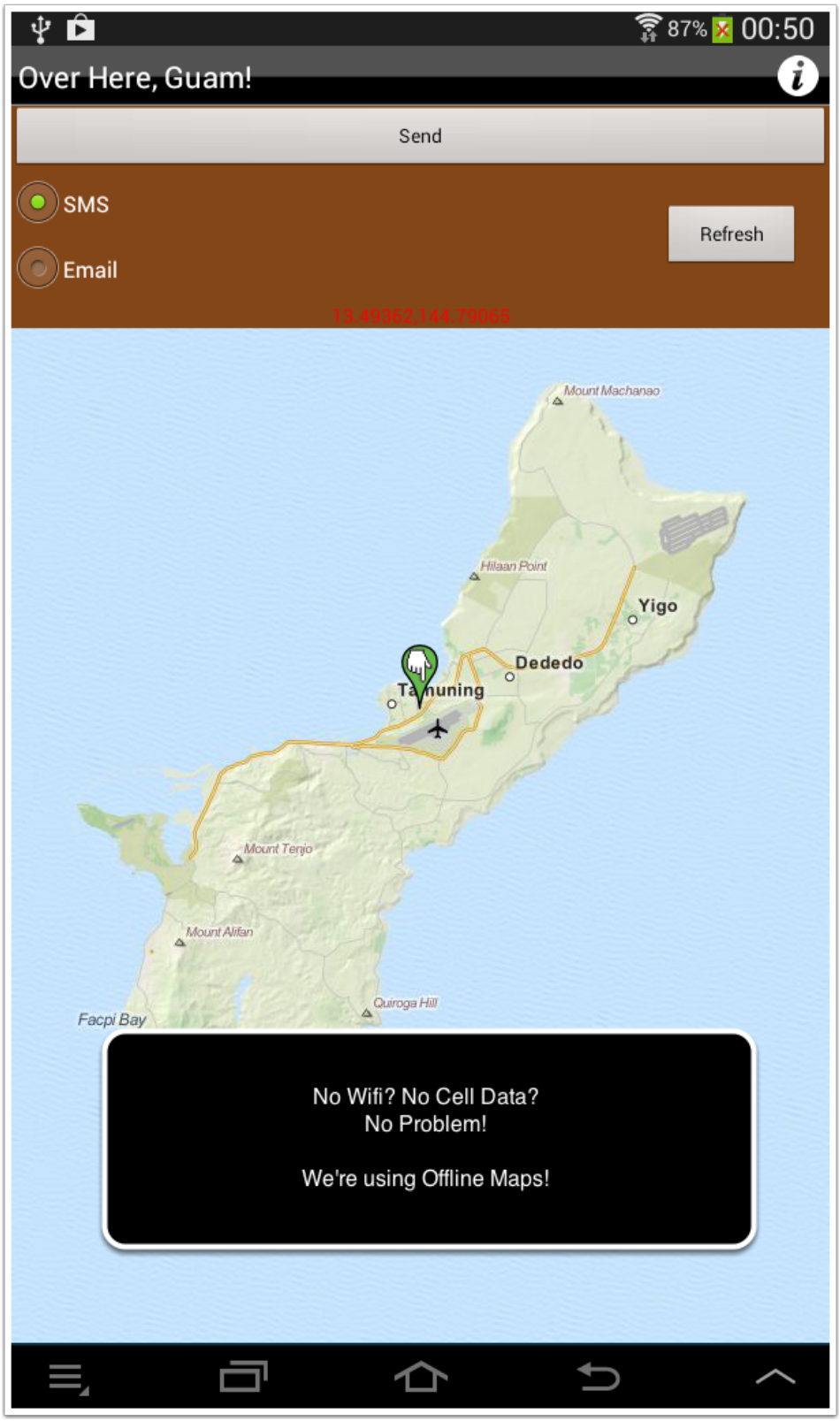
Creating a Map Database for Offline Maps using 'MOBAC'.



Release History

// Release History:
//
// v1.0
// April 11th 2014
//
// SmugWimp Software

This manual is in it's first edition

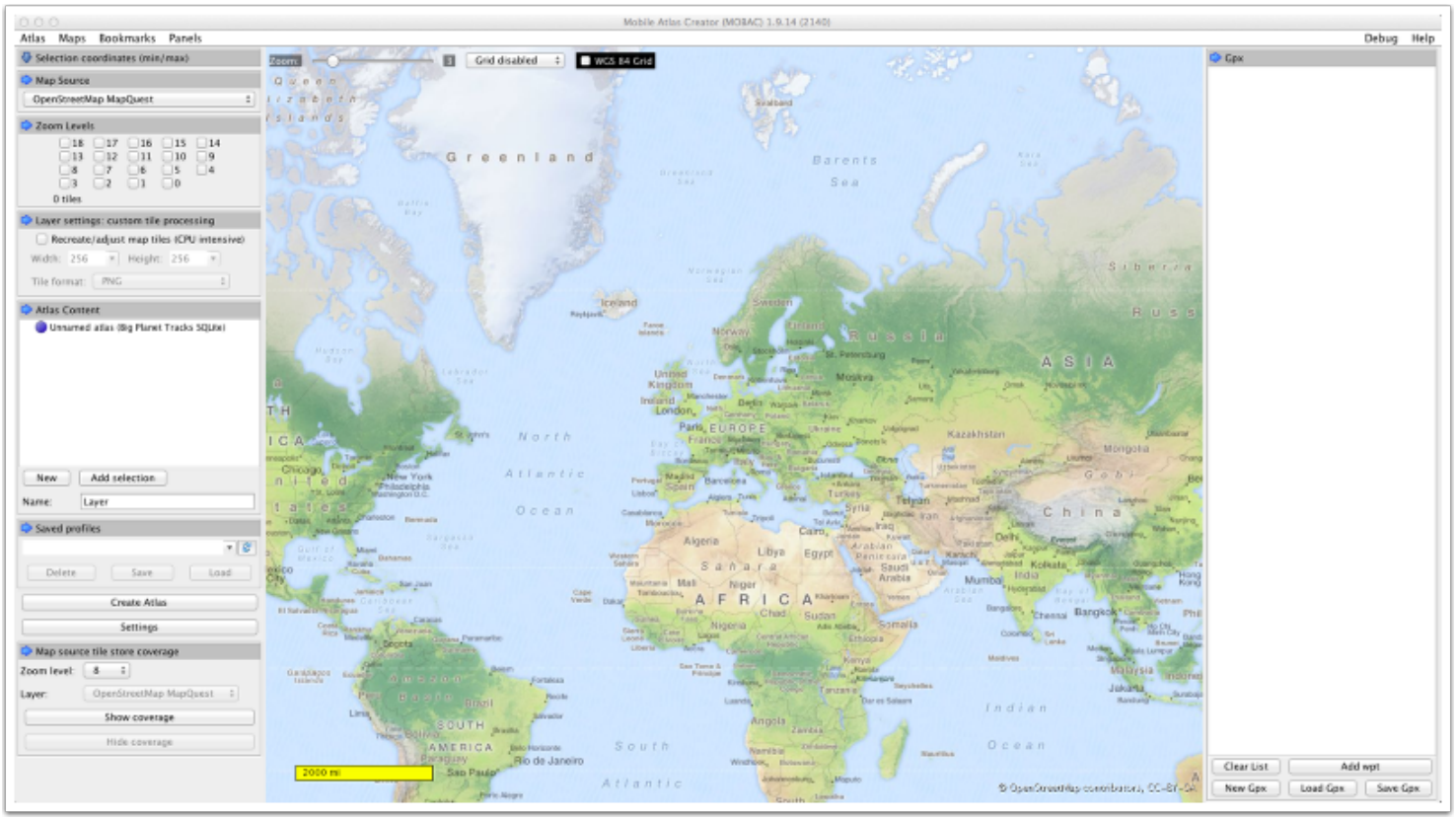
This documentation was written expressly to assist those who have purchased "Smug's Offline Map Kit" from the BT Marketplace. It's a nifty map plugin, very similar to the BT_screen_map plugin, except it allows for offline maps. Offline maps mean your users do not need a network connection to display their location on a high quality, detailed map. You determine how detailed you would like it to be. You could also keep the maximum level lower than the actual capability, and then perhaps allow greater detail as an inApp purchase. There are many ways to expand on the Smug Offline Map Kit. After all, it's a kit.

This documentation explains how to obtain SQLite mapsets with your custom region contained within. This is critical to your success using Smug's offline map kit.

The information in this document was wholly written by Smug Wimp, as a collection of steps to be performed to complete the task of creating custom offline map databases.

Please read this document thoroughly. There are many steps, and missing one could cause spurious errors in your project outcome.

So simple like the Jitterbug, it plumb evaded me...



This is the typical 'first view' when you open MOBAC (MOBile Atlas Creator)

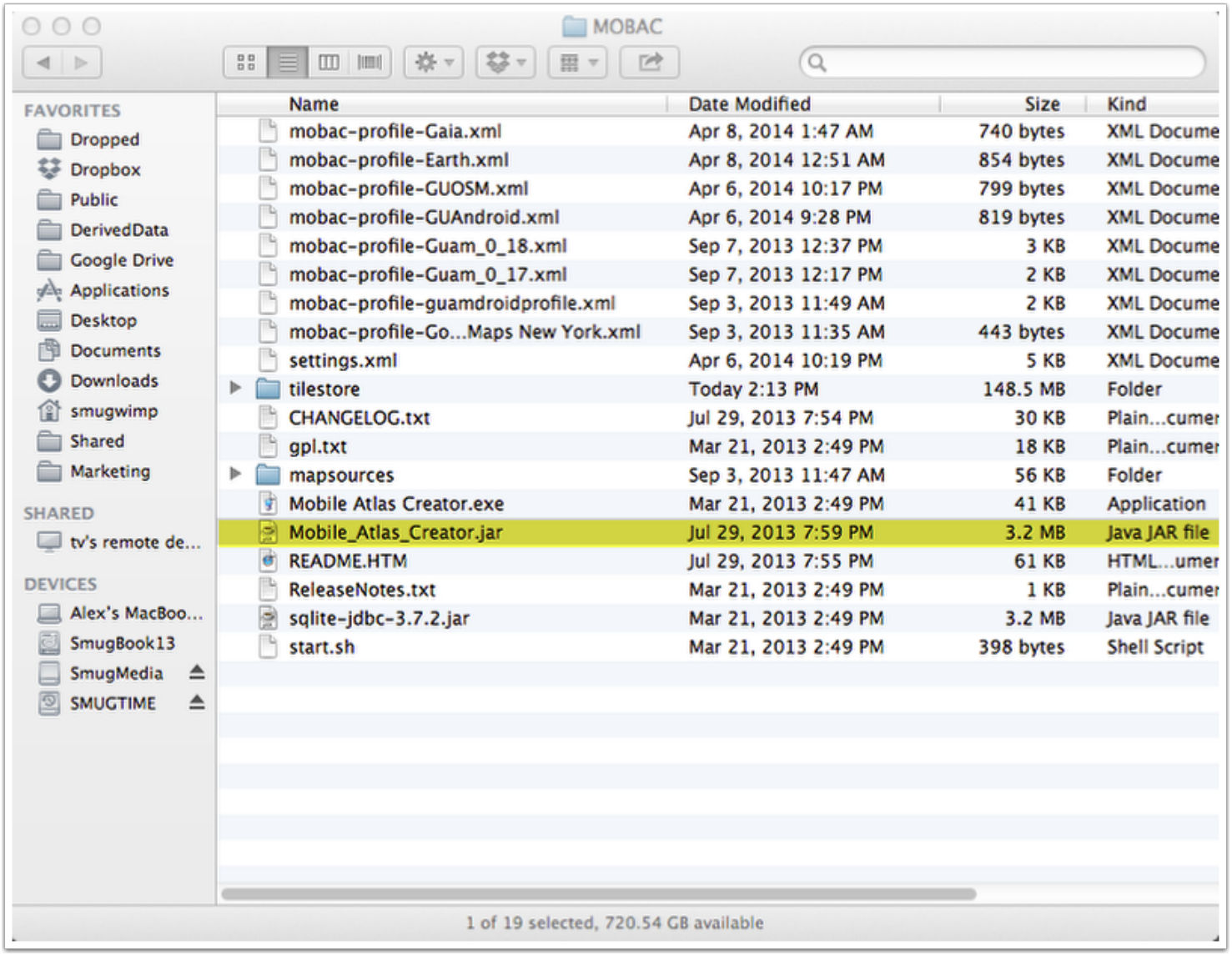
This document will try to show you how to create your own SQLite database of map blobs for use within your apps, giving you offline map capability. Just do each step and you should have no problems. If you do have problems, or wish to share some insight, please let us know on the buzztouch forums.

Obtaining Mobac

MOBAC is open source and free. You can download it from http://mobac.sourceforge.net

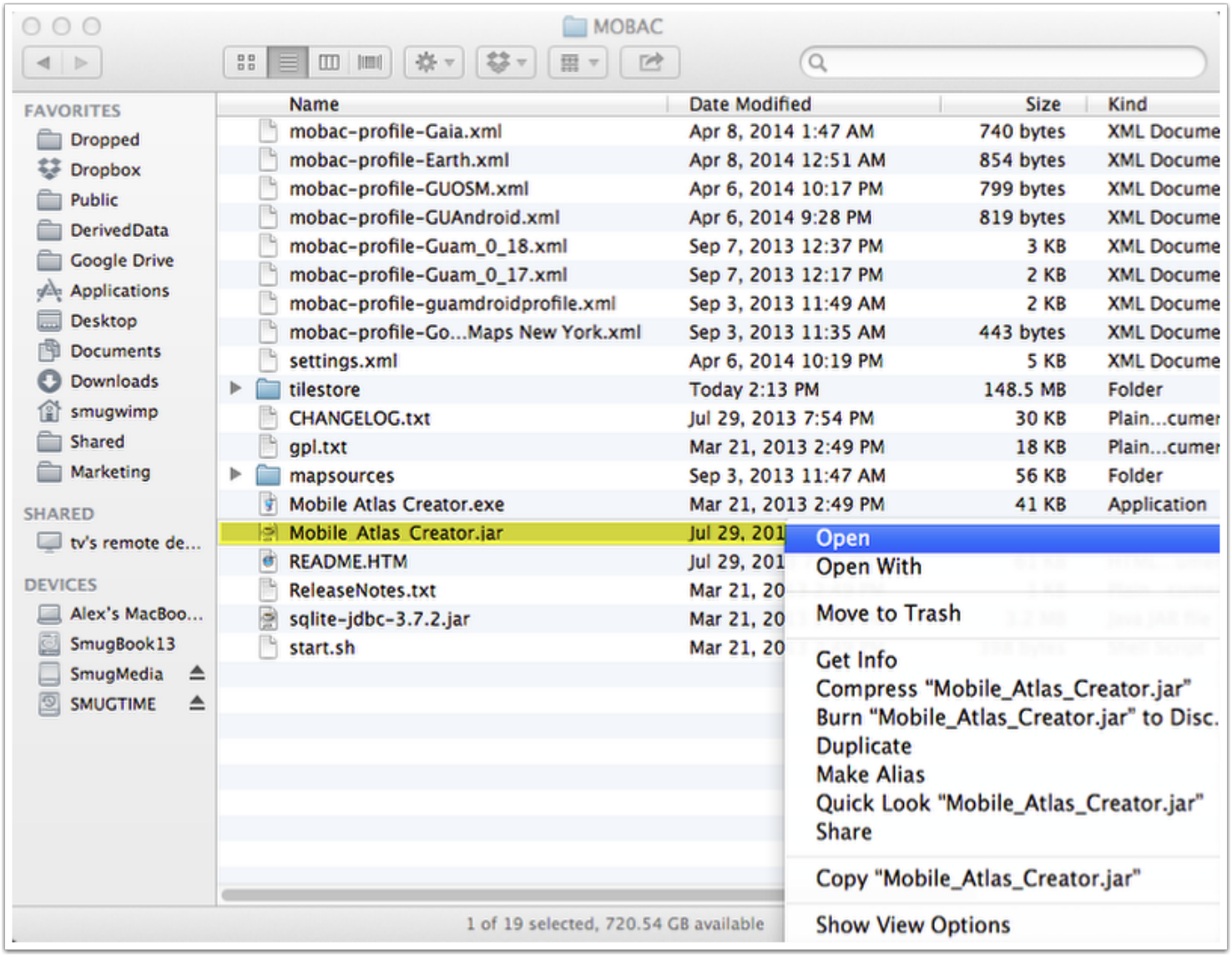
Hey, while you're there, pickup the Mobac Quickstart Guide (http://mobac.sourceforge.net/quickstart/) as well... It'll give you something to read while your map tiles are downloading ;)

Starting Mobac



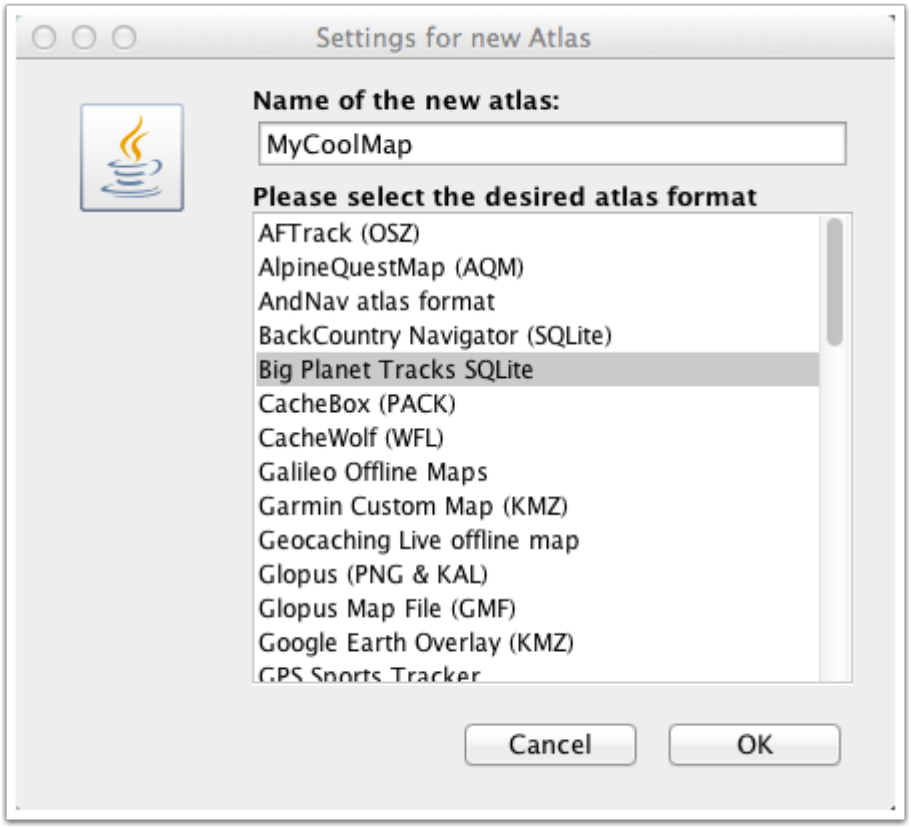
When you unzip unpack extract or whatever you do to unarchive a file, you should have a directory similar to this.

Mobac on a Mac



"Launching" MOBAC may vary from OS to OS. I'm working on a Macintosh, so I launch MOBAC by opening the 'Mobile Atlas Creator.jar' file. Perform whatever you do to launch a Java application in your environment. I guess windows users use the 'exe' file. give it a shot! :)

On Launch...



When you launch MOBAC, the first dialog that pops up is this one. You need to name your database project, and you need to specify 'what' kind of map output style you need.

IMPORTANT!

For Android:

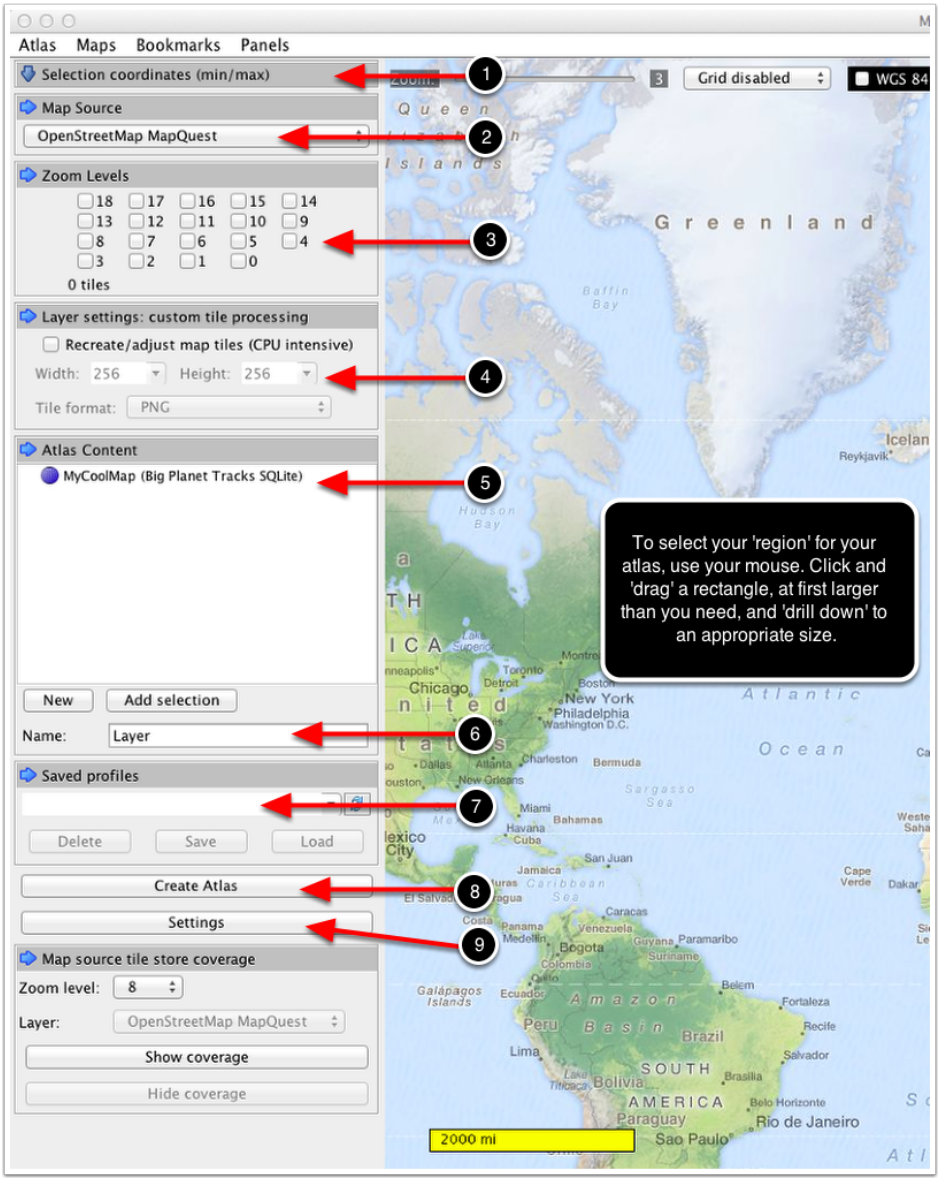
You want to select '**Big Planet Tracks SQLite**' ***ONLY***. No others have been tested, and I cannot verify that they will work.

For iOS:

You want to select '**MBTiles SQLite**' ***ONLY***. Everything else has been tested, and this is the only one I could get to work.

Save your settings (explained below) so that you can use the 'same' map for each platform.

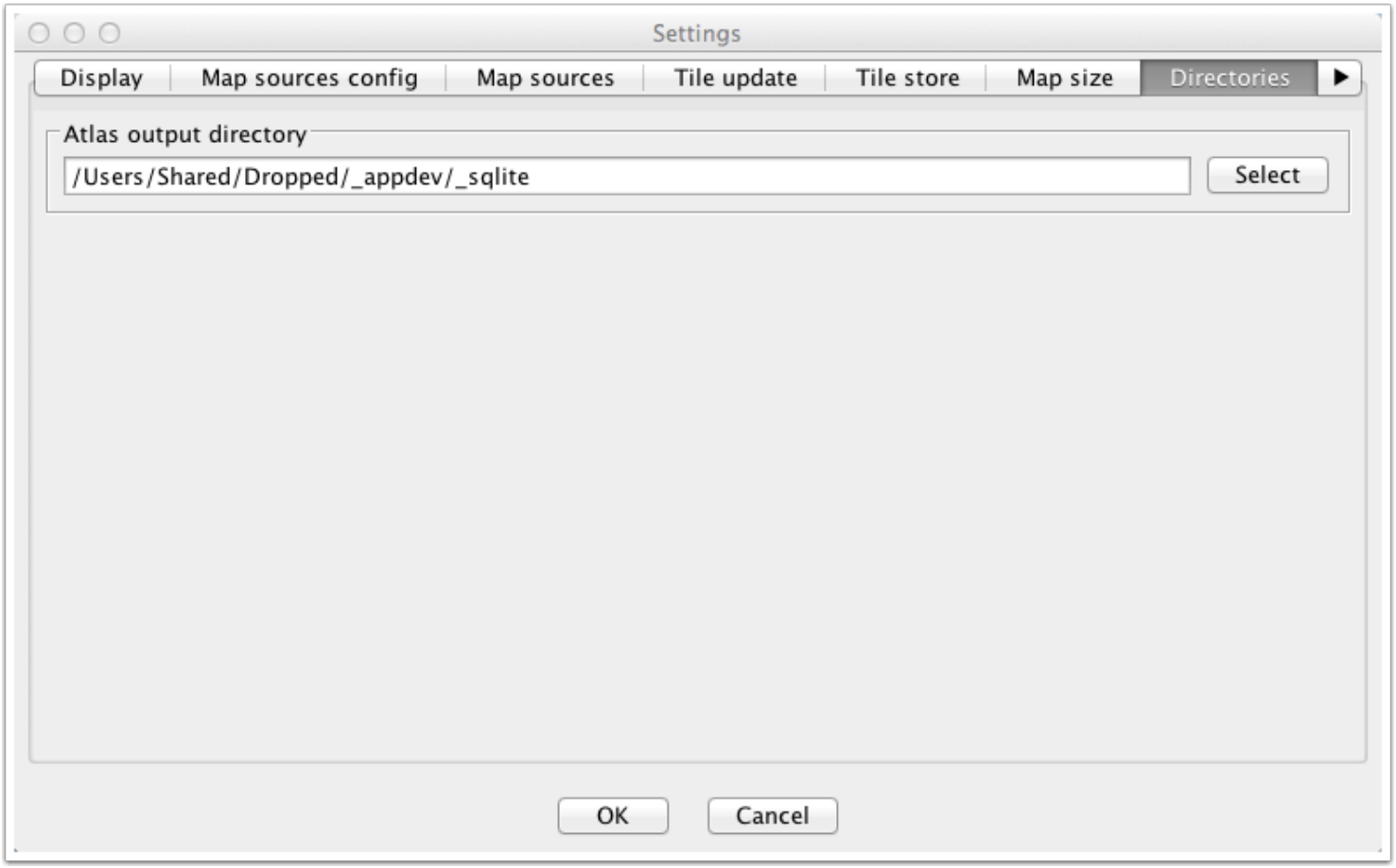
A few things about the User Interface...



01) This is where you determine the 'area' of your map. It will display coordinates. We'll discuss that in a minute.
02) This is your map source. By default, it shows 'Open Street Map - Mapquest', but take a look around! There are many, many different kinds of maps available!
03) Zoom Levels - The lower the number, the less detail. The higher the number, the greater the detail. And the greater filesize too. An interesting balance.
04) Tile Size. Leave this alone. There is no need to change this; all the systems you will work with, use 256 x 256 size png tiles.
05) Your database. At the moment, it is empty. We will put 'layers' of information there later. Those layers will be a zoom level of the map. More zoom, more layers.

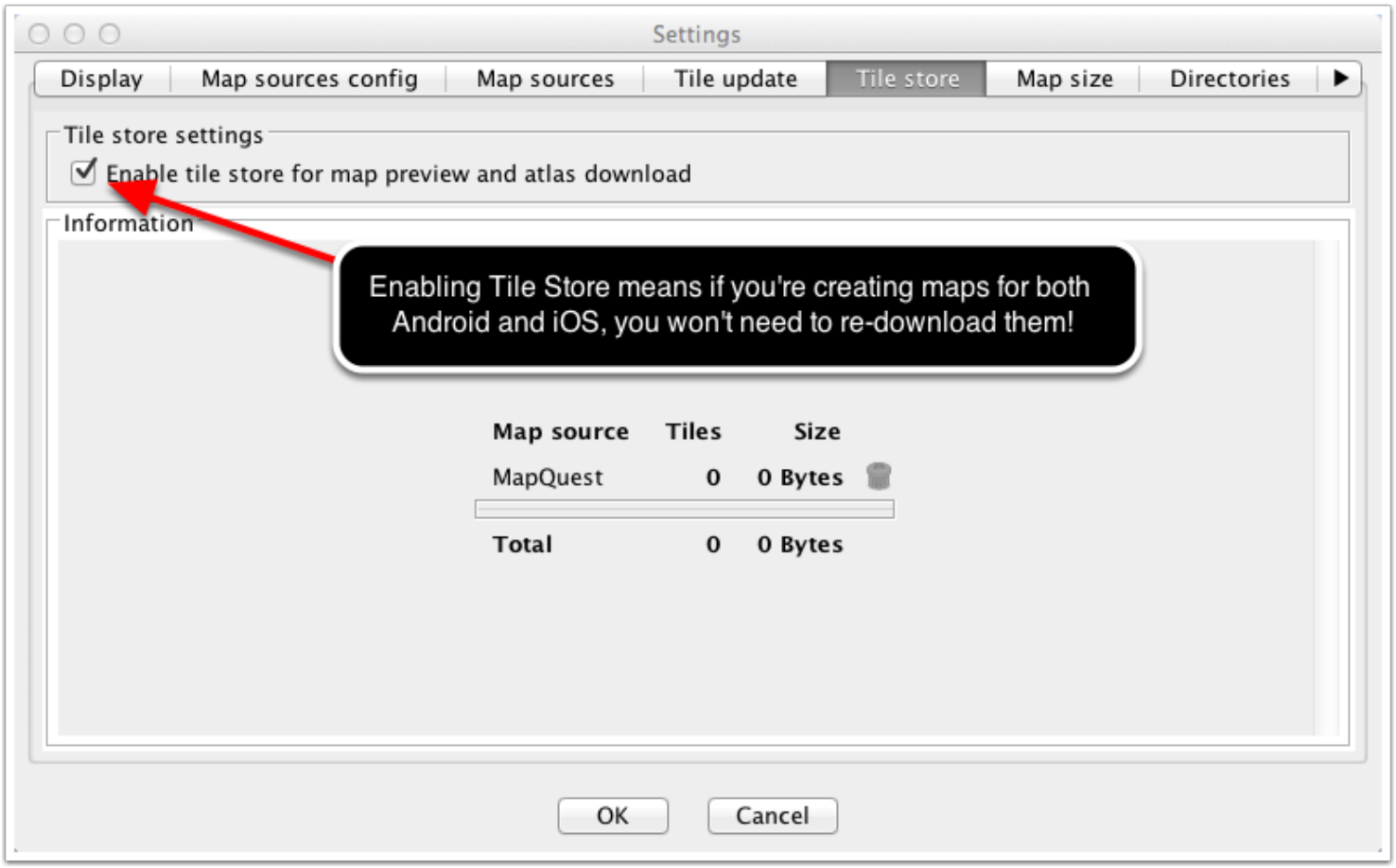
06) Your layer name. Kind of like a subcategory. In this manner, you can have several areas in one database, should you desire.
07) If you create a map you like, and you think you may need an exact copy again, you might wish to save the profile so that you can retrieve it later.
08) This is the 'go' button. When you've got everything the way you want it, this initiates the creation of your database information.
09) Settings. This is where you go to for system level preferences, like where you save your map files.

Output Directory Settings

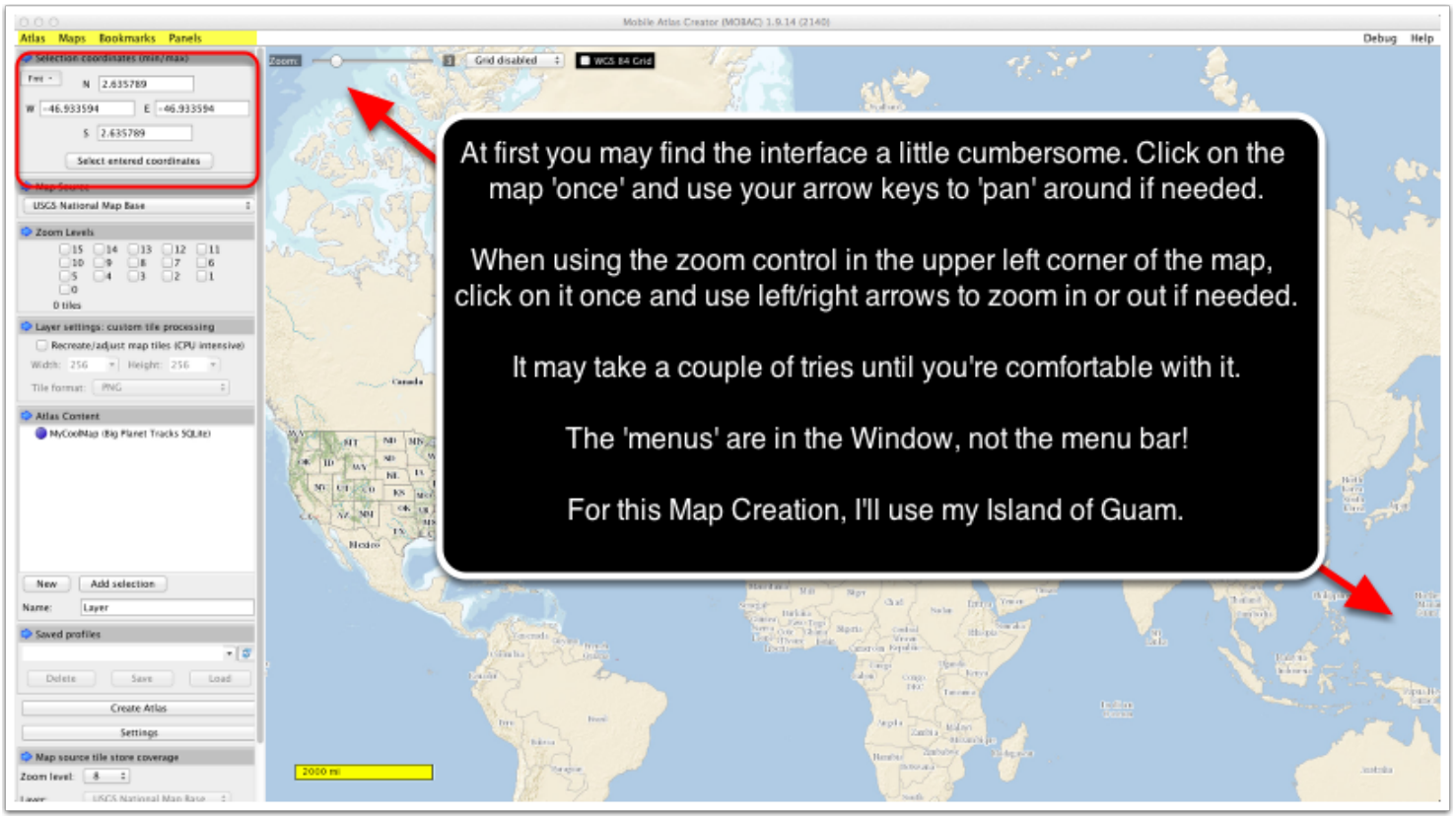


Pressing the 'settings' button (see last page) will bring up global settings. always nice to be familiar with it all, but for the moment, all you need worry about is the 'directories'. This is where your map output will be, and you'll want to know that. Local Tile storage is also a good thing to have enabled. If you're creating atlases for both iOS and Android, it will keep you from downloading the tilesets over again (provided the parameters do not change).

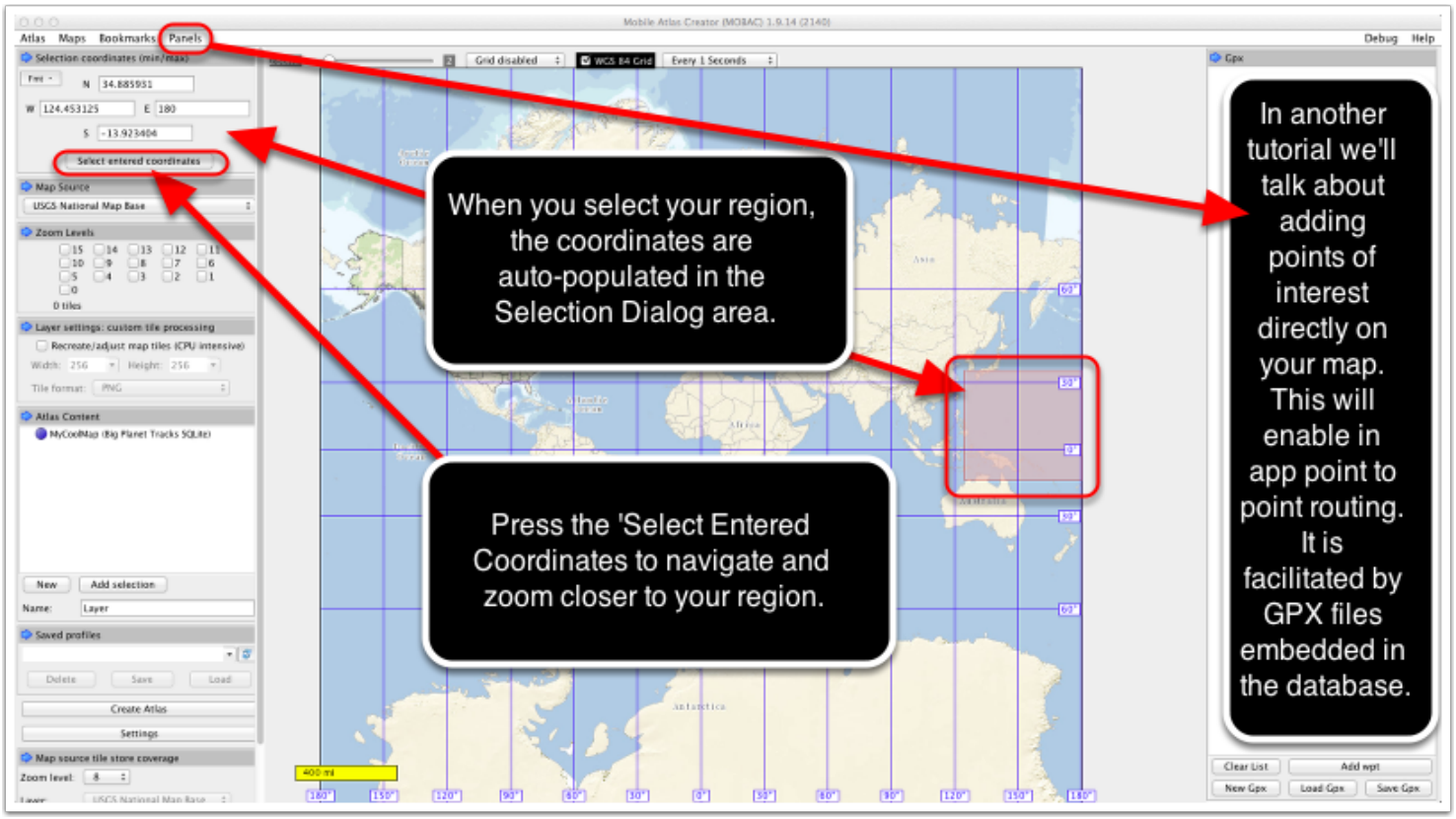
Tile Store Settings



Creating your map 'region' or 'area'



Mobile Atlas Creator (MOBAC) 1.9.14 (2140)



A word about coordinates...

Decimal degree precision versus length

decimal places	degrees	N/S or E/W at equator	E/W at 23N/S	E/W at 45N/S	E/W at 67N/S
0	1.0	111.32 km	102.47 km	78.71 km	43.496 km
1	0.1	11.132 km	10.247 km	7.871 km	4.3496 km
2	0.01	1.1132 km	1.0247 km	.7871 km	.43496 km
3	0.001	111.32 m	102.47 m	78.71 m	43.496 m
4	0.0001	11.132 m	10.247 m	7.871 m	4.3496 m
5	0.00001	1.1132 m	1.0247 m	.7871 m	.43496 m
6	0.000001	111.32 mm	102.47 mm	78.71 mm	43.496 mm
7	0.0000001	11.132 mm	10.247 mm	7.871 mm	4.3496 mm
8	0.00000001	1.1132 mm	1.0247 mm	.7871 mm	.43496 mm

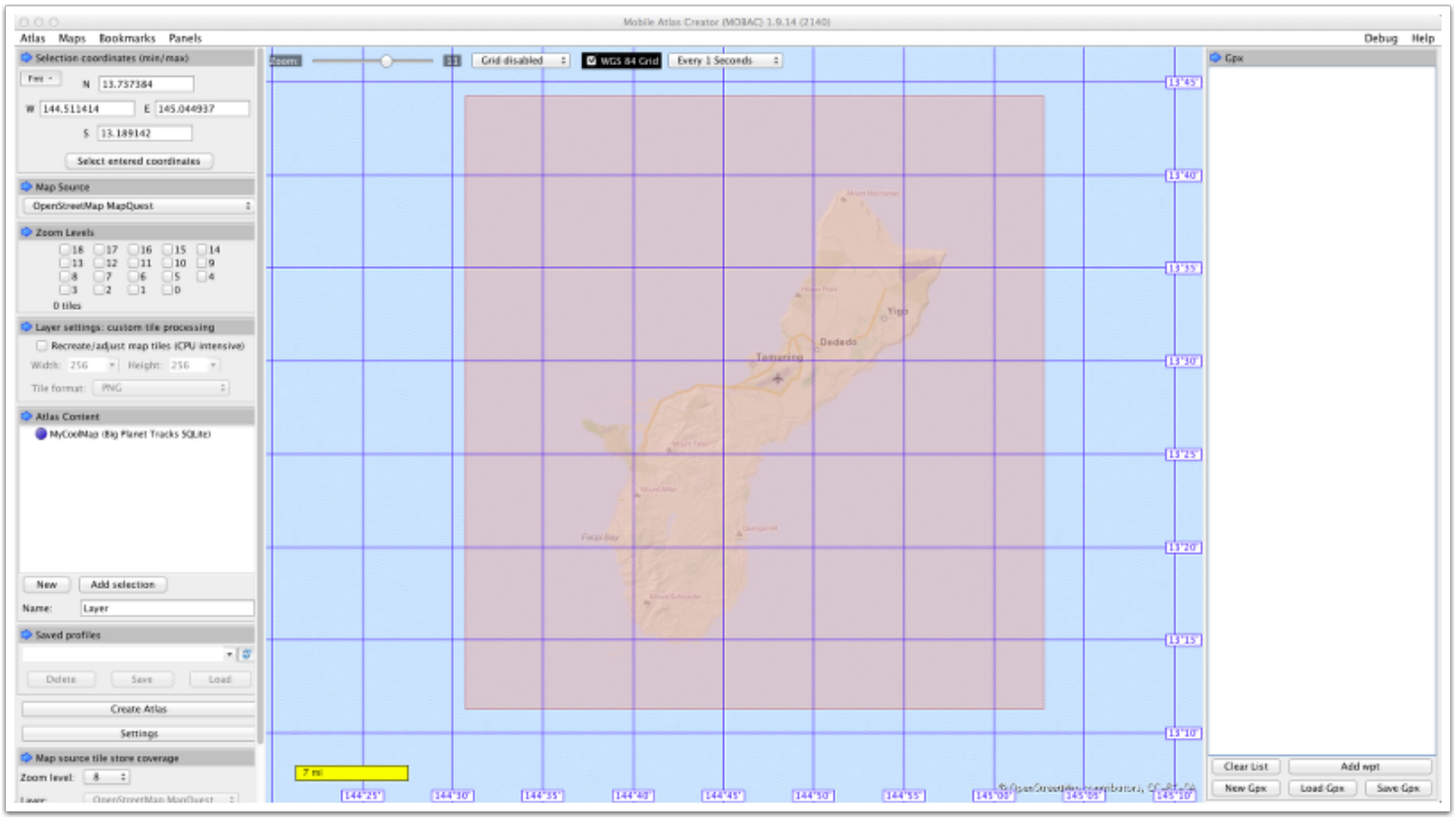
Typically we use decimal coordinates in our programming. Much easier. But remember every digit counts. You will typically want to have your points of interest, or other 'recorded coordinates' with at least 5 figures (usually 6) after the decimal. One number goes a long way. Here's how it breaks down (sort of) in American Statute miles:

0.000001 = 4 inches
0.000010 = 43 inches
0.000100 = 36 feet
0.001000 = 121 Yards
0.010000 = .7 miles
0.100000 = 7 miles
1.000000 = 69 miles

These are darn close estimates, although not 'exact'. Actual distance will vary depending on your coordinates, due to earth curvature and other scientific stuff.

But it lets you know that the difference between 13.8 and 13.82321 could be as much as a half a mile or more. That counts if you're looking for some place.

Selecting your area



When you select your region, remember to select a 'larger than needed' area. This is so when users are zoomed 'out' all the way, there is still 'map' in the view. Sometimes, if you crop it too closely, your map will not completely fill the mapView region, and it looks ugly.

Selecting an area auto-populates the coordinates in the selection dialog area. So when you're finished with your region selection, leave those values alone.

Selecting Map Layers....

A map 'layer' is a set of generated 256 x 256 bitmap images that cover the selected coordinates at a specified zoom level. An image 'square' from a smaller 'zoom level' will show a larger area. So it would stand to reason that, a smaller number 'zoom' would contain less tile images than a higher number zoom. Subsequently, the file size of a smaller numbered layer is a smaller size, due to the smaller number of images comprising the area.

A higher zoom level will contain more images, with more detail. This will increase the file size of your overall database. An exact size is hard to determine due to the differences in desired regions, and the zoom levels needed for those regions. With experience, you can create very efficient databases using only the needed zoom levels. But for the moment, we're going to do a garden variety database, with levels 10-13. Later (or even now) you can add as many layers as you wish.

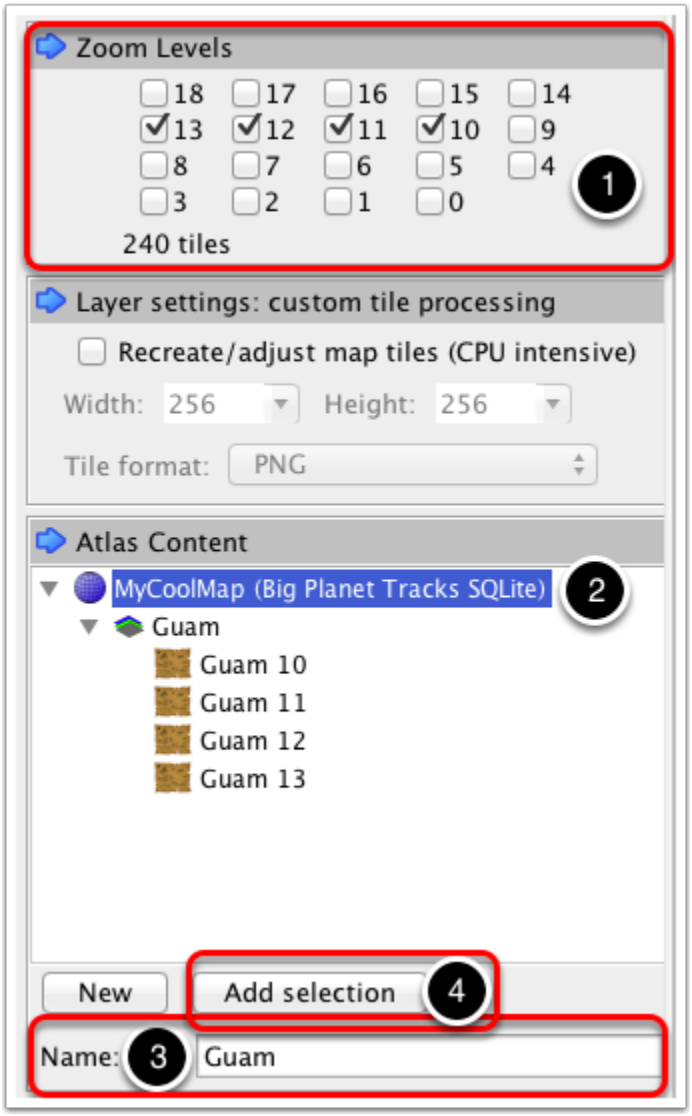
A lower number will have 20-40 tiles for a 50sq mi area. A higher number could have thousands. Depending on the zoom level, a single tile can cover as many as 8000 square miles, or 300 square feet. If you select a zoom level checkbox, it will show the number of map tiles needed to display your selected area at the zoom level checked. For Guam, Zoom Level 0 requires 1 tile square. Zoom Level 18 requires 152,084 tile squares. The current selection is a TOTAL of 240 tiles for all selected zoom levels.

Level 0 - 8000 miles
Level 1 - 4000 miles
Level 2 - 2000 miles
Level 3 - 1000 miles
Level 4 - 800 miles
Level 5 - 500 miles
Level 6 - 200 miles
Level 7 - 100 miles
Level 8 - 60 miles
Level 9 - 30 miles
Level 10 - 10 miles
Level 11 - 7 miles
Level 12 - 3 miles
Level 13 - 2 miles

Level 14 - 5000 feet
Level 15 - 2000 feet
Level 16 - 1000 feet
Level 17 - 600 feet
Level 18 - 300 feet

Although you can set your map 'in your app' to achieve levels greater than 18, the detail will not get any better. it's just closer. My database of Guam, using Level 10 to Level 15 takes about 4 megabytes. This will be added to the total size of your app. Remember most markets have a 50MB limit.

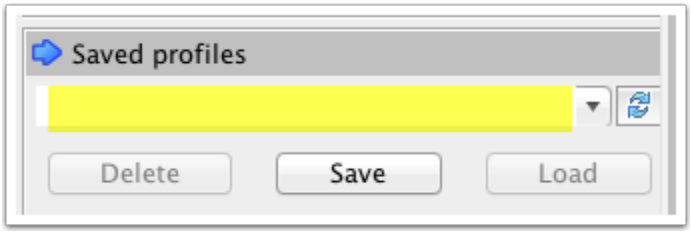
Adding Layers to your Database



Once you'd decided on your levels, time to 'add' them to the database.

1) Select your desired levels
2) Select your database
3) Give this a 'friendly' name so you'll know what part it is (this is because you may want to add many different areas, or different 'types'... all kinds of cool stuff!)
4) Press the 'Add Selection' to add it to the database.

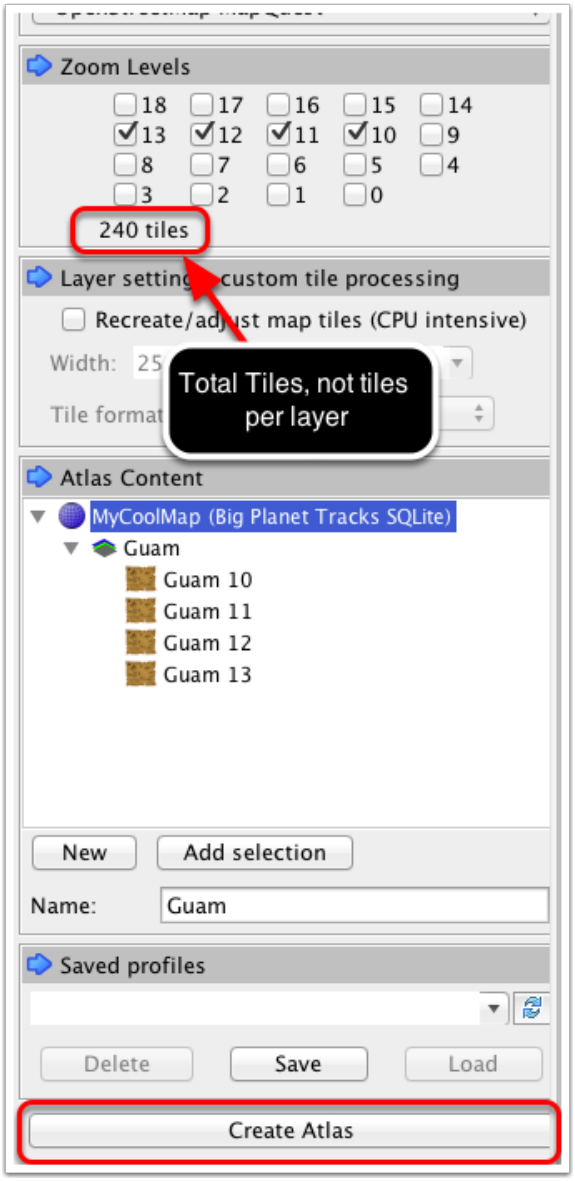
Saving your profile



You may, for many reasons, desire to keep this setup should you ever need to create another database, or what have you. If so, enter a 'friendly' name for the configuration, and press 'save'.

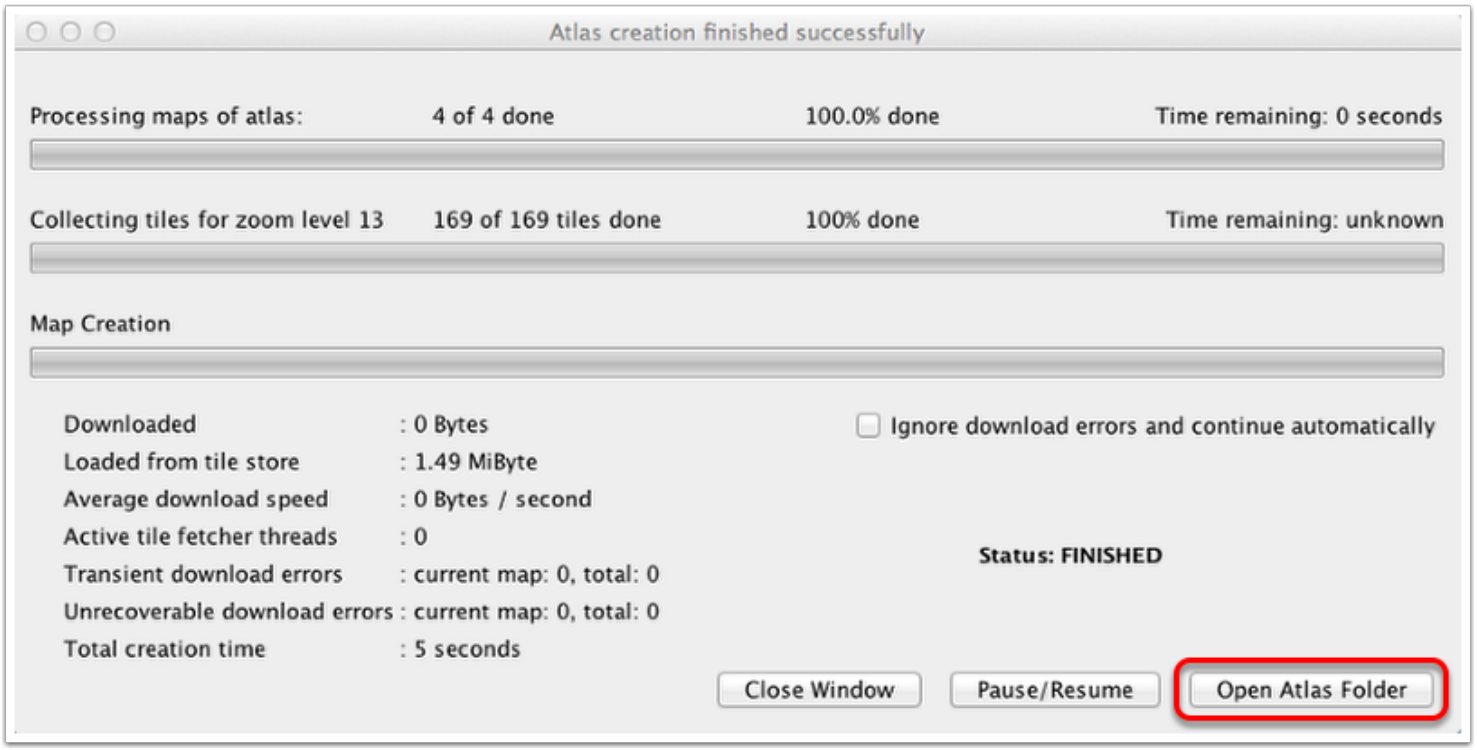
If you 'load' a configuration, you 'may' need to change the type of output depending on Android or iOS. Under the "Atlas" menu (window menu, not menubar menu) choose "Convert Atlas Format" and it will allow you to change the output type of the database. Remember: Big Planet Tracks, or MBTiles.

Creating the Database...



One button says it all. If you're finished with your configuration, press this button to initiate the creation process.

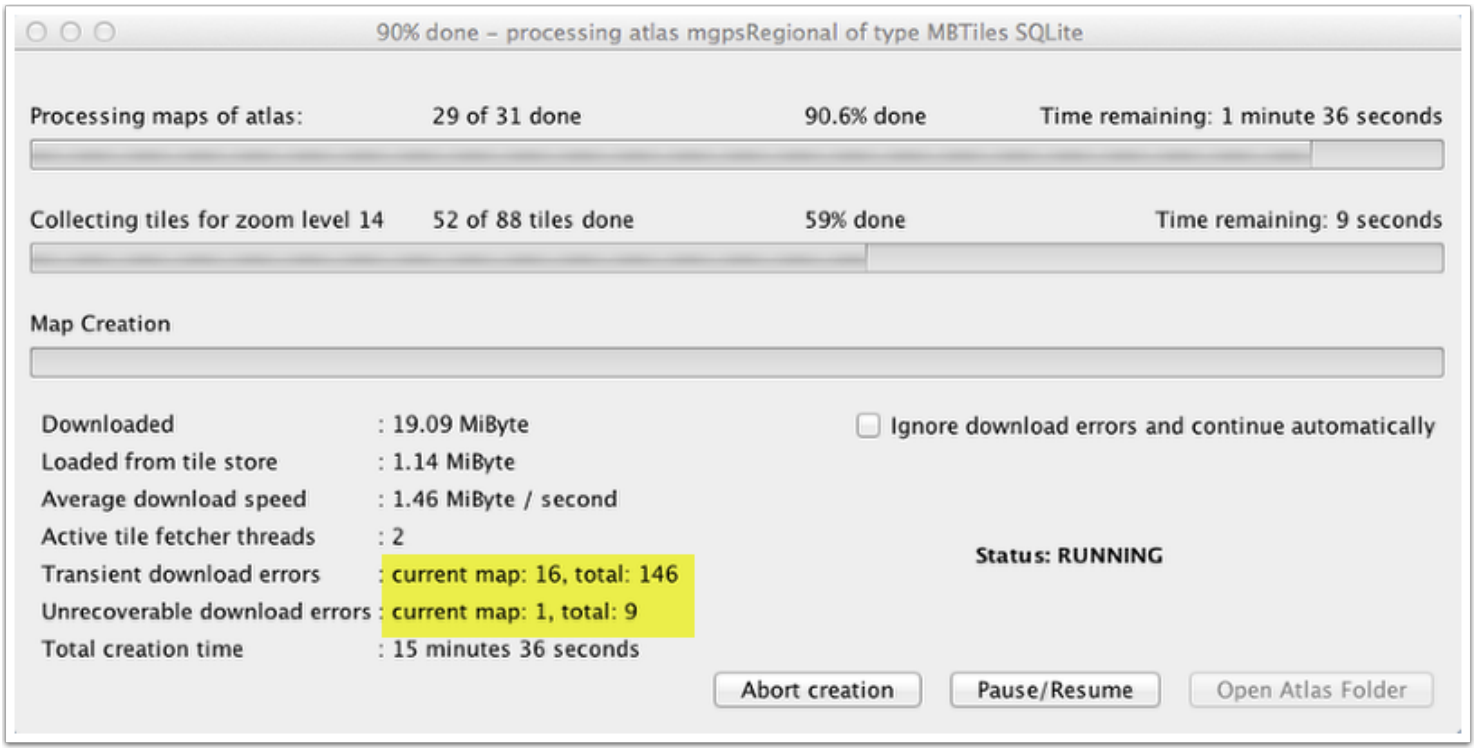
Atlas creation finished successfully



After you've pressed your 'create Atlas' button, you will see a dialog box that will monitor the download process. Be sure to have adaquate storage space in your destination volume... sometimes the raw files can get rather large.

When you're finished, you can either manually navigate to the directory you designated in the 'properties/directories' dialog, or you can press the convenient 'Open Atlas Folder' button...

In case of errors...

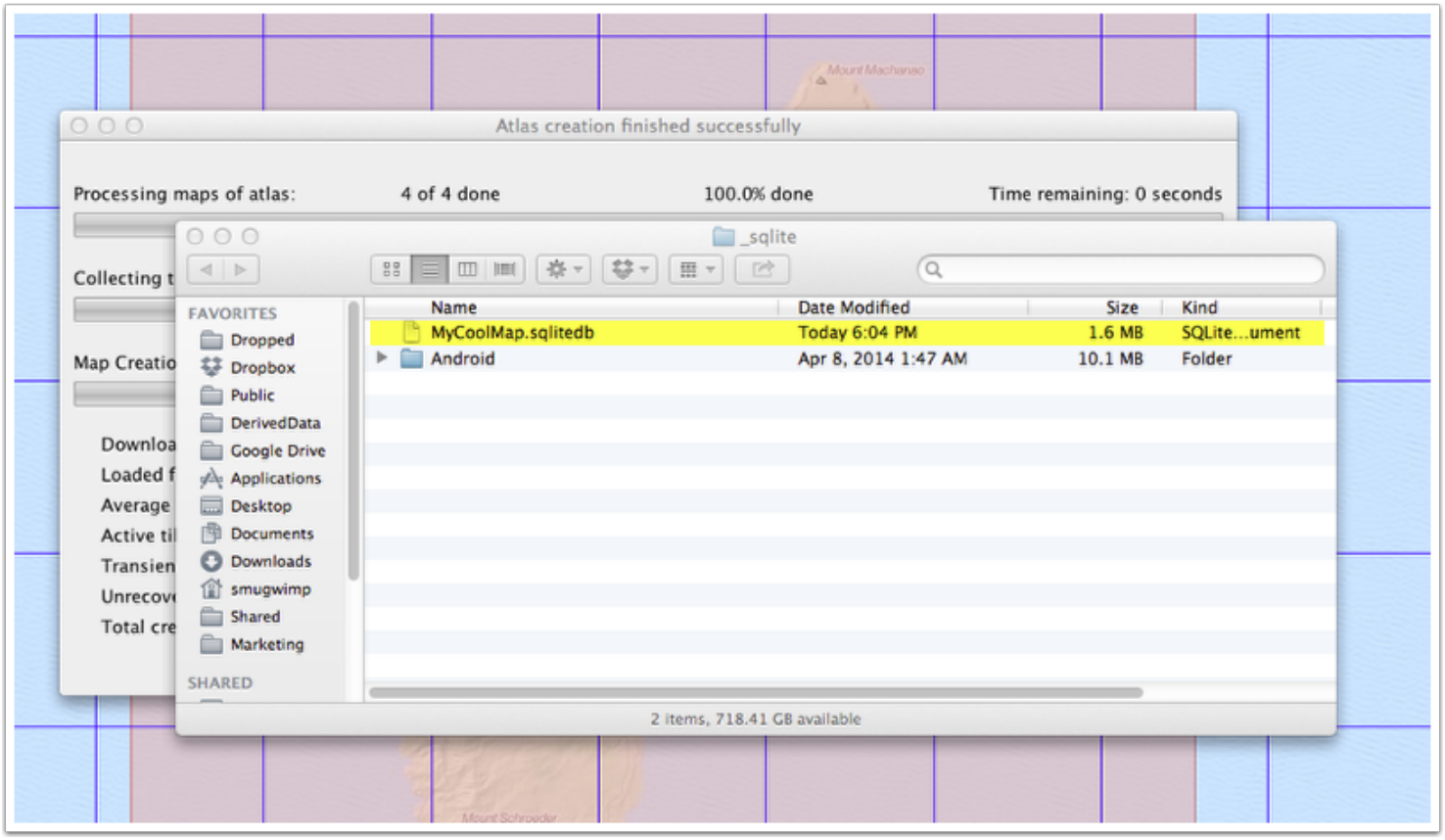


Errors. Arrrgh! What do you do about these things?

Sometimes the complete map won't download. Sometimes, for some reason, a tile will just 'not' come down. And eventually Mobac will give up trying.

No worries! You *did* set 'Tile Store' in your settings, right? If you did, all you need to do is 'create' the atlas again. Mobac will check and include all the cached tiles, as well as re-download any that aren't available, such as all the tiles that had errors. This makes it very simple to get a complete database fairly painlessly.

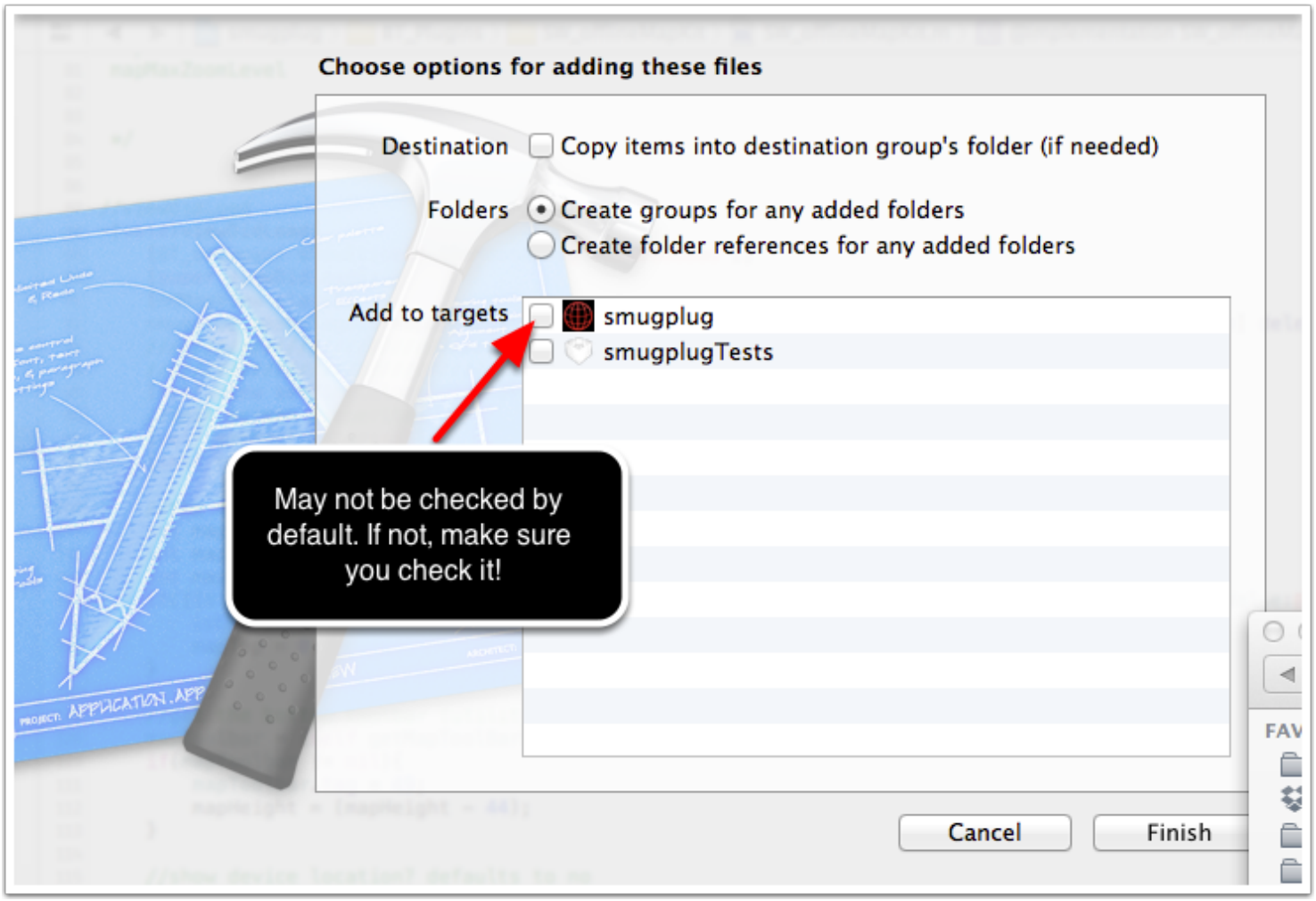
Viewing your product



Woot! We've finished creating our database. By default this one uses an 'sqlitedb' suffix. The MBTiles db will use an 'mbtiles' suffix. You can use whatever filename you desirebut leave the suffix names alone.

So... Are you happy? I thought you might be! Go on and enjoy making your own maps for offline use! iOS! Android! Conquer the world!

Be sure when adding resources to your project, that you select the 'add to target' checkbox of your project!!



The last couple of times I added my database to my project, the 'checkbox' by my projectname must not have been checked. Even though I added the database, and everything 'looked' good, it didn't work. Drove me nuts. I created a new database, and upon adding it, I noticed the checkmark not checked.

I removed and readded my databases, ensuring the checkmark for the project was checked, and everything went MUCH better. Don't get caught like I did.