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Weekly analysis of wildfires in the Amazon region: October 26 - November 1, 2020

2020

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Scope of this report and executive summary

This report describes the trends of wildfires in the Amazon in 2020 through the comparison with the fire activity in the region in previous fire seasons. It must be noted than 2019 was a critical year in terms of fire activity in many of the countries in the region. Seasonality and trends on fire activity in the countries can be found at the JRC Technical Report on the Amazon. The current report has been produced by the European Commission's Joint Research Centre (JRC) within its activities on the development of a Global Wildfire Information System (GWIS)[1]. Most of the Amazon region is in Brazil, specifically in the Brazilian Legal Amazon (BLA)[2], and in other neighbor countries. Paraguay has been included in this report due to the high fire activity observed this year, although it is not part of the Amazon region. Figure 1 shows the geographical extent of the countries analyzed in this report.

- In the Brazil Legal Amazon (BLA), within Brazil, **a total of 30.42 Mha burnt since January 1 until November 1, 2020. This values is about 57% higher than that of 2019**. **In the last 3 weeks, the number of fires in the BLA has considerably decreased,** while the fire size was similar to that of 2018 and 2019. **Last week 3,065 fires occurred, which is a higher** value than those in 2019 and 2018 for the same week. The value of burnt areas in October 2020 are above that of 2019.
- **42.54 Mha ha burnt in Brazil since January 1 until November 1, 2020**, with a total 0.98 Mha burnt in the last week**. The value of the last week was below the value of the same week in 2019**. **So far, the total burnt area in Brazil is about 47% higher than that of 2019. 4,114 fires occurred last week**. The average fire size is similar to 2019 that was a critical year.
- In Bolivia, the last week had lower burnt area but higher number of fires than the same week in 2019, **increasing the burnt area trend of the year 2020 (7.31 Mha)**. However, the average fire size remains similar to previous years, although lower than the peaks of the fire size reached during July of 2019.
- **In Colombia, the total burnt area in the country (3.26 Mha) remains approximately 23.68% above the values of 2019, due to the intensive fire activity from January to April 2020.**
- **Paraguay, with 5.73 Mha burnt since January 1 until November 1, 2020, has reached values nearly two times the values in 2018 and 2019.** The average fire size has decreased during the last 3 weeks reaching the values of the same weeks of 2018 and 2019**.**
- A total of 2.46 Mha burnt in Peru since January 1 until November 1, 2020. **This value is almost double than that of 2019, mainly because of the increase of the fire activity during July and August**. The number of fires mapped in GWIS is nearly double of that in 2019.
- Venezuela recorded 6.88 Mha burnt in the current year. **The value of the total burnt area in Venezuela is approximately 16.03% higher than that in 2019 due to the intensive fire activity in the country between January and April. The trend in the last week is comparable to those of 2018 and 2019.**
- This week, will remain extreme in a narrow area in eastern Brazil and high to very high in Bolivia, Paraguay and southwestern Brazil.

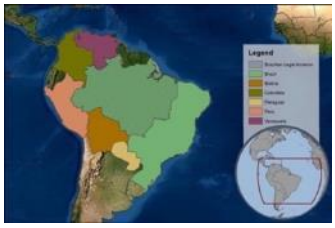


Figure 1. Areas analyzed in this report: Brazil Legal Amazon, Brazil, Bolivia, Colombia, Paraguay, Peru and Venezuela

[1] https://gwis.jrc.ec.europa.eu

[2] The Brazilian Legal Amazon is a geopolitical region in Brazil, established in the article 2 of the complementary law 124, of 2007, that includes 772 municipalities over 9 states. It comprises approximately five million square kilometres, which correspond to 59% of the Brazilian territory (IBGE, 2019)

1 Wildfires in the Brazilian Legal Amazon Region

Figure 2 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 30.42 Mha burnt in the BLA since January 1 until November 1, 2020, with 0.76 Mha burnt in total the last week, similar for the same week in 2019. Until November 1th, the total burnt area in 2020 in BLA is about 57% higher than that of 2019.

The number of fires recorded in GWIS in the last week was 3065, higher than the value in 2019 and 2018 in that week. The total number of fires in 2020 is above the figures in 2018 and 2019. On average, fires that occurred in the BLA in the last 3 weeks, were of a similar size in 2020 compared to 2019 and 2018. The number of thermal anomalies until November 1, 2020 (938,617) shows a typical trend in the region as compared to the trends in 2018 and 2019. A number of 65,853 thermal anomalies was registered last week.

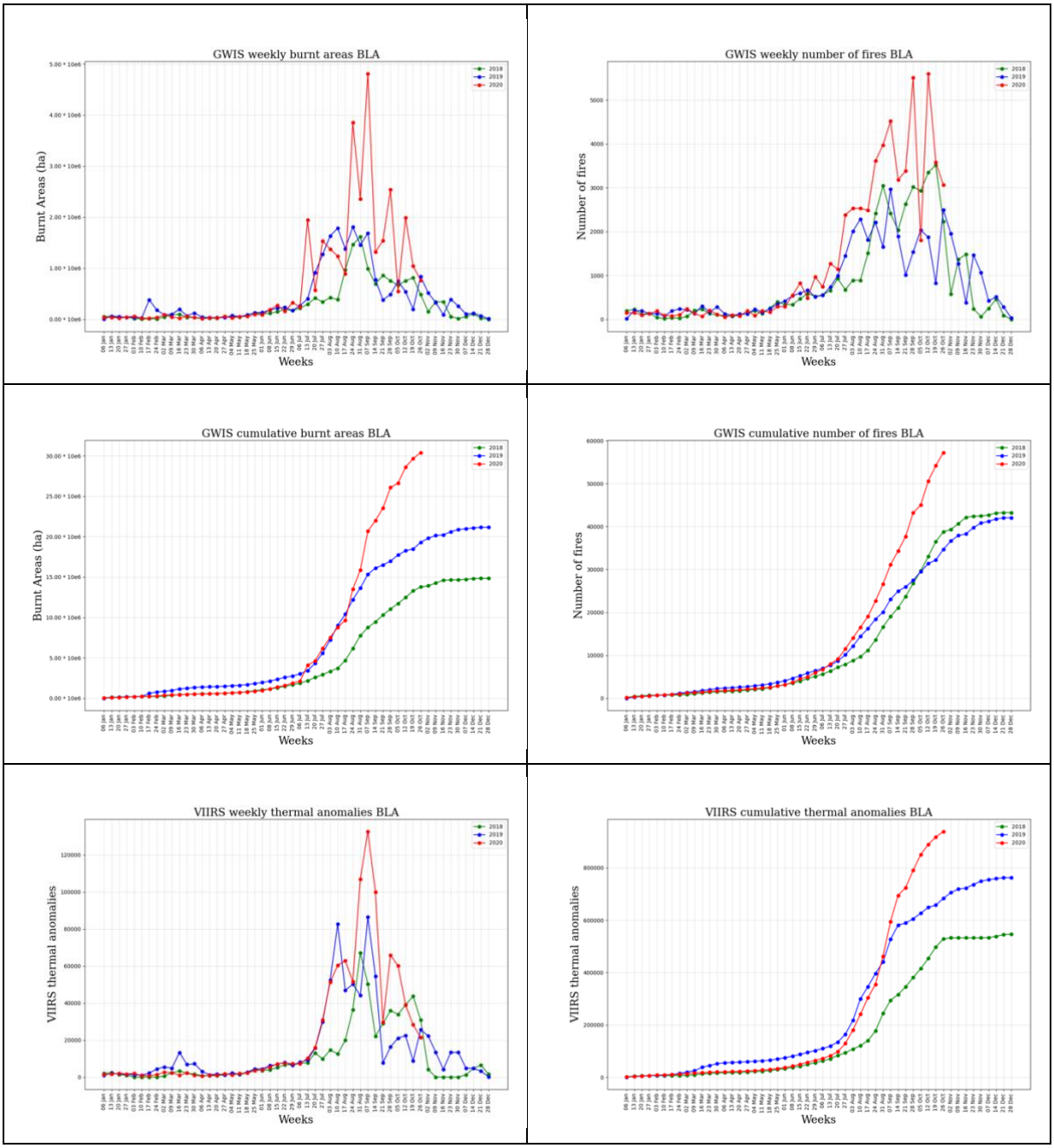


Figure 2. Trend of burnt areas and number of fires as compared to data in the last two years.

2 Wildfires in Brazil

Figure 3 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 42.54 Mha ha burnt in Brazil since January 1 until November 1, 2020, with a total 0.98 Mha burnt in the last week. The value of the week was lower than of the values for the same week in 2019. Until November 1th, the total burnt area in Brazil is about 47% higher than that of 2019.

The number of fires recorded in GWIS in the last week was 4114, similar to the value in 2019 but higher than 2018 in that week. The number of fires in 2020 up to November 1 is higher than that of 2019, although the average fire size is similar to 2019 that was a critical year. The number of thermal anomalies until November 1, 2020 (1,321,926) shows a typical trend in the region but with lower values as compared to the trends in 2018 and 2019. 26,785 thermal anomalies were registered last week.

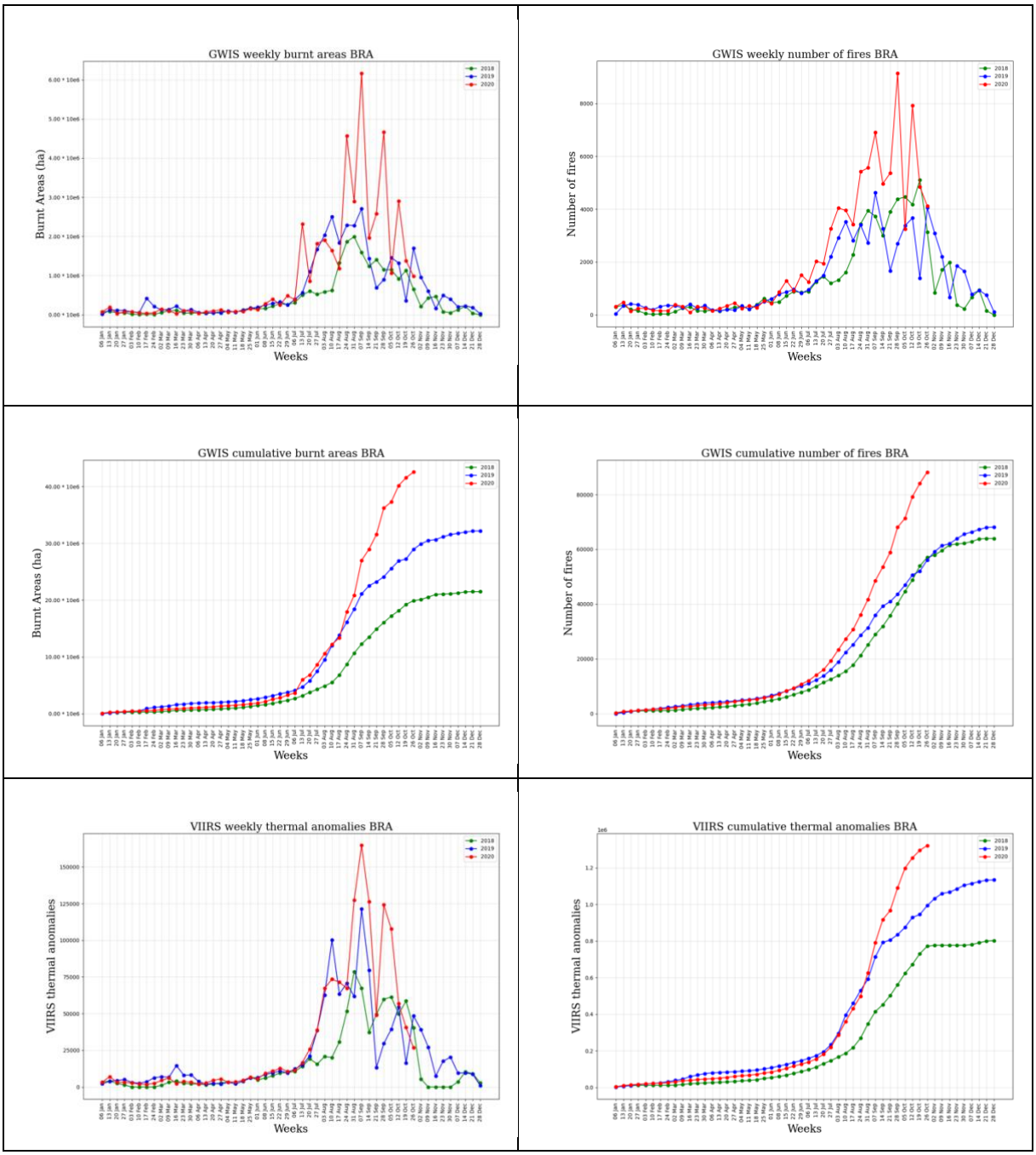


Figure 3. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

3 Wildfires in Bolivia

Figure 4 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 7.31 Mha ha burnt in Bolivia since January 1 until November 1, 2020, with 319,457 ha burnt in the last week. The last week had lower burnt area but higher number of fires than the same week in 2019. However, the average fire size remains similar to previous years and much lower from the peaks of the average fire size reached during July of 2019 (see Figure 18).

The number of fires recorded in GWIS in the last week was 985, higher than the number of fires in the same week in 2018 and 2019.The number of thermal anomalies until November 1, 2020 (232,182) shows a typical trend in the region. 10,677 thermal anomalies were detected by VIIRS in the last week.

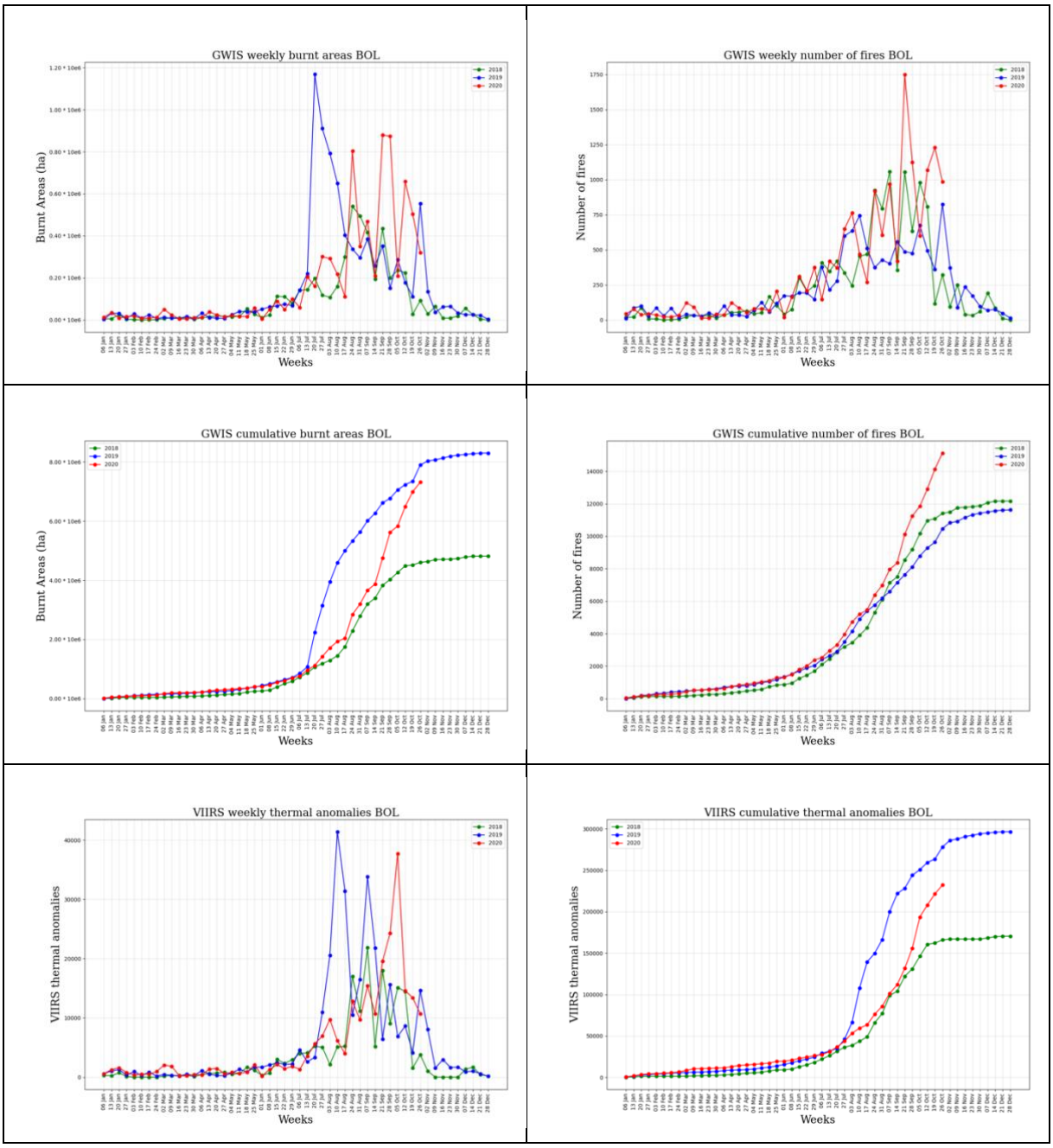


Figure 4. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

4 Wildfires in Colombia

Figure 5 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 3.26 Mha burnt in Colombia since January 1 until November 1, 2020, with 48,604 ha burnt in the last week. The fire activity of last week is higher to those of previous years, the total burnt area in the country is approximately 23.68 % above the values of 2019, due to the intensive fire activity from January to April 2020.

The number of fires recorded in GWIS in the last week was 210, which shows a stable trend in the last weeks, as compared to 2018 and 2019, but increasing from the last week. The number of fires is approximately 26.25% higher than that of last year. The number of thermal anomalies until November 1, 2020 (114,749) shows a typical trend in the region as compared to the trends in 2018 and 2019, with values approximately 20% higher than those in 2019. 1027 thermal anomalies were detected by VIIRS during the last week, which is similar to the values in the same week in 2019 and 2018.

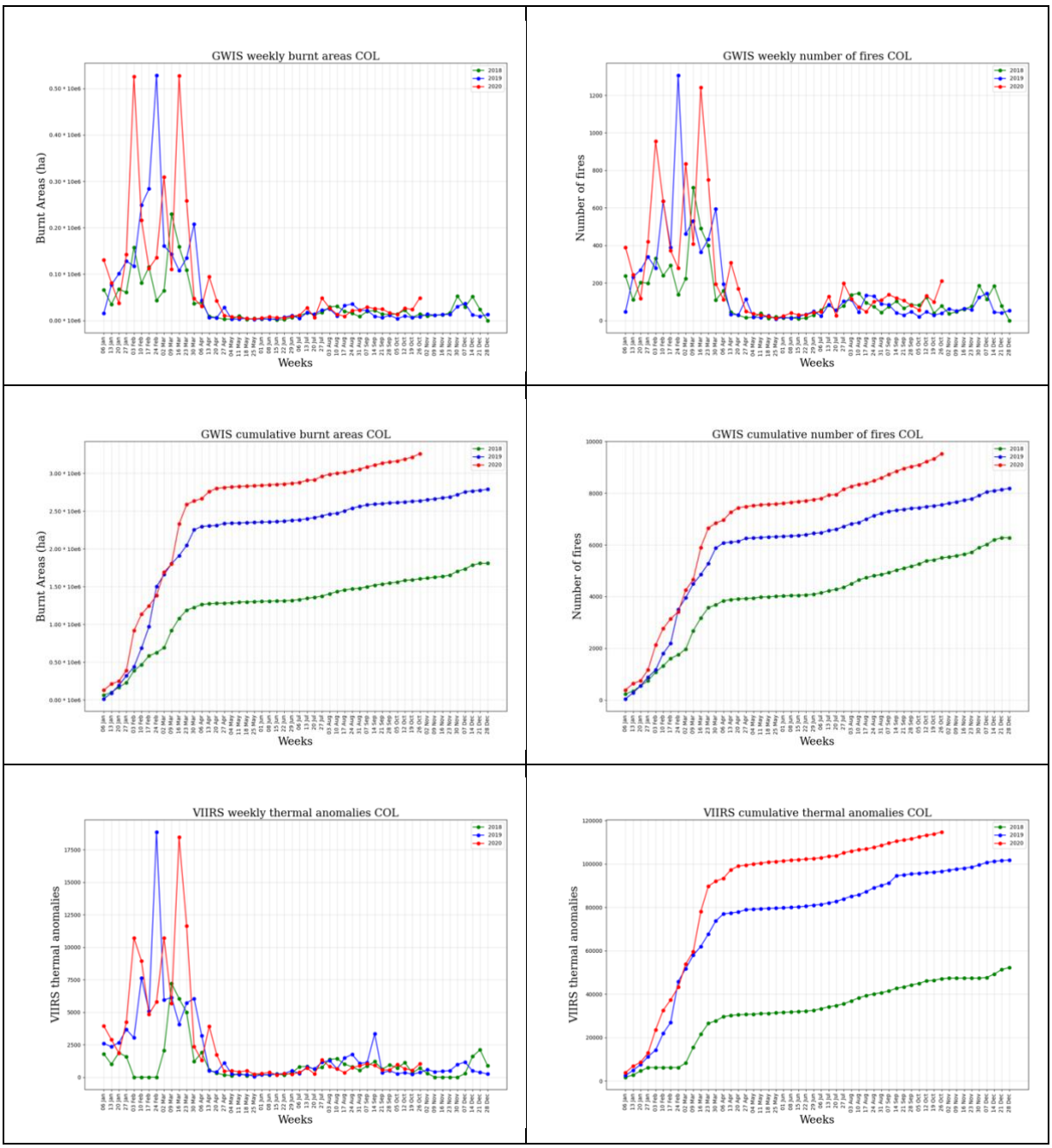


Figure 5. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

5 Wildfires in Paraguay

Figure 6 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 5.73 Mha burnt in Paraguay since January 1 until November 1, 2020, which is nearly two times the values in 2018 and 2019. Approximately 94,978 ha burnt in the country the last week, lower than the value of the same week of 2019.

The number of fires recorded in GWIS in the last week was 292, which is lower than the value in 2019 but higher than 2018. The average fire size has decreased during the last 3 weeks and is similar of the same weeks of 2018 and smaller than 2019. The number of thermal anomalies until November 1, 2020 (184,569) follows a typical trend in the region, but with higher values, nearly the double as compared to 2018 and 2019. 2,818 thermal anomalies detected by VIIRS last week.

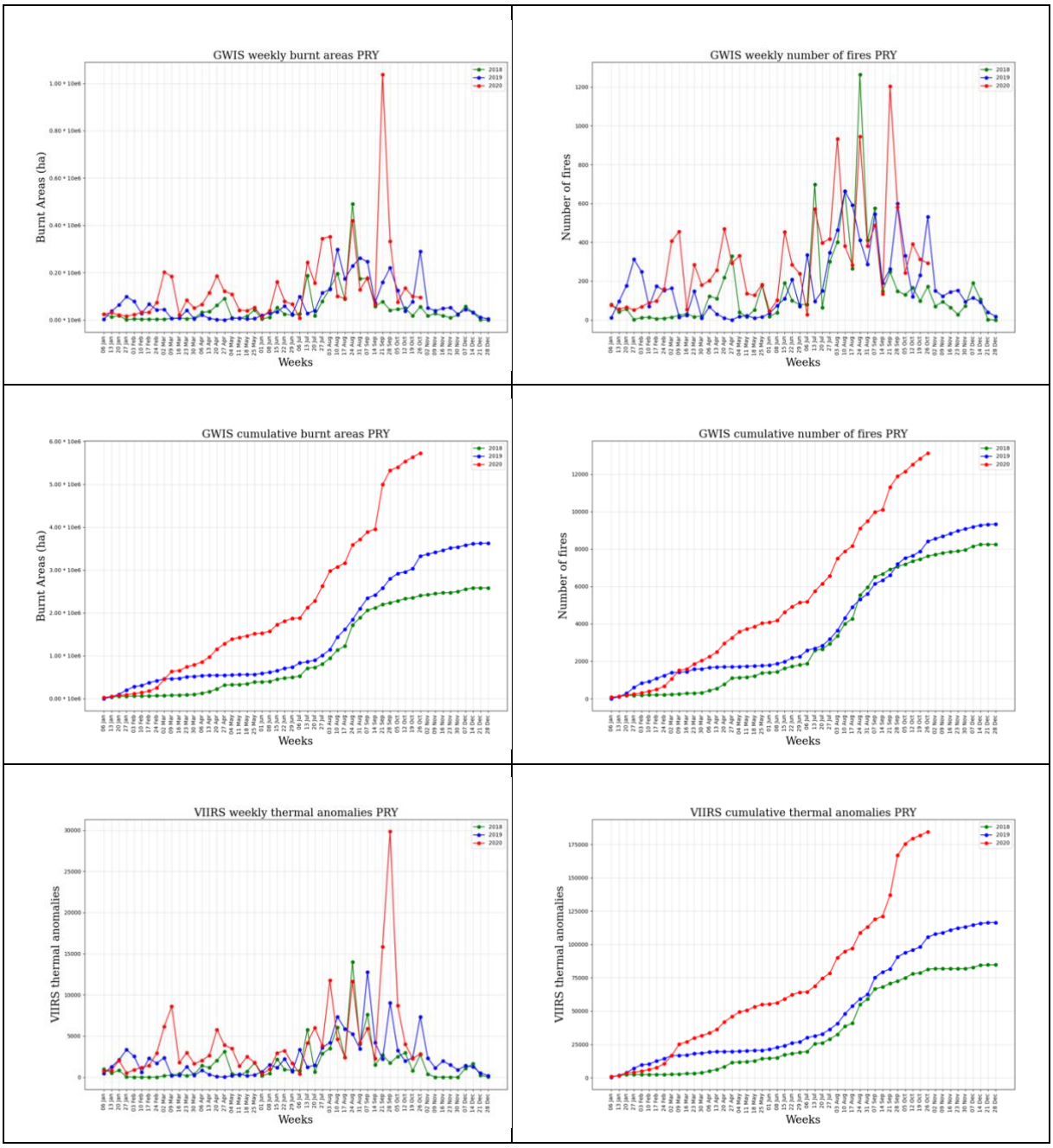


Figure 6. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

6 Wildfires in Peru

Figure 7 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 2.46 Mha burnt in Peru since January 1 until November 1, 2020. This value is almost the double than that of 2019. Approximately 98,162 ha burnt in the last week, higher values than ones of 2018 and 2019 for the same week.

The number of fires recorded in GWIS in the last week was 444, increased from the last week and was a higher value than ones of 2018 and 2019 for the same week. The total number of fires since the beginning of the year, above 8,000, is about double of that of 2019. Compared with previous years, the fire season in 2020 is taking more weeks to end than in 2018 and 2019. The number of thermal anomalies until August 30, 2020 (74,528) shows a typical trend in the region, with values higher than in 2018 and 2019. 2,239 thermal anomalies registered last week, increasing after the last week.

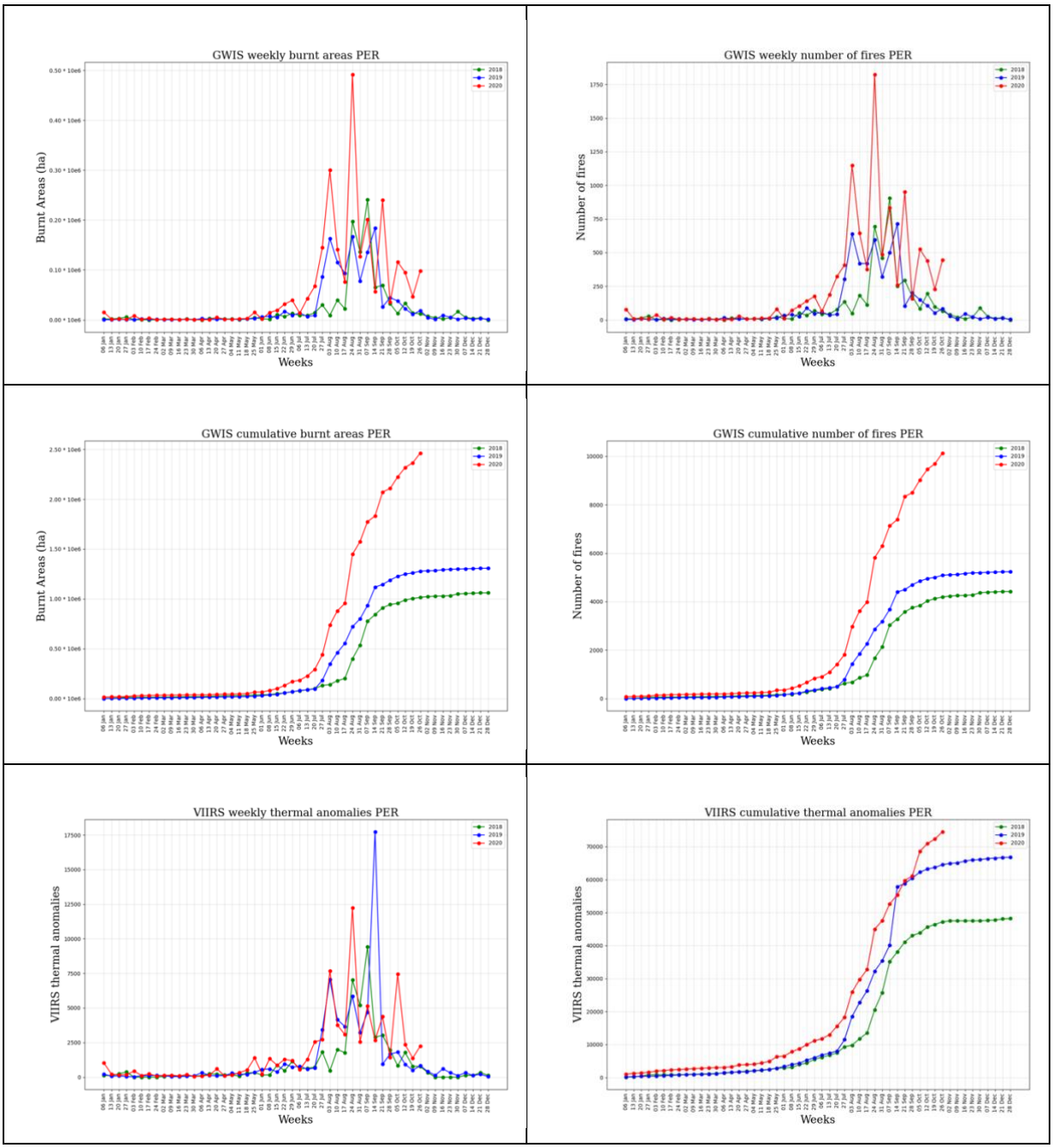


Figure 7. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

7 Wildfires in Venezuela

Figure 8 shows the trends on the extent of burnt areas and the number of fires since January 1, 2020 produced by the Near-Real Time (NRT) fire analysis in GWIS. The last row shows the evolution of active hot spots (thermal anomalies) detected by the satellite sensor VIIRS. A total of 6.88 Mha burnt in Venezuela since January 1 until November 1, 2020, with 23,003 ha burnt in the last week. The value of the total burnt area in the country is approximately 16.03 % higher than that in 2019 due to the intensive fire activity in the country between January and April. The trend in the last week is comparable to that of 2018 and 2019.

The number of fires recorded in GWIS in the last week was 117, which shows a stable trend comparable to those of the previous two years, although the total number of fires remains approximately 18.5% higher than in 2019. The number of thermal anomalies until November 1, 2020 (273,106) shows a typical trend in the region as compared to the trends in 2018 and 2019, but with approximately 30% higher value than the previous years. 1455 thermal anomalies were recorded by VIIRS during the last week, a value that is like those recorded in that week the previous two years.

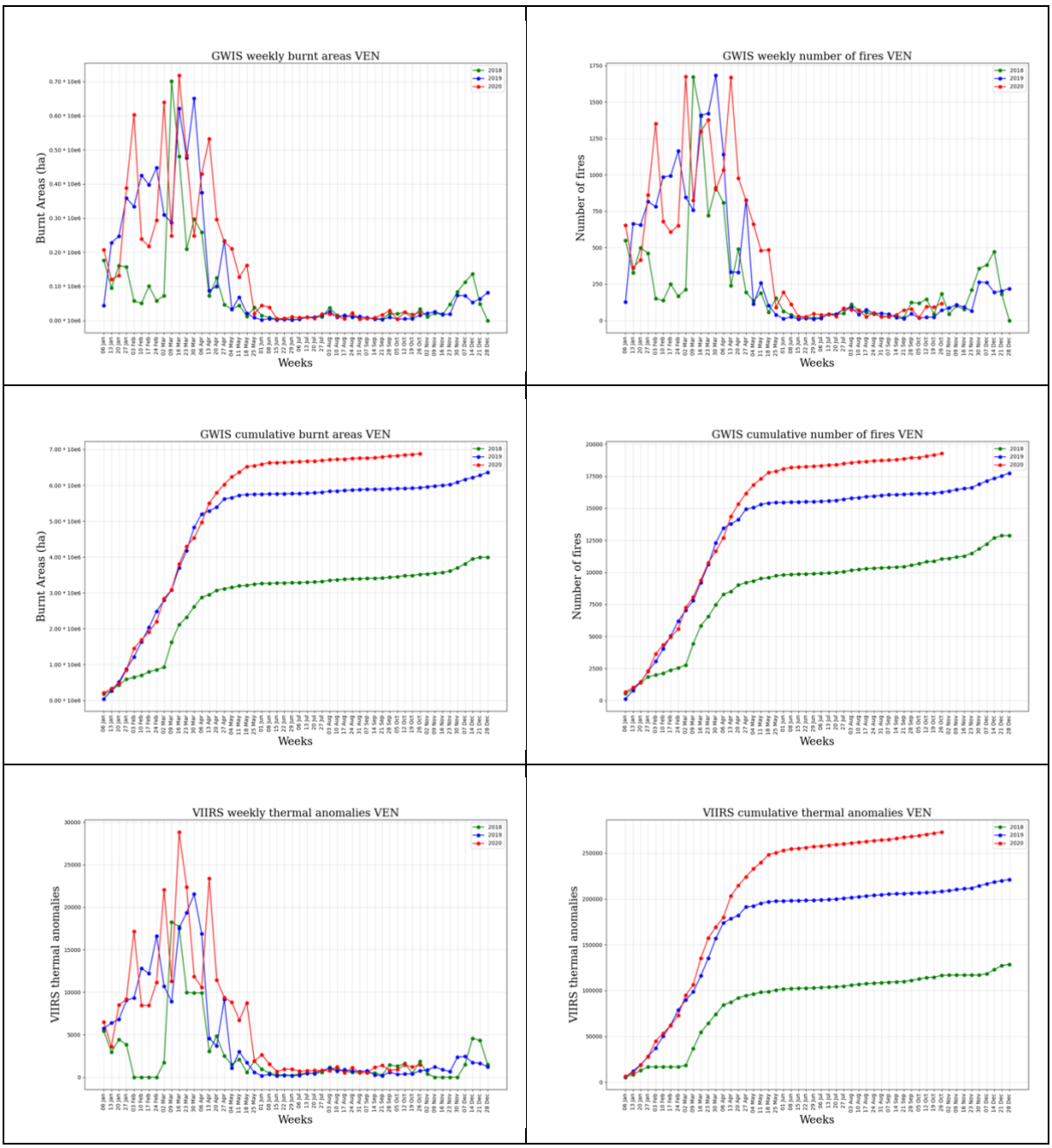


Figure 8. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last two years.

8 Fire danger and fire weather forecast in the Amazon region

This section provides information on the fire danger forecast in the Amazon region for the current week. High levels of fire danger facilitate fire ignitions and the propagation of ongoing fires. Figure 9 provides the average fire danger for the week of September 7 to September 13, 2020. This information is based on the daily fire danger forecast that is provided online in GWIS[3]. According to this forecast, it is expected that fire danger conditions will remain extreme in the eastern part of Brazil and high to very high in Bolivia, Paraguay and southwestern Brazil.

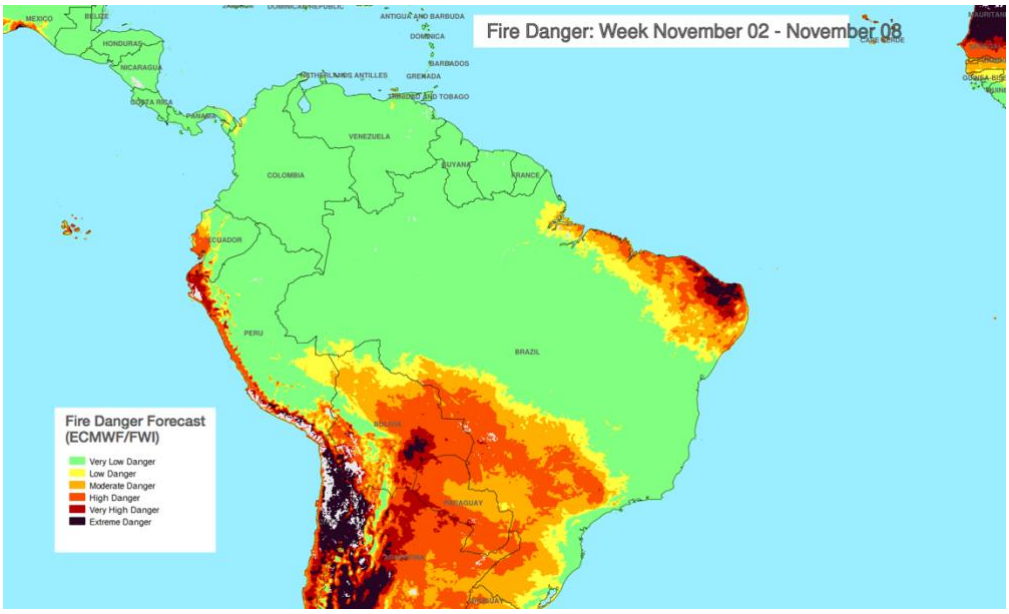


Figure 9. Average Fire danger forecast. Week, November 02-November 08, 2020.

The weekly fire weather forecast of temperature and precipitation anomalies for this week is presented in Figure 10. Above average temperatures are forecasted for southwestern Brazil, eastern Bolivia and northern Paraguay. Below averages temperatures values are forecasted for eastern Brazil. The models estimate an above average precipitation rates for this week mainly in areas of the north/eastern of Brazil and Venezuela. Below average precipitation is foreseen in Peru, most of Bolivia, Paraguay and southwestern Brazil.

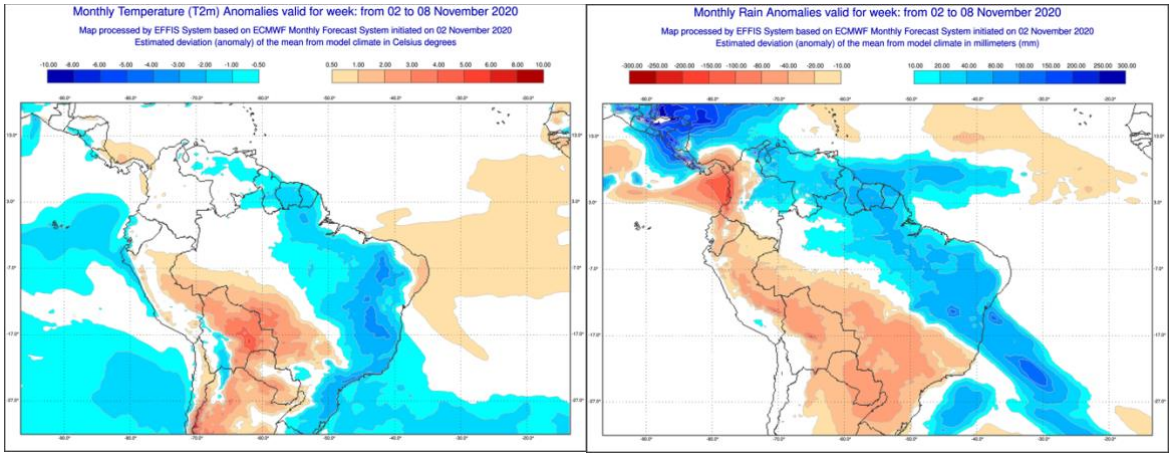


Figure 10. Fire weather anomalies of the current week, November 02-November 08, 2020.

[3] https://gwis.jrc.ec.europa.eu/static/gwis_current_situation/public/index.html

9 Monthly analysis (up to 31 October 2020)

9.1 Brazilian Legal Amazon (BLA)

Figure 11 shows the spatial distribution of burnt areas for 2020 mapped by the Near-Real Time (NRT) process in GWIS in the Brazilian Legal Amazon region, within Brazil.

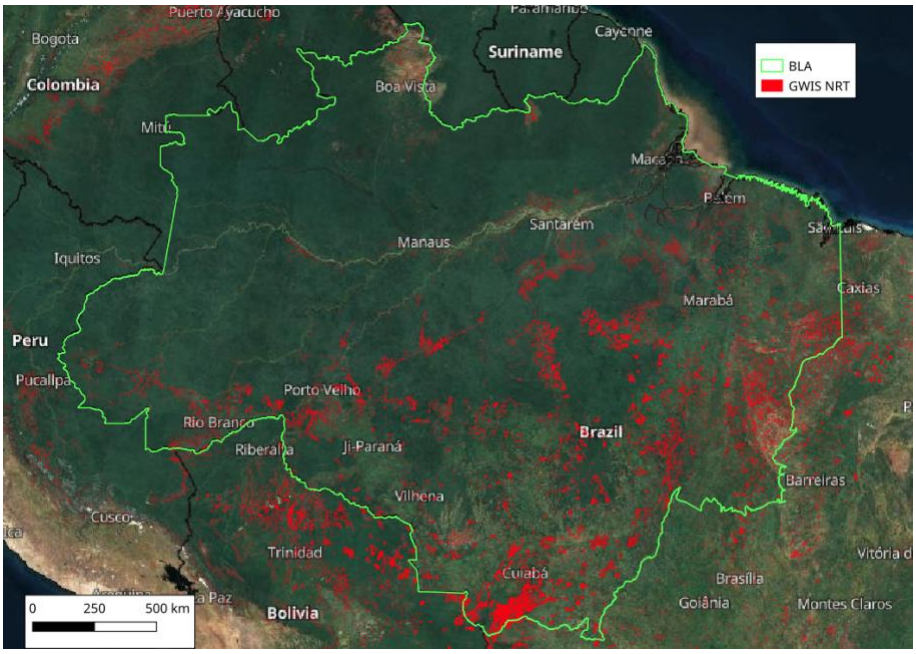
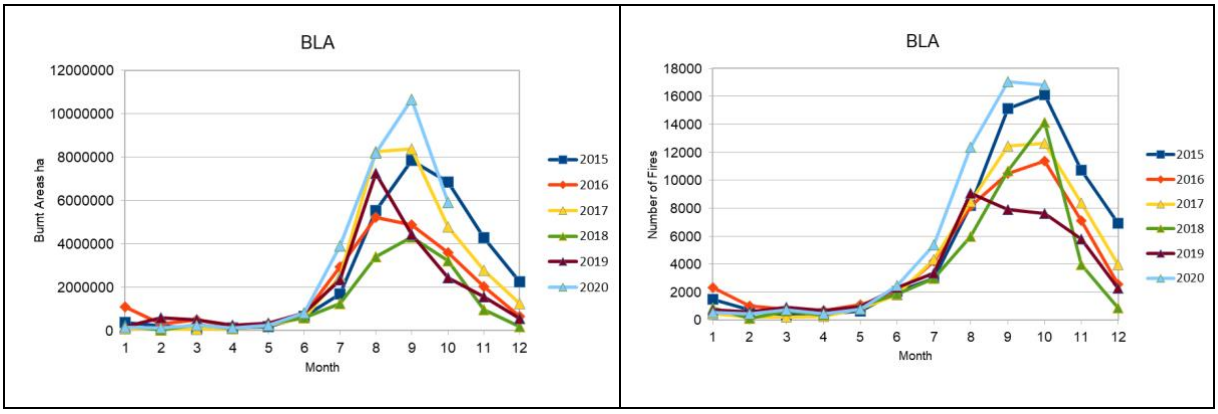


Figure 11. GWIS burnt areas for 2020 in Brazilian Legal Amazon (BLA). Burnt areas until November 1.

The 2020 fire season in the BLA was following similar trends of the last year until September as shown in Figure 12. However, this year the burnt area of October is higher (5.9Mha) than the previous last two years for the same month (2.4 and 3.2 Mha for 2018 and 2019). The numbers of fires is also higher compared to 2018 (16818 in 2020 compared with 7621 in 2018 and 14154 in 2019). During September 2019 the fire season decreased but this year keeps burning contributing to higher value of accumulated burnt area (30Mha) and higher average fire size than the same month for the previous two years. This year the fires are about the same size of last year but in more quantity and during a longer period of time. The 2020 fire season has a similar behavior of the one in 2018 but with an average fire size similar to the one of the last year 2019.



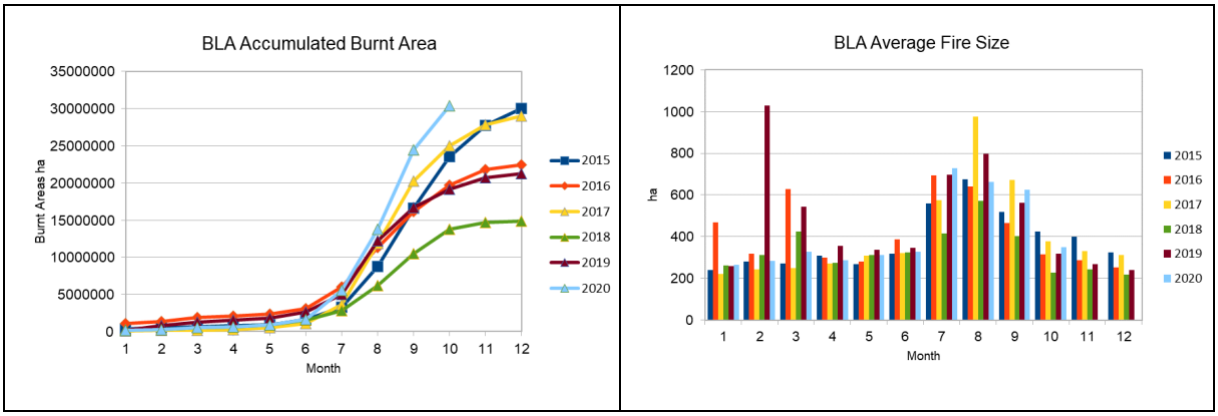


Figure 12. Trend of burnt areas and number of fires as compared to data in the last six years.

Figure 13 shows the monthly burnt land cover distribution for the year 2020, with an increase of burnt area in forest especially during the fire season months where the fires are bigger.

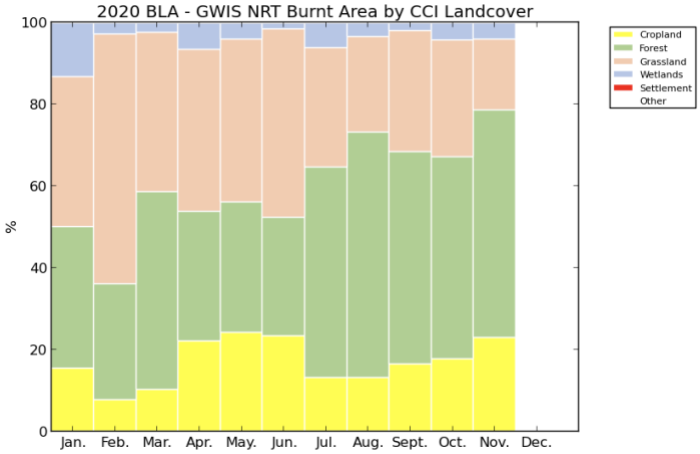
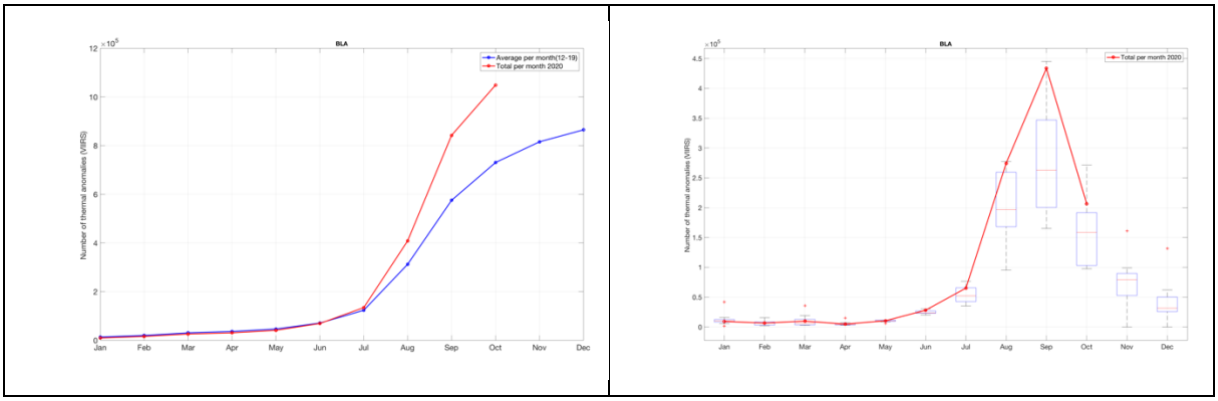


Figure 13. Monthly percentage of burnt land cover for the year 2020

In terms of the number of **active fire spots retrieved directly by the VIIRS sensor, 2020 presents a number of active fire spots from May to October above the average for the period between 2012 and 2019** as shown in Figure 14. These type of data are those often reported in the media, which point out to a higher number of fires this year as compared to past years.



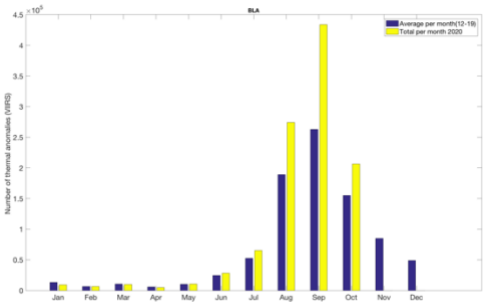


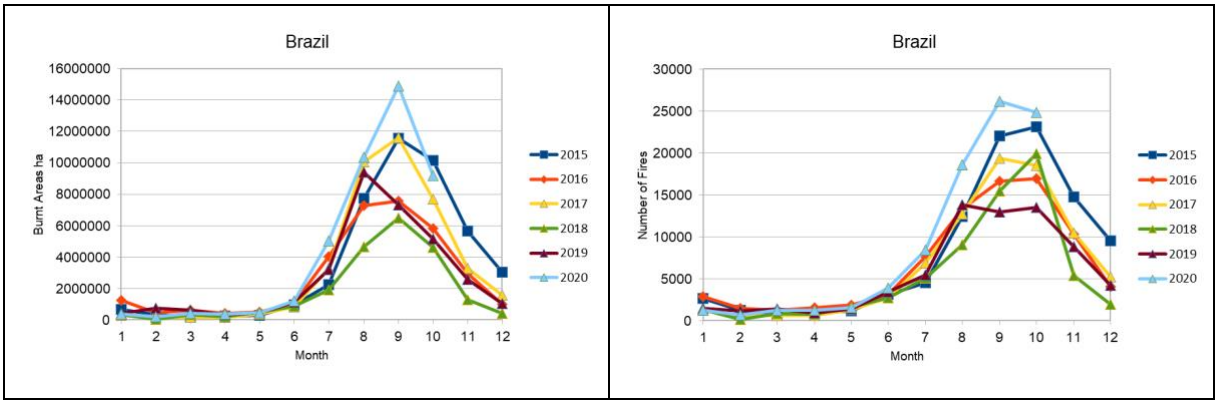
Figure 14. Trend of burnt areas and number of fires as compared to data in the last two years.

9.2 Brazil

The spatial extent of the burnt areas mapped by the Near-Real Time (NRT) process in GWIS is presented in Figure 15. Although most of the burnt areas occurred in the center of the country (Cerrado Biome), the fire activity and the resulting burnt areas show a wide spread from north to south, including the humid Amazon forest.

Figure 15. GWIS burnt areas for 2020 in Brazil. Burnt areas until 0November 1.

The 2020 fire season in Brazil was showing similar behavior of 2017 as shown in Figure 16. This year the peak of the fire season is by now in September, like last year. The average fire size is less than in 2017 but the burnt area is bigger. Therefore, this year has more burnt area despite of having smaller fires, in average, than of those of 2017. Last year 2019 had, in average, smaller fires during September than in August. During October 2020 the burnt area reached 0.92Mha with 24841 fires contributing to a total burnt area of 42Mha for 2020, 41.20% higher than in 2019.



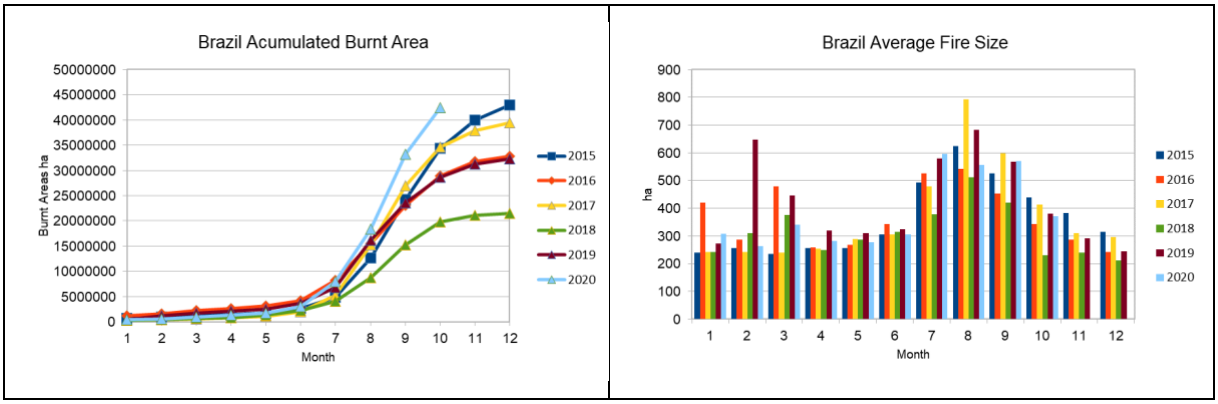


Figure 16. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 17 shows the monthly burnt land cover distribution for the year 2020, following a similar trend as in BLA where there is an increase of forest class during the fire season months when the fires are bigger.

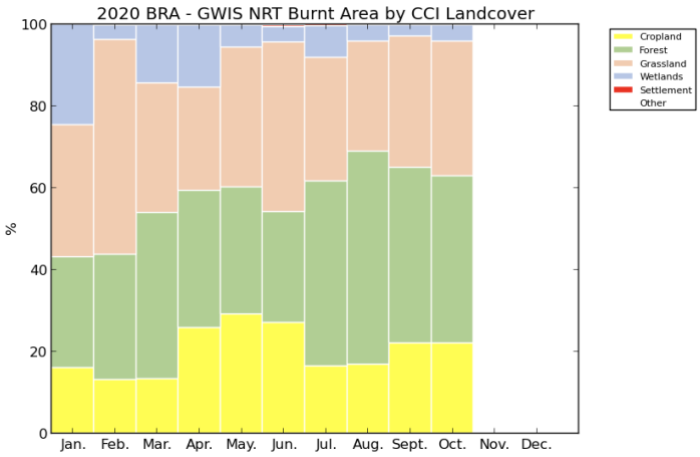
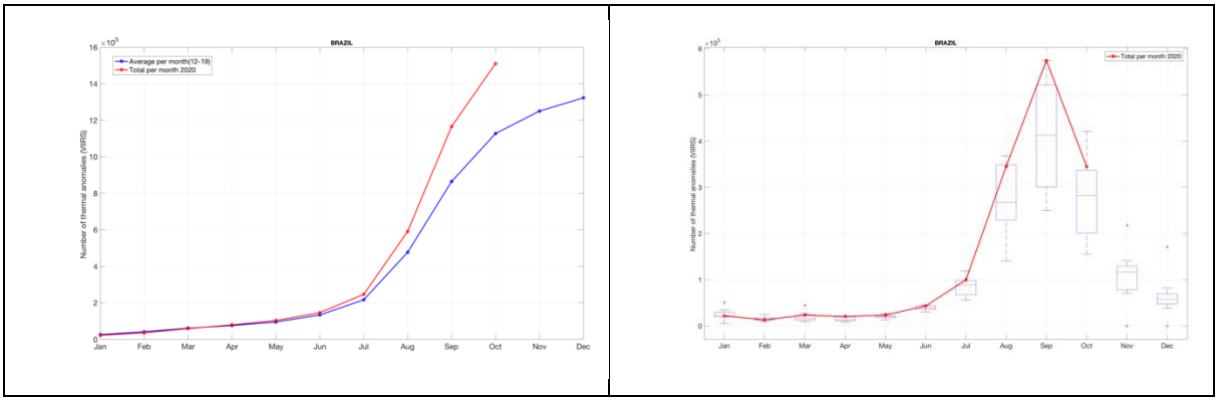


Figure 17. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents a number of active fire spots in the period between March and October (especially August to October) above the average for the period between 2012 and 2019 as shown in Figure 18.



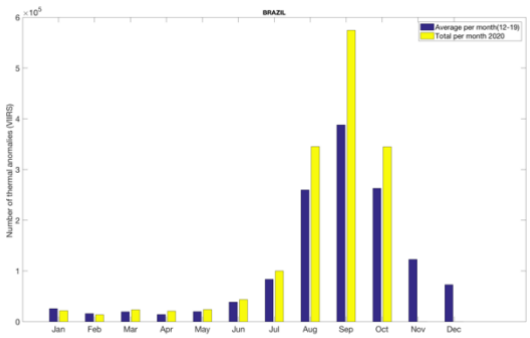


Figure 18. Trend of burnt areas and number of fires as compared to data in the last two years.

9.3 Bolivia

The spatial distribution of burnt areas in Bolivia in 2020 mapped by the Near-Real Time (NRT) process in GWIS is shown in Figure 19.

In Bolivia the 2020 fire season is following a similar trend to the fire season of 2017 and 2018 as shown in Figure 20. Despite of this similar behavior the number of fires is a record value since 2015. Although this season has much smaller fires than 2019, the high value of number of fires contributes to yearly burnt area that is close to the one of the critical season in 2019. Bolivia has 7.17 Mha of burnt area and 14872 fires up to October. However, the current year is clearly better compared with the critical 2019 fire season that had clear peak in August and an anomalous average fire during July, August and September as can be seen in Figure 20.

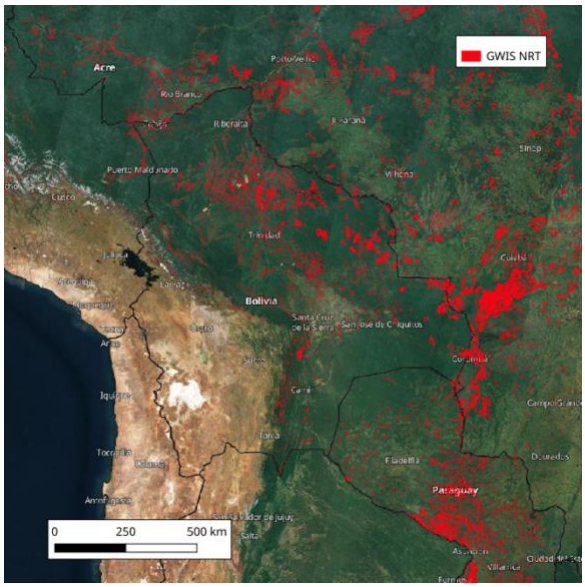
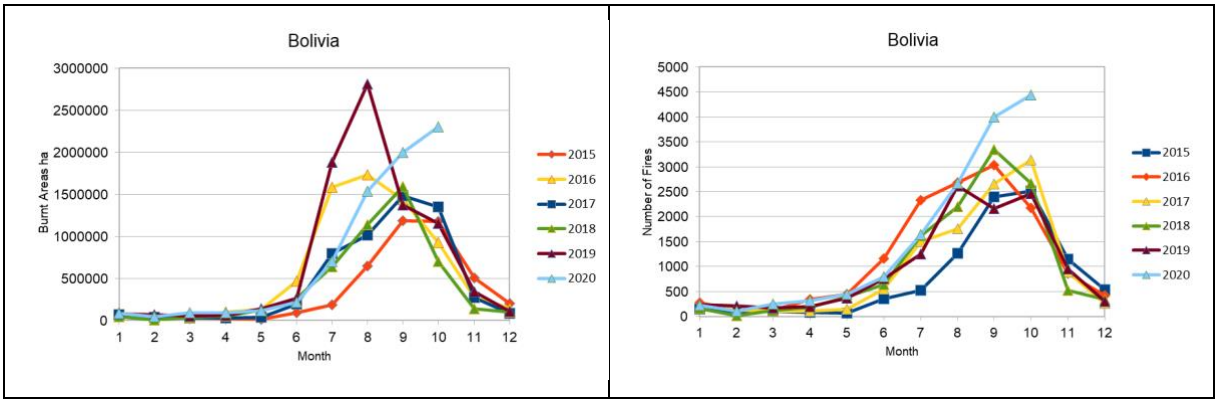


Figure 19. GWIS burnt areas for 2020 in Bolivia. Burnt areas until November 1.



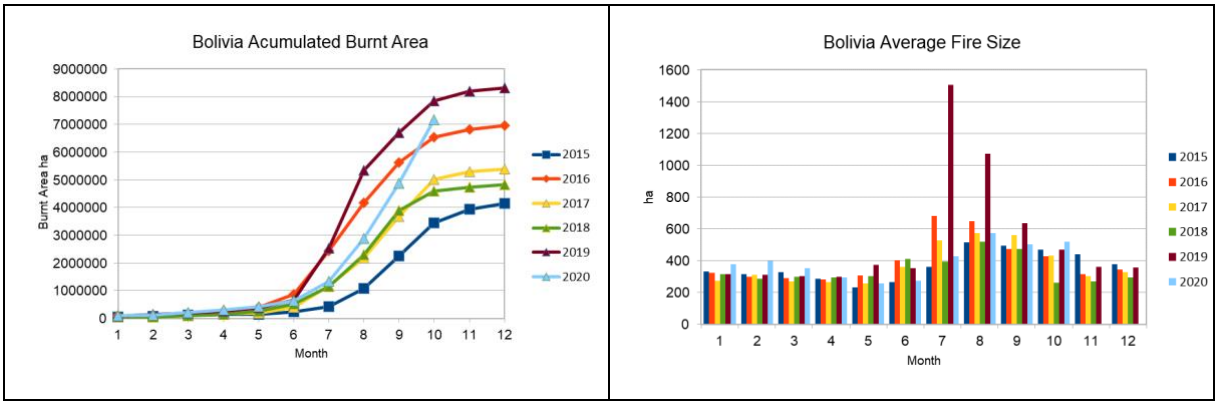


Figure 20. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 21 shows the monthly burnt land cover distribution for the year 2020, with forest as the most affected landcover by fire.

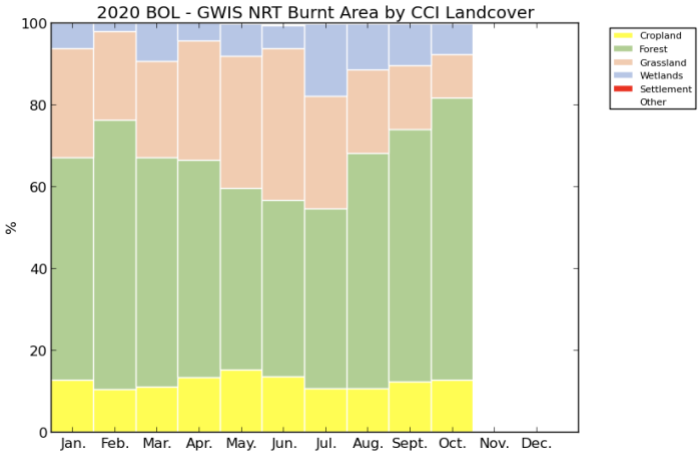
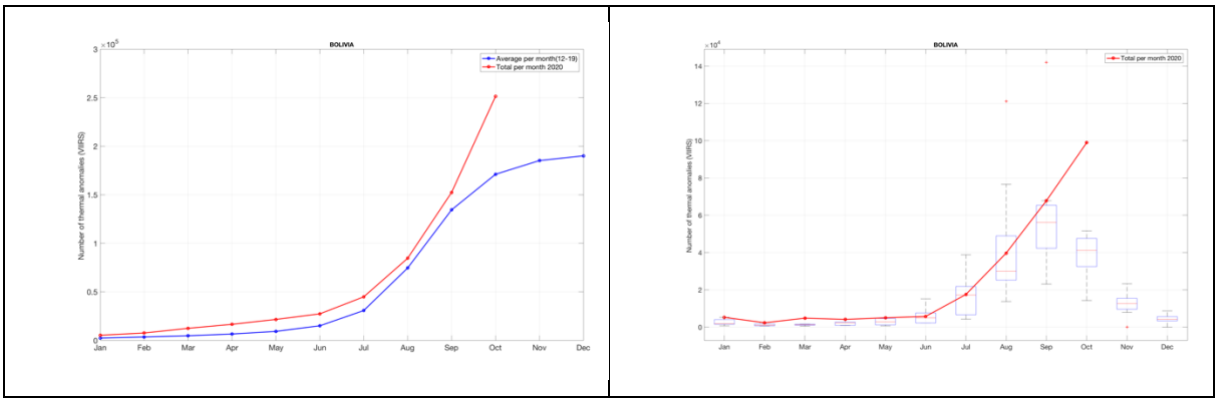


Figure 21. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents a number of active fire spots in the period above between January and July and September-October above the average and below the average in August compared with the average for the period between 2012 and 2019 as shown in Figure 22.



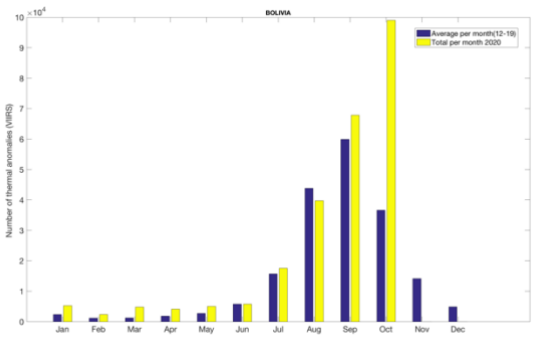


Figure 22. Trend of burnt areas and number of fires as compared to data in the last two years.

9.4 Colombia

The spatial distribution of burnt areas in Colombia in 2020 mapped by the Near-Real Time (NRT) process in GWIS is shown in Figure 23.

Figure 23. GWIS burnt areas for 2020 in Colombia. Burnt areas until November 1.

The current fire season has been more severe than the last years, except of 2016. About 3.4 Mha of burnt areas have been mapped in the country until end of October. Figure 24 shows how the number of fires is considerable higher in March of 2020. The same happens with the burnt area and the average monthly fire size. This fact points out to a considerable increase of fire activity, having more uncontrolled fires. The fires are mainly located on the center and south-west of the country, a region designated as “Llanos”, a complex savanna ecosystem which undergoes periodic, human-induced and natural biomass burning during the dry season, usually between November and April.

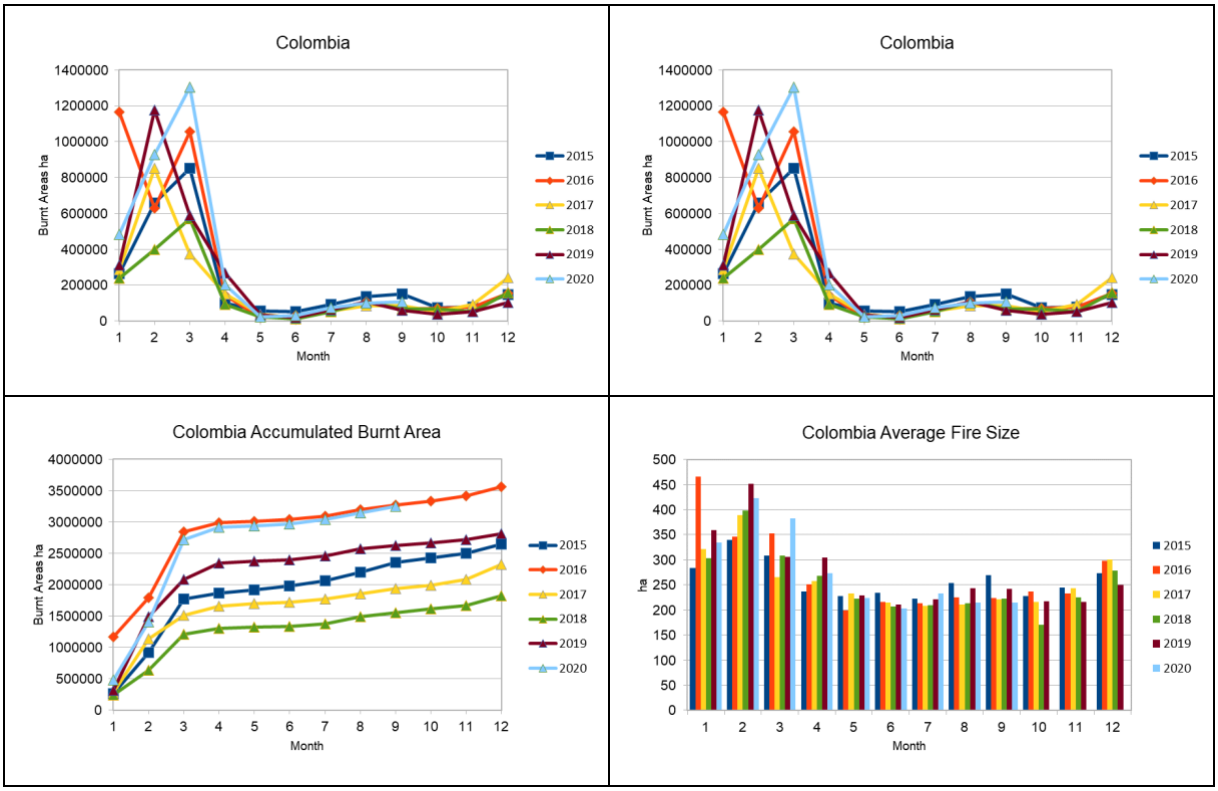


Figure 24. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 25 shows the monthly burnt land cover distribution for the year 2020, with forest mass mostly grassland as the most affected landcover classes by fire during the fire season from January to April.

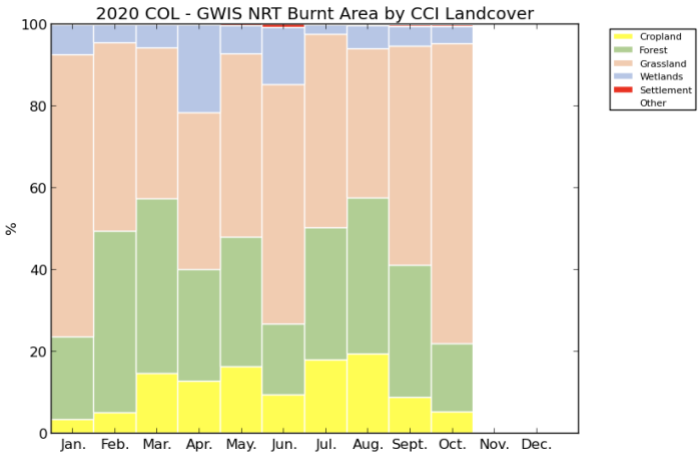


Figure 25. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents a number of active fire spots mainly in the period between January and May above the average for the period between 2012 and 2019 as shown in Figure 26.

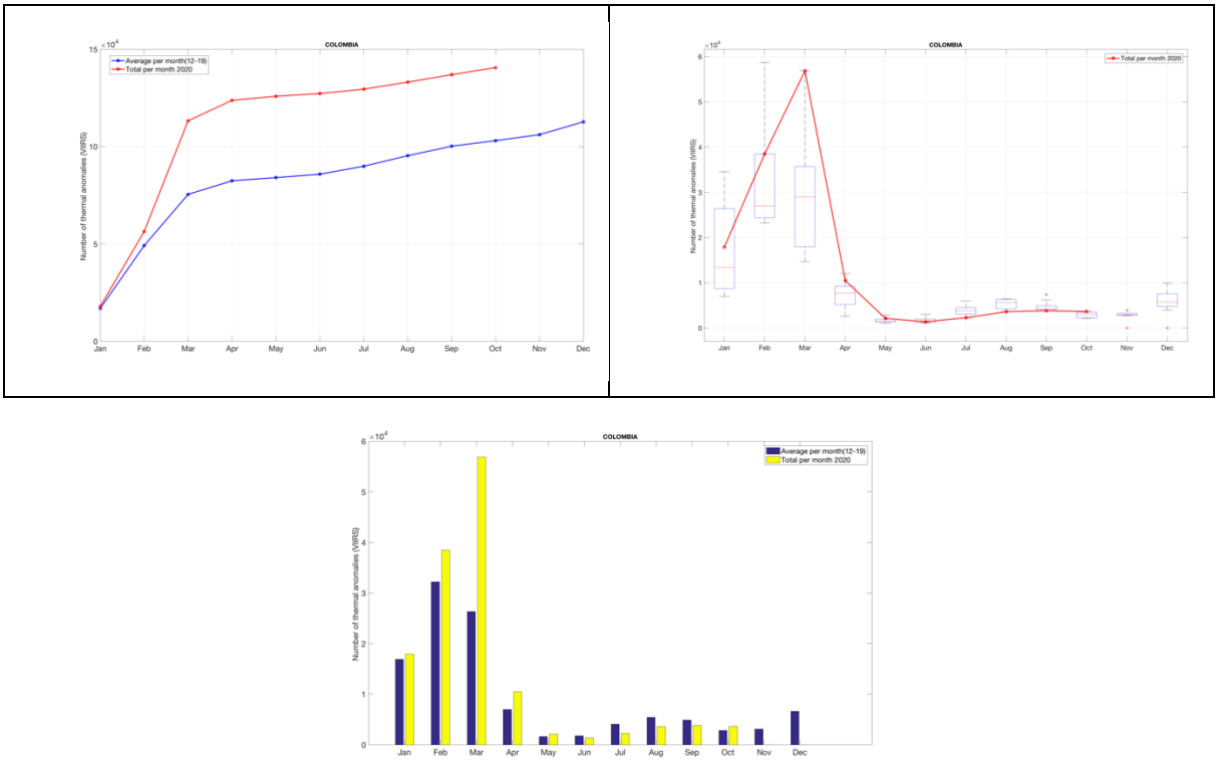


Figure 26. Trend of burnt areas and number of fires as compared to data in the last two years.

9.5 Paraguay

In 2020, the spatial extent of the burnt areas in the country mapped by the Near-Real Time (NRT) process in GWIS is presented in Figure 27.

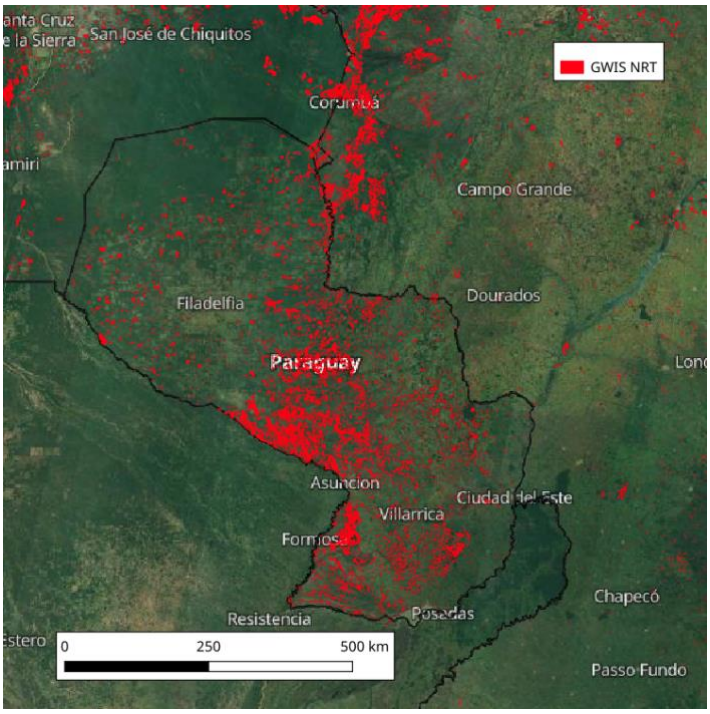


Figure 27. GWIS burnt areas for 2020 in Paraguay. Burnt areas until November 1.

The 2020 fire season in Paraguay is showing an atypical behavior compared with the two previous years. March and April had a peak with is not present in 2018 and 2019 (Figure 28). In addition, in September 2020 there was an increase of number of fire and average fire size producing an anomalous burnt area. This

fact already happened last year but in September 2020 the fires were even larger than the same month in 2019. In September we had a record of average fire size regarding to all the months since 2015. The current burnt area is 5.73 Mha and 13160 fires. The anomalous peak of burnt area for September 2020 is 1.54 Mha, 80.11% higher than 2019 (which was already critical compared with 1.14 Mha of August of 2018).

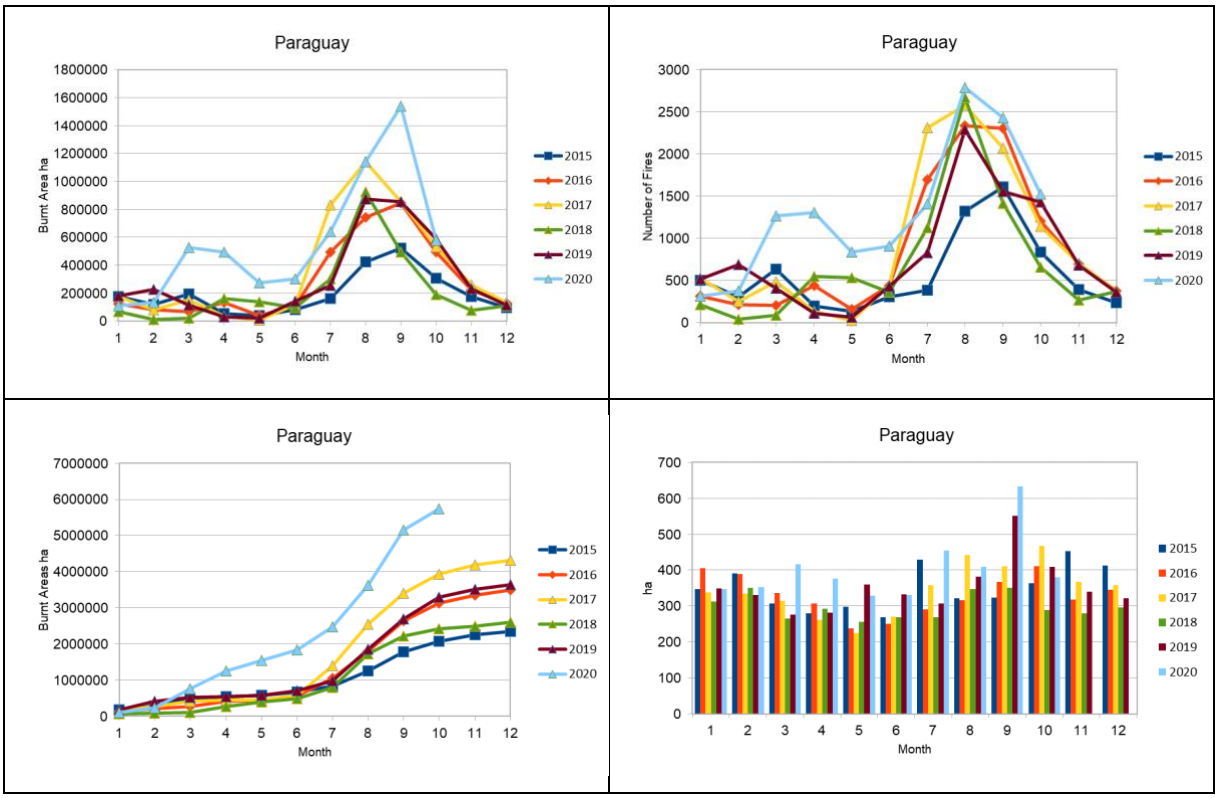


Figure 28. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 29 shows the monthly burnt land cover distribution for the year 2020, with forest as the most affected landcover class by fire, except January when grasslands is as dominant as forest.

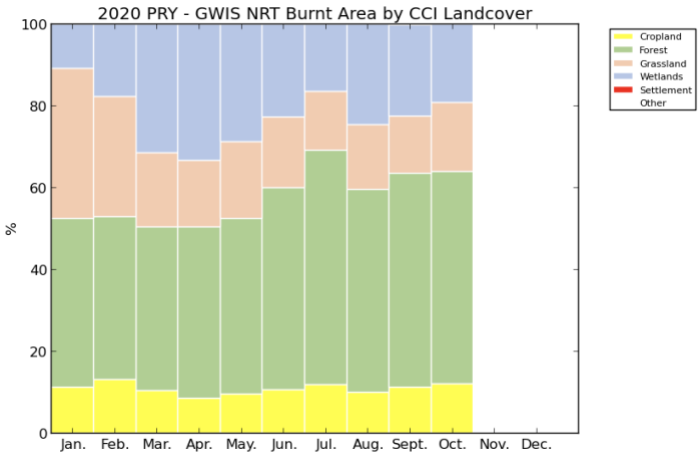


Figure 29. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents the same atypical trend of the burned area and number of fires shown in Figure 24, with a number of active fire spots in the first ten months of the year above the average for the period between 2012 and 2019, as shown in Figure 30.

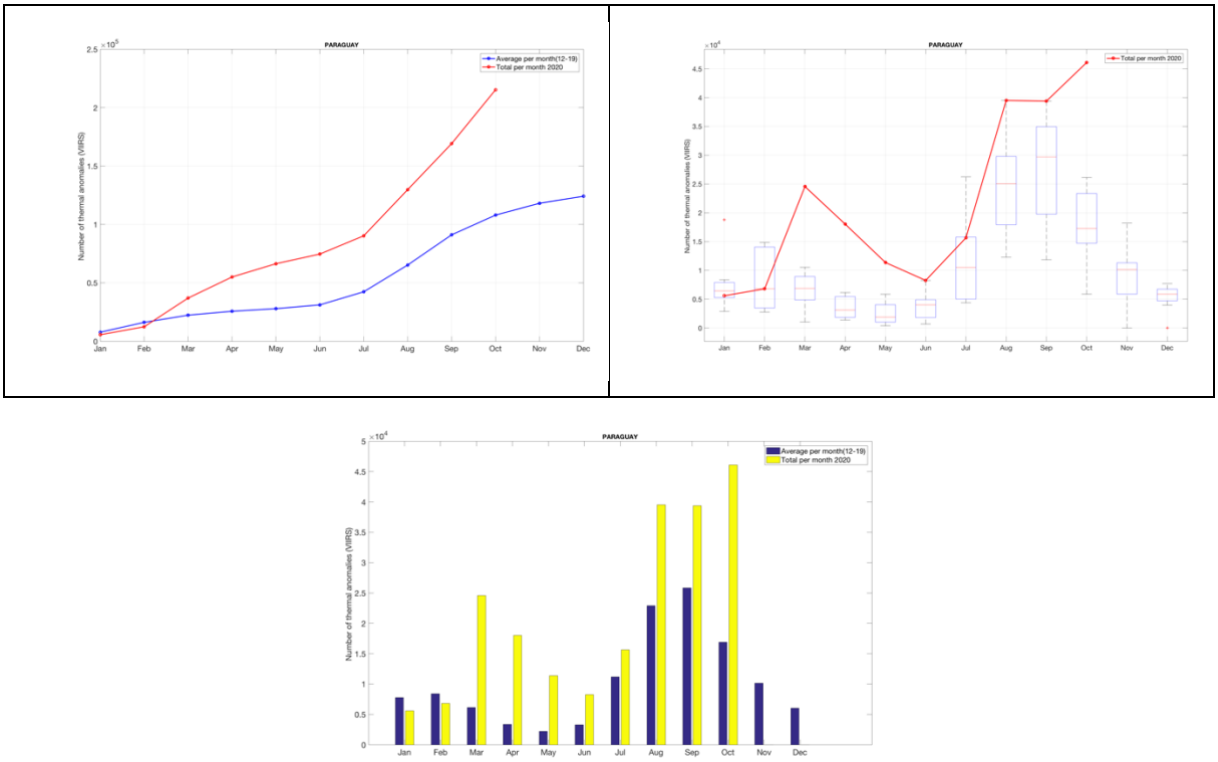


Figure 30. Trend of burnt areas and number of fires as compared to data in the last two years.

9.6 Peru

The spatial extent of the burnt areas in the country in 2020 mapped by the Near-Real Time (NRT) process in GWIS is presented in Figure 31.

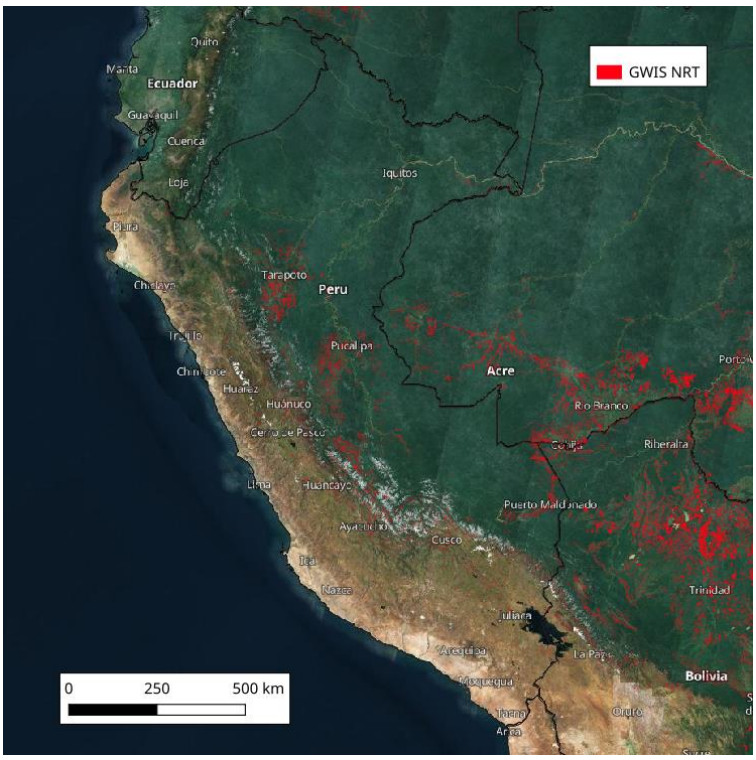


Figure 31. GWIS burnt areas for 2020 in Peru. Burnt areas until November 1.

Despite the 2020 fire season may look much worse than previous years, it is worth to mention that the average fire size remains quite constant during the years and also considerably low, see Figure 32. Therefore, the data for Peru is much more sensitive to uncertainty in the data when monitoring small fires

for large areas for long time periods. Despite this last fact, it is clear that there is an increase of fire activity in 2020 compared to other years. The fact that the fire size remains constant during the year could point out to a very low amount of uncontrolled burnt area and a strong relation of fire activity with human activity in forested areas.

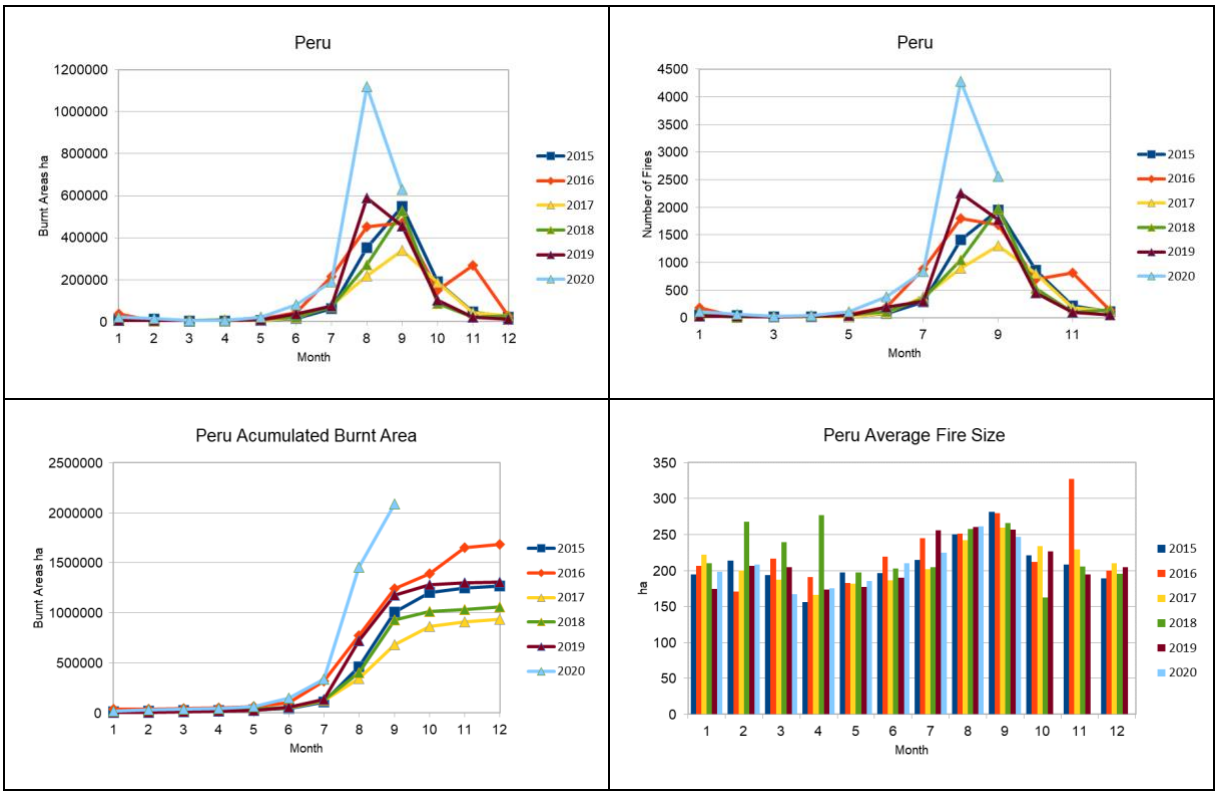


Figure 32. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 33 shows the monthly burnt land cover distribution for the year 2020, with forest as the most affected landcover class by fire, especially during the fire season months.

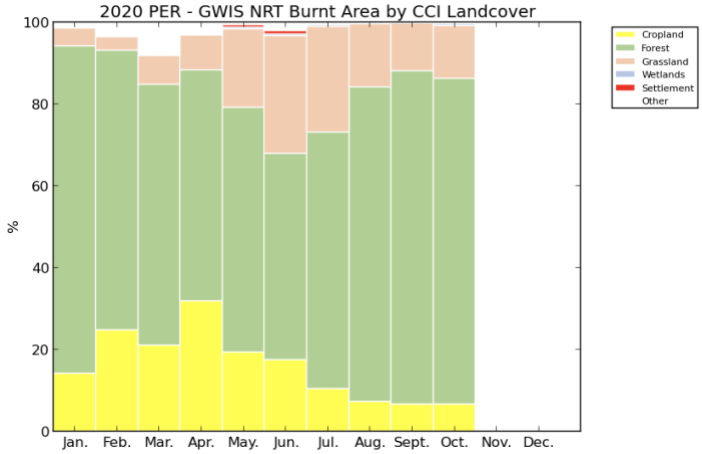


Figure 33. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents the same trend of the burned area and number of fires shown in Figure 27, with a number of active fire spots in nine of the ten months of the year above the average for the period between 2012 and 2019, especially in August, as shown in Figure 34.

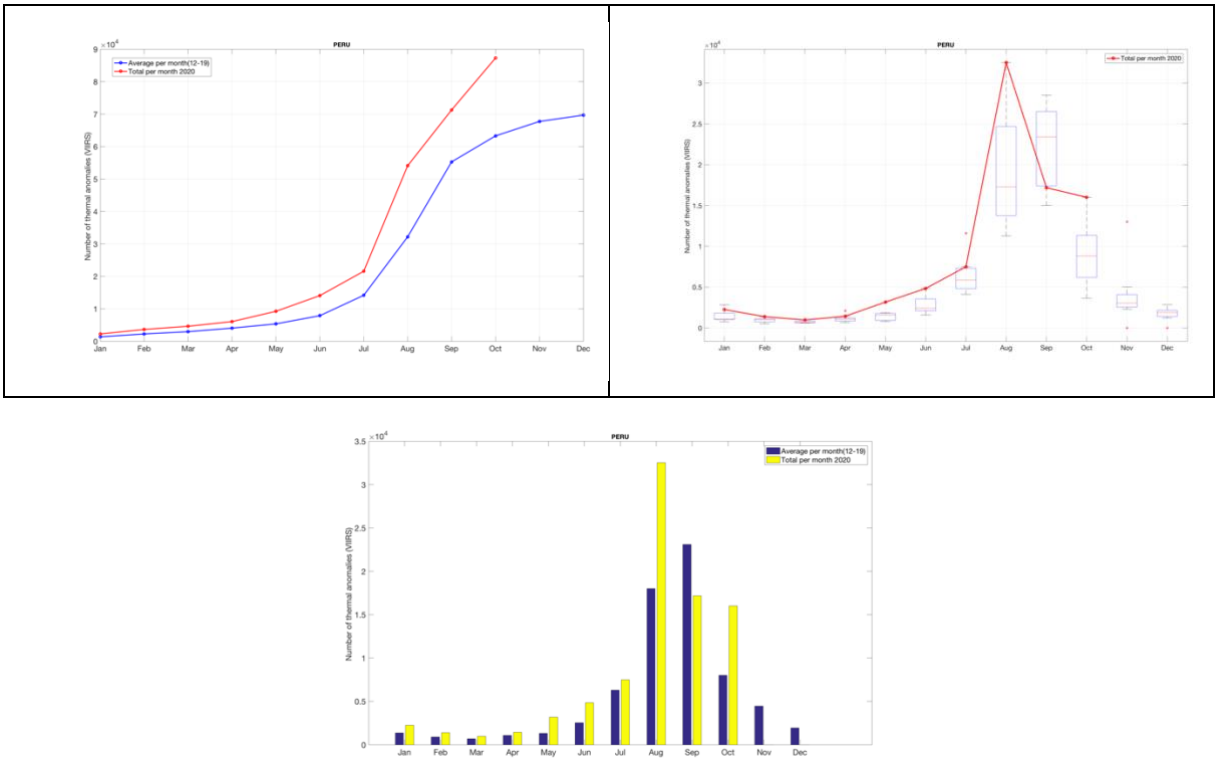


Figure 34. Trend of burnt areas and number of fires as compared to data in the last two years.

9.7 Venezuela

In 2020, wildfires in Venezuela spread over the central and northern areas of the country, with very large fires on the west of the country, such as those on the west side of Maracaibo lake. (Figure 35). This region is part of the designated "Llanos", a complex savanna ecosystem where it undergoes periodic, human-induced and natural biomass burning during the dry season, usually between November and April.

Figure 35. GWIS burnt areas for 2020 in Venezuela. Burnt areas until November 1.

The current fire season for 2020 is above the last two years in all terms, see Figure 36. The total burnt area is slightly above the previous year, 2019, and considerable higher than that of the 2018 fire season. Besides, the number of fires also increased. Looking at the average fire size, the largest fires occurred in March, instead of February, as in 2018 and 2019. The average fire size was like previous years until February, afterwards the monthly average fire size in 2020 is above the 2018 and 2019. During March, there was an increase of burnt areas, number of fires, and size of the fires. Until October, almost 7 Mha of burnt areas have been mapped by GWIS in the region, which are higher values than in 2019 and almost double than the value of 2018.

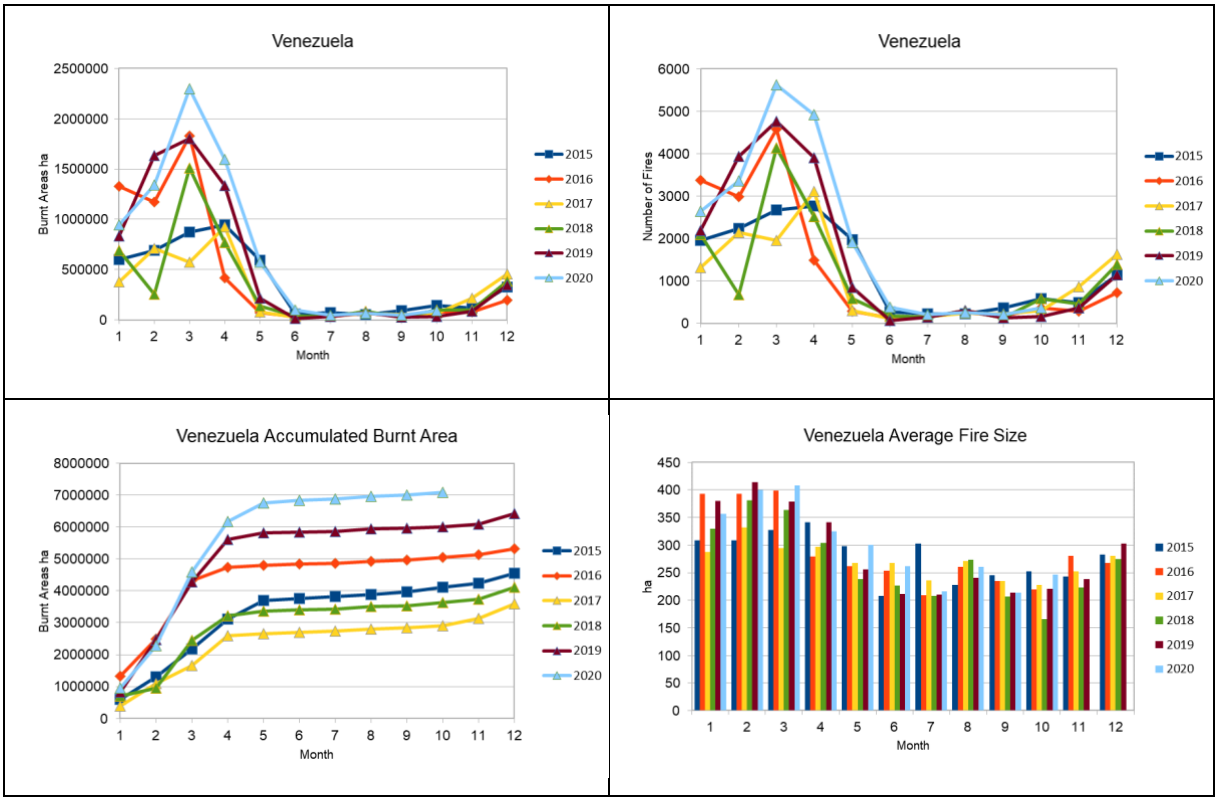


Figure 36. Trend of burnt areas and number of fires as compared to data in the last two years.

Figure 37 shows the monthly burnt land cover distribution for the year 2020, with grassland as the most affected landcover class by fire, especially during the fire season months.

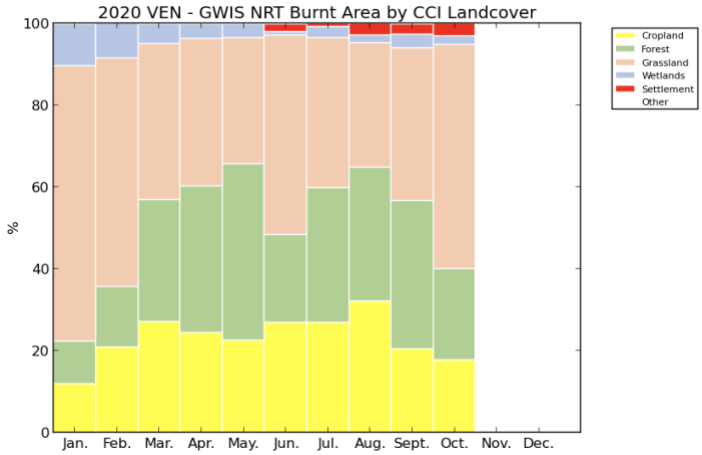


Figure 37. Monthly percentage of burnt land cover for the year 2020

In terms of active fire spots detected by VIIRS, 2020 presents the same trend of the burned area and number of fires shown in Figure 30, with a number of active fire spots in the first six months of the year above the average for the period between 2012 and 2019, especially in March, as shown in Figure 38.

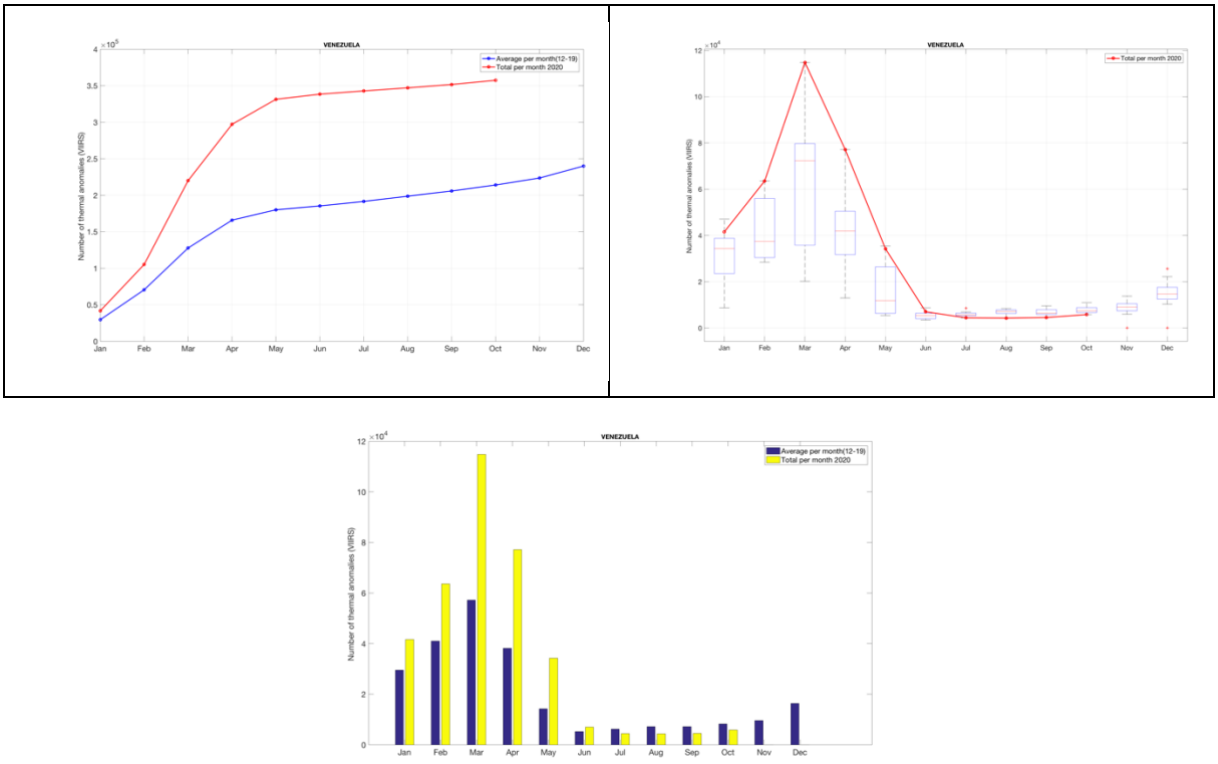


Figure 38. Trend of burnt areas and number of fires as compared to data in the last two years.

9.8 Fire danger and fire weather forecast in the Amazon region

The monthly fire weather forecast of temperature and precipitation anomalies for November is presented in Figure 39. **A strong average temperature anomaly is forecasted for southern Brazil, extending to Bolivia and Paraguay. However above average temperatures are also expected in the BLA, Peru and southern Colombia**. Additionally, negative trends on temperature are only in Venezuela. The models estimate a decrease on precipitation rates for this month in central Brazil, Peru, Bolivia and Paraguay.

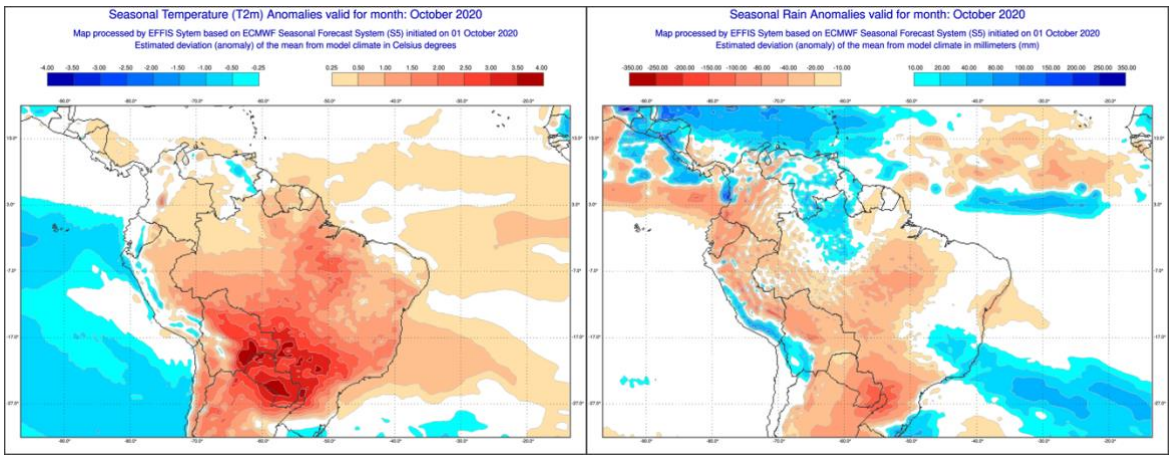


Figure 39. Fire weather anomalies of the current month, November, 2020.

At the current date, its foreseen that December will present slight above average temperature anomalies values over Bolivia and Paraguay and increasing precipitation rates over Brazil (Figure 40). All northern Brazil and the eastern part shows an increase of precipitation. In southern Paraguay, central Bolivia and northwest of Peru the precipitation rates decreases. The forecast for November will be updated at the beginning of the November.

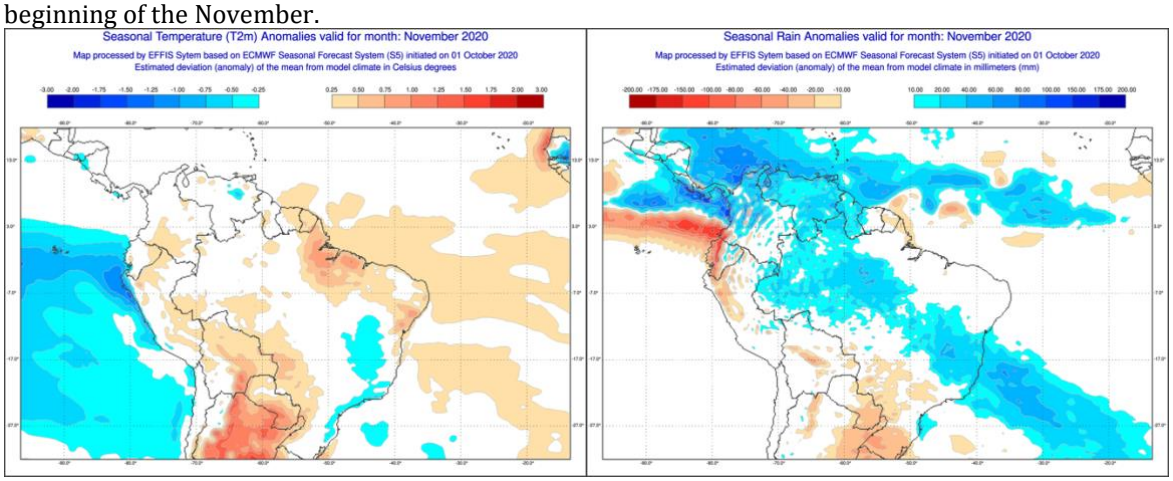


Figure 40. Fire weather anomalies of December, 2020.

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