



CHRONOS System - a network of federated databases and tools for sedimentary geology and paleontology

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The CHRONOS System provides an open, community-based geoinformatics platform for storing, accessing, and analyzing sedimentary geological and paleobiological data. The full CHRONOS System, which includes a core Information Technology (IT) facility and databases, an international network of federated databases, tools, targeted development projects, and education-outreach activities. The CHRONOS System is a new effort that reflects the merger of the two geoinformatics projects, CHRONOS (www.chronos.org) and PaleoStrat (www.paleostrat.org).

The CHRONOS System data include lithostratigraphic, biostratigraphic, taxonomic, sequence stratigraphic, cyclostratigraphic, geochronologic, major, trace, and isotope geochemistry, and other data and metadata relevant to sedimentary geology and paleobiology research. Analytical tools to date include Age Depth Plotting (ADP, graphic correlation and user-based age model generation), CONOP9 (a stratigraphic sequencing tool), and other tools for analysis and visualization of data. These data and tools are used to support a broad array of research problems, including the evolution and diversity of life, climate change, geochemical cycles, paleoceanography, crustal dynamics of orogenic systems, and other aspects of the Earth system.

The bulk of the data is currently contained in three main networked databases: PaleoStrat (www.paleostrat.org) is the sample-based database engine for terrestrial stratigraphic data; Neptune is CHRONOS's database for age-calibrated marine plankton occurrences from DSDP and ODP cores; Paleobiology (www.paleodb.org) is a federated database containing global, collection-based occurrence and taxonomic data

for fossil animals and plants. A sedimentary geochemistry information module for the PaleoStrat database has just been implemented and will be further developed in collaboration with the emerging SedDB project, IODP, and GeoSystems. The CHRONOS System continues to actively pursue collaborations with international paleontologists and paleontological societies to upgrade, develop, and network digital databases for taxonomic information for all fossil groups at the species level.

The CHRONOS System is partnering with PaleoPortal (UCMP - www.paleoportal.org), American Geological Institute (AGI), American Geophysical Union (AGU), National Association of Geoscience Teachers (NAGT), National Earth Science Teachers Association (NESTA), US Geological Survey, EARTHTIME (www.earth-time.org), and geoscience educators to develop educational resources that 're-humanize' scientific discoveries that have led to our current understanding of Earth history. We are also developing virtual reality applications aimed at conveying the concept of deep time and visualizing the processes involved in some of the most significant milestones in the history of Earth.