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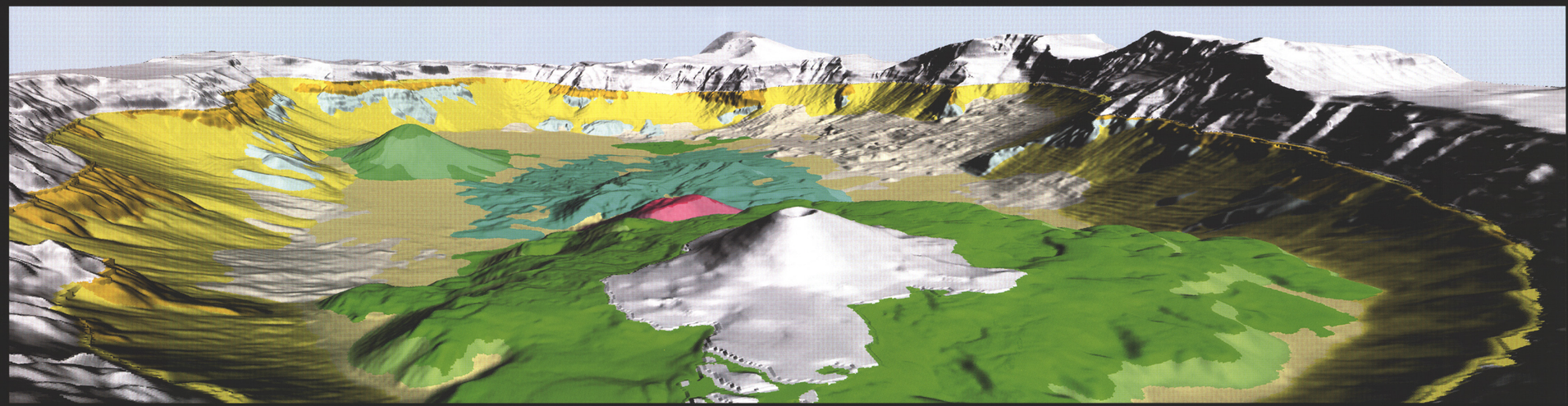
Crater Lake, Oregon

Around 500,000 people each year visit Crater Lake National Park in the Cascade Range of southern Oregon. Volcanic peaks, evergreen forests, and Crater Lake's incredibly blue water are the park's main attractions. Crater Lake partially fills the caldera that formed approximately 7,700 years ago by the eruption and subsequent collapse of a 12,000-foot volcano called Mount Mazama. The caldera-forming or climactic eruption of Mount Mazama drastically changed the landscape all around the volcano and spread a blanket of volcanic ash at least as far away as southern Canada.

Prior to the climactic event, Mount Mazama had a 400,000 year history of cone building activity like that of other Cascade volcanoes such as Mount Shasta. Since the climactic eruption, there have been several less violent, smaller postcaldera eruptions within the caldera itself. However, relatively little was known about the specifics of these eruptions because their products were obscured beneath Crater Lake's surface. As the Crater Lake region is still potentially volcanically active, understanding past eruptive events is important to understanding future eruptions, which could threaten facilities and people at Crater Lake National Park and the major transportation corridor east of the Cascades.

Recently, the lake bottom was mapped with a high-resolution multibeam echo sounder. The new bathymetric survey provides a 2m/pixel view of the lake floor from its deepest basins virtually to the shoreline. Using Geographic Information Systems (GIS) applications, the bathymetry data can be visualized and analyzed to shed light on the geology, geomorphology, and geologic history of Crater Lake.



Upper image: Panoramic photograph taken from visitor overlook on The Watchman by Peter Dartnell. View is to the east. Digital photographic processing by Eleanore Ramsey.

Lower image: Digital perspective view of generalized geologic map of the lake floor draped over shaded-relief image of 2-m bathymetry. Illuminated from 225° azimuth and 45° elevation. Created with ArcInfo and USGS perspective view calculation program. Scale varies with distance.

CRATER LAKE REVEALED

By

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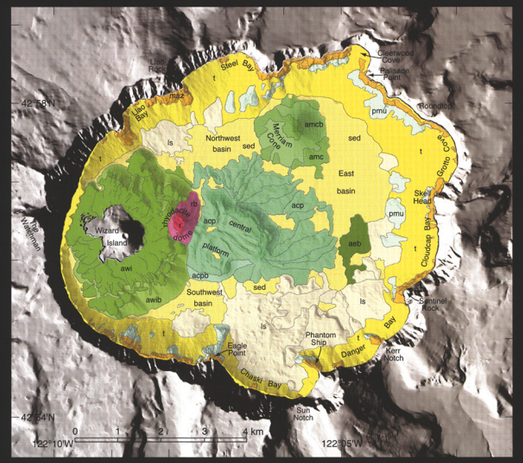
2003

Location Map

Wizard Island cinder cone is flanked by forested partially drowned lava flows erupted while Crater Lake was filling. photo by Charles R. Bacon

Phantom Ship is a remnant of resistant lava within the oldest part of Mount Mazama above lake level. photo by Charles R. Bacon

Talus rests on the bench known as Chaski slide, a landslide block arrested in its descent into Chaski Bay. photo by Charles R. Bacon



Generalized geologic map of the floor of Crater Lake, Oregon.

sed	sediment gravity-flow deposits	ls	landslide and debris-avalanche deposits	amc / amcb	andesite of Merriam Cone, lava & breccia	maz	andesite & dacite of Mount Mazama
t	talus and debris-flow deposits	r / rb	rhyodacite lava & breccia	acp / acpb	andesite of the central platform, lava & breccia	pmu	pre-Mazama rocks, undivided
		awi / awib	andesite of Wizard Island, lava & breccia	aeb	andesite of the east basin		

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