
Appalachian tectonic maps

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Tectonic maps have been employed to portray the relationships between large and small tectonic units for many decades. A 1961 USGS-AAPG tectonic map of the U.S. portrayed the Appalachians in a pre-plate tectonics context. P. B. King's 1969 North American tectonic map was produced at the dawn of widespread infusion of plate tectonics theory into geoscience, but at a time when we were on the threshold of extensive detailed geologic mapping in the internides of the Appalachians. Because of this, while most major boundaries on King's map in western North America survived into W. R. Muehlberger's 1996 AAPG "Tectonic map of North America," those in the Appalachians internides mostly did not. King's 1970 tectonic map of the southern and central Appalachians was an improvement on the 1961 and 1969 tectonic maps, but it also suffered from a lack of new data on the internides.

Harold Williams' monumental 1978 "Tectonic-Lithofacies Map of the Appalachians" produced the first modern tec-

tonic map covering the entire orogen and portrayed the entire Appalachians at a convenient scale (1:1 000 000 and 1:2 000 000), where state-of-the-art details could be shown, and the differences between the northern and southern-central Appalachians were more apparent. Throughgoing elements also became more obvious. It became the basis for the first application of the suspect terranes concept to the whole orogen in the early 1980s, and is still a useful compilation. The 2006 Hibbard, van Staal, Rankin, and Williams lithotectonic map updates the 1978 map and attempts to interpret the components of the Appalachians in terms of tectonic kindred, to apply a modified version of Williams' 1970s Newfoundland model throughout the orogen and to accurately depict the shapes of plutons and other elements.

J.D. Keppie's 1982 map of the New England and Canadian Maritime Appalachians delineated most of the tectonostratigraphic terranes and plutons that we still recognize, except for those added recently in Newfoundland. The Hatcher, Osberg, Drake, Robinson, and Thomas 1989 DNAG "Tectonic map of the U.S. Appalachians" attempted to integrate the terranes concept and accurately depict the shapes of plutons and known tectonic units.

Prior to the 1989 Thomas, Chowns, Daniels, Neathery, Glover, and Gleason paleogeologic map of the subsurface Appalachians beneath the Coastal Plain and the 1991 Horton, Drake, Rankin, and Dallmeyer terrane map of the southern and central Appalachians, few attempts had been made to portray and compile the geology beneath the Gulf and Atlantic Coastal Plains in a modern context. Today it is possible to produce a tectonic map of the southern and central Appalachians that includes interpretation of subsurface geology from modern compilations of potential field and drill data. For example, these data reveal the much greater extent of the Alleghanian eastern Piedmont fault system, internal structure of the Inner Piedmont, the possible Carolinian affinity of the Brunswick terrane, and much better resolution of the Wiggins-Suwannee suture and failed rift.

Doubtlessly, future tectonic maps will greatly improve these maps as new techniques are invented, new data become available, and more of the internides are mapped in detail.