

**R.L. Harris Project
Relicensing
Harris Action Team (HAT) Meetings
FERC No. 2628**

September 20, 2018



Agenda



- **9:00 – 10:30 AM HAT 1 (Project Operations)**
- **10:45 – 12:00 PM HAT 5 (Recreation) and HAT 4 (Project Lands)**
- 12:00 PM Lunch (Provided by Alabama Power)**
- **1:00 – 2:30 PM HAT 3 (Fish and Wildlife)**
- **2:45 – 3:45 PM HAT 2 (Water Quality and Use)**





HAT 1

Project Operations

- **Operating Curve Change Feasibility Analysis Study Plan**

Safety Moment



In case of an emergency.....

- Designee will contact 911
- Exit locations
- Designated meeting area
- Location of AED



Role of Harris Action Teams



- Provides opportunity to participate in resource-specific teams
 - Get involved with issues important to you
 - Meet other stakeholders & understand their interests in the resources at Harris
- Provide technical expertise
- Review and comment on study plans, study reports
- You may be involved in more than 1 HAT



Harris Relicensing

Project Operations – HAT 1

Overview of Study Models

September 20, 2018

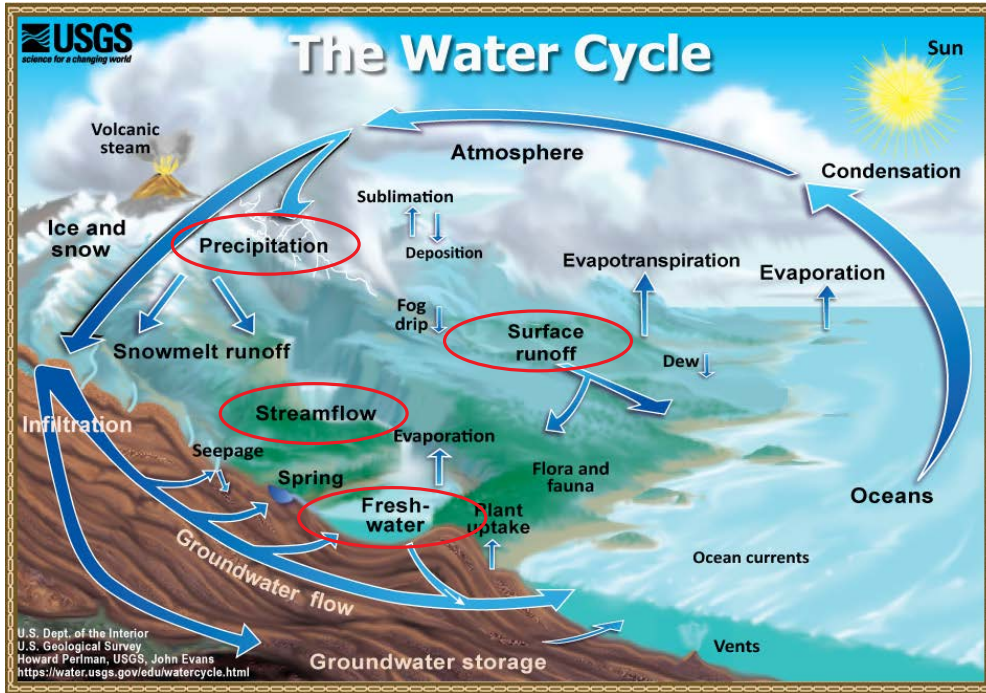


A few things to remember during this presentation...



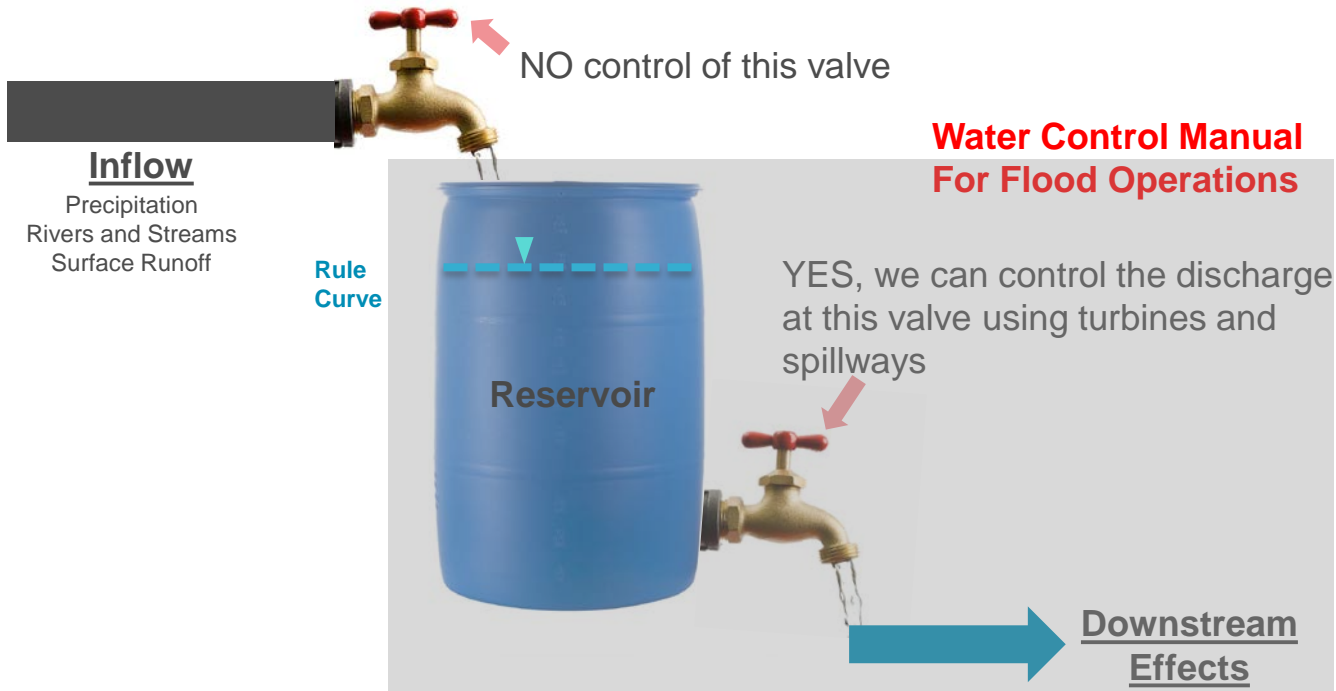
- **Bolded RED** letters highlight an acronym that stands for a U.S. Army Corps of Engineers' modeling software package such as **RAS** (**R**iver **A**nalysis **S**ystem) developed in their **H**ydrologic **E**ngineering **C**enter (**HEC**) in Davis, California. For example... this particular software package here would be called **HEC-RAS**
- This will be a broad overview of the software that we will be using to study the different options that affect project operations. For example... How does an increase in the winter pool affect project operations?
- Think of this overview like an auto mechanic showing you the tools they use to perform work
- We **WILL NOT** be discussing results. Why? Simply because, at this point, we don't have results. Up to this point it's been all about information gathering.
- **DISCLAIMER:** The list you see today may not be all-inclusive. We may find that other tools are needed as we go through this process and those will be announced at that time. Understand that any proposed changes must be approved by appropriate federal agencies.

Let's start at the beginning...

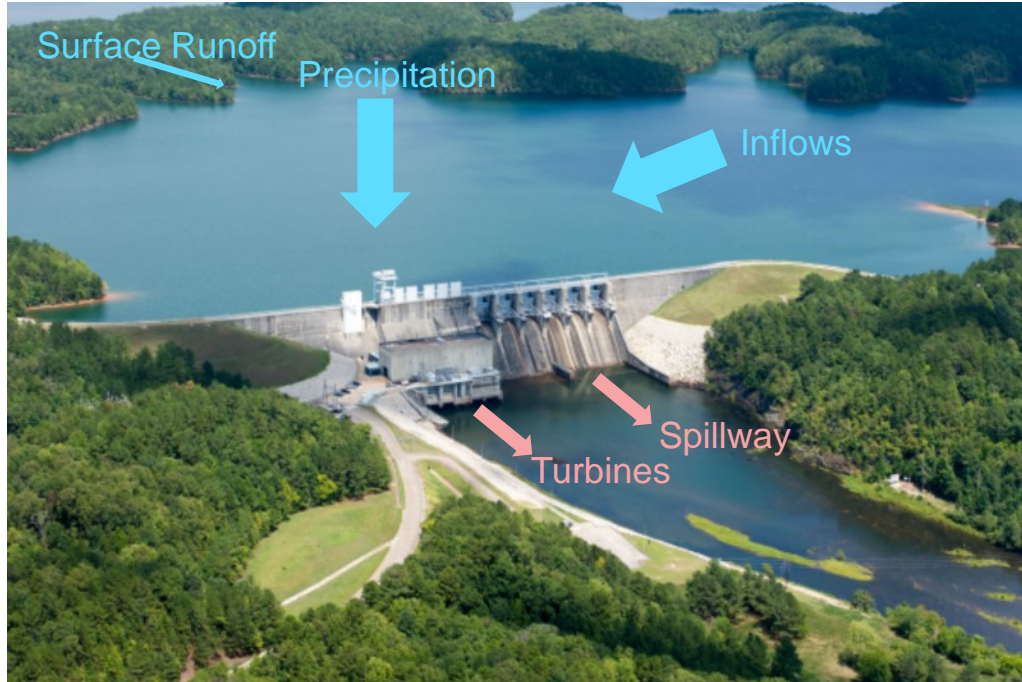




Harris Reservoir Analogy



Let's focus our attention on Harris



Determining Inflows

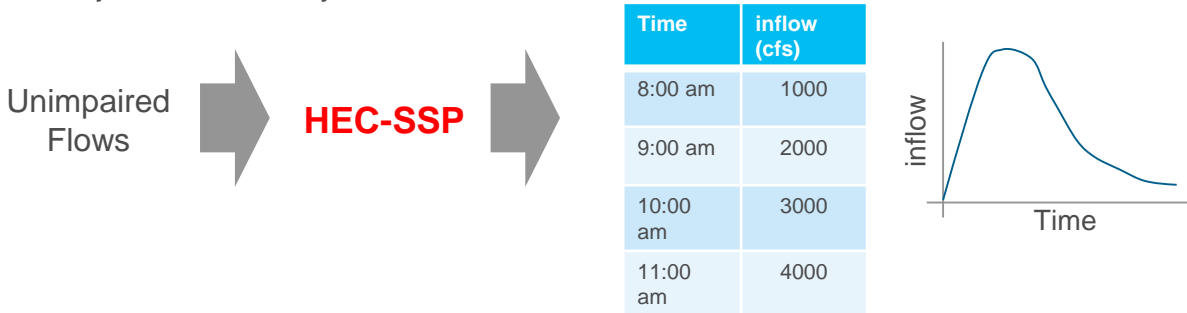


Modeling Inflows



- **HEC-SSP** – **S**tatistical **S**oftware **P**ackage

- Software used for reading in time-series data and calculating flows for a specified flood event
- **EXAMPLE:** Calculate the 100-year flood (a flood with a 1% chance of occurring in any given year based on a historical record)
- **DATA USED:** *Unimpaired* flows database for Alabama-Coosa-Tallapoosa developed by the USACE
- **RESULTS** used to develop the inflow *hydrograph* to the reservoir
- Not just for the 100-year flood event, but a number of floods



Determining Outflows

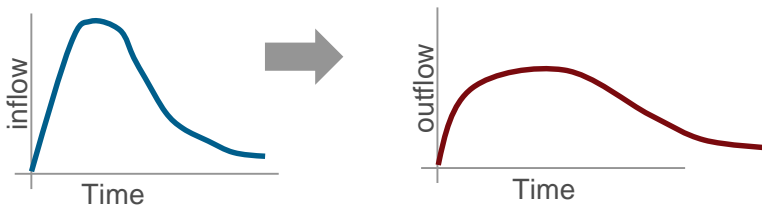


Modeling Discharges from Harris to the Tallapoosa River



- **HEC-ResSim – Reservoir System Simulation**

- Model used to route the inflow hydrograph (inflows) through the reservoir to the point of discharge below the dam
- Handles the operations of the dam including:
 - Staying on rule curve
 - Turbines
 - Spillways
 - Water Control Manual (for flood control operations)
- Compare existing operations to proposed operational changes



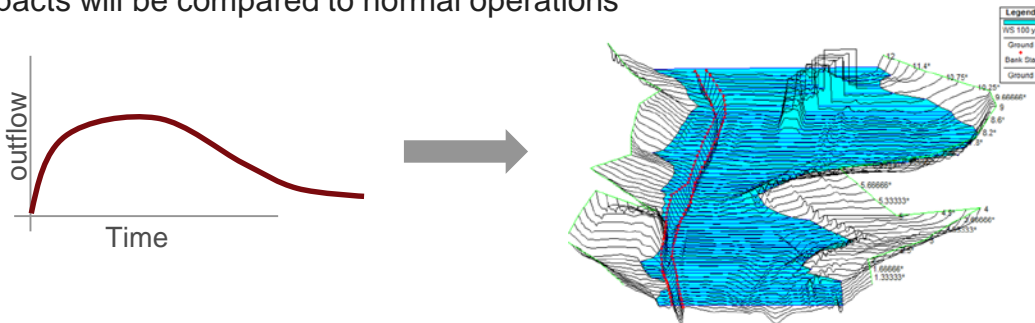
Tallapoosa Conditions from Harris Releases



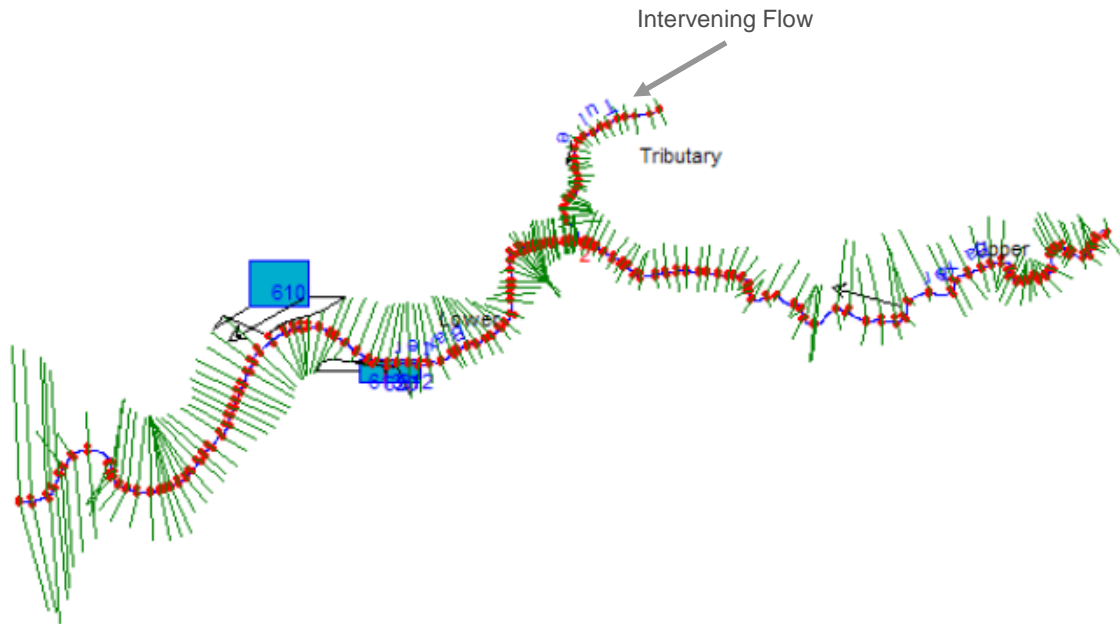


- **HEC-RAS - River Analysis System**

- This model is used to determine the downstream effects in the Tallapoosa River channel and floodplain resulting from flows released at the dam.
- This model can handle changes in flow like you would see if turbines were turned on/off or spillway gates being opened/closed. (Often referred to as unsteady flow.)
- Cross-section data at points along the Tallapoosa River, all the way to Martin, have been gathered using a combination of land surveying, LiDAR, and aerial surveys.
- Takes into account intervening flows, not just what is released from Harris
- Flood impacts will be compared to normal operations



Cross-sections on a river section



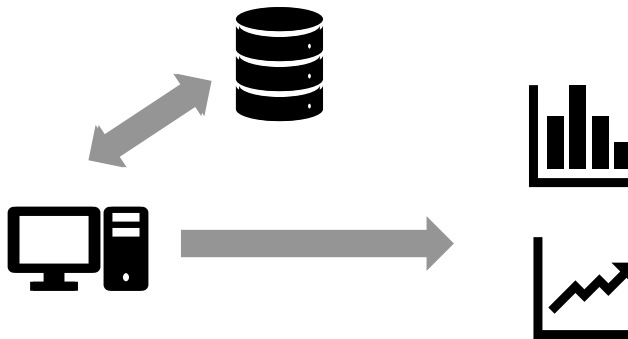
Storing all the data...



Storing dataset used in models



- **HEC-DSS** and **HEC-DSSVue** – **D**ata **S**torage **S**ystem and **V**iewer
 - **DSS** - A data storage system that stores input and output data for the models
 - **DSSVue** – A viewer for graphing datasets stored in DSS
 - Also used to transfer data between modeling packages



Other data sources

- U.S. Geological Survey
- National Weather Service
- U.S. Army Corps of Engineers
- Alabama Power Company



Modeling Summary Notes



Flood Studies

- Models will be used for a number of storm events, not just the 100-year flood
- Today's operation scheme is the BASE CASE
- Flood impacts from proposed will be compared to BASE CASE operations

These models may be used for other studies in the relicensing process, including, but not limited to:

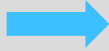
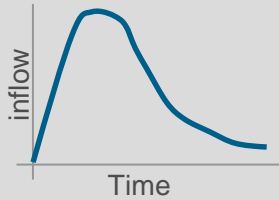
- Flooding (not only for the 100-year flood event)
- Alabama-ACT Drought Response Operations Plan (ADROP)
- Navigation
- The Green Plan

ANY CHANGES and/or RISKS will be taken **very seriously** in the evaluation by FERC

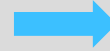
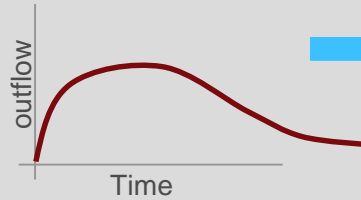
Summary of the Process



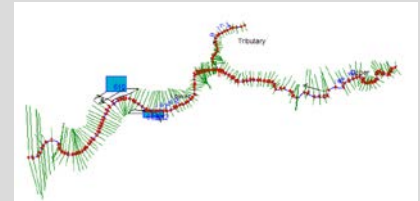
HEC-SSP



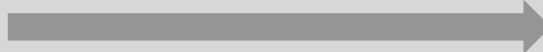
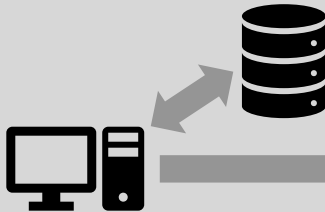
HEC-ResSim



HEC-RAS



HEC-DSS and DSSVue



APC Hydro Energy Model



- Proprietary model created by APC
- Based on over 60 years of operational data collected by APC
- Provides economic gains and/or losses associated with power generation based on proposed operational changes
- Compares existing with proposed
- Consideration of power generation and economics are a FERC requirement of the relicensing process so this step must be performed for **ANY** proposed operational change

Operating Curve Change Effects on Other Resources



Resource	Method	
	Lake Harris	Harris Dam to Horseshoe Bend
Water Quality	<ul style="list-style-type: none"> • Phase 1 results • Existing information • CE-QUAL-W2 and HEC-ResSim 	<ul style="list-style-type: none"> • Existing information • CE-QUAL-W2 to qualitatively evaluate potential effects on dissolved oxygen in the tailrace
Water Use	<ul style="list-style-type: none"> • Phase 1 results • Existing information - Water Quantity, Water Use, and Discharges Report 	<ul style="list-style-type: none"> • Phase 1 results • Existing information - Water Quantity, Water Use, and Discharges Report
Erosion and Sedimentation (including invasive species)	<ul style="list-style-type: none"> • Phase 1 results • FERC-approved Erosion and Sedimentation Study • LIDAR, aerial imagery, historic photos • Quantitative and qualitative evaluation of areas most susceptible to increase in nuisance aquatic vegetation 	<ul style="list-style-type: none"> • Phase 1 results • FERC-approved Erosion and Sedimentation Study • LIDAR, aerial imagery, historic photos



Operating Curve Change Effects on Other Resources



Resource	Method	
	Lake Harris	Harris Dam to Horseshoe Bend
Aquatics	<ul style="list-style-type: none"> Phase 1 results Existing information on the Harris Reservoir fishery 	<ul style="list-style-type: none"> Phase 1 results CE-QUAL-W2 HEC-RAS Other FERC approved studies as appropriate
Wildlife and Terrestrial Resources-including T&E Species; and Terrestrial Wetlands	<ul style="list-style-type: none"> Phase 1 results FERC-approved Threatened and Endangered Species Study GIS 	<ul style="list-style-type: none"> Phase 1 results FERC-approved Threatened and Endangered Species Study existing wetlands data GIS
Recreation Resources	<ul style="list-style-type: none"> Phase 1 results FERC-approved Recreation Evaluation Study LIDAR data 	<ul style="list-style-type: none"> Phase 1 results FERC-approved Recreation Evaluation Study LIDAR data
Cultural Resources	<ul style="list-style-type: none"> Phase 1 results LIDAR, aerial imagery, and expert opinions 	<ul style="list-style-type: none"> Phase 1 results LIDAR, aerial imagery, and expert opinions



Operating Curve Change Feasibility Analysis



TASK	2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1 Modeling Analysis		■	■	■								
Initial Study Report						■						
Phase 2 Effects Analysis based on Phase 1 modeling						■	■	■	■			
Develop PM&E measures					■	■	■	■	■	■		
Updated Study Report											■	

Next Steps

October 1, 2018: Stakeholders file written comments on PAD, SD1 and any study requests (or comments on studies) with FERC

October 5-20: Alabama Power reviews comments on study plans and edits as appropriate

October 20-30: Potential HAT meetings (via conference call) to resolve comments

November 13, 2018: Alabama Power files study plans

December 13, 2018: Study Plan Meeting

