A Write-up on Non-Earthquake Seismic Events
By Robert Rogness

Pre-feedback visualization:

[Non-Earthquake Seismic Events USGS Data v1](#)

Post-feedback visualization:

[Non-Earthquake Seismic Events USGS Data v2](#)

Summary

The most well-known seismic event is an earthquake. But there are other event types that cause the ground to shake. With the help of the USGS's data, I thought it would be interesting to go through these event types and look at where and when the strongest magnitude events have occurred.

Design

At first I thought of looking at the average magnitude by time period and by country. But since the data does not show all events, I decided that it would be most honest and interesting to look at the largest magnitude events instead. Initially line charts, I changed to dots after switching to looking at the largest magnitude events. A line chart implies correlation to the previous and following data points. But the largest magnitude event in 1992 has no relation to the largest events in 1991 and 1993, so I switched to points.

After the intro story point, I made an overview story point for the data. I wanted to show the bias of the data towards the United States and towards events occurring in the past 40 plus years. So comparing the number of events for the United States and the number of events for other countries by year. Then briefly introducing that we will be going into more detail later.

For the most part I stuck to a pattern of title card, timeline, and map. Depending on how crowded the data timeline was, I showed the data by month and year, quarter and year, or all the data. For mine explosions and nuclear tests I also included a bar graph showing the total number of events by quarter and year, or month and year. For these two events I thought it would be interesting to supplement the plot above.

While the timeline gave a temporal sense of when these events took place, I felt a map was needed to give a physical sense of where these events took place. For the most

part, showing the country or county was enough. But there were times when there was not enough data, so I felt it was better use both a zoomed in map along with a zoomed out map to give a better sense of where the events took place. The default maps, when zoomed in closely, show nothing but grey. So I thought using satellite backgrounds would be more interesting for the reader.

There is a lot of information in each plot. So to keep things clean, I highlighted interesting individual events and the rest of the data can be seen by hovering over it. There are also a lot of plots to look through, so I added little animated (when able to) title cards for each seismic event type to break things up. After collecting feedback, I added a written introduction to make the limitations of the data more clear. I also made the titles better reflect the plots shown.

Feedback

From my Father:

General comments:
- The titles for several of the timeline charts say Largest Seismic Events… Is the data just the largest events or is it all events of each type? I understood that the charts include all incidents of that type, but the title confuses me. If they only include the largest events, that should be defined early on.
- A general comment on your Timeline sheet titles. Some refer to quarterly data and some monthly. Since months or quarters are not visible on the chart, you could say "… by month and year" or "… by quarter and year".
- Several of your notes in the miscellaneous section refer to volcanos as the cause. Shouldn't they be on the Volcano page? I would expect to see Mt St Helens in the volcano section. Having said that, I really like what you did with the Hawaiian eruptions data. Could you do the volcano section including all volcanos like the other sections, then include your Hawaiian volcano pages following as a demonstration of drilling down into the data.
- Its not clear if you have the sections in your final order. My recommendation would be to sort the most impactful first to the least, with the Misc. section last.
- In the summary section, it might be informative if you can add a note that compares the number of Earthquake events to non-earthquake events i.e. "Over the period (whichever one you use) the total number of non-earthquake events represent XX% of the total number of events recorded by the USGS." Provides some additional context. Not required, just a nice to have.
- This is a nit: on your map pages, the color coding for magnitude 2-3 when showing magnitude is almost the same color as the map shading. So, on the landslide map, the dot on Hawaii is hard to see, except for the note pointing it out.

- On the timeline page for misc. events, when you hover over a data point it shows two different locations (I assume one too many fields shown?) I don't see that on the other tables
- Landslides map: the note for Greenland has a repeated phrase
- Quarry blast map: when hovering over the locales, the magnitude field doesn't pull through to the little floating table

Sheet 1 (non-eq seismic event types) I'm wondering if titling this section as summary or overview would help the reader visualize the flow of the report from sheet to sheet.

First chart
- The first chart shows magnitudes and the second shows number of events. That confused me initially. I kept trying to match up something from the first chart with the second. To make even clearer, I would add to the title of the first chart *Magnitude of* Non-Earthquake Seismic Events.
- In the sub-title, I would add something like "(Richter scale)" so the reader knows what the vertical axis numbers represent. Alternatively, it could be added in parenthesis to the vertical axes.
- After I sorted the table, the titles of the columns drop to the bottom of the column rather than stay at the top. I think there is a setting to exclude titles from the data sort

Second Chart
- Good table to show the limits of the data. One question I have is if the "other countries" data that is shown represents a complete picture of those years. I see the note stating that it is very use focused on the US. What's not clear for me is if that reflects that there wasn't international data in the earlier years (as you document), or if it means that the intl. data in later years is incomplete or both.

Potential new chart
- Consider adding a chart that shows the total number of events (sum of years) by type of event. This could also be an added column in the first chart. (answers the question how many of each event type.) another nice to have

Resources

[USGS - Search Earthquake Catalog](#)

[USGS - ANSS Comprehensive Earthquake Catalog (ComCat) Documentation](#)

[Stack Overflow - I would like help optimizing a triple for loop with an if in statement](#)

[Tableau Community Forums](#)