

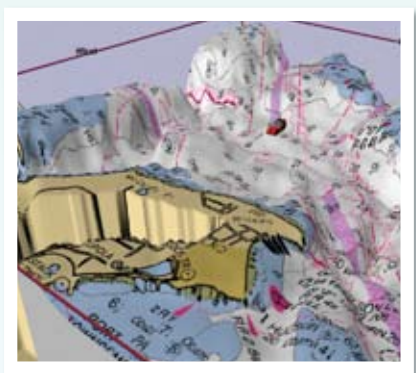
The Beauty of GPX Format

If you have ever tried to exchange routes and waypoints with someone, or input your own favorite routes or waypoints from another program, you've probably been frustrated by how difficult it is. This might require manually inputting waypoints, and the penalty for one missed key stroke can put lives at risk. The problem is that each maker of navigation hardware and software uses a different format, making it difficult or impossible, to easily exchange data with someone else that uses a different brand of navigational equipment.

This chaotic state of affairs reflects an immature market, where each manufacturer hopes that by making it hard for customers to migrate data between navigation products, that they can lock customers into purchasing all their navigation products from a single supplier. Vendor lock-in is not in the best interest of consumers; it keeps prices high and stifles competition. The early days of the computer industry exhibited exactly the same market dynamic.

Without a common language for transferring waypoints, the usual option for exchanging waypoints and routes would be to use proprietary formats or text files, such as the CSV (comma separated values) format. Unfortunately, these text files don't define the datum used for the waypoints, and don't define the ordering of the information within the text files.

Datums provide a common point of reference for interpreting chart coordinates. The exact placement of lines of latitude and longitude on a nautical chart depends on the horizontal reference datum. More than 200 horizontal datums exist; GPS uses the WGS84 datum; the current NOAA chart datum is North American Datum 1983 (NAD83), which is compatible with WGS84; however, many NOAA charts still reference the older NAD27 datum. The Canadian Hydrographic Service produces nautical charts referenced to NAD83, NAD27, and others. Most vector format electronic charts are based on WGS84 for compat-



MaxSea, one of the few programs that reads and writes GPX, is able to 'learn' the actual bottom shape from a depth sounder—here rendered in 3D view with a chart overlay.

ibility with GPS. Raster charts use the datum of the paper charts they were scanned from. To make matters worse, a variety of vertical datums exist for tidal data. Chapter Two of Bowditch (online at www.irbs.com/bowditch/) has a lot of information on chart datums.

Conversion programs such as GPS-Babel and the Geocaching Swiss Army Knife (GSAK) do a reasonable job of converting between various file formats, but if the datum isn't in the original data file, the resulting translation will not have it either. Interpreting the same set of coordinates using different datum can result in the waypoints having significant error, perhaps as much as 1,500 feet.

Fortunately, a universal standard exists for interchanging waypoint and route data: GPX, or GPS eXchange format. GPX provides a standard method of storing waypoints and routes, and includes the datum reference as well as a description of the contents in XML (Extensible Markup Language). Boaters (and hikers and motorists) post GPX files on websites for others to download. GPX is supported by many programs such as Google Earth and navigation software. You can learn more about GPX at www.topografix.com/gpx.asp.

Bottom Line: When transferring waypoints and routes between navigation products, the datum(s) used must also be transferred, or the translated co-ordinates can suffer significant error. The GPX format takes care of datum conversion problems for you and can help keep you safe. *PS* encourages readers to look for products that read and write in GPX format.