

Space Shuttle Columbia Recovery relies on Geographic Information Systems (GIS), Global Positioning System (GPS) and Standard Surveying and Mapping Techniques

When the space shuttle Columbia came apart upon re-entry into the Earth's atmosphere on February 1st, fragments of the spacecraft were scattered over several states. NASA's first priority was to find, map and catalogue each piece of debris.

Recovery efforts have been centered on the GIS/mapping centers at the Forestry Resources Institute and the Hues GIS lab, both at Stephen Austin University in Nacogdoches, Texas and the Federal Disaster Field Office in Lufkin, Texas. Within an hour of the disaster, detailed maps of the debris area were provided to emergency officials and NASA. Initial shuttle debris found on the ground was located with approximate coordinates and then mapped. These points were used to create a Base Search Vector.

Hand held GPS units were used to collect coordinate data at the debris sites and electronic measuring devices

were used to take measurements to pieces of debris that were considered unsafe to approach. The data was processed to within a meter accuracy and combined with existing digital geographic data and historical aerial photography to create new digital maps. This allowed searchers to prioritize where to search and how to get there.

Four mapping field units were set up as mini GIS labs in areas of heavy debris. The Toledo Bend Reservoir was one of the areas believed to contain a substantial amount of shuttle material. It was difficult for divers to determine if debris was present under the water due to the presence of submerged forests, railroad tracks and old farmhouses. The local fire department

donated the use of an entire firehouse to be set up as a GIS lab, complete with computer workstations, plotters and Internet access. Aerial photos from the 1960s, before the lake was created, were used to create digitized maps of the reservoir bottom to help the divers distinguish and recover the shuttle material.

For NASA, the need for mapping and imagery in the recovery effort was immediately clear. This exercise however, has emphasized the importance of uniformity and consistency in information management. There are a variety of sources of imagery and many different software tools for analysis and display. In cases such as the Columbia Shuttle recovery, it has been imperative that information be transferred seamlessly from one product to the other.



Editor's note: Material for this article was gathered from: GIS Monitor Newsletter, February 27, 2003 published by Professional Surveyor magazine; GEOResources newsletter, February 21, 2003 published by geoplace.com; and, the Forest Resources Institute web site: <http://www.fri.sfasu.edu/Columbia>.

To read a newspaper article posted by "The News Sentinel" about two Indiana surveyors who volunteered to help with the Columbia Shuttle recovery, visit the following website: <http://www.fortwayne.com/mld/newssentinel/5200947.htm>.



Base Search Vector

http://www.fri.sfasu.edu/Columbia/pages/pub_maps.html