

This Geologic Note provides a systematic review of the ages of certain rocks and other volcanic materials found within the park. It should be a major aid in both your boat tours and Sinnott talks as well as answers you may provide to geologic questions from visitors.

Howel Williams suggested that Mount Mazama (and the other volcanoes of the High Cascades) was approximately 2 million years old. With the advent of paleomagnetic studies, it has been learned that none of the rocks associated with the Cascade volcanoes show magnetic reversals (see Cranson, pp. 37-38). This places an upper limit on the age of these rocks at about 700,000 years. In general, it is quite likely that the Cascade volcanic front we see today began forming approximately a half million years ago.

Recent work by Bacon and others have further restrained the age of the volcanic materials associated with Mount Mazama. These data are primarily based on three techniques; 1) radiocarbon dating (see Cranson, pp. 83-85) of charcoal remains associated with certain volcanic rocks or pyroclastic materials, 2) potassium-argon dating of older volcanic flows, 3) paleomagnetic dating of younger volcanic rocks and materials. The following outlines dates that have been obtained within the past two years. Many other rocks/materials are currently in the process of being dated by the U.S.G.S. Stay tuned!

References:

Cranson, K.R., 1982, CRATER LAKE - Gem of the Cascades.

Williams, Howel, 1942, GEOLOGY OF CRATER LAKE NATIONAL PARK.

T A B L E O F R E C E N T D A T E S

<u>ROCK</u>	<u>LOCATION</u>	<u>AGE(y.b.p.)</u>	<u>DATING METHOD</u>	<u>COMMENTS</u>
andesite	Wizard Island	between 1,000 and 6,800	estimate	The story about trees 800 years old on the western lava flow cannot be substantiated (see Williams, pp. 117)
1. dacite	Climactic ash flows, air fall and Cleetwood Flow	6,800	C ¹⁴ - charcoal	These materials occurred almost simultaneously
2. dacite	Llao lava flow Lower Air Fall	7,000	C ¹⁴ - charcoal	Explosion to form the crater beneath the Llao flow, deposit of the gas-rich Lower Air Fall (note the east side of Llao Rock below the 'wing') followed by the Llao Rock Flow. (see Williams, plates 28 & 29)
3. dacite	two small dikes below Llao Rock	7,000	estimate	the easternmost dike is often called the "Staircase" dike, both have glassy margins.
4. dacite	Redcloud Cliff Flow	7,200	estimate based on paleomagnetic data	represents the beginning of a series of dacite eruptions ending with the climactic event (see Williams, plate 23 & G. Note #5)
5. andesite	Palisades	25,000	C ¹⁴ - "dirt" from below the flow	Both the Palisades and the Round Top flows appear to be deposited in glacial valleys (see Williams, plate 25)
6. debris flow	long road cut near the top of the Corkscrew	25,000- 30,000	paleomagnetic data + C ¹⁴ confirmation at another location	appears to be debris shed off a dome that was building higher up the flanks of Mount Mazama. HOT !
7. andesite	Watchman Flow	50,000	K - Ar	road cut on the north side of Watchman.
8. andesite	Pumice Point Flow	50,000	K - Ar	the thick lava flow on the eastern flank of Pumice Point just below the air fall. (see Williams, plate 27)
9. andesite air fall	Pumice Castle area	50,000-60,000	estimate	(see Geologic Note #5)
10. andesite	Hillman Peak (top)	67,000	K - Ar	
11. andesite	below Llao Rock	110,000	K - Ar	series of lava flows at lake level (see Williams, plate 28 & 29)
12. andesite	Phantom Cone	400,000	K - Ar	at lake level opposite Phantom Ship

