

Merit Criteria

The North and East Barge Berths at the Port of Morehead City's Phosphoric Acid Terminal are over 55 years old and at the end of their useful service life. The East Barge Berth has been closed to service due to reported stability issues with the existing bulkhead wall, and the North Barge Berth's capacity has been reduced, with a full closure necessary in the next few years. The ***Modernization and Revitalization of Barge Berths*** project will restore these essential Port assets to full capacity, improving the safe handling of cargo, enhancing efficiency through the elimination of unnecessary movements, and alleviating the need to divert cargo to other modes of transportation.

Safety

Safety is a primary purpose of the Project. In May 2022, the terminal's primary tenant –PCS Phosphate Company Inc., commonly known as Nutrien – conducted a stability analysis of the terminal's eastern bulkhead. This analysis found several structural deficiencies that could individually cause failure of the bulkhead: scour exceeding the bending capacity of the sheet pile, weak concrete cap, and sheet pile corrosion. In short, it is not a matter of if the existing bulkhead will fail, but when. Because workers' safety is of utmost importance, the East Barge Berths have been closed to service and the North Barge Berths are operating at half-capacity.

The lack of safe operating conditions on both barge berths is the primary reason they are not currently being optimized by the Port. The ***Modernization and Revitalization of Barge Berths*** project prioritizes safety at the facility by incorporating improvements including repairs and refurbishments that provide stability and quality operation of water utilities, electrical devices, lighting, stormwater infrastructure, pavement, paint and striping, and existing appurtenances such as trestles, fixed cranes and hoists, to restore a safe working environment for barge workers.

The North Barge Berths have the same structural deficiencies as the East Barge Berths and are anticipated to be closed for service in 2027. At that time, cargo will be diverted to truck and rail to make the 70-mile trip from the Nutrien Aurora Production Facility to storage at the terminal and finally export. The reconstructed barge berths will maintain safer operations along the highways and roadways between the Aurora Production Facility and Morehead City by maintaining transport by barge instead of diversion to truck and rail. The Project would realize over \$500,000 in total benefits from avoided crashes, injuries, and fatalities over the next 20 years. Further, the cargo this terminal accommodates; potash, fertilizer, and liquid acid, are classified as hazardous material. Transporting these goods via barge is safer than by rail and truck because it offers the lowest spillage rate by mode and routes the hazmat away from populated communities.¹ Nutrien takes the safety risks associated with transporting its products very seriously; in 2022, they developed an agricultural hazardous materials course and hosted over ten pilot training sessions to train emergency first responders in North Carolina and Georgia.²

¹ [Waterways: Working for America](#), MARAD.

² [2023 Environmental, Social and Governance Report](#), Nutrien.

The current operational workaround to the closure of the East Barge Berths at the terminal requires liquid barges to navigate to the south side of the Newport River Bridge (US 70) to unload at Berth 1, as shown in Figure 1. The passage under the bridge has a narrow clearance that requires an experienced hand and calm weather conditions, with many scenarios that could delay safe passage through for hours or days at a time. During inclement weather, the closure of the East Barge Berths increases the distance to a safe place for barges to tie down. With the Project, acid barges would not need to attempt this passage at all.



Figure 1. Without the Project, barges must navigate the narrow passage beneath the Newport River Bridge (US 70) to unload at Berth 1.

The current workaround using Berth 1 also requires the use of an on-site generator and barge pumps to power manifold operations, which have a higher risk of potential leakage than using the infrastructure at the East Barge Berths that were made for unloading the liquid fertilizer, exposing workers to greater risk.

Environmental Sustainability

The *Modernization and Revitalization of Barge Berths* project aligns with the state's climate and clean energy objectives as identified in the NCDOT Clean Transportation Plan. The plan complements the North Carolina's Carbon Reduction Strategy (CRS) efforts, which aim to cut carbon emissions by at least 50% below 2005 levels by 2030 as outlined in Governor Roy Cooper's Executive Order 246. The Project benefits also aid the state's trajectory towards achieving net-zero emissions across the transportation sector by 2050, as identified in the North Carolina Deep Decarbonization Pathways Analysis (2023).

Reduced Emissions by Maintaining Maritime Transportation (Avoided Modal Shift)

The North Carolina Department of Environmental Quality [2024 Greenhouse Gas Inventory](#) underscores the environmental advantages of maritime transportation over trucking. According to a National Waterways Foundation-published report conducted by the Texas Transportation Institute, barge transport emits nearly 90% less carbon dioxide per ton-mile of cargo transported compared to trucking.³ Through the restoration of full berthing capacity north of the Newport River Bridge, this Project is positioned to significantly curtail carbon dioxide emissions and mitigate the environmental and health impacts of freight transportation on communities along North Carolina's coast.

Depending on the diversion scenario (with such limited rail capacity at the Port, it is not certain whether rail service to accommodate a portion of the cargo would be feasible), the Project generates between \$7 million and \$21 million in total emissions reduction benefits.

Environmental Justice Community

The Port aims to be a good neighbor. In addition to providing over 50 local jobs, the Port maintains assets for the Morehead City community including a water tower, public beach, and public pier, which are further described in Quality of Life. The Port aims to continue providing these community benefits, in addition to minimizing the impact of its operations. Ensuring cargo can travel by waterway keeps trucks off this community's limited roadway network, improving their safety, quality of life, and air quality. According to the EPA's EJScreen, Tract 9704.02, which is where the Project is located, has critical transportation service gaps and is identified as a food desert. Additionally, 46% of the population in Tract 9704.02 is low income and 29% are people of color. Approximately 5% of the population speaks Spanish at home. According to the EPA's Climate and Economic Justice Screening Tool (CEJST), Tract 9704.02 is also in the 94th percentile for flood risk and expected loss rate due to natural hazards. Tract 9308, where the Nutrien-Aurora facility is located, ranks high for all five indicators of climate disadvantage as shown in Figure 2.

This Project also supports over 1,000 jobs and 1,000 contracted positions in Aurora, North Carolina, by ensuring the continued viability of the production facility located there. According to EJScreen, Aurora is listed at or above the 80th percentile for environmental, health and socioeconomic indicators as compared to the rest of the nation, including:

- Flood risk – 96th percentile,
- Heart disease – 96th percentile,
- Persons with disabilities – 89th percentile,
- Toxic releases to air – 86th percentile,
- Low life expectancy – 85th percentile,
- Wildfire risk – 83rd percentile, and
- Cancer risk – 81st percentile.

³ A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2019. Texas A&M Transportation Institute. January 2022.
<https://www.nationalwaterwaysfoundation.org/file/28/TTI%202022%20FINAL%20Report%202001-2019%201.pdf>

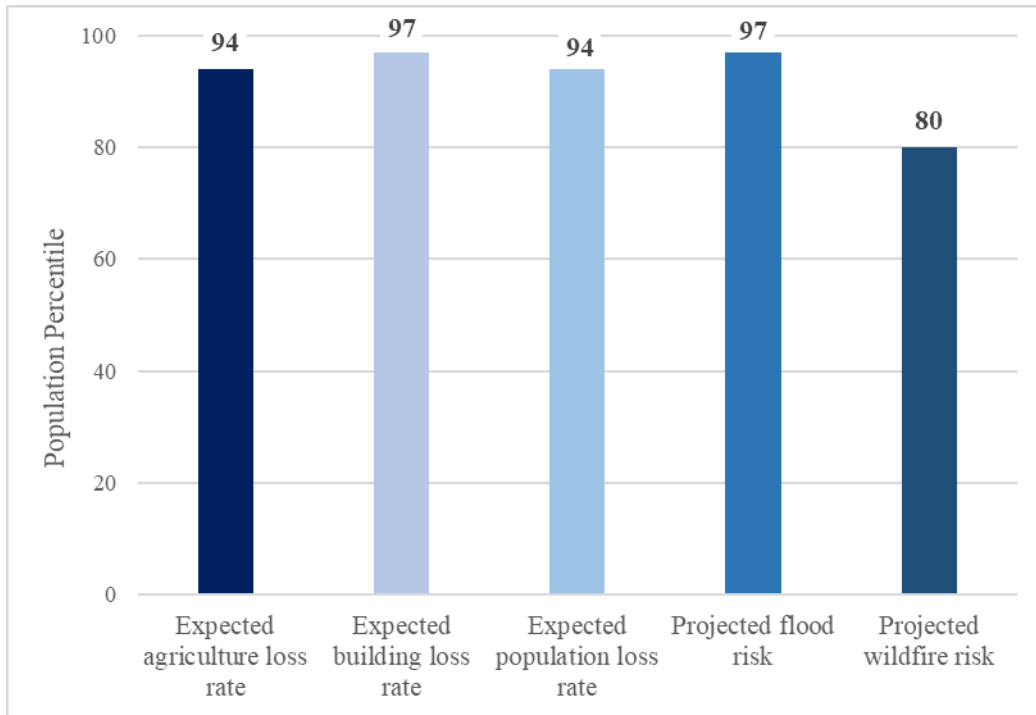


Figure 2. The EPA's Climate and Economic Justice Screening Tool (CEJEST) shows the significant climate-related disadvantage residents of the City of Aurora and Beaufort County Census Tract 9308 are exposed to.

Improving Resilience

The Project will incorporate current design standards to enhance the infrastructure's resiliency to extreme weather events and natural disasters.

According to the North Carolina Institute for Climate Studies, global sea levels will rise within a range of 1–4 feet by the year 2100. Addressing rising sea levels is crucial to prevent extensive harm to North Carolina's property, tourism, and agriculture. North Carolina's coastline, especially in the northern Coastal Plain, is highly vulnerable to natural disasters such as hurricanes, tropical storms, and tornadoes. On average, a high-intensity storm makes landfall once every three years³. Notably, Hurricane Florence in September 2018 caused over \$20 billion in damages due to record-breaking rainfall.³ Florence made landfall in Wrightsville Beach, North Carolina, and a multitude of cities along the coast were plagued with torrential downpours for over two days. Morehead City, while over 90 miles away, recorded over 20 inches of rain, as shown in Figure 3.

In 2022, the North Carolina State Climate Office highlighted the extreme weather experienced in the state through a year-long series of articles. Figure 4 below shows that some of the most extreme hurricanes in North Carolina's history as measured by low pressure or high wind speed have made landfall in or near Morehead City.

Observed Precipitation

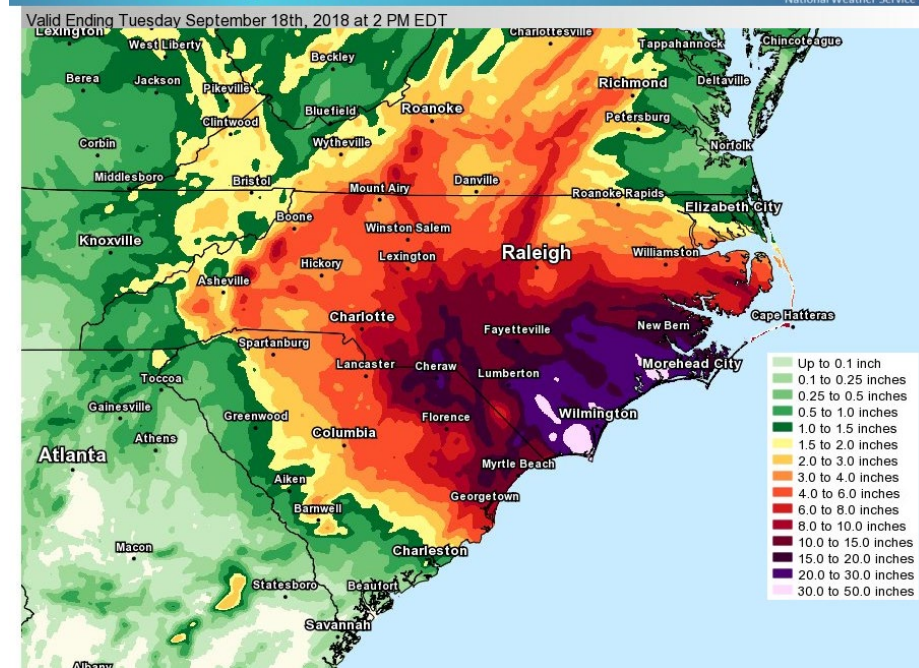


Figure 3. National Weather Service Observed Precipitation of Hurricane Florence. Morehead City experienced over 20 inches of rain.

North Carolina's Strongest Hurricanes **NC** EXTREMES

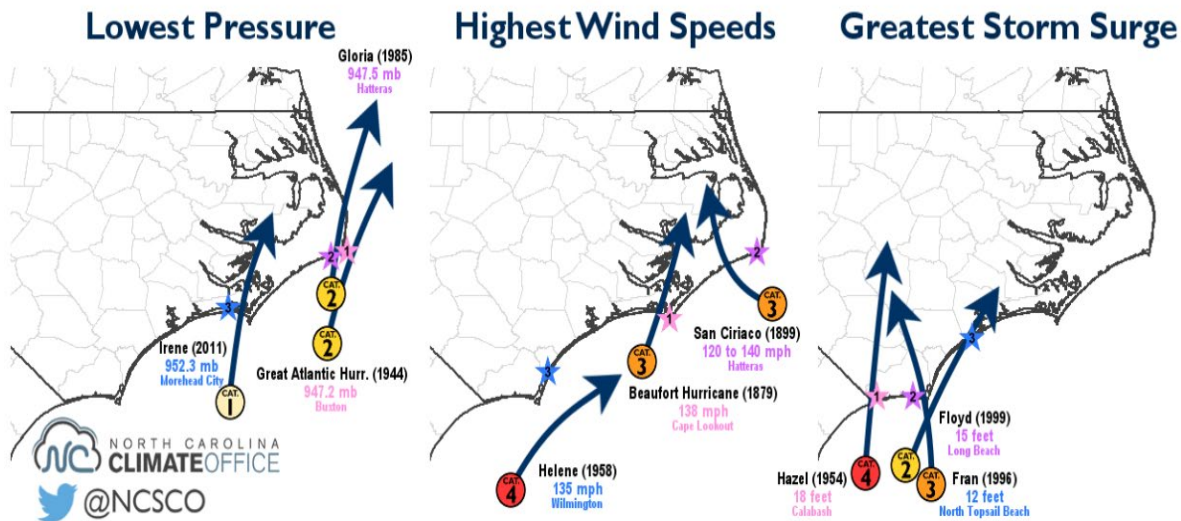


Figure 4. North Carolina State Climate Office maps show the lowest pressure and highest wind speed hurricanes crossed Morehead City.

<https://climate.ncsu.edu/blog/2015/09/nc-extremes-strong-hurricanes-are-no-strangers-to-ncs-coast/>

Quality of Life

The Project will enhance the Carteret County area's quality of life by avoiding safety risks, congestion, road wear, and emissions, in addition to sustaining good-paying jobs with low barriers to entry and supporting global agri-food supply chains. Without the rebuilt barge berths, all cargo from the Phosphoric Acid Terminal will need to be transported by other modes – with limited rail capacity available, the no-build option for this Project would route substantial truck traffic (volumes upwards of 26,000 additional truck trips each year) through the community. The Project will avoid this diversion, limiting additional truck traffic and rail crossings that would increase congestion – resulting in discounted savings for local residents and businesses of over \$6.1 million over 30 years.

The North Carolina State Ports Authority (the Authority) understands and values Morehead City's long history with the waterfront, supporting a strong tradition of recreational fishing and tourism. The Authority owns more than 475 acres in Carteret County including four islands around the Port of Morehead City. On Radio Island (which is located across from the Project and has active port activity), the Authority leases a recreational area known as the Newport River Pier and Boat Ramp to the town of Morehead City. The area features a fishing pier and is a popular casting spot for a wide array of fish. Also located on Radio Island, the Authority leases a public beach known as East Beach to Carteret County. In July of 1999, the Authority partnered with Carteret County to build and lease an area for public beach recreation. East Beach includes more than eleven acres with approximately 1,200 feet of beach/water frontage that is open to the public. These Port-provided public facilities are shown in Figures 5 and 6.



Figure 5. East Beach on Radio Island is the closest beach to Beaufort and offers calm, relaxing waters.

*Image Source:
Visit Beaufort NC*



Figure 6. The North Carolina State Port Authority owns and maintains the Newport River Pier and Boat Ramp, which includes a public pier for fishing. The dry bulk storage silos of the Phosphoric Acid Terminal are visible in the distance.

*Image Source:
Crystal Coast NC*

Advancing Equity

Additionally, this Project will advance equity by maintaining over 2,250 good-paying jobs in North Carolina and encouraging the use of Historically Underutilized Businesses, as further described in the Economic Competitiveness and Opportunity section. Disadvantaged communities in Morehead City will directly benefit from the employment opportunities the Project supports. Of Morehead City's approximately 9,500 residents, EJScreen reports 20% are people of color and 29% are low income with a 4% unemployment rate. These demographics are higher in the Census Tract where the Project is located, with people of color comprising 29% of the population and 46% identified as low income. The median household income in Morehead City per U.S. Census Bureau data in 2022 dollars is \$51,716, with a per capita income of \$37,849.

The region needs to maintain a skilled workforce to remain competitive in the future. In the Authority's 2021 Strategic Plan⁴, Developing the Talent Pipeline was identified as one of the four core pillars needed for future success. Among the strategies for success, the Authority has formalized an apprentice/internship program by partnering with the local county school districts, particularly trade schools and high school dual enrollment programs and local community colleges, providing hands-on job training. The Authority recognizes that an effective and efficient organization requires the talents, skills, and abilities of all qualified and available individuals, and actively seeks opportunities to promote diversity and inclusion at all occupational levels of the workforce through equal employment EEO workforce planning initiatives.

The Authority has a commitment to diversity with its workforce and port partners. The Authority recruits through diverse avenues and sources including military/veteran events, career fairs and counseling, and job skills events. The Authority has partnerships with local non-profits working to assist underemployed and underrepresented communities, such as StepUp Wilmington, a mentoring organization serving girls and women of color, and first-generation students.

Mobility and Community Connectivity

This Project is intended to restore the efficient movement of freight.. With the North Barge Berths limited in capacity and the East Barge Berths completely out of use, the length of time for barge transport and unloading is extended, which causes export vessels to wait and delay shipments, creating a ripple effect through the agricultural product supply chain.

The North Barge Berths are limited to unloading only one barge at a time. Under normal conditions, that would be restored with the Project, a second barge could be staged alongside the first while it is being unloaded. In these conditions, barges can be handled back-to-back with only one hour to adjust the unloading equipment between vessels. In current conditions, the second barge must wait until the first is completely unloaded and moved away from the barge berth. But it is not as simple as waiting nearby for this maneuver as there is no place for the second barge to tie off or be staged nearby. The second barge must wait at the Aurora Production Facility, 57 nautical miles away, until it can start its journey to the North Barge Berths. This

⁴ <https://connect.ncdot.gov/resources/PORTS2024/Documents/Strategic%20Plan.pdf>

increases the turnaround time for barge unloading at the North Barge Berths from one hour with the Project, to about 24 hours total under current operations.

Currently, because the East Barge Berths are unusable, Nutrien must lease another facility in the Port that is open to other tenants: Berth 1. To pump the liquid cargo for unloading, Nutrien is using a rented generator and the barge's power as a temporary solution. A long-reach forklift is used to lift the hoses onto the barge. This extends the amount of time needed to fully unload the barge from 6 hours under normal circumstances using the East Barge Berths to 9 hours using the temporary facility. With the Project, the East Barge Berths will have proper manifolding and power to pump the liquid cargo out. Without the Project, liquid cargo must be pumped a farther distance to the liquid storage tanks near the East Barge Berths, which further increases freight transportation time and reduces the life of the barge pump. Because this process can only accommodate one barge at a time and takes longer, Nutrien must have export vessels wait at anchor until they have stored enough cargo to be fully loaded, since they cannot unload directly to the vessels or export a partially full vessel. A liquid cargo export vessel is typically a 40,000-ton ship that can accommodate about 25 barges.

The current deficiencies of the East Barge Berths result in inefficient movement of cargo that must backtrack, causing delays in the supply chain. With the reconstructed berths, this cargo can be unloaded from the barge and transported the shortest distance to the storage facility. The dry and liquid storage facilities were constructed to be adjacent to the barge berths to allow for efficient transfer of cargo and cannot be easily moved. These movements are shown in Figure 7 in the Economic Competitiveness and Opportunity section.

Additionally, Berth 1 is located on the south side of the Newport River Bridge that has a narrow clearance (80 feet) for barges. Navigating this passage challenges less experienced pilots in good weather but proves nearly impossible during severe winds, such as are often experienced during the North Carolina Coast's extreme weather events as previously noted in the Environmental Sustainability section. Even experienced pilots generally need to tie off on the north side of the bridge to wait for calmer conditions before maneuvering past the bridge because the barges are up to 72 feet wide.

Maintaining barge transport, instead of diverting significant amounts of cargo to rail and truck without the Project, keeps this hazardous cargo off highways and out of communities. Barge transport also prevents congestion caused by additional truck traffic and rail crossings. Without the Project, between 26,000 and 30,000 additional truck trips would travel the 70+ mile route between Nutrien's production facility in Aurora and the Port of Morehead City each year. This traffic would be especially impactful for the disadvantaged community surrounding the Port, with a population just under 10,000 and very limited east/west transportation infrastructure due to its coastal geography. The rail line that reaches the Port travels through the center of the community, which means diversion to this mode without the Project would disrupt Port truck operations and local traffic.

Economic Competitiveness and Opportunity

Improving Freight Mobility

The Project will directly improve freight mobility by restoring barge berthing capabilities at the Port's Phosphoric Acid Terminal for at least the next 50 years, alleviating the current supply chain bottleneck at the Newport River Bridge/Berth 1 and avoiding a scenario in which cargo must be diverted to truck and rail. As shown in Figure 7, if the East Barge Berths were to stay closed to service, liquid barges would have to continue navigating the narrow marine passage beneath the Newport River Bridge, which delays even experienced captains and is not navigable under all weather conditions. Additionally, liquid cargo must be pumped over 1,400 feet longer using a temporary generator and other equipment, which is also prone to failure and causes delay, as compared to the purpose-built infrastructure at the Phosphoric Acid Terminal. The Project will improve the efficiency of liquid barge operations, decreasing turnaround time by over 95% and unloading time by over one third. Restoring the ability to berth two barges simultaneously at both the North and East Barge Berths will significantly increase the terminal's capacity, which would allow Nutrien to increase production and throughput at the Port.



Figure 7. Without the Project, barges must travel beneath the Newport River Bridge, which delays even experienced pilots and is not navigable under all weather conditions.

Supporting Local, Regional, and Global Economies

The Project supports economic vitality at the regional and national level by providing North Carolina businesses unrestricted access to the global marketplace. A study by NC State University⁵ determined that the Authority contributed approximately \$16.1 billion annually to the state’s economy between July 1, 2020, to June 30, 2021. The Authority directly and indirectly supports more than 88,200 jobs across North Carolina, which comprises a substantial portion of the state’s economy. Indeed, the Port of Morehead City broadly is a tremendous catalyst for economic growth and development throughout North Carolina and the region.

The Port of Morehead City’s Largest Tenant Feeding the World

As mentioned, these barge berths serve Nutrien, the Port of Morehead City’s largest tenant by volume. Nutrien moves nearly 800,000 tons of cargo via barge and vessel annually through the Port of Morehead City.⁶ Nutrien is the largest producer of potash and the third-largest producer of nitrogen fertilizer in the world. The Nutrien-Aurora production facility employs nearly 2,000 individuals, about half of which are direct jobs and the other half contract. Nutrien is the area’s largest private employer, contributing approximately \$250 million in spending in the state in 2023 and \$8 million in state and local taxes annually. Without the Project, the significant inefficiencies in Nutrien’s operations (including required diversion to other modes) would likely reduce production and as a result, could decrease the number of jobs Nutrien is able to provide. The ***Modernization and Revitalization of Barge Berths*** project is necessary to not just maintain Nutrien’s local presence and current production capacity but allow it to continue growing and increasing economic opportunity for North Carolinians.

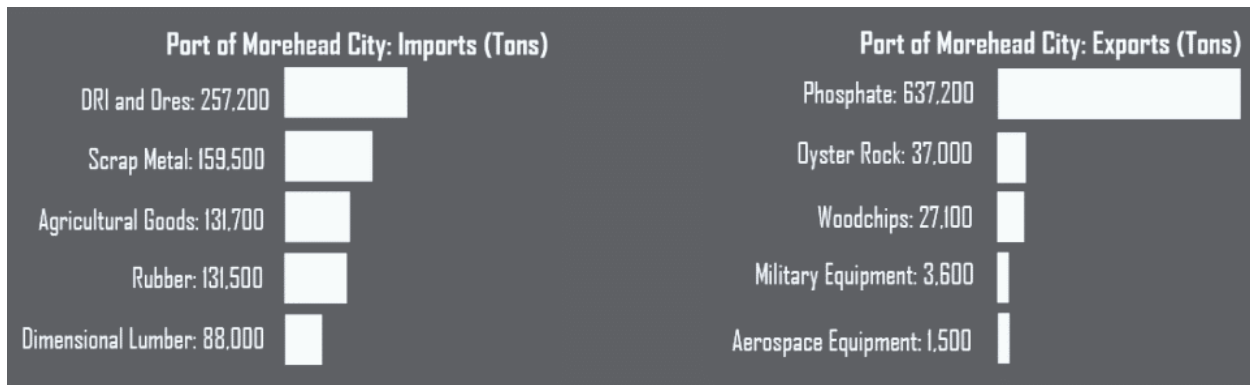


Figure 8. Phosphate – including dry fertilizer, potash, and animal feed produced through Nutrien – is by far the Port’s largest export.

⁵ <https://connect.ncdot.gov/resources/PORTS2024/Documents/Economic%20Contribution.pdf>

⁶ Based on a 20-year average calculated with historical data provided by Nutrien.

Providing High Quality Jobs and Workforce Development

The Project sustains jobs in Morehead City, Wilmington, and Aurora, North Carolina, including Port staff, stevedores, and longshoremen, captains and deckhands, and production facility workers. The Authority has over 250 employees, including 50 in Morehead City. Longshoremen are members of the International Longshoreman's Association (ILA) Local 1807. The Authority offers full benefits including medical, dental, vision and supplemental insurance, and participates in the Teachers' and State Employees' Retirement System.

The Nutrien-Aurora facility supports nearly 1,000 direct jobs and nearly 1,000 contract jobs. Nutrien-Aurora actively collaborates with East Carolina University, NC State University and Virginia Tech in the recruitment and acquisition of engineering students/candidates to help improve its talent pool, support current business needs, and facilitate succession planning. The site has launched Operator-in-Training programs, Maintenance Apprenticeships and Engineer-in-Training roles to develop workforce skills and provide access to new opportunities. Nutrien-Aurora has operated a registered NC Apprenticeship Program since 1984, when the program began with two maintenance trades and has continued to expand to broader maintenance crafts and operating departments. Nutrien played a key role in developing the Master Craftsman Program in 2000 for a statewide recognized program. The Aurora site currently has 51 trades in the NC Community College Apprenticeship Programs; to date, over 1,700 Journeyman and 300 Master Craftsman have graduated from the programs. Nutrien-Aurora also partners with Beaufort Community College on the delivery of its Maintenance Craft Training Program, which includes customized curriculum, as well as the Volt Center at Craven Community College, which offers National Center for Construction Education and Research (NCCER) certification for welders and mechanics. As mentioned in the Safety Section, in 2022, Nutrien developed an agricultural hazardous materials course and hosted over ten pilot training sessions to train emergency first responders in North Carolina and Georgia.⁷

Promoting Local Inclusive Economic Development

The Authority encourages inclusivity in hiring through the utilization of Disadvantaged Business Enterprises, Minority-owned Businesses, and Women-owned businesses. The Authority procurement staff track total spending by percent of Historically Underutilized Businesses, which has ranged from 5 to over 20 percent in recent quarters. Spending on DBE/HUB businesses will also be documented and reported for the Project. The Authority will distribute information about contracting opportunities widely, including to existing HUB partners.

⁷ [2023 Environmental, Social and Governance Report](#). Nutrien.

State of Good Repair

One of the key goals of the Project is to restore and modernize the berths at the Phosphoric Acid Terminal, some of which have already been closed to service due to safety and stability concerns. The new infrastructure will provide an additional 50 years of life, mitigating risks associated with aging infrastructure and ensuring the continuity of maritime activities. The Project will restore the bulkhead within its existing footprint.

Without the Project, according to the May 2022 Stability Analysis Report, the cost to replace the bulkhead if even a partial failure were to occur would be significantly more expensive than to do so while the existing bulkhead is still intact. Moreover, the Port would likely be responsible for the removal of the failed bulkhead section and any upland material that spilled into the channel.

The new infrastructure will be designed to current standards to include scour protection measures, a new fendering system, and an anchor system that will strengthen and protect the new barge berths and, therefore, modernize the replaced infrastructure. A robust maintenance and operations plan will be developed to maintain the new barge berths in a state of good repair. This plan will include a schedule of the minimum inspections and routine maintenance required to help avoid future damage to the infrastructure.

Partnership and Collaboration

This Project reflects a partnership between the Authority and its largest tenant, Nutrien (which covered the cost of Project design to expedite reconstruction of this urgently needed Port infrastructure), to restore infrastructure that supports efficient, safe freight movement by barge and regional economic vitality. As mentioned in Economic Competitiveness, the Authority coordinates with local county school districts, trade schools, and community colleges to provide apprenticeships, internships, and other work experiences. As relevant, the Authority will keep these partners and students informed of Project progress and other learning opportunities.

The Port of Morehead City is committed to community engagement as part of the Project planning and execution. As part of a 2021 PIDP-funded rail improvement project at Radio Island, the project team hosted public engagement sessions, as well as in person meetings with the homeowner's association (Marsh Creek HOA) in the project vicinity. Feedback from those sessions included a request to minimize project construction of road and rail crossings during high tourist season. Community feedback was incorporated into the project schedule to be responsive to this request, and ongoing communication was provided to the Marsh Oak HOA via postal mail and email throughout project mobilization and construction. The feedback from the Marsh Oak HOA related to community engagement was very positive. The Port has now developed the relationships to continue outreach to these and similar communities.

The *Modernization and Revitalization of Barge Berths* project will build on the Port's past engagement efforts in Radio Island and use a similar approach. Community engagement through the NEPA process is anticipated to be conducted early in 2025 and the Port will use a webpage, email, or other tools to keep parties of interest informed as the Project progresses. As the Project schedule is further refined during final design, the community feedback about additional traffic during high construction season will be taken into account when considering procurement methods and timelines.

Innovation

Delivery

To expedite the delivery of potential project permits, the Port may utilize NCDOT's innovative project, Advancing Transportation through Linkages Automation and Screening (ATLAS), a mapping program that reduces the data collection burden of the environmental review process. Current data collection during project development requires extensive, time-consuming research across multiple platforms and agencies. Project ATLAS consolidates data from local, state, and Federal agencies and adjacent projects to provide single-point access to GIS-based information and accelerate the environmental reviews of projects.

Technology

The Port intends to use sensors and small unmanned aerial vehicles to enhance infrastructure inspection and asset management processes, which are a new approach for the Port. This innovative technology will allow for real-time notification of infrastructure that needs to be serviced or repaired, as well as provide a consistent record of events.

Financing

This Project is a Public Private Partnership between Nutrien and the Port. Nutrien covered the cost and collaborated with the Authority throughout the design of the Project, which is currently at 90%, and was engaged throughout development of this application. The Authority and Nutrien look forward to continuing their synergy to restore this critical Port infrastructure to a state of good repair.