



Regional Resource Stewardship Council

April 3-4, 2019

Kentucky Dam Village State Park



Mark Iverson

Term 10 RRSC Members

RaeLynn Butler

Muscogee (Creek) Nation

Keith Carnahan

Meriwether Lewis Electric Cooperative

Robert Englert, Jr

Crouse Corporation

Ray Hardin

Decatur Utilities

Brock Hill

TN Dept. of Environment & Conservation

Richard Holland

Packaging Corporation of America

Donny Holland

KY Parks

Mark Iverson*

Bowling Green Municipal Utilities

Avis Kennedy

State of Tennessee

Kim Klinker

Klinker Management

Brad Kreps

Nature Conservancy

Tom Littlepage

Ala Dept. of Economic & Community Affairs

Gary Myers

State of Tennessee

Will Nelson

Nelson Tractor Co.

Sen. Clay Scofield

Alabama Senate, District 9

Danette Scudder

TN Valley Public Power Association

Patricia Thomasson

Thomasson Company

Catherine Via

TN Farm Bureau Federation

Randy Wiggins

Cherokee County, NC

*RRSC Chair

Safety First



Building Emergency Plan

Introductions



- Name
- Organization
- Favorite Water-based Activity



Today's Meeting

Meeting Goals

- Navigation reliability in the region
- February flood control efforts
- Erosion study
- Invasive species management – Asian Carp
- Advice from Council
- Update on TVA Natural Resources Stewardship and River Management activities

Agenda – April 3, 2019

8:30	Welcome	Mark Iverson, Chair and GM Bowling Green Municipal Utilities
8:40	Introductions and Agenda Review	Liz Upchurch, Facilitator
8:55	FACA Briefing	Kendra Mansur – Office of the General Counsel
9:00	DFO Briefing	Amy Henry, Enterprise Relations and Innovation and Designated Federal Officer
9:20	Break	
9:35	River Management & Feb 2019 Flood Control	James Everett
10:00	Navigation and KY Lock project	Don Getty, Army Corps of Engineers
10:20	Break	
10:35	Invasive Species – Asian Carp	Dennis Baxter
11:05	Fish Fence at Lake Barkley	Don
11:20	Erosion Control Study	Shannon O’Quinn
11:45	Announcements	Liz
12:00	Wrap up and adjourn	

Agenda – April 4, 2019

8:30	Welcome and Recap	Liz, Facilitator
8:45	Announcements	Amy
9:00	Council Discussion	Liz and Council
9:25	Prepare for Public Comment Period	
9:30	Public Comment Session	Liz
10:30	Break	
10:45	Natural Resources Update	Bucky Edmondson
11:15	Finalize Advice Statement	Council
11:45	Wrap Up	Amy/Liz
12:00	Adjourn	

RRSC Meeting Facilitation

- The facilitator will ensure good order during all open discussions
- Only one person is permitted to comment at a time
- Please turn your name card on its side in order to be recognized by the Chair or facilitator when wanting to provide comment.



The Federal Advisory Committee Act
and
The Regional Resource Stewardship Council

Kendra Mansur, Office of the General Counsel
FACA Briefing—10th Term
Third Meeting

RRSC FACA Meeting Protocols – 10th Term

Agenda

- Joe Hoagland, Vice President, Enterprise Relations & Innovation is the Designated Federal Officer (DFO); Amy Henry, Senior Manager, Enterprise Relations & Innovation is the alternate DFO
- Agenda prepared and approved by the DFO in consultation with Council Chair, Mark Iverson
- Agenda distributed to Council and an outline is published in the Federal Register prior to each meeting
- Topics may be submitted to the DFO by any member of the Council, or non-members, including members of the public

Meeting Minutes

- DFO will ensure that minutes are prepared for each meeting, approved by the Chair, and made available to Council members and the public

Voting

- Any member of the Council may make a motion for a vote
- Quorum is 11 members
- Advice requires an affirmative vote of majority of Council members present
- Advice may include minority or dissenting views

Membership

- Balanced Membership
- Professional or personal qualifications to achieve the mission of regional resource stewardship
- Broad range of diverse views and interests, including recreational, environmental, industrial, business, consumer, educational and community leadership



DFO Briefing

Amy Henry, Senior Manager, Enterprise Relations and Innovation
Designated Federal Officer Alternate

TVA Update

Board of Director Announcements

Approved the retirement of Paradise Unit 3 in 2020 and Bull Run in 2022

Jeff Lyash named new President and CEO to replace retiring CEO Bill Johnson

James “Skip” Thompson was elected the new Board Chair to a two-year term

Discontinuing the existing Green Power Providers (GPP) program at the end of 2019 and will develop new programs in partnership with LPCs



Bill Johnson



Jeff Lyash

New Biz in the Valley

- SmileDirectClub, a market leader in doctor-directed, remote invisible aligner therapy, announced plans to expand operations in Nashville, Tennessee. Plans for the project include the creation of more than 2,000 new jobs and \$217 million in investment to expand the company's Middle Tennessee presence.
- Toyota Motor Manufacturing announced plans to expand its Huntsville, Alabama, engine plant. Plans for the OEM expansion project include the addition of 450 new jobs and \$288 million in capital investment.
- Expansion of Volkswagen in Chattanooga
- New Amazon facilities in Nashville and Marshall County, Miss.

IRP 2019 Preliminary Observations

- New capacity is needed in all scenarios, even in the lower load futures, to replace expiring or retiring capacity
- Solar expansion plays a substantial role across all portfolios
- Gas, storage and demand response additions provide reliability and/or flexibility
- No wind or hydro resources are added, indicating that solar backed up by gas and/or storage is the more optimal choice
- No baseload resources, designed to operate around the clock, are added except in one case where Small Modular Reactors are promoted for resiliency
- Additional coal retirements occur in lower load and carbon-constrained futures
- Energy Efficiency (EE) levels are relatively similar across the portfolios



Questions?



February 2019 Flood & River Management Overview

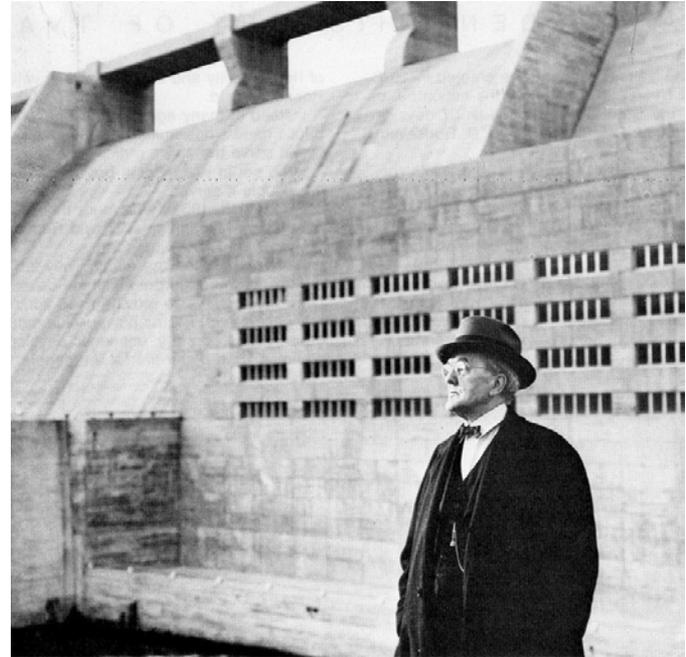
James H. Everett, PE

April 3, 2019

Integrated Resource Management

River system assigned multipurpose role through TVA Act in 1933

(section 9a) ...to regulate the stream flow primarily for the purposes of promoting navigation and controlling floods. So far as may be consistent with such purposes, ...for the generation of electric energy...



“Father of TVA,” Senator George Norris

Integrated River Management

Provides Multiple Benefits



Navigation



Water Supply



Flood -Damage
Reduction



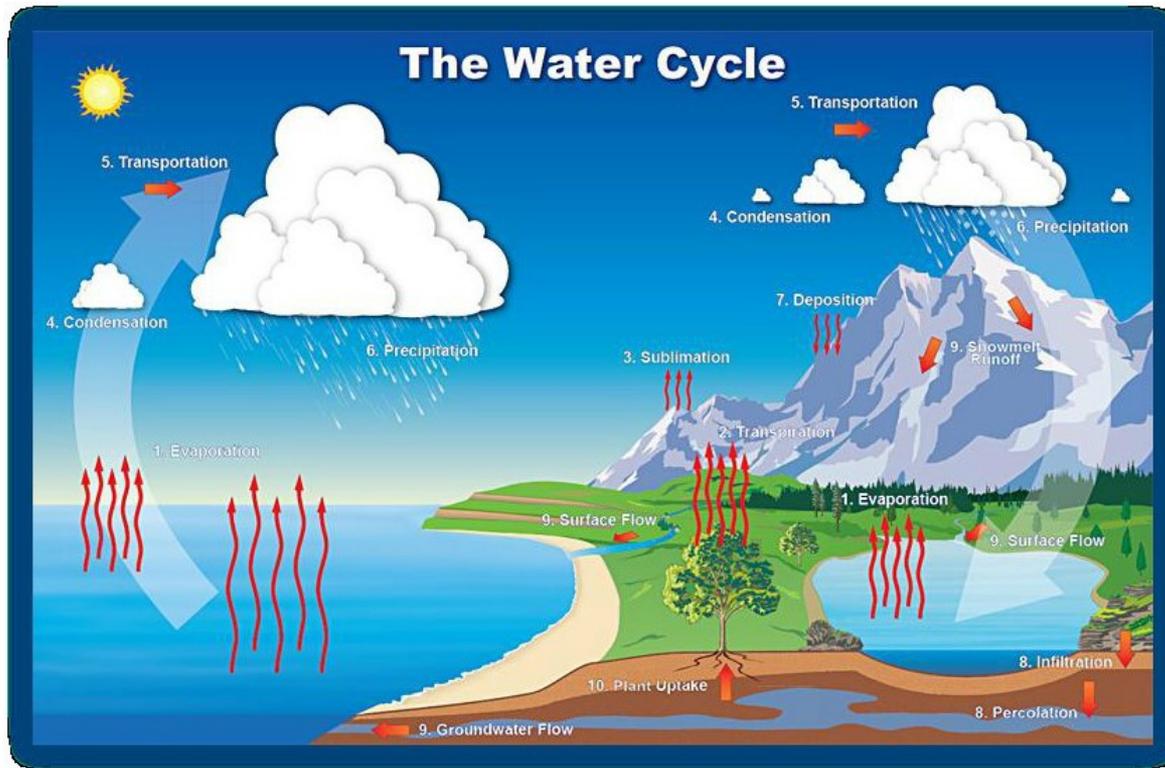
Recreation



Power
Generation

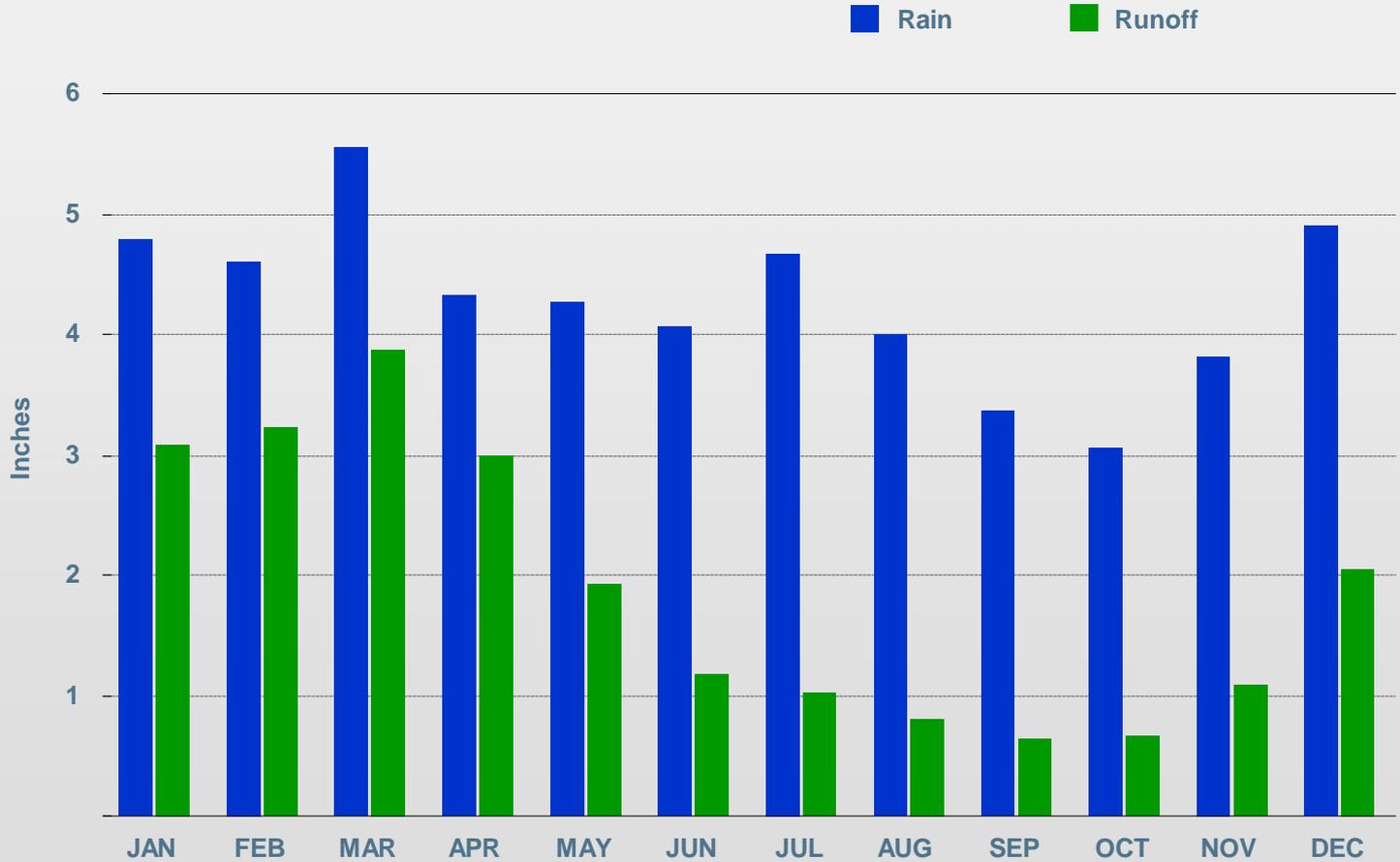


Water Quality

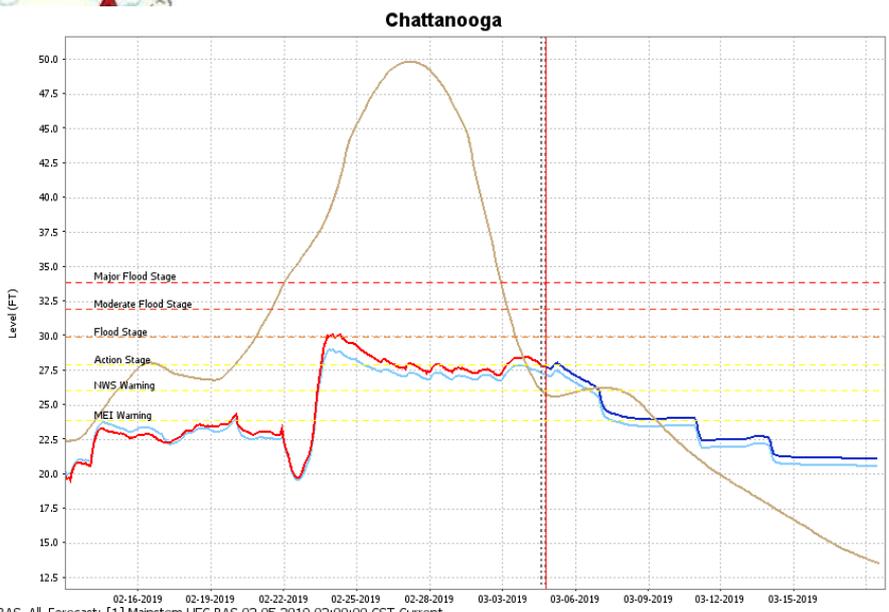
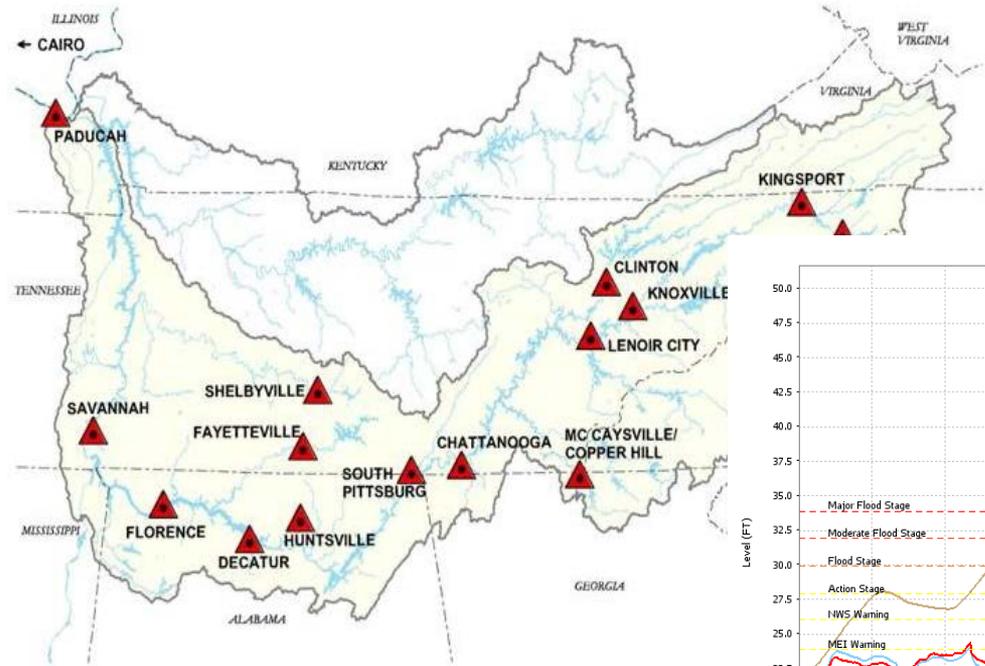


- Average annual rainfall is about 51 inches
- Average annual runoff is about 22 inches
- About 60% of the average runoff - Jan. through April

3-4, 2019



Flood Control



RAS_All_Forecast: [1] Mainstem HEC-RAS 03-05-2019 02:00:00 CST Current
 Copy_Naturals_Forecast: [2] Show Naturals in RAS Plots 03-05-2019 07:00:00 CST Local

— RAS HG [1] — Adjusted HG [1] — Observed HG — Naturals HG [2]





- 1867 Flood
- 58 foot stage



Flood Control



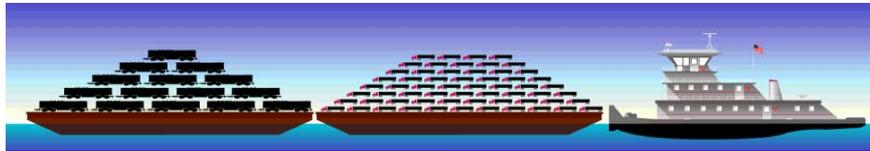
- Use tributary dams to store water to reduce downstream flooding
- TVA issues flood forecasts for major areas along the Tennessee River through partnerships with the National Weather Service
- Release water at non-flood rate once levels below dams have receded
- Annual average flood damages averted are \$280 million (\$8.6 billion to date)
- Add'l \$17M averted on the Ohio and Mississippi Rivers

Navigation



Navigation

- Cost-effective transportation
- Raw materials, coal, grains, aggregates, iron, steel, petroleum
- ~ \$1B/year in shipper savings
- 800 miles of commercially navigable waterways
- Partners with the U.S. Army Corps of Engineers and U.S. Coast Guard, and towing industry

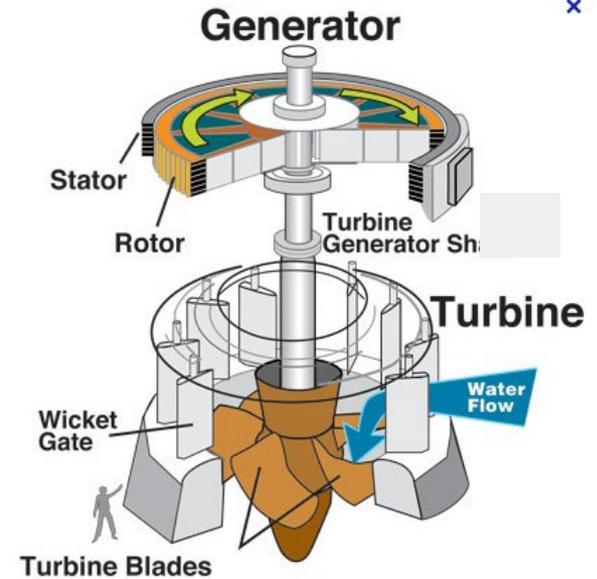


1 barge = 15 railcars = 60 trucks



Hydropower

- 3,538 MW Conv. generating capacity (109 Units)
- 1,653 MW Pump-storage capacity (4 units)
- Peaking power demand
- Rapid dispatch and flexibility
- ~ 10% of TVA's energy portfolio
- Low O&M Costs
- Displaces more expensive fuels
- Water temperature support at thermal generating plants



Water Supply and Quality



- Temperature and Dissolved Oxygen monitoring
- Adaptive Management for T&E species
- Minimum flow for downstream habitat
- Thermal compliance at TVA fossil and nuclear sites

- 700 Water Intakes
- Process water for industry, thermal-electric cooling, municipal, irrigation
- Drinking water for nearly 5 million people
- Provide minimum depths for intakes
- Manage inter-basin transfers



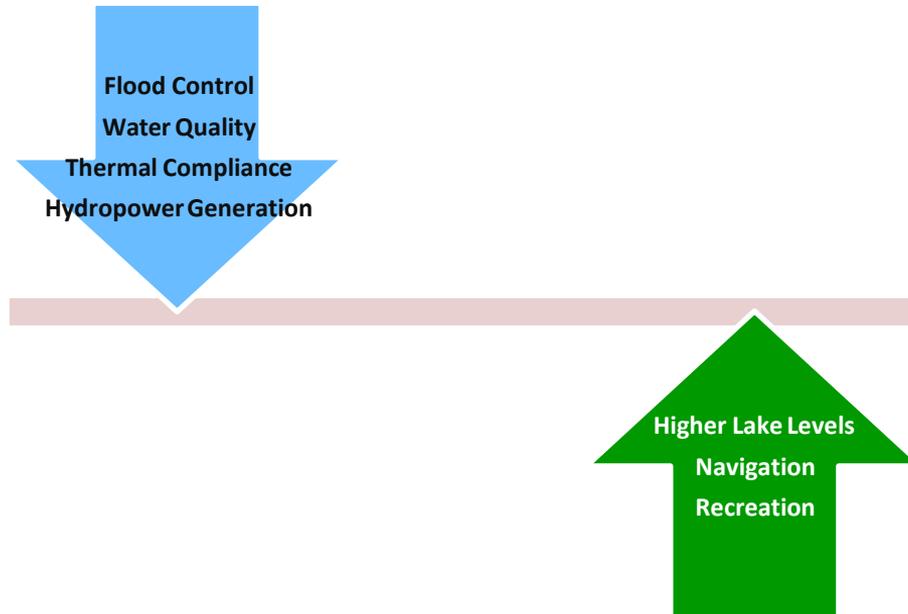
Recreation

- 230 Commercial Marinas
- 260 Campgrounds
- Drawdown restricted June 1 – Labor Day to provide higher summer lake levels
- Numerous tailwater releases to support trout fishing, whitewater rafting and drift-boating
- Economic boost
- Stakeholder involvement
- Special flows and elevations to support community events



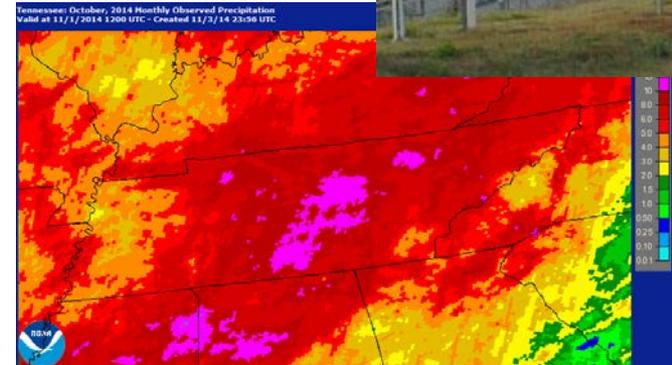
Challenges

- Balancing the competing demands on the system and the overall value to the public
- Understanding of the trade-offs associated with various scenarios
- Example: Can you keep my reservoir higher, longer?



Forecasting & Decision Support

- 200 Rain Gages
- 60 Stream Gages
- Data Management (FEWS)
- Inflow and Runoff Modeling (SAC-SMA)
- Reservoir Storage Routing and Simulation (Riverware)
- Hydraulic Modeling (HEC-RAS)
- Hydropower Optimization (Riverware)
- Information Dissemination (Varies)



The River Forecast Center

- Staffed 24/7/365
- Teams issue 2-4 forecasts per day
- Data validation
- Modeling
- System monitoring
- Emergency response
- Hydropower scheduling
- Interaction with stakeholders

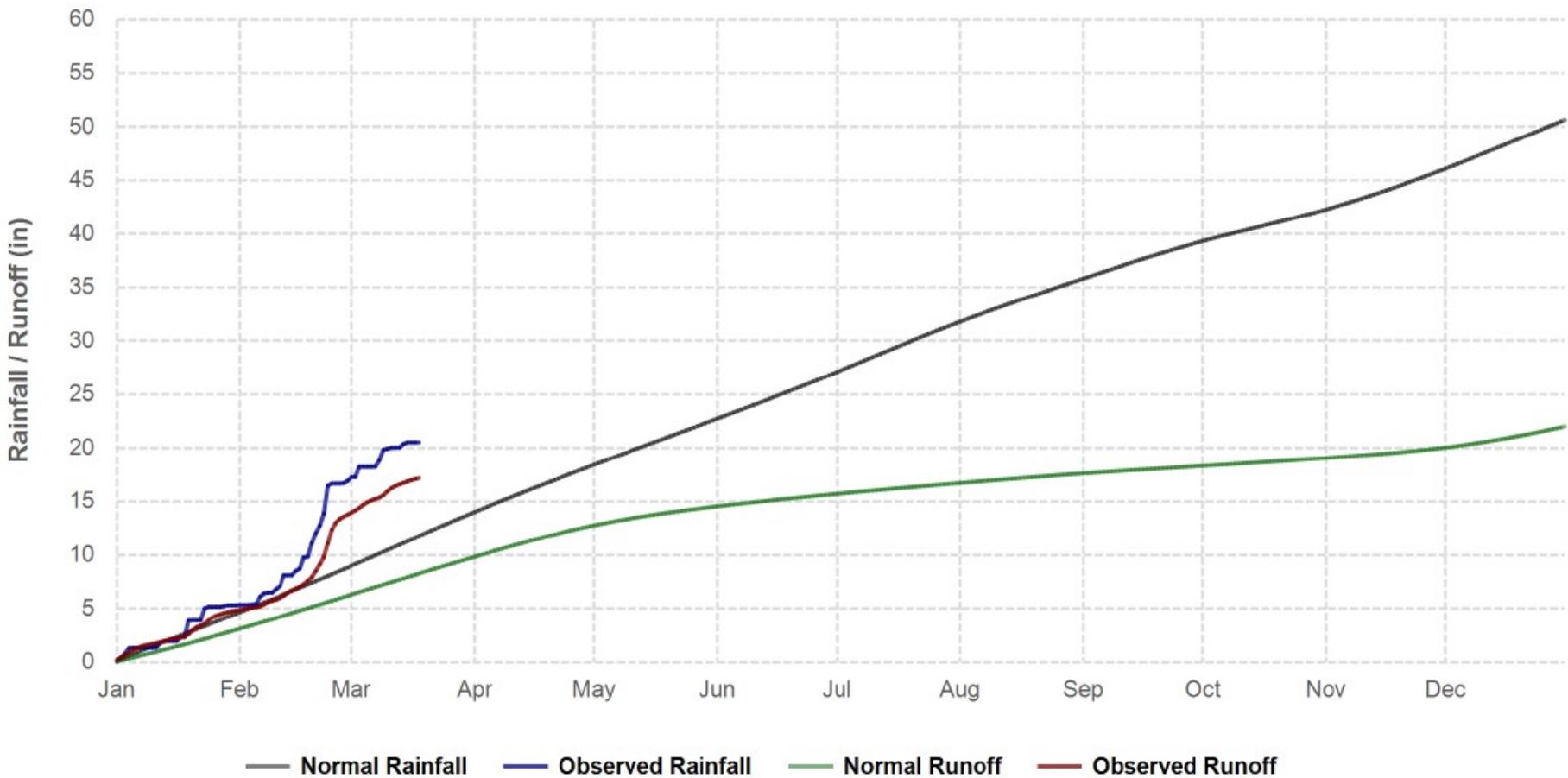


3-4, 2019



February 2019 Flood

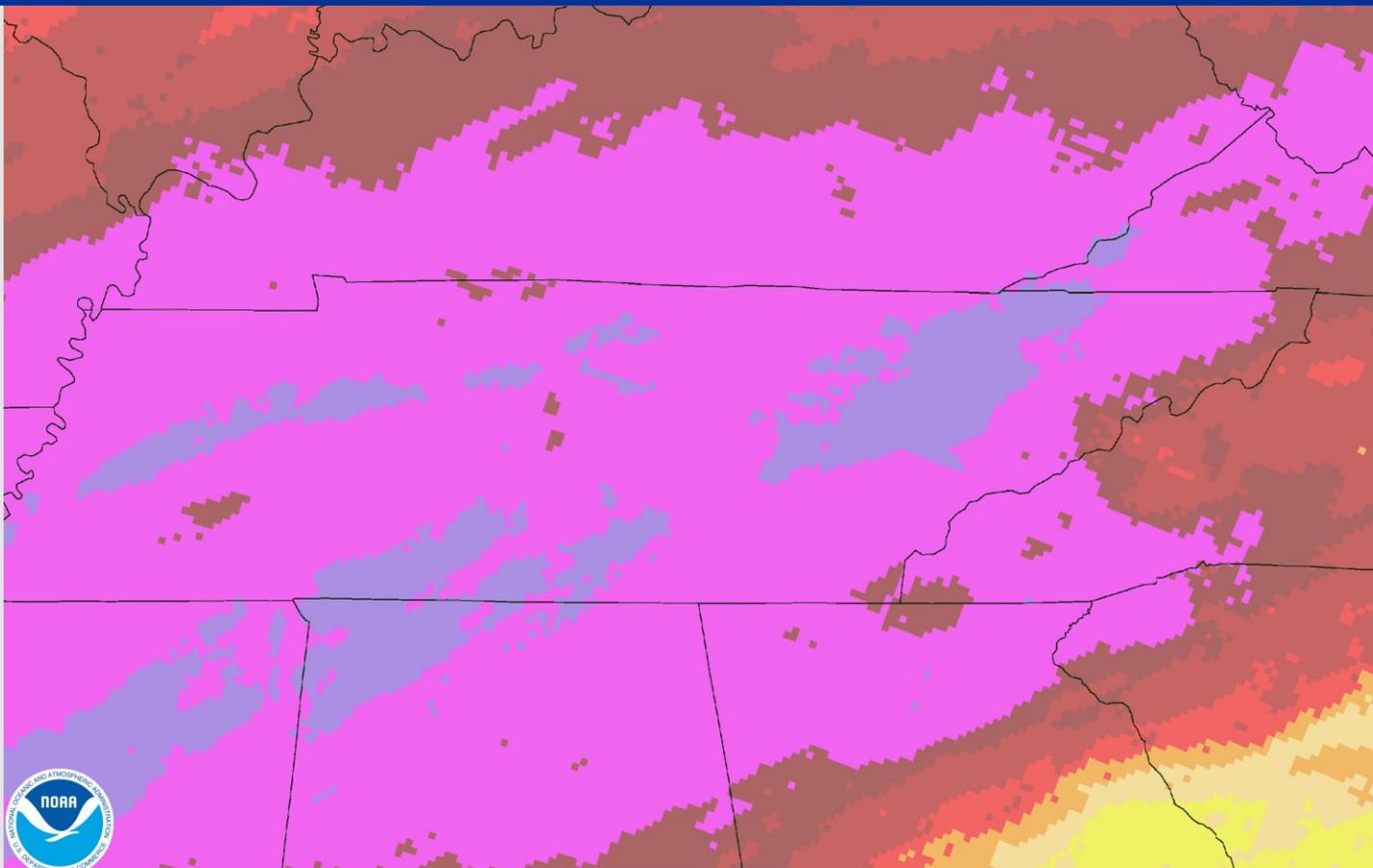




March 04, 2019 30-Day Observed Precipitation

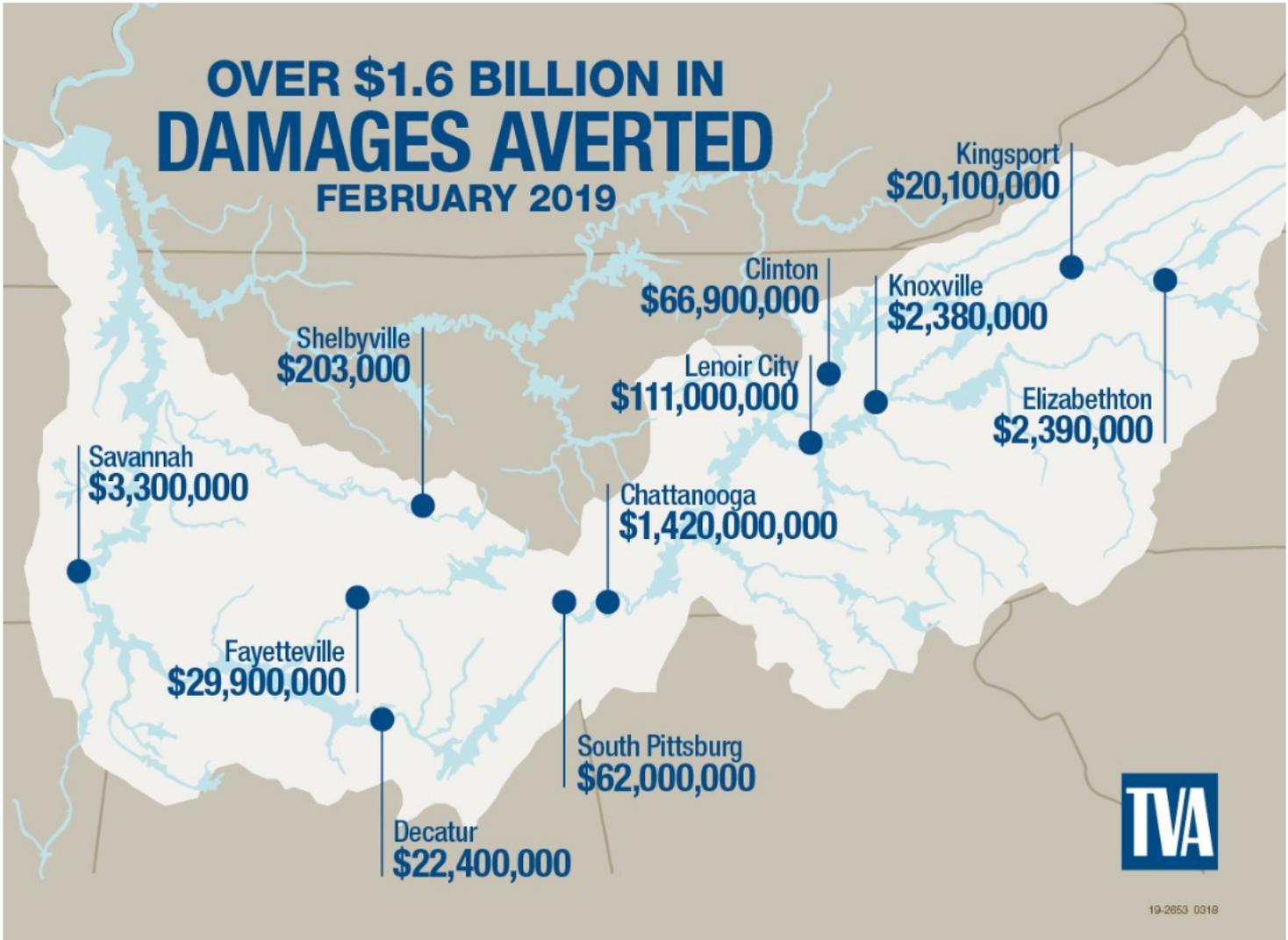
Created on: March 05, 2019 - 13:22 UTC

Valid on: March 04, 2019 12:00 UTC



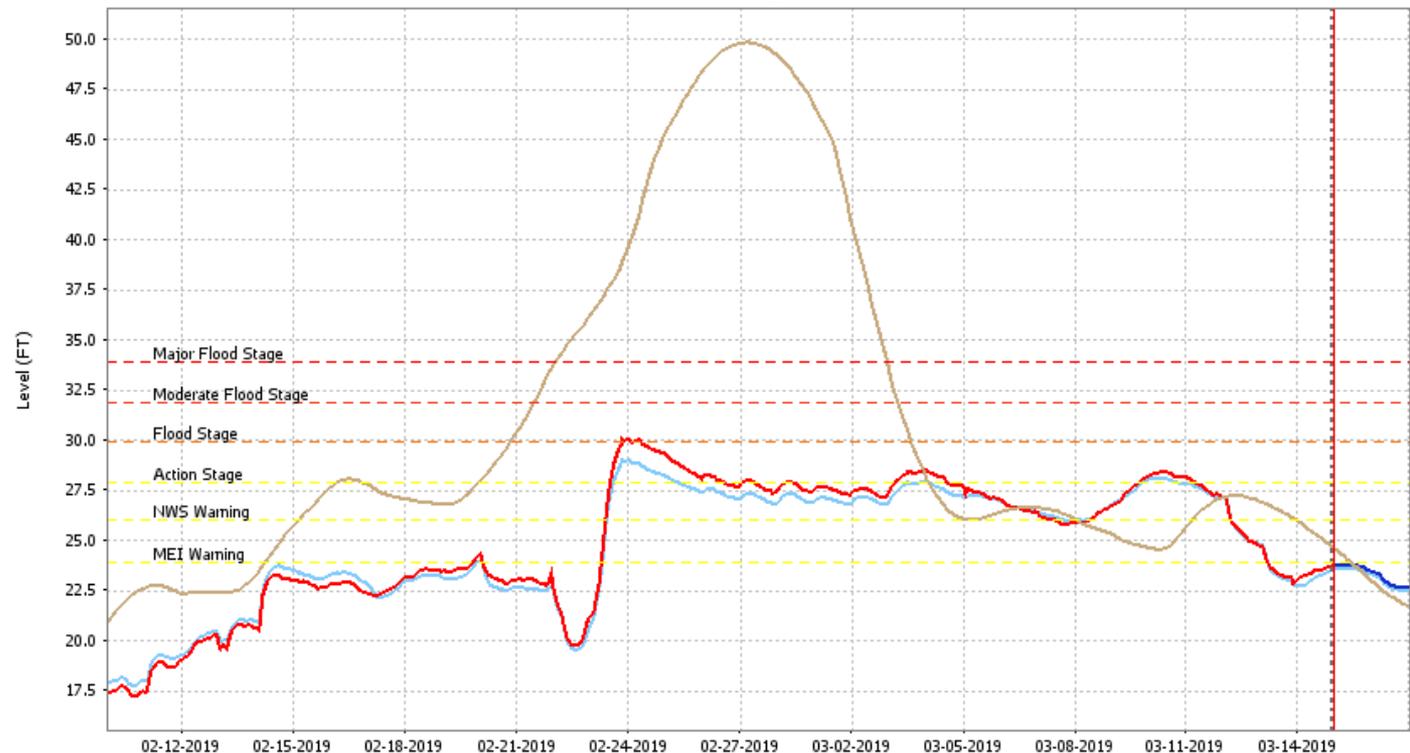
OVER \$1.6 BILLION IN DAMAGES AVERTED

FEBRUARY 2019



River Stages

Chattanooga



RAS_All_Forecast: [1] Mainstem HEC-RAS 03-15-2019 11:00:00 CDT Current

Copy_Naturals_Forecast: [2] Show Naturals in RAS Plots 03-15-2019 11:00:00 CDT Local

— RAS HG [1] — Adjusted HG [1] — Observed HG — Naturals HG [2]

Stakeholder Outreach

- Directly to County Emergency Management Authorities
- Conference calls with State Emergency Management
- Conference calls with Navigation Industry
- Updating National Weather Service routinely
- Updates to recreational interests, marinas, rowing venues, campgrounds, etc.
- Updates to major industries near the Tennessee River
- Updates to industries in the lower Tennessee and Ohio Rivers
- Updates daily to Redstone Arsenal



Tennessee Valley Authority @TVANews · Mar 1

Management of the Tenn. River system using our integrated system of 49 dams across the region averted \$1.6 billion in flood damages. After the wettest February and fourth wettest month on record, we continue to manage high river and lake conditions to minimize flood impacts.



1:03 3,199 views

7 37 127

Show this thread



Tennessee Valley Authority @TVANews · Feb 26

River Forecast Center Manager James Everett on the @weatherchannel discussing how we're managing the Tennessee River to reduce downstream impacts all across the Valley after a record-breaking month of rainfall.



1 7 28



Tennessee Valley Authority @TVANews · Feb 27

River Update: We are increasing releases out of tributary dams to recover flood storage in preparation for the next rain event, so you can expect to see above normal river flows below those dams. (1-3)



0:16 4,329 views

4 16 52



Tennessee Valley Authority @TVANews · Feb 20

Incredible site! Wilson Dam near Florence AL is releasing 2 million gallons per second. Heavy rainfall has resulted in high river conditions along the Tennessee River. We are storing water at tributary and main stem reservoirs to help reduce downstream flood levels. #ALWX #TNWX



1:21 12.6K views

9 134 276



Social Media Impact

Facebook:

Number of Posts: 35

Number of Impressions: **7,610,058**

Number of Users Reached: 2,755,040

Number of Link Clicks: 17,700

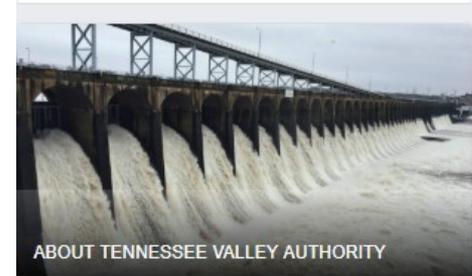
Number of Video Views: 2,210,756

Avg. Reach Per Post: **141,286.63** < Very impressive

Engagement Rate: **9.76%** (Compared to the national average of 0.17%)

Tennessee Valley Authority
Public Utility Company in Knoxville,
Tennessee

4.3 ★★★★★



facebook.com/TVA

We gained 9,387 Facebook followers over the 18 days a 9.85% growth. We now have 104,718 followers Facebook.

Twitter:

Number of Tweets: 88

Impressions: 996,400

Overall Reach **1,684,800**

Retweets 1,896

Engagement Rate: **4.1%** (National average is 0.05%)



[@TVAnews](https://twitter.com/TVAnews)

We gained 1,200 new Twitter follower over the period, a 6.26% growth. We now have 20,800 Twitter followers.

February rainfall breaks Tennessee River Valley records

Posted: Feb 25, 2019 04:15 PM EST
Updated: Feb 26, 2019 06:03 AM EST



(Photo: WATE)

Near Historic River Levels

Site	Current Level	Forecast	Record	Most Recent Crest of this Magnitude
TN River at Florence	28.78ft	Steady/Falling	32.50ft (1897)	30.03ft (1973)
TN River at Decatur	9.77ft	11.26ft	14.80ft (1867)	10.29ft (2003)
TN River at Whitesburg	21.80ft	24.20ft	26.10ft (1973)	24.67ft (2003)
TN River at Guntersville	36.04ft	40.11ft	38.18ft (2015)	38.18ft (2015)

Some of these records were before the dams were built along the river (Florence & Decatur)!

Forecasts Could Change as TVA adjusts water levels at various dams along the river.

Credit: @ NWSHuntsville



FLOODING FORCES UNION COUNTY FAMILIES TO BOAT IN AND OUT OF THEIR NEIGHBORHOOD

NEWS

Lingering Impacts



Rains bring flooding, lock closures on Tennessee River

By Kirk Moore on FEBRUARY 26, 2019

SHARE [f](#) [t](#) [in](#) [✉](#)



The Tennessee Valley Authority is managing water levels at the Kentucky Dam and other structures to control flooding and river levels across the region. TVA photo.



Summary

- TVA continues it's river management mission – dating back to the TVA Act
- Operations are driven by rainfall and runoff as guided by Reservoir Operations Policy
- Integrated operation allows TVA to balance river system benefits:
 - Navigation
 - Flood-damage reduction
 - Affordable and reliable electricity
 - Improved water quality and aquatic habitat
 - Dependable water supply
 - Recreation



- Release schedules
- Current reservoir elevations
- Operating guides
- Tailwater improvements
- Monitoring results

TVA Lake Info App



Available on the
App Store

Questions?



Kentucky Lock Addition & Lake Barkley Fish Fence Research Project

Don Getty, Project Manager
US Army Corps of Engineers
April 3, 2019

KENTUCKY LOCK ADDITION



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

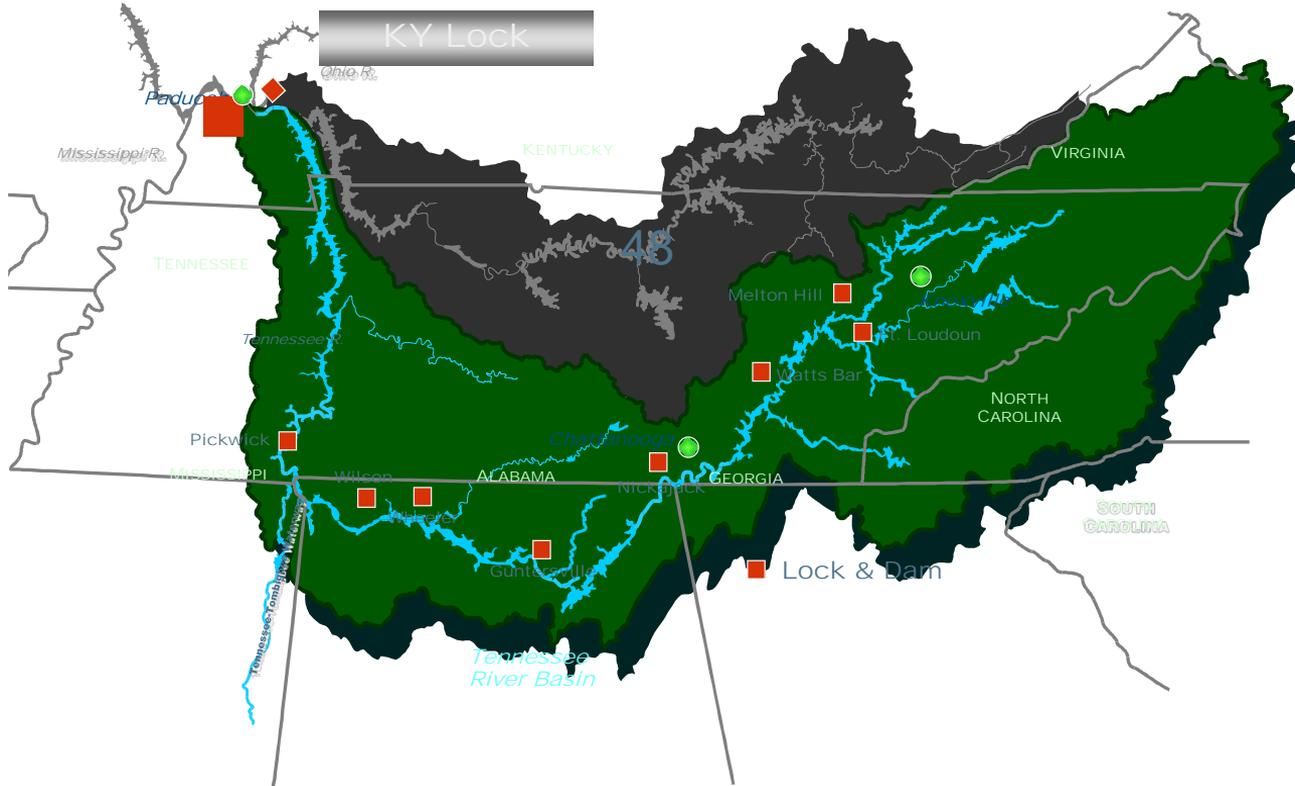


US Army Corps of Engineers





KY Lock Location



KY/Barkley System Vicinity Map



KY Lock - Ft. Campbell Unit
traveling to Louisiana
February 2018



Delta Mariner

7/15/04



Delta Mariner - April 2010 Wheeler Lock



Delta Mariner - Rocket Loading in Decatur 2010





Sand Mining on Ohio



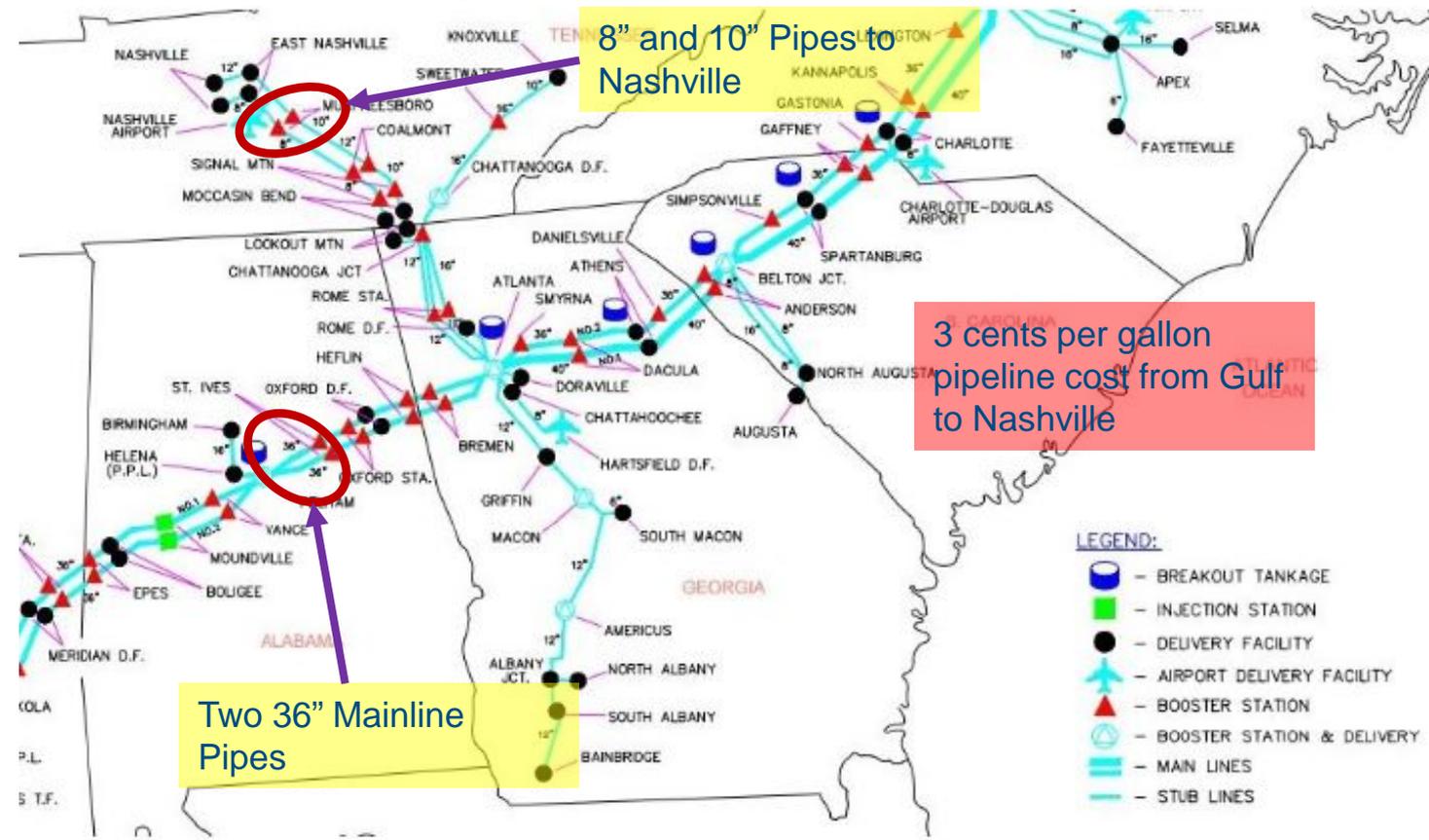
Vulcan Materials –
Grand Rivers



Quarry

Harbor

Changes in Refined



Colonial Pipeline System Map (Colonial Pipeline)



Nashville petroleum Trend

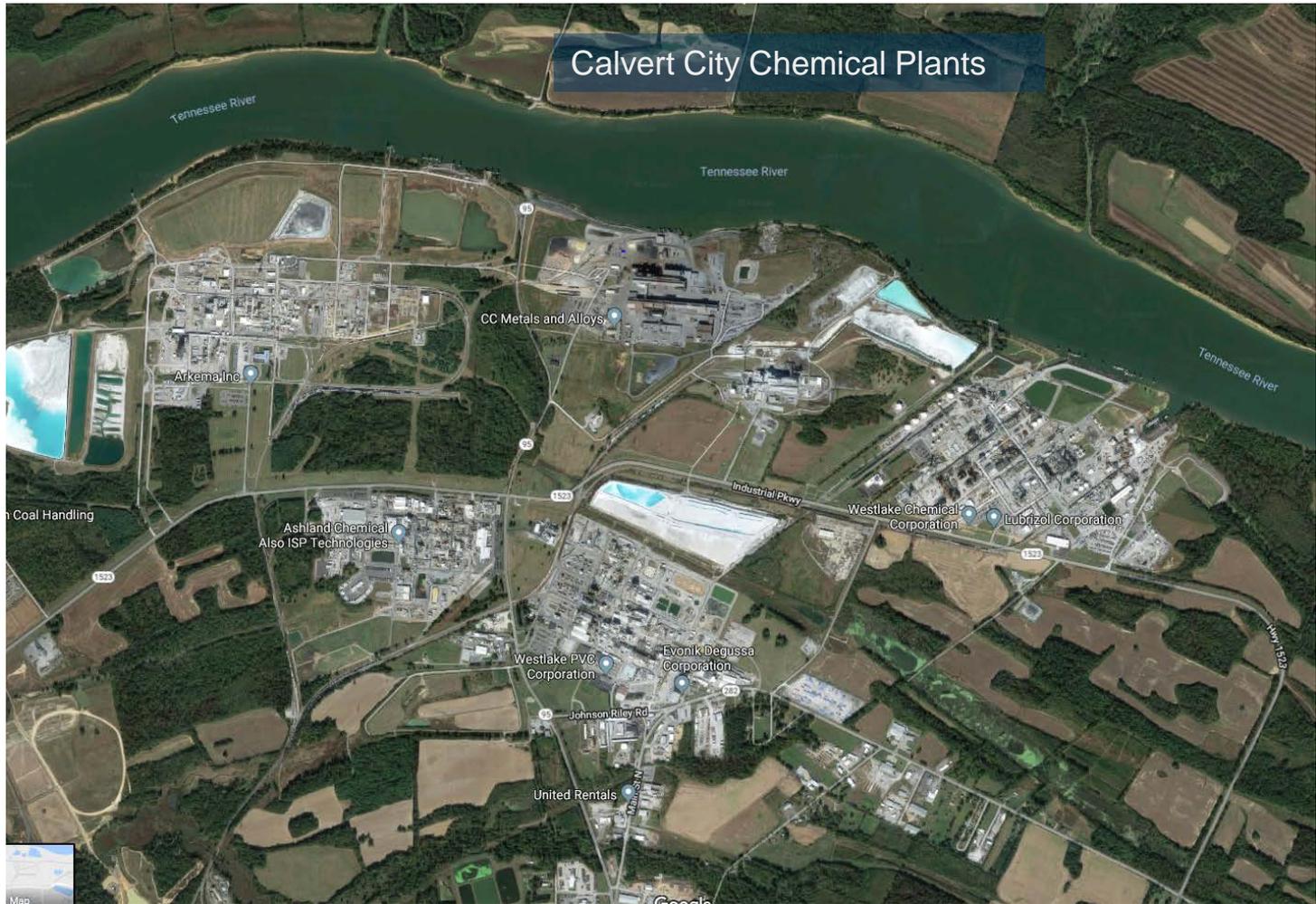
Gasoline and Ethanol

	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Middle TN Market Share by Barge	<2%	2-10%	10-20%	>25%	>40%

Diesel

	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Middle TN Tons by Barge	<150K tons	<150K tons	>250K tons	>450K tons	>600K tons

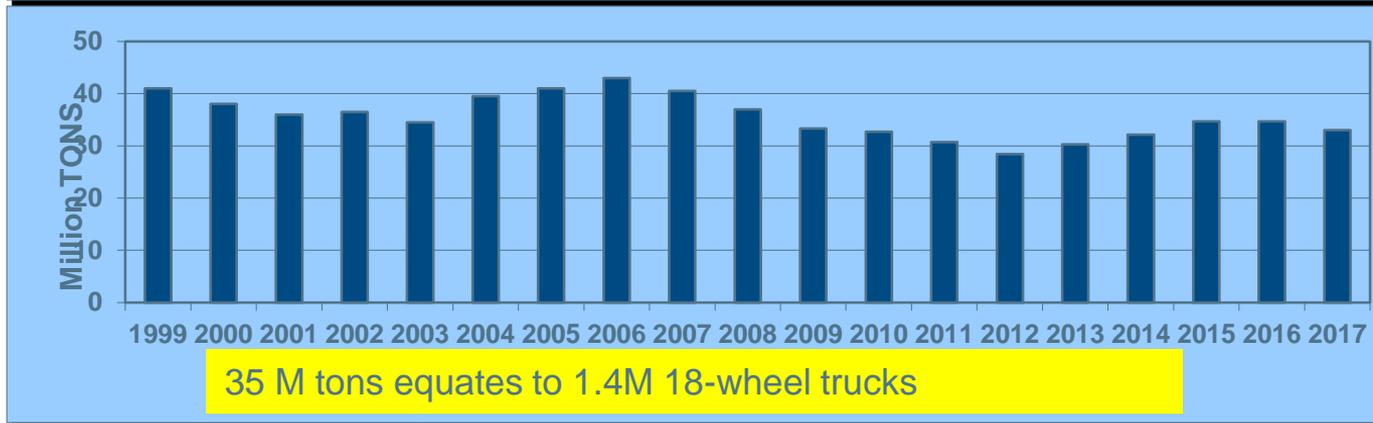
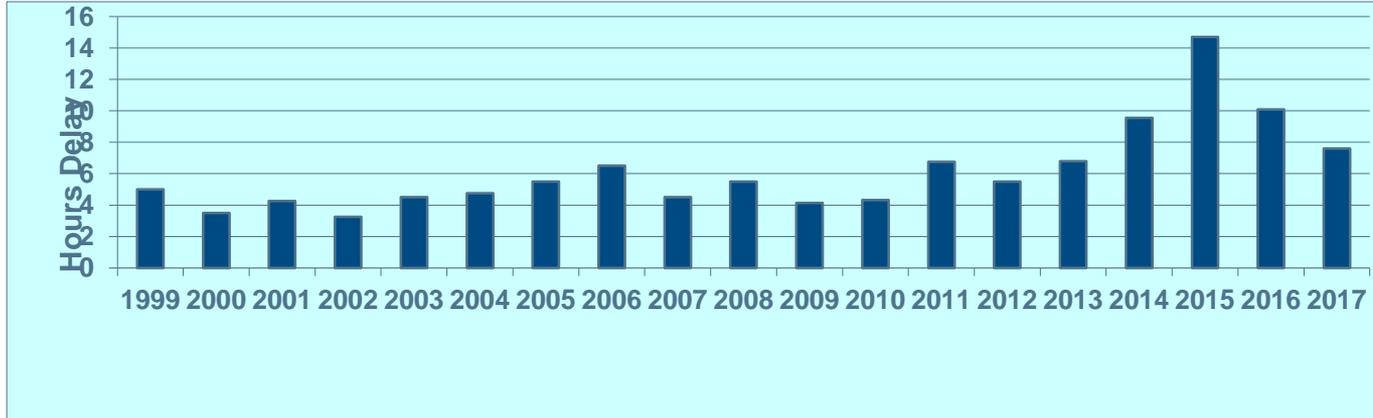
Calvert City Chemical Plants



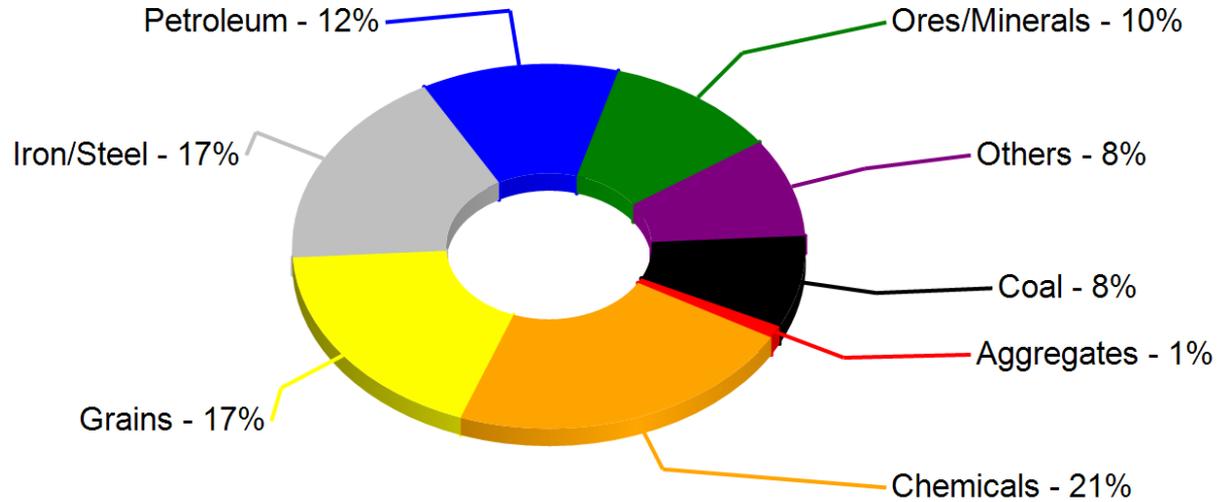
Eddyville Riverport



Kentucky Lock System - Delays and Tonnage

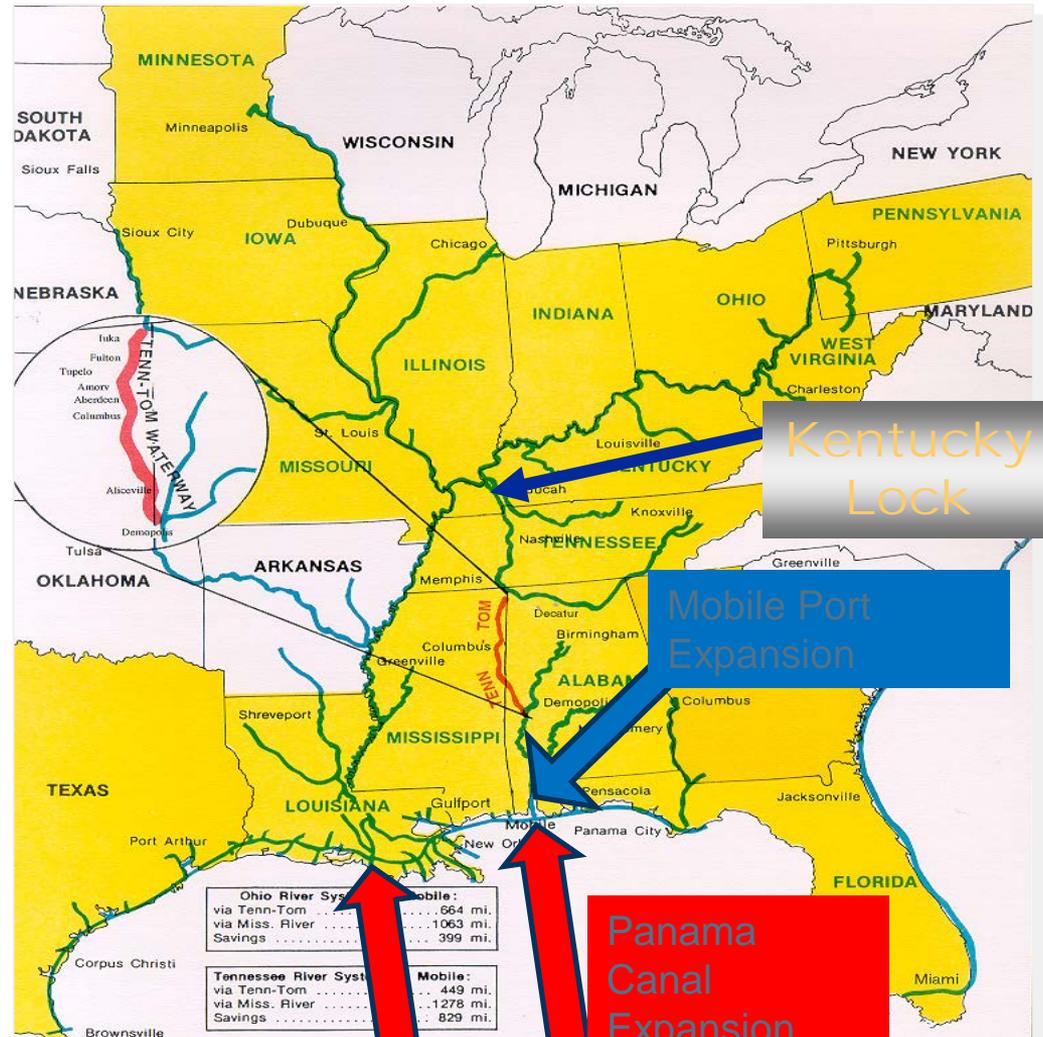


2015 Commodity Value Distribution



Source: WCSC and 2012 NDSU Commodity Value Study

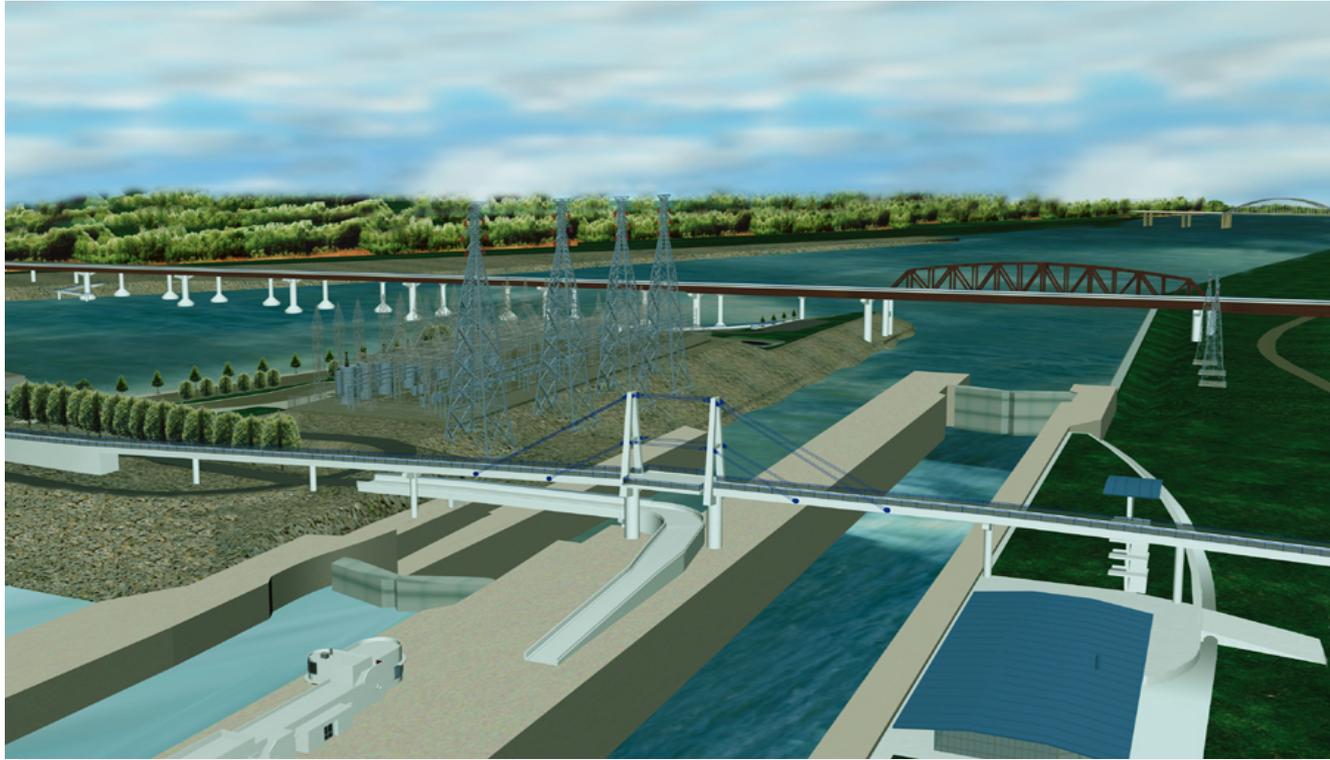
Near Term Changes to Inland Waterways



Kentucky Lock Addition Artist Rendering



KY Lock Computer Rendering



Proposed Visitors Center





New Hwy and RR Bridges

New Transmission Towers

Upstream Lock Monoliths

Upstream Cofferdam

Kentucky Lock Addition Completed Features



Total Project Cost Estimate (Fully Funded, Oct 2017 \$'s)

Total	\$1,254M*
-------	-----------

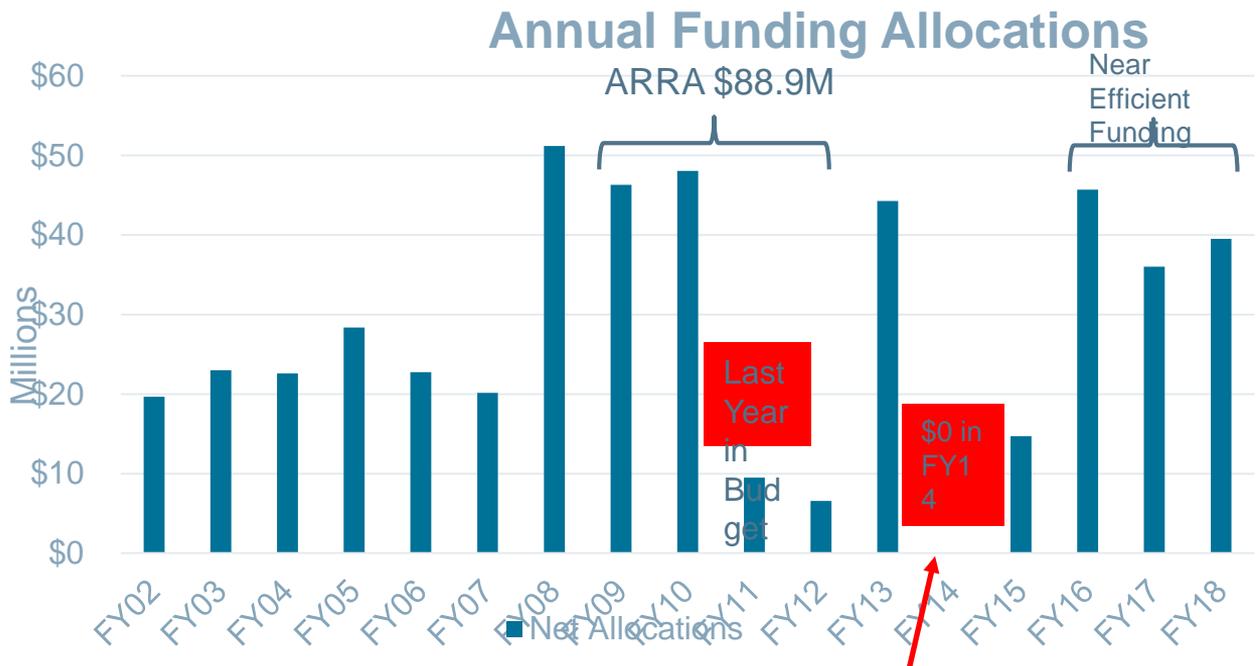
*Based on 2028 completion date

\$455M Expended to date = 36% complete

BCR = 1.3 & RBRCR = 2.3 (both @ 7%)

BCR = 2.8 & RBRCR = 5.3 (both @ 2.75%)

KY Lock Funding history



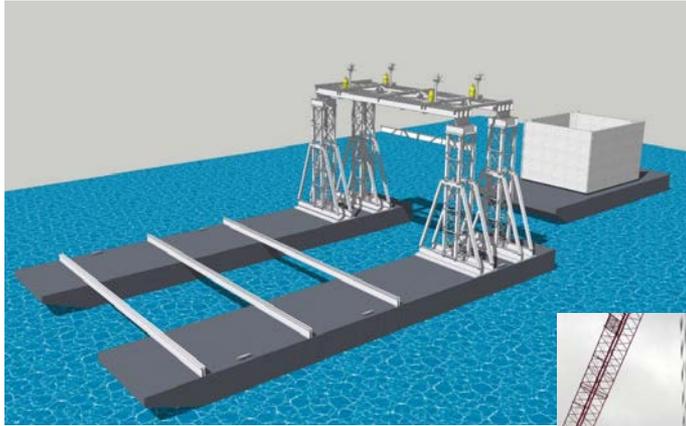
CY 14 – 2 Major positive game changers to IWTF by Congress

Downstream Cofferdam

- Low Bid: \$67.1M
- Contractor: Johnson Bros.
- Award: September 2016
- Complete: February 2020



Downstream Cofferdam



Lift-in Arrangement
3D Model

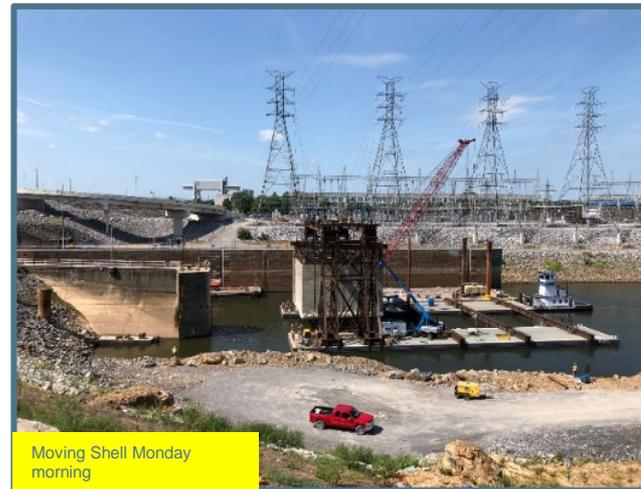
2 Feb 2018 – Gantry
barge system being
assembled



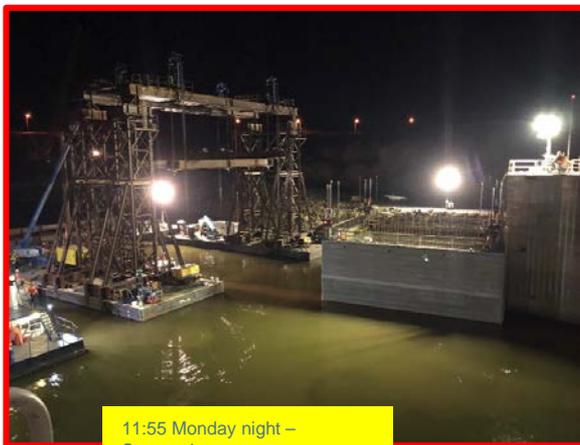
Kentucky Lock First Downstream Cofferdam Shell Set-Down (Aug 2018)



Lift-off Saturday morning



Moving Shell Monday morning



11:55 Monday night – Success!



Tuesday Morning



**Downstream Lock Excavation
Award: September 2018**

TVA Towers Crown of last 375' Tower



TVA Towers - Crew on last Crown



TVA Towers View from Top of Tower



26 March 2013





7 June
2016



13 July 2016

Last Gate
Segment

Kentucky Lock – June



KY Lock - Summary and Challenges

- Future Funding
- Structural funding issues are trending positive
- Impact to costs and ultimate project completion date
- Funding flexibility is still being designed in next large construction contract – Downstream Lock Monoliths
- Impacts to Existing Lock during construction of Downstream Cofferdam

- Ongoing Economic Analysis and Traffic Forecast
 - New Economic Metrics (e.g.. BCR's)
 - Downward trend in coal
 - Upward trend in liquid shipments and aggregates



Status of Asian Carp in the Valley

Dennis S. Baxter

April 3, 2019

Asian Carp in the Valley



Bighead carp



Grass carp



Black carp



Silver carp

Non-native and invasive in North America

There are four Asian carp species in the Tennessee River Watershed:

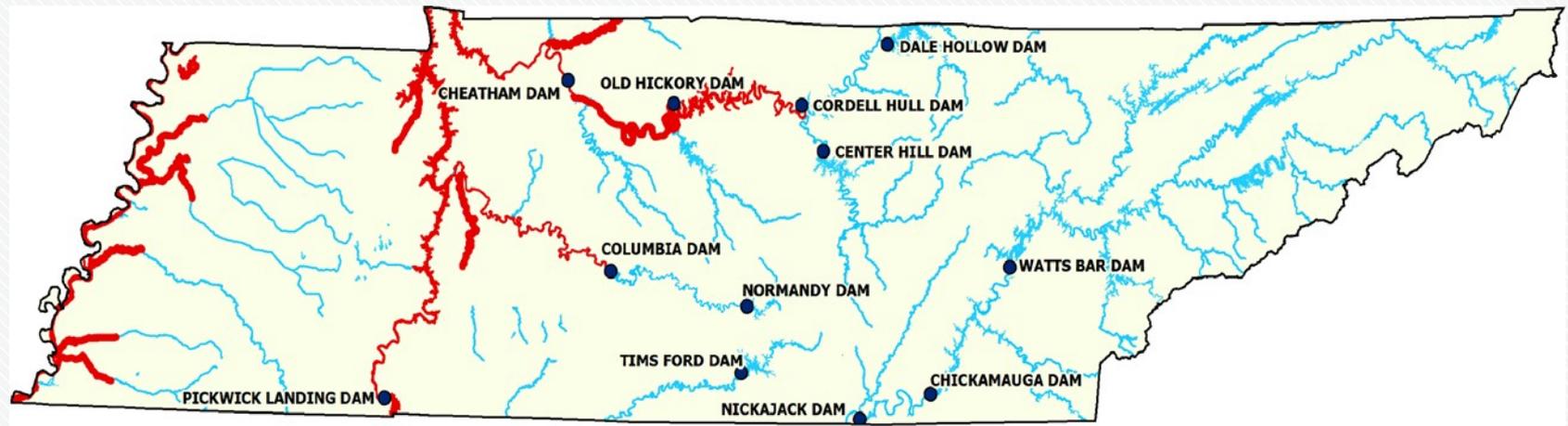
Silver

Bighead

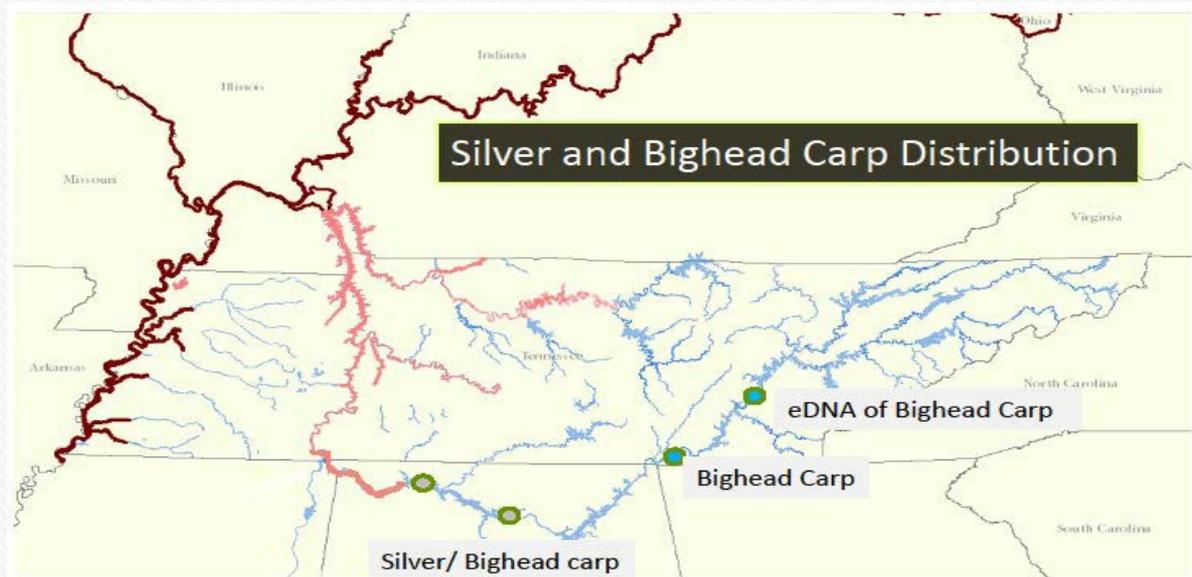
Grass

Black

Asian Carp Distribution in Tennessee



Asian Carp Distribution & eDNA



Mistaken Identity



Gizzard Shad, Silver Carp, Blueback Herring and Alewife Comparisons



MICRA (Mississippi Interstate Cooperative Resource Association)

- MICRA functions as an umbrella organization
 - Organizes multi-state partnerships
 - Address inter-jurisdictional fishery management issues
 - Within six Mississippi River sub-basins
 - MICRA is a partnership of
 - > 28 state agencies with fisheries management jurisdiction
 - > 4 Federal Partners in the Mississippi River Basin
 - > TVA participates in the Tennessee/Cumberland sub-basin

MICRA Objectives

- Conduct Targeted Sampling Surveillance
- Early Detection
- Population Characteristics
- Evaluate Lock & Dam Passage



National Strategies for Asian Carp

- Contain and control the expansion of populations of Bighead, Black, grass, and Silver carps in the United States
- Extirpate, or reduce to levels of insignificant effect
- Conduct research to provide accurate and scientifically valid information necessary for the effective management and control
- Effectively plan, implement, and evaluate management and control efforts

Who is Responsible

- The states (KY, MS, AL, TN) **fisheries management**
- The USFWS obtains **funding** then **facilitates program** The USACE **operates locks**
- The TVA manages water/**operates dams** Tennessee River

Can These Fish Be Stopped?



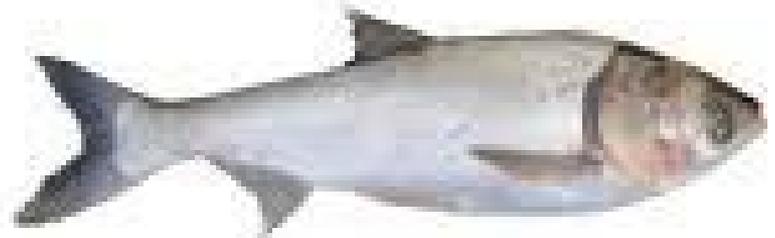
Bighead carp



Grass carp



Black carp



Silver carp

Understanding Population Dynamics

First Actions



- Silver and Bighead carp form tight schools. Individuals will be tagged so the schools of Asian carp can be tracked. This is called the “**Judas fish technique.**”
- The fish can be affectively netted to ensure re-capture and removal of other invasive carp found in the school.
- Commercial fishermen will be able to remove fish in the school at the state’s request.

First Actions (cont.)

Collaboration of Sub-basin agencies and universities

- Implanting acoustic transmitters and receivers
- Monitor movements through locks and dams
- Provide information for lock management and deterrent barriers
- Surveying relative densities
- Determine if natural recruitment is occurring in the reservoirs



Fill Knowledge Gaps

Understand distributions and habitat use in the Ohio River sub-basin and determine:

- **Spawning** occurring within the systems,
- **Movement** within the systems, and will provide
- **Life history** and **population dynamics** data for informing Tennessee River specific-models
- Estimating **control needs** and **invasion impacts**



Will Asian Carp Affect the Fisheries?

- Unknown at this Time
- Long Term Monitoring Programs & Historical Fisheries Data will help Determine Changes in Fish Populations



Silver Carp Monitoring



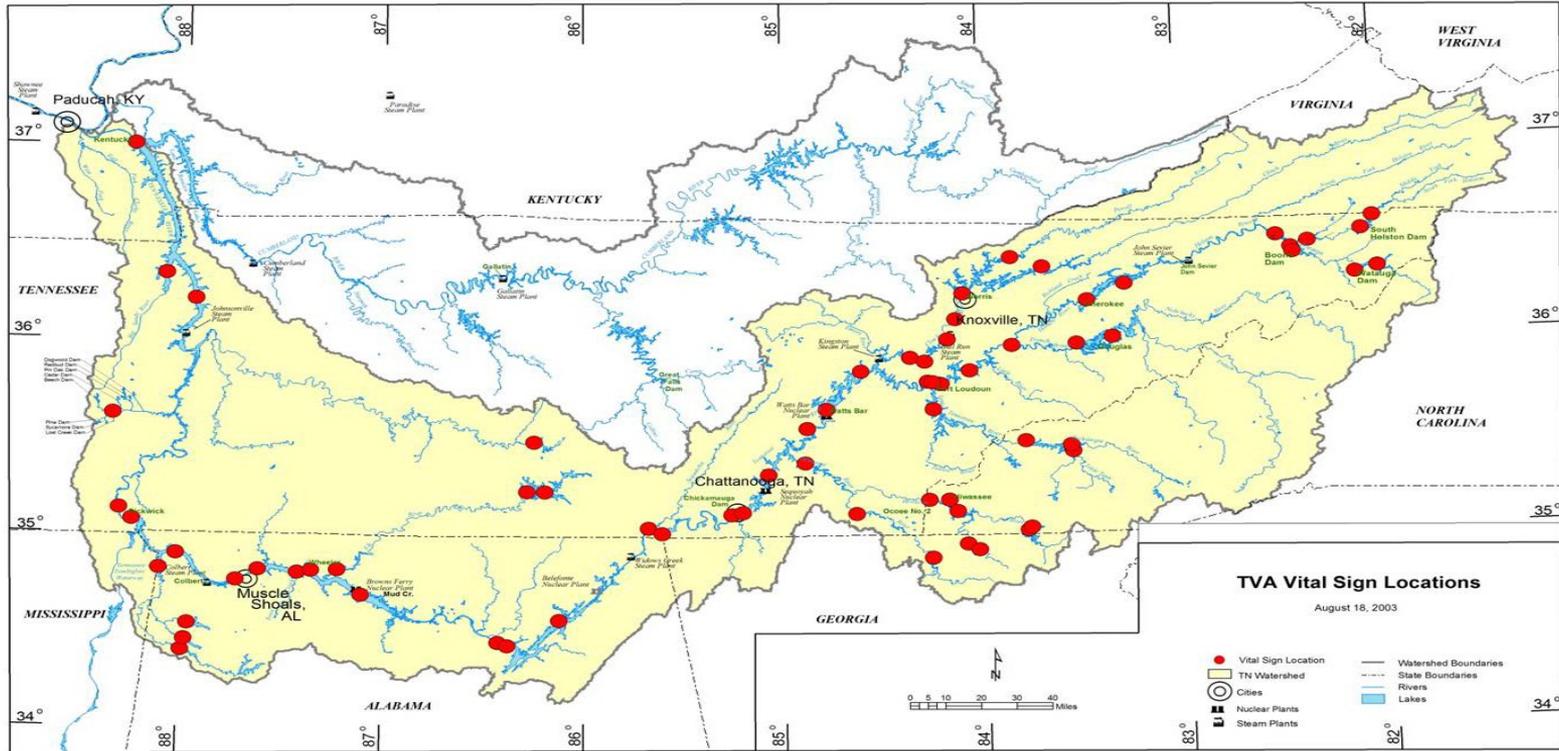
Silver Carp



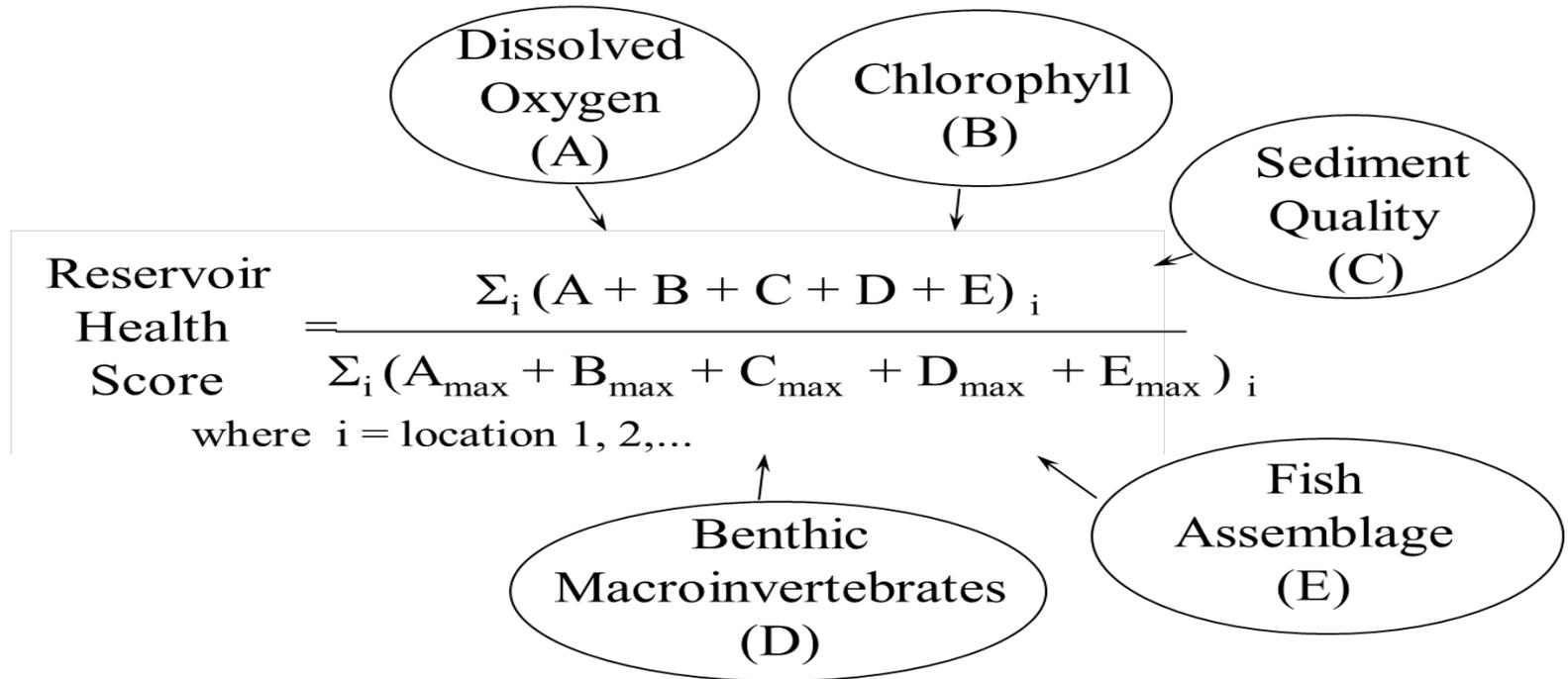
Silver Carp Larvae



Reservoir Ecological Health Locations



Ecological Health Score Calculation Utilizing Five Key Indicators



Strategies to Stop Upstream Migration

- Communication
- Barriers
- Commercial Fishing
- Contract Fishing
- Bow Fishing Tournaments
- Large Scale Netting at Pinch Points



Communication



Websites

TV Interviews

Tennessee Uncharted

Public Meetings

Sportsman Events

Barriers

- Electric and Acoustic
 - Positioned at the downstream lock entrances
 - Current research will determine if barriers are successful

Acoustic Barrier System at Lake Barkley Lock

- Sound Barrier-Installed by the USGS
- Install in March
- Test in May
- Verify if barrier works by tagging and tracking movement
- Successful spawning has only occurred once in 2015 and not has been seen in KY or Barkley Lakes.
- 100% effectiveness is not necessarily needed to reduce population
- Recruitment reduction to upstream waters will keep populations from exploding.



Commercial Fishing



Bow Fishing for Asian Carp



Asian Carp Roundup

- Removal at Pinch Points
- Multi-Agency Event



Cooperative Tagging and Removal

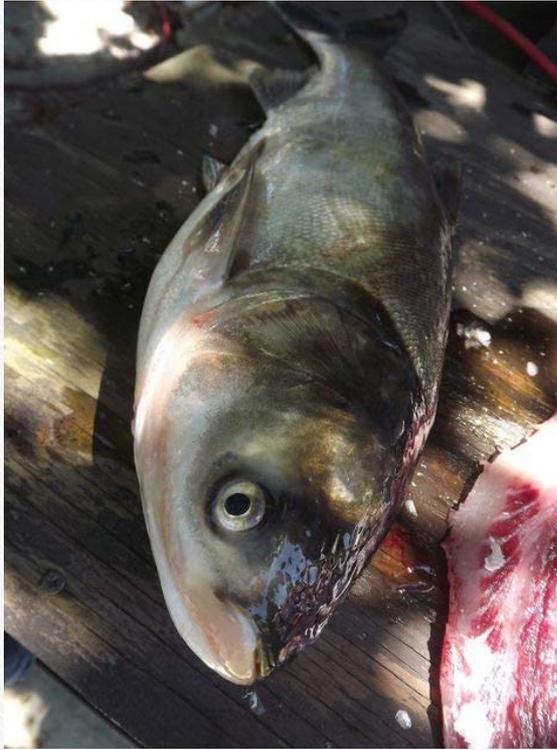


Uses for Asian Carp

- Table Fare
- Bait
- Animal Feed
- Compost
- Recreation?



Asian Carp are Great Table fare!





Kentucky Fish Center, LLC

- Opened the Kentucky Fish House
 - Public-Private Partnership to harvest and sell Asian Carp
- Harvest goal by 2024 is 20-million-pound production goal
- Teaches Commercial Fishers – Use nets and how to fish for Asian Carp
- Ice Machine



Turning an invasive problem into a bait solution

- Lowering numbers of silver carp moving upstream by using them for bait
 - Harvest, freeze it, cut it into pieces
 - Sell it as a cheap bait to East Coast lobster fishermen
 - Lobster Fisherman want live bait and are willing to pay 50 cents per pound
 - > 50,000 lbs. needed



Lacey Act

- It's legal to transport invasive species across state lines
 - if the fish are **dead and eviscerated**
- Significant regulations must be amended to make this work



Silver Carp on Kentucky and Barkley Lakes



Health and Safety Issues



Flying Carp are a Hazard to Boaters



Benjamin Lowy via Getty Images

State of the Valley



All State and Federal Agencies are working together through MICRA

State of the Valley

- All State and Federal Agencies are working together through MICRA-Ohio Sub-Basin
- We Established the Leading Edge of Invasion
 - Deployed Receivers & Tagged Fish
 - Identified Pinch Points



State of the Valley

- All State and Federal Agencies are working together through MICRA-Ohio Sub-Basin
- We Established the Leading Edge of Invasion
 - Deployed Receivers & Tagged Fish
 - Identified Pinch Points
- We are Testing Acoustic Barrier
- KY developed fish house & bought Ice Machine
- Contract with commercial fishing programs





Questions







Invasive Fish Deterrent

Don Gibbs

Critical Lake Barkley Information

- Major part of the largest reservoir system east of the Mississippi River.
- In conjunction with nearby Kentucky Lake, supports an annual \$1.2B sport fish and recreation boating industry.
- Movement through lock systems is the primary means of migration of invasive fish.
- Asian carp are entering the Tennessee and Cumberland Rivers from the Ohio River through Kentucky and Barkley Locks.



★ Barkley Lock: BAFF installation site on the Cumberland River

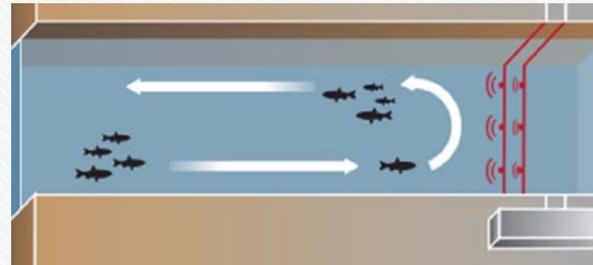
Research Project Information

- Three year research effort led by USFWS, with USACE, USGS and Kentucky DFWR support
- Involves testing of a proprietary alternative deterrence method consisting of sound, light and air bubbles – BAFF (Bio-Acoustic Fish Fence)
- USACE is reviewing design documents to
 - ensure integrity of the navigation structure
 - minimize impact to navigation industry
- **Construction start June 2019 and** project operational August 2019



Introduction

- Fish Guidance Systems Ltd (FGS) has been awarded the design build contract by USFWS to install a Bio Acoustic Fish Fence system at Barkley Lock & Dam.
- Project is currently in 100% design phase.
- Research design is being developed through the partnership.
- Construction of the BAFF System is planned for spring/summer 2019.



THE BIOACOUSTIC FISH FENCE - BAFF™

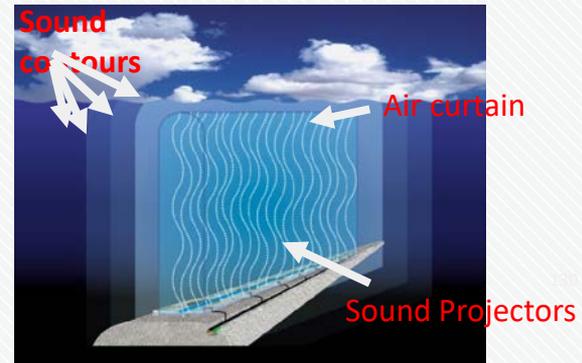
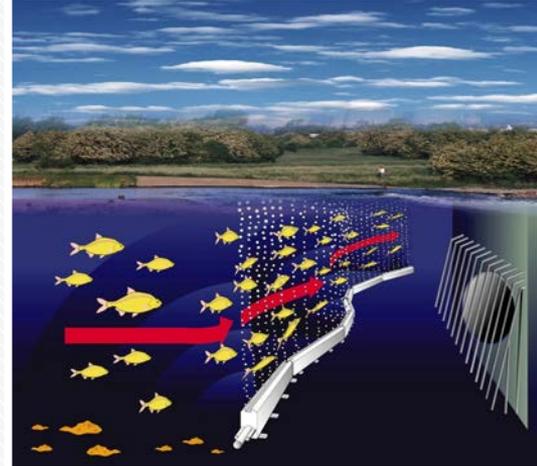
BAFF developed by FGS

System evaluated by University of Minnesota

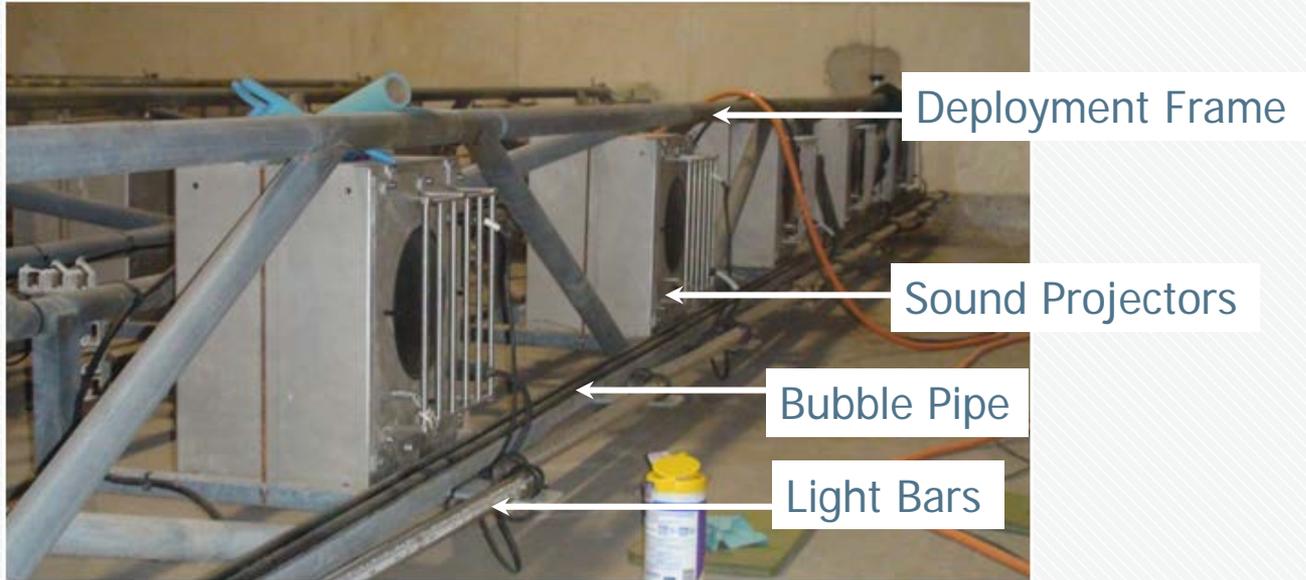
Uses proprietary sound signal that is introduced into water in a bubble curtain

Produces a confined 'wall of sound' enabling fish to be *guided* to a bypass or trap

Utilizes sound projectors, compressed air, and lights



PROPOSED BAFF SYSTEM AT BARKLEY LOCK & DAM





Questions?



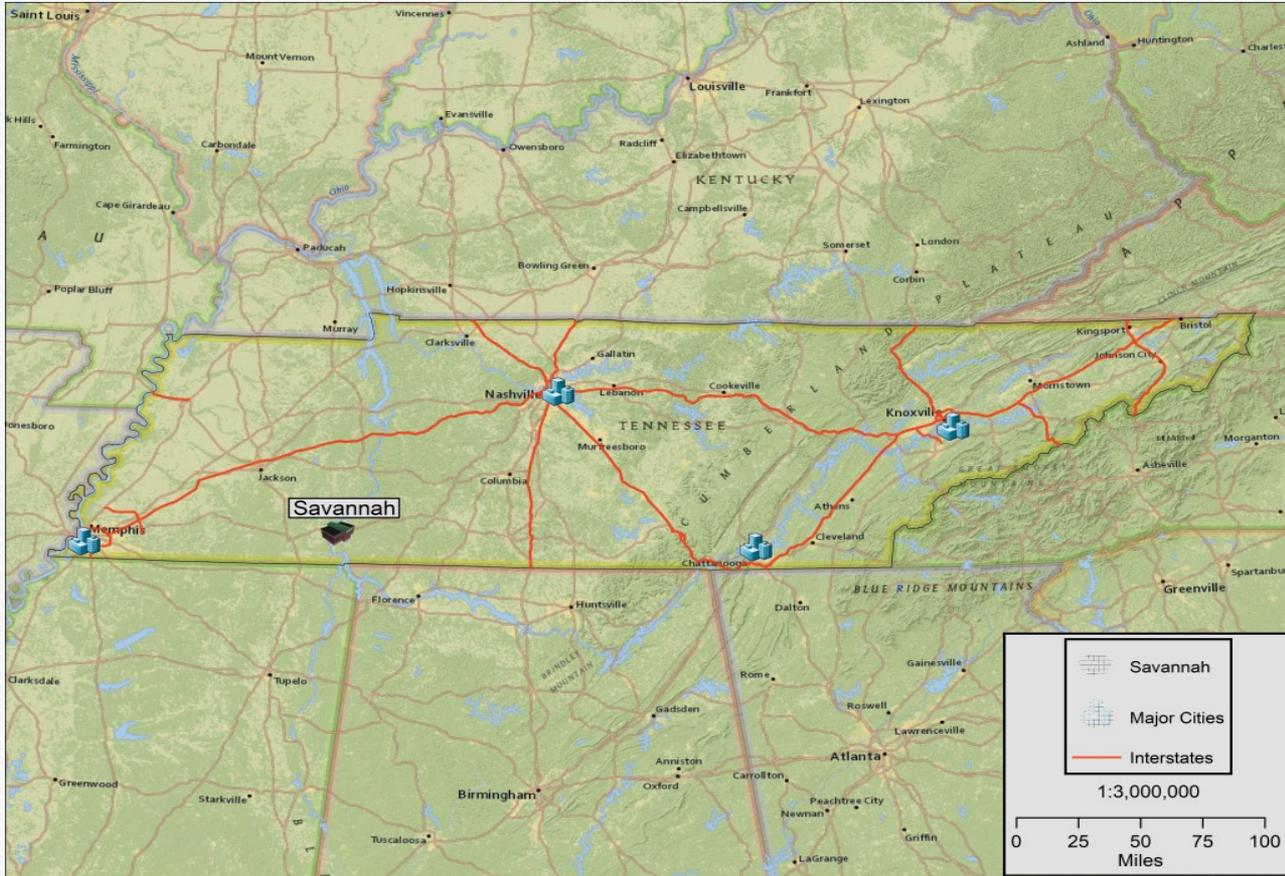
Savannah, TN Erosion Study

April 3, 2019

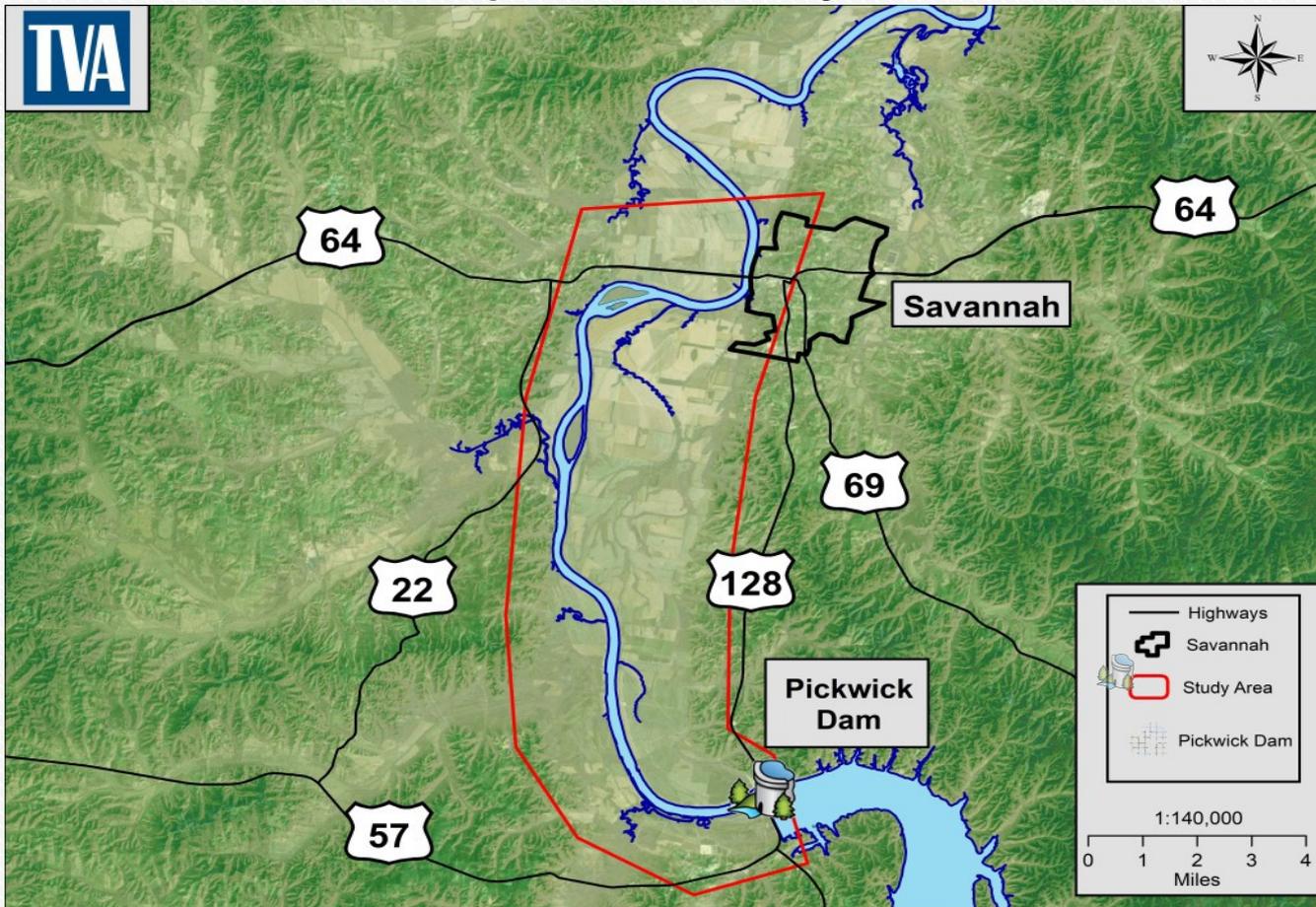
RRSC

Shannon O'Quinn

Project Location



Project Study Area



Tennessee Valley Farmers



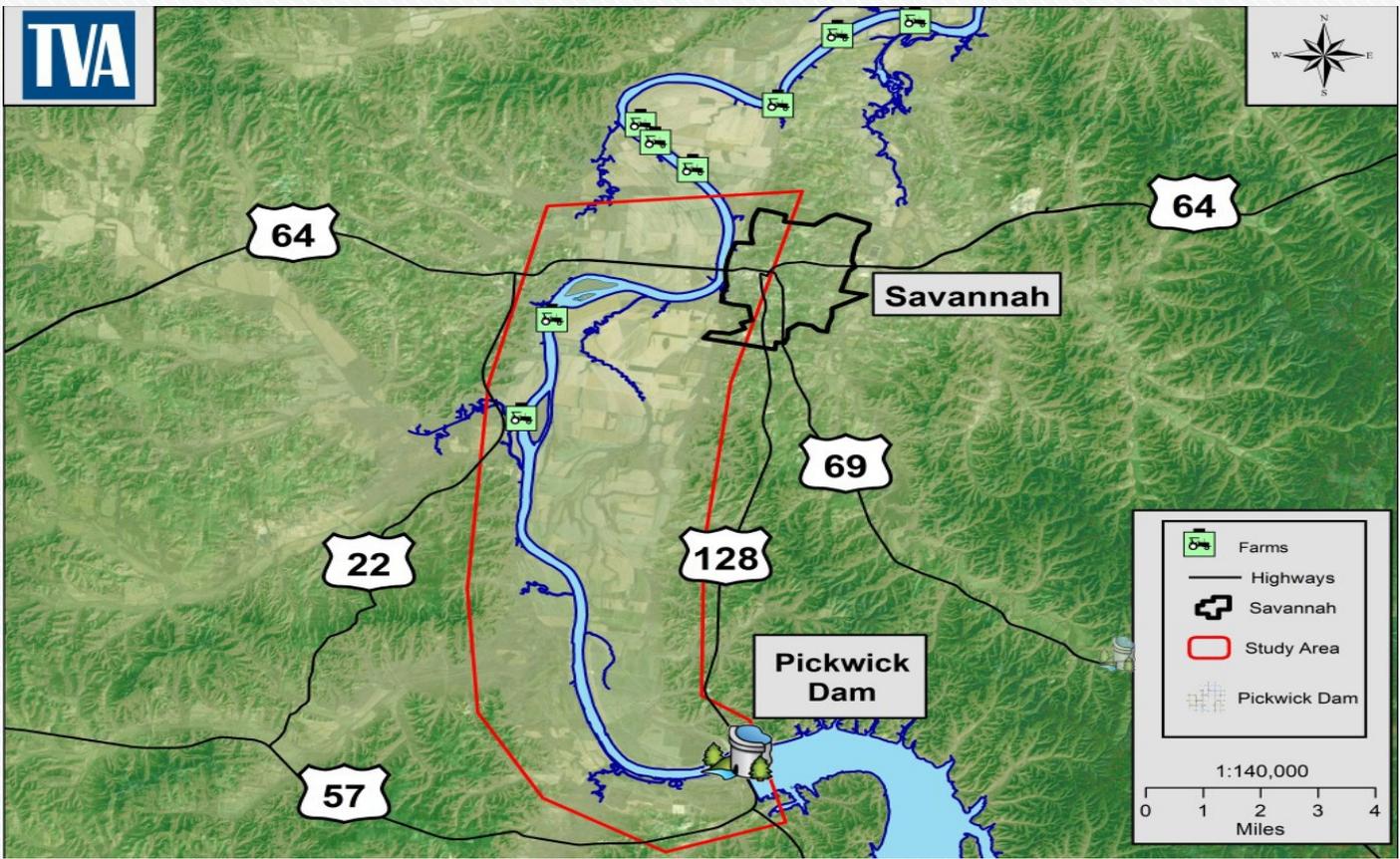
Shoreline Erosion on Tennessee River



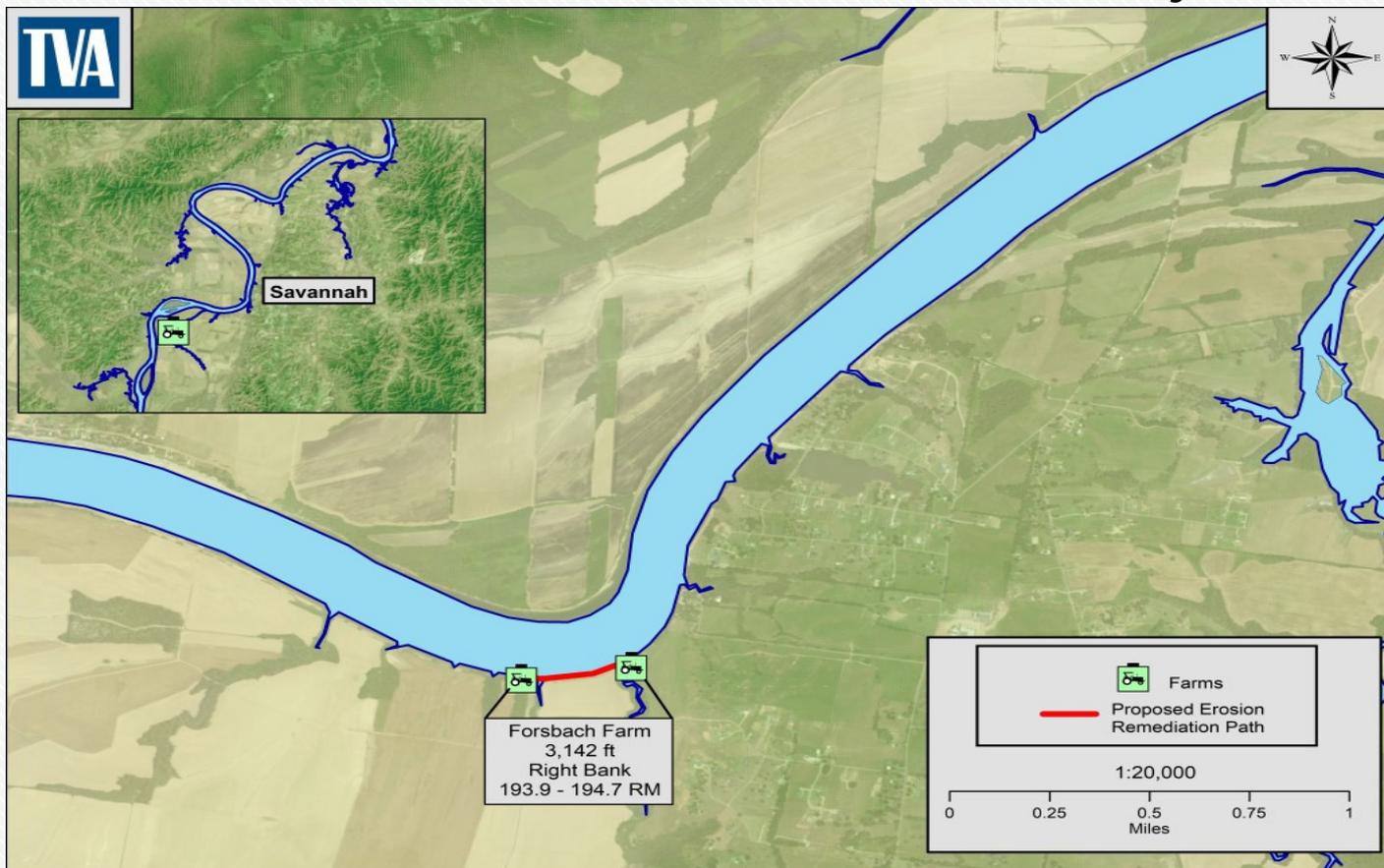
Shoreline Erosion on Tennessee River



Farms Located on Tennessee River



Demonstration Stabilization Project



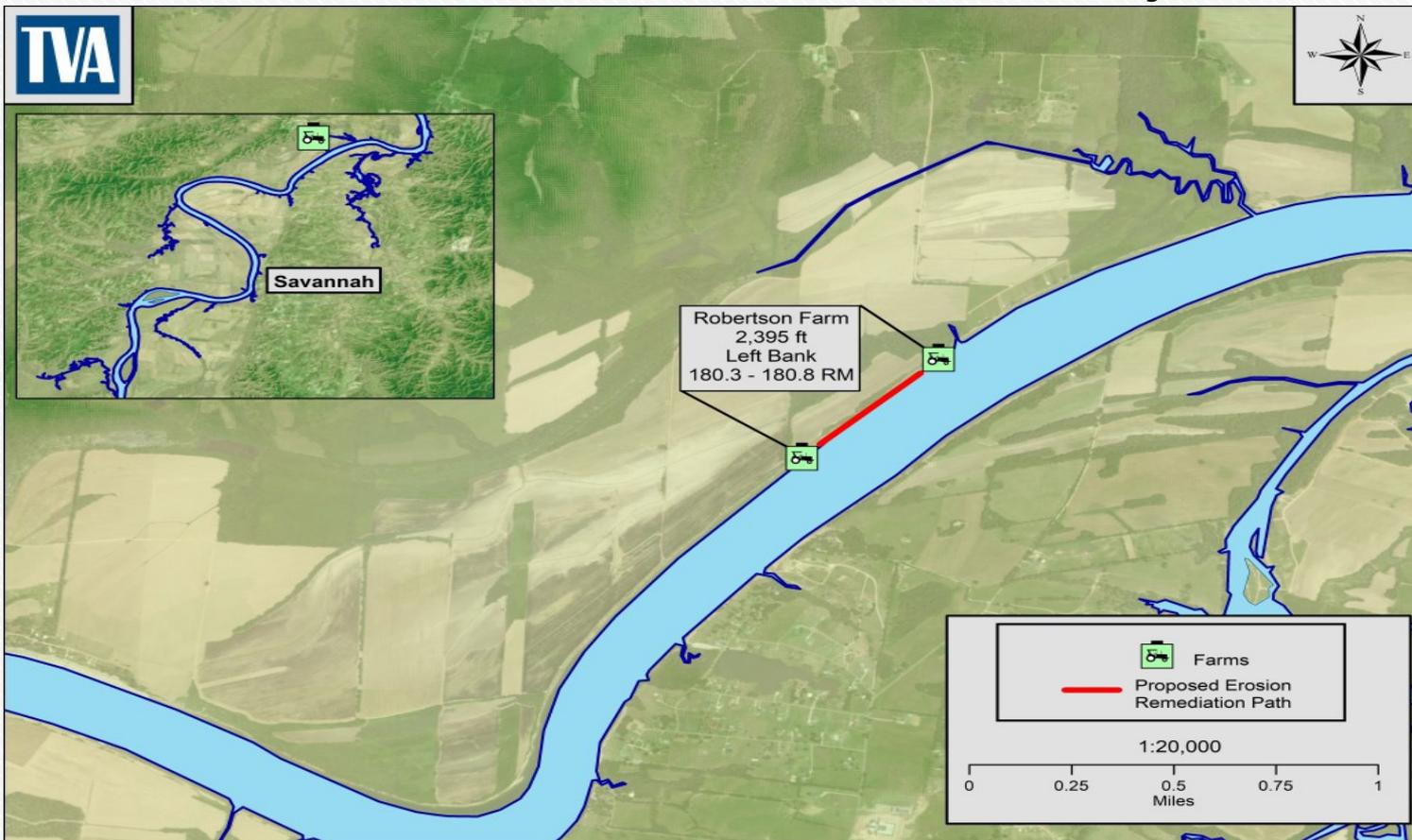
Forsbach Before



Forsbach After



Second Demonstration Project



Robertson Farm

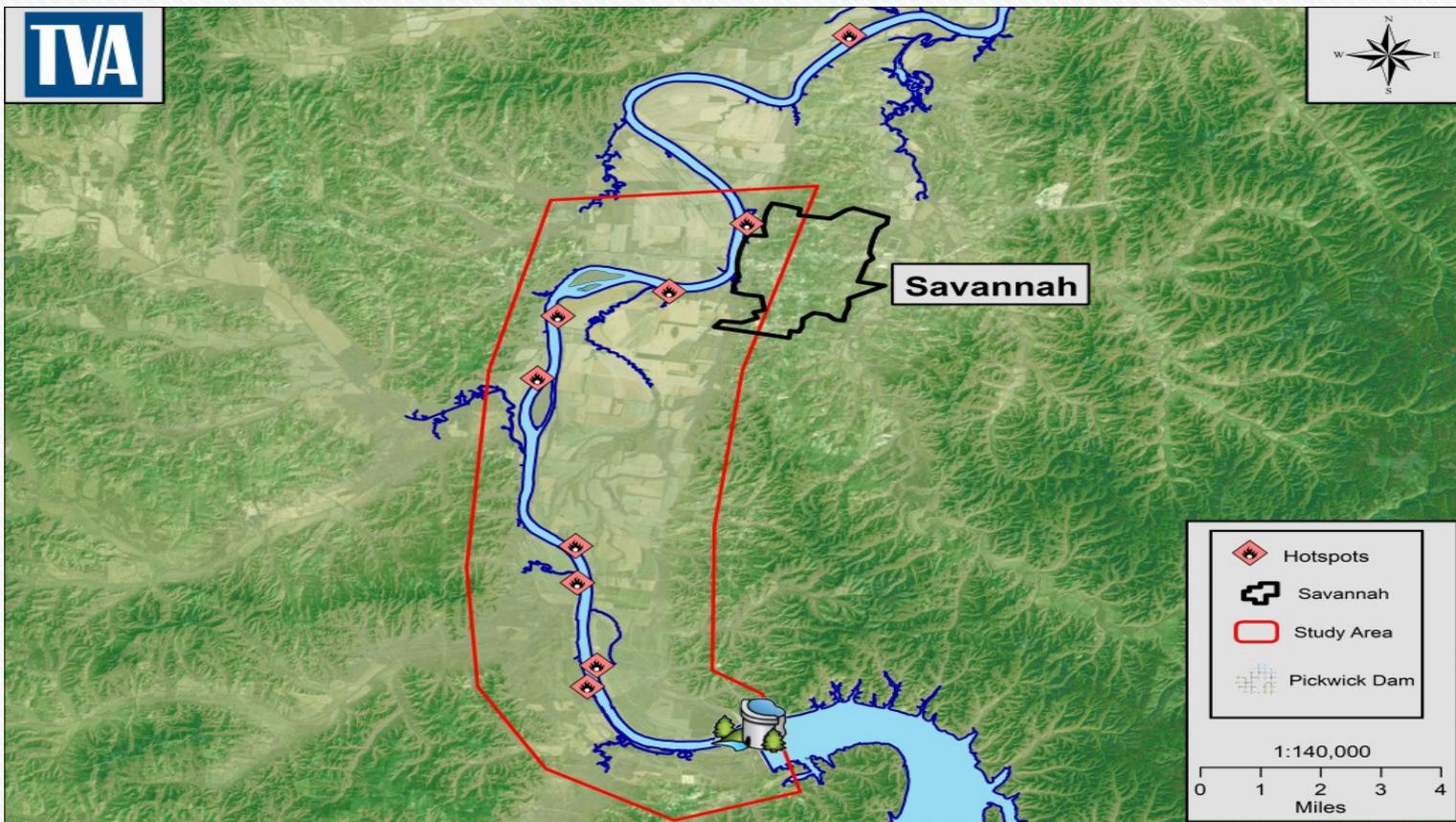


Erosion Study

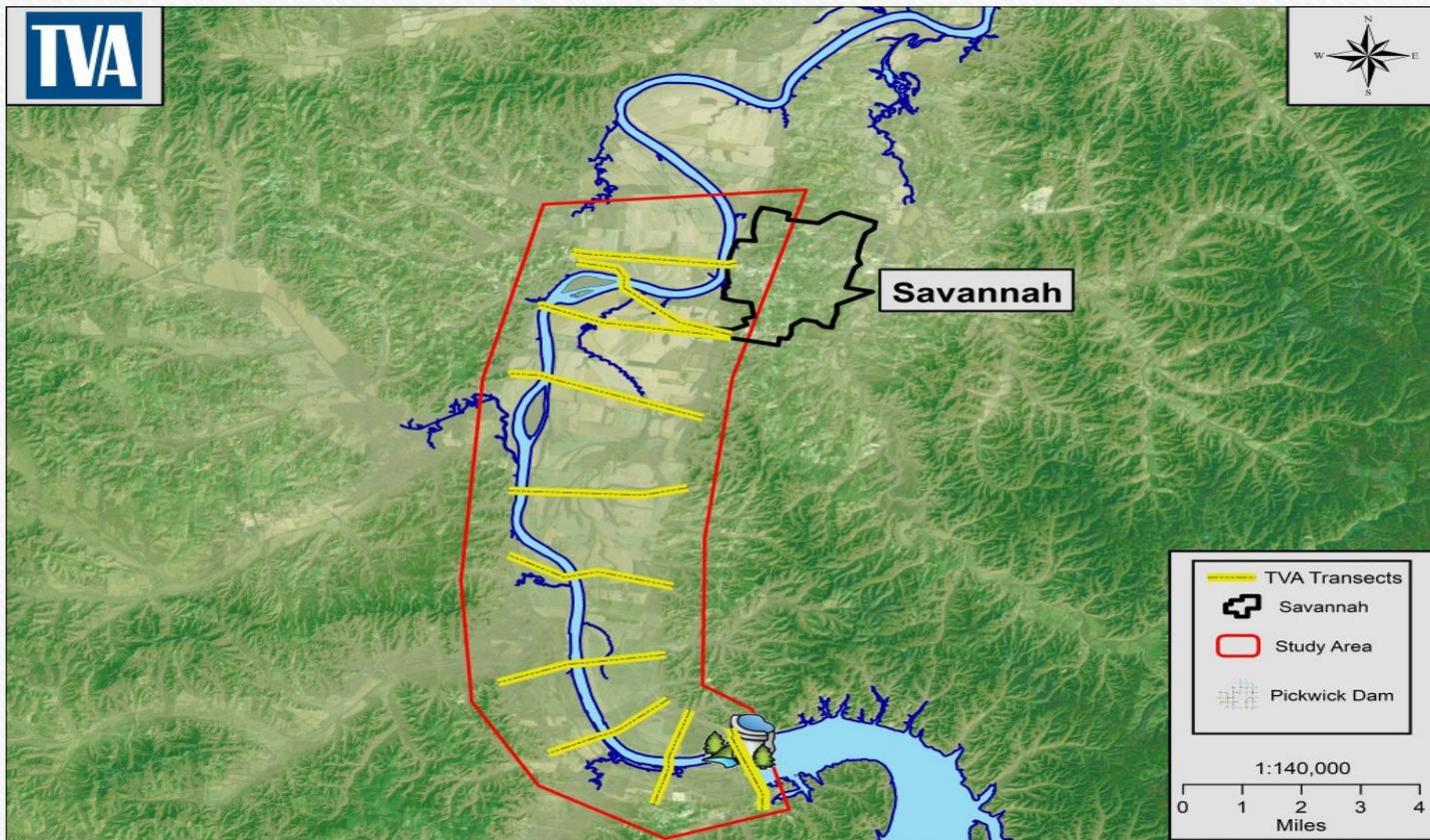
- Determine Extent of Soil Erosion
- Identify Hotspots and Collect Shoreline Characteristics
- Determine Soil Strength
- Suggest Best Stabilization Practices



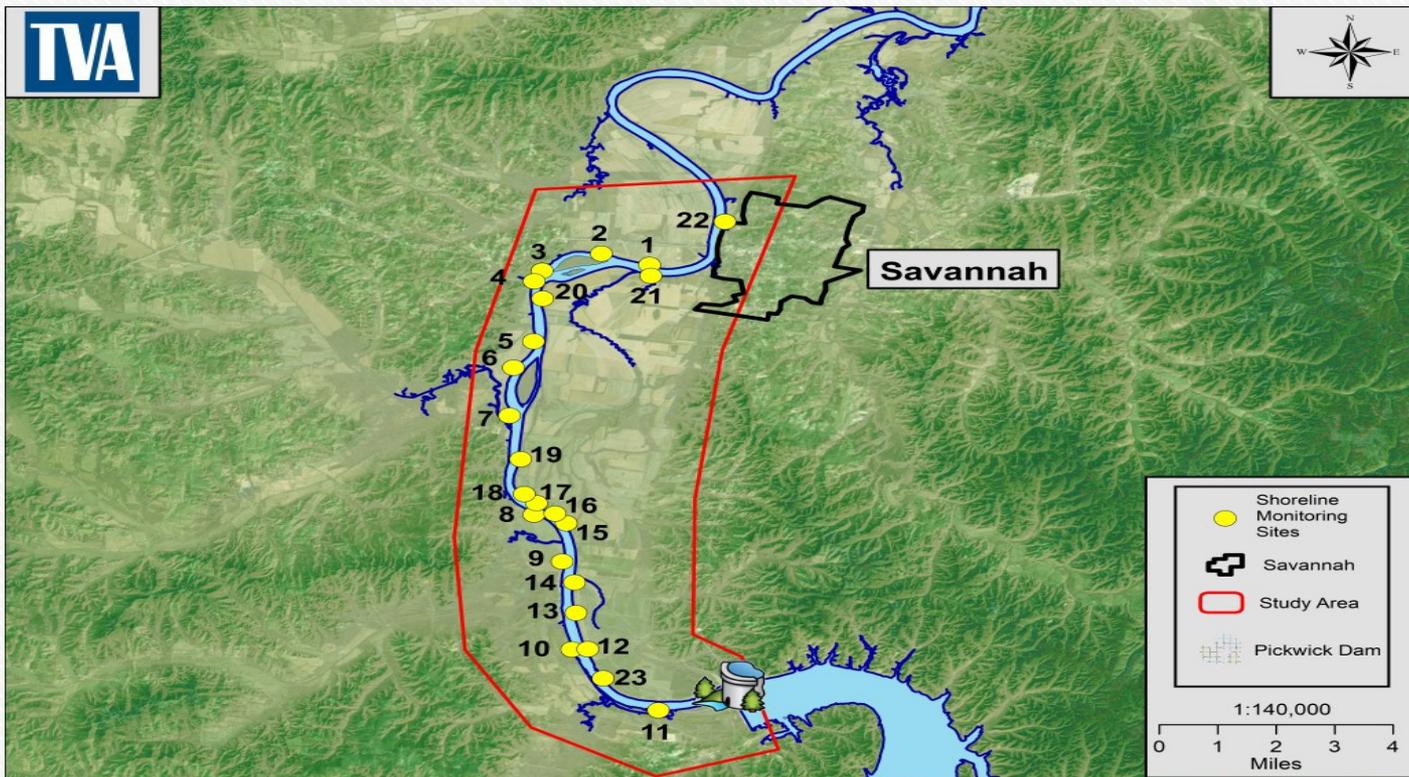
Shoreline Erosion Hotspots



TVA Transects



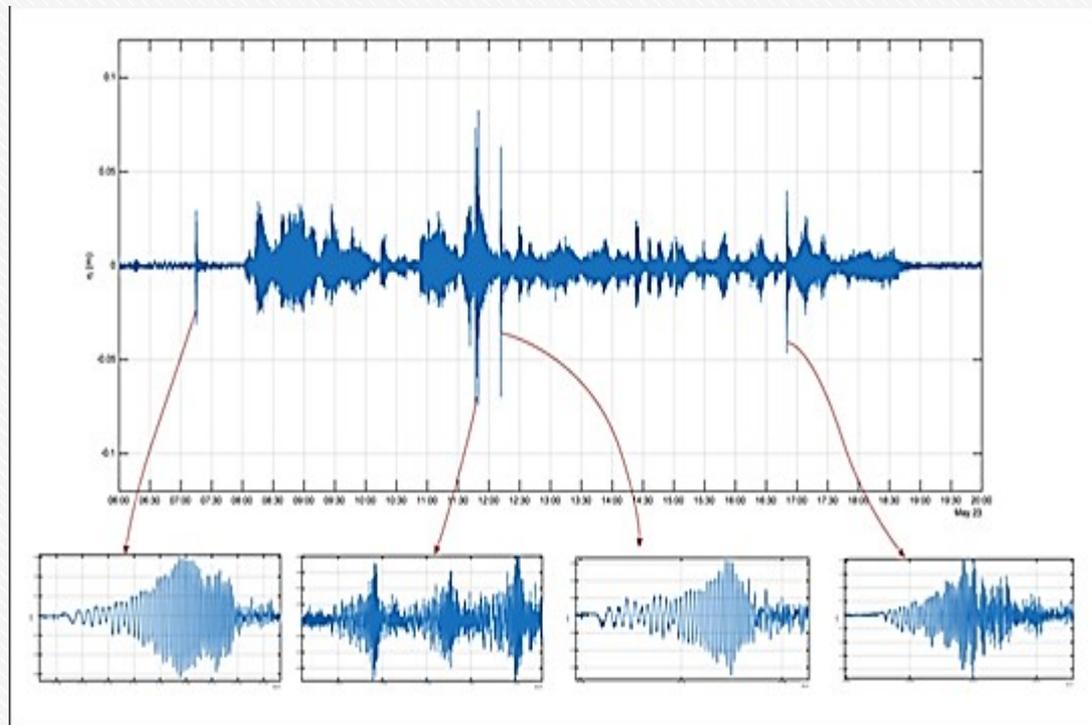
Shoreline Erosion Monitoring Sites



Soil Resistance to Erosion



Boat Wakes



Study Results

- Determine major influences on erosion
- Identify Most Cost Effective Stabilization Practices
- Recruit Additional Partners
- Leverage Additional Resources



Questions?

Wrap up and Adjourn

- Field trips bus location
- Breakfast at the hotel
- September meeting date
- Term 11



Lunch Break

Meeting Adjourned for Today

Meeting will reconvene tomorrow, 4/4, at 8:30 am

Day 2



Regional Resource Stewardship Council

April 4, 2019

Kentucky Dam Village Resort

A black and white photograph of the word "welcome" written in a cursive script on a wooden plank background. The photo is framed by a white border.

welcome

Agenda – April 4, 2019

- | | | |
|--------------|--|------------------|
| 8:30 | Welcome and Recap | Liz, Facilitator |
| 8:35 | Council Discussion / Form Advice | Council |
| 9:25 | Prepare for Public Comment Period | |
| 9:30 | Public Comment Session | Liz |
| 10:30 | Break | |
| 10:45 | Finalize Advice Statement | |
| 11:05 | Natural Resources Update | Bucky Edmondson |
| 11:15 | By-laws update | Amy |
| 11:30 | Wrap Up | Liz |
| 11:45 | | |
| 12:00 | Adjourn | Liz |
| | (lunch available for Council Members) | |

Day 1 Recap

- Navigation and Flood Control
- Invasive Species
- Erosion Control

Announcements

- Administrative By-laws updated
- Next meeting date and location
- 11th term – April 2020
- Meeting reimbursements



RRSC Discussion



Break

Prepare for Public Comment Period

Public Comment Period

- **Public participation is appreciated**
- **This is a listening session; responses are typically not provided**





TVA Natural Resources Update

April 4, 2019

Bucky Edmondson, Director of Natural Resources

Natural Resources Focus Areas

**Reservoir
Lands
Planning**

**Section 26a
& Land Use
Agreements**

**Public Land
Protection**

**Land &
Habitat
Stewardship**

**Nuisance &
Invasive
Species
Management**

**Cultural
Resource
Management**

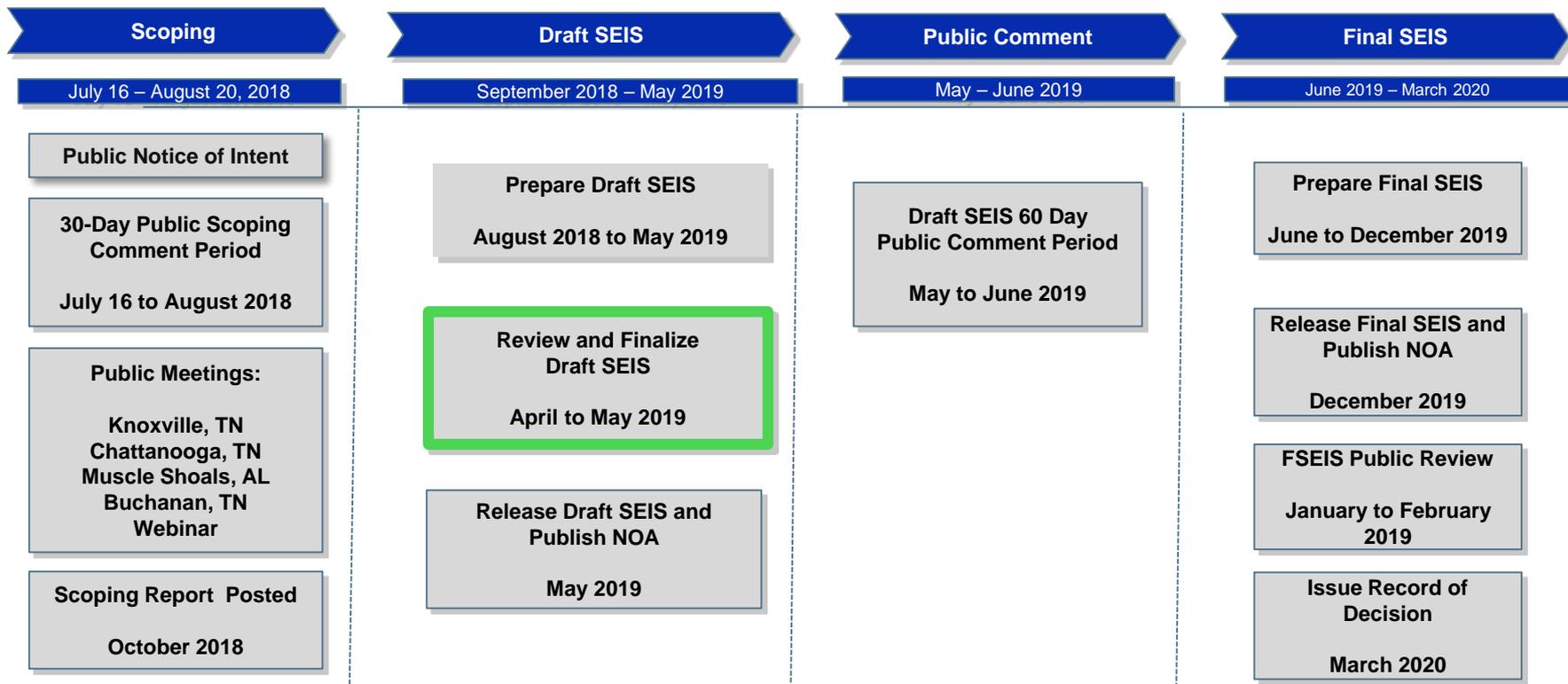
**Water
Resource
Stewardship**

Recreation

Ecotourism

**Public
Outreach &
Information**

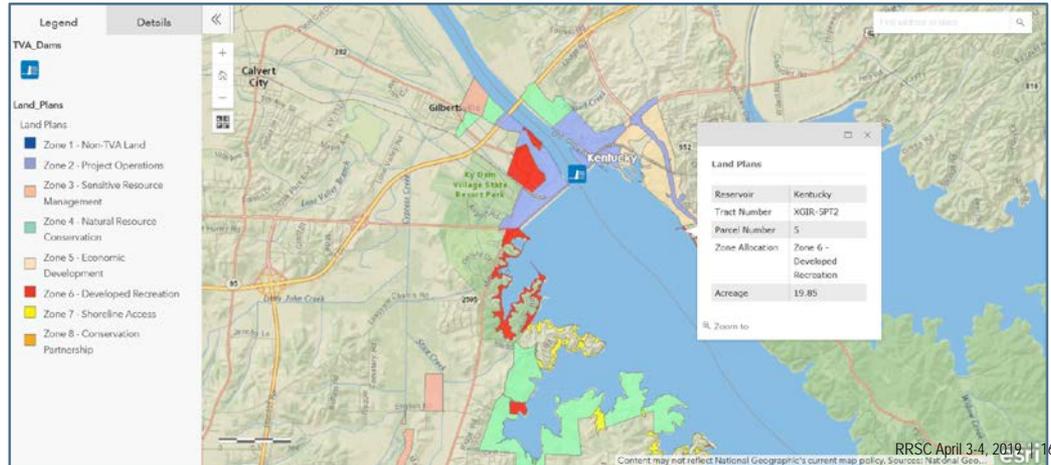
2020 NRP Update Schedule



Please note the schedule is subject to change.

Reservoir Lands Planning

- Watts Bar Reservoir Land Plan Amendment - due early summer
- Tellico Reservoir Land Management Plan - begins in May 2019
- Reservoir Land Planning Viewer Map <https://www.tva.gov/landplans>
 - Interactive land planning zone map with address search box and optional aerial imagery background



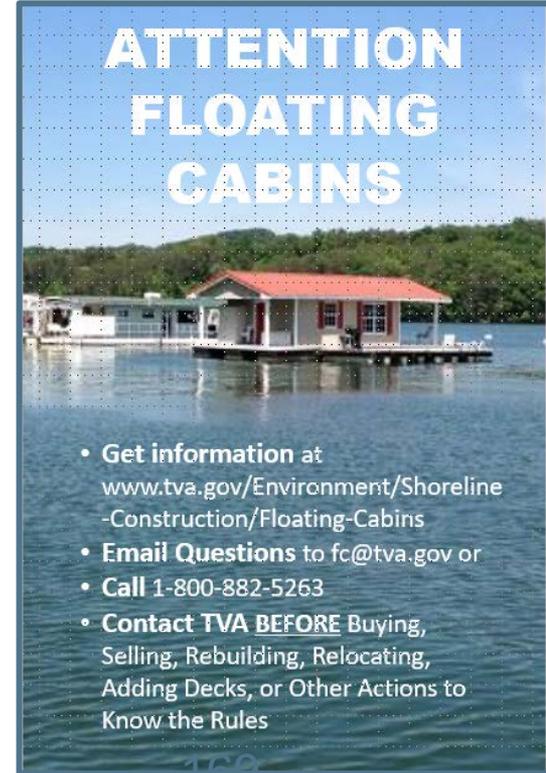
Floating Cabin Program

- Phase 1 Rules effective October 1, 2018
- Phase 2 Rules target Summer 2019
 - Electrical, wastewater, flotation, mooring, & compliance fees
 - Permitting, rebuilds, transfers, locations, schedule
- Hardspots for Rules
 - Compliance Fee Amount
 - Enclosing Open Space
 - Attachments



Floating Cabin Program

- Stakeholder Advisory group
- Engagement and Information
 - Marina visits
 - One on one conversations
 - Updated web pages
 - Informational posters
 - Upcoming summer interactions

A poster with a blue background and a grid pattern. The text 'ATTENTION FLOATING CABINS' is written in large, white, bold, sans-serif capital letters at the top. Below the text is a photograph of a white floating cabin with a red roof on a body of water. At the bottom of the poster, there is a list of contact information in white text.

**ATTENTION
FLOATING
CABINS**

- **Get information at**
www.tva.gov/Environment/Shoreline-Construction/Floating-Cabins
- **Email Questions** to fc@tva.gov or
- **Call 1-800-882-5263**
- **Contact TVA BEFORE** Buying, Selling, Rebuilding, Relocating, Adding Decks, or Other Actions to Know the Rules



Flood Damage Assessments

Began assessing TVA properties as soon as it was safe

- Focused on frequently visited areas
 - Campgrounds on Dam Reservations
 - Day use areas
 - Launching ramps
 - Courtesy piers below the dams
 - Dewatering areas
 - Trails
- More remote TVA public lands need assessment



Flood Damage Impacts

- Anticipate over \$1.2 million dollars to repair flood damaged assets
- Recovery will likely take several years
- High impact areas are located in the West Region in the tailwater areas of Wheeler, Wilson, Pickwick and Kentucky



Community Engagement

- 18 Reservoir and Community Cleanups with 16 communities
- 300+ Outreach events in 63 communities
- Bassmaster Classic fishing tournament with record attendance
- TVA Science Kids – World Water Monitoring for more than 6,000 children



Community Engagement

Upcoming activities include

- Hidden Rivers film viewing
- National Geographic Tennessee River Valley film launch
- Volunteer events (Earth Day, Trails Day and National Public Lands Day)
- 41 more cleanups planned



Community Engagement

Upcoming activities include

- Gunterville HydroFest and fishing tournaments with TVA's mobile aquarium
- Environmental education programs focused on water monitoring
- 300 more outreach events and educational activities planned



My Lake Guntersville Campaign

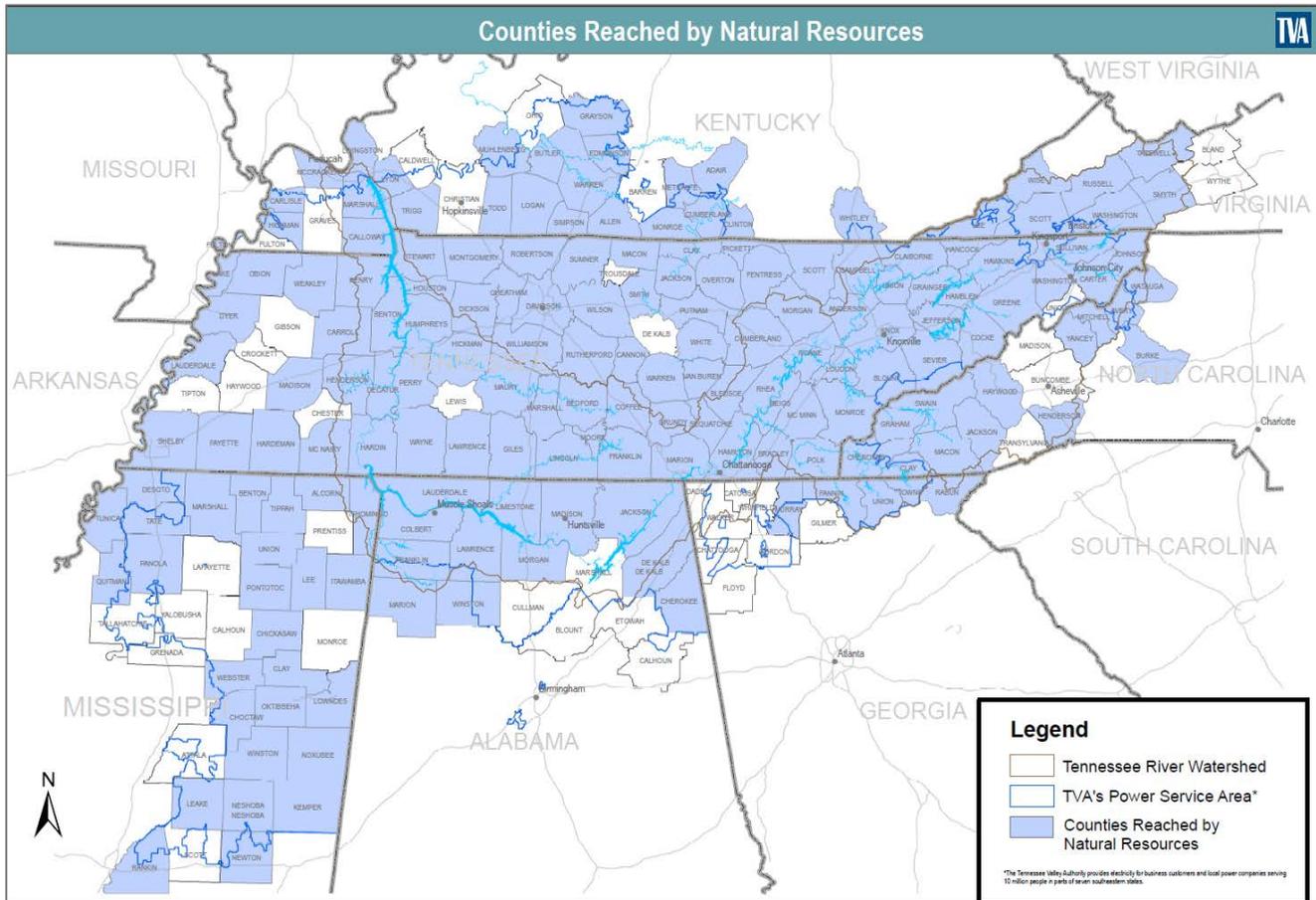
The W.E.T. Foundation and its partners support the protection and preservation of Lake Guntersville.

- Raise awareness and money to address threats to healthy and safe lake
- Manage invasive species including plants, zebra mussels and Asian Carp
- Halt island erosion, water contamination and trash

Ongoing social media campaign that will begin mid-April and run throughout the year as funding permits



Counties Reached Through Stewardship Efforts





Questions



Finalize Advice Statement



Wrap Up and Adjourn



Thank you and please travel safely!