

Water Words Dictionary – Appendix F-1

GEOLOGIC TIME CHART

THE CENOZOIC ERA — 65,000,000 Years Ago to the Present

Dates	Period (System)	Epoch (Series)	Age (Stage)	Physical/Biological Features
10,000 Years Ago	QUATERNARY	HOLOCENE	(Present)	Continental glaciers restricted to antarctica and Greenland; extinction of giant mammals; development and spread of modern human culture.
1,800,000		PLEISTOCENE	Wisconsinan	Continental glaciers covered much of Northern North America and Northwestern Europe; volcanoes along the west coast of the U.S.; many giant mammals; appearance of modern man late in Pleistocene.
			Sangamonian	
			Illinoian	
			Yarmouthian	
			Kansan	
			Aftonian	
			Nebraskan	
5,000,000	TERTIARY	PLIOCENE	Blancan	Western North America uplifted; most recent uplift of Sierra Nevadas, much modernization of mammals; first possible apelike humans appeared in Africa.
			Hemphillian	
22,500,000		MIOCENE	Clarendonian	Renewed uplift of Rocky Mountains and Sierra Nevada Mountains; great lava flows in Western U.S.; mammals began to acquire modern characteristics; dogs, modern type horses, manlike apes appeared.
			Barstovian	
			Hemingfordian	
38,000,000		OLIGOCENE	Arikareean	Many older types of mammals became extinct; mastodons, first monkeys, and apes appeared.
			Whitneyan	
			Orellan	
	Chadronian			
54,000,000	EOCENE	Duchesnean	Mountains raised in Rockies, Andes, Alps, and Himalayas; continued expansion of early mammals; primitive horses appeared.	
		Uintan		
		Bridgerian		
		Wasatchian		
65,000,000	PALEOCENE	Clarkforkian	Great development of primitive mammals	
		Tiffanian		
		Torrejonian		
		Dragonian		
		Puercan		

MESOZOIC ERA — 225 Million Years Ago to 65 Million Years Ago

Dates	Period	Physical/Biological Features
65,000,000 – 136,000,000	CRETACEOUS	Rocky Mountains began to rise; most plants, invertebrate animals, fishes, and birds of modern types; dinosaurs reached maximum development and then became extinct; mammals small and very primitive.
136,000,000 – 190,000,000	JURASSIC	Granite foundation of Sierra Nevada Mountains laid down; conifers and cycads dominant among plants; primitive birds appeared.
190,000,000 – 225,000,000	TRIASSIC	Lava flows in East North America; ferns and cycads dominant among plants; modern corals appeared and some insects of modern types; great expansion of reptiles including earliest dinosaurs.

PALEOZOIC ERA — 570 Million Years Ago to 225 Million Years Ago

Dates	Period		Physical/Biological Features
225,000,000 – 280,000,000	PERMIAN		Final folding of Appalachians and central European ranges; great glaciers in Southern Hemisphere and reefs in warm northern seas; trees of coal forests declined; ferns abundant; conifers present; first cycads and ammonites appeared; trilobites became extinct; reptiles surpassed amphibians.
280,000,000 – 320,000,000	PENNSYLVANIAN	CARBONIFEROUS	Mountains grew along east coast of North America and in central Europe; great coal swamp forests flourished in Northern Hemisphere; seed-bearing ferns abundant; cockroaches and first reptiles appeared.
320,000,000 – 345,000,000	MISSISSIPPIAN		Land plants became diversified, including many ancient kinds of trees; crinoids achieved greatest development; sharks of relatively modern types appeared; little evidence of land animals.
345,000,000 – 395,000,000	DEVONIAN		Mountains raised in New England; land plants evolved rapidly, large trees appeared; brachiopods reached maximum development; many kinds of primitive fishes; first sharks, insects, and amphibians appeared.
395,000,000 – 435,000,000	SILURIAN		Great mountains formed in northwestern Europe; first small land plants appeared; corals built reefs in far northern seas; shelled cephalopods abundant; trilobites began decline; first jawed fish appeared.
435,000,000 – 500,000,000	ORDOVICIAN		Mountains elevated in New England; volcanoes along Atlantic Coast; much limestone deposited in shallow seas; great expansion among marine invertebrate animals, all major groups present; first primitive jawless fish appeared.
500,000,000 – 570,000,000	CAMBRIAN		Shallow seas covered parts of continents; first abundant record of marine life, especially trilobites and brachiopods; other fossils rare.

PRECAMBRIAN ERA — 5 Billion Years Ago to 570 Million Years Ago

Dates	Period	Physical/Biological Features
570,000,000 – 2,500,000,000	LATE PRECAMBRIAN (Algonkian)	Metamorphosed sedimentary rocks, lava flows, granite; history complex and obscure; first evidence of life, calcareous algae and invertebrates.
2,500,000,000 – 4,550,000,000	EARLY PRECAMBRIAN (Archean)	Crust formed on molten earth; crystalline rocks much disturbed; history unknown.