



**EXPLANATION**

- Areal extent of the Appalachian basin and eastern part of the Black Warrior basin**
- Vitrinite reflectance isograd (in percent, %R<sub>0</sub>) for Pennsylvanian coal strata**—Isograds are shown in 0.2-%R<sub>0</sub> intervals
- Sample locations**—Values are in percent vitrinite reflectance (%R<sub>0</sub>). Values are in groups of 0.2-%R<sub>0</sub> intervals. See appendix 1 for complete data

<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: red; border-radius: 50%; margin-right: 5px;"></span> Less than 0.59</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: orange; border-radius: 50%; margin-right: 5px;"></span> 0.60 to 0.79</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: yellow; border-radius: 50%; margin-right: 5px;"></span> 0.80 to 0.99</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightgreen; border-radius: 50%; margin-right: 5px;"></span> 1.00 to 1.19</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border-radius: 50%; margin-right: 5px;"></span> 1.20 to 1.39</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: blue; border-radius: 50%; margin-right: 5px;"></span> 1.40 to 1.59</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: darkblue; border-radius: 50%; margin-right: 5px;"></span> 1.60 to 1.79</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border-radius: 50%; margin-right: 5px;"></span> 1.80 to 1.99</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: brown; border-radius: 50%; margin-right: 5px;"></span> 4.50 to 4.99</li> </ul>
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- Allegheny structural front (ASF)**
- Structural discontinuity**—P-WSD, Pittsburgh-Washington; T-MUSD, Tyrone-Mount Union
- Thrust fault**—CT, Chattanooga; HV, Hunter Valley; PMT, Pine Mountain; STC, St. Clair
- Fault**—AF, Akron; HF, Highlandtown; PF, Potchunk; RF, Russell Fork; SF, Suffield; STF, Smith Township

0 50 100 MILES  
 0 50 100 KILOMETERS  
 Base from U.S. Geological Survey digital data, 2001, 1:7,000,000  
 Albers Equal Area Conic projection  
 Standard parallels 35°00'N and 43°00'N  
 Central meridian 81°00'W  
 Latitude of origin 37°30'W

**Figure 6.** Map showing smoothed percent-vitrinite-reflectance (%R<sub>0</sub>) 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).