Seismic Forecast Region: Alaska

Seismic Energy Forecast for Alaska

Critical Period: January 21, 2026 to January 27, 2026

Version: 0

First Revision: 2025-12-16 05:39:40

Last Revision: Rev. 0 - 2025-12-16 05:39

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1. Revision History

Version	Date	Author	Description
0	2025-12-16 05:39:40	MF	Seismic Energy Forecast for Potential Earthquake or Eruption in Alaska
	first emission		

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

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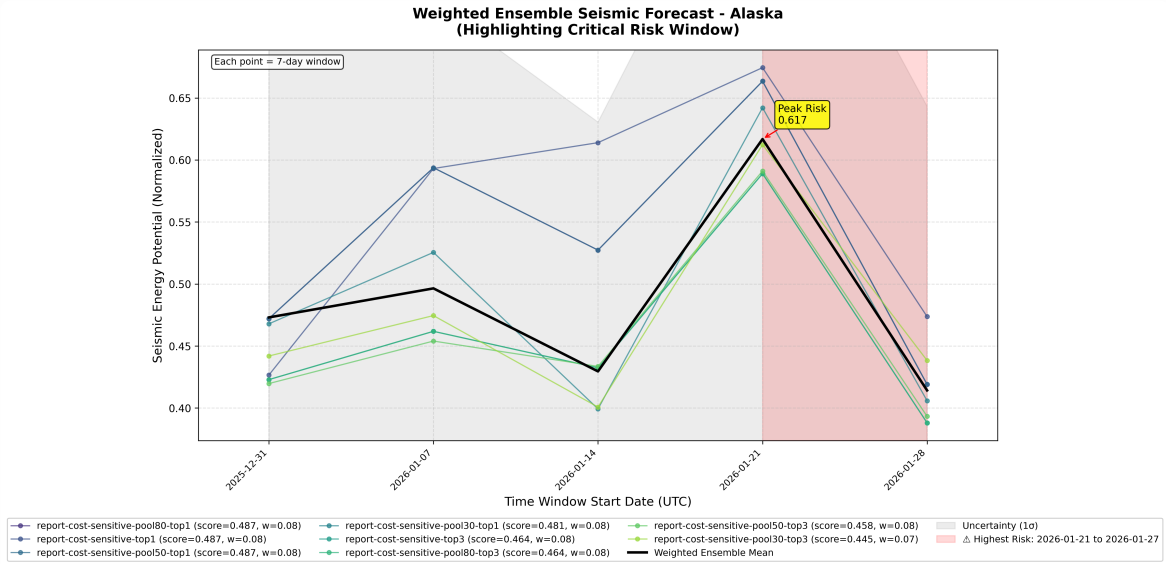
About Time Slot

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)

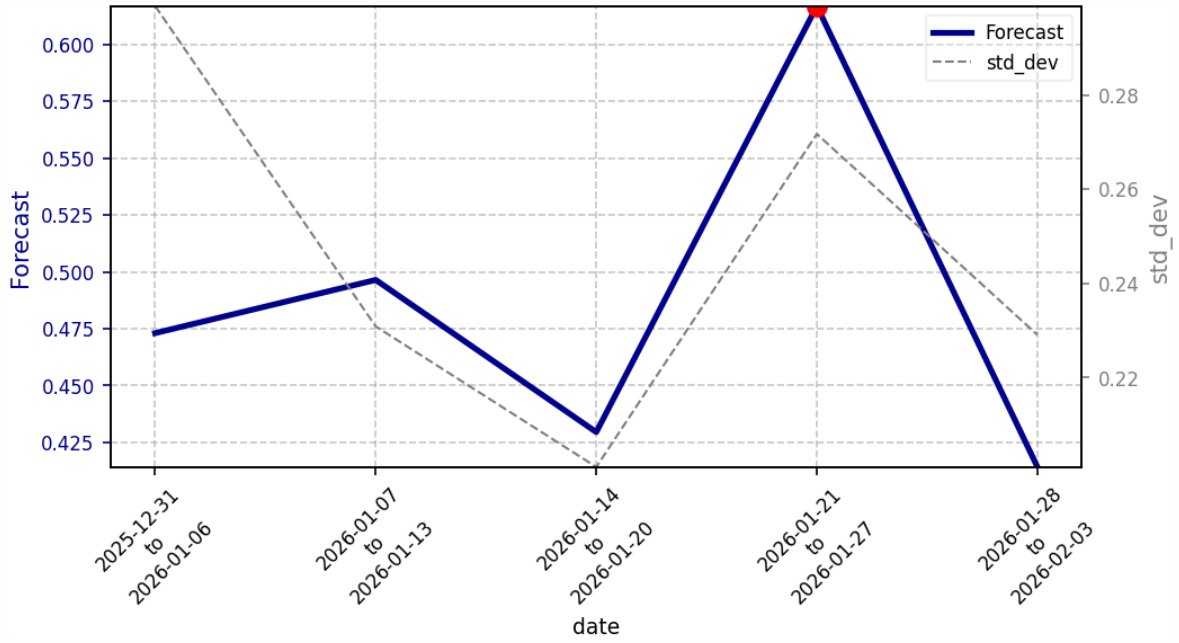
3. Forecasts

3.1 Ensemble Consensus Forecast with Critical Window



Rank	Model	Metric	Score	Weight
1	report-cost-sensitive-pool80-top1	cost_sensitive+precision	0.487	8.04%
2	report-cost-sensitive-top1	cost_sensitive+precision	0.487	8.04%
3	report-cost-sensitive-pool50-top1	cost_sensitive+precision	0.487	8.04%
4	report-cost-sensitive-pool30-top1	cost_sensitive+precision	0.481	7.94%
5	report-cost-sensitive-top3	cost_sensitive+precision	0.464	7.66%
6	report-cost-sensitive-pool80-top3	cost_sensitive+precision	0.464	7.66%

3.2 Time Window Risk Assessment



> *Each row represents a 7-day forecast window. Risk scores indicate relative probability of significant seismic activity.*

4. Ensemble Methodology

Ensemble Methodology & Model Weights

Overview

Weighted ensemble of independent model configurations. Weights are proportional to validation scores (higher score → larger influence).

Time Windows

Forecasts represent time windows (not single days); values indicate the probability of significant seismic activity within the window. - Window duration: 7 days - Windows analyzed: 5

Weights

$$ W*i* = *dfrac{S*i}{\sum*j S*j} $$

Uncertainty (1σ)

Computed as weighted standard deviation: $$\sigma*t* = *sqrt{\sum*i W*i (x*{i,t}-\mu_t)^2}$$

Highest Risk Window

2026-01-21 to 2026-01-27 — 7 days — score **0.6169**

Top Contributing Models (compact)

Rank	Model	Score	Weight
1	report-cost-sensitive-pool80-top1	0.4873	8.04%
2	report-cost-sensitive-top1	0.4873	8.04%
3	report-cost-sensitive-pool50-top1	0.4873	8.04%
4	report-cost-sensitive-pool30-top1	0.4812	7.94%
5	report-cost-sensitive-top3	0.4638	7.66%
6	report-cost-sensitive-pool80-top3	0.4638	7.66%
7	report-cost-sensitive-pool50-top3	0.4580	7.56%
8	report-cost-sensitive-pool30-top3	0.4451	7.35%
9	report-f1-pool50-top1	0.3150	5.20%
10	report-f1-top1	0.3150	5.20%

Only top contributing models shown.

5. Top Contributing Models

Top Contributing Models

The following table lists the highest-performing models that contributed to this ensemble forecast. Models are ranked by their validation score (weighted influence).

Rank	Model Name	Metric	Score	Weight
1	report-cost-sensitive-pool80-top1	cost_sensitive+precision	**0.4873**	**8.04%**
2	report-cost-sensitive-top1	cost_sensitive+precision	**0.4873**	**8.04%**
3	report-cost-sensitive-pool50-top1	cost_sensitive+precision	**0.4873**	**8.04%**
4	report-cost-sensitive-pool30-top1	cost_sensitive+precision	**0.4812**	**7.94%**
5	report-cost-sensitive-top3	cost_sensitive+precision	**0.4638**	**7.66%**
6	report-cost-sensitive-pool80-top3	cost_sensitive+precision	**0.4638**	**7.66%**
7	report-cost-sensitive-pool50-top3	cost_sensitive+precision	**0.4580**	**7.56%**
8	report-cost-sensitive-pool30-top3	cost_sensitive+precision	**0.4451**	**7.35%**
9	report-f1-pool50-top1	f1	**0.3150**	**5.20%**
10	report-f1-top1	f1	**0.3150**	**5.20%**
11	report-f1-top3	f1	**0.2970**	**4.90%**
12	report-f1-pool50-top3	f1	**0.2954**	**4.88%**
13	report-cost-sensitive-subtract-bad-top1	cost_sensitive+precision	**0.2828**	**4.67%**
14	report-cost-sensitive-subtract-bad-top3	cost_sensitive+precision	**0.2807**	**4.63%**
15	report-f1-subtract-bad-top1	f1	**0.1575**	**2.60%**
16	report-f1-subtract-bad-top3	f1	**0.1535**	**2.54%**
17	report-cost-sensitive-only-negative-top3	cost_sensitive+precision	**0.0976**	**1.61%**

Rank	Model Name	Metric	Score	Weight
18	report-cost-sensitive-only-negative-top1	cost_sensitive+precision	**0.0784**	**1.29%**
19	report-f1-only-negative-top3	f1	**0.0101**	**0.17%**

Note: Only models with positive weights (>0%) are shown.

6. Summary and Conclusion

Summary of Findings

The weighted ensemble analysis of 24 independent model configurations identifies the following **highest-risk time window** for significant seismic activity in Alaska:

⚠ Critical Period: 2026-01-21 to 2026-01-27 (UTC)

- **Duration**: 7 days
- **Ensemble Risk Score**: 0.6169
- **Model Agreement**: 56.0% consensus

Conclusions

Based on the weighted ensemble of 19 validated models, elevated seismic energy is forecasted for Alaska during the period **January 21, 2026 through January 27, 2026**.

This represents the time window with the highest consensus risk score across all model configurations.

7. 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

The analysis and conclusions represent the best judgment of our research team based on the available data. This is not an official warning or alert. For official information, please consult your local government and geological survey authorities.