Lesson 2 - 3D Display of Integrated Publicly Available Data

Exercise 2-8

Objective: Record waypoints and a track using a handheld GPS receiver and create a GIS map using these data.

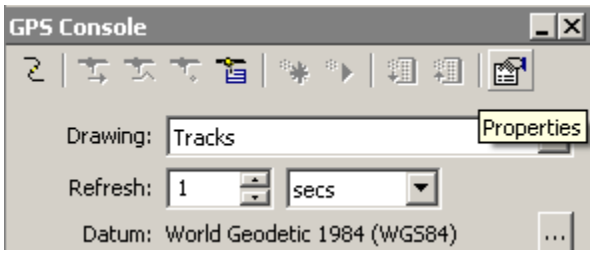
1. Turn on a **Garmin eTrex Legend H**, or similar, GPS receiver. When at a designated location, go to the **Main Menu** and click **Mark** command. If needed, change the default waypoint's name. Press **OK**. Notice that elevation is recorded as well as latitude and longitude. Repeat if needed. In case geographic coordinates are for a different location, make modifications before pressing **OK**.

2. From the **Main Menu**, click **Tracks** option. Make sure that the **Record Method** is set to ***Time*** and the **Interval** is ***1 sec***. When ready, enable track log by clicking ***On***. Walk the track and terminate track log by clicking ***Off***. Do NOT save the track. When done, turn the receiver off.

3. Connect the GPS receiver to a computer using either **USB** or **Serial** communication cable and turn it on.

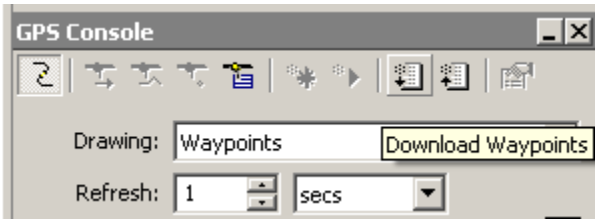
4. Launch **Manifold** software. For Nebraska Tractor Test Laboratory test track location, open ***NTTL.map***. Select **File – Create – Drawing**. Name the drawing ***Waypoints***. Create another drawing named ***Tracks***.

5. Select **View – Panes – GPS Console**. Click on the **Properties** icon. In the Properties menu, select **Garmin USB GPS**.

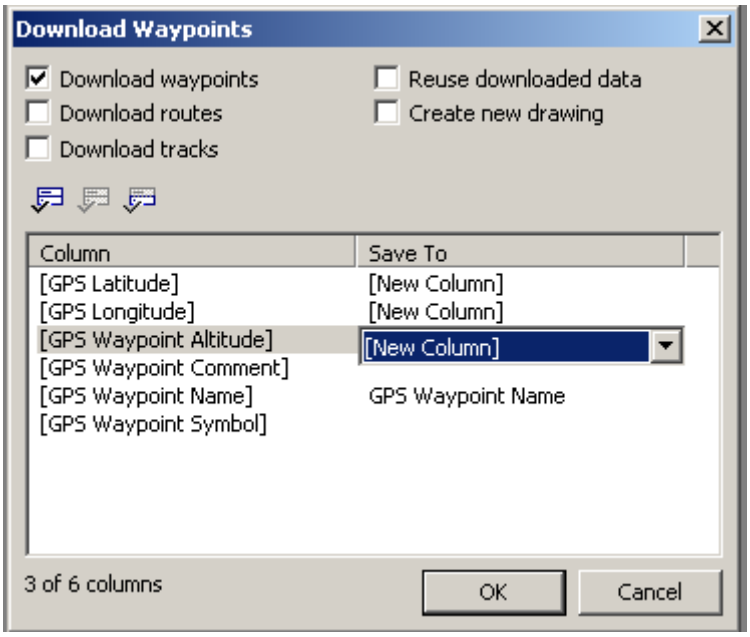


6. Click the **Connect** icon to get connected to the GPS receiver.

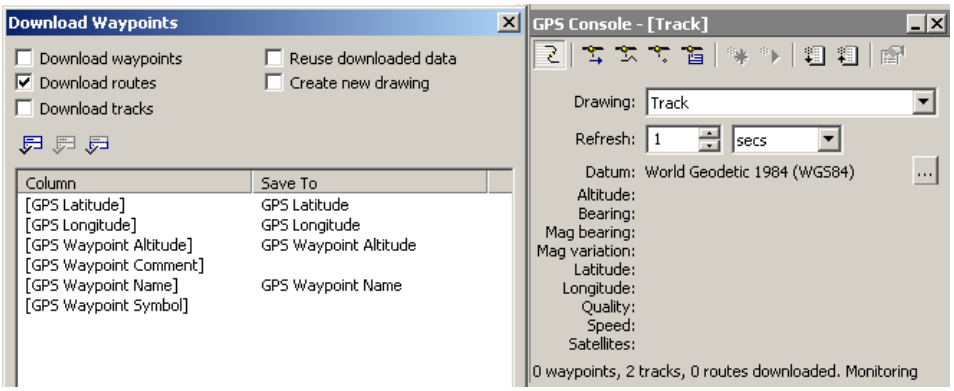
In the **Drawing** drop-down box, select ***Waypoints***. Click the **Download Data** icon.



Uncheck all check-box options except "**Download Waypoints**." In the window pane, double-click next to **[GPS Latitude]**, **[GPS Longitude]**, and **[GPS Waypoint Altitude]** to allow the attributes to be saved to **New Columns**. Click **OK**.



7. In the **GPS Console**, change the dropdown box to **Tracks**. Click **Download Data**. Uncheck each checkbox option except "**Download tracks**." Double-click next to **[GPS Latitude]**, **[GPS Longitude]**, and **[GPS Waypoint Altitude]** to save the attributes to new columns. Click **OK**.



8. Right click on the ***Waypoints*** drawing component and select **Assign Projection**. Click **OK** to confirm the latitude and longitude coordinates. Repeat for the ***Track*** drawing component.

9. Right click on ***Waypoints*** drawing component and select **Change Projection**. Select **Universal Transverse Mercator Zone 14 (North)** and click **OK**. Confirm the projection. Repeat for the ***Tracks*** drawing component.

10. Right click in the project pane to **Create – Map**. In the dialogue box, use the **Select All** icon to include the ***Waypoints***, the ***Track***, and the ***4009611NE*** surface.

11. Open the map, and **Maximize** the window. Click the **"Zoom to Fit"** icon

12. **File – Save** as ***Project_2-8.map***.