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Evolution of Southern Appalachian Drainage and its Effect on Sedimentation in the Gulf of Mexico

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ABSTRACT

Rivers of the eastern United States were initiated during the latest Triassic on the flanks of a continental-scale dome whose central axis was near the present coastline. The flanks of the dome were cut by four or more parallel sets of northeast-trending rift grabens: the easternmost and the eastern side of the dome were reduced to sea level during the Jurassic and Cretaceous by marine erosion. Rivers flowed either northwest down the western flanks of the dome, southeast down the marine-cut slope of the old eastern flank, or northeast along the axes of the old Triassic grabens. Most of the sediment eroded from the western flank of the dome was later deposited in the Gulf of Mexico, but the amount and type of this sediment has varied greatly through time.

There are differing opinions on whether these variations in sediment yield were due to episodes of rapid uplift or to events of major stream capture on a landscape that was mostly at equilibrium. This paper begins an attempt to answer that question.

Most Piedmont rivers have similar low-gradient profiles lacking pronounced knickpoints. Northwest-flowing streams have widely differing profiles and pronounced knick points separating reaches of low stream gradient. The Yadkin and the Catawba rivers have used the Brevard Zone to dismember lower reaches of a northeast-flowing river, moving the divide westwards. The South Carolina Green River has beheaded the major stem of the French Broad, also moving the divide westward. Areas of relatively low-relief topography of widely differing sizes and at very variable elevations between 2000 feet and 4000 feet above sea-level reflect periods of landscape stability.

NOTES
