# #105 Add Elevation Fields (ground z, top of tree, tree height) to database output.

Solution:

1. Add a terrain raster field to the UI. If the raster is not provided, the relevant fields will be left empty.
2. Both treetops and crowns databases will have the same fields (plus any that are specific to the format):

Treetops:

TREE\_ID | GROUND\_Z | TOP\_Z | TREE\_HT | GEOMETRY

Crowns:

TREE\_ID | GROUND\_Z | TOP\_Z | TREE\_HT | GEOMETRY

1. The TREE\_ID, GROUND\_Z and TOP\_Z columns are identical in each, but the TREE\_HT column is different:
   1. In the tops database it contains the maximum pixel value from within the delineated crown
   2. In the crowns database it is calculated as: GROUND\_Z + (0.5 \* TREE\_HT)
2. Geometries in both tables are converted to 3D geometries.

Unresolved:

1. The smoothed values will be removed from the output entirely, with only the heights extracted from the original raster remaining. Since the crowns phase is required for generating top heights from the original raster, if the tops phase is run alone, these columns will be empty. Our choices for handling this are:
   1. Leave the intermediate smoothed columns in.
   2. Leave them in unless the crowns phase is run, and then delete them.
   3. Join the tops and crowns phases and require both to run every time.
   4. Add a checkbox with a message to the effect of “Keep Smoothed Heights” and default to off. (This is my preferred option as other users have found this data useful.)
   5. Something else?

The extra column would contribute to the size of the database, obviously.

**Time Estimate: need more information.**

# #104 Add ability to save and use a settings file.

Solution:

1. The application already uses the built-in Qt-supplied settings features. The ability to load/serialize from a file will be added. Suggest the use of user-editable text in “[property]:[value]” format, unless something else is required.
2. A text field and file selection button will be added.
3. Rather than using explicit load and save buttons, and auto-save on close, file will be saved whenever a property is changed. This avoids the problem of a user forgetting to save, or of a failure to save if the program crashes.

**Time Estimate: 3h. (Completed. Esitmate was 2h)**

# #103 Auto fill all source dest fields when first raster selected for smoothing. Use same input folder and last database type and extension – default Sqlite database with .sqlite extension.

Solution:

1. Choose a default format for both database and raster formats. Say, SHP and Gtiff.
2. Remember the last-used file formats and display these in the drop-downs, unless a settings file is loaded.
3. Determine the default extensions for each file format. According to issues #97 and #98, these formats are now limited to:
   1. Shapefile → .shp
   2. SQLite → .sqlite
   3. Gtiff → .tif
   4. HFA/IMG → .img
4. When a file is selected, remove the extension and auto-generate file names by appending a standard set of post-fixes and extensions, according to the selected drivers. For example,
   1. Smoothed output raster: [file]\_smoothed[.extension]
   2. Tops database: [file]\_tops[.extension]
   3. Crowns raster: [file]\_crowns[.extension]
   4. Crowns database: [file]\_crowns[.extension]

Optional:

1. If the user changes the selected driver, the extension will be changed automatically *unless* the user has edited the filename to something other than the auto-generated name.

**Time Estimate: 8.5h without option. (Completed. Estimate was 2h without the optional)**

# ~~#102 Report file with parameters and input/output params~~

~~Unresolved:~~

1. ~~How to select the file, we could:~~
   1. ~~Provide a text field to let the user determine where to put it and what to call it.~~
   2. ~~Auto-generate a suggested filename per issue #103, such as: [file]\_settings.txt~~
   3. ~~Auto-generate a report and output it with a standard name in the folder that contains one of the output files.~~
2. ~~File format? Text is easiest, obviously. PDF is also an option, but would add dependencies.~~

**~~Time Estimate: need more information.~~ #104 Resolves this.**

# #100 Sync database text field and type field

Solution:

1. Prevent format selector from clearing when a file is selected.
2. Restrict the last-file-selected functionality to the specific button, rather than globally. For example, the tops file button should open to the last selected tops file directory while the crowns raster button opens to the last crowns raster directory.

Suggestion:

1. If a file is selected whose extension matches the format that is *not* selected, switch to that format.
2. New: prevent the file field from clearing if the user cancels the dialog.

Unresolved:

1. Not sure if #2 above is desired.
2. If the user selects a file format, should the selection dialog filter to those kinds of files, or should the user be able to select *any* type of file. I suspect more freedom in this regard is better because there isn’t a strong convention w/r/t file extensions in GIS. This is also a reason not to do #1.

**Time Estimate: 2h without suggestion. 3h with. This is partially resolved by other issues but needs testing and may implement suggestion.**

# #99 Add check for shp too large and exit gracefully (now just crashes with no explanation).

Solution:

1. Default to SQLite format, then re-save as SHP if that format is selected.
2. On failure, the SQLite file still exists and can still be used.
3. Develop meaningful error messages instructing the user as to what has happened and what to do about it, specifically, how to continue processing with the alternative file type.

Suggestion:

1. If the treetops phase fails due to file size constraint, the program can automatically change the remaining fields to SQLite. Requires more development time but can be convenient. Also, if the tops file is too large, then the crowns file would be too large by definition so they all have to be changed anyway.

**Time Estimate: 10.5h without suggestion, 12.5h with. (Completed without suggestion.)**

# #98 Remove all database options except SHP and SQlite.

Solution:

1. Continue to use driver list, but filter out the undesired options.

**Time Estimate: 45min. (Completed.)**

# #97 Available raster output formats.

Solution:

1. Continue to use driver list, but filter out the undesired options.
2. Rewrite the HFA option to IMG.

**Time Estimate: 45min. (Completed.)**

# #96 Projection Selection

Solution:

1. Remove projection selection, but display the projection of the input if there is one.
2. Apply the projection information to all outputs; if there is none, skip this step.

**Time Estimate: 4h.**

# #94 Installation failure.

~~This will be addressed after everything else is sorted out, and distributed for testing. I’m developing a new build environment and a document describing the process of setting it up to be reproducible.~~

**I have achieved this. The remaining effort will be in testing.**

# #109 Separate settings page to reduce clutter/hide infrequently-used options.

I’m suggesting this because, for situations like #105, #102 and #104, we might want to move these settings off the cluttered main view, and obscure them a bit so people don’t have to think about the option.

**Time Estimate: I’ll wait until everything else is decided and if you want to do this to estimate it.**