DNAG

DECADE OF NORTH AMERICAN GEOLOGY
GEOLOGIC TIME SCALE

GEOLOGICAL SOCIETY OF AMERICA

CENOZOIC

AGE (Ma)	PERIOD	EPOCH	AGE	PICKS (Ma)
	QUATERNARY	HOLOCENE		0.01
		PLEISTOCENE	CALABRIAN	1.6
	NEOGENE	PLIOCENE L	PIACENZIAN	3.4
		PLIOCENE E	ZANCLEAN	5.3
		MIOCENE L	MESSINIAN	6.5
			TORTONIAN	11.2
		MIOCENE M	SERRAVALLIAN	15.1
			LANGHIAN	16.6
		MIOCENE E	BURDIGALIAN	21.8
			AQUITANIAN	23.7
	PALEOGENE	OLIGOCENE L	CHATTIAN	30.0
		OLIGOCENE E	RUPELIAN	36.6
		EOCENE L	PRIABONIAN	40.0
			BARTONIAN	43.6
		EOCENE M	LUTETIAN	52.0
		EOCENE E	YPRESIAN	57.8
		PALEOCENE L	SELANDIAN: THANETIAN	60.6
			SELANDIAN: UNNAMED	63.6
		PALEOCENE E	DANIAN	66.4

TERTIARY

MESOZOIC

AGE (Ma)	PERIOD	EPOCH	AGE	PICKS (Ma)	UNCERT. (m.y.)
	CRETACEOUS	LATE	MAASTRICHTIAN	66.4	
			CAMPANIAN	74.5	4
			SANTONIAN	84.0	4.5
			CONIACIAN	87.5	2.5
			TURONIAN	88.5	
			CENOMANIAN	91	2.5
		EARLY	ALBIAN	97.5	4
			APTIAN	113	9
		NEOCOMIAN	BARREMIAN	119	9
			HAUTERIVIAN	124	8
			VALANGINIAN	131	5
			BERRIASIAN	138	5
	JURASSIC	LATE	TITHONIAN	144	12
			KIMMERIDGIAN	152	6
			OXFORDIAN	156	15
		MIDDLE	CALLOVIAN	163	15
			BATHONIAN	169	34
			BAJOCIAN	176	34
			AALENIAN	183	34
		EARLY	TOARCIAN	187	28
			PLIENSBACHIAN	193	32
			SINEMURIAN	198	18
			HETTANGIAN	204	18
	TRIASSIC	LATE	NORIAN	208	
			CARNIAN	225	8
		MIDDLE	LADINIAN	230	22
			ANISIAN	235	10
		EARLY	SCYTHIAN	240	22
				245	20

RAPID POLARITY CHANGES

PALEOZOIC

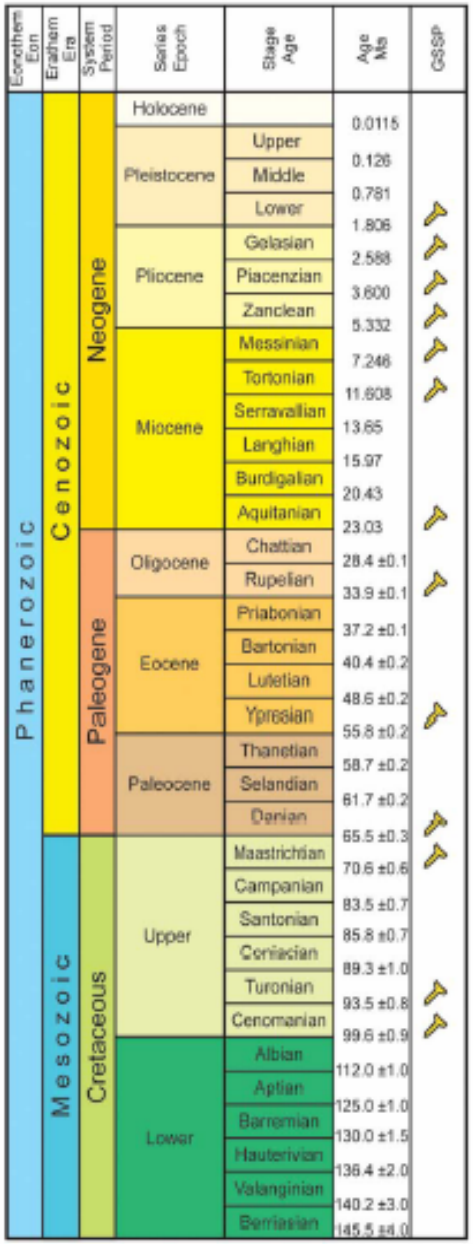
AGE (Ma)	PERIOD	EPOCH	AGE	PICKS (Ma)	UNCERT. (m.y.)
	PERMIAN	LATE	TATARIAN	245	20
			KAZANIAN	253	20
			UFIMIAN	258	24
		EARLY	KUNGURIAN	263	22
			ARTINSKIAN	268	12
			SAKMARIAN		
			ASSELIAN	286	12
	CARBONIFEROUS: PENNSYLVANIAN	LATE	GZELIAN / KASIMOVIAN (S.)	296	10
			MOSCOVIAN (W.)		
			BASHKIRIAN (W.)	315	20
			SERPUKHOVIAN (N.)	320	
	CARBONIFEROUS: MISSISSIPPIAN	EARLY	VISEAN	333	22
			TOURNAISIAN	352	8
	DEVONIAN	LATE	FAMENNIAN	360	10
			FRASNIAN	367	12
		MIDDLE	GIVETIAN	374	18
			EIFELIAN	380	18
		EARLY	EMSIAN	387	28
			SIEGENIAN	394	22
			GEDINNIAN	401	18
	SILURIAN	LATE	PRIDOLIAN	408	12
			LUDLOVIAN	414	12
		EARLY	WENLOCKIAN	421	12
			LLANDOVERIAN	428	8
	ORDOVICIAN	LATE	ASHGILLIAN	438	12
			CARADOCIAN	448	12
		MIDDLE	LLANDEILAN	458	16
			LLANVIRNIAN	468	16
		EARLY	ARENIGIAN	478	16
			TREMADOCIAN	488	20
	CAMBRIAN	LATE	TREMPEALEAUAN / FRANCONIAN / DRESBACHIAN	505	32
		MIDDLE		523	36
		EARLY		540	28
				570	

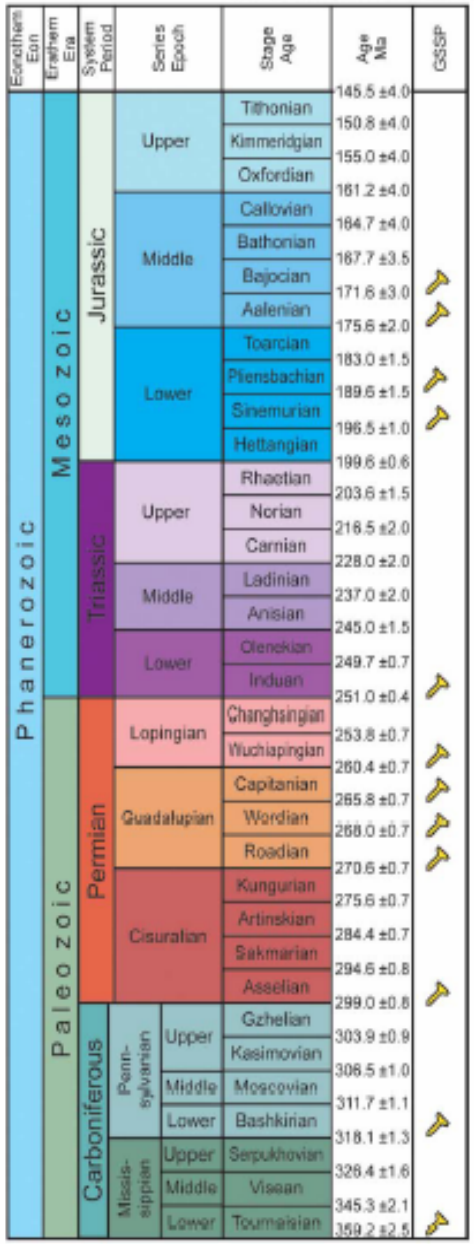
PRECAMBRIAN

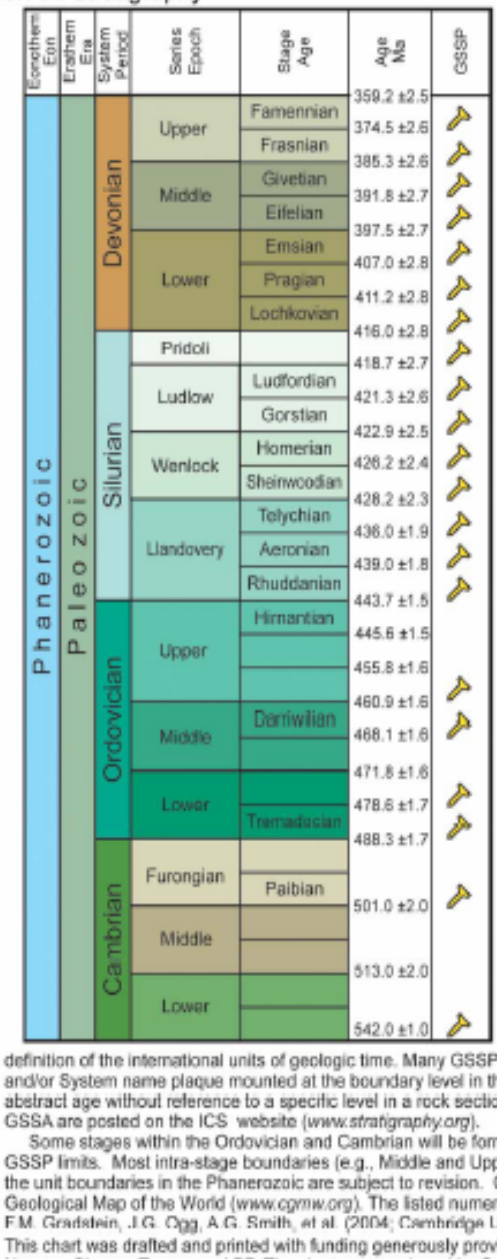
AGE (Ma)	EON	ERA	BDY. AGES (Ma)
	PROTEROZOIC	LATE	570
		MIDDLE	900
		EARLY	1600
	ARCHEAN	LATE	2500
		MIDDLE	3000
		EARLY	3400
			3800?

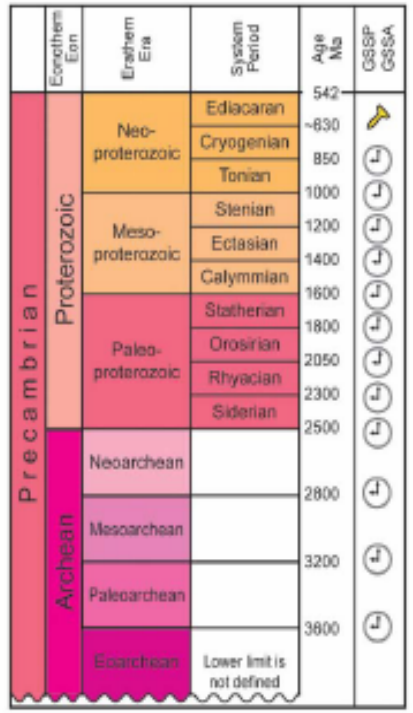
INTERNATIONAL STRATIGRAPHIC CHART

International Commission on Stratigraphy









Subdivisions of the global geologic record are formally defined by their lower boundary. Each unit of the Phanerozoic interval (~542 Ma to Present) and the base of the Ediacaran is defined by a Global Standard Section and Point (GSSP) at its base, whereas the Precambrian interval is formally subdivided by absolute age, Global Standard Stratigraphic Age (GSSA).

This chart gives an overview of the international chronostratigraphic units,their rank, their names and formal status. These units are approved by the International Commission on Stratigraphy (ICS) and ratified by the International Union of Geological Sciences (IUGS).

The Guidelines of the ICS (Remane et al., 1996, Episodes, 19: 77-81) regulate the selection and definition of the international units of geologic time. Many GSSP's actually have a 'golden' spike ( ) and Stage and/or System name plaque mounted at the boundary level in the boundary stratotype section, whereas a GSSA is an abstract age without reference to a specific level in a rock section on Earth. Updated descriptions of each GSSP and GSSA are posted on the ICS website (*www.stratigraphy.org*).

Some stages within the Ordovician and Cambrian will be formally named upon international agreement on their GSSP limits. Most intra-stage boundaries (e.g., Middle and Upper Aptian) are not formally defined. Numerical ages of the unit boundaries in the Phanerozoic are subject to revision. Colors are according to the Commission for the Geological Map of the World (*www.cgmw.org*). The listed numerical ages are from 'A Geologic Time Scale 2004', by F.M. Gradstein, J.G. Ogg, A.G. Smith, et al. (2004; Cambridge University Press).

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