

OSAGE RIVER BASIN OPERATIONS

WATER MANAGEMENT

An Overview of Basin Operations

Water Management Section
Hydrologic Engineering Branch
Kansas City District
Northwestern Division
US Army Corps of Engineers

February 2013



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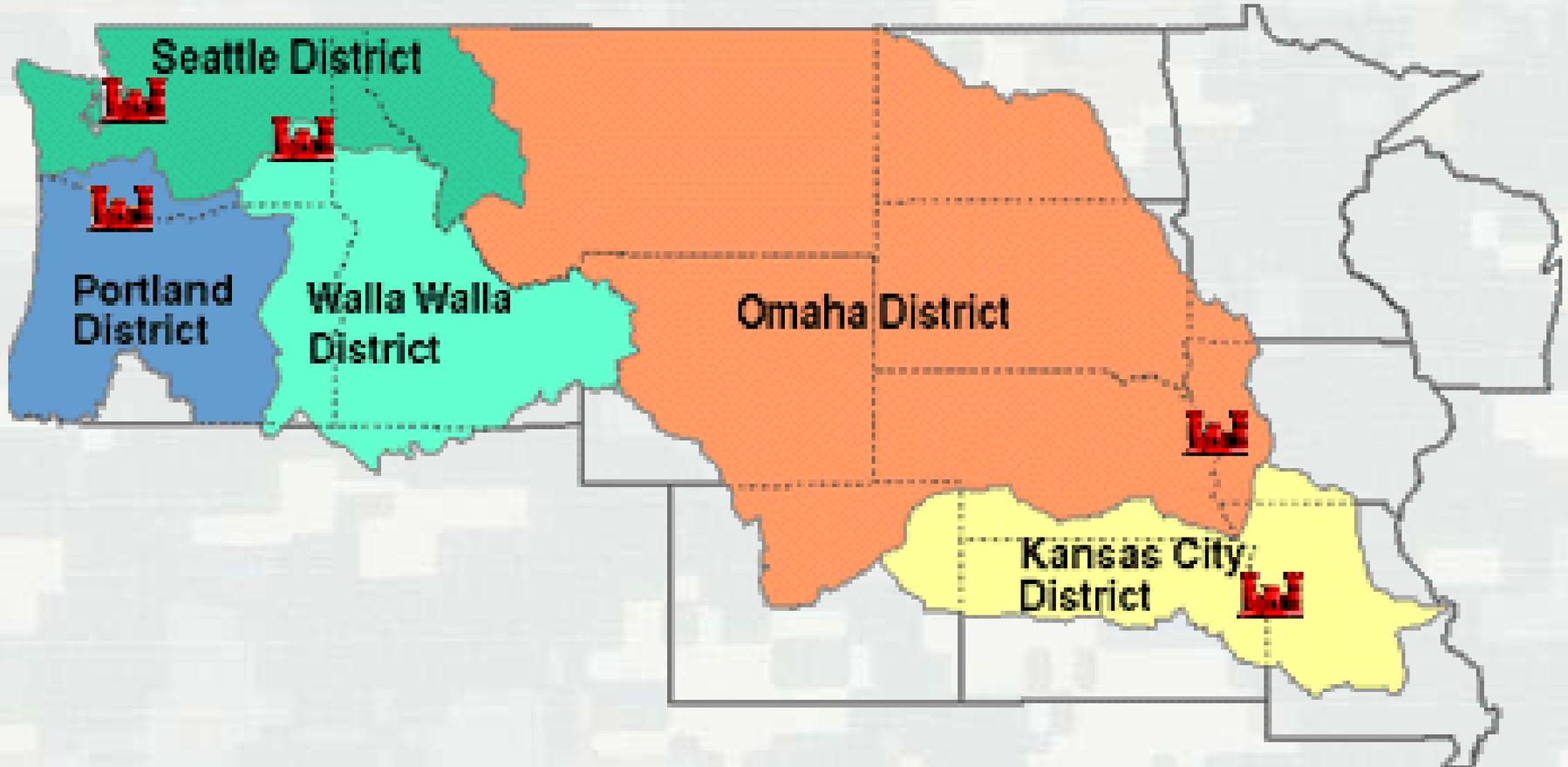
US Army Corps of Engineers
BUILDING STRONG®



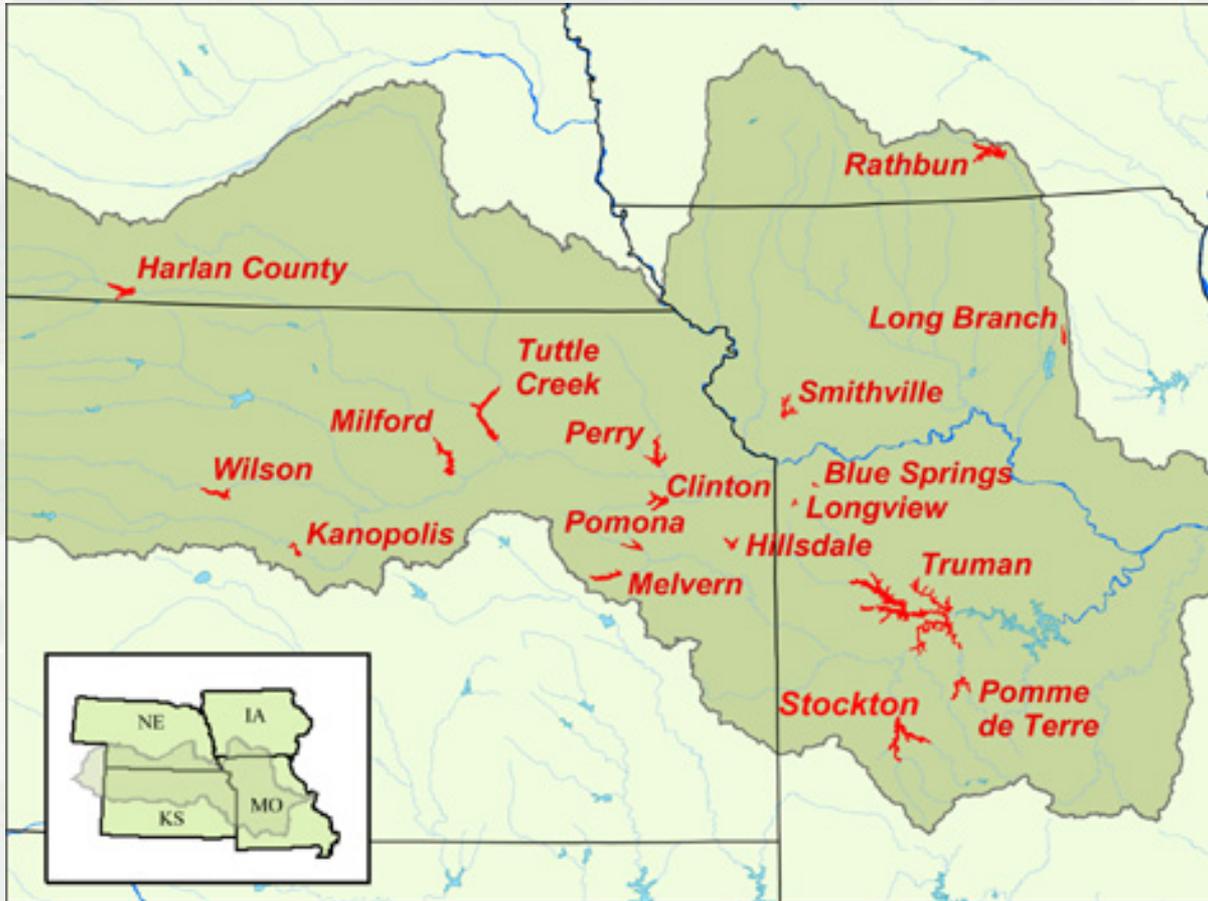
USACE Divisions



Northwestern Division



Kansas City District



- Total of 18 USACE lakes
- Total of 11 Bureau of Reclamation lakes



Osage River Basin

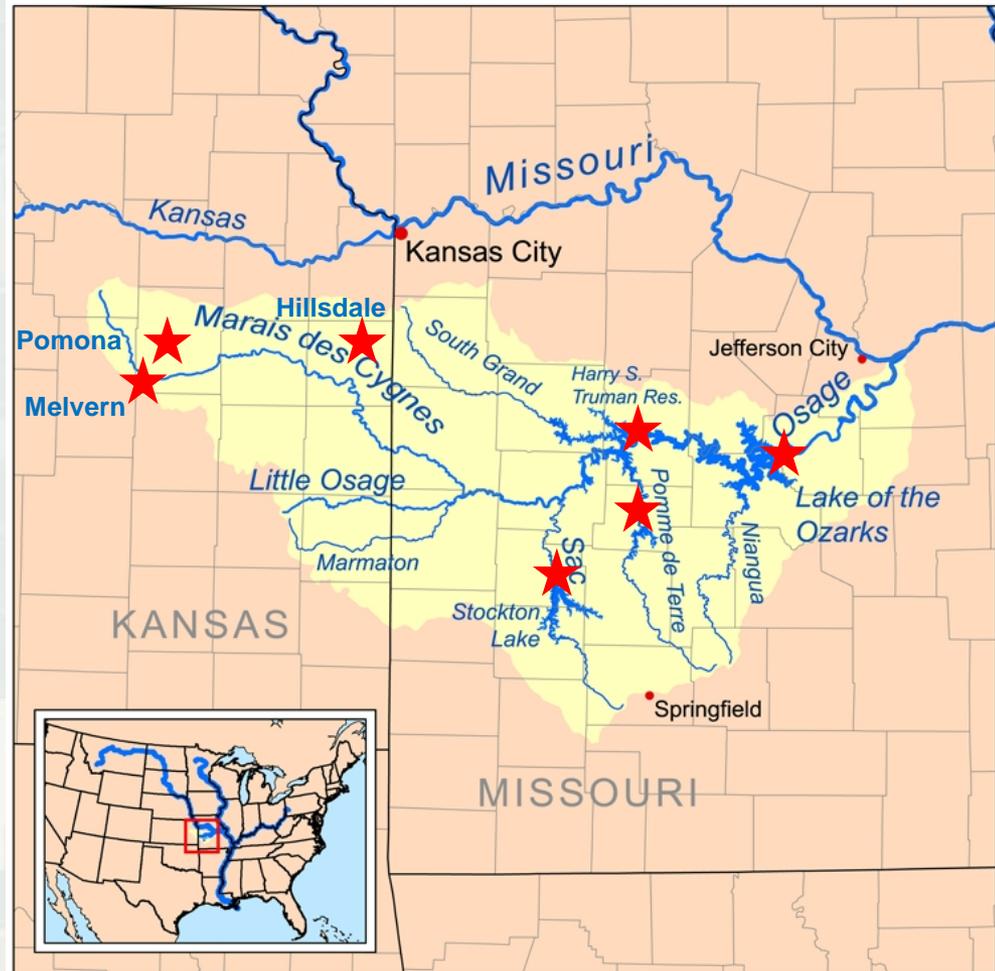
Covers roughly 15,000 square miles over two states

Lakes in Kansas:

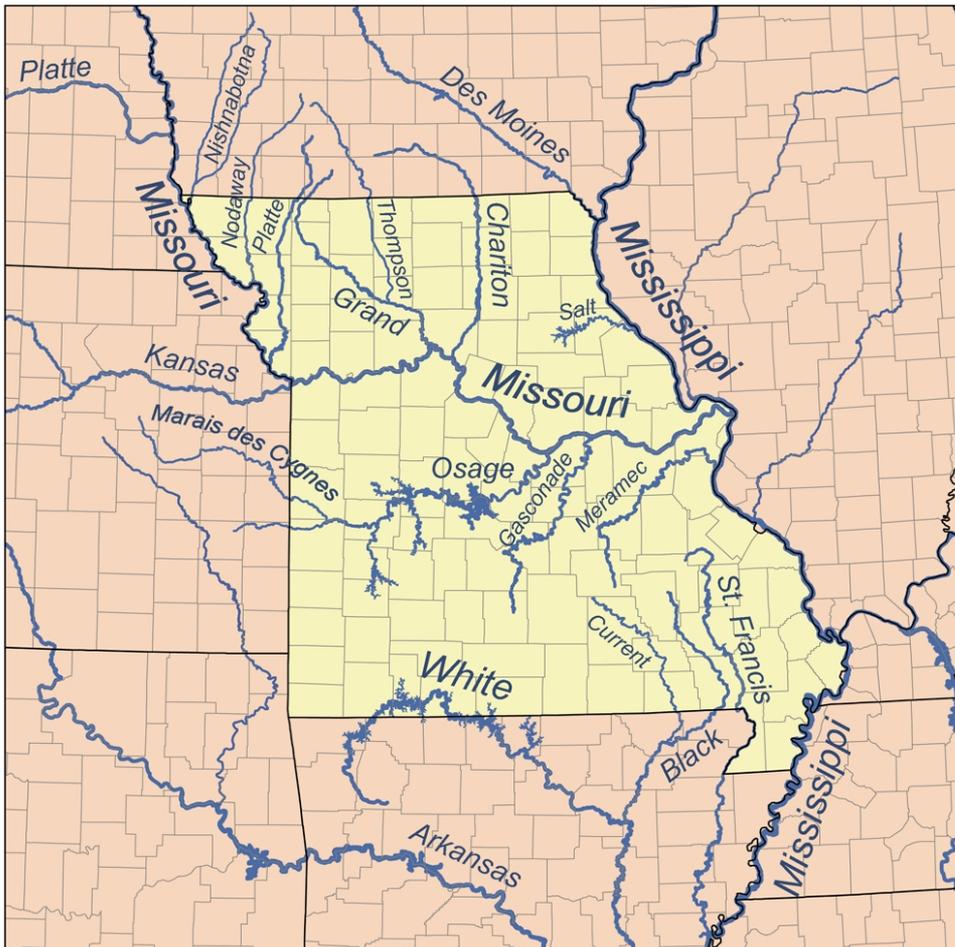
- Melvern
- Pomona
- Hillsdale

Lakes in Missouri:

- Stockton
- Pomme De Terre
- Harry S. Truman
- Lake of the Ozarks, Bagnell Dam (Ameren)



Water Management



- Job is to regulate KCD lake releases
- Releases contribute to Missouri River, Mississippi River
- Operation requires extensive analysis, communication



Operating Purposes

Osage River Basin Lakes

- Flood Control
- Hydroelectric Power Production
- Water Supply
- Water Quality
- Recreation
- Fish and Wildlife



Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- Control Points
- System Balance
 - ▶ Upstream
 - ▶ Downstream



Flood Control Operations

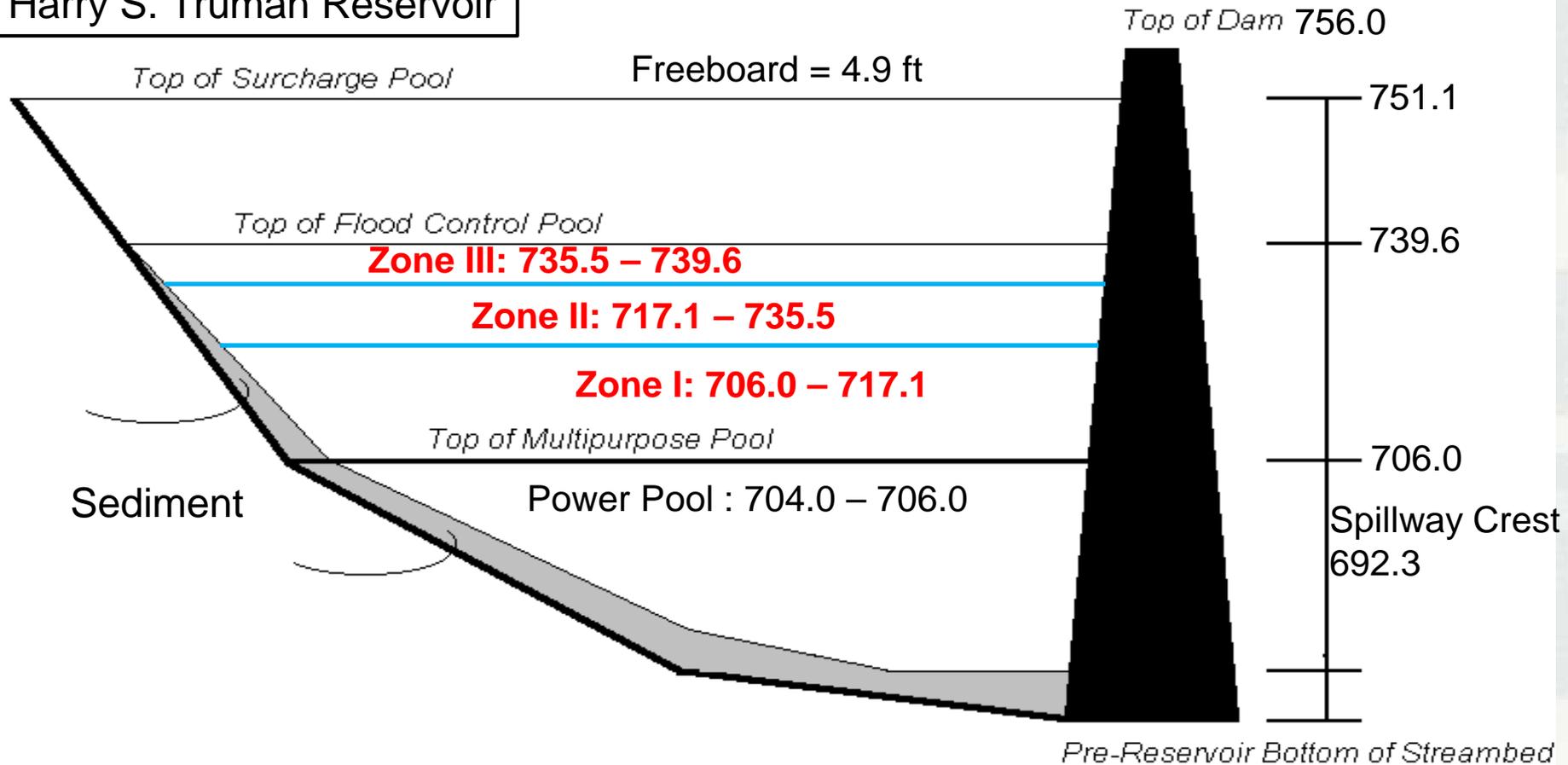
Lake Regulation Manual

- **Flood Control Zones: Storage**
- Control Points
- System Balance
 - ▶ Upstream
 - ▶ Downstream



Flood Control Zones

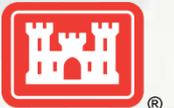
Harry S. Truman Reservoir



Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- **Control Points: Specific downstream locations with measured flow**
- System Balance
 - ▶ Upstream
 - ▶ Downstream



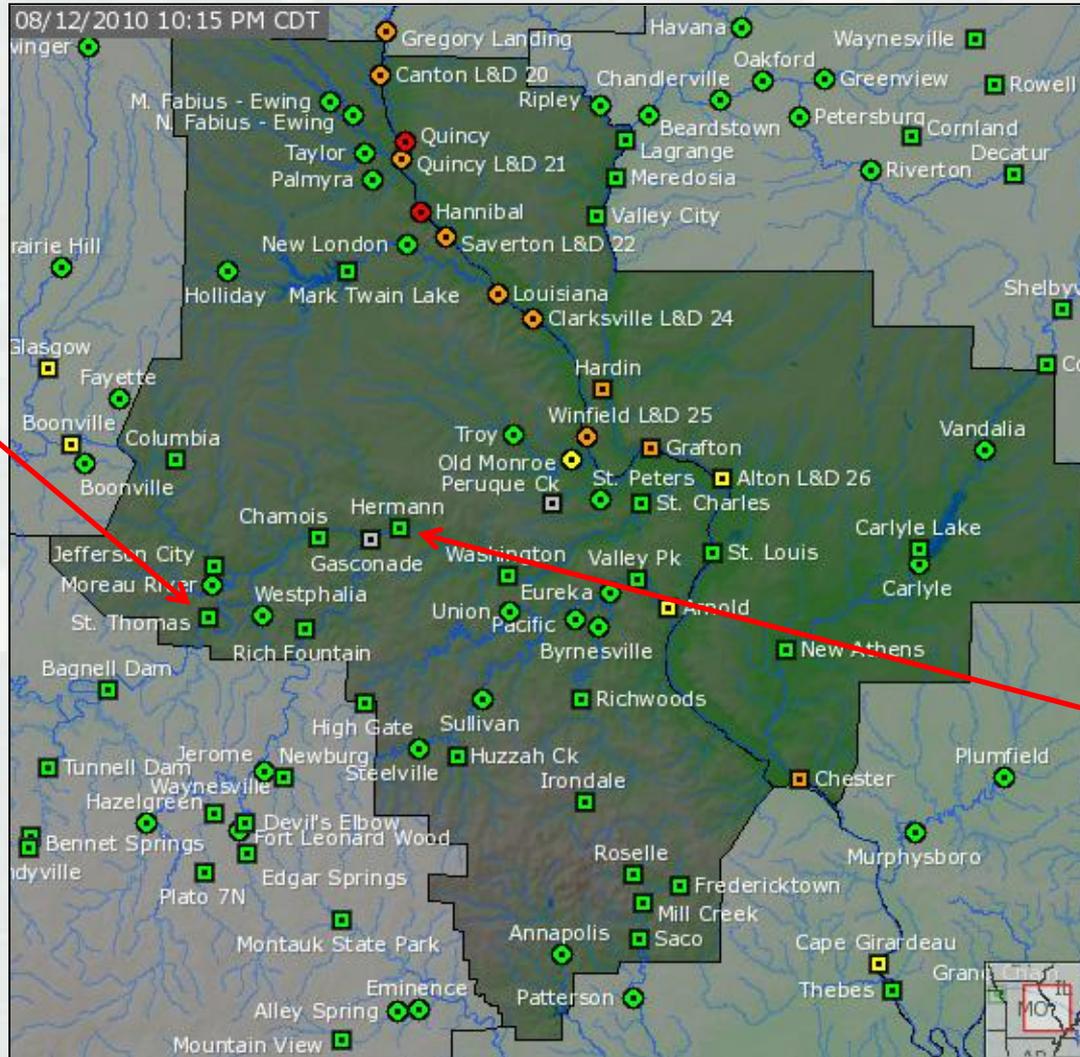
Control Points

- Osage River Basin
 - ▶ Ottawa
 - ▶ State Line/Trading Post
 - ▶ Hermitage
 - ▶ Caplinger Mills
 - ▶ St. Thomas
 - ▶ Hermann



Truman Control Points

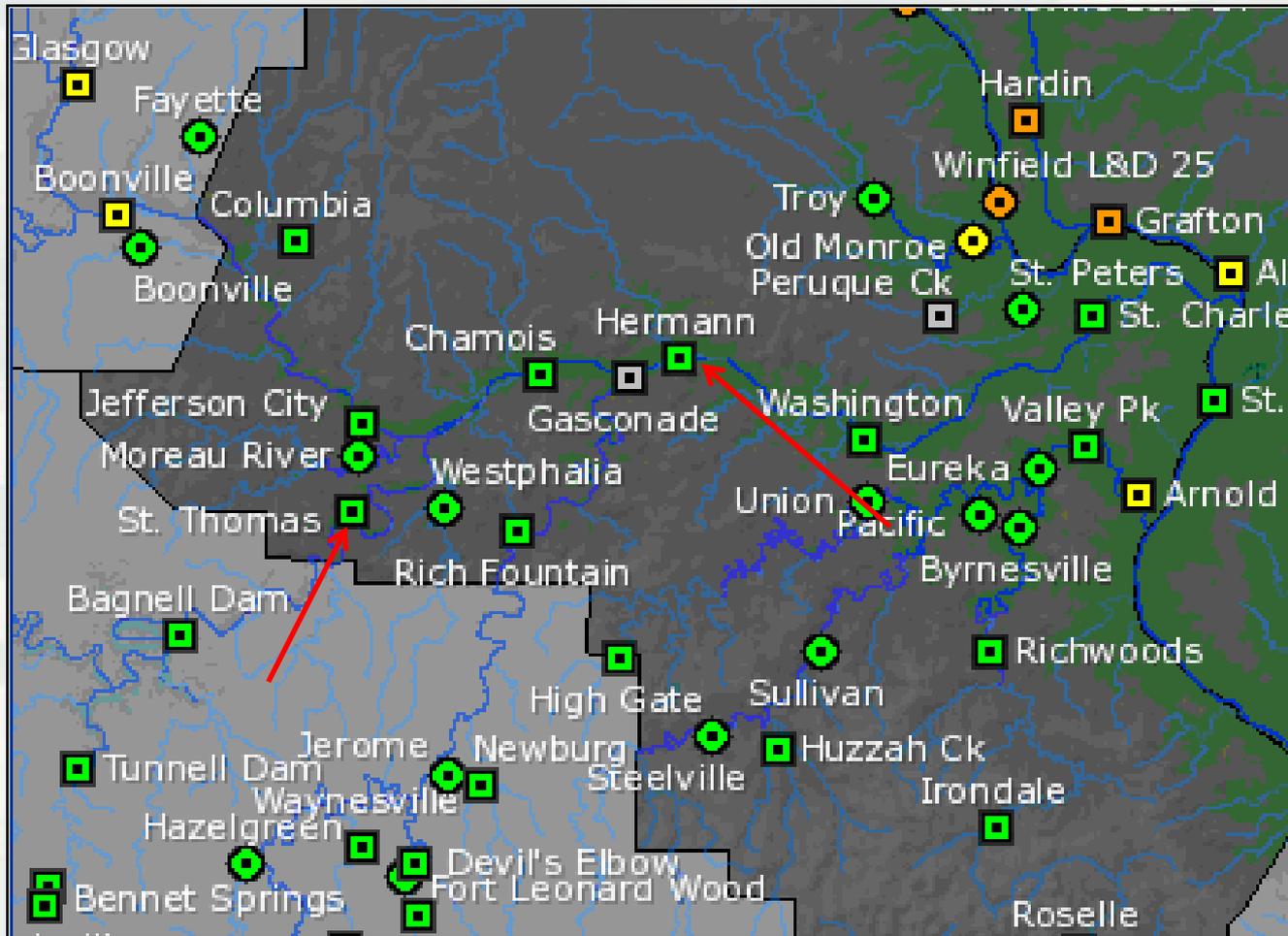
St. Thomas
on the
Osage River



Hermann
on the
Missouri
River



Truman Control Points



Maximum flows

St. Thomas:

Zone I: 34,000 cfs

Zone II: 54,000 cfs

Zone III: 80,000 cfs

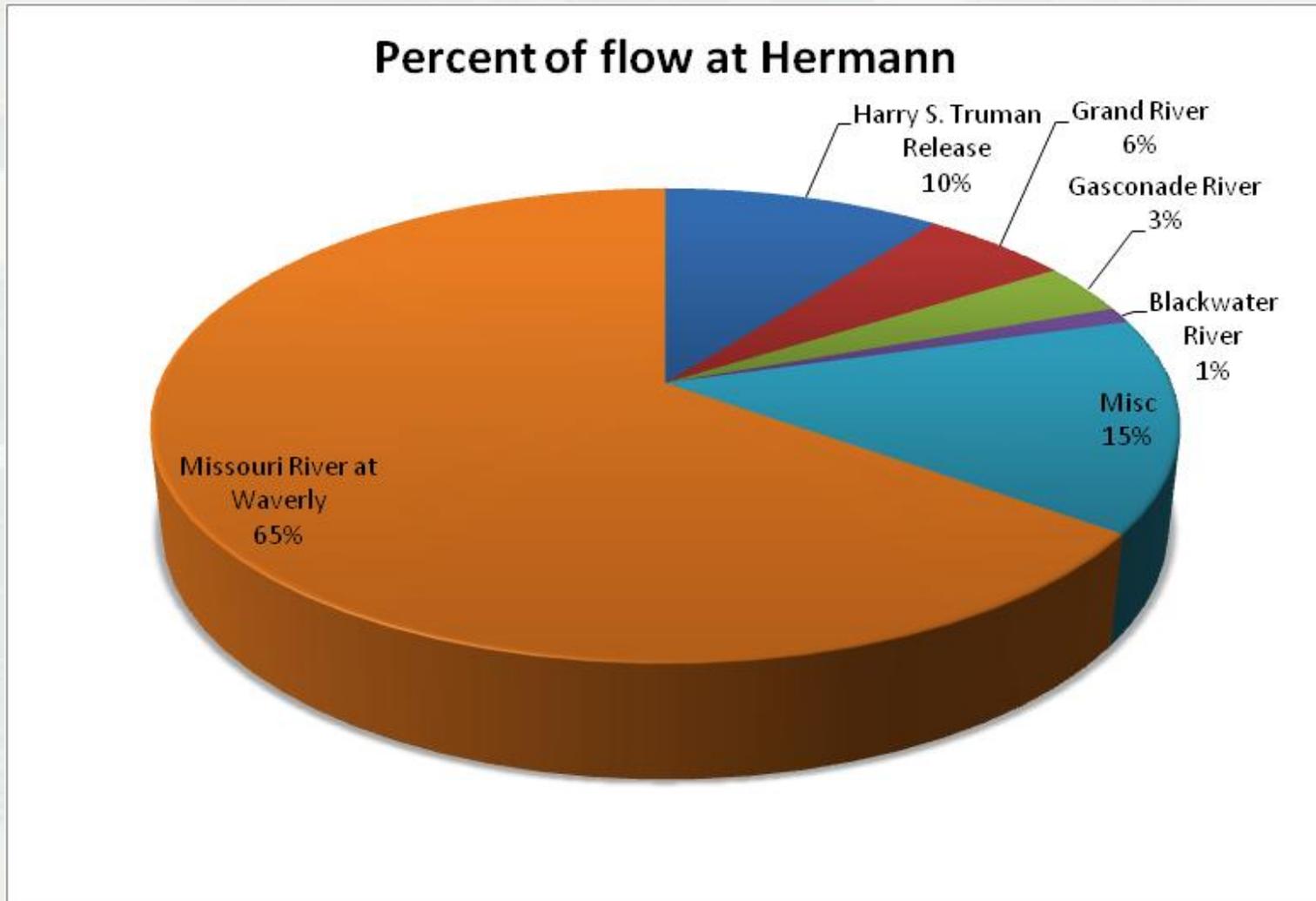
Hermann:

Rising: 260,000 cfs

Falling: 90% of crest



Flows Contributing to Hermann



Flood Control Operations

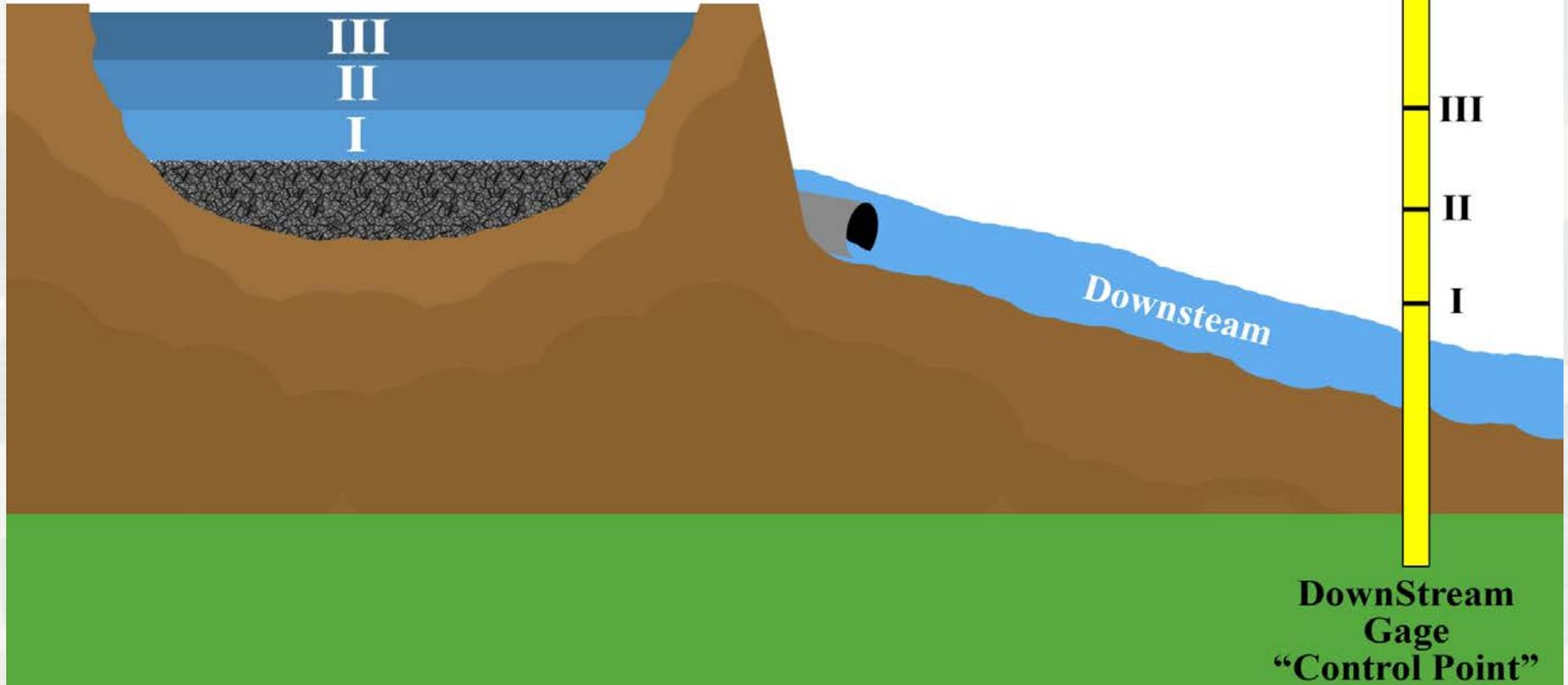
Lake Regulation Manual

- **Flood Control Zones**
- **Control Points**
- System Balance
 - ▶ Upstream
 - ▶ Downstream



FC Zones & Control Points

Flood Control Zones



Not to scale

Flood Control Operations

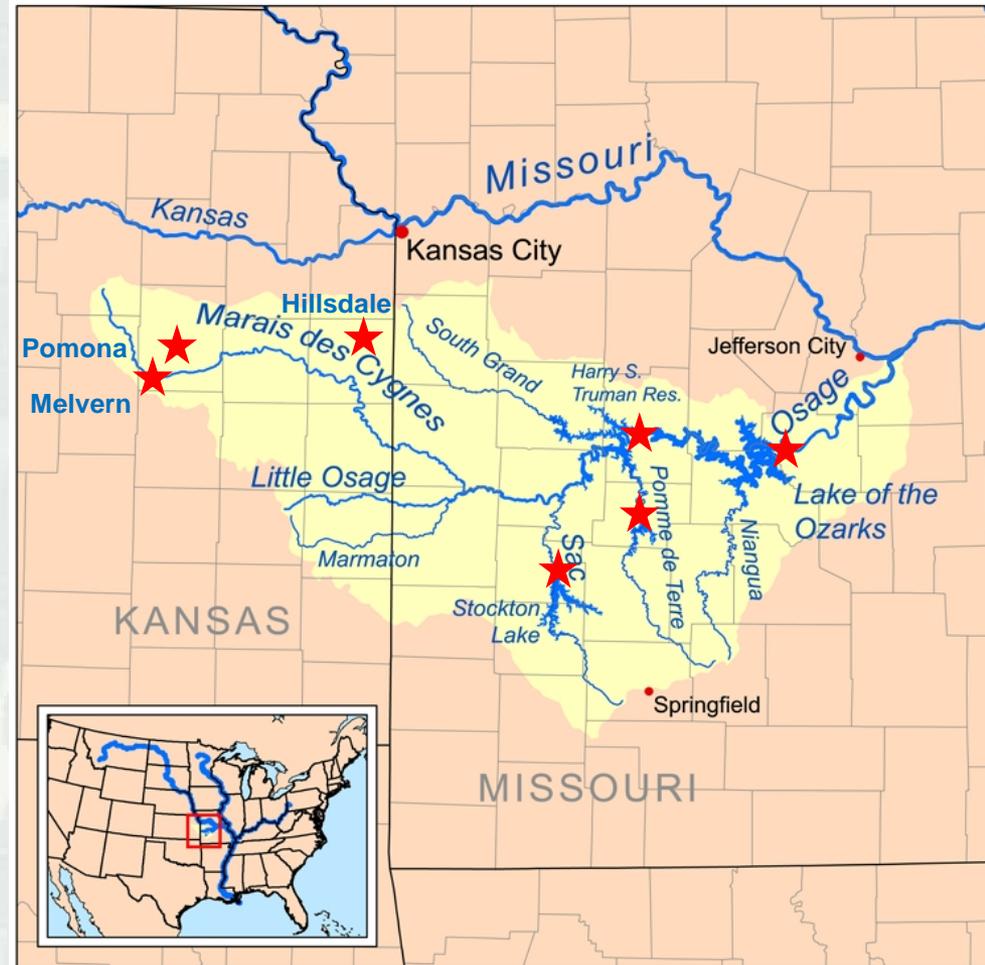
Lake Regulation Manual

- Flood Control Zones
- Control Points
- **System Balance**
 - ▶ **Upstream**
 - ▶ **Downstream**



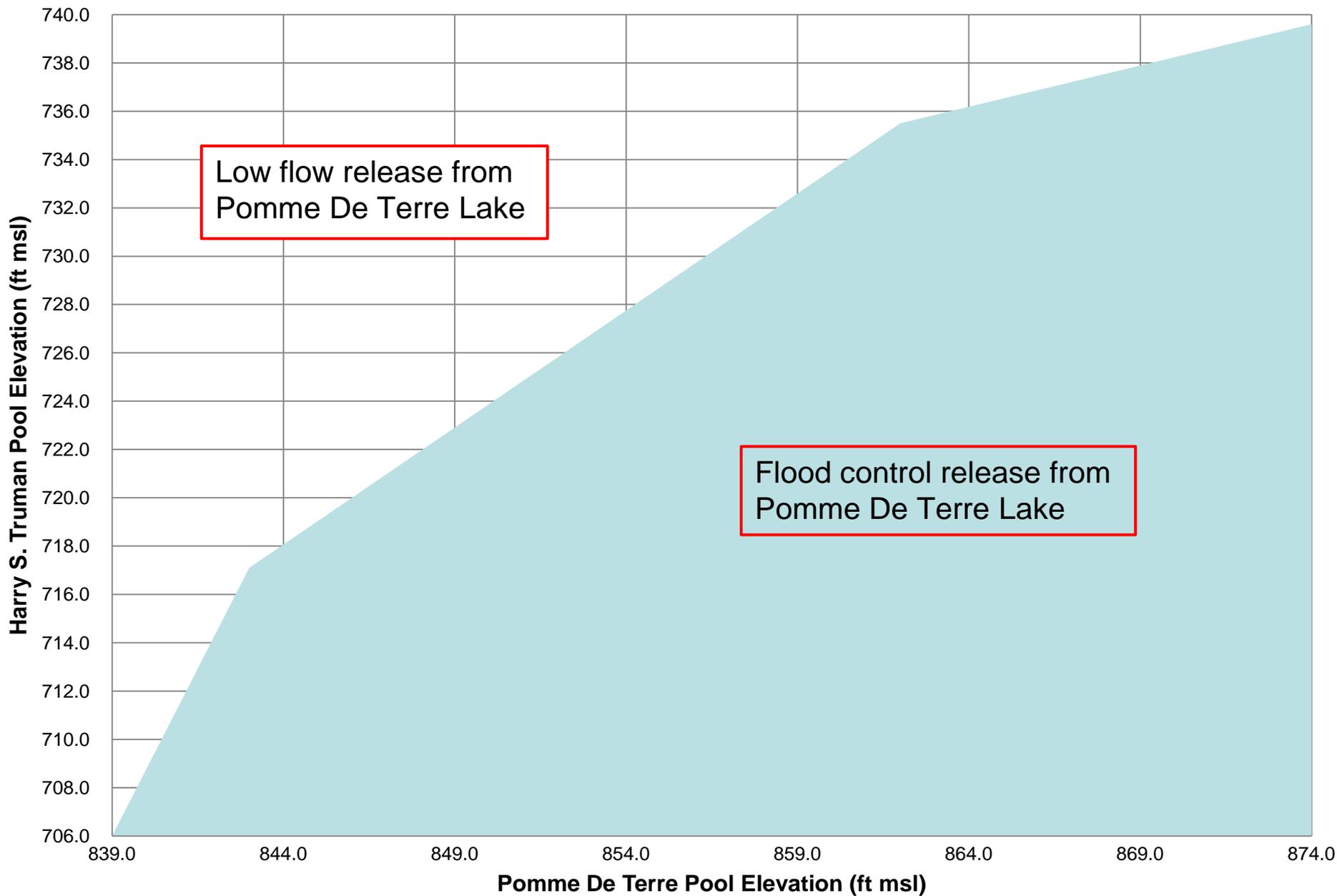
Tandem Balance

- Release from one reservoir becomes inflow to another
- Limits u/s* releases to keep flood control storage proportionate
- Five u/s* reservoirs operate in tandem with Truman



*u/s = upstream

Pomme De Terre & Harry S. Truman Tandem Balance



Tandem Balance

- Five lakes operate in tandem with Truman
- Travel Time
- Rain
- Local Inflow
- Uncontrolled Inflow



Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- Control Points
- **System Balance**
 - ▶ **Upstream**
 - ▶ **Downstream**



Ameren

- Lake of the Ozarks, Bagnell Dam
- Hydroelectric Dam
- Daily communication
- Memorandum of Agreement (MOA)



Memorandum of Agreement

- Agreement between USACE and Ameren
 - ▶ Ameren may request low flow from Truman
 - ▶ USACE requests curtailment of Ameren's release due to downstream flooding
 - ▶ Ameren may pass local, uncontrolled inflows during flood events



Communication

- US Geological Survey
- National Weather Service
- Southwestern Power Administration
- Stakeholders



Communication

- **US Geological Survey**
- **National Weather Service**
- Southwestern Power Administration
- Stakeholders



Data Collection

- US Geological Survey
 - ▶ River and lake gages
- National Weather Service to USACE
 - ▶ Lake inflow forecast
 - ▶ River flow forecast
 - ▶ Precipitation records
 - ▶ Forecasted precipitation
- USACE to National Weather Service
 - ▶ Lake release changes
 - ▶ Lake forecasts

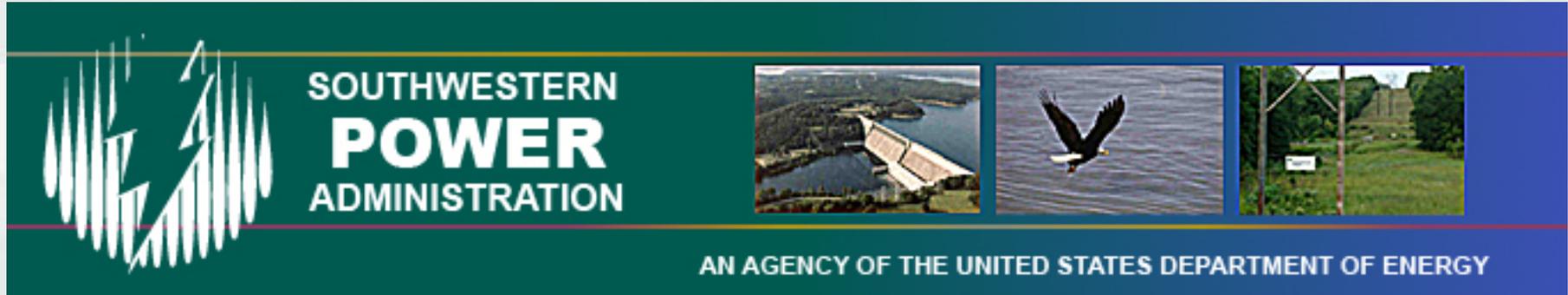


Communication

- US Geological Survey
- National Weather Service
- **Southwestern Power Administration**
- Stakeholders



Southwestern Power Administration



- Schedule power generation for parts of Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas from 24 USACE multipurpose dams
- Coordinate Stockton and Truman operations
- Memorandum of Understanding (MOU)



Memorandum of Understanding

- Understanding between USACE and SWPA
 - ▶ Information exchange
 - USACE: water available
 - SWPA: power needs
 - ▶ Current lake elevation
 - ▶ Daily lake inflow
 - ▶ Downstream flooding: USACE will shut down



Communication

- US Geological Survey
- National Weather Service
- Southwestern Power Administration
- **Stakeholders**

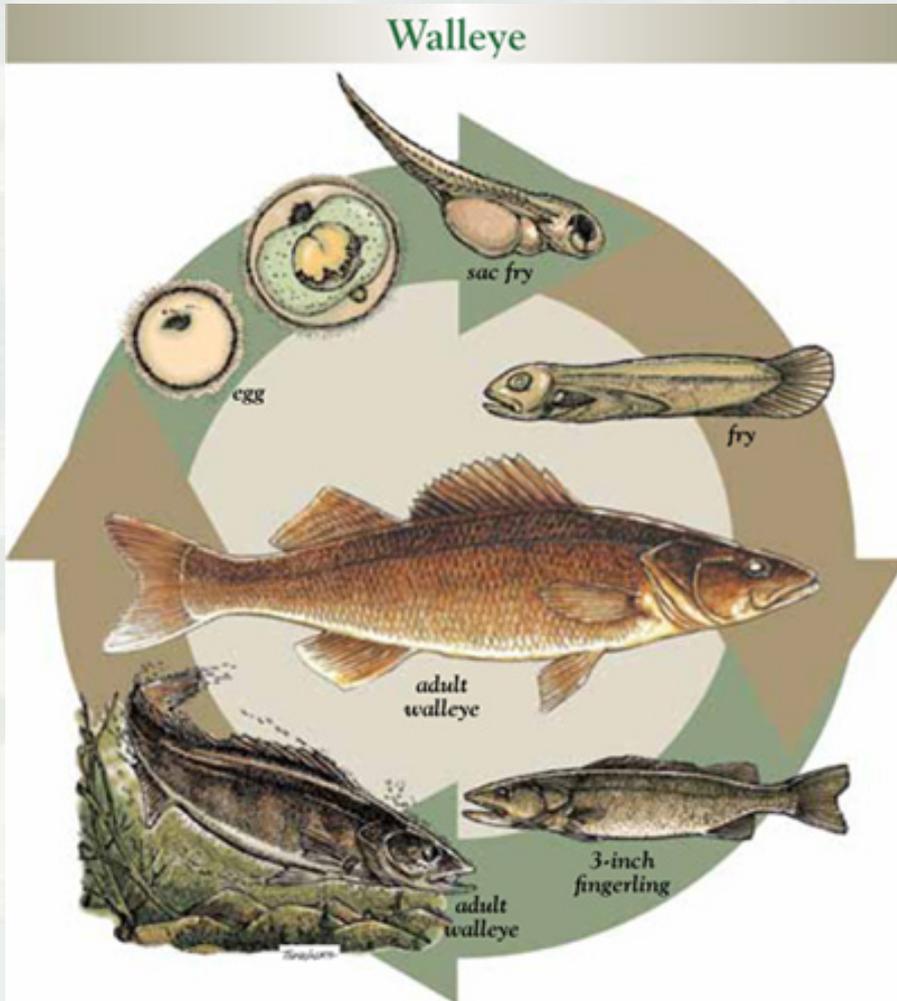


Harry S. Truman Consensus Operating Plan

- Agreement among State of Missouri, Southwestern Power Administration, USACE
- Rules for power generation
- No impact on total volume of release
- Boating, recreation safety
- Fish spawn



Downstream Fish Spawn



- State of Missouri initiates coordination
- Usually begins in March, runs for 45 days
- Minimum flow:
 - ▶ If pool is 706.0+: Run 1 unit continuously at half load
 - ▶ If pool is below 706.0: Spill inflows
- In warm weather small spills to maintain D/S dissolved oxygen levels



Water Management Daily Reports

Water Management's Home Page

Water Management

Water Management Daily Reports

- Key Gages (Radio Room Report) (RAW Data)
- MRR Daily River Bulletin
- NWK Daily Reservoir Data (RAW Data)
- 8-Day River Report (RAW Data)
- 8-Day Reservoir Report (RAW Data)
- 3-Day Reservoir Forecast (RAW Data)

FAQ

- Find Missouri River Basin and Reservoir Conditions
- Missouri River Flow Frequency Information

Links to WM daily reports

3-Day Reservoir Forecast Report

KANSAS CITY DISTRICT LAKE FORECAST (EC-HC)
02-22-2013

	MPP	DAY 1		DAY 2		DAY 3	
		Elev	Outfl	Elev	Outfl	Elev	Outfl
			14000		14000		14000
Gavins Pt.							
Kanopolis	1463.0	1457.16	10	1457.17	10	1457.17	10
Wilson	1516.0	1512.38	5	1512.40	5	1512.41	5
Harlan Co	1945.7	1935.49	0	1935.52	0	1935.53	0
Milford	1144.4	1137.77	100	1137.78	100	1137.79	100
Tuttle Creek	1075.0	1062.96	300	1062.98	300	1062.99	300
Perry	891.5	885.80	25	885.83	25	885.84	25
Clinton	875.5	871.80	7	871.84	7	871.85	7
Smithville	864.2	861.75	8	861.78	8	861.79	8
Longview	891.0	888.97	8	889.01	8	889.03	8
Blue Springs	802.0	802.45	20	802.45	20	802.42	18
Melvorn	1036.0	1031.82	20	1031.76	20	1031.66	20
Pomona	974.0	969.98	15	969.99	15	969.98	15
Hillsdale	917.0	913.62	3	913.66	3	913.68	3
Stockton	867.0	860.10	40	860.17	40	860.19	40
Pomme D Terr	839.0	840.78	50	840.84	50	840.86	50
Harry Truman	706.0	707.44	2500	707.50	1000	707.52	1000
Rathbun	904.0	903.11	17	903.12	17	903.12	17
Long Branch	791.0	790.04	7	790.03	7	790.00	7

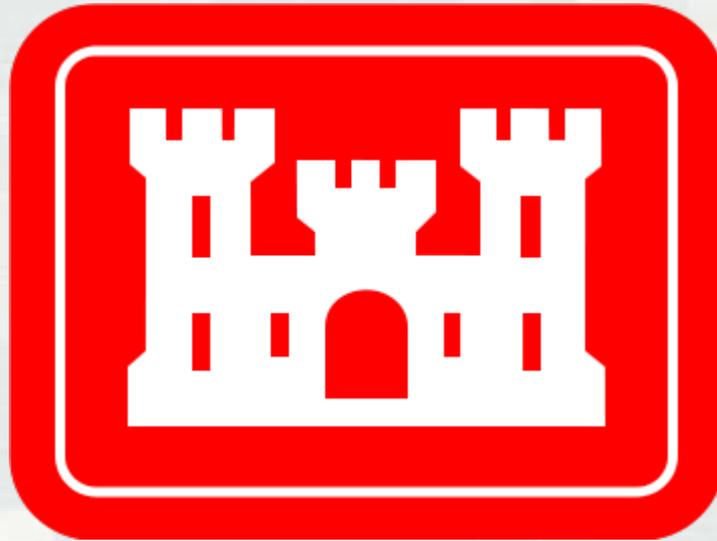
The Lake of the Ozarks is owned and operated by Ameren UE of Saint Louis.
For lake forecast information contact Ameren UE at (573) 365-9205.

Osage River Basin

- Operating requires
 - ▶ Data collection
 - ▶ Analysis
 - ▶ Tandem balance
 - ▶ Control points
 - ▶ Communication
- Result: Balance of all operating purposes at each of the Osage River Basin reservoirs



Thank you for your interest



in the operation of the
Osage River Basin.



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