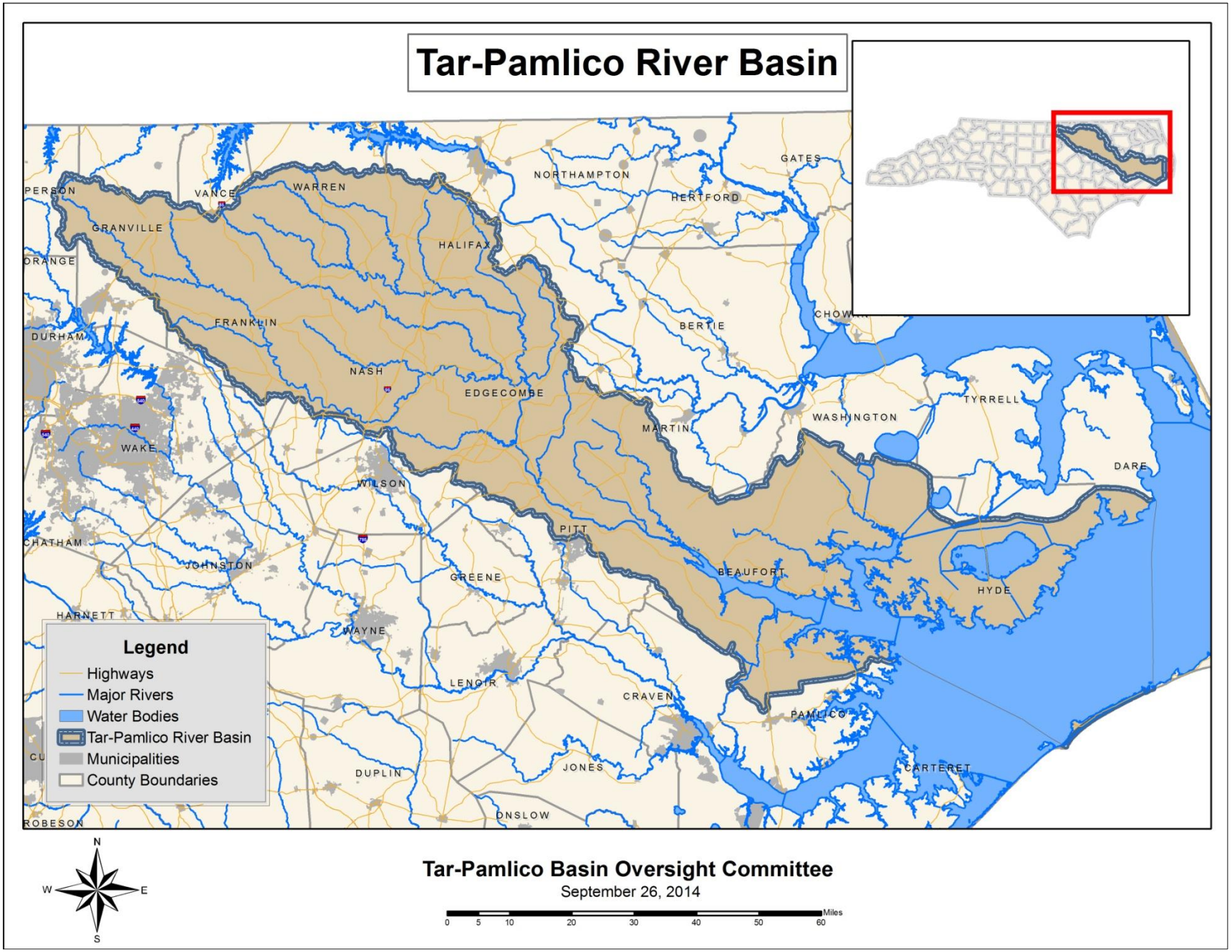
NCDA&CS

2015 Annual Progress Report (Crop Year 2014) on the Tar-Pamlico Agricultural Rule (15 A NCAC 02B.0256)

A Report to the Environmental Management Commission from the Tar-Pamlico Basin Oversight Committee: Crop Year 2014


Tar-Pamlico River Basin
PERSON
VANCE
WARREN
GRANVILLE
ORANGE
FRANKLIN
DURHAM
NASH
WAKE
CHATHAM
JOHNSTON
HARNETT
WILSON
EDGECOMBE
HALIFAX
NORTHAMPTON
GATES
HERTFORD
BERTIE
MARTIN
PITT
GREENE
WAYNE
LENOIR
DUPLIN
JONES
ONSLOW
CRAVEN
PAMLICO
CARTERET
BEAUFORT
WASHINGTON
TYRRELL
DARE
HYDE
ROBESON
Legend
Highways
Major Rivers
Water Bodies
Tar-Pamlico River Basin
Municipalities
County Boundaries
N
W
E
S
Tar-Pamlico Basin Oversight Committee
September 26, 2014
0 5 10 20 30 40 50 60
Miles

Summary

The Tar-Pamlico Basin Oversight Committee (BOC) received and approved crop year (CY) 2014 annual reports from the fourteen Local Advisory Committees (LACs) operating under the Tar-Pamlico Agriculture Rule as part of the Tar-Pamlico Basin Nutrient Management Strategy. The report demonstrates agriculture's ongoing collective compliance with the Tar-Pamlico Agriculture Rule and estimates further progress in decreasing nutrient losses. In CY2014, agriculture collectively achieved an estimated 51% reduction in nitrogen loss compared to the 1991 baseline, continuing to exceed the rule-mandated 30% reduction. This represents a 10% increase in reduction compared to the 41% reduction reported for CY2013. Thirteen of the 14 LAC's exceeded the 30% reduction goal established by the BOC. Phosphorus tracking in the basin indicates less risk of phosphorus loss during CY2014 than in the baseline year for all but one qualitative indicator. Funding remains limited and is essential for rule compliance. Without adequate funding the Division of Soil & Water Conservation and these 14 LACs will find it challenging to meet the reporting requirement on an annual basis.

Tar-Pamlico NSW Strategy

The Environmental Management Commission (EMC) adopted the Tar-Pamlico nutrient strategy in 2000. The management strategy built upon the precedent-setting Neuse River Basin effort established three years earlier, which for the first time set regulatory reduction measures for nutrients on cropland acres in the state. The NSW strategy goal is to reduce the average annual load of nitrogen to the Pamlico estuary by 30% from 1991 levels and to limit phosphorus loading to 1991 levels. Mandatory controls were applied to addressing non-point source pollution in agriculture, urban stormwater, nutrient management, and riparian buffer protection. As of 2015, the Pamlico estuary is still classified as impaired and is not meeting its 30 percent nitrogen loading reduction goals.

Rule Requirements and Compliance History

Effective September 2001, the Tar-Pamlico Nutrient Sensitive Waters Management Strategy (NSW) provides for a collective strategy for farmers to meet the 30% nitrogen loss reduction and no-increase phosphorus goals within five years. A BOC and fourteen LACs were established to implement the rule and to assist farmers with complying with the rule. In CY2014 there was 1 full time technician that worked with LACs to coordinate information for the annual reports. This technician was funded by the EPA 319 grant program, NC Agriculture Cost Share Program (ACSP) technical assistance funds, and county funds.

All fourteen Local Advisory Committees (LACs) submitted their first annual report to the BOC in November 2003, which collectively estimated a 39% nitrogen loss reduction, and 10 of 14 LACs exceeded the 30% individually. Collective reductions had gradually increased in succeeding years, and by CY2007 only one LAC was shy of the 30% individually. All fourteen LACs met as required in 2015, and in CY2014 the collective reduction of 51% exceeded the mandated 30%. One county fell below the 30% goal established by the BOC (Martin).

Scope of Report and Methodology

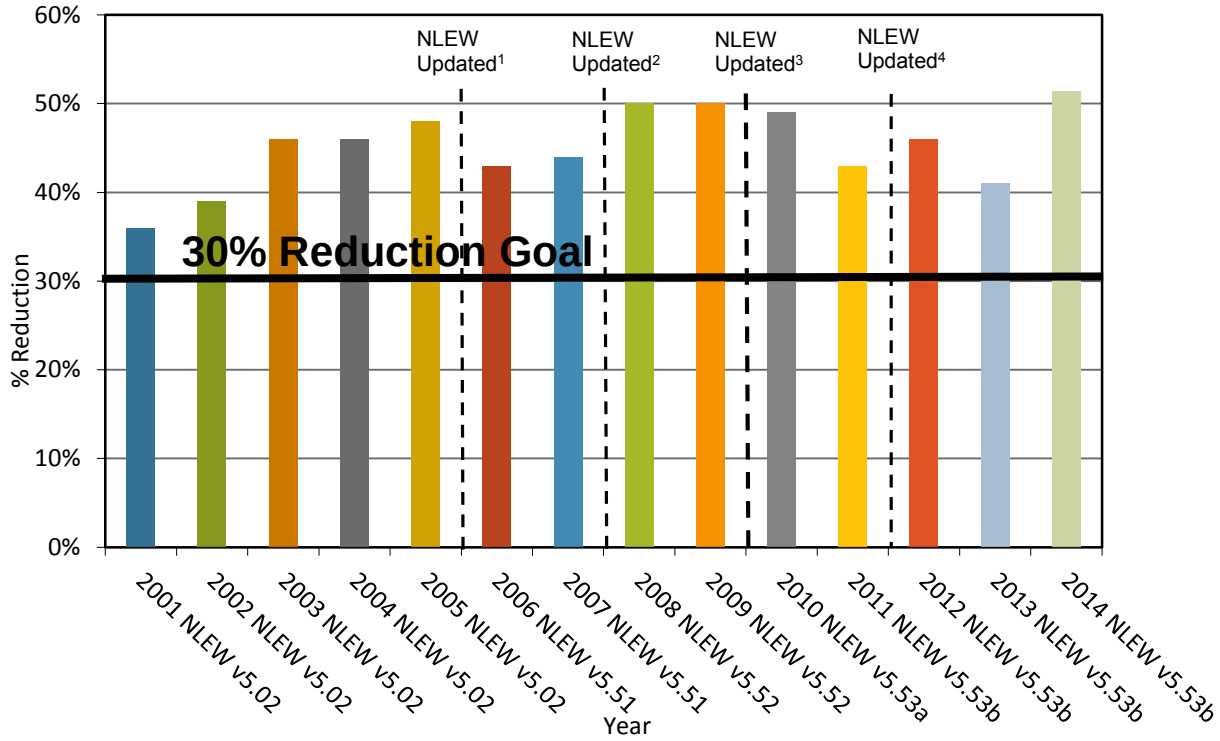
The estimates provided in this report represent whole-county scale calculations of nitrogen loss from cropland agriculture in the basin made by soil and water conservation district technicians using the 'aggregate' version of the Nitrogen Loss Estimation Worksheet, or NLEW, an accounting tool developed to meet the specifications of the Neuse Rule and approved by the EMC for use in the Tar-Pamlico Basin. The development team included interagency technical representatives of the NC Division of Water Resources (DWR), NC Division of Soil and Water Conservation (DSWC), USDA-NRCS and was led by NC State University Soil Science Department faculty. NLEW captures application of both inorganic and animal waste sources of fertilizer to cropland. It does not capture the effects of nitrogen applied to pastureland, and is an "edge-of-management unit" accounting tool; it estimates changes in nitrogen loss from croplands, but does not estimate changes in nitrogen loading to surface waters. An assessment method was developed for phosphorus, approved by the EMC, and is described later in the report.

Annual Estimates of N Loss and the Effect of NLEW Refinements

As discussed below, the NLEW software is periodically revised to incorporate new knowledge gained through research and improvements to data. These changes have incorporated the best available data, but changes to NLEW must be considered when comparing nitrogen loss reduction in different versions of NLEW. Further updates in soil management units are expected as NRCS produces updated electronic soils data. The small changes in soil management units are unlikely to produce significant effects on nitrogen loss reductions.

In past years reported data included acreages and nitrogen application rates for specialty crops and produce. Because NLEW was not programmed to accommodate these crop acres, the software was attributing the total required nitrogen for every acre reported in these categories as nitrogen loss, even when crops were under-fertilized. Due to the fact that the software was inaccurately calculating nitrogen loss for specialty crops and produce, a decision was made with the research scientists who originally designed the program to exclude these crops from the reporting framework beginning in CY2014. In addition, several crops were removed from baseline calculations due to this error. Recent years have been adjusted to account for that change and so some reductions reported in 2014 for CY2013 have changed. As a matter of perspective these acres represent only 2.8% of the overall reported cropland acres in the basin. The BOC feels that because the current reporting methodology is more appropriately comparing similar acres, the new reduction percentage is a more accurate reflection of nitrogen reductions achieved in the basin. Figure 1 represents the annual percent nitrogen loss reduction from 2001 to 2014.

Figure 1. Collective Nitrogen Loss Reduction Percent 2001 to 2014, Tar Pamlico River Basin.



[1]Between CY2005 & CY2006 NLEW was updated to incorporate revised soil management units and buffer nitrogen reduction efficiencies were reduced.
[2]Between CY2007 & CY2008 NLEW was updated to incorporate revised soil management units and correct realistic yield errors.
[3]Between CY2009 & CY2010 NLEW was an administration software update with no effect on accounting.
[4]In 2011 NLEW was updated to significantly decrease buffer nitrogen removal efficiencies based on the most current research; CY2010 and the baseline reductions were recalculated to reflect changes in NLEW.

The first NLEW revision (v5.51) marked a significant change in the nitrogen reduction efficiencies of buffers so both the baseline and CY2005 were re-calculated based on the best available information. The second (v5.52) and third (v5.53a) revisions were administrative along with minor updates of soil mapping units. In April of 2011 the NLEW Committee established further reductions (v5.53b) in nitrogen removal efficiencies for buffers based on additional research. Table 1 lists the changes in buffer nitrogen reduction efficiencies over time.

Table 1. Changes in Buffer Width Options and Nitrogen Reduction Efficiencies in NLEW

Buffer Width	NLEW v5.02* % N Reduction 2001-2005	NLEW v5.51, v5.52, v5.53a % N Reduction 2006-2010	NLEW v5.53b % N Reduction 2011-Current
20'	40% (grass) 75% (trees & shrubs)	30%	20%
30'	65%	40%	25%
50'	85%	50%	30%
70'	85%	55%	30%
100'	85%	60%	35%

**NLEW v5.02 - the vegetation type (i.e. trees, shrubs, grass) within 20' and 50' buffers determined reduction values. Based on research results, this distinction was dropped from subsequent NLEW versions.*

Current Status

Nitrogen Reduction from Baseline for CY2014

All fourteen LACs submitted their tenth annual report to the BOC in September 2015. For the entire basin, in CY2014 agriculture achieved a 51% reduction in nitrogen loss compared to the 1991 baseline. This year 13 of the 14 LACs achieved the at-least 30% nitrogen loss reduction goal individually. Table 2 lists each county's baseline, CY2013 and CY2014 nitrogen (lbs/yr) loss values, and nitrogen loss percent reductions from the baseline in CY2013 and CY2014.

Table 2. Estimated Reductions in Agricultural Nitrogen Loss from Baseline (1991) for CY2013 and CY2014, Tar-Pamlico River Basin

County	Baseline N Loss (lb)* NLEW v5.53b	CY2013 N Loss (lb)* NLEW v5.53b	CY2013 N Reduction (%) NLEW v5.53b	CY2014 N Loss (lb)* NLEW v5.33b	CY2014 N Reduction (%) NLEW v5.33b
Beaufort	9,190,250	6,244,198	32%	5,526,800	40%
Edgecombe	5,037,628	3,248,575	36%	2,601,962	48%
Franklin	2,161,460	638,918	70%	468,974	78%
Granville	890,371	418,951	53%	160,730	82%
Halifax	2,799,574	1,851,810	34%	1,471,470	47%
Hyde	4,975,781	3,482,142	30%	3,222,700	35%
Martin	782,152	588,851	25%	567,557	27%
Nash	4,321,750	1,761,548	59%	1,118,526	74%
Person	153,228	53,968	65%	55,425	64%
Pitt	6,147,790	3,115,117	49%	2,706,244	56%
Vance	419,485	164,303	61%	131,930	69%
Warren	535,517	197,299	63%	159,204	70%
Washington	863,483	653,424	24%	453,491	47%
Wilson	850,780	518,769	39%	346,689	59%
Total	39,129,249	22,937,873	41%	18,991,702	51%

**Nitrogen loss values are for comparative purposes. They represent nitrogen that was applied to agricultural lands in the basin and neither used by crops nor intercepted by BMPs in a Soil Management Unit, based on NLEW calculations. This is not an in-stream loading value.*

Nitrogen loss reductions were achieved through the combination of fertilization rate decreases, cropping shifts, BMP implementation, and cropland acreage fluctuation. The most significant factor continues to be fertilization management. Martin County's individual nitrogen reduction of 27% is below the BOC's county goal of 30% due mostly to cropping shifts and the fact that the county has only reduced cropland acres by 2,261 from baseline, but their reduction increased from the previous year by 2%. This county saw cotton decrease by 1,325 acres while tobacco, and wheat, which require higher nitrogen inputs, increased by 1,069 and 212 acres, respectively. In addition, soybeans, which need no nitrogen application, increased by 805 acres. The Division of Soil and Water Conservation will support the LAC in encouraging BMP implementation in order to increase their reduction.

Overall, NLEW estimates the following factors contributed to the total nitrogen loss reduction according to the percentages shown in Table 3.

*Table 3. Factors that Influence Nitrogen Reduction by Percentage on Agricultural Lands, Tar-Pamlico River Basin**

Factor	CY2011 NLEW v5.53b	CY2012 NLEW v5.53b	CY2013 NLEW v5.53b	CY2014 NLEW v5.33b
BMP implementation	9%	10%	8%	12%
Fertilization Management	17%	17%	20%	18%
Cropping shift	8%	10%	6%	10%
Cropland converted to grass/trees	3%	5%	5%	5%
Cropland lost to idle land	4%	4%	1%	5%
Cropland lost to development	1%	1%	1%	1%
TOTAL	43%	46%	41%	51%

**Percentages are based on a total of the reduction, not a year-to-year comparison.*

BMP Implementation

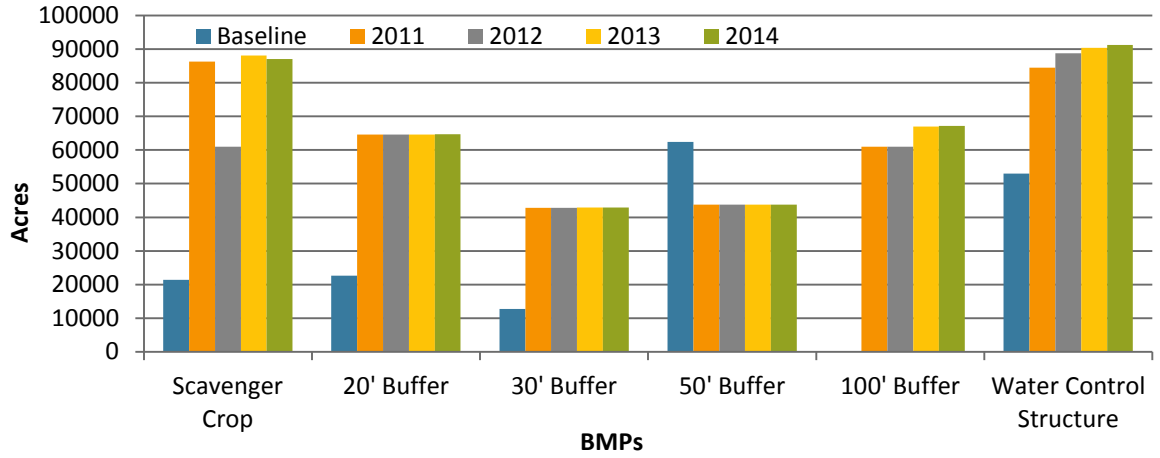
As illustrated in Figure 2, CY2014 yielded a net increase of 884 acres affected by water control structures and a decrease of 1,036 acres of nutrient scavenger crops, while buffer acres increased by 183. While there is some opportunity for variability in the data reported, LACs are including data that is the best information currently available. As additional sound data sources become available, the LACs will review these sources and update their methodology for reporting if warranted.

Overall, the total acres of implementation of BMPs have increased since the baseline, as illustrated in Figure 2. Based on a comparison of the actual acres of BMPs installed through federal, state and local cost share programs to the total 653,954 cropland acres; over half of all reported cropland receives some kind of treatment by BMPs. However this treatment estimate does not take into account the entire drainage area treated by buffers in the piedmont which is generally 5 to 10 times higher than the actual acres of the buffer shown in Figure 2.[1]

From 2001 through 2006, the NLEW program captured buffers 50’ and larger as one category. After the 2007 update, categories for 70’ and 100’ buffers were added. In CY2006 the buffers larger than 50’ were redistributed into these new categories. If this redistribution had not occurred the 50’ buffer acres would have been higher in subsequent years.

[1] **Bruton, Jeffrey Griffin. 2004. Headwater Catchments: Estimating Surface Drainage Extent Across North Carolina and Correlations Between Landuse, Near Stream, and Water Quality Indicators in the Piedmont Physiographic Region. Ph.D. Dissertation. Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, NC 27606.http://www.lib.ncsu.edu/theses/available/etd-03282004-174056/**

*Figure 2: Nutrient Reducing BMPs Present on Agricultural Lands for Baseline (1991) and Installed from 2011-2014, Tar-Pamlico River Basin**



**The acres of buffers listed represent actual acres. Acres affected by the buffer could be 5 to 10 times larger in the Piedmont than the acreage shown above[1]*

Additional Nutrient BMPs

At the field level, a number of BMPs contribute to nutrient reduction and subsequent water quality improvement. Not all BMP types are tracked by NLEW. These include: livestock-related nitrogen and phosphorus reducing BMPs, BMPs that reduce soil and phosphorus loss, and BMPs that do not have enough scientific research to support estimating a nitrogen benefit. The BOC believes it is worthwhile to recognize these practices. Table 4 identifies BMPs not accounted for in NLEW and tracks their implementation in the basin since CY2011.

Increased implementation numbers are evident in CY2014 across all BMP types since the baseline. Some of these BMPs will yield reductions in nitrogen loss that are not reflected in the NLEW accounting in this report but will benefit the estuary.

*Table 4: Nutrient-Reducing Best Management Practices Not Accounted for In NLEW, 2011-2014, Tar-Pamlico River Basin**

BMP	Units	2011	2012	2013	2014
Diversion	Feet	394,461	398,291	425,596	428,696
Fencing (USDA Programs)	Feet	235,865	241,732	256,384	256,384
Field Border	Acres	1,001	1,264	1,284	1,289
Grassed Waterway	Acres	1,154	2,475	2,518	2,524
Livestock Exclusion	Feet	221,096	233,061	238,676	238,676
Sod Based Rotation	Acres	37,052	52,502	70,456	70,596
Tillage Management	Acres	40,612	46,808	52,185	52,428
Terraces	Feet	371,936	371,936	371,936	371,936

**Values represent active contracts in State and Federal cost share programs.*

Fertilization Management

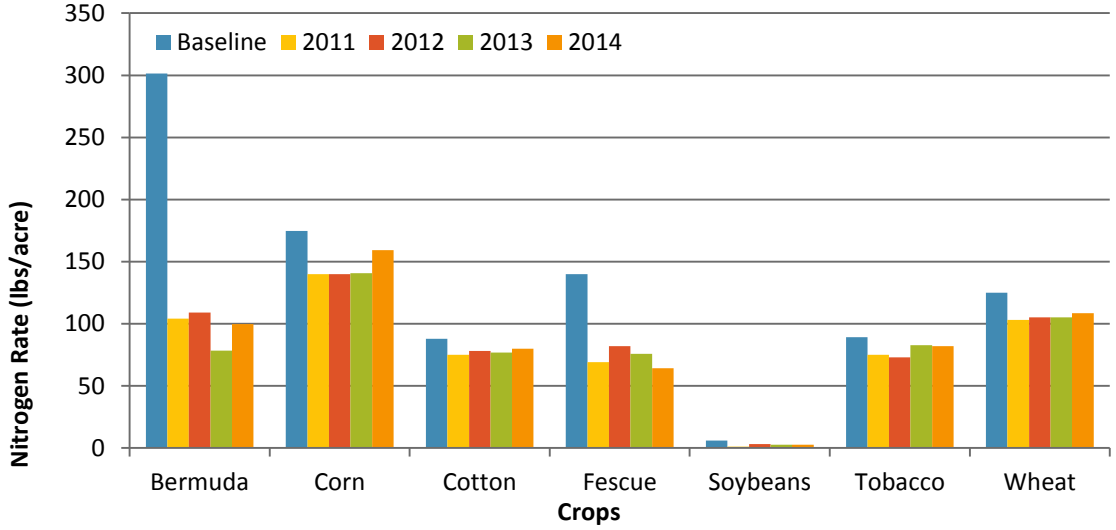
Both increased fertilizer cost and better nutrient management have resulted in farmers in the Tar-Pamlico River Basin reducing their nitrogen application from baseline levels. Figure 3 indicates that nitrogen rates for the major crops in the basin have reduced from the baseline period. In CY2014 nitrogen rates were stable for cotton, soybeans, tobacco, and wheat compared to CY2013, increased for bermuda and corn, and decreased for fescue. The rates for bermuda grass increased significantly from an abnormally low rate of 78 lbs per acre and are now close to the long-term rate since baseline. New varieties of corn with higher yield expectations and nitrogen uptake have led to increases in corn nitrogen application rates. Rates for cotton increased by less than 3 lbs per acre. Fescue nitrogen rates increased by 8 lbs per acre this year. Most pastures are under-fertilized throughout the Tar-Pamlico basin. The pasture and hayland are typically not supplemented with inorganic fertilizers.

Factors Identified by LACs Contributing to Reduced Nitrogen Rates since the Baseline Year

- Rising fertilizer costs and fluctuating farm incomes.
- Increased education & outreach on nutrient management (NC Cooperative Extension holds an annual nutrient management training session, since 2004 approximately 2,000 farmers and applicators have received training.)
- Mandatory waste management plans
- The federal government tobacco quota buy-out reducing tobacco acreage.
- Neuse & Tar-Pamlico Nutrient Strategies.

With increasing fertilizer prices, there has been an economic incentive for producers to consider more efficient nitrogen rates, sources, timing, and placement alternatives. Fertilizer rates and standard application practices are revisited annually by LACs using data from farmers, commercial applicators and state and federal agencies' professional estimates.

Figure 3. Average Annual Nitrogen Fertilization Rate (lb/ac) for the Major Agricultural Crops for the Baseline (1991) and 2010-2014, Tar-Pamlico River Basin

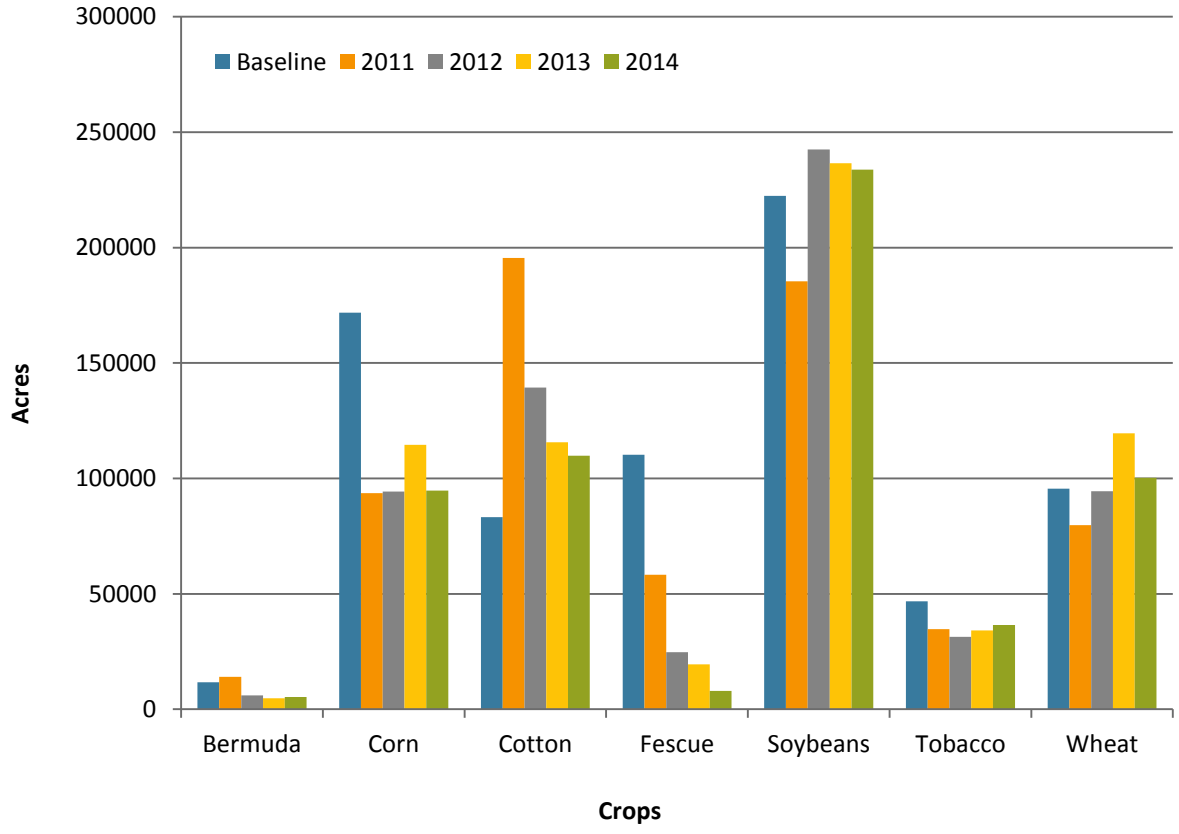


Cropping Shifts

The LACs calculated the cropland acreage by utilizing crop data reported by farmers to the USDA-Farm Service Agency. Each crop requires different amounts of nitrogen and utilizes the nitrogen applied with different efficiency rates. Changes in the mix of crops grown can have a significant impact on the cumulative yearly nitrogen loss reduction.

Figure 4 shows crop acres and shifts for the last four years compared to the baseline. While some crops – bermuda grass and tobacco – have remained relatively stable, others show more volatility. In CY2014, cotton acreage continued a recent decline, and corn acres decreased to a total that more closely matches previous years. From CY2011 to CY2014, fescue lost significant acreages in the piedmont. A host of factors from individual to global determine crop choices.

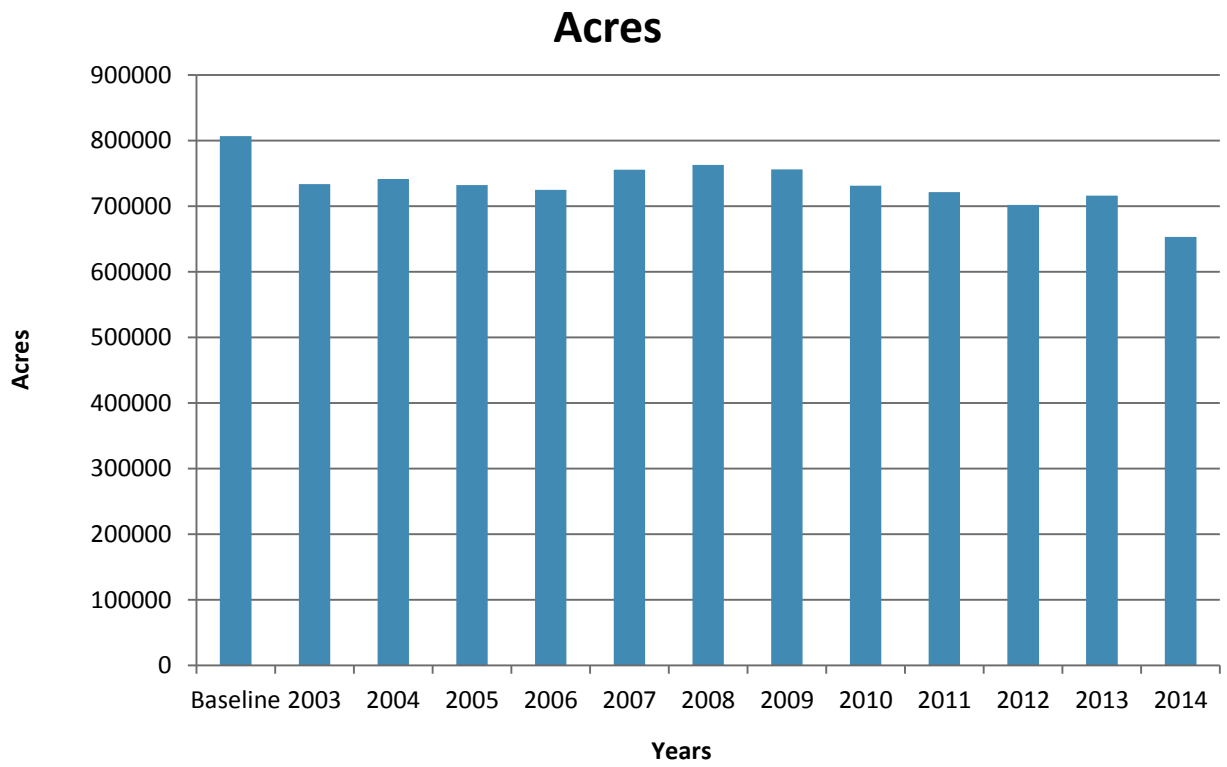
Figure 4. Acreage of Major Crops for the Baseline (1991) and 2010-2014, Tar-Pamlico River Basin



Land Use Change to Development, Idle Land and Cropland Conversion

The number of cropland acres fluctuates every year in the Tar-Pamlico River Basin due to cropland conversion, idle land and development. Each year, some cropland is permanently lost to development or converted to grass or trees and likely to be ultimately lost from agricultural production. Idle land is agricultural land that is currently out of production but could be brought back into production at any time. Currently it is estimated that approximately 11,795 acres have been permanently lost to development in the basin and more than 46,837 acres have been converted to grass or trees since the 1991 baseline. For CY2014 it is estimated that there are approximately 41,620 idle acres. There is a total of 653,954 NLEW-accountable acres of cropland (see Fig. 5). In addition to these changes, based on LAC documentation a total of 2,053 cropland acres have been lost to newly leased and constructed solar farms. This total will be updated in future years, but it is uncertain if this should be considered a permanent or temporary loss of cropland. If a landowner terminates a lease after the 30-year contract expires, most agreements include a stipulation that the land will return to its previous use. All of the above estimates come from the LAC members' best professional judgment, USDA-FSA records and county planning department data. The total crop acres are obtained from USDA-FSA and NC Agricultural Statistics annual reports. Cropland acres have continued to decrease from the baseline period (see Figure 5).

Figure 5. NLEW-Accounted Cropland Acres in the Tar-Pamlico River Basin, Baseline (1991) and 2003-2014



Phosphorus

Phosphorus Indicators for CY2014: The qualitative indicators included in Table 5 show the relative changes in land use and management parameters and their relative effect on phosphorus loss risk in the basin. This approach was recommended by the Phosphorus Technical Advisory Committee (PTAC) in 2005 due to the difficulty of developing an aggregate phosphorus tool parallel to the nitrogen NLEW tool and was approved by the EMC. Table 5 builds upon the data provided in the 2005 PTAC report, which included all available data at the time ending with data from 2003. This report adds phosphorus indicator data for CY2011 through CY2014. With the exception of animal waste P, all other parameters indicate less risk of phosphorus loss than in the baseline year.

Phosphorous Technical Assistance Committee (PTAC)

The PTAC's overall purpose was to establish a phosphorus accounting method for agriculture in the basin. It determined that a defensible, aggregated, county-scale accounting method for estimating phosphorus losses from agricultural lands is not currently feasible due to "the complexity of phosphorus behavior and transport within a watershed, the lack of suitable data required to adequately quantify the various mechanisms of phosphorus loss and retention within watersheds of the basin, and the problem with not being able to capture agricultural conditions as they existed in 1991". The PTAC instead developed recommendations for qualitatively tracking relative changes in practices in land use and management related to agricultural activity that either increase or decrease the risk of phosphorus loss from agricultural lands in the basin on an annual basis.

Contributing to the reduced risk of phosphorus loss is the increase of nutrient reducing BMPs in the basin. As indicated in Table 5, the acres affected in the basin by water control structures have steadily increased over the past three years. It should also be noted that the soil test phosphorus median number reported for the basin fluctuates each year due to the nature of how the data is collected and compiled. The soil test phosphorus median numbers shown in Table 5 are generated by using North Carolina Department of Agriculture and Consumer Services (NCDA&CS) soil test laboratory results from voluntary soil testing and the data is reported by the NCDA&CS. The number of samples collected each year varies. The data only includes samples submitted for cropland. It does not include soil tests that were submitted to private laboratories. The soil test results from the NCDA&CS database represent data from entire counties in the basin, and have not been adjusted to include only those samples collected in the river basin area.

Table 5. Relative Changes in Land Use and Management Parameters and their Relative Effect on Phosphorus Loss Risk in the Tar-Pamlico

Parameter	Units	Source	1991 Baseline	CY 2011	CY 2012	CY 2013	CY2014	1991 - 2014 Change	CY2014 P Loss Risk +/-
Agricultural land	Acres	FSA	807,026	721,432	702,227	716,289	653,954	-19%	-
Cropland conversion (to grass & trees)	Acres	USDA-NRCS & NCACSP	660	31,631	42,330	46,647	46,837	6997%	-
CRP / WRP (cumulative)	Acres	USDA-NRCS	19,241	41,833	41,833	41,833	41,833	117%	-
Conservation Tillage * (cumulative)	Acres	USDA-NRCS & NCACSP	41,415	40,612	46,808	52,185	52,428	27%	-
Vegetated buffers (cumulative)	Acres	USDA-NRCS & NCACSP	50,836	227,528	212,212	218,236	218,419	330%	-
Water control structures (cumulative)	Acres Affected	USDA-NRCS & NCACSP	52,984	84,442	88,755	90,356	91,240	72%	-
Scavenger crop	Acres	LAC	13,272	86,283	73,177	92,269	83,700	531%	-
Animal waste P	lbs of P/ yr	NC Ag Statistics	13,597,734	16,695,543	16,561,052	16,880,526	14,530,827	7%	+
Soil test P median	P Index	NCDA&CS	83	87	85	85	81	-2%	-

** Conservation tillage is being practiced on additional acres but this number only reflects active cost share contract acres, not acres where contracts have expired or where farmers have implemented conservation tillage without cost share assistance.*

Based on the these findings, the BOC recommends that no additional management actions be required of agricultural operations in the basin at this time to comply with the "no net increase above the 1991 levels" phosphorus goal of the agriculture rule. The BOC will continue to track and report the identified set of qualitative phosphorus indicators to the EMC annually, and to bring any concerns raised by the results of this effort to the EMC's attention as they arise, along with recommendations for any appropriate action. The BOC expects that BMP implementation will continue to increase throughout the basin in future years, and notes that BMPs installed for nitrogen, pathogen and sediment control often provide significant phosphorus benefits as well.

Looking Forward

The Tar-Pamlico BOC will continue to report on rule implementation, relying heavily on Soil and Water Conservation District staff to compile crop reports.

Because cropping shifts are susceptible to various pressures, the BOC is working with LACs in all counties to continue BMP implementation that provides for a lasting reduction in nitrogen loss in the basin while monitoring cropping changes. Due to a steep decline in corn prices and based on input from several LACs, the BOC expects a significant reduction in corn acreage in CY2015.

Basin Oversight Committee recognizes the dynamic nature of agricultural business.

- Changes in the world economies, energy or trade policies.
- Changes in government programs (i.e., commodity support or environmental regulations)
- Weather (i.e., long periods of drought or rain)
- Scientific advances in agronomics (i.e., production of new types of crops or improvements in crop sustainability)
- Plant disease or pest problems (i.e., viruses or foreign pests)
- Urban encroachment (i.e., crop selection shifts as fields become smaller)
- Age of farmer (i.e., as retirement approaches farmers may move from row crops to cattle)

The Division of Soil and Water Conservation has secured funding to support a revision to the NLEW software, which was written with now outdated software language. Software updates such as new yield expectations and crop additions are periodically needed. North Carolina Department of Agriculture and Consumer Services (NCDA&CS) IT staff has assessed the programming requirements of an NLEW upgrade, and a project design document has been produced that will guide these necessary upgrades. A contractor position will be advertised this fall through the IT Supplemental Staffing Program, and Department staff intends for work to begin this winter. It is hoped that these and future updates will enable the BOC to report more crop types for the counties in the basin.

The BOC will continue to review data from all studies as they are completed and become available and will consider the results as they relate to nutrient loadings from land based sources and uses. This includes studies related to the 2004 NPDES permit issued to Rose Acre Farms.

Funding is an integral part in the success of reaching and maintaining the goal through technical assistance and BMP implementation. It is also important for data collection and reporting.

In 2001, ten basin technicians and two basin coordinators were employed to assist in the reporting requirements for the Neuse and Tar-Pamlico Agriculture Rules. In 2013 there remained funding for 5.25 full-time basin technicians and one Neuse/Tar-Pamlico Basin Coordinator. In 2015, there is no funding for basin technicians or a coordinator, so a full-time position in the Division of Soil and Water has been revised to include some of the duties of the basin coordinator. Technicians have been essential in promoting and assisting farmers with BMP installation and nutrient management since the rule's adoption, but on June 30, 2015 the last technician funding was expended.

Farmers and agency staff personnel with other responsibilities serve on the LACs in a voluntary capacity. Without funding for technicians, the annual progress reports fall on the LACs without local technical assistance to compile data and annual reports. Few currently serving LAC members were active during the stakeholder process for the Agriculture Rule, so some institutional knowledge about annual reporting requirements has been lost. As a result, training of new Soil and Water Conservation District staff and LAC members regarding rule requirements and reporting is ongoing.

Now that watershed technician funding has been eliminated, a more centralized approach to data collection and verification is necessary. This evolving approach will involve GIS analysis and more streamlined FSA acreage documentation. The LACs will be trained to handle the new workload to the best of their ability. Because district staff has neither the time nor financial resources to synthesize county level data, this centralized approach will come at the expense of local knowledge. Annual agricultural reporting is required by the rules; therefore continued funding for the division's remaining position is essential for compliance.