



Impacts and uncertainties of upscaling of remote sensing data validation for a semi-arid woodland

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Over the last decade remote sensing products found their use in numerous public applications and scientific research. Frequent validation of remote sensing products is necessary to ensure the quality and accuracy. An important step in this process is the upscaling from field measurements of leaf area index (LAI) or other bio-geophysical variables to the scale of a high resolution satellite image. Unlike other vegetation types semi-arid woodlands are often characterized by a distinct vegetation pattern, a low vegetation cover and site variations in bare soil reflectance which influence the upscaling process. This paper focuses on the upscaling of LAI field measurements of a semi-arid woodland in northwest China and the uncertainties associated with it. The LAI measurements were scaled up using two different approaches. The first upscaling method uses an ordinary average of the LAI measurements. The alternative method uses an area based weighted average. The vegetation characteristics showed abundant small vegetation patches which were not accurately reflected in the systematic LAI field measurements. Therefore the alternative method which reflected the vegetation structure more accurately needs to be considered. We conclude that an area weighted average based on the fractional green vegetation cover is to be preferred over a simple average. If possible destructive sampling of the LAI is preferred over indirect LAI measurements to reduce the errors associated with vegetation clumping and the

presence of abundant non-green biomass.