

Introduction of PaleoGeo: A web-GIS for distributing information from paleoenvironmental literature

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There is a growing interest in the paleoenvironment, and the number of relevant research papers has been growing rapidly. Paleoenvironmental studies cover various fields such as paleohydrology, geomorphology, paleoceanology, paleobiology, paleoclimatology, and chronology. It is hard for an individual researcher to collect and compile enormous data regarding these fields. For the multidisciplinary project "Replacement of Neanderthals by Modern Humans", we have been compiling portal data and presenting them using a web-based geographical information system (web-GIS). It shows information with a map which is an advantage over text-based systems.

The PHEIMS (Paleo-Hydrology and Environment Internet Map Server), a precursor of the PaleoGeo, was developed in the late 1990s by one of the co-authors (T. O.), using ESRI ArcView IMS as a main server software package. It contained information from papers in international journals of earth and Quaternary sciences published during the mid-1990s to 2002. It was viewed up to 3000 times annually; however, its updating ceased because of the end of the relevant project.

The PaleoGeo is being developed to revive and update the PHEIMS. We improved the user interface and data quantity (papers up to the present). The new system uses ESRI ArcGIS Server 10 and to reduce redundancy of the data, a relational database management system (RDBMS) is applied.

The collected data consist of the journal name, information about each paper (authors, title, volume, year, and page numbers), site location (country name, longitude, and latitude), theme, subtheme, keywords, DOI (Digital Object Identifier), and period (era). DOI enables users to see publisher's abstract pages in one click. Bibliographic information is also available at some existing web-based search engines such as the ISI Web of knowledge. However, location data are indispensable in paleoenvironmental studies. The PaleoGeo shows information with a map, which is the most distinguishable advantage of this database system.

We have collected information from almost three thousand articles of 13 journals regarding paleoenvironmental research (i.e., Boreas, Catena, Climatic Change, Earth Surface Processes and Landforms, Geomorphology, Journal of Quaternary Science, Palaeogeography, Palaeoclimatology, and Palaeoecology, Quaternary International, Quaternary Research, Quaternary Science Reviews, The Holocene, and The Journal of Geology). The themes of the articles were classified into six (paleohydrology, earth surface processes and materials, paleoceanology, paleobiology, palaeoclimatology, and chronology) and 19 subthemes (hydrology, flood, fluvial, glacier, fluvial/glacier, sedimentology, soil, slope process, periglacial, peat land, eolian, sea-level, biology, vegetation, zoology, vegetation/zoology, archaeology, climate, atmosphere, and chronology). Until now, information of over 7000 sites has been collected and the number is being increased.

Although the PaleoGeo seems to be a useful tool, it has room for improvement; for example, expanding a window showing search results, and improving the map print function. In the future, our system will be connected to the holistic bibliography catalog of the National Institute of Information (NII), Japan, to facilitate easier access to the data.

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