

SOY MORATORIUM



SOYBEAN PLANTING IN
THE AMAZON BIOME
FOURTH YEAR OF
MAPPING AND
MONITORING



2011

EXECUTIVE SUMMARY

The Soy Moratorium for the Amazon Biome was renewed for the fourth time in July 2010, reaffirming the commitment made by ABIOVE's and ANEC's industry and exporting members not to acquire soybeans from areas in the Amazon Biome that were deforested as from July 2006.

For this fourth monitoring program, the GTS (Soy Task Force), made up of ABIOVE and ANEC member companies, the Ministry of the Environment, the Bank of Brasil and civil society organizations (International Conservation, Greenpeace, IPAM, TNC and WWF-Brasil), continued its partnership with INPE (National Space Research Institute) for application of a methodology that uses satellite images and was especially developed to detect the presence of agricultural crops in deforested areas. With the objective of generating reliable information on the actual participation of soybeans in the Amazon Biome's deforestation process, the data bases at FUNAI (National Native Indians Foundation), IBAMA (Brazilian Environmental & Renewable Natural Resources Institute), IBGE (Brazilian Geographic & Statistical Institute), IMAZON (Institute of the Amazon People & Environment) and INPE were used.

Geoambiente Sensoriamento Remoto Ltda., a company specialized in remote sensing, digital cartography and geographical information systems, was hired to identify, characterize and measure land use and occupation in areas pre-selected by INPE. Based on its experience in thematic mapping projects, a specific air-survey methodology was created to identify and quantify agricultural crops, especially soybean crops. Field visits were made and legal documentation researched to identify the rural properties in order to consolidate the information.

Interpretation of the satellite images, and their validation through aerial photographs, made it possible to identify the presence of soybeans on 11,698 hectares (45 sq.miles) that were deforested after July 2006. In the same period, a total of 4.19 million hectares (16,178 sq.miles) were deforested in the whole Amazon Biome, of which 2.97 million hectares (11,467 sq.miles) – or 71% – are located in the three soybean-producing states. Of this latter amount, 370,000 hectares (1,429 sq.miles) are located in the municipalities that grow soybeans.

The soybean acreage located in deforested areas of the Amazon Biome during the Moratorium corresponds to 0.28% of the total deforestation, 0.39% of the deforestation in the three soybean-producing states and 3.1% of the deforestation in the municipalities that grow soybeans. Brazil's total soybean acreage is 24.1 million hectares (93,051 sq.miles), of which 1.94 million hectares (7,490 sq.miles) are in the Amazon Biome. Soybeans planted on deforested land during the Moratorium amount to 0.05% of Brazil's total soybean acreage and to 0.6% of soybean acreage in the Amazon Biome.

This report describes the methodology used and presents the results of the Moratorium's fourth monitoring. Detailed information on the deforested polygons, including the satellite images, panoramic photographs and field surveys that were part of this work, can be found on the site www.abiove.com.br.

I INTRODUCTION

The Soy Moratorium for the Amazon Biome, which represents 49% of Brazil's land mass and has a population of 20 million inhabitants, was signed on July 24, 2006 by the industries and exporters that are members of ABIOVE (Brazilian Vegetable Oils Industry Association) and ANEC (National Grain Exporters Association). The Moratorium was renewed for the fourth time on July 8, 2010, continuing the commitment made by the companies not to acquire soybeans from areas of the Amazon Biome deforested after July 2006.

Selection of the polygon sampling was based on information regarding the deforested areas to be monitored, supplied by PRODES (Brazilian Amazon Deforestation Monitoring Program)¹. For the first monitoring program in the 2007/08 crop year, a sampling of 265 deforested polygons was selected, with a total monitored area of 49,809 hectares (192 sq.miles). After flyovers and identification of land use, it was concluded that no soybeans had been planted on these deforested polygons.

The sampling for the second monitoring program, in the 2008/09 crop year, was increased to 630 polygons, with a total monitored area of 157,896 hectares (610 sq.miles). Soybeans were found on 12 of these polygons, corresponding to 1,384 hectares (5 sq.miles) deforested after the declaration of the Moratorium.

A new methodology, developed by INPE, was used for the third monitoring program, covering 2,955 polygons corresponding to an area of 302,149 hectares (1,167 sq.miles). Soybeans were found on 76 of these polygons, a total of 6,295 hectares (24 sq.miles).

For the fourth monitoring program, the methodology was improved, mainly through adjustments related to the period of flyovers and to the acquisition of auxiliary satellite images. This monitoring took into consideration the agricultural calendar, whose main difference is between Pará state and Rondônia and Mato Grosso states. In addition, all the deforested areas within the scope of the Moratorium were monitored, including an evaluation of conservation units, indigenous lands and settlements.

In the 2010/11 crop year, the GTS decided to hire Geoambiente to do the flyovers of the preselected polygons and to make field visits to the rural properties with the possible presence of soybean planting. The data bases of the following institutes were used: FUNAI (National Indians Foundation), IBAMA (Brazilian Institute of the Environment and Natural Renewable Resources), IBGE (Brazilian Institute for Geography and Statistics), AMAZON (Amazon Institute of People and the Environment), INCRA (National Institute of Colonization and Agrarian Reform) and INPE (National Space Research Institute).

The scope of the work is to identify the occurrence of soybean planting in areas of the Amazon Biome deforested after July 24, 2006, in accordance with the criteria of the Soy Moratorium.

The specific objective of the work is to use satellite images to select areas with the probably presence of soybeans in deforested areas indicated by the PRODES project. Information of land use and occupation was later confirmed through aerial photographs and field surveys.

The methodology of the current work consists in defining the current area of concentration of soybean plantings in the Amazon Biome and in pre-selecting the PRODES deforested polygons where the possible presence of annual agricultural crops was identified through satellite images. Flyovers of the preselected polygons were then made to confirm whether or not soybean plantings had occurred. The methodology is detailed below.

The selection of deforested polygons to be monitored was based on the following criteria:

1. Polygons wholly or partially within the Amazon Biome (source: IBGE).
2. Polygons located in the states of Mato Grosso, Pará and Rondônia, the main soybean producers in the Amazon Biome (source: IBGE).
3. Polygons located in municipalities, whose current crop or that projected for the following year indicates a soybean planted area of more than 5,000 hectares (19 sq.miles) (source: IBGE).²
4. Merged polygons (see item 3.2) over 25 hectares (62 acres) identified by PRODES in 2007, 2008, 2009 and 2010.
5. Polygons outside the protected areas – Conservation Units and Indigenous Reserves (source: IBAMA and FUNAI) or Settlements (source: INCRA).

Figure 1 illustrates the municipalities selected for monitoring in accordance with the criteria established above.

1-Available at www.obt.inpe.br/prodes/ (Shimabukuro et al., 1998).

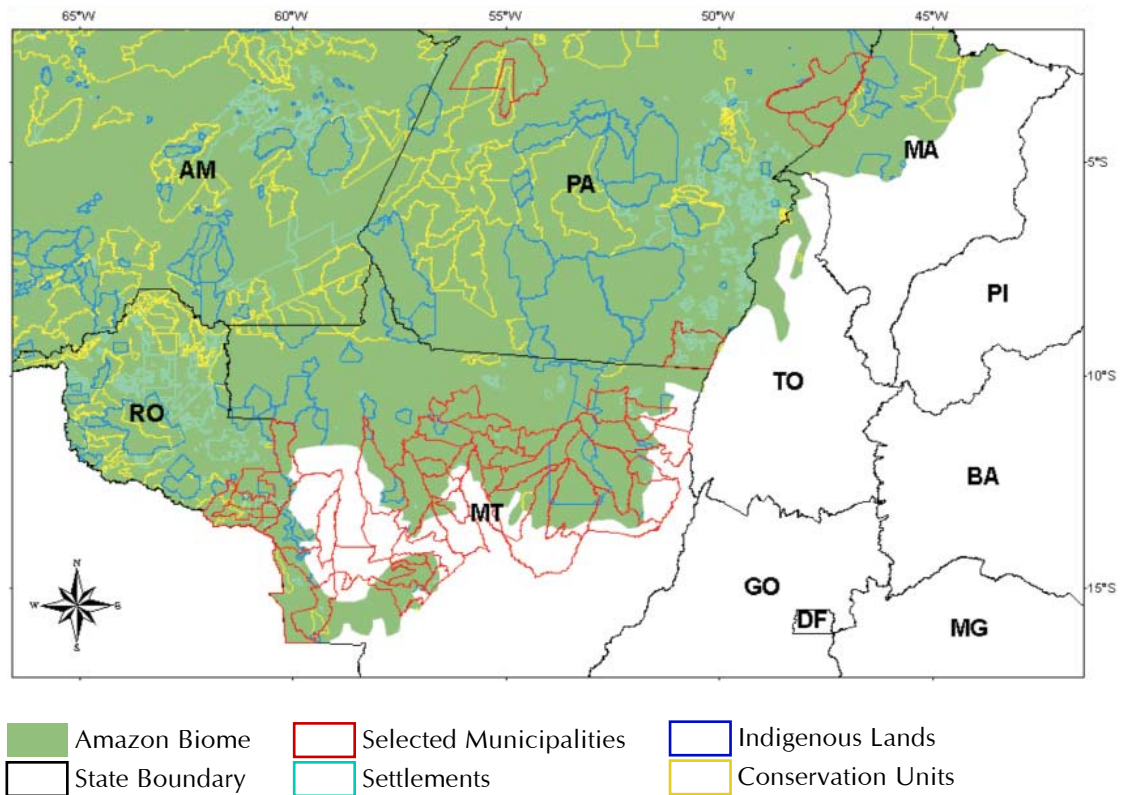
2-The PRODES annual evaluations are based on images acquired between August and July of the following year. PRODES 2007 used some images acquired after the Soy Moratorium was signed (July 24, 2006).

II SCOPE OF THE WORK

III METHODOLOGY

3.1 Definition of the study area

Figure 1 – Study area based on following criteria: (1) Amazon Biome; (2) soybean-producing states (Mato Grosso, Pará and Rondônia); (3) municipalities with soy acreage over 5,000 hectares; (4) outside protected areas (conservation units, indigenous lands); and (5) outside settlements.

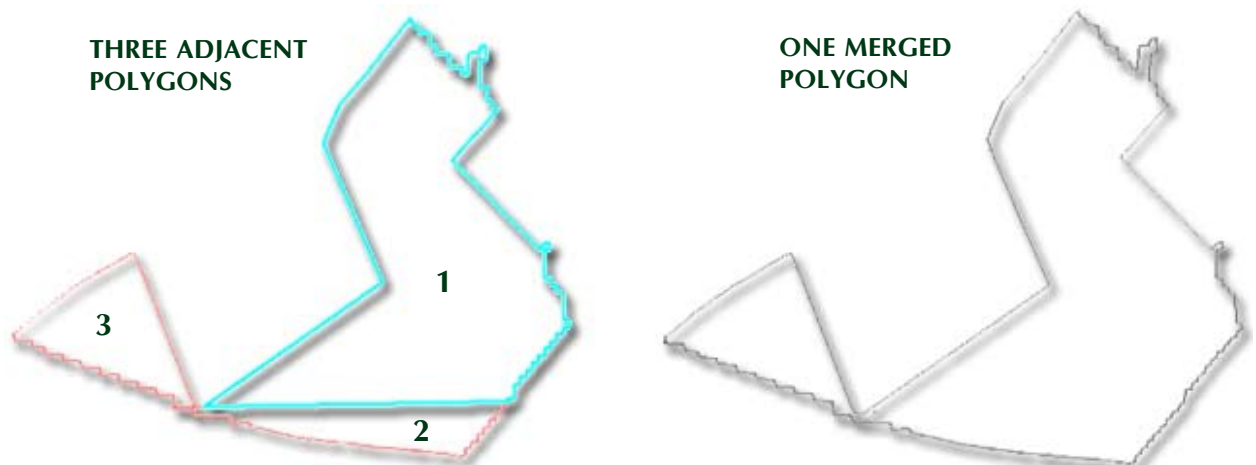


3.2. Merger of polygons

Adjoining areas with deforestation of more than 25 hectares (62 acres) were monitored as the MODIS³ sensor has a moderate spatial resolution (250x250 meters, or 273x273 yards). The PRODES program also has a size limitation for mapping deforested areas, in this case 6.25 hectares (15 acres). In addition, deforested areas in different years could be adjoining and, for this reason, these polygons were merged.

In this way, a gradual deforestation of less than 25 hectares (62 acres) per year can be monitored when the sum of annual and adjacent deforestation is over 25 hectares (62 acres). For example, Figure 2 illustrates the merger of three polygons into one. Before the merger, the individual area of Polygons 2 and 3 was less than 25 hectares (62 acres); with the merger, the total area was over 25 hectares (62 acres) and therefore could be monitored.

Figure 2 – Example of the merger of three PRODES polygons.



3.3. Identification of polygons with agricultural crops through satellite images

The presence of soy in deforested polygons, detected through satellite images, needs to be identified early on, during the initial stages of soy growth, to determine the following steps of flyovers and field visits. Thus, images from the MODIS sensor on board Earth satellite⁴ were obtained from the start of the soy planting season up to about 50 days after planting ended. With images from this period, it was possible to pre-select polygons with agricultural crops; however, it was not possible to differentiate soy from other crops.

This year, to improve pre-selection of polygons and adapt the methodology to regional crop characteristics, two selections using MODIS images were made for the states of Mato Grosso and Rondônia. The first analysis was made from images from the start of the soy growth cycle (between October 15, 2010 and December 15, 2010), and the second from images obtained between October 15, 2010 and January 15, 2011. In the case of the state of Pará, due to the soy planting calendar, the MODIS images used for the first selection were taken between December 1, 2010 and January 31, 2011, while the second selection used images obtained between December 1, 2010 and March 10, 2011.

To reduce the number of polygons designated for flyovers, the pre-selected polygons were submitted to visual interpretation using images with better spatial resolution and with no cloud cover. These images were obtained from the Landsat-5 (sensor TM) and Resourcesat-1 (AWIFS and LISS3 sensors) satellites, acquired by INPE at the reception station in Cuiabá, Mato Grosso state. It is important to highlight that the analysis of images with better spatial resolution does not exclude polygons with agricultural crop characteristics; in other words, it does not omit polygons with a possible soy presence but it does exclude those polygons mistakenly classified as having agricultural crops in the original analysis using MODIS images with lesser spatial resolution. It should be noted that, due to the high temporal resolution of the MODIS images, analysis of deforested polygons covered the entire area of study, whereas the analysis of higher spatial resolution images (lower temporal resolution) was made only in areas where images had no clouds. The 2010/11 crop was particularly favorable for acquisition of cloud-free images, making it possible to refine the selection of polygons for the flyover stage.

A typical example of the procedure for selecting deforested polygons with agricultural crops, in Mato Grosso state, is shown in Figure 3. Figure 3a shows the Evolution of Vegetation Index (EVI), based on the MODIS images, from planting in October through harvest in February of the following year. The MODIS image analysis period for the pre-selection of this particular polygon is highlighted in Figure 3a (Day 289 of the first year to Day 16 of the following year). Figure 3b points to the presence of an agricultural crop in the polygon selected from the MODIS images. Figure 3c shows the characteristic of an agricultural area in a TM image from the Landsat-5 satellite, with the result that this polygon was selected for a flyover to verify whether soybeans were present or not.

Figure 3a – Graph of Evolution of Vegetation Index (EVI).

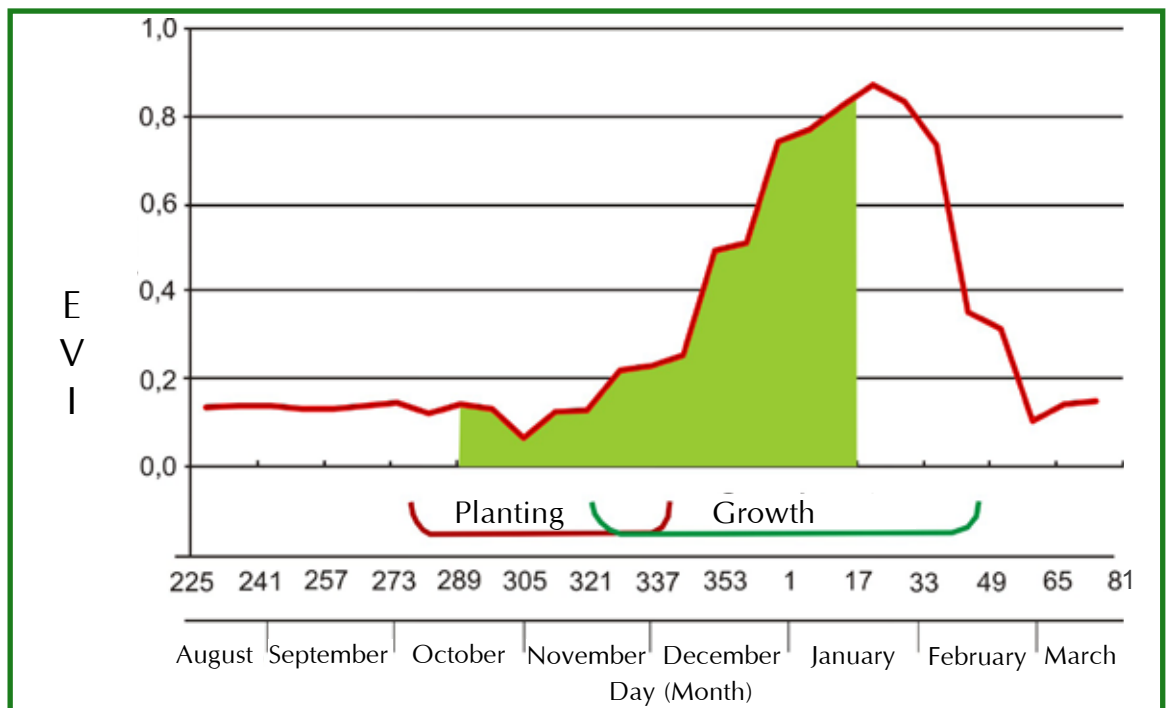


Figure 3b – Result of MODIS image classification.

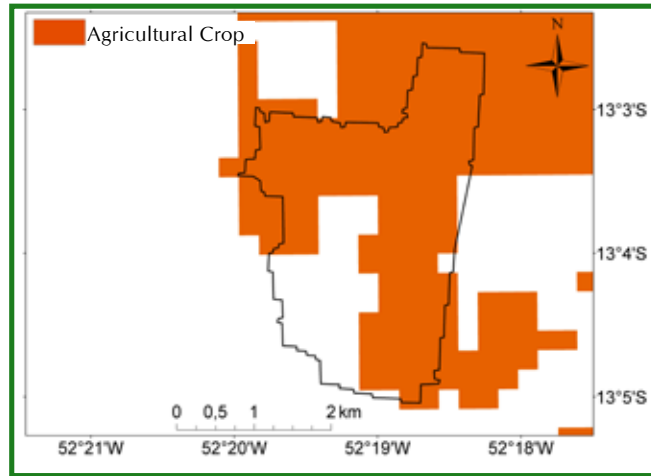
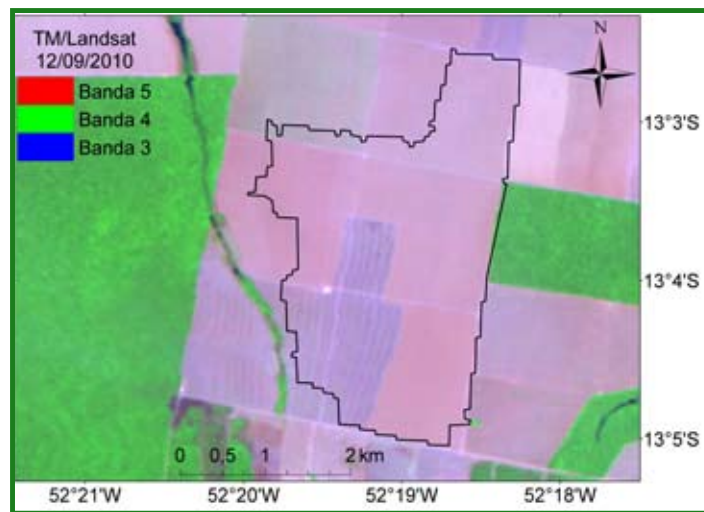


Figure 3c – TM image used in visual interpretation.



The polygons identified through satellite images as having signs of an annual agricultural crop were subjected to a flyover in planes equipped with GPS, computers and cameras to obtain panoramic photographs. The total or partial occurrence of soy and other land use can be identified from these panoramic photographs of the polygons, using the following definitions:

1. **Soybeans and/or rice and/or corn:** area partially or fully planted with soybeans and/or rice and/or corn;
2. **Pasture:** area with pastures for livestock activities;
3. **Deforestation:** area whose native vegetation has been cleared, with the forest totally or partially cut down;
4. **Slash-and-burn:** area where there have been recent fires;
5. **Reforestation:** area with forest plantings of eucalyptus or pine;
6. **Natural regeneration:** area left fallow after deforestation or slash-and-burn and which currently has occurrences of naturally developing native species.

Each selected polygon was identified with:

1. Identification number: ID with the municipality;
2. Name of the proprietor and the property (confidential use): obtained during visits to the property and confirmed with the relevant entities;
3. Land use and occupation: according to classification;
4. Deforested area, in hectares;
5. Area planted with soybeans, in hectares;
6. Central geographic coordinates (X, Y);
7. Satellite images and aerial photographs.

Between December 21, 2010 and April 19, 2011, 157 hours were logged flying over 29 municipalities in the states of Mato Grosso, Rondônia and Pará.

In addition to climatic adversities typical for the time of year, the realization of this project is hampered by the lack of adequate infrastructure (aerodromes and roads), communication problems in some municipalities and difficulties in obtaining information in the field.

IV RESULTS

4.1. Selection of PRODES polygons

Based on the methodology defined for selecting the study area to be monitored, 16,197 polygons have been deforested since the start of the Soy Moratorium, corresponding to a total area of 486,235 hectares (1,877 sq.miles) (Table 1). These polygons are distributed among 53 municipalities in the Amazon Biome: 41 in Mato Grosso, 6 in Pará and 6 in Rondônia. With the merger of adjoining deforested polygons in the years 2007, 2008, 2009 and 2010, the number of polygons fell to 12,041, as shown in Table 1.

Table 1 shows that the merger reduced the number of polygons in the classifications with the smaller acreages (≤ 25 hectares or 62 acres, and 25-50 hectares or 62-124 acres) and increased the number with larger acreages (50-100 hectares or 124-247 acres, and >100 hectares or 247 acres). As can be seen, the merger did not significantly impact the total area being studied.

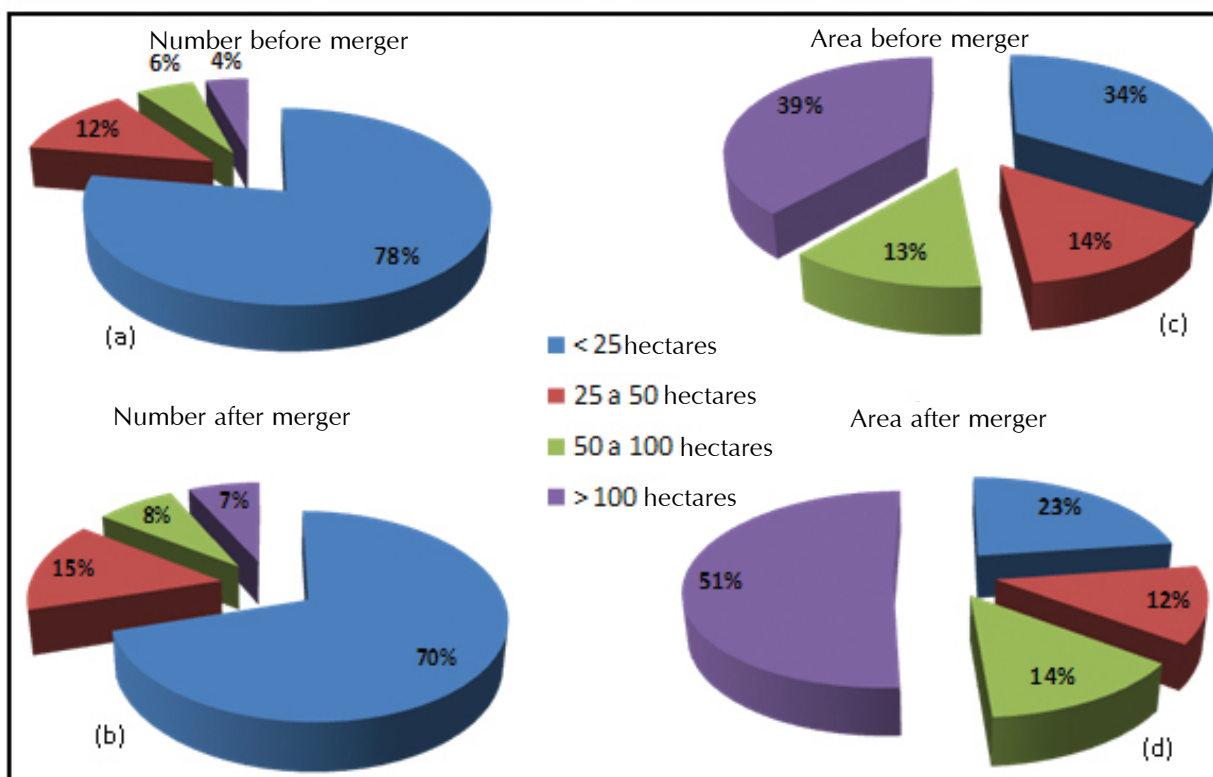
Table 1 – Number of polygons (n) and the acreage (hectares), with and without the merger of adjoining polygons.

Classification	PRODES		PRODES - Merged	
	hectares	n	hectares	n
≤ 25	165,156	12,579	110,612	8,470
25 - 50	69,454	2,020	61,034	1,765
50 - 100	63,467	923	66,142	948
>100	188,158	675	248,324	858
Total	486,235	16,197	486,112	12,041

Before the merger, the smallest polygons with an area less than 25 hectares (62 acres) represented 78% of the total, while the largest polygons, with an area of over 100 hectares (247 acres), represented only 4% (Figure 4a). After the merger, the smallest polygons (less than 25 hectares, or 62 acres) represent 70% and the largest (over 100 hectares, or 247 acres) increased to 7% of the total (Figure 4b).

This variation caused by the merger impacted the representativity of the smallest polygons (less than 25 hectares, or 62 acres), which went from 34% (Figure 4c) to 23% (Figure 4d) of the total deforested area. On the other hand, the largest polygons (over 100 hectares, or 247 acres) increased their representativity, going from 39% (Figure 4c) to 51% (Figure 4d) of the total deforested area. In addition, the total area of the polygons with more than 25 hectares (62 acres) increased from 321,079 hectares (1,240 sq.miles) before the merger to 375,500 hectares (1,450 sq.miles) after the merger.

Figure 4 – Percentage variation of the number (a and b) and the area (c and d) of the polygons, classified by size, before and after the merger.



Based on the criteria for selecting merged polygons with more than 25 hectares (62 acres), 3,571 polygons were selected, made up of 1,765 polygons in the 25-50 hectares (62-124 acres) classification, 948 polygons in the 50-100 hectares (124-247 acres) classification, and 858 polygons in the over 100 hectares (247 acres) classification. These 3,571 polygons represent an area of 375,500 hectares (1,450 sq.miles), or 77% of all the polygons being studied (Table 2).

Table 2 presents the number of deforested polygons by classification of the area monitored in each of the three states analyzed. The largest number of polygons in the soy-producing municipalities (>5,000 hectares, or 19 sq.miles) of the Amazon Biome are found in Mato Grosso (2,185), or 61% of the total. Based on the same criteria, Pará was responsible for 34% of the polygons (1,211) and Rondônia for 5% (175).

Table 2 – Number of polygons (n) and acreage (hectares) by classification of monitored area in the states of Mato Grosso, Pará and Rondônia.

Classification hectares	Mato Grosso		Pará		Rondônia		Subtotal	
	n	hectares	n	hectares	n	hectares	n	hectares
25 - 50	1,011	35,259	644	22,119	110	3,656	1,765	61,034
50 - 100	575	39,996	330	22,999	43	3,147	948	66,143
>100	599	177,494	237	64,504	22	6,326	858	248,324
Subtotal	2,185	252,749	1,211	109,622	175	13,129	3,571	375,500

From the evaluation of the 3,571 polygons monitored by MODIS sensor images, followed by the visual interpretation of medium-resolution spatial images, 293 polygons (9% of the total analyzed) were selected as showing signs of agricultural crops. Of these, 270 polygons were located outside settlements and 23 were on settlement boundaries, as shown in Table 3. This table also shows that 42 polygons with agricultural crops were identified within settlement boundaries. It should be noted that no deforested polygon with agricultural characteristics was found within Indigenous Lands or Conservation Units.

Table 3 – Number of polygons selected for flyovers, evaluated based on MODIS images and medium-resolution spatial images.

Polygons	States			
	MT	PA	RO	Total
Selected outside settlements	191	78	1	270
Selected close to settlement boundaries	23	-	-	23
Total	214	78	1	293

MT- Mato Grosso State; PA- Pará State; RO- Rondônia State.

Of the total deforested polygons in the study area (3,571), 91% (3,236 polygons) showed no signs of the presence of agricultural crops (Table 3).

Geoambiente was responsible for the flyovers of the 293 selected polygons. Of these, 147 polygons were found to have soybeans, corresponding to an area of 11,698 hectares (45 sq.miles) (Table 4), indicating conversion of the forest to soybeans within the period of the Soy Moratorium. This corresponds to 0.28% of all deforestation in the Amazon Biome, or 0.39% of the deforestation in the three states of the Amazon Biome subjected to this monitoring, or 3.1% of the deforestation in the soy-producing municipalities.

In Mato Grosso state, 105 polygons did not comply with the rules of the Soy Moratorium. These polygons represent an area of 8,385 hectares (32 sq.miles) with soy planting (Table 4), corresponding to 72% of soy crops found in monitoring period, but only 1.2% of the total area deforested in the state of Mato Grosso.

Pará state had 41 polygons, with an area of 3,284 hectares (13 sq.miles), planted with soybeans (Table 4), corresponding to 28% of the soy crops found in this monitoring period, but only 0.17% of the total area deforested in the state of Pará during the Soy Moratorium. In Rondônia state, only one polygon, with 29 hectares (0.1 sq.miles) of soybeans (Table 4), was identified in a total deforested area of 365,600 hectares (1,412 sq.miles) (Table 5).

It is worth mentioning that, of the 293 polygons selected for flyovers, 113 were in the >100 hectares (247 acres) classification, of which 55 were identified as having soybean plantings. Soy acreage in these polygons amounted to 8,346 hectares (32 sq.miles) (Table 4), corresponding to 71% of the total soy acreage on deforested land.

Item VIII – Appendix – has the complete listing of the monitored polygons.

Table 4 – Number of polygons with soybeans and soy acreage (hectares) by polygon classification in the states of Mato Grosso, Pará and Rondônia.

Classification	Mato Grosso		Pará		Rondônia		Total	
	hectares	n	hectares	n	hectares	n	hectares	n
25 - 50	40	1,149	17	418	1	29	58	1,567
50 - 100	23	1,340	10	445	-	-	33	1,785
>100	42	5,896	13	2,421	-	-	55	8,346
Total	105	8,385	40	3,284	1	29	146	11,698

Table 5 – Total deforested area (hectares) in the Amazon Biome, in the states of Mato Grosso, Pará and Rondônia.

State	Period of the Soy Moratorium				
	2007	2008	2009	2010	Total
Mato Grosso	237,142	317,123	68,438	65,757	688,460
Pará	552,600	560,700	428,100	371,000	1,912,400
Rondônia	161,100	113,600	48,200	42,700	365,600
Total	952,849	993,431	546,747	479,457	2,972,484

Of the 293 polygons selected for flyovers, an agricultural crop was found in 209 polygons, showing that the classification procedure for areas with agricultural crops using satellite images is very conservative. Therefore, the method for selecting polygons to be subjected to flyovers could be more restrictive in order to reduce the number of polygons selected for flyovers. However, care must be taken not to exclude polygons with agricultural crops, especially those with soybeans.

Another point to be noted is that the number of polygons is cumulative and therefore tends to increase each year; hence the importance of having a good polygon selection method. For example, in 2007, the deforested area to be monitored in the soy-producing states of Mato Grosso, Pará and Rondônia was 952,849 hectares (3,679 sq.miles), compared to the area of 2,972,484 hectares (11,477 sq.miles) that was monitored in 2010, in the same states of the Amazon Biome, an area 3.1 times larger (Table 5).

4.4. Comparison between the monitored crops

Figure 5 shows a comparison of the monitoring during the years of the Soy Moratorium. In the first year, approximately 50,000 hectares (193 sq.miles) in 265 polygons were monitored, of which 195 had an acreage of over 100 hectares (247 acres) and 70 were part of a small sample of polygons with a smaller area. In the second year, the monitored area increased to 158,000 hectares (610 sq.miles) in 560 polygons with more than 100 hectares (247 acres), in addition to a sampling of 70 polygons with a smaller area that was selected using the same criteria as the previous year. In these two years, flyovers were made of all polygons with over 100 hectares (247 acres).

Starting in the Soy Moratorium's third year (crop year 2009/2010), all deforested polygons with more than 25 hectares (62 acres) after any mergers, located in a region with soybean influence, were evaluated, thus widening the reach of the monitoring program. In the 2009/2010 crop year, 693 deforested polygons with over 100 hectares (247 acres) were found, but only 61 polygons had flyovers due to the pre-selection made using satellite images, as 632 polygons (91.2%) showed no presence of agricultural crops and therefore did not need flyovers. In the 2010/11 crop year, 858 deforested polygons with over 100 hectares (247 acres) were found, with flyovers of only 113 polygons due to the pre-selection made by analyzing satellite images. Thus, when compared to the first and second years of the Moratorium, it can be concluded that the use of satellite images significantly reduced flyovers of polygons with more than 100 hectares (247 acres).

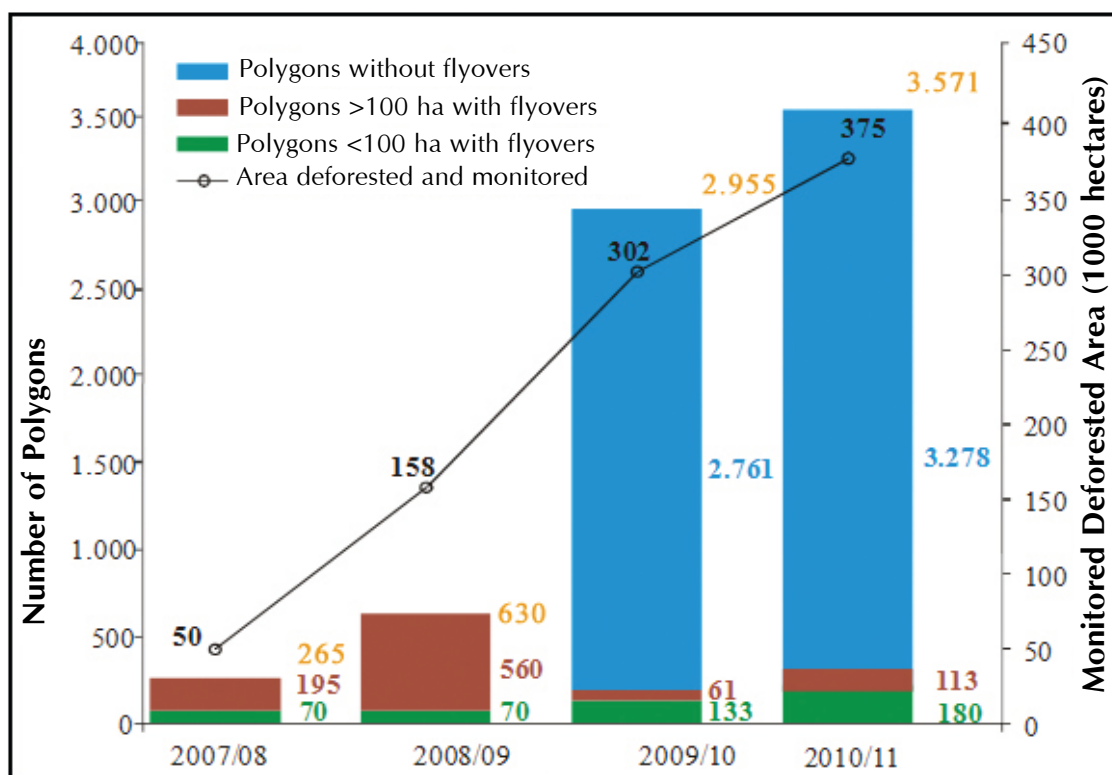
In the classification of polygons with less than 100 hectares (247 acres), a comparison of the first two crop years analyzed with the last two showed an increase in the number of polygons selected for flyovers (Figure 5). One of the reasons is that, in the first two crop years analyzed, only a sampling of 70 deforested polygons of less than 100 hectares (247 acres) were included in the program, all in a very restricted area represented by three municipalities (28 polygons in Feliz Natal, 26 in União do Sul and 16 in Vera). In the third crop year (2009/10), of the 2,262 polygons with between 25 hectares (62 acres) and 100 hectares (247 acres), only 133 were selected for flyovers because they showed signs of agricultural crops in the satellite images. In the 2010/11 crop year, of the 2,713 polygons of this size, only 180 polygons had flyovers.

When comparing the data of the Soy Moratorium's fourth year with that of the prior year's monitoring program, the number of monitored polygons increased by 20.8%, from 2,955 to 3,571 polygons. In the

same period, the monitored area also increased, going from 302,149 hectares (1,167 sq.miles) to 375,500 hectares (1,450 sq.miles), an increase of 24.3%. It is thus evident that both the area monitored and the number of polygons increased significantly in the fourth monitoring period (the 2010/11 crop year) due to new deforestation and to deforestation in prior years that is now visible due to the mergers. A comparison of this year's data to that of the first monitoring program shows that the number of polygons analyzed went from 265 in the first year to 3,571 this year, with the monitored area increasing from 49,809 hectares (192 sq.miles) to 375,500 hectares (1,450 sq.miles).

Considering the immense area covered by the study, the PRODES contiguous deforestation, accumulated since the start of the Soy Moratorium, can only be observed by using satellite images.

Figure 5 – Number of polygons with and without flyovers, and the deforested area monitored over the last four crop years.



In the 2007/08 and 2008/09 crop years, all the polygons of more than 100 hectares (247 acres) had flyovers, as did a further 70 polygons in the pilot project⁵. In the current and the prior crop years, all polygons with more than 25 hectares (62 acres) were monitored, first by satellite images and then by flyovers.

A comparison of the 2010/11 crop year with the prior year shows that the number of polygons with flyovers increased 51%, despite the fact that the total number of PRODES polygons increased 21%. An important factor associated with this increase is the greater length of time that has elapsed since the Soy Moratorium was signed because, in the first years after deforestation occurs, rice is the most common crop, preceding soybean planting which starts in the third year⁶. The same applies when evaluating the number of polygons with agricultural crops that were subjected to flyovers, including soybeans, which number went from 116 to 209, representing an increase of 80% (Table 6).

Table 6 – Total deforested area (hectares) in the Amazon Biome, in the states of Mato Grosso, Pará and Rondônia, in the last two crop years.

Area / polygons	2009/10	2010/11	(%)
Total area monitored (hectares)	302,149	375,500	24%
Total number of polygons	2,955	3,571	21%
Number of polygons with flyovers	194	293	51%
Number of polygons with agriculture	116	209	80%
Number of polygons with soybeans	76	146	92%
Area with soybeans (hectares)	6,295	11,698	86%

5-The pilot project comprised the municipalities of Feliz Natal, União do Sul and Vera, in the state of Mato Grosso.

6-Sorrensen, 2004; Morton et al., 2006.

4.5. Probable causes for the increase in soybean planting in deforested polygons

A comparison of the number of polygons with soybeans can only be made between the current crop year (2010/11) and the prior crop year (2009/2010) because these two monitoring periods used equivalent methodologies. In the earlier years, only polygons with an area of more than 100 hectares (247 acres), with no mergers, were evaluated, which impedes the comparison.

As regards the prior crop year, there was an increase of approximately 93% in the number of polygons used for soybean crops, going from 76 polygons to 146, while the soybean acreage increased from 6,295 hectares (24 sq.miles) to 11,698 hectares (45 sq.miles), or an increase of about 86%. The causes of this increase can be attributed to the following factors:

- An increase in the monitored area, from 302,149 hectares (1,167 sq.miles) in 2009/10 to 375,500 hectares (1,450 sq.miles) in 2010/11;
- A favorable market scenario that stimulated soybean planting;
- Longer period between deforestation and planting soybean crops as it is more usual to plant rice for a year or two in recently deforested areas before planting soybeans⁷.

4.6. Relevance of soybean planting in recently deforested areas of the Amazon Biome

The 2010/11 soybean crop was the largest in Brazil's history, with a production of 75.3 million tons. This record was due to the increase in cultivated area and also, mainly, to increased yields. Despite the drought at the start of the planting season, the states of Mato Grosso and Rondônia also had record yields in the most recent crop, with special mention for the state of Pará which had a 12% gain in productivity over the prior crop year (CONAB, 2011).

The results of this, the fourth year of monitoring, show that soybean planting has occurred in just 0.39% of the total deforested area since the start of the Soy Moratorium. This represents only 0.05% of Brazil's total soybean acreage for the 2010/11 crop year. In view of these results, there is a strong indication that the Moratorium has, over the last four years, inhibited the advance of deforestation in the Amazon Biome for the purpose of planting soybeans.

In the 2010/11 crop year, soybean acreage in deforested polygons, during the period of the Soy Moratorium, represents 0.6% of the total soybean acreage in the Amazon Biome (Table 7). It should be noted that, in the state of Mato Grosso, which is responsible for 88% of the soybeans planted in the Amazon Biome, soybeans in deforested areas during the period of the Moratorium represent 0.49% of the total soybean acreage in the Amazon Biome (Table 7).

Table 7 – Comparison of the area found to have soybeans in the Soy Moratorium polygons and the estimated soybean acreage in the Amazon Biome, by state.

State	Soybean acreage in the Amazon Biome (hectares)		
	Moratorium polygons	Total	% of the total
Mato Grosso	8,385	1,704,963	0.49%
Pará	3,284	104,800	3.13%
Rondônia	29	132,300	0.02%
Total	11,698	1,942,063	0.60%



V CONCLUSIONS

By using satellite images and panoramic aerial photographs, it was possible to map 11,700 hectares (45 sq.miles) of soybean planting in the 2010/11 crop year, in deforested areas during the period of the Soy Moratorium that began on July 24, 2006. Mato Grosso state has the largest participation in soybean acreage (8,385 hectares, or 32 sq.miles), followed by Pará state (3,284 hectares, or 13 sq.miles). Rondônia state had an irrelevant area of 29 hectares (0.1 sq.miles).

This area of 11,700 hectares (45 sq.miles) corresponds to 0.39% of the deforestation in the Amazon Biome, in the states of Mato Grosso, Pará and Rondônia, which amounted to 2.974 million hectares (11,483 sq.miles) in the four-year period 2007-2008-2009-2010. Based on the surveys made by the Soy Moratorium, it can be concluded that soybeans do not play an important role in the deforestation of the Amazon region.

Deforestation in the four-year period 2007-2008-2009-2010, in the states of Mato Grosso, Pará and Rondônia, is still high. However, the same four-year period has produced the lowest historical rates for deforestation in the Legal Amazon region, in an historical series of 22 years (INPE, 2011).

The use of satellite images for monitoring deforested areas, with a view to identifying agricultural crops, makes it possible to evaluate practically the entire area of soybean influence in the Amazon Biome. We can conclude that the Soy Moratorium's monitoring process, using a combination of satellite images and panoramic aerial photographs, provides a high degree of reliability in the identification and mapping of soybean planting in deforested areas during this period.

In summary, the careful process used to analyze satellite images, followed by flyovers with photographic records and collection of documentation from local registry entities, allows the industries and exporters that take part in the Soy Moratorium to comply with their commitment not to acquire soybeans from areas of the Amazon Biome that were deforested after July 24, 2006.

São Paulo, October 13, 2011

Bernardo Rudorff
Technical Coordinator
INPE



Carlo Lovatelli
President
ABIOVE



Izabel Cecarelli
Director
GEOAMBIENTE



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VII TECHNICAL TEAM

7.1. INPE

- **Coordinator:** Bernardo Rudorff
- **Analysts:** Marcos Adami, Joel Rizzo and Flávia Mendes de Souza

7.2. GEOAMBIENTE

- **General Coordinator:** Izabel Cecarelli
- **Technical Coordinator:** Leandro Fabiani
- **Staff:** Elder Silva Marquez, Flavio Fortes Camargo, Jonathas Schultz and Marcos de Almeida Castro

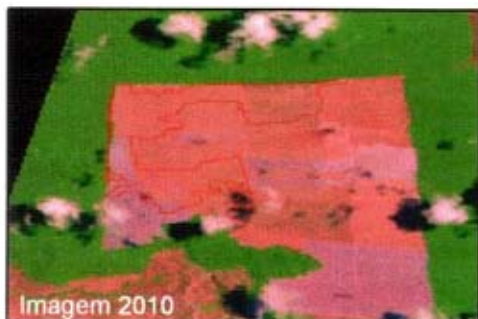
7.3. ABIOVE

- **General Coordinator:** Fábio Trigueirinho
- **Technical Coordinator:** Bernardo Pires
- **Staff:** Daniel Furlan Amaral and Rodrigo Feix

Photographs and satellite images of all monitored polygons are available on ABIOVE's site: www.abiove.com.br.
See the example below:

Click on the ID number to access the photographs and satellite images of each polygon.

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
2955	62.44	PA	PARAGOMINAS	SOYBEANS
2956	345.55	PA	PARAGOMINAS	SOYBEANS/CORN
2982	39.93	PA	PARAGOMINAS	CLEARING



Land use & occupation:
Soybeans/Corn

Polygon area:
345.55 hectares

Soy area:
277.33 hectares

Flyover date:
2011, April

VIII – APPENDIX

8.1. Polygons with flyovers in the state of Mato Grosso (MT), in hectares

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
221	43.9	MT	CANARANA	RICE
268	154.87	MT	CANARANA	RICE
1979	220.28	MT	CLÁUDIA	DEFORESTATION/PASTURE
1646	229.86	MT	CLÁUDIA	RICE/SOYBEANS/REGENERATION
1978	36.34	MT	CLÁUDIA	SOYBEANS
2345	38.61	MT	CLÁUDIA	DEFORESTATION/PASTURE
1977	37.58	MT	CLÁUDIA	PASTURE
1981	25	MT	CLÁUDIA	RICE
1654	35.27	MT	CLÁUDIA	RICE
1530	178.38	MT	CLÁUDIA	DEFORESTATION/REGENERATION/SOYBEANS
1643	65.66	MT	CLÁUDIA	PASTURE
1622	85.62	MT	CLÁUDIA	SOYBEANS/REGENERATION
1640	27.02	MT	CLÁUDIA	REGENERATION/DEFORESTATION
341	37.21	MT	COMODORO	SOYBEANS
444	84.47	MT	COMODORO	SOYBEANS/RICE
1870	810.24	MT	COMODORO	PASTURE
1872	47.36	MT	COMODORO	PASTURE
2011	32.93	MT	COMODORO	PASTURE
8815	49.4	MT	COMODORO	SOYBEANS/REGENERATION
1544	189.68	MT	FELIZ NATAL	DEFORESTATION/REGENERATION
47	204.89	MT	FELIZ NATAL	DEFORESTATION/REGENERATION
673	53.83	MT	FELIZ NATAL	REGENERATION
1609	35.83	MT	FELIZ NATAL	DEFORESTATION
33	428.19	MT	FELIZ NATAL	DEFORESTATION/RICE
29	714.76	MT	FELIZ NATAL	DEFORESTATION/SOYBEANS
96	175.02	MT	FELIZ NATAL	REGENERATION/DEFORESTATION
117	348.83	MT	FELIZ NATAL	DEFORESTATION/SOYBEANS
46	25.82	MT	FELIZ NATAL	PASTURE
73	228.76	MT	FELIZ NATAL	DEFORESTATION/PASTURE/RICE/SOYBEANS
83	29.97	MT	FELIZ NATAL	SOYBEANS
108	41.54	MT	FELIZ NATAL	SOYBEANS/DEFORESTATION
105	228.41	MT	FELIZ NATAL	DEFORESTATION/RICE
124	236.81	MT	FELIZ NATAL	DEFORESTATION
1545	553.75	MT	FELIZ NATAL	DEFORESTATION/RICE
1301	56.67	MT	FELIZ NATAL	SOYBEANS/DEFORESTATION
724	26.61	MT	FELIZ NATAL	DEFORESTATION/REGENERATION
1555	37.15	MT	FELIZ NATAL	REGENERATION/SOYBEANS
751	763.84	MT	FELIZ NATAL	DEFORESTATION/REGENERATION

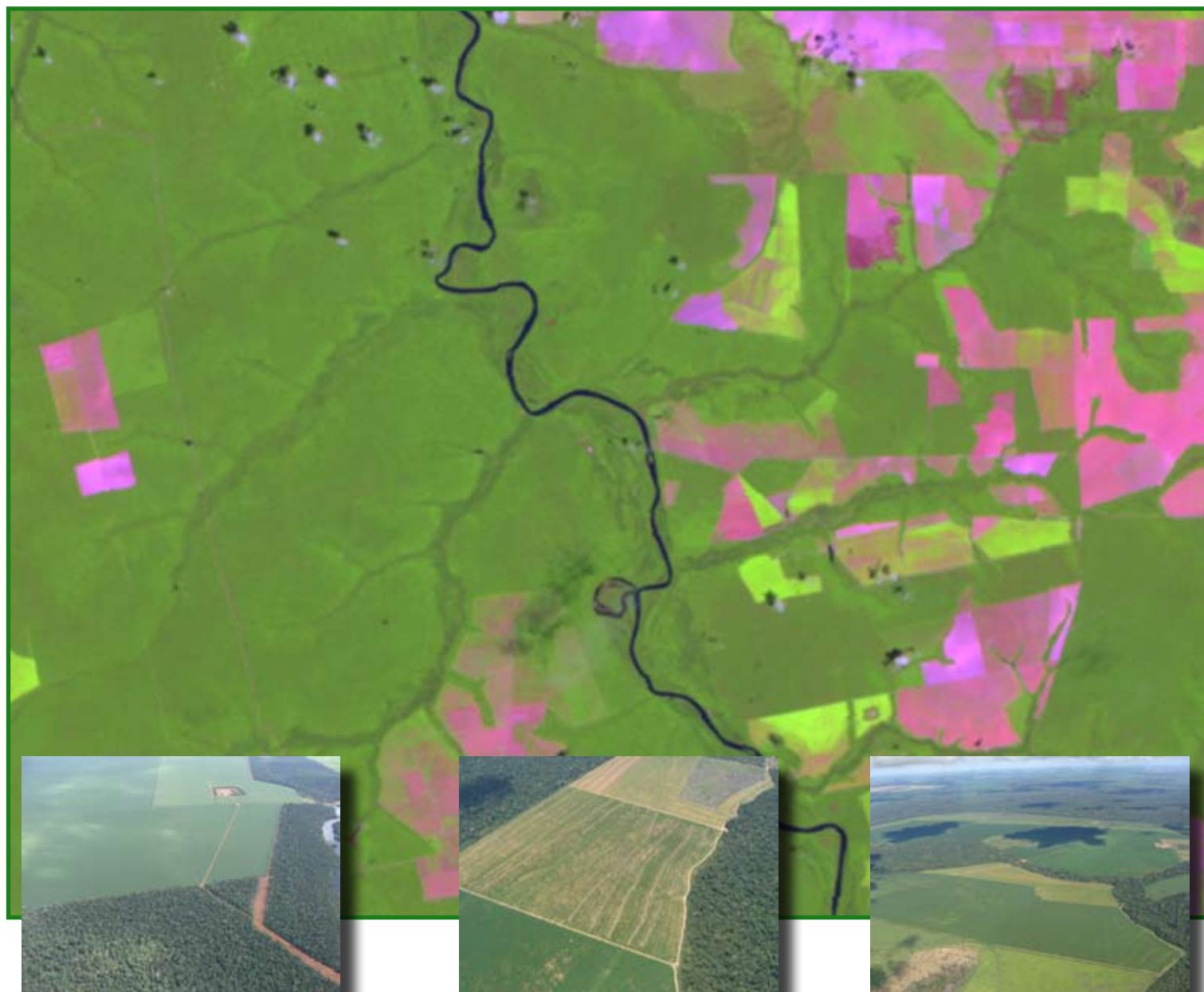
ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
1554	105.44	MT	FELIZ NATAL	SOYBEANS
1628	117.25	MT	FELIZ NATAL	SOYBEANS/REGENERATION
1550	26.07	MT	FELIZ NATAL	REGENERATION/SOYBEANS
1629	159.03	MT	FELIZ NATAL	RICE
1626	192.63	MT	FELIZ NATAL	RICE/DEFORESTATION
292	42.91	MT	FELIZ NATAL	SOYBEANS/PASTURE
747	197.14	MT	FELIZ NATAL	SOYBEANS/REGENERATION
1303	539.29	MT	FELIZ NATAL	DEFORESTATION/SOYBEANS
534	165.38	MT	FELIZ NATAL	SOYBEANS
535	30.37	MT	FELIZ NATAL	SOYBEANS
1308	968.61	MT	FELIZ NATAL	DEFORESTATION/REGENERATION
179	29.31	MT	FELIZ NATAL	SOYBEANS
529	297.99	MT	FELIZ NATAL	RICE/SOYBEANS
743	412.74	MT	FELIZ NATAL	SOYBEANS
750	58.57	MT	FELIZ NATAL	SOYBEANS
1894	543.4	MT	FELIZ NATAL	DEFORESTATION/REGENERATION
764	57.82	MT	FELIZ NATAL	REGENERATION
1587	58.51	MT	GAÚCHA DO NORTE	RICE
1429	73.35	MT	GAÚCHA DO NORTE	SOYBEANS
1579	481.96	MT	GAÚCHA DO NORTE	SOYBEANS/RICE
1750	29.96	MT	GAÚCHA DO NORTE	SOYBEANS
1580	87.54	MT	GAÚCHA DO NORTE	SOYBEANS
1825	28.06	MT	GAÚCHA DO NORTE	SOYBEANS
1822	88.99	MT	GAÚCHA DO NORTE	DEFORESTATION
1136	33.34	MT	GAÚCHA DO NORTE	REGENERATION
1819	74.06	MT	GAÚCHA DO NORTE	SOYBEANS
1140	82.77	MT	GAÚCHA DO NORTE	SOYBEANS
1144	441.32	MT	GAÚCHA DO NORTE	DEFORESTATION/RICE/SOYBEANS
266	255.48	MT	GAÚCHA DO NORTE	SOYBEANS/RICE
222	70.02	MT	GAÚCHA DO NORTE	SOYBEANS/DEFORESTATION/REGENERATION
162	27.91	MT	GAÚCHA DO NORTE	SOYBEANS
230	93.35	MT	GAÚCHA DO NORTE	SOYBEANS/REGENERATION
1126	127.09	MT	GAÚCHA DO NORTE	REGENERATION/SOYBEANS
1125	32.5	MT	GAÚCHA DO NORTE	REGENERATION/SOYBEANS
651	83.49	MT	IPIRANGA DO NORTE	DEFORESTATION/REGENERATION
685	80.9	MT	IPIRANGA DO NORTE	SOYBEANS
681	269.04	MT	IPIRANGA DO NORTE	SOYBEANS/DEFORESTATION
2340	456.53	MT	IPIRANGA DO NORTE	DEFORESTATION
1958	1,305.91	MT	IPIRANGA DO NORTE	DEFORESTATION
2347	301.09	MT	IPIRANGA DO NORTE	DEFORESTATION
653	28.98	MT	IPIRANGA DO NORTE	DEFORESTATION/SOYBEANS

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
660	421.9	MT	IPIRANGA DO NORTE	DEFORESTATION/SOYBEANS
654	30.44	MT	ITANHANGÁ	PASTURE
678	26.66	MT	ITANHANGÁ	PASTURE
209	53.6	MT	ITANHANGÁ	SOYBEANS
578	28.44	MT	ITANHANGÁ	DEFORESTATION/REGENERATION
214	113.66	MT	ITANHANGÁ	DEFORESTATION/RICE/SOYBEANS
1514	100.43	MT	ITANHANGÁ	RICE/PASTURE/DEFORESTATION
1526	38.04	MT	ITANHANGÁ	SOYBEANS
212	186.33	MT	ITANHANGÁ	DEFORESTATION
168	162.39	MT	ITANHANGÁ	RICE/DEFORESTATION
208	29.57	MT	ITANHANGÁ	SOYBEANS
199	77.5	MT	ITANHANGÁ	SOYBEANS
1515	31.2	MT	ITANHANGÁ	PASTURE/DEFORESTATION
977	35.69	MT	ITAÚBA	REGENERATION
975	34.3	MT	ITAÚBA	REGENERATION
727	33.61	MT	ITAÚBA	DEFORESTATION
1490	75.36	MT	ITAÚBA	DEFORESTATION
1374	30.93	MT	ITAÚBA	PASTURE
489	74.05	MT	LUCAS DO RIO VERDE	DEFORESTATION/REGENERATION
493	127.08	MT	LUCAS DO RIO VERDE	SOYBEANS/REGENERATION
500	30.82	MT	LUCAS DO RIO VERDE	SOYBEANS/DEFORESTATION
911	26.65	MT	NOVA MARINGÁ	SOYBEANS
910	105.6	MT	NOVA MARINGÁ	SOYBEANS
1481	51.24	MT	NOVA MARINGÁ	PASTURE
917	418,56	MT	NOVA MARINGÁ	DEFORESTATION/RICE
1489	132.95	MT	NOVA MARINGÁ	RICE
481	51.06	MT	NOVA MARINGÁ	SOYBEANS/REGENERATION
475	112.62	MT	NOVA MARINGÁ	DEFORESTATION/SOYBEANS/PASTURE
476	31.52	MT	NOVA MARINGÁ	DEFORESTATION/PASTURE
480	28.49	MT	NOVA MARINGÁ	SOYBEANS
163	33.65	MT	NOVA MARINGÁ	SOYBEANS
820	142.37	MT	NOVA UBIRATÃ	SOYBEANS
425	26.14	MT	NOVA UBIRATÃ	SOYBEANS
130	284.08	MT	NOVA UBIRATÃ	DEFORESTATION/REGENERATION/SOYBEANS
131	231.54	MT	NOVA UBIRATÃ	SOYBEANS
413	34.17	MT	NOVA UBIRATÃ	SOYBEANS
317	204.72	MT	NOVA UBIRATÃ	PASTURE
311	635.64	MT	NOVA UBIRATÃ	SOYBEANS/REGENERATION
935	123.86	MT	NOVA UBIRATÃ	RICE
365	53.87	MT	NOVA UBIRATÃ	RICE/DEFORESTATION/SOYBEANS
366	194.26	MT	NOVA UBIRATÃ	RICE/DEFORESTATION

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
367	1,456.37	MT	NOVA UBIRATÃ	RICE/DEFORESTATION
404	47.12	MT	NOVA UBIRATÃ	DEFORESTATION/RICE
400	221.37	MT	NOVA UBIRATÃ	DEFORESTATION/RICE/REGENERATION/PASTURE
1619	26.68	MT	NOVA UBIRATÃ	RICE/SOYBEANS
1362	84.58	MT	NOVA UBIRATÃ	DEFORESTATION
1364	39.09	MT	NOVA UBIRATÃ	DEFORESTATION/REGENERATION
1363	38.64	MT	NOVA UBIRATÃ	RICE/DEFORESTATION
1365	71.44	MT	NOVA UBIRATÃ	REGENERATION/DEFORESTATION
1761	28.27	MT	PARANATINGA	RICE/REGENERATION
1762	37.59	MT	PARANATINGA	RICE/DEFORESTATION
656	66.96	MT	PORTO DOS GAÚCHOS	DEFORESTATION
1592	32.16	MT	PORTO DOS GAÚCHOS	REGENERATION
1593	146.7	MT	PORTO DOS GAÚCHOS	DEFORESTATION/REGENERATION
655	29.1	MT	PORTO DOS GAÚCHOS	SOYBEANS
650	99.26	MT	PORTO DOS GAÚCHOS	DEFORESTATION
464	30.23	MT	PORTO DOS GAÚCHOS	SOYBEANS
2357	43.23	MT	QUERÊNCIA	DEFORESTATION
375	861.48	MT	QUERÊNCIA	DEFORESTATION/SOYBEANS
376	35.66	MT	QUERÊNCIA	SOYBEANS
505	79.97	MT	QUERÊNCIA	SOYBEANS
386	119.25	MT	QUERÊNCIA	SOYBEANS
430	122.29	MT	QUERÊNCIA	RICE/SOYBEANS/DEFORESTATION
1662	315.83	MT	QUERÊNCIA	SOYBEANS/RICE
782	103.54	MT	QUERÊNCIA	DEFORESTATION
776	40.74	MT	QUERÊNCIA	SOYBEANS
731	41.82	MT	SANTA CARMEM	SOYBEANS
741	67.94	MT	SANTA CARMEM	RICE/SOYBEANS
1841	51.68	MT	SANTA CARMEM	SOYBEANS
2349	55.48	MT	SANTA CARMEM	RICE
1575	46.97	MT	SANTA CARMEM	SOYBEANS/REGENERATION/DEFORESTATION
745	355.06	MT	SANTA CARMEM	RICE
554	439.19	MT	SANTA CARMEM	SOYBEANS
516	180.44	MT	SANTA CARMEM	RICE/DEFORESTATION
672	27.98	MT	SANTA CARMEM	REGENERATION
178	71.51	MT	SANTA CARMEM	DEFORESTATION/REGENERATION
671	221.81	MT	SANTA CARMEM	RICE/DEFORESTATION
739	52.32	MT	SANTA CARMEM	SOYBEANS
740	33.36	MT	SANTA CARMEM	SOYBEANS
278	573.93	MT	SANTA CARMEM	DEFORESTATION/SOYBEANS/REGENERATION
1850	45.05	MT	SANTA CARMEM	PASTURE
177	31.17	MT	SANTA CARMEM	PASTURE

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
1908	50.62	MT	SÃO JOSÉ DO RIO CLARO	SOYBEANS
1598	52.49	MT	SÃO JOSÉ DO RIO CLARO	SOYBEANS
280	32.74	MT	SINOP	SOYBEANS
1840	26.81	MT	SINOP	SOYBEANS
1852	129.46	MT	SINOP	RICE
1311	149.89	MT	SINOP	SOYBEANS
1964	26.49	MT	SINOP	RICE
1871	40.04	MT	SINOP	SOYBEANS
1447	45.19	MT	SINOP	REGENERATION
1836	27.32	MT	SINOP	PASTURE/DEFORESTATION/REGENERATION
1092	1,060.04	MT	SINOP	DEFORESTATION/REGENERATION/SOYBEANS
1441	60.41	MT	SINOP	RICE
1097	75.53	MT	SINOP	RICE
1465	133.67	MT	SINOP	RICE
1099	125.74	MT	SINOP	DEFORESTATION/RICE
1443	159.35	MT	SINOP	REGENERATION/SOYBEANS
691	135.47	MT	SORRISO	SOYBEANS
1073	562.69	MT	TABAPORÃ	RICE/SOYBEANS/DEFORESTATION
989	32.84	MT	TABAPORÃ	RICE
688	51.79	MT	TABAPORÃ	PASTURE
684	732.07	MT	TABAPORÃ	RICE
1269	45.74	MT	TABAPORÃ	REGENERATION
649	76.92	MT	TAPURAH	RICE
817	33.05	MT	TAPURAH	SOYBEANS
451	32.76	MT	TAPURAH	PASTURE
503	42.81	MT	TAPURAH	SOYBEANS/RICE
813	120.42	MT	TAPURAH	RICE
504	54.77	MT	TAPURAH	SOYBEANS
467	119	MT	TAPURAH	PASTURE/DEFORESTATION/SOYBEANS
422	51.91	MT	TAPURAH	PASTURE/DEFORESTATION
1382	27.82	MT	UNIÃO DO SUL	DEFORESTATION
1862	48.01	MT	UNIÃO DO SUL	RICE
752	57.86	MT	UNIÃO DO SUL	RICE
1384	77.15	MT	UNIÃO DO SUL	RICE
1861	35.57	MT	UNIÃO DO SUL	SOYBEANS
1682	673.72	MT	UNIÃO DO SUL	DEFORESTATION/RICE/REGENERATION/SOYBEANS
1990	111.67	MT	UNIÃO DO SUL	SOYBEANS
1986	142.88	MT	UNIÃO DO SUL	SOYBEANS/PASTURE
1383	141.04	MT	UNIÃO DO SUL	PASTURE
1557	33.8	MT	UNIÃO DO SUL	PASTURE/REGENERATION
1412	89.56	MT	UNIÃO DO SUL	PASTURE/DEFORESTATION

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
1411	71.16	MT	UNIÃO DO SUL	PASTURE/DEFORESTATION
1681	48.21	MT	UNIÃO DO SUL	DEFORESTATION/PASTURE
1375	113.9	MT	UNIÃO DO SUL	DEFORESTATION
584	25.72	MT	VERA	SOYBEANS
1535	89.13	MT	VERA	PASTURE
1534	331.59	MT	VERA	PASTURE/RICE
834	52.79	MT	VERA	PASTURE/RICE
734	84.94	MT	VERA	SOYBEANS
1543	33.78	MT	VERA	SOYBEANS/DEFORESTATION
81	104.62	MT	VERA	DEFORESTATION/RICE
735	144.5	MT	VERA	DEFORESTATION/SOYBEANS
517	34.8	MT	VERA	SOYBEANS/PASTURE



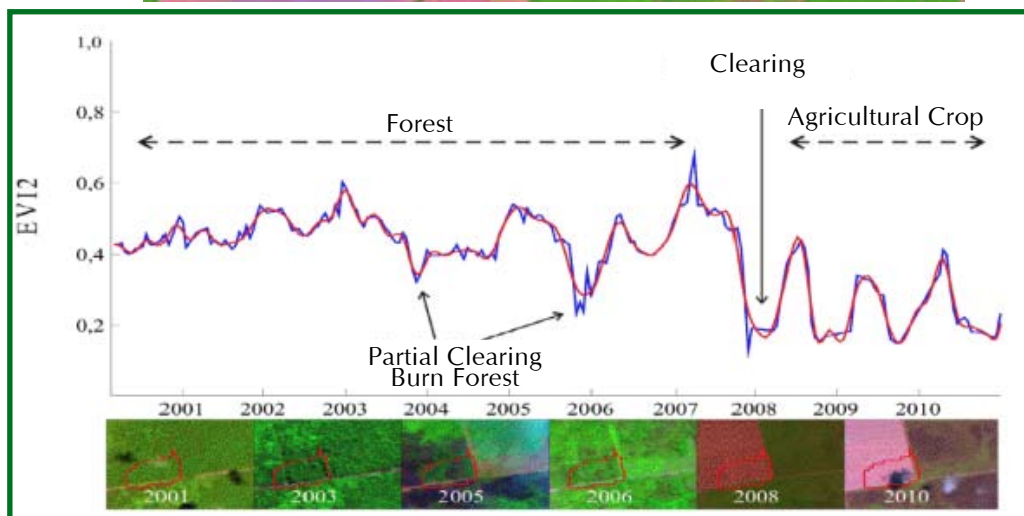
8.2. Polygons with flyovers in the state of Pará (PA), in hectares

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
3161	29.86	PA	BELTERRA	DEFORESTATION/SOYBEANS/CORN
3025	64.47	PA	BELTERRA	SOYBEANS/RICE/DEFORESTATION
3027	27.15	PA	BELTERRA	SOYBEANS/DEFORESTATION
3036	29.3	PA	BELTERRA	SOYBEANS
3041	32.19	PA	BELTERRA	DEFORESTATION/REGENERATION
3165	46.03	PA	BELTERRA	DEFORESTATION/PASTURE/REGENERATION
3166	27.57	PA	BELTERRA	SOYBEANS/DEFORESTATION
3518	27.14	PA	BELTERRA	SOYBEANS
2695	32.31	PA	DOM ELISEU	SOYBEANS/DEFORESTATION
2696	28.91	PA	DOM ELISEU	SOYBEANS
2698	39.8	PA	DOM ELISEU	REFORESTATION/SOYBEANS
2702	36.06	PA	DOM ELISEU	SOYBEANS/DEFORESTATION
2704	151.12	PA	DOM ELISEU	CORN/SOYBEANS/REGENERATION
2705	79.2	PA	DOM ELISEU	REFORESTATION/REGENERATION
2706	27.71	PA	DOM ELISEU	CORN
2708	70.98	PA	DOM ELISEU	REGENERATION/REFORESTATION/DEFORESTATION
2709	48.55	PA	DOM ELISEU	PASTURE/REGENERATION
2713	153.06	PA	DOM ELISEU	REGENERATION/REFORESTATION
2719	79.17	PA	DOM ELISEU	REFORESTATION
2728	38.79	PA	DOM ELISEU	REFORESTATION
2731	97.73	PA	DOM ELISEU	REFORESTATION/DEFORESTATION/REGENERATION
2734	25.03	PA	DOM ELISEU	CORN/DEFORESTATION
2735	26.03	PA	DOM ELISEU	SOYBEANS/REGENERATION
2742	50.82	PA	DOM ELISEU	REFORESTATION
2745	30.04	PA	DOM ELISEU	SOYBEANS
2747	112.39	PA	DOM ELISEU	DEFORESTATION/REGENERATION
2748	163.52	PA	DOM ELISEU	CORN/SOYBEANS
2749	84.12	PA	DOM ELISEU	DEFORESTATION/SOYBEANS/REGENERATION
2750	34.24	PA	DOM ELISEU	SOYBEANS
2778	59.07	PA	DOM ELISEU	CORN
2786	664.79	PA	DOM ELISEU	DEFORESTATION/CORN/RICE/REGENERATION
2801	36.44	PA	DOM ELISEU	CORN
2804	25.58	PA	DOM ELISEU	CORN/DEFORESTATION
3346	410.79	PA	DOM ELISEU	CORN/SOYBEANS/RICE/DEFORESTATION
3347	286.43	PA	DOM ELISEU	SOYBEANS/DEFORESTATION/REGENERATION
3348	495.1	PA	DOM ELISEU	SOYBEANS/REGENERATION/CORN/PASTURE
3352	227.26	PA	DOM ELISEU	DEFORESTATION/REFORESTATION/RICE
3353	298.25	PA	DOM ELISEU	SOYBEANS/CORN/DEFORESTATION
3354	41.68	PA	DOM ELISEU	SOYBEANS

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
3357	821.37	PA	DOM ELISEU	DEFORESTATION/SOYBEANS/REGENERATION
3361	420.2	PA	DOM ELISEU	SOYBEANS/CORN/DEFORESTATION
3364	178.3	PA	DOM ELISEU	REGENERATION/SOYBEANS/DEFORESTATION
3369	189.45	PA	DOM ELISEU	DEFORESTATION/RICE
3371	64.87	PA	DOM ELISEU	CORN/REGENERATION
3373	95.29	PA	DOM ELISEU	DEFORESTATION/SOYBEANS
3375	67.7	PA	DOM ELISEU	SOYBEANS
3376	291.74	PA	DOM ELISEU	DEFORESTATION/CORN/REGENERATION
3379	113.42	PA	DOM ELISEU	PASTURE/CORN
2955	62.44	PA	PARAGOMINAS	SOYBEANS
2956	345.55	PA	PARAGOMINAS	SOYBEANS/CORN
2982	39.93	PA	PARAGOMINAS	DEFORESTATION
3008	107.59	PA	PARAGOMINAS	SOYBEANS/DEFORESTATION
3012	118.66	PA	PARAGOMINAS	CORN
3145	145.14	PA	PARAGOMINAS	SOYBEANS/DEFORESTATION
3473	61	PA	PARAGOMINAS	SOYBEANS
3488	108.38	PA	PARAGOMINAS	DEFORESTATION/RICE
3503	65.23	PA	PARAGOMINAS	DEFORESTATION/SOYBEANS
3505	435.2	PA	PARAGOMINAS	SOYBEANS/DEFORESTATION
3257	58.56	PA	SANTANA DO ARAGUAIA	PASTURE
3099	114.41	PA	SANTARÉM	RICE/DEFORESTATION
3156	38.27	PA	SANTARÉM	DEFORESTATION/REGENERATION
3184	30.82	PA	SANTARÉM	SOYBEANS/RICE
2932	85.44	PA	ULIANÓPOLIS	CORN
2938	28.74	PA	ULIANÓPOLIS	DEFORESTATION/SOYBEANS
2939	136.52	PA	ULIANÓPOLIS	SOYBEANS/DEFORESTATION
2940	32.53	PA	ULIANÓPOLIS	DEFORESTATION
2941	77.95	PA	ULIANÓPOLIS	RICE/DEFORESTATION
2945	25.47	PA	ULIANÓPOLIS	SOYBEANS
2946	46.12	PA	ULIANÓPOLIS	CORN
2947	39.13	PA	ULIANÓPOLIS	SOYBEANS/DEFORESTATION
2948	65.36	PA	ULIANÓPOLIS	DEFORESTATION/SOYBEANS
2949	30.99	PA	ULIANÓPOLIS	REGENERATION/DEFORESTATION
2950	228.45	PA	ULIANÓPOLIS	PASTURE/RICE
3392	234.05	PA	ULIANÓPOLIS	DEFORESTATION/PASTURE/CORN/REGENERATION
3399	250.83	PA	ULIANÓPOLIS	RICE/DEFORESTATION/REGENERATION
3408	1,731.82	PA	ULIANÓPOLIS	REFORESTATION/REGENERATION
3423	144.61	PA	ULIANÓPOLIS	DEFORESTATION/RICE
3428	96.59	PA	ULIANÓPOLIS	SOYBEANS/DEFORESTATION

8.3. Polygons with flyovers in the state of Rondônia (RO), in hectares

ID	Area of Polygon (hectares)	State	Municipality	Land Use & Occupation
2233	28.32	RO	VILHENA	SOYBEANS



PRODUCTION



SPONSORSHIP



GTS – SOY TASK FORCE

