Barry LeRay, left, of Cape Fear Catamarans of Wilmington, talks with Geodynamics owner Chris Freeman about options for mounting electronic equipment aboard the research vessel built for the Morehead City firm and delivered last week. (Mark Hibbs photo)

New research vessel delivered

Geodynamics firm gets custom-built cat for shallow-water sonar mapping projects

BY MARK HIBBS
NEWS-TIMES

MOREHEAD CITY — Any job requires the right tools for the best results and when the work is highly specialized, it's sometimes necessary to have tools custom-made.

Geodynamics at 310 Greenfield Drive in the county business park here specializes in high-resolution seafloor mapping. On Thursday, the firm took delivery of the R/V *Echo*, a custom designed and built hydrographic survey and research vessel – a 21-foot aluminum-hulled catamaran motorboat with a 9-foot beam – for use in shallow water surveys.

Geodynamics owners, husband and wife Chris and Sloane Freeman, have built the 11-year-old firm largely on contracting work for the U.S. Army Corps of Engineers. The company has been using a flat-bottomed skiff for work including sea grass habitat delineation with side-scan sonar and hydrographic surveys of off-

over the side of the skiff, the rolls sometimes lift the transducer above the surface of the water. The firm learned the hard way that hull-mounting the transducer didn't work either.

"The thing that kills sonar data is bubbles. We found out that skiff was just a bubble machine," Mr. Freeman said. "When we put the transducer through the hull it never really worked well."

Also, the skiff can be a rough ride for the survey team and its expensive and delicate instruments when the weather turns and the crew has to get home quickly.

The catamaran design of the new vessel provides a more stable platform for shallow-water research and allows for a hull-mounted transducer free of bubble troubles, according to tests conducted last week.

"This one is through the hull and we've had great results with it in our testing," Mr. Freeman said.

Cape Fear Catamarans of Wilmington built the vessel with

Lembke designed it from the ground up to support its "purpose-built mission," Mr. Freeman said.

In addition to the unique hull design developed by CFC to provide the stability and shallow draft required by Geodynamics, the vessel is outfitted with custom computer and instrument compartments that are shock mounted to protect sensitive equipment.

A specialized hatch or "moon pool" has been built between the catamaran hulls to allow for deployment of side-scan sonar or other scientific equipment.

"The R/V *Echo* represents perhaps the most advanced shallow-water research vessel in its class anywhere in the country," said Capt. Lembke in a statement. "In addition, Geodynamics is one of the only private groups in the U.S. using tightly coupled inertial navigation to support single-beam operations."

Typically, the seven-axis position and vessel motion technology is reserved for more complex multi-beam hydrographic surveys, he said. But using inertial navigation for single-beam efforts allows the crew to process the

testing between the port and AR-315 (the artificial reef site about 1.5 mile off Atlantic Beach) since we have repetitive, high-accuracy surveys of the seafloor and structures on the seabed with which to compare" said Geodynamics Chief Hydrograher Dave Bernstein, the scientist who assessed the accuracy of all the onboard survey systems.

Geodynamics will spend the next two months integrating and further testing the scientific equipment aboard the vessel.

The addition will also allow for new uses of the existing five-vessel fleet, including sending crews to different locations simultaneously or working together at the same sites to complete projects more quickly.

Mr. Freeman said 2011 was a busy year with hurricanes and offshore swell events that were not as widely reported.

Mr. Freeman said a talented team worked on the project and Cape Fear Catamarans' "exceptional" craftsmanship will lead to future collaborations.