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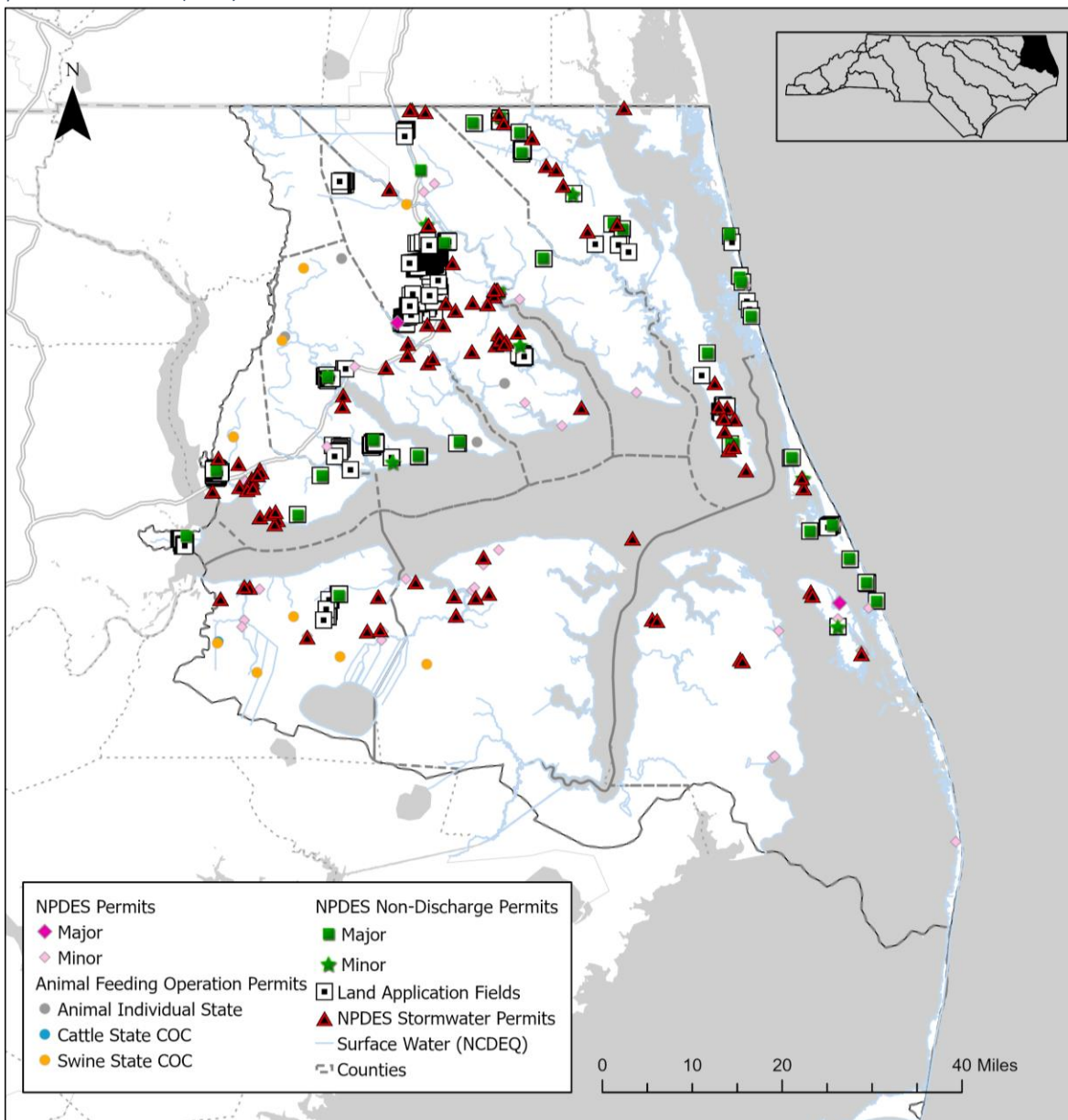
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Chapter 7 Permitted and Registered Activities

7.1 Overview

There are several programs to protect North Carolina’s water resources. These include programs which oversee wastewater, stormwater, land application of wastewater effluent and biosolids, wetlands and buffers, animal operations, local water supply, public water systems, coastal management, source water protection, groundwater and drinking water protection programs (Figure 7-1). This section includes brief descriptions of the programs, management strategies, and resources available for protecting waters of the state. More information about each of the programs can be found on the NC Department of Environmental Quality (DEQ) website and in the Supplement Guide to Basinwide Planning (2008) as well as other state agency and county websites responsible for permitting or compliance issues.

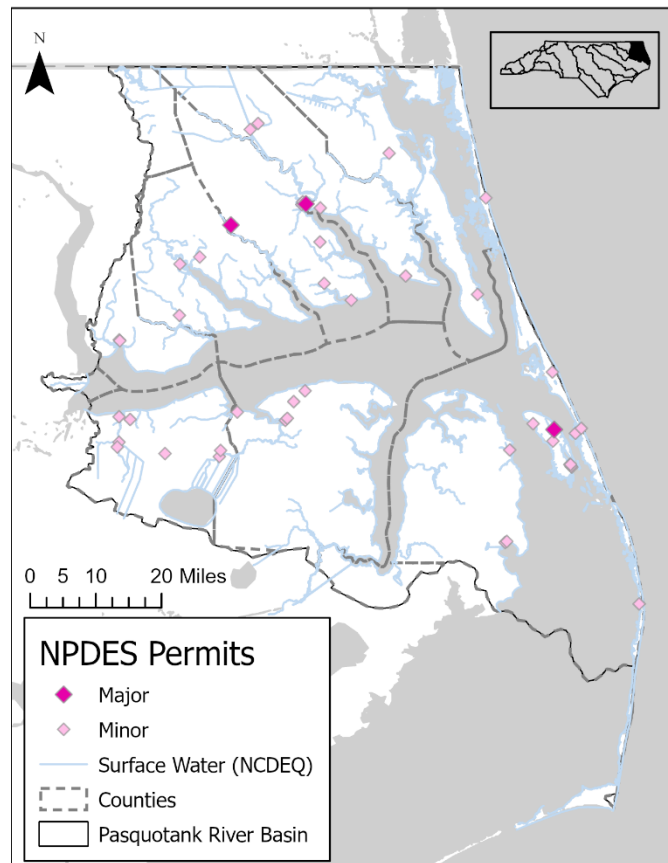
Figure 7-1 NPDES Permits, NPDES Stormwater, NPDES Non-Discharge, Animal Operations, and Land Application Permits in the Pasquotank River basin (2021).



7.2 National Pollutant Discharge Elimination Systems (NPDES)

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. It is authorized under the Clean Water Act (CWA). Not complying with permit limits on wastewater flow can lead to degraded water quality making surface waters unsafe for drinking, fishing, swimming and other activities. NPDES wastewater permits are issued by the [NPDES Complex Permitting, NPDES Compliance, and Expedited Permitting](#) branches within Division of Water Resources (DWR). These permits are reviewed and potentially renewed every 5 years. As of July of 2021, there are 45 active and 1 proposed NPDES permitted facilities in the Pasquotank River basin (Figure 7-2 and [Appendix VII Table VII-1](#)). As part of their NPDES permit, some facilities are required to monitor whole effluent toxicity (WET) ([Appendix VII Table VII-6](#)). Acute and/or chronic toxicity tests are used to determine toxicity of the discharge to sensitive aquatic species (usually the fathead minnow, *Pimephales promelas*, or the water flea, *Ceriodaphnia dubia*). Results of the test can be used to help predict the impacts of the discharge to a receiving stream. DWR's Aquatic Toxicology Branch (ATB) in the Water Sciences Section maintains a compliance summary for all facilities required to perform WET tests and provides monthly updates of the information to regional offices as well as the central office.

Figure 7-2 NPDES Permits in the Pasquotank River Basin (2021)



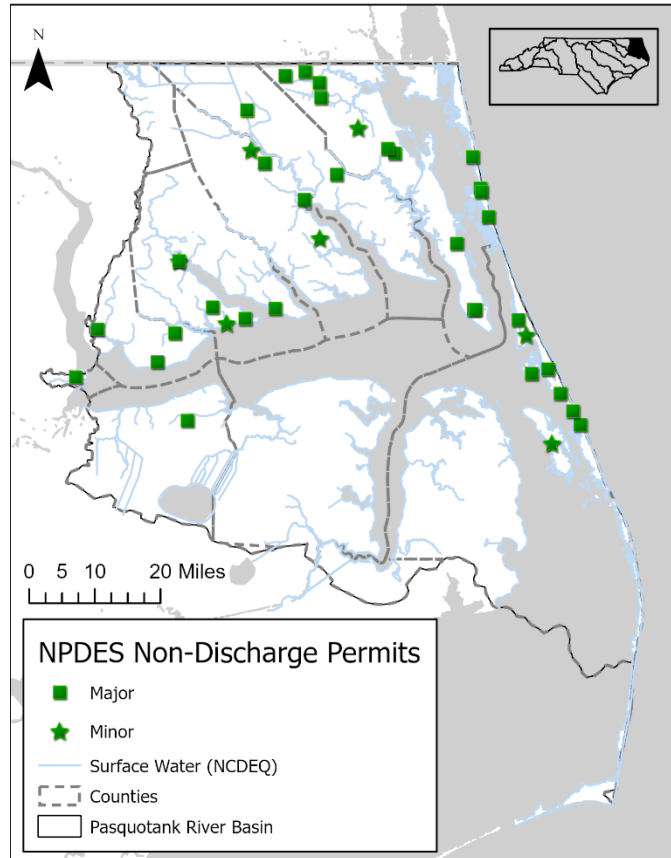
7.3 Pretreatment, Emergency Response and Collections System (PERCS)

The Federal and State Pretreatment Program gives regulatory authority for EPA, states, and municipal governments to control the discharge of industrial wastewater into municipal wastewater treatment plants (WWTP) or publicly owned treatment works (POTW). The objectives of the pretreatment program are to (1) prevent pass-through, interference, or other adverse impacts to a POTW, employees, or the environment; (2) promote the beneficial reuse of biosolids; and (3) assure all categorical pretreatment standards are met. There are an estimated 620 Significant Industrial Users (SIU) who discharge industrial wastewater to over 130 POTW throughout the state of North Carolina. Pretreatment programs are managed by the [DWR Pretreatment, Emergency Response and Collections Systems \(PERCS\)](#).

7.4 NPDES Non-Discharge Permitting and Land Application of Wastewater Effluent

The [Non-Discharge Branch \(NDB\)](#) is responsible for the permitting of facilities that land apply residuals, reclaimed water, and wastewater effluent. Residuals, often refer to as biosolids, treated sludge, or sewage sludge, which are generated during wastewater treatment, water treatment, and air pollution control. The program has operational and monitoring requirements similar to those of the NPDES wastewater program; however, the primary difference is that the treated effluent is not discharged to surface waters. Non-discharge wastewater disposal options include irrigation (spray or drip), high-rate infiltration, low rate infiltration, and evaporative systems. Non-discharge residual disposal includes dedicated and non-dedicated residual disposal sites, and agricultural land for crops not consumed by humans. Residuals are also available to the public as fertilizer for home use. During the application process, steps must be taken to assure that residuals are applied at or below agronomic rates based on the soil and crop type. If the application is over

Figure 7-3 NPDES Non-Discharge Permits in the Pasquotank River Basin (2021)



agronomic rates, the residuals must be taken to a dedicated residual disposal site or landfill. In addition to land application of residuals and treated effluent, the NDB is also responsible for permitting facilities for the beneficial use of reclaimed water for the purpose of conserving the state's potable, ground, and surface water resources. As of June 2021, there are 35 active and 4 proposed permitted facilities alongside 1 facility listed as inactive with no monitoring required (Figure 7-3 and [Appendix VII Table VII-2](#)) and 448 land application sites ([Appendix VII Table VII-4](#)). Within the Pasquotank basin, it is important to note that there is a direct connection between groundwater and surface water in many places. Drainage ditches and canals are widespread in northeastern North Carolina and function as a direct pathway for groundwater that may be impacted from nutrients and coliform bacteria, especially in rural areas where agriculture is widespread, to enter into the surface water system. In other cases, surface water bodies, themselves, directly border areas where groundwater quality may be impaired. In many areas, the time it takes for groundwater to move into the surface water system is brief. Although groundwater quality at non-discharge facilities may be compliant with 2L groundwater quality standards, groundwater flux moving into the surface water system has the ability to transport contaminants into surface water bodies and add to total mass loadings. It is recommended that research be conducted to better establish and understand the relationship between groundwater and surface water in eastern North Carolina. Such understanding would provide for more accurate assessment of surface water impairments resulting from groundwater discharges and enable the state to make sound permitting judgments and recommendations to better protect water quality in general.

Many non-discharge systems are constructed by the developer and turned over to a home owner's association (HOA) after completion. If there is a major problem, the HOA is responsible for the repair bill and funding the repair can be an issue. For systems that will be or are owned by a HOA, the statutes and rules require special accounts be set up by the HOA for the operation of the treatment system. In addition, the HOA must set up a reserve fund for major repairs.

Another issue that can be associated with non-discharge systems is the installation of high rate infiltration systems in very densely developed areas. The high rate systems, combined with low pressure systems and individual septic tank systems, can overload the upper groundwater aquifer in coastal areas. These conditions make it very difficult to conduct meaningful groundwater compliance monitoring because of the large number of neighboring influences from septic systems. Some solutions include effluent monitoring limits combined with more effective bacteriological treatment, increased denitrification, centralized waste treatment or limiting growth.

Non-discharge systems create some challenges for the DWR regional offices in terms of inspections and assuring permit and compliance conditions are met. DWR may seek additional staffing resources to meet these challenges.

7.5 On-Site Wastewater Treatment Systems (Septic Systems)

Instead of being sent to a wastewater treatment facility, wastewater from many households is treated on-site through the use of an on-site wastewater treatment system, more commonly referred to as a septic system. Poorly planned and/or maintained septic systems can fail and contribute to nonpoint source pollution. Wastewater from failing septic systems can contaminate ground and surface water. Failing septic systems are also health hazards and are considered illegal discharges when surface water is impacted. On-site septic systems are common throughout the Pasquotank River basin. Three in every four houses in this watershed uses septic systems to treat and dispose of their household wastewater. Of the 100 counties in North Carolina, Camden county and Hyde county have the highest septic system user percentage (93%). However, soil conditions in the basin may limit the functionality of the septic system treatment allowing untreated effluent to reach surface waters. Precautions should be taken by local septic system permitting authorities to ensure that failing systems are repaired, older systems are upgrade and new systems are sited and constructed properly allowing an adequate repair area.

On-site systems in North Carolina fall under the regulatory jurisdiction of the North Carolina Department of Health and Human Services (DHHS) under rules adopted by the Commission for Public Health (CPH). Centralized sewer systems and surface dispersal systems are permitted by the NC DEQ under rules adopted by the Environmental Management Commission. The CPH on-site system rules are administered by local health departments throughout the state, under the supervision of the On-Site Water Protection (OSWP) Branch in DHHS's Division of Public Health <https://ehs.ncpublichealth.com/oswp/>. The OSWP Branch is responsible for providing regulatory oversight and consultative services for sub-surface on-site wastewater and dispersal systems to local health departments, builders, developers, homeowners, system installers, well drillers, system operators, engineers, soil scientists, geologists, and environmental health consultants. The Non-Point Source (NPS) Pollution Management Program in the OSWP Branch identifies ways to reduce or remove septic system-derived potential NPS pollution through the best management practices and education and outreach programs to ensure an on-site system is functioning properly.

In order to protect human health and maintain water quality failing septic systems should be repaired, older systems must be updated, and straight pipes must be eliminated. Additional monitoring of fecal coliform throughout tributary watersheds will aid in identifying where straight pipes and failing septic systems are problems. County, town, and city planners need to understand the economic and human health ramifications caused by unsatisfactory septic systems and plan for long-term septic system sustainability. In areas where soils prevent individual septic systems a collective community septic system in appropriate soils may allow for sustainable development where a centralized sewer system is not available.

On-going on-site waste management activities in the Pasquotank River basin are led by the Albemarle Regional Health Services (ARHS), a district Board of Health for Bertie, Gates, Pasquotank, Perquimans, Camden, Tyrrell, and Washington counties, which conducts annual inspections. In addition, Chowan, Currituck, Hertford, and Martin counties contract with ARHS for their services. They follow-up on all on-site waste system repairs and are responsible for conventional systems within the 7-county district.

Figure 7-4 Number of Septic Systems per Land Square Mile (Image Source: <https://ehs.ncpublichealth.com/oswp/docs/nps/stats/pasquotankstats.pdf>).

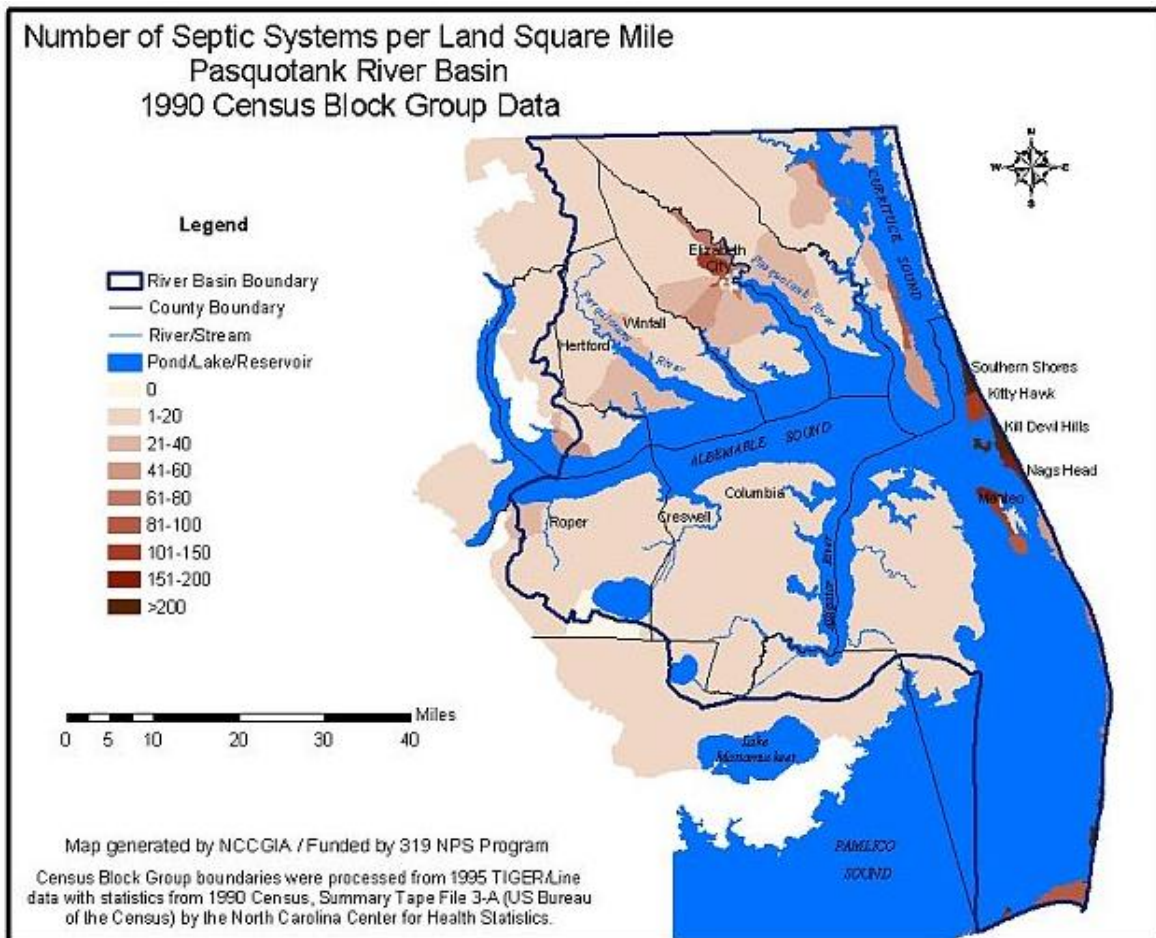


Table 7-1 Number of Septic Systems in the Pasquotank River Basin (1990)

County	Area (mi ²)	Total Population	Sewage Disposal (Housing Units)			Sewer Usage (%)	Septic Usage (%)	Potential N (lbs./yr.)
			Sewer	Septic	Other			
Camden	240.7	5,904	26	2,296	144	1.05	93.11	58,379
Chowan	75.69	3,929	559	1,125	13	32.94	66.29	25,870
Currituck	261.71	13,736	1,037	6,196	134	14.08	84.10	129,415
Dare	381.67	22,746	4,012	17,505	50	18.60	81.17	189,371
Gates	124.55	2,854	12	960	144	1.08	86.02	28,242
Hyde	386.44	1,545	24	707	29	3.16	93.03	14,983
Pasquotank	226.89	31,298	6,574	5,540	184	53.46	45.05	151,501
Perquimans	247.19	10,447	1,109	3,691	172	22.30	74.24	80,884
Tyrrell	389.93	3,856	467	1,267	173	24.49	66.44	28,483
Washington	276.98	7,104	565	2,213	115	19.53	76.49	56,610
Total	2,611.74	103,419	14,385	41,500	1,158			763,737

Source: <https://ehs.ncpublichealth.com/oswp/docs/nps/stats/pasquotankstats.pdf>

Recommendations for on-site wastewater treatment systems (septic systems) include:

- Characterize the location, age, and types of septic systems within the Pasquotank River basin and consider financial incentives and financial assistance to address failing septic systems.
- Conduct research studies to gain a better understanding of climate change impacts on septic system performance as the function of these subsurface systems has been shown to be impacted by heavy rains and flooding, sea-level rise, rising groundwater tables, and other climate related impacts.
- Education and outreach programs for property owners, septic systems installers/operators to learn about potential impacts of extreme weather, rising sea levels, and rising groundwater levels could have on operation, maintenance, design, and installation of systems.

7.6 Wetland and Buffer Permitting Programs

7.6.1 Federal Section 404 Permitting

[Section 404 of the Clean Water Act \(CWA\)](#) established a program to regulate the discharge of dredged or fill material into waters of the United States (US). Activities such as damming a stream channel to create a pond or placing material in a stream, wetland, or open water require a permit before dredged or fill material can be discharged into jurisdictional waters of the US. Permit applications must show that steps have been taken to avoid and minimize impacts to wetlands, streams, and other aquatic resources and in some cases, [Compensatory Mitigation](#) will be provided for unavoidable permanent losses (EPA, 2017a). Many routine farming, ranching, or silviculture activities that are part of an “on-going” farming or forestry operation are considered [exempt](#).

The [Wilmington District](#) of the US Army Corps of Engineers (ACOE) administers Section 404 in North Carolina. [General Permits](#) (GPs), also referred to as Nationwide Permits (NWP) or [Regional General Permits](#), are issued for impacts that will have minimal adverse effects and Individual Permits (IPs) are

issued for significant impacts. In most cases, permittees are required to submit a joint [Pre-Construction Notification or an Individual Application Form](#) to the ACOE and/or DWR.

Under the ACOE, the federal compensatory mitigation requirement is generally triggered for permanent losses to 0.10 acres of wetland but varies for perennial and intermittent streams (0.02 acres or 150 linear feet depending on the NWP). The loss of medium to high quality functioning streams and wetlands are typically assigned a compensatory mitigation ratio of 2:1 by the ACOE (i.e. for every acre of wetland or foot of stream or lost, two credit units must be provided). Lower quality permanent aquatic resource losses may be assigned a lower ratio. The assigned ratio accounts for both the condition of the impacted natural resource and the time-lag associated with mitigation (Williams, A., 2018, Homewood, S., pers comm, Davis, E., pers comm).

Recent changes to the Waters of the U.S. (WOTUS) in June 2020, now called the Navigable Waters Protection Rule, have removed federal protection from wetlands that do not have a direct surface hydrologic connection to traditionally navigable waters (US EPA, 2020). Many of North Carolina's valuable wetlands such as pocosins, headwater forests, seeps, hardwood flats, pine flats and Carolina bays that do not have a surface hydrologic connection, including wetlands found in the Pasquotank River basin, may fall into this non-jurisdictional federal category.

7.6.2 North Carolina Section 401 Permitting and Certification

[Section 401](#) of the CWA requires states and recognized tribes to certify any federally permitted or licensed activity that results in a discharge to waters of the United States. By issuing a Water Quality Certification (WQC), the state certifies that the project will not degrade Waters of the State or violate State water quality standards (EPA, 2010; EPA, 2017b). Mitigation is triggered at the State level for losses greater than or equal to 1/10-acre of wetland or 300 feet of perennial stream. A mitigation ratio of 1:1 is required for both wetlands and perennial streams (i.e. for every acre of wetland or feet of stream lost an equivalent amount must be replaced).

In addition to 401 regulation through the CWA, the state has a permitting program to authorize impacts to isolated wetlands under 15A NCAC 02H .1300 and federally non-jurisdictional wetlands and classified surface waters under 15A NCAC 02H .1400 (temporary rules). The state also maintains a regulatory program for riparian buffers. [Riparian Buffer Authorizations or Variances](#) are required in the Neuse River basin, Tar-Pamlico River basin, Catawba River basin, Randleman Lake watershed, Jordan Lake watershed, and Goose Creek watershed. The State has delegated authority to administer the riparian buffer protection rules to over 40 local municipalities in buffered basins.

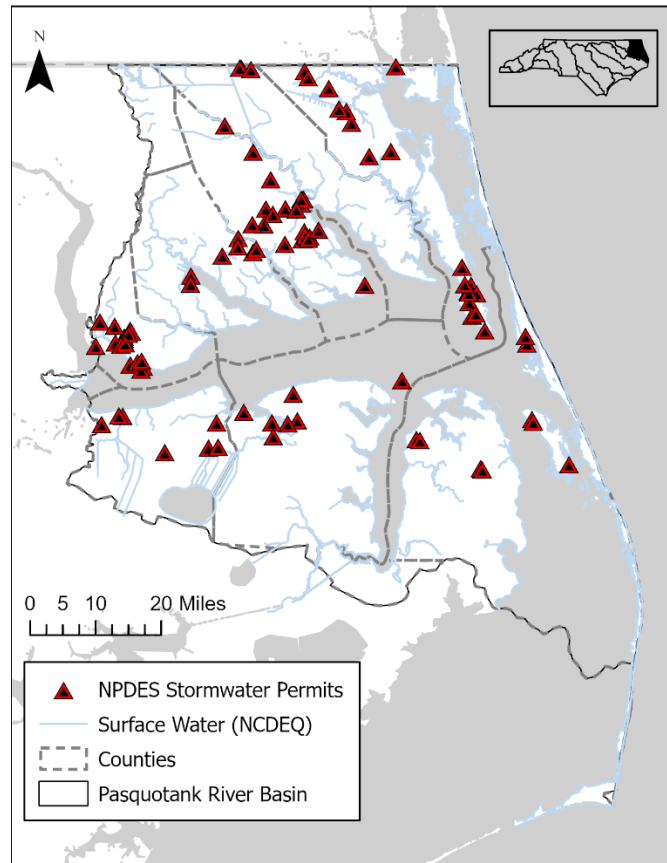
There are two branches within DWR responsible for implementing North Carolina's water, wetlands, and riparian buffer regulatory programs: the [401 & Buffer Permitting Branch](#) (NC DWR, n.d.-a) and [Transportation Permitting Branch](#) (NC DWR, n.d.-b). DWR's [401 & Buffer Permitting Branch](#), which gets its name from Section 401 of the CWA, also assists with [Compliance and Enforcement](#) issues and manages DWR's mitigation oversight programs: [Stream & Wetland Mitigation Program](#) and [Nutrient Offset & Buffer Mitigation Program](#). NC DWR works with the ACOE to provide regulatory oversight to North Carolina wetland and stream compensatory mitigation through participation in the Interagency Review Team (IRT). The [Transportation Permitting Branch](#) works with the NC Department of Transportation (DOT) and local municipalities on transportation related projects. The branch reviews 401 certificate applications and on-site permittee-responsible wetland and stream mitigation plans associated with transportation projects. For larger more complex DOT projects, DWR, the ACOE, and other resources agencies work with DOT

through the [Merger Process](#) which streamlines the permitting process (NC DOT n.d.). Both branches maintain active and expired 401 certifications on an [interactive projects map](#) and associated project documents can be found in DWR's document's library, [Laserfiche](#).

7.7 Stormwater Systems

Stormwater runoff is a primary carrier of nonpoint source pollution and is a particular concern in the agricultural based Pasquotank River basin. Previous hydrologic alterations of the landscape have ditched and channelized the land to improve drainage. Stormwater currently moves quickly off the land bypassing swamps and enters directly into creeks and rivers untreated. The impact of stormwater runoff is also severe in developing areas where recently graded lands are highly susceptible to erosion. Water quality impacts are also evident in urbanized areas where stormwater runoff is increased by impervious surfaces and is rapidly channeled through ditches, curb and gutter systems into nearby waterbodies. The goal of the [NC Division of Energy, Minerals and Land Resources \(DEMLR\)](#) stormwater programs is to prevent pollution from entering the waters of the state via stormwater runoff. The [Stormwater Permitting Program](#) develops, plans and implements statewide stormwater control policies, strategies and rules designated to protect surface waters. The program handles permitting for industrial, municipal and postconstruction (development) projects and provides technical assistance to communities, engineers, industry, citizens, and local governments. Stormwater control programs include those required under NPDES, Post-Construction, and Water Supply Watershed Protection. DEMLR maintains an [interactive web-based Post Construction Stormwater map](#) to help the public determine whether development activities are subject to the post-construction permitting program or other stormwater permitting requirements. A tutorial and guidance documents are also available for interpreting the map. Currently, there are 106 stormwater permits in the Pasquotank River basin (Figure 7-5 and [Appendix VII Table VII-3](#)).

Figure 7-5 NPDES Stormwater Permits in the Pasquotank River Basin (2021)

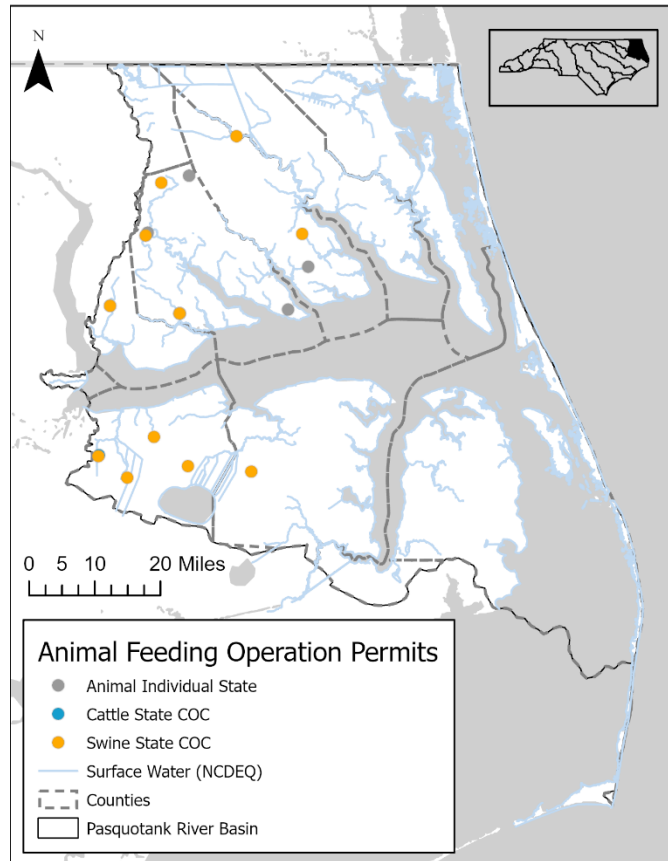


7.8 Animal Operations Permits

DWR's [Animal Feeding Operations \(AFO\) Program](#) is responsible for permitting and compliance activities of animal feeding operations across the state. Animal operations are defined by General Statute 143- 215.10B as feedlots having more than 250 swine, 100 confined cattle, 75 horses, 1,000 sheep or 30,000 poultry with a liquid waste management system. All permitted animal operations are required to have a Certified Animal Waste Management Plan (CAWMP). The CAWMP is developed by a Certified Technical Specialist and is incorporated into the permit. There are many deemed permitted operations across the state. Operations considered deemed permitted have fewer animals than the state requires to obtain a permit or have a waste management system that does not require a state or federal permit. Poultry operations that use dry-litter poultry waste systems are examples of operations that are deemed permitted. Owners or operators of dry-litter poultry waste facilities are, however, required to adhere to rules set forth under [15A NCAC 02T](#)

[.1303](#) and [General Statute 143-215.10C](#) which include minimum stream setbacks, land application rates, soil analysis, and recordkeeping. As of June 2021, there are 15 permitted animal operations in the Pasquotank River basin (Figure 7-6 [Appendix VII Table VII-5](#)). Several poultry operations are located in the basin as well, but these facilities are deemed permitted. More information about animal feeding operations can be found on the program's website.

Figure 7-6 Animal Feeding Operation Permits in the Pasquotank River Basin (2021)



7.9 Water Use

7.9.1 Public Water Systems

It is the responsibility of DWR's [Public Water Supply Section \(PWSS\)](#) to regulate public water systems (PWS) within the state under the authority of General Statute 130A Article 10: North Carolina Drinking Water Act. Public water systems (PWS) are those that provide piped drinking water to 15 or more service connections or 25 or more people for 60 or more days per year (Table 7-2). A PWS is identified by the number of people served or number of connections and the number of days or months of the year that the population is served.

Table 7-2 Types of Public Water Supply Systems (PWS)

Public Water Supply (PWS) Type	Description
Community	Regularly serves 25 or more year-round residents or has 15 or more connections. Examples include subdivisions, mobile home parks, prisons and assisted living centers.
Non-Transient Non-Community	Serves at least 25 of the same persons 6 or more months per year. Examples include schools, daycares and industries.
Transient Non-Community	Serves 25 or more people at any given time at least 60 days per year. Examples include restaurants, gas stations, rest areas and campgrounds.

7.9.2 Source Water Assessment Program (SWAP)

Pollution prevention is recognized as the most effective approach for ensuring a reliable, long-term and safe public drinking water supply. The Safe Drinking Water Act (SDWA) amendments of 1996 required that all states establish a [Source Water Assessment Program](#) (SWAP). SWAP allows the state to systematically identify potential contaminants and delineate source water protection areas by using existing data from established federal and state environmental programs.

The primary goal of SWAP is to protect public drinking water supplies. [Detailed assessments](#) of all public drinking water intakes are available for review and can be used as a planning tool to protect public drinking water sources. An [interactive map](#) is also available which provides general information about the water source and its susceptibility rating. The susceptibility rating is based on a contaminant rating and an inherent vulnerability rating and indicates the potential for a drinking water source to become contaminated. It should be noted that the susceptibility rating is not an indicator of water quality, but rather, the potential for a water source to be impacted by the identified contaminants within the assessment area.

7.9.3 Wellhead Protection (WHP) Program

In 1986, amendments to the Safe Drinking Water Act (SDWA) established requirements for states to develop [Wellhead Protection](#) (WHP) programs. WHP programs were intended by Congress to be a key part of a national groundwater protection strategy to prevent contamination of groundwater used for public drinking water supplies. In North Carolina, development of a local WHP plan is not mandatory but is encouraged and viewed as a valuable supplement to existing groundwater protection programs. North Carolina’s program is intended for city and county governments and water supply operators who wish to provide added protection to their local ground water supplies. The WHP plan identifies the wellhead protection area (WHPA). A WHPA is defined as “the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonable likely to move toward and reach such water well or wellfields.” Once implemented, the WHP plan reduces, but does not eliminate, the susceptibility of wells to contaminants.

7.9.4 Local Water Supply Plans (LWSP)

Under General Statute 143-355(I), local governments that provide public water service are required to prepare [local water supply plans](#) (LWSP). All community water systems that have 1,000 or more service connections or serve more than 3,000 people on a regular basis are also required to prepare a LWSP. The

LWSP is an assessment of a water system's current and future water needs and its ability to meet those needs. By understanding current and future needs, local governments and community systems will be able better able to manage water supplies, plan for future growth, and prepare for system improvements. Data in the LWSP is entered by the Public Water Supply System (PWSS) and includes information about population, population projections, water supply and demand. The PWS reports water usage annually to DWR and updates the LWSP at least every five years. More information about LWSPs can be found in [Chapter 9](#).

7.9.5 Water Withdrawal & Transfer Registration (WWATR)

[General Statute 143-215.22H](#) requires that any non-agriculture person or entity who withdraws 100,000 gallons or more of water per day from surface water or groundwater or who transfers 100,000 gallons or more of water per day from one river basin to another register the withdraw or transfer with the Environmental Management Commission. Any agricultural water users that withdraw or transfer 1,000,000 gallons or more of surface water or groundwater per day must also register the withdraw or transfer. The withdrawal or transfer can be registered through the Water Withdrawal & Transfer Registration program administered through DWR. Under administrative rule ([15A NCAC 02E .0604](#)), registrants must report monthly average water use in million gallons per day on an annual basis.

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