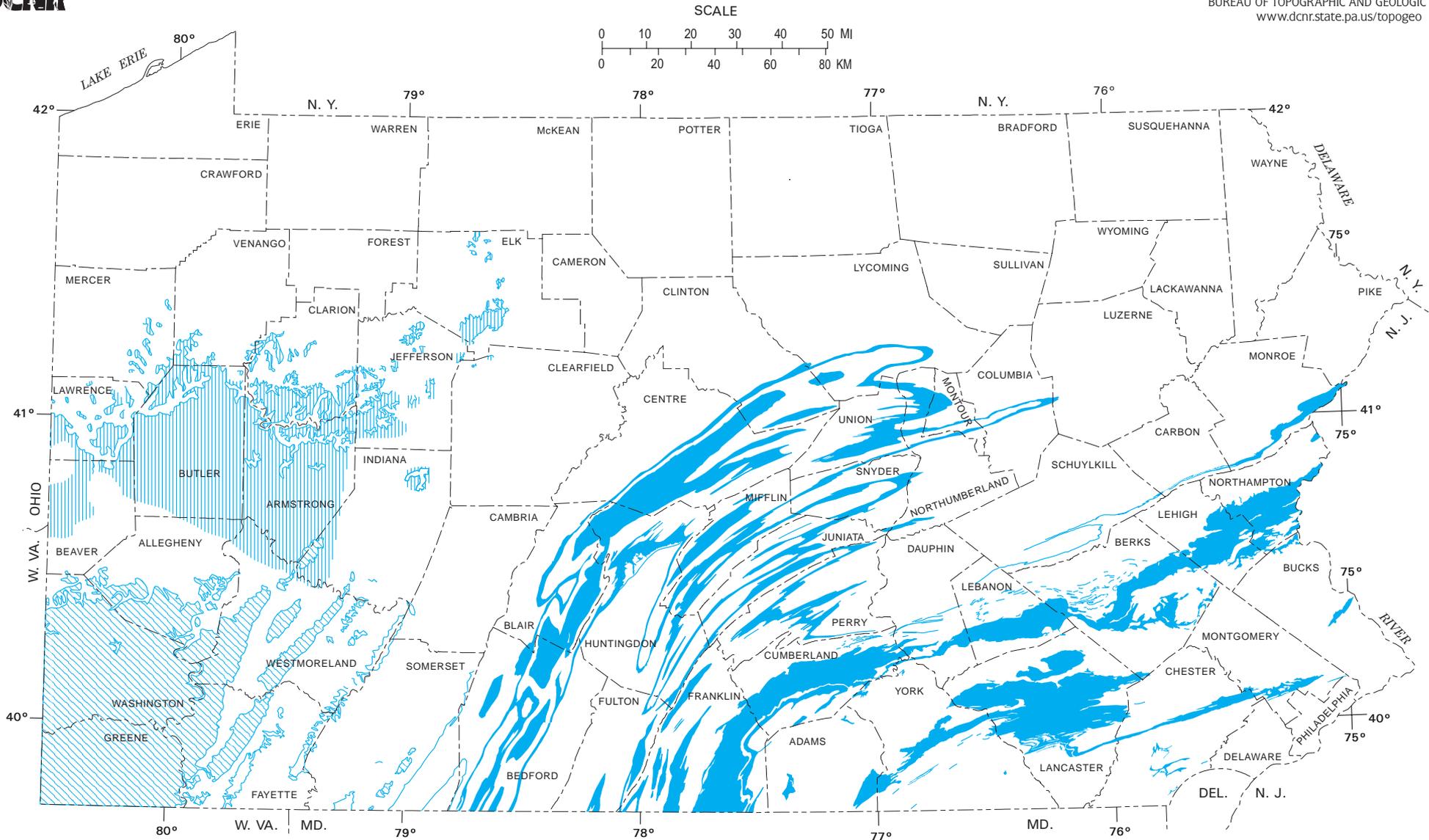


# LIMESTONE AND DOLOMITE DISTRIBUTION IN PENNSYLVANIA



**EXPLANATION**



Area where limestone, dolomite, or both are at the surface. Layers are usually strongly folded and steeply dipping. Includes economically important high-calcium limestones of the Kinzers, Annville, Benner, and Keyser Formations and the Cockeysville Marble, as well as the high-magnesian dolomites of the Ledger Formation and the Cockeysville Marble. This area is most susceptible to sinkhole development.

Area underlain by flat-lying, generally thin, but locally thick, limestone beds, which are discontinuous in places and are commonly interbedded with shale.

Area underlain by the generally flat lying Pennsylvania Vanport Limestone, a high-calcium limestone. This limestone is generally overlain by less than 100 feet of sedimentary rocks, except in the southern part of the area.

## LIMESTONE AND DOLOMITE DISTRIBUTION IN PENNSYLVANIA

Carbonate rocks, consisting of limestone and dolomite, are significant among the great variety of rock types in Pennsylvania. These rocks affect man's activities in three major ways: as hazards, as mineral resources, and as groundwater reservoirs. This map shows the distribution of limestone and dolomite in Pennsylvania and will be of assistance to those engaged in planning and development in these carbonate areas.

**HAZARDS**—Carbonate rocks can present potential construction problems and hazards due to the presence of solution cavities and bedrock irregularities in the subsurface and sinkholes at the surface. The cavities are the result of the gradual dissolving of the rock by water, particularly along fractures or joints. In turn, joints and cavities are enlarged and can form caves. Related features, such as surface depressions and sinkholes, are caused by the movement of surficial materials into the cavities shaped by the dissolving process. Sinkholes also can result from the collapse of the roof of a cave. Because the potential exists for sinkhole development in most of the carbonate rocks of Pennsylvania, areas underlain by these rocks should receive a thorough subsurface investigation prior to construction so that remedial measures may be designed to cope with these hazards. These investigations should include local geologic mapping, test borings, and possibly geophysical surveys to establish subsurface conditions for such structures as highways, dams, bridges, disposal sites, transmission lines, and buildings.

**RESOURCES**—Limestone ( $\text{CaCO}_3$ -rich) and dolomite ( $\text{MgCO}_3$ -rich) are major sources of mineral raw materials for the construction, agricultural, and manufacturing indus-

tries of the Commonwealth. Except for coal, carbonates are the major rock type mined in Pennsylvania, accounting for about 80 percent of all nonfuel mineral production. Significant uses of mined limestone and dolomite in Pennsylvania include (1) crushed stone for roads, concrete, and railroads; (2) agricultural lime and grit; (3) the manufacture of cement; (4) fluxstone and refractory materials for the steel industry; (5) acid neutralization; (6) raw material for the glass industry; and (7) mineral fillers and whiting. Thus, the carbonates in various parts of Pennsylvania should be recognized as a valuable mineral resource, and land use planners should take this into account.

**WATER**—Because of the development of solution cavities in carbonate rocks, these rock formations may contain and yield large quantities of underground water. Areas underlain by limestones and dolomites may supply the water needs of a community through the proper development of the subsurface water resources. Those charged with the planning and development of water supplies should recognize the existence of this valuable underground water source.

The permeable nature of the carbonate rocks also makes them natural conduits for conveying solid and liquid wastes. Using these conduits, contaminants can rapidly enter the groundwater system and travel long distances underground over a relatively short period of time. Therefore, it is important to be particularly careful in conducting industrial, agricultural, or construction activities in limestone-dolomite areas to prevent the contamination of valuable groundwater resources.

### STATEWIDE REFERENCES

- ES 11 *Sinkholes in Pennsylvania*, W. E. Kochanov, 1999, 33 p.
- G 66 *Geology and biology of Pennsylvania caves*, W. B. White, ed., 1976, 103 p.
- Map 1 *Geologic map of Pennsylvania*, T. M. Berg, W. E. Edmunds, A. R. Geyer, and others, compilers, 2nd ed., 1980. Scale 1:250,000 (1 inch=4 miles), 3 sheets.
- M 20 *Limestones of Pennsylvania*, B. L. Miller, 1934, 729 p.
- M 50 *Atlas of Pennsylvania's mineral resources*.  
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- Part 4, The distribution of limestones containing at least 90 percent  $\text{CaCO}_3$  in Pennsylvania*, B. J. O'Neill, Jr., 1976, 2 p., 1 map, scale 1:500,000.
- M 83 *Reconnaissance survey of potential carbonate whiting sources in Pennsylvania*, S. W. Berkheiser, Jr., 1983, 53 p.

### OTHER PUBLICATIONS

**PUBLICATIONS ON LIMESTONES AND DOLOMITES**—For publications dealing with limestones and dolomites in local areas of Pennsylvania, please refer to *Pennsylvania Geological Publications*, available on-line at [www.dcnr.state.pa.us/topogeo/pub/pub.htm](http://www.dcnr.state.pa.us/topogeo/pub/pub.htm), and upon request from the Pennsylvania Geological Survey, Department of Conservation and Natural Resources, P. O. Box 8453, Harrisburg, Pa. 17105-8453.

**OPEN-FILE REPORTS**—Open-file reports on sinkholes and karst-related features of various counties in central and southeastern Pennsylvania are available for inspection at the Pennsylvania Geological Survey office in Harrisburg; copies of these county reports are also available for a price to cover copying and handling. For further information, please contact the Survey at the address listed in the previous paragraph.