Visual Confirmation of Additional Burned Communities and RSF Forces in El-Fasher

29 April 2024

Yale SCHOOL OF PUBLIC HEALTH Humanitarian Research Lab

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I. Key Findings

The Yale School of Public Health's Humanitarian Research Lab (HRL) finds:

- Rapid Support Forces (RSF) are confirmed present in El-Fasher, including likely checkpoints at major east and north ingress/egress roads in and out of the city;
- Yale HRL confirms an additional 11 communities razed by apparent arson: three of the communities are outside Mellit, north of El-Fasher, between 20-25 April 2024, and an additional eight of the apparently-burned communities are west of El-Fasher and burned prior to 20 April 2024; and
- As of 18 April 2024, Sudan Armed Forces (SAF) bombardment of RSF on the eastern neighborhoods and northeast access point of El-Fasher was continuing.

Yale HRL has visually identified forces consistent with the Rapid Support Forces (RSF) in eastern and northern El-Fasher. Checkpoints controlling the major roads in and out of El-Fasher are observed in satellite imagery from 25 April 2024. There is widespread open source reporting that RSF controls the checkpoints on the road heading north and east to Mellit, likely the Kutum Street connecting to the B26 road.ⁱ Additionally, Yale HRL has visually identified forces consistent with RSF in the north of El-Fasher apparently on the move on 25 April 2024. Yale HRL has not yet visually confirmed reports of RSF movement from the south but is continuing to monitor the area. Sudan Armed Forces (SAF) appear to be hardening positions to the west consistent with an expectation of RSF forces attempting to move from that direction as well.

Yale HRL also confirms an additional 11 communities are verified to have been burned, potentially by RSF forces between 31 March and 25 April 2024. Significantly, three of these likely arson attacks occurred 26-44 km west of Mellit, a reported RSF staging ground for their attack on El-Fasher. Mellit is approximately 90 km north of El-Fasher. As of publication, Yale HRL has confirmed that a total of 22 communities in North Darfur have been attacked in a manner consistent with the intentional targeting and burning of civilian structures, 19 communities to the northwest of El-Fasher between 1 March – 20 April 2024 and three west of Mellit (and north of El-Fasher) between 20–25 April 2024.

As of 18 April 2024, SAF had been bombarding the east and northeast of El-Fasher consistent with RSF presence in the area. Yale HRL assesses that SAF has reportedly conducted aerial strikes in the northeast of El-Fasher and near and around Mellit throughout at least 10 - 26 April 2024.ⁱⁱ There are also visual confirmations and VIIRS detections of munition impact points observed across the east and northeast of El-Fasher as recently as 18 April 2024. Some of the munition strikes are close to the borders of Al-Salam Internally Displaced Persons (IDP) camp, which is home to over 88,000 displaced people.ⁱⁱⁱ

II. Human Security Analysis

Yale HRL assesses that three forms of civilian mass casualties are likely to occur in El-Fasher. Two of the three, deprivation-related deaths and death due to crossfire, are likely occurring:

- 1. Deprivation-related deaths from lack of basic necessities (food, water, medical assistance), already occurring and widespread;
- 2. Civilian death from crossfire between armed actors, already occurring; and
- 3. Civilian death from targeted mass atrocity events including systematic mass atrocities, not yet identified.

Attacks in El-Fasher are taking place as the humanitarian situation there is worsening. Under-resourced IDP camps are reportedly struggling to accommodate increasing arrivals, including up to more than 50,000 people forcibly displaced from communities that the RSF razed to the west of El-Fasher.^{iv} The United Nations and Médecins Sans Frontières (MSF) have reported famine conditions in Zamzam IDP camp.^v MSF has established a field clinic treating both measles and severe acute malnutrition (SAM) and has stated that a child is dying from malnutrition/starvation every two hours in Zamzam IDP camp^{vi} Furthermore, hospitals lack medical supplies and ambulances, the city has few working water locations, and water bottles and food are being further rationed.^{vii} There are reports of sexual and gender-based violence (SGBV) including sexual exploitation, sexual assault, and rape in displaced persons' shelters, and insufficient care for survivors has reportedly contributed to suicides.^{viii} The attacks on communities west of El-Fasher and near Mellit likely caused additional civilian displacement; although Yale HRL cannot, at present, identify the status of the nowdisplaced community members.

The current status of combat operations in El-Fasher is not currently known. Yale HRL finds that RSF has taken control of the northern and eastern routes into El-Fasher through the capture of Mellit and positions on the eastern B26 road.^{ix} RSF's forces in Nyala, Zalengei, El-Daein, and other Darfuri areas are also reportedly in or moving to El-Fasher to prepare for a rumored minimum three front attack on the city.^x Meanwhile, using satellite imagery, Yale HRL assesses that SAF and aligned forces are mobilizing and continuing to harden defensive positions in and around El-Fasher in anticipation of a large-scale urban assault.^{xi} Yale HRL has withheld information on these positions due to the potential for this information being used for targeting.

A large-scale RSF multidirectional siege and battle for El-Fasher would have severe consequences for civilians in El-Fasher. SAF is deploying airstrikes in an indiscriminatory manner, and both RSF and SAF have deployed artillery and heavy munitions without sufficient protection of civilians.^{xii} Civilian death from mass atrocity events is also a major concern but not yet identified. RSF typically infiltrates neighborhoods in waves and conducts widespread and targeted mass atrocities including mass executions, often of Masalit, Fur, and Zaghawa men and boys, sexual and gender-based violence toward women and girls, and systematically razing communities.^{xiii} On Saturday 27 April the UN Security Council released a statement calling for both sides to stop fighting and identified an imminent attack on El-Fasher by RSF and allied militias.^{xiv} On Sunday 28 April 2024 RSF Commander Hamdan Dagalo "Hemedti" released a statement saying RSF was "exercising legitimate right to self-defense in the face of the aggression" (*translated*) in El-Fasher.^{xv} There is an emergency UN Security Council meeting on Sudan scheduled for 29 April 2024.^{xvi}

Methodology

Yale HRL utilizes data fusion methodologies of open source and public and commercially available remote sensing data. Yale HRL produced this report through the cross-corroboration of open source and remote sensing data, including satellite imagery and thermal sensor data.

Place names were identified using UN P-codes obtained via the United Nations Humanitarian Data Exchange (HDX) and International Organization for Migration (IOM)'s Displacement Tracking Matrix (DTM) Sudan. This baseline source of information was then verified and informed through open source analysis by Yale HRL's analysts with relevant cultural and linguistic skills. In some cases, communities may have names similar to other communities or may be known by multiple names.

Specific coordinates have been provided to support the further identification and disambiguation of specific place names and community locations. Human security concerns were accounted for as part of the decision to release specific coordinates; potential civilian risk was rated minimal because these communities have already been visibly attacked, and in the case of combat activity and coordinates are released, it is assessed that the combatants are aware of this situation.

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Probable RSF Elements

PROBABLE RSF ELEMENTS OBSERVED AT NORTHERN SECTION OF EL-FASHER

According to analysis of satellite imagery collected between 15 and 25 April 2024, at least two vehicles arrived at the northern checkpoints and at least five vehicles were in a group at the northern section of the El-Fasher. According to open source reporting, probable RSF elements have taken control of the northern and eastern sections of El-Fasher.



Imagery 25 April 2024 © 2024 Maxar, USG-Plus

Imagery 25 April 2024 © 2024 Maxar, USG-Plus

Imagery 25 April 2024 © 2024 Maxar, USG-Plus

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El-Fasher East

DOI: 25 April 2024

Newly arrived vehicle
Object or vehicle

Probable RSF Elements Observed at Eastern Section of El-Fasher

According to analysis of satellite imagery collected between 15 and 25 April 2024, at least 12 vehicles arrived at the eastern section of El-Fasher. According to opens source reporting, probable RSF elements have taken control of the northern and eastern sections of El-Fasher.



Probable RSF Elements Observed Northeast of El-Fasher

According to analysis of satellite imagery collected between 15 and 25 April 2024, at least four vehicles arrived approximately 6km north-east of El-Fasher, consisting of at least one probable technical.

At least four possible RSF-associated vehicles are assessed to have arrived at this location between 15 and 25 April 2024.



A. Newly arrived probable technicalB. Newly arrived vehicle

Probable RSF Elements Observed Northeast of El-Fasher

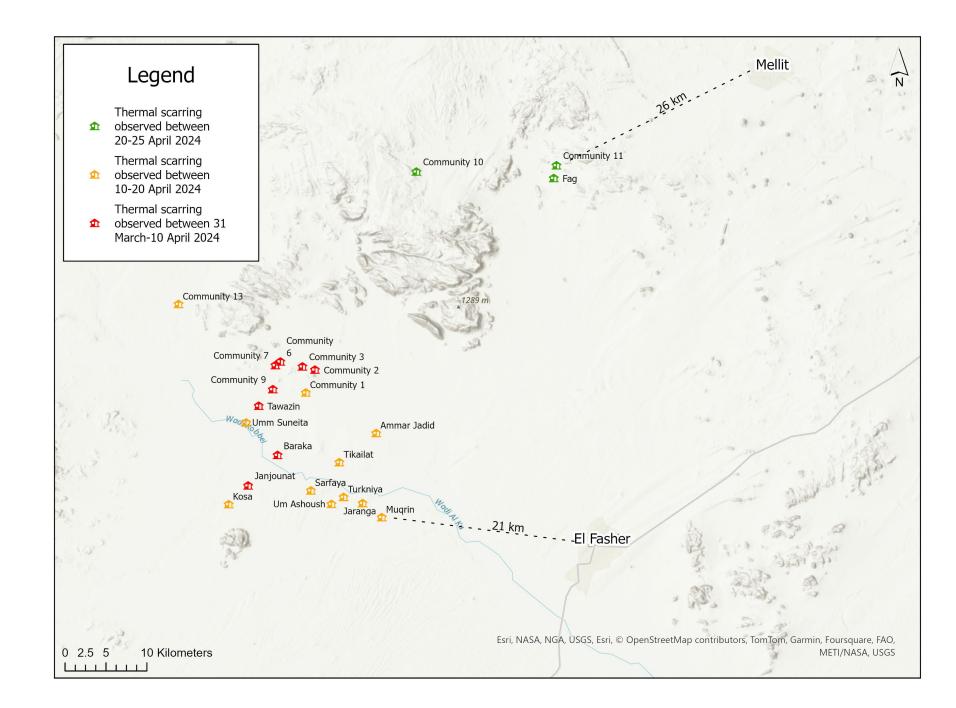
According to analysis of satellite imagery collected on 25 April 2024, at least eight probable RSF-associated vehicles arrived approximately 17km NE of El-Fasher Airfield between 15 and 25 April 2024.

Additionally, at least six vehicles were observed on the road leading to El-Fasher.



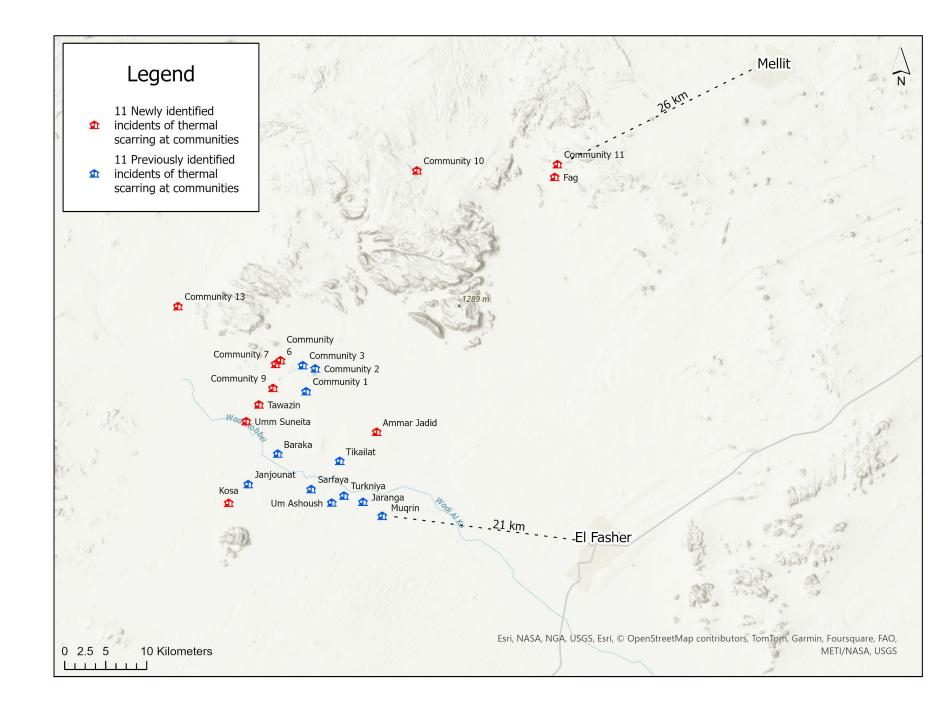
Overview of Thermal Scarring West of El-Fasher

This assessment is based on Sentinel satellite imagery, VIIRS data and open source reporting. The radii represent the distance of the closest damaged communities to Mellit and El-Fasher. Overall, thermal scarring is observed at 21 communities within the timeframe of 31 March and 25 April 2024.



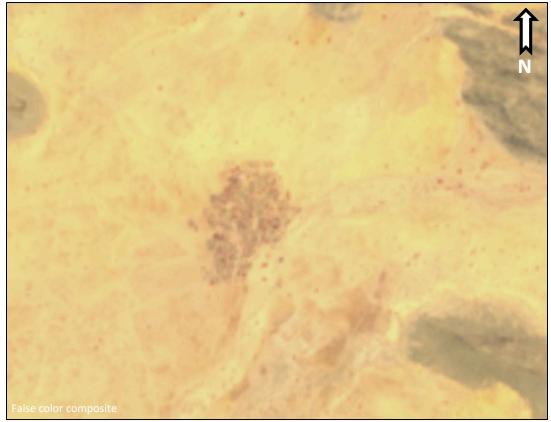
Overview of Newly Confirmed Thermal Scarring West of El-Fasher

This assessment is based on Sentinel satellite imagery, VIIRS data and open source reporting. The radii represent the distance of the closest damaged communities to Mellit and El-Fasher. Overall, thermal scarring is observed at 21 communities within the timeframe of 31 March and 25 April 2024.



Unidentified Community 11, North Darfur

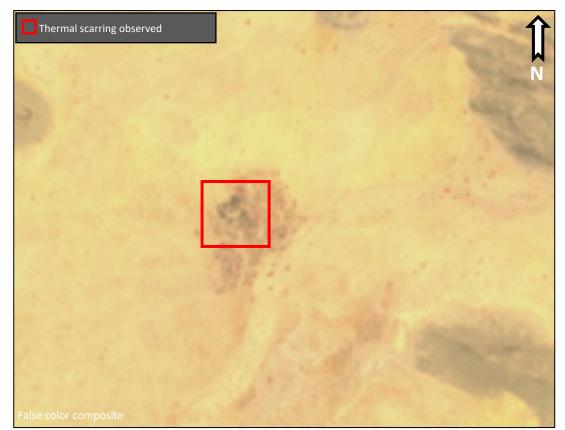
THERMAL SCARRING OBSERVED BETWEEN 20 AND 25 APRIL 2024



25.3125108°E 14.0315413°N

20 April 2024 © 2024 Sentinel

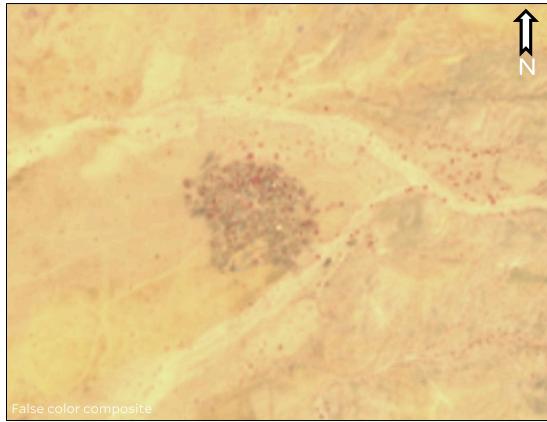
According to analysis of satellite imagery, thermal scarring was observed between 20 and 25 April 2024, within village 26 km west of Mellit, North Darfur. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 22 April 2024.



25.3125108°E 14.0315413°N

25 April 2024 © 2024 Sentinel

Fag, North Darfur THERMAL SCARRING OBSERVED BETWEEN 20 AND 25 APRIL 2024



25.3096240°E 14.0179952°N

20 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 20 and 25 April 2024, within village 29 km west of Mellit. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 22 April 2024.

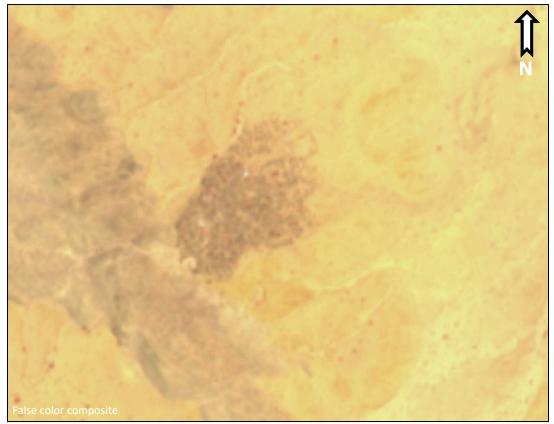


25.3096240°E14.0179952°N

<u>SOURCE | https://browser.dataspace.copernicus.eu</u>; <u>https://firms.modaps.eosdis.nasa.gov</u>; names identified via <u>https://mapcarta.com/</u> and <u>https://www.bing.com/maps</u>

Unidentified Community 10, North Darfur

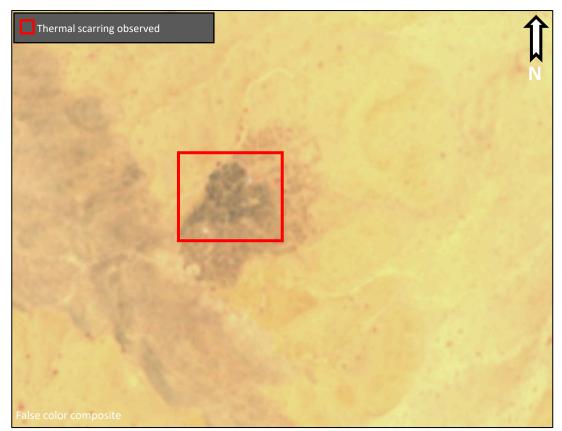
THERMAL SCARRING OBSERVED BETWEEN 20 AND 25 APRIL 2024



25.1589384°E 14.0253479°N

20 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 20 and 25 April 2024, within village 44 km west of Mellit. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 22 April 2024.

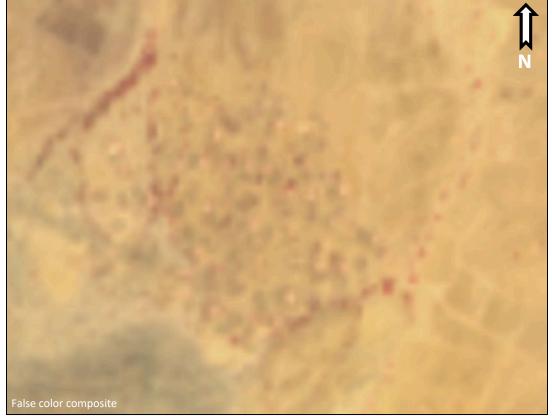


25.1589384°E 14.0253479°N

25 April 2024 © 2024 Sentinel

Unidentified Community 2, North Darfur

THERMAL SCARRING OBSERVED BETWEEN 05 AND 10 APRIL 2024



25.0477445°E 13.8122770°N

05 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed within village between 05 and 10 April 2024. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 08 April 2024.

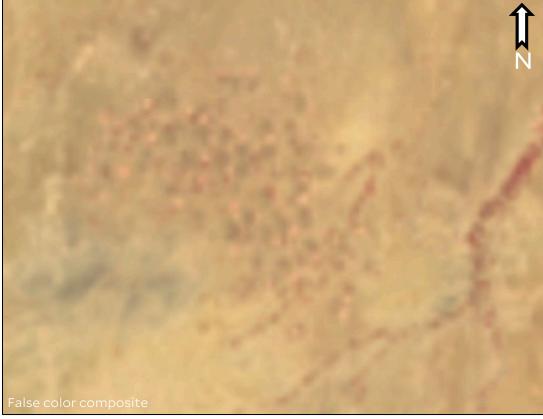


25.0477445°E 13.8122770°N

10 April 2024 © 2024 Sentinel

Unidentified Community 3, North Darfur

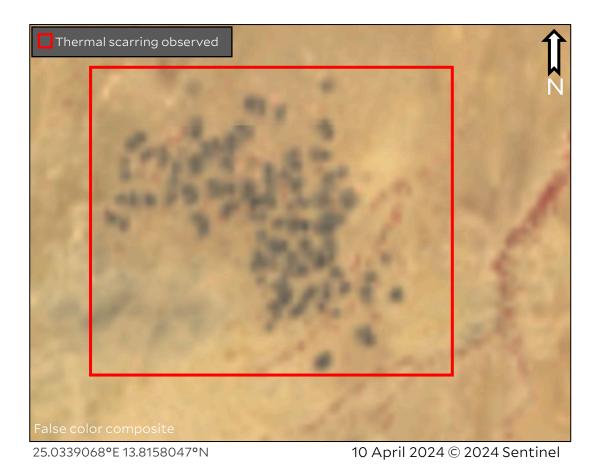
THERMAL SCARRING OBSERVED BETWEEN 05 AND 10 APRIL 2024



25.0339068°E13.8158047°N

05 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed within village between 05 and 10 April 2024. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 08 April 2024.



Ammar Jadid, North Darfur

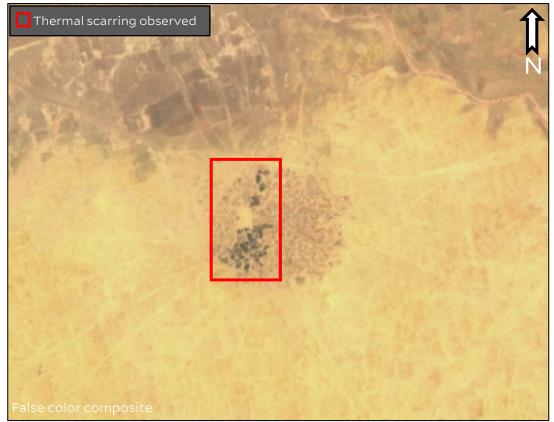
THERMAL SCARRING OBSERVED BETWEEN 15 AND 20 APRIL 2024



25.1146511°E 13.7455559°N

15 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 15 and 20 April 2024, within village 29 km west of El-Fasher. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 15 April 2024.

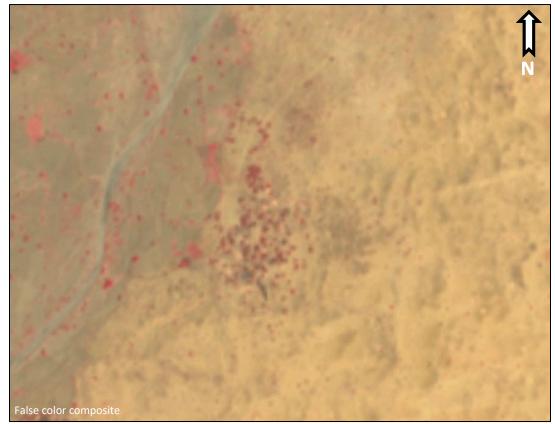


25.1146511°E 13.7455559°N

20 April 2024 \odot 2024 Sentinel

Kosa, North Darfur

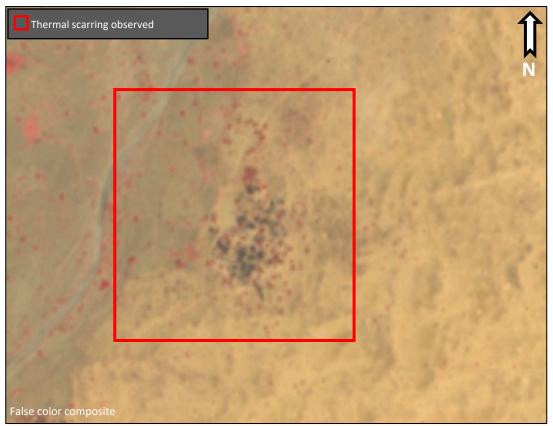
THERMAL SCARRING OBSERVED BETWEEN 10 AND 20 APRIL 2024



24.9532062°E 13.6681680°N

10 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 10 and 20 April 2024, within village 44 km west of El-Fasher. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 20 April 2024.

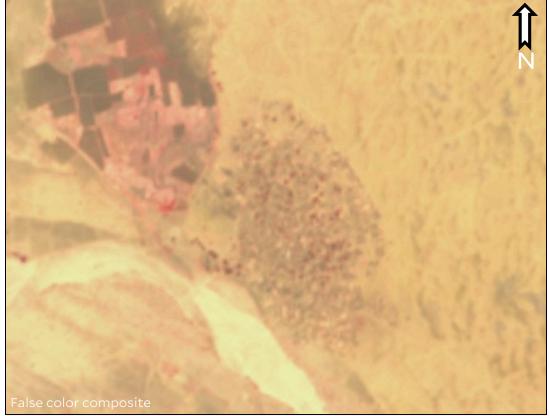


24.9532062°E 13.6681680°N

20 April 2024 © 2024 Sentinel

Umm Suneita, North Darfur

THERMAL SCARRING OBSERVED BETWEEN 15 AND 20 APRIL 2024



24.9725794°E 13.7545435°N

15 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 15 and 20 April 2024, within village 45 km west of El-Fasher. According to analysis of VIIRS data, the time of thermal scarring can be narrowed down to 18 and 19 April 2024.



24.9725794°E 13.7545435°N

20 April 2024 $\ensuremath{\mathbb{C}}$ 2024 Sentinel

Unidentified Community 6 & 7, North Darfur

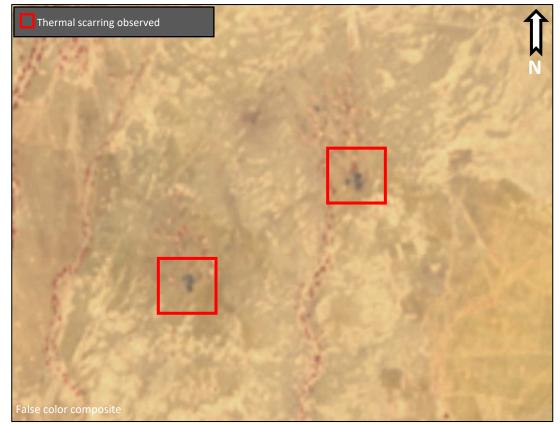
THERMAL SCARRING OBSERVED BETWEEN 05 AND 10 APRIL 2024

According to analysis of satellite imagery, thermal scarring was observed between 05 and 10 April 2024, within village 44.5 km west of El-Fasher. Additionally, VIIRS detections were registered close to the communities on 22 April 2024. This possibly suggests a continuation or new thermal scarring at the same location on 22 April 2024.



25.0070513°E 13.8190071°N

05 April 2024 © 2024 Sentinel



25.0070513°E 13.8190071°N

10 April 2024 © 2024 Sentinel

Tawazin, North Darfur

THERMAL SCARRING OBSERVED BETWEEN 05 AND 10 APRIL 2024



24.9860997°E 13.7736311°N

05 April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 05 and 10 April 2024, within village 44.5 km west of El-Fasher.

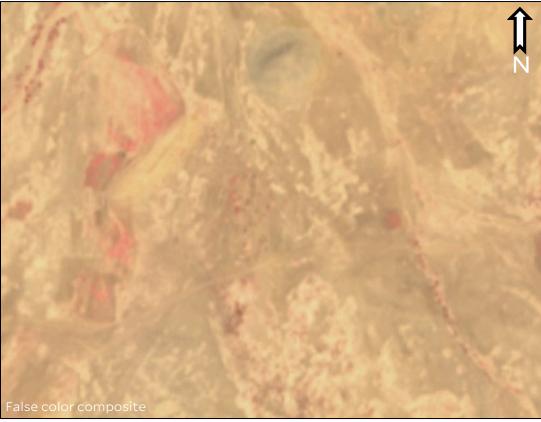


24.9860997°E 13.7736311°N

10 April 2024 \odot 2024 Sentinel

Unidentified Community 9, North Darfur

THERMAL SCARRING OBSERVED BETWEEN 31 MARCH AND 15 APRIL 2024



25.0014360°E 13.7912662°N

31 March 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 31 March and 15 April 2024, within village 43 km west of El-Fasher.

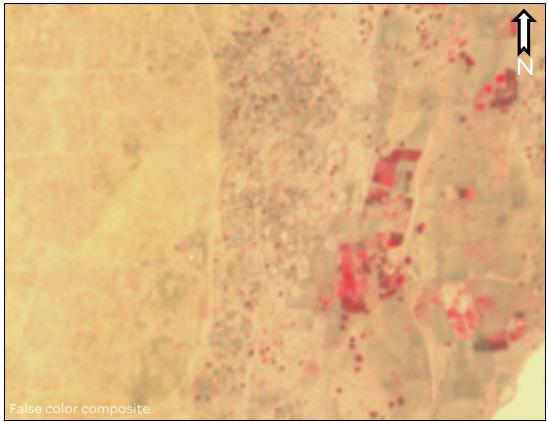


25.0014360°E 13.7912662°N

15 April 2024 \odot 2024 Sentinel

Unidentified Community 13, North Darfur

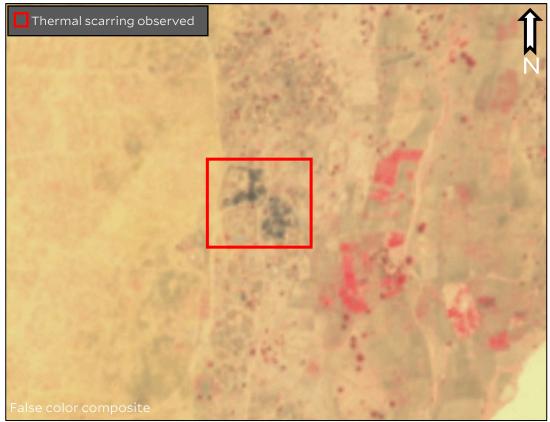
THERMAL SCARRING OBSERVED BETWEEN 15 AND 20 APRIL 2024



24.8979452°E13.8836349°N

15April 2024 © 2024 Sentinel

According to analysis of satellite imagery, thermal scarring was observed between 15 and 20 April 2024, within village 55 km north-west of El-Fasher. Additionally, satellite imagery from 25 April 2024 and VIIRS detections on 28 April 2024, suggest the continuation of burning afterwards.



24.8979452°E13.8836349°N

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https://medicine.yale.edu/lab/khoshnood/