



Rock Resources

Rock Resources of the Coastal Plain Region 3

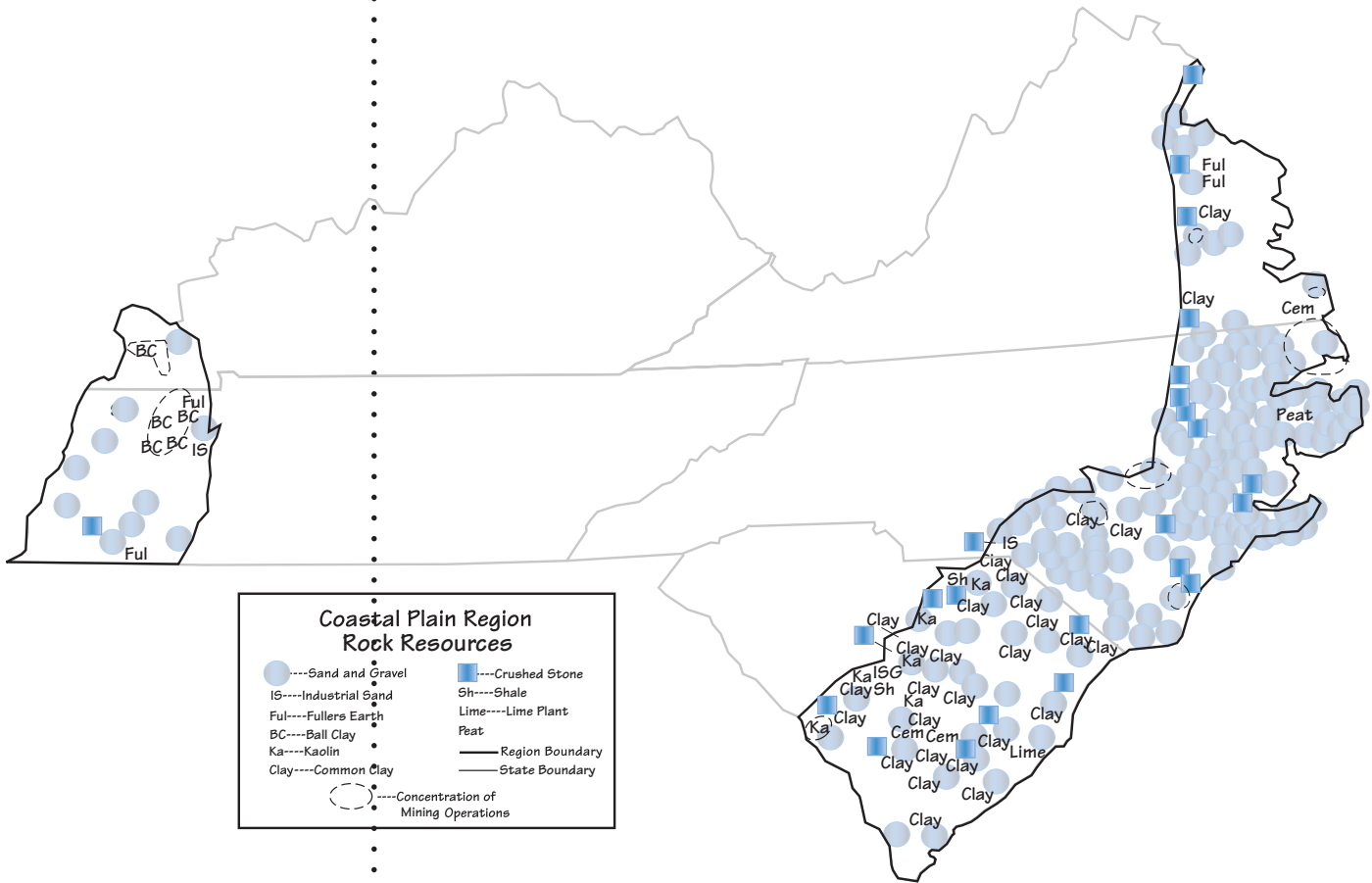


Figure 5.4: Principal rock resource-producing localities of the northern section of the Southeast Coastal Plain region. Figure adapted from 1998 United States Geological Survey State Mineral Information, <http://minerals.usgs.gov/minerals/pubs/state/>



The primary rock resources of the Coastal Plain are the layers of sediment eroded during the Cretaceous, Tertiary and Quaternary from the Appalachian Mountains (FIGURE 5.3 and 5.4). Because unconsolidated sediment (not rock yet!) dominates the region, the Coastal Plain region has few solid rock resources at or near the surface except in Florida where sediment cover is locally thin.



Rock Resources

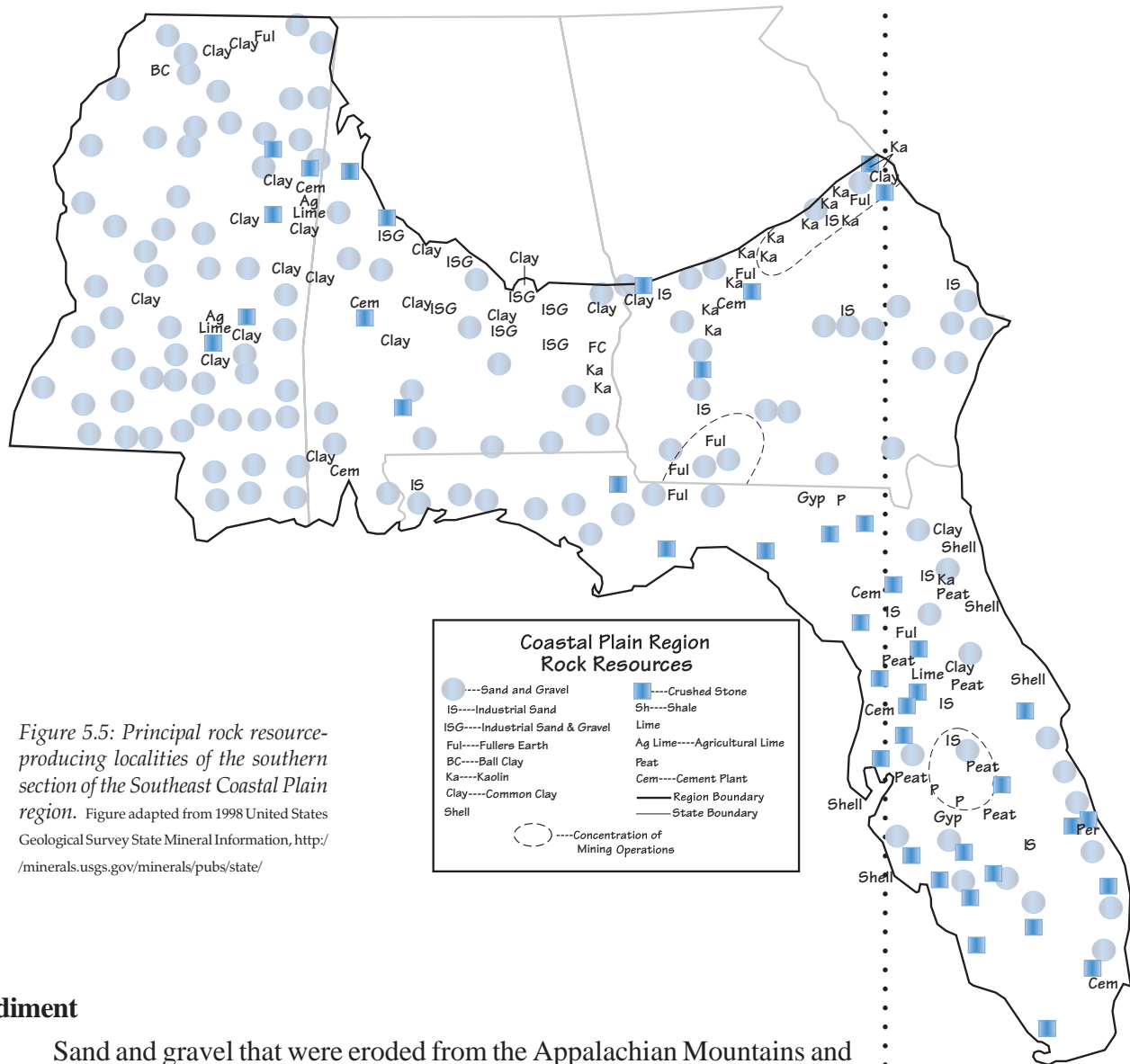


Figure 5.5: Principal rock resource-producing localities of the southern section of the Southeast Coastal Plain region. Figure adapted from 1998 United States Geological Survey State Mineral Information, <http://minerals.usgs.gov/minerals/pubs/state/>

Sediment

Sand and gravel that were eroded from the Appalachian Mountains and redistributed by rivers and the ocean blanket the Coastal Plain. These materials (along with clay) are the dominant natural resource mined on the Southeast Coastal Plain because they are abundant along the coast, in rivers, and along river terraces. Sand and gravel are primarily used in concrete, and road fill. The Coastal Plain region also produces *industrial sand* as in the other regions.

Clay deposits, extremely abundant in the Coastal Plain region, also were originally eroded from the mountains and redistributed. Six of the top ten clay producers in the Nation occur in the Southeast Coastal Plain, with Georgia and South Carolina in the lead. There are several types of clays, each used for different

see *Rock Resources*, p. , for more on **industrial sand**.





Rock Resources

Kaolin, fuller's earth, ball clay and common clay are each composed of different types of clay minerals, giving the various clays distinctive properties.

Clay	Clay Minerals
kaolin =	kaolinite
fuller's earth =	montmorillonite
ball clay & common clay =	illite/montmorillonite

China clay (also known as kaolin clay) is the main ingredient in fine china dishes such as Wedgewood. Before the Revolutionary War kaolin from South Carolina was exported to England for production of Wedgewood pottery and china.

At one time, people known as fullers cleaned sheep's wool before it was spun. The wool was cleaned using a very absorbent type of clay derived from volcanic ash that became known as **fuller's earth**. Dusting this clay through the sheep's wool absorbed dirt and grease, and made the wool easier to spin.



purposes: **kaolin**, **fuller's earth**, **ball clay** and **common clay**.

Kaolin is earthy white clay, also known as **china clay**. Deposits of kaolin clay occur along the western margin of the Coastal Plain along a 300-mile-long trend from Aiken, South Carolina, through Macon, Georgia, to Eufaula, Alabama (Figure 5.6). These clays are formed from the weathering of the crystalline rocks of the piedmont and occur as lenses in sediments of Late Cretaceous to Tertiary age. Mining of these deposits accounts for around

90% of total United States kaolin production and 40% of global production. Remaining resources are estimated at billions of tons. Kaolin is used in the manufacture of ceramics such as fine porcelain, as a paper coating, in refractories, and as an additive in rubber products, fertilizers, cosmetics, and detergents. **Fuller's earth** is another type of earthy clay with a moisture content that is higher than other clays. Because it naturally absorbs water, it is used in the manufacture of kitty litter, as an adsorbent in refining oils, and as an additive to various types of pastes and putties. Ball clay is a plastic clay that got its name in England, where it was rolled into balls of a certain size for sale. Ball clay is used as a bonding agent in the manufacture of ceramics and is common in the upper Mississippi River Embayment. Common clay is used in the manufacture of bricks, lightweight aggregate, cement, and other structural clay products. In fact, North Carolina is annually the Nation's leader in brick production because of its common clay resources. The extremely fine-grained, smooth nature of pure clay, which makes it ideal for a variety of industrial uses, is a result of its environment of deposition. Clay-sized particles do not settle to the bottom of an ocean or river unless the water is barely moving. Thus, the main sources of clay are the marine shales of the westward reaches of the Paleozoic inland ocean.

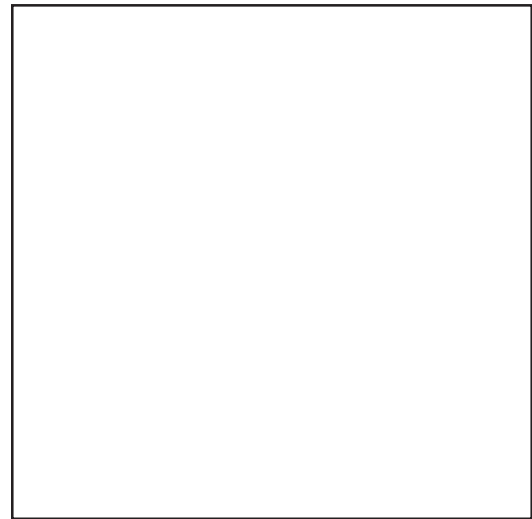


Figure 5.6: The 300-mile long kaolin clay deposit.





Peat

Some of the largest swamps in the Nation are found in the Coastal Plain region of the Southeast, including the Everglades of Florida, the Okefenokee Swamp of Georgia, and the Great Dismal Swamp of Virginia and North Carolina. Swamps, bogs and marshes have abundant vegetation. Thick piles of plant material accumulate as the vegetation naturally dies, and are buried by successive layers of dead plants. This creates a low-oxygen environment in which the plant material is not being decomposed. The more the layers are buried, the more they are squeezed and compressed and gradually they become peat. With further compression, the organic material becomes lignite and then coal. Not surprisingly, peats produced in these swampy environments are a valuable resource in Coastal Plain region. Florida is the top peat producer in the Nation. Peats are used in potting soil, as a soil conditioner, insulation for packing fruits and vegetables and as a protein additive in cattle food.

Sedimentary rock

Although sedimentary rock commonly is not exposed at the surface in the Coastal Plain region, sedimentary bedrock is mined in many quarries where sediment and soil cover are thin. **Limestone** is quarried as a building stone and to make crushed stone. Some of the Cretaceous and less commonly the Tertiary layers of sediment at the surface in the Coastal Plain have been sufficiently hardened for use as a dimension stone. In Alabama, the Tertiary Marianna Limestone, though soft enough to be cut with a saw, hardens upon exposure and was commonly used as a **dimension stone** in southern Alabama. Crushed stone is principally used as construction aggregate and in the manufacture of cement and lime. Because much of Florida was deposited as a carbonate platform, there are extensive carbonate (limestone and dolomite) resources near the surface. Florida is one of the top producers of crushed stone in the Nation, and annually leads the Nation in the manufacture of masonry cement. There are two varieties of cement: natural and Portland cement. Both types incorporate limestone. Natural cement uses limestone with a particular amount of clay as a hardener. Portland cement is made through a heated combination of limestone with other rocks and minerals. Concrete consists of gravel, pebbles, and broken rock with a cement matrix.

see *Fuel Resources*,
p. , for more on **peat**.



Shell **limestone** (*coquina*) can also be easily cut into dimension stone, and was used in many historic buildings of St. Augustine, Florida, including the Castillo de San Marcos, the first permanent European settlement in the United States.

Dimension stone is the commercial term applied to quarried blocks of rock cut to specific dimensions and used for buildings, monuments, facing and curbing.

