B Note on the use of SAGA GIS

The WAsP Map Editor now supports direct import of SRTM elevation and coastline data; therefore it is <u>not</u> necessary to use SAGA GIS (or similar software) for this task. However, this GIS tool may still come in handy for processing other elevation data sets in grid format. This section contains a brief guide to making such vector maps, using the SRTM data as an example.

SAGA (System for Automated Geo-scientific Analyses) is a GIS system developed by University of Göttingen (Conrad *et al.*, 2015); the home page is <u>www.saga-gis.org</u>. SAGA GIS can be used to make WAsP height contour (vector) maps from different kinds of gridded (raster) data. SAGA is a Free Open Source Software (FOSS).

Processing an SRTM grid for WAsP use

SRTM elevation data can be downloaded from <u>dds.cr.usgs.gov/srtm/</u> (version 2.1) or <u>e4ftl01.cr.usgs.gov/SRTM/</u> (version 3, requires login). Once you have downloaded and unzipped a $1^{\circ} \times 1^{\circ}$ tile, import the grid from the **Geoprocessing** menu:



Left-click in the white field next to Files and enter or select the grid file name (*.hgt):



Make the height contours from the **Geoprocessing** menu, selecting the range and height contour interval:

Load Tool Library						
Find and Run Tool						
Climate	•					
Database	+					
File	+					
Garden						
Grid						
Imagery	•					
Projection	+					
Shapes	•	Construction	•			
Simulation	•	Conversion	•			
Spatial and Geostatistics	•	Grid	•	Grid Values	+	
TIN	+	Lines	+	Spatial Extent	+	
Table	+	Point Clouds	•	Vectorization	+	Contour Lines from Grid
Terrain Analysis	•	Points	•			Gradient Vectors from Direction and Length
Visualization	•	Polygons	•			Gradient Vectors from Directional Compone
Import USGS SRTM Grid		Selection	+			Gradient Vectors from Surface
Import 0303 SKTW Old		Table	•			Grid Values to Points
		Tools	•			Grid Values to Points (randomly)
						Vectorising Grid Classes

Set the grid system and contour interval in the Contour Lines from Grid window:

-	Da	ata Objects					
		Grids					
		Grid system	0.000833; 1201x 1201y; 12x 55y				
		>> Grid	01. N55E012				
		Shapes					
		<< Contour	<create></create>				
		< Polygons	<not set=""></not>				
	Ор	tions					
	Ve	rtex Type	х, у				
	Int	erpolation Scale	1				
	Sp	lit Parts					
	Mi	nimum Contour Value	-60				
	Ma	aximum Contour Value	140				
	Eq	uidistance	10				

The Data workspace (Tree view) should now look something like this:

🚘 Data
🖕 📠 Grids
🚊 🌆 0.000833; 1201x 1201y; 12x 55y
01. N55E012
🗄 🔁 Shapes
🗄 📈 Line

where the **Grids** section contains the SRTM grid and the **Shapes** section the contour lines. Double-click the grid, e.g. "01. N55E012", to display it – same goes for the Shape "01. N55E012". The **Maps** workspace could look something like this:



Finally, export the contours to a WAsP terrain map file from the Geoprocessing menu:



Each SRTM3 grid file covers a $1^{\circ} \times 1^{\circ}$ tile and contains 1201×1201 cells; an SRTM1 grid file also covers a $1^{\circ} \times 1^{\circ}$ tile, but contains 3601×3601 cells. This is sometimes too much information too process or too large an area. The imported SRTM grid can be trimmed from the **Geoprocessing** menu:

Grid > Grid System > Clip Grids [interactive]

First, show the grid in a **Map** window. Next, start the **Clip Grids** [interactive] tool, select the grid system and grid and click **Okay**. Next, select the **Action** pointer (the black arrow) in the toolbar:



In the **Map** window, drag out (left click and drag) the approximate area for the sub-grid that you would like to extract. A **Clip to Extent** window now pops up:

Clip to Ext	tent		—X —			
Optio	Options					
Left		12.2066666584				
Right		12.487499980499999	Cancel			
Botto	m	55.185833325899999				
Тор		55.457499981699996				
Colur	mns	338	Load			
Rows		327				
			Save			
			Defaults			

The sub-grid configuration may be edited further here. Press **Okay** to continue. The **Data** workspace should now look something like this:



The new (sub)grid can be contoured and exported as a WAsP map file as described above.



The coordinates of the exported WAsP map file are geographical latitude and longitude; these must be transformed to a metric coordinate system in the WAsP Map Editor:

- 1. **Open** the map in the Map Editor.
- Click Yes to switch to geographic Lat-Lon coordinate system, and then Ok twice.
- 3. Next, select Tools > Transform > Projection.
- 4. Select Global Projections > UTM projection for the Projection Type.
- 5. Leave Datum as WGS 1984 (or change to other) global/local datum.
- 6. Press **Ok** to transform the map coordinates.