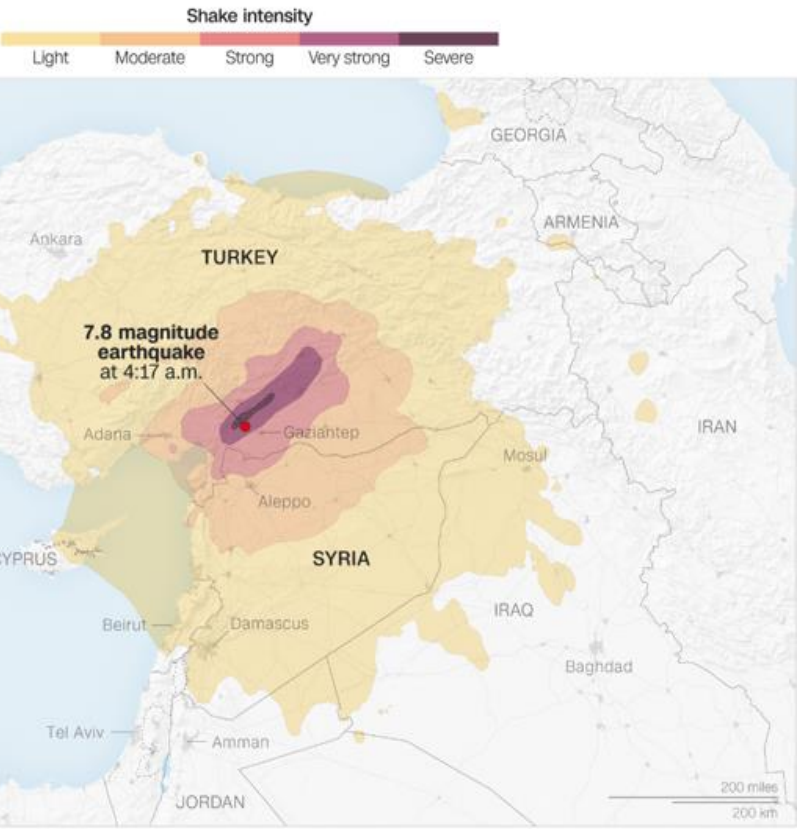




Report on Turkey-Syria Earthquakes



Sources: US Geological Survey, LandScan | Graphic: Henrik Pettersson, CNN

Figure 1. Epicenter map of the Turkey-Syria Earthquakes ([Source](#))

Basic Information

Occurrence Date: 06 February 2023
Magnitude: 7.8
Epicenter: Nurdağı, Gaziantep Province, Turkey

	Turkey	Syria	Source of information
Est. No. Of People Killed	~51,000	~4,500	STL / WV
Est. No. Of People Injured	~107,000	~10,400	STL / WV
Est. No. Of People Homeless	~1.5 Million	~5.3 Million	USGS
Est. Economic Damage	~100 Billion USD	~5.1 Billion USD	USGS

Sources: ([USGS, 2023](#)) ([STL, 2023](#)) ([WV, 2023](#))

STL: Support to Life
WV: World Vision
USGS: United States Geological Survey

Background

- Turkey joined ADRC in 2018 with AFAD (Disaster and Emergency Management Presidency under the Ministry of Interior, ([Source](#)) as counterpart
- On 6 February 2023, ADRC (on behalf of AFAD) made an *emergency observation request* at Sentinel Asia: ([Source](#))
- On the same day, Sentinel Asia activated the request, and emergency observation satellite images were made available online: ([Source](#))
- ADRC issued a GLIDE number for the earthquakes in Turkey ([EQ-2023-000015-TUR](#)) as well as for the earthquakes in Syria ([EQ-2023-000015-SYR](#)) so that all information of this event are integrated
- On 11 March 2023, **preliminary data on the impacts** were presented at the Asian Conference on Disaster Reduction (ACDR2022) – an annual event organized by ADRC – in Sendai, Japan

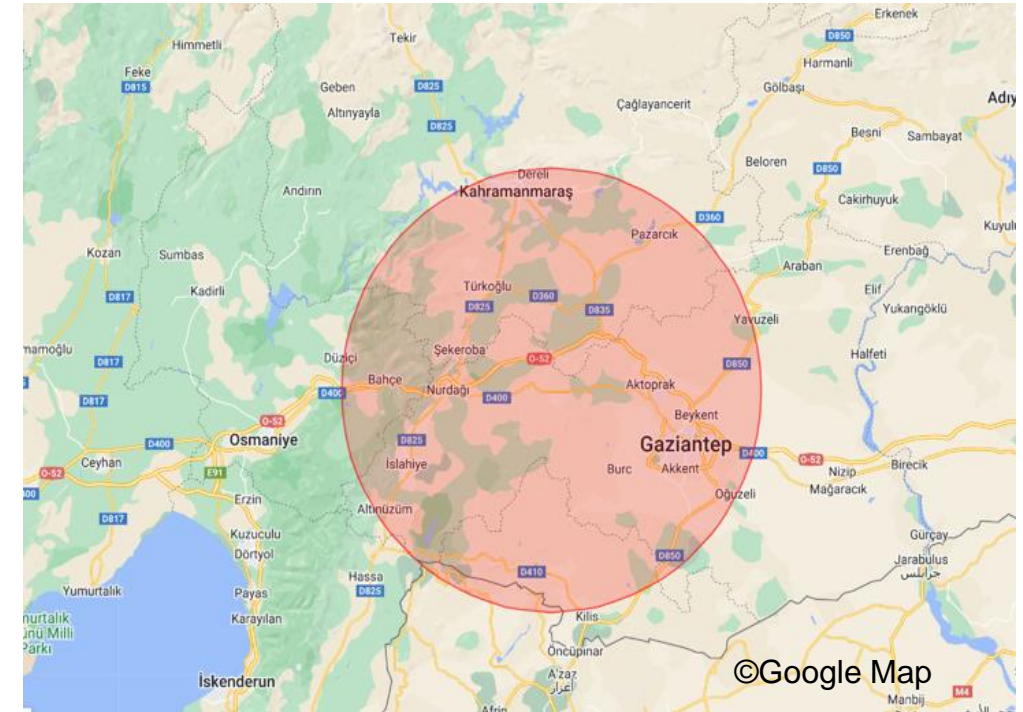
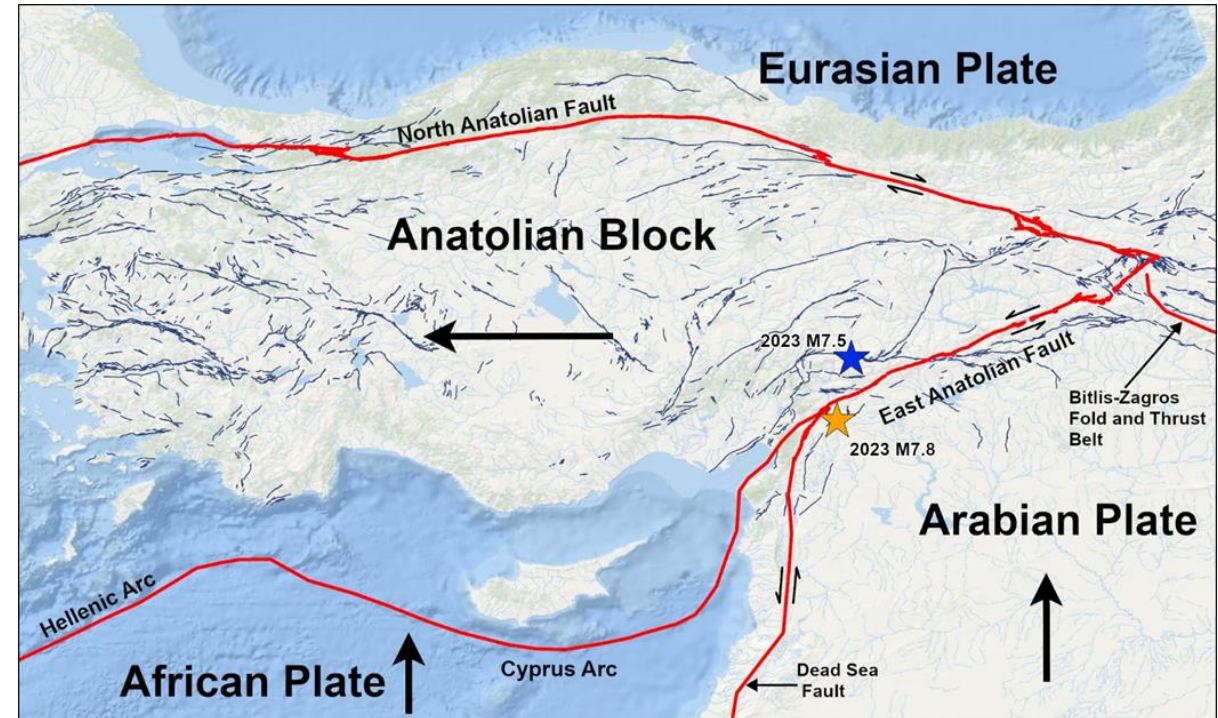


Figure 2. Turkey Earthquakes, 6 February 2023 (Sentinel Asia, 2023) ([Source](#))

Tectonic Summary

- The initial assessment of the earthquake's location situates it near a triple-junction where the Anatolia, Arabia, and Africa plates converge.
- The earthquake's characteristics and position align with two potential fault zones: the East Anatolia fault zone or the Dead Sea transform fault zone.
- The East Anatolia fault zone facilitates the westward movement of Turkey into the Aegean Sea, while the Dead Sea Transform fault zone accommodates the northward shift of the Arabian Peninsula relative to the Africa and Eurasia plates.



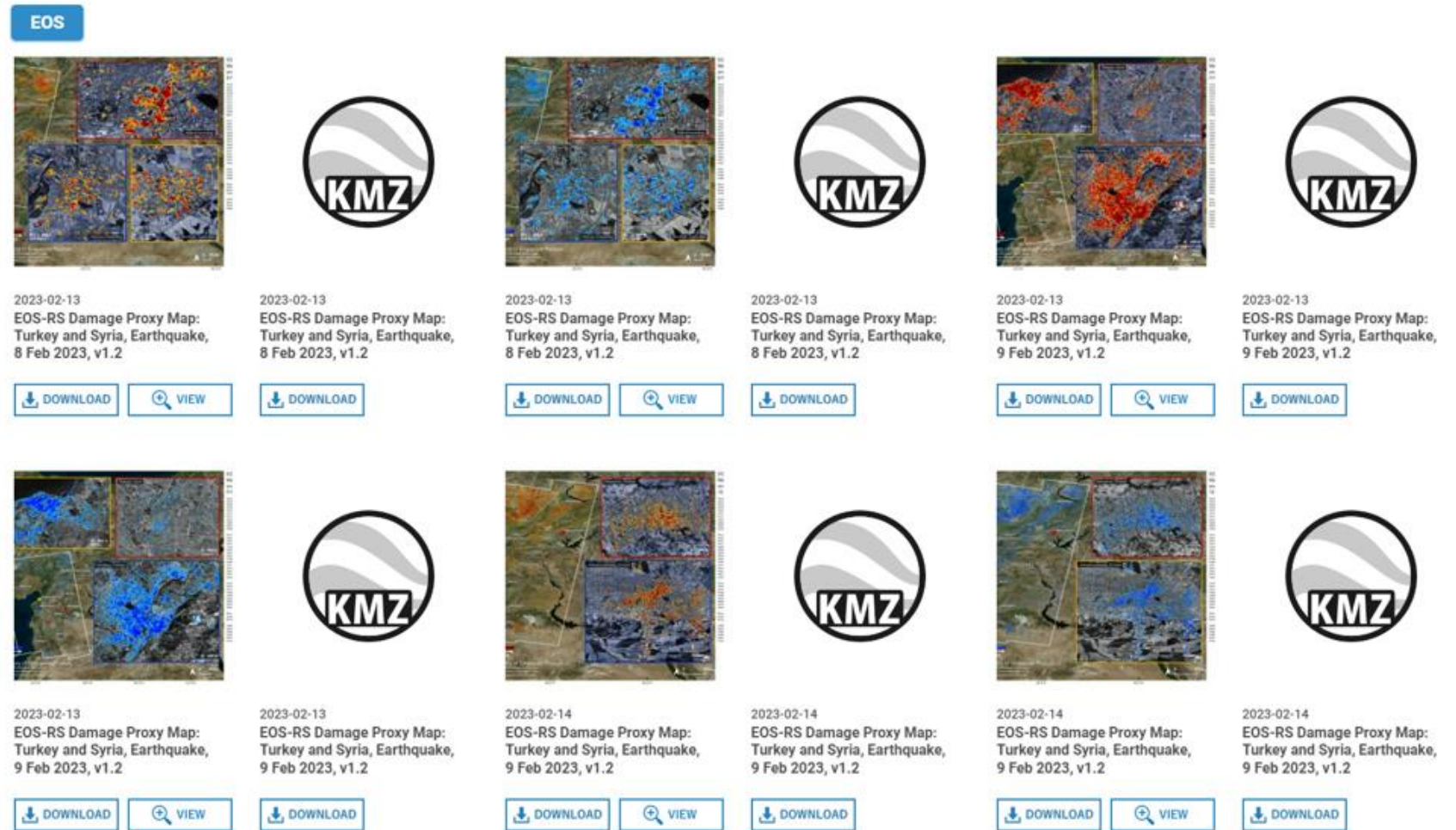
Source: [USGS, 2023 – Story Map](#)

Source: [USGS, 2023 – Event Page](#)

Emergency Observation Satellite Imageries

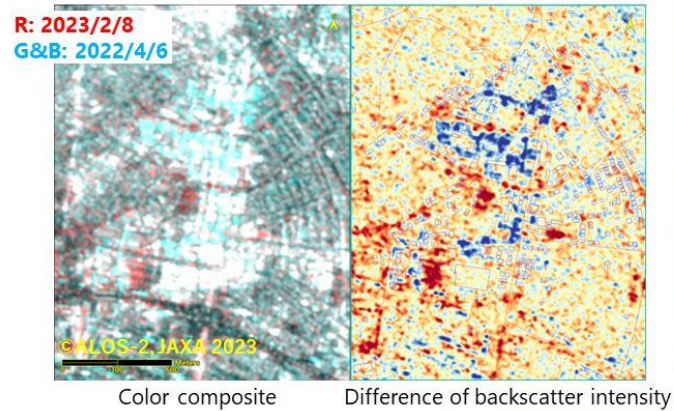
Satellite imageries of the 2023 Earthquakes in Turkey can be viewed and downloaded on the Sentinel Asia website.

71 products (analyzed map) and 107 satellite images are provided by Sentinel Asia members (as of September the 6th 2023)



satellite images
(Source)

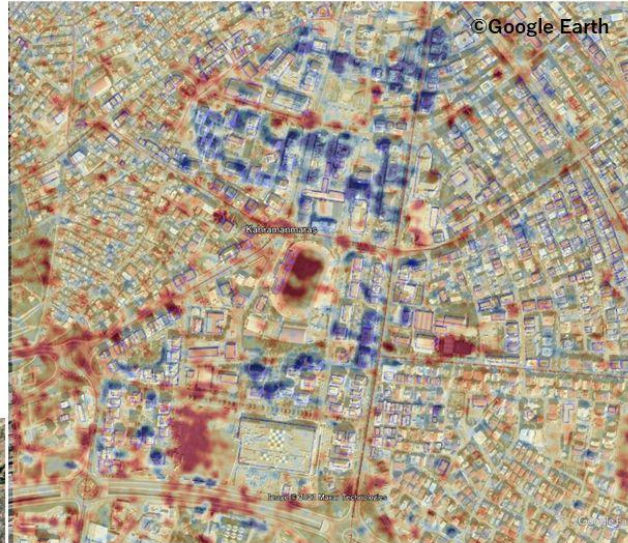
Utilization of satellite imageries for disaster response



2023 Turkey earthquake

Location: Kahramanmars City, Turkey
Sensors: ALOS-2 PALSAR-2

Comparison of backscatter intensity difference and color composite (HH polarization). The buildings with the decrease of backscatter intensity (blue color) may be collapsed. Red color in open space and gymnasium may be caused by evacuation. The red lines are city blocks and blue polygons are buildings, downloaded from the OpenStreetMap. ALOS-2 images were owned by JAXA (6.25m/pixel).

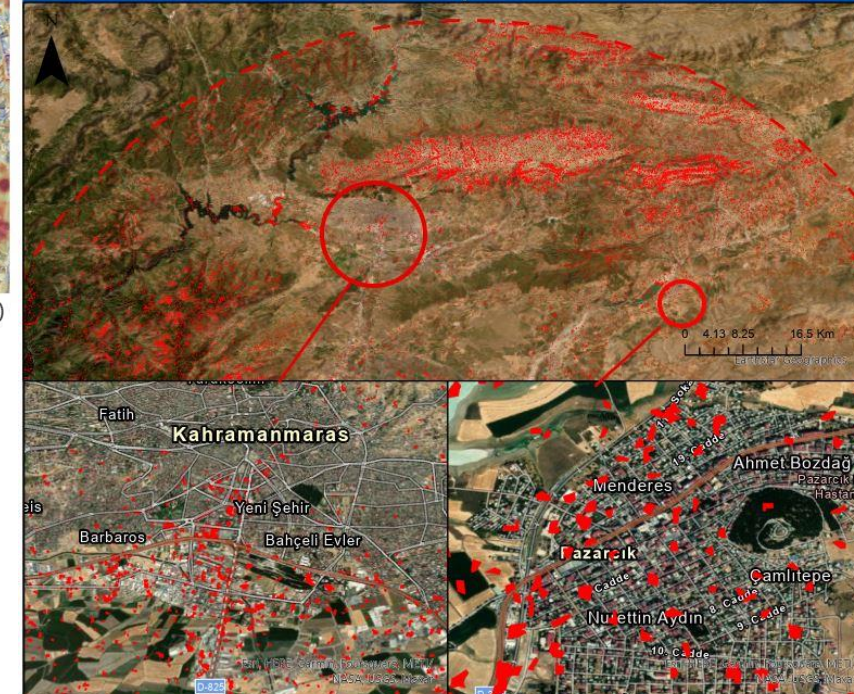


Difference of HH polarization over the Google Earth (2021/11/5)



MBRSC

Earthquake strikes in Turkey near Syrian border on 06 February 2023. Observed on Sentinel images on the 08 of February 2023.



<p>SENTINEL ASIA</p> <p>مركز محمد بن راشد للفضاء</p> <p>MUHAMMAD BIN RASHID SPACE CENTRE</p>	<p>Location</p>
<p>Konya</p> <p>Adana</p> <p>Gaziantep</p> <p>Aleppo</p> <p>Nicosia</p> <p>HERE, Garmin, FAO, NOAA, USGS</p>	<p>Legend</p>
<p>Significant Change</p>	<p>Description</p>
<p>Strong 7.8 magnitude earthquake strikes in Turkey near Syrian border. Massive quake hits near southern city of Kahramanmars and is felt in Syria and Lebanon, with fears of widespread destruction and casualties.</p>	<p>Data Source</p>
<p>Pre-disaster image: Sentinel1A_IW_SLC_1SDV, acquired on 29 January, 2023 at T: 03: 35: 19. Post-disaster image: Sentinel1A_IW_SLC_1SDV, acquired on 10 February, 2023 at T:03:34:54 Note: The resulted outputs had not been verified with any ground truth observation.</p>	

Chiba University

products (analyzed map)

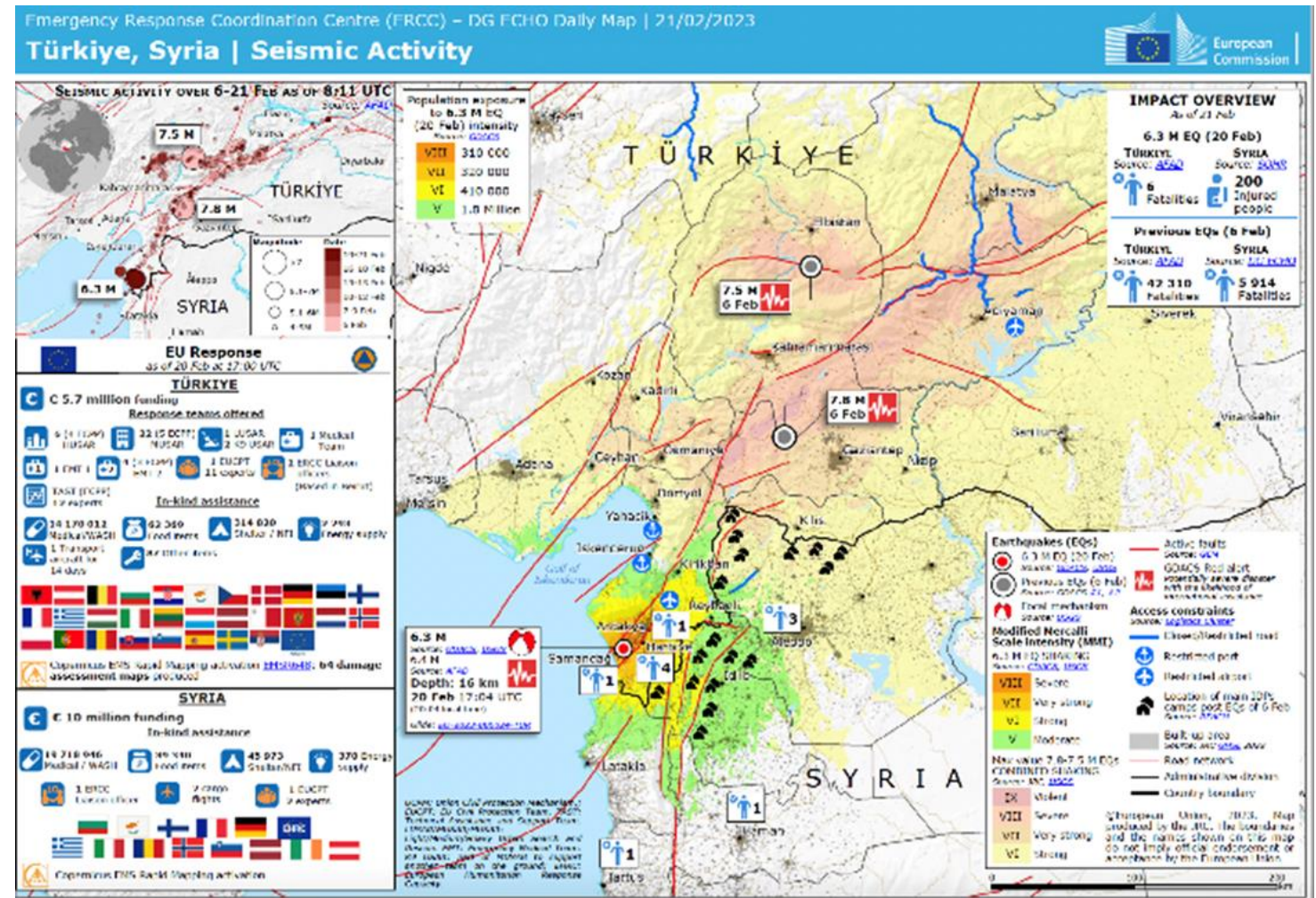
(Source)



Asian Disaster Reduction Center

Initial Assessment

- The earthquake occurred close to the border between Turkey and Syria.
- In Turkey, it was initially assessed that 10 out of 81 provinces were affected by the earthquakes.



Source: DG-ECHO

Disaster Response in Turkey

Disaster Damages

- 11,020 after shocks.
- Death ~ 51,000 Injury ~ 107,000
- ~2 million people have been evacuated
- Disaster shelters 358,037 tent cities 332points
- Container city installation 10 provinces, 162 points

Sources:

Disaster and Emergency Management Presidency (AFAD) Press Briefing No.36

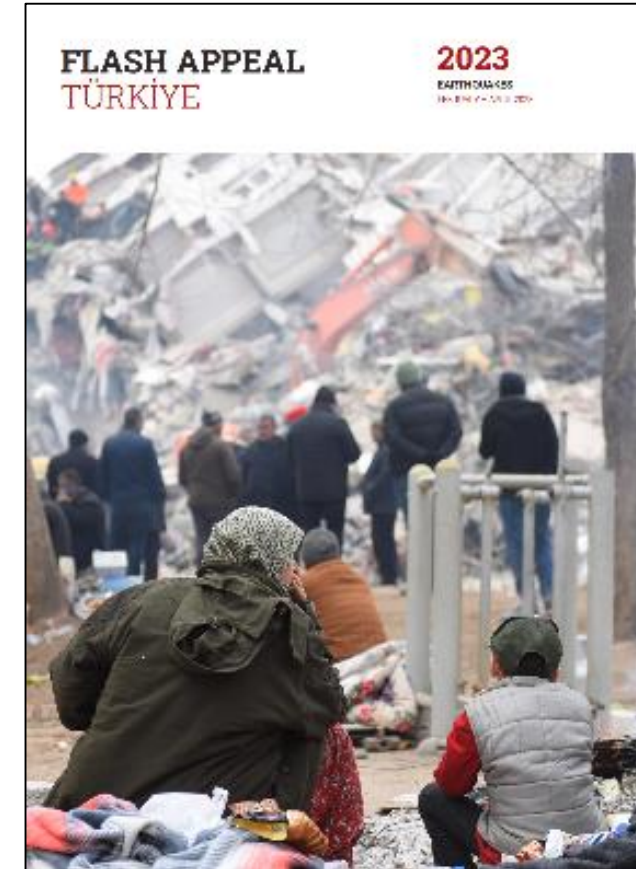
Support to Life, Emergency Situation Report, 17.08.2023

International Humanitarian Assistance

- Quick request for International Humanitarian Assistance from AFAD to UNDAC for USAR (1 hour after of the first earthquake)
- Quick coordination with international community
- 16 February 2023 Flash Appeal



<https://en.afad.gov.tr/>



FLASH APPEAL

Situation Report as of 30th of August 2023

- The government of Turkey has as of the 17th of August ended its state of emergency. The initial state of emergency was set to three months, and ended on May 6th but was then deemed necessary for further extension. Sources based on findings, from local authorities in Turkey, state that approx. 51.000 people, including 7.300 foreign nationals, lost their lives to the earthquake.
- In sequence to the end of Turkey's state of emergency the multi-stakeholder Relief efforts have begun to phase out response efforts and have commenced with Transitioning to the recovery phase. The Regional Refugee & Resilience Plan (3RP), led by UNDP & UNHCR, along with future recovery plans, are currently being reviewed for implementation.

Source



Regional Bureau for Europe

UNHCR TÜRKİYE EARTHQUAKE EMERGENCY RESPONSE 30 August 2023

RECENT DEVELOPMENTS

The OCHA-led earthquake coordination structure phased out on 17 August. An Area Based Coordination (ABC) structure has been established under the leadership of the UN Resident Coordinator's Office and co-chaired by UNHCR and IOM. The UN Country Team+ which includes civil society partners from the Local Humanitarian Forum, the INGO Forum, and the Turkish Red Crescent and IFRC, is operating through a recovery framework to address the needs of host and refugee communities affected by the earthquakes.

In transitioning to the recovery phase, UNHCR co-leads with UNDP the multi-stakeholder response under the [Regional Refugee & Resilience Plan \(3RP\)](#) in support of refugees and the host community across Türkiye. The 3RP is being reviewed to incorporate current priorities and needs, including those relevant to the earthquake response.

UNHCR FINANCIAL INFORMATION

(as of 28 August 2023)



USD 150 M

UNHCR's requirements for the earthquake emergency response in Türkiye, targeting 1.5 million people



The overall funding to the Syria and Türkiye Earthquake Emergency Appeal is 88%

UNHCR ITEMS DELIVERED TO DATE



**Overall:
2.9 million**

core relief items dispatched to Turkish authorities, municipalities and partners; including among others:



449,300
sanitary
items



260,300
sleeping items
(blankets and
sleeping bags)



126,650
beds and
bedding



111,750
hygiene kits



101,350
sleeping mats/
mattresses



72,100
clothing
items



63,600
kitchen sets



34,700
tents

Steps towards recovery

- As outlined in the Türkiye Post-Disaster Recovery Plan (TASIP) developed by AFAD, individuals impacted by the disaster will reside in temporary shelter areas for a maximum of 2 years. For households eligible for permanent housing or those receiving housing loans due to the disaster, evacuation from temporary shelter areas will occur within 30 days. This plan is expected to be implemented by the end of the current year.
- Additionally, the Ministry of Environment, Urbanization, and Climate Change has announced the completion of the tender process for approximately 180,000 permanent residences and village homes across 11 provinces, with construction already underway. The earthquake-affected regions have seen the destruction or significant damage to around 280,000 buildings, including hospitals and social service centers.
- However, it is estimated that 90% of those displaced by the earthquake disaster still reside in temporary settlement areas.



Support to Life, Emergency Situation Report, 17.08.2023

Steps towards recovery

Out phasing of temporary tented sites - as of 31.08.23.

- Kahramanmaraş: No formal tented sites left, reportedly 51 container sites, hosting approximately 75,000 people (61,721 Turkish citizens and around 14,000 Syrian Temporary Protection beneficiaries in TAC). Information about rural areas and individual containers is missing.
- Adıyaman: No formal tented sites are left, and relocations have been made to Bebek TAC, located 20KM from the city. Although transportation was supposed to be provided, field observations suggest this hasn't always been the case. The site's readiness is also a concern, with only 2 hours of electricity reported. There are 49 container sites in the latest reports, hosting 59,501 people, with 37,466 individuals in containers near homes or in rural areas.
- Malatya: There are no formal tented sites remaining despite initial plans to remove informal tent sites by the end of August. Around 40 informal sites are still in use, and they are likely to continue until capacity at container sites is reached. Expansion is ongoing at Beydağı TAC and Yeni Hayat container site, which are the designated destinations for those still in informal sites. AFAD reports 65 container cities, with a total plan for 73, currently hosting 99,427 people in container sites, and an additional 22,099 individuals in individual containers near homes or in rural areas.
- Hatay: There are 16 formal tented sites remaining, housing 10,378 people (7,791 foreign nationals and 8,947 with low damage to homes). Plans include over 215 container sites, with ongoing closures and expansions. Currently, 152,442 people are in container sites, and 10,391 individuals are in containers near homes or in rural areas.

Source

Steps towards equitable recovery

- Women are often identified as vulnerable groups post-disasters, they often rely on male income due to limited pre-earthquake workforce participation, primarily handling unpaid caregiving and household duties. Equitable recovery efforts have been made to prioritize women, including those in rural areas and with disabilities.
- Women-owned businesses in the earthquake-affected area faced significant disruptions. A rapid assessment by UN Women and KAGİDER found that a month after the earthquake, 88% of women entrepreneurs experienced business disruptions, with 50% unable to resume due to issues like building damage and equipment loss. Their top needs were grants (25%), human resources (18%), and equipment (16%). Moreover, 70% reported increased caregiving responsibilities for dependents post-earthquake.



Support to Life, Emergency Situation Report, 17.08.2023

Initial Disaster Response Fund

After the earthquake, an initial fund of **87 billion Turkish Lira (TRY)** was earmarked from the emergency appropriation to respond to emergency expenditures of public agencies including particularly, AFAD, MoEUCC, and MoAF. It is appropriated under Law No.2935 on State of Emergency

Source: Strategy and Budget Office (SBO) of the Turkish Presidency

Additional Funds Earmarked under Law No. 2935 on State of Emergency

Agency	Additional Funding (billion TRY)	Description
AFAD	50.0	To cover for appropriations required by all types of activities, works and procedures to alleviate earthquakes damage and provide aid in kind and in cash to families residing in the earthquake-affected provinces.
MoEUCC	5.5	To cover the repair and rehabilitation of infrastructure damage, identification of new settlement areas, preparation of geological and geotechnical study reports, conduct of soil studies, making development and land-plotting plans, and assistance of rent, moving and goods to beneficiaries under the Law No. 6306 on Transformation of Spaces under Disaster Risk.
AFAD	30.0	For transfer to TOKI to cover disaster housing units to be built through TOKI in the earthquake-affected provinces.
MoAF	1.5	To be used as animal fodder disbursements in the provinces hit by the earthquake of 06.02.2023 and declared a disaster zone by the Presidential Decree No. 6808 of 16.02.2023 to ensure the continuity of livestock breeding, improve productivity, secure animal health and well-being.

Source: SBO

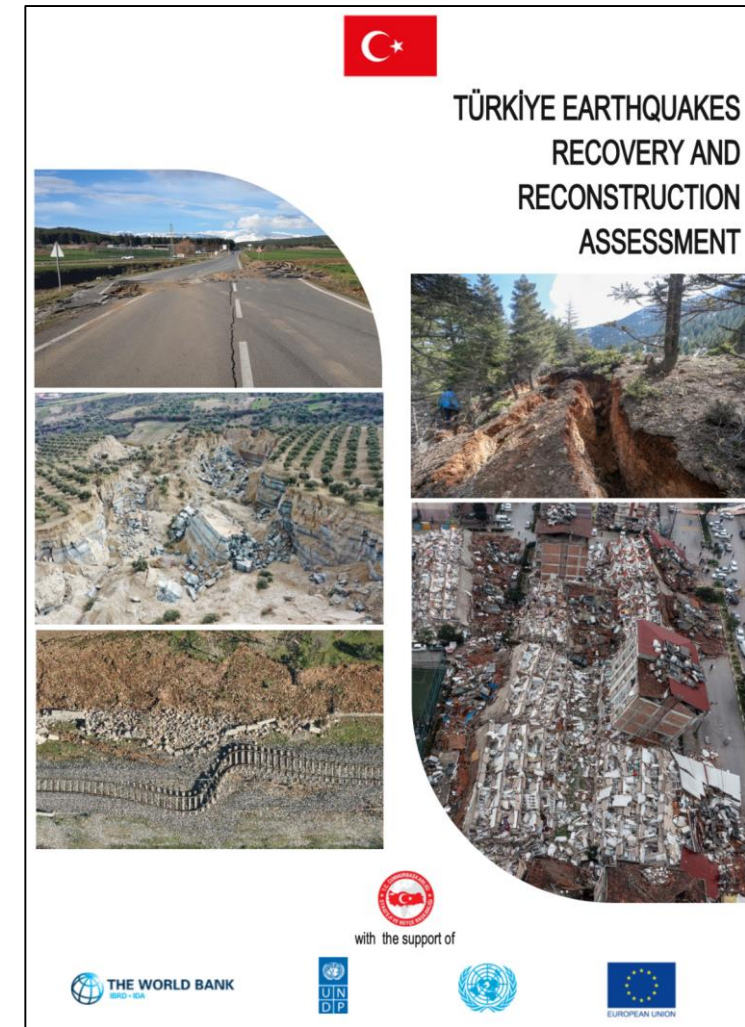
Preliminary Post-Disaster Needs Assessment (PDNA)

The Government of Turkey collaborated with the United Nations Development Programme (UNDP), the World Bank, and the European Union (EU) in preparing a preliminary PDNA for a donor conference for the people of Türkiye and Syria on 20 March 2023.

PDNA covered the following sectors:

- **Social sectors** (i.e., housing, education, culture, and health)
- **Infrastructure sectors** (i.e., water & sanitation services, energy, transportation, and communication)
- **Economic sectors** (i.e., agriculture, mining, manufacturing, and tourism)
- **Cross-cutting sectors** (i.e., employment & social protection, and environment)

The document, “Türkiye Earthquakes Recovery and Reconstruction Assessment” is available [online](#):



Estimated Total Funding Needs based on the PDNA

	billion TRY	billion USD	Rate of GDP (%)
Estimated Total Costs (1)			
Emergency Expenditures	128.0	6.8	0.6
Estimated Public Damage (2)	242.5	12.9	1.1
Estimated Private Damage (3)	222.4	11.8	1.0
Estimated Housing Damage (requiring urgent demolition + collapsed + severely damaged)	1,073.9	56.9	5.0
Costs of Domestic Goods	58.5	3.1	0.3
Cost of Excavation (100-120 million m3) + Crusher (Public + Private)	41.9	2.2	0.2
Damage to Private Motor Vehicles (4)	6.1	0.3	0.0
Subtotal	1,773.2	94.0	8.2
Cost of Motor Vehicle Insurance Compensation (4)	1.2	0.1	0.0
DASK (5)	36.4	1.9	0.2
Revenue Loss by Tradespersons (6)	13.9	0.7	0.1
GDP Output Loss (7)	130	6.9	0.6
Grand Total	1,955	103.6	9.0

<https://www.sbb.gov.tr/wp-content/uploads/2023/03/Turkiye-Recovery-and-Reconstruction-Assessment.pdf>

Frequently Asked Questions about the 2023 Earthquakes in Turkey

USGS compiled the following FAQs to provide quick basic answers to many questions about the earthquakes, and can be accessed [online](#):

What is the name of the Türkiye earthquake(s)?

Kahramanmaraş Earthquake Sequence

When did the Kahramanmaraş Earthquake Sequence occur?

On February 06, 2023, at 1:17 UTC, a [magnitude 7.8 earthquake](#) struck south-central Türkiye near the Syrian border. The earthquake was relatively shallow. A [magnitude 6.7 aftershock](#) followed 11 minutes later followed by a [magnitude 7.5 aftershock](#) about 9 hours after that. Aftershock earthquakes in the sequence extend for 402 km (200 mi) from the Mediterranean coast inland to Malatya, Türkiye.

Where were these earthquakes felt?

The earthquakes were felt by people throughout [Türkiye](#), [Syria](#), and [surrounding countries](#), including Israel, Jordan, Egypt, Armenia, Georgia, and Iraq.

How much damage did the earthquakes cause?

The [USGS PAGER](#) loss estimation indicated that economic and fatality losses would be high, with widespread and extensive damage. Earthquakes of this magnitude in this region could lead to tens of thousands of deaths and billions of dollars worth of damage and economic losses. As of the end of March 2023, the death toll was over 57,000. ([Reliefweb](#))

Why was there so much damage?

The population in this region typically resides in structures that are extremely vulnerable to earthquake shaking, although some more resilient structures exist. The vulnerable buildings were older low- to mid-rise concrete frames constructed with infill or unreinforced masonry.

Were there other geologic hazards triggered by the earthquakes?

Yes, there were both landslides and liquefaction across a significant area. While aerial reconnaissance and on-the-ground investigations can authoritatively map out these locations, the [USGS Ground Failure Report](#) provides an estimate of where they're most likely to have occurred.

How long did the shaking last?

Scientists are able to estimate the time it took for the earthquake to complete its rupture. In the case of the M7.8 earthquake, this time was about 85 seconds. The duration and intensity of shaking felt by individuals depends on many different factors, most importantly how far away they are from the fault. During the M7.8 earthquake, some people experienced intense shaking for 30 seconds or more.

