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MIDOP - Macroseismic Intensity Data Online Publisher

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MIDOP – MACROSEISMIC INTENSITY DATA ONLINE PUBLISHER

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Abstract

Within the activities of the Networking Activity 4 (NA4) module called “Distributed Archive of Historical Earthquake Data” of the European Commission NERIES project, a massive quantity of historical earthquakes related data is being published online. The NA4 working team is composed of many researchers coming from five European National Institutions. The retrieved data ranges from year 1000 to year 1900 and covers all of Europe.

One of the fundamental components of historical seismology research is the so called “macroseismic intensity data” which describes the level of damage caused by an earthquake in a list of places. Usually these data come in form of printed maps and/or tables; only rarely data are available in digital form. Among other tasks, the NA4 working team is dedicated to publishing maps representing retrieved material.

Until now no dedicated software for online map publishing existed and general purpose solutions were adopted. However a macroseismic map requires a series of additional information such as explanation on the sources used, detailed places information and representation of the level of damage using special glyph.

These requirements are of difficult implementation using out-of-the-box tools, resulting in extremely time-consuming hard to do customization and manual operations, tasks that NERIES NA4 couldn’t afford. To solve the situation the working team decided to create MIDOP, a specific tool that allows web-inexperienced researchers to easily transform unappealing tables into deeply customized interactive maps.

A completely coding-free approach has been adopted sporting a user friendly web interface capable of generating entire websites from scratch. Once a website has been created, its publication on the web is easy as dragging a folder to the final web server. Thanks to its SVG and JavaScript integration the web server will only manage static pre-generated pages, resulting in a secure and lightweight web application from the server point-of-view. Only the client computer resources will be used when users require actions such zoom, pans or mapped places search.

The MIDOP tool is based on open source solutions such as JavaScript, PHP and MySQL and extensively uses SVG for visual representation and interaction. The tool is being released under an open source license. This document is a comprehensive final user manual.

1. Introduction

The main goal of the **NA4 module "Distributed Archive or Historical Earthquake Data"** of the **EU NERIES project** (http://emidius.mi.ingv.it/neries_NA4/) is to establish and implement an Archive of Historical Earthquake Data (AHEAD), with special reference to the supporting data, to be used to compile a homogeneous European Parametric Earthquake Catalogue. This task is being accomplished by searching, retrieving, evaluating and making available the macroseismic datasets on European and Mediterranean earthquakes occurred in the time-span 1000-1900.

The most important supporting material is the "**historical earthquake study**", used by researchers to publish a comprehensive report with all the information regarding a specific earthquake. Among the retrieved information, a study presents the "**macroseismic intensity data**" which describe the effect expressed using a Macroseismic Scale (e.g. the EMS-98 [Grünthal et al., 1998] or the MCS) caused by an earthquake in a set of places. Usually these data come in form of tables or as maps printed on paper; only rarely data are available in digital form. Among other tasks, the NA4 working team is dedicated to make available online these intensity data by publishing interactive maps.

Until now no dedicated software for online map publishing existed and general purpose solutions had been adopted. However a macroseismic map requires a series of additional information such as the sources used, detailed places information and representation of the level of intensity using special symbols. These requirements are of **difficult implementation using out-of-the-box tools**, because they result in extremely time-consuming and hard to do customization, as well as manual operations. These are tasks that NA4 working team could not afford.

Previous experiences in historical macroseismic map publishing systems available in Europe have been considered: the Italian DBMI04 [Stucchi et al., 2007], the Swiss ECOS [ECOS, 2002] and the French SisFrance [Scotti et al., 2004] databases.

The best fitting solution to NA4 scopes was identified as the mapping solution adopted by DBMI04 [Locati et al., 2006] (http://emidius.mi.ingv.it/DBMI04/), internally developed at INGV. But a straightforward adoption of the DBMI04 solution was not possible because of the complete lack of a friendly graphical user interface and the tightly Italian-oriented code not suitable for a broader use.

An improvement was required, and the NA4 working team decided to create **MIDOP**, which stands for Macroseismic Intensity Data Online Publisher, a specific tool strongly inspired by the DBMI software, but allowing web-inexperienced researchers to easily transform unappealing tables into deeply customized interactive maps.

Before implementing the tool, a series of requirements have been filed by listening to involved researchers and to the IT people of the different research Institutions.
The tool addresses the following tasks:

- managing one or more catalogues of earthquakes, parametric or not;
- for each earthquake creates:
  - a table listing the affected places and their macroseismic intensity;
  - an interactive map of the macroseismic intensity points;
- for every place mentioned it creates:
  - the list of earthquakes and the relative level of intensity experienced;
  - a diagram representing the level of damage experienced at the place for each earthquake;
- publish the macroseismic studies on which published data are taken.

The features most requested by seismologists for such a tool are:

- use of already existing standards in terms of input data table formats and content;
- effortless online publication of the material, reducing as much as possible problems while transferring material to IT staff;
- complete coding-free approach while publishing;
- interactive maps, featuring zoom, pan and search trough the represented places;
- use of a long standing and open technology, avoiding possible future bottleneck or solutions that might disappear in the years to come;
- possibility to interactively add points on already published maps;

- export of the published material to downloadable files such as spreadsheets, high quality images and high quality print;
- easy-to-understand graphical user interface, using as much as possible seismological terms;
- advanced graphical customization, both of the geographical features and symbols used.

Features requested by the IT staff are:
- safety measures against probable online attacks;
- lightweight technologies, use of a small footprint server;
- simplified source code modifications in case of customization requests by researchers;
- use of web standards where possible, possibly open source and well documented.

MIDOP can be referenced as:
Locati M. and Cassera A., (2010). MIDOP, Macroseismic Intensity Data Online Publisher. Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Milano-Pavia. http://emidius.mi.ingv.it/neries_NA4/MIDOP/

2. Quick reference

MIDOP official homepage
http://emidius.mi.ingv.it/neries_NA4/MIDOP/ (available under registration)

Hardware configuration requirement
- minimum: CPU 2Ghz (at least), RAM 2Gb (4Gb for Microsoft Vista)

Operating system tested
- Windows 2000, XP and Vista;
- Mac OSX Tiger (10.4) and Leopard (10.5);
- Linux: Ubuntu 9, OpenSuse 11, Fedora 11.

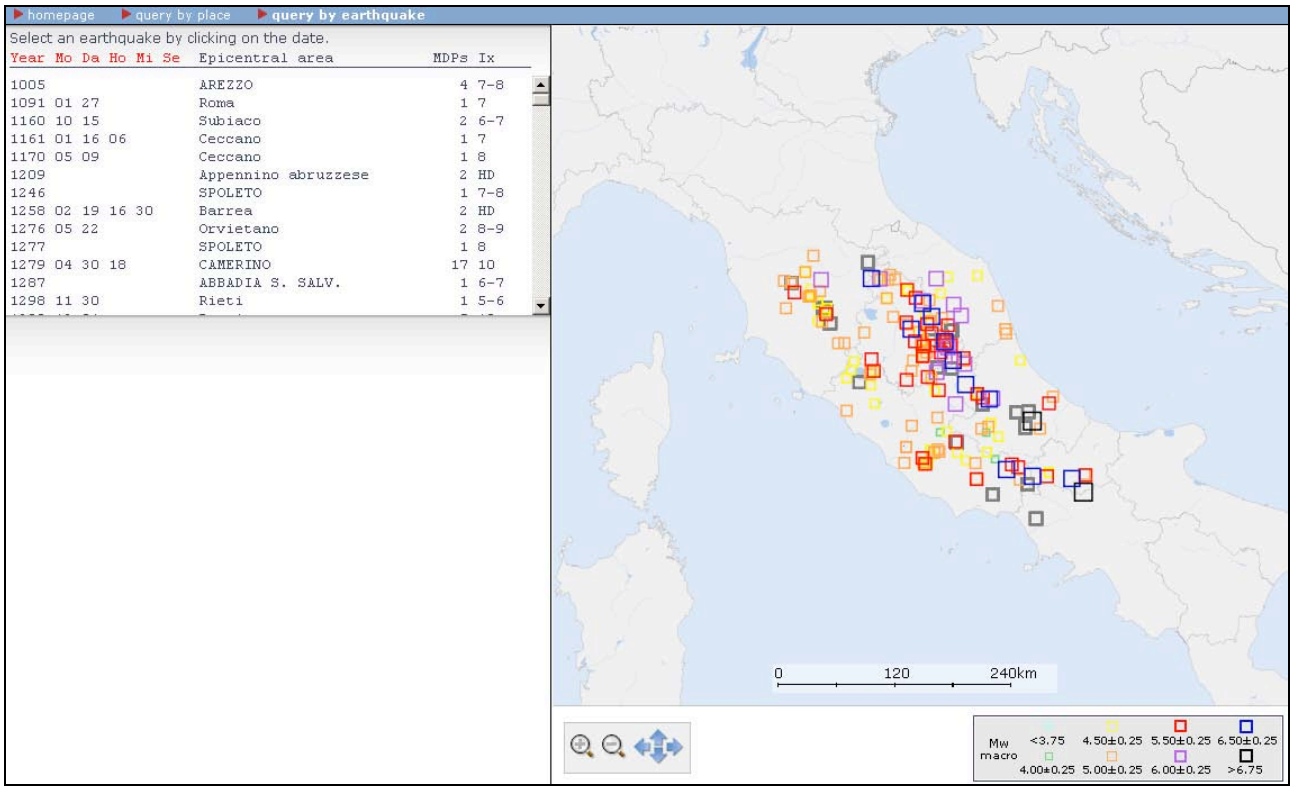
Additional software (any AMP environment)
1. web and DBMS server: Apache 2.x configured with PHP 5.x and MySql 5.x;
2. software for manipulating data tables content:
   a. online: phpMyAdmin
   b. offline: Microsoft Access (linked tables) or OpenOffice Base;

Macroseismic data formatted (minimum requirement)
3. earthquake list table with:
   a. earthquake identifier code;
   b. origin time;
4. macroseismic intensity points data table:
   a. earthquake identifier code;
   b. places latitude and longitude, expressed in geographical coordinates in decimal degree;
   c. a macroseismic intensities (ordinal number) and the corresponding numerical value expressed in decimals (e.g. 9-10 and 9.5, 4 and 4.0, 5-6 and 5.5)

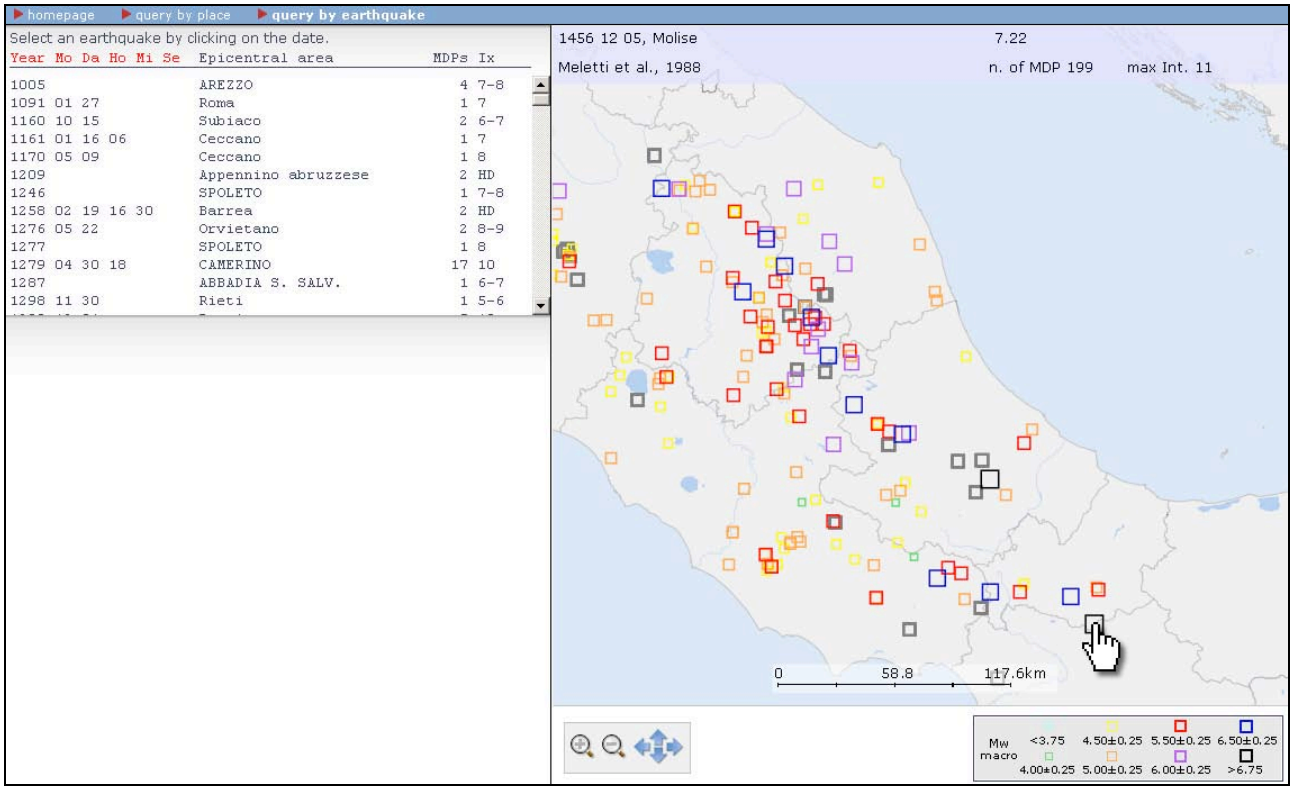
Published output
1. standard HTML frameset with pre-generated earthquake tables, earthquake interactive maps (projected UTM zones) and related intensity data points;
2. places seismic histories (available only if places have unique identifiers).

A browser capable of rendering SVG (Scalable Vector Graphic) is required for interactive maps and places seismic histories (Firefox 3.x+, Safari 3+, Opera 9.x+, Chrome). Internet Explorer needs a SVG plug-in enabler (e.g. Adobe SVG Viewer, www.adobe.com/svg/viewer/install/).

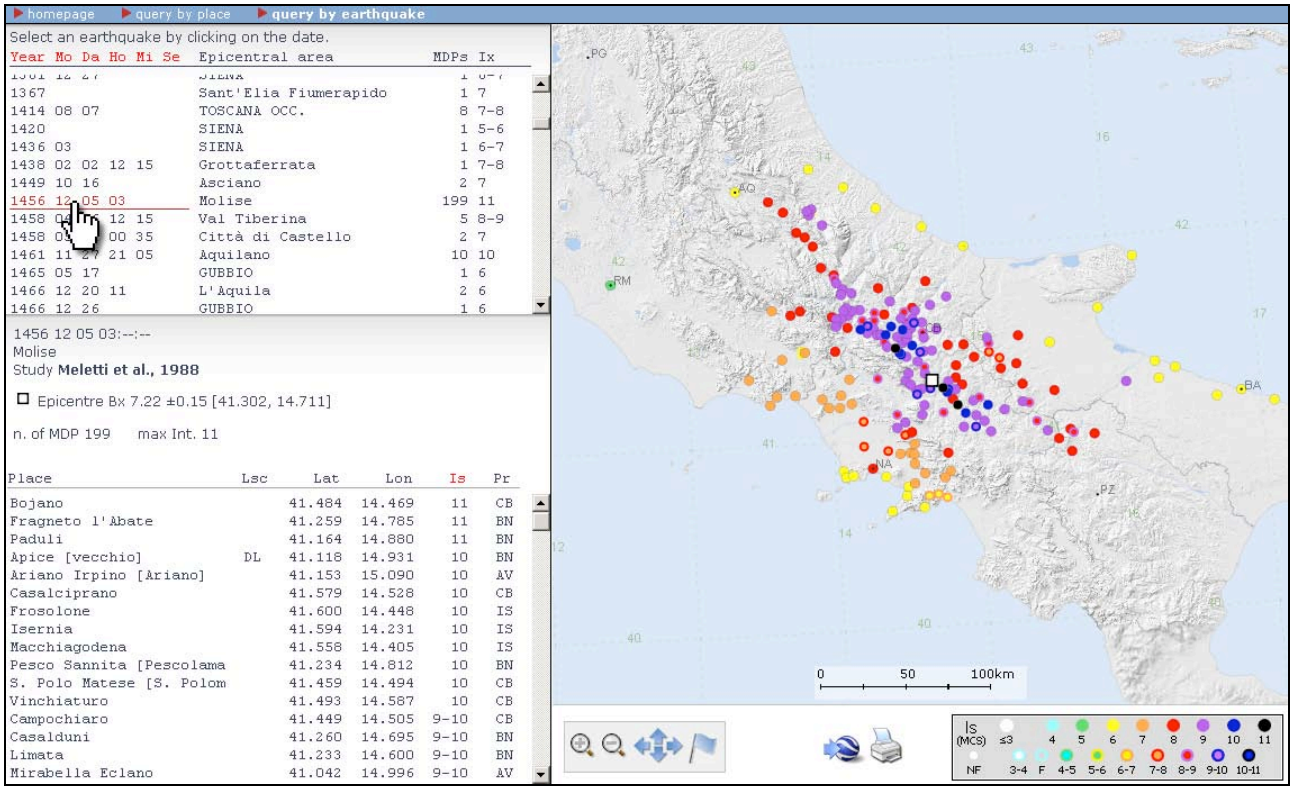
2.1 Output examples



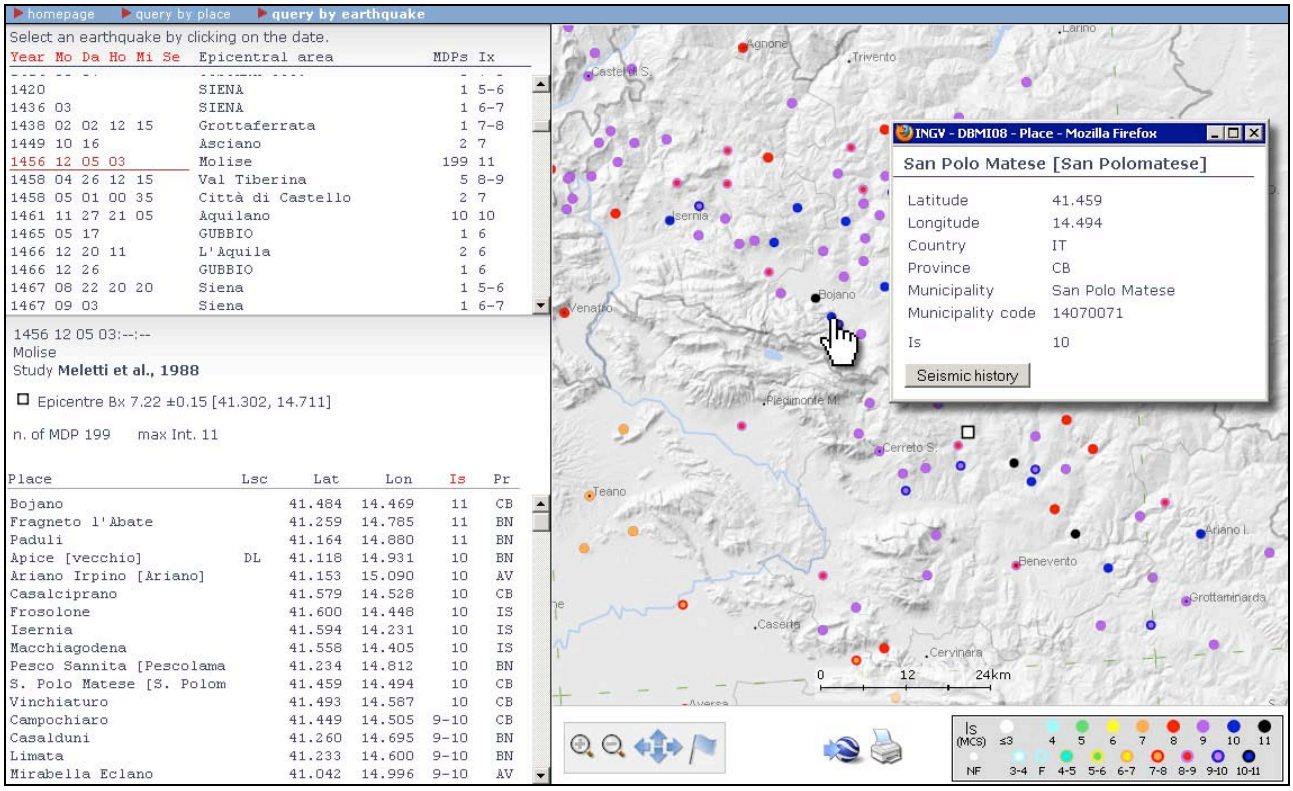
Query by earthquake - General earthquakes map



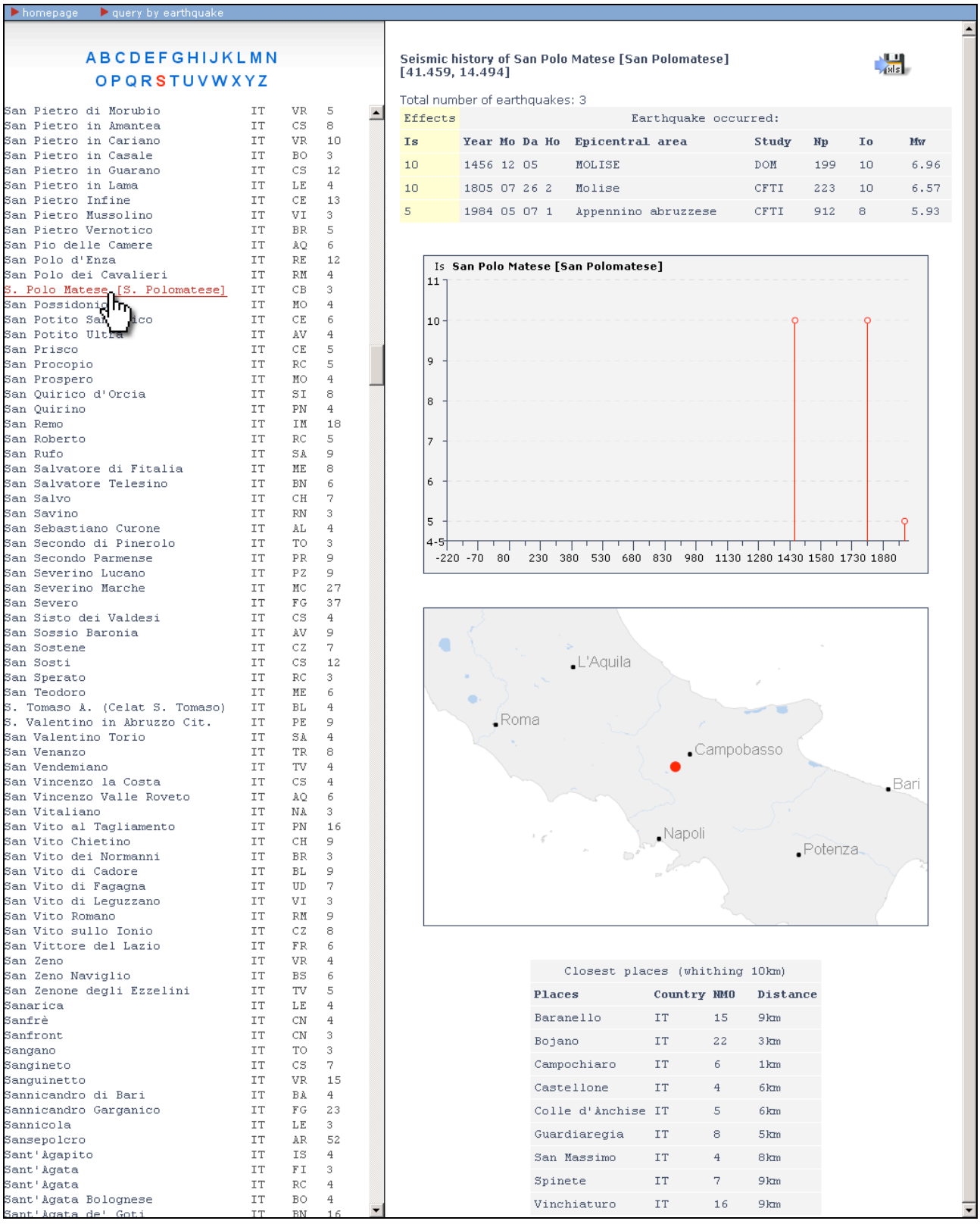
Query by earthquake - General earthquakes map, zoomed



Query by earthquake - Macroseismic Intensity map of a selected earthquake



Query by earthquake - Macroseismic Intensity map of a selected earthquake, zoomed



Query by place - Example output for “San Polo Matese” in central Italy

3. Setting up the MIDOP environment

In order to use the MIDOP publishing system a development computer is needed, which will be used for tuning all the available settings and for generating an output folder that will contains all is needed for publishing the website.

The minimum computer hardware configuration is a 2GHz CPU and a RAM of 2Gbyte, as the software performs many heavy operations.

3.1 Requested software configuration

MIDOP is a web application based on AMP (Apache, MySql, PHP) environment, which is required to make it work. The adopted solution is theoretically independent from the operating system in use. The AMP environment is widely used by web developers and it usually requires each part of it (web server, mark-up language interpreter and a database management system) to be installed separately.

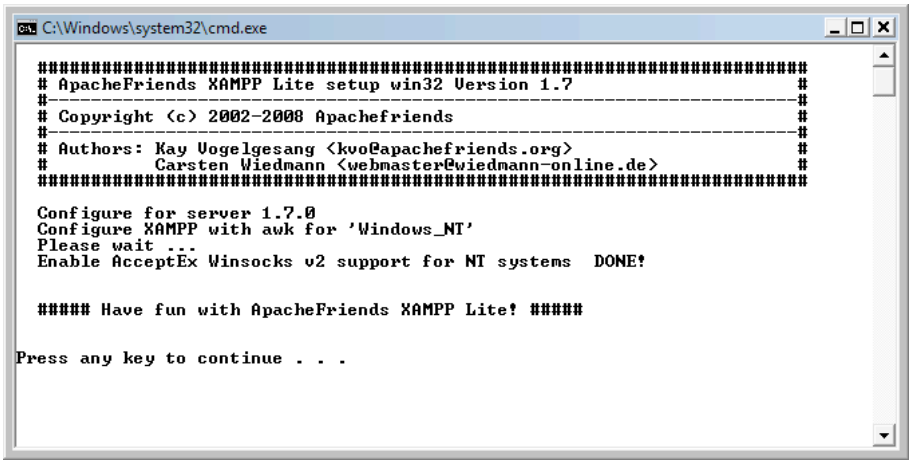
As the installation procedure of the entire environment is both complicated and time consuming for novice users, we encourage the use of pre-packaged AMP solutions which are coming with a out-of-the-box complete AMP environment.
MIDOP has been successfully tested on:

- Windows (2000, XP and Vista) using XAMPP Lite and WAMP packages;
- Mac OSX (10.4 and 10.5), using the MAMP package;
- Linux, using manually installed Apache, PHP and MySql.

Note that by installing an AMP environment, you will have a web server working on your computer, so you'll probably have to contact the technical support of your department and check if this complies the software security installation policy.

Installation procedure of XAMPP Lite and WAMP

1. download the freely available package of your choice:
   XAMPP Lite, Self-extracting, http://www.apachefriends.org/en/xampp-windows.html#646
   WAMP, http://www.wampserver.com/
2. execute the installer script;
3. (only if you're using Windows Vista): check the existence of the file "msvcr71.dll" within the folder "c:\windows\system32\"; if it doesn't exists try to copy it from another MS Windows computer, or try to find it using a web search engine;
4. (only for XAMPP) execute "setup_xampp.exe". If the procedure will be successful, this message will appear:



5. modify the Apache configuration file "`httpd.conf`" adding the following lines at the end of the existing "`<IfModule mime_module>`" tag:

```
<IfModule mime_module>
     ...
     AddType image/svg+xml .svg
     AddType image/svg+xml .svgz
     AddEncoding gzip .svgz
     <FilesMatch \.svgz$>
       <IfModule mod_gzip.c>
         mod_gzip_on No
       </IfModule>
     </FilesMatch>

     AddType application/vnd.google-earth.kml+xml .kml
     AddType application/vnd.google-earth.kmz .kmz
</ifModule>
```

6. modify the PHP configuration file "`php.ini`" by customizing the default value of the following parameters:

```
precision = 18
max_execution_time = 120
memory_limit = 950M
post_max_size = 32M
upload_max_filesize = 32M
error_reporting  =  E_ALL & ~E_NOTICE
display_errors = On
short_open_tag = On
auto_detect_line_endings = On
magic_quotes_gpc = On
```

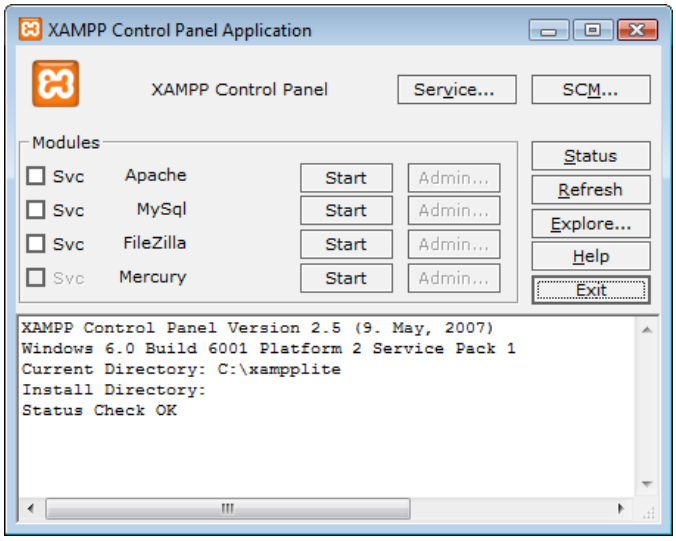
7. enable the following PHP extension in "`php.ini`":

```
extension = php_curl.dll
extension = php_dbase.dll
extension = php_gd2.dll
extension = php_mbstring.dll
extension = php_mcrypt.dll
extension = php_mime_magic.dll
extension = php_mysql.dll
extension = php_mysqli.dll
extension = php_pdo_mysql.dll
extension = php_pdo_odbc.dll
```

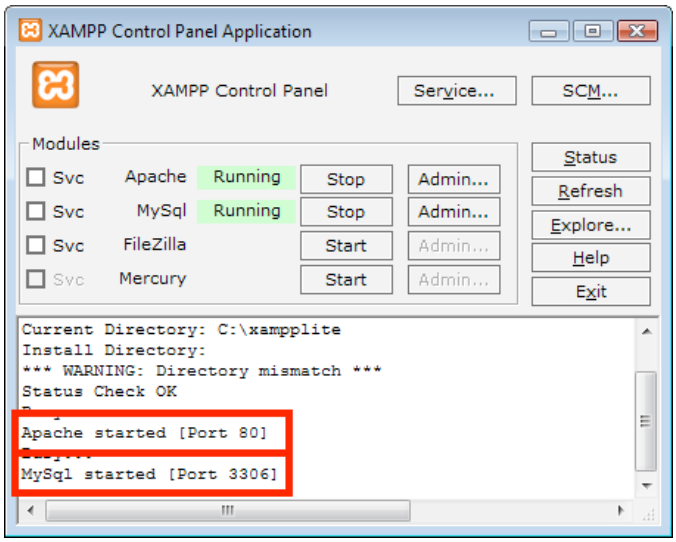
```
extension = php_soap.dll
extension = php_zip.dll
```

8. start the HTTP and MySql servers:

   a) if you are using XAMPP, execute the “xampp-control.exe”, the XAMPP Control Panel:

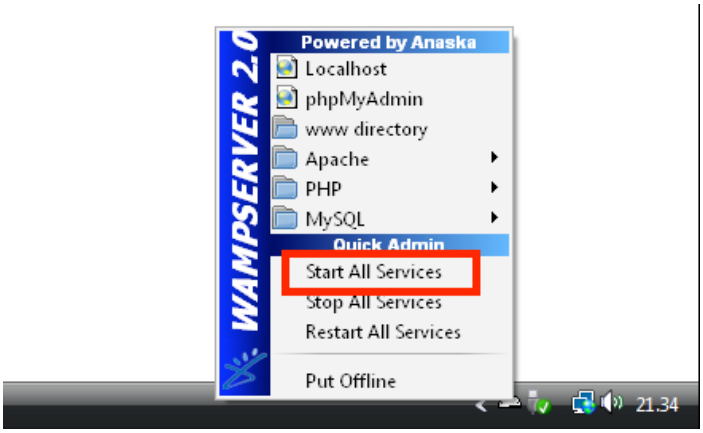


   By clicking on the button “Start” of 1) Apache and 2) MySql you will enable respectively the web server and the database engine server:



   By pressing “Stop” you will turn off the servers.

   b) if you are using WAMP, you will find its icon in the system tray, select “Start All Services”:



At this stage the environment is ready for the MIDOP installation.

IMPORTANT SECURITY NOTE
Both XAMPP and WAMP are not meant for production use, but only for developers in a development environment. Packages are configured to be as open as possible and to allow the web developer anything he wants. For development environments this is great but in a production environment, where security is a key factor, it could be fatal.
Please, don't use these packages for serving in Internet your websites to the public without any tuning and testing phase.

MacOS X MAMP package installation procedure

Installation steps:

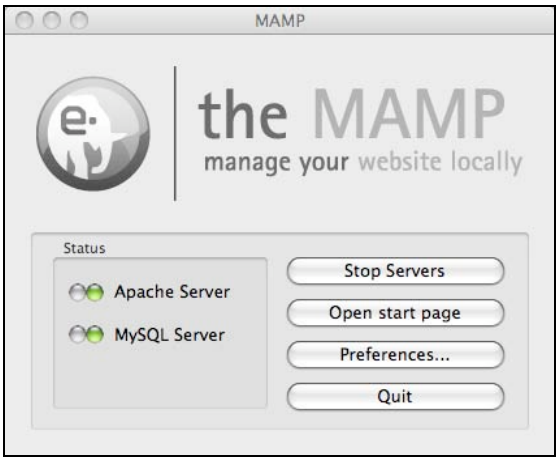
1. Download the MAMP package from http://www.mamp.info/en/mamp/index.html
2. Drag the MAMP icon to the Application folder
3. By using a text editor, modify the file "Applications / MAMP / conf / php5 / php.ini" and set the following variables as follow:

```
precision = 18
max_execution_time = 120
memory_limit = 950M
post_max_size = 32M
upload_max_filesize = 32M
error_reporting  =  E_ALL & ~E_NOTICE
display_errors = On
short_open_tag = On
auto_detect_line_endings = On
magic_quotes_gpc = On
```

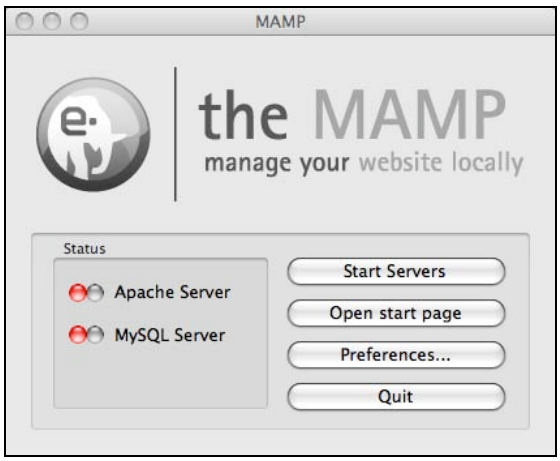
4. Edit the content of the file "Applications / MAMP / conf / apache / http.conf" as follow (section in the red box):

```
#
#AddEncoding x-compress .Z
#AddEncoding x-gzip .gz .tgz
#
# If the AddEncoding directives above are commented-out, then you
# probably should define those extensions to indicate media types:
#
AddType application/x-compress .Z
AddType application/x-gzip .gz .tgz

AddType image/svg+xml .svg
AddType image/svg+xml .svgz
AddEncoding gzip .svgz
<FilesMatch \.svgz$>
  <IfModule mod_gzip.c>
    mod_gzip_on No
  </IfModule>
</FilesMatch>

AddType application/vnd.google-earth.kml+xml .kml
AddType application/vnd.google-earth.kmz .kmz

#
# AddHandler allows you to map certain file extensions to "handlers":
# actions unrelated to filetype. These can be either built into the server
```

5. For MAMP; both Apache (the web server) and MySql (the database management system) should be automatically started. As we require to do some customizations turn the servers of by clicking on the button “Stop Servers”:

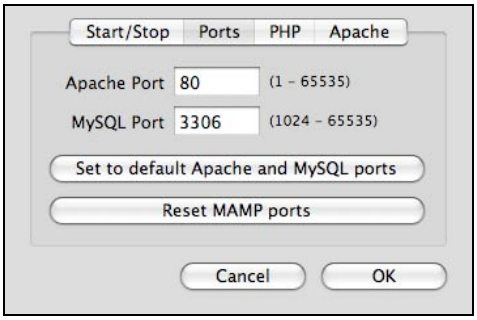


MAMP control panel with Servers started.



MAMP control panel with Servers stopped.

6. Click “Preferences”, select the “Ports” tab and change the default ports values as follow, then click “OK”:



7. Turn both servers on by clicking “Start Servers”

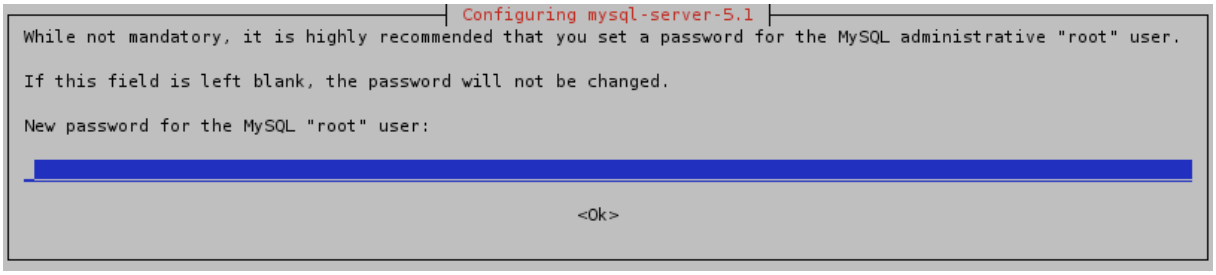
Your OSX system is now ready for the MIDOP installation.

Linux (Ubuntu) LAMP installation procedure

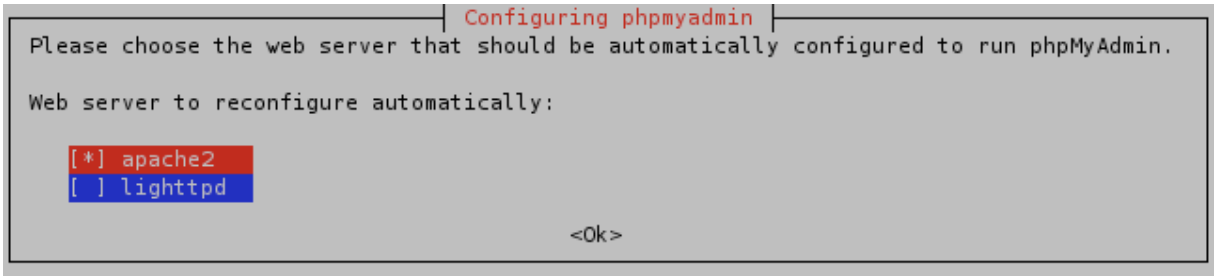
Execute the following terminal commands:

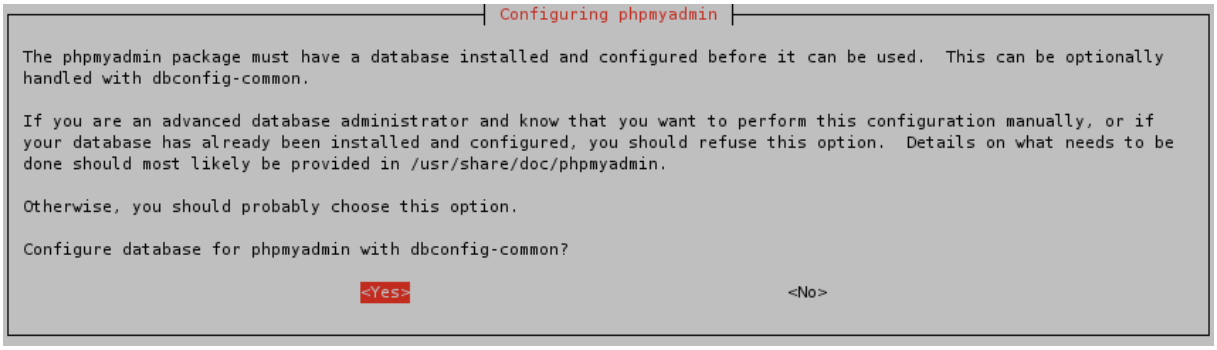
- sudo apt-get install apache2
- sudo apt-get install php5 libapache2-mod-php5
- sudo /etc/init.d/apache2 restart
- sudo apt-get install mysql-server

  (insert the mysql root password when asked, which will be used later)



- sudo apt-get install libapache2-mod-auth-mysql
- sudo apt-get install php5-mysql
- sudo apt-get install php5-curl
- sudo /etc/init.d/apache2 restart
- sudo apt-get install phpmyadmin (select “apache2” when asked)





Some web server customization must be manually done in order to use MIDOP.

- edit the Apache configuration file "/etc/php5/apache2/apache2.conf" and add the following lines at the end of the file:

```
AddType image/svg+xml .svg
AddType image/svg+xml .svgz
AddEncoding gzip .svgz
<FilesMatch \.svgz$>
  <IfModule mod_gzip.c>
    mod_gzip_on No
  </IfModule>
</FilesMatch>
AddType application/vnd.google-earth.kml+xml .kml
AddType application/vnd.google-earth.kmz .kmz
```

- edit the PHP configuration file "/etc/php5/apache2/php.ini" and change these values:

```
precision = 18
max_execution_time = 120
memory_limit = 950M
post_max_size = 32M
upload_max_filesize = 32M
error_reporting  =  E_ALL & ~E_NOTICE
display_errors = On
short_open_tag = On
auto_detect_line_endings = On
magic_quotes_gpc = On
```

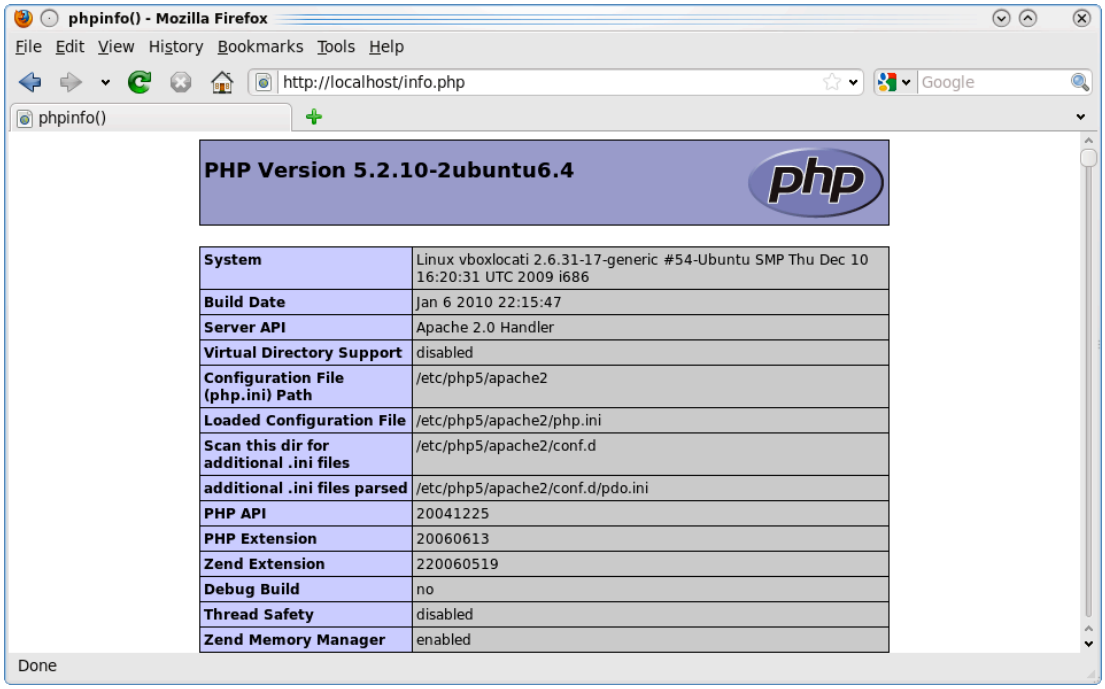
- restart the Apache web server by entering the command:

```
sudo /etc/init.d/apache2 restart
```

The Apache (and its PHP module) and the MySQL servers are now installed. Also the MySQL frontend called "phpmyadmin" is ready to be used.

Now check your installation:

- create a PHP test file using a text editor. If you are using a Gnome environment enter "sudo gedit /var/www/info.php", if you are using a KDE environment enter "sudo kate /var/www/info.php";
- write "<?php phpinfo(); ?>" within the text file and save;
- open an internet browser and enter the address "http://localhost/info.php"; below an example of a correctly working installation:



Your Linux system is now ready for the MIDOP installation.

3.2 Browser compatibility

MIDOP uses the SVG (Scalable Vector Graphic) language for describing graphical elements such as maps or diagrams. Such format is a World Wide Web Consortium (W3C) standard established since 1999 and descirbes vector graphic objects on the Web. Its diffusion is slowly growing, but still has some issue on browsers that don't fully support nowadays W3C standards.

Below a browser compatibility matrix resuming our tests:

	Operating systems			
Browser rendering engines	**Windows**	**MacOSX PPC**	**MacOSX Intel**	**Linux**
Gecko based *(Firefox 2.x+, Camino 1.6.x, Epiphany 2.2.x)*	OK	OK	OK	OK
Internet Explorer 6.x+	OK [1]	-	-	-
WebKit based *(Safari 3.x+, Google Chrome 1.x+)*	OK	OK [2]	OK	-
Opera 9.5+	OK	OK	OK	OK
KHTML based (*Konqueror*)	-	-	-	NO

[1] Internet Explorer requires a plug-in in order to show SVG content; MIDOP has been successfully tested using the Adobe SVG Viewer plug-in (http://www.adobe.com/svg/viewer)

[2] On PowerPC based Macs (Macs sold prior to year 2006) Safari for OSX have problems if the plug-in Adobe SVG Viewer is installed.

4. Input data preparation

4.1 Data management

Macroseismic intensity data are usually stored heterogeneously.
The tiding up process performed in order to create a scientific publication requires, among others, reformatting the raw data, georeferencing places on a map, create a list of bibliographical references and obviously mention the main scientific text accompanying the published data. Think about MIDOP as an alternative way of publishing this material.

By using this tool you can:
- publish a list of earthquakes, based on an earthquake catalogue table;
- publish a map and a table for each earthquake, based on a list of georeferenced places which have been affected by some degree of intensity;
- publish the bibliographical references, based on a reference table;
- publish the scientific study accompanying the data.

The whole process of publishing within MIDOP requires that data tables are well formatted.
The key point of well formatting in MIDOP is the concept of "unique item identifier code". Each basic element must be uniquely identifies in order to be able to call it from other elements.
Some examples of unique identifiers considered in MIDOP:
- every earthquake in the catalogue must have a unique identifier code, as it will be used by its related macroseismic intensity observations;
- every macroseismic intensity observations has a unique identifier;
- places mentioned by macroseismic observations have a unique identifier in all earthquakes; they are used for creating places seismic histories and they might refers to a geographical gazetteer.

Unique identifiers in MIDOP are preferably abstracted codes or simply numbers.
It must be said for example that in historical seismology the origin time cannot be the identifier code, because of the big time range uncertainty might cause overlapping earthquakes. A simple solution is to adopt integer numbers, or, if you prefer, a combination of numbers and letters, to make it easier the identification.
The unavoidable rule about unique identifiers is to avoid spaces and special characters such as è , ì, ù, ñ, č, @, ç, ^ " ' § | (/ …).

The amount of records involved in historical seismology is usually small and its data manipulation is possible using general purpose spreadsheet software such as Microsoft Excel (closed source) or OpenOffice Calc (open source). Spreadsheets are a comfortable solution both for creating new data, organising existing ones, simple analysis and for sharing data with other colleagues. In order to avoid misunderstandings about the transferred data between colleagues, we would like to stress on the importance of always incorporate a description of the data content and a description of each field name used in table.

We encourage users to take a step forward in their data manipulation processes by adopting a relational database system in addition to a spreadsheet.
Packages such as Microsoft Access, OpenOffice Base or Koffice Kexi are relational databases capable of facing complex analysis by using a relatively user friendly interface. These instruments have been created with a series of constraints that helps people avoiding compilation errors that might produce unwanted publication mistakes.

4.2 Input data table formats

The Deliverable 4 of the NERIES NA4 project called "European macroseismic database 1000-1600, M > 5.0" and its continuation in Deliverable 7 part 1 "European Macroseismic Database 1000-1750, M > 5.0" tries to establish a series of guidelines for macroseismic data compilation and validation. MIDOP has been designed within the NA4 Working Group and adopts all of its guidelines.

Note that the represented field names are just a suggestion, being MIDOP capable of using any field name used in the table header. The real naming constraint is that spaces, special characters and duplicated names must be avoided.

In the following tables the symbol "*" mean that the field is required; other mentioned fields are not necessary but they will be used if filled.

Earthquake catalogue table

The earthquake catalogue table contains the complete list of earthquakes that you are going to publish within MIDOP. It contains all the information about the whole earthquake, such as the origin time, the epicentral area and the source of information from which data are taken.

Field	Description	Type
EQid *	Earthquake unique identifier. Trailing spaces and special characters must be avoided (a simple integer number is advisable) *(field used retrieving all the corresponding macroseismic intensity points)*	text or number
Year *	Time of the event (year). Note that negative values are accepted	integer
Mo *	Time of the event (month)	integer
Da *	Time of the event (day)	integer
Ho *	Time of the event (hours)	integer
Mi *	Time of the event (minutes)	integer
Se *	Time of the event (seconds)	integer
Ax	Denomination of the area where the largest effects are located	text
AxShort	Denomination of the area where the largest effects are located (shortened) *(field useful for html tables that have a character space constraint)*	text
StudyShort	Short bibliographical citation, mentioning the main author and the date of study publication (e.g.: Stucchi M., 2009 - Stucchi & Locati, 2009 - Stucchi et al., 2009)	text
StudyCode	An extremely simplified code representing the study. Trailing spaces and special characters must be avoided *(field used to link to the corresponding record in the bibliographical table and used for naming study related PDFs and images, see chapter 4.3)*	text or number

Table 1a. Earthquake catalogue data.

The earthquake catalogue table may contain information about the epicentre: if you want to plot such epicentre within MIDOP, you must add an additional set of fields to the catalogue in order to describe the epicentre parameters. Below the list of available epicentre descriptors (**tab.1b**):

Field	Description	Type
EpLabel *	Epicentre label *(will appear within the earthquake information frame)*	text
EpLocationSource	Epicentre location source	text
EpLat *	Epicentre latitude (geographical coordinates in decimal degree)	decimal
EpLon *	Epicentre longitude (geographical coordinates in decimal degree)	decimal
EpIntensity	Epicentral intensity, expressed using a macroseismic intensity scale, such as MCS (Mercalli Cancani Sieberg) MM (Modified Mercalli), EMS98 (European Macroseismic Scale 1998), MSK (Medvedev-Sponheuer-Karnik) (e.g.: 6, 6-7, 7, 7-8)	text
EpIntensityNum	Epicentral intensity numerical (e.g.: 6, 6.5, 7, 7.5, …)	decimal
EpMagnitudeSource	Epicentre magnitude source (e.g.: references to a published paper)	text
EpMagnitude	Epicentre magnitude (might contains also text)	text
EpMagnitudeNum	Epicentre magnitude, the corresponding numerical value	decimal
EpMagnitudeError	Epicentre magnitude associated error	text
EpMagnitudeType	Epicentre magnitude type (how the epicentre is obtained: manually or if calculated, the adopted method, mentioning the reference published paper or, at least, a descriptive text)	text

Table 1b. Epicentres description data.

MIDOP allows more than one epicentre, each one represented with a different symbol.

In order to add another epicentre, another set of dedicated fields must be added to the catalogue table. Remember that within the same table two fields cannot have the same name, so you will have to change it, for instance by adding a progressing number (e.g.: Ep2Label, Ep2Source, Ep2Lal, Ep2Lon, Ep2Intensity, ...).

Macroseismic intensity data table

The macroseismic intensity data table stores the complete list of Macroseismic Data Point (MDP) for each earthquake. Their scope is to describe as much as possible all those information retrieved in the original published earthquake study about the places where the earthquake was felt.

Field	Description	Type
EQid *	Earthquake unique identifier *(field used for retrieving the corresponding earthquake in the catalogue)*	text or number
MDPid *	Macroseismic Data Point (MDP) unique identifier. Trailing spaces and special characters must be avoided (a simple integer number is advisable)	text or number
PlaceID	Place unique identifier. It must be the same in every earthquake where the place is mentioned. Trailing spaces and special characters must be avoided (a simple integer number is advisable). It may differs from the original gazetteer identifier used for retrieving the place coordinates. *(field used in order to generate place seismic histories: if not specified the "query by place" will not be available)*	text or number
PlaceName	Place name	text
PlaceNameShort	Place name (shortened) *(field useful for html tables that have a character space constrain)*	text
PlaceSC	Place special case. See the two characters code reference tab. 2c below	text
PlaceLat *	Place latitude in geographical coordinates in decimal degree *(field used for plotting the place)*	decimal
PlaceLon *	Place longitude in geographical coordinates in decimal degree *(field used for plotting the place)*	decimal
PlaceLatTE	Place latitude in geographical coordinates in decimal degree for large territories. Such places will not be represented on map but their coordinates, if present, will be taken into account for centering the map.	decimal
PlaceLonTE	Place longitude in geographical coordinates in decimal degree for large territories. See above.	decimal
IntensityScale	The macroseismic intensity scale used for assessing the degree of damage, such as MCS (Mercalli Cancani Sieberg) MM (Modified Mercalli), EMS98 (European Macroseismic Scale 1998), MSK (Medvedev-Sponheuer-Karnik).	text
Intensity *	Intensity expressed using the specified macroseismic scale on the mentioned place. Special intensity values as specified within the NERIES NA4 Deliverable 7 part 1 are accepted (see tab. 2a below).	text
IntensityNum *	Numerical value corresponding to the expressed intensity *(field used for sorting tables and layering by intensity the plotted MDP on the earthquake map)*	decimal
Reliability	Reliability (as available from the convention in use locally)	text
GazetteerName	Source gazetteer used for obtaining the place coordinates	text
GazetteerID	Place unique identifier within the source gazetteer	text or number
Country	Present country code of the locality as described in the ISO 3166-1 (see the reference table below)	text
Region	First order country administrative division	text
Province	Second order country administrative division	text
MunicipalityName	Third order country administrative division	text
MunicipalityCode	Third order country administrative division (coded). Its coding rules is different in each country	text

Table 2. Macroseismic intensity data.

Further information on geographical Gazetteers can be found in [Hill L., 2006].

For your convenience, below is reported the simplified and generalized European Macroseismic Scale (EMS-98, [Grünthal et al., 1998]) (tab. 2a) which is the recommended scale to be used.

EMS-98 intensity	Definition	Description of typical observed effects (abstracted)
1	Not felt	Not felt.
2	Scarcely felt	Felt only by very few individual people at rest in houses.
3	Weak	Felt indoors by a few people. People at rest feel a swaying or light trembling.
4	Largely observed	Felt indoors by many people, outdoors by very few. A few people are awakened. Windows, doors and dishes rattle.
5	Strong	Felt indoors by most, outdoors by few. Many sleeping people awake. A few are frightened. Buildings tremble throughout. Hanging objects swing considerably. Small objects are shifted. Doors and windows swing open or shut.
6	Slightly damaging	Many people are frightened and run outdoors. Some objects fall. Many houses suffer slight non-structural damage like hair-line cracks and fall of small pieces of plaster.
7	Damaging	Most people are frightened and run outdoors. Furniture is shifted and objects fall from shelves in large numbers. Many well built ordinary buildings suffer moderate damage: small cracks in walls, fall of plaster, parts of chimneys fall down; older buildings may show large cracks in walls and failure of fill-in walls.
8	Heavily damaging	Many people find it difficult to stand. Many houses have large cracks in walls. A few well built ordinary buildings show serious failure of walls, while weak older structures may collapse.
9	Destructive	General panic. Many weak constructions collapse. Even well built ordinary buildings show very heavy damage: serious failure of walls and partial structural failure.
10	Very destructive	Many ordinary well built buildings collapse.
11	Devastating	Most ordinary well built buildings collapse, even some with good earthquake resistant design are destroyed.
12	Completely devastating	Almost all buildings are destroyed.

Table 2a. EMS-98, the European Macroseismic Scale, 1998.

Notes on the intensity notation:

- the so called uncertain intensity values, such as 7-8, 8-9, etc. are accepted;
- the intensity notation is of fundamental importance in order to let MIDOP plot the right symbol. Please, do not use variants such roman numerals, decimals or other characters as they will not get plotted on the map;
- MIDOP requires also a numerical translation of such intensity in order to being able to correctly sort tables and for the correctly layering of the intensity symbols on maps (lower intensities will be displayed underneath higher intensities).

Special macroseismic intensity codes reference table (extracted from NEIRES NA4 Deliverable 7 part 1) (tab. 2b):

Code	Intensity code description
E	Environmental effects only (e.g.: landslide, liquefaction)
W	Environmental effects only (e.g.: sea or lake waves)
F	Felt
D	Damage
HD	Heavy damage, destruction, extensive damage or total collapse
G3	Light damage to an isolated building (requires “IB” in place special case field)
G4	Moderate damage to an isolated building (requires “IB” in place special case)
G5	Heavy damage to an isolated building (requires “IB” in place special case)

Table 2b. Macroseismic intensity codes.

Place special case codes reference table (extracted from NERIES NA4 Deliverable 7 part 1) (tab. 2c):

Code	Special case	Description	Problem	Epicentral parameters assessment notes
TE	large area, territory	area containing several localities; the size of the area exceeds the one suggested by the EMS98	intensity assignment is not compatible with the definition of intensity and any location would be arbitrary	coordinates and intensity must not be assessed. F, D or HD and arbitrary coordinates, only for graphical representation, should be assessed. These MDPs must not be used for earthquake parameters determination.
UL	unknown (not located) locality	a place which both the author of the study and the MDP compiler is not able to locate today	coordinates cannot be assigned	these MDPs cannot be used for earthquake parameters determination
SS	small settlement	settlement the size of which is too small to supply a significant building sample for intensity assessment	intensity assignment is not compatible with the statistical meaning of intensity	coordinates are assessed; F, D or HD are assessed. As a first choice these MDPs should not be used for earthquake parameters determination
IB	isolated building	single (isolated) building. A building standing alone, like a light tower, a country church etc.	intensity assignment is not compatible with the statistical meaning of intensity	coordinates are assessed; F, G3, G4 or G5 (grade damage of the EMS98) are assessed. These MDPs should not be used for earthquake parameters determination
MS	multiple settlement	settlement whose traditional place name refers to a set of small settlements in a limited area, including small islands	information may not strictly refer to the place name. However, no better interpretation can be provided	assess intensity and coordinates. The code represents a warning for the user
DL	deserted locality	abandoned locality, eventually rebuilt elsewhere with the same or another name	the seismic history may show interruptions or non seismic gaps	assess intensity and coordinates. The code is a warning for understanding the seismic history
AL	absorbed locality	a locality absorbed into a larger one	same as above	assess intensity and coordinates. The code is a warning for understanding the seismic history
CQ	city quarter	information related to part of a city	place name and the coordinates may be somewhat arbitrary	assess Is and coordinates. The code is a warning for understanding the seismic history

Table 2c. Places special case codes.

ISO 3166-1 country codes reference table (extracted from NA4 Deliverable 7 part 1) (tab. 2d):

Code	Geographical area
AL	Albania
DZ	Algeria
AD	Andorra
AT	Austria
BY	Belarus
BE	Belgium
BA	Bosnia and Herzegovina
BG	Bulgaria
HR	Croatia
CY	Cyprus
CZ	Czech Republic

Code	Geographical area
MD	Moldova
MC	Monaco
ME	Montenegro
MA	Morocco
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RU	Russian Federation
RS	Serbia

DK	Denmark
EG	Egypt
EE	Estonia
FI	Finland
FR	France
DE	Germany
GR	Greece
HU	Hungary
IS	Iceland
IE	Ireland
IT	Italy
LV	Latvia
LY	Libyan Arab Jamahiriya
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
MK	Macedonia
MT	Malta

SK	Slovakia
SI	Slovenia
ES	Spain
SE	Sweden
CH	Switzerland
TN	Tunisia
TR	Turkey
UA	Ukraine
UK	United Kingdom

Additional codes	
GG	Guernsey
GI	Gibraltar
IM	Isle of Man
JE	Jersey
SU	Soviet Union (being phased out)
YU	Yugoslavia (being phased out)

Table 2d. ISO 3166-1 country codes.

Map reference places

MIDOP can show place names on maps to be used as a geographical reference. Built-in support is available for the whole Europe (UK, Iberia, France, Italy, Eastern Europe, Fennoscandia, Aegean). In order to let MIDOP understand when it has to plot a place you must specify the geographical area for each place. For example if you want to show "Paris" both in UK and France maps, you must insert "Paris" twice in this table, one will be used while generating maps for the UK area, and the another will be used while generating maps for the France area. If you plan covering an extra European area you should integrate the new places within the built-in table called "ref_places", structured as follows:

Field	Description	Type
RecordID *	Record unique identifier. This is not a place identifier, as the same place can be inserted more than one time.	text or number
PlaceName *	Place name.	text
PlaceNameDistant *	Place name displayed when the map will be zoomed out.	text
PlaceLat *	Place latitude in geographical coordinates in decimal degree.	decimal
PlaceLon *	Place latitude in geographical coordinates in decimal degree.	decimal
ZoomLevel *	When to show the place on the map. MIDOP accepts one of these 3 zoom values: "detail", "medium", "large". If empty the place will never appear.	text
GeographicalArea *	Geographical area code where the place will be shown. MIDOP has these built-in areas: "iberia", "france", "uk", "italy", "eastern_europe", "fennoscandia", "aegean".	text

Table 3. Map reference places data.

4.3 Macroseismic earthquake studies

MIDOP can publish Macroseismic Earthquake studies related information from which the intensity points are taken.

Bibliographical citations, original documents in digital format such as PDFs, related images and link to external web pages can be specified for each study mentioned in the earthquake catalogue.
In order to publish such information, a bibliographical table must be prepared **(tab. 4)**:

Field	Description	Type
StudyCode *	Simplified code representing the study. Trailing spaces and special characters must be avoided. *(field used to link to the corresponding field in the earthquake catalogue and used for naming study related PDFs and images)*	text or number
ShortCitation	Short bibliographical citation, mentioning the main author and the date of study publication (e.g.: Stucchi M., 2009 - Stucchi & Locati, 2009 - Stucchi et al., 2009). The field content is the same as the corresponding field in the earthquake catalogue.	text
CompleteCitation	Complete bibliographical citation of the study, with authors, year of publication, title and publisher.	text
ExternalPageURL	Address link to an external web page containing online relevant information about the study.	text
ExternalPDFURL	Link to an external website with the PDF file of the study.	text
YearOfPublication	Year of publication of the study.	integer
Authors	List of authors of the study.	text

Table 4. Macroseismic earthquakes studies data.

By specifying a link in the above table, MIDOP will automatically show the external link within the popup window containing bibliographical information. A similar link will appear if an external PDF is filled in.

PDFs stored on your computer can also be published: these files must be named using the "StudyCode" with ".pdf" as file extension and stored in the folder "data / studies / YOUR_STUDY_CODE / ": MIDOP will automatically scan the study archive folder and the PDF will shows up in the bibliographical popup window.

A similar procedure is used for publishing study images: PNG or JPG image files must be named "StudyCode" with extension ".jpg" or ".png" and stored in the relative study folder.
Additionally to the above methods, MIDOP has a way of linking PDF and images to subsets of a study. By naming a PDF or an image with "StudyCode" and the complete earthquake date, the file will be show only when that specific earthquake will be selected.

Here an example on how to compile a study bibliographical record (tab. 4a):

StudyCode	ALBVO008
ShortCitation	Albini & Vogt, 2008
CompleteCitation	Albini P. and Vogt J., 2008. A glimpse into the seismicity of the Ionian Islands between 1658 and 1664. In: J. Fréchet, M. Meghraoui, M. Stucchi (eds.), Historical Seismology, 43-91.
ExternalPageURL	http://www.springerlink.com/content/m2578573521h4n60/
ExternalPDFURL	http://www.springerlink.com/content/m2578573521h4n60/fulltext.pdf
YearOfPublication	2008
Authors	Albini P. and Vogt J.

Table 4a. Study bibliographical record example.

As we want to show also a thumbnail image of the whole study, using a paint program we create an image with the front cover of the study, we called it "ALBVO008.jpg" and we store it in the folder "data / studies / ALBVO008 /". The image will show up in the bibliographical popup window every time users will click the corresponding study.

Suppose that the catalogue that is going to be published considers three earthquakes from this study: the 11th September 1661, the 12th March 1662 and the 1664 earthquakes all in Zakynthos (Greece). Three PDF files and three thumbnail images are created, respectively (both PNG or JPG can be used):

- "ALBVO008_1661_09_11.pdf" and "ALBVO008_1661_09_11.png"
- "ALBVO008_1662_03_12.pdf" and "ALBVO008_1662_03_12.png"
- "ALBVO008_1664.pdf" and "ALBVO008_1664.png"

These PDF and images will only show up in the popup window when the corresponding earthquake is selected from the catalogue.

4.4 Uploading data into MySql

Macroseismic data tables must be loaded into MySql in order to let MIDOP using them.
This load process is crucial: if something goes wrong your data could be affected by some conversion error, so be careful while doing it.

In order to avoid potential problems, please follow these simple rules:

- within the same table do not duplicate field names;
- in table names and field names avoid spaces, special characters and use always or lower or uppercase characters;
- for each field specify the data format (integer or floating numbers, characters, long text).

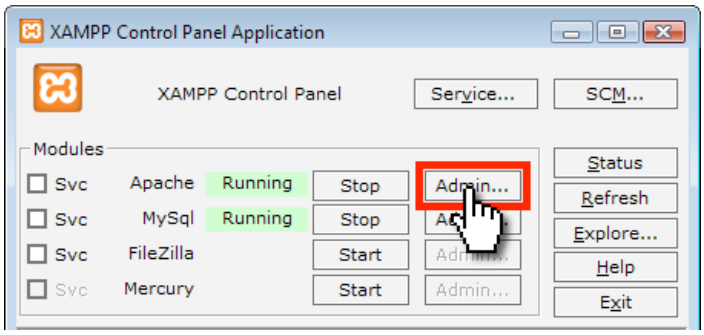
If you are new to MySql, consider a database as a folder which may contains various data tables.
Each table might contain hundreds of fields, each with a unique name and a specific "type".
With "type" MySql specifies the nature of the field content. Below a list of main data types available in MySql.

Type	Description
VARCHAR [length]	A fixed-length field from 0 to 255 characters long
TINYTEXT	A string with a maximum length of 255 characters
TEXT	A string with a maximum length of 65,535 characters
MEDIUMTEXT	A string with a maximum length of 16,777,215 characters
LONGTEXT	A string with a maximum length of 4,294,967,295 characters
TINYINT [length]	Range of -128 to 127 or 0 to 255 unsigned
SMALLINT [length]	Range of -32,768 to 32,767 or 0 to 65535 unsigned
MEDIUMINT [length]	Range of -8,388,608 to 8,388,607 or 0 to 16,777,215 unsigned
INT [length]	Range of -2,147,483,648 to 2,147,483,647 or 0 to 4,294,967,295 unsigned
BIGINT [length]	Range of -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807 or 0 to 18,446,744,073,709,551,615 unsigned
FLOAT	A small number with a floating decimal point
DOUBLE [length, dec]	A large number with a floating decimal point
DECIMAL [length, dec]	A double stored as a string, allowing for a fixed decimal point
DATE	In the format of YYYY-MM-DD
DATETIME	In the format of YYYY-MM-DD HH:MM:SS
TIMESTAMP	In the format of YYYYMMDDHHMMSS; range ends in the year 2037
TIME	In the format of HH:MM:SS

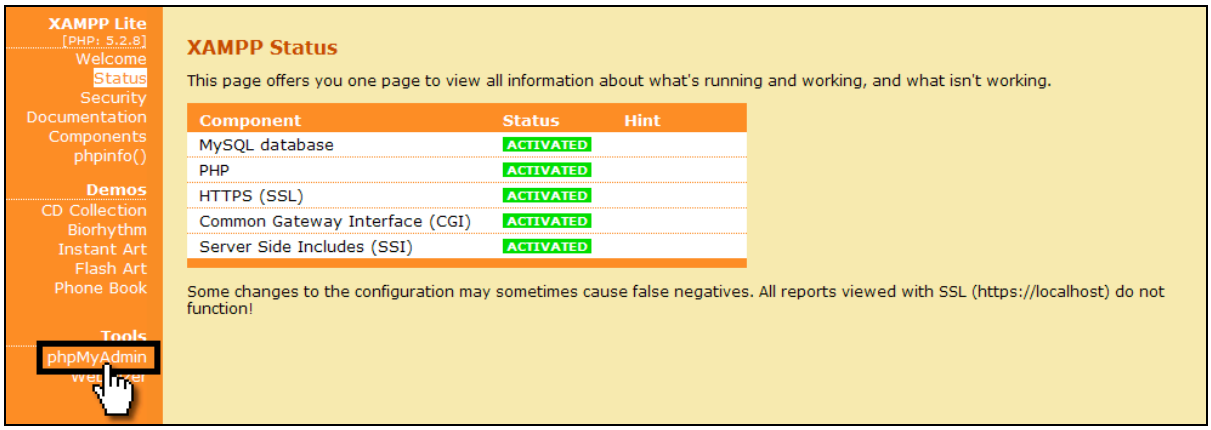
Table 5. Main MySql field data types.

Main database creation

1. Open the XAMPP online administration panel and click the "Admin" button corresponding to the Apache web server (Apache must be turned on):

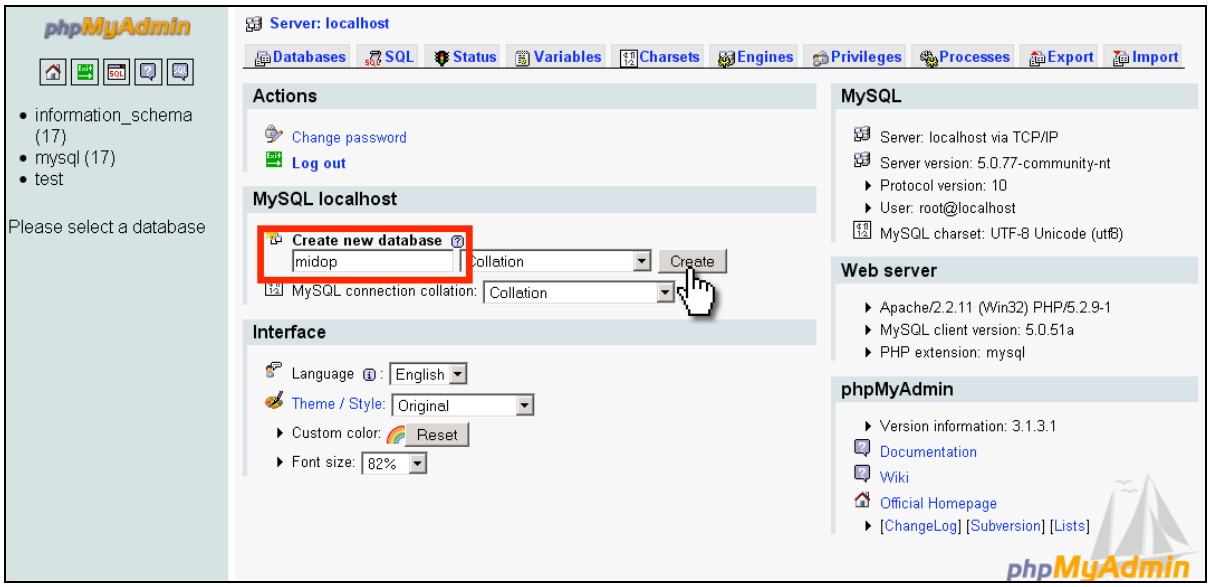


2. Select “phpMyAdmin” within the web interface panel:

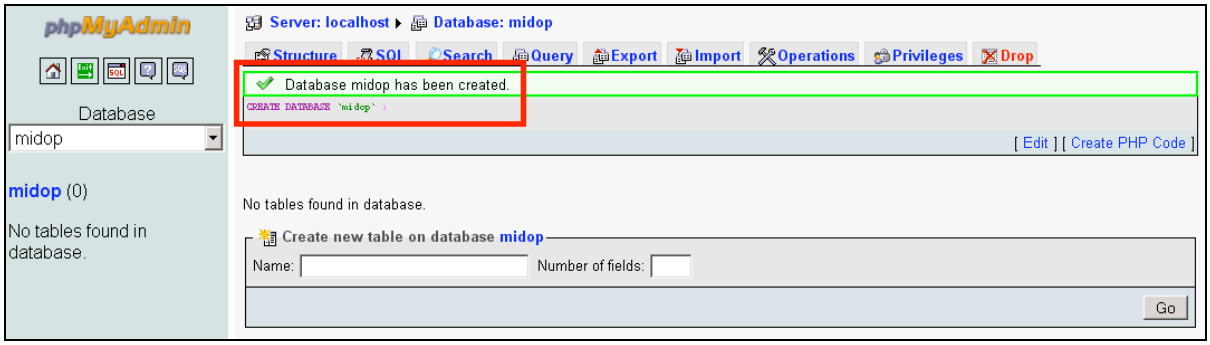


phpMyAdmin is a web tool written in PHP language that offers let you visually manage your MySql databases. By using it you will be able to create, modify and query both databases and tables and also upload and download your data content.

3. In the phpMyAdmin window create a new database, for example called “midop” (lower case); think about databases as a folder: here you’ll be able to store all the data tables about a project;

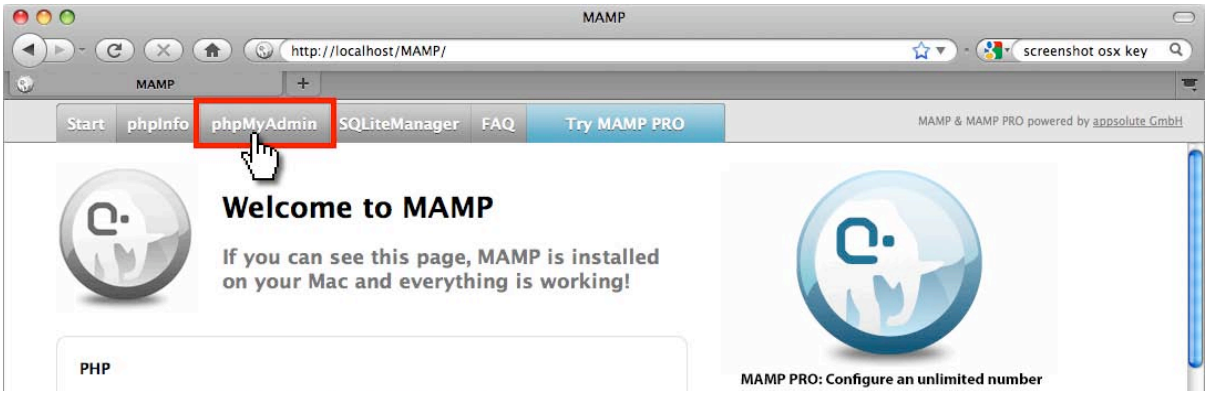


For every action requested by the user phpMyAdmin give a feedback message telling if the operation was successful or not. Below a screenshot showing a correctly created database:

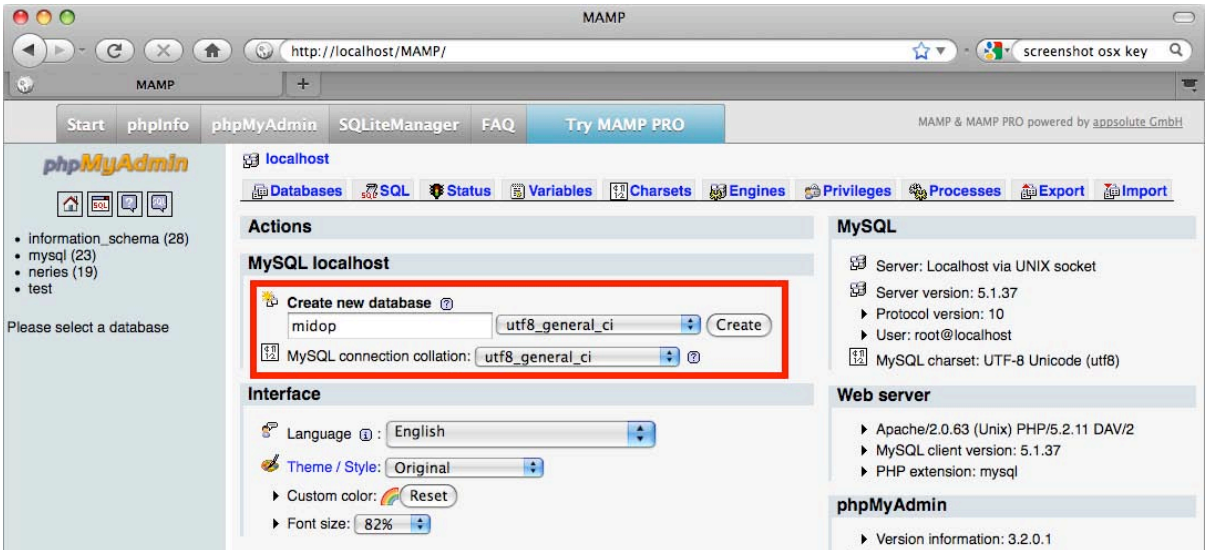


MacOS X

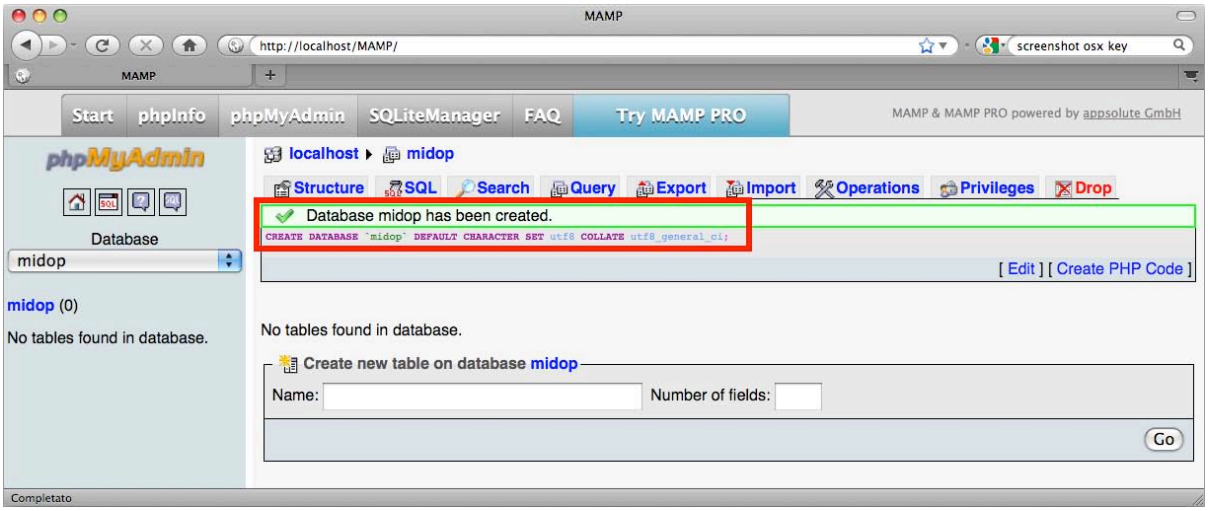
1. In the MAMP window click on “Open start page”; a new browser window will appear and the MAMP web control panel interface will appear and shows up; click on “phpMyAdmin”:



2. Proceed to the MySql administration interface:



3. Let’s create your first MySql database, for example enter “midop” (do NOT use upper case, spaces nor special characters) in the “Create a new database” field, then click “create”. A feedback message will show up telling you if the requested operation successfully succeeded.



If you decide to alter/change/correct your data directly in MySql using phpMyAdmin we advice you to keep trace of all of them or you'll end up with a data set which will not correspond to your initial data, resulting in odd situation later.

Data upload via CSV text file

- open the table that you want to load in MySql and do a bit of cleaning:
  - if the first line is a header with the name of each column content, delete the entire row;
  - in order to avoid the import of unwanted content delete some column and rows at the end of the table; apparently empty cells might contain spaces and they will be exported;
- from the spreadsheet export a CSV file ("Comma Separated Value") for each table; the output is a plain text file. The character used to delimit each field content depends on your operating system regional settings: in order to know which character is used open the exported CSV file using a standard text editor. Usually a semicolon or a comma character are used;
- turn on both your Apache and MySql server if needed;
- open a browser and surf to your phpMyAdmin folder;
- access your database (or create a new one);
- for each table that you want to import into MySql:
  - create a new table containing a field for each column of your spreadsheet table; define its name and data type;
  - click on the "import" tab and load each of your CSV file;
  - specify which character is used as field delimiter ("Fields terminated by");
  - check your imported data by clicking on the "Browse" tab;

Data upload via ODBC

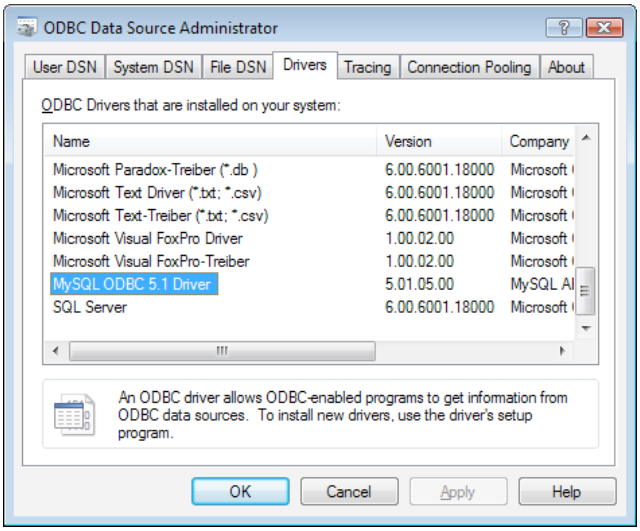
This section covers the procedure on how to transfer a table from Microsoft Access to MySql using an ODBC, Open Database Connectivity (http://en.wikipedia.org/wiki/ODBC).
In order to let Access and MySql communicate directly, Windows need to know which driver must be used while transferring data; such database engine driver will transparently maps Access data into MySql and vice versa with just a couple of clicks.

Windows

The MySql ODBC driver (also called "connector") is freely available on the MySql website. Follow these installation steps:

1. Download and install the MySql driver/connector Windows MSI Installer package from http://dev.mysql.com/downloads/connector/odbc/

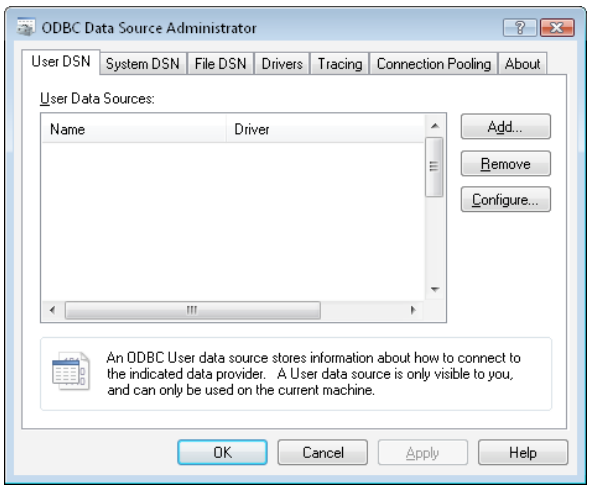
2. Once the automatic installation procedure ends, check if the driver is correctly installed by opening the Data Sources (ODBC) (navigate to Control Panel / Administrative Tools); the MySql driver should appear in the list of installed “Drivers” tab;



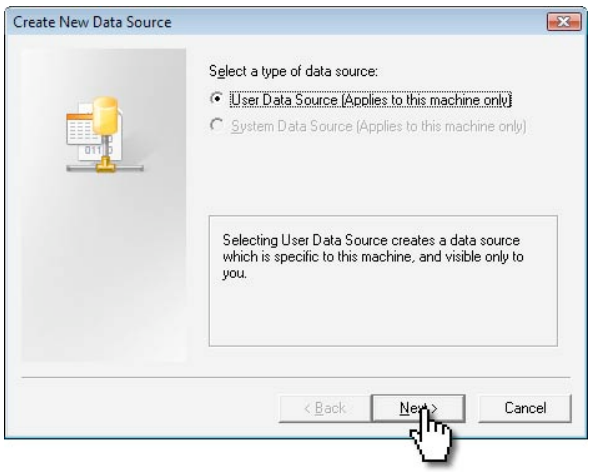
The driver is now installed and ODBC aware applications such Microsoft Access can now connect to MySql.
The first time an ODBC connection is requested, a configuration procedure must be stored as a new source of ODBC data in order to be used also in future:

1. Turn on the both Apache and the MySql server using XAMPP control panel, if needed;
2. Create a connection referring to the above created database “midop”, open the ODBC Data Source Administrator within the “Control Panel > Administrative Tools” (this path might change depending on your localized copy of Windows).

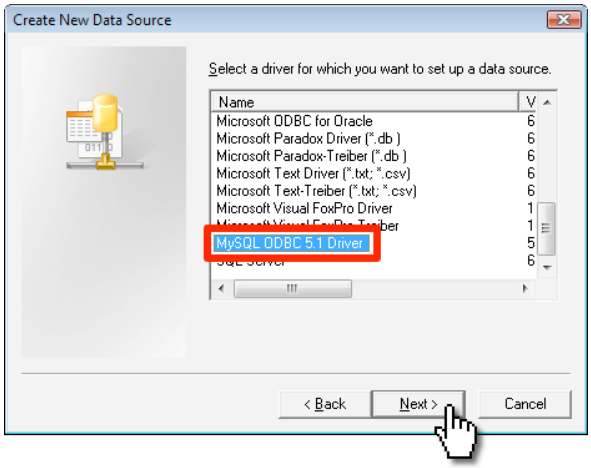
a)



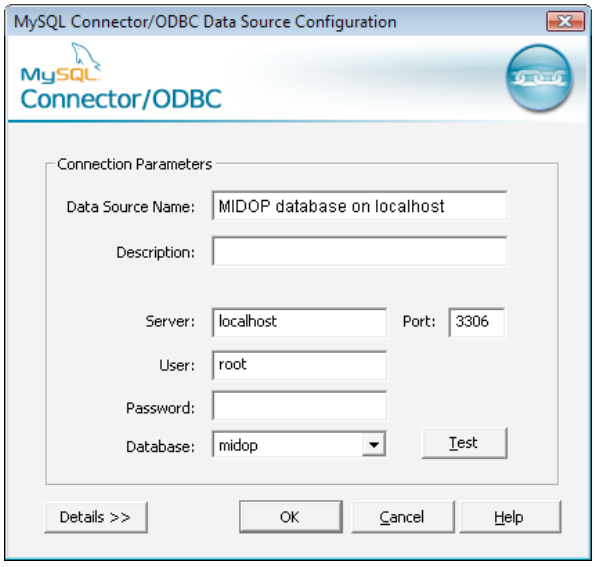
b)



c)



d)



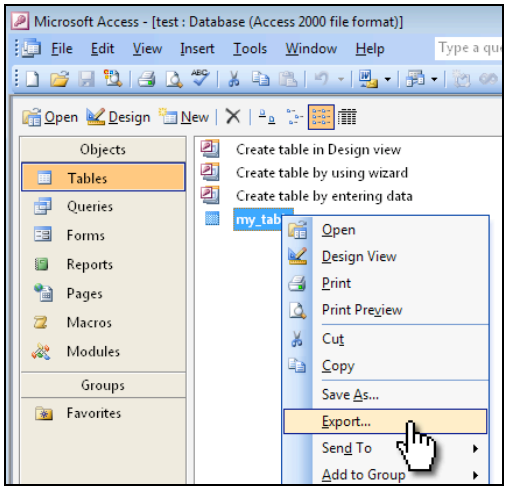
a) Click “add” in order to create a new ODBC data source;
b) Select “User data source (applis only to this machine only)”, then click “Next”;
c) Scroll the list of available source driver until you find “MySQL ODBC 5.1 Driver”, then click “Next”;

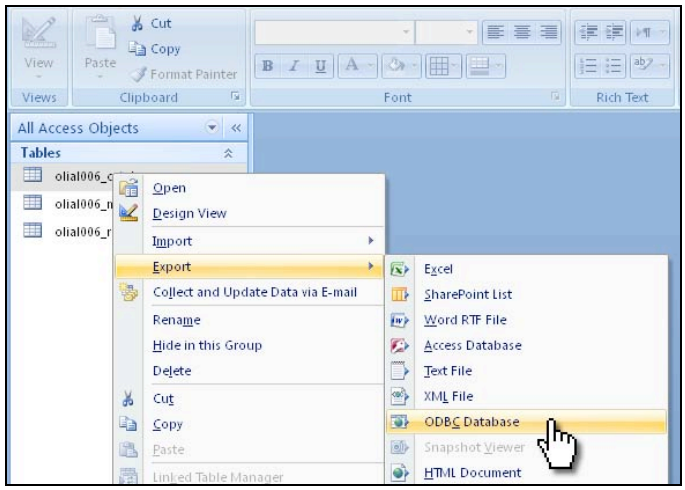
d) In the “Data source name” insert the connection label: enter a text that will helps you later remembering the data stored in the database you are going to connect to. You can enter also an extensive text “Description” of the connection if you want. In the “Database” field you must enter the exact name (lower/upper case sensible) of the MySQL database. In “User” and “Password” you must insert a MySQL user enabled to work on data from your computer. If you are using a XAMPP Lite or a WAMP based installation just enter “root” without a password, otherwise you must specify the password entered while installing MySQL. For advanced users we remember that phpMyAdmin offer a comfortable way of managing MySQL users through a visual interface (“Privileges” tab);

From now on you will be able to connect to this data resource from every application ODBC enabled. You are now ready to transfer data from Access and MySql with a couple of clicks. Note that this connection works in both ways: you can export but also import data tables from MySql.

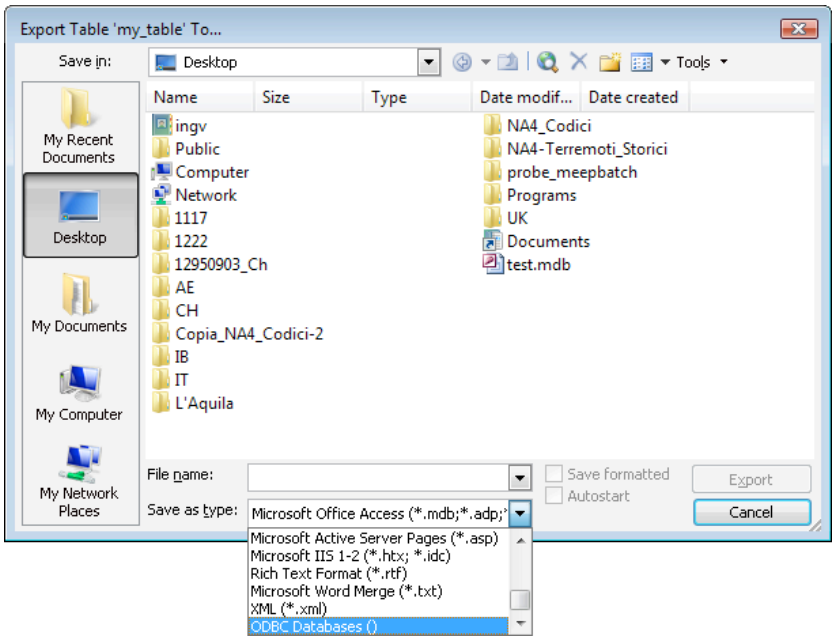
In order to export a table from Access to MySql follows these steps:

1. In Access (left version 2003, right version 2007) right click on the table that you want to transfer to MySql:

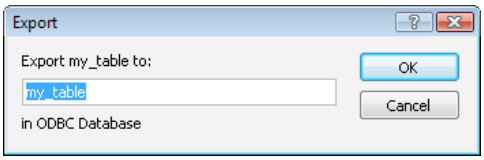




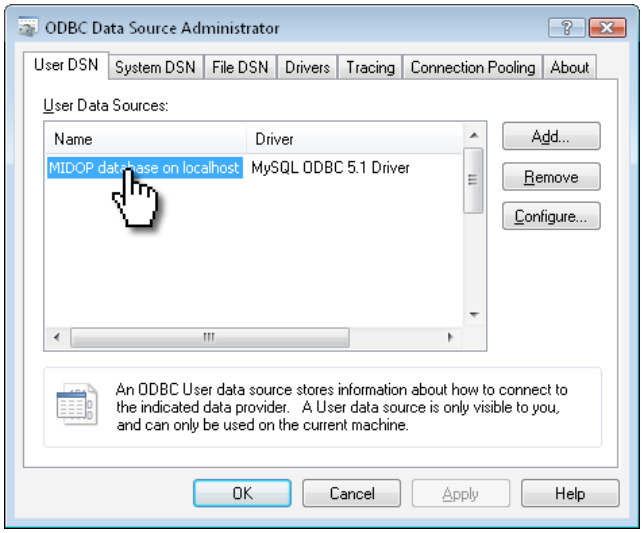
2. (only for Access 2003) scroll down the types on the export table dialogue and choose “ODBC Database”:



3. Enter the name of the table that will be created in MySql. Note that you can also specify different a table name than what is used in for the Access table (you might have stored in your database various versions of the same table).



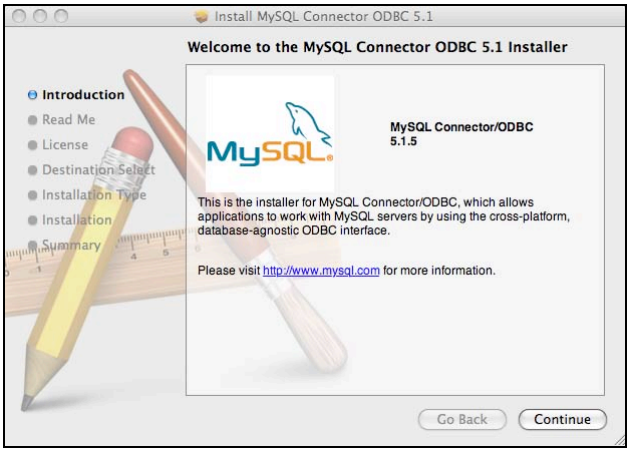
4. Select the previously created ODBC data source connection then click “ok”:



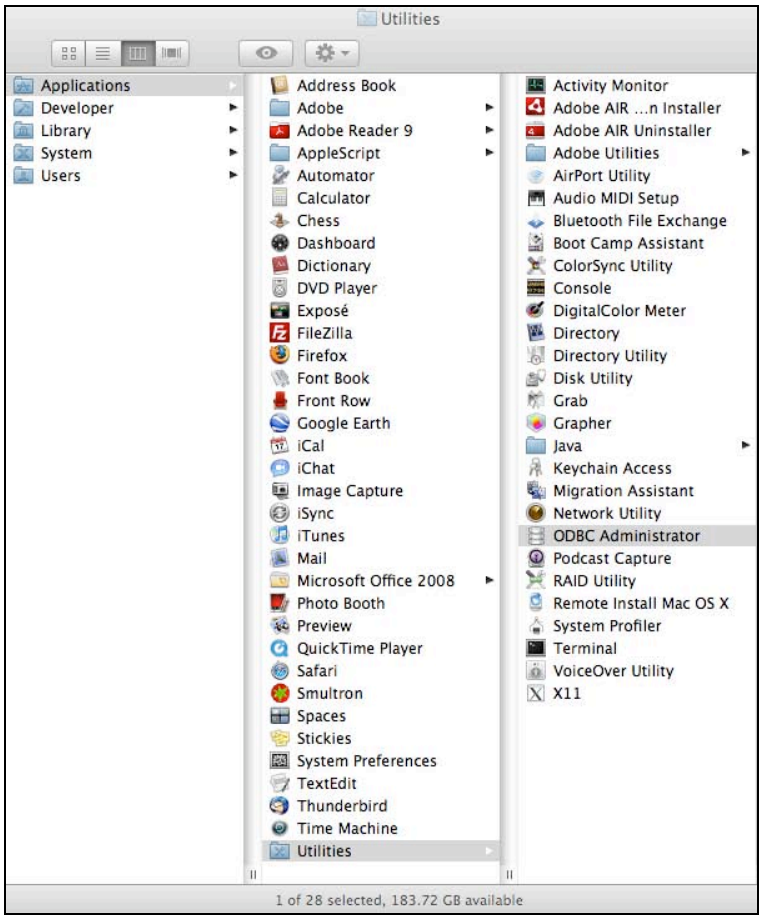
The data transfer speed might depends on the table size and the type of connection to MySQL (local, on the same computer or a remote connection).
That’s it: your table is now stored in MySql and will be available to MIDOP.

MacOS X

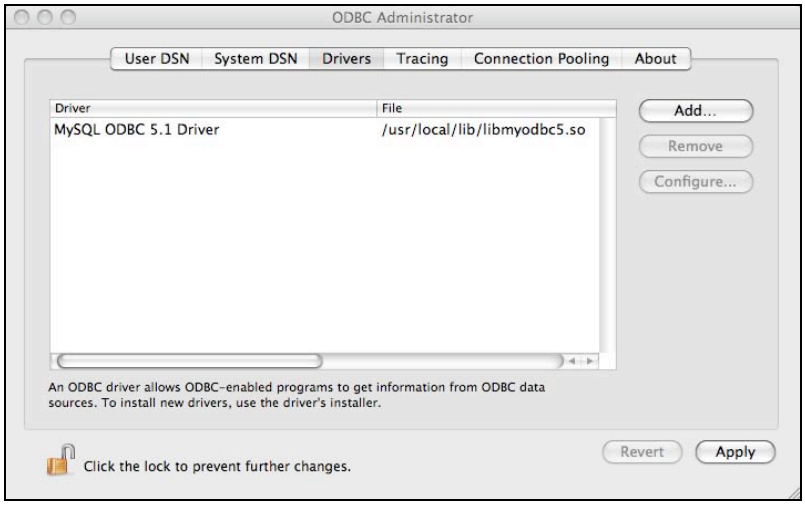
1. Download and install the MySql driver/connector from http://dev.mysql.com/downloads/connector/odbc/5.1.html#macosx-dmg



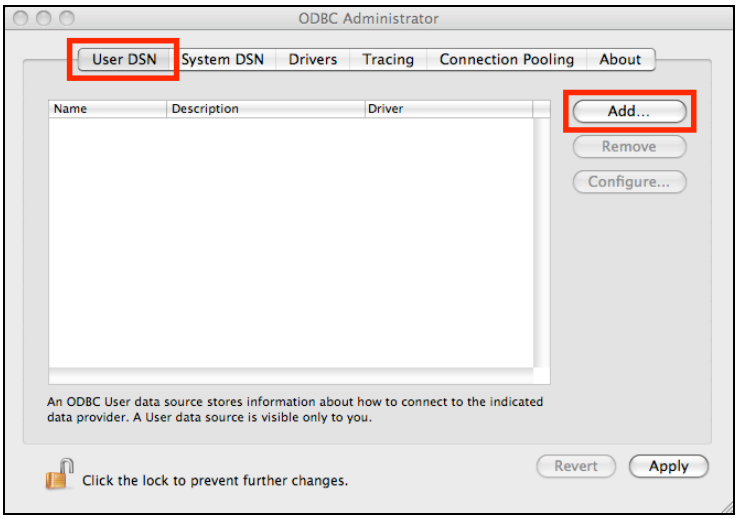
2. Once the installation process has finished, open the ODBC control panel available in "Applications / Utilities / ODBC Administrator"



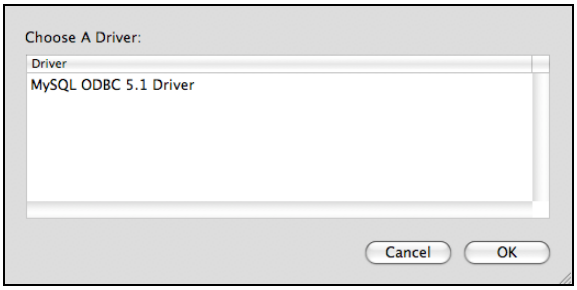
3. Check if the MySql driver is available to the system by opening the "Drivers" tab:



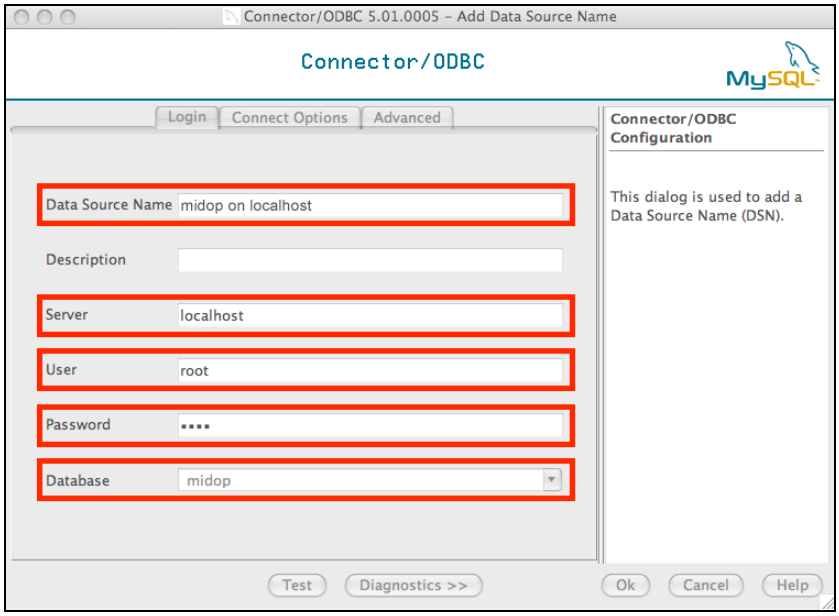
4. Add a new ODBC connection in the "User DNS" tab that from now on you will use in order to transfer data to and from the selected data source:

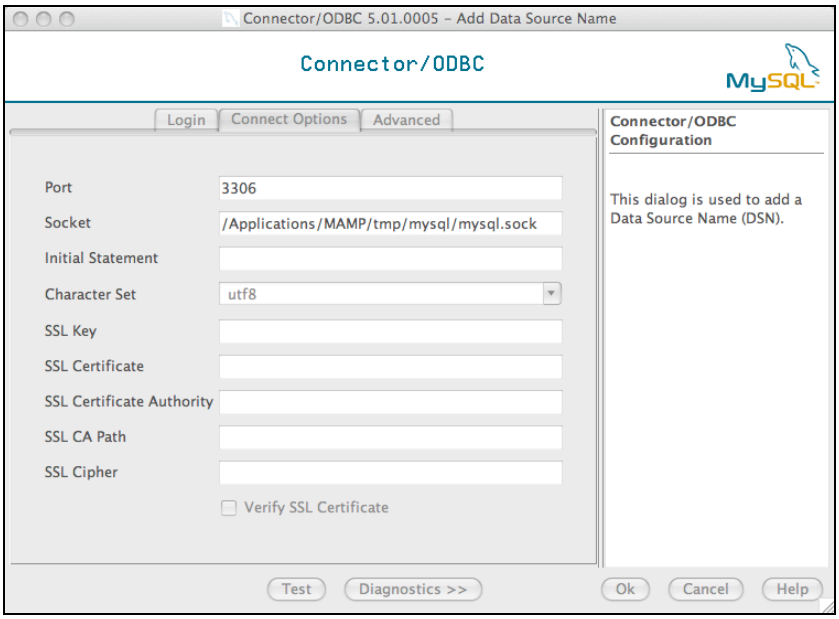


5. Select the appropriate driver used by the ODBC connection:

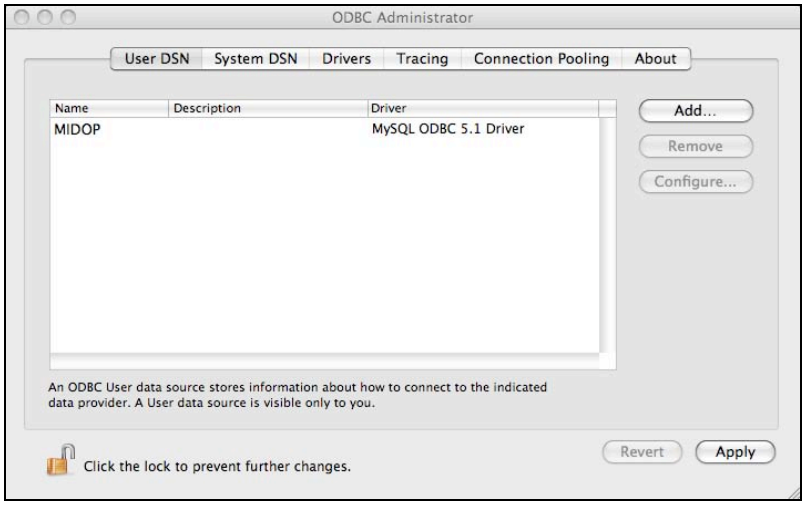


6. Insert the name of the ODBC connection (something that will help you later remember where the connection is pointing to), the server name "localhost", the user name and the password in order to connect to your MySql server; in the "Connect Options" tab insert "3306" as the port number and "Applications/MAMP/tmp/mysql/mysql.sock" as the used socket:





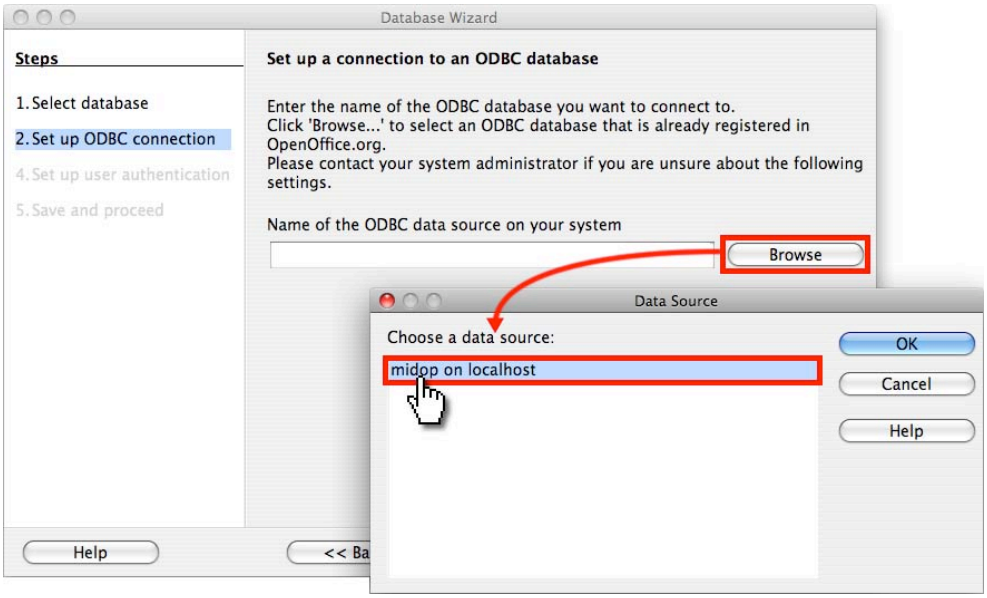
7. Save your ODBC connection.



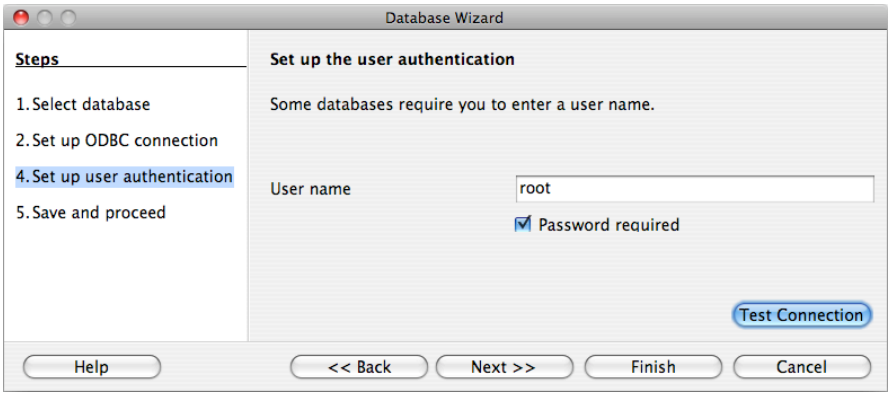
Create an OpenOffice Base file that is connected to MySql follow this procedure:

1. open OpenOffice Base and select to connect to an existing database via ODBC:

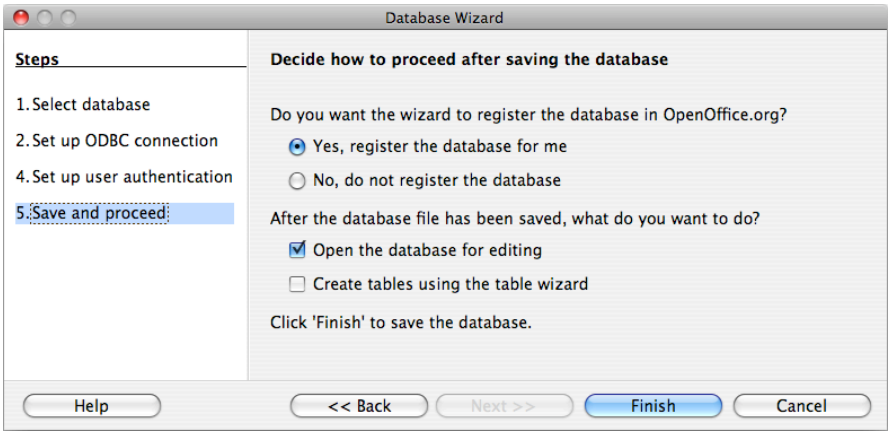
2. selected the previously stored ODBC connection "*midop on localhost*":



3. enter the required MySql server authentication parameters (username and password):



4. register the database connection into OpenOffice and open the created file:

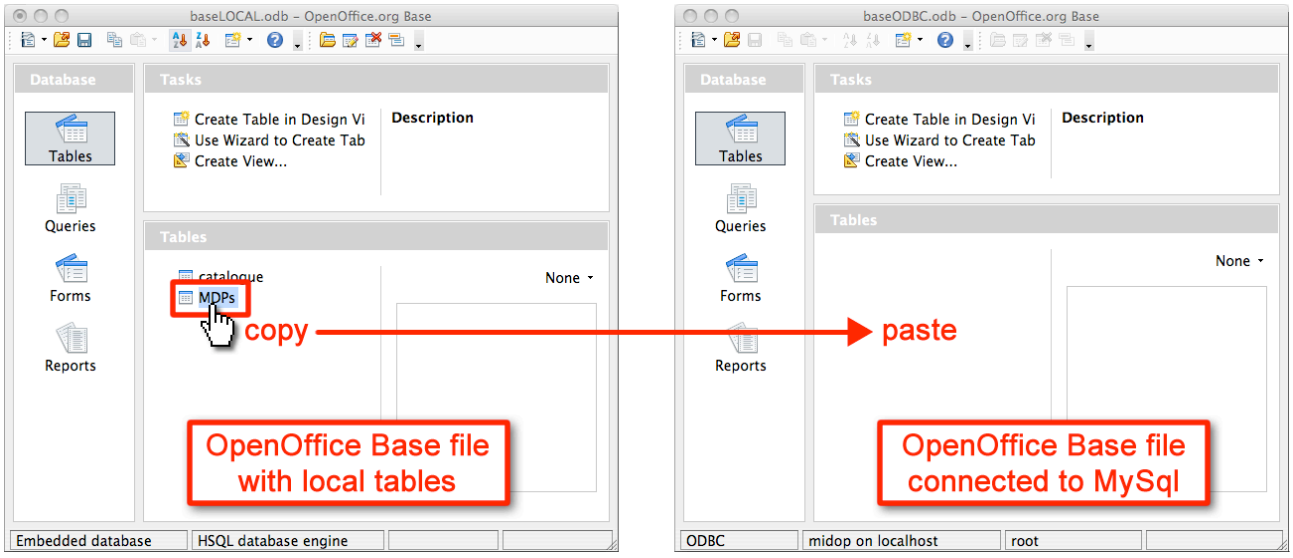


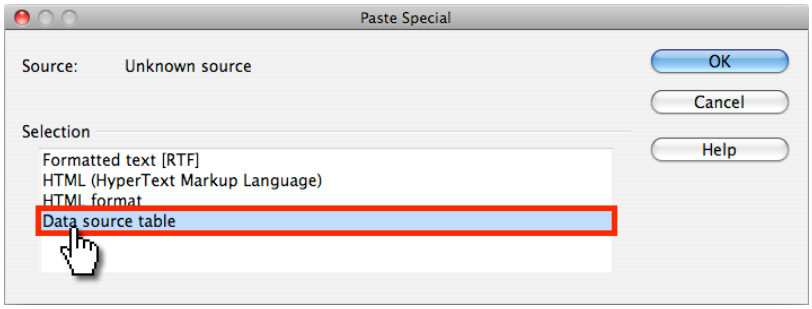
To copy a table from a OpenOffice Base to MySql database you require two different OpenOffice Base files:

1. a Base file with your locally stored tables;
2. a Base file connected to MySql server (created above).

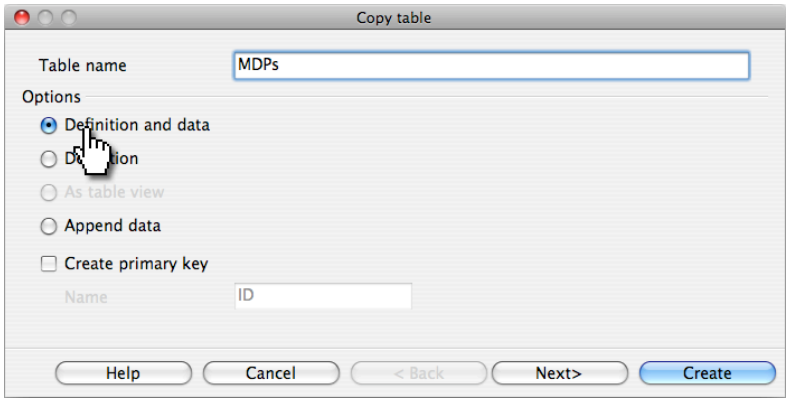
As OpenOffice Base cannot manage local and linked tables within the same Base file you must follow this procedure in order to copy a table to MySql:

- open both the OpenOffice Base file containing your local stored tables and the above created Base file connected to MySql then copy and paste (as a "Data source table") the table between the two Base files:
-

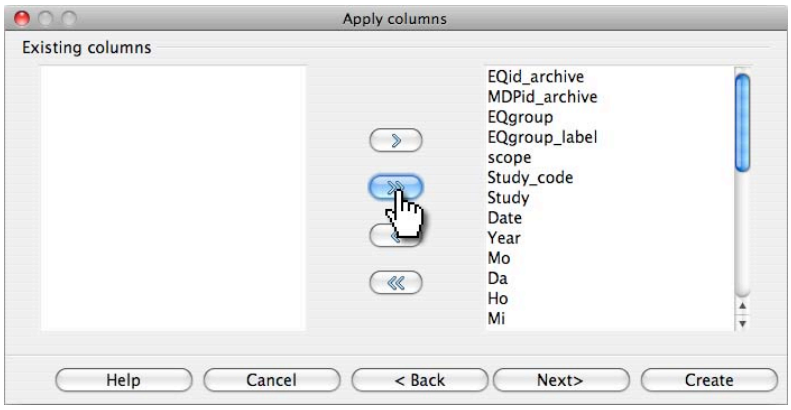




- once you paste a table into the destination OpenOffice Base file a requester appear asking to define what to copy, select "Definition and data":



- OpenOffice will now ask which columns must be copied, select all the fields by pressing the double arrow:



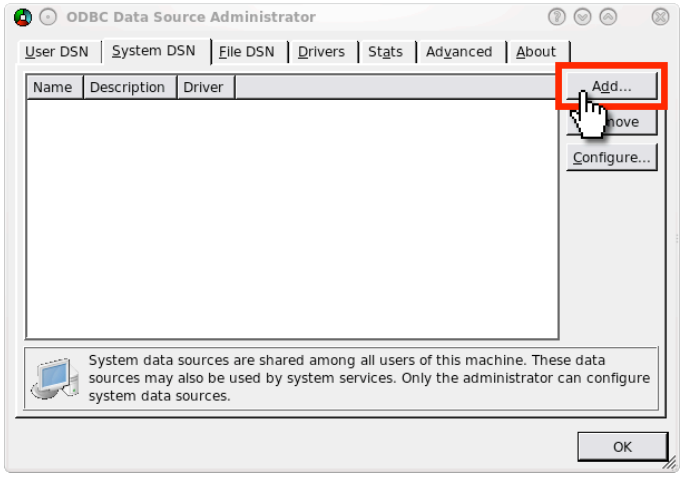
For more information on OpenOffice Base usage refer to:
http://wiki.services.openoffice.org/wiki/Database

Your "midop" database in the MySql server contains now your data table and the MIDOP package can now use your data.

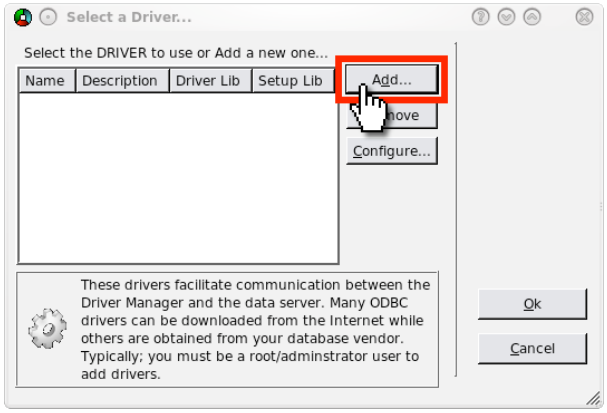
Linux (Ubuntu)

In order to use OpenOffice Base with MySql tables, the ODBC ("Open Database Connectivity", http://en.wikipedia.org/wiki/ODBC) system drivers must be installed.

1. install these three packages entering the following command in a terminal:
   `sudo apt-get install unixodbc libmyodbc unixodbc-bin`
2. launch the ODBC configuration tool tool with:
   `sudo ODBCConfig`
3. click the "System DNS" tab and click the "Add" button;



4. click “Add” again to create a new ODBC driver;



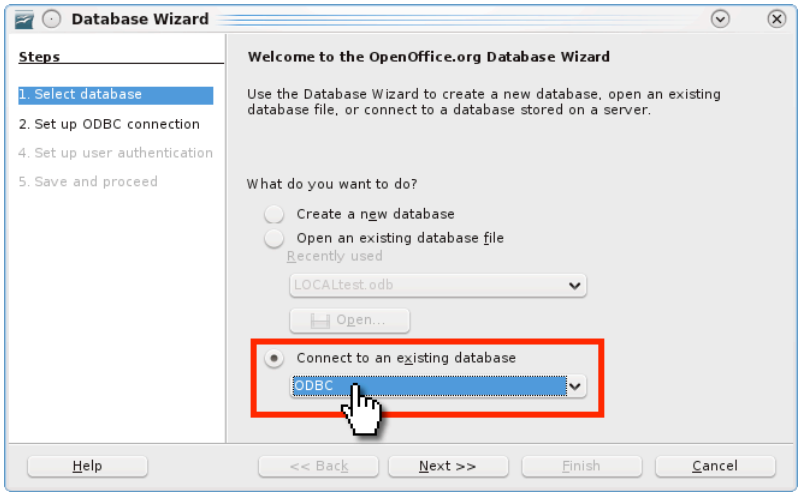
5. in the “Driver Properties” window enter a label representing the new driver and its description using the appropriate fields;
6. enter the path to the libmyodbc.so file in the Driver field ("/usr/lib/odbc/libmyodbc.so");
7. enter the path to the libodbcmyS.so file in the Setup field ("/usr/lib/odbc/libodbcmyS.so");
8. the final result should look like the figure;

9. click the Save and Exit button to save the settings;
10. click OK to open the “Data Source Properties” window;
11. give the new data source a name, enter its description, then specify the MySql server address, the database name, and port;

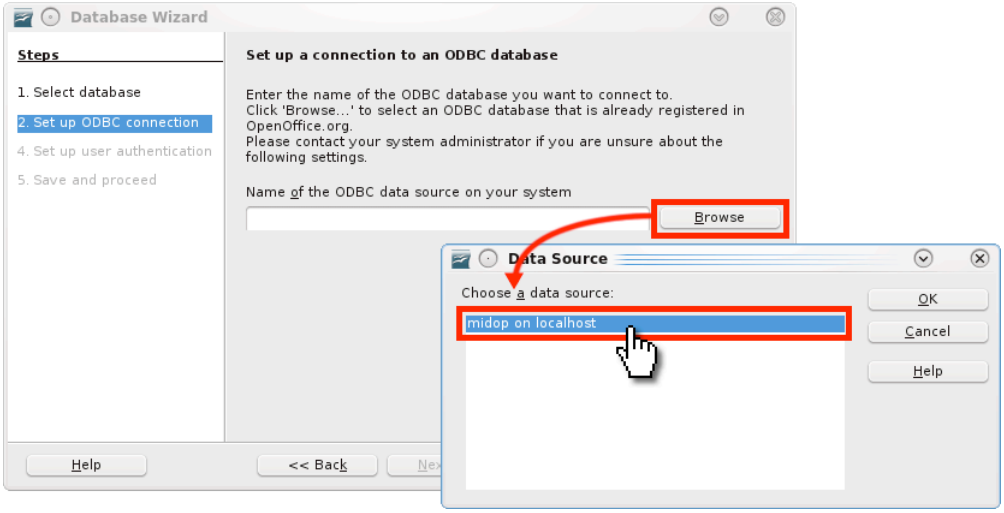
12. click OK; from now on you can access the midop database from every software capable ODBC aware such as OpenOffice.

In order to use OpenOffice as a front-end for your MySql database follow these steps:

- select “ODBC” as data source:



- select which data source must be used:



- enter the MySql access parameters (username and password):

The procedure for copying a table from OpenOffice Base local tables to MySql is the same as the Mac OSX procedure described above.

4.5 MySql data manipulation

At the end of the macroseismic data production workflow every table must be transferred to MySql in order to let MIDOP load data. Once tables are transferred to the MySql server, every modification must be obviously made on MySql tables.

Luckily enough direct modification of MySql table content is quite easy, both using online web applications and offline packages. These solutions adopt the so called “client/server” approach: a graphical interface (usually referred as a “client” or “front-end”) separated from the engine that manipulate physically the data (called “server” or “back-end”); by having two separate applications for each function, the database engine is not tied to a specific interface and anything can ask for data.

Queries to a database engine follow the SQL query language specifications (Structured Query Language, http://en.wikipedia.org/wiki/SQL).

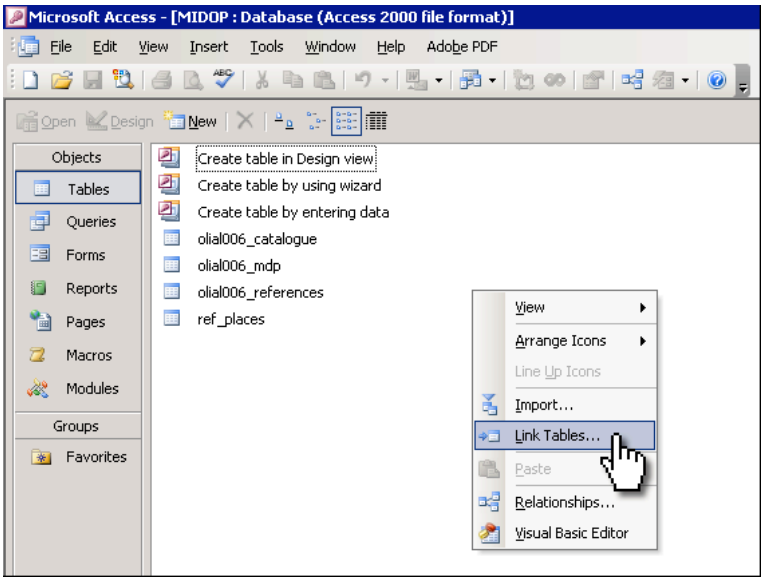
MIDOP can be considered as a front-end or a client that ask for data to a database engine server and then, after some manipulation, serve tables and maps within web pages.

Tables used by MIDOP are exposed to anything that can interact with MySql, so a multitude of graphical front-ends, both stand-alone applications and web applications, can manipulate the same table contents. Standalone relational database such as Microsoft Access and OpenOffice Base have an internal database engine but can also rely on external engines such as MySql.

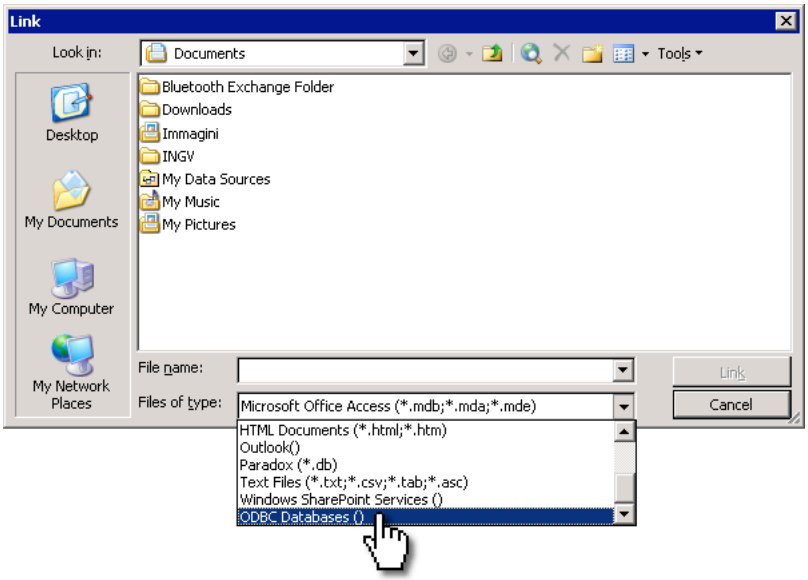
In order to create a link to an existent MySql table, the procedure is different between Access 2003 and Access 2007. Below both are explained together with phpMyAdmin application.

Using Access 2003:

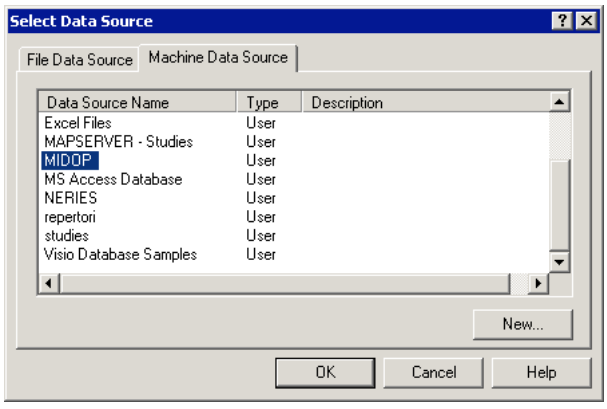
1. create or open a database and right click in the empty white space, select “Link tables…”;



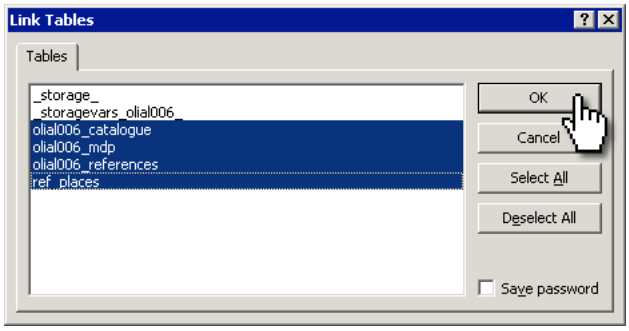
2. select “ODBC Databases ()” from the “Files of type” drop down list;



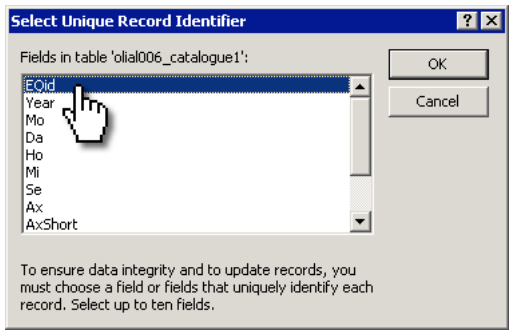
3. Select the stored ODBC connection that links to the database containing the wanted table;



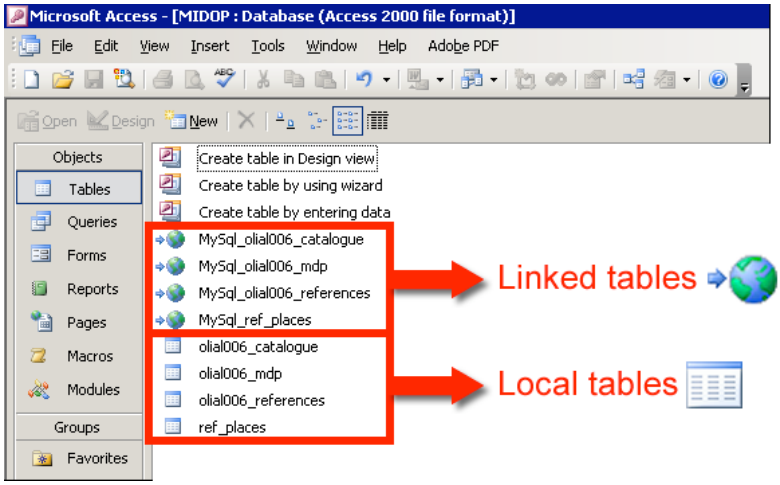
4. Select the table (or tables by multi-select using the “shift” key) that you want to link;



5. It might happens that Access cannot automatically establish which is the table unique record identifier, in such cases you must select the identifier field manually;

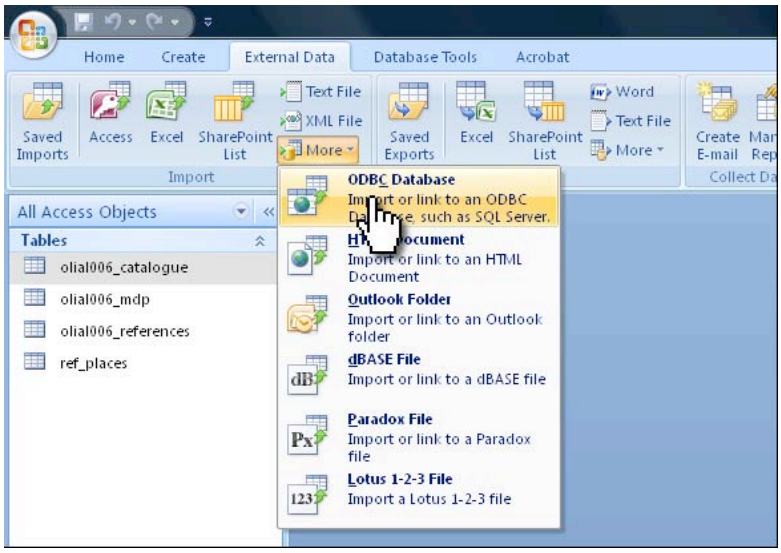


6. Once the procedure is finished, the requested tables will show up in the Access "Tables" section. You can distinguish between local and remote MySql tables intuitively as they use a different icon:

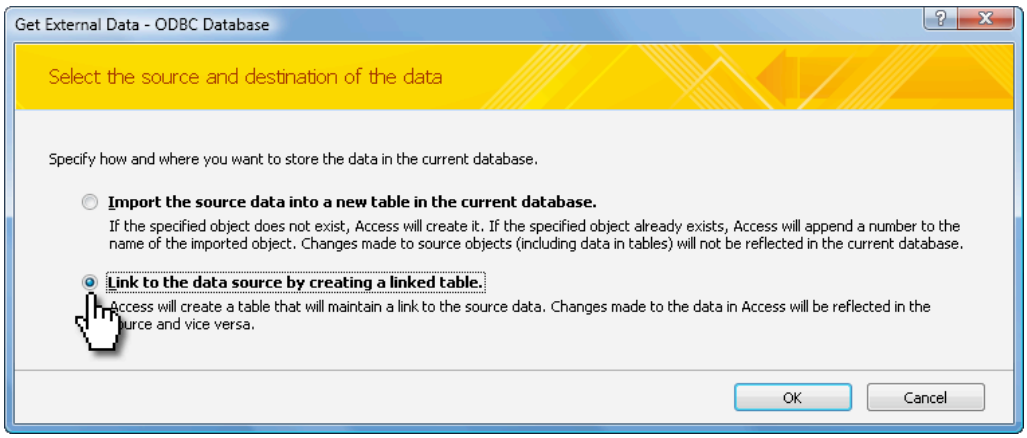


Using Access 2007:

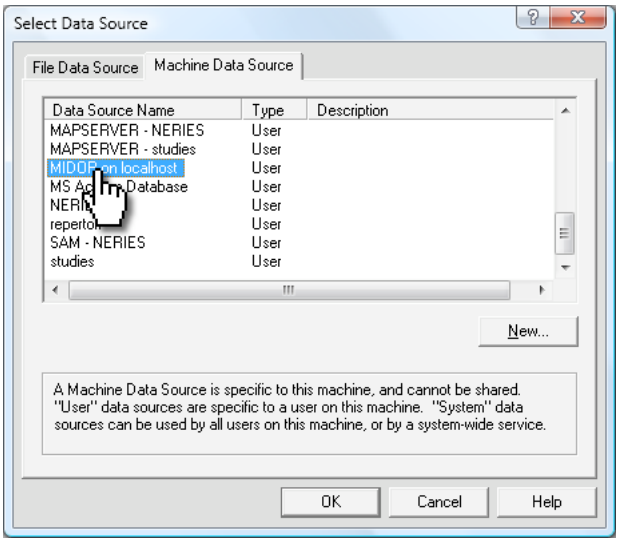
1. create or open a database, select the top menu "External Data" and choose "ODBC Database";



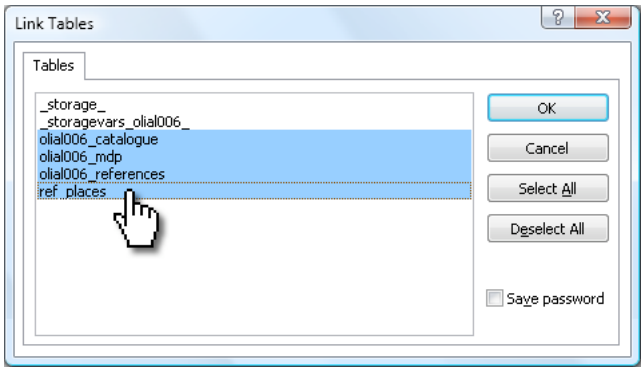
2. select “Link to the data source by creating a linked table”;



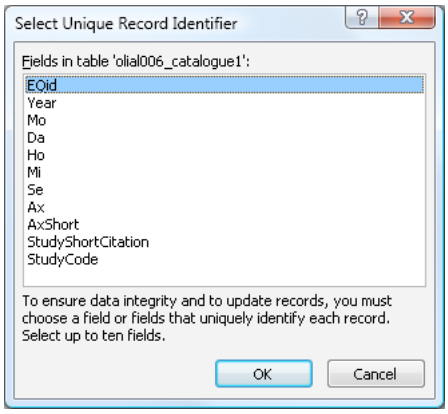
3. Select the stored ODBC connection that links to the database containing the wanted table;



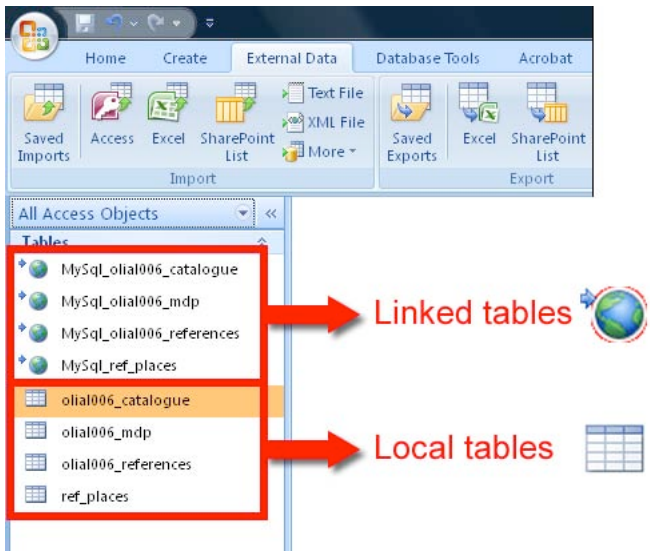
4. Select the table (or tables by multi-select using the “shift” key) that you want to link;



5. It might happens that Access cannot automatically establish which is the table unique record identifier, in such cases you must select the identifier field manually;

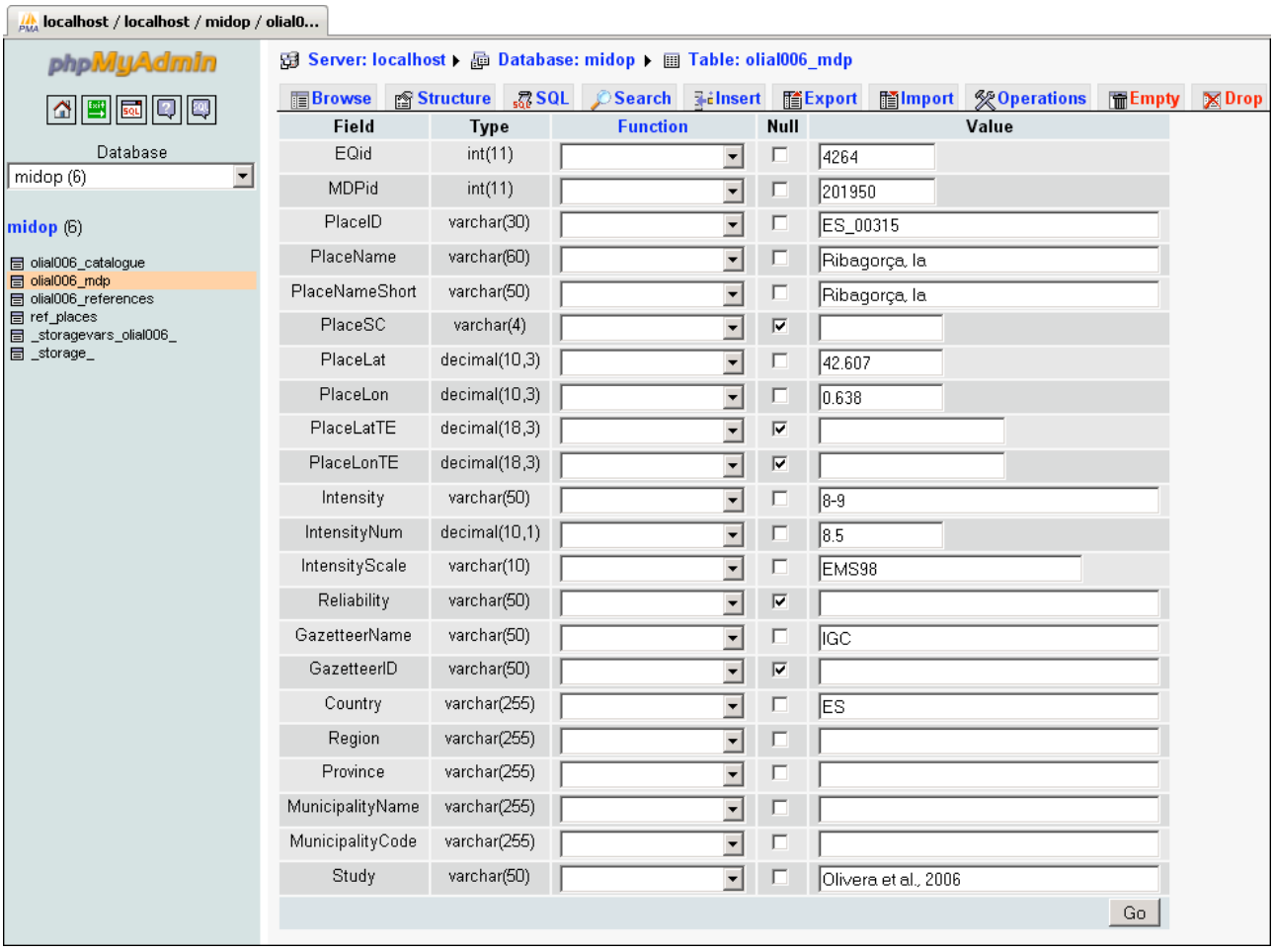


6. Once the procedure is finished, the requested tables will show up in the Access "Tables" section. You can distinguish between local and remote MySql tables intuitively as they use a different icon:



PhpMyAdmin application

The most used web application interacting with MySql tables is the already mentioned phpMyAdmin. By using it, users will be able to view and modify existing data intuitively, change table structures, create new tables, create indexes and keys, import and export data and execute direct SQL commands.
Below a screenshot example showing a editing session of macroseismic intensity record:



For a detailed explanation please refer to the phpMyAdmin user manual available at:
http://www.phpmyadmin.net/home_page/docs.php

5. MIDOP setup

5.1 MIDOP first installation

Once both the required AMP environment and the supporting macroseismic data tables are ready, MIDOP can be installed.
Follow these simple steps:

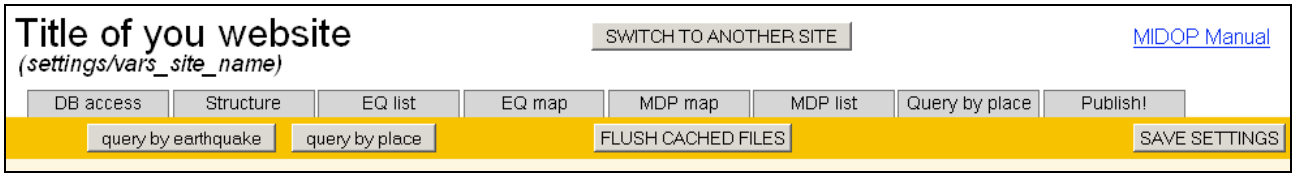
- copy the MIDOP folder to "*htdocs",* where the Apache web server stores its websites;
- switch ON both the Apache and the MySql servers if needed;

5.2 Available settings

MIDOP lets you customize many aspects of the final website through a simplified control panel. You can access it by opening a web browser and surf to:

http://localhost/MIDOP/settings/

Settings are organized in pages, grouping logically every aspect:



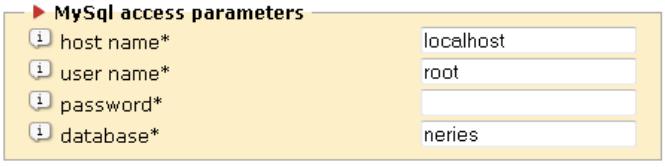
Note that whenever a settings page is modified it must be saved by pressing "save settings" in the upper right in order to apply changes. You can open the customized website by clicking "query by earthquake" in the upper left. The content of these web pages is generated in real time; only maps are generated once then cached, so, in order to reflect new settings applied on maps, cached files must be flushed by clicking "flush cached files". When you have done with your customization and are happy with the results you can proceed to publishing it.

The control panel has a built-in help system: whenever you require further information click on the symbol "i" and a popup message with an explanation will appear. It is possible to customize these messages editing the file "settings/language/language.english.help.php".
Below the detailed list of settings available.

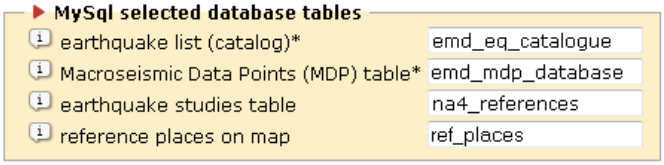
Page "DB access"

This page is dedicated to configure the connection between MIDOP and the MySql database server and the table names with your macroseismic data. You can use a server working on your computer or a remote server. In order to connect to the MySql server a user name and a password are required and, if using a remote server, your computer IP address must be accepted by the server.
The following settings boxes are available:

1. MySql access parameters;
2. MySql selected database tables.



Host name	Set the host name or IP address where the MySql server is installed
User name	Set the user name for opening a MySql connection
Password	Set the password for opening a MySql connection
Database	Set the MySql database name where all the needed tables are stored

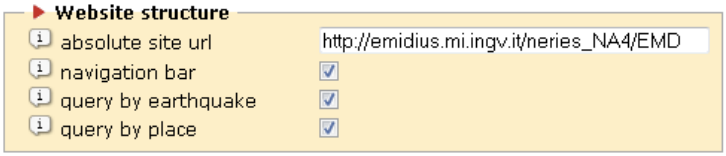


Earthquake list (catalogue)	Set the table name with the earthquake catalogue list and macroseismic parameters
Macroseismic Data Points (MDP) table	Set the table name with the macroseismic intensity database
Earthquake studies table	Set the table name with the earthquake studies references.
Reference places on map	Set the table name with places to be used as a geographical reference on maps

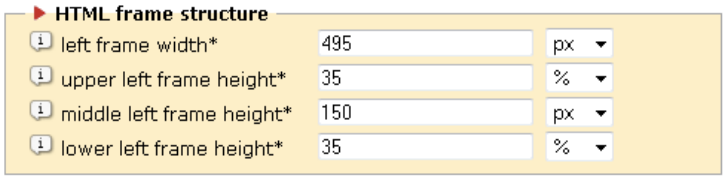
Page "Structure"

This page let you customize the graphical layout of the website that you are going to publish. The following settings boxes are available:

1. Website structure;
2. HTML frame structure;
3. Site language.

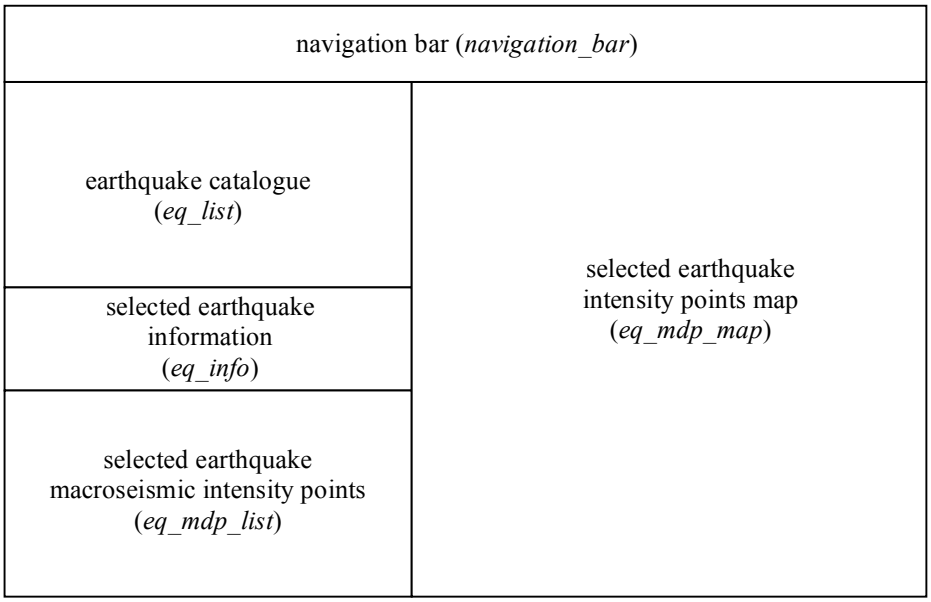


Absolute site URL	Set the absolute URL where the final site will be published. This information will be only used if the export to Google Earth is enabled.
Navigation bar	enable or disable the navigation bar in the upper part of the window; it will contains: • a link to the homepage; • a link to each earthquake group created; • a link to the places seismic history.
Query by earthquake	enable or disable the query by earthquake part if the website.
Query by place	enable or disable the query by place. Note that in order to enable these seismic histories, places must have a unique identifier in table 1a.

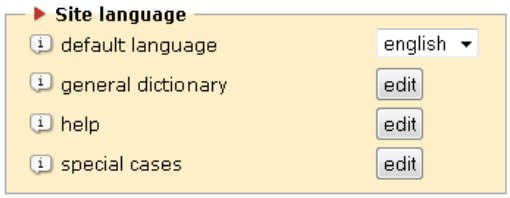


Left frame width	Set the horizontal width of the left part of the frameset, the one containing the earthquake list (upper left), detailed earthquake information (middle left) and macroseismic observations (lower left). The number can be expressed as a percentage value, where 100% is the entire window width, or in number of pixels.

Upper left frame	Set the height of the upper left part of the frameset containing the earthquake list. The number can be expressed as a percentage value, where 100% is the entire window height, or in number of pixels.
Middle left frame height	Set the height of the middle part of the frameset containing the detailed earthquake information. The number can be expressed as a percentage value, where 100% is the entire window height, or in number of pixels.
Lower left frame height	Set the height of the lower left part of the frameset containing the list of macroseismic observations. The number can be expressed as a percentage value, where 100% is the entire window height, or in number of pixels.



Above the frameset layout (in *italic* the actual html frame name)



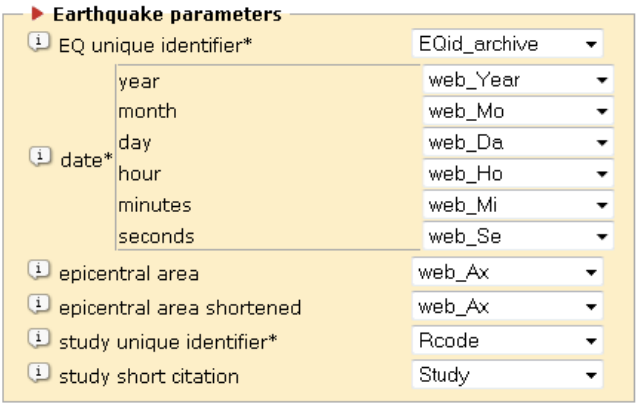
Default language	Set the language of the entire site. It will change also the control panel user interface language. By clicking "Edit" you will be able to modify all the texts used. In order to create a new language you must create 3 new files in "settings/languages/": • "language.XXX.php", with the general interface terms (e.g.: “language.french.php”); • "language.XXX.help.php", with popup help information; • “language.XXX.sc.php", with locality special cases definitions.
General dictionary	Edit the general interface language text file.
Help	Edit the help language text file used for popup windows within the control panel.
Special cases	Edit the locality special cases language text file, as specified in table 2c.

Page “EQ list”

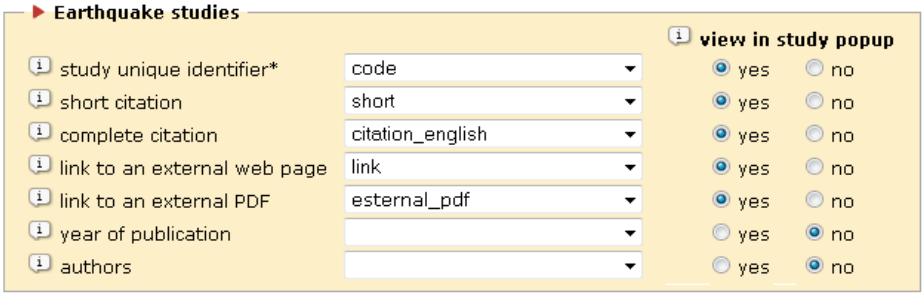
In this page you configure the earthquake catalogue table (tab.1a) that you previously uploaded into MySql: each field existing in your table must be selected and mapped to the corresponding MIDOP field. Field with the “*” symbol are required by MIDOP in order to work: not setting these field will cause MIDOP failing creating tables and maps.

The following settings boxes are available:

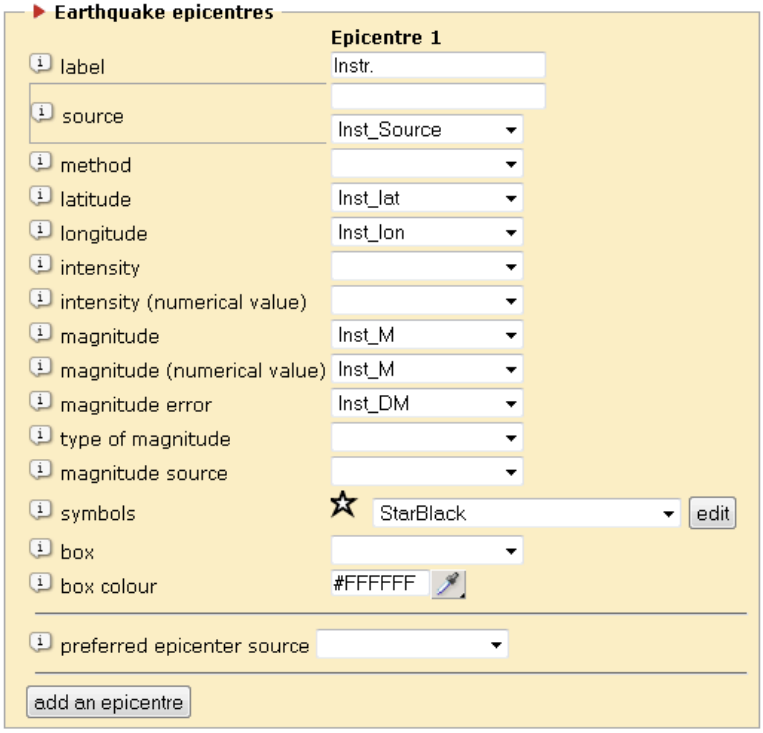
1. Earthquake parameters;
2. Earthquake studies;
3. Earthquake epicentres;
4. Earthquake list table columns definition;
5. Earthquake groups.



Earthquake unique identifier	Set the earthquake unique identifier. The identifier can be a number or a text but it must follow some rules: it can not contains spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter must be always set and it will be used by the system to create references between tables. This parameter will also be used for the dynamic file name creation of the final website files.
Date • year • month • day • hour • minutes • seconds	Set the date of the earthquake (also called "origin time"). Once you will set year, month, day, hour and seconds, the control panel will consider them all together as "date". This parameter must be always set, but some of the sub-parameter (such as seconds, minutes or hour) could be left unset. This parameter will also be used for the dynamic file name creation of the final website files.
Epicentral area	Set the extended text representing the epicentral area. This field is not required to publish a site; if it is set, it will be available in the control panel, for example for the label that will appear in the general earthquake map. It will be used by the system for creating the epicentral area field within downloadable MS Excel files.
Epicentral area (shortened)	Set the shortened text representing the epicentral area. This field is not required to publish a site; if it is set, it will be available in the control panel. It might be useful for saving space when creating html table columns in the earthquake catalogue list.
Study unique identifier	Set the unique identifier code of the study. This field is required in order to link the earthquake list table with the studies table where all the complete descriptions, links amd other information are kept. This identifier can be a number or a text but it must follow some rules: it can not contain spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter will be used for the dynamic file name creation of the final website files.
Study short citation	Set the short version of the earthquake study citation. If set, this field will be used for creating the html text referring to the study.

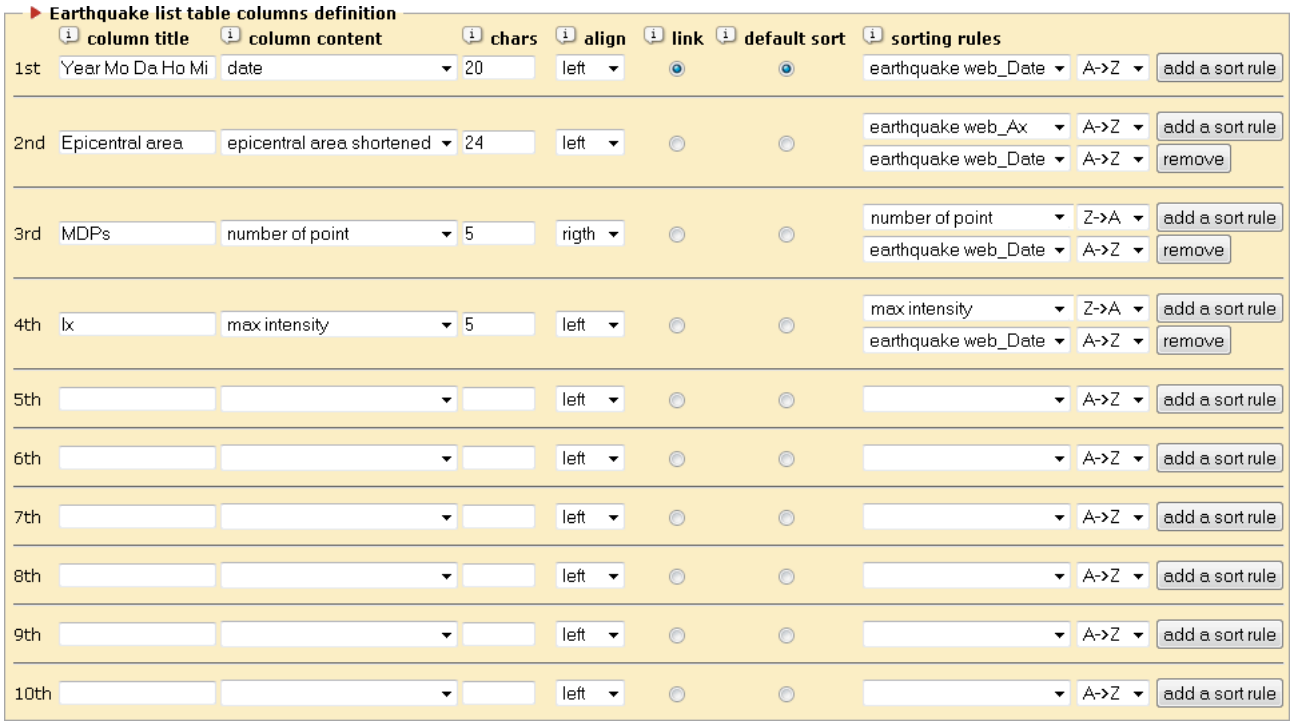


Study unique identifier	Set the unique identifier code of the study. This field is required in order to link the earthquake list table with the studies table where all the complete descriptions, links and other information are kept. This identifier can be a number or a text but it must follow some rules: it can not contain spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter will be used for the dynamic file name creation of the final website files.
Short citation	Set the short version of the earthquake study citation. If set, this field will be used for creating the html text of the popup window referring to the study and for the dynamic file name creation of the stored files.
Complete citation	Set the study complete citation text. If set will be used in the popup window with the study detailed information.
Link to an external web page	Set the URL address pointing to an external web page with relevant information about the study. If set, the link will appear in the popup window with study information.
Link to an external PDF	Set the URL address pointing to an external PDF containing the study or relevant information about it. If set, the PDF link will appear in the popup window with study information.
Year of publication	Set the study publication year.
Authors	Set the author/s of the study.
Vie in study popup	If set to “yes” the specified information will be shown in the popup window that appear clicking on the link of the study citation.



Label	Set the epicentre label that will appear in the detailed information frame in the middle left frame.
Source	Set the epicentre source (who did provide the information). You can use a fixed text or a field from the earthquake catalogue list.
Method	Set the method used for the epicentre calculation. You can use a fixed text or a field from the earthquake catalogue list.
Latitude	Set the latitude of the epicentre. The value must be expressed in decimal degree.
Longitude	Set the longitude of the epicentre. The value must be expressed in decimal degree.
Intensity	Set the epicentral intensity value. The value is usually expressed with a text (5, 5-6, 6, 6-7, F, D, HD, ...).
Intensity (numerical value)	Set the corresponding numerical value of the epicentral intensity value. The value must expressed using decimal numbers (5, 5.5, 6, 6.5, 3.9, 6.5, 7.5, ...).
Magnitude	Set the magnitude value. This field can be a text.
Magnitude (numerical value)	Set the magnitude value using numerical values only.

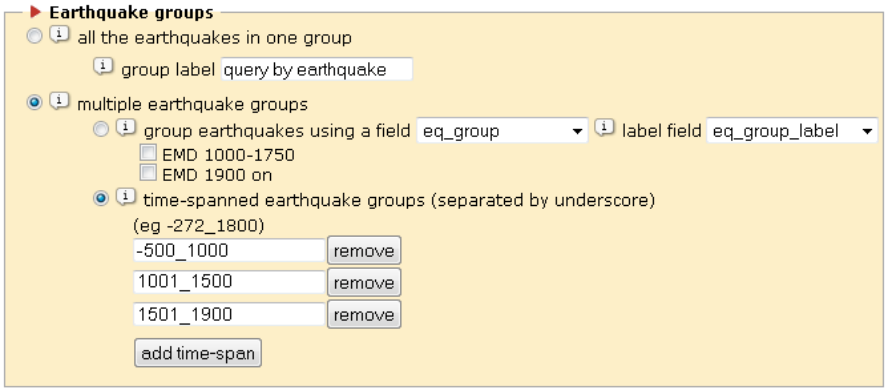
Magnitude error	Set the error associated (uncertainty) to the magnitude value. This field can be a text (example: ±0.2, >0.2, >=0.2)
Type of magnitude	Set the magnitude type. Usual values are Mw (Moment Magnitude), ML (Local Magnitude), Ms (Surface waves Magnitude), mb (Body wave Magnitude).
Magnitude source	Set the magnitude source value (who did provide the value).
Symbols	Set the epicentre symbol to be used on maps. The pop-down selector contains the list of available choices. Customization and creation of new symbols is possible by editing the PHP/SVG source code (button "edit").
Box	If you require plotting a rectangle representing the surface projection of the seismogenic source, you can use this field for adding the 4 couples of coordinates representing the four vertices. The field must be compiled with 4 couple of coordinates expressed in decimal degree. Use ";" to separate each couple and the symbol "_" to separated longitude and latitude (lon1_lat1; lon2_lat2; lon3_lat3; lon4_lat4). For example "15.5567_40.4425;15.642_40.5316;16.042_40.1726;16.1273_40.2617".
Box colour	Set the line color of the box using HTML color code. HTML colors are defined using a hexadecimal (hex) notation for the combination of Red, Green, and Blue color values (RGB). The lowest value that can be given to one of the light sources is 0 (hex 00). The highest value is 255 (hex FF).
Preferred epicentre source	Set the preferred epicentre. Useful when many epicentres are shown on the map as it help to highlight which one is the selected choice by the compilers. This field must contain the exact text describing the selected epicentre source selected above. The symbol used by the system will be the above selected symbol + "_preferred" as described in the PHP/SVG code.
Add an epicentre	If you created more than one epicentre in your earthquake catalogue table, by clicking this button you will be able to add as many epicentre as you require, each with its parameters and its symbol.



Column title	Define the text to be used as a column header.
Column content	Define the column content source field.
Chars	Define the maximum number of characters of the column content. If a text has a number of characters longer than this value the resulting text will be truncated.
Align	Define the column alignment.
Link	Define which column has to be used as a link for selecting an earthquake.
Default sort	Define which column is the table default sort. Only one column can be set as the default sort.
Sorting rules	Define the rules for sorting the column content. The resulting sort of the column is the result of the sort of all the specified fields selected from the earthquake catalogue table, starting from

	the top to bottom. Click “add a sort rule” for adding a filed to the list. It is possible to specify a sort order for each selected field.

The following settings box called “Earthquake groups” let you create logical groups of earthquakes. With the terms “earthquake group” MIDOP means different sub-set of the earthquake catalogue and it will result in automatic splitting of the original single catalogue in multiple parts. It is possible to have one earthquake group, resulting in one earthquake catalogue only, featuring all the earthquakes present in your original earthquake catalogue table. It is also possible to split the catalogue in multiple time-spanned sub-catalogues only by specifying the time-span of each group: MIDOP will automatically generate as many sub-catalogues as requested. If you need a custom group of earthquakes, you can add a field in your catalogue table and set its content for each earthquake part of that group. For custom groups MIDOP let you specify two fields: one used for sorting the group and the other for specifying the earthquake group label (e.g. you can create 5 groups, in the first field you set a number from 1 to 5 and in the second field the label for each group. MIDOP will order the list of earthquake group using the first field).

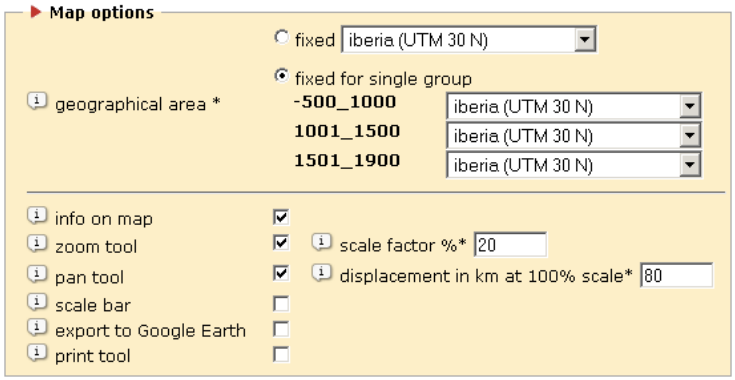


All the earthquake in one group	If set, one earthquake list only with all the earthquakes will be created.
• group label	Set the label to be used for creating the link in the upper frame of the window.
Multiple earthquake groups	If set, multiple earthquake lists will be created.
• group earthquakes using a field	Create as many groups as specified by the selected field. This field name used for grouping earthquakes and for sorting the list of groups.
• label field	Define the text label to be used for identifying each earthquake group.
Time-spanned earthquake groups	Set each group time-span subdivision. By clicking the button “add time-span” you can enter a new time-spanned earthquake group. Only year are accepted for defining a time-span and year must be separated by the symbol “_”. Overlapping time-windows are possible, but it will result in earthquakes listed in more than one group. The label for the upper frame link of the window will be created automatically.

Page “EQ map”

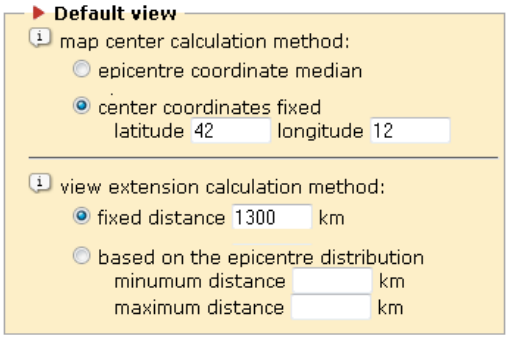
This page let you customize the appearance of the map representing all the earthquakes listed in the selected earthquake catalogue list.
The following settings boxes are available:

1. Map options;
2. Default view;
3. Map layers;
4. Earthquake parameters.



Geographical area • fixed • fixed for single group Info on map	Select the geographical area where the earthquakes listed in the earthquake catalogue list are referred to. If you created more than one sub-sets of earthquake groups you can specify a geographical area for each group. If selected, a text will appear in the upper part of the map when the user will put the mouse pointer over an earthquake symbol. The text will contain information about the earthquake such the date and the epicentral area.
Zoom tool • scale factor %	If selected, the zooming tool will be available to the user with the icon "  " (zoom in) and "  " (zoom out) in the map frame toolbox. Define the scale step factor to be used with the zoom tool; the lower is this percentage, the lower will be the different scale factor between each click.
Pan tool • displacement in km at 100% scale	If selected, the pan tool will be available to the user with the icon "  " in the map frame toolbox and users will be able to pan the map. Define the displacement steps to be used with the pan tool.
Scale bar	If selected, a graphical scale will be available to the user in the lower part of the map. The units of measurements are expressed in kilometers.
Export Google Earth	If selected, the icon "  " will be available to the user and will let to see the selected map in Google Earth. End users must have Google Earth previously installed on their system.
Print tool	If selected, the print tool will be available to the user with the icon "  " in the map frame toolbox.

The following settings box will let you customize the default look of the earthquakes map: how MIDOP will calculate the map center and how big the zoom will be.



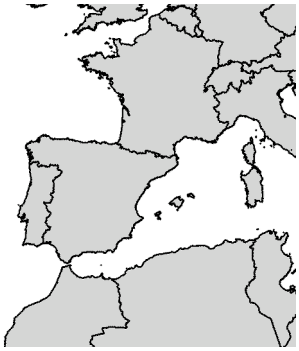
Map center calculation method: • epicentre coordinate median • center coordinates fixed	Set how the default center of the map will be calculated: - by using the coordinate median of all the plotted epicentres - by using a couple of fixed coordinates
View extension calculation method: • fixed distance • based on the epicentre distribution o minimum distance o maximum distance	Set how the default view extension of the map will be calculated. - by a specified value - by calculating the complete geographical extension of all the plotted epicentres

MIDOP can generate maps projected in UTM zones only.
It has built-in support for European UTM zones such as 30, 31, 32, 33 and 34. MIDOP includes:

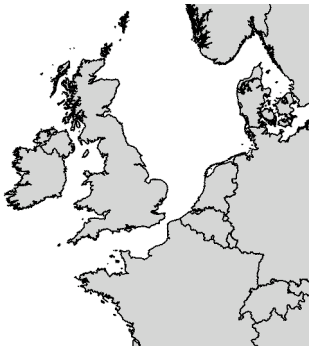
- geographical layers, such as countries, first administrative subdivision and main rivers;
- place names to be represented on maps for geographical reference.

Height geographical areas covering the whole Europe are available out-of-the-box:

UTM 30 - Iberia

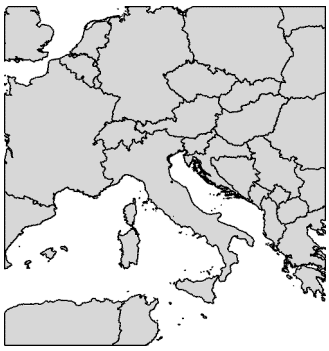


UTM 30 - UK



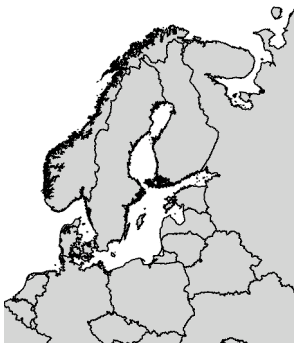
UTM 31 - France

UTM 32 - Italy

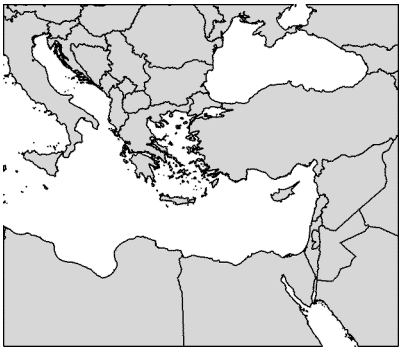


UTM 33 - Eastern Europe

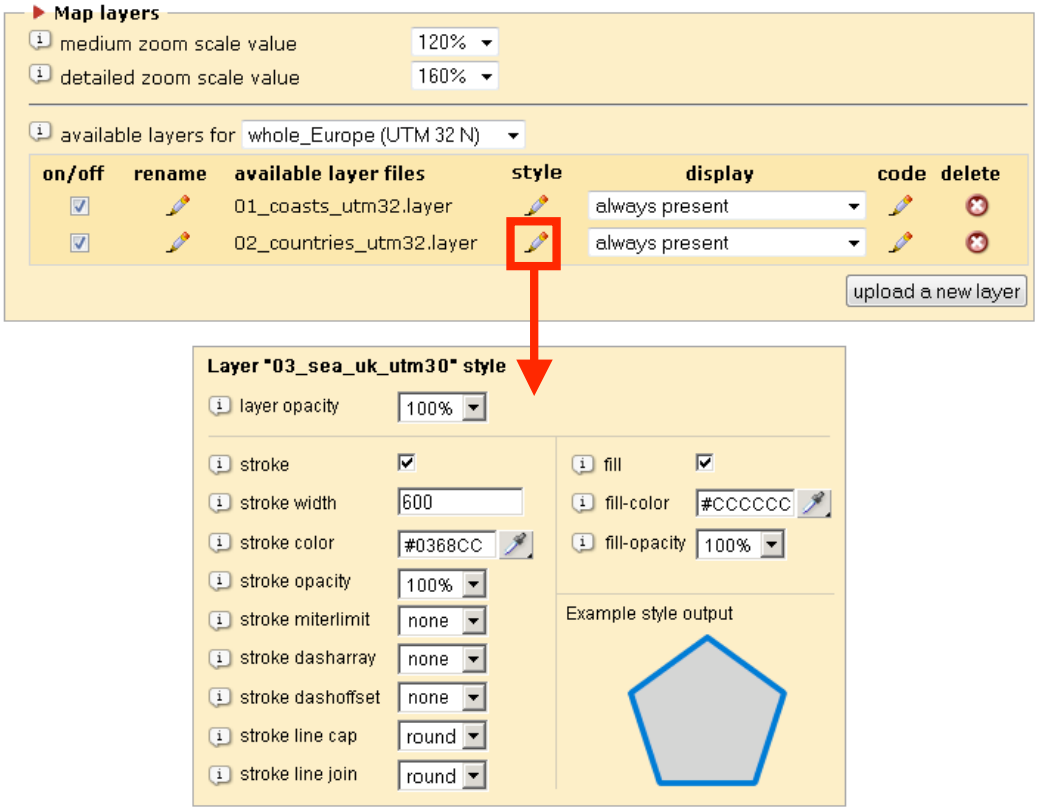
UTM 33 - Fennoscandia



UTM 34 - Aegean

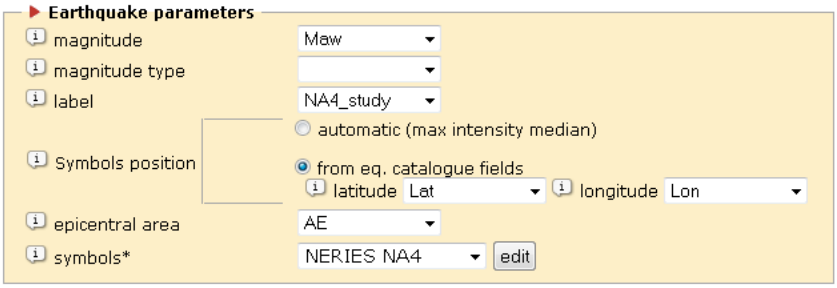


UTM 32 - Whole Europe (low resolution)



Medium zoom scale value	Set the meaning of "medium" zoom in terms of zoom degree.
Detailed zoom scale value	Set the meaning of "detailed" zoom in terms of zoom degree.
Available layers for [*covered area*] • on/off • rename • available layer files • style • display • code • delete	Manage which layers must be included with the generated maps. Built-in layers covers the following UTM zones: 30, 'iberia' or 'uk'; 31, 'france'; 32, 'italy'; 33, 'eastern_europe' or 'fennoscandia'; 34, 'aegean'. For further information on layers managements see chapter "Advanced customization". turn on or off the layer when creating an earthquake map. Rename the layer file name (the extension ".layer" must be kept) Layer file name (files stored in "data / layers_eq / [*UTM*] / [*covered area*]"). The level at which the layer will be inserted when creating the map is established by alphabetical sorting the list, that's why buil-in layers starts with a progressive number. Change the layer's appearance style. Set when the layer will be shown: always present, shown at medium and detailed zoom, only on detailed zoom. Edit the layer source code. Delete the layer file (a requester will prevent accidental deletion).
• upload a new layer	Load an additional layer file to MIDOP. Layer files are basically uncompressed plain text containing SVG objects.

IMPORTANT NOTE You should avoid renaming layers or deleting them: these changes will affect not only the current selected website but all the websites managed using MIDOP.

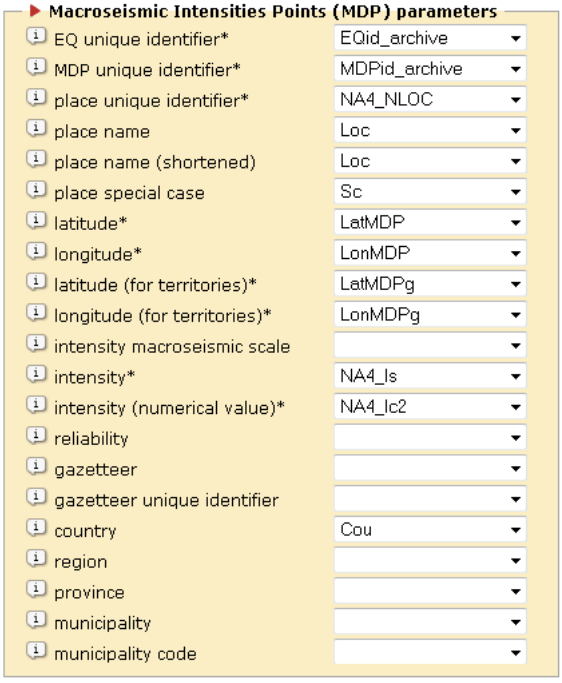


Magnitude	Define the earthquake magnitude value that will appear on top of the epicentres map.
Magnitude type	Define the magnitude type (e.g. local magnitude, moment magnitude, surface wave magnitude).
Label	Define the epicentre label that will appear on top of the epicentres map (usually this field is used for the study citation).
Symbols position	Set where MIDOP will plot symbols representing earthquakes: • automatically, MIDOP will calculate the couple of coordinates representing the median point of the observations with maximum intensity contained in each earthquake; • taking for each earthquake coordinates from two field in the earthquake catalogue table.
Epicentral area	Set the epicentral area text that will appear on top of the epicentres map.
Symbols	Set which symbol set will be used for representing earthquakes on the map. By pressing "edit" you will be able to customize the source code of the set of symbols.

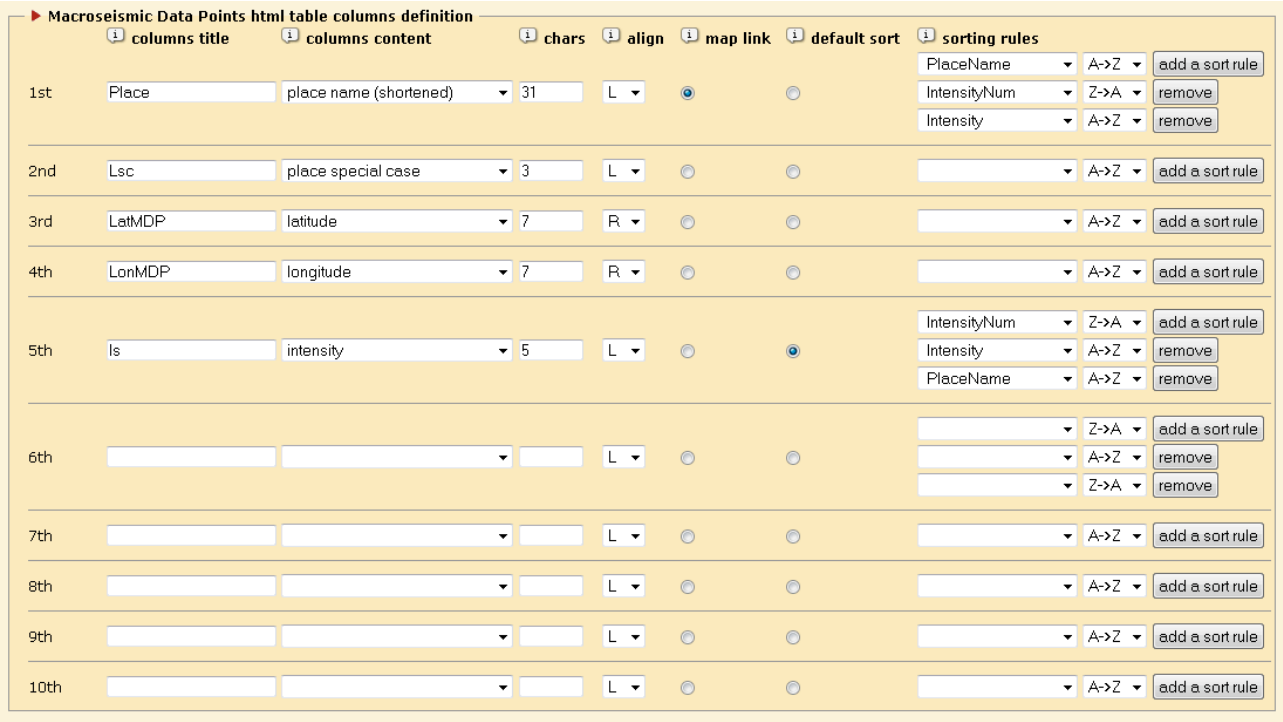
Page "MDP list"

In this page you can define all the information contained in your Macroseismic Intensity Data table (as defined in tab.2). Each field existing in your table must be mapped to the corresponding MIDOP field. Fields with the "*" symbol are required.
The following settings boxes are available:

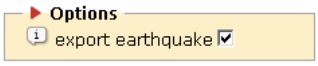
1. Macroseismic Intensity Points (MDP) parameters;
2. Macroseismic Data Points html table columns definition;
3. Options.



EQ unique identifier	Define the earthquake unique identifier. The identifier can be a number or a text but it must follow some rules: it can not contain spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter must be always set and it will be used by the system to create references between tables. This parameter will also be used for the dynamic file name creation of the final website files.
MDP unique identifier	Define the macroseismic data point identifier; it can be a number or a text but it must follow some rules: it can not contain spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter must be always set.
Place unique identifier	Define the cited place identifier; it can be a number or a text but it must follow some rules: it can not contain spaces, nor special character such "è, ì", accents, apostrophes, parenthesis, symbols (<, >, /, *, @, #, §, ...). Only the symbol "_" (underscore) is allowed. This parameter must be always set.
Place name	Define the place name of the macroseismic data point.
Place name (shortened)	Define the truncated version of the place name of the macroseismic data point. It will be used for html content creation.
Place special case	Define the place special case code. See the “locality special case” code tables in chapter 4.2.
Latitude and longitude	Define the MDP latitude and longitude. The value must be expressed in geographical decimal degree.
Latitude and longitude (for territories)	Define the MDP latitude and longitude for territories. Observations based on these geographical areas will not be represented on map; however their position (if specified here) will be included within the calculation of the earthquake intensity field extension. The value must be expressed in geographical decimal degree.
Intensity macroseismic scale	Define the macroseismic scale adopted for expressing the intensity value.
Intensity	Define the MDP observed intensity. The value must be expressed with a text (5, 5-6, 6, 6-7, NF, F, D, HD, ...).
Intensity (numerical value)	Define the corresponding numerical value of the observed intensity value. The value must expressed using decimal numbers (5, 5.5, 6, 6.5, 1, 3.9, 6.5, 7.5, ...).
Reliability	Define the reliability code of the assigned macroseismic intensity.
Gazetteer	Define the source geographical Gazetteer from which the places information such as name and coordinates are taken.
Gazetteer unique identifier	Define the unique place identifier used in the source Gazetteer for identifying the place.
Country	Define the place country code (available codes in tab.2d).
Region	Define the place second national administrative subdivision (usually called region, sometimes department, district or canton).
Province	Define the place third national administrative subdivision (usually called province, sometimes county).
Municipality	Define the place municipality (sometimes called city or town).
Municipality code	Define the place municipality code as defined at national level.



Columns title	Define the text to be used as a column header.
Columns content	Define the column content source field.
Chars	Define the maximum number of characters of the column content. If a text has a number of characters longer than this value the resulting text will be truncated.
Align	Define the column alignment (L=left, R=right).
Map link	Define which column will be used as a link for finding places on the map.
Default sort	Define which column is the table default sort. Only one column can be set as the default sort.
Sorting rules	Define the rules for sorting the column content. The resulting sort of the column is the result of the sort of all the specified fields selected from the earthquake catalogue table, starting from the top to bottom. Click “add a sort rule” for adding a filed to the list. It is possible to specify a sort order for each selected field.

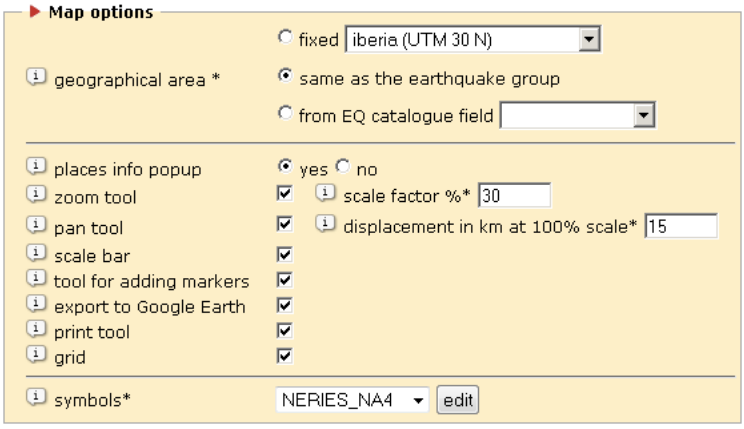


Export earthquake	Let the user download the MDP list as MS Excel file.

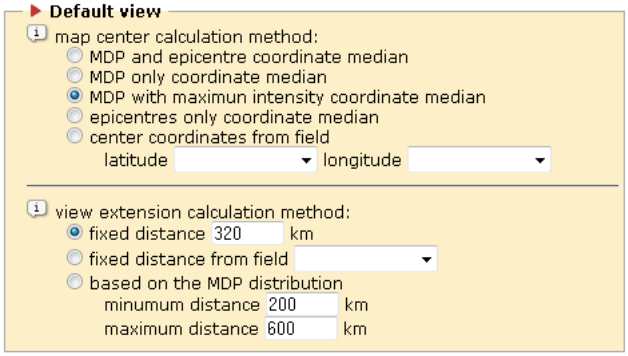
Page “MDP map”

This settings page let you customize the appearance and functionalities of the intensity map. You can specify the default view zoom and extension, the geographical layers to be included and the available tools for the final user.

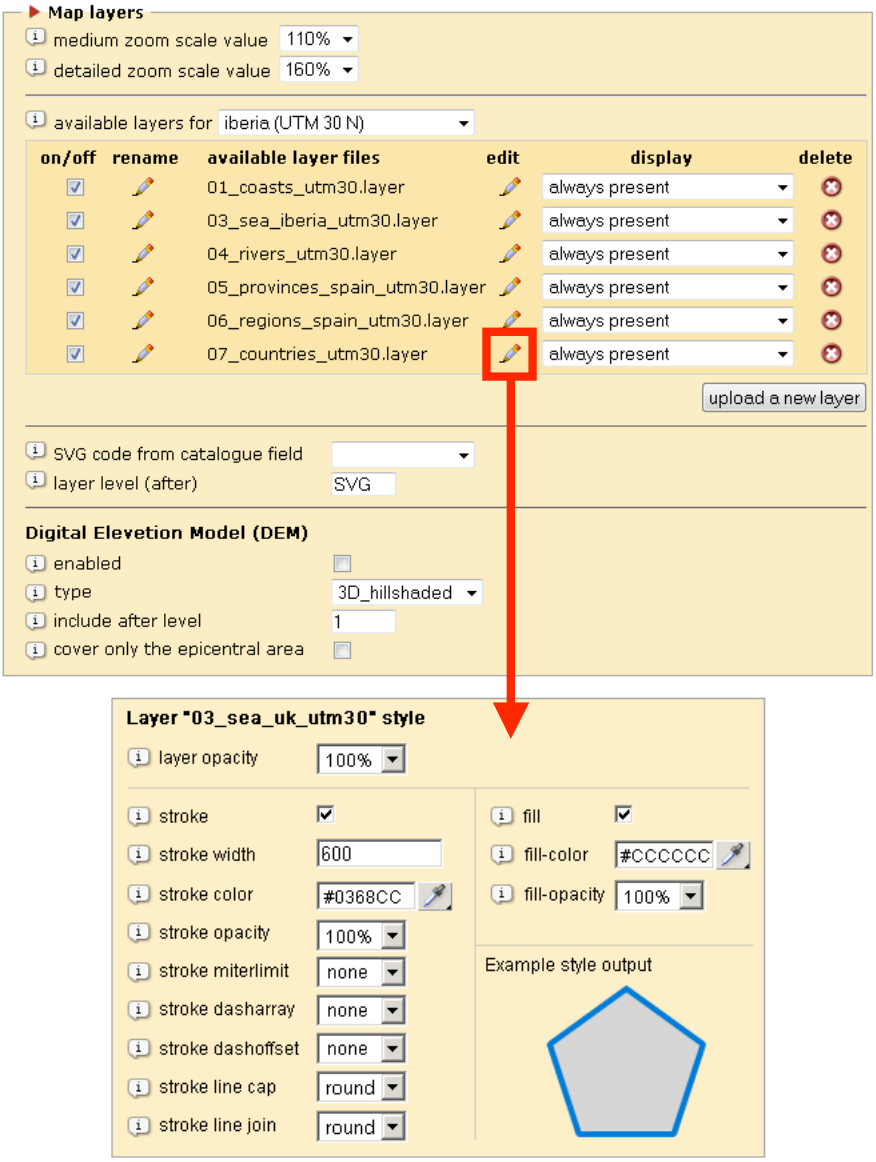
The following settings boxes are available:
1. Map options;
2. Default view;
3. Map layers;
4. Reference places on map.



Geographical area • fixed • same as the earthquake group • from EQ catalogue field Places info popup	Select the geographical area where the earthquakes are placed. You can put all the earthquakes in a single area, inherit the group geographical area selection (specified in control panel page "EQ map") or select a field in the catalogue table where a different geographical area has been specified for each earthquake. If selected, intensity symbols rendered on map can be clicked by the user. A popup window will appear with information such as place name and geographical coordinates and, if available, the place seismic history.
Zoom tool • scale factor %	If selected, the zooming tool will be available to the user with the icon "  " (zoom in) and "  " (zoom out) in the map frame toolbox. Define the scale step factor to be used with the zoom tool; the lower is this percentage, the lower will be the different scale factor between each click.
Pan tool • displacement in km at 100% scale	If selected, the pan tool will be available to the user with the icon "  " in the map frame toolbox and users will be able to pan the map. Define the displacement steps to be used with the pan tool.
Scale bar	If selected, a graphical scale will be available to the user in the lower part of the map. The units of measurements are expressed in kilometers.
Tool for adding markers	If selected, the tool for adding new markers on the map will be visible in the map frame toolbox. End users will be able to add a -temporary- marker over the selected earthquake map by entering the coordinates.
Export to Google Earth	If selected, the icon "  " will be available to the user and will let to see the selected map in Google Earth. End users must have Google Earth previously installed on their system.
Print tool	If selected, the print tool will be available to the user with the icon "  " in the map frame toolbox.
Grid	If selected, maps will be created with the geographical grid layer (graticule 1° by 1°).
Symbols	Select which set of symbols must be used for representing observed macroseismic intensities. By clicking 'edit' the administrator can modify the PHP/SVG file containing symbols for each set.



Map center based on • MDP and epicentre coordinate median • MDP only coordinate median • MDP with maximum intensity coordinate median • epicentres only coordinate median • center coordinates from field o Field latitude o Field longitude	Define how the default center of the map will be calculated. Define the map center to the coordinates resulting from the median between plotted epicentres and all the intensity points. Define the map center to the coordinate median resulting from all the plotted intensity points plotted. Only places corresponding to large areas (tab. 2c) that have coordinates will be used within the calculation. Define the map center to the coordinate median of the highest intensity value points plotted. Define the map center to the epicentre; only in case of more than one epicentre, the center will be set to the coordinate median resulting from all the plotted epicentres. Define the map center to coordinates taken from the earthquake catalogue table.
View extension • fixed distance • fixed distance from field • based on the MDP distribution o minimum distance o maximum distance	Define how the default view extension of the map will be calculated. Define the view extent to a fixed value valid for every earthquake map. Define the view extent from a value taken from the earthquake catalogue table field. Each earthquake can have a different value. Define the view extent automatically. The extent will be calculated taking into account all the intensity points of the earthquake. Limit the minimum value in kilometers of the automatic extent calculation. It useful in case the earthquake has a very small amount of points or they are very close to each other. Limit the maximum value in kilometers of the automatic extent calculation. It is useful in those earthquakes that cover very large geographical areas.



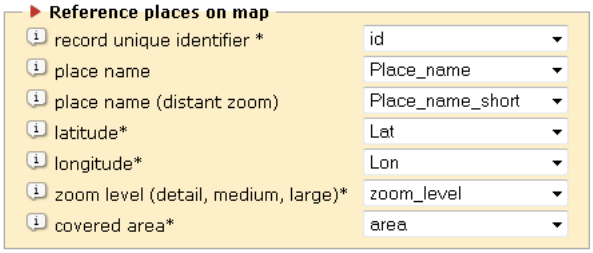
Medium zoom scale value	Set the meaning of “medium” zoom in terms of zoom degree.
Detailed zoom scale value	Set the meaning of “detailed” zoom in terms of zoom degree.
Available layers for [*covered area*] • on/off • rename • available layer files • style • display • code • delete	Manage which layers must be included with the generated maps. Built-in layers covers the following UTM zones: 30, area 'iberia' or 'uk';31, area 'france';32, area 'italy'; 33, area 'eastern_europe' or 'fennoscandia'; 34, area 'aegean'. For further information on layers managements see chapter “Advanced customization”. Switch on or off the layer use when creating an earthquake map Rename the layer file name (the extension “.layer” must be kept) Layer file name (files stored in “data / layers_eq / [*UTM*] / [*covered area*]”). The level number at which the layer will be inserted within the map is automatically established by sorting the list of layer filenames alphabetically. Change the layer’s appearance style. A popup window will appear (see the image above) where you can specify both fill and stroke and the layer opacity. Set when the layer will be shown: always present, shown at medium and detailed zoom, only on detailed zoom Edit the layer source code. Delete the layer file (a requester will prevent accidental deletion)
upload a new layer	Load an additional layer file to MIDOP.
SVG code from catalogue field	Load SVG source code directly from a catalogue field. Read chapter 5.5 for further details.
layer lever (after)	Set the layer level where the loaded SVG code will be drawn in the map.

Digital elevation model • enabled • type • include after level • cover only the epicentral area	MIDOP can include a DEM (Digital Elevation Model) when creating a map. Switch on or off the DEM inclusion when generating a map. Set the type of pre-elaborated DEM to be included: flat shaded (2D) or hill shaded (3D) Set the layer level where the DEM will be drawn in the map. Set if the DEM will cover only the epicentral area where there are macroseismic observations or the entire geographical area.

Layer opacity	Define the level of opacity (or transparence) of the geographical layer.
Stroke	If enabled, the geographical layer content will be drawn with a stroke.
Stroke width	
Stroke color	Specify the stroke color expressed in hex triplet (a six-digit, three-byte hexadecimal number used in HTML, CSS, SVG).
Stroke opacity	Define the level of opacity (or transparence) of the fill color of the stroke.
Stroke miter limit	Define the stroke miter limit. For further details see http://www.w3.org/TR/SVG/painting.html.
Stroke dash array	Define the stroke dash array. For further details see http://www.w3.org/TR/SVG/painting.html.
Stroke dash offset	Define the stroke dash offset. For further details see http://www.w3.org/TR/SVG/painting.html.
Stroke line cap	Define the stroke line cap. For further details see http://www.w3.org/TR/SVG/painting.html.
Stroke line join	Define the stroke line join. For further details see http://www.w3.org/TR/SVG/painting.html.
Fill	If enabled, the geographical layer content will be drawn with a fill.
Fill color	Specify the fill color expressed in hex triplet (a six-digit, three-byte hexadecimal number used in HTML, CSS, SVG).
Fill opacity	Define the level of opacity (or transparence) of the fill color of the layer.

IMPORTANT NOTE Geographical layers are shared between all the websites managed by MIDOP. Renaming layers, deleting them or changing their style appearance, such fill or stroke color, will affect all the websites stored in MIDOP.

Important note about DEM use If you enable the DEM image inclusion within the generated maps, MIDOP uses PHP functionalities for image manipulation (GD image libraries, usually built-in in the PHP distribution). These procedures require a lot of computational power, both in terms of used RAM memory and CPU cycles. Generation is not in real time, and several seconds will be required; once the map is generated it will be cached and the next time it will ready instantaneously. To flush pre-generated maps stored within the MIDOP cache, simply click the "flush cache" button. Cached map files are stored within the folder "data / svg / maps".



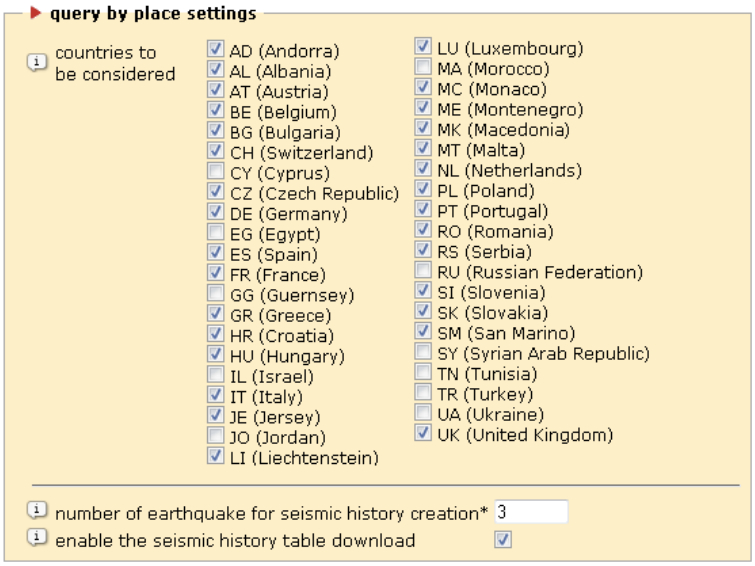
Record unique identifier	Record unique identifier, not repeated in the table.
Place name	Set the place name that will be plotted as a geographical reference on the map.
Place name (distant zoom)	Set the truncated place name that will be plotted as a geographical reference on the map with a distant zoom.

Latitude	Set the reference place latitude. The value must be expressed in geographical decimal degree.
Longitude	Set the reference place longitude. The value must be expressed in geographical decimal degree.
Zoom level (detail, medium, large)	Set the zoom value to be used for the place name. Allowed values are: detail, for close up zoom; medium, for medium distant view; large, for distant zoom.
Covered area	Set in which geographical area the place will be shown. MIDOP has 6 built-in areas: “iberia”, “france”, “uk”, “italy”, “eastern_europe”, “fennoscandia”, “aegean”,.

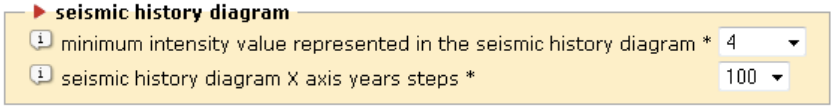
Page “Query by place”

This settings page controls the “query by place” part of your website. This functionality is available only if mentioned places are identified by uniquely identifier as specified in tab.2 and if the country field has been compiled.
The following settings boxes are available:

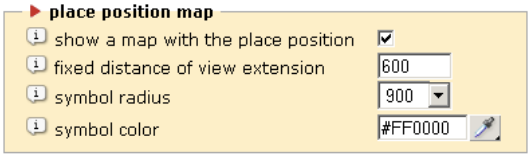
1. Query by place settings;
2. Seismic history diagram;
3. Place position map.



Countries to be considered	Select which countries will be considered for creating seismic histories. MIDOP will only list here countries mentioned in the field “Country” as specified in the control panel page “MDP list”.
Number of earthquake for seismic history creation	Select the minimum number of earthquakes occurred in the place in order to create a seismic history. If the place is mentioned in a number of earthquake inferior of this value, the seismic history of the place will not be generated.
Enable the seismic history table download	If selected, the table with the list of earthquakes occurred in the place can be downloaded as MS Excel file (files with .xls extension).



Minimum intensity value represented in the seismic history diagram	Specify the minimum degree of macroseismic intensity represented in the place seismic history diagram. Smaller intensities will not be represented
Seismic history diagram X axis years steps	Specify the step in number of years for the X axis of the diagram.



Show a map with the place position	If selected, a map representing the place position will be shown
Fixed distance of view extension	Specify the zoom level of the map
Symbol radius	Specify the radius size of the circle representing the place on the map
Symbol color	Specify the color of the circle expressed in hex triplet (a six-digit, three-byte hexadecimal number used in HTML, CSS, SVG) representing the place on the map.

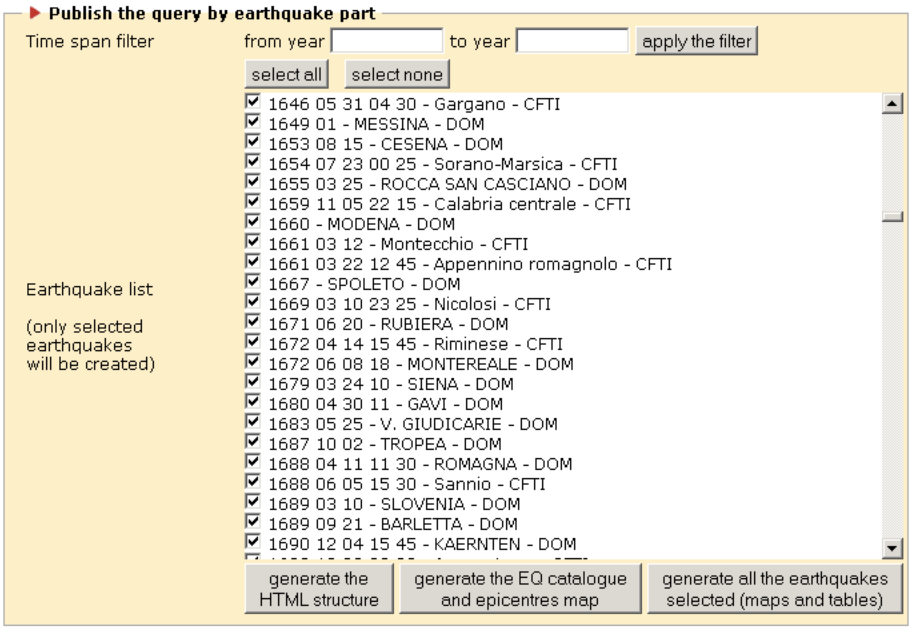
MIDOP has the built-in functionality to extrapolate the places seismic histories.
The only condition in order to create such feature is that places within the macroseismic database must have a unique identifier. For example the town “Milan” must have always the same identifier so that MIDOP can process the whole database tracking down every earthquake in which “Milan” appeared.

Page “Publish”

This page let you “publish” your website in its final version. Publishing a website mean that you will create a folder (MIDOP / PUBLISHED_SITES /) containing all the files required in order to load your website in Internet. There are two main publishing areas: one for the “query by earthquake” and the other for the “query by place”. Each part has been divided in publication steps in order to let you better control the publication process. If you repeat one step you will overwrite previously published files: this is useful for updating only those parts that are being updated.

The time required for the complete publication of a website varies based on many factors: the CPU performance of the computer used for the website development, the size of the RAM memory, the number of earthquakes and the number of mentioned places. Also the DEM inclusion will heavily affect the publishing time. Just to have an idea a website containing more or less 1000 earthquakes with 14000 mentioned places without a DEM requires more or less 2 hours on a computer based on a 2 GHz CPU.

The following settings boxes are available:
1. Publish the query by earthquake part;
2. Publish the seismic history part.



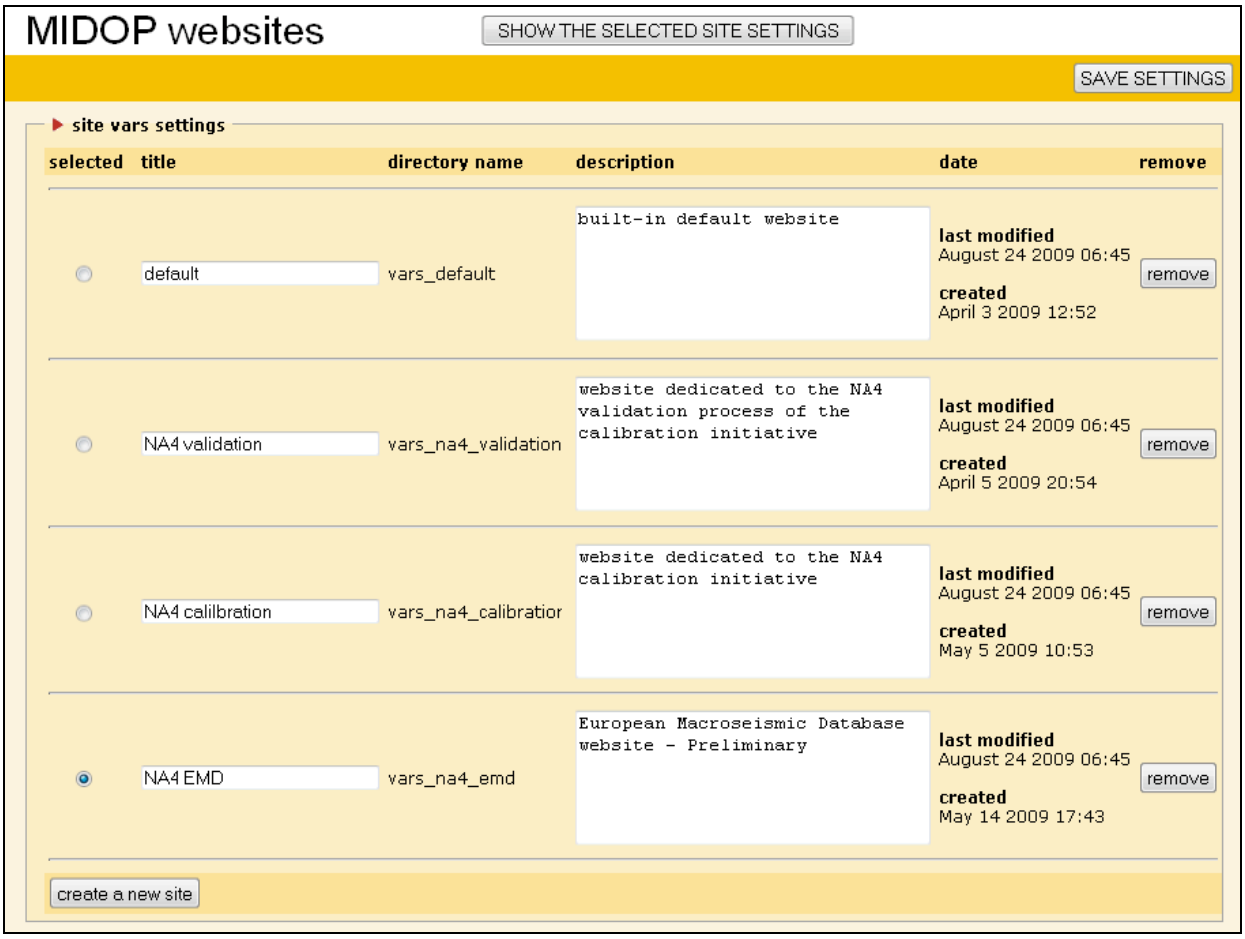
Time span filter • from year • to year Apply the filter	By specifying a starting and a final year all the earthquakes occurred in such time-span will be selected from the list, leaving other earthquakes unselected. This is useful while updating only a sub-set of the entire earthquake catalogue.
Select all Select none	Select all or unselect all the earthquakes listed in the table.
Earthquake list	Contains all the earthquakes listed in the selected earthquake catalogue.
Generate the HTML structure	Generate all the html files defining the website structure of the "query by earthquake" part of the final website.
Generate the EQ catalogue and epicentres map	Generate the earthquake catalogue and its corresponding map.
Generate all the earthquakes selected (maps and tables)	Generate all the earthquake intensity map

Generate the HTML structure	Generate all the html files defining the website structure of the "query by place" part of the final website.
Generate the place list Generate all the seismic histories	Generate the list of available places. Generate of each available place seismic history (tables, diagrams and maps).

IMPORTANT NOTE Publishing a sub-set of an already published website will result in overwriting the old version and updating it losing all the old content. If you want to keep old files, please backup your data before publishing.

5.3 Multiple sites management

MIDOP is capable of managing more than one site, each using separate settings, such as separate MySql source servers, data tables, frameset size or source field names, geographical layers, etc..
This is a major advantage: by using one tool an unlimited number of websites can be managed easily. Switching between sites can be performed without data loss at any time, it is enough to specify which site must be used, save the multisite preference and switch to the selected site control panel and settings.



By clicking the button “create a new site” you will be able to add a new website and some information must be entered such as:

- the site title, that will appear in the window title;
- the site settings folder, that will contain all the customized files describing the website; it must be named without spaces nor special characters, possibly starting with the prefix “vars_”;
- a site description/comment, that helps administrators remembering important information related to the website;

The creation date and further changes dates will be kept automatically by MIDOP.
Select the newly created site by clicking on the corresponding column “selected” and click “save settings” in order to activate your changes. Click now the top button “show the selected site settings” and the control panel will switch to the selected website settings.

If you would like to remove a website click the button “remove”; a popup message will appear asking you to confirm the delete operation. As additional safety measure you must also click the button “save settings” in order to completely delete the website.

Every time a new site is created, a series of default values will be applied helping administrators speeding up the customization process. All the presets values are stored within the folder “settings / defaultvars”; by changing them every new site will inherit these settings.

The list of all managed sites is kept in the file “settings / settings_vars.php”.

5.4 Epicentre and intensity symbols

MIDOP comes with a variety of predefined set of symbols for epicentres and for macroseismic intensities.

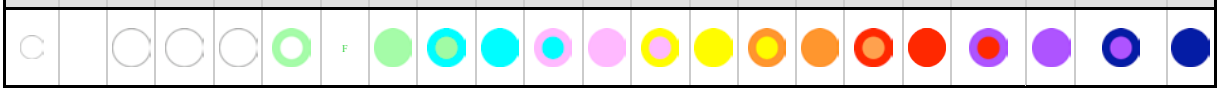
Epicentre set

For every plotted epicentre one of the following symbols can be specified:

Symbol	Available colors
	Black Blue Brown Cyan Green Orange Pink Red Violet Yellow
	
	
	
	
	
	
	

DBMI04 intensities set

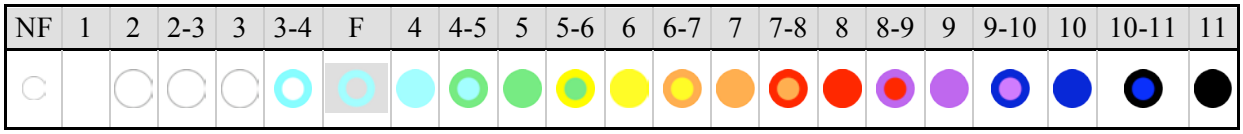
This symbol set comes from the Italian Macroseismic Database 2004.
(http://emidius.mi.ingv.it/DBMI04)

NF	1	2	2-3	3	3-4	F	4	4-5	5	5-6	6	6-7	7	7-8	8	8-9	9	9-10	10	10-11	11
																					

Intensity value	Hexadecimal codes		RGB values			RGB values		
	Fill	Stroke	Fill			Stroke		
			Red	Green	Blue	Red	Green	Blue
NF	#FFFFFF	-	255	255	255	-	-	-
2	#FFFFFF	-	255	255	255	-	-	-
2-3	#FFFFFF	-	255	255	255	-	-	-
3	#FFFFFF	-	255	255	255	-	-	-
3-4	#FFFFFF	#A0E46F	255	255	255	160	228	111
4	#A0E46F	-	160	228	111	-	-	-
4-5	#A0E46F	#00FFFF	160	228	111	0	255	255
5	#00FFFF	-	0	255	255	-	-	-
5-6	#00FFFF	#FFA5FF	0	255	255	255	165	255
6	#FFA5FF	-	255	165	255	-	-	-
6-7	#FFA5FF	#FFFF00	255	165	255	255	255	0
7	#FFFF00	-	255	255	0	-	-	-
7-8	#FFFF00	#FF8224	255	255	0	255	130	36
8	#FF8224	-	255	130	36	-	-	-
8-9	#FF8224	#FF0000	255	130	36	255	0	0
9	#FF0000	-	255	0	0	-	-	-
9-10	#FF0000	#9C31FF	255	0	0	156	49	255
10	#9C31FF	-	156	49	255	-	-	-
10-11	#9C31FF	#00008C	156	49	255	0	0	140
11	#00008C	-	0	0	140	-	-	-

DBMI08 intensities set

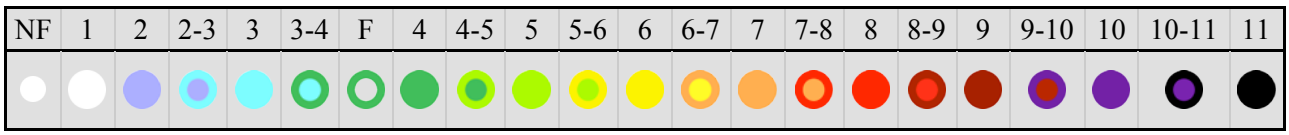
This symbol set comes from the Italian Macroseismic Database 2008.
(http://emidius.mi.ingv.it/DBMI08)



Intensity value	Hexadecimal codes		RGB values Fill			RGB values Stroke		
	Fill	Stroke	Red	Green	Blue	Red	Green	Blue
NF	#FFFFFF	-	255	255	255	-	-	-
2	#FFFFFF	-	255	255	255	-	-	-
2-3	#FFFFFF	-	255	255	255	-	-	-
3	#FFFFFF	-	255	255	255	-	-	-
3-4	#FFFFFF	#79FFFF	255	255	255	121	255	255
F	-	#95FFFF	-	-	-	149	255	255
4	#95FFFF	-	149	255	255	-	-	-
4-5	#95FFFF	#69EB70	149	255	255	105	235	112
5	#69EB70	-	105	235	112	-	-	-
5-6	#69EB70	#FFFF00	105	235	112	255	255	0
6	#FFFF00	-	255	255	-	-	-	-
6-7	#FFFF00	#FF9F40	255	255	-	255	159	64
7	#FF9F40	-	255	159	64	-	-	-
7-8	#FF9F40	#FF0000	255	159	64	255	0	0
8	#FF0000	-	255	0	0	-	-	-
8-9	#FF0000	#AC4DF4	255	0	0	172	77	244
9	#AC4DF4	-	172	77	244	-	-	-
9-10	#AC4DF4	#0303CD	172	77	244	3	3	205
10	#0303CD	-	3	3	205	-	-	-
10-11	#0303CD	#000000	3	3	205	0	0	0
11	#000000	-	0	0	0	-	-	-

NERIES NA4 intensities set

This symbol set is the official NERIES NA4 which was intended for covering as much as possible the intensity ranges of the entire Europe (http://emidius.mi.ingv.it/neries_NA4/).



Intensity value	Hexadecimal codes		RGB values Fill			RGB values Stroke		
	Fill	Stroke	Red	Green	Blue	Red	Green	Blue
1	#FFFFFF	-	255	255	255	-	-	-
2	#9C9CFF	-	156	156	255	-	-	-
2-3	#9C9CFF	#95FFFF	149	255	255	156	156	255
3	#6FFFFF	-	111	255	255	-	-	-
3-4	#6FFFFF	#3ABB4B	111	255	255	58	187	75
F	-	#3ABB4B	-	-	-	59	191	77
4	#3ABB4B	-	56	181	71	-	-	-

4-5	#3ABB4B	#A0FF00	56	181	71	160	255	0
5	#A0FF00	-	160	255	0	-	-	-
5-6	#99F400	#FBF400	153	244	0	251	244	0
6	#FBF400	-	251	244	0	-	-	-
6-7	#FBF400	#FF9F40	255	255	32	255	159	64
7	#FF9F40	-	255	159	64	-	-	-
7-8	#FF9F40	#FF0000	255	159	64	255	0	0
8	#FF0000	-	255	0	0	-	-	-
8-9	#FF1515	#9F1400	255	0	0	159	20	0
9	#941100	-	148	17	0	-	-	-
9-10	#AA1500	#5E0095	170	21	0	94	0	149
10	#5E0095	-	94	0	149	-	-	-
10-11	#5E0095	#000000	100	0	159	0	0	0
11	#000000	-	0	0	0	-	-	-

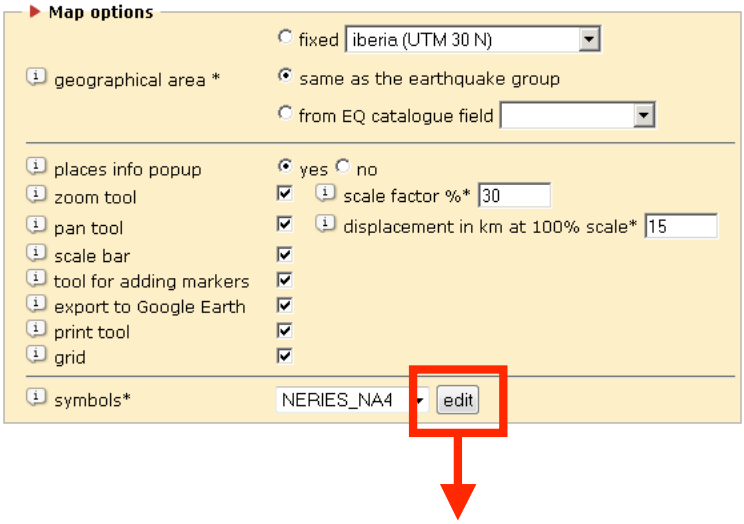
5.5 Advanced customisations

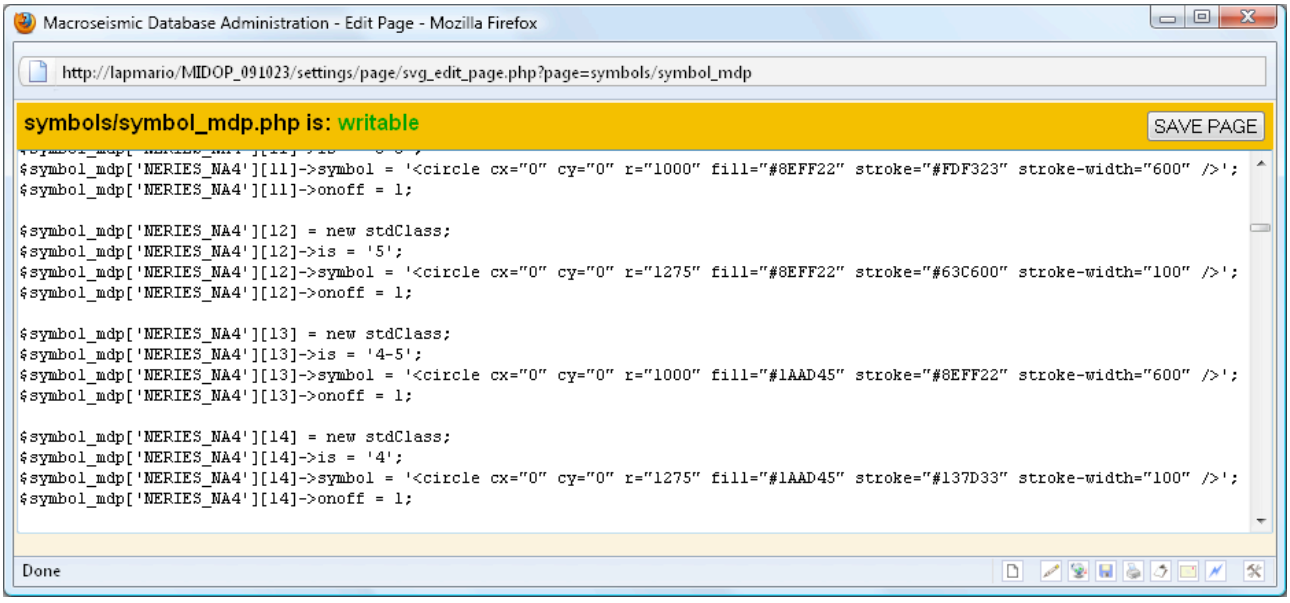
MIDOP is by nature extensively customizable. Whenever you find a button “Edit”, by clicking it you will be able to directly modify the source code using a built-in source code editor.

Off course such modifications requires at least a basic PHP and HTML coding knowledge, but also novice users might understand it by reading existing code. A big effort while developing MIDOP is being putted on the coding style adopted: extensive use of comments, PHP variable with self-explaining names and simple text files for storing each managed website settings.

Symbols customization

Available symbols used for plotting macroseismic intensities can be customized and new symbols can also be created by clicking the button “Edit” within the page “MDP map”: a popup window will open presenting a source code editor.





The presented code uses PHP macro-language for defining SVG (Scalable Vector Graphic) shapes.

WARNING Be careful while inserting or modifying source code: errors might produce unpredictable effects and might completely harm MIDOP.

Intensity symbols are organized in sets, each with as many symbols as the possible range of macroseismic intensities. Each intensity symbol within a set is defined using again four lines:

1. third level array object class creation named using a progressive integer as the unique identifier within the set. The array intensity so defined it's contained in an array called as the name of the set, in its turn contained in another array called "$symbol_mdp" (e.g.: $symbol_mdp['name_of_the_set']['intensity value']). Note that the set name must not contains spaces nor special characters
2. definition of the macroseismic intensity value for which the symbol will be used. Note that the specified intensity notation must be identical to the intensity notation used for the compilation of the input data. If for example the symbol says that it must be used for values "6-7" but the input data is compiled with a "VI-VII" or "6.5" the symbol will not be used;
3. SVG shape definition code. Note that symbols must be inscribed in an rectangle of 3000 by 3000 in order to be homogenous;
4. define if the symbol will be used when creating the final map SVG code. This is useful in order to turn on ("1") or off ("0") plotted symbols without the need of deleting the symbol code.

Below the source code used for defining the 9th symbol of the "NERIES_NA4" set defining the represented intensity "4-5":

```
$symbol_mdp['NERIES_NA4'][9] = new stdClass;
$symbol_mdp['NERIES_NA4'][9]->is = '4-5';
$symbol_mdp['NERIES_NA4'][9]->symbol = '<circle
                                        cx="0" cy="0" r="1000"
                                        fill="#FDF323"
                                        stroke="#FF963F"
                                        stroke-width="600" />';
$symbol_mdp['NERIES_NA4'][9]->onoff = 1;
```

Epicentre symbols are defined by four PHP lines:

1. second level array object class creation named as the name of the symbol. The so created array in its turn is contained in another array called "$symbol_epicentre" (e.g.: $symbol_epicentre['name_of_the_symbol']). Note that the symbol name must not contains spaces nor special characters;

2. unique identifier definition. Note that the code of the map is written in SVG and the specified identifier of each object must be unique in order to let the JavaScript command “getElementById()” operating correctly on the DOM (Document Object Model);
3. SVG shape definition code. Note that symbols must be inscribed in an rectangle of 3000 by 3000 in order to be homogenous;
4. define if the symbol will be used when creating the final map SVG code. This is useful in order to turn on (“1”) and off (“0”) plotted symbols without the need of deleting the symbol itself.

Below the source code used for defining the rectangle:

```
$symbol_epicentre['SquareBlack'] = new stdClass;
$symbol_epicentre['SquareBlack']->id = 'idSquareBlack';
$symbol_epicentre['SquareBlack']->symbol = '<rect
                                x="-1500" y="-1500"
                                width="3000" height="3000"
                                stroke="#000000" stroke-width="500"
                                fill="#FFFFFF" />';
$symbol_epicentre['SquareBlack']->onoff = 1;
```

Custom geographical layers

Geographical layers in MODOP are plain text files containing SVG elements. Before trying to create such files you can find further information on the SVG specifications at the W3C website (http://www.w3.org/TR/SVG/).

Layers are stored in the folder “data” separately for the general earthquake map and for single earthquake intensity maps, and for each UTM zone and covered area following this structure:

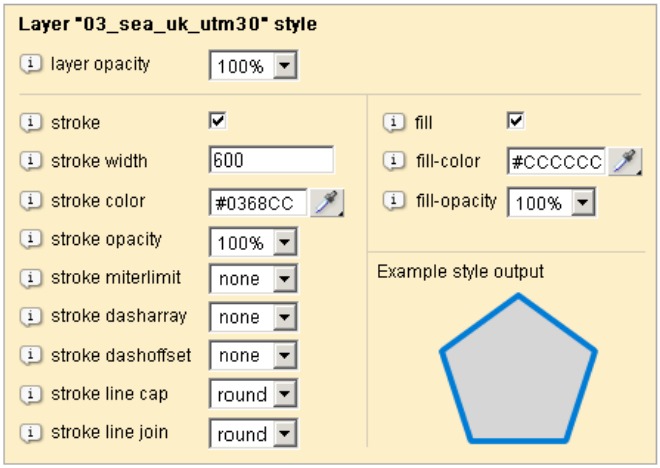
- earthquakes maps: “data \ layers_eq \”
    - UTM zone 30: “data \ layers_eq \ 30”;
        - Iberian layers: “data \ layers_eq \ 30 \ iberia”;
        - UK layers: “data \ layers_eq \ 30 \ uk”;
    - UTM zone 31: “data \ layers_eq \ 31”;
        - France layers: “data \ layers_eq \ 31 \ france”;
    - UTM zone 32: “data \ layers_eq \ 32”;
        - Italian layers: “data \ layers_eq \ 32 \ iberia”;
        - entire Europe layers: “data \ layers_eq \ 32 \ whole_europe”;
    - UTM zone 33: “data \ layers_eq \ 33”;
        - Eastern Europe layers: “data \ layers_eq \ 33 \ eastern_europe”;
        - Fennoscandia layers: “data \ layers_eq \ 33 \ fennoscandia”;
    - UTM zone 34: “data \ layers_eq \ 34”;
        - Aegean layers: “data \ layers_eq \ 34 \ aegean”;

An identical file structure is used for storing geographical layers for earthquake intensity maps in folder “data \ layers_mdp \”.

Layers files must follow some important rule:

- each layer file must contains only SVG elements of the same kind (e.g. only “path”, only “rect” or only “circle”);
- no groups must be present (no “<g>” elements);
- no “styles” must be specified.

Styling the layer is possible within the dedicated control panel window (below) available both for layers in the “EQ map” and “MDP map” page. Through the visual interface can specify both the fill and the stroke style and the layer opacity (transparency).

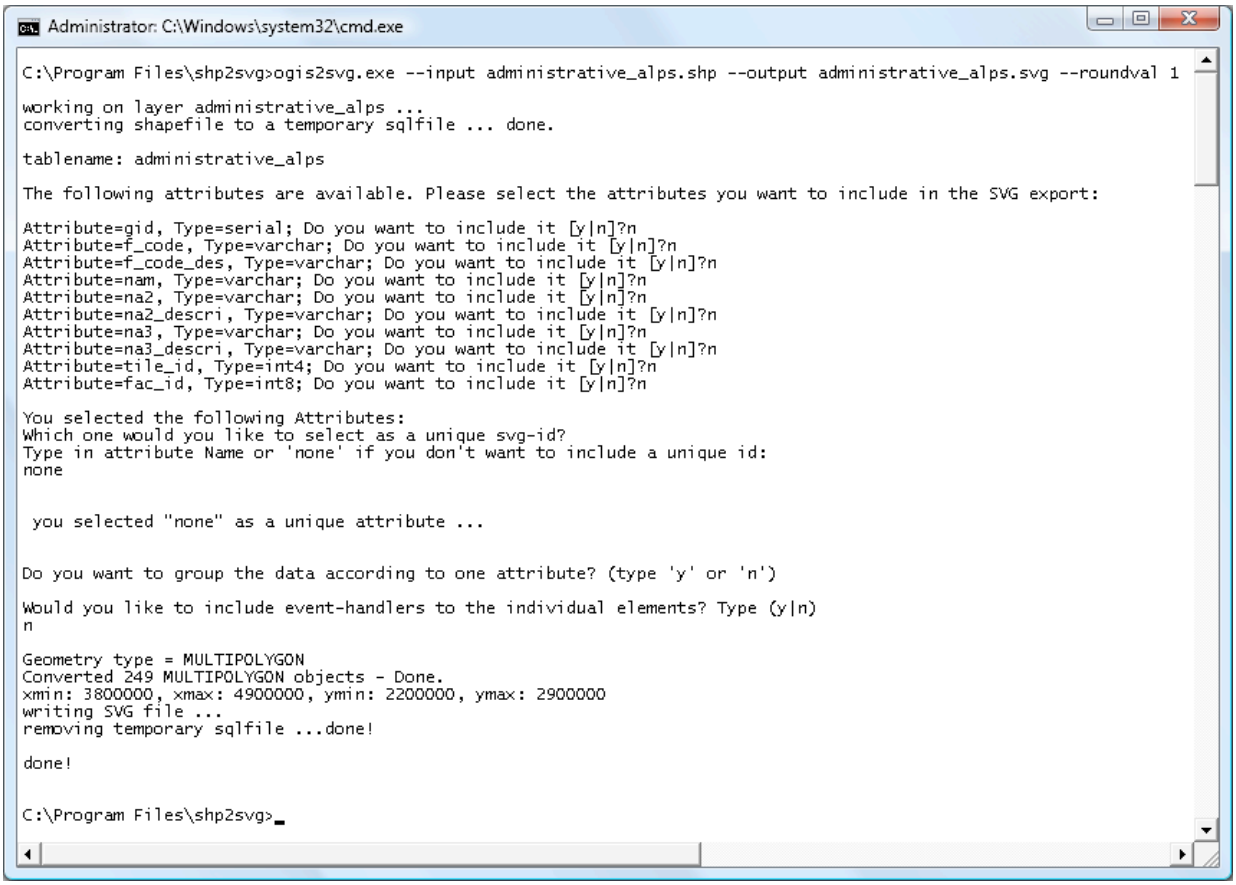


New geographical layers can be created for example from ESRI shapefiles (".shp" extension).

These files must be already projected using the corresponding UTM zone to the geographical area where they are going to be used. The conversion can be done using the freely available "shp2svg" [Neumann, 2007] utility at the CartoNet website (http://carto.net/papers/svg/utils/shp2svg/) composed by two MS Windows executables "ogis2svg.exe" and "shp2pgsql.exe" that works in the Windows Command Prompt. The conversion is done entering the following command:

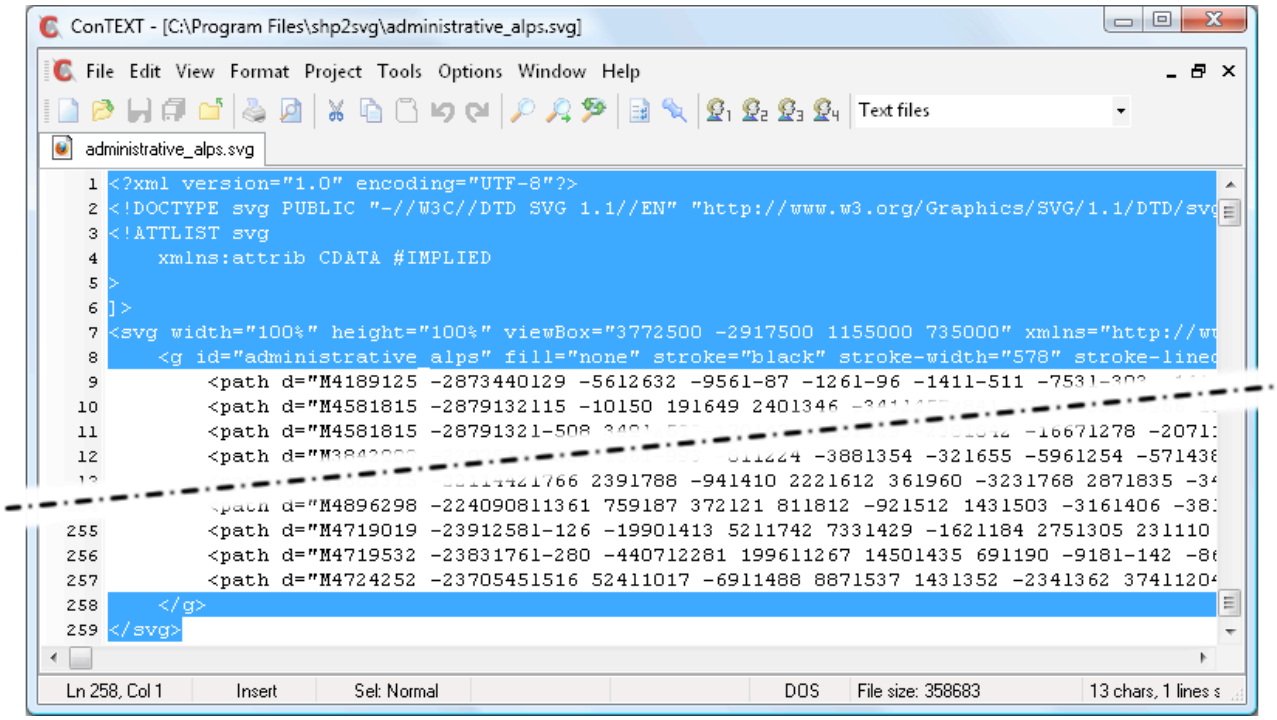
```
ogis2svg.exe --input your_shapefile --output svg_output_file.svg --roundval 1
```

When asked, answer "n" to every question. Below an example output of the conversion of the shapefile called "administrative_alps.shp":

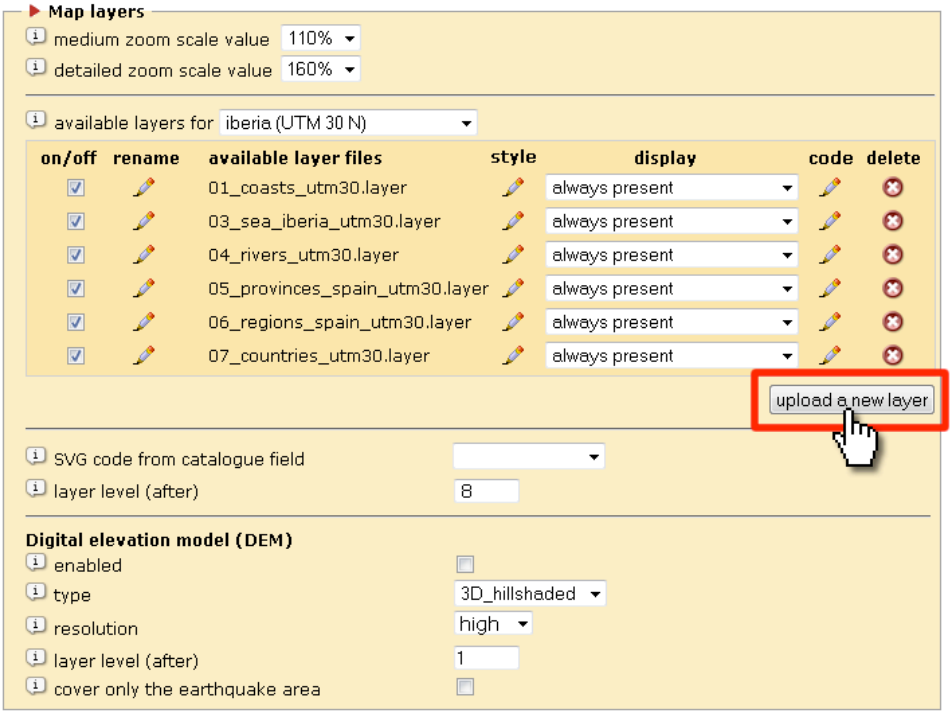


At the end of the conversion process, the output generated SVG file can be found in the same folder. In order to use such file in MIDOP as a geographical layer you must open the SVG file in a text editor and delete all the lines that don't contain SVG elements and save the file with the ".layer" extension.

Below an example screenshot showing the above converted "administrative_alps.svg" file loaded into a text editor (enlighten in blue lines that must be deleted):



Once you have your file with the ".layer" extension you can load it into MIDOP by clicking the button "upload a new layer" in the control panel. You can load it into the page "EQ map" if the layer must be used while generating the map of all the earthquakes present in the catalogue list, or in the page "MDP map" if the layer must be used while generating macroseismic intensity map of a selected earthquake.



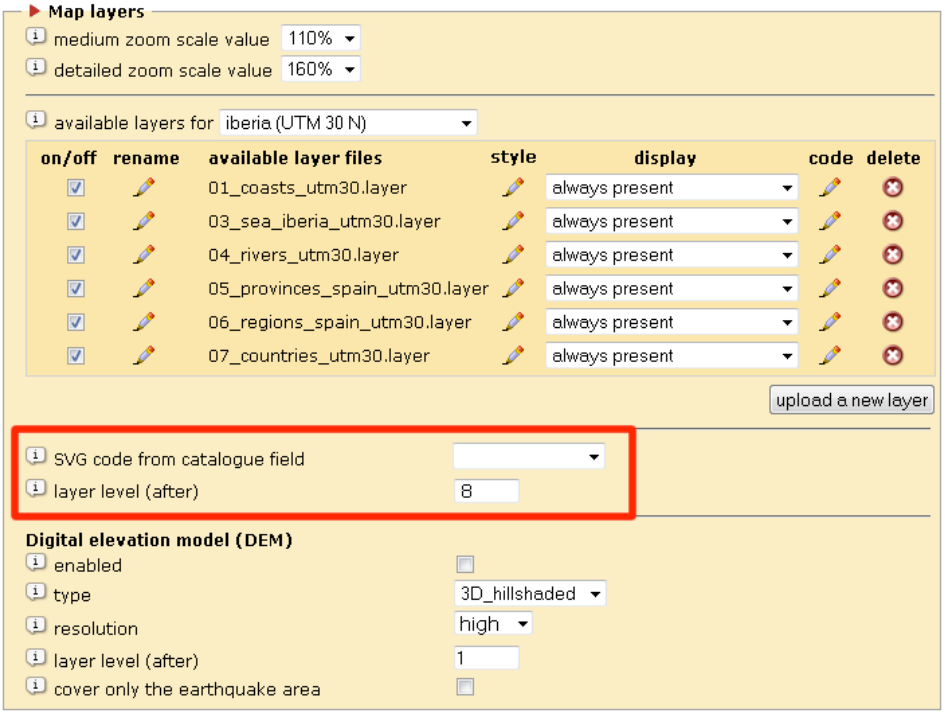
Please, note that MIDOP will load the layer file as is and no geographical projection or other transformation will be performed.

For simple changes to the layers source code a text editor can fulfill the task.

If complicated SVG manipulation is required, you can use the freely available graphic tool Inkscape (http://www.inkscape.org/) which uses SVG as its native format of manipulating graphical object. Once you've done your changes within Inkscape remember to save the file as "plain SVG code" and, again, strip off all the unnecessary SVG lines of code.

SVG code from catalogue fields

Within the "Map layers" settings box, in the "MDP map" control panel page, you can select a field from the catalogue table where you can store custom SVG code. The scope of this option is the ability to insert custom geographical objects only in specific earthquakes. For example you can insert the administrative boundaries existing at the time of the earthquake or shapes representing large areas such natural parks or entire damaged areas.



SVG code loaded in this way must only contain a single SVG object ("rect", "circle", "ellipse", "line", "polyline", "polygon") or groups of objects (by using the "<g>" tag). Also the style of loaded object must be inserted by using tags such as "fill", "fill-opacity" or "stroke". Inserted geographical elements will be loaded as is, no geographical transformation will be applied, so the coordinate system used must be referred at the same UTM zone of the plotted earthquake intensity map. Remember that SVG is a dialect of XML, and, as such, is quite restrictive with coding errors.

For further information on how to code SVG, see the official specifications at: http://www.w3.org/TR/SVG/

6. Publishing a site

6.1 Final publication introduction

While reviewing your website within the control panel using the two top buttons “query by earthquake” and “query by place”, MIDOP generates web pages in real time and only SVG generated maps are cached. This method let you extensively test your website while tuning up available settings in order to obtain what you need. This solution is not advisable for the final publication as too many issues would arise; among others, security is surely one of the most sensitive subjects that will potentially affect the final product.

In order to keep satisfying performance, quality and security, MIDOP has a dedicated process called “publication”. By using it, the final output website will be a folder that can be simply copied in the final web server, no installation will be required. Experts that are taking care of the web services will surely appreciate the simple procedure. The whole website is a “passive” folder: no active pages will be dynamically generated by the server and no databases are queried. By adopting this solution hacker attacks through the website are simply not possible.

Once published, the MIDOP technology is based on the combination of SVG (Scalable Vector Graphics) and JavaScript and this guarantee a good level of user interactivity, without the need of a powerful web server. Once the map will reach the final user through the web, every action such as zoom and pan, will be executed directly by the final user browser. This point will make happy the people that are taking care of the web services, as any web server will be powerful enough to serve your final website, there will be no need to buy and configure expensive hardware or software.

The only special configuration requested on the final web server is the ability to serve both SVG and KML headers correctly. You will have to contact the web services administrator and ask if the current configuration does support those headers. If so, you will only need to copy the published folder to the server, otherwise few lines must be added to the server configuration as follow:

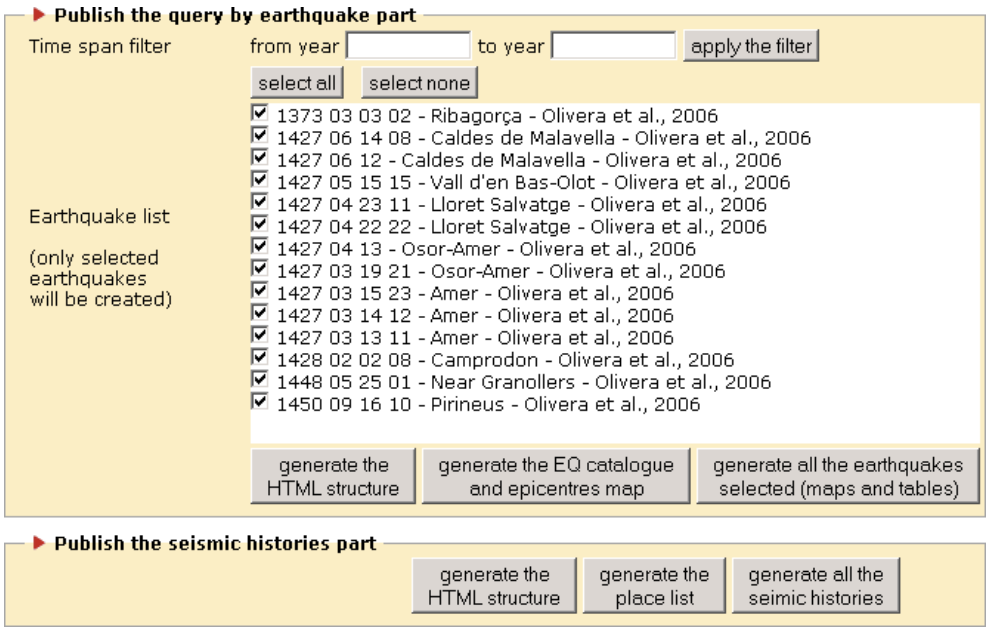
(for the Apache web server the configuration file is called “httpd.conf”)

```
AddType image/svg+xml .svg
AddType image/svg+xml .svgz
AddEncoding gzip .svgz
<FilesMatch \.svgz$>
  <IfModule mod_gzip.c>
    mod_gzip_on No
  </IfModule>
</FilesMatch>

AddType application/vnd.google-earth.kml+xml .kml
AddType application/vnd.google-earth.kmz .kmz
```

If the correct header corresponding to the served file is not sent, the final browser will likely not be able to show your maps, and will complain that an unknown file format is encountered leaving the user puzzled.

6.2 Publishing a new site

Once you are happy with your finely tuned website, you can proceed and publish it.
Click on the control panel “publish!” page and two areas, one for each consultation methods, will appear:



The "Publish the query by earthquake part" is dedicated to the publishing of the catalogue, its map of earthquakes and each earthquake intensity map and MDP tables. The entire process is subdivided in three sub-processes:

a. generation of the html frameset structure, all the html files that will be filled with the content;
b. generation of the earthquake catalogue and epicentre map, or maps if you chose to have more than one earthquake group;
c. generation of each earthquake map and table of intensity observations.

The "Publish the seismic histories part" (also previously mentioned in this document as "query by place") is a three step process:

1. generation of the html frameset structure;
2. generation of the list of available places;
3. generation of each available place seismic history.

Each process will show a popup window that will inform you about the generation status.

At the end of the publishing process your website can be found in "PUBLISHED_SITES" folder and will contain everything is needed to work. Copy it to the final web server and that's it, you will have your macroseismic data points online.

At every publication step process a series of log files are created helping you keeping trace of the parameters used in order to generate the website. Below the description of the available logs:

- "HTML_structure_generated.log", contains the parameters for generating the html frameset structure;
- "Earthquake_lists_and_epicentres_maps_generated.log", contains the list of MySql source tables and the content of the defined groups of earthquakes;
- "Selected_earthquakes_maps_and_tables.log", contains the list of MySql source tables and the complete list of earthquakes generated;
- "Place_lists_generated.log", contains the complete list of places for which a seismic history has been generated.

6.3 Update subsets of an already published site

In research activities, it often happens that a sub-set of the original data must be updated or corrected in some parts. When you have finished updating such data in MySql tables, you can proceed updating the

already published website by publishing again only those parts that you have modified and only those generated files will have to be copied on the web server.
To do so, click on the "publish!" page and follow your specific update case below.

Frameset structure update. It might happen that only the general layout must be updated, for example the left frame needs to be a bit larger or the selected information frame a bit higher. To create the needed updated files, click only the button "Generate the html structure" and copy the resulting files in your publication folder to the already published website.

Earthquakes list table and general earthquakes map update. If you only have to update something within the earthquake list table content in the upper left frame, for example new columns or modified earthquake parameters, you have to click only on the button "Generate EQ list catalogue and epicentres map".

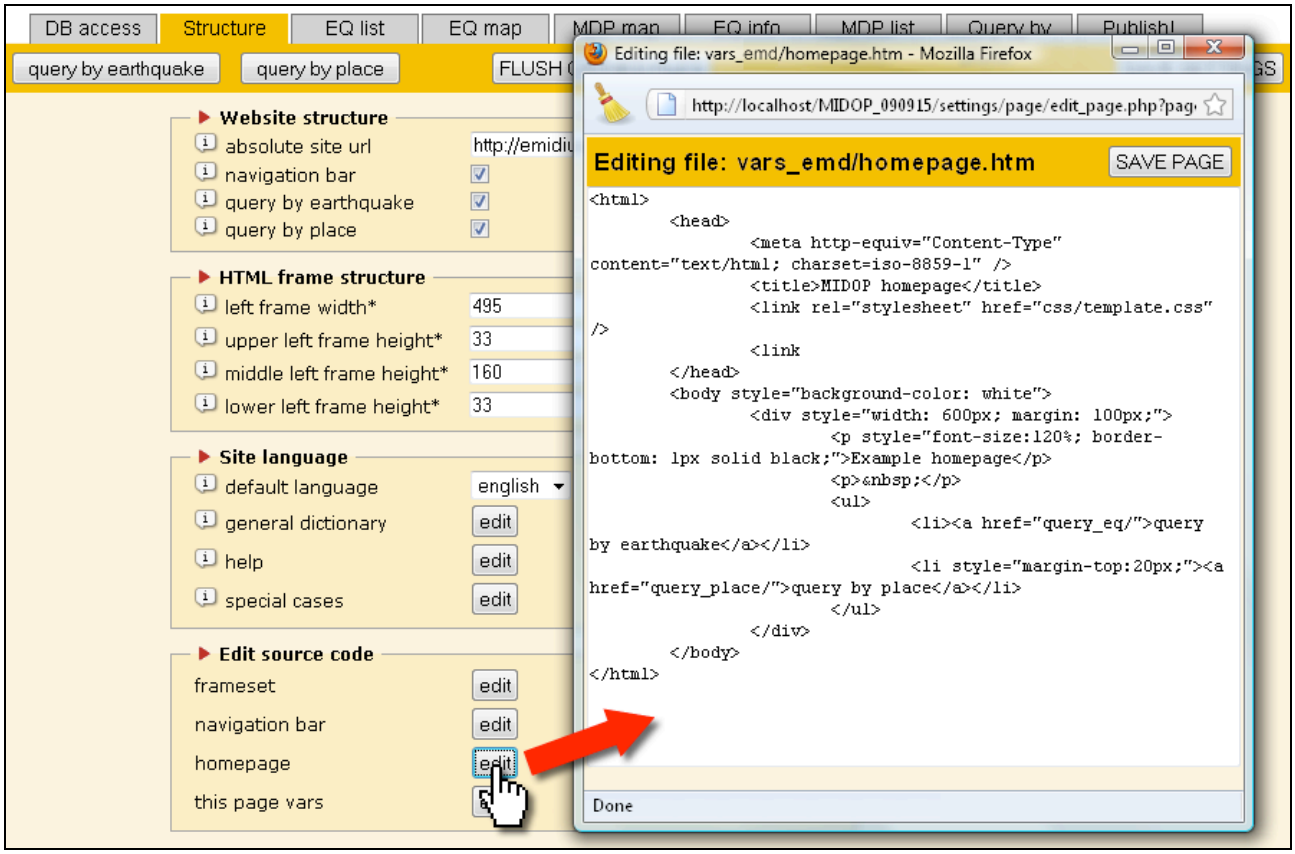
Selected earthquake map and macroseismic observations table update. Within the publication page you can choose a subset of the entire earthquake catalogue: just select those events that you want to re-generate and then click "Generate all the earthquakes selected (maps and tables)". Once the system has finished you can copy the newly generated files on the final web server.

IMPORTANT NOTE Before generating the updated version of your files, remember that MIDOP will overwrite existing file. You can create a backup folder for each version of a published site; this will help you keeping track of what has been published in the past and any data content or setting change.

6.4 Final homepage customization

MIDOP let you customize the homepage of each managed website. The homepage file is a plain HTML file stored in "settings / your_website_settings_folder / homepage.htm".

In order to personalize the page you can directly edit the HTML source code using the built-in text editor available by clicking the homepage "Edit" button in the "Structure" page of the control panel (see image below).



The final HTML must contain a link to one or two relevant query methods:

- for entering the query by earthquake area use the standard HTML element "<a>":
  `<a href="query_eq/">query by earthquake</a>`
- for entering the query by place area insert:
  `<a href="query_place/">query by place</a>`

Further page layout customization can be done in every HTML editor such as the free tool "Kompozer" (http://www.kompozer.net/) or the commercial product "Dreamweaver" by Adobe.

6.5 Linking from external website to a MIDOP generated site

Site published with MIDOP can be directly linked from external web pages with ease.
Below a list of the available linkable objects:

- the published site homepage
  "`http://YOUR_WEBSITE_URL/`"
- the query by earthquake homepage
  "`http://YOUR_WEBSITE_URL/query_eq/`"
- a specific earthquake within
  "`http://YOUR_WEBSITE_URL/query_eq/external_call.htm?`" + earthquake identifier
- a specific earthquake group within the query by earthquake page
  "`http://YOUR_WEBSITE_URL/query_eq/?eq_group=`" + the name of the group
- the query by place homepage
  "`http://YOUR_WEBSITE_URL/query_place/`"

6.6 XML export

A published website is equipped with a XML file used for storing published data and related information. Its format is highly inspired by the QuakeML format (https://quake.ethz.ch/quakeml/QuakeML).
The file is stored in the “data / quakeml /” folder of the published site in the “PUBLISHED_SITES” folder.
The purpose of this XML file is to keep in a comprehensive and standardized file the original data, a file that can be used for future use or for potential data analysis for researchers.

7. MIDOP internal file structure

index.php	MIDOP homepage
[css]	folder for common CSS and Javascripts
├─jquery.js	Javascript for sorting tables content in seismic histories
├─jquery.tablesorter.js	Javascript for sorting tables content in seismic histories
├─print.css	CSS used when printing pages
├─style.css	CSS used for visualizing pages
├─template.css	CSS used for visualizing MIDOP control panel pages
└─video.css	CSS used for visualizing pages
[data]	folder containing raw data for generating maps and caching outputs
├─[dem]	folder for pre-generated raster DEMs
│ ├─[2D_flatshaded]	folder for 2D flat-shaded DEMs
│ │ ├─[30]	folder for 2D flat-shaded DEMs in UTM 30 zone
│ │ ├─[31]	folder for 2D flat-shaded DEMs in UTM 31 zone
│ │ ├─[32]	folder for 2D flat-shaded DEMs in UTM 32 zone
│ │ ├─[33]	folder for 2D flat-shaded DEMs in UTM 33 zone
│ │ └─[34]	folder for 2D flat-shaded DEMs in UTM 34 zone
│ └─[3D_hillshaded]	folder for 3D hill-shaded DEMs
│ ├─[30]	folder for 3D hill-shaded DEMs in UTM 30 zone
│ ├─[31]	folder for 3D hill-shaded DEMs in UTM 31 zone
│ ├─[32]	folder for 3D hill-shaded DEMs in UTM 32 zone
│ ├─[33]	folder for 3D hill-shaded DEMs in UTM 33 zone
│ └─[34]	folder for 3D hill-shaded DEMs in UTM 34 zone
├─[grid]	folder for the geographical grid layer
│ ├─[30]	grid used when creating maps in UTM 30 zone
│ │ ├─[iberia]	grid used when creating maps in UTM 30 in Iberia
│ │ └─[uk]	grid used when creating maps in UTM 30 in UK
│ ├─[31]	grid used when creating maps in UTM 31 zone
│ ├─[32]	grid used when creating maps in UTM 32 zone
│ ├─[33]	grid used when creating maps in UTM 33 zone
│ └─[34]	grid used when creating maps in UTM 34 zone
├─[kml]	folder for temporary cache of kml files
├─[layers_eq]	geographical layers used for generating the earthquakes map
│ ├─[30]	layers used for UTM 30 zone
│ │ ├─[iberia]	layers used for UTM 30 zone in Iberia
│ │ └─[uk]	layers used for UTM 30 zone in UK
│ ├─[31]	layers used for UTM 31 zone
│ │ └─[france]	layers used for UTM 31 zone in France
│ ├─[32]	layers used for UTM 32 zone
│ │ ├─[italy]	layers used for UTM 32 zone in Italy
│ │ └─[whle_europe]	layers used for UTM 32 zone for the whole Europe
│ ├─[33]	layers used for UTM 33 zone
│ │ └─[eastern_europe]	layers used for UTM 33 zone for eastern Europe
│ └─[34]	layers used for UTM 34 zone
│ └─[aegean]	layers used for UTM 34 zone for Aegean
├─[layers_mdp]	geographical layers used for generating single earthquake MDP map
│ ├─[30]	layers used for UTM 30 zone
│ │ ├─[iberia]	layers used for UTM 30 zone in Iberia
│ │ └─[uk]	layers used for UTM 30 zone in UK
│ ├─[31]	layers used for UTM 31 zone
│ │ └─[france]	layers used for UTM 31 zone in France
│ ├─[32]	layers used for UTM 32 zone
│ │ └─[italy]	layers used for UTM 32 zone in Italy
│ ├─[33]	layers used for UTM 33 zone
│ │ └─[eastern_europe]	layers used for UTM 33 zone for eastern Europe
│ └─[34]	layers used for UTM 34 zone
│ └─[aegean]	layers used for UTM 34 zone for Aegean
├─[studies]	folder for storing bibliographical material about used studies
│ ├─[images]	studies images
│ └─[pdf]	studies PDFs
├─[svg]	folder for temporary cache of SVG files
│ ├─[maps]	cached SVG maps
│ └─[places]	cached SVG seismic history diagrams
└─[xls]	cached XLS table files
[images]	folder for storing all bitmap images used by MIDOP
└─kml_{nome simboli}	folder for storing bitmap symbols to be used in exported Google Earth files

[query_eq]	folder containing MIDOP files used for generating the query by earthquake part
├─external_call.php	used when receiving calls from an external website requesting a specific earthquake
├─frame_eq_info.php	html loaded into the frame "eq_info", contains information about the selected earthquake
├─frame_eq_list_frameset.php	frameset loaded into the frame "eq_list", contains the earthquake list and its header
├─frame_eq_list_table.php	html containing the earthquake list or catalogue table
├─frame_eq_list_table_header.php	html containing the earthquake list or catalogue table header
├─frame_eq_mdp_list.php	html containing the selected earthquake MDP table
├─frame_eq_mdp_map.php	html containing the selected earthquake MDP map
├─frame_navigation_bar.php	html loaded into the frame "navigation_bar", contains generated link
├─frame_navigation_bar_external.php	html of the navigation bar used when receiving external calls
├─function.php	geographical conversion operations and other common functions
├─index.php	query by earthquake HTML frameset
├─make_dem_svg.php	generates the MDP map DEM
├─make_eq_js_svg.php	Javascript functions used in the earthquakes map
├─make_eq_map_svg.php	generates the earthquakes map
├─make_layers_svg.php	generates the layers to be included into maps
├─make_mdp_js_svg.php	Javascript functions used in the selected earthquake MDP map
├─make_mdp_map_svg.php	generates the selected earthquake MDP map
├─make_symbols_svg.php	generates the symbols to be included into maps
├─make_viewbox.php	generates the map view parameters (SVG viewbox)
├─popup_addpoint.php	functions for adding points in realtime into an existing map
├─popup_study.php	file delle pop-up contenenti le informazioni dello studio del singolo terremoto
├─quakeml_catalogue.php	generates the QuakeML file for exporting the catalogue
├─quakeml_mdp.php	generates the XML file for exporting the list of MDP for each earthquake
├─save_kml.php	generates the KML file for exporting the list of MDP into Google Earth
└─save_xls.php	generates the XLS file for exporting the list of MDP into Excel
[query_place]	folder containing MIDOP files used for generating the query by place
├─call_eq.php	contains functions for calling an earthquake from the seismic history diagram
├─call_place.php	used when receiving calls from an external website requesting a place seismic history
├─frame_navigation_bar.php	html loaded into the frame "navigation_bar", contains generated link
├─frame_places_index.php	html loaded into the frame "places_index", contains the index alphabet
├─frame_places_list.php	html loaded into the frame "places_list", contains the list of places
├─frame_places_selected.php	html loaded into the frame "place_selected", contains the selected place seismic history
├─graph.php	generates the selected place seismic history diagram
├─index.php	query by place HTML frameset
├─make_place_map_svg.php	generates the selected place map
└─save_xls.php	generates the XLS file for exporting the seismic history into Excel
[root_publish]	folder containg published sites
[settings]	folder containg the MIDOP control panel and all the managed website settings
├─index.php	control panel homepage, calls the user selected control panel page
├─settings_vars.php	used for storing the list of managed websites
├─[defaultvars]	default websites settings, used when a new website is being created
│ ├─db_access.php	default settings for connecting to the MySql server
│ ├─eq_info.php	file contenente le variabili di default per la generazione del frame informazioni sul terremoto
│ ├─eq_list.php	file contenente le variabili di default per la generazione del catalogo dei terremoti
│ ├─eq_map.php	file contenente le variabili di default per la generazione delle mappe dei cataloghi
│ ├─html_info.htm	template di default per le informazioni sul terremoto
│ ├─mdp_list.php	file contenente le variabili di default per la generazione dei piani quotati
│ ├─mdp_map.php	file contenente le variabili di default per la generazione delle mappe dei piani quotati
│ ├─page_places_introduction.htm	pagina di default usata come introduzione alla parte del sito consultazione per località
│ ├─page_structure.php	file contenente le variabili di default della struttura del sito
│ ├─place_history.php	file contenente le variabili di default per la generazione della storia sismica
│ └─homepage.htm	pagina index di default del sito
├─[languages]	cartella contenente i file delle lingue
│ ├─language.english.help.php	used for storing the control panel help language, english
│ ├─language.english.php	general MIDOP language file, english
│ ├─language.italian.php	general MIDOP language file, italian
│ └─popup_help.php	html popup window used for showing help information within the control panel
├─[page]	folder for each control panel page
│ ├─active_country.php	generates the list of countries to be used into the "Query by pace" page
│ ├─active_group.php	file di supporto allla pagina di settaggi dei cataloghi dei terremoti
│ ├─database.php	functions for calling the MySql server and selecting data
│ ├─db_access.php	control panel "DB access" page
│ ├─edit_page.php	control panel source code editor popup window
│ ├─eq_info.php	control panel earthquake information page
│ ├─eq_list.php	control panel "EQ list" page
│ ├─eq_map.php	control panel "EQ map" page
│ ├─example.php	example shape within the popup window for styling geographical layers
│ ├─flushcache.php	functions for flushing all the cached files

├─index2.php	contains functions for storing the control panel variables into settings file
├─js_script.php	control panel common Javascript functions
├─layers_delete.php	functions for deleting the geographical layer file
├─layers_edit.php	functions for editing the geographical layer file source code
├─layers_rename.php	functions for renaming the geographical layer file
├─layers_style.php	popup window for styling geographical layers
├─layers_table.php	generates the list of available geographical layer files
├─layers_upload.php	functions for uploading a geographical layer file
├─lightbox.css	style used when publishing a website
├─lightboxiframe.js	Javascript functions called while publishing a website
├─mdp_list.php	control panel "MDP list" page
├─mdp_map.php	control panel "MDP map" page
├─page_structure.php	control panel "Structure" page
├─piker.png	immagine contagocce usata per l'apertura della poup "scelta colore"
├─place_history.php	control panel "Query by place" page
├─prototype.js	Javascript functions called while publishing a website
├─publish.php	control panel "Publish!" page
├─publish_maker.php	generates published files containing the earthquake list
├─publish_maker_place.php	generates published files containing seismic histories
├─settings.php	functions for loading, updating and saving control panel settings
├─svg_edit_page.php	control panel SVG source code editor popup window
├─table_colors.php	color selector tool
├─utility.class.php	common functions and classes for the control panel
├─utility.settings.php	functions for loading and saving the list of managed websites settings
└─utm_group.php	functions for retrieving the current earthquake group UTM zone
├─[query]	folder for common query function to the database
├─eq_list_query.php	query for generating the earthquake list or catalogue
└─mdp_list_query.php	query for generating the selected earthquake MDP list
└─[symbols]	folder for storing symbols used when generating maps
├─symbol_epicentre.php	epicentre symbols definitions
├─symbol_eq_map.php	general earthquake map symbols definitions
├─symbol_mdp.php	selected earthquake MDP map symbols definitions
└─symbol_return.php	draw all the plotted epicentre symbols within the earthquake information frame

8. References

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9. Licence, used products and credits

9.1 Licences

MIDOP is released under two open source licenses models which will hopefully help the tool in many ways: free circulation within the researchers, easier adoption by public institutions, open development and improvements, debugging effort shared among involved subjects.

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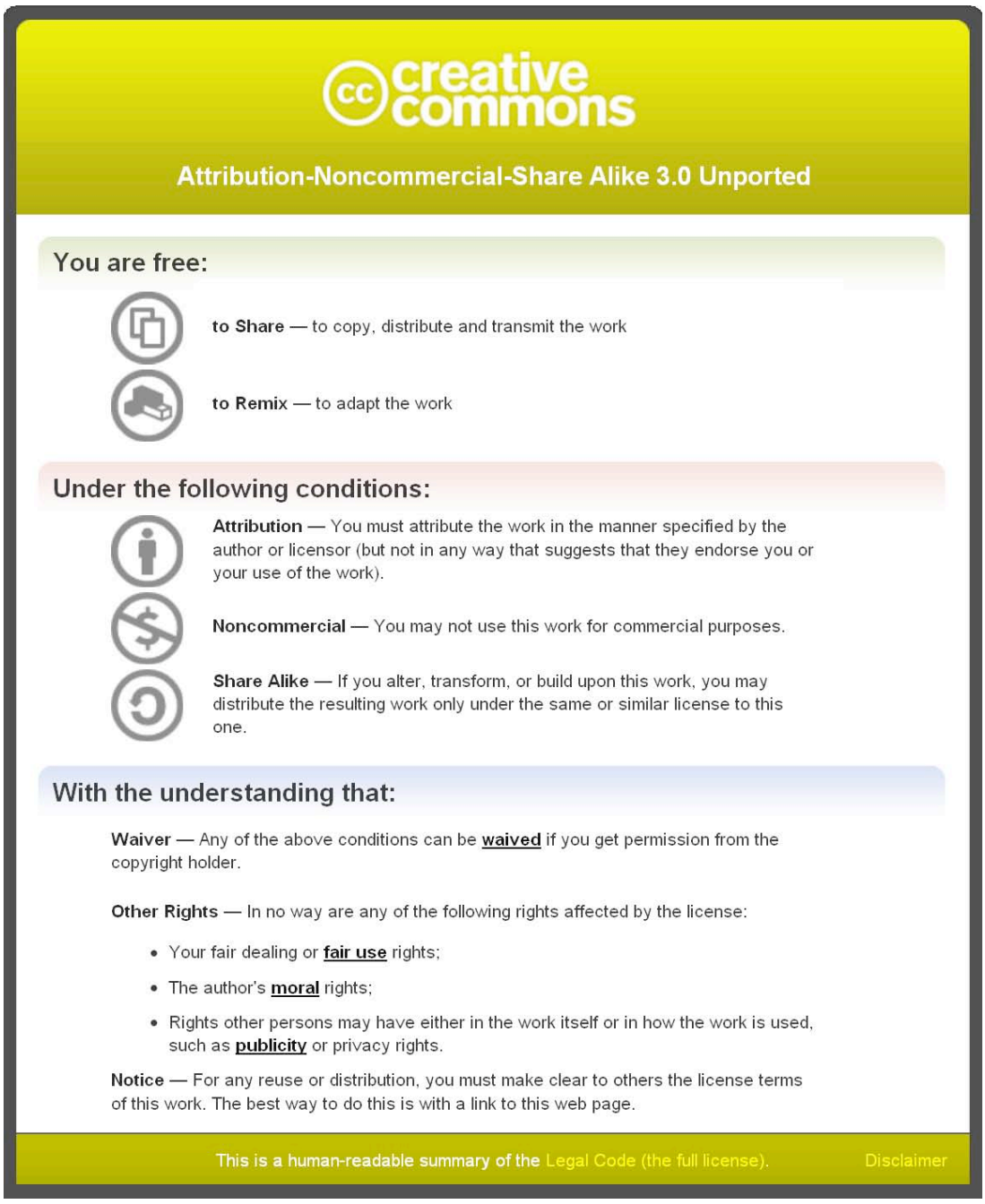

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9.2 Use of third party products

MIDOP is using modified version of the following third party products:

- for geographical layers:
    - GADM database of Global Administrative Areas. Files used for generating European countries administrative boundaries, Italy excluded;
      http://www.gadm.org/
    - ISTAT (2005).Confini amministrativi e dei sistemi locali del lavoro. Files used for generating Italian administrative boundaries.
      http://www.istat.it/ambiente/cartografia/
    - Shuttle Radar Topography Mission (SRTM). Files used for generating the raster DEM covering the whole of Europe and surrounding areas.
      http://www2.jpl.nasa.gov/srtm/
- modified code (file "database.php") for managing MySql database calls, Joomla project Copyright (C) 2005 Open Source Matters. License GNU/GPL
  http://www.joomla.org/
- modified code ("mosHTML" class from the file "joomla.php") for managing HTML form content dynamically, Joomla project, Copyright (C) 2005 Open Source Matters. License GNU/GPL
  http://www.joomla.org/
- Lightboxes HTML object by Chris Campbell, used while publishing a website
  http://particletree.com/features/lightbox-gone-wild/

9.3 Credits

This product has been designed and developed by Mario Locati (locati@mi.ingv.it) and Andrea Cassera with contributions of participants of the module Networking Activity 4 "Distributed Archive of Historical Earthquake Data" of the project NERIES. The present manual is by Mario Locati.

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