

Paleo-databases: Their role in modeling, reconstructing paleoclimate and understanding paleoenvironments

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Aims

The European Pollen Database (EPD) began with a flourish in 1992 as a world leader and quickly grew in size and scientific value. Funding, however, has been sporadic during recent years and the addition of new sites has slowed to a trickle. A workshop was held to highlight the value of paleo-databases and to revitalize the EPD with a new generation of European palynologists. The fresh impetus follows the appointment of Michelle Leydet as database engineer (funded by the French CNRS), new financial support from the European Science Foundation through the EuroCLIMATE program (coordinated by Daniela Turk, www.esf.org/euroclimate), and the EU through the EVOLTREE Network of Excellence. 78 scientists (mostly early in their pollen careers) gathered in Arbois for lectures, posters, a field excursion and four training workshops.

Activities

Highlights from the invited talks included the varied applications of the North American Pollen Database to climate research (Jack Williams, Madison) and the use of a fossil mammal database to track long-term developments in species diversity (Tony Barnosky, Berkeley). The three key functions of paleo-databases were identified as:

- 1) Data preservation (as information is quickly lost - Fig. 1)
- 2) Inter-site comparisons
- 3) Regional-continental syntheses.

Simon Brewer (Cerege) and Thomas Giesecke (Liverpool) gave examples of data-model comparisons using pollen data to verify climate and dynamic vegetation models and generate paleoclimatic reconstructions by inverse modeling. The use of pollen databases in development of the modern genetic structure of European forests was reviewed (Jacques-Louis de Beaulieu, Marseilles), as was the reconstruction of changing European land-cover (Marie-Jose Gaillard, Kalmar), which has important feedbacks to the climate system. 31 poster presentations supported the lecture themes.

Most of the participants took part in a one-day excursion to the Champsaur

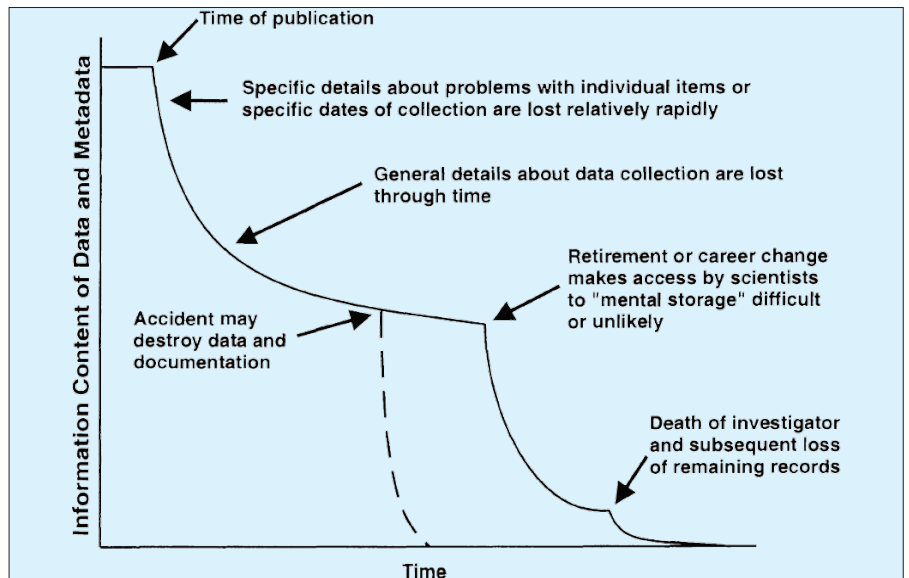


Fig. 1. A typical trajectory of information loss following publication of data (after Michener et al. 1997: *Nongeospatial metadata for the ecological sciences, Ecological Applications*, 7: 330-342.)

basin, where the Holocene vegetational development and the origin of the present landscape were presented, based on paleoecological records from several sedimentary basins (Fig. 2). The meeting concluded after the field trip with the following four training workshops:

1. Multivariate methods (Bent Odgaard, Aarhus)
2. Data-model comparison (Simon Brewer, Cerege)
3. Pollen-land surface calibration (Jane Bunting, Hull)
4. Age-depth modeling (Maarten Blaauw, Belfast)

Outcomes

The main outcomes of the workshop included a plan to re-launch the EPD, to involve a larger section of the research community than before, and to take advantage of the many online and informatics tools that have developed over the last 15 years.



Fig. 2. The French team interpret a pollen diagram in the field.

A commitment was made to make data accessible as quickly as possible, once the backlog of work from the unfunded years has been added.

Three breakout groups also reported on the desired uses of the paleo-database, administrative structure and database structure. Conclusions of these discussions can be found at www.europeanpollendatabase.net. Finally, eight support groups were established to assist Michelle Leydet with database maintenance (taxonomy, database structure, age-depth chronologies, finance, community outreach, national contact points, mapping and data accuracy, intellectual property and protocol).

Getting involved

If you wish to join one of the aforementioned support groups, please add your name to the EPD wiki on the website. All are now encouraged to add or download data and provide ideas for improvement on the wiki. Authors contributing new data can choose to submit a 2-page standardized description of their site for publication in *Grana* to gain extra academic merit. The support groups are co-ordinated by Richard Bradshaw (Liverpool) and Valerie Andrieu (Marseilles) until the next EPD open meeting that is to be held at the International Palynological Congress in Bonn September 2008.