Appendix 1. Contributing Watersheds and Nutrient Load Summaries for Major Lakes and Estuaries in the Eastern United States (South Atlantic Coast)

From Moorman, M.C., Hoos, A.B., Bricker, S.B., Moore, R.B., García, A.M., and Ator, S.W., 2014, Nutrient load summaries for major lakes and estuaries of the Eastern United States, 2002: U.S. Geological Survey Data Series 820, 94 p., *http://dx.doi.org/10.3133/ds820*.

[The number(s) at the beginning of each map or table title in appendix 1 (for example "44. Albemarle Sound…") refers to the map index number(s) (fig. 1B, Moorman and others, 2014) for the estuaries and their contributing watersheds. Abbreviations used in maps and tables: kg/km^2/yr, kilogram per square kilometer per year; km^2, square kilometer; kg/yr, kilogram per year; kg/ha/yr, kilogram per hectare per year; lbs/acre, pounds per acre; d, days; d/m, days per meter; Mg, megagram; kg, kilogram; mg/L, milligram per liter; TN, total nitrogen; TP, total phosphorus; TN:TP, ratio of total nitrogen to total phosphorus; NA, not assessed or data not available.]

44. Albemarle Sound (Chowan and Roanoake River Basins)

45–47. Pamlico Sound and Pamlico/Pungo and Neuse River Estuaries (Pungo, Tar, Neuse, and Trent River Basins)

48–50. Bogue Sound and New River and Cape Fear River Estuaries (New and Cape Fear River Basins)

51. Winyah Bay (Pee Dee, Waccamaw, Lynches, and Black River Basins)

52 and 53. Santee River Estuary and Charleston Harbor (Santee, Ashlee, Cooper, and Wando River Basins)

54 and 55. Stono/North Edisto River Estuary and St. Helena Sound (Stono, Ashepoo-Combahee-Edisto (ACE), and Coosaw River Basins)

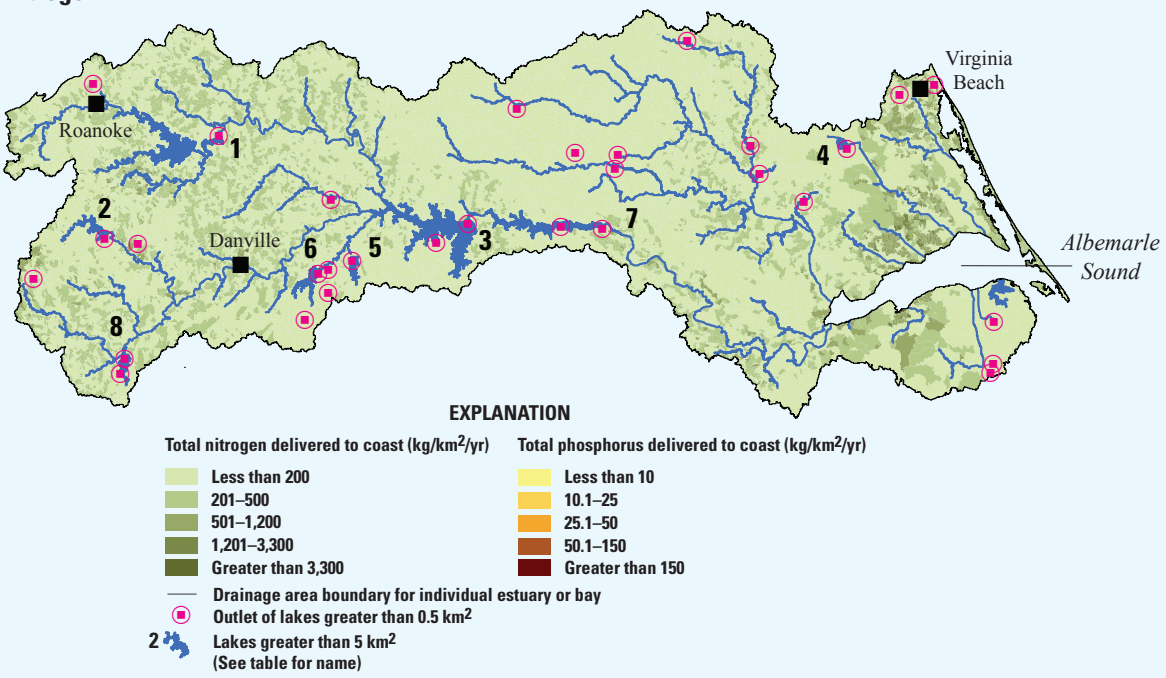
56–59. Broad River Estuary (Port Royal Sound), Savannah River Estuary, and Ossabaw and St. Catherines/Sapelo Sounds (Coosawhatchie,Tulfiny, Savannah, New, Ogeechee, Little Ogeechee,Jerico, North Newport, and Sapelo River Basins)

60–62. Altamaha River Estuary, St. Andrew/St. Simons Sounds, and St. Mary's River/Cumberland Sound (Altamaha, Turtle, Satilla, Little Satilla, St. Mary's, Crooked and Cumberland River Basins)

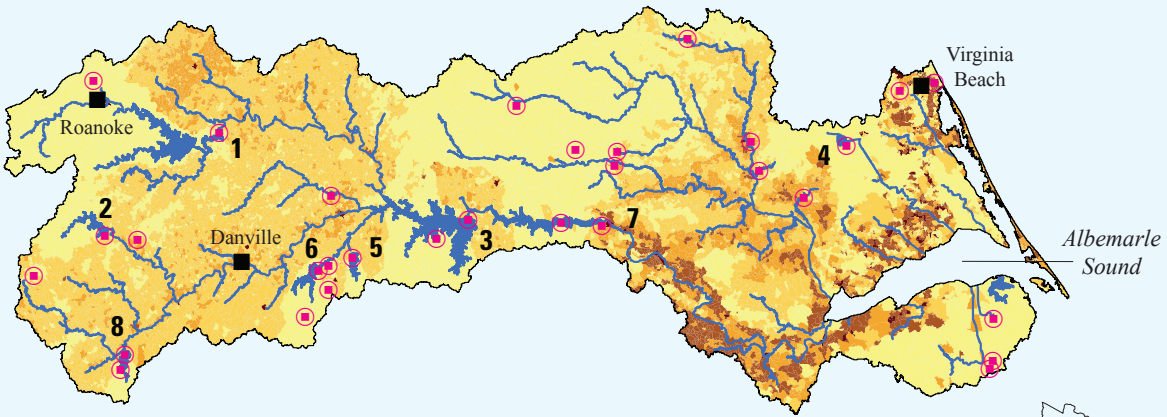
63 and 64. St. Johns River Estuary and Indian River Lagoon (St. Johns and Indian River Basins)

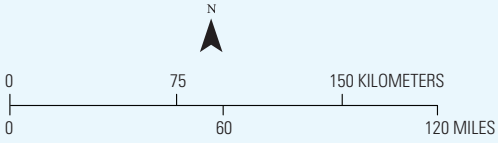
44. Contributing watersheds and nutrient yield for Albemarle Sound
(Chowan and Roanoke River Basins)

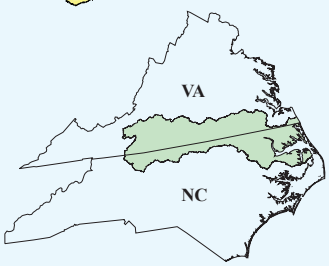
Nitrogen



Phosphorus







Location of study area in Virginia and North Carolina

44. Nutrient source shares and loads delivered from the watershed to Albemarle Sound and to major lakes in the watershed

Total nitrogen	Source shares, in percent[a]								Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Powerplant emissions	Industrial emissions	Vehicle emissions	Background		
Estuaries and other coastal waterbodies										
Albemarle Sound, NC	4	11	47	16	5	7	8	1	10,382,301	228
Major lakes										
1. Smith Mountain Lake, VA	13	20	31	16	5	6	7	1	1,364,159	357
2. Philpott Reservoir, VA	0	10	34	19	10	11	13	2	130,676	235
3. John H. Kerr Reservoir, VA	7	17	30	19	7	9	10	2	5,376,843	264
4. Lake Drummond, VA	0	3	64	9	5	9	9	1	19,057	80
5. Mayo Reservoir, NC	0	12	36	16	11	11	13	2	10,973	81
6. Hyco Lake, NC	0	11	35	19	9	11	13	2	85,157	167
7. Roanoke Rapids Lake, NC	6	17	30	20	7	9	10	2	5,514,730	252
8. Belews Lake, NC	0	22	34	13	9	9	12	1	28,562	159

Total phosphorus	Source shares, in percent[a]						Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines		
Estuaries and other coastal waterbodies								
Albemarle Sound	23	5	32	6	33	0	947,828	20.8
Major lakes								
1. Smith Mountain Lake, VA	17	10	28	8	38	0	49,830	13.1
2. Philpott Reservoir, VA	0	7	19	6	68	0	4,307	7.8
3. John H. Kerr Reservoir, VA	15	8	28	7	42	0	421,752	20.7
4. Lake Drummond, VA	0	4	50	4	42	0	217	0.9
5. Mayo Reservoir, NC	0	9	21	4	66	0	156	1.1
6. Hyco Lake, NC	0	6	33	6	55	0	2,085	4.1
7. Roanoke Rapids Lake, NC	15	8	29	7	42	0	369,451	16.9
8. Belews Lake, NC	5	11	22	3	58	0	300	1.7

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.

[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.

[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

44. Estuary and lake characteristics: Albemarle Sound and major lakes in the watershed

				Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		
	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	Overall Eutrophic Condition[h]
Estuaries and other coastal waterbodies											
Albemarle Sound, NC	45,036	2,497	9	93,441	8,530	0.70	0.06	11	NA	NA	Unknown
Major lakes											
1. Smith Mountain Lake, VA	3,818	91	27	52,400,877	4,512,822	1.58	0.14	12	563,604	116,191	NA
2. Philpott Reservoir, VA	555	12	19	3,236,418	249,889	0.76	0.06	13	39,806	8,856	NA
3. John H. Kerr Reservoir, VA	20,370	178	9	55,954,775	5,793,901	0.86	0.09	10	576,798	194,724	NA
4. Lake Drummond, VA	237	13	61	2,724,096	308,287	0.58	0.07	9	25,691	4,847	NA
5. Mayo Reservoir, NC	136	11	94	3,481,070	431,590	0.87	0.11	8	26,019	4,430	NA
6. Hyco Lake, NC	511	17	39	5,632,254	591,311	0.90	0.09	10	58,528	13,000	NA
7. Roanoke Rapids Lake, NC	21,901	80	4	22,804,978	1,817,715	0.79	0.06	13	292,732	93,444	NA
8. Belews Lake, NC	180	14	68	4,730,795	352,350	0.95	0.07	13	40,680	4,858	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

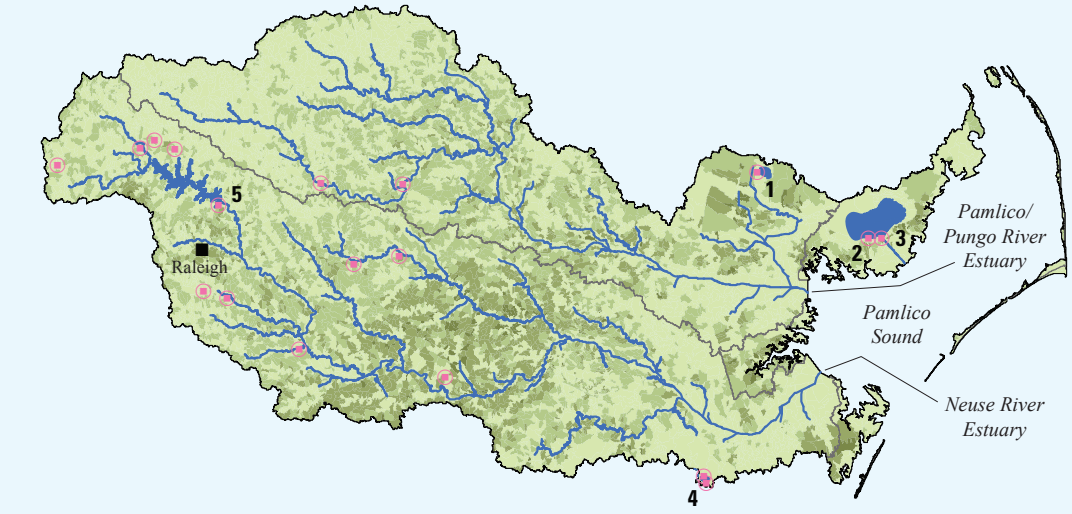
[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

45–47. Contributing watersheds and nutrient yield for Pamlico Sound and Pamlico/Pungo and Neuse River Estuaries
(Pungo, Tar, Neuse, and Trent River Basins)

Nitrogen



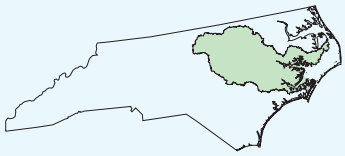
EXPLANATION

Total nitrogen delivered to coast (kg/km^2/yr)	Total phosphorus delivered to coast (kg/km^2/yr)
Less than or equal to 200	Less than or equal to 10
201–500	10.1–25
501–1,200	25.1–50
1,201–3,300	50.1–150
Greater than 3,300	Greater than 150

Drainage area boundary for individual estuary or bay

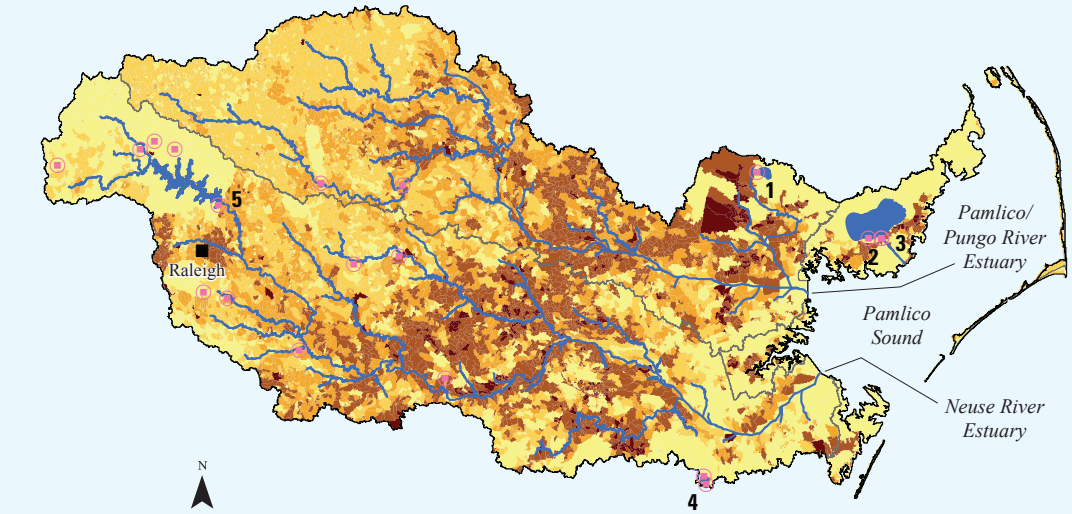
Outlet of lakes greater than 0.5 km^2

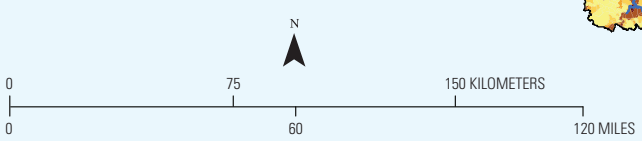
4 Lakes greater than 5 km^2
(See table for name)



Location of study area in North Carolina

Phosphorus





45–47. Nutrient source shares and loads delivered from the watershed to Pamlico Sound and Pamlico/Pungo and Neuse River Estuaries and to major lakes in the watershed

Total nitrogen

	Source shares, in percent[a]									
	Wastewater[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies										
Pamlico Sound (Direct), NC	0	7	71	4	4	6	6	1	563,794	273
Pamlico/Pungo River Estuary, NC	4	11	51	19	3	5	6	1	3,541,292	318
Neuse River Estuary, NC	5	15	38	31	2	4	5	1	6,487,062	443
Total from all tributaries to Pamlico Sound, including Pamlico/Pungo and Neuse Rivers	4	13	44	25	3	4	5	1	10,592,147	395
Major lakes										
1. Pungo Lake, NC	0	3	75	10	2	5	4	1	3,600	129
2. West Lake Mattamuskeet, NC	0	15	32	9	10	16	15	3	206	21
3. East Lake Mattamuskeet, NC	0	3	39	10	11	18	16	4	8,462	24
4. Ellis Simon Lake, NC	0	7	3	22	15	26	22	4	491	30
5. Falls Lake, NC	7	31	21	14	6	8	12	1	616,124	308

Total phosphorus

	Source shares, in percent[a]							
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies								
Pamlico Sound (Direct), NC	0	14	43	1	42	0	29,107	14.1
Pamlico/Pungo River Estuary, NC	10	9	36	10	32	2	441,916	39.7
Neuse River Estuary, NC	20	11	26	21	23	0	632,114	43.1
Total from all tributaries to Pamlico Sound, including Pamlico/Pungo and Neuse Rivers	15	10	31	16	27	1	1,103,138	39.6
Major lakes								
1. Pungo Lake, NC	0	6	38	5	51	0	0	0.0
2. West Lake Mattamuskeet, NC	0	12	5	0	82	0	3	0.3
3. East Lake Mattamuskeet, NC	0	1	1	0	99	0	149	0.4
4. Ellis Simon Lake, NC	0	12	0	0	88	0	5	0.3
5. Falls Lake, NC	9	19	26	4	42	0	17,109	8.6

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

45–47. Estuary and lake characteristics: Pamlico Sound, Pamlico/Pungo and Neuse River Estuaries, and major lakes in the watershed

	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		Overall Eutrophic Condition[h]
				TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	
Estuaries and other coastal waterbodies											
Pamlico Sound (Direct), NC	2,045	4,680	34	19,169	990	1.13	0.06	19	NA	NA	Unknown
Pamlico/Pungo River Estuary, NC	10,730	452	39	138,110	17,235	0.94	0.12	8	NA	NA	Unknown
Neuse River Estuary, NC	14,066	456	73	473,556	46,144	1.22	0.12	10	NA	NA	High
Total from all tributaries to Pamlico Sound, including Pamlico/Pungo and Neuse Rivers	26,841	5,588	NA	NA	NA	1.11	0.12	10	NA	NA	Unknown
Major lakes											
1. Pungo Lake, NC	28	11	411	11,151,356	2,290	2.71	0.00	4,870	23,565	5	NA
2. West Lake Mattamuskeet, NC	10	5	556	1,126,910	80,144	0.58	0.04	14	1,822	141	NA
3. East Lake Mattamuskeet, NC	352	128	371	29,790,630	1,591,022	0.64	0.03	19	71,887	4,142	NA
4. Ellis Simon Lake, NC	16	5	289	660,201	6,686	0.35	0.00	99	1,796	18	NA
5. Falls Lake, NC	1,998	53	29	17,920,078	2,464,775	0.92	0.13	7	10,755	69,114	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

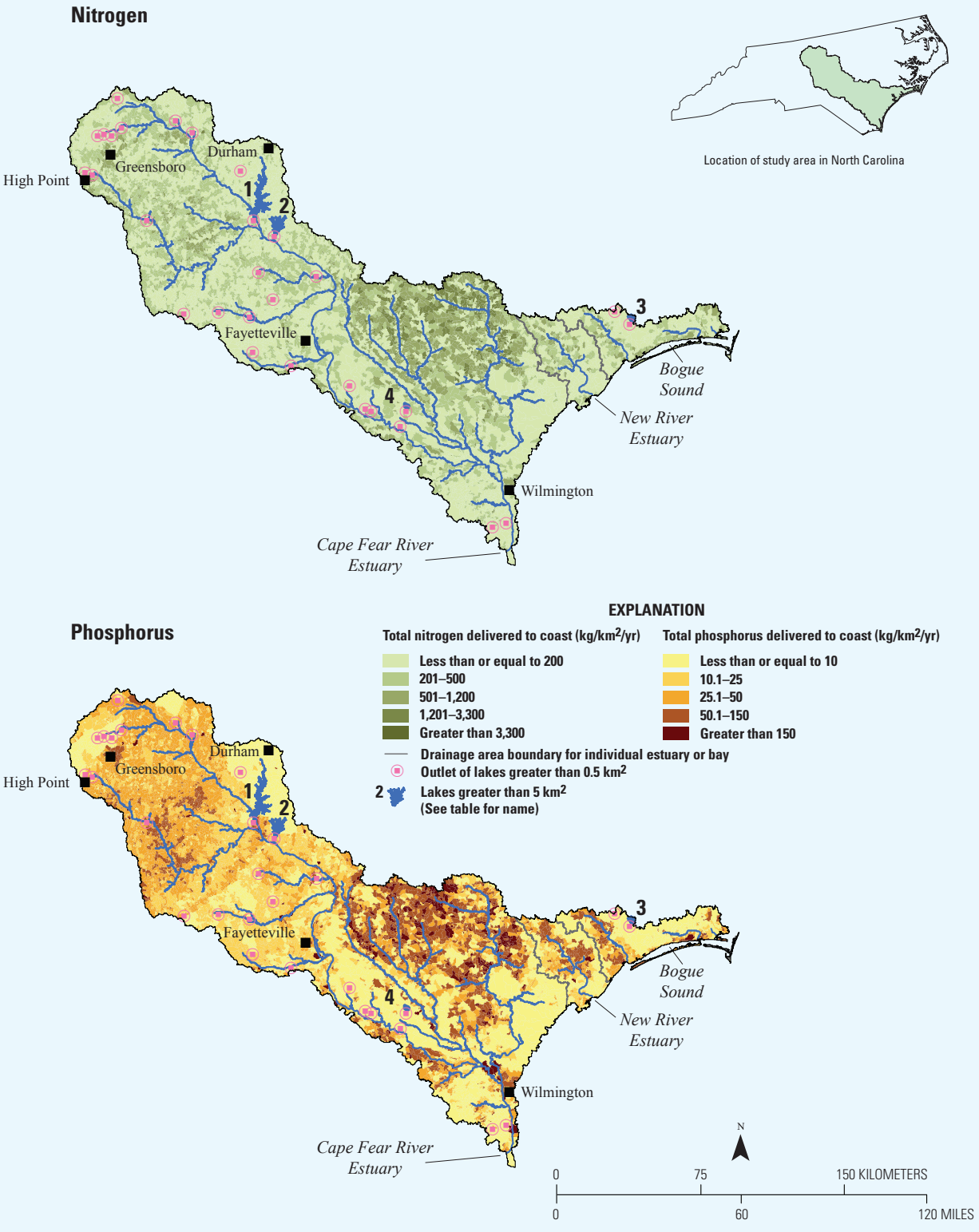
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

48–50. Contributing watersheds and nutrient yield for Bogue Sound and New River and Cape Fear River Estuaries
(New and Cape Fear River Basins)



48–50. Nutrient source shares and loads delivered from the watershed to Bogue Sound, New River and Cape Fear River Estuaries, and to major lakes in the watershed

Total nitrogen	Source shares, in percent[a]									
	Wastewater[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies										
Bogue Sound, NC	8	20	41	16	3	5	5	1	451,457	301
New River Estuary, NC	0	22	31	32	3	5	5	1	376,868	318
Cape Fear River Estuary, NC	10	11	23	45	3	4	4	1	10,989,169	465
Major lakes										
1. B. Everett Jordan Lake, NC	25	24	17	17	4	5	7	1	1,894,476	433
2. Shearon Harris Reservoir, NC	7	22	17	21	7	11	14	2	18,438	101
3. Great Lake, NC	0	0	3	23	16	28	24	5	320	27
4. Bay Tree Lake, NC	0	3	16	64	4	6	7	1	827	63

Total phosphorus	Source shares, in percent[a]							
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies								
Bogue Sound, NC	16	25	22	16	21	0	33,844	22.6
New River Estuary, NC	13	24	18	18	27	0	33,957	28.7
Cape Fear River Estuary, NC	40	6	14	24	16	0	1,132,184	47.9
Major lakes								
1. B. Everett Jordan Lake, NC	35	12	23	6	24	0	187,939	43.0
2. Shearon Harris Reservoir, NC	2	11	12	6	70	0	400	2.2
3. Great Lake, NC	0	0	0	0	100	0	1	0.1
4. Bay Tree Lake, NC	0	5	11	28	56	0	1	0.0

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

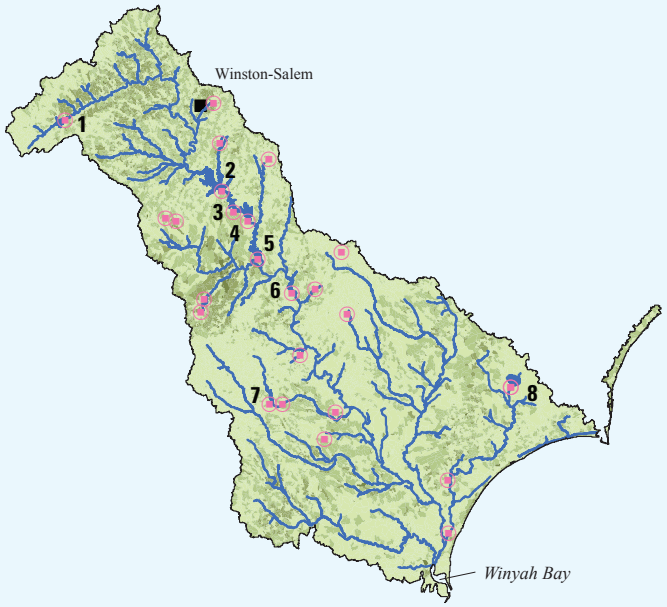
48–50. Estuary and lake characteristics: Bogue Sound, New River and Cape Fear River Estuaries, and major lakes in the watershed

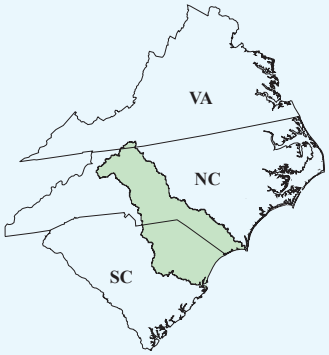
				Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		
	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	Overall Eutrophic Condition[h]
Estuaries and other coastal waterbodies											
Bogue Sound, NC	1,555	274	2	903	68	0.83	0.06	13	NA	NA	Unknown
New River Estuary, NC	1,177	88	2	754	68	0.83	0.07	11	NA	NA	Moderate
Cape Fear River Estuary, NC	23,589	100	2	21,978	2,264	1.23	0.13	10	NA	NA	Moderate Low
Major lakes											
1. B. Everett Jordan Lake, NC	4,371	53	14	30,041,114	3,531,254	1.55	0.18	9	299,021	69,901	NA
2. Shearon Harris Reservoir, NC	183	17	83	4,002,018	483,555	0.65	0.08	8	29,994	5,452	NA
3. Great Lake, NC	12	11	864	4,095,714	89,908	1.01	0.02	46	4,418	103	NA
4. Bay Tree Lake, NC	13	6	413	2,588,809	7,864	1.22	0.00	329	5,445	18	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).
[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.
[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).
[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

51. Contributing watersheds and nutrient yield for Winyah Bay
(Pee Dee, Waccamaw, Lynches, and Black River Basins)

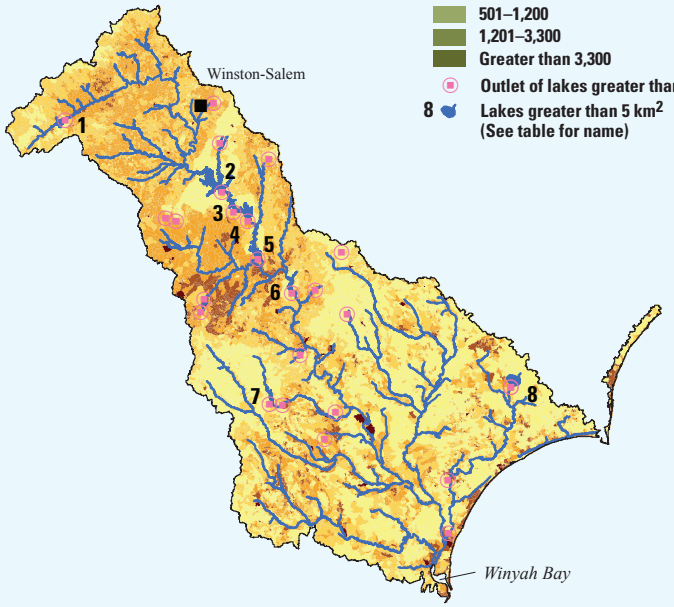
Nitrogen





Location of study area in Virginia, North Carolina, and South Carolina

Phosphorus



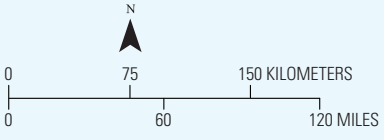
EXPLANATION

Total nitrogen delivered to coast (kg/km^2/yr)

- Less than or equal to 200
- 201–500
- 501–1,200
- 1,201–3,300
- Greater than 3,300
- Outlet of lakes greater than 0.5 km^2
- 8 Lakes greater than 5 km^2 (See table for name)

Total phosphorus delivered to coast (kg/km^2/yr)

- Less than or equal to 10
- 10.1–25
- 25.1–50
- 50.1–150
- Greater than 150



51. Nutrient source shares and loads delivered from the watershed to Winyah Bay and to major lakes in the watershed

Total nitrogen

	Source shares, in percent[a]									
	Wastewater[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies										
Winyah Bay, SC	8	13	40	25	3	4	5	1	15,815,341	336
Major lakes										
1. W. Kerr Scott Reservoir, NC	0	10	11	51	7	9	11	2	300,195	318
2. High Rock Lake, NC	9	16	30	31	3	4	6	1	6,137,872	597
3. Tuckertown Reservoir, NC	9	16	30	31	4	4	6	1	6,207,107	585
4. Badin Lake, NC	9	16	30	31	4	4	6	1	6,154,006	572
5. Lake Tillery, NC	8	16	29	31	4	5	6	1	6,498,785	539
6. Blewett Falls Lake, NC	9	15	29	33	3	4	6	1	9,871,764	557
7. Lake Robinson, SC	0	17	33	24	6	9	10	2	87,167	196
8. Lake Waccamaw, NC	0	9	37	38	4	5	6	1	21,598	82

Total phosphorus

	Source shares, in percent[a]							
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies								
Winyah Bay, SC	38	8	20	10	25	0	1,418,788	30.2
Major lakes								
1. W. Kerr Scott Reservoir, NC	0	5	19	17	59	0	26,327	27.9
2. High Rock Lake, NC	36	8	20	12	24	0	597,726	58.1
3. Tuckertown Reservoir, NC	35	8	20	12	25	0	581,677	54.8
4. Badin Lake, NC	35	8	20	12	25	0	544,379	50.6
5. Lake Tillery, NC	33	8	21	13	26	0	539,085	44.7
6. Blewett Falls Lake, NC	37	7	19	13	23	0	958,206	54.1
7. Lake Robinson, SC	3	12	20	5	59	0	3,896	8.8
8. Lake Waccamaw, NC	0	10	18	18	54	0	216	0.8

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.

[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.

[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

51. Estuary and lake characteristics: Winyah Bay and major lakes in the watershed

	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		Overall Eutrophic Condition[h]
				TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	
Estuaries and other coastal waterbodies											
Winyah Bay, SC	46,959	89	7	110,707	9,932	0.88	0.08	11	NA	NA	Moderate
Major lakes											
1. W. Kerr Scott Reservoir, NC	944	6	5	1,602,887	180,139	0.77	0.09	9	25,908	10,322	NA
2. High Rock Lake, NC	10,289	53	4	28,771,900	3,295,604	1.49	0.17	9	352,210	145,664	NA
3. Tuckertown Reservoir, NC	10,613	9	1	4,606,338	447,097	1.40	0.14	10	64,898	27,091	NA
4. Badin Lake, NC	10,759	22	2	11,102,686	1,038,489	1.38	0.13	11	111,109	41,628	NA
5. Lake Tillery, NC	12,059	20	1	9,455,213	843,499	1.31	0.12	11	130,600	52,322	NA
6. Blewett Falls Lake, NC	17,711	10	1	5,202,848	517,734	1.43	0.14	10	68,881	30,985	NA
7. Lake Robinson, SC	444	8	16	1,729,484	159,959	0.57	0.05	11	23,300	6,321	NA
8. Lake Waccamaw, NC	264	13	49	2,056,061	70,608	0.42	0.01	29	19,949	1,211	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

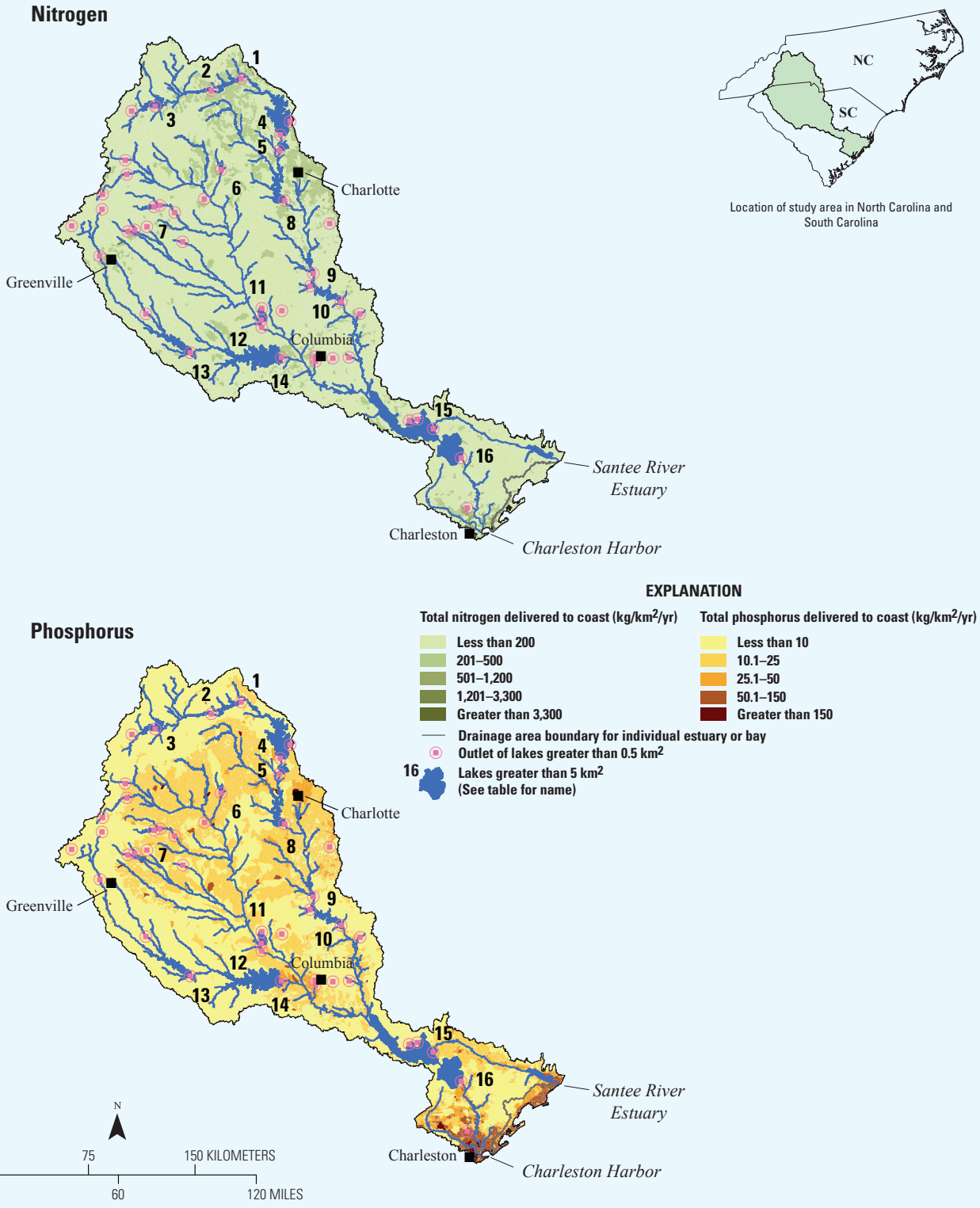
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

52 and 53. Contributing watersheds and nutrient yields for Santee River Estuary and Charleston Harbor
(Santee, Ashley, Cooper, and Wando River Basins)



52 and 53. Nutrient source shares and loads delivered from the watershed to Santee River Estuary and Charleston Harbor and to major lakes in the watershed

Total nitrogen	Source shares, in percent[a]								Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Powerplant emissions	Industrial emissions	Vehicle emissions	Background		
Estuaries and other coastal waterbodies										
N. Santee/S. Santee River Estuary, SC	13	27	16	19	5	8	10	1	5,190,434	176
Charleston Harbor, SC	27	27	13	13	5	7	8	1	2,583,604	190
Major lakes										
1. Lake Hickory, NC	10	32	13	19	6	8	11	1	1,142,547	337
2. Rhodhiss Lake, NC	9	30	13	16	7	10	13	2	837,260	296
3. Lake James, NC	2	25	11	17	10	14	18	2	209,729	209
4. Lake Norman, NC	7	29	16	24	6	8	10	1	1,568,188	339
5. Mountain Island Lake, NC	7	29	16	24	5	8	10	1	1,631,566	338
6. Moss Lake, NC	0	18	33	30	4	6	7	1	60,656	344
7. Lake Bowen, SC	0	32	22	17	6	9	12	1	62,365	294
8. Winthrop University Lake, SC	10	31	16	20	5	7	9	1	2,883,429	369
9. Cedar Creek Reservoir, SC	18	31	13	18	4	6	8	1	4,665,668	414
10. Wateree Lake, SC	18	31	13	18	4	6	8	1	4,700,475	383
11. Monticello Reservoir, SC	0	14	8	26	11	18	20	3	1,231	30
12. Par Shoals Reservoir, SC	8	26	14	21	6	10	12	2	2,852,575	233
13. Lake Greenwood, SC	6	34	13	19	6	9	12	1	792,053	262
14. Lake Murray, SC	7	26	16	28	5	8	10	1	1,438,666	229
15. Lake Marion, SC	14	28	15	19	5	8	10	1	6,921,292	251
16. Lake Moultrie, SC	14	28	15	19	5	8	10	1	2,463,050	230

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.

[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.

[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

52 and 53. Nutrient source shares and loads delivered from the watershed to Santee River Estuary and Charleston Harbor and to major lakes in the watershed

Total phosphorus	Source shares, in percent[a]						Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines		
Estuaries and other coastal waterbodies								
N. Santee/S. Santee River Estuary, SC	39	10	14	4	33	0	490,897	16.7
Charleston Harbor, SC	58	14	6	1	20	0	334,994	24.7
Major lakes								
1. Lake Hickory, NC	41	11	12	3	33	0	141,328	41.6
2. Rhodhiss Lake, NC	42	10	11	3	35	0	126,834	44.9
3. Lake James, NC	8	12	14	4	62	0	12,852	12.8
4. Lake Norman, NC	33	12	16	7	32	0	109,595	23.7
5. Mountain Island Lake, NC	31	13	17	7	33	0	108,800	22.6
6. Moss Lake, NC	0	9	44	11	36	0	3,675	20.8
7. Lake Bowen, SC	0	15	29	4	51	0	3,424	16.1
8. Winthrop University Lake, SC	33	14	19	5	30	0	240,884	30.8
9. Cedar Creek Reservoir, SC	51	12	12	4	21	0	615,144	54.6
10. Wateree Lake, SC	50	12	12	4	22	0	558,769	45.5
11. Monticello Reservoir, SC	0	7	12	3	78	0	27	0.7
12. Par Shoals Reservoir, SC	22	10	21	5	42	0	413,753	33.8
13. Lake Greenwood, SC	26	14	18	5	37	0	66,678	22.0
14. Lake Murray, SC	26	11	19	9	36	0	77,354	12.3
15. Lake Marion, SC	42	11	14	4	30	0	728,854	26.5
16. Lake Moultrie, SC	41	11	14	4	30	0	187,440	17.5

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

52 and 53. Estuary and lake characteristics: Santee River Estuary and Charleston Harbor and major lakes in the watershed

				Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		
	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	Overall Eutrophic Condition[h]
Estuaries and other coastal waterbodies											
N. Santee/S. Santee River Estuary, SC	29,653	18	0	0	0	0.36	0.03	11	NA	NA	Moderate
Charleston Harbor, SC	13,384	85	5	12,918	1,675	0.41	0.05	8	NA	NA	Moderate Low
Major lakes											
1. Lake Hickory, NC	3,395	16	3	3,108,272	445,091	0.55	0.08	7	54,082	30,024	NA
2. Rhodhiss Lake, NC	2,825	9	2	1,527,384	254,244	0.48	0.08	6	25,493	16,778	NA
3. Lake James, NC	1,001	25	14	3,675,420	378,196	0.41	0.04	10	51,652	14,044	NA
4. Lake Norman, NC	4,631	121	15	28,124,200	3,156,603	0.64	0.07	9	328,588	103,296	NA
5. Mountain Island Lake, NC	4,823	8	1	1,594,088	112,761	0.54	0.04	14	25,005	8,382	NA
6. Moss Lake, NC	176	6	19	1,527,662	202,589	0.76	0.10	8	19,005	6,889	NA
7. Lake Bowen, SC	212	6	17	1,334,835	174,247	0.63	0.08	8	17,464	6,997	NA
8. Winthrop University Lake, SC	7,818	45	3	10,505,572	1,067,756	0.64	0.07	10	152,221	67,651	NA
9. Cedar Creek Reservoir, SC	11,269	12	1	3,527,088	483,651	0.79	0.11	7	47,545	31,155	NA
10. Wateree Lake, SC	12,267	45	3	12,553,053	1,650,097	0.76	0.10	8	141,923	77,763	NA
11. Monticello Reservoir, SC	41	25	524	6,042,602	626,813	0.67	0.07	10	10,294	1,168	NA
12. Par Shoals Reservoir, SC	12,257	7	0	1,068,552	157,765	0.43	0.06	7	17,031	9,926	NA
13. Lake Greenwood, SC	3,025	40	10	8,806,600	1,243,207	0.61	0.09	7	120,288	62,115	NA
14. Lake Murray, SC	6,277	196	23	44,181,051	5,490,304	0.62	0.08	8	475,987	160,577	NA
15. Lake Marion, SC	27,550	305	8	60,299,936	7,672,805	0.54	0.07	8	649,183	234,443	NA
16. Lake Moultrie, SC	10,730	179	12	32,555,422	3,235,043	0.50	0.05	10	212,368	78,417	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

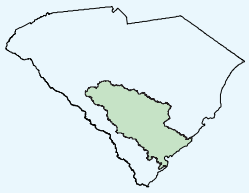
[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

54 and 55. Contributing watersheds and nutrient yield for Stono/North Edisto River Estuary and St. Helena Sound (Stono, Ashepoo-Combahee-Edisto (ACE), and Coosaw River Basins)

Nitrogen





Location of study area in South Carolina

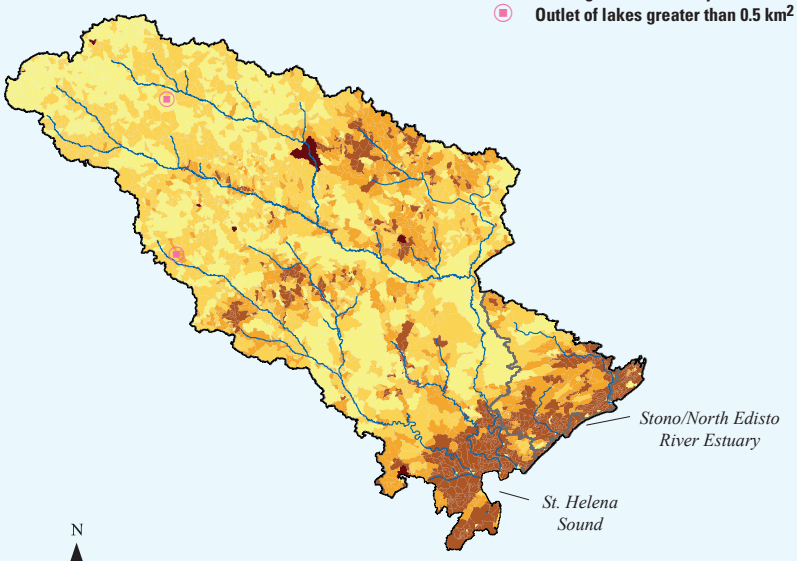
EXPLANATION

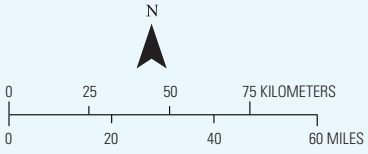
Total nitrogen delivered to coast (kg/km^2/yr)	Total phosphorus delivered to coast (kg/km^2/yr)
Less than or equal to 200	Less than or equal to 10
201–500	10.1–25
501–1,200	25.1–50
1,201–3,300	50.1–150
Greater than 3,300	Greater than 150

Drainage area boundary for individual estuary or bay

Outlet of lakes greater than 0.5 km^2

Phosphorus





54 and 55. Nutrient source share and loads delivered from the watershed to Stono/North Edisto River Estuary and St. Helena Sound

Total nitrogen	Source shares, in percent[a]								Total load, kg/yr	Total yield, kg/km²/yr[c]
	Waste-water[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background		
Estuaries and other coastal waterbodies										
Stono/North Edisto River Estuary, SC	0	20	28	8	10	16	15	2	166,533	145
St. Helena Sound, SC	1	12	51	15	5	7	7	1	2,531,860	200

Total phosphorus	Source shares, in percent[a]						Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines		
Estuaries and other coastal waterbodies								
Stono/North Edisto River Estuary, SC	0	12	18	1	69	0	47,320	41.1
St. Helena Sound, SC	5	9	28	5	52	0	270,883	21.4

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

54 and 55. Estuary characteristics: Stono/North Edisto River Estuary and St. Helena Sound

				Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		
	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	Overall Eutrophic Condition[h]
Estuaries and other coastal waterbodies											
Stono/North Edisto River Estuary, SC	1,171	69	6	999	284	0.41	0.12	4	NA	NA	Moderate
St. Helena Sound, SC	12,263	203	2	5,064	542	0.52	0.06	9	NA	NA	Moderate

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).
[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.
[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).
[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

56–59. Contributing watersheds and nutrient yield for Broad River Estuary (Port Royal Sound), Savannah River Estuary, and Ossabaw and St. Catherines/Sapelo Sounds

(Coosawhatchie, Tulfiny, Savannah, New, Ogeechee, Little Ogeechee, Jerico, North Newport, and Sapelo River Basins)

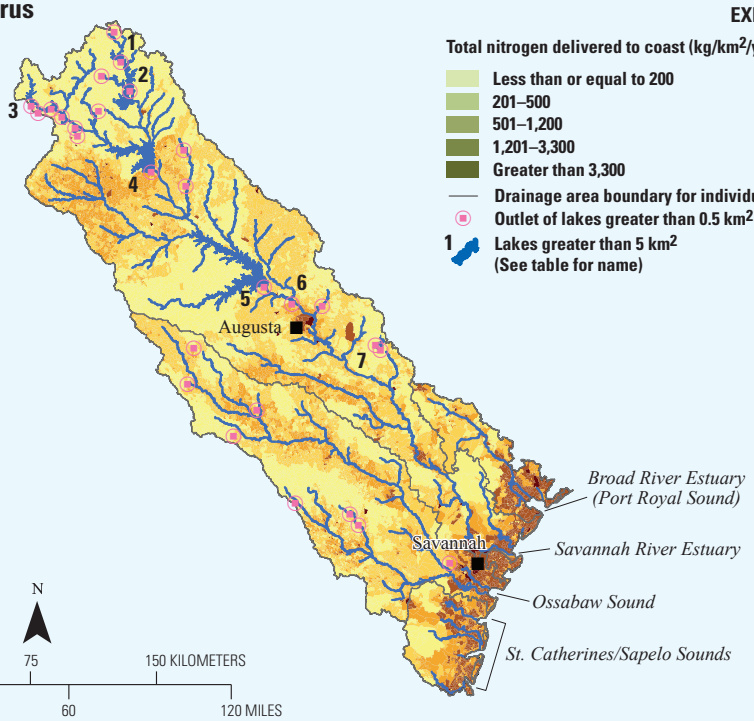
Nitrogen





Location of study area in North Carolina, South Carolina, and Georgia

Phosphorus



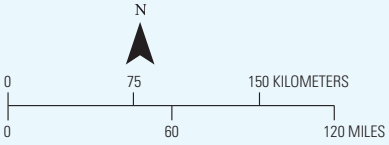
EXPLANATION

Total nitrogen delivered to coast (kg/km^2/yr)	Total phosphorus delivered to coast (kg/km^2/yr)
Less than or equal to 200	Less than or equal to 10
201–500	10.1–25
501–1,200	25.1–50
1,201–3,300	50.1–150
Greater than 3,300	Greater than 150

Drainage area boundary for individual estuary or bay

Outlet of lakes greater than 0.5 km^2

1 Lakes greater than 5 km^2 (See table for name)



56–59. Nutrient source shares and loads delivered from the watershed to Broad River Estuary (Port Royal Sound), Savannah River Estuary, and Ossabaw and St. Catherines/Sapelo Sounds and to major lakes in the watershed

Total nitrogen

	Source shares, in percent[a]									
	Wastewater[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies										
Broad River Estuary (Port Royal Sound), SC	2	24	41	6	6	10	9	2	400,128	161
Savannah River Estuary, SC-GA	8	19	14	35	5	8	9	1	5,714,242	204
Ossabaw Sound, GA	3	22	34	14	6	9	9	2	2,259,491	183
St. Catherines/Sapelo Sounds, GA	0	28	3	9	14	22	21	3	301,672	124
Major lakes										
1. Lake Jocassee, SC	0	18	4	18	13	19	25	3	83,890	221
2. Little River Dam Lake, SC	0	18	6	26	11	16	21	3	219,671	220
3. Lake Burton, GA	0	22	5	22	12	16	21	3	92,595	305
4. Hartwell Lake, SC	1	21	9	38	7	10	13	2	1,715,269	316
5. Strom Thurmond Lake, SC	1	16	8	52	5	8	10	1	4,754,656	300
6. Augusta City Lock and Dam, SC	1	17	9	49	5	8	10	1	5,121,728	278
7. Par Pond, SC	0	4	11	15	17	23	24	5	4,091	45

Total phosphorus

	Source shares, in percent[a]							
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines	Total load, kg/yr	Total yield, kg/km²/yr[c]
Estuaries and other coastal waterbodies								
Broad River Estuary (Port Royal Sound), SC	14	14	11	1	60	0	96,051	38.6
Savannah River Estuary, SC-GA	43	8	11	7	30	0	680,802	24.3
Ossabaw Sound, GA	11	16	22	4	49	0	251,991	20.4
St. Catherines/Sapelo Sounds, GA	1	10	2	0	87	0	81,914	33.7
Major lakes								
1. Lake Jocassee, SC	4	9	3	1	84	0	1,938	5.1
2. Little River Dam Lake, SC	1	12	12	10	64	0	6,328	6.3
3. Lake Burton, GA	0	11	3	2	84	0	5,005	16.5
4. Hartwell Lake, SC	15	11	16	12	46	0	71,713	13.2
5. Strom Thurmond Lake, SC	9	8	20	23	40	0	301,962	19.0
6. Augusta City Lock and Dam, SC	10	8	20	20	43	0	360,878	19.6
7. Par Pond, SC	0	2	5	1	93	0	78	0.9

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.

[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.

[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

56–59. Estuary and lake characteristics: Broad River Estuary (Port Royal Sound), Savannah River Estuary, and Ossabaw and St. Catherines/Sapelo Sounds and major lakes in the watershed

	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		Overall Eutrophic Condition[h]
				TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	
Estuaries and other coastal waterbodies											
Broad River Estuary (Port Royal Sound), SC	2,365	243	3	1,200	288	0.48	0.12	4	NA	NA	Moderate Low
Savannah River Estuary, SC-GA	28,023	121	1	5,714	681	0.41	0.05	8	NA	NA	Moderate
Ossabaw Sound, GA	12,133	88	1	2,259	252	0.57	0.06	9	NA	NA	Moderate Low
St. Catherines/Sapelo Sounds, GA	2,255	188	1	302	82	0.43	0.12	4	NA	NA	Unknown
Major lakes											
1. Lake Jocassee, SC	380	31	33	4,383,931	408,891	0.38	0.04	11	49,035	10,460	NA
2. Little River Dam Lake, SC	998	70	28	8,902,235	614,929	0.35	0.02	14	99,036	15,687	NA
3. Lake Burton, GA	304	10	12	1,340,461	132,959	0.37	0.04	10	18,633	6,027	NA
4. Hartwell Lake, SC	5,422	219	16	34,986,647	3,326,894	0.44	0.04	11	509,634	139,854	NA
5. Strom Thurmond Lake, SC	15,865	275	11	56,591,561	5,497,655	0.56	0.05	10	599,751	218,198	NA
6. Augusta City Lock and Dam, SC	18,447	8	0	1,444,600	103,735	0.50	0.04	14	20,472	8,376	NA
7. Par Pond, SC	91	10	104	1,148,427	106,581	0.31	0.03	11	6,948	947	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

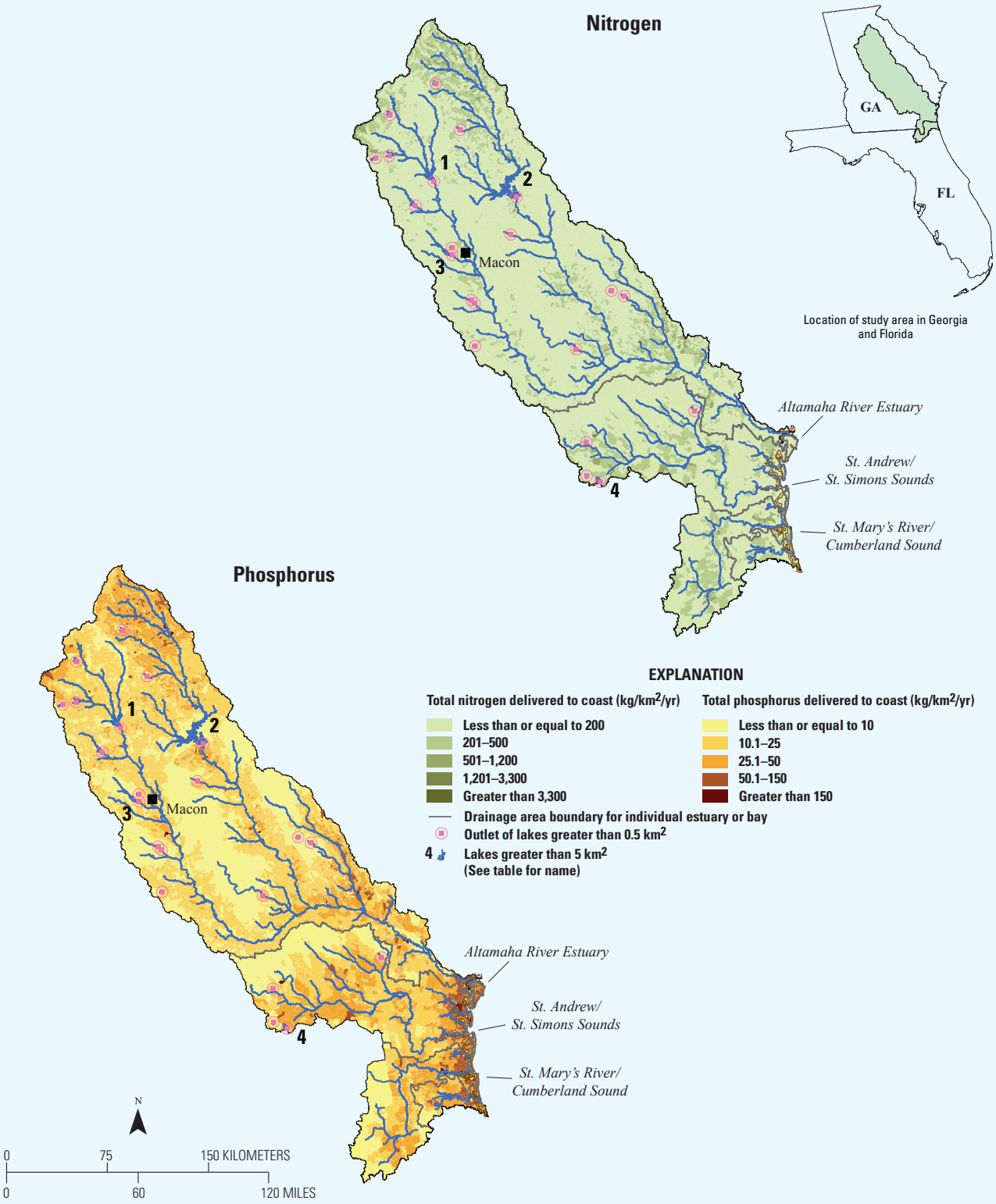
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

60–62. Contributing watersheds and nutrient yield for Altamaha River Estuary, St. Andrew/St. Simons Sounds, and St. Mary's River/Cumberland Sound
(Altamaha, Turtle, Satilla, Little Satilla, St. Mary's, Crooked, and Cumberland River Basins)



60–62. Nutrient source shares and loads delivered from the watershed to Altamaha River Estuary, St. Andrew/St. Simons Sounds, and St. Mary's River/Cumberland Sound and to major lakes in the watershed

Total nitrogen	Source shares, in percent[a]								Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Power-plant emissions	Industrial emissions	Vehicle emissions	Background		
Estuaries and other coastal waterbodies										
Altamaha River Estuary, GA	7	23	18	28	5	8	10	1	6,781,650	184
St. Andrew/St. Simons Sounds, GA	4	21	29	22	5	9	9	2	2,129,462	205
St. Mary's River/Cumberland Sound, GA-FL	1	27	7	21	10	15	16	2	1,115,456	249
Major lakes										
1. Jackson Lake, GA	22	46	3	10	3	6	10	1	1,521,939	417
2. Lake Sinclair, GA	4	18	6	52	4	7	9	1	2,507,997	333
3. Lake Tobesofkee, GA	0	16	15	40	6	9	12	2	96,497	206
4. Guest Millpond, GA	0	17	21	36	5	9	10	2	13,177	123

Total phosphorus	Source shares, in percent[a]						Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines		
Estuaries and other coastal waterbodies								
Altamaha River Estuary, GA	27	11	16	8	38	0	780,862	21.2
St. Andrew/St. Simons Sounds, GA	21	15	17	7	40	0	289,492	27.9
St. Mary's River/Cumberland Sound, GA-FL	19	19	4	4	54	0	121,135	27.0
Major lakes								
1. Jackson Lake, GA	12	30	13	3	41	0	132,947	36.5
2. Lake Sinclair, GA	26	7	16	17	34	0	304,831	40.5
3. Lake Tobesofkee, GA	15	6	17	11	51	0	9,184	19.6
4. Guest Millpond, GA	0	12	16	13	60	0	236	2.2

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

60–62. Estuary and lake characteristics: Altamaha River Estuary, St. Andrew/St. Simons Sounds, and St. Mary's River/Cumberland Sound and major lakes in the watershed

	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		Overall Eutrophic Condition[h]
				TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	
Estuaries and other coastal waterbodies											
Altamaha River Estuary, GA	36,962	39	0	0	0	0.57	0.07	9	NA	NA	Low
St. Andrew/St. Simons Sounds, GA	10,242	176	2	4,259	579	0.75	0.10	7	NA	NA	Low
St. Mary's River/Cumberland Sound, GA-FL	4,386	64	2	2,231	242	0.76	0.08	9	NA	NA	Moderate Low
Major lakes											
1. Jackson Lake, GA	3,647	12	3	5,294,972	551,579	1.20	0.13	10	63,702	32,230	NA
2. Lake Sinclair, GA	7,527	48	5	14,157,993	2,128,524	0.80	0.12	7	158,772	96,093	NA
3. Lake Tobesofkee, GA	469	6	13	1,554,893	265,304	0.68	0.12	6	19,053	10,532	NA
4. Guest Millpond, GA	107	7	86	2,694,282	162,533	1.09	0.07	17	18,102	1,651	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

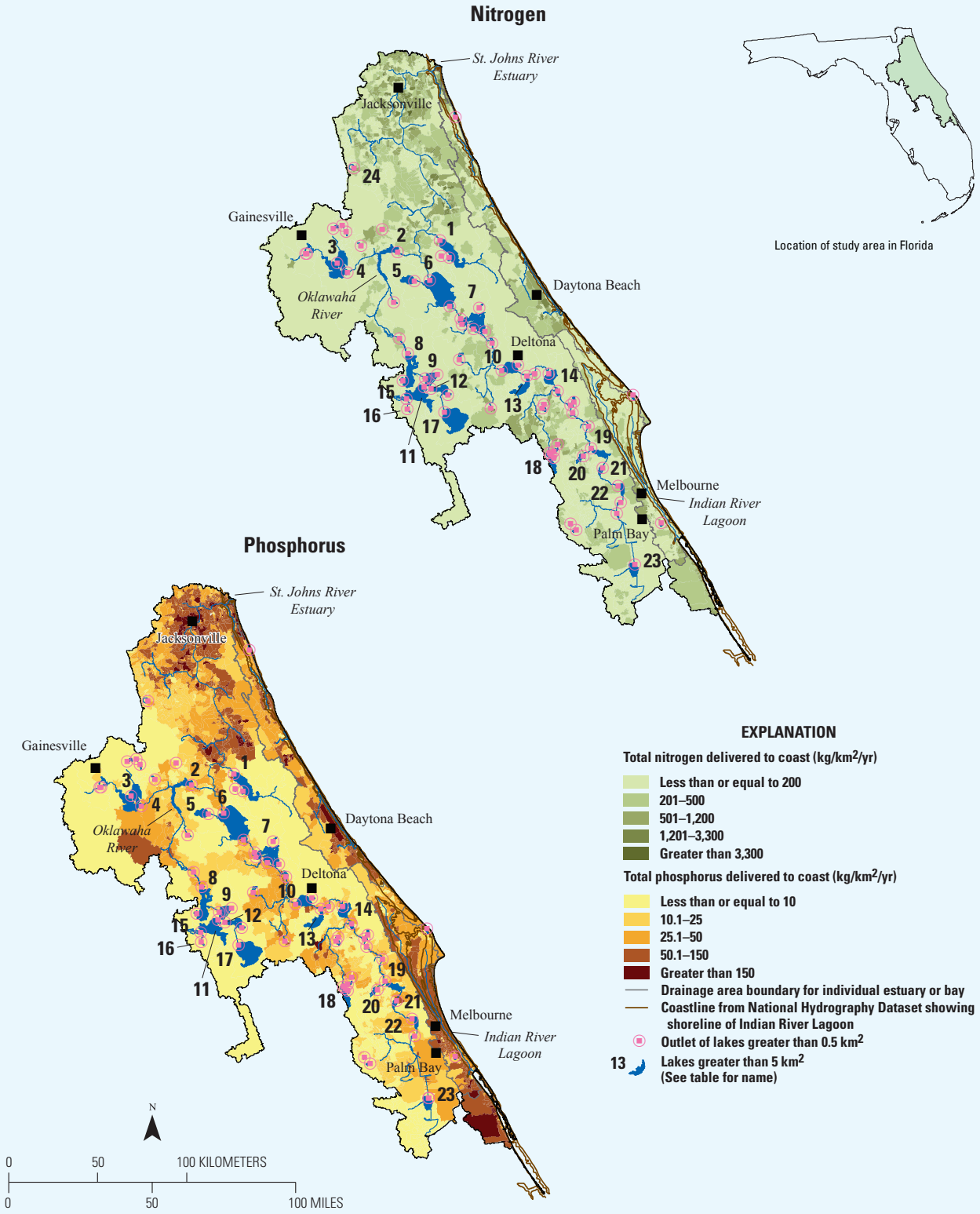
[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

63 and 64. Contributing watersheds and nutrient yield for St. Johns River Estuary and Indian River Lagoon
(St. Johns and Indian River Basins)



63 and 64. Nutrient source shares and loads delivered from the watershed to St. Johns River Estuary and Indian River Lagoon and to major lakes in the watershed

Total nitrogen	Source shares, in percent[a]								Total load, kg/yr	Total yield, kg/km²/yr[c]
	Waste-water[b]	Urban land	Fertilizer	Manure	Powerplant emissions	Industrial emissions	Vehicle emis-sions	Back-ground		
Estuaries and other coastal waterbodies										
St. Johns River Estuary, FL[d]	6	39	17	11	6	9	11	1	6,221,737	254
Indian River Lagoon, FL	1	59	10	4	5	8	10	1	977,509	412
Major lakes										
1. Crescent Lake, FL[d]	0	26	32	11	7	10	12	2	184,944	137
2. Lake Ocklawaha, FL[d]	3	35	14	19	6	9	12	2	764,754	105
3. Right Arm Lochloosa Lake, FL[d]	0	15	22	22	10	13	17	3	28,571	96
4. Orange Lake, FL	11	32	18	23	3	5	6	1	197,918	71
5. Little Lake Kerr, FL	0	23	3	20	12	18	21	3	8,850	33
6. Lake George, FL	2	30	24	16	5	9	12	2	2,100,326	212
7. Lake Dexter, FL [d]	2	30	25	16	5	9	12	2	2,157,354	245
8. Oklawaha River, FL[d]	0	36	25	13	5	8	11	2	150,222	66
9. Lake Eustis, FL	0	41	25	10	5	8	11	1	132,560	71
10. Monroe Lake, FL[d]	2	27	27	17	5	8	11	2	1,640,788	238
11. Lake Harris, FL[d]	0	32	28	13	5	8	12	2	59,415	53
12. Lake Dora, FL	0	40	29	10	4	7	10	1	57,959	96
13. Lake Jesup, FL	0	56	10	5	5	8	14	1	60,443	151
14. Lake Harney, FL[d]	2	24	29	19	5	8	11	2	1,462,178	264
15. Lake Denham, FL[d]	0	31	26	21	4	7	10	1	16,844	111
16. Unnamed pond on Palatlakaha River, FL	0	21	44	16	4	6	8	1	1,042	2
17. Lake Apopka, FL	1	24	39	11	5	8	12	1	25,098	60
18. Econlockhatchee River Swamp, FL	0	6	31	31	6	11	13	2	3,137	27
19. Unnamed pond on St. Johns River, FL	0	13	33	30	4	8	10	2	854,721	240
20. Taylor Creek Structure, FL	0	1	40	38	4	7	8	2	24,359	163
21. Lake Winder, FL	0	11	35	31	4	8	10	2	821,037	260
22. Lake Washington, FL	0	12	35	29	4	8	10	2	724,562	266
23. Blue Cypress Lake, FL	0	7	34	43	3	6	7	1	133,898	192
24. Kingsley Lake, FL	0	53	2	11	7	11	14	2	1,542	81

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.
[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.
[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.
[d] The nitrogen yield map for the Oklawaha River Basin and nitrogen loading summaries for the St. Johns River estuary and lakes within the Oklawaha River Basin are presented but may be less reliable due to a potentially important component of loading not accounted for in this assessment: flow exchange with the underlying regional aquifer and resulting nitrogen inflow to and outflow from surface-water flow.

63 and 64. Nutrient source shares and loads delivered from the watershed to St. Johns River Estuary and Indian River Lagoon and to major lakes in the watershed

Total phosphorus	Source shares, in percent[a]						Total load, kg/yr	Total yield, kg/km²/yr[c]
	Wastewater[b]	Urban land	Fertilizer	Manure	Background	Mines		
Estuaries and other coastal waterbodies								
St. Johns River Estuary, FL	20	28	9	2	41	0	603,076	24.6
Indian River Lagoon, FL	4	40	12	3	42	0	175,494	74.0
Major lakes								
1. Crescent Lake, FL	4	15	13	3	65	0	3,120	2.3
2. Lake Ocklawaha, FL	1	18	14	5	62	0	75,431	10.3
3. Right Arm Lochloosa Lake, FL	0	6	6	3	85	0	236	0.8
4. Orange Lake, FL	4	14	21	7	55	0	20,328	7.2
5. Little Lake Kerr, FL	0	11	2	3	84	0	933	3.4
6. Lake George, FL	3	21	20	5	51	0	132,205	13.4
7. Lake Dexter, FL	4	22	21	5	49	0	183,213	20.8
8. Oklawaha River, FL	0	15	21	4	60	0	7,902	3.5
9. Lake Eustis, FL	0	34	14	2	50	0	3,720	2.0
10. Monroe Lake, FL	4	20	24	6	46	0	139,302	20.2
11. Lake Harris, FL	0	24	17	3	57	0	1,909	1.7
12. Lake Dora, FL	0	36	15	2	46	0	1,431	2.4
13. Lake Jesup, FL	0	19	10	3	68	0	581	1.4
14. Lake Harney, FL	4	19	26	6	45	0	148,972	26.8
15. Lake Denham, FL	0	19	21	4	55	0	1,106	7.3
16. Unnamed pond on Palatlakaha River, FL	0	17	28	6	49	0	2,229	3.7
17. Lake Apopka, FL	0	17	18	3	61	0	580	1.4
18. Econlockhatchee River Swamp, FL	0	4	33	10	53	0	485	4.1
19. Unnamed pond on St. Johns River, FL	0	10	38	10	43	0	107,474	30.2
20. Taylor Creek Structure, FL	0	1	46	14	39	0	946	6.3
21. Lake Winder, FL	0	9	39	10	42	0	130,977	41.5
22. Lake Washington, FL	0	10	38	10	42	0	122,723	45.0
23. Blue Cypress Lake, FL	0	5	37	15	43	0	7,073	10.1
24. Kingsley Lake, FL	0	42	3	1	55	0	26	1.4

[a] Due to rounding, the sum of source shares for a given lake or estuary may not equal 100.

[b] The types of nutrient sources included within each of the source shares are described in more detail in table 2.

[c] 1 kg/km²/yr = 0.01 kg/ha/yr = 0.00893 lbs/acre; therefore, to convert values reported as kg/km²/yr to kg/ha/yr, multiply by 0.01.

63 and 64. Estuary and lake characteristics: St. Johns River Estuary and Indian River Lagoon and major lakes in the watershed

	Contributing watershed area, km²[f]	Surface area, km²	Residence time, d or d/m[g]	Load from watershed per hydraulic flushing rate of receiving waterbody[d]		Concentration of tributary inflow to receiving waterbody			Load assimilated in receiving waterbody[e]		Overall Eutrophic Condition[h]
				TN, Mg*d or, for lakes, kg*d/m	TP, Mg*d or, for lakes, kg*d/m	TN, mg/L	TP, mg/L	Ratio of TN:TP	TN, kg/yr	TP, kg/yr	
Estuaries and other coastal waterbodies											
St. Johns River Estuary, FL[i]	23,214	684	6	37,330	3,618	0.76	0.07	10	NA	NA	High
Indian River Lagoon, FL	2,373	866	3–195	NA	NA	1.55	0.28	6	NA	NA	Moderate
Major lakes											
1. Crescent Lake, FL[i]	1,352	72	54	20,135,666	1,634,848	0.77	0.06	12	184,657	26,889	NA
2. Lake Ocklawaha, FL[i]	7,310	28	4	3,452,398	425,361	0.34	0.04	8	60,715	26,273	NA
3. Right Arm Lochloosa Lake, FL[i]	296	31	115	10,398,706	766,336	0.92	0.07	14	62,113	6,447	NA
4. Orange Lake, FL	2,806	51	20	5,216,039	1,292,738	0.28	0.07	4	63,355	44,426	NA
5. Little Lake Kerr, FL	272	17	70	1,308,491	435,595	0.22	0.07	3	9,867	5,298	NA
6. Lake George, FL	9,888	177	20	49,273,949	4,302,964	0.76	0.07	11	308,673	78,166	NA
7. Lake Dexter, FL[i]	8,822	55	7	15,897,824	1,415,750	0.80	0.07	11	87,196	16,671	NA
8. Oklawaha River, FL[i]	2,267	63	31	6,948,946	752,919	0.30	0.03	9	75,097	16,511	NA
9. Lake Eustis, FL	1,858	31	19	3,256,143	163,658	0.28	0.01	20	41,907	5,048	NA
10. Monroe Lake, FL[i]	6,905	35	6	10,126,447	1,045,044	0.80	0.08	10	113,881	41,779	NA
11. Lake Harris, FL[i]	1,119	76	75	11,771,936	1,285,953	0.42	0.05	9	97,788	15,264	NA
12. Lake Dora, FL	607	25	45	4,573,929	356,477	0.51	0.04	13	44,641	6,565	NA
13. Lake Jesup, FL	401	33	94	17,399,074	1,194,309	1.45	0.10	15	125,612	12,190	NA
14. Lake Harney, FL[i]	5,549	29	6	9,293,375	1,051,040	0.87	0.10	9	71,779	24,512	NA
15. Lake Denham, FL[i]	152	10	72	2,791,909	960,025	0.77	0.26	3	21,869	12,206	NA
16. Unnamed pond on Palatlakaha River, FL	604	64	116	344,888	2,698,666	0.01	0.12	0	1,929	21,024	NA
17. Lake Apopka, FL	418	118	311	59,070,159	9,899,857	1.37	0.23	6	164,605	31,214	NA
18. Econlockhatchee River Swamp, FL	117	17	164	1,866,906	1,144,641	0.30	0.19	2	8,222	6,479	NA
19. Unnamed pond on St. Johns River, FL	3,556	19	6	5,795,703	974,524	0.82	0.14	6	72,961	48,512	NA
20. Taylor Creek Structure, FL	150	7	54	2,579,220	372,550	1.00	0.14	7	23,397	5,952	NA
21. Lake Winder, FL	3,158	6	2	1,967,608	348,981	0.84	0.15	6	25,335	19,139	NA
22. Lake Washington, FL	2,726	11	5	3,696,898	793,389	0.90	0.19	5	53,563	44,270	NA
23. Blue Cypress Lake, FL	699	25	40	9,037,086	1,694,823	1.01	0.19	5	90,668	35,042	NA
24. Kingsley Lake, FL	19	7	351	3,567,456	267,211	1.49	0.11	13	8,626	736	NA

[d] Large values of the metric 'Load from watershed per hydraulic flushing rate of receiving waterbody' (equivalent to load multiplied by residence time) characterize waterbodies with both high nutrient loading and low capacity to assimilate nutrients via hydraulic flushing alone.

[e] Estimated for lakes and reservoirs only (estuary assimilation not assessed).

[f] Calculated from modeled contributing area and may differ from values reported in Bricker and others, 2007.

[g] Estimate of residence time (in days) for estuaries is from Bricker and others, 2007. Residence time has not been estimated for lakes; the value reported is instead the ratio of lake surface area to outlet streamflow (days/meter) and is an approximation of residence time (it does not account for the effect of lake depth on residence time).

[h] Estimate of Overall Eutrophic Condition is for the year 2004 (Bricker and others, 2007), for estuaries only (lakes and reservoirs not assessed).

[i] The nitrogen yield map for the Oklawaha River Basin and nitrogen loading summaries for the St. Johns River estuary and lakes within the Oklawaha River Basin are presented but may be less reliable due to a potentially important component of loading not accounted for in this assessment: flow exchange with the underlying regional aquifer and resulting inflow to and outflow from surface-water flow.