

Three Slide Introduction

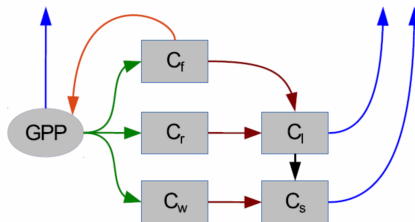
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PhD Title:

Understanding the Information Content in Diverse Observations of
Forest Carbon Stocks and Fluxes for Data Assimilation and
Ecological Modeling

4DVAR with DALEC



The DALEC model is coded up in a 4DVAR data assimilation scheme with cost function and gradient to be minimised where,

$$J = \frac{1}{2}(\mathbf{x}_0 - \mathbf{x}_B)^T \mathbf{B}^{-1}(\mathbf{x}_0 - \mathbf{x}_B) + \frac{1}{2} \sum_{i=0}^n (\mathbf{y}_i - \underline{h}_i(\mathbf{x}_i))^T \mathbf{R}_i^{-1}(\mathbf{y}_i - \underline{h}_i(\mathbf{x}_i))$$

$$\nabla J = \mathbf{B}^{-1}(\mathbf{x}_0 - \mathbf{x}_B) - \sum_{i=0}^n \mathbf{M}_{i,0}^T \mathbf{H}_i^T \mathbf{R}_i^{-1}(\mathbf{y}_i - \underline{h}_i(\mathbf{x}_i)).$$

DA Run with initial guess $x_0=[40.0, 102.0, 770.0, 40.0, 9897.0]$

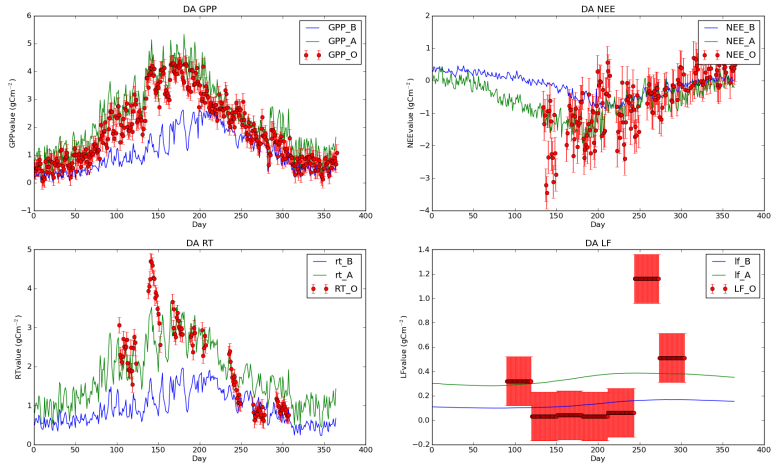


Figure : 4DVAR DALEC with a 365 day assimilation window and only observations of NEE assimilated.