

What is North Carolina's Blue Economy?

Introduction

Duke University's Nicholas Institute for Environmental Policy Solutions and North Carolina Sea Grant recently published an initial assessment of North Carolina's ocean economy. The white paper provides an overview of the state's ocean economy sectors and begins a conversation about transitioning to a blue economy. This inaugural issue of *North Carolina's Blue Economy* information series summarizes the key findings from that publication.



Roger Winstead/NC State

Waters upstream, like the Neuse River, also play a role in the blue economy.



North Carolina's ocean and coastal areas and their resources shape a unique and important segment of the state's economy, particularly for its coastal counties. From seafood and commercial fishing, to access to global markets through shipping and transport, and finally tourism and recreation, thousands of jobs and billions in revenue for the state depend on the ocean and coast.

North Carolina's ocean economy includes the economic activities that take place in the ocean, receive inputs from the ocean and deliver outputs to the ocean. These activities take place in the state's coastal counties, coastal waters under state jurisdiction and adjacent federal waters.

Significant portions of the the ocean economy depend on the underlying ecological systems and associated ecosystem services — the benefits people obtain from ecosystems. These ocean ecosystem services include:

- Seafood
- Minerals
- Energy
- Marine biotechnology
- Transport and trade
- Tourism and recreation
- Carbon sequestration
- Coastal protection
- Waste disposal
- Biodiversity

Natural resources and ecological systems underpin the state's ocean economy, functioning as the natural capital asset base. This asset base includes fish stocks, beach and coastal water quality, and natural habitats and associated biodiversity.

Ocean economy activities, which depend heavily on the health of the underlying natural capital asset base, also have the potential to deplete these resources and systems — putting jobs and economic growth at risk. A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems, resulting in a blue economy.

The blue economy concept creates a lens by which to view and develop policies that simultaneously enhance ocean health and economic growth. The blue economy lens allows us to:

- Better understand a unique and discrete segment of the state's economy, particularly of the coastal region, as a basis for more targeted policy, opportunities for business clustering and increased investment; and
- Visualize the connection between this segment of the economy and the state's ocean resources and ecological systems, and eventually, the relationship between the two.

How Big is North Carolina's Ocean Economy?

Based on data from the National Ocean Economics Program and U.S. Census Bureau County Business Patterns program, **North Carolina's ocean economy contributed \$2.1 billion to gross domestic product, or GDP, in 2013, and 43,385 jobs.**

These results should be considered conservative estimates, particularly given the absence of data on recreational fishing, coastal development, and emerging sectors like marine biotechnology, and coastal protection and restoration.

Recreational fishing supported an estimated \$1.6 billion in sales and 16,150 jobs not captured in the above totals. Coastal properties in North Carolina also add value to the ocean economy on the order of hundreds of billions of dollars. These properties — including a range of natural ecological features such as barrier islands and wetlands — provide benefits like protection from flooding, among other services.

Figure 1 shows that employment in North Carolina's ocean economy measures favorably to other natural resource-based segments of the state's economy. It rivals food manufacturing and surpasses other sectors like wood-product and paper manufacturing, and textile mills.



Figure 1: Employment in North Carolina's Ocean Economy vs. Other Sectors in 2013

Even these very conservative estimates show the vital contributions of the ocean economy to the livelihoods and revenues of North Carolina's coast. For the state's 20 coastal

counties, the ocean economy contributes 6.5 percent of the region's GDP and 12.9 percent of employment. Some coastal counties depend even more on the ocean economy as shown in **Table 1**. Dare County, home to the Wanchese Seafood Industrial Park and the tourist-driven Outer Banks, attributes 26.3 percent of its employment to the ocean economy.

Table 1: Coastal Counties with Highest Percentage of Employment in the Ocean Economy in 2013

County	% of Employment from Ocean Economy
Dare	26.3
Carteret	18.6
Onslow	12.4
New Hanover	12.2
Brunswick	11.8
Craven	10.0
Pasquotank	9.5
Beaufort	8.4

Figure 2 shows that the tourism and recreation sector contributes the most — 53.7 percent — to the state's ocean economy (measured by GDP). All of the economic sectors and ocean services that contribute to North Carolina's ocean economy are shown in **Table 2**.

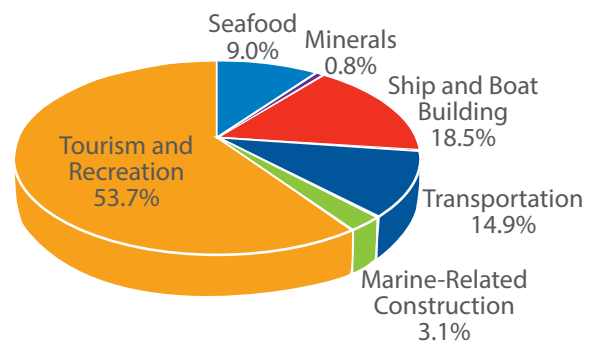


Figure 2: Contribution by Sector to North Carolina's Ocean Economy in 2013

Table 2: Components of North Carolina's Ocean Economy

Ocean Service	Economic Sector	
Seafood	Fisheries <ul style="list-style-type: none"> • Finfish fishing • Shellfish fishing • Other marine fishing 	
	Aquaculture <ul style="list-style-type: none"> • Finfish farming • Shellfish farming • Other aquaculture 	
	Processing, retailing <ul style="list-style-type: none"> • Seafood-product preparation and packaging • Seafood canning • Fresh and frozen seafood processing • Fish and seafood markets 	
Minerals	Limestone, sand and gravel <ul style="list-style-type: none"> • Construction sand and gravel mining • Industrial sand mining 	
Energy	Oil and gas <ul style="list-style-type: none"> • Crude petroleum and natural gas extraction • Drilling oil and gas wells • Support activities • Oil and gas pipeline and related structures 	
	Renewables <ul style="list-style-type: none"> • Offshore wind 	
Marine biotechnology	Pharmaceuticals, chemicals, etc.	
Transport and trade	Transport <ul style="list-style-type: none"> • Deep-sea and coastal freight transportation • Deep-sea and coastal passenger transportation • Port and harbor operations • Marine-cargo handling • Other support activities to water transportation 	
	Ship and boat building <ul style="list-style-type: none"> • Ship building and repair • Boat building and repair • Boat dealers • Navigational services to shipping 	
	Marine-related construction	
Tourism and recreation	Tourism <ul style="list-style-type: none"> • Scenic and sightseeing transportation, water and other • Recreational-goods rental • Sports and recreation instruction • Zoos and botanical gardens • Nature parks and other similar institutions • Amusement and recreational services, not elsewhere classified 	<ul style="list-style-type: none"> • Hotels (except casino hotels) and marinas • Bed-and-breakfast inns • RV parks and recreational camps • Full-service restaurants • Limited-service eating places • Snack and nonalcoholic beverage bars
	Recreational fishing	
	Coastal development (e.g., vacation home rental properties)	
Carbon sequestration	Blue carbon (e.g., coastal vegetated habitats)	
Coastal protection	Habitat protection, restoration	
Water disposal	Assimilation of nutrients, solid waste	
Existence of biodiversity	Protection of species, habitats	

Transitioning to a Blue Economy

Transition to a blue economy requires tracking metrics of economic growth and environmental sustainability in the state’s ocean and coastal areas. The transition also necessitates clear principles to leverage greater investment in the ocean economy and increased benefits for North Carolina over the long term. The following examples describe economic sectors that align with a blue economy.

Oyster aquaculture could produce a substantial source of income and economic stability for North Carolina’s seafood industry, as well as improve water quality and provide habitat for other species. In 2014, the farm-gate value of oysters cultivated in North Carolina was only \$450,000 as shown in **Figure 3**. The farm-gate value of cultivated oysters in Virginia in 2014 was \$17.1 million — compared to less than \$250,000 in 2004 for that state. North Carolina might emulate the significant investments in oyster-reef restoration and aquaculture that led to the remarkable growth in Virginia.

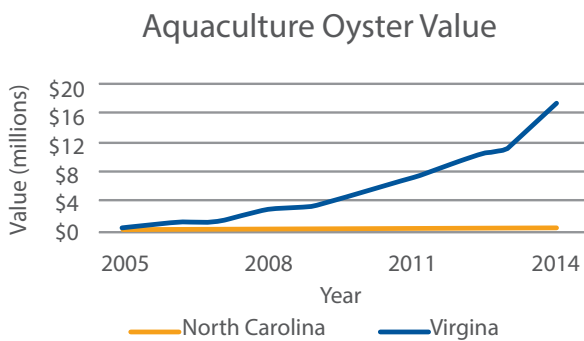


Figure 3: Oyster Value in North Carolina and Virginia

Oyster farmers would benefit from further development of specific oyster broodstock lines, additional nursery capacity, and consistent seed and spat supply, as well as increased outreach and technical assistance. Comprehensive regulatory reform and a process that minimizes use conflicts is also needed.

Ecotourism could supplement North Carolina’s already booming coastal tourism and recreation industries. With \$2 billion in expenditures in 2013, tourism and recreation is the largest ocean-economy sector in coastal North Carolina. Its continued success depends on protecting the natural amenities that attract visitors.



Canoe launches and camping platforms are examples of ecotourism infrastructure.

Restoration of degraded coastal resources, as well as investments in infrastructure like public-access points, boat launches, trails, lodging, and food and beverage establishments can help ecotourism grow. Additionally, education and workforce-training programs for coastal residents can increase locals’ environmental literacy and advance ecotourism business development.

For Further Reading

Harrison, J., Pickle, A., Vegh, T., and J. Virdin. 2017. North Carolina’s ocean economy: A first assessment and transitioning to a blue economy. UNC-SG-17-02. Available at ncseagrant.ncsu.edu/blueeconomy.

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North Carolina’s Blue Economy information series describes research and extension activities related to the state’s ocean economy and the underlying natural resources.

To learn more, visit: ncseagrant.ncsu.edu/blueeconomy.

