

6. FINAL PRODUCT OPTIONS

A successful habitat mapping project should be planned from the top down. In addition to having identified the purpose, scope and scales of a project, the format and content of the final products should also be considered well in advance of field work and budgeting. Habitat data can be received and presented as: 1) raw or intermediate data, 2) hardcopy maps and 3) digital maps and GIS themes, 4) multimedia GIS and 3D rendering. Here we provide only a brief description of each of these options because they are not specific to marine habitat mapping, but are broadly considered by all those working with geospatial technology.

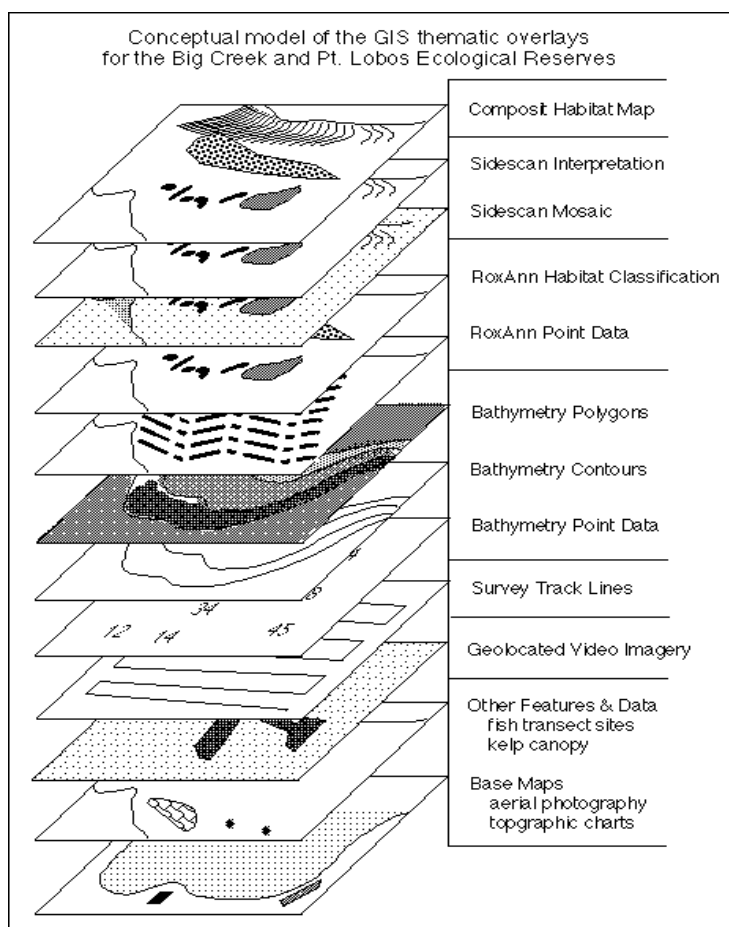


Figure 6.1. Conceptual model of how GIS can be used to combined data of diverse sources, formats and content for marine habitat analysis and classification.

Raw or intermediate data sets include x, y, z point data, gridded bathymetry, and raster backscatter imagery of substrates. Often, the first generation of data recorded from the sensor is stored in a proprietary format. This raw data is not only unreadable by other programs, but it usually requires some degree of filtering to remove spurious points and errors. Once filtered and checked for accurate georeferencing, the data is usually stored in a more generic format for additional processing and export to GIS. While raw and intermediate data are the most flexible, they also require advanced skills, training and technology for analysis, interpretation, display, and merging. Unless the end user has the capabilities

required to process data in these forms, they may be best served by requesting more finished products in addition to copies of the earlier data. These finished products might include depth contours, substrate interpretation in GIS themes compatible with those already held by the end user. Care must often be taken in specifying the correct datum, projection and coordinate system when GIS themes are to be combined. If the end user is not equipped to make use of GIS ready files, hardcopy maps may be the final product of choice.

While traditional and familiar, hardcopy paper maps are the least flexible, have the greatest limits to display resolution, scale, data density and layering, merging and updating, and dissemination. Combining kelp forest canopy coverage or interpretations from high-resolution (< 1m) sidescan sonar surveys with bathymetric contours for the entire width of the continental shelf would be pointless.

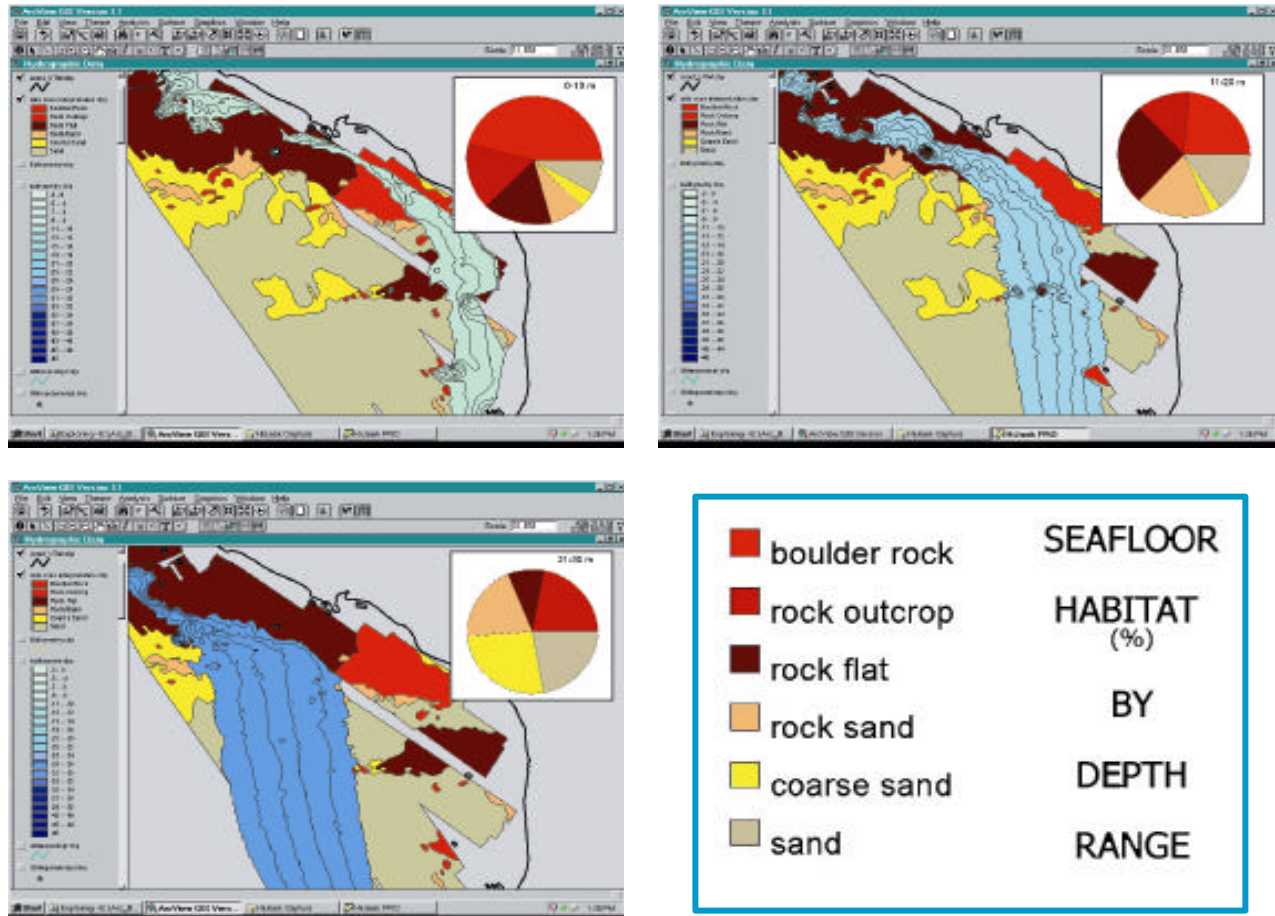


Figure 6.2. Habitat at Big Creek Marine Reserve sorted by depth and substrate type using GIS (authors' unpublished data).

Geographic Information Systems (GIS) are the most flexible and powerful means available for combining database, text, raster, vector, and CAD data, while maintaining the ability to layer, compare, and quarry data sets (Fig. 6.1). GIS also contributes to the ease of storing metadata, assessing and sorting by QA/QC, and displaying or exporting data in any coordinate system or datum. As a result, sidescan sonar images can be layered and displayed along with the substrate interpretation, and bathymetry contours, as well as species distribution or catch data as a means of assessing species/habitat associations. Indeed, the ability of GIS to use virtually any type of geocoded data to sort

and classify habitat by depth, substrate, slope and aspect makes it the single most powerful tool for habitat analysis available (Fig. 6.2). Simulated 3D fly-throughs of subtidal habitats can be created in some GIS programs by drawing a path in the plan-view of the area (Fig 6.3 left) to be followed by the 3D display view when the “flight” is initiated (Fig. 6.3 right). The 3D view is created by draping a plan view image of the area (e.g. sonograph, interpretation, aerial photograph, etc.) over a digital elevation model created from the bathymetric data.

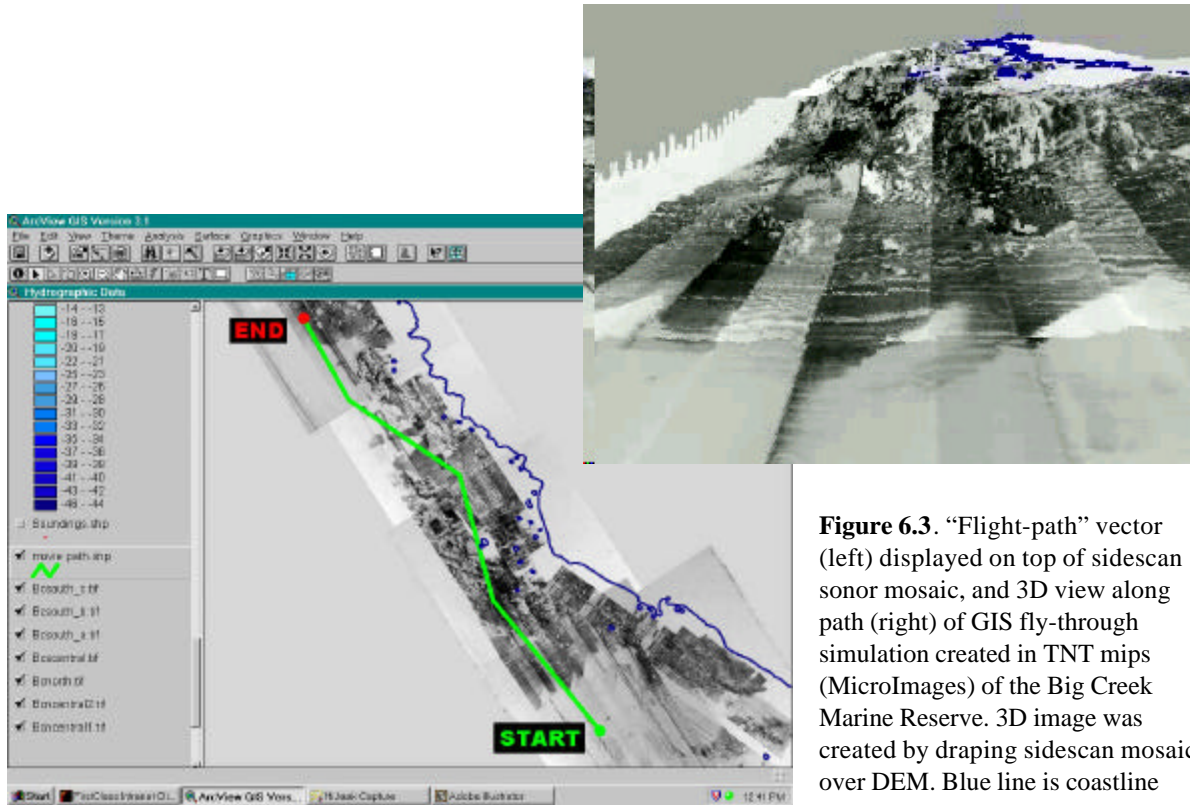


Figure 6.3. “Flight-path” vector (left) displayed on top of sidescan sonar mosaic, and 3D view along path (right) of GIS fly-through simulation created in TNT mips (MicroImages) of the Big Creek Marine Reserve. 3D image was created by draping sidescan mosaic over DEM. Blue line is coastline vector.