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Indiana Geologic Names Information System: Details

LOUISVILLE LIMESTONE, LOUISVILLE MEMBER

Age:

Silurian

Type designation:

Type locality:

The Louisville Limestone was named by Foerste (1897, p. 218, 232) for about 60 ft (18 m) of light-colored to medium brown fine-grained thick-bedded argillaceous limestone and dolomitic limestone exposed in and just east of Louisville, Jefferson County, Kentucky, where many good exposures remain, including in road cuts along the interstate highway system (Shaver, 1970; Droste and Shaver, 1986).

History of usage:

Droste and Shaver (1986) noted that from the time of its first introduction, the name “Louisville” was applied in many Indiana reports to rocks in the southeastern Indiana outcrop area that had been considered to be the top part of the Niagara Group, which was true, considering that the Devonian truncation of older rocks extends well down in the Silurian section in that area.

Droste and Shaver (1986) stated that the name was also applied at an early time in northern Indiana (see Cumings, 1922, p. 455-456) but with great confusion, as much of the application was to rocks considerably younger than the Louisville and as the actual Louisville extension northward was often mislabeled as the younger Liston Creek Limestone because of the commonality of chert in these two different units. The correct application in northern Indiana began with John B. Patton in 1954 as recorded by Shaver and others (1961, p. 15 see also p. 13) and as furthered by Pinsak and Shaver (1964, p. 31-33). Becker (1974, p. 20) established definitive use of the name in the Illinois Basin part of southwestern Indiana (Droste and Shaver, 1986).

Droste and Shaver (1982, p. 11) recommended that the use of the name “Louisville” be dropped in northern Indiana and the pertinent rocks be assigned as an upper, unnamed member of the then-new Pleasant Mills Formation. Later, Droste and Shaver (1986) noted that the abandonment of "Louisville" in this area proved to be unsatisfactory, as the name has been used even in adjacent Ohio (Griest and Shaver, 1982, p. 377 and 380), and the term Louisville-equivalent rocks has been appearing in northern Indiana-based reports (for example, Ault and Carr, 1983, and Shaver and Sunderman, 1983). For these reasons, Droste and Shaver (1986) reintroduced the term Louisville to northern Indiana use as the Louisville Member of the Pleasant Mills Formation.

Description:

Becker (1974, p. 20) noted that in the subsurface of southern Indiana the Louisville Limestone is characteristically limestone and dolomitic limestone that is light olive to light gray (5 Y 6/1 to N 7), fine to medium grained, and in places shaly and cherty.

The Louisville normally ranges between 40 and 75 ft (12 and 23 m) in thickness, and the thicker sections are westward and northward (Droste and Shaver, 1986). Near the Fort Wayne Bank, nonreefy to somewhat reefy Louisville rocks are as thick as 145 ft (49 m) (Droste and Shaver, 1982, p. 38).

Distribution:

Droste and Shaver, (1986) reported that the type-Louisville lithology is present in much of the southern Indiana outcrop area along the west flank of the Cincinnati Arch and in the southwestern subsurface area. The argillaceous facies, particularly in the lower part, extends well northward into the area of application of the name, but farther north and northwestward clastic and calcareous contents decrease, so that these rocks become fairly pure dolomite in northern Indiana (Droste and Shaver, 1986). Chert is common, both in the southwestern subsurface and in the area of outcrop in eastern northern Indiana. The Louisville has a reef facies and this facies is present in a great many pinnacle or patch reefs, southwestern to northern Indiana, and in a lower part of the barrierlike, Michigan Basin-fringing Fort Wayne Bank (Droste and Shaver, 1986).

Although reeflike rocks, bearing stromatoporoids and many tabulate and rugose corals, are present in the southeastern outcrop area, true reefs, complete with topographic relief, are not known in this area (Droste and Shaver, 1986).

Boundaries:

Droste and Shaver (1986) state that Louisville rocks in Indiana are underlain conformably nearly everywhere by the Waldron Shale (Waldron Formation, Waldron Member) and with a conspicuous transitional zone in some places that involves terrigenous clastic sediments well up into the otherwise rather pure carbonate rocks. In far western counties, however, the Louisville lies directly, but conformably, on Salamonie rocks because so few of the Waldron type of sediments are present in that area that Waldron recognition becomes impractical (Droste and Shaver, 1986).

The Louisville is overlain conformably nearly everywhere in its area of Indiana recognition by the Mississinewa Shale Member of the Wabash Formation or, simply, by cherty to pure carbonate rocks of the Wabash where the Mississinewa type lithology is absent (Droste and Shaver, 1986). This contact also involves transitional rocks and as a classificatory procedure the contact is placed at the very bottom of the transitional lithology (Rexroad, Noland, and Pollock, 1978, p. 2). Along part of the area of southeastern Indiana outcrop, the pre-Middle Devonian unconformity overlaps the Mississinewa Shale Member (Silurian), so that rocks of the Muscatatuck Group rest directly on the Louisville (Droste and Shaver, 1986).

The Louisville Limestone, classified at formation rank, has a northern and northwestern vertical cutoff boundary with the Pleasant Mills Formation along a line defined by the southernmost and southwestwardmost limit of the Limberlost Dolomite Member (Pleasant Mills Formation, Salina Group) (Droste and Shaver, 1986). Northward and eastward of this Limberlost limit, the Louisville Member (Pleasant Mills Formation) extends approximately to a line extending from central LaPorte County to central Allen County, that is, to positions along the bottom part of the Fort Wayne Bank (Droste and Shaver, 1982, figs. 5-7). Farther north the Louisville Member mostly cannot be separated from the underlying Pleasant Mills rocks because of northward loss of Waldron recognition (Droste and Shaver, 1986). The Louisville Limestone also has a defined vertical cutoff relationship southwestward with the upper part of the St. Clair Limestone (Becker, 1974, p. 11, fig. 9, and pl. 2).

Correlations:

As already noted, the Louisville Limestone correlates with upper Pleasant Mills rocks of northern Indiana (named in part as the Louisville Member) and with upper St. Clair rocks in the Illinois Basin. In the latter area, probably time-equivalent rocks are also present in the lower part of the Moccasin Springs Formation; this is due to an apparent time-transgressive relationship along the St. Clair-Moccasin Springs boundary (Droste and Shaver, 1986).

The name "Louisville" is used southward across western Kentucky, but the extension of this unit in central southern Kentucky and adjacent Tennessee is called the Lego Limestone. Louisville equivalents are widely recognizable in the Great Lakes area, including northeastern Illinois, eastern Wisconsin, the Michigan Basin, western Ontario and adjacent New York, and Ohio (Droste and Shaver, 1986). Droste and Shaver (1986) noted that partial equivalencies apply to the Racine Formation, the A unit (Salina Group), the Guelph Dolomite, and the Lockport Group.

Louisville rocks coincide closely with the Zone of *Rhipidium* in the Silurian pentamerid brachiopod zonation (Berry and Boucot, 1970; Shaver and others, 1971; Indiana University Paleontology Seminar, 1976; Droste and Shaver, 1977 and 1985; and Shaver and Sunderman, 1983). Conodont investigations of the southern facies of the Louisville (Rexroad, Noland, and Pollock, 1978) show that it has close affinities with the *Kockella variabilus* Zone. These guide fossils are considered to record a late Wenlockian to early Ludlovian age (late Niagaran) (Droste and Shaver, 1986).

Regional Indiana usage:

Illinois Basin (COSUNA 11)

Supergroup: *none*

Group: *none*

Formation: *Louisville Limestone*

Illinois Basin Margin (COSUNA 12)

Supergroup: *none*

Group: *Salina Group*

Formation: *Pleasant Mills Formation*

Member: *Louisville Member*

Illinois Basin Margin (COSUNA 12)

Supergroup: *none*

Group: *none*

Formation: *Louisville Limestone*

Cincinnati Arch (COSUNA 13)

Supergroup: *none*

COSUNA areas and regional terminology

Names for geologic units vary across Indiana. The Midwestern Basin and Arches Region COSUNA chart (Shaver, 1984) was developed to strategically document such variations in terminology. The geologic map (below left) is derived from this chart and provides an index to the five defined COSUNA regions in Indiana. The regions are generally based on regional bedrock outcrop patterns and major structural features in Indiana. (Click the maps below to view more detailed maps of COSUNA regions and major structural features in Indiana.)

Group: *none*
 Formation: *Louisville Limestone*
Cincinnati Arch (COSUNA 13)
 Supergroup: *none*
 Group: *Salina Group*
 Formation: *Pleasant Mills Formation*
 Member: *Louisville Member*
Kankakee Arch (COSUNA 14)
 Supergroup: *none*
 Group: *none*
 Formation: *Louisville Limestone*
Kankakee Arch (COSUNA 14)
 Supergroup: *none*
 Group: *Salina Group*
 Formation: *Pleasant Mills Formation*
 Member: *Louisville Member*
Michigan Basin (COSUNA 15)
 Supergroup: *none*
 Group: *Salina Group*
 Formation: *Pleasant Mills Formation*
 Member: *Louisville Member*

Misc/Abandoned Names:

New Corydon Limestone

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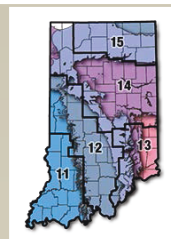
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COSUNA areas and numbers that approximate regional bedrock outcrop patterns and major structural features in Indiana.



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FOR ADDITIONAL INFORMATION CONTACT:

Nancy Hasenmueller (hasenmue@indiana.edu) or

Walter Hasenmueller (whasenmu@indiana.edu)

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