

DATA REPOSITORY

Stable isotope and trace-element geochemistry of the basal Bouse Formation carbonate, southwestern USA: Implications for the Pliocene uplift history of the Colorado Plateau

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SAMPLE LOCATION AND DESCRIPTIONS

(samples listed geographically from north to south)

Lost Cabin Wash, Arizona**BS-14b**

35° 22.37'N, 114° 32.35'W (Spirit Mtn.SE, AZ-NV 7.5' quadrangle); 1440' (sampled on north side of wash)

Bedding 005°/4°W (toward the basin interior). Sample from 18 cm thick, well-lithified micritic carbonate. Small, 1-2 cm plant or algal fragments locally preserved (Turak, 2000).

BS-15

35° 21.09'N, 114° 33.08'W (Spirit Mtn.SE, AZ-NV 7.5' quadrangle); 1240'

Horizontal bedding. Sample collected 60 cm from base of section; massive micritic carbonate, overlain by, and interstratified with planar laminated siliciclastic mud. No fossils present.

Silver Creek Wash, Arizona**BS-12d**

35° 05.23'N, 114° 28.02'W (Oatman AZ 7.5' quadrangle); 1795'

Sample of thin bedded marl from 15 cm above base of 1.5-3m thick section. Parallel laminated marl interstratified with 10-30 cm thick beds of bioturbated (?) sand, near the top of the exposed section. Rare gastropod and bivalve fragments noted at 50, 100 and 290 cm above the basal shales (Turak, 2000).

BS-12e

35° 05.30' N, 114° 28.26' W (Oatman AZ 7.5' quadrangle); (1693')

Sample of very rough tufa mantling volcanic bedrock, ~6-8 meters above Silver Creek Wash (sampled from north side of wash). Tufa up to ~1.5 meters thick, may be locally

silicified, and drapes over 5-7 meters of topography. No laminations, tubules or other structures evident in outcrop. Sample equivalent to Spencer and Patchett (1997) sample #96BS-23.

Northern Sacramento Mountains, California

BS-13

34° 52.67'N, 114° 46.63'W (Bannock, CA 7.5' quadrangle); 1509'
Sample of 10-20 cm thick, well-laminated marl, from ~ 5 cm above base. No fossils present.

Needles area, California

EC96-22 (E. Sacramento Mountains, CA)

34° 44.45'N, 114° 36.79'W (Whale Mountain, CA-AZ 7.5' quadrangle); 925'
Bedding dips 14° E (into the basin). Sample of 60 cm thick, laminated marl, with detrital biotite. No fossils present.

Bouse-1 (Park Moabi, CA)

34° 42.94'N, 114° 30.75'W (Whale Mountain, CA-AZ 7.5' quadrangle); 680'
Sample of 10-20 cm thick, well-laminated marl, from ~ 4 cm above the sharp base. Flaggy character of the carbonate due to a high percentage of shale. Host to numerous lithic fragments to ~5-8 mm. No fossils present.

Bouse-2 (E. Sacramento Mountains, CA)

34° 42.49'N, 114° 38.05'W (Monumental Pass, CA 7.5' quadrangle); 1120'
Bedding dips 5° E (into the basin). Sample of <2 meter thick, massive micritic carbonate, with rare detrital biotite grains (to 0.5 mm). No fossils present.

Chemehuevi Wash, California

BS-10

34° 32.77'N, 114° 27.45' W (Havas Lake, CA 7.5' quadrangle); 867'
Subhorizontal dip. Sample of v. fine grained, flaggy white carbonate mud, with shaley laminations ~2-5 cm thick, locally with lithic fragments up to several centimeters in diameter. No fossils present. Section grades upward into pink, quartz-rich silt.

BS-11

34° 26.88'N, 114° 25.88'W (Havas Lake, CA 7.5' quadrangle); 640'
Poorly defined bedding oriented 175°/5°E (toward the basin interior). Four samples taken from > 3 meter thick (basin fill section), massive micritic carbonate with >90% carbonate. Section poorly laminated, with partings ~20-30cm, that grades upward into greenish-yellowish silts with gypsiferous horizons. Shale content increases upward through the entire 4-5 meter section. Interbedded carbonate-rich shale and shale are exposed at the top of the section (Turak, 2000).

BS-11a

Sample of slightly resistant, massive marl from 50 cm above base of 2m thick marl. No fossils present.

BS-11b

Sample of marl from 150 cm above base of 2m thick marl. No fossils present.

BS-11c

Sample of marl from weakly, parallel laminated section (above 2 m section of massive micritic carbonate, collected ~250 cm above base of Bouse), with mud interlayers ~1-2 cm thick. No fossils present.

BS-11d

Sample of carbonate silt/clay, collected ~290 cm above base of the Bouse. No fossils present.

Earp area, north of Parker, Arizona***Bouse-3*** (NW of Earp, CA)

34° 10.66'N, 114° 17.84'W (Parker, CA-AZ 7.5' quadrangle); 508'

Well-defined bedding dips 2°E (toward the basin interior). Sample from thinly laminated marl up to 1 m thick, above yellowish-stained alluvial deposits.

Osborn Wash, Arizona

Subhorizontal bedding. Section at sample site up to ~1 meter thick; basal 15 cm, massive, overlain by finely (0.5-1.5 cm thick) laminated carbonate. Carbonate fairly pure with little detrital component except at base.

BS-9a

34° 10.30'N, 114° 13.71'W (Crossroads CA-AZ 7.5' quadrangle); 440'

Sample from massive, base of marl layer.

BS-9b

34° 10.30'N, 114° 13.71'W (Crossroads CA-AZ 7.5' quadrangle); 440'

Sample from thinly laminated marl, with ostracods.

Limekiln Wash (SE of Ehrenberg), Arizona***BS-7*** (Limekiln Wash, AZ)

33° 32.44'N, 114° 27.33'W (Dome Rock Mtns, SW AZ 7.5' quadrangle); 750'

Sample of massive, mound-like tufa with resistant silica-rich zones, and little interstratified detrital material. Deposit drapes over > 15 meters of topography locally.

BS-8 (Limekiln Wash, AZ)

33° 32.93'N, 114° 26.87'W (Dome Rock Mtns, SW AZ 7.5' quadrangle); 640'

Subhorizontal bedding. Sample of 15m thick section of massive (poorly laminated) carbonate and with shelly horizons. Layering on the scale of 10-20 cm.

Milpitas Wash/Palo Verde Mountains area, California

Sample site bedding oriented $010^{\circ}/13^{\circ}\text{W}$, with dip gently into erosional slope. Overall exposed thickness ~3.6 meters; base of the Bouse Formation not exposed. Lowest exposed Bouse is fine-grained, laminated carbonate with 1-1.5 cm planar bedding with minor, locally derived clastic material. Middle of section, thicker bedded to 6-8 cm. Upper 1 meter with coarse volcanic detritus to 4-6 cm)

BS-4a

$33^{\circ} 17.71'\text{N}, 114^{\circ} 47.37'\text{W}$ (Palo Verde Peak, CA 7.5' quadrangle); 560'
Sample of marl collected 8cm from top of exposed section; contains numerous volcanic clasts to ~10 cm.

BS-4b

$33^{\circ} 17.71'\text{N}, 114^{\circ} 47.37'\text{W}$ (Palo Verde Peak, CA 7.5' quadrangle); 560'
Sample of marl collected 90cm from top of exposed section; massive bedding to ~4cm thick.

BS-4c

$33^{\circ} 17.71'\text{N}, 114^{\circ} 47.37'\text{W}$ (Palo Verde Peak, CA 7.5' quadrangle); 560'
Sample of marl collected 200 cm from top of exposed section; recessive, thick (6-8 cm partings) bedded carbonate.

BS-4d

$33^{\circ} 17.71'\text{N}, 114^{\circ} 47.37'\text{W}$ (Palo Verde Peak, CA 7.5' quadrangle); 560'
Sample of laminated marl collected 350 cm from top of exposed section; bedding ~2-3 cm thick.

Milpitas Wash, east of CA 78, California

Sample site bedding oriented $024^{\circ}/8^{\circ}\text{W}$, with dip gently into basin center. Overall exposed thickness ~33 meters (~ten times thicker than exposed section to the north of the basin at BS-4); base and top of the Bouse Formation not exposed. Lowest exposed Bouse is fine-grained, laminated carbonate with 2-8 cm planar bedding. Top of the section characterized by low-angle planar cross-beds up to ~15cm across. Section grades from very high proportion of carbonate upward to more clastic-rich towards unexposed top.

BS-6a

$33^{\circ} 15.13'\text{N}, 114^{\circ} 47.80'\text{W}$ (Buzzards Peak, CA 7.5' quadrangle); 735'
Sample of clastic limestone (barnacle cochina) from ~10 cm above base of the exposed section.

BS-6b

$33^{\circ} 15.13'\text{N}, 114^{\circ} 47.80'\text{W}$ (Buzzards Peak, CA 7.5' quadrangle); 735'

Sample of laminated, clastic limestone (barnacle, gastropods and lithic-rich carbonate) from top of exposed section (~5 meters above base of the exposed section). Top of section characterized by meter-scale low angle cross-bedding.

BS-6c

33° 15.13'N, 114° 47.80'W (Buzzards Peak, CA 7.5' quadrangle); 735'
Clastic limestone, with high porosity (~10 meters above base of the exposed section). Rich in shell material (gastropods, other unidentified material).

BS-6d

33° 15.13'N, 114° 47.80'W (Buzzards Peak, CA 7.5' quadrangle); 735'
Clastic limestone, with high porosity (~20 meters above base of the exposed section). Rich in shell material (gastropods, other unidentified material).

Buzzards Peak area, Chocolate Mountains, California

BS-5

33° 10.08'N, 114° 52.08'W (Buzzards Peak, CA 7.5' quadrangle); 1000'
Sample from poorly exposed, rubbly outcrop of finely laminated marl, with detrital biotite grains to ~0.5mm, and ostracods.