

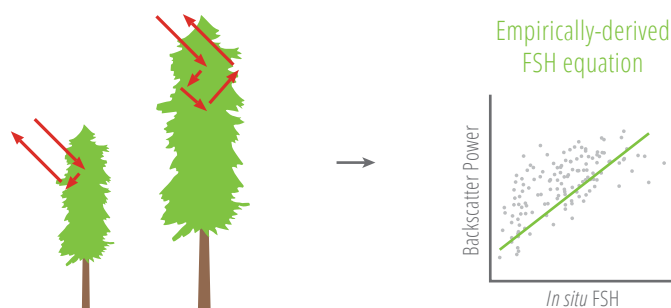
SAR & Estimating Forest Stand Height

A quick reference for three approaches using SAR to estimate FSH. For more information, check out the SAR Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation and associated training materials at [SERVIRglobal.net](https://servirglobal.net)

FSH METHOD 1: Backscatter

As a general rule, as Forest Stand Height (FSH) increases, the number of scatterers—and therefore, backscatter power—increases.

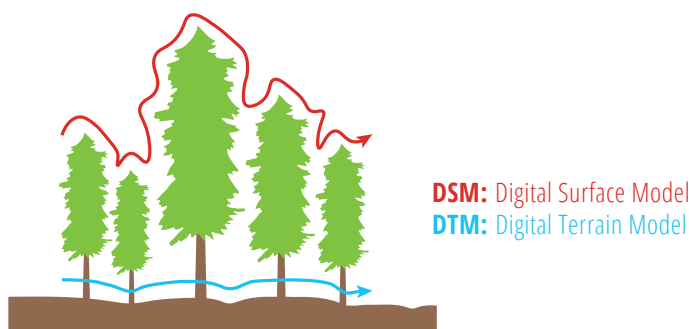
This relationship allows us to derive an empirical relationship between *in situ* FSH data and backscatter power.



FSH METHOD 2: InSAR

Interferometric SAR, or InSAR, uses the geometric relationship between two different SAR observations to calculate tree top elevation.

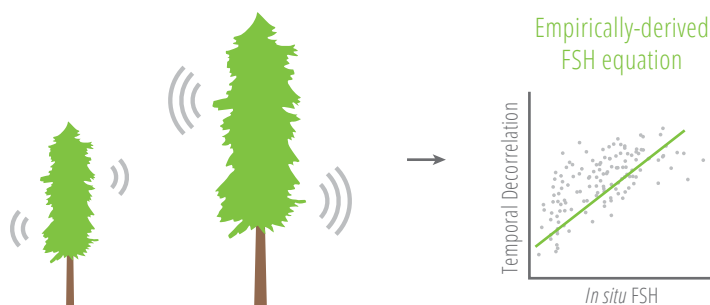
$FSH = \text{InSAR-derived Elevation} - \text{Surface Elevation}$



FSH METHOD 3: Temporal Decorrelation

As a general rule, the taller the FSH, the more movement exists between two SAR observations. This movement, or TD, can be calculated from repeat-pass InSAR.

We can thus derive an empirical relationship between *in situ* FSH data and temporal decorrelation.



SOURCE: Siqueira, Paul. "Forest Stand Height Estimation." SAR Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation. Eds. Flores, A., Herndon, K., Thapa, R., Cherrington, E. NASA 2019. DOI: 10.25966/4530-7686