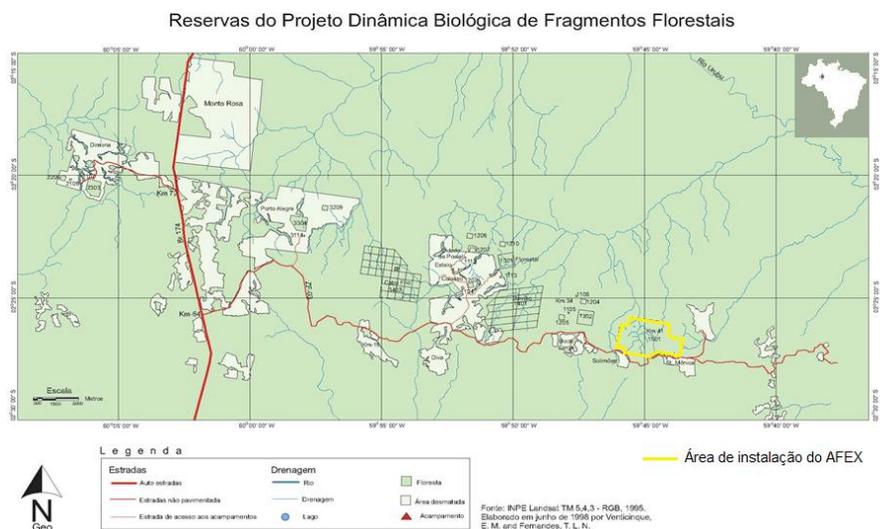


## 1. Study area

The study was developed inside the Biological Dynamics of Forest Fragments Project (BDFFP) area, in the KM41 reserve, located ~100 km from Manaus city, in the 41 kilometer of the vicinal road ZF-3 of the BR-174 highway (02° 24'S, 59°52'W) (**Figure 1**). Local soils are clay-rich Ferrasols which cover ~ 30% of the Amazon Basin (Quesada et al. 2011). Rainfall ranges from 1900 - 2500 mm annually with a pronounced dry season from June to October (Ranking de Merona et al. 1992). In relation to forest structural variables was estimated an AGB (above ground biomass) of  $322 \pm 54 \text{ Mg ha}^{-1}$  ( $\text{ind} \geq 10 \text{ dbh}$ ) and mean wood density of  $0.67 \text{ g cm}^{-3}$  (Duque et al. 2017). Regarding species richness, it was found about 280 species ( $\geq 10 \text{ cm dbh}$ ) per hectare (de Oliveira and Mori, 1999).

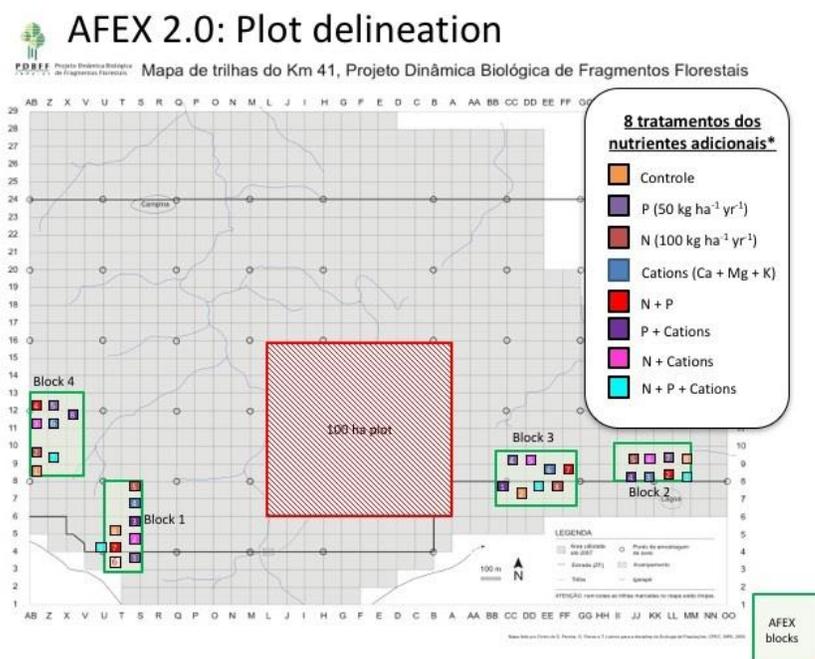


**Figure 1** – Location map of the Biological Dynamics of Forest Fragments Project (BDFFP) area. The study was developed in the KM41 reserve (yellow).

## 2. Sampling design

## 2.1 – Amazon Fertilization Experiment (AFEX)

AFEX started in March 2017, and consists in a full factorial fertilization experiment. The experiment has eight treatments, with four replicates per treatment, totalling 32 plots, divided into four independent blocks at least 200 meters apart from each other. The treatments consist of the factorial application of: N ( $125 \text{ kg N ha}^{-1} \text{ year}^{-1}$ ) as urea; P ( $50 \text{ kg P ha}^{-1} \text{ year}^{-1}$ ) as triple superphosphate; and the Cations: K ( $50 \text{ kg K ha}^{-1} \text{ year}^{-1}$ ) as potassium chloride - KCl, Ca ( $160 \text{ kg Ca ha}^{-1} \text{ year}^{-1}$ ) and Mg ( $160 \text{ kg Mg ha}^{-1} \text{ year}^{-1}$ ) as dolomitic limestone. The treatments are: Control; nitrogen (N); phosphorus (P); cations; nitrogen (N) + phosphorus (P); nitrogen + cations; phosphorus (P) + cations and finally nitrogen (N), + phosphorus (P) + cations. Plots size is 50 x 50 meters and all are at least 50 meters apart from each other. All plots were established in areas with similar soil, vegetation and topography (Figure 2).



**Figure 2.** Location map from all fertilized AFEX blocks and plots inside the KM41 reserve.

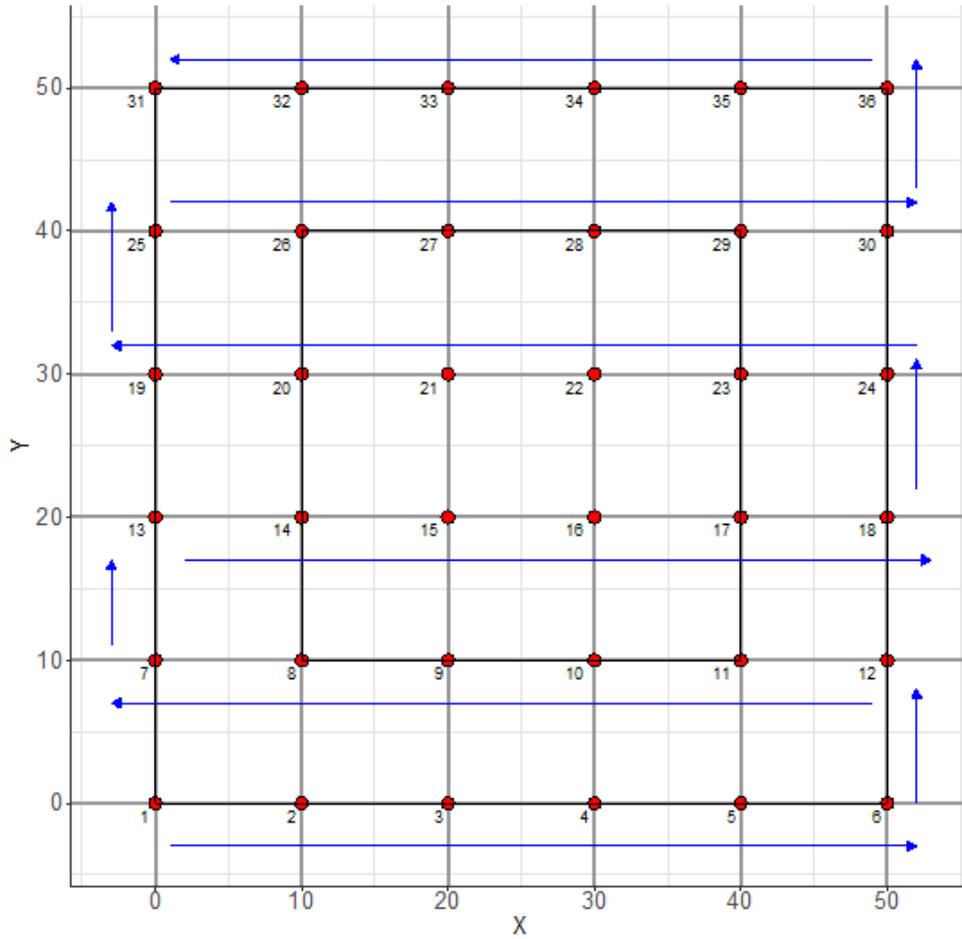
Fertilization is carried out annually, divided into three applications, in order to mitigate nutrient loss by leaching and runoff. Fertilizers are spread by hand throwing during a systemic walk within the plots.

## **2.2 Collection methods**

The points were collected in 36 points inside the plot with the LAI -2200 C (**Figure 3**). The data were collected from 6 am to 5 pm, avoiding recording data between 12:00 and 2:00 pm, to avoid direct sun. The LAI-2200 C requires an above canopy reading for reference, and in our case the optical sensor was placed in a clearing to log automatically while the user operator collected manually below the canopy. The sensors were always placed in the same compass direction ( both in the west in the morning and east in the afternoon). We used a view cap of 45 °C in the sensors to remove the operator from the sensor's view. The sensors were matched before the data collection, as recommended in the manual.

The row data were analysed using the FV2200 software, where LAI was obtained ( $m^2$  one sided foliage area/  $m^2$  ground area), that was computed with 5, 4 and 3 rings, and each ring respond over a different range of zenith angles.

The data were collected in October 2017, March 2018, August 2018 and October 2018 in a fertilization experiment in Central Amazon (Brazil, Amazonas, Manaus).



**Figure 3:** Schematic of LAI sample locations. Blue arrows indicate sampling path. Red symbols represent sampling points above each of the plot markers placed every 10 m.

### 3. Data spreadsheet

The spreadsheet contains (**Figure 4**):

A	B	C	D	E	F	G	H	I	J
CENSO	PlotID	B_Obs	Time	LAI_5_rings	Time	LAI_4_rings	Time	LAI_3_rings	Date
1	B1P1	1	10:23:34	4,16018	10:23:34	5,18498	10:23:34	6,76648	October_2017
1	B1P1	3	10:24:12	4,46654	10:24:12	5,74039	10:24:12	7,27109	October_2017
1	B1P1	5	10:24:48	2,62908	10:24:48	3,21916	10:24:48	4,01533	October_2017
1	B1P1	7	10:25:36	4,59412	10:25:36	5,63722	10:25:36	7,19348	October_2017
1	B1P1	9	10:26:08	5,05727	10:26:08	6,19376	10:26:08	7,24898	October_2017
1	B1P1	11	10:26:31	4,7458	10:26:31	5,92302	10:26:31	7,38238	October_2017
1	B1P1	13	10:27:04	4,07063	10:27:04	4,94322	10:27:04	6,42274	October_2017
1	B1P1	15	10:27:33	5,14844	10:27:33	6,45339	10:27:33	7,86047	October_2017
1	B1P1	17	10:28:01	3,29737	10:28:01	4,06789	10:28:01	5,8931	October_2017
1	B1P1	19	10:28:41	4,36531	10:28:41	5,32214	10:28:41	6,86658	October_2017
1	B1P1	21	10:29:17	3,65557	10:29:17	4,67626	10:29:17	7,38513	October_2017

**Figure 4.** leaf area index data spreadsheet deposited in EIDC system.

**Column A – CENSO:** Sampling number

**Column B – PlotID:** combination of block and plot codes

**Column C – B\_Obs:** The 36 points that were collected

**Column D – Time:** The time it was collected in hours, minutes and seconds.

**Column E – LAI\_5\_rings:** LAI computed with 5 rings.

**Column F – time:** The time it was collected in hours, minutes and seconds.

**Column G – LAI\_4\_rings:** LAI computed with 4 rings.

**Column H– Time:** The time it was collected in hours, minutes and seconds.

**Column I – LAI\_3\_rings:** LAI computed with 3 rings.

**Column J – Date:** campaign date in year\_month

**Column K – coord x:** the horizontal points on the x axis in the plots (can be 0, 10, 20, 30, 40, 50 m).

**Column L - coord y:** the vertical points on the y axis in the plots ( can be 0, 10, 20, 30, 40, 50 m).

### 3. References

**Duque A, Mulher Landare, HC, Valencia R, Cardenas D, Davies S, de Oliveira A, Perez AJ, Romero Santos H, Vicentini A. 2017.** Insights into regional patterns of Amazonian forest structure and dominance from three large terra firme forest dynamics plots. *Biodiversity and Conservation*, 26:669-686.

**De Oliveira A, Mori SA. 1999.** A central Amazonia terra firme forest. I. High tree species richness on poor soils. *Biodiversity and Conservation*, 8: 1219-1244.

**Quesada, CA. Lloyd, J. Anderson, LO. Fyllas, NM. Schwarz, M. Czimczik, C. I. 2011.** Soils of Amazonia with particular reference to the RAINFOR sites. *Biogeosciences*. v.8. 1415-1440.

**Rankin de Merona, J.M., Prance, J.M., Hutchings, R.W., Silva, R.M., Rodrigues, W.A., Uehling, M.A. 1992.** Preliminary results of a large scale inventory of upland rainforest in the Central Amazon. *Acta Amazonica* 22, 493-534.