

Southeast Conservation Blueprint Summary

for North Carolina

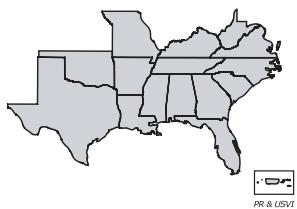
Created 12/12/2023

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The Southeast
Conservation
Adaptation Strategy

SECAS



The Southeast Conservation Blueprint 2023

PR & USVI

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About the Southeast Blueprint

The Southeast Conservation Blueprint is the primary product of the [Southeast Conservation Adaptation Strategy](#) (SECAS). It is a living, spatial plan to achieve the SECAS vision of a connected network of lands and waters across the Southeast and Caribbean. The Blueprint is regularly updated to incorporate new data, partner input, and information about on-the-ground conditions.

The Blueprint identifies priority areas based on a suite of natural and cultural resource indicators representing terrestrial, freshwater, and marine ecosystems. A connectivity analysis identifies corridors that link coastal and inland areas and span climate gradients.

For more information:

- Visit the [Blueprint webpage](#)
- Review the [Blueprint 2023 Development Process](#)
- View and download the Blueprint data and make maps on the [Blueprint page of the SECAS Atlas](#)

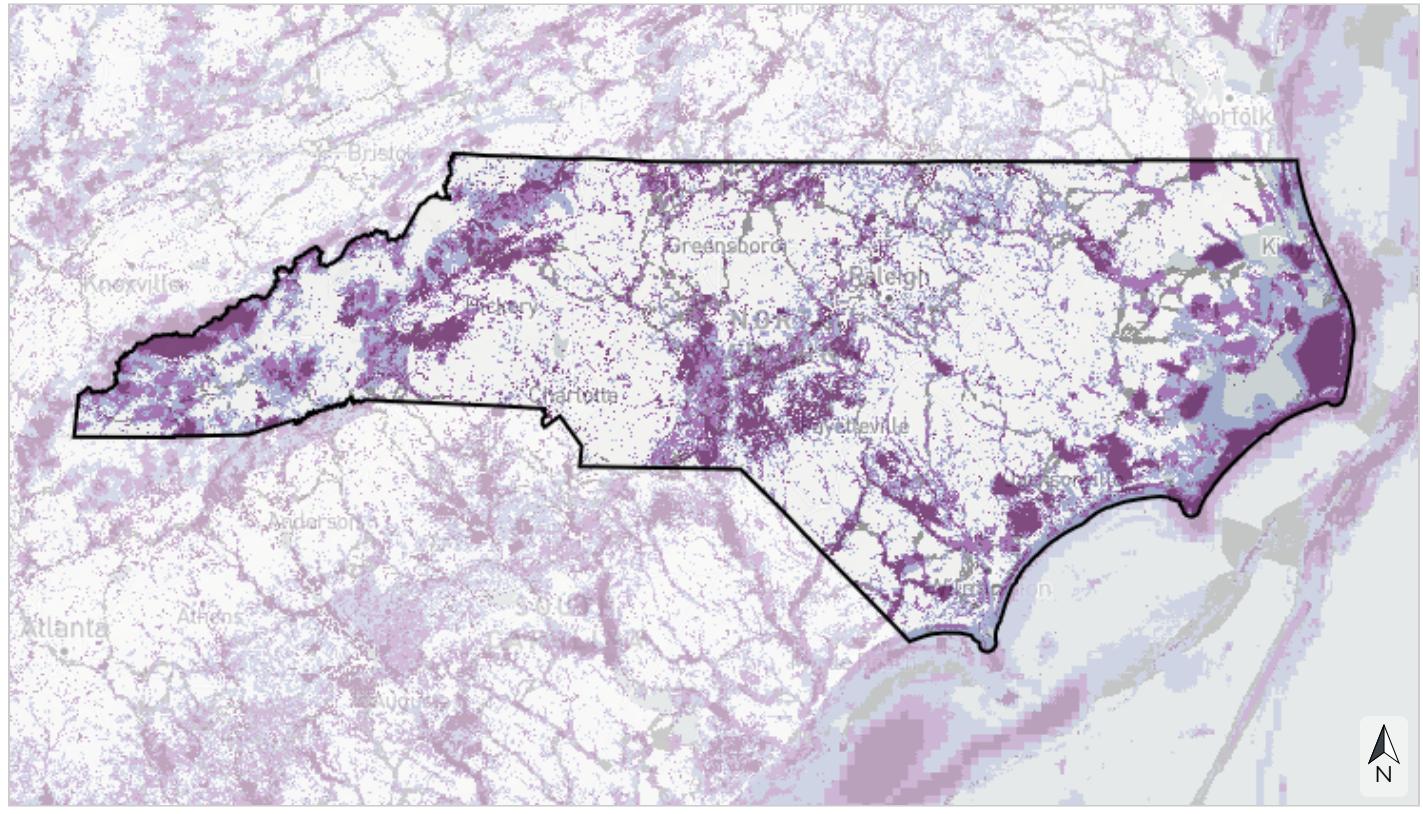
We're here to help!

- Do you have a question about the Blueprint?
- Would you like help using the Blueprint to support a proposal or inform a decision?
- Do you have a suggestion on how to improve the Blueprint? The Blueprint and its inputs are regularly revised based on input from people like you.
- Do you have feedback on how to improve the Simple Viewer interface?

If you need help or have questions, [contact Southeast Blueprint staff](#) by reaching out to a member of the user support team.

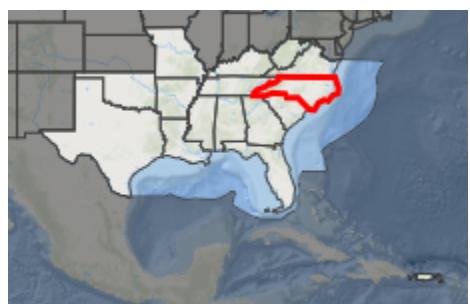
We're here to support you. We really mean it. It's what we do!

Southeast Blueprint Priorities



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Priorities for a connected network of lands and waters

- Highest priority
- High priority
- Medium priority
- Priority connections

Priority Categories

For a connected network of lands and waters

In total, Blueprint priorities and priority connections cover roughly 50% of the Southeast Blueprint geography.

Highest priority

Areas where conservation action would make the biggest impact, based on a suite of natural and cultural resource indicators. This class covers roughly 10% of the Southeast Blueprint geography.

High priority

Areas where conservation action would make a big impact, based on a suite of natural and cultural resource indicators. This class covers roughly 15% of the Southeast Blueprint geography.

Medium priority

Areas where conservation action would make an above-average impact, based on a suite of natural and cultural resource indicators. This class covers roughly 20% of the Southeast Blueprint geography.

Priority connections

Connections between priority areas that cover the shortest distance possible while routing through as much Blueprint priority as possible. This class covers roughly 5% of the Southeast Blueprint geography.

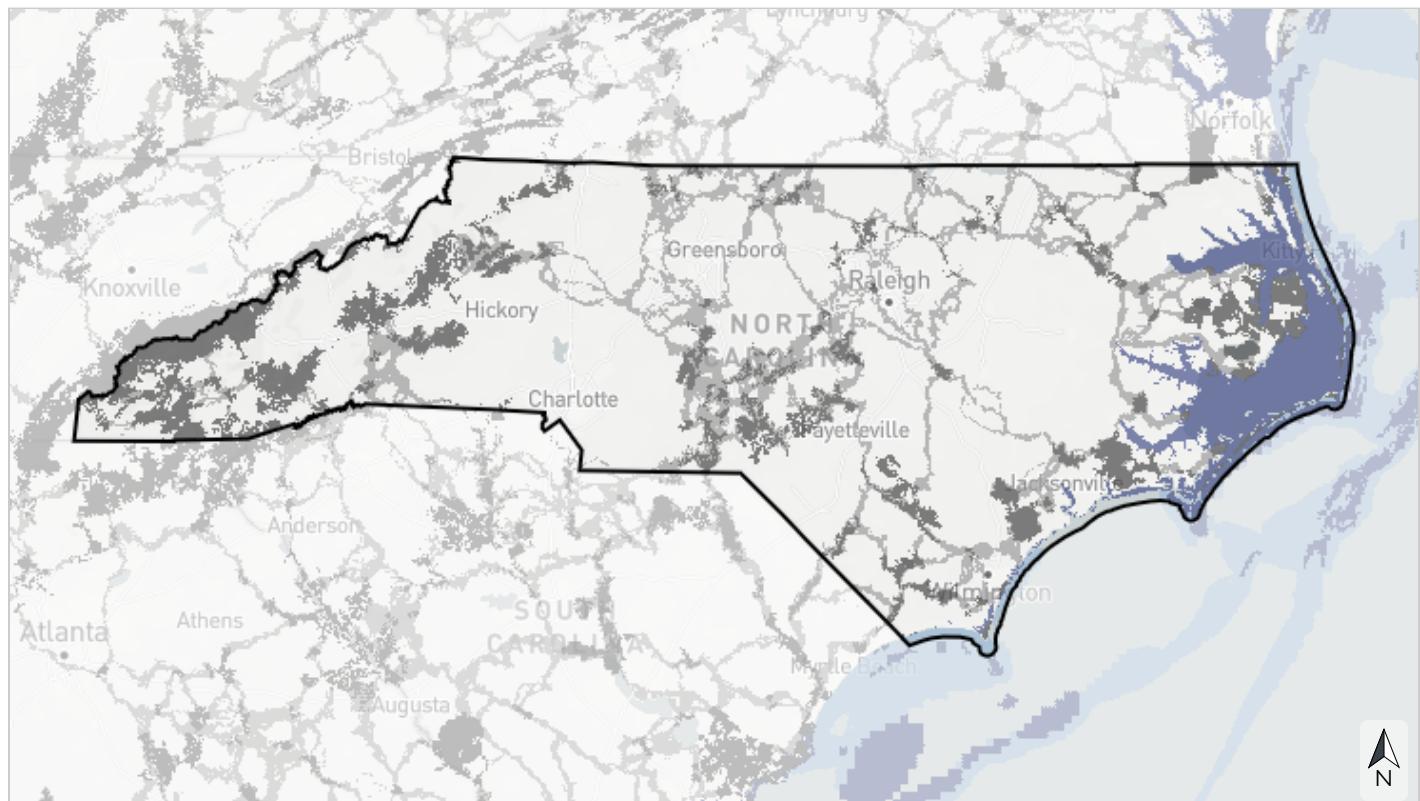
Table 1: Extent of each Blueprint priority category within North Carolina.

Priority Category	Acres	Percent of Area
Highest priority	3,797,185	11.0%
High priority	4,986,568	14.5%
Medium priority	6,057,212	17.6%
Priority connections	1,333,781	3.9%
Lower priority	18,269,086	53.0%
Total area	34,443,831	100%

Hubs and Corridors

The Blueprint uses a least-cost path connectivity analysis to identify corridors that link hubs across the shortest distance possible, while also routing through as much Blueprint priority as possible.

Inland hubs are large patches (~5,000+ acres) of highest priority Blueprint areas and/or protected lands, connected by inland corridors. Marine and estuarine hubs are large estuaries and large patches (~5,000+ acres) of highest priority Blueprint areas. Marine and estuarine corridors connect those hubs within broad marine mammal movement areas.



- Inland continental hubs
- Inland continental corridors
- Marine & estuarine continental hubs
- Marine & estuarine continental corridors
- Not a hub or corridor

Table 2: Extent of hubs and corridors within North Carolina.

Type	Acres	Percent of Area
Inland continental hubs	4,015,248	11.7%
Inland continental corridors	4,097,447	11.9%
Marine & estuarine continental hubs	2,270,704	6.6%
Marine & estuarine continental corridors	371,544	1.1%
Not a hub or corridor	23,688,888	68.8%
Total area	34,443,831	100%

Indicator Summary

Table 3: Terrestrial indicators.

Indicator	Present
East Coastal Plain open pine birds	✓
Equitable access to potential parks	✓
Fire frequency	✓
Greenways & trails	✓
Intact habitat cores	✓
Interior Southeast grasslands	✓
Resilient terrestrial sites	✓
South Atlantic amphibian & reptile areas	✓
South Atlantic forest birds	✓
South Atlantic low-urban historic landscapes	✓
Urban park size	✓

Table 4: Freshwater indicators.

Indicator	Present
Atlantic migratory fish habitat	✓
Imperiled aquatic species	✓
Natural landcover in floodplains	✓
Network complexity	✓
Permeable surface	✓
West Virginia imperiled aquatic species	-

Table 5: Coastal & marine indicators.

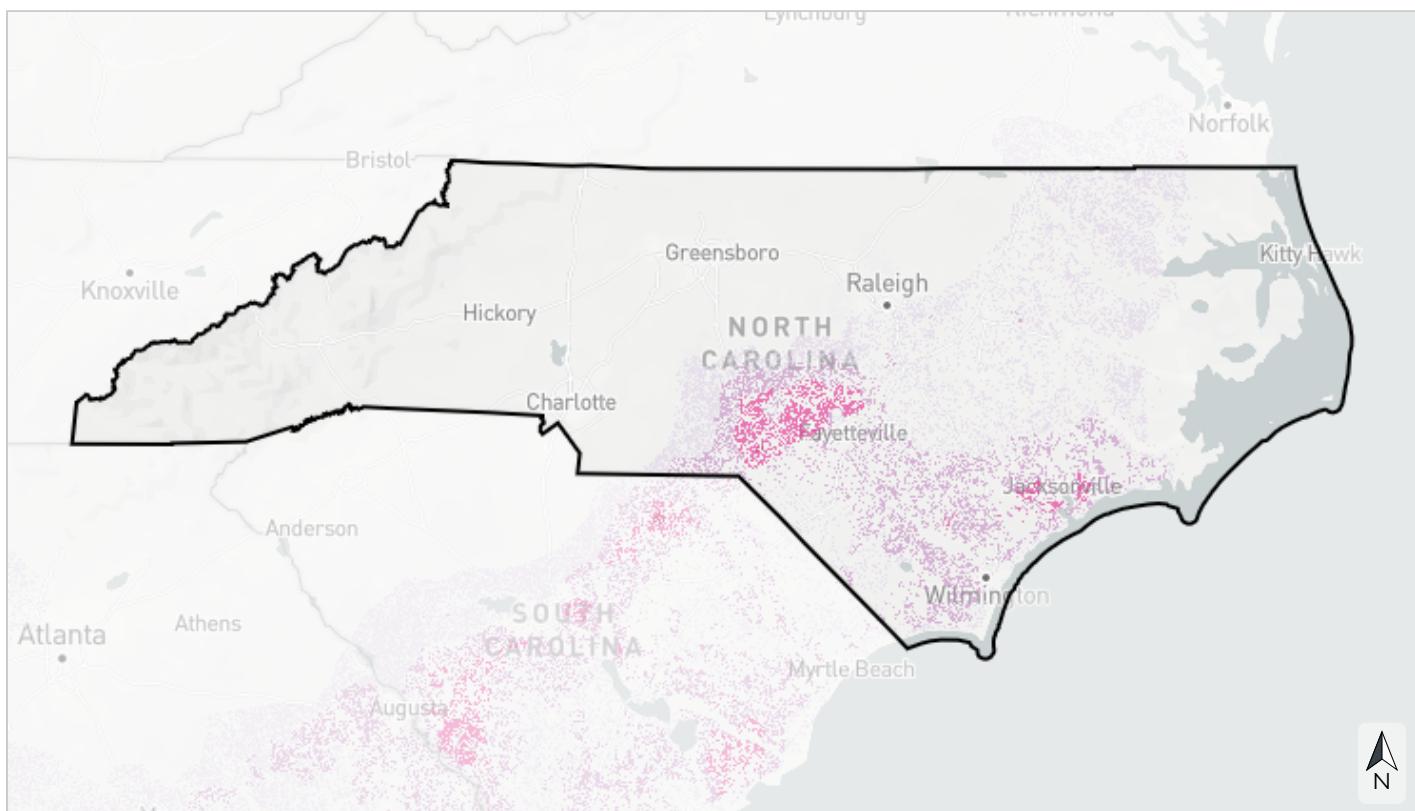
Indicator	Present
<u>Atlantic coral & hardbottom</u>	✓
Atlantic deep-sea coral richness	-
<u>Atlantic estuarine fish habitat</u>	✓
<u>Atlantic marine birds</u>	✓
<u>Atlantic marine mammals</u>	✓
<u>Coastal shoreline condition</u>	✓
<u>Estuarine coastal condition</u>	✓
Gulf coral & hardbottom	-
<u>Island habitat</u>	✓
<u>Marine highly migratory fish</u>	✓
<u>Resilient coastal sites</u>	✓
<u>Seagrass</u>	✓
<u>South Atlantic beach birds</u>	✓
<u>South Atlantic maritime forest</u>	✓
<u>Stable coastal wetlands</u>	✓



Terrestrial

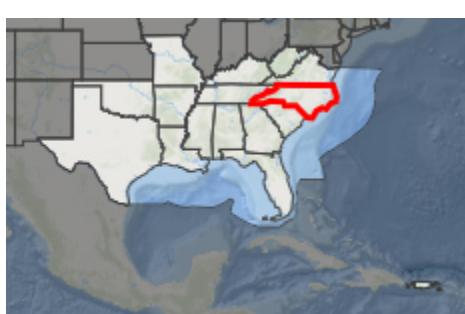
East Coastal Plain open pine birds

This indicator identifies areas within the historic longleaf pine range east of the Mississippi River where creating or maintaining open pine habitat would most benefit six focal species of birds (Bachman's sparrow, red-cockaded woodpecker, Henslow's sparrow, red-headed woodpecker, Northern bobwhite, brown-headed nuthatch). It prioritizes areas for open pine conservation based on suitability for longleaf pine, feasibility of prescribed burning, proximity to protected lands, habitat suitability for focal bird species, and proximity to bird source populations. It originates from the East Gulf Coastal Plain Joint Venture's prioritization of areas for open pine ecosystem restoration.



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Priority for open pine conservation for focal bird species

- High priority (score >80-100)
- Medium-high priority (score >60-80)
- Medium priority (score >40-60)
- Medium-low priority (score >20-40)
- Low priority (score 0-20)
- Not a priority (not identified as upland pine)

Table 6: Indicator values for east coastal plain open pine birds within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values: Priority for open pine conservation for focal bird species	Acres	Percent of Area
↑ High	High priority (score >80-100)	0	0%
	Medium-high priority (score >60-80)	2,223	<0.1%
	Medium priority (score >40-60)	328,341	1.0%
	Medium-low priority (score >20-40)	1,207,941	3.5%
	Low priority (score 0-20)	1,870,062	5.4%
↓ Low	Not a priority (not identified as upland pine)	10,392,890	30.2%
	<i>Area not evaluated for this indicator</i>	20,642,373	59.9%
	Total area	34,443,831	100%

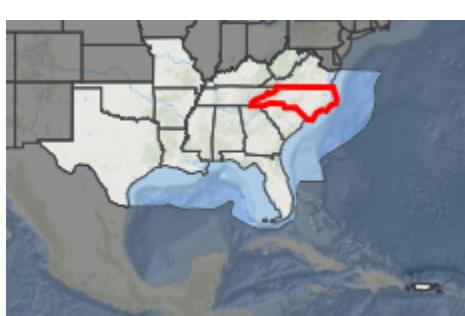
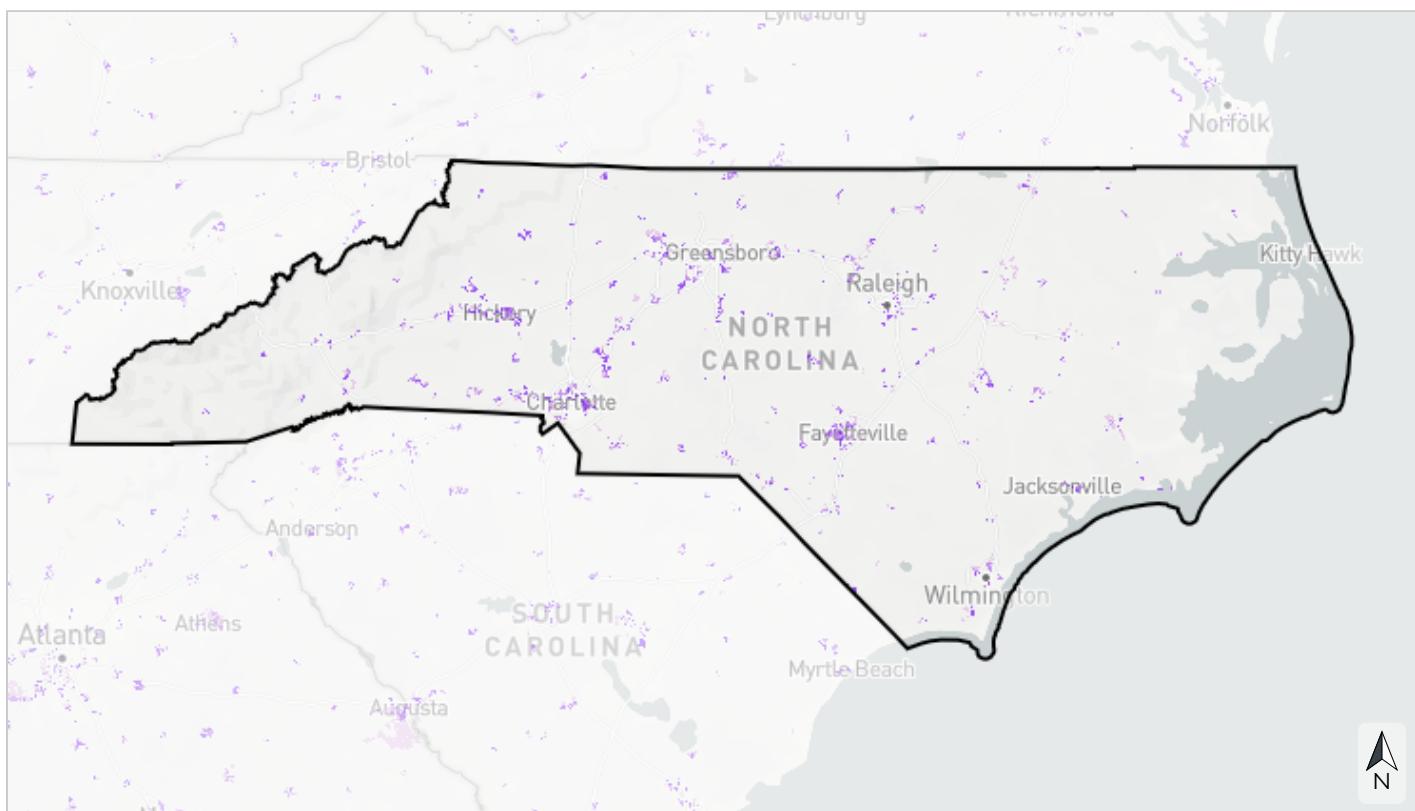
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Equitable access to potential parks

This cultural resource indicator prioritizes places to create new parks that would fill gaps in equitable access to open space within socially vulnerable communities in urban areas. It identifies areas where residents currently lack access to parks within a 10-minute walk (accounting for walkable road networks and access barriers like highways and fences), then prioritizes based on park need using demographic and environmental metrics. Parks help improve public health, foster a conservation ethic by providing opportunities for people to connect with nature, and support critical ecosystem services. This indicator originates from the Trust for Public Land's ParkServe park priority areas and the Center for Disease Control's Social Vulnerability Index.



Priority for a new park that would create nearby equitable access

- Very high priority
- High priority
- Moderate priority
- Not identified as a priority (within urban areas)

Table 7: Indicator values for equitable access to potential parks within North Carolina. A good condition threshold is not yet defined for this indicator.

Indicator Values: Priority for a new park that would create nearby equitable access		Acres	Percent of Area
↑ High	Very high priority	168,102	0.5%
	High priority	223,385	0.6%
	Moderate priority	180,159	0.5%
↓ Low	Not identified as a priority (within urban areas)	31,205,755	90.6%
	<i>Area not evaluated for this indicator</i>	2,666,429	7.7%
	Total area	34,443,831	100%

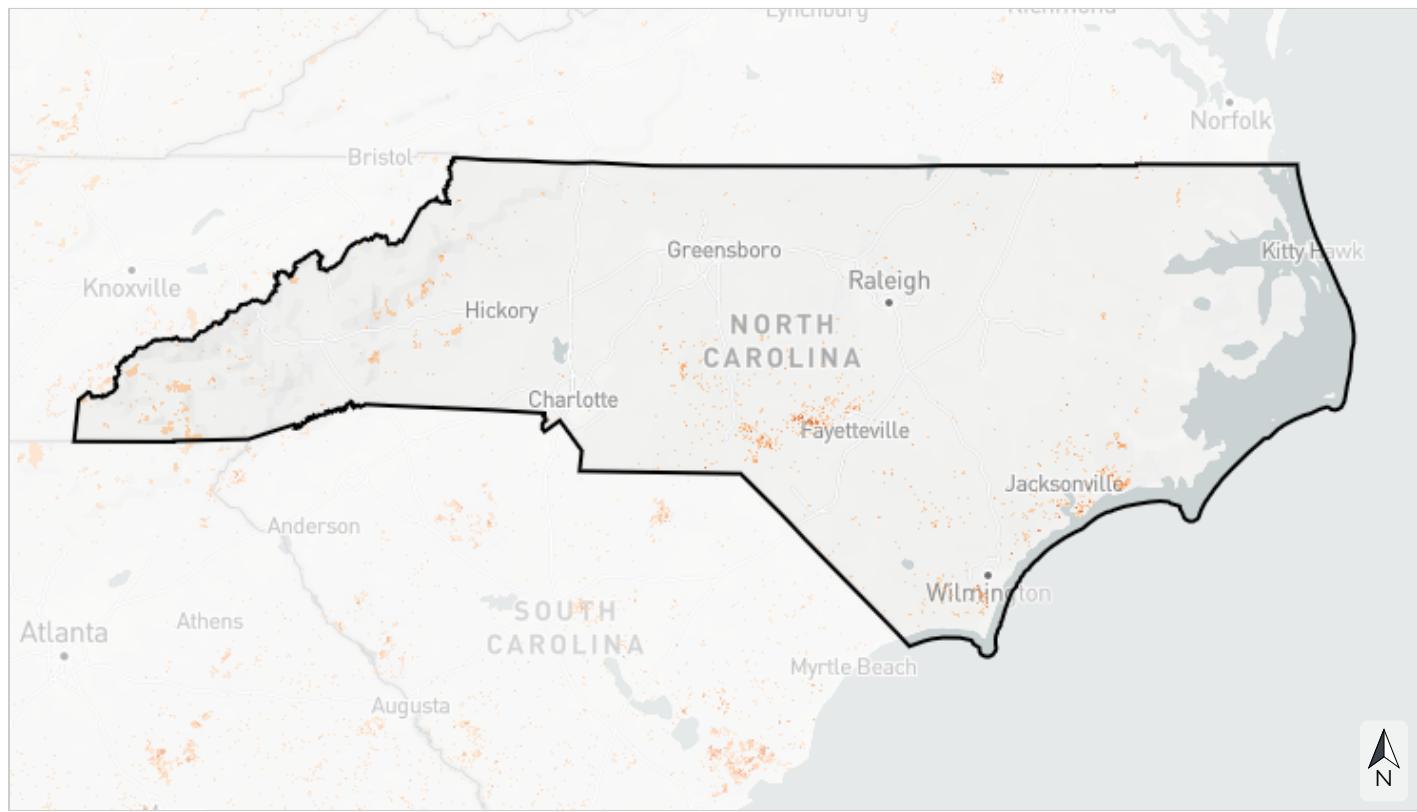
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

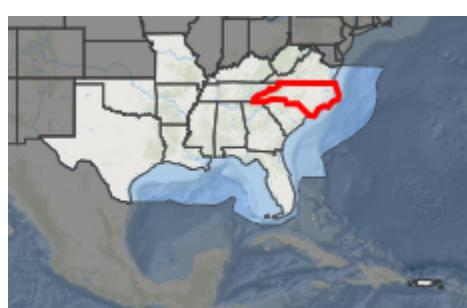
Fire frequency

This indicator uses remote sensing to estimate the number of times an area has been burned from 2013 to 2021. Many Southeastern ecosystems rely on regular, low-intensity fires to maintain habitat, encourage native plant growth, and reduce wildfire risk. This indicator combines burned area layers from U.S. Geological Survey Landsat data and the inter-agency Monitoring Trends in Burn Severity program. Landsat-based fire predictions within the range of longleaf pine are also available through [Southeast FireMap](#).



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- Burned 3+ times from 2013-2021
- Burned 2 times from 2013-2021
- Burned 1 time from 2013-2021
- Not burned from 2013-2021 or row crop

Table 8: Indicator values for fire frequency within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Burned 3+ times from 2013-2021	12,470	<0.1%
	Burned 2 times from 2013-2021	54,036	0.2%
	Burned 1 time from 2013-2021	420,556	1.2%
↓ Low	Not burned from 2013-2021 or row crop	33,944,884	98.6%
	<i>Area not evaluated for this indicator</i>	11,885	<0.1%
Total area		34,443,831	100%

↑ In good condition

↓ Not in good condition

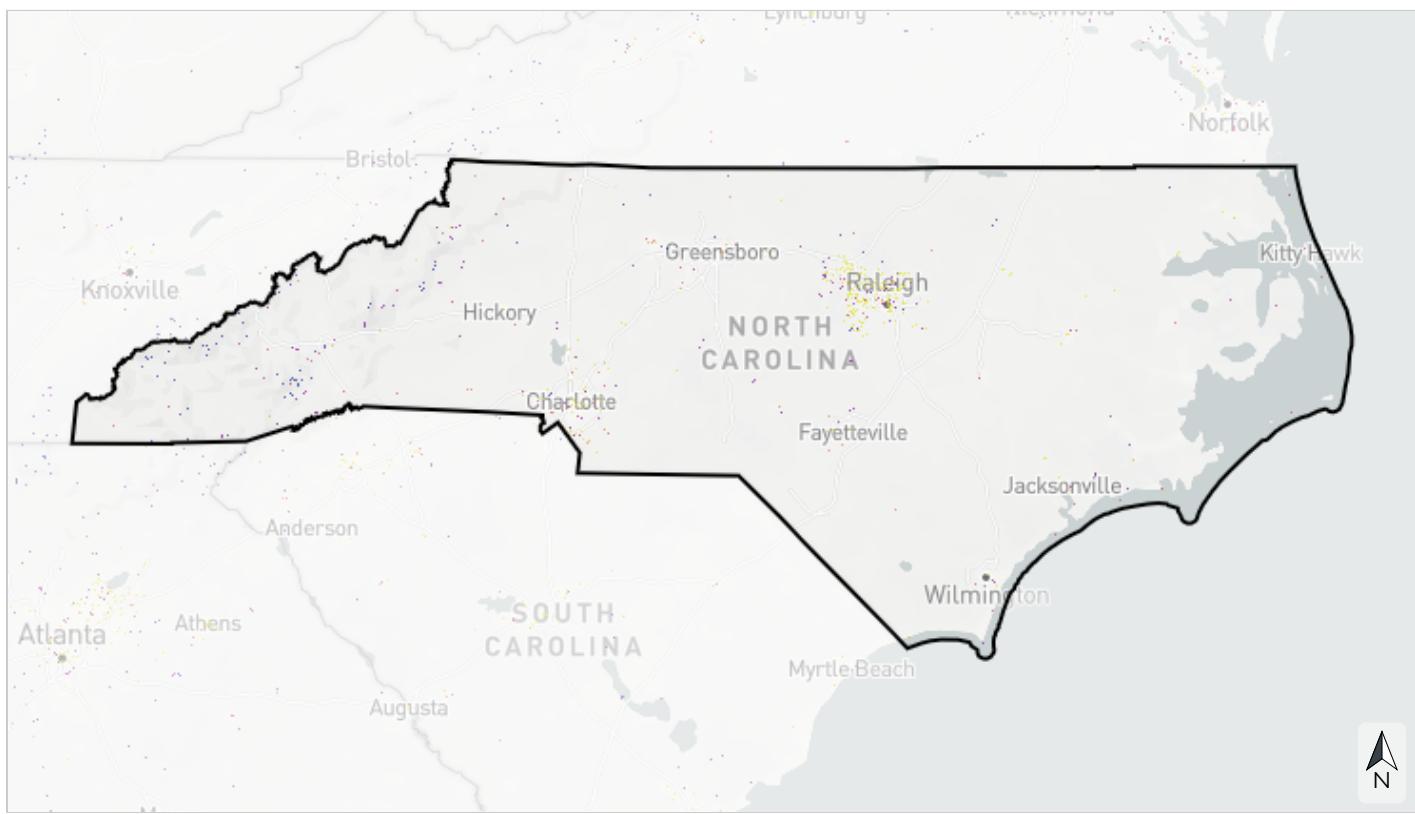
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Greenways & trails

This cultural resource indicator measures both the natural condition and connected length of greenways and trails to characterize the quality of the recreational experience. Natural condition is based on the amount of impervious surface surrounding the path. Connected length captures how far a person can go without leaving a dedicated path, based on common distances for walking, running, and biking. This indicator originates from OpenStreetMap data and the National Land Cover Database.



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- Mostly natural and connected for ≥ 40 km
- Mostly natural and connected for 5 to < 40 km or partly natural and connected for ≥ 40 km
- Mostly natural and connected for 1.9 to < 5 km, partly natural and connected for 5 to < 40 km, or developed and connected for ≥ 40 km
- Mostly natural and connected for < 1.9 km, partly natural and connected for 1.9 to < 5 km, or developed and connected for 5 to < 40 km
- Partly natural and connected for < 1.9 km or developed and connected for 1.9 to < 5 km
- Developed and connected for < 1.9 km
- Sidewalk
- Not identified as a trail, sidewalk, or other path

Table 9: Indicator values for greenways & trails within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Mostly natural and connected for ≥ 40 km	18,822	<0.1%
	Mostly natural and connected for 5 to < 40 km or partly natural and connected for ≥ 40 km	25,184	<0.1%
	Mostly natural and connected for 1.9 to < 5 km, partly natural and connected for 5 to < 40 km, or developed and connected for ≥ 40 km	20,040	<0.1%
	Mostly natural and connected for < 1.9 km, partly natural and connected for 1.9 to < 5 km, or developed and connected for 5 to < 40 km	13,257	<0.1%
	Partly natural and connected for < 1.9 km or developed and connected for 1.9 to < 5 km	6,508	<0.1%
	Developed and connected for < 1.9 km	7,991	<0.1%
	Sidewalk	79,488	0.2%
	Not identified as a trail, sidewalk, or other path	34,270,901	99.5%
↓ Low	<i>Area not evaluated for this indicator</i>	1,640	<0.1%
	Total area	34,443,831	100%

↑ In good condition

↓ Not in good condition

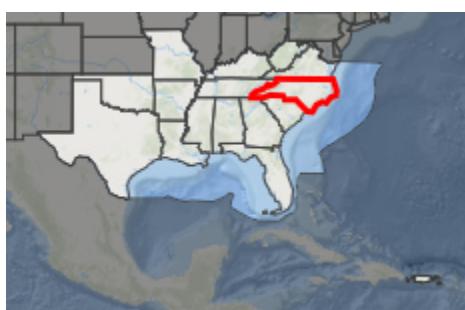
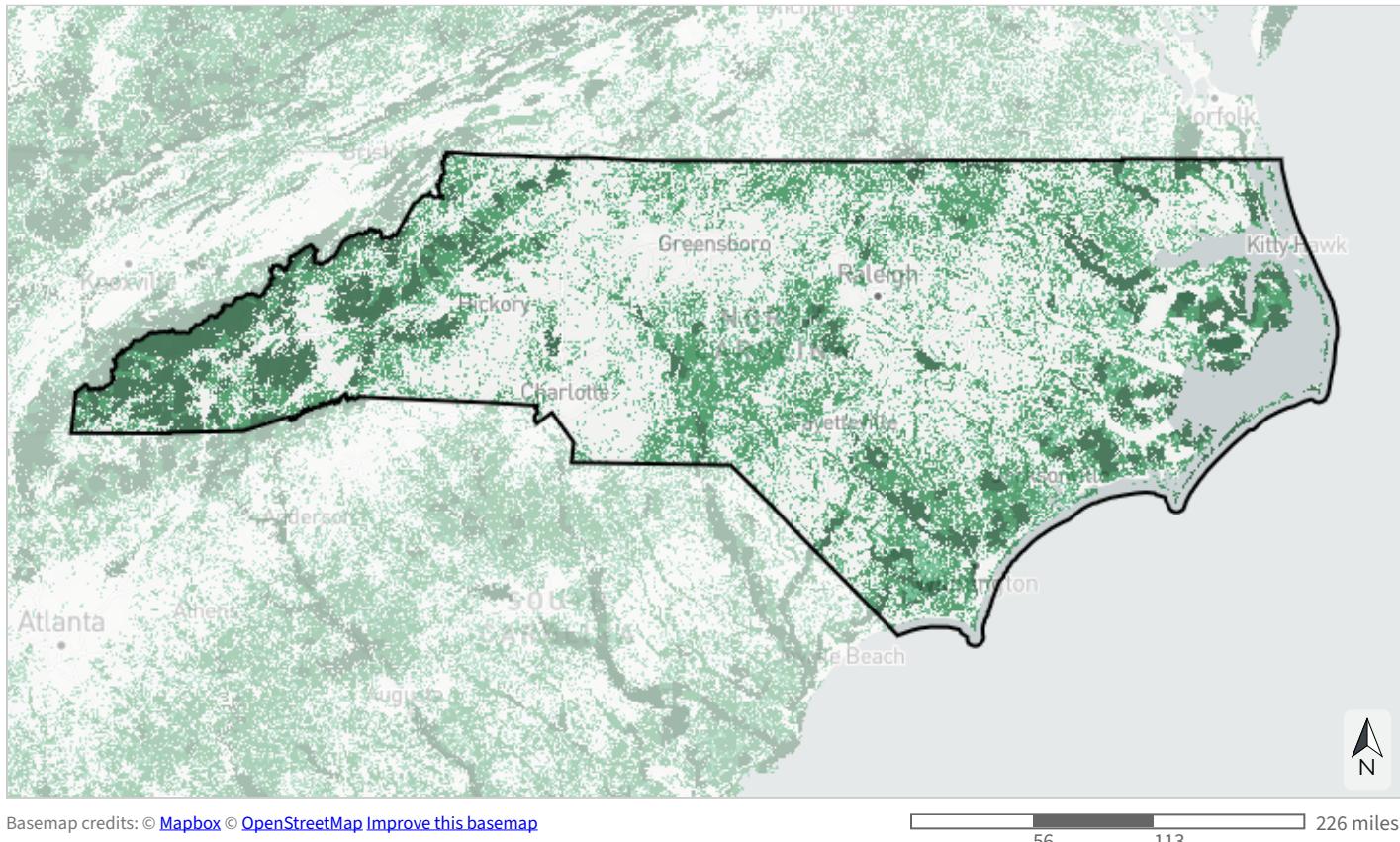
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Intact habitat cores

This indicator represents the size of large, unfragmented patches of natural habitat. It identifies minimally disturbed natural areas at least 100 acres in size and greater than 200 meters wide. Large areas of intact natural habitat are important for many wildlife species, including reptiles and amphibians, birds, and large mammals. This indicator originates from Esri's green infrastructure data.



- Large core (>10,000 acres)
- Medium core (>1,000-10,000 acres)
- Small core (>100-1,000 acres)
- Not a core

Table 10: Indicator values for intact habitat cores within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Large core (>10,000 acres)	4,091,498	11.9%
	Medium core (>1,000-10,000 acres)	6,541,968	19.0%
	Small core (>100-1,000 acres)	3,882,134	11.3%
↓ Low	Not a core	19,926,591	57.9%
	<i>Area not evaluated for this indicator</i>	1,640	<0.1%
Total area		34,443,831	100%

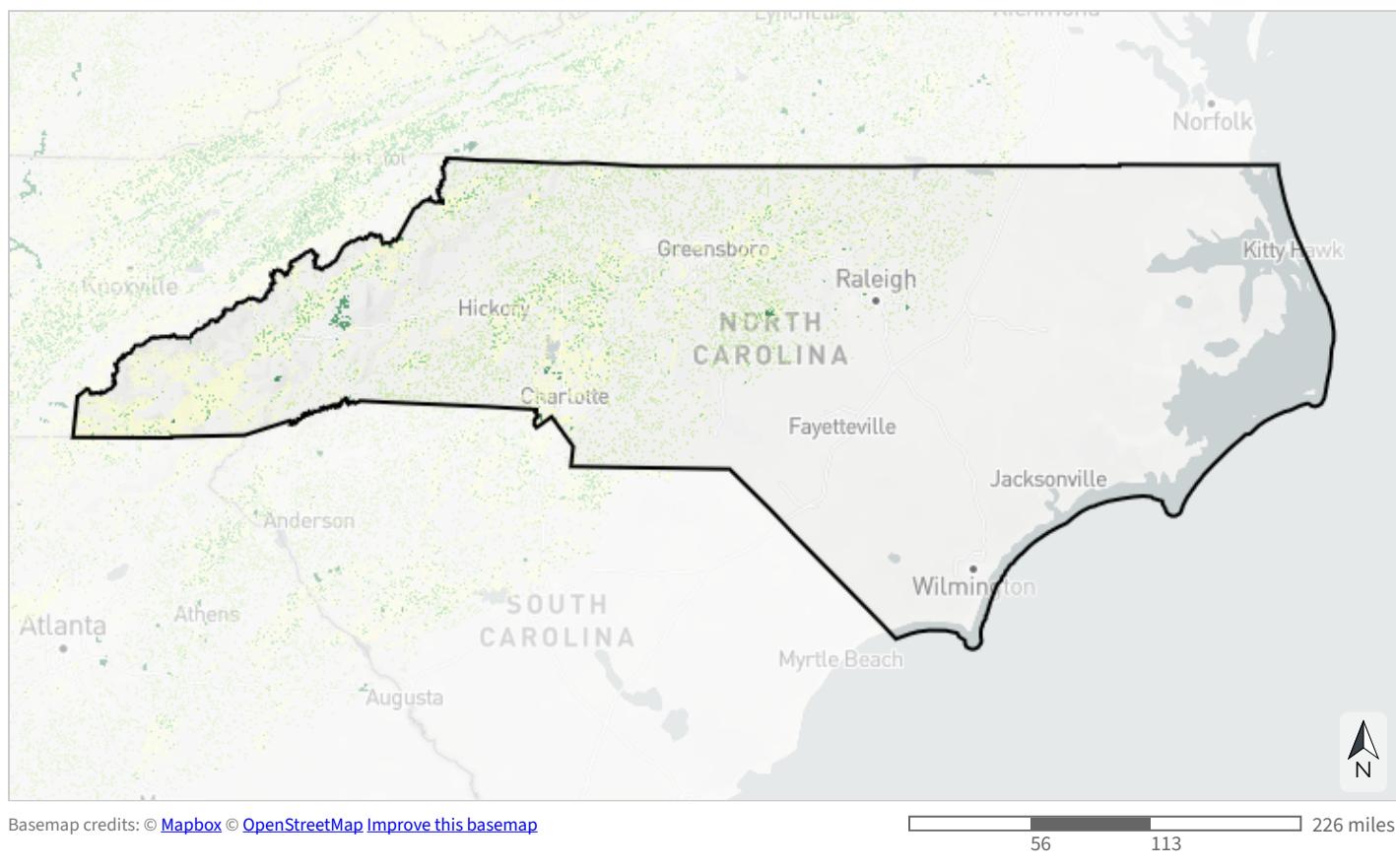
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Interior Southeast grasslands

This indicator represents grasslands in the interior southeastern United States, which support important plants, birds, and pollinators. It includes grasslands with and without trees that are historically maintained by geology (e.g., outcrops, glades, and barrens), fire (e.g., Piedmont prairies), and/or the regular violent flooding on the banks of high-energy rivers known as “riverscour” (e.g., riverscour prairies). Known grasslands receive the highest scores, followed by bumble bee habitat buffers around known sites, areas in potentially compatible management, and restoration opportunities within grassland geology. This indicator combines data from multiple sources, including the Southeastern Grasslands Institute, Central Hardwoods Joint Venture, Rangeland Analysis Platform, and more.



- Known grassland
- Known grassland buffer
- Potentially compatible management within grassland geology
(undeveloped powerline right-of-way or perennial forbs and grasses)
- Potentially compatible management outside of grassland geology
(undeveloped powerline right-of-way or perennial forbs and grasses)
- Grassland geology
- Grassland less likely

Table 11: Indicator values for Interior Southeast grasslands within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Known grassland	3,163	<0.1%
	Known grassland buffer	54,585	0.2%
	Potentially compatible management within grassland geology (undeveloped powerline right-of-way or perennial forbs and grasses)	291,382	0.8%
	Potentially compatible management outside of grassland geology (undeveloped powerline right-of-way or perennial forbs and grasses)	1,794,975	5.2%
↓ Low	Grassland geology	2,232,195	6.5%
	Grassland less likely	12,622,893	36.6%
	<i>Area not evaluated for this indicator</i>	17,444,638	50.6%
Total area		34,443,831	100%

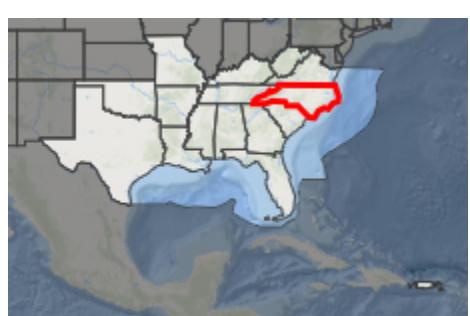
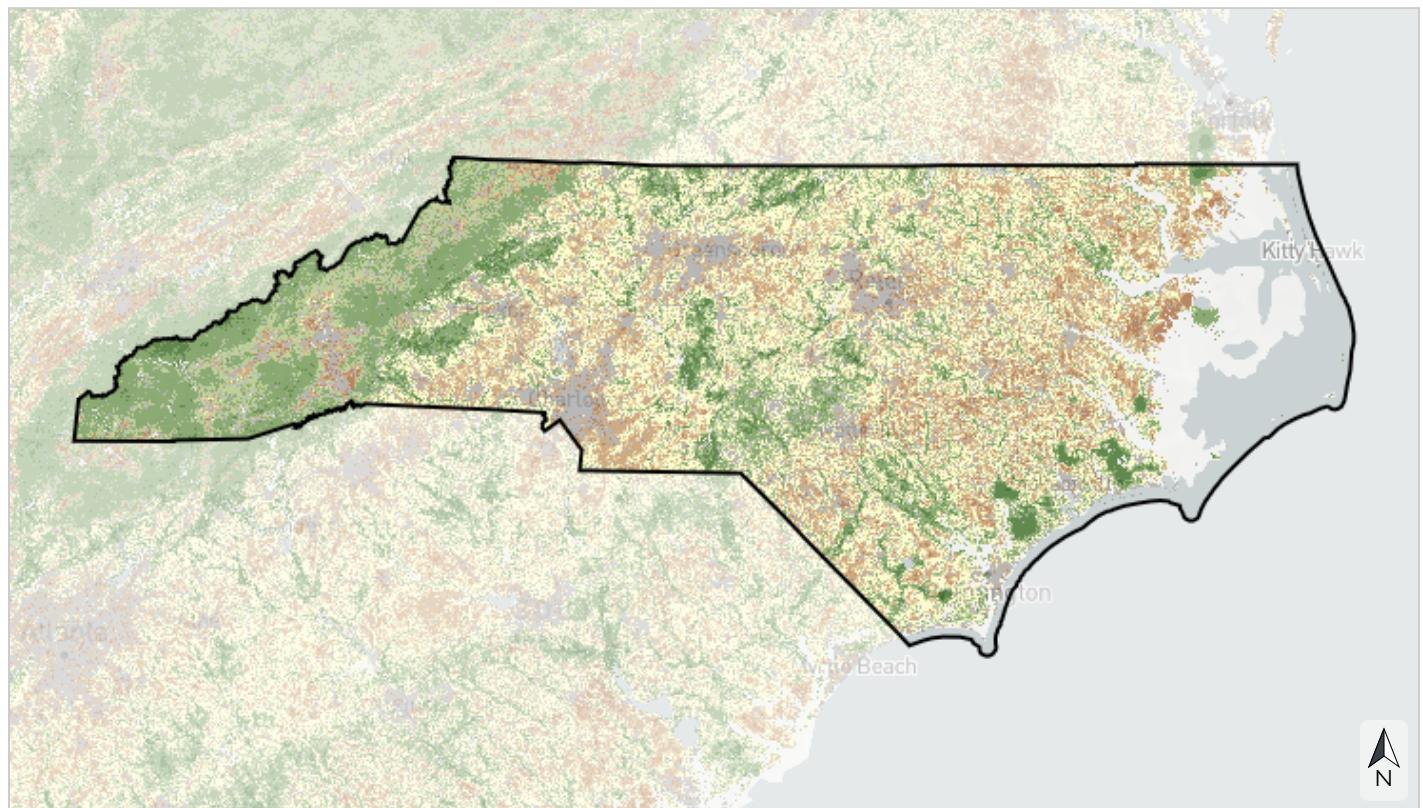
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Resilient terrestrial sites

This indicator depicts an area's capacity to maintain species diversity and ecosystem function in the face of climate change. It measures two factors that influence resilience. The first, landscape diversity, reflects the number of microhabitats and climatic gradients created by topography, elevation, and hydrology. The second, local connectedness, reflects the degree of habitat fragmentation and strength of barriers to species movement. Highly resilient sites contain many different habitat niches that support biodiversity, and allow species to move freely through the landscape to find suitable microclimates as the climate changes. This indicator originates from The Nature Conservancy's Resilient Land data.



- Most resilient
- More resilient
- Slightly more resilient
- Average/median resilience
- Slightly less resilient
- Less resilient
- Least resilient
- Developed

Table 12: Indicator values for resilient terrestrial sites within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Most resilient	897,721	2.6%
	More resilient	5,385,116	15.6%
	Slightly more resilient	3,980,535	11.6%
	Average/median resilience	7,267,817	21.1%
	Slightly less resilient	3,317,387	9.6%
	Less resilient	3,143,594	9.1%
	Least resilient	667,530	1.9%
	Developed	4,155,850	12.1%
↓ Low	<i>Area not evaluated for this indicator</i>	5,628,281	16.3%
	Total area	34,443,831	100%

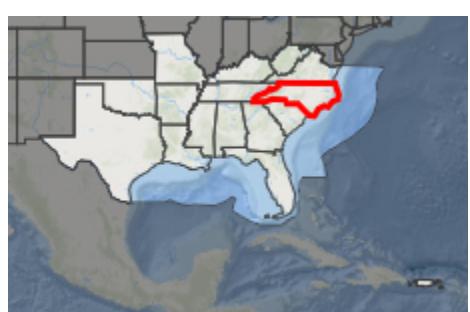
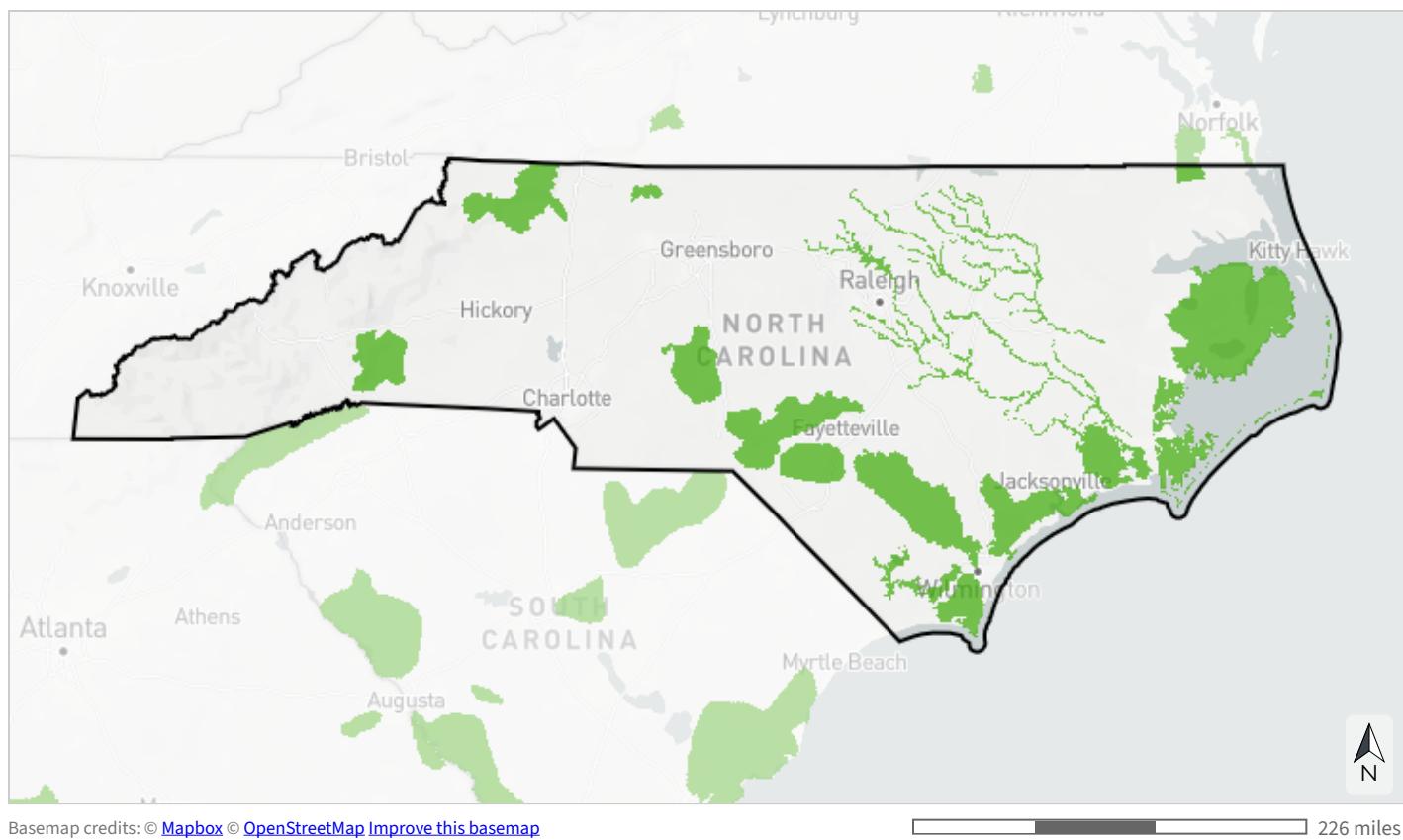
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

South Atlantic amphibian & reptile areas

This indicator represents Priority Amphibian and Reptile Conservation Areas (PARCAs) in the South Atlantic. PARCA is an expert-driven, nonregulatory designation that includes places capable of supporting viable amphibian and reptile populations, places occupied by rare or imperiled species, and places rich in biodiversity or species unique to that geographic area (i.e., endemism). Reptiles and amphibians are a critical part of the Southeast region's rich biodiversity and many populations are declining in the face of threats like habitat loss, invasive species, and climate change.



- █ Priority Amphibian and Reptile Conservation Area (PARCA)
- █ Not a Priority Amphibian and Reptile Conservation Area (PARCA)

Table 13: Indicator values for South Atlantic amphibian & reptile areas within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Priority Amphibian and Reptile Conservation Area (PARCA)	5,094,068	14.8%
↓ Low	Not a Priority Amphibian and Reptile Conservation Area (PARCA)	25,582,498	74.3%
	<i>Area not evaluated for this indicator</i>	3,767,265	10.9%
Total area		34,443,831	100%

Priority Amphibian and Reptile Conservation Areas:

Bladen Lakes

The Bladen Lakes PARCA encompasses a largely rural landscape that includes a series of public lands with high ecological value. Extensive areas of unprotected land could serve as habitat connectors between these public lands, if managed for conservation. Priority conservation species known to occur in the PARCA include southern hognose snake, mimic glass lizard, ornate chorus frog, and pine barrens treefrog.

Carolina Bays

Located in the upper Coastal Plain, the Carolina Bays PARCA encompasses a particularly dense concentration of unique Carolina bay wetlands. The bays in this PARCA are known to have supported exceptionally large numbers of rare pond breeding amphibians. Though some species have likely been lost from this area, priority species known to remain include the eastern tiger salamander, oak toad, dwarf salamander, eastern chicken turtle, southern chorus frog, and Mabee's salamander. Only very small areas of the PARCA are currently managed as natural habitat, though a high potential for conservation exists with future habitat restoration and management.

Croatan Forest

Dominated by Croatan National Forest, the Croatan PARCA also includes many pieces of adjacent unprotected land. A hotspot of diversity for reptiles and amphibians, conservation measures taken on some of these additional lands would prove highly beneficial. Species of note in the Croatan PARCA include gopher frog, ornate chorus frog, southern chorus frog, oak toad, Mabee's salamander, mimic glass lizard, eastern chicken turtle and pygmy rattlesnake.

Great Dismal Swamp

No description available for PARCAs in Virginia

Green Swamp

Encompassing large tracts of managed habitat as well as significant areas of currently unprotected lands, the Green Swamp PARCA is known to support small populations of priority conservation species, including the northern pine snake, mimic glass lizard, eastern chicken turtle and southern chorus frog. A high potential for conservation exists with the restoration of exceptionally large areas of currently

undeveloped, but highly degraded, habitats.

Hickory Nut Gorge

The Hickory Nut Gorge PARCA represents steep, rocky gorges, riverine floodplain, low to mid-elevation rock outcrop, granitic dome, and rocky bald habitats, and includes large tracts of public land. Focal species include timber rattlesnake, coal skink, a disjunct population of green salamander, and two endemics – crevice salamander and Blue Ridge gray-cheeked salamander.

Holly Shelter Lejeune

Largely comprised of Angola Bay, Stone's Creek, and Holly Shelter game lands, along with Marine Corps Base Camp Lejeune, the Holly Shelter Lejeune PARCA supports an extremely high diversity of reptiles and amphibians. Additionally, although these public land holdings are near or adjacent to one another, many opportunities for unprotected land conservation exist. Focal amphibian species include gopher frog, ornate chorus frog, southern chorus frog, and oak toad. Conservation concerns regarding reptiles include the best remaining North Carolina population of eastern diamondback rattlesnake, good populations of chicken turtle, and nesting habitat for the loggerhead sea turtle.

Neuse Tar River

The Neuse Tar River PARCA follows the flows of the Neuse and Tar Rivers. Flowing from the Piedmont to the Coastal Plain, these two long rivers make up the entire known range of the Neuse River waterdog, a salamander endemic to North Carolina. Other priority species found within this PARCA include lesser siren and rainbow snake.

Northern Fall Line Sandhills

This region comprises much of the Fall Line-Sandhill habitat in South Carolina between the Wateree River and the North Carolina state line. Like Fort Jackson, this area is characterized by deep, droughty sands dissected by small blackwater streams that typically support pocosin habitat along their margins. The uplands would have supported longleaf pine historically, and periodic fire would have played a role in maintaining this forest. Within the existing forest, there are areas of bare sand in addition to sandstone and ironstone outcrops. This region contains the only known extant populations of the state threatened pine barrens treefrog in South Carolina. This area also contains records for the state threatened southern hognose snake and the pine snake.

Pamlico

The Pamlico PARCA covers a very large area of the Pamlico Sound along with a large landmass in the Alligator River area. This PARCA is important for many species of turtles, both freshwater and saltwater. The nesting beaches on the ocean side in this area are not the highest density in the state, but they tend to be the coolest, hence they likely produce the least female-biased sex ratio of hatchlings. This, in turn, may become increasingly important in the face of climate change and projected warming in the region. The Pamlico Sound and adjacent creeks are hotspots for sea turtles, including loggerhead, Kemp's ridley, and green turtles. They are also known to support good populations of diamondback terrapins. The freshwater sites within the Pamlico PARCA support large populations of spotted turtles as well as many other species.

Sandhills

Characterized by deep, well-drained soils, the Sandhills originally supported an extensive fire-maintained, longleaf pine-wiregrass community. The Sandhills PARCA includes several large tracts of public land that are managed as natural habitat as well as extensive areas of buffer and possible landscape-scale habitat connectors. Priority conservation species including the southern hognose snake, northern pine snake, eastern chicken turtle, eastern tiger salamander, pine barrens treefrog, and gopher frog still occur in limited numbers in the Sandhills PARCA.

Sauratown Mountains

Rising sharply over 1,000 feet above the surrounding landscape, the Sauratown Mountains dominate the scenery of the Sauratown PARCA. These Piedmont monadnocks consist of forested ridges occasionally broken by open, rocky cliffs. Focal species include Wehrle's salamander and timber rattlesnake.

South Brunswick

The South Brunswick PARCA encompasses an area known to support an exceptionally diverse array of habitats and associated species, including the northern pine snake, eastern chicken turtle, and gopher frog. While most of the remaining habitat in this PARCA is currently found on private property, a few small areas of high quality lands are managed with public resources. Significant potential for conservation exists in the South Brunswick PARCA.

South Carolina Blue Ridge Escarpment

South Carolina's Blue Ridge Escarpment is a region where the Blue Ridge Mountains meet the Atlantic Piedmont region. This region is characterized by high rainfall, lush cove forests, bare rocky cliffs, and numerous small streams and rivers. All of the known locations for the newly described patchnose salamander and dwarf blackbelly salamander, green salamander, federally threatened bog turtle, state endangered coal skink, timber rattlesnake, shovelnose salamander and seepage salamander are contained within this region.

South Mountains

The rugged landscape of the South Mountains chain, combined with cool and clear streams, create a unique topographical oasis in the western Piedmont of North Carolina known as the South Mountains PARCA. Elevations rising up to 3,000 feet provide habitat for both the timber rattlesnake and the narrowly endemic South Mountain gray-cheeked salamander.

Uwharrie Mountains

The Uwharries PARCA contains some of the largest remaining tracts of wildlife and rare plant habitat in the North Carolina Piedmont and includes much of the Uwharrie Mountains, among the oldest mountain ranges in North America. Species of conservation concern known to occur in the Uwharries PARCA include mole salamander, four-toed salamander, and timber rattlesnake.

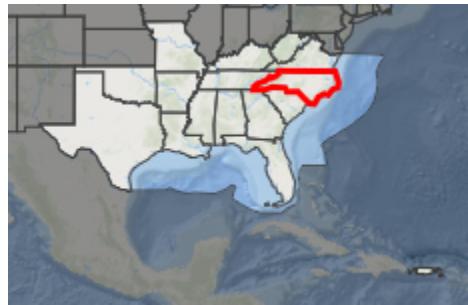
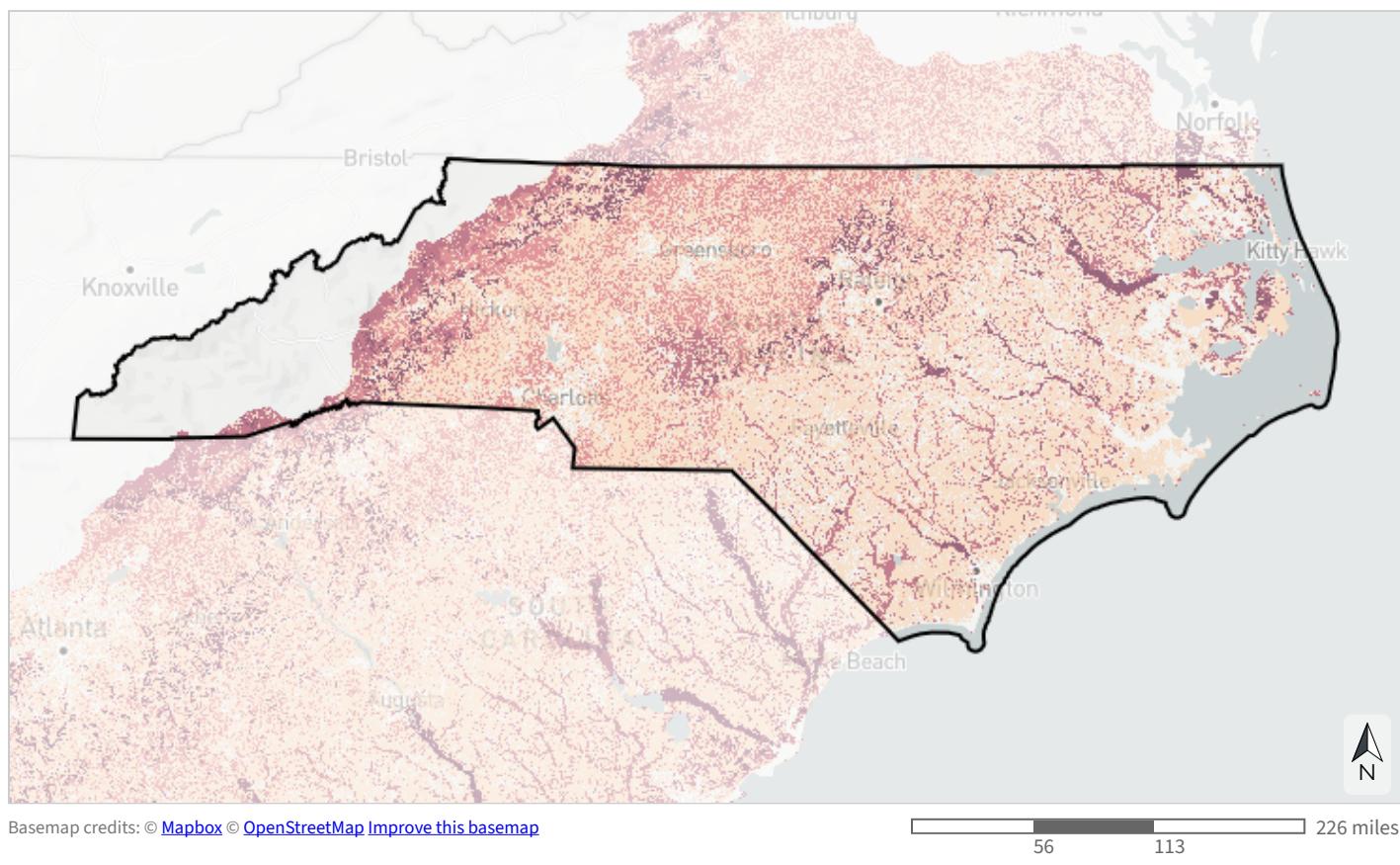
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

South Atlantic forest birds

This indicator is an index of habitat suitability for twelve upland hardwood and forested wetland bird species (wood thrush, whip-poor-will, American woodcock, red-headed woodpecker, Chuck-will's widow, hooded warbler, Kentucky warbler, Acadian flycatcher, Northern parula, black-throated green warbler, prothonotary warbler, Swainson's warbler) based on patch size and other ecosystem characteristics such as proximity to water and proximity to forest and ecotone edge. The needs of these species are increasingly restrictive at higher index values, reflecting better quality habitat. It originates from Southeast Gap Analysis Program and Designing Sustainable Landscapes bird habitat models.



- Very large patches near water (potential for presence of Swainson's warbler)
- Large patches often near water (potential for presence of Northern parula, black-throated green warbler, or prothonotary warbler)
- Medium patches (potential for presence of Acadian flycatcher)
- Small patches often near water (potential for presence of hooded warbler or Kentucky warbler)
- Very small patches or near open areas (potential for presence of wood thrush, whip-poor-will, red-headed woodpecker, Chuck-will's widow, or American woodcock)
- Less potential for presence of forest bird index species

Table 14: Indicator values for South Atlantic forest birds within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Very large patches near water (potential for presence of Swainson's warbler)	1,133,642	3.3%
	Large patches often near water (potential for presence of Northern parula, black-throated green warbler, or prothonotary warbler)	2,363,212	6.9%
	Medium patches (potential for presence of Acadian flycatcher)	3,282,344	9.5%
	Small patches often near water (potential for presence of hooded warbler or Kentucky warbler)	1,192,294	3.5%
	Very small patches or near open areas (potential for presence of wood thrush, whip-poor-will, red-headed woodpecker, Chuck-will's widow, or American woodcock)	14,628,914	42.5%
↓ Low	Less potential for presence of forest bird index species	7,958,810	23.1%
	<i>Area not evaluated for this indicator</i>	3,884,615	11.3%
	Total area	34,443,831	100%

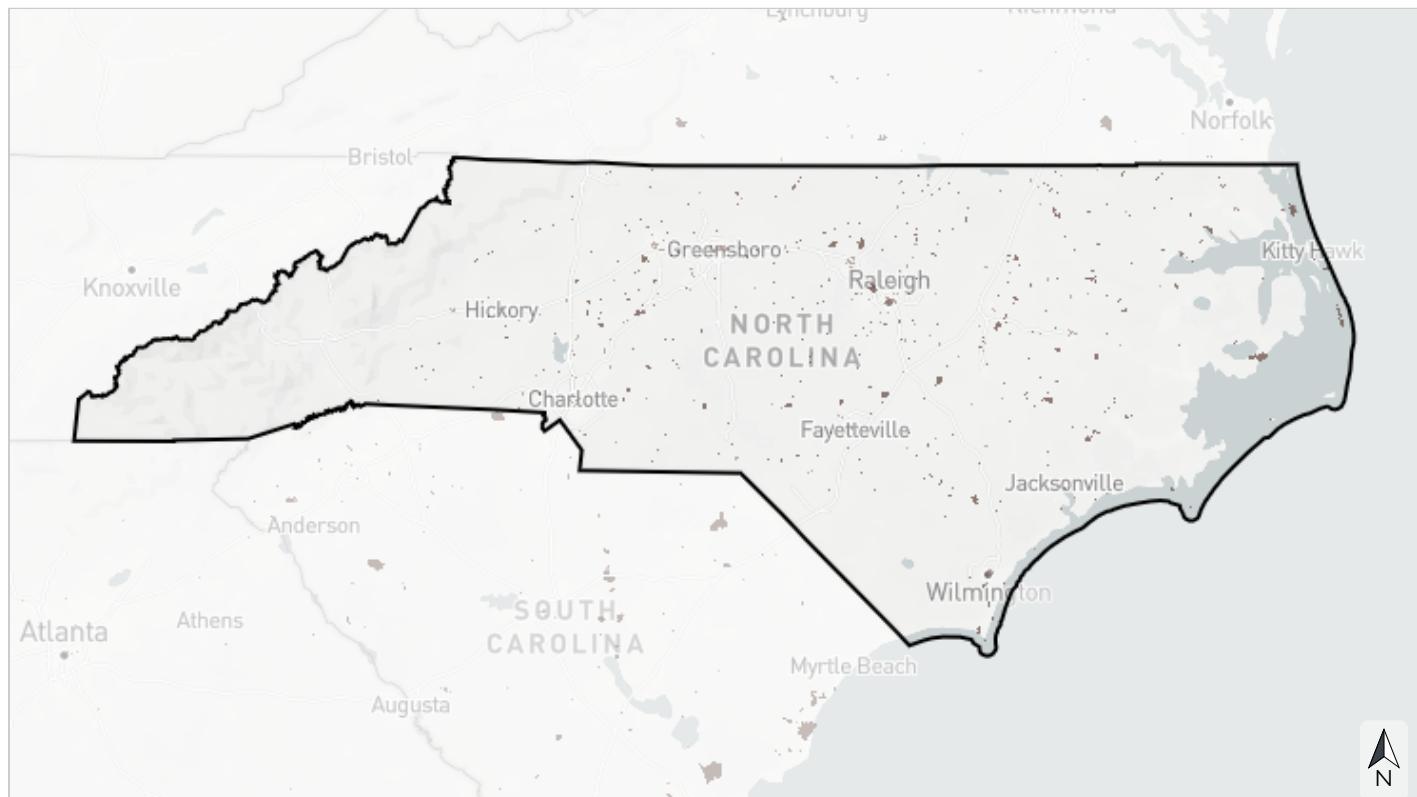
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

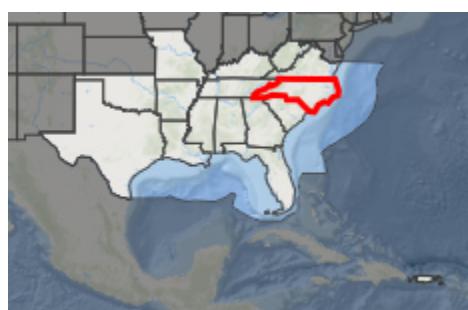
South Atlantic low-urban historic landscapes

This cultural resource indicator is an index of sites on the National Register of Historic Places surrounded by limited urban development. It identifies significant historic places that remain connected to their context in the natural world. It uses the National Land Cover Database and historic places data from the National Park Service and various state historic resource agencies.



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- Historic place with nearby low-urban buffer
- Historic place with nearby high-urban buffer
- Not in the National Register of Historic Places

Table 15: Indicator values for South Atlantic low-urban historic landscapes within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Historic place with nearby low-urban buffer	217,931	0.6%
	Historic place with nearby high-urban buffer	82,674	0.2%
↓ Low	Not in the National Register of Historic Places	29,262,478	85.0%
	<i>Area not evaluated for this indicator</i>	4,880,748	14.2%
Total area		34,443,831	100%

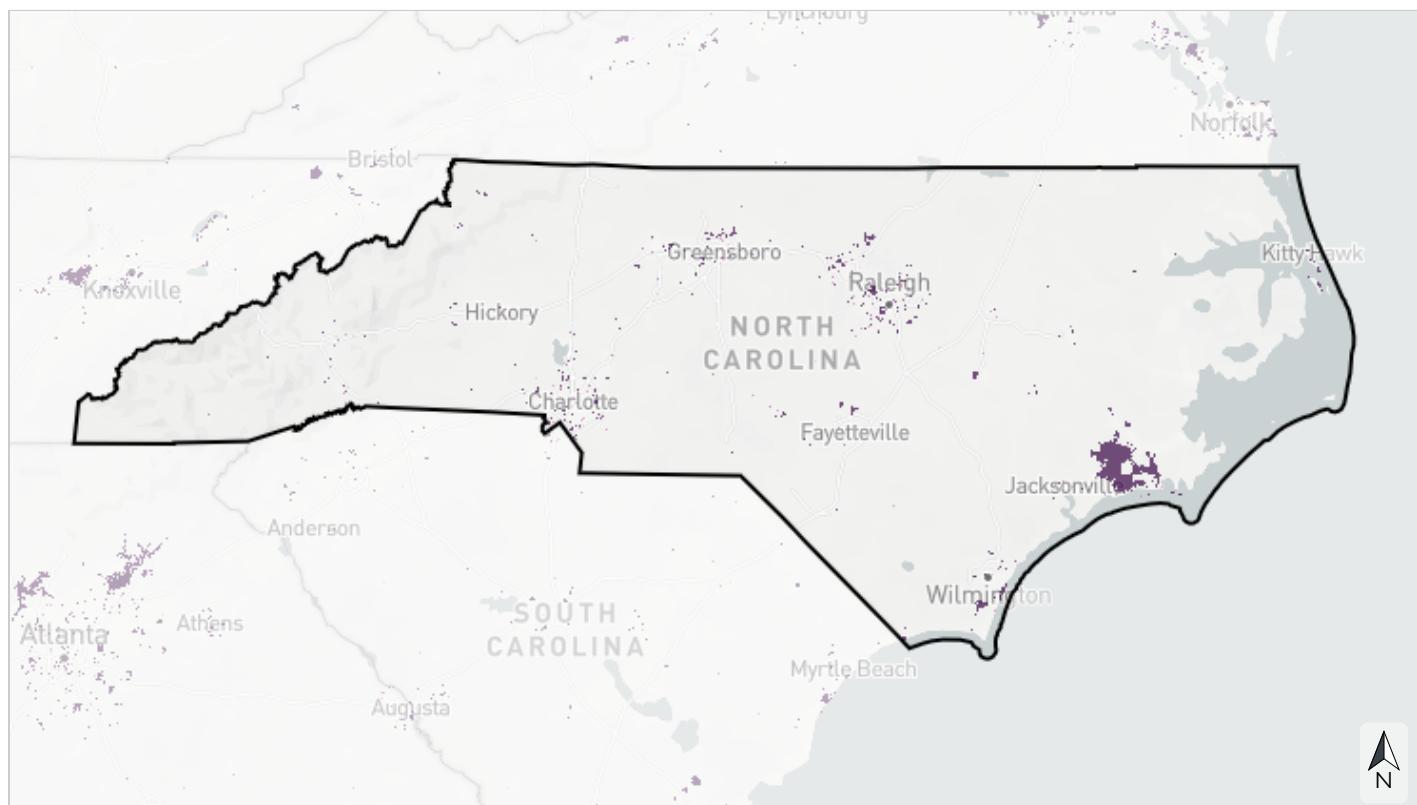
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Terrestrial

Urban park size

This cultural resource indicator measures the size of parks larger than 5 acres in the urban environment. Protected natural areas in urban environments provide urban residents a nearby place to connect with nature, and offer refugia for some species. This indicator complements the equitable access to potential parks indicator by capturing the value of existing parks. It originates from the Protected Areas Database of the United States, Census urban areas, and the National Land Cover Database.



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- 75+ acre urban park
- 50 to <75 acre urban park
- 30 to <50 acre urban park
- 10 to <30 acre urban park
- 5 to <10 acre urban park
- <5 acre urban park or not identified as an urban park

Table 16: Indicator values for urban park size within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	75+ acre urban park	309,210	0.9%
	50 to <75 acre urban park	11,766	<0.1%
	30 to <50 acre urban park	14,203	<0.1%
	10 to <30 acre urban park	20,722	<0.1%
	5 to <10 acre urban park	7,086	<0.1%
	<5 acre urban park or not identified as an urban park	34,079,205	98.9%
<i>Area not evaluated for this indicator</i>		1,640	<0.1%
Total area		34,443,831	100%

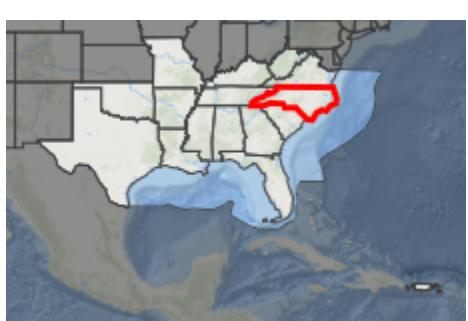
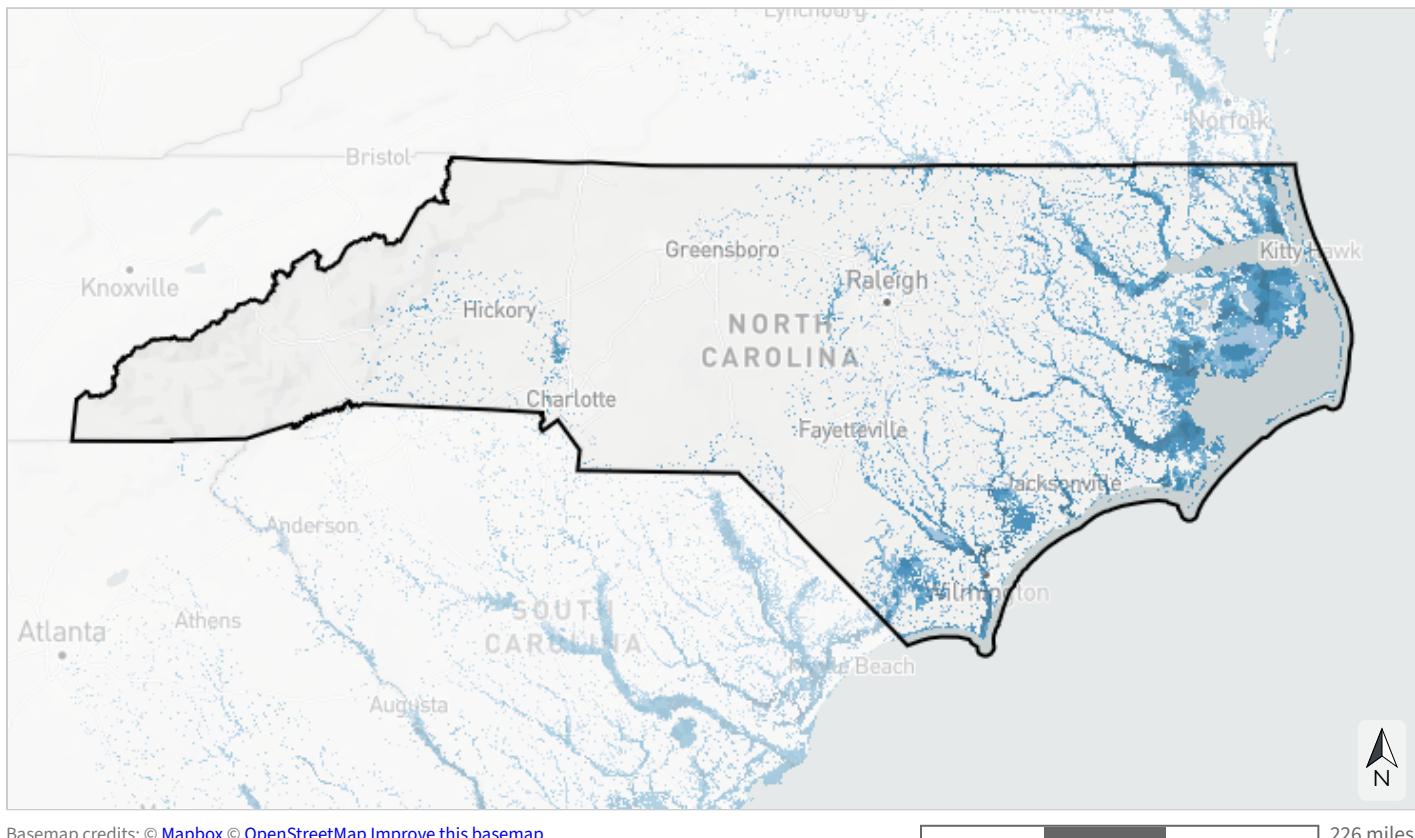
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Freshwater

Atlantic migratory fish habitat

This indicator measures the condition of migratory fish habitat along the Atlantic coast within each catchment, using metrics of water quality, aquatic connectivity, habitat fragmentation, flow alteration, and more. Areas of excellent fish habitat are already in good condition and face few threats. Restoration opportunity areas are doing well in some respects, but restoration projects could significantly improve them. Degraded areas of opportunity face many challenges, and restoration projects are unlikely to increase available fish habitat unless particularly large in scope and scale. This indicator originates from the Atlantic Coast Fish Habitat Partnership's fish habitat conservation area mapping and prioritization project.



- Final score of 80 (areas of excellent fish habitat)
- Final score of 70 (areas of excellent fish habitat)
- Final score of 60 (restoration opportunity areas)
- Final score of 50 (restoration opportunity areas)
- Final score of 40 (restoration opportunity areas)
- Final score of 30 (restoration opportunity areas)
- Final score of 20 (restoration opportunity areas)
- Final score of 10 (degraded areas of opportunity)
- Final score of 0 (degraded areas of opportunity)

Table 17: Indicator values for Atlantic migratory fish habitat within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Final score of 80 (areas of excellent fish habitat)	38,152	0.1%
	Final score of 70 (areas of excellent fish habitat)	466,907	1.4%
	Final score of 60 (restoration opportunity areas)	1,057,215	3.1%
	Final score of 50 (restoration opportunity areas)	700,781	2.0%
	Final score of 40 (restoration opportunity areas)	1,043,183	3.0%
	Final score of 30 (restoration opportunity areas)	945,435	2.7%
	Final score of 20 (restoration opportunity areas)	152,569	0.4%
	Final score of 10 (degraded areas of opportunity)	21,870	<0.1%
	Final score of 0 (degraded areas of opportunity)	2,366	<0.1%
	<i>Area not evaluated for this indicator</i>	30,015,353	87.1%
Total area		34,443,831	100%

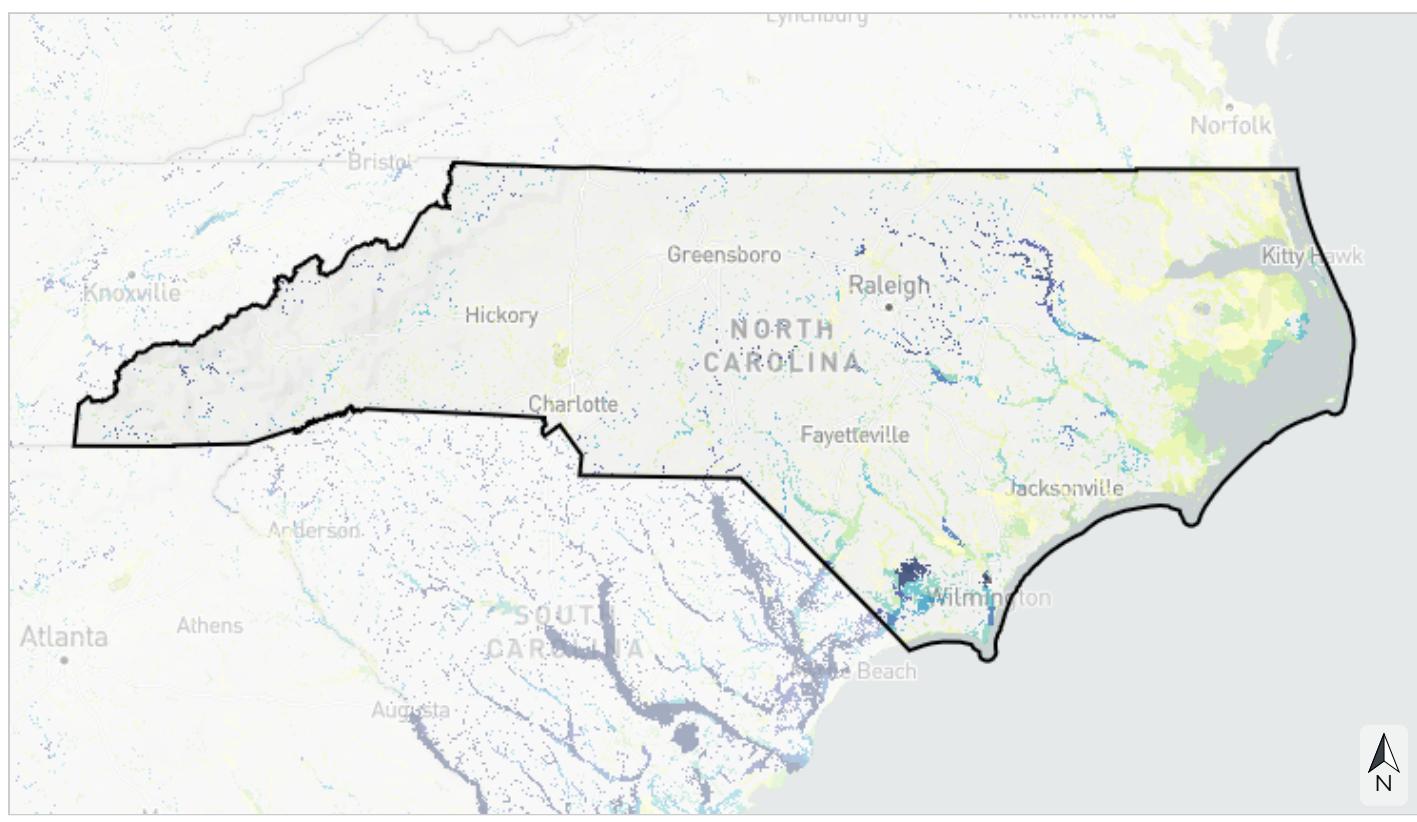
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Freshwater

Imperiled aquatic species

This indicator measures the number of aquatic animal Species of Greatest Conservation Need (SGCN) observed within each 12-digit HUC subwatershed, including fish, mussels, snails, crayfish, and amphibians. SGCN are identified in State Wildlife Action Plans as most in need of conservation action. This indicator captures patterns of rare and endemic aquatic species diversity. It originates from state Natural Heritage Program data collected by the Southeast Aquatic Resources Partnership and applies to the Environmental Protection Agency's estimated floodplain, which spatially defines areas estimated to be inundated by a 100-year flood (also known as the 1% annual chance flood).



Number of aquatic animal Species of Greatest Conservation Need observed

8+ species
7 species
6 species
5 species
4 species
3 species
2 species
1 species
0 species
Not identified as a floodplain (excluding West Virginia)

Table 18: Indicator values for imperiled aquatic species within North Carolina. A good condition threshold is not yet defined for this indicator.

Indicator Values: Number of aquatic animal Species of Greatest Conservation Need observed		Acres	Percent of Area
↑ High	8+ species	171,972	0.5%
	7 species	82,755	0.2%
	6 species	104,836	0.3%
	5 species	96,567	0.3%
	4 species	203,675	0.6%
	3 species	415,024	1.2%
	2 species	1,059,678	3.1%
	1 species	1,484,884	4.3%
	0 species	1,562,261	4.5%
	Not identified as a floodplain (excluding West Virginia)	26,830,655	77.9%
↓ Low	<i>Area not evaluated for this indicator</i>	2,431,524	7.1%
Total area		34,443,831	100%

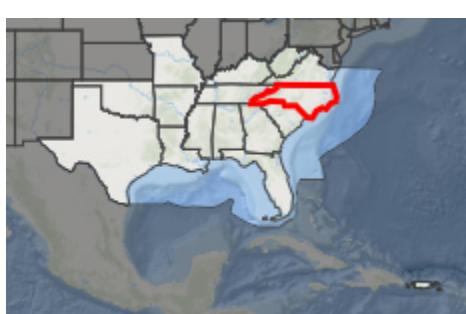
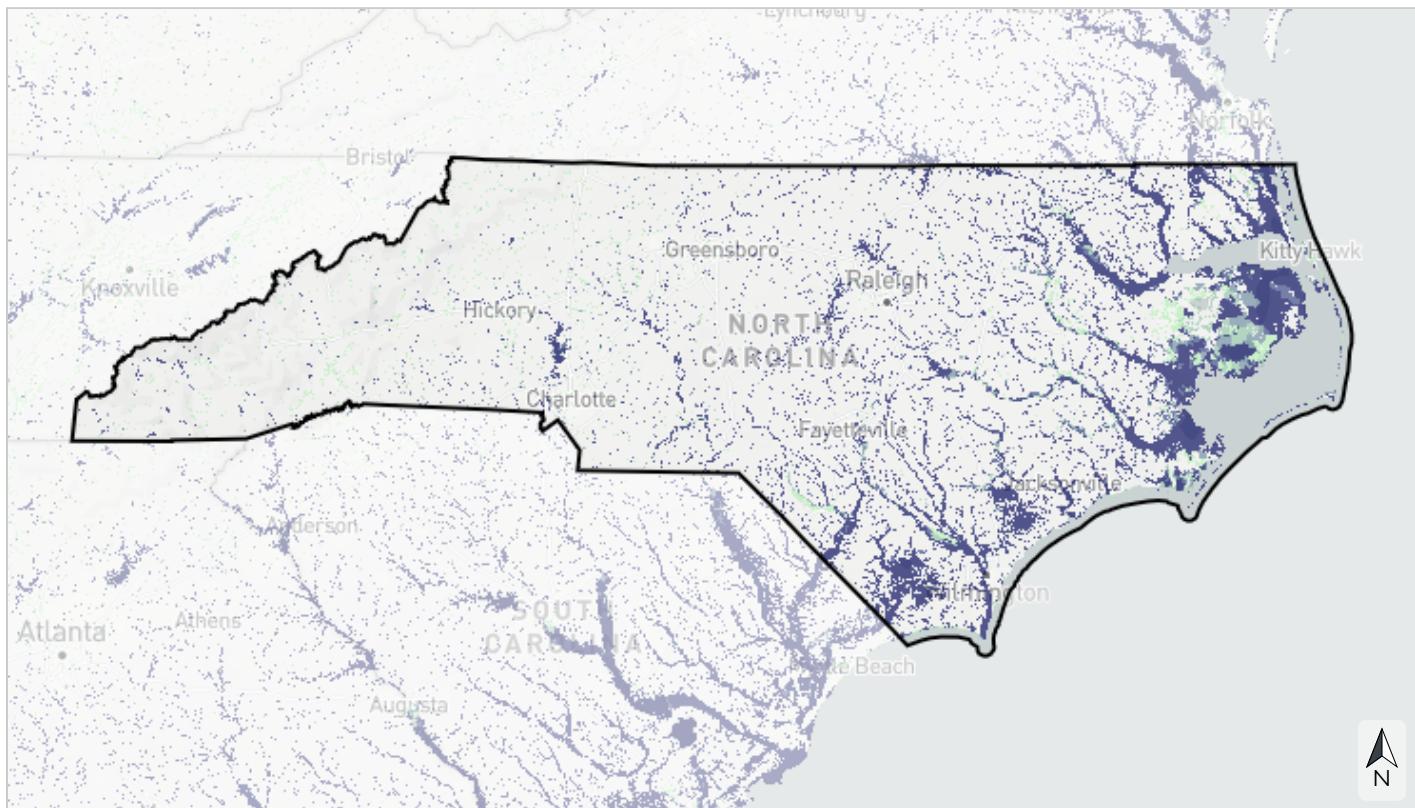
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Freshwater

Natural landcover in floodplains

This indicator measures the amount of natural landcover in the estimated floodplain of rivers and streams within each catchment. It assesses the stream channel and its surrounding riparian buffer, measuring the percent of unaltered habitat like forests, wetlands, or open water (rather than agriculture or development). Intact vegetated buffers within the floodplain of rivers and streams provide aquatic habitat, improve water quality, reduce erosion and flooding, recharge groundwater, and more. This indicator originates from the National Land Cover Database and applies to the Environmental Protection Agency's estimated floodplain, which spatially defines areas estimated to be inundated by a 100-year flood (also known as the 1% annual chance flood).



Percent natural landcover within the estimated floodplain, by catchment

- >90% natural landcover
- >80-90% natural landcover
- >70-80% natural landcover
- >60-70% natural landcover
- ≤60% natural landcover
- Not identified as a floodplain

Table 19: Indicator values for natural landcover in floodplains within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

Indicator Values: Percent natural landcover within the estimated floodplain, by catchment		Acres	Percent of Area
↑ High	>90% natural landcover	3,499,897	10.2%
	>80-90% natural landcover	509,021	1.5%
	>70-80% natural landcover	328,552	1.0%
↓ Low	>60-70% natural landcover	281,294	0.8%
	≤60% natural landcover	562,887	1.6%
	Not identified as a floodplain	26,832,381	77.9%
	<i>Area not evaluated for this indicator</i>	2,429,799	7.1%
Total area		34,443,831	100%

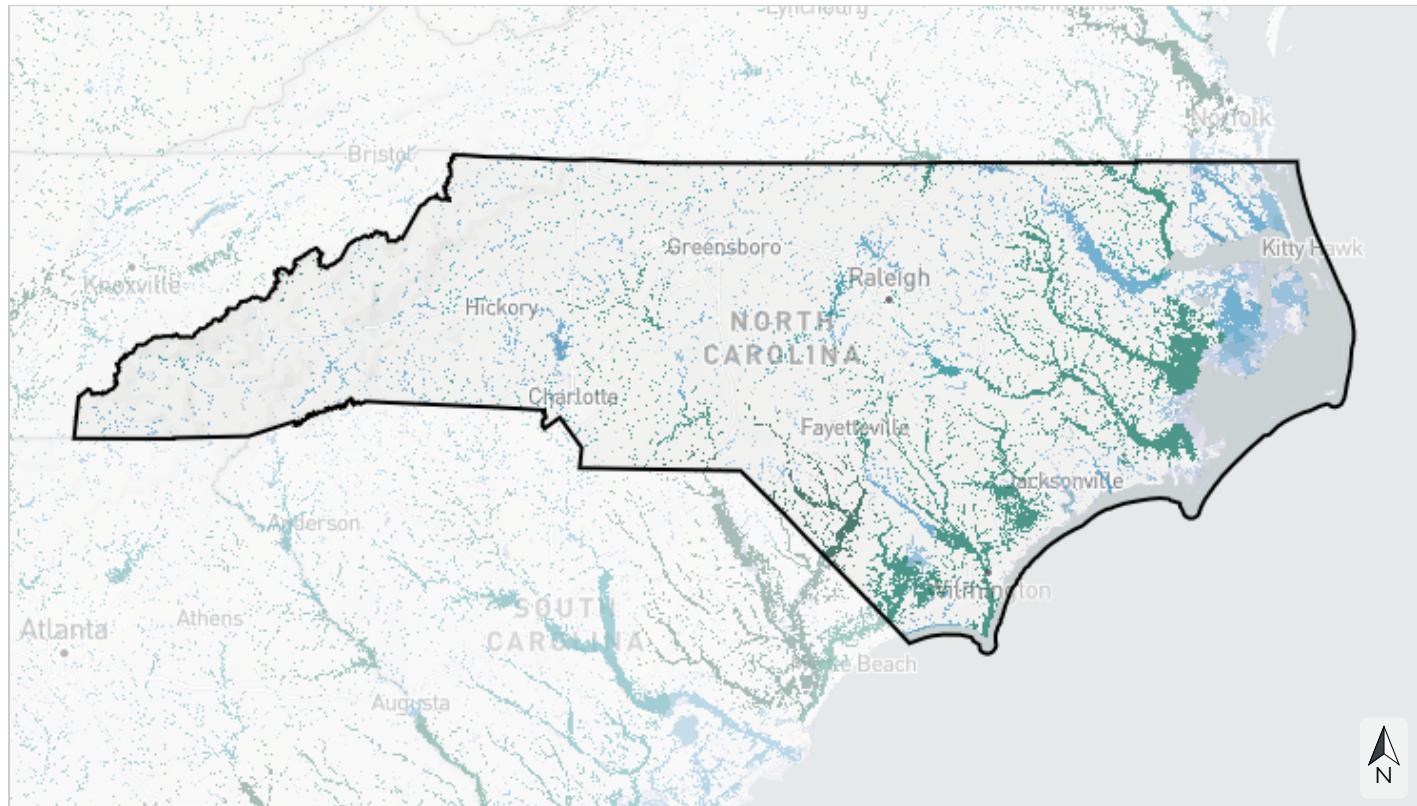
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Freshwater

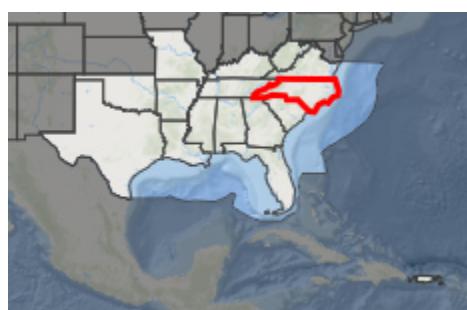
Network complexity

This indicator depicts the number of connected stream size classes in a river network between dams or waterfalls. River networks with a variety of connected stream classes help retain aquatic biodiversity in a changing climate by allowing species to access climate refugia and move between habitats. This indicator originates from the Southeast Aquatic Resources Partnership and applies to the Environmental Protection Agency's estimated floodplain, which spatially defines areas estimated to be inundated by a 100-year flood (also known as the 1% annual chance flood).



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Number of connected stream size classes

- 7 size classes
- 6 size classes
- 5 size classes
- 4 size classes
- 3 size classes
- 2 size classes
- 1 size class
- Not identified as a floodplain

Table 20: Indicator values for network complexity within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values: Number of connected stream size classes	Acres	Percent of Area
↑ High	7 size classes	196,302	0.6%
	6 size classes	2,042,687	5.9%
	5 size classes	294,876	0.9%
	4 size classes	913,779	2.7%
	3 size classes	783,245	2.3%
	2 size classes	434,121	1.3%
	1 size class	402,719	1.2%
	Not identified as a floodplain	26,828,689	77.9%
↓ Low	<i>Area not evaluated for this indicator</i>	2,547,411	7.4%
	Total area	34,443,831	100%

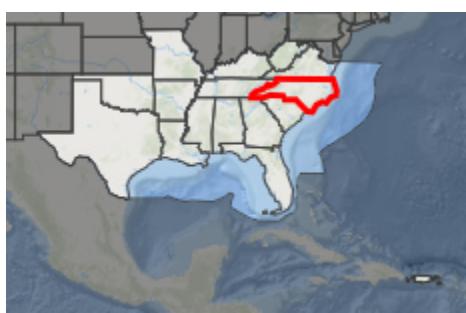
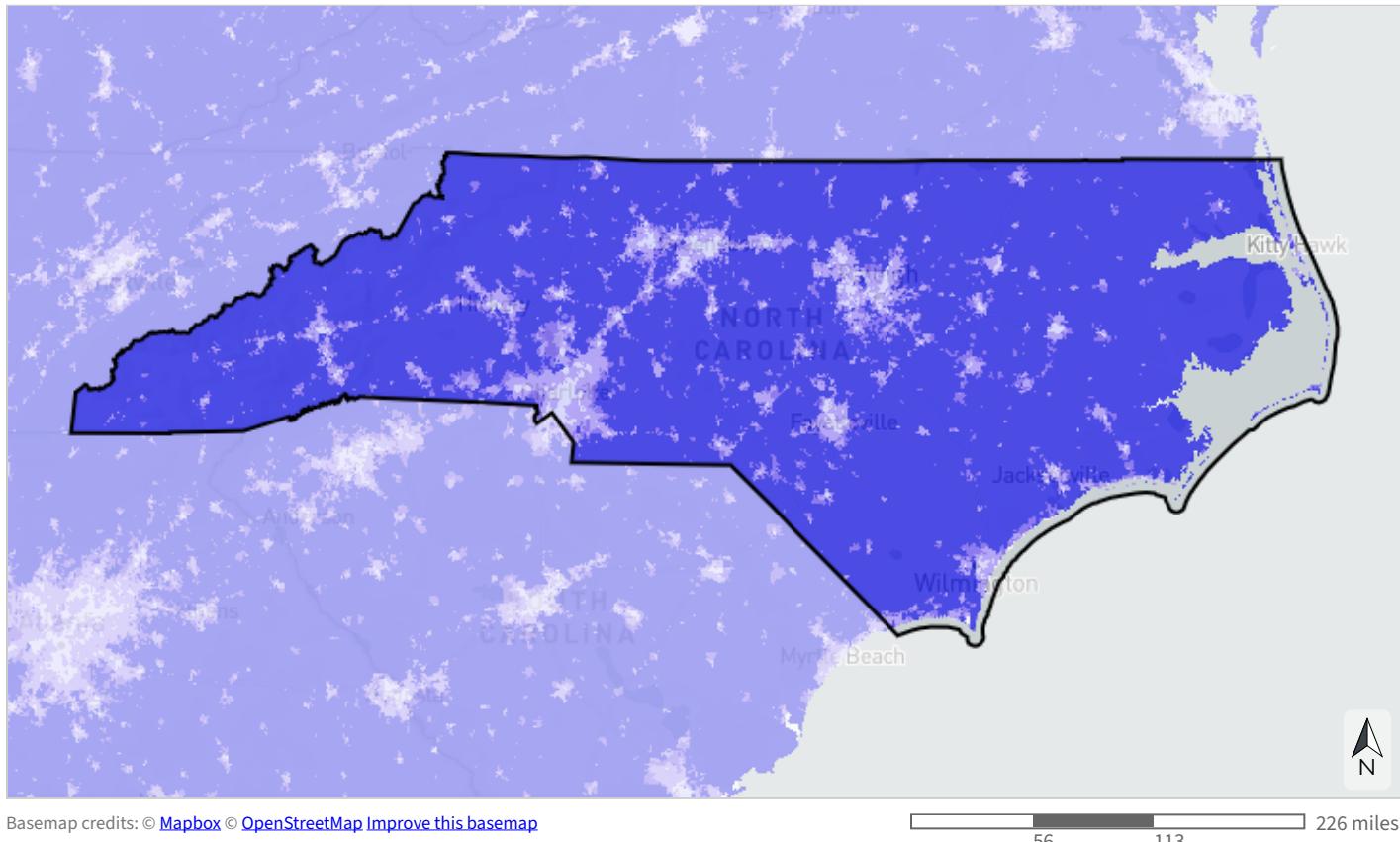
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Freshwater

Permeable surface

This indicator measures the average percent of non-impervious cover within each catchment. High levels of impervious surface degrade water quality and alter freshwater flow, impacting both aquatic species communities and ecosystem services for people, like the availability of clean drinking water. This indicator originates from the National Land Cover Database.



Percent of catchment permeable

- >95% permeable (likely high water quality and supporting most sensitive aquatic species)
- >90-95% permeable (likely declining water quality and supporting most aquatic species)
- >70-90% permeable (likely degraded water quality and not supporting many aquatic species)
- ≤70% permeable (likely degraded instream flow, water quality, and aquatic species communities)

Table 21: Indicator values for permeable surface within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values: Percent of catchment permeable	Acres	Percent of Area	
↑ High	>95% permeable (likely high water quality and supporting most sensitive aquatic species)	27,564,110	80.0%	↑ In good condition
	>90-95% permeable (likely declining water quality and supporting most aquatic species)	1,893,467	5.5%	↓ Not in good condition
	>70-90% permeable (likely degraded water quality and not supporting many aquatic species)	2,046,480	5.9%	
↓ Low	≤70% permeable (likely degraded instream flow, water quality, and aquatic species communities)	508,251	1.5%	
	<i>Area not evaluated for this indicator</i>	2,431,524	7.1%	
	Total area	34,443,831	100%	

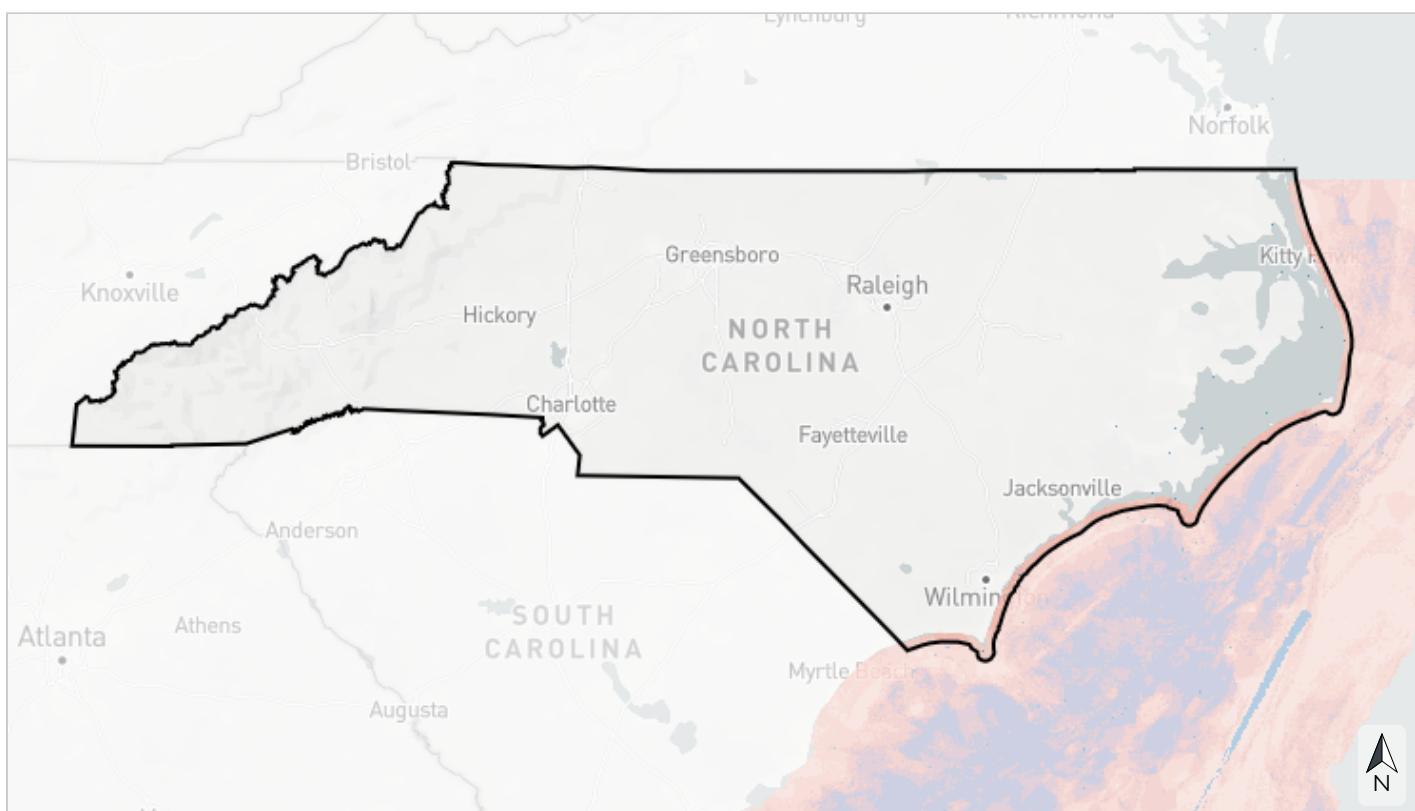
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Atlantic coral & hardbottom

This indicator predicts the presence of coral and hardbottom in the Atlantic ocean based on direct observations, known locations of human-created structures like artificial reefs, and predictive models. The models use hardbottom observations and a suite of environmental predictors including measures of depth, seafloor topography and substrate, oceanography, and geography. Hardbottom provides an anchor for important seafloor habitats such as deep-sea corals, plants, and sponges, providing valuable structure that supports a wide range of invertebrate and fish species. This indicator combines data from The Nature Conservancy's South Atlantic Bight Marine Assessment and multiple National Oceanic and Atmospheric Administration datasets (deep-sea coral observations, shipwrecks, artificial reefs, and two projects predicting hardbottom distribution).



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- Confirmed coral
- Confirmed natural or human-created hardbottom (shipwrecks, artificial reefs)
- Predicted cold water coral mounds (Blake Plateau)
- Highest probability of hardbottom (>80th percentile)
- High probability of hardbottom(>60th-80th percentile)
- Medium probability of hardbottom (>40th-60th percentile)
- Low probability of hardbottom (>20th-40th percentile)
- Lowest probability of hardbottom (<=20th percentile)
- Not identified as hardbottom

Table 22: Indicator values for Atlantic coral & hardbottom within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Confirmed coral	18	<0.1%
	Confirmed natural or human-created hardbottom (shipwrecks, artificial reefs)	8,445	<0.1%
	Predicted cold water coral mounds (Blake Plateau)	0	0%
	Highest probability of hardbottom (>80th percentile)	4.4	<0.1%
	High probability of hardbottom(>60th-80th percentile)	1,691	<0.1%
	Medium probability of hardbottom (>40th-60th percentile)	64,794	0.2%
	Low probability of hardbottom (>20th-40th percentile)	409,050	1.2%
	Lowest probability of hardbottom (\leq 20th percentile)	243,451	0.7%
	Not identified as hardbottom	10,723,942	31.1%
	<i>Area not evaluated for this indicator</i>	22,992,436	66.8%
Total area		34,443,831	100%

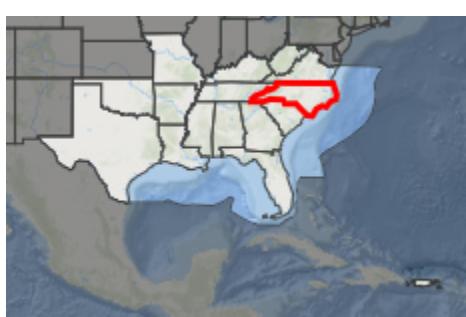
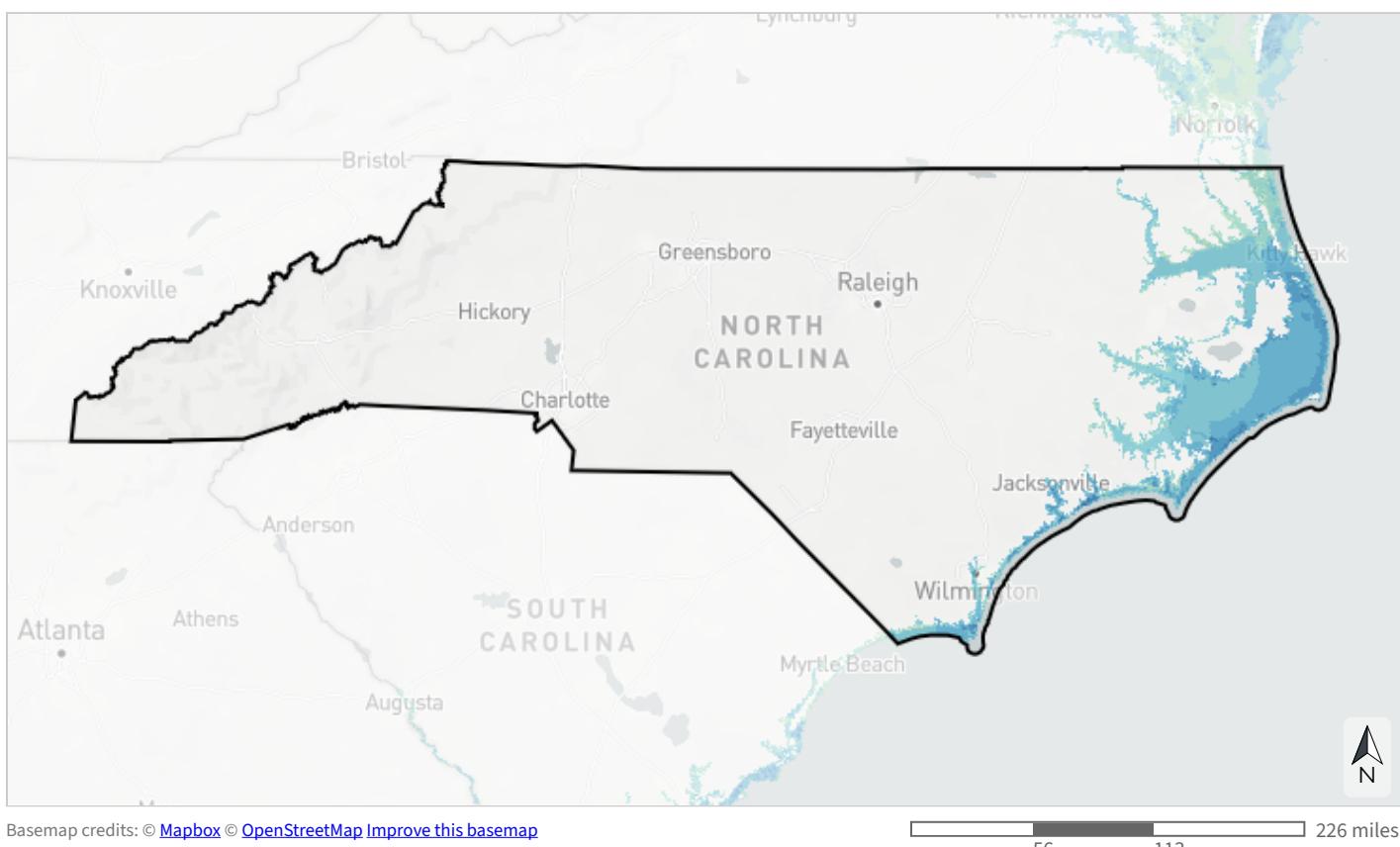
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Atlantic estuarine fish habitat

This indicator measures the condition of estuarine fish habitat along the Atlantic coast using metrics of water quality, marsh edges, seagrass and oyster reefs, fragmentation, human development, and more. Areas of excellent fish habitat are already in good condition and face few threats. Restoration opportunity areas are doing well in some respects, but restoration projects could significantly improve them. Degraded areas of opportunity face many challenges, and restoration projects are unlikely to increase available fish habitat unless particularly large in scope and scale. This indicator originates from the Atlantic Coast Fish Habitat Partnership's fish habitat conservation area mapping and prioritization project.



- Final score of 80 (areas of excellent fish habitat)
- Final score of 70 (areas of excellent fish habitat)
- Final score of 60 (restoration opportunity areas)
- Final score of 50 (restoration opportunity areas)
- Final score of 40 (restoration opportunity areas)
- Final score of 30 (restoration opportunity areas)
- Final score of 20 (restoration opportunity areas)
- Final score of 10 (degraded areas of opportunity)
- Final score of 0 (degraded areas of opportunity)

Table 23: Indicator values for Atlantic estuarine fish habitat within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Final score of 80 (areas of excellent fish habitat)	2,227	<0.1%
	Final score of 70 (areas of excellent fish habitat)	33,810	<0.1%
	Final score of 60 (restoration opportunity areas)	286,155	0.8%
	Final score of 50 (restoration opportunity areas)	1,002,203	2.9%
	Final score of 40 (restoration opportunity areas)	1,266,886	3.7%
	Final score of 30 (restoration opportunity areas)	435,706	1.3%
	Final score of 20 (restoration opportunity areas)	97,999	0.3%
	Final score of 10 (degraded areas of opportunity)	8,161	<0.1%
	Final score of 0 (degraded areas of opportunity)	0	0%
	<i>Area not evaluated for this indicator</i>	31,310,683	90.9%
Total area		34,443,831	100%

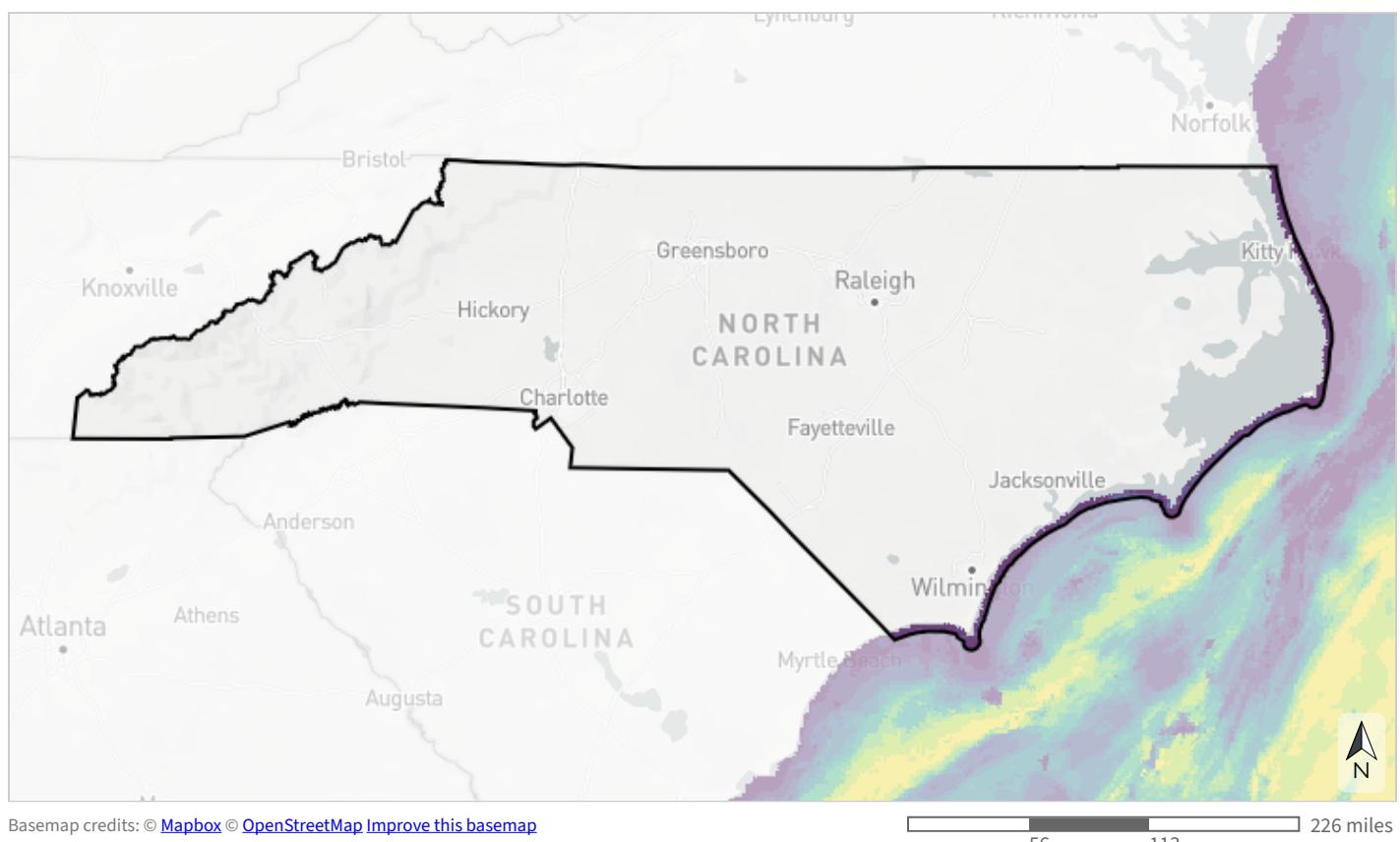
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Atlantic marine birds

This indicator identifies important areas in the Atlantic Ocean for birds that feed exclusively or mainly at sea. It uses seasonal predictions of relative abundance for 19 species of marine birds (Audubon's shearwater, band-rumped storm petrel, black-capped petrel, black scoter, Bonaparte's gull, bridled tern, brown pelican, common loon, common tern, Cory's shearwater, great shearwater, Manx shearwater, Northern gannet, parasitic jaeger, red-throated loon, royal tern, sooty shearwater, sooty tern, white-winged scoter) based on sightings from boat-based surveys and marine environmental data like fronts, primary productivity, and ocean currents. This indicator originates from Duke University's Marine-life Data and Analysis Team marine bird models.



Percentile of importance for marine bird index species (across the full East Coast study area)

- >90th percentile
- >80th-90th percentile
- >70th-80th percentile
- >60th-70th percentile
- >50th-60th percentile
- >40th-50th percentile
- >30th-40th percentile
- >20th-30th percentile
- >10th-20th percentile
- ≤10th percentile
- Land

Table 24: Indicator values for Atlantic marine birds within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values: Percentile of importance for marine bird index species (across the full East Coast study area)	Acres	Percent of Area
↑ High	>90th percentile	453,365	1.3%
	>80th-90th percentile	163,285	0.5%
	>70th-80th percentile	16,342	<0.1%
	>60th-70th percentile	0	0%
	>50th-60th percentile	0	0%
	>40th-50th percentile	0	0%
	>30th-40th percentile	0	0%
	>20th-30th percentile	0	0%
	>10th-20th percentile	0	0%
	≤10th percentile	0	0%
↓ Low	Land	3,984	<0.1%
	<i>Area not evaluated for this indicator</i>	33,806,855	98.2%
Total area		34,443,831	100%

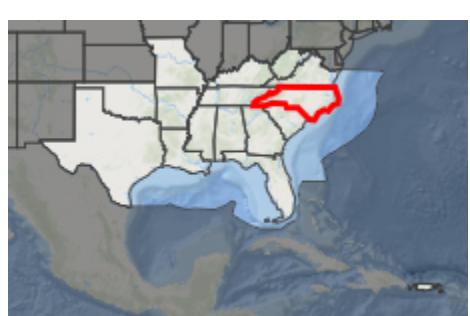
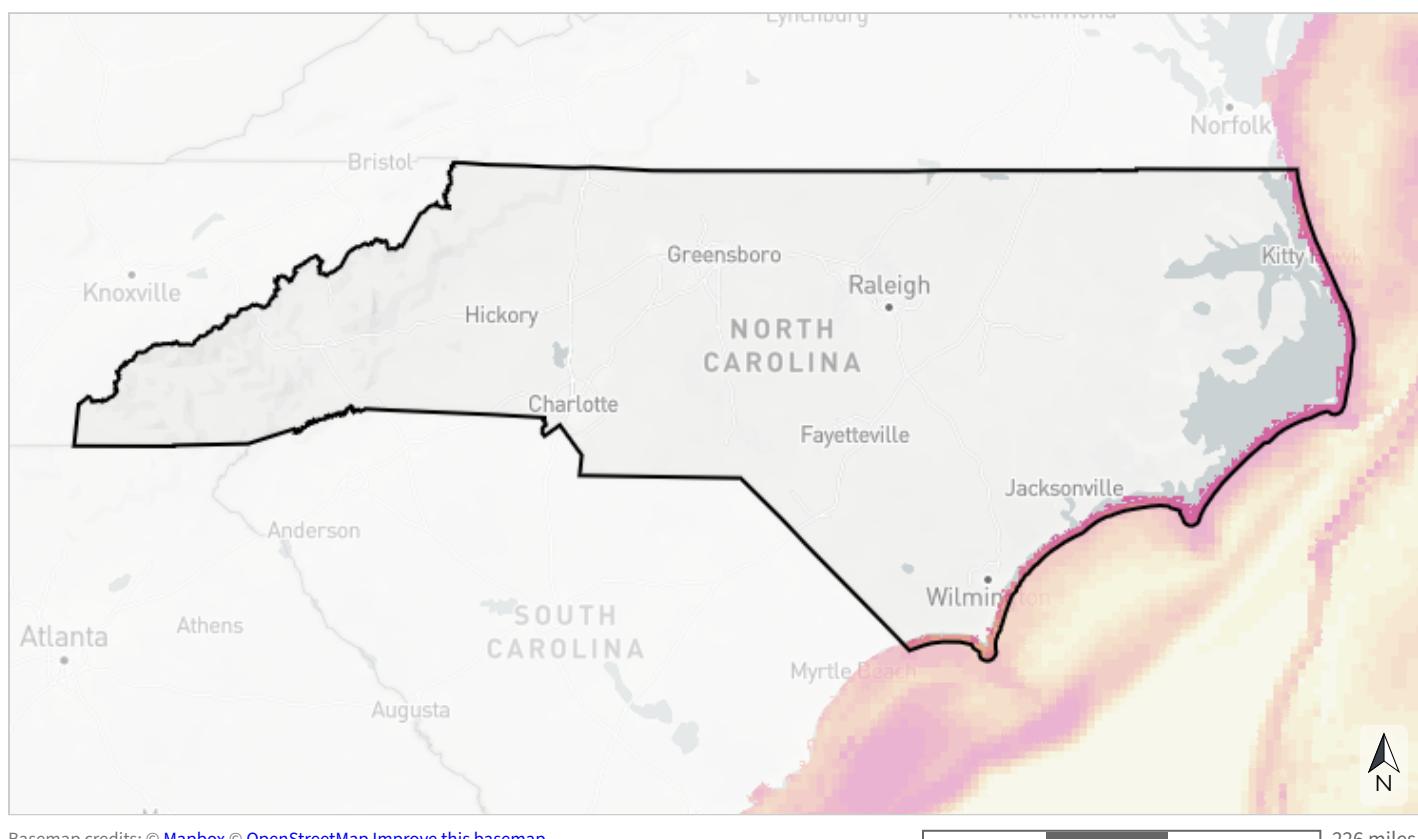
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Atlantic marine mammals

This indicator identifies important areas in the Atlantic Ocean for dolphins, whales, and seals. It incorporates density predictions for 20 marine mammal species or species groups (Atlantic spotted dolphin, Atlantic white-sided dolphin, Clymene dolphin, common bottlenose dolphin, Cuvier's beaked whale, dwarf and pygmy sperm whales, fin whale, harbor porpoise, humpback whale, mesoplodont beaked whales, North Atlantic right whale, pantropical spotted dolphin, pilot whales, Risso's dolphin, rough-toothed dolphin, seals, short-beaked common dolphin, sperm whale, striped dolphin, unidentified beaked whales) based on sightings from boat-based and aerial surveys and data on oceanographic conditions. It uses marine mammal models developed by the Duke Marine Lab.



Percentile of importance for marine mammal index species (across the full East Coast study area)

- >90th percentile
- >80th-90th percentile
- >70th-80th percentile
- >60th-70th percentile
- >50th-60th percentile
- >40th-50th percentile
- >30th-40th percentile
- >20th-30th percentile
- >10th-20th percentile
- ≤10th percentile
- Land

Table 25: Indicator values for Atlantic marine mammals within North Carolina. A good condition threshold is not yet defined for this indicator.

Indicator Values: Percentile of importance for marine mammal index species (across the full East Coast study area)		Acres	Percent of Area
↑ High	>90th percentile	416,121	1.2%
	>80th-90th percentile	174,818	0.5%
	>70th-80th percentile	98,572	0.3%
	>60th-70th percentile	66,975	0.2%
	>50th-60th percentile	19,884	<0.1%
	>40th-50th percentile	0	0%
	>30th-40th percentile	0	0%
	>20th-30th percentile	0	0%
	>10th-20th percentile	0	0%
	≤10th percentile	0	0%
↓ Low	Land	79,587	0.2%
	<i>Area not evaluated for this indicator</i>	33,587,872	97.5%
	Total area	34,443,831	100%

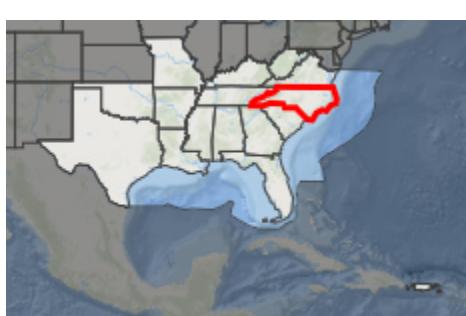
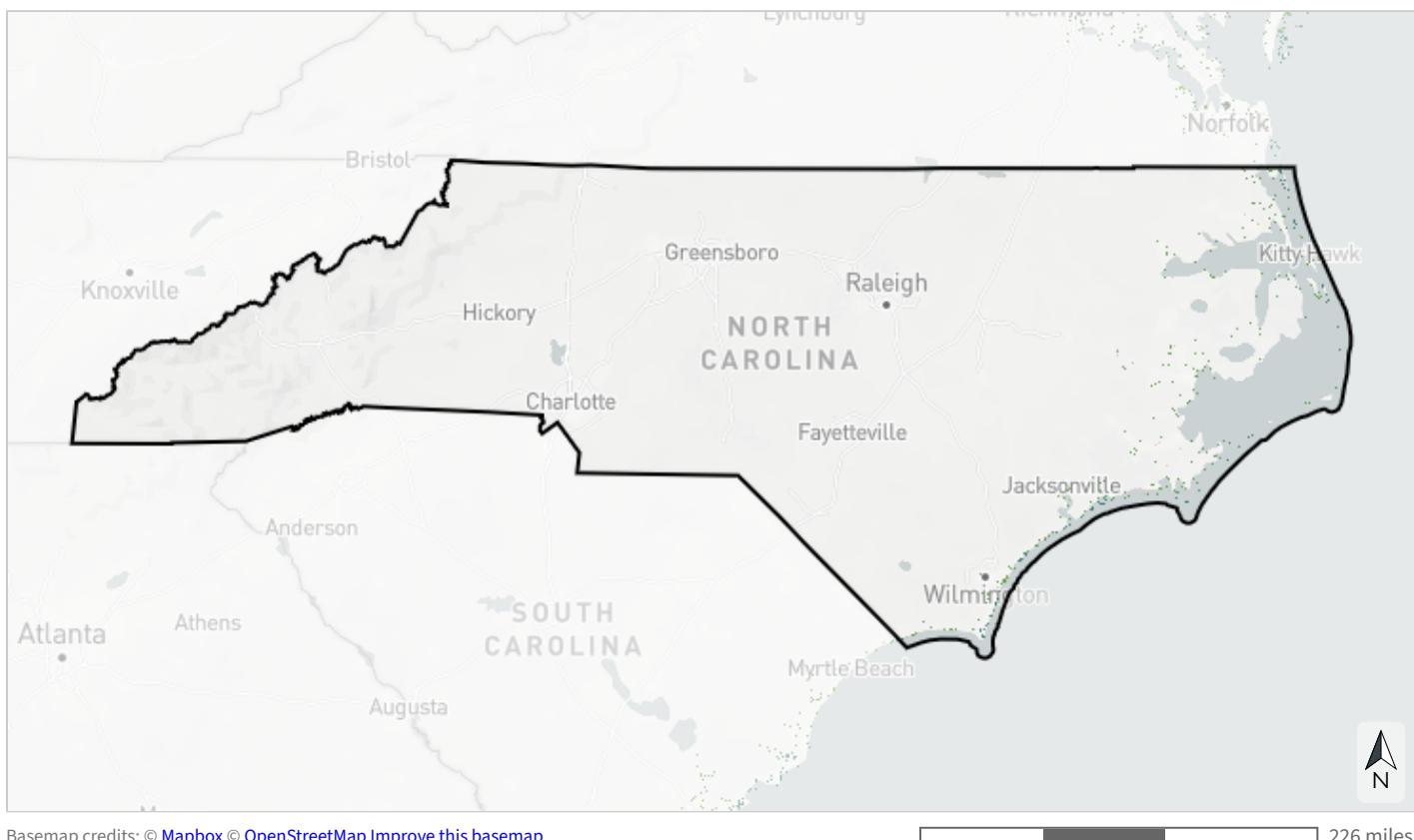
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Coastal shoreline condition

This indicator assesses shoreline condition based on the presence of hardened structures like jetties, groins, and riprap, as well as other human development. By restricting the natural movement of sediment, shoreline armoring increases erosion, prevents the inland migration of coastal ecosystems in response to sea-level rise, and degrades habitat for birds, sea turtles, fish, plants, and other species both on and offshore. Natural shorelines in harder-to-develop coastal areas receive the highest shoreline condition scores, while hardened shorelines receive the lowest scores. This indicator originates from the National Oceanic and Atmospheric Administration's Environmental Sensitivity Index dataset.



- Natural and harder to develop
- Natural
- Partially armored and harder to develop
- Partially armored
- Armored

Table 26: Indicator values for coastal shoreline condition within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area	
↑ High	Natural and harder to develop	25,189	<0.1%	↑ In good condition
	Natural	81,562	0.2%	
	Partially armored and harder to develop	77	<0.1%	
↓ Low	Partially armored	2,889	<0.1%	↓ Not in good condition
	Armored	10,763	<0.1%	
	<i>Area not evaluated for this indicator</i>	34,323,351	99.7%	
Total area		34,443,831	100%	

To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Estuarine coastal condition

This indicator combines measures of water quality, sediment quality, contaminants in fish tissue, and benthic community condition to create an overall index of coastal estuarine condition. Estuaries serve as important nursery habitat for wildlife, including many species of fish and shellfish eaten as seafood. They also improve water quality by filtering out sediments and pollutants, provide recreational opportunities, and support coastal economies. This indicator originates from the Environmental Protection Agency's National Coastal Condition Assessment data.



- Good
- Fair to good
- Fair
- Poor to fair
- Poor
- Shallow estuary not assessed for condition

Table 27: Indicator values for estuarine coastal condition within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Good	710,296	2.1%
	Fair to good	588,199	1.7%
	Fair	1,053,796	3.1%
	Poor to fair	35,034	0.1%
	Poor	3,449	<0.1%
	Shallow estuary not assessed for condition	91,818	0.3%
↓ Low	<i>Area not evaluated for this indicator</i>	31,961,238	92.8%
	Total area	34,443,831	100%

↑ In good condition

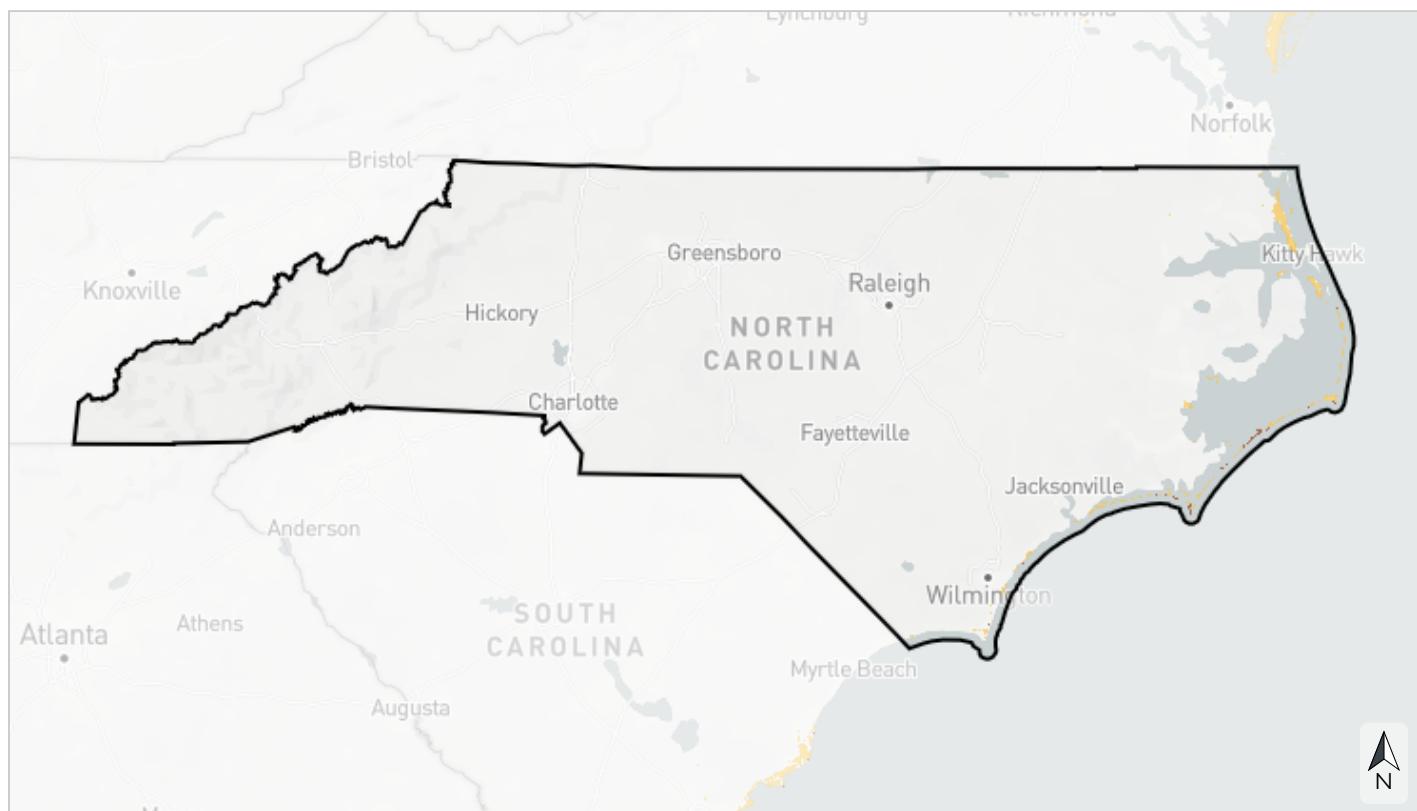
↓ Not in good condition

To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



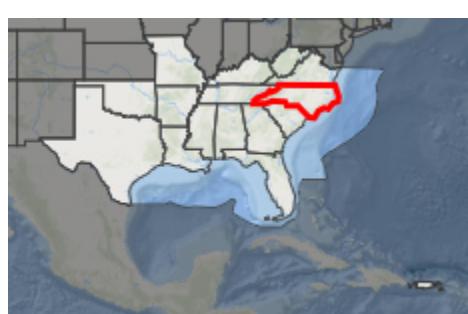
Coastal & marine Island habitat

This indicator represents important habitat for coastal island-dependent species across the Southeast. Because the isolation of islands can make them ecologically unique and protect them from disturbance and mainland predators, they often serve as important habitat for many species of mammals, plants, and insects, as well as breeding coastal birds and sea turtles. The highest scores go to island critical habitat for six threatened and endangered animal and plant species: piping plover, loggerhead sea turtle, Cape Sable thoroughwort, Florida semaphore cactus, silver rice rat, and Bartram's hairstreak butterfly. This indicator uses U.S. Fish and Wildlife Service critical habitat data and island boundaries from the U.S. Geological Survey and Esri.



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- █ Island critical habitat for any of six threatened and endangered species (piping plover, loggerhead sea turtle, Cape Sable thoroughwort, Florida semaphore cactus, silver rice rat, or Bartram's hairstreak butterfly)
- █ Other island area
- █ Not a coastal island

Table 28: Indicator values for island habitat within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Island critical habitat for any of six threatened and endangered species (piping plover, loggerhead sea turtle, Cape Sable thoroughwort, Florida semaphore cactus, silver rice rat, or Bartram's hairstreak butterfly)	13,202	<0.1%
	Other island area	137,408	0.4%
↓ Low	Not a coastal island	9,875,297	28.7%
	<i>Area not evaluated for this indicator</i>	24,417,924	70.9%
Total area		34,443,831	100%

To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Marine highly migratory fish

This indicator identifies important foraging and spawning areas for highly migratory fish in the Atlantic Ocean and Gulf of Mexico. It uses physical capture and satellite tag observations, remote sensing of environmental variables, and physical oceanographic data to analyze the habitat preferences of three species (skipjack tuna, bluefin tuna, and blue shark) at various life stages. It originates from European Commission Joint Research Centre global fish models.

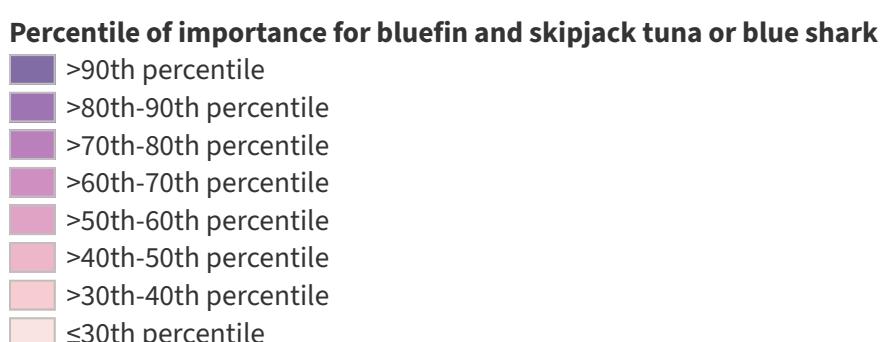
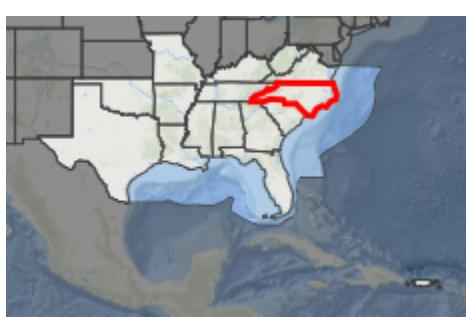
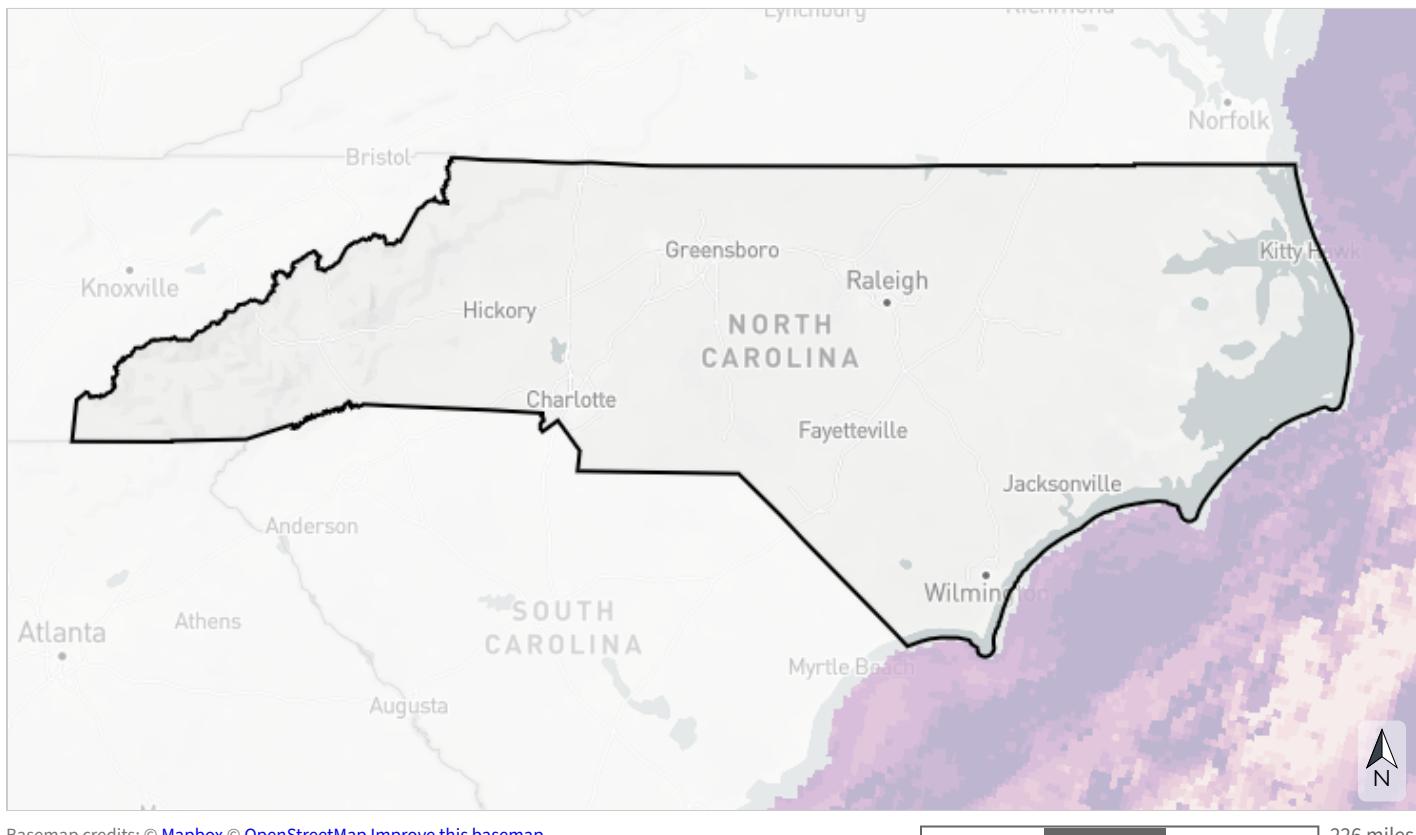


Table 29: Indicator values for marine highly migratory fish within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values: Percentile of importance for bluefin and skipjack tuna or blue shark	Acres	Percent of Area
↑ High	>90th percentile	0	0%
	>80th-90th percentile	1,640	<0.1%
	>70th-80th percentile	1,064	<0.1%
	>60th-70th percentile	0	0%
	>50th-60th percentile	0	0%
	>40th-50th percentile	0	0%
	>30th-40th percentile	0	0%
	≤30th percentile	0	0%
<i>Area not evaluated for this indicator</i>		34,441,126	100.0%
Total area		34,443,831	100%

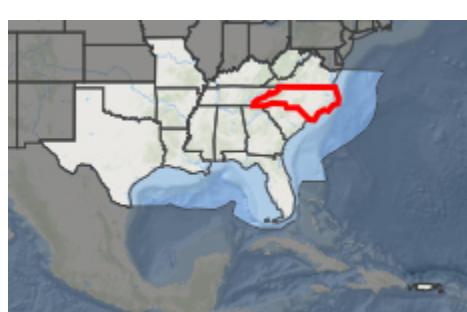
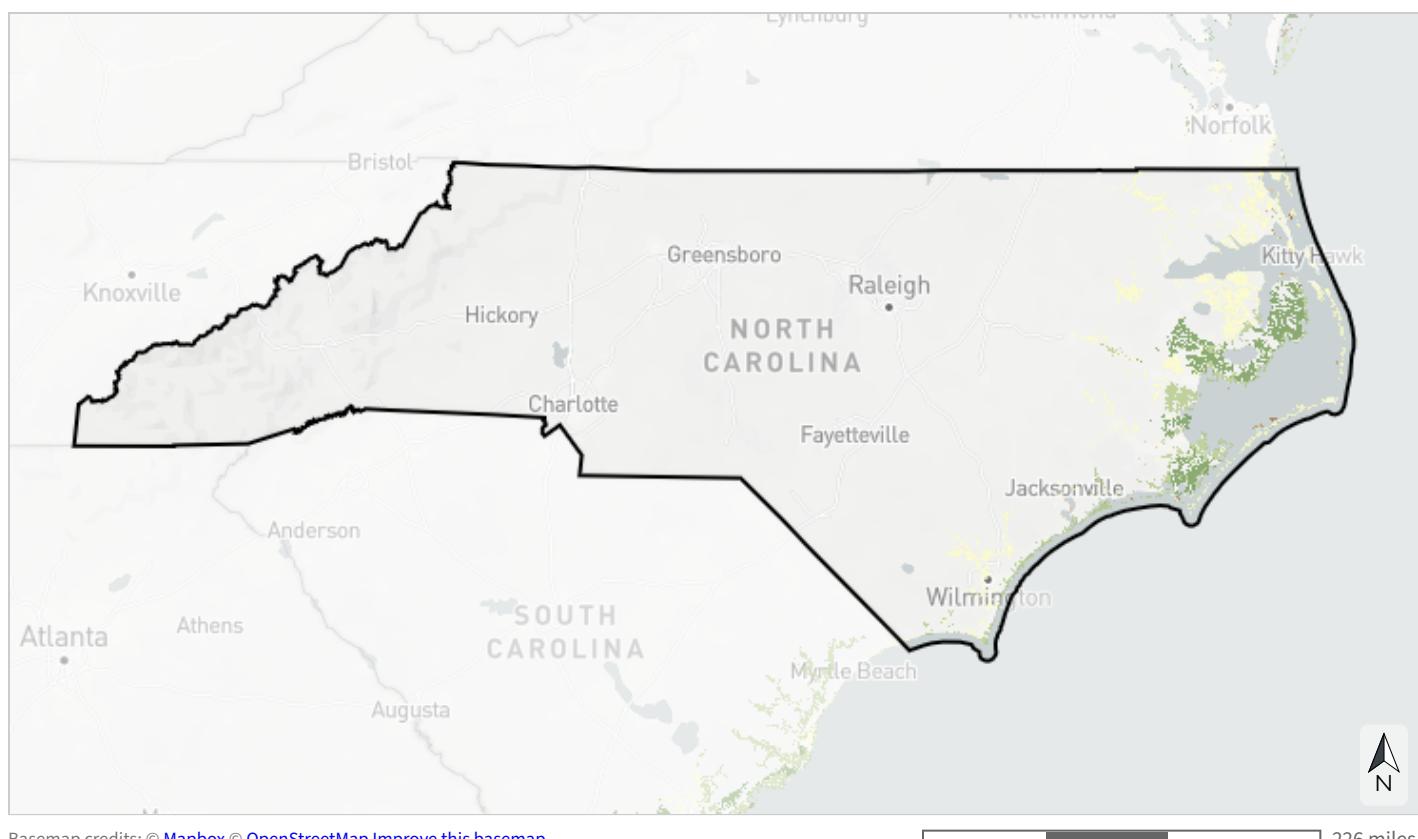
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Resilient coastal sites

This indicator depicts the capacity of coastal habitats to migrate to adjacent lowlands in order to sustain biodiversity and natural services under increasing inundation from sea-level rise. It is based on the physical and condition characteristics of current tidal complexes, their predicted migration space, and surrounding buffer areas. These characteristics include marsh complex size, shared edge with migration space, sediment balance, water quality, natural landcover, landform diversity, and more. This indicator originates from The Nature Conservancy's Resilient Coastal Sites project.



- Most resilient
- More resilient
- Slightly more resilient
- Average/median resilience
- Slightly less resilient
- Less resilient
- Least resilient

Table 30: Indicator values for resilient coastal sites within North Carolina. A good condition threshold is not yet defined for this indicator.

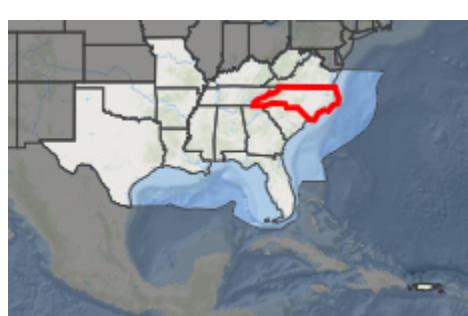
		Indicator Values	Acres	Percent of Area
↑ High	Most resilient		0	0%
	More resilient	368,999	1.1%	
	Slightly more resilient	303,702	0.9%	
	Average/median resilience	687,523	2.0%	
	Slightly less resilient	9,506	<0.1%	
	Less resilient	6,410	<0.1%	
	Least resilient	3,632	<0.1%	
	<i>Area not evaluated for this indicator</i>	33,064,060	96.0%	
		Total area	34,443,831	100%

To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine **Seagrass**

This indicator represents the presence of seagrass in the Atlantic Ocean and Gulf of Mexico. Seagrasses provide food and habitat for a range of marine and estuarine wildlife, including fish, sea turtles, shrimp, crabs, oysters, and more. They also produce oxygen, filter water, control erosion, and buffer storms. Seagrasses serve as an important indicator of the overall health of coastal ecosystems because they are sensitive to water quality and require sufficiently clear water for sunlight to penetrate. This indicator originates from the National Oceanic and Atmospheric Administration's Marine Cadastre.



Seagrass present

Table 31: Indicator values for seagrass within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Seagrass present	138,206	0.4%
	<i>Area not evaluated for this indicator</i>	34,305,625	99.6%
	Total area	34,443,831	100%

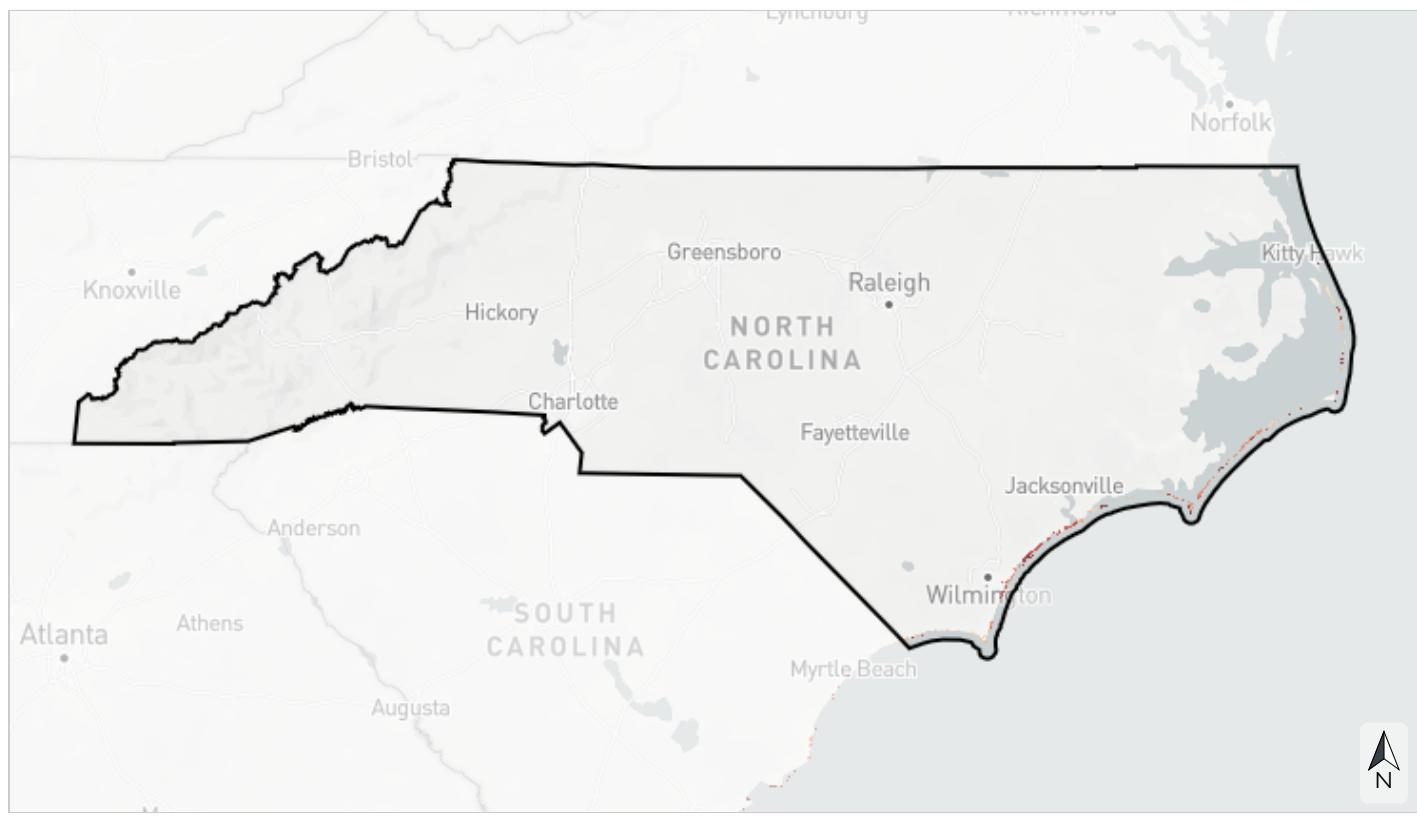
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

South Atlantic beach birds

This indicator is an index of habitat suitability for four shorebird species (American oystercatcher, Wilson's plover, least tern, piping plover) in the South Atlantic, based on observed abundance. It assesses beaches and nearby onshore habitats. Shorebirds' relative use of beaches and neighboring habitats for nesting, foraging, and breeding is an indicator of ecosystem health and quality. This indicator combines bird data from the U.S. Geological Survey and state waterbird biologists in FL, GA, SC, and NC.



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Percentile of importance for beach bird index species

- >80th percentile
- >60th-80th percentile
- >40th-60th percentile
- >20th-40th percentile
- ≤20th percentile
- Open water or not identified as a priority

Table 32: Indicator values for South Atlantic beach birds within North Carolina. A good condition threshold is not yet defined for this indicator.

Indicator Values: Percentile of importance for beach bird index species		Acres	Percent of Area
↑ High	>80th percentile	11,427	<0.1%
	>60th-80th percentile	15,998	<0.1%
	>40th-60th percentile	21,678	<0.1%
	>20th-40th percentile	14,892	<0.1%
	≤20th percentile	19,427	<0.1%
↓ Low	Open water or not identified as a priority	3,985,069	11.6%
	<i>Area not evaluated for this indicator</i>	30,375,340	88.2%
Total area		34,443,831	100%

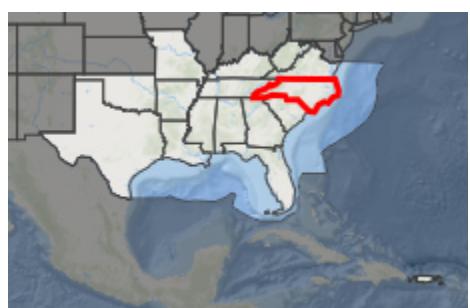
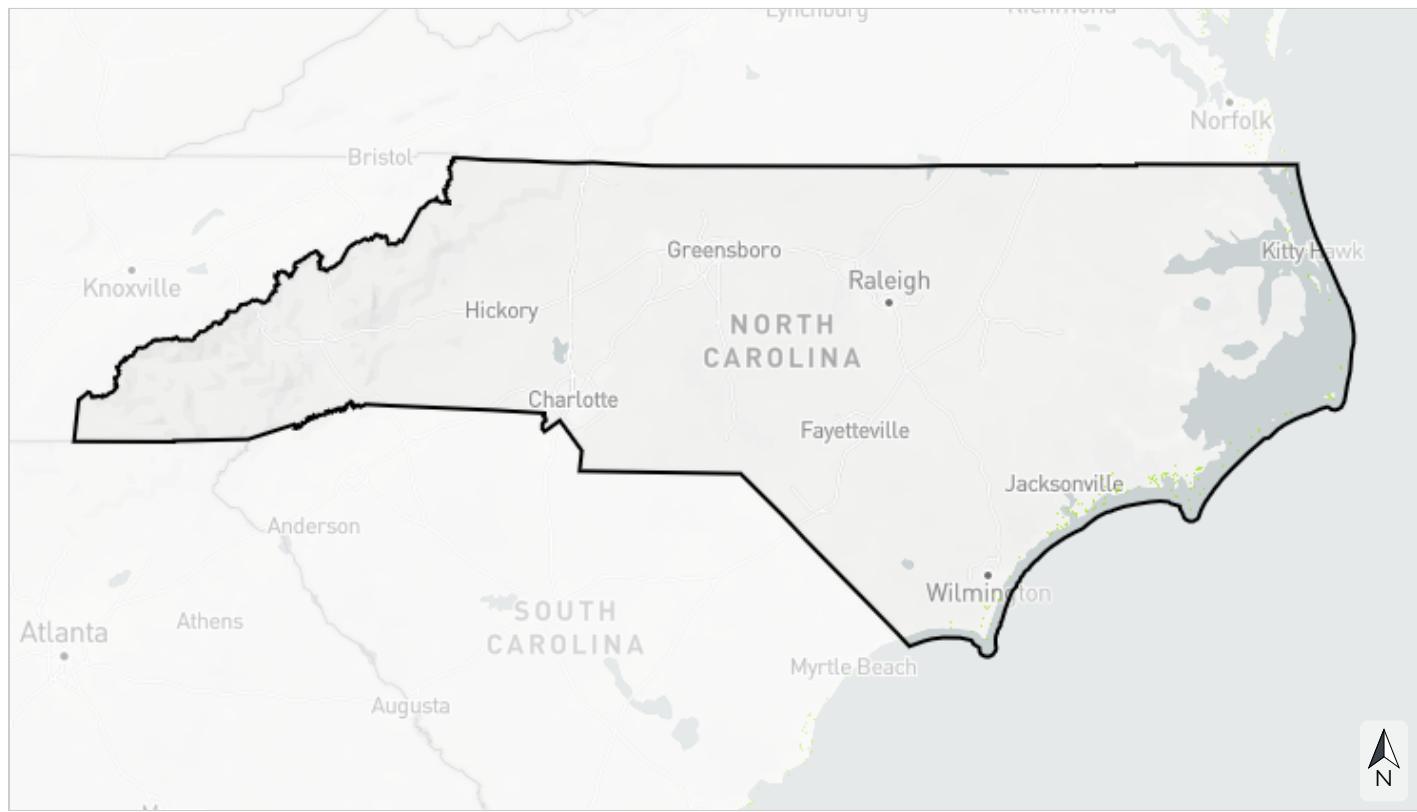
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

South Atlantic maritime forest

This indicator depicts the maritime forest currently present in the South Atlantic. Since maritime forest has been substantially reduced from its historic extent, protecting the remaining acreage is particularly important. This ecosystem supports a unique suite of plants that tolerate wind, salt, and flooding, as well as many species of birds, mammals, and reptiles. It also helps buffer the coastline from storms. This indicator originates from LANDFIRE landcover.



Maritime forest
Not identified as maritime forest

Table 33: Indicator values for South Atlantic maritime forest within North Carolina. A good condition threshold is not yet defined for this indicator.

	Indicator Values	Acres	Percent of Area
↑ High	Maritime forest	43,111	0.1%
↓ Low	Not identified as maritime forest	3,116,589	9.0%
	<i>Area not evaluated for this indicator</i>	31,284,130	90.8%
Total area		34,443,831	100%

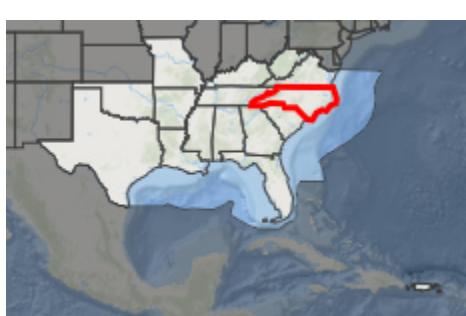
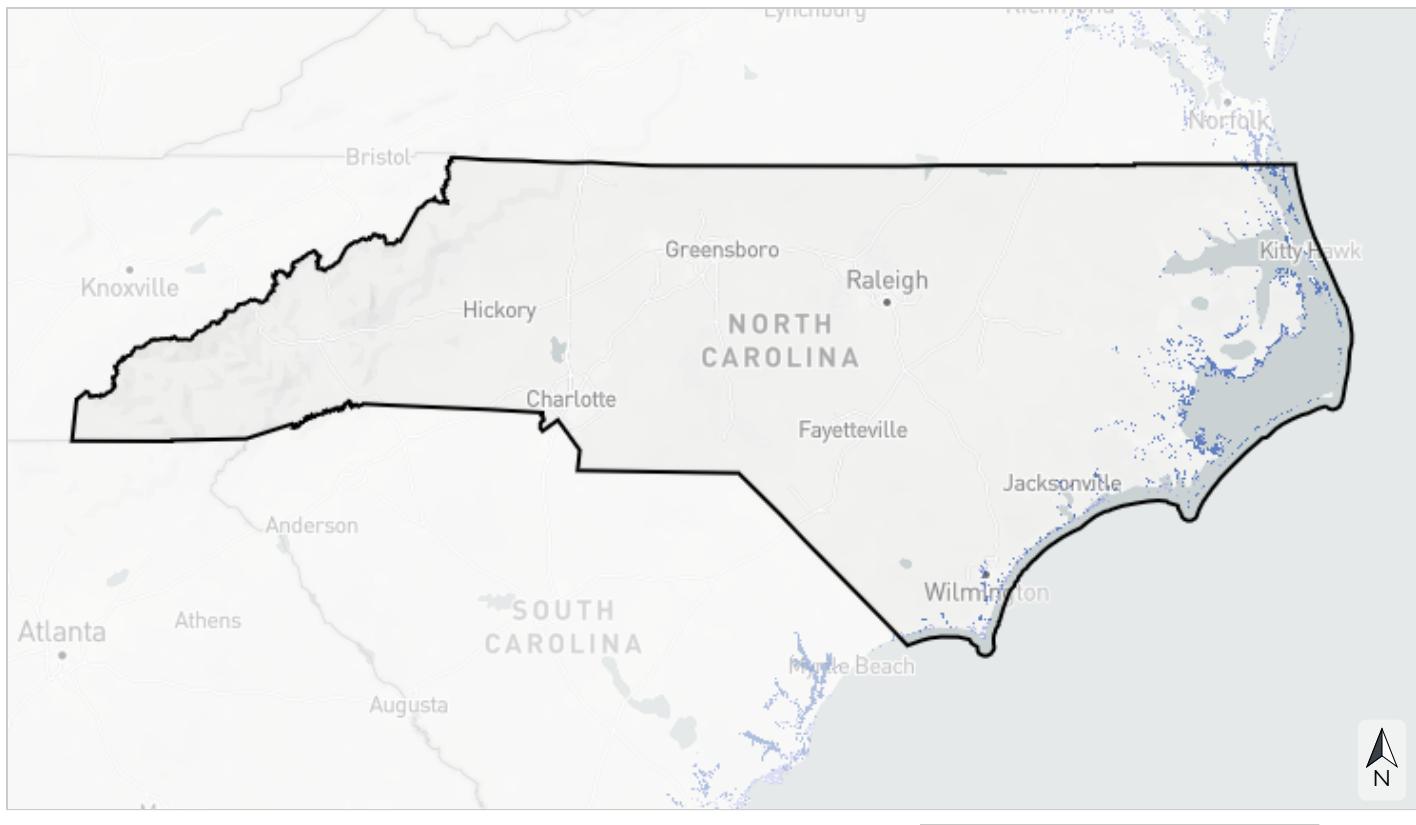
To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).



Coastal & marine

Stable coastal wetlands

This indicator uses remote sensing to calculate the unvegetated-vegetated ratio of tidal wetlands, which compares how much of a wetland is not covered by plants (e.g., sediment, rocks, open water) to how much is covered by plants. Marshes that maintain a higher proportion of vegetation tend to be more stable and resilient to threats like sea-level rise, erosion, and coastal development. This ratio, and how it changes over time, is a good surrogate for salt marsh degradation processes like sediment loss and conversion to open water. This indicator originates from a U.S. Geological Survey project on an unvegetated to vegetated ratio for coastal wetlands.



- Stable coastal wetlands
- Other coastal wetlands
- Not identified as coastal wetlands

Table 34: Indicator values for stable coastal wetlands within North Carolina. Good condition thresholds reflect the range of indicator values that occur in healthy, functioning ecosystems.

	Indicator Values	Acres	Percent of Area
↑ High	Stable coastal wetlands	283,181	0.8%
	Other coastal wetlands	105,648	0.3%
↓ Low	Not identified as coastal wetlands	3,810,337	11.1%
	<i>Area not evaluated for this indicator</i>	30,244,666	87.8%
Total area		34,443,831	100%

↑ In good condition

↓ Not in good condition

To learn more and explore the GIS data, [view this indicator in the SECAS Atlas](#).

Threats

Sea-level rise

NOAA's sea-level rise (SLR) inundation models represent areas likely to experience flooding at high tide based on each foot of inundation depth above current levels. These inundation depth models are not linked to a future timeframe; see the projections below. NOAA calculates the inundation depth at "mean higher high water", or the average highest daily tide. The area covered by each inundation depth level includes areas projected to be inundated at lower levels. For example, areas inundated by 4 ft of SLR also includes areas inundated by 3 ft, 2 ft, 1 ft, and current inundation levels.

To explore additional SLR information, please see NOAA's [Sea Level Rise Viewer](#).

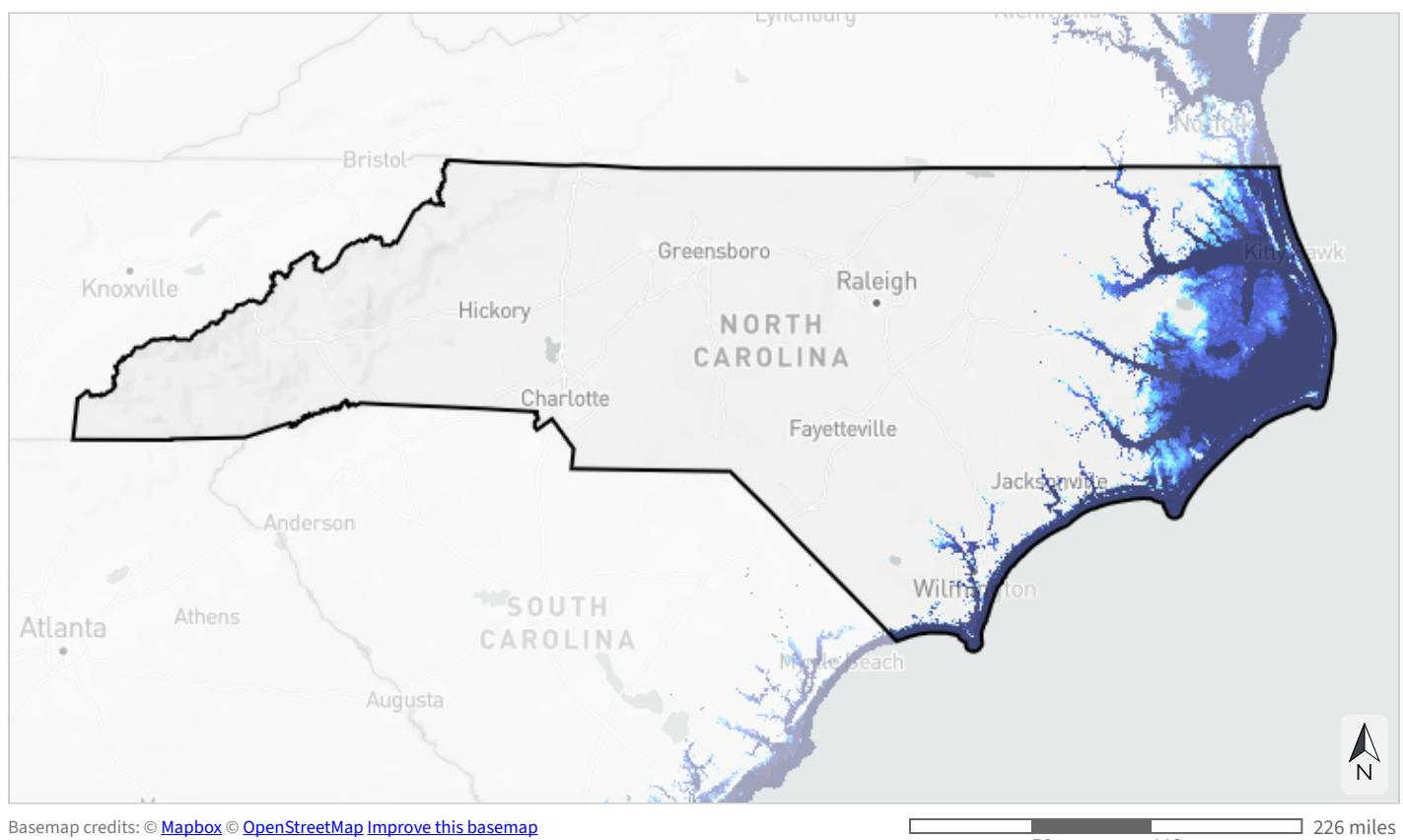


Table 35: Extent of flooding by projected average highest daily tide due to sea level rise within North Carolina. Values from the [NOAA sea-level rise inundation data](#).

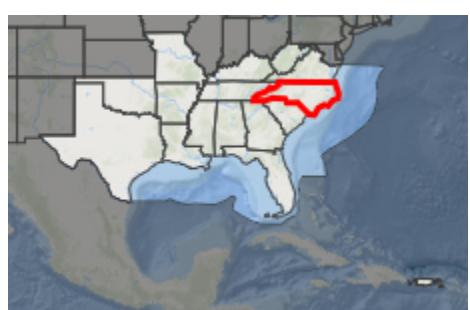
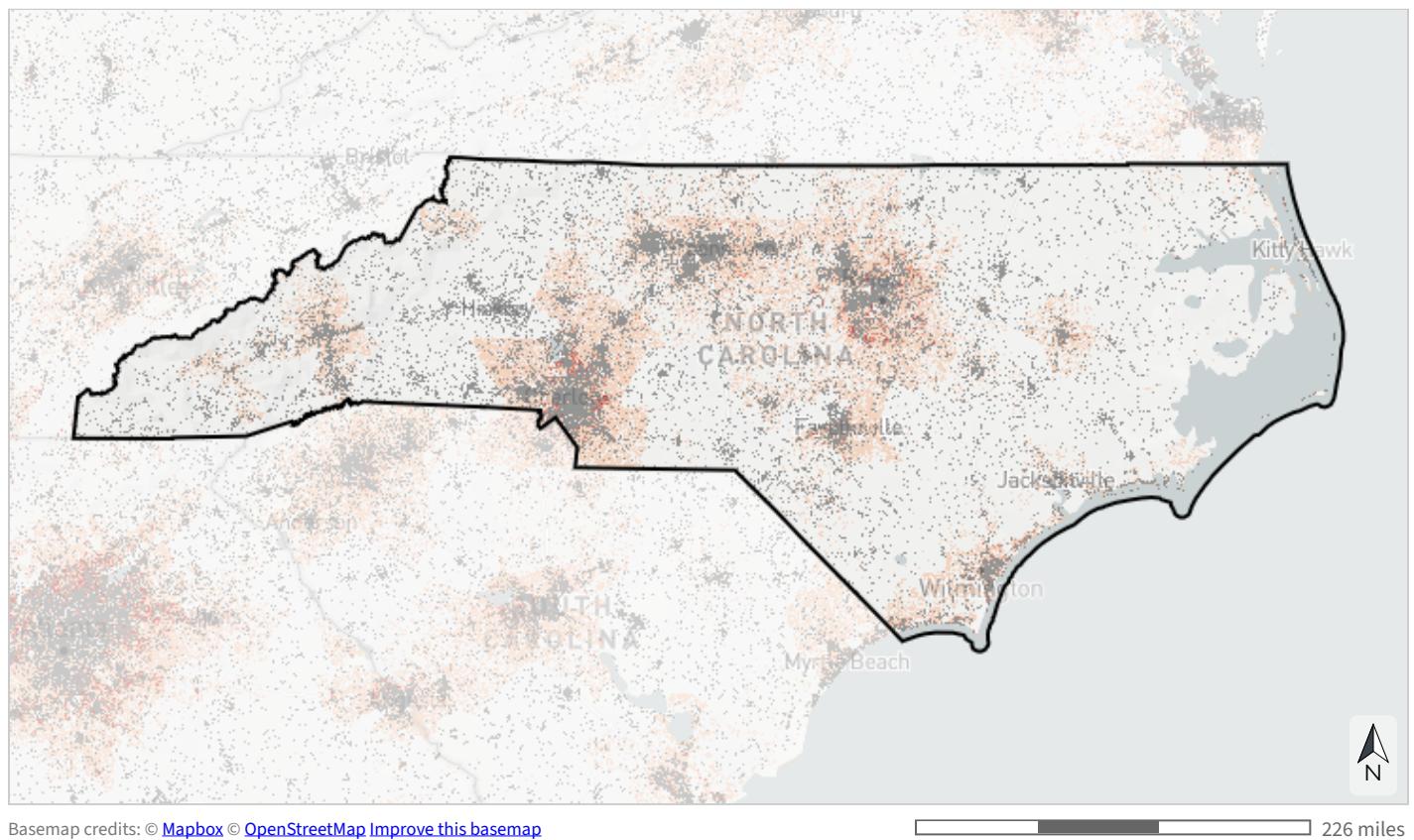
Feet of sea-level rise	Acres	Percent of Area
0 feet	3,031,797	8.8%
1 foot	3,218,091	9.3%
2 feet	3,774,828	11.0%
3 feet	4,109,332	11.9%
4 feet	4,304,195	12.5%
5 feet	4,454,698	12.9%
6 feet	4,609,282	13.4%
7 feet	4,760,701	13.8%
8 feet	4,910,145	14.3%
9 feet	5,040,470	14.6%
10 feet	5,169,379	15.0%
<i>Not projected to be inundated by up to 10 feet</i>	8,688,365	25.2%
<i>Sea-level rise unlikely to be a threat (inland counties)</i>	20,586,087	59.8%
Total area	34,443,831	100%

Table 36: Projected sea level rise by decade within North Carolina. Values are based on area-weighted averages of decadal projections for 1-degree grid cells that overlap this area based on [NOAA's 2022 Sea Level Rise Report](#). 2060 corresponds to the [SECAS goal](#): a 10% or greater improvement in the health, function, and connectivity of Southeastern ecosystems by 2060.

SLR Scenario	2020 (ft)	2030 (ft)	2040 (ft)	2050 (ft)	2060 (ft)	2070 (ft)	2080 (ft)	2090 (ft)	2100 (ft)
Low	0.38	0.6	0.83	1	1.2	1.4	1.5	1.6	1.8
Intermediate-low	0.41	0.65	0.91	1.2	1.4	1.6	1.9	2.1	2.3
Intermediate	0.41	0.68	0.96	1.3	1.6	2	2.5	3.1	3.8
Intermediate-high	0.42	0.71	1	1.5	2	2.7	3.4	4.3	5.2
High	0.42	0.72	1.1	1.6	2.4	3.3	4.4	5.5	6.8

Urban growth

The FUTURES urban growth model predicts the likelihood that an area will urbanize at every decade from 2020 to 2100. Developed areas from the 2021 National Landcover Database serve as the baseline for current urban areas. The model simulates landscape change based on trends in population growth, local development suitability factors, and an urban patch-growing algorithm. It considers environmental drivers like distance to floodplain, slope, and available infrastructure, and even socio-economic status. The probability of urbanization for each area reflects how many times it urbanized out of 50 model runs.



Probability of urbanization by 2060

- Urban in 2021
- Very high likelihood of urbanization (>50% probability)
- High likelihood of urbanization (25 - 50% probability)
- Moderate likelihood of urbanization (2 - 25% probability)
- Not likely to urbanize

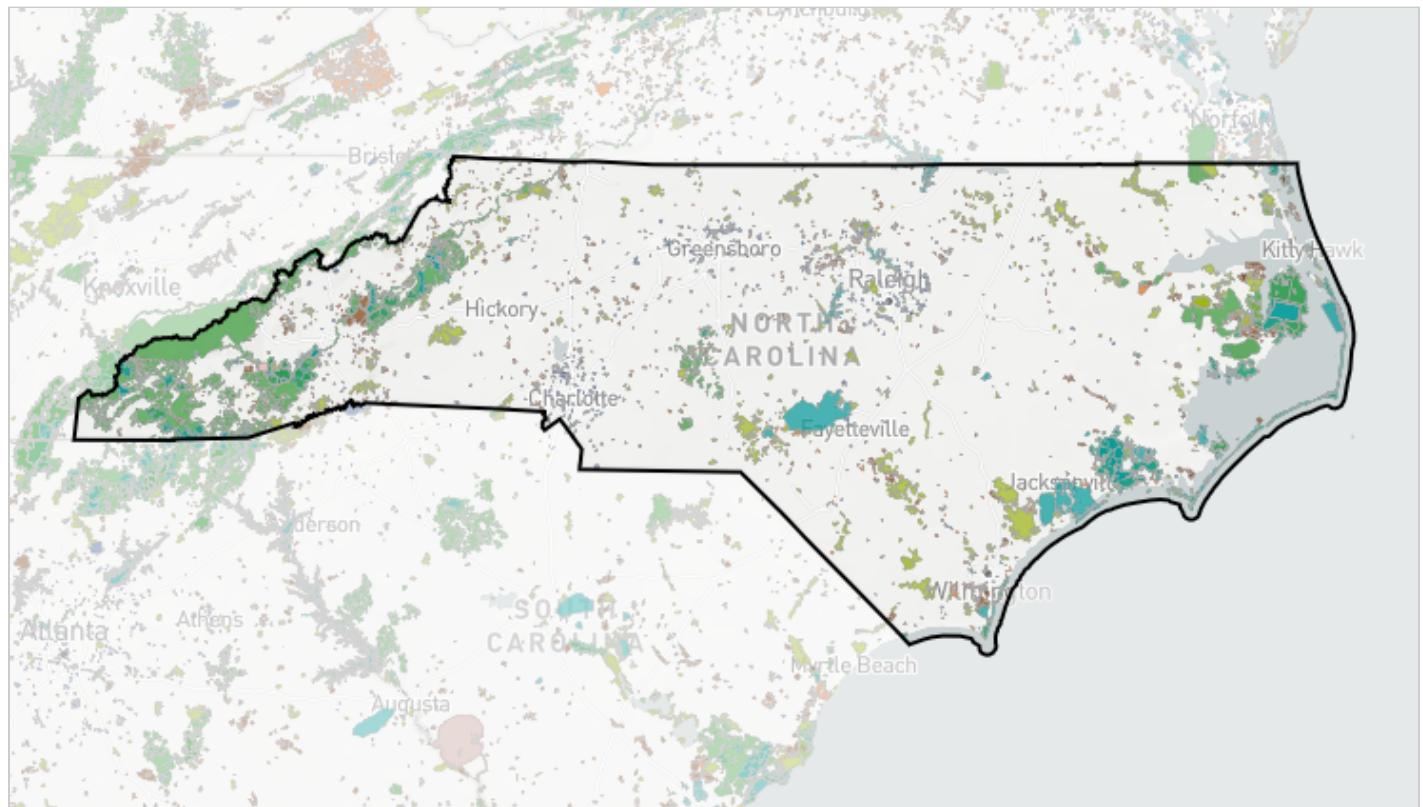
12.0% of this area is already urban in 2021, and an additional 13.4% has at least a moderate probability of urbanizing by 2060.

Table 37: Extent of projected urbanization by decade within North Carolina. Values from [FUTURES model projections for the contiguous United States](#) developed by the [Center for Geospatial Analytics](#), NC State University. 2060 corresponds to the [SECAS goal](#): a 10% or greater improvement in the health, function, and connectivity of Southeastern ecosystems by 2060.

Decade	Acres	Percent of Area
Urban in 2021	4,123,363	12.0%
2030 projected extent	4,237,836	12.3%
2040 projected extent	4,315,910	12.5%
2050 projected extent	4,377,970	12.7%
2060 projected extent	4,429,992	12.9%
2070 projected extent	4,477,496	13.0%
2080 projected extent	4,516,583	13.1%
2090 projected extent	4,543,343	13.2%
2100 projected extent	4,560,919	13.2%
<i>Not projected to urbanize by 2100</i>	24,954,360	72.4%
Total area	34,443,831	100%

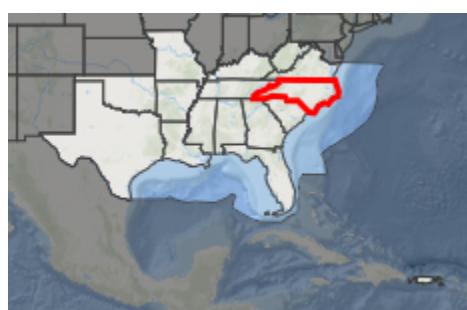
Ownership and Partners

Conserved lands ownership



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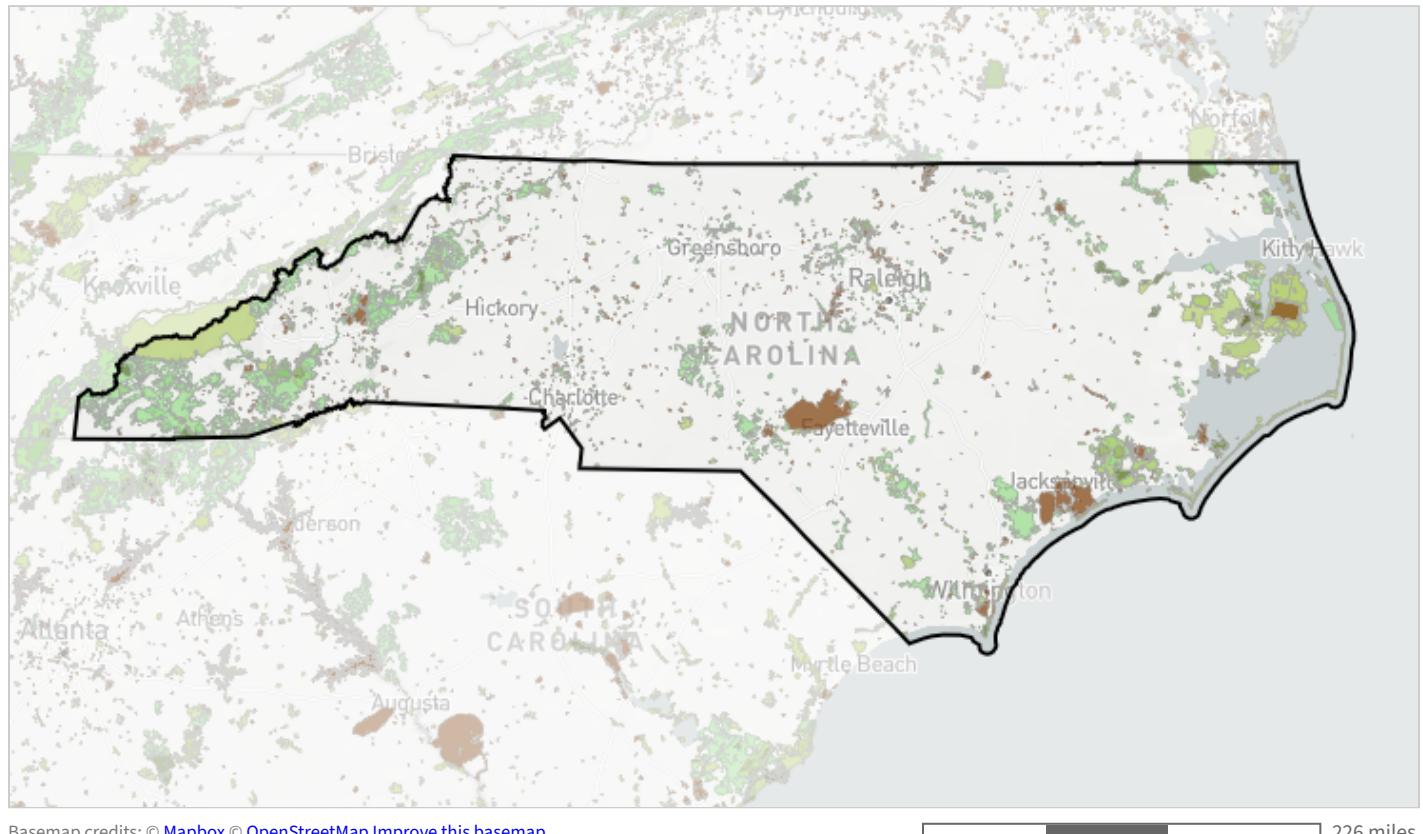


- | | |
|----------------|------------------------------------|
| Federal | Joint |
| State/province | Private non-profit conserved lands |
| Territorial | Private conservation land |
| Regional | Tribal |
| Local | Designation |
| | Ownership unknown |

Table 38: Extent of ownership class within North Carolina. Protected areas are derived from the [Protected Areas Database of the United States](#) (PAD-US v3.0) and include Fee, Designation, Easement, Marine, and Proclamation (Dept. of Defense lands only) boundaries. Note: areas are based on the polygon boundary of this area compared to protected area polygons, rather than pixel-level analyses used elsewhere in this report. Also note: PAD-US v3.0 includes protected areas that may overlap within a given area; this may cause the area within and between the following categories to be greater than the actual ground area.

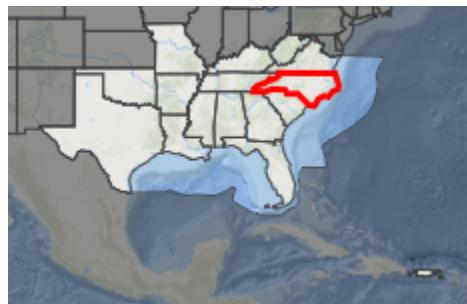
Ownership	Acres	Percent of Area
Federal	2,052,739	6.0%
State/province	917,506	2.7%
Regional	1,413	<0.1%
Local	152,662	0.4%
Joint	17,399	<0.1%
Private non-profit conserved lands	76,727	0.2%
Private conservation land	342,846	1.0%
Tribal	69	<0.1%
Designation	1,469,724	4.3%
Ownership unknown	35,936	0.1%

Land protection status



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- Managed for biodiversity (disturbance events proceed or are mimicked)
- Managed for biodiversity (disturbance events suppressed)
- Managed for multiple uses (subject to extractive uses such as mining or logging, or OHV use)
- No known mandate for biodiversity protection

Table 39: Extent of land protection status within North Carolina. Protected areas are derived from the [Protected Areas Database of the United States](#) (PAD-US v3.0) and include Fee, Designation, Easement, Marine, and Proclamation (Dept. of Defense lands only) boundaries. Note: areas are based on the polygon boundary of this area compared to protected area polygons, rather than pixel-level analyses used elsewhere in this report. Also note: PAD-US v3.0 includes protected areas that may overlap within a given area; this may cause the area within and between the following categories to be greater than the actual ground area.

Land Protection Status	Acres	Percent of Area
Managed for biodiversity (disturbance events proceed or are mimicked)	251,413	0.7%
Managed for biodiversity (disturbance events suppressed)	1,729,336	5.0%
Managed for multiple uses (subject to extractive uses such as mining or logging, or OHV use)	2,412,604	7.0%
No known mandate for biodiversity protection	673,667	2.0%

Protected Areas

- National Forests in North Carolina (USDA FOREST SERVICE; 1,256,569 acres)
 - (NC Wildlife Resources Commission; 414,865 acres)
 - GRSM (NPS; 279,592 acres)
 - (NC DENR, Division of Parks and Recreation; 239,260 acres)
 - Croatan Game Land (Unknown; 161,417 acres)
 - Fort Bragg (154,894 acres)
 - ALLIGATOR RIVER NATIONAL WILDLIFE REFUGE (Fee; 152,654 acres)
 - Alligator River National Wildlife Refuge (Unknown; 149,665 acres)
 - POCOSIN LAKES NATIONAL WILDLIFE REFUGE (Fee; 114,929 acres)
 - Marine Corps Base Camp Lejeune (97,617 acres)
 - Pisgah (71,908 acres)
 - (Multiple owners; 60,755 acres)
 - BLRI (NPS; 52,362 acres)
 - MATTAMUSKEET NATIONAL WILDLIFE REFUGE (Fee; 49,630 acres)
 - (NC Department of Agriculture, Forest Service; 48,578 acres)
 - Dare County Range (46,626 acres)

- Dare Game Land (Unknown; 46,063 acres)
- Sandhills Game Land (NC Wildlife Resources Commission; 43,660 acres)
- (NC DENR, Division of Coastal Management; 42,526 acres)
- Presidential Proclamation No.2284 Closing Order Boundary (37,548 acres)
- Cape Hatteras National Seashore (Unknown; 31,093 acres)
- Gull Rock Game Land (Unknown; 28,592 acres)
- Cape Lookout National Seashore (Unknown; 27,945 acres)
- GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE (Fee; 27,628 acres)
- Marine Corps Air Station New River (26,973 acres)
- ... and 2,749 more protected areas ...

Nearby land trusts

[Click here](#) to search for land trusts within 500 miles of this area on the Land Trust Alliance website.

Credits

This report was generated by the Southeast Conservation Blueprint Explorer, which was developed by [Astute Spruce, LLC](#) in partnership with the U.S. Fish and Wildlife Service under the [Southeast Conservation Adaptation Strategy](#).

Data credits

Land ownership and conservation status is derived from the [Protected Areas Database of the United States](#) (PAD-US v3.0).

Future urban growth estimates derived from [FUTURES model projections for the contiguous United States](#) developed by the [Center for Geospatial Analytics](#), NC State University.

Sea level rise data are derived from the National Oceanic and Atmospheric Administration's [Sea Level Rise Inundation Depth Data](#) and the [2022 Sea Level Rise Technical Report](#).