

An Exceptional Day at Biscuit Basin

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ON MAY 17, 2009, a group of scientists visited Biscuit Basin as part of a two-day Earthscope field trip. The group was standing by Wall Pool, discussing hydrothermal explosions. Just as the discussion finished at 11:17 AM, Wall Pool surged, then erupted, expelling foot-sized ejecta (figs. 1 and 2). There was a sensation of heat associated with the eruption, which lasted for an estimated 10 to 15 seconds.

Was the May 17 event a hydrothermal explosion or a geyser eruption? A hydrothermal explosion is caused by a depressurization of a column of boiling water, much like the forces that cause a geyser eruption. The difference between a small hydrothermal explosion and a geyser eruption is that a hydrothermal explosion results in the fragmentation and ejection of overlying strata. Rocks are expelled, either creating a new depression or enlarging an existing vent. The expelled rocks form a debris pattern of ejecta around the explosion.

The Wall Pool event, however, had characteristics of both a hydrothermal explosion and a geyser eruption. Debris were ejected and formed a pattern around the pool (fig. 3). The current turbidity of the pool's water makes it difficult to determine if there was any change in the vent. Sometimes the pool erupts many times in a season, much like geysers. Dick Powell and Ralph Taylor, park volunteers, documented nine eruptions of the pool between June 29 and September 21, 2009. Thus, the eruption of Wall Pool can be considered on a continuum between a geyser eruption and a hydrothermal explosion. Perhaps the best term to use is an unusually forceful geyser eruption.

The name of the feature erupting also is unclear. US Geological Survey maps of the area from 1974 clearly label Black Opal Pool and Wall Pool. However, other investigations indicate that the area of the eruption may be named Black Diamond Pool.



Figure 1. Beginning of the hydrothermal explosion/forceful eruption in Wall Pool on May 17, 2009, looking north northwest.



Figure 2. Continuation of the hydrothermal explosion/forceful eruption in Wall Pool. Note the debris being ejected by the explosion/eruption.



Figure 3. A park geologist and volunteer analyze ejected debris after a 2006 explosion/eruption of Wall Pool.

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