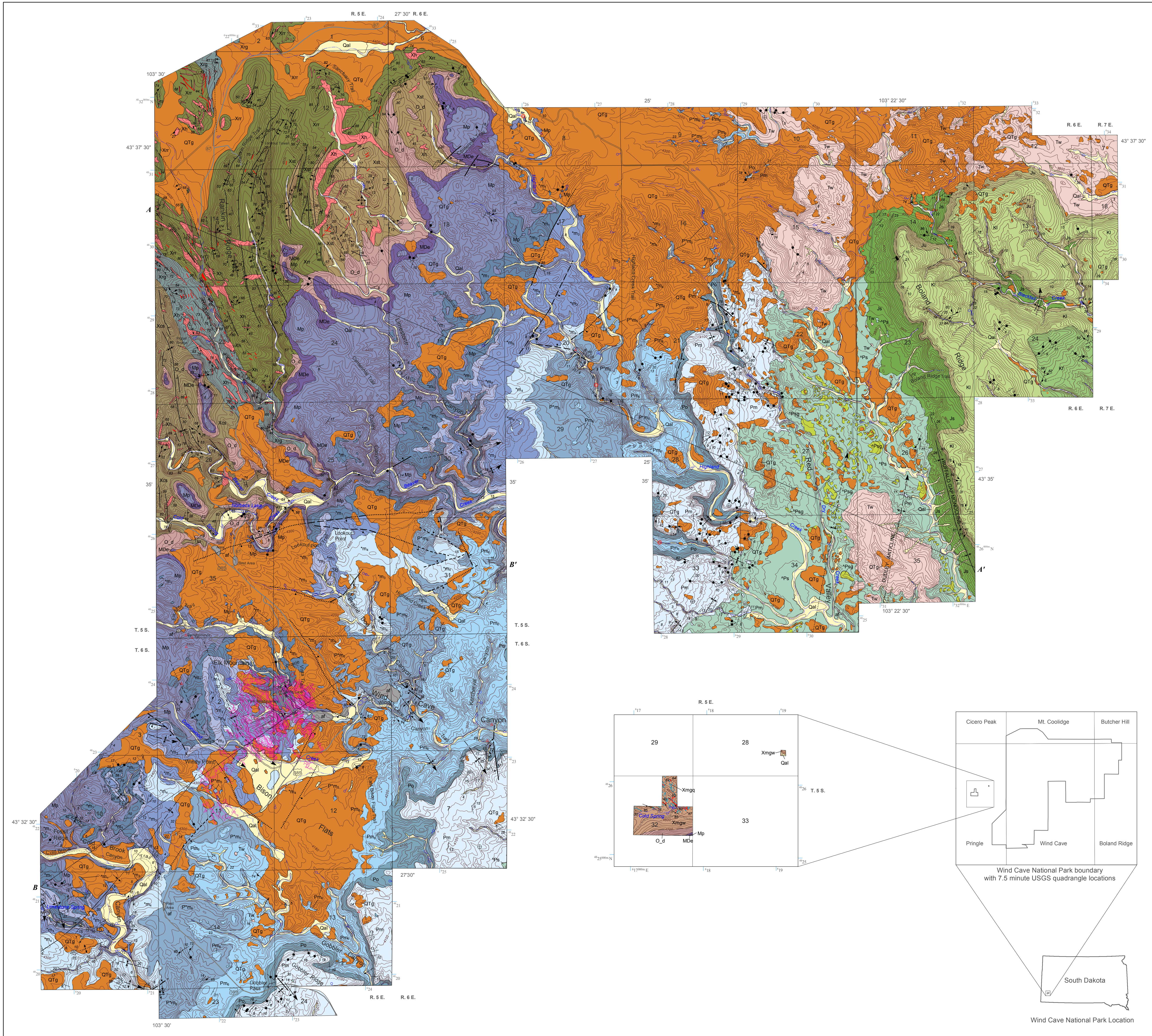


Geologic Map of Wind Cave National Park

Brian A. Fagnan, Beth Z. Lincoln¹, and Timothy N. Lincoln¹
2011

State of South Dakota
Dennis Daugaard, Governor

South Dakota Geological Survey
Derric L. Iles, State Geologist



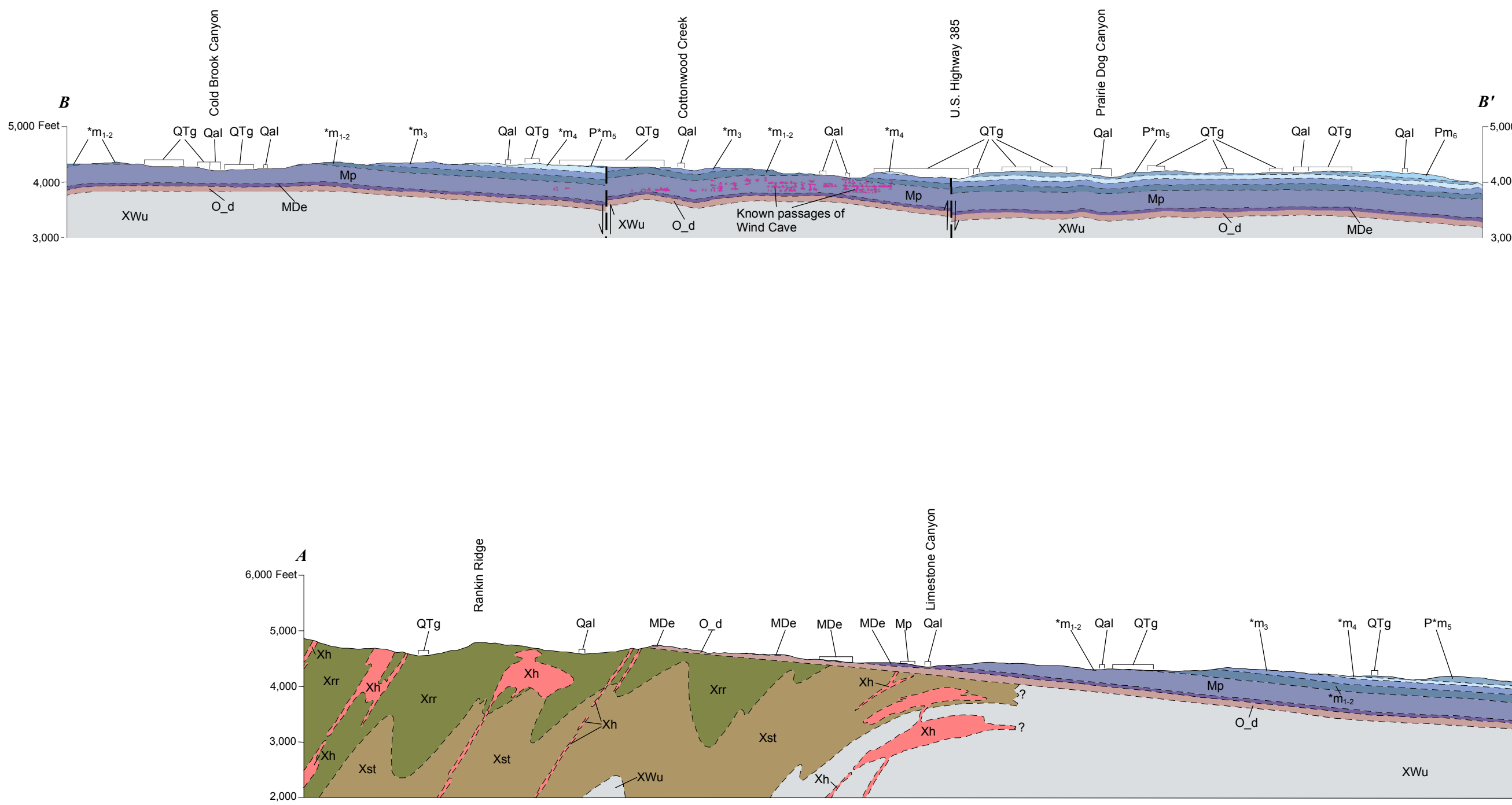
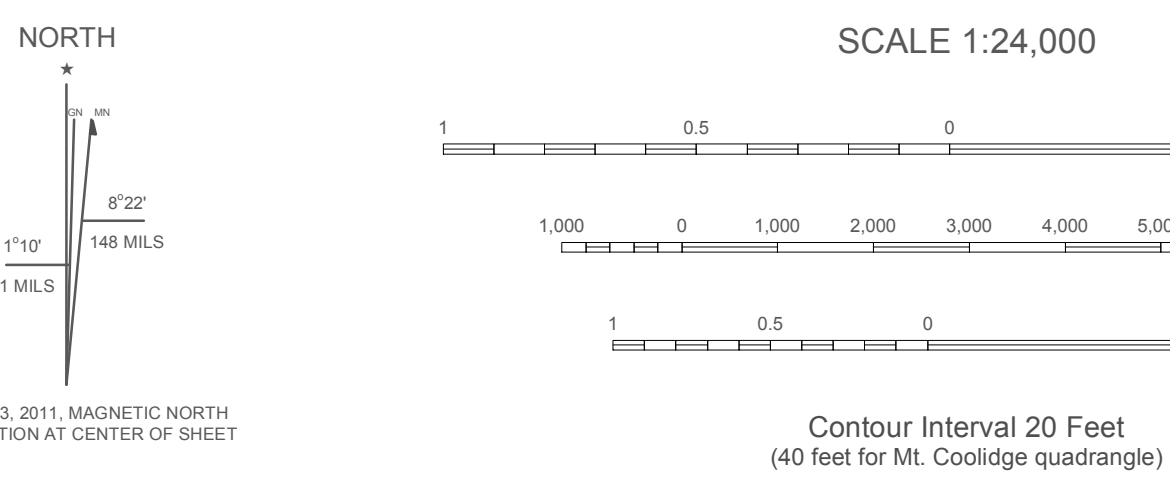
¹Albion College, Albion, Michigan

Field assisted by Darren W. Dyk and Jacob A. Tielke

Digital cartography by Wesley P. Christensen and Brian A. Fagnan

Map base modified from U.S. Geological Survey 1:24,000-scale Boland Ridge, Butcher Hill, Mt. Coolidge, Pringle, and Wind Cave digital line graphs. Projection is Universal Transverse Mercator, Zone 13 N. Datum is 1983 North American. UTM grid information generated from the Arcmap layout grid function.

The Geological Survey Program, Department of Environment and Natural Resources, engages in an ongoing data collection and interpretation process. An outcome of that process is to reflect those interpretations on maps such as this one. Reasonable efforts have been made to ensure that this map accurately reflects the source data used in its preparation. This map is date specific. As additional data become available, geologic interpretations may be revised and the map may be updated by the Geological Survey. This map should not be enlarged or otherwise used in an attempt to interpret more detail than can be seen at a scale of 1:24,000.



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Prepared in cooperation with Albion College, Albion, Michigan



EXPLANATION

Quaternary	Qal	Alluvium - Unconsolidated to loosely consolidated clay, silt, and angular to rounded, sand and gravel. Deposited in present-day drainages.	--- ---	Contact
	QTg	Gravel deposit - Unconsolidated to loosely consolidated clay- to boulder-sized clasts comprised of Precambrian lithologies and minor Paleozoic carbonates and sandstone. All gravels are sub-rounded to rounded. Some gravel deposits could be associated with the White River Group but were not differentiated in the study area.	--- ---	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Tertiary	Disconformity		-----	Form line
	Tw		-----	To indicate dip direction of beds
Oligocene to Eocene	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Cretaceous	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Cretaceous	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Upper Jurassic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Jurassic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Middle Jurassic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Triassic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Triassic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Upper Permian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Permian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Permian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Pennsylvanian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Upper Pennsylvanian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Mississippian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Mississippian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Devonian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Upper Devonian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Devonian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Ordovician	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Middle to Upper Cambrian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Cambrian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Precambrian	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Lower Proterozoic	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Unnamed formation Xq	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Micaceous metagraywacke unit	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Cold Spring Creek quartzite unit	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Reaves Gulch schist unit	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Rankin Ridge quartzite unit	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Sanctuary Trail schist unit	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.
Undifferentiated Lower Proterozoic and Upper Archean rocks	Disconformity		-----	Fault
	Tw		-----	Long dashed where approximately located; short dashed where referred only in cross section; arrow indicates contact dip direction and amount.