

Measuring the sea: the first oceanographic cruise (1679-1680) and the roots of oceanography

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The first quantitative measurements of seawater properties were carried out by Count Luigi Ferdinando Marsili in a cruise between 1679 and 1680 in the Aegean Sea, Marmara Sea and the Bosphorus Strait. The data reported in the historical oceanographic treatise “Osservazioni intorno al Bosforo Tracio” (Marsili, 1681) allowed us to reconstruct the seawater density at different geographic locations in 1679-1680. The Marsili experimental methodology included the collection of surface and deep water samples from the ship, the analysis of the samples with a hydrostatic ampoule and the choice of a reference water to standardize the measurements. Reconstructed densities comparison with present day values show agreement within a 10-20% uncertainty owing to some aspects of the measurement methodology which are difficult to reconstruct from the documentary evidence. The experimental data collected in the Bosphorus allowed Marsili to enunciate a theory on the cause of the two-layer flow at the Strait, thereafter confirmed by many laboratory and numerical studies.