

An Integrated Observatory for Redwood Forest Health

Directly and continuously measuring carbon dioxide, water, and energy exchange

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Flux towers provide continuous measurement of how much carbon, water, and energy are entering and leaving an ecosystem over time. In this way we can estimate how changes in weather are affecting the health of an ecosystem. Over the long-run, with direct and constant monitoring, we can then estimate how climate change is affecting an ecosystem. For the first time, flux towers will be located in California's redwood forest ecosystem to provide critical climate change and forest health information.



Photo taken at US-Ho1
Howard Forest Eddy-Covariance Site, ME
A long-operating site since 1996

Carbon Uptake

- Monitor carbon flow into/out of the redwood forest
- Understand how climate, management, or disturbance influences carbon flow and redwood forest health

Water Use

- Quantify water used (transpired) by a redwood forest
- How do climate, fog, or drought affect redwood forest water use?

Ecosystem-level Observations

- Using satellite data and computer models along with flux tower data, we can get a better understanding of how all of the redwoods throughout California are being impacted, or will be impacted, by climate change

Phase 1 (2023-2026) Site Establishment, Instrumentation, Data Analysis, & Outreach

- The project will establish two flux towers at Jackson Demonstration State Forest located in:
 - **Intermediate forest:** 60-120 years of age; Canopy height: 110'-130'; 200+ acre uniform stand; Gentle slope
 - **Young Forest:** < 40 years; Canopy height: 60'; 20-45 acre uniform stand; Gentle slope
- Tower footprints are small (~6'x4') and will be built with minimal site disturbance to ensure surrounding forest is protected for measurements
- A full suite of instruments (100+ variables) will be installed on each tower

