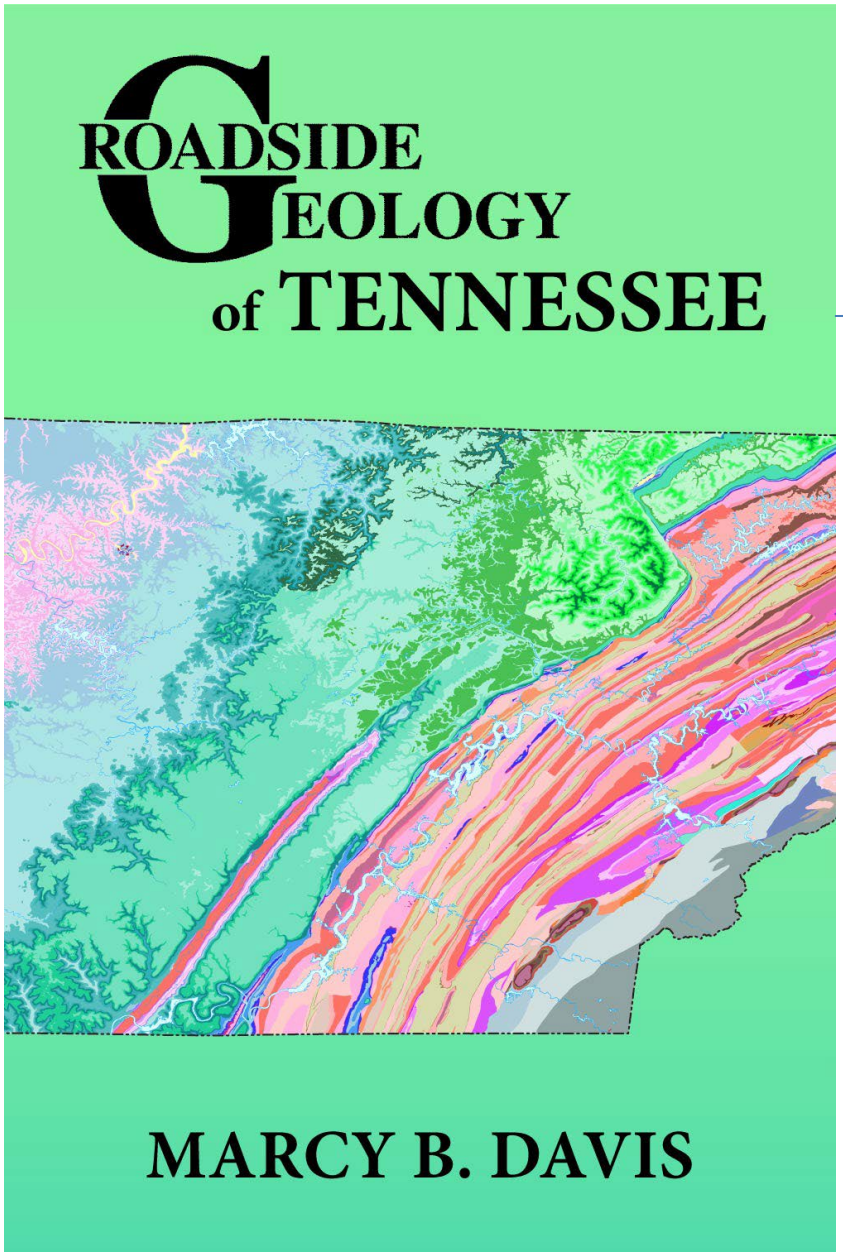
Tennessee's Natural Resources & Geology-Related Tourism

Presentation to:
The Geological Society of Minnesota
By Ronald P. Zurawski, Tennessee State Geologist Emeritus
November 2023

Presented by Ron Clendening, PG

TN Department of Environment & Conservation

Tennessee Geological Survey



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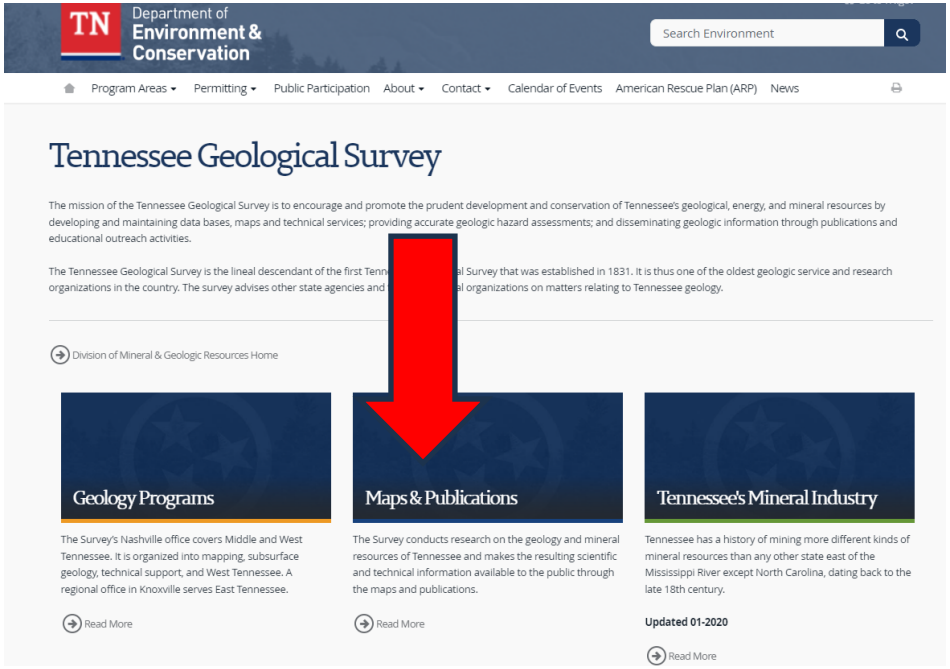
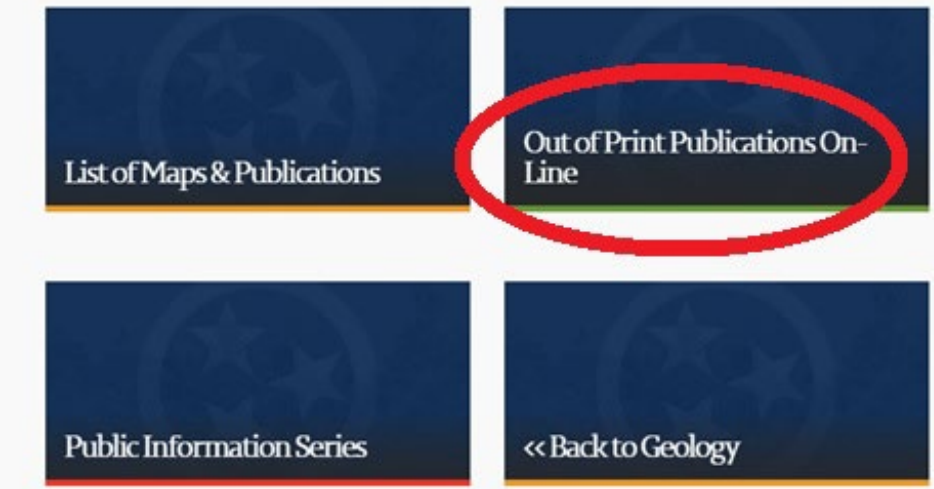
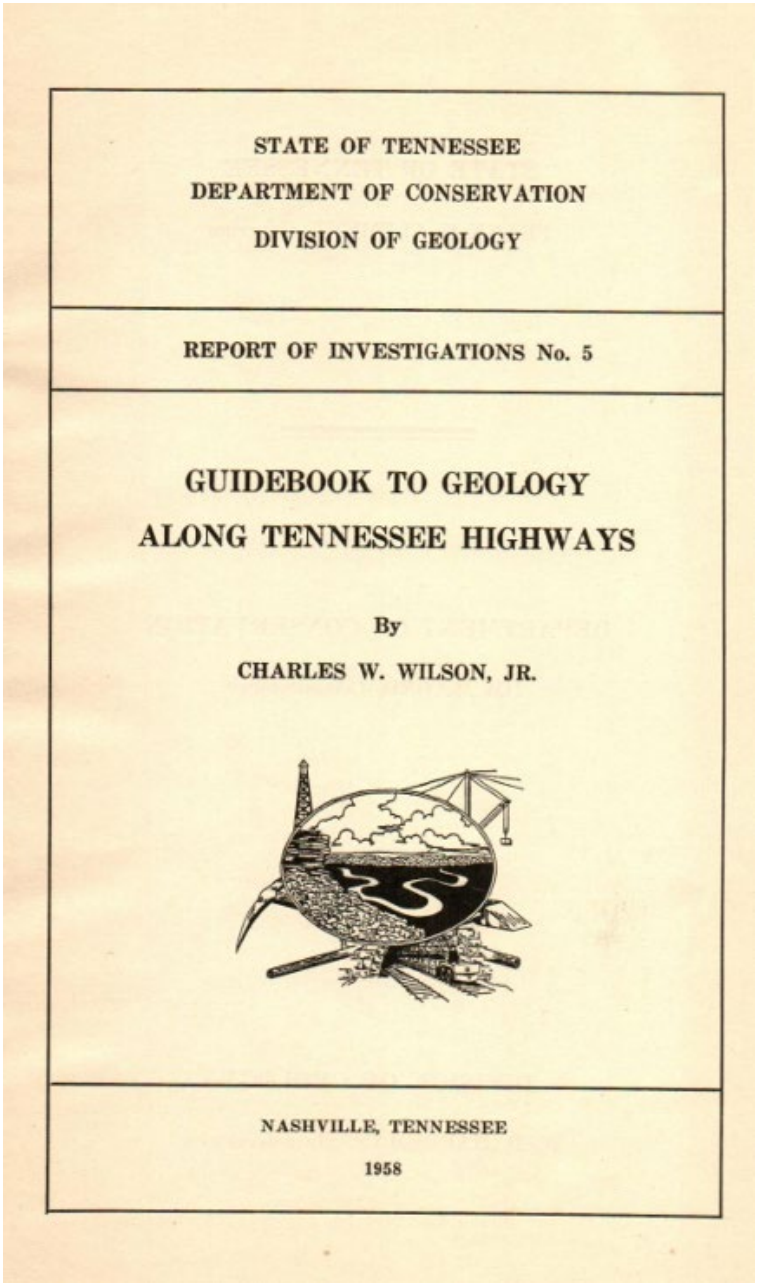
Report of Investigation #39

39. GUIDE TO THE GEOLOGY ALONG INTERSTATE HIGHWAYS IN TENNESSEE, 79 + viii p., by Robert Lake Wilson (1981). Reprinted (1987). The State of Tennessee possesses a varied topography and a geologic history representative of eastern North America. This book is designed to provide the traveler on the Interstate System a brief synopsis of the geology along each route .....






STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY

REPORT OF INVESTIGATIONS No. 5

GUIDEBOOK TO GEOLOGY
ALONG TENNESSEE HIGHWAYS

By
CHARLES W. WILSON, JR.

NASHVILLE, TENNESSEE
1958

Like the Dachshund that is a dog-and-a-half long and half a dog high, the State of Tennessee has peculiar proportions.

- Madeline Kneberg, 1952

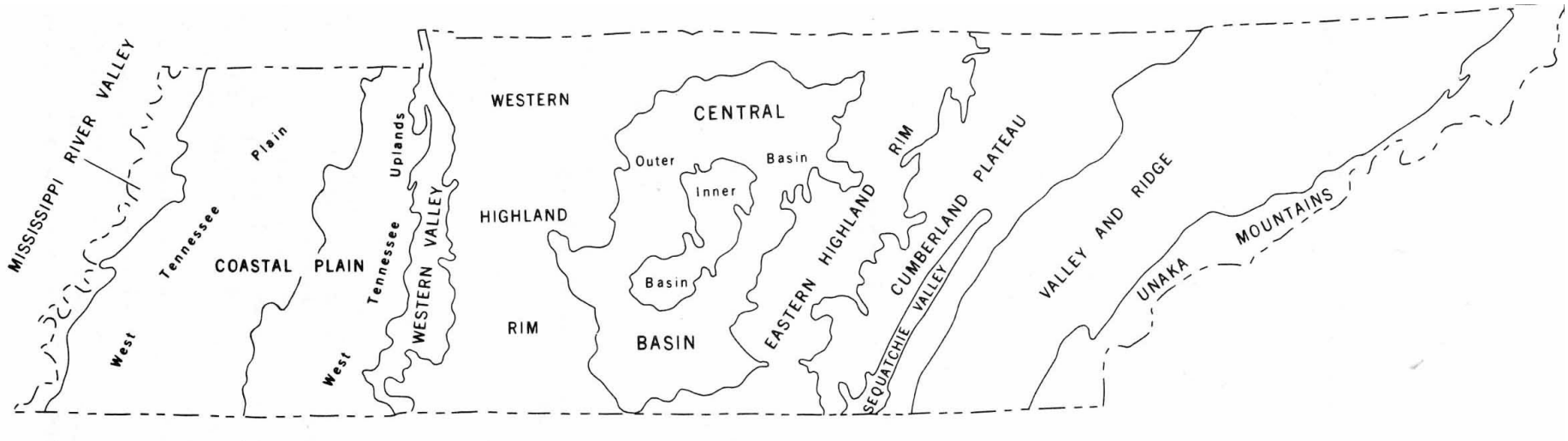
Topography

- General configuration of the earth's surface, including the shape, relief, and location of landforms and water bodies
- Tennessee's topography is among the most varied and interesting of any state in the nation, ranging from mountains in the east to wide, swampy river bottoms in the west, and with rolling hill country, deep gorges, and other features in between

Physiographic Province

- Broad area whose pattern of landforms differs significantly from other adjacent regions
- Parts of a province are closely related in geomorphic history, geologic structure, and other aspects of the physical environment, such as climate

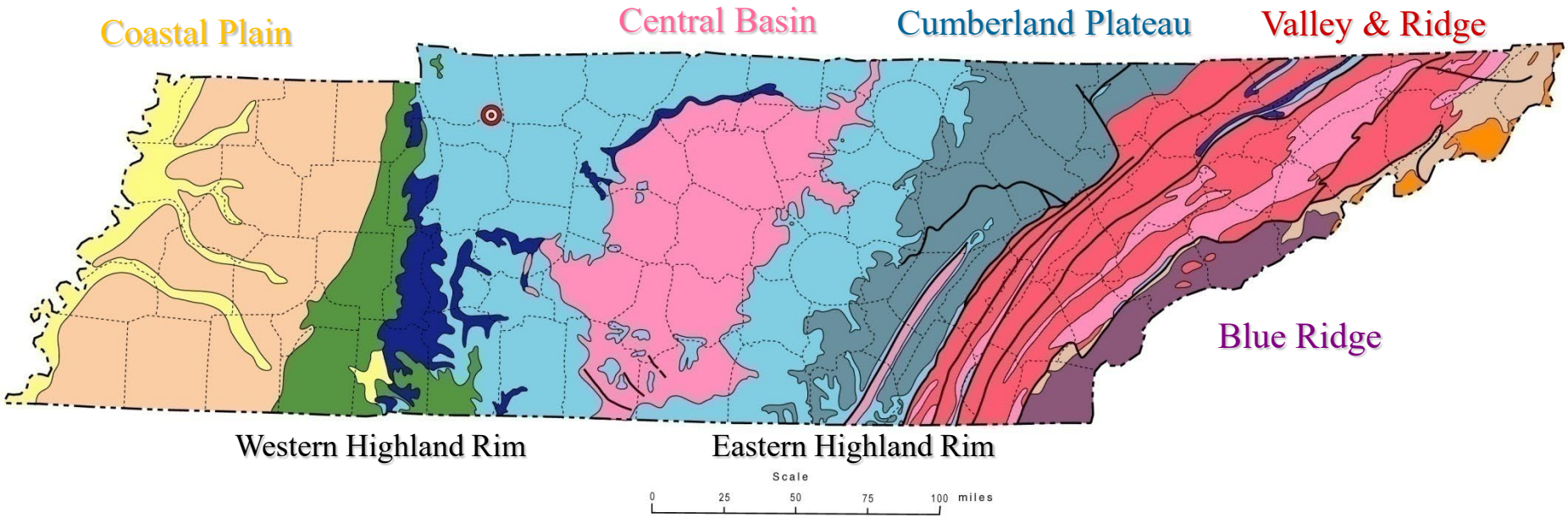
Tennessee's Eight Physiographic Provinces



- Coastal Plain
- Western Valley
- Western Highland Rim
- Central Basin
- Eastern Highland Rim
- Cumberland Plateau
- Valley and Ridge
- Unaka Mountains

Simplified Geologic Map of Tennessee

Increasing geologic deformation related to mountain building



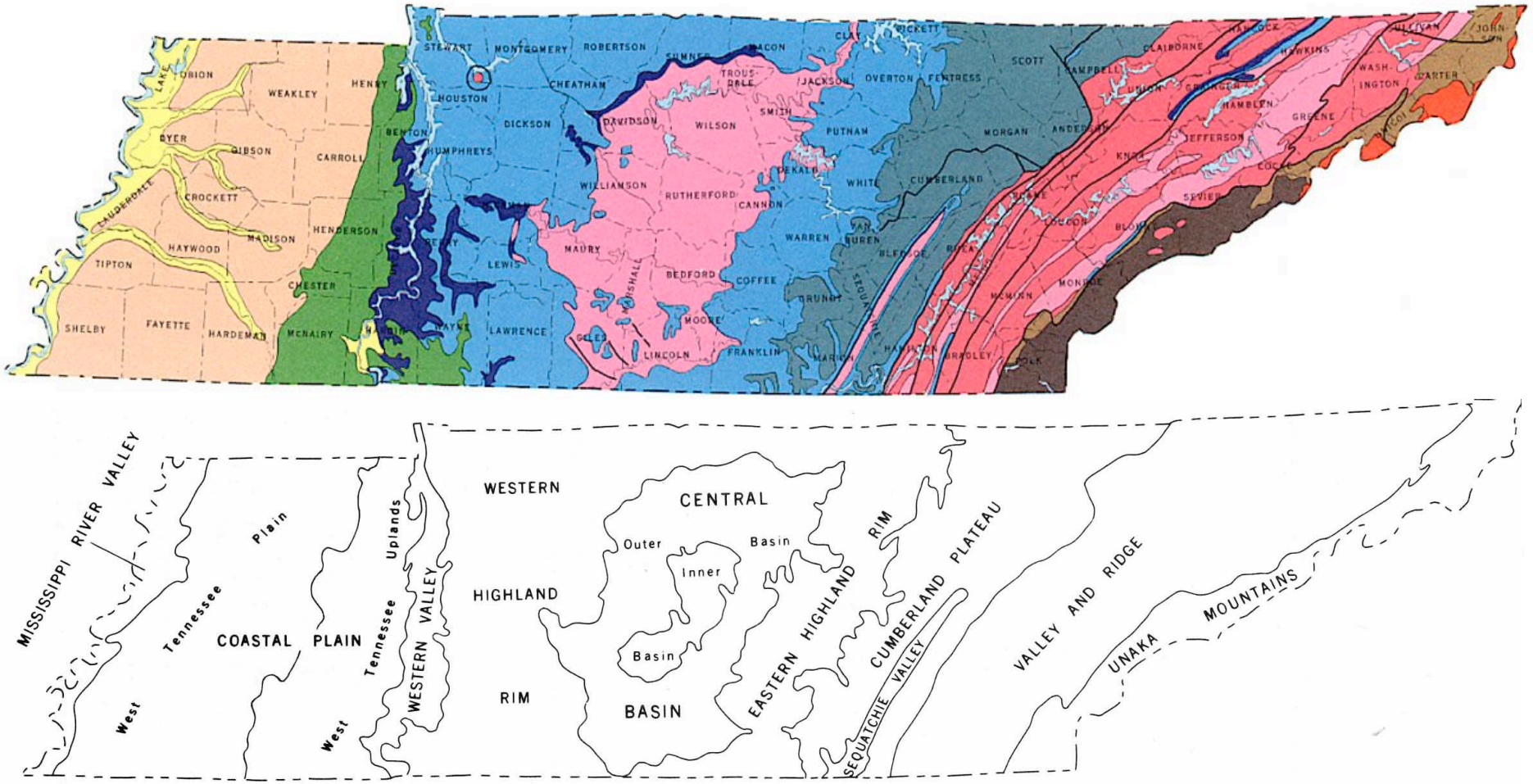
CENOZOIC
- QUATERNARY — SEDIMENTARY DEPOSITS
- TERTIARY — SEDIMENTARY DEPOSITS

MESOZOIC
- CRETACEOUS — SEDIMENTARY DEPOSITS

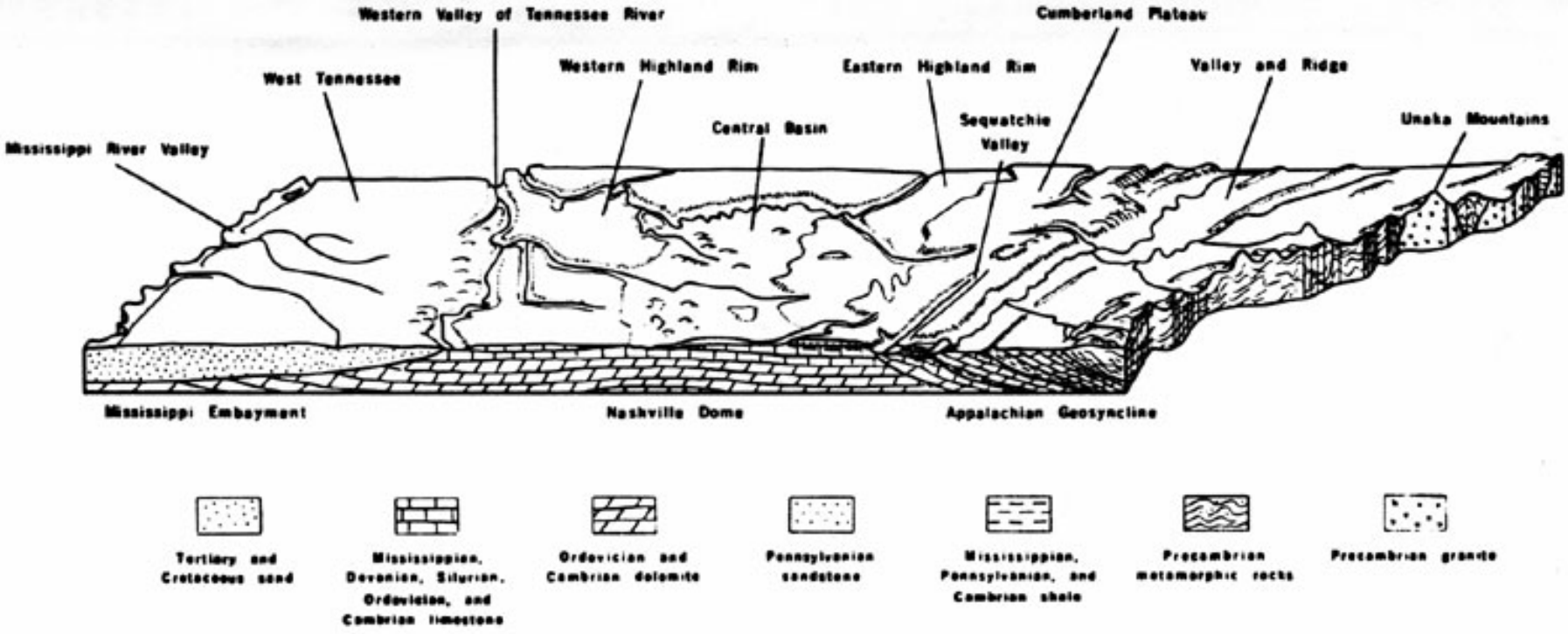
PALEOZOIC
- PENNSYLVANIAN — SEDIMENTARY ROCKS
- MISSISSIPPIAN — SEDIMENTARY ROCKS
- DEVONIAN-SILURIAN — SEDIMENTARY ROCKS
- ORDOVICIAN — SEDIMENTARY ROCKS
- ORDOVICIAN-CAMBRIAN — SEDIMENTARY ROCKS
- CAMBRIAN — SEDIMENTARY ROCKS

PRECAMBRIAN
- PRECAMBRIAN — SEDIMENTARY AND METAMORPHIC ROCKS
- PRECAMBRIAN — IGNEOUS AND METAMORPHIC ROCKS

Physiographic Provinces Related to Geology



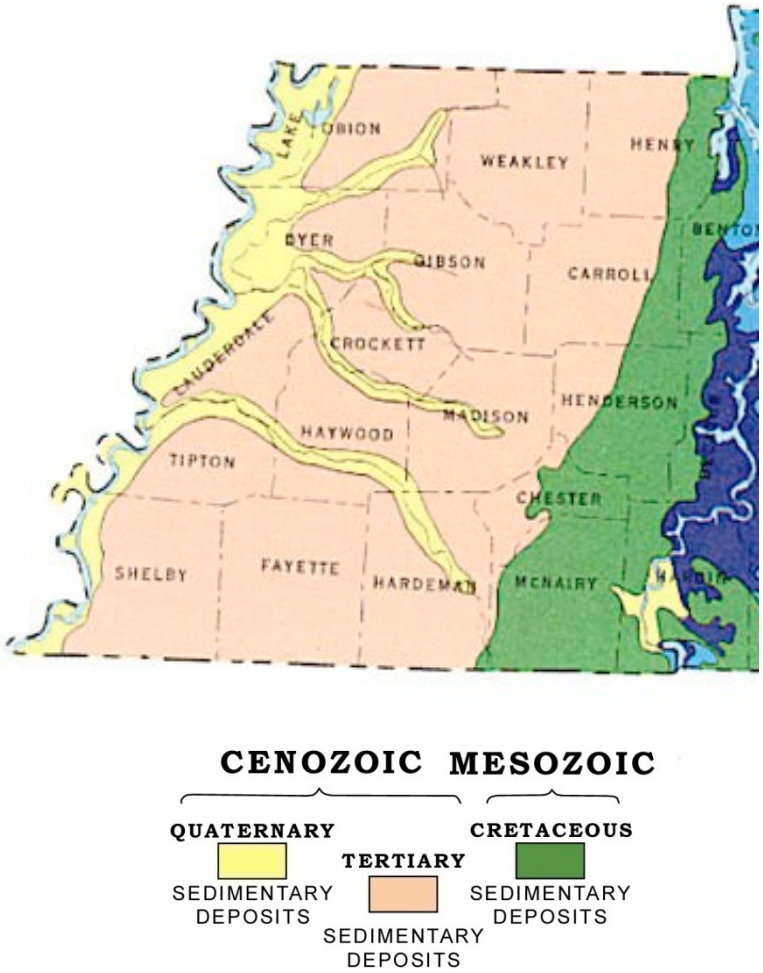
Geology Shapes the Landscapes We See



RELIEF MAP OF TENNESSEE SHOWING THE RELATIONSHIP OF MAJOR GEOLOGIC STRUCTURES TO PHYSIOGRAPHIC UNITS

Source: (Miller,1974).

Coastal Plain & Western Valley

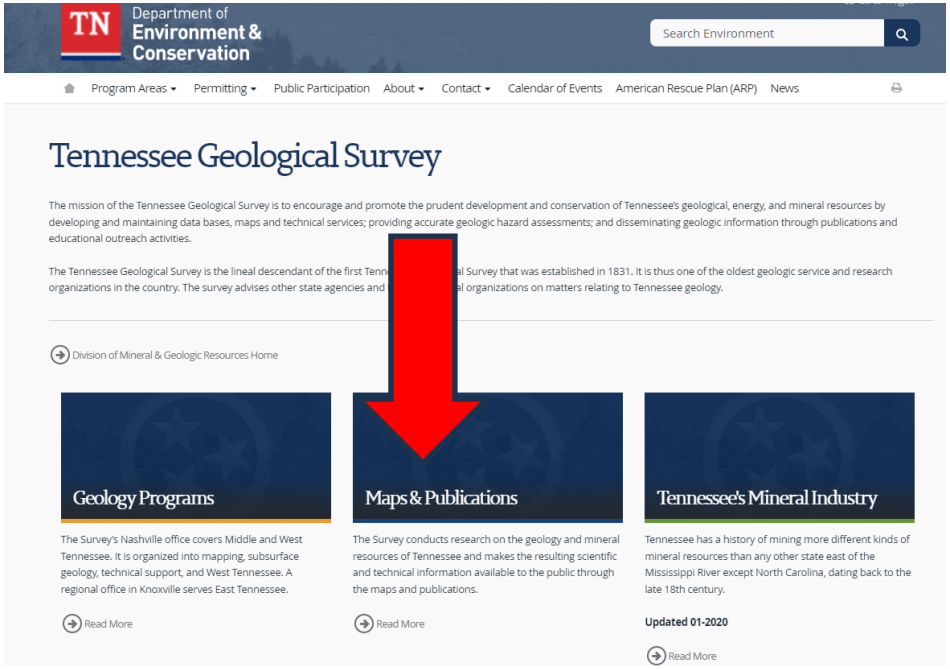


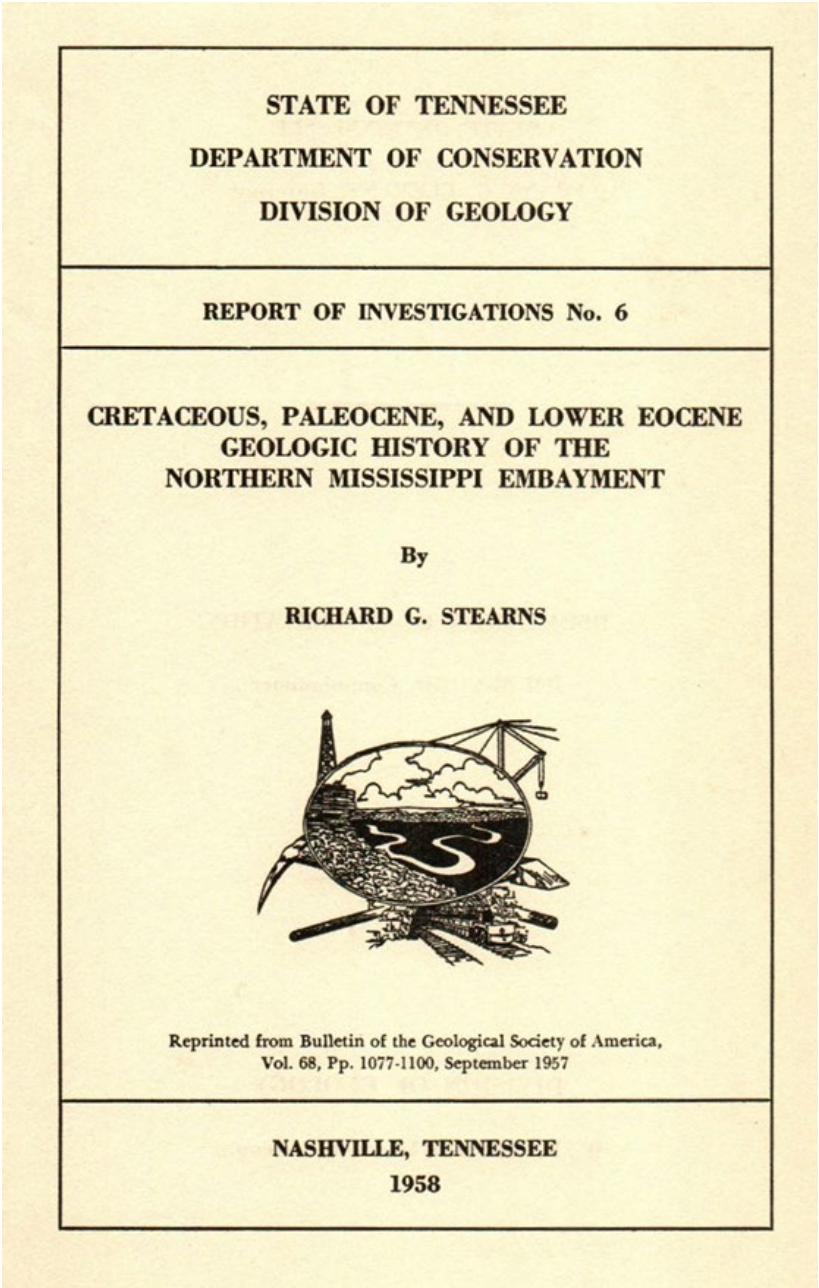
Coastal Plain

- Elevations range from 180 feet above sea level along Mississippi River to an average of 500 feet near Tennessee River, with some over 700 feet
- Relief is less than 80 feet along Mississippi River to 200 feet near Tennessee River
- Ball clay, Fuller's Earth, and kaolin are mined in this region

Coastal Plain

- Unconsolidated sediments less than 65.5 million years old occupy most of the region
- Varying combinations of sand, silt, and clay
- Rocks 65.5 to 145.5 million years old near Tennessee River are a mix of unconsolidated sands and clays and loosely consolidated materials




STATE OF TENNESSEE

DEPARTMENT OF CONSERVATION

DIVISION OF GEOLOGY

REPORT OF INVESTIGATIONS No. 6

CRETACEOUS, PALEOCENE, AND LOWER EOCENE GEOLOGIC HISTORY OF THE NORTHERN MISSISSIPPI EMBAYMENT

By

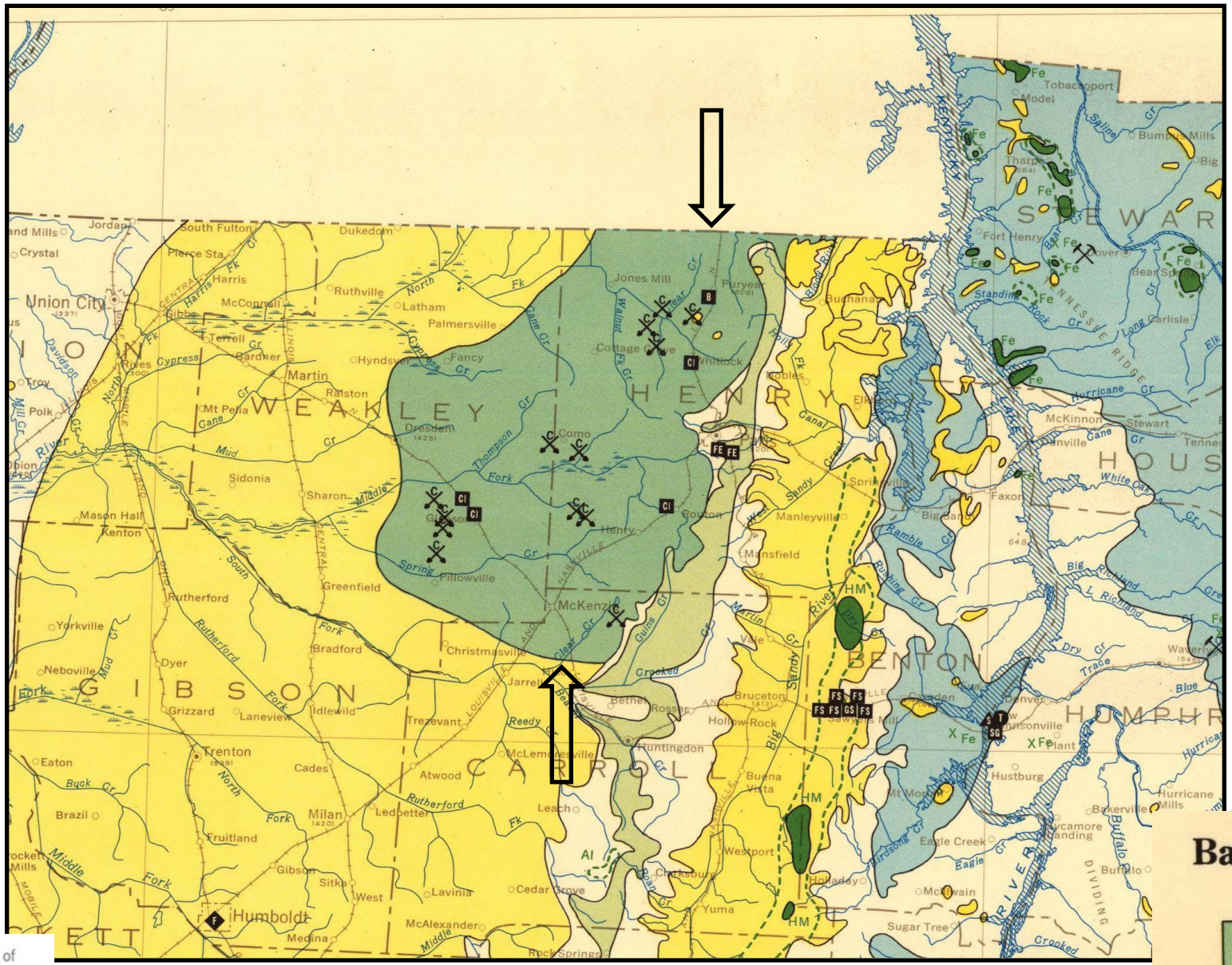
RICHARD G. STEARNS

Reprinted from Bulletin of the Geological Society of America, Vol. 68, Pp. 1077-1100, September 1957

NASHVILLE, TENNESSEE

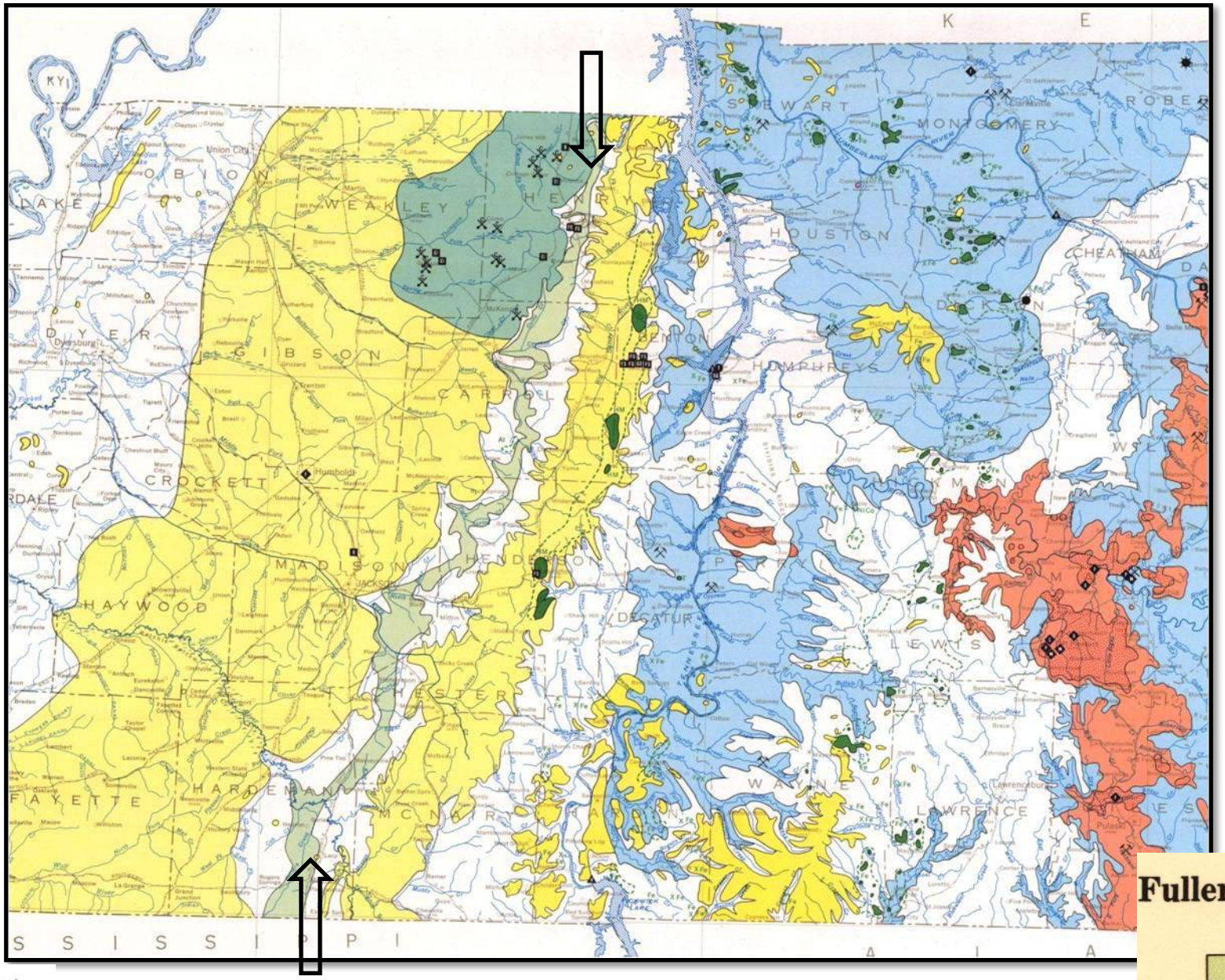
1958

Regions With Ball Clay and Kaolin Mining



Clay Mining in West Tennessee

Fuller's Earth Resources



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Tennessee Geological Survey

The mission of the Tennessee Geological Survey is to encourage and promote the prudent development and conservation of Tennessee's geological, energy, and mineral resources by developing and maintaining data bases, maps and technical services; providing accurate geologic hazard assessments; and disseminating geologic information through publications and educational outreach activities.

The Tennessee Geological Survey is the lineal descendant of the first Tenn… l Survey that was established in 1831. It is thus one of the oldest geologic service and research organizations in the country. The survey advises other state agencies and … l organizations on matters relating to Tennessee geology.

Division of Mineral & Geologic Resources Home

Geology Programs

The Survey's Nashville office covers Middle and West Tennessee. It is organized into mapping, subsurface geology, technical support, and West Tennessee. A regional office in Knoxville serves East Tennessee.

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Maps & Publications

The Survey conducts research on the geology and mineral resources of Tennessee and makes the resulting scientific and technical information available to the public through the maps and publications.

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Tennessee's Mineral Industry

Tennessee has a history of mining more different kinds of mineral resources than any other state east of the Mississippi River except North Carolina, dating back to the late 18th century.

Updated 01-2020

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<< Back to Geology

STATE OF TENNESSEE
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WALTER F. POND, *State Geologist*

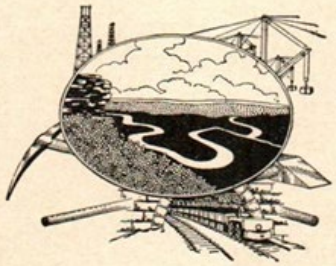
BULLETIN 49

THE CLAYS OF WEST TENNESSEE

By

GEO. I. WHITLATCH
Associate Geologist

PUBLISHED IN COOPERATION WITH TENNESSEE VALLEY AUTHORITY



NASHVILLE, TENNESSEE
1940

ball clay – A highly plastic, sometimes refractory clay, commonly characterized by the presence of organic matter, having unfired colors ranging from light buff to various shades of gray, and used as a bonding constituent of ceramic wares

kaolin – A soft white non-plastic clay, composed principally of kaolinite, much used in making ceramics, refractories, and paper

fuller's earth – A clay possessing a high adsorptive capacity, consisting largely of montmorillonite (dioctahedral clay mineral) or palygorskite (chain-lattice clay mineral). It is extensively used as an adsorbent in refining and decolorizing oils and fats, and is a natural bleaching agent

Definitions from the AGI Dictionary of Geological Terms

Are there fossils in the clay pits?

Yes. Typically plant fossils.

Google search:
“West Tennessee clay pit fossils”
“West Tennessee plant fossils”
“West Tennessee fossils”

~~~~~~

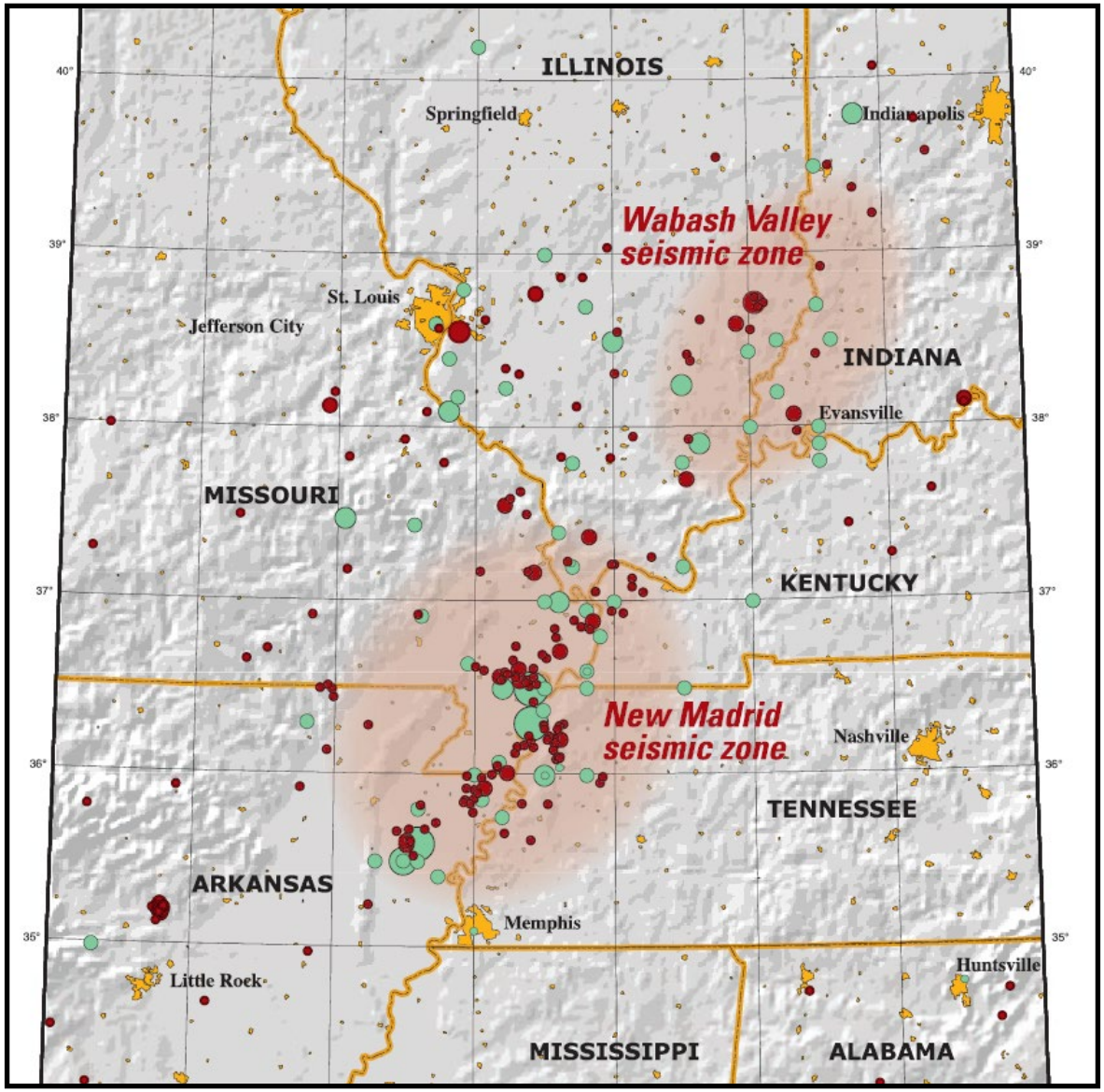
Can the public visit clay pits?

Generally, no. The clay companies are notoriously secretive.
~~~~~~

Lignite Coal

- There are deposits of lignite coal in the West Tennessee coastal plain
- They have been investigated many times over the decades
- Due to the nature of the deposits (scattered, varying thicknesses, varying depths, etc.) they are not economical to mine

Location of Major Earthquakes in the New Madrid Seismic Zone

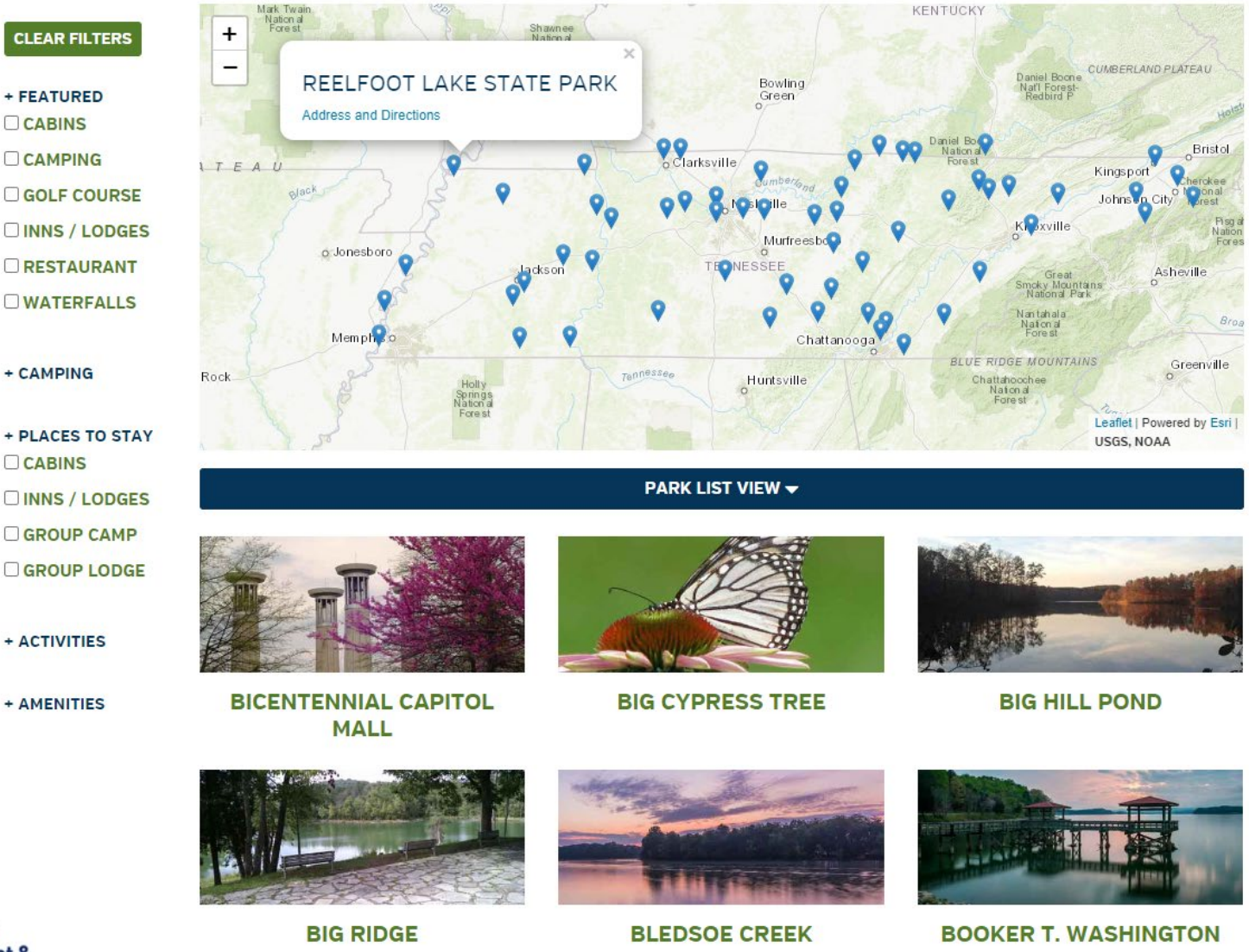


Reelfoot Lake in Northeast Lake County along the Lake-Obion County Line

Courtesy of State of Tennessee Photographic Services


REELFOOT
LAKE
STATE PARK
ESTABLISHED - 1956
REELFOOT LAKE STATE PARK SCENIC CRUISE
CALHOU
REELFOOT LAKE BOATS

Tennessee State Parks
https://tnstateparks.com/




COON
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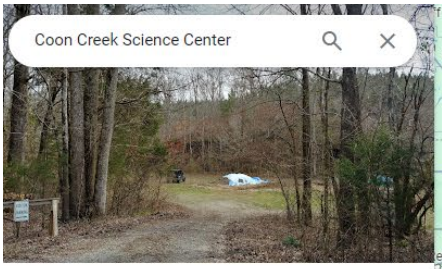
CENTER


UT MARTIN
COON CREEK SCIENCE CENTER



Coon Creek Science Center

4.6 ★★★★☆ (16)

Museum

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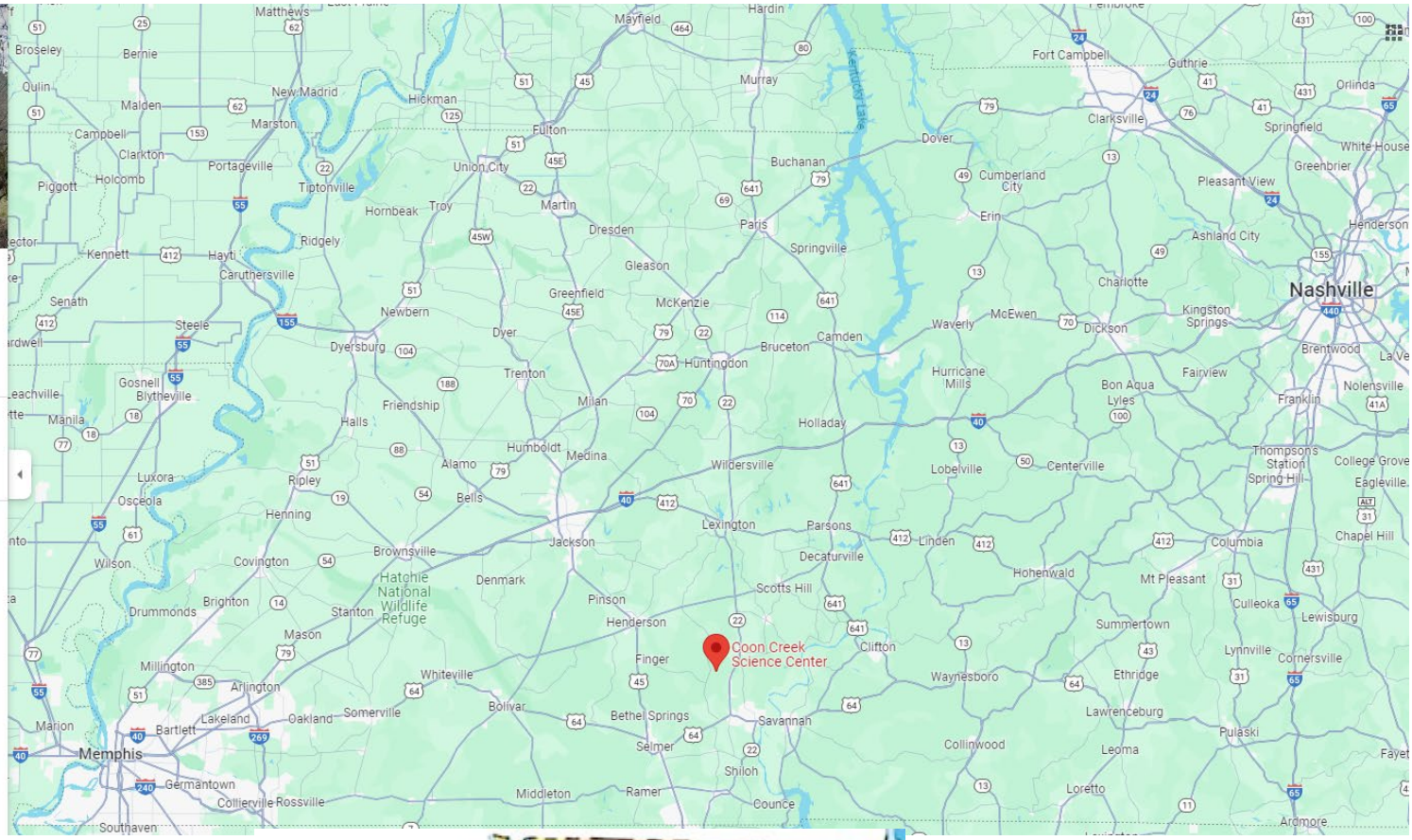
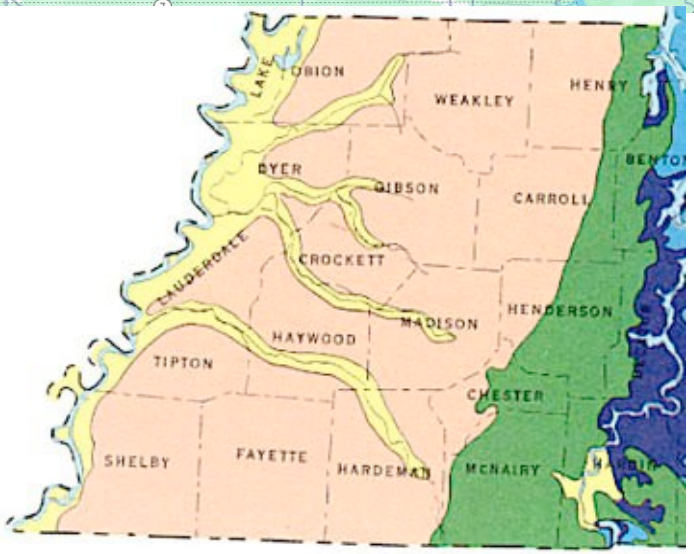




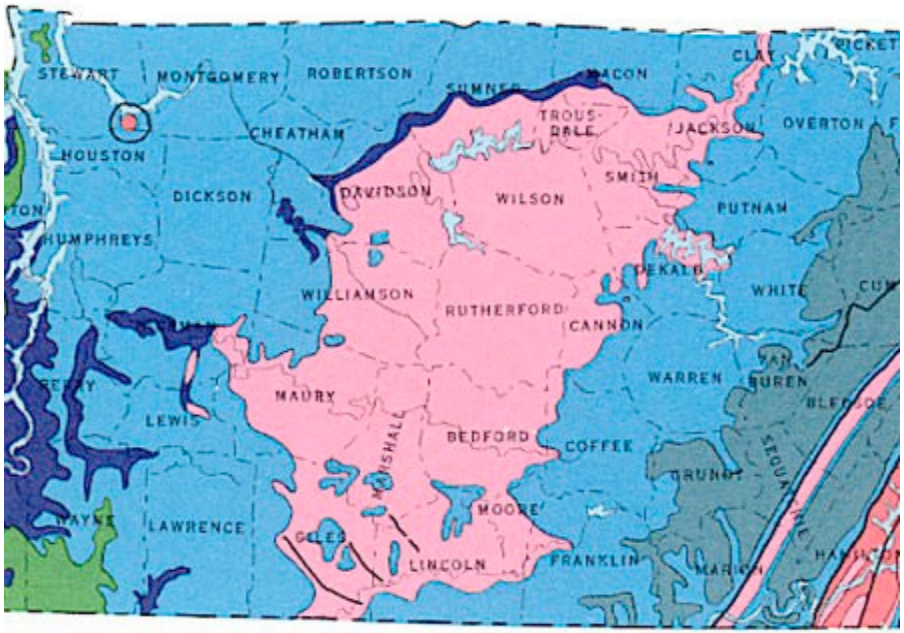
Tennessee State Fossil: Pterotrigonia (Scabrotrigonia) thoracica

(found in the Cretaceous, Coon Creek Formation)

Report of Investigation (RI)

36. FIELD TRIPS IN WEST TENNESSEE, 82 + vi p., 44 figs., 4 tables, 7 contributors (1975). Reprinted (1990). A guide to Southeastern GSA field trips for 1975 including fossiliferous Silurian, Devonian, and Cretaceous formations in the vicinity of Tennessee River; environmental geology of Memphis; geology of Reelfoot Lake and vicinity $5.00

Highland Rim & Central Basin



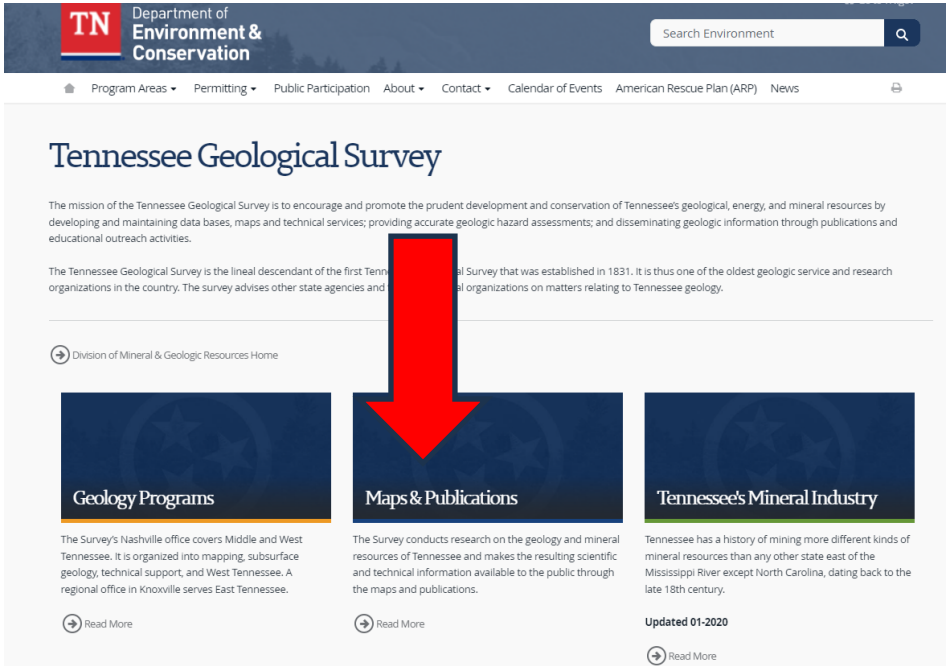
Western Highland Rim

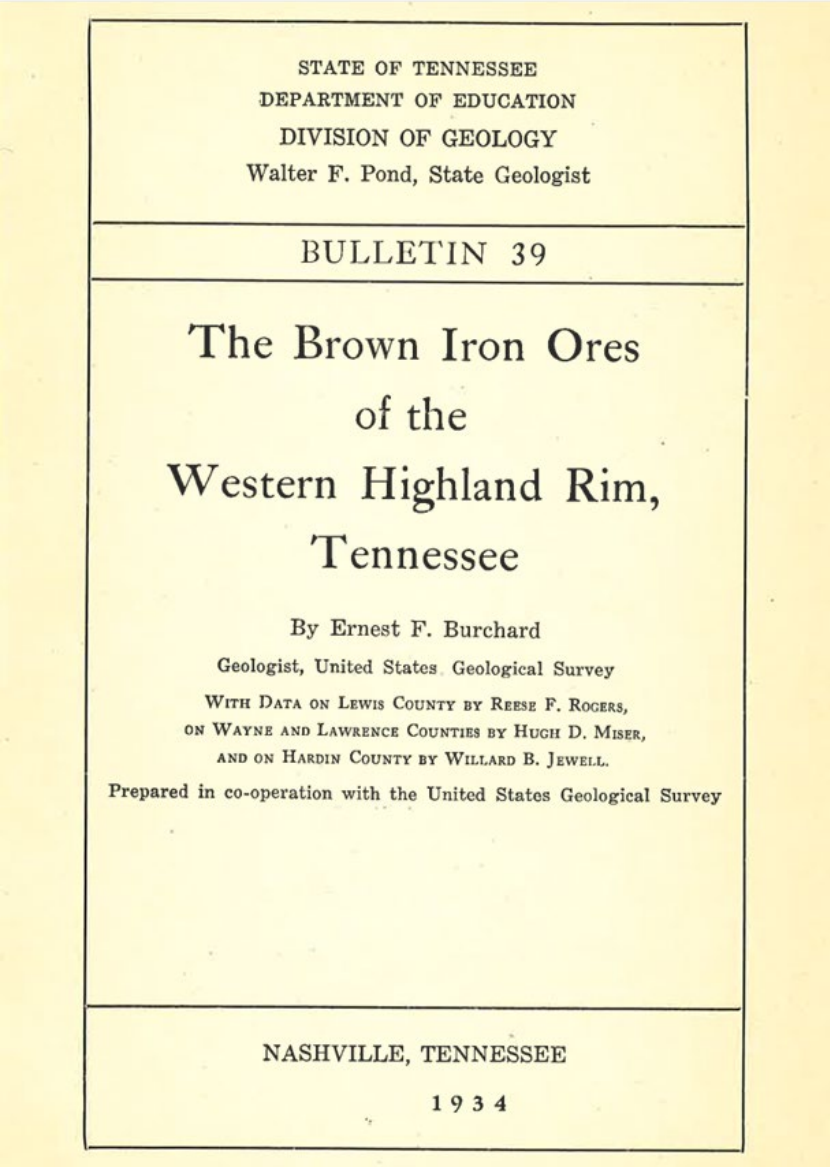
- Dissected, rolling terrain
- Elevations greater than 1,000 feet above sea level in the southern part
- Relief of 100 to 200 feet
- For many years iron and phosphate were mined in this region

Highland Rim & Central Basin

- 440- to 488-million-year-old limestones, with some shale
- 416 to 440 and 359- to 416-million-year-old limestones and shale with some sandstones
- 318- to 359-million-year-old limestones, cherty limestones, and shale.

Counties with Iron Mining in Middle and West Tennessee





STATE OF TENNESSEE
DEPARTMENT OF EDUCATION
DIVISION OF GEOLOGY
Walter F. Pond, State Geologist

BULLETIN 39

The Brown Iron Ores of the Western Highland Rim, Tennessee

By Ernest F. Burchard
Geologist, United States Geological Survey

With Data on Lewis County by Reese F. Rogers, on Wayne and Lawrence Counties by Hugh D. Miser, and on Hardin County by Willard B. Jewell.

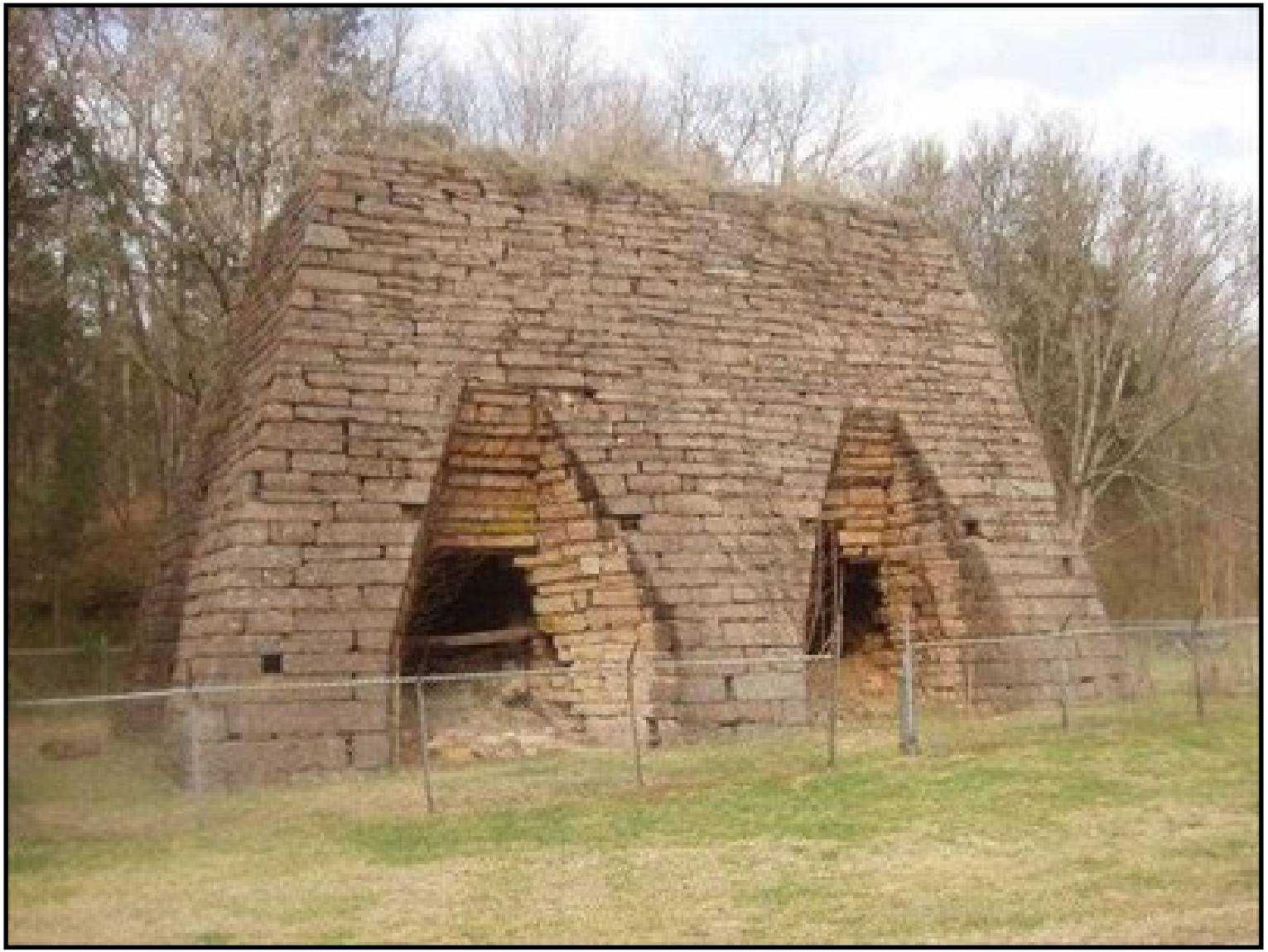
Prepared in co-operation with the United States Geological Survey

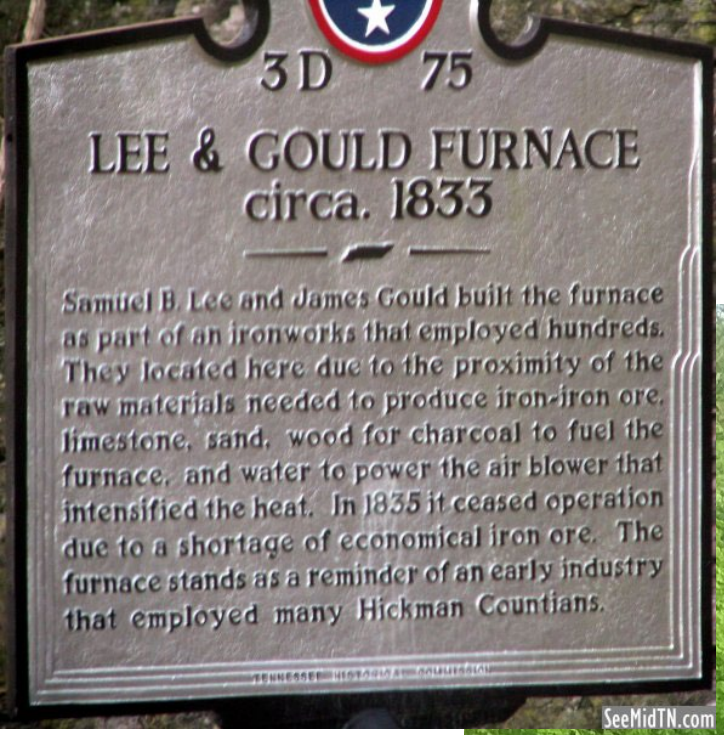
NASHVILLE, TENNESSEE
1934

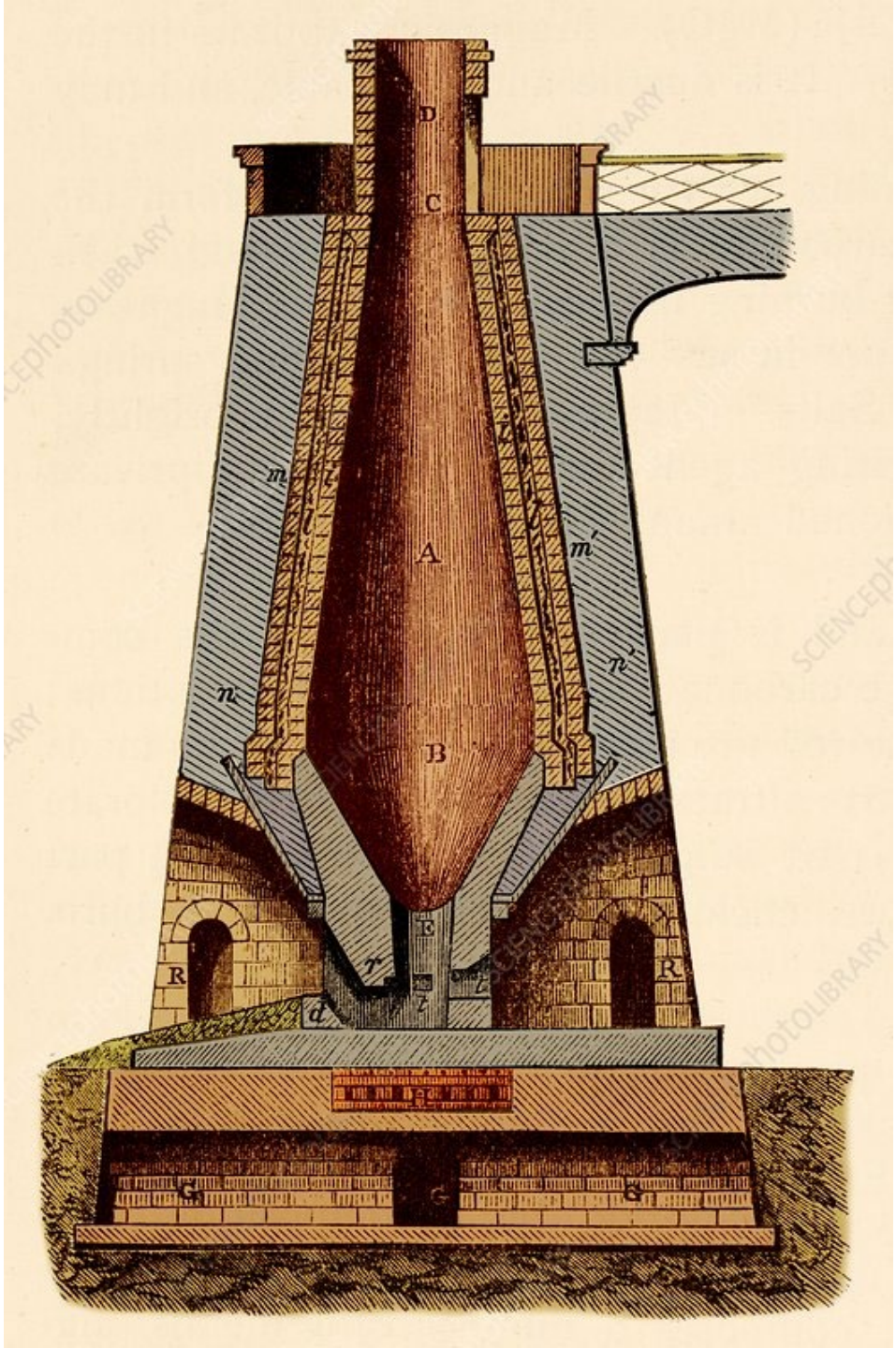
Limonite from the Western Highland Rim

Photo by Elaine Foust

Cedar Grove Iron Furnace Ruins in Perry County, Tennessee



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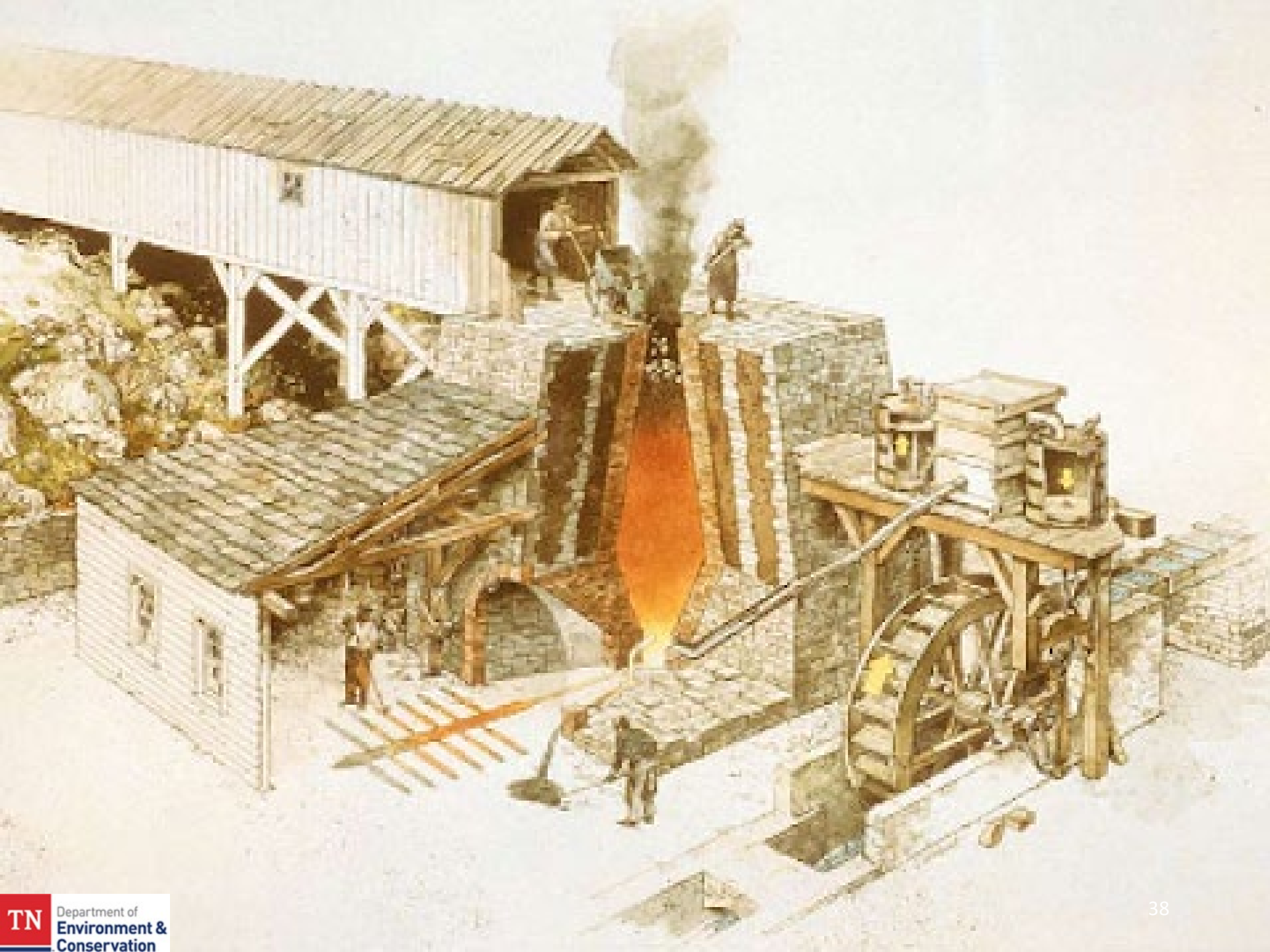
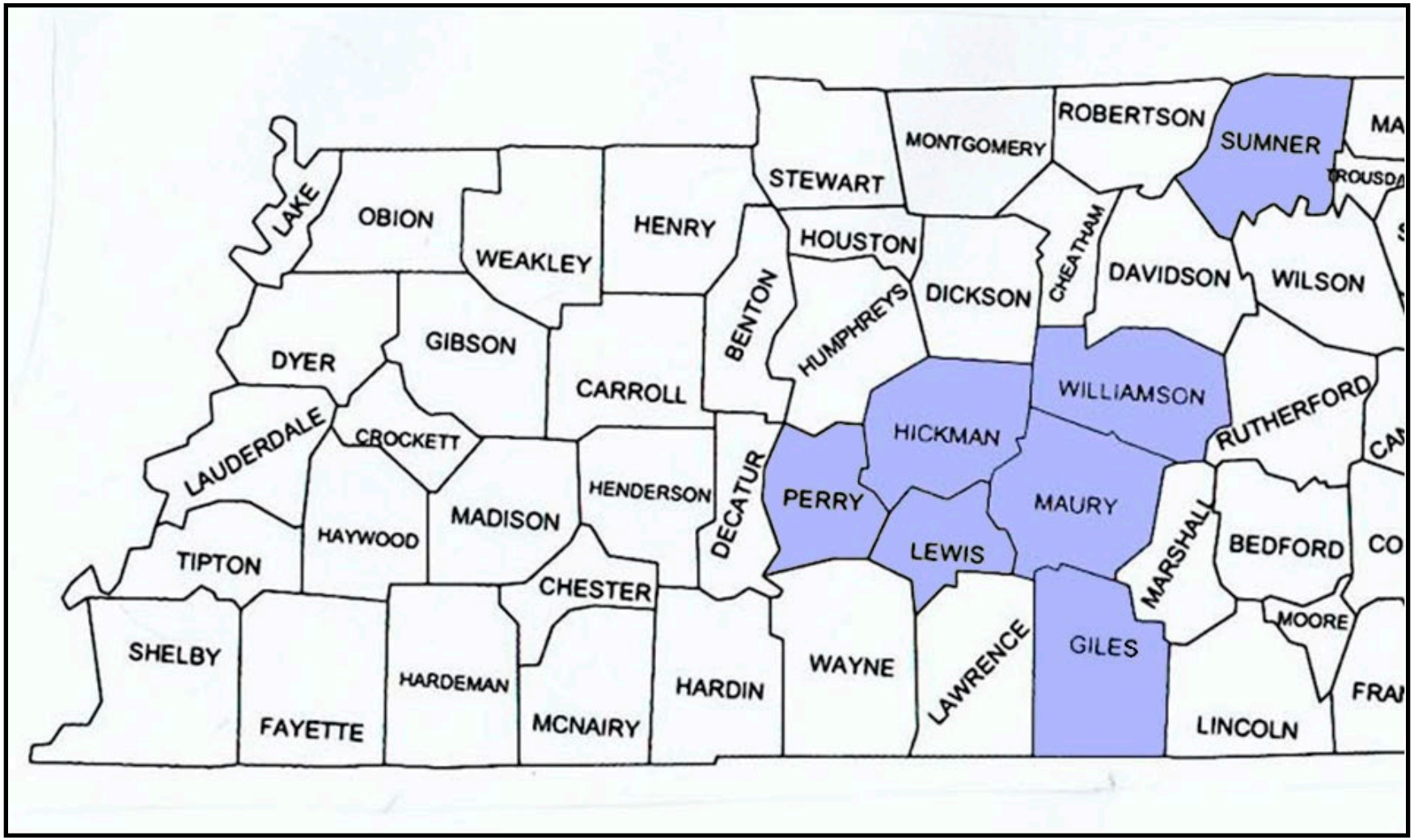
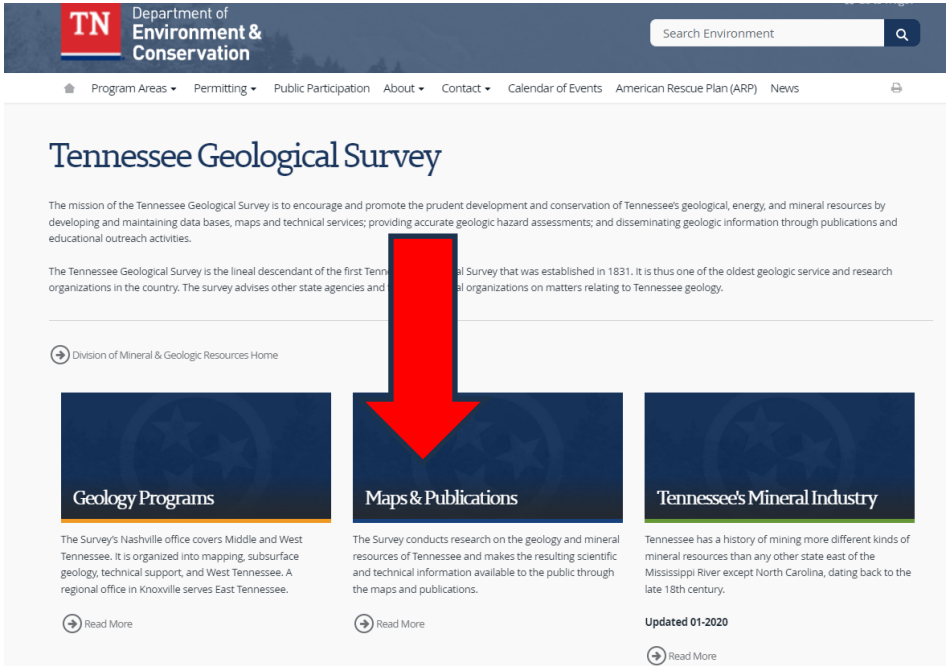
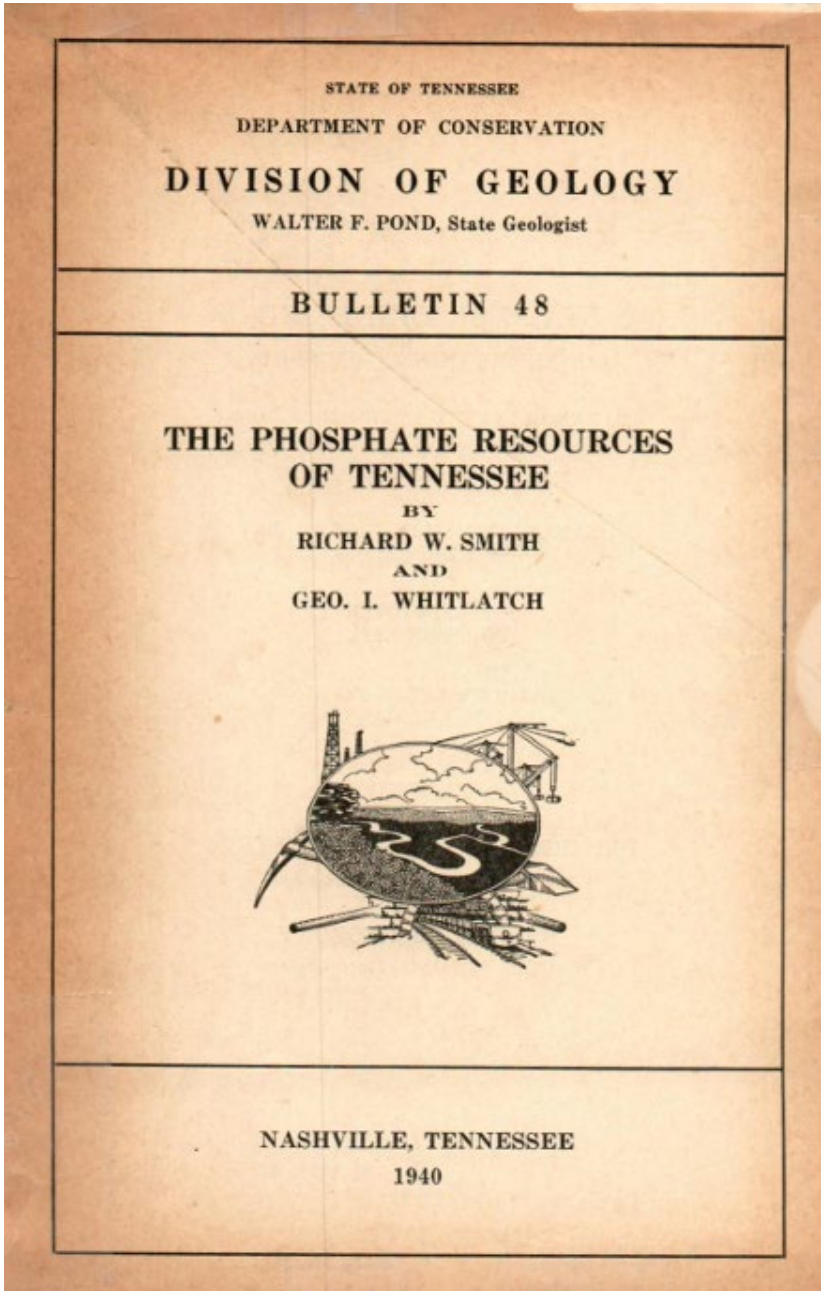


Counties with Phosphate Mining in Middle and West Tennessee



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WALTER F. POND, State Geologist

BULLETIN 48

THE PHOSPHATE RESOURCES OF TENNESSEE

BY

RICHARD W. SMITH

AND

GEO. I. WHITLATCH

NASHVILLE, TENNESSEE

1940

Phosphate from Franklin, Tennessee

Phosphate Mine in Middle Tennessee

Cutter & Pinnacle Deposits

Central Basin

- Outer Basin is characterized by hilly terrain
- Elevations of nearly 1,300 feet above sea level
- Relief of 50 to 300 feet
- Erosional remnants of the Highland Rim called outliers are at the outer edge of the region
- Zinc has been mined in this region

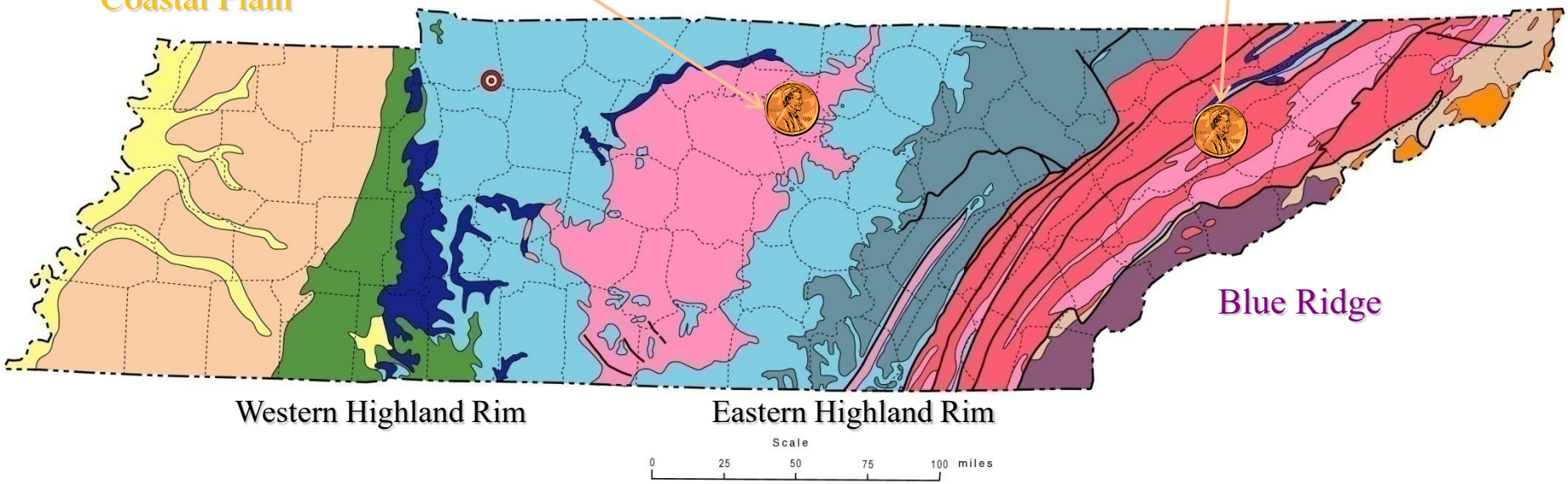
Tennessee Zinc Mining Districts

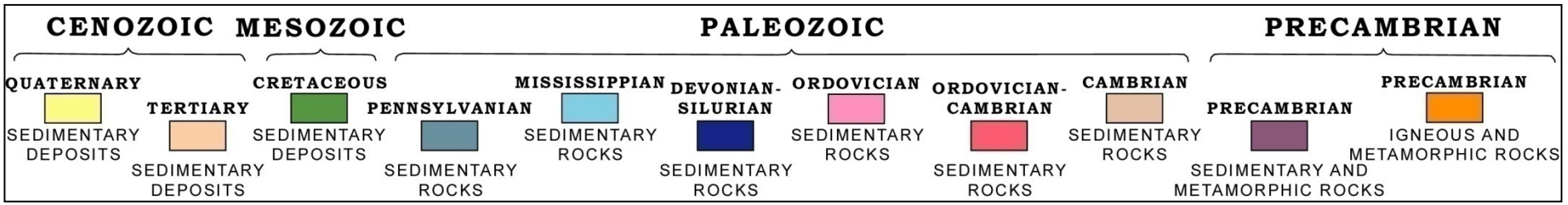
Middle Tennessee District

Gordonsville-Elmwood-Cumberland-South Carthage

Mascot-Jefferson City District

Immel-Young-Coy





MVT Mineral Deposits

- MVT = Mississippi Valley Type (MVT) Pb-Zn ore deposits

- The deposits are named after the type area of the Mississippi Valley in the Central United States where many Pb-Zn mines have been discovered and mined over the past 100 years

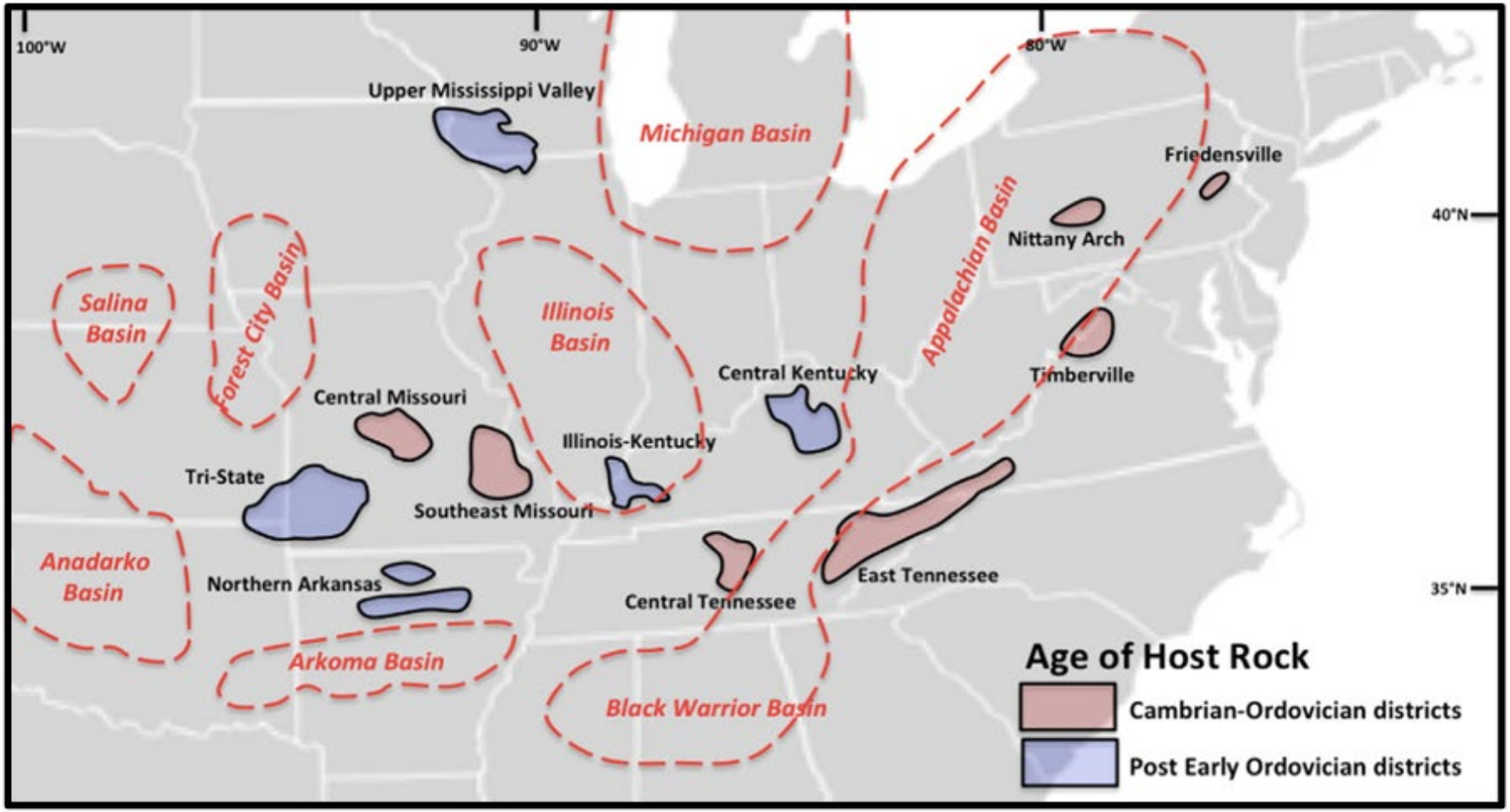


Figure 1. Map of North American MVT Deposits and the ages of their host rocks. Associated Basins are circled with red dashed lines. From Potra and Moyers (2017).

What is a MVT mineral deposit?

- These are Pb-Zn mineral deposts found in carbonate sedimentary rocks
- The ore mineralization commonly occurs in open pores, vugs, and veins found in limestones and dolostones
- In mineable settings, the mineral deposits have formed in massive and semi-massive beds that have partially replaced the carbonate rocks

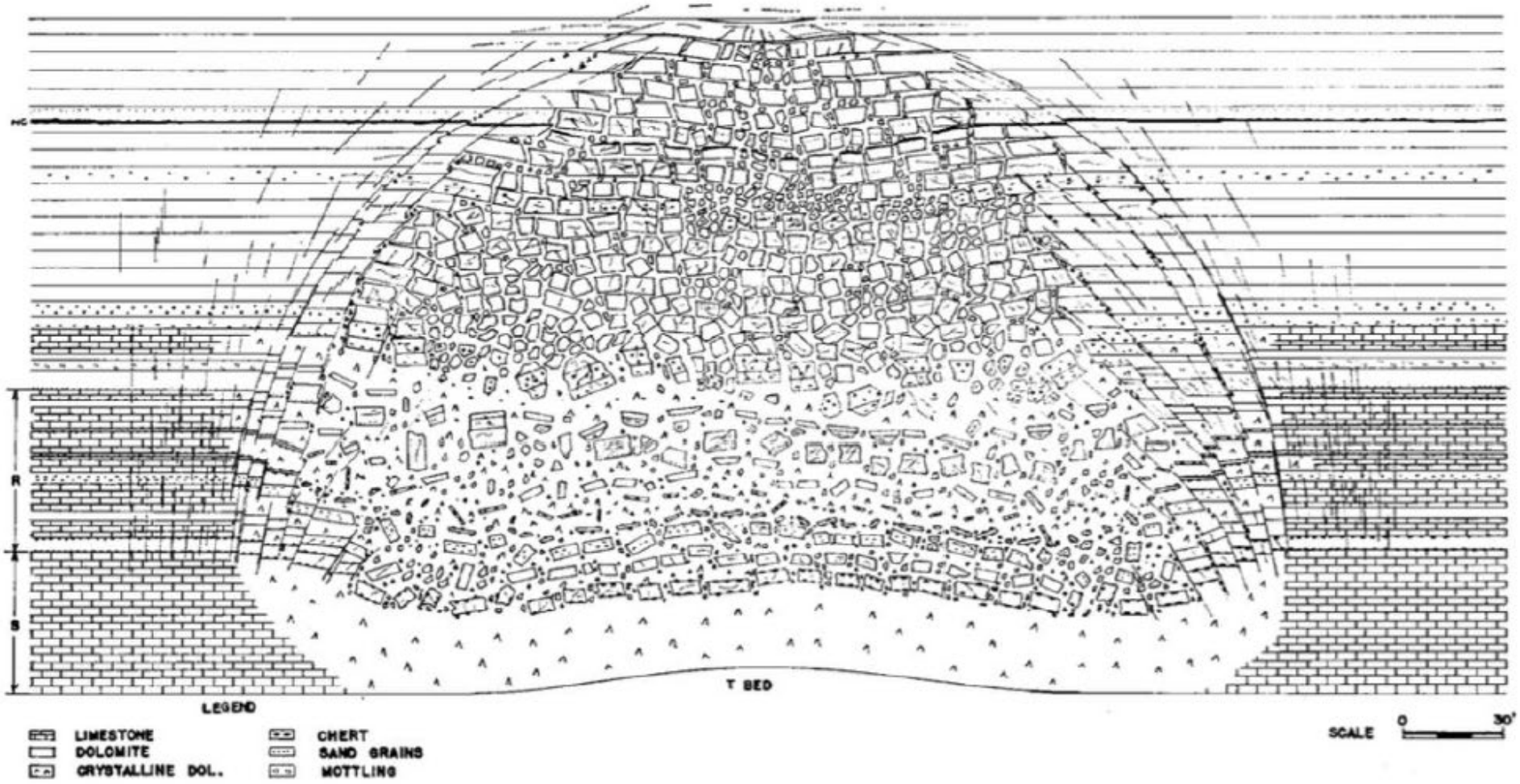
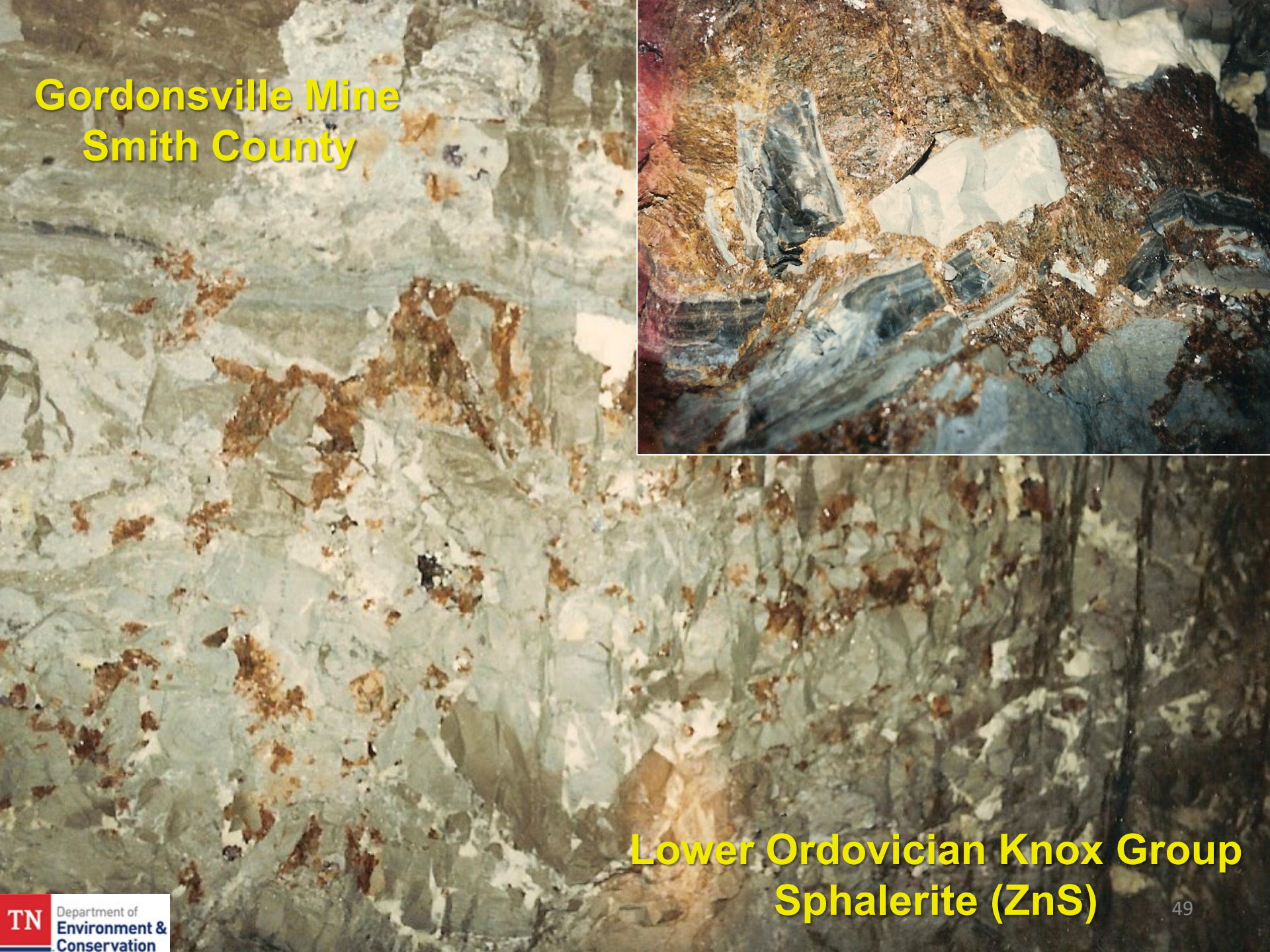
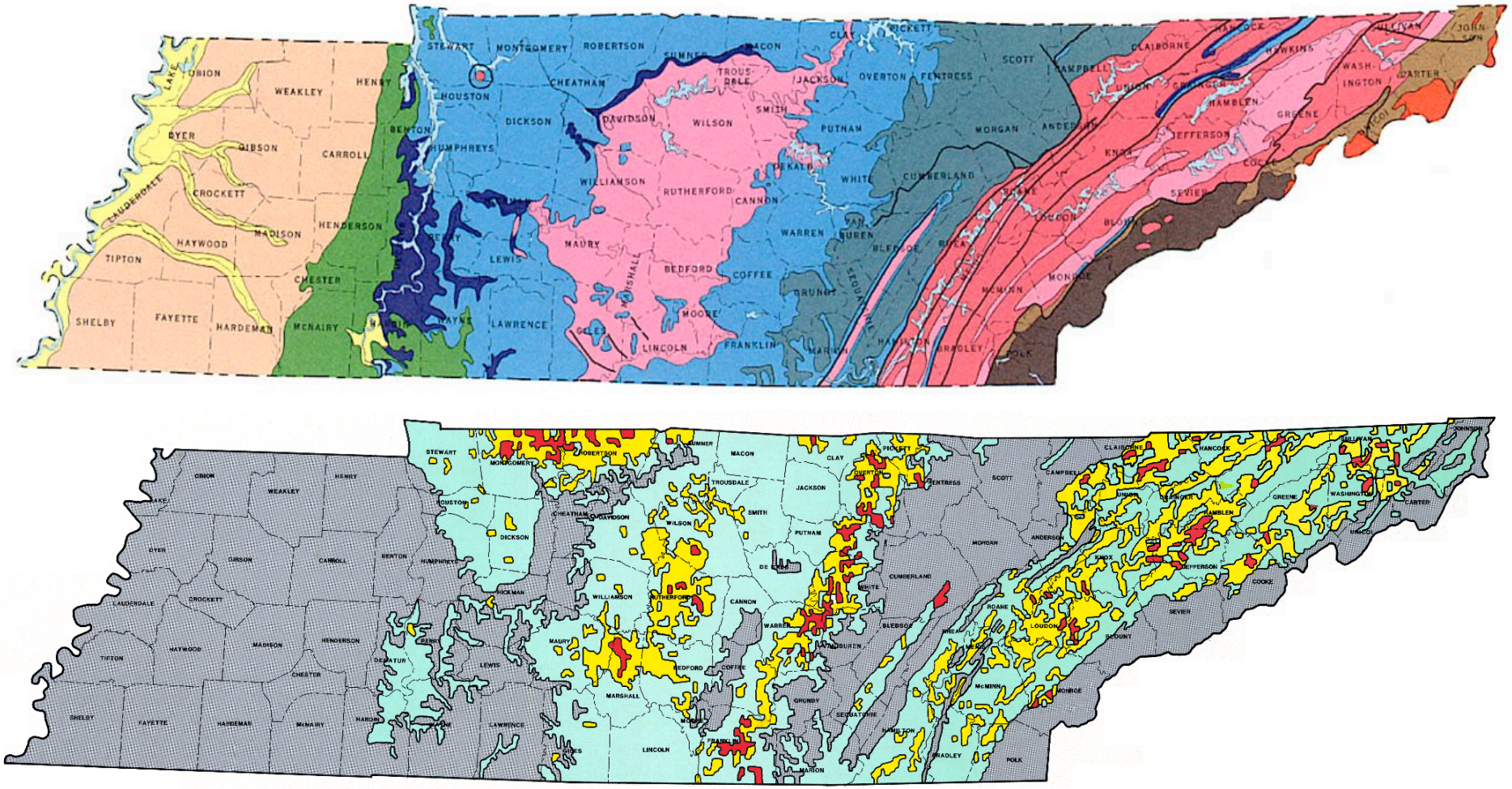


Figure 6: generalized high-domal ore structure depicting collapse structures created through dissolution from paleoaquifer system; common to Central and Eastern Tennessee MVT Districts (from McCormick et al., 1971).


Gordonsville Mine
Smith County
Lower Ordovician Knox Group
Sphalerite (ZnS)

Karst

Approx. 25,500 Sq. Miles of Carbonate Rocks

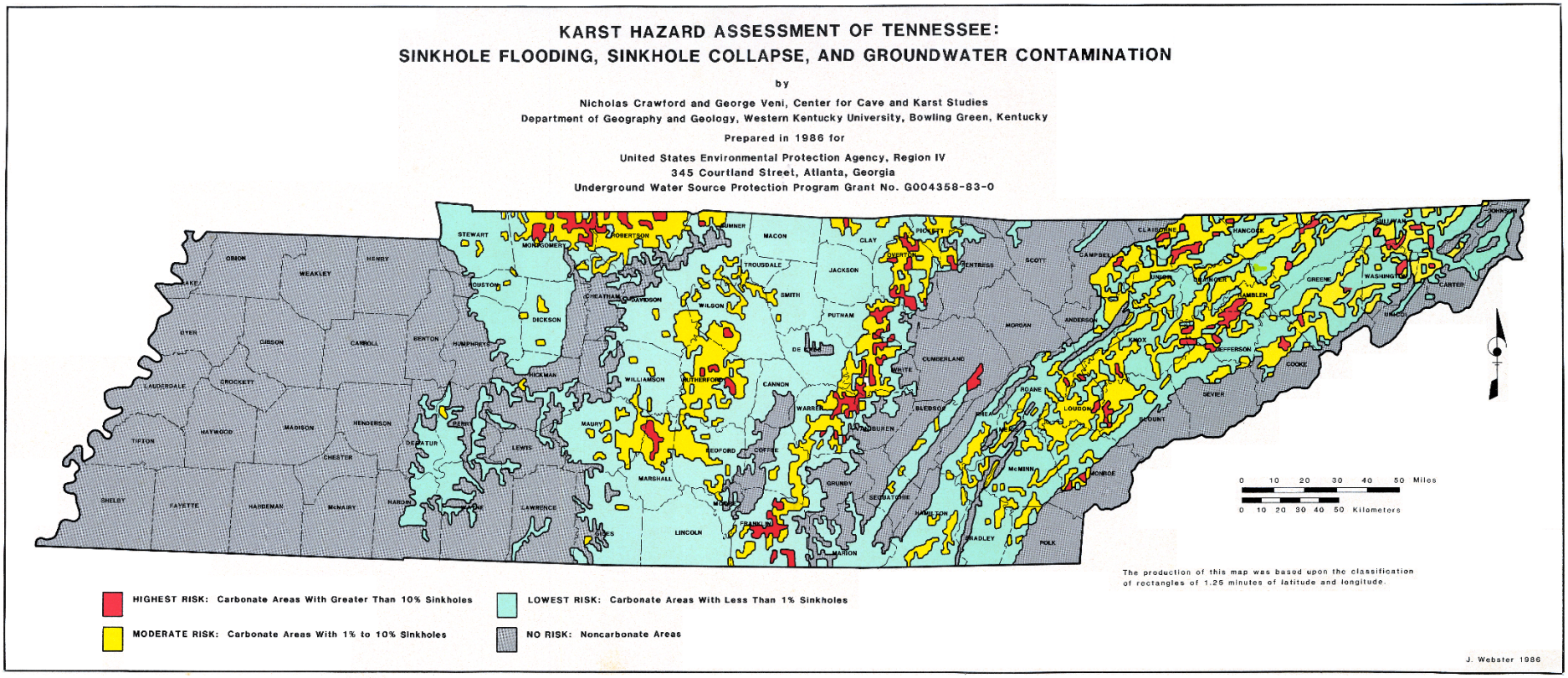


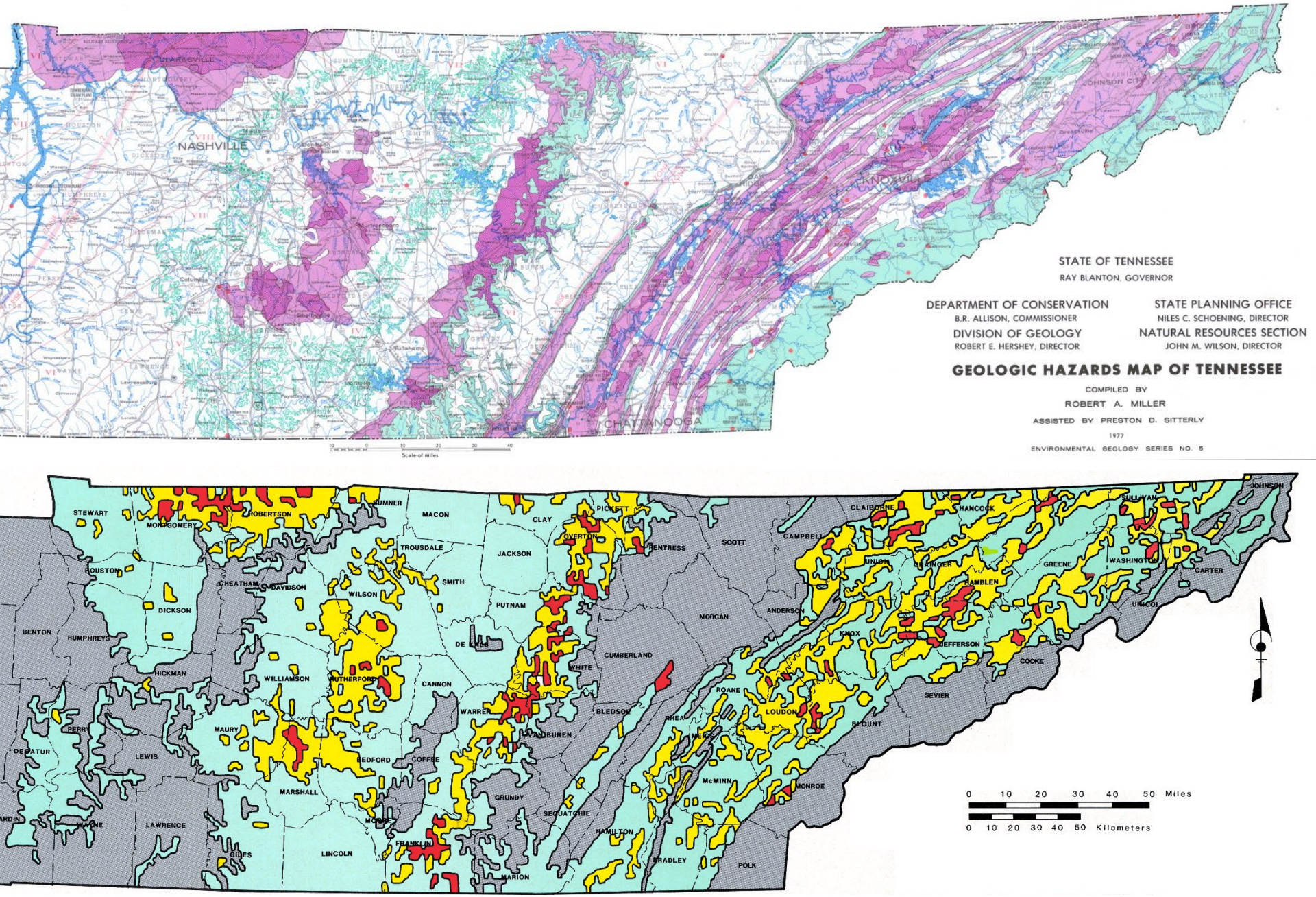
Karst

A type of topography that is formed in limestone, dolomite, or gypsum by dissolution

Karst topography is characterized by sinkholes, caves, springs, and subterranean drainage systems

Karst Areas in Tennessee

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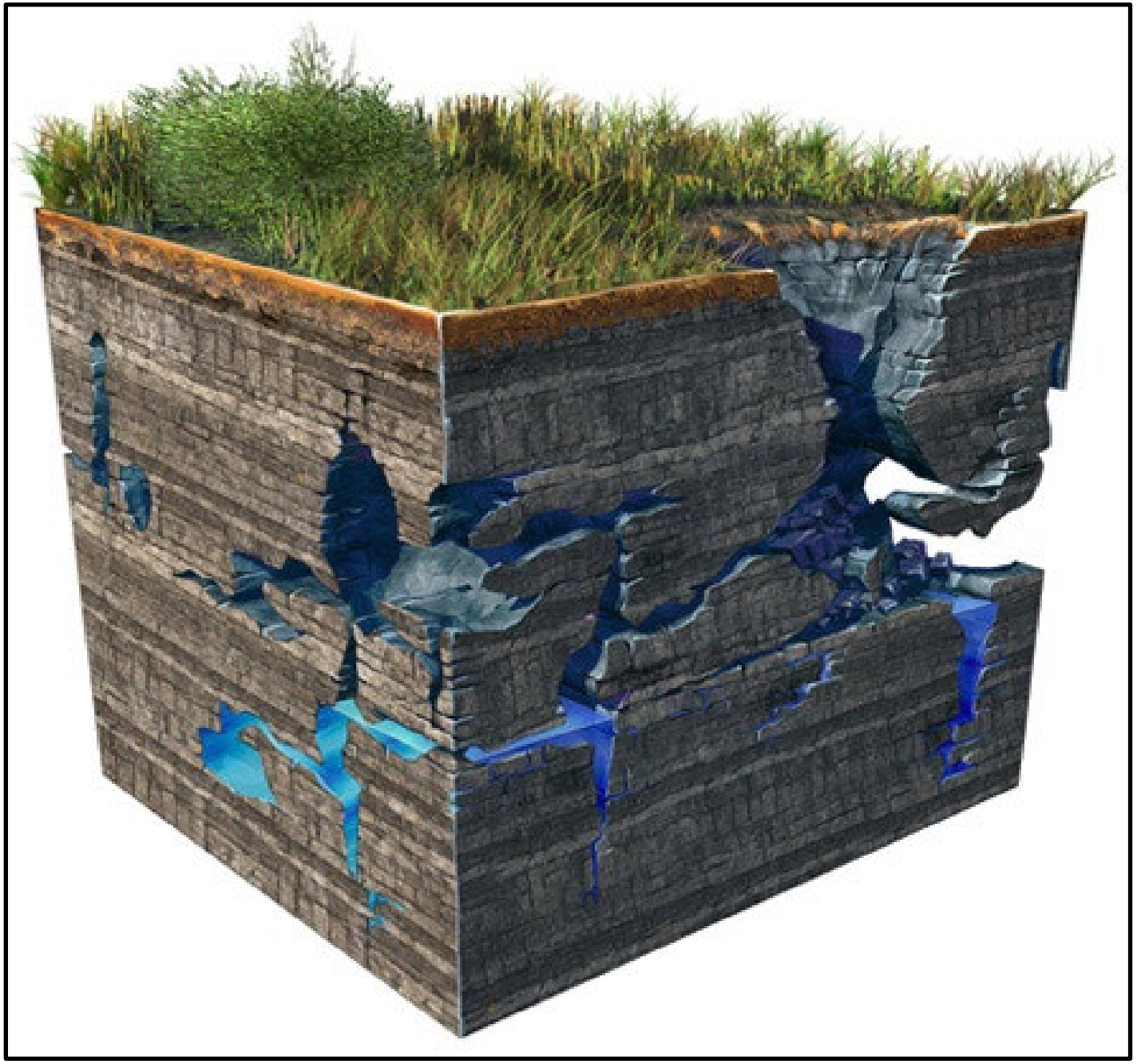
GEOLOGIC HAZARDS MAP OF TENNESSEE
COMPILED BY
ROBERT A. MILLER
ASSISTED BY PRESTON D. SITTERLY
1977
ENVIRONMENTAL GEOLOGY SERIES NO. 5
Scale of Miles
STEWART
MONTGOMERY
ROBERTSON
SUMNER
MACON
CLAY
PICKETT
OVERTON
FENTRESS
SCOTT
CAMPBELL
CLAIBORNE
HANCOCK
SULLIVAN
JOHNSON
HOUSTON
TROUSDALE
JACKSON
UNION
CLAIBORNE
GREENE
WASHINGTON
CARTER
CHEATHAM
DAVIDSON
WILSON
SMITH
HAMBLEN
UNICOI
DICKSON
PUTNAM
ANDERSON
BENTON
HUMPHREYS
DE KALB
MORGAN
KNOX
JEFFERSON
COOKE
CUMBERLAND
WHITE
HICKMAN
WILLIAMSON
RUTHERFORD
CANNON
ROANE
SEVIER
WARREN
BLEDSOE
RHEA
LOUDON
BLOUNT
PERRY
MAURY
VAN BUREN
MEIGS
DECATUR
LEWIS
BEDFORD
COFFEE
McMINN
MONROE
MARSHALL
GRUNDY
SEQUATCHIE
LAWRENCE
MOORE
HAMILTON
GILES
LINCOLN
FRANKLIN
BRADLEY
POLK
MARION
0 10 20 30 40 50 Miles
0 10 20 30 40 50 Kilometers



How many caves are in Tennessee?

- 10 – Pennsylvania: 800 caves
- 9 – Arkansas: 1,000 caves
- 8 – Georgia: 1,000 caves
- 7 – West Virginia: 1,500 caves
- 6 – Virginia: 2,000 caves
- 5 – Indiana: 2,500 caves
- 4 – Kentucky: 3,000 caves
- 3 – Alabama: 4,000 caves
- 2 – Missouri: 7,300 caves
- 1 – Tennessee: 10,000 caves

Cumberland Caverns

494 reviews • #1 of 10 things to do in McMinnville • Caverns & Caves

Open now • 9:00 AM - 5:00 PM Write a review

About

Tennessee's Largest Show Cave and a U.S. National Natural Landmark; Cumberland Caverns displays some of the largest underground rooms and most spectacular formations in America. The daily scenic walking tour is offered year-round, from 9:00 to 5:00 without a reservation. Our ...

Read more

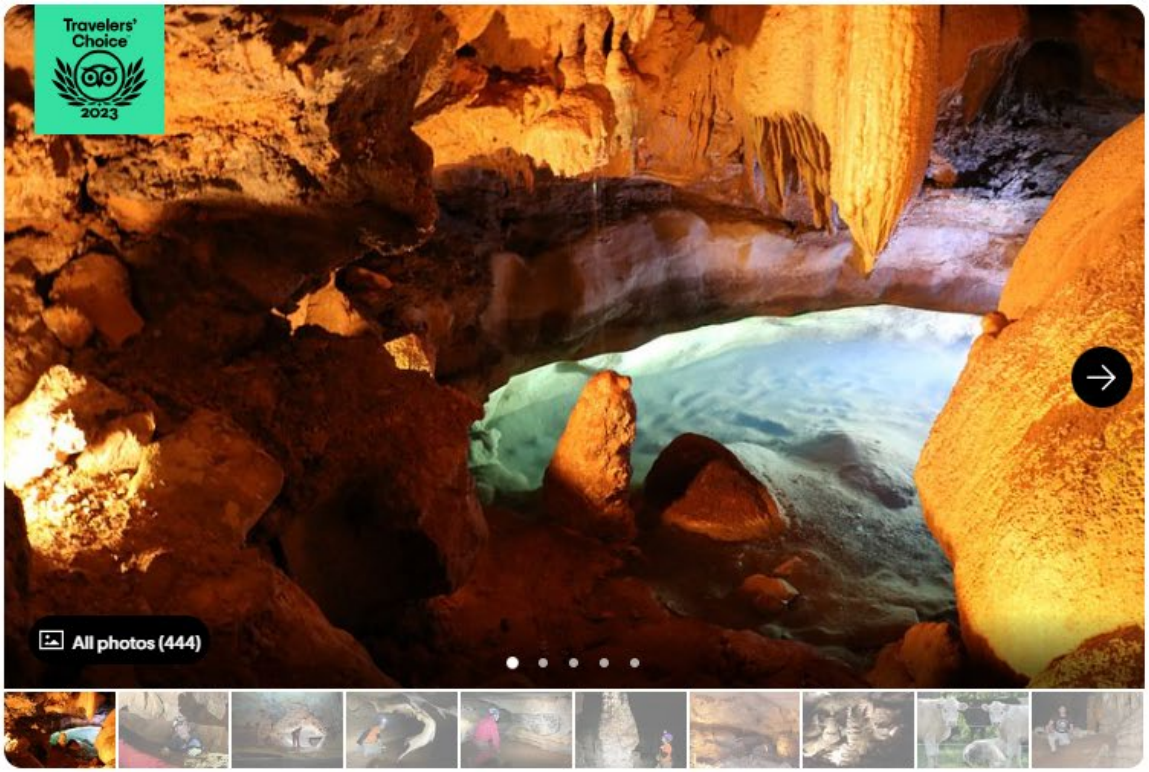
Suggest edits to improve what we show.

Improve this listing

Tours & experiences

Explore different ways to experience this place.

See options



Tripadvisor.com

Ruby Falls

7,290 reviews • #20 of 169 things to do in Chattanooga • Caverns & Caves • Waterfalls

Open now • 8:00 AM - 8:00 PM Write a review

About

ADVENTURE AWAITS! Ruby Falls is the tallest and deepest underground waterfall open to the public in the United States. Take a guided Classic Waterfall Tour, Lantern Tour or Extended Cavern Experience Tour along the scenic cavern trail to the breathtaking waterfall. See ancient geological ...
Read more

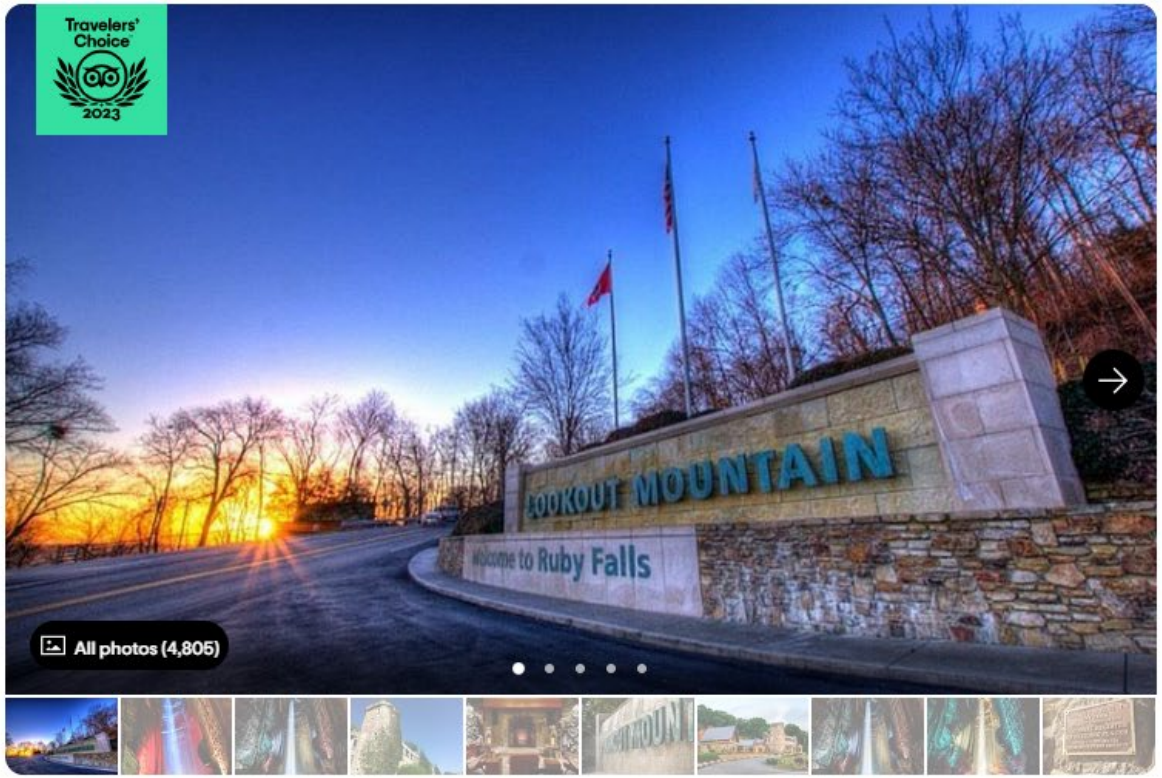
Duration: 2-3 hours

Suggest edits to improve what we show.
Improve this listing

Tours & experiences

Explore different ways to experience this place.

See options



Tripadvisor.com

Impact Structures

Impact Sites in Tennessee

- Wells Creek Structure
- Flynn Creek Structure

  Jackson County, Tennessee; has Wikipedia page

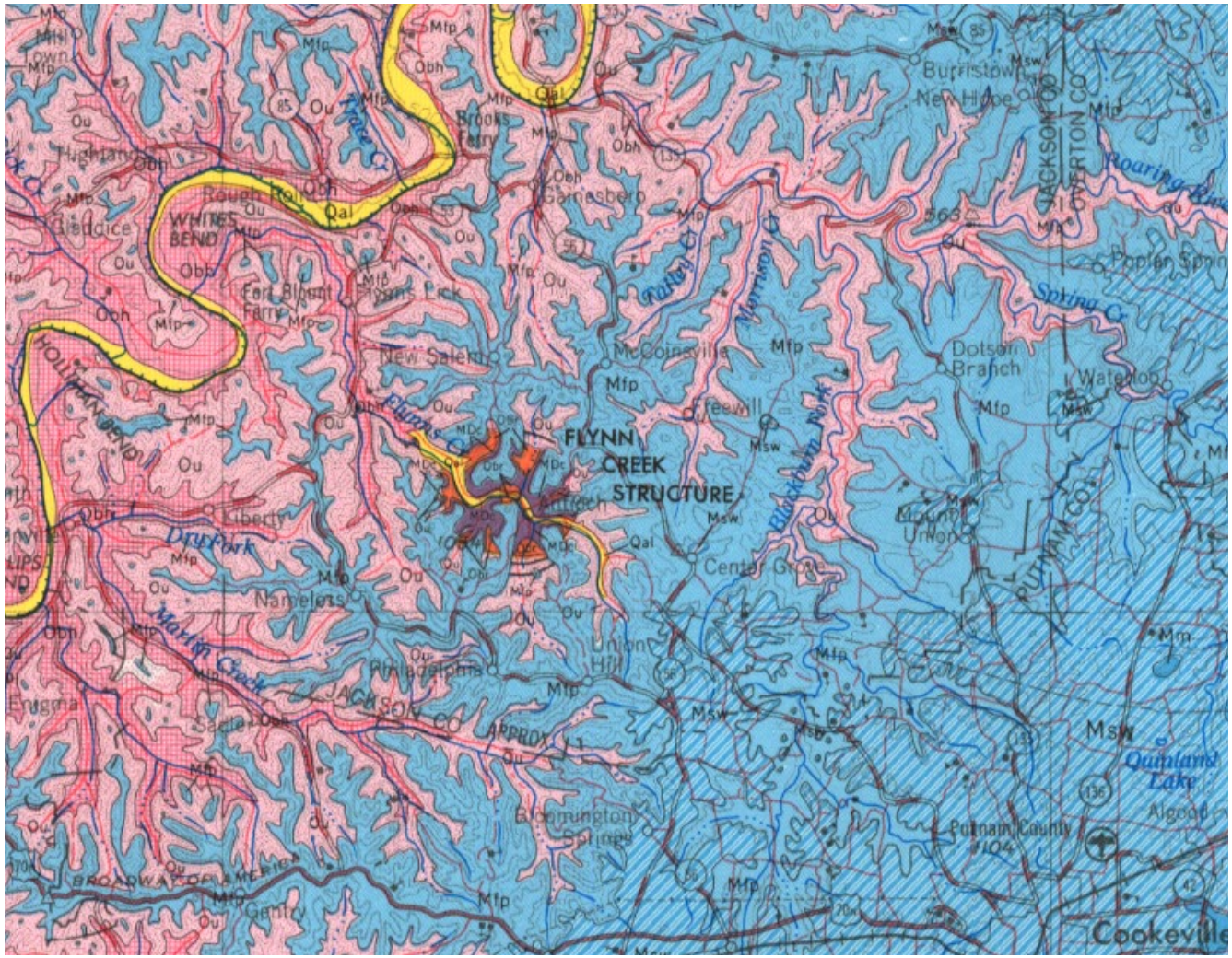
- Howell Structure

  https://www.lpi.usra.edu/meetings/lpsc2004/pdf/1692.pdf

- Dycus Disturbance

  https://www.lpi.usra.edu/meetings/lpsc2006/pdf/1358.pdf

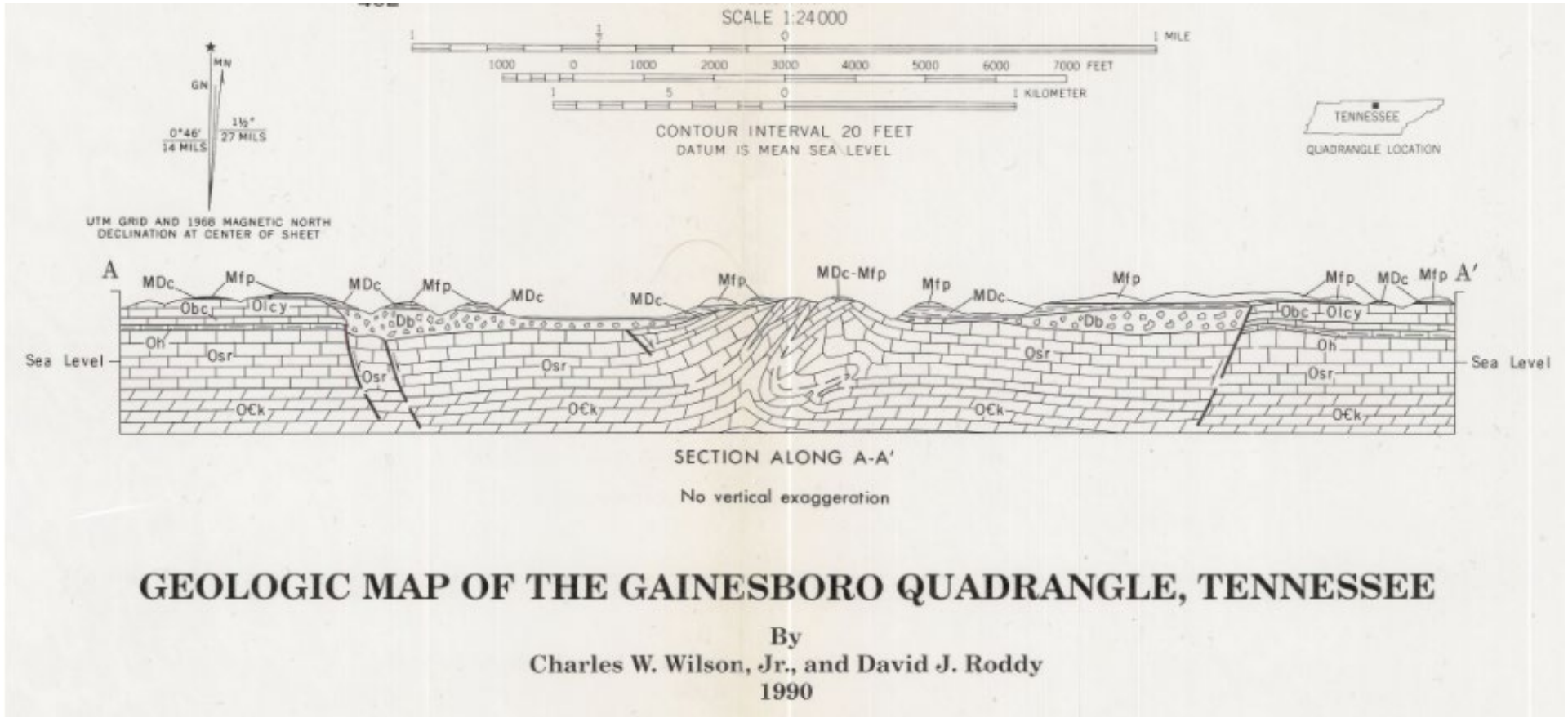
Flynn Creek Structure



West Central Sheet, 1:250,000 Scale, Geologic Map of Tennessee, 1966

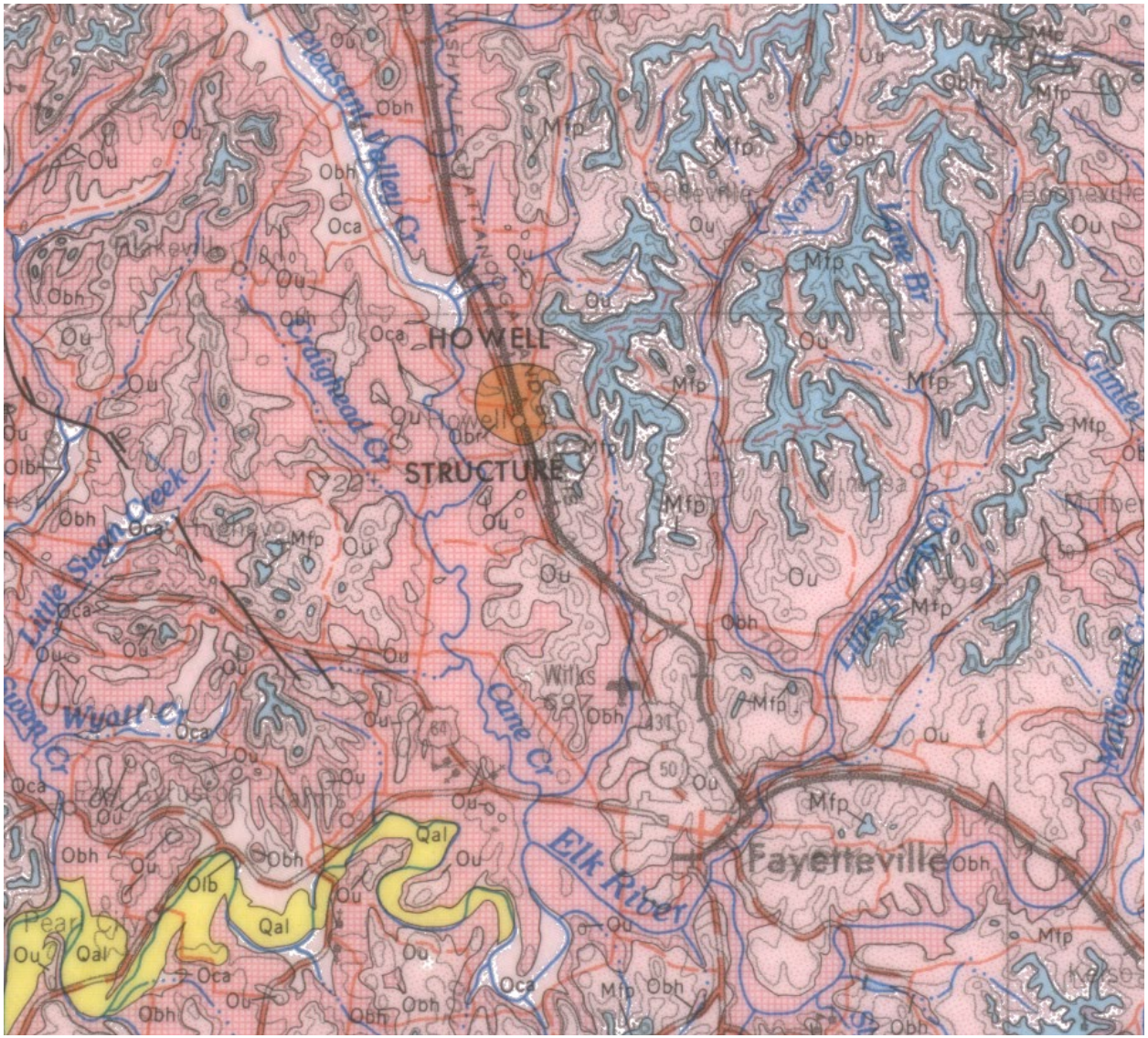
Flynn Creek Structure

Gainesboro Quadrangle 1:24,000 Geologic Map



Biography of Dave Roddy
https://www.usgs.gov/centers/astrogeology-science-center/dave-roddy

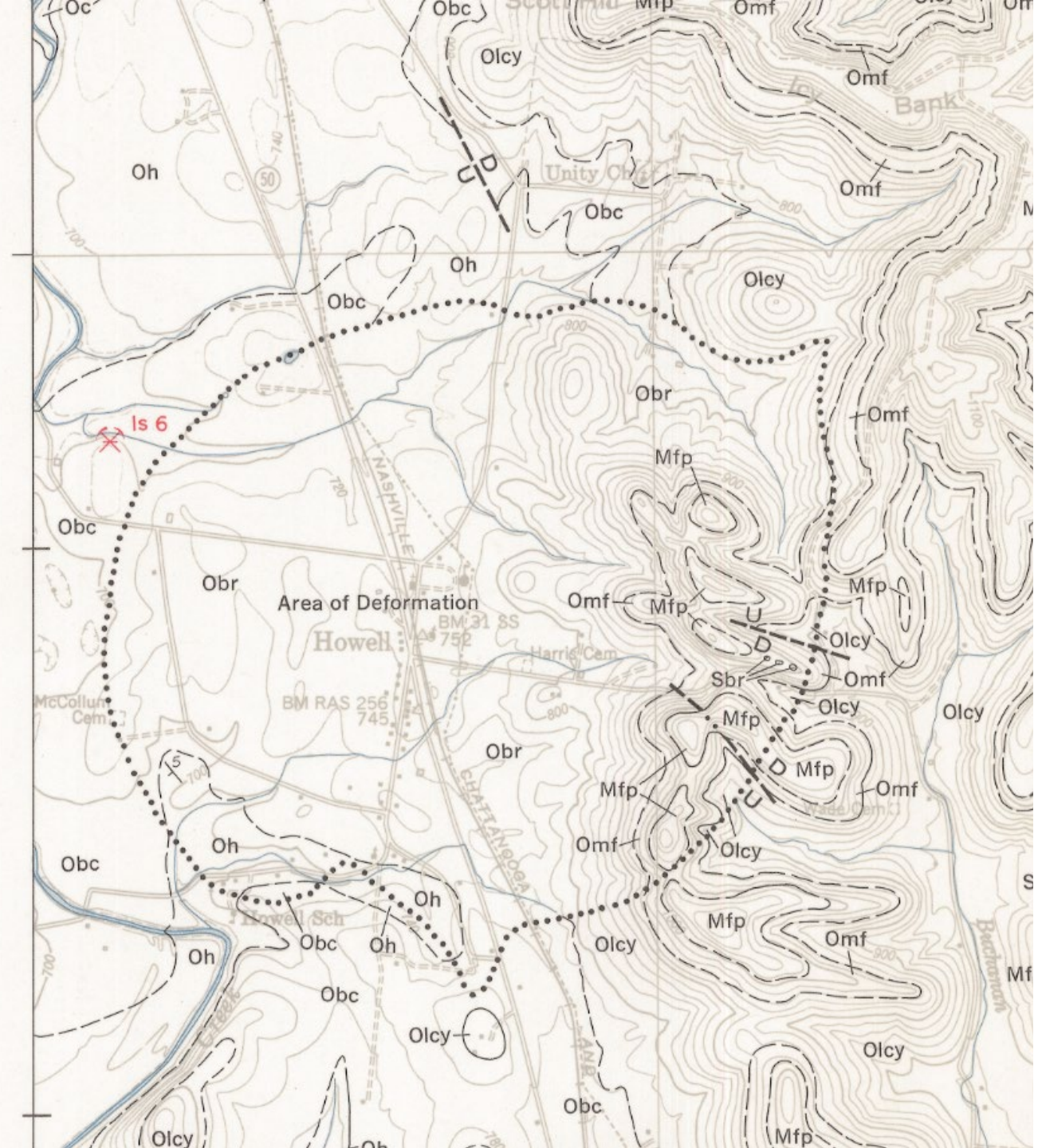
Howell Structure



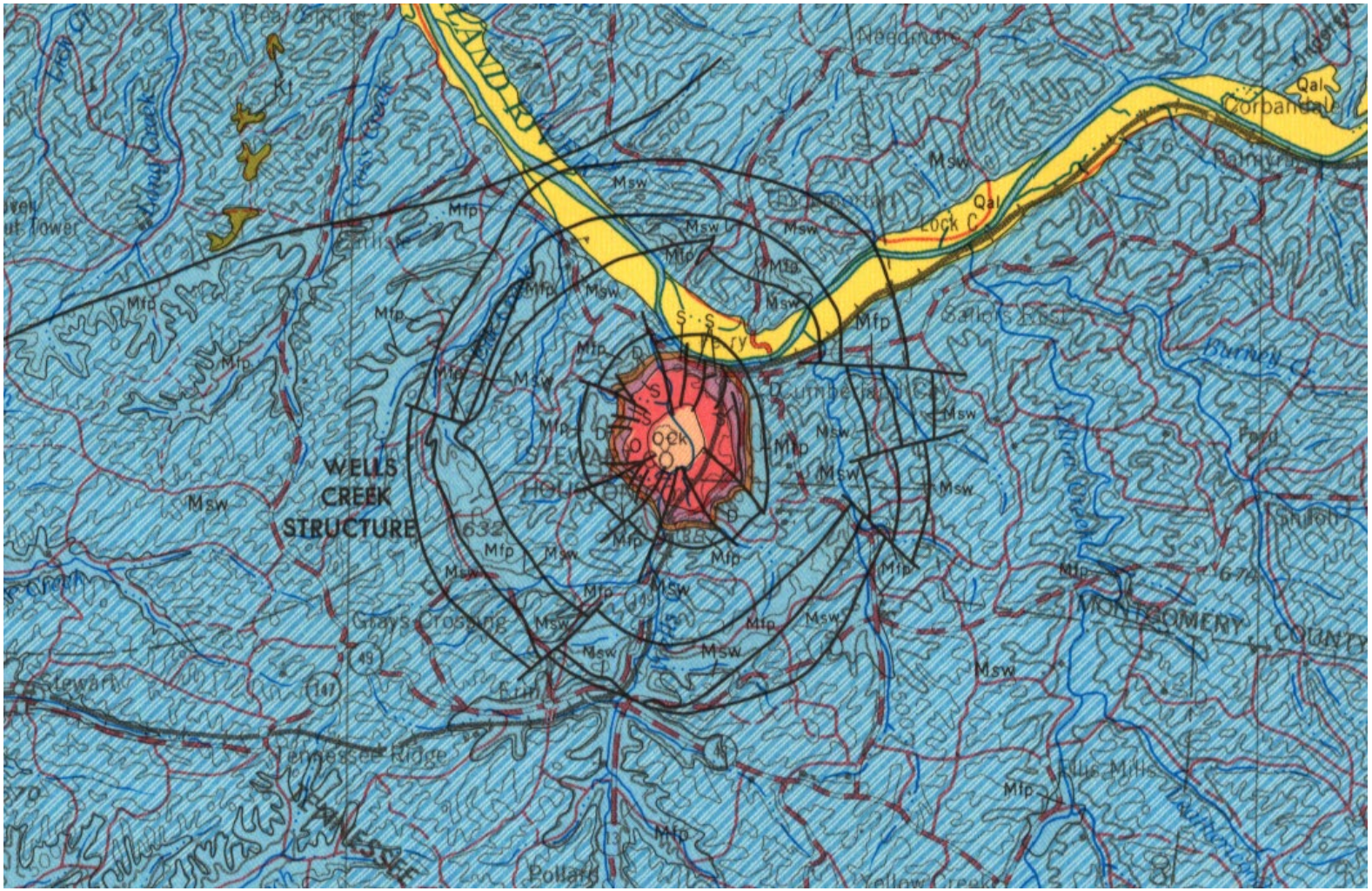
West Central Sheet, 1:250,000 Scale, Geologic Map of Tennessee, 1966

Howell Structure

Fayetteville Quadrangle 1:24,000 Geologic Map



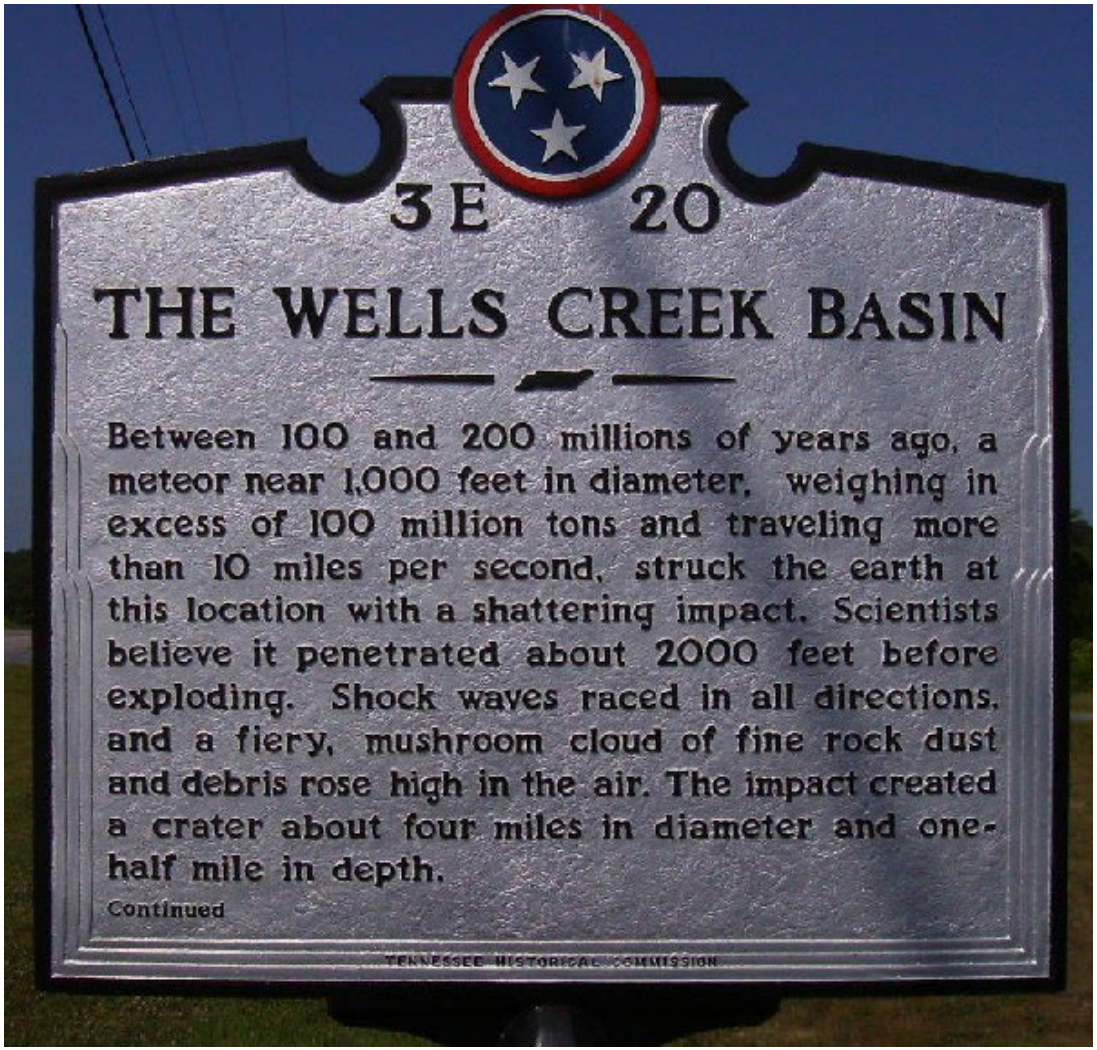
Wells Creek Structure

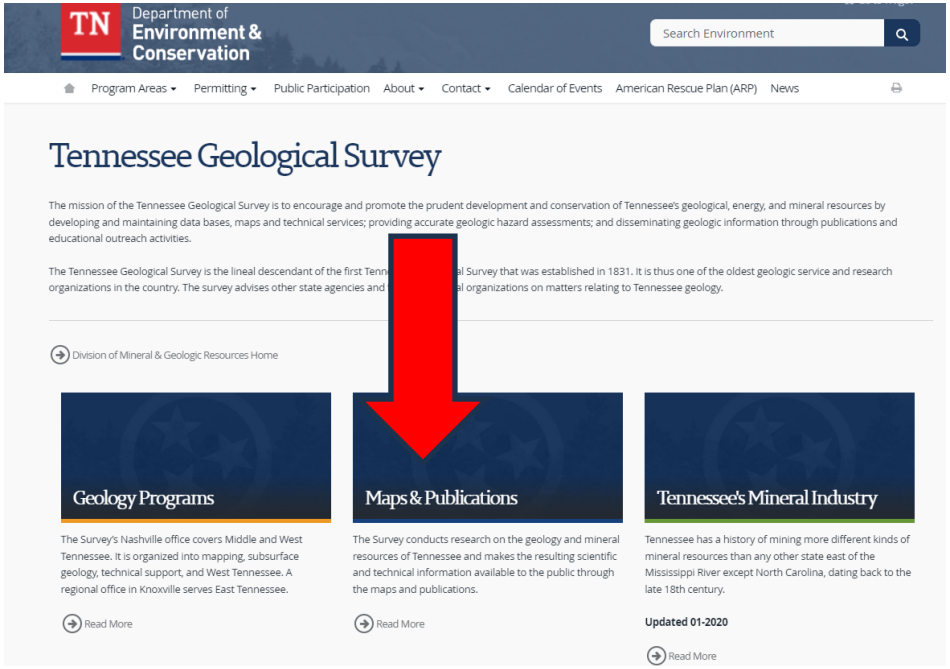


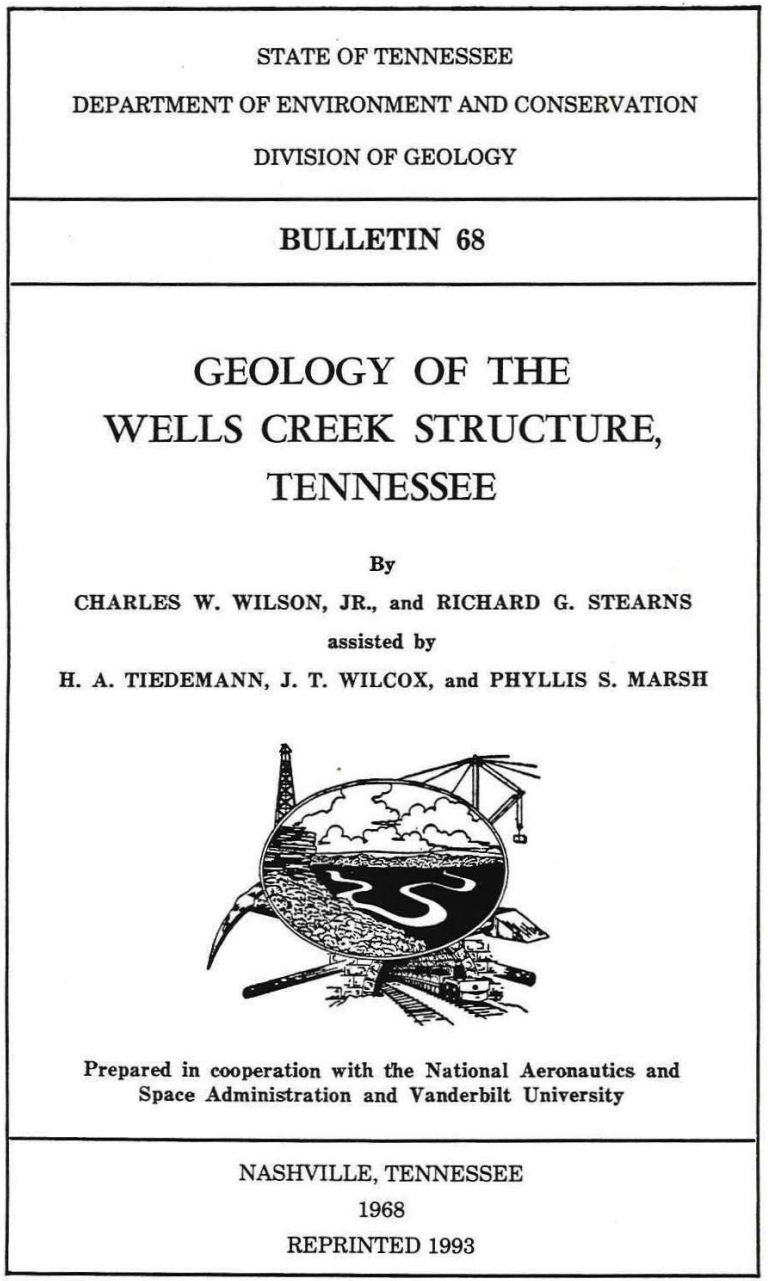
West Central Sheet, 1:250,000 Scale, Geologic Map of Tennessee, 1966


STEWART
MONTGOMERY
ROBERTSON
CHEATHAM
HOUSTON
DICKSON
DAVIDSON
HUMPHREYS
WILLIAMSON


WELLS
CREEK


3 E 20
THE WELLS CREEK BASIN
Between 100 and 200 millions of years ago, a meteor near 1,000 feet in diameter, weighing in excess of 100 million tons and traveling more than 10 miles per second, struck the earth at this location with a shattering impact. Scientists believe it penetrated about 2000 feet before exploding. Shock waves raced in all directions, and a fiery, mushroom cloud of fine rock dust and debris rose high in the air. The impact created a crater about four miles in diameter and one-half mile in depth.
Continued
TENNESSEE HISTORICAL COMMISSION





STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF GEOLOGY

BULLETIN 68

GEOLOGY OF THE WELLS CREEK STRUCTURE, TENNESSEE

By

CHARLES W. WILSON, JR., and RICHARD G. STEARNS

assisted by

H. A. TIEDEMANN, J. T. WILCOX, and PHYLLIS S. MARSH

Prepared in cooperation with the National Aeronautics and Space Administration and Vanderbilt University

NASHVILLE, TENNESSEE

1968

REPRINTED 1993

Bulletin 68, Plate 1

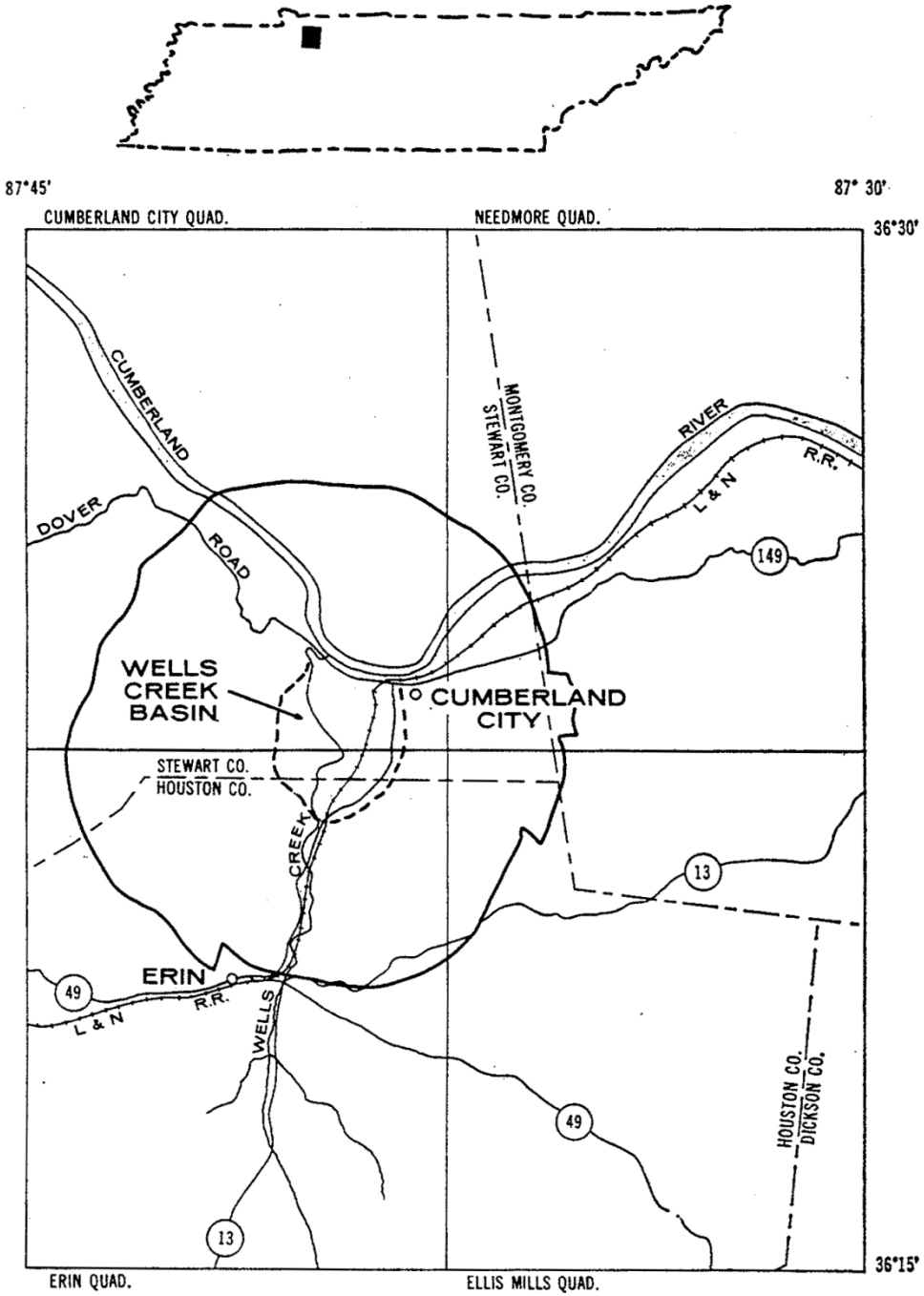
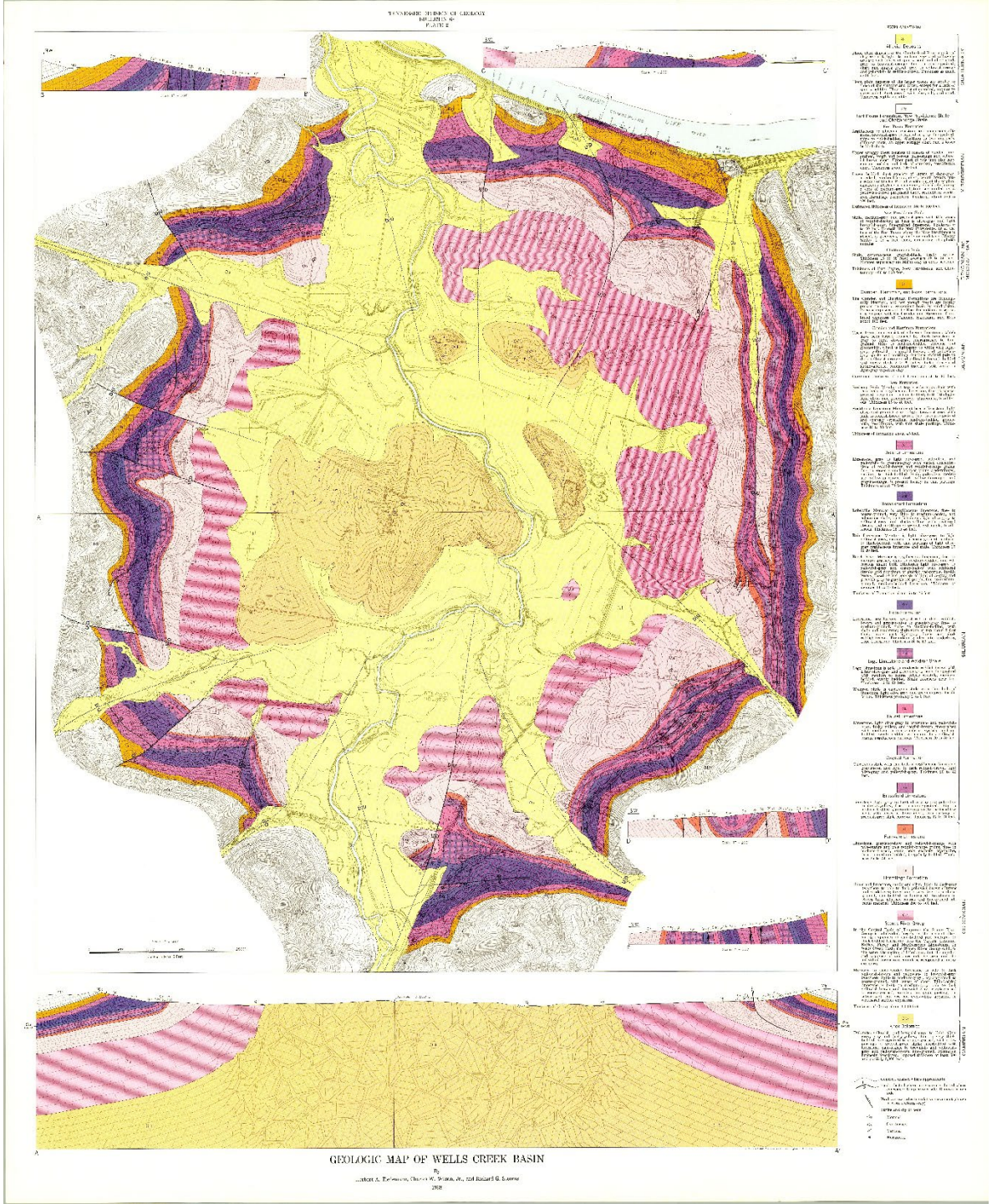
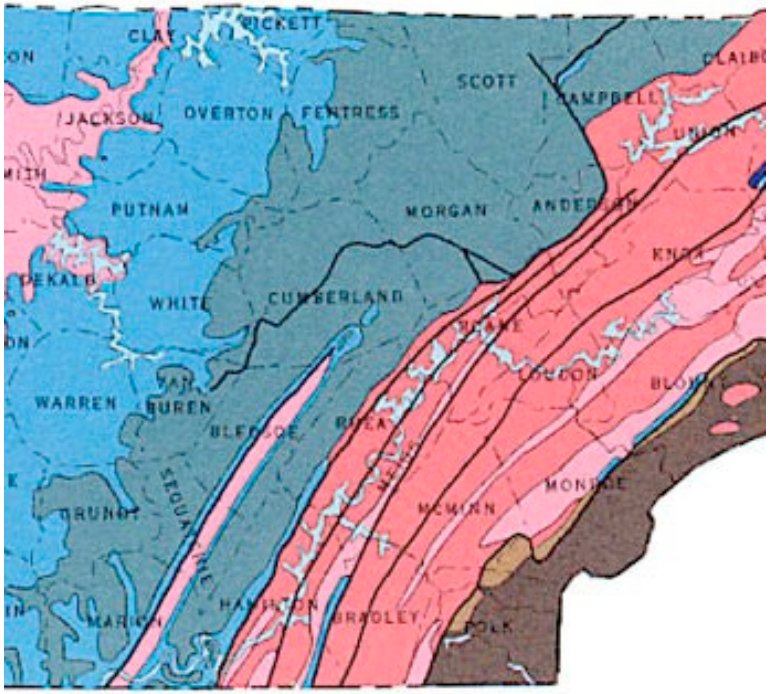


FIGURE 1.—Index map showing location of the Wells Creek structure.

Bulletin 68, Plate 2



Cumberland Plateau



Cumberland Plateau

- Mostly flat with elevation of 1700 to 1900 feet
- Irregular western margin and 900-foot escarpment on the east side
- Hilly areas in south and southeast exceed 2000 feet in elevation
- Mountainous areas as high as 3534 feet
- Numerous deep gorges and two prominent valleys – Sequatchie Valley to the south and much smaller Elk Valley to the north
- Coal, natural gas, and oil have been mined or produced from this region

TN Department of Environment & Conservation

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The Tennessee Geological Survey is the lineal descendant of the first Tenn… Survey that was established in 1831. It is thus one of the oldest geologic service and research organizations in the country. The survey advises other state agencies and … organizations on matters relating to Tennessee geology.

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Tennessee's Mineral Industry

Tennessee has a history of mining more different kinds of mineral resources than any other state east of the Mississippi River except North Carolina, dating back to the late 18th century.

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STATE OF TENNESSEE
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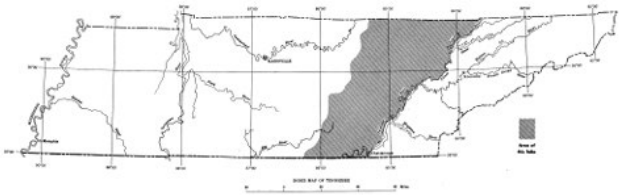
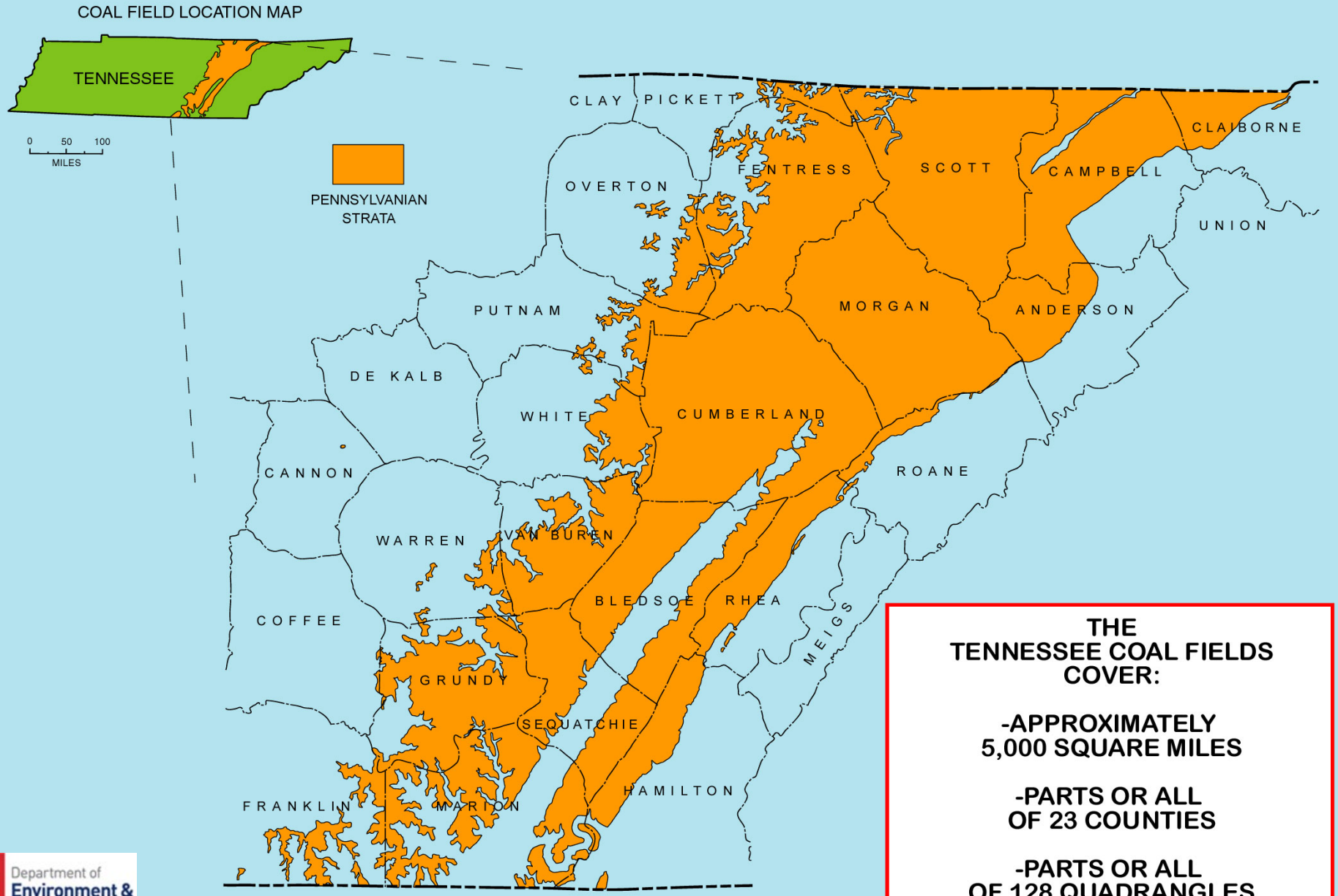
W. D. Hardeman, State Geologist

PENNSYLVANIAN GEOLOGY OF THE CUMBERLAND PLATEAU

By
Charles W. Wilson, Jr., John W. Jewell
and Edward T. Luther



NASHVILLE, TENNESSEE
1956



THE
TENNESSEE COAL FIELDS
COVER:

-APPROXIMATELY
5,000 SQUARE MILES

-PARTS OR ALL
OF 23 COUNTIES

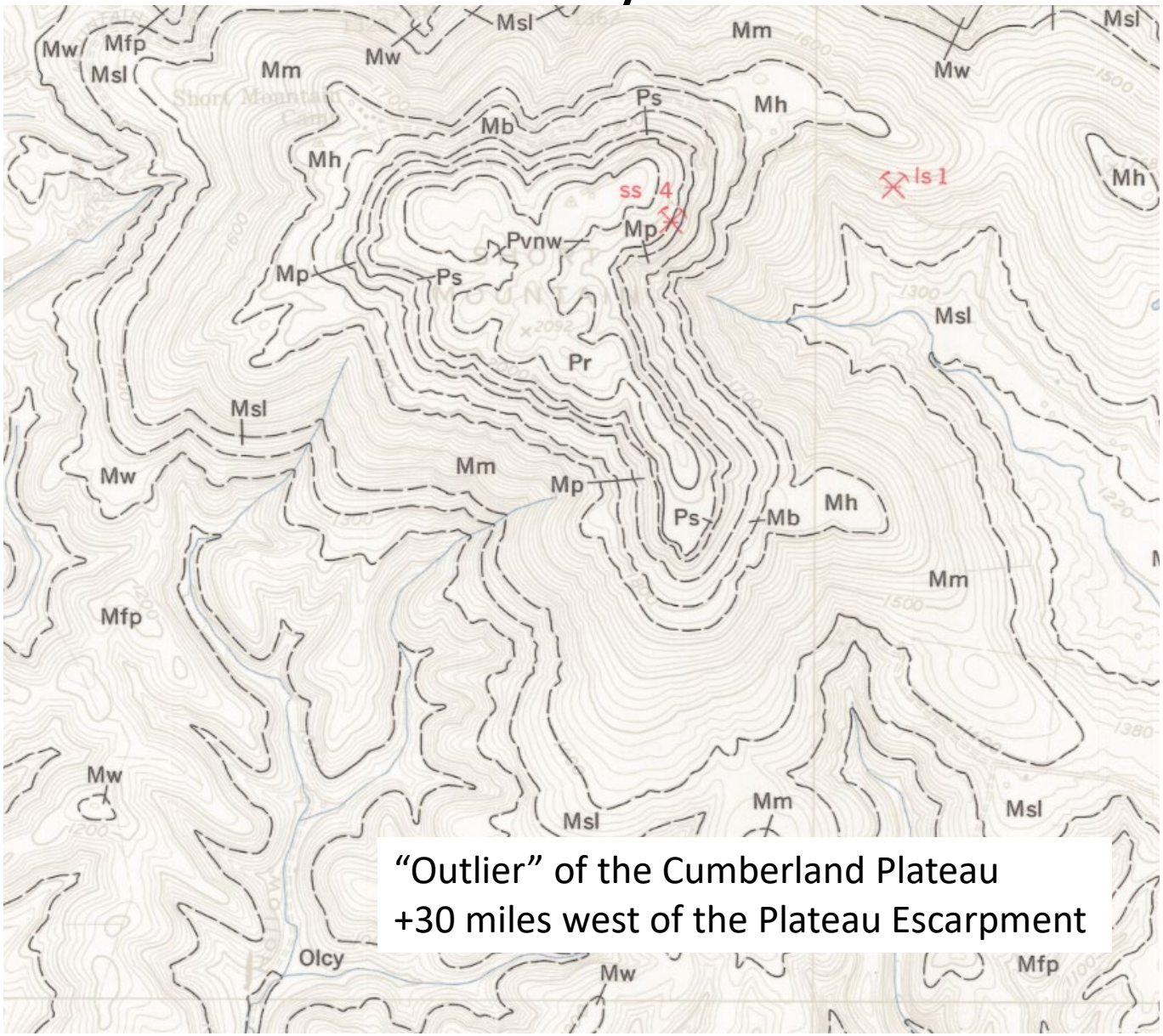
-PARTS OR ALL
OF 128 QUADRANGLES

TN Department of Environment & Conservation

THE TENNESSEE COAL FIELDS

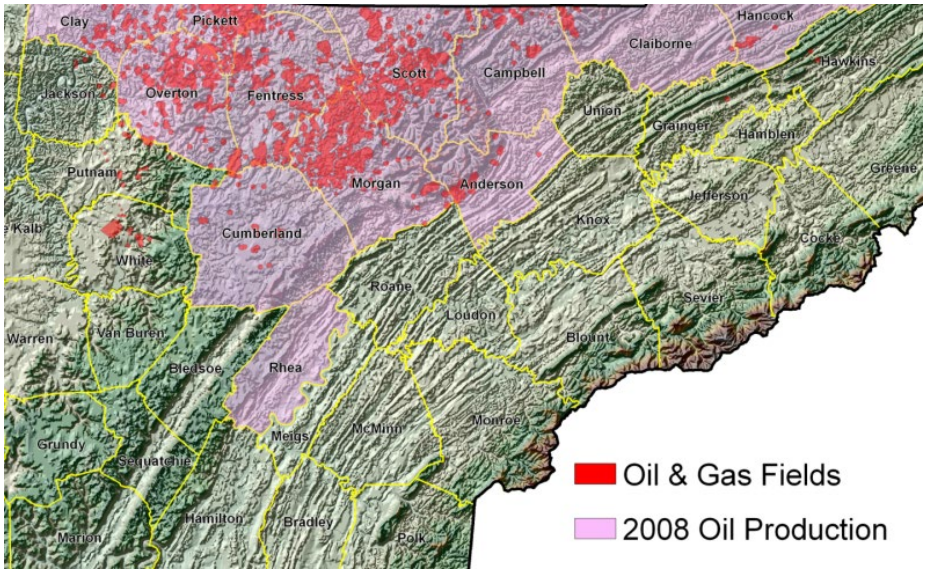
Short Mountain

Cannon County Tennessee

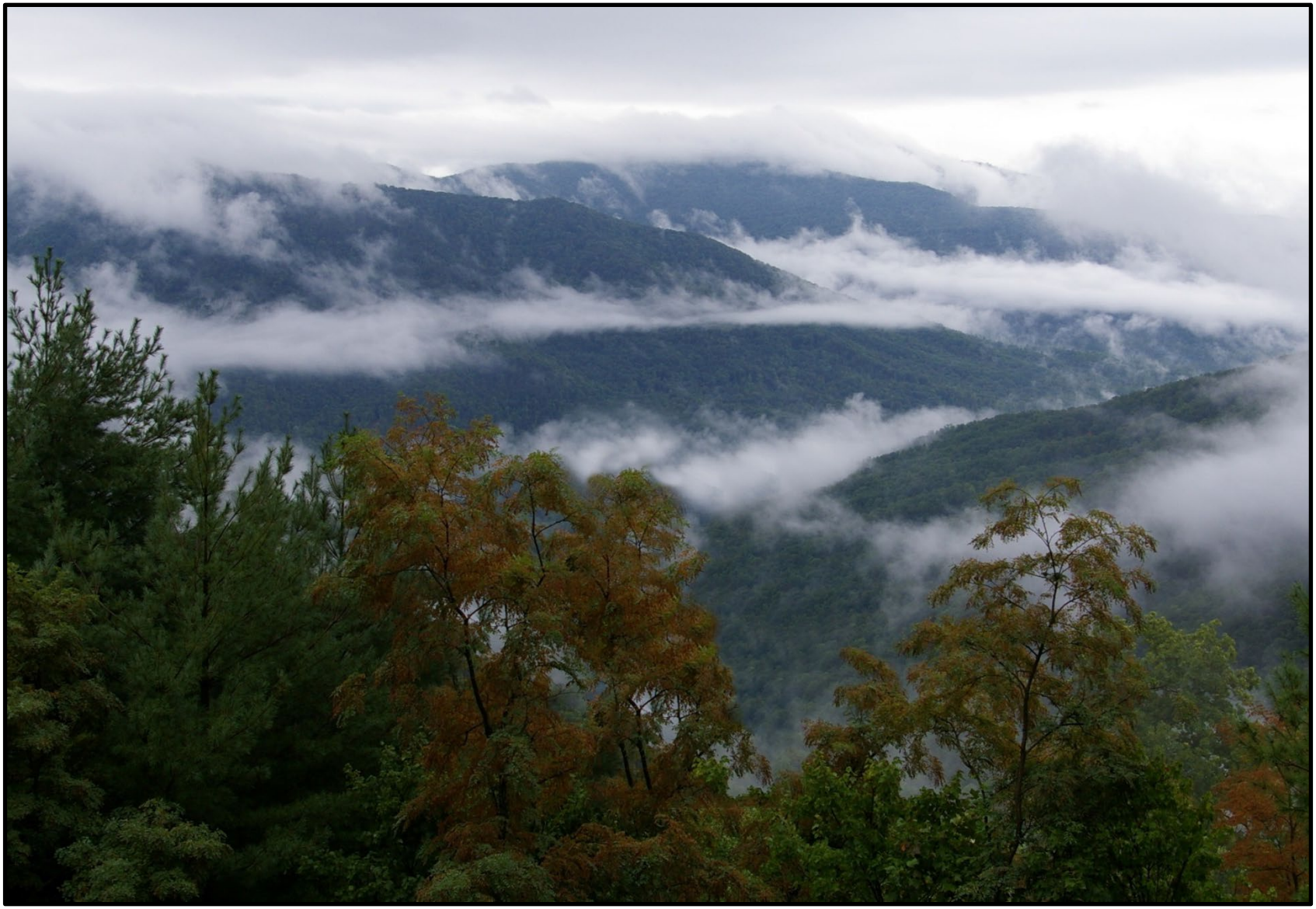


"Outlier" of the Cumberland Plateau
+30 miles west of the Plateau Escarpment

Oil Producing Counties in Tennessee



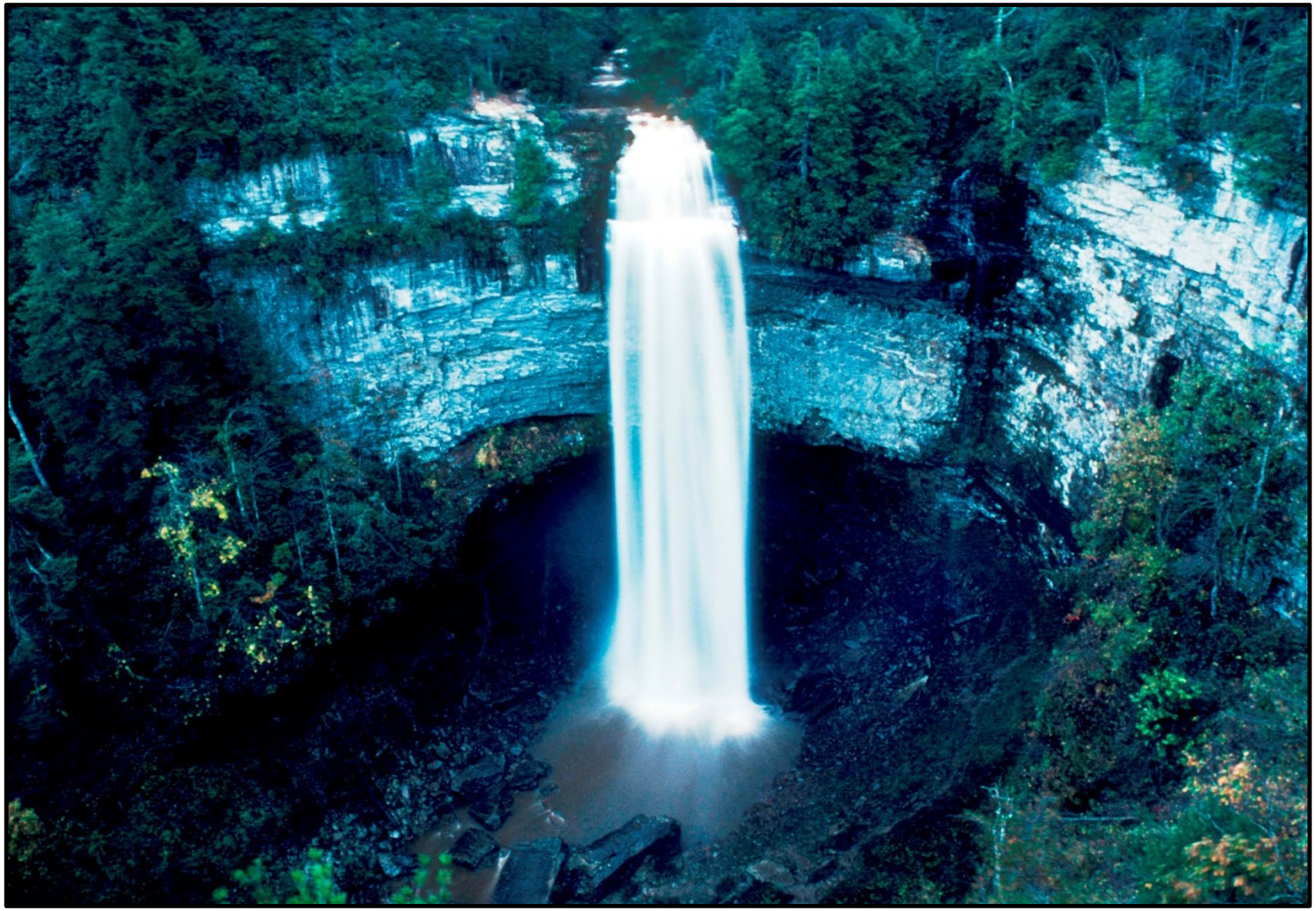
View of Cumberland Mountains from Bird Mountain in Morgan County



Cumberland Plateau

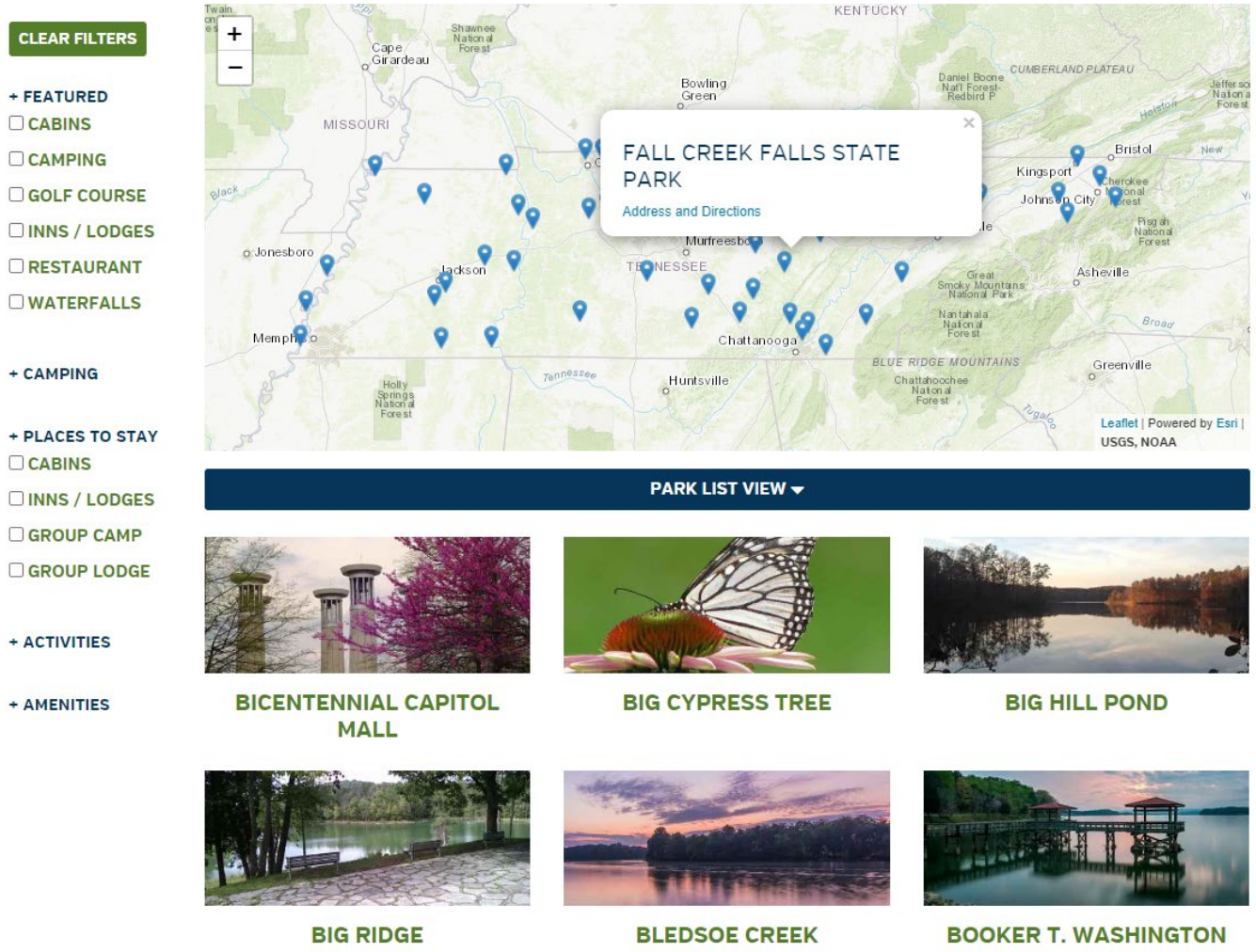
- Capped by 299- to 318-million-year-old sandstones and shales
- Underlain by 318- to 359-million-year-old limestones, cherty limestones, and shale.
- Prominent cliffs and many waterfalls, including 256-foot-high Falls Creek Falls
- Numerous Natural Bridges (Bull. 80)

Falls Creek Falls in Van Buren County



FCF - 256 Ft; 6 other water falls in FCF State Park

Tennessee State Parks
https://tnstateparks.com/



Twin Arches State Natural Area

Courtesy of State of Tennessee Photographic Services

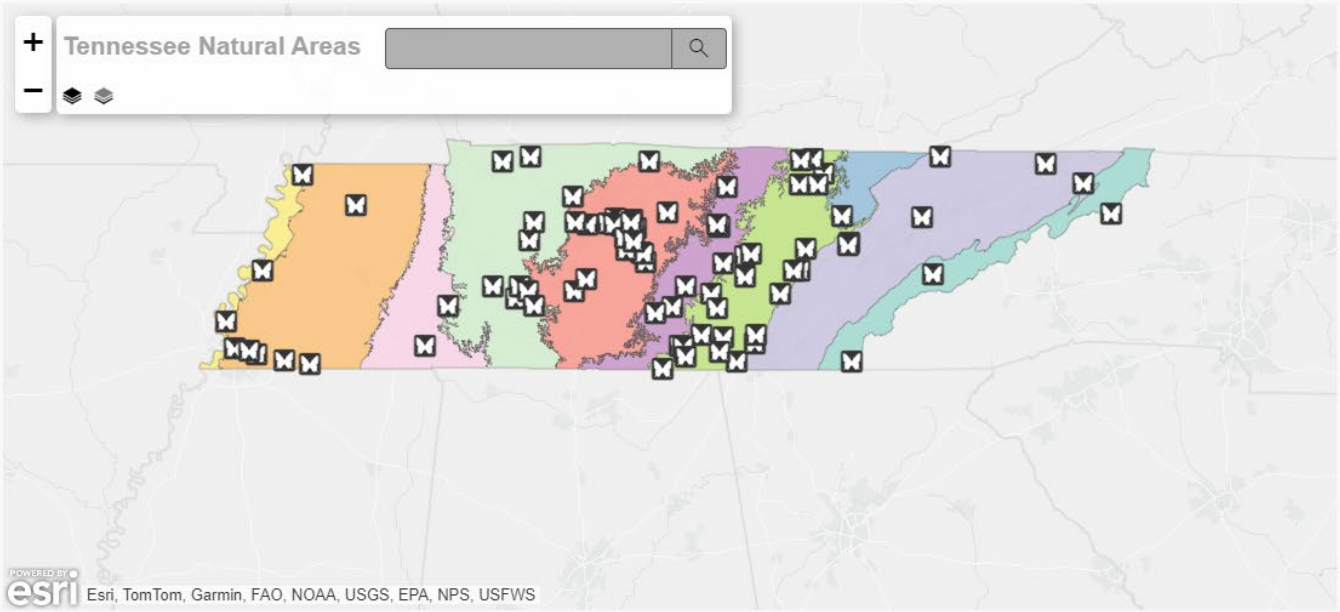
https://www.tn.gov/environment/program-areas/na-natural-areas/list-of-natural-areas.html

Program Areas ▾ Permitting ▾ Public Participation About ▾ Contact ▾ Calendar of Events American Rescue Plan (ARP) News

List of Natural Areas

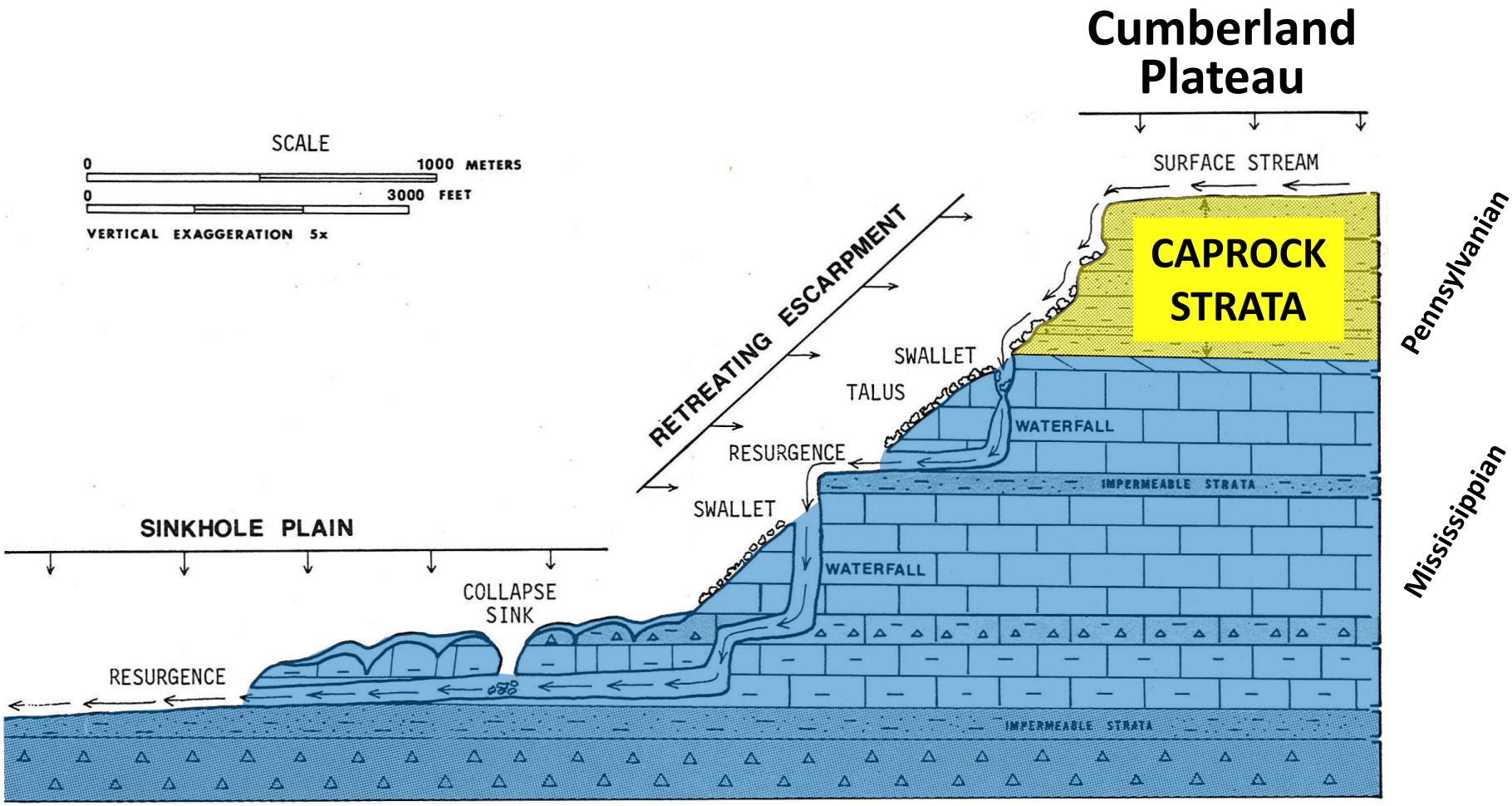
Map showing the location of each Natural Area listed below. Use the search box to find your Natural Area by name or number.

You may also click on the black icon under the search box to activate or deactivate the counties and/or physiographic provinces layers depending on your visualization preferences.

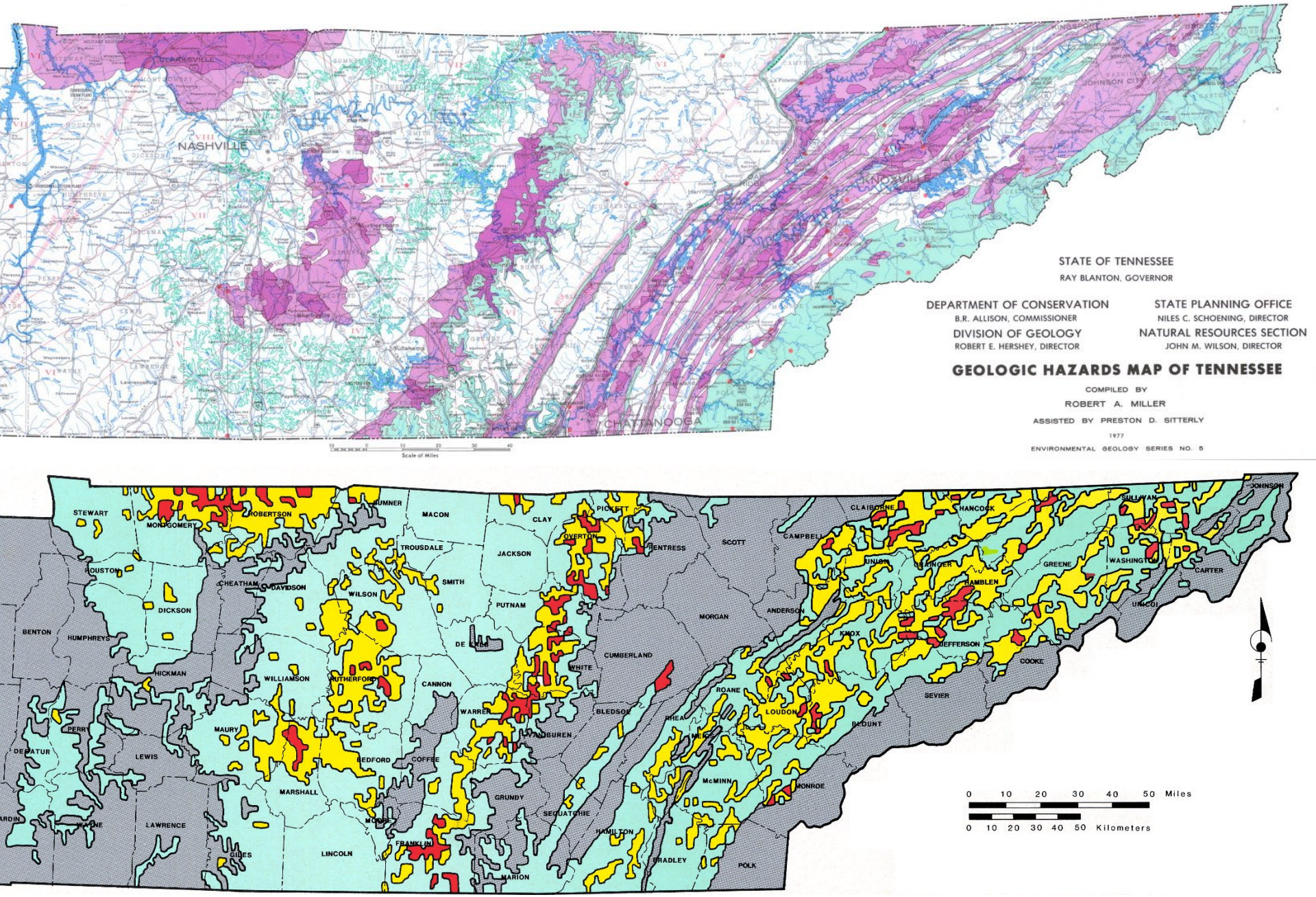


Clicking on the various Natural Areas names below provides a brief description and printable/downloadable map for each site. The maps for each Natural Area are geo-referenced PDF
map is opened using an app like Avenza PDF Maps on your smart phone, a dot/reference point displays on the device's screen at your exact location. Navigate with only
e disabled), record your tracks, estimate travel times, and add placemarks and photos to share with others.

Resistant Caprock Forms the Plateau



Underlying strata is less resistant to weathering and erosion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KNOXVILLE
JOHNSON CITY
KINGSPORT
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HOUSTON
TROUSDALE
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UNION
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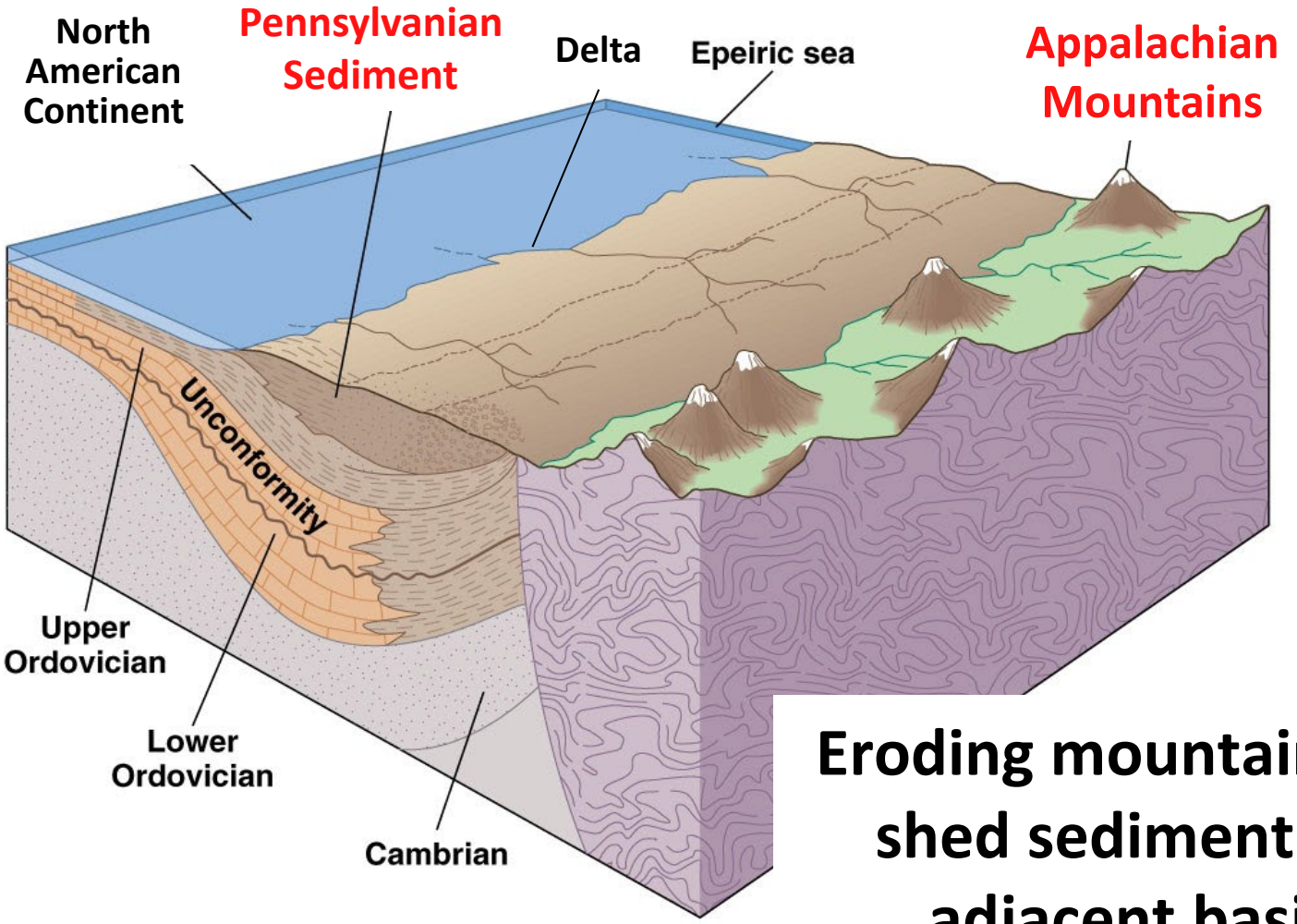
GREENE
WASHINGTON
CARTER
CHEATHAM
DAVIDSON
WILSON
SMITH
HAMBLEN
DICKSON
PUTNAM
ANDERSON
UNICOI
BENTON
HUMPHREYS
DE KALB
MORGAN
KNOX
JEFFERSON
COOKE
HICKMAN
WILLIAMSON
RUTHERFORD
CANNON
CUMBERLAND
WHITE
ROANE
SEVIER
PERRY
MAURY
WARREN
BLEDSOE
RHEA
LOUDON
BLOUNT
DECATUR
LEWIS
BEDFORD
COFFEE
VANBUREN
MARSHALL
GRUNDY
McMINN
MONROE
LAWRENCE
MOORE
SEQUATCHIE
HAMILTON
GILES
LINCOLN
FRANKLIN
BRADLEY
POLK
MARION
0 10 20 30 40 50 Miles
0 10 20 30 40 50 Kilometers

Appalachian Mountains Shed Sediment Westward into a Continental Sea



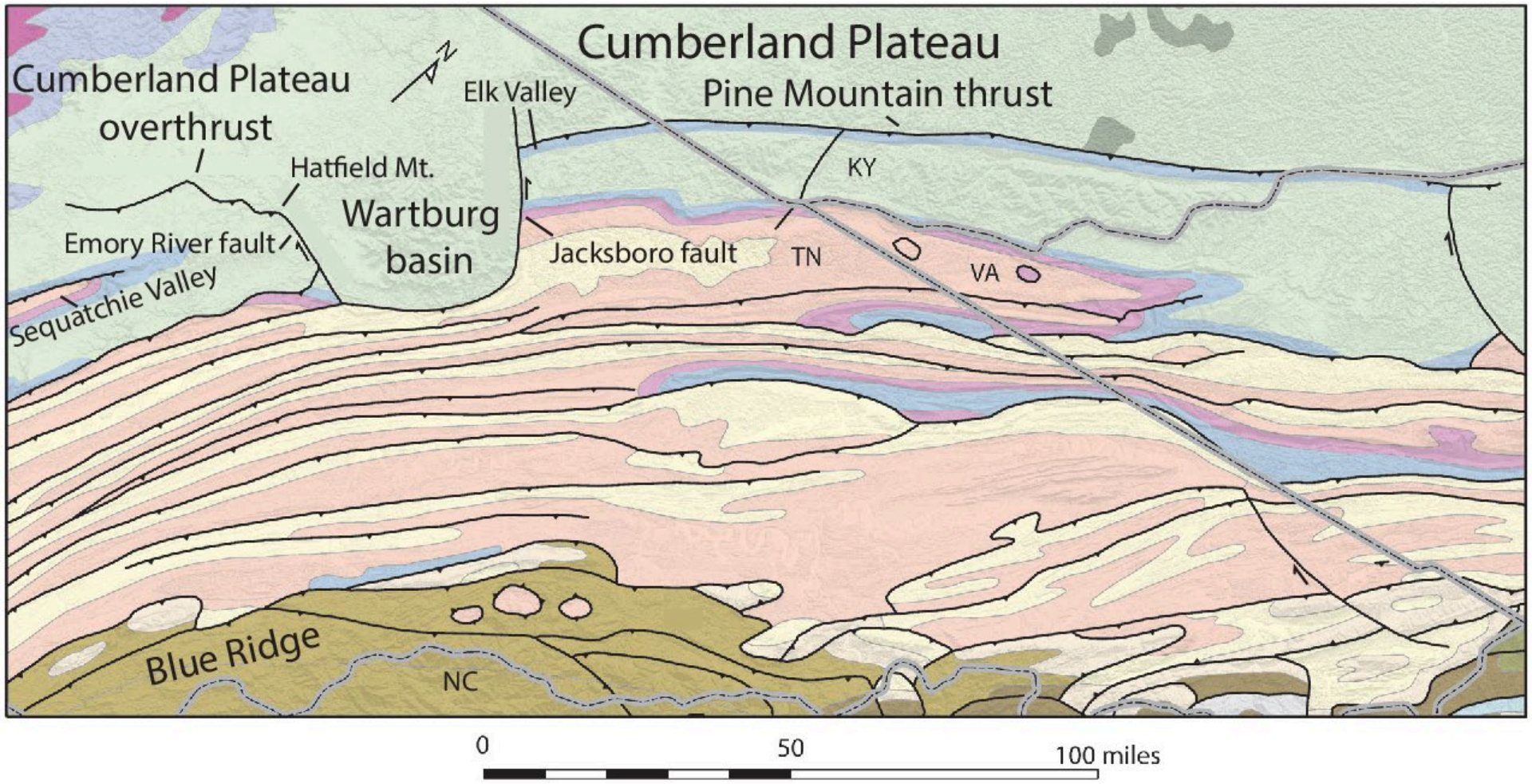
Eroding mountain belts shed sediment into adjacent basins

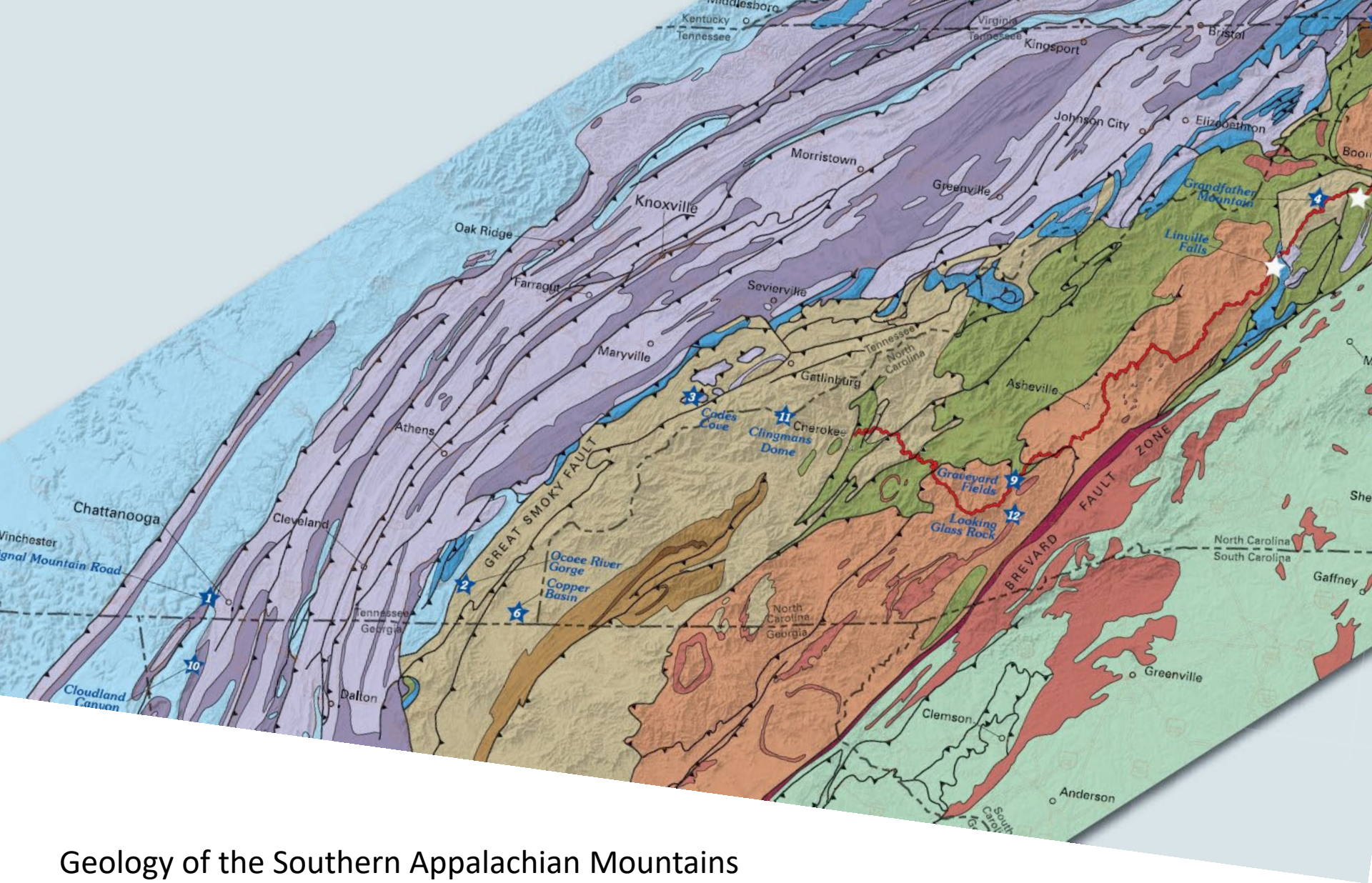
Cumberland Plateau Structures

The plateau region has three prominent structural features that can be seen on the geologic map and on satellite photos

- Sequatchie Valley
- The Cumberland Mountain Overthrust Fault
- The Pine Mountain Overthrust Fault

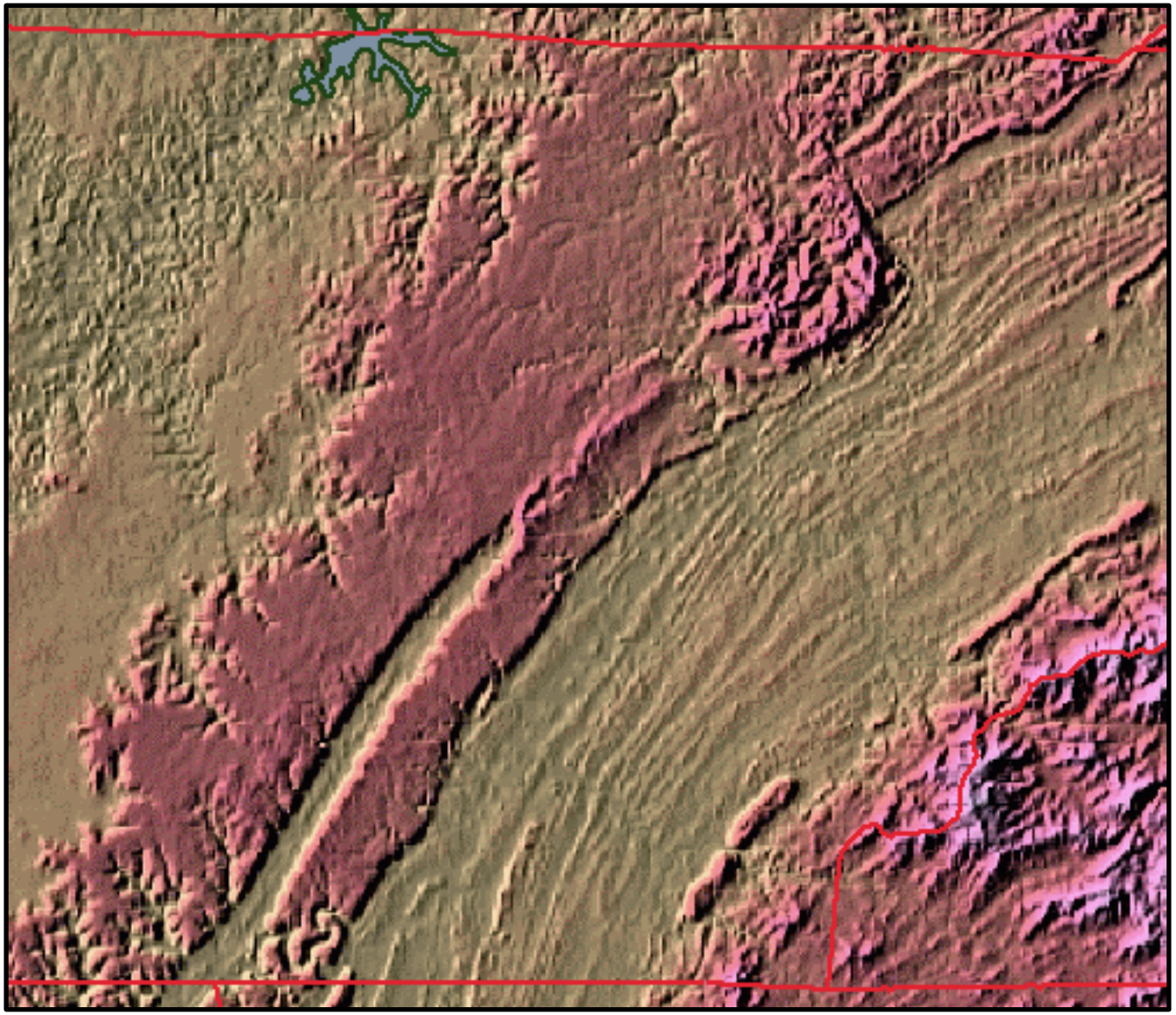
Cumberland Plateau Structures





Geology of the Southern Appalachian Mountains
USGS Scientific Investigations Map (SIM) 2830

Sequatchie Valley in the Southern Cumberland Plateau



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BULLETIN 60

THE CUMBERLAND PLATEAU OVERTHRUST AND GEOLOGY OF THE CRAB ORCHARD MOUNTAINS AREA, TENNESSEE

BY

RICHARD G. STEARNS

NASHVILLE, TENNESSEE

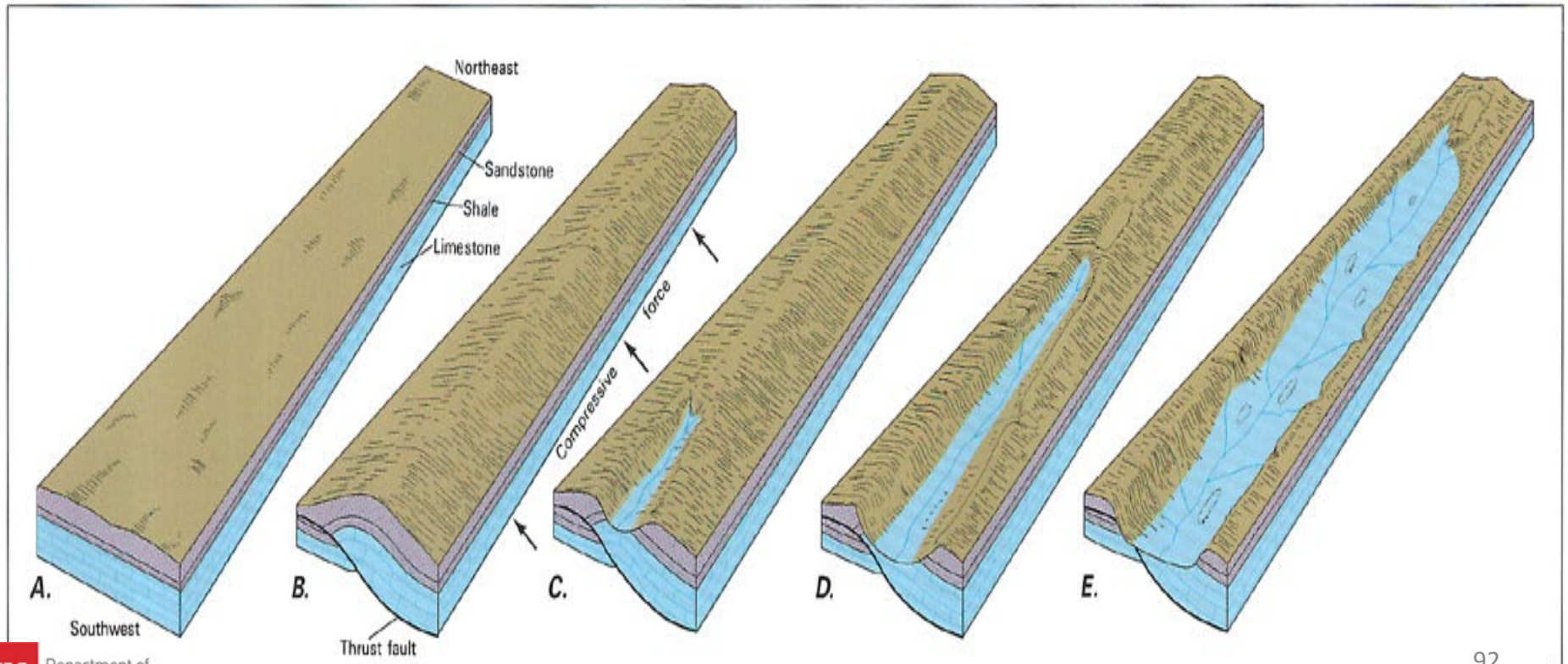
1954

Rugged Eastern Wall and Floor of Sequatchie Valley

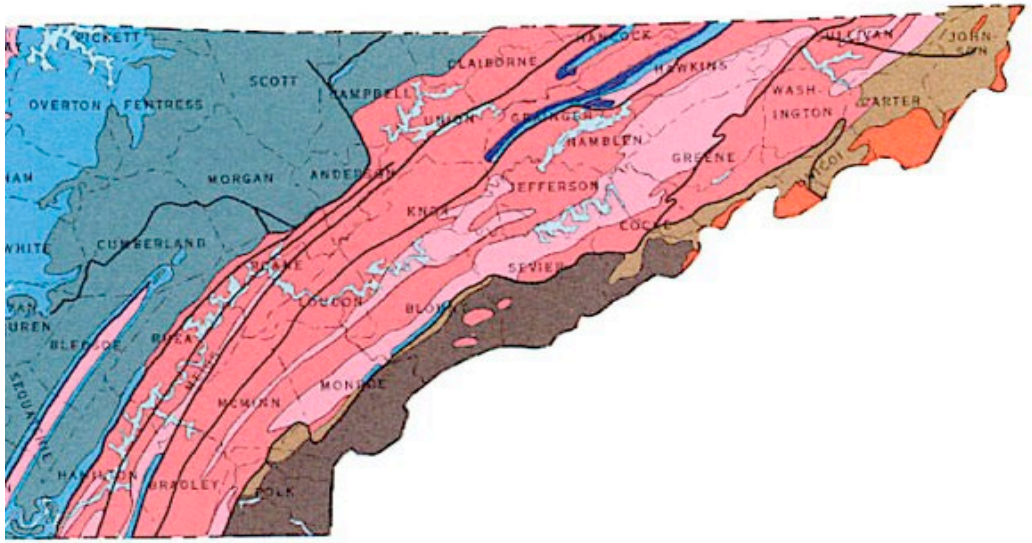
Courtesy of State of Tennessee Photographic Services

Formation of Sequatchie Valley

A. Undisturbed sediments near end of Paleozoic Era
B. Began about 300 million years ago during formation of the Appalachian Mountains
C. Ancestral Sequatchie River began its headward erosion about 225 million years ago
D. By about 70 million years ago overlying resistant sandstones had been removed in the lower valley, and sinkholes had begun forming at the head of the valley
E. Continuing erosion has resulted in the present valley configuration



Valley & Ridge Province



PALEOZOIC

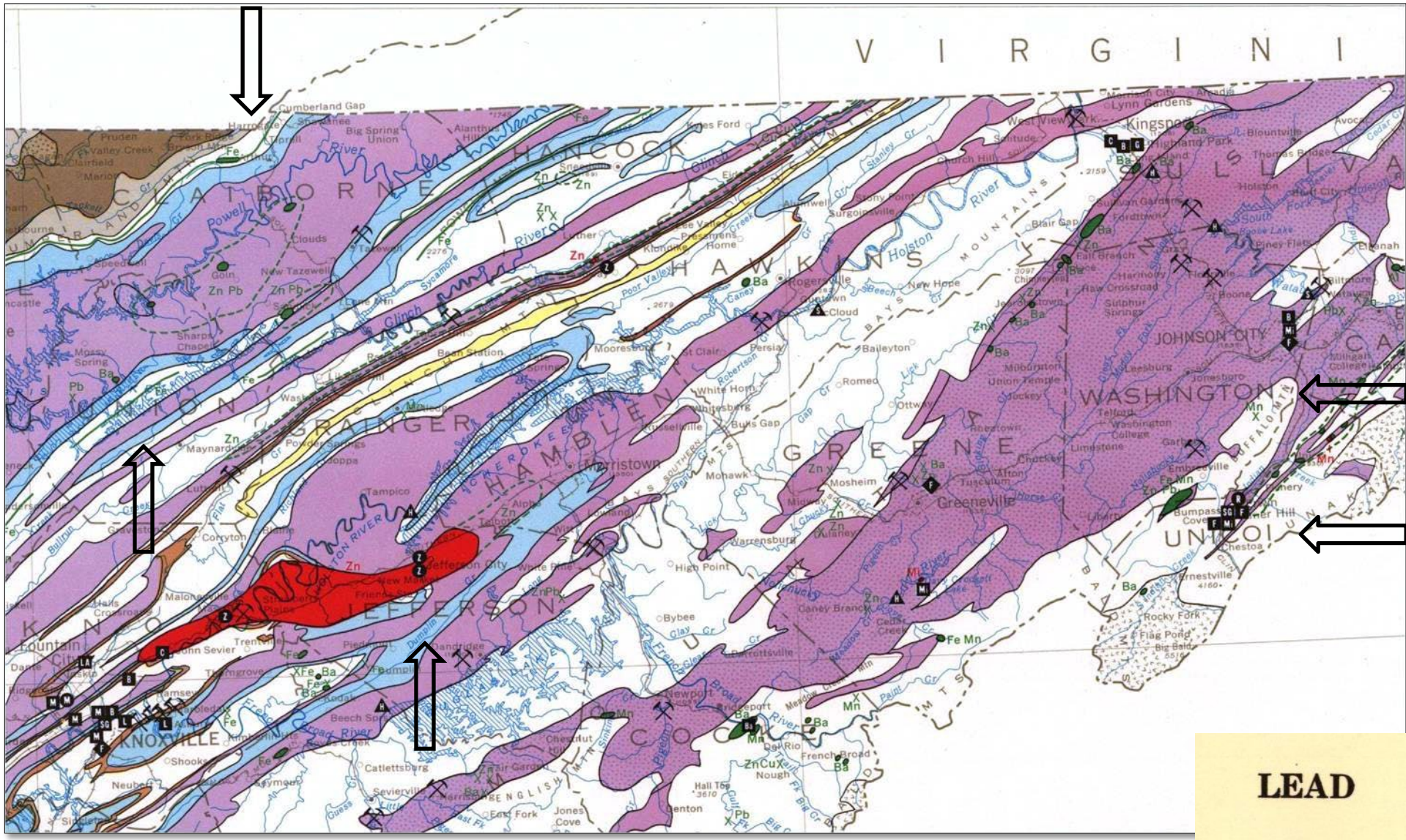
ORDOVICIAN	ORDOVICIAN-CAMBRIAN	CAMBRIAN
SEDIMENTARY ROCKS	SEDIMENTARY ROCKS	SEDIMENTARY ROCKS

Valley and Ridge

- Also known to as the Great Valley of East Tennessee
- Characterized by numerous elongate ridges and valleys, all trending northeast to southwest
- Ridges range in elevation from 1495 to 3097 feet
- Valleys to the north average about 1000 feet in elevation and to the south about 750 feet
- Iron, lead, marble, and zinc have been mined from this region

Peg Leg Iron Mine in Roane Mountain State Park in Carter County

Areas With Pb-Zn Mining or Occurrences



LEAD

Pb 96

TN Department of Environment & Conservation

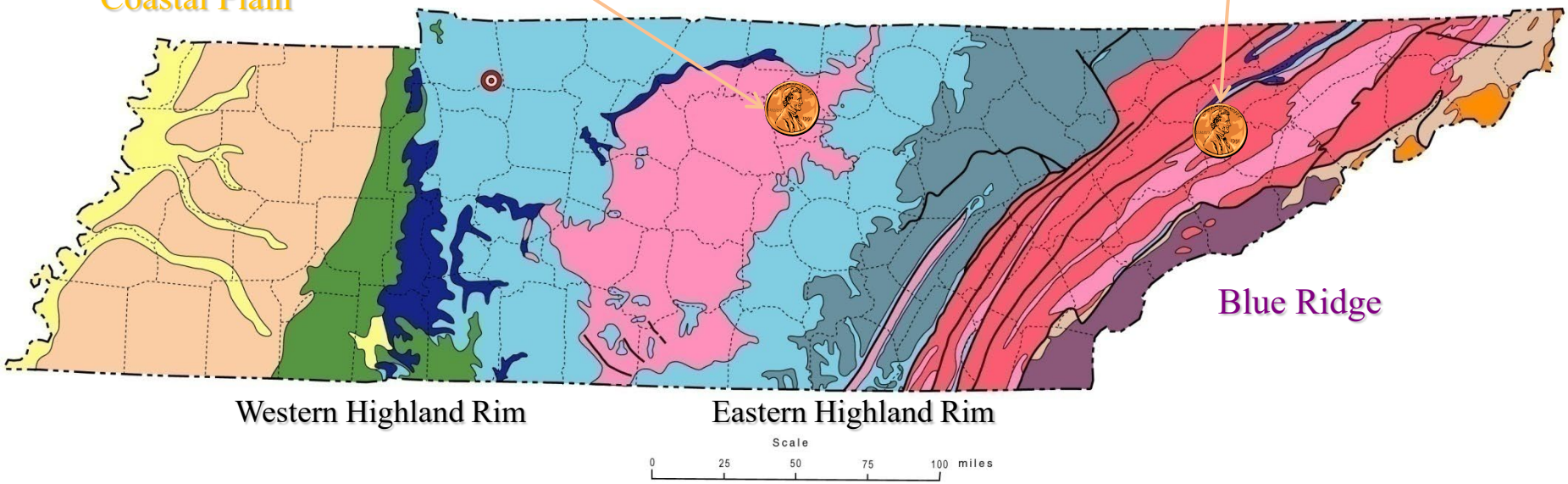
Tennessee Zinc Mining Districts

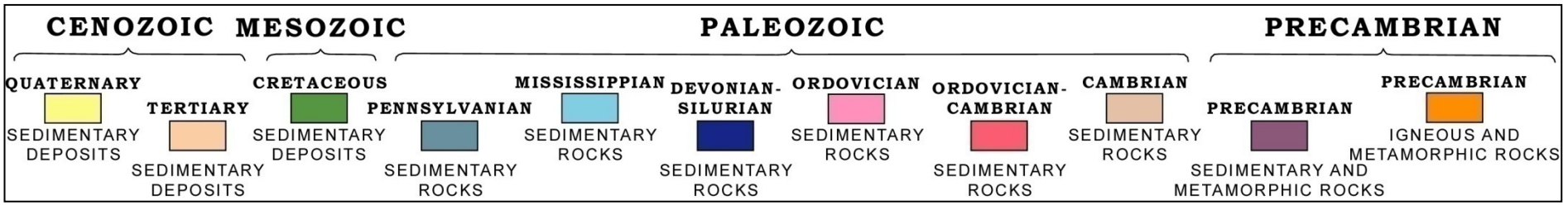
Middle Tennessee District

Gordonsville-Elmwood-Cumberland-South Carthage

Mascot-Jefferson City District

Immel-Young-Coy





TN Department of Environment & Conservation

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Tennessee Geological Survey

The mission of the Tennessee Geological Survey is to encourage and promote the prudent development and conservation of Tennessee's geological, energy, and mineral resources by developing and maintaining data bases, maps and technical services; providing accurate geologic hazard assessments; and disseminating geologic information through publications and educational outreach activities.

The Tennessee Geological Survey is the lineal descendant of the first Tenn[illegible]al Survey that was established in 1831. It is thus one of the oldest geologic service and research organizations in the country. The survey advises other state agencies and [illegible]al organizations on matters relating to Tennessee geology.

Division of Mineral & Geologic Resources Home

Geology Programs

The Survey's Nashville office covers Middle and West Tennessee. It is organized into mapping, subsurface geology, technical support, and West Tennessee. A regional office in Knoxville serves East Tennessee.

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Maps & Publications

The Survey conducts research on the geology and mineral resources of Tennessee and makes the resulting scientific and technical information available to the public through the maps and publications.

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Tennessee's Mineral Industry

Tennessee has a history of mining more different kinds of mineral resources than any other state east of the Mississippi River except North Carolina, dating back to the late 18th century.

Updated 01-2020

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STATE OF TENNESSEE
DEPARTMENT OF EDUCATION

DIVISION OF GEOLOGY

Wilbur A. Nelson, State Geologist.

BULLETIN 31

ZINC DEPOSITS
OF
EAST TENNESSEE

By Mark H. Secrist.

Nashville, Tennessee
1924

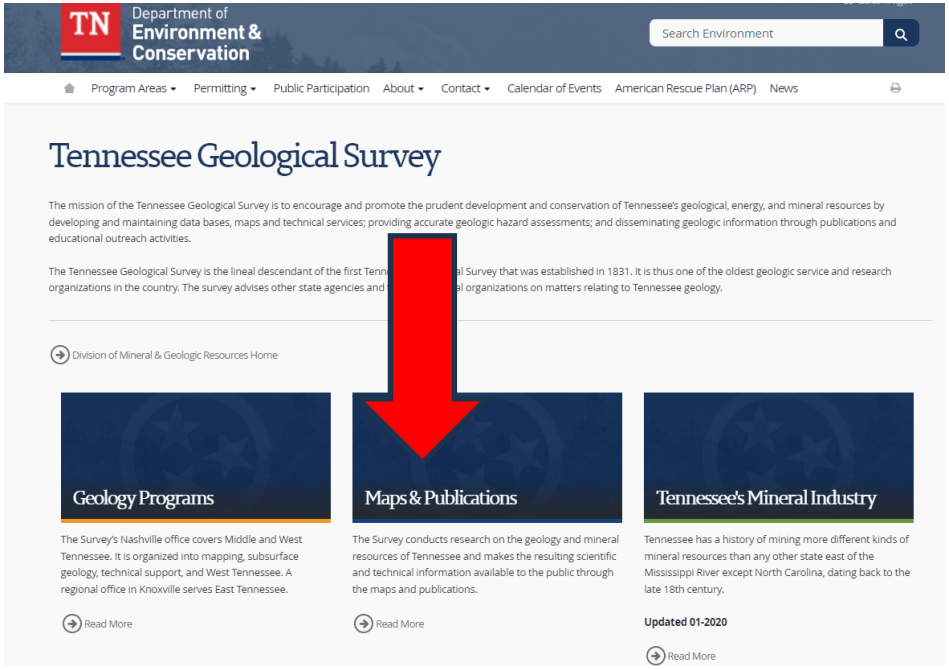
Marble Quarry in East Tennessee

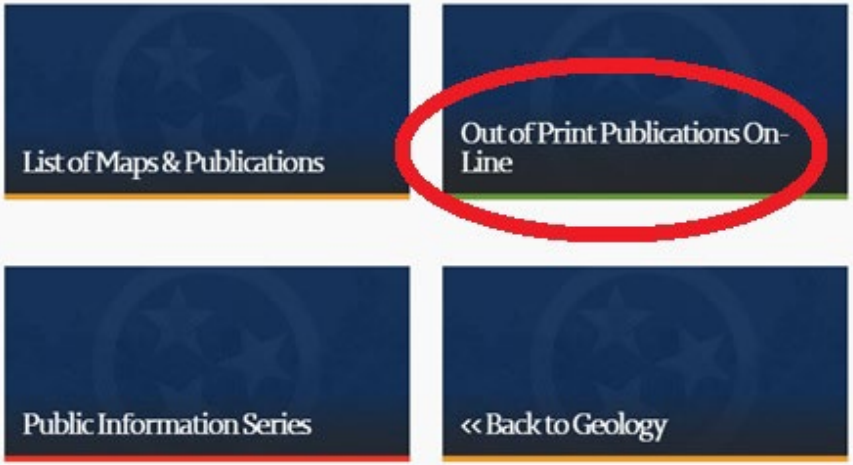
Black Marble Quarry in Grainger County

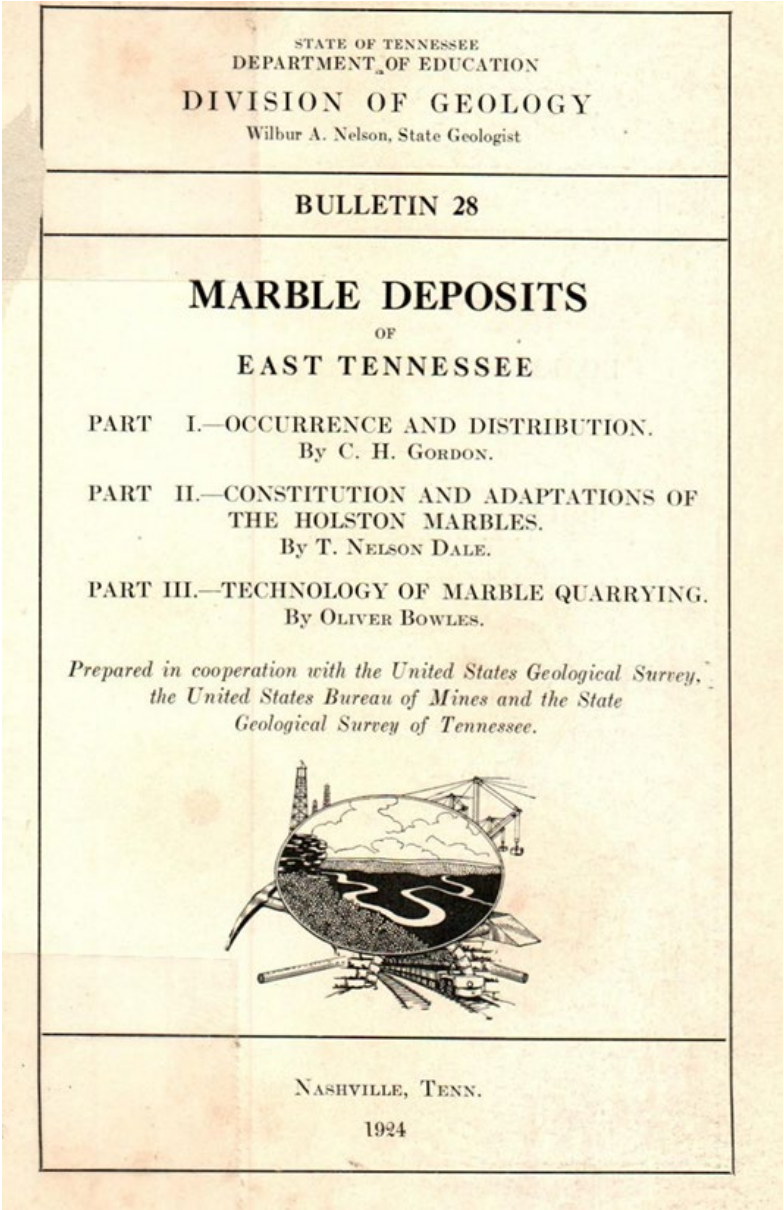
marble

1. A metamorphic rock consisting of predominantly of fine- to coarse-grained recrystallized calcite and/or dolomite.
2. In commerce, any crystalized carbonate rock, including true marble and certain types of limestone, that will take a polish and can be used as architectural or ornamental stone.

Definition from the AGI Dictionary of Geological Terms






STATE OF TENNESSEE
DEPARTMENT OF EDUCATION
DIVISION OF GEOLOGY
Wilbur A. Nelson, State Geologist

BULLETIN 28

MARBLE DEPOSITS
OF
EAST TENNESSEE

PART I.—OCCURRENCE AND DISTRIBUTION.
By C. H. Gordon.

PART II.—CONSTITUTION AND ADAPTATIONS OF THE HOLSTON MARBLES.
By T. Nelson Dale.

PART III.—TECHNOLOGY OF MARBLE QUARRYING.
By Oliver Bowles.

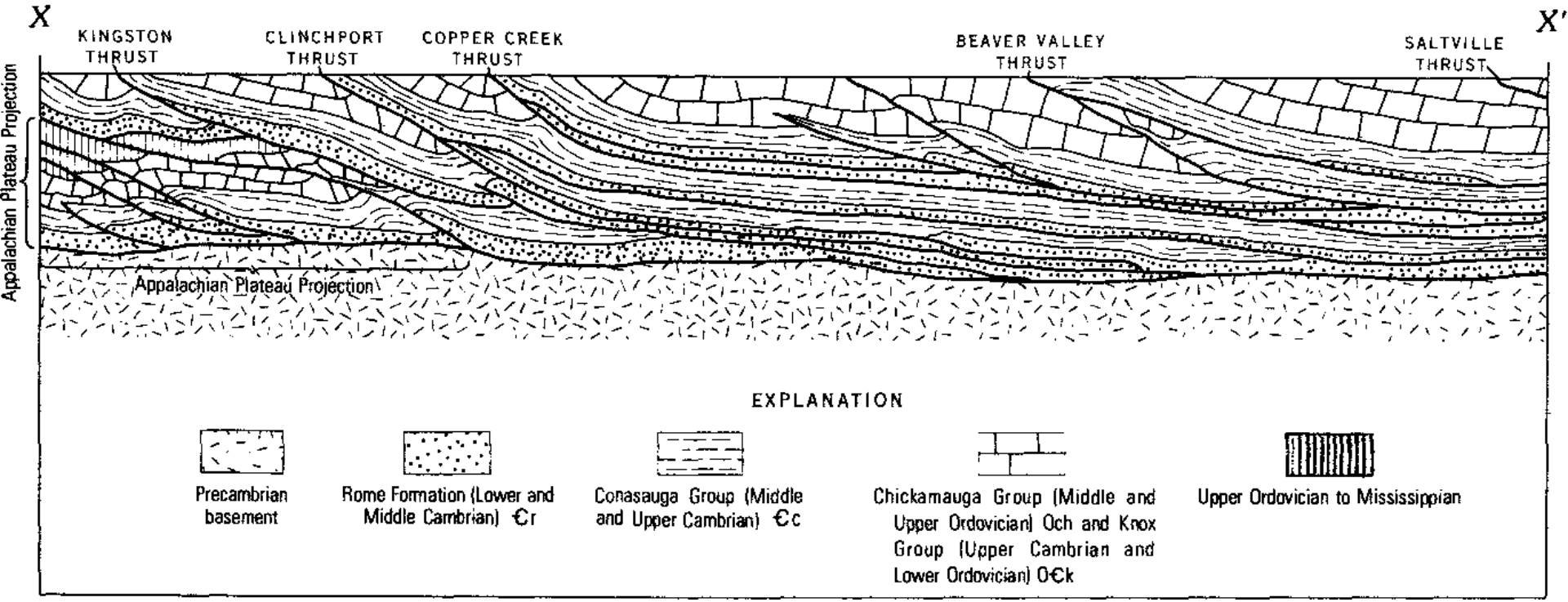
Prepared in cooperation with the United States Geological Survey, the United States Bureau of Mines and the State Geological Survey of Tennessee.

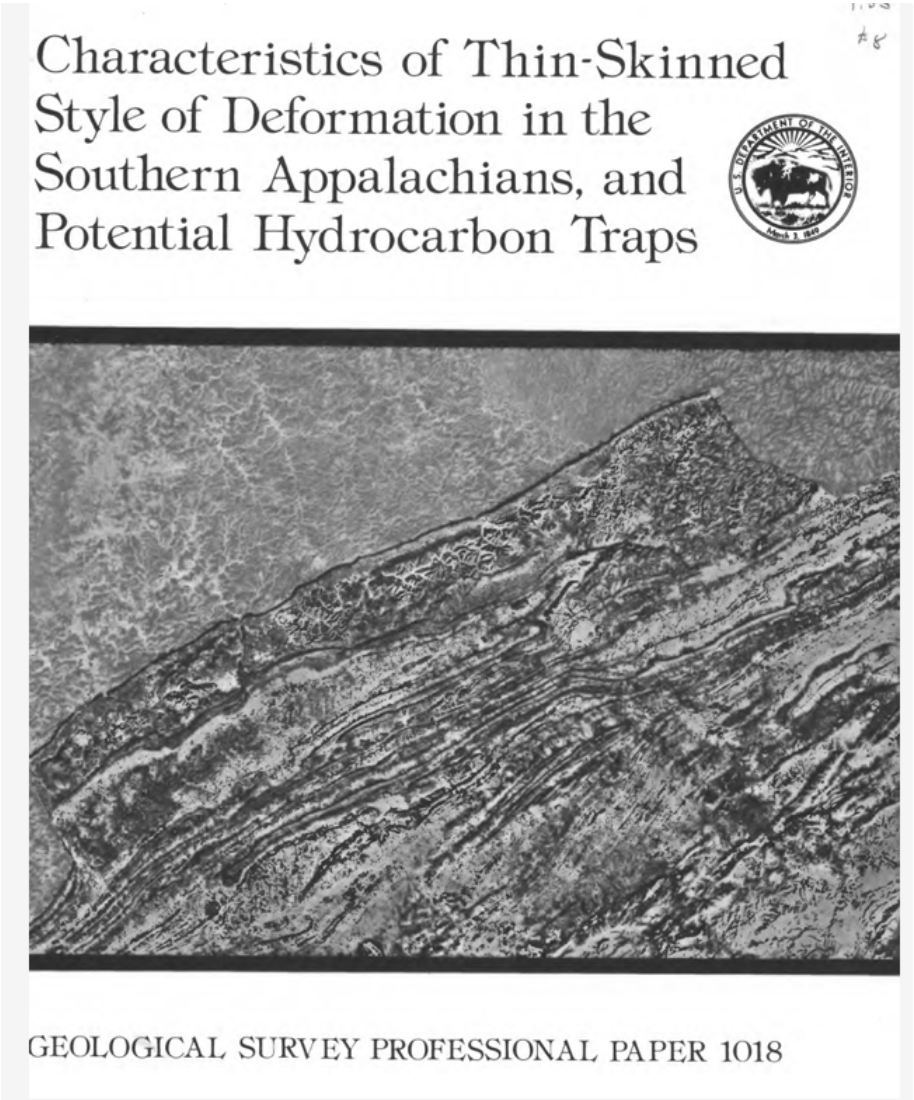
Nashville, Tenn.
1924

Valley and Ridge

- 542 million year old to 318 million year old rocks make up its western boundary at the base of the Cumberland Plateau
- 1 billion year old to 542 million year old rocks form its eastern boundary at the base of the mountain ranges of the Unakas
- Dolomite, limestone, sandstone, shale, and siltstone – all sedimentary rocks

Structure of the Valley & Ridge





Characteristics of Thin-Skinned Style of Deformation in the Southern Appalachians, and Potential Hydrocarbon Traps

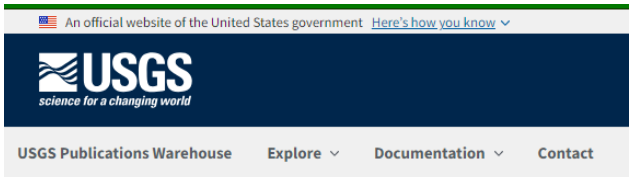
By LEONARD D. HARRIS and ROBERT C. MILICI

GEOLOGICAL SURVEY PROFESSIONAL PAPER 1018

Description of and field guide to large- and small-scale features of thin-skinned tectonics in the southern Appalachians, and a discussion of hydrocarbon production and potential

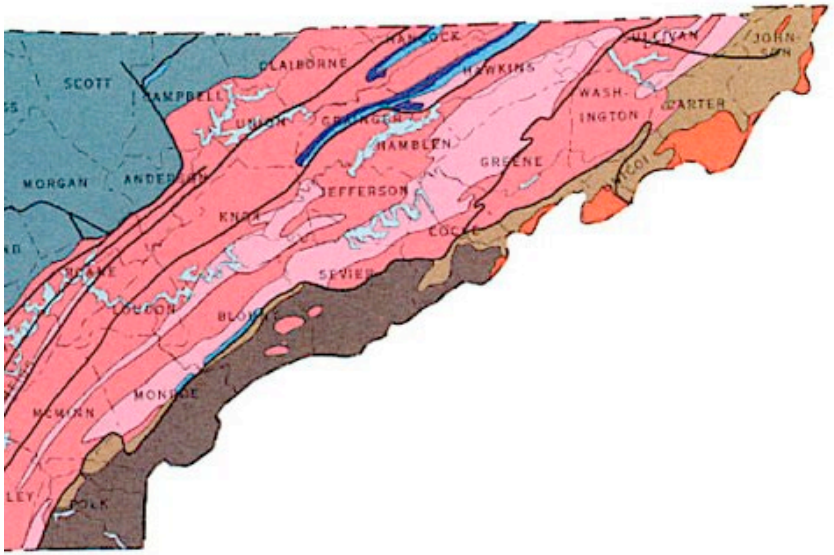
UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1977

https://doi.org/10.3133/pp1018



USGS Publications Warehouse

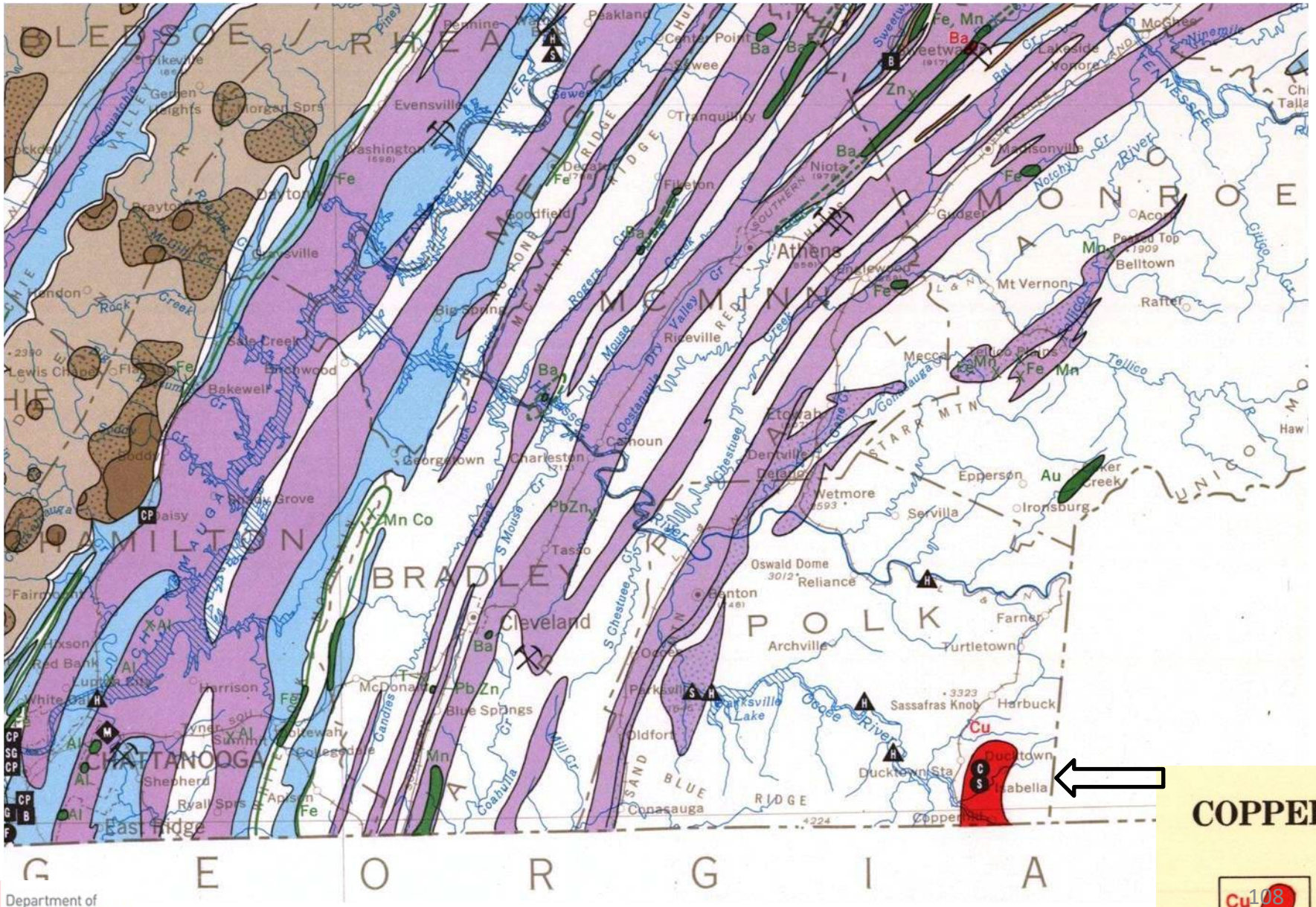
Blue Ridge Province (Unaka Mtns)



Unaka Mountains

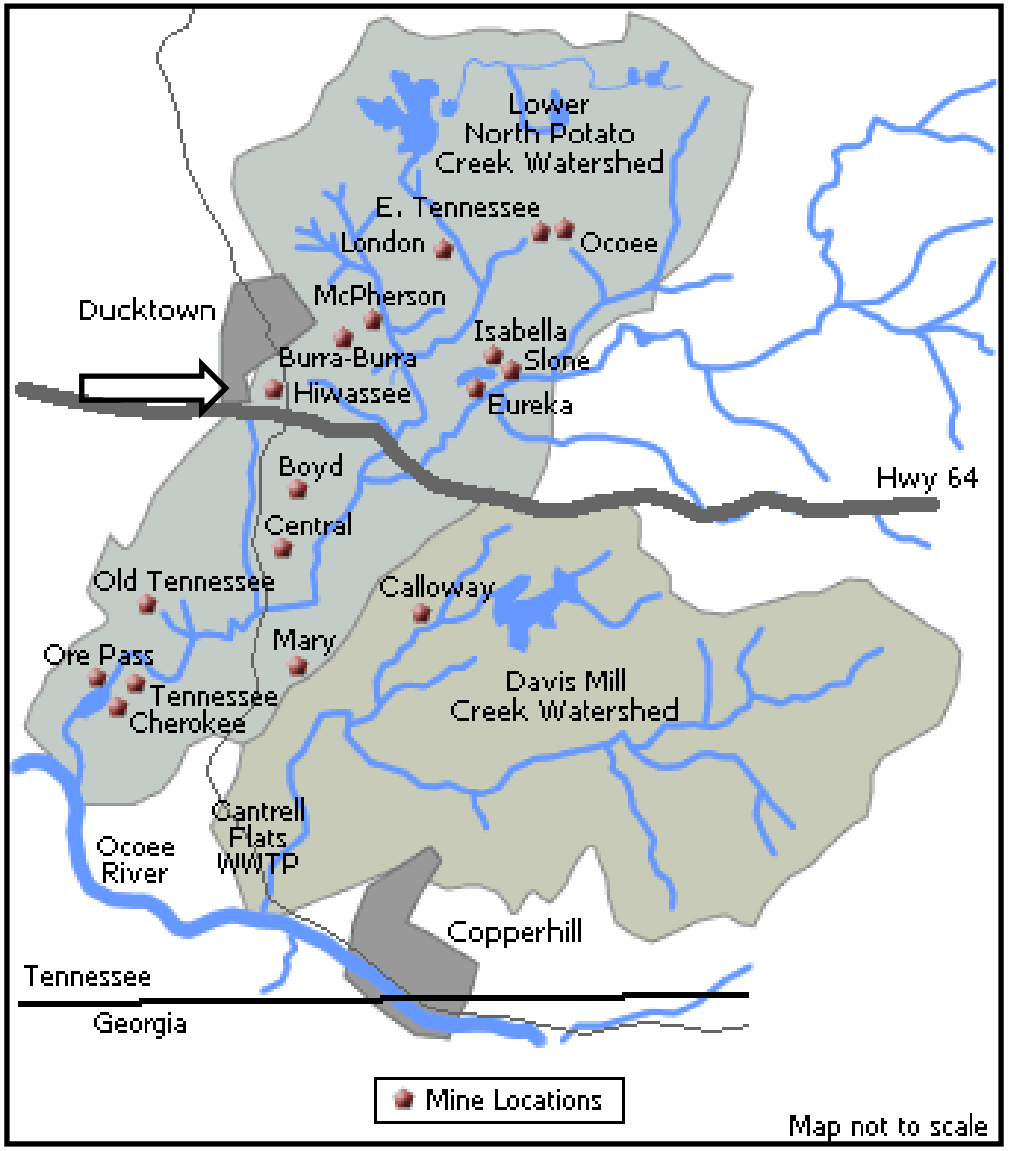
- Includes the Great Smoky Mountains
- Rugged terrain, heavily forested slopes, and rushing streams with waterfalls
- Valleys range in elevation from about 1000 feet in the south to 1500 feet in the north, with several peaks more than 6000 feet (highest in Tennessee is Clingmans Dome at 6643 feet)
- Copper and gold have been mined in this region

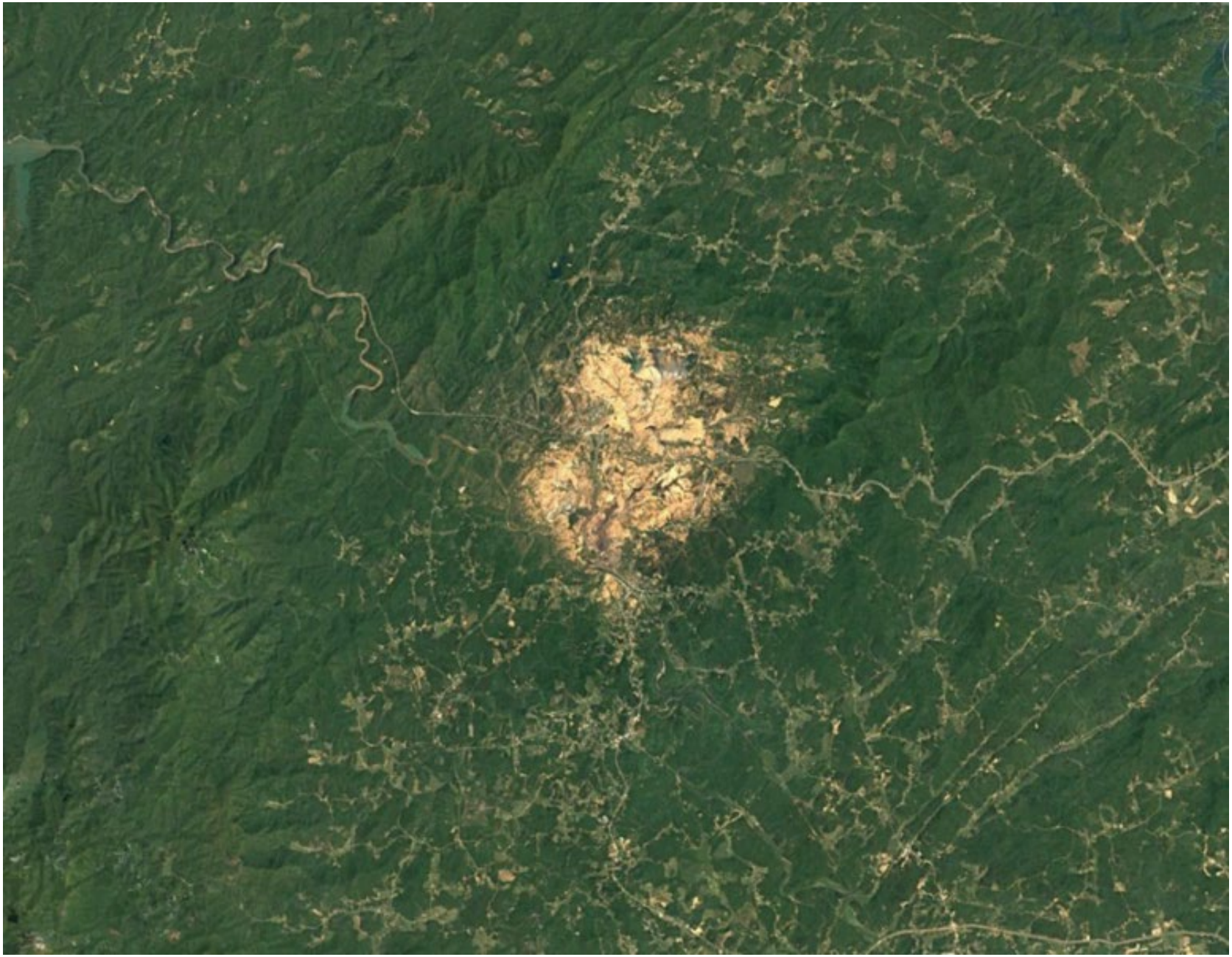
Copper Mining in Tennessee



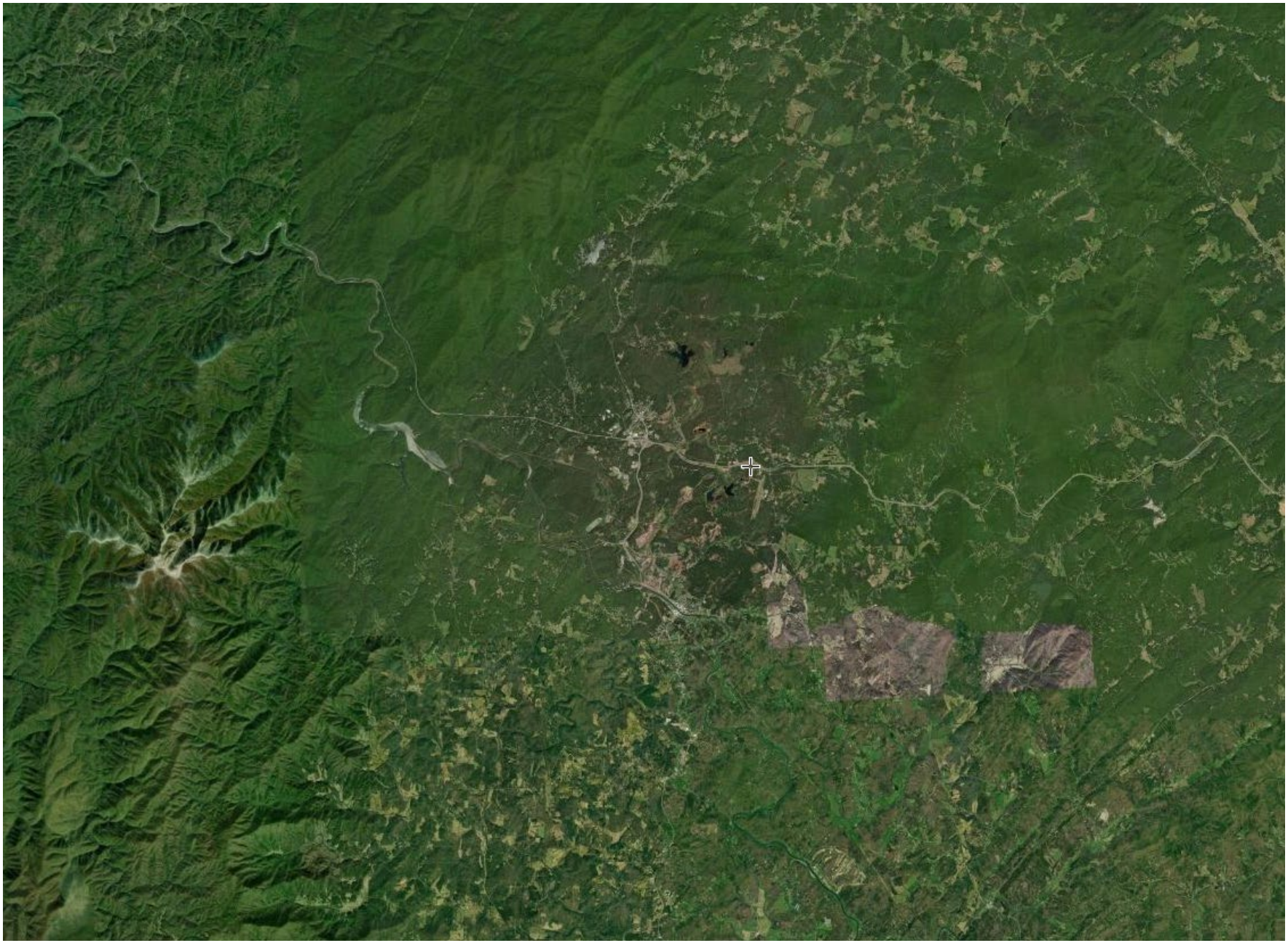
COPPER

Map of the Copper Basin Showing Mine Locations

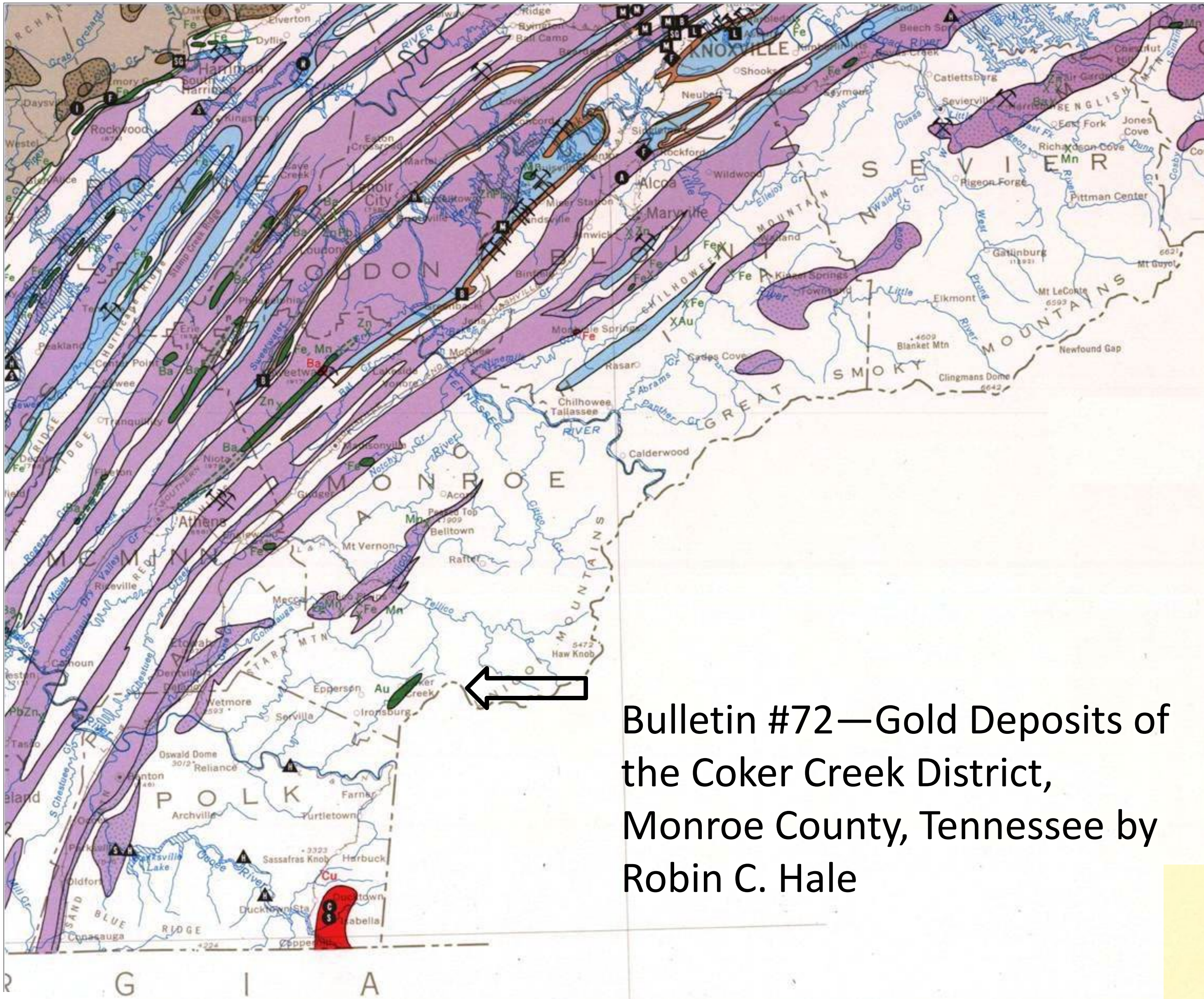




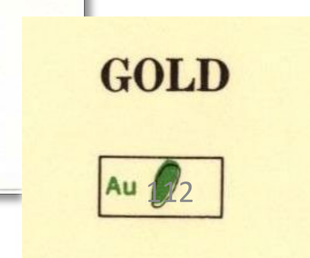
Copper Basin, Polk Co. Tennessee, 1984



Gold Mining Areas in Tennessee



Bulletin #72—Gold Deposits of the Coker Creek District, Monroe County, Tennessee by Robin C. Hale



TN Department of Environment & Conservation

Cherohala Skyway in the Unicoi Mountains in Monroe County

Courtesy of State of Tennessee Photographic Services

Clingmans Dome Observation Tower in Great Smoky Mountains National Park

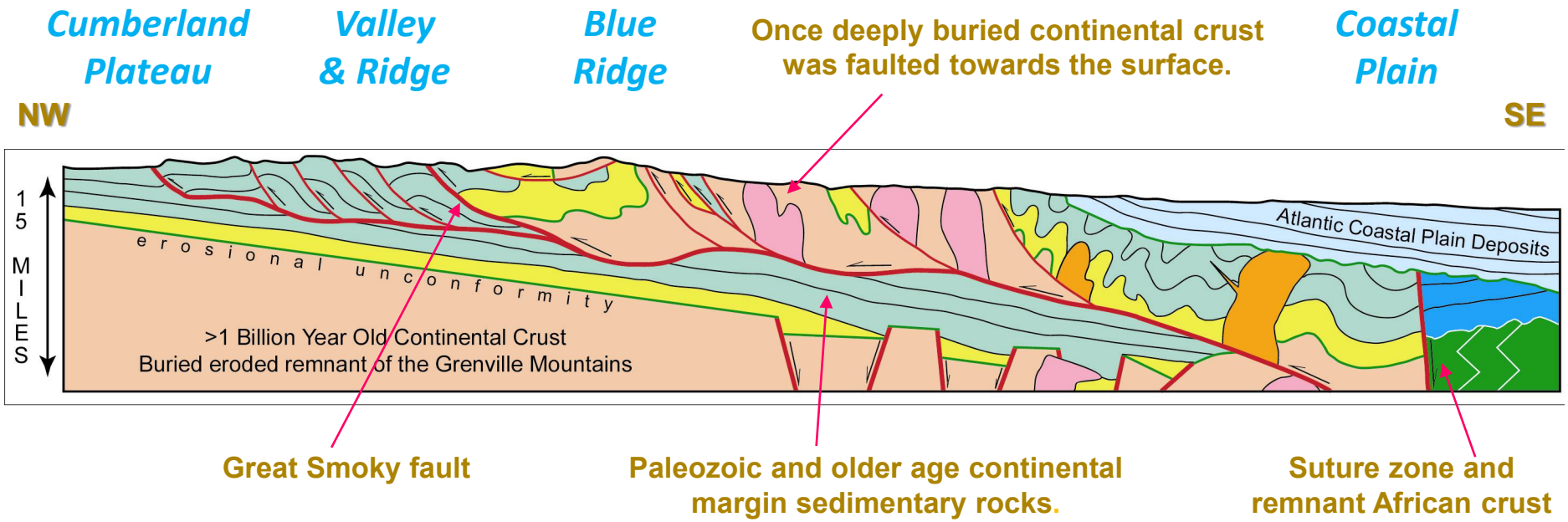
Unaka Mountains

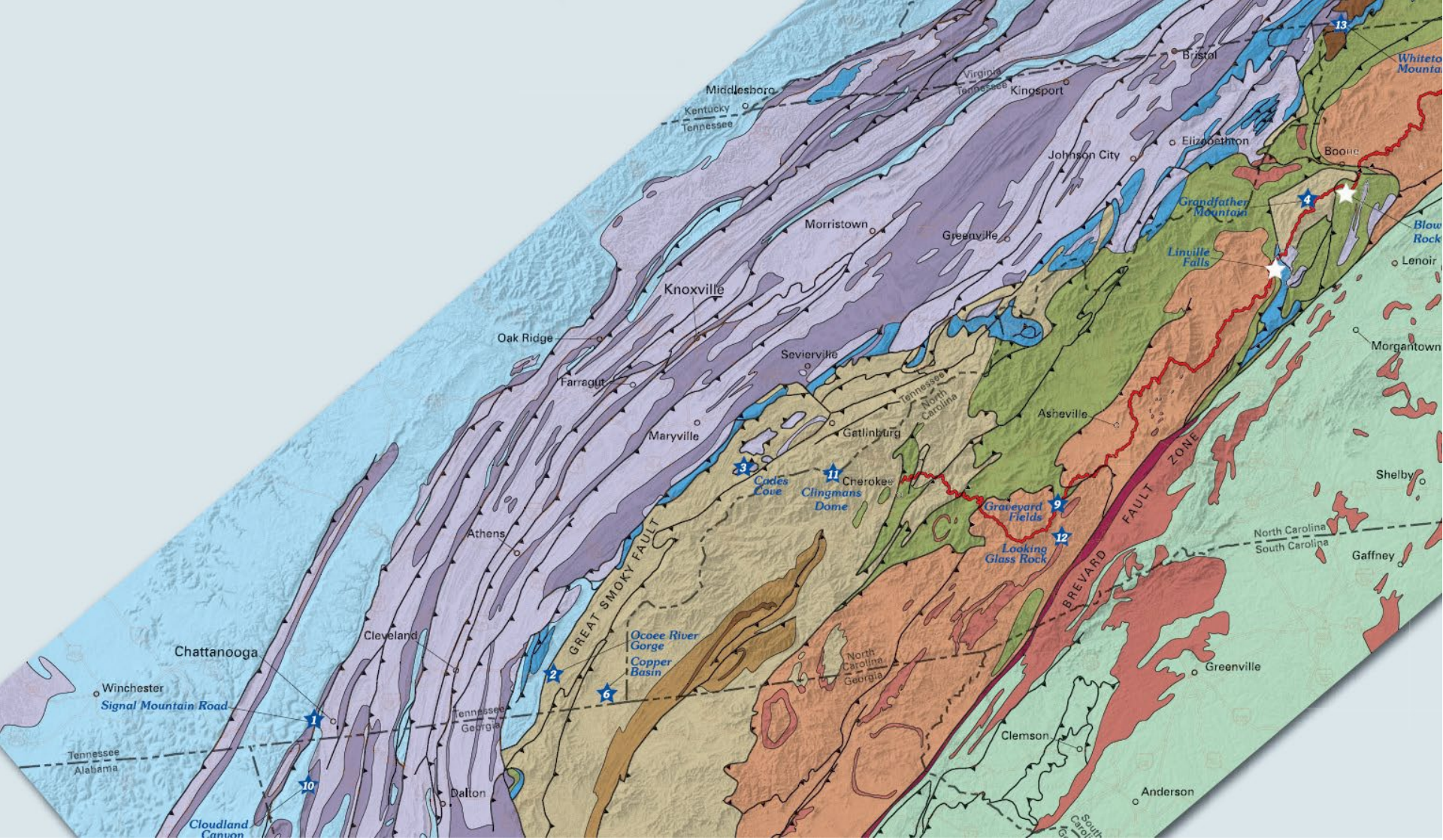
- 1 billion-year-old to 542-million-year-old rocks underlie its mountain ranges
- Predominately metamorphic and igneous rocks of varying types.
- Some small pockets of carbonate rocks occur in the province.

Unaka Mountains

The geologic structures comprising this province are very complex. However, one very interesting aspect of this region is that older rocks have been thrust westward over younger rocks.

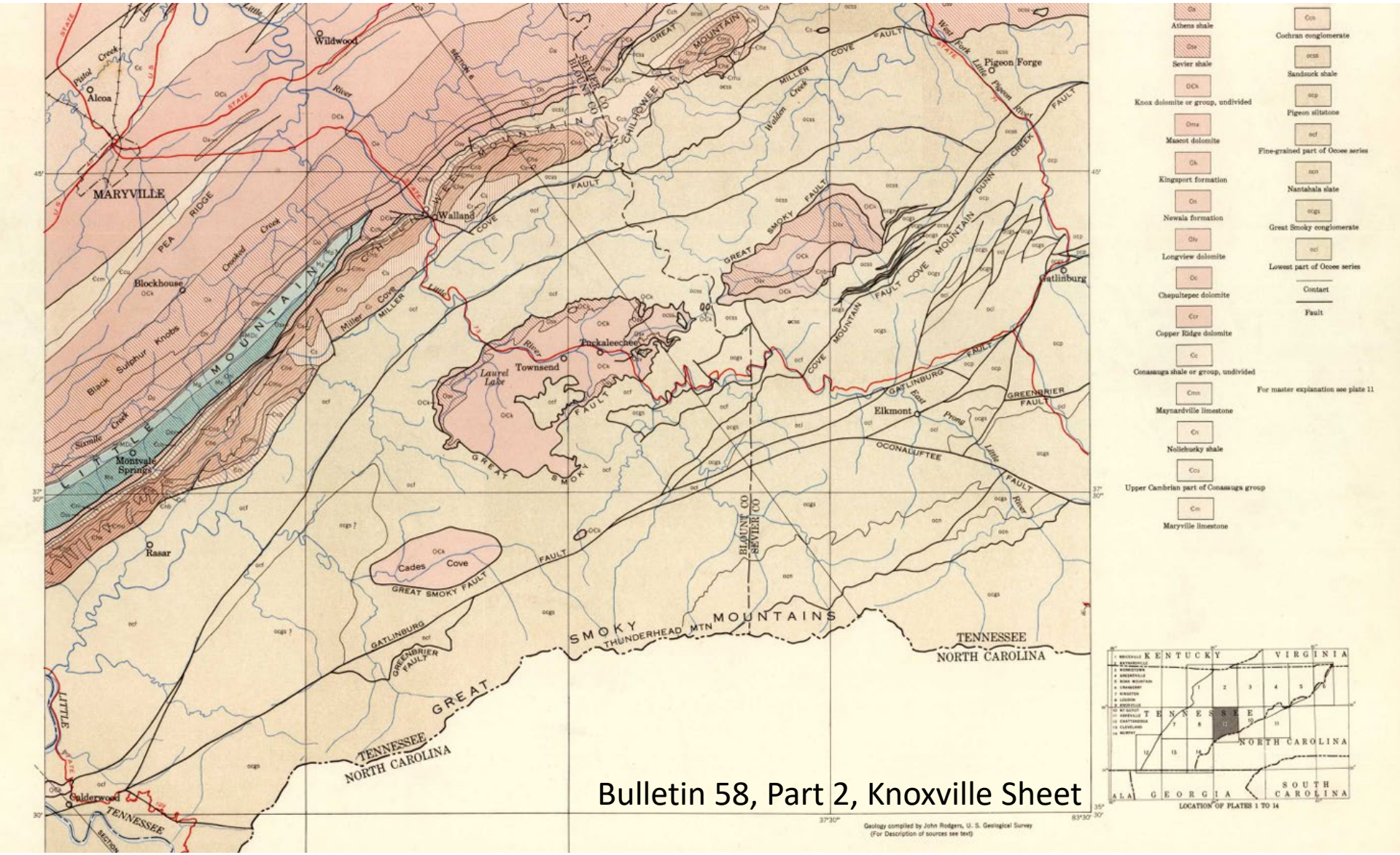
Continents Collide – Rocks are Bulldozed





Geology of the Southern Appalachian Mountains
USGS Scientific Investigations Map (SIM) 2830

The *Coves*



Bulletin 58, Part 2, Knoxville Sheet

Cades Cove, Tuckaleechee Cove, & Ware Cove – geologic ‘fensters’

Tuckaleechee Caverns

2,895 reviews • #2 of 18 things to do in Townsend • Caverns & Caves

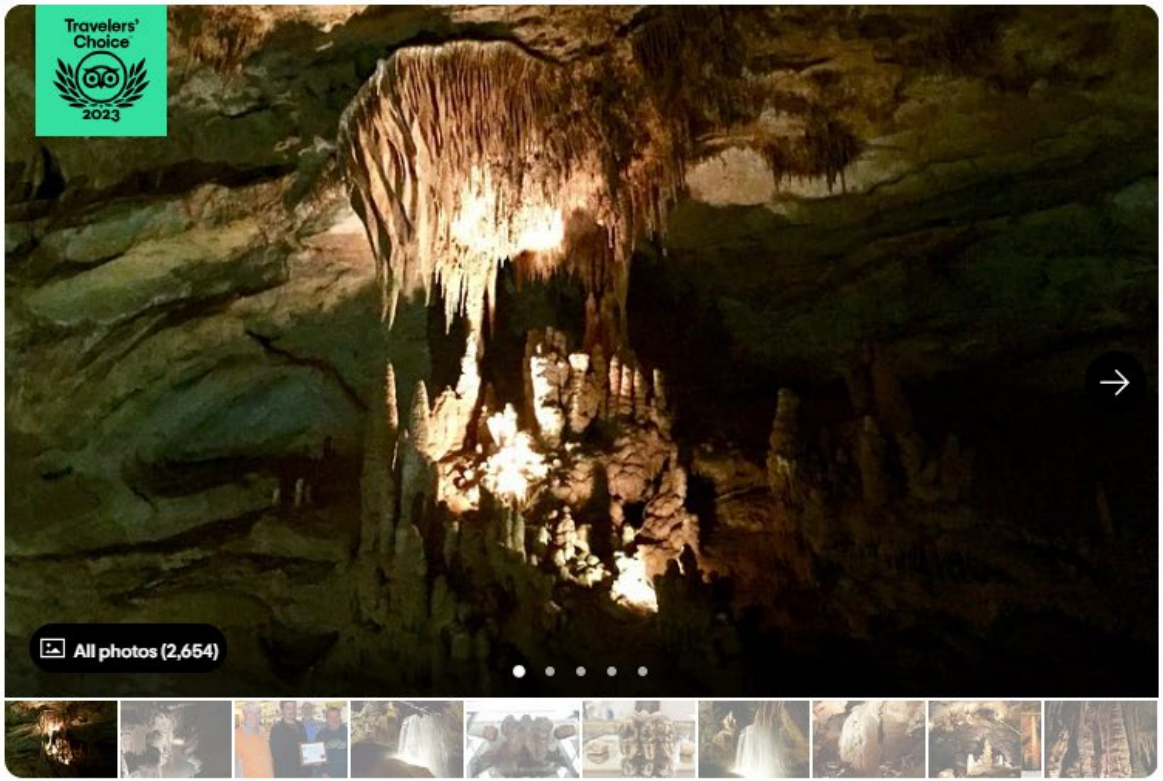
Write a review

About

Tuckaleechee Caverns is a massive cave / cavern system and tourist attraction located in Townsend, Tennessee awarded 5 stars by AAA. Tuckaleechee Caverns is a short drive from Gatlinburg, Sevierville, Townsend, Cades Cove, Knoxville and Chattanooga. Tuckaleechee Caverns is th...
Read more

Duration: 1-2 hours

Suggest edits to improve what we show.
Improve this listing



Tripadvisor.com

END

So much to see in Tennessee, but not enough time to discuss everything.

Websites to visit:

- Tennessee State Parks
- Tennessee Natural Areas
- Tennessee Geological Survey
- Tennessee Dept. of Tourism
- USGS
- National Park Service