# Using Charts in Greensea

## Concepts

Greensea subsurface navigation relies on the DVL to track the ROV's relative motion across the bottom and the compass to resolve this relative motion into an actual bearing and allow geolocation. In order to know its true position, the starting point must be seeded with GPS coordinates. The ROV GPS antenna accessory can be used to do this, or if known, the coordinated can be manually entered. If the ROV mission does not require geolocation, the seeded GPS value does not matter and the DVL / Compass will allow for relative tracking without any further interaction.

This allows several methods of navigation:

1. Visual / Sonar Relative (no geolocation, but distances and bearings can be mapped)
2. Marker Reference
3. Chart Overlay

In situations where Geolocation is required, but a GPS signal is not available, the coordinates of a known landmark must be ascertained, the ROV moved to that location and the coordinated entered into the system.

## The following step-by-step instructions are provided for navigation using Chart Overlay.

Steps 1 – 2 can be completed in the office.

1. If you are using Chart Overlay, a georeferenced chart must be created. Instructions for creating georeferenced chart overlay files are provided below.
2. For Chart Overlay navigation, the GPS coordinates of at least one landmark must be collected from a mapping program such as browser based mapping application (Google, Yahoo, and other) or a dedicated application like Google Earth. The selected landmark should typically be the planned deployment location for the ROV.
3. In Greensea, display the Map (F1 or F5)
4. Below the map, select the Map Config tab and then the Chart tab.
5. Import the Map (Drag and Drop or Click on the Load Chart button.
6. Launch the ROV.
7. Follow the steps in the Auto Flight and Course Following Checklist section of: <http://download.videoray.com/documentation/mss/html_defender/pilot_tools.html>, but do NOT complete step 5.3, "Fuse GPS."
8. Move the ROV to the position of the desired landmark with known coordinates (most likely the planned deployment location).
9. In Greensea, display the Map (F1 or F5) if not still displayed.
10. Below the map, select the Setup tab.
11. In the Position section, Enter the GPS coordinates of the landmark to which you moved the ROV in the Set Desired Position field (most likely the deployment location).
12. Click on the Update Vehicle Position button.
13. You are now ready to navigate using the Chart Overlay for reference or record the coordinates of any other point of interest.

## Georeference chart creation

Several programs can be used to create georeferenced charts.

GE2KAP is a program that works in conjunction with Google Earth and is available for free from:

<http://www.gdayii.ca/> Home Page

<http://www.gdayii.ca/Downloads.php> Downloads Page

Download: GE2KAP.V30.0.0.1 and Fix\_GE\_API

GE2KAP is extensively documented here: <http://shoreline.fr/PHiggins/GE2KAP/English/index.html> or within the application by clicking on the Step by Step Procedures button, There is also an option to view a 30 minute video tutorial presented during application startup.