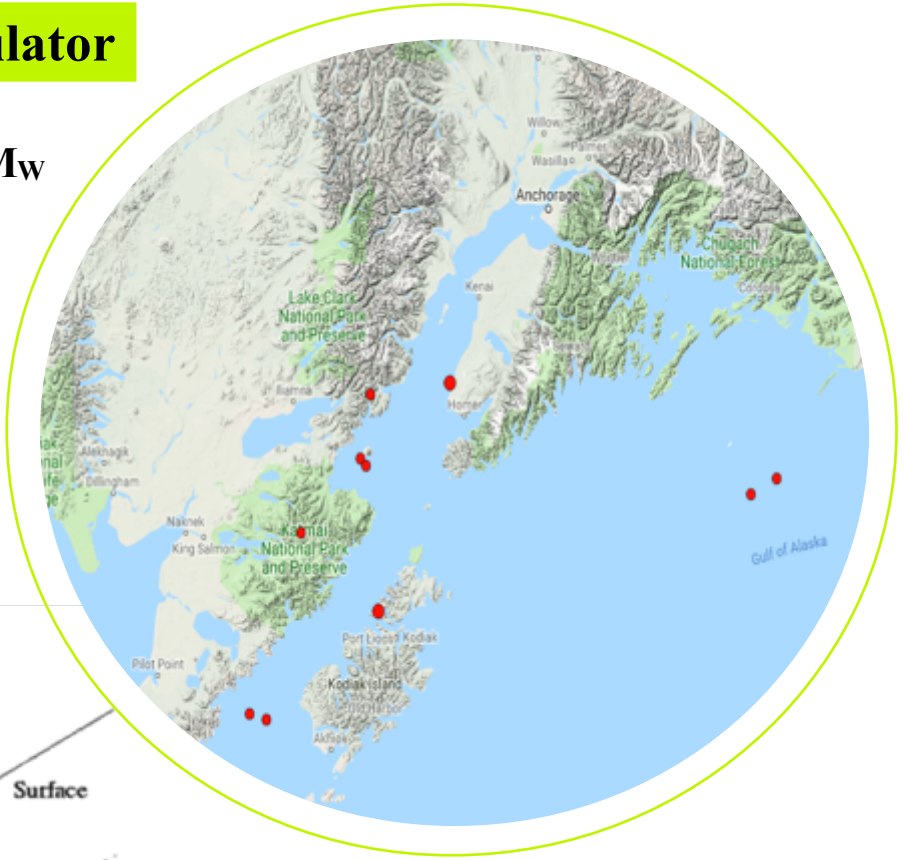
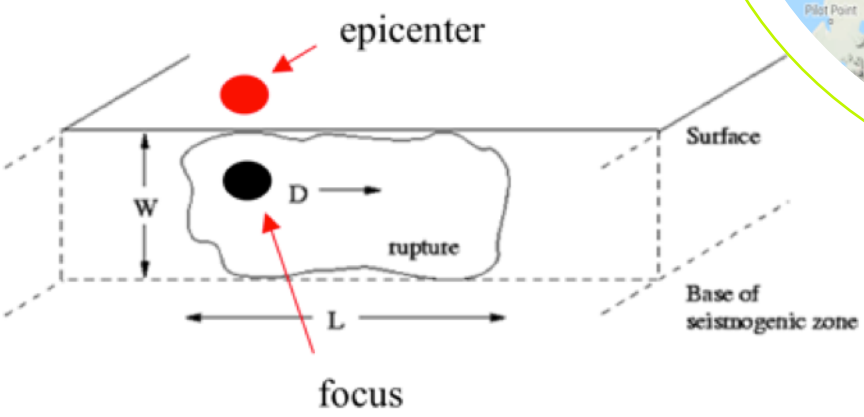
Moment Magnitude Calculator



Moment Magnitude abbreviated **M_W** is the total moment release of an earthquake. The moment is measured as the product of the distance moved by the fault slip and the force needed to move the fault. The data is found and derived from multiple stations near and around the epicenter.



"Earthquake Glossary-Seismic Moment." *U.S. Geological Survey*.

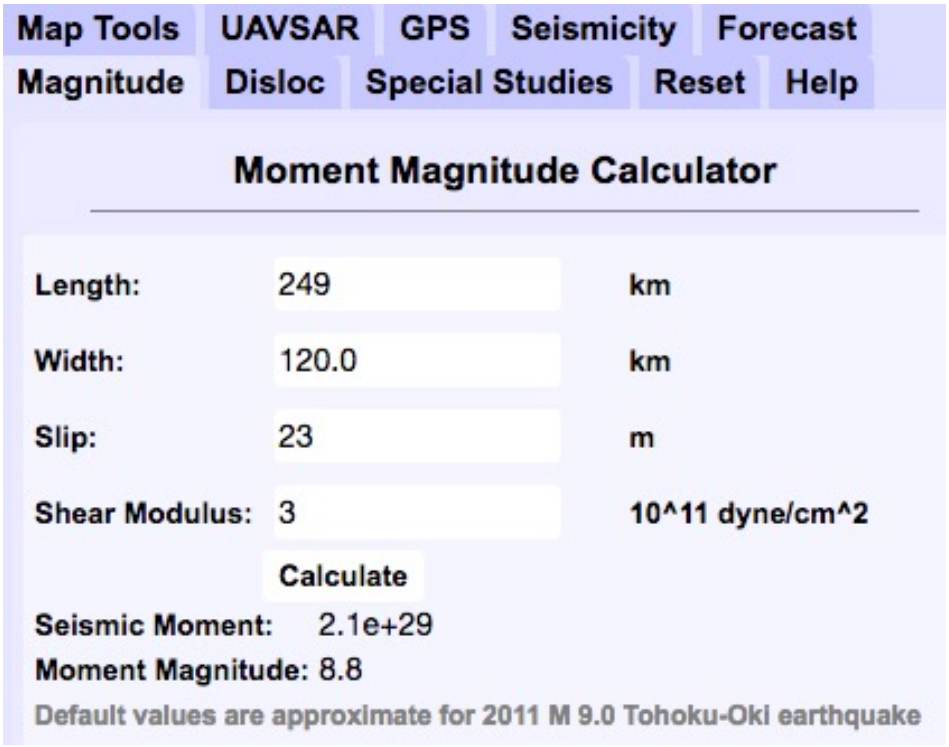
In the diagram on the lower left we see an example of an earthquake, with the epicenter representing the red dot and the focus representing the black dot.

The shear modulus or μ is

3.2×10^{11} dynes/cm^2 in the crust

7.5×10^{11} dynes/cm^2 in the mantle

The area (km^2) can be found as shown in the diagram by using the length (L) and width (W). The slip (meters) is the average displacement (D) of the rupture.



Within GeoGateway, the moment magnitude can be calculated by clicking on the "Magnitude" tab. Once the page is loaded, insert the **length**, **width**, **slip**, and **shear modulus** (in units shown) to calculate the moment magnitude as shown in the image above of an example of the M_W 9.0 Tohoku-Oki earthquake.