

Exploring the earth



**ASSIGN
BUSTER**

FSTG111 Exploring the Earth Assignment 1 Study Figure I-1 and answer the following questions: (a) With which type of plate boundary are most of the modern volcanoes associated?

_____ (b)

Identify the following volcanoes and indicate the plate-tectonic environment of each (all of these are listed in Table 1): Volcano Plate 1. Mount St. Helens, WA 2. Kilauea, Hawaii 3. Krakatoa, Indonesia Tectonic Environment

----- 4. Mount Pinatubo, Phillipines

-----5. Mount Vesuvius, Italy 6. Mount Pelee, Martinique 7. Nevado del Ruiz, Columbia 8. Katmai, Alaska 9. Laki, Iceland

----- (c) Would you expect an overlap between the volcanic belts and earthquake zones? If so, why? 2` Table 1. Selected major volcanic eruptions. Year Volcanic Eruption VEI* Comments 4895 B. C. ± 1390 B. C. ± 79 130 + 1631 1783 1792 1815 Carter Lake (Mt. Mazama), Oregon Santorini, (Thera), Greece Vesuvius, Italy Taupo, New Zealand Vesuvius, Italy Laki, Iceland Unzen, Japan Tambora, Indonesia 7 6 5 7 4 4 2 7 1883 Krakatoa, Indonesia 6 1902 1912 1914-1917 Mount Pelée, Island of Martinique, West Indies Katmai, Alaska Lassen Peak, California 4 6 3 1919 1959 1963 1968 1980 Kelut (Java) Kilauea, Hawaii Agung, Bali Fernandina, Galapagos Mount St. Helens, Washington El Chichon, Mexico Nevado del Ruiz,. Columbia Mount Pinatubo, Phillipine Islands Unzen, Japan Etna, Italy Kilauea, Hawaii 4 2 4 4 5 1982 1985 1991 1991 1991-1993 1983-1993 4 3 5 4 ? ? Post-eruption collapse formed caldera; 42 billion cubic meters of new

material ejected. Late Minoan civilization devastated; explosion and tsunami. Pompeii and Herculaneum buried; 2. 6 billion cubic meters of new material; 3, 000 to 16, 000 people killed. 16, 000 square km area devastated. Modern Vesuvius eruptive cycle begins, pyroclastic flows. Largest historic lava flows; 9, 350 and most livestock killed. Debris avalanche and tsunami killed 14, 500. Most explosive eruption in history; 25 billion cubic meters of new material; 92, 000 killed; global cooling (" year without summer") due to encircling volcanic ash. 18 billion cubic meters of new material; caldera collapse; 36, 000 killed, mostly by tsunami; worldwide temperature o drop by about 0. 5 C that persisted for almost 10 years. Saint Pierre destroyed; 30, 000 to 40, 000 killed by ash flow in a matter of minutes; spine extruded from lava dome. May be the largest 20th century eruption; 21 cu. km of tephra ejected; volcanic ash carried for more than 160 km. California's last historic eruption; 1. 0 billion cubic meters of new material; pyroclastic flows, debris flows, and lava flows covered over 16 sq. km area. Mudflows; 5, 110 deaths. Lava lake formed which is still cooling. 1, 100 killed; climatic effects. Caldera floor dropped 350 meters. Ash flow; about 2. 0 billion cubic meters of new material; 57 killed; 600 sq. km area devastated and timber valued at several hundred million dollars destroyed. Ash flows killed 1, 877; climatic effects. Mud flows killed more than 23, 000 people. Probably the second largest eruption of the 20th century; huge SO₂ emission; 300 killed; thousands evacuated. Pyroclastic flow killed 41, including 3 volcanologists; over 10, 000 people evacuated; lava dome. Longest activity (473 days) in 300 years; 300 cubic meters of lava extruded. Longest continuing eruption, with over 50 eruption vents; about 78 sq. km covered by lava and 120 hectometers of new land added to the island of Hawaii. * VEI = Volcanic Explosivity Index

Sources of data: Global Volcanism Program, Smithsonian Institution, Washington, D. C., U. S. A.; U. S. Geological Survey Circular 1073 (1992); Geology and the Environment by B. W. Pipkin (1994). 3 `