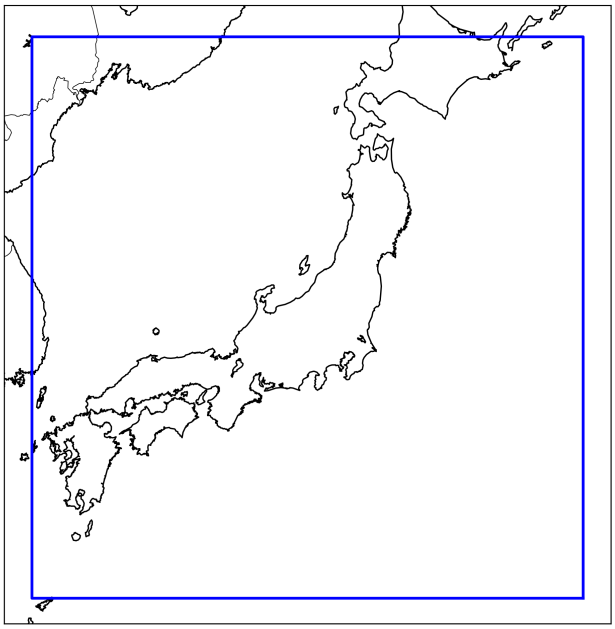


Seismic Forecast for Japan

2025 August 7th - High Seismic Risk in Japan Center

Version: 2

First Revision: 2025-02-27 14:00:00

Last Revision: Rev. 2 - 2025-08-05 00:00

Index

1. Revision History

Version	Date	Author	Description
0	2025-02-27 14:00:00	MF	Whole Japan Forecast , resolution 30 days Feb-Dec 2025 (UTC+09:00)
	https://www.academia.edu/127905650/Seismic_Forecast_for_Whole_Japan_from_2025_02_until_2025_12		
1	2025-07-15 00:00:00	MF	Finalized analysis methods and published first official version with time resolution of 7days frame.
2	2025-08-05 00:00:00	MF	Added 24 hrs resolution forecast
	using Tropospheric and GPS seismic sensors collected by JPL NASA laboratory		

2. Explanation of Terms and Concepts

About Features used to produce this forecast

We produced this forecast using the following specific source:

1. astronomical solar system data (same day - 0 shift)
2. seismic sensor GPS data (60 days shift)
3. tropospheric data (60 days shift)

The Purpose it to demonstrate the validity of using GPS + TROPO data several week before a seismic event.

Time series sharpness achievable by astronomical data only can be up to 7 days.

This study demonstrate that using augmented data in past geophysical observations can rise the time line sharpness up to 24 hrs and more.

About Graph system

*Note: **trend** graph*

Forecast graph and tables refer to a base value, against it.

For instance if a value of 37 per latitude is the base line and graph value is 0% it means that the location estimated for that period of time is UNDER 37.

Another example is for magnitude graph, with baseline Mw 7.0, 0% means no risk detected, and 100% means high risk detected

---

About Time Slot

Note: each date point represent **the beginning of the time slot**

For instance if a forecast time point is on 2025-01-01 and the graph resolution is 7 days, it's a forecast for 2025-01-01 until 2025-01-06 (UTC)

3. Features Used For Magnitude

Features Analysis Report

Generated: 2025-08-05T15:32:37.537723 **Keyword Used:** `target` **Files Processed:** 4 **Total Features in Files:** 130 **Features Matching Keyword:** 2

Complete Dataset Overview

Analysis of ALL features present in the source files

Category	Count	Percentage
Astro	46	35.4%
Tropo	49	37.7%
Pos	32	24.6%
Target	2	1.5%
Other	1	0.8%

Filtered Dataset (Used for Analysis)

Features matching keyword 'target' that were actually processed

Category	Count	Percentage
Astro	0	0.0%
Tropo	0	0.0%
Pos	0	0.0%
Target	2	100.0%
Other	0	0.0%

Detailed Features Breakdown (Filtered)

Target Features

Primary target variables for prediction

Count: 2

Features: - `Add_pred_target` - `Add_target`

File-by-File Analysis

Complete Dataset (All Features)

File	Total	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	37	16	8	10	2	1
explore_forecast.csv	29	14	8	4	2	1
cycle2_forecast.csv	56	16	23	14	2	1
cycle3_forecast.csv	59	11	29	16	2	1

Filtered Dataset (Used for Analysis)

File	Filtered	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	2	0	0	0	2	0
explore_forecast.csv	2	0	0	0	2	0
cycle2_forecast.csv	2	0	0	0	2	0
cycle3_forecast.csv	2	0	0	0	2	0

Summary Insights

Complete Dataset:

- **Astronomical data** represents 35.4% of all features (46 features)
- **Tropospheric data** represents 37.7% of all features (49 features)
- **Position/GPS data** represents 24.6% of all features (32 features)
- **Target variables** represent 1.5% of all features (2 features)
- **Dominant category in complete dataset:** Tropo features

Filtered Dataset (Actually Used):

- **Target variables** represent 100.0% of filtered features (2 features)
- **Dominant category in filtered dataset:** Target features

This report was automatically generated by the median_calculator_target_only.py script.

4. Features Used For Latitude

Features Analysis Report

Generated: 2025-08-05T15:56:05.120343 **Keyword Used:** `target` **Files Processed:** 4 **Total Features in Files:** 198 **Features Matching Keyword:** 2

Complete Dataset Overview

Analysis of ALL features present in the source files

Category	Count	Percentage
Astro	57	28.8%
Tropo	75	37.9%
Pos	63	31.8%
Target	2	1.0%
Other	1	0.5%

Filtered Dataset (Used for Analysis)

Features matching keyword 'target' that were actually processed

Category	Count	Percentage
Astro	0	0.0%
Tropo	0	0.0%
Pos	0	0.0%
Target	2	100.0%
Other	0	0.0%

Detailed Features Breakdown (Filtered)

Target Features

Primary target variables for prediction

Count: 2

Features: - `Add_pred_target` - `Add_target`

File-by-File Analysis

Complete Dataset (All Features)

File	Total	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	96	12	44	37	2	1
explore_forecast.csv	93	16	38	36	2	1
cycle2_forecast.csv	95	16	40	36	2	1
cycle3_forecast.csv	88	21	38	26	2	1

Filtered Dataset (Used for Analysis)

File	Filtered	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	2	0	0	0	2	0
explore_forecast.csv	2	0	0	0	2	0
cycle2_forecast.csv	2	0	0	0	2	0
cycle3_forecast.csv	2	0	0	0	2	0

Summary Insights

Complete Dataset:

- **Astronomical data** represents 28.8% of all features (57 features)
- **Tropospheric data** represents 37.9% of all features (75 features)
- **Position/GPS data** represents 31.8% of all features (63 features)
- **Target variables** represent 1.0% of all features (2 features)
- **Dominant category in complete dataset:** Tropo features

Filtered Dataset (Actually Used):

- **Target variables** represent 100.0% of filtered features (2 features)
- **Dominant category in filtered dataset:** Target features

This report was automatically generated by the median_calculator_target_only.py script.

5. Features Used For Longitude

Features Analysis Report

Generated: 2025-08-05T16:01:43.563125 **Keyword Used:** `target` **Files Processed:** 4 **Total Features in Files:** 160 **Features Matching Keyword:** 2

Complete Dataset Overview

Analysis of ALL features present in the source files

Category	Count	Percentage
Astro	40	25.0%
Tropo	63	39.4%
Pos	54	33.8%
Target	2	1.2%
Other	1	0.6%

Filtered Dataset (Used for Analysis)

Features matching keyword 'target' that were actually processed

Category	Count	Percentage
Astro	0	0.0%
Tropo	0	0.0%
Pos	0	0.0%
Target	2	100.0%
Other	0	0.0%

Detailed Features Breakdown (Filtered)

Target Features

Primary target variables for prediction

Count: 2

Features: - `Add_pred_target` - `Add_target`

File-by-File Analysis

Complete Dataset (All Features)

File	Total	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	97	16	38	40	2	1
explore_forecast.csv	96	17	41	35	2	1
cycle2_forecast.csv	69	10	30	26	2	1
cycle3_forecast.csv	96	17	41	35	2	1

Filtered Dataset (Used for Analysis)

File	Filtered	Astro	Tropo	Pos	Target	Other
cycle1_forecast.csv	2	0	0	0	2	0
explore_forecast.csv	2	0	0	0	2	0
cycle2_forecast.csv	2	0	0	0	2	0
cycle3_forecast.csv	2	0	0	0	2	0

Summary Insights

Complete Dataset:

- **Astronomical data** represents 25.0% of all features (40 features)
- **Tropospheric data** represents 39.4% of all features (63 features)
- **Position/GPS data** represents 33.8% of all features (54 features)
- **Target variables** represent 1.2% of all features (2 features)
- **Dominant category in complete dataset:** Tropo features

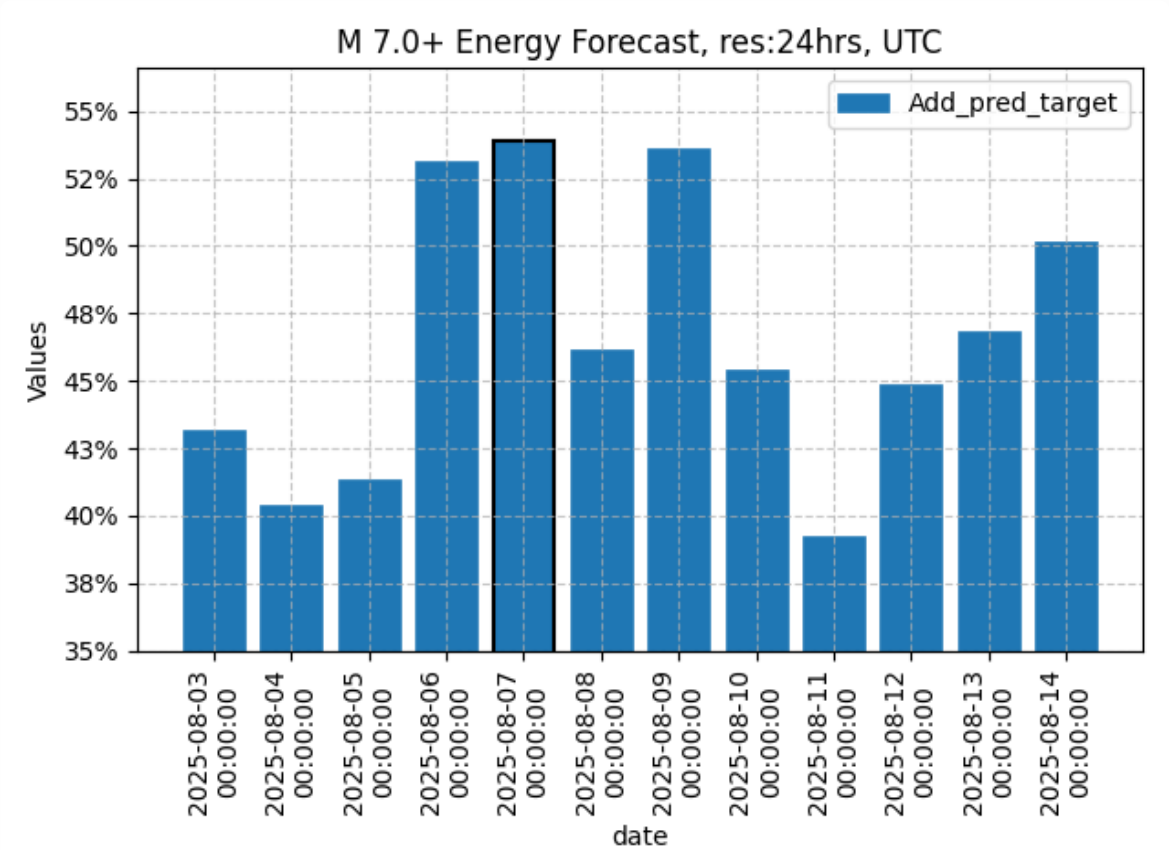
Filtered Dataset (Actually Used):

- **Target variables** represent 100.0% of filtered features (2 features)
- **Dominant category in filtered dataset:** Target features

This report was automatically generated by the median_calculator_target_only.py script.

6. Forecasts

6.1 M 7.0+ Energy Forecast, res:24hrs, UTC

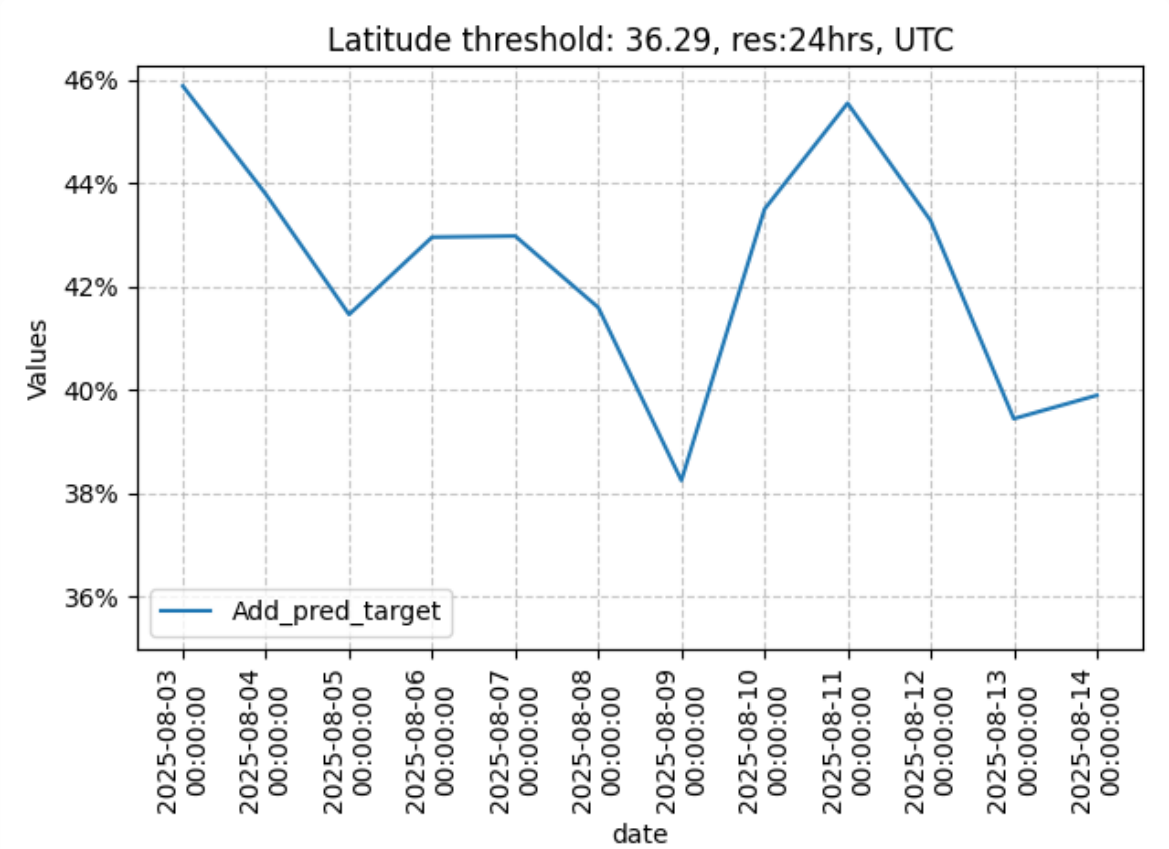


⚠ Higher Risk Detected for Following Dates:

- 1. from 2025-08-07 to 2025-08-08 (UTC) - Risk Value: 0.539

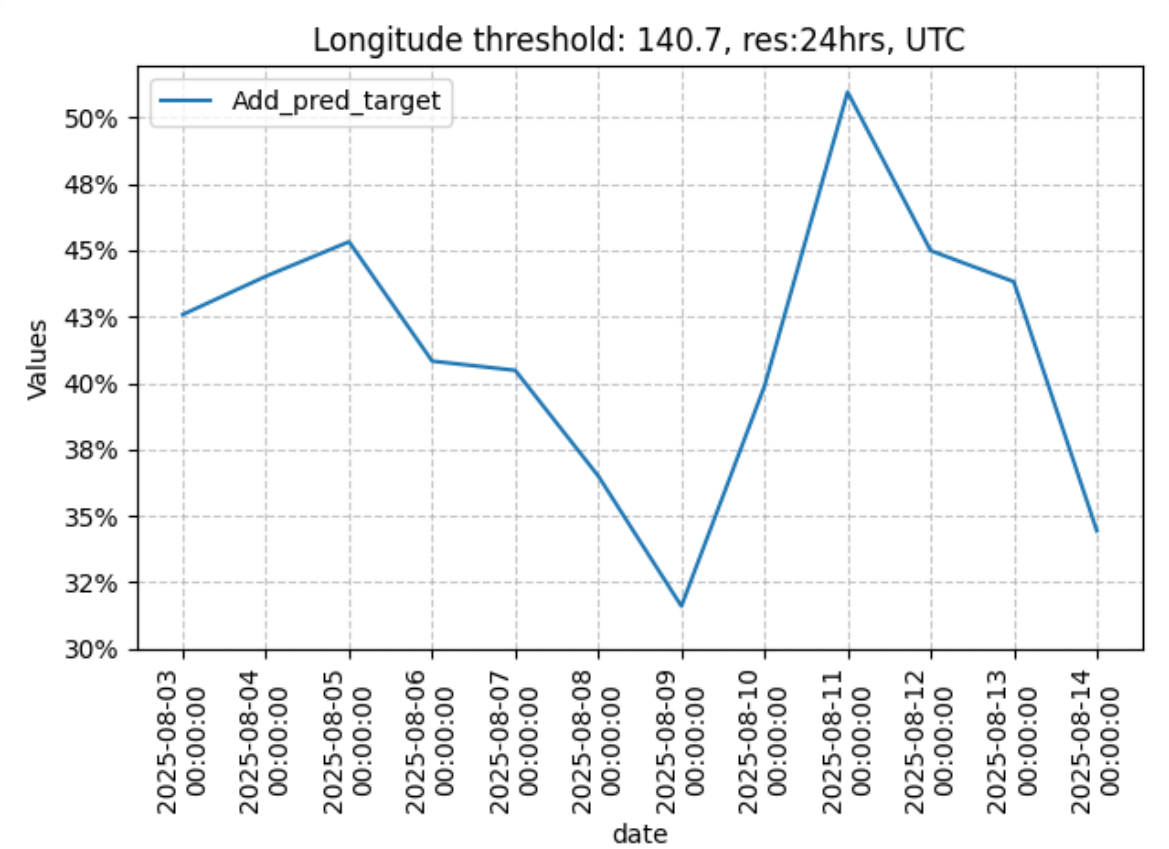
Each date represent the BEGINNING of time slot

6.2 Latitude threshold: 36.29, res:24hrs, UTC



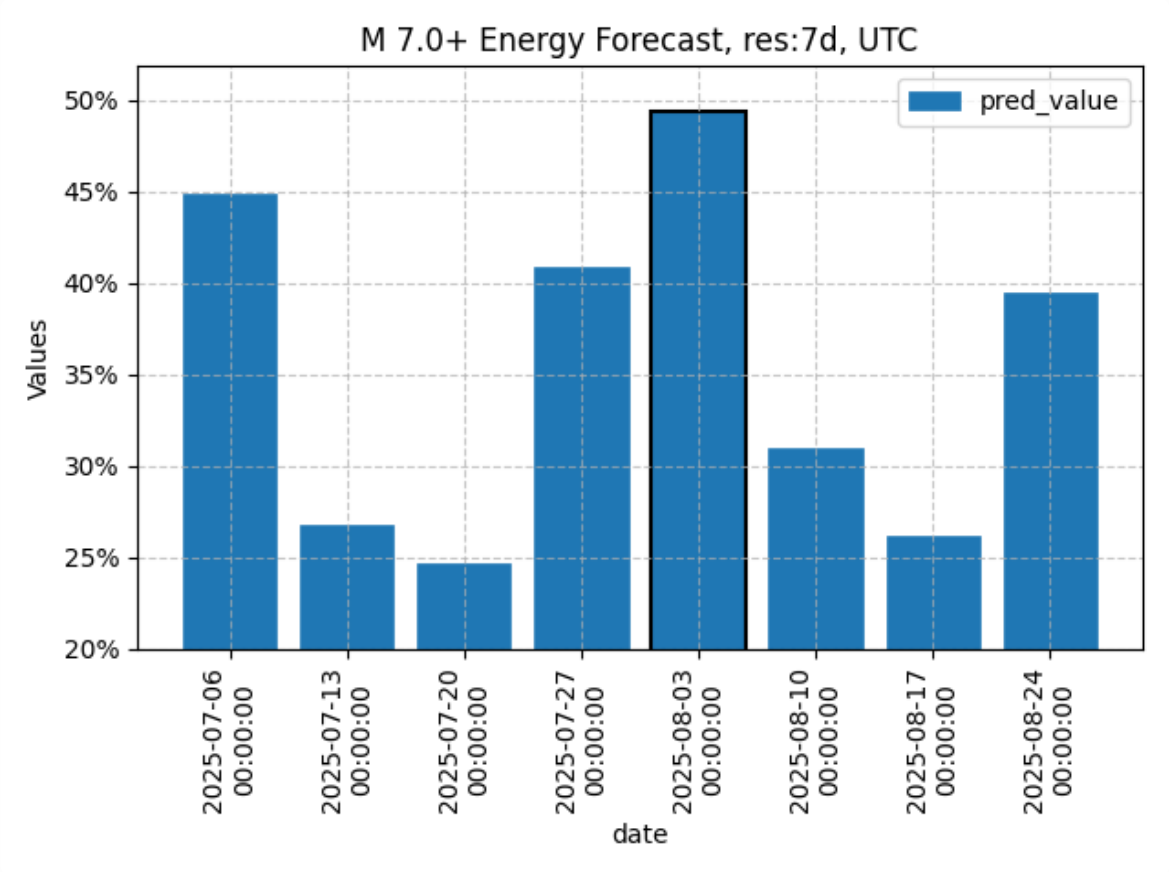
> *>50%:North Japan, < 40%:South Japan, 40%-50%: Middle Japan*

6.3 Longitude threshold: 140.7, res:24hrs, UTC



> *>50%:East Japan, < 40%:West Japan, 40%-50%: Middle Japan*

6.4 M 7.0+ Energy Forecast, res:7d, UTC

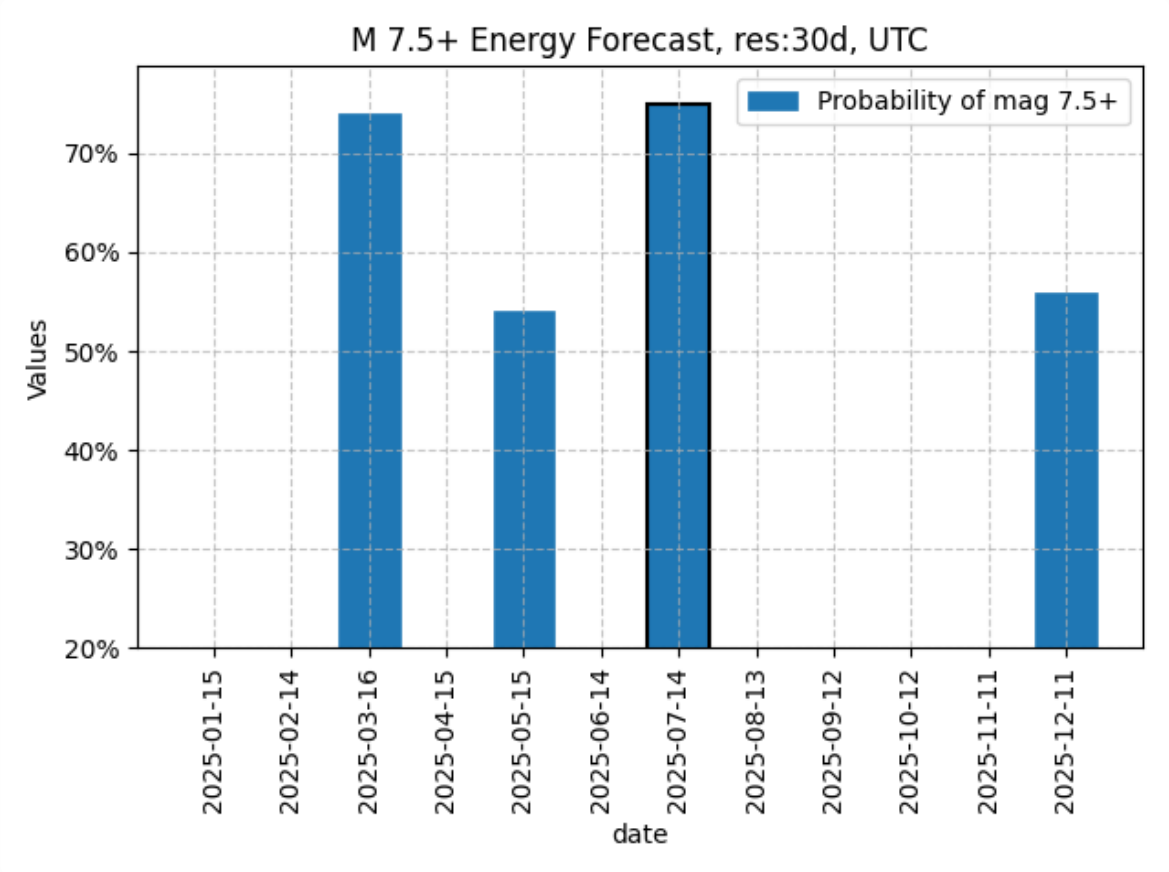


⚠ Higher Risk Detected for Following Dates:

- 1. from 2025-08-03 to 2025-08-10 (UTC) - Risk Value: 0.494

Each date represent the BEGINNING of time slot

6.5 M 7.5+ Energy Forecast, res:30d, UTC



⚠ Higher Risk Detected for Following Dates:

- 1. from 2025-07-14 to 2025-08-13 (UTC) - Risk Value: 0.750

Each date represent the BEGINNING of time slot

7. Summary and Conclusion

Summary of Findings

Risk detected of a significant seismic event in following time/space of Japan: ***time: 2025-08-07 (UTC)***

Conclusions

1. **Increased Risk:* detected for 2025-08-07 in Center of Japan
2. **Recommendations:** It is advised to review preparedness protocols for the identified high-risk areas. Continuous monitoring is essential.

8. Attribution and Disclaimers

Data Sources

- Seismic data utilized in this report is sourced from the **USGS Earthquake Catalog** and the **Japan Meteorological Agency (JMA)**.
- Planetary ephemeris data provided by **NASA/JPL Horizons System**.
- All tropo + gps positional data provided by **NASA/JPL**

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Responsibility Statement

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