

Earthquake Energy Rise on Earth

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Abstract

This article presents a method of monitoring earthquake activity on the planetary scale using the data of all individual earthquakes on Earth since 1973, available from US Geological Survey (USGS) [4]. The method reveals that in recent years the annual earthquake energy on Earth has increased **five times** and that its trend is to grow in the future.

Introduction

Earthquakes on Earth are reported and classified using a logarithmic scale, such as the Richter-scale magnitude.

Using the logarithmic quake data statistics it is difficult to monitor trends and detect changes in seismic activity on Earth.

This article presents a method of monitoring seismic activity on Earth on the basis of the accumulated annual energy of all observed earthquakes.

Earthquake energy

Energy E of an earthquake can be estimated from its magnitude M as follows [1]:

$$E = 10^{(c+1.5M)} = A 10^{1.5M} \quad (1)$$

Where $A=10^c$ is a constant. Traditionally c is chosen in such a way that the energy of an earthquake of the magnitude 4.0 matches the energy of exploding 1 kiloton of the TNT explosive. [2]

The accumulated energy of all earthquakes in a year K can be computed by adding the energy values of all earthquakes during that year.

$$E_K = A \sum_K 10^{1.5M_i} \quad (2)$$

For practical purposes it is convenient to calculate the annual earthquake energy ratio η_K , relative to the year when reasonably accurate earthquake records began. In the case of the USGS earthquake database, the “reference year” is 1973.

$$\eta_K = \frac{\sum_K 10^{1.5M_i}}{\sum_{1973} 10^{1.5M_i}} \quad (3)$$

The annual earthquake energy ratio η_K is independent of the arbitrary constant A .

Rising Earthquake energy on Earth

The plot of η_K for the period 1973 to 2007 computed from all 257,509 earthquakes of magnitude 4.0 and above in the USGS quake database is presented in Fig 1. The plot demonstrates that the energy of large quakes (7.0M and above) grows faster in time than energy of quakes above 4.0M. (see [5] for details). The year 2008 is omitted because at the time of writing of this article the year 2008 has not finished and the author prefers to avoid extrapolations.

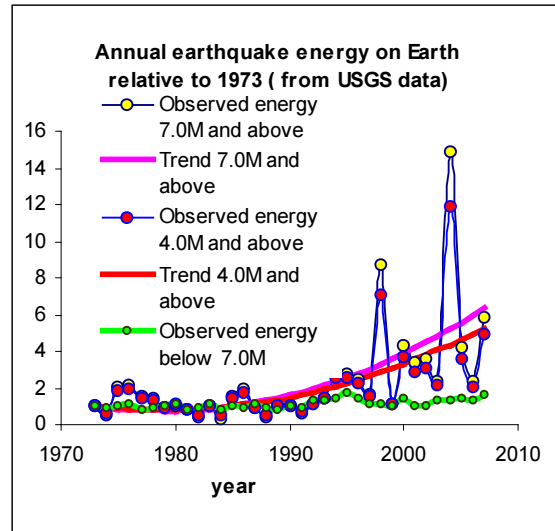


Fig 1. History of the annual earthquake energy ratio η_K in the period 1973 - 2007, computed from the USGS earthquake database in cooperation with A.Soderlund

Fig 1 demonstrates that the annual earthquake energy of large quakes has increased about 6 times in recent years and that it has a tendency to grow in the future. It also shows that smaller quakes (<7.0M) become increasingly insignificant, which indicates a systematic change to the fundamental mechanism of the seismic activity on Earth.

The result presented above is not theoretical. It represents the Observed Reality, because it is computed directly from accurate and cross-verified seismic records kept at USGS.

Conclusions

The observed 5-fold increase in annual earthquake energy in the period 1980-2007 and the rapidly increasing trend are alarming.

Results presented in this article indicate that the main danger for humanity on Earth may come not from a slow climate change, but from the rapidly increasing seismic/tectonic activity.

In the period of time when the planetary climate changed by a small fraction of one degree, earthquakes have become 5 times more energetic. How long do we need to wait until someone brings this problem to our awareness?

Awareness of the problem is essential not only to explain the reason for the observed phenomenon but also to consider possible solutions.

What could be a reason for the observed 5-fold increase in annual earthquake energy?

According to the currently adopted dogmas the planetary interior “crystallizes” in time and hence becomes more solid. Motion of tectonic plates should therefore become slower and the associated seismic activity should not increase in time.

And yet, historic earthquake energy observations presented above in this article

demonstrate that the behavior of the Real Planet is exactly the opposite. Something must be fundamentally wrong with the currently adopted planetary interior theories. One of the most plausible explanations for the systematic increase in seismic/tectonic activity is overheating of the planetary interior.

NASA measurements from space confirm [3] that Earth as a whole absorbs more energy from the Sun than it is able to radiate back to space. Hansen et al state [3] that this energy imbalance is 0.85 ± 0.15 Megawatts per square kilometre. This is not a theory - it is an observable fact [3], just like earthquakes.

Since Earth absorbs more energy than it can radiate, the whole planet overheats, not just the atmosphere.

Specifically, the heat that is generated in the planetary interior (as a result of decay of all radioactive isotopes there) is trapped and the planetary interior temperatures rise. The overheating occurs because the only way for the radionic heat to escape from the planetary interior is through the surface, but the surface receives more energy than it is able to radiate away.

Planetary interior overheating is the most serious consequence of so-called “global warming” and constitutes the main danger for humanity on Earth today.

References

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