

QUANTIFICATION OF TRAWL DAMAGE TO PRE-MODERN SHIPWRECK SITES: CASE STUDIES FROM THE AEGEAN AND BLACK SEAS

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The past four years of exploration by the E/V Nautilus off the Aegean and Black Sea coasts of Turkey have located 40 pre-modern shipwrecks, ranging from Archaic Greek to early 19th century. More importantly, these wrecks also range in their state of preservation, due in a large part to the amount each site has been damaged by bottom trawling activities. Analysis was conducted of the damage reflected by each wreck site, the extent and intensity of trawl scars visible in side-scan sonar mapping, and the proximity of each site to the coast and other areas of fishing restrictions. In the Black Sea, these results are correlated with evidence of anoxic events caused by internal wave activity at the oxic/anoxic interface, reflected by the preservation of wooden shipwrecks. These data show areas of the Turkish coast where sites are more severely threatened or where they may have already been eradicated. Damage reflected by the dispersal of wooden timbers or by broken ceramic cargos indicates areas that may be aided by additional establishment and enforcement of marine protected areas.