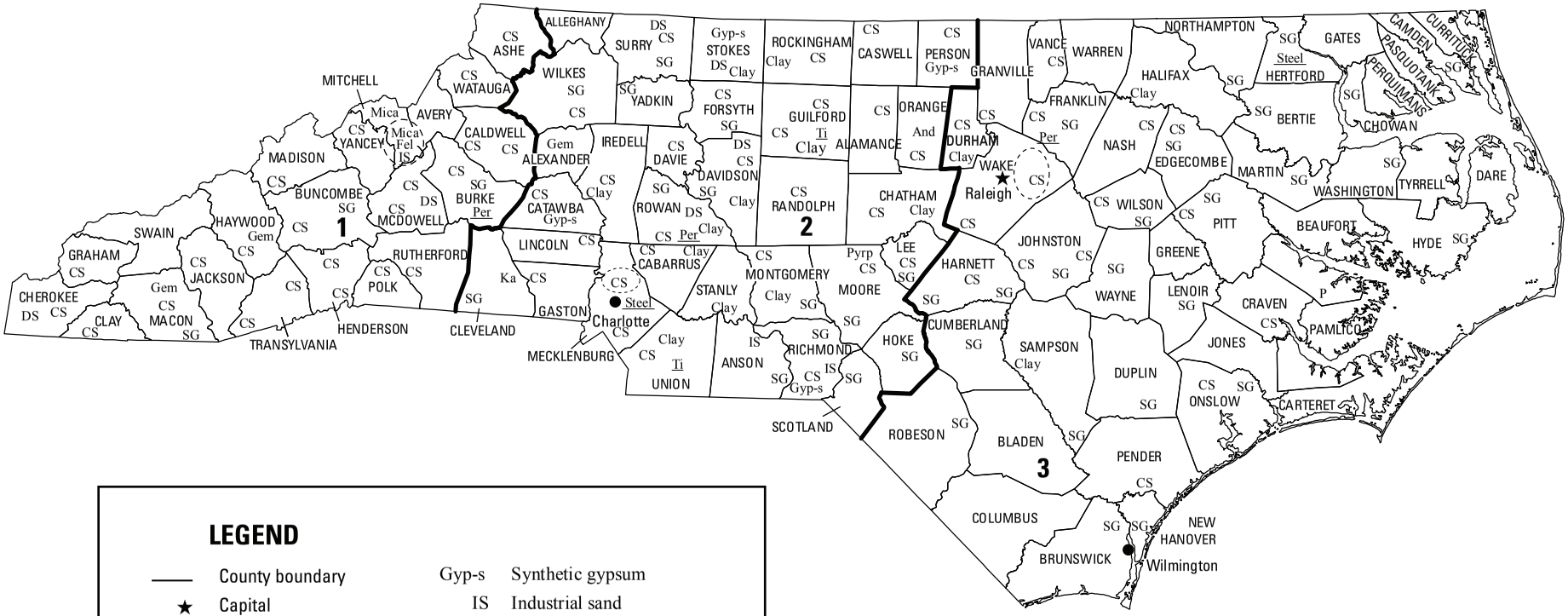
2012–2013 Minerals Yearbook

NORTH CAROLINA [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

October 2016

NORTH CAROLINA



LEGEND

——	County boundary
★	Capital
●	City
1——	Crushed stone and sand and gravel boundary

MINERAL SYMBOLS
(Principal producing areas)

And	Andalusite
Clay	Common clay
CS	Crushed stone
DS	Dimension stone
Fel	Feldspar
Gem	Gemstones
Gyp-s	Synthetic gypsum
IS	Industrial sand
Ka	Kaolin
Mica	Mica
Per	Perlite plant
P	Phosphate rock
Pyrp	Pyrophyllite
SG	Construction sand and gravel
Steel	Steel plant
Ti	Titanium metal plant

Concentration of mineral operations

Source: North Carolina Geological Survey/U.S. Geological Survey (2012–13).

The Mineral Industry of North Carolina

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the North Carolina Geological Survey for collecting information on all nonfuel minerals.

In 2013, the value of the nonfuel mineral production[1] in the State of North Carolina increased to $846 million,[2] 1.1% of the total U.S. nonfuel mineral production, ranking it 22d in the Nation. In 2012, the corresponding value was $720 million,[2] 1.2% of the U.S. total nonfuel mineral production, ranking it 25th among the 50 States. In 2013, on a per capita basis, nonfuel mineral production in North Carolina had a value of $86 compared with the national average of $238. In 2012, the per capita value was $93 compared with the national average of $241.

The value of nonfuel mineral production in North Carolina for the years 2006 through 2013 was as follows (in billions of dollars): $1.040[2] (2006), $1.170 (2007), $1.090 (2008), $0.850 (2009), $0.885 (2010), $0.688[2] (2011), $0.720[2] (2012), and $0.846[2] (2013).

In 2013, there were 1,675 employees in nonfuel mineral mines in North Carolina and 1,159 in mills and preparation plants. In 2012, the corresponding numbers were 1,808 in nonfuel mineral mines and 1,201 in mills and preparation plants (U.S. Mine Safety and Health Administration, 2013, p. 13; 2014, p. 13). In 2013, the average annual wage in North Carolina for all mining was $45,368 compared with $43,758 for all industries. In 2012, the corresponding figures were $43,919 and $43,039, respectively (National Mining Association, unpub. data, February 4, 2016).

In 2012 and 2013, North Carolina produced a variety of industrial nonfuel mineral commodities. It was the sole producing State for andalusite, used in refractory mineral products for the foundry and ceramics industries. It was also the only State to produce pyrophyllite, also used in refractory products and in ceramics and paint. On the basis of quantity, North Carolina ranked first in feldspar of 7 producing States, second in mica of 4 producing States, third in both phosphate rock and common clays of 4 producing States and 35 producing States, respectively, and sixth in crushed stone out of 50 producing States. On the basis of production value, crushed stone, mainly granite (table 2), was the leading commodity in the State and construction sand and gravel was the third leading mineral commodity. Table 1 shows production value and production quantity of North Carolina's mineral commodities; some data were withheld at the State level to prevent disclosing company proprietary data.

Commodity Review

The same mineral deposits that made North Carolina the first-ranked feldspar and second-ranking mica producer were also considered to be the source of the world's most suitable supply of quartz from which high-purity quartz (HPQ) sand could be obtained. Two companies based in Spruce Pine, NC, produced HPQ products for use in technological products such as semiconductors and solar cells, as well as high-temperature applications in solar crucibles and specialty lighting. Owing to a downturn in the solar cell industry, an oversupply of HPQ existed from 2011, but consumption was reportedly returning to normal by the end of 2013 (Hughes, 2013).

Olivine was no longer being produced in North Carolina in 2012 or 2013. Olivine sand had been mined for use in casting molds of foundries as recently as 2011, but was being replaced by staurolite sands, silica sands, or manufactured sand, depending on the application (Wetzel, 2012).

Synthetic gypsum was produced through the operation of flue gas desulfurization units for pollution control, mainly in coal-fired power plants. CertainTeed Gypsum NC, Inc. (a subsidiary of Compagnie de Saint-Gobain SA, France) opened a new wallboard plant in 2012 that was collocated with a power plant to take advantage of byproduct synthetic gypsum, as well as the savings on transportation costs of the gypsum. Without such an efficient arrangement, byproduct synthetic gypsum is often sent to a landfill rather than being cleaned and filtered for use as a natural gypsum replacement (U.S. Department of Energy, undated).

Though considered downstream mineral products and, therefore, not included in the State's total nonfuel mineral commodity value, there were two steel plants processing scrap and pig iron, two titanium metal operations producing ingot for use in the aerospace industry, and one operation processing imported chromite ore to make sodium dichromate, an intermediate product from which other chromium products are made. In 2012, a plant producing lithium hydroxide for batteries opened at Kings Mountain, making use of a $28.4 million grant from the American Reinvestment and Recovery Act (U.S. Department of Energy, 2012). The facility had the annual capacity to produce 5,000 metric tons of lithium hydroxide, enough for about 500,000 electric cars (Rockwood Lithium GmbH, 2012). Raw materials for these metal-processing plants were not mined in the State.

---

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All USGS mineral production data published in this chapter are those available as of February 2016. Data in this report are rounded to three significant digits and percentages are calculated from unrounded data. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at http://minerals.usgs.gov/minerals.

[2]Partial total; excludes values that must be withheld to avoid disclosing company proprietary data.

References Cited

Hughes, Emma, 2013, High purity quartz; a cut above: Industrial Minerals, no. 555, December, p. 22–25.

Rockwood Lithium GmbH, 2012, New facilities inauguration in Kings Mountain: Rockwood Lithium GmbH press release, June 29. (Accessed April 21, 2016, at http://www.rockwoodlithium.com/news-events/news/news/archive/showing/article/new-facilities-inauguration-in-kings-mountain/.)

U.S. Department of Energy, 2012, Expanded North Carolina lithium facility opens, boosting U.S. production of a key manufacturing material: U.S. Department of Energy press release, June 29. (Accessed April 20, 2016, at http://energy.gov/articles/expanded-north-carolina-lithium-facility-opens-boosting-us-production-key-manufacturing.)

U.S. Department of Energy, [undated], Roxboro gypsum wallboard plant, *in* Showcase projects, *of* Better buildings: U.S. Department of Energy. (Accessed April 25, 2016, at http://betterbuildingssolutioncenter.energy.gov/showcase-projects/roxboro-gypsum-wallboard-plant.)

U.S. Mine Safety and Health Administration, [2013], Mine injury and worktime, quarterly, January–December 2012, Final, closeout edition, 33 p. (Accessed February 8, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20125.pdf.)

U.S. Mine Safety and Health Administration, [2014], Mine injury and worktime, quarterly, January–December 2013, Final, closeout edition, 34 p. (Accessed February 8, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20135.pdf.)

Wetzel, Shannon, 2012, Replacing olivine sand: American Foundry Society, Modern Casting, v. 102, no. 12, December, p. 20–24. (Accessed April 25, 2016, at http://www.afsinc.org/multimedia/contentMC.cfm?ItemNumber=12879.)

TABLE 1
NONFUEL MINERAL PRODUCTION IN NORTH CAROLINA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2011		2012		2013	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	764	4,460	732	20,100	727	20,000
Gemstones, natural	NA	1,990	NA	2,060	NA	371
Sand and gravel:						
Construction	8,250 r	47,700 r	7,220	42,900	8,800	60,100
Industrial	1,330	35,300	1,230	30,400	1,290	30,700
Stone:						
Crushed	40,100 r	586,000 r	41,100	615,000	46,600	715,000
Dimension	59	11,600	53	8,480	47	19,600
Combined values of andalusite, clays (kaolin), feldspar, mica (crude), olivine (2011), phosphate rock, and pyrophyllite (crude)	XX	W	XX	W	XX	W
Total	XX	687,000 r	XX	719,000	XX	845,000

[e]Estimated. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; excluded from "Total." XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
NORTH CAROLINA: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE[1]

Type	2012 Number of quarries	2012 Quantity (thousand metric tons)	2012 Value (thousands)	2012 Unit value	2013 Number of quarries	2013 Quantity (thousand metric tons)	2013 Value (thousands)	2013 Unit value
Limestone[2]	10	3,010	$43,700	$14.51	10	3,190	$47,300	$14.84
Dolomite	1	255	3,910	15.31	1	292	4,510	15.43
Granite	88	29,400	438,000	14.91	88	35,000	537,000	15.34
Traprock	8	5,910	90,400	15.29	8	5,720	88,300	15.45
Slate	2	637	9,170	14.40	2	601	8,860	14.74
Miscellaneous stone	7	1,920	30,700	15.96	6	1,830	28,700	15.66
Total or average	XX	41,100	615,000	14.98	XX	46,600	715,000	15.33

XX Not applicable.
[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes limestone-dolomite reported with no distinction between the two kinds of stone.

TABLE 3
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS BY USE[1]

Use	2012 Quantity (thousand metric tons)	2012 Value (thousands)	2012 Unit value	2013 Quantity (thousand metric tons)	2013 Value (thousands)	2013 Unit value
Construction:						
Coarse aggregate (+1½ inch):						
Riprap and jetty stone	123	$2,030	$16.52	210	$3,340	$15.86
Filter stone	W	W	W	W	W	W
Unspecified coarse aggregate	W	W	W	W	W	W
Coarse aggregate, graded:						
Concrete aggregate, coarse	W	W	W	W	W	W
Bituminous aggregate, coarse	--	--	--	W	W	W
Bituminous surface-treatment aggregate	W	W	W	W	W	W
Railroad ballast	36	549	15.26	56	884	15.64
Unspecified graded coarse aggregate	W	W	W	W	W	W
Fine aggregate (-⅜ inch):						
Screening, undesignated	585	8,260	14.13	472	7,000	14.84
Unspecified fine aggregate	W	W	W	W	W	W
Coarse and fine aggregates:						
Graded road base or subbase	1,130	17,200	15.26	1,040	16,500	15.90
Crusher run or fill or waste	434	5,320	12.26	598	7,490	12.53
Unspecified coarse and fine aggregates	3,160	41,600	13.16	3,870	51,800	13.39
Unspecified and other construction materials	162	2,240	13.81	--	--	--
Agricultural:						
Poultry grit and mineral food	--	--	--	5	401	87.96
Other miscellaneous uses and specified uses not listed						
Unspecified:[2]						
Reported	22,300	326,000	14.64	27,300	412,000	15.09
Estimated	6,310	96,400	15.28	6,090	94,000	15.43
Total or average	41,100	615,000	14.98	46,600	715,000	15.33

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Reported and estimated production without a breakdown by end use.

TABLE 4

NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2012, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	W	W	W	W	W	W
Coarse aggregate, graded[3]	W	W	W	W	W	W
Fine aggregate (-⅜ inch)[4]	416	5,600	W	W	W	W
Coarse and fine aggregates[5]	1,330	18,000	W	W	W	W
Other construction materials	--	--	162	2,240	--	--
Agricultural	--	--	--	--	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:[6]						
Reported	1,240	17,300	10,300	150,000	10,700	159,000
Estimated	2,460	37,400	1,080	16,500	2,780	42,500
Total	6,730	100,000	17,600	260,000	16,800	255,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes riprap and jetty stone, filter stone, and unspecified coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and unspecified graded coarse aggregate.

[4]Includes screening (undesignated) and unspecified fine aggregate.

[5]Includes graded road base or subbase, crusher run, and unspecified coarse and fine aggregates.

[6]Reported and estimated production without a breakdown by end use.

TABLE 5

NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2013, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	305	5,910	W	W	W	W
Coarse aggregate, graded[3]	W	W	W	W	W	W
Fine aggregate (-⅜ inch)[4]	W	W	W	W	W	W
Coarse and fine aggregates[5]	1,480	20,200	W	W	W	W
Other construction materials	--	--	--	--	--	--
Agricultural[6]	--	--	5	401	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:[7]						
Reported	5,520	85,600	10,400	154,000	11,400	173,000
Estimated	2,480	38,200	1,120	17,300	2,490	38,500
Total	11,400	177,000	17,900	270,000	17,300	268,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes riprap and jetty stone, filter stone, and unspecified coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and unspecified graded coarse aggregate.

[4]Includes screening (undesignated) and unspecified fine aggregate.

[5]Includes graded road base or subbase, crusher run, and unspecified coarse and fine aggregates.

[6]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

[7]Reported and estimated production without a breakdown by end use.

TABLE 6
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	2,310	$14,400	$6.23
Concrete products (blocks, bricks, pipe, decorative, and so forth)[2]	22	351	15.95
Asphaltic concrete aggregates and road base materials[3]	761	4,610	6.06
Fill	1,120	3,920	3.50
Other miscellaneous uses[4]	75	650	8.67
Unspecified:[5]			
Reported	1,170	8,120	6.94
Estimated	1,770	10,800	6.10
Total or average	7,220	42,900	5.94

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, railroad ballast, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.

TABLE 7
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	818	$6,530	$7.98
Concrete products (blocks, bricks, pipe, decorative, unspecified)[2]	50	562	11.24
Asphaltic concrete aggregates and road base materials[3]	457	4,850	10.61
Fill	676	3,460	5.12
Other miscellaneous uses[4]	22	252	11.45
Unspecified:[5]			
Reported	744	5,690	7.65
Estimated	6,030	38,800	6.43
Total or average	8,800	60,100	6.83

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.

TABLE 8
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	W	W	W	W	1,760	11,500
Asphaltic concrete aggregates and road base materials[3]	W	W	W	W	590	2,310
Fill	7	57	105	340	1,000	3,520
Other miscellaneous uses[4]	4	48	35	332	35	271
Unspecified:[5]						
Reported	--	--	340	2,180	824	5,940
Estimated	23	139	408	2,450	1,340	8,220
Total	51	595	1,620	10,500	5,550	31,800

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, railroad ballast, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.

TABLE 9
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	W	W	W	W	W	W
Asphaltic concrete aggregates and road base materials[3]	W	W	W	W	W	W
Fill	3	34	62	332	611	3,090
Other miscellaneous uses[4]	1	4	22	248	--	--
Unspecified:[5]						
Reported	--	--	6	63	738	5,630
Estimated	908	6,330	1,880	12,200	3,240	20,200
Total	928	6,700	2,460	16,800	5,410	36,600

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.