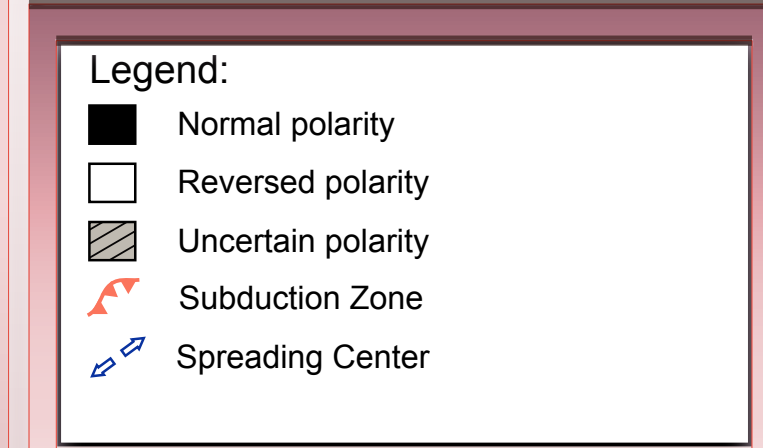
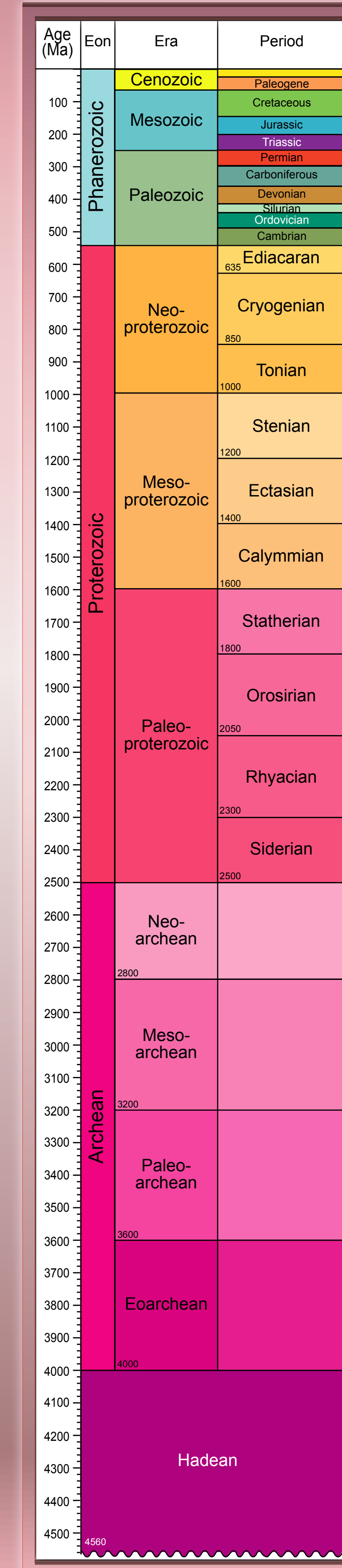
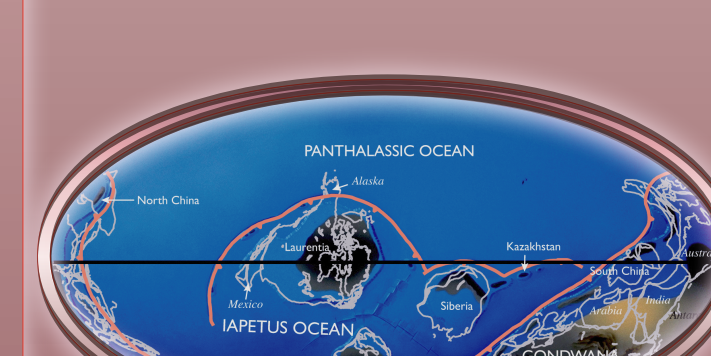
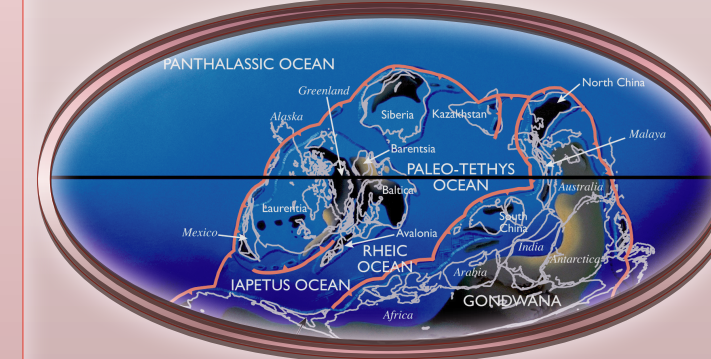
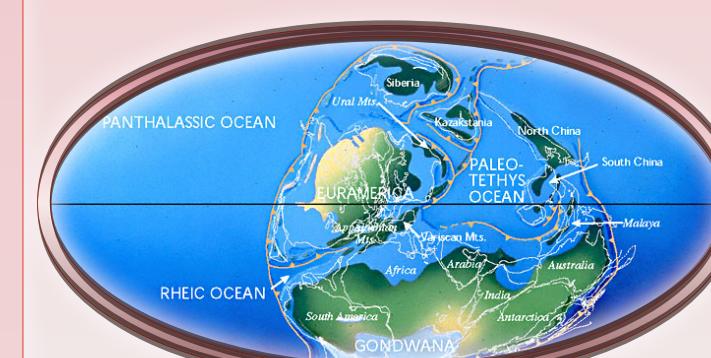
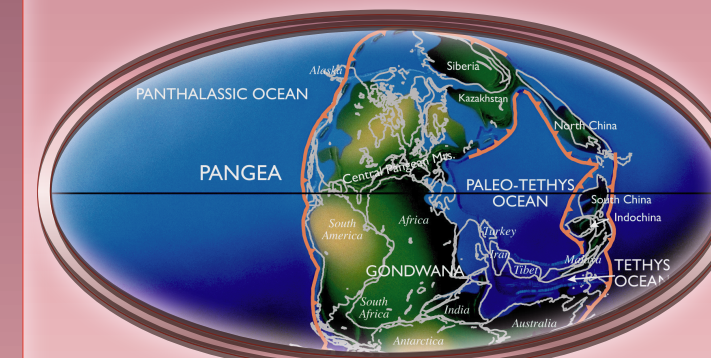
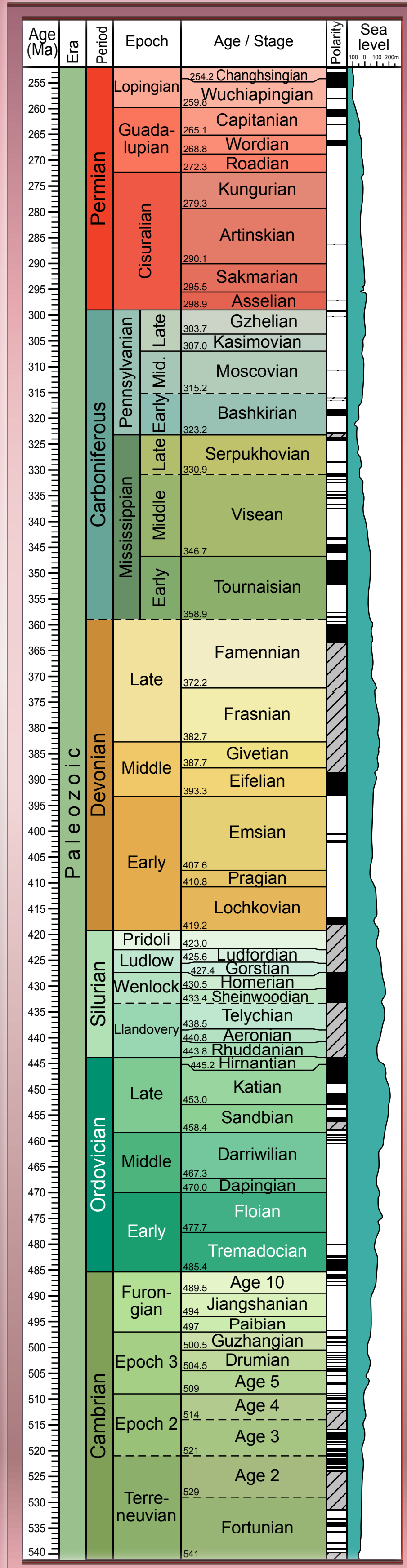
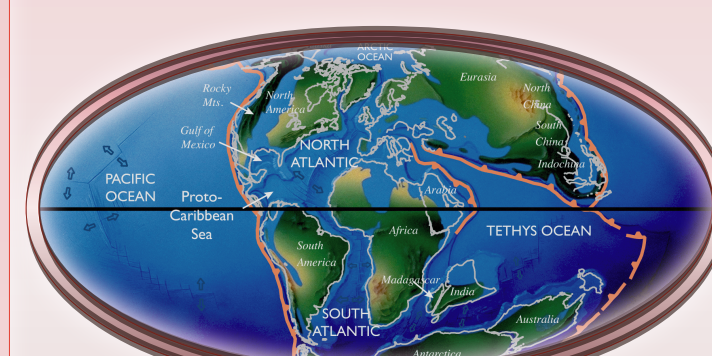
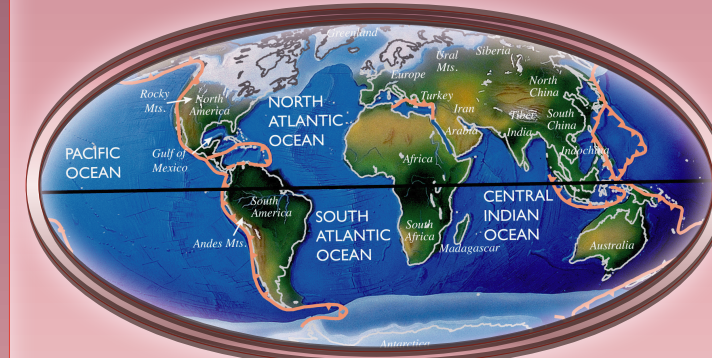
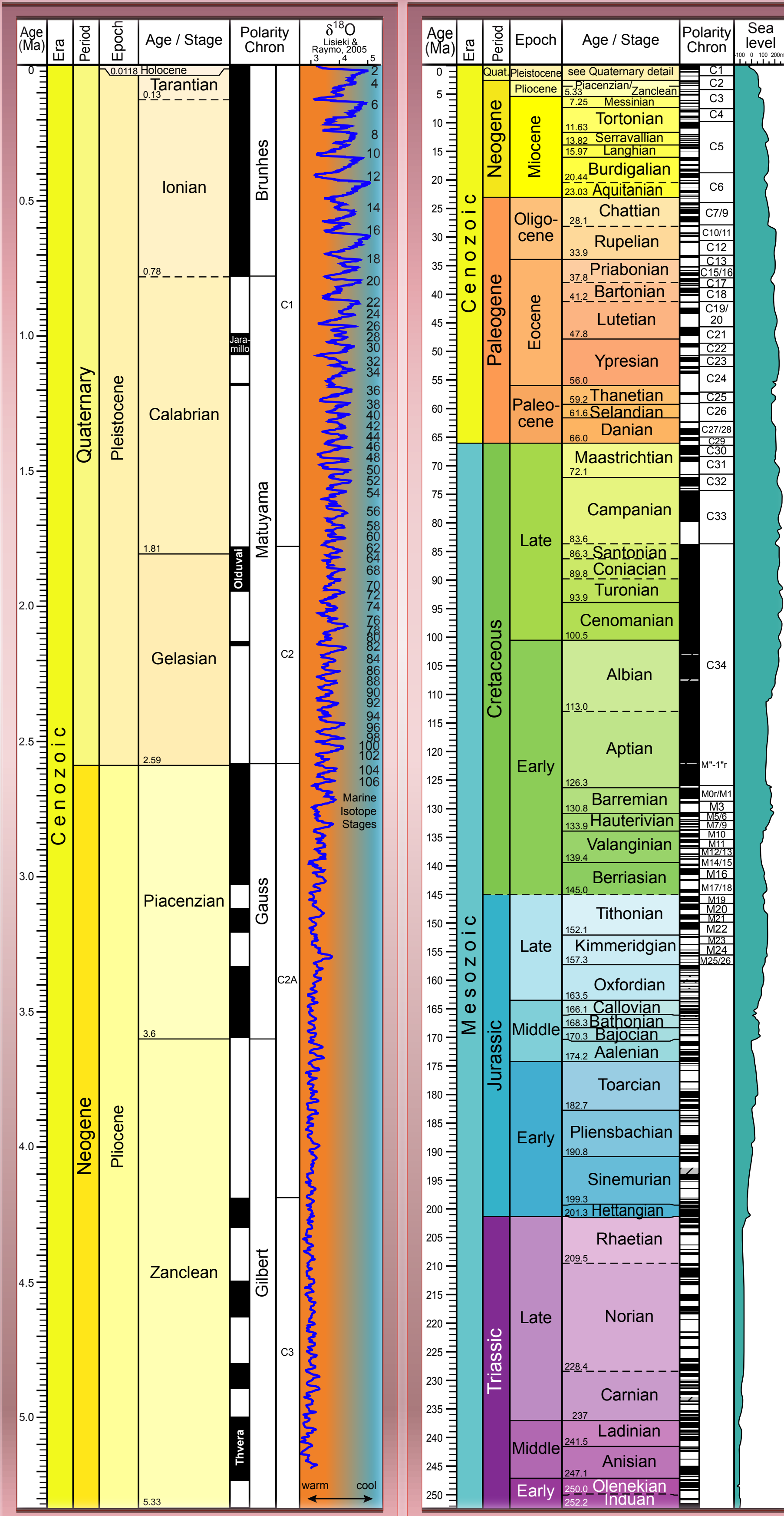


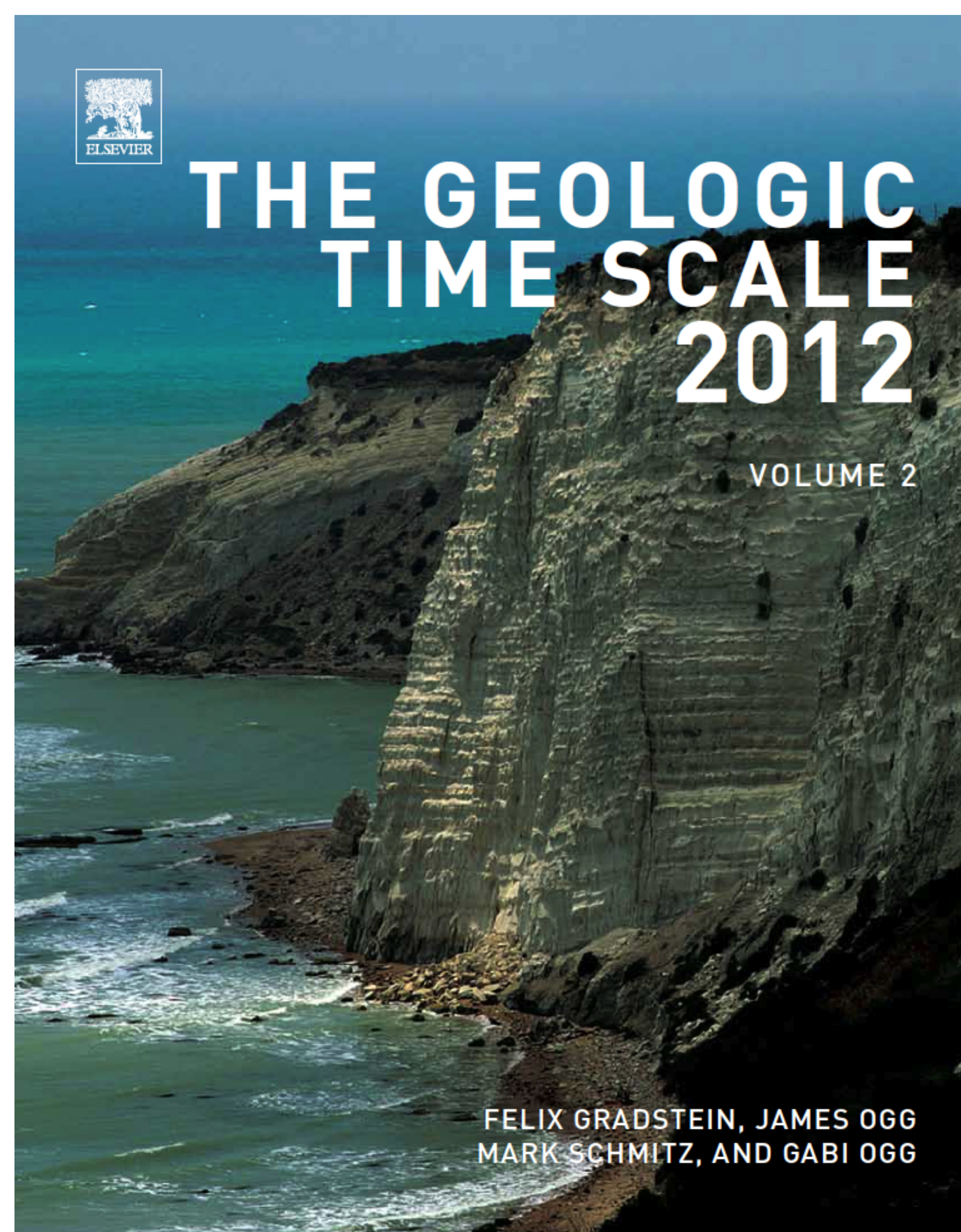
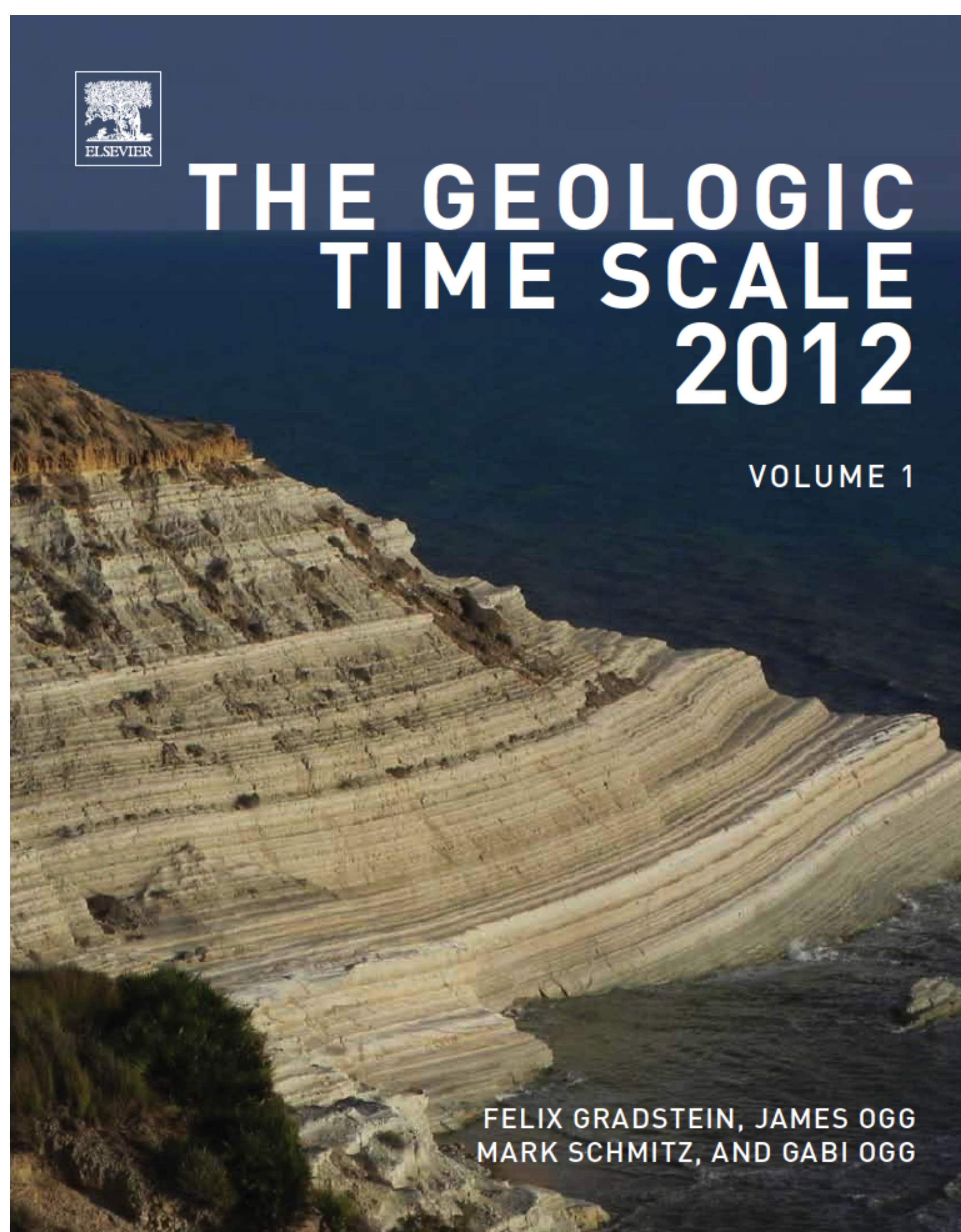
## PHANEROZOIC

## PHANEROZOIC & PRECAMBRIAN



For details see:  
 "The Geologic Time Scale 2012" by F. M. Gradstein, J. G. Ogg, M. Schmitz and G. Ogg (2012, published by Elsevier), and the website of the Geologic TimeScale Foundation <http://stratigraphy.science.purdue.edu>. The maps were provided by Chris Scotese.

This chart was produced by Gabi Ogg using TimeScale Creator software: <http://www.tscreator.org>



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Introduction, F.M. GRADSTEIN  
 Chronostratigraphy, Linking Time and Rock, F.M. GRADSTEIN and J.G. OGG  
 Biochronology, F.M. GRADSTEIN  
 Cyclostratigraphy and Astrochronology, L.A. HINNOV and F.J. HILGEN  
 The Geomagnetic Polarity Time Scale, J.G. OGG  
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 Appendix 1 - Recommended Color Coding of Stages, G. OGG  
 Appendix 2 - Radiometric Ages Used in GTS2012, M.D. SCHMITZ  
 Appendix 3 - Cenozoic and Cretaceous Biochronology of Planktonic Foraminifera and Calcareous Nannofossils, D.E. ANTHONISSEN and J.G. OGG (compilers)

### Senior Authors

**FELIX GRADSTEIN** (Professor at Oslo University, Norway) was chair of the International Commission on Stratigraphy (2000-2008). Under his tenure major progress was made with the formal definition of chronostratigraphic units from Precambrian through Quaternary. For his fundamental work with regards to the Geologic Time Scale and stratigraphy, micropaleontology and geochronology in general, the European Geosciences Union awarded him in 2010 the Jean Baptiste Lamarck Medal. He teaches applied biostratigraphy and paleoenvironment courses.

**JAMES OGG** (Professor at Purdue University, Indiana, USA) was Secretary General of the International Commission on Stratigraphy (2000-2008) and coordinated the ICS Stratigraphy Information Service (2008-2012). His Mesozoic Stratigraphy Lab group works on aspects of climate cycles, magnetic polarity correlations and integration of stratigraphic information. Their TimeScale Creator array of visualization tools for extensive databases in global and regional Earth history was used to generate many of the diagrams in this book.

**MARK SCHMITZ** is Associate Professor of Geochemistry at Boise State University, Idaho, USA, and has extensive research interests in the development and application of radiogenic isotope geochemistry and high-precision U-Pb geochronology to problems of Earth systems evolution.

**GABI OGG** applied micropaleontology to Jurassic-Cretaceous correlations before concentrating on public outreach in geosciences. She coordinated the extensive array of graphics in this GTS2012 book, and is the webmaster for the Geologic TimeScale Foundation (<http://stratigraphy.science.purdue.edu>) and for the TimeScale Creator visualization and database suites ([www.tscreator.org](http://www.tscreator.org)). In addition to co-authoring the Concise Geologic TimeScale (GTS2008) book, she has produced numerous posters and time scale cards for public audiences.

Earth's surface history is a complex interplay of climate, evolution and other processes framed within a geologic timescale with numerical ages. **The Geologic TimeScale 2012** program involved over 60 geoscientists, including officers of most subcommissions of the International Commission on Stratigraphy, working to integrate paleontology, radio-isotopic dating, cycle stratigraphy, geochemical trends, and other stratigraphic information. This synthesis includes detailed summaries of each geologic period with full-page graphics (map, section, photos) of each GSSP (international stage boundary) and age scales derived from a re-evaluation of radio-isotopic ages (including new monitor standards for Ar-Ar) coupled with astronomical cycle tuning. Additional components are a synopsis of our state of knowledge and formal geologic subdivisions of lunar and Martian stratigraphy, a massive synthesis in preparation for revising the Precambrian subdivisions, extensive sets of geochemical curves, and a summary of stages of humanoid evolution. Even though some periods are still lacking international agreement on all stage definitions and reliable high-precision age models, this compilation will be the reference standard for the remainder of this decade.