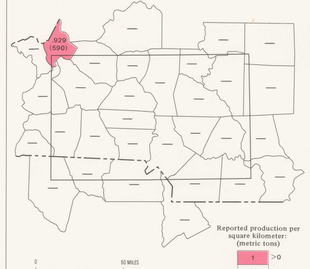
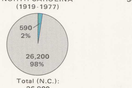
ASBESTOS (101)

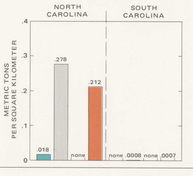
CUMULATIVE REPORTED PRODUCTION FROM 1919 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



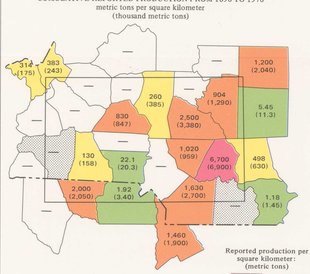
CUMULATIVE REPORTED PRODUCTION
per square kilometer



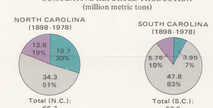
Reported production from Avery County is probably from outside the quadrangle.

COMMON CLAY AND SHALE (103)

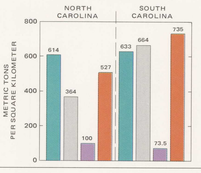
CUMULATIVE REPORTED PRODUCTION FROM 1898 TO 1978
metric tons per square kilometer
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
(million metric tons)



CUMULATIVE REPORTED PRODUCTION
per square kilometer

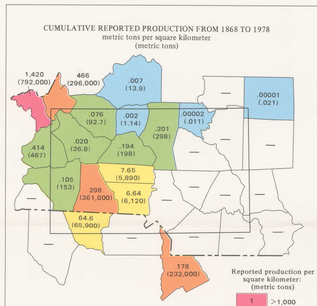


The common clay and shale category (103) includes clay and raw clay used for structural clay products such as brick and drain tile. It also includes clay used to produce bloated lightweight aggregate (Stanly County). These materials are classified as construction materials (100); see kaolin and specialty clays (406). Most reported production is from counties in the Charlotte belt or the Carolina slate belt. Reported production from Avery, Guilford, Lancaster, Mitchell, Randolph, and Richmond Counties is probably from outside the quadrangle. Some of this material has been produced from clay pits in stream or river banks; these pits are not necessarily shown in the location map of clay production for the quadrangle (D'Agostino and Rowe, in press*). For example, Gaston County has reported clay production but has no reported locations of producers.

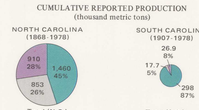
*References cited in these explanatory texts may be found in the accompanying pamphlet.

MICA (106)

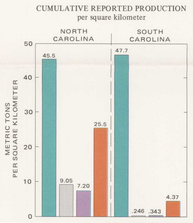
CUMULATIVE REPORTED PRODUCTION FROM 1868 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(thousand metric tons)



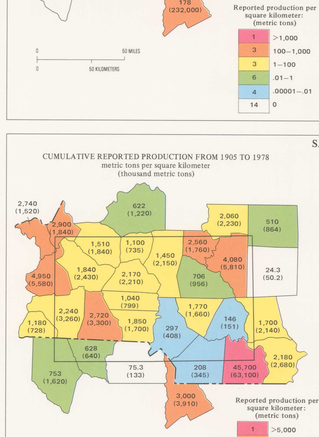
CUMULATIVE REPORTED PRODUCTION
per square kilometer



Production statistics for scrap, sheet, and flake mica are included in mica (106). Because separate data on sheet and scrap mica were not uniformly available, all mica production has been placed in the construction materials category. Production data attributable to specific counties were collected from as early as 1900. Production for 1897-99 and for some later years has been reported as State or district totals; in these cases, amounts attributable to specific counties have been estimated. Reported production of mica (muscovite or phlogopite) is from pegmatites, weathered granites, and saprolites of the Blue Ridge belt (Spruce Pine district), Inner Piedmont belt, and Kings Mountain belt. Small amounts of reported production are from deposits in Alexander, Burke, Caldwell, Catawba, Davie, Gaston, Iredell, Lincoln, and Rutherford Counties that are not shown on the location map of mica and feldspar production for the quadrangle (D'Agostino and Rowe, in press). Reported mica production from Guilford, Mitchell, Spartanburg, and Wilkes Counties is probably from outside the quadrangle.

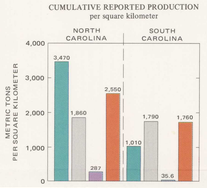
SAND AND GRAVEL (107)

CUMULATIVE REPORTED PRODUCTION FROM 1905 TO 1978
metric tons per square kilometer
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
(million metric tons)

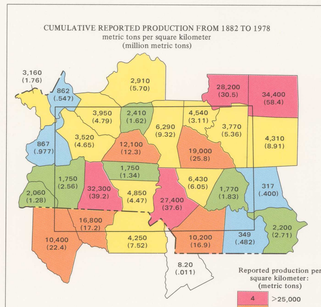
CUMULATIVE REPORTED PRODUCTION
per square kilometer



Sand and gravel (107) includes sand and gravel for all construction material uses and for some industrial mineral uses. Production of olivine for foundry sands and of crushed quartz for industrial mineral uses has been classified as industrial sands (421). Reported production from sand and gravel pits is mostly from counties in the Inner Piedmont belt and the Charlotte belt. Gravel includes material removed from quarries in friable igneous rock. Reported sand and gravel production from Anson, Avery, Forsyth, Guilford, Lancaster, Mitchell, Montgomery, Polk, Randolph, Richmond, Union, and Wilkes Counties is probably from outside the quadrangle. Production data include sand and gravel produced by the North Carolina State Highway and Public Works Commission from dredging sites not necessarily shown on the location map of sand and gravel production for the quadrangle (D'Agostino and Rowe, in press). The dredged material includes reported production from Alexander, Davidson, Davie, Stanly, and other counties.

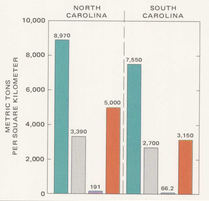
STONE (108)

CUMULATIVE REPORTED PRODUCTION FROM 1882 TO 1978
metric tons per square kilometer
(million metric tons)



CUMULATIVE REPORTED PRODUCTION
(million metric tons)

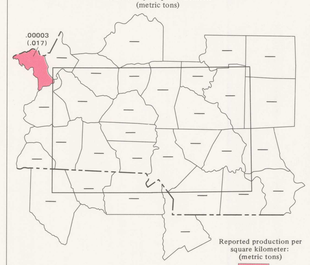
CUMULATIVE REPORTED PRODUCTION
per square kilometer



Stone (108) includes production of crushed and dimension stone and some stone used for abrasive purposes. The names by which stone production has been reported (abrasive stone, basalt, granite (crushed and dimension), limestone, marble (crushed and dimension), millstones, sandstone (crushed and dimension), stone (crushed and dimension), and trap rock) may not always agree with the geologic terms that describe the quarried rock. For example, production of crushed igneous rock containing feldspar and quartz has been reported as sandstone. Material classified as limestone for construction material use, especially in recent years, also includes limestone used for agricultural purposes and for cement production. For records from earlier years, agricultural lime and limestone have been reported as lime (413). Reported production from Avery, Forsyth, Guilford, Lancaster, Mitchell, Polk, Randolph, Richmond, Spartanburg, and Wilkes Counties is probably from outside the quadrangle. Production data include crushed stone produced by the North Carolina State Highway and Public Works Commission.

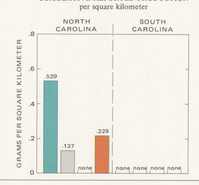
URANIUM ORE (211)

CUMULATIVE REPORTED PRODUCTION FROM 1900 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(kilograms)

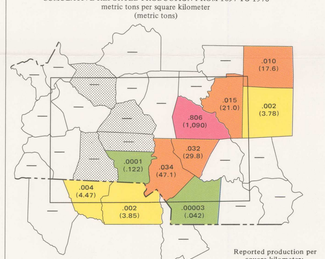
CUMULATIVE REPORTED PRODUCTION
per square kilometer



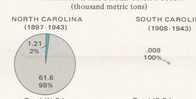
Production of uranium ore (pitchblende) in the Blue Ridge belt was reported in the early 1900's. Most reported production is from the Flat Rock mine in the Brown Mountain Granite in Mitchell County, outside the quadrangle. There are no known sources of uranium production in the Charlotte quadrangle.

COPPER (309)

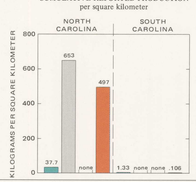
CUMULATIVE REPORTED PRODUCTION FROM 1897 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(thousand metric tons)



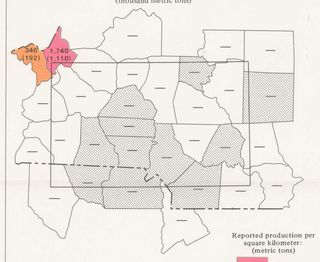
CUMULATIVE REPORTED PRODUCTION
per square kilometer



Counties with reported copper production lie mostly along the contact between the Charlotte belt and the Carolina slate belt. Reported production for 1901-16 from the Union Copper mine in Rowan County accounts for most of the reported production from the quadrangle; records by county of most copper produced during the 1800's were not available for use in this compilation. Reported production from Guilford and Randolph Counties is probably from outside the quadrangle.

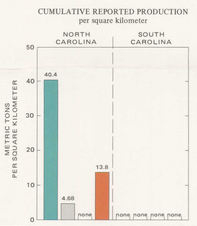
IRON ORE (310)

CUMULATIVE REPORTED PRODUCTION FROM 1880 TO 1978
metric tons per square kilometer
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
(thousand metric tons)

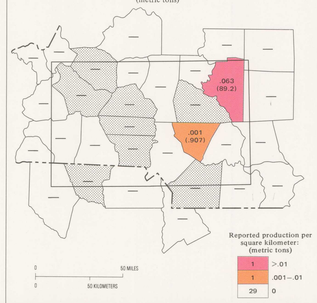
CUMULATIVE REPORTED PRODUCTION
per square kilometer



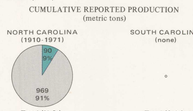
Iron-ore production took place in the Charlotte quadrangle from the mid-1700's to the late 1800's in "The Old Iron District" in South Carolina (Cherokee and York Counties) and in the Kings Mountain belt and vicinity in North Carolina, but data about this production are not available in the sources used for this compilation. Production shown here is from the Cranberry district in Avery and Mitchell Counties which is outside the quadrangle. As is the case with other commodities, data on production from parts of Charlotte quadrangle counties that are outside the quadrangle are included in this study and have been included in totals for "Charlotte quadrangle counties" because it was not possible for all counties and for all commodities to determine production from inside and outside the quadrangle.

LEAD (311)

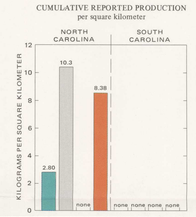
CUMULATIVE REPORTED PRODUCTION FROM 1910 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



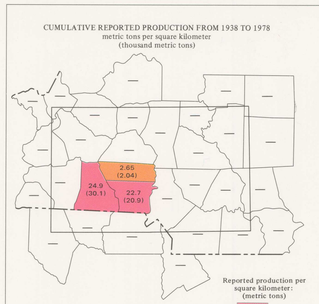
CUMULATIVE REPORTED PRODUCTION
per square kilometer



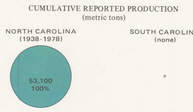
Reported production of lead is from the silver-lead ores of the Silver Hill mine (Davidson County) over the period 1910-38 and from one year (1936) of byproduct production from the Allan Furr mine (Cabarrus County). Most lead production from counties in the quadrangle took place in the 1800's; consistent statistical records of this early production were not available for this compilation.

LITHIUM (312)

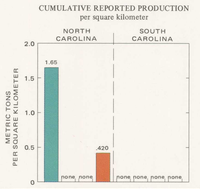
CUMULATIVE REPORTED PRODUCTION FROM 1938 TO 1978
metric tons per square kilometer
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



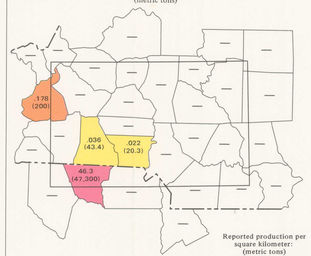
CUMULATIVE REPORTED PRODUCTION
per square kilometer



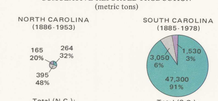
Spodumene-bearing pegmatite dikes in the Kings Mountain belt are the principal sources of the world's lithium. Production in Cleveland and Gaston Counties was reported as early as 1938, and production has been continuous since 1951 in Cleveland County and 1969 in Gaston County. Some production came from Lincoln County during the mid-1950's. Lithium production has been reported in tons of spodumene, lithium minerals, and lithium (the terms "spodumene" and "lithium minerals" have been used synonomously in USBM reports). Because the computer programs used to calculate urw simply sum the physical units associated with the commodity code (312), it was necessary to convert any production data for spodumene and lithium minerals to contained lithium. A conversion factor of 2.88 percent lithium per ton of spodumene was obtained from records of the late 1950's and early 1960's where both physical measures were reported. Production was apportioned among producing counties in the mid-1950's based on reported total production and field observations of pits in each county that were operated during that period.

MANGANESE ORE (314)

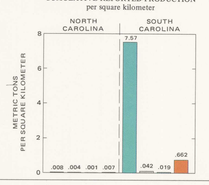
CUMULATIVE REPORTED PRODUCTION FROM 1885 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



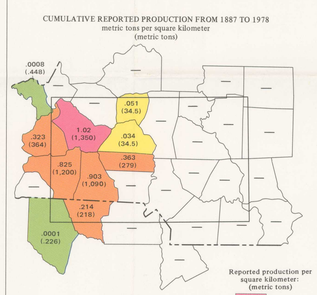
CUMULATIVE REPORTED PRODUCTION
per square kilometer



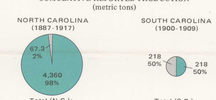
Manganese ore (314) includes material reported as manganese, manganese ore, and manganiferous ore. Production in the Charlotte quadrangle was mostly from those counties in the Kings Mountain belt. Residual manganese oxide (generally psilomelane or clayey pyrolusite) of the Battleground Formation has been mined for use as pigment in brick-clay. In the Blue Ridge belt, the North Cove mine (McDowell County) produced manganese ore from rocks within the Chilhowee Group.

THORIUM ORE (320)

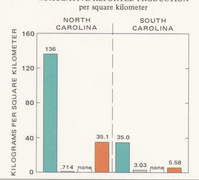
CUMULATIVE REPORTED PRODUCTION FROM 1887 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



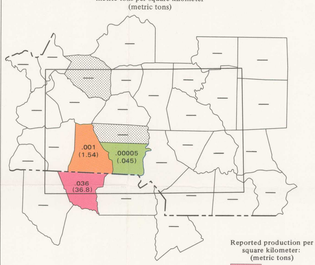
CUMULATIVE REPORTED PRODUCTION
per square kilometer



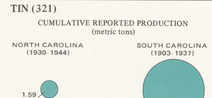
Most reported thorium ore production is from monazite- and zircon-bearing placer deposits. Thorium ore (320) production also includes rare-earth sands which consist of undifferentiated zircon, columbite, and samarskite, produced in 1902. Monazite has been produced chiefly from stream gravels within the Inner Piedmont belt; small production has been from gravels in Alexander, Catawba, and Lincoln Counties that are not shown on the location map of thorium production for the quadrangle (D'Agostino and Rowe, in press). Reported monazite production from Spartanburg County is probably from outside the quadrangle. Rare-earth production took place in the Blue Ridge belt (Mitchell County), outside the quadrangle.

TIN (321)

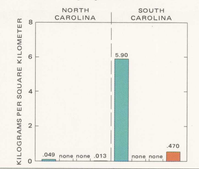
CUMULATIVE REPORTED PRODUCTION FROM 1903 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



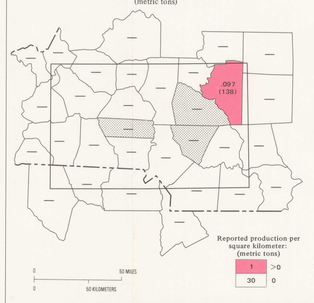
CUMULATIVE REPORTED PRODUCTION
per square kilometer



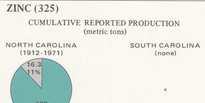
Tin (cassiterite) mining in the quadrangle took place in counties lying within the Inner Piedmont belt. Production was from pegmatites close to contacts with adjacent belts or from placer deposits. Most tin production from counties in the quadrangle took place in the 1800's; records of this production for each county were not available for use in this compilation.

ZINC (325)

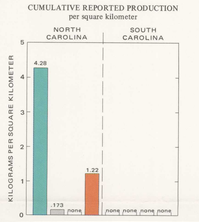
CUMULATIVE REPORTED PRODUCTION FROM 1912 TO 1978
metric tons per square kilometer
(metric tons)



CUMULATIVE REPORTED PRODUCTION
(metric tons)



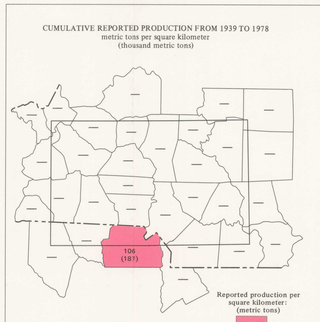
CUMULATIVE REPORTED PRODUCTION
per square kilometer



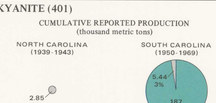
Reported production of zinc is from the silver-lead ores mined in 1912 and 1913 from the Silver Hill mine (Davidson County). Most zinc production from counties in the quadrangle took place prior to the collection of consistent statistical records. In addition, zinc contained in lead or lead-silver ores mined in the early and mid-1800's was not recovered but was discarded with mine or mill wastes.

KYANITE (401)

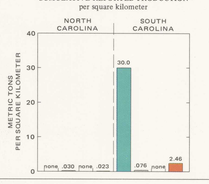
CUMULATIVE REPORTED PRODUCTION FROM 1939 TO 1978
metric tons per square kilometer
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
(thousand metric tons)



CUMULATIVE REPORTED PRODUCTION
per square kilometer



Reported kyanite production is from kyanite quartzites in the Kings Mountain belt (Henry Knob mine, York County), where kyanite (and byproduct pyrite) production was reported from the 1950's and 1960's. The State totals for the kyanite (401) category include small amounts of staurolite.

Interior—Geological Survey, Reston, Va.—1985—G84210

MINERAL PRODUCTION MAPS OF THE CHARLOTTE 1° X 2° QUADRANGLE, NORTH CAROLINA AND SOUTH CAROLINA

By
John H. DeYoung, Jr., Michael P. Lee, and James P. Dorian
1985