AGE ^{14}C YEARS B.P.[1]	[2]Valleys of Whitney, Bolam, and Graham Creeks, northwest flank of Mount Shasta	Valley of Inconstance Creek and the north flank of Mount Shasta	Valley of Gravel Creek and the northeast flank of Mount Shasta	Valleys of Ash Creek and Cold Creek and the east flank of Mount Shasta	Valleys of Mud Creek, Squaw Valley Creek, and Panther Creek and the south and southeast flanks of Mount Shasta	Northwest, west, and southwest flanks of Mount Shasta
1000	⊗ During the last several hundred years, many mudflows traveled ≥24 km from the Hotlum cone[3] and formed an extensive fan north and east of Lake Shastina.	○ Three or more mudflows traveled ≥10 km from the Hotlum cone within the last 210 years (date from tree rings). ● Block-and-ash flow traveled ≥8 km from the Hotlum cone ~700 years ago.	⊗ More than five mudflows traveled ≥12 km from the Hotlum cone during the last several hundred years.	● A pyroclastic flow, a hot mudflow, and three cold mudflows traveled ≥12 km down Ash Creek during the last ~200 years[4]. ● One hot and six cold mudflows traveled ≥11 km down Ash Creek during about the last 700 years[4]. ● Hot and cold mudflows formed a large fan and traveled ≥14 km from the Hotlum cone ~750 years ago.	○ Seven or more mudflows traveled ≥14 km down Mud Creek from the Hotlum cone during about the last 100 years. ● Hot mudflow traveled ≥19 km down Mud Creek from the Hotlum cone ~200 years ago.	
2000	⊗ Mudflows reached ≥15 km from the Hotlum cone less than ~2000 years ago. ⊗ Block-and-ash flow reached ≥9 km from the Hotlum cone 2000–3000 years ago.	○ One or more mudflows traveled ≥11 km from the Hotlum cone between ~1000 and 1500 years ago. ⊗ Several pyroclastic flows or mudflows, or both, traveled ≥13 km from the Hotlum cone ~1800 years ago. ⊗ Lithic pyroclastic flow traveled ≥18 km down north flank of Mount Shasta between about 2000 and 3000 years ago.	● Lithic pyroclastic flow traveled ≥13 km down Gravel Creek from the Hotlum cone ~1800 years ago. ○ Andesite lava flows traveled ~5 km down Gravel Creek from the Hotlum cone.	● Pyroclastic flow traveled ≥8 km to the east-northeast from the Hotlum cone ~1100 years ago. ● As many as eight mudflows traveled down Ash Creek ≥13 km from the Hotlum cone summit sometime during about the last 1700 years[4].	● Pyroclastic flow traveled ≥14 km to the south down Panther Creek from the Hotlum cone ~2100 years ago.	● Pyroclastic flow traveled ≥9 km from the Hotlum(?) cone toward the southwest ~2100 years ago.
3000			⊗ Block-and-ash flows traveled ≥5.5 km from the Hotlum cone between about 1800 and about 3400 years ago. ● Pyroclastic flow traveled ≥8 km down Brewer Creek fan from the Hotlum(?) cone ~3400 years ago.	● Several pyroclastic flows and mudflows traveled ≥12 km down Ash Creek from the Hotlum cone ~2800 years ago. ● Hot mudflows formed deposits of large volume that reached ≥13 km from the Hotlum cone ~3100 years ago.	● Hot mudflow traveled ≥15 km down Mud Creek from the Hotlum cone ~2600 years ago.	
4000					● Two or more mudflows traveled ≥30 km down Squaw Valley Creek ~4000 years ago.	
5000		⊗ Andesite lava flows traveled as far as 5 km down Inconstance Creek from the Hotlum cone.			● Hot mudflow traveled ≥19 km down Mud Creek fan from the Hotlum cone ~4500 years ago.	
6000	⊗ Two or more mudflows traveled ≥15 km down Graham Creek from the Shastina cone.	⊗ A series of block-and-ash flows and mudflows traveled as far as 9.5 km down Inconstance Creek from the Hotlum cone.			● Two or more hot mudflows traveled ≥18 km down Squaw Valley Creek and onto the Mud Creek fan ~6000 years ago.	
7000						
8000			⊗ Mudflows traveled ≥7 km down the Gravel Creek fan. ⊗ Block-and-ash flows formed a large fan between Brewer Creek and Gravel Creek that extends ≥10.5 km from the Hotlum cone.	⊗ Several mudflows (some of which may have been hot) traveled ≥11 km down Ash Creek and the southeast flank of Mount Shasta from the Hotlum cone.	● Several hot mudflows and a pyroclastic flow(?) traveled ≥16 km down Mud and Squaw Valley Creeks from the Hotlum cone ~8000 years ago.	
9000	○ Andesite lava flows from the Hotlum cone traveled ≥6.5 km down Bolam Creek. ○ Andesite lava flows from the summit and north and west flanks of Shastina traveled as far as 8 km from vents and reached ≥14 km from the summit.	○ Andesite lava flows flowed as far as 9 km from the Hotlum cone. ○ Red Banks eruption deposited dacite pumice lapilli as thick as 40 cm over the north flank of Mount Shasta ~9600 years ago.	● Pyroclastic flows and air-fall lapilli from the Red Banks eruption were deposited as far as 13 km (pyroclastic flows) and 16 km (air fall) from the Hotlum cone ~9600 years ago.	● Dacite air-fall pumice lapilli from the Red Banks eruption were deposited east and southeast of Mount Shasta 9600 years ago; primary air-fall thickness is 52 cm at 8 km and 25 cm at 14 km from the Hotlum cone.	○ Dacite air-fall pumice lapilli as thick as 50 cm deposited on Sargents Ridge at a distance of 5 km from the Hotlum cone. ○ Eruption of basaltic-andesite cinders south of Red Butte[5].	● Emplacement of dacite domes at the site of Black Butte was accompanied or followed by block-and-ash flows and pumice flows that traveled ≥11 km to the south and ~5 km to the north ~9500 years ago. ● Emplacement of dacite domes at the summit of Shastina was accompanied or followed by block-and-ash flows that traveled ≥18 km to the west ~9500 years ago.
10 000	○ Andesite block-and-ash flows and pumice flows traveled ≥10 km down valleys from Shastina(?) between ~9700 and 9500 years ago. ⊗ Andesite block-and-ash flows reached ≥21 km from the Hotlum(?) cone ~9700 years ago. Lithic andesite block-and-ash flows traveled ≥10 km from Mount Shasta before 9700 years ago.	⊗ Block-and-ash flows traveled ≥11 km down the north flank from the Hotlum cone.	○ As many as 12 pyroclastic flows and mudflows extended more than 6.5 km from the Hotlum cone.	○ Pumice flows of the Red Banks eruption traveled ≥10 km down Ash Creek from the Hotlum cone ~9600 years ago. Lithic block-and-ash flows traveled ≥13 km down Ash Creek from the Hotlum cone.	● Dacite lapilli as thick as 25 cm from the Red Banks eruption deposited at a distance of 14 km on the south side of Mount Shasta ~9600 years ago. ● Eruption of basaltic-andesite cinders south of Red Butte[5]. Block-and-ash flows traveled ≥16 km down Mud Creek from the Hotlum cone ~9700 years ago.	○ Cone-building and flank lava flows from Shastina reached ≥13 km from the summit between ~9700 and 9500 years ago. ● Pumice flows from the Red Banks eruption descended the southwest side of Mount Shasta to a distance of ≥8 km from the Hotlum cone ~9700 years ago. ● A block-and-ash flow traveled ≥19 km to the west and northwest from the Hotlum(?) cone ~9700 years ago.

[1]All ages are based on radiocarbon-age determinations made in the U.S. Geological Survey radiocarbon laboratory under the supervision of Meyer Rubin and Elliot Spiker.
[2]See figure 1 for locations of creek valleys.
[3]Distances indicated are from summits of various cones unless otherwise specified.
[4]Some of the events listed have only maximum or minimum age control: deposits from certain individual events may be present, but not identified, at several locations within a valley.
[5]Air-fall lapilli from the Red Banks eruption are interbedded with basaltic andesite cinders of a cinder cone south of Red Butte; thus, the eruptions were closely spaced in time (R. L. Christiansen, oral commun., 1978).

EXPLANATION

● Age of event dated by radiocarbon.

○ Age of event relatively well known based on a range of radiocarbon dates, stratigraphic position, soil-profile development, ring counts on trees, or other methods of approximating the age of deposits.

⊗ Age of event relatively poorly known and may have been any time between the nearest older and younger events. Plotted time is a "best guess."

EVENTS AT MOUNT SHASTA DURING THE LAST 10,000 YEARS

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