


09 October 2023

PRELIMINARY SATELLITE-DERIVED DAMAGE ASSESSMENT



Herat, 6.3M earthquake




Zindajan & Injil Districts, Herat Province, Afghanistan

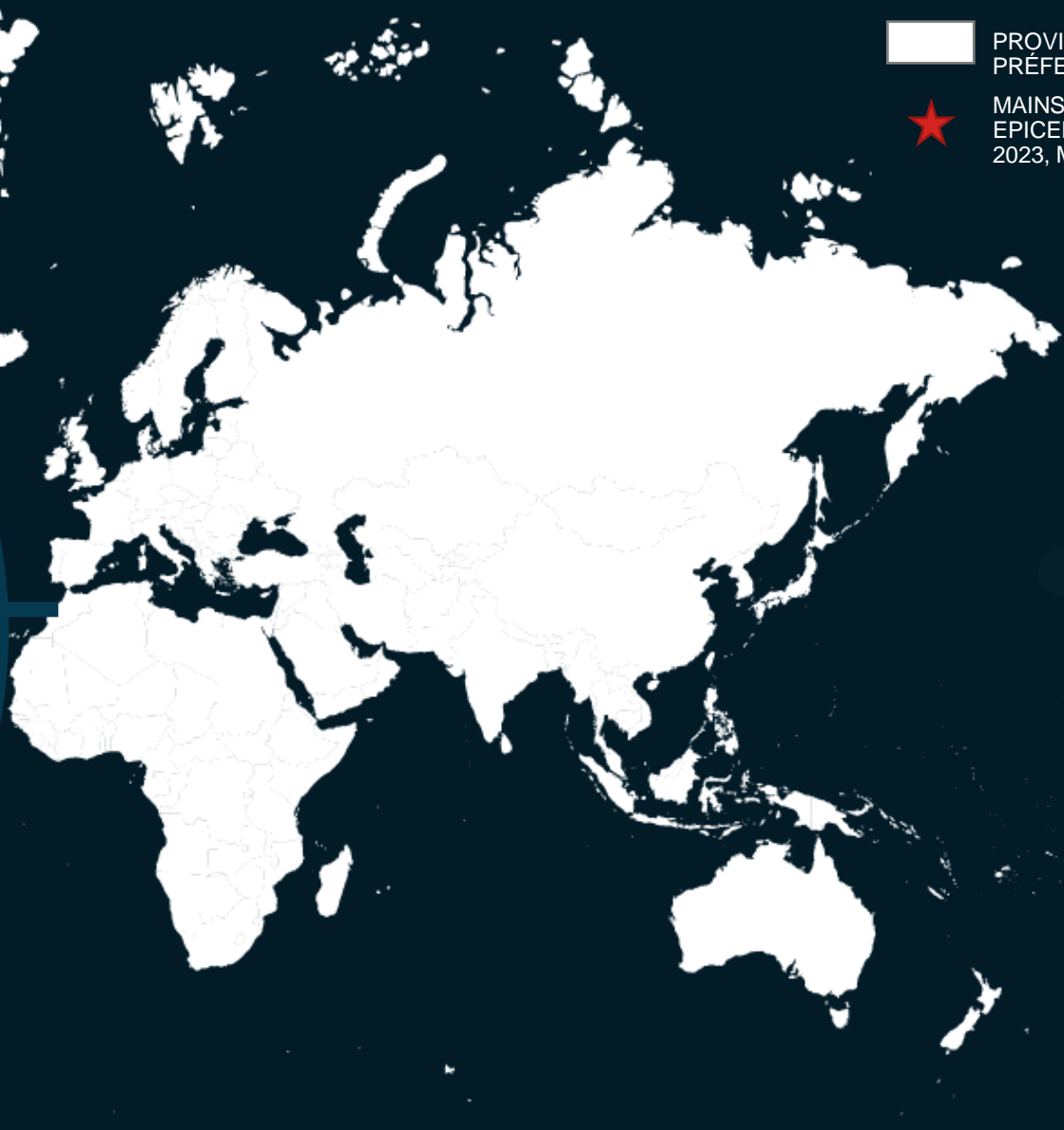
 Status: Destroyed structures observed

 Further action(s): full assessment to be conducted

AFGHANISTAN

09 Oct. 2023

-  AREA OF INTEREST (AOI)
-  PROVINCE OR PRÉFECTURE BOUNDARY
-  MAINSHOCK EARTHQUAKE EPICENTRE (7 OCTOBER 2023, M6.3)



M6.3 HERAT EARTHQUAKE, AFGHANISTAN OF 07 OCTOBER 2023 (06:41 UTC)

Population potentially exposed by intensity zone in Afghanistan
 (VI to VII Intensity zones)
~660,000

Seismological Data [USGS]

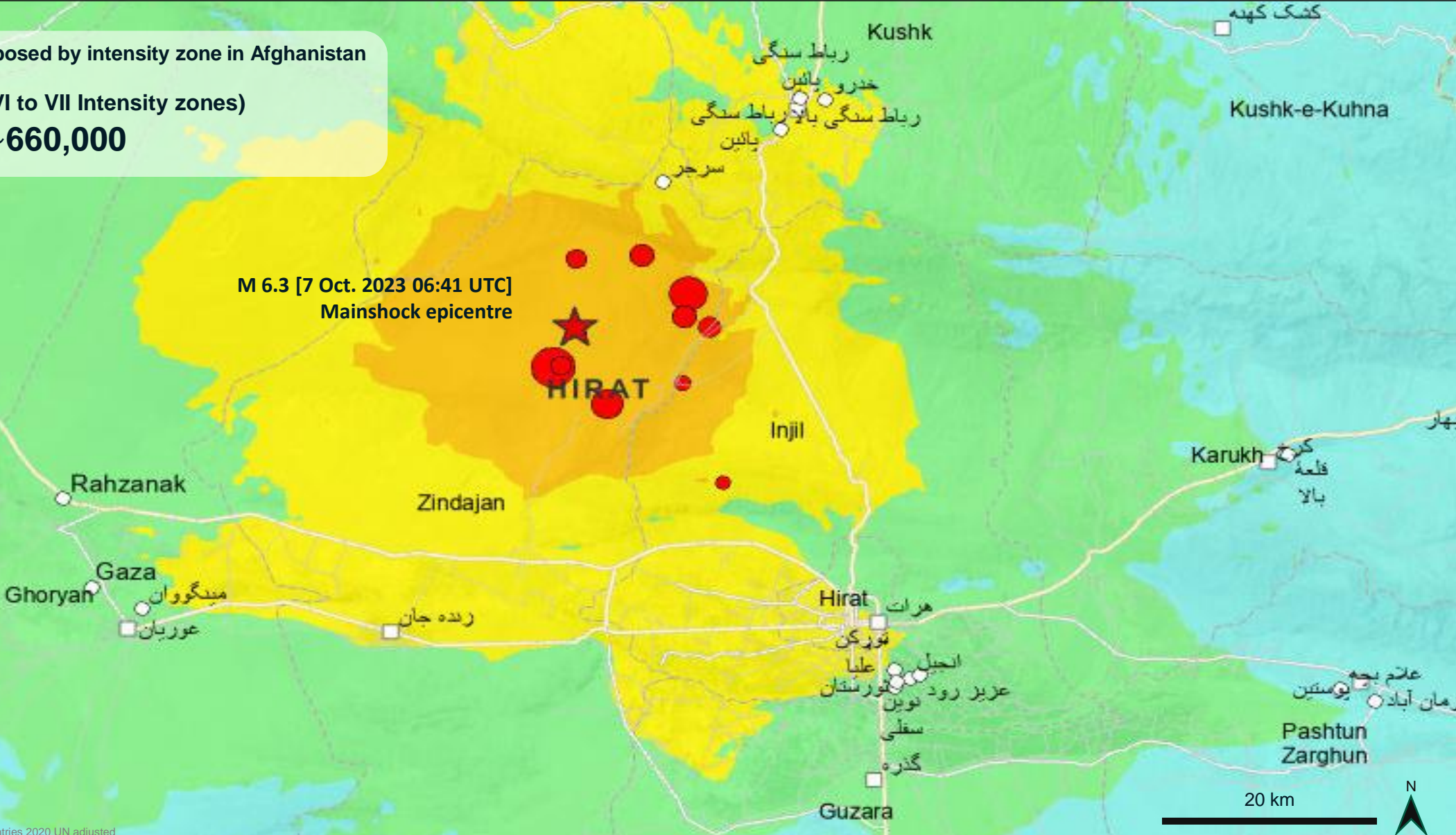
★ Mainshock Epicentre

Aftershock (Magnitude)

- 1
- 5
- 10

SEISMIC INTENSITY SCALE

- IV (Light)
- V (Moderate)
- VI (Strong)
- VII (Very Strong)



Seismological data: USGS

*Population data : WorldPop / Unconstrained individual countries 2020 UN adjusted

Important note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

AOI 1: Zindajan & Hinjil District, Herat Province

Destroyed structures and temporary shelters

M 6.3 [7 Oct. 2023 06:31 UTC]
Mainshock epicentre



5km to the epicentre

AOI1-1



30km Herat

10km to the epicentre

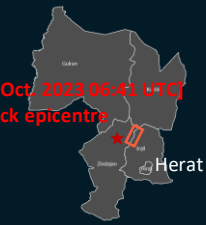
AOI1-2



AOI 1 – 1: Zindajan & Hinjil District, Herat Province

Image center:
34°33'4"N
61°57'10"E

M 6.3 [7 Oct. 2023 08:41 UTC]
Mainshock epicentre



Destroyed structures and temporary shelters



BEFORE

GeoEye-1 / 15 August 2021



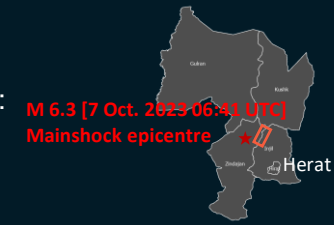
AFTER

Pleiades / 09 October 2023

AOI 1 – 2: Zindajan & Hinjil District, Herat Province

Destroyed structures and temporary shelters

Image center:
34°31'5"N
61°59'41"E



ESRI Basemap / 23 August 2019



Pleiades / 09 October 2023

AOI 2: Hinjil District, Herat Province

Destroyed structures and temporary shelters

M 6.3 [7 Oct. 2023 06:41 UTC]
Mainshock epicentre



UNOSAT
United Nations
Satellite Centre

35 km to the epicentre

AOI2-1

AOI2-2

10 km to Herat

Pléiades image acquired on 09 October 2023, 09:00 UTC
Image Center : 62°13'45"E 34°26'9"N



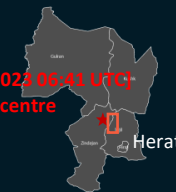
170

AOI 2 – 1: Hinjil District, Herat Province

Destroyed structures and temporary shelters

Image center:
34°26'03"N
62°14'07"E

M 6.3 [7 Oct. 2023 05:41 UTC]
Mainshock epicentre



BEFORE

WorldView-2 / 21 January 2023



AFTER

Pleiades / 09 October 2023

AOI 2 – 2: Hinjil District, Herat Province

Destroyed structures and temporary shelters

Image center:
34°26'03"N
62°14'07"E

M 6.3 [7 Oct. 2023 05:41 UTC]
Mainshock epicentre



WorldView-2 / 21 January 2023

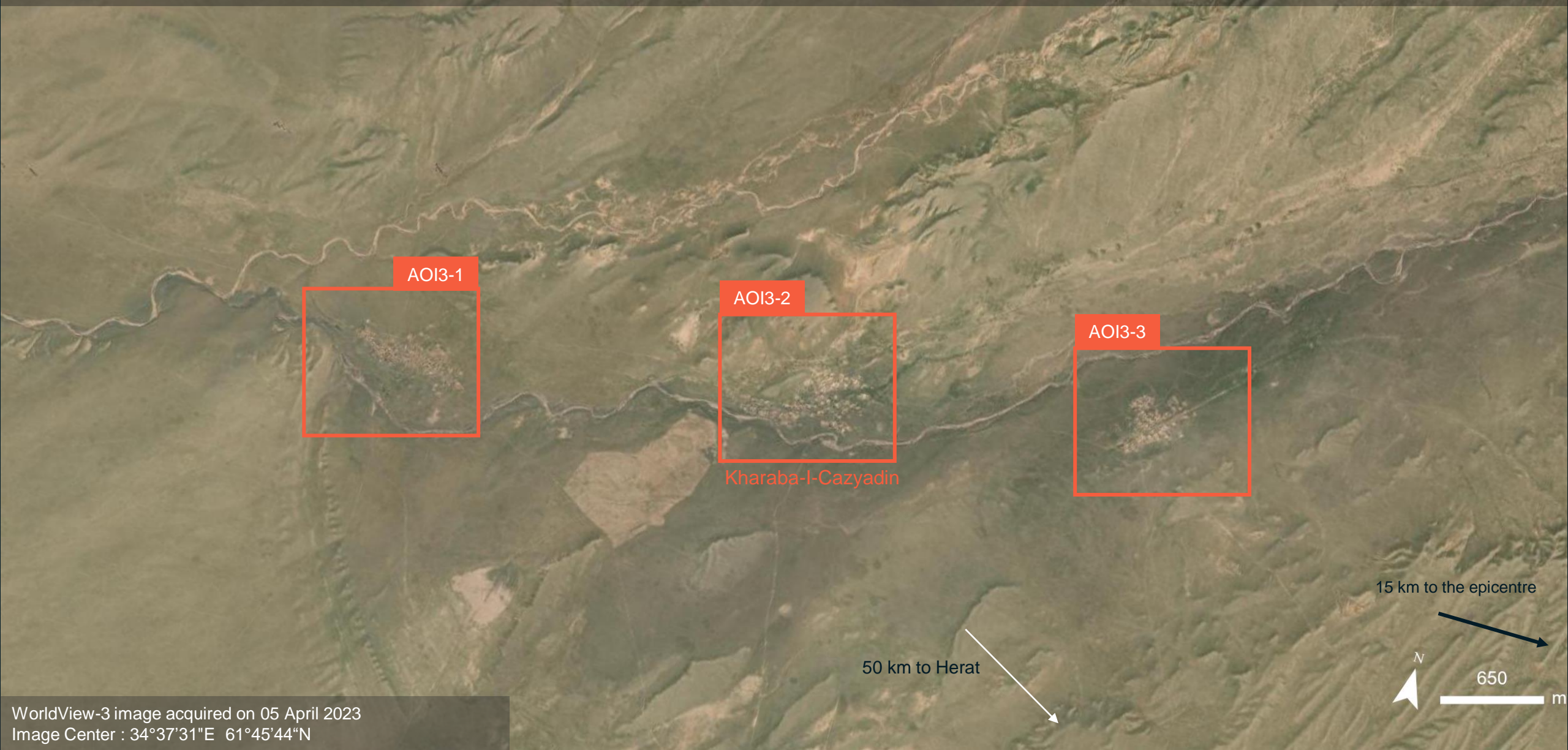


Pleiades / 09 October 2023

AOI 3: Zindajan District, Herat Province

Destroyed structures and temporary shelters

M 6.3 (17 Oct. 2023 06:41 UTC)
Mainshock epicentre



AOI3-1

AOI3-2

AOI3-3

Kharaba-I-Cazyadin

15 km to the epicentre

50 km to Herat



650 m

WorldView-3 image acquired on 05 April 2023
Image Center : 34°37'31"E 61°45'44"N

AOI 3 – 1: Zindajan District, Herat Province

Image center:
34°37'12"N
61°44'21"E

M 6.3 [7 Oct. 2023 06:41 UTC]
Mainshock epicentre



Destroyed structures and temporary shelters



WorldView-3 / 05 April 2023



Pleiades / 09 October 2023

AOI 3 – 2: Zindajan District, Herat Province

Image center:
34°37'25"N
61°46'04"E

M 6.3 [7 Oct. 2023 05:41 UTC]
Mainshock epicentre



Destroyed structures and temporary shelters in Kharaba-I-Cazyadin village



WorldView-3 / 05 April 2023



Pleiades / 09 October 2023

AOI 3 – 2: Zindajan District, Herat Province

Image center:
34°37'40"N
61°47'24"E

M 6.3 [7 Oct. 2023 05:41 UTC]
Mainshock epicentre



Destroyed structures and temporary shelters



WorldView-3 / 05 April 2023



Pleiades / 09 October 2023

SUMMARY OF FINDINGS

- Based on seismic intensities (USGS) and population data (Worldpop), about 660,000 people were exposed to strong to very strong shaking in Herat Province, Afghanistan;
- Widespread destroyed structures observed in villages North and Northeast of Herat in Zindajan & Hinjil District, Herat Province as of 9 October 2023;
- Temporary shelters observed in the affected villages as of 09 October 2023.

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Data sources:

(1) Satellite Image (Post-event): Pléiades

Acquisition date : 09 October 2023

Resolution: 50cm

Copyright: Includes Pleiades material © AIRBUS DS (2023)

Source: Airbus D&S

(2) Satellite Image (Pre-event): ESRI Basemap

(3) Ancillary data

Administrative boundaries: Afghanistan Geodesy and Cartography Head Office (AGCHO)

Populated place: OpenStreetMap

Waterway: OpenStreetMap

Road data: OpenStreetMap

Analysis: United Nations Satellite Centre (UNOSAT)

Production: United Nations Satellite Centre (UNOSAT)

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