14 February 2023

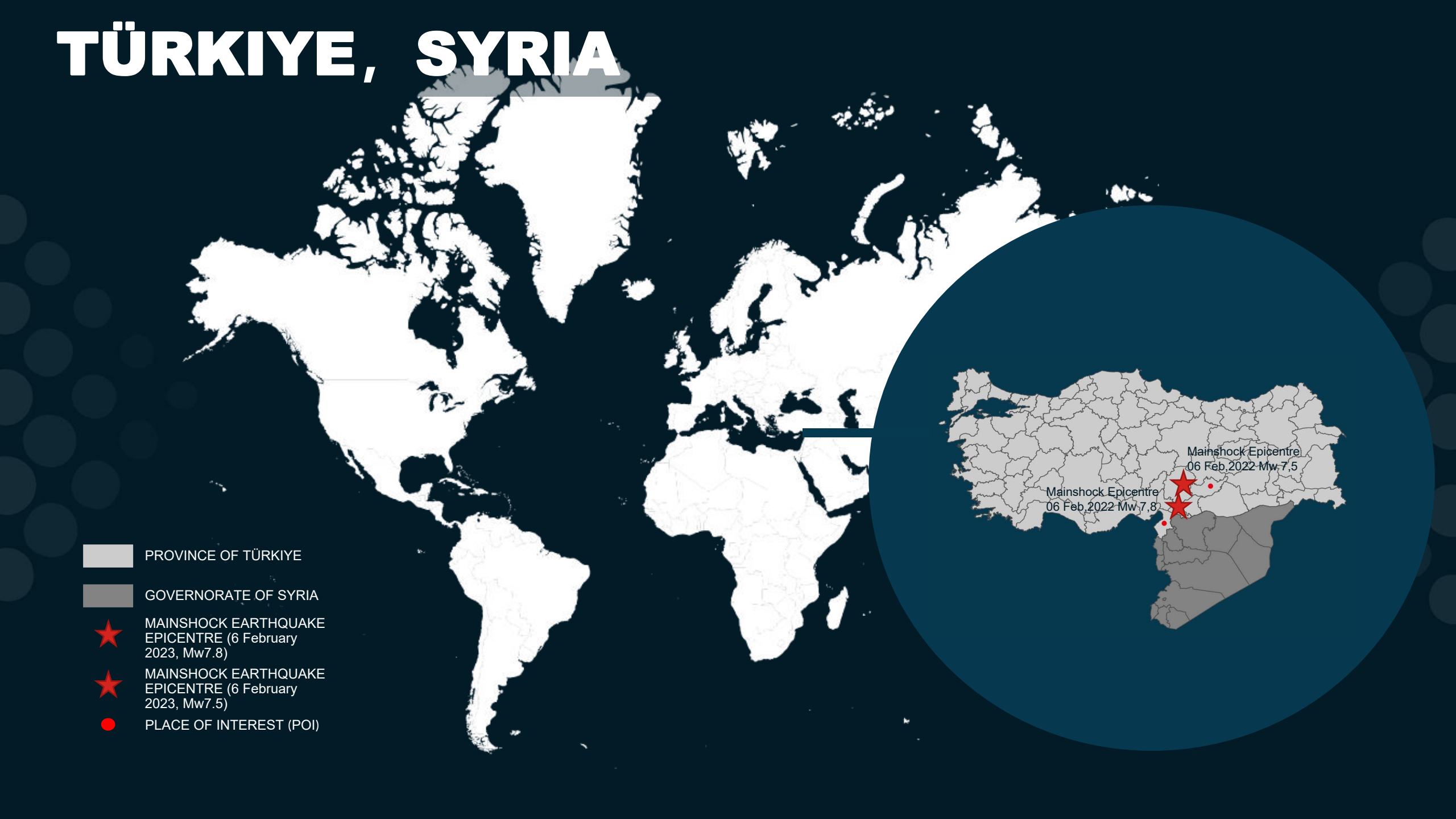
Light loss assessment following the Marash / Antep Earthquake (6 February 2022, Mw 7.8) using Night-time Light Imagery

Türkiye & Syrian Arab Republic

Status: Significant light loss observed.

Further action(s): full assessment to be conducted

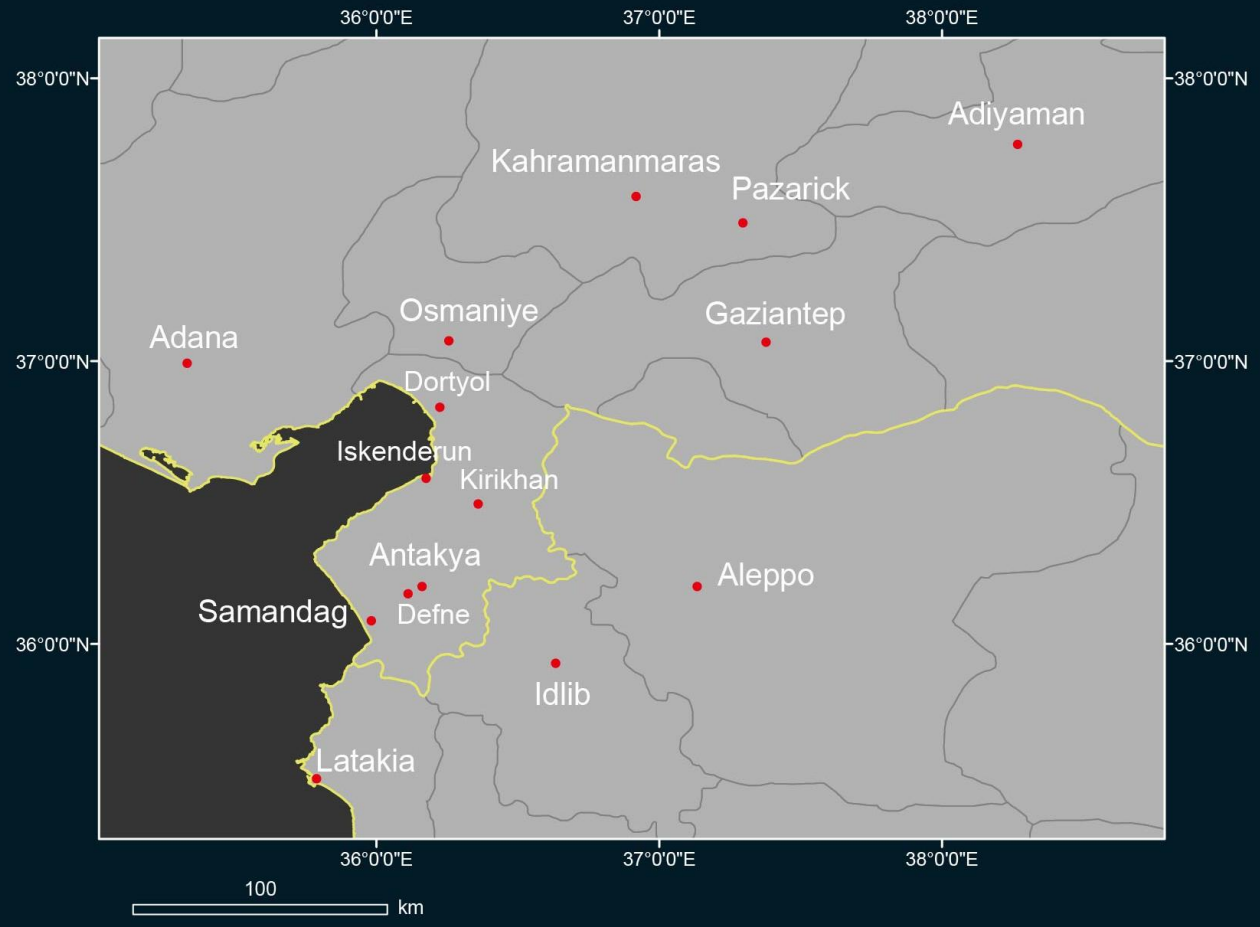
TÜRKIYE, SYRIA



Light loss after the earthquake

Image centre:
36°12’15.1"N
36°09’28.7"E

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



N

- 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%

Data source: VIIRS VNP46A2 [24 Jan. 2023] Vs. [08 Feb. 2023]

International boundary Province/Governorate boundary Place of interest

Light before and after the earthquake

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

Image centre:
36°12'15.1"N
36°09'28.7"E

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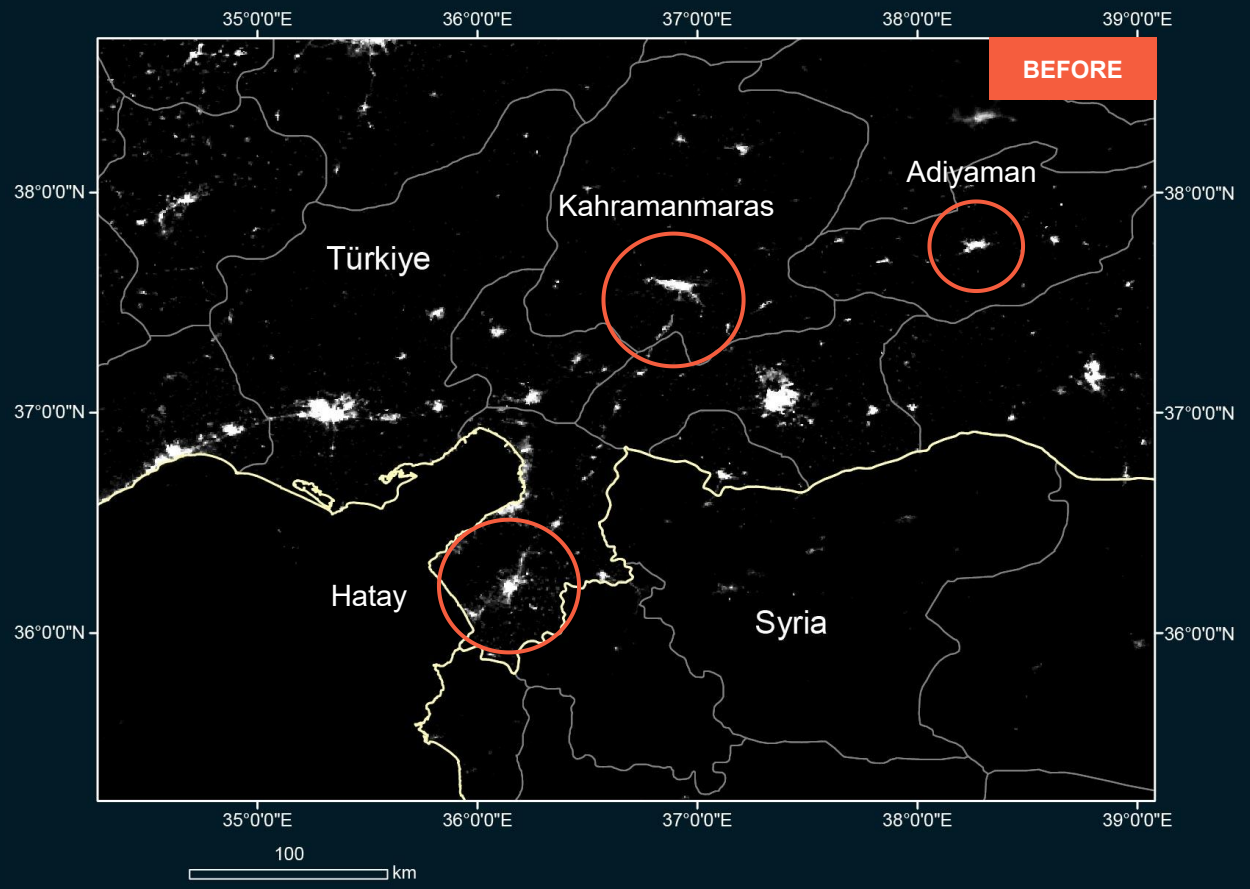
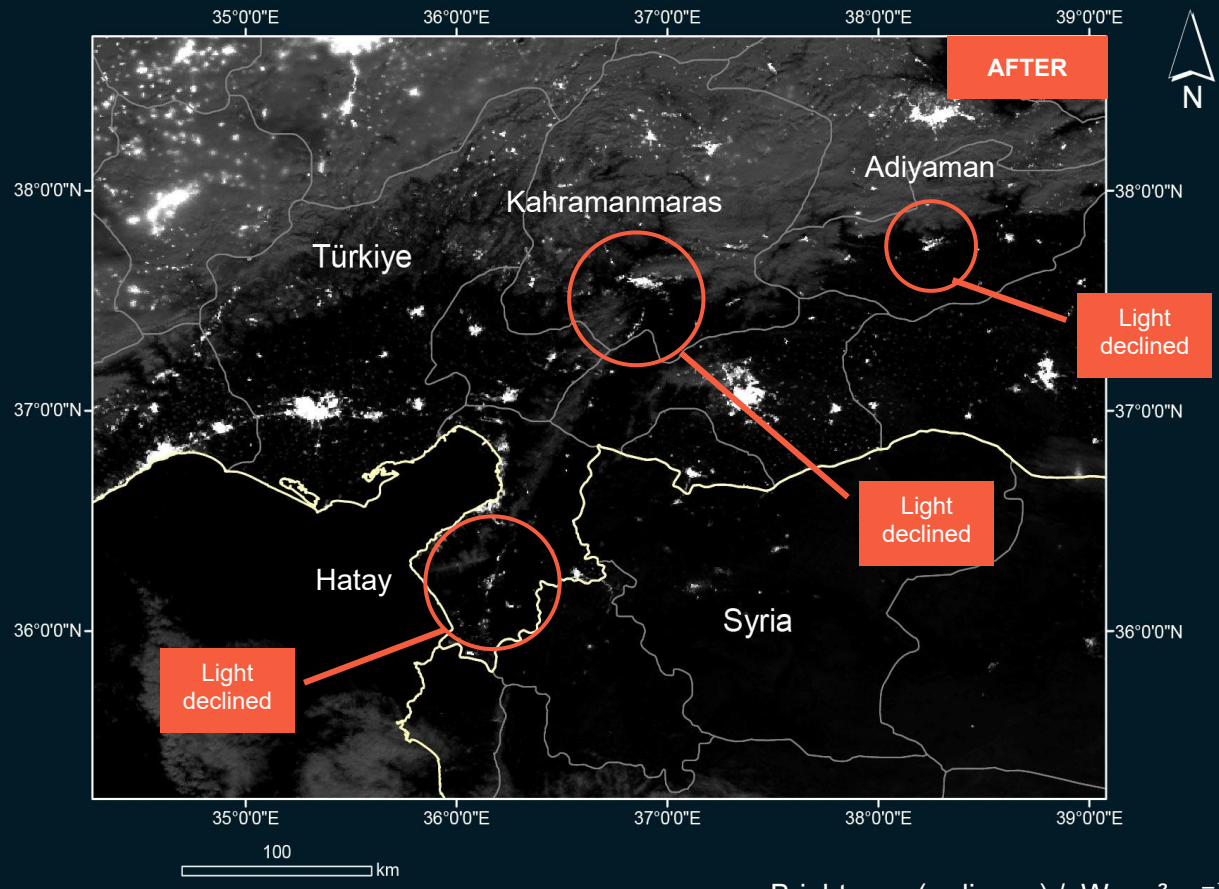


VIIRS VNP46A1 / 24 Jan. 2023



VIIRS VNP46A1 / 08 Feb. 2023

Brightness (radiance) /nW·cm²·sr^{-1}

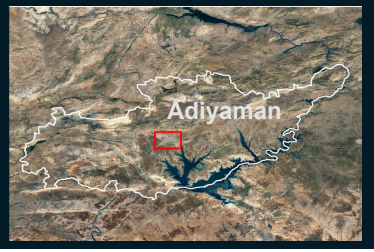
International boundary

Province/Governorate boundary

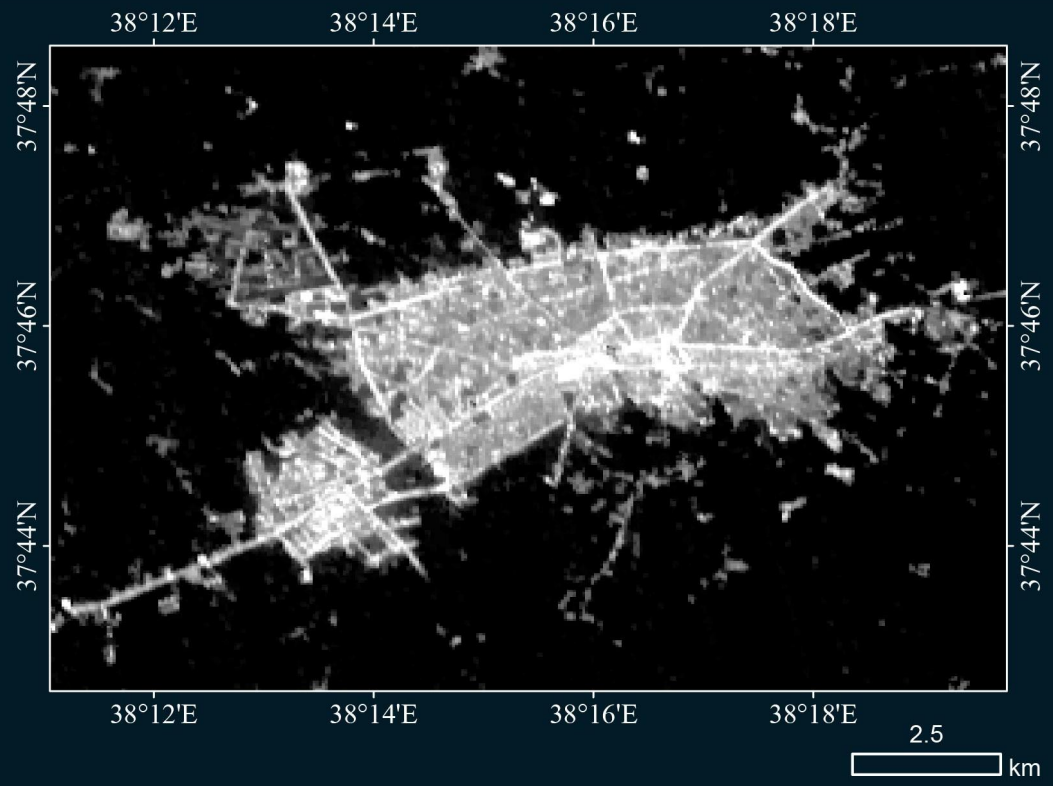
Night-time Light in Adiyaman

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

Image centre:
37°45’49.8"N
38°16’19.7"E

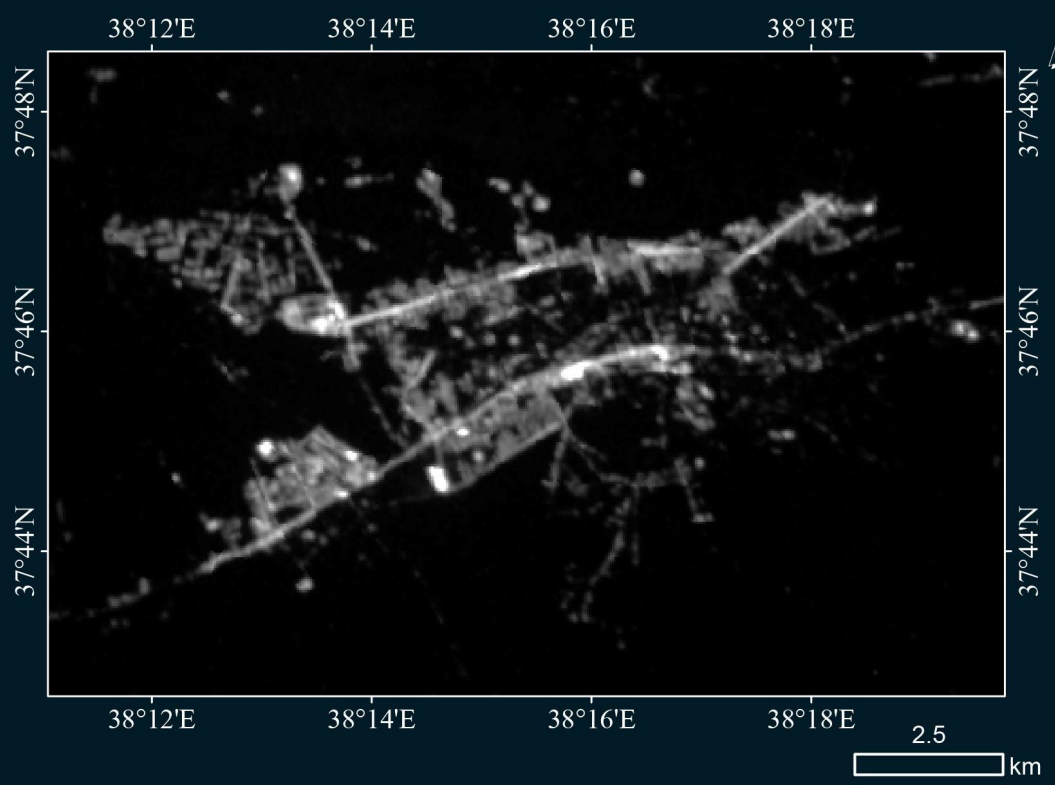


BEFORE



SDGSAT-1 / 23 Aug. 2022

AFTER



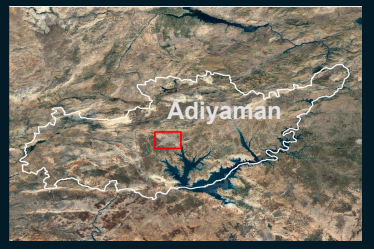
Yangwang-1 / 09 Feb. 2023

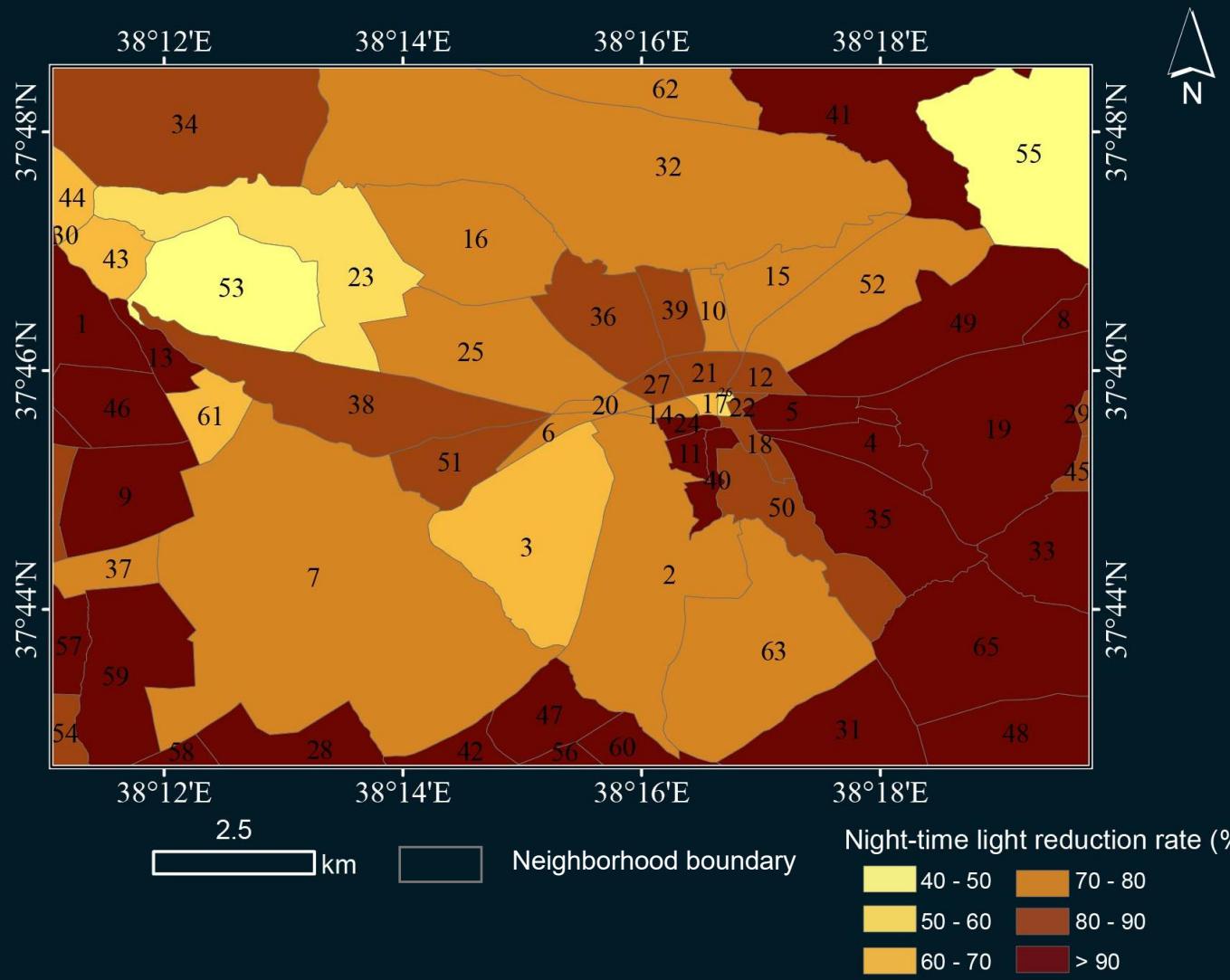
Brightness (DN)

Light loss after the earthquake

East sectors of Adiyaman lost more light than the west sectors.

Image centre:
37°45’49.8"N
38°16’19.7"E





1. Tekpınar Köyü
2. Alitaşı
3. Sümerevler
4. İmamağa
5. Bahçelievler
6. Barbaros Hayrettin
7. Altınşehir
8. Ziyaretpayamlı Köyü (Kemalık)
9. Bağdere Köyü
10. Malazgirt
11. Mara
12. Mehmet Akif
13. Ataköy Köyü
14. Eskisaray
15. Fatih
16. Esentepe
17. Hocaömer
18. Kapcami
19. Yunus Emre
20. Mimar Sinan
21. Turgut Reis
22. Sıratut
23. Türkiye Petrolleri
24. Ulucami
25. Yeni
26. Yenipınar
27. Yavuz Selim
28. Hasankendi Köyü
34. Kayaönü Köyü
35. Bahçecik
36. Cumhuriyet
37. Bağdere Köyü (Gültepe)
38. Karapınar
39. Kayalık
40. Musalla
41. Örenli
42. Güzelyurt Köyü (Kilisik)
43. Kayaönü Köyü (Afetevleri)
44. Kayaönü Köyü (Kayabaşı)
45. İpekli Köyü (Mahmut El Ensari Ziyareti)
46. Bağdere Köyü (Uzunömer)
47. Büyükkavaklı Köyü (Karaköprü)
48. Lokman Köyü (Karruz)
49. Siteler
50. Varlık
51. Yeni Sanayi
52. Yeşilyurt
53. Petrol OSB
54. Yarmakaya Köyü
55. Yenigüven Köyü
56. Büyükkavaklı Köyü
57. Bağdere Köyü (İkidam)
58. Hasankendi Köyü (Çaylı)
59. Bağdere Köyü (Özelevler)
60. Büyükkavaklı Köyü (Küçük Kavaklı)
61. Bağdere Köyü (Güzelevler)

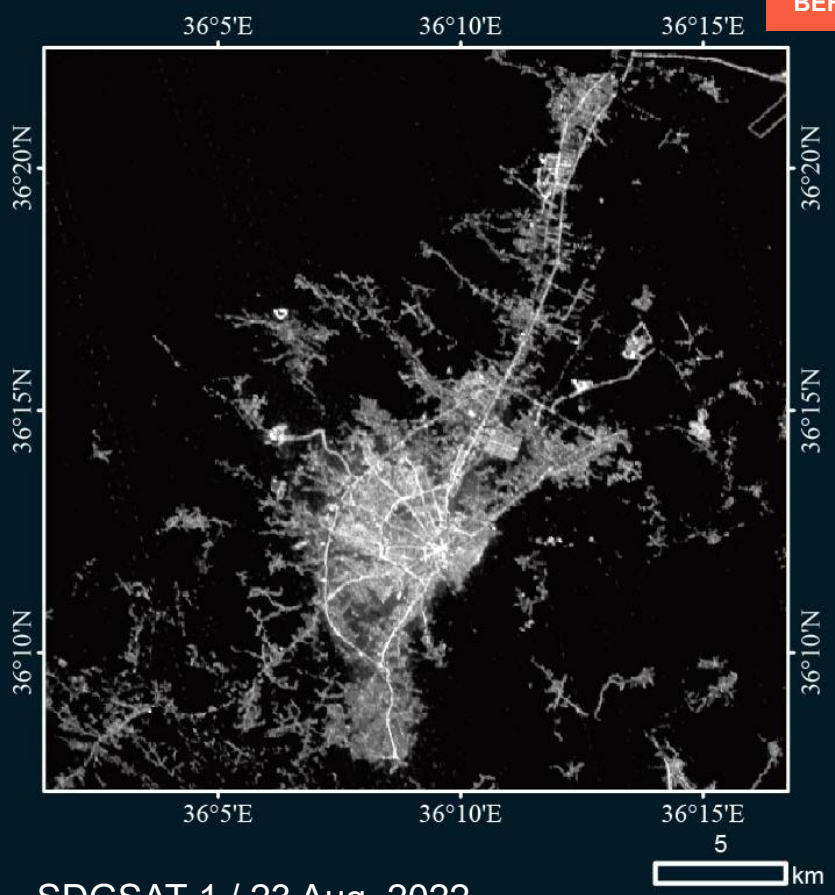
Night-time Light in Antakya, Hatay

Most areas in Antakya city suffer from significant power outages.

Image centre:
36°12’15.1"N
36°09’28.7"E

UNOSAT

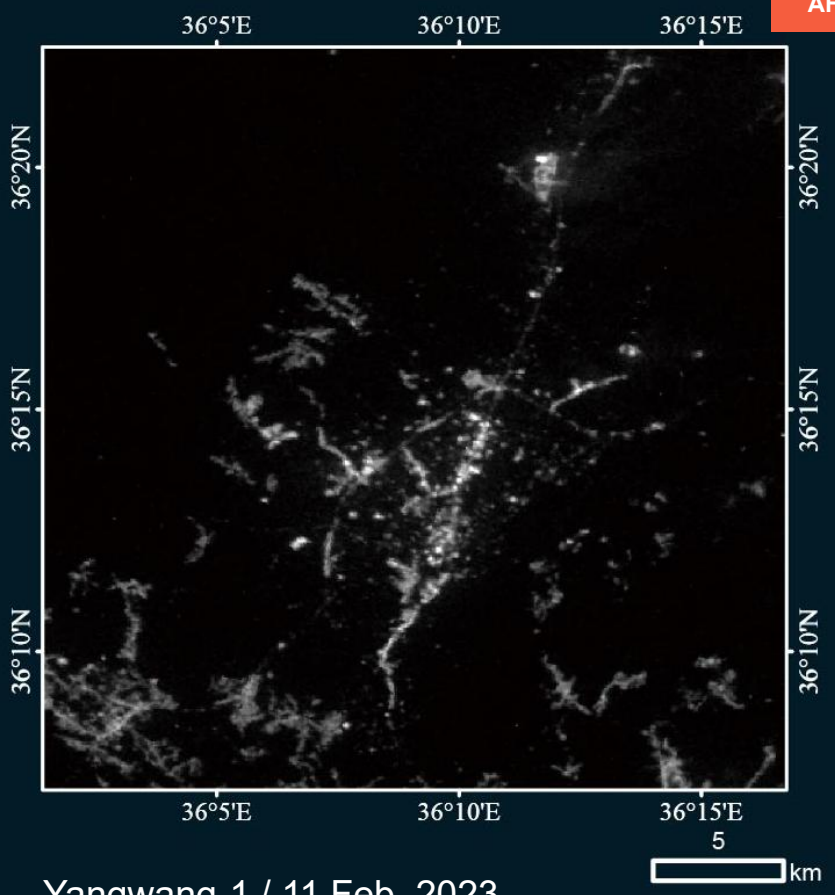
BEFORE



SDGSAT-1 / 23 Aug. 2022

Brightness (DN)

AFTER

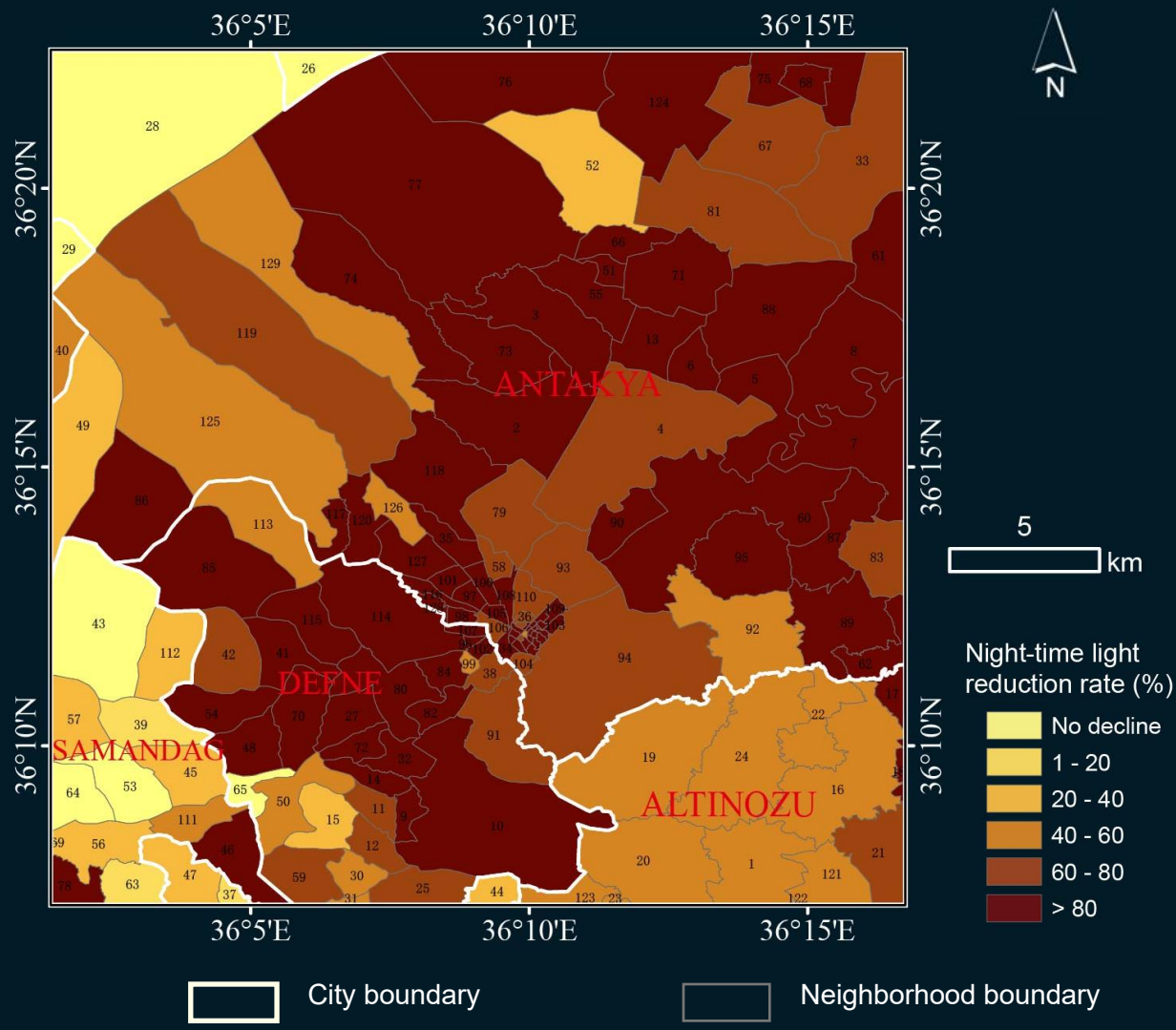


Yangwang-1 / 11 Feb. 2023

Light loss after the earthquake

Downtown Antakya lost more light than the suburbs.

Image centre:
36°12’15.1"N
36°09’28.7"E



1. Fatikli
2. Kuzeytepe
3. Karaali
4. Güzelburç
5. Alaattin
6. Hasanlı
7. Üzümdalı
8. Yeşilova
9. Gümüşgöze
10. Harbiye
11. Samankaya
12. Yeşilpınar
13. Büyükdalyan
14. Çardaklı
15. Değirmenyolu
16. Altınkaya
17. Atayurdu
18. Büyükburç
19. Enek
20. Kamberli
21. Karsu
22. Kazancık
23. Kozkalesi
24. Tepehan
25. Döver
26. Çerçikaya
27. Güneysöğüt
28. Kurtbağı
34. Kışla Saray
35. Saraykent
36. Meydan
37. Büyükçat
38. Sümerler
39. Çanakoluk
40. Ceylandere
41. Çınarlı
42. Çökek
43. Çubuklu
44. Bozlu
45. Huzurlu
46. Karaçay
47. Özbek
48. Hüseyinli
49. Seldiren
50. Tavla
51. Akhisar
52. Alahan
53. Tomruksuyu
54. Üzengili
55. Alazı
56. Uzunbağ
57. Yaylıca
58. Ürgen Paşa
59. Yeniçağ
60. Narlıca
61. Suvatlı
67. Arpahan
68. Aşağıoba
69. Eriklikuyu
70. Koçören
71. Derince
72. Meydancık
73. Dikmece
74. Oğlakören
75. Paşaköy
76. Tahtaköprü
77. Üçgedik
78. Yeşilköy
79. Odabaşı
80. Subaşı
81. Zülüflühan
82. Aşağıokçular
83. Bitiren
84. Turunçlu
85. Toygarlı
86. Yaylacık
87. Açıkdere
88. Akçaova
89. Akcurun
90. Maşuklu
91. Dursunlu
92. Gökçegöz
93. Küçükdalyan
94. Kuruyer
100. Akevler
101. Aksaray
102. Armutlu
103. Aydınlıkevler
104. Bağrıyanık
105. Cebrail
106. Cumhuriyet
107. Gazi
108. General Şükrü Kanatlı
109. Hacı Ömer Alpagot
110. Haraparası
111. Ataköy
112. Avcılar
113. Ballıöz
114. Çekmece
115. Orhanlı
116. Altınçay
117. Doğanköy
118. Ekinci
119. Karlısu
120. Günyazı
121. Sarılar
122. Yenişehir
123. Sofular
124. Serinyol
125. Kisecik
126. Saraycık
127. Akasya

SUMMARY OF FINDINGS

- Provinces with major light loss are Hatay, Kahramanmaras and Adiyaman as observed on 8 February 2023;
- The power outage areas are mainly distributed along the plate junction of Kahramanmaras 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
Copyright : NASA
Source : NASA

(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) Verision4.1
United Nations Cartographic Section (UNCS) and United Nations Office for the Coordination o f Humanitarian Affairs (UNOCHA), HDX

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

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