

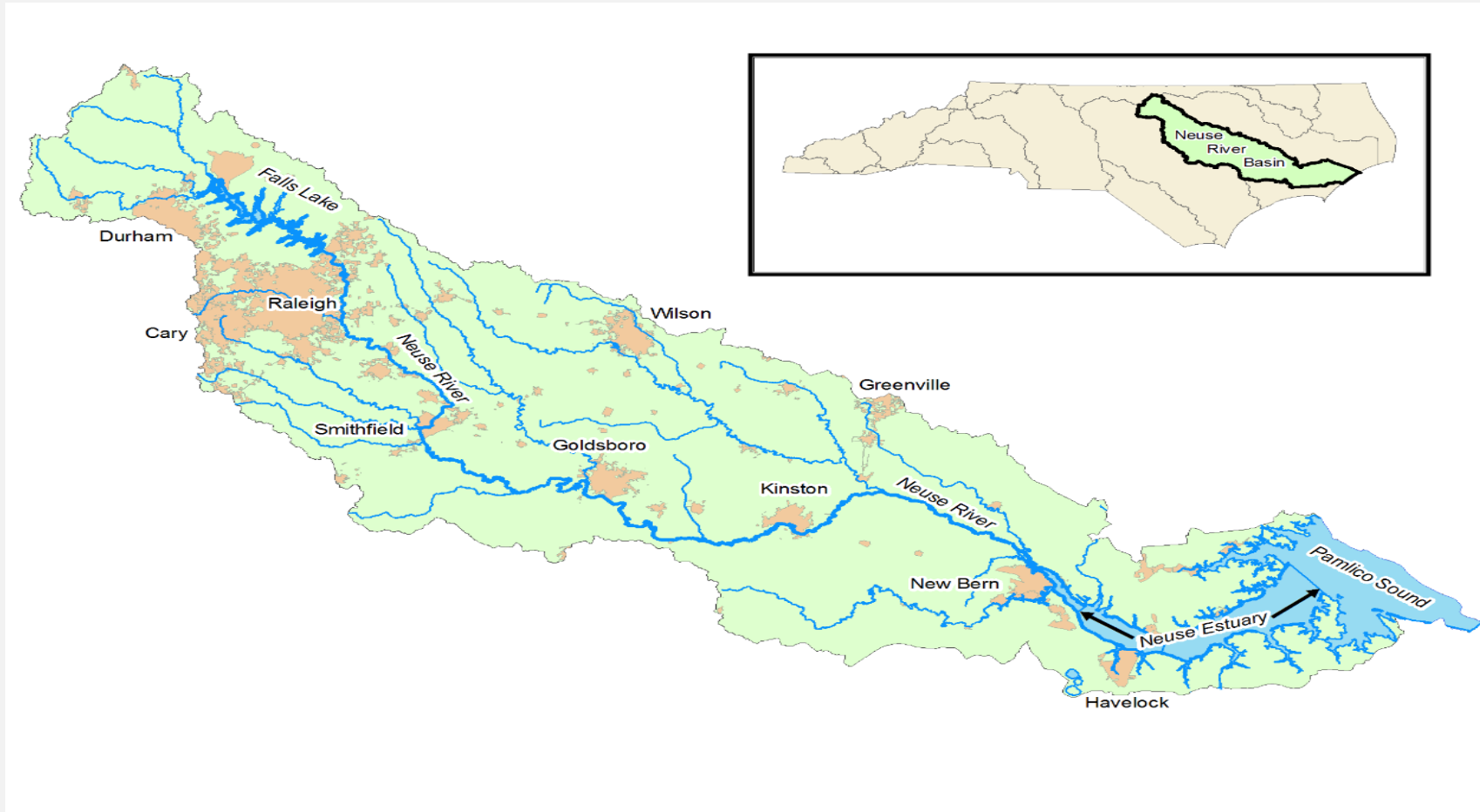


# LOWER NEUSE BASIN ASSOCIATION® & NEUSE RIVER COMPLIANCE ASSOCIATION®

Presented by:

Haywood M. Phthisic, III,  
Executive Director

# NEUSE RIVER BASIN



# NEUSE RIVER BASIN STATISTICS

- 6,200 square miles.
- 3,500 miles of fresh water streams.
- 200 miles long, Roxboro to the Pamlico Sound.
- 371,000 estuarine/saltwater acres in a broad, shallow estuary with an average depth of 15 feet.

# LOWER NEUSE BASIN ASSOCIATION (LNBA)<sup>®</sup>

- Created in 1994 as a monitoring and information sharing organization.
- 501(c)3 non-profit corporation; 19 NPDES Permit members.
- MOA with DWR, monitors water quality at 46 sites (\$97,000 annually).
- Provides funds and other assistance to:
  - ModMon estuary monitoring program
  - FerryMon monitoring program
  - FluorMod research program (“cutting edge” technology to potentially identify organic nitrogen by its source).
- Provides technical resources:
  - annual operator training
  - waste water plant optimization

*Lower Neuse Basin Association/Neuse River Compliance Association  
Membership*

Town of Apex  
Town of Benson  
Town of Cary  
Town of Clayton  
Contentnea MSD  
Town of Farmville  
Covation Bio, Inc.  
Duke Energy Progress  
Town of Fuquay-Varina  
Aqua, North Carolina  
South Granville Water & Sewer Authority  
City of Durham  
MCAS – Cherry Point

City of Goldsboro  
Town of Havelock  
Johnston County  
Town of Kenly  
Town of LaGrange  
City of New Bern  
City of Raleigh  
City of Wilson  
City of Kinston  
Town of Snow Hill  
CWS Systems, Inc.  
Town of Hillsborough

\* LNBA Member Only  
\* NRCA Members Only

## FORMER LNBA CHAIRS

1994 – Dempsey Benton, City of Raleigh

1998 – Richard Hicks, Town of Farmville

2001 – Tim Donnelly, Town of Apex

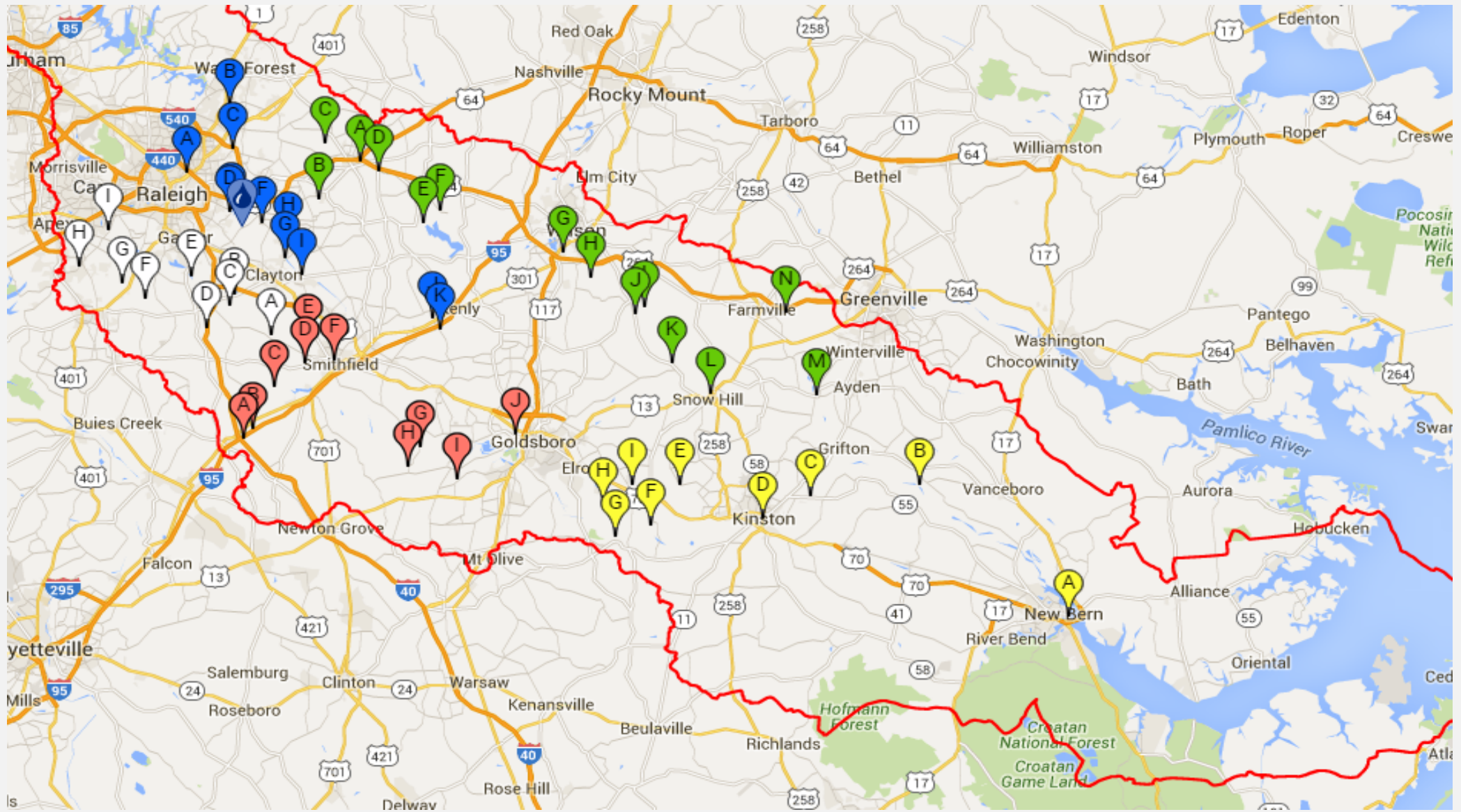
2004 – Haywood Phthisic, Johnston County

2009 – Dan McLawhorn, City of Raleigh

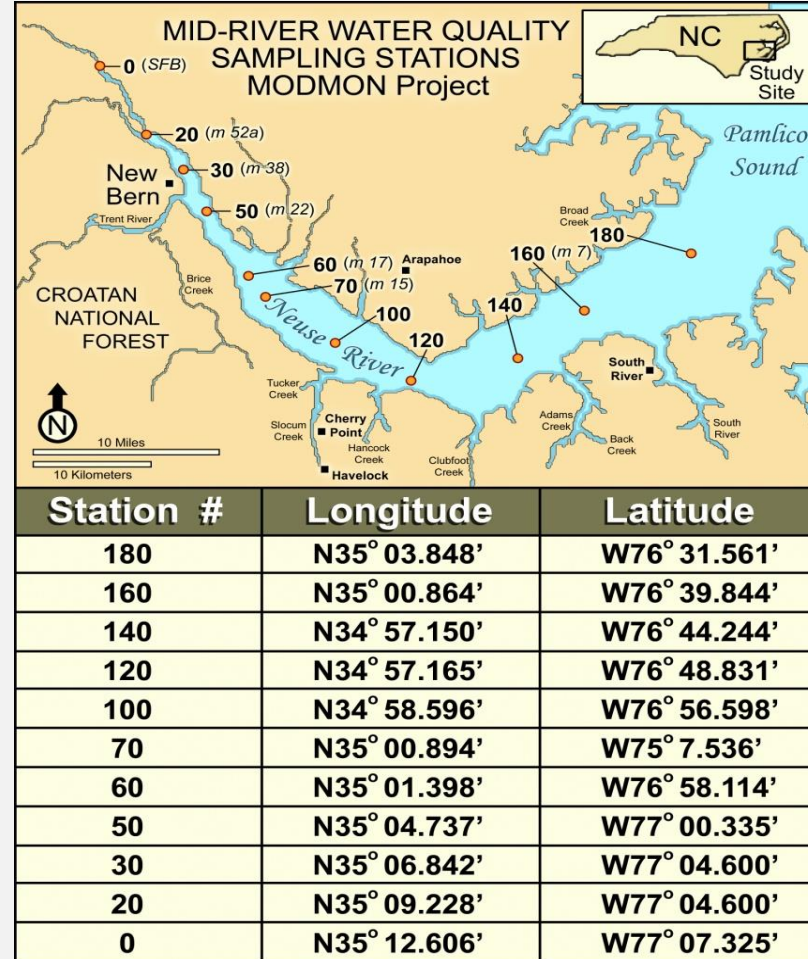
2021 – Barry Parks, City of Wilson

# FALLS LAKE DAM -

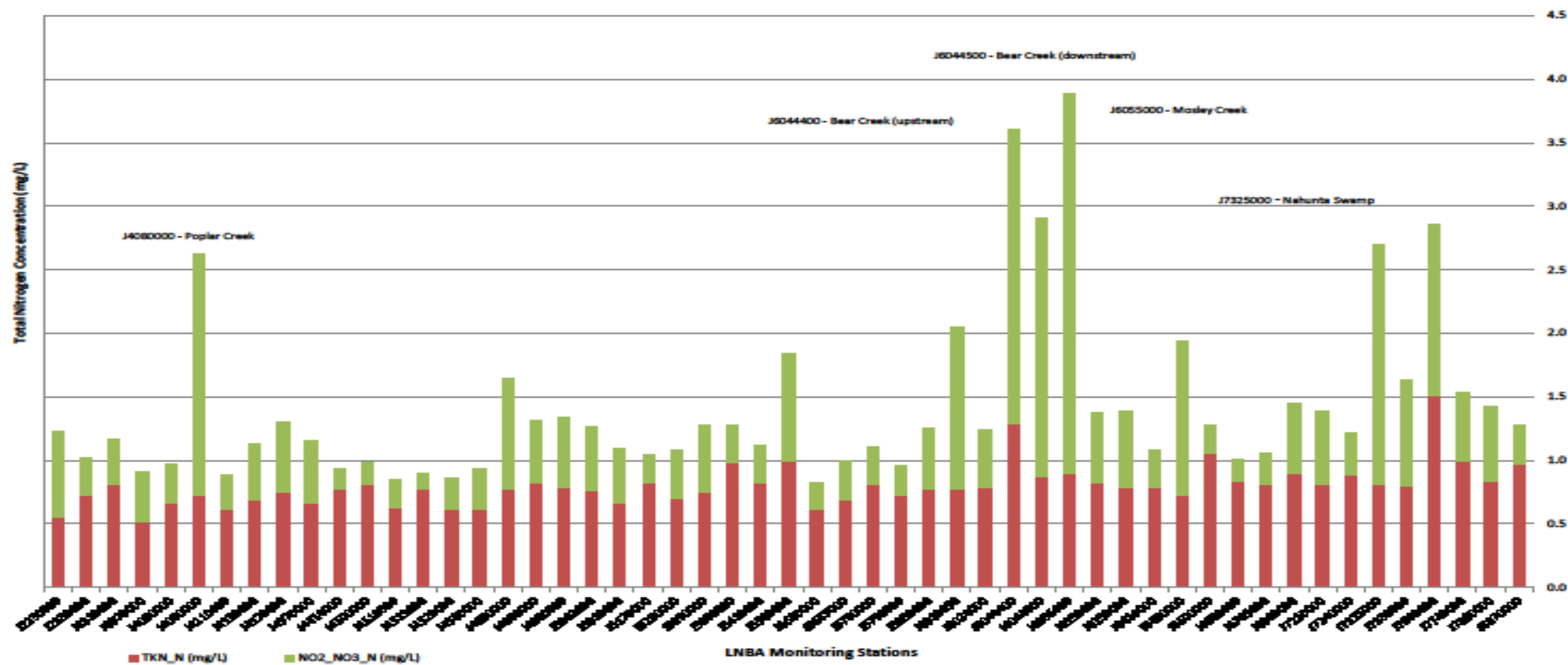




# NEUSE RIVER ESTUARY MONITORING - MODMON



2021 LNBA Monitoring Stations Total Nitrogen Annual Average Concentrations



## AS THE NEWLY FORMED LNBA BEGAN ITS WORK:

- 1995 - Total Nitrogen delivery by the LNBA members to the Neuse Estuary was 1,784,000 lbs. at a flow of 80 MGD equaling 7.3 mg/L concentration.
- During the summer of 1995 there were massive fish kills in the Neuse Estuary sparking public outcry and a call for action.

# 1997 NEUSE MANAGEMENT STRATEGY

- Overall goal – 30% reduction in TN loading of the estuary from mean 1991-1995 baseline.
- Goal established without a model to allocate TN among all sources.
- Point sources:
  - Total point source TN allocation (Neuse Rules): 1,640,000 lbs. (Total Estuary TMDL: 6.75 million lbs.)
  - Budget allocated among existing NPDES permit discharges.
  - Small point sources (permit flows <0.5 mgd) have no TN limits.
- Non-point sources (no allocated TN budget):
  - No allocation or budget by source.
  - BMPs, buffers, and MS4 programs in some, but not all locales.
  - Reductions in TN are not measured.
- The strategy (or rules) allowed for a nitrogen trading association for point sources because of inequities in total nitrogen allocations for individual permit holders. The effective date for point source compliance with the rules was January 1, 2003.

# TN ALLOCATION TABLE

**Table 1**  
Sorted by Zone  
and Type

## TOTAL NITROGEN (TN) ALLOCATIONS Neuse River Basin - Wastewater Discharges Baseline Values

NPDES Permit No.	Permittee & Facility (1995)	1995 Permitted Flow (MGD)	TN Allocations (lb/yr)		
			At End-of-Pipe	At Estuary	
ZONE 1 - 10% TRANSPORT					
Large Dischargers					
1	NC0023841	DURHAM, NORTH WTR. RECLAM. FAC	20.0	334,851	33,485
2	NC0026824	DHR-JOHN UMSTEAD HOSPITAL WWTP	3.5	58,599	5,860
3	NC0026433	HILLSBOROUGH, TOWN-WWTP/ORANGE	3	50,228	5,023
			443,678	44,368	
Small Dischargers					
1	NC0037869	ARBOR HILLS MHP	0.006	121	12
2	NC0058785	BIBLE BAPTIST CHURCH	0.003	61	6
3	NC0022853	DURHAM PRODUCTS/ ENO SEWAGE FAC	0.015	303	30
4	NC0024520	G & S ASSOCIATED-DBA DAYS INN	0.018	364	36
5	NC0043389	GORMAN BAPTIST CHURCH	0.004	81	8
6	NC0049662	HEATER UTIL-HAWTHORNE	0.25	5,055	506
7	NC0063614	HEATER UTIL-WILDWOOD SUBD	0.1	2,022	202
8	NC0059099	LAKE RIDGE AERO PARK	0.016	324	32
9	NC0043001	MT. SYLVAN UNITED METHODIST CH.	0.002	40	4
10	NC0036471	PERSON CO SCH - HELENA ELEM.	0.008	162	16
11	NC0051071	ALL YOUTH ATHLETIC, INC.	0.002	40	4
12	NC0056731	SEDGEFIELD DEV.CORP-GRANDE OAK	0.0068	137	14
13	NC0081752	WILLOWHAVEN COUNTRY CLUB ***	0.0019	38	4
			8,749	875	
ZONE 1 TOTAL			452,427	45,243	
ZONE 2 - 50% TRANSPORT					
Large Dischargers					
1	NC0029033	RALEIGH, CITY-NEUSE RIVER WWTP	60.00	675,790	337,895
2	NC0023906	WILSON WWTP, TOWN OF	14.00	157,684	78,842
3	NC0064564	RIVER DELL UTILITIES, INC.	0.75	8,447	4,224
4	NC0030716	CENTRAL JOHNSTON COUNTY WWTP	4.99	56,203	28,102
5	NC0060330	CAROLINA WTR SERV.-WHITE OAK S	0.5	5,632	2,816
6	NC0064556	RIVER DELL UTILITIES, INC. #2	0.50	5,632	2,816
7	NC0064050	APEX, TOWN-WWTP/MIDDLE CREEK	3.60	40,547	20,274
8	NC0020389	BENSON WWTP, TOWN OF	3.00	33,790	16,895
9	NC0065102	CARY-SOUTH WWTP, TOWN OF	16.00	180,211	90,105
10	NC0048879	CARY-NORTH WWTP, TOWN OF	12.00	135,158	67,579
11	NC0025453	CLAYTON WWTP, TOWN OF	1.90	21,400	10,700
12	NC0029572	FARMVILLE WWTP, TOWN OF	3.50	39,421	19,711
13	NC0066516	FUQUAY-VARINA	6.00	67,579	33,790
14	NC0064891	KENLY NEW WWTP, TOWN OF	0.63	7,096	3,548
15	NC0020842	SNOW HILL WWTP, TOWN OF	0.50	5,632	2,816
16	NC0030759	WAKE FOREST, TOWN-SMITH CRK WW	6.00	67,579	33,790
17	NC0079316	ZEBULON TOWN OF-LITTLE CREEK	1.85	20,837	10,418
18	NC0001376	BURLINGTON IND., WAKE PLANT	5.00	48,879	24,440
			1,577,517	788,758	

By the end of 2002 the members of the LNBA had reduced the TN delivery to the Neuse estuary from 1,784,000 pounds (1995) to 798,000 pounds through facility operational optimizations (Neuse Rules effective date, January 01, 2003).

# NEUSE RIVER COMPLIANCE ASSOCIATION®

- During 2002 the NRCA was created as a nutrient trading association. To meet the 1/01/2003 deadline as 501(c)3 non-profit corporation.
- The NRCA applied for and received an NPDES Permit, NCC000001 effective 1/01/2003.
- The NRCA accepts members from the entire Neuse Basin, 25 permit holders.
- NRCA members allowed to make annual transfers of TN within the total TN limit allocated in Permit NCC000001.
- Members exempted from compliance with their individual TN allocation if NRCA complies with its allocation. 2022 TN allocation is 1,214,838 lbs. (**or 74%**).
- Permit violations for both the NRCA and any member exceeding its allocation, if NRCA allocation is exceeded.

# NRCA FORMER CHAIRS

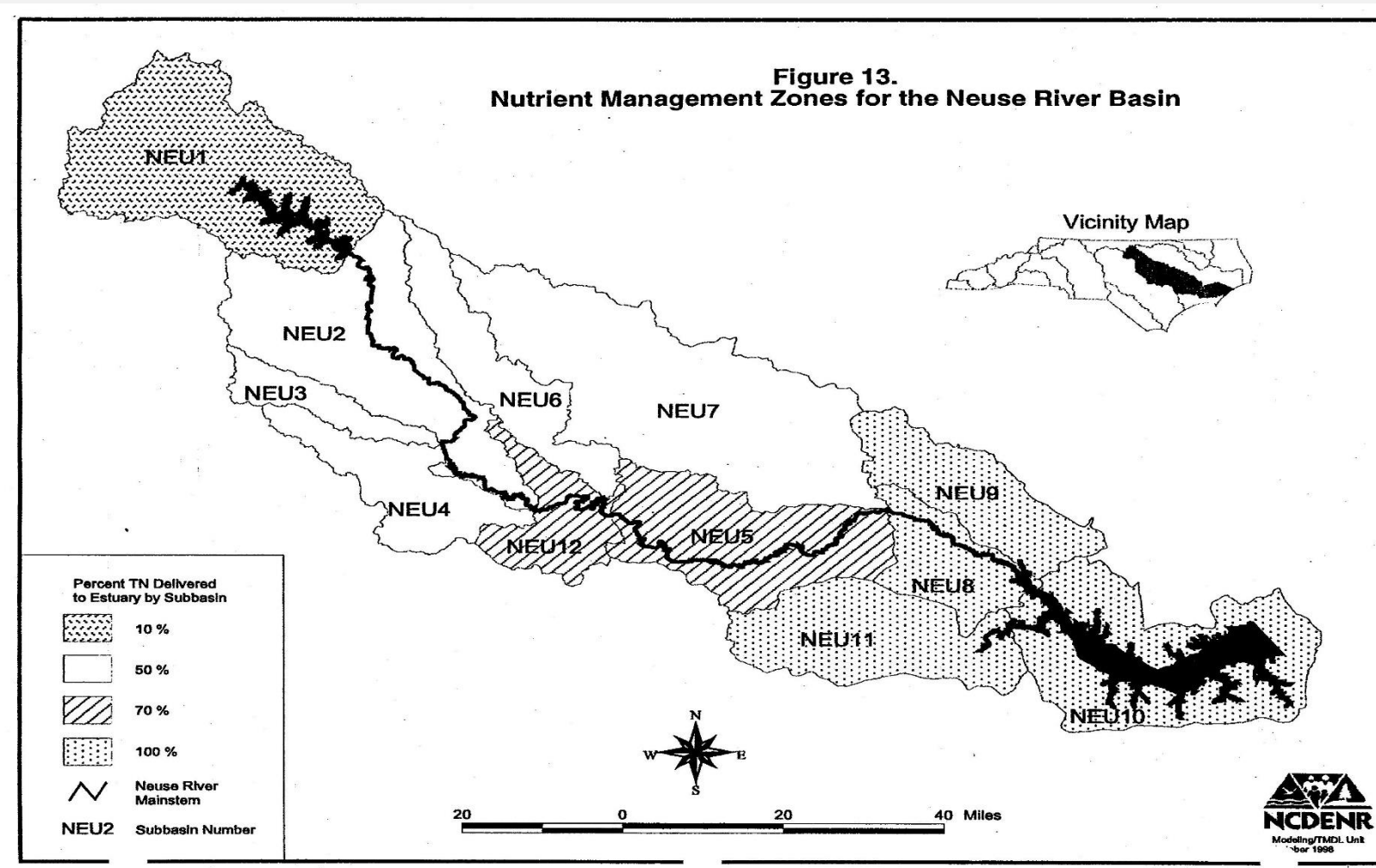
2001 – Tim Donnelly, Town of Apex

2004 – Haywood Phthisic, Johnston County

2009 – Dan McLawhorn, City of Raleigh

2021 – Barry Parks, City of Wilson

# NEUSE RIVER TRANSPORT ZONES



# NRCA'S OPERATIONAL PROCEDURES

- Members assessed penalty if their individual TN allocation is exceeded.
- Up to 80% of penalty eligible for refund if timely correction of reason for allocation exceedance.
- Members able to lease or sell nitrogen allocation to other members without NRCA approval.
- Members cannot lease or sell nitrogen outside of the NRCA.
- Members' investment to reduce TN exceeds \$475,000,000.

# NRCA NITROGEN LEASES & SALES

Year	Type of Nitrogen Transaction	Seller/Leasor	Buyer/Leasee	Estuary Lbs. of Nitrogen *	Cost per Pound
2020	Lease	Dow Industrial Bioscience, LLC	Aqua, N.C.	700	\$ 5.00
	Lease	Dow Industrial Bioscience, LLC	Craven County	3,000	5.00
	Lease	Contentnea MSD	Carolina Water Service, Inc.	7,100	5.00
	Lease	Town of Benson	Town of Kenly	2,600	4.00
	Sale	International Paper, Inc.	Town of Clayton	15,000	500.00
	Sale	RS-Flat Swamp, LLC	Town of Clayton	15,908	500.00

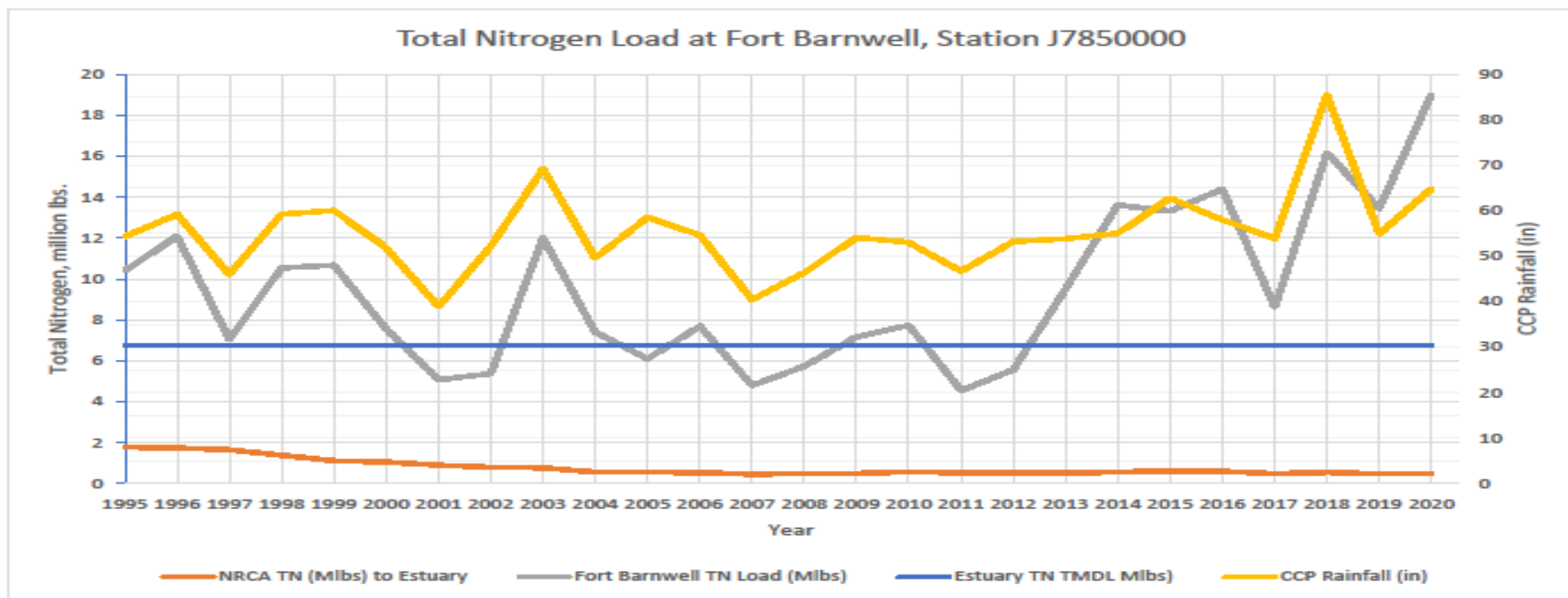
# ASSOCIATIONS' NITROGEN REDUCTION HISTORY

Year	Estuary TN Delivery (Lbs.)	Average Daily Flow (gallons/day)	Average Estuary TN Delivery Conc. (mg/L)	Neuse Basin Population
1995	1,784,000	80,000,000	7.3	~ 1,100,000
2000	1,055,000	83,000,000	4.2	1,320,790
2014	568,387	108,359,000	1.72	~ 1,850,000

\*\* TN reduction of approx. 70% with a population increase > 50%.

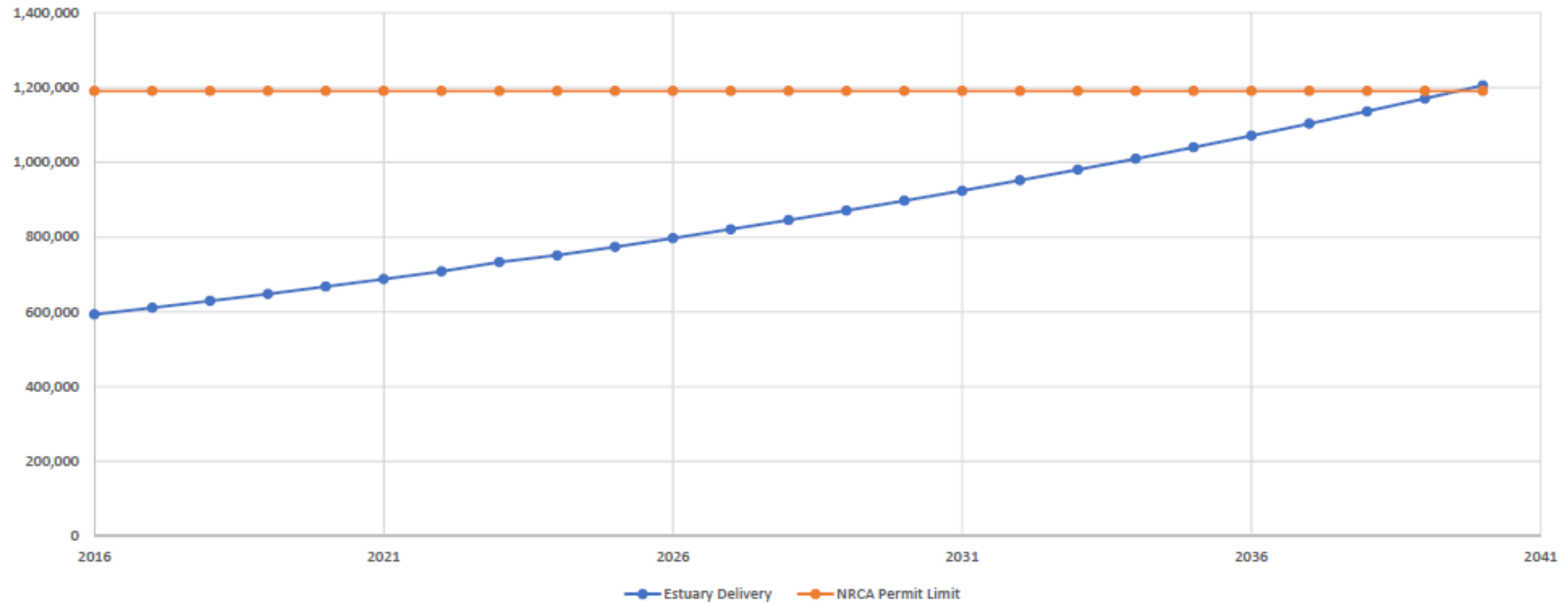
# MEMBER TN END OF PIPE CONCENTRATIONS FOR 2021

	Average	Average
FACILITY	EOP Conc	Flow
	(mg/l)	MGD
Duke Energy Progress - Lee	0.32	0.104
Town of Farmville	0.91	1.422
Contentnea MSD	1.07	2.150
Town of Hillsborough	1.43	1.078
Craven County	1.46	0.772
Town of Cary, South	1.62	5.437
City of Raleigh - Neuse River	1.88	47.482
City of Durham	2.03	9.404
Dow-Dupont, Inc.	2.14	0.278
SGWASA	2.32	1.452
Town of Cary, North	2.32	6.209
City of Wilson	2.33	9.696
Johnston County	2.38	5.978
City of Raleigh - Little Creek	2.64	0.863



# 3% Growth in TN Delivery to Neuse Estuary

NRCA TN Delivery with 3% Increase in TN Discharge



# SUMMARY

- The Associations' are a strong voice and advocate of the Neuse River Basin.
- The NRCA's nitrogen trading program has proven successful given the inequities of the initial nitrogen allocations.
- In order to have a successful nutrient management strategy all contributors have to be at the table and participate equally.

# QUESTIONS/DISCUSSION -

Contact Information:

Haywood M. Phthisic, III, [exec.director@LNBA.net](mailto:exec.director@LNBA.net)

Web Site: <https://lnba.net>

# Costs per pound vary over 4 orders of magnitude

