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## **AGENDA**

**Lower Cape Fear Water & Sewer Authority**  
**1107 New Pointe Boulevard, Suite # 17, Leland, North Carolina**  
**9:00 a.m. – Regular Monthly Board Meeting**  
**October 12th, 2020**

**MEETING CALL TO ORDER:** Chairman Milliken

**INVOCATION**

**PLEDGE OF ALLEGIANCE**

### **APPROVAL OF CONSENT AGENDA**

- C1** - Minutes of Regular Board Meeting September 14, 2020
- C2** - Kings Bluff Monthly Operations and Maintenance Report
- C3** - Bladen Bluffs Monthly Operations and Maintenance Reports
- C4** - Resolution Approving Destruction of Specified Public Records for Fiscal Years of 2002-2003 Through 2019-2020 in Accordance with the Water & Sewer Authorities and Sanitary Districts Records Retention and Disposition Schedule.

### **PRESENTATION**

Julie DeMeester with The Nature Conservancy will discuss the algae sampling at Kings Bluff.

### **OLD BUSINESS**

**OB-1** Proposed Amendment to the Brunswick County Operation and Maintenance Agreement

### **NEW BUSINESS**

- NB1** - Resolution Committing the Authority to Working with Wilmington Business Development and Pender County to Investigate the Possibility of Working on a Joint Project to Pretreat Water in the Pender County Industrial Park
- NB2** – Initial Rate Review Report to the Board

### **ENGINEER'S COMMENTS**

### **ATTORNEY COMMENTS**

### **EXECUTIVE DIRECTOR REPORT**

- EDR1** – Comments on Customers' Water Usage and Raw Water Revenue for Month Ending September 30th, 2020
- EDR2**- Fuquay Varina's initial scoping for inter basin transfer

*Lower Cape Fear Water & Sewer Authority*

1107 New Pointe Blvd, Suite 17  
Leland, North Carolina 28451



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*Water is Our Business*

## **AGENDA**

**Regular Monthly Board Meeting - Lower Cape Fear Water & Sewer Authority**

**October 12, 2020**

**Page 2**

**CLOSED SESSION -Motion to go into closed session to preserve the Authority's attorney client privilege.**

**PUBLIC COMMENT**

**ADJOURNMENT**

*The next board meeting of the Lower Cape Fear Water & Sewer Authority is scheduled for Monday, November 9<sup>th</sup> at 9:00 a.m. in the Authority's office located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina.*

## **AGENDA ITEM**

To: CHAIRMAN MILLIKEN AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: October 12, 2020

Re: Consent Agenda

Reviewed and Approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

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Please find enclosed, items of a routine nature for consideration and approval by the Board of Directors with one motion. However, that does not preclude a board member from selecting an item to be voted upon individually, if so desired.

**C1** - Minutes of Regular Board Meeting September 14, 2020

**C2** - Kings Bluff Monthly Operations and Maintenance Report

**C3** - Bladen Bluffs Monthly Operations and Maintenance Reports

**C4**- Resolution Approving Destruction of Specified Public Records for Fiscal Years of 2002-2003 Through 2019-2020 in Accordance with the Water & Sewer Authorities and Sanitary Districts Records Retention and Disposition Schedule.

**Action Requested:** Motion to approve/disapprove Consent Agenda

Lower Cape Fear Water & Sewer Authority  
Regular Board Meeting Minutes

September 14, 2020

Chairman Milliken called to order the Authority meeting scheduled on September 14, 2020 at 9:00 a.m. and welcomed everyone present. The meeting was held at the Authority's office located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina. Director Burroughs gave the invocation.

**Roll Call by Chairman Milliken:**

**Present:** Norwood Blanchard, Trent Burroughs, Patrick DeVane, Wayne Edge, Harry Knight, Patricia Kusek, Al Leonard, William Milliken, Jackie Newton, Charlie Rivenbark, William Sue, and Frank Williams

**Present by Internet or Telephone:** Bill Saffo, Phil Norris

**Absent:** none

**Staff:** Tim H. Holloman, Executive Director; Matthew Nichols, General Counsel; Tony Boahn P.E., McKim & Creed, and Allison Covington, Financial Administration Assistant

**Guests Present:** Anthony Colon, Pender County Utilities

**PLEDGE OF ALLEGIANCE:** Director Rivenbark led the Pledge of Allegiance.

**ADMINISTER OATH OF OFFICE:** Patrick DeVane, Bladen County Representative was sworn in by Chairman Al Milliken.

**APPROVAL OF CONSENT AGENDA**

C1 - Minutes of Regular Board August 10, 2020

C2 - Kings Bluff Monthly Operations and Maintenance Report

C3 - Bladen Bluffs Monthly Operations and Maintenance Reports

**Motion:** Director Blanchard **MOVED**; seconded by Director Newton, approval of the Consent Agenda Items as presented. Upon roll call vote, the **MOTION CARRIED**.

	<u>For</u>	<u>Against</u>	<u>Abstained</u>	<u>Absent</u>
Norwood Blanchard	X			
Trent Burroughs	X			
Wayne Edge	X			
Patrick DeVane	X			
Harry Knight	X			
Patricia Kusek	X			
Al Leonard	X			
Jackie Newton	X			
Phil Norris	X			
Al Milliken	X			
Charlie Rivenbark	X			
Bill Saffo	X			
Bill Sue	X			
Frank Williams	X			
	14	0	0	0

**OLD BUSINESS**

None

**NEW BUSINESS****NB1 - Easement Research Pertaining to the Remaining 10-mile Segment of the Kings Bluff 48-inch Raw Water Main Right-of-Way**

- A) **A Resolution of Lower Cape Fear Water and Sewer Authority Exempting Lower Cape Fear Water and Sewer Authority from the Provisions of N.C.G.S § 143-64.31**
- B) **Proposal for Professional Consulting Engineering Service for Boundary Research for the Remaining 10-mile Segment of Kings Bluff 48" Raw Water Main Right-of-Way**
- C) **Fiscal Year 2020 - 2021 Budget Amendment #2**

Executive Director reported that the remaining 10 miles of LCFWASA right-of-way is not being addressed during the construction of the current Kings Bluff 48" Raw Water Main Right-of-Way. The Resolution is just for investigation of boundaries, provision to award professional engineering contract, and a budget amendment to cover the contract expenses.

**Motion:** Director Burroughs **MOVED**; seconded by Director Sue, approval of the *Easement Research Pertaining to the Remaining 10-mile Segment of the Kings Bluff 48-inch Raw Water Main Right-of-Way*, the *Resolution of Lower Cape Fear Water and Sewer Authority (LCFWASA) Exempting LCFWASA from the Provision*, *Proposal for Professional Consulting Engineering Service for Boundary Research for the Remaining 10-mile Segment of Kings Bluff 48" Raw Water Main Right-of-Way*, and *Fiscal Year 2020 - 2021 Budget Amendment #2* as presented. Upon roll call vote, the **MOTION CARRIED**.

	<u>For</u>	<u>Against</u>	<u>Abstained</u>	<u>Absent</u>
Norwood Blanchard	X			
Trent Burroughs	X			
Wayne Edge	X			
Patrick DeVane	X			
Harry Knight	X			
Patricia Kusek	X			
Al Leonard	X			
Jackie Newton	X			
Phil Norris	X			
Al Milliken	X			
Charlie Rivenbark	X			
Bill Saffo	X			
Bill Sue	X			
Frank Williams	X			
	14	0	0	0

**NB2 – Proposed Amendment to the Brunswick County Operation and Maintenance Agreement**

Executive Director reported that once our property and liability coverage insurance carrier was switched, they had concerns on how the Brunswick County Operations and Management agreement were written and wanted the wording to align with the way the Smithfield Foods agreement was written. This proposal is to replace some technical wording changes and added indemnification. The proposal will be taken to the Brunswick County Board at their next scheduled meeting on September 21<sup>st</sup>. Attorney Matt Nichols stated he reviewed the changes Friday September 11<sup>th</sup>, agreed with them, but noted the Brunswick County Attorney's office has not seen yet.

Director Newton motioned that the proposal come before the board after the appropriate legal review has been completed.

**Motion:** Director Newton **MOVED**; seconded by Director Williams, approval of the *Amendment to the Brunswick County Operation and Maintenance Agreement* be tabled. Upon roll call vote, the **MOTION CARRIED**.

	<u>For</u>	<u>Against</u>	<u>Abstained</u>	<u>Absent</u>
Norwood Blanchard	x			
Trent Burroughs	x			
Wayne Edge	x			
Patrick DeVane	x			
Harry Knight	x			
Patricia Kusek	x			
Al Leonard	x			
Jackie Newton	x			
Phil Norris	x			
Al Milliken	x			
Charlie Rivenbark	x			
Bill Saffo	x			
Bill Sue	x			
Frank Williams	x			
	14	0	0	0

#### **EXECUTIVE DIRECTOR REPORT**

##### **EDR1 - Customers' Water Usage and Raw Water Revenue Report for Month Ending August 31, 2020**

Executive Director Holloman reported that during the Month of August 2020, Pender County CPFUA's usage is below projection for the month. He has spoken to CFPWA and they are still running at low capacity on their pumps. They are expected to use LCFWASA water more starting the end of September. He states that overall in the year, we are below revenue projections, but have cut out Capital Expenditures for this year, which include Kings Bluff truck and Variable Frequency Drive.

##### **EDR2 – Status Report on the Bladen Bluff Regional Surface Water Plant Cape Fear River Bank Restoration Project**

Executive Director Holloman reported that the project is complete. Final payout is being made, and there are no cost overruns. The final FEMA submittal will be in October and they will complete their final inspection. He stated that FEMA usually withholds 5% until they finalize their review.

##### **EDR3– The Finance Committee Review of Rates in Preparation for the Coming Year and the First Report at the October Board Meeting**

Executive Director Holloman reported that depending on the recommendation by Finance Committee meeting, there may be information regarding a potential rate increase to support funding of the Authority's capital improvement plan submitted to the Board in October.

#### **CLOSED SESSION**

##### **CS1- Closed Session in Accordance with NCGS§143-318.11(3)(i) Attorney Client Privilege to Review Unauthorized Encroachment on Right-of-Way**

Chairman Milliken requested a motion for the Board to enter closed session in accordance NCGS§143-318.11(3)(i) to discuss potential action regarding unauthorized encroachment on the LCFWASA right-of-way.

**Motion:** Director Blanchard **MOVED**; seconded by Director Rivenbark, to enter closed session in accordance with NCGS§143-318.11(3)(i) for stated purposes of discussion. Upon roll call vote, the **MOTION CARRIED**.

	<u>For</u>	<u>Against</u>	<u>Abstained</u>	<u>Absent</u>
Norwood Blanchard	x			
Trent Burroughs	x			
Wayne Edge	x			
Patrick DeVane	x			
Harry Knight	x			
Patricia Kusek	x			
Al Leonard	x			
Jackie Newton	x			
Phil Norris	x			
Al Milliken	x			
Charlie Rivenbark	x			
Bill Saffo	x			
Bill Sue	x			
Frank Williams	x			
	14	0	0	0

At 9:55 a.m. the Board went into closed session. At 10:10 a.m. the Board returned to open session. No action was taken.

#### **DIRECTOR'S COMMENTS AND/OR FUTURE AGENDA ITEMS**

None

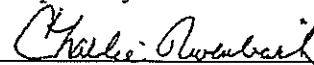
#### **PUBLIC COMMENT**

Anthony Colon, Assistant Utilities Director for Pender County utilities spoke of the struggle to keep up with the consumer demand this summer, and how the department heads got together to create a plan to resolve the issue. He stated McKim & Creed and Pender County Utilities are working together to build ground water wells on the eastern side of the county. Currently the well at Annex is pumping about 350 gallons per minute for 12 hours. Pender County Utilities has repaired about 14 hydrants, and maintenance on multiple water mains. The second well should be up and running in November or December and generate about 250-300 gallons per minute. The new well along with the water source in Wallace should produce about 6 million gallons of water a day. He also stated that there is funding in place to build two more wells on the eastern side of the county five years from now. On the west side of the county there is new development of over 150 homes, which will create a need for the maximum 4 million gallons of water from the water plant, he and Executive Director Holloman have previously discussed. A new home development off Highway 117 is set to build 700 homes. The rise in new developments has Pender County Utilities ordering and installing about 300 meters every other month.

#### **ADJOURNMENT**

There being no further business, Chairman Milliken adjourned the meeting at 10:10 a.m.

Respectfully Submitted:



Charlie Rivenbark, Secretary

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COUNTY OF BRUNSWICK  
PUBLIC UTILITIES DEPARTMENT  
Kings Bluff Pump Station



246 Private Road  
Riegelwood, NC 28456  
(910) 655-4799 Office  
(910) 655-4798 FAX

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TO: Tim Holloman

FROM: Jack Hogan

DATE: 10/5/2020

SUBJECT: Monthly maintenance report for September 2020

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Mr. Holloman,

The Maintenance and Operations of the king's bluff facility for the month of September was performed as prescribed in the station SOP'S and other items are as follows.

The diesel drive booster pumps along with the standby SCADA generator located at the raw tank and the SCADA generator located at INVISTA / CFPUA vaults off HWY 421 were ran and tested weekly and verified standby ready.

KB personnel completed all locates issued by the 811 system.

KB personnel are currently working on the decking board replacement of the walkway to river and other items in the McKim & Creed yearly inspection report.

Brunswick I&C dept. replaced fuse on the # 4 VFD that failed.

Brunswick I&C dept. changed out flow meter and pressure transmitter at Pender Co./ Authority vault due to some meter reading differences presented by Pender Co. treatment plant.

KB personnel replaced concrete pad base around the valve operator for new wet well intake.

KB personnel repaired sink hole around the 4160V cabinet with concrete flow fill to seal it up.

KB personnel repaired leaking potable water line at station.

KB personnel completed yearly PM on the Val Matic actuator valves located on the discharge line of 1, 4 & 5 pumps.



KB personnel completed repairs on the new side Halon Fluid Strainer discharge line.

KB personnel repaired coolant leak on # 2 EMD generator.

Contractors:

LJ'S Lawn and Right of way services completed yearly mowing of the Station ditch and hill behind the station.

NEWCOMB completed quarterly PM on the # 1 & 3 HVAC units located at the VFD building.

Thank you,  
Jack Hogan



To: Tim Holloman - LCFWASA

From: James Kern – Bladen Bluffs SWTP ORC

Date: 10/2/20

Subject: September 2020 Operations

During the month of September, Bladen Bluffs SWTP operated a total of 22 days, treating 62.162 million gallons of water.

We used:

44,721 lbs. of aluminum sulfate (Alum)

13,096 lbs. of sodium hydroxide (Caustic)

1,896 lbs. of sodium hypochlorite (3,807 gallons of 6% Chlorine Bleach)

**James Kern**  
**Water Treatment Plant**  
**Supervisor**

**Smithfield.**  
*Good food. Responsibly.®*

(910) 862-3114  
(910) 862-3146  
(719) 761-0026 mobile  
[jkern@smithfield.com](mailto:jkern@smithfield.com)

Bladen Bluffs Surface Water Treatment  
Plant  
17014 Highway 87 West  
Tar Heel, NC 28392  
[www.smithfieldfoods.com](http://www.smithfieldfoods.com)

## Monthly Operating Reports (MORs) Summary

(No user data entry – all values are auto-populated.)

Year: 2020 PWS Name: Bladen Bluffs Water System PWSID#: NC5009012  
 Month: September Facility Name: Bladen Bluff

### Combined Filter Effluent (CFE) Turbidity

Samples exceeding 1 NTU (count): <u>0</u>	Number of samples required: <u>113</u>
Samples exceeding .3 NTU (count): <u>0</u>	Number of samples taken: <u>113</u>
Samples exceeding .3 NTU (pct): <u>0.0%</u>	Highest single turbidity reading NTU: <u>0.105</u>
	Monthly average turbidity NTU: <u>0.049</u>

### Individual Filter Effluent (IFE) Turbidity

1) Was each filter <u>continuously</u> monitored for turbidity?	Yes	<u>X</u>	No	
2) Was each filter's monitoring results <u>recorded every 15 minutes</u> ?	Yes	<u>X</u>	No	
3) Was there a failure of the continuous turbidity monitoring equipment?	Yes		No	<u>X</u>
4) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements?	Yes		No	<u>X</u>
5) Was any individual filter turbidity level > 0.5 NTU in two consecutive measurements at the end of 4 hours of operation after the filter has been backwashed or otherwise taken offline?	Yes		No	<u>X</u>
6) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements in each 3 consecutive months?	Yes		No	<u>X</u>
7) Was any individual filter turbidity level > 2.0 NTU in two consecutive measurements in 2 consecutive months?	Yes		No	<u>X</u>

### Entry Point Residual Disinfectant Concentration (EPRD)

Disinfectant Used <u>Chlorine</u>	Number of samples required <u>113</u>
Minimum EPRD concentration <u>0.4400</u>	Number of samples taken <u>113</u>

### Distribution Residual Disinfectant Concentration

Number of samples under 0.010 mg/L (without any detectable) excluding where HPC is  $\leq$  500/mL 0

### Contact Time (CT) Ratio

Lowest CT ratio reading <u>15.17</u>	Number of CT ratios required <u>22</u>
Number of CT ratios below 1.0 <u>0</u>	Number of CT ratios calculated <u>22</u>

### Remarks From General Info Worksheet

☒ By checking this box, the ORC certifies that the requirements of 15A NCAC 18C .1301 "General Requirements", .1302 "Tests, Forms, and Reporting", and .1303 "Facility Oversight" have been met for the month of September, 2020 and that records documenting compliance with this rule are maintained on the premises and available for inspection upon request.

NCDENR/DEH  
PWSS  
Version: V02.10-00

COMPLETED BY:

James Kern

CERTIFICATE GRADE:

A - Surface

CERTIFICATE NUMBER:

120147

## Bladen Bluffs SWTP Maintenance Report

Date: 10/2/2020

### ISSUE:

### PLAN OF ACTION:

Air on finished water line (maybe from GAC)	Radio installed (waiting for new SCADA Spring 2020)
Need to run spare finished chlorine line	Will contact Halsey
SCADA will need upgrade/servers/move rack	COMPLETE
2" tap on finished line	Scheduled Oct.
Some tiles need replacement	IN PROGRESS
Fire system supply change to county water	IN PROGRESS
Chemical Pump PM due	Scheduled Oct.
Carbon filter #1 and #2 annual replacement	Scheduled Oct.
Carry water caustic Pump #2 leaking	FIXED
Alum fill line cam fitting leaks	FIXED
Trucker ran over gate keypad	FIXED
Pressure gauge leaking	FIXED
Transfer pumps ramping up/down quickly	FIXED

**Resolution Approving Destruction of Specified Public Records for Fiscal Years of  
2002-2003 Through 2019-2020 in Accordance with the Water & Sewer Authorities and  
Sanitary Districts Records Retention and Disposition Schedule**

**Whereas**, on May 9, 2016 the Lower Cape Fear Water & Sewer Authority (Authority) Board of Directors approved the *Water & Sewer Authorities and Sanitary Districts Records Retention and Disposition Schedule* dated May 1, 2016 which was prepared in accordance with the provisions of Chapters 122 and 132 of the General Statutes of North Carolina and issued by the North Carolina Department of Natural and Cultural Resources Division of Archives and Records Government Records Section.

**Now Therefore Be It Resolved**, that the Board of Directors for the Lower Cape Fear Water & Sewer Authority approves the destruction of specified public records for Fiscal Years 2002-2003 through 2019-2020 in accordance with the disposition schedule time periods instructions and acceptable methods of destruction as stipulated in the *Water & Sewer Authorities and Sanitary Districts Records Retention and Disposition Schedule* and a more complete description of the records designated for destruction is attached hereto labeled Appendix "A."

**Adopted this 12<sup>th</sup> day of October, 2020**

\_\_\_\_\_  
Al Milliken, Chairman

ATTEST:

\_\_\_\_\_  
Charlie Rivenbark, Secretary

## APPENDIX A

### Disposition of Public Record Log

#### Standard 2: Budget, Fiscal and Payroll Records

Pulled Date	Item #		Record Date	Destruction Date
9/24/2020	2	Accounts Payable	FY 2007-09	
9/24/2020	2	Accounts Payable	FY 2004-2009	
9/24/2020	2	Accounts Payable	FY 2002-10	
9/24/2020	10	Bids and Proposals	FY 2006-07	
9/24/2020	10	Bids and Proposals	FY 2008-09	
9/24/2020	10	Bids and Proposals	FY 2011-12	
9/24/2020	10	Bids and Proposals	F7 2007-08	

#### Standard 8: Risk Management Records

Pulled Date	Item #		Record Date	Destruction Date
9/30/2020	11	Insurance Certificate	FY 2011-12	2 Docs
9/30/2020	11	Insurance Certificate	FY2012-13	
9/30/2020	11	Insurance Certificate	FY 2013-14	
9/30/2020	11	Insurance Certificate	FY 2013-14	
9/30/2020	11	Insurance Certificate	FY2012-13	
9/30/2020	11	Insurance Certificate	FY 2013-14	2 Docs
9/30/2020	11	Insurance Certificate	FY 2014-15	
9/30/2020	11	Insurance Certificate	FY 2014-15	10 Docs
9/30/2020	11	Insurance Certificate	FY 2017-18	5 Docs
9/30/2020	11	Insurance Certificate	FY 2017-18	
9/30/2020	11	Insurance Certificate	FY2012-13	3 Docs
9/30/2020	11	Insurance Certificate	FY 2016-17	4 Docs
9/30/2020	11	Insurance Certificate	FY 2016-17	
9/30/2020	11	Insurance Certificate	FY 2017-18	7 Docs
9/30/2020	11	Insurance Certificate	FY 2017-18	
9/30/2020	11	Insurance Certificate	FY 2015-16	4 Docs
9/30/2020	11	Insurance Certificate	FY 2016-17	2 Docs
9/30/2020	11	Insurance Certificate	FY 2015-16	
9/30/2020	11	Insurance Certificate	FY 2015-16	
9/30/2020	11	Insurance Certificate	FY 2015-16	
9/30/2020	11	Insurance Certificate	FY 2015-16	4 Docs
9/30/2020	11	Insurance Certificate	FY 2014-15	
9/30/2020	11	Insurance Certificate	FY 2014-15	3 Docs
9/30/2020	11	Insurance Certificate	FY 2011-12	
9/30/2020	11	Insurance Certificate	FY 2011-12	
9/30/2020	11	Insurance Certificate	FY 2018-19	2 Docs
9/30/2020	11	Insurance Certificate	FY 2018-19	7 Docs
9/30/2020	11	Insurance Certificate	FY2019-20	7 Docs
9/30/2020	11	Insurance Certificate	FY 2018-19	4 Docss
9/30/2020	11	Insurance Certificate	FY 2016-17	

#### Standard 5: Legal Records

Pulled Date	Item #		Record Date	Destruction Date
9/30/2020	8	Lease of Equipment	FY 2013-14	

## PRESENTATION

## Lower Cape Fear Water & Sewer Authority

# AGENDA ITEM

To: CHAIRMAN MILLIKEN AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: October 12, 2020

Re: The Nature Conservancy and the Army Corps Sustainable Rivers Program in the Cape Fear by Julie DeMeester, Ph.D., Director of Water Resources, TNC North Carolina

Reviewed and Approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

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### Background:

The Army Corps of Engineers (Corps) and The Nature Conservancy (TNC) have a joint nationwide program called the Sustainable Rivers Program (SRP). The goal of SRP is to improve the health of rivers by analyzing the operations of Corps infrastructure. There are 25 rivers in the nationwide program and the Cape Fear river was enlisted in 2016. The Cape Fear River Basin was chosen because of its complex human-ecology relationships, the expert stakeholders in the basin, and because the Corps-owned B. Everett Jordan Dam (Jordan Dam) has potential to influence fish and wildlife habitat, water quality, and other natural resources. The first phase of the Cape Fear SRP was to gather experts to identify issues of concern and review the basin. The Cape Fear launch meeting occurred with basin experts in October of 2017. Following that, TNC and the Corps developed a literature review and analysis of conditions in the Cape Fear River Basin pre- and post-Jordan dam. The 100+ page literature review was completed in October of 2019 and was designed to support and inform development of flow hypotheses for an E-flows workshop involving expert stakeholders. Background data included ecology and biology flow needs, as well as hydrologic conditions before and after Jordan Dam construction and impoundment. Following distribution of the literature review to applicable parties, the expert e-flow workshop was held on Oct 1-2, 2019. At this meeting, experts crafted e-flow prescriptions for several reaches of the mainstem Cape Fear River between Jordan dam and Lock and Dam 1 with the considerations of fish, floodplains, and reducing harmful algal blooms. In the past year, TNC and the Corps have initiated test pulses out of Jordan of some of the prescription components. Equipment is deployed at LD1 to track if the pulses accomplish the desired goal, especially around water quality. This presentation will review SRP, the flow prescriptions, and the current efforts to make a healthier Cape Fear River.

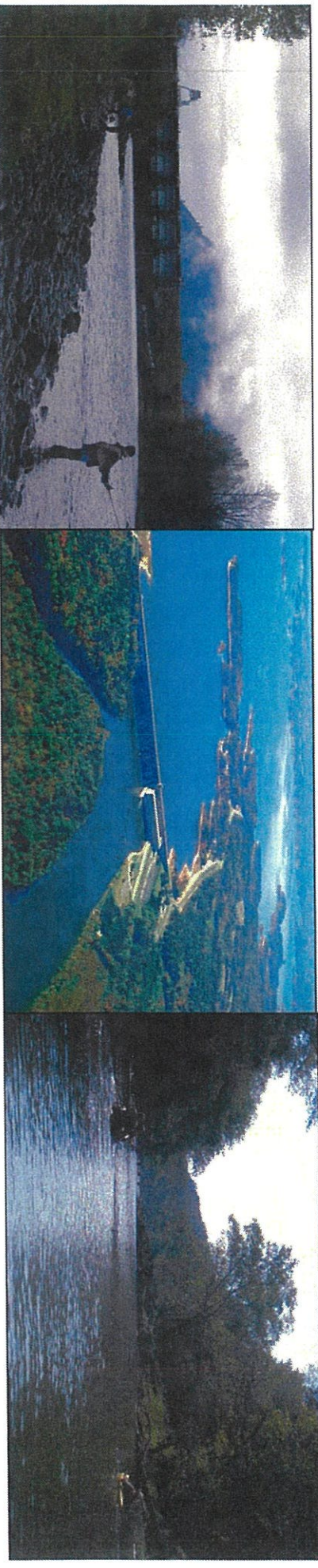
**Action Requested:** For information purposes only



# Sustainable Rivers Program: A Joint Program with the US Army Corps of Engineers and The Nature Conservancy

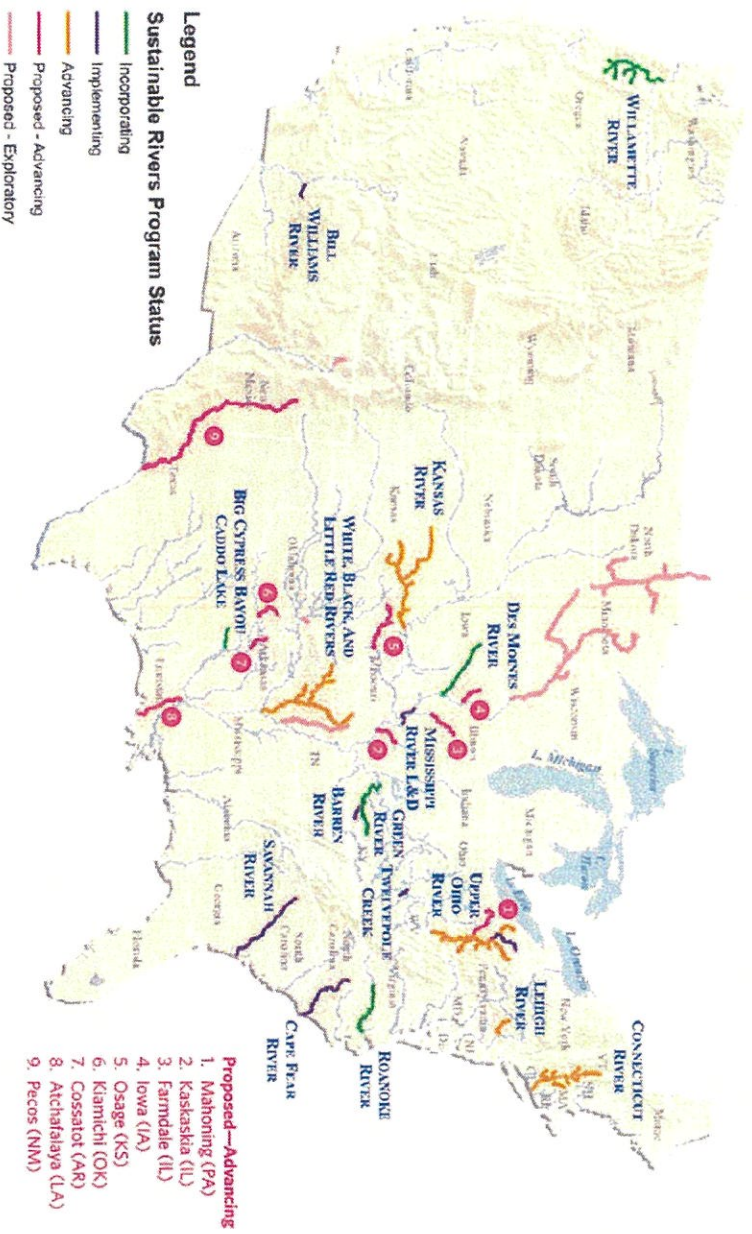
**Mission:** Improve the health and life of rivers by changing dam operations to restore and protect ecosystems, while maintaining or enhancing other project benefits

Presentation by Dr. Julie DeMeester, The Nature Conservancy

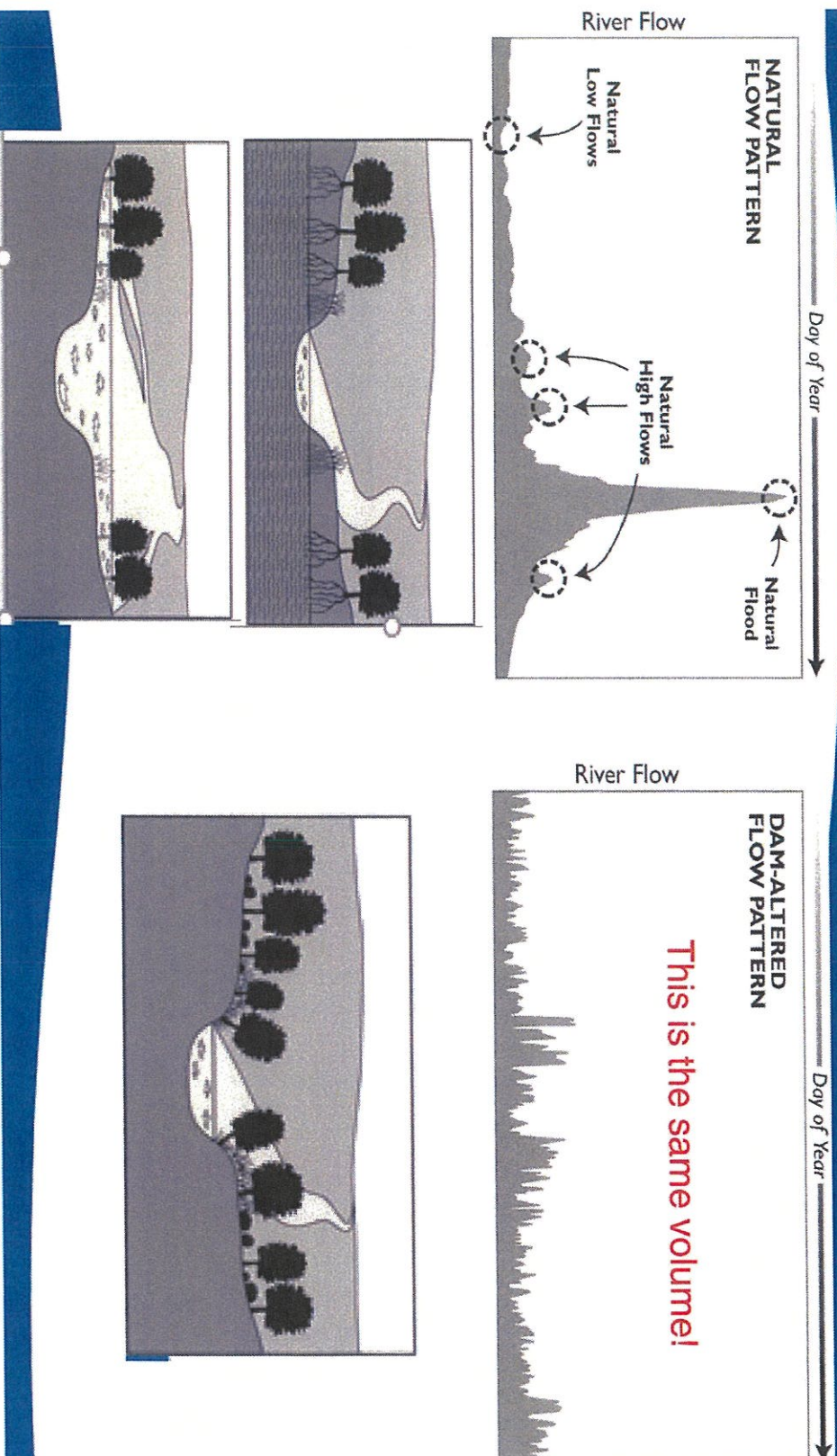




# SRP across the US



# Impacts of Altered Hydrologic Regimes





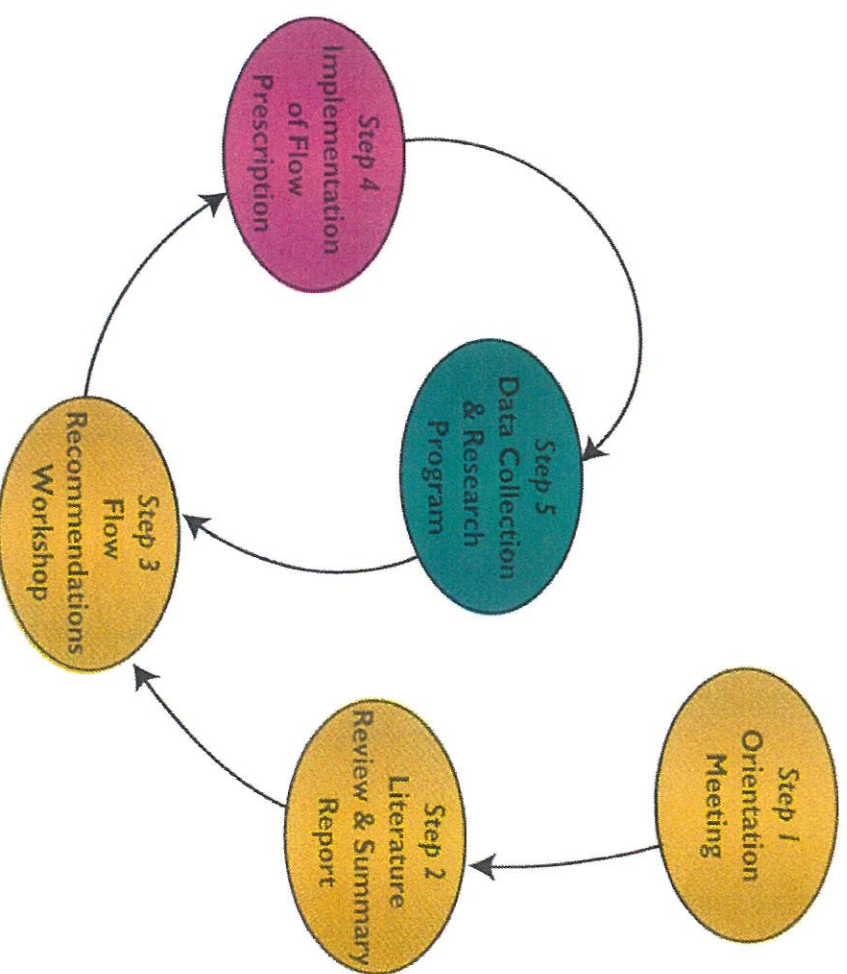
# How Do We Think About E-flows For An Entire River?

We gather background literature on e-flow requirements for river ecology.

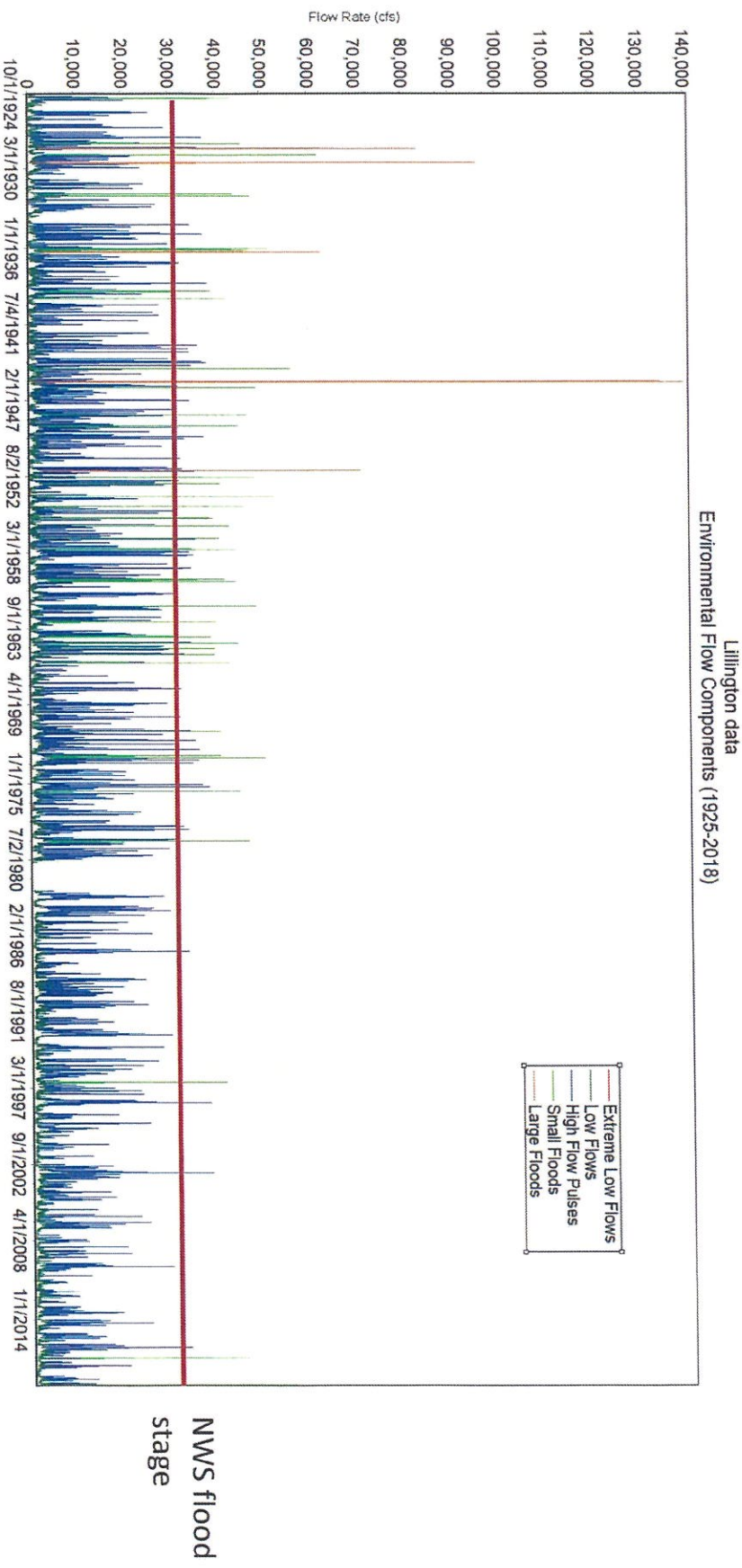
We use tools to examine the effects of hydrologic alterations (for example, dams) using pre and post-dam water flow data.

Experts identify incompatibilities between hydrologic alterations and river ecology needs.

We brainstorm ways to change reservoir operations that still account for the its authorized purposes.

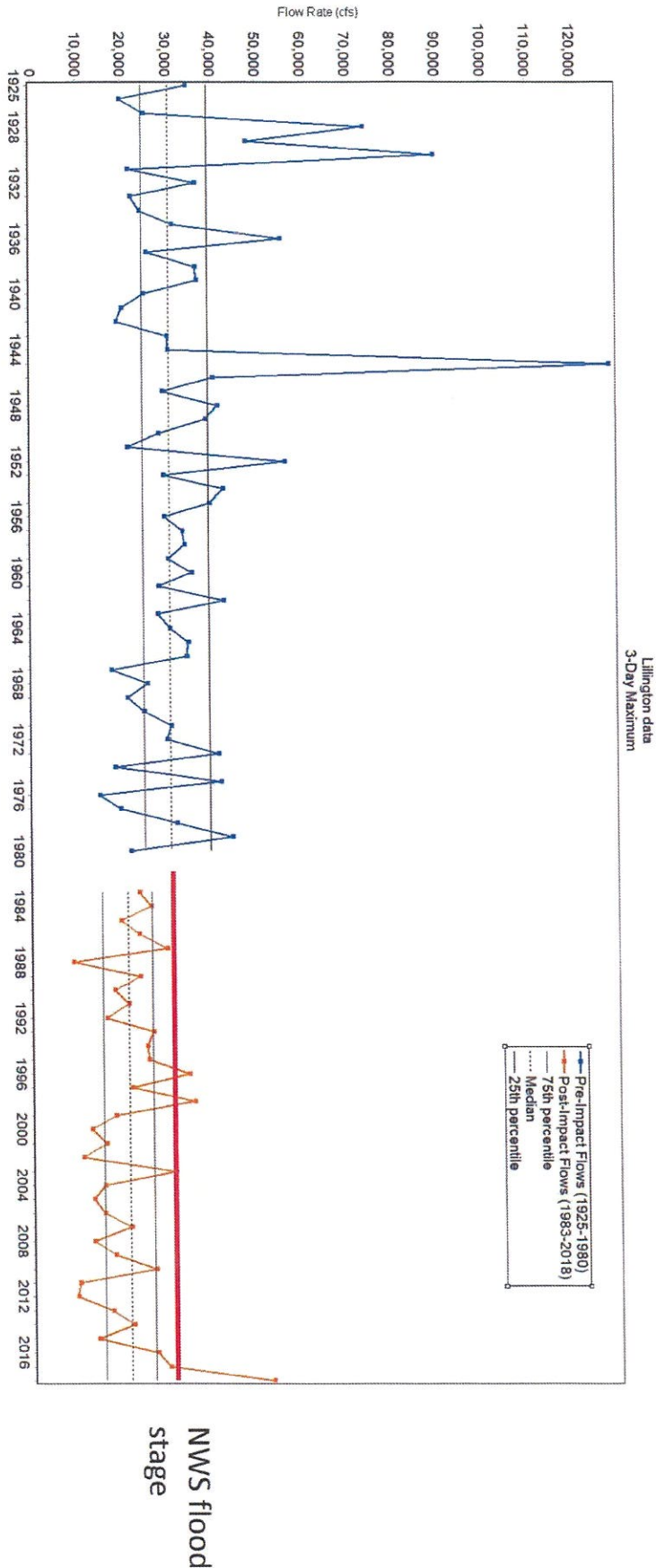


# Effects of Jordan at Lillington

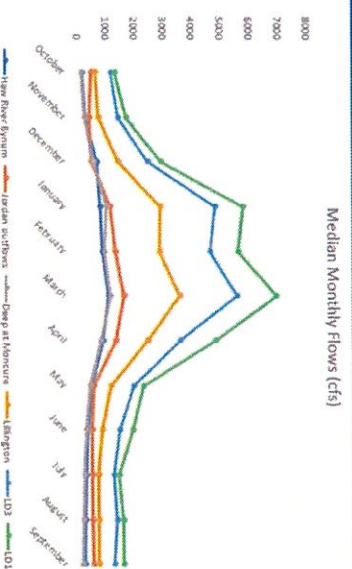




# Effects of Jordan at Lillington- Big floods



# General hydrology trends in the basin post Jordan



Gage name	Description	Mean annual flow (cfs)				
		flow (cfs)	Oct median flow (cfs)	Jan median flow (cfs)	April median flow (cfs)	July median flow (cfs)
Haw River at Bynum	Upstream of Jordan lake	963	198	790	882	255
Jordan Lake Inflows	Corps compiled inflows at Jordan Lake	1586	244	1120	1055	362
Jordan Lake Outflows	Corps compiled outflows at Jordan Lake	1524	518	1150	1318	487
Deep River at Moncure	Just before the Deep joins the Haw	1280	146	992	796	174
Lillington	At Lillington	3041 (50%)	663 (78%)	2885 (40%)	2440 (54%)	698 (70%)
Lock and Dam 3	At LD3	4466 (34%)	1195 (43%)	4830 (24%)	3568 (37%)	1235 (39%)
Lock and Dam 1	At LD1	5056 (30%)	1315 (39%)	5765 (20%)	4835 (27%)	1400 (35%)

\*Data analyzed since Jordan Lake was complete, 1983-2018. Numbers in parenthesis are Jordan outflow percentage of flow at each gage.



# Estimates of overbank flow with HEC RAS

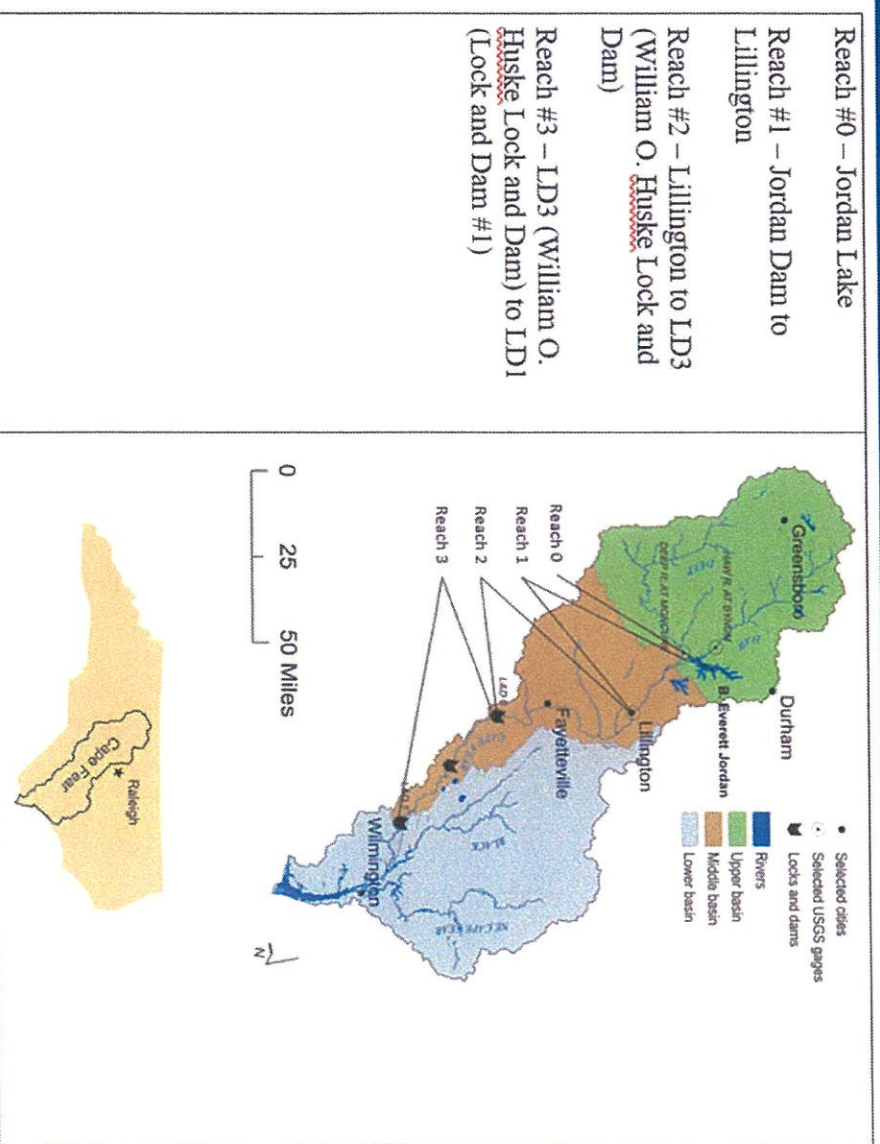


**REACH 1 – INUNDATION AT 20,000 CFS**  
REACH 1 IS LOCATED BETWEEN JORDAN DAM AND LILLINGTON  
REPRESENTATIVE LOCATION IS APPROX 15 RIVER MILES DOWNSTREAM OF JORDAN DAM



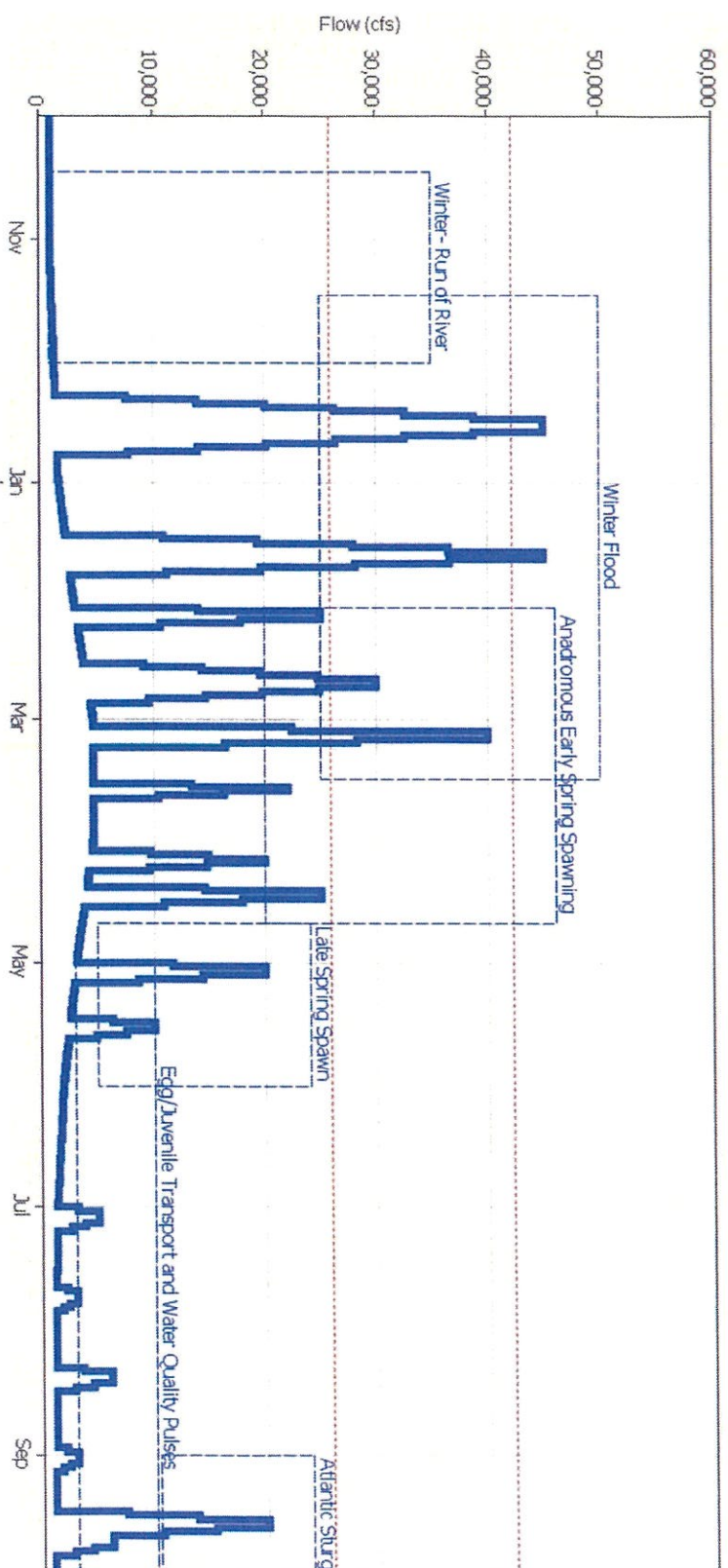
# Expert e-flow meeting on Oct 1-2, 2019

- We broke 45 experts into three teams: water quality, floodplains, fish.
- We used real-time computer tools to draft the prescription flows.
- On the second day, we combined each team's recommendations and created a unified flow prescription for the river.



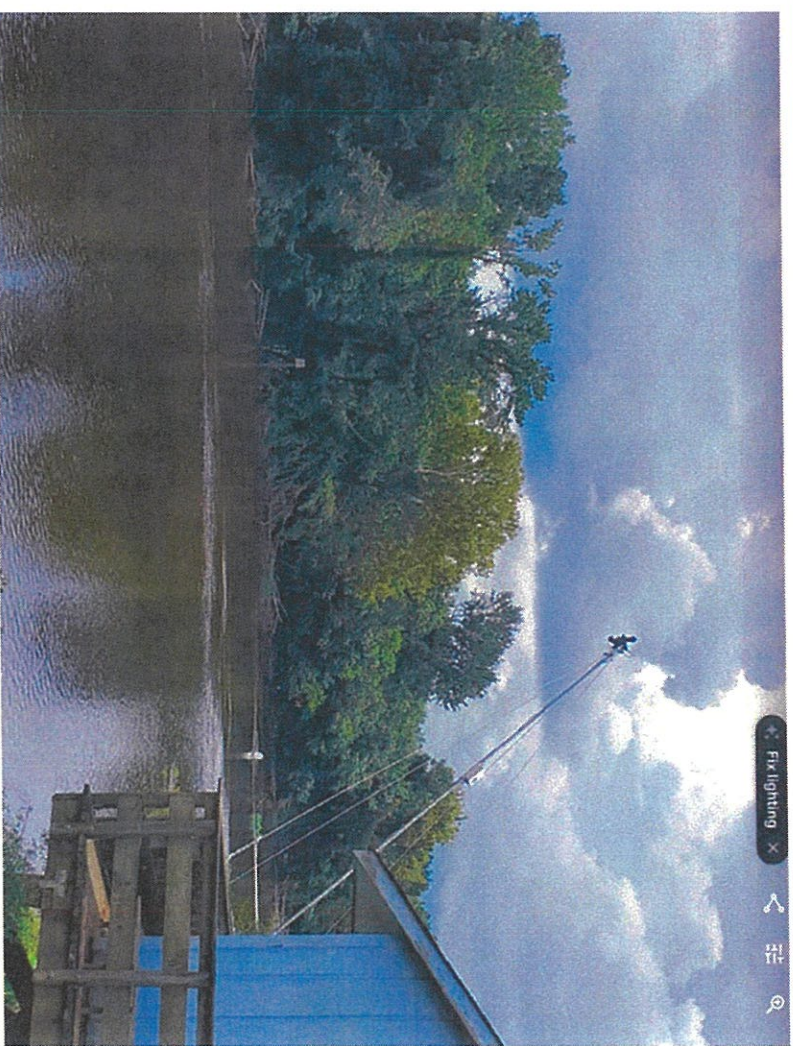


# Example Flow Recommendation from LD3 to LD1



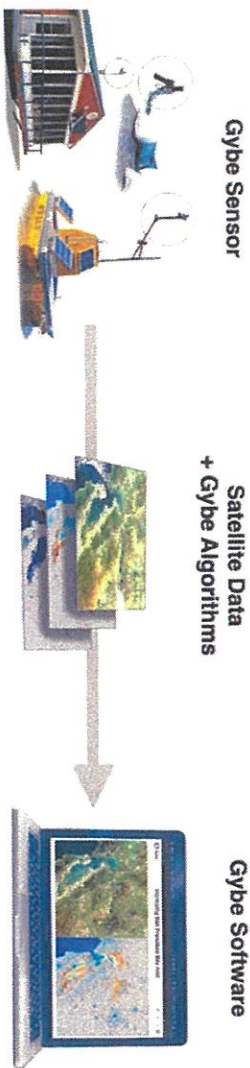
# Spring and Summer 2020

- Sent a Jordan pulse for fish in March 2020
- Sent multiple pulses for summer water quality
- Using technology and equipment to monitor pulses with Gybe and UNC-Ch





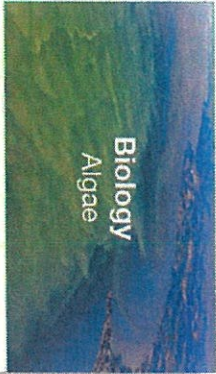
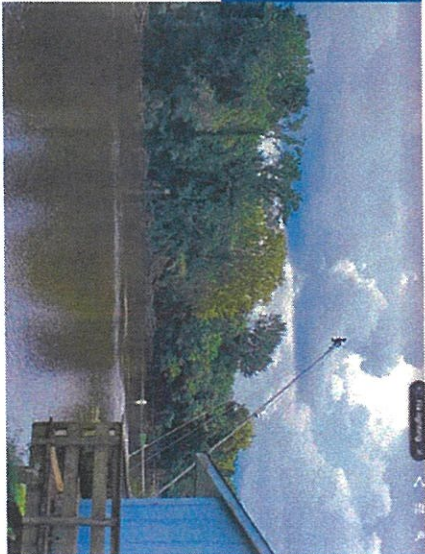
# Gybe technology



The Gybe sensor, installed above the water, measures and streams water data into our system.

The sensor data is interpreted by our algorithms, and combined with data from satellite imagery.

The Gybe software shows time-series and maps of water quality, giving our customers quantified insights about the whole body of water.



Chlorophyll-a Concentration  
Phycocyanin (cyanobacteria)

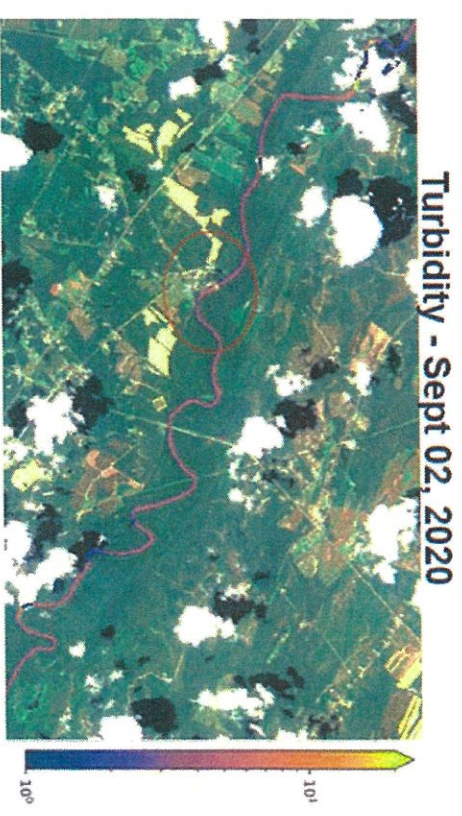
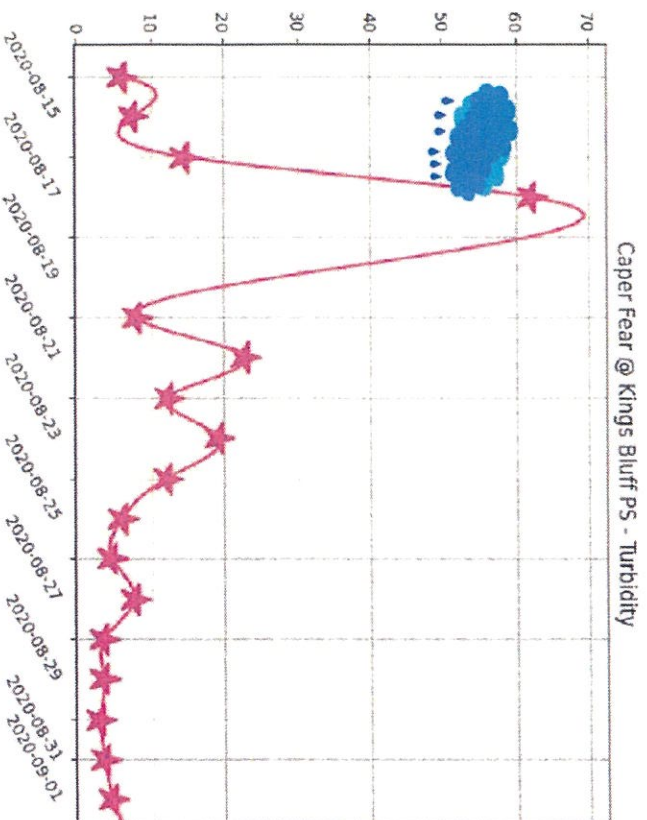


Turbidity  
Sediment Concentration



CDOM  
(Colored dissolved organic matter)

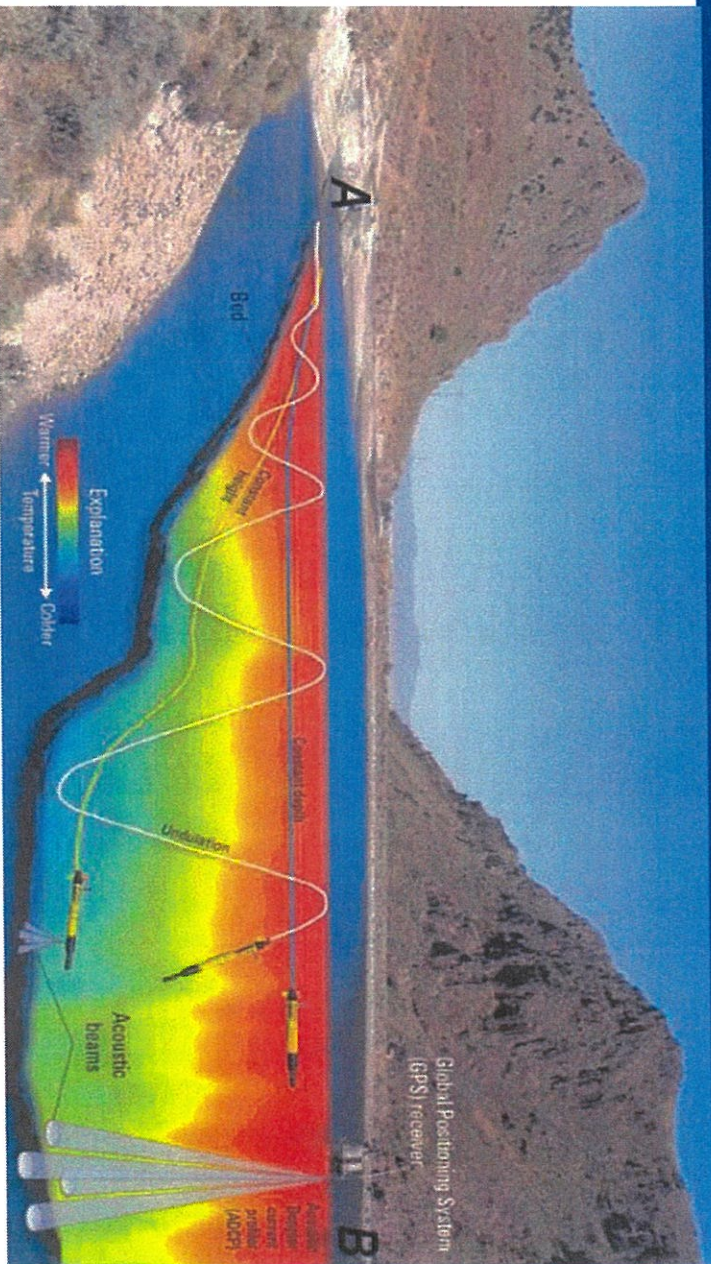
# Gybe: Uncalibrated early data (not for distribution)





# Moving forward 2020-2022

- Formal 2-year partnership with USGS
- Updating the gage information at Fayetteville to include CFS. Adding water quality sensor to Lillington gage
- Using the USGS Autonomous Underwater Vehicle to study water quality. First pass to occur in late Oct 2020.
- Calibrating Gybe sensor technology to get more real-time samples of water quality.
- Working with UNC-Ch to analyze thermal canisters and sonar at LD1 to analyze mixing.



Thank you!

Questions?

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