

Petition for  
Establishment of

UPPER  
CUMBERLAND

American  
Viticultural  
Area

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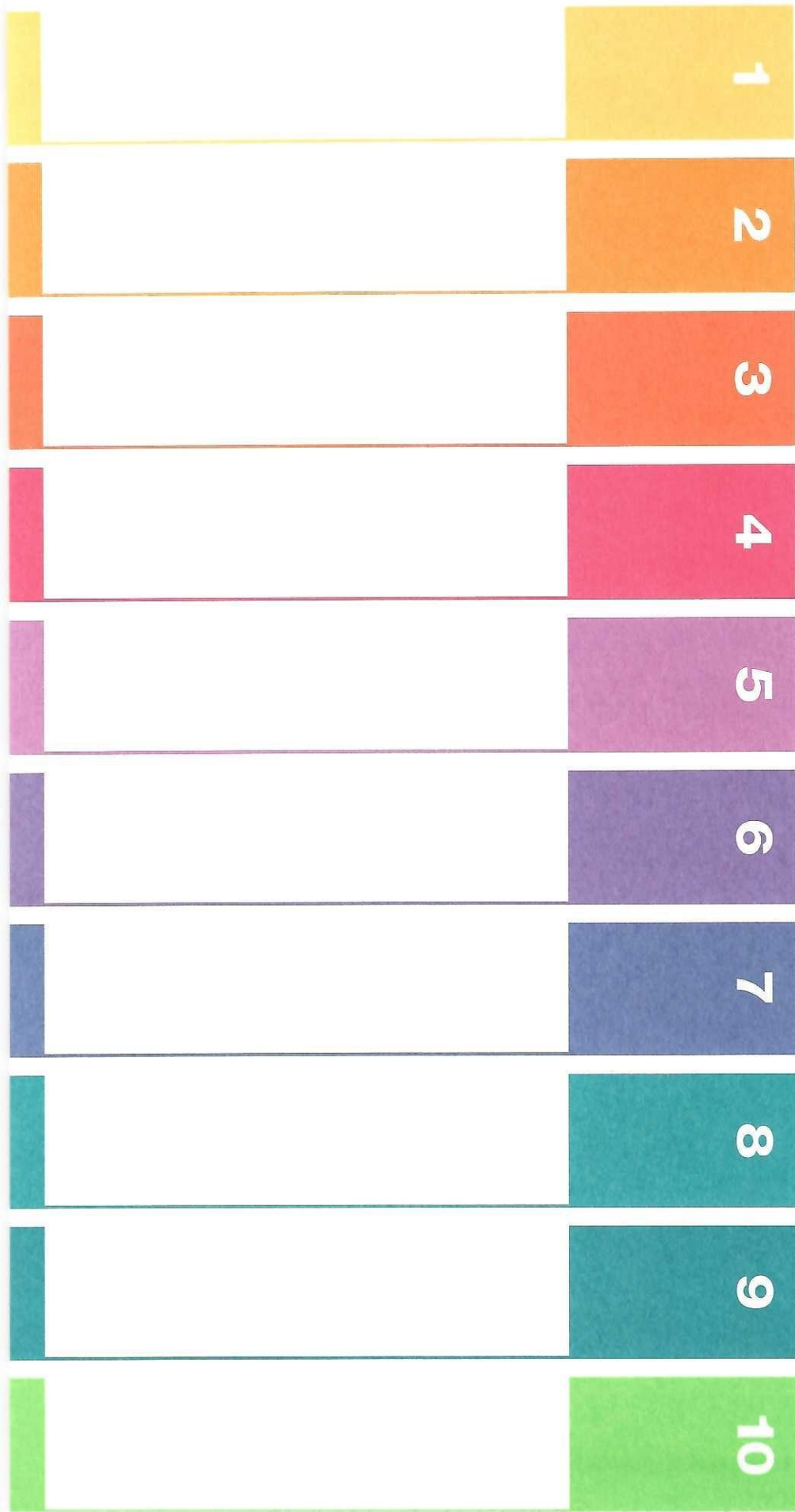
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## INTRODUCTION

“[T]his region, so favourably distinguished by nature, now become the habitation of civilization, at a period unparalleled in history, in the midst of a raging war, and under all the disadvantages of emigration to a country so remote from the inhabited parts of the continent.”

*- Daniel Boone, on passing through the Cumberland Gap into what would become the Upper Cumberland, from Daniel Boone, The Adventures of Daniel Boone (1784).*

This petition is submitted by Patricia McRitchie on behalf of the Appalachian Region Wine Producers Association. This petition seeks the establishment of a viticultural area encompassing all or parts of fourteen counties located in Middle Tennessee to be known as Upper Cumberland.

The boundaries of this proposed viticultural area encompass approximately 4874.62 square miles (3,119,756.54 acres). At the present time there are nine wineries and 55 vineyards with more than 71 acres planted. Vineyards are dispersed throughout the entire proposed Upper Cumberland American Viticultural Area (AVA) and wineries are located in half of the fourteen counties. Additional new vineyard and winery projects in various stages of development are found throughout the proposed Upper Cumberland AVA. This is a relatively new region for modern commercial winery and vineyard development but grape growing and winemaking have a long and substantial history in the region. This rapidly growing viticultural region anticipates continued and sustained vineyard and winery growth.

This petition is submitted under the authority of 27 CFR Parts 4 and 9, which allow the establishment of definitive viticultural areas. Section 4.25a(e)(1), Title 27 CFR, defines an American viticultural area as a delimited grape-growing region distinguishable by geographical features. These features include climate, soil, topography, and elevation that distinguish the viticultural region from the surrounding areas.

This petition seeks to establish Upper Cumberland as an American viticultural area based on the following:

1. Evidence that the name of the proposed viticultural area, Upper Cumberland, is locally, regionally, and/or nationally known as referring to the area specified in the application.
2. Evidence that the boundaries of the proposed viticultural area are as specified in the application.
3. Evidence of geographical features (climate, soil, physical features) distinguishing the viticultural features of the proposed area from surrounding areas.
4. A description of the specific boundaries of the proposed viticultural area using features found in U.S. Geological Survey (U.S.G.S.) maps.

Copies of the appropriate U.S.G.S. maps with these specific boundaries are provided and the boundaries are prominently marked.

1. **EVIDENCE RELATING TO NAME AND EVIDENCE THAT THE BOUNDARIES OF THE VITICULTURAL AREA ARE AS SPECIFIED.**

The name Upper Cumberland is locally, regionally, nationally, and internationally known to refer to the boundaries of the viticultural area this petition proposes to establish.

a. **Name Evidence.**

Tennessee is divided into three main regions: East, Middle and West.<sup>1</sup> These divisions are so distinct that they were constitutionally mandated in the early 1900s. The proposed Upper Cumberland AVA is located entirely in Middle Tennessee.

“Upper Cumberland” has referred to the area of the proposed Upper Cumberland AVA since the mid-eighteenth century. “Upper Cumberland” has historically referred to the following Middle Tennessee counties: Cannon, Clay, Cumberland<sup>2</sup>, DeKalb, Fentress, Jackson, Macon, Pickett, Putnam, Overton, Smith, Van Buren, Warren, and White.<sup>3</sup> The proposed Upper Cumberland AVA includes all of these counties with the exception of a portion of southeast Cumberland County. A brief history of Middle Tennessee helps in understanding the historic significance of the “Upper Cumberland”.

Tennessee has a long history of habitation.<sup>4</sup> The unique geography of Tennessee dictated the pattern of settlement. The first humans to inhabit this area were the nomadic Paleo-Indian hunters between 12,000 and 15,000 years ago. Their descendants settled first on the plentiful river terraces located throughout much of the state then expanded outward establishing permanent settlements and reaching a peak of prehistoric cultural development between 700 and 1300 AD. The first non-native explorers arrived in 1540 followed by a period of European exploration and exploitation.

For over two hundred years the native populations co-existed with the small number of settlers, frontiersmen, and explorers in the Upper Cumberland area. This changed dramatically in the late eighteenth-century. In 1775, Daniel Boone opened a wagon route, the Wilderness Road, between eastern and western parts of the soon to be

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<sup>1</sup> See Map 1, *Tennessee Grand Divisions*.

<sup>2</sup> Cumberland County is occasionally considered part of the Cumberland Plateau, a division of East Tennessee, but its regional identity and affiliation is the Upper Cumberland of Middle Tennessee.

<sup>3</sup> See Exhibits 1-7.

<sup>4</sup> “A History of Tennessee: The Land and Native People.” In *Tennessee Blue Book*, 539-99. Nashville, TN: Tennessee Department of State, 2017. [https://publications.tnsosfiles.com/pub/blue\\_book/17-18/17-18mhistory.pdf](https://publications.tnsosfiles.com/pub/blue_book/17-18/17-18mhistory.pdf).

United States via the Cumberland Gap, a passageway through the Cumberland Mountains between Kentucky and Tennessee. The Wilderness Road forked soon after the Cumberland Gap, with the southern route leading directly into the Upper Cumberland. These first settlers in the Upper Cumberland region came from Virginia and North Carolina and were primarily of English and Scotch-Irish ancestry.

The use of the name Cumberland predates these early settlers. The name Cumberland came from English explorer Thomas Watson who named the Cumberland River after the Duke of Cumberland in 1750 and it soon become an oft-used name for geographic entities, including the Cumberland Plateau and the region known as Upper Cumberland.<sup>5</sup>

Agriculture was a driving force in the settlement and development of Tennessee and the Upper Cumberland. The vast majority of immigrants to the state of Tennessee during the late eighteenth century and early nineteenth century were in search of a better life and the route to this life was exploitation of the rich farming potential of the region. By 1810 Middle Tennessee became more populous than East Tennessee; the latter, an area with an early history of settlement.<sup>6</sup>

European settlers were quick to introduce grape growing and winemaking to Tennessee. In 1880 the Tennessee Department of Agriculture estimated there were 1128 acres of grapes growing in the state.<sup>7</sup> Mark Twain, in his autobiography, reminisces about his father's estate in the Upper Cumberland, which "produced a wild grape of a promising sort."<sup>8</sup> Those grapes were sent to a renowned winemaker in Ohio who opined, "that [they] would make as good wine as his Catawbas."<sup>9</sup> However, as in all states, prohibition slowed or halted grape production in Tennessee. The industry rebounded during the later decades of the 20<sup>th</sup> century. In 1980 the first post-prohibition wineries were licensed and by 2015 Tennessee was estimated to have over 1000 acres of grapes and around 70 wineries.<sup>10</sup> The

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<sup>5</sup> "The Cumberland Gap: America's First Gateway to the West." Geography. ThoughtCo., February 17, 2019. <https://www.thoughtco.com/cumberland-gap-geography-1435717>.

<sup>6</sup> Winters, Donald L. "Agriculture." Tennessee Encyclopedia. Accessed July 2, 2019. <https://tennesseencyclopedia.net/entries/agriculture>, October 8, 2017.

<sup>7</sup> "Viticulture." Tennessee Department of Agriculture. Accessed July 2, 2019. <https://www.tn.gov/agriculture/farms/produce-nursery/viticulture.html>.

<sup>8</sup> Twain, Mark. *Autobiography of Mark Twain. Complete and Authoritative Edition*. Berkeley, CA: University of California Press, 2013, p 420.

<sup>9</sup> *Ibid.*

<sup>10</sup> "Tennessee Wine History." Tennessee Wines, <https://tennesseewines.com/tennessee-wine-history/>.

first modern winery in Tennessee, Highland Manor Winery, is located in the proposed Upper Cumberland AVA.<sup>11</sup>

At the present time there are 71 acres of vineyards and 9 wineries in the proposed Upper Cumberland AVA. Vineyards and wineries are located throughout the proposed AVA.<sup>12</sup> Most wineries within the proposed AVA have estate vineyards comprising the majority of vineyard acreage with a number of small vineyards supplying additional grapes. Many types and varieties of grapes are grown within the proposed AVA including native, muscadine, hybrid, and vinifera.

Although modern winemaking in Tennessee and in the Upper Cumberland region is relatively recent, it is an area successfully growing a wide variety of grapes and producing wines expressive of the region. The wineries in the proposed viticultural area have garnered awards for their locally produced wines and are effectively utilizing available information regarding climate, soils, and topography to determine the best sites and varieties for their vineyards. New growers are looking to the region as an area where successful cultivation of a broad variety of wine grapes can successfully be grown.

“Upper Cumberland” is the appropriate name for the proposed AVA. Supporting materials are provided in Section 6 of this petition showing use of Upper Cumberland to refer to this specific region and the counties included in the proposed Upper Cumberland AVA. Google searches for “Upper Cumberland”, “Upper Cumberland Wine”, or similar generate pages of results.<sup>13</sup> Examples are included in Section 6. The name is used by wineries, government entities, businesses, and other organizations in the region for promotion and identification. Finally, it has broad regional support as the name to refer to and market this fast-growing viticultural region.<sup>14</sup>

The preceding paragraphs provide evidence that “Upper Cumberland” has longstanding local, regional, national and international name recognition and is a name closely associated with this part of Tennessee.<sup>15</sup>

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<sup>11</sup> Highland Manor Winery was established in 1980 in Fentress County.

<sup>12</sup> See Map 2, *Upper Cumberland Wine Trail*, and Chart 1, *Upper Cumberland Wineries and Vineyards*, below. Data provided by Upper Cumberland winery websites and Appalachian Region Wine Producers Association.

<sup>13</sup> See Exhibits 7-13.

<sup>14</sup> See Exhibits 14-18.

<sup>15</sup> Sites specifically referring to this region are first to appear in a Google search of “Upper Cumberland”; see Exhibit 11.

County	Winery/Vineyard	Grape Species Grown	Vineyard
Cannon			
Clay			
Cumberland	Chestnut Hill		
	Stonehaus	Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	
DeKalb			
Fentress	Highland Manor	Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	
Jackson			
Macon	Red Barn	Native	Yes
		Hybrid	
		Muscadine	
Overton			
Holly Ridge		Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	
Pickett			
Putnam	DelMonaco	Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	
	Paris	Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	
Smith			
Cellar 53		Native	
		Hybrid	
		Muscadine	
		Vinifera	
Van Buren			
Warren	Dellinger	Hybrid	Yes
		Muscadine	
White			
Northfield		Native	Yes
		Hybrid	
		Muscadine	
		Vinifera	

Chart 1. Upper Cumberland Wineries and Vineyards



b. Boundary Evidence.

The proposed boundaries of the Upper Cumberland AVA include fourteen counties that are identified as being “Upper Cumberland”.<sup>16</sup> The proposed boundary follows county lines with a few exceptions as noted.

The proposed Upper Cumberland AVA is located entirely in Tennessee within the Middle Tennessee Grand Division. Middle Tennessee includes the western portion of the Cumberland Plateau, the Highland Rim, and the Central Basin.<sup>17</sup> The Highland Rim is further divided into the Western Highland Rim and Eastern Highland Rim. The Central Basin is divided into the Inner Central Basin and Outer Central Basin.

The fourteen counties included in the proposed AVA encompass portions of each of these regions, specifically the western Cumberland Plateau, Eastern Highland Rim, and Outer Central Basin. All counties that historically and currently identify and are considered part of the Upper Cumberland are included in the proposed AVA.<sup>18</sup>

Surrounding regions outside of the proposed Upper Cumberland AVA are excluded on the basis of a lack of name nexus with “Upper Cumberland” as well as geographical reasons discussed later in this petition.

The geographic region to the northeast identifies as the Cumberland Mountains and is geographically distinct. The Valley and Ridge Province east of the proposed AVA is excluded due to geographical and climatic differences. Similarly, parts of the Cumberland Plateau or Cumberland Escarpment to the east are also excluded due to elevation and/or climatic differences. The boundaries to the north and northwest are formed by the state border with Kentucky or by the borders of Tennessee counties that lack nexus with the name “Upper Cumberland”.

The counties to the south do not identify as part of the Upper Cumberland nor do the counties to the west. These regions are also distinct on the basis of geography and climate.

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<sup>16</sup> See Map 3, *Tennessee and the Upper Cumberland*, and Exhibits 1-6.

<sup>17</sup> See Figure 1, *Level IV Ecoregions of Tennessee*. The Central Basin is also referred to as the Nashville Basin. This petition uses “Central Basin”.

<sup>18</sup> See Section 6, *Exhibits*.

The Upper Cumberland region includes part of the Cumberland Plateau on the east and the Eastern Highland Rim on the west. The western counties also have portions in the Outer Central Basin.

The Upper Cumberland remained a fairly isolated area well into the 20<sup>th</sup>-century and developed a very strong independent identity.<sup>19</sup> References to the Upper Cumberland are plentiful and consistent in the geographic area included in the Upper Cumberland.<sup>20</sup> The proposed AVA includes those counties that historically have been included in the Upper Cumberland. With the exception of a portion of southeast Cumberland County, located in the easternmost section of the proposed AVA, counties and/or areas of the Upper Cumberland are not excluded on geographic bases because this regional identity is so strong and the geographic similarities across all included counties are strong and distinct from surrounding geographic regions.<sup>21</sup>

The proposed Upper Cumberland AVA lies within the watershed of the Cumberland and Tennessee Rivers or their tributaries.<sup>22</sup> The majority of the proposed AVA is in the Cumberland River Watershed while a small section of the eastern part of the proposed AVA is in the Tennessee River Watershed. The areas to the south and further east are in the Tennessee River Watershed.

The physiographic regions outside the proposed Upper Cumberland AVA are geographically distinct from both the Cumberland Plateau and Eastern Highland Rim included in the proposed AVA. These distinctions will be discussed in detail in subsequent sections of this petition.

Petitioner notes that the Big South Fork National River and Recreation Area is located in Pickett and Fentress counties. Pickett State Rustic Park and Forest is located in Pickett County.<sup>23</sup> The U.S.G.S. maps either do not or incompletely identify the boundaries of these areas. Petitioner believes this may be due to the age of the maps and the establishment date of the areas. Petitioner further acknowledges that these areas may

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<sup>19</sup> Like many regions, isolation led to the development of jargon specific to the region. See Cooper, Carl. *Upper Cumberland "Jargon"*. Jamestown, TN: Jimtown Publications, 2013. Also see Exhibits 19-20.

<sup>20</sup> See Section 6, *Exhibits*.

<sup>21</sup> See Section 6, *Exhibits*.

<sup>22</sup> See Map 4, *Cumberland and Tennessee River Watershed*. A watershed is a geographic area of land draining water to a shared destination. Watershed boundaries always follow the highest ridgelines around the stream channels and meet at the bottom or lowest point of land where the water flows out of the watershed.

<sup>23</sup> See Map 5, *Big South Fork National River and Recreation Area*.

properly be excluded from the proposed Upper Cumberland AVA since they are unavailable for viticultural activity.

The boundaries of counties included in the proposed in whole are: Cannon, Clay, DeKalb, Fentress, Jackson, Macon, Pickett, Putnam, Overton, Smith, Van Buren, Warren, and White. Cumberland County is included in part, with approximately 18% of the county excluded.

Counties	Square Miles	Acres	% In AVA	Square Miles	Acres
Cannon	265.667	170026.88	100	265.667	170026.88
Clay	236.117	151114.88	100	236.117	151114.88
Cumberland	681.63	436243.2	82	558.937	357719.424
DeKalb	304.588	194936.32	100	304.588	194936.32
Fentress	498.659	319141.76	100	498.659	319141.76
Jackson	308.899	197695.36	100	308.899	197695.36
Macon	307.146	196573.44	100	307.146	196573.44
Overton	433.363	277352.32	100	433.363	277352.32
Pickett	162.922	104270.08	100	162.922	104270.08
Putnam	400.966	256618.24	100	400.966	256618.24
Smith	314.438	201240.32	100	314.438	201240.32
Van Buren	273.475	175024	100	273.475	175024
Warren	432.701	276928.64	100	432.701	276928.64
White	376.742	241114.88	100	376.742	241114.88
<b>TOTAL</b>				4874.62	3119756.54

**Chart 2. Area of Proposed Upper Cumberland AVA**

The foregoing is evidence that Upper Cumberland is locally and regionally known as encompassing the area proposed by this petition and that the proposed boundaries are the best and most appropriate boundaries for the proposed Upper Cumberland AVA.

## 2. EVIDENCE OF GEOGRAPHICAL FEATURES.

### a. *Geology.*

The proposed Upper Cumberland AVA is located entirely in Tennessee within the Middle Tennessee Grand Division. Middle Tennessee includes the western portion of the Cumberland Plateau, the Eastern Highland Rim, and the Outer Central Basin. The proposed AVA is bounded on the north by the border with Kentucky, by the Cumberland Mountains to the northeast, the Cumberland Escarpment and Valley and Ridge Province to the east, and the Inner Central Basin to the west.

The Grand Divisions of Tennessee are three distinct geological zones.<sup>24</sup> This geology exerted a controlling influence on the topography, hydrology, mineral resources, soil types and thicknesses, all of which in time impacted human settlement and activity and was discussed in Section 1a.

To understand the geology of the proposed Upper Cumberland AVA it is necessary to look at the geologic history of Tennessee generally, and the geologic history of Middle and East Tennessee in greater detail, since the proposed AVA includes or is bounded by both divisions of the state.

The rocks and subsequent soils of Tennessee have origins extending back to the early formation of the earth's continental landmasses.<sup>25</sup> This geologic history is complex and involves plate tectonics (continental drift, continental collisions, subduction zones, intercontinental deformations) and the whole spectrum of uplifting and erosional wearing down for the entire mountain building cycle. Each of these cycles required several hundred million years during which the ongoing uplift and erosional wearing down processes were constantly active. The erosional cycle gradually reduced land surfaces from great mountains to relatively level surfaces, gently sloping toward a depositional basin (ocean/sea) to the east of the mountains and unique geologic regions to the west.

Geological evidence indicates at least three complete tectonic cycles, the last of which (the Alleghanian orogeny - 325 million to 260 million years ago) involved a collision of the Euro-African Plate with the North American Plate and produced a mountain range, the Appalachian Mountains, on the order of the present day Andes Mountains of South America. The collision of tectonic plates created the supercontinent Pangea, which subsequently broke apart and resulted in the creation of the Atlantic Ocean and the present day plate positions.

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<sup>24</sup> See Map 6, *Landforms of Tennessee.*

<sup>25</sup> See Figure 2, *Rock Ages of Tennessee.*

Present day geology will be discussed moving east from the Valley and Ridge Province of East Tennessee through the Cumberland Plateau to the Central Basin of Middle Tennessee.<sup>26</sup>

Prior to the formation of Pangea, a great ocean covered much of eastern North America. This ocean, along with the erosion of bordering landmasses, generated large amounts of sedimentary rocks. The ocean eventually came to a close in the Alleghanian orogeny, as the North American and African protocontinents came together to form Pangea. As the continents collided, the sediment and rock stuck between them had nowhere to go. It was put under stress from the approaching landmass. The folding and fracturing during the late Paleozoic time resulted in the southwest to northeast orientation of the valleys and ridges, which are underlain by respectively resistant and weaker rocks.<sup>27</sup>

This is East Tennessee's Valley and Ridge Province that ranges in width from 100 to 30 miles from north to south. The elevations in the valleys range from 750' in the south to 1000' in the north. Ridges can reach up to 1500' with a number of select mountain peaks reaching 3000.<sup>28</sup>

The Valley and Ridge has bedrock consisting of alternating beds of limestone, dolomite, shale, and sandstone of early Paleozoic age. Ridgetops are capped with more resistant carbonate and sandstone layers, and valleys have been eroded into the less resistant shale beds. The narrow river valleys are filled with unconsolidated deposits of clay, silt, sand, and gravel.

Moving west, the Valley and Ridge Province is separated from the Cumberland Plateau by the eastern escarpment<sup>29</sup> of the Cumberland Plateau. Approximately 33% of the proposed Upper Cumberland AVA is located in the western Cumberland Plateau.

The Cumberland Plateau is a tableland thirty to fifty-five miles wide and is on average from five hundred to over a thousand feet higher than the adjacent Valley and Ridge to the east. Like the Valley and Ridge region, the sedimentary rocks were deposited in horizontal layers of sandstones, limestones, and shales when the ocean covered the region. However, while the force of the continental collision resulted in the folding and faulting of the Valley and Ridge Province, the Cumberland Plateau was merely uplifted. The Cumberland Mountains northeast of the proposed AVA are an exception where sufficient force resulted in an elevated ridgeline.

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<sup>26</sup> See Map 7, *Geologic Map of Tennessee*, and Map 8, *Rock Types of Tennessee*.

<sup>27</sup> See Figure 3, *Geology of Valley and Ridge Appalachians*. See also Figure 4, *Formation of Appalachians*.

<sup>28</sup> Mitchell, Brooks. "A Look at the Valley and Ridge." Thought Co., February 29, 2019. <https://www.thoughtco.com/a-look-at-the-valley-and-ridge-1441241>.

<sup>29</sup> An escarpment is a long, steep slope, especially one at the edge of a plateau or a slope separating areas of land at different heights.

Conglomeritic sandstone, siltstone, shale, and coal are the major rock types of the Cumberland Plateau. These rocks, from the Paleozoic Era, are of the Pennsylvanian period and are underlain by shales, limestone, and dolomite of the Mississippian period. Deposits of silt, sand, and gravel are in major river valleys and terraces along rivers while the lower slopes of many hills have a thin layer of colluvium.

To the west of the Cumberland Plateau is the Eastern Highland Rim. Approximately 33% of the proposed Upper Cumberland AVA is in this region. This is a *cuesta*<sup>30</sup>, typically with sandstone on the ridges and limestone on valley floors. Here, too, sedimentary rock was laid down when the ocean covered the region during the Mississippian period. The constituent bedrock is primarily Mississippian aged St. Louis and Warsaw limestones with Fort Payne chert underlain by Chattanooga shale.

West of the proposed Eastern Highland Rim is the Central Basin of Middle Tennessee. This basin can be further divided into the Inner Central Basin and the Outer Central Basin. A small portion of the proposed Upper Cumberland AVA is in the Outer Central Basin (approximately 25%). This is mostly an escarpment that increases in elevation rapidly to the level of the Highland Rim. Underlying rocks here are limestone, chert, and shale.

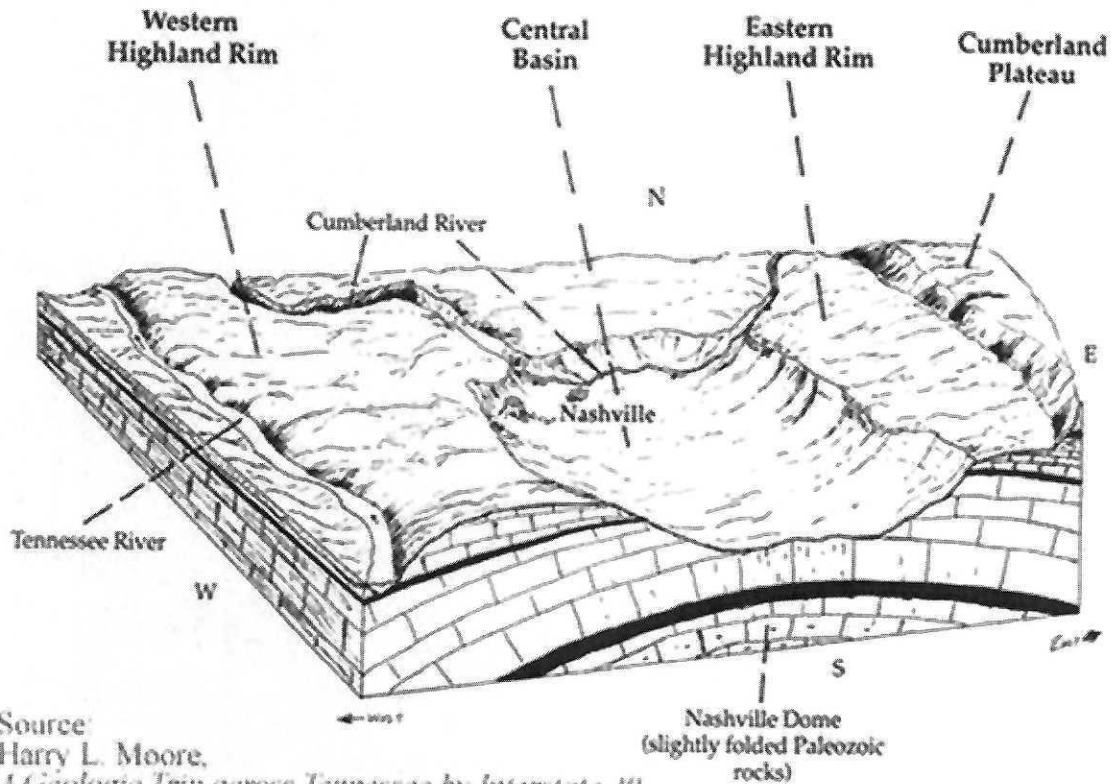
The Central Basin was formed during the Paleozoic Era (570 to 250 million years ago). When the continental plates collided, the same compressional forces that buckled the earth's surface and formed the Valley and Ridge Province and Cumberland Plateau, formed a bulge in middle Tennessee. Subsequent collisions caused the dome to be squeezed and become steeper. During the period between collisions the dome eroded and became flatter. Many types of rocks were deposited during the Paleozoic era including silicacious silt composed of limestone mixed with large quantities of shale and phosphate. Other rocks deposited during the Paleozoic Era include black Chattanooga Shale (late Devonian Period), cherty Fort Payne Formation (early Mississippian Period), and sandstone (Pennsylvanian Period). Over time all rock deposited during the Paleozoic Era has gradually eroded; the insoluble rocks (sandstone, chert, and shale) at a slower rate than the soluble limestone. When the limestone was exposed and quickly began eroding the basin began to form.<sup>31</sup>

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<sup>30</sup> A *cuesta* is a ridge where a harder sedimentary rock overlies a softer layer, the whole being tilted somewhat from the horizontal. This results in a long and gentle backslope called a dip slope that conforms with the dip of resistant strata, called *caprock*. Where erosion has exposed the front slope of this, a steep slope or escarpment occurs.

<sup>31</sup> "The History of the Glades of the Central Tennessee Basin." Center for Cedar Glades Studies. Middle Tennessee State University, August 29, 2018. <https://www.mtsu.edu/glade-center/gladehistory.php>.

The following diagram illustrates the present day landforms of the Cumberland Plateau, Eastern Highland Rim, and Central Basin. The proposed Upper Cumberland AVA is in the higher elevations of the Outer Central Basin.



Source:  
 Harry L. Moore,  
*A Geologic Trip across Tennessee by Interstate 40*,  
 University of Tennessee Press / Knoxville, 1994.

These geologic differences are also reflected in the hydrogeology of the three regions.<sup>32</sup> Roughly two-thirds of Tennessee is underlain by limestone. Within the proposed Upper Cumberland AVA all areas are underlain by limestone with the exception of areas in the Cumberland Plateau where aquifers are almost exclusively in Pennsylvanian sandstones and conglomerates. In the Valley and Ridge, aquifers are composed for the most part of carbonate rocks that are Cambrian and Ordovician in age. The Highland Rim aquifers are Mississippian carbonate and the Inner Basin aquifers are Ordovician carbonate.

<sup>32</sup> See Map 9, *Tennessee Hydrogeology*. Hydrogeology is the study of how groundwater moves and is distributed through the soils and rocks.

The following chart summarizes the different rock types found in the proposed Upper Cumberland AVA and in the surrounding regions.

ECOREGION		GEOLOGY
<b>In AVA</b>	<b>Interior Plateau</b>	
71g	<i>Eastern Highland Rim</i>	Quaternary cherty clay and chert fragment solution residuum; Mississippian chert and cherty limestone, calcareous silicestone, minor shale, some sandstone on knobs in north.
71h	<i>Outer Nashville Basin</i>	Quaternary phosphatic sand solution residuum and cherty silty clay, locally phosphatic, solution residuum; Ordovician limestone and shaly limestone; Mississippian chert and cherty limestone on higher hills and knobs; some Devonian (Chattanooga) shale.
<b>W</b>	<b>Interior Plateau</b>	
71i	<i>Inner Nashville Basin</i>	Quaternary thin clayey solution residuum; Ordovician limestone, low in phosphates.
<b>E</b>	<b>Valley and Ridge Province</b>	
	<i>Southern Limestone / Dolomite Valleys and Low Rolling Hills</i>	Quaternary cherty clay solution residuum, Ordovician dolomite and limestone, cherty in places.
	<i>Southern Shale Valleys</i>	Quaternary sandy shaly decomposition residuum, Ordovician and Cambrian shale, limestone, siltstone.
	<i>Southern Sandstone Ridges</i>	Quaternary quartzite-block loamy colluvium; Ordovician, Silurian, Devonian and Mississippian sandstone, shale, siltstone, conglomerate.
	<i>Southern Dissected Ridges and Knobs</i>	Quaternary sandy shaly decomposition residuum, Ordovician and Cambrian shale, limestone, siltstone.
<b>In AVA</b>	<b>Cumberland Plateau</b>	
68a	<i>Cumberland Plateau</i>	Quaternary sandy decomposition residuum; Pennsylvanian conglomerate, sandstone, siltstone, shale.
<b>E</b>	<b>Cumberland Plateau</b>	
68c	<i>Plateau Escarpment</i>	Quaternary colluvium with huge blocks; Pennsylvanian sandstone, siltstone, shale, conglomerate; Mississippian limestone, sandstone, shale.
<b>NE</b>	<b>Cumberland Mountains</b>	
69d	<i>Cumberland Mountains</i>	Quaternary sandstone- and shale-clast loamy colluvium; Pennsylvanian shale, sandstone, siltstone, and coal.

**Chart 3. Geology of Upper Cumberland and Surrounding Regions**



b. **Soils.**<sup>33</sup>

Formation of the soils of the proposed Upper Cumberland AVA was dependent on a number of factors including topography, geology, climate, vegetation, elevation and time. The preceding section described the geologic forces that resulted in the landforms and rocks of the proposed AVA and the surrounding areas. The soils derived from these rocks are described below.

The proposed Upper Cumberland AVA includes parts of several physiographic regions. Soils within each region are consistent throughout the region so discussion of each region can be extrapolated to refer to the smaller area of the proposed AVA contained within it. Any exceptions are noted.

Most of the eastern Highland Rim is underlain by Ordovician- to Mississippian-age limestone and dolomite that has been exposed through erosion of the Cincinnati Arch.<sup>34</sup> A thick layer of clay (up to 80 feet) covers parts of the rocks and karst areas are present where the clay does not occur. A loess cap covers bedrock on the uplands and ridges and there is significant sand and gravel deposition. The predominant soil orders are Ultisols,<sup>35</sup> Alfisols,<sup>36</sup> and Inceptisols<sup>37</sup>.

The soils of the eastern Highland Rim are predominantly in the thermic temperature regime<sup>38</sup> and udic soil moisture regime<sup>39</sup>. They are moderately deep to very

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<sup>33</sup> The soils information was compiled from the published soil surveys of the included counties in the proposed Upper Cumberland AVA. See Bibliography for complete list. See Map 10, *Soil Map of Tennessee*, and Figure 5, *Major Soil Series of the Upper Cumberland*.

<sup>34</sup> See Figure 6, *Formation of the Central Basin and Highland Rim*.

<sup>35</sup> Ultisols are strongly leached, acid forest soils with relatively low native fertility. They are found primarily in humid temperate and tropical areas of the world.

<sup>36</sup> Alfisols are moderately leached soils with relatively high native fertility, primarily found in temperate humid and subhumid regions.

<sup>37</sup> Inceptisols are soils exhibiting minimal horizon development and lacking in features characteristic of other soil orders. Often found in mountainous areas.

<sup>38</sup> The thermic soil temperature regime has an average annual soil temperature, at a depth of 20 inches, of 59°F to 72°F. This thermic area closely mirrors the Valley and Ridge Province with some exclusion to the north. The higher elevation provinces to the east and west of the proposed AVA are in the mesic temperature regime, which is in the 47°F to 59°F range.

<sup>39</sup> The udic moisture regime is common to soils of humid climates which have well-distributed rainfall, or which have enough rain in summer so that the amount of stored moisture plus rainfall is approximately equal to, or exceeds, the amount of evapotranspiration. Water moves down through the soil at some time in most years.

deep, generally are moderately well drained or well drained, and are loamy or clayey. Predominant Ultisols soil suborders include Paleudalfs (eg. Baxter series) formed in the residuum and loess over residuum or old alluvium; and Crider, Hammack, and Pembroke series formed on hills and ridges. Other Ultisols include Hapludalfs (eg. Caneyville series) and Hapludults (eg. Frankstown series) formed in residuum on hills and ridges as well as Fragiudalfs (eg. Bedford and Nicholson series) formed in loess over residuum on hills and ridges.

Ultisols suborders include Fragiudults (eg. Dickson series) formed in loess over residuum on hills and ridges and Paleudults (eg. Frederick series) formed in residuum on uplands as well in loess over residuum on ridges and plateaus (eg. Mountview series). Also found are Inceptisols, specifically, Eutrudepts formed in residuum on hills (eg. Garmon series) and in alluvium on flood plains (eg. Nolin series)<sup>40</sup>.

There is small percentage of the proposed Upper Cumberland AVA that is located in the Outer Central Basin. Most of the outer part of the Central Basin is deeply dissected and consists of steep slopes between narrow, rolling ridgetops and narrow valleys. The underlying bedrock is Ordovician limestone exposed by geologic erosion of the top of the Nashville Dome. These are older rocks than those found on the Highland Rim.<sup>41</sup>

Soils orders in the Outer Central Basin include Ultisols, Inceptisols, and Alfisols, with the latter the predominant order, and with many soils consisting of the Udalfs suborder of soils. The soils of the Outer Central Basin are predominantly in the thermic temperature regime and udic soil moisture regime. They are moderately deep to very deep, well-drained, clayey soils formed in limestone residuum. These Udalfs (eg. Mimosa, Braxton, Gladdice, and Hampshire series) are dominantly in rolling to steep areas but also can be found in the Inner Central Basin (eg. Talbott and Bradyville Series).<sup>42</sup>

The most agriculturally productive soils are the very deep, well-drained, clayey or loamy soils that formed in alluvium and/or loess over alluvium or limestone residuum in nearly level to undulating areas (eg. Armour, Cumberland, Harpeth, Lomond, and Maury series). The less extensive soils generally are moderately well drained to somewhat poorly

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<sup>40</sup> "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin." NRCS MRLA Explorer: Custom Reporter. National Conservation Resource Service/Penn State University CEI. Accessed October 10, 2018. <http://wa.cei.psu.edu/MLRA/pdf/rep637103155443718946.pdf>.

<sup>41</sup> *Ibid.*

<sup>42</sup> "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin." NRCS MRLA Explorer: Custom Reporter. National Conservation Resources Service/Penn State University CEI. Accessed October 10, 2018. <http://wa.cei.psu.edu/MLRA/pdf/rep637103156705584942.pdf>.

drained and formed in loamy or clayey alluvium and/or residuum (eg. Byler, Capshaw, Colbert, and Tupelo series).

While there are some similarities in the soils of the Inner and Outer Central Basin, there are significant distinctions. The Inner Central Basin has significant acreage of Mollisols<sup>43</sup>, a soil order not found in the proposed Upper Cumberland AVA. Shallow or moderately deep, well drained, clayey Udolls (eg. Ashwood and Barfield series) formed in limestone residuum dominantly in rolling to steep areas. Very shallow, well-drained, clayey Rendolls (eg. Gladeville series) formed in limestone residuum dominantly in undulating to rolling areas of the Inner Basin. Very deep, well-drained or moderately well-drained Udolls (eg. Arrington, Egam, Lynnville, and Staser series) and somewhat poorly drained or poorly drained Aquolls (eg. Agee, Godwin, and Lanton series) formed in loamy or clayey alluvium derived from limestone on flood plains. Most of the remaining soils on flood plains are moderately well drained or well drained Udepts (eg. Lindell and Ocana series). Ultisols are not well represented in this region.

The eastern counties of the proposed Upper Cumberland AVA are in the Cumberland Plateau. This area is underlain over much of its area by nearly horizontal, Mississippian and Pennsylvanian sandstone and shale beds. The landscape consists of flat-topped, high-elevation plateaus separated by deep, steep-sided valleys. The plateaus slope gently from the northeast to the southwest. Drainage is dendritic and winding narrow-crested sandstone ridges and deep narrow valleys are common.

The soils of the Cumberland Plateau are Inceptisols and Ultisols. The most prevalent soil sub-orders are Udufts and, to a lesser extent, Udepts. They have a thermic or mesic soil temperature regime and an udic soil moisture regime; are moderately deep, dominantly well drained, strongly acid, and highly leached; and have a clay-enriched subsoil. They are medium textured to fine textured. They range from shallow on sandstone and shale ridges to very deep in valleys and on large limestone formations.

Hapludults (eg. Shelocta, Jefferson, Clymer, Gilpin Latham, Lily, and Hartsells series) and Fragiudults (eg. Tilsit series) on side slopes and ridges formed in loamy hillside colluvium or residuum. Medium textured, very gravelly Dystrochrepts (eg. Dekalb, Berks, and Calvin series) are on upper side slopes and ridges. Loamy Dystrochrepts (eg. Pope series) and Fluvaquents (eg. Bonnie series) are on flood plains. Loamy Hapludults (eg. Allegheny series) and Fragiudults (eg. Monongahela series) are on stream terraces.<sup>44</sup>

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<sup>43</sup> Mollisols are the soils found in grassland ecosystems and are characterized by a thick, dark surface horizon.

<sup>44</sup> "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin." NRCS MRLA Explorer: Custom Reporter. Natural Conservation Resources

East of the Cumberland Plateau is the Valley and Ridge Province. The soils are derived mainly from sedimentary rocks, with limestone, dolomite, and shale common in the valleys and sandstone and conglomerate on most ridges. Here the predominant soil order is Ultisols. These soils are broadly characterized as “strongly leached, acid forest soils with low native fertility.”<sup>45</sup> They have a clay-enriched subsoil. These are the red-clay soils that predominate in the southeastern United States. The predominant suborders of Ultisols in this region are Udults (more or less freely drained and relatively humus poor), and to a lesser extent, Udepts (freely drained and humus poor in more humid locations). The soils on stable positions on ridges and in valleys have argillic horizons and are dominantly Udupts especially Hapludults and Paleudults. The soils on steep slopes are commonly Dystrudepts. The soils over cherty limestone often are gravelly or stony.

Ultisols have an udic soil moisture regime and predominantly thermic soil temperature regime. They range from shallow on sandstone and shale ridges to very deep in valleys and on large limestone formations.<sup>46</sup>

Paleudults (eg. Decatur, Dewey, and Fullerton series, commonly cherty) are in the many extensive areas underlain by limestone that traverse the Valley and Ridge Province from southwest to northeast. Hapludults (especially Townley series) are dominant in valleys underlain by acid shale. Steep, shallow or moderately deep, shaly and stony Dystrudepts (especially Wallen and Montevallo series) are on the sides of steep ridges. Shallow, shaly Eutrudepts (eg. Dandridge series) are in areas of the shale formation extending along the eastern side of the Valley and Ridge. Eutrudepts (eg. Hamblen, Sullivan, and Pettyjon series) are on narrow bottomland.<sup>47</sup>

In summary, the soils of the proposed Upper Cumberland AVA are predominantly Ultisols, Inceptisols, and Alfisols. The predominant soil order differs in each of the discussed regions but only in the Valley and Ridge region to the east are the soils almost exclusively Ultisols formed from softer sedimentary rock with predominantly sandstone ridges and valley floors of limestone, shale and other sedimentary deposits. The soils

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Service/Penn State University CEI. Accessed October 10, 2018.  
<http://wa.cei.psu.edu/MLRA/pdf/rep637103158029929473.pdf>.

<sup>45</sup> “Ultisols.” The Twelve Soil Orders. University of Idaho - College of Agricultural and Life Sciences. Accessed November 3, 2019. <https://www.uidaho.edu/cals/soil-orders/ultisols>.

<sup>46</sup> “Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin.” NRCS MRLA Explorer: Custom Reporter. National Conservation Resource Service/Penn State University CEI. Accessed October 10, 2018.  
<http://wa.cei.psu.edu/MLRA/pdf/rep637068382840903970.pdf>, p 3.

<sup>47</sup> “Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin.” NRCS MRLA Explorer: Custom Reporter. National Conservation Resources Service/Penn State University CEI. Accessed October 10, 2018.  
<http://wa.cei.psu.edu/MLRA/pdf/rep637068387445202091.pdf>, p 3.

formed from these rocks are acidic and low in natural fertility. The soils of the Central Basin to the west of the proposed AVA include Mollisols that are not found in the proposed Upper Cumberland AVA. Throughout the proposed AVA the soils are generally moderately deep to deep (except on ridges) and moderately well drained to well drained.

All soils within the proposed Upper Cumberland AVA are suitable for viticultural use. Some shallower or acidic soils may benefit from soil amendments. Recommended best management practices will minimize soil erosion and contribute to crop yield and contribute to the support of continued growth in the vineyard industry.

c. **Elevation.**<sup>48</sup>

As discussed in prior sections, Tennessee is composed of three major physiographic regions: West, Middle and East Tennessee. The proposed Upper Cumberland AVA is located entirely within Middle Tennessee, which is further divided into three regions: the Central Basin, which is surrounded by the Highland Rim, and the western Cumberland Plateau.<sup>49</sup> The proposed AVA includes parts of the eastern Highland Rim and Cumberland Plateau with a small incursion into the Outer Central Basin. Elevations in the proposed AVA increase from west to east and are distinct within each of the divisions.

The eastern Highland Rim ranges from 600' to 1000' in elevation from west to east, rising 300' to 400' over the rolling plain of the Central Basin. The portions of the proposed Upper Cumberland AVA located in the Outer Central Basin have elevations higher than the average elevation of the Central Basin and are predominantly located in the higher elevations of the escarpment between the Central Basin and Highland Rim.<sup>50</sup>

The easternmost parts of the proposed Upper Cumberland AVA are located in the western side of the Cumberland Plateau. The average elevations of the Cumberland Plateau are between 1500' and 1800' with the higher elevations generally located in the eastern parts of the Cumberland Plateau that are not included in the proposed AVA. The eastern edge of the Cumberland Plateau, the Cumberland Escarpment, is 750' above the Valley and Ridge Province lowlands and features rugged terrain with steep slopes.<sup>51</sup> This escarpment is not included in the proposed AVA.

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<sup>48</sup> See Figure 7, *Rivers and Topography with Elevations*, Figure 8, *Topography of Tennessee*.

<sup>49</sup> See Map 5, *Land Forms of Tennessee*. The Highland Rim is further divided into the eastern Highland Rim and the western Highland Rim. The Central Basin is divided into the Inner Central Basin and Outer Central Basin.

<sup>50</sup> See Figure 9, *Elevations of the Upper Cumberland and Surrounding Areas*.

<sup>51</sup> See Map 5 and Figure 8.

Elevations in the Valley and Ridge Province to the east of the proposed Upper Cumberland AVA range between 1100' to 1500' in the ridges and 700' to 1000' in the valleys. In the northeast, the Cumberland Mountains range between 2000' and 4145'.

In general, the average elevations in the proposed Upper Cumberland AVA are higher than the areas to the south, west, and northwest. All counties located on the Cumberland Plateau, whether in or out of the proposed AVA, have higher average elevations.

Existing vineyards within the proposed Upper Cumberland AVA are located at a variety of elevations within the proposed AVA. The elevations are all within suitable parameters for grape growing. Elevation is not used as a factor for drawing boundaries of the proposed AVA with the exception of part of southeastern Cumberland County, which has higher elevations and a more radical elevation gain than elsewhere. However, because lower and higher elevations of the regions outside the proposed Upper Cumberland AVA affect climate a discussion of the impact of elevation is important. Climate is addressed in detail in Section 2d.

d. **Climate.**<sup>52</sup>

Climate data was provided by the PRISM climate data mapping system.<sup>53</sup> Climate has an important, if not the most important, influence on grape growing. The growing season length and temperatures have significant impact on fruit ripening and quality.<sup>54</sup> The proposed Upper Cumberland AVA has distinct climatic conditions that uniquely influence viticulture in the region.

Tennessee has an elongated geography. Climate in Tennessee, while generally temperate with warm summers and mild winters, varies according to its latitude and altitude. This is abundantly illustrated by comparing climatic conditions in the proposed AVA to those of the regions surrounding it.

Thirteen weather stations located within the proposed Upper Cumberland AVA provide data for the proposed AVA<sup>55</sup>. This data was compared to data from nineteen

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<sup>52</sup> See Section 7, *Climate Tables 1-10*.

<sup>53</sup> The PRISM Climate Group gathers climate observations from a wide range of monitoring networks including weather stations, global positioning systems and remote sensing technologies. Other factors used include elevation, longitude and slope angles. Climate normals datasets used in this petition were from the most recent available data, 1981-2010.

<sup>54</sup> See Jones, G. (2015, August 12). *Climate, Grapes, and Wine - Terroir and the Importance of Climate to Winegrape Production*. Retrieved April 21, 2019, from [https://www.guildsomm.com/public\\_content/features/articles/b/gregory\\_jones/posts/climate-grapes-and-wine](https://www.guildsomm.com/public_content/features/articles/b/gregory_jones/posts/climate-grapes-and-wine).

<sup>55</sup> See Table 1, *Weather Stations and Locations*.

weather stations located in seven cardinal or primary intercardinal directions outside the proposed Upper Cumberland AVA. Distance of weather station from boundaries of the proposed AVA is in Table 1.

1. Temperature.<sup>56</sup>

The impact of topography is significant with temperature variations directly correlated to elevation and latitude. Increases in elevation have a concomitant decrease in temperature, on average 3°F per 1000' elevation gain. Generally, in Tennessee, average annual maximum temperatures decrease from south to north and west to east. Average annual minimum temperatures also decrease from south to north and west to east.

The proposed Upper Cumberland AVA has lower annual minimum temperatures than all areas except the Cumberland Mountains region to the northeast. It has nearly the same annual minimum temperature as the region directly east. Within the proposed AVA, weather stations located at higher elevations have the lowest annual maximum temperatures and mean growing season temperatures. The mean elevation in the Cumberland Mountains region is higher than all regions, including the proposed AVA. Elevation correlates to lower annual minimum temperature.<sup>57</sup>

The proposed Upper Cumberland AVA has an average maximum annual temperature of 68.7°F, growing season mean temperature of 67.5°F, and an average minimum annual temperature of 45.4°F. The area to the northeast has an average maximum temperatures of 67.5°F, growing season mean temperature of 65.8°F, and an average minimum annual temperatures of 43.3°F. The area east of the proposed Upper Cumberland AVA has an average maximum temperature of 68.6°F, growing season mean temperature of 67.7°F, and an average minimum annual temperature of 45.2°F. The area to the southeast has an average maximum annual temperature of 70.0°F, growing season mean temperature of 69°F, and an average minimum annual temperatures of 47°F. To the south the average maximum temperature is 70.6°F, growing season mean temperature is 69.8°F, and average minimum annual temperature is 48.5°F. To the southwest the average maximum annual temperature is 69.8°F, growing season mean temperature is 68°F, and average minimum annual temperature is 45.8°F. To the west the average maximum annual temperature is 70.5°F, growing season mean temperature is 69.2°F, and average minimum annual temperature is 46°F. Finally, the area to the northwest has an average maximum annual temperature of 69°F, growing season mean temperature of 69°F, and average minimum annual temperatures of 46.8°F.

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<sup>56</sup> See Table 2, *Maximum Temperatures*, Table 3, *Minimum Temperatures*, and Table 4, *Growing Season Mean Temperatures*.

<sup>57</sup> See Table 10, *Data Summary*, and Figure 9.

In general, the proposed Upper Cumberland AVA has lower maximum annual and growing season temperatures than all surrounding regions with the exception of the mountainous region to the northeast and the Valley and Ridge to the east. It has lower minimum annual temperatures than all regions except that to the northeast and east. This is due to the influence of elevation and latitude and a lack of moderating influences.<sup>58</sup>

2. Frost-Free Season / Growing Season.<sup>59</sup>

The proposed Upper Cumberland AVA enjoys an average growing season of 212 days. It is a longer growing season than the regions to the northeast and east and a much shorter season than the areas to the south and southwest. This can be directly correlated to elevation and latitude with longer growing seasons at lower elevations and latitudes.

3. Heat Summation.<sup>60</sup>

Using Amerine and Winkler heat summation definitions,<sup>61</sup> the proposed viticultural area has areas ranging from climatic regions III to V<sup>62</sup>. This variation is directly correlated to elevation. Climate data from weather stations located at higher elevations are, without exception, warmer than that from weather stations at lower elevations. The area to the northeast is predominantly in climatic region III but all other surrounding regions are in climatic region IV or V and except for the area southwest of the proposed AVA, have significantly more growing degree days.

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<sup>58</sup> The Cumberland Plateau and the Blue Ridge Mountains both have moderating influences on neighboring regions. The regions surrounding the proposed Upper Cumberland AVA do not have such an influence.

<sup>59</sup> See Table 5, *Frost-Free Growing Season* and Table 6, *Frost-Free Growing Season Mean*. See also Figure 10, *Median Last 28°F Freeze Southeast United States* and Figure 11, *Median First 28°F Freeze Southeast United States*.

<sup>60</sup> See Table 7, *Growing Degree Days/Heat Summation*.

<sup>61</sup> Winkler, A.J., Cook, James A., Kliewer, W.M., and Lider, Lloyd A., *General Viticulture*, (Berkeley, CA: University of California Press, 1974): pp 61-64. The Winkler classification system divides geographical areas into five zones based on growing degree days using a base of 50°F, the minimum temperature required for grapevine growth. Climate Zone I is the coolest and Climate Zone V is the warmest.



Location	Growing Season	Growing Degree Days (Mean)	Climate Region	Plant Hardiness Zone
In AVA	212	3760	IV	6b-7a
Northeast	194	3426	III	6b
East	208	3785	IV	7a
Southeast	219	4068	V	7a, 7b
South	242	4240	V	7a, 7b
Southwest	222	3854	IV	7a
West	210	4102	V	7a
Northwest	215	4204	V	6b, 7a

Chart 4. Heat Summation.

4. Hardiness Zone.

The proposed Upper Cumberland AVA is in Zone 6b and 7a of the USDA Hardiness Zone Map.<sup>63</sup> Areas in the Cumberland Plateau are predominantly in Zone 6b and the other areas are in Zone 7a. The immediately surrounding areas transition to Zone 6b to the northeast and northwest and to Zone 7a and Zone 7b in all other directions. Both Zone 6b and Zone 7a are well suited to growing a variety of wine grapes, from muscadine to vinifera.<sup>64</sup> For example, North Carolina's Yadkin Valley and the Columbia Valley viticultural area in Washington State are also located in Zone 7a and grape growing regions across the central plains are located in Zone 6b.

This is further supported by the location of the Upper Cumberland region in the warm temperate latitude between 35°30'34.5571" and 36°38'23.1863" N.<sup>65</sup> This latitude is well-suited to growing a wide variety of wine grapes, including vinifera, hybrid, native and muscadine varieties which are all currently growing in the proposed AVA.

5. Precipitation.<sup>66</sup>

Much of the moisture falling as rain in Tennessee comes from the Gulf of Mexico. There is a gradual decrease in precipitation from south to north.

<sup>63</sup> See Figure 12, *Plant Hardiness Map of Tennessee*.

<sup>64</sup> See Grapevine Characteristics Chart. (n.d.). Retrieved April 24, 2019, from <https://doublevineyards.com/news/app/uploads/sites/2/2017/07/Grapevine-Characteristics-Chart.pdf>.

<sup>65</sup> See Section 10, U.S.G.S. Maps.

<sup>66</sup> See Table 8, *Precipitation*, and Table 9, *Snowfall*. See also Figure 13, *Tennessee Annual Average Precipitation*.

Mean annual precipitation in the proposed Upper Cumberland AVA is lower than in the surrounding areas. However, with the exception of the area southwest of the proposed AVA, mean annual precipitation during the growing season<sup>67</sup> is higher, although in most cases by less than one inch.

Annual mean precipitation during winter in the form of rain is highest in the southern regions and the east. The proposed AVA receives less precipitation than these areas but more than the areas to the west and north. On the other hand, annual snowfall in the proposed AVA is higher than in every region with the exception of to the northeast. Most of the snowfall within the proposed AVA occurs at higher elevations on the Cumberland Plateau.

In general, the proposed Upper Cumberland AVA receives less precipitation in the form of rainfall than nearly all the surrounding areas on an annual basis but it is concentrated in the growing season to a slightly greater extent than elsewhere. It receives more snowfall than all regions except the higher elevation northeast.

#### 6. Climate Summary.

The proposed Upper Cumberland AVA is cooler and enjoys less precipitation than the surrounding regions with some exceptions. Areas of the proposed AVA with the highest elevations within the AVA are generally cooler, have less precipitation, but more snowfall. The growing season and frost-free dates fall within the range for cultivation of a variety of wine grapes.<sup>68</sup> The growing season is longer than all areas to the northeast and east, virtually identical to areas to the west and northwest and shorter than the areas to the southeast, south, and southwest. The hardiness zones in the proposed AVA include 6b and 7a while most other areas, with the exception of the region to the northeast that also is in Zone 6b, are in warmer Zones 7a or 7b. The foregoing evidence supports the proposition that the proposed Upper Cumberland AVA possesses climatic conditions distinguishing it from the surrounding areas.

Further, all of the geographical factors discussed are evidence that the proposed Upper Cumberland AVA is unique and distinct from the surrounding regions.

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<sup>67</sup> The growing season is from April through October. Winter is December, January and February.

<sup>68</sup> An analysis was made by North Carolina State University using data such as elevation, climate, and soils that divided North Carolina into four zones. The Upper Cumberland region is roughly analogous to Zones 2 or 3 in North Carolina, areas determined by the analysis to be "best" for vinifera and hybrids or "good" for vinifera, hybrids and Muscadines. In comparison, grapes of any type are not recommended in the high mountain areas and vinifera and certain hybrids are not recommended in regions further south and west of the proposed AVA.

### 3. DESCRIPTION OF PROPOSED BOUNDARIES OF UPPER CUMBERLAND.

The area of the proposed Upper Cumberland AVA encompasses approximately 4874.62 square miles (3,119,756.54 acres) consisting of all or parts of fourteen Tennessee counties: Cannon, Clay, Cumberland, DeKalb, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith, Van Buren, Warren, and White.

Counties	Square Miles	Acres
Cannon	265.667	170026.88
Clay	236.117	151114.88
Cumberland	558.937	357719.42
DeKalb	304.588	194936.32
Fentress	498.659	319141.76
Jackson	308.899	197695.36
Macon	307.146	196573.44
Overton	433.363	277352.32
Pickett	162.922	104270.08
Putnam	400.966	256618.24
Smith	314.438	201240.32
Van Buren	273.475	175024
Warren	432.701	276928.64
White	376.742	241114.88
<b>TOTAL</b>	<b>4874.62</b>	<b>3119756.54</b>

**Chart 5. Counties of Proposed Upper Cumberland AVA**

The subject area is shown within the outlined perimeter on the included 1:100,000 metric scale topographic maps. The Tennessee Valley Authority and the U.S.G.S produced this series. The following maps are included:

NAME	MAP NUMBER	CONTOUR INTERVAL	DATE
Bowling Green	36086-E1-TM-100	10 meters	1985
Tompkinsville	36085-E1-TM-100	20 meters	1985 photoinspected 1992
Corbin	36084-E1-TM-100	50 meters	1981
Nashville	36086-A1-TM-100	20 meters	1984
Cookeville	N3600-W8500/30x60	20 meters	1982
Oak Ridge	N3600-W8400	50 meters	1979
Murfreesboro	35086-E1-TM-100	20 meters	1985
McMinnville	N3530-W8500/30x60	20 meters	1981
Watts Bar Lake	N3530-W8400	20 meters	1981

**Chart 6. USGS Map List**

Each whole map is a 30 x 60 minute quadrangle showing:

- Contours and topographic features;
- Highways, roads, and other man-made features;
- Water features;
- Woodland areas; and
- Geographic names.

The actual proposed Upper Cumberland AVA perimeter follows the county lines of the included counties. All points used are identifiable on the enclosed U.S.G.S. maps.

The numbers on the text below correlate with the numbered red dots on the map, one number for each identified point.

- (1) On the Bowling Green map, begin at the intersection of Macon and Sumner counties with the Kentucky state line. Follow the Macon/Sumner county line south onto the Nashville map.
- (2) Proceed south on the Nashville map to the point where Macon, Sumner, and Trousdale counties meet.
- (3) Follow the Macon/Trousdale county line east, then southeast, then east onto the Cookeville map.
- (4) Continue east along the Macon/Trousdale county line to the point where Macon, Trousdale, and Smith counties meet.
- (5) Turn south and proceed along the Trousdale/Smith county line in a southerly direction then west back onto the Nashville map.
- (6) Proceed southwest along the Trousdale/Smith county line to the point where Trousdale, Smith, and Wilson counties meet.
- (7) Continue generally south along the Smith/Wilson county line to the point where Smith, Wilson, and DeKalb counties meet.
- (8) Proceed generally south along the meandering Wilson/DeKalb county line onto the Murfreesboro map.
- (9) Continue south along the Wilson/DeKalb county line to the point where Wilson, DeKalb, and Cannon counties meet.

- (10) Follow the Wilson/Cannon county line west then south to the point where Wilson, Cannon, and Rutherford counties meet.
- (11) Proceed generally south along the meandering Cannon/Rutherford county line as it turns sharply west.
- (12) Turn south and continue along the Cannon/Rutherford county line to the point where Cannon, Rutherford, and Coffee counties meet.
- (13) Proceed southeast along the Cannon/Coffee county line.
- (14) Turn east and continue along the meandering Cannon/Coffee county line onto the McMinnville map.
- (15) Continue east along the Cannon/Coffee county line to the point where Cannon, Coffee, and Warren counties meet.
- (16) Turn generally south-southeast and continue on the meandering Coffee/Warren county line to the point where the Coffee/Warren county line intersects the Louisville and Nashville Railroad track.
- (17) Continue generally southeast on the meandering Coffee/Warren county line to the point where Coffee, Warren, and Grundy counties meet.
- (18) Proceed east along the Warren/Grundy county line to the point where Warren, Grundy, and Sequatchie counties meet.
- (19) Continue east along the Warren/Sequatchie county line to the point where Warren, Sequatchie, and Van Buren counties meet.
- (20) Proceed generally east/northeast along the Sequatchie/Van Buren county line to the point where Sequatchie, Van Buren, and Bledsoe counties meet.
- (21) Turn northeast and continue along the Van Buren/Bledsoe county line to its intersection with Long Branch Creek.
- (22) Continue following the Van Buren/Bledsoe county line as it continues north in a serpentine line to the point where Van Buren, Bledsoe, Cumberland, and White counties meet.

- (23) Proceed east along the Bledsoe/Cumberland county line to its intersection with US Highway 127/State Road 29.
- (24) Proceed northeast 64 degrees in a straight-line for 6 kilometers/3.73 miles to the point where it intersects with US Highway 127 and then onto the Watts Bar Lake map.
- (25) Continue northeast along the straight-line for 25.7 kilometers/15.97 miles onto the Oak Ridge map.
- (26) Continue northeast along the straight-line for 3.4 kilometers/2.11 miles to the point where it intersects with the Cumberland/Morgan county line. Total straight-line distance between points 24 and 27 is 35.1 kilometers/21.81 miles.
- (27) Proceed northwest along the Cumberland/Morgan county line.
- (28) Turn generally west and continue along the meandering Cumberland/Morgan county line.
- (29) Proceed northwest along the Cumberland/Morgan county line to the point where Cumberland, Morgan, and Fentress counties meet.
- (30) Proceed north along the meandering Morgan/Fentress county line.
- (31) Turn generally northeast and proceed along the meandering Morgan/Fentress county line to the point where Morgan, Fentress, and Scott counties meet.
- (32) Continue generally northeast along the Fentress/Scott county line.
- (33) Turn northwest and proceed northwest along the Fentress/Scott county line onto the Corbin map.
- (34) Proceed northwest along the Fentress/Scott county line to the point where Fentress, Scott, and Pickett counties meet.
- (35) Continue northwest along the Scott/Pickett county line to the intersection of the Scott/Pickett county line and the Kentucky border.
- (36) Proceed west along the Pickett county/Kentucky border and onto the Tompkinsville map.

- (37) Continue west along the Pickett county/Kentucky border to the intersection of Pickett and Clay counties and the Kentucky border.
- (38) Proceed west along the Clay county/Kentucky border to the intersection of Clay and Macon counties and the Kentucky border.
- (39) Continue west along the Macon county/Kentucky border and onto the Bowling Green map.
- (40) Proceed west along the Macon county/Kentucky border to the intersection of Macon and Sumner counties and the Kentucky border, Point 1, the origin point of the boundary description.

This concludes the description of the perimeter survey of the proposed Upper Cumberland AVA as shown outlined on the included U.S.G.S. maps.

#### 4. MAPS

Nine Tennessee Valley Authority/U.S.G.S. maps with the boundaries of the proposed Upper Cumberland AVA are clearly marked and included with this petition. The boundaries are outlined in yellow.

- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), Bowling Green Quadrangle, Kentucky-Tennessee [map], 1:100,000, 30x60 minute series, Denver, CO or Reston, VA: U.S.G.S., 1985.
- U.S. Geological Survey (U.S.G.S.), Tompkinsville Quadrangle, Kentucky-Tennessee, [map], 1:100,000, 30x60 minute series, Denver, CO or Reston, VA: U.S.G.S., 1985, photoinspected 1992.
- U.S. Geological Survey (U.S.G.S.), Corbin Quadrangle, Kentucky-Tennessee, [map], 1:100,000, 30x60 minute series, Reston, VA: U.S.G.S., 1981.
- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), Nashville Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Denver, CO or Reston, VA: U.S.G.S., 1984.
- U.S. Geological Survey (U.S.G.S.), Cookeville Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Reston, VA: U.S.G.S., 1982.
- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), Oak Ridge Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Denver, CO or Reston, VA: U.S.G.S., 1979.
- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), Murfreesboro Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Reston, VA: U.S.G.S., 1985.
- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), McMinnville Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Reston, VA: U.S.G.S., 1981.
- U.S. Geological Survey (U.S.G.S.)/Tennessee Valley Authority (TVA), Watts Bar Lake Quadrangle, Tennessee, [map], 1:100,000, 30x60 minute series, Reston, VA: U.S.G.S., 1981.



Also included in Section Five are the following maps:

- Map 1. Tennessee Grand Divisions.
- Map 2. Upper Cumberland Wine Trail.
- Map 3. Tennessee and Upper Cumberland.
- Map 4. Cumberland and Tennessee River Watershed.
- Map 5. Big South Fork National River and Recreation Area.
- Map 6. Landforms of Tennessee.
- Map 7. Geologic Map of Tennessee.
- Map 8. Rock Types of Tennessee.
- Map 9. Tennessee Hydrogeology.
- Map 10. Soil Map of Tennessee.

# Map 1

## Tennessee Grand Divisions

Proposed Upper Cumberland  
American Viticultural Area



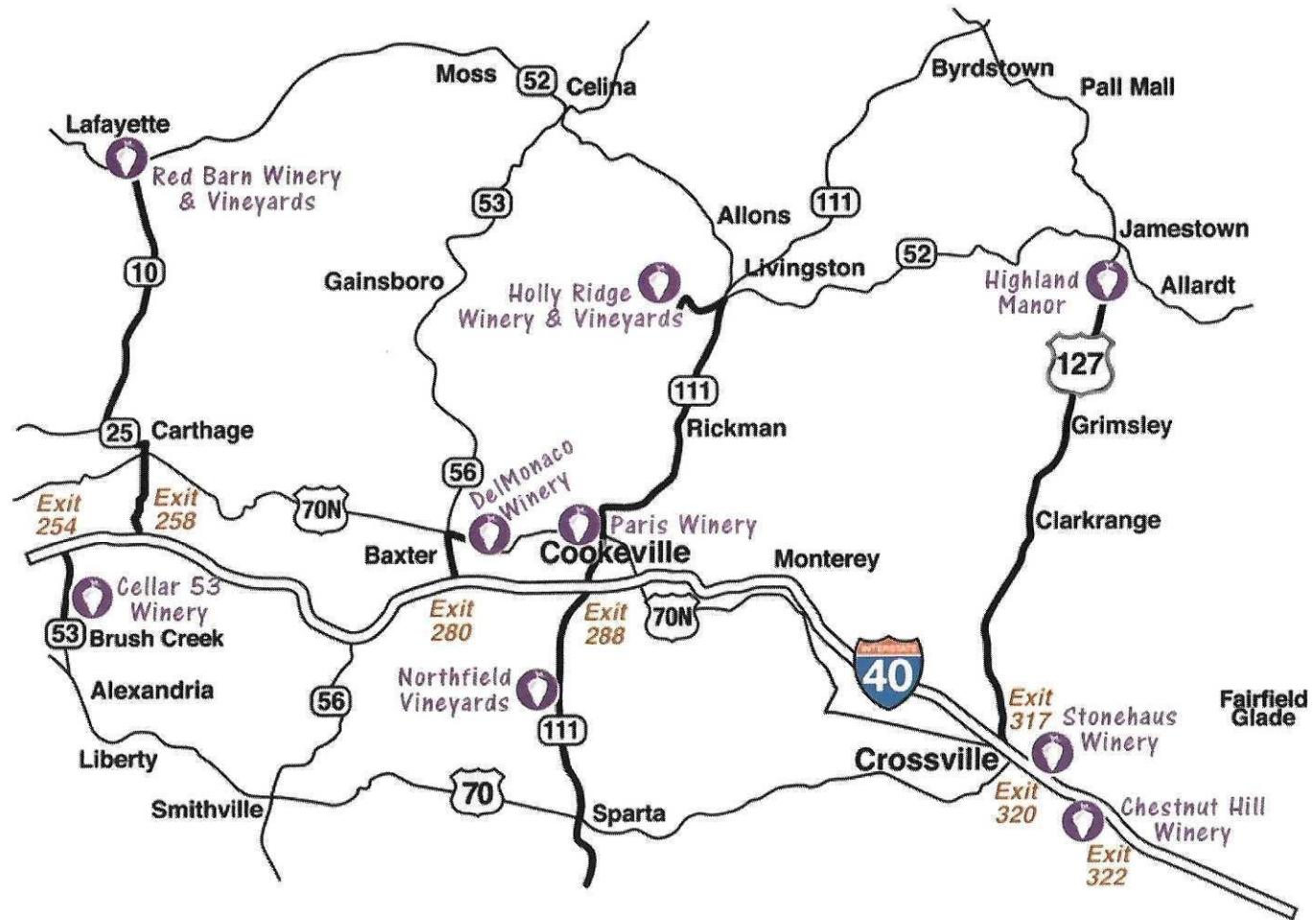
West

Middle

East

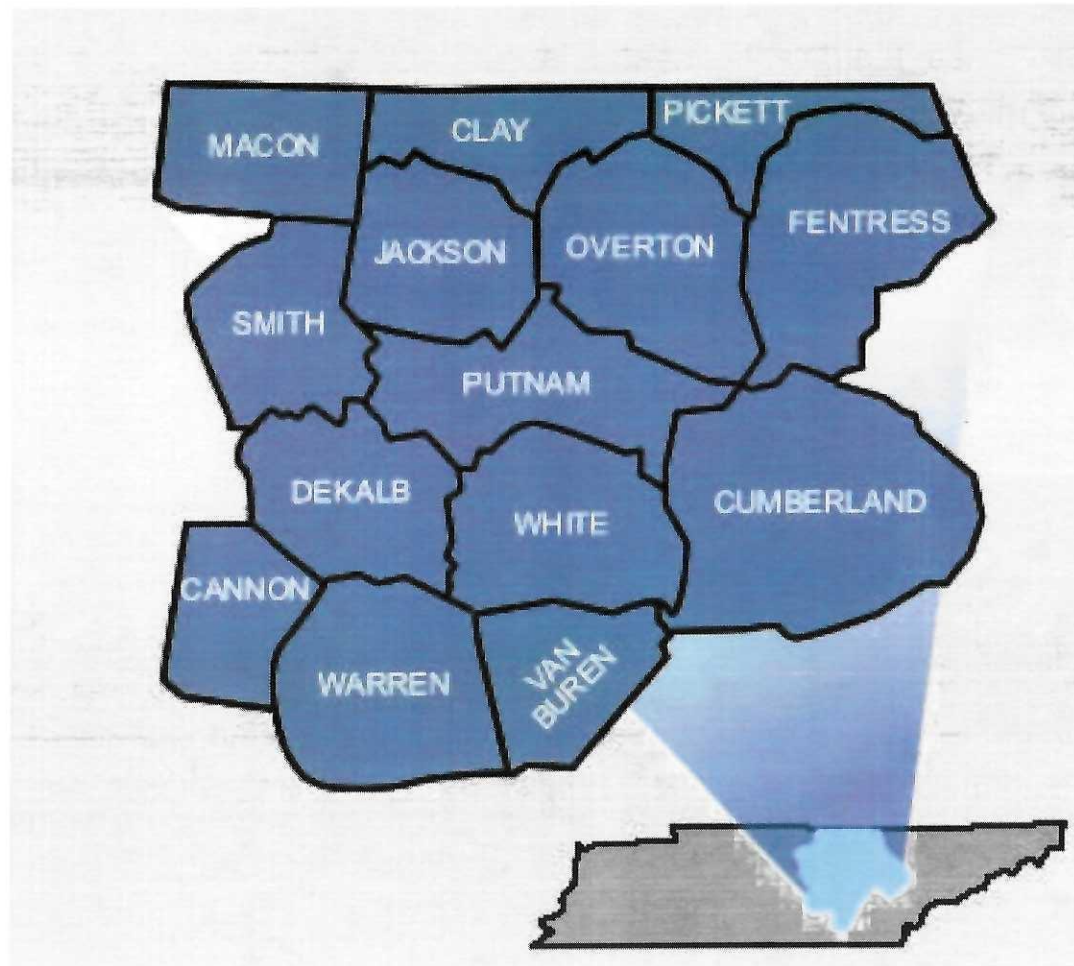
Map 2

Upper Cumberland Wine Trail



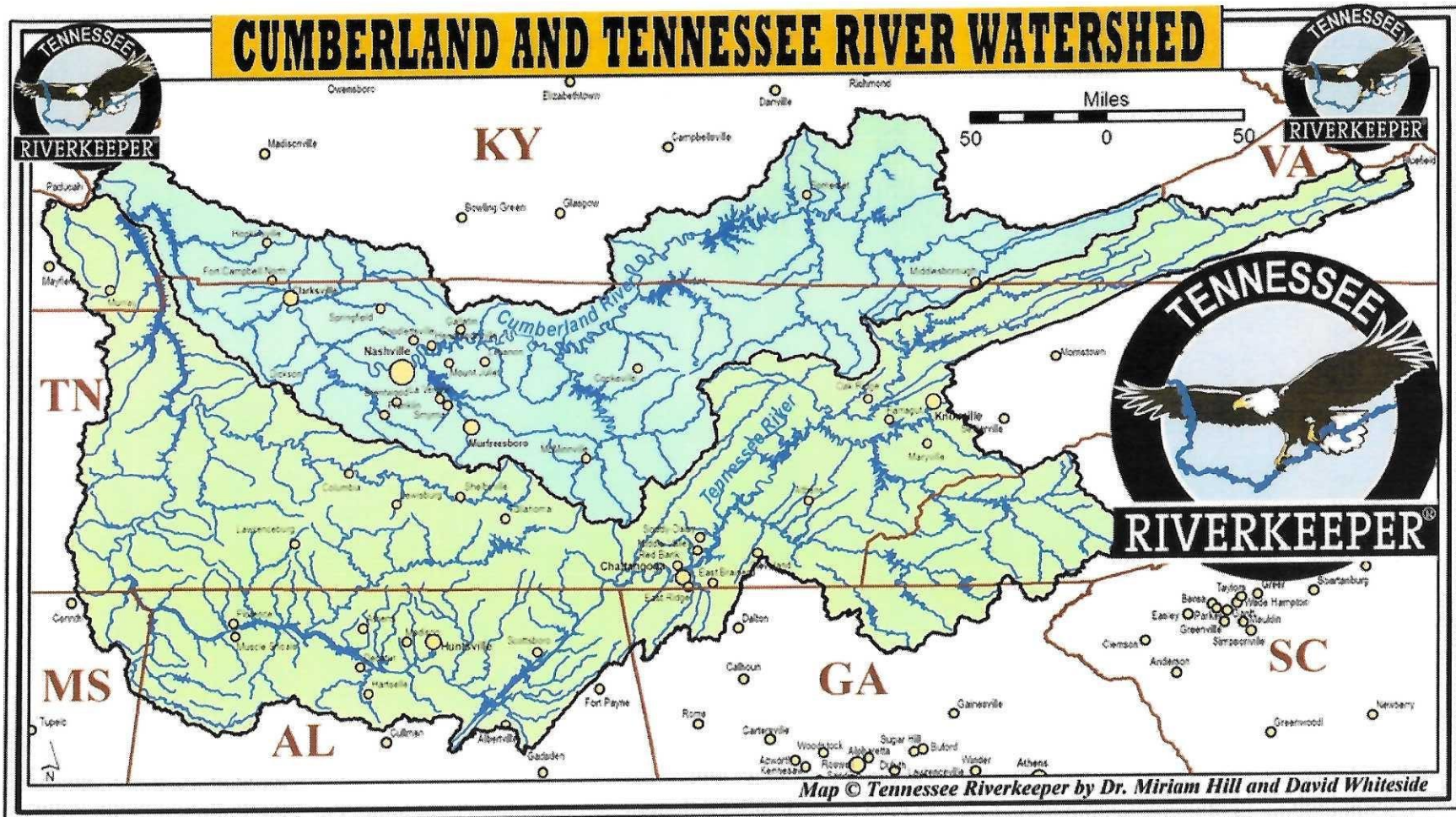
Map 3

Tennessee and the Upper Cumberland



Map 4

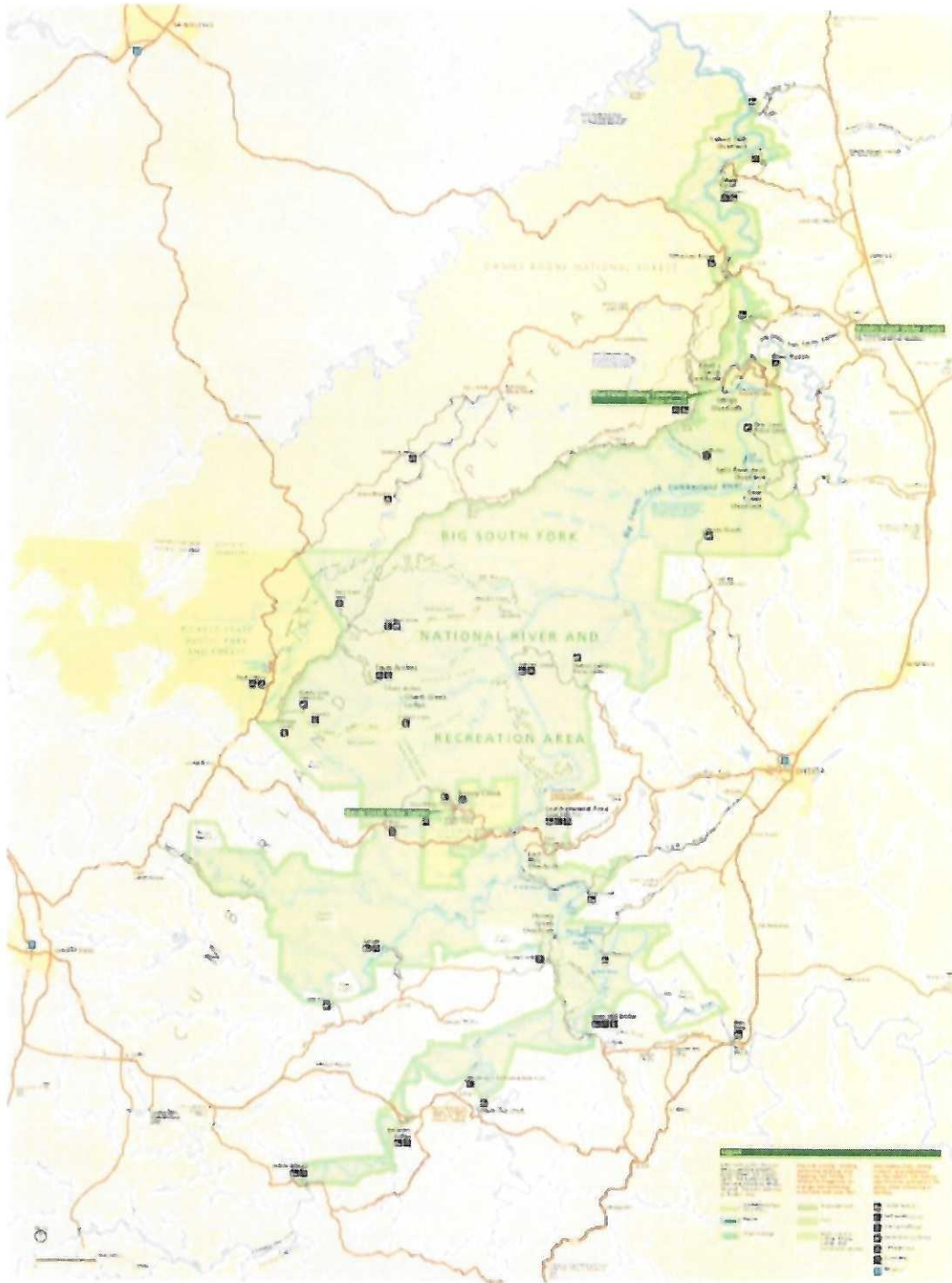
Cumberland and Tennessee River Watershed



Map © Tennessee Riverkeeper by Dr. Miriam Hill and David Whiteside

# Map 5

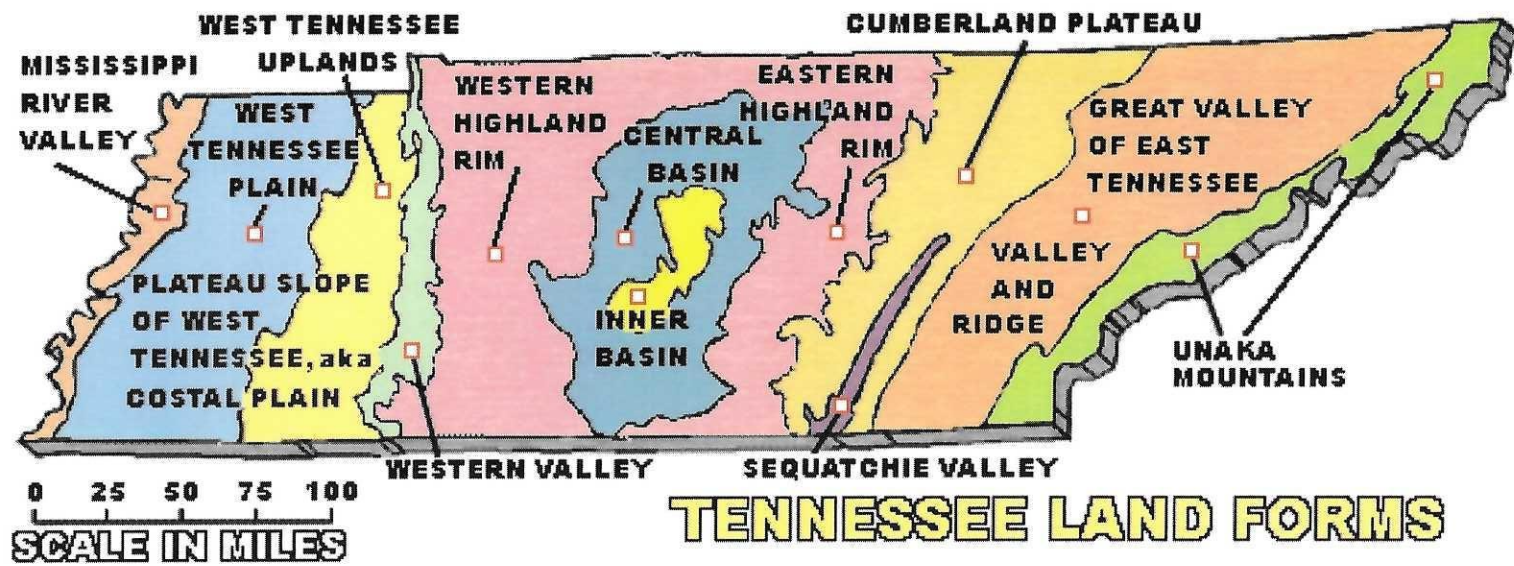
## Big South Fork National River and Recreation Area



Map provided by National Park Service

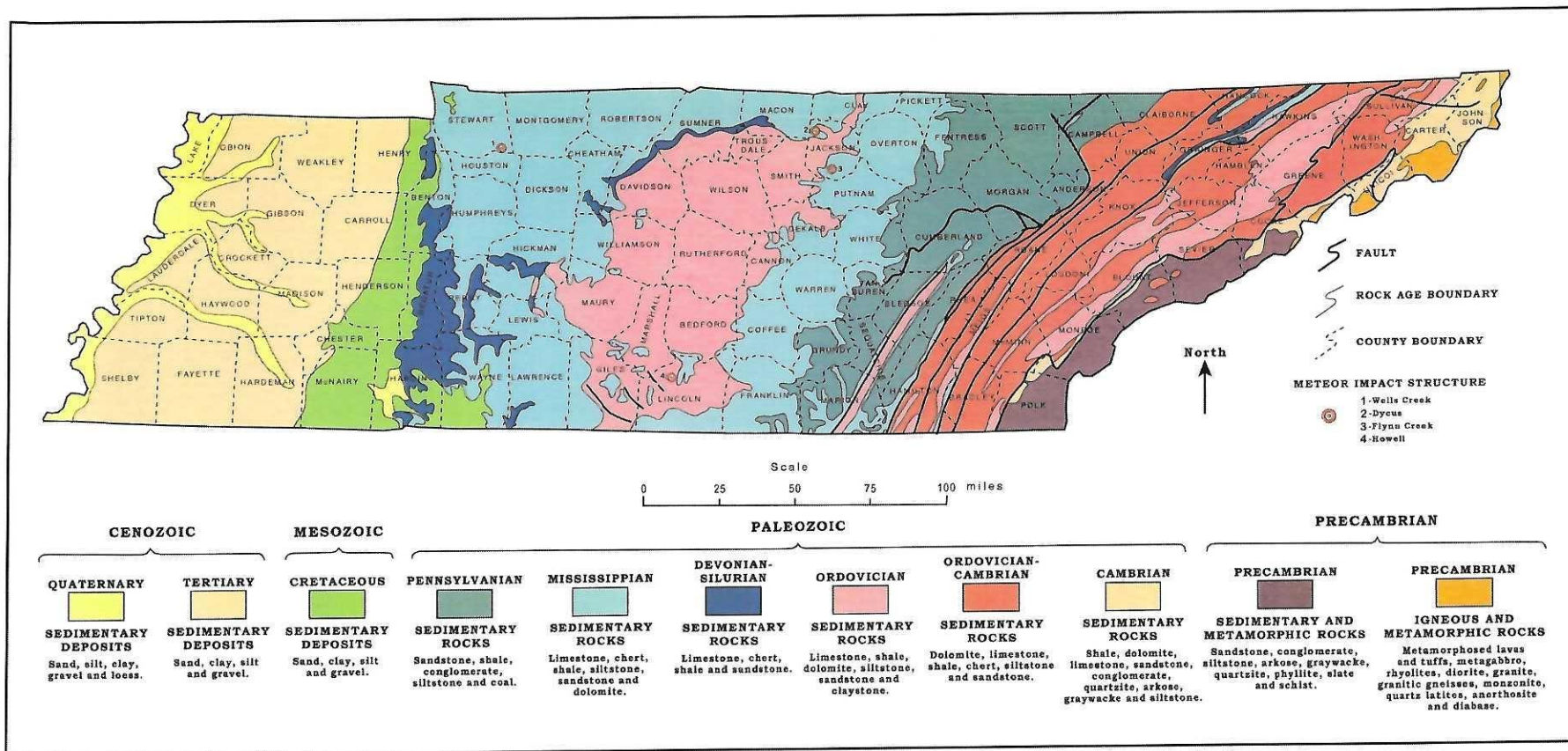
Map 6

Landforms of Tennessee



# Map 7

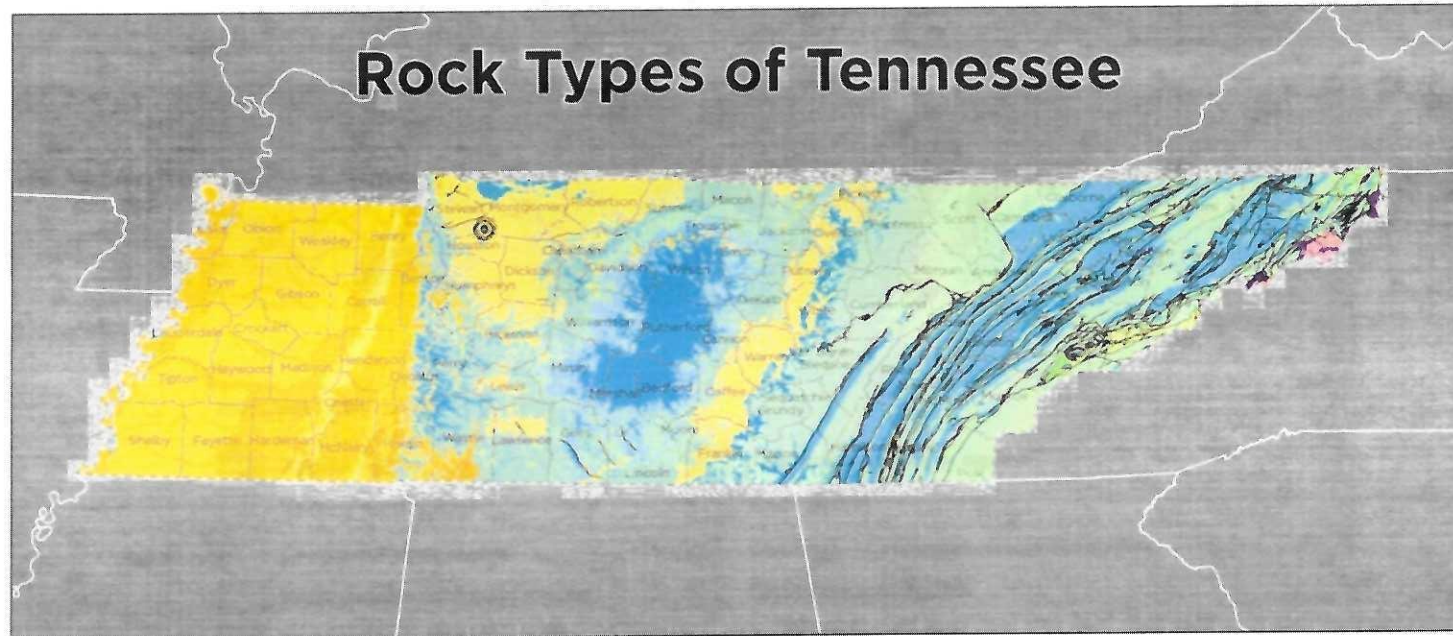
## Geologic Map of Tennessee





## Map 8

### Rock Types of Tennessee



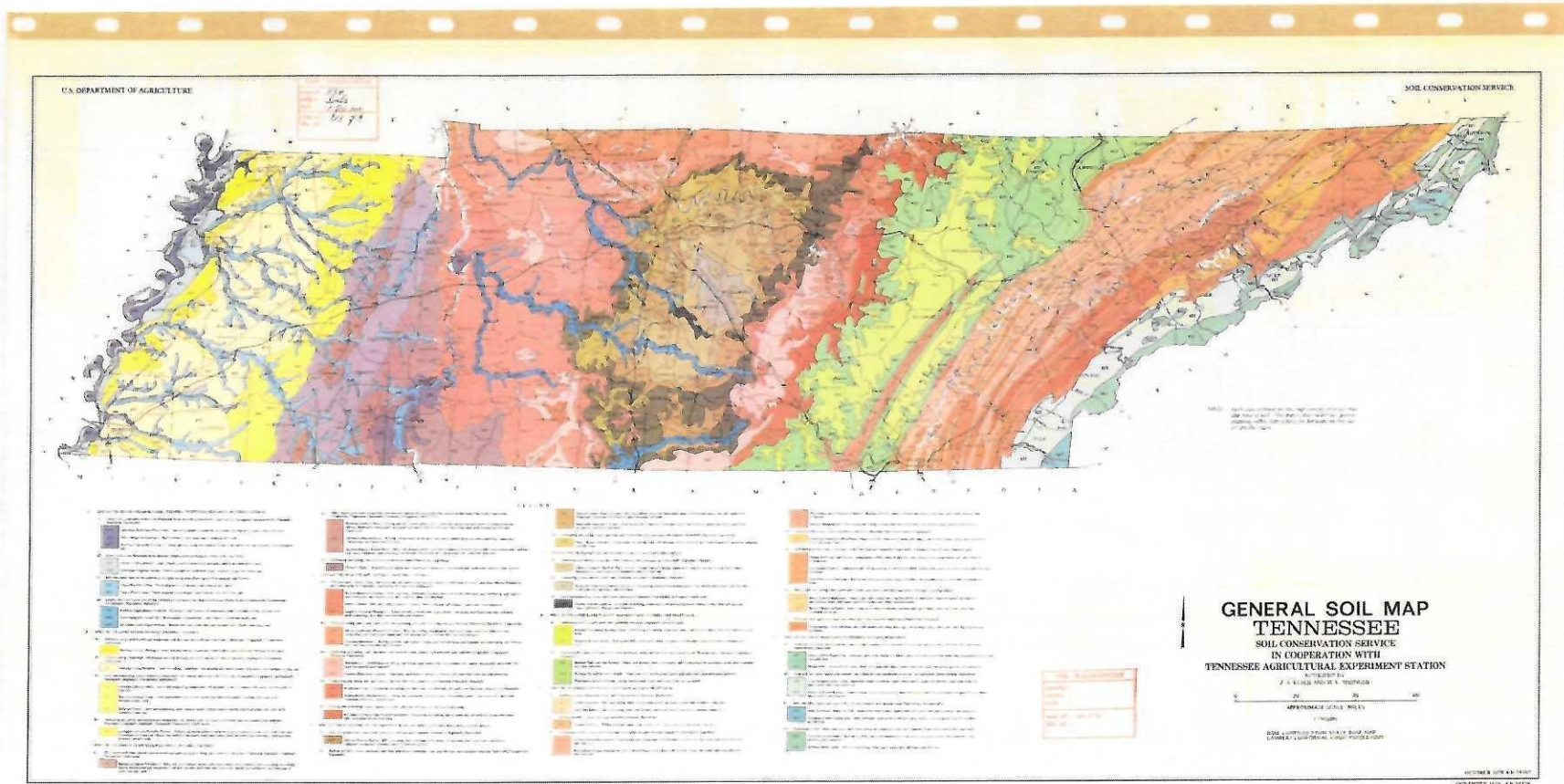
### Rock Type



Data Source: USGS Mineral Resource Database | Author: UTK GIS Outreach and Engagement Lab  
Date: 07/26/2018 | Projection: TN State Plane

# Map 10

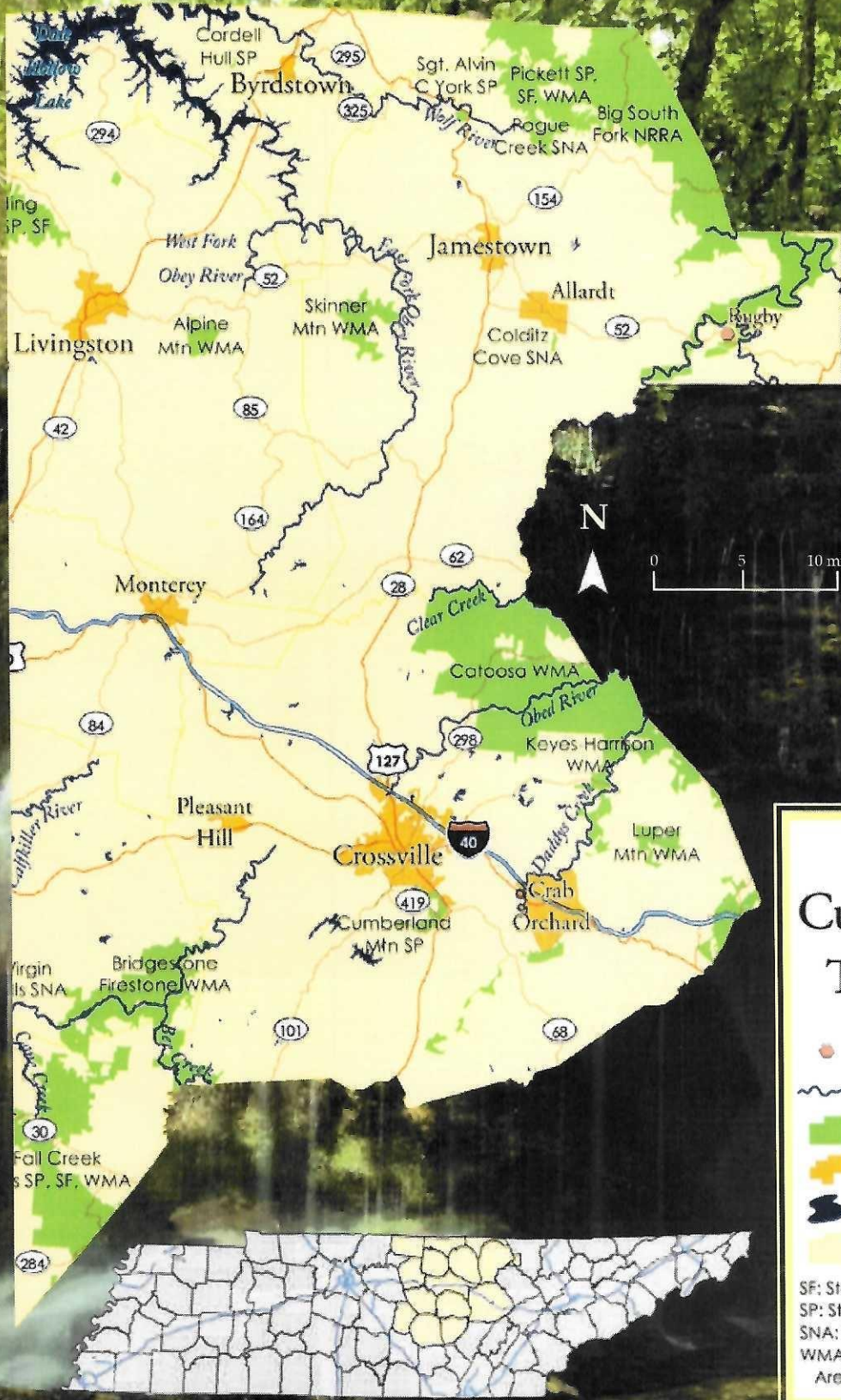
## Soil Map of Tennessee



## EXHIBIT LIST

- Exhibit 1. Upper Cumberland Visitors Guide Map
- Exhibit 2. Tennessee's Upper Cumberland
- Exhibit 3. Upper Cumberland Area Agency
- Exhibit 4. Upper Cumberland Genealogical
- Exhibit 5. Upper Cumberland District Special Olympics
- Exhibit 6. Upper Cumberland Weather | Twitter
- Exhibit 7. Upper Cumberland Medical Society
- Exhibit 8. Google Search - "Upper Cumberland Wine Trail" | Images
- Exhibit 9. Google Search - "Upper Cumberland" | Images
- Exhibit 10. "Upper Cumberland" Website Listing
- Exhibit 11. Google Search - "Upper Cumberland"
- Exhibit 12. Google Search - "Upper Cumberland Wine"
- Exhibit 13. Yellow Pages Listing of "Upper Cumberland" Businesses
- Exhibit 14. *Local Table* Article - "Upper Cumberland Wine Trail", 12/10/2012
- Exhibit 15. *Crossville Chronicle* Article - "Wine Trail takes its fest to the Crossroads", 9/24/2019
- Exhibit 16. Upper Cumberland Wine Festival
- Exhibit 17. Upper Cumberland Chocolate and Wine Tour
- Exhibit 18. Upper Cumberland Chocolate and Wine Tour Map
- Exhibit 19. Blog Post - *Tennessee Mountain Stories* "Upper Cumberland 'Jargon'", 1/18/2018
- Exhibit 20. Tennessee Tech Catalog Listing - ENGL 4820 Upper Cumberland Folklore - 2013/2014
- Exhibit 21. *Austin Food* Article - "11 Delicious Reasons to Explore the Upper Cumberland of Tennessee", 2/11/2018
- Exhibit 22. "Upper Cumberland "Name Search - USGS GNIS
- Exhibit 23. Upper Cumberland Logos
- Exhibit 24. Upper Cumberland Wine Trail.

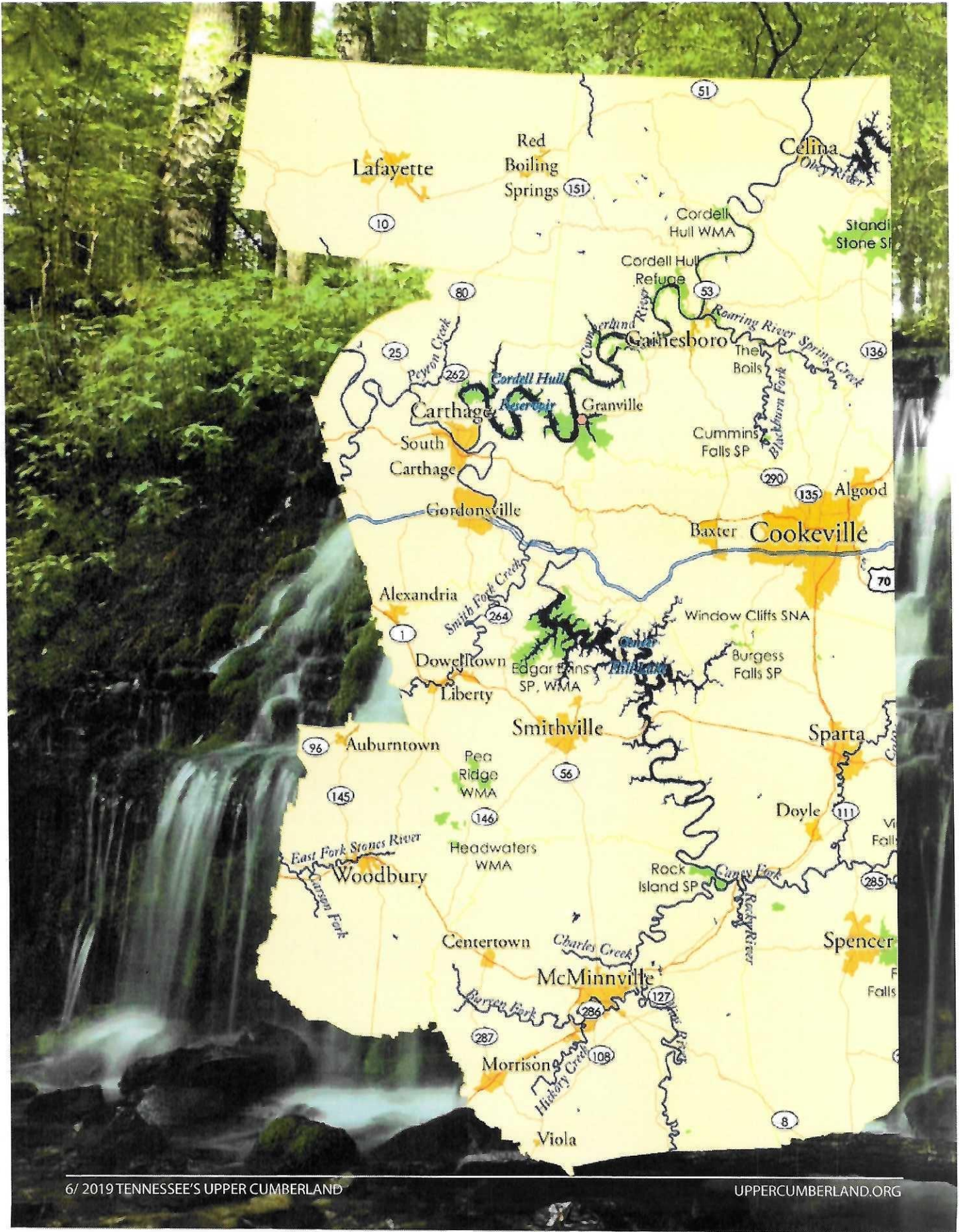
Exhibit 1



## Upper Cumberland Tennessee

- Communities
- Rivers
- Public Lands
- Cities
- Lakes
- Upper Cumberland

SF: State Forest (TDoF)  
 SP: State Park (TDEC)  
 SNA: State Natural Area (TDEC)  
 WMA: Wildlife Management Area (TWRA)





# Tennessee's UPPER CUMBERLAND

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Events
Day Trips & Trails
Group Travel
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**TENNESSEE UNCHARTED**  
THE TELEVISION SHOW

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**WCTE**  
Upper Cumberland PBS

**State of Tennessee Visitors Info**











Download this Map in PDF format, print and save!

## Welcome To Tennessee's Upper Cumberland



*Tennessee State Tourism Videos ~ A Must Watch!*






*A Destination for the Whole Family to Explore*

Discover pristine natural beauty, breathtaking waterfalls, three sparkling lakes, winding rivers and historic town squares, all tucked away like jewels amidst the lush hills of the Upper Cumberland. From world-class fishing and championship golf to miles of horseback trails and outdoor adventure, the Upper Cumberland is a place to relax, reflect and become acquainted with real Tennessee.

- Big South Fork National Park & 16 state parks
- Cumberland Caverns & Bluegrass Underground
- Upper Cumberland Wine Trail with six wineries
- Upper Cumberland Quilt Trail with more than 300 barns
- Home of two Nobel Laureates & Sgt. Alvin C. York
- Historic Granville & Victorian Rugby
- Cumberland County Playhouse
- Largest yoga and meditation hall in the U.S.
- Bluegrass & Americana music to symphony orchestra
- Outstanding arts & crafts galleries & studios
- Theatre performances & dinner theatre throughout the year
- Boutiques & antique stores
- Walking, hiking, biking and driving trails
- Formal dining, local dives to traditional Southern cooking
- Beer brewery & moonshine distillery
- Rustic cabins, charming B&Bs & well-known hotels
- Over 60 sites along Tennessee Civil War Trail
- Home of two Nobel Laureates Cordell Hull & Al Gore & Sgt. Alvin C. York

*Find out how you can become a member!*

*For more information on our friendly Chambers of Commerce in The Upper Cumberland Counties...*

Cannon Clay Cumberland DeKalb Fentress Jackson  
Macon Overton Pickett Putnam Smith Van Buren Warren  
White

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Upper Cumberland Tourism Association - P.O. Box 2411 - Cookeville, TN 38502  
phone: 931-537-6347 - Email: [uctourism@gmail.com](mailto:uctourism@gmail.com)

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## Upper Cumberland Area Agency

Service area includes: Cannon, Clay, Cumberland, DeKalb, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith, Van Buren, Warren and White counties.

Patty Ray, Director  
Upper Cumberland Development District  
1225 South Willow Avenue  
Cookeville, TN 38506-4194  
(931) 432-4111

Information & Referral  
1-931-432-6170

Web Site: <http://www.ucdd.org/>

Mailing Address: P.O. Box 4757, Chillicothe, TN 37625 | Physical Address: 1942 Riverfront Parkway, Chattanooga, TN 37402



# Upper Cumberland Genealogical Association

## ABOUT US



Counties of the Upper Cumberland

President

Vice President: Guy Zimmerman

Recording Secretary: Mary Jo Meyer

Treasurer : Faye Curry

Circulation Manager: Euneatta Jenkins

Program Committee: Mary Jo Meyers,  
Guy Zimmerman , Claude Anne Burton,  
John Buck, Larry Meyers

Researcher Publisher: Nancy Fitzpatrick

Web Site: Guy Zimmerman

**Board Members:** Jim Loftis, Overton Co., Guy Zimmerman, Cumberland Co., Carter Harris, Davidson Co., David Starnes, Putnam Co.

The UPPER CUMBERLAND GENEALOGICAL ASSOCIATION, INC meets on the second Thursday of each month at 5:30 p.m. in the meeting room of the Putnam County Library, Cookeville, TN (unless otherwise arranged in advance). Membership is \$15.00 per year in the U.S. (See inside back cover for late renewals).

**The Upper Cumberland Researcher** is published quarterly (Spring, Summer, Fall and Winter) at P.O. Box 575, Cookeville, TN 38503-0575. A subscription is included in the annual membership fee. Back issues may be obtained from the Association. **Articles for the Researcher are welcomed and can be**



Districts Register Now!



of Tennessee

Home District Games Upper Cumberland District

# Upper Cumberland District

## Upper Cumberland District

Event for the following counties: Cannon, Clay, Cumberland, DeKalb, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith, Van Buren, Warren, and White

Coordinator: Angela Shadden

Email: [apsctn@yahoo.com](mailto:apsctn@yahoo.com)

Phone: 931-484-7416

Website: [www.lairparkseniorcenter.org/2017-senior-olympics.html](http://www.lairparkseniorcenter.org/2017-senior-olympics.html)

### Dates

2019 District Dates: September 4 - 28, 2019

Entry Deadline: August 21

[Downloadable 2019 Upper Cumberland Entry Form](#)

### Results

2017 Upper Cumberland District Results

[1 on 1 Basketball, Bowling, Golf, Tennis](#)

[Horseshoes, Pickleball, Swimming](#)

[Basketball Free Throw, 3 Point, Swimming, Table Tennis](#)

[Shuffleboard, Softball Throw, Table Tennis, Tennis](#)

[Field Events](#)

[Track Events](#)

2016 Upper Cumberland District Results

	<a href="#">Basketball Results 2016 UC.pdf</a>	97.7KB	<input type="checkbox"/>	Jan 06, 2017 11:35 AM
	<a href="#">BOWLING SINGLES.pdf</a>	37.0KB	<input type="checkbox"/>	Jan 06, 2017 11:36 AM
	<a href="#">BOWLING DOUBLES.pdf</a>	34.3KB	<input type="checkbox"/>	Jan 06, 2017 11:36 AM
	<a href="#">BOWLING MIXED DOUBLES.pdf</a>	34.0KB	<input type="checkbox"/>	Jan 06, 2017 11:37 AM

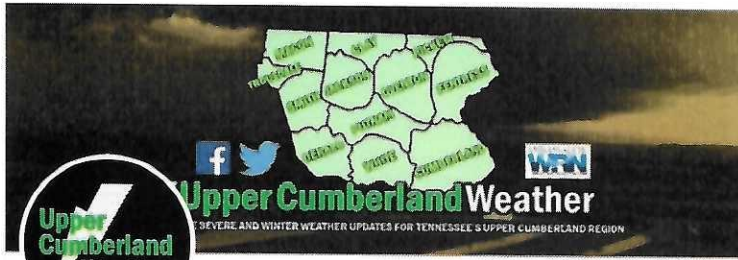
# Exhibit 6



- Home
- Explore
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Tweet

Upper C  
14.4K Tweets



## Upper Cumberland Weather

@CumberlandWx

NOAA WRN Ambassador & @NWSNashville-verified #tSpotter Coordinator tweeting real-time updates during severe and winter weather. Admin is @anthonytaylorwx.

Tennessee, USA patreon.com/uppercumberlan...  
Joined September 2012

875 Following 1,730 Followers

Followed by Susan Bennett

Follow

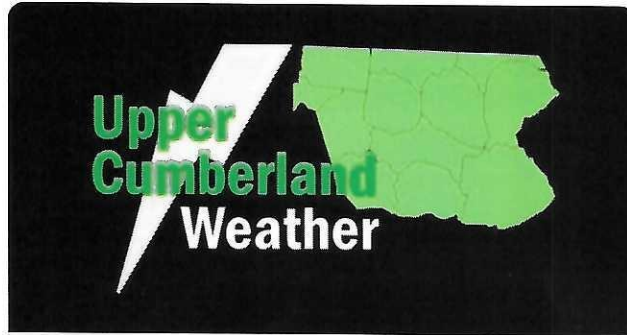
Tweets Tweets & replies Media Likes

Pinned Tweet



Upper Cumberland Weather @CumberlandWx · Jun 23

I was asked yesterday if there there was a way to support what we're doing, and there is! Haven't mention it in a while, but we do have a Patreon set up. I'll never hide UCW behind a paywall, but if you would like to help our mission, that option is there:



Upper Cumberland Weather is creating real-time severe and winter w...  
Become a patron of Upper Cumberland Weather today; Read posts by Upper Cumberland Weather and get access to exclusive content and patreon.com

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4,539 Tweets

#LadyAndTheTramp  
Streaming Now on Disney+  
Promoted by Disney+

Trending in United States  
#bringmebojangles

Trending in United States  
#SundayFunday  
20.1K Tweets

Trending in United States  
#WalterReedHospital  
22.9K Tweets

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# THE REGIONAL MEDICAL SOCIETY MODEL WORKED IN 1895. IT WORKS NOW.

Toward the end of the 19th century, physicians in the Upper Cumberland region of Tennessee formed one of the most active medical societies in the Southeastern U.S. After thriving for more than a century, it began to decline in recent years and was on the brink of collapse until a few determined doctors in Putnam County resurrected the model, secured a new charter from TMA and began revitalizing the Upper Cumberland Medical Society.

Now, doctors in communities throughout the 14-county region in the Upper Cumberland have a nearby resource for professional collegiality, growth and development, and a conduit to ensure Upper Cumberland physicians have a statewide voice in public health and legislative issues.

YouTube Twitter Facebook JOIN NOW SIGN IN CONTACT

**TMA** MEMBERSHIP ADVOCACY NEWS & EVENTS EDUCATION LEADERSHIP BUSINESS ABOUT  
Tennessee Medical Association

## UPPER CUMBERLAND MEDICAL SOCIETY TODAY

The Upper Cumberland Medical Society is a component Society of the Tennessee Medical Association (UCMS-TMA). UCMS welcomes new members and supports personal leadership development of physicians from any of the 14 counties of Upper Cumberland: Cannon, Clay, Cumberland, DeKalb\*, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith\*, Van Buren, Warren, and White.



\*Physicians in these counties may choose to join UCMS-TMA in lieu of

JOIN UCMS TMA  
Visit UCMS Website



Dr. Jim Ratson, Cookeville

their county medical society on record.



Read about the new UCMS charter in the *Cookeville Herald-Citizen*, the daily newspaper of the Upper Cumberland.

Dr. Jim Watson, Cookeville pediatrician and active UCMS-TMA member, speaks to a television reporter during TMA's annual Day on the Hill in Nashville in 2017.

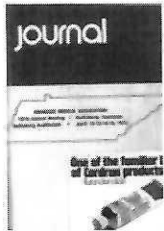
### Contact

Doug Word  
TMA Director of Regional Development  
615.460.1678  
doug.word@tnmed.org

## HISTORY OF THE UPPER CUMBERLAND MEDICAL SOCIETY



Read about the formation of the UCMS in an article from the Journal of the Tennessee State Medical Association in 1933.



Read a detailed account of the rich heritage and physician leaders who played a role in the thriving UCMS throughout the 1900s in an article from a 1972 edition of the Journal of the Tennessee Medical Association.

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# Exhibit 8



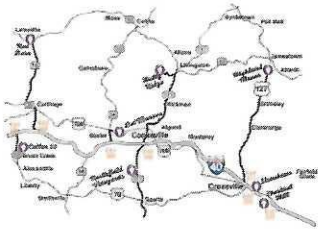
upper cumberland



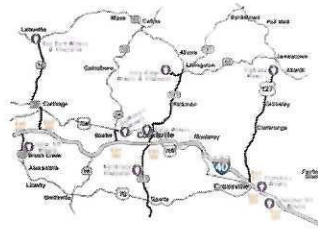
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wine trail wine festival uncock wine tasting cookeville tn crossville tn uppercumberlandwinetrail tennessee cookeville tenr



Upper Cumberland Wine Trail  
uppercumberlandwinetrail.com



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m.facebook.com



Upper Cumberland Wine Tra  
uppercumberlandwinetrail.com



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facebook.com



Upper Cumberland Wine, ...  
stayatfallcreekfalls.com



3rd Annual Upper Cumbe...  
granvilletn.com



Upper Cumberland Wine Trail  
uppercumberlandwinetrail.com



Upper Cumberland Wine Festival April 13 ...  
ucjournal.com



Four Tennessee Wine Trails You Don't ...  
tnvacation.com



6 Tennessee Wine Trails Everyone Should ...  
onlyinyourstate.com



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pinterest.com



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facebook.com



6 Tennessee Wine Trails Everyone Should ...  
onlyinyourstate.com



Chestnut Hill Winery | Tennessee Wines  
tennesseawines.com



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matadornetwork.com



Eat & Drink  
visitcookev





Tour the Upper Cumberland - Home | ...  
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Watertown Wine Festival  
watertownfn.com



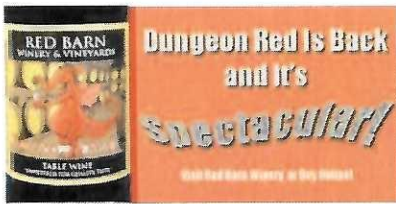
UCWTF-Events - Cumberland Mountain ...  
cumberlandmountaingeneralstore.net



Tour the Upper Cumberland ...  
pikdo.net



Upper Cumberland  
ka-ge.facebook.com



Red Barn Winery and Vineyards  
redbarnwinery.com



3rd Annual Upper Cumberland Wine Festival  
granvilletn.com



Upper Cumberland Wine Trail  
uppercumberlandwinetrail.com



Tennessee Whiskey & W  
winsontherails.com



Book a Tour - Tour The UC  
tourtheuc.com



Upper Cumberland Wine Trail in ...  
tnvacation.com



Upper Cumberland Wine Tr...  
facebook.com



Waterfalls & wine tucked away amo...  
maps.roadtrippers.com



Legacy Wine Trail | V  
visitmaryland.org



List of U.S. Wine Trails  
win6-nomad.com



August Events in Cookeville, Tennessee ...  
thereatyfirm.com



Upper Cumberland Wine...  
facebook.com



Upper Cumberland Railroad Society (UCRS ...  
tnvacation.com

HIGHLAND  
WINE

Highland Manor Wi  
tennesseewines.com



Antietam Highlands Wine Trail | Visit ...  
visitmaryland.org



3rd Annual Upper Cumberland Win...  
granvilletn.com



Nine Lakes Wine Festival in Oak Ridge ...  
tnvacation.com



Chesapeake Wine Trail ...  
chesapeakewinecountrymd.com



Chuck Sutherland:  
chuck-sutherland.biz



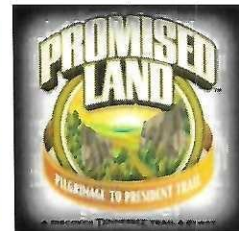
Wild Mountain Winery  
wildmountainwinery.com



Five Tennessee Falls in Five Hours ...  
boommagazine.com



Maryland Wineries and Wine Trails ...  
visitmaryland.org



Trip Planner | Upper Cumberl...  
uccheg.com



Upper Cumberland A  
tnvacation.com



UC\*\*DD



# Exhibit 9



upper cumberland



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wine trail putnam county cookeville tn uchra cookeville tennessee resource agency cumberland region winery cumberlar



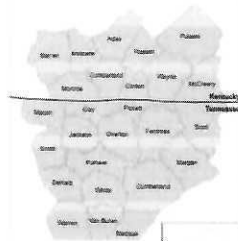
Counties of the Upper ... researchgate.net



Upper Cumberland Genealogical ... uca.info



Upper Cumberland Chapter :: Ten... Intsrc.org



Counties of the Upper Cumber... researchgate.net



Discover the Upper Cumberland wcte.org



Upper Cumberland Wine Trail uppercumberlandwinetrail.com



Upper Cumberland Wine Trail uppercumberlandwinetrail.com



Upper Cumberland Reporter | Covering ... uppercumberlandreporter.com



Upper Cumberland basin location ... researchgate.net



This week's Upper Cumberland tourism ... ucjournal.com



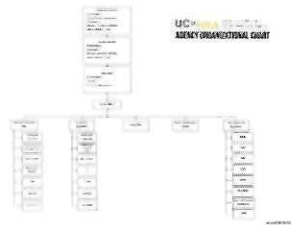
Upper Cumberland FCU - Home ucfcu.org



Upper Cumberland Weather on Twitter ... twitter.com



Upper Cumberland Pride Promises a ... focusmidann.com



Upper Cumberland Human Resource Agency uchra.com



Upper Cumberland Urology Associates PC ucurology.com



Upper Cumberland Wal... twhbea.com



Upper Cumberland Development Dis... govserve.org

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Genesis House, Inc. of facebook.com



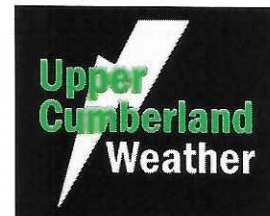
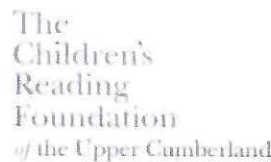
Upper Cumberland Landscaping - ... facebook.com



UPPER CUMBERLAN... iflightplanner.com



Upper Cumberland CORE eventzilla.net



Upper Cumberland Weather (@Cu... twitter.com



Upper Cumberland Qu timagazine.org



Discovering the Upper Cumberland basin, a region of the South. The area has been a landscape of fields with small, scattered houses. A line of trees runs across the top of the page. The text is small and difficult to read.

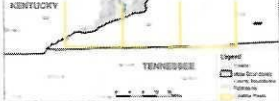
Upper Cumberland basin. Gridboxes ... researchgate.net

The Biz Foundry & Upper Cumb...  
uppercumberlandreporter.com

October Upper Cumb...  
uppercumberlandwomen.com



Discover the Upper Cumberland  
wcte.org



Upper Cumberland basin. Gridboxes ...  
researchgate.net



Upper Cumberland Arts Alliance  
invacation.com



Deeper Still Upper Cumberland  
deeperstilluppercumberland.org



Upper Cumberland Home ...  
homeadvisor.com



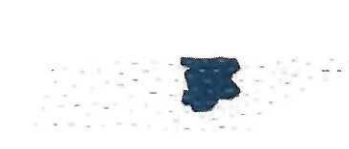
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Upper Cumberland Wi...  
nowplayingnashville.com

READ WITH YOUR CHILD

Reading Foundation of Upper Cumb...  
tcschools.org



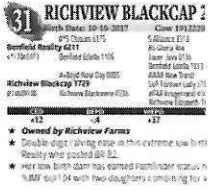
Upper\_Cumberland-Region  
tn.gov



Upper Cumberland Haunted Half Race ...  
raceraves.com



Upper Cumberland — Caney Fork River ...  
herald-citizen.com



Upper Cumberland Angus Associat...  
dvauction.com



March Events in Cookeville and the ...  
therealtyfirms.com



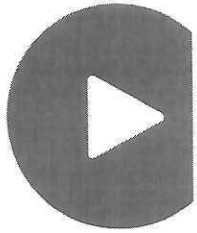
Upper Cumberland Foster ...  
facebook.com



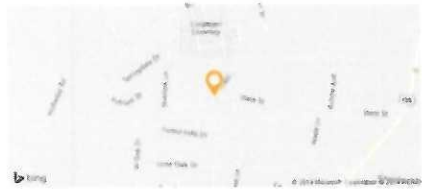
Upper Cumberland Watershed Climate and ...  
kyconservation.org



317 W Spring Street  
yumpu.com



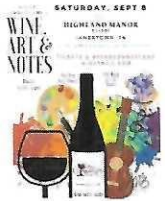
Discover the Upper Cumb...  
wcte.org



Upper Cumberland Christian Home on ...  
religious-organizations.cmac.ws



Upper Cumberland Regional Health ...  
tmapartners.com



Upper Cumberland Wi...  
stayatfallcreekfalls.com



June 21 Songs of the Upper Cumberland ...  
centerhilllaketen.com



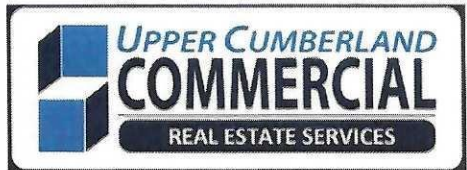
EMT Re...  
pdfdir.com



Upper Cumberland Co...  
upress.state.tn.us



5 Unforgettable Hikes in L...  
forbes.com



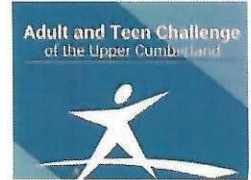
Upper Cumberland Commercial Real Estate...  
uppercumberlandcommercial.com



Upper Cumberland Win...  
stayatfallcreekfalls.com



Upper Cumberland Workforce Devel...  
uework.org





## Exhibit 10 | Upper Cumberland Website Listing (examples)

Title	Category	URL
Anderson - Upper Cumberland Funeral Home	Business	<a href="http://www.ucfuneral.com/Home.html">http://www.ucfuneral.com/Home.html</a>
Children's Reading Foundation of the Upper Cumberland	Service	<a href="https://www.readyforkindergarten.org/crfuc">https://www.readyforkindergarten.org/crfuc</a>
HBA of Upper Cumberland	Business	<a href="https://uchba.com">https://uchba.com</a>
MyRide TN: Upper Cumberland TN	Business	<a href="https://www.myrideuctn.com">https://www.myrideuctn.com</a>
The Upper Cumberland Association of Realtors	Business	<a href="https://www.usamls.net/upper_cumberland/">https://www.usamls.net/upper_cumberland/</a>
The Upper Cumberland Human Resource Agency	Service	<a href="https://www.uchra.com">https://www.uchra.com</a>
The Upper Cumberland Region of Tennessee   The Realty Firm	Business	<a href="https://therealtyfirms.com/the-upper-cumberland-region-of-tennessee/">https://therealtyfirms.com/the-upper-cumberland-region-of-tennessee/</a>
Today in the Upper Cumberland: LiteRock 95.9	Business	<a href="http://literock959.com/today-in-the-upper-cumberland/">http://literock959.com/today-in-the-upper-cumberland/</a>
UCBJ - Upper Cumberland Business Journal	Business	<a href="http://www.ucbjournal.com">http://www.ucbjournal.com</a>
United Way of Wilson County and the Upper Cumberland	Service	<a href="https://www.unitedway.org/local/united-states/tennessee/wilson-county-and-the-upper-cumberland">https://www.unitedway.org/local/united-states/tennessee/wilson-county-and-the-upper-cumberland</a>
Upper Cumberland Auto Sales	Business	<a href="https://uppercumberlandautosales.com/newandusedcars">https://uppercumberlandautosales.com/newandusedcars</a>
Upper Cumberland Business Journal	Business	<a href="https://www.ucbjournal.com">https://www.ucbjournal.com</a>
Upper Cumberland Child Advocacy Center	Service	<a href="http://www.ucchildadvocacycenter.com">http://www.ucchildadvocacycenter.com</a>
Upper Cumberland Commercial Real Estate	Business	<a href="https://uppercumberlandcommercial.com">https://uppercumberlandcommercial.com</a>
Upper Cumberland Development District	Business	<a href="http://ucdd.org">http://ucdd.org</a>
Upper Cumberland District   Tennessee Senior Olympics	Other	<a href="http://www.tnseniorolympics.com/upper-cumberland-district">http://www.tnseniorolympics.com/upper-cumberland-district</a>
Upper Cumberland Electric Membership Corporation	Utility	<a href="https://www.ucemc.com">https://www.ucemc.com</a>
Upper Cumberland Family Physicians	Business	<a href="http://www.ucfamilyphysicians.com">http://www.ucfamilyphysicians.com</a>
Upper Cumberland Federal Credit Union	Business	<a href="https://www.ucfcu.org">https://www.ucfcu.org</a>
Upper Cumberland Foster Closet	Service	<a href="https://www.ucfostercloset.org">https://www.ucfostercloset.org</a>
Upper Cumberland Genealogical Association	Business	<a href="http://ucga.info">http://ucga.info</a>
Upper Cumberland Habitat for Humanity	Business	<a href="https://www.habitat.org/us-tn/cookeville/upper-cumberland-hfh">https://www.habitat.org/us-tn/cookeville/upper-cumberland-hfh</a>
Upper Cumberland Medical Society	Service	<a href="https://www.tnmed.org/TMA/UCMS_history.aspx">https://www.tnmed.org/TMA/UCMS_history.aspx</a>
Upper Cumberland Orthopedics	Business	<a href="https://orthopedic.io/clinic/upper-cumberland-orthopedic-surgery-pc-cookeville-tn/">https://orthopedic.io/clinic/upper-cumberland-orthopedic-surgery-pc-cookeville-tn/</a>
Upper Cumberland Quilt Trail	Tourism	<a href="http://www.ucquilttrail.com/">http://www.ucquilttrail.com/</a>
Upper Cumberland Real Estate	Business	<a href="http://ucresells.com">http://ucresells.com</a>
Upper Cumberland Regional Airport	Place	<a href="http://whitecountyttn.gov/upper-cumberland-regional-airport">http://whitecountyttn.gov/upper-cumberland-regional-airport</a>
Upper Cumberland Relative Caregiver Program	Service	<a href="https://www.kidcentraltn.com/program/upper-cumberland-relative-caregiver-program.html">https://www.kidcentraltn.com/program/upper-cumberland-relative-caregiver-program.html</a>
Upper Cumberland Reporter	Business	<a href="https://uppercumberlandreporter.com/">https://uppercumberlandreporter.com/</a>

Upper Cumberland Tourism Association	Tourism	<a href="https://www.tnvacation.com/local/cookeville-upper-cumberland-tourism-association">https://www.tnvacation.com/local/cookeville-upper-cumberland-tourism-association</a>
Upper Cumberland United Soccer Club	Other	<a href="https://www.uppercumberlandsoccer.com">https://www.uppercumberlandsoccer.com</a>
Upper Cumberland Watershed Climate & Biodiversity Conference	Other	<a href="https://www.eventbrite.com/e/upper-cumberland-watershed-climate-and-biodiversity-conference-tickets-65790718811">https://www.eventbrite.com/e/upper-cumberland-watershed-climate-and-biodiversity-conference-tickets-65790718811</a>
Upper Cumberland Weather Twitter	Other	<a href="https://twitter.com/cumberlandwx?lang=en">https://twitter.com/cumberlandwx?lang=en</a>
Upper Cumberland Window Cleaning	Business	<a href="https://uppercumberlandwindowcleaning.com">https://uppercumberlandwindowcleaning.com</a>
Upper Cumberland Wine Trail	Tourism	<a href="http://www.uppercumberlandwinetrail.com">http://www.uppercumberlandwinetrail.com</a>
WCTE Discover the Upper Cumberland Video Series	Tourism	<a href="https://www.wcte.org/productions/discover/">https://www.wcte.org/productions/discover/</a>



"upper cumberland"



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About 472 results (0.94 seconds)

Upper Cumberland Federal Credit Union

Upper Cumberland FCU - Home

Routing #264182337. NCUA EHL America's Credit Unions. Upper Cumberland FCU Upper Cumberland Federal Credit Union FREE In Google Play. View.

Contact Us Online Services About Us Checking Services



Hours

A Upper Cumberland Electric Membership Co...

Cookeville, TN · (931) 528-5449
Closed · Opens 8AM Wed

WEBSITE DIRECTIONS

B Upper Cumberland Electric Membership Co...

Carthage, TN · (615) 735-2940
Closed · Opens 8AM Wed

WEBSITE DIRECTIONS

C Upper Cumberland Tourism Associates

Cookeville, TN · (931) 537-6347

WEBSITE DIRECTIONS

More locations

TN Vacation > local > cookeville-upper-cumberland-tourism-association

Upper Cumberland Tourism Association in Cookeville, TN ...

Plan your next trip to Cookeville, TN and be sure to visit Upper Cumberland Tourism Association. Tennessee offers many local attractions and business for you ...

Upper Cumberland Reporter

Upper Cumberland Reporter | Covering local sports and ...

Upper Cumberland Reporter. MENU. Home · Sports >. Algood Sports · Baxter Sports · Clay .... Happy Thanksgiving From The Upper Cumberland Reporter ... Mugshots Putnam County Mugshots Cumberland County Mugshots Sports

Upper Cumberland Electric

Upper Cumberland Electric Membership Corporation: Official ...

"The UPPER CUMBERLAND ELECTRIC MEMBERSHIP CORPORATION (often shortened to UCEMC) is an electric power distribution cooperative. UCEMC is ... Service Requests District Office Locations Management & Staff Mobile App Intro

https://www.uppercumberland.org

Upper Cumberland Tourism Association

No information is available for this page.

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About 172 results for "upper cumberland"

Upper Cumberland Federal Credit Union

Upper Cumberland FCU - Home

Routing #264182337. NCUA EHL America's Credit Unions. Upper Cumberland FCU Upper Cumberland Federal Credit Union FREE In Google Play. View.

Contact Us Online Services About Us Checking Services



Hours

- A Upper Cumberland Electric Membership Co... Cookeville, TN · (931) 528-5449
B Upper Cumberland Electric Membership Co... Carthage, TN · (615) 735-2940
C Upper Cumberland Tourism Associates Cookeville, TN · (931) 537-6347

More locations

TN Vacation local cookeville-upper-cumberland-tourism-association

Upper Cumberland Tourism Association in Cookeville, TN ...

Plan your next trip to Cookeville, TN and be sure to visit Upper Cumberland Tourism Association. Tennessee offers many local attractions and business for you ...

Upper Cumberland Reporter

Upper Cumberland Reporter | Covering local sports and ...

Upper Cumberland Reporter. MENU. Home · Sports · Algood Sports · Baxter Sports · Clay ... Happy Thanksgiving From The Upper Cumberland Reporter ... Mugshots Putnam County Mugshots Cumberland County Mugshots Sports

Upper Cumberland Electric

Upper Cumberland Electric Membership Corporation: Official ...

The UPPER CUMBERLAND ELECTRIC MEMBERSHIP CORPORATION (often shortened to UCEMC) is an electric power distribution cooperative. UCEMC is ... Service Requests District Office Locations Management & Staff Mobile App Intro

https://www.uppercumberland.org

Upper Cumberland Tourism Association

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Upper Cumberland Wine Trail

### Upper Cumberland Wine Trail

Explore the eight Wineries & Vineyards that the **Upper Cumberland Wine** Trail has to offer. Travel Tennessee's beautiful Upper Cumberland back roads and ...  
 Events How to Taste Wine Types of Wine Wine Terminology

You've visited this page 4 times. Last visit: 11/24/19

TN Vacation › local › cookeville-upper-cumberland-wine-trail

### Upper Cumberland Wine Trail in Cookeville, TN - Tennessee ...

Plan your next trip to Cookeville, TN and be sure to visit **Upper Cumberland Wine** Trail. Tennessee offers many local attractions and business for you to explore.

Upper Cumberland Wine Trail › indexNew

### We Invite you to Follow The Upper Cumberland Wine Trail

Explore the eight Wineries & Vineyards that the **Upper Cumberland Wine** Trail has to offer. Cellar 53 in Brush Creek, Chestnut Hill in Crossville, DelMonaco in ...

Facebook › Pages › Non-Business Places › Landmark & Historical Place

### Upper Cumberland Wine Trail - Home | Facebook

**Upper Cumberland Wine** Trail, Cookeville, TN. 1.4K likes. Wineries in the Upper Cumberland.

TripAdvisor › ... › DelMonaco Winery & Vineyards

### On the Upper Cumberland Wine Tour - Review of DelMonaco ...

Rating: 5 Review by a TripAdvisor user

DelMonaco Winery & Vineyards: On the **Upper Cumberland Wine** Tour - See 75 traveler reviews, 37 candid photos, and great deals for Baxter, TN, ...

Facebook › UpperCumberlandWineTrail

### Upper Cumberland Wine Trail - Facebook

**Upper Cumberland Wine** Trail, Cookeville, TN. 1.1K likes. Wineries in the Upper Cumberland.

https://visitcookevilletn.com › upper-cumberland-wine-festival

### Upper Cumberland Wine Festival | Cookeville-Putnam County ...

Step back in time while savoring the sips of Tennessee's finest wines at the **Upper Cumberland Wine** Festival. Hosted in 2018 in Historic ...

cumberlandmountaingeneralstore.net › Article › Choc-Lovers-17

### Upper Cumberland Chocolate Lovers Wine Tour

Spend Valentines sampling delectable chocolate delights & wine pairings at all eight Upper Cumberland wineries.

Wine Trails › wine-trails › tennessee-wineries › upper-cumberland-win...

### Upper Cumberland Wine Trail | America's Wine Trails | Plan a ...

**Upper Cumberland Wine** Trail. Chestnut Hill Winery 78 Chestnut Hill Rd, Crossville TN 38555  
 931-707-7878 DelMonaco Winery & Vineyards 600 Lance Dr ...

Wilson Post › community › upper-cumberland-wine-festival-set-for-april

### Upper Cumberland Wine Festival set for April 13 | Community ...

The **Upper Cumberland Wine** Trail wineries will hold their 2019 **Upper Cumberland Wine** Festival on April 13 from noon to 5 p.m. at the Pioneer ...

## Searches related to "upper cumberland wine"

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[tennessee wine trail](#)

[wine trails near me](#)

[winery crossville tn](#)

[cellar 53 winery](#)

[upper cumberland tourism](#)

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# Upper Cumberland in Tennessee, TN

BBB Rated A+/A

All Filters

**SORT** Default

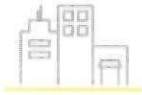


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**Ad** [www.mapsgalaxy.com/Maps](http://www.mapsgalaxy.com/Maps) Stay Updated With Live Traffic Situations. Fastest Route and Avoid Getting Lost. Never Leave Without Knowing the Current Traffic Situation With Our ToolTab. Driving Directions. Free Maps. Zip Code Lookup. Satellite & Aerial Views. Street Views. Real-Time Traffic Report. Quick and Easy.

[Visit Website](#)



### Visit Tennessee Guide - Plan Your Tennessee Vacation

**Ad** [www.tnvacation.com/](http://www.tnvacation.com/) Plan your **Tennessee** vacation & download your free guide today. New venues, expansions, commemorations & festivals are set to make 2019 a big year. See What's New for 2019. Made in **Tennessee**. Plan the Perfect Trip. Relive History. Inspiration Just for You. Free Vacation Guide. Follow Your Craving. Destinations: Memphis, Nashville, Bristol, Gatlinburg, Chattanooga, Sevierville.

[Visit Website](#)



### Upper Cumberland - Amazon Official Site

**Ad** [www.amazon.com/books](http://www.amazon.com/books) Browse & Discover Thousands of Book Titles, for Less.

[Visit Website](#)



## 1. Upper Cumberland Electric Membership Corporation

Utility Companies, Electrical Power Systems-Maintenance, ...

**BBB Rating: A+**

[Website](#) [Directions](#) [More Info](#)

**(615) 735-3208**

907 Main St N  
Carthage, TN 37030



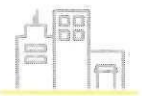
## 2. Upper Cumberland Federal Credit Union

Financial Services, Credit Unions

[Website](#) [YP Ad](#) [Directions](#) [More Info](#)

**(931) 484-9433**

627 Livingston Rd  
Crossville, TN 38555



From Business: A credit union is a cooperative, not-for-profit financial institution organized to promote thrift and provide credit to members. It is member-owned and...

## 3. Upper Cumberland Shopper Inc

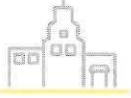
Business Coaches & Consultants

[Website](#)

**(931) 372-9978**

2685 Lake Valley Dr  
Cookeville, TN 38506



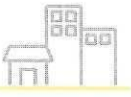


#### 4. Upper Cumberland Cancer Care

Physicians & Surgeons

**(931) 823-3799**

510 W Main St  
Livingston, TN 38570

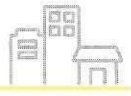


#### 5. Upper Cumberland Board of Realtors Inc

Real Estate Agents, Real Estate Buyer Brokers, Real Estate...  
Website

**(931) 528-4093**

1330 Neal St Ste B  
Cookeville, TN 38501



#### 6. U C H R A-Upper Cumberland

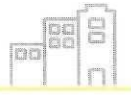
Social Service Organizations, Community Organizations  
(1)

**(931) 372-8000**

586 S Jefferson Ave  
Cookeville, TN 38501

Website

MN I want to sign up for engery assistance again can u send me an application please my address is 67hayes lane crossville tn 38571 please

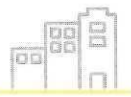


#### 7. Dismas House Of The Upper Cumberland

Social Service Organizations  
Website

**(931) 520-8448**

1226 Byrne Ave  
Cookeville, TN 38501



#### 8. Upper Cumberland Real Estate

Real Estate Agents, Real Estate Buyer Brokers, Real Estate...  
**BBB Rating: A+**  
Website

**(931) 268-6767**

101 E Gore Ave  
Gainesboro, TN 38562



#### 9. Upper Cumberland Human Resource Agency

Human Resource Consultants, State Government  
Website

**(615) 563-2916**

301 W Main St Ste 302  
Woodbury, TN 37190

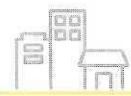


#### 10. Upper Cumberland Lawn Care

Lawn Maintenance, Landscaping & Lawn Services

**(931) 277-5254**

10217 Sparta Hwy  
Crossville, TN 38572



#### 11. Upper Cumberland Lawn Care

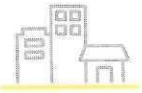
Lawn Maintenance

**(931) 267-3061**

2059 Iris Ln  
Rickman, TN 38580

From Business: We do everything due to Lawn Care including: Mowing Mulching Weeding Feeding Areate Overseed \* Our hours as of right now are weekends. Due to season. When





### 12. Upper Cumberland Electric Membership Corp

Electric Companies, Utility Companies

Website

**(931) 268-2123**

1085 N Grundy Quarles  
Hwy  
Gainesboro, TN 38562



### 13. Upper Cumberland Human Resource Agency

Marriage, Family, Child & Individual Counselors

Website

**(931) 738-6255**

826 Valley View Dr  
Sparta, TN 38583



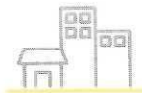
### 14. Upper Cumberland Human Rsrc

Human Resource Consultants, State Government

Website

**(931) 243-3674**

500 Dow Ave  
Celina, TN 38551



### 15. Military Memorial Museum of Upper Cumberland

Museums, Places Of Interest, Tourist Information & Attractio...

(83)

**(931) 456-5520**

20 S Main St  
Crossville, TN 38555

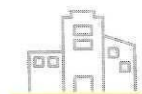


### 16. Upper Cumberland Human Rsrcs

Legislators

**(615) 597-4504**

527 W Main St  
Smithville, TN 37166



### 17. Upper Cumberland Vending

Vending Machines

**(931) 823-6204**

215 Monterey Hwy  
Livingston, TN 38570



### 18. Upper Cumberland Family Dentistry

Dentists

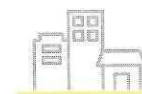
(1)

**(931) 537-2254**

554 W Main St  
Cookeville, TN 38506



Great service and great people. Best in Cookeville!!



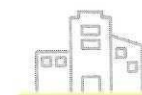
### 19. Upper Cumberland Community Services Agency

Social Service Organizations

Website

**(931) 520-0200**

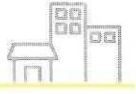
1000 England Dr Ste F  
Cookeville, TN 38501



### 20. Upper Cumberland Electric

**(615) 735-1818**

61 Hogans Creek Rd  
Carthage, TN 37030



### 21. Upper Cumberland Dev District

Apartment Finder & Rental Service, Apartments

**(931) 752-7260**

518 Mace Ave  
Jamestown, TN 38556

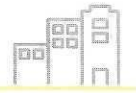


### 22. Upper Cumberland Consulting

Business Coaches & Consultants

**(931) 498-5558**

176 Creekside Ln  
Cookeville, TN 38506

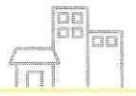


### 23. Upper Cumberland Center for Women

Physicians & Surgeons, Obstetrics And Gynecology, Medica...

**(931) 823-9970**

700 W Main St  
Livingston, TN 38570



### 24. Upper Cumberland Electric Membership Corp - CLOSED

Electric Companies, Utility Companies

**(615) 735-0911**

303 High St N  
Carthage, TN 37030



### 25. Upper Cumberland Sign Services

Signs

**(931) 823-1320**

616 Windle Community Rd  
Livingston, TN 38570



### 26. Upper Cumberland Human Resource Agency

Social Service Organizations, Community Organizations, St...

Website

**(931) 823-7323**

106 W Henson St  
Livingston, TN 38570



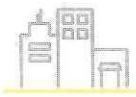
### 27. Upper Cumberland Gas Utility District

Gas Companies, Propane & Natural Gas

Website

**(931) 484-9380**

1031 Woodlands Cir  
Crossville, TN 38571



### 28. Upper Cumberland Human Resource Agency

Human Resource Consultants, Management Consultants

**(931) 946-7151**

Spencer  
Spencer, TN 38585



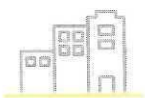
### 29. Upper Cumberland Family Dentistry

Dentists, Dental Hygienists, Prosthodontists & Denture Cent...

**(931) 823-5517**

215 Oak St  
Livingston, TN 38570

From Business: Upper Cumberland Family Dentistry provides dental services such as denture implants, gentle dentistry, laser bleaching, gold caps, sleep dentistry, digital...



### 30. Upper Cumberland Computer Consultants

Computer System Designers & Consultants, Computers & C...

**(931) 526-7766**

401 Joff Dr  
Cookeville, TN 38501

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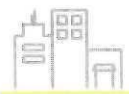


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## Upper Cumberland Wine Trail

*By Stephen Ornes for LOCAL TABLE*

### **Winemakers in the Upper Cumberland Plateau Forge a New Identity in Vino**

If you order "peanut butter and jelly" at the tasting counter of the Stonehaus Winery in Crossville, prepare yourself: You're not getting a sandwich. "We take some of our homemade peanut butter fudge or peanut butter crackers and pair those with a Davenport red," says Rob Ramsey, an owner of the winery. The Davenport red is a sweet wine made from Concord grapes—the same varietal used to make classic grape jelly. Ramsey says the pairing is popular. It's typical whimsy for Stonehaus, where the ambience comes with a light and welcome touch, but the wine is serious business.

This is vino country on the Upper Cumberland Plateau, where conventions and pretensions about wine culture get turned on their heads. The region is probably more famously associated with whiskey and tobacco, but in recent years, a number of wineries have bloomed - and they're aging well. Many of the wineries ferment native grapes, like Concord and muscadines; others make wine from imported, more familiar grapes from California. Others ferment fruits like blackberries or raspberries—Stonehaus even has a sparkling peach-to make sweeter dessert wines.

For wine lovers looking for something a little different close to home, the Upper Cumberland Tourism Association has mapped out a wine lovers' route that starts at the DelMonaco Winery near Cookeville and traces a circuitous, 168-mile path around the plateau, winding up at the Chestnut Hill Winery in Crossville. Destinations along the route include the Tudor-style house and blueberry patches at Highland Manor, Tennessee's oldest licensed winery, and the tasting counter at Stonehaus. Visitors can obtain a passport and get stamps at each winery.

Today's winemakers aren't the first Tennesseans to see the potential in the grapes of the Upper Cumberland. "My father left a fine estate behind him in the region round about Jamestown," wrote Mark Twain in his Autobiography, a rambling collection of notes and anecdotes. "He had always said that the land would not become valuable in his time, but that it would be a commodious provision for his children some day. It contained coal, copper, iron and timber. It also produced a wild grape of a promising sort."

Over a hundred years later, that wild grape has burst onto the scene. "The wine industry in Tennessee is growing by leaps and bounds," says Barbara DelMonaco from DelMonaco Winery. "People want to learn more about wines, and stopping in at the winery is an ideal place to do that." Ramsey credits the success of his own winery to his father and to Jamestown native Fay Wheeler, whom he calls the "father of Tennessee wine." During his career as an intelligence officer in the Air Force, Wheeler spent a lot of time in Europe and he spent a lot of that time touring wineries. When he left the armed services, Wheeler returned to Jamestown with his wine knowledge intact. "He had the idea to plant some grapes, and my father, Bob Ramsey, drank the successes and mistakes," says the younger Ramsey. "Fay came up with his recipe for the muscadine wine and started saying we needed to have a winery."

Rob Ramsey has a folksy goal for wine in Tennessee. He doesn't want to build up the cultural snobbery traditionally associated with wine culture; instead, he wants to break it down. "So many people are intimidated by wine," he says. "They're nervous and feel like they're not comfortable, or feel unsophisticated because they see all these wines and don't know what type they should be drinking."

But Ramsey thinks wine is more democratic than its reputation suggests. "The generation coming along now is not so interested in matching wines with courses. They want to put the food on one table and the liquor on the other, and try different combinations. For them, a lot of rules have gone out the window. We like to educate people. If they want to experiment and try different things that's okay with me. If you want to drink muscadine with a cheeseburger, go ahead. Drink it."

Many winemakers, Ramsey says, want to make wine that pleases them. But he wants to make wines that please his customers. And in the South, that can play out as producing more sweet wines than dry. "People talk dry and drink sweet," he says. "We're in the South, and we're raised on Coca-Cola and GooGoo Clusters. People want something sweeter."

DelMonaco prefers the dries for herself, but says that DelMonaco Winery sells more sweet wines. "People have a wide range of tastes, so that's quite all right," she says. "We have something for everybody: reds, whites, dries, sweets-you name it." DelMonaco is a relative newcomer to the scene. Barbara and her husband, David, planted their first grapes eight years ago and opened the business three years ago. Now the winery includes an extensive wine list and an expansive facility that's usually booked far in advance for weddings and business conferences.

Ruth Dyal, for her part, once turned up her nose at the thought of Tennessee wines. She's the executive director of the Upper Cumberland Tourism Association-and also the creator of the rambling route through the countryside. Dyal hails from a wine-rich region of Germany, so she knows her grapes. (She admits she's partial to DelMonaco's vivance, a bright and summery white wine, and the pinot grigio at Stonehaus.)

She's not a fan of the sweet wines-but the region has something for her, too. Many of the wineries produce drier varieties, largely made from imported California grapes. "I had a glass of muscadine, which is very sweet wine, and I said, "Dear God, you can't do that to me!" she remembers. But when she tried the drier sorts coming from DelMonaco and Stonehaus and Highland Manor, she tasted something more familiar. "I thought, 'Whoa! This is Ten'ry, nice fresh taste.'" And she offers up her own favorite recipe as well: "You take a little white rum and a little amaretto, mix it up with a little squeezed lime, and put a seyval blanc [a white wine readily available locally] over it."

When Dyal got excited about the wineries, she came up with the idea for the wine trail. But she's not through yet. Though the wineries host their own small gatherings-concerts, movies, picnics, tastings, the works-she envisions larger events that incorporate all of the local winemakers. Her current endeavor is to organize a special package tour during which visitors can take a limousine from winery to winery-to stay safe-and spend the night at a bed-and-breakfast in the region. Though it's not available for wine tourists yet, the day is coming: Dyal says she's got almost everyone "sitting around the same table."

The Upper Cumberland doesn't have the grapes or the climate of California-after all, Tennessee's humidity and extremes can quickly devastate a grape crop. But the enterprising winemakers don't

## Exhibit 15

[https://www.crossville-chronicle.com/news/lifestyles/wine-trail-takes-its-fest-to-the-crossroads/article\\_d651a2a8-defe-11e9-ba25-ef905fc0ad4b.html](https://www.crossville-chronicle.com/news/lifestyles/wine-trail-takes-its-fest-to-the-crossroads/article_d651a2a8-defe-11e9-ba25-ef905fc0ad4b.html)

### Wine Trail takes its fest to the Crossroads

Sep 24, 2019



Tastings and a souvenir glass are among the perks of the first-ever Wine at the Crossroads-Upper Cumberland Wine Festival at the Oct. 4 Friday at the Crossroads.

Bill Luton



The Upper Cumberland Tourism Association along with the wineries of the Upper Cumberland Wine Trail will host the Wine at the Crossroads - Upper Cumberland Wine Festival Oct. 4 from 5 to 8 p.m.

This is the first time for all wineries in the region to join Friday at the Crossroad in Crossville.

Tickets for the festival are \$15 per person participating in tasting. Admission includes wine tastings at each of the winery booths and a complimentary souvenir wine glass. All guests must be at least 21 years of age. Wine will also be available for purchase at each winery booth.

The eight wineries of the Upper Cumberland Wine Trail include Cellar 53, Chestnut Hill, DelMonaco, Highland Manor, Holly Ridge, Northfield Vineyards, Paris and Stonehaus.

Tickets are also available on line at [www.uppercumberlandwinetrail.com](http://www.uppercumberlandwinetrail.com) or at Eventbrite. Photo ID is required for entry - no exceptions. Tickets are non-refundable. Event will take place, rain or shine. No coolers or outside food/drinks allowed.

For more information about the festival, go to [www.uppercumberlandwinetrail.com](http://www.uppercumberlandwinetrail.com) or <https://www.facebook.com/UpperCumberlandWineTrail>.

## Exhibit 16



# UPPER CUMBERLAND WINE FESTIVAL

**April 14, 2018**



([https://visitcookevilloten.com/sites/default/files/upper%20cumberland%20wine%20\\_%20cookeville%20tn%20web%20promo.jpg](https://visitcookevilloten.com/sites/default/files/upper%20cumberland%20wine%20_%20cookeville%20tn%20web%20promo.jpg))

Step back in time while savoring the sips of Tennessee's finest wines at the Upper Cumberland Wine Festival. Hosted in 2018 in Historic Granville, this popular festival joins the wineries of the Upper Cumberland Wine Trail to offer tastings, food and live jazz and blues concerts.

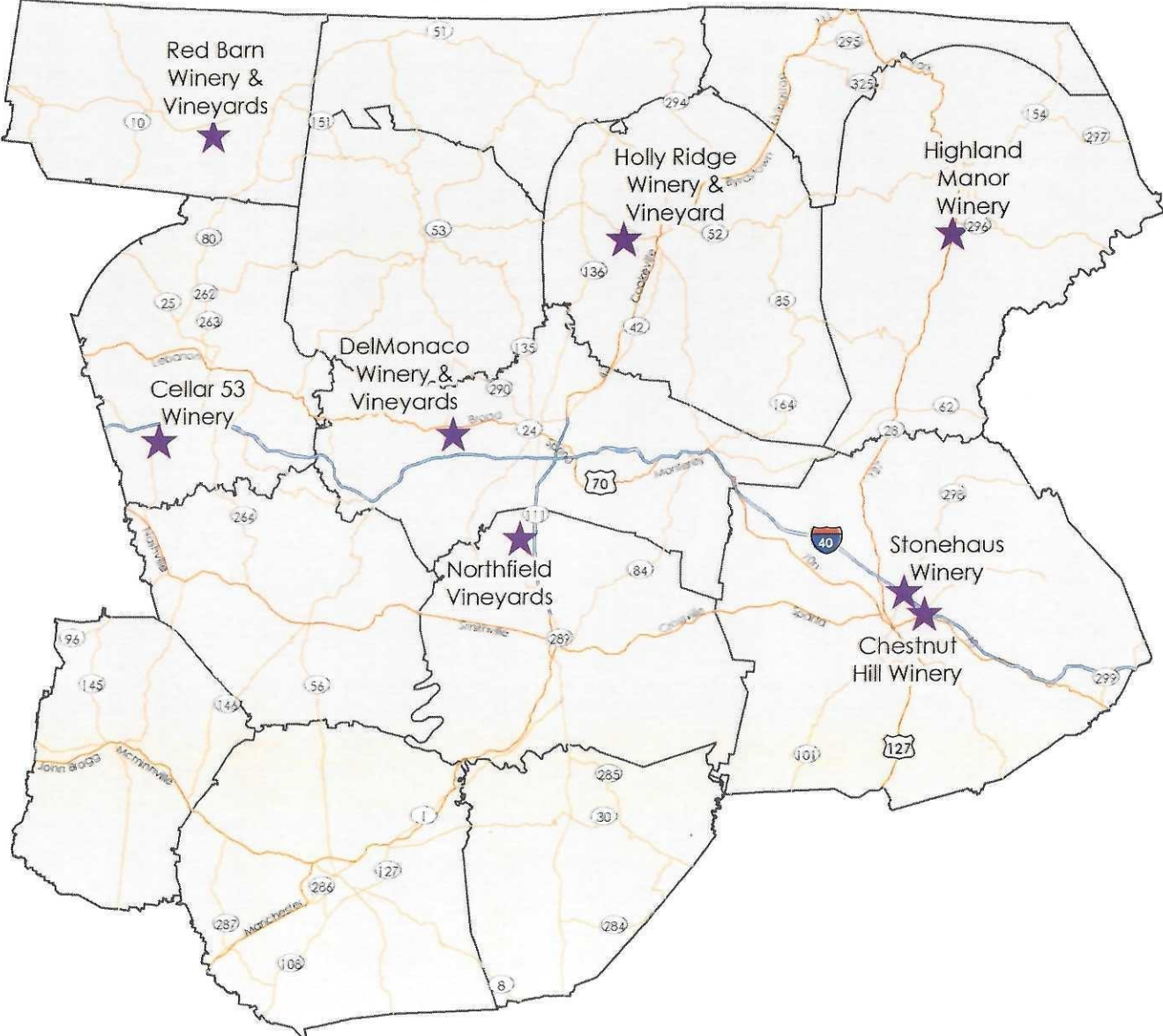
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# Chocolate Lover's Wine Trail



## Tennessee Mountain Stories

Upper Cumberland “Jargon”

January 18, 2018 Beth Durham



In last week's story I mentioned a local author, Carl R. Cooper, and his book *Upper Cumberland "Jargon"*. Some discussion made me think that I should share more about this book .

I guess to begin at the beginning...

According to the book's forward by former Fentress County Mayor John B. Mullinix, the author is the 8th generation of his family living in the Upper Cumberland – that's a lot of generations for a region that was the Wild West during the formative years of our country (I can personally only count 7 generations, and I can't wait to hear from you readers how many you can count). Mr. Cooper's early career was in broadcasting which one would fear would try to work-out the local vernacular. However, during his mother's waning years he found himself along with his siblings staying with her and listening a little more closely to the things she had to say. He realized her command of *Upper Cumberland* English was something worthy of documentation.

*Upper Cumberland "Jargon"* lists "900 old words, sayings, phrases, and idioms that the people of the *Upper Cumberlands* use on a daily basis." His self-avowed purpose is to preserve a language that with wider communication and exposure is blending into the larger American language.

Now you know that I'm really fascinated by regional dialects anyway. And like Mr. Cooper I long to preserve every aspect of our Plateau heritage. As I bump into terminology that people off the mountain cannot recognize, I will continue to share them among the stories. And as you've heard me say before, I often have trouble differentiating our dialect from the rest of the world – I guess it's just so much a part of me that I assume everybody talks this a'way!

Here's a sampling from **Upper Cumberland "Jargon"**:

**Court** (To date)

**Every jot and tittle** (Every small detail)

**Fair to middlin** (fairly good / average)

**Hind Catcher** (Baseball catcher)

*Is that not a regulation title? Who knew!*

**Libel** (a good chance)

**Lick and a promise** (a hasty job)

**Lights** (Lungs)

*This was a new one to me.*

**Light Bread** (Loaf bread)

*I think this one must have come about when commercial loaf bread became available. Before that, homemade bread would have almost always have been whole wheat because you couldn't create bleached white flour at home.*

**Old as Methusalah** (very old)

**On the mend** (Feeling better)

**Pine Blank** (Exactly)

**Plunder** (Odds and Ends)

**Pone** (A lump)

**Rared up** (rose up)

**Racket** (noise)

**Smidgen** (Small amount)

**Start in on me** (To fuss or confront)

**Tick** (A homemade mattress)

**Time about** (Take turns)

**Under the mountain** (And area of Fentress County that is not on the Cumberland Plateau, notably the northern and especially the western valleys of Fentress County)

**Yourn** (Yours)

My copy of the book had a quiz inserted with a grading scale. If you missed 6 you were "Country but you spent your summers in Muncie picking maters." If you missed 12 you "courted someone from the 'Country'". Miss 14 and you "spent your vacation in this part of the country". If you missed 18 "you know someone from the 'Country'".



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## ENGL 4820 - Upper Cumberland Folklore

Lec. 3. Credit 3.

Prerequisite: [ENGL 1010](#) and [ENGL 1020](#) and one course from among [ENGL 2130](#),

[ENGL 2230](#), and [ENGL 2330](#) are prerequisites for all upper division courses. The

prerequisite for upper-division courses of [ENGL 2130](#) or [ENGL 2230](#) or [ENGL 2330](#) is

waived for ENGL and SEEN majors. Folklore of the Upper Cumberland, with emphasis

on relationships between regional material and the broad perspective of the

humanities.

[View the Summer 2019 Schedule of Classes](#)



## 11 Delicious Reasons to Explore the Upper Cumberland of Tennessee

Amy Drohen

February 11, 2016

Featured, Tennessee, Travel

The Upper Cumberland region of Tennessee is known for their breathtaking waterfalls, scenic state parks and Bluegrass & Americana music. What some may find a surprise is the number of hidden culinary gems, up-and-coming distilleries/breweries/wineries along with a variety of entertainment that can be found while exploring the region. The Upper Cumberland is abundant with hospitality and each town has its own unique charm.

...

**DRINK**

**WINE**

### **Stonehaus Winery**

Stonehaus Winery is one of the eight stops along the [Upper Cumberland wine trail](#). Stonehaus' winemaker and visionary Mr. Fay Wheeler opened the doors to Stonehaus Winery in 1991. Mr. Wheeler was instrumental in paving the way for winemakers in Tennessee with his part in getting the Wine and Grape Act enacted in 1977 and later opening his first winery in 1979. The winery has a well rounded portfolio of both still and sparkling wines. The winery on occasion partners with Tennessee organizations and celebrities to include the fruit forward "Aaron Tippin Country Jam". While visiting Stonehaus Winery make sure to stop by their shop and pick up some of their fresh homemade butter fudge in seasonal flavors.

*2444 Genesis Rd #103, Crossville, TN 38571*

[stonehauswinery.com](http://stonehauswinery.com)

<http://austinfoodmagazine.com/upper-cumberland-of-tennessee/>

# Exhibit 22

## Feature Query Results

**Click the feature name for details and to access map services**

Click any column name to sort the list ascending ▲ or descending ▼

Feature Name	ID	Class	County	State ▲	Latitude	Longitude	Elo(ft)*	Map**	BGN Date	Entry Date
<a href="#">Mount Pisgah Upper Cumberland Presbyterian Church</a>	152488	Church	Cullman	AL	341636N	0863843W	961	Lawrence Cove	-	01-DEC-2003
<a href="#">Upper Cumberland (historical)</a>	2336226	Populated Place	Letcher	KY	370415N	0824408W	2218	Flat Gap	-	06-AUG-2007
<a href="#">Upper Cumberland School</a>	505872	School	Letcher	KY	370418N	0824405W	2060	Flat Gap	-	20-SEP-1979
<a href="#">Upper Cumberland Church</a>	1273295	Church	Smith	TN	362250N	0855647W	551	Pleasant Shade	-	19-MAY-1980
<a href="#">Upper Cumberland Council Boy Scout Camp</a>	1318930	Locale	Campbell	TN	361713N	0840300W	1043	Demory	-	01-OCT-1989
<a href="#">Upper Cumberland Regional Airport</a>	1301395	Airport	White	TN	360322N	0853141W	1024	Burgess Falls	-	01-AUG-1991

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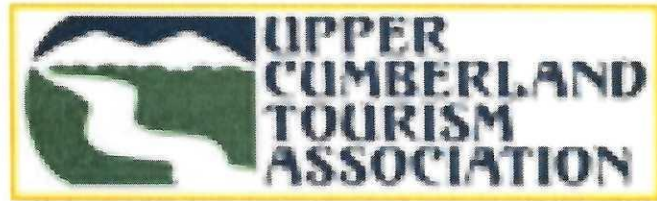
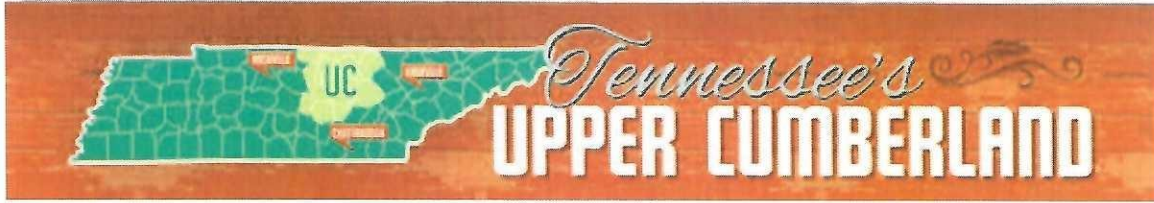
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\*Elevations are from the [National Elevation Dataset](#)

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THE  
**UPPER CUMBERLAND**  
REGION OF TENNESSEE







We Invite you to Follow  
The Upper Cumberland Wine Trail



WELCOME

Travel Tennessee's beautiful Upper Cumberland back roads, enjoying spectacular views, visiting small historic towns, and finding our wineries as you meander through our region..

Explore the nine Wineries & Vineyards that the Upper Cumberland Wine Trail has to offer. Cellar 53 in Brush Creek, Chestnut Hill in Crossville, DelMonaco in Baxter, Highland Manor in Jamestown, Holly Ridge in Livingston, Northfield in Sparta, Paris Winery in Cookeville, Red Barn in Lafayette, Stonehaus in Crossville; all our wineries are small and family owned.

Follow the Upper Cumberland Wine Trail for a day tour or start planning your weekend of wine tasting. Pick up our Wine Trail Rack Card at any of the eight wineries or visitors centers and have card stamped at each winery you visit.

Once you have completed the trail and get your final stamp you'll receive a special thank you gift. It matters not where you begin or where you end, good times abound all along the way!

Join us for our very special events throughout the year. We host these events together as a trail as well as special tastings, music and more at our individual wineries.

## INFORMATION REGARDING TABLES

Climate data was compiled from data provided by the PRISM climate data mapping system. (PRISM). PRISM is a computerized climate mapping system that estimates climate patterns by using data gathered from weather stations, global positioning systems, and remote sensing technologies, along with other factors such as elevation, longitude, slope angles, and solar aspects. This is a service provided by PRISM Climate Group at Oregon State University.<sup>1</sup>

Secondary climate data was provided by National Centers for Environmental Information (NCEI)<sup>2</sup>, and the Southeast Regional Climate Center (SERCC)<sup>3</sup>. The NCEI preserves, monitors, assesses and provides public access to climate and historical weather data and information. The mission of SERCC is to provide timely, high quality and pertinent climate data and information to public and private users in the region. SERCC is one of six regional climate centers in the United States and

The period of record for all climate normals data is 1981 - 2010, the most recent available data for all stations. See Table 1 for locations of weather stations.

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Table 7.	Growing Degree Days / Heat Summation.
Table 8.	Precipitation.
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Table 10.	Data Summary.

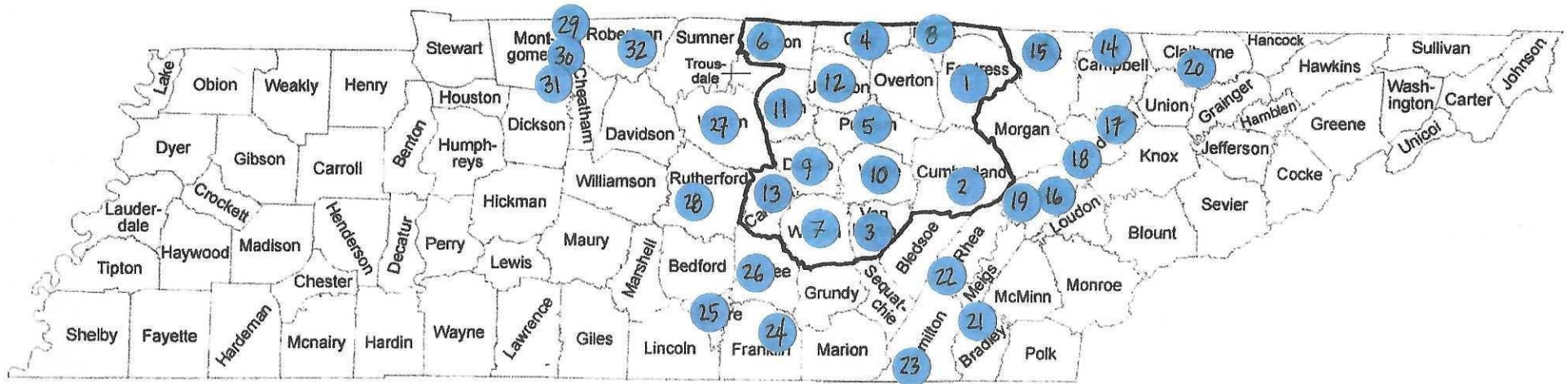
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<sup>1</sup> PRISM Climate Group, <http://prism.oregonstate.edu>.

<sup>2</sup> National Centers for Environmental Information: National Oceanic and Atmospheric Administration, <https://www.ncdc.noaa.gov>.

<sup>3</sup> Southeast Regional Climate Center, <http://sercc.com>.

## NWS Weather Stations



In AVA	In AVA	Outside AVA	Outside AVA
1 - Allardt	10 - Sparta Water Plant	14 - Newcomb	24 - Winchester
2 - Crossville AP	11 - Carthage	15 - Oneida	25 - Lynchburg
3 - Fall Creek Falls	12 - Gainesboro	16 - Kingston	26 - Manchester #2
4 - Celina	13 - Woodbury 1 WNW	17 - Norris	27 - Lebanon
5 - Cookeville		18 - Oak Ridge ATDD	28 - Murfreesboro
6 - Lafayette		19 - Rockwood	29 - Clarksville No. 2
7 - McMinnville		20 - Tazewell	30 - Clarksville Outlaw Field
8 - Pickett SP		21 - Cleveland Filter Plant	31 - Clarksville WWTP
9 - Smithville 2 SE		22 - Dayton	32 - Springfield
		23 - Chattanooga AP	

Table 1

## Weather Stations and Locations

Station	County	Location	Distance in Miles from Boundary (approximate)
<i>Allardt</i>	Fentress	In AVA - northeast	
<i>Crossville AP</i>	Cumberland	In AVA - center	
<i>Fall Creek Falls SP</i>	Van Buren	In AVA - south	
<i>Celina</i>	Clay	In AVA - north	
<i>Cookeville</i>	Putnam	In AVA - center	
<i>Lafayette</i>	Macon	In AVA - north	
<i>McMinnville</i>	Warren	In AVA - south	
<i>Pickett SP</i>	Pickett	In AVA - north	
<i>Smithville 2 SE</i>	DeKalb	In AVA - west	
<i>Sparta Water Plant</i>	White	In AVA - center	
<i>Carthage</i>	Smith	In AVA - west	
<i>Gainesboro</i>	Jackson	In AVA - center	
<i>Woodbury 1 WNW</i>	Cannon	In AVA - west	
<i>Newcomb</i>	Campbell	Northeast of AVA	27.5
<i>Oneida</i>	Scott	Northeast of AVA	10
<i>Kingston</i>	Roane	East of AVA	17.4
<i>Norris</i>	Anderson	East of AVA	37.2
<i>Oak Ridge ATDD</i>	Anderson	East of AVA	28.4
<i>Rockwood</i>	Roane	East of AVA	11.5
<i>Tazewell</i>	Claiborne	East of AVA	54.6
<i>Cleveland Filter Plant</i>	Bradley	Southeast of AVA	39.2
<i>Dayton</i>	Rhea	Southeast of AVA	18
<i>Chattanooga AP</i>	Hamilton	South of AVA	30.4
<i>Winchester</i>	Franklin	South of AVA	22.5
<i>Monteagle</i>	Marion	Southwest of AVA	16.1
<i>Sewanee</i>	Franklin	Southwest of AVA	19.2
<i>Lebanon</i>	Wilson	West of AVA	9.5
<i>Murfreesboro</i>	Rutherford	West of AVA	9
<i>Clarksville No. 2</i>	Montgomery	Northwest of AVA	50
<i>Clarksville Outlaw Field</i>	Montgomery	Northwest of AVA	50
<i>Clarksville WWTP</i>	Montgomery	Northwest of AVA	50
<i>Springfield</i>	Robertson	Northwest of AVA	31.9

**Table 2**  
**Maximum Temperatures**

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
<b>In AVA</b>	46.4	51.0	60.1	69.5	76.9	84.1	87.3	86.9	81.0	71.1	60.4	49.2	68.7
<b>Northeast</b>	44.8	49.7	59.2	68.5	76.7	83.4	86.3	85.5	79.5	69.5	59.1	47.9	67.5
<b>East</b>	46.0	50.8	60.6	70.0	77.5	84.6	87.3	86.9	81.0	70.7	59.5	48.4	68.6
<b>Southeast</b>	48.4	53.2	62.2	71.2	78.4	85.6	88.4	88.1	81.9	71.7	60.9	50.4	70.0
<b>South</b>	49.5	54.2	62.9	71.7	78.8	85.9	88.6	88.3	82.3	72.3	61.7	51.6	70.6
<b>Southwest</b>	48.0	52.2	61.0	69.9	78.0	85.6	88.8	88.4	82.3	72.0	61.1	50.6	69.8
<b>West</b>	47.5	52.1	61.2	70.8	78.9	86.7	90.1	90.0	83.6	72.9	61.7	50.3	70.5
<b>Northwest</b>	45.8	50.6	59.8	69.7	77.3	85.1	88.9	88.8	82.2	71.5	60.3	48.4	69.0

**Table 3**  
**Minimum Temperatures**

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
<b>In AVA</b>	26.12	29.0	35.8	43.6	52.7	61.4	65.3	64.1	56.7	45.1	36.4	29.0	45.4
<b>Northeast</b>	24.10	27.0	32.5	40.7	50.0	59.0	63.8	62.1	55.6	43.4	34.4	27.7	43.3
<b>East</b>	25.76	28.5	34.9	42.7	52.4	61.6	65.7	64.7	57.3	45.0	35.6	28.5	45.2
<b>Southeast</b>	27.80	31.1	37.5	45.4	54.3	62.9	66.8	66.0	58.6	46.8	37.4	30.2	47.0
<b>South</b>	29.60	32.8	39.4	46.9	55.7	63.9	67.8	67.0	59.9	48.3	39.1	32.0	48.5
<b>Southwest</b>	25.95	29.0	36.5	44.4	53.4	61.7	65.7	64.6	57.6	45.5	37.0	28.5	45.8
<b>West</b>	25.70	28.3	35.5	43.8	52.9	61.8	66.2	64.4	56.9	44.6	35.8	28.6	46.0
<b>Northwest</b>	26.43	29.2	36.6	45.7	54.9	63.5	67.4	65.8	58.4	46.8	38.3	29.0	46.8

Table 4

Growing Season Mean Temperatures  
(April - October)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
<i>In AVA</i>	0.0	0.0	0.0	56.5	64.8	72.8	76.3	75.5	68.8	58.1	0.0	0.0	67.5
<i>Northeast</i>	0.0	0.0	0.0	54.6	63.3	71.3	75.1	73.8	67.0	55.7	0.0	0.0	65.8
<i>East</i>	0.0	0.0	0.0	56.4	64.9	73.1	76.5	75.8	69.1	57.9	0.0	0.0	67.7
<i>Southeast</i>	0.0	0.0	0.0	58.3	66.4	74.2	77.6	77.1	70.4	59.2	0.0	0.0	69.0
<i>South</i>	0.0	0.0	0.0	59.3	67.2	74.9	78.2	77.6	71.1	60.3	0.0	0.0	69.8
<i>Southwest</i>	0.0	0.0	0.0	56.5	65.2	73.4	77.2	76.2	69.6	58.0	0.0	0.0	68.0
<i>West</i>	0.0	0.0	0.0	57.6	66.5	74.9	78.6	77.8	70.5	59.0	0.0	0.0	69.2
<i>Northwest</i>	0.0	0.0	0.0	57.7	66.1	74.3	78.2	77.4	70.3	59.1	0.0	0.0	69.0

**Table 5 | Frost-Free Growing Season\***

Weather Station	First Fall Frost	Last Spring Frost	Location	Growing Season
Allardt	31-Oct	4-Apr	In AVA	209
Crossville AP	1-Nov	3-Apr	In AVA	211
Celina	4-Nov	4-Apr	In AVA	213
Cookeville	2-Nov	4-Apr	In AVA	211
Lafayette	9-Nov	27-Mar	In AVA	226
McMinnville	5-Nov	30-Mar	In AVA	220
Smithville 2 SE	27-Oct	6-Apr	In AVA	203
Sparta Water Plant	29-Oct	7-Apr	In AVA	204
Carthage	10-Nov	28-Mar	In AVA	226
Woodbury 1 WNW	24-Oct	9-Apr	In AVA	197
Oneida	25-Oct	13-Apr	NE of AVA	194
Norris	3-Nov	5-Apr	E of AVA	210
Oak Ridge ATDD	5-Nov	30-Mar	E of AVA	220
Rockwood	2-Nov	31-Mar	E of AVA	215
Tazewell	22-Oct	17-Apr	E of AVA	188
Cleveland Filter Plant	4-Nov	31-Mar	SE of AVA	217
Dayton 2 SE	8-Nov	31-Mar	SE of AVA	221
Chattanooga AP	16-Nov	19-Mar	S of AVA	242
Lynchburg	6-Nov	29-Mar	SW of AVA	222
Lebanon	27-Oct	4-Apr	W of AVA	205
Murfreesboro 5 N	4-Nov	3-Apr	W of AVA	215
Clarksville WWTP	5-Nov	31-Mar	NW of AVA	218
Springfield Exp Stn	3-Nov	4-Apr	NW of AVA	212

Threshold 28 | Probability 50%

**Table 6 | Frost-Free Growing Season (Mean)**

	Min	Max	Mean
In AVA	197	226	212
Northeast	194	194	194
East	188	220	208.25
Southeast	217	221	219
South	242	242	242
Southwest	222	222	222
West	205	215	210
Northwest	212	218	215

\* Data unavailable for the following stations: Fall Creek Falls SP, Pickett SP, Gainesboro, Newcomb, Kingston, Winchester 1 E, Manchester #2, Clarksville No. 2, Clarksville Outlaw Field



**Table 7 | Growing Degree Days / Heat Summation (Winkler Scale)**

	April	May	June	July	Aug	Sept	Oct	Heat Summation Units	Region
Allardt	144	372	585	703.7	678.9	471	179.8	3134.4	III
Crossville AP	175.5	421.6	631.5	762.6	739.35	516	215.45	3462	III
Fall Creek Falls SP	132	392.15	598.5	728.5	713	504	209.25	3277.4	III
Celina	175.5	455.7	682.5	832.35	806	576	248	3776.05	IV
Cookeville	172.5	449.5	679.5	815.3	787.4	561	235.6	3700.8	IV
Lafayette	262.5	528.55	762	899	869.55	631.5	313.1	4266.2	V
McMinnville	288	534.75	742.5	868	846.3	627	322.4	4228.95	V
Pickett SP	145.5	412.3	625.5	751.75	737.8	511.5	218.55	3402.9	III
Smithville 2 SE	168	443.3	678	812.2	779.65	541.5	213.9	3636.55	IV
Sparta Water Plant	247.5	492.9	706.5	830.8	806	579	279	3941.7	IV
Carthage	225	497.55	732	872.65	852.5	631.5	300.7	4111.9	V
Gainesboro	214.5	499.1	741	875.75	840.1	595.5	271.25	4037.2	V
Woodbury 1 WNW	201	475.85	715.5	841.65	824.6	589.5	258.85	3906.95	IV
Newcomb	154.5	437.1	655.5	790.5	757.95	562.5	241.8	3599.85	IV
Oneida	120	389.05	616.5	762.6	716.1	490.5	158.1	3252.85	III
Kingston	220.5	509.95	750	866.45	844.75	615	289.85	4096.5	V
Norris	171	434	651	775	756.4	541.5	217	3545.9	IV
Oak Ridge ATDD	247.5	514.6	730.5	863.35	846.3	618	294.5	4114.75	V
Rockwood	190.5	452.6	690	816.85	790.5	570	240.25	3750.7	IV
Tazewell	123	406.1	643.5	781.2	756.4	526.5	181.35	3418.05	III
Cleveland Filter Plant	250.5	508.4	730.5	861.8	843.2	603	291.4	4088.8	V
Dayton 2 SE	246	503.75	723	847.85	833.9	612	280.55	4047.05	V
Chattanooga AP	315	576.6	793.5	928.45	911.4	675	356.5	4556.45	V
Winchester 1 E	243	489.8	699	819.95	799.8	589.5	282.1	3923.15	IV
Lynchburg	199.5	482.05	712.5	855.6	829.25	601.5	252.65	3933.05	IV
Manchester #2	190.5	457.25	690	832.35	793.6	570	240.25	3773.95	IV
Lebanon	226.5	514.6	754.5	897.45	866.45	612	274.35	4145.85	V
Murfreesboro 5 N	228	505.3	738	877.3	855.6	615	280.55	4099.75	V
Clarksville No. 2	244.5	503.75	724.5	875.75	850.95	612	289.85	4101.3	V
Clarksville Outlaw Field	226.5	508.4	733.5	872.65	841.65	601.5	275.9	4060.1	V
Clarksville WWTP	274.5	554.9	780	925.35	895.9	642	303.8	4376.45	V
Springfield Exp Stn	217.5	492.9	732	868	841.65	606	274.35	4032.4	V

**Table 8 | Precipitation**

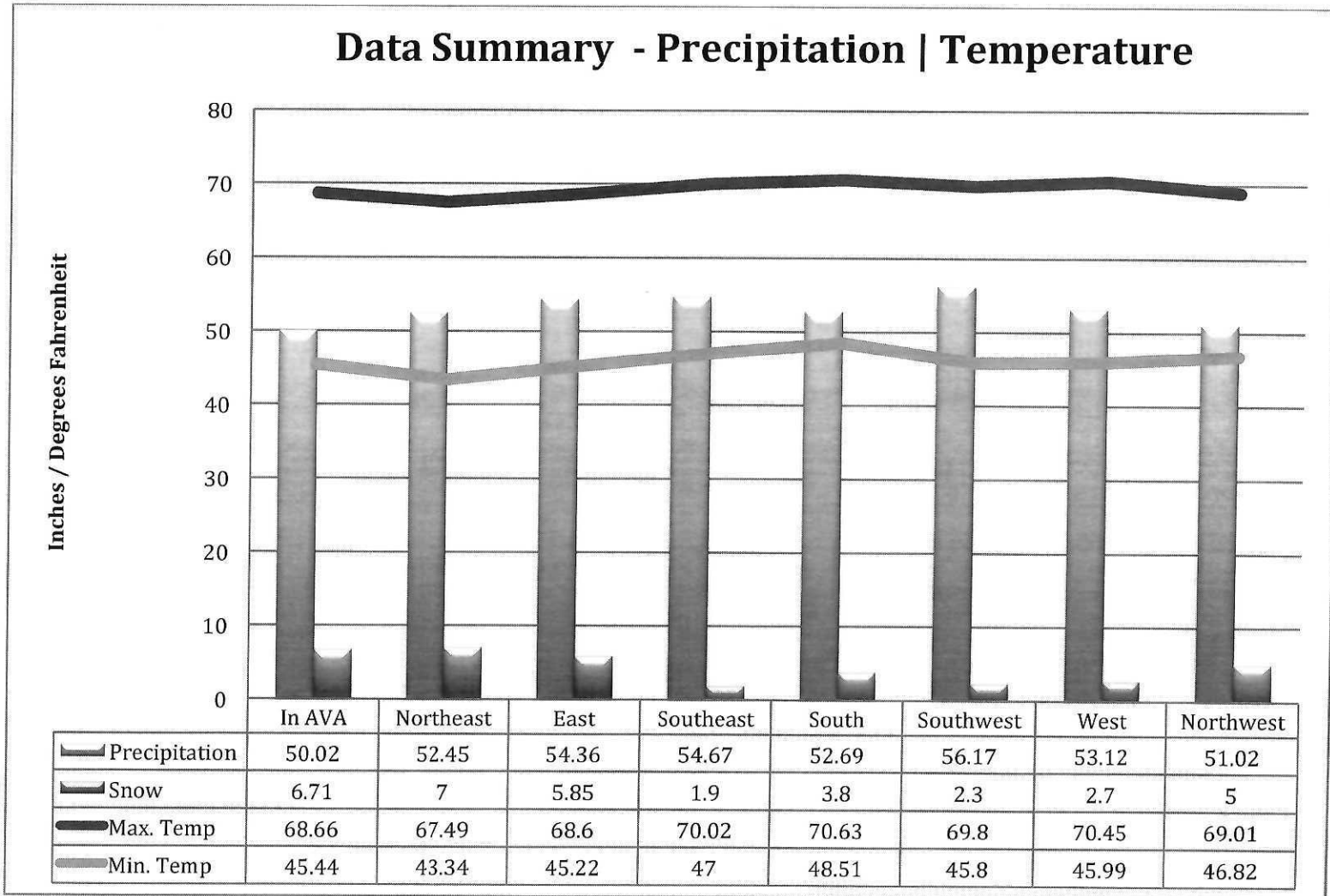
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual	Growing Season	Winter
<b>In AVA</b>	4.27	4.21	4.53	4.05	4.94	4.26	4.55	3.60	3.51	2.98	4.27	4.85	50.02	30.21	14.44
<b>Northeast</b>	4.33	4.19	4.70	4.28	5.26	4.68	5.00	4.29	3.63	3.06	4.15	4.90	52.45	30.19	13.42
<b>East</b>	4.87	4.94	4.85	4.69	4.80	4.58	5.11	3.89	3.80	3.04	4.54	5.25	54.36	29.91	15.06
<b>Southeast</b>	5.01	4.76	4.91	4.35	5.01	4.27	4.79	3.85	4.22	3.30	4.99	5.23	54.67	29.78	15.00
<b>South</b>	4.64	4.68	5.11	4.13	4.47	4.29	4.62	3.26	4.10	3.23	4.97	5.22	52.69	28.10	14.53
<b>Southwest</b>	4.73	4.62	5.27	4.63	5.43	4.83	4.64	3.74	4.24	3.20	4.91	5.97	56.17	30.69	15.31
<b>West</b>	4.38	4.33	4.75	4.22	5.60	4.63	4.71	3.68	3.87	3.31	4.46	5.20	53.12	30.01	13.91
<b>Northwest</b>	3.86	4.21	4.34	4.49	5.73	4.38	4.15	3.12	3.56	3.82	4.47	4.90	51.02	29.24	12.97

Growing Season: April- October | Winter: January/February/December

**Table 9 | Snowfall**

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
<b>In AVA</b>	2.63	2.17	0.87	0.10	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.86	6.71
<b>Northeast</b>	2.90	2.20	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	7.00
<b>East</b>	2.13	2.08	0.45	0.23	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.95	5.85
<b>Southeast</b>	0.85	0.50	0.15	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	1.90
<b>South</b>	1.45	0.75	1.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	3.80
<b>Southwest</b>	0.70	0.90	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	2.30
<b>West</b>	1.20	0.90	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2.70
<b>Northwest</b>	1.30	2.40	0.55	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	5.00

Table 10



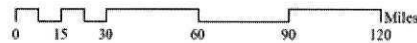
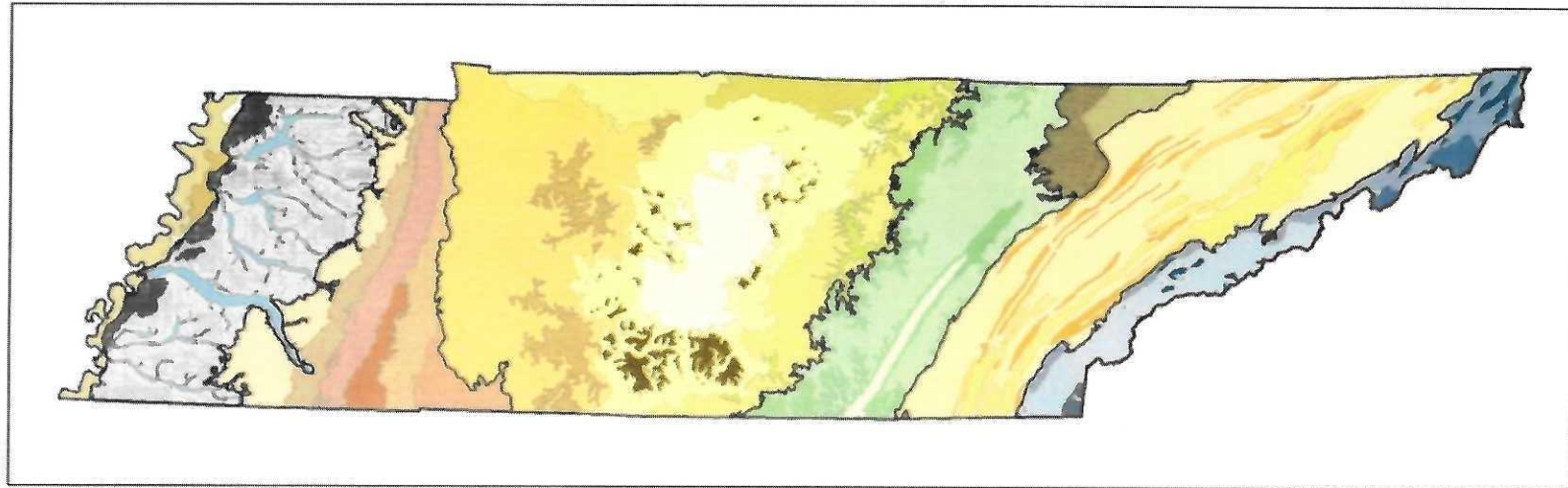
Data Provided by PRISM Climate Group | Southeast Regional Climate Center  
 Period of Record: 1981-2010

## FIGURES

- Figure 1. Level IV Ecoregions of Tennessee.
- Figure 2. Rock Ages of Tennessee.
- Figure 3. Geology of Valley and Ridge Appalachians.
- Figure 4. Formation of Appalachians.
- Figure 5. Major Soils Series of Upper Cumberland.
- Figure 6. Formation of the Central Basin and Highland Rim.
- Figure 7. Rivers and Topography with Elevations.
- Figure 8. Topography of Tennessee.
- Figure 9. Elevations of Upper Cumberland and Surrounding Areas.
- Figure 10. Median Last 28°F Freeze Southeast United States.
- Figure 11. Median First 28°F Freeze Southeast United States.
- Figure 12. Plant Hardiness Map of Tennessee.
- Figure 13. Tennessee Average Annual Precipitation.

Figure 1

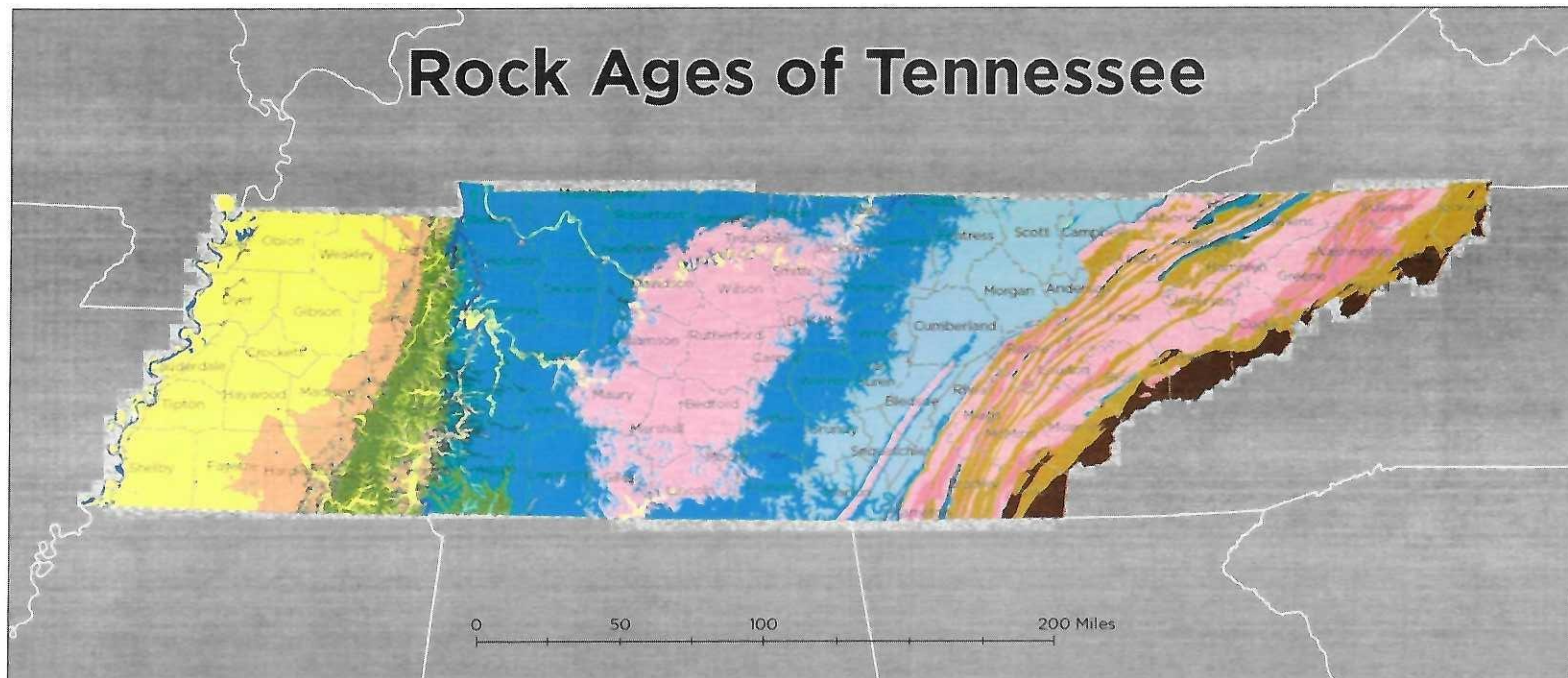
# Level IV Ecoregions of Tennessee



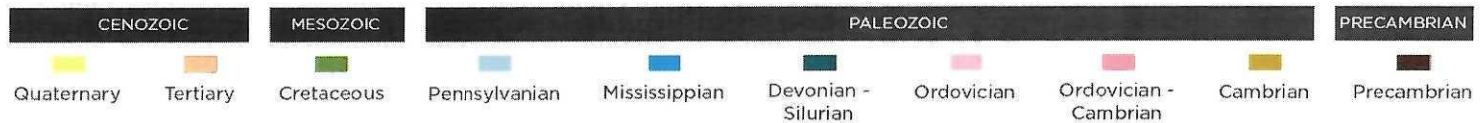
Primary Authors: Sanny Fleming (TDEC), Dwayne Eates (APSU, BRIT)  
Adapted from EPA Level IV Ecoregions

Coordinate System: NAD 83 StatePlane Tennessee FIPS 4100 Feet  
Projection: Lambert Conformal Conic  
Datum: North American 1983  
False Easting: 1,000,000.0000  
False Northing: 0.0000  
Central Meridian: -84.0000  
Standard Parallels: 33.21000  
Standard Parallel 2: 35.41811  
Latitude Of Origin: 34.52333  
Units: Feet U.S.

Figure 2

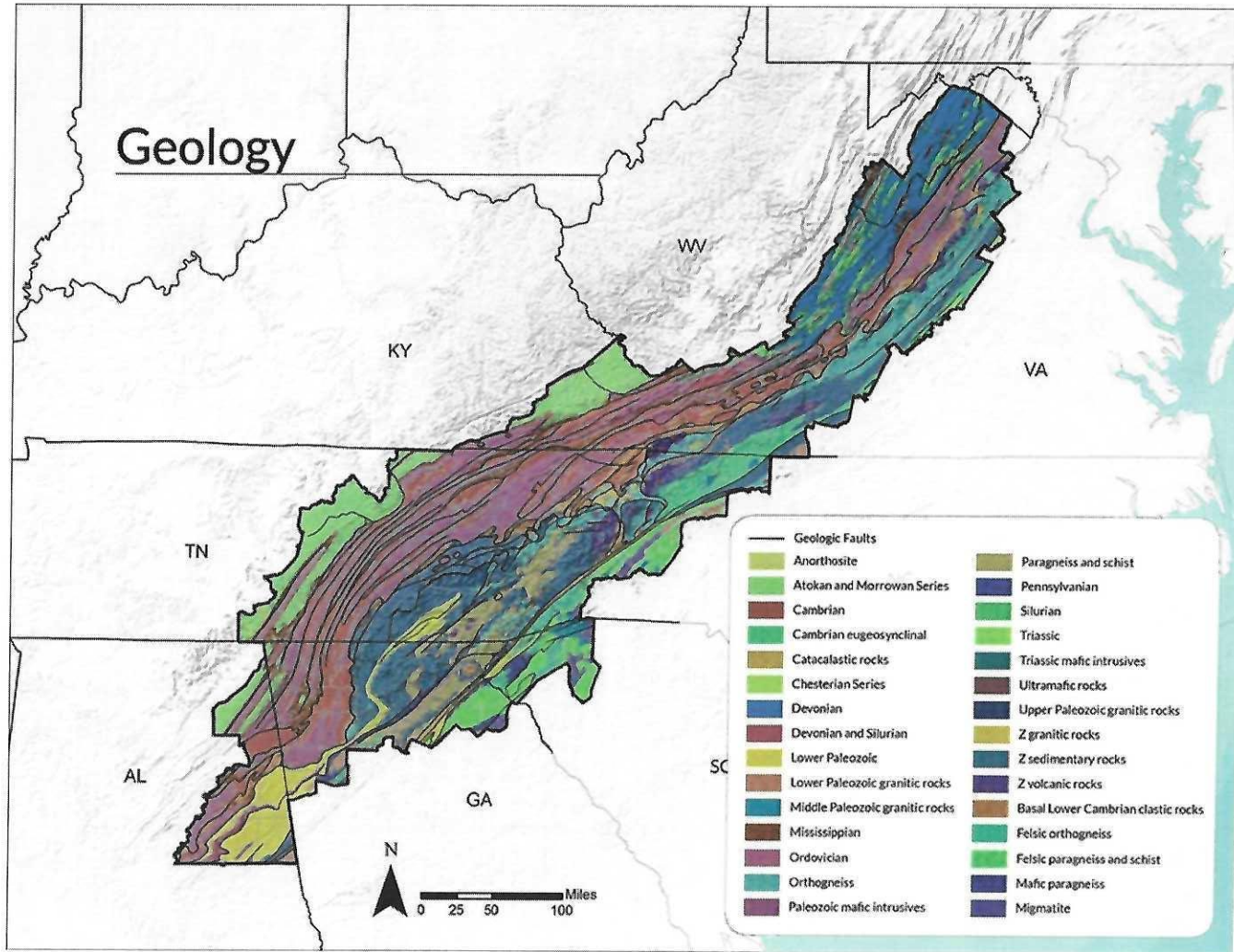


### Geologic Age



Data Source: USGS Mineral Resource Database | Author: UTK GIS Outreach and Engagement Lab  
Date: 07/26/2018 | Projection: TN State Plane

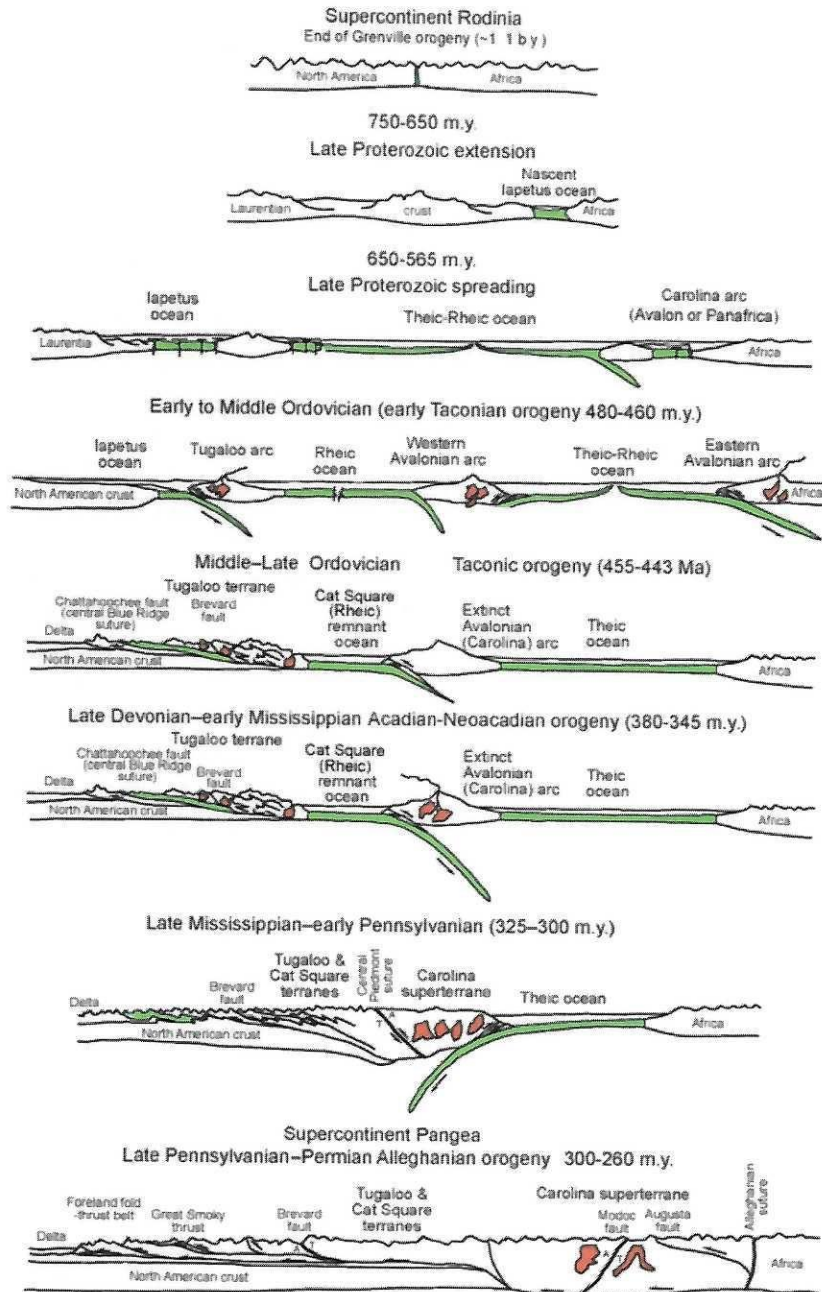
Figure 3 | Geology of Valley and Ridge Appalachians



Map provided by Southern Appalachian Vitality Index

Figure 4

Formation of Appalachians





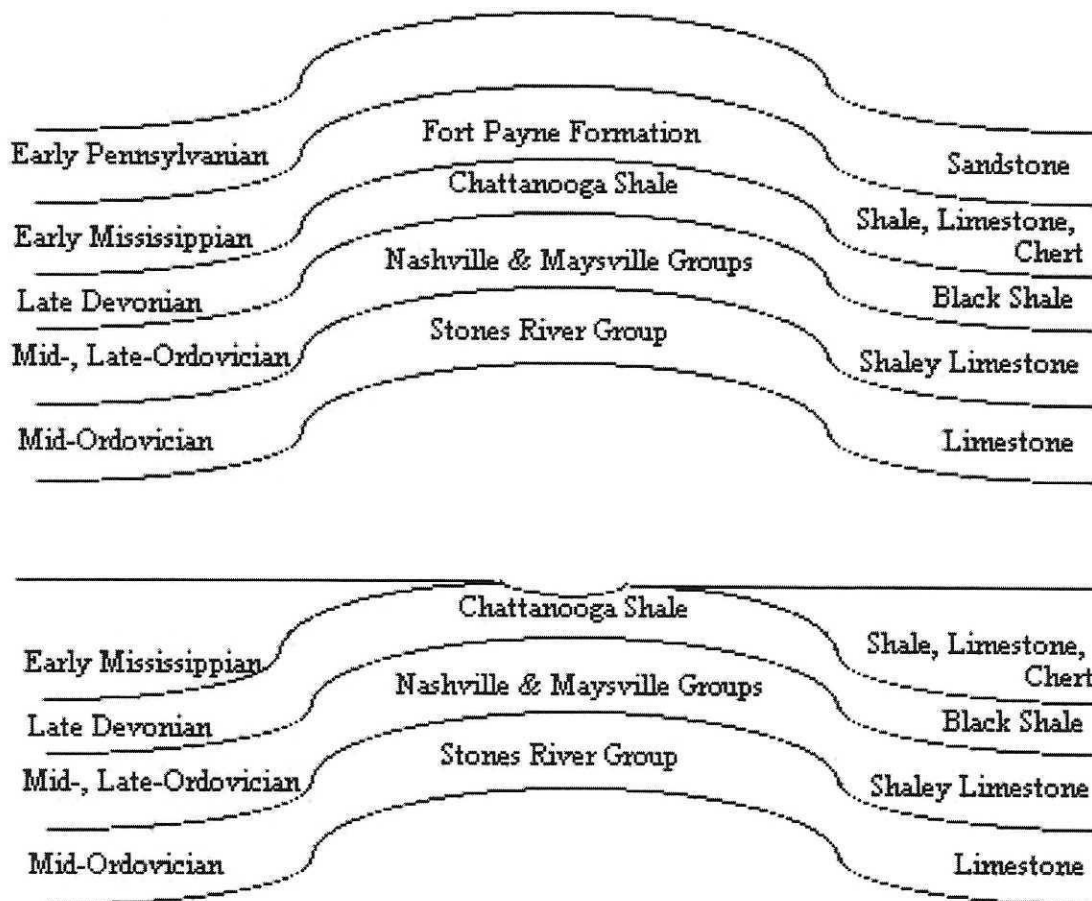
**Figure 5 | Major Soil Series of Upper Cumberland and Surrounding Areas**

	ECOREGION	SOILS	TEMP/MOISTURE	SOIL ORDERS
<b>AVA-E</b>	<b>Cumberland Plateau</b>			
	<i>Cumberland Plateau - 68a</i>	Lily   Ramsey   Lonewood   Gilpin	Mesic / Udic	Ultisols (Hapludults) / Inceptisols (Dystrachrepts)
	<i>Plateau Escarpment - 68c</i>	Bouldin   Ramsey   Gilpin   Allen   Jefferson   Varilla	Mesic / Udic	Ultisols (Paleudults, Hapludults) / Inceptisols (Dystrachrepts)
<b>AVA-C</b>	<b>Highland Rim</b>			
	<i>Eastern Highland Rim - 71g</i>	Dickson   Mountview   Baxter   Waynesboro   Cumberland   Decatur	Thermic/Udic	Ultisols (Fragiudults, Paleudults) / Alfisols (Paleudalfs)
<b>AVA-N</b>	<b>Outer Nashville Basin</b>			
	<i>Outer Nashville Basin - 71h</i>	Dellrose   Mimosa   Stiversville   Hampshire   Armour   Maury   Barfield   Hawthorne   Sulphura	Thermic/Udic	Ultisols (Paleudults, Hapludults) / Alfisols (Hapludalfs) / Inceptisols (Dystrachrepts, Eutrochrepts)
<b>E</b>	<b>Valley and Ridge Province</b>			
	<i>Southern Limestone / Dolomite Valleys and Low Rolling Hills - 67f</i>	Fullerton   Dewey   Decatur   Bodine   Waynesboro	Thermic/Udic	Ultisols (Paleudults)
<b>NE</b>	<b>Central Appalachians</b>			
	<i>Cumberland Mountains - 69d</i>	Jefferson   Shelocta   Gilpin   Petros   Ramsey   Lily   Alticrest   Muskingum	Mesic / Udic	Inceptisols (Dystrachrepts) / Ultisols (Hapludults)
<b>W</b>	<b>Inner Central Basin (Nashville Basin)</b>			
	<i>Inner Nashville Basin - 71i</i>	Talbott   Bradyville   Gladeville   Inman   Mimosa	Thermic/Udic	Alfisols (Hapludalfs) / Mollisols (Rendolls), Inceptisols (Eutrochrepts)

See Figure 1 for Ecoregion Map of Tennessee

Figure 6

### Formation of Central Basin and Highland Rim



### Cross Section of the Nashville Basin

vertical dimension exaggerated

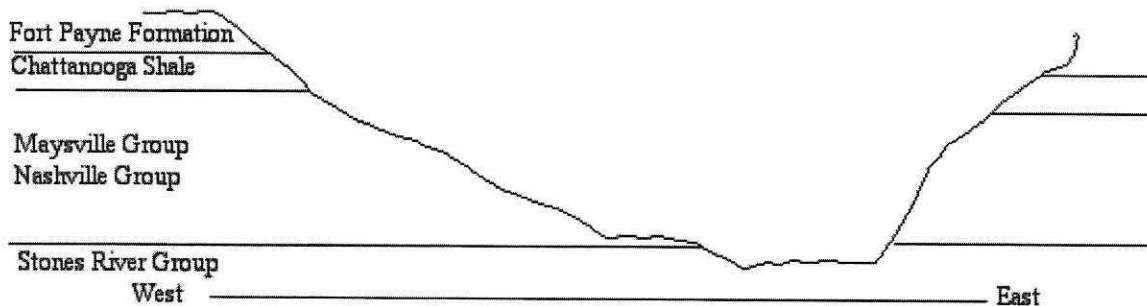


Figure 7

Rivers and Topography with Elevations

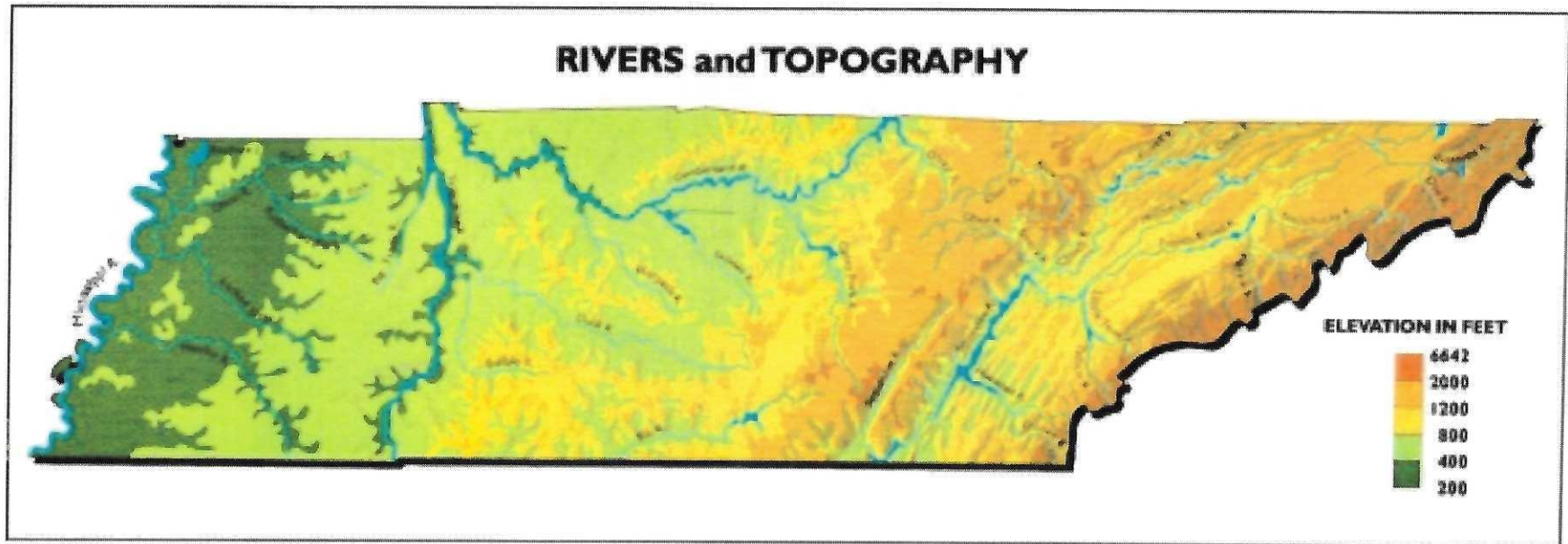


Figure 8

Topography of Middle and East Tennessee

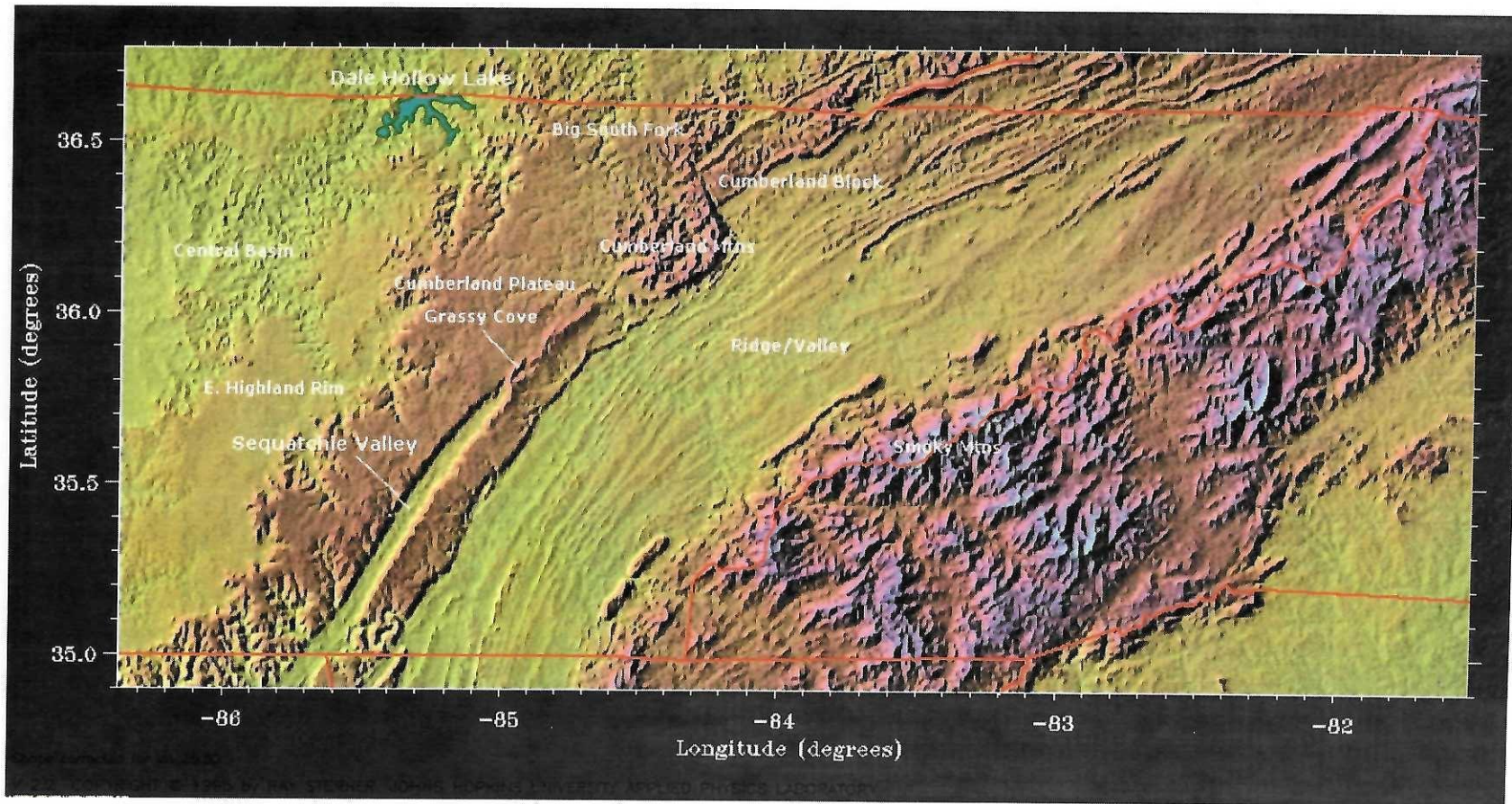


Figure 9

Elevations of the Upper Cumberland and Surrounding Areas

	Period of Record	Elevation	Lat	Long	County	Location
Allardt	1981-2010	1645	36.3806	-84.8744	Fentress	In
Crossville AP	1981-2010	1867	35.9508	-85.0814	Cumberland	In
Fall Creek Falls SP	1981-2010	1790	35.6392	-85.3586	Van Buren	In
Celina	1981-2010	540	36.5408	-85.4594	Clay	In
Cookeville	1981-2010	1090	36.1075	85.5033	Putnam	In
Lafayette	1981-2010	975	36.5192	-86.03	Macon	In
McMinnville	1981-2010	940	35.6719	-85.7811	Warren	In
Pickett SP	1981-2010	1625	36.5514	-84.7967	Pickett	In
Smithville 2 SE	1981-2010	890	35.9419	-85.7892	DeKalb	In
Sparta Water Plant	1981-2010	920	35.9336	-85.4706	White	In
Carthage	1981-2010	515	36.2456	-85.9444	Smith	In
Gainesboro	1981-2010	487	36.3661	-85.6553	Jackson	In
Woodbury 1 WNW	1981-2010	750	35.8375	-86.0894	Cannon	In
Newcomb	1981-2010	985	36.5522	-84.1722	Campbell	NE
Oneida	1981-2010	1440	36.5028	-84.5308	Scott	NE
Kingston	1981-2010	730	35.8581	-84.5275	Roane	E
Norris	1981-2010	1110	36.2131	-84.0603	Anderson	E
Oak Ridge ATDD	1981-2010	905	36.0028	-84.2486	Anderson	E
Rockwood	1981-2010	860	35.8528	-84.705	Roane	E
Tazewell	1981-2010	1365	36.465	-83.5603	Claiborne	E
Cleveland Filter Plant	1981-2010	800	35.2203	-84.7981	Bradley	SE
Dayton 2 SE	1981-2010	865	35.4717	-84.9947	Rhea	SE
Chattanooga AP	1981-2010	671	35.0311	-85.2014	Hamilton	S
Winchester 1 E	1981-2010	940	35.1803	-86.0925	Franklin	S
Lynchburg	1981-2010	810	35.2983	-86.3631	Moore	SW
Manchester #2	1981-2010	1070	35.5158	-86.0875	Coffee	SW
Lebanon	1981-2010	525	36.2292	-86.3181	Wilson	W
Murfreesboro 5 N	1981-2010	535	35.9203	-86.3728	Rutherford	W
Clarksville No. 2	1981-2010	496	36.4975	-87.3356	Montgomery	NW
Clarksville Outlaw Fld	1981-2010	560	36.6239	-87.4194	Montgomery	NW
Clarksville WWTP	1981-2010	402	36.5472	-87.3353	Montgomery	NW
Springfield Exp Stn	1981-2010	745	36.4711	-86.8414	Robertson	NW

Figure 10

### Median Last 28°F Freeze Southeast United States

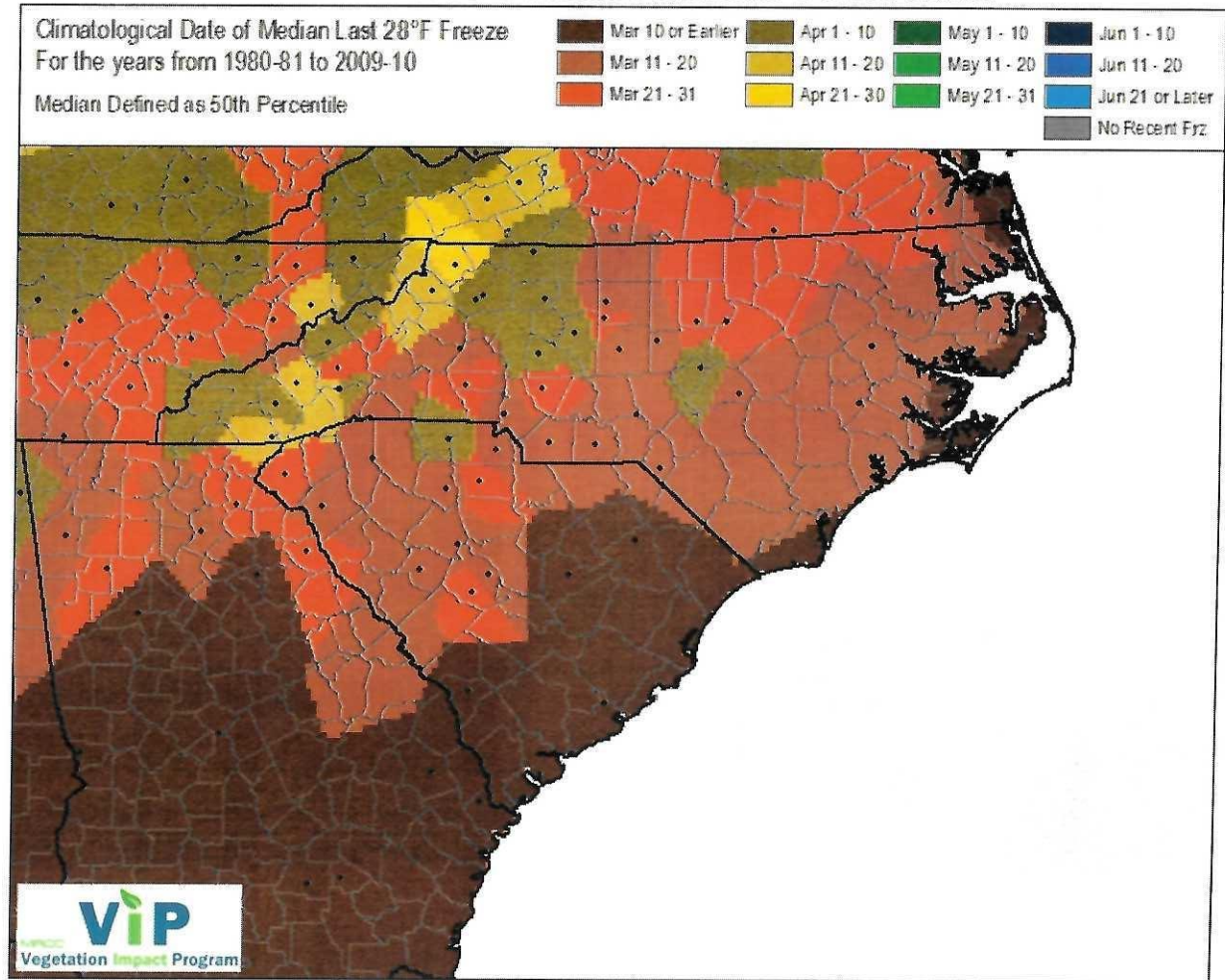


Figure 11

Median First 28°F Freeze Southeast United States

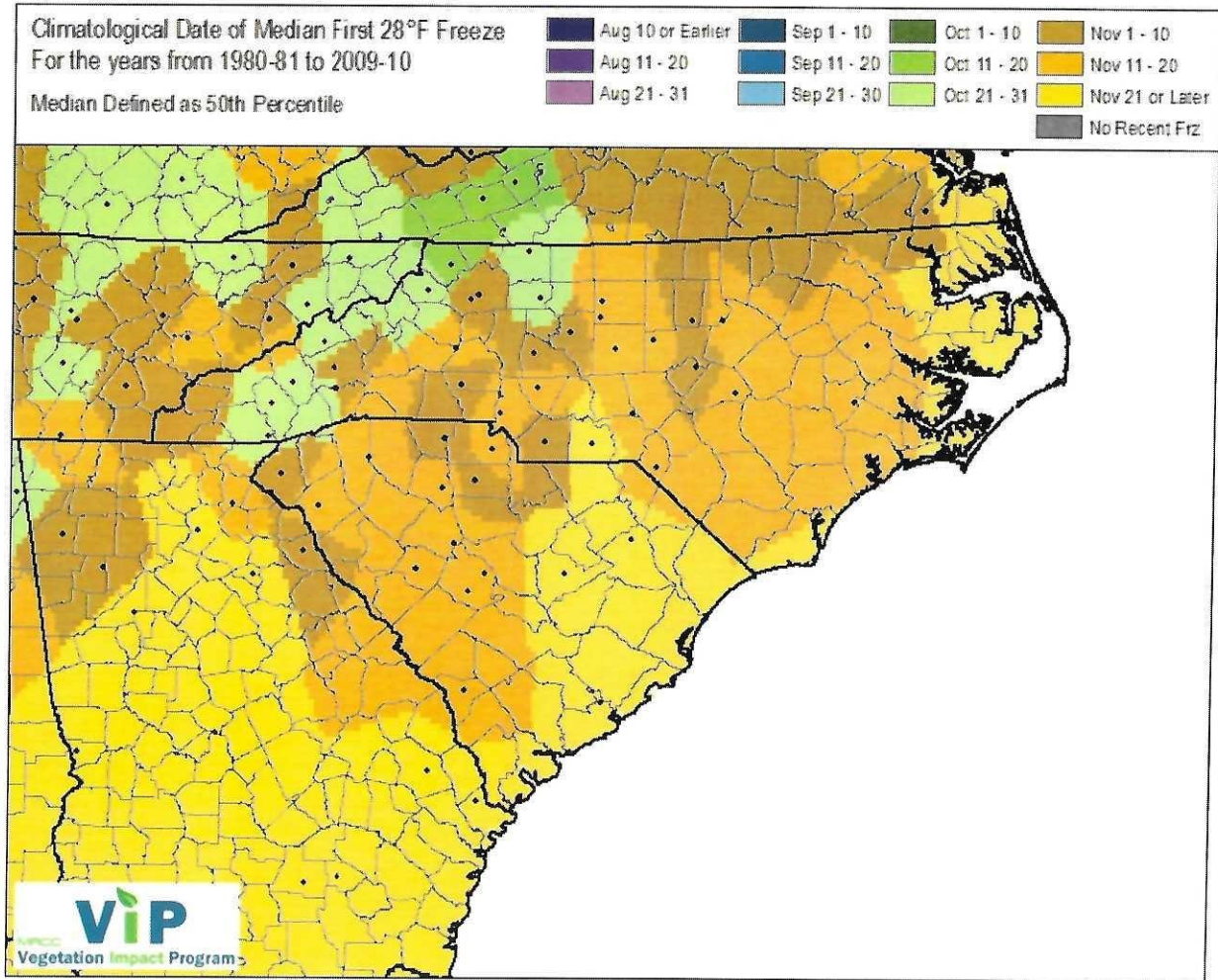


Figure 12

Plant Hardiness Map of Tennessee

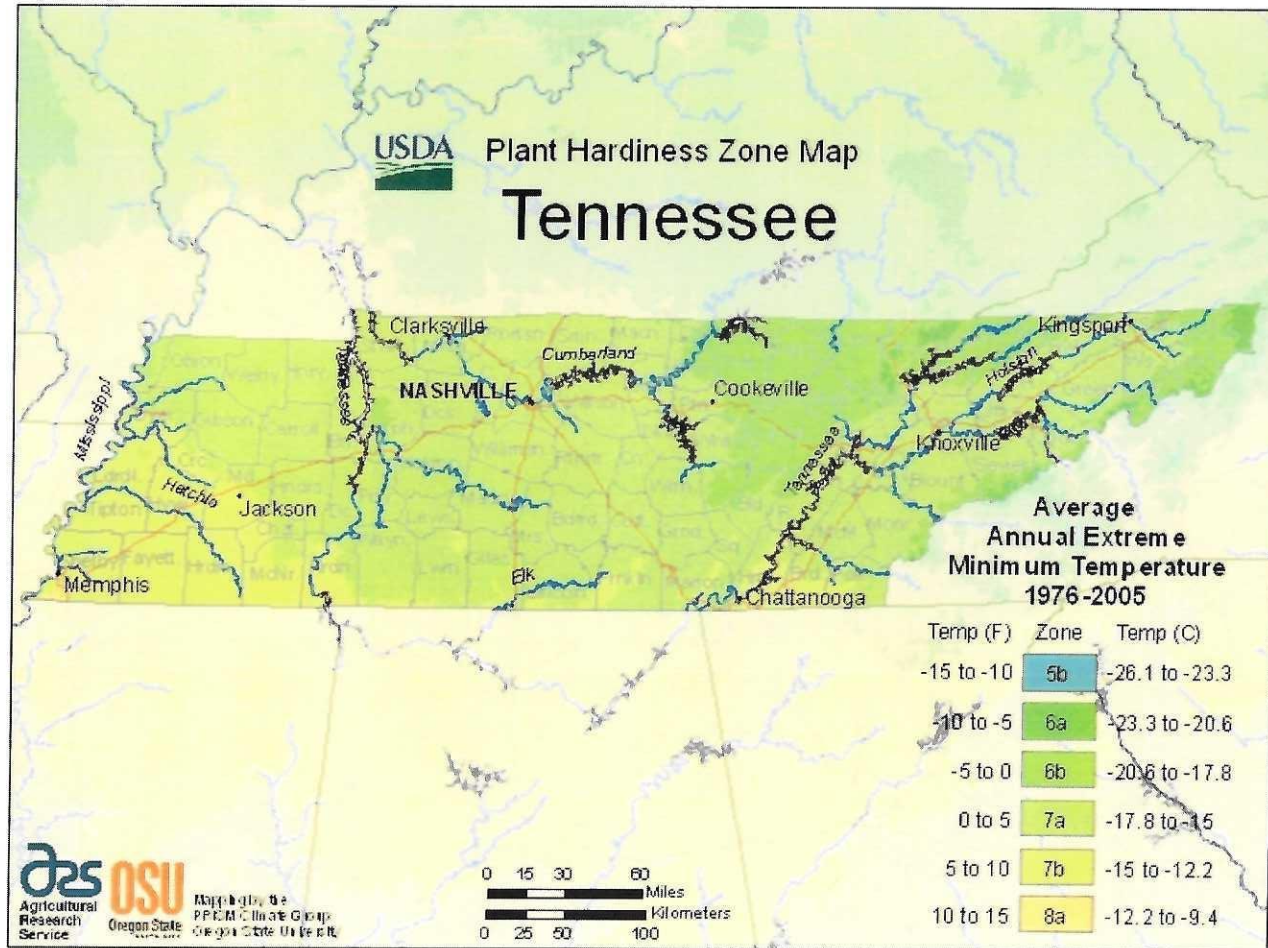
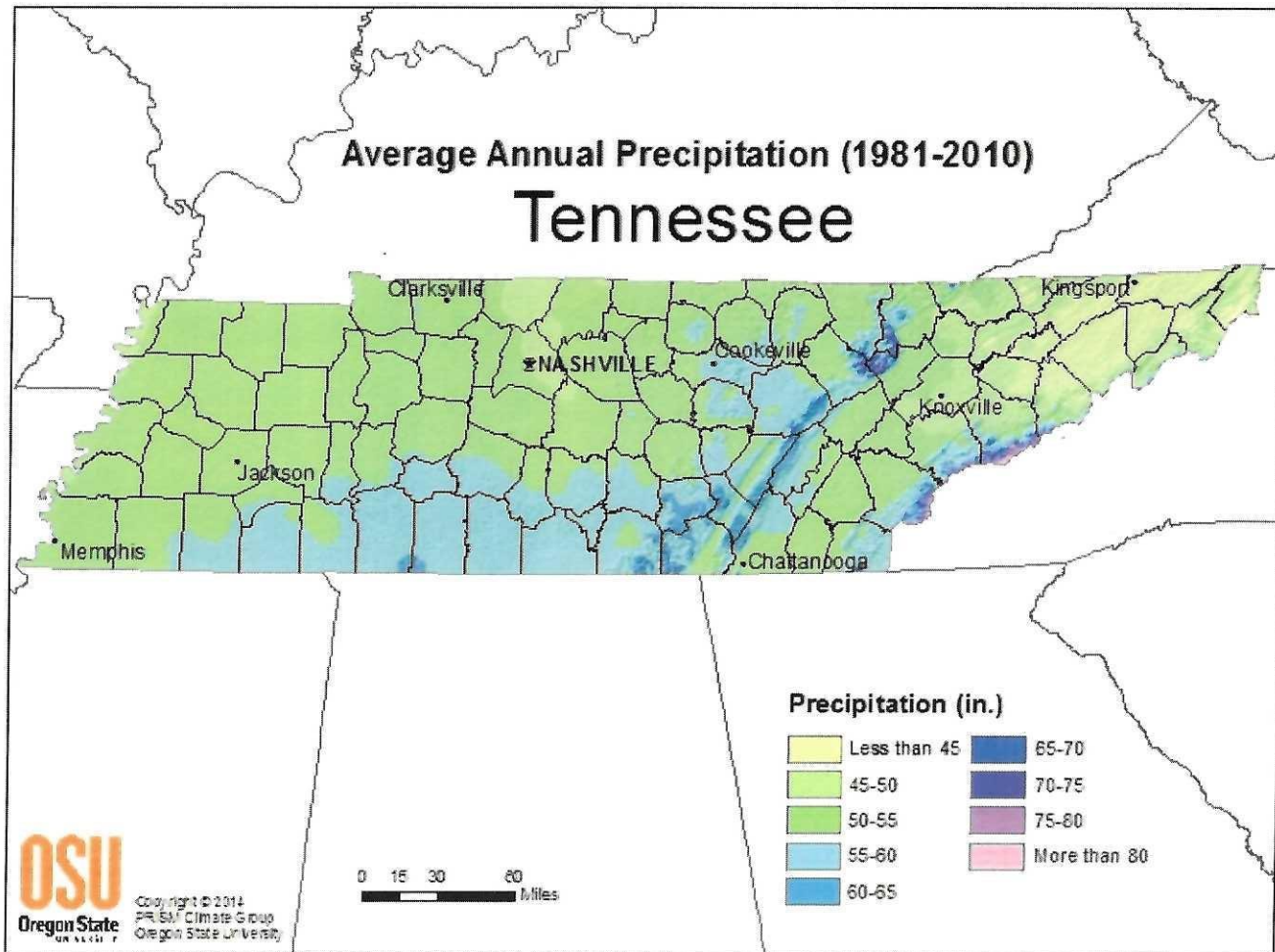




Figure 13

Tennessee Average Annual Precipitation



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