

Learning From Earthquakes Virtual Earthquake Reconnaissance Team (VERT):

Phase 1 Response to M6.8 Uto, Japan Earthquake, July 28, 2026

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Please Note: This report is based on publicly available data within 1 week of the event. The assessment provided in the report is performed by the judgment of the authors with limited access to ground-truthing.

Disclaimer

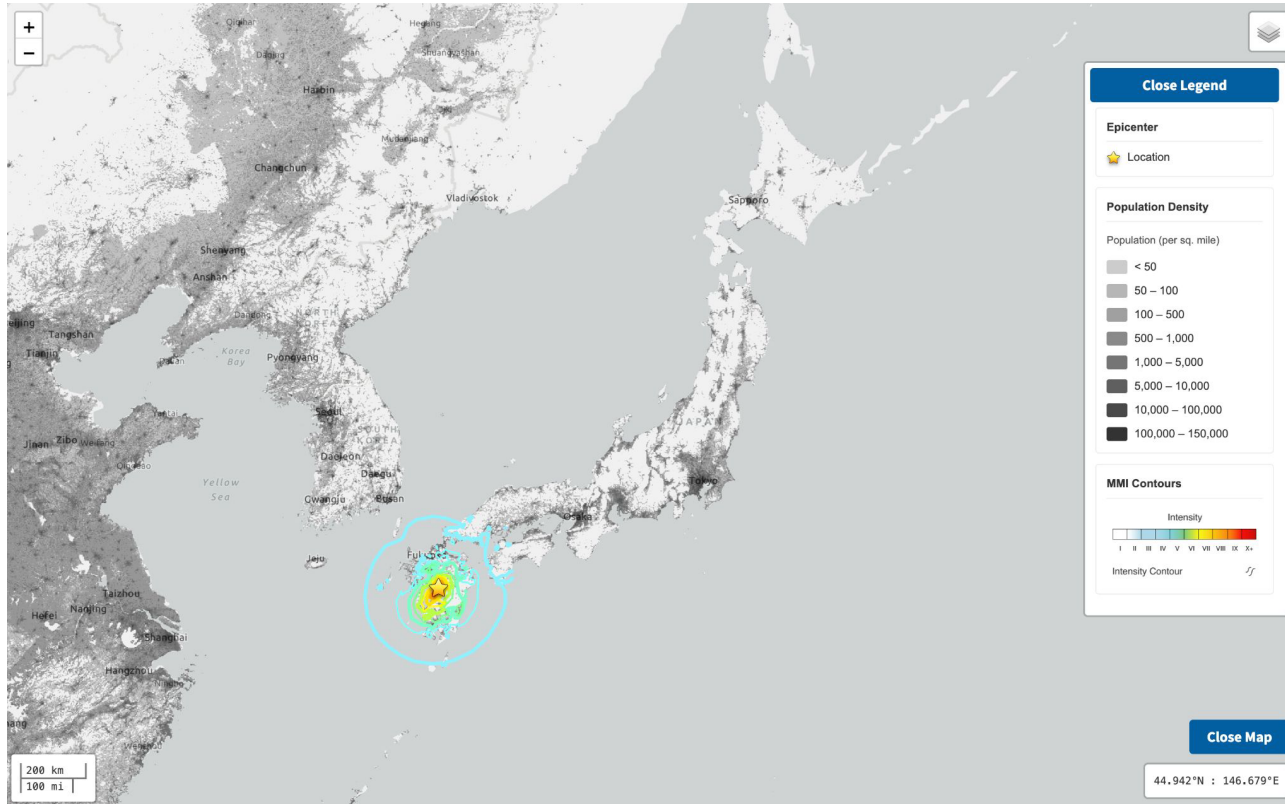
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This report was developed by volunteers to summarize and analyze engineering, scientific, and social impacts of this earthquake. The report serves as an important resource for researchers planning technical field investigations that aim to better understand the technical and policy practices that can improve community resilience and reduce the damages from future earthquakes. All external resources in this report were used in good faith and in consideration of the possibility of 'fair use.'

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Map of Japan



Location of Earthquake in Japan, with population density [\[USGS\]](#)

1. Earthquake Characteristics

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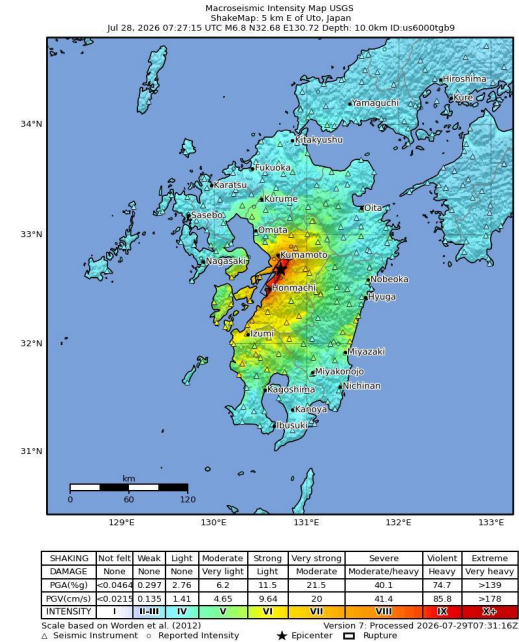
Date: July 28, 2026 07:27:15 (UTC) [3]

Magnitude: M_W 6.8 [3]

Location:

- Epicenter located 20 km (12.5 miles) south of Kumano City [1]
- 32.682°N 130.722°E [3]

Depth: 10.0 km [3]



USGS Shakemap [4]

1. Earthquake Characteristics

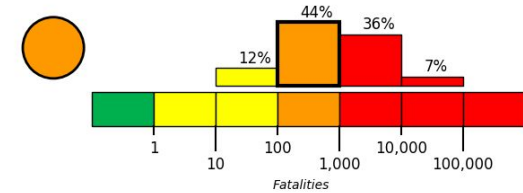
Impact on human safety:

- **35*** fatalities reported [1]
- **80*** injuries reported [1]

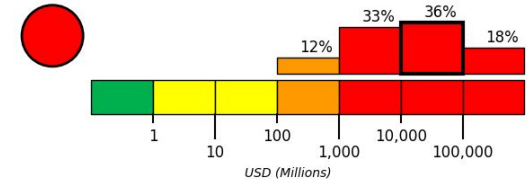
**updated July 31, 5:28 PM ET*

Impact on society:

- USGS estimates losses between **\$10-\$100 billion USD**, less than 1% of the GDP, leading to a PAGER red alert [2]
- ~0.86M exposed to Severe–Violent (MMI VIII–IX) shaking, concentrated in Kyushu/Kumamoto Prefecture [2]
- Cities/areas experiencing severe-to-violent shaking: Uto, Uki, Mashiki, Kashima, Kumamoto City [2]



USGS estimated fatalities [2]



USGS estimated economic losses [2]

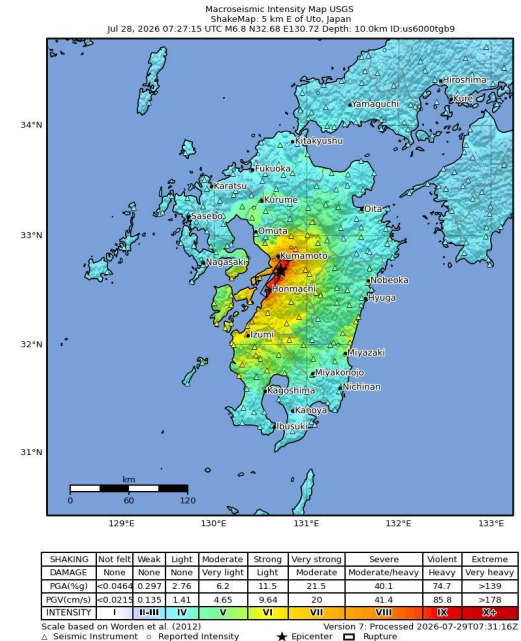
1. Earthquake Characteristics

Fault Mechanism:

- The earthquake resulted from a shallow strike-slip rupture of the Yatsushiro and/or Mifune Fault zones (also called Hinagu Fault) [5].
- Maximum Slip: 2.5 m [6]

Max Intensity:

- Violent Shaking [7]



USGS Shakemap [4]

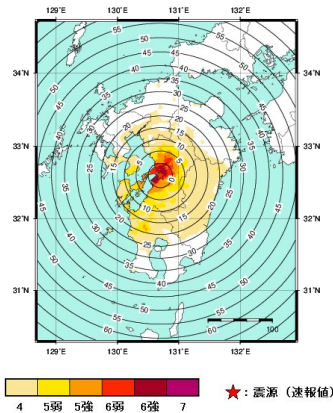
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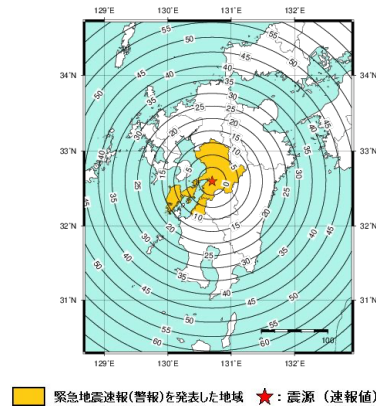
2. Alerts and Early Warnings

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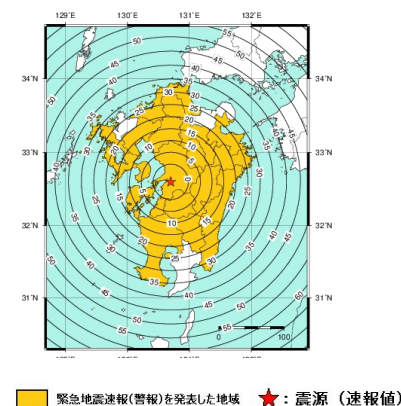
- The Japanese Meteorological Agency (JMA) operates an earthquake early warning system which has been active since October 1, 2007 [1].
- JMA disseminates alerts through television, radio, and cell broadcasts. [1,2]
- Two JMA warnings were issued; **first, 3.8s** and **second, 5.8s** after earthquake start [3].
 - The first was **only issued within areas inside Kumamoto Prefecture** (near to the epicenter) in the Kyushu region (Figure (b)). The second updated the predicted intensities; and warning was sent **throughout the Kyushu island** excluding only some outermost regions (Figure (c)).



(a) Time and estimated seismic intensity (on JMA scale called "shindo") distribution from first alert. Source: Japan Meteorological Agency [3]



(b) Regions where **first alert** (3.8s) was issued. Source: Japan Meteorological Agency [3]



(c) Regions where **second alert** (5.8s) was issued. Source: Japan Meteorological Agency [3]

2. Alerts & Early Warnings

Additional warnings

- Japan Meteorological Agency tsunami advisory was lifted at 6:10 pm [4]
- Japan Meteorological Agency has issued a warning for heatstroke [5] (more in Section 4)

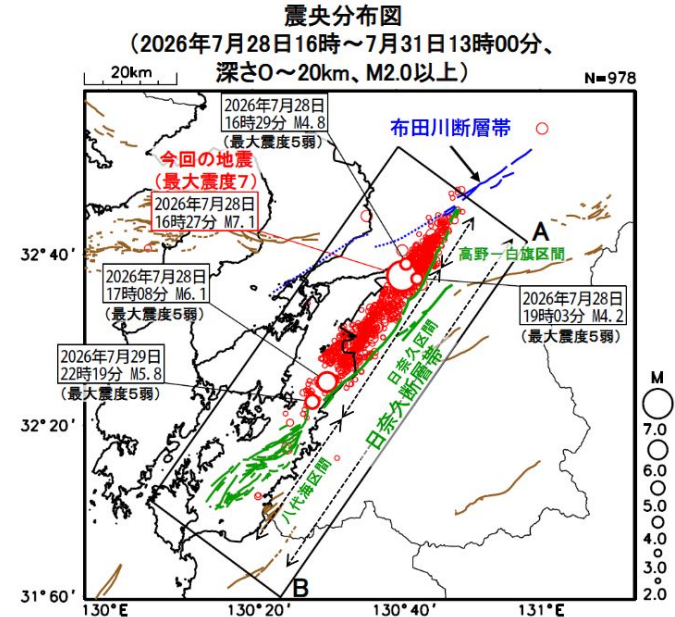
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3. Aftershocks

3. Aftershocks

- By 3:00 p.m. JST on July 31, 2026, 299 aftershocks had produced measurable or felt shaking. [1,2]
- The strongest aftershocks produced strong shaking capable of moving furniture and further damaging weakened structures. [1,2]
- Aftershocks were concentrated at shallow depths of 0–20 km along the Hinagu–Futagawa fault system. [1,2]
- JMA advised residents to remain cautious for approximately one week because additional strong shaking remained possible. [1,2]



Epicenter distribution of the 2026 Kumamoto earthquake sequence (JMA). July 28 16:00 – July 31 13:00 JST, depth 0–20 km, M2.0+, N = 978. Magnitudes are JMA (Mj) and times are JST — note these differ from the USGS Mw/UTC values used elsewhere in this section. English annotations added. Source: Japan Meteorological Agency [1]

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4. Emergency Response

4. Emergency Response and Early Recovery

List of Responding Agencies

- Search and Rescue
 - Japan Self-Defense Forces (SDF), led by Defense Minister Shinjiro Koizumi [2][4]
 - Japan Coast Guard [4]
 - Japan Fire and Disaster Management Agency [9]
 - Local Police and Fire response, for example:
 - Kagoshima Prefecture Emergency Fire Rescue Team, the Kumamoto Prefectural Police, Osaka Prefectural Police's Wide-Area Emergency Assistance Team, and Prefecture Emergency Fire Rescue Team responded to Nippon Paper Industries Yatsushiro Plant in Yatsushiro City [6]
 - 230 officers from Hyogo, Osaka, and Tokyo responded to mall collapse [5]
- Supplies (food, water, HVAC, power)
 - Japan SDF has distributed water for 350K people and 10 hospitals [2]
 - Special attention to AC units and sanitation, due to heatwave [4] [7]

4. Emergency Response and Early Recovery

Governmental Response and Aid

- Prime Minister Takaichi immediately established the Emergency Headquarters for the 2026 Kumamoto Earthquake, coordinating national response with prefectures and local governments [1]. PM Takaichi also announced the central government will take a lead role in coordinating rescue efforts [2].
- ¥20 billion are being approved by the Cabinet to support recovery, in addition to ¥61.6 billion in ordinary allocation tax grants approved to support affected local governments. Kumamoto prefecture had received more than ¥730 million in private donations as of 08/03 [3]
- Disaster Relief Act applied to 21 municipalities within hours; PM ordered advance disbursement of local allocation tax grants; METI rolled out "Safety Net Guarantee No. 4" emergency credit for small businesses within 24 hours; Blanket relief issued across ~20 ministries (loan deferrals, insurance/pension premium waivers, relaxed benefit eligibility) within 3 days [4]
- Follow Prime Minister's office news updates for latest information:
<https://japan.kantei.go.jp/news/index.html>

4. Emergency Response and Early Recovery

Shelter and Shelter Needs

- Shelter Needs
 - 3,800 houses were damaged, including 181 that were completely destroyed [3]
 - 260,000 people were advised to evacuate, mostly in Kumamoto Prefecture [8].
- Shelters
 - Kumamoto Prefecture began relocating survivors to 94 hotels [3]
 - 8,800 people, primarily in Kumamoto Prefecture, remain in evacuation shelters as of 08/01. Many continue to shelter at home or in their vehicles. [1]

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5. Context

5.1 The Built Environment

- The general building code is defined by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the detailed building requirements are defined by the Architectural Institute of Japan (AIJ) and/or by the Japan Housing & Wood Technology Center. [1,2,3,4]
 - Building Standards Act
 - Timber: Allowable Stress Design for Wood Post-and-Beam Construction Housing
 - Reinforced Concrete: AIJ Standard for Structural Calculation of Reinforced Concrete Structures
 - Steel: AIJ Design Standard for Steel Structures - Based on Allowable Stress Concept -
- **Prevalent construction materials [5]:**
 - Mostly timber structures for low-rise housing and reinforced concrete and/or steel structures for mid- to high rise buildings.

5.1 The Built Environment

- The Japanese Building Code does not use IBC/ASCE 7. [6]
- Japan implements several "routes" for the seismic calculations. [7]
 - Route 1: Prescriptive design
 - Route 2: Allowable stress design + irregularity check
 - Route 3: Allowable stress design + ultimate lateral strength design
 - Others: Limit strength calculation and time-history response analysis
- The building codes are strictly followed. [1,8]
 - Pre-construction plan review, interim and final inspections, and structural calculation conformity review are required by the building code.
- The 1981 Building Standards Act revision [9]:
 - Post-1981 buildings were significantly more earthquake-resistant, as demonstrated in the 1995 Kobe earthquake.

5.1 The Built Environment

- The design earthquake acceleration is defined in the ministerial notification by MLIT. [10]
- The design earthquake acceleration is calculated based on [10]:
 - The building's natural period
 - The regional seismic zone factor
 - The local soil/ground amplification
 - Rare (Level 1) vs. extremely rare (Level 2) design earthquake motion

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5.2 Socioeconomic Characteristics (Demographics)

Japan

- **Population:** 122.1M [1]
- **Population density:** 335.0 /km² [1]
(U.S.:37.4/km²)
- **Male to female ratio:** 0.946 [1]
- **Age structure:** 11.2% aged 0–14;
29.3% aged 65+ [2]
- **Distribution:** 70.0% in Densely
Inhabited Districts (DID) [3]
- **Rate of population change:** –0.44%/yr
(2024); population has fallen every year
since 2011 [2]
- **Religious Identity:** Shinto-affiliated
83.37M, Buddhist-affiliated 81.07M,
Christian 1.25M, other 6.55M [4]

Kumamoto Prefecture

- **Population:** 1.68M [5]
- **Population density:** 227.2 /km² [5,6]
(U.S.: 37.4/km²)
- **Male to female ratio:** 0.906 [7]
- **Age structure:** 16.1% aged 0–14;
31.1% aged 65+ [2]
- **Distribution:** Kumamoto City holds
43.7% of the prefectural population; the
top 3 cities (Kumamoto, Yatsushiro,
Amakusa) together hold 54.6% [5]
- **Rate of population change:** –0.77%/yr
(–13,029 people, Oct 2024–Oct 2025)
[5]

5.2 Socioeconomic Characteristics (Economics)

Japan

- **GDP:** ¥557.48 trillion (2024) [8]; \$4.38–4.46 trillion (2026), ranked 4th globally [9]
- **GDP growth:** 1.2% (2025); 0.7% (2026 est.) [9]
- **Industry structure:** tertiary industry = 73.4% of employment and ~73% of GDP (2020); secondary industry = 23.4% of employment; primary industry = 3.2% [8]
- **Income inequality:** Gini coefficient of 0.38 after tax/social-security redistribution [10]
- **Poverty:** Relative poverty rate = 15.4%; child poverty rate (age ≤17) = 11.5% [11]

Kumamoto Prefecture

- **GDP:** ¥6.72 trillion (2023) [12]
- **Dominant industry:** semiconductors (TSMC's Japan subsidiary JASM began production at Kumamoto Fab 1 in December 2024; Fab 2 (co-invested by Sony, Denso, Toyota) is under construction, combined investment exceeding ¥3 trillion [13]; Kyushu's total IC production value reached ¥1.17 trillion in 2025 [14])

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5.3 Health Systems

- Universal Health Coverage (UHC) through National Health Insurance [1]
 - National Health Insurance (NHI) aim to contribute to the improvement of social security and national health which covers all Japanese citizens except:
 - People enrolled in another public health insurance plan (Employee's Health Insurance) [1], [3]
 - People receiving public assistance[1], [3]
 - People enrolled in the Late-Stage Elderly Medical Care System (Late-State Elderly Healthcare)[1]. [3]
 - Some foreign nationals with short-term residence status[1], [3]
 - Coverage Rate 93.6% [2]

5.3 Health Systems

- Universal Health Coverage (UHC) through National Health Insurance, cont'd
 - Coverage
 - Outpatient and inpatient care, Hospitalization, Surgery, Prescription medication, Childbirth-related benefits, Home visits [1], [2]
 - Free access
 - Citizen can freely choose medical institutions [3]
 - Medical expenses are supported by: [1]
 - insurance premiums
 - patients out of pocket
 - governmental funding
 - Out of pocket [1]
 - Over 75 year-old: 10% (Subject to change based on income)
 - 70-74 year-old: 20% (Subject to change based on income)
 - Adults (15-69 years old): 30%
 - Pre school: 20%

5.3 Health Systems

Top 10 causes of death in Japan (2024) [4]

Cause of death	Number of Deaths (people)	Mortality rate (per 100,000 population)	Percentage of total deaths (%)
Malignant neoplasms	384,111	319.30	23.90%
Heart disease	226,388	188.20	14.10%
Senility	206,887	172.00	1.90%
Cerebrovascular disease	102,821	85.50	6.40%
Pneumonia	80,176	66.60	5%
Aspiration pneumonia	63,667	52.90	4%
Accidental deaths	45,743	38.00	2.80%
COVID-19	35,865	29.80	2.20%
Renal failure	29,665	24.70	1.80%
Alzheimer's disease	25,595	21.30	1.60%

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5.4. Hazard Exposure

- The deadliest recent earthquake in the Kyushu region occurred on April 15, 2016 (M 7.0) [1].
- This event occurred north of Kumamoto and was the result of strike-slip faulting at shallow depth [1].
 - 273 people died, and more than 2809 people were injured [2].
 - 8,657 homes fully destroyed, 34,489 half-broken and 155,239 were partially damaged [3].
 - Up to 10% of the entire prefecture's population was evacuated to shelters established by municipalities by April 17 [3].
 - Approximately 1,65,000 customers lost electricity initially, while water services were disrupted to 90,000 customers up to three days after the event [4].
 - Significant number of landslides and liquefactions were observed across the affected region [4].
- Major learnings
 - This event led to significant increase in efforts towards earthquake education and strengthening local level disaster prevention capabilities. [3]

5.4. Hazard Exposure

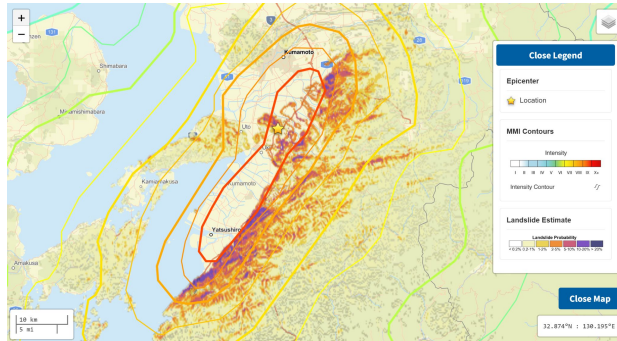
- In addition to earthquakes, Kyushu region experiences other hazards such as:
 - Active Volcanoes
 - These include the Sakurajima and Mount Aso [5].
 - Eruptions in Sakurajima date back as recent as **November 2025** [6].
 - Tropical Cyclones
 - Kyushu is one of Japan's most typhoon-prone regions with **August-October** being the peak typhoon season [7].
 - Severe Storms, heavy rains and subsequent flooding
 - Severe storms and heavy rains occur annually every year during **June and July** continuing through August and September (typhoon seasons) [8].
 - These severe storms and heavy rains are typically followed by flooding events, the most recent one seen in early **July of 2026** in Kumamoto [9].
 - Extreme heat
 - Temperatures in affected areas have risen to record levels with JMA warning possibility of heatstroke [10]
 - (more on this in Section 6.2)

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6. Secondary / Concurrent Hazards

6.1. Geotechnical Hazards



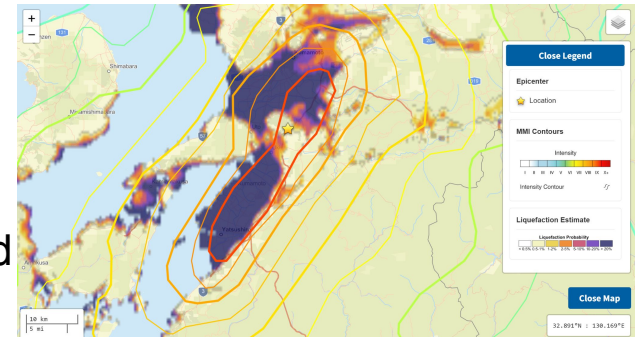
USGS-Estimated Earthquake-Triggered Landslide Probability [1]

Liquefaction:

- Estimated exposed area: 10–100 km². [1]
- Estimated exposed population: more than 100,000 people. [1]
- Highest susceptibility occurs on saturated alluvial and reclaimed ground near Uto, Uki, Yatsushiro, and the Ariake and Yatsushiro Sea coasts. [2]

Landslides:

- Estimated exposed area: 10–100 km². [1]
- Estimated exposed population: 1,000–10,000 people. [1]
- Susceptible areas include steep slopes in the Kumamoto–Kyushu highlands and around Mount Mayuyama. [2]



USGS-Estimated Earthquake-Triggered Liquefaction Probability [1]

6.1. Geotechnical Hazards

Slope failures

- Three landslides were confirmed in Miyazaki; one house was partially damaged, with no casualties. [4]
- Rockfalls, slope collapse, and sediment inflow caused road closures. [4]
- Landslide-warning thresholds were reduced to 70–80% in 26 municipalities because aftershocks and rainfall may reactivate unstable slopes. [3, 4]

Liquefaction and settlement

- Yatsushiro Port experienced liquefaction, ground depressions, cracking, and reclaimed-ground settlement. [3, 4]
- A 40 m-long elevation step formed behind a strengthened quay; 20 m received emergency repairs. [4]
- Liquefaction was confirmed at Eco Park Minamata, where access restrictions and temporary measures were implemented. [5]
- Ground depressions developed around manholes at the Yatsushiro North wastewater treatment plant. [5]

6.1. Geotechnical Hazards

Ground Deformation and Infrastructure Impacts

- Surface rupture along the Hinagu Fault damaged roads, bridges, and buildings, including vertical displacement at Ogawa in Uki. [5]
- GNSS measurements recorded coseismic displacement of 0.84 m northeast at Yatsushiro, 0.40 m north at Kumamoto, and 0.17 m south at Izumi. [5]
- Levee cracking occurred at 69 locations along seven national rivers; a 250 m reach of the Kuma River also experienced settlement and bulging. [4]
- Liquefaction damaged two fuel terminals in Yatsushiro and contributed to road, embankment, pipeline, and water-service disruptions. [4]
- Several Kyushu expressway sections were closed because of ground, road, and bridge damage. [4,5]

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6.2. Extreme Heat

- In the immediate aftermath of the earthquake on July 28, affected regions have seen record high temperatures [1,2]
 - On August 3, temperatures reached a record high of 40.3°C in Kumamoto City and 40 in Kikuchi City, one of the hardest hit areas [1,2].
- The displaced population is living in evacuation shelters (converted community centers, school gyms, classrooms), many lacking air-conditioning and are thus exposed to extreme high temperatures [3].
 - This exposure increases risk of heatstroke, economy class syndrome, and food poisoning [4]
 - A woman in her 70s, who was living in her car was reported dead by news outlet due to an apparent heat stroke caused by the car running out of gas [3].
- The government has announced plans to install air conditioning and restore water supply services to provide drinking water and support sanitation needs [4].

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7. Earthquake Impacts

7.1 Economic and Business Disruption

- **Post-quake economic disruption:** Kyushu Expressway split (2 sections closed), Kyushu Shinkansen suspended Chikugo-Funagoya–Kagoshima-Chūō, Yatsushiro and Kumamoto ports damaged, agricultural damage across 14 farmland sites and 146 agricultural facilities, 26 fishing ports damaged [1]
- **Earthquake impact on the semiconductor cluster:** TSMC and Sony Semiconductor plants (Kikuyō, Ōzu, Kōshi) briefly evacuated staff outdoors after the earthquake; operations resumed the same evening after safety checks, though some Fab 2 construction was paused as an aftershock precaution [2]

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7.2 Hospitals and Health Systems

Deaths & Injuries

- **34 reported deaths, at least 6 seriously injured, and dozens of other injured** - as of July 31 [1, 2, 3]
- Thousands more at continuous risk from heatstroke, with more than 19,000 homes without electricity, 9,000 people staying in shelters, and temperatures nearing 40 °C (104 °F) - as of July 30 [4, 5]

Overview of Hospital Damage

- **84 medical facilities had reported sustaining damage** during the earthquake. Of these:
 - 22 experienced power outages
 - 77 experienced water outages
 - 12 experienced medical gas system failures [6]
- 49 of these facilities remained affected as of 4:00 PM on July 31 [6]

7.2 Hospitals and Health Systems

Hospital Status

- One hospital in Uki City unable to operate directly after the earthquake due to loss of electricity. [7, 8]
 - 127 patients safely transported to other medical facilities [9]
- Several major hospitals have reported the **suspension of outpatient services and scheduled hospitalizations** [10, 11, 12]
 - Many appear to have planned to resume normal operations by August 1 or 3

Bed Availability

- As of July 31, 2026 - **no official public reports describing hospital bed or room availability** had been released by the Ministry of Health, Labour, and Welfare or Kumamoto Prefecture
- Many hospitals in the prefecture have reported a surge in patients [8]



Damage to Minami Hospital in Uki City (Reuters) [8]

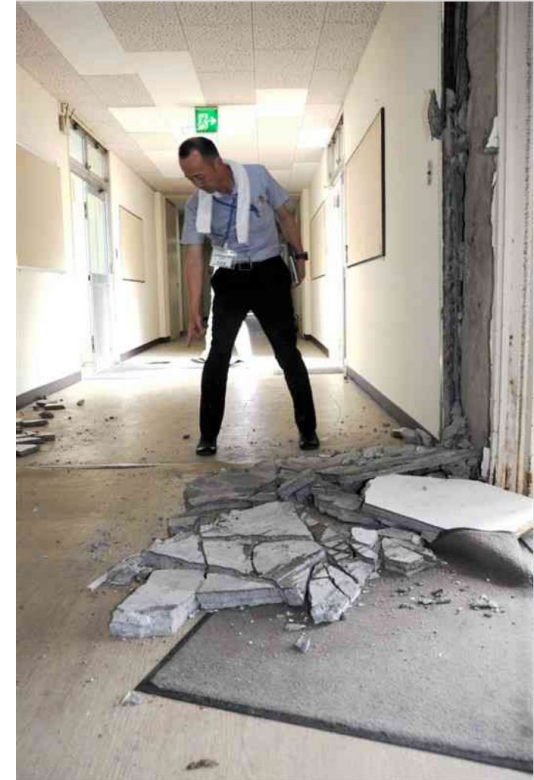
7.2 Hospitals and Health Systems

Dialysis Services

- Of 94 total dialysis facilities in the area, **13 reported difficulties providing dialysis**
 - As of July 31, 6 had been restored; 7 had limited operations due to equipment damage [6]

Communications

- Hospitals notifying the public of their operations primarily through their websites [10, 11, 12]
- City officials are continuously monitoring hospital operational status and coordinating communication among healthcare facilities to:
 - optimize regional healthcare capacity,
 - facilitate patient transfers,
 - and maintain continuity of essential medical services [13]



Kumamoto Minami Hospital, around 8:30 AM July 29, Matsubashi-cho, Uki City. [9]

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7.2 Hospitals and Health System

- Hospital visit fee relief [1]
 - MHLW notified insurers that disaster-affected patients can receive relief from copays and that health insurance premiums can be deferred or reduced.
- Reimbursement [2]
 - Disaster rules allowed reimbursement flexibility for prescriptions and visiting nursing, including care provided in shelters or evacuation settings.
- Insurance premium relief [3]
 - MHLW notified local governments that disaster-affected National Health Insurance households may receive premium/tax relief measures.
- Loss of insurance card/qualification document [4]
 - People who lost their My Number insurance card or qualification documents could still receive care by stating their name, date of birth, contact information, and address.

7.2 Hospitals and Health System

- Disability care [5]
 - affected people with disabilities could receive flexible support, including reduced user fees, continued disability welfare services, and support for assistive devices and daily living tools.
- Mental health patient care [6]
 - MHLW allowed urgent transfer of psychiatric inpatients without family consent if necessary for safety, with formal procedures completed later when possible.
- Elderly care [7]
 - Municipal insurers were asked to respond flexibly so that care for affected older adults could continue in shelters or temporary housing, with possible fee relief and flexible handling of capacity and staffing shortages.

7.2 Hospitals and Health System

Earthquake impact on major cause of death in Japan

- Renal failure
 - Regular dialysis service is essential to replace the kidney function for those who have renal failure. [8]
 - Dialysis service at several facilities had damaged by the earthquake, but 6 facilities resumed the dialysis services and 7 facilities still experience the damage though patients transfers has been operated. [9]
- Pneumonia/aspiration patients
 - Infection prevention at shelters are issued and should be carefully conducted [9]
 - Infection prevention measures includes cough etiquette, mask wearing, hand hygiene, and ventilation. [10]

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7.3 Housing (Single-Family Homes)

- Reports of partial in 45 public housing in Kumamoto Prefecture [3].
- 31 reports of entrapment in elevators; all rescued [3].
- Post-earthquake rapid damage assessment is taking place in Uki City and Hikawa Town in Kumamoto Prefecture from July 29 and will take place in other regions [3].
- Reconnaissance teams within Japan are being formed at this moment.



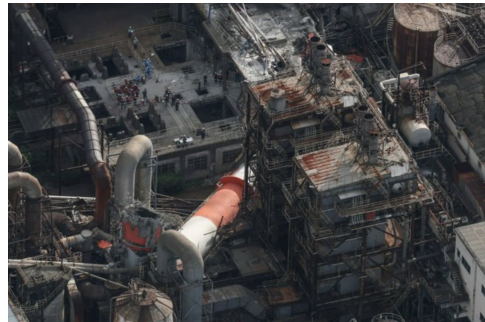
Housing [4]

7.4 Other Damage

- Bridges: displacements and partial collapse [4]
- Factory: collapse of the chimney at the Nippon Paper Industries Yatsushiro Mill [4]
- Shopping mall: Gas explosion caused the building to collapse at the second story [5]



Bridges [4]



Factory [4]



Shopping mall [5]

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7.5 Schools

Overall impact

As of 31 July 2026, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) reported **physical damage at 342 school facilities** in Kumamoto Prefecture. Of these, 283 were schools operated by prefectural or municipal governments, 53 were privately operated schools, and 6 were nationally administered institutions.

These figures represent facilities where earthquake-related damage had been identified during the initial inspections and do not necessarily indicate severe structural damage or loss of functionality [1].

7.5 Schools

Overall impact

The ministry reported that the **most common forms of damage included cracking or damage to reinforced concrete columns and beams, detachment or falling of interior finishes, and damage to building equipment [1].**

While these descriptions suggest that both structural and nonstructural components were affected, the available reports do not quantify the relative frequency of each damage type or provide engineering assessments of damage severity. Consequently, it is not currently possible to distinguish schools requiring only minor repairs from those requiring extensive structural evaluation.

7.5 Schools

Injuries

MEXT also reported **25 injured students under school supervision** in Kumamoto Prefecture, including injuries caused by falling objects and one case involving the collapse of corrugated roofing during a club activity [1].

The ministry also reported **nine injured education personnel**, comprising seven minor injuries and two serious injuries. Reported causes included falling objects, broken window glass, and an overturned safe [1].

7.5 Schools

Closures and operational disruption

As of 31 July 2026, **31 school facilities in Kumamoto Prefecture were reported closed** [1]. The same ministry also reported **38 closed social-education, sports, and cultural facilities**. These were not schools. The earthquake occurred during the summer vacation period making it difficult to distinguish between facility closures and actual interruption of scheduled instruction.

Evacuation shelters

A total of **36 school facilities in Kumamoto Prefecture were being used as evacuation shelters** [1].

References

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7.6. Utilities

Lifeline	Status
Electric power	~48,530 households lost power at peak (July 28); ~22,940 still out July 30; restoration timeline unclear after estimate was retracted
Gas	~9,400 households had city-gas supply cut across Kumamoto City and Yatsushiro, with restoration in Yatsushiro expected by early August
Water	~140,000 households were without water on July 28, dropping to ~95,200 by July 30, with groundwater turning turbid in some areas and emergency rationing limiting residents in other areas to about 5 liters per person per visit
Airport	Canceled flights from Japan Airlines Co. and All Nippon Airways Co. Airport open after 7pm on 28th.
Port	Yatsushiro and Kumamoto ports damaged & 26 fishing ports damaged
Public Transit	Services suspended on the Kagoshima Main Line between Sendai and Kagoshima Freight Terminal, and Tosu Freight Terminal and Yatsushiro. Hisatsu Orange line down.

7.6 Utilities - Oil & Gas

- Two fuel terminals in Yatsushiro (Idemitsu and ENEOS-Cosmo) were damaged by liquefaction and were unable to ship product [1].
- Japan's Agency for Natural Resources and Energy (ANRE) requested additional gasoline shipments from Fukuoka and Oita to meet rising demand from residents sheltering in vehicles, while Prime Minister Takaichi pledged to ensure sufficient fuel supplies [1, 2].
- As of July 29, of 190 gas stations surveyed, 71 were operating, 18 closed, and 101 unconfirmed; some stations capped fuel sales [1, 3].
- Saibu Gas and Kyushu Gas suspended city gas supply to 481 households in Kumamoto City and 8,892 households in Yatsushiro, respectively. Service in Yatsushiro was expected to be restored by around August 3, while no LNG facilities or gas leaks were reported [4, 5].
- Saibu Gas's city gas plant in Koshi City temporarily halted production after the earthquake, but customer supply continued using stored gas [5].

7.6 Utilities - Electric

- Power outages peaked at approximately 48,530 households on the evening of July 28, primarily affecting Yatsushiro, Uki, and Mashiki [4].
- ~1,270 personnel and 80+ generator vehicles were deployed for restoration; still more than 20,000 households remained without power on the evening of July 29 [6].
- ~22,940 households remained without power as of July 30; Kyushu Electric Power first estimated full restoration by July 31, then retracted the estimate [7, 8].
- The Sendai and Genkai nuclear power plants continued operating normally [9].
- Power outages also disrupted mobile services in Yatsushiro, Uki, and other areas after cell towers lost power [10, 11].
 - “KDDI has reported mobile phone service disruptions in parts of Yatsushiro City and Hitoyoshi City in Kumamoto Prefecture, and a total of 28 base stations in Kumamoto Prefecture.” [11]
- Japan’s Ministry of Economy, Trade and Industry (METI) warned residents about the risk of electrical fires after power restoration, advising them to switch off circuit breakers before leaving home and inspect for damage before restoring power [12].

7.6 Utilities - Water

- Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) reported ~140,000 households without water across 17 municipalities on July 28, including all of Yatsushiro City (~60,000) [13].
- ~95,200 households remained without water as of July 30 across 11 municipalities; Hitoyoshi experienced an additional ~15,000 outages from turbid groundwater [14].
- ~68 water tankers were deployed (~9.6 per 10,000 households), proportionally more than the 2016 earthquake response (108 trucks for ~446,000 households) [15].
- The city-wide water outage in Yatsushiro and Hikawa was caused by major damage to the pipeline supplying the Shiiya Water Purification Plant [16].
- In Yatsushiro, emergency water supplies were limited to approximately 5 liters per person per visit on July 31 through designated distribution points [16].
 - As of July 31, 79,000 households experiencing water outages [16]

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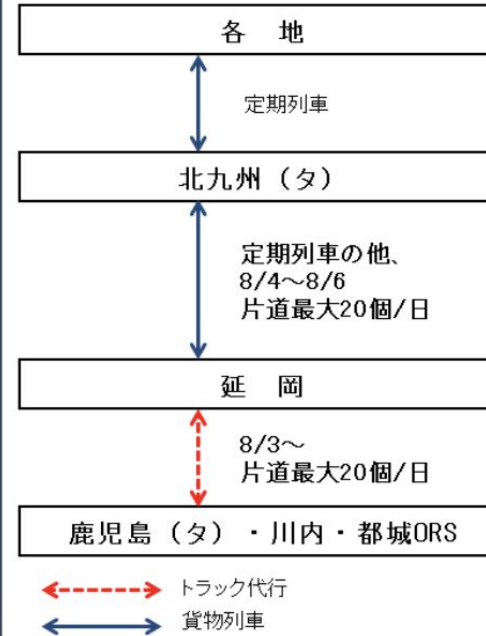
7.7 Transportation

- Preliminary reporting indicates multiple bridge collapses
 - Pedestrian Auxiliary bridge in Yatsushiro [1] [2]
 - Deck Unseating and Pounding damage visible in Kyushu Expressway [3]
 - Bridge partial collapse into the Kumagawa River [1]
- Railways
 - Downed power lines on rails in Hikawa [4]
 - Abandoned trains due to damage and derailment [5]
 - Services suspended on the Kagoshima Main Line between Sendai and Kagoshima Freight Terminal, and Tosu Freight Terminal and Yatsushiro. Hisatsu Orange line down. [5]
 - Over 200 locations of damage [17]
 - Kyushu Shinkansen bullet train line down, injuries on train [5] [6]
 - A train at Yatsushiro station was derailed and fell on its side [1]
- Airports
 - Japan Airlines Co. and All Nippon Airways Co. canceled 11 and 2 flights, respectively [6]

7.7 Transportation



< 迂回輸送・代行輸送体制 >



7.7 Transportation

- Airport
 - Japan Airlines Co. and All Nippon Airways Co. canceled and suspended 40 flights, “majority of flights are operating including the international flights to Taiwan and South Korea.” [6] [8]
 - Normal operation has ensued, safety checks completed at 7pm on Tuesday, July 28th [18]



7.7 Transportation

- Higashi-Kyushu Expressway section was closed in June for repair work, serves as key transportation link. [11]
- This section was repaved and opened directly after earthquake, to compensate for closure of the Kyushu Expressway to the west (see next slide) [10]



7.7 Transportation



Closure of expressways in red (w/ x), fixed detour in blue. [10]

7.7 Transportation



Severe unseating along Kyushu Expressway [10] [12], due to ground raising 1 m. This intersection is directly on the Hinagu Fault [12]

7.7 Transportation



7.7 Transportation



Ueyanagi Pedestrian Bridge in Yatsushiro [1] [2] (Not critical but widely reported)

7.7 Transportation

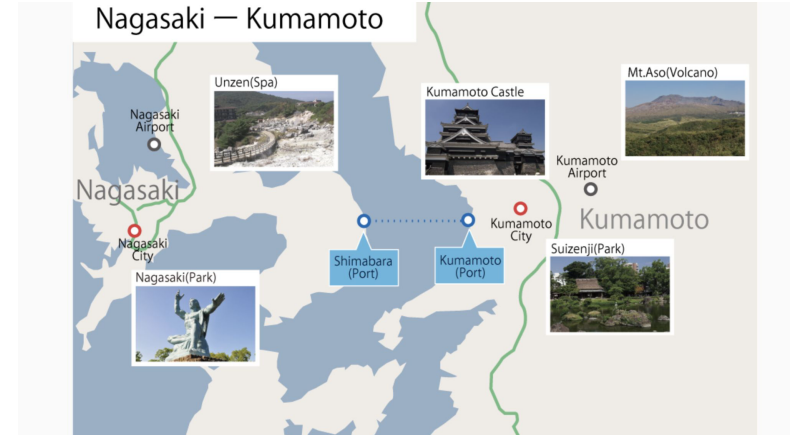
Ports - Kumamon Port Yatsushiro:

- ‘Chief Cabinet Secretary Minoru Kihara said it was hard to estimate the impact on the economy now. “Our immediate priority is to restore and repair infrastructure, including ports and other key facilities. We will also closely monitor the impact on economic activity, particularly supply chains in sectors such as semiconductors and automobiles” [13]
- Quote from the cruise ship port in Yatsushiro: “ Due to the effects of the earthquake, Kumamon Port Yatsushiro is currently conducting safety inspections of its facilities and grounds. As a result, the park will be temporarily closed until Wednesday, August 5th. We apologize for the inconvenience and appreciate your understanding. *Please note: if the closure period is extended, we will provide an updated announcement.”[14]

7.7 Transportation

Ports - Kumamoto and Mishimi Port:

- Limited information. Kumamoto Port is operational according to the Ferry website (image from there)[15], but was closed on the 29th.
 - “The earthquake that struck the Kumamoto region of Kumamoto Prefecture on the 28th has caused damage to ports located in the prefecture. At Yatsushiro Port, ground subsidence and liquefaction have been confirmed in the container yard (CY), as well as deformation of gantry crane rails. Container shipping companies calling at the port are temporarily suspending services. Multiple cracks have also appeared at Kumamoto Port and Misumi Port, and Kumamoto Ferry has decided to suspend operations at Kumamoto Port for the entire day on the 29th. The earthquake registered a seismic intensity of 7 in Uki City and Hikawa Town.” [16 (translated)]



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