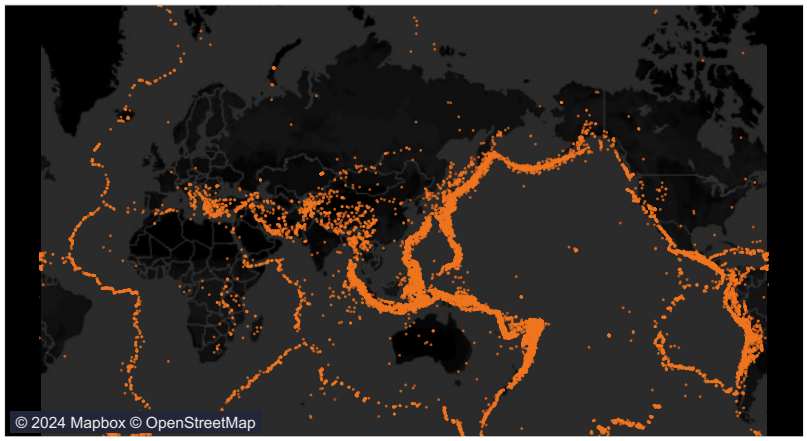
EarthQuake

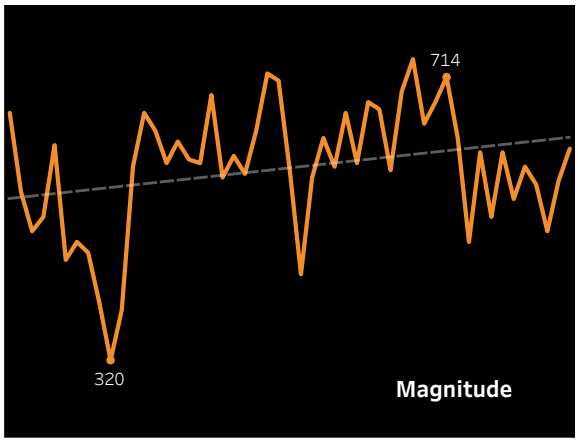
Analysis of 50 years Earthquake data	Earthquake Depth Analysis	Aftermath and occurence of Earthqu..	Non Earthquake seismic activity	K-means Clustering

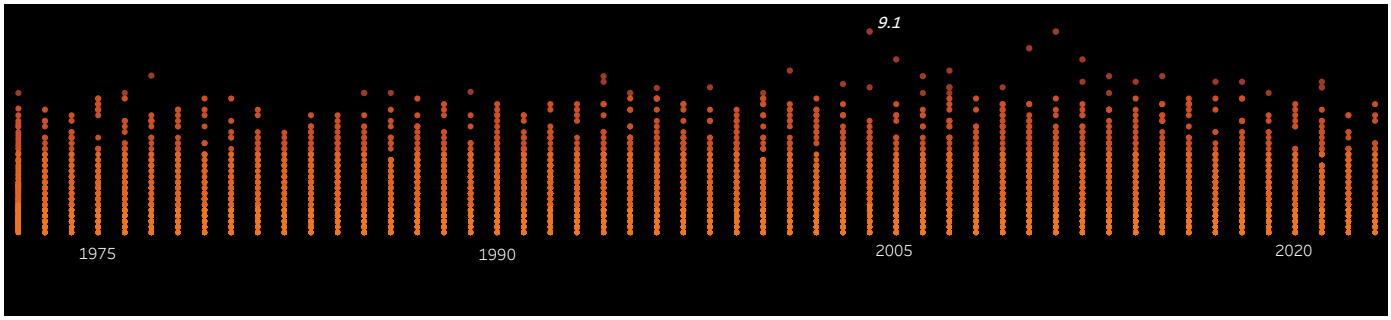
EARTHQUAKES USGS

Total EarthQuake	Totla Damage	Total Death	Total Injured	Countrires Effected
24,214	$927B	1.41M	2.93M	116

The **Ring of Fire** is a 25,000-mile horseshoe-shaped ring that spans the **Pacific Ocean** and is known for its frequent volcanic eruptions and seismic activity. The region is home to about 90% of the world's **earthquakes**. In the below visual, we explore the seismic activity in this region over the past 50 years. Over the last 50 years, there has been 14% **increase** in the number of earthquakes with a positive trend line indicating a consistent rise in seismic activity. In a single year, **2011** recorded a historic peak of 714 earthquakes, while in contrast, **1981** had a historic low of only **320** earthquakes. The **Indian Ocean region** experienced the largest earthquake in the past 50 years, which occurred in **2004** and had a magnitude of 9.1.







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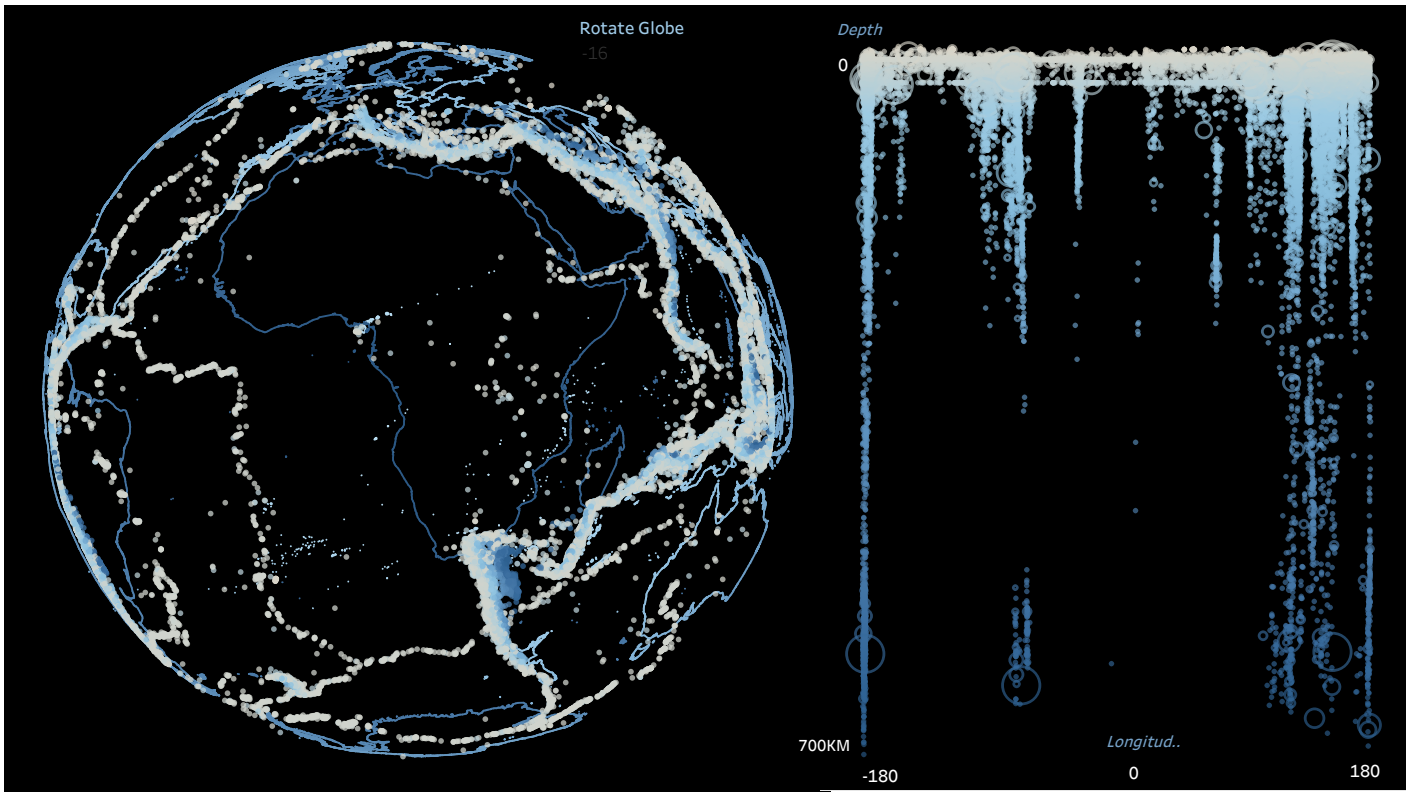
Earthquake Depth analysis

The depth graph displayed on our dashboard depicts the occurrence of earthquakes over the last 50 years, highlighting their depths ranging from **0 to 700 kilometers**. Majority of the earthquakes happens in earth crust and upper mantle. The **depth** of the earthquakes is indicated by the color, whereas the size of the bubble represents the **energy** released in joules, which is calculated using the equation **Log E= 4.5+1.5M**. As the magnitude of the earthquake increases, the energy released also increases, which is clearly illustrated by the varying size. And Majority of the **high energy and more deep earth quake** happening near the **Ring of Fire** regions. And also we can infer that, there are more **frequent earthquakes** occuring in **earth's shallow part .**



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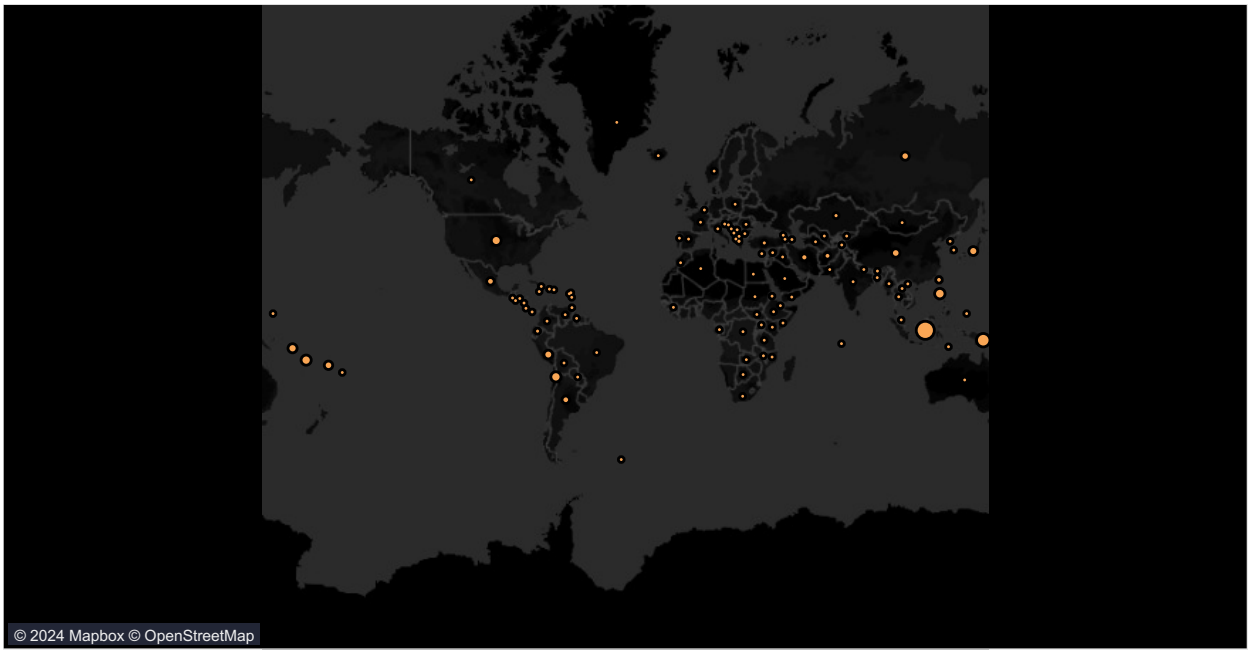
Earthquake aftermath analysis

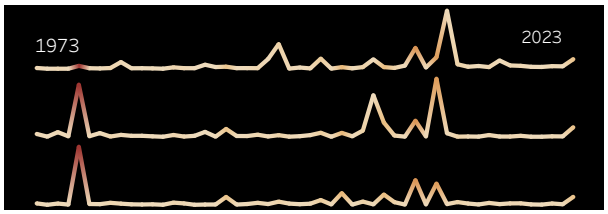
Hover over map for detailes

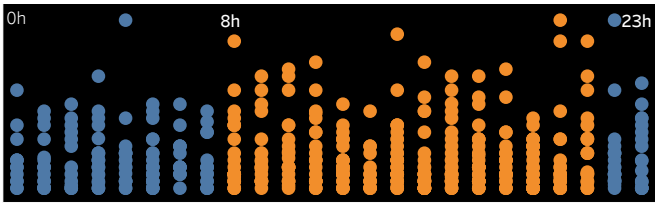
To explore patterns and trends over last 50 years in earthquake occurrence and depth of earthquakes across different region..



Over the past 50 years, earthquakes have caused a staggering $927 billion in damages, claiming the lives of 1.41 million people and leaving 2.93 million injured.

examining the timing of earthquakes in the USA, we gained insights into the potential influence of day/night cycles on seismic activity. we see a relatively equal distribution of earthquakes occurring during day and night times, with a slightly higher occurrence in the day time.





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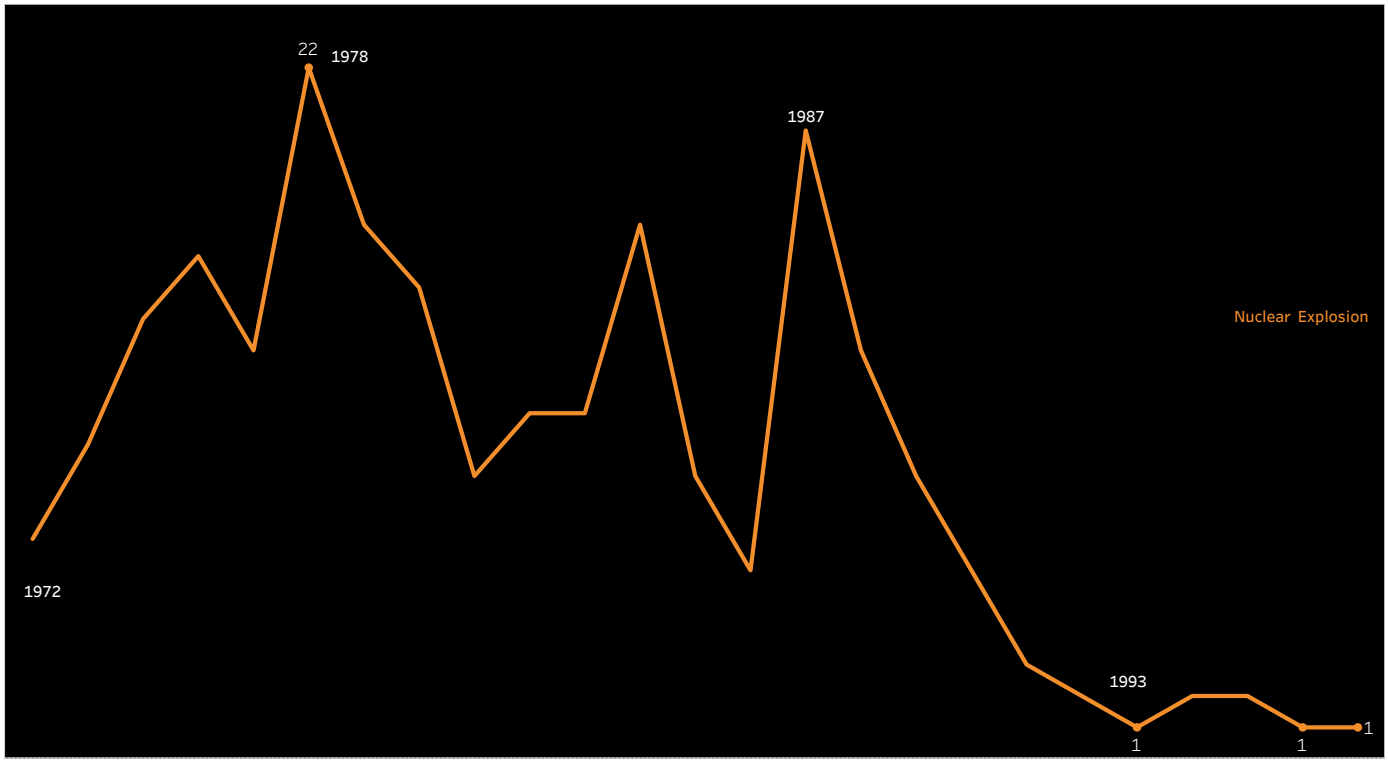
Seismic activity Due to non Earthquake Factors

In the below line graph of nuclear explosion of 50 years, we can observe that in **1987**, there was a **20 nuclear explosion** of magnitude greater than **5.5** occured. But then it was exponentially decreased due to the **Intermediate-Range Nuclear Forces Treaty(INF)** between USA and Soviet Union.



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K-means Clustering

The purpose of using k-means clustering in this context would be to identify any underlying patterns or clusters.By applying k-means clustering to the data, we can group earthquakes that have similar characteristics, such as magnitude, depth, and location, into distinct clusters. The cluster represented by red contains a significantly greater number of earthquakes with a magnitude of 7 or higher. On the map, the two clusters of centroid epicenters are displayed in cross, Notably, the cluster with a magnitude exceeding 7 is located on the eastern coast of the world.