

## EARTHQUAKES AND VOLCANOES

### Research Paper Assignment

The purpose of this “research paper” exercise is two-fold: first, to gain experience finding information on the internet and from other sources, and second to familiarize yourself with a current (this semester) earthquake (EQ) or volcanic eruption, so you understand it well enough to a) relate it to dynamic Earth processes, b) explain the event and the damage it caused, and c) summarize its importance and impact on society.

First, decide on a topic; do a little research to make sure you can locate appropriate information, and post your topic choice on the Choice Topic Assignment by the due date (to avoid duplication.) Please try and select an event with some significance--you will undoubtedly find more information for the larger magnitude events. For example, you might select a state or country you would like to learn more about, and determine the most recent EQ or volcanic eruption there. You are not permitted to select any of the case study topics previously discussed in class.

Information for the paper should be obtained from a variety of sources, including books in the library, journal articles, and mainly reputable web sites, and should be properly cited. At least 3 or 4 sources should be used for the paper (blend of reviewed printed sources, such as newspaper and journal articles or books, and the internet-but beware-do not trust any one website-confirm and verify).

The paper should address three main aspects: 1) how the particular EQ or eruption relates to plate tectonics or other earth processes, 2) a descriptive summary of the event, and 3) its impact on society (eg., injuries, deaths, damage). Quantitative information should be summarized, such as vital statistics, size, nature, timing, etc. The paper should be very short, a maximum of 2 pages in length (1 sheet-preferably printed or photocopied on 2 sides) and include a very concise analysis of the subject. Feel free to download and use either of the Microsoft word file. If you have problems understanding any of your sources, feel free to consult the instructor or TA and they will be happy to help.

Please do not procrastinate event selection or your research, as we will be unable to assist you the last week prior to the due date. University regulations regarding Plagiarism will be strictly followed. Include this signed statement at the top of your paper: “I certify that this paper represents my own work and that I have properly cited all sources of information contained herein:” \_\_\_\_\_ signed & dated

**Grading** is as follows: 25% clarity & quality (following outline, syntax, grammar, spelling), 75% content, including: a. plate tectonics, b. vital statistics, and c. impact on society.

### **Possible Sources of Information**

- Internet search engines such as Google, Yahoo, and volcano or earthquake websites.
- Citation search databases: GeoRef, Web of Science, WorldCat, etc.: all available on the library web page- list of electronic databases. These searches should provide you with some Journal articles, which you should definitely consult (that is, do not limit yourself to the internet).
- Journals: such as: Earthquakes and Volcanoes (formerly Earthquake Information Bulletin), Seismological Society of America Bulletin, Seismological Research Letters, Journal of Geophysical Research, Geophysical Research Letters, Pure and Applied Geophysics, Journal of Volcanology & Geothermal Research, Bulletin of Volcanology, etc. are in the Journal collection of the Library; some are electronically available on the library web page-electronic journals where pdfs can be downloaded.
- Books: such as: Bruce Bolt, Earthquakes, Ritchie & Gates, Encyclopedia of Earthquakes & Volcanoes. Decker & Decker, Volcanoes. Also many books with the call letters QE534-QE539.

Paper Outline

1. Location Information (City, State, Country, Latitude/Longitude if you wish)
2. Date & Time of event (local time); Duration of ground shaking or eruption
3. Depth to hypocenter or magma source (km below ground surface)
4. Magnitude (note EQ magnitude type used: Ml, Ms, Mw, mb, mf); Volcanic magnitude VEI or kg erupted.
5. Maximum Modified Mercalli Intensity (MMI) (I-XII) and felt area (km<sup>2</sup>) for EQ or area covered by ash.
6. Fault Name, Fault type & orientation, total length of rupture zone, maximum amount of offset for EQ or Type of Volcano, volcanic chain name, size (diameter, height above base, area, volume)
7. Plate Tectonic Setting (discuss home plate, distance to nearest major plate boundary, type of boundary, and plot location as a star on the world plate map with relative motion arrows showing nearest plate boundary; include both a local sketch map showing the plate tectonics and a lithospheric-scale cross section sketch showing fault for EQ and magma source & vent for volcanoes).
8. Damage Details: Deaths, injuries, \$ value destruction, tsunamis, types of hazards, etc.
9. Impact on culture, economy, & society
10. References cited (follow example on other side)