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Commission

JRC TECHNICAL REPORT

Weekly analysis of wildfires in the Amazon region and South America: November 08 - November 14 2021

2021

The screenshot displays the GWIS interface. At the top, there are logos for the European Commission, GEO, NASA, and Copernicus. The main header reads "Global Wildfire Information System" and "European Commission > JRC EU Science Hub > DRM > GWIS > Applications > Current Situation Viewer".

The left sidebar contains several sections:

- Map Options:** Includes checkboxes for Country Boundaries Layer, Human Settlement Layer, Protected Areas Layer, and OCI Landcover.
- Forecasts:** Includes "FIRE DANGER FORECAST" (Source: ECMWF (8 km res.), Index: Fire Weather Index (FWI)), "LIGHTNING FORECAST", and a date selector set to "15 Nov 2021".
- Rapid Damage Assessment:** Includes a date range selector set to "From: 08 Nov 2021 To: 15 Nov 2021".
- ACTIVE FIRES:** Includes checkboxes for MODIS and VIIRS.
- BURNT AREAS:** Includes checkboxes for MODIS (Last update: 2021-05-31) and MODIS & VIIRS NRT.
- FIRE EMISSIONS:** Includes checkboxes for Black Carbon, Carbon Dioxide, Sulfur Dioxide, Organic Carbon, Non-Methane Hydro-Carbon, Total Carbon in Aerosols, Methane, Carbon Monoxide, Nitrogen Oxides, and Particulate Matter.
- FUELS:** Includes a checkbox for FUELS.
- Analysis Tools:** Includes a button for "GWIS Estimates per Country".

The main map area shows a satellite-style view of South America with various data layers overlaid. A red dot is visible in the Mato Grosso region of Brazil. A vertical toolbar on the right side of the map includes icons for home, search, zoom in/out, full screen, and other navigation functions.

At the bottom right of the map area, there is a blue box with the text "Joint Research Centre".

The bottom right corner of the page contains the text "JRC127205" and "GWIS | Ver. 2.6."

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JRC127205

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Scope of this report and executive summary

This report describes the trends of wildfires in the Amazon in 2021 through the comparison with the fire activity in the region in previous fire seasons. It must be noted that 2019 and 2020 were critical years 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 "[country profile application](#)" in GWIS. 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 and the [EU Project on support to wildfire management in LAC](#). Most of the Amazon region is in Brazil, specifically in the Brazilian Legal Amazon (BLA)², and in other neighbor countries. Figure 1 shows the geographical extent of the countries analyzed in this report.

- In the **Brazil Legal Amazon (BLA)**, within Brazil, a total of 12,34 Million ha (Mha) burnt since January 1 until November 14, 2021. This value the lowest of the last 6 years. **Last week, 173 fires occurred, following the decreasing trend from previous weeks.**
- **In Brazil, 20,01 Mha burnt since January 1 until November 14, 2021**, with a total of 60,338 ha burnt in the last week. The total burnt area and number of fires in Brazil are lowest values of the last 6 years. 287 fires occurred last week occurred last week, while the area burnt in the last week was the lowest value of the last 6 years for the same week The average size of the fires is smaller than in all the previous 6 years.
- **In Bolivia**, the total burnt area (6.88 Mha) and number of fires (13,505 fires) decreased from the previous week. The total burned area this year is below the values of 2019 and 2020.
- **In Colombia**, the total burnt area in the country (2.79 Mha) is above the values of 2018 and 2019 but approximately 10% below the values of 2020. The total number of fires since January 2021 is 9,741, which is the second highest value since 2015 for the same period (below 2020).
- **In Paraguay**, 3.3 Mha burnt since January 1 until November 14, 2021. This figure is above those of 2018 but below the value of 2019 and 26 % below the value of 2020.
- **In Peru**, since January 1 until November 14, 2021, the total burnt area is 2.15 Mha and total number of fires is 8,309. These are the second highest values recorded since 2015 (below 2020).
- **In Venezuela**, 4.03 Mha burnt in the current year until November 14. The value of the total burnt area in Venezuela is lower than that in 2019 and 2020.
- **In Chile**, 438,334 ha burnt in the current year until November 14, 2021. This value is 51% higher than that of 2020. This year, the number of fires (1760) is the highest since 2015.
- **In Argentina**, a total of 4.35 Mha burnt since January 1 until November 14, 2021, which is less than half of what was burned in 2020 in the same period. A total of 14,319 fires were mapped in this period.
- **In Ecuador**, a total of 625 fires burnt 139,773 ha since January 1 until November 14, 2021. These values are lower than the values of 2018 and 2020.
- **In Uruguay**, a total of 48305 ha burnt since January 1 until November 14, 2021. This value is higher than those of 2018 and 2019 but lower than the figure of 2020. 1 fire was recorded last week.
- **In French Guiana** a total of 6,641 ha burnt since January 1 until November 14, 2021. This value is the lowest of the last 6 years. 1 fire was recorded last week.
- **In Guyana**, a total of 80,734 ha burnt since January 1 until November 14, 2021, the lowest value of the last 6 years. 5 fires were mapped last week.
- **In Suriname**, 54 fires burnt a total of 12,810 ha since January 1 until November 14, 2021, the lowest value of the last 6 years. 11 fires were mapped last week.
- This week, fire danger conditions will be very high to extreme in southern Argentina and northern Chile. Eastern part of Brazil will have moderate to high fire danger.

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](#))



Figure 1. Areas analyzed in this report: Brazil Legal Amazon, Brazil, Bolivia, Colombia, Paraguay, Peru, Venezuela, Chile, Argentina, Ecuador, Uruguay, French Guiana, Guyana and Suriname

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, 2021 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 12.34 Mha burnt in the BLA from January 1 until November 14, 2021, with 37,649 ha burnt in total during the last week, which is lowest value of the last six years for the same week. The number of fires recorded in GWIS in the last week was 173, decreasing from the previous week. The number of thermal anomalies until November 14, 2021 (628,022) shows a typical trend in the region as compared to the trends in 2018 and 2020, but the values remain below. 7,597 thermal anomalies were registered last week.

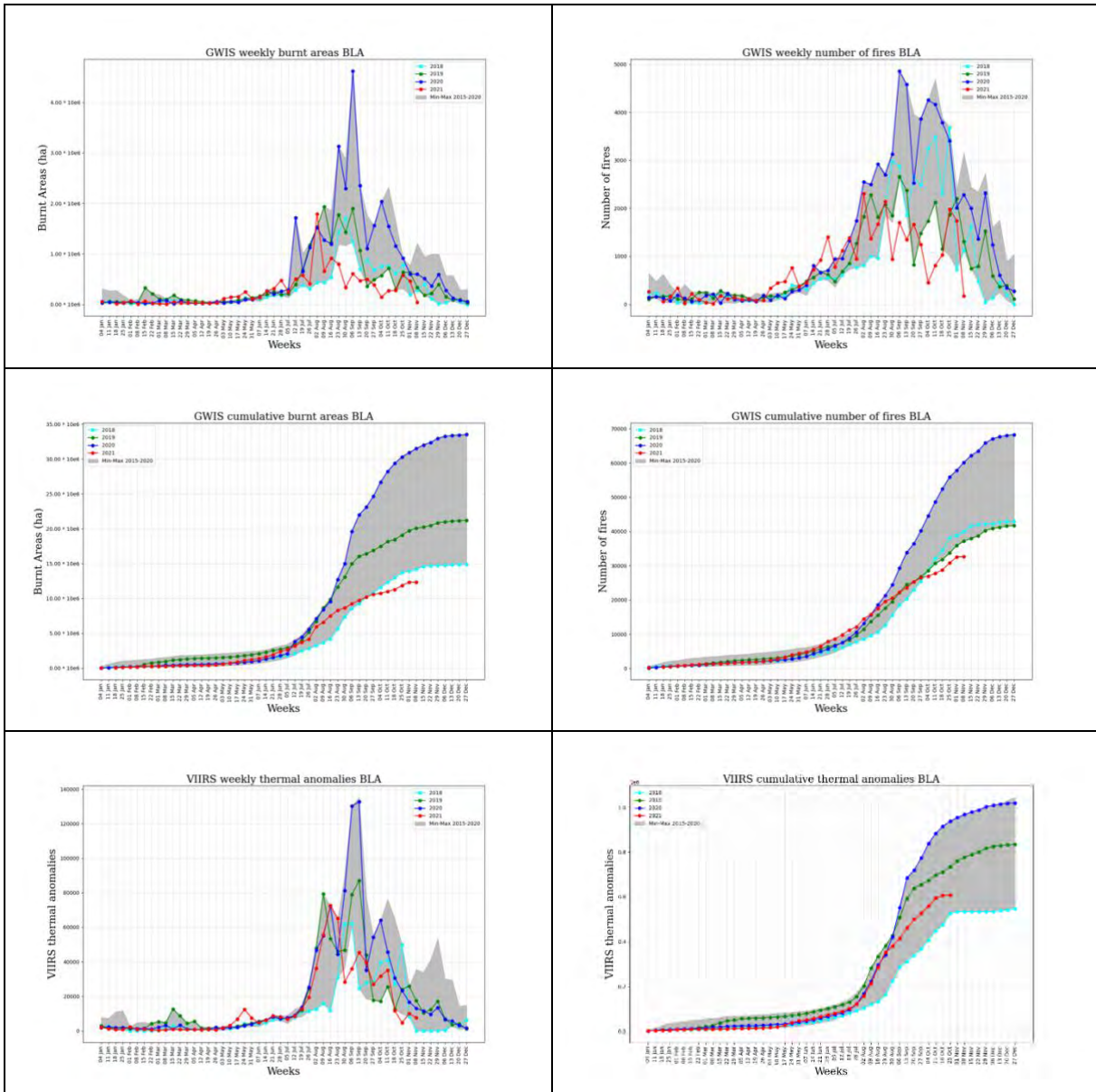


Figure 2. Trend of burnt areas and number of fires as compared to data in the last 6 years.

2 Wildfires in Brazil

Figure 3 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 20,01 Mha ha burnt in Brazil since January 1 until November 14, 2021, with a total 60,338 ha burnt in the last week. The total burnt area in the country remains below the values of the previous two years. The number of fires recorded in GWIS in the last week was 287, decreasing from the last week. The number of thermal anomalies until November 14, 2021 (1,138,486) shows a typical trend in the region. 12,485 thermal anomalies were registered last week.

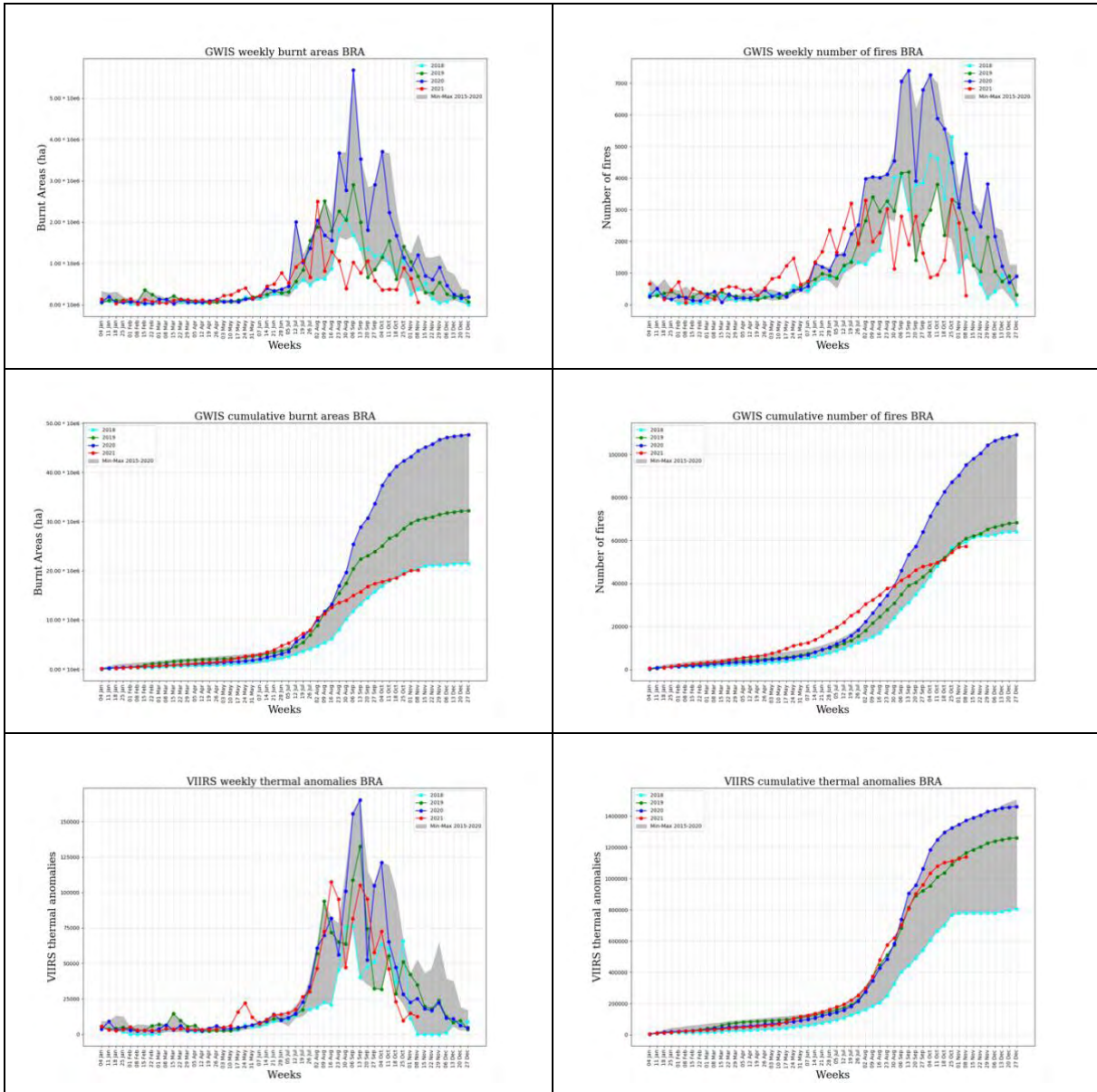


Figure 3. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

3 Wildfires in Bolivia

Figure 4 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 ha burnt in Bolivia since January 1 until November 14, 2021, with 26,078 ha burnt in the last week, decreasing from the last week. The number of fires recorded in GWIS in the last week was 114, higher than the number of fires in the same week from the last 6 years. The number of thermal anomalies until November 14, 2021 (274,160) is between the values of 2018 and 2020 the same period. 3,840 thermal anomalies were detected by VIIRS in the last week.

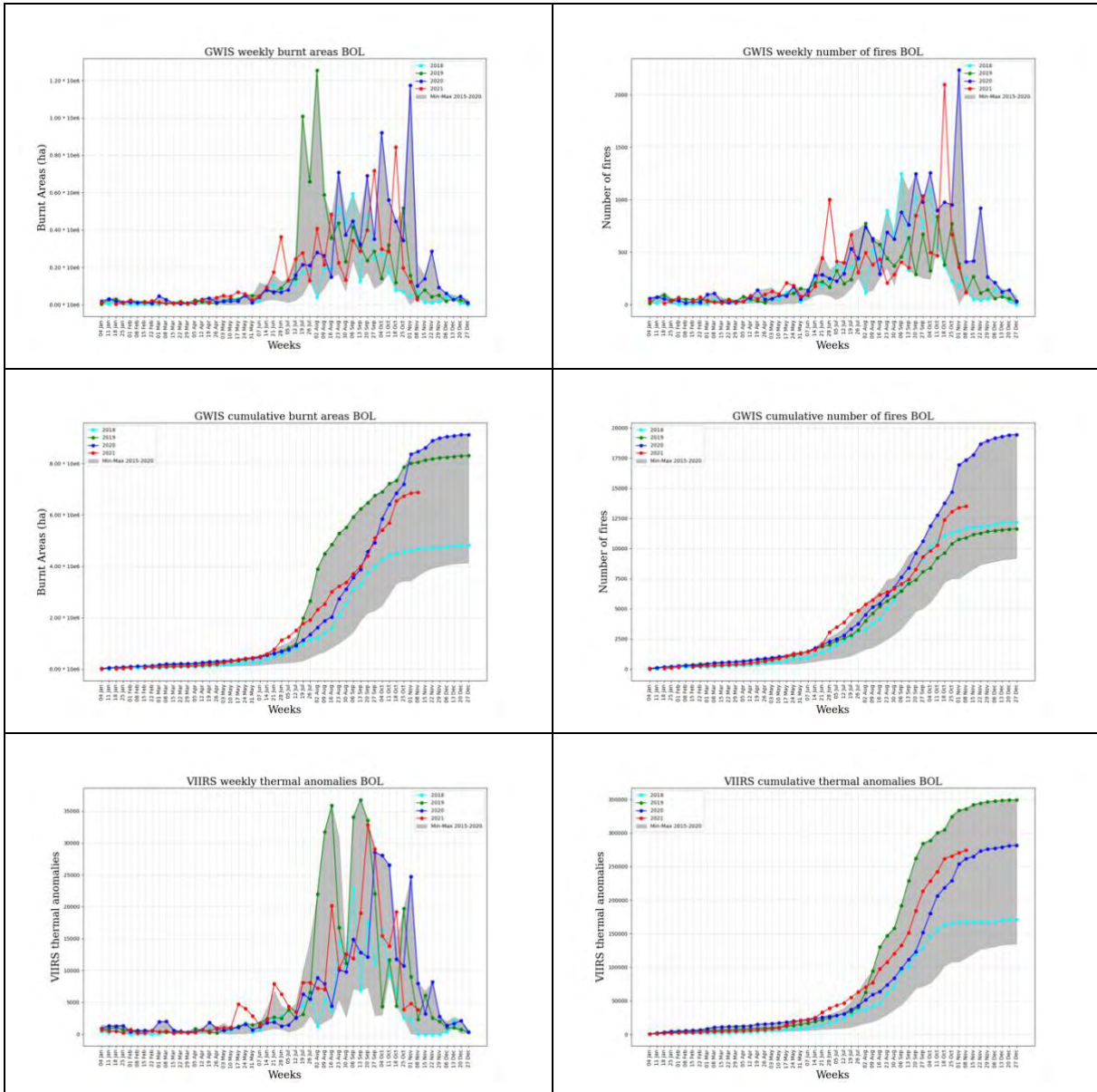


Figure 4. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

4 Wildfires in Colombia

Figure 5 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 2.84 Mha burnt in Colombia since January 1 until November 14, 2021. Approximately 46,654 ha burnt in the country the last week. The number of fires recorded in GWIS in the last week was 197 and the total number of fires since January 1 is the highest value since 2015 for the same period. The number of thermal anomalies until November 14, 2021 (72,727) follows a typical trend in the region with similar values of 2018 but way below of 2019 and 2020. 1,781 thermal anomalies recorded by VIIRS last week.

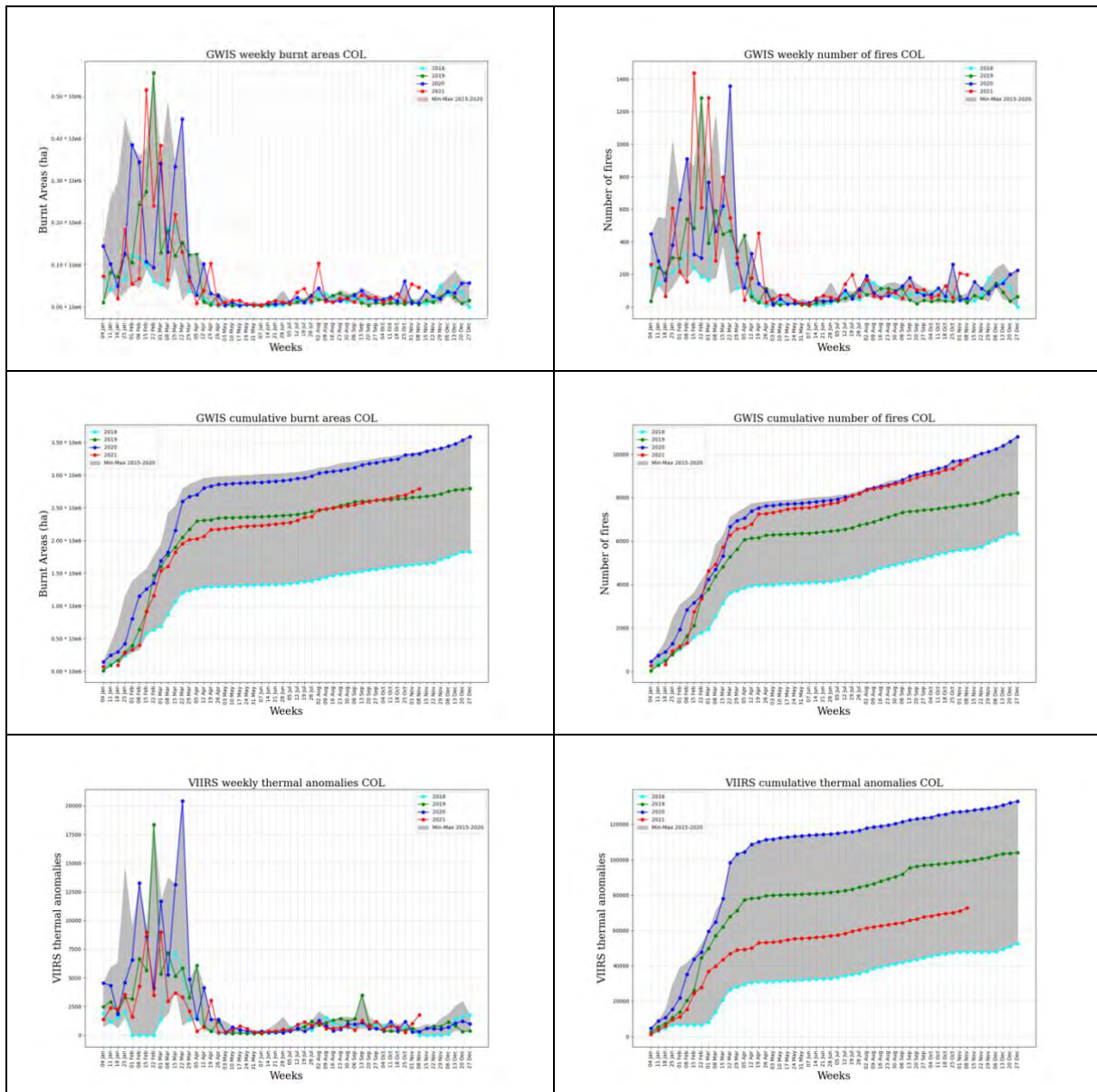


Figure 5. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

5 Wildfires in Paraguay

Figure 6 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 3.28 Mha burnt in Paraguay since January 1 until November 14, 2021. Approximately 22,989 ha burnt in the country the last week, decreasing from the previous week. The number of fires recorded in GWIS in the last week was 49. The number of thermal anomalies until November 14, 2021 (233,033) follows a typical trend in the region. 1,260 thermal anomalies detected by VIIRS last week.

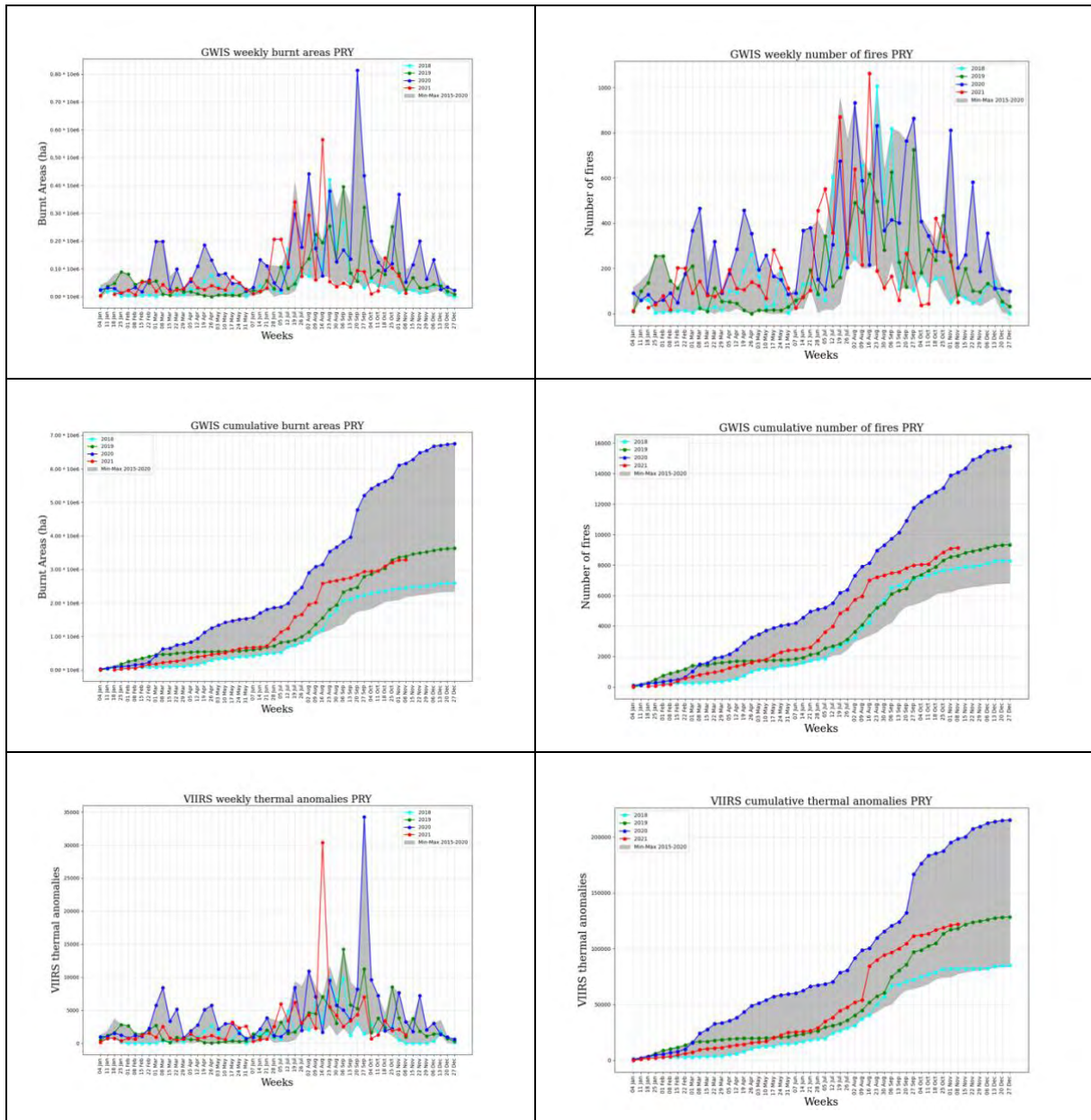


Figure 6. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

6 Wildfires in Peru

Figure 7 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 2.15 Mha burnt in Peru since January 1 until November 14, 2021, the second highest value since 2015 for the same period. Approximately 9,571 ha burnt in the last week, decreasing from the previous week. The number of fires recorded in GWIS in the last week was 54. The number of thermal anomalies until November 14, 2021 (57,808) shows a typical trend in the region. 596 thermal anomalies registered last week, decreasing after the last week.

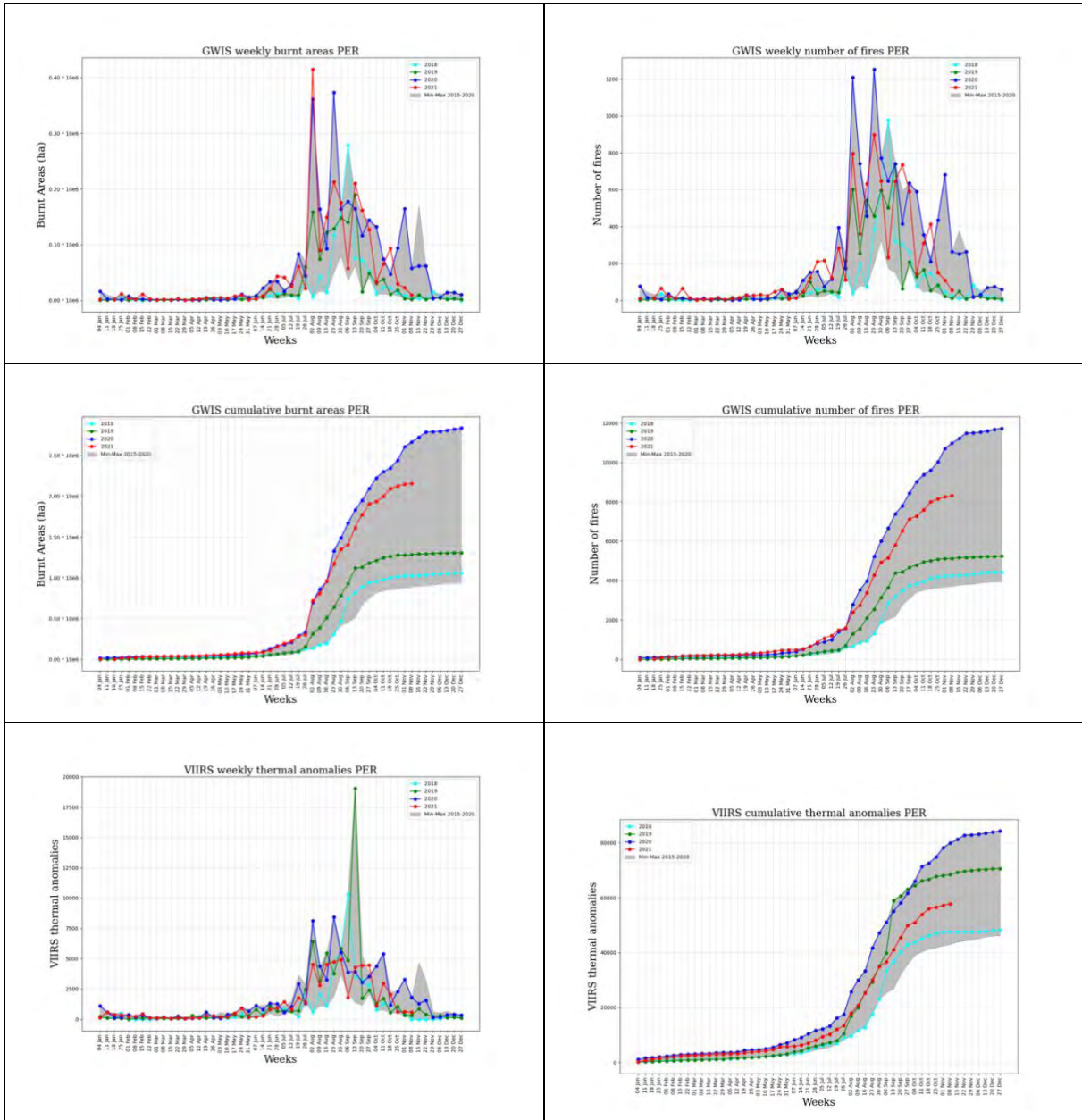


Figure 7. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

7 Wildfires in Venezuela

Figure 8 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 4.03 Mha burnt in Venezuela since January 1 until November 14, 2021, with 26,851 ha burnt in the last week. The number of fires recorded in GWIS in the last week was 120. The number of thermal anomalies until November 14, 2021 (140,931) shows a typical trend in the region. 2,833 thermal anomalies were recorded by VIIRS during the last week.

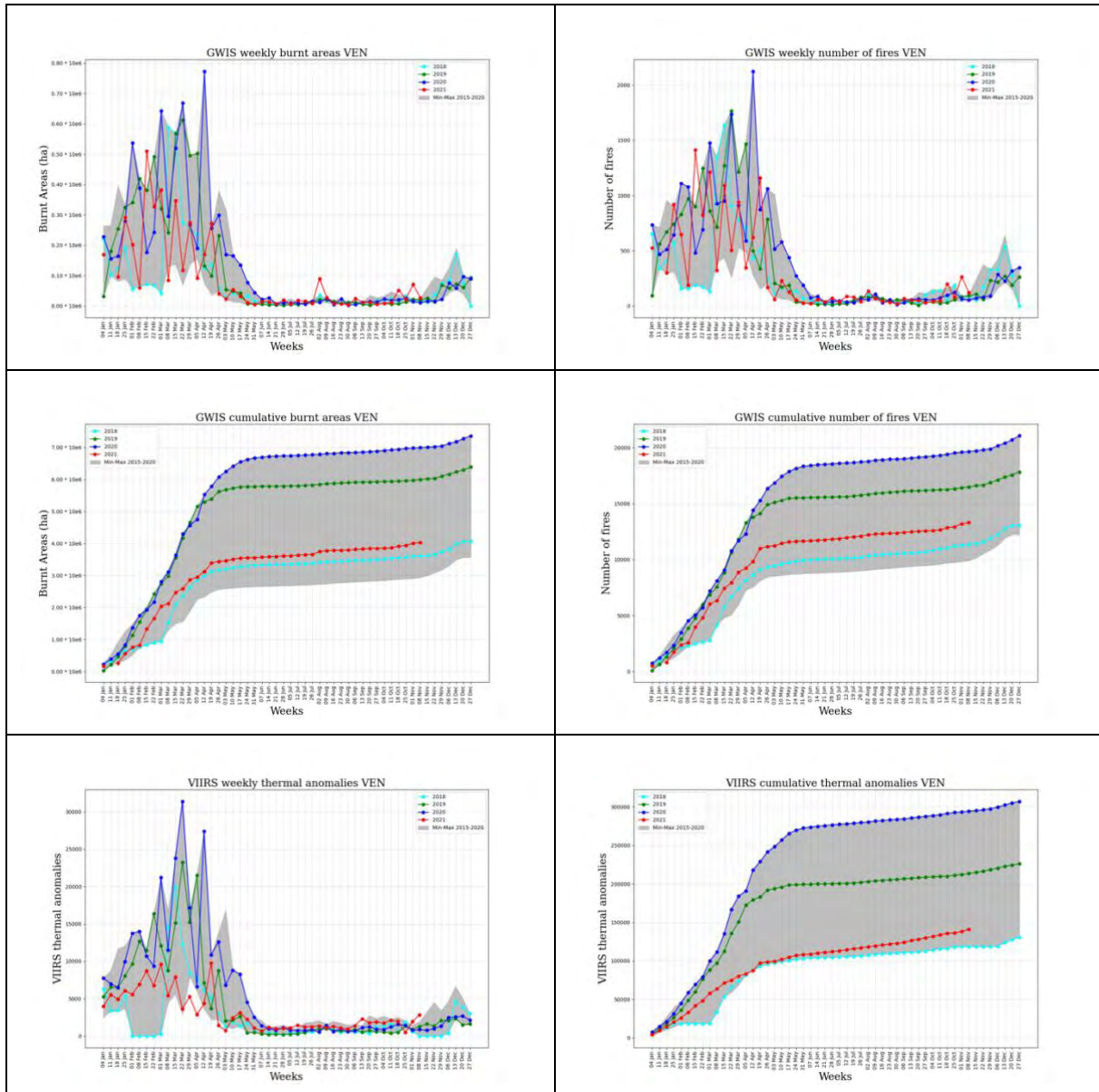


Figure 8. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

8 Wildfires in Chile

Figure 9 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 438,334 burnt in Chile since January 1 until November 14, 2021, with 1,462 ha burnt in the last week. The number of fires recorded in GWIS in the last week was 9. The number of thermal anomalies until November 14, 2021 (14,189) shows a typical trend in the region as compared to the trends during previous years. 115 thermal anomalies were detected by VIIRS during the last week, which is similar to the values in the same week during previous years.

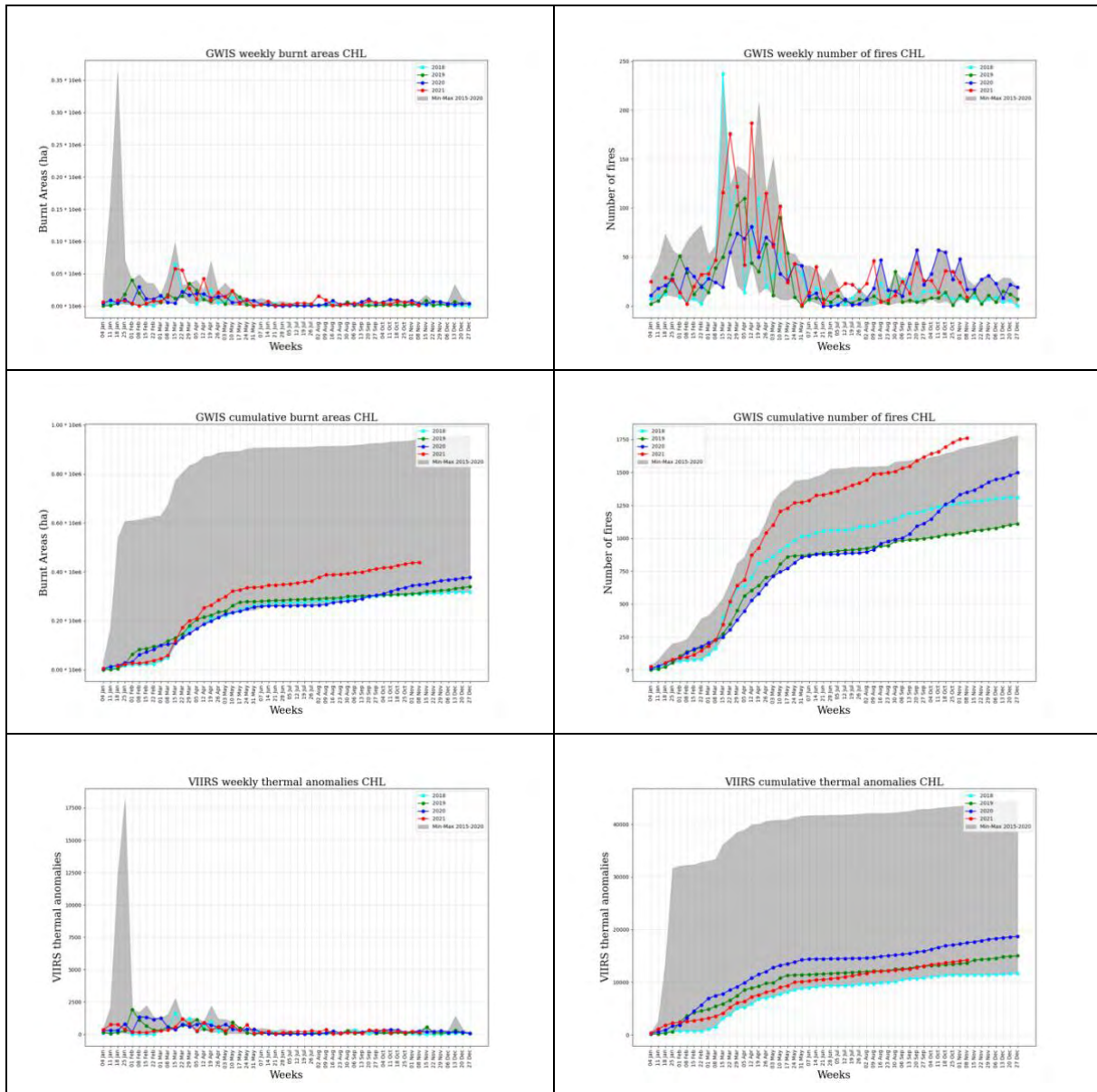


Figure 9. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

9 Wildfires in Argentina

Figure 10 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 4.35 Mha burnt in Argentina since January 1 until November 14, 2021, with 18,780 ha burnt in the last week. These values are the second highest since 2015 for the same week. The number of fires recorded in GWIS in the last week was 76, the second highest value since 2015 for the same period. The number of thermal anomalies until November 14, 2021 (146,316) shows a typical trend in the region. 1,390 thermal anomalies were recorded by VIIRS during the last week, a value that is like those recorded in that week for 2020.

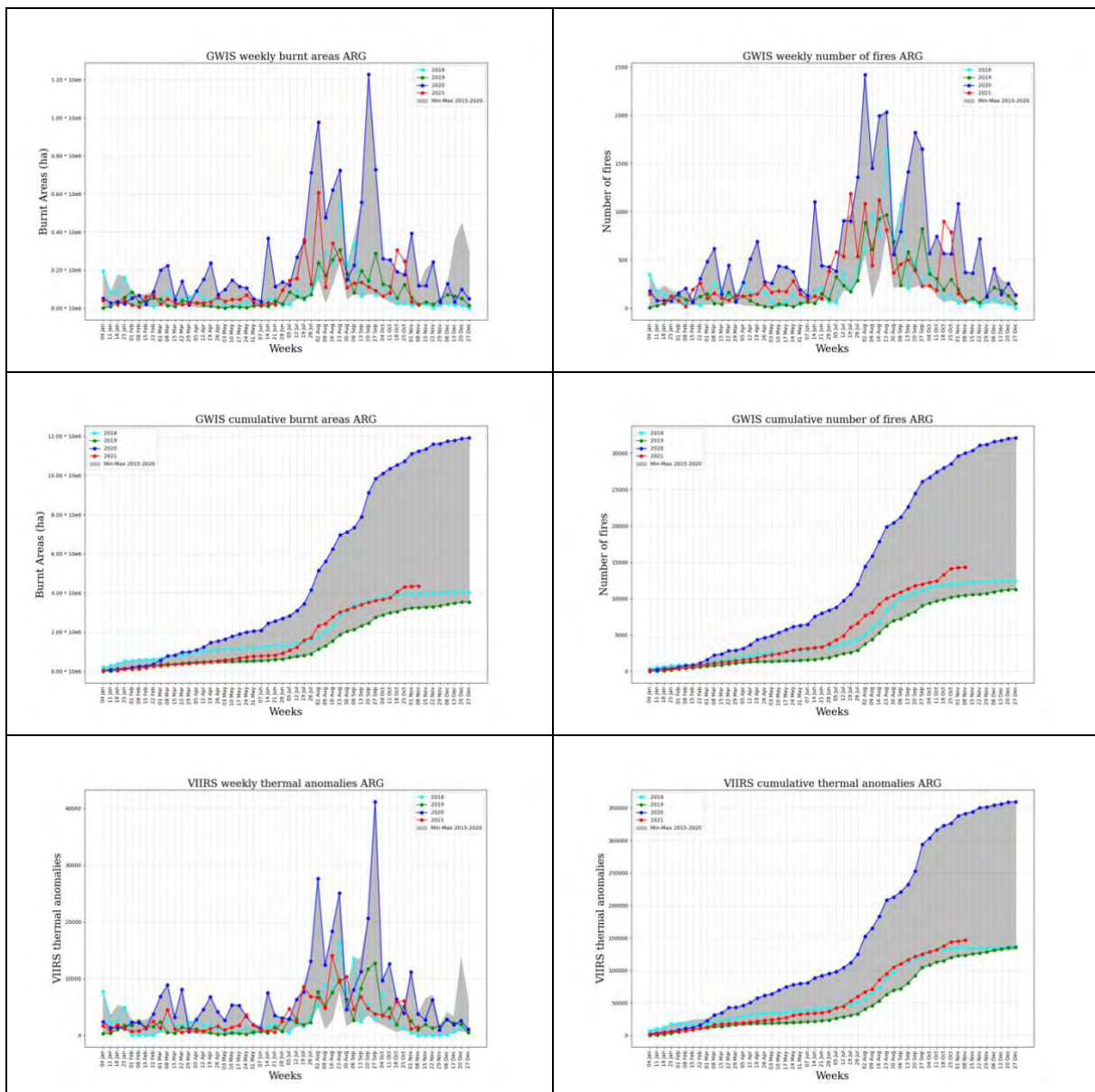


Figure 10. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

10 Wildfires in Ecuador

Figure 11 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 139,773 ha burnt in Ecuador since January 1 until November 14, 2021, on of the lowest values for the same period in the last 6 years, with 13,742 ha burnt in the last week. The number of fires recorded in GWIS in the last week was 66. The number of thermal anomalies until November 14, 2021 (4,349) shows a typical trend in the region. 534 thermal anomalies were detected by VIIRS in the last week.

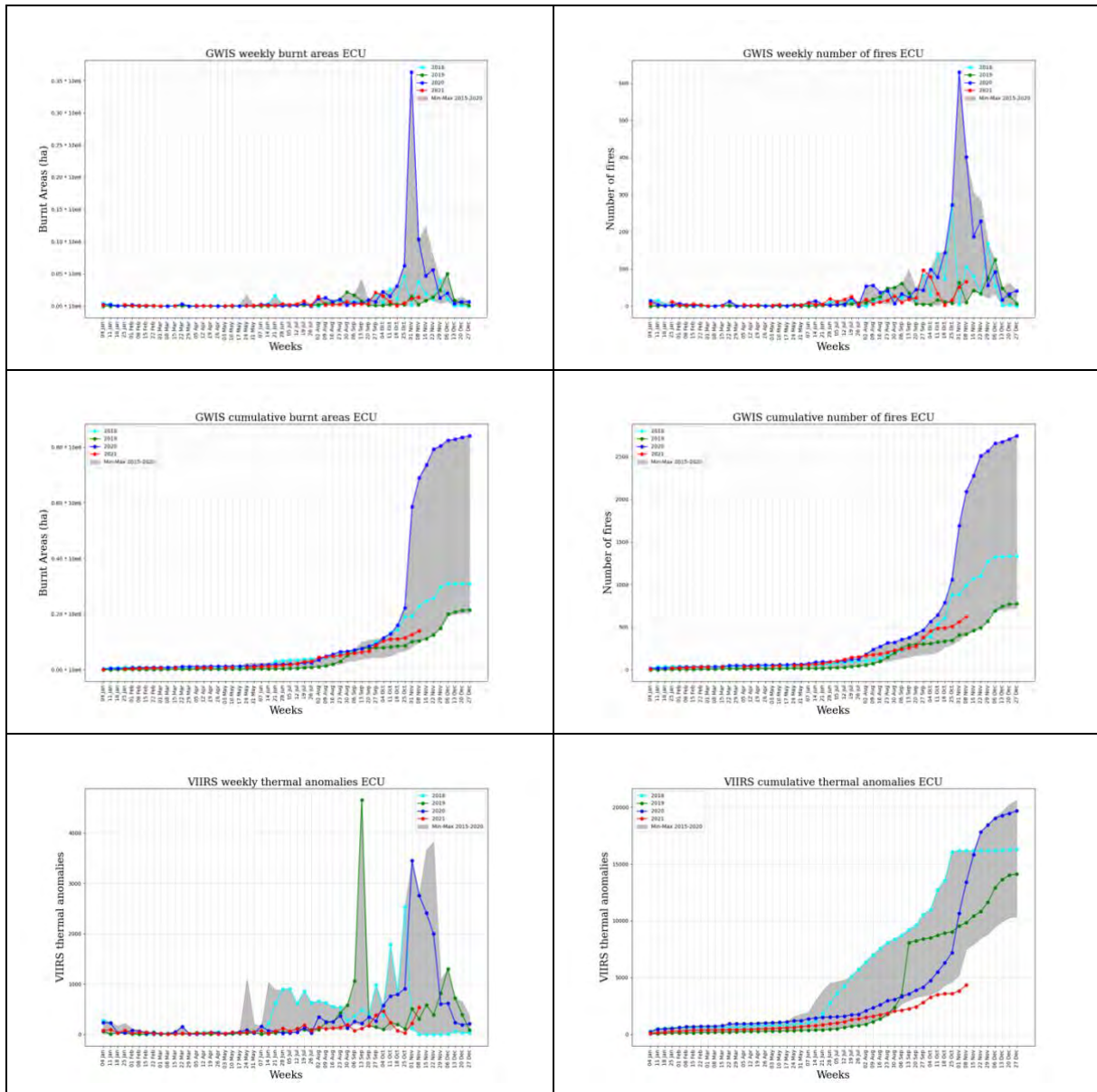


Figure 11. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

11 Wildfires in Uruguay

Figure 12 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 48,305 ha burnt in Uruguay since January 1 until November 14, 2021. 1 fire was recorded last week. The number of thermal anomalies until November 14, 2021 (1,920) shows a typical trend in the region.

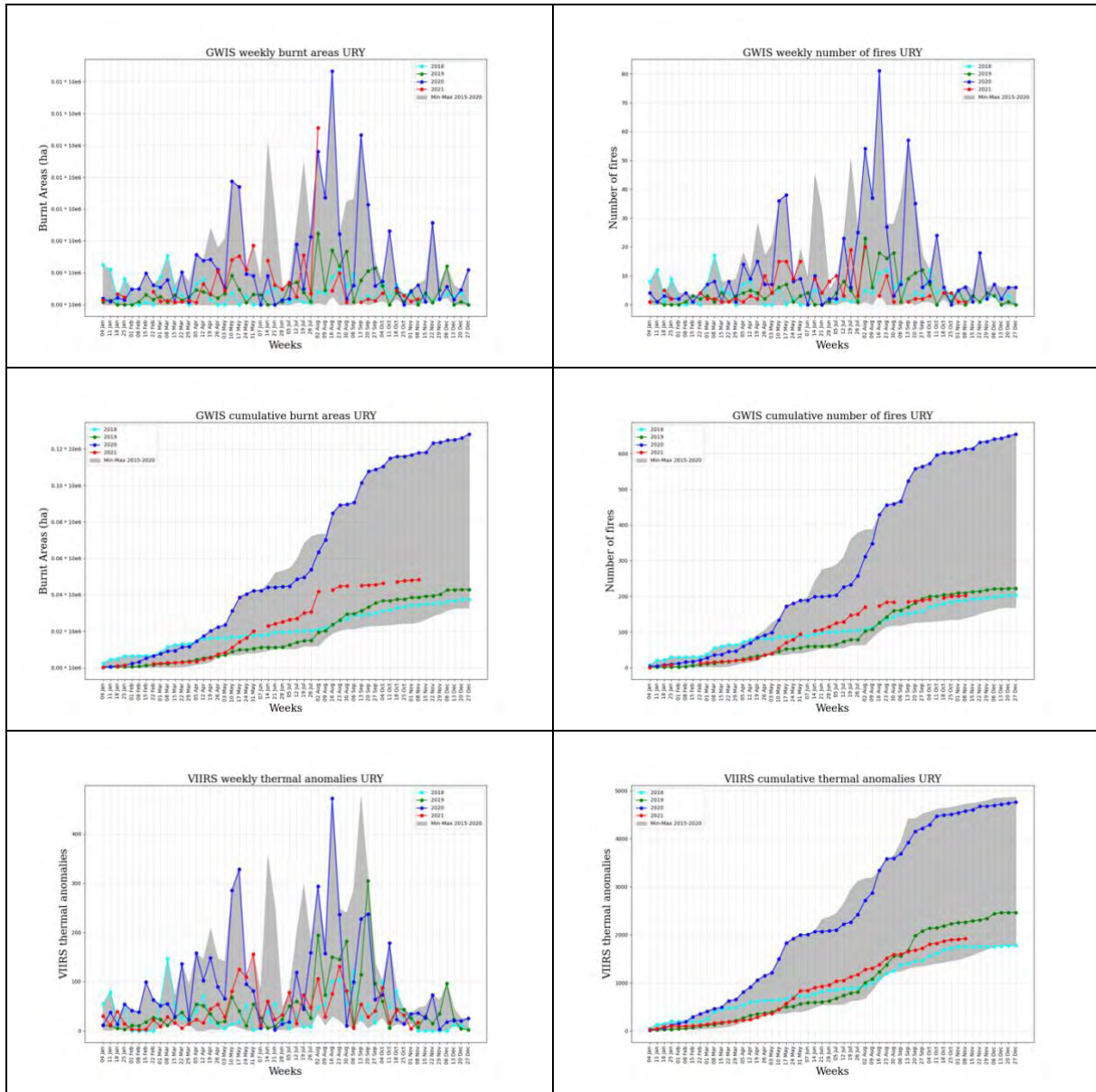


Figure 12. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

12 Wildfires in French Guiana

Figure 13 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 6,641 ha burnt since January 1 until November 14, 2021, with 1 fire recorded last week. The number of thermal anomalies until November 14, 2021 (341) shows a typical trend in the region as compared to the trends during previous years. 4 thermal anomalies were detected by VIIRS during the last week, which is similar to the values in the same week during previous years.

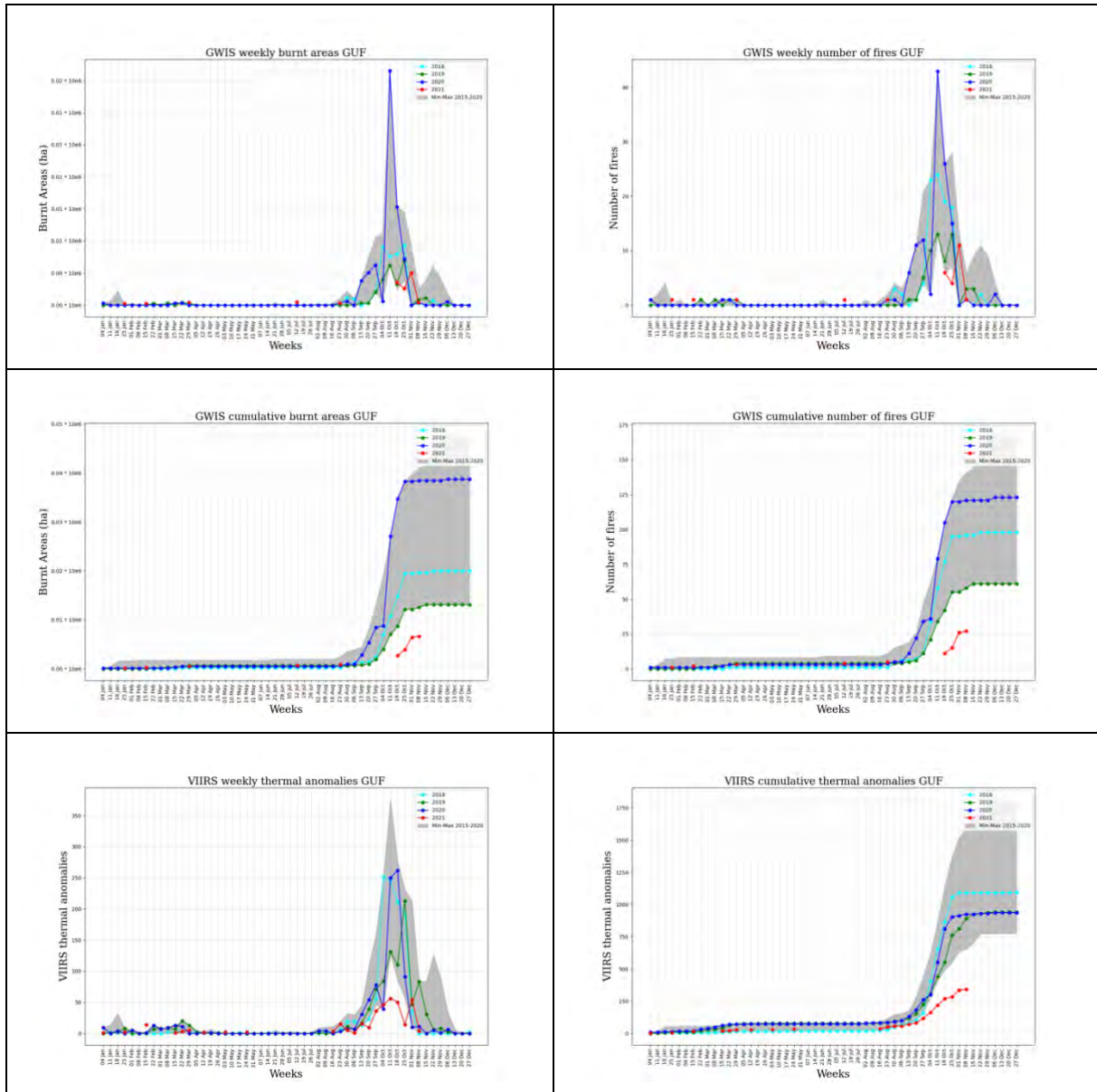


Figure 13. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

13 Wildfires in Guyana

Figure 14 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 80,734 ha burnt in Guyana since January 1 until November 14, 2021, with 5 fires recorded last week. The number of thermal anomalies until November 14, 2021 (3,492) shows a typical trend in the region as compared to the trends during previous years. 141 thermal anomalies were detected by VIIRS during the last week, which is similar to the values in the same week during previous years.

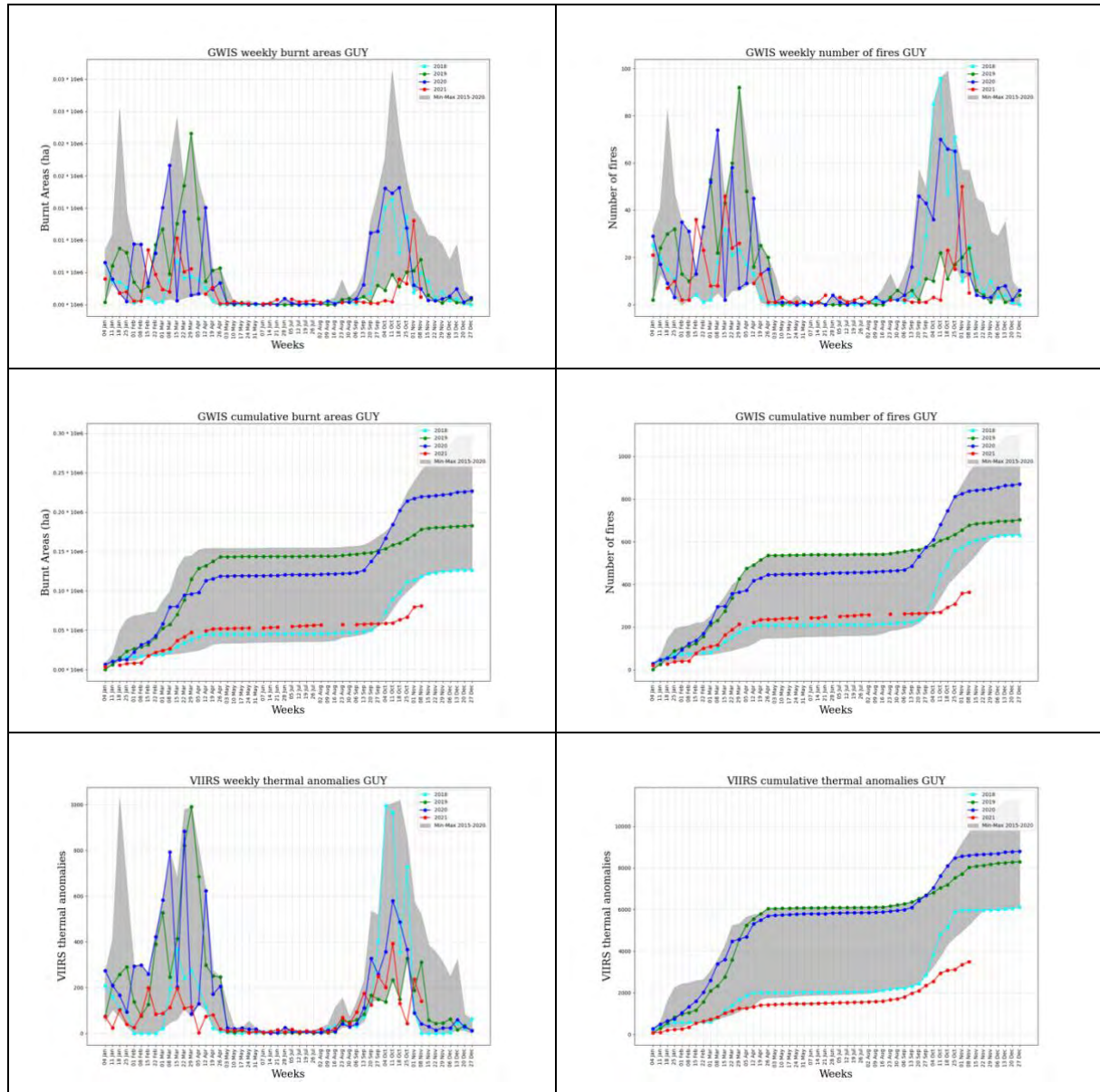


Figure 14. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

14 Wildfires in Suriname

Figure 15 shows the trends on the extent of burnt areas and the number of fires since January 1, 2021 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 12,810 ha burnt in Suriname since January 1 until November 14, 2021. 11 fires were recorded last week. The total number of fires since the beginning of the year is 54. The number of thermal anomalies until November 14, 2021 (812) shows a typical trend in the region. 36 thermal anomalies registered last week, increasing after the last week.

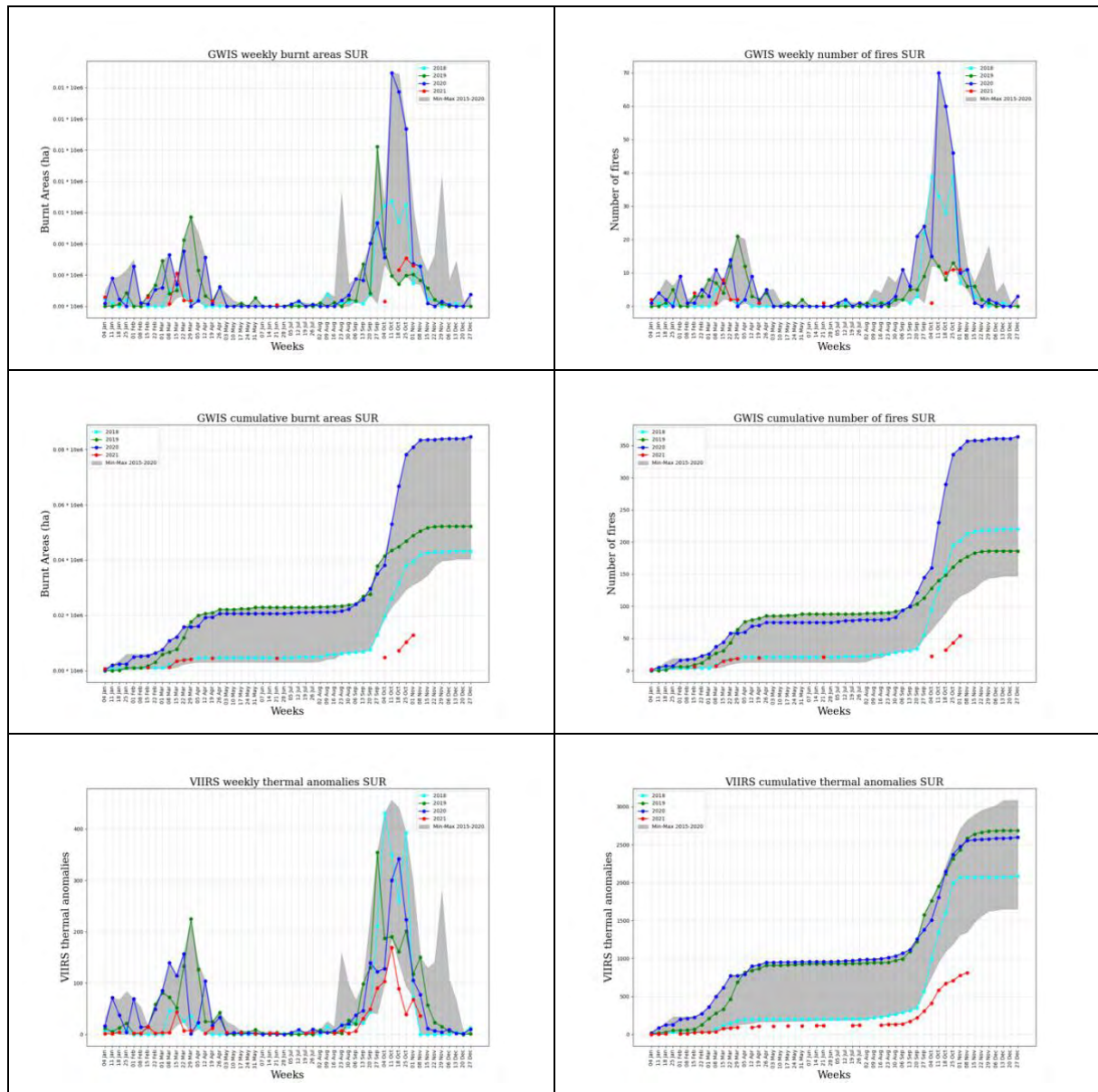


Figure 15. Trend of burnt areas, number of fires and thermal anomalies as compared to data in the last 6 years.

15 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 16 provides the average fire danger for the week of November 15 to November 21, 2021. This information is based on the daily fire danger forecast that is provided online in GWIS³. According to this forecast, it is expected that fire danger conditions will be very high to extreme in southern Argentina and northern Chile. Eastern part of Brazil will have moderate to high fire danger.

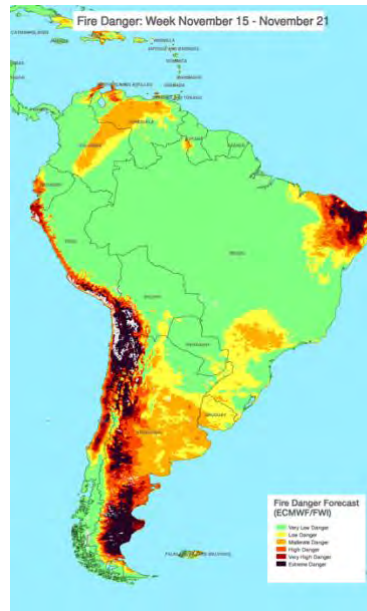


Figure 16. Average Fire danger forecast. Week, November 15 – November 21, 2021.

The weekly fire weather forecast of temperature and precipitation anomalies for this week is presented in Figure 17. Above average temperatures are forecasted for areas of southeastern Brazil and Colombia. Below average temperatures are forecasted in Brazil, Bolivia, Paraguay and Argentina. The models estimate an above average precipitation rates for next week mainly in Brazil, Bolivia, Paraguay and southern Peru. Below average precipitation is foreseen mainly in northern Argentina, Venezuela and Colombia.

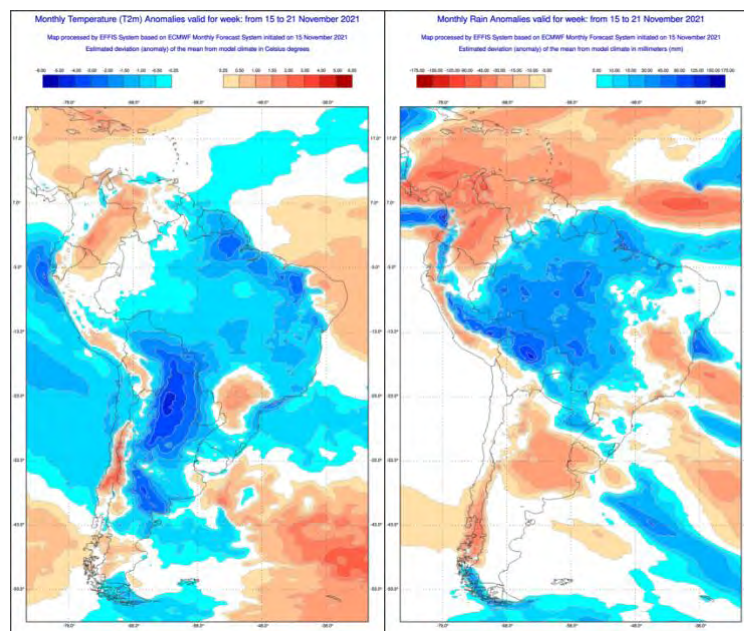


Figure 17. Fire weather anomalies of the current week, November 15 - November 21, 2021.

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

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