



Cross-sensor Vicarious Calibration using Synthetic in-situ Data

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Inconsistencies can occur between estimations of water-leaving radiances (L_w) from two or more sensors over coincident locations within short time scales. This can be due to effects of different solar and sensor geometries between satellite sensor scenes and different sensor response functions. It can also be due to natural in-water variability occurring within the sensor's acquisition interval. Vicarious calibration uses in situ L_w data collected from surface stations to adjust sensor gains used in atmospheric correction. For cross-sensor calibration purposes we define "synthetic" as in situ L_w values estimated from a "base" sensor image; we then use this "synthetic" in situ data to vicariously calibrate overlapping data from a second sensor. We also examine time scales of natural variability to determine the image time separation over which this approach is valid. This cross-sensor "vicarious" calibration can help blend multiple sensor scenes that have missing pixels due to cloud cover. Furthermore, merging consistent measurements from multiple scenes/sensors can help fill-in missing water pixels.