

The Missouri Cave Database

by Scott House

The Missouri Cave Database (MCD) is a relational database managed by the Missouri Speleological Survey (MSS) in cooperation with a variety of other organizations and agencies. It contains information on nearly 7000 caves in the state.

The MCD is an outgrowth of early attempts to computerize the listing of caves in Missouri. Original paper lists were printed into a "catalog" beginning in the late 1950's. This was replaced in ~1964 with a computerized cave listing. The "fields" (categories, really) were simple text with no search capabilities. Eventually this was ported over to a slightly more advanced system where simple searches on county names were made possible.

As micro-computers came about, the need for more search capabilities became obvious. Categories became fields and searches were possible. A prototype was developed on Apple computers, using National Park Service caves as the data set. In time, the old text fields of the main dataset, written in arcane languages, were broken and imported into different programs. Eventually the superiority of one of these programs became obvious and further development of the alternatives was abandoned.

The MCD is written in FileMaker Pro, a cross-platform program known for the ease of programming and use. The MCD is easy to use and yet powerful at the same time. Import functions are powerful and simple. This allows multiple people to work on aspects of the data and reimport the revised material into the main database. The import functions also allow for simple importation of locational data revised in other programs, such as GIS, and then brought back into the main database.

Purchase of the "Advanced" version of the software allows the data manager to export data sets as runtimes, suitable for use by anyone with a 64 bit machine. This enables us to distribute runtimes containing subsets of the data. For example, the Mark Twain National Forest gets a subset that contains information only on caves within the Forest, which amounts to something over 700 caves or roughly 10% of the total within the state. All of the large public agencies in the state cooperate, in one form or another, with the MCD. While primarily a volunteer effort of the MSS, additional funds for the development and maintenance of the database have come from National Park Service, U.S. Forest Service, Missouri Department of Natural Resources, and Missouri Department of Conservation. Other public entities cooperating in the sharing of data include the Department of Defense (Corps of Engineers and Ft. Leonard Wood). St. Louis County Parks, and City of Perryville. Private entities such as the L-A-D Foundation (owner of nearly 200,000 acres) also cooperate in sharing data and supporting expansion of the database. Cave Research Foundation (CRF) has provided financial support, software, and office space for the data manager.

The Missouri Cave Database has served as the model for databases elsewhere including Mammoth Cave National Park KY, Buffalo National River AR, and a new database for the Illinois Speleological Survey.

Brief Description of the Tables:

There are currently seven tables with six relationships tying them together. A database design report in HTML format is available for anyone interested. Most of the tables are linked by using a cave's MSS accession number, e.g. SHN139 – three letters for the county and then a sequential number within the county.

The Main Table contains 65 fields and approximately 7000 records. The fields include several locational fields, simple attribute fields such as geologic unit, ownership, status, length, cultural notes, etc. Using this table alone, one can sort out (for example) all of the caves on a certain quad that are owned by a certain agency that are more than X length or in Y geologic unit. The Main Table has several pages and layouts to it, terms that will mean little to most people. Also included are portals or gateways into the related tables. The 7000 records represent caves or disparate entrances to the same cave.

The Maps Table contains 14 fields and over 3500 records. This is not a link to the gigabytes of digitized cave maps but rather an index to existing cave maps on file with the MSS. The 3543 records each stand for a sheet of a cave map; most are single sheets. However, this table could be exported and act as a link if someone wished to program such a beast.

The Reports Table contains 15 fields and approximately 11,000 records. These records are individual entries from cave files reports, grotto newsletters, emails, professional reports, etc.

The Faunal Table contains 42 fields and nearly 19,000 records. Each record represents a species occurrence in a particular cave on a particular date. For example, ten pipistrelle bats in Cave X on Y Date is one record. As MSS cooperators dig into old reports this number is rapidly increasing. Regular monitoring of caves is also adding a great many records. Again, this information can be easily exported for use in GIS or other applications.

The Species Table contains 22 fields and over 1100 records. This is a reference table used by the faunal table to insert specific information on a certain species. These two tables are linked via a species number. The 1100 records represent different species noted from Missouri caves. Extinct species are included.

The Use Monitoring Table contains 24 fields and, so far, less than 50 records. This table exists to track monitoring of caves. Information from other databases will be imported into this table; the monitoring database for Ozark Riverways has over 1500 records that will be imported and linked to the main table.

A Do List table currently has 8 fields and 1100 records. This is a trial table that may or may not be continue. Consider it under development. If the concept does not work, it will be removed.