# Evaluation of the completeness and accuracy of an earthquake catalogue based on hydroacoustic monitoring

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NOAA's Pacific Marine Environment Laboratory (PMEL) produces a catalogue of Pacific Ocean earthquakes based on hydroacoustic monitoring from April 1996. The International Seismological Centre (ISC) worked without referring to the PMEL catalogue for earthquakes through April 2000, so the ISC and PMEL catalogues are independent until then. The PMEL catalogue includes many more intraplate and mid-ocean ridge earthquakes; more than 20 times as many earthquakes as the ISC catalogue in some areas. In some areas ISC earthquakes are nearly a strict subset PMEL earthquakes, but elsewhere many ISC earthquakes are not in the PMEL catalogue. Along the Pacific-Antarctic Plate Boundary (45°-70°S, 110°-180°W), for example, the PMEL catalogue misses out many ISC earthquakes, including a few MW(Harvard)>5 crustal earthquakes. Near the Cocos Ridge (2°-7°N, 81°-88°E) for many of the earthquakes in each catalogue, there is no corresponding earthquake in the other. Among earthquakes that are in both catalogues, location differences may be much greater than the formal location uncertainties. But formal errors are known to underestimate true location errors, so studying the seismic arrival time residuals with respect to the hydroacoucoustic origins and hydroacoustic arrival times residuals with respect to the seismic origins provides a more rigorous evaluation of the intrinsic differences between these two monitoring technologies.