

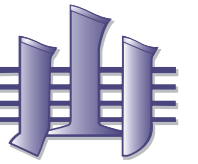


# INTERNATIONAL CHRONOSTRATIGRAPHIC CHART

www.stratigraphy.org

International Commission on Stratigraphy

v 2018/08



Eonothem / Eon	Erathem / Era	System / Period	Series / Epoch	Stage / Age	GSSP	numerical age (Ma)	
Phanerozoic	Cenozoic	Quaternary	Holocene	Meghalayan	U/L	present	
				Northgrippian	M	0.0042	
				Greenlandian	L/E	0.0082	
			Pleistocene	Upper	0.0117		
					Middle	0.126	
						Calabrian	0.781
					Lower	Gelasian	1.80
						Piacenzian	2.58
			Pliocene	Zanclean	3.600		
				Messinian	5.333		
	Neogene	Miocene	Tortonian	7.246			
			Serravallian	11.63			
			Langhian	13.82			
			Burdigalian	15.97			
			Aquitanian	20.44			
			Chattian	23.03			
			Oligocene	Rupelian	27.82		
				Priabonian	33.9		
			Paleogene	Eocene	Bartonian	37.8	
					Lutetian	41.2	
	Ypresian	47.8					
	Thanetian	56.0					
	Palaeocene	59.2					
	Mesozoic	Cretaceous	Upper	Selandian	61.6		
				Danian	66.0		
				Maastrichtian	72.1 ± 0.2		
				Campanian	83.6 ± 0.2		
				Santonian	86.3 ± 0.5		
			Lower	Coniacian	89.8 ± 0.3		
				Turonian	93.9		
				Cenomanian	100.5		
				Albian	~ 113.0		
				Aptian	~ 125.0		
	Paleocene	Lower	Barremian	~ 129.4			
			Hauterivian	~ 132.9			
Valanginian			~ 139.8				
Berriasian			~ 145.0				

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Phanerozoic	Mesozoic	Jurassic	Upper	Tithonian		~ 145.0
				Kimmeridgian	152.1 ± 0.9	
			Middle	Oxfordian	157.3 ± 1.0	
				Callovian	163.5 ± 1.0	
				Bathonian	166.1 ± 1.2	
				Bajocian	168.3 ± 1.3	
				Aalenian	170.3 ± 1.4	
			Lower	Toarcian	174.1 ± 1.0	
				Pliensbachian	182.7 ± 0.7	
				Sinemurian	190.8 ± 1.0	
	Triassic	Upper	Hettangian	199.3 ± 0.3		
			Rhaetian	201.3 ± 0.2		
			Norian	~ 208.5		
			Carnian	~ 227		
			Ladinian	~ 237		
		Middle	Anisian	~ 242		
			Olenekian	247.2		
			Induan	251.2		
			Changhsingian	251.902 ± 0.024		
			Wuchiapingian	254.14 ± 0.07		
	Paleozoic	Permian	Lopingian	Lopingian	259.1 ± 0.5	
				Capitanian	265.1 ± 0.4	
				Wordian	268.8 ± 0.5	
				Roadian	272.95 ± 0.11	
				Kungurian	283.5 ± 0.6	
			Cisuralian	Artinskian	290.1 ± 0.26	
				Sakmarian	293.52 ± 0.17	
				Asselian	298.9 ± 0.15	
				Gzhelian	303.7 ± 0.1	
				Kasimovian	307.0 ± 0.1	
	Carboniferous	Pennsylvanian	Upper	Bashkirian	315.2 ± 0.2	
				Serpukhovian	323.2 ± 0.4	
			Middle	Visean	330.9 ± 0.2	
				Moscovian	346.7 ± 0.4	
				Tournaisian	~ 145.0	
Lower		Tournaisian	358.9 ± 0.4			

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Phanerozoic	Paleozoic	Devonian	Upper	Famennian		372.2 ± 1.6
				Frasnian	382.7 ± 1.6	
				Givetian	387.7 ± 0.8	
				Eifelian	393.3 ± 1.2	
				Emsian	407.6 ± 2.6	
			Middle	Pragian	410.8 ± 2.8	
				Lochkovian	419.2 ± 3.2	
				Pridoli	423.0 ± 2.3	
				Ludlow	425.6 ± 0.9	
				Gorstian	427.4 ± 0.5	
	Lower	Homerian	430.5 ± 0.7			
		Sheinwoodian	433.4 ± 0.8			
		Telychian	438.5 ± 1.1			
		Aeronian	440.8 ± 1.2			
		Rhuddanian	443.8 ± 1.5			
	Silurian	Upper	Hirnantian	445.2 ± 1.4		
			Katian	453.0 ± 0.7		
			Sandbian	458.4 ± 0.9		
			Darriwilian	467.3 ± 1.1		
			Dapingian	470.0 ± 1.4		
		Middle	Floian	477.7 ± 1.4		
			Tremadocian	485.4 ± 1.9		
			Furongian	~ 489.5		
			Jiangshanian	~ 494		
			Paibian	~ 497		
	Ordovician	Upper	Guzhangian	~ 500.5		
			Drumian	~ 504.5		
			Wuliuan	~ 509		
			Stage 4	~ 514		
			Stage 3	~ 521		
		Middle	Stage 2	~ 529		
			Terreneuvian	541.0 ± 1.0		

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Precambrian	Proterozoic	Neo-proterozoic	Ediacaran			541.0 ± 1.0
			Cryogenian	~ 635		
			Tonian	~ 720		
		Meso-proterozoic	Stenian	1000		
			Ectasian	1200		
			Calymmian	1400		
			Paleo-proterozoic	Statherian	1600	
				Orosirian	1800	
				Rhyacian	2050	
				Siderian	2300	
	Archean	Neo-archean		2500		
				2800		
				3200		
				3600		
				4000		
		Eo-archean		~ 4600		

Units of all ranks are in the process of being defined by Global Boundary Stratotype Section and Points (GSSP) for their lower boundaries, including those of the Archean and Proterozoic, long defined by Global Standard Stratigraphic Ages (GSSA). Charts and detailed information on ratified GSSPs are available at the website <http://www.stratigraphy.org>. The URL to this chart is found below.

Numerical ages are subject to revision and do not define units in the Phanerozoic and the Ediacaran; only GSSPs do. For boundaries in the Phanerozoic without ratified GSSPs or without constrained numerical ages, an approximate numerical age (~) is provided.

Ratified Subseries/Subepochs are abbreviated as U/L (Upper/Late), M (Middle) and L/E (Lower/Early). Numerical ages for all systems except Quaternary, upper Paleogene, Cretaceous, Triassic, Permian and Precambrian are taken from 'A Geologic Time Scale 2012' by Gradstein et al. (2012), those for the Quaternary, upper Paleogene, Cretaceous, Triassic, Permian and Precambrian were provided by the relevant ICS subcommissions.

Colouring follows the Commission for the Geological Map of the World (<http://www.ccgw.org>)

Chart drafted by K.M. Cohen, D.A.T. Harper, P.L. Gibbard, J.-X. Fan (c) International Commission on Stratigraphy, August 2018

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URL: <http://www.stratigraphy.org/ICSChart/ChronostratChart2018-08.pdf>

