Light loss assessment following the Marash/Antep Earthquake (6 February 2022, Mw 7.8) using Night-time Light Imagery

Türkiye & Syrian Arab Republic

Status: Significant light loss observed.

Further action(s): full assessment to be conducted
MAINSHOCK EARTHQUAKE EPICENTRE (6 February 2023, Mw7.8)

MAINSHOCK EARTHQUAKE EPICENTRE (6 February 2023, Mw7.5)

PLACE OF INTEREST (POI)
Light loss after the earthquake

Significant light losses are observed in several Districts affected by the earthquake(s).

- Adana: 6.60%
- Adiyaman: 75.60%
- Aleppo: 14.90%
- Antakya: 95.80%
- Defne: 99.20%
- Dortyol: 11.00%
- Gaziantep: 5.10%
- Idlib: 2.50%
- Iskenderun: 36.60%
- Kahramanmaras: 64.20%
- Kirikhan: 97.40%
- Latakia: 34.00%
- Osmaniye: 0.80%
- Pazarick: 53.80%
- Samandag: 99.00%

Light before and after the earthquake

Several urban areas located in different provinces, including Hatay, Kahramanmaraş and Adıyaman, became darker after the earthquake.

Image centre: 36°12'15.1"N 36°09'28.7"E
Night-time Light in Adiyaman

In the city of Adiyaman, the urban areas lost more light than the industrial areas in the north-west.
Light loss after the earthquake

East sectors of Adiyaman lost more light than the west sectors.
Night-time Light in Antakya, Hatay

Most areas in Antakya city suffer from significant power outages.
Light loss after the earthquake

Downtown Antakya lost more light than the suburbs.
SUMMARY OF FINDINGS

- Provinces with major light loss are Hatay, Kahramanmaraş and Adiyaman as observed on 8 February 2023;
- The power outage areas are mainly distributed along the plate junction of Kahramanmaraş and Antakya;
- Many urban areas located in EQ affected areas became darker after the earthquake;
- Night-time light declined by more than 90 percent in many sectors of Hatay City as observed on 8 February 2023;
- In Adiyaman, east sectors of the city lost more light than the west sectors;
- Downtown Antakya (areas with higher light density) lost significant light after the earthquake compared to the suburbs.
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Data sources:

(1) Satellite Images
Satellite Data: VIIRS VNP46A1
Imagery Date: 24 January 2023 & 08 February 2023
Resolution: 500 m
Copyright: NASA
Source: NASA

(2) Satellite Images
Satellite Data: VIIRS VNP46A2
Imagery Date: 24 January 2023 & 08 February 2023
Resolution: 500 m
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(3) Satellite Images
Satellite Data: SDGSAT-1
Imagery Date: 23 August 2022
Resolution: 40 m
Copyright: International Research Center of Big Data for Sustainable Development Goals (CBAS)
Source: International Research Center of Big Data for Sustainable Development Goals (CBAS)

(4) Satellite Images
Satellite Data: Yangwang-1 Space Telescope night-time data
Imagery Date: 09 February 2023 & 11 February 2023
Resolution: 37 m
Copyright: Origin Space Co., Ltd., China
Source: Origin Space Co., Ltd., China

(5) Ancillary data
Earthquake epicentre: USGS

Administrative boundaries: Database of Global Administrative Areas (GADM) Version4.1
United Nations Cartographic Section (UNCS) and United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), HDX

Analysis: Wuhan University & United Nations Satellite Centre (UNOSAT)
Production: United Nations Satellite Centre (UNOSAT) & Wuhan University

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