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Forest Inventories at Burned and Unburned Tropical Forest Sites, Acre, Brazil, 2014

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Summary

This dataset provides measurements for diameter at breast height (DBH) and species identification of trees for inventories taken at five tropical forest sites in Acre state, Brazil, in the southwestern Amazon region. The sites included one in a forest reserve (Reserva Bonal) and four within forest fragments situated on private property. The inventory sites included forests burned in 2005 and 2010 and also unburned forests. Surveys were conducted in July and August 2014.

Data are provided in two comma separated (*.csv) files.



Figure 1. Photos of recovering burned (left) and unburned (right) sampling sites show vegetation changes due to burning and recovery of aboveground biomass after burning. Photos courtesy of I. Numata.

Citation

Numata, I., M.A. Cochrane, J. Kjaersgaard, and S.S. da Silva. 2018. Forest Inventories at Burned and Unburned Tropical Forest Sites, Acre, Brazil, 2014. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1563>

Table of Contents

- [1. Data Set Overview](#)

2. [Data Characteristics](#)
3. [Application and Derivation](#)
4. [Quality Assessment](#)
5. [Data Acquisition, Materials, and Methods](#)
6. [Data Access](#)
7. [References](#)

1. Data Set Overview

This dataset provides measurements for diameter at breast height (DBH) and species identification of trees for inventories taken at five tropical forest sites in Acre state, Brazil, in the southwestern Amazon region. The sites included one in a forest reserve (Reserva Bonal) and four within forest fragments situated on private property. The inventory sites included forests burned in 2005 and 2010 and also unburned forests. Surveys were conducted in July and August 2014.

Related Publication:

Numata, I., Silva, S.S., Cochrane, M.A., d'Oliveira, M.V.C., 2017. Fire and edge effects in a fragmented tropical forest landscape in the southwestern Amazon. *Forest Ecology and Management*, 401, 135-146. <https://doi.org/10.1016/j.foreco.2017.07.010>

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2. Data Characteristics

Spatial Coverage: Forest inventories were conducted in the eastern part of Acre state, Brazil

Spatial Resolution: 25 x 25 m plots were established every 100 m along 500 m transects in selected forested areas

Temporal Coverage: Surveys were conducted in July and August 2014.

Temporal Resolution: One time inventory

Study Area (All latitude and longitude given in decimal degrees)

Site	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Acre, Brazil	-67.63699	-67.01988	-9.73446	-9.89909

Data File Information

This dataset is comprised of two comma separated (*.csv) formatted files: forest inventory data and inventory plot locations.

Inventory data: forest_inventory_acre_2014.csv

Column	Colum Heading	Unit/Format	Description
1	Area		There are five inventoried areas located in Acre.
2	Transect		The transect ID number within an area.
3	Plot		The plot ID number within a transect
4	Sample		Plot size depending upon DBH class. 25 x 25 m, 10 x 10 m, and 5 x 5 m
5	Forest_fire		Forest classes: Forest burned in "2005", "2010", "Burned date unknown", and "unburned".
7	DBH	cm	Diameter at Breast Height, 1.3 m above the ground
8	Dead		Dead trees identified with value "Dead"
13	Scientific_name		Scientific name of tree. Some "Not Identified"

14	Family		Family name of tree. Some "Not Identified"
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Plot locations: forest_inventory_acre_locations_2014.csv

Column	Column Heading	Units	Description
1	Area		There are five inventoried areas located in Acre.
2	Transect		The transect ID number within an area.
3	Plot		The plot ID number within a transect
4	Easting	meters	Location of plot center, Easting, UTM Zone 19S, WGS84
5	Northing	meters	Location of plot center, Northing, UTM Zone 19S, WGS84
6	Longitude	Decimal degrees	Location of plot center, Longitude, WGS84
7	Latitude	Decimal degrees	Location of plot center, Latitude, WGS84

3. Application and Derivation

In Numata et al. (2017), the data were used to characterize the post-fire forest recovery of sites from wildfires in 2005 and 2010 and determine the edge effects on forest aboveground biomass (AGB) and stem density in different tree size classes in the five fragmented forest areas.

4. Quality Assessment

Sampled stems were classified as live or dead and botanically identified to species or higher taxon (genus or family) level by two botanists.

5. Data Acquisition, Materials, and Methods

Sites

Forest inventories were conducted from July to August 2014 at five tropical forest sites in the eastern side of Acre state in Brazil. The study sites included one in a forest reserve area (Reserva Bonal, A1) and four within forest fragments situated in private properties (A2 to A5) (Figure 2).

The forest reserve has been under a sustainable development project led by the Institute of Agricultural Reform and Colonization (INCRA). All sites were located within a distance of 67 km of each other. Sites included forests burned in 2005 and 2010 and also unburned areas.

Sampling Transects

We established thirty-two 500-m transects across the study region. To establish transects for forest inventories in fragmented forests, we selected areas where forest edges are clearly defined and consist of straight lines and avoided fuzzy edge zone with irregular shapes, while transects were established in forests edges near roads within the reserve. Each transect was designed to contain six 25 m x 25 m plots in every 100 m starting from forest edge up to 500 m into the interior of the forest. However, due to occasional events, such as forest fires undetected by our image inspection, five transects had less than six plots. In total, 127 25 m x 25 m plots (14.25 ha) were sampled over unburned forests and 54 plots were sampled in burned forests. Of these burned plots, 18 were burned in 2005 and 36 burned in 2010. Our study plots of "unburned" forests were distributed across five forest areas.

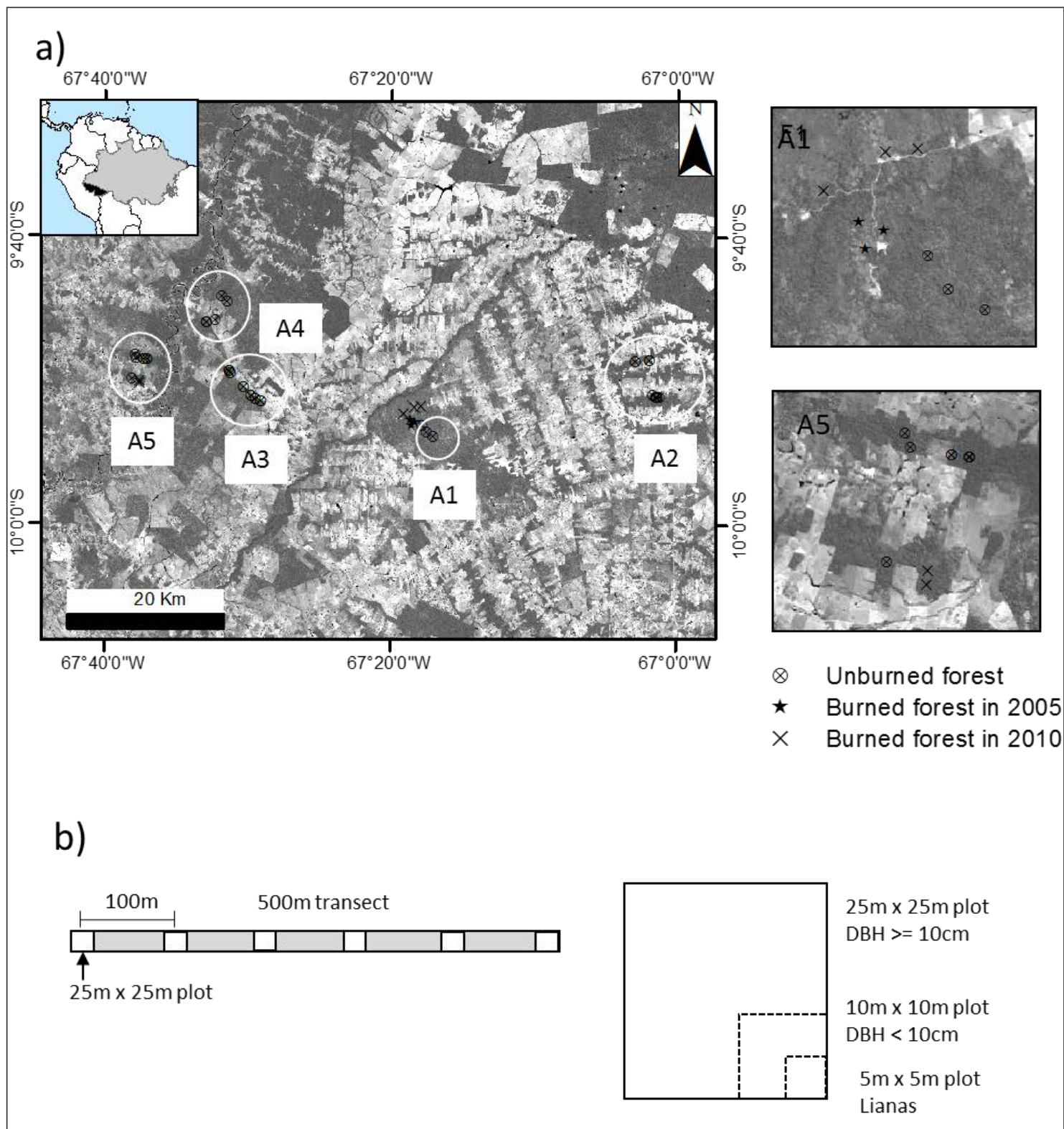


Figure 2. a) Acre state location in South America (top right map); studied areas distribution (bottom right image) and forest inventories conducted in five forest areas (marked by circles) consisted of four forest fragments (A2 to A5) and one continuous forest area (A1) (zoomed image). Different symbols in the map indicate transect sites in unburned and burned forests. A1 is located in Reserve Bonal and includes forests burned in 2005 and 2010, and unburned areas. There are two more sites burned in 2010 in A5. **b)** Illustration of a 500 m transect with the six 25 m x 25 m plots and 10 m x 10 m and 5 m x 5 m sub-plots. From Numata et al., 2017.

Tree Inventory

All stems with DBH >10 cm were measured within the 25 x 25 plots. Within each plot, we set subplots of 10 m x 10 m and of 5 m x 5 m to sample stems with DBH < 10 cm and lianas, respectively. Sampled stems were classified as live or dead and botanically identified to species or higher taxon (genus or family) level by two botanists.

Species were divided into pioneer and non-pioneer classes. The presence of pioneer species is an indicator of disturbance. Identified pioneer species are listed in Figure 3.

Table 1
Total number and relative density of pioneer species individuals identified in the burned and unburned study areas in Acre State, southwestern Amazon.

Species	Number	%
<i>Apeiba membranacea</i>	46	3.4
<i>Bauhinia</i> spp.	13	1.0
<i>Bixa urucurana</i>	322	23.7
<i>Carica microcarpa</i>	38	2.8
<i>Cecropia</i> spp.	477	35.1
<i>Cochlospermum orinocense</i>	23	1.7
<i>Colubrina glandulosa</i>	17	1.3
<i>Erythrina amazonica</i>	27	2.0
<i>Piper</i> spp.	30	2.2
<i>Sapium marmieri</i>	19	1.4
<i>Schefflera morototoni</i>	15	1.1
<i>Stryphnodendron pulcherrimum</i>	21	1.5
<i>Urera</i> spp.	71	5.2
<i>Vismia</i> spp.	154	11.3
<i>Zanthoxylum rhoifolium</i>	34	2.5
Other species less than 1% of the pioneer species group	53	3.9

Figure 3. Pioneer species identified in both burned and unburned study areas. From Numata et al., 2017.

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

[Forest Inventories at Burned and Unburned Tropical Forest Sites, Acre, Brazil, 2014](#)

Contact for Data Center Access Information:

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7. References

Numata, I., Silva, S.S., Cochrane, M.A., d'Oliveira, M.V.C., 2017. Fire and edge effects in a fragmented tropical forest landscape in the southwestern Amazon. *Forest Ecology and Management*, 401, 135-146. <https://doi.org/10.1016/j.foreco.2017.07.010>



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