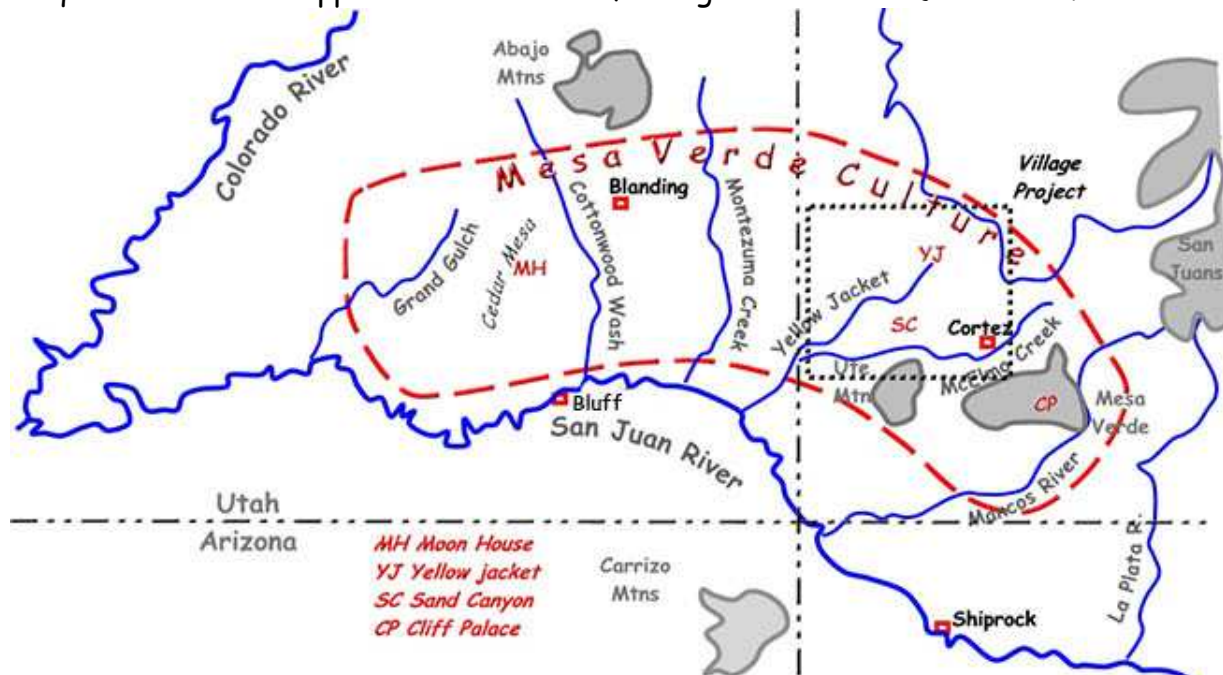


Mesa Verde Culture ~ The Anasazi

The Anasazi intermittently inhabited the Four Corners region for 1100 years from 200-1300 A.D.. Various aspects of Mesa Verde culture can be found from Mesa Verde National Park, southwest Colorado, to regions east of the Colorado River and Grand Gulch, south-central Utah. Mesa Verde, Canyons of the Ancients, Hovenweep, Comb Wash, Cedar Mesa, and Grand Gulch are today's popular place names for some Four Corners areas which hosted the Mesa Verde culture. That unique culture was supported tributaries flowing south to San Juan River.



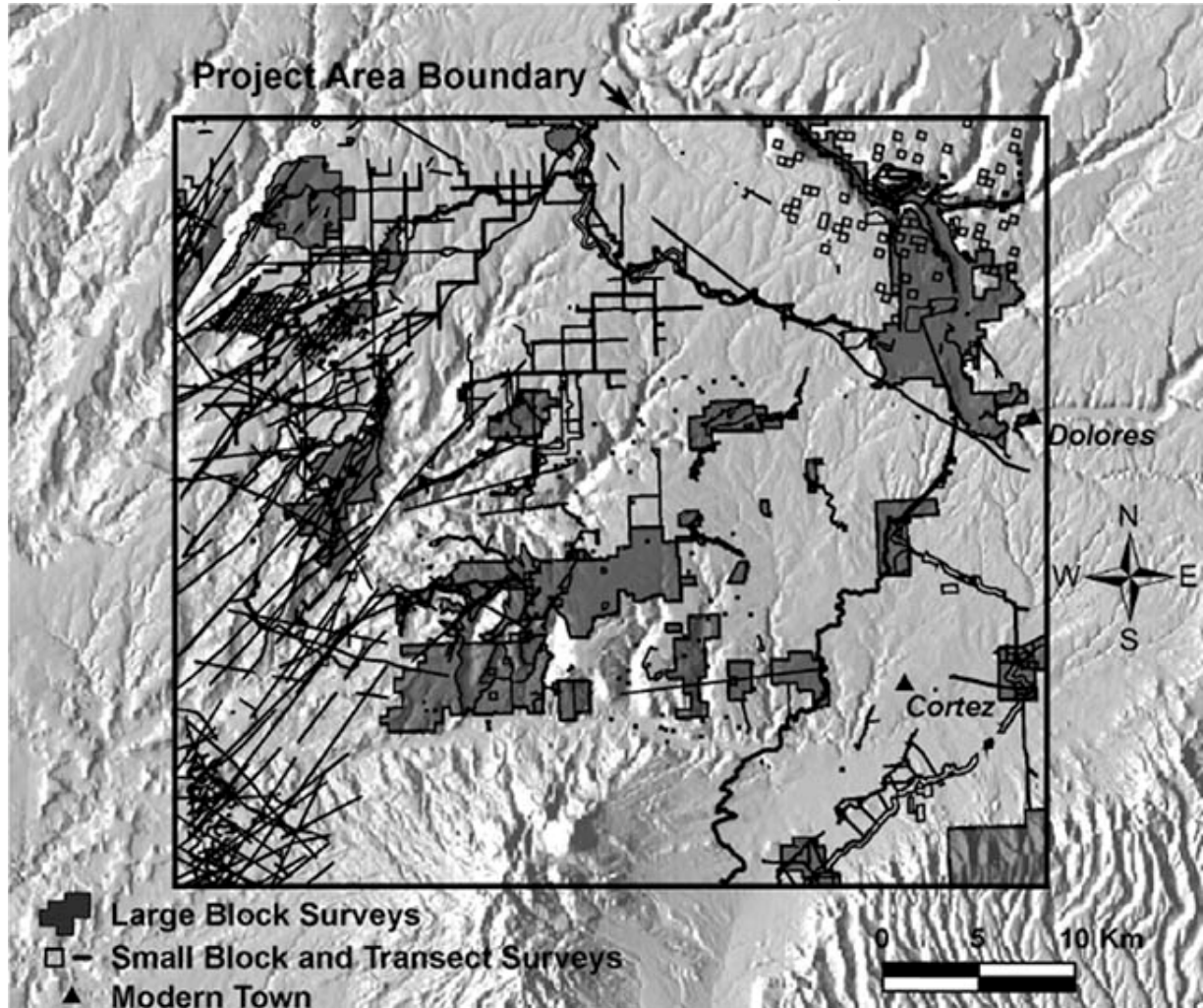
Since then, beauty of nature and elegance of science have contributed much to our understanding of Anasazi culture!

In the map above, Mesa Verde National Park and Crow Canyon Archaeological Center (near Cortez, Colorado) are two areas of significant ideological influence. Crow Canyon's Village Project is shown in the black dotted square. In one, the beauty of Cliff Palace and its environs captivates heart and soul. In the other, the rationale of science has helped to sort out many complex interactions at Yellow Jacket and Sand Canyon Pueblos (Canyons of the Ancients) of the 1100 year Anasazi history.

Little did the Anasazi realize their culture would create such a famous, world wide heritage? Museums and late-stage cliff dwellings of Mesa Verde are a marvelous testament to a long architectural trend for of Anasazi lifestyle. Recent

modeling studies, based on immense archeology data collections, began to both penetrate and predict more subtle aspects of Anasazi heritage.

A large-scale aerial photo of Crow Canyon's Village Project is shown below.



Canyons of the Ancients Study Area
Aerial Photo © Crow Canyon Archeological Center, Village Project, 2007

Anasazi Timelines

A generalized history of the Mesa Verde culture may differ in both space and time, but some general guidelines can help us learn Anasazi history. First, we need to become familiar with names for Anasazi periods; Basketmaker and Pueblo. These names are broken into five categories; Basketmaker II/III and Pueblo I/II/III.

Basketmaker - nomadic tribes famous for weaving gorgeous basketry.

Pueblo - farming tribes famous for exquisite pottery and extraordinary stone masonry buildings.

For six centuries, from 600-1200 A.D., ancient Anasazi primarily lived on mesa tops in the Mesa Verde cultural area. Anasazi began to construct and live in cliff dwellings during their final 75 to 100 years.

Anasazi history intertwines with multiple migrations for survival. Their principal concern was water to support forests, animals, farming, and life. Several different ecological niches were available; San Juan River drainage, mesa tops, and in their final years, springs at canyon edges. San Juan drainage would encompass many parts of Canyons of the Ancients and Hovenweep. Mesa tops were more typical for early Mesa Verde, Canyons of the Ancients, and Cedar Mesa. High canyon enclosure was typical of Cliff Palace and Spruce Tree House at Mesa Verde, Moon House and the Citadel on Cedar Mesa.

Such a variation in migratory and farming patterns provides slightly different calendars depending on who lived where and when. Anasazi Timelines is a display of this complex history.

Anasazi Population Growth and Decline

About **197,000 people** lived in the Village Project during seven centuries between A.D. 600 and 1300. In contrast to traditional views of population continuity, in situ growth, and gradual culture change in the Mesa Verde region, Crow Canyon's work suggests up to five episodes of **immigration** (arrivals) and two periods of **emigration** (departures) in Canyons of the Ancients.

600-725 AD Immigration

Early immigration occurred with settlement by a substantial population of year-round residents, ~ 600-725 AD. We know little about reasons for this migration or source of migrants.

800-840 AD Immigration

The second immigration occurred as well-documented villages of Dolores River valley formed in the northeast corner of our study area. These groups moved in from a source in upper reaches of San Juan drainage (east) and another in southeastern Utah (west). Moving occurred primarily during 800-840 AD then later coalesced into large villages of Dolores River valley.

880-920 AD Emigration

Now many migrants went south into northwestern New Mexico and the San Juan Basin. Several recent studies argue this movement from north to south contributed to initial development of a Chacoan regional system.

1060-1100 AD Immigration {Bonito Style Great Houses...}

Despite a third episode of immigration in late 900s, populations remained low until a fourth episode of immigration in 1060-1100 AD. This is a surprising and

significant finding. Building Bonito-style great houses in central Mesa Verde region began in earnest around 1080 AD.

1225-1260 AD Immigration {Canyon Centers w domestic water sources...}

A fifth period of population growth and immigration occurred during 1225-1260 AD, with peak population. This increase in population density was largely unrecognized in previous studies. It is part of other important changes in settlement patterns. *First*, both number of community centers and proportion of people who lived in these centers increased. *Second*, new centers were built in canyon settings with less-productive catchments than in established upland centers, but did contain domestic water sources, especially springs. Ready access to stone and timber helped create great masonry buildings.

1260-1280 AD Abandonment by 10,000 Anasazi

Changes in settlement pattern, unparalleled in scope and speed, predict the largest change of all: every body left during the late 1200s. Emigration was a long-term process that began in early 1200s at least 20 years before final depopulation. It also suggests more than 10,000 people remained after 1260 AD. These people either emigrated or died over the next two decades. The *last* tree-ring cutting-date from Mesa Verde region is 1280 AD. The Anasazi were out of Cedar Mesa after 1268. It is likely the entire region was abandoned just a few years later.

The Village Project did not include all Mesa Verde Anasazi dwellings or artifacts. Numbers are conservative, since the Anasazi lived over a much larger region than was modeled.

Growth of Typical Mesa Verde Culture Households

Most people in the Mesa Verde region during Basketmaker III time lived in small, scattered farmsteads which were home to one or two households, each with its own pithouse and outdoor storage facilities. As population grew, clusters of farmsteads began to appear on the landscape, forming early communities.

Dramatic changes in housing took place during Pueblo I period, changes in which archaeologists see beginnings of a true pueblo architecture. The word pueblo is Spanish for "town" or "village". During Pueblo I period, such villages came into being in the Mesa Verde region. Archaeologists consider any settlement with more than 50 rooms a village.

The most dramatic change in family housing during Pueblo I period was building of substantial above ground rooms, one story tall, used not only for food storage, but also for daily living. Unlike above ground rooms of Basketmaker III period, which were not connected to one another, those built during Pueblo I period were constructed side-by-side, with "shared" walls. These groups of rooms are called

"roomblocks" and are usually located north of pithouses. Some rooms were used exclusively for storing dried corn and other foodstuffs. Others had fire hearths and food-grinding tools, which indicates people lived and worked there for at least part of each year. The open area between roomblock and pithouses was a plaza, used as an additional work area when weather permitted. As before, refuse accumulated in a designated midden area south of the pithouses.

Most people during Pueblo II lived in small farmsteads consisting of a one-story roomblock; a plaza area; a small, underground kiva; and a midden. Loose clusters of farmsteads formed communities, often focused on a large, centrally located site with a great kiva, a great house, or both. Archaeologists call these centrally located sites "community centers" and found more than 30 in Mesa Verde region.

Early in Pueblo II, many roomblocks were constructed using the jacal technique, but by the period's end, virtually all were made of walled masonry. With walls built of stone and mortar, masonry structures offered good protection from the elements. Such structures are better preserved in the record than those built of less-durable materials. As with roomblocks built during the preceding period, those built during Pueblo II consisted of both living and storage rooms.

Small upland farmsteads that were home to most families early during Pueblo III consisted of a masonry roomblock, a plaza area, a masonry kiva, and a midden, usually aligned on a north-south axis. With formation of large villages later in the period—some of which housed hundreds of people—basic elements of the farmstead were preserved, but they looked very different when incorporated into a densely populated settlement. Large villages contained many roomblocks and kivas, and the arrangement of structures had to be tailored to specific settings—canyon head, canyon slope, or rock alcove.

Villages wrapped around the heads of canyons and stepped down canyon slopes - often enclosed by short, but very thick walls. Such walls clearly defined village limits and may have been used for defense. Typically, each village had at least one natural spring to provide reliable drinking water. Controlling access to such a water supply was a priority for village residents, especially in a time of drought. At least portions of most room blocks in canyon-head sites were multi-story. Circular, masonry towers were often built nearby. Towers were sometimes connected to kivas by means of underground tunnels.

Ecological Models

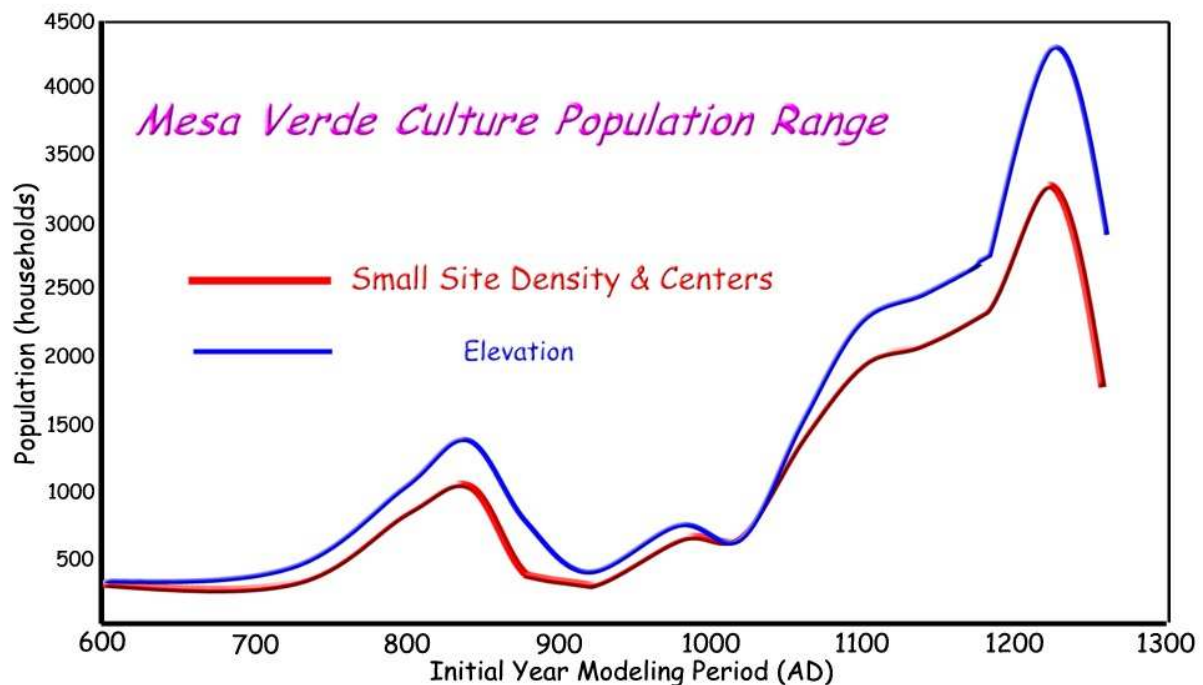
We've briefly looked at historical archaeology. Now what can models tell us...?

Only a small fraction of human history is known through texts. For the rest, archaeology is the main source. By examining ruins, artifacts, and remains,

archaeologists painstakingly created a series of pictures showing human societies as they existed thousands of years ago. It is much more difficult, however, to determine processes that produced and changed these societies. Researchers are still struggling to understand the long chain of cause-and-effect (and chance events) stretching from our hominid ancestors a million years ago to gorgeous stone buildings, centers, and cultures as advanced as the Anasazi.

With advent of computers, archaeologists began to experiment with model simulations as an aid to exploring human prehistory. The logic is simple: your program mimics processes such as population growth and resource usage. You want to see how well software predictions coincide with the archaeological data.

Quite a breeding ground for fertile new archaeological ideas...



Software allows researchers to create models with many interacting agents, e.g. individual households distributed across a landscape. Agent interactions can either represent individual households across a landscape or other factors. Dynamic agent interaction can simulate formation of alliances or exchange of resources or information. Archaeologists give agents built-in rules to specify their actions. But agents can also learn to acquire new behaviors.

It's this amazing predictive capability which can create such fertile aspects for answering age old questions like

"Why did the Anasazi leave?"

After several years of modeling, numerous conclusions have come out of the Crow Canyon effort.

Crow Canyon's models have focused on prehistory of North American Southwest (1,100 years between 200-1300 A.D.), for the Four Corners area where Arizona, New Mexico, Colorado and Utah meet. This region, home to ancient Anasazi (also called ancestral Puebloans), has one of the best-known archaeological records in the world. Anasazi culture peaked between A.D. 1000 and 1300 with elaborate towns and remote cliff dwellings. By 1300 A.D., the Anasazi had abruptly abandoned settlements and migrated south to central and eastern Arizona, western New Mexico, and the northern Rio Grande Valley.

First Model Conclusion

Ecology and social factors need to be considered to understand the history of aggregated settlements. Center populations grew during each settlement cycle, peaking during immigration at the cycle's end. Evidently, centers exerted a stronger hold on their inhabitants than isolated farmsteads. There is little correlation between long-term climatic fluctuation and proportion of households living in community centers. Climatic fluctuation was measured by mean potential maize productivity. This suggests farming was not as marginal as is often assumed. While the number of occupied centers was proportional to overall population, people actually living in the centers were not closely related to the same population levels. Rather, the number of households living in the centers during a given period more strongly correlates with the time lapse in the settlement cycle rather than either average maize productivity or overall population density.

Conclusion 2

Although increasing population strongly influenced aggregation size, it did not necessarily lead to increased environmental impacts. Although late population was only one third of early population, the latter did more damage to woodland surrounding settlements. Changes in architecture may have made it easier to conserve and recycle pre-cut trees. Early builders used wood and earth. Late builders created masonry structures. Wood was used almost solely for roofing.

Conclusion 3

The peak population of 19,500, in the mid-13th century, was 11 persons per square kilometer of arable land. 35% of the land below 7500 feet could produce a two-year supply of daily caloric needs of mid-13th century population. This production was in a year one standard deviation below the long-term mean of annual farm growth. In short, even if there was much less good maize grown, land could

still supply two years worth of need at large population levels. And this occurred without all arable land being under cultivation.

Final Conclusion

The 1200s were plagued by drought and cooler-than-normal temperatures, resulting in poor harvests. Sixty nine years were below the long term agricultural potential average. Thirty one years were above. Yet, population grew.

New York Times Article

"Until very recently, the most perplexing mystery of Southwestern archeology -- what caused collapse of the ancient Anasazi empire -- seemed all but solved. Careful scrutiny of tree-ring records established that in late 1200's a prolonged dry spell called the Great Drought drove ancestors of today's pueblo Indians, to abandon their magnificent stone villages at Mesa Verde and elsewhere on the Colorado Plateau, never to return again.

"But in the last few years, archeology has been shaken with a quiet revolution. Textbooks are being rewritten as common wisdom, taught to generations of students, is overturned. Nobody is talking about great droughts anymore!

"What all these theories have in common is rejection of the old notion of negative environment as the single determining cause, with Anasazi no more than passive pawns of blind forces. You have to look further than just environment. There is a whole social dimension to abandonment we are only now starting to realize."

Quotes from Science Desk, New York Times, G. Johnson, 1996.

Sudden Departure

In the 10 years since that article was written, many pieces of evidence indicate all work on such elaborate masonry structures was abandoned in a relatively short period of time.

From studying human bones left in the ruins, archeologists were pretty sure the Anasazi had been suffering from malnutrition, shorter life spans, and increased infant mortality. If there was potential to grow enough food, then why were people starving?

Crow Canyon Archaeological Center has been in the midst of using sophisticated models which integrate 'what if' questions of such behavior. An extensive project near Cortez, Colorado, the Village Project, has gathered and analyzed data, created models, then begun to predict answers to a number of such intriguing questions.

Yet 125 years of archeology and recent modeling still leaves the puzzle.

"Why, after 700 years of relatively steady growth, did Anasazi go to a defensive position, then within about 20 years, either die or move away?"

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