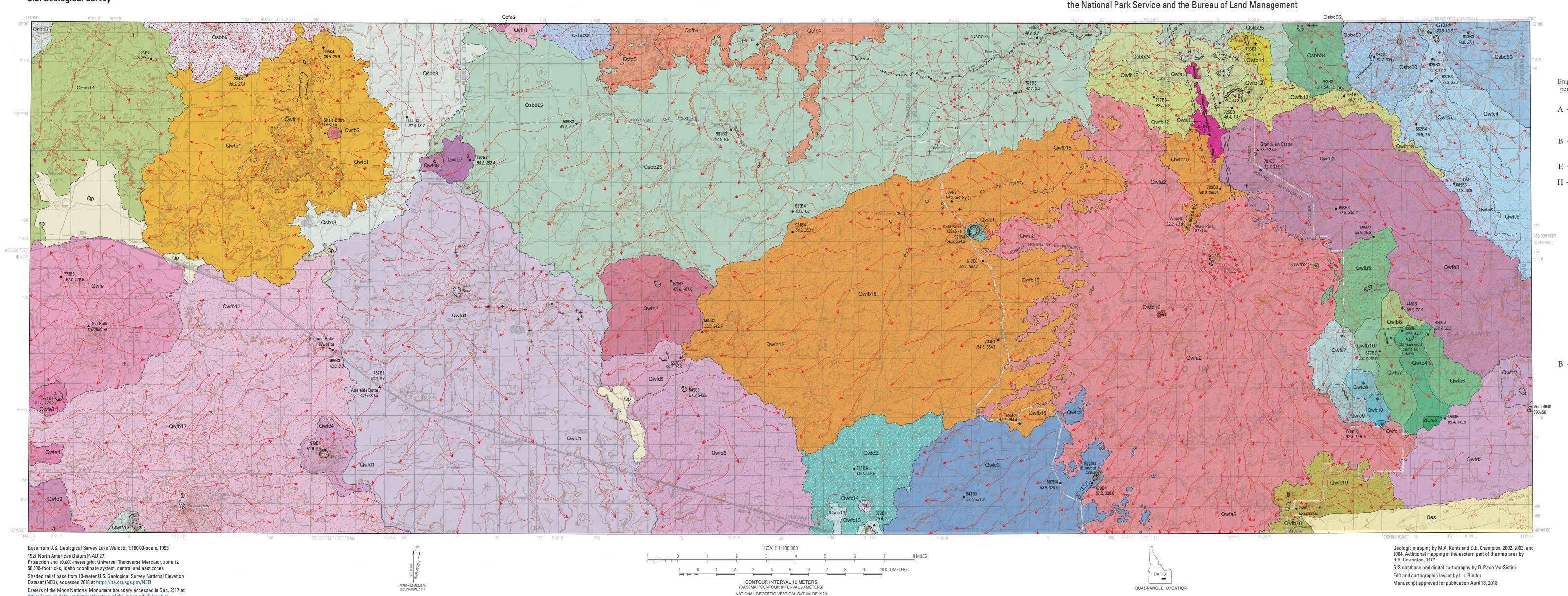
Prepared in cooperation with

ages (yr B.P.) 2,130±130\*

<sup>40</sup>Ar/<sup>39</sup>Ar and K-Ar ages



TO CONVERT FROM FEET TO METERS MULTIPLY BY 0.3048

ERUPTIVE PERIOD D

Qwfd2 Basaltic proximal, medial and distal pahoehoe lava flows of the Vent 4659

Gwfd4 Basaltic near-vent pyroclastic deposits and proximal pahoehoe lava flows

Qwfd5 Basaltic near-vent pyroclastic deposits and proximal pahoehoe lava flows

of the Vent 4401 lava field (early middle Pleistocene)

Qwfd6 Near-vent pyroclastic deposits and proximal and medial pahoehoe lava

Qwfd7 Basaltic near-vent pyroclastic deposits and proximal pahoehoe lava flows

Qwfd8 Basaltic, near-vent pyroclastic deposits and proximal pahoehoe lava flows

flows of the Knoll Vent lava field (early middle Pleistocene)

of the vent 4371 lava field (early middle Pleistocene)

of the Vent 4267 lava field (early middle Pleistocene)

Qwfd9 Basaltic, near-vent pyroclastic and proximal and medial pahoehoe lava

ERUPTIVE PERIOD E

R Qwfe1 Near-vent pyroclastic deposits and proximal, medial, and distal pahoehoe

Vent 4559 lava field (early Pleistocene)

Vent 4373 lava field (early Pleistocene)

lava flows of the Sid Butte lava field (early Pleistocene)

None of the following map units have radiometric ages that would determine their

absolute age. Some of the units have stratigraphic relations with dated lava fields; thus, their

relative ages can be inferred. Where applicable, depth of loess and eolian sand has been used

to determine relative age. Arrows in Correlation of Map Units show inferred age range of units

Owfb19 Basaltic near-vent deposits and proximal pahoehoe lava flows of the Vent

Owfb20 Near-vent pyroclastic deposits and pahoehoe lava flows of the Vent 4757

Qwfc12 Basaltic, near-vent pyroclastic deposits of the Vent 4811 lava field (late

Basaltic near-vent pyroclastic deposits of the Vent 4354 lava field (late

Qwfb18 Basaltic near-vent deposits of the Rattlesnake Butte lava field (late

4645 lava field (late Pleistocene)

middle and early middle Pleistocene)

lava field (late Pleistocene)

middle Pleistocene)

Pleistocene)

flows of the Vent 4429 lava field (early middle Pleistocene)

of The Crater lava field (early middle Pleistocene)

pahoehoe lava flows of the Adelaide Butte lava field (early middle

Basaltic proximal, medial and distal pahoehoe lava flows of the Vent

Qwfd1 Basaltic near-vent pyroclastic deposits, proximal, medial and distal

lava field (early middle Pleistocene)

4640 lava field (early middle Pleistocene)

#### LIST OF MAP UNITS

[More detailed descriptions of these units are available in the accompanying pamphlet. R, in the lower left of the unit box, indicates reversed polarity. Due to the addition of a shaded relief base, colors in the Correlation of Map Units and the Description of Map Units may not exactly match unit colors on the map] UNCONSOLIDATED SURFICIAL DEPOSITS

Qes Eolian sand (Holocene to early middle Pleistocene) Qp Playa deposits (Holocene to early middle Pleistocene)

https://catalog.data.gov/dataset/craters-of-the-moon-administrative-

management-boundary4c667/resource/a2058d58-c72c-49b6-bb49-f441644e2c25

#### HOLOCENE AND PLEISTOCENE BASALTIC LAVA FLOWS AND RELATED NEAR-VENT PYROCLASTIC AND ERUPTIVE-FISSURE DEPOSITS OF THE SNAKE RIVER GROUP

lava flows of the Kings Bowl lava field (Holocene) Qwfa2 Proximal, medial, and distal, chiefly tube-fed, basaltic pahoehoe lava flows and near-vent deposits of the Wapi lava field (Holocene) Distal pahoehoe basalt lava flows of the Minidoka lava field (Holocene) of Distal pahoehoe basalt lava flows of the Larkspur Park lava field (Holocene)

Qwfa1 Surface- and fountain-fed, proximal, medial, and distal basaltic pahoehoe

Ocfe2 Distal pahoehoe and a'a basalt lava flows of the Laidlaw Lake lava field Octh1 Distal pahoehoe basalt lava flows of the Kimama lava field (late Pleistocene)

Near-vent pyroclastic deposits and proximal, medial, and distal pahoehoe and a'a basaltic lava flows of the Shale Butte lava field (late Pleistocene) Near-vent, basaltic pahoehoe lava flows of the Vent 4319 lava field (late Qwfb3 Pahoehoe basaltic lava flows of the Grandview Crater lava field (late

Qsbb5 Distal pahoehoe basaltic lava flows of the Broken Top lava field (late

Qsbb6: Distal pahoehoe basaltic lava flows of the Sand Butte lava field (late Qsbb8 Basaltic pahoehoe lava flows and near-vent pyroclastic deposits of West

Wildhorse Butte lava field (late Pleistocene) CLAASEN VENT COMPLEX (LATE PLEISTOCENE)

Basaltic, near-vent, pyroclastic deposits and proximal and medial pahoehoe lava flows of Claasen lava field Basaltic pahoehoe lava flows of the Winters Blowout lava field Basaltic pahoehoe lava flows and near-vent pyroclastic deposits of the Vent 4829

Dasaltic near-vent pyroclastic deposits and medial and distal pahoehoe lava flows of the Vent 4801 lava field Basaltic near-vent pyroclastic deposits and medial and distal pahoehoe lava flows of the Vent 4862 lava field

Basaltic near-vent pyroclastic deposits and medial and distal pahoehoe lava flows of the Vent 4835 lava field Basaltic near-vent pyroclastic deposits and proximal pahoehoe lava flows of the Vent 4569 lava field

INFERNO CHASM VENT COMPLEX (LATE PLEISTOCENE) Qsbb24 Basaltic pahoehoe lava flows and minor near-vent pyroclastic deposits of the Vent 5094 lava field Basaltic, pahoehoe lava flows and near-vent deposits of the Inferno Chasm

lava field Owtb13 Basaltic pahoehoe lava flows and near-vent pyroclastic deposits of the East Inferno Chasm lava field Qsbb25 Basaltic pahoehoe lava flows and near-vent pyroclastic deposits of the Horse

Butte lava field Qwtb14 Near-vent pyroclastic deposits and proximal pahoehoe lava flows of the Cottrells Blowout lava field



Photograph 1. Split Butte. Split Butte (Qwfc1) is a maar volcano located near the northwest edge of the Holocene Wapi lava field (Qwfa2). The vent area is roughly circular, 600 meters in diameter, and consists of a tephra ring containing an inner lava pond. Photograph by Susan Sakimoto (Space Science Institute and University at Buffalo) and Scott Hughes, pilot (Dept. of Geosciences Idaho State University). Photograph taken July 15, 2004. Used with permission.

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The following five map units are not part of the Inferno Chasm vent complex Basaltic, near-vent and proximal, medial, and distal pahoehoe lava flows of the Wapi Park lava field (late Pleistocene) Qwfb16 Near-vent, basaltic pyroclastic deposits of the Vent 4901 lava field (late

Qwfb17 Basaltic near-vent pyroclastic deposits and pahoehoe lava flows of the Kimama Butte lava field (late Pleistocene) Basaltic medial and distal pahoehoe lava flows of the Black Ridge Crater lava field (late Pleistocene) Basaltic near-vent pyroclastic deposits and medial and distal pahoehoe lava flows of the Vent 5329 lava field (late Pleistocene)

Qwfc1 Near-vent pyroclastic deposits and distal pahoehoe lava flows of the Split **Butte lava field (late middle Pleistocene)** Basaltic, distal pahoehoe flows (late middle Pleistocene) Qsbc22 Basaltic pahoehoe flows of the Vent 4645 lava field (late middle Qsbc52 Distal pahoehoe flows of the Mosby Butte lava field (late middle

ERUPTIVE PERIOD C

Basaltic, near-vent pyroclastic deposits and proximal and medial pahoehoe lava flows of Higgins Blowout lava field (late middle Pleistocene) FLAT TOP VENT COMPLEX (LATE MIDDLE PLEISTOCENE)

Qwfe2 Near-vent pyroclastic deposits and proximal pahoehoe lava flows of the Qwfc4 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe flows of the Flat Top lava field Qwfe3 Near-vent pyroclastic deposits and proximal pahoehoe lava flows of the Owfc5 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Vent 5026 lava field Owfe4 Proximal pahoehoe lava flows of the Vent 4373 lava field (early Owfc6 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Vent 4822 lava field

Qsbc53 Distal basaltic pahoehoe flows of the Vent 5083 lava field Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Streifling lava field The following five map units may be part of a vent complex, but this has not been verified by paleomagnetic studies. Supposition of vent complex status is supported by close

proximity of vents and similar thickness of loess cover, suggesting close or similar ages for the five map units Qwfc7 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Vent 4753 lava field (late middle Pleistocene) **Qwfc8** Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe

lava flows of the Vent 4754 lava field (late middle Pleistocene) Qwfc9 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Vent 4705 lava field (late middle Pleistocene) Qwfc10 Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe lava flows of the Vent 4644 lava field (late middle Pleistocene) wic11 Basaltic, near-vent pyroclastic deposits and proximal, medial, and distal pahoehoe lava flows of the Vent 4539 lava field (late middle Pleistocene)



**Photograph 2.** Higgins Blowout. View looking northeast at the slot-shaped vent of the Higgins Blowout (Qwfc3). The vent is 600 meters (m) long, 200 m wide, and as deep as 50 m. The darker pahoehoe is from the Wapi lava field (Qwfa2). Photograph by Susan Sakimoto (Space Science Institute and University at Buffalo) and Scott Hughes, pilot (Dept. of Geosciences Idaho State University). Photograph taken July 15, 2004. Used with permission.

Multiply	Ву	To obtain
	Length	
millimeter (mm)	0.03937	inches (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
	Area	
square kilometer (km²)	0.3861	square mile (mi²)
	Volume	
cubic kilometer (km³)	0.2399	cubic mile (mi3)

## Basaltic near-vent pyroclastic deposits of the Vent 4384 lava field (late middle and early middle Pleistocene) Basaltic, near-vent pyroclastic and proximal, medial, and distal pahoehoe flows of the Vent 5270 lava field (late middle Pleistocene)

Photograph 3. Wapi Park. View to the southwest at aligned vents of the Wapi Park lava field (Qwfb15). Encroaching dark lava flows are of the Wapi lava field (Qwfa2). Distance from nearest vent to farthest vent is

about 2 kilometers. Photograph by Susan Sakimoto

University). Photograph taken July 11, 2002.

Used with permission.

(Space Science Institute and University at Buffalo) and

Scott Hughes, pilot (Dept. of Geosciences Idaho State

#### **EXPLANATION OF MAP SYMBOLS**

- Contact—Where dashed indicates separate individual lava flows within the same map unit where the identity or existence is certain and location approximate. Dashed contact indicates inferred limit of a'a flows for Shale Butte lava field, and slab pahoehoe for Wapi lava field. Dashed contact in Horse Butte lava field separates flows erupted from two adjacent lava-tube systems **Eruptive fissure**—Fractures in rock through which lava has erupted. Width 1–2 m Non-eruptive fissure—Fractures in rock through which lava has not erupted.

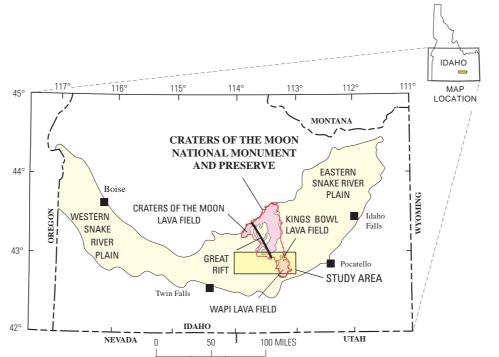
Width generally <1 m Narrow lava channel—Less than 5 m wide. Hachures point away from channel Wide lava channel—Greater than 5 m wide. Hachures point away from channel Lava flowline—Arrow indicates direction of flow

AREAL FEATURES

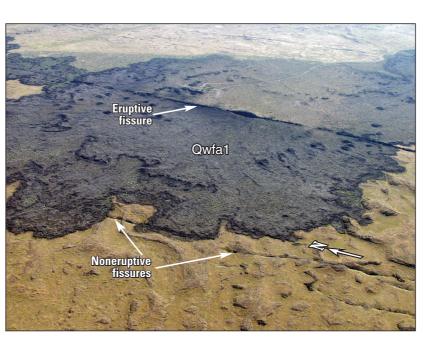
Crater—Hachures point into crater o∞ Skylights—Black circles outline collapsed parts of lava tubes. Mapped to scale Lava pond—Basalt-filled depression surrounded by levees that are shown by hachured line. Ticks point toward lava pond

POINT FEATURES \* Small cone—Small lava cone, cinder cone, or spatter cone + **Rootless vent**—Secondary source of lava not directly related to conduit to deep

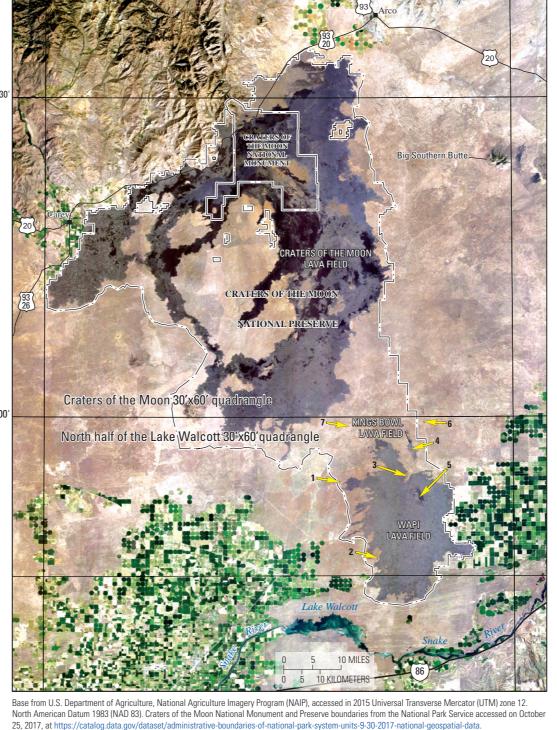
Sample sites—40Ar/39Ar sample sites with geographic location (if named) and preferred age in thousands of years (ka). See table 1 Paleomagnetic sample location—Showing site label, remanent direction of inclination and declination



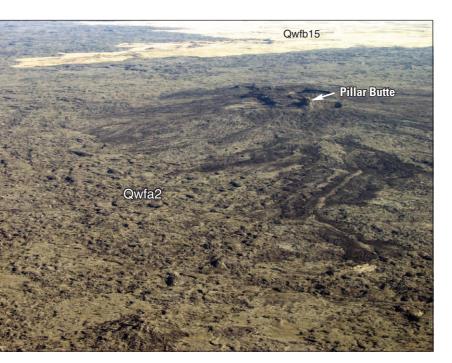
0 50 100 KILOMETERS Regional index map showing the location of the study area prominent features. Modified from Kuntz and others (2007). Yellow area is the Snake River Plain. This is figure 1 in the accompanying pamphlet.



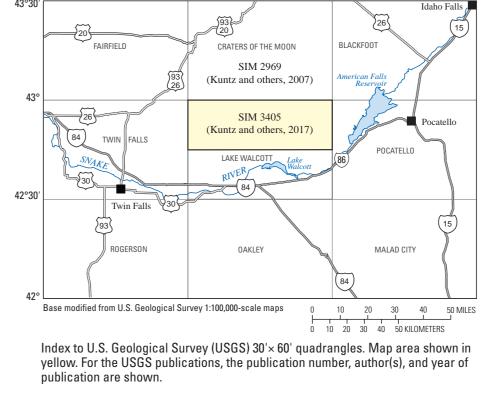
Photograph 4. Kings Bowl. View to the northeast. Kings Bowl (Qwfa1) is located in the Great Rift volcanic rift zone. It is an 85-meter (m)-long, 30-m-wide, and 30-m-deep explosion pit. The Kings Bowl lava field area shows good examples of noneruptive fissures in older flows in Idaho (tan area). The slightly lighter area to the east of the fissure on the Kings Bowl lava field is fine-grained ejecta blown out of Kings Bowl. Note encrusted prominent basalt in mounds that surround the Kings Bowl. Photograph by Susan Sakimoto (Space Science Institute and University at Buffalo) and Scott Hughes, pilot (Dept. of Geosciences Idaho State University). Photograph taken July 11, 2002. Used with permission.



Digital orthophotograph of the Craters of the Moon, Kings Bowl, and Wapi lava fields showing the location of the Craters of the Moon 30'×60' quadrangle and the north half of the Lake Walcott 30'×60' quadrangle. Yellow arrows indicate the locations of photographs of selected features: 1, Split Butte; 2, Higgins Blowout; 3, Wapi Park; 4, Kings Bowl; 5, Pillar Butte; 6, Cottrells Blowout; 7, Bear Trap cave. This is figure 3 in the accompanying pamphlet.



Photograph 5. Pillar Butte and Wapi Park. Oblique view to the northeast of Pillar Butte, the vent area for the Wapi lava field (Qwfa2). The light-colored area to the north is the Wapi Park lava field (Qwfb15). Late-stage channel-fed a'a and slab pahoehoe cover the vent area. Pillar Butte is a mass of agglutinated spatter adjacent to one of the many pit craters that occur in the vent area. Photograph by Susan Sakimoto (Space Science Institute and University at Buffalo) and Scott Hughes, pilot (Dept. of Geosciences Idaho State University). Photograph taken July 11, 2002. Used with permission.





Photograph 6. Cottrells Blowout. View to the southwest of Cottrells Blowout (Qwfb14), a slot-shaped vent located just north of the Kings Bowl lava field (Qwfa1). It is one of the most spectacular vents in terms of length and depth in the eastern Snake River Plain. Photograph by Susan Sakimoto (Space Science Institute and University at Buffalo) and Scott Hughes, pilot (Dept. of Geosciences Idaho State University). Photograph taken July 11, 2002. Used with permission.

# West Wildhorse Butte VENT COMPLEX Late Pleistocene VENT COMPLEX OUATERNARY Mosby Butte Late middle Pleistocene VENT COMPLEX Vent 4644 Vent 4539 Vent 4354 | Vent 4384 | Vent 5270 Early middle Pleistocene Early Pleistocene

used in this report<sup>1</sup>

**CORRELATION OF MAP UNITS** 

[R, in the lower left of the unit box, indicates measured reversed polarity. Yr B.P., years before present (before A.D. 1950); ka, thousand years; n.d., not determined; \*, precise location of sample is unknown. Arrows show inferred age range of units]

> HOLOCENE AND PLEISTOCENE BASALTIC LAVA FLOWS AND RELATED NEAR-VENT PYROCLASTIC AND ERUPTIVE-FISSURE DEPOSITS OF THE SNAKE RIVER GROUP



https://commons.wikimedia.org/wiki/File:Bear\_Trap\_Cave\_-\_panoramio.jpg. B, View looking out of Bear Trap cave. Entrance is approximately 5 meters high. Photograph by JF Hobbs, July 25, 2009. Accessed May 28, 2018, at https://commons.wikimedia.org/wiki/File:In Bear\_Trap\_Cave\_-\_panoramio.jpg.

### Geologic Map of the North Half of the Lake Walcott 30'×60' Quadrangle, Idaho

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1:100,000, https://doi.org/10.3133/sim3405.

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Pamphlet accompanies map