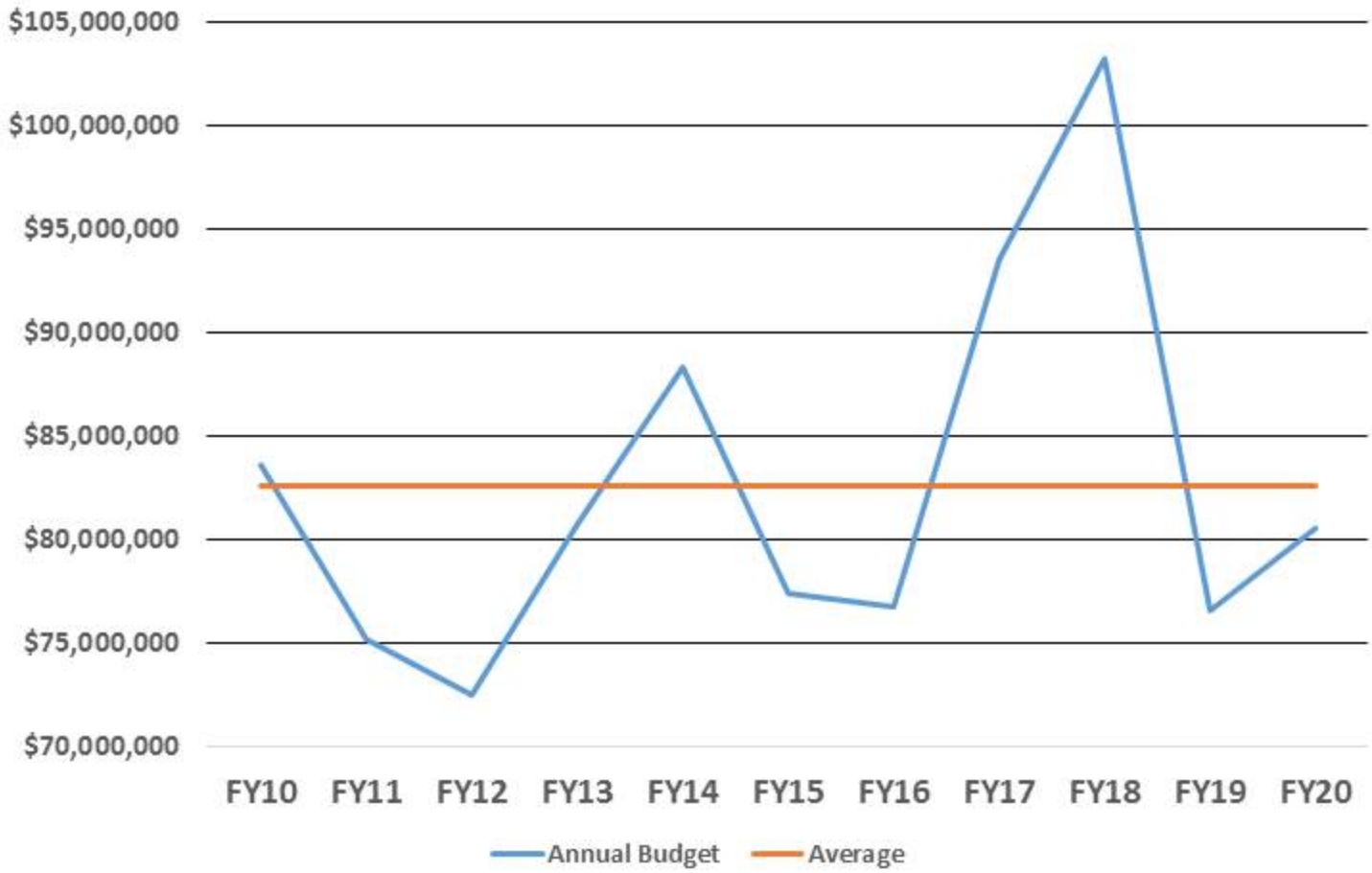
# Annual O&M Budget for Oklahoma Lakes

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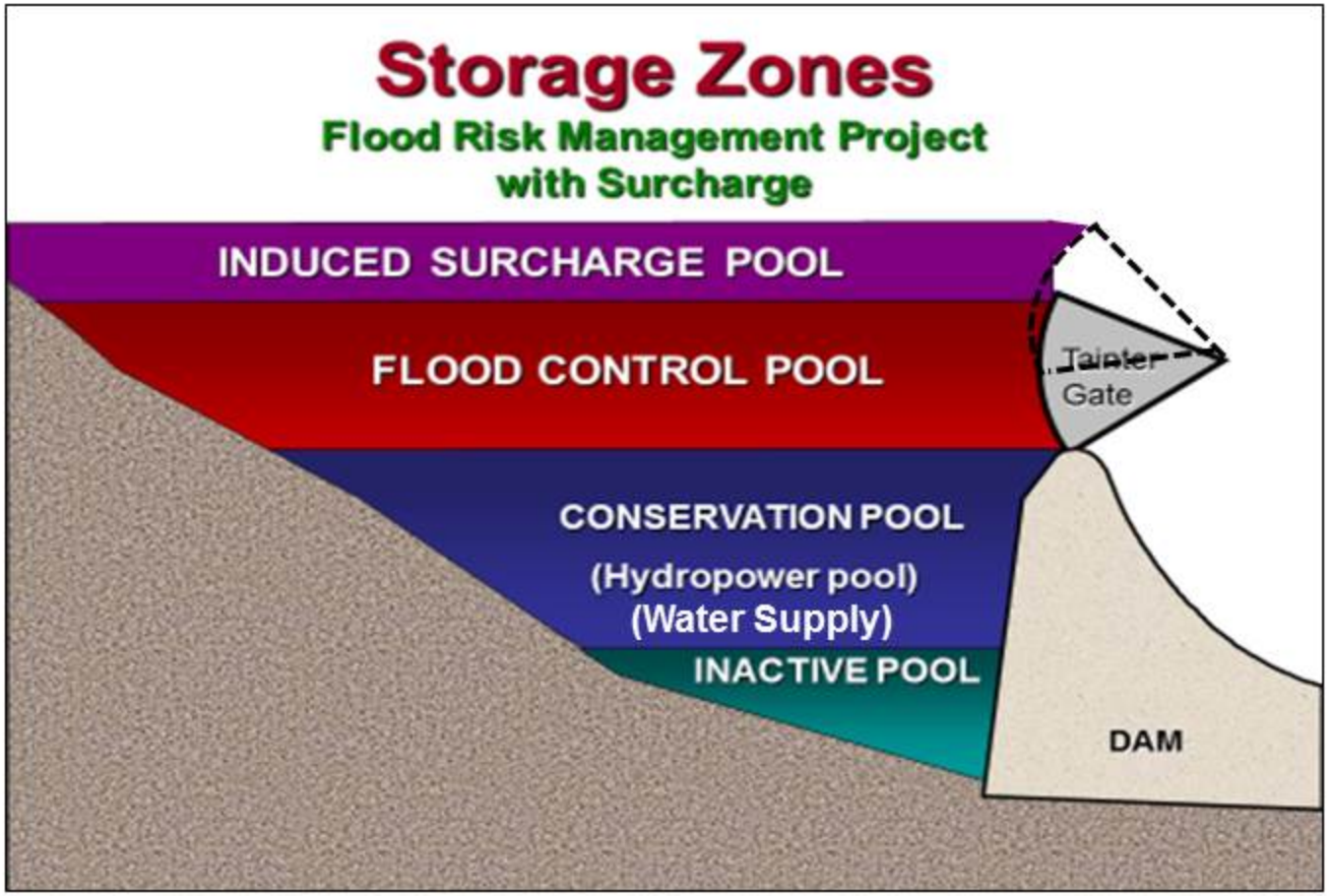
# Anatomy of a Lake / Reservoir

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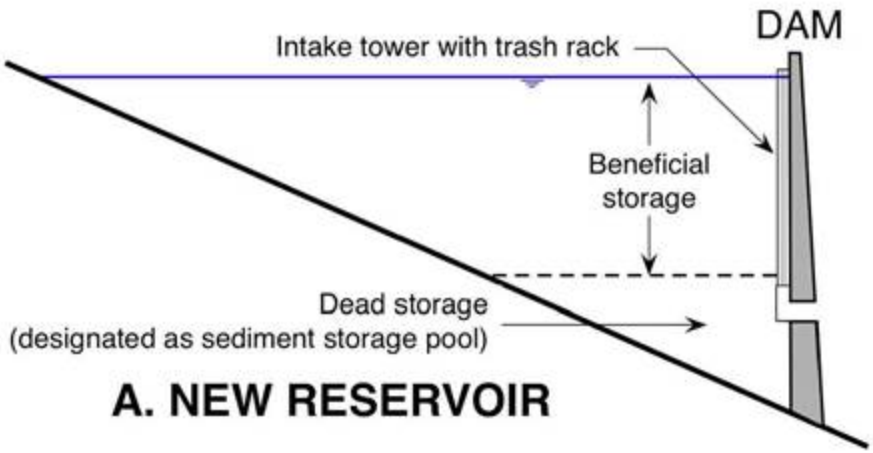
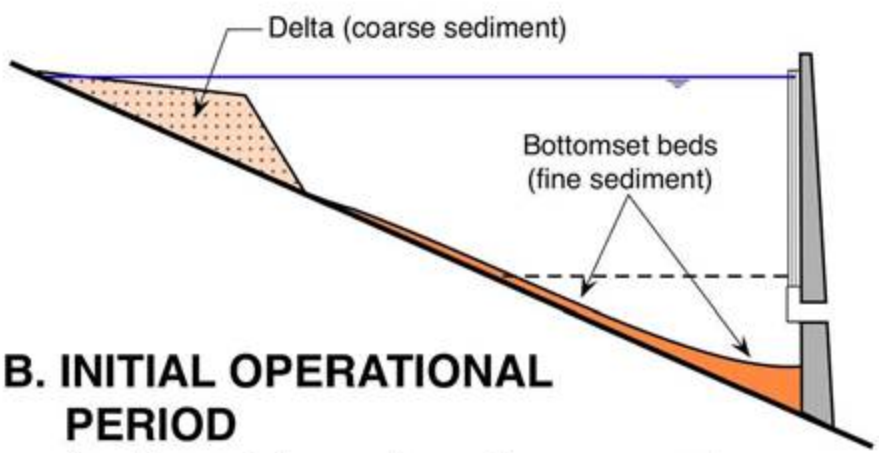
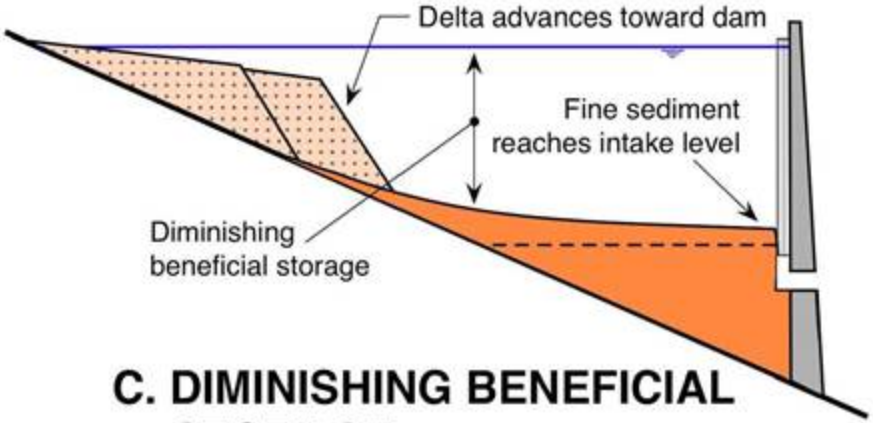
# Reservoir Sedimentation



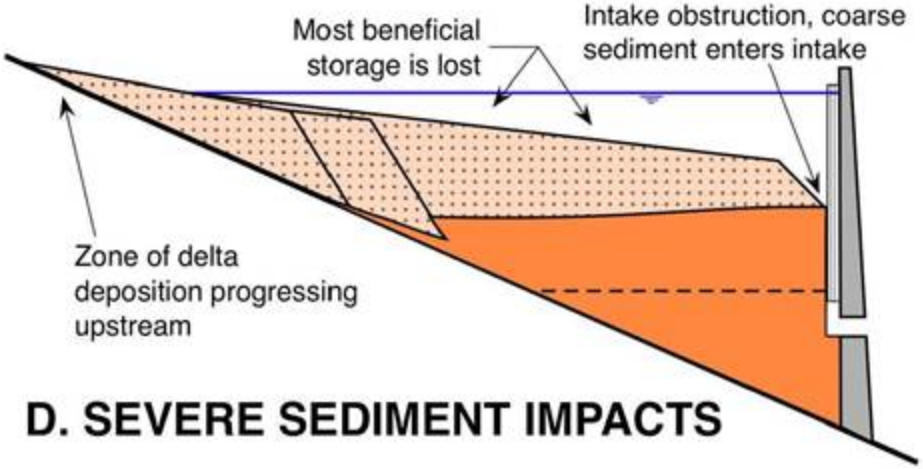

**A. NEW RESERVOIR**




**B. INITIAL OPERATIONAL PERIOD**
(sediment impacts not a concern)



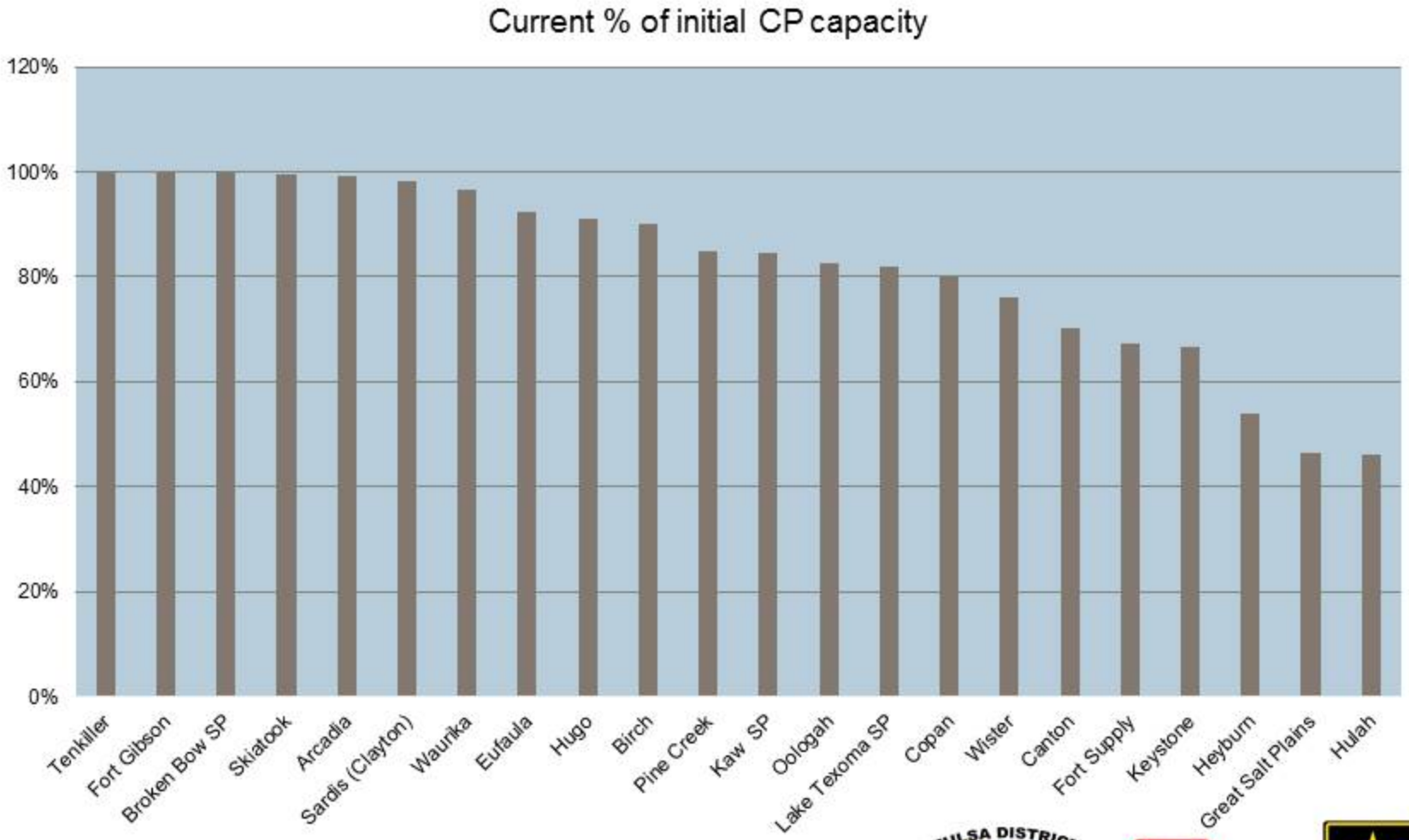

**C. DIMINISHING BENEFICIAL STORAGE**




**D. SEVERE SEDIMENT IMPACTS**

G. Morris

# Conservation Pool Remaining Percentage

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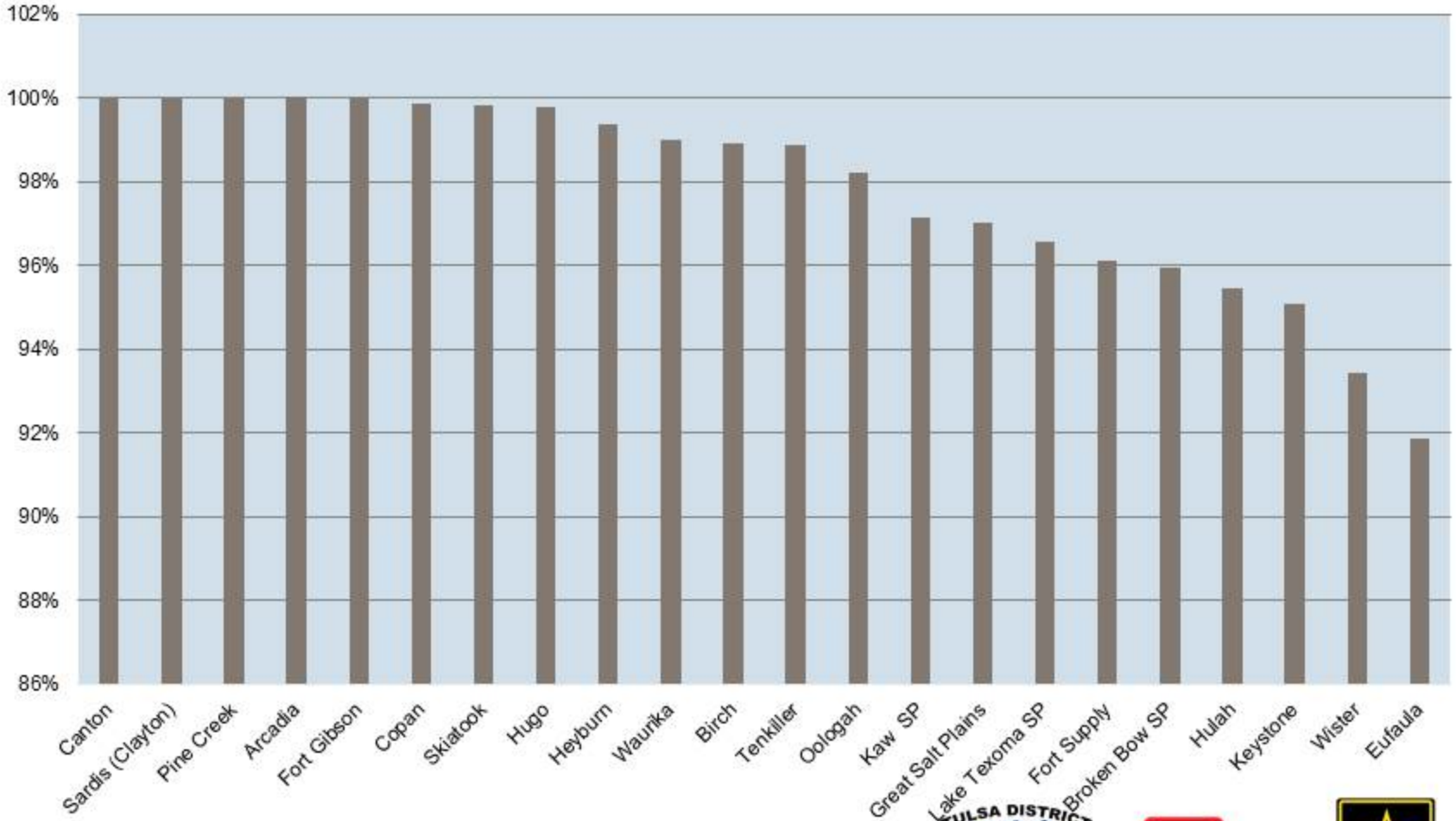
# Flood Pool Remaining Percentage

Current % of initial FP capacity

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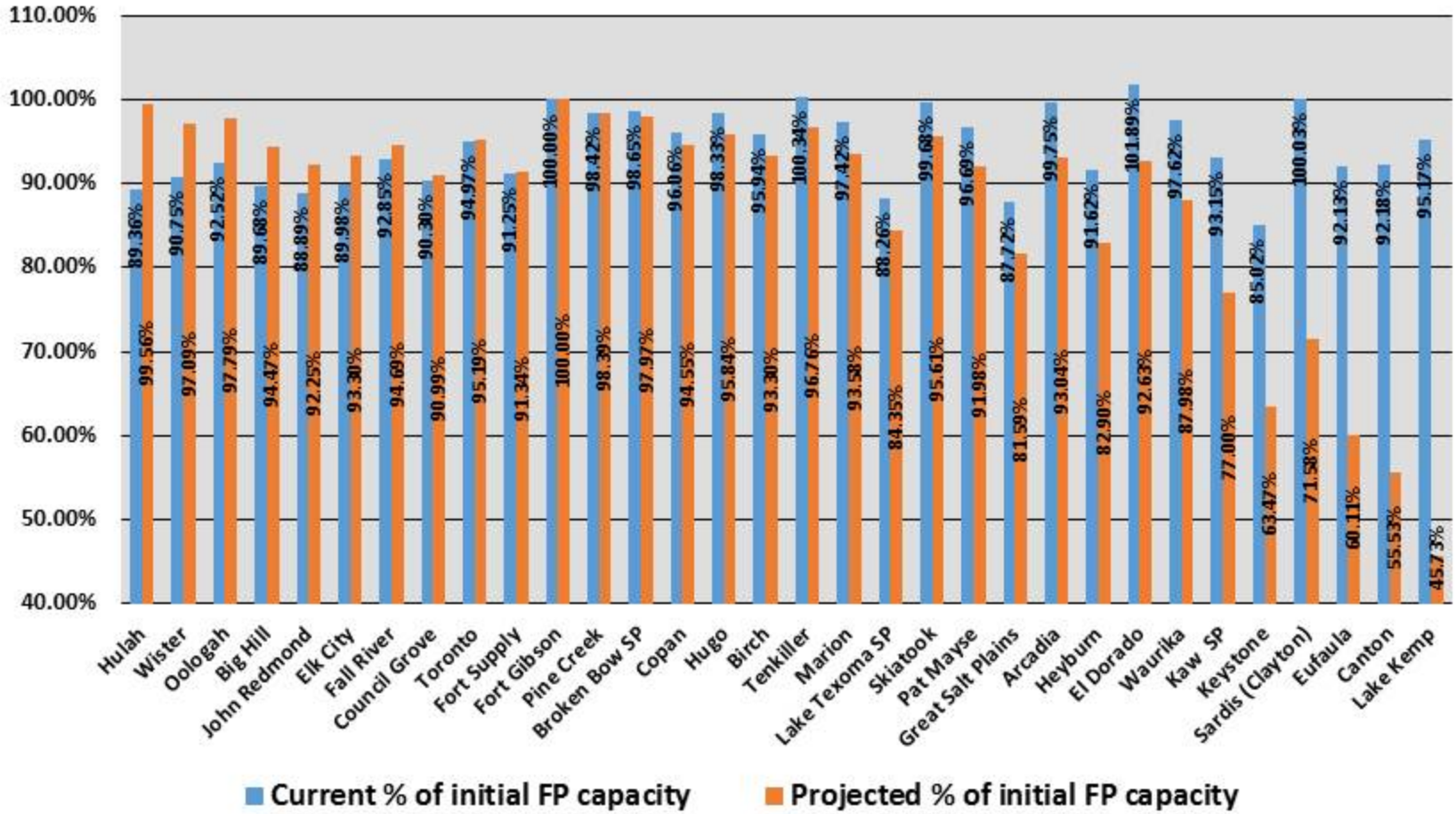
# Flood Pool Sedimentation: Current vs Projected

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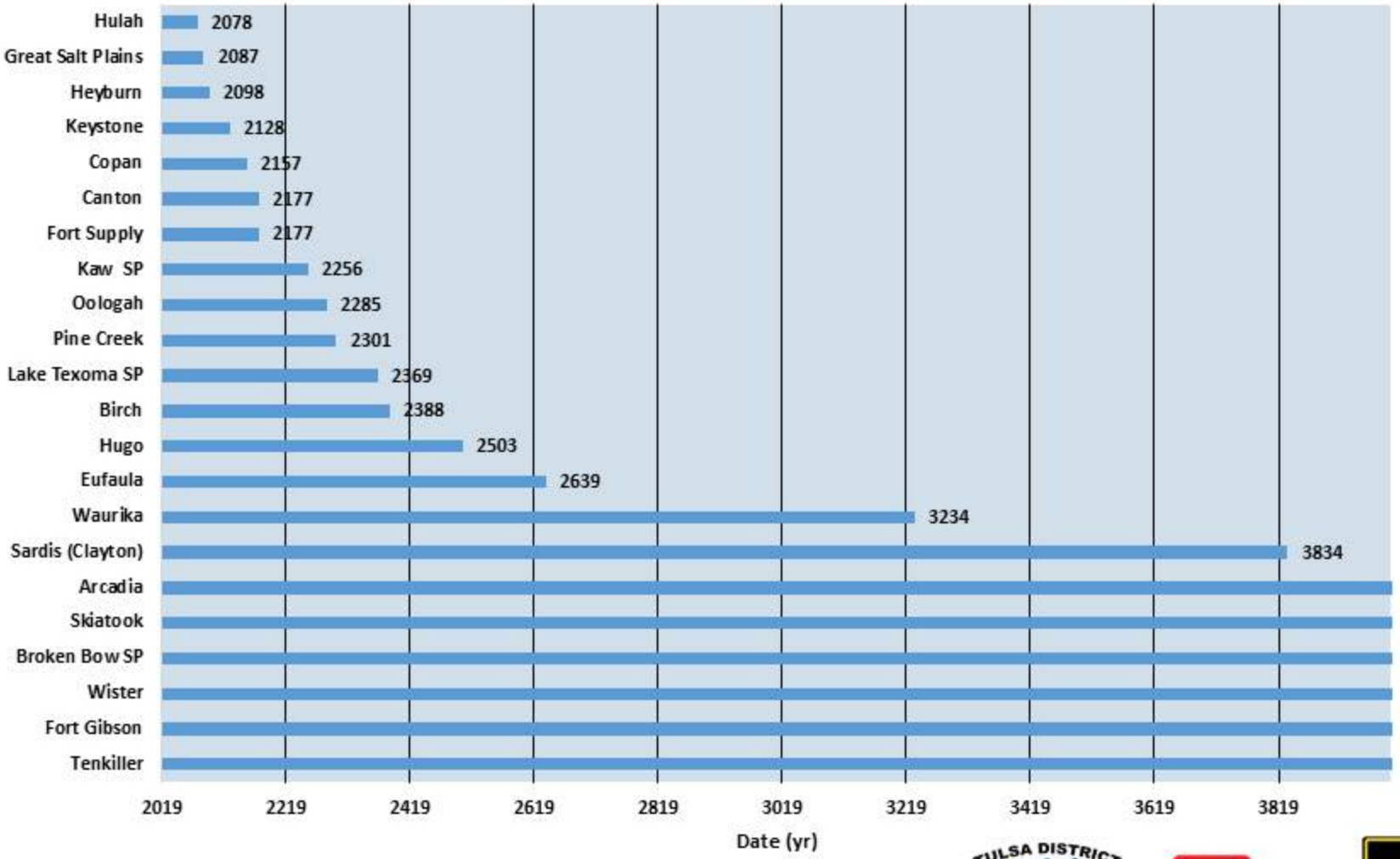
# Estimate Date to Fill Conservation Pool with Sediment



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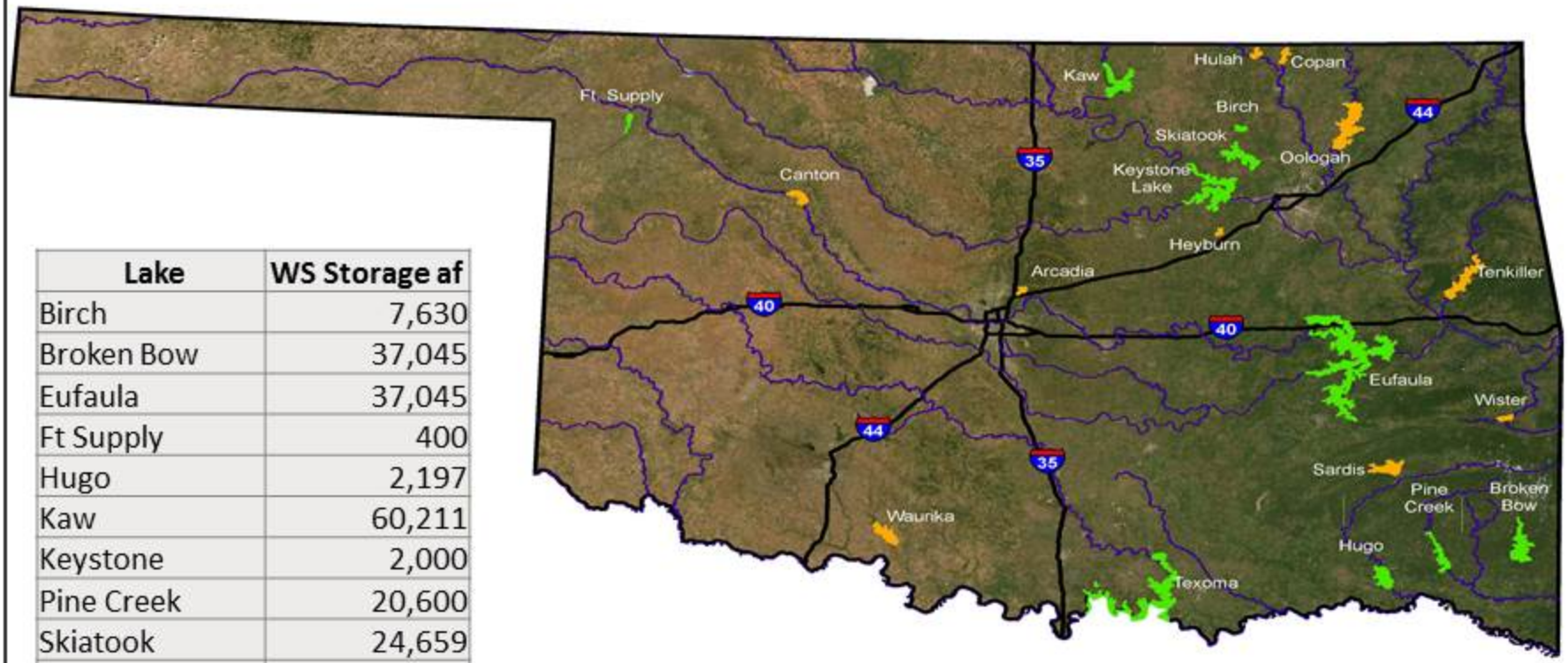
# Water Supply Storage




| Lake | WS Storage af |
|---|---|
| Birch | 7,630 |
| Broken Bow | 37,045 |
| Eufaula | 37,045 |
| Ft Supply | 400 |
| Hugo | 2,197 |
| Kaw | 60,211 |
| Keystone | 2,000 |
| Pine Creek | 20,600 |
| Skiatook | 24,659 |
| Texoma | 150,000 |
| TOTAL | 341,787 |

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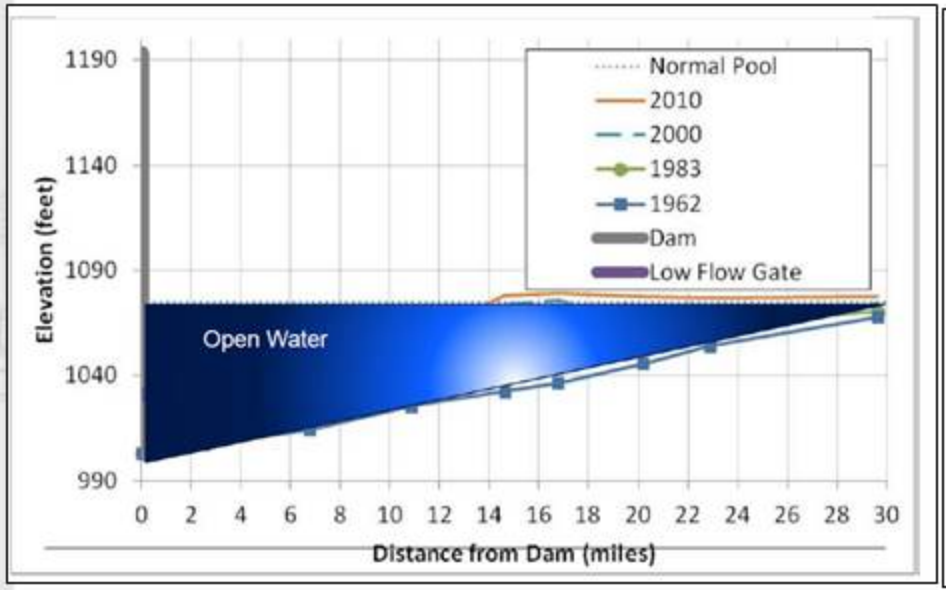
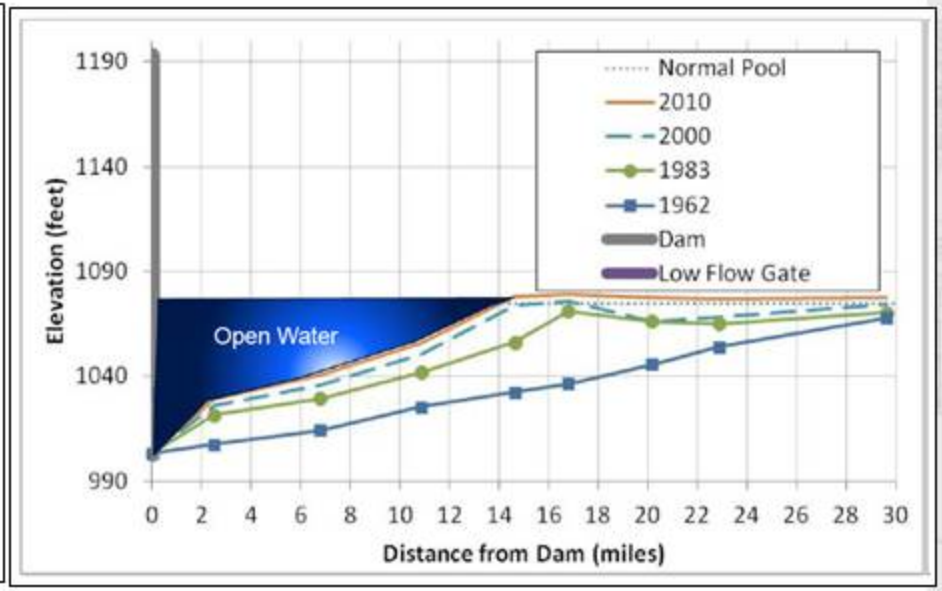
# Extreme Example of Reservoir Sedimentation

## Tuttle Creek Lake, KS

**1984**




**2016**

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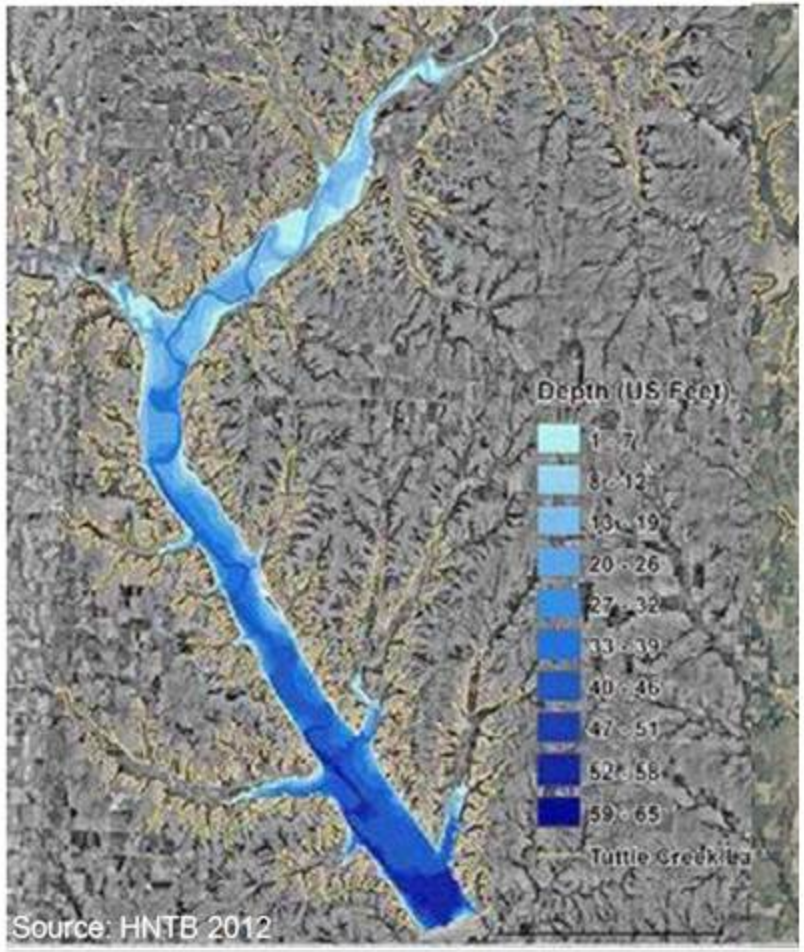
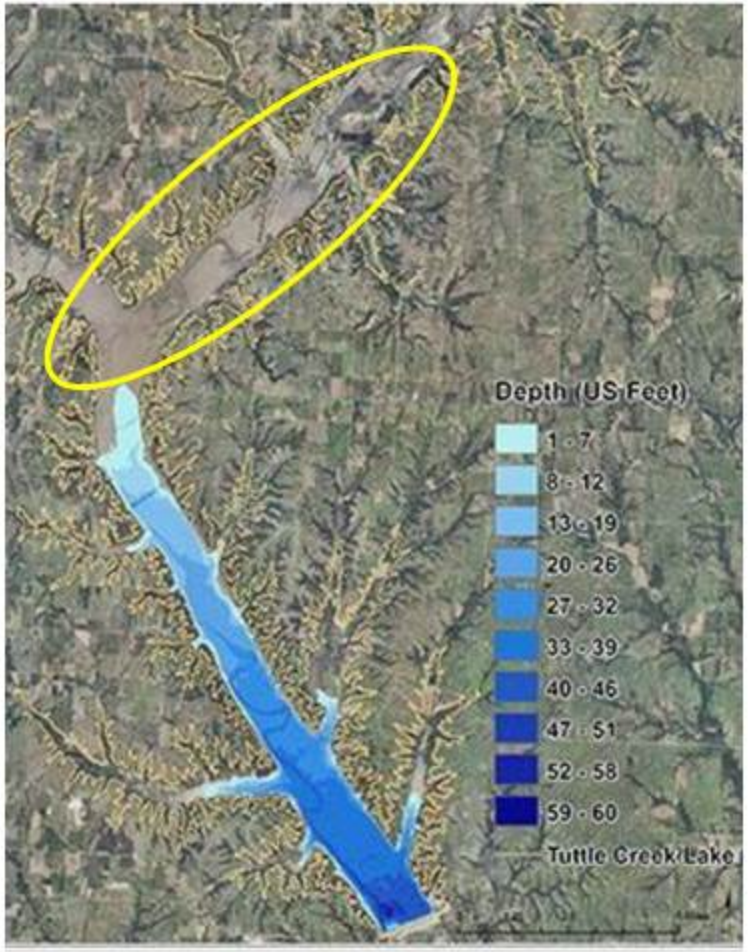
# Tuttle Creek Lake, KS

## Satellite View




Source: HNTB 2012




**1962 To 2010**

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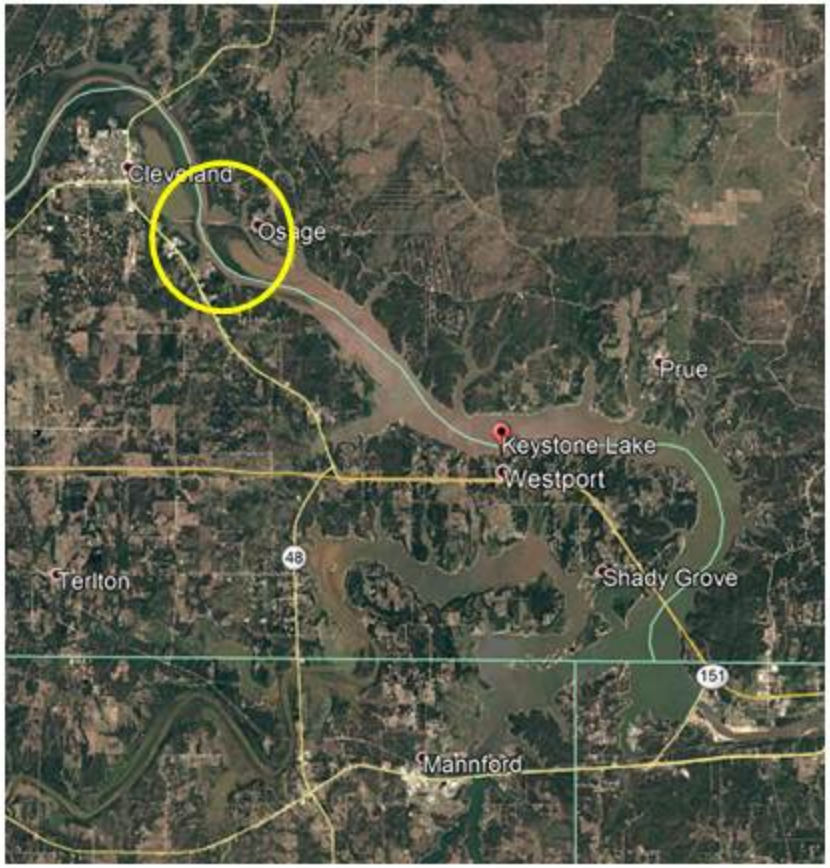
# Keystone Lake
## Satellite View

**1984**

**2016**




**~ 5% reduction in Flood Storage**

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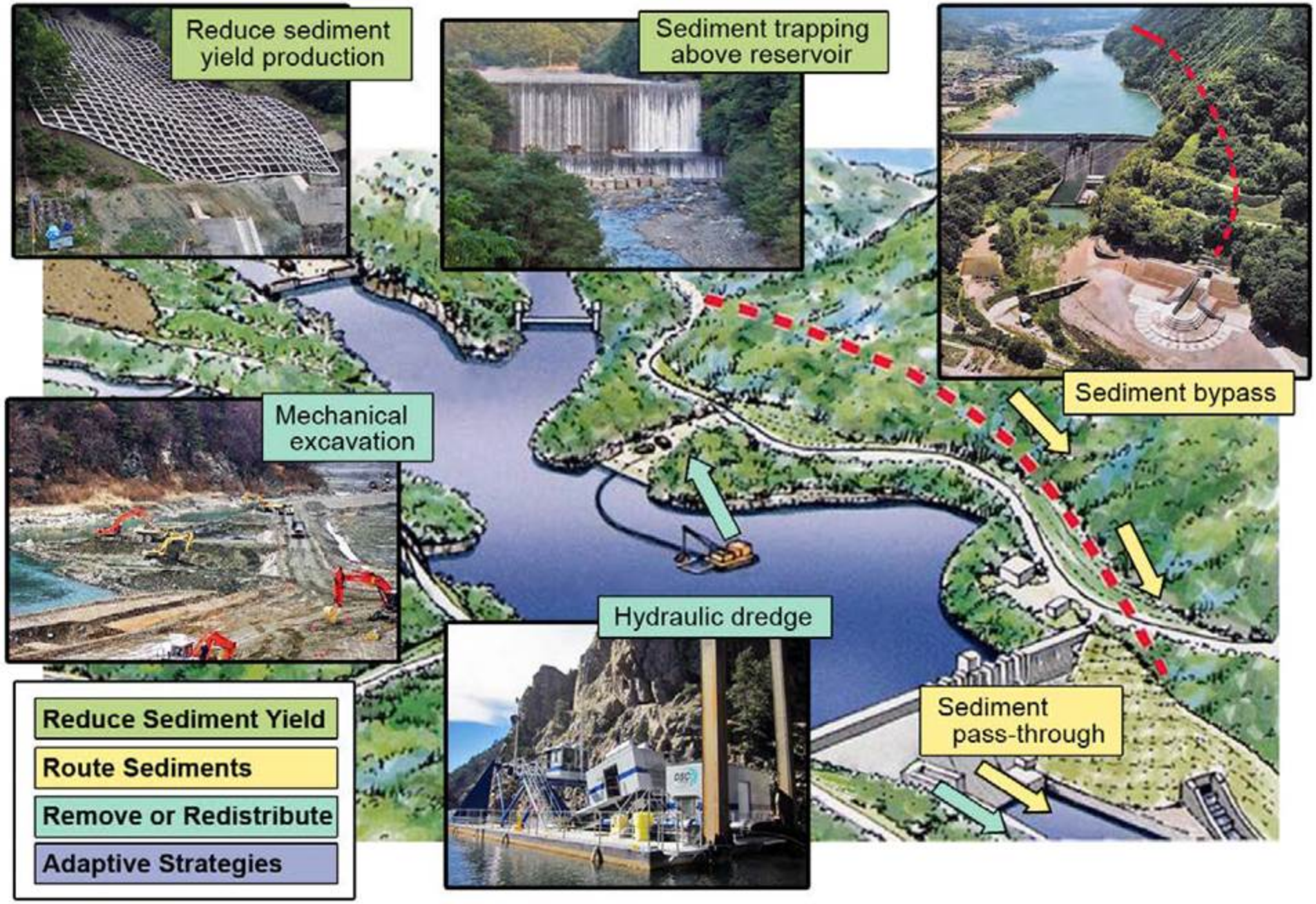


Reservoir Sediment Management: Building a Legacy of Sustainable Water Storage Reservoirs
National Reservoir Sedimentation and Sustainability Team White Paper June 12, 2019

# Takeaways

- Corps projects are aging
  - Average age over 55 years
  - Flat budgets increases risks in performing critical maintenance
- Sedimentation results in an Expiration Date of our Lakes
- Corps has over 341,000 af of Water Supply Storage available at Oklahoma Lakes

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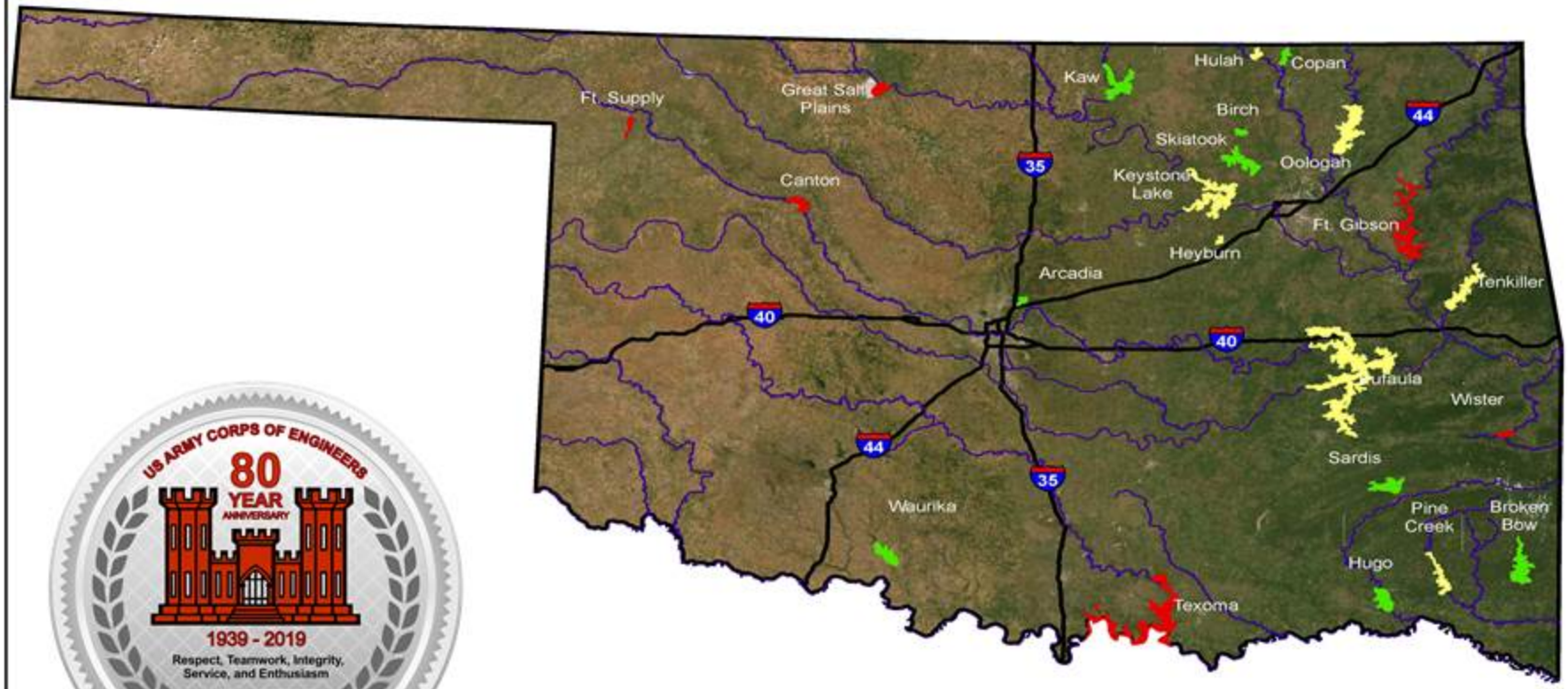
# Questions ???

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80 YEAR ANNIVERSARY
1939 - 2019
Respect, Teamwork, Integrity, Service, and Enthusiasm

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