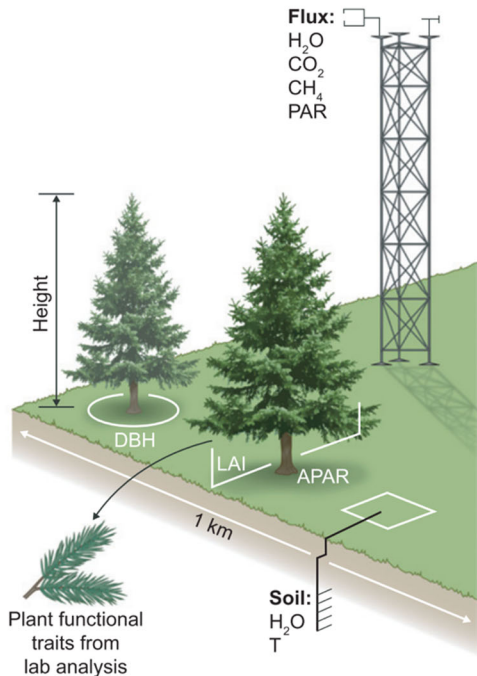


ECL 298: Environmental Data Science

Professor: Troy Magney | <https://magneylab.ucdavis.edu> | tmagney@ucdavis.edu
Fall 2022 | 3 credits | M & W 2:10-4:00 PM | CRN: 29727

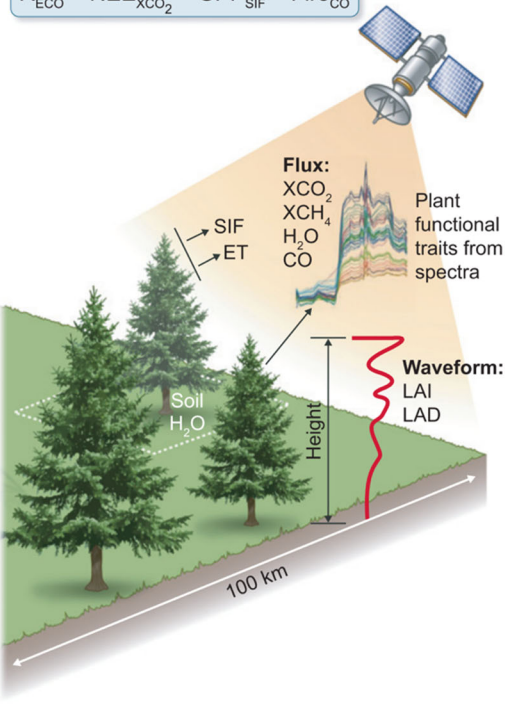
In situ

Carbon equation
 $GPP = NEE_{EC} - R_{ECO}(\text{night})$



Space

Carbon equation
 $R_{ECO} = NEE_{XCO_2} - GPP_{SIF} - Fire_{CO}$



Environmental data: *Where does it come from? Where does it go? And how can we use it to advance plant, agricultural and ecological research?*

Overview: Understanding quantitative approaches for collecting, analyzing and interpreting environmental data used in ecological research. You will learn how to leverage data to form and frame relevant questions and identify patterns by working at the intersection of interdisciplinary fields.

Major themes include: Emerging technologies. Proximal and satellite based remote sensing (lidar, radar, thermal, multi-hyperspectral). Network analysis of flux tower, meteorological, soil and climate data. Applications of data science in environmental research (machine/deep learning, neural networks, cloud computing and artificial intelligence). Spatial and temporal characteristics of environmental data. Model-data assimilation for gaining mechanistic insights into plant structure and function. Uncertainty quantification. Data visualization.

No coding experience necessary, though some simple coding examples (in R and python) will be used. Note: ECL 198 'R Davis' would be a useful compliment to this course!