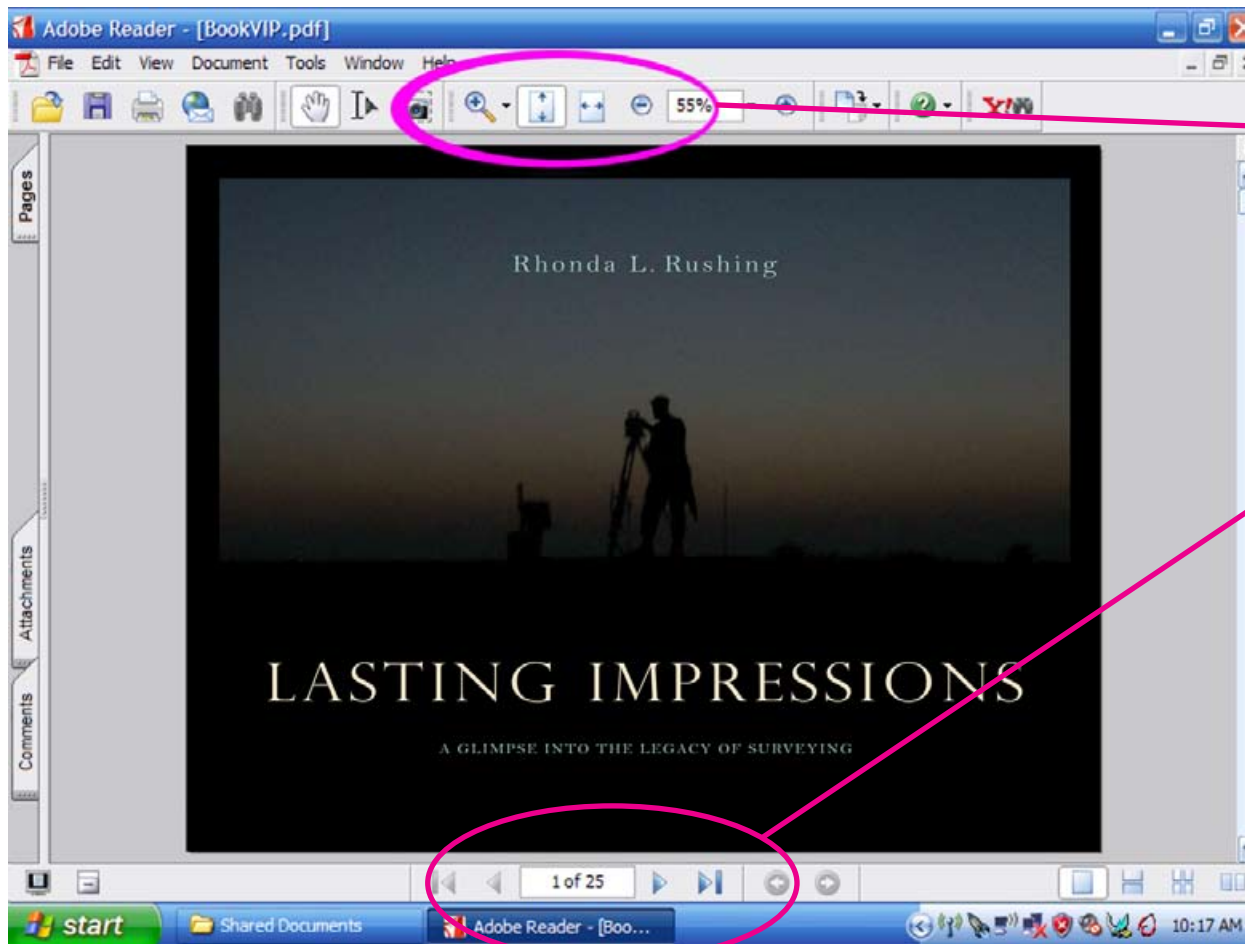


LASTING IMPRESSIONS

UNDERWATER BY DESIGN



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UNDERWATER BY DESIGN

Near midnight on August 4, 1984, the M/V Wellwood, a 400-foot steel-hulled freighter, struck Molasses Reef in the Florida Keys National Marine Sanctuary. This wasn't good for the Wellwood, and it was disastrous for Molasses Reef; 1,280 square meters of coral reef habitat were utterly destroyed, reduced to pulverized coral rubble.

Court-awarded restoration funds were paid out over 15 years, delaying restoration. During that period, the site was hit by two hurricanes that excavated 14 craters in the crushed reef framework. Restoration finally began in 2001 when exposed areas were filled in with precast "Reef Replacement Modules" made of quarried limestone and concrete. Made to mimic natural coral outcroppings with nooks, crannies, and a reef cave, the structures represent the very latest thinking in coral reef restoration. Because the modules are innovative, monitoring the recovery of the Wellwood site is important to future restoration efforts. Lessons learned will benefit similar projects worldwide.

On June 17, 2004, in an event sponsored by National Oceanic & Atmospheric Administration (NOAA)/NOAA's National Ocean Service (NOS), the Marine Sanctuaries Program, and the National Geodetic Survey (NGS), a ten-inch diameter brass monument was placed at precise coordinates and permanently embedded in the reef. It is believed to be the first high-precision geodetic marker placed underwater anywhere in the world.

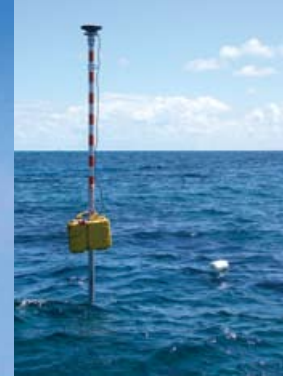
The marker is surrounded by a stainless steel frame to protect it and to provide attachment points for a meter tape and a portable fiberglass compass rose. Marine scientists can use these to accurately locate and measure features of interest in the recovery. When not being used as a monitoring tool, a spar buoy will be anchored to the frame by means of a tautline mooring system. Since the highly visible buoy is directly above the monument, boaters can use it to recalibrate Global Positioning System (GPS) units, allowing more careful navigation in this highly sensitive area. The buoy marks the Wellwood restoration area for divers and snorkelers, allowing exploration of this interesting and beautiful project. Natural reef processes are already beginning to cover the replacement modules with macroalgae, tunicates, sponges, corals, reef fish, mollusks, crustaceans, and countless other reef organisms. With the new monument in place, the reef can be monitored even as it gradually transforms, and the rate of recovery can be measured. Eventually, the repaired area should blend in perfectly with the surrounding reef and only the brass monument will mark the site of the M/V Wellwood damage.

— Gregory L. De Angelo, Electronics Engineer, Geosciences Research Division of National Geodetic Survey, resides in Homestead, Georgia.

— Harold Hudson, Reef Restoration Biologist, Florida Keys National Marine Sanctuary

— Jeff Anderson, Photographer, Florida Keys National Marine Sanctuary

Source The SurveyLog 15, no. 3



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