The Global Charcoal Database

The GCD contains information about palaeofire activity in the form of sedimentary charcoal records from sites across the globe since the last 100 000 years.
paleofire: An R package to analyse sedimentary charcoal records from the Global Charcoal Database to reconstruct past biomass burning

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Model in the ACCESS database
Database needs/features

- **Sharing the database**
  - Database has to be on a server with concurrent access
  - Database must be accessible with Internet 24/24
  - Offer Graphical User Interface (GUI) instead of spreadsheet to overview the DB / import, export, control & manage the data

- **Provide security of the data**
  - Network and hardware security
  - Software access management

- **Database scalability**
  - Use MySQL instead of Access
  - API to communicate with R-package
  - Automatic generation of charts and graphs based on monthly releases of the database
Network security

Usage of a **firewall**, barrier to prevent unauthorized or unwanted communications between computer networks or hosts.

Server web virtualization
The best possible utilization of physical web related equipment that is turned in to virtual machines and giving you the complete control. This making your virtual platform extremely reliable, flexible, stable, safe, and secure from the many hazards of the web hosting industry.

We use twin server connected at the University of Franche-Comté (Eastern France) far from any fire risk!
Software security

WEB APPLICATION (session starts)

IDENTIFICATION (Login, password)

AUTHENTICATION (check right)

WEB APPLICATION

Open MySQL connection

Other User

GPWG User

Public GCD

Write site and samples info

Working GCD

Read
Write
Update
Export data

Read
Export data
## Access versus MySQL

<table>
<thead>
<tr>
<th></th>
<th>ACCESS</th>
<th>MySQL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>Paying</td>
<td>Freeware, Open Source</td>
</tr>
<tr>
<td><strong>Concurrent Users</strong></td>
<td>20</td>
<td>More than 255</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>Windows</td>
<td>Windows, Linux, mobile platforms...</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>Low (just password encrypted)</td>
<td>High (password, SSL-encrypted connections between MySQL clients and servers, accounts with privileges)</td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td>Access isn't designed to create websites</td>
<td>MySQL was designed and optimized for Web applications</td>
</tr>
<tr>
<td><strong>Max Database size</strong></td>
<td>2Go</td>
<td>Unlimited</td>
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<tr>
<td><strong>Database reliability</strong></td>
<td>MDB is easily corrupted <em>(Faulty Networking Device, write operation abort...)</em></td>
<td>Detecting and prevent corruption of the replication stream, automatically recovering the binary log in the event of a crash</td>
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