

## Absolute Gravity and Uplift in the Yellowstone Caldera

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GPS time-series of uplift show that points in and around the caldera have gone through cycles of uplift, followed by subsidence since observations began about three decades ago. A dramatic increase in the uplift rate started in 2004 at the GPS station LKWY near Yellowstone Lake and Old Faithful, OFWY. Since 2010, the sites have subsided, began uplifting again in 2014 coincidentally after a M 4.8 earthquake near the Norris Geyser Basin, and then started subsiding again in 2016. The cause of the episodic uplift and subsidence and the spatial pattern of the surface displacement are not yet well understood. The 2003-2009 episode of rapid uplift is believed to result from deep source magma intrusion simultaneous with depressurization of the hydrothermal systems beneath the Norris Geyser Basin. But whether it is caused by the intrusion of magma from a distant reservoir, or by the expulsion and localized trapping of pressurized water and gas from rock that is already in-place, is not known. We have taken observations of absolute gravity at LKWY and OFWY almost annually since 2009. In this presentation, we compare gravity and uplift and provide some insight into the mechanism driving the uplift/subsidence cycles.

**Publication:** American Geophysical Union, Fall Meeting 2019, abstract #V23A-02  
**Pub Date:** December 2019  
**Bibcode:** 2019AGUFM.V23A..02V  
**Keywords:** 4302 Geological; NATURAL HAZARDS; 7280 Volcano seismology; SEISMOLOGY; 8424 Hydrothermal systems; VOLCANOLOGY; 8488 Volcanic hazards and risks; VOLCANOLOGY

 [Feedback/Corrections? \(/feedback/correctabstract?bibcode=2019AGUFM.V23A..02V\)](#)