



▲ **Organic matting** was employed on exposed substrates to stabilize soils until plants from the surrounding marsh could recolonize damaged sites.

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VEGETATION MAPPING

Vegetation-mapping products from the USGS Biological Resources Division—funded and —administered program for vegetation mapping on NPS lands increased in 1998.

However, at the current funding level, the program would take 30 years or more to fill all park vegetation-mapping needs. Plans for 1999 are to realize efficiencies in the overlap of vegetation-mapping products for NPS fire management under the FirePro program (i.e., development of park-specific fire fuels maps and plots for fire effects monitoring) and those intended for general resource management use. The resulting products will serve both purposes.

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Resource Disturbances](#)

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by James Åkerson

Oil & Gas Development ▶ JEAN LAFITTE LEARNS FROM 3-D SEISMIC OIL EXPLORATION EXPERIENCE

by Sandee Dingman

Petroleum exploration technology advanced into the national parks in 1998 when a three-dimensional seismic operation was undertaken in Jean Lafitte National Historical Park and Preserve (Louisiana), the first such operation in a national park. This new technology presented challenges for park managers to protect resources while providing for the exercise of nonfederal oil and gas rights consistent with the park's enabling legislation. Cooperative planning with the operator, Burlington Resources, was crucial to reducing the resource impacts of this intensive operation.

As a geophysical exploration technique, 3-D seismic technology is a relatively new application of an old skill: listening. Energy waves are generated near the earth's surface by detonation of an explosive charge known as a source. The energy travels through the earth to a subsurface target, where it is reflected back to the surface to be recorded on a grid of receivers. The recorded energy waves are then computer-analyzed to identify potential petroleum reserves. It is the grid of sources and receivers that makes 3-D different from the 2-D or straight-line operations of the past.

The Burlington Resources operation covered 32,000 acres, including 6,360 acres of the park's Barataria Preserve unit, a highly productive estuarine complex of floating marshes and forest wetlands. Within the park, 477 sources were detonated on precise alignments along 36 miles of source lines. The generated energy was then recorded by 1,300 receivers along 54 miles of receiver lines laid out in an overlapping grid.

During 18 months of planning, a number of creative solutions were developed to protect sensitive resources such as rare plant communities, popular hiking and canoe trails, archeological sites, and long-term research plots. Bio-remediating explosives were used to avoid water and soil contamination. Travel routes were carefully designed and equipment was modified to reduce weight to minimize compression of the organic marsh substrate and resulting hydrologic modifications. Very sensitive resources were designated as avoidance

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areas for all motorized equipment. Park newsletter and local newspaper articles kept the community informed, and a new interpretive wayside paid for by the operator explained this complex operation to park visitors.

Essential to successful implementation of the planned operation was the use of third-party compliance monitors hired by the operator with approval by the park. Monitoring was accomplished by wetland scientists, who provided on-site control of all field operations under the guidance of the park's natural resource management specialist. The monitors maintained daily contact with the many field crews and provided comprehensive documentation of field activities during 74 days of continuous operations.

Thanks to cooperative planning and effective monitoring, resource damage was minor and localized. In the few areas where damage occurred, the substrate was stabilized with organic matting and, where needed, replanted. Most plant communities had recovered by the end of the growing season. Aerial photography and visual inspections will continue for three years, as planned, but no long-term impacts are anticipated.

To share insights regarding 3-D seismic operations, Jean Lafitte hosted a workshop in May for other parks with nonfederal oil and gas rights. As 1998 drew to a close, Big Thicket National Preserve (Texas), Big Cypress National Preserve (Florida), and Padre Island National Seashore (Texas) were all in the planning or implementation process for other 3-D seismic operations, and more are likely to follow.

<http://www2.nature.nps.gov/YearInReview/yir/yir98/chapter04/chapter04pg1.html>

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