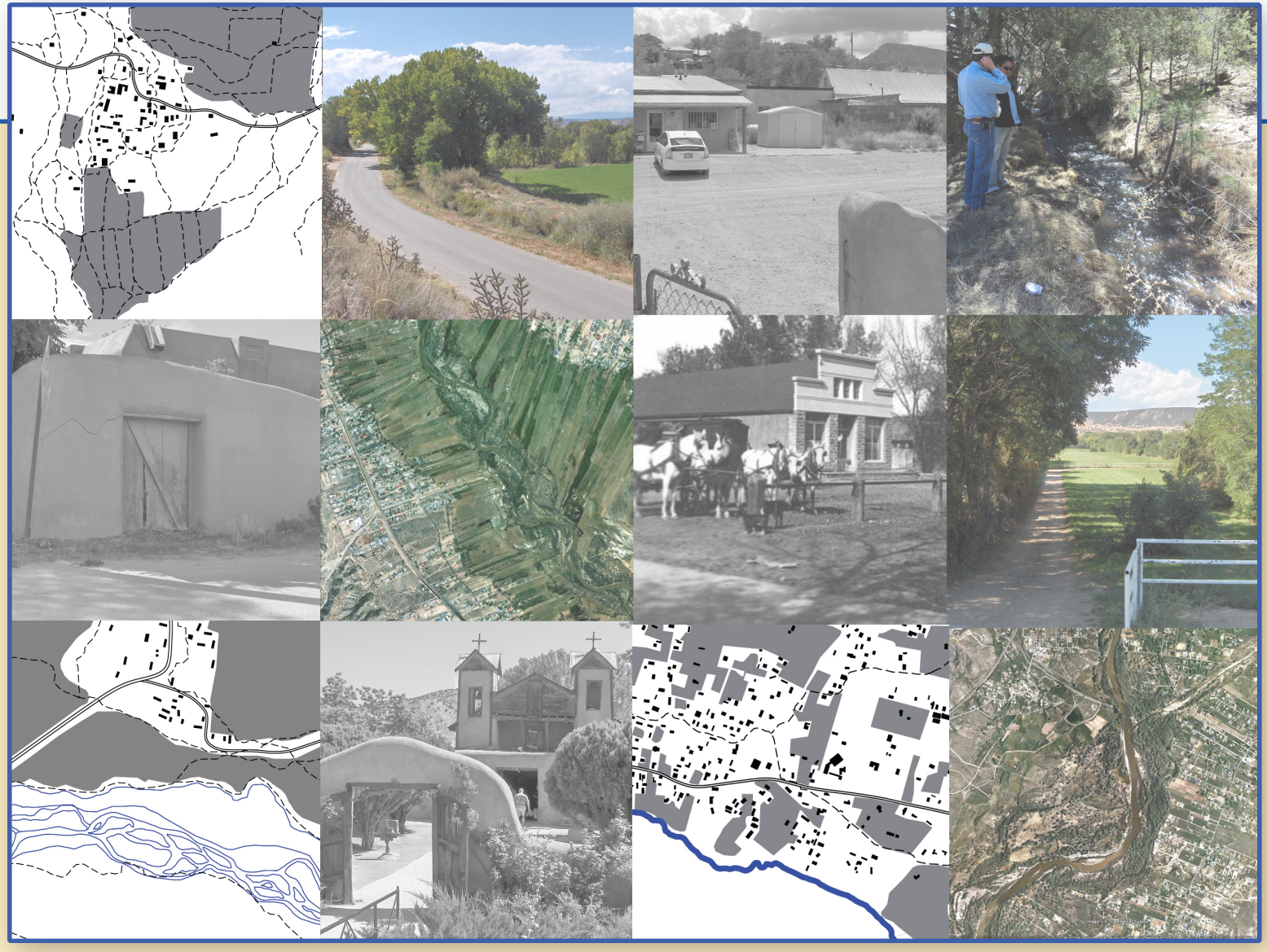
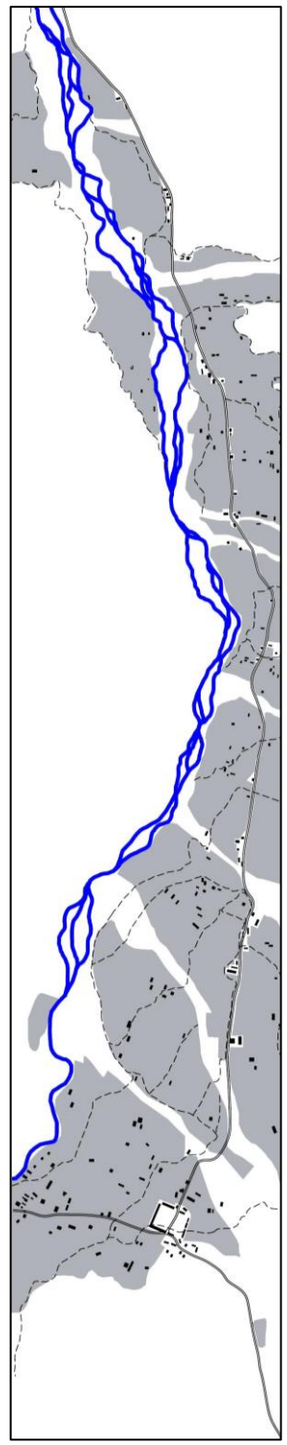
~ Places that Change, Water that Remains ~

An Analysis of Río Arriba County, NM – Land Use and Figure Ground Study

J. Jarrett Garcia Community & Regional Planning Program School of Architecture and Planning University of New Mexico May 2014



CHAPTER 1



CHAPTER 2

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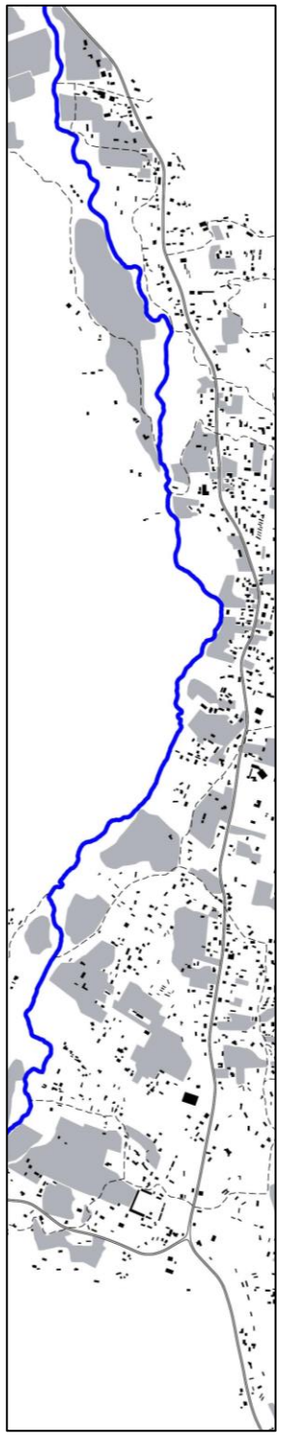

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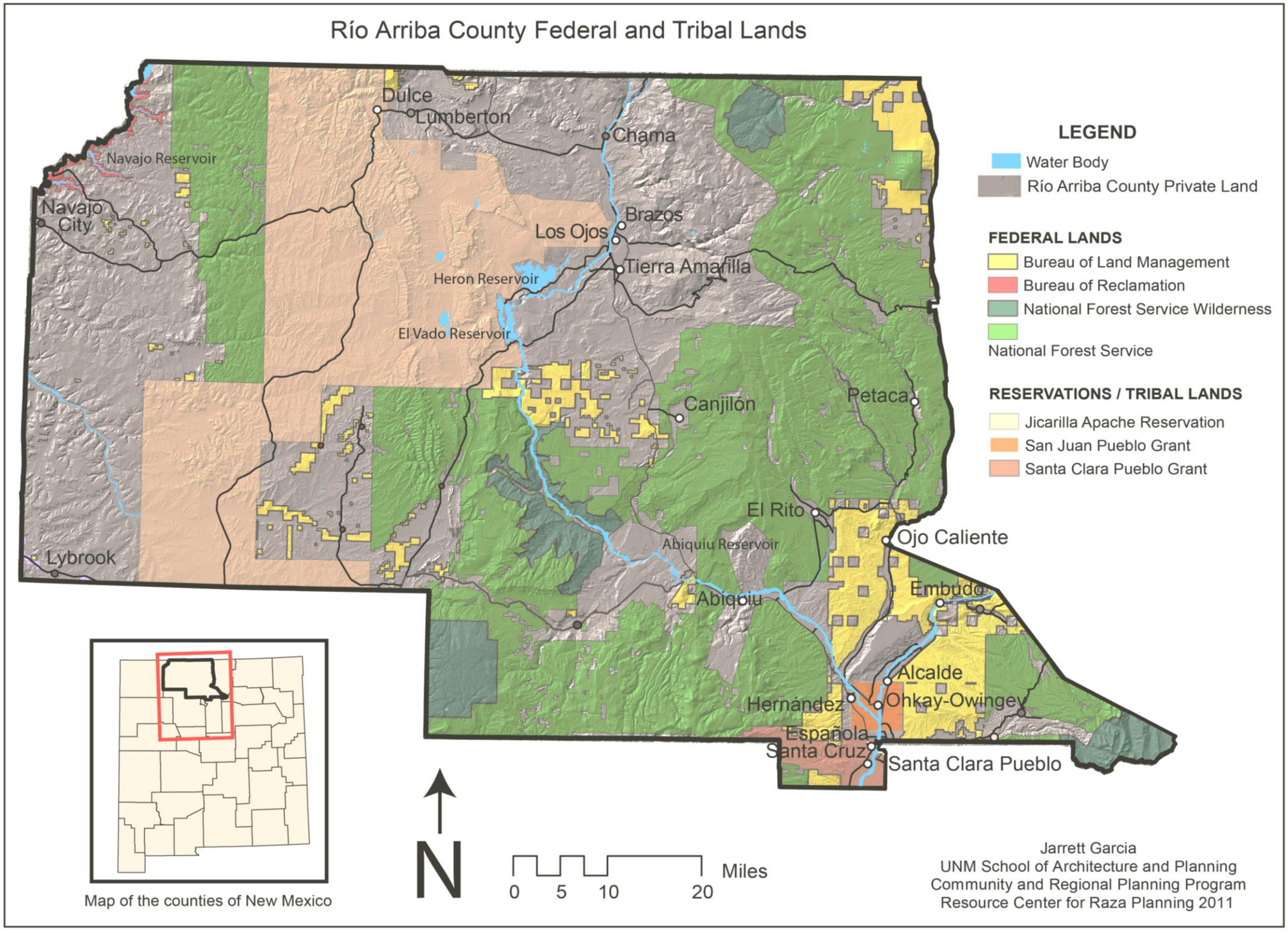

Río Arriba County Federal and Tribal Lands
Dulce
Lumberton
Chama
Navajo Reservoir
Navajo City
Brazos
Los Ojos
Tierra Amarilla
Heron Reservoir
El Vado Reservoir
Canjilón
Petaca
El Rito
Ojo Caliente
Abiquiu Reservoir
Lybrook
Abiquiu
Embudo
Alcalde
Hernández
Ohkay-Owingey
Española
Santa Cruz
Santa Clara Pueblo
LEGEND
Water Body
Río Arriba County Private Land
FEDERAL LANDS
Bureau of Land Management
Bureau of Reclamation
National Forest Service Wilderness
National Forest Service
RESERVATIONS / TRIBAL LANDS
Jicarilla Apache Reservation
San Juan Pueblo Grant
Santa Clara Pueblo Grant
Map of the counties of New Mexico
N
0 5 10 20
Miles
Jarrett Garcia
UNM School of Architecture and Planning
Community and Regional Planning Program
Resource Center for Raza Planning 2011

Chapter 1

Introduction: Río Arriba County, New Mexico – Land Use and Figure Ground Study Professional Project:

Methodologies

The goal of this Professional Project is as follows: Study the change in the built environments of various towns in Río Arriba County through orthographic aerial imagery and graphic, illustrative maps. In addition, I also present historical events and cultural information in terms of human settlements, the social, and the interaction between human societies and natural resource systems (Gonzales and Rivera *et al* 2013). I also provide recommendations on further researcher possibilities using these map products in conjunction with Geographic Information Systems(GIS).

My main contribution and the backbone of this Professional Project are the series of maps that I created which show the changes to the built and natural landscape from 1935 to present. By my approximation, literally hundreds of hours went into the creation of the "Figure Ground" and aerial imagery maps that represent fourteen distinctly different towns in Río Arriba County. As far as I am aware, nothing of this scope regarding figure ground studies of these towns has ever been produced by others. The reason may be simple, the process was highly technical, it was time consuming and very tedious in a challenging way. Also, the historic ortho-aerial imagery is costly and somewhat arduous to assemble into coherent maps. The graphic and technical component of this body of work suited me well though and I feel that I definitely excel in that arena. In terms of writing however, I have left much of that to the professional authors who present their specific findings, facts and opinions. In other words, I have taken the time to compile many different literary works of different authors to help give background, context and relevance to my graphic work regarding the places, spaces, towns, and history of this county. Many of the passages were found by researching the Office of the State Historian web site (http://dev.newmexicohistory.org/about_us/history.php). I call out and cite explicitly which authors have written specific passages. I also do some of my own writing but make every effort to give credit where credit is due and give the sources of where I was able to discover any relevant literary information.

In addition to the main content of this Professional Project, the ortho-aerial images and figure ground diagrams, a hypothetical design intervention is created for an area located in the community of Hernández. Located in the Appendix section of this paper, this residential housing design is informed from the findings of the development and settlement patterns that are apparent in the figure ground maps. The design intervention is also created to give relevance to the Cluster Development sections of

the Río Arriba County Comprehensive Plan, which I include in Appendix as well. I borrow some key concepts from the literary journal article, *"Qualitative and Visualization Methodologies for Modeling Social-Ecological Dimensions of Regional Water Planning"* that I contributed to and that Professor Moises Gonzales and Professor José Rivera are the primary lead authors. The figure ground diagrams that I created are part of a greater body of work that I produced during a Graduate Student Assistantship that spanned six academic semesters. The first few semesters of the assistantship I was working under the guidance of the Resource Center for Raza Planning (RCRP), with Professors José Rivera and Moises Gonzales as lead researchers. The remaining semesters I had a Graduate Student Assistantship with grant funds from the National Science Foundation that was administered by the Center for Regional Studies (CRS) and we worked in conjunction with EPSCOR and New Mexico State University. Professors José Rivera and Moises Gonzales where also the lead researchers for that time period as well.

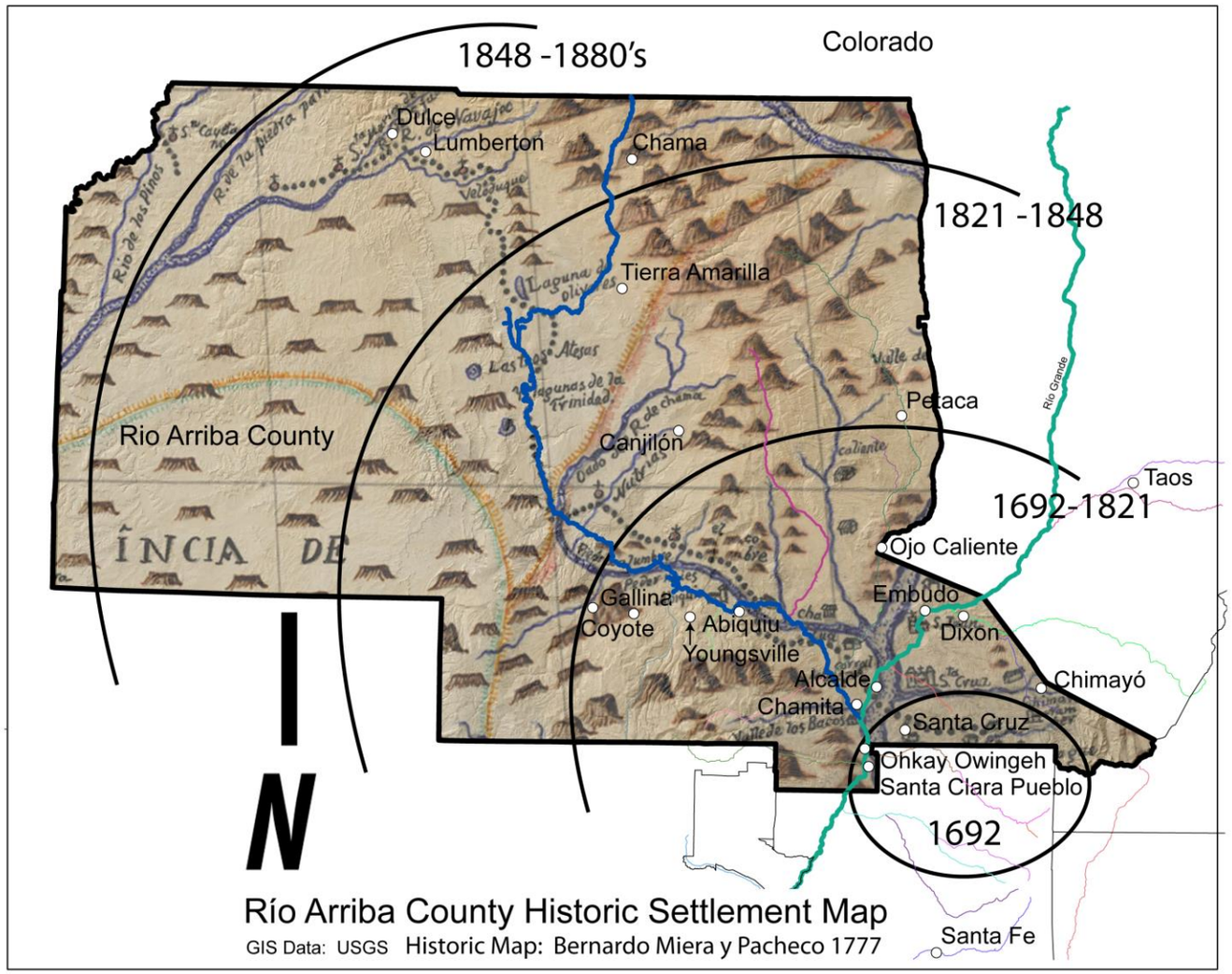
In this Professional Project I clearly explain concepts that are common knowledge to Design Professionals and Planners. At its best this project is designed to educate and inform the reader who has no prior knowledge of the subject matter. In other words, it is written in a manner that assumes the reader has limited previous knowledge of Río Arriba County, New Mexico History and Rural Development Policy and strategies. I clearly spell out and explain basic visualization concepts such as Plan View Maps and graphics, visualizations concepts and methodologies, diagrams and other basic, if not mundane elements of Planning and Design.

Visualization Modeling

Visualization methodology takes abstract ideas or data and translates them into images that enhance the understanding of complexity in the built and natural environment (Gonzales and Rivera et al 2013). Visualization modeling tools and techniques assist in the comprehension of factors that transform the cultural landscapes and explicate settlement morphology (Gonzales and Rivera et al 2013). Settlement morphology examines changes in urban form, resolution, and time that shaped and altered the built environment and natural systems (Tiesdell 2007). In the context of planning, the modeling of landscapes in visual communicative forms can be used to engage community stakeholders and interdisciplinary researchers to describe physical and natural systems (Gonzales and Rivera et al 2013). Geo-spatial mapping of natural systems was originally developed by Ian McHarg (1969) to conduct analysis of regional ecological conditions by layering multiple data inventories such as riparian zones, slope, settlement patterns, and land use, a process that eventually led to the development of Geographic Information Systems.

The map graphic on the next page shows a historic base map originally created by Bernardo Miera y Pacheco. Historic maps provide a visual tool for examining natural features, places, landscapes, and the connection of people and cultures to physical forms that in combination represent hundreds of years in data points (Eidenbach 2012); (Gonzales and Rivera *et al* 2013). Miera y Pacheco was a cartographer that accompanied the Franciscan friars Dominguez and Escalante that conducted an expedition seeking mineral wealth and a westward route from New Mexico to California. The Friars were also interested in expanding missions and spreading Christianity to the Ute tribes and the Hopi. The Expedition left in 1776 from Santa Fe passing through Abiquiu, onto Colorado and Utah. The mission failed to reach

California due to weather, but they accomplished a few really important things such as forging the path for the discovery of the Old Spanish Trail and defining the extent of Ute Indian territory. Miera y Pacheco was a great artist and this map was very detailed, which helped future cartographers immensely and also aided later explorers. There is a section devoted to this illustrious cartographer. This map of settlement history explains graphically through circular arcs the outward expansion of settlement, from the confluence to north-northwest following the Río Chama and its tributaries. The natural systems and human interaction is the central theme in the search for natural resources of food, water, grassland as range for sheep, forests for timber and some game animals for hunting, and trees for nuts and berries. And, of course, we know that the "Río de Chama" extended well beyond the area shown in this 1777 map, past Chama and into the headwaters at the Colorado border. But the region was surrounded by other human cultures that also depended on the land and other natural resources, especially hunter gatherer societies of Utes, Navajo, and Apache. Thus, there is a settlement expansion history that took time, centuries to accommodate in times of conflict and warfare for this "contested space" in the Río Arriba/Río Chama. Settlements were established, abandoned, and reoccupied decades later, and a new cycle of accommodation, with intermittent truces, some trading, more raids



Legend

Rivers
- Rio de Chama
- Rio Grande

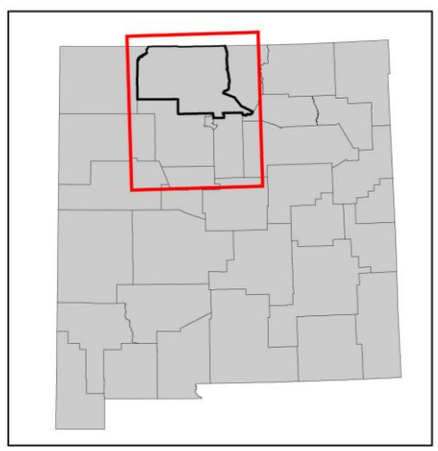
Map Features
- Towns (Present-Day)

CNH: Acequia Water Systems Linking Culture and Nature: Río Chama Basin

New Mexico & Río Arriba County

Historic Settlement Map
(Spanish Colonial Mexican Period and American Period)
1692 to 1880's

0 12.5 25 50 Miles



Map by Jarrett Garcia, 2013

(Rivera 2011, *personal communication*). Eventually, the nomadic peoples, who were there first, were rounded up and placed in reservations by the U.S. Government. This was a much reduced homeland compared to before where they roamed as nomadic hunter-gatherers, and where they survived by raiding sheep camps and for horses as they perceived encroachment on their native or seasonal lands.

The joint UNM NMSU project team that I was a part of was given the task of investigating the complexity of human-natural system interactions in the Río Chama basin of northern New Mexico and far southern Colorado. The UNM research team employed geo-spatial visualization modeling of cultural landscapes in order to understand dynamic transformation of settlements, natural environment, and agricultural networks on a temporal scale. Cultural landscape morphology as a method and a research strategy spans the fields of geography, history, archeology, architecture and planning (APA 2006). To develop the Río Chama case study, the team collected and mapped complex physical conditions on the landscape of the Río Chama Basin (Gonzales and Rivera *et al* 2013). Then, visualization strategies and tools allowed for deconstructing complex and dynamic networks of social and natural processes (Corner 2011). This professional project also discusses in depth the history that is associated with these specific towns in Río Arriba County. As mentioned previously, in this professional project I also present and cite other author's works that give a very detailed history associated with the State of New Mexico, the County and the various towns that are located therein. The author's works that I cite give a very detailed account of notable people, origin of Land Grants, water law, important events and other interesting aspects of Northern New Mexico. This Professional Project could aptly be titled, '*Anything & Everything You Ever Wanted To Know About Río Arriba County*."

In order to illustrate land use change at the community scale, we formulated a mapping catalog of settlements along the Río Chama to document land use change from 1935 to 2011-2012. In a community scale mapping series, we used aerial maps that provided detailed information of settlement form, agricultural parcel size, spatial organization of the acequia network, in addition to assessing riparian conditions along the Río Chama and Río Grande (Gonzales and Rivera *et al* 2013). To analyze land use change within the Río Chama, morphology mappings that took the form of figure ground maps were developed for **Tierra Amarilla**, **Los Brazos**, and **Los Ojos** in the upper basin in addition to **El Rito, Abiquiu**, and **Hernández** in the lower stretch of the Río Chama. In addition, I created figure ground maps for the following other towns in Río Arriba County: **Alcalde, Cañones, Chimayó, Ohkay Owingeh** (formerly San Juan Pueblo), **Petaca, Santa Clara Pueblo**, **Santa Cruz** and finally **Ojo Caliente**, in Taos County. These maps provide key information on how land use conditions have been altered and what land use alternatives may be considered in planning for long term drought mitigation in the basin. To produce the settlement pattern maps, base mapping of key physical elements in built and natural systems were traced over 1935 aerial photography (EDAC 2010). The 1935 aerial photography is one of the most important mapping series in the context of studying land use change for several reasons: (a) 1935 is the first deployment of aerial photography technology in the Río Chama basin; (b) the photography was produced at the advent of World War II which brought significant changes in technology and farming practices in the region; and (c) the high resolution of the imagery is such that landscape and settlement features allows for fine grain mapping at the community scale(Gonzales and Rivera *et al* 2013). Community scale maps provide a baseline data set for understanding

land use conditions along the Río Chama and Río Grande such as diverse crop types, smaller farm plots, compact settlement form, and a more natural riparian network characteristic of a pre-channelization river system. In addition, the same geographic layers were mapped over the 2011-2012 aerial photography for each of the selected village settlements. It is now possible to analyze localized land use change from 1935 compared to the 2011-2012(Gonzales and Rivera *et al* 2013). Findings from this community scale morphology study reveal some very interesting changes over time. There is generally much larger farm plot size, dispersed settlement forms, less crop diversity, and a restricted channelized riparian condition in both the Río Chama and Río Grande rivers. Many different changes in landscape morphology can be ascertained with these series of past and present figure ground studies. In this paper I discuss and compare changes that are visually and graphically apparent in these diagrams. I am able to touch the surface of what can be learned from this body of graphic maps, but much more can be understood and revealed.

Mapping Theoretical Frameworks

The Diagram

The word "diagram" (literally "marked out by lines" in Greek) refers to any schematic visual explanation of an idea. Diagrams take advantage of the differences between how our minds process language and how they process images. The power of a diagram is reductive: It distills a complex idea into a simpler and powerful visual statement. Its clarity results from the omission of non-essential information, so it is often achieved at the expense of nuance and specificity. Diagrams allow for experimentation and for the purposes of this professional project, bring to light aspects and information of aerial imagery that one is unable to grasp from simply viewing the aerial image alone. Diagrams have a special power when it comes to the representation of a town, its acequia systems, agriculture lands and dwelling footprints, since they are able to combine spatial and non-spatial ideas. In this way, the diagram becomes a remarkably fertile space in which to explore the shaping of the built world of Río Arriba County.

Maps, Plans and Plan View

The word "plan" implies forethought and aspiration, not simply a representation of what is. But at times, maps and plans converge. The contextualist revolt in city planning in the 1960s and '70s insisted that a major part of the discipline consists of analytical mapping of existing conditions, in contrast with the grandiose erasures of modernist urbanism (2012. Retrieved from www.spur.org/publications/library). "The cognitive mapping of planners like Kevin Lynch and Donald Appleyard prefigured the explosion of alternative cartography and data visualization now made possible by digital media. The tools of cartography — and its tacit filtering of reality — have been radically democratized, and map-making has become a discourse in which artists, activists, tech nerds and planners can assert their own visions of what is and what ought to be." (2012. Retrieved from www.spur.org/publications/library). Plans and maps share a visual system called "ichnography" or simply "plan view," a

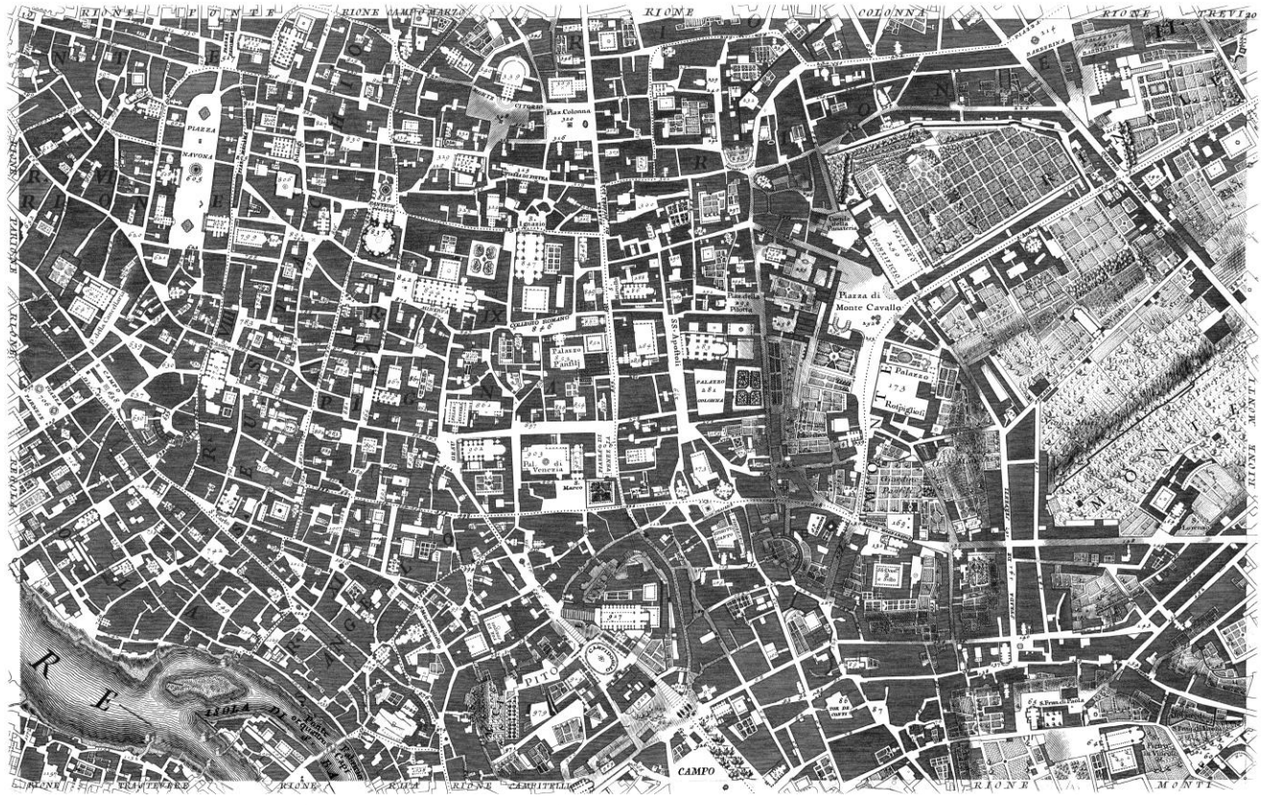
shorthand that represents every point as if the viewer is directly above it, looking down. In any real aerial view, only one point is seen this way, with all others seen at an oblique angle that increases with distance.

The Figure Ground Diagram - The Nolli Map

Giambattista Nolli's 1748 map of Rome was a major milestone in cartography. It presented the entire city to scale in plan (or "ichnographic") view — with every point seen as if from directly above. At the time, most urban views were imagined bird's-eye aerial perspectives that were not technically rigorous.

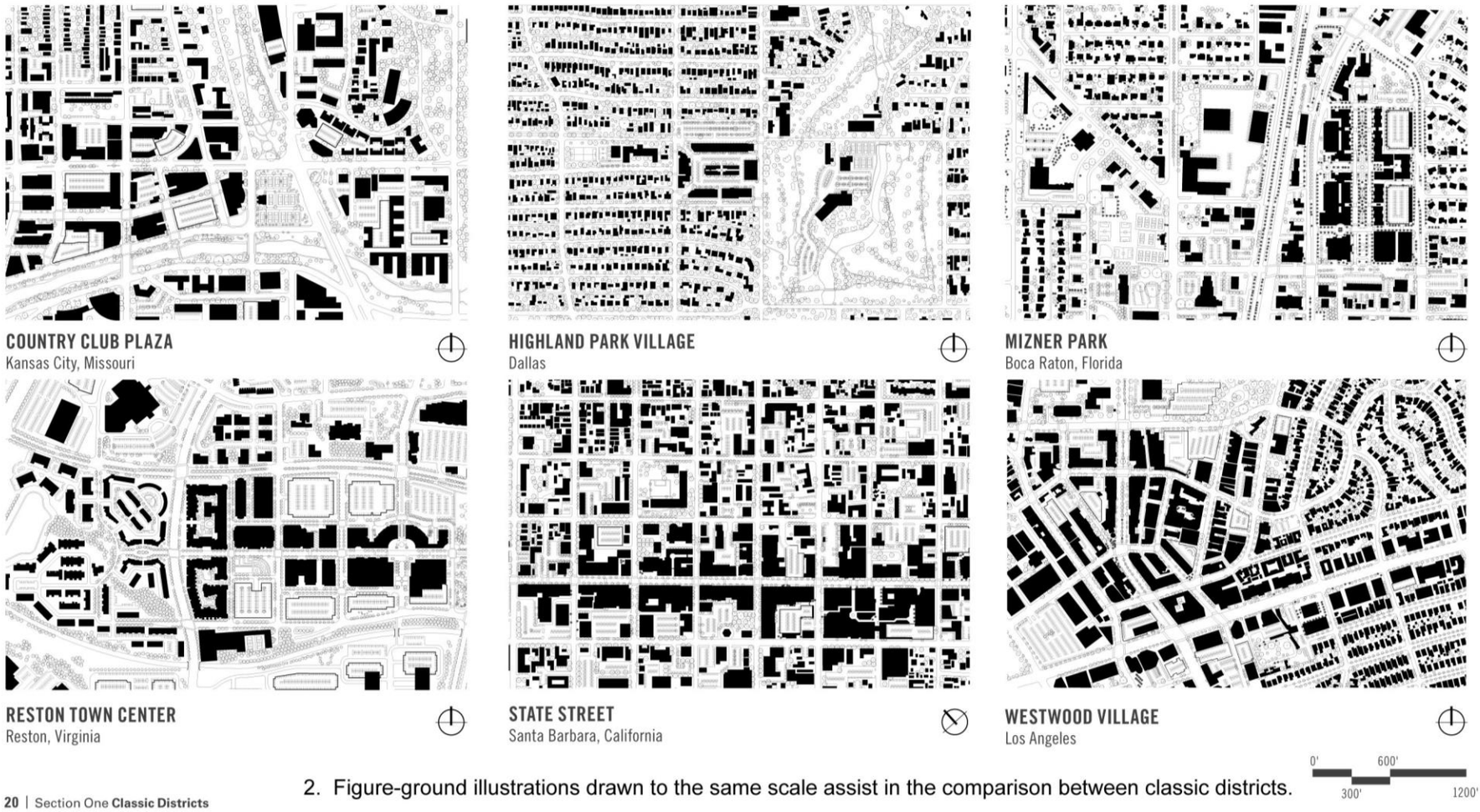
The Nolli map's impact on urban design and planning stems from its graphical convention: In figure ground diagrams, buildings are shown as dark masses, with streets and open space left white. The effect — now a common analytical technique — is to reveal the characteristic pattern of streets and buildings that underlies urban form.

The figure-ground or form-void relationships that these diagrams illustrate proved to be hotly contested in the 20th century. In traditional urban patterns like Nolli's Rome, streets and open spaces generally read as the foreground, defined and shaped like urban rooms by background buildings.



Giambattisti Nolli's 1748 map of Rome (Nuova Pianta Di Roma) 2014. Retrieved from http://cluster3.lib.berkeley.edu/EART/maps/nolli.html

Modern architects and designers inverted this relationship, with buildings as foreground objects, set in background space, which tended to be poorly defined. Beginning in the 1970s, urban designers like Colin Rowe turned to figure-ground maps to illustrate the qualities that were being lost, and to make the case for traditional patterns (2012. Retrieved from www.spur.org/publications/library).



2. Figure-ground illustrations drawn to the same scale assist in the comparison between classic districts.

Source: Image courtesy of asla.org; RTKL Assoc.

A figure-ground diagram is a two-dimensional map of an urban space that shows the relationship between built and un-built space. It is used in analysis of urban design and planning. It is similar to but not the same as a Nolli map which shows public space both within and outside buildings and also similar to a block pattern diagram that records public and private property as simple rectangular blocks. The figure ground plan organizes the primary urban landscape components - plots, streets, constructed spaces, and open spaces – into a diagram of solid and void; the proportions, of which, can be manipulated to create different urban morphologies.

If building mass is greater than open space, spatial continuity is achieved through street walls and articulated public spaces, creating a mixed-use urban environment that fosters pedestrian activity (Carmona 2010). The figure-ground theory of urban design and urban morphology is based upon the use of figure ground studies. It relates the amount of "figure" to the amount of "ground" in a figure-ground diagram, and approaches urban design as a manipulation of that relationship, as well as being a manipulation of the geometric shapes within the diagram. (Balmer 2012).

The morphology of the modern city has undergone considerable changes during the past century as manipulations of the figure ground have revealed new fabric types. Dense cities became diffuse as the car began to dictate the city fabric, greatly augmenting the space allotted for roads and parking spaces(Okerlund, G. 2010). This shift is represented in the fragmentation of the figure ground's formerly dense poche, or the black figures in the diagram representative of built structure (Okerlund, G. 2010). During the twenty-first century this increasingly fragmented urban condition has proven problematic and is being addressed by the New Urbanism movement's promotion of infill construction, returning cities to a denser poche (Okerlund, G. 2010).

Chapter 2

The History of Río Arriba County

A snap-shot of Río Arriba County: The boundaries of Río Arriba County in Northern New Mexico, a rural agricultural county with a land base about the size of the state of Connecticut. According to county records, there are approximately 30,000 acres of farmland in the Río Chama Valley irrigated by surface water canals or acequias (Río Arriba County Comprehensive Plan 2009). In recent years the recession and the economic impact of job losses in the area have resulted in significant cuts in federal funding to agencies such as Los Alamos National Laboratory and the U.S. Forest Service, thus shifting the population growth pattern of the last three decades. At the time of the 2010 United States Census, Río Arriba County had a population decrease of -2.3% over a decade and faces new challenges of out-migration by young adults. During this same period, prolonged drought, a reduced snow pack, and forest fires have placed additional pressures on the viability of acequia-based agriculture. Other stressors have resulted from population growth in Santa Fe, New Mexico's capital city, and particularly in the urbanizing area located within the Middle Río Grande Regional Water Plan, a region that includes Albuquerque and fast growing Río Rancho(Gonzales and Rivera *et al* 2013).

A Bit of History

Excerpts by Robert Torrez. (2010) ***Rio Arriba: A New Mexico County.*** Torrez & Trapp. Rio Grande Books

For thousands of years, Río Arriba County has been home to various groups of people who have survived on the water, land and economy of the region. Human settlement in Río Arriba County reaches back 10,000 years, when Paleo-Indians hunted and gathered in the area. The Anasazi people of New Mexico are believed to have cultivated corn as early as 3000 BC, and squash, beans and melons by 1000 BC. By 1200 AD, the Anasazi were developing settlements of cliff dwellings and Great Houses on the mesas and cliffs of the Pajarito Plateau, while supporting themselves with complex dry land farming systems, hunting and gathering in the valleys below. Around 1500 AD, drought and other factors caused them to move permanently into the river valleys, where they irrigated their crops with surface water. There, village life began to flourish in communities known today as Pueblos. The Pueblo communities of Santa Clara and Ohkay Owingeh (formerly San Juan Pueblo) are located within Río Arriba County's boundaries today (Río Arriba County Comprehensive Plan 2009).

The 1500s marked great change for the Pueblo Indians. Jicarilla Apache bands that had settled in the Platte and Arkansas River Valleys of Colorado in the 1200s or 1300s discovered the mountainous areas of northern New Mexico, and the first Spanish colonists began to explore the region. In 1598, Don Juan de Oñate established the territory's first capitol at the village of Yunque Yunque, located near present-day Ohkay Owingeh, and renamed it San Gabriel. From there, he and his men launched numerous expeditions in the area(Torrez 2010). In these early years, the Spanish captured nomadic Plains Indians, including Navajos, Apaches, Utes, and later, Comanches, to create peripheral settlements that buffered the Spanish from attack by nomadic tribes. Known as genizaros, these detribalized Indians became permanently integrated into northern New Mexico's communities and cultures over time(Torrez 2010). The Pueblo Indians also experienced negative effects on their culture and livelihood during the near century of Spanish rule. In 1680, Popay, a medicine man from Ohkay Owingeh, organized the Pueblo Revolt, which united all the Pueblos in the territory to drive the Spanish from New Mexico. The Pueblos lived in relative peace and isolation until the Spanish re-conquered the territory in 1692.

Within this legacy of conquest, the Spanish participated in cultural exchange with the Pueblos to the extent of introducing new crop varieties, the adobe brick, and technologies that included surface irrigation systems or acequias. However, it was not until la *reconquista* or the reconquest of 1692, that a more equitable and synergistic relationship emerged(Torrez 2010). After 1692, Mexican families, rather than Spanish conquistadores, were recruited to settle in the territory in exchange for *mercedes* or land grants provided by the government. Dictated by town design in the Laws of the Indies, the physical layout of the land grants was ingenious for its arrangement of land uses. A central plaza served as the center of commerce and economic activity, and was surrounded by adjoining homes which doubled as defensive walls. The plaza's only openings were solid wooden gates which could be closed and fortified in case of raids by nomadic Indian tribes. Outside of the plaza, land was divided into or narrow strips of common land, which began at the river and stretched into the mountains(Torrez 2010). The intent was to provide a family with all of the necessities for survival—irrigated land for crops; dry land for a home; grass lands for grazing; and mountainous areas for hunting, gathering and timber. It was from this integrated system of land use that northern New Mexico's pastoral traditions and livelihoods, which include grazing and timber harvesting, flourished (Torrez 2011).

The settlers' success in surviving from the land was aided by the social and political structures that underpinned their communities. The settlers formalized irrigation systems into political organizations known as acequia commissions. Acequias were viewed as community-owned infrastructure, and were managed by the commissioners. The ditches themselves were maintained by a mayordomo (ditch boss) and the parciantes (irrigators)(Torrez 2010). As a result of this history, acequia commissions are recognized as political subdivisions of the State of New Mexico to this day. Within the context of the acequias and land grants, many of Río Arriba County's communities were founded in the 1700s, including Chimayó, Truchas, Canjilon, Vallecitos and Cañon Plaza.

In 1776, Francisco Antanasio Dominguez passed from Santa Fe through Río Arriba County with Francisco Garcés and Silvestre Velez de Escalante to establish a route between the older settlements of New Mexico and the new ones on the west coast. They traveled north from Santa Fe, through what would become southwest Colorado and from there they went west toward Monterey; but didn't make it to the west coast and returned back to Santa Fe. So while no direct link was established, the West had at last been explored and chronicled(Torrez 2010). The Dominguez-Escalante expedition would become invaluable to those who would follow, opening what would be called the Old Spanish Trail 40 years later, between Santa Fe and California. The 1800s witnessed an explosion of new communities in Río Arriba County, some due to construction of the railroad, which began in the 1860s. Gallina and La Madera were settled in the early 1800s, Tierra Amarilla and Española were established in the middle of the century, and Brazos, Chama, Dulce, Velarde, El Rito, Cebolla, Lumberton and the coal-mining town of Monero followed from 1860 through 1890(Torrez 2011). In 1821, Mexico won its independence from Spain following the eleven-year Mexican War of Independence. New Mexico came under the rule of the Mexican government, although few changes were made to the status or government of the territory.

In 1846, the U.S. declared war on Mexico after Mexico attempted to defend the territory of Texas, which the U.S. annexed in 1845. The U.S. won the war in 1848, and Mexico's sparsely-populated northern territories, including New Mexico, fell to the U.S. The Treaty of Guadalupe Hidalgo, which established the terms for ending the war, allowed those living in the territories to become U.S. citizens, but did not commit to recognizing Spanish and Mexican land grants. As a result, it is estimated that only 13% of New Mexico's land grants were validated by the U.S. Court of Private Land Claims(Torrez 2010). The Pueblos of New Mexico, including those in Río Arriba County, had their land grants recognized by the US government, although many grants were considerably reduced in size. The Jicarilla Apache Tribe negotiated with the U.S. for its own reservation, which was established by Executive Order in 1887. Today, these lands represent 24% of Río Arriba County and are designated as federal reservations held in trust for the Pueblos and Tribes.

The Homestead Act of 1862 led to the development of a different settlement pattern in the western half of the County. The Act provided incentives as a method to spread population westward by granting land for farming to anyone whom would improve, or cultivate, the land and build a permanent shelter. The western part of Río Arriba County witnessed a population increase in the middle 1870's as settlers from several eastern states came to New Mexico. The Western part of the County, a portion of the San Juan Basin, arid and known for its rugged topography, became home to several farmers and ranchers. Settlers found the land fertile, but with no surface water available and difficult access to groundwater, crop success was contingent on the weather(Torrez 2010). The settlers of the San Juan Basin developed cultivation techniques that accommodated their environment and were able to survive independently. As oil and gas reserves were discovered in the area, presenting new livelihood opportunities, crop cultivation began to be practiced less, however, limited ranching and grazing activities have continued to this day along with the oil and gas development(Torrez 2010).

Under U.S. law, most of the land designated as "commons" under the land grants were set aside as forest reserves and national forests. This included most grazing and forest land. In Río Arriba County, today's Santa Fe and Carson National Forests were established as forest reserves in 1892 and 1906, respectively(Torrez 2010). To the land grant heirs of Río Arriba County, the federalization of former land grants remains a difficult and controversial issue that is being addressed through the judicial and legislative systems. It is hoped that traditional livelihoods on communal grazing and timber lands can be restored to bring a higher level of social and economic stability to the area.

Río Arriba County experienced several economic shifts after 1850. Timber and mining industries prospered in the late 1800s and the early 1900s, due to the arrival of the Denver and Río Grande Western Railroad (D&RGW) to the area. Chama became home to the timber industry in the 1920s, and by the 1930s, two coal mines operated in Monero(Torrez 2010). The economy of the western half of the County, which encompasses a portion of the San Juan Basin, was also dependent upon the production of raw materials, in this case, oil and gas. Early oil and gas exploration dates back to 1906 in the San Juan Basin, a geologic basin with oil and gas reserves of national significance, but it wasn't until 1921 that oil and gas production started to dominate the economy of this region (Torrez 2010). Large mineral reserves and continually improving drilling technology have allowed the basin to sustain a prosperous oil and gas industry for over 50 years. The commercial center of the oil and gas industry in the San Juan Basin is the City of Farmington in San Juan County, but many small communities in Río Arriba, such as Lindrith, which were originally homesteader communities have sustained themselves with a mix of ranching and oil and gas development for over 50 years(Torrez 2010). Today, as of 2012, there are over 11,000 oil and gas wells in the western part of the County which contribute to the economic sustainability of these communities as well as the County and the State.

By the 1960s, mining and timber-harvesting declined as resources became depleted. In 1909, the Spanish American Normal School was founded in El Rito and eventually became a community college. A fiber arts program was instituted there in the 1930s and the strong sheep ranching traditions of the area have sustained fiber arts as a major local industry, concentrated today in Tierra Amarilla, Española and Chimayó. The El Rito fiber arts program was initiated at the Northern New Mexico Community College, which established a branch campus in El Rito in the 1990s. Northern New Mexico Community College opened the doors of its main branch in Española in 1970, and today has evolved into an accredited four-year college. Over time, the residents of Río Arriba County have become increasingly dependent on wage labor, secured through work in state and federal government agencies, as well as in the local school district and institutions of higher education(Torrez 2010). Established during World War II to produce nuclear technology for the war, Los Alamos National Laboratories (presently Los Alamos National Security) is one of the largest employers in the area. Despite these radical changes in the economy, Río Arriba County retains strong ties to its agricultural roots. Tens of thousands of acres remain under agricultural production, and agriculture and livestock remain important components of the local economy. As an encouraging testament to the strength of the Río Arriba's traditions, culture and history, the protection of irrigated farm and grazing land continues to be a top priority for residents of the County(Torrez 2010).

In 2000, the U.S. Census Bureau estimated the population of Río Arriba County to be approximately 41,190 people. Although Río Arriba County had an average annual population increase of 1.5% from 1970 through 2003, this pattern began to shift toward the end of 1999. For the five year period of 2000 through 2005, the County actually experienced a 0.88% annual loss in population. Population decreases were recorded in all areas of the County, including the City of Española and the Village of Chama(www.census.gov).

Migration patterns from 1999 through 2004 reveal a net population loss in the County of an average of 240 persons per year. Each subsequent year results in an increasing number of people leaving the County. From this data, the University of New Mexico's Bureau of Business and Economic Research (BBER) projects a declining rate of growth for Río Arriba County from 2010 through 2030. Growth in the County is hampered by several issues, such as the diminishing availability of land and water, and the relative lack of high paying jobs(Torrez 2010).

Northern New Mexico, which is predominantly rural and characterized by a unique history and culture, has seen its fair share of both success and failure in its small, mostly Hispano communities. Recently, however, economic hardship has taken its toll on the local landscape. According to 2010 census data, Mora, Río Arriba, and Taos counties have a combined poverty rate of 22.2% (compared to a national rate of 12.4%) and a per capita income of $14,235, compared to $21,208 nationwide. Statewide, over 15% of households suffer from food insecurity. Also, gaps in these measures are present between Anglos and Hispanos, with Hispanos coming up short (Atencio 2004). A good many Hispano residents of northern New Mexico believe that the loss of their land base that resulted from the chicanery of the U.S. government and territorial lawyers and speculators has put them in an economically and culturally disadvantaged position, and the data presented by Atencio(2004) corroborate their claims. In fact, recent studies link the heroin problem in northern New Mexico (the Española Valley has the highest rate of heroin overdoses and heroin-induced death in the country) to the forced severance of ties to the land that for generations defined many Hispanos in northern New Mexico (Garcia 2008, Garcia 2006). Also, because of the historical shift of livelihoods from the traditional land-based communities, many generations of Northern New Mexicans have been forced to move to larger cities for work and educational opportunities.

Out-migration has been occurring in Río Arriba County for many decades. This is largely due to the scarcity of employment opportunities and the lack of educational resources. The following excerpt was written by a notable author who lived in El Rito, Río Arriba County:

> "The burden of most of this recent sequence of commentaries on the human condition in the Hispanic Rockies is surprisingly similar to what we read in the corresponding literature of one and two generations past. The same physical problems present themselves-for

> decade after decade- soil erosion, river silting, floods, declining agriculture production. Ambitious public programs are outlined calling for vastly stepped-up engineering and conservation works. The statistics remain stubborn, always indicating a reluctance of the regional community to participate wholeheartedly in the general march of industrial and commercial progress. The "productive age" inhabitants continue to" out-migrate"; per capita possession or enjoyment of the various perquisites of modern civilization continue to lag behind national standards. "Job-creating industries" continue to bypass the region in their endless quest for "labor pools," "mass markets," and "accessible raw materials." - *A Landscape for Humans*. Peter Van Dresser, El Rito. 1973.

Is the future of this unique region, then, culturally rich and in many respects well endowed by nature to be shaped simply by a continuation of the dominant trends of the past half-century? Will the studies and reports written a generation from now still speak of chronic rural depression," "disadvantaged minorities," "lagging economy," "aging and out-migration of population," as they have for so many decades? Or are new forces at work in our society capable of carrying this regional community into a brighter and more vigorous realization of its potentials? - *A Landscape for Humans*, Peter Van Dresser. 1973.

Spanish and Mexican Land Grants

By Robert Torrez. (2014). *Spanish and Mexican Land Grants*. Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=21447

One of the most enduring legacies of the Spanish and Mexican colonial experience in New Mexico comes from the process by which these governments distributed land. Throughout history, governments have given land to citizens to reward them for service, to encourage the colonization of a frontier, or to promote economic growth. In the United States, for example, much of the West was settled through a land distribution process called homesteading. During the time New Mexico was part of Spain and later of the Mexican Republic, these governments distributed land to their citizens through a system of land grants. The success of this land grant system can be measured by the fact that many descendants of New Mexico's early pioneers still live on the land grants given to their ancestors as many as three hundred years ago.

After Don Diego de Vargas reconquered New Mexico in 1692, the Spanish government began to distribute several types of land grants in accordance with legislation compiled in the 1680 Laws of the Indies. Among the earliest of these were the pueblo grants, or grants of land made to the Indian communities in New Mexico. All of New Mexico's pueblos currently exist within a reservation that has its basis in a Spanish land grant. Another was a series of grants made to individuals as rewards for

their service to the government. These were called private grants because they were for the personal use of individuals and their families and became private property which could be sold by the owner.

A third and possibly the most important type of grant made by the Spanish and Mexican governments in New Mexico was the community grant. Community grants were grants of land made to groups as part of the process of settling and defending the vast and largely unpopulated New Mexican frontier. These were different from private grants because private grants were, as the name implies, private property. In a community grant, each individual in the group was given a parcel of land on which to build a home and which they could irrigate and cultivate. However, the remainder of the grant, which often consisted of thousands of acres, was not allocated to individuals. Rather, it was reserved for the common use and benefit of all the settlers. Each person in the grant had access to these common, or community lands, where they could graze their flocks, gather firewood, cut timber, hunt, and utilize the resources within the grant to provide for their families. After an individual settler of a community grant satisfied a residency requirement by living on and cultivating the land for a specified period of time, he was given a deed to the individual plot of land that had been allocated to him, and that piece became his private property. He could sell it or do what he wanted with that lot, but the common lands remained community property and could not be sold.

The process for acquiring a community grant normally began with a written petition to the governor. The grant application usually stated that the petitioners, as a group, had no land or had land which was inadequate for them to support growing families. One such example is in the application Lorenzo Marques submitted to Governor Fernando Chacon for the San Miguel del Vado grant in 1794 on behalf of fifty-one residents of Santa Fe. The grant was necessary, Marques explained, because he found himself "...with a growing family, as do those who accompany me, and although we all have some land in the Villa [Santa Fe], they are insufficient for our maintenance; for this and for the scarcity of water we are experiencing and the great number of people, we are unable to utilize it...." Typically, the application then described the parcel of land they wanted, noting it was to the best of their knowledge vacant public land, and promised to settle and cultivate it as required by law.

After the governor reviewed the petition, he typically ordered an alcalde, or other government official who lived near the land being requested, to investigate whether the land was indeed vacant and as described by the applicants. Once the alcalde determined there were no other claims to the land being requested, the governor would order the alcalde to place the applicants in legal possession of the land. To accomplish this, the alcalde escorted the families being given the grant to the property, where he would point out the boundaries of the grant. These were easy to recognize because grant boundaries were always described in terms of clearly visible

features of the landscape, such as a mountain range, a hill, a river, or an arroyo. After this was done, the settlers would then make a physical demonstration which sealed the act of possession. The Land Records of New Mexico, or land grant records as they are more popularly known, reside in the New Mexico State Records Center and Archives in Santa Fe and contain a number of examples of this act of possession. For the purposes of this article, one will suffice. In 1769, Bartholome Fernandes, the alcalde mayor of the Keres jurisdiction in central New Mexico was ordered to place several families in possession of the San Joaquin del Nacimiento community grant which was located along the Río Puerco near present-day Cuba, New Mexico. After going through a number of preliminary procedures in which he described the boundaries of the grant and reviewed a number of conditions for the settlement and defense of the proposed community, he proceeded with the actual act of possession, noting,

...they all said they understood...[so] I took them by the hand and walked them through the said lands, they pulled up grass, threw stones, and shouted to the four winds three times in strong voices, 'Long live the King and may God Guard Him,' all as a sign of true possession...

This interesting and curious procedure demonstrates that in order to own property under the Spanish and Mexican land grant system, you had to physically step on the land, run your fingers through the soil, and make a public commitment to live on it, cultivate it, and, if necessary, defend it with your life. This was an important part of the land grant process. If this was not done, or done incorrectly, the settlers' legal claim to the grant could be called into question. Under Spanish and Mexican rule, as well as in the late nineteenth century when these grants were being adjudicated by the American government, some grants were declared invalid and lost because the settlers could not prove the alcalde had given them formal possession.

By making a physical demonstration of the agreement they had made on paper, our ancestors made a commitment to live along New Mexico's often dangerous frontier. They endured extraordinary hardships in order to keep their land. But these hardy pioneers took their commitment sincerely, as evidenced by the fact that although there are few extant community grants, many New Mexicans still live on the lands assigned to their ancestors by the Spanish and Mexican governments many generations ago.

Land Grants: Types

Explanation of Types of Land Grants in New Mexico

by Malcolm Ebright. (2014). *Explanation of Types of Land Grants in New Mexico.*
Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=25044

Hispano Private

Grants made to Hispano individuals who owned the entire grant and could sell it after the four year possession requirement was met. These grants did not include common lands, either at the outset or later.

Hispano Community

Grants made to a group of Hispanos that included common lands in the grant at the outset. Settlers would receive small tracts of private land for their houses and garden plots with the right to use the remaining common lands for pasturing their cattle, gathering firewood and logs for building, hunting wild game, and gathering other resources, such as herbs and stone. Settlers owned their private tracts outright after four years and could sell them. The sale of a private tract by an individual carried with it the right to use the common lands, but the common lands could not be sold because they were owned by the community.

Hispano Quasi-community

Grants made to Hispano individuals who owned the entire grant and could sell it after the four year possession requirement was met. Unlike Hispano/private grants however, Hispano/quasi-community grants included an explicit or implied promise by the grantee to bring other settlers on the grant, and when those settlers arrived the grant would be operated like a community grant. The new settlers would receive tracts of private land with the implied right to use the unallotted land for grazing, wood-gathering, and other traditional uses. In US courts, these rights have been not enforceable by the users of the "common lands" unless they were expressed in writing. See Lobato v. Taylor opinion re the Taylor Ranch in the San Luis Valley.

Hispano Grazing

This was a grant to individual Hispanos for the purposes of grazing their livestock. Settlement on the land was not required by law, for example the Cochiti Pasture Grant.

Pueblo Community

Community grants made to a Native American Pueblo. Since the majority of Native American land holdings in New Mexico were of a communal nature, there were no private Native American grants.

Pueblo Grazing

A grant to a Native American Pueblo for the purpose of grazing Native American-owned livestock. No legal requirement to settle the land. An example of this type of grant is the grazing grant made to the pueblo of Cochiti by Governor Vélez Cachupín in 1766.

Pueblo Cruzate

Grants to New Mexico Pueblos by Governor Domingo Jironza Petriz de Cruzate (1683-1686 and 1689-1691). The grants are not in the usual form of land grants, but rather purport to be the testimony of a Zia Native American named Bartolomé Ojeda, who was captured in 1689 after the Pueblo Revolt. Ojeda is asked as to each Pueblo whether he thought that pueblo would revolt again and he answers "no, that [Picuris] would not fail to render obedience [to the Spaniards]." Accordingly, Governor Cruzate makes a grant of four square leagues of land (about 17,700 acres) to each pueblo. Under Hispanic law and custom, the pueblos were considered to be entitled to four square leagues even without a grant. The Cruzate grants submitted to Surveyor General William Pelham were all confirmed by Congress, though they were later determined to be spurious. Since the pueblos were entitled to four square leagues of land in any case, the spurious character of the Cruzate grants is of little consequence from a legal standpoint. Historically, however, questions over the genesis of these documents and whether they may have been based on legitimate documents, have not been fully answered. See Sandra Matthews-Lamb, 'Designing and Mischievous Individuals': The Cruzate Grants and the Office of the Surveyor General, New Mexico Historical Review 71 (October 1996): 341-359 (http://www.southwestbooks.org/landwater.htm).

Additional Types of Grants

by Robin Collier. (2014). *Additional Types of Grants.* Retrieved from http://dev.newmexicohistory.org/about_us/history.php

*The need for these and additional classifications of types of grants is still under consideration by the Land Grant Database Project.

Hispano Protective

These were grants made to protect the rights of an existing grant, for example up stream water rights. They may not have required settlement. For example, the Rancho del Río Grande in Taos.

Hispano Mining

These were grants made for mining only, which only required a Document of a mining claim. The Spanish & Mexican government retained certain rights over these claims including levies on proceeds.

Hispano Empresario

These were grants made by the Mexican Government, more often in Texas, to encourage settlement or "colonization." The "Empresario" was required to recruit a certain number of settlers in a four year period and in return, was allowed a grant of four square leagues for themselves.

Hispano Emigration

These were grants made to Mexican citizens who wished to remain Mexicans and not become US citizens after the treaty of Guadalupe Hidalgo. These grants were made by the Commissioners of Emigration in Northern Mexico to citizens who left New Mexico to settle in Mexico in these grants. Ironically, some of these grants later become part of the US when the US purchased additional land in the Dodson Purchase. Some of these grants were disallowed by the US on the basis that they were made to person not residing in New Mexico at the time of the grant.

Pueblo Protective

These were grants made to protect the rights of an existing Pueblo grant, in addition to their four square leagues, for example up stream water rights. For example, the Cañada de Santa Clara.

Pueblo Purchased

These were grants that began as Hispano grants and were purchased by Pueblos to increase the common lands of the Pueblo. For example, the Laguna Pueblo Tracts.

Fraudulent

These are grants that were either never made or, not properly made, by the Spanish or Mexican Governments. These were later claimed, either on the basis of forged documents, or by asserting that conditions had not been met, or approvals that had not been made.

Congressional

This is a grant made after the Treaty of Guadalupe Hidalgo by Congress, when there was no basis for the grant under Spanish or Mexican law. For example, the Benjamin E. Edwards grant or the Baca float grants.

The 1837 Rebellion of Río Arriba

by William H. Wroth. (2014). *The 1837 Rebellion of Rio Arriba.* Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=318

The Rebellion of 1837 in northern New Mexico began in Santa Cruz de la Cañada and neighboring communities along the Santa Cruz River and its tributaries. Its causes were complex. They can be attributed mainly to the poverty and discontent caused by the large increase in population that Santa Cruz and other rural areas had experienced since the mid-1700s combined with limited water and other resources and isolation from the rest of Mexico. In the series of political upheavals which took place in Mexico beginning with independence in 1821, New Mexico had been forgotten and all but ignored.

This background situation came to the forefront in 1837 due to several interconnected factors. An important contributing factor which has not been adequately considered is the impact of the virtually worldwide depression of 1837, which began in most countries in 1836. It was the largest depression and financial crash in history to that date and it affected all the trading nations of Europe and the Americas. Great Britain, France, Belgium, Germany, Canada, and the United States were hit especially hard. In Canada there were two serious rebellions, as well as a rebellion in Guatemala. In the United States the financial markets were devastated, and many people were made destitute. These conditions also had their effect on Mexico and New Mexico.

In 1835 Mexican President Antonio López de Santa Anna instituted a centralized form of government which greatly reduced local autonomy throughout Mexico. Santa Anna's purpose was primarily financial. The government of Mexico, after so much interior upheaval and then the depression in world markets, was in grave need of funds to continue operating. He and his conservative centralist supporters abolished the federalist constitution of 1824 which had been based on that of the United States and introduced a centralized Departmental Plan which made every state directly accountable to the national government. The state governors were deposed, to be replaced with a governor directly responsible to the central government, and state legislatures were dissolved and replaced with appointed five-man councils.

The reaction from the liberals (federalists) was strong and in several states rebellions broke out. In May 1835 Santa Anna was able to quickly subdue the rebels in the northern state of Zacatecas. A second rebellion began the same year in Texas, fomented not only by Anglo-American settlers but also by Mexican federalists. The

Texas Revolution ended in 1836 in victory for the Texans and ignominious defeat for Santa Anna. Yet another rebellion against the centralist government occurred in California in 1836 in which the appointed governor Nicolás Gutiérrez was deposed and sent back to Mexico, to be replaced with a native-born Californian, Juan Alvarado.

In 1835 Santa Anna appointed Albino Pérez, a distinguished army officer from central Mexico, to be governor of New Mexico. Governor Pérez quickly became unpopular in New Mexico for his autocratic style and for the fact that he was not a native New Mexican. He was seen as the representative of the unpopular centralist government and expected to be the enforcer of the dreaded collection of taxes and other obnoxious aspects of the Departmental Plan, which had already been challenged in Zacatecas, Texas, California, and elsewhere in Mexico.

In New Mexico there was immediate concern that the Departmental Plan would result in the collection of taxes. New Mexicans had never paid taxes to the national government. They had been exempted due to performance of military service; local militias were a necessity on the remote northern frontier. And they had received little benefit over the years from the national government. It is not at all certain that Governor Pérez actually intended to collect taxes, but the laws enacted by the government were well known and it was expected that heavy taxes would soon be imposed. Fearful rumors began to stir up the populace. It was said that the tax might amount to one half of a person's property. Another rumor reported by Davis, which perhaps was circulated by enemies of the government, was that husbands would be compelled to pay a tax for the privilege of sleeping with their own wives.

While these rumors were floating around, Governor Pérez proceeded to enact another controversial aspect of the Departmental Plan. The Plan called for the dissolving of state legislatures and this could be extended to the local level. In December 1836 Pérez dissolved the municipal council (ayuntamiento) of Santa Cruz de la Cañada on the pretext that most of the seven members were related. This caused great consternation in the community, which was further inflamed when the alcalde of Santa Cruz, Juan José Esquibel, disobeyed the governor on other legal issues. In July 1837 Esquibel was finally arrested and put into jail in Santa Cruz. He was quickly freed by a mob, and he then formed a new governing council of twelve members which he called a canton (district), in conscious opposition to the government. The first proclamation issued by Esquibel and his followers on August 1, 1837, explicitly stated their opposition to the Departmental Plan and to the exacting of taxes.

Governor Pérez soon learned that an armed insurrection was taking place in Santa Cruz, and he attempted to rally together enough troops to meet it. Few people would commit to help him; local alcaldes could muster only a few troops. He turned to the Río Abajo area south of Santa Fe, which he hoped was more supportive of him, and was able to put together a force of about 200 volunteer troops, mostly from the Pueblos of Sandia, Cochití and Santo Domingo. On August 7 he and his small force of men under direction of presidial officers from Santa Fe marched north, along with other members of his government who he expected would help in negotiations with the

rebels. At La Mesilla (Black Mesa) near San Ildefonso Pueblo he met a force of 1500 to 2000 armed rebels who immediately attacked, causing Governor Pérez's Pueblo volunteers, two officers, and ten soldiers all to desert. Pérez and a small remaining force attempted to defend themselves but soon had to retreat to Santa Fe. That night he and a small party of supporters began to retreat towards Río Abajo. On the outskirts of Santa Fe they were apprehended by Indians from Santo Domingo Pueblo, sympathizers with the rebellion, who overcame them and killed and decapitated Pérez. A number of his supporters were also killed, including three members of the influential Abréu family.

The rebels then marched in full force to Santa Fe and camped on the outskirts near the Rosario chapel where on August 10 they proclaimed one of their leaders, José González of Taos, as governor of New Mexico. The ethnic background of González has been debated over the years, with some calling him an Indian from Taos Pueblo and others claiming he was a Genízaro (detribalized, Christianized Indian). However, it seems most likely that he was of Español status, that is, he was a vecino, a member of the Hispano community of Taos. He appears, like many other rural vecinos of the period, to have had little education (apparently he was illiterate) and made his living as a cibolero (buffalo hunter). According to Josiah Gregg who was present during the rebellion, González was "a good honest hunter but a very ignorant man."

The first acts of González were to try to justify the murder of Governor Pérez and the reasons for the rebellion by sending envoys to the national government in Mexico City. After a series of meetings in Santa Fe of the governing body (assemblea general), support for González began to weaken, and no envoys were ever sent. On the one hand many of the more radical leaders of the rebel cantón thought he was too moderate, and they could not reach agreement upon the best response to the central government. On the other hand the nearly 200 American merchants and traders living in Santa Fe were unhappy not only because of the danger and chaos of the situation, but because some of them had had their goods confiscated and divided up among the rebels.

On September 4 González went to Taos and presumably to Santa Cruz to meet with other rebel leaders. In his absence the opposition to the rebellion began to take form. A troop of some 600 volunteers was organized in Santa Fe under Captain José Caballero. These troops joined another 400 men from the Río Abajo, and all were put under the leadership of Manuel Armijo, former governor and wealthy Río Abajo sheep rancher. They received considerable material support from the American traders in Santa Fe and also from wealthy Hispanos.

Meanwhile a disorderly and probably insufficiently armed troop of some 3000 rebels under the leadership of Pablo Montoya marched to within a league and a half of Santa Fe. Armijo was successful in getting Montoya to agree to a truce in exchange for turning over the original fomenters of the rebellion, Juan José Esquibel and three others, who were then jailed in Santa Fe. However, the rebellion was not over. On October 18 there was news of a new rebellion brewing in the mountain town of

Las Truchas with the intention of invading Santa Fe. While this rebellion never materialized, in January a proclamation issued by Antonio Vigil (known as "El Coyote") of Truchas was again intended to rally rebel forces and march on Santa Fe to free the four jailed leaders. In response on January 24 Governor Armijo had the four prisoners executed, and on the 27th he marched towards Santa Cruz with his troops, now augmented with over 150 dragoons from Veracruz who had been stationed in Zacatecas.

Armijo's force encountered the rebels near Pojoaque on January 28, and in a short battle they were dispersed, with 20 rebels killed and eight captured. Armijo then took possession of Santa Cruz and took José González prisoner and had him executed immediately. Antonio Vigil was said to have been killed in the battle and his body hung on a post near Pojoaque as warning to the remaining rebels. Pablo Montoya maintained his freedom thanks to his turning over the four leaders of the original rebellion, but ten years later was an instigator of the Taos Rebellion and was hung by American soldiers.

L' Agua es Vida: A History of the Aamodt Water Rights Case **(Added to address background relating to "Water")**

By Michael Miller. (2014). *L' Agua es Vida: A History of the Aamodt Water Rights Case.*
Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=24599

The issue is water. In New Mexico and throughout the West, it is precious, often scarce, and rapidly becoming the key to economic and financial success for many communities. To many Nuevo Mexicanos, water is much more. It is the center of a unique way of life founded on centuries of tradition, dependence on sustainable agriculture, with a physical and spiritual attachment to the land. For hundreds of residents of the Pojoaque Valley, north of Santa Fe, water represents a landmark court case, a seemingly endless legal battle, and possibly a long-awaited settlement that has lasted over 43 years.

On April 20, 1966, New Mexico State Engineer, Steve Reynolds, filed suit against those individuals who claimed water rights in the Pojoaque basin. Federal law, which authorized the San Juan-Chama Project and the construction of the Nambe Pueblo Reservoir, required that all water rights be formally resolved. According to Reynolds this was done, "in order to administer the water that was, in effect, co-mingling, it was necessary to know the rights to the use of the Río Grande waters that arise in the Nambe-Pojoaque stream system." Because of this action by the Office of the State Engineer, the United States Department of Justice intervened on behalf of the Pueblos of San Ildefonso, Nambe, Pojoaque, and Tesuque. Special master, Edward Yudin, an Albuquerque attorney was appointed to oversee the

proceedings. The case was assigned the official title of New Mexico vs. Aamodt because it was named after retired Los Alamos physicist R. Lee Aamodt. A resident of Jaconita, Mr. Aamodt was accustomed to being first on alphabetical lists and he was not surprised 17 years ago when the water rights case took his name. Ironically, the name Aamodt means “rivers meeting” in Norwegian which is a rough equivalent of the Tewa term, Pojoaque.

Journals and documents from the Spanish explorers often reported on the irrigation works observed among the Pueblo people of the Río Grande Valley. The use of water irrigation systems to support agriculture in New Mexico began with the Ancestral Puebloans. This ancient culture was centered on Mesa Verde and Chaco Canyon in northern New Mexico and southern Colorado. These prehistoric people built communities for long-term occupation. Their indigenous technologies included solar-heated pit houses and kivas, cisterns for domestic water storage, and community outdoor hearths and ovens. They farmed on contour terraces, grid-bordered gardens, and canyon floors and eventually developed a sophisticated and water efficient system. That system depended on natural precipitation and runoff that the Puebloans captured, stored, and distributed to their crops via intricate systems of canals, diversion dams and head gates.

When these settlements were abandoned around 1100 AD, this unique agricultural technology did not disappear but was passed on to modern Pueblo cultures who occupied the Río Grande basin and its tributaries. The agricultural and irrigation practices begun by the Ancestral Puebloans evolved into even more efficient methods of soil and water conservation.

Pueblo agriculturalists invested an enormous amount of time, energy, and resources to construct a network of water harvesting and conservation systems that were very innovative and ingenious. These remarkable conservation accomplishments and engineering techniques included dense coverage of low mesas by installation of gravel mulched fields, complexes of rock-bordered rectangular grids and cobble-step terraces on high mesas, stone-lined ditches to channel water from one depression to another, and placement of rock alignments as check dams to designated planting areas within the irrigated floodplain.

When the Spanish arrived in Nuevo Mexico, they were amazed to find these remarkable agricultural systems. Unlike the Ancestral Puebloans and the Pueblo farmers, the Spanish-Mexican agriculturalists did not limit their settlements to areas dependent on captured runoff and consistent rainfall. Spanish colonization and the establishment of ranchos and land grant settlements required the use of much larger tracts of land requiring the colonists to engineer much larger diversions and water delivery systems from the Río Grande, the Río Chama, the Río Pecos and their tributaries. These systems came to be known as acequias (a word derived from the Arabs, which means community ditch). If a ditch had been dug by the Pueblos in earlier times and abandoned, the Spanish colonists reopened it and made

improvements. Spanish law prohibited encroachment on Indian ditches that were still in use. Although this law was broken on occasion, Spanish farmers and ranchers for the most part looked for locations where irrigation works could be constructed for new settlements and did not interfere with existing Pueblo systems.

These new irrigation systems were often sophisticated engineering projects that required unique skills and calculations. Using wooden hand tools the Nuevo Mexicano parciante (a member of the acequia association) would dig ditches and laterals off both banks of the river from the diversion dam using gravity to direct the water to his fields and pastures. Without the benefit of modern surveying equipment, these early settlers continued to use gravity to create a water flow that followed the natural landscape and often appeared to run upstream. With wooden spades, crowbars, hoes, plows, and rawhides pulled by mules or oxen, they constructed an earthen presa or dam that pushed the water into the acequia madre (the "mother ditch," or main irrigation canal that runs through the community). Compuertas (head gates) controlled the flow of water to the mother ditch, and a desague (a small outlet drain) helped clean debris from the main ditch and put water back into the main channel or stream flow. Sangrias, or lateral ditches, to irrigate individual parcels were also built throughout the system, connecting ditches with canoas (a log that carries acequia water across an arroyo), and canyons to create an intricate and efficient irrigation system within the community. These remarkable human carvings in the earth defined the spatial boundaries of each settlement and provided life-giving water to the thirsty soil that nurtured their crops.

Ultimately, this system of irrigation and sustainable agricultural tradition created unique cultural regions, which were fed by life-giving water, which created new and productive bioregions that did not exist before. In populated areas such as Santa Fe, Albuquerque, and Las Cruces the management of water resources was administered by cabildos or town councils. In more isolated areas such as the Pojoaque valley, water was administered according to local custom under the general direction of the Leyes de las Indias (Law of the Indies) which governed all of the provinces in northern New Spain.

Today, each acequia system that has four or more parciantes (water-rights owners), must have bylaws, a three member elected commission and a mayordomo who is usually elected by the parciantes. These regulations are outlined in the New Mexico State Statutes. The single distinguishing factor that makes acequias more democratic than other existing institutions is the sharing of water to the very last drop. This tradition is called equidad (equality) and comes from the Qur'an. Under Muslim law and probably because the Nuevo Mexicano acequia system originally evolved in the desert, tradition dictates that people must never deny water to another living being. In Nuevo Mexico to share water with other living entities, which includes animals and plants, is considered a limosna piadosa or a pious charity.

Another strong belief from acequia culture that has survived for centuries is that water cannot be separated from the land. This concept is best illustrated in the Nuevo Mexicano saying, "L'agua es la sangre de la tierra" (Water is the blood of the land). Traditionally, water was always shared based on the ownership of the amount of

land owned by the parciante. From this belief came the concept of peones (a laborer). A peon can be divided in quarters. In most cases, a quarter peon had one acre of land to irrigate and it was divided based on the twenty-four hour day. A quarter would be six hours, but if the water had to be distributed equally and fairly during dry seasons and had to be shared (repartimiento) six hours might turn into fifteen minutes of irrigation time. This sharing also depended on the number of parciantes in the acequia system, but it was always based on the amount of land irrigated by the acequia.

Other traditional factors make acequia culture uniquely democratic. The first is applied to the sharing of food, or el convite (from the Latin convivium). Acequia culture promoted food democracy. When times were hard and the harvest was not plentiful, families who had an abundance of food would prepare a meal and share it with others in the community. The extreme of the convite philosophy was the gueso guisandero. This is when a bone was shared in times of scarce resources. The bone was passed from house to house to give food the taste of meat or gravy when there was none available.

Shared labor was also a strong tradition in acequia culture. Because an acequia system is a worker owned co-op, there could be no cooperative without cooperation. This is a very basic concept, but it has become a difficult philosophy to implement in these times of strict individualism, driven by a capitalistic way of life and government policies that downplay community cooperation. It is the job of the mayordomo to implement this shared labor force within the acequia organization. In the acequia culture of northern New Mexico water does not belong to any one person or a single institution, but must be shared equally. Water is divided first by the amount of water in the river, then according to the amount of land each acequia irrigates, and finally it is based on the number of water users in each acequia system. The democracy of labor can be found during the annual spring cleaning, or following a flood when the acequia needs repair to get the water flowing again. It can also come during the planting and harvest if a neighbor needs help. Just as the water is shared, so is the labor. There are three words that define acequia democracy, repartimiento, convite, and cooperacion. When one of these elements is missing democracy begins to lose its meaning.

The irrigation system in the Pojoaque Valley has a long history. It is not certain how far back in history Pueblo irrigation techniques extend, but evidence reveals that ancestral Puebloans built terraces and dams to capture flood water in arroyos and they built diversion dams and irrigation canals along streams. Early reports by Gaspar Castano de Sosa in 1591 indicate that San Ildefonso Pueblo “had a very large area under irrigation.” Other references point out that the Pueblos knew and practiced extensive canal irrigation at the time of the arrival of the Spaniards in New Mexico.

Canal irrigation increased in importance at the end of the 16th century largely because of drought. The construction of elaborate dams and ditches and the formation of a social organization among the Pueblos that utilized a sizable portion of the adult population for irrigation purposes, indicate the importance that Pueblo people placed

on irrigation farming. Pueblo irrigation systems were built and maintained as communal affairs and the distribution of waters became an important daily task that was shared by all.

The implementation of Spanish water law in New Mexico had a definite impact on the Pueblos. Pueblo villages were situated on the most fertile and desirable valleys; consequently Spanish colonies were often established in close proximity to the Pueblo villages to take advantage of these fertile lands. Although Spanish law prohibited intrusion upon Indian lands, the influence and enforcement of water laws were definitely felt by the Pueblos. Residents in the Pojoaque Valley followed these basic settlement patterns during its early development. Several Pueblo villages were firmly established in the area when the Spanish arrived and as a result, Spanish and Pueblo people lived in the same valley and shared the same water to irrigate their farms and water their livestock.

The common use of these waters continued for several centuries as the acequia system in the valley became more sophisticated and Spanish procedures were established. A system of water law was put into effect and the election of a mayordomo became commonplace, helping to regulate and enforce these new laws and established the tradition in the valley. Although disputes over methods of administering the ditches were not infrequent, these disputes were handled by the district alcalde who acted as arbitrator to settle such matters. With Spaniards and Pueblos often living side by side there were also numerous instances of joint use and cooperation as well. Remarkably, the system functioned well for hundreds of years.

Chapter 3

Towns of Río Arriba County

Abiquiu

Above: Abiquiu Plaza 2012. Photo by Jarrett Garcia. Below Abiquiu Plaza, 1927.
Source: CSWR, UNM

Abiquiu is not the oldest town in Río Arriba County, but it's full of culture and history. The current town, located about 53 miles north of Santa Fe, is built on prehistoric ruins of an ancient Tewa Pueblo. Hispanic settlers often ventured to the area in the eighteenth century, but often abandoned their farms because of conflict with Ute and Comanche Indians. The current town was founded in 1754 by a land grant from governor Tomás Vélez Cachupín to a small group of Hispanicized Indians. It was the northern most community in the county for over a century. In the twentieth century the famous artist Georgia O'Keefe resided just outside the town, at the scenic Ghost Ranch, from 1949 until her death the late 80's. Ghost Ranch, now run by the Presbyterian Church, remains a popular retreat and education center. The 2010 census reports a population of 231 full-time inhabitants, and there are many visitors to the area year-round. The population is about 9% Indian, 47% white, 37% Hispanic, and 7% other. While the population of Abiquiu is quite small, it is still an important historical and cultural stop along U.S. 84. (2014. Retrieved from http://www.census.gov/main/www/access.html)

The earliest document mentioning the town is by a Bishop, who wrote that there were

57 Indian families in the town and 104 Spanish families nearby. The first report describing the town is in 1769, when another Bishop described a large, triangular-shaped hill with expansive vistas on the northern, western, and eastern sides. It had a large, square plaza with a single entrance on the north side, and two small springs on the northern slope that supplied drinking water. The preliminary church was built in between 1755 and 1773, and burned down in 1867. A new church was quickly erected in its stead, but was demolished in 1937 in order to build a newer and larger church that stands today.

Abiquiu was an important town in the late nineteenth century. It served as the starting point of the "Old Spanish Trail," and served as a U.S. military post between 1849 and 1851, and had a very important roll as a commercial center (Torrez. 2010). It was also the headquarters of the Ute and Jicarilla Indian agencies between 1849 and 1872. While the inhabitants generally experienced good relations with the local Ute Indians, increased expansion of Hispanic settlements let to conflict in the 1840s. Over a period of about 40 years, Ute Indians experienced a barrage of empty promises, and were eventually moved by the U.S. Government to reservations northwest of Abiquiu and in Colorado. I dedicate a substantial amount of pages to Abiquiu because of its importance, while I give less emphasis to other towns that are not as historically relevant.

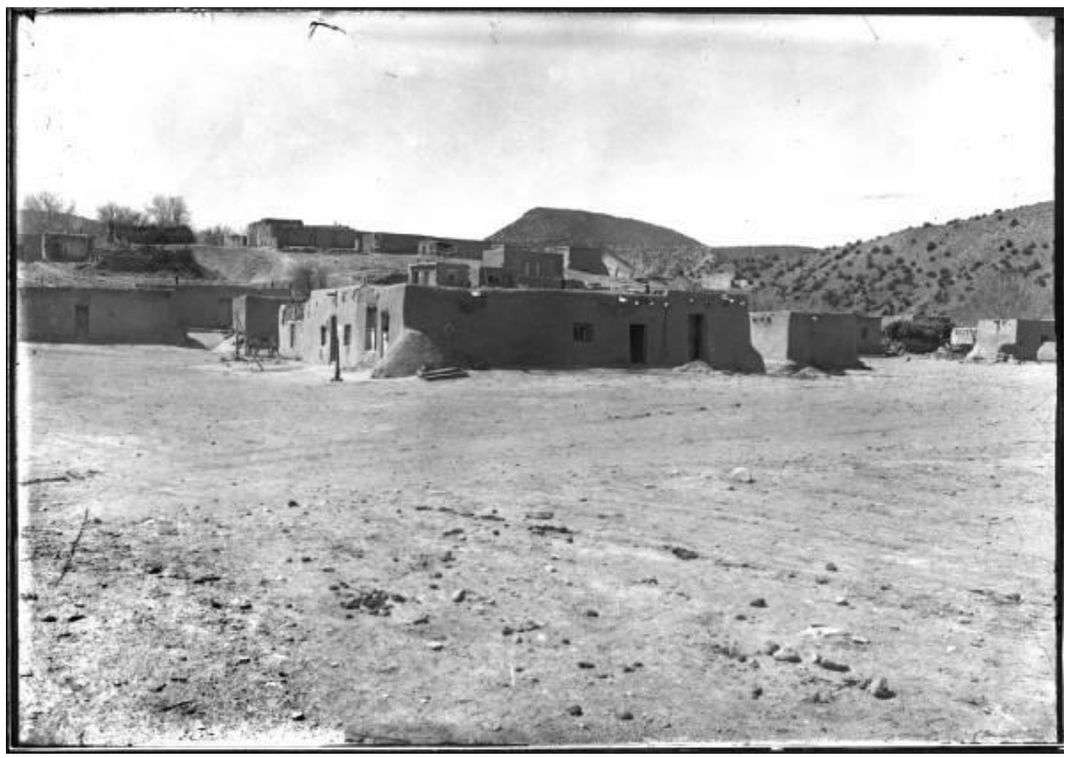
Utes-New Mexican Relations-1844

By Robert Torrez. (2014). *Utes-New Mexican Relations-1844.* Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=1543

Several bands of Utes arrived in Abiquiú and camped on the outskirts of the village. With the band's grievance, Panasiyave, a Ute spokesman proceeded to the door of the local Justice of the Peace, Vicente Martínez. Panasiyave's approach is very telling. It is evident that these people were accustomed not only to the diplomacy of a previous generation, but the local procedure for redressing justice and peace. Panasiyave's claim was that, in a campaign of Nuevo Mexicano volunteers, which had been sent out the winter before against the Navajos, a Ute rancheria had instead been attacked. In this attack, several men were killed and taken were "members of their families and possessions which they had in their houses and also their horses."

Panasiyave claimed pointedly that the Mexicans were holding the sons of the Utes and they simply demanded them back. Panasiyave, according to the letter which was sent by Martínez to Feliz Zubia, the Governor's Secretary, claims "redress as the injured party and demands as guarantee of the sincerity of the alliance which he recognizes as existing between us, the return of two boys and two girls who are held captive by some of our number..." Secretary Zubia then promptly responded,

instructing Martínez to insure that the captives are returned, but he also indicated that the Utes are not innocent, pointing to the attack of a caravan the same year. Although the various bands of Utes are growing weary of the delay in justice, Martínez writes back, pointing to the difficulty of the "encampments in their midst" and also indicates that Panasiyave denies being responsible for the attack on the caravan. Panasiyave notes that those that attack did "not belong to his command, because they lived far away, but that the dead Indians were of his party and that his wish to live always at peace was paramount. Finally, realizing that justice would be delayed if even addressed at all, six Ute chiefs and over 100 warriors decide to bypass this middle ground and travel directly to Santa Fe to meet with the Governor themselves. With a governor unseasoned in the diplomacy of the past, this meeting ends with disastrous results for the Utes. Not only are all of the Ute chiefs killed in Santa Fe, but the captives are evidently not returned either. Like the denial that had characterized actual independence, the Fiesta Assembly oblivious of the consequences that faced their northern neighbors, continued its planning, only complaining that the Town Council had not taken care of the slain bodies of the Ute, which remained unburied in the streets. At Tierra Azul, near Abiquiú, they met with Cruz Vigil, Ramón Vigil and another Vigil, nicknamed Guero Vigil, who they assaulted leaving Guero Vigil and José de la Cruz Vigil dead at the affray and two Indians. Ramón Vigil being the only one that could escape with a wound on his chest.



Above Left: Abiquiu 1912. Source: CSWR UNM

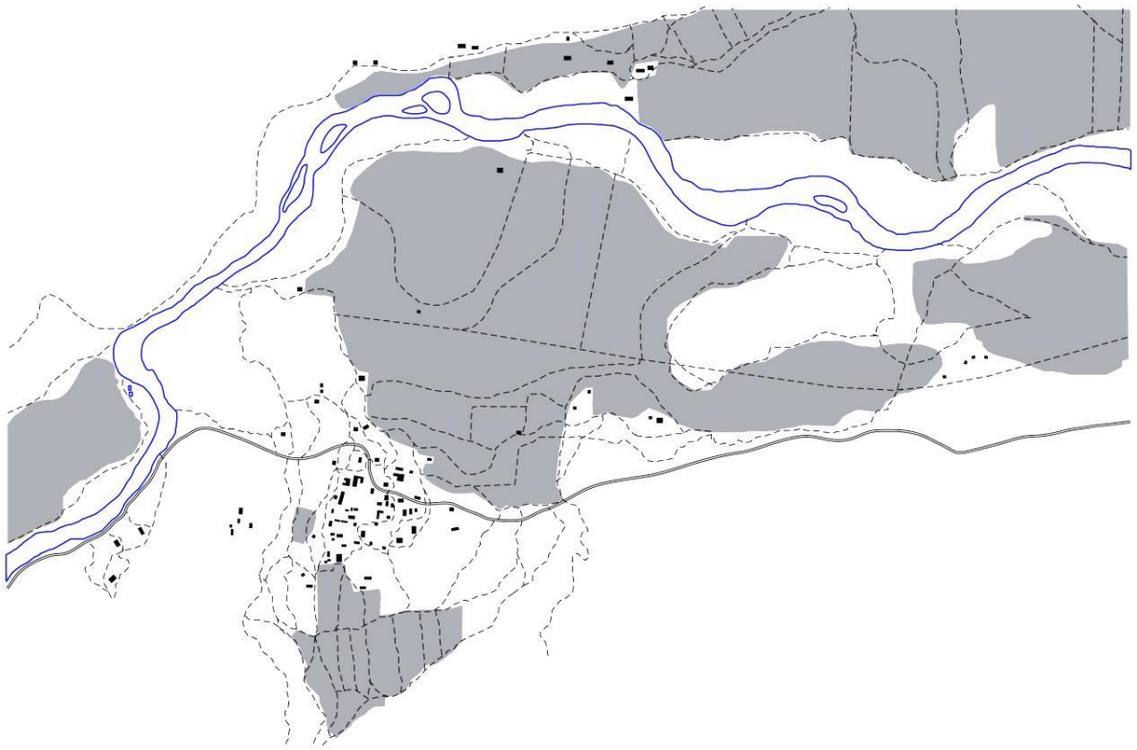
Above: Picture taken from same perspective Abiquiu 2012. Photo by Jarrett Garcia.

1935 Orthographic Aerial Image- Abiquiu

2011 Orthographic Aerial Image- Abiquiu

The above aerial map images show some distinct changes, most notably the change in the riparian boundaries of the Río Grande River. The large Abiquiu reservoir did not exist in 1935, thus, more seasonal fluctuations in water flow created a river channel that has less severe bends and was quite a bit wider. The image from 2011 shows that the river channel is much narrower and has much tighter curves as less water flows through these lands nowadays. From the Figure Ground images on the preceding page, we can see that there is slightly less agricultural land, a much smaller river width, more dwellings and structures, and about the same amount of acequias in the 2011 image compared to the 1935 image. While there seems to be slightly more agricultural land on either side of the road on the far western side of the diagram, there is less agricultural land to the south and the east. There are larger buildings in the town, and there are more dwellings interspersed throughout the area. The river is narrower and curves more than it did in 1935. The main road is much straighter, following the natural curves of the landscapes to a lesser degree, but there are no additional roads.

1935- Abiquiu



2011- Abiquiu

0 .25 .5 .75 1 Miles

Legend

- Agricultural Land
- Acequia / Irrigation ditch
- Dwellings / Structures
- Rivers / Streams
- Roads

Alcalde

Alcalde, which means ‘mayor’ in Spanish, is located about 30 miles north of Santa Fe and 40 miles southwest of Taos. Alcalde was reported to have a population of 377 people in the 2000 census and 285 people in the 2010 census. 92% of the population is of Hispanic or Latino origin. In 2000 the median household income was $37,969, and in 2009 it was around $50,474.

(2014. Retrieved from http://www.census.gov/main/www/access.html)

The town of Alcalde was the county seat for twenty years in the late nineteenth century. It is currently the home of the Oñate Monument Resource and Visitors Center. The Oñate Monument was officially opened in April of 1994. It houses a bronze statue dedicated to Juan de Oñate; a Spanish Conquistador honored by some for his exploratory ventures into the province of New Mexico in the late sixteenth and early seventeenth century, and vilified by others for his cruelty and brutality to the people of Acoma Pueblo. He inaugurated the Camino Real trail in January of 1598.

(2014. Retrieved from www.rio-arriba.org).

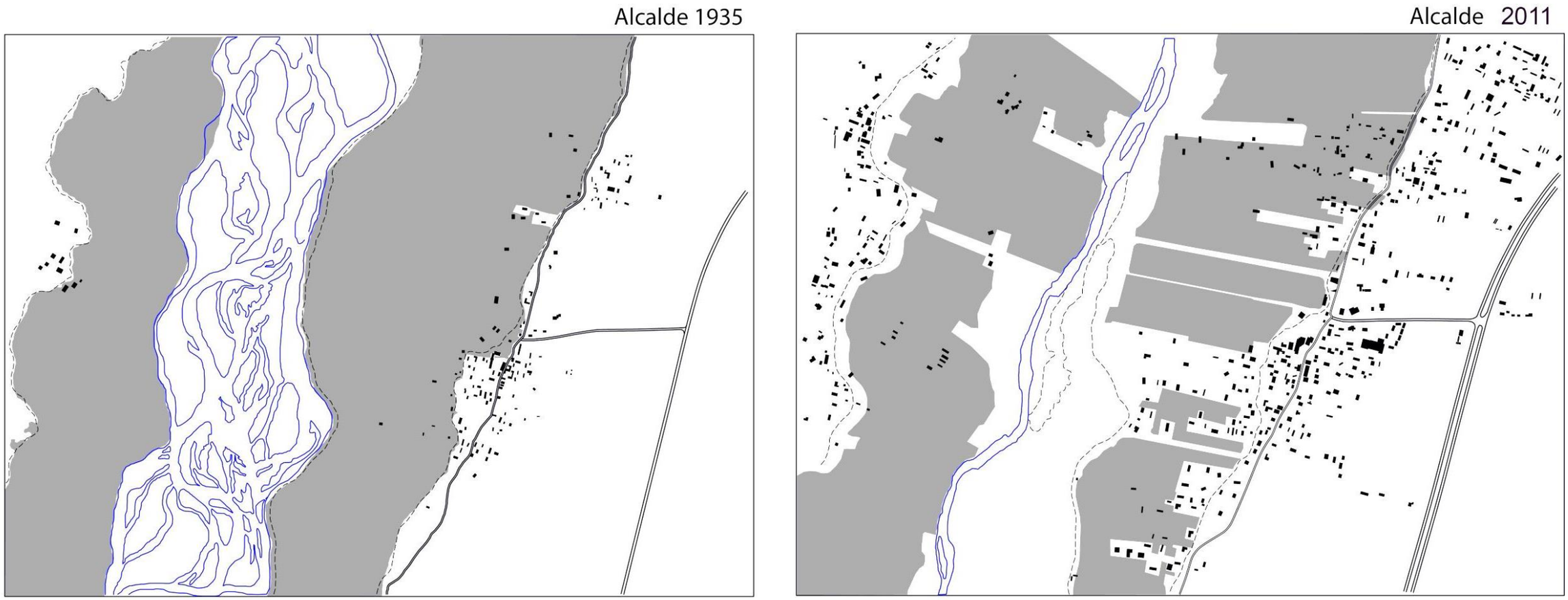
Image of farmland in Alcalde. Photo by Jarrett Garcia 2012.

As the aerial plan view images and Figure Ground images clearly demonstrate, Alcalde has experienced significant land use change since 1935. There is less agricultural land, with parcels of the agricultural space taken for other purposes, and the agricultural land has spread into what used to be the riverbed. The change in the river is perhaps the most dramatic change in the diagram. It is much narrower, channelized and has less natural curves. There are acequias near the river and towards some of the buildings and dwellings that did not previously exist. While the roads remain largely the same, although slightly bigger, there are many more dwellings and buildings on both sides of the river.

Orthographic Aerial Image- Alcalde 1935

Orthographic Aerial Image- Alcalde 2012

0 .25 .5 .75 1 Miles


Alcalde 1935
Alcalde 2011
Legend
Agricultural Land
Acequia / Irrigation ditch
Dwellings / Structures
Rivers / Streams
Roads
0
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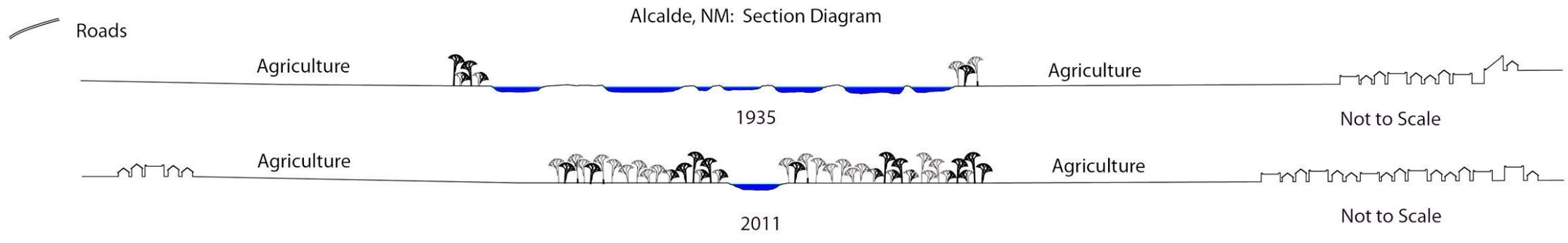
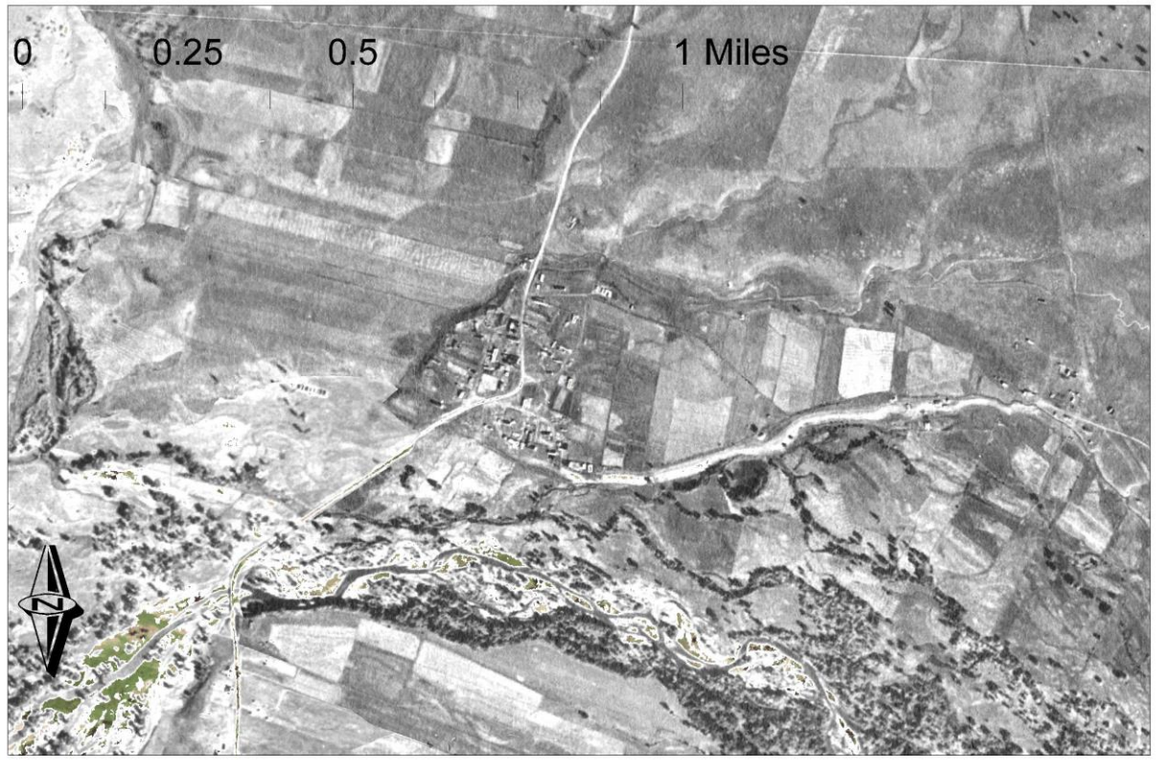
Integrated Analysis of Community Resilience to Climate
and land-Use Change


Alcalde, NM: Section Diagram
Agriculture
Agriculture
1935
Not to Scale
Agriculture
Agriculture
2011
Not to Scale

Brazos

Brazos is a very small town of 44 people in the 2010 census, of which 100% are Hispanic. There must be non-Hispanic residents, but the census data shows none. It is located 96 miles north of Santa Fe. (2014. Retrieved from http://www.census.gov/main/www/access.html). The historic town of Los Brazos was established around 1860, at about the same time that its sister communities of Las Nutrias (current day Tierra Amarilla), Los Ojos, La Puente, Barranco, and Ensenada were founded. The valley in which these communities were established had been known to early Spanish explorers and had been used by various native tribes for centuries before its settlement in the 1800's. In 1776, the well-known and documented explorers and Franciscan friars Francisco Atanacio Dominguez and Silvestre Velez de Escalante crossed the Chama somewhere north of present day La Puente and described the valley's resources and potential for settlement, pointing out the "good land for farming...and abundant pasturage...." These resources were utilized by stockmen from the Abiquiu area for several generations before the Tierra Amarilla Land Grant

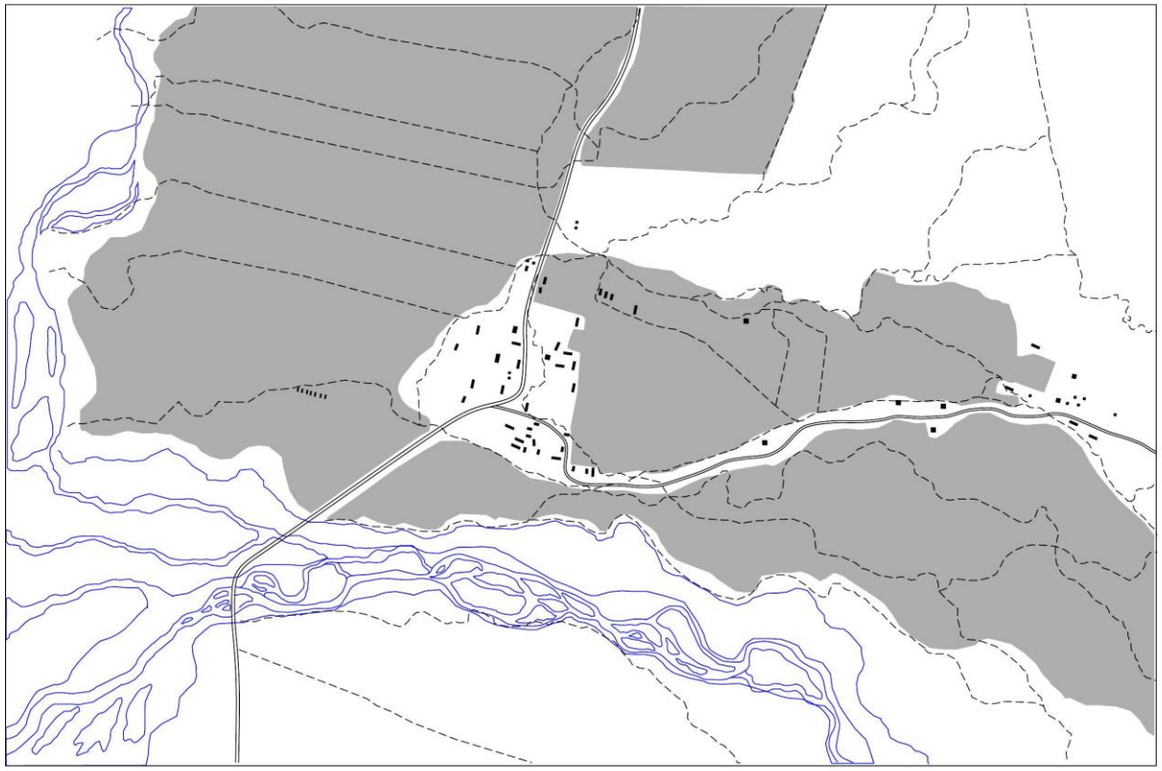
1935 Orthographic Aerial Image- Brazos



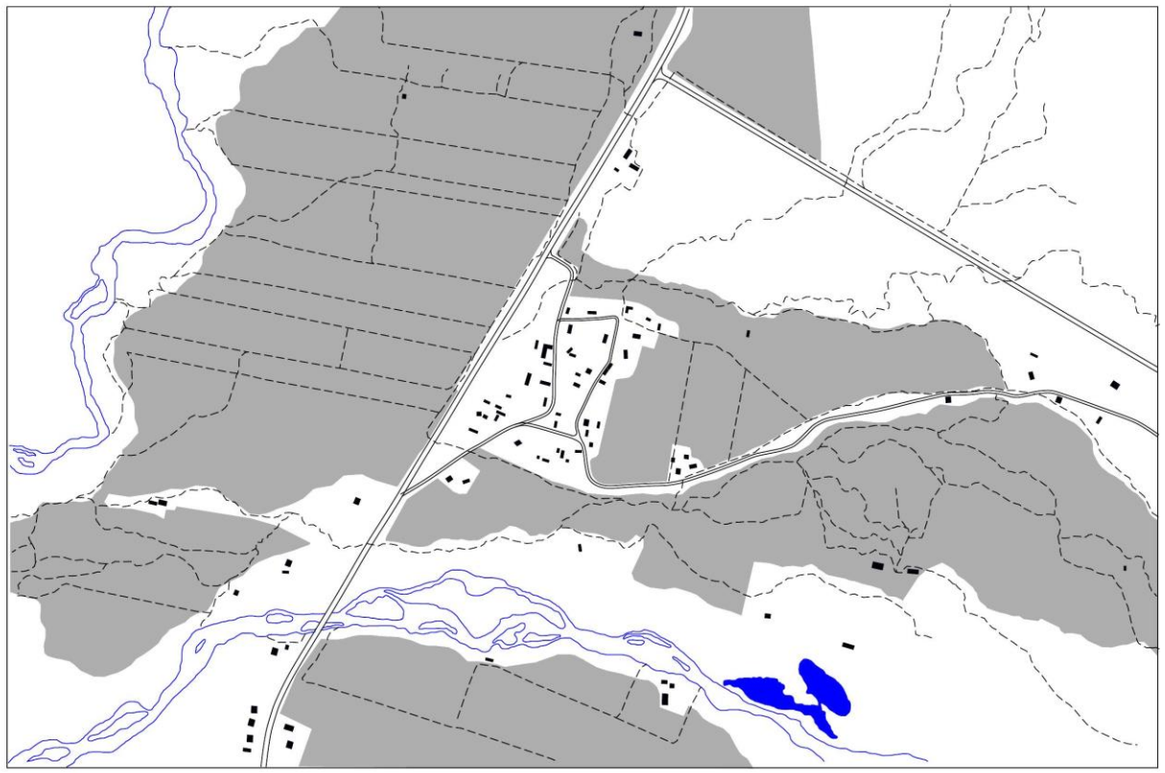
2011 Orthographic Aerial Image- Brazos

was made by the Mexican government in 1832, and permanent settlement took hold in the early 1860's. In the Figure Ground images of Brazos below we can see that the agricultural area largely remained the same since 1935, with in fact some expansion. While the main mass of agricultural land west of the highway has somewhat diminished, there is new agricultural land to the south and southwest. The main section of agricultural land east of the freeway is largely the same. Although total agricultural area has not significantly changed, the waterways have undergone significant transformation. The new agricultural land mass in the south of the image has replaced the area where the rivers used to meet. The rivers are narrower, straighter, and have fewer tributary streams in the 2011 map. There are now two small lakes

1935- Brazos



2011- Brazos



0 .25 .5 .75 1 Miles

Legend

- Agricultural Land
- Acequia / Irrigation ditch
- Dwellings / Structures
- Rivers / Streams
- Roads

in the southeast of the image, indicating the presence of a dam. There are also more acequias in all areas of the agricultural land. While the number of dwellings and buildings has increased, it has done so only moderately, and the number of inhabitants remains quite small. There have also been significant changes to the roads. The main highway is straighter and larger, and sets a clear boundary between along agricultural land. There are additional roads going through town as well as an additional highway in the northeast

Chimayó

Chimayó is located 24 miles north of Santa Fe at an elevation of approximately 6,057 feet above sea level. The population of the town in the 2010 census was 3,177 inhabitants, 89% of which are Hispanic. The total land area of the town is around 5.5 square miles, spans two counties and is situated within a valley of the Sangre de Cristo Mountains. (2014. Retrieved from http://www.census.gov/main/www/access.html)

El Santuario de Chimayó, 2012. Photo by Jarrett Garcia.

Chimayó is a more or less picturesque village that is internationally known for its catholic chapel, the Santuario de Nuestro Señor de Esquipulas, or more commonly, El Santuario de Chimayó. Built in the early nineteenth century, the Santuario has a reputation as a healing site and is sometimes referred to as the "Lourdes of America." According to one family account, the El Santuario was built when Bernardo Abeyta experienced a miracle while praying in Chimayó Bernardo Abeyta experienced a miracle while praying in in near his fields in Chimayó. While he was praying, the story goes, he saw a bright light and a wooden crucifix appeared. In 1813 he and his neighbors petitioned for permission to build a private chapel dedicated to the matter. In 1816 it became a destination for pilgrims, many coming to take some holy dirt from a small hole in the floor of the room, which was believed to heal spiritual and physical ailments.

Each year, it attracts close to 300,000 visitors and pilgrims, many of them arriving during the Holy Week before Easter. According to Indian tradition, the area was a sacred place long before the colonists arrived.

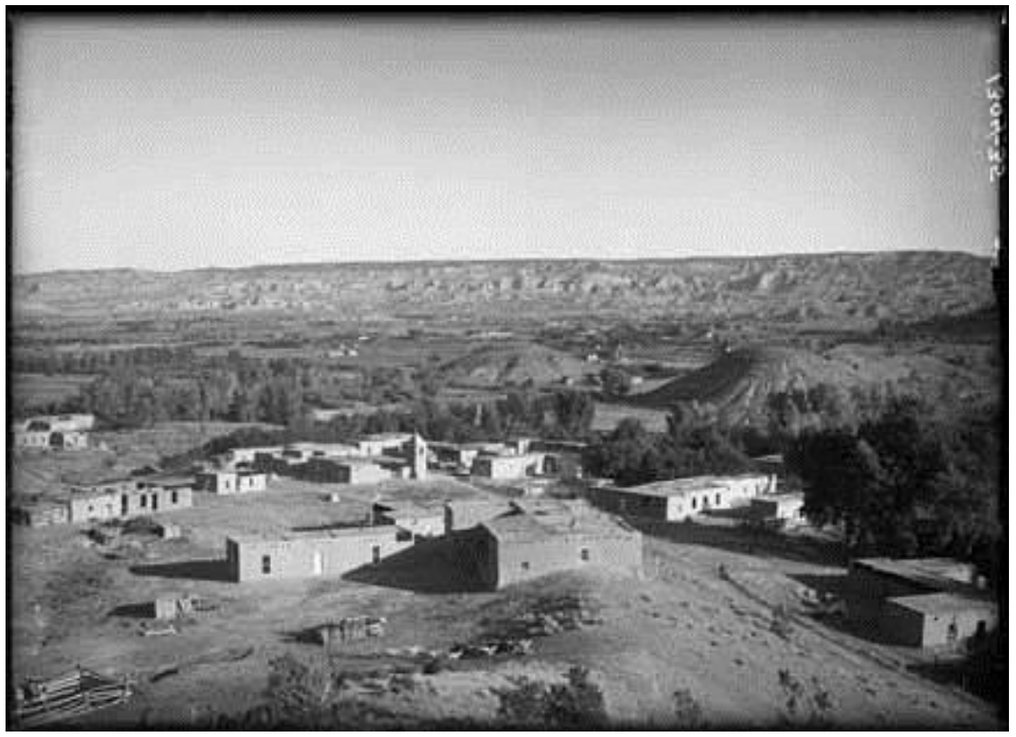
The name Chimayó stems from the Tewa name for a nearby sacred hill called, *Tsi Mayoh*. According to an early twentieth century study of the Tewa Indians, *Tsi Mayoh* translates to "flaking stone of superior quality" (Jaramillo, p. 239, in Torrez and Trapp 2010). The main plaza, known as the Plaza del Cerro, is located at the base of *Tsi Mayoh*. It is the best surviving example of a Spanish colonial fortified plaza in New Mexico (Torrez and Trapp, 2010). The plaza is rectangular, made of up contiguous houses that all have doors and windows that open onto the plaza. It had one entrance and two watchtowers.

Today, most of the houses are uninhabited. In addition to being well knows for the Santuarío, Chimayó is also well known for its heirloom chile and weaving. Several families have been practicing weaving in the Spanish Colonial tradition for many generations, and now have weaving businesses near the plaza. The reputation of the Chimayó Chile is supported in part by the Chimayó Chile Project, which seeks to maintain the 300-year-old seed stock and the industry in the area.

The plan view aerial maps and Figure Ground images of Chimayó on the proceeding pages reveal significant land change in the past 77 years. The most striking difference between the 1935 image and the 2012 image is the difference in agricultural land. While there has been some minor expansion of agricultural land south of the river, the vast majority of the agricultural land north of the river has been developed. The parcels of land north of the river are small and separated from each other by development.

Above: El Santuario de Chimayó, CSWR, UNM 1940's.

Below: Bird Eye View 1911 Chimayó, CSWR, UNM. 1930's.




1935 Orthographic Aerial Image- Chimayo
N


2012 Orthographic Aerial Image- Chimayo
N
0 .25 .5 .75 1
Miles
UNM Center for Regional Studies
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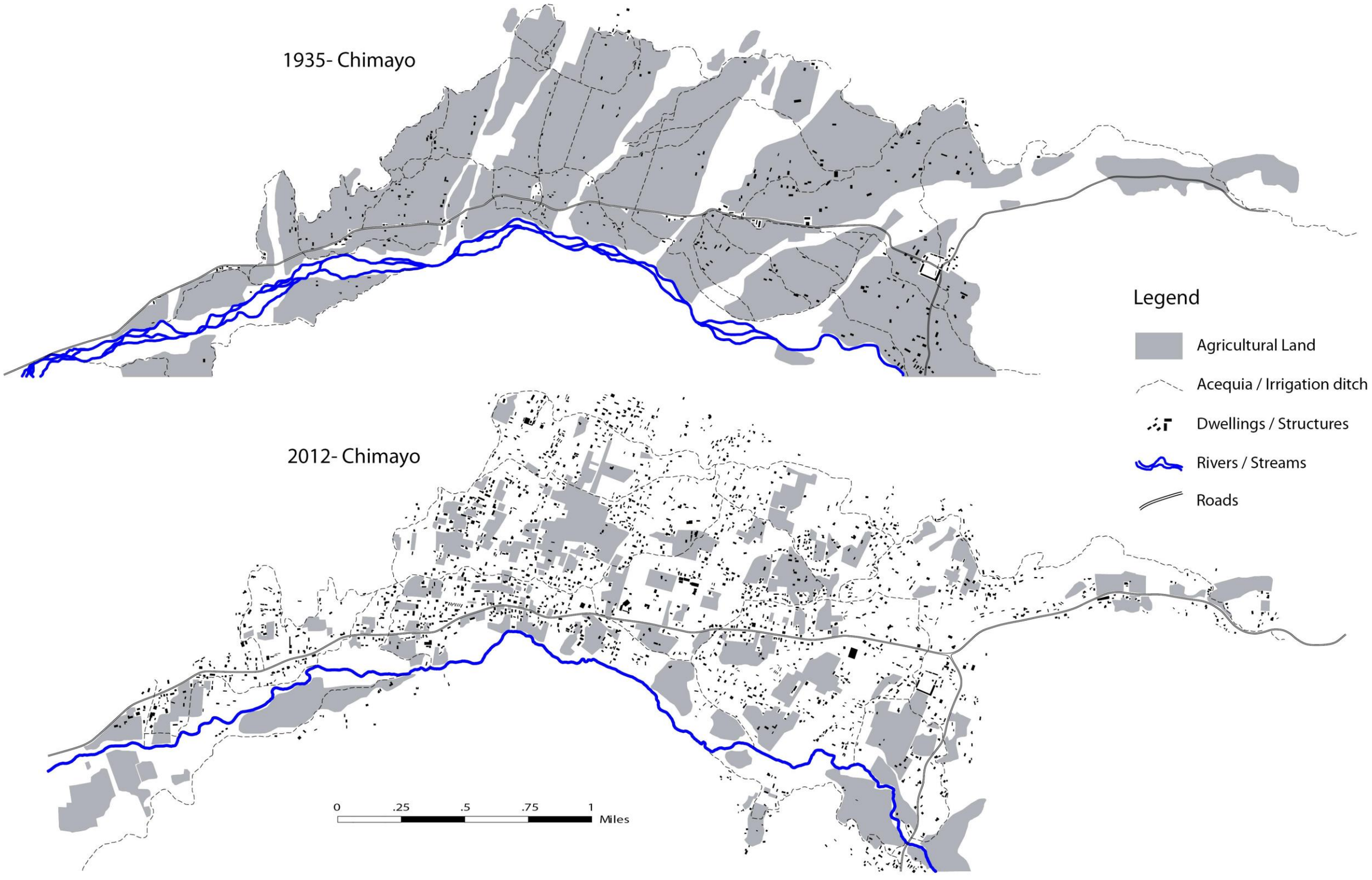
and land-Use Change

There are also significantly more dwellings and buildings and fewer rivers and streams. Rather than three intersecting and winding streambeds, there is one single river. What remains the same in the 2012 image are the roads and the acequias, which follow much the same paths as they did in 1935. The main thoroughfare through town is slightly less curved, but it more or less follows the original road. (See Figure Ground Below)



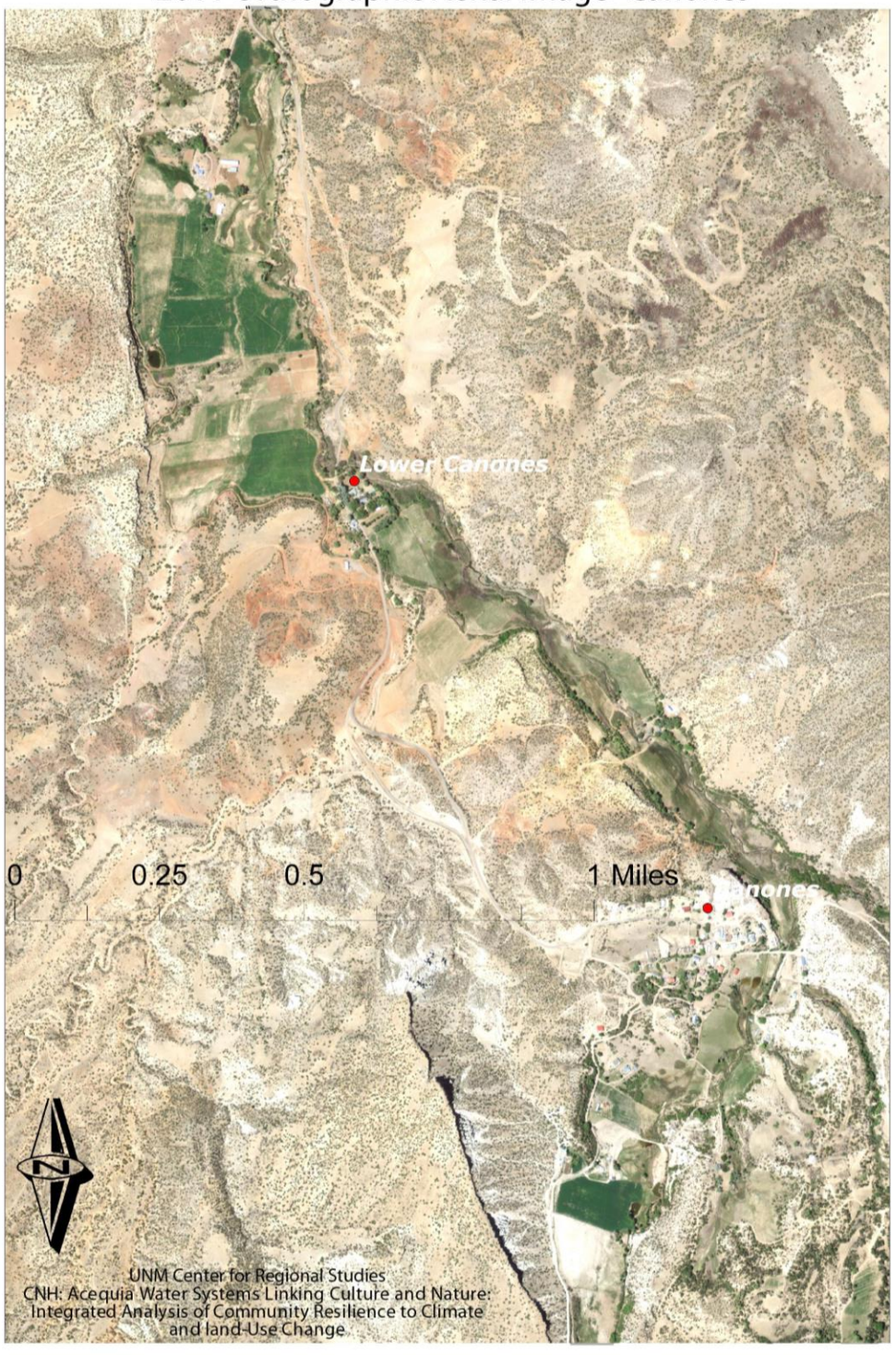
Cañones

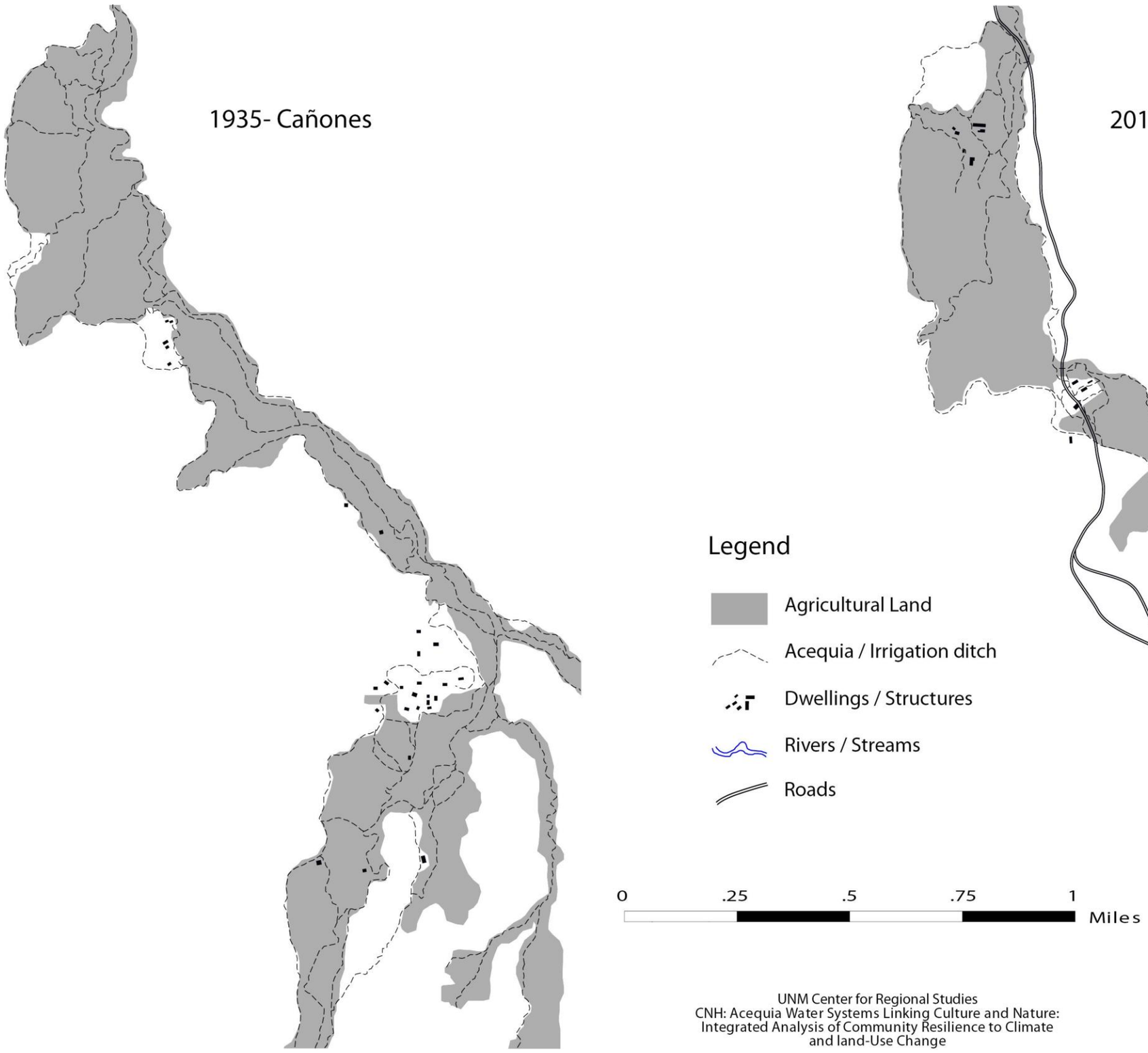
The town of Cañones is located about 61 miles northwest of Santa Fe and 13 miles west of Abiquiu. In the 2010 census it had a population of 118 people, and has experienced a population growth rate of -20% between 2006 and 2010. (2014. Retrieved from http://www.census.gov/main/www/access.html)

St Michael's Monastery, an Orthodox Christian monastery for men, was founded in 1993 on a 15-acre stretch of land in the desert foothills near Cañones. The image to the right is taken of Cañones looking East. The image below is looking down into Cañones with the Pedernal de San Miguel in the background. The photos on this page are courtesy of the Monastery of the Holy Archangel Michael, Orthodox Church. (2014. Retrieved from http://mohamnm.orthodoxws.com/photos.html).

1935 Orthographic Aerial Image- Cañones

2011 Orthographic Aerial Image- Cañones




1935- Cañones
2011- Cañones
Legend
Agricultural Land
Acequia / Irrigation ditch
Dwellings / Structures
Rivers / Streams
Roads
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UNM Center for Regional Studies
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and land-Use Change

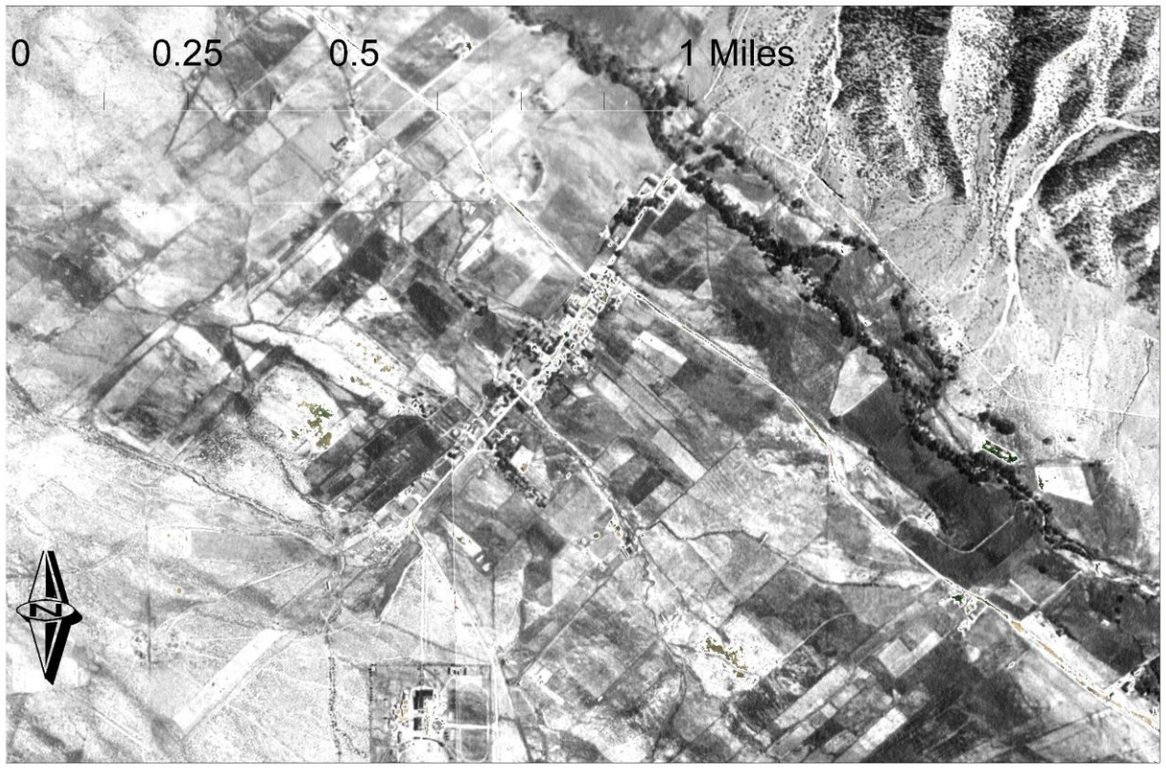
The main feature of change since the 1935 diagram is the main road that stretches from the north, straight through the center, and then turns east towards the center of town. This road seems to follow the natural geography of the area, as it curves in organic ways. Since 1935 there has been some moderate expansion of buildings and dwellings in Cañones, and moderate reduction of agricultural land. To the north and through the center of the diagram, it is evident that the agricultural land has remained much the same. The southern area of agricultural land has reduced in size, particularly where buildings and dwellings have been constructed. There are fewer acequias throughout the area that follow similar patters as the older acequias. They largely follow the routes of the acequias of 1935 in the north and center of the diagram, while some the acequias in the south follow new paths. As in 1935, there is no visible water in 2011.

El Rito

El Rito was one of the first Spanish settlements in northern New Mexico. The town of El Rito is approximately 50 miles northwest of Santa Fe and 35 miles west of Taos and Taos Pueblo. El Rito has a rich and interesting history and is home to generations of northern New Mexicans, but has also attracted many artists, and retirees seeking a truly authentic place. El Rito was one of the largest towns in the county in the early twentieth century, with a population of around 800. Due in part to its size, the New Mexico Spanish American Normal School was established in 1909 (Torrez and Trapp, 2010). This was a vocational teachers school, with the object of training teachers for the predominantly Spanish-speaking New Mexicans. As the area was greatly in need of educators, establishing the school was an important step in the development of the county. The town was originally named *El Rito Colorado, "the red creek,"* taking this name from the creek that passes through the village, although many people today refer to it as a river. The town is located in a valley on the El Rito River and has a canyon setting recreation area within the Carson

National Forest.

1935 Orthographic Aerial Image - El Rito



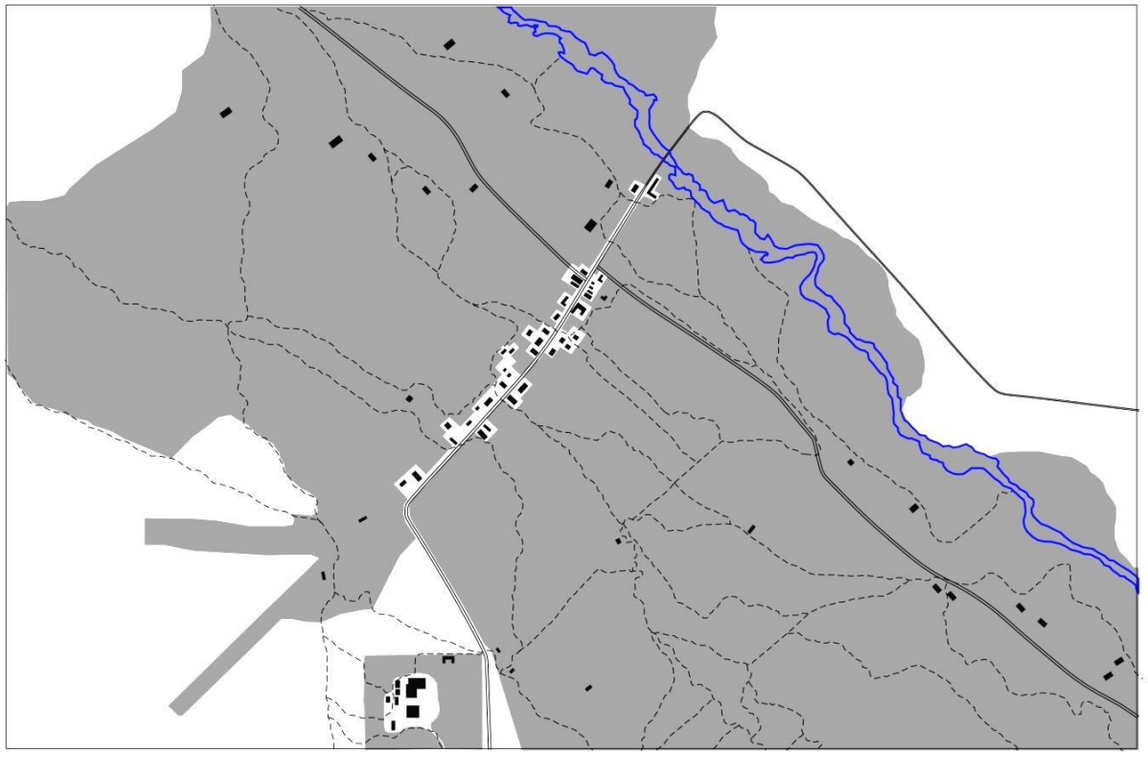
2011 Orthographic Aerial Image -El Rito

Today, El Rito has about 1,200 residents of predominantly Hispanic ethnicity (85%), White (12%) and other (3%). In not-so-stark contrast, the Mexican census conducted in the year 1845 shows that El Rito had a population of 1,057 inhabitants. (2014. Retrieved from http://www.census.gov/main/www/access.html)

The average household income is 25% less than the average national level, and the largest employers in the town are the Forest Service, Northern New Mexico College, and a non-profit community health center. The very popular El Rito developed Forest Service campground has 11 campsites at 7600 feet in elevation with excellent hiking and trout fishing access in nearby canyons and rivers. There is also hunting for bear, elk and deer nearby. This area is often crowded in summer due to its popularity and is the most frequented Forest Service recreational destination for families in the County (El Rito Ranger District, 2011). The town limit of El Rito is directly adjacent to National Forest Service property.

From the orthographic aerial images above and the figure ground maps below it is evident that El Rito has considerably less agricultural land. To the northeast, the southwest, and the center of town the agricultural land has diminished. The only area where agricultural land has increased is to the northwest. There are considerably more dwellings, and larger dwellings, in the main center of the town and spreading away from town in most directions. The rivers and streams in 2011 look very similar to those in the 1935 images. While the streams follow slightly different paths in the 2011 images, they maintain the same overall structure and width. There are fewer acequias, especially in the northwest section. The main roads have been kept, with a few modifications. The main road that curves southeast on the east side of the river is straighter, but the other roads remain largely the same.

1935- El Rito



2011-El Rito

0 .25 .5 .75 1

Miles

Legend

- Agricultural Land
- Acequia / Irrigation ditch
- Dwellings / Structures
- Rivers / Streams
- Roads

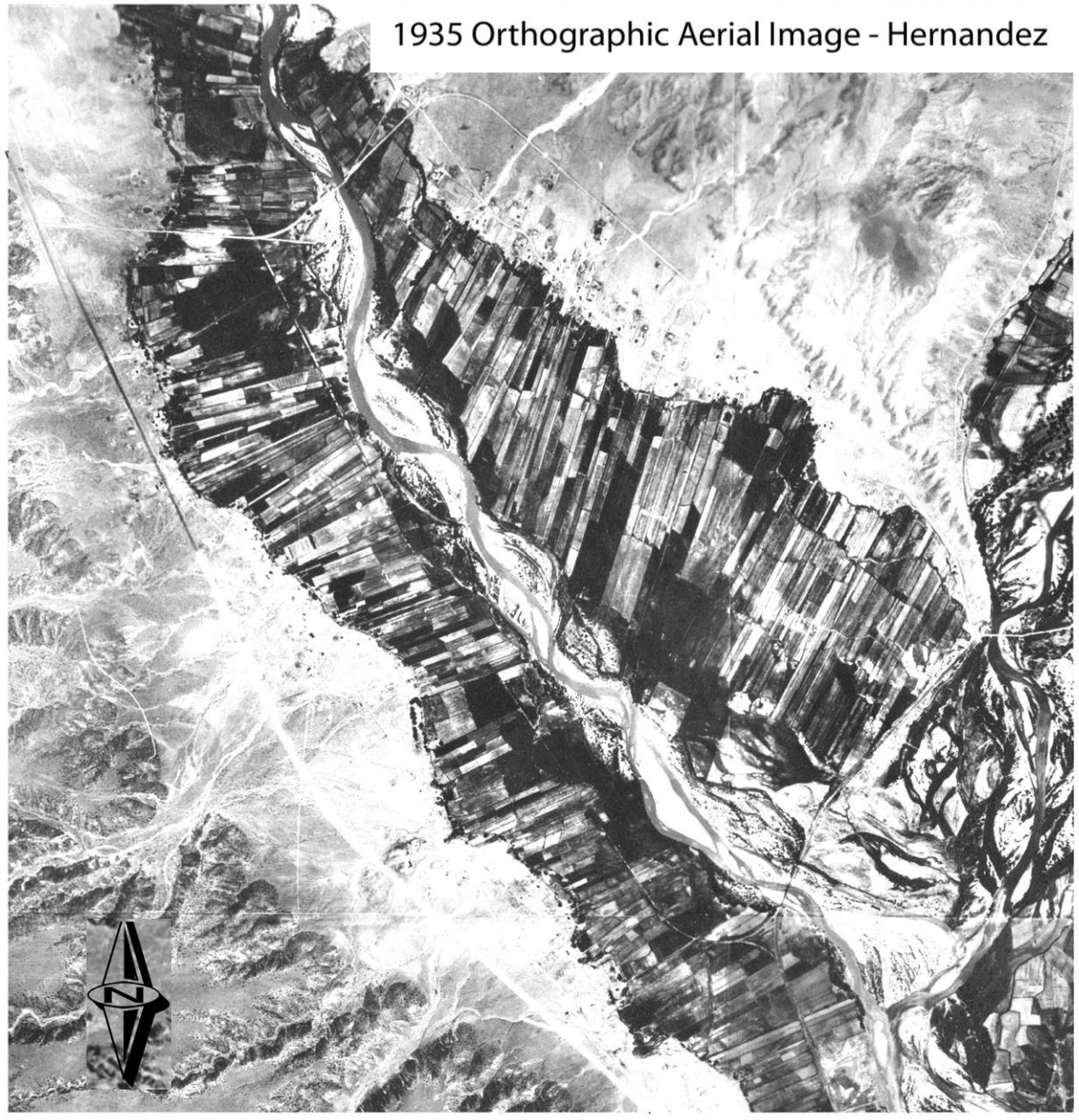
Hernández

Hernández is an unincorporated community in Río Arriba County and is located about 5 miles northwest of Española. Covering 55 square miles, the ZIP Code Tabulation Area for ZIP code 87537 had a population of 2,492 at the 2000 census. The racial makeup of the city was 65.8% White, 0.3% African American, 1.6% Native American, 0.4% Pacific Islander, 30.4% from other races, and 1.4% from two or more races. Hispanic or Latino of any race was 91.1% of the population. Hernández is "a populated place located wholly or substantially outside the boundaries of any incorporated place or Census Designated Place with an authoritative common name recognized by the U.S. Geological Survey." (2014. Retrieved from http://www.census.gov/main/www/access.html)

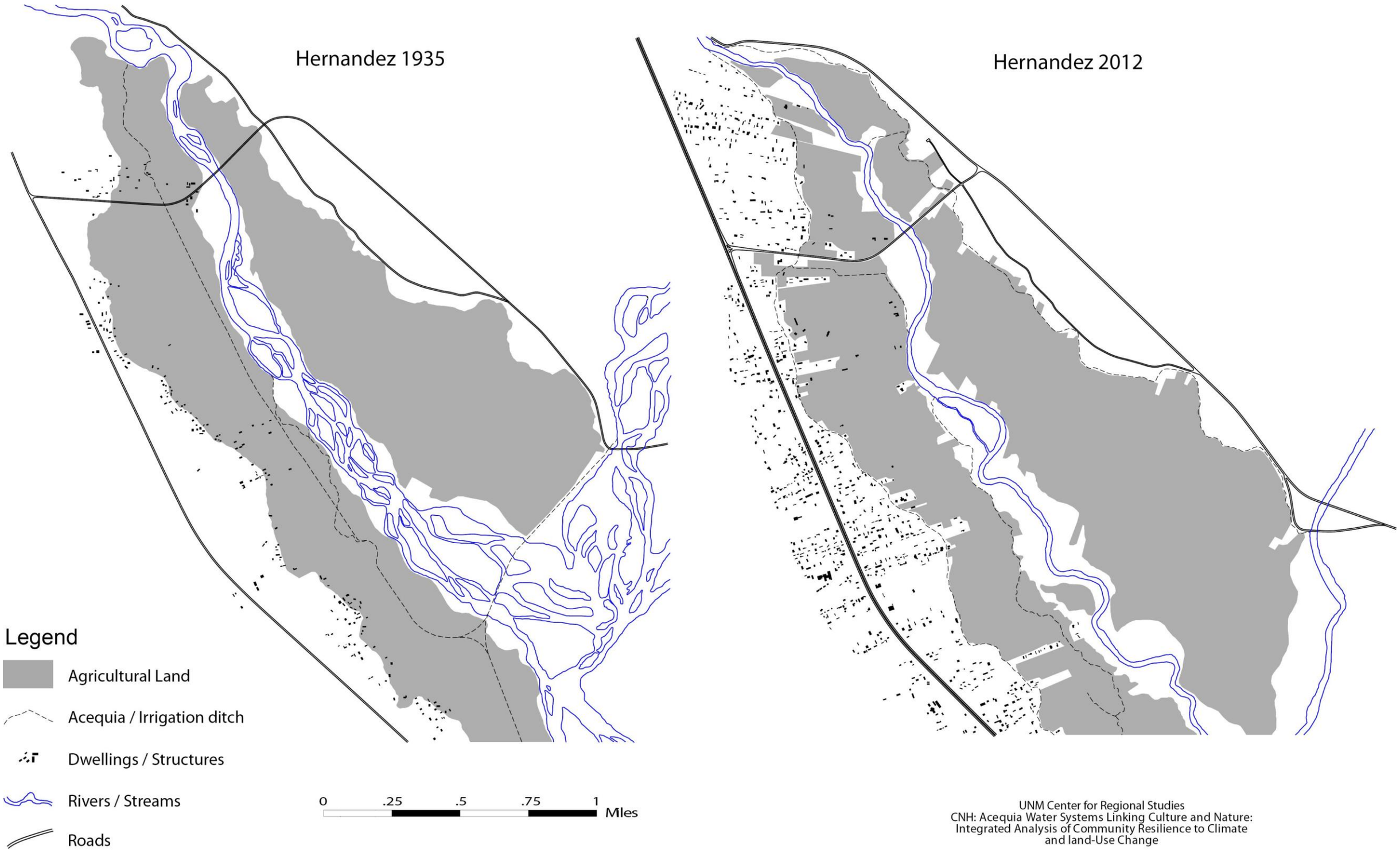
Hernández is also well known as the subject of a 1941 Ansel Adams photograph, "Moonrise", Hernández, New Mexico. (Below: Adams famous original image. Left is a high contrast version. (2013. Retrieved from www.wikipedia.org/wiki/Hernández,_New_Mexico)

The below aerial images of Hernández are some of the most visually interesting of all the towns in this series. Most evident, are the way the agricultural areas are so fragmented and are separated into linear bands. The Laws of the Indies stipulated that the land grant system assigned long, narrow parcels of land known as *lineas* to settlers. These parcels originated in the river bottoms and stretched into the mountains, providing all the necessities for survival—irrigated land for crops; dry land for a home; grass lands for grazing; and mountainous areas for hunting, gathering and timber. The other visual difference is the 1935 river channel is much wider and has more channels within the floodplain. In contrast, the 2012 image has a very contained and smaller river channel.

1935 Orthographic Aerial Image - Hernandez



2012 Orthographic Aerial Image - Hernandez


Hernandez 1935
Hernandez 2012
Legend
Agricultural Land
Acequia / Irrigation ditch
Dwellings / Structures
Rivers / Streams
Roads
0 .25 .5 .75 1
Miles
UNM Center for Regional Studies
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Integrated Analysis of Community Resilience to Climate
and land-Use Change

The Figure Ground images on the preceding page reveal that Hernández has experienced a marked increase in agricultural land and buildings, and a reduction of rivers and streams. This is really unique area because the Río Chama (left) converges with the Río Grande (right). While there are plots of agricultural land that has been converted to residential areas, particularly in the western plane of the image, the loss of this agricultural land has been more than accounted for in the expansion of land to the south east of the river. The river and streams have been significantly reduced and narrowed, particularly where the agricultural land has expanded to the southwest. The network of streams from 1935 has been reduced to a single flow of water. The major acequias that lined the western agricultural plane and the southern part of the eastern agricultural plane in 1935 are no longer there. New acequias have been established on both the eastern and westerns plots of agricultural land. There is a moderate increase in the amount of acequias. The number of buildings and dwellings has significantly increased. This expansion has occurred only on the western side of the image. The roads, on the other hand, have largely remained the same.

Los Ojos

The village of Los Ojos is part of the original historic core of *La Tierra Amarilla*. Los Ojos was a significant landmark along transportation routes in the late nineteenth century. In 1866 a military post called Camp Plummer was established about 1.5 miles south of Los Ojos in response to mounting tensions with local Indian populations. The post's name was soon changed to Fort Lowell, and then was abandoned by the military in 1869 when a military evaluation concluded that Indian presence was no longer a threat in the region. In 1877 a government survey of the roads of the region concluded that every road connecting Colorado to Northern New Mexico had a common point where the Río Chama crossed at Los Ojos. In the early twentieth century it had a sizeable population on 811, which was smaller than Tierra Amarilla (844), but larger than El Rito and Chimayó (Torrez and Trapp, 274). According to the 2010 Census, Los Ojos has a population of 287; a land area of 1.39 sq. miles; a water area of 0.01 sq. miles. (2014. Retrieved from http://www.census.gov/main/www/access.html)

In the 1920s Thomas D. Burns, an influential business man and politician from Ireland, settled in Los Ojos and established prominent general stores in towns throughout the region. He was very active in the Republican Party in the new state, and is sometimes referred to as the "Father of the Republican Party" in Río Arriba County (Torrez and Trapp, 2010, p. 212).

Los Ojos, NM.

By Robert J. Torrez. (2014). *Los Ojos, NM.* Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=21396

The historic village of Los Ojos was established around 1860, at about the same time that its sister communities of Las Nutrias (current day Tierra Amarilla), La Puente, Los Brazos, Barranco, and Ensenada were founded. The valley in which these communities were established had been known to early Spanish explorers and had been used by various native tribes for centuries before its settlement in the 1800's. In 1776, the intrepid explorers and Franciscan friars Francisco Atanacio Dominguez and Silvestre Velez de Escalante crossed the Chama somewhere north of present day La Puente and described the valley's resources and potential for settlement, pointing out the "good land for farming...and abundant pasturage...." These resources were utilized by stockmen from the Abiquiu area for several generations before the Tierra Amarilla Land Grant was made by the Mexican government in 1832, and permanent settlement took hold in the early 1860's. Los Ojos, situated on a low plateau overlooking the Chama River, was originally named for the many fresh water springs (ojos or ojitos) which seep from the surrounding hillsides. Indeed, one of these springs has been the principal source of fresh water for the Park View Fish Hatchery for more than fifty years. Some early documents also call the site Los Ojos de San Jose, or occasionally San Jose. It is notable that the parish church which was established in Los Ojos in 1883 was named after St. Joseph.

Maps and documents from the 1870's indicate that Los Ojos was known by its historic name. An 1877 mapping expedition by the United States Army described the village as one of the principal settlements of the region, with four stores and a population of about 200. The 1870's were also a time of extraordinary immigration to the West from all parts of the world. During this period, developers and entrepreneurs regularly organized colonization societies which purchased tracts of land in the West and then designed elaborate promotional campaigns to encourage emigration to the property. Many of these companies were legitimate, but the era provided ample opportunity for shady operators to entice land-hungry immigrants to every imaginable corner of this vast territory. A pamphlet distributed by one colonization company of the period boasted that settlers who came to its colony had no need to fear any of the hardships inherent to starting a new life in the western wilderness. Their company, it noted, made it possible for them to "find civilization ready-made" when they arrived.

The colony of Park View was established in the late summer of 1876, with lots being staked out on a low plateau which overlooks the Chama River about a mile north of present day Los Brazos. The name chosen for the colony was apparently inspired by the site's magnificent setting. A letter promoting the colony which appeared in the Chicago Prairie Farmer in December 1876 certainly invokes this image:

...the new town of Park View has just been laid out...It is, indeed a beautiful spot for a town...nestling in a beautiful valley near the base of mountains, whose...tops are covered with glistening snow..., while the sides of the same...and the valleys below, are covered with a mantle of green and luxuriant vegetation amid which are found numberless varieties of flowers...The scenery here is grand and beautiful and worthy the pen and brush of poet and painter.

Colonists were recruited mainly from among the Scandinavian immigrant population in the Chicago area. By late 1876, optimistic newspaper reports in Santa Fe's Daily New Mexican and the Pueblo, Colorado, Daily Chieftain make it clear that a slow but steady flow of emigrants was making its way through southern Colorado to the Park View colony. In February 1877, a post office was authorized for the town.

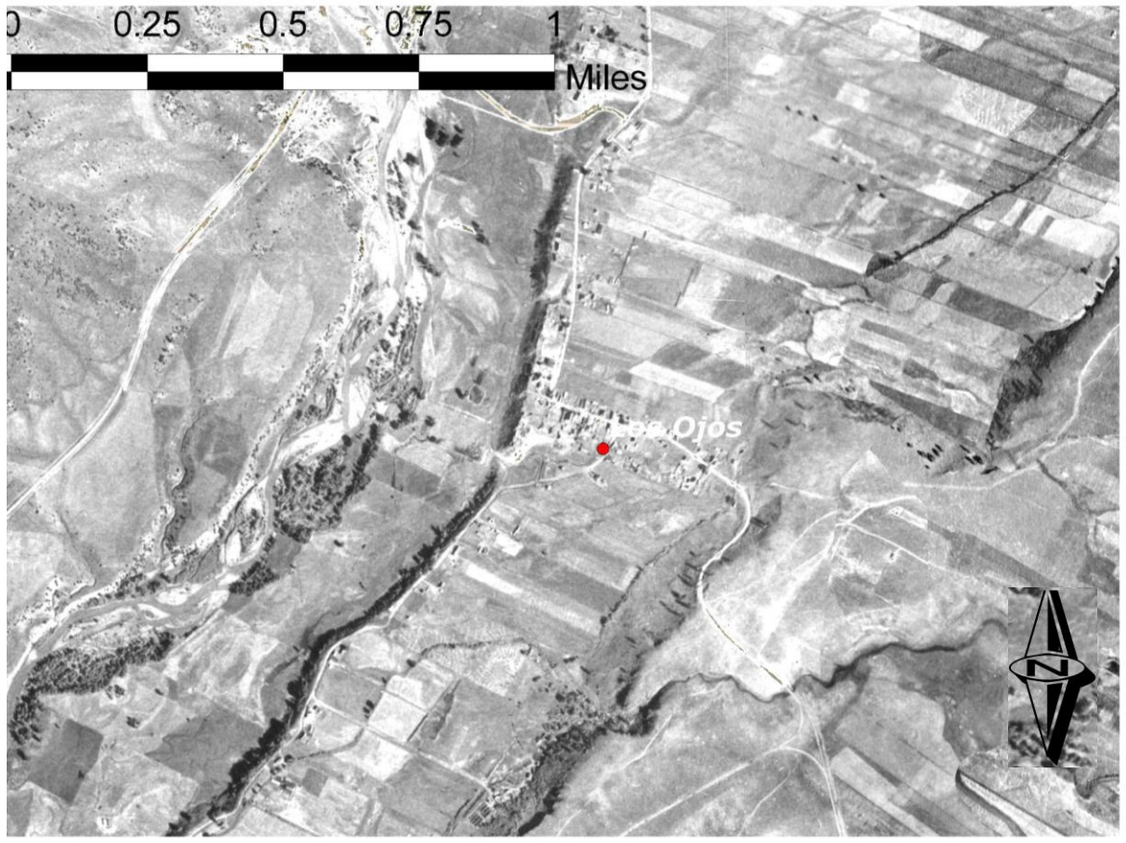
Despite early optimism, the colony quickly floundered. In the summer of 1877, a team of surveyors for the U. S. Corps of Topographical Engineers passed through the Tierra Amarilla area. Their report listed Park View among the several communities they found in the area, noting that the colony consisted of eight cabins with a population of less than thirty persons and had no more than ten acres under cultivation. The Reverend Sheldon Jackson, a Presbyterian minister who traveled through Tierra Amarilla later that year, reported that this "Chicago colony" had eight families. Reverend Jackson also apparently met Broad and his partners, as he noted they had spoken "hopefully" of the colony's prospects. But Jackson was not impressed; "...to a stranger," he observed, "it does not give promise of rapid growth."

Within just a few years, the colony was virtually abandoned. The post office, which had been established for the Park View colony in 1877, had by then burned down or simply been abandoned. In 1880, the United States census showed that Park View consisted of ten households, four of which had Spanish surnames, presumably local families who had moved into cabins abandoned by departing colonists. In February of 1880, the Park View post office was reestablished but it was not reopened in its original location. Instead it was moved to nearby Los Ojos. During subsequent decades, mail addressed to the Park View Post Office in Los Ojos soon resulted in Los Ojos itself being designated as Park View on the maps. So it was that Park View survived in name only by supplanting its neighbor's name.

Los Ojos, one of the most historic settlements in northern New Mexico, was thus inadvertently assigned the task of keeping alive the name of a place whose existence has been lost to history. For many years, this picturesque northern New Mexico village was known as Park View. In 1971, a number of residents instituted a controversial petition which asked local and federal officials to recognize an official name change which would restore the area known as Park View to its original name of Los Ojos. On July 25, 1972, a proclamation signaling the name change was read at the annual San Jose Parish Fiesta de Santiago, and on September 7, 1972, a resolution of the Río Arriba County Board of Commissioners made the change official.

While there have been land use changes in Los Ojos since 1935, none of the changes has significantly altered the composition of uses. Agricultural land has somewhat decreased in the center and in the southeastern part of the image; however it has considerably expanded to the west of the river. The river is narrower and has fewer branches. There are fewer acequias in the central and southeastern agricultural plains; however these acequias tend to follow similar paths as the acequias from 1935.

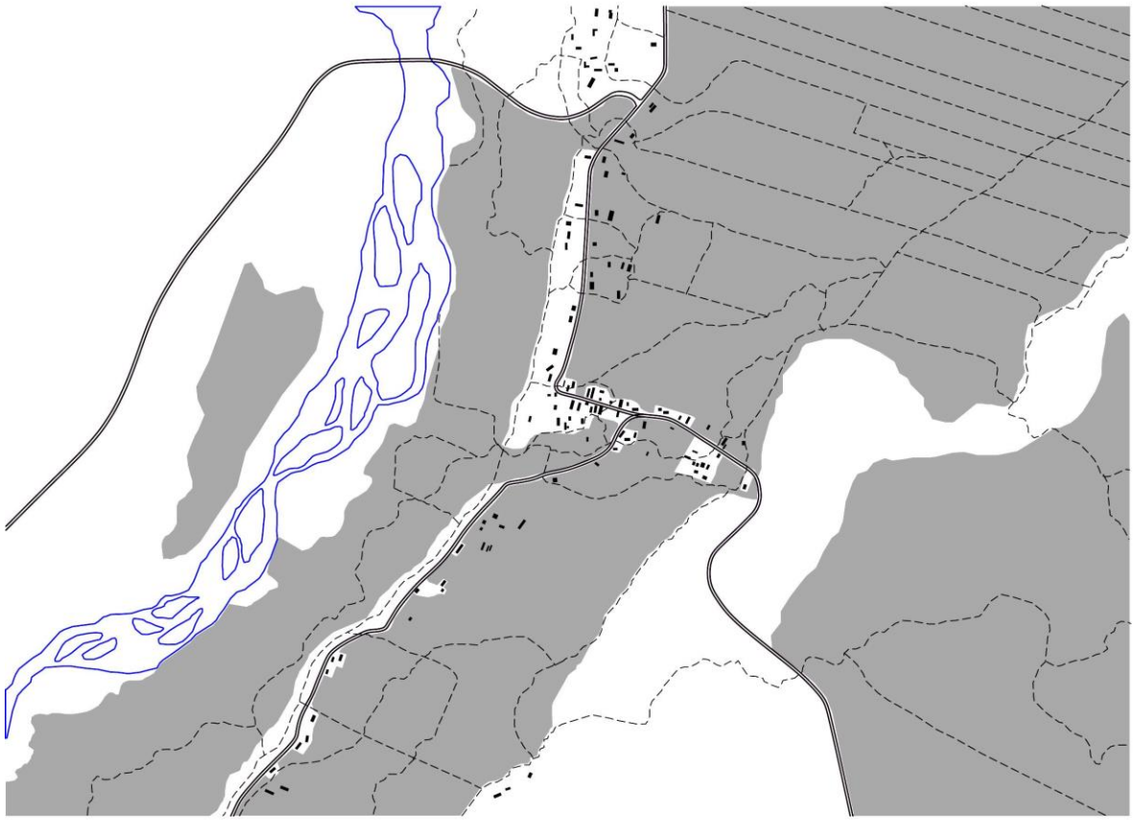
1935 Orthographic Aerial Image - Los Ojos



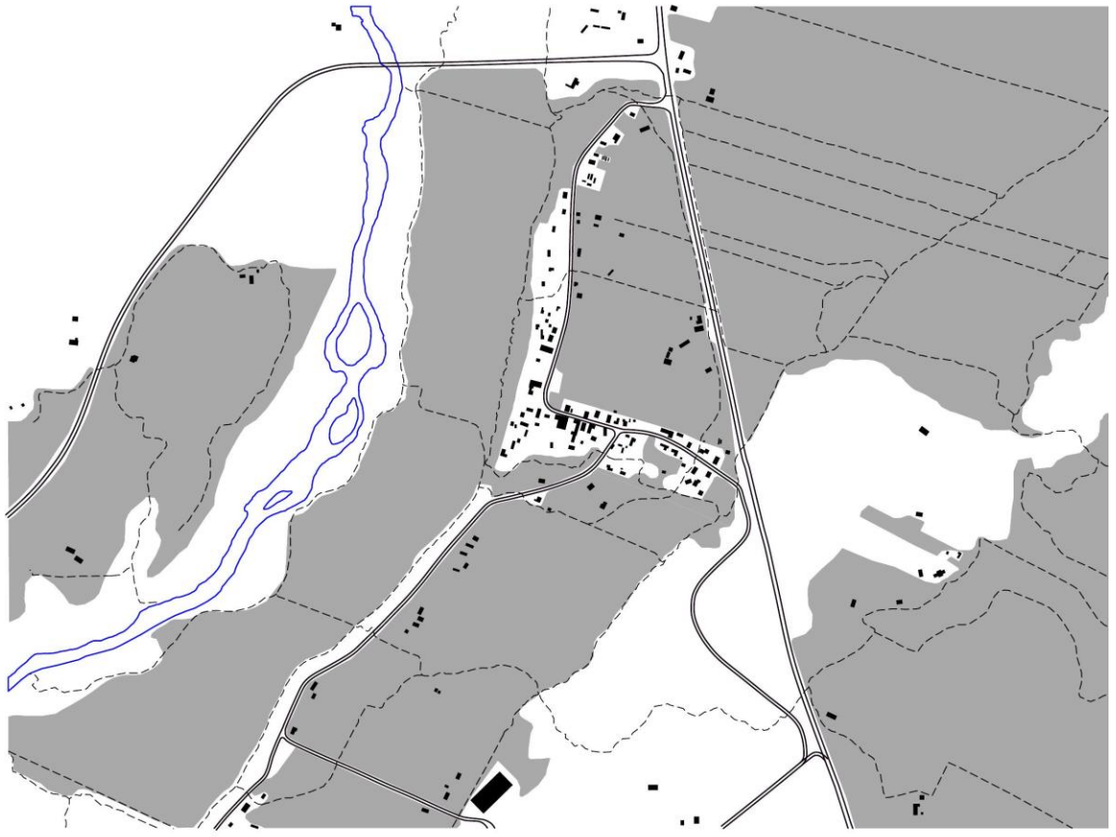
2012 Orthographic Aerial Image - Los Ojos

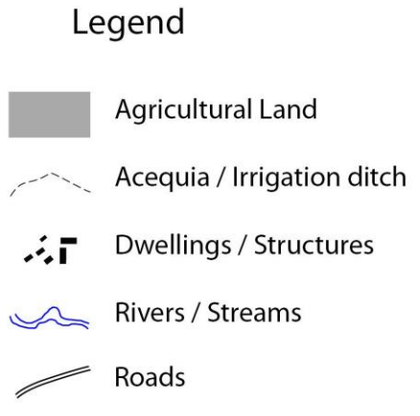
There are new acequias in the agricultural land that has expanded to the west. New and larger buildings and dwellings have been built throughout the town to a moderate degree. The most significant change is perhaps the major roadway that cuts through the image from the lower right to the upper center in the 2012 image. The other roads follow a similar path to the roads that existed in 1935.

Los Ojos 1935



Los Ojos 2012





Ohkay Owingeh

Ohkay Owingeh

by William H. Wroth. (2014). *Ohkay Owingeh.* Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=510

Ohkay Owingeh Pueblo, named Pueblo de San Juan de los Caballeros by the Spaniards in the sixteenth century, is a Tewa-speaking village twenty-five miles north of Santa Fe, on the Río Grande just north of the confluence with the Chama River. In the traditional history of Ohkay Owingeh ("Place of the Strong People") the ancestors are said to have emerged from a lake in the north, hence a sipapu or place of emergence from the under-world. The lake is often said to have been in southern Colorado, near the great sand dunes of the San Luis valley. The Tewa people after emergence traveled south making settlements on both sides of the Río Grande, and at the site of Ohkay Owingeh they built two villages one on each side of the river, probably about 1200 A.D. Directly across from Ohkay Owingeh was Yungé Owingeh ("Mockingbird Place") on the west side of the Río Grande.

In 1598 Juan de Oñate listed eleven Tewa-speaking villages. Today seven still survive; in addition to Ohkay Owingeh, are Nambe, Pojoaque, San Ildefonso, Santa Clara, and Tesuque. There is also a group of Tewa-speaking Tanos from the Galisteo Basin who were displaced by Diego de Vargas in the Reconquest and by 1701 had established themselves among the Hopis at First Mesa where they still live and are known today as the Hopi-Tewas.

The people of Ohkay Owingeh first encountered Europeans when the Francisco Vásquez de Coronado expedition came to New Mexico in 1541, but no doubt hearing of the rapacious behavior of Coronado and his men, the people fled into the mountains when the expedition came and set up camp near their village. The exploring expedition of Gaspar Castaño de Sosa briefly visited Ohkay Owingeh in 1591, but it was the colonizing expedition of Juan de Oñate in 1598 which brought the full force of the Spanish presence to the village. After living at Ohkay Owingeh for a while, which he first named San Juan Bautista, then renamed San Juan de los Caballeros, Oñate chose to make Yungé Owingeh the capital of the new Spanish colony of New Mexico, naming it San Gabriel de Yungé. Oñate forced or convinced the

inhabitants of Yungé to relocate to Okhay, and the settlers and soldiers from Mexico moved into their former homes, a Pueblo house block of some 400 apartments. They renovated Yungé according to European tastes, such as the addition of wooden doorways and window frames. Oñate's main purpose in colonizing New Mexico was to discover gold and silver mines as rich as or richer than those of his home in Zacatecas. When he discovered nothing of value and the harsh reality of life in New Mexico became apparent, he resigned under fire for his poor leadership and in 1607 returned to Mexico. The capital of New Mexico was moved in 1608 from San Gabriel de Yungé to its present site at Santa Fe.

In the decades that followed, the people of Ohkay Owingeh, like other Pueblo Indians in New Mexico, suffered under an oppressive Spanish rule in which they were conscripted into forced labor, required to pay demanding taxes in goods, and their religious activities were suppressed. By the 1670s there was a great deal of discontent amongst the Pueblo peoples which came to a head in 1675 when 47 Pueblo religious leaders were jailed in Santa Fe and were subjected to whipping for practicing their religion, viewed by the Spaniards as idolatry. Four of the men were hanged. Among those who were released was a medicine man, as the Spanish documents characterize him, from Ohkay Owingeh named Popay (Popé) who soon became the leader of the Pueblo Rebellion of 1680. Popay moved to Taos Pueblo and began plotting with confederates from other Pueblos to drive the Hispanic settlers out of New Mexico.

Soon a well-coordinated effort, which included the support of Ohkay Owingeh and other Tewa villages, was launched in August 1680. The intent was to kill the missionaries and destroy the churches at each Pueblo, and to kill any settlers who resisted and did not evacuate their settlements and leave New Mexico. As soon as the rebellion broke out, the Hispanic settlers in the Santa Cruz de la Cañada valley and other settlements close to Ohkay Owingeh abandoned their farms and assembled at the home of the Santa Cruz alcalde mayor. They then retreated en masse to Santa Fe, after which the Tewas from Ohkay Owingeh and other nearby Pueblos destroyed their houses and chapels. After the Spanish retreat to El Paso, Tewa-speaking Tano Indians from the Pueblos of San Cristóbal and San Lázaro in the Galisteo basin moved north to the Santa Cruz River valley to be close to their linguistic kin at Ohkay Owingeh and to re-establish themselves in a more fertile and safer area.

After several unsuccessful attempts by Spanish forces to re-conquer New Mexico, Diego de Vargas and his forces marched north in 1692, and most of the Pueblos submitted to Spanish rule. However, by 1696 dissatisfaction had again come to a head. In March 1696 Fray Gerónimo Prieto at Ohkay Owingeh wrote to Vargas asking for military protection. He said that Pueblo leaders, including those from Hopi, Zuni, and Acoma, were on their way to San Juan under the pretense of coming to trade;

but actually were meeting to plot a rebellion. In June 1696 the second Pueblo Rebellion began with many of the Pueblo villages participating, including Taos, Picuris, Santo Domingo, Cochiti, Ohkay Owingeh, and the other Tewa and Tano Pueblos. The rebels killed five missionaries and 21 soldiers and settlers and burned several of the mission churches before fleeing into the mountains. In 1697 Vargas succeeded in subduing the rebellion among the eastern Pueblos. Ohkay Owingeh again submitted to Spanish rule, but the Tanos of the Santa Cruz valley fled westward and by 1701 had established themselves among the Hopis at First Mesa where they still live and are known today as the Hopi-Tewas.

By 1706 if not earlier, a new church was under construction at Ohkay Owingeh Pueblo with the Franciscan friar, Fray José Antonio de Torres, in residence. Through the eighteenth century it served as the religious center for the newly established and re-established Hispanic communities in the area. Little is known of this church, but in the 1740s Fray Juan José Pérez de Mirabel directed its renovation and enlargement or the construction of an entirely new church at Ohkay Owingeh. In the late 1800s this church was extensively renovated by the French priest Father Camilo Seux, and a new stone chapel in neo-gothic style dedicated to Our Lady of Lourdes was completed in 1890. The old church was finally torn down and replaced in 1912 by a brick neo-gothic church still in use today.

In the eighteenth century the Spanish authorities, both religious and political, realized that the 1680 rebellion had been caused in great part by their harsh treatment of the Indians, and after the Re-conquest they adopted a much more lenient attitude. Forced labor and tribute were no longer permitted, and the large haciendas which demanded Indian workers were replaced by smaller family-operated farms. Indigenous religious rites were no longer suppressed by the missionaries. Ohkay Owingeh and the other Pueblos were able to practice both their traditional religion and Catholicism in an accommodated blending of the two. Many of the traditional religious ceremonial dances at Ohkay Owingeh, such as the Deer Dance and the Cloud Dance, were allowed and are still performed today.

Although conditions were better, Ohkay Owingeh in the 1700s was surrounded by growing Hispanic communities while its own population was in decline. In 1776 Father Francisco Atanasio Domínguez listed the Pueblo's population as 201 individuals and 623 Hispanos living in neighboring communities. In 1781 a serious smallpox epidemic hit northern New Mexico and took the lives of about one-third of the population of Ohkay Owingeh. The census of 1810 showed the Pueblo's population back up to 200, but the neighboring Hispano communities now totaled 1733. However, relations between the people of Ohkay Owingeh and their neighbors have generally been good. In the 1700s Hispanos and Pueblo members cooperated in facing attacks by the nomadic tribes, with the men of Ohkay Owingeh and other Pueblos providing large numbers of troops. Truces were made, usually in the late summer and fall, so that trading fairs could be held with all the tribes. San Juan became an

important trading center, not only for Pueblos and Hispanos but also for nomadic tribes, such as the Utes and the Navajos, especially in the late 1700s when the threat of nomadic raiding had abated.

In 1820 during the last months of the Spanish government, the Pueblo Indians were given full citizenship and were allowed to install their own municipal governments in each Pueblo. This prerogative was honored in the period of Mexican rule, 1821 to 1846, and in the American period after 1846. However, in the Mexican period, Pueblo lands, including those of Ohkay Owingeh, were under threat. The philosophy of classical eighteenth-century liberalism enshrined in the Mexican constitution of 1824 held that communal lands impeded individual liberties, were often not well utilized, and should be distributed to individual owners. In at least one case Ohkay Owingeh Pueblo was successful in averting the sale of its lands. In 1825 Governor Antonio Narbona rejected a petition by Hispanic settlers for portions of Ohkay Owingeh Pueblo lands. The land issue, as well as the threat of newly enforced tax laws, contributed to the short-lived Rebellion of 1837 launched by both Hispanos and Pueblo Indians, in which members of Ohkay Owingeh Pueblo participated.

The American occupation brought a change in sovereignty but did little to ameliorate Pueblo land problems until the twentieth century. The American view of Indian land in the nineteenth century was similar to that of the Mexican government. The alienation of Pueblo lands was achieved through the courts with the premise that Spanish land grants to the Pueblo Indians were legally distinct from the reservation lands of other tribes, which were protected by treaties with the federal government. Pueblo lands were allowed to be sold by a U. S. Supreme Court ruling in 1876 but in 1913, the Court reversed this ruling, stating that the Pueblo lands had to be protected in the same manner as other Indian lands. The result of this ruling was that Pueblo land could no longer be sold, and that squatters on Pueblo lands were subject to eviction.

To protect long established communities of non-Indians on these lands, New Mexico Senator Holm Bursum introduced the so-called “Bursum Bill” which would have given clear title to virtually all squatters on Pueblo lands, thus alienating the land from the Indians and opening it to development. Fortunately this bill was defeated in Congress, and the much more favorable United States Pueblo Lands Board Act was passed in 1924. The Pueblo Lands Board Act made it very difficult for outsiders to gain title to Pueblo lands and served to extinguish many of the land claims against the Pueblos. For land claims that were approved, the Pueblos were financially compensated. In effect it meant that many squatters could not gain title through adverse possession and could be legally removed from Pueblo lands. At Ohkay Owingeh squatters had at some point in the nineteenth century re-settled the long-abandoned San Gabriel de Yungé, an integral part of the lands belonging to the

Pueblo. In the 1920s these squatters were finally removed by joint action of the San Juan Pueblo council and the United States Pueblo Lands Board.

With the settling of land issues, improvements in health and education, the people of Ohkay Owingeh gradually entered the economy and way of life of twentieth-century America. They were able to do this and still maintain their traditional culture and worldview. Their ability to live comfortably in both worlds continues to the present day. For example, a recently completed affordable housing project, Tsigo bugeh Village, at the Pueblo was developed in sharp contrast to the typical federal government project imposed on Ohkay Owingeh and many other Indian communities in the past. Traditional concerns such as sacred geography, spatial directions and orientation, and maintaining ceremonial pathways were taken into account in the planning that was based upon the expressed views and needs of community members. And finally in December 2005 the tribal council formally changed the name from San Juan Pueblo back to Ohkay Owingeh, the name by which the people themselves have always called their home from long before Europeans came to the Southwest.

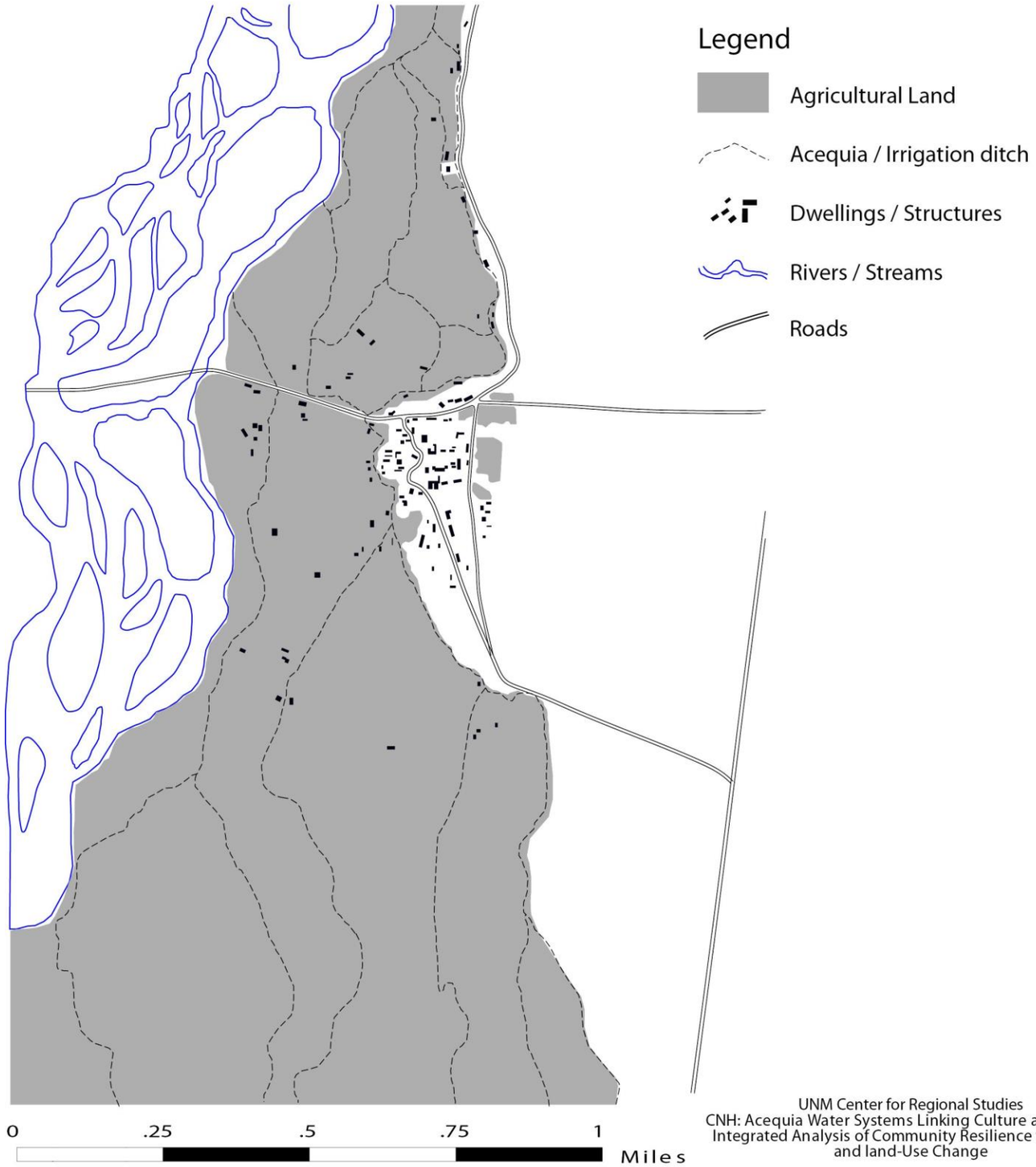
In Ohkay Owingeh, the agricultural land has been reduced in the center of the image on the proceeding page. The number of buildings has significantly increased, particularly in the center of town where the agricultural land has been reduced, as well as to the east and southeast. The number of buildings has also increased in the upper right-hand side of the image. The acequias have decreased in number, and the current acequias follow different path from the acequias of 1935, with the exception of the most southern acequia, which follows a similar path of the previous acequias. The river and stream network has been significantly reduced, with one single stream of water remaining. Agricultural land has not been expanded into areas formerly occupied by streams; however there are a few dwellings that have been constructed in that area. The roadways of 2011 follow the paths of the 1935 roads almost exactly. A small branch of the center road from 1935 no longer exists.

1935- Orthographic Aerial Image - San Juan/Ohkay Owingeh

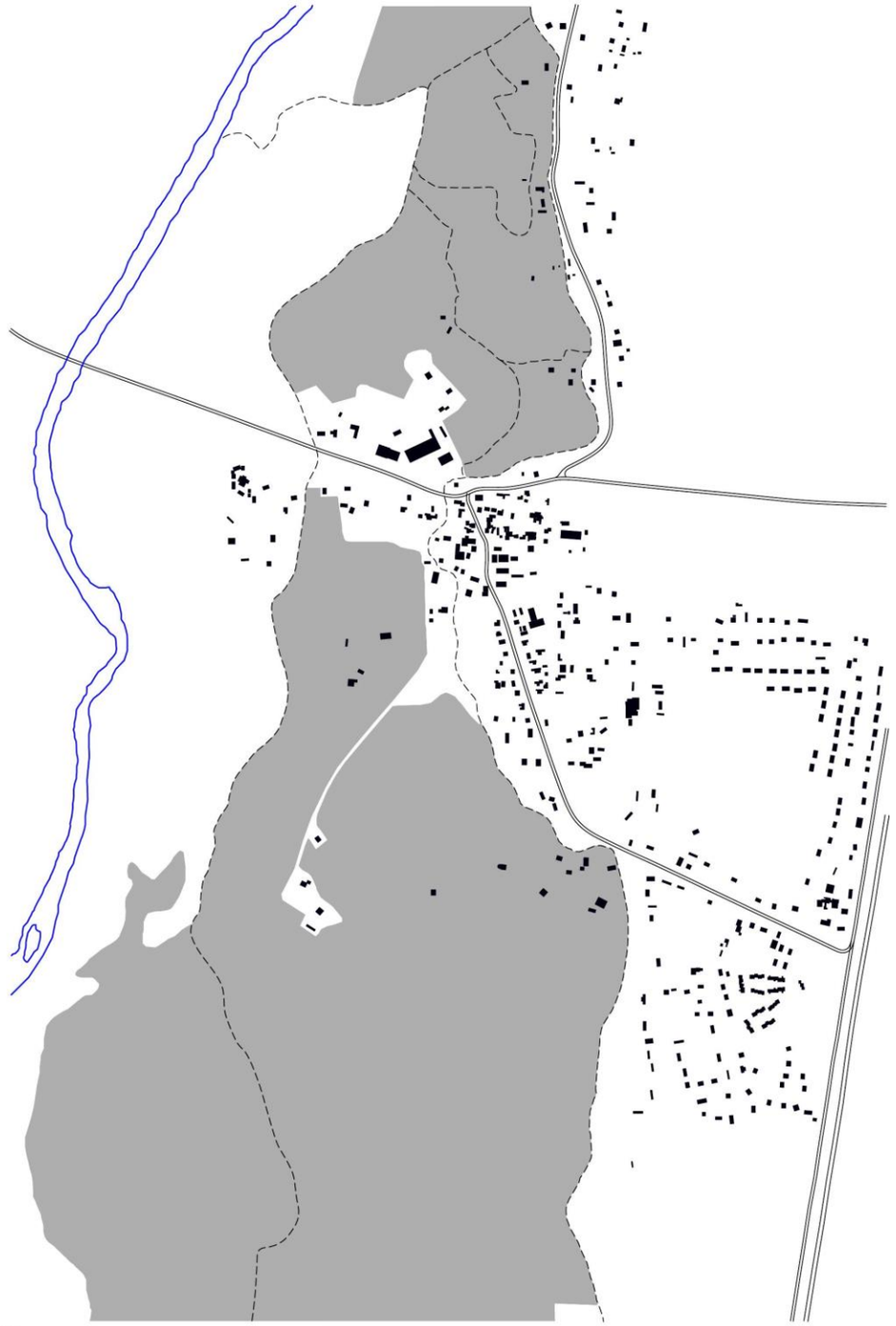
2011 Orthographic Aerial Image - San Juan/Ohkay Owingeh

UNM Center for Regional Studies
CNH: Acequia Water Systems Linking Culture and Nature:
Integrated Analysis of Community Resilience to Climate
and land-Use Change

San Juan/Ohkay Owingeh 1935



San Juan/Ohkay Owingeh 2011



UNM Center for Regional Studies
CNH: Acequia Water Systems Linking Culture and Nature: Integrated Analysis of Community Resilience to Climate and land-Use Change

Ojo Caliente

The Ojo Caliente Land Grant

by Malcolm Ebright. (2014). *The Ojo Caliente Land Grant*. Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=4767

The Ojo Caliente area is the site of several prehistoric pueblos and hot springs from which the area derives its name. These springs were sacred to ancient Pueblo people who abandoned their pueblos in the early 1500s. The prehistoric pueblo closest to and most connected to the hot springs was Posi-ouinge, said to be the pueblo where the mythical culture hero Poseyemu lived. The main hot spring, known to the Tewa as Posipopi, or the green springs/greenness pool because of the emerald algae that grew on the surrounding rocks, was revered by the Tewa and other pueblos in the region. According to Tewa myths, Poseyemu's grandmother was said to live in this spring, and he came to visit her regularly. This sacred green-edged pool was changed and obscured when a bath house operated by Antonio Joseph in conjunction with his hotel, was built over the pool. Joseph's attempt to control the hot springs was a prelude to his acquisition of much of the land in the Ojo Caliente region.

Although its remote location and raids by the Utes, Comanches and other tribes made it difficult to permanently settle, Spanish settlement at Ojo Caliente began in the early 1700s. Though there is little direct evidence of early land grants to Spaniards, a lawsuit in 1735 reveals that Antonio Martín received a grant at Ojo Caliente around 1730. The grantees gradually settled on farms and ranches at Ojo Caliente until they were suddenly dislodged and forced to temporarily abandon their holdings due to a devastating Ute and Comanche raid on Abiquiú and surrounding settlements in August of 1747. The Ute and Comanche raiders took twenty-three women and children captive. Governor Codallos y Rabal's troops were not able to catch the Indians though a settlers' militia did pick up their trail. It did not find the raiding party itself, only the dead bodies of three women and a newborn baby. This deadly scene, together with others, was enough to convince the settlers in the communities surrounding Abiquiú to leave their homes and landholdings.

In 1749 a new governor succeeded Codallos y Rabal, bringing with him a radically different approach to the difficult task of settling Hispanos in northern New Mexico on the Ute, Comanche, Navajo, and Jicarilla Apache frontier. Tomás Vélez Cachupín took quite seriously the Indian threat and the chilling effect of raids on peripheral Spanish settlements. In the spring of 1750, the governor was ordered to resettle the communities of Abiquiú, Embudo, and Ojo Caliente. In March 1751 Vélez

Cachupín's lieutenant governor, Bernardo Antonio Bustamante y Tagle, who had recently completed the resettlement of Sandia Pueblo, ordered the Ojo Caliente settlers to "reoccupy their homes and cultivate their lands within the term of two months" or lose their land. Lieutenant Governor Bustamante ordered the alcalde to ask each of the settlers if they would return to Ojo Caliente and then record their answers. Five settlers asked for two more months to resettle because the houses and church were in a tumble-down condition and because they lacked oxen for plowing. Bustamante gave them until October 1751, but when that deadline came and went, Governor Vélez Cachupín ordered them to resettle by the spring of 1752 or lose their land and be subject to a twenty-five peso fine. Francisco Duran complied with the order and moved to Ojo Caliente with his family, but by February 1752 no other Spaniard had moved. Duran, in fear for his life and property, asked Governor Vélez Cachupín to assign an escort of soldiers to protect him and his family. Instead, Vélez Cachupín ordered the noncompliant settlers to resettle by March 30, 1752. On that date nine more families returned to the vulnerable outpost of Ojo Caliente, in spite of the certainty of continued Ute and Comanche attacks.

In 1766 Alcalde Manuel García Pareja notified Governor Vélez Cachupín that some Ojo Caliente settlers "have gone to settle some other places out of their fear of the enemies [the Ute and Comanche] . . . and have left their tracts of land to the care and protection of the few vecinos who are in said site. " The remaining Ojo Caliente settlers asked the governor to order the resettlement of Ojo Caliente "with families who have firearms and gear for riding horseback," and not those who would use the land only for grazing. Their argument was that the livestock herders, who would be living at Ojo Caliente, would be more trouble than they were worth as defenders of the community because they lacked weapons. Accordingly, Vélez Cachupín ordered that the land of settlers who did not return be declared public land available to other settlers who might apply for it, as long as they had adequate firearms to defend the settlement.

Vélez Cachupín was not able, in mid-1766, to follow up on whether the Ojo Caliente settlement was re-populated, but his successor, Governor Pedro Fermín de Mendinueta, found that the same situation prevailed in December of 1767: vacant houses and abandoned land. Mendinueta referred to the Vélez Cachupín order of resettlement of February 1766 and gave the affected parties fifteen days to reclaim their lands. When none of the original Spanish settlers appeared during that period, Mendinueta ordered that Hispano vecinos and Genízaros who had stayed at Ojo Caliente be assigned the lands declared public domain by Vélez Cachupín. There were over a dozen Genízaros who had stayed at Ojo Caliente and had been completely overlooked by the authorities. As in other settlements, the Genízaros were typically not given title to the land on which they were living, so Mendinueta's actions were somewhat revolutionary. He ordered that both the Hispano vecinos and the Genízaros be given deeds to the lands they were farming or to previously abandoned irrigable lands.

A year after the allotment of land to the Ojo Caliente Genízaros in 1768, the Spanish settlers, who were originally granted land there, still had not returned. Governor Mendinueta's frustration at not being able to accomplish the resettlement of Ojo Caliente boiled over in late March 1769 when he ordered the Spaniards who had left their homes because of Comanche depredations, to return within four days of notification of his decree. Those who failed to obey would be fined 200 pesos and brought to Santa Fe as prisoners to be jailed until they agreed to resettle Ojo Caliente. Although some of the settlers initially responded that they would resettle, upon reflection most answered defiantly that they lacked the supplies necessary to make the resettlement and would not be able to return within the short span of four days. The governor ordered Alcalde Ortiz to gather the Spanish settlers together and ask them one more time if they would resettle. If they refused, Alcalde Ortiz was to apply the penalties previously ordered. Yet again the settlers reiterated their stories of trials and tribulations on the frontier at Ojo Caliente in the face of Indian attacks. Most of the settlers were saying indirectly what Francisco Marquez said directly and succinctly: He would not take his family to Ojo Caliente until all of the families went together.

When Governor Mendinueta received the declarations of the reluctant settlers, he decided to go to Ojo Caliente and see for himself why it was so difficult to defend the community from attacking Ute and Comanche raiding parties. He discovered that the main plaza was dominated on the east by a ridge of hills, the arroyos of which allowed the enemies to get near the plaza without being seen and attack the settlement. There was a similar ridge of hills toward the south and west which in the governor's view made the entire area difficult to defend. Mendinueta told the settlers to wall up their houses and the church, and wait until measures were "taken to provide greater protection for the Ojo Caliente settlement." Now understanding the difficulty of the situation in Ojo Caliente, Mendinueta allowed most of the settlers to escape the punishment he had outlined in his earlier order. He did however single out Miguel Abeyta and Ignacio Alarid for punishment. Governor Mendinueta found their protests concerning the impossibility of retaliation against the Ute and Comanche to be “false, frivolous, denigrating, insolent, and full of malice." He sentenced Abeyta and Alarid to serve "one whole month with the militia detachment personally, besides the time they are obliged to serve like the others," noting that the community had always been provided with an adequate militia to provide for its safety.

However, Ojo Caliente remained unoccupied by Spaniards for two more decades during the 1770s and 1780s due to Indian raids. During the administration of Governor Juan Bautista de Anza (1778-88), peace was achieved with the Comanches and Utes after the famous defeat in 1779 of the clever and talented Comanche leader Cuerno Verde. On their expedition to defeat Cuerno Verde and his Comanche band, Governor Anza and his soldiers camped at Ojo Caliente. He described the area as "abandoned on account of the hostilities of the enemy," but upon further inspection he found “twenty-five or thirty families scattered over more than four leagues

(10 1/2 miles), their houses unfortified." Anza surmised that: "For this reason, it is not strange that there were such attacks, as this disorder [in the settlement pattern] brought upon them the loss of their poor fields." As in other New Mexico communities, Ojo Caliente settlers preferred living apart from each other in ranchos scattered along the source of irrigation water rather than in centralized fortified communities. Governor Mendinueta, in an earlier report, described the settlers and their preference of a dispersed settlement pattern as these "churlish types of settlers" who are "accustomed to live apart from each other, as neither fathers nor sons associate with each other."

By September 1790, the Comanche and Ute peace had made settlement at Ojo Caliente feasible for the first time in decades. José Manuel Velarde and eighteen petitioners asked Governor Fernando de la Concha (1778-1794) for permission to resettle Ojo Caliente. Velarde must have been familiar with the policy favoring compact defensible communities; for he told the governor that he wanted to establish a walled settlement at Ojo Caliente. Governor Concha knew the history of the attempts to settle Ojo Caliente, and notified Velarde that he would approve the petition only if the settlers formed "a well-aligned and regular settlement at the place where there was one, years ago, which today is called the [Pueblo] Viejo at the outskirts of the Cañada de los Comanches." Governor Concha believed that this site was the most suitable because of "the ease of digging an acequia [to irrigate] their fields, which can run along the foot of said settlement for their subsistence and for raising livestock in all the surrounding area." When notified of Governor Concha's decree, the settlers, who now numbered thirty-two, replied that they would not settle the Cañada de los Comanches at the Pueblo Viejo because "the old pueblo is a long way from the water when the acequia is not running in the winter." They wanted to settle at the old plaza near the chapel where they had settled before. Governor Concha's reply said that "in no way do I agree to the formation of a settlement in the place proposed by the founders, since experience has proven that nobody can last there in time of war on account of its unfortunate location." Settlement at Ojo Caliente was again stalemated.

Three years after the standoff between Governor Concha and the hopeful settlers, a new group of fifty-three petitioners, some of whom were already in possession of land at Ojo Caliente, petitioned Governor Concha for a formal grant. After all the earlier attempts to settle at Ojo Caliente under Governors Vélez Cachupín and Mendinueta, and all the reports of loss of property and deaths of livestock and family members, this routine request for a land grant at Ojo Caliente was anticlimactic. Governor Concha made the grant on 11 September, 1793 to the community of fifty-three heads of families, giving them the land they had requested. Since the petition by Antonio José Espinosa, Juan Zamora, and Salvador Maese did not specify the boundaries requested, Governor Concha left it to the alcalde to delineate the boundaries of the grant. As was often the case with the designation of imprecise boundaries, this situation led to great confusion later on when the United States

government tried to adjudicate the Ojo Caliente grant.

Governor Concha provided that "the watering places on the Ojo Caliente River [were] common between [the grantees] and the balance of the citizens of Río Arriba," with the condition that the neighboring stockmen cause no damage to the fields of the Ojo Caliente settlers as their cattle approached the Ojo Caliente River to slake their thirst. When Alcalde Manuel García de la Mora placed the grantees in possession of the land at Ojo Caliente, he specified the boundaries as: north, the Cañada de los Comanches; south, a landmark "of stone and mortar with a holy cross made of cedar placed in the center;" east, the foothills; and west, the foothills on the other side of the river. The southern landmark containing a cross of cedar was undoubtedly connected to the official name for the mission at Ojo Caliente: Santa Cruz de Ojo Caliente. It is not clear which foothills García de la Mora intended, however, but it seems clear that Ojo Caliente was intended to be a community grant with common grazing lands.

Alcalde García de la Mora placed the fifty-three grantees (many of whom were already living on and farming their land), in possession of tracts of land each 150 varas wide along the Río del Ojo Caliente from the Cañada de los Comanches to the torreon of the deceased José Baca; providing that the pastures and watering places remain for the benefit of the grantees and the citizens of Río Arriba. At the conclusion of the act of possession, García de la Mora conducted the traditional ritual the Spanish performed when they received a land grant: "each individual walked over the land assigned to him, and they jumped and leaped about and plucked up weeds with their hands, and expressed their thanks to the King and to the Colonel [Governor Concha], who made them the grant in the name of His Majesty."

The 1793 settlement of Ojo Caliente was on tracts of land that had been previously cultivated, planted, and irrigated by settlers who had repeatedly tried to establish a permanent settlement at Ojo Caliente more than six decades earlier. While many family names of earlier Ojo Caliente Hispano settlers were missing from the 1793 list, so too were the names of many of the loyal Genízaros who had stayed at Ojo Caliente when all the Spaniards had left. The vagueness of the boundaries of the Ojo Caliente Grant, the lack of clarity about the location of the common lands, and the failure to name all the potential owners of the grant, sowed the seeds for future problems when the grant was acquired by Antonio Joseph and adjudicated by the Court of Private Claims.

On July 22, 1854, the United States Congress had appointed a Surveyor General of New Mexico to review the validity of the various land grant claims and to advise Congress as to how to decide these matters relative to the 1848 Treaty of Guadalupe Hidalgo. In 1873 Felix Galvez filed a petition for confirmation of the Ojo Caliente

grant as a community land grant. After taking testimony from witnesses such as Dionisio Vargas, the Surveyor General recommended confirmation of the Ojo Caliente grant to the heirs and legal representatives of the fifty-three grantees under the 1793 grant. The grant was surveyed in 1877 by Deputy Surveyors Griffin and McMullen, but was not confirmed because Congress was wary of confirming grants of which it had little knowledge. In the past, Congress had bad experiences in issuing confirmation of large grants including the Maxwell Grant (1.7 million acres).

While Felix Galvez was trying to get the Ojo Caliente grant confirmed, land speculator and merchant Antonio Joseph began buying up the interests of the heirs of the fifty-three 1793 grantees. By 1878 Antonio Joseph claimed to have purchased the interests of most of the grantees of the Ojo Caliente grant and on that basis, he objected to the results of the 1877 survey. Joseph claimed that the west boundary as surveyed was about six miles too far east. In December 1878 Antonio Joseph submitted a supplemental petition claiming the entire common lands of the Ojo Caliente grant; he also claimed the grant contained 44,000 acres instead of the approximately 38,000 acres surveyed by Deputy Surveyors Griffin and McMullen in 1877.

Because Congress had failed to confirm the Ojo Caliente grant in March of 1893, Antonio Joseph filed a petition before the Court of Private Land Claims seeking confirmation of what was then called the Antonio Joseph Grant. Represented by attorney Napoleon Bonapart Laughlin, Antonio Joseph set forth the history of the 1793 grant to the fifty-three grantees, including the boundaries called for in the act of possession. Joseph had apparently submitted copies of deeds to the land as proof of his purchase of the interests of the grantees, though these documents are no longer in the Land Claims Court's files. What does remain is an elaborate chart, in Antonio Joseph's meticulous handwriting, listing the dates and other information for all of the deeds. The Joseph chart, which he called an Abstract of Title, shows that between 1873 and 1879 Antonio Joseph obtained deeds from the heirs or assigns of each of the fifty-three grantees or from the grantees themselves.

When Antonio Joseph filed his petition for confirmation of the grant in 1893, many residents were unaware that he was claiming the entire grant, but the U. S. government confirmed that it was a valid grant based on legal title papers and a long history of possession of the land. The only dissenting voice came from an heir of one of the fifty-three grantees who also claimed an ownership interest: Jesús María Olguin, descendant of Antonio Olguin. The Jesús María Olguin claim was apparently dropped when it appeared from Antonio Joseph's abstract of title that he, Antonio Joseph, had previously obtained deeds for Olguin's interest in the grant. Jesús María Olguin was the only one to object to Antonio Joseph's claim to the entire Ojo Caliente Grant and it is not likely that the other heirs were even notified of the proceedings. The Land Claims Court was not required to notify either the grantees or their heirs, even though they had a potential interest in the property.

The case was tried in April 1894. The government's attorneys conceded that the Ojo Caliente grant was valid and had been continuously occupied since its inception in 1793, but they contended that the true eastern boundary was eight miles west of the location established by Deputy Surveyors Griffin and McMullen. This would place the eastern boundary at the foot of a low range of foothills just east of the river, drastically reducing the size of the Ojo Caliente grant. On 28 April 1894, Chief Justice Joseph R. Reed signed a decree confirming the Ojo Caliente Grant to the heirs of the fifty-three Hispano grantees, but he determined that both the eastern and the western boundaries were located at the foot of the first row of hills on each side of the Ojo Caliente River. This decision effectively eliminated the common lands from the grant. Deputy Surveyor Sherrard Coleman resurveyed the grant in September of 1894 and found that it contained approximately 2245 acres.

Because Antonio Joseph claimed to have purchased the interests of those fifty-three heirs, he became the owner of what was left of the Ojo Caliente Grant. He received the patent for the grant when it was issued on 2 November 1894, a tract of land greatly reduced in size from the 44,000 acres he had originally claimed in 1878. Antonio Joseph owned the entire Ojo Caliente grant (except for the occupied land) and the Ojo Caliente Hot Springs Resort which is still a popular health resort in northern New Mexico.

Today, Ojo Caliente is a small unincorporated community in Taos County. It lies along U.S. Route 285 near the Rio Grande between Española and Taos, approximately 50 miles north of Santa Fe, the state capital. It's population is around 1,000 people.

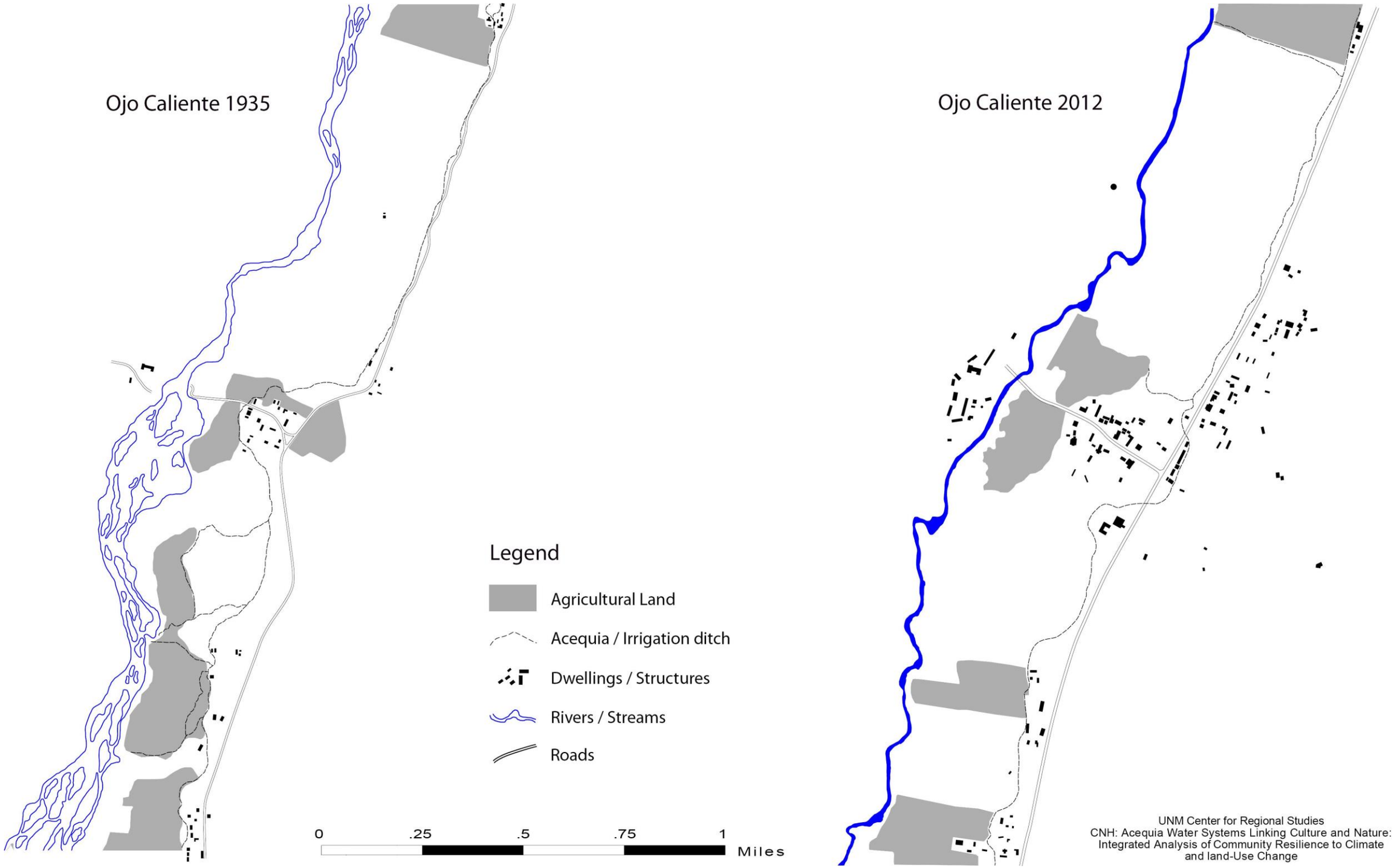
(2014. Retrieved from http://www.census.gov/main/www/access.html)

1935 Orthographic Aerial Image - Ojo Caliente

2012 Orthographic Aerial Image - Ojo Caliente

UNM Center for Regional Studies
CNH: Acequia Water Systems Linking Culture and Nature:
Integrated Analysis of Community Resilience to Climate
and land-Use Change

The agricultural land of Ojo Caliente has change both in size and, to a certain extent, in location. The plot of agricultural land to the north of the image is slightly larger, and is in the same place as it was in 1935. The center plots of land are larger, and have moved west towards the water. The two lower plots of land are smaller and in



different shapes from the plots of 1935. Although the agricultural land has changed in shape and sometime in location, the area it covers remains about the same. The amount of buildings and dwellings has risen and expanded around the center of town. There are different buildings towards the south, but the number of buildings has only increased by a few small dwellings. The number of buildings towards the north of the town has remained about the same. The network of streams and rivers has been reduced to a singly river of water. While the area that is taken by water has been reduced, the river that remains is substantial. A few of the acequias from the 1935 image have disappeared. The main acequia that stretches from the south to the north remains the same and follows a similar, though not identical, path as in 1935.

Petaca

Petaca is a very small town located in the north easternmost part of Río Arriba County. There is no 2010 census data available, but the town itself has less than 30 full time residents. Petaca' s elevation is just over 7,200 ft. There are no services in town, but agricultural activities exist and some people are able to eke out a living. This town resides in a very narrow valley and not much has changed here in terms of the way of life in fifty years. Jose Rivera, Moises Gonzales, Marcos Roybal and myself made a trip out to Petaca in 2011. It is definitely one of the most remote places that I have been to in northern New Mexico.

Agricultural land in Petaca has substantially increased in the south and has somewhat decreased in the center and north of the image. Interestingly, there appears to be slight net gain of agricultural land as can be inferred by comparing the two figure ground diagrams from the two time periods. There are more buildings and dwellings in the center of town in 2011 from 1935, though the increase is moderate. The river has remained a single path of water and is much in the same position, although it is perhaps narrower at points. Agricultural land hugs the banks of the river throughout its path in both the 1935 and 2011 figure ground image on the proceeding pages. There are similar amounts of acequias throughout the agricultural area, though they take different paths than the 1935 figure ground image. The road is straighter, but follows a similar path. New roads have not been constructed.

The La Petaca Land Grant is located in Rio Arriba and Taos counties. It was petitioned by Jose Julian Martinez and a group of families in 1836. The grant was approved by Governor Albino Perez for 186,977 acres. Following proceedings with the Office of the Surveyor General and the Court of Private Land Claims the total acreage was reduced to include 1,392 acres. The U.S. Supreme Court violated international law when it ruled in favor of this major reduction in common lands held by land grant heirs.

1935 Orthographic Aerial Image - Petaca

2011 Orthographic Aerial Image - Petaca

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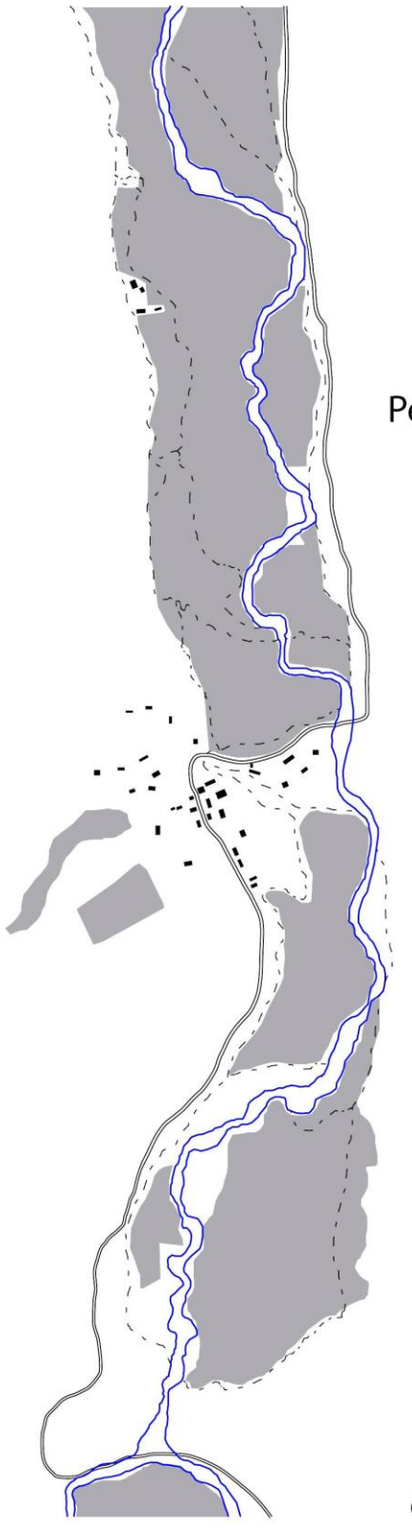
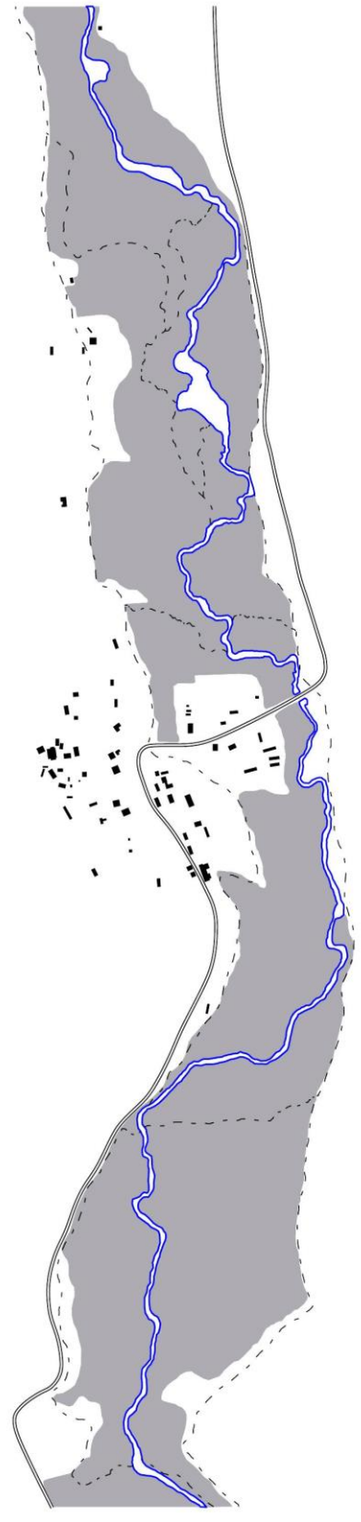
Integrated Analysis of Community Resilience to Climate
and land-Use Change



Petaca 1935

Petaca 2011



Legend

Agricultural Land

Acequia / Irrigation ditch

Dwellings / Structures

Rivers / Streams

Roads

UNM Center for Regional Studies
CNH: Acequia Water Systems Linking Culture and Nature: Integrated Analysis of Community Resilience to Climate and land-Use Change

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Miles

Santa Clara

Kha'p'oo Owinge (Valley of the Wild Roses) is the traditional name for Santa Clara Pueblo. Santa Clara Pueblo is located 24 miles north of Santa Fe. The large Santa Clara Pueblo reservation is home to the historic cliff dwellings of Puye, and has fishing and camping in the nearby canyon. Today, the pueblo still practices many of their ancient traditions, and prides itself on a high regard for education in both modern and traditional ways. They celebrate St. Anthony's Feast Day in June, and in August they have a Corn Dance in honor of their patron saint, St. Claire.

Pueblo of Santa Clara Grant

by J. J. Bowden. (2014). *Pueblo of Santa Clara Grant.* Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=24768

In prehistoric times, a tribe of Tewa Indians dwelt in a cluster of artificial grottos excavated in the cliffs located west of the Río Grande and about thirty miles above Santa Fe. This pueblo was called Caypa when Juan de Oñate visited the settlement on July 11, 1598. However, by 1601, the pueblo had been renamed Santa Clara. A church was completed by 1617, and in 1629 Fray Alonso de Benavides established a monastery at the pueblo. For some unknown reason, the monastery had been abandoned prior to 1680, and Santa Clara was only a vista of the Pueblo of San Ildefonso. Thus, Santa Clara did not have a priest when its 300 inhabitants joined the Pueblo Rebellion and destroyed their church. After the reconquest, a new church was built at Santa Clara, but it frequently was without a priest. During such times it became of vista of the Mission of San Ildefonso. In 1782 the Pueblo of Santa Clara was stricken with an epidemic of small pox which carried off a large portion of its population. It never fully recovered from the loss and in 1850, it had a total population of only 279.

The provision of the eighth section of the Act of July 22, 1854 charged the Surveyor General with: Making a report in regard to all pueblos existing in the Territory, showing the extent and locality of each, stating the number of inhabitants in said pueblos, respectively, and the nature of their titles to the land. Pursuant to this mandate, Surveyor General William Pelham held a hearing on June 16, 1856, to gather the required information concerning the Pueblo of Santa Clara. At this hearing, the three leading officials of the pueblo testified as follows:

Question: Did the pueblo of Santa Clara receive a grant from the Government of Spain, and was it understood by tradition in the pueblo that such a grant was ever in their possession?

Answer: The old men of the pueblo say that they had a grant from the King; but, as we are young men, we never saw it, the document having been lost before we arrived at years of discretion.

Question: Are the lands of the pueblo considered to extend one league from the church to the four cardinal points of the compass?

Answer: The grant made to all the pueblos called for the same amount of land, and we claim the same amount that the other pueblos contain.

Question: Have you any tradition in your pueblo of the length of time it has been in existence, and the oldest man among you born in the pueblo?

Answer: We do not know how long the pueblo has been in existence. The oldest man was born in the pueblo. We do not know the number of generations that have passed since the pueblo was occupied.

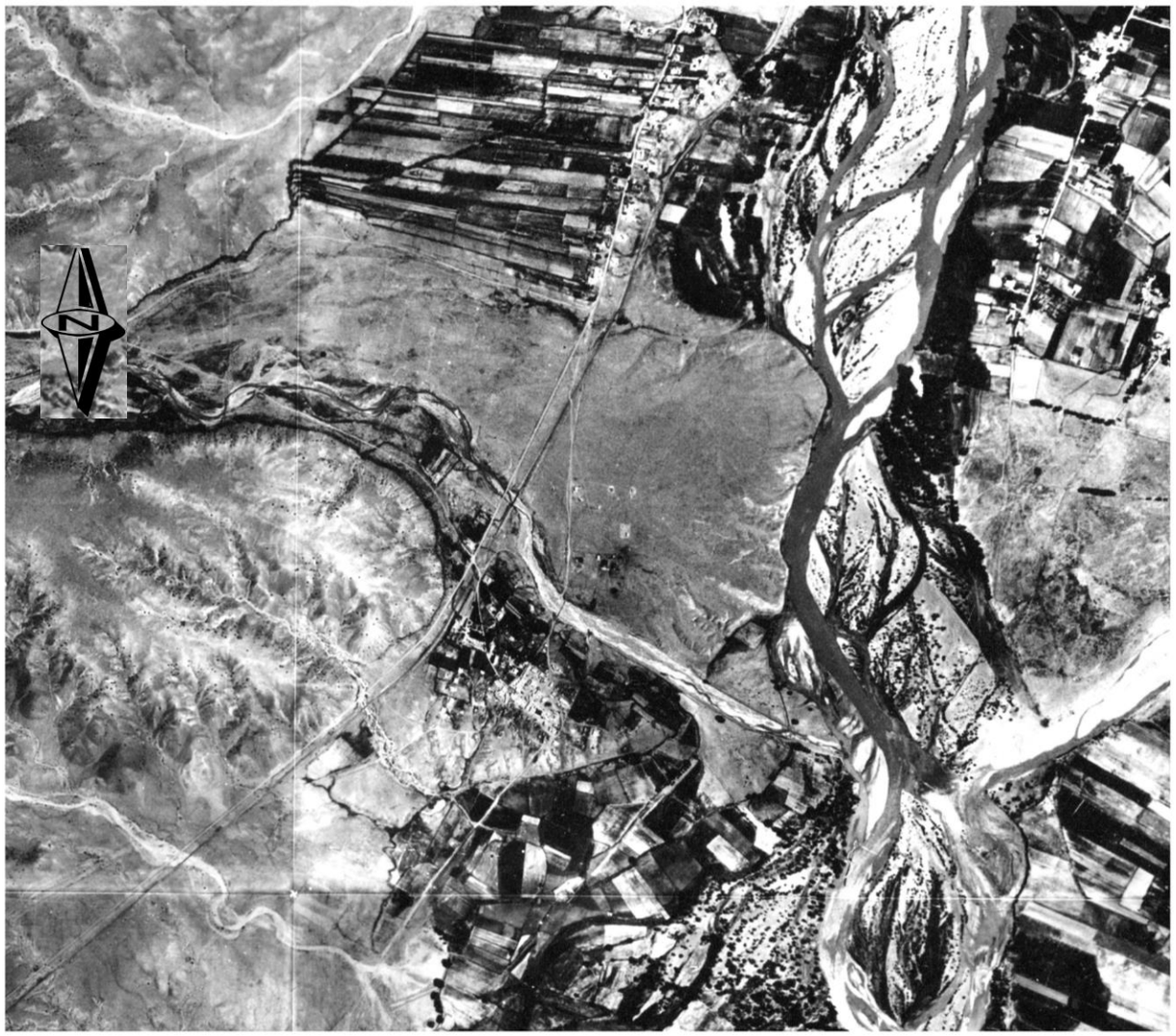
Question: Do you raise corn, wheat, fruit, and stock in the pueblo, and do you subsist entirely by agricultural pursuits?

Answer: We do raise corn and wheat and a little fruit, and a few head of stock. Our support is derived entirely from the products of the soil. When our crops are not good, we suffer for the necessaries of life.

Donaciano Vigil, the former Secretary of the Territory of New Mexico, gave a certificate in which he stated that there were no title deeds to the Indian Pueblos of New Mexico in the archives while they were under his charge from 1840 to 1856, and that as Secretary he was also recorder of public documents. He stated that in such capacity he had occasion to examine the archives very often and would have known it if such a document were among the archives. Continuing, he stated that the lands had been held and occupied by the Pueblo of Santa Clara since time immemorial and always had been recognized as belonging to its inhabitants by virtue of a grant made to them towards the close of the seventeenth century by the proper Spanish authorities. The Indians also introduced a copy of the Royal Decree of October 15, 1713, which directed the Governors of New Spain to remedy the numerous abuses which were being practiced upon the Indians and to grant each Indian pueblo sufficient land, water, timber, entrances and exits for cultivation and a commons of one league, where they could pasture their cattle.

Based upon this meager evidence, Pelham, in his annual report dated September 30, 1856, found that the Pueblo of Santa Clara had lost its original title papers to its grant, but the testimony taken by his office showed that such title papers had existed and their loss had been partially accounted for. In conclusion, he recommended the speedy confirmation and survey of the grant in order to protect the inhabitants of the grant from encroachment by non-Indians. The Pueblo of Santa Clara Grant was among the first group of land claims recognized by Congress. By Act approved December 22, 1858, Congress confirmed the grant and directed the Commissioner

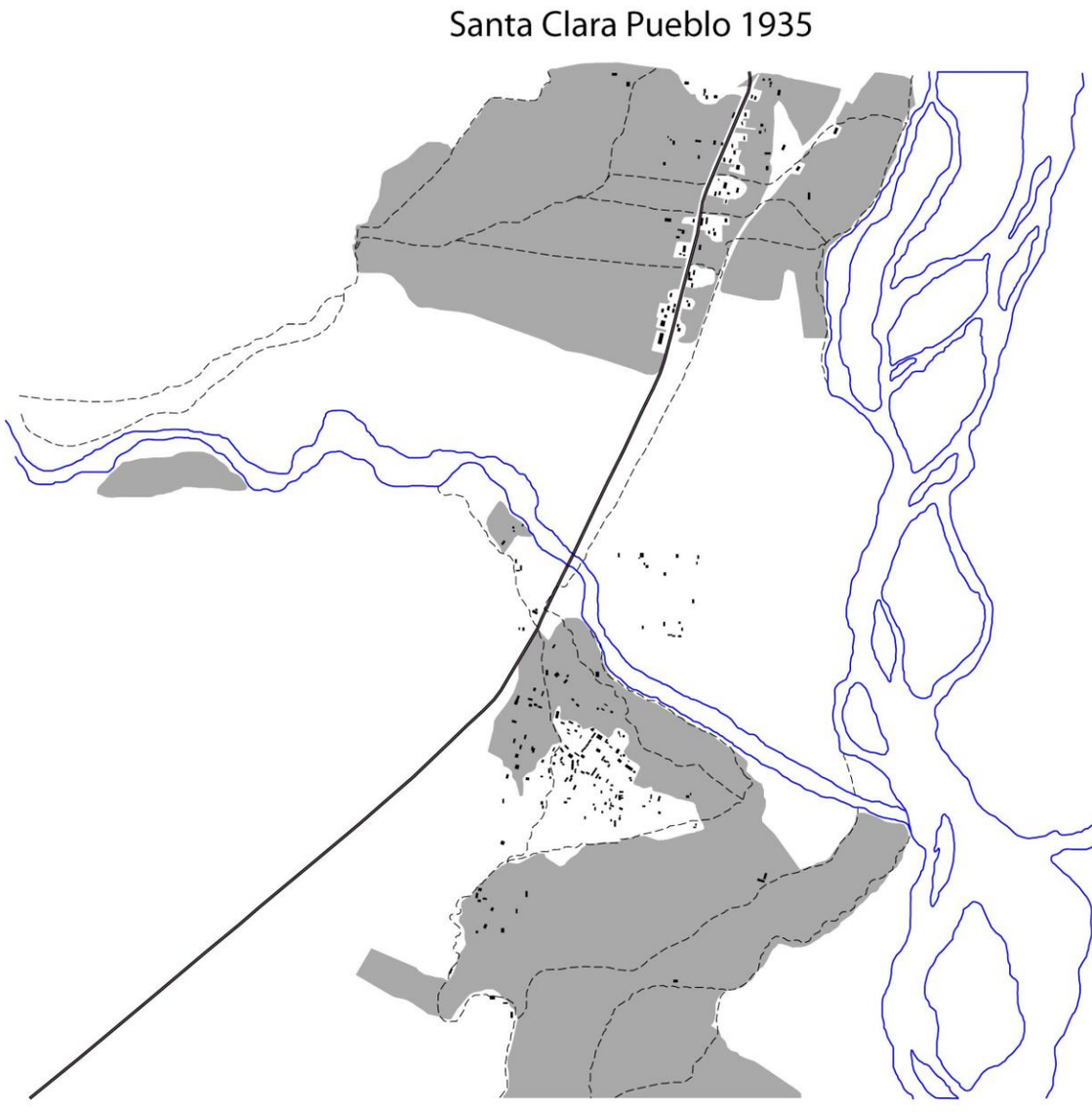
1935 Orthographic Aerial Image - Santa Clara Pueblo 1935

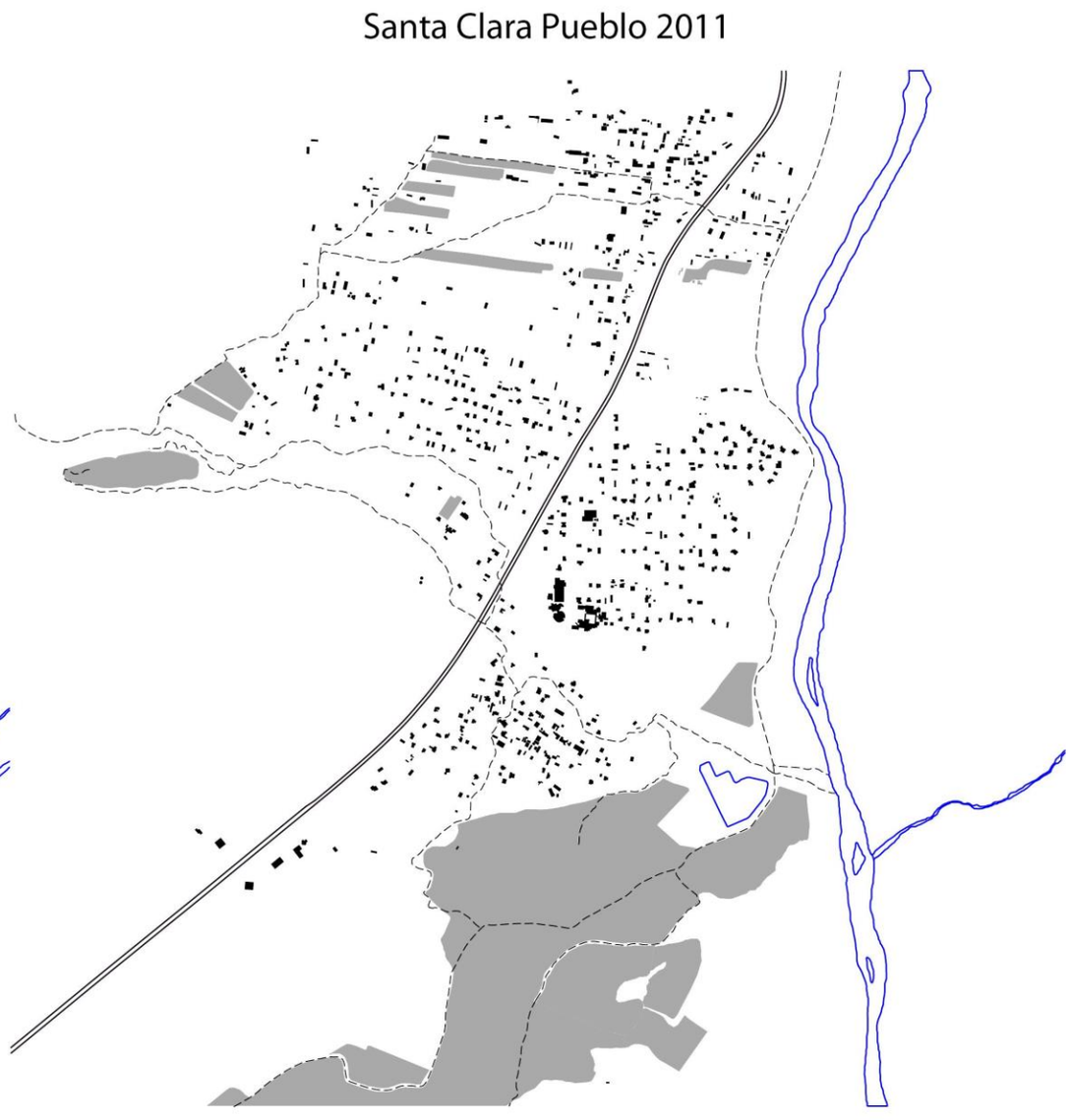


2012 Orthographic Aerial Image - Santa Clara Pueblo

0 .25 .5 .75 1
Miles

of the General Land. Office to survey and patent the lands covered thereby. In response thereto, the grant was surveyed in July, 1859, by Deputy Surveyor John W. Garretson, for 17,368.52 acres. A patent based on the survey was issued on July 1, 1864.





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Legend

- Agricultural Land
- Acequia / Irrigation ditch
- Dwellings / Structures
- Rivers / Streams
- Roads

UNM Center for Regional Studies
CNH: Acequia Water Systems Linking Culture and Nature:

Santa Clara's composition of land use has significantly changed in the last decades. In terms of agriculture, almost the entire northern half of apicultural land is no longer used for agriculture. In this section only a few small and segregated agricultural parcels remain. To the south of the village, while there is still a considerable area of agricultural land, it has somewhat diminished, especially towards the northern and western sections. There is small section that has been converted into agriculture.

The village itself has greatly expanded. The number of dwellings and buildings has greatly increased in the northern part of the village. There are also new and larger buildings towards the south of the images. The waterways have also changed. The creek that cut east-west through the town no longer exists, but there are acequias in its place. The network of streams and creeks that runs north-south has been reduced to a single flow of water with one small tributary. There is one small stream of water that still departs from the main river, and there is a small lake or pond to the west of the river. Although the northern section of land has been converted into buildings from agriculture, a few of the old acequias remain. The current acequias in the southern section of agricultural land follow similar paths to the acequias of 1935. The main route is the only thing that remains much the same. While it veers of slightly more to the east in the northern section of the image, by in large it follows the same path.

Santa Cruz

Santa Cruz de la Cañada

by William H. Wroth. (2014). *Santa Cruz de la Cañada*. Retrieved from http://dev.newmexicohistory.org/filedetails_docs.php?fileID=504

The town of Santa Cruz de la Cañada is located approximately 25 miles northwest of Santa Fe in the Santa Cruz River valley and a few miles east of Española. In prehistoric times the Pueblo Indians built numerous settlements along the river and its tributaries; at least 33 prehistoric sites have been documented. In 1598 the Oñate expedition, leaving from the Pueblo of San Juan, first came to the "Cañada de los Teguas." This may have been the Santa Cruz valley, at that time still populated by Tewa-speaking Pueblo Indians. In the seventeenth-century Hispano settlers established a few farms and haciendas in the area, which was called simply La Cañada, meaning a small river or creek valley. In August 1680 the life of these settlers was disrupted by the Pueblo Revolt, and they abandoned their farms and assembled at the home of the alcalde mayor, Luis de Quintana. They then retreated en mass to Santa Fe, after which the Tewas from nearby Pueblos destroyed their houses and chapels. After the Spanish retreat to El Paso, Tano Indians from the Pueblos of San Cristóbal and San Lázaro in the Galisteo basin moved north to the

Santa Cruz River valley to join their linguistic kin, the Tewas, and to re-establish themselves in a more fertile and safer area.

During the Reconquest of 1692-1694 under Diego de Vargas, the Tanos in the Santa Cruz valley were first grouped into two pueblos bearing the same names as they had in Galisteo: San Lázaro and San Cristóbal. Then, to accommodate incoming settlers from Mexico, Vargas began to evict the Tanos and tried to resettle some of them near Chimayó, but many of them withdrew into the mountains to the east. In 1696 as part of the second Pueblo Revolt, these Indians attacked San Cristóbal and killed the resident Franciscan friar, Fray José Arbizu and a visiting Franciscan Fray Antonio Carbonel. Vargas was able to crush the rebellion, thus effectively ending the presence of Pueblo Indians in the Santa Cruz valley. Many of the displaced Tanos fled to the west and by 1701 had established themselves among the Hopis at First Mesa where they still live and are known today as the Hopi-Tewas.

In order to resettle the fertile Santa Cruz valley with Hispanos, in April 1695 Vargas founded a new town officially named La Villa Nueva de Santa Cruz de Españoles Mexicanos del Rey Nuestro Señor Don Carlos Segundo (The New Villa of Santa Cruz of Mexican Spaniards under the King Our Lord Carlos II). It was established on the south side of the river, at the site of the Pueblo of San Lázaro. The new community quickly became identified in the records (to distinguish it from Santa Cruz de Galisteo) as Santa Cruz de la Cañada. After Santa Fe it was the first villa to be founded in New Mexico and one of only three in the colonial period, the third being Albuquerque founded in 1706. The residents of the new villa were returning original settlers of the valley augmented by a group of families brought north from Mexico by the returning Franciscan Fray Francisco Farfán and later in 1696 by some twenty new families from Zacatecas.

During the 1696 uprising Vargas used the new villa of Santa Cruz as his base of operations in pursuing the rebellious Tanos, and most of the Hispanic settlers moved away because of the unsettled conditions. After the defeat of the Indians, they returned and moved the site of Santa Cruz to its present location on the north side of the river. However, by 1712 the community had not grown appreciably. A document from that period states that the success of the community had been overstated in earlier reports. Even though government buildings (casas reales) and a church were promised to be built, no one could even find the foundations for these structures, and the new site on the north side of the river had only three or four residences and a church. At San Lázaro there had been a small chapel, and the new one at the present site of Santa Cruz was built by 1706. It was administered as a visita by the resident friar at San Juan Pueblo, an indication of the small size and relative unimportance of the “villa” of Santa Cruz at this time. The earliest extant baptismal record at Santa Cruz is from September 1710 for a child "de nación Apache" and is signed by the resident friar at San Juan, Fray José Antonio de Torres.

Little is known of this original church structure, except that it was built at the expense of the citizens, but by 1732 it was said to be "beyond repair and in danger of collapsing." The resident friar at San Ildefonso Pueblo, Fray José de Irigoyen, then administering the Santa Cruz parish, petitioned for the building of a new church. The petition was approved by the viceroy in 1733, but it took nearly 15 years, until about 1748, to complete, as again it was being built at the expense of the citizens. By 1760 although some 1500 people lived on the farms up and down the valley, at the villa of Santa Cruz itself, according to visiting Bishop Pedro Tamarón y Romeral, "there is no semblance of a town." By that date the new church was large, but sparsely adorned, and a Franciscan friar, Fray Mariano Rodriguez de la Torre, was in residence.

At the time of the visit of Fray Francisco Atanasio Domínguez in 1776, the villa of Santa Cruz had not grown appreciably. The urbane Domínguez recorded that the church had only "eight small houses like ranchos to keep it company. The rest of the villa is nothing more than ranchos located at a distance.... Some of them lie down the road to the south in the direction of San Ildefonso, other to the West on the meadows of the Río del Norte, and still others, the least in number, to the north." Domínguez noted that the Santa Cruz River and its tributaries provided the necessary irrigation water for "a copious harvest" each year, and that there were good orchards of pears, grapes, peaches, and other fruits. The villa at this time was the administrative and religious center for a larger area including Chimayó, Quemado (now Córdova), and Truchas. According to Domínguez's census the population of these places totaled 1389 people, including servants: "most of them pass for Spaniards.... All speak the Spanish current and accepted here." "Passing for Spaniards" would include the genízaros (detribalized Indians), most of whom had been ransomed from nomadic tribes and served as servants in the wealthier families.

The formal plaza of the villa of Santa Cruz may be said to date from 1779. In the preceding year the viceroy issued orders for the consolidation of towns on the frontiers of New Spain for defensive purposes, and also as a means of having more control over the local citizenry. In 1779 Governor Juan Bautista de Anza reduced the villa to a regular form, requiring settlers to cluster their homes around the church to form a plaza. This plaza existed through the nineteenth century and is still partially intact today. Thanks in part to these defensive plazas, the danger of Indian incursions began to lessen in northern New Mexico, and in response the Hispanic population increased dramatically all over the region, including both the plaza of Santa Cruz and in the towns and villages throughout the valley. The 1790 census shows a population of over 7000 Españoles in the Santa Cruz jurisdiction. While these figures may include a few settlements not counted in 1760 and 1776, it still shows a huge increase in population. Again the citizens began to spread out away from the plaza, establishing new settlements wherever they found water and could farm.

With this large increase in population, most of the citizens of the Santa Cruz valley were subsistence farmers barely able to make a living. After 1821 the government of the new republic of Mexico went through a long period of instability changing frequently from a more democratic to a more dictatorial form. In 1837 President Santa Anna whose tendency was dictatorial attempted to institute a centralized form of government, greatly reducing local autonomy and increasing the ability of the central government to collect taxes. In response many poor people in northern New Mexico objected and a rebellious movement came together centered in Santa Cruz. Governor Albino Pérez, who was not a native New Mexican, was unpopular in the north for his autocratic style. In the summer of 1837 he marched towards Santa Cruz with an inadequate force and was defeated by the rebels at nearby Black Mesa. On his retreat towards Santa Fe he was captured and decapitated by the rebels who installed José González as governor. Under the leadership of Manuel Armijo, and with financial help from Anglo-American merchants in Santa Fe, the final battle of the rebellion took place at Puertocito Pojoaque a few miles east of Santa Cruz. Here the rebels were defeated. González was captured and executed by firing squad in Santa Cruz.

In the Taos Rebellion of January 1847 Santa Cruz de la Cañada again played a part. The rebels, having killed Governor Charles Bent in Taos, marched south to Santa Cruz with the intention of attacking Santa Fe. In response Colonel Sterling Price marched north from Santa Fe with his troops and with superior fire arms. Just east of the Santa Cruz plaza he routed a force of about 1500 rebels. He then stationed his troops in the Santa Cruz plaza for the night, before going on to defeat the rebels again in Embudo and in Taos.

In 1776 Father Domínguez noted that one of the outlying districts to the west of Santa Cruz where people had settled was “the meadows of the Río del Norte.” After the American occupation and change of sovereignty in 1846 this area was to assume a much greater importance, especially after the coming of the Denver and Río Grande railroad in 1881 when it reached a place, at the juncture of the Chama with the Río Grande, known as La Vega de Los Vigiles. There a new railroad station was built and became known as Española. Because of the railroad and later the highway from Santa Fe to Taos, Española soon became the commercial center of the area, eclipsing Santa Cruz, which today has become more like a satellite community. Yet Santa Cruz still retains its character as a rural Hispanic town. The church continues to be the center of a large and active parish encompassing the surrounding communities of Cuarteles, La Mesilla, La Puebla, San Pedro, and Santo Niño. It is the second largest extant church in New Mexico to have been built in the colonial period and contains important examples of works by eighteenth and nineteenth century santeros (folk artists), such as Fray Andres García, Pedro Fresquiz (the Truchas Master), and José Rafael Aragón.

The Santa Cruz de la Cañada Grant was petitioned by Joseph Mascareñas and a group of families in 1695. The grant was approved by Governor Diego de Vargas and Pedro Cubero for 60,000 acres. Proceedings before the Office of the Surveyor General and the Court of Private Land Claims reduced the acreage to 4,567 acres on confirmation. The grant is located in Santa Fe and Río Arriba counties. Around 1845, some of the settlers from this grant petitioned for another land grant on the Sapello River because of shortages of land and water for agriculture.

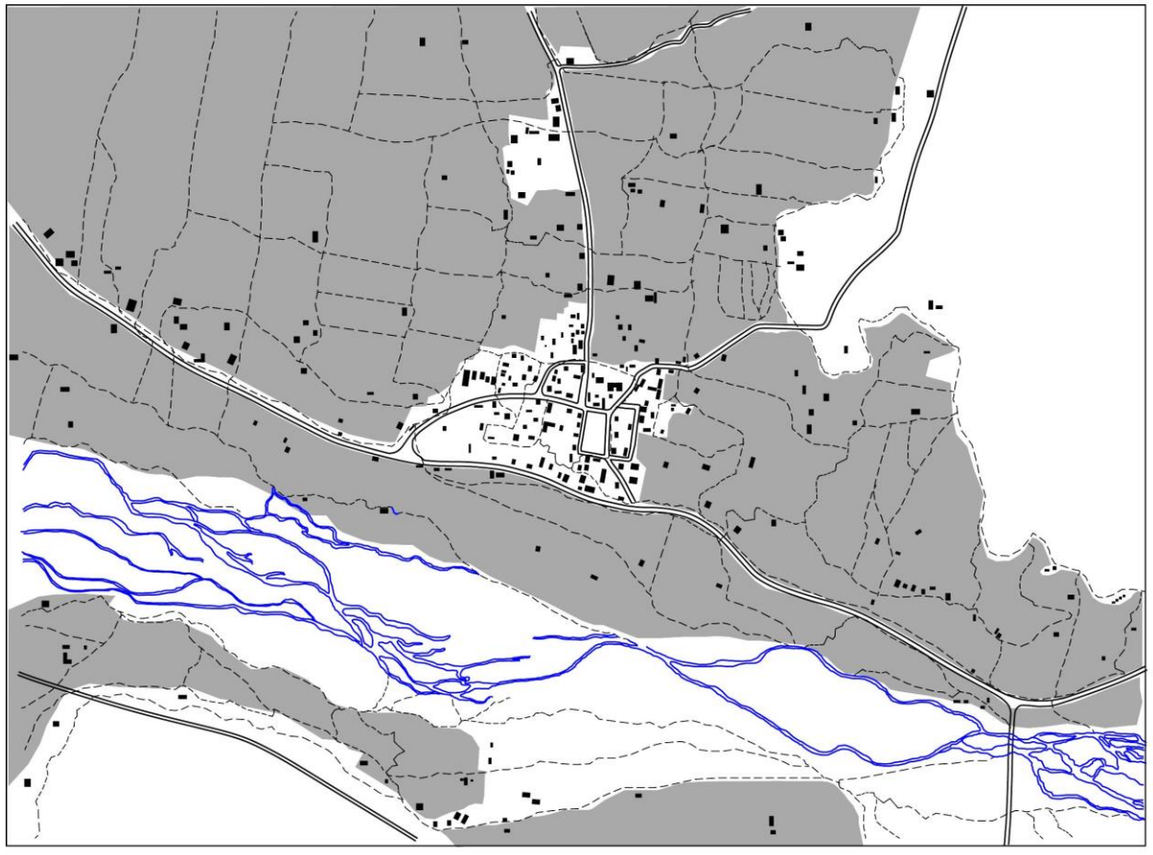
1935 Orthographic Aerial Image - Santa Cruz

2012 Orthographic Aerial Image - Santa Cruz

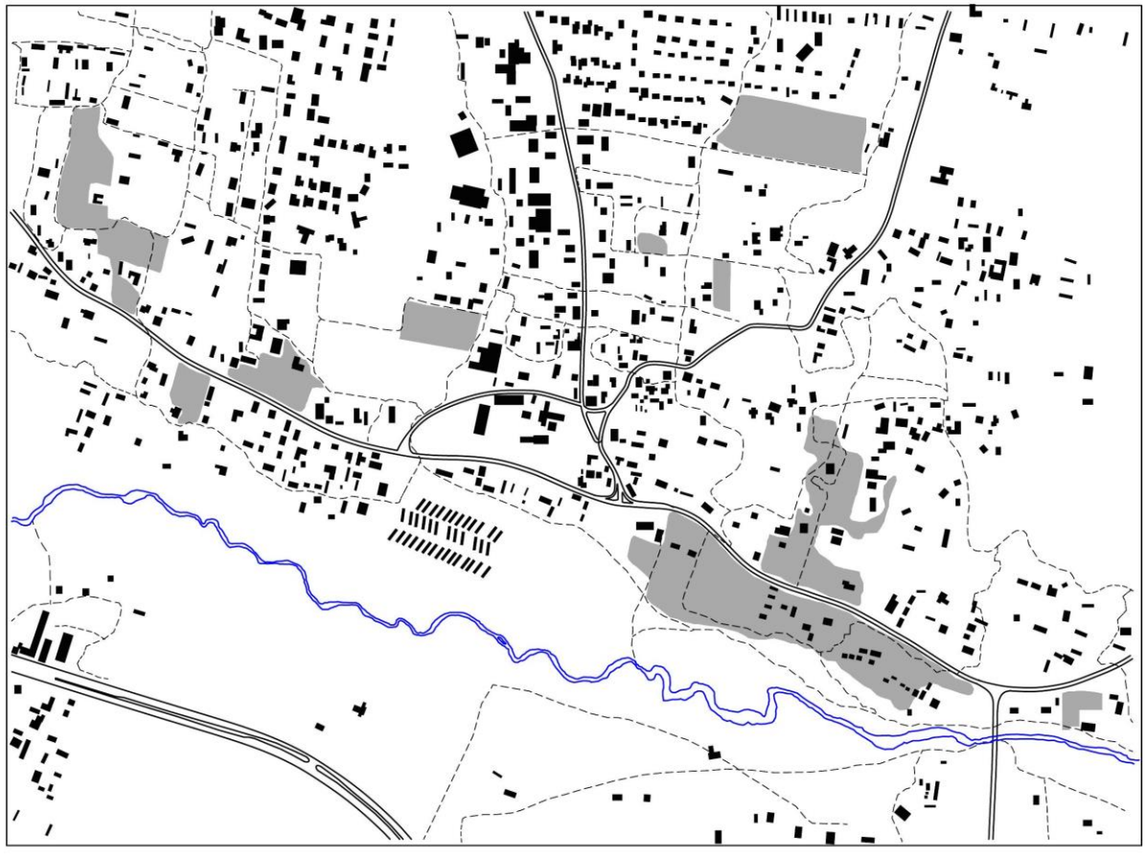
In Santa Cruz there has been significant land use change. On the proceeding page, one can clearly see that nearly all of the agricultural land is gone. While the majority of the area in the 1935 images is agricultural land, only a few small and isolated parcels remain. There is one larger agricultural parcel to the southeast, just north of the river. There are many more dwellings and buildings throughout the area in the more recent images. The buildings in the images from 1935 are scattered

throughout the area with a small cluster in the center of town. There is no immediately apparent center of town in the newer images; rather the numerous buildings are spread throughout the area. While the agricultural land is mostly gone, a good part of the old network of acequias remains in place. The old network of rivers and streams has been reduced to a singly stream of water. The roads of 2012 are almost exactly as they were in 1935. The main highway in the southwest corner has been widened, and there are a few smaller roads that have disappeared, but otherwise the routes are the same.

Santa Cruz 1935

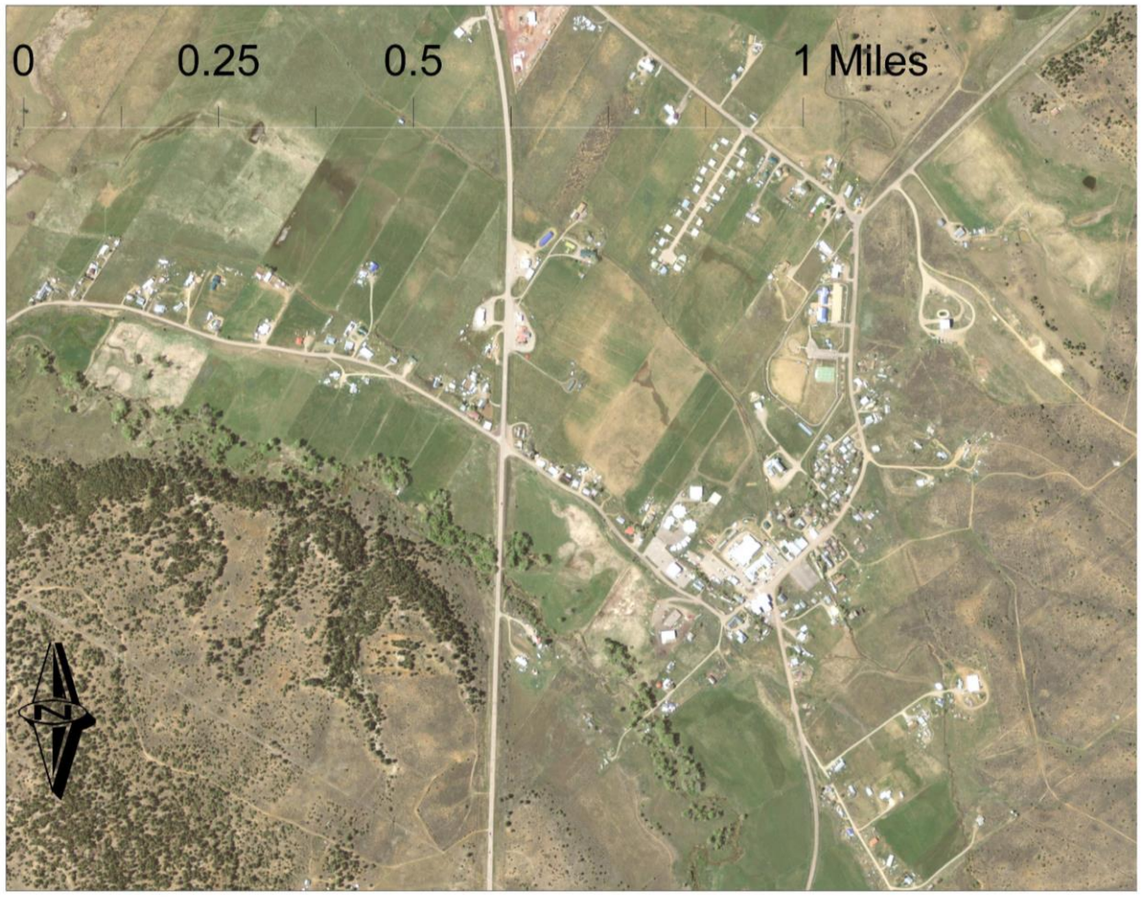


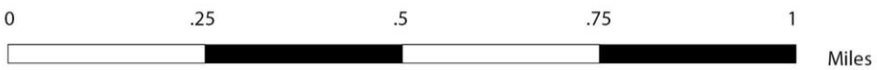
Santa Cruz 2012



1935 Orthographic Aerial Image - Tierra Amarilla

2011 Orthographic Aerial Image - Tierra Amarilla

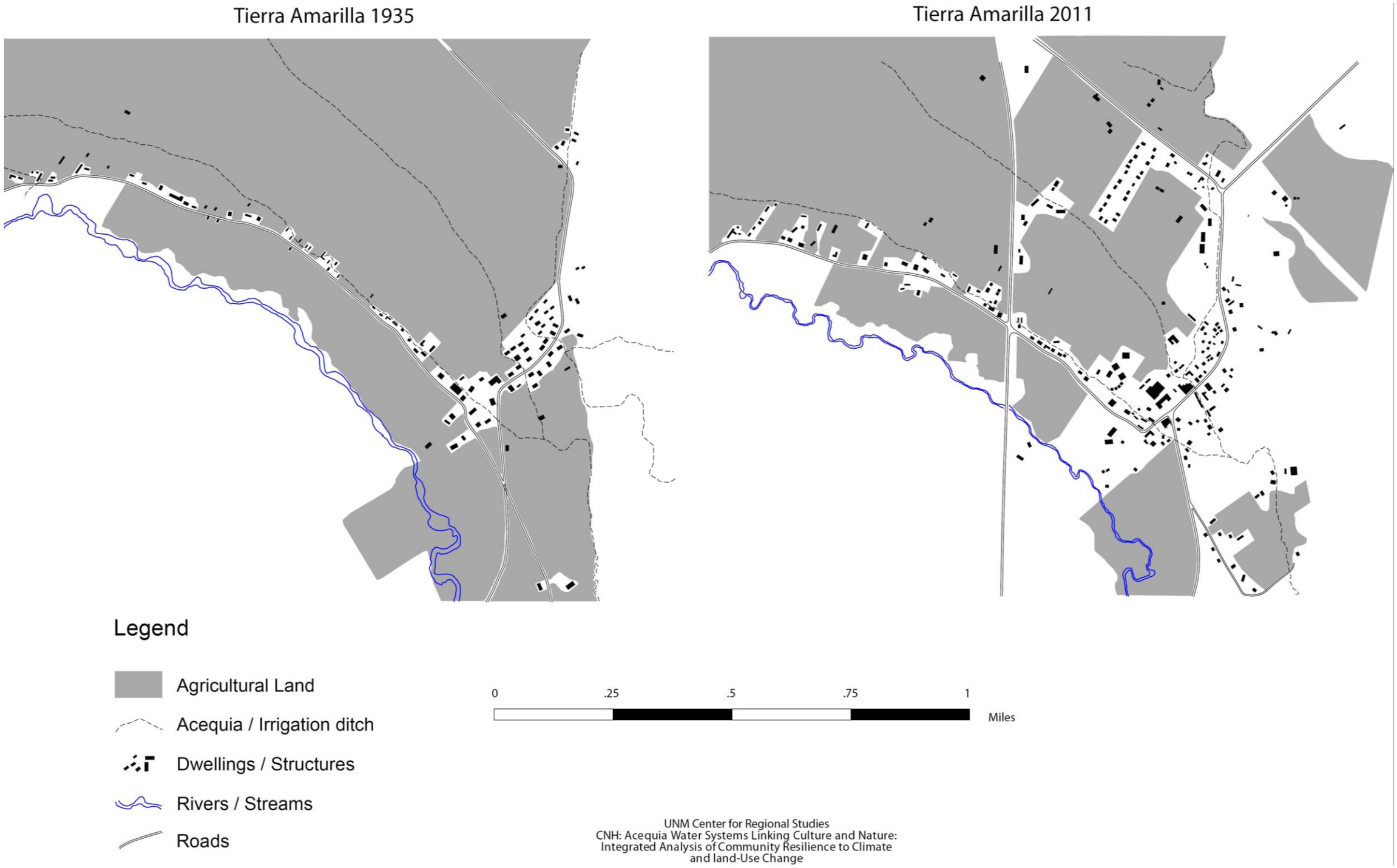




Tierra Amarilla

TA, as it is often referred to, is the county seat of Rio Arriba County. As of 2010, the total Tierra Amarilla population is 382. (2014. Retrieved from http://www.census.gov/main/www/access.html). Land use in Tierra Amarilla has not dramatically changed since 1935. A significant portion of the land remains dedicated to agriculture. While there is now slightly less area for agriculture in parts of the northeast and southeast edges, there is more agricultural land in the northeast region of the town. There are more buildings and dwellings that have remained in a similar pattern to the buildings and dwellings in 1935. The river, which

consisted of two streams of water quite close to each other, is now one flow of water and follows the same path. The acequias are in the same locations as before, with a few small new acequias added in the north. The roads have changed and there is a new road that cuts north-south along the town in addition to the roads of 1935.



Chapter 4

Recommendations:

Land Use & Figure Ground Diagrams

The work presented in this Professional Project is a lead in to further research, data collection and maps. The series of maps from 1935 to 2011-13 show a great change in the natural and built landscapes of northern New Mexico. However, there remains decades in between the time span from 1935 to 2013 that can be looked at in order to shed more light on the transformation of cultural and physical space. It would be beneficial to select other years in history to create aerial and figure ground maps to acquire further understanding about how the landscape has changed. The next step for future research would be to select years in the past that have some sort of significant historical rational that is relevant to land use change. My first thought with regard to selecting a time period to look at next, would be the post World War II era.

The post WWII era saw a period of rapid development and outward expansion from cities and towns that created new communities and suburbs. Pent-up consumer demand fueled exceptionally strong economic growth during this period. The automobile industry successfully converted back to producing cars. A housing boom, stimulated in part by easily affordable mortgages for returning members of the military, added to the expansion. Farmers, on the other hand, faced tough times. Gains in productivity led to agricultural overproduction, as farming became a big business. Small family farms found it increasingly difficult to compete, and more and more farmers left the land. As a result, the number of people employed in the farm sector, which in 1947 stood at 7.9 million, began a continuing decline; by 1998, U.S. farms employed only 3.4 million people (2014. Retrieved from http://economics.about.com/od/useconomichistory/a/post_war.htm). Growing demand for single-family homes and the widespread ownership of cars led many Americans to migrate from central cities to suburbs. As new, federally sponsored highways created better access to the suburbs, business patterns began to change as well. Shopping centers multiplied, rising from eight at the end of World War II to 3,840 in 1960. Many industries soon followed, leaving cities for less crowded sites(2014. Retrieved from http://economics.about.com/od/useconomichistory/a/post_war.htm).

With this in mind, a logical place in time to create a bridge between 1935 and 2011-13, would be to compile orthographic aerial images of the towns in Rio Arriba County on or around 1960. It would be interesting to see how agriculture land looked from aerial images in 1960. No doubt that more roads would have been

constructed and many more dwellings would certainly be present in such communities as Hernández, El Rito, Ohkay-Owingeh, Santa Clara and especially Santa Cruz(Española). This is where GIS becomes an important tool in order to analyze and compare physical relationships in History. Using GIS software, it is possible to compare Historical aerial maps and other relevant data sets to discover new relationships and factual hypothesis. Thus, any Planner, Historian, Cultural Anthropologist, or any number disciplines can benefit in terms of research possibilities.

Historical spatial information is often hard to deal with. In this Professional Project, I use maps (with various scales, levels of detail, degrees of accuracy), aerial photographs and ground-level photographs. Comparing spatial information from one of these sources with information from another, or with information from the same type of source but a different time period, can be complicated and difficult, especially for people who are not familiar with spatial sources or the specialized cartographic techniques that enable one to glean the most from visual spatial information(Seibert 2000). By linking historical spatial information to corresponding geographic features in GIS, it is possible to record, display, and evaluate relationships between types of information that were in hard-to-compare formats or spread over many sequential historical maps (Seibert 2000). There are three basic roles that GIS can be used for: as a spatially referenced database; a visualization tool; and an analytic tool(Gregory 2005). Each of these roles of GIS can be utilized in conjunction with historical aerial maps in order to propel many possibilities involving further research and discovery.

The following except is written by Loren Seibert and taken from the literary article, “Using GIS to Document, Visualize, and Interpret Tokyo’s Spatial History.” The literary article is found in the Journal, ***Social Science History***, 24:3 (fall 2000). Seibert explains the use of geographic information systems (GIS) for historical analysis from her perspective as an urban form historian and mapping scientist who uses GIS to document, visualize, and interpret spatial history.

“Many aspects of the history of an urban region’s form can be recorded to produce an integrated spatial database. For example, the GIS can include changes in visible spatial features such as land cover, transportation networks, and physical geography. Changes in abstract spatial features such as political units and boundaries, socioeconomic patterns, and demographic data from censuses and other sources can also be incorporated. Temporal events or other information can often be linked to spatial features, such as linking corporate events and business performance statistics to the geographic locations Tokyo’s Spatial History 539 of different branches and customers, or linking organizational events in the history of a railroad company to the rail lines, stations, and service areas affected by mergers and acquisitions.

Integration of this diverse information allows analysis of relationships that might not otherwise have been considered. For example, a GIS can be used to display at a similar scale the urban patterns seen in various historical maps and aerial photographs and recorded from census data, as well as rail network growth patterns recorded from maps and rail company chronologies.

Such overlay comparisons are possible using conventional, non-computer mapping techniques with acetate film, but a GIS greatly facilitates coordination of display scales and selective display of different components for easy comparison. Another use would be to compare an urban plan with mapped data on conditions in existence at the time the plan was made, then at various times after it was implemented.

Research on spatial history using GIS can take a variety of approaches. Some researchers may be interested in a specific set of questions and hypotheses, so they may need to map and evaluate only certain types of historical spatial features (e.g., county boundaries and census data). Other researchers may be more interested in developing a multifaceted spatial database that can be used to record and analyze a wider range of spatial features, both physical and human.

As a mapping scientist interested in urban form history, I have intentionally used the latter, multifaceted approach to develop methods of recording and analyzing many different types of spatial phenomena and their changes over time. This is a "data-driven" approach that starts with questions about what existed, where it existed, how it changed, and how such information can be accurately and efficiently mapped using a new technology. Once the geographic features are mapped and the associated information is recorded, the researcher can then begin to evaluate the broader historical questions ("why" things existed and changed). My approach is thus an inductive one that relies on a logical progression from description to visualization and interpretation. What a researcher chooses to describe is influenced by his or her interests, but, there are inherent relationships between mapped phenomena that require the researcher also, and perhaps first, to map things he or she may not be specifically interested in. To develop a multi-faceted spatial history database, I thus intentionally strive for thematic, data source, and mapping-method variety, to ensure that a variety of technical issues would be addressed. "

As can be read, Siebert clearly and articulately explains a wide range of possibilities of how utilizing GIS can aid a particular body of research. In the case of Rio Arriba County, GIS can be used in a similar manner to discover any number of relevant and important connections that can benefit both the people and the natural resources of northern New Mexico. To conclude, I really believe that further research can and should be initiated in order to take this body of work to the next level of analysis.
I further hope that the research and maps presented in this Professional Project can and will be used in the future to make important contributions to diverse academic disciplines.

Acknowledgements

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Appendix

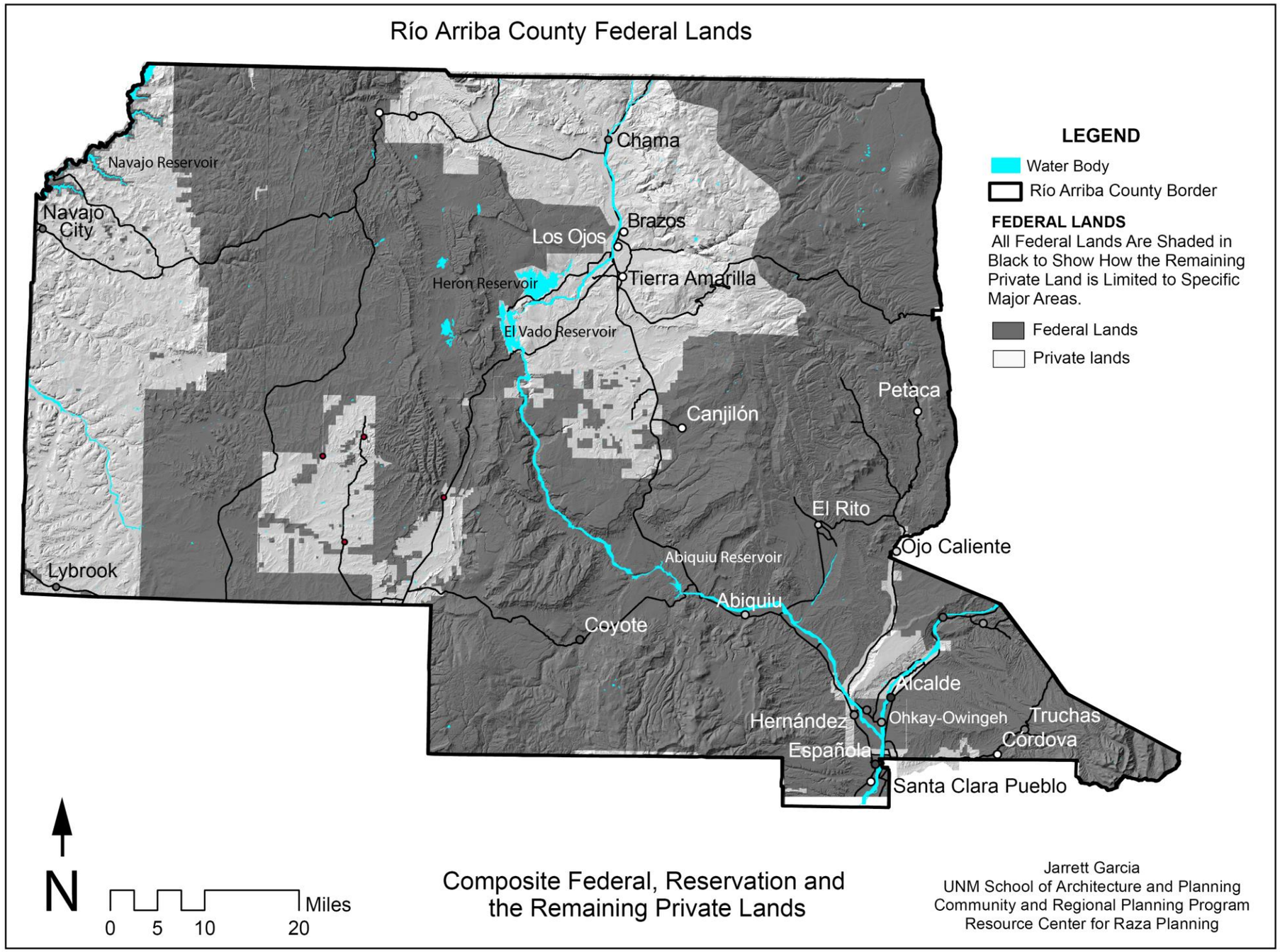
Rural Cluster Development & Land Use Patterns of Río Arriba County

The arrangement of communities and land uses in Río Arriba County reflect the historical settlement patterns of the area. The majority of communities in the County were settled in the 1700s and 1800s, under Spanish and Mexican rule. As mentioned several times previously, The *Laws of the Indies,* mandated by the Spanish Crown, dictated town design back then. One of the main requirements of these laws stipulated that there must be a constructed centralized plaza in the middle of a town or settlement. This plaza had to be surrounded by homes sharing common walls, where commercial and economic activities were concentrated. Outside of the plaza, the land grant system assigned long, narrow parcels of land known as *lineas* to settlers. These parcels originated in the river bottoms and stretched into the mountains, providing all the necessities for survival—irrigated land for crops; dry land for a home; grass lands for grazing; and mountainous areas for hunting, gathering and timber. And of course acequia systems supported irrigated agriculture by diverting water from major streams and rivers. The use of this system allowed traditional communities to support mixed land uses such as residential, commercial, and public uses within the town center, while leaving agricultural lands, grazing lands and forest lands open, to economically sustain the community.

Today, several traditional communities in Río Arriba County, such as Abiquiu, Chimayó, Cordova, and Truchas, have maintained their traditional plazas. However, most communities have shifted away from higher density plaza centers to low-density, single-family housing, which accounts for the majority of housing in the County today. Anyone who travels to northern New Mexico can clearly see that low-density single-family housing and agricultural land uses dominate the landscape throughout Río Arriba County. Most often one can see choice agricultural lands adjacent to low density residential areas, with no centralized plan for residential development.

Just as residences have migrated from the plaza center to surrounding agricultural fields and dry lands, commercial businesses have abandoned the plaza for highway frontage. Examples of common rural commercial uses in Río Arriba County include gas stations, automotive shops, convenience stores, art galleries, restaurants and bed and breakfasts. NM 64/68 from Alcalde to Rinconada, US 84 from Hernández to Chama, and NM 76 from Chimayó to Truchas offer examples of commercial growth that occurs in a linear pattern along the highway. For instance, if one looks at an aerial photo of Hernández, the shift is now away from the village center to a system where residential development is dispersed and commercial uses dot the highways.

This section is centered on discussing how cluster development is a much better alternative than the current conventional or traditional type of development that has been the norm all over the country and also in Río Arriba County. The current situation for much of the county can be characterized as being low-density residential sprawl, or low density rural development where dwellings and houses are spread out and many tracts of land exist with many access roads. It is of great importance



that development of private land looked at critically because there is not very much private land left in the county. The map on the proceeding page gives a current snapshot of the small amount of private land holdings left in Río Arriba County. There is definitely too much conventional development occurring all over this area of the state that will not benefit the area for the long term. It is understandable why people want to continue the status quo and have their houses distanced from their neighbors, have their own separate and distinct access roads and driveways and be surrounded with land and fences. But, when houses are grouped together in clusters the remaining land is maximized for any number of uses, especially agricultural use. In the case of Río Arriba county, it makes a lot more sense to encourage cluster development, it is more sustainable for the future and it would be the best alternative to benefit the community.

The following is taken directly from the Río Arriba County Comprehensive Plan as amended, 2009. I present to the reader the sections that relate to sustainable growth strategies and cluster development.

VI. Economic Development - Río Arriba County Comprehensive Plan 35

Goals and Implementation Strategies pp.35

Goal 6: Encourage compact and sustainable growth that reflects traditional settlement patterns, promotes biodiversity, reduces our carbon footprint, reduces our water footprint, and enhances our unique diversity and quality of life.

 Strategy 51: Prepare a Río Arriba County Growth Management Plan that creates land use districts, defines and identifies traditional and contemporary communities, and defines land use intensities that are concurrent with the area's water and infrastructure capacities and respond to the cultural and physical characteristics.

 Strategy 55: Adopt a Cluster Development Option in the Land Use regulations that protects watersheds, utilizes community water/wastewater systems, and promotes cluster development in family transfers/exemptions through incentives of fee waivers and density bonuses

Goal 9: Designate and map existing and potential node development in the County at community centers, commercial clusters, transportation intersections, and traditional communities and, where compatible, encourage new development to locate at these nodes to increase efficiency of service and transportation. pp. 44

 Strategy 30: Map existing and potential nodes and surrounding area including;

o *Community centers*

o *Traditional Communities*

o *Major transportation intersections*

o *Commercial clusters*

o *Areas of higher residential density (such as neighborhoods)*

 Strategy 31: Through Ordinance create incentives such as density bonuses, smaller lot sizes, reduced fees for new development located in node development locations identified in this plan that is compatible with thesurrounding community and environment.

END OF PORTION OF RÍO ARRIBA COUNTY COMPREHENSIVE PLAN

What Is Cluster Development?

Residential cluster development is concept and style of designing physical space by which it is possible to permanently protect open space, rural character, and important environmental resources in new housing developments, while still providing homeowners with good housing and landowners with the opportunity to develop their property. Cluster development is the grouping of a development's residential structures on a portion of the available land, reserving a significant amount of the site as protected open space. Many communities across the United States are updating their comprehensive land use plans and establishing specific ordinances to guide the development and construction of residential clusters. New ordinances require design standards and identify minimum open space and density standards. These key changes have prompted some communities to opt for more descriptive terminology, including open space development or conservation subdivision design, for the more traditional cluster development. While the different terminology has created some confusion, each term still adheres to the three basic goals of cluster development: preserving open space, protecting critical ecological habitat and preserving agricultural land.

The usable open space created by a cluster development can meet a number of community goals. These goals sometimes conflict with one another. For example, the protection of wildlife habitat may be incompatible with the preservation of agricultural land. However, the key benefit is the availability of open space, space that has been preserved by clustering units on smaller lots. The landowner and the community make the ultimate decision on how the open space is used.

Ensuring Full Potential of Development

The intent of cluster development ordinances is simple: develop less land area while allowing the same number of housing units that would be permitted under standard subdivision ordinances. By allowing the same number of units, landowners and developers aren't penalized financially for doing cluster development. A yield plan or

development plan is currently being used by communities around the United States (and also abroad, though it probably has different name depending on the country) to determine the maximum number of units allowed in a cluster development. The yield plan provides a conceptual sketch of a conventional subdivision based on all standard criteria (setbacks, width, lot size, etc.). The result is the maximum number of units allowed on the parcel (its gross density). Some communities do not specifically require a yield plan, basing the maximum number of units instead on the net developable land as determined by performance standards(Blaine & Schear 1998).

Protection of Water Resources

Cluster development may offer many other advantages to the municipality, developer and prospective homeowner. The use of rural technologies for storm water management, for example, can avoid expensive curbs, gutters and storm sewers. Instead, the development's storm water management system can be more responsive to the land's environmental constraints. And wastewater treatment systems can incorporate technologies that ensure that systems are sited appropriately and that centrally-located municipal systems or individual sewage treatment systems are avoided (Blaine & Schear 1998).

Storm Water Management

The design of storm water management systems in cluster developments seeks to maximize overland flow and combine the use of plants and landforms to slow, hold, and treat runoff from new development.

Wastewater Management

Many options are available to treat wastewater from a cluster of homes, including community drain fields, irrigation systems, and package plants. These options all have the potential to reduce infrastructure investment and allow systems to be located on sites that minimize adverse environmental impact.

The Local Adoption and Approval Process

The local approval process for cluster development must be consistent with local comprehensive plans and ordinances and must satisfy the permit process for rural technologies. Cluster developments generally follow the same review and approval process that traditional subdivisions do. This process is characterized by a preliminary and final plat review process that takes place at public hearings and planning and zoning board meetings. Many local permit processes have not been revised to give developers the flexibility they need (Lasnier 2012). This lack of revisions has been the main difficulty in encouraging developers to use community

wastewater treatment facilities and more complex storm water management technologies. Many developers, anticipating greater costs and disapproval of new methods, simply opt for more traditional systems.

Management of Common Resources

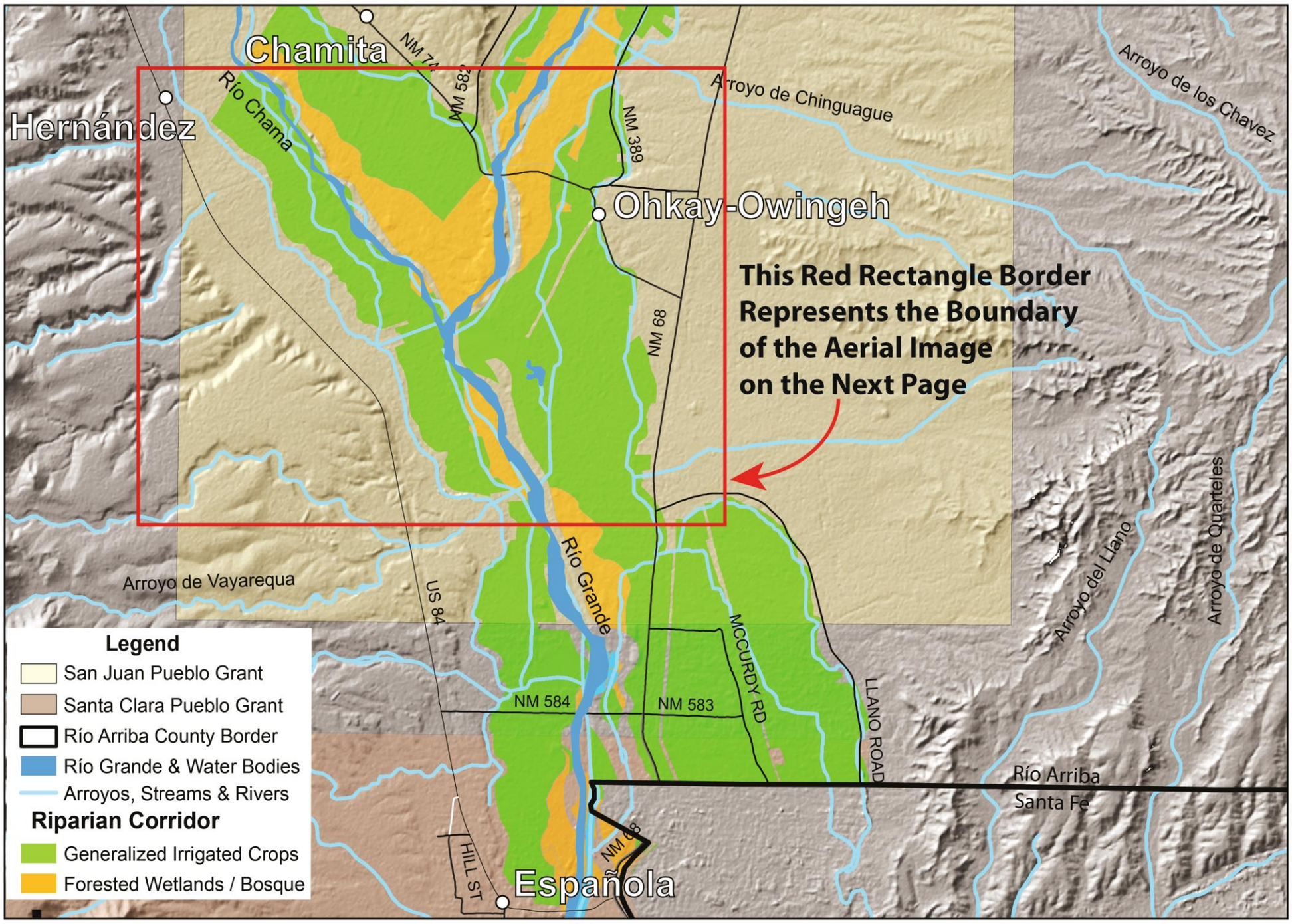
Clustering housing leaves the majority of a new development as open, shared space, mutually owned and managed. In a cluster development, that management involves controlling, directing, and handling all resources held in common by individual homeowners. These include, but are not limited to, open space, wastewater treatment systems, and storm water management facilities.

Many cluster development ordinances mandate the establishment of a homeowners association (HOA) to manage the common open space. Set up by the developer, who may remain a member until all or a specified number of units are sold, the HOA is then responsible for all management responsibilities and capital improvements.

Design Intervention: A Rural Cluster Development

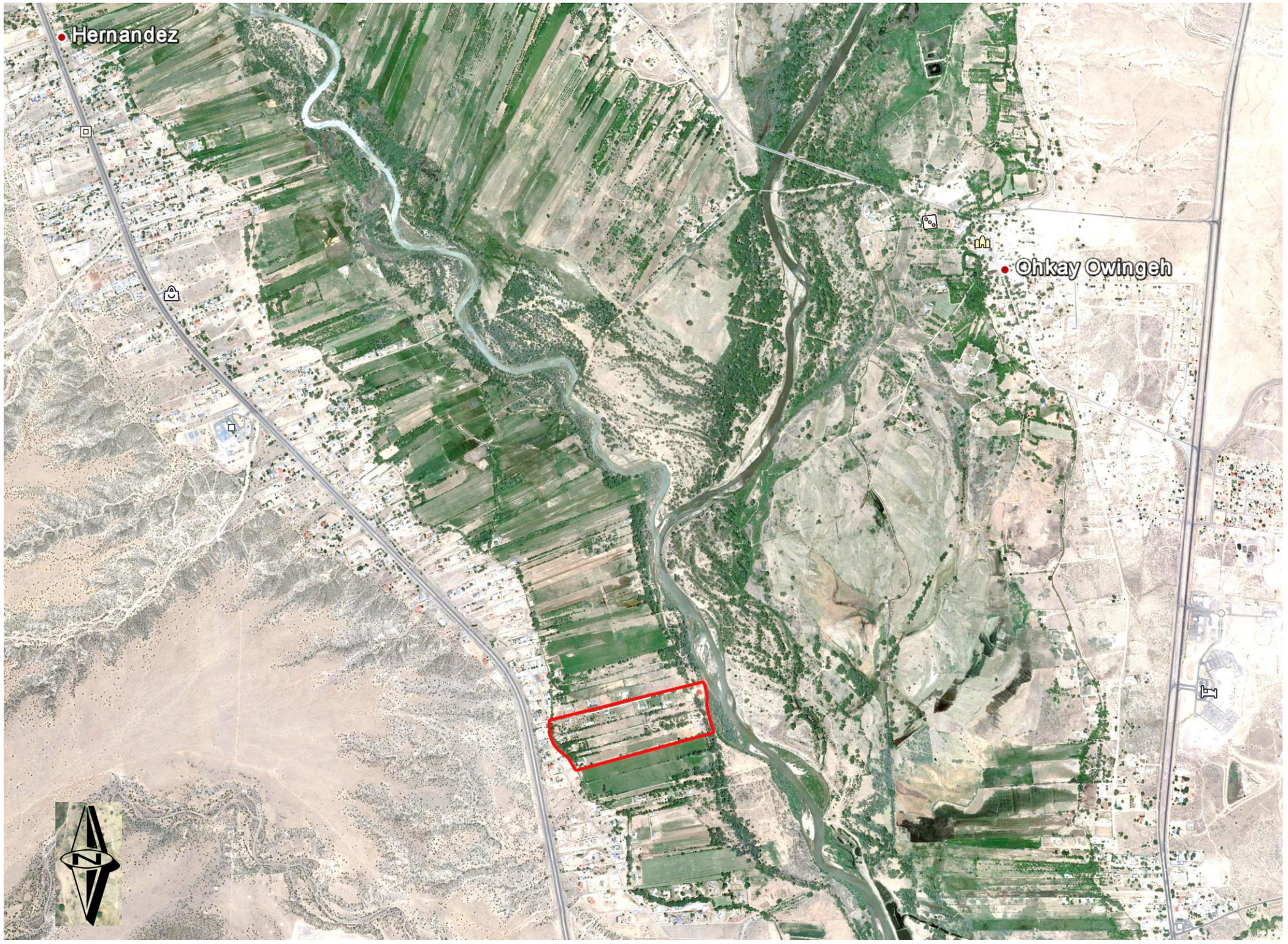
This next part of the Recommendations chapter is about designing an example for a cluster development infill in Río Arriba County. I have designed a cluster development that is hypothetical, as if this is my own studio course and my site was to be some small town in Río Arriba County. The site I chose is in Hernández, in an area that shows the typical arrangement of homes and dwellings that all sit on their own lots. The resultant condition is basically rural sprawl. The land is fragmented and many roads go through this space. The land is also subdivided in a way that is typical in that there are now very linear bands of property that all seem to have irrigation, but some do not water any crops. The premise of the design is essentially being able to show that it is possible to developed sites differently, especially areas that are vacant land or are agricultural use areas. Special thanks go out to Dodson & Associates, Landscape Architects and Planners. I saw several examples from their site that enabled me to create a nice schematic design for a cluster development.

The following pages show the site, and where things are situated with respect to Hernández, the Río Grande River and the Río Chama. I chose this particular spot because it was very typical of many areas all around the county and prevalent in many other counties of New Mexico along riparian corridors.



Río Arriba County Río Grande & Río Chama
Riparian Corridors and Irrigated Croplands

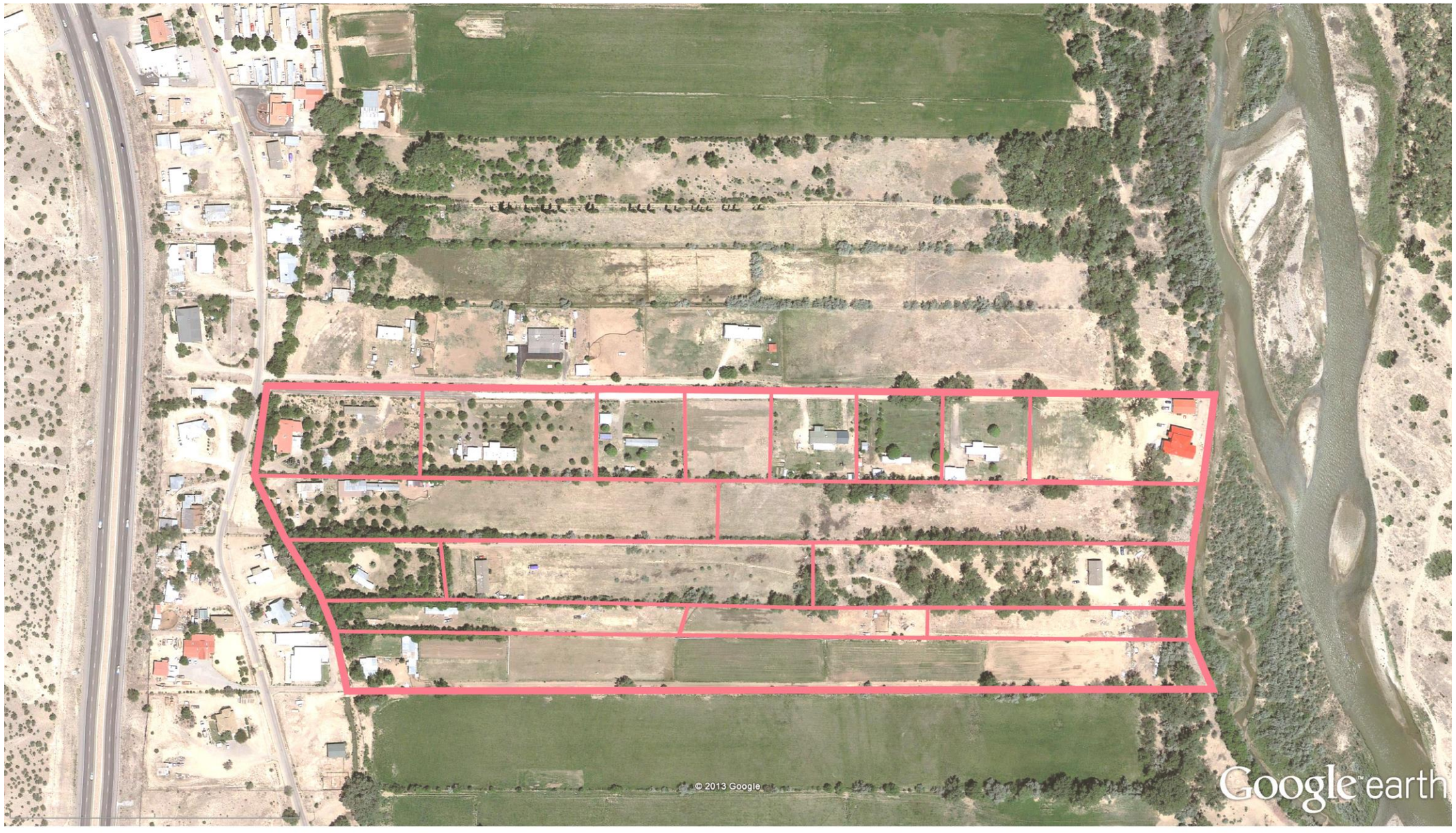
image by Jarrett Garcia 2012


Hernandez
Ohkay Owingeh
N

Below: This is the area in Hernández where the design intervention will be situated. I chose this site because it is a good example of the type of low density residential development that is found all throughout the Río Grande and Río Chama Valley in northern New Mexico. In this case, there are about a dozen separate parcels that may be owned by many members of a family or may just be separate and individual owners. The majority of the parcels are irrigated and support some degree of agriculture. There are several access roads and the houses are fairly uniform, there are a few manufactured dwellings also.

100′ - 0″

Below: There are about 17 individual visually recognizable parcels(not the legal parcels, just visual) on this site and at least four access roads that traverse the site from west to east allowing vehicular access to all the dwellings and parcels closest to the Río Grande. It is easy to see that this is not an efficient use of space when there are residential and agricultural components that affect each other. The built environment could be greatly improved by utilizing cluster zoning and cluster development methods.



100′ - 0″

This is a cluster development schematic design that I created for this site that shows how a different configuration of dwellings, agriculture space and road access could create a better use of resources and benefit everybody. This is a simple concept and one that was practiced in a less formal way by the original settlers. The original settlers grouped their houses together for protection and had communal agricultural areas for farming.

100′ - 0″

The design would have just two access roads, one on the very top to be the main access point for residents and a secondary route below to the left. A circular one-way shared loop access road to houses would minimize road width and shared driveways minimize road surfaces. There is a central multi-use Community Space that could be small scale gardens, a grove of fruit trees, turf grass, or any number of possibilities. There would be an Event space that could have a shade structure, or this

space could be a volleyball or basket-ball court. There is ample agriculture land available for farming by the community, or the land could be leased to generate revenue to re-invest into the community. There are several outbuildings that could be large sheds for agriculture equipment or they could be event, office or retail spaces. The number of houses can vary, but this design creates about the same number of residences as the site currently has to show how it could be re-imagined.

As growth continues in this era of drought that we are experiencing many areas around New Mexico are facing real water shortages. Currently, where I now reside in California, there is even a drought here the likes of which have not been seen for several decades. The need for serious and contemplative planning is going to have to be completely embraced in New Mexico. Communities across the state must stick to a robust comprehensive plan. Only then will the planning process allow rural New Mexicans to define the future of their communities. Comprehensive plans definitely need to include items that speak directly to the relationship of land use to water availability, economic development, affordable housing, environmental preservation, environmental racism and other identified issues and needs. These much talked about tools of rural growth management can be used to make certain that growth and development will not severely screw-up what makes New Mexico so completely special and unique.

References

Adams, Eleanor B. Fray Angelico Chavez, eds. *The Missions of New Mexico, 1776*. Albuquerque: University of New Mexico Press, 1956.

Agoyo, Herman, et al. *When Cultures Meet: Remembering San Gabriel del Yunge Oweenge*. Santa Fe; Sunstone Press, 1987.

Arendt, Randall. 1999. *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*. Washington, DC: Island Press.Balmer. 2005

Arendt, Randall. *Open Space' Zoning: What It Is & Why It Works*. (2011) : http://www.plannersweb.com/articles/are015.html

Jeffrey & Swisher, Michael T. *Diagramming the Big Idea: Methods for Architectural Composition*. 2012; Routledge

Balmer, M. (2007) *Travel demand modeling for multi-agent transport simulations: Algorithms and Systems.* Dissertation, ETH Zurich, Zurich.

Baxter, John O. *Spanish Irrigation in the Pojoaque and Tesuque Valleys During the 18th and Early 19th Centuries*. Report, NM State Engineer, 1984.

Baxter, John. *Dividing New Mexico's Waters, 1700-1912*. UNM, Albuquerque, NM, 1997.

Berkes, F., J. Colding, and C. Folke (Eds), 2003. *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*. Cambridge University Press: West Nyack, NY.

Bernardo Miera y Pacheco. http://cybergata.com/roots/6607.htm (accessed 14 April 2011).

Blaine, Thomas, and Peggy Schear. 1998. *Cluster Development Fact Sheet*. Ohio State University Extension Land Use Fact Sheet Series.

Bloom, Lansing Bartlett. *New Mexico Under Mexican Administration, 1821-1846*. Santa Fe: Old Santa Fe Press, 1913-1914.

Blosser, Jamie. *Built Form as a Community Value: An Ethics of Architecture*. In: Forward: The Quarterly Journal of the National Associates Committee, American Institute of Architects, January, 2006.

Bolton, Herbert E. *Pageant in the Wilderness*. Salt Lake City: Spanish Historical Society, 1950.

Bowden, J. J. *Private Land Claims in the Southwest*. 6 vols. Master's thesis, Southern Methodist University, 1969.

Boyd, E. *Troubles at Ojo Caliente, a Frontier Post*. El Palacio (November/December 1957); 347-360.

Brooks, James F. *Captives and Cousins: Slavery, Kinship, and Community in the Southwest Borderlands*. Chapel Hill & London: Univ. of North Carolina Press, 2002.

Carmona, M; (2010). *Public Places Urban Spaces, The Dimensions of Urban Design* (Second Edition). Architectural Press

Chávez, Fray Angélico. *Origins of New Mexico Families in the Spanish Colonial Period.* Santa Fe: Historical Society of New Mexico, 1954.

Lasnier, Richard. *Cluster Housing Development*. (2012). http://www.reinet.com/library/general/file3.html

Census Data. (200-2012). http://www.census.gov/main/www/access.html

Corner, J. (2011). *The Agency of Mapping: Speculation, Critique and Intervention*. In R. K. Martin Dodge, The Map Reader; Theories of Mapping Practice and Cartographic Representation (p. 214). New Jersey: Wiley-Blckwell.

Correia, D. Making destiny manifest: United States territorial expansion and the dispossession of two Mexican property claims in New Mexico, 1824-1899. 2009. Journal of Historical Geography 35: 87-103.

Cox, Michael, 2010. *Exploring the Dynamics of Social-Ecological Systems: The Case of the Taos Valley Acequias*. Ph.D. dissertation, School of Public and Environmental Affairs, Indiana University. Dumar, Charles and others. *Pueblo Indian Water Rights: Struggles for a Precious Resource*. University of Arizona Press, Tucson, AZ, 1984.

EDAC. Earth Data Analysis Center. 1935 Aerial Photography of Rio Arriba County. Image Archive and Data Service. Albuquerque, NM. University of New Mexico

Ebright, Malcolm. *Land Grants and Lawsuits in Northern New Mexico*. Albuquerque: University of New Mexico Press, 1994.

Eidenbach, P. L., 2012. *An Atlas of Historic New Mexico Maps, 1550-1944*. Albuquerque: UNM Press, 2012.

El Nuevo Estado, Tierra Amarilla, NM, August 11, 1918; April 26, 1920.

Francis Wilson Papers, NMSRCA, Santa Fe.

Garcia, A. *Land of Disenchantment*. 2006. High Country News: April 03, 2006. Available at: http://www.hcn.org/issues/319/16202. Accessed 22 November 2009.

Gonzales, Moises & Rivera, José A. *et all*. *Qualitative and Visualization Methodologies for Modeling Social-Ecological Dimensions of Regional Water Planning.* Journal of Contemporary Water Research & Education. Issue 152. December 2013.

Gregory, Ian, N. *A Place in History: A Guide to Using GIS in Historical Research*. 2nd Edition. Centre for Data Digitization and Analysis, Queens University, Belfast, Northern Ireland, BT7 1NN. 2005.

Jenkins, Myra Ellen. Ojo Caliente Grant-1793. Unpublished manuscript, April 1979.

Kessell, John L. The Missions of New Mexico since 1776. Albuquerque: University of New Mexico Press, 1980.

Knowles, A.K. Past Time, Past Place: GIS for Historians. Redlands, CA: ESRI Press. 2002, ed.

Lecompte, Janet. Rebellion in Río Arriba, 1837. Albuquerque: University of New Mexico Press, 1985.

McHarg, I. L. (1969). In Design with Nature. Canada: John Wiley and Sons Inc.

Meyer, Michael C. *Water in the Hispanic Southwest: A Social and Legal History, 1550—1850*. University of Arizona Press, Tucson, AZ, 1984.

New Mexico Office of the State Historian. Website. (2004-2014). http://dev.newmexicohistory.org/about_us/history.php

Ojo Caliente (Antonio Joseph) Grant, PLC 94, Roll 43, frames 588-617.

Ojo Caliente Grant, PLC 88, Roll 43, frames 6-25.

Ojo Caliente Grant, SG 77, Roll 21, frames 6-138.

Okerlund, Gary. *Go Figure: Figure-ground as a Land Use/Transportation Tool*. tripplannermag.com/index.php/2010/07.

Ortiz, Alfonso. *San Juan Pueblo*. In: Handbook of North American Indians, Volume 9: Southwest. Washington: Smithsonian Institution, 1979.

Palmer, General W. J., and M. A. Bell. *Development and Colonization of the Great West*. London: Chapman and Hall, 1874.

Reed, Bill. *The Integrative Design Guide to Green Building, Redefining the Practice of Sustainability*. 2009.

Río Arriba County Comprehensive Plan. Adopted January 24, 2008/Amended and Adopted May 20, 2009. Prepared by Community By Design in association with Abeita Consulting Southwest Planning and Marketing.

Rivera, José. A. (1998). *Acequia Culture: Water, Land, and Community in the Southwest*. University of New Mexico Press: Albuquerque, NM.

Roach, Lt. J. P., Report: June 5-25, 1940. John E. Miles Official Governor's Papers, Correspondence, State Police, 1939-1942. SRCA.

Rodriguez, Sylvia. *Acequia: Water Sharing, Sanctity, and Place*. School for Advanced Research, Santa Fe, NM, 2006.

Sargent, F.O., P. Lusk, J. Rivera, and M. Varela. Rural Environmental Planning for Sustainable communities. 1991. Washington, DC: Island Press. pp. 272.

Siebert, Loren. *Using GIS to Document, Visualize,and Interpret Tokyo's Spatial History*. Social Science History 24:3 (fall 2000).

Simmons, Marc. *History of Pueblo-Spanish Relations to 1821*. In: Handbook of North American Indians, Volume 9: Southwest. Washington: Smithsonian Institution, 1979.

Simmons, Marc. *Settlement Patterns and Village Plans in Colonial New Mexico*. Journal of the West, 8 (January 1969): 12-19.

Spanish Archives of New Mexico (SANM I): 28, 650, 655, 656, 1098, and 1129.

Swadesh, Frances Leon. *Los Primeros Pobladores: Hispanic Americans of the Ute Frontier*. Notre Dame, Indiana: University of Notre Dame Press, 1974.

Spur.org. 2012. (http://www.spur.org/publications/library/article/grand-reductions-10-diagrams-changed-city-planning)

Tenth Census of the United States, 1880. New Mexico: Río Arriba, Mora, and San Miguel Counties. National Archives Microfilm.

Tiesdell, M. C. (2007). *The Morphological Dimension.* In M. C. Tiesdell, Urban Design Reader (p. 61). Burlington: Elsevier.

Torrez, Robert J. *El Bornes: La Tierra Amarilla and T.D. Burns*. New Mexico Historical Review 56:2 (April 1981): 161 175.

Torrez, Robert J and Trapp. *Rio Arriba: A New Mexico County*. Rio Grande Books. Los Ranchos de Corrales. 2010.

University of Minnesota Extension Residential Cluster Development Fact Sheet Series, 1998.

USGS. (2004-2012). National Elevation Dataset 10 meter 7.5 minute quadrangle Data. National Elevation Database. USA: National Cartography and Geospatial Center.

Van Dresser, Peter. *A Landscape for Humans: A Case Study of the Potentials for Ecologically Guided Development in an Uplands Region*. Biotechnic Press, 1972.