

time	x	y	depth	Alvin Dive 4600 port side observation(observer = Ken Rubin)
				(abbreviation notes: LST-SP = light sediment dusting on top, some sed in pockets; traj = trajectory; ornam= ornamentation)
	14728	8443	2778	10m off bottom, sedimented lobates 20 cm fissure off of port side
1533.5	14721	8446		looking for place to set down off of fissure, transitioning into a jumbled sheet, moderate sed cover, folds not covered in sed.
1536	14706	8452	2786	on bottom; jumbled sheet flow, in a channel, looking for sample
1542	14706	8452	2786	sample 1 into basket 1b, jumbled sheet frag, triang shaped, ~10 cm long, 5 cm thick
1545				going to get underway to wp 2 to collapse pit
1549				still at same position getting setup to move; can see light Mn coating on folds of jumbled sheet, 100 yr-old time frame?
1552.8	14706	8452	2786	underway heading 300 to wp2
1554	14705	8460	2786	broad, sedimented lobes, 4-5m across, low relief
1555.5	14687	8489	2786	more relief of lobes, heading 315
1557	14663	8500	2787	lobes are transitioning into ornamented pillows, same sed cover, semi-coalesced pockets
				slope has come up a bit; bulbous pillows, same sed cover - dusting on top, can see striations on tops; nice pillows, some drained out,
1557.8	14653	8411	2785	pillows flowing primarily in the direction of sub motion
1600	14625	8542	2780	transitioning into small lobes, some ornaments
1601	14614	8555	2778	large lobes now, small collapses on both sides of sub
1602	14607	8572		dropoff - we've hit the edge of the pit; nav is off a little; talus in front of us, can see far side of pit off to port
				7m off bottom of pit; nav is off by ~50m or so?; broken pillows at bottom of pit, layer in wall, pillows and lobes/sheets in the wall lobates
1603.5	14600	8595	2782	on the top of the wall; shelly lobates/sheets in the wall. We can see ~5m of section - looks all the same age; cone looks monogenetic
1608	14594	8611	2785	looking for sample 2 spot; rock looks fresh, less sed on this high relief surface but looks the same as lava rise we were on from WP1
				got a few more map fixes, nav looks closer
1615.5	14593	8613		sample 2, tabular piece of lobate crust, cube shaped, 15x15 cm, glass, some Mn, into basket 4a
				sample was from top of northern wall of pit; pit looks like it is ~10m deep
1617.5				underway to wp3, going west
1618				radial fracture, ~20 cm wide, 1.5m wide chunk of crater rim is slumped into the pit a little bit
			2782	lobates, heading 260
1620.5	14555	8636	2779	lobates, same sed, significant on low lying parts, dusting on top; seeing some pillows too, bottom dropping away
1621.5	14527	8629	2778	5m off bottom; pillows, some ornamentations; fissure in same heading as sub, 1m across on port side, can see pillows in the wall
1622.8	14514	8628	2779	intersection bulb. Pillows, no obvious flow direction, similar sed dusting; can see ornamentation and striations, sed in pockets
				proper pillow tubes flowing downslope in sub direction as we head to first mound of El Dragon
1624.5	14486	8619		ornament pillows, same sed as low lava shield; slope is picking up
				small pillow about the size of a mini VW
				wall off to starboard on sonar (part of next mound north)
1628	14396	8591	2759	nice ornament pillows, elongate in heading of sub, constructional slope of pillow mound, interspersed lobed
1629.5	14365	8580	2752	pillows, squatter lobateish pillows, starting to crest mound
1631.5	14324	8579		seeing dropoff off other side of mound; squat pillows and lobes
1633	14297	8577	2754	can see next mound on sonar, crested top of first subtle mound, going to turn around for a sample

1635.5	14303	8589		trolling for a sample from a collapsed pillow
				sample 3, small piece of a pillow, 15 cm long, like a blob of cauliflower, into box 1a
1640.5	14304	8590	2755	getting underway, going upslope
				7m off bottom at back of slope, can see pillows and then talus, range of sizes (golfballs to melons) in a small debris flow, then back
1643	14278	8587		into pillow rubble
1643.8	14266	8590		Mike says map is shifted about 30m west; talus strewn slope, can see some pillows in place, same sed cover
				still coming up slope, hms are off to conserve power; same sed pillows, long tubes, some truncated pillows, looks same age in terms of
1646	14253	8601	2726	sed cover, not much talus, this looks more constructional
1648	14224	8617	2718	ornamented, bulb pillows, same sed cover, slope getting more gentle approaching crest of mound
				starting to see more lobate lavas, must be at the top, look for a sample; small collapses, similar sed cover, larger more coalesced
1650	14202	8622		pockets on lobates
1653	14194	8625		about to grab sample 4 of lobate, near wp4
				triangular lobate wedge 20-25 cm long, some Mn on it, but looks like the others in age terms
1659.5				underway to wp5
				<i>end of vn620204.wma</i>
				heading 310 to next wp; pillows transitional to lobes, slope goes off to port, seeing longer ornamented pillow tubes in distance, tunes are
1704	14179	8642		heading about 260
1706.5	14145	8680		off top of low mound going to wp5, 30m adj mike did on map is right on, ornate pillows, about 6m off bottom, same sed cover
				squatter, flatter pillows, gentler slope towards wp from here, drained out lobates and bulb pillows interspersed, some ornate
1708.8	14119	8723		went over a sinuous deep between pillows, not a fissure but I could see into it
1709.5				slightly more sedimented bit of pillow/lobe terrain, small drainouts in squat pillows
1711	14091			close to wp5, next mound is visible on sonar, going to change heading to wp6 to bag sample
1714	14092	8832	2720	starting to slope of big pillow mound as we come across depression; flying 8m up; can see bulb, same sed pillows, some ornate.
1715.5	14102	8850	2719	fairly steep slope, can see pillows stacked on top of each other, long tubes, at bottom of next mound.
1720	14126	8863	2718	sample 5, piece of collapsed pillow
	14126	8863		nice pillow frag piece, 15cm long, quasi roundish, went into basket 1a along with sample 3 by accident
	14126	8863	2718	sample 6, smaller piece of pillow toe into basket 2a (same spot as sample 5), small 6-7 cm long
1725				heading off to next WP
1728.5	14121	8875	2712	flying back over divide on way to wp7, bottom is barely in sight, pillows, expecting lower relief on top of next mound
1730				end of tape 1
1730.5	14094	8892		seeing slope of next mound, pillows, getting tape 2 started, 11m off bottom
				lobates on top of slope, small hillock at wp 6, flat feature on top, side was pillows, same sed age. Can see surfaces of lobes but
1734	14076	8903	2715	pockets are coalesced, dusting on high standing surfaces
1736.5	14041	8910	2717	pillows, just over the edge of mound, will look for a sample spot, sed cover is the same as on previous pillow mound
1738	14039	8913	2718	setting down for sample, pillows with ornate.
				basically at wp7, Mike getting a sample of a pillow toe, sample 7, slight Mn coating, whitish stain on broken face of sample, 15-20cm
1741	14038	8913	2718	long, into box 2a, much bigger than sample 6, which had gone into the same box.
1751.5	14026	8922	2717	underway to wp8

1753.5	14018	8909		heading 210, ornam pillows, fair amt of sed locally in pockets, but basically looks like same sed cover (lor a little bit thicker, or a local effect?) pillows are relatively flat, but some are elongated in the direction we are heading
1756	13990	8856	2717	12m up, can see pillowsd in gulley between small mound and big mound to the west
1758.8	13970	8809	2718	9m off, approaching pillow slope flowing towards us, elongate pillows and bulbuous ones; small mound, simiar sed cover (dusting on tops, some pockets), some ornam, slope is constructional
1800	13963	8793	2718	7m off on back of sub, approaching slope, can see a few fragments and debris, pieces of ornam trhat have fallen off, can see top of mound, looking for sample before we crest
1805	13962	8778	2717	basicalty at wp8, ornam pillows, some Mn coating, LST-SP, going for pilow toe frag
1810	13962	8778		sample 8, into basket 3a (stbd aft), small pilow toe frag; next we are going to cut off S wps at tip of dive plan and head over to base of fault near our wp 11 (their wp 12) to save time
				heading 259
1818	13936	8778		7m off bottom, heading down to slope, big mound should be off to stbd, expecting the fault and we will double back over
				constructional pillow slope in front of us, ornam pillows, LST-SP; accoriding to nav we are still on the way to the fault; so slope should be from mound with our wp12 on it. pillows are in place, can see drop off to port, is this the fault? Very ornam pilows flowing roughly
1819.8				with sub (sub heading = 244 so pillows are 230-230)
1823	13841	8752		going along fault at oblique angle, I see pillow frags and talus, just passed over high standing pillow spine to see debris covered slope
				at based of fault step
1825				have come accros fault and see a constructional slope with pillow tubes, but that also has some pillow debris, slope drops off to port, starting to come about to turn into the hill
				now seeing lots of pilow frag and debris as we round the nose of the mound, can see truncated pillows in the face but there is mostly constructional stuff on the slope. Did pillows drape fault? No, looks like fault is superimposed on steep pre-existing face, expecting slope to flatten soon according to the map, less ornam, flatter pillow tubes now
1828.5	13795	8754	2699	pillows on port, heading in direction of mound heading 180 *we are heading 270, constructional, but south face of mound is sort of chewed up, since there is a pit or fissure on stbd
				seeing 30cm fissure fissure on port now, cutting into this face, fair amt of debris but slope has in place pillows, we wil get a sample here, 1/2 way to our wp 11, still below the main fault
1833.5	13769	8744	2697	stopping for sample 9; 2/3 from our wp8 to 11 traverse, can see fissure on port side, can see pillows draping the surface, or is this just how it cracked?
	13769	8744	2697	sample 9 at makeshift 10cm accross round pillow toe will go into basket 3b
1839				getting underway to our wp 12 (their 13), but we will head east of it, on a heading due N, which is toward our wp13 (theri 14)
1841.8	13878	8770	2688	coming across the fault; small pit, the fault is a vertical wall, trunc pillows in the face; talus at the base, sed pilows below that. No sed on talus, 3 m across into the face
				truncated pilows as we go up the fault wall
1846	13781	8784	2677	seing same pillows on top, bulb, some ornam, sed pockets a bit bigger, but pilows are a bit flatter; can see a small pillow ridge off to port which has same LST-SP as other mounds
				1m fissure, per to traj (020, so it is 110)
1849.5	13747	8800	2675	pillows, LST-SP, semi lobate, dropoff in front of us, another fissure to port, 2 to 3 m across, downdropped on far side
1850.3	13757	8819	2676	slope is picking up in front of us, gentle depression at base of a constructional slope, LS pillow tubes, undulating topo coming up on wall in front of us, fault zone is a series of steps with some depressions, trunc pillows in face of wall now visible

1852.5	13773	8848		staring at next face, base of next mound, constructional but talus at base, we will go up face to make sure we are on it
				slope is a little less steep, at base of (our) wp13 mound
1855.8	13816	8904	2657	about 2/3 up slope, less steep here, wil try to bag a sample, since we've passed over the steeper south face
1857	13818	8909	2659	looking at collapsed ornam pillow for sample 10
				<i>end of vn620205.wma</i>
1904	13819	8909	2659	got sam 10 in basket 5a, pillow toe piece that looks like ice cream cone, bulb part and ang part
1907				underway from last stop
1907.5	13823	8919	2656	15-20 cm across fissure, in sed pillows near top of mound
1908.5				series of 10-15 m fissures, running paralel to face of mound, perpen to us, we are going 010, so they are running 270-280
				lobates, another fissure, can see drained lobate tubes in fissure face; mound is more fissured than others, pretty nice proper lobates
1909	13823	8948		here, seeing some collapsed lobes (~1m across)
1913	13857	9052	2659	pillows , light sed, flowing off into slight deep of port side, we are heading due north at 005
				comng into slight moat at nase of next mound, sonar show us in a small low or pit
				just intersecting slope of next mound that has our wp15 on it, not going for sample at base, can see trunc. Ornam pillows, but also
				some platey pieces of debris, some pillow tuves in various orientations, sed in pockets, unclear how this mound relates to one below,
1916				jumbled character of deposits makes contactg relation to lower mound unclear
1919	13872	9108	2654	heading 000 up slope, ornam. bulbuous pillows, constructional slope, pillow bud city
				very orn pillow, pillow tubes flowing down in direction we are heading, less sed here?, almost at mound top, going for sample before we
1921	13875	9130	2645	hit the top
1924	13879	9137	2643	stopping for sample 11
				striated pillows, some ornam, dusting of sed, some Mn, trolling for sample
1933	13878	9137	2643	sample 11 also went into basket 2a, small pillow toe frag along with 2 other prior samples
				going for 2nd piece, broken surface looks fresh (fresher than others?) looks like a cashew
				<i>end of vn620206.wma</i>
				got a couple more small pieces of sample 11 (3 in total for sample 11, all 3 are pretty small, ~ 5cm), did last piece even go into the
				basket? Not sure
1940				tape change/start of tape 3
				<i>end of vn620207.wma</i>
1944				finishing at 11 spot, heading to our wp 16. going across void in the map
1947	13921	9166	2640	ornam pillows, high is off to port
1949	13974	9183	2638	we have entered the map void, pillows trans to lobes, same sed
				starting to see broken pillow frags, slope is going down on stbd and also on port, we are sort of on a saddle, but there is a rise in front
1950.5	13984	9189		on us on sonar, large bulb pillows
				ornam pillows approaching slope, base of next mound, same sed.; there were some flat pillows transitional to lobates on isthmus we
1951.5	13963	9180	2641	passed over, now we have big pillow tubes, hil coming up (misspoke on tape I think and said "2614" for depth)
				flat lying lobates, pillow lobes, collapsed lobate, 1m across, cresting summit of next mound, we aimed for north side, fissure or
1953	14008	9203	2643	shaddow on sonar, can see it now off port, on north face of mound, sort of cresting summit of mound
				not a fissure, small gulley/depression with rise on other side, transitioning from lobes into pilows; we went over flat top of mound with
				lobates are are back into pilows with toes
				looking for sample 12, flattened pillows, much be at flow front, plenty on Mn but can see glass tetures, same sed as rest of mounds,
1956				going for a slabby piece

2005	14047	9214	2645	sample 12 is very large, 25 cm long, glass on both sides, went into 5b, big lobate slab, "wp17 sampling spot", underway to wp 17 <i>end of vn620208.wma</i> accidentally left recorder on; 4:02 minutes of background chatter in the sub. <i>end of vn620209.wma</i>
2011	14076	9206	2642	went over a bit of a drop off, heading to next wp 10 m off bottom, we've been over an open space, a wall of pillows is in front of us, we are now facing a west-facing scarp near their wp 17. looks like in-place pillows, much deeper embayment between this pillow mound the last one, compared to other pillow mound
2018.5	14146	9172	2677	contacts. ornate pillows, some debris as well (broken pillow tubes, broken frags) pillows have same sed as before, lots of ornate; large tubes 5-6m long off to port piling down sides, constructional slope but some
2020	14144	9193	2677	debris and truncated pillows, debris could easily be syn eruptive near top of slope, looking for a sample, a little past their wp17, but navae may be off. We see elongated pillow tubes, same sed cover,
2024	14173	9204	2661	some ornamentation, striated pillows sample 13; pillow bud, near wp 17 on steep slope, flow front, lots of ornaments and toes, sub heading = 037 will go to our wp 18 - long
	14174	9208	2662	traverse underway, heading 099; pillows, large bulb forms, light sed on top, some ornate, small depression than mound off to port, undulating topo, small pillow mounds; transitioned quickly into some lobes, small local but pillows off in distance, we are hugging N wall of this
2032	14184	9206	2658	feature; steep drop on stbd, construction face, pillows on port
2036.5	14274	9195	2661	15m off bottom; map shows gully in divide between mounds, we are in blue water, heading down 14m off bottom, can see pillows off in distance in front will head for next slope without going down since we are short on power and
2038	14294	9191	2671	time
2040.5	14351	9171	2675	22m off bottom; can see slope off to port on sonar but not visible off to port or in front
2042	1435x	9171	2675	28m off bottom
2043.5	14391	9174	2679	20m off bottom at back of sub, I can see steep port off to port side, looks like pillows, slope looks largely constructional steep, constructional slope, not much talus, big pillow tubes, some ornaments (toes and buds), cliff coming up steep and fast, butt of sub is at 10m going up steep constructional face, some pillow debris but primarily in place, very steep slope, will approach top for a sample, nice
2047.5	1420x	9172	2667	hard return on sonar
2049	14453	9166	2657	slope is more gentle, bulb pillows, very light sed dust on top, ornate pillows, some sed in pockets, is this less sed than elsewhere?
2051	14476	9169	2651	less sed on pillows, nearly at crest of mound, sonar return is softer; is there less Mn here? Sed looks a bit lighter
2054	14479	9170	2652	sample 14, in between position of our wp 18 and 19; pillow toe sample, will head to last wp for one more sample
2101	14496	9168	2645	underway 069, bulb ornate pillows, sed dusting on top <i>end of vn620210.wma</i>
2102	14513	9174	2542	coming across 2m wide fissure, truncated pillows in face; unclear if fissure or collapse; lobates on top of feature on top we see shelly lobates, lots of drainouts, somewhat more sed here zooming in for a sample of these small lobates, trans to pillows, lots of collapsed pillows, look like we are at summit of our wp19 mound,
2104	15431	9182	2643	looks pretty fresh here considering these are lobates; looks a bit like lava shield cover sample 15 is two pieces: one is a pillow toe into bio box front area; the other is a lobate crust, 40 cm long into space on top of baskets.
2113	14532	9184	2644	Getting ready to come off the bottom <i>end of vn620211.wma</i> this file is 19+ min of random noise recorded on the ship after the dive (i.e., it is not part of my transcript) <i>end of vn620212.wma</i>