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Title
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Permalink
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Journal
Journal of California and Great Basin Anthropology, 23(1)

ISSN
0191-3557

Authors
Erlandson, Jon M
Rick, Torben C
Vellanoweth, Rene L

Publication Date
2001-07-01

Peer reviewed

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Journal of California and Great Basin Anthropology
Vol. 23, No. 1, pp. 67–76 (2001)

Radiocarbon Chronology for Corona Del Mar (CA-SBA-54): A Middle Holocene Site on the Goleta Slough, Santa Barbara County, California

JON M. ERLANDSON, TORBEN C. RICK, and RENÉ L. VELLANOWETH
Department of Anthropology, University of Oregon, Eugene, OR 97403-1218

The Corona Del Mar site, a subject of archaeological inquiry since at least the 1920s, was fundamental to William Harrison's development of an archaeological sequence for the Santa Barbara Coast. Harrison, a pioneer in radiocarbon dating of California shell middens, excavated 21 test units at CA-SBA-54 but obtained no ^{14}C dates. Here, we report on a suite of ^{14}C dates recently obtained for Harrison's collections and peripheral deposits at CA-SBA-54. The radiocarbon chronology suggests that the site contains at least two discrete Middle Holocene components, one dating between about 5900 and 5400 CYBP and another dated to approximately 4800 CYBP. The younger component validates aspects of Harrison's site chronology, but the earlier dates suggest that CA-SBA-54 was occupied contemporaneously and slightly earlier than the Aerophysics site (CA-SBA-53). Our results help contextualize the Corona Del Mar assemblage in relation to other sites in the Santa Barbara Channel area and the southern California Coast.

The Middle Holocene, between about 6700 and 3350 RCYBP, continues to be one of the least known periods in the long history of Native American occupation of the California Coast (Erlandson 1997:2). In the 1960s, William Harrison (1964; Harrison and Harrison 1966) published the results of archaeological investigations at two Middle Holocene sites located along the margins of the Goleta Slough, sites attributed to the Hunting People (Rogers 1929). One of these, the Aerophysics site (CA-SBA-53) was ^{14}C dated by Harrison and has played a major role in a number of syntheses for the southern California Coast and the Santa Barbara Channel area (e.g., Colten 1989; Glassow 1997; Glassow et al. 1988; Harrison 1964; King 1990; Rick and Glassow 1999). The other site, Corona Del Mar or CA-SBA-54, was not ^{14}C dated and has remained relatively obscure and rarely discussed in such syntheses (see Hoover [1986:4] for a significant exception). In an evolutionary discipline such as archaeology, the lack of relatively precise chronological data for a collection is a serious inhibitor to further scholarly research.

The lack of ^{14}C dates for the Corona Del Mar site has literally left it in the shadows of regional prehistory. To help correct this problem, we recently obtained marine or estuarine shell samples from Harrison's collection and submitted them for radiocarbon dating. These results, combined

with dates obtained from peripheral or redeposited site areas, provide a relatively detailed chronology for the occupational history of CA-SBA-54. In this paper, we provide background data on the setting and history of research at the Corona Del Mar site to contextualize our work, summarize our efforts to develop a relatively high resolution chronology for the site, and discuss the regional implications of our results.

THE CORONA DEL MAR SITE: BACKGROUND

CA-SBA-54 was a relatively large shell midden located on a knoll along the northwest margin of the ancestral Goleta Slough, a large estuary that appears to have been a focus of Native American settlement for more than 9,000 years (Erlandson 1994). The site was briefly described in D. B. Rogers' (1929) pioneering synthesis of Santa Barbara Channel archaeology. Rogers (1929:155) described the site as occupying the "crest of a small, abrupt-sided mound" on which "evidences of the former presence of the Oak Grove People are scattered upon the surface. A few small pits, driven to the subsoil, confirmed my conjecture that a village of this people had once been located here."

In 1956, Harrison (1964:106; Harrison and Harrison 1966:40-41) excavated 21 test units, a human burial, and several auger holes on the knoll at Corona Del Mar. The depth of the site deposits varied from 6 to 16 in. (15-41 cm.) and averaged about 12 in. (31 cm.), but some of the midden had been disturbed by plowing activities to a depth of 6-8 in. (15-20 cm.). The 5 x 5 ft. (1.5 x 1.5 m.) units were excavated in 6 in. (15 cm.) arbitrary levels. In excavating about 15.5 m^3 (20.3 cu. yd.) of shell midden deposits, Harrison (1964:115) recovered a total of 307 formal artifacts from the test units and 13 more from the burial and features. Because none of the excavated sediments appear to have been screened, beads, other small artifacts, and overall artifact frequencies are almost certainly underrepresented in the assemblage.

Artifacts collected by Harrison (1964) from CA-SBA-54 include contracting-stem and side-notched projectile points, hammerstones, choppers, manos and metates, mortars and pestles, charmstones, asphaltum, and worked bone (Table 1). Interestingly, manos and metates (n=37) outnumber mortars and pestles (n=25) by almost 50%, and the diagnostic projectile points include roughly equal numbers of side-notched and contracting-stem varieties. Shellfish were not systematically collected from the units, but samples of open coast and estuarine species, including *Tivela stultorum* (Pismo clam), *Saxidomus nuttalli* (Washington clam), *Mytilus californianus* (California mussel), *Chione undatella* (Venus clam), and others were collected. Animal bones encountered during excavation were more systematically collected: most of the 238 specimens (82%) appear to be from small mammals, with only trace amounts of deer, fish, bird, and sea mammal (Harrison 1964:117). The lack of screening makes it difficult to assess the importance of various faunal classes at CA-SBA-54.

Unfortunately, the knoll on which most of CA-SBA-54 was once located was leveled shortly after Harrison's excavation[1] and the site was long believed to have been destroyed. In the 1990s, however, Larry Wilcoxon and archaeologists working with Peak and Associates identified peripheral site deposits located around the base of the old knoll. Intact site remnants on the north and south sides of the knoll were recently studied by archaeologists associated with CALTRANS, recovering materials being analyzed under the direction of Valerie Levulett, William Hildebrandt, and Deborah Jones (V. Levulett, personal communication, 2000).

Based on a typological comparison of the artifacts he recovered, Harrison (1964) estimated that CA-SBA-54 was slightly younger than the Aerophysics site located about 500 meters to the southeast, for which he obtained three uncorrected ^{14}C dates falling between 5000 and 4600 RCYBP (Table 2). Harrison (1964:337) noted that the artifact assemblages from the two sites were generally similar, but that Corona Del Mar contained higher percentages of contracting-

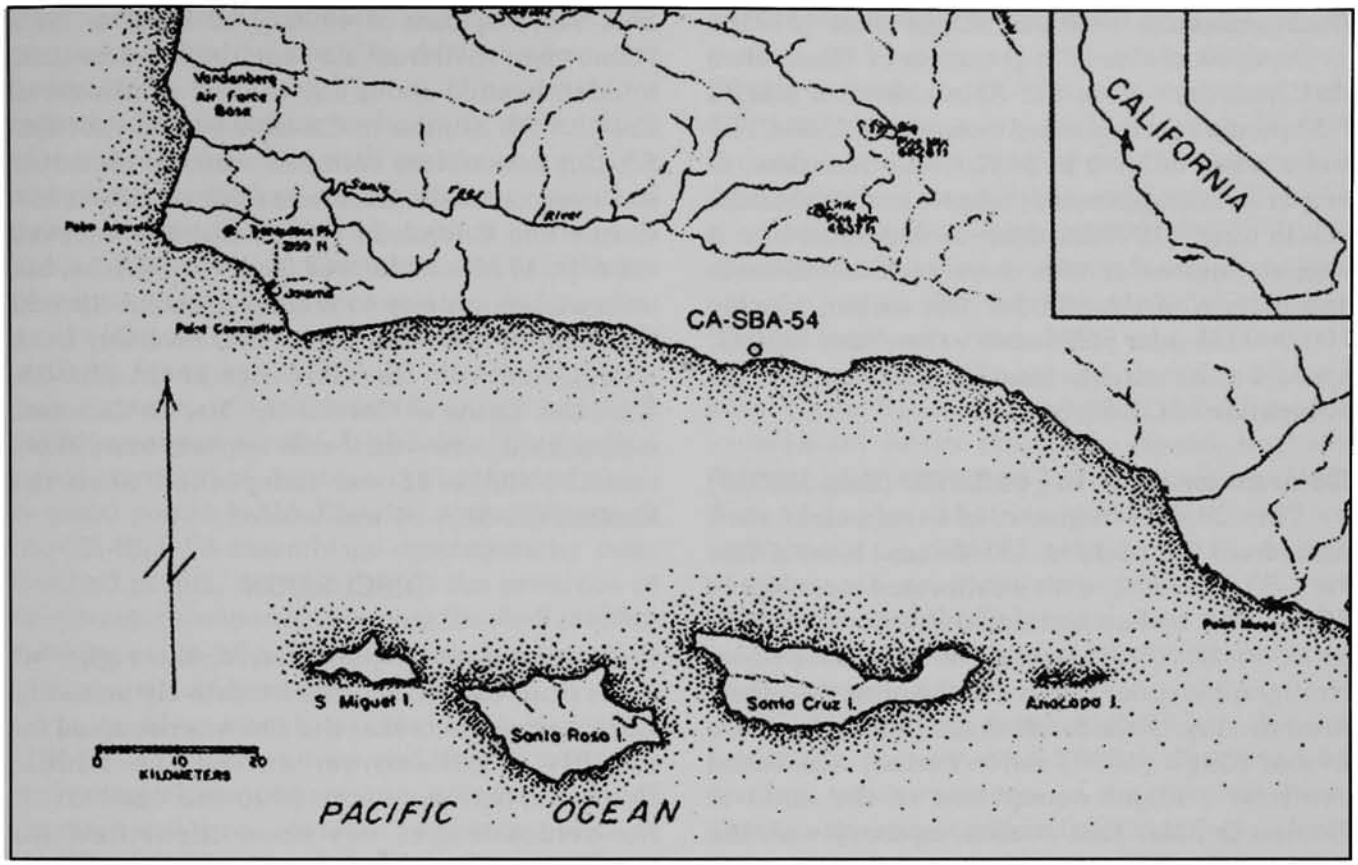

Figure 1. Location of CA-SBA-54 and Santa Barbara Channel.

stem points and some more symmetrical and finely made mortars than he found at CA-SBA-53. If Harrison was right, the occupation of Corona Del Mar should date to shortly after that of the Aerophysics site, which is now bracketed by six ^{14}C dates ranging between about 5750 and 4950 CYBP (Rick and Glassow 1999).

A RADIOCARBON SERIES FOR CA-SBA-54

Dates on Harrison's Collection

To help establish an absolute chronology for Corona Del Mar, we obtained three ^{14}C dates for marine shell samples collected by Harrison from atop the knoll at CA-SBA-54. Each sample consisted of a single fragment of relatively well preserved marine shell from the six inch arbitrary levels within the excavated test units. All three samples were sent to Beta Analytic, Inc., where they were analyzed using conventional liquid scintillation counting techniques. Prior to analysis, each sample was etched in hydrochloric acid to remove the outer portions of the shell most susceptible to contamination. The samples were measured for isotopic fractionation by Beta Analytic and we calibrated them via CALIB 4.1.2 using a delta-R of 225 $\pm$ 35 years (Stuiver et al. 1986; Stuiver and Reimer 1993). The samples, dates, and calibrated ages are summarized below (see also Table 2).

Polinices lewisii 4380 $\pm$ 80 RCYBP (Beta-131917)

Analysis of this sample, a 19.6 g. fragment of estuarine moon snail shell from the 0-6 in. (0-15 cm.) level of Harrison's Test Pit G-53, produced a calibrated age of 4810 CYBP, with a range of 4850 to 4680 CYBP at one standard deviation. This date, falling in the poorly defined phase Ey of King's (1990) Early Period, is consistent with Harrison's (1964) conclusion that occupation of CA-SBA-54 took place slightly after the occupation of CA-SBA-53.

***Tivela stultorum* 4980 ± 60 RCYBP (Beta-131918)**

Analysis of this 28.6 g. sample of Pismo clam shell from the 6-12 in. (15-31 cm.) level of Test Pit F-53 produced a calibrated intercept of 5560 CYBP and a range of 5590 to 5460 CYBP. This date, in proper stratigraphic order relative to the first date, falls in King's (1990:28) Early Period phase Eya. It suggests, moreover, that there were two discrete occupations of CA-SBA-54. The earlier, roughly 700-900 calendar years earlier than Beta-131917, appears to be roughly contemporaneous with the occupation of CA-SBA-53.

***Tivela stultorum* 5040 ± 60 RCYBP (Beta-131919)**

This 29.6 g. fragment of Pismo clam shell came from the 12-18 in. (31-46 cm.) level of Test Pit L-53. The date, with a calibrated intercept of 5590 CYBP and an estimated age range of 5650 to 5560 CYBP (1 sigma), is also in proper stratigraphic order relative to the other two dates from the top of the knoll. Again falling in phase Eya of King's (1990) Early Period, this dated confirms a major occupation of the knoll at Corona Del Mar that is contemporary with the occupation of CA-SBA-53.

Additional ^{14}C Dates

In the late 1990s, CALTRANS archaeologist Valerie Levulett directed investigations of remnants of CA-SBA-54 during a freeway overpass study. The site remnants consist of an apron of intact archaeological material located around the base of the north and south sides of the knoll. As part of the CALTRANS study, five ^{14}C dates were obtained on small samples of marine shell. The peripheral site remnants of CA-SBA-54 produced calibrated midpoints ranging from 5870 to 5590 CYBP. These dates are consistent with the age of the earlier component atop the knoll, but may extend the age of the site back as much as 300 years. No evidence for the younger component identified atop the knoll has yet been identified by the ^{14}C dates from the peripheral deposits.

Based on our dating of Harrison's materials, it now seems likely that a ^{14}C date obtained by Colten and Erlandson (1983) from a disturbed shell midden at CA-SBA-1745 also relates to CA-SBA-54.[2] The date of 4990 ± 90 RYBP is for a Pismo clam shell from a 20 cm. thick redeposited midden located about 150 meters southwest of CA-SBA-54. Similar to CA-SBA-54 and CA-SBA-53, this assemblage contains a mix of estuarine and open coast shellfish taxa (Colten 1989:205). Colten and Erlandson (1983) initially believed CA-SBA-1745 was derived from CA-SBA-54, but its contemporaneity with dates from CA-SBA-53 led them to conclude that it had probably been redeposited from the more distant CA-SBA-53. With the dating of Corona Del Mar to the same time period, however, it now appears most likely that CA-SBA-1745 was redeposited when the knoll at CA-SBA-54 was leveled.

DISCUSSION

From a general perspective, the eight ^{14}C dates from CA-SBA-54 are a relatively coherent suite that suggests that the site was occupied for roughly a millennium during the Middle Holocene, between about 5900 and 4800 CYBP. No evidence has yet been identified for occupation of the site during the Early Holocene and the lack of younger dates is consistent with the absence of Late Holocene cultural hallmarks such as arrow points, shell fishhooks, etc. This suggests that the assemblage recovered by Harrison dates primarily — and possibly entirely — to a relatively narrow time period within the Middle Holocene. Consequently, the stratigraphic mixing of site components from widely divergent time periods does not seem to be as significant a problem at CA-SBA-54 as it is known to be at several sites along the mainland coast of the Santa Barbara Channel, including Glen Annie (CA-SBA-142), Little Sycamore (CA-VEN-1), CA-SBA-96, and others (see Erlandson 1994; Erlandson et al. 1988).

A higher resolution reading of the archaeological record, however, suggests that there were at least two discrete Middle Holocene occupations of CA-SBA-54, one dating to about 4800 CYBP and another between about 5900 and 5400 CYBP. These dates confirm Harrison's (1964:338) general conclusion that the site was occupied slightly after CA-SBA-53, but suggest

that most of the site occupation was contemporary or slightly earlier than the occupation of Aerophysics. The artifacts recovered by Harrison, particularly the mixture of mortars and pestles with manos and metates and contracting-stem points with side-notched points, suggest that this radiocarbon chronology is essentially correct. The numerical dominance of manos and metates over mortars and pestles, unlike the roughly even distribution of such artifacts found at CA-SBA-53 (Harrison 1964), seems consistent with the evidence for a slightly earlier occupation of CA-SBA-54. The roughly equal number of contracting-stem and side-notched points at CA-SBA-54, contrasting with the CA-SBA-53 assemblage dominated by side-notched points, may be due to the presence of the younger component capping the shell midden deposits at CA-SBA-54 and a general increase in the intensity of hunting through time.

It is also worth noting that Harrison (1964:114) recovered several exotic artifacts, including three charmstones (one made of steatite) and three obsidian projectile points at CA-SBA-54. The steatite and obsidian artifacts suggest that a relatively substantial Middle Holocene trade network existed between mainland, island, and interior regions of California and the Great Basin. In recent years, a variety of items have been cited as evidence for exchange between coastal peoples and those of interior California and the Great Basin, including *Olivella* Grooved Rectangle beads, stone balls, obsidian artifacts, and others (see Howard and Raab 1993; Jenkins and Erlandson 1996; Porcasi 1998; Vellanoweth 2001). The presence of exotic steatite and obsidian artifacts at CA-SBA-54 and CA-SBA-53 further supports the scale and scope of this interaction.

SUMMARY AND CONCLUSIONS

Harrison (1964) was among the first California archaeologists to use radiocarbon dating to anchor an archaeological chronology for the Santa Barbara Channel area. Despite this fact, the Corona Del Mar site was one of the more significant sites of the southern California Coast for which ^{14}C dates had not previously been reported. Recent radiocarbon dating suggests that the site contains two discrete components dating to the Middle Holocene, one the result of a major occupation dated between about 5900 and 5400 CYBP and a second dated to about 4800 CYBP. These dates also add to the evidence for a substantial occupation on the west margin of the Goleta Slough between about 5900 and 4800 years ago. Glassow (1997) argued that CA-SBA-53 may have been one of just a few major residential bases along the Santa Barbara Coast during this time. The ^{14}C dates from CA-SBA-54 suggest that its occupation overlaps with that of CA-SBA-53, reinforcing the notion of this area as a major population center during the Middle Holocene. As a result, the relationship between these two sites is even more intriguing.

It is also worth emphasizing that, despite assertions that CA-SBA-54 was destroyed by grading, intact remnants of the site still exist. This is a situation California archaeologists have encountered over and over again, where sites supposedly destroyed are found to be partially intact. The remnants of such sites, even if peripheral or redeposited, are especially significant as they often provide the only remaining opportunity to help place important museum collections such as those excavated by Harrison, Rogers, Olsen, and Orr in a broader ecological and cultural framework.

Finally, at a time when many anthropologists are trying to make a case for the significance and preservation of museum collections, thousands of collections housed in American museums remain incompletely analyzed and unpublished. Recently, a number of California scholars have led efforts to radiocarbon date significant museum collections and refine the chronology of key sites and artifact types (e.g., Broughton 1999; Erlandson 1991a, 1991b; Erlandson et al. 1992; Koerper et al. 1995; Rick et al. 2000; Taylor et al. 1985; Vellanoweth 2001). Now more than ever, we must show that the study of such collections continues to contribute to our knowledge about the history and archaeology of America.

NOTES

1. Grading of the knoll at Corona Del Mar was related to the construction of a freeway overpass for Glen Annie Road.

2. CA-SBA-1745 was significant as a source of systematically recovered shellfish and other faunal remains from CA-SBA-54, where faunal remains were not systematically collected. Unfortunately, CA-SBA-1745 was recently destroyed during construction of a housing development.

ACKNOWLEDGMENTS

Funds for ^{14}C dating shell samples from Harrison's CA-SBA-54 collection were provided by the University of Oregon's College of Arts and Sciences as part of a Petrone Scholar Fellowship awarded to Erlandson. We are grateful to David and Nancy Petrone for their financial support and commitment to scholarly research. We are also indebted to Valerie Levulett, William Hildebrandt, and Deborah Jones for sharing the results of their work at the remnants of CA-SBA-54 and allowing us to cite the ^{14}C dates they recently obtained. For assistance in obtaining shell samples from Harrison's collection, housed in the Museum of Anthropology at UCSB, we thank Peter Paige and Michael Glassow. We also thank Paul Apodaca and anonymous reviewers for their assistance in the reviewing, editing, and production of this paper. For his enduring contributions to California archaeology, we respectfully dedicate this paper to Dr. William Harrison.

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Table 1
ARTIFACTS FROM CA-SBA-54[a]

Artifact Type	Harrison Collections
Mano	21
Metate Fragments	16
Pestle	5
Grinding Stone	13
Stone Vessel (Whole)	2
Stone Vessel Fragment	18
Anvil Stone	4
Rubbing Stone	2
Pitted Stone	4
Notched Stone	1
Asphaltum Covered Stone	1
Undiff. Ground Stone	14
Unmodified Stone[b]	2
Projectile Point	19
Drill	1
Scraper	152
Hammer	17
Chopper	7
Undiff. Chipped Stone	9
Charmstone	3
Worked Bone	9

[a] Data adapted from Harrison (1964).
[b] Recovered from burial 1.

Table 2
RADIOCARBON DATES FROM CA-SBA-54, CA-SBA-53, and CA-SBA-1745[a]

Site	Sample #	Material	^{14}C age	$^{13}C/^{12}C$ Adjusted	Calendar Age (B.P.)
CA-SBA-54	Beta-131917	Moon snail	4380±80	4800±80	4850 (4810) 4680
	Beta-131918	Pismo clam	4980±60	5400±60	5590 (5560) 5460
	Beta-131919	Pismo clam	5040±60	5460±60	5650 (5590) 5560
	Beta-129405	Pismo clam	5030±70	5470±70	5670 (5590) 5560
	Beta-129407	Pismo clam	5080±50	5520±50	5710 (5640) 5590
	Beta-129406	*Protothaca*	5170±100	5590±110	5880 (5720) 5600
	Beta-129408	*Protothaca*	5170±50	5630±50	5870 (5750) 5700
	Beta-129409	Pismo clam	5250±50	5690±50	5900 (5870) 5750
CA-SBA-1745	Beta- 5173	Pismo clam	4990±90	5420±90	5640 (5570) 5320
CA-SBA-53	A-0303	Abalone	4620±80	5050±80	5270 (5070) 4960
	A-0302	Pismo clam	4890±80	5320±80	5570 (5460) 5320
	A-0363	Abalone	4980±60	5410±60	5600 (5570) 5470
	Beta-103595	Pismo clam	4790±60	5200±60	5430 (5300) 5260
	Beta-101902	Pismo clam	5090±80	5520±80	5730 (5640) 5580
	Beta-101901	Pismo clam	5110±60	5530±70	5730 (5650) 5540

[a] All dates were calibrated using Calib 4.1.2 (Stuiver and Reimer 1993), range is one sigma standard error. Beta calculated the isotopic fractionation for all specimens, except the Harrison and CA-SBA-1745 specimens, for which we used an average of +430 years (Erlandson 1988); dates compiled from Harrison (1964), Rick and Glassow (1999), and Breschini et al. (1996). Beta-129405-9 were obtained by Hildebrandt, Jones, and Levulett; Beta-129406, -129408, and -129409 were AMS dates.