



Commission de la Carte Geologique  
du Monde  
Commission on the Geological Map  
of the World

# INTERNATIONAL STRATIGRAPHIC CHART

International Union of Geological Sciences

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International Commission on Stratigraphy

EONOTHEM EON	ERATHEM ERA	SYSTEM PERIOD	SERIES EPOCH	STAGE AGE	AGE Ma SEPM Spec. Vol. #54 (1995) +/-	STAGE NOTATION	SERIES NOTATION	SYSTEM NOTATION		
<b>PHANEROZOIC</b>	<b>CENOZOIC</b>	Quaternary	HOLOCENE		0.01		Q <sub>2</sub>	<b>Q</b>		
			PLEISTOCENE			Q <sub>1</sub>				
		NEOGENE	PLIOCENE	Calabrian		1.81	GSSP	n <sub>9</sub>	N <sub>2</sub>	<b>N</b>
				Gelasian		2.58	GSSP	n <sub>8</sub>		
				Piacenzian		3.60	GSSP	n <sub>7</sub>		
				Zanclean		5.32	GSSP	n <sub>6</sub>		
				Messinian		7.12	GSSP	n <sub>5</sub>		
			MIOCENE	Tortonian		11.2		n <sub>4</sub>	N <sub>1</sub>	
				Serravallian		14.8		n <sub>3</sub>		
				Langhian		16.4		n <sub>2</sub>		
				Burdigalian		20.5		n <sub>1</sub>		
				Aquitanian		23.8		n <sub>1</sub>		
		PALEOGENE	OLIGOCENE	Chattian		28.5	GSSP	e <sub>9</sub>	E <sub>3</sub>	<b>E</b>
				Rupelian		33.7	GSSP	e <sub>8</sub>		
				Priabonian		37.0		e <sub>7</sub>		
				Bartonian		41.3		e <sub>6</sub>		
				Lutetian		49.0		e <sub>5</sub>		
			EOCENE	Ypresian		55.0		e <sub>4</sub>	E <sub>2</sub>	
				Thanetian		57.9		e <sub>3</sub>		
				Selandian		61.0		e <sub>2</sub>		
				Danian		61.0		e <sub>1</sub>		
						65.5	GSSP	k <sub>6</sub>		
		CRETACEOUS	UPPER/LATE	Maastrichtian		71.3	GSSP	k <sub>5</sub>		
				Campanian		83.5		k <sub>4</sub>		
				Santonian		85.8		k <sub>3</sub>		
	Coniacian				89.0		k <sub>2</sub>			
	Turonian				93.5		k <sub>1</sub>			
	LOWER/EARLY		Cenomanian		98.9	GSSP	k <sub>1</sub>			
			Albian		112.2		b <sub>6</sub>	K <sub>1</sub>		
			Aptian		121.0		b <sub>5</sub>			
			Barremian		127.0		b <sub>4</sub>			
			Hauterivian		132.0		b <sub>3</sub>			
	Valanginian		136.5		b <sub>2</sub>					
	MESOZOIC	JURASSIC	Berriasian		142.0		b <sub>1</sub>	J <sub>2</sub>	<b>J</b>	
			Tithonian		150.7		j <sub>7</sub>			
			Kimmeridgian		154.1		j <sub>6</sub>			
			Oxfordian		159.4		j <sub>5</sub>			
			Callovian		164.4		j <sub>4</sub>			
		UPPER/LATE	Bathonian		169.2		j <sub>3</sub>	J <sub>1</sub>		
			Bajocian		176.5	GSSP	j <sub>2</sub>			
			Aalenian		180.1	GSSP	j <sub>1</sub>			
			Toarcian		189.6		l <sub>4</sub>			
			Pliensbachian		195.3		l <sub>3</sub>			
	LOWER/EARLY	Sinemurian		201.9	GSSP	l <sub>2</sub>	J <sub>1</sub>			
		Hettangian		205.1		l <sub>1</sub>				
		Rhaetian		209.6		t <sub>7</sub>		T <sub>3</sub>		
		Norian		220.7		t <sub>6</sub>				
		Carnian		227.4		t <sub>5</sub>				
	Ladinian		234.3		t <sub>4</sub>	T <sub>2</sub>				
	Anisian		241.7		t <sub>3</sub>					
	Olenekian		244.8		t <sub>2</sub>		T <sub>1</sub>			
	Induan		250	GSSP	t <sub>1</sub>					

EONOTHEM EON	ERATHEM ERA	SYSTEM PERIOD	SERIES EPOCH	STAGE AGE	AGE Ma Subcommissions or other sources +/-	STAGE NOTATION	SERIES NOTATION	SYSTEM NOTATION			
<b>PHANEROZOIC</b>	<b>PALEOZOIC</b>	<b>PERMIAN</b>	LOPINGIAN	Changhsingian	251.4		p <sub>9</sub>	<b>P<sub>3</sub></b>			
				Wuchiapingian	253.4		p <sub>8</sub>				
			GUADALUPIAN	Capitanian	265	GSSP	p <sub>7</sub>	<b>P<sub>2</sub></b>			
				Wordian		GSSP	p <sub>6</sub>				
				Roadian		GSSP	p <sub>5</sub>				
			CISURALIAN	Kungurian		283		p <sub>4</sub>	<b>P<sub>1</sub></b>		
					Artinskian		p <sub>3</sub>				
					Sakmarian		p <sub>2</sub>				
				Asselian		292		p <sub>1</sub>			
				CARBONIFEROUS	PENNSYLVANIAN	Gzhelian		320		GSSP	c <sub>7</sub>
		Kazimovian					327			c <sub>6</sub>	
		Moscovian					342			c <sub>5</sub>	
		MISSISSIPPIAN	Bashkirian			354		c <sub>4</sub>	<b>C<sub>1</sub></b>		
			Serpukhovian			364		c <sub>3</sub>			
			Visean			370		c <sub>2</sub>			
			Tournaisian			380		c <sub>1</sub>			
		<b>DEVONIAN</b>	UPPER/LATE	Famennian		391	GSSP	d <sub>7</sub>	<b>D<sub>3</sub></b>		
				Frasnian		400		d <sub>6</sub>			
				Givetian		412		d <sub>5</sub>			
			MIDDLE	Eifelian		417		d <sub>4</sub>		<b>D<sub>2</sub></b>	
				Emsian		423		d <sub>3</sub>			
			LOWER/EARLY	Pragian		428		d <sub>2</sub>		<b>D<sub>1</sub></b>	
				Lochkovian		440		d <sub>1</sub>			
				PRIDOLI		447		s <sub>8</sub>			<b>S<sub>4</sub></b>
				LUDLOW	Ludfordian		449				
	Gorstian				455		s <sub>6</sub>				
	WENLOCK	Homerian		467.5		s <sub>4</sub>	<b>S<sub>2</sub></b>				
		Sheinwoodian		475		s <sub>5</sub>					
	LLANDOVERY	Telychian		485		s <sub>3</sub>	<b>S<sub>1</sub></b>				
		Aeronian		495		s <sub>2</sub>					
		Rhuddanian		500		s <sub>1</sub>					
	<b>ORDOVICIAN</b>	UPPER/LATE	"sixth stage"		467.5	GSSP		<b>O<sub>3</sub></b>			
			"fifth stage"		475	GSSP					
		MIDDLE	Darriwilian		485		O <sub>2</sub>				
	LOWER/EARLY	"third stage"		495		O <sub>1</sub>	<b>O</b>				
		"second stage"	Tremadocian		495	GSSP					
	<b>CAMBRIAN</b>	UPPER/LATE		500			€ <sub>3</sub>	<b>€</b>			
		MIDDLE		520			€ <sub>2</sub>				
		LOWER/EARLY		545			€ <sub>1</sub>				

EONOTHEM EON	ERATHEM ERA	SYSTEM PERIOD	AGE (Defines these Eras and Periods)	NOTATION SYSTEM	NOTATION ERA	
<b>PRECAMBRIAN</b>	<b>PROTEROZOIC</b>	NEOPROTEROZOIC	540		NP <sub>3</sub>	
			650	GSSA	NP <sub>2</sub>	
			850	GSSA	NP <sub>1</sub>	
		MESOPROTEROZOIC	1000	GSSA	MP <sub>3</sub>	<b>MP</b>
			1200	GSSA	MP <sub>2</sub>	
			1400	GSSA	MP <sub>1</sub>	
			1600	GSSA	MP <sub>1</sub>	
		PALEOPROTEROZOIC	1800	GSSA	PP <sub>4</sub>	<b>PP</b>
			2050	GSSA	PP <sub>3</sub>	
			2300	GSSA	PP <sub>2</sub>	
2500	GSSA		PP <sub>1</sub>			
<b>ARCHEAN</b>	<b>ARCHEAN</b>	NEOARCHEAN			NA	
		MESOARCHEAN			MA	
		PALEOARCHEAN			PA	
		EOARCHEAN			EA	
		No subdivision into periods				

This 2000 edition of the International Stratigraphic Chart is intended to give a clear picture of the present state of the art in chronostratigraphic subdivisions of geological time, mentioning only units recommended for international use. A typographical distinction is made between **formal**, semiformal and *informal* units.

The 1986 Guidelines of ICS (COWIE et al, 1986) and their recent revision (REMANE et al, 1996) regulate the definition of the international chronostratigraphic/geochronologic units. The Revised Guidelines were voted by the full commission of ICS as a mandatory document. Both versions of the guidelines stipulate that global chronostratigraphic units are not defined by unit-stratotypes, but their lower boundary only, following the principle introduced with the definition of the base of the Devonian in 1972 (MARTINSSON, 1977). This is indeed the only way to arrive at a global chronostratigraphic scale made of strictly contiguous units.

Phanerozoic global chronostratigraphic boundaries are formally defined by a Global Standard Stratotype Section and Point (GSSP - COWIE et al, 1986), whereas Precambrian chronostratigraphic boundaries are formally defined in terms of absolute ages : Global Standard Stratigraphic Age (GSSA - REMANE et al, 1996). In order to become mandatory, a boundary definition as to be accepted by 60% majority in successive votes, first by the working group responsible for the choice of the GSSP, then by the concerned Subcommission of ICS and finally by the Full Commission of ICS. With its ratification through IUGS, the GSSP or GSSA becomes mandatory.

**FORMAL UNITS** (in bold characters) are all the those which have their lower boundary defined by a GSSP or GSSA voted by ICS in accordance with the Guidelines and ratified by IUGS. Proposed GSSPs (in bold italic) are pending ratification. **SEMIFORMAL UNITS** (normal characters): Several Subcommissions of ICS (Neogene, Paleogene, Jurassic, Triassic, Permian) have conducted a formal vote by postal ballot about the stage names which should be used and codified by a GSSP. But as long as no GSSP has been formally adopted, these units, recommendable as they are, have no formal status. **INFORMAL UNITS** (in italics) are not formally adopted by the Subcommissions.

The subdivisions used in the present Global Chart, are based on the proposals made by the concerned Subcommissions. Simplified subdivisions have, however been adopted for the Carboniferous and the Ordovician, in order to maintain the necessary homogeneity of presentation. The complete versions were included in the detailed explanatory note. Also some traditional names which are becoming obsolete have been omitted : Lias, Dogger, Malm in the Jurassic and Tertiary in the Cenozoic (the latter already abandoned in the first edition of this chart). "Tertiary" can be used as an informal name like Permotrias.

Numerical ages of the Phanerozoic chronostratigraphic boundaries were provided by Subcommission summaries, compilation in Episodes (1997) by Gradstein & Ogg, or other sources, and are subject to revision.

The letter/number symbols used for divisions down to stage/age rank and the colours of the individual units are established by the CGMW, taking as a basis its Geological Atlas of the World. This chart is updated periodically during its general assemblies occurring within the International Geological Congress and upon ratification of GSSPs by IUGS.