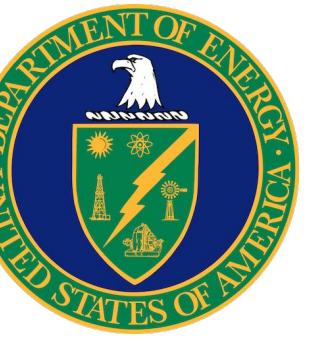




# NGEE-Tropics

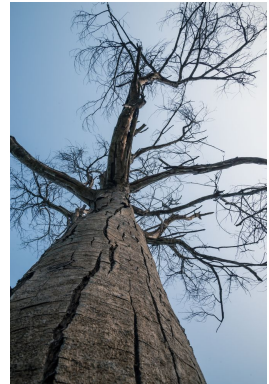
## Utilizing Interdisciplinary Strategies for Next Generation Ecosystem Experiments Tropics Data Organization

Emily Robles, Deb Agarwal, Danielle Christianson, Boris Faybishenko, Robinson Negron Juarez, Gilberto Pastorello, Charuleka Varadharajan  
Lawrence Berkeley National Laboratory



### OUR PROJECT

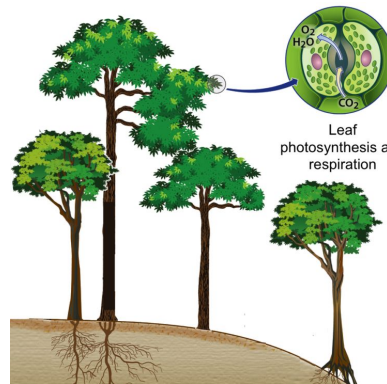
The goal of NGEE-Tropics is to develop a predictive understanding of how tropical forest carbon balance and climate system feedbacks will react to changing environmental drivers over the 21st Century. Data collected by NGEE-Tropics researchers offers insight into how tropical forests in Central and South America respond to..



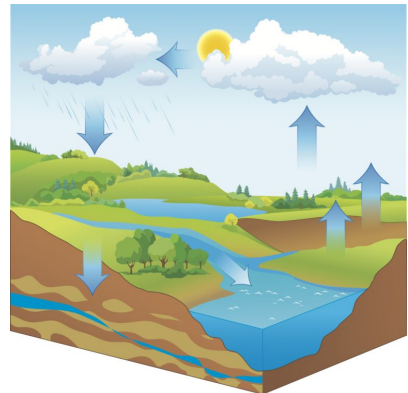
Drought



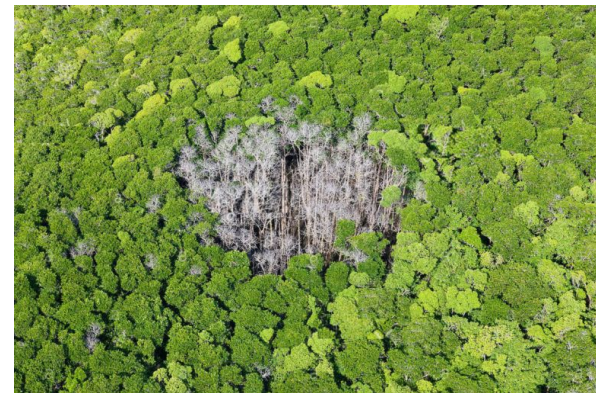
Anthropogenic Disturbance



CO<sub>2</sub> and Temperature



Hydrology



Natural Disturbance



Nutrient Constraints

Dataset ID	Dataset Title	Access Level	Submission Date
NGE0041	FRAMES Metadata Reporting Templates for Ecological Observations, version 1.1	Public	2018
NGE0042	Hurricane Maria Puerto Rico Landsat Analysis	Public	2018
NGE0044	El Verde Ridge, El Verde Valley, and Rio Tocaes root phosphorus and bacterial community composition (December 2015)	Public	2018
NGE0047	Leaf gas exchange survey by leaf age, Feb2017, PA-SLZ: Panama	NGEE Tropics	2018
NGE0050	Seven years (2008-2014) of meteorological observations plus a synthetic El Niño drought for SCZ Panama	NGEE Tropics	2018
NGE0043	Leaf mass area, Feb2016-May2016, PA-SLZ, PA-PNM, PA-BCI: Panama	NGEE Tropics	2017
NGE0039	Diurnal leaf gas exchange survey, Feb2016-May2016, PA-SLZ, PA-PNM, PA-BCI: Panama	NGEE Tropics	2017
NGE0038	Leaf sample detail, Feb2016-May2016, PA-SLZ, PA-PNM, PA-BCI: Panama	NGEE Tropics	2017
NGE0036	Leaf water potential, Feb2016-May2016, PA-SLZ, PA-PNM, PA-BCI: Panama	NGEE Tropics	2017
NGE0044	CO2 response (AC) gas exchange, calculated Vmax & Jmax parameters, Feb2016-May2016, PA-SLZ, PA-PNM, PA-BCI: Panama	NGEE Tropics	2017
NGE0034	Xylem vulnerability curves of canopy branches of mature trees from Caxiuanã and Tapajós National Forests, Para, Brazil	Public	2017
NGE0032	Leaf Pressure Volume Data in Caxiuanã and Tapajós National Forest, Para, Brazil (2011)	Public	2017

A variety of data types are collected including sapflow, ecohydrological, and meteorological measurements. The data team collaborates with researchers to curate their data packages before approval and publication on the NGEE-Tropics archive.

### GOALS

1. Design an easy to use data archive with a streamlined submission process
2. Define standards for reporting file and package level metadata
3. Promote researcher engagement in data curation
4. Improve the quality, longevity, and reproducibility of NGEE-Tropics data

### THE SUBMISSION AND APPROVAL PROCESS

Through the data archive, users can internally curate and publish data with a digital object identifier (DOI). Package level metadata is easily collected and organized using our data submission form, which is visible to archive users before downloading any data.

1:1 meetings and project wide presentations are used to train scientists on the elements of quality data packages and include topics such as..

- Package organization
- Submission steps and demonstrations
- Data package and file examples

#### Example

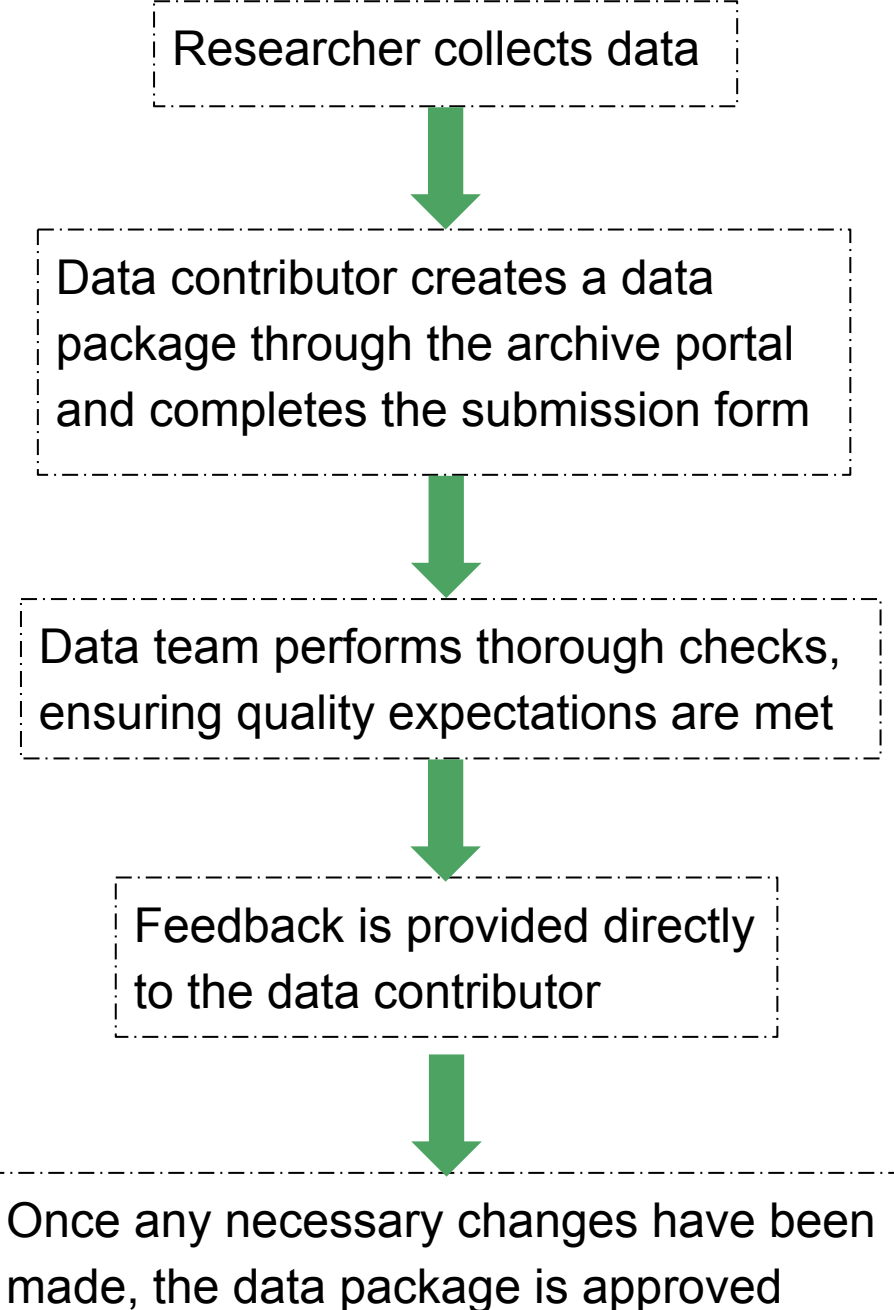
Format as you would a publication title  
Include type of sample, date, and location  
If related to publication, ideally format "Title of paper, Journal: Data"

Leaf sample details, leaf traits by age, Feb2017, PA-SLZ: Panama  
Dataset ID: NGE0045  
Dataset Version: 1.0  
Dataset Name: Leaf sample details, leaf traits by age, Feb2017, PA-SLZ: Panama  
Dataset Description: Details of leaves sampled for leaf water potential and gas exchange measurements from PA-SLZ, February 2017. Sunlit canopy leaves of APEIME, GUATDU, MICOBO, TERMAM, VIROSP and VOCHFE species were collected before dawn and around midday. Data for each sample includes species, age, sample number and a photograph. This data was collected as part of the 2017 BNL-STRI leaf traits by age campaign. See related datasets (existing and future) for leaf water potential, leaf spectra, sap flow, LMA, gas exchange and leaf chemistry.  
PA-SLZ: Bosque Protector San Lorenzo (Fort Sherman)  
Dataset Field Site(s):  
Dataset Author(s): Kim Ely < kely@lbnl.gov >  
Alistair Rogers < arogers@lbnl.gov >  
Shawn Serbin < sserbin@lbnl.gov >  
Jin Wu < jwu@lbnl.gov >  
Brett Wolfe < bwo@lbnl.gov >  
Dataset Originating Institution(s): Brookhaven National Laboratory; STRI  
Author order will be the same as citation order

Description should formatted similarly to an abstract:  
Concise description of purpose and content of data package  
Adequate information to decide if data is useful to a user  
Complete sentences, correct grammar

Spell out originating institution(s)

### PUBLICATION WORKFLOW

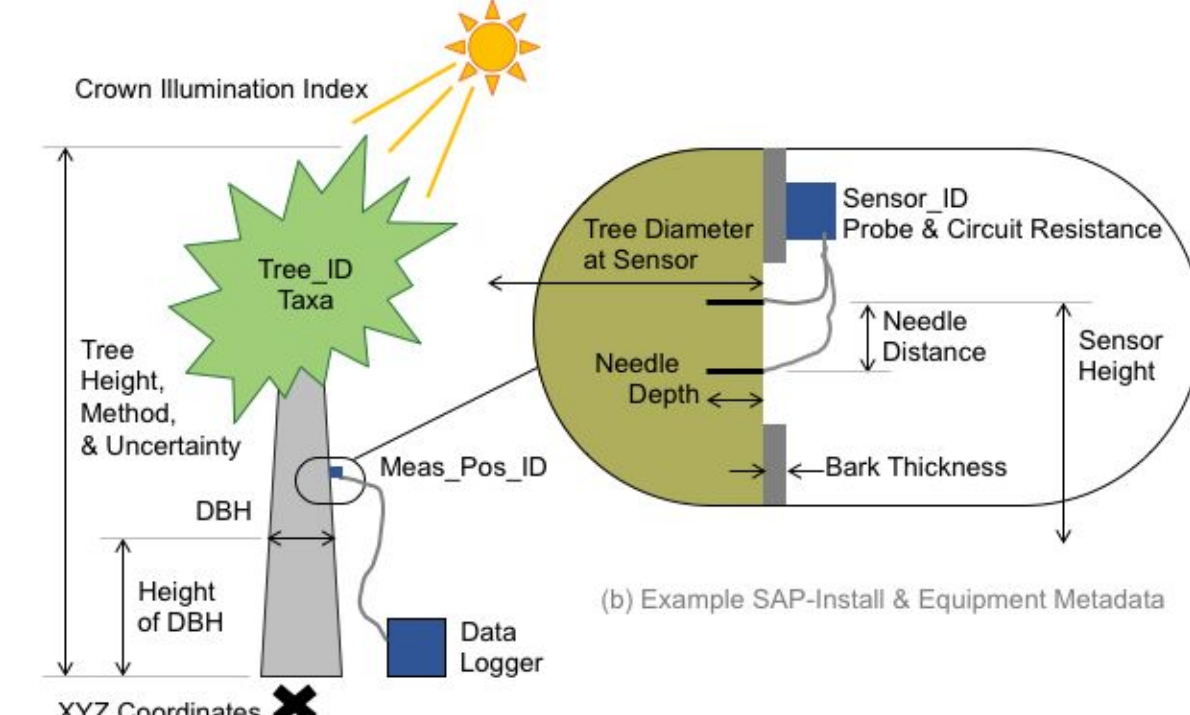


### A COMMUNITY CENTERED APPROACH

Interdisciplinary group work and community outreach were utilized to meet our main objectives.

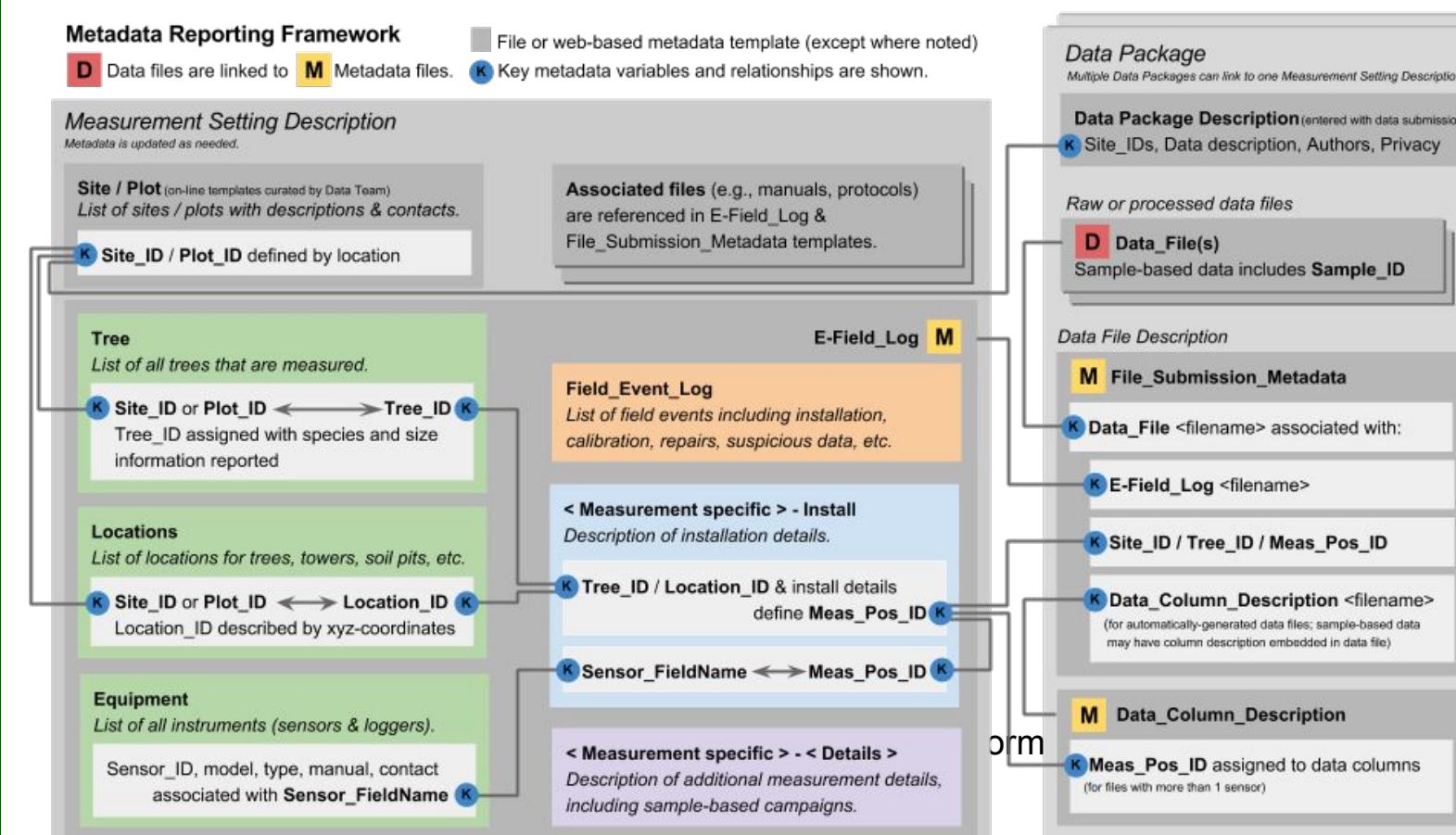
#### FILE LEVEL METADATA

To record file level metadata, the NGEE Tropics Archive and metadata reporting templates (FRAMES) were designed using user-experience research methods to incorporate user feedback through interviews and surveys.



Danielle Christianson, et al. (2017). "A metadata reporting framework (FRAMES) for synthesis of ecohydrological observations." Ecological Informatics Volume 42, November 2017, Pages 148-158.

The resulting three Excel and online templates describe the measurement setting, data collection, and data file organization. This standardization enables cross-site comparison for different sensor types in various formats, QA/QC, and processing levels.



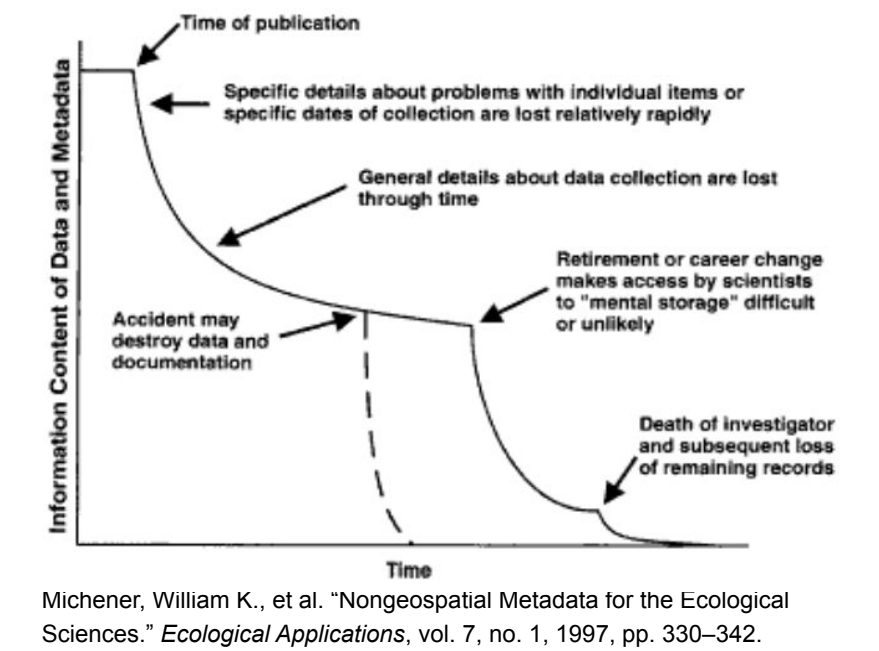
#### PACKAGE LEVEL METADATA

Package level metadata for each dataset is reviewed using a series of quality checks. These expectations align with community agreed standards, including those implemented by data repositories and scientific journals, and are tailored specifically for NGEE-Tropics.

A focus on community input ensured that these standards fit within the existing workflows of researchers.

### ONGOING OBJECTIVES

1. Create data packages with sufficient metadata for reuse by researchers to answer multiple scientific questions
2. Maximize the longevity of NGEE-Tropics data to increase its impact
3. Increase awareness and prioritization of data package quality through educational opportunities for research teams



The scientific community benefits from your data, and **"No data set is perfect and self explanatory"** without complete metadata to accompany it.

Don't let your data die with you!

### IMPACT

The NGEE-Tropics archive currently has..

107 total data packages, 45 of which are publicly available, and 172 unique users.  
Data packages on the archive have been downloaded 1316 times.

A focus on generating high quality metadata as part of creating the NGEE-Tropics data legacy will benefit the tropical research community for decades into the future.

### ACKNOWLEDGMENTS

Danielle Christianson, et al. (2017). "A metadata reporting framework (FRAMES) for synthesis of ecohydrological observations." Ecological Informatics Volume 42, November 2017, Pages 148-158. Accessed at <http://dx.doi.org/10.15486/ngt/1419956>.

Kim Ely, Alistair Rogers, Shawn Serbin, Jin Wu, Brett Wolfe(2019). Leaf sample details, leaf traits by age, Feb2017, PA-SLZ: Panama. NGEE Tropics Data Collection. Accessed at <http://dx.doi.org/10.15486/ngt/1508122>.

Michener, William K., et al. "Nongeospatial Metadata for the Ecological Sciences." *Ecological Applications*, vol. 7, no. 1, 1997, pp. 330-342. *JSTOR*, [www.jstor.org/stable/2269427](http://www.jstor.org/stable/2269427).

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