



# SOY MORATORIUM

2014/2015





## EXECUTIVE SUMMARY

The Soy Moratorium is a market commitment set up by the GTS (Soy Task Force), which is formed by the members of ABIOVE (Brazilian Vegetable Oil Industries Association) and ANEC (National Grain Exporters Association), by the Ministry of the Environment, the Bank of Brasil and civil society organizations (Conservação Internacional, Greenpeace, IPAM-Institute of Environmental Research in the Amazon, IMAFLORA-Institute of Forestry & Agricultural Management & Certification, TNC and WWF-Brasil). The objective of this commitment is to eliminate deforestation in the Amazon biome caused by the soy production chain. The Soy Moratorium was signed on July 24, 2006, largely motivated by the high and growing rates of deforestation observed in the Amazon, especially between the years 2001 and 2004, culminating in the campaign “Eating up the Amazon”<sup>1</sup>. The efficacy of the Soy Moratorium is internationally recognized and the positive impacts of this pact are reported in various scientific studies. The greatest proof of success is that, during the first seven years of the pact’s existence, only a very small portion of the total deforestation in the Amazon biome was planted with soy. However, it did not stop soy from expanding into areas that had been cleared before the Soy Moratorium went into effect, thus demonstrating that it is possible to reconcile increased soy production with a mitigation of deforestation. The Soy Moratorium, which will continue in effect through May 31, 2016, recently underwent a change in its reference date as a result of the new Forest Code; the new reference date is now July 22, 2008.

The deforestation estimates made by PRODES (Deforestation Monitoring of the Brazilian Legal Amazon) during the period August 2008 to July 2014 (PRODES 2009-2014) identified approximately 3,405,700 hectares (13,149 sq.miles) of deforested land throughout the Amazon biome, with 2,657,117 hectares (10,259 sq.miles), or 79%, in the three monitored states (Mato Grosso, Pará and Rondônia), where nearly all the soy production, in this biome, is concentrated. In these three states, the 76 municipalities responsible for 98% of the Amazon biome’s soy acreage were monitored, identifying 494,933 hectares (1,911 sq.miles) that have been deforested, or 14.5% of the total deforestation in the Soy Moratorium’s new reference period starting in July 22, 2008.

Soy planted in nonconformity with the Soy Moratorium is detected each crop year through satellite images obtained by sensors with complementary spatial and temporal resolutions,

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1 Greenpeace. Eating up the Amazon. 64 p. Greenpeace International 2006.

ensuring the correct identification and mapping of soy plantings in deforested areas in the PRODES database. To evaluate the true participation of soy crop grown on private rural properties in the Amazon biome's deforestation process, the databases of FUNAI (Brazilian Native Indians Foundation), the Ministry of the Environment, IBGE (Brazilian Institute of Geography & Statistics), INCRA (Brazilian Colonization & Agrarian Reform Institute), and INPE (Brazilian Space Research Institute) were also used.

In the 2014/2015 crop year, 28,768 hectares (111 sq.miles) were identified as not conforming to the Soy Moratorium. This soy acreage in deforested areas mapped by PRODES/INPE from 2009 to 2014 corresponds to 0.84% of the total deforested land in the Amazon biome; 1.1% of the total deforested land in the three monitored states (Pará, Rondônia and that part of Mato Grosso that lies within the Amazon biome), and 5.8% of the deforested land in the 76 soy-producing municipalities.

In the 2014/2015 crop year, Brazil planted soy on 31.9 million hectares (123,167 sq.miles) (CONAB, 2015<sup>2</sup>), of which 3.65 million hectares (14,093 sq.miles) were in the Amazon biome (11.4%<sup>3</sup>). According to the monitoring data, the 28,768 hectares of soy that do not conform to the Soy Moratorium represent 0.79% of soy acreage in this biome.

This report describes the methodology used and presents the results of soy monitoring in the Amazon biome in the context of the Soy Moratorium. The Appendix provides detailed information of the deforested polygons where soy was planted in nonconformity with the Soy Moratorium for the 2014/2015 crop year.

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2 CONAB. Monitoring Brazil's 2014/2015 Grain Crop, No. 09, 2015.

3 Estimate of soy acreage in the Amazon Biome (Agrosatélite, 2015).

## **I – INTRODUCTION**

The Soy Moratorium was signed on July 24, 2006 by ABIOVE and ANEC for the purpose of inhibiting the advance of soy production into the Amazon biome's tropical forest. The Soy Moratorium was last renewed during the GTS meeting on December 12, 2014, in Brasília, and will remain in effect until May 31, 2016, when it completes ten years. At this time, the GTS decided to alter the reference date of the Soy Moratorium from July 24, 2006 to July 22, 2008, to bring it into line with the new Forest Code that was sanctioned on May 25, 2012. PRODES<sup>4</sup> (Deforestation Monitoring of the Brazilian Legal Amazon) supplies the baseline for the deforestation that occurred in the Amazon biome during the Soy Moratorium (PRODES 2009-2014).

In the first two years, PRODES identified soy in deforested areas by sampling. In the first year (2007/2008 crop year), all soy production was found to conform to the Soy Moratorium while, in the second year (2008/2009 crop year), 1,384 hectares (5.3 sq.miles) were not in conformity. Starting in the third year (2009/2010 crop year), all polygons mapped by PRODES in the main soy-producing municipalities of the Amazon biome have been monitored. From the third to the seventh year, the following soy acreages did not conform to the Soy Moratorium: in 2009/2010 (third year) 6,295 hectares (24.3 sq.miles); in 2010/2011 (fourth year) 11,698 hectares (45.2 sq.miles); in 2011/2012 (fifth year) 18,410 hectares (71.1 sq.miles); in 2012/2013 (sixth year) 29,295 hectares (113.1 sq.miles); in 2013/2014 (seventh year) 47,028 hectares (181.6 sq.miles). Through the 2012/2013 crop year, all deforestation was monitored in the first instance through satellite images taken during the initial phase of the crop's cycle to select the deforested areas with a probable presence of soy. Then these areas were photographed during flyovers to confirm soy plantings, and this was followed by individual visits to the farms or the regional registry office to get the rural property's land title and identify the producer. This stage is necessary to ensure and certify the correct identification of soy acreage. The experience accumulated in the first six years of the Soy Moratorium, monitoring soy plantings through satellite images, showed that the combined use of images from sensors with different temporal and spatial resolutions obtained throughout the crop's cycle allows the identification and mapping of soy acreage with a high degree of accuracy. This observation led the GTS to eliminate the flyover stage from the monitoring process beginning in the 2013/2014 crop year.

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4 Available on [www.obt.inpe.br/prodes/](http://www.obt.inpe.br/prodes/) (Shimabukuro et al., 1998).

In addition to the satellite images, the monitoring work in the context of the Soy Moratorium also used the databases of the following institutions: FUNAI (Brazilian Native Indians Foundation), the Ministry of the Environment, IBGE (Brazilian Institute of Geography & Statistics), INCRA (Brazilian Colonization & Agrarian Reform Institute), and INPE (Brazilian Space Research Institute).

## **II – SCOPE OF THE WORK**

The scope of the work is to identify and map soy plantings in the 2014/2015 crop year in areas of the Amazon biome deforested after July 22, 2008, in accordance with the criteria established and adopted by the GTS (Soy Task Force).

The specific objective of the work is to use satellite images to identify and map soy crop for the 2014/2015 crop year, grown in deforested areas that were mapped by PRODES between 2009 and 2014, on private rural properties outside the settlements in the Amazon biome.

## **III – METHODOLOGY**

In the first stage of the work, the main soy-producing municipalities in the Amazon biome were selected. Then, all the deforested polygons in the Amazon biome mapped by PRODES (2009-2014) were selected. Finally, the soy crop in these deforested areas were identified and mapped through remote sensing satellite images. The detailed methodology is described below.

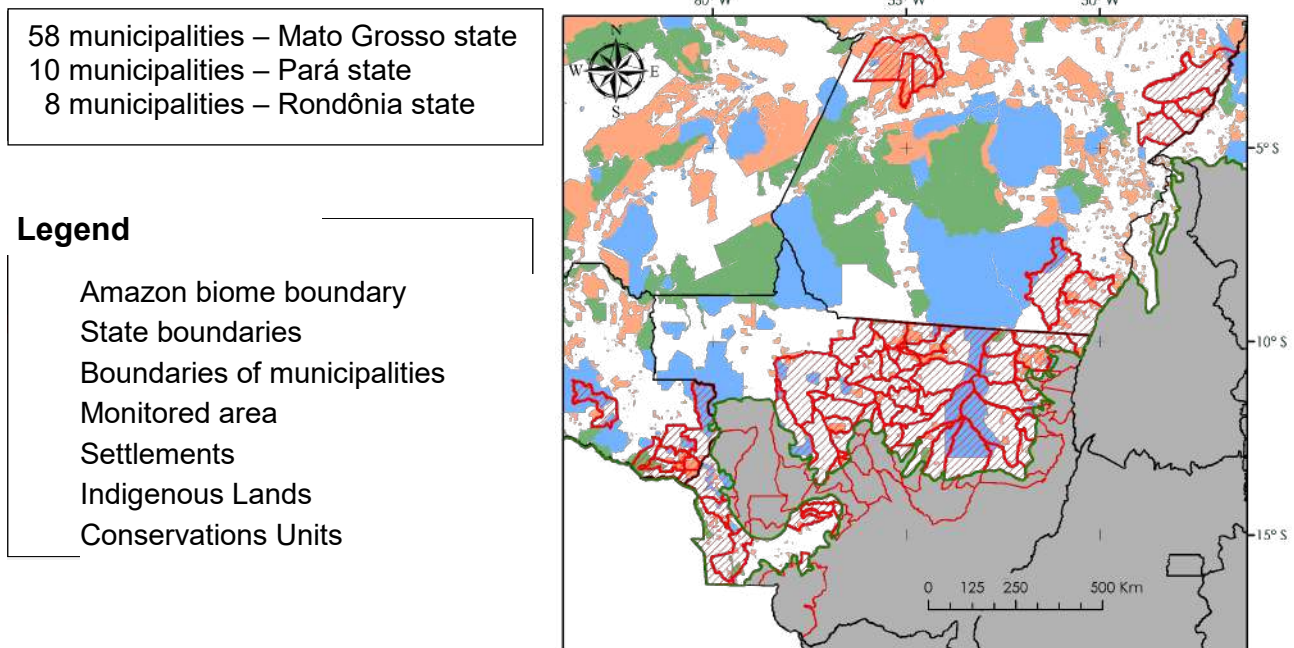
### **3.1. Definition of the study area**

The selection of deforested polygons for satellite-image monitoring was based on the following criteria:

1. Located fully or partially within the Amazon biome (Source: IBGE);
2. Located in that part of Mato Grosso state that lies within the Amazon biome and in the states of Pará and Rondônia; which are the three main soy producers states in the biome (Source: IBGE);
3. Located in municipalities with a soy acreage of more than 5,000 hectares (19.3 sq.miles) (Source: IBGE);

4. Aggregated deforested polygons (see Item 3.3) with an area of more than 25 hectares (62 acres), identified by PRODES in the years 2009 to 2014.

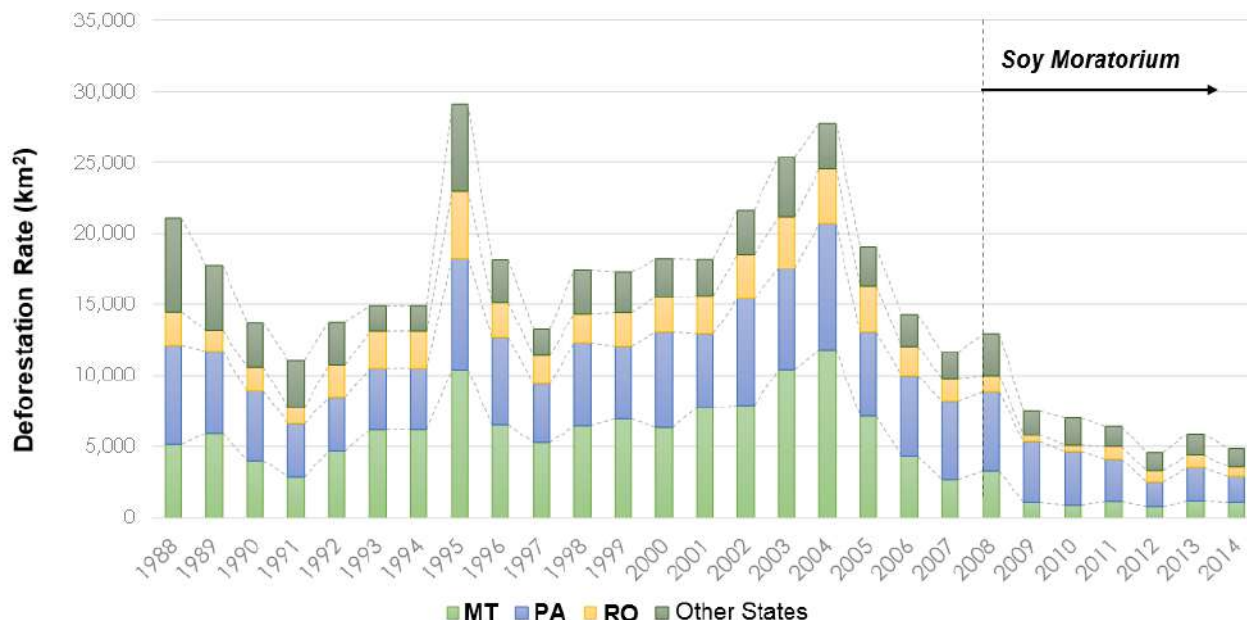
Figure 1 shows the 76 selected municipalities, as well as the Conservation Units, Indigenous Lands and Settlements, according to the criteria listed above that define the study area for selecting the polygons deforested during the Soy Moratorium.



**Figure 1 – Monitored area of the 76 selected municipalities. In the case of municipalities partially located in the Amazon biome, the data analysis focuses only on that part that is located within the biome**

### 3.2. Deforested polygons in PRODES

Since 1988, PRODES, a program developed and executed by INPE, has been mapping deforested areas and calculating annual deforestation rates in the Legal Amazon. The deforestation maps are included in a georeferenced database that is available on the Internet (<http://www.obt.inpe.br/prodes/>). Figure 2 shows the rates of deforestation in the Legal Amazon, as calculated by PRODES, highlighting the years before and after the Soy Moratorium.



Source: Adapted from INPE, 2015

**Figure 2 – Deforestation rates calculated by PRODES for the Legal Amazon, highlighting the years before and after the Soy Moratorium**

Table 1 shows PRODES data for the states of Mato Grosso, Pará and Rondônia, related to the polygons deforested in the Amazon biome during the period of the Soy Moratorium.

**Table 1 – Total annual deforested area (in hectares) in the Amazon biome during the Soy Moratorium, in the states of Mato Grosso, Pará and Rondônia**

State	Year of PRODES monitoring during the Soy Moratorium*						
	2009	2010	2011	2012	2013	2014	Total
Mato Grosso**	95,384	79,199	101,840	68,833	103,568	95,293	<b>544,117</b>
Pará	428,100	377,000	300,800	174,100	234,600	182,900	<b>1,697,500</b>
Rondônia	48,200	43,500	86,500	77,300	93,200	66,800	<b>415,500</b>
<b>Total</b>	<b>573,693</b>	<b>501,709</b>	<b>491,151</b>	<b>322,245</b>	<b>433,381</b>	<b>347,007</b>	<b>2,657,117</b>

Source: Adapted from INPE, 2015

\* PRODES identifies deforestation occurring from August of one year to July of the following year (e.g. PRODES 2009 monitors from August 2008 to July 2009).

\*\* Deforested area in Mato Grosso that lies within the Amazon biome

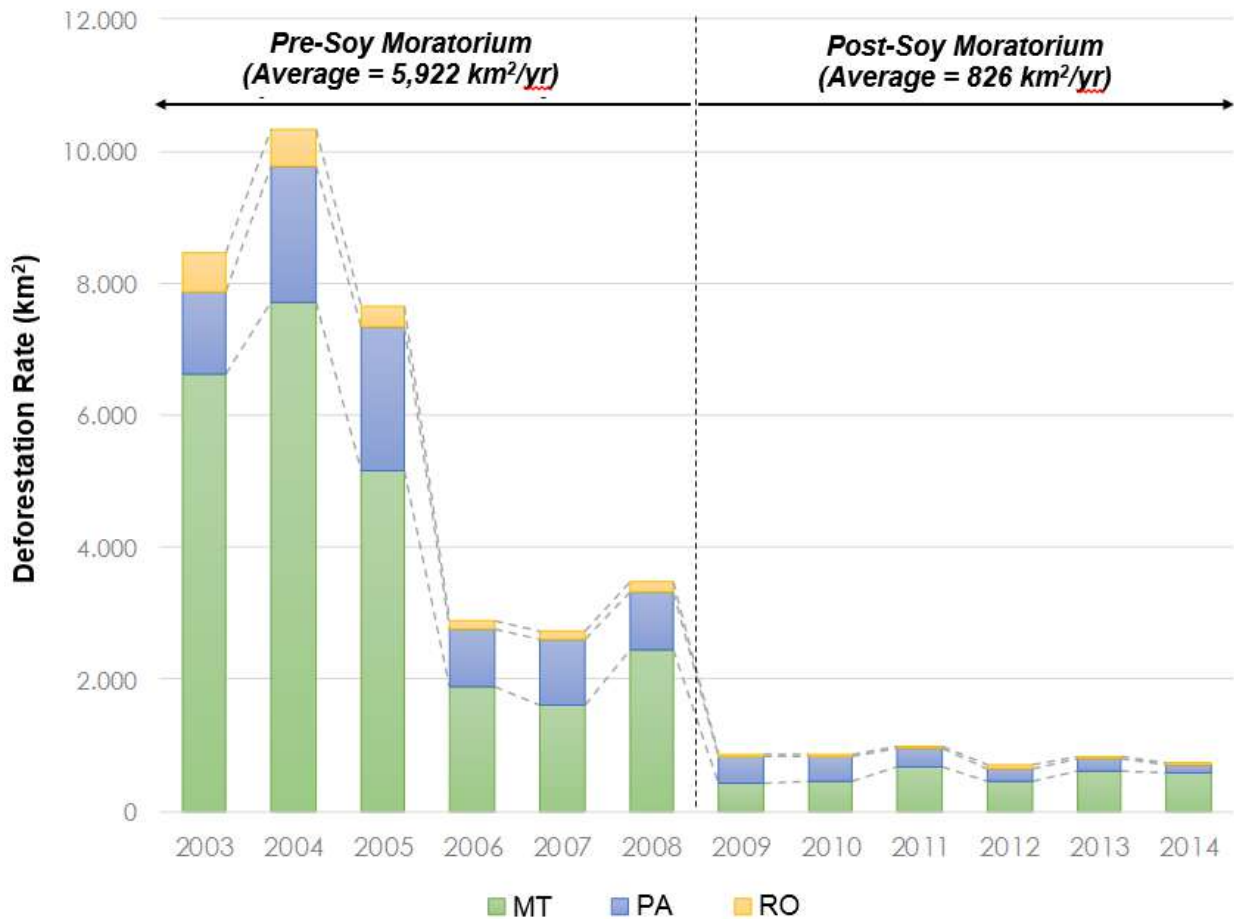
All the polygons deforested in the Amazon biome between 2009 and 2014, in the states of Mato Grosso, Pará and Rondônia, were selected from the PRODES database. These polygons were intersected with the boundaries of the 76 municipalities that grow over 5,000 hectares (19.3 sq.miles) of soy and with the boundaries of the Amazon biome so that the



final selection included only those polygons located within the Amazon biome and within the 76 selected municipalities which represent 98% of the biome's soy acreage.

Figure 3 shows the deforestation rates calculated by PRODES for the period from 2003 to 2014 for the 76 municipalities with over 5,000 hectares of soy in the Amazon biome. The graph shows a clear reduction in deforestation rates after the Soy Moratorium was signed. The average deforestation rates in these 76 municipalities calculated by PRODES before (2003-2008) and after (2009-2014) the Soy Moratorium were 5,922 km<sup>2</sup>/year (2,286 sq.miles) and 826 km<sup>2</sup>/year (319 sq.miles), respectively. In other words, comparing the periods before and after the Soy Moratorium, the average deforestation rate fell by a factor of seven. In addition, these municipalities were responsible for 32% and 13% of the total deforestation in the Legal Amazon in the periods before (2003-2008) and after (2009-2014) the Soy Moratorium, respectively. This shows that the mechanisms for reducing deforestation were much more effective in the soy-producing municipalities of the Amazon biome than in other areas of the Legal Amazon.

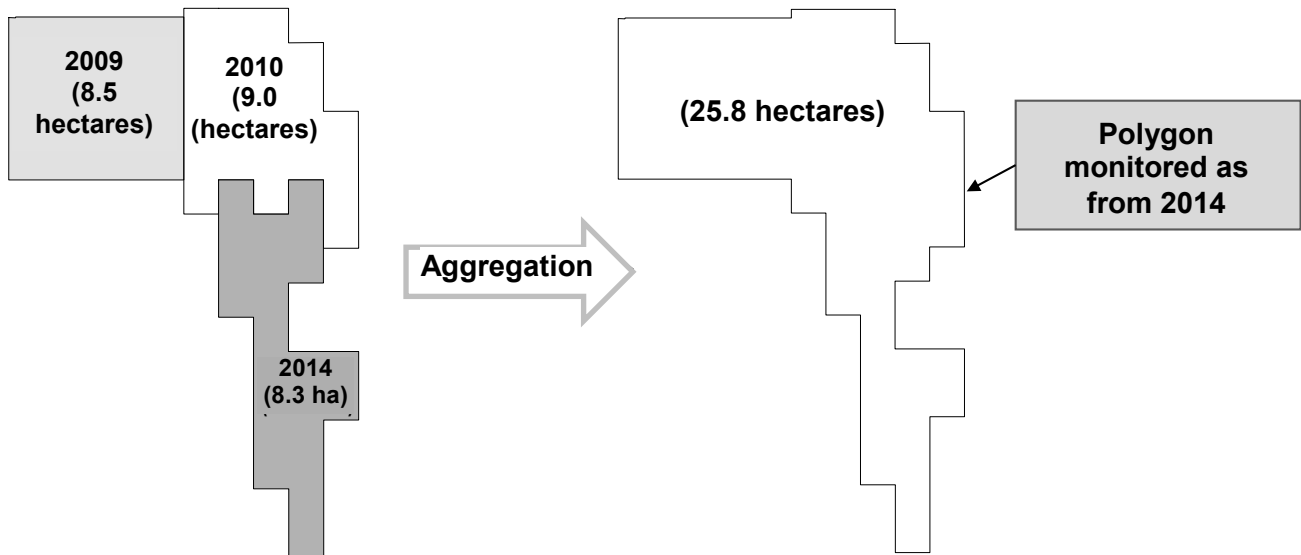
Figure 3 also shows that the deforestation rates in Mato Grosso's soy-producing municipalities decreased by a factor of eight, when comparing the before (4,241 km<sup>2</sup>, or 1,637 sq.miles) and after (534 km<sup>2</sup>, or 206 sq.miles) periods of the Soy Moratorium. Furthermore, it is interesting to note that, during the period of the Soy Moratorium, Pará's soy-producing municipalities also showed a significant reduction in deforestation rates, from 1,371 km<sup>2</sup> (529 sq.miles) to 261 km<sup>2</sup> (101 sq.miles), decreasing by a factor of five. In Rondônia's case, the decrease was by a factor of ten, from 310 km<sup>2</sup> (120 sq.miles) in the period before the Soy Moratorium to 31 km<sup>2</sup> (12 sq.miles) in the period after the pact was signed.



**Figure 3 – Deforestation rates calculated by PRODES for the 76 municipalities producing over 5,000 hectares of soy in the Amazon biome, highlighting the years before and after the Soy Moratorium**

### 3.3. Aggregation of adjacent polygons

The GTS determined that deforested areas mapped by PRODES with over 25 hectares (62 acres) should be monitored. However, a significant portion of deforestation occurs in small areas that gradually increase in size over the years. To incorporate adjacent deforested areas with  $\leq 25$  hectares, these areas must be aggregated each year. When the sum of annual and adjacent areas deforested after the Soy Moratorium is more than 25 hectares, they become eligible for monitoring. For example, Figure 4 shows the aggregation of three adjacent polygons that were cleared in different years. Before aggregation, the individual polygons had an area of less than 25 hectares but, with aggregation, they total more than this and, consequently, began to be monitored. This aggregation is done for all polygons and, therefore, even polygons over 25 hectares increase in size when adjacent areas are newly deforested.



**Figure 4 – Example of aggregation of three adjacent polygons mapped by PRODES between 2009 and 2014, forming a single polygon over 25 hectares that began to be monitored in crop year 2014/2015.**

### **3.4. Identification of soy in deforested polygons**

The experience acquired over the last few years from the analysis of the combined MODIS and Landsat satellite images ensures complete success in identifying soy crops, especially when the images analyzed are taken throughout the entire soy cycle. This analysis uses about 100 images from the MODIS sensor aboard the Terra satellite, 215 images from the Landsat-7 and -8 satellites, and 79 images from the Resourcesat-2 satellite taken during the soy crop cycle in the different analyzed regions.

Based on the soy calendar in the states of Mato Grosso and Rondônia, MODIS sensor images from July 2014 to April 2015 were used to monitor the soy crop. Because of the different soy calendar in the state of Pará, the images used to monitor the crop in this state covered a longer period, through June 2015.

The method used to detect the presence of soy in deforested polygons was based on an index called *Crop Enhancement Index* (CEI<sup>5</sup>), that underscores the difference in the values of a vegetation index called *Enhanced Vegetation Index* (EVI<sup>6</sup>) at two specific moments in the soy calendar: (a) during the off-season, before the start of the soy-growing season, when EVI values of soy are relatively lower than those of a forest in regeneration or pastures

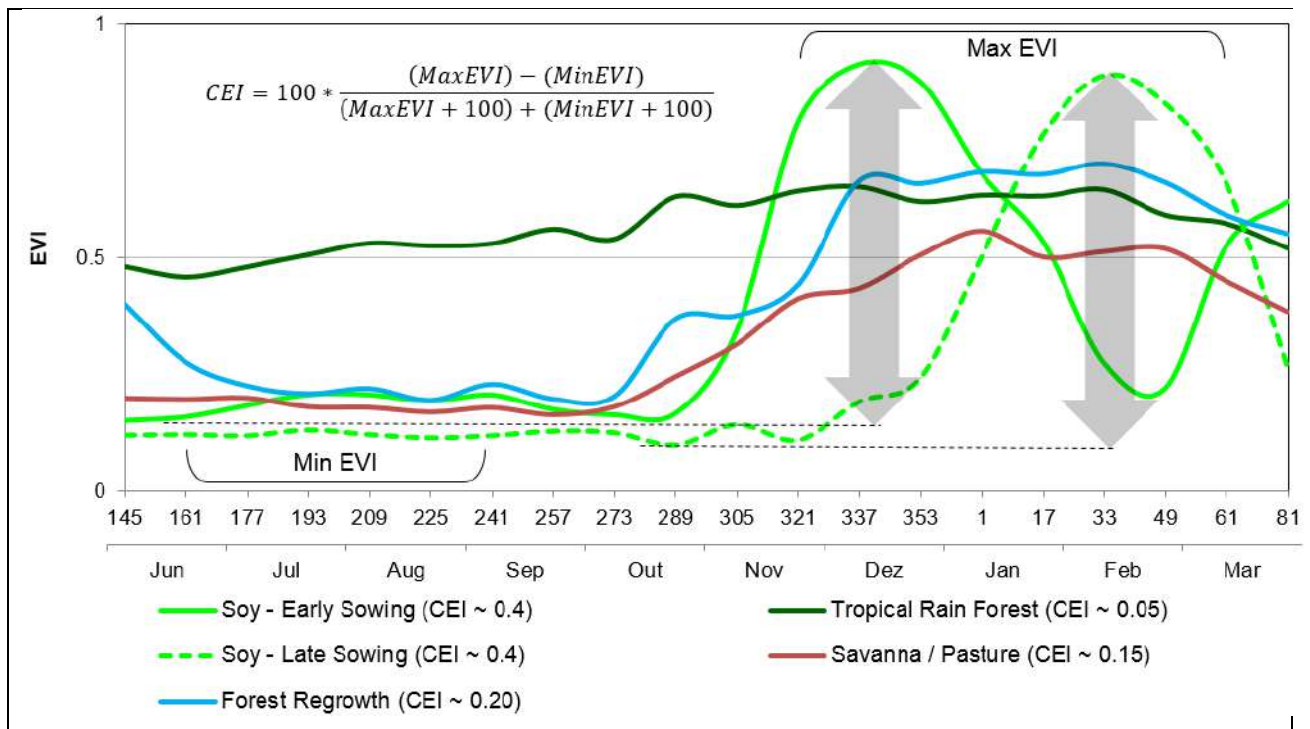
5 Rizzi et al., 2009

6 Huete et al., 2002



(MinEVI; Figure 5 and 6a); and (b) when the soy is well developed and shows higher EVI values than those of a forest in regeneration, savanna or pasture (MaxEVI; Figure 5 and 6b).

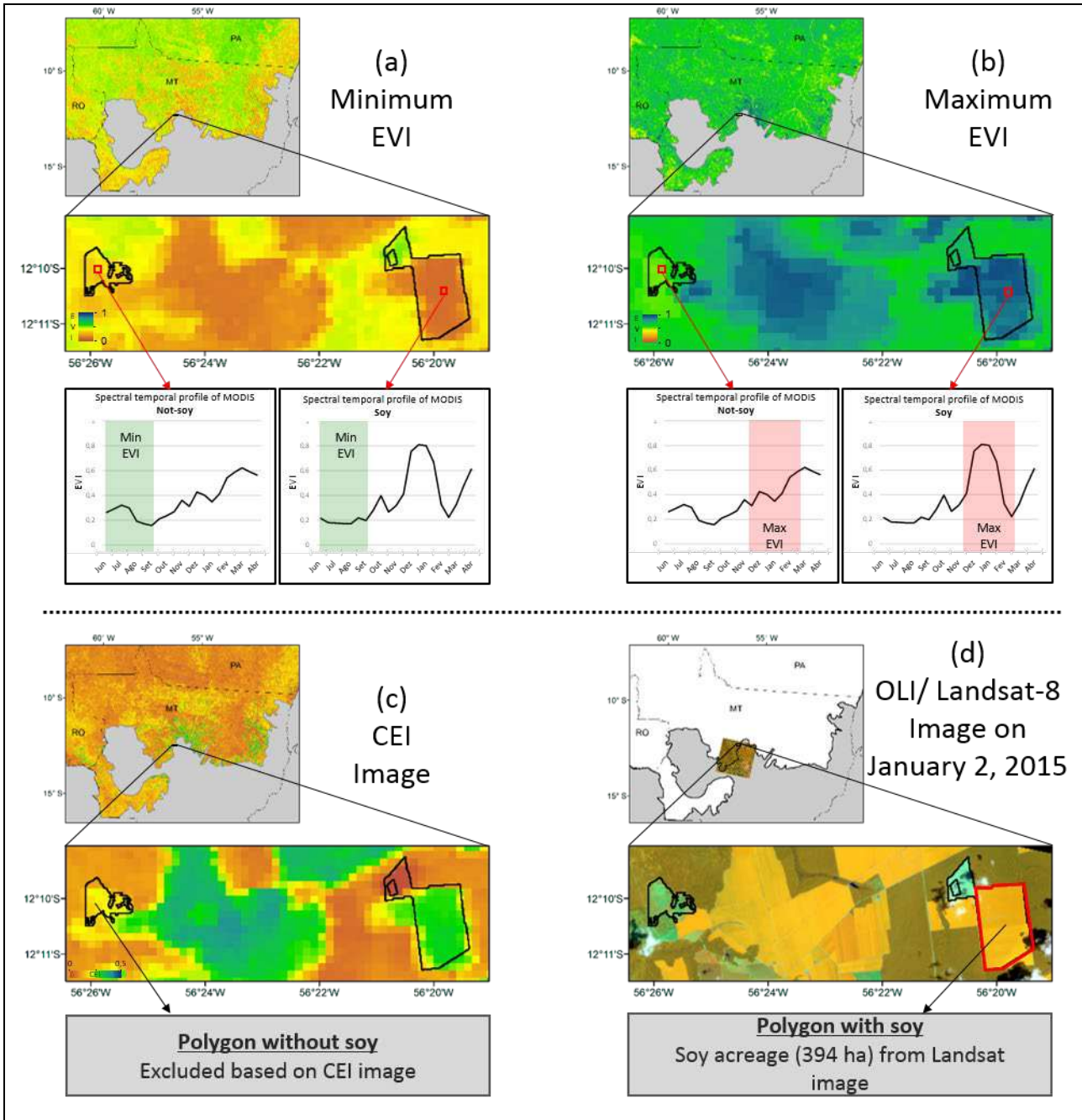
High CEI values indicate the presence of soy or, possibly, of another annual crop with similar characteristics in the same planting and maximum development periods as soy. Forests in regeneration and pasture show low CEI values because of their smaller EVI seasonal variation, when compared to soy (Figure 5). Thus, CEI is able to differentiate soy from other land uses and cover, such as a forest in regeneration or pasture.



**Figure 5 – Example of the temporal variation in EVI values for: (a) early and late soy according to the Mato Grosso crop calendar; (b) forest; (c) forest in regeneration; and (d) pasture. Also shown are the periods when minimum values (MinEVI) and maximum values (MaxEVI) are obtained to calculate CEI**

Figure 6a shows a MODIS/EVI composite image for the period when soy crops have the lowest EVI values (MinEVI), while Figure 6b shows a MODIS/EVI composite image for the period of highest EVI value (MaxEVI). These minimum and maximum EVI values lead to the CEI image shown in Figure 6c. The highest and lowest CEI values are associated with the presence and absence of soy, respectively. Figure 6c also shows a false-color composite image taken on January 2, 2015 by the OLI sensor aboard the Landsat-8 satellite, at maximum soy developmental stage, with soy crops shown in yellow.

After selecting the polygons with soy crop from the CEI images, their classification was refined through a visual analysis of images that were free or partially free of clouds, obtained from the following satellites: Landsat-7 (sensor ETM+) and/or Landsat-8 (sensor OLI) and/or Resourcesat-2 (sensors LISS-3 and AWIFS).



**Figure 6 – Example of two deforested polygons, with and without soy, classified by the CEI method: (a) composite image with MODIS/EVI minimum values; (b) composite image with MODIS/EVI maximum values; and (c) image showing that highest and lowest CEI values indicate the presence and absence of soy, respectively, as confirmed by (d) Landsat-8/OLI image on January 2, 2015**

## IV – RESULTS

### 4.1. Selection of PRODES polygons

In the area monitored in accordance with the criteria of the Soy Moratorium, PRODES mapped 27,118 deforested polygons, corresponding to a total area of 494,933 hectares (1,911 sq.miles) (Table 2). These polygons, as mentioned before, are located in the 76 soy-producing municipalities in the Amazon biome, namely: 58 in Mato Grosso state, 10 in Pará state and 8 in Rondônia state (Figure 1). With the aggregation of adjacent polygons, according to the methodology described in Item 3.3, the total number of deforested polygons between 2009 and 2014 decreased by 29%, to 19,267 polygons as shown in Table 2.

Table 2 also shows that aggregation significantly reduced (by 34%) the number of polygons in the  $\leq 25$  hectare class, which is precisely the purpose of aggregation. Similarly, the area of the  $\leq 25$  hectare class polygons decreased from 216,873 hectares (837 sq.miles) to 138,296 hectares (534 sq.miles) (Table 2). The 25-50 hectare class had a reduction of 10% in the number of polygons, while in the 50-100 hectare and  $\geq 100$  hectare classes the number of polygons increased by 16% and 36%, respectively. Before aggregation, the  $\leq 25$  hectare class polygons represented 87% of the total number of polygons, while the  $\geq 100$  hectare class represented just 2% (Figure 7a). After aggregation, the  $\leq 25$  hectare polygons represented 80% of the total polygons and the  $\geq 100$  hectare polygons represented 4% of the total (Figure 7c).

The variation caused by aggregation means that the  $\leq 25$  hectare class polygons decreased their representativity in terms of acreage, going from 44% (Figure 7b) to 28% (Figure 7d) of the total deforested area. On the other hand, polygons in the  $\geq 100$  hectare class increased their representativity from 29% (Figure 7b) to 44% (Figure 7d) of the total deforested area.

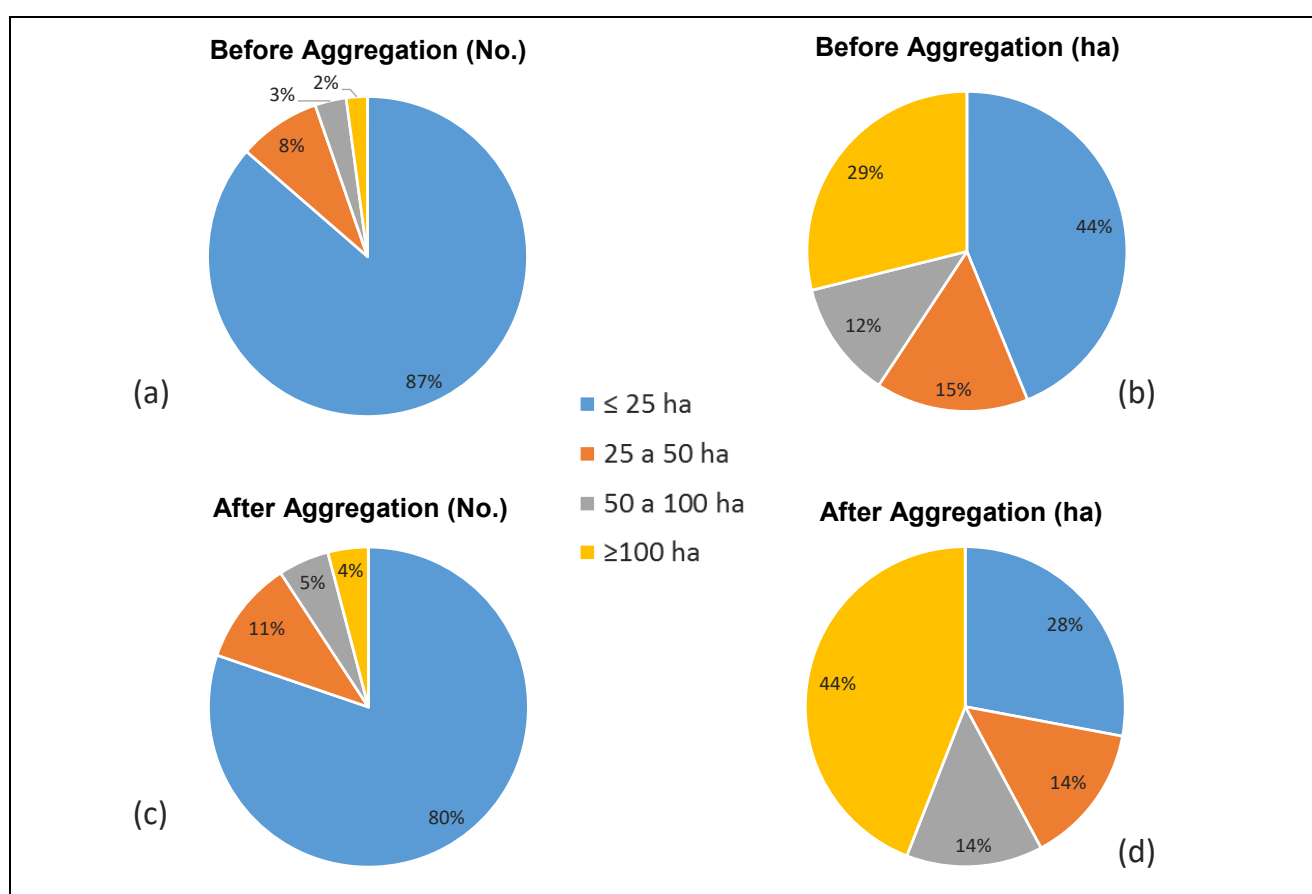
In summary, aggregation caused an increase of 28% in the total area of polygons in the  $\leq 25$  hectare class, going from 278,060 hectares (76,506 + 58,553 + 143,001), or 1,074 sq.miles, to 356,406 hectares (70,279 + 68,221 + 217,905), or 1,376 sq.miles, which represents 72% of the deforested area in these 76 municipalities during the period of the Soy Moratorium (Table 2).



**Table 2 – Number and area of polygons with and without aggregation of deforested polygons between 2009 and 2014**

Classes	PRODES – Not Aggregated		PRODES – Aggregated	
	No.	Hectares	No.	Hectares
≤25 ha	23,425	216,873	15,463	138,297
25-50 ha	2,256	76,506	2,025	70,279
50-100 ha	858	58,553	992	68,221
≥100 ha	579	143,001	787	217,905
<b>Total</b>	<b>27,118</b>	<b>494,933</b>	<b>19,267</b>	<b>494,703</b>

NB. Aggregation of polygons causes a residual variation (0.05%) in the total area, before and after the aggregation.



**Figure 7 – Percentage variation of the number and area of polygons, by size class, before and after aggregation**

The 58 soy-producing municipalities in that part of Mato Grosso state that lies within the Amazon biome had a deforested area of 252,295 hectares (974 sq.miles), corresponding to 71% of the total deforestation in polygons of >25 hectares (62 acres) in the 76 municipalities, during the period of the Soy Moratorium. In the ten municipalities in Pará state, the deforested area (>25 hectares) was 92,919 hectares (359 sq.miles), representing 26% of

total deforestation, while the eight municipalities in Rondônia had a deforested area (>25 hectares) of 11,193 hectares (43 sq.miles), or 3% of total deforestation (Table 3).

**Table 3 – Number of polygons and deforested area during the period of the Soy Moratorium, in the 76 municipalities in the states of Mato Grosso (MT), Pará (PA) and Rondônia (RO)**

Classes	Mato Grosso		Pará		Rondônia		Total	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
25-50 ha	1,217	42,740	711	24,290	97	3,249	2,025	70,279
50-100 ha	635	44,063	311	20,864	46	3,293	992	68,221
≥100 ha	584	165,490	181	47,764	22	4,651	787	217,905
<b>Total</b>	<b>2,436</b>	<b>252,294</b>	<b>1,203</b>	<b>92,919</b>	<b>165</b>	<b>11,193</b>	<b>3,804</b>	<b>356,406</b>

According to the criteria established by the GTS, the monitoring of soy crops is restricted to deforested land on private rural properties (see Item 3.1) or to deforestation partially located within Conservation Units (CU), Indigenous Lands (IL) and Settlements (Set.), totaling an area of 273,176 hectares (1,055 sq.miles) (Table 4).

**Table 4 – Selection of polygons on private rural properties and deforestation data after the Soy Moratorium**

Deforestation	Mato Grosso		Pará		Rondônia		Total	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
a. Private Properties	1,450	177,382	709	63,622	148	10,282	2,307	251,287
b. Partially in CU, IL,	123	13,119	66	8,648	3	122	192	21,889
c. Fully in CU, IL, Set.	863	61,792	428	20,649	14	789	1,305	83,230
<b>Total Monitored (a+b)</b>	<b>1,573</b>	<b>190,502</b>	<b>775</b>	<b>72,270</b>	<b>151</b>	<b>10,404</b>	<b>2,499</b>	<b>273,176</b>

#### 4.2. Identification of polygons with soy crop through satellite images

The 273,176 hectares in 2,499 deforested polygons were monitored through CEI images (see Item 3.4, Figure 6) and supported by over 215 Landsat images and 79 Resourcesat-2 images. Each polygon was individually inspected through visual interpretation techniques to identify and map soy crop in these polygons.

All told, the 244 polygons identified with soy crop passed through a process to review their deforestation dates in order to verify that the area in question had, in fact, been deforested during the period of the Soy Moratorium. A review of the PRODES deforestation dates is necessary as the images used by PRODES were not selected based on the Soy Moratorium

criteria but on identification of the deforestation that occurred in each year. This review is based on Landsat images from the year 2000 up to the date closest to the start of the Soy Moratorium (July 22, 2008). The polygons identified with soy crop and which are partially located in Conservations Units, Indigenous Lands and Settlements were also submitted to a review process to eliminate the polygons with soy crop located in those special areas. After executing both review processes, 19 polygons (13 in Mato Grosso, 5 in Pará and 1 in Rondônia) were found to have a total of 751 hectares (2.9 acres) of soy in conformity with the Soy Moratorium. This leaves 225 polygons with soy (Table 5).

Finally, we can conclude that 28,768 hectares (111 sq.miles) were converted from forest to soy during the period of the Soy Moratorium, as Table 5 shows in more detail. This soy acreage corresponds: to 0.84% of the deforestation in the Amazon biome during the period of the Soy Moratorium; to 5.8% of the deforested land in the 76 monitored municipalities within the Amazon biome; and to 0.79% of the soy acreage in the Amazon biome in the 2014/2015 crop year.

In Mato Grosso state, 21,887 hectares (84.5 sq.miles) of soy in 157 polygons were identified as not meeting the criteria of the Soy Moratorium (Table 5), which corresponds to 76.1% of the soy detected in this monitoring cycle and 4.0% of total deforestation in that part of this state that lies within the Amazon biome during the period of the Soy Moratorium (544,117 hectares, or 2,101 sq.miles – Table 1). In Pará state, 5,722 hectares (22 sq.miles) were identified as having soy (62 polygons – Table 5), representing 19.9% of the soy detected in this monitoring cycle but only 0.34% of the deforestation in this state during the Soy Moratorium (1,697,500 hectares, or 6,554 sq.miles – Table 1). In Rondônia state, 1,159 hectares (4.5 sq.miles) of soy were identified (6 polygons – Table 5), corresponding to 4.0% of the soy detected in this monitoring cycle and 0.28% of the total deforestation in this state during the Soy Moratorium (415,500 hectares, or 1,604 sq.miles – Table 1).

It should be emphasized that the soy acreage in polygons of >100 hectares (247 acres) was 24,378 hectares (94 sq.miles) (Table 5), corresponding to 85% of the total soy acreage on deforested land, an indication that most of the soy acreage not meeting the Soy Moratorium criteria is found in the large deforested polygons. On the other hand, in Mato Grosso state, the 52 polygons in the 25-50 hectare class have a total area of 1,414 hectares (5.5 sq.miles), representing just 6.5% of the soy acreage in this state that did not conform to the pact. In Pará, the 20 polygons in the 25-50 hectare class represent 9.7% of the area in nonconformity. In Rondônia, all the polygons in the 25-50 hectare class conformed to the



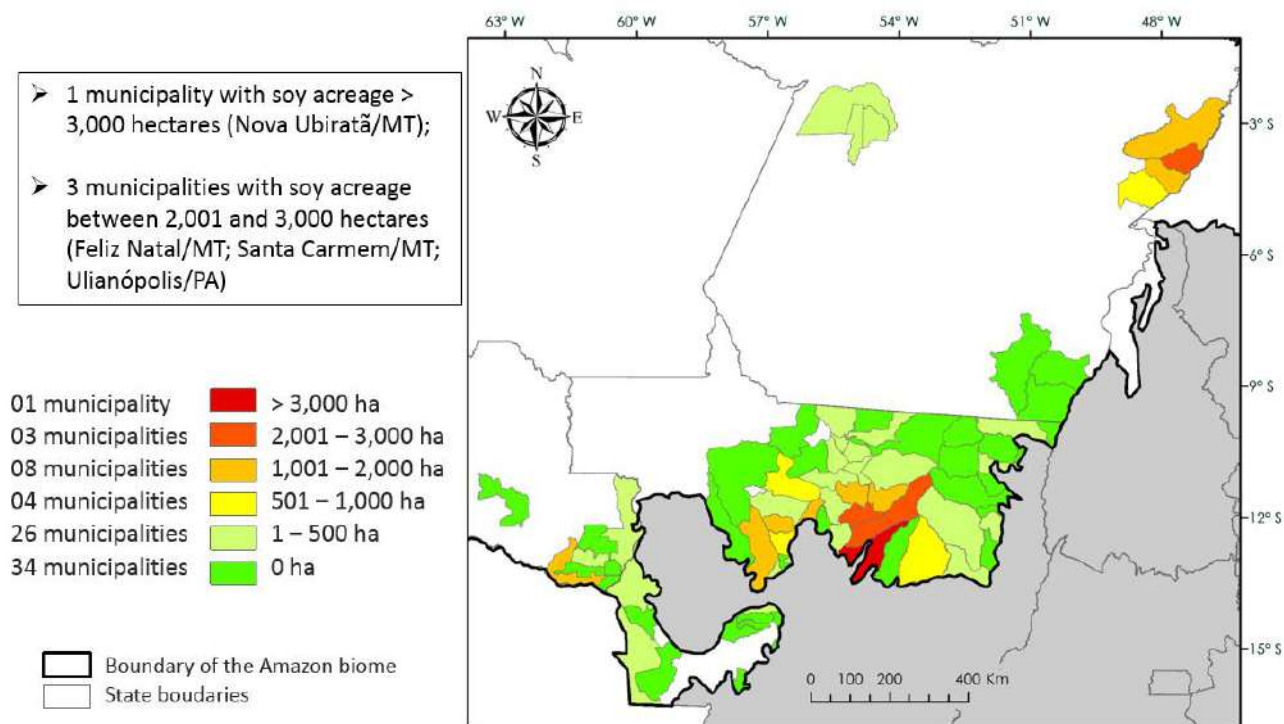
Soy Moratorium. Therefore, the total number of polygons in this class represents a small proportion of the soy acreage in nonconformity with the Soy Moratorium. This is a strong indication that the 28% of the unmonitored area in polygons with less than 25 hectares (62 acres) (138,297 hectares, or 534 sq.miles – Table 2) do not contribute significantly to the soy acreage as this crop is generally grown on larger areas.

Item VIII – Appendix – has a complete list of the 225 polygons monitored in the 2014/2015 crop year.

**Table 5 – Number of polygons with soy and the soy acreage, by class of polygon, in the states of Mato Grosso (MT), Pará (PA) and Rondônia (RO)**

Class	Mato Grosso		Pará		Rondônia		Total	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
25-50 hectares	52	1,414	20	555	---	---	72	1,969
50-100 hectares	30	1,538	16	774	2	110	48	2,422
<b>&gt;100 hectares</b>	<b>75 (48%)</b>	<b>18,935 (87%)</b>	<b>26 (42%)</b>	<b>4,394 (77%)</b>	<b>4 (67%)</b>	<b>1,049 (91%)</b>	<b>105 (47%)</b>	<b>24,378 (85%)</b>
<b>Total</b>	<b>157</b>	<b>21,887</b>	<b>62</b>	<b>5,722</b>	<b>6</b>	<b>1,159</b>	<b>225</b>	<b>28,768</b>

Figure 8 classifies the 76 monitored municipalities by size of soy acreage in nonconformity with the Soy Moratorium. Forty-two municipalities planted soy in nonconformity with the Soy Moratorium (Table 6), while the remaining 34 municipalities fully conformed to the Soy Moratorium. Of the 42 municipalities with some soy acreage in nonconformity, 26 are in the 1-500 hectare class with an area of 3,793 hectares (14.6 sq.miles), representing 13.2% of the total soy acreage not in conformity with the pact. Furthermore, the 12 municipalities in the >1,000 hectare class represent 77.4% (22,266 hectares, or 86 sq.miles) of the soy acreage not in conformity. Finally, two municipalities in Pará state (Ulianópolis and Dom Eliseu) and four municipalities in Mato Grosso state (Nova Ubiratã, Santa Carmem, Feliz Natal and Itanhanga) are responsible for 50% of the soy acreage that does not conform to the Soy Moratorium (Table 6).



**Figure 8 – Spatial distribution of the 76 municipalities analyzed, classified in accordance with the soy acreage not in conformity with the Soy Moratorium**

**Table 6 – List of the 42 municipalities with soy acreage not in conformity with the Soy Moratorium**

Municipality	State	Polygons with Soy (No.)	Soy Acreage (hectares)
Nova Ubiratã	MT	18	3,954
Santa Carmem	MT	15	2,915
Feliz Natal	MT	9	2,129
Itanhangá	MT	13	1,620
Nova Maringá	MT	12	1,534
Cláudia	MT	12	1,444
Ipiranga do Norte	MT	5	1,385
União do Sul	MT	3	1,297
Tabaporã	MT	2	810
Tapurah	MT	5	745
Gaúcha do Norte	MT	7	541
Matupã	MT	5	457
Porto dos Gaúchos	MT	7	439
Itaúba	MT	3	428
Marcelândia	MT	9	413
Bom Jesus do Araguaia	MT	1	289

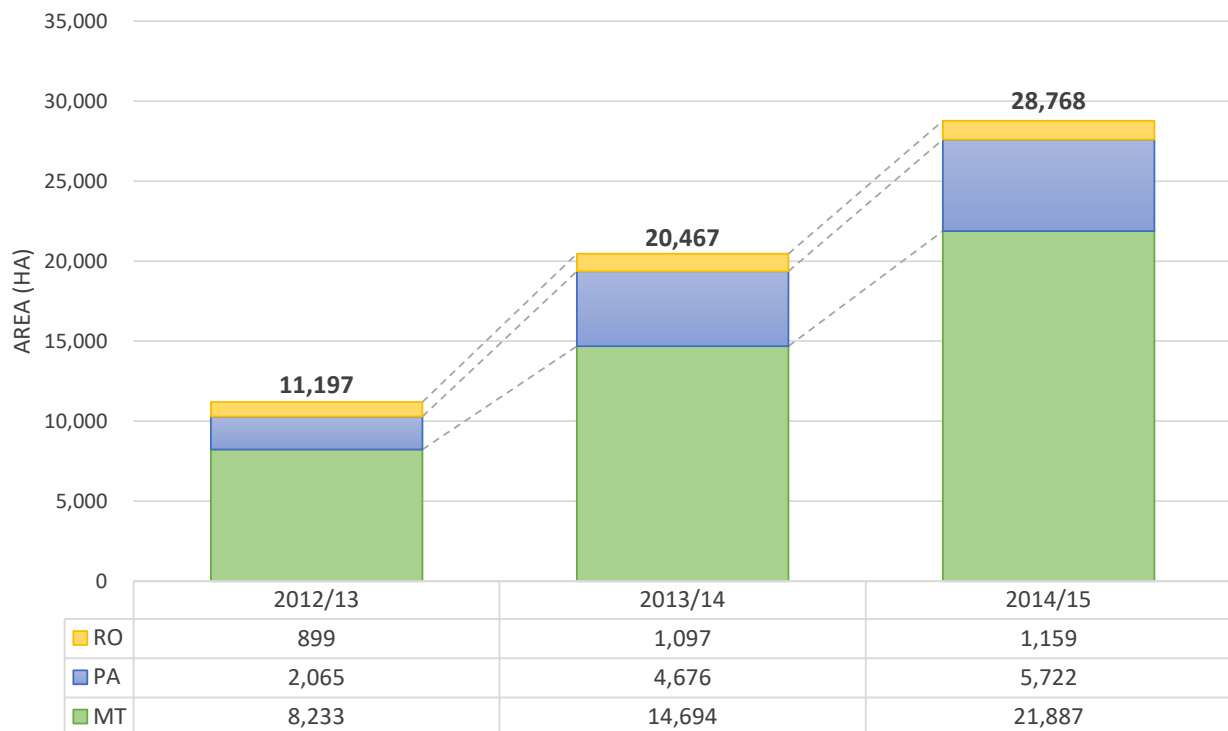
Vera	MT	3	266
Sinop	MT	3	254
Nova Santa Helena	MT	3	203
Lucas do Rio Verde	MT	3	181
Canarana	MT	1	118
Diamantino	MT	2	110
Comodoro	MT	3	84
São José do Rio Claro	MT	2	59
Querência	MT	2	51
Colíder	MT	1	46
Porto Alegre do Norte	MT	1	27
Vila Bela da Santíssima Trindade	MT	1	27
Terra Nova do Norte	MT	3	23
Novo Mundo	MT	1	15
Nova Guarita	MT	1	15
Vila Rica	MT	1	8
<b>Total Mato Grosso</b>		<b>157</b>	<b>21,887</b>
Ulianópolis	PA	11	2,085
Dom Eliseu	PA	26	1,784
Paragominas	PA	14	1,095
Rondon do Pará	PA	5	613
Mojú dos Campos	PA	4	58
Belterra	PA	1	57
Santarém	PA	1	31
<b>Total Pará</b>		<b>62</b>	<b>5,722</b>
Pimenteiras do Oeste	RO	2	1,024
Vilhena	RO	3	81
Corumbiara	RO	1	53
<b>Total Rondônia</b>		<b>6</b>	<b>1,159</b>

Note: The following 34 municipalities are in conformity with the Soy Moratorium for the 2014/2015 crop year: Mato Grosso state – Alta Floresta, Alto Boa Vista, Alto Paraguai, Brasnorte, Cáceres, Campo Novo do Parecis, Canabrava do Norte, Confresa, Guarantã do Norte, Juara, Nortelândia, Nova Lacerda, Nova Canaã do Norte, Nova Mutum, Paranatinga, Peixoto de Azevedo, Pontes e Lacerda, Ribeirão Cascalheira, Santo Afonso, São José do Xingu, Santa Cruz do Xingu, Santa Terezinha, São Félix do Araguaia, Sorriso, Tangará da Serra, Nova Marilândia; Pará state – Cumaru do Norte, Santa Maria das Barreiras, Santana do Araguaia; Rondônia state – Cabixi, Cerejeiras, Colorado do Oeste, São Miguel do Guaporé, Chupinguaia.



### 4.3. Increase of soy not in conformity in the last three crop years

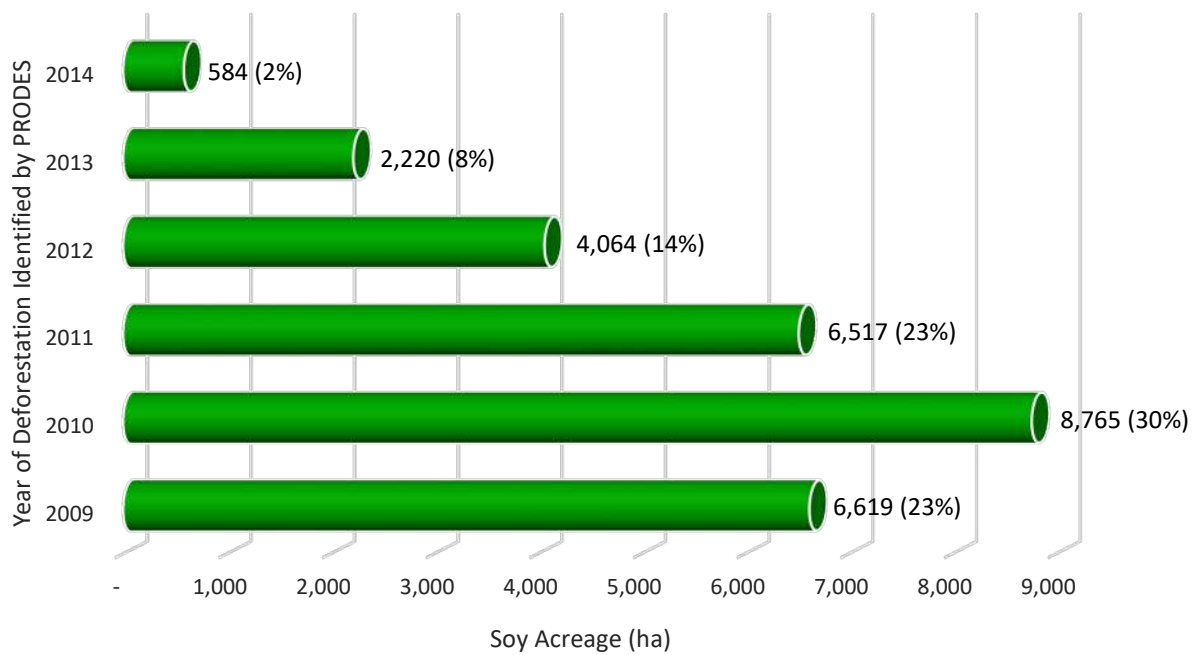
Based on July 22, 2008, the new reference date for the Soy Moratorium on planting soy on deforested land, the crop year 2012/2013 had 11,197 hectares (43.2 sq.miles) that did not conform to the criteria, increasing to 20,467 hectares (79 sq.miles) in the following crop year (2013/2014), an increase of 83% (9,270 hectares, or 35.8 sq.miles). The 2014/2015 crop year had a similar increase of 8,301 hectares (32 sq.miles), with a total of 28,768 hectares (111 sq.miles) of soy not in conformity, as illustrated in Figure 9.



**Figure 9 – Evolution of soy acreage in nonconformity with the Soy Moratorium in the states of Mato Grosso (MT), Pará (PA) and Rondônia (RO) in the crop years 2012/13, 2013/14 and 2014/15**

The gradual increase in soy acreage that does not conform to the Soy Moratorium, observed over the last three crop years, is mainly due to the increasing time lapse since July 22, 2008 because, after an area is deforested, rice is usually planted for a year or two before soy.

Figure 10 shows the soy acreage in the 2014/2015 crop year, fractionated in accordance with the year that the corresponding deforestation was first mapped by PRODES. As can be seen, 53% (15,384 hectares, or 59.4 sq.miles) of the soy acreage on deforested land was planted in the first two years of the new reference date for the Soy Moratorium (2009 and 2010). On the other hand, soy acreage in areas deforested within the last two years (2013 and 2014) was just 10% (2,804 hectares, or 10.8 sq.miles).



**Figure 10 – Soy acreage in crop year 2014/2015 by year of deforestation**

#### **4.4. Relevance of soy planting on recently cleared land in the Amazon biome**

The Brazilian soy production for crop year 2014/2015 was 96.04 million tons, grown on 31.9 million hectares (123,167 sq.miles). Brazil increased its soy acreage by 5.7% and its productivity by 5.5% compared to the prior year. In the states of Pará and Rondônia, the increase in production over the prior year was essentially due to an increase in planted acreage of 45% (101,000 hectares, or 390 sq.miles) and 20% (40,000 hectares, or 154 sq.miles), respectively. In the state of Mato Grosso (both the Cerrado and the Amazon biomes), the increase in planted acreage was 3.5% (301,000 hectares, or 1,162 sq.miles) (CONAB, 2015).

In this last crop year, the increase in soy acreage in nonconformity with the Soy Moratorium was 22% (1,046 hectares, or 4 sq.miles) in Pará state, 6% (62 hectares, or 0.2 sq.mile) in Rondônia state and 49% (7,193 hectares, or 27.8 sq.miles) in Mato Grosso state. If the period when the Soy Moratorium has been in effect is taken into account, soy acreage in the Amazon biome went from 1.35 million hectares (5,212 sq.miles) in the 2008/2009 crop year to 3.65 million hectares (14,093 sq.miles) in the 2014/2015 crop year, representing an increase of 2.30 million hectares (8,880 sq.miles). Of this latter total, only 1.25% (28,768 hectares, or 111 sq.miles) do not conform to the Soy Moratorium. These results clearly indicate the efficacy of the Soy Moratorium in preventing new soy plantings on recently

deforested land, essentially expanding soy acreage into pastures that resulted from deforestation prior to the Soy Moratorium<sup>7</sup>.

The results obtained in this monitoring cycle show that soy plantings occurred in only 1.1% of the total area deforested in the Amazon biome, in the states of Mato Grosso, Pará and Rondônia, since the beginning of the Soy Moratorium on July 22, 2008. This represents 0.09% of the total soy acreage in Brazil for the 2014/2015 crop year. In view of the results presented, there is a strong indication that the Soy Moratorium continues to meet its objective of inhibiting the advance of soy into areas deforested in the most recent crop years in the Amazon biome. Even so, it has not fully stopped new deforestation in soy-producing municipalities, though consideration must be given to the fact that the average rate of deforestation in the six years of the Soy Moratorium's existence is lower than the prior six years by a factor of seven (Figure 3), showing the efficacy of the various mechanisms being used to reduce deforestation in this biome over the last few years.

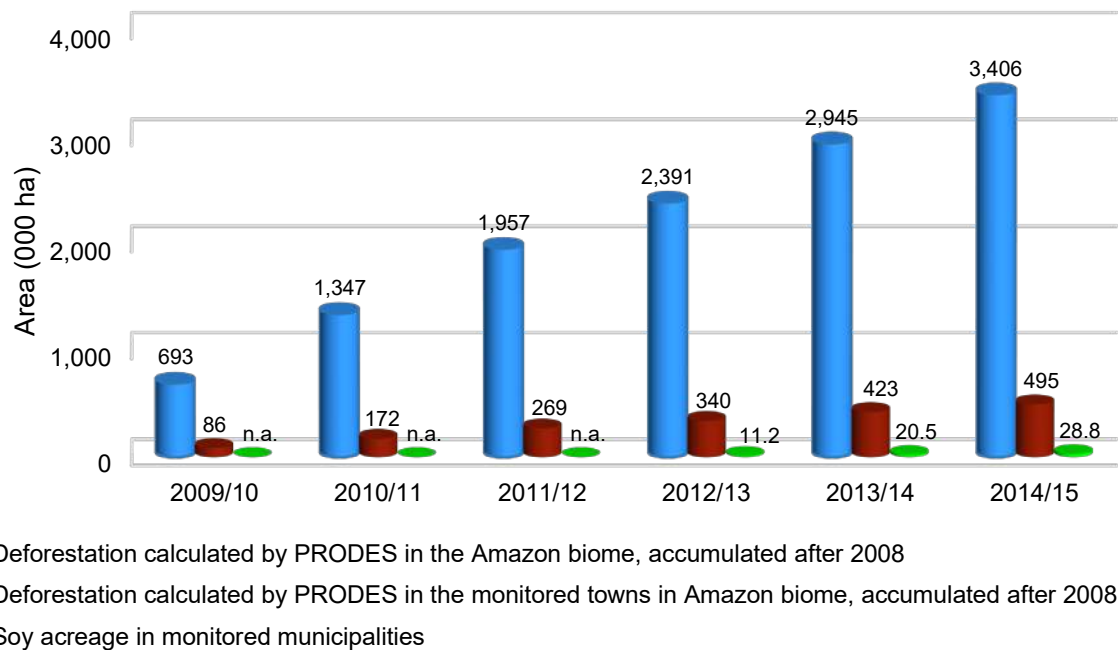
In the 2014/2015 crop year, soy acreage that did not conform to the Soy Moratorium represents 0.79% of the total area planted with this crop in the Amazon biome (Table 7). It should be noted that, in Mato Grosso state, which is responsible for 85% of the Amazon biome soy acreage, the soy planted on deforested land during the period of the Soy Moratorium represents 0.71% of the total area planted with this oilseed in the Amazon biome part of this state (Table 7). However, Mato Grosso is responsible for 76% of the soy acreage not in conformity with the Soy Moratorium. Despite Pará's low percentage of soy grown in the Amazon biome (8.8%), 1.78% of this acreage was not in conformity with the Soy Moratorium.

**Table 7 - Comparison of the soy acreage in nonconformity with the Soy Moratorium, with the soy acreage in the Amazon biome (in hectares)**

State	Soy Acreage in Nonconformity	Soy Acreage in Amazon biome	% of Soy Acreage in Nonconformity
Mato Grosso	21,887	3,100,000 *	0.71%
Pará	5,722	322,100 **	1.78%
Rondônia	1,159	230,700 **	0.50%
<b>Total</b>	<b>28,768</b>	<b>3,652,800</b>	<b>0.79%</b>

Source: \* Agrosatélite (2014); \*\* CONAB (2015)

Figure 11 presents a graphic comparison of the deforested area in the Amazon biome, the deforested area in the 76 monitored municipalities and the soy acreage on deforested land during the period of the Soy Moratorium. This graph shows that the monitored municipalities were responsible for 14.5% of the deforestation in the Amazon biome, with 5.8% of this area being used for soy production in the 2014/2015 crop year.



**Figure 11 – Evolution of the accumulated deforested area (Amazon biome and 76 municipalities) and soy in nonconformity in the 76 monitored municipalities**

## **V – CONCLUSIONS**

Based on the satellite images taken during the 2014/2015 crop year, soy was identified on 28,768 hectares (111 sq.miles) of land that was cleared after July 22, 2008, i.e., during the period of the Soy Moratorium. Mato Grosso is the state with most soy plantings in areas that do not conform to the Soy Moratorium (76% | 21,887 hectares, or 84.5 sq.miles), followed by Pará state (20% | 5,722 hectares, or 22.1 sq.miles) and Rondônia state (4% | 1,159 hectares, or 4.5 sq.miles). A comparison of these results to those from the prior year shows that the area not in conformity in Mato Grosso increased 49%, going from 14,694 hectares (56.7 sq.miles) to 21,887 hectares, while in Pará the increase was 22%, going from 4,676 hectares (18 sq.miles) to 5,722 hectares and in Rondônia the increase was just 5.6% (62 hectares, or 0.2 sq.miles).

The 28,768 hectares of soy in nonconformity with the Soy Moratorium correspond to 1.1% of the total deforestation (2.66 million hectares, or 10,270 sq.miles) in those areas of the states of Mato Grosso, Pará and Rondônia that fall within the Amazon biome in the period 2009-2014. Based on these surveys, we can conclude that soy is not playing a significant role in the deforestation of the Amazon biome, representing 5.8% of the deforestation in the 76 municipalities where 98% of the soy crops are concentrated and just 0.84% of the deforestation in the Amazon biome as a whole. Nevertheless, the area deforested in the period 2009-2014 in the states of Mato Grosso, Pará and Rondônia is significant and the Soy Moratorium has not fully prevented deforestation in soy-producing municipalities. On the other hand, in the 76 monitored municipalities, the average deforestation rate after the period of the Soy Moratorium (2009-2014) is less than that for the prior period (2003-2008) by a factor of seven, showing that the various mechanisms being used in the last few years to reduce deforestation in the Amazon biome are effective.

Finally, it must be emphasized that, during the period of the Soy Moratorium, soy acreage in the Amazon biome increased by 2.3 million hectares (8,880 sq.miles), of which only 28,768 hectares (111 sq.miles) – or 1.25% – were found to be in nonconformity with the Soy Moratorium, while the remaining acreage (98.75%) does conform to this pact. Of the 76 soy-producing municipalities in the Amazon biome, 34 conform fully to the Soy Moratorium. On the other hand, six municipalities (four in Mato Grosso state and two in Pará state) are responsible for 50% of the soy planted in nonconformity with the Soy Moratorium.

The careful process of analyzing hundreds of satellite images to monitor the areas deforested after July 22, 2008, with a view to identifying soy crop in nonconformity with the Soy Moratorium, made it possible to monitor 98% of the entire soy acreage in the Amazon biome. We can conclude that this monitoring offers consistent, highly reliable results in the identification and mapping of soy plantings in deforested areas in the context of the Soy Moratorium.

São Paulo, August 14, 2015

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## VII – TECHNICAL TEAMS

### 7.1. **AGROSATÉLITE GEOTECNOLOGIA APLICADA LTDA.**

- **General Coordinator:** Bernardo Rudorff
- **Technical Coordinator:** Joel Risso
- **Technical Team:** Daniel Alves de Aguiar, Moisés Pereira Galvão Salgado, Luciana Oliveira and Marco Aurélio Virtuoso

### 7.2. **INPE**

- **Auditor:** Marcos Adami

### 7.3. **ABIOVE**

- **General Coordinator:** Fábio Trigueirinho
- **Technical Coordinator:** Bernardo Machado Pires
- **Contributors:** Beatriz Domeniconi and Daniel Furlan Amaral

# ORGANIZATION



## GTS – SOY TASK FORCE



## VIII – APPENDIX

### 8.1. Soy polygons in Mato Grosso State (MT)

ID	Area of Polygon (hectares)	State	Municipality	Soy Acreage (hectares)
2734	857.84	MT	Bom Jesus do Araguaia	289.31
3450	710.01	MT	Canarana	117.94
2465	43.64	MT	Cláudia	4.86
2344	51.40	MT	Cláudia	7.56
2425	28.33	MT	Cláudia	28.33
2431	28.42	MT	Cláudia	28.42
2530	38.43	MT	Cláudia	38.43
2371	150.85	MT	Cláudia	40.13
2453	42.67	MT	Cláudia	42.67
2362	293.96	MT	Cláudia	88.86
2598	122.79	MT	Cláudia	122.79
2590	574.46	MT	Cláudia	173.71
2536	218.19	MT	Cláudia	218.19
2475	650.05	MT	Cláudia	650.05
1935	45.62	MT	Colíder	45.62
3584	32.73	MT	Comodoro	3.02
3592	28.62	MT	Comodoro	28.62
3303	82.76	MT	Comodoro	52.81
3624	25.78	MT	Diamantino	25.78
3621	83.98	MT	Diamantino	83.98
3094	57.44	MT	Feliz Natal	14.16
3072	29.47	MT	Feliz Natal	25.99
3267	61.16	MT	Feliz Natal	61.16
3038	172.44	MT	Feliz Natal	172.44
3189	498.67	MT	Feliz Natal	187.65
2981	202.38	MT	Feliz Natal	194.26
3134	843.29	MT	Feliz Natal	430.46
3212	519.75	MT	Feliz Natal	448.41
3143	594.69	MT	Feliz Natal	597.69
3468	193.69	MT	Gaúcha do Norte	5.21
3502	236.27	MT	Gaúcha do Norte	11.98
3375	31.67	MT	Gaúcha do Norte	31.67
3462	387.24	MT	Gaúcha do Norte	78.93
3442	82.27	MT	Gaúcha do Norte	82.27
3451	144.85	MT	Gaúcha do Norte	144.85
3483	1,196.17	MT	Gaúcha do Norte	186.32
2608	43.59	MT	Ipiranga do Norte	43.59
2706	169.79	MT	Ipiranga do Norte	169.79



2715	1,704.70	MT	Ipiranga do Norte	320.54
2832	466.66	MT	Ipiranga do Norte	394.38
2602	456.63	MT	Ipiranga do Norte	456.63
2947	259.69	MT	Itanhangá	9.32
2780	55.57	MT	Itanhangá	19.86
2948	227.59	MT	Itanhangá	35.23
2960	36.41	MT	Itanhangá	36.41
2982	36.84	MT	Itanhangá	36.84
2952	44.92	MT	Itanhangá	43.34
3000	64.73	MT	Itanhangá	64.73
2749	252.62	MT	Itanhangá	67.61
2765	216.08	MT	Itanhangá	85.97
2726	284.28	MT	Itanhangá	106.85
2965	137.64	MT	Itanhangá	137.64
3009	187.10	MT	Itanhangá	187.10
2762	1,390.99	MT	Itanhangá	789.28
2229	345.81	MT	Itaúba	29.47
2226	122.16	MT	Itaúba	104.02
2212	388.32	MT	Itaúba	294.66
3373	64.74	MT	Lucas do Rio Verde	17.88
3357	68.26	MT	Lucas do Rio Verde	58.39
3369	455.88	MT	Lucas do Rio Verde	104.50
2203	48.37	MT	Marcelândia	3.04
2213	29.42	MT	Marcelândia	17.97
2196	44.14	MT	Marcelândia	24.58
2289	246.43	MT	Marcelândia	26.41
1933	27.62	MT	Marcelândia	27.62
1922	55.77	MT	Marcelândia	55.77
1932	69.89	MT	Marcelândia	62.02
2170	93.58	MT	Marcelândia	82.05
2182	226.71	MT	Marcelândia	113.90
1505	25.54	MT	Matupá	22.00
1598	25.53	MT	Matupá	25.53
1475	36.68	MT	Matupá	27.39
1378	92.14	MT	Matupá	92.14
1385	290.21	MT	Matupá	290.21
1647	31.10	MT	Nova Guarita	14.57
3347	63.98	MT	Nova Maringá	10.00
3349	94.52	MT	Nova Maringá	12.17
2781	40.91	MT	Nova Maringá	27.05
3389	31.84	MT	Nova Maringá	31.84
3438	76.33	MT	Nova Maringá	43.19
3247	60.81	MT	Nova Maringá	60.81
3403	81.34	MT	Nova Maringá	81.34

2986	133.07	MT	Nova Maringá	133.07
3321	161.79	MT	Nova Maringá	161.79
3431	254.71	MT	Nova Maringá	254.71
3324	291.88	MT	Nova Maringá	291.88
2999	426.31	MT	Nova Maringá	426.31
2211	35.68	MT	Nova Santa Helena	27.81
2210	28.19	MT	Nova Santa Helena	28.19
2083	145.90	MT	Nova Santa Helena	146.90
3313	149.03	MT	Nova Ubitatã	4.99
3277	166.81	MT	Nova Ubitatã	20.99
3385	27.47	MT	Nova Ubitatã	27.47
3391	27.99	MT	Nova Ubitatã	27.99
3335	33.44	MT	Nova Ubitatã	33.44
3304	65.24	MT	Nova Ubitatã	34.16
3509	91.47	MT	Nova Ubitatã	91.47
3388	129.82	MT	Nova Ubitatã	129.82
3298	142.68	MT	Nova Ubitatã	142.68
3523	958.13	MT	Nova Ubitatã	145.92
3293	1,278.02	MT	Nova Ubitatã	168.96
3506	220.17	MT	Nova Ubitatã	220.17
3387	222.29	MT	Nova Ubitatã	222.29
3533	261.33	MT	Nova Ubitatã	261.33
3198	287.68	MT	Nova Ubitatã	287.68
3511	798.36	MT	Nova Ubitatã	567.01
2975	648.25	MT	Nova Ubitatã	648.25
3195	1,010.59	MT	Nova Ubitatã	919.19
1290	29.02	MT	Novo Mundo	15.21
2148	31.73	MT	Porto Alegre do Norte	27.14
2571	34.20	MT	Porto dos Gaúchos	12.51
2703	62.80	MT	Porto dos Gaúchos	17.26
2634	27.42	MT	Porto dos Gaúchos	27.42
2681	28.20	MT	Porto dos Gaúchos	28.20
2594	30.59	MT	Porto dos Gaúchos	30.59
2754	99.57	MT	Porto dos Gaúchos	99.57
2654	888.75	MT	Porto dos Gaúchos	223.79
3219	41.37	MT	Querência	7.01
3409	43.55	MT	Querência	43.55
2657	74.95	MT	Santa Carmem	8.87
2646	26.10	MT	Santa Carmem	26.10
2724	28.19	MT	Santa Carmem	28.19
2692	33.12	MT	Santa Carmem	33.12
2711	48.31	MT	Santa Carmem	34.05
2658	38.13	MT	Santa Carmem	38.13
2750	42.23	MT	Santa Carmem	42.23

2761	46.27	MT	Santa Carmem	46.27
2685	55.61	MT	Santa Carmem	55.61
2785	216.66	MT	Santa Carmem	152.15
2694	172.19	MT	Santa Carmem	172.19
2593	227.32	MT	Santa Carmem	227.32
2707	354.86	MT	Santa Carmem	354.86
2697	758.66	MT	Santa Carmem	758.66
2740	1,211.00	MT	Santa Carmem	936.90
3475	32.16	MT	São José do Rio Claro	23.60
3437	46.43	MT	São José do Rio Claro	35.00
2485	559.84	MT	Sinop	32.82
2494	394.95	MT	Sinop	73.05
2588	148.03	MT	Sinop	148.03
2508	320.94	MT	Tabaporã	320.94
2484	488.76	MT	Tabaporã	488.76
3039	25.43	MT	Tapurah	25.43
3175	79.24	MT	Tapurah	79.24
3331	94.54	MT	Tapurah	94.54
3176	261.49	MT	Tapurah	261.49
3047	283.90	MT	Tapurah	283.90
1954	48.62	MT	Terra Nova do Norte	4.12
2015	79.48	MT	Terra Nova do Norte	8.27
2011	59.81	MT	Terra Nova do Norte	10.99
2500	253.84	MT	União do Sul	27.00
2626	75.58	MT	União do Sul	75.58
2564	1,194.34	MT	União do Sul	1,194.34
2868	39.66	MT	Vera	20.88
2877	102.05	MT	Vera	102.05
2934	143.10	MT	Vera	143.10
3681	27.14	MT	Vila Bela da Santíssima Trindade	27.14
1444	33.32	MT	Vila Rica	8.37
<b>Total for Mato Grosso State</b>				<b>21,887.24</b>

## 8.2. Soy polygons in Pará state (PA)

ID	Area of Polygon (hectares)	State	Municipality	Soy Acreage (hectares)
225	56.80	PA	Belterra	56.80
515	58.88	PA	Dom Eliseu	4.01
395	50.57	PA	Dom Eliseu	7.50
491	155.18	PA	Dom Eliseu	8.39
409	33.39	PA	Dom Eliseu	10.01
451	572.44	PA	Dom Eliseu	15.41
566	79.44	PA	Dom Eliseu	16.52

403	36.70	PA	Dom Eliseu	18.26
376	359.96	PA	Dom Eliseu	21.89
572	25.23	PA	Dom Eliseu	25.23
405	25.33	PA	Dom Eliseu	25.33
577	94.11	PA	Dom Eliseu	25.68
581	34.26	PA	Dom Eliseu	26.32
530	26.40	PA	Dom Eliseu	26.40
526	28.10	PA	Dom Eliseu	28.10
483	35.98	PA	Dom Eliseu	35.98
580	41.78	PA	Dom Eliseu	41.78
479	44.75	PA	Dom Eliseu	44.75
408	382.83	PA	Dom Eliseu	47.10
511	55.21	PA	Dom Eliseu	55.21
394	741.55	PA	Dom Eliseu	68.64
567	81.06	PA	Dom Eliseu	76.16
583	141.79	PA	Dom Eliseu	141.79
569	177.50	PA	Dom Eliseu	177.50
504	354.74	PA	Dom Eliseu	203.80
590	329.57	PA	Dom Eliseu	304.15
365	574.92	PA	Dom Eliseu	328.19
76	28.68	PA	Mojuí dos Campos	9.82
96	31.10	PA	Mojuí dos Campos	12.94
113	34.78	PA	Mojuí dos Campos	16.50
105	130.51	PA	Mojuí dos Campos	18.85
226	112.00	PA	Paragominas	22.17
239	27.68	PA	Paragominas	27.68
144	29.75	PA	Paragominas	29.75
215	48.12	PA	Paragominas	48.12
135	135.15	PA	Paragominas	50.89
169	51.89	PA	Paragominas	51.89
129	59.42	PA	Paragominas	59.42
106	62.83	PA	Paragominas	62.83
282	181.08	PA	Paragominas	66.28
218	117.83	PA	Paragominas	68.57
268	72.01	PA	Paragominas	72.01
192	267.93	PA	Paragominas	92.52
143	151.55	PA	Paragominas	151.55
237	432.56	PA	Paragominas	291.18
644	31.03	PA	Rondon do Pará	31.03
618	32.74	PA	Rondon do Pará	32.74
516	64.16	PA	Rondon do Pará	64.16
503	75.35	PA	Rondon do Pará	75.35
582	459.75	PA	Rondon do Pará	409.62
48	30.84	PA	Santarém	30.84

368	93.19	PA	Ulianópolis	3.95
361	33.12	PA	Ulianópolis	33.12
283	70.03	PA	Ulianópolis	70.03
271	81.86	PA	Ulianópolis	72.27
338	138.50	PA	Ulianópolis	73.02
345	101.70	PA	Ulianópolis	101.70
358	257.83	PA	Ulianópolis	235.94
356	1,283.65	PA	Ulianópolis	265.50
278	331.01	PA	Ulianópolis	311.97
285	411.76	PA	Ulianópolis	370.76
273	1,134.75	PA	Ulianópolis	546.44
<b>Total for Pará State</b>				<b>5,722.33</b>

### 8.3. Soy polygons in Rondônia state (RO)

<b>ID</b>	<b>Area of Polygon (hectares)</b>	<b>State</b>	<b>Municipality</b>	<b>Soy Acreage (hectares)</b>
3305	53.33	RO	Corumbiara	53.33
3501	389.18	RO	Pimenteiras do Oeste	389.18
3498	634.93	RO	Pimenteiras do Oeste	634.93
3289	115.80	RO	Vilhena	6.22
3280	108.02	RO	Vilhena	18.20
3308	88.88	RO	Vilhena	56.75
<b>Total for Rondônia State</b>				<b>1,158.60</b>