Chronology of Events in the Geologic History of Virginia

Page One - Oldest History. Read from bottom to top

Age (mya)	Events	Virginia Provinces	Observation/ Interpretation	Cross Section
Unconformity Taconic mountains in eastern Virginia eroded to peneplain; no direct evidence remaining				
450 - 435 Mid to Late Ordovician	**Taconic Orogeny** Gander terrane (Chopawansic+Arvonia+ ?microcontinent) collides with east coast. first stage of Protoatlantic closing (see Wilson cycle)	**Blue Ridge and Piedmont** east to about Richmond	Mountain building; Hayesville fault active in Blue Ridge; metamorphism and deformation.	
		Shenandoah Valley (**Valley and Ridge**) and west	Shendoah valley = eastern flysch basin (lithic rich turbidites). To west is cratonic basin dominated by storm shelf deposits (Reedsville fm.) These are the "Queenston clastic wedge."	**H**
570 - 435 Cambrian to middle Ordovician (events occuring out in the Protoatlantic while Virginia is a tectonically stable continental margin	**Arvonia Volcanic Arc** active in lower to middle Ordovician	**Avalon Terrane in Piedmont** (Terrane begins in Iapetus (Protoatlantic) ocean; later collides with North America to cause Taconic orogeny)	Graptolite bearing flysch unconformably overlying Chopawamsic arc volcanics	**G**
	Chopawamsic Volcanic Arc	**Chopawamsic Belt in Piedmont** (now a narrow synclinal terrane just west of Fredricksburg.	Mafic volcanics cut by granite plutons at 500 mya; plus flysch deposits (lithic rich turbidity deposits). Probably created by west dipping subduction zone.	**E,F**
570 - 450 Cambrian to Middle Ordovician	**Continental Margin Deposition**	**Valley and Ridge**, esp Shenandoah Valley and subsurface under **Piedmont**	Deposition of eastward thickening wedge of tidal flat and shelf carbonates as rifted margin colls and subsides. "Africa" rifts away.	**D**
640 - 570 Late Proterozoic up to Earliest Cambrian	**Rifting** of "Africa" and North America and opening of the Protoatlantic (Iapetus) ocean	**Piedmontprovince** including far wesern **piedmont**, in a belt running through the Charlotesville and Culpepper area	Rifts are filled. Earliest stable continental margin deposition; transgressive quartz ss (Antietam fm,) marks the transition.	**C**
			Catoctin flood basalts indicate initiation of ocean crus formation.	
			Active rifting; rifts filled with (sub)arkosic sandstones and conblomerates and basin shales. Rift system is complicated; see links.	**B**
690 - 570 Late Proterozoic	**Crossnore Plutonic Event**	**Blue Ridge**	Felsic (alkali) volcanics at Mt. Rogers and South Mountain hot spots. Early stage rifting	
Unconformity Grenville mountains across Virginia eroded to peneplain; nonconformity in Blue Ridge				
915 - 1800 Early, Mid, Late Proterozoic	**Grenville Orogeny** "Africa" collides and fuses with North America (915-940) creating a supercontinent (Rodinia)	**Blue Ridge** and and same age rocks in **Piedmont** (Sauratown Mtn, and Goochland belts)	A very complex history 8-900 mil years long involving perhaps several orogenies and rifting events (Wilson cycles)	**A**

Chronology of Events in the Geologic History of Virginia

Page Two - Most Recent History. Read from bottom to top

Age (mya)	Events	Virginia Provinces	Observation/ Interpretation	Cross Section
Unconformity In Progress. Creation of present topography and continued erosion.				
65 - 0 Cenozoic	**Rejuvenation**	Blue Ridge, Valley and Ridge, Allegheny Plateau	Gentle uplift; long, resistant, ridges , water gaps (trellis drainage); dendritic drainage on the Allegheny plateau	
Unconformity Most of Virginia eroded to a peneplain by the end of the Cretaceous				
192 - 0 Cretaceous and Cenozoic	**Continental Margin**	Coastal Plain and Continental Shelf	Eastward thickening wedge of marine and near shore sediments (often unconsolidated)	**M**
230-192 Triassic and Lower Jurassic	**Rifting** and the opening of the Atlantic ocean	Piedmont and under the Coastal Plain; Culpepper, Richmond, Farmville, etc. basins.	Rift graben clastics (border conglomerates, fluvial and lake) and mafic intrusive and extrusive igneous rocks.	**L**
Erosion and Unconformity Allegheny mountains across most of Virginia undergoes erosion; extent of erosion unknown				
320 - 230 Pennsylvanian and Permian	**Alleghenian Orogeny** Gondwana (Africa) collides with eastern North America to create the supercontinent Pangaea. Final stage in closing of Protoatlantic (Wilson Cycle)	Allegheny Plateau	Molasse deposits (deltaic and shallow marine) spreading westward as far as Kansas	**K**
		Piedmont, Blue Ridge, Valley and Ridge	Ramp and flat thrust faulting and folding	
		Goochland terrane in eastern Piedmont	Plutonism (313-285 mya) metamorphism and deformation	
350 - 320 Mississippian	**Orogenic Calm** and final erosion of the Acadian mountains	Allegheny Plateau	Deposition of shelf carbonates (oolites, biosparites, etc.) in far western Virginia; clastics in SW Virginia and Pennsylvania	
Unconformity Acadian soureland in eastern Virginia erodes; but no direct evidence; remains in Avalon terrane				
370 - 350 Mid- to Late Devonian	**Acadian Orogeny** Avalon terrane extending from Virginia north to New England collides with east coast. Second state in Wilson cycle closing of Protoatlantic (Rheic ocean)	Valley and Ridge and under Allegheny Plateau	Catskill clastic wedge deposited in foreland basin of western Virginia, and Pennsylvania and West Virginia	**J**
		Blue Ridge	Fries-Rockfish valley fault activated; regional metamorphism	
		Avalon Terrane in Piedmont; Charlotte, Carolina state, and Goochland belts	Deformation, intrusion, volcanism, and metamorphism.	
435 - 370 Silurian and Early Devonian	**Orogenic Calm** Central Appalachian Basin	Valley and ridge and rocks now under Allegheny Plateau into W. VA. and Ohio	Blue Ridge/western Piedmont a low sourceland. To west a slowly subsiding basin of quartz sandstone, tidal and reef carbonates/evaporates.	**I**