



Figure 3. Map showing smoothed percent-vitrinite-reflectance (% R_0) isograds for Pennsylvanian coals in the Appalachian basin and the eastern part of the Black Warrior basin, based on individual and averaged percent-vitrinite-reflection measurements of coal beds or coal zones from 1,868 locations. Vitrinite-reflectance values were 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from the Penn State Coal Sample Bank and Database (Penn State Earth and Mineral Sciences Energy Institute, 2011), unpublished databases (James C. Hower, unpub.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 data, 2005), two unpublished doctoral dissertations (Hower, 1978; Rimmer, 1985), and published sources (see appendix 1).