

Ski Path Finder

Version 1.0

User Manual

Authors: Jiri Kadlec, Tevaganthan Veluppillai

<http://jiriteva.codeplex.com>

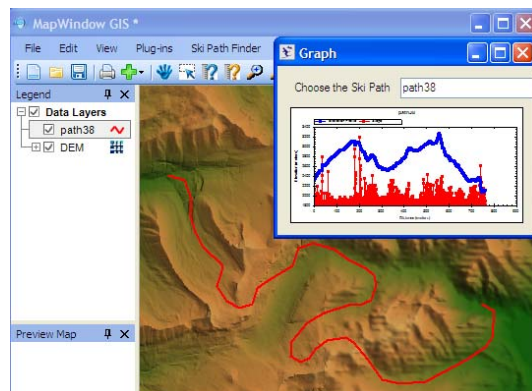




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1 Introduction

Cross country skiing is a healthy and adventurous outdoor activity. On the skis you can venture into otherwise inaccessible wilderness. Travelling by ski is much faster than walking when using the proper skiing technique. For long distance skiing trips it is important to have a good route plan. The SkiPathFinder tool helps you with ski tour route planning. For each ski path, you can show a detailed graph of the elevation profile. In addition, ski paths can be compared based on their difficulty. This way you can choose the best ski path.

2 Installation Instructions

The following type of computer and programs are required in order to plan ski paths using the Ski Path Finder:

- A Computer with Windows 98, 2000, XP, Vista or Windows 7
- 256 MB of Computer Memory
- Free MapWindow GIS Software

Please follow the instructions to install the Ski Path Finder tool.

2.1 Install MapWindow GIS

If you don't already have MapWindow on the computer, go to the website <http://www.mapwindow.org>. Go to the Downloads page. Under downloads select **MapWindow GIS Application**. After downloading the setup file, go through the installation steps.

The screenshot shows the MapWindow GIS website. At the top left, there is a logo for the '1st International Users and Developers Conference' held from '31 March - April 2 2010'. The main header features the 'MapWindow GIS' logo. Below the header is a navigation bar with links: Home, Downloads, Community, Source Code, and Documentation. The 'Downloads' link is highlighted. The main content area is titled 'MapWindow GIS Application'. It contains a 'Description' section that describes the software as a free, open source, standards-based standalone software package. It lists various features like geoprocessing tasks, watershed delineation, and an experimental geodatabase plug-in. It also mentions that the installer includes sample data and is compatible with Windows 98 and up. A note at the bottom states that a 'MapWindow CD' is also available for purchase. In the 'Downloads' section, it shows '264673 total' and '239 today' downloads. A list of download links is provided, including 'MapWindow47SRa-x86-Setup.exe' (47.6 MB - November 28 2009.) and 'Full MapWindow GIS application installation - v4.7 Stable Release'.

Figure 1 Download MapWindow GIS



2.2 Copy the Ski Path Finder File

From the Ski Path Finder WebSite <http://jiriteva.codeplex.com> go to Downloads and select Ski Path Finder. Download the file SkiPathFinder.dll. Copy the file SkiPathFinder.dll to the folder C:\Program Files\MapWindow\Plugins\. The ski path finder tool is ready to run!

Please note: If MapWindow GIS is located in a different folder than C:\Program Files on your computer, copy the file SkiPathFinder.dll to the Plugins subfolder of the folder where MapWindow.exe is installed.

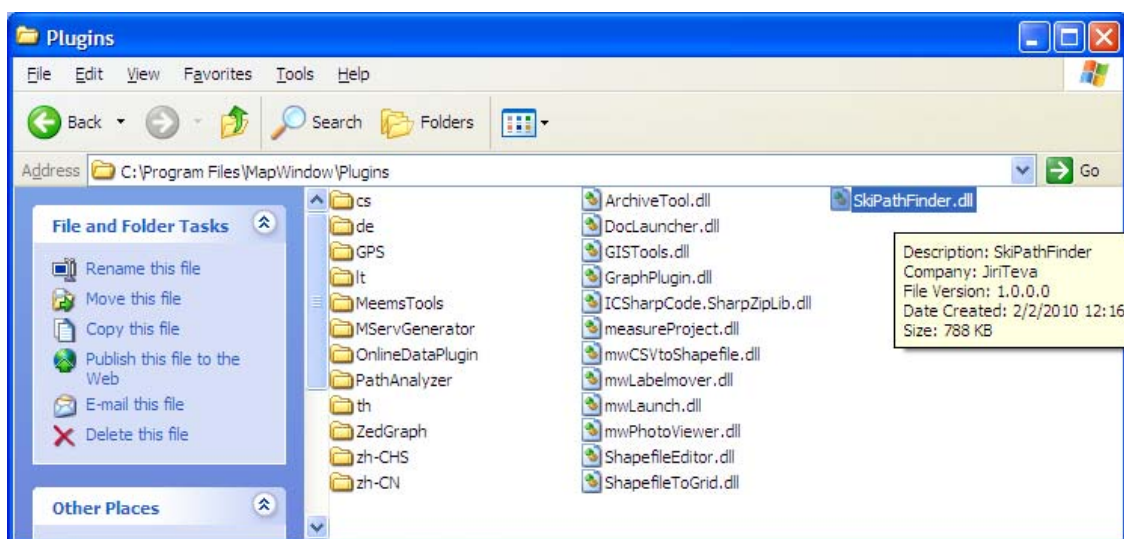


Figure 2 Copy the file SkiPathFinder.dll

3 Launching the Ski Path Finder

To launch the ski path finder, start MapWindow GIS. MapWindow GIS can be started by:

- Double – click the MapWindow GIS  icon on the desktop
- Or go to Start – Programs – MapWindow GIS – MapWindow GIS in the Windows start menu.

The first time MapWindow GIS is opened, the SkiPathFinder tool needs to be activated. To activate the tool, Select the Plugins menu and select **SkiPathFinder** (Figure 3). A new menu **Ski Path Finder** appears on the top menu bar (Figure 4).

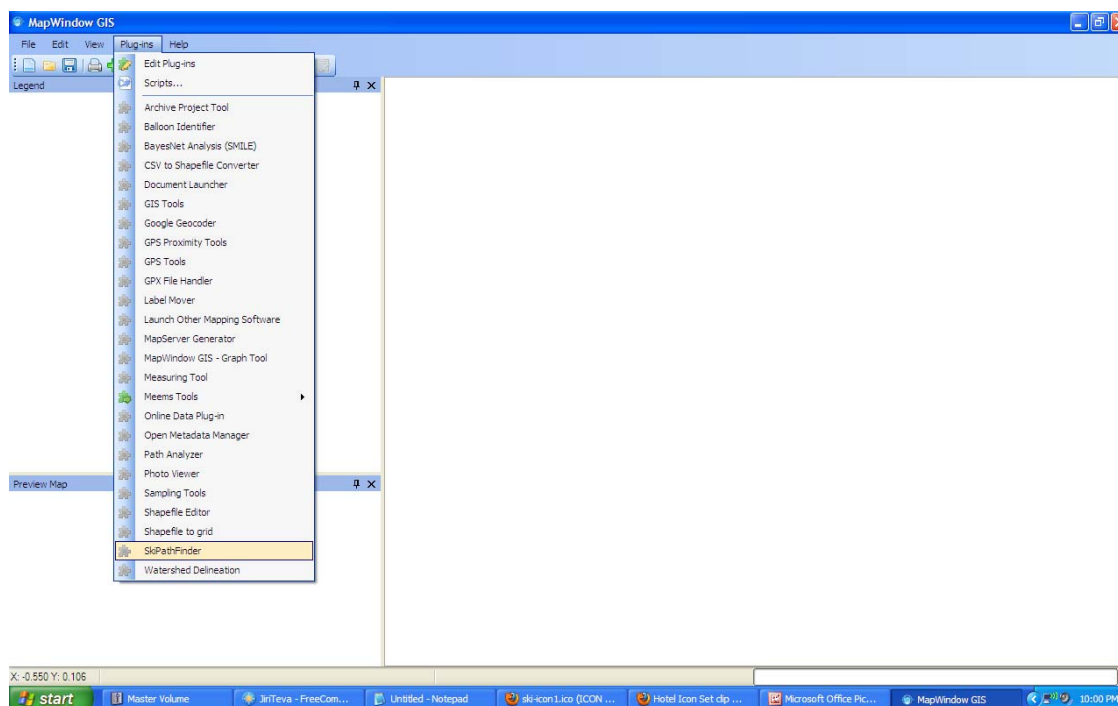


Figure 3 Activate the Ski Path Finder Tool

4 Load a DEM Elevation Map

Before planning the first ski path, select the **Load DEM** menu and choose the elevation map of the ski area in the “Please Select a DEM window” (Figures 4 and 5). The elevation map is called DEM (Digital Elevation Model). You can use many different file formats of the DEM including .bgd, .tiff, .asc and other formats. There are numerous websites where you can download the DEM elevation map of your ski area. The website (<http://seamless.usgs.gov/>) provides free detailed DEM elevation maps for the whole USA.

After clicking OK, the shaded elevation is displayed in the MapWindow map.

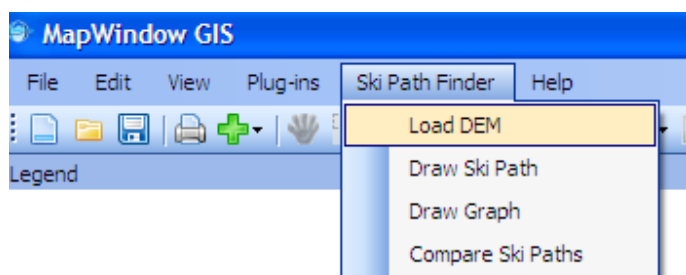


Figure 4 The Load DEM menu

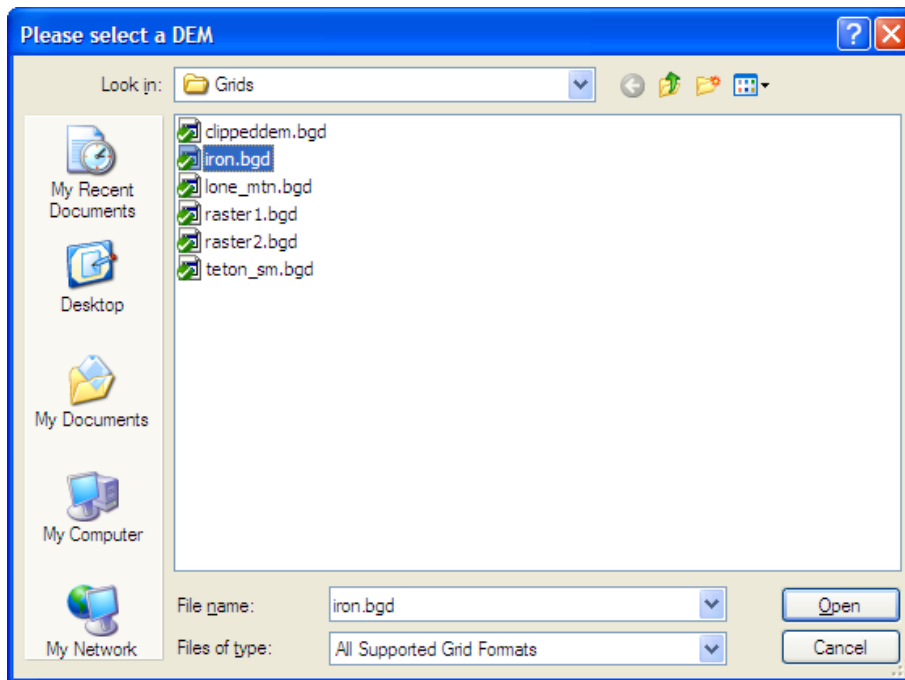


Figure 5 Select a DEM file

5 Drawing a Ski Path

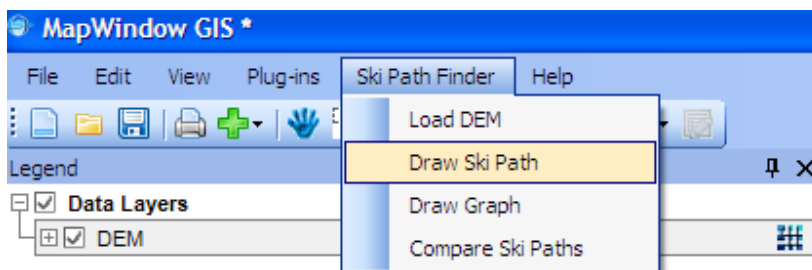


Figure 6 The Draw Ski Path menu

To plan a new ski path, select the **Draw Ski Path** menu. The mouse cursor will change from arrow to “cross” (+). To start drawing, left – click the mouse on the map. Move the mouse and notice a red line. This is the line of the ski path. To change the path direction, left click again and move the mouse. To **finish** drawing the ski path, **right click** the mouse button (Figure 7). Notice a new item “Path 1” in the legend next to the map has been created.

To draw a second path, select the Draw Ski Path menu again and draw the path using the mouse.

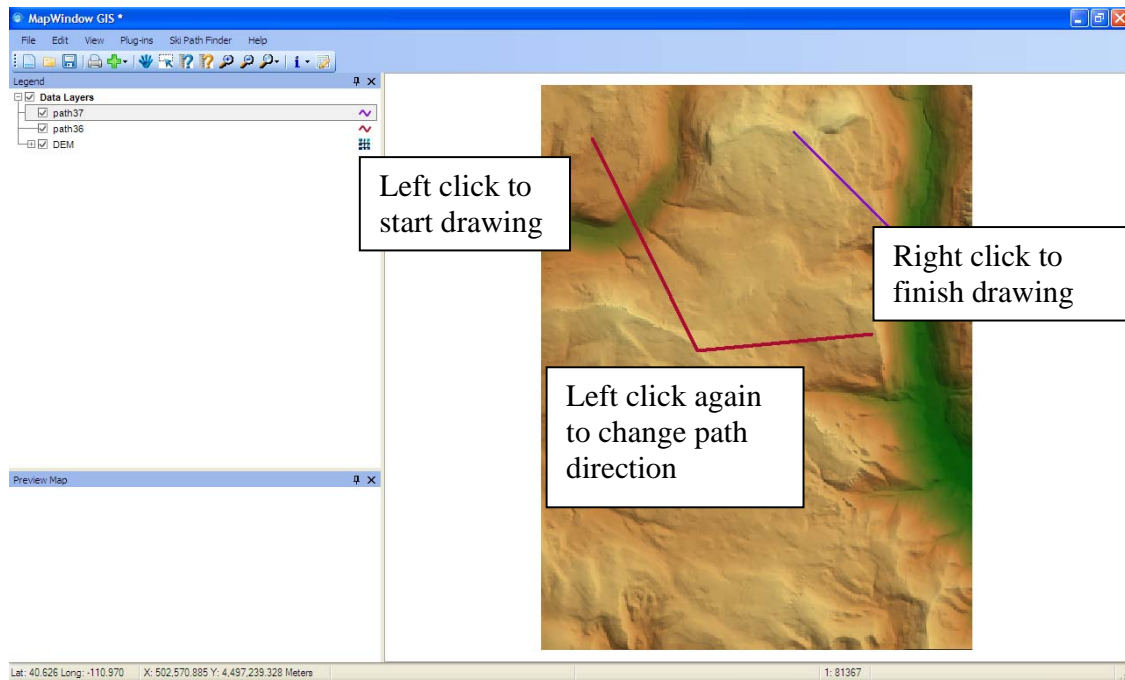


Figure 7 Draw Ski Path

6 Draw Graph

To display the graph of the ski path elevation profile, select the **Draw Graph** menu (Figure 8). In the new window, select the ski path name. The graph will be shown (Figure 9). The graph contains two lines. The blue line shows how the elevation changes along the path. You can see the highest point, lowest point, parts where the path goes uphill and parts where it goes downhill. The red line shows the path gradient (slope). the higher the red value is, the steeper the slope of the path is. Sections with highest red value are the most difficult parts of the ski path.

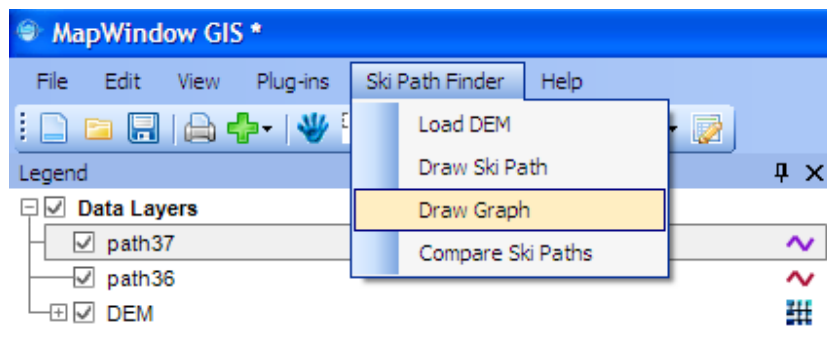


Figure 8 Draw Graph menu

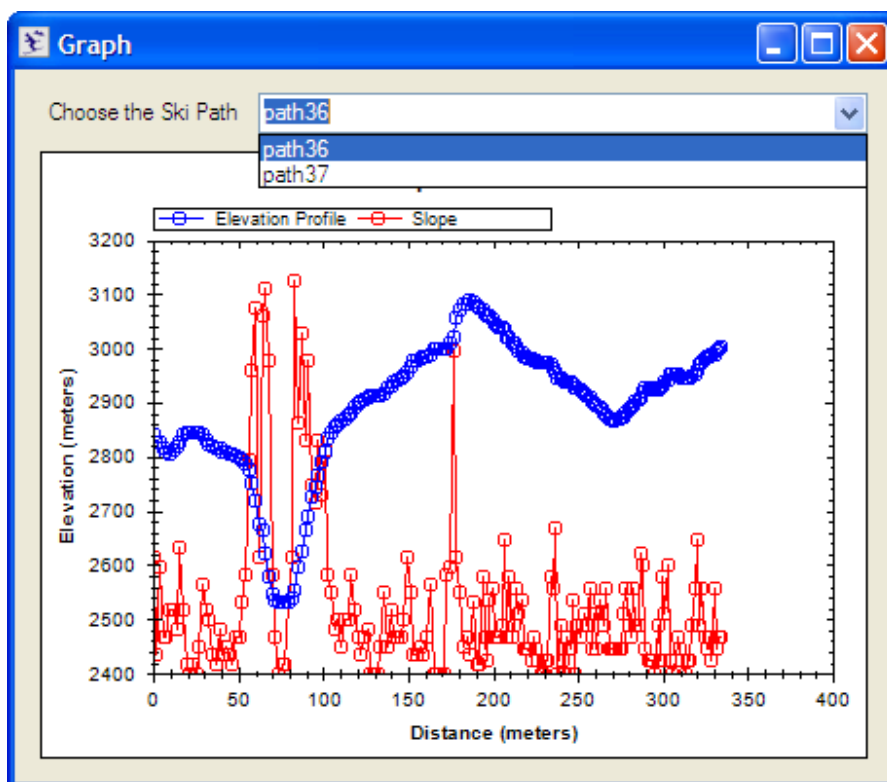


Figure 9 Graph of the Ski Path

7 Compare Ski Paths

You can compare ski paths based on their difficulty. The difficulty of each path is calculated by the Ski Path Finder tool. First, the tool divides the path into small steps and computes difficulty for each of these steps. Then, it computes the overall difficulty. The overall difficulty has one of the following values:

- **Normal.** This is a suitable path for beginner cross country skiers. This path is mainly flat, doesn't have any steep slopes or risky parts.
- **Moderate.** This path is easy in most of its parts, but there are some challenging parts where you can go at a high speed. This path provides a good workout for skiers with a small experience.
- **High.** This path has numerous steep uphill and downhill sections. It is suitable for more experienced skiers in good physical condition.
- **Very high.** This path can only be recommended for expert skiers. There are very steep slopes and almost no flat sections. If you are not an experienced skier, travelling this path may be risky.

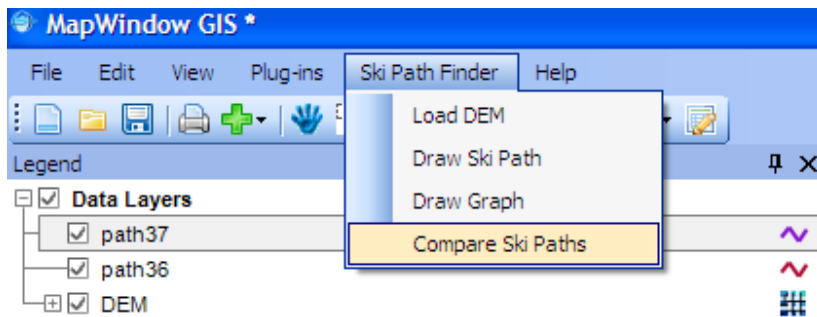


Figure 10 Compare Ski Path menu

The screenshot shows the 'Analyze' window with a table titled 'Ski Path Difficulty'. The table has seven columns: 'path', 'Normal Risk', 'Moderate Risk', 'High Risk', 'Very High Risk', and 'Overall Risk'. There are two rows of data: 'path36' and 'path37'. 'path36' has values 79, 13, 6, 2, and 'Normal'. 'path37' has values 64, 22, 8, 6, and 'Moderate'.

| | path | Normal Risk | Moderate Risk | High Risk | Very High Risk | Overall Risk |
|---|--------|-------------|---------------|-----------|----------------|--------------|
| ▶ | path36 | 79 | 13 | 6 | 2 | Normal |
| | path37 | 64 | 22 | 8 | 6 | Moderate |

Figure 11 The final Ski Path comparison table

In the Ski path difficulty table, choose the path most suitable for you. Enjoy the skiing!