Background: Accurate measurement of carotid plaque volume is an important measure for evaluating progression of carotid atherosclerosis. Using a novel GPS-like technique that allows for image fusion between ultrasound (US) and other imaging modalities including magnetic resonance imaging (MRI), we examined if CEA specimen volume measurements obtained with this novel 3DUS technique are comparable to MRI and true volume measurements. Methods: After imaging (Fig 1) 10 CEA specimens with a 3.0 Tesla Siemens MRI scanner, images were loaded on a LOGIQ E9 3D (GE Healthcare) US system. This GPS-like system utilizes a novel position sensing technology that uses an electromagnetic (EM) transmitter placed near the scan area and a pair of EM sensors attached to a bracket connected to the US transducer to allow for continued knowledge of transducer position and hence provide 3D information. Volumes were measured using a) VesselMASS (Leiden University) for MRI b) in-built software for 3DUS and c) water volume displacement (VD) for true volume. Results: The mean +/- standard deviation volume for MRI, 3DUS and VD were 1.25 +/- 0.36 mL, 1.43 +/- 0.44 mL, and 1.26 +/- 0.36 mL, respectively. The intra-class coefficient (ICC) between MRI and VD was 0.81, between 3DUS and VD 0.85, and between MRI and 3DUS 0.72. Bland-Altman analysis revealed insignificant bias for both MRI and 3DUS (Fig 2). Conclusion: Volume measurements acquired via this novel 3DUS technique were comparable to MRI and true volume measurements for ex vivo CEA specimens. Given the high ICC, this imaging fusion technology may allow comparison across imaging modalities and enhance our ability to obtain complementary information if validated in vivo.