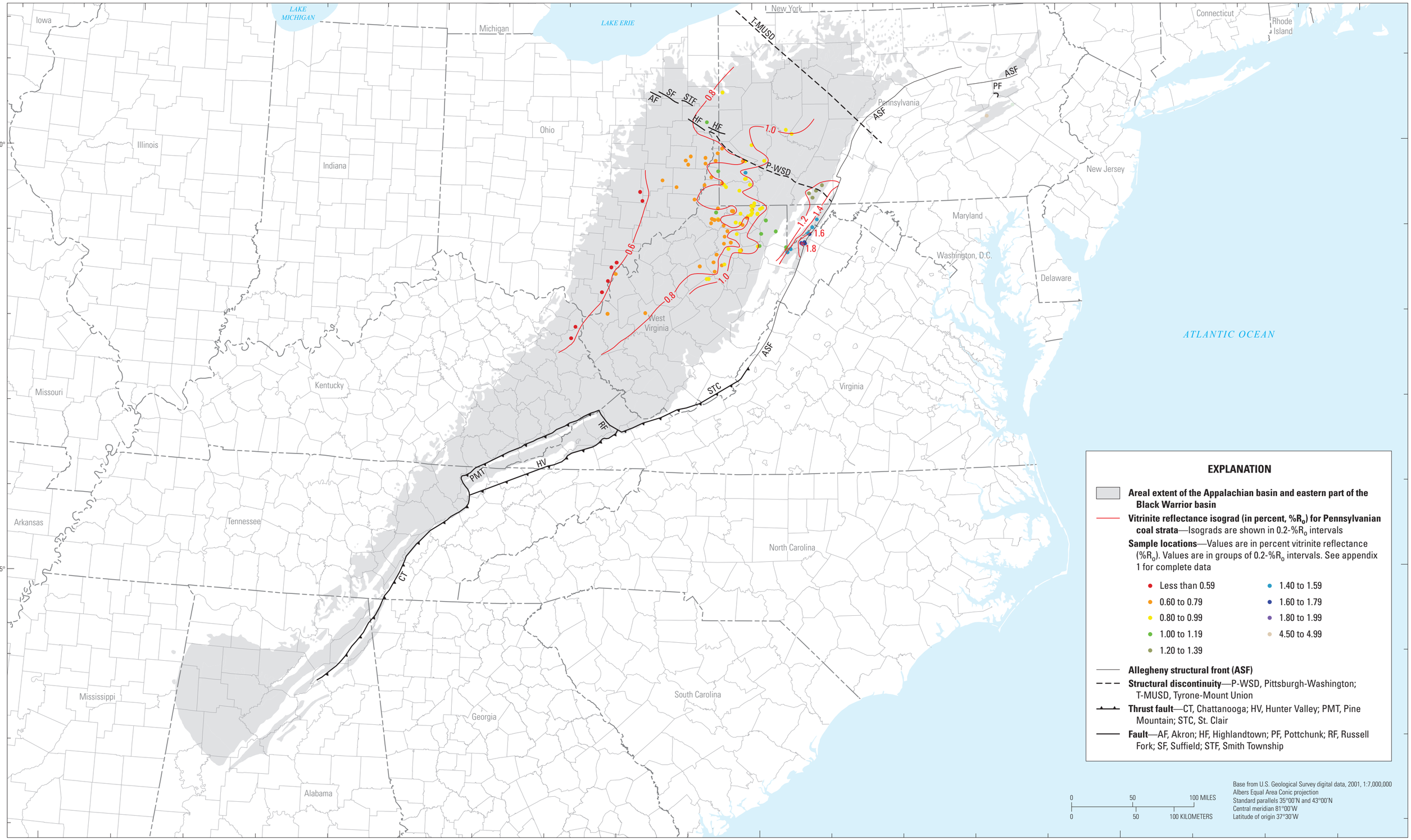

Figure 6. Map showing smoothed percent-vitrinite-reflectance ($\%R_o$) isograds for Upper Pennsylvanian coal beds in the Appalachian basin, based on 112 individual and averaged percent-vitrinite-reflectance measurements obtained from the Penn State Coal Sample Bank and Database (Penn State Earth and Mineral Sciences Energy Institute, 2011), unpublished databases (James C. Hower, unpub. data, 2005; J.C. Hower and Cortland F. Eble, Kentucky Geological Survey, unpub. data, 2005; John C. Crelling, Southern Illinois University at Carbondale, unpub. data, 2005; William C. Grady, West Virginia Geological and Economic Survey, unpub. data, 2005; U.S. Geological Survey, unpub. data, 2005), two unpublished doctoral dissertations (Hower, 1978; Rimmer, 1985), and published sources (see appendix 1).