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## **Failed Agricultural Impoundments: An Interdisciplinary Assessment of Community Structure and Social Resilience**

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FAILED AGRICULTURAL IMPOUNDMENTS: AN INTERDISCIPLINARY  
ASSESSMENT OF COMMUNITY STRUCTURE AND SOCIAL RESILIENCE

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Science

in

The Department of Oceanography and Coastal Sciences

by  
Stacy Nicole Peterson  
B.S., Louisiana State University A&M, 2007  
December 2014

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## Table of Contents

Acknowledgments.....	Page ii
List of Tables .....	iv
List of Figures .....	v
Abstract .....	.ix
Chapter 1: Overview of Agricultural Impoundments and Their Roles in Southern Louisiana.....	1
Chapter 2: Description of Delta Farms .....	6
Chapter 3: Comparisons among Reclaimed Farmlands.....	14
Chapter 4: Impoundment Formation, Failure, and Aftermath .....	21
Chapter 5: Political Ecology and the Influences Shaping People and the Environment...	27
Conclusion.....	32
References .....	33
Appendices	
I. Data Sources .....	38
II. Methods .....	41
III. Interviews: .....	48
Clarence Breaux.....	48
Wayne H. Crenshaw .....	51
Barbara Fournier .....	54
Theresa Fournier .....	55
Kathleen Hunter .....	57
Marilyn Ledet.....	59
Ronald Richoux Sr.....	61
Carolyn Smith .....	62
Memoirs .....	63
IV. Sand, Silt, Clay Measurements .....	65
V. Interview release form & certification.....	66
VI. IRB Information.....	68
Vita.....	69

## **List of Tables**

Chapter 2	Page
2.1. Chart illustrating changes in Delta Farms population from 1920-2010 .....	9
Chapter 5	
5.1. Chart illustrating the parallels of Paul Robbins' five theses of political ecology with the failure of Delta Farms .....	28

## List of Figures

Chapter 1		Page
	1.1. Remnants of an ancient community’s raised agricultural fields in the Karouabo area, central coast of French Guiana from Rostain 1989. ....	1
	1.2. Pencil rendition of early 1800s Helder Dyke, North Holland. From Pictures of Holland by Richard Lovett 1887. ....	2
	1.3.A newspaper advertisement promoting reclaimed land in Louisiana as being drained on the Holland Principle From The Decateur Review, December 27, 2011 .....	3
Chapter 2		
	2.1. Harang Canal before being widened and becoming part of the Gulf Intracoastal Waterway. The Delta Farms side is to the right of the photo. ....	6
	2.2. A. One of the steam-driven pumping stations on Delta Farms. B: Drainage canal on Delta Farms, bordered to the left by undrained marsh. C: Land being plowed for the first time on Delta Farms while being overseen by manager M.M. Mallory (photo from The Country Gentleman, 1919).....	7
	2.3. Lawrence "Paca" Dufrene and Abel Theriot standing at the entrance of Delta Farms in 1930 (photo from: Jody Pougel). ....	8
	2.4. The Ledet's in front of a sharecropper's home before moving to Delta Farms where he grew watermelons (photo courtesy of Marilyn Ledet). ....	8
	2.5. Typical house on Delta Farms. This is the home of former manager Clarence Breaux's parents (photo courtesy of Carolyn Smith). ....	9
	2.6. Advertisements in an Illinois newspaper promoting trips to see Delta Farms to potential investors (The Decateur Review 1912,1913). ....	11
	2.7. Loading cane on a barge near Houma (Photo from Russell Lee 1938- Library of Congress Call Number: LC-USF33- 011841-M4 [P&P]). ....	11
	2.8. Resident, ‘Mr.Courage’ living on Delta Farms Road working in his garden (photo:Annette Cheramie). ....	12
	2.9. Old Larose Ferry was pulled by a rope on the other side. Students used the ferry to get to school before a bridge was built across Bayou	

Lafourche at Larose (photo J. Hubert-National Geographic Society). ....	12
2.10. Hand drawn map of Delta Farms around 1930s courtesy of Andrew Cheramie, former resident. 1989. ....	13
Chapter 3	
3.1. The location of the five agricultural impoundments discussed in this chapter.....	14
3.2. Map views showing the transition of Simoneux Ponds from farm land to open water. A. USGS Topographic Quad Map 1932. B. USGS Topographic Quad Map 1952. C. The image is from Google Earth for 2014.....	15
3.3. The Simoneux Ponds hotel after the Great Flood of 1927 (photo by Catherine Simoneux Accordo. ....	16
3.4. The Avoca Island pumping station from Drainage District 1. ca. 1917(Pharr family collection, LSU Archives). ....	17
3.5. The Drainage District no.1 pump station submerged in 2014 (photo by Andy Nyman). ....	17
3.6. A Google Earth Image showing the extent of flooding on Avoca Island in 2014.....	17
3.7. Sketch of the Des Allemands Drainage District in 1918 (from Okey 1918).....	18
3.8. Image of open water Des Allemands Drainage District (photo USGS Topographic 2012). ....	18
3.9. 1942 USGS quadrangle map showing Clovelly Farms. ....	19
3.10. 1998 USGS topographic map showing Clovelly Farms. ....	19
3.11. A Google Earth image of Clovelly Farms in 2014. The east-to-west rows are planted in sugar cane. ....	19
3.12. A picture taken from the bottom of a levee on the northeast corner of Clovelly Farms, illustrating the significance subsidence occurring there (photo by R. Eugene Turner). ....	19
3.13. A canal being dug on Smithport Plantation one of Edward Wisner's property's (from Merry 1909). ....	20

3.14. These USGS topographic maps illustrate the changes that the Smithport property has undergone. Starting with the 1932 cultivation, then the 1939 flooding, the 1963 further loss of land, and the more recent property drainage by 2012. ....	20
Chapter 4	
4.1. Shows the increase in oil and gas wells on Delta Farms and surrounding properties between 1956 (highlighted in white) and 1978 (highlighted in yellow). ....	22
4.2. Map illustrating the division of land on the Delta Farms property from a 1939 survey.....	23
4.3. Former location of Dixie Lafourche Club house. Pilings from the structure and docks are still visible in the water .....	24
4.4. The location of the 1961 and 1971 levee breaks on Delta Farms.(photo:courtesy of Google Earth).....	26
Appendices	
A.2.1. The locations of soil sampling. Photo Google Earth 2012 .....	41
A.2.2. 1m long core taken near Intracoastal Canal at sample site 12 (photo by author).....	42
A.2.3 Bathymetry contour map of Delta Farms 2014.....	43
A.2.4. The four different quadrants of Delta Farms illustrating differences in length of time farmed. 1-never farmed, 2-partially drained, 3-drained and farmed ~12 years, 4-drained and farmed for 62 years. ....	45
A.2.5 Locations of 5 cm sampling sites on Delta Farms.....	46
A.2.6 Graph showing the percentages of sand silt and clay recorded across the property from the transect in Figure A.1.4.....	47
A.3.1. Photo of Clarence Breaux - He worked on Delta Farms from 1929-2002 and was manager from 1992-2002. (photo courtesy of Carolyn Smith.)....	48
A.3.2. Wayne H. Crenshaw Jr. Manager Delta Farms, 1952-1992. Interviewed October 19, 2013 in Raceland, Louisiana.....	51
A.3.3. Barbara Fournier, former resident of Delta Farms from 1938-1943. ....	54



A.3.4. Theresa Fournier- former resident of Delta Farms from 1934-1943.....	55
A.3.5. Kathleen Chiasson Hunter, resident of Delta Farms from 1957-1971.....	57
A.3.6. Marilyn Ledet. Her family was employed and lived on Delta Farms 1920s-1940s.....	59
A.3.7. Ronald Richoux Sr. featured with wife, Becky Richoux, Lived in Larose, La in the 1930's and 40's.....	61
A.3.8. Caroline Smith, Former resident of Delta Farms, with her father, Clarence Breaux.....	62

## **Abstract**

The remnants of the wetland reclamation era of the early 1900s are visible in the leveed, drained, and failed impoundments across the United States, and especially in coastal regions. The common themes of their history are flooding, restoration, and – sometimes - community resilience. The physical changes occurring during and after impoundment, and after failure includes subsidence, erosion, and flooding are well-documented. Here I construct an environmental history that integrates data on these physical changes with archival records, historical documents, site visits and personal interviews. The primary region of focus is ‘Delta Farms’ - a failed agricultural impoundment in Lafourche Parish, Louisiana that was first farmed in 1909 and failed in 1971. It consisted of 4 agricultural units: one that was never drained, one that was drained but not farmed, and two that were farmed for different periods. Some of the physical data includes soil and water depth measurements in the flooded portions of the property. These physical measurements were combined to assemble an environmental history of the property that integrated the experience of individuals and community. The growth and declines in population, recreational activities, agricultural practices, occasional levee failures, and mineral recovery on the property can be related to sociopolitical decisions that shifted during its 61 year history. The accuracy and completeness of this re-creation of the Delta Farms environmental history was greatly enhanced by including residents as a source of observation. They gave insight into the rate of natural marsh recovery, the timelines of developmental activity, and of community resilience. The study was a great example of how to understand a community, the social dynamics driving environmental changes, and community reactions.

## Chapter 1: Overview of Agricultural Impoundments and Their Roles in Southern Louisiana

Environmental history has been interpreted in many different ways by historians and anthropologists. One widely used description was that by Donald Worster who described environmental history as “the interaction between human cultures and the environment in the past” (Worster 1988). The field has expanded since its introduction as has the definition and description. J. Donald Hughes described environmental history in a way that is close to what this study attempted. He stated that it is “... history that seeks understanding of human beings as they have lived, worked and thought in relationship to the rest of nature through the changes brought by time... As a method, environmental history is the use of ecological analysis as a means of understanding human history ... an account of changes in human societies as they relate to changes in the natural environment” (Hughes 2006). The dynamic deltaic environment and the expansion and shifting nature of human societies and populations in coastal Louisiana are two factors that form the basis for constructing an environmental history. These two factors working in a sometimes opaque conjunction with each other influence environmental debates in this region. The use of a reconstructed environmental history is one method of objective consideration to understand the causes and consequences of changes that occurred in an area. This is best achieved by looking at multiple variables and their interactions including historical, physical, and societal aspects.

Wetland drainage, alterations and impoundments have a long and well-documented history. Ancient communities from as early as 200 AD used raised farming techniques and drainage ditches to accomplish large scale agricultural independence (Erickson 1994; 2006). Remnants of these raised fields can still be seen from the air, shown in Figure 1.1 (Rostain 1989). Agricultural relics such as these have led many anthropologists to examine the large scale communities these wetland alterations supported (Sluyter 1994). Even in these prehistoric times, an ever occurring menace to agricultural welfare and wetland-based societies was the flooding



Figure 1.1. Raised fields in the Karouabo area, central coast of French Guiana (photo: S. Rostain 1989).

that threatened to wash away everything (Butzer 1996). These ancient communities found ways of protecting their lands and crops by raising them up, but many other wetland manipulations in the name of agriculture have not been so successful.

An impoundment is an area "created or modified by a barrier or dam which purposefully or unintentionally obstructs the outflow of

water" (Cowardin 1979). The method of impoundment varies from place to place depending on local geology, hydrology, and impoundment function, but ultimately it results in the same outcome, which is the hydrologic isolation of land and resources. The function of an agricultural impoundment is to isolate an area of land for agricultural purposes, e.g., crop development or livestock grazing (Day 1990, Warren 1911). Typically the impoundment has the purpose of flooding protection, however, depending on the location of the impoundment, natural processes can make failure increasingly more likely (Harrison 1947). Impoundments created from drained wetland areas may not be quickly restored to the pre-impoundment conditions once failure has occurred, and Okey reported a loss of forty percent in elevation when highly organic drained marshes were reflooded due to oxidation of the soils (Okey 1915, Day 1990). However, some drained wetlands have recovered vegetative growth and support a wide range of ecosystems depending on location and length of time farmed through restored hydrological functions (Turner 1994).

Across the world, the drainage and impoundment of wetland areas is well-documented



Figure 1.2. Pencil rendition of early 1800s Helder Dike, North Holland. (Lovett 1887).

and ongoing. There are several examples of mighty triumphs in engineering, such as that of the Dutch (Figure 1.2), as well as examples of mass reclamation failure such as those in the Southeast United States (Harrison 1947). In the Dutch communities of Western Europe, locations of one of the most epic fights with rising sea levels, the annual flooding and land subsidence started with the development of the diking system

(Hoeksema 2007). The system was originally developed in a manner similar to raised communities of the Amazon basin, as a method of protecting towns and villages from flooding. However the raised lands or dikes had another effect of impounding nearby land (Woodward 1915, Hoeksema 2007). The pumping systems in the Netherlands made it possible for flooded lands to be drained and farmed (Woodward 1915). Impoundments in some parts of the world have been made for use as wildlife refuges or from the connections of traversing canal spoil banks, those in the Netherlands were made with the main purpose of human expansion and agricultural development (Turner 1984). With the rising tide of the sea; came innovations to keep it at bay. When canals and ditches were no longer sufficient, mechanical pumping systems were developed. Originally these pumps of the Netherlands were drained by windmills (Woodward 1915, Hoeksema 2007). With the advent of steam-powered pumping systems, many more

wetland drainage projects were opened up not only in the Netherlands, but around the world, including the United States of America (Woodward 1915). The relevance of the Netherlands' diking system to the United States is that in many places it was promoted as example of how wetlands could be drained and utilized successfully as seen in the newspaper article from Figure 1.3 (Nesbit 1885, *Decatur Review* 1911). In one 1911 article from the Louisiana Sugar Cane Manufacturers, Edward Wisner, 'the father of reclamation' is quoted as saying:

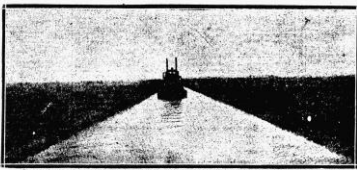
"Holland is a great country, but it isn't anything like as great in natural riches as Louisiana. When the lower coast country, sometimes called the Holland of America, has been developed to the same extent as Holland is to-day we will have the richest, and most prosperous agricultural section on the globe."

**Excursion Tuesday, January 2, 1912**

.....BY.....

**LOUISIANA DELTA FARMS COMPANY**


who own and are reclaiming 50,000 acres within twenty five miles of New Orleans, the second seaport in the United States, and the gateway to the Panama Canal. This company now has something over 5,000 acres completely reclaimed and ready for the market and the plow.



Steamboat passing the land, making daily trips to New Orleans, a two-hour ride.



Lateral ditching machine, cutting half mile per day.



Sugar cane on Louisiana Delta land, Sept. 5, 1911. Third crop, one planting, 14 feet high.

**It is the Holland Principle of Reclaiming Land and is the Richest Land in America**

Government reports and those of soil experts show this land to be as rich as the Delta of the Nile. You can raise three crops a year, corn or rice, potatoes, and winter vegetables.

It is now producing sixty to one hundred bushels of corn per acre, which brings the Chicago price plus the freight to New Orleans.

It is now producing thirty-five to sixty tons of sugar cane per acre, that sells this year from \$5.00 to \$6.00 per ton.

The oranges, figs and grape fruit of this district are of fine quality and ripen and are ready for the market thirty days in advance of the California fruits.

On our Jan. 2, 1912, excursion we will have our own private car. Upon an advance of \$50.00 we pay all expenses of round trip, such as berth, meals, railroad fare and hotel bills. Two days or more will be spent among northern farmers who are now on the reclaimed land, one day to see New Orleans, and one day each way on the road. By accepting this offer, you place yourself under no obligations. We want you to see the land and talk with the farmers who are happily located there. Land that will produce such incomes, and so favorably located, will not long sell for \$100.00 per acre on the easy terms we offer.

The reclaimed land exhibit made by the State of Louisiana at the Chicago land show, together with the company's advertisements, has brought forth so many inquiries from land seekers in Mason County, that I find it impossible to call on all before making this trip, but will be glad to meet you at my office in the Poyers Building, and furnish you with information about this reclaimed land and this most enjoyable trip.

CALL ON OR ADDRESS

**FRED W. BALDWIN**

Figure 1.3. A newspaper advertisement promoting reclaimed land in Louisiana as being drained on the Holland Principle. From: The Decatur Review, Illinois December 27, 1911.

Edward Wisner was not alone in his optimism for the reclamation of Louisiana. It is the beliefs in an untapped economic source that spurred much of the reclamation fervor that swept the country (Phenis 1911).

Some of the earliest drainage reclamation projects in the United States occurred in the Northeastern states around the 1700s mainly in tidal areas (Harrison 1947). Wetland drainage in the U.S. surged in popularity in the 19th century because of its use for agriculture, but also because of the belief that wetland drainage would deter the spread of mosquito-borne illnesses such as malaria (Pavelis 1987). By the late 1800s drainage and reclamation projects were underway across the country and particularly in the South. Up until the wetland's drainage it was mainly used for hunting, trapping, and fishing by locals who knew of its highly productive nature, but to the rest of the country these wetland areas were generally viewed as useless, filthy, disease-ridden, and wasted space (Rose 1919). So, in an effort to spark interest and raise money for flood control levees, the Federal government enacted the Swamp Land Acts of 1849 and 1850 to sell, promote and drain federally-owned marshlands (Davis

2000). Investors continued to buy large swathes of land and market it to Northern farmers and immigrants as a start to a presumed prosperous new life (Davis 2010). Drainage typically involved the installation of a large pumping station, a series of canals and ditches to promote drainage to the pump, and levees surrounding the property (Rose 1919, Harrison 1947). Impoundment failures in the form of flooding occurred due to poor levee maintenance or construction and storm events such as hurricanes. Despite these

setbacks, the land was promoted and continued to sell with hopes of creating agricultural money makers.

### **Delta Farms, Louisiana as a sample site**

Some aspects of the plight of the southern Louisiana reclamation projects are well-documented. The breadth of drainage undertakings in Louisiana were inventoried by Charles Okey (1918) and a brief history completed by Harrison and Kollmorgen (1947). Okey noted some of the physical changes exhibited in the reclaimed lands such as subsidence and soil alkalinity. Included within his survey is the impoundment this study is about - Delta Farms. Delta Farms borders the present-day Intracoastal Canal, is surrounded on three sides by fresh floating marsh and its agricultural activities ceased when its levees failed catastrophically. It is the focus in this study because it provides a great example of the ways impoundments can play such an integral role in a community's structure before, during, and after their demise (Wicker 1980, Durabb 1972). The land is now primarily used for the oil and gas deposits beneath it, and secondarily for hunting, fishing, and crabbing (Durabb 1972, DeFelice 2007, Phillips 1980). The average depth of the submerged areas is 1.5-2.4 meters and is mainly influenced by precipitation and tidal changes (Swenson 1995). Delta Farms is unique in that a true experiment in drainage can be seen in the four quadrants that make up its structure. One section was never drained, another partially drained, a third quadrant drained for 12-15 years and the last one drained and farmed for over 60 years. That quadrant was drained in 1905 and farmed from 1909-1971 (Gagliano 1973, Crenshaw 2013 (Interview), Breaux 2013, Rose 1919, DeFelice 2007). Why do these physical changes matter to the community? It has been shown that changes in range soils have played important roles as an environmental conditioner of human livelihoods and experiences (Basset 2003). The historical developments of this community's hydrology and soil characteristics in relation to social dynamics will be further discussed in the next chapters.

The broad purpose of this study might be framed this way: an estimated 54 percent of the original wetlands in the US have been drained, 87 percent of that converted to agriculture (Tiner 1984). While such mass conversions have mostly ceased in the United States, the practice of draining wetlands and using them for agriculture has continued in many countries (Smarden 2009). A reconstruction of wetland impoundment environmental histories can, perhaps, become case histories for learning about what to avoid or how to manage other wetland areas. Understanding the greater social implications over time from impoundment, failure and changes in natural productivity, is one way the subject of drainage can be broached in other countries as well as the United States.

This study was done through a combined approach of compiling archival data and historical sources from public archives and personal libraries. The data was combined with physical measurements gathered in the Lafourche Parish region from 1915- 2013 to build an accurate environmental history of the Delta Farms property. In addition, personal interviews were conducted with former residents and employees. The interviews provided details for many events that shaped the life of the property including: farming activities, environmental changes, social structures, flooding and storm events, and locations of structures on the property. In the upcoming chapters, details of Delta Farms physical and community history will be discussed as

well as the chronology of events leading to each levee failure and the response, comparisons with other reclamation projects in the area, and an evaluation of using integrative approaches to understand multiple aspects in the development, failure, and outcome of a typical southern Louisiana reclamation project.



## Chapter 2. Description of Delta Farms

Two recurring themes appear again and again in coastal areas across the United States—restoration and resilience. The restoration of coastal land and processes is linked to the resiliency of people inhabiting these coastal systems as both people and land shift and change. Coastal resilience is described by the National Oceanic and Atmospheric Administration (2014) as “the ability of a community to “bounce back” after hazardous events such as hurricanes, coastal storms, and flooding – rather than simply reacting to impacts.” What has brought the attention to these subjects? -- the understanding and realization of the importance of coastal wetlands. Despite many years of manipulation and an occasionally

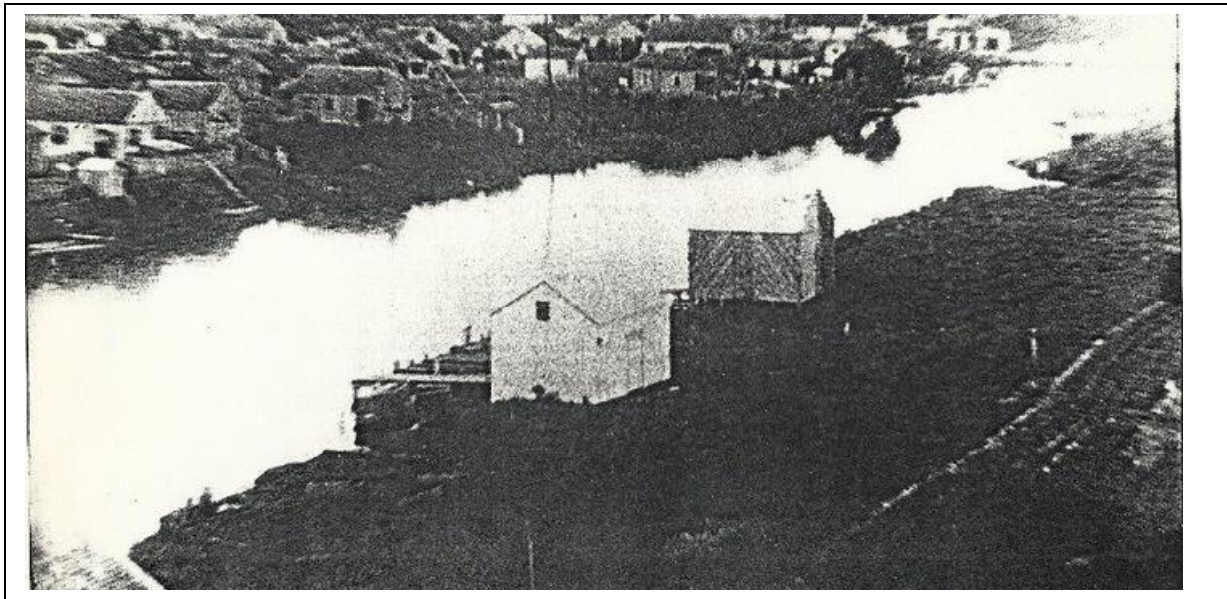


Figure 2.1. Harang Canal before being widened and becoming part of the Gulf Intracoastal Waterway. The Delta Farms side is to the right of the photo. (Photo from We Are What We Remember: The Story of Larose.)

tumultuous relationship with growth and expansion, the coastal wetlands, marshes, and swamps remain a vital asset to people throughout the world.

A certain amount of power is imparted as these entities are built and the infrastructure developed by contractors choosing land for community and business developments within and around them. In the case of the Delta Farms agricultural impoundment both the drained farmlands and the bordering marshes have played integral roles in the development of community and social bonds formed between neighbors. The growth of Delta Farms and subsequent failure was also an element of profound influence on the livelihoods of many living there and nearby including job choice, location and availability of housing, access to amenities, and supplemental hunting and trapping incomes (Defelice 2007).



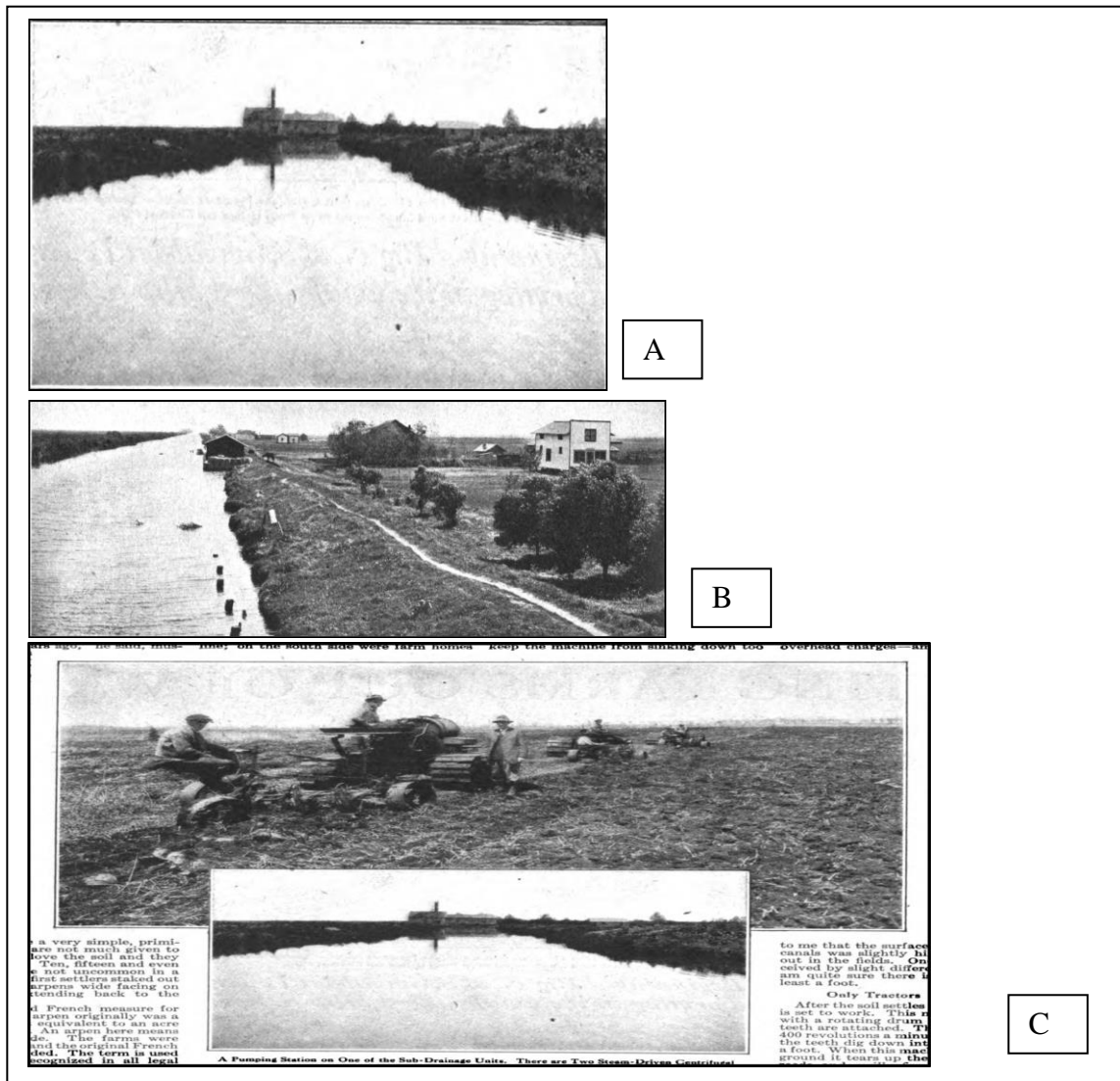


Figure 2.2. A. One of the steam-driven pumping stations on Delta Farms. B: Drainage canal on Delta Farms, bordered to the left by undrained marsh. C: Land being plowed for the first time on Delta Farms while being overseen by manager M.M. Mallory (photo by P. Rose in *The Country Gentleman*, June 13, 1919).

Delta Farms was formed as part of the large scale Southern reclamation era of the early 20<sup>th</sup> century. Around 1905 the land that was to be Delta Farms was purchased by several investors from Ohio and soon sold to Henry L. Doherty, who in 1910 became the owner of Cities Service Oil Company (Phillips 1980). Of the over 45,000 acres (182.1 km<sup>2</sup>) originally purchased, approximately 3,500 was drained and used as parts of the farm as can be seen in figure 2.2 A and B. These were referred to as District No. 1 and the Dixie (Phillips 1980, Defelice 2007). Delta Farms is located in the Barataria watershed and was bordered on the north and west by the Harang Canal (see Figure 2.1), to the east by Bayou Perot and Little Lake, and to the south by Bayou Lafourche Ridge (Durabb 1978). The Harang Canal was an important navigation waterway used to transport produce and agricultural products to the port city of New Orleans (Alperin 1983). The Harang Canal would later be widened to become part of the Gulf Intracoastal Waterway in 1935, and this alteration would come to affect the farm in multiple ways (Alperin 1983).

Production on the farm began around 1910 and started with watermelons, cotton, corn, and sugar cane, and pictures of the first plowing and the original drainage ditches can be seen in a 1919 article in *The Country Gentleman*, see Figure 2.2 (Rose 1919, Cheramie 1989, Ledet 2014). Marilyn Ledet, former resident of Delta Farms, remembered her grandfather, in Figure 2.4, loading barges full of watermelons headed for the New Orleans French Market (Ledet 2014).



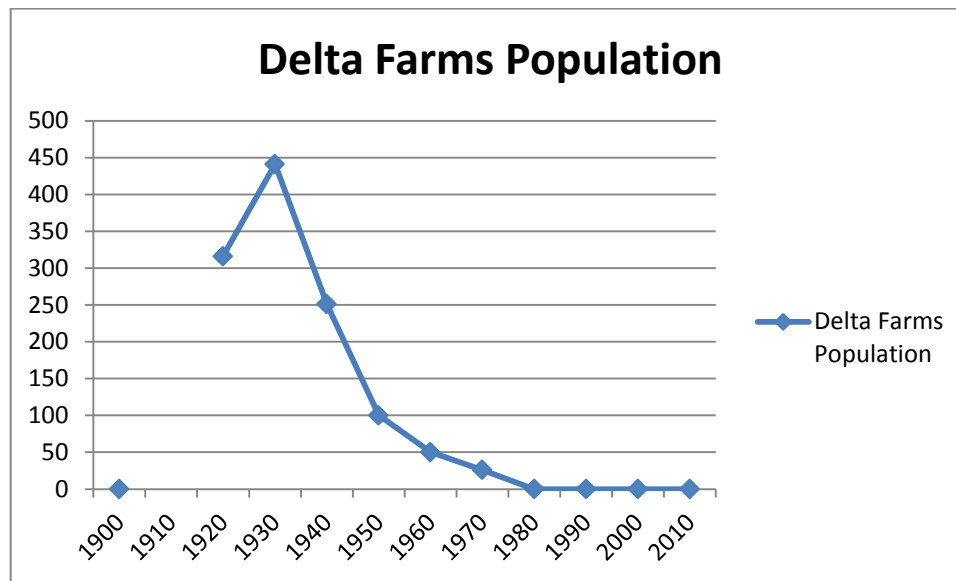
Figure 2.3. Lawrence "Paca" Dufrene and Abel Theriot standing at the entrance of Delta Farms in 1930 (photo from: Jody Pougel)

There were one hundred and sixty-eight children and 148 adults in the 55 families living on Delta Farms in 1920 (1920 US Census data), which means that the average family size was 5.74 people. Their professions included electrical engineers, oyster farmers, blacksmith, carpenters, salesmen, teacher, bookkeeper and managers, with the majority comprising farmers, laborers (1920 US Census). The majority of the children went to school on the farm, but many from 12-17 years old were also described as laborers or farmers (1920 US Census). As Barbara Fournier a 1935 resident of Delta Farms stated in an interview, even at five years old, she had to go out in to the field with the rest of her family and help to pick cotton (Fournier, B. 2013). There were many Louisiana residents working the farm, but many of the families were also recruited from Midwestern states such as Ohio, Kentucky, Illinois, and Indiana along with some immigrants from Sweden, Denmark and Austria (1920 census). The transplanted families functioned as a virtually self-sufficient community. The Delta Farms Company built and leased houses to farmers and their families on the property, along with a plot of land to maintain a family garden and a few livestock (Defelice 2007).



Figure 2.4. The Ledet's in front of a sharecropper's home before moving to Delta Farms where he grew watermelons (photo courtesy of Marilyn Ledet).

Table 2.1 Chart illustrating changes in Delta Farms population from 1920-2010



The Delta Farms owners erected housing for its employees (Figure 2.5), a company store, a blacksmith shop, and mechanic shop, school, a hotel on the property and even a landing strip for small airplanes. The pay for employees (circa 1930) was around \$1.00/ day for farm laborers and even more for tradesmen such as the blacksmith (Cheremie 1989, Davis 2010). Although considered poor, former residents reported an overall sense of satisfaction and fairness with conditions on the farm, management practices, pay and



Figure 2.5. Typical house on Delta Farms. This the home of former manager Clarence Breaux's parents (photo courtesy of Carolyn Smith)

living conditions, which it was said contributed to worker's positive productivity.

The crops grown ranged from cotton and rice, to sugar cane and corn (Phillips 1980).

The farm was described numerous times by residents and employees as a supportive and congenial environment, despite the hard and hot work of Louisiana farming. The roles people played in the community not only added to the neighborly atmosphere and kept employees happy, but provided a hierarchal backbone to the plantation structure. As the land changed oil found, crops or livestock were introduced, or the land flooded, and so did the type of work and skills required by employees.

## **Roles of the property owners**

Delta Farms was originally developed by Henry L. Dougherty. Dougherty envisioned a vast agricultural empire of over 50,000 acres in the South. On the Delta Farms property in 1905 he started to install pumps and drainage canals to drain the land, and started with an area of about 4000 acres and ending with a total drained area of 7,000 acres (1 Ha = 2.47 acres). Of those, the 4000 was the part settled and farmed for the longest period of time (Okey 1918, Phillips 1978, Rose 1919, Crenshaw 2013). It was during this time that the first land manager was hired, M.M. Mallory. In addition to finding the right management for the project, owners worked to promote Delta Farms to potential immigrants and Midwest transplants; some of the advertisements are seen in Figure 2.6 (Merry 1909, Harrison 1947, *Decatur Review* 1912, *Decatur Review* 1913). The result of such advertising was an eclectic mix of the first families on Delta Farms. While the managers maintained day-to-day farm activities including pump maintenance, it was ultimately the decision of the owners to re-drain the property after each major levee breach (Crenshaw 2013, Durabb 1978). In 1930 the ownership of Delta Farms passed to Alton Jones, and it was during this period that oil was discovered on the property, and responsibility of owners included the safe extraction of oil deposits. The first hole drilled in the pursuit of oil was a dry hole completed on December 3, 1939 and was 3703 m deep (Morgon 1953).

## **Management**

M.M. Mallory was hired to oversee the drainage process and act as Delta Farms's first land manager. Mallory was an engineer from Ohio associated with several drainage projects (1920 Census, 1930 Census, Rose 1919). There was also quite a bit of crop growth experimentation on the property including: watermelons, sugar cane, corn, cotton, potatoes and hay (Cheramie 1989, Fournier 2013, Ledet 2014, Rose 1919). Mallory was also responsible for hiring laborers and farmhands. He was described as a respectable and fair man in Andrew Cheramie's memoir of his family's life on the farm. While Mallory was the manager the main crops grown were cotton and sugar cane (DeFelice 2007). Because of the location of Delta Farms near a waterway, crops could be harvested, loaded on barges similar to that in Figure 2.7, and shipped to the French Market in New Orleans to be sold (Rose 1919, Cantrelle 2000, Cheramie 1989). Hugh Hawthorne took over as manager after Mallory in 1944 (U.S. Postmaster Appointments). In addition to maintenance of the pumps, the manager was also responsible for ensuring the levees and bridges stayed secure throughout the year. Hawthorne was followed by Wayne Crenshaw in 1952, Clarence Breaux in 1990 and Lynne Melancon in 2002 (DeFelice 2007, Breaux 2013, Crenshaw 2013). Reported in the 2007 *Story of Larose and It's People*, there was a shift in production from crops to cattle in the 1940s (Thomassie 2007). This is described as being mainly influenced by World War II and the increased need for beef production (DeFelice 2007).



## A RECORD OF 100 PER CENT

—The Louisiana Delta Farms company will on May 7 run their sixth excursion since Jan. 1 to the Reclaimed Land District of Southern Louisiana. The Mississippi River has passed all high water and has in no way interfered with the work on these Delta lands. The big 45 horsepower gasoline tractor drawing eight 16-inch bottom gang plows, cutting 12 feet at a turn, is fast completing the work of the season. In the three principal crops of sugar cane, corn and vegetables, the cultivator is now at work.

Everyone who has thus far gone with us from Decatur on these excursions has bought a tract of this land.

"It is one of the most fertile farming districts in the world"—Theodore Roosevelt.

An advance of \$50 covers the entire cost of the trip—everything. Special features of the trip are a 50-mile motor boat ride through the reclaimed district and a 25-mile ride by water from these lands to New Orleans with two days to see that beautiful city.

Many ladies are making this instructive and delightful trip. Whether you are a land buyer or not, you are invited to join this excursion. Leave Decatur next Tuesday evening at 8:40 and return the following Tuesday evening at 7:43 p. m.

For reservations call on Fred W. Baldwin, General Agent, 326 Powers Bldg., Automatic 1969.

## DECATUR BUSINESS MEN INTERESTED

—A party of business men from Decatur will, on Tuesday, May 21st, take advantage of the opportunity offered by the Louisiana Delta Farms Co's excursion to see the reclaimed lands of southern Louisiana. The features of this trip will be a fifty-mile motor boat ride, through the reclaimed districts, a two days' stay on the lands at Delta Farms, where the most thorough job of reclaiming ever accomplished in America will be inspected, and then a twenty-five mile boat ride from the lands to New Orleans, and two days sight-seeing in that city.

People who have just returned from this district say that the greatest flood in the history of the Mississippi has not affected these lands except to prove conclusively that they are not subject to flood waters from any source. Crops are in fine shape and a dozen new houses are being built at Delta Farms.

The entire trip takes one week, total cost is \$50, everything included. Whether land buyer or not, you are invited to join this excursion. For reservation see Fred W. Baldwin, General Agent, 326 Powers Building. Automatic phone 1969.

## GOING TO SEE THE MARDI GRAS

—Many from Decatur and vicinity will join the Baldwin Party leaving Decatur Tuesday, Jan. 28. Mr. Baldwin has made arrangements with the Louisiana Delta Farms Co. for a limited number of reservations in their private car that provides first-class sleeping and dining accommodations for the entire trip, including the stay in New Orleans for the two big days of the Mardi Gras.

Three days will be spent at a fine hotel at Delta Farms, La., on the lands of the above named company, 25 miles southwest of New Orleans, where they are reclaiming 46,000 acres of the most productive farm lands in America. This part of the trip will include motor boat excursions through the orange, fig and pecan orchards of the reclaim district, and a return trip by water to New Orleans.

Many people spend hundreds of dollars each year to see the Mardi Gras, while an advanced payment of \$50 covers the entire cost of this trip, as outlined above. All are invited, and especially the progressive farmer who wants to own land where he can raise three crops a year, and at a time when those crops bring top prices. Act promptly if you want to make this trip. Call on any of the following agents of the Louisiana Delta Farms Company:

Jacob C. Kuns, Monticello, Ill.  
Monroe & Flynn, Sullivan, Ill., or  
Fred W. Baldwin, General agent, 326 Powers building, Decatur, Ill. Auto phone 1969.—Adv.

Figure 2.6. Advertisements in an Illinois newspaper promoting trips to see Delta Farms to potential investors (*The Decatur Review*, 1912, *The Decatur Review*, 1913).



Figure 2.7. Loading cane on a barge near Houma. (Photo from Russell Lee 1938- Library of Congress Call Number: LC-USF33- 011841-M4 [P&P])

The final flood of 1971 occurred during Crenshaw's management and from that moment the responsibilities of the manager changed. The main area managed was submerged farmlands and a new crop was raised from the depths that of fish, shrimp and crabs (Durabb 1978). The managers currently prevent public access with the use of gates blocking entrance points from the Intracoastal Waterway. Throughout

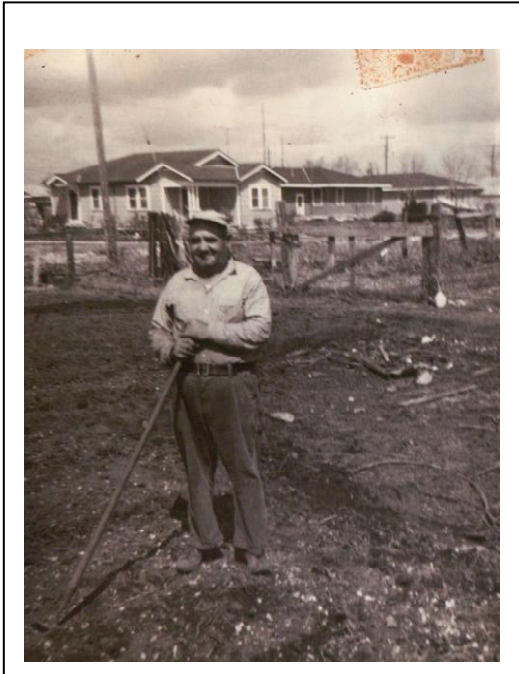


Figure 2.8. Resident, ‘Mr.Courage’ living on Delta Farms Road working in his garden (Photo: Annette Cheramie).

the life of the property the managers also sustained hunting leases in the surrounding marshes, owned by Delta Farms (Miller 2014, Crenshaw 2013).

### Farmers/ Laborers

If the owners were the head, and managers the brain, then the farmers were definitely the backbone of Delta Farms while their families provided the heart and soul of the community.

The farmer’s job was not easy, but all resident interviews,

“Everybody was poor in money, but rich in family, friends, and the ability to enjoy life even in the poor surroundings.”

-Andrew Cheramie, 1989

memoirs, and stories, describe the overall life on Delta Farms as difficult but a strong comradery among families. Farmers were assigned plots of land which they were in charge of maintaining. For those families actually living on the Delta Farms property, their house

was on a 40 acre plot of land which included a family garden and pasture animals that they were responsible for maintaining (Cheramie 1989).

As mentioned previously, farmhands ranged in age from 14 and up. Education, however, was very important to the parents of Delta Farms and most children went to school on the property (Cantrelle 2000). After the school on the property closed students would walk up to 3 miles a day to attend school in Larose (Breux 2013, Cheramie 1989, Defelice 2007).

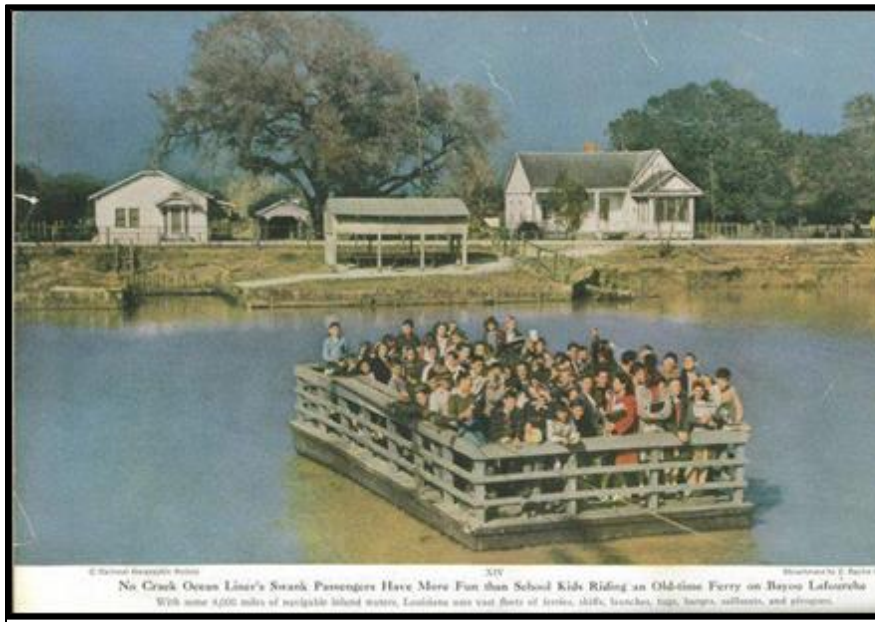
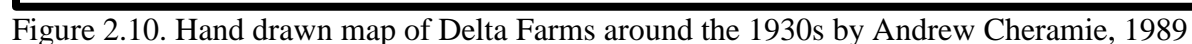


Figure 2.9. The Old Larose Ferry was pulled by a rope on the other side. Students used the ferry to get to school before a bridge was built across Bayou Lafourche at Larose (Photo J. Hubert-National Geographic Society).

The closeness and supportive nature of the community, was very important during times of duress, such as hurricanes and floods. Many residents recalled during the three property floods, everyone from nearby Larose, Louisiana would come to help move animals and belongings from the property as quickly as possible (Cheramie 1989, Adams 2014, DeFelice 1977-deposition). The flooding events on the property are examined with more detail in chapter 3 along with details of community involvement, and physical property changes that were measured and observed by residents. Ms. Caroline Smith described Delta Farms entrance as, “You could see when you get off the bridge in Delta Farms, you’d go down. Even though it wasn’t flooded at the time, you could tell it was like a bowl” (Smith 2013).





### Chapter 3: Comparisons among Reclaimed Farmlands

The impoundment, reclamation and failure of Delta Farms was certainly not a unique sequence of events in south Louisiana. What does make Delta Farms unique is the length of time it was farmed before abandonment and the size of the community it supported. A number of projects are described in Charles Okey's 1918 description of reclaimed lands in Louisiana, including several in and near Lafourche Parish. Okey described the physical characteristics of the properties, including the size, layout, location and subsidence since reclamation (Okey 1918). Many of these reclamation projects were re-examined by Harrison and Kollmorgen (1947) who included information on their failures. In addition, they address some of the communities and workforce living on some of the impoundments (Harrison 1947). Both of those articles have been referenced many times in the descriptions of failed impoundments in Louisiana, and also in Donald Davis' book "*Washed Away,?*" where he describes some of the community features of the agricultural impoundments including details about housing, agricultural endeavors and failures (Davis 2010). As mentioned previously, many did not possess the longevity of Delta Farms and many owners lost large sums of money in their agricultural pursuits. Below are some details and descriptions of five agricultural impoundments in southern Louisiana (Figure 3.1).

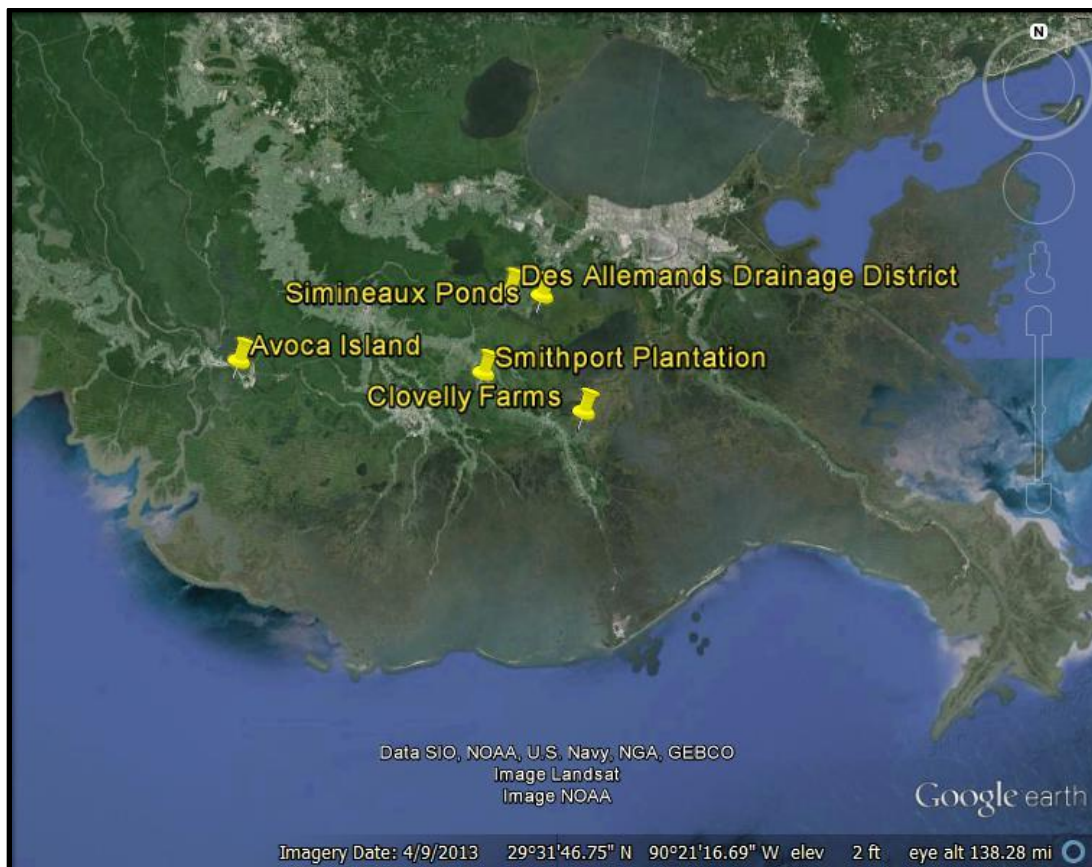


Figure 3.1. The location of the five agricultural impoundments discussed in this chapter. Photo from Google Earth



## Simoneaux Ponds

Located near Des Allemands, Louisiana, this failed impoundment was the location of multiple attempts at cultivation (Figure 3.2). Beginning in 1920 with the purchase by a Mennonite community, Simoneaux Ponds was drained and planted with rice and corn (Davis 2010). Many land companies promoted reclaimed ventures as opportunities for religious groups to start fresh and support themselves off the land (Harrison 1947). This is perhaps what first drew the interest of the Mennonite community to this location. However, like many new settlers and immigrants, the extent of engineering needed to maintain the land and the lack of profit proved to be too difficult and the land was sold. In 1929, the Simoneux family unsuccessfully attempted to use the land as an alligator and muskrat farm (Davis 2010). They did, however, use

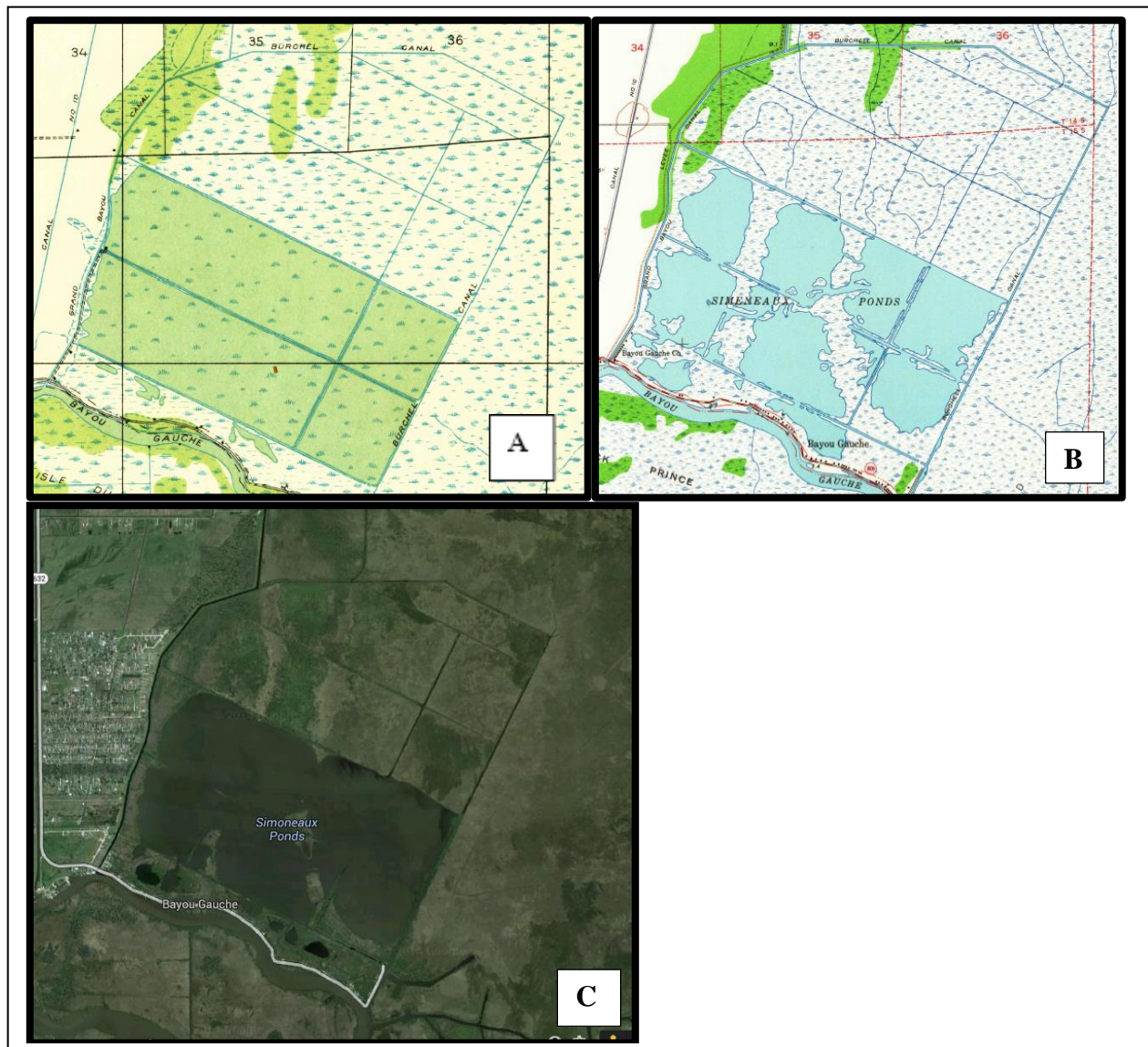


Figure 3.2. Map views showing the transition of Simoneaux Ponds from farm land to open water. A. USGS Topographic Quad Map 1932. B. USGS Topographic Quad Map 1952. The image is from Google Earth for 2014.

a three-story hotel on the property as a resort hotel (Figure 3.3). This hotel was originally built to house farm workers ([www.st.charlesgov.net](http://www.st.charlesgov.net)). In the 1930s the hotel was replaced with a clubhouse and the family leased land to a hunting camp until 1982 (Davis 2010, St.Charles gov.net). Figures 3.2 A-D show the typical transition that occurs in a drained wetland impoundment that has been inundated. In Figure 2A, from 1932, the land, while impounded, has not failed yet. Most of the land was submerged by 1952 (Figure 2.1B). It is at this time, like many failed impoundments, that the land was mostly used for hunting and fishing. Based on topographical maps, the impounded areas appear to erode, leaving the current image in Figure 3.2.C of a mostly open water area.



Figure 3.3. The Simoneux Ponds hotel after the Great Flood of 1927 (photo by Catherine Simoneux Accordo).

### **Avoca Island**

The Avoca Island Drainage Project was a private venture located in St. Mary Parish (Figure 3.1). As early as 1803, this land was claimed and used as cattle pasture by Samuel Rice Sr. who at the time referred to it as Cowpen Island (Kelly 1988). The land was sold to the Woffered family who created a large sugar cane plantation on the property. Sugar cane was first recorded as being planted in 1844. The Woffered family plantation thrived until the Civil War erupted, resulting in heavy losses to the Woffereds (Kelly 1988). After changing hands several times, it was owned by the Pharr family who in 1917 added the drainage pumps shown in Figure 3.4 and 3.5, and which serviced approximately 16,000 acres (Kelly 1988). The Pharr family used the land partly for agriculture and partly for cattle grazing. Like Delta Farms, Avoca Island supported a large number of workers as evidence from a 1912 panoramic photo showing workers houses (Kelly 1988). The property was seriously damaged by the 1927 Mississippi River flood. Harrison and Kollmorgen reported that only 13,500 acres remained with the rest lost to flooding, subsidence and erosion (Harrison 1947, Kelly 1988). The Island now is partly used for cattle, and the rest is used by the Avoca Duck Club. A Ducks Unlimited Project report from 2005, indicated it as the location of a restoration project involving the installation of several water control

structures. This was done with the hopes of increasing the amount of emergent and submerged aquatic vegetation and to minimize erosion (Dew 2005). Looking at the current image of the property in Figure 3.6, it appears that there has been some success in the increase of aquatic vegetation



Figure 3.4. The Avoca Island pumping station from Drainage District 1. ca. 1917 (Pharr family collection, LSU Archives).



Figure 3.5. The Drainage District no.1 pump station submerged in 2014 (photo from Andy Nyman).



Figure 3.6. Image of Avoca Farms currently flooded areas, Google Earth 2014

### **Des Allemands Drainage District**

Also known as Lafourche Drainage District no. 6, the Des Allemands Drainage District was a short-lived endeavor that was never able to support a large community. Drainage on this impoundment began in 1910 and was one of several described by Okey in his survey of reclamation projects in Louisiana (Okey 1918, Harrison 1947, Gagliano 1979). The sketch in Figure 3.7 was a rendition of drainage canals and levees drawn by Okey (Okey 1918). What was not mentioned by Okey is the poor planning that went in to the design and location of pumping stations and canals. This, along with storms and burrowing animals, contributed to problems with

seepage and subsidence that compromised levees (Gagliano 1979). The cumulative effects of soil oxidation and flooding resulted in more than 1300 acres to sink up to 5 feet below sea level. It is now an open water pond (Figure 3.8) and has served as a wildlife hunting area since the 1940s (Harrison 1947, Gagliano 1979, Davis 2010). This project, like many that were started in the reclamation era, illustrate the prevalence of unfortunate planning and lack of knowledge in alluvial soil characteristics by the investors taking on these developments.

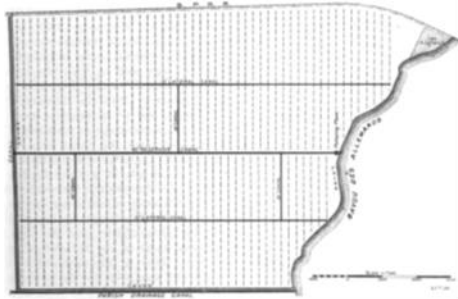


Figure 3.7. Sketch of the Des Allemands Drainage District in 1918 (from Okey 1918)



Figure 3.8. Image of open water Des Allemands Drainage District. (photo USGS Topographic 2012).

### **Clovelly Farms**

Clovelly Farms, started in 1916 is one of the few agricultural reclamation projects that continues to exist as a farm. Clovelly is a 2,500 acre plot of land located in Lafourche Parish, south of Delta Farms (Harrison 1947; Figure 3.1). It started as a tenant farm, but was later switched to a central management system. Clovelly is proudly described in a 1946 book about Lafourche Parish as the largest individually-owned farm in the parish (Borne 1946). Clovelly also supported up to 500 people on their property according to the 1940 Census, and many of them were friends and family members of those on Delta Farms. The farm was used to grow several experimental crops including sugarcane and cotton (Borne 1946, Davis 2010, US Census 1940). When faced with soil acidity problems, the owners mixed large amounts of calcareous sand into the soil to support crop growth. Figures 3.9 and 3.10 illustrate two things: first the significant decrease in population living on the property between 1942 and 1998, and, second, the increase in subsidence that has occurred on the property. In 1942, the farm was one to three feet below sea level, however by 1998 it was over five feet below (USGS Quad maps 1942 and 1998).





Figure 3.9. A 1942 USGS quadrangle map showing Clovelly Farms.

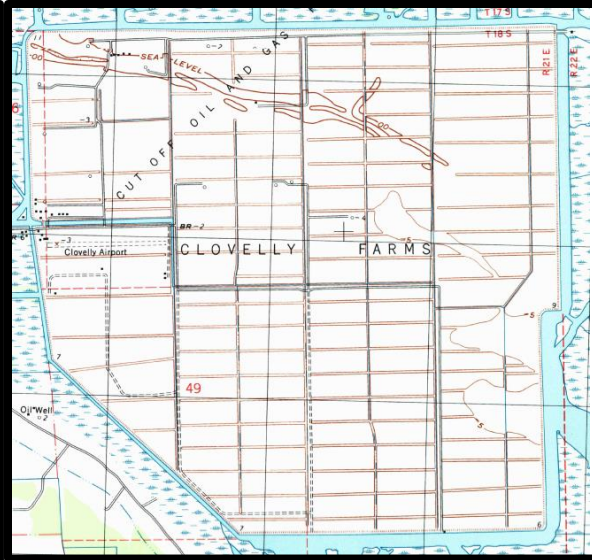


Figure 3.10. A 1998 USGS topographic map showing Clovelly Farms



Figure 3.11. A Google Earth image of Clovelly Farms in 2014. The east to west rows are planted in sugar cane.



Figure 3.12. A picture taken from the bottom of a levee on the northeast corner of Clovelly Farms, illustrating the significant subsidence occurring there (photo by R. Eugene Turner).

The property is still currently cultivated with sugarcane (Figure 3.11) and there are also several oil and gas wells on the property. Like most of the land in southern Louisiana, Clovelly Farms has continued to subside. In Figure 3.12, the view from below a levee on the property shows the dramatic difference in elevation that exists between the inside of the property and the area around it (the levee top is about 3-5 feet above the water level outside the levee).

## Smithport Plantation

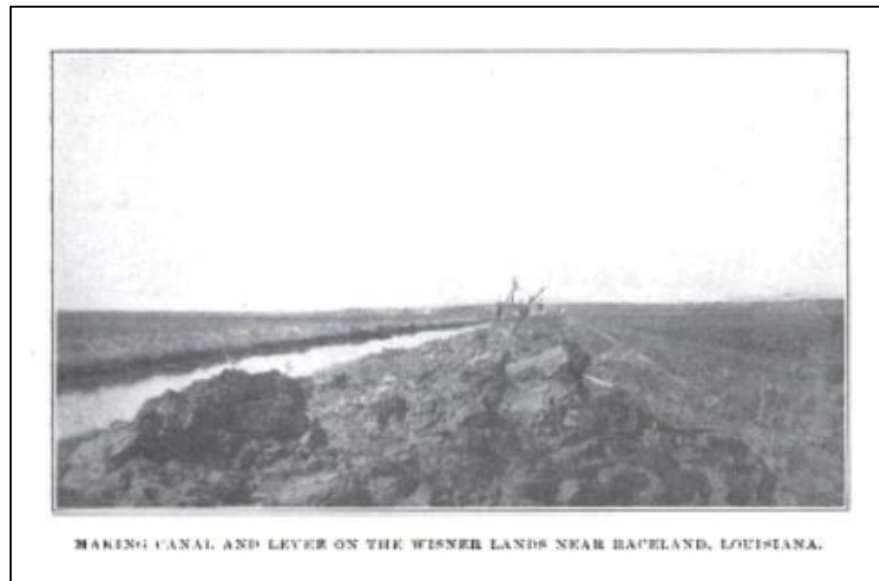


Figure 3.13. A canal being dug (from Merry 1909).

Smithport is a 846 acre track of land near Lockport, LA, that was drained and developed in 1909 (Gagliano 1979). The plantation was part of the large drainage project intialized by Edward Wisner (Davis 2010). Smithport is described in promotional materials titled “The Call of the Alluvial Empire” as one of Wisner’s successful reclamation projects.

Figure 3.13 is an image from that brochure

showing the construction of a canal on the property (Merry 1909). The damage of tropical storms and financial stress brought on by the Great Depression (1927-1934) resulted in the failure of the levees on the property, which can be seen on a 1939 topographic map (Figure 3.14, Gagliano 1979, Davis 2010). 2012 maps, however, show vegetation on the land indicating a renenwed drainage project on the land.



Figure 3.14. These USGS topographic maps illustrate the changes that the Smithport property has undergone. Starting with the 1932 cultivation, then the 1939 flooding, the 1963 further loss of land, and the more recently the property is drained again in 2012.

## **Chapter 4. Impoundment Formation, Failure, and Aftermath**

### **The major historical developments**

There are three major developments that led to the formation of the Delta Farms agricultural area and failure. The first was legislation. The Swamp Land Acts of 1849, 1850 and 1860 were implemented to raise funds for the State of Louisiana to aid in levee construction and maintenance (Davis 2000). The Swamp Land Acts granted states the right to sell wetlands to private owners with the intent to drain the land and use it as a means of financial gain. The implementation of this policy was viewed as an innovative solution to lack of funding sources and an opportunity to use the “barren marshlands”.

The second was the development of the Gulf Intracoastal Waterway (GIWW). The GIWW, on the north-west side of the property, is a major transportation channel through the Gulf Coast to the eastern United States. It was championed by a Texas group known as the Gulf Intracoastal Canal Association seeking legislation allowing for a navigable waterway extending from Galveston to New Orleans. The Association successfully lobbied for the passing of the Rivers and Harbors Act of 1925 which authorized the GIWW's construction (Alperin 1983). The GIWW was completed by 1935 and was integrated within a network of existing canals that were deepened and widened to accommodate larger vessels (Alperin 1983). To the northwest of Delta Farms the Harang Canal was integrated into GIWW. The creation of the GIWW increased the ease of transport between ports, and for Delta Farms production to move to these ports.

The third major development was the discovery and extraction of oil reserves. Canals were dredged to extract the oil and gas buried thousands of feet belowground. The canals and their spoil banks (formed with the materials dredged to form the canal) have been attributed with increased erosion, saltwater intrusion, and flooding throughout Gulf Coast region (Turner 2002, Gagliano 1973). The crisscrossed patterns of drilling canals still cover the marshes. The length of canals dug for oil and gas more than doubled from 1956 to 1978 (Gagliano 1973). These features have consequences for the ecosystem and are a continued presence on the property, and were the central focus of a lawsuit brought against the oil companies operating on Delta Farms as well as the Delta Farms Corporation that is discussed below.

These three developments led to the environmental evolutions impacting creation, development, and industry on Delta Farms, along with the land changes within that occurred with that drainage: Subsidence, soil oxidation, and erosion after flooding (Turner 2004, Turner 1984). They also brought with them environmental changes outside Delta Farms in the form of increased flooding vulnerabilities, altered hydrology with faster water currents, and an influx of saline waters into freshwater environments (Durabb 1972, Falgout 1978). The physical changes within Delta Farms, for example, were observed from the first moments after of land drainage - most notably a significant subsidence rate of up to 10 cm in the first year, and an average of 1 cm / year afterwards (Okey 1918a, Turner 2004).





Figure 4.1 Shows the increase in oil and gas canals on Delta Farms and surrounding properties between 1956 (highlighted in white) and 1978 (highlighted in yellow). Map: From Google Earth

## Levee Failures

There were three major levee failures (Figure 4.4) throughout the history of the farmed area.

### 1927

The first levee breach in 1927 occurred forty-three years before the last Delta Farms breach (Breux 2013; Davis 2007, Cheramie 1989). A levee on the south side of the property broke in the early morning hours of April 17, 1927, flooding the farmed area. According to residents' memoirs, this first break was initiated by high flood waters connected to the Great Flood of 1927, and occurred simultaneously with a breach in the Mississippi River levees near Donaldsonville, Louisiana (Crenshaw 2013). Andrew Cheramie, who lived on the Delta Farms property, noted that three days and nights of rain started on April 15, 1927. The levees bordering the southern portion of the property collapsed, causing water to pour into the impoundment and stranding some residents (Cheramie 1989).



“One Good Friday in 1927, a deluge began to fall and it rained for three days and nights. The levees around the farm could not contain the rising waters and the entire farm was under water. We had to be evacuated to Larose on a large barge.” (Cheramie 1989)

The owners of the property re-drained the property which took approximately 3 months (Crenshaw 2013, Cheramie 1989). The 1930 Census indicated that many residents returned and, in fact, the population increased by 1940 (US Census 1930,1940). Like many drained coastal impoundments, Delta Farms’ significance subsidence added to its vulnerability and increased the reliance on pump systems and drainage ditches (Day 1990, Lafourche 2013). Several residents noted that in the following years, certain areas of the land held water and flooded after heavy rainstorms making road crossing and bridges inaccessible in some cases.

### 1961

Another levee failure occurred on September 11, 1961, prompting another extended evacuation. According to the manager at the time the failure, levee failure was attributed to poor levee conditions and to Hurricane Carla (Crenshaw 2013). In a 1962 report on hurricanes of the past year, Hurricane Carla was described as the most intense and destructive hurricane to strike the Gulf Coast to that time, and the high tides and flooding in both Louisiana and Texas played a large role in this description (Dunn 1962). The main income from the land by the second flood was in the form of oil and natural gas wells. The main agricultural uses had shifted to sugar cane

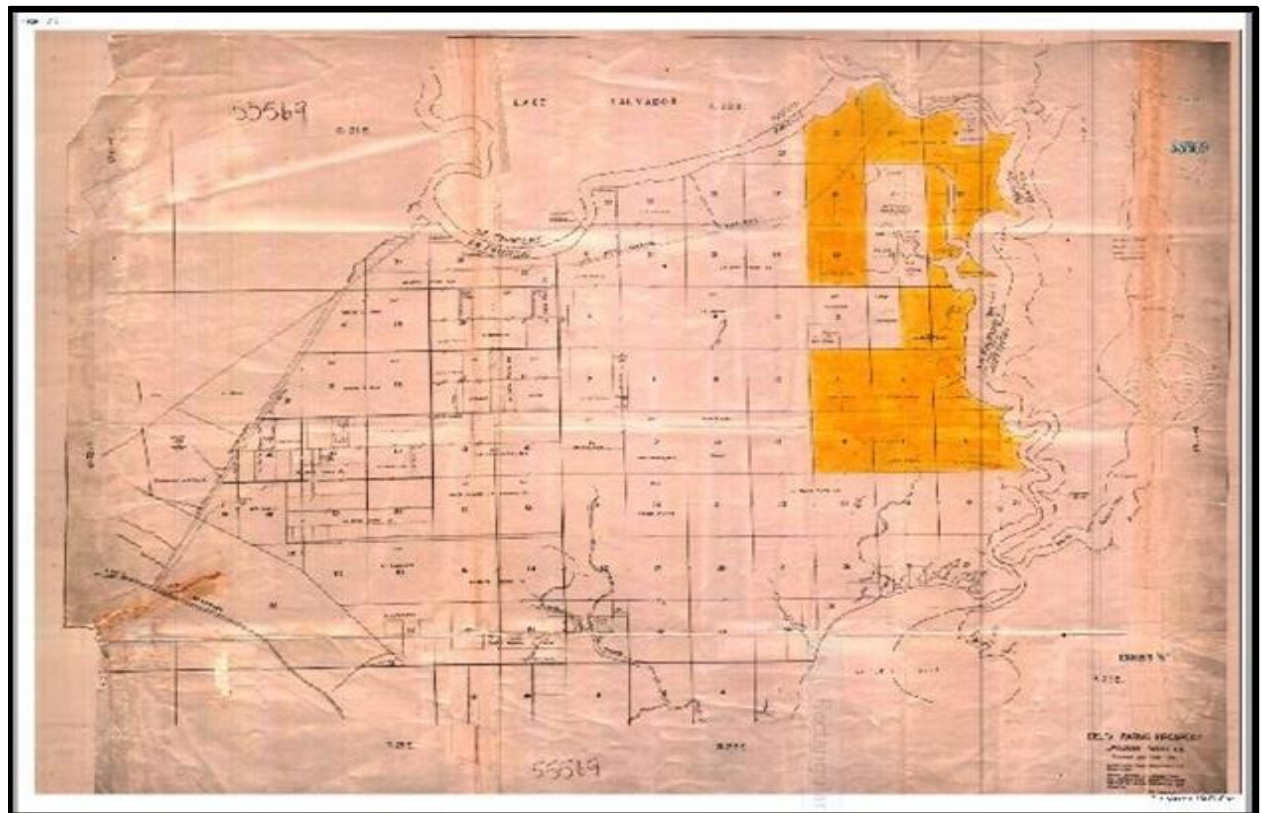


Figure 4.2 Map illustrating the division of land on the Delta Farms property from a 1939 survey.

and cattle grazing (B.Fournier 2013, Crenshaw 2013, Breaux 2013). Many families after the 1961 flood chose to move to higher ground either on the Delta Farms road or nearby Larose. According to an interview with the manager at the time, Wayne Crenshaw Jr., the decision to drain or not after the 1961 flood was influenced by an agreement between the owner of one of the gas wells and the owners of Delta Farms (Crenshaw 2013, Chiasson 1977). Figure 4.2 illustrates the multiple ways ownership was distributed in the property before it was flooded - a feature that contributed to its re-drainage in 1961-1962 (Crenshaw 2013). The oil well owner, named Meachum, agreed to pay the costs of levee reconstruction if Delta Farms agreed to drain the property. After the impoundment was drained, it was mainly inhabited by employees hired by Crenshaw, and families that leased property for cattle and sugar cane (Crenshaw 2013, Chiasson 1977, Pierce Sr. 1977). The use of a portion of the property was as a hunting club, which introduced some of the alternative land uses for the failed impoundment.



Figure 4.3 Former location of the Dixie Lafourche Club building. Pilings from the structure and docks are still visible in the water.

### 1971

The levees of Delta Farms failed one final time on September 12, 1971, ten years after the previous failure. Lester Chiasson was awakened around 6:00 AM to the calls from manager Wayne Crenshaw for help because the levee had broken on the northern side of the property, Fig. 2; Chiasson 1977). The deposition from a subsequent lawsuit describes the mad dash by farmers to remove their cattle and equipment as fast as possible, while the impoundment filled with water. Kathleen Hunter, a 14 year old at the time, recalled watching as the water rose over three days and finally forced her family to take a boat from her aunt and uncle's camp at the northern portion of the property to get to land (Hunter 2013).

Some of the after-effects of the flood described by farmers were the economic losses of building materials and equipment, as well the stress put on the cattle to move and sell them quickly. Many cane farmers had extra sources of income, but still described the loss of the ability to plant their final crop (Cheramie 1977, Pierce 1977, J. DeFelice 1977, Herbert 1977).

A lawsuit by farmers living and leasing the land alleged that the final levee break was because pipelines intersecting the levees led to weakening of the levees and contributed to their failure (Chiasson, 1977, LaFont 1977). Failures of impoundment levee systems were not uncommon at the time, which is when the primary responsibility for private levee maintenance was on the property owner (Miller 2014, Davis 2000). Impoundments built between 1918 and 1985 in the Louisiana Coastal Zone had a failure rate of 13% over time (Day 1990). Harrison and Kollmorgan's 1947 Reclamation assessment estimated that the variability in levee heights ranged from 2 feet to 8 feet, and that the Delta Farms levees and drains, specifically, were in "a deteriorated state" (Harrison 1947). This early assessment gives one outlook into the constant struggle to maintain levees. Factored into that maintenance was the cost of building up the levee after it settled, subsided, and eroded; maintenance was also required to compensate for wildlife burrowing and storm damage (Harrison 1947, Gagliano 1973, McFalls 2010).

Once the property flooded it was mainly used by the nearby residents of Larose for fishing, swimming, duck and alligator hunting, and trapping (Cheramie 2013, Hunter 2013, Durabb 1972, Crenshaw 2013). There are a number of hunting leases on the property and several camps on the edge of the property. The property remains an active site for oil and gas extraction. The land bordering the Intracoastal Waterway and eastern most portion of the flooded property has shown increased shallowing over time due to sediment and organic matter accumulations (Miller 2014, Lafourche 2013).

Policies at the local and national level played an intrinsic role in the development of the agricultural impoundment. For instance, the Swamp Lands Act of 1850 influenced the widespread drainage of wetlands and convergence to agricultural lands in Louisiana (Davis 2000). The purchase of the property by Henry Dougherty and subsequent ownership by Alton Jones, both prominent figures in the oil industry were strong contributors to the longevity of the impoundment. Unlike many other failed impoundments the owners possessed the financial ability to maintain their property and pumps despite setbacks of flooding and multiple levee failures. The discovery of oil on the land also provided an additional income so the property was not entirely reliant on its agricultural endeavors. The economic shift in the area also had an effect on employees of Delta Farms. As the crop shifted to cattle production, so did the growth in the oil industry in that region. Without the need of intensive farming, many farmers and laborers transferred to oil industry jobs and moved off the property (Padgett 1969). Now making more money, the farming community was not as dependent on hunting, fishing and trapping to supplement food and income. The 1930 Census documented approximately 400 people living on the property. Only about 26 remained by 1971, the year of the final levee failure (1930 Census, Adams 2014). These factors ultimately contributed to the decision not to pump out the water after levees in Delta Farms' final failure.



Figure 4.4 The location of the 1961 and 1971 levee breaks on Delta Farms (photo: courtesy of Google Earth.)



## **Chapter 5. : Political Ecology and the Influences Shaping People and the Environment**

Political ecology is one means of providing an encompassing system to classify and review the many players whether human or physical that interacts to direct the behaviors, lives and development of communities. If applying this sort of ecological thought to a community such as Delta Farms, one might consider several important features that worked to shape and direct the people along with their environment. Here we might apply five key theses presented by Paul Robbins as integral to understanding the connections of environment, politics and community. These theses include: degradation and marginalization, conservation and control, environmental conflict and exclusion, environmental subjects and identities, and political objects and actors (Robbins 2004). Applying these theses can help to give a sense of the role political ecology played in the construction, maintenance, failure, and current uses of the Delta Farms property.

### **Degradation and marginalization**

Several topics can be addressed under this these and all played a unique role in the developmental history of Delta Farms. Beginning with the Swamplands Act of 1849, this act was originally implemented with the purpose of raising excess fund for the state of Louisiana to aid in levee creation and maintenance to counter problems with flooding in the numerous habitations along the river (Harrison 1947, Davis 2000). The Swampland Act granted states the right to sell wetland areas to private owners with the intent to drain the land and use it as a means of financial gain. This of course led to the drainage and creation of Delta Farms along with the land changes that occurred with that drainage; subsidence, soil oxidation, and erosion (Trepaigner 1995). The implementation of this policy was viewed as an innovative solution to lack of funding sources and an opportunity to use the “barren marshlands”. Next was the development of the Gulf Intracoastal Waterway (GIWW). In the early 1900’s there was a strong push from a Texas group known as the Gulf Intracoastal Canal Association, for legislation allowing for a navigable waterway extending from Galveston to New Orleans. They succeeded with the passing of the Rivers and Harbors Act in 1925 (Alperin 1983). The GIWW was connected through a network of existing canals with those being deepened and widened for larger vessels. To the east of Delta Farms was the Harang Canal which was used as a connecting canal for the GIWW. While the creation of the GIWW increased the ease of transport between ports, for Delta Farms it also brought with it environmental changes in the form of increased flooding vulnerabilities, altered hydrology with the faster water currents, and the influx of saline waters into freshwater environments; affecting native plants and wildlife sensitive to these habitat changes (Durabb 1978). Finally the last major contributor to the degradation and of the marsh and farm was the discovery and extraction of oil reserves and deposits. With the exploration and drilling of oil and gas deposits in Delta Farms and surrounding marshes, came the crisscross patterns of drilling and pipeline canals that still cover the marshes. The canals have been attributed to increased erosion, saltwater intrusion, and flooding throughout Gulf Coast region (Gagliano 1973).

### **Environmental conflict & exclusion:**

As previously mentioned before the construction of Delta Farms, the land was inhabited first by Native American hunters and fishermen, then subsequently by German immigrants and

the Acadians of Canada. These immigrants also lived off the land as hunters, trappers, and fishermen (Davis 2000, Phillips 1980). Following the drainage of the farm lands many of these same immigrant families worked as laborers and supplemented their income by continuing to use the lands for hunting, fishing, and trapping. With the alterations of the land, habitat was reduced, also reducing the amount of stock able to be taken by trappers and hunters. But more important in the examination of this thesis was the exclusion that occurred following the final failure of the impoundment. Hunting leases reportedly increased in price significantly, limiting the ability of trappers and hunters to supplement their income (Crenshaw 2013). Families who

Table 5.1. Chart illustrating parallels of Paul Robbin’s five theses of political ecology with the failure of Delta Farms.

<b><u>5 Theses of Robbins (2004)</u></b>	<b><u>Definition</u></b>	<b><u>Delta Farms</u></b>
<b>Degradation &amp; Marginalization</b>	“Otherwise environmentally innocuous production systems undergo transition to overexploitation of natural resources on which they depend as a response to state development intervention and/or increasing integration in regional and global markets”	Swamp Lands Act 1849, Rivers and Harbors Act in 1925, development of the Intracoastal Canal, oil and gas drilling, and land drainage
<b>Environmental conflict &amp; exclusion</b>	“Increasing scarcities produced through resource enclosure or appropriation by state authorities, private firms, or social elites accelerate conflict between groups (gender, class, or ethnicity).”	Originally marsh lands used for hunting, trapping, and fishing by Cajuns, bought by corporation converted to farm lands and hired same hunters/fishermen. After impoundment failure, recreational uses limited by purchased leases. Lawsuit brought against company after 1971 failure
<b>Conservation &amp; Control</b>	“Control of resources and landscapes has been wrested from producers or producer groups (associated by class, gender, or ethnicity) through the implementation of efforts to preserve “sustainability,” “community,” or “nature.” In the process, local systems of livelihood, production, and socio – political organization have been disabled by officials and global interests seeking to preserve the “environment.””	Coastal Zone Management Act of 1972. Introduced plans and policy to reduce further degradation of marshlands and increase recreational uses of Lafourche Parish impoundments
<b>Political Objects and Actors</b>	“Material characteristics of non - human nature and its components (dung, climate, refrigerators, bacteria, lawn grass, road salt, goats, and tropical soils) impinge upon the world of human struggles and	Corporate farm owners, Oil and Gas tax laws and subsidies, levees and Levee Boards, nutria, hurricanes, subsidence

	are entwined within them, and so are inevitably political. Yet as these characteristics and agents assume new roles and take on new importance, they are also transformed by these interactions.”	
<b>Environmental Subjects and Identities</b>	Institutionalized and power - laden environmental management regimes have led to the emergence of new kinds of people, with their own emerging self - definitions, understandings of the world, and ecological ideologies and behaviors.	Levee Boards and lawsuits, displaced Delta Farms residents

relied on the same marsh as a resource for generations, were forced to relocate their activities or find other means of support.

### **Conservation & Control**

This thesis examines the idea of land being wrested from groups and set aside for the sake of preservation of nature or conservation of resources such as national parks or preserves (Zimmerer 2003). While Delta Farms did not exhibit the extremes of state or national park status, following the final failure of the levees a review of Delta Farms and the surrounding marsh described it as highly susceptible to subsidence and deterioration. The response was the Coastal Zone Management Act of 1972 (Durabb 1972). This act aimed to decrease degradation in the area and promote it for recreational purposes. However, it is not certain whether the goals were fully achieved.

### **Political Objects and Actors**

These are entities whether human or non-human that with power or control take on a new identity that influences the social, economic and environmental structure in a community. On Delta Farms and the surrounding communities, the actors and objects that took on this role included the corporate farm owners, oil and gas tax laws and subsidies, levees and Levee Boards. The owners became an integral part of the lives of their employees, not only with the creation of the farm community, but the influence their policies had on day-to-day life for employees and their families. With each failure, the decision to pump it dry and restore residents rested upon the owners and subsequently by the balance of economic gain and worth. The owners also had to agree to oil and gas exploration on their property which resulted in positive prospects for the use of the property, but not necessarily the best interests of the dependent community or environment (Morgan 1953). Oil and gas subsidies and tax laws were originally enacted to help oil drilling operations in the early implementation of this technology to allay costs. However, even with the dramatic rise in profitability to oil companies and owners of oil deposits, the laws continue to exist and reduce the taxable contributions to the state and community that contains these operations (Davis 2010). In Delta Farms, the lack of financial responsibility to the state and community may have led to practices that compounded the precarious nature of the Delta Farms levee system and farmland. In addition, with increases in profit, came an increase in power. Last

in this thesis are the levees and Levee Boards. Levee systems in Louisiana have a long history of influencing the shape, development, resources, and safety of communities in areas prone to flooding from the Mississippi River and its tributaries. People relied on them, they influenced policy, they sparked major structural debates including the now lamented argument of levees versus diverges to control the Mississippi River (Colton 2000, Davis 2000). The levee system for Delta Farms was not only its means of protection from flooding; it acted as a source of power for those who were responsible for maintenance and rebuilding after failure (Harrison 1947, Davis 2010). These actors worked their ways into the fabric of the landscape. Their influences became so ingrained in the community that, adaptation occurred almost naturally.

## **Environmental Subjects and Identities**

As mentioned in the previous thesis, Levee Boards had a certain power and authority in the parish along with major responsibilities to the residents (Chiasson 1977, Galjour 1977). The power entrusted to these groups of people provided a means for them to create their own identity within the state. This empowerment of identity may be the motivator behind recent lawsuits against oil and gas companies operating in the Louisiana wetlands blaming their canals and drilling practices for the significant land loss that has occurred across the Gulf Coast (Board of Commissioners 2013). The development and existence of Delta Farms also contributed to a sense of identity for residents that lived on farm or worked on it. Although many dispersed into neighboring communities following the decision not to re-drain Delta Farms, they continued to maintain a sense of community through social media groups, recording of memoirs and diaries, and several books and accounts about the day to day lives of the Delta Farms residents (Thomassie 2007, Defelice 2007).

The examination of these theses is one way to get a sense of the interworking of policy and people with the temporal changes occurring in the environment (Pearson 2012). A closer look at the community raises the question of how might a community like Delta Farms be classified? Does this community qualify as a collapsed community? Would one call it a resilient community? Unlike the case with some disasters, the residents of Delta Farms were forced from their homes permanently in a short period of time, and in some cases forced to change lifestyles and identities. Near the time of its final flood, Delta Farms showed signs of declining agro-productivity and was mainly being used as grazing land for cattle and sugar cane. It also showed signs of anthropogenic degradation from erosion, subsidence, and numerous oil and gas canals on the perimeters (Crenshaw 2013). Rural poverty was also prevalent with many farm laborers working multiple jobs. As Delta Farms devolved we see declining productivity with the decrease in families, farmers, and land used for agricultural purposes. There are also the ever recurring climatic events of Southern Louisiana, hurricanes and heavy rain events. These contribute to strains on the levee systems surrounding the property. Rural flight began to occur after the previous flood of 1961 on the property. Although the property may not have been losing revenue at the time, it certainly earned more off oil and gas drilling operations than from agricultural means. Following the flood of 1971, it was decided the land would not be re-drained because the costs to drain outweighed benefits of agriculture on the land. Finally, collapse occurred swiftly to the remaining community with the flood of 1971, and the forced relocation of residents. However, while the Delta Farms community did collapse, other aspects of the situation must be considered in the aftermath of this community. While residents were no longer together in the



same vicinity, they managed to stay connected in different ways thereby preventing the complete collapse of community and maintaining the sense of identity developed by them over time. There was a sense of loss from many former residents interviewed, but the communal loss acted like glue, binding residents together through time. At the moment, while resilience is of people and community is such a topic of concern, the reaction of the Delta Farms community, may be a quintessential example of this concept in action. A group of people who fought to keep their story, traditions and identity alive among themselves and the surrounding communities they became a part of.

## Conclusion

The Louisiana coastal region is faced with multiple environmental challenges and stressors. There are natural elements such as eustatic sea level rise and natural erosion that have always existed, but it is undeniable that certain anthropogenic activities have had an influence on the coast. How can we best understand the processes shaping the environment around us, and disseminate that knowledge to those who have the control over those processes? As scientists, it is difficult for us to be in the same location for extended periods of time while observing decadal-to-century long environmental changes. The answer is to access those that were there - looking to the citizens who witnessed, influenced, and themselves were dynamically impacted by the evolving landscape of place and people. Involving communities in the science has the potential of increasing environmental awareness and accountability where the issues are most pressing. It is in these areas that people feel more empowered and feel like their best interest is at the heart of decisions (Friedmann 1992). The citizens of the parish, along with private and public entities, were a key part of the development of the Lafourche Parish Comprehensive Resiliency Plan of 2014. The residents were included in deciding some of the issues that were most pressing to them. They indicated that the most important issues were the need to preserve wetlands and to plan for anticipated future land loss and for coastal restoration (Lafourche 2014). The fact that residents have spent their entire lives in the same region, as have several generations of their family, and been intimately connected with the ecosystem, either through work, food, or recreation, is what makes them an important witness to ecological transformations that have occurred. Also, because of the interwoven communication networks in the area, the residents are privy to, and involved in, many facets of local government decisions. Through this study, not only was it clear that residents observed the environmental changes that were occurring, and that many understood the exact mechanisms behind them, as had their fathers, mothers, grandmothers, and grandfathers. Those mechanisms were told through stories and interviews about canals and salt water intrusion, and erosion and subsidence. Wayne Crenshaw said, for example, "The land is going to sink and the water is coming up. Nature took thousands and thousands of years to build and overflow this land and it's going down, it's sinking." Mrs. Theresa Fournier's father told her many years throughout her life that "they built the Mississippi River levees way too soon, the land would have been much higher if that silt had been allowed to build up the country. People always try to control Mother Nature, but nature is going to take its course and the river will go where it wants to." Local knowledge should never be underestimated in its potential contributions. Examining the Delta Farms property, its history, its transformations, its communities, what has contributed to the longevity and resilience of the 'Delta Farms Gang' - as they call themselves - revealed the importance of their ability to be an active part of their parish developments, to stay connected, to share stories, and to pass on their cultural experiences and the knowledge so that the story of Delta Farms is not lost. It is the history, the story and the measurements of change that can survive and continue to influence the development of a greater understanding of the natural world, the ecosystem they live in, and their livelihoods. These three elements are intricately intertwined in this coastal community, as it is in many. In future studies of restoration and environmental change I would hope that environmental history is a more widely used tool outside of the field of anthropology.

## References

- Alperin, L.M. and Study, N.W. 1983. History of the Gulf Intracoastal Waterway, National Waterways Study, U.S. Army Resources Support Center, Institute for Water Resources.
- Basset, T.J., and Zimmerer, K.S. 2003. Cultural and political ecology in the 1990s. In: C. Wilmott and G.Galle (Eds.), *Geography in America*, 2003 pp 282-307. Oxford, UK: Oxford University Press.
- Batzer, D.P., and Baldwin, A.H. 2012. Wetland Habitats of North America: Ecology and Conservation Concerns: University of California Press.
- Barras, J., Beville, S., Britsch, D., Hartley, S., Hawes, S., Johnston, J., Kemp, P., Kinler, Q., Martucci, A., Porthouse, J., Reed, D., Roy, K., Sapkota, S., and Suhayda, J., 2003. Historical and projected Coastal Louisiana Land Changes—1978–2050, Appendix B of Louisiana Coastal Area (LCA): Louisiana Ecosystem Restoration Study. U.S. Geological Survey Open-File Report 2003-334, 39pp
- Bayou Gauche Town History Courtesy of the L’Observateur and River Current magazine January 2000. <http://www.stcharlesgov.net/index.aspx?page=1085>
- Board of commissioners of the Southeast Louisiana Flood Protection Authority v. Tennessee Gas Pipeline Company, LLC*. Civil action case no.13-5410. 2013. Retrieved from <http://jonesswanson.com/wp-content/uploads/2013/07/Petition-for-Damages-and-Injunctive-Relief-with-Exhibits-A-G.pdf>
- Borne, L.A. 1946. *The Longest Street in the World*. Police Jury of Lafourche Parish, Lafourche Parish, Louisiana.
- Bureau of Land Management 2008. Louisiana reasonably foreseeable development scenario for fluid minerals. U.S. Department of Interior. Prepared by the Jackson Field Office. Jackson, MS.
- Butzer, K.W. 1996. Ecology in the long view: Settlement histories, agrosystemic strategies, and ecological performance. *Journal of Field Archaeology* 23: 141-150.
- Butzer, K.W. 2012. Collapse, environment, and society. *Proceedings of the National Academy of Sciences (USA)* 109(10): 3632-3639.
- Cahoon, D. and. Turner,R.E 1989. Accretion and canal impacts in a rapidly subsiding wetland II. Feldspar marker horizon technique. *Estuaries* 12(4): 260-268.
- Cantrelle, Lois (date unknown) A Teacher Remembers Life in Delta Farms, personal memoirs.
- Cheramie, A. 1989. "My Memories of Delta Farms." Unpublished.
- .

- Colten, C.E. 2000. *Transforming New Orleans and Its Environs: Centuries of Change*, University of Pittsburgh Press.
- Couvillion, B.R., Barras, J.A., Steyer, G.D., Sleavin, William, Fischer, Michelle, Beck, Holly, Trahan, Nadine, Griffin, Brad, and Heckman, David, 2011, Land area change in coastal Louisiana from 1932 to 2010: U.S. Geological Survey Scientific Investigations Map 3164, scale 1:265,000, 12 pp. pamphlet.
- Craig, N.J., Turner, R.E, and Day, J.W. Jr. 1979. Land loss in coastal Louisiana (U.S.A.). *Environmental Management* 3(2): 133-144.
- Davis, D. 2000. Historical perspective on crevasses, levees, and the Mississippi River. pp. 84-106 In: *Transforming New Orleans and Its Environs: Centuries of Change*, University of Pittsburgh Press. Edited by Craig Colten.
- Davis, D.W. 2010. *Washed away?: The invisible peoples of Louisiana's wetlands*. Lafayette, LA: University of Louisiana at Lafayette Press.
- Day, R.H., Holtz, R.K. and Day, J.W. Jr. 1990. An inventory of wetland impoundments in the coastal zone of Louisiana, USA: Historical trends. *Environmental Management* 14(2): 229-240.
- Day, J. W. 2014. *Perspectives on the Restoration of the Mississippi Delta: The Once and Future Delta*, London, Springer Limited.
- Defelice, M., and Picou, D. 2007. Louisiana Delta Farms. pp. 49-60 In: *We Are What We Remember: A Story of Larose and Its People*, by Thomassie, R. The Knights of Columbus Council 8898 Noah Project. Larose, Louisiana.
- Dew, B. 2005. Avoca Island - Coastal Marsh Restoration Project. Ducks Unlimited Inc. <http://www.ducks.org/louisiana/louisiana-projects/avoca-island-coastal-marsh-restoration-project>. Retrieved 10/23/2014.
- Dunn, G. 1962. The hurricane season of 1961. *Monthly Weather Review*. U.S. Weather Bureau Office, Miami, FL.
- Durabb, E. and Landry, M. 1978. *Coastal Zone Management for Lafourche Parish*. Volume I, II, III, Thibodaux, Louisiana, South Central Planning and Development Commission.
- Erickson, C.L. 2006. Intensification, Political Economy, and the Farming Community; In *Defense Of A Bottom-Up Perspective Of The Past*. In *Agricultural Strategies*, edited by Joyce Marcus and Charles Stanish, pp. 233-265. Cotsen Institute, Los Angeles
- Erickson, C.L. 1994. Raised Fields as a Sustainable Agricultural System from Amazonia. Paper presented in the Symposium on Recovery of Indigenous Technology and Resources in

- Bolivia at the 18th International Congress of the Latin American Studies Association, Atlanta, March 10-12.
- Fox, J.A. 1917. The Wisner Estates Incorporated: Embracing Nearly a Million Acres of the Richest Land in America; a Brief Story Concerning the Formation of the Delta Lands of Louisiana; Their Reclamation by Drainage, Wisner Estates Incorporated.
- Friedmann, J. 1992. Empowerment: The politics of alternative development. Blackwell Publishing. Cambridge, MA.
- Gagliano, S.M. 1973. Canals, Dredging, and Land Reclamation in the Louisiana Coastal Zone: Center for Wetland Resources, Louisiana State University.
- Harrison, R.W., and Kollmorgen, W.M. 1947. Past and prospective drainage reclamations in the coastal marshlands of the Mississippi River delta. *J. Land Public Utility Economics* 23: 297-320.
- Hoeksema, R.J. 2007. Three stages in the history of land reclamation in the Netherlands. *Irrigation and Drainage*, 56(S1), S113-S126. doi: 10.1002/ird.340
- Jaynes, D. B. and James, D. 2007. "The Extent of Farm Drainage in the United States" Paper presented at the annual meeting of the Soil and Water Conservation Society, Florida.
- Kelley, D. 1988. Archeological and Historical Research on Avoca Plantation: Testing of Site 16 SMY 130 and Survey of Proposed Borrow Areas for EABPL (East Atchafalaya Basin Protection Levee) Item E-96, Saint Mary Parish, Louisiana. Ft. Belvoir, Defense Technical Information Center.
- Lafourche Parish Comprehensive Resiliency Plan Draft January 2014. Lafourche Parish Government Planning Department
- Lovett, R. 1887. Pictures from Holland Drawn with Pen and Pencil, Religious Tract Society, Netherlands
- Merry, J.F. and I. C. R Company. 1909. Louisiana Reclaimed Lands Make Fertile Farms: A Pamphlet Full of Information Concerning the Prairie Marshes and Cypress Swamp Lands of Louisiana and how They are Being Reclaimed, Poole Bros.
- McFalls, T.B., Keddy, P.A.; Campbell, D., and Shaffer, G. 2010. Hurricanes, floods, levees, and nutria: vegetation responses to interacting disturbance and fertility regimes with implications for coastal wetland restoration. *Journal of Coastal Research*, 26(5), 901–911.
- Miller, R.L., Fram, M.S., Fujiil, R., and Wheeler, G. 2008. Subsidence reversal in a re-established wetland in the Sacramento-San Joaquin Delta, California, USA. *San Francisco Estuary and Watershed Science* 6(3).

- Morton, R.A., Bernier, J.C., and Kelso, K.W. 2009, Recent subsidence and erosion at diverse wetland sites in the southeastern Mississippi delta plain: U.S. Geological Survey Open-File Report, 2009–1158, 39 pp., plus app. (pp. 41-221).
- Morton, R.A., Bernier, J.C., and Barras, J.A. 2006. "Evidence of regional subsidence and associated interior wetland loss induced by hydrocarbon production, Gulf Coast region, USA." *Environmental Geology* 50(2): 261-274.
- National Oceanic Service 2014. "What is Resilience?" <http://oceanservice.noaa.gov/facts/resilience.html>. Retrieved. 11/12/14.
- Nyman, J.A., Walters, R.J., Delaune, R.D., and Patrick Jr, W.H. 2006. Marsh vertical accretion via vegetative growth. *Estuarine, Coastal and Shelf Science* 69(3–4): 370-380.
- Okey, C. W. 1914. The wetlands of southern Louisiana and their drainage. Washington, D.C., U.S. Dept. of Agriculture.
- Okey, C. W. 1918. The subsidence of muck and peat soils in southern Louisiana and Florida. *Transactions of the American Society of Civil Engineers* 82: 396-422.
- Pavelis, G.A., 1987.. "Farm drainage in the United States: History, status and prospects. Economic Research Service, U.S. Department of Agriculture, miscellaneous publ. no. 1455.
- Pearson, L.J., and Pearson, C. J. 2012. Societal collapse or transformation, and resilience. *Proceedings of the National Academy of Sciences (USA)* 109(30): E2030-E2031.
- Phenis, A. 1911. Holland: Exemplar for Louisiana. The Louisiana Planter and Sugar Manufacturer, Louisiana Planter and Sugar Manufacturer Company, Cambridge, MA.
- Phillips, P. Jr. 1980. Land reclamation in the Cut-Off quadrangle area of Louisiana 1874-1978. Reclamation Seminar. Department of Geography and Anthropology, Louisiana State University. Fall 1980.
- Powers, W. L. 1946. Reclamation and use of alkali soils. Corvallis: Oregon State System of Higher Education, Agricultural Experiment Station.
- Robbins, P. 2004. *Political Ecology: A Critical Introduction*. Blackwell Publishing, Maiden, Oxford and Victoria.
- Rose, P. S. 1919. Lifting farms out of water. *The Country Gentleman*, Vol 1.XXI 21
- Rostain, S. 2010. Pre-Columbian Earthworks in Coastal Amazonia. *Diversity* 2, no. 3: 331-352
- Scarborough, V.L. 2003. How to interpret an ancient landscape. *Proceedings of the National Academy of Sciences* 100(8): 4366-4368.



- Sluyter, A. 1994. Intensive wetland agriculture in Mesoamerica: Space, time, and form. *Annals of the Association of American Geographers* 84(4): 557-584.
- Smardon, R. 2009. *Sustaining the World's Wetlands: Setting Policy and Resolving Conflicts*, Springer Science & Business Media.
- Swarzenski, C. M. 2003. Surface-water hydrology of the Gulf Intracoastal Waterway in south-central Louisiana, 1996-99, U.S. Geological Survey Professional Paper 1672. Prepared in cooperation with the U.S. Army Corps of Engineers New Orleans District.
- Swenson, E.M. 1995. Water levels and salinities in the Delta Farms area. Draft Report. Coastal Ecology Institute. Louisiana State University, Baton Rouge, LA.
- Tiner, R.W. 1984. *Wetlands of the United States: Current status and recent trends*. Washington, D.C.: National Wetlands Inventory, Fish and Wildlife Service, U.S. Dept. of the Interior.
- Trepagnier, C.M., Korgas, M.A., Turner, R.E. 1995. Evaluation of wetland gain and loss of abandoned agricultural impoundments in South Louisiana, 1978–1988. *Restoration Ecology* 3(4): 299-303.
- Turner, R.E., and Neill, C. 1984. Revisiting impounded wetlands after 70 years. pp. 309-322 In: R.J. Varnell (Ed.), *Water Quality and Wetland Management Conference Proceedings*. New Orleans, LA., August 4-5, 1983.
- Turner, R.E., and Streever, B. 2002. *Approaches to Coastal Wetland Restoration: Northern Gulf of Mexico*, SPB Academic Pub. The Hague, The Netherlands.
- Turner, R.E. 2004. Coastal wetland subsidence arising from local hydrologic manipulations. *Estuaries* 27(2): 265-272.
- van Eerd, M. 1985. The influence of vegetation on erosion and accretion in salt marshes of the Oosterschelde, The Netherlands. *Vegetation* 62(1-3): 367-373.
- Warren, G.M. 1911. *Tidal Marshes and Their Reclamation*, by George M. Warren. Prepared Under the Direction of C. G. Elliott: U.S. Government Printing Office.
- Wicker, K., Johnson, J., Rogers, R., Young, M. 1980. Mississippi Deltaic Plain region Ecological characterization: A habitat mapping study. Bureau of Land Management. Department of Interior.
- Woodward, S.M., Okey, C. 1915. *Land drainage by means of pumps*, U.S. Dept. of Agriculture.
- Wright, J.O., and Stations, U.S. Office of Experiment Stations. 1907. *Reclamation of Tide Lands*: By J.O. Wright: U.S. Government Printing Office.
- Zimmerer, K. S., Basset. T. J. 2003. *Political Ecology: An Integrative Approach to Geography and Environment-development studies*. New York, Guilford Press.

## Appendix I. Data Sources

### Maps Consulted

1. U.S. Geologic Survey. 1932 Cut Off Quadrangle, S.E. Quarter, LA. (retrieved from Louisiana Sea Grant Digital Maps Collection)
2. U.S. Geologic Survey. 1968 Cut Off Quadrangle, S.E. Quarter, LA. (retrieved from Louisiana Sea Grant Digital Maps Collection)
3. U.S. Geologic Survey. 1932 Houma Quadrangle, N.E. Quarter, LA. (retrieved from USGS.com)
4. U.S. Geologic Survey. 1939 Houma Quadrangle, N.E. Quarter, LA. (retrieved from USGS)
5. U.S. Geologic Survey. 2012 Lockport Quadrangle, LA. (USGS.com)
6. U.S. Geologic Survey. 1963 Lockport, LA. Houma Quadrangle, N.E. Quarter. (retrieved USGS.com)
7. U.S. Geologic Survey. 1939 Cut Off Quadrangle, S.E. Quarter, LA. (retrieved from USGS.com)
8. U.S. Geologic Survey. 1998 Cut Off Quadrangle, S.E. Quarter, LA. (retrieved from USGS.com)
9. U.S. Geologic Survey. 1932 Hahnville Quadrangle, S.W. Quarter, LA. (retrieved from USGS)
10. U.S. Geologic Survey. 1940 Allemands Quadrangle, N.W. Quarter, LA. (retrieved from USGS)
11. U.S. Geologic Survey. 2012 Allemands Quadrangle, LA. (retrieved from USGS)
12. Hand drawn map of Delta Farms 1930s, Andrew Cheramie.-donated by Elizabeth Plaisance in 2013
13. Louisiana Coastal Resource Atlas- Lafourche Parish
  - a. Flood Prone Areas
  - b. Hydrologic Characteristics
  - c. Important Farmlands
  - d. Land Surface Feature Classification
  - e. Development Potential Based on Land Suitability
  - f. Existing and Projected Use of Land
  - g. Soil Subsidence and Land Loss Potential
  - h. Unique Ecological Features and Potential Preservation and Restoration Areas
  - i. Historic, Cultural and Archeological Sites
  - j. Important Farmlands
14. Mississippi River Deltaic Plain- Land Loss and Land Accretion, Cut Off, LA. 1998
15. Sonar Bathymetry Map made in ArcGIS
16. Coastal Environments, Inc. (1980). Mississippi Deltaic Plain Region Habitat Map 1956. Coastal Environments, Inc. Baton Rouge, La.
17. Coastal Environments, Inc. (1980). Mississippi Deltaic Plain Region Habitat Map 1978. Coastal Environments, Inc., Baton Rouge, La.
18. Google Earth (2012). Delta Farms and some surrounding marshes.

Interviews- See Appendix III for abstracted content

Breaux, C., born in 1915 on Delta Farms and worked on Delta Farms from 1929-2002; interviewed September 2013

Crenshaw, W.H. Jr., Manager Delta Farms; interviewed October 2013.

Fournier, B., Former resident of Delta Farms; interviewed September 2013.

Fournier, T., Former resident of Delta Farms; interviewed October 2013.

Hunter, K., Former resident of Delta Farms; interviewed September 2013.

Ledet, M., Family employed and lived on Delta Farms; interviewed July 2014

Miller, E., Family owner and manager of oil and gas reserves on Delta Farms; interviewed July 2014.

Richoux, R. Sr., Lived in Larose, LA in the 1930's and 40's. Family worked at Delta Farms; interviewed February 2014.

Smith, C., Former resident of Delta Farms; interviewed September 2013.

Depositions

Richard Bourg- *Fredrick Pierce, Jr. vs California Company et al.* No. 72-2384 United States District Court Eastern District of Louisiana, February 24, 1977.

Lester Chiasson, Sr.- *Fredrick Pierce, Jr. vs California Company et al.* No. 72-2384 United States District Court Eastern District of Louisiana, February 17, 1977.

Johnny P. DeFelice- *Fredrick Pierce, Jr. vs California Company et al.* No. 72-2384 United States District Court Eastern District of Louisiana, March 16, 1977.

Roland J. Galjour- *Fredrick Pierce, Jr. vs California Company et al.* No. 72-2384 United States District Court Eastern District of Louisiana, March 15, 1977.

Hubert Lafont- *Fredrick Pierce, Jr. vs California Company et al.* No. 72-2384 United States District Court Eastern District of Louisiana, March 10, 1977.

Census Data

1. 1920 Census of Delta Farms Year: 1920; Census Place: Police Jury Ward 10, Lafourche, Louisiana; Roll: T625\_616; Page: 10A; Enumeration District: 56; Image: 1163. Ancestry.com. 1920 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2010. Images reproduced by FamilySearch.
2. 1930 Census of Delta Farms year: 1930; Census Place: Police Jury Ward 10, Lafourche, Louisiana; Roll: 798; Page: 2A; Enumeration District: 0018; Image: 1092.0; FHL microfilm: 2340533. ncestry.com. 1930 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2002.Original data: United States of

America, Bureau of the Census. *Fifteenth Census of the United States, 1930*. Washington, D.C.: National Archives and Records Administration, 1930. T626, 2,667 rolls.

3. 1940 United States Federal Census [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2012. Original data: United States of America, Bureau of the Census. Sixteenth Census of the United States, 1940. Washington, D.C.: National Archives and Records Administration, 1940. T627, 4,643 rolls. Year: 1940; Census Place: , Lafourche, Louisiana; Roll: T627\_1410; Page: 6B; Enumeration District: 29-19.

## Appendix II. Methods

### Methods

- 1) Historical uses and changes over time. The examination of this dynamic process was achieved by using map data comparisons, previous studies and measurements, and interviews with former residents. Historical maps used for engineering purposes, land development, GIS data, and hand drawn maps by former residents, were used to look at the developmental history and land loss from initial drainage to present day in Delta Farms. The history is also obtained from documentation of the initial drainage of Delta Farms, along with subsequent episodes of flooding and levee failures. This included newspaper and journal articles on reclamation and wetland loss from 1900 through 2014 and personal resident memoirs and the deposition from a 1977 court case regarding the levee failure of 1971.
- 2) Physical aspects of the property including comparisons to nearby failed impoundments: The current physical features of the property were observed and measured using the bathymetry of the presently submerged areas using a Lowrance HDS-5 Sonar. A grid transect covered the flooded portion of Delta Farms, and following it by boat, the depths were measured every 3 seconds. These measurements were used in ArcGIS as a raster to construct a bathymetry of the parts of Delta Farms currently underwater. In addition, 5 cm sediment samples were taken across the submerged parts of the property from the Intracoastal Waterway to the eastern end of the property using a Barney Barrett corer. Using a Hargis corer, a 1 m core was taken from sample site DMW 12 where the property meets the Intracoastal Canal.



Figure A.2.1 The locations of soil sampling. Photo Google Earth 2012





Figure A.2.2. 1m long core taken near Intracoastal Canal at sample site 12 (photo by author)

The cores were analyzed for sand, silt, clay percentages, and compared to each other. Comparisons to nearby impoundments were achieved using aerial photos, and historical records.

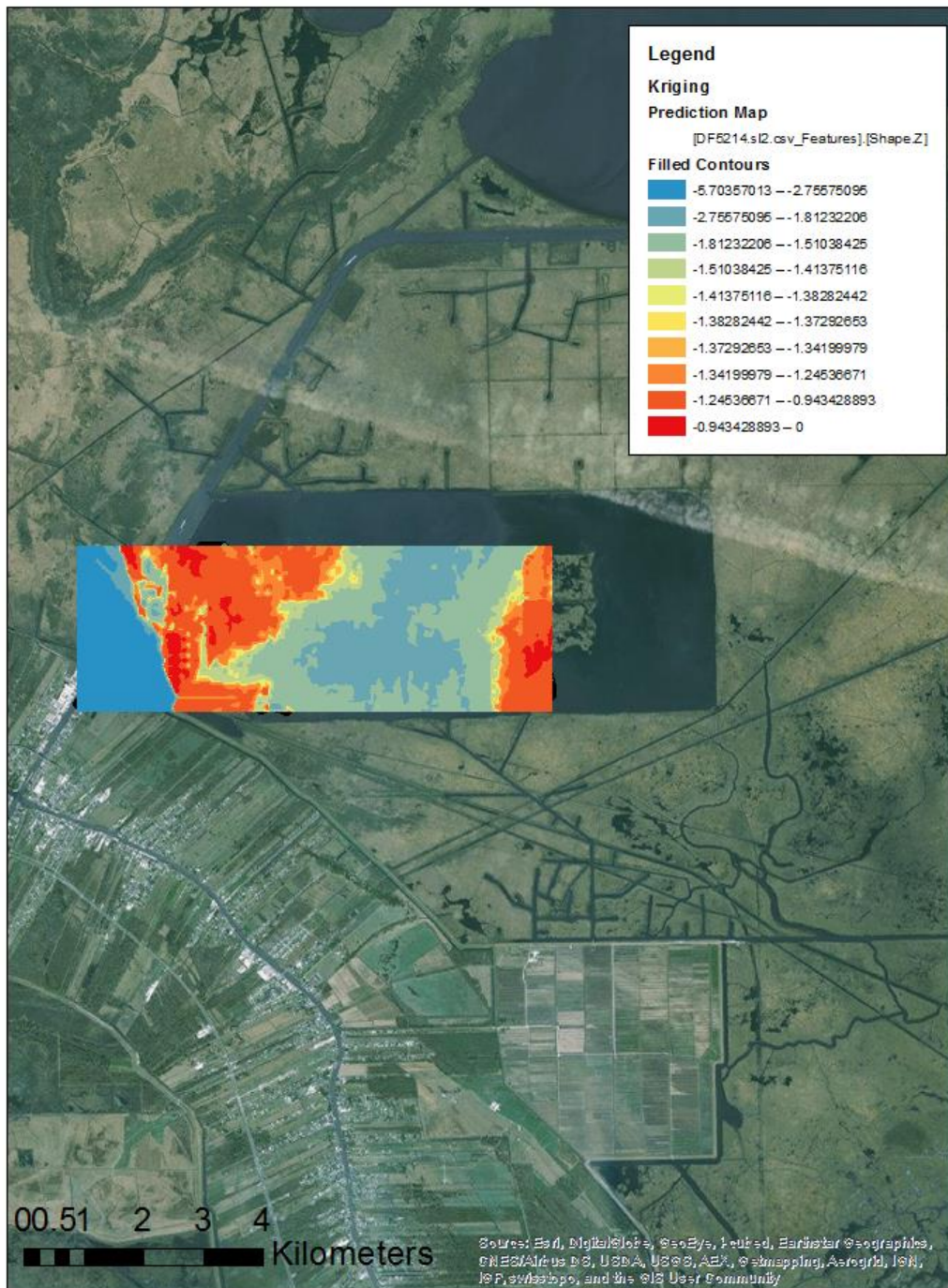


Figure A.2.3 Bathymetry contour map of Delta Farms 2014

- 3) The social dynamics and community impacts that the impoundment's development and failure had on the people who lived there.

The social dynamics of the impoundment development, usage and failure were learned from personal accounts, memoirs, documentation of socioeconomic and political dynamics. These included United States Census data, newspaper articles, agricultural reports, and studies examining cultural intricacies in Gulf Coast Louisiana communities. These were applied to current theories on political ecology. Data on the division of labor, pay, accessibility to resources, industry developments and proximity to the nearest towns were relevant to understanding how economics and policy played a role in the longevity of farming/ grazing practices.

## **Analysis**

### **1. Historical uses and changes over time:**

I was able to construct a timeline of major events in the history of the Delta Farms impoundment. Using environmental history of the land many human responses on the property corresponded with the landscape changes occurring simultaneously. These changes: subsidence, erosion, the deepening and widening of the Intracoastal canal, discovery and extraction of gas and oil, flooding, and hurricanes all played a role in the maintenance, longevity and community dynamics (mainly location of residents). I used [Quadrant 1- has never been drained; Quadrant 2- was partially drained; Quadrant 3- was drained and farmed for 10-15 years (~1909-1930); Quadrant 4- was drained and farmed for over 60 years (~1909-1971).] This information could be useful in future evaluations of agricultural impoundment changes throughout time in the Gulf Coast region. USGS topographic maps from 1939, 1941, 1963, 1998, and 2012 to look at shifts in structures on the property, prevalence of oil and gas wells. A structural analysis of the Delta Farms oil fields located just east of the property recorded between 1939, the discovery of the first oil well to 1952 there were approximately 146 wells drilled (Morgan 1952). The interior island has shown significant erosion. The transition on the property from cash crops, corn, cotton, and sugar cane, to mainly cattle grazing can be seen using agricultural Census data. Interviews with managers and former employees, memoirs and impoundment studies aided in the agricultural history of the property and helped to construct a quadrant view of the land based on length of time farmed shown in Figure 5.1.

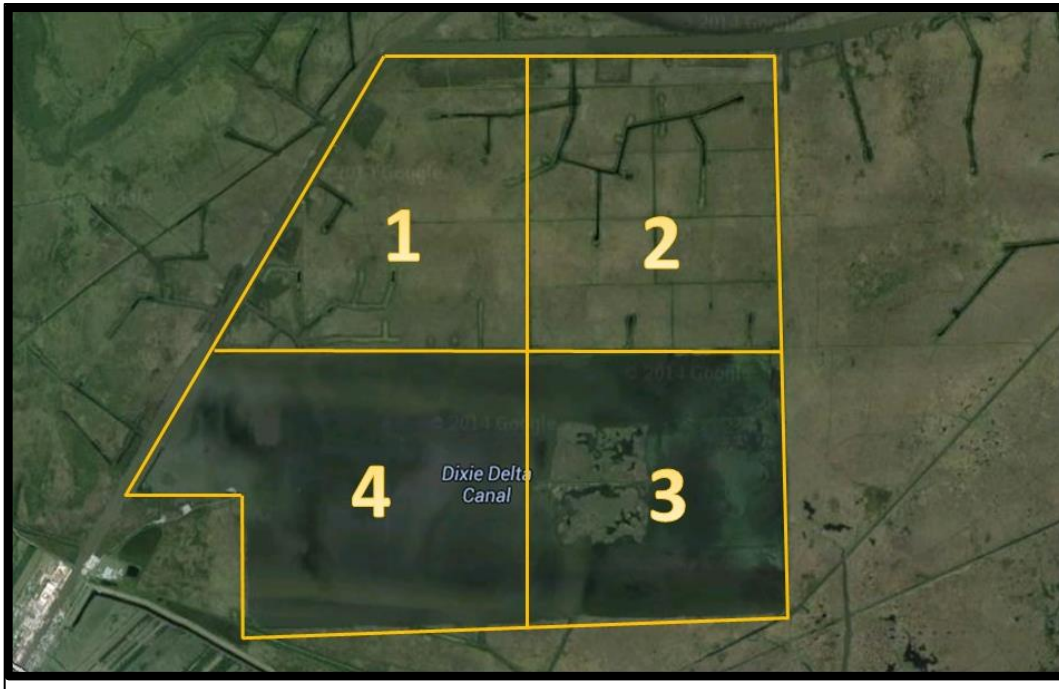


Figure A.2.4. The four different quadrants of Delta Farms illustrating differences in length of time farmed. 1-never farmed, 2-partially drained, 3-drained and farmed ~12 years, 4-drained and farmed for 62 years. (Photo: Google Earth 2014.)

2. Physical aspects of the property including comparisons to nearby failed impoundments  
 The bathymetry scan of the property indicated a transitional shallowing across the property. The Delta Farms areas closest to the Gulf Intracoastal Waterway (GIWW) showed some sedimentary inflow from the waterway. In addition to increased percentages of silt and clays, the depth up to .38 miles from the GIWW averaged 2-3 ft, and showed increasing densities of submerged aquatic vegetation. It was not clear if the shallowing was attributed to the erosion of the levee separating Delta Farms from the ICW or from inflow of the GIWW or a combination of the two. The east side of the property (Quadrant 3) also showed increasing shallowing from west to east as well as greater densities of submerged aquatic vegetation. The 5 cm samples across the flooded areas revealed a change from higher organics on the east side of the property to higher silts and clays on the west near the GIWW. This was found by measuring weights of samples before and after removal of organic material through additions of hydrogen peroxide and sieves.



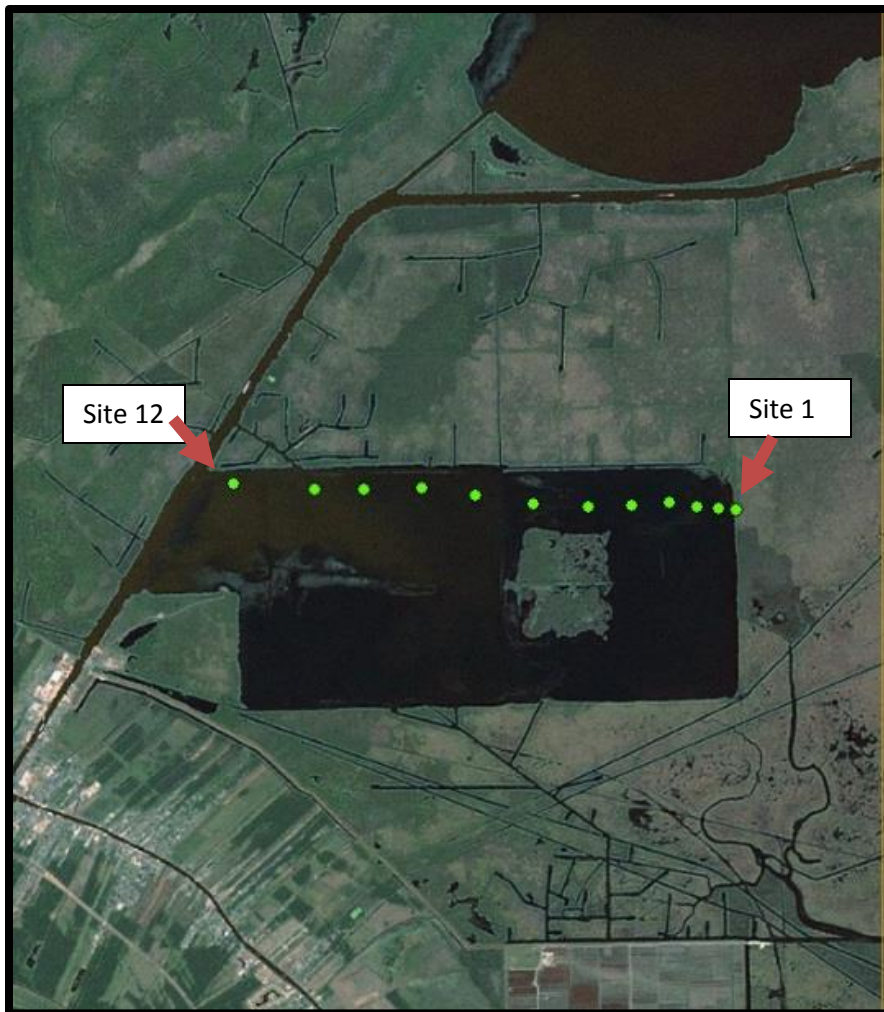


Figure A.2.5 Locations of 5 cm sampling sites on Delta Farms

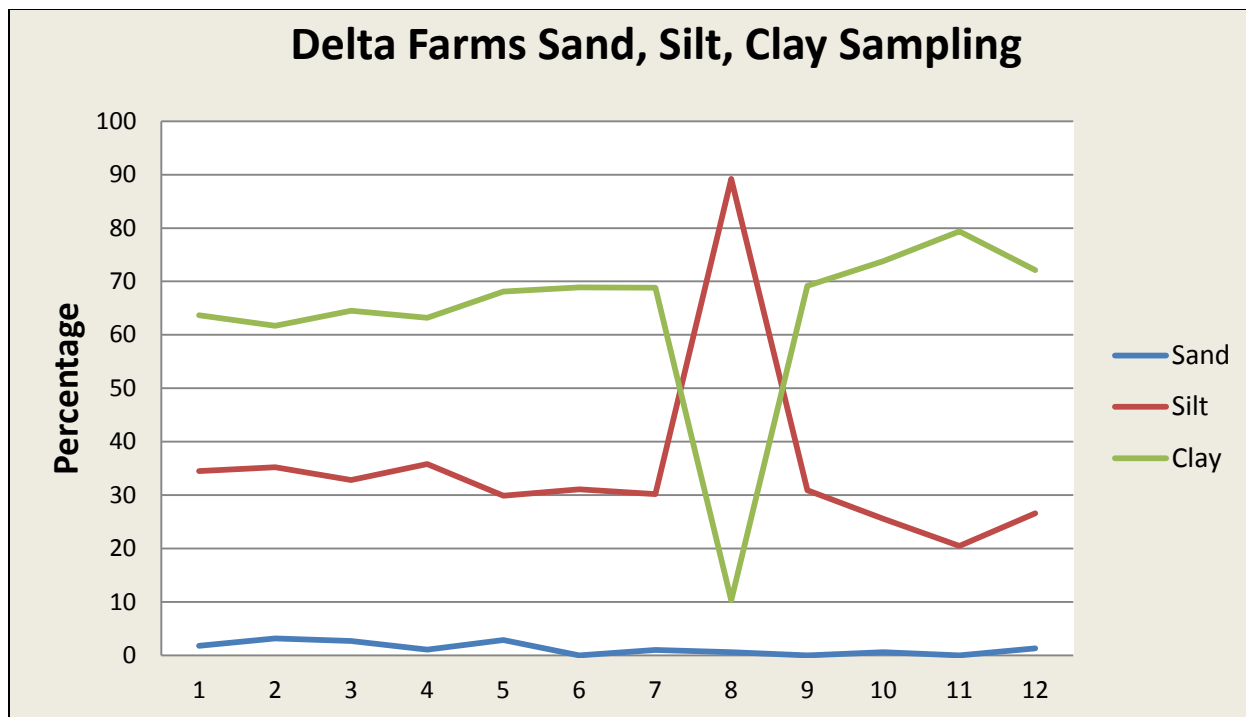


Figure A.2.6 Graph showing the percentages of sand silt and clay recorded across the property from the transect in Figure A.1.4.

Comparisons were done amongst some similarly sized impoundments in Lafourche, St. Mary, and St. Charles Parish using topographic maps, aerial imagery, and historical documentation about structural details-See Chapter 4. Many went through similar physical processes as Delta Farms, however their vulnerabilities varied from poor drainage design and pump location, to loss of economic backing, to irreparable storm damage, and increased soil acidity.



### Appendix III. Interviews



Figure A.3.1. Clarence Breaux - born in 1915 on Delta Farms. He worked on Delta Farms from 1929-2002 and was Manager from 1992-2002. Interviewed September 28, 2013 in Larose, Louisiana (photo courtesy of Carolyn Smith.)

Mr. Clarence Breaux was interviewed at his home in Larose, Louisiana. At 98 years old, Mr. Breaux still had a sharp memory on many events throughout his lifetime and the lifetime of Delta Farms. He proudly displayed his home garden of green beans, figs, 15 ft. high okra, and eggplant, thriving under the agricultural experience of his many years. Mr. Breaux was born in 1915 and was connected to Delta Farms for over 70 years either living there with his parents or working as a farmer or as a manager or an alligator harvester. He lived on the property for 7 years, starting at the age of 14. He retired from Delta Farms in 2002.

Mr. Breaux looked at a map of Delta Farms and began identifying the former location of his father's home, which was just beyond the bridge that entered into the property. His father was a laborer who hoed cotton, and harvested corn. He said that the first crop farmed on the property was corn, the second was cotton, and then cattle. The farm leased land to the cattle owners once Hugh Hawthorne became manager. Most of the houses and property belonged to Delta Farms, but there were some houses and lands owned by private owners. He described the original size of the Harang Canal before it was widened to the Intracoastal Canal as very small - 6-8 ft deep and 20 to 30 ft. wide. When the Intracoastal Waterway was built in Larose, a big event was the

removal of the bridge that crossed Bayou Lafourche. The portion of the property known as Dixie was pumped but apparently never produced a crop while he lived there, and the portion above it had a pump installed, but was never completely drained and dried.

He and his wife trapped there for many years in the back of the property, catching muskrat and nutria every year. He caught his first nutria in 1941, and he recalled nutria spreading out on the property after hurricanes and eating up a lot of the marsh. One year, on December 23, (during the trapping season) everything iced up all the canals and you could walk on it. A trapper, Brian, was stuck at his camp and while trying to make it back to his dad's house for Christmas. His boat capsized, drowning his girlfriend. They got \$1.12/ day to hoe cotton, shuck corn, and cut the grass. They lived in a one room house with ten people. They picked cotton for fourteen days in one instance and made \$40. "We were in hog heaven, then my grandma died and we had to bury her and we were broke again." He then went to on to be a painter, getting paid \$1.00/day, and while his bosses suggested \$1.25, he was never paid that much.

Mr. Breaux discussed having to walk to school in Larose as a child up to 3 miles and without shoes. "In the winter time our feet were so chapped, we couldn't touch 'em; they hurt so much." School started at 9:00 AM.

He spoke Cajun French with his family until he went to school, where they were punished for speaking French. They couldn't speak French even at recess. The first few years at school, he did really poorly because he couldn't understand English, but eventually by the third year was caught up and making A's. He also is left handed and was swatted on the hand whenever attempting to write with his left hand. He still speaks Cajun French with his family and occasionally with boat workers who stop in from foreign countries.

When asked about medical care on the farm, he said that there was no doctor on the farm, but there was one in Larose who cared for everyone – Dr. Erwin J. Boulet. Mr. Breaux had to visit the doctor when he fell on a piece of dry twig and had 13 splinters in his eye that the doctor removed piece by piece. He told a story of his sister who had mastoiditis in her ear, and cried for days because of the pain. But, because doctors were unfamiliar with the medical problem in those days, she was unable to be healed and lost her hearing.

Mr. Breaux was responsible for taking care of the hunting blinds for the owners and taking care of the hunting parties when they came down. He said that the Dixie Hunting Club had a large two story club house on Dixie and that he took businessmen from New Orleans out on hunting trips. "In the winter, when the ducks would arrive, you could hear them in the night. In the older days the ducks would fill the sky up." He said with hunting people could make a good living in those days. He said the hotel on the farm was very beautiful and that it was a shame when it was torn down. The hotel was torn down in 1939 when a new one was built west of Delta Farms and became known as the Larose Hotel (Defelice 2003).

Mr. Breaux said the main cause of flooding was the levees not being continuously reinforced by managers. "All this land here is about maybe a foot above sea level, but most of it is below sea level, and the tides are coming up all the time." Speaking about the soil subsidence, he said that: "Before they farmed the marsh had 8 to 10 inches and now its 8-10 feet.", and, "Whenever you drain, you sink."

"It's hard to stop erosion, once it starts...the muskrats ate a lot of the land, you could hear them at night. It was waist high and they ate it down."

By the last flood, the owners' interests were in the oil fields and he said it wasn't worth it. "It would've cost more to drain it than it was worth. A long time ago, people didn't want to make farms like that in the marsh because it destroyed the environment, and ...now number 4 and

Dixie are flooded, it's a waste."

He said the Delta Farms owners were good people who donated lots of money to many charities, but made a lot of money from the oil on the property. "The first well was drilled in 1938 and they've been drilling ever since." He told a story about Hugh Hawthorne, the second manager of Delta Farms, who was a cattleman and bought a cypress swamp near Vacharie, Louisiana. Mr. Hawthorne struck oil on his land and became a millionaire.

He also told a story about his aunt and uncle driving in their car to Golden Meadows which was about 12 miles away, and the car drove 10 miles/hr. and it had to travel down a dirt road. So they had to get an early start and pick a beautiful day to travel and see their relatives. Along the way they had to contend with cattle blocking the road.



Figure A.3.2. Wayne H. Crenshaw Jr. Manager Delta Farms, 1952-1992. Interviewed October 19, 2013 in Raceland, Louisiana.

Mr. Crenshaw was raised in Bethanny, LA, on the Texas-Louisiana border. While he was showing cattle for 4-H one year he decided he wanted to go to LSU where his older sister had also gone. He graduated in 1950 from LSU in Animal Industry. He was married in 1951, then got a job at Delta Farms in 1952 and had a son the same year. He raised three children on Delta Farms and enjoyed his time there. He said that he really enjoyed his job on Delta Farms and felt it was a great place to raise children.

Mr. Crenshaw began talking about the land owned by Delta Farms and the original owner Henry Doherty. From stories he'd heard from residents on the property, and after the levee was built, he surmised that the owners began advertising for people in the North to buy land there, saying that they could make two and three crops a year without frost. But that didn't quite pan out because it cost \$2-\$3 an acre to drain and many people ended up losing the property back to the company that sold it to them. When Doherty died in 1939, Alton Jones bought most of Doherty's share, 54.12% and Mr. Doherty's estate retained 33%. In 1940, Alton Jones, then President of Cities Services Oil, leased the property to Tidewater who spent several million dollars trying to build an oil well. After Tidewater gave up the lease, he leased it to California Oil which became Chevron and they struck oil. Mr. Jones then built a pipeline from Louisiana to New Jersey for the federal government. The main motivation for the government doing this was to protect the oil in tankers from being sunk by German submarines in WW2. With the pipeline in place, Mr. Jones was able to ship oil across the country. And make lots of money.

Chevron drilled a well in 1954 and found gas. They sold 50% to John Mecum who sold 50% of that to Freeport Sulphur. John Mecum was still the operator and drilled several wells, including a production well.

Mr. Crenshaw told a story about the first levee break at Delta Farms, which he stated occurred in 1927 following the Great Mississippi River Flood and a levee break at Donaldsonville. The levee broke in two places then and over 200 people had to relocate while the property was drained.

When Mr. Crenshaw came to Delta Farms in 1952, he asked the man who hired him, Floyd Spencer, "Why are you leaving?" To which Mr. Spencer replied, "Those levees bother me." Mr. Crenshaw came to understand this statement in September 1961, when Hurricane Carla moved across the Gulf of Mexico. In a ten-day period he reported water was running over the levees and was ten inches high; it eventually broke and flooded the property for a second time.

Mr. Crenshaw was staying in Larose after the flood, since the manager's house on the property had over 4 ft. of water in it. Mecum's manager called and asked if he thought the owners would be interested in re-draining. Mecum agreed to repair the levee if Delta Farms agreed to re-drain. After verifying with the owners, drainage began and from the date of the flood September 11, 1961, the property was drained by March 1962. All the cattle people returned to their pastures and Delta Farms was back in operation. Eight farmers came in after the re-draining and began growing sugar cane. Mr. Crenshaw noticed that the 850 acres of cane grew without the need of fertilizer and the property, being extremely fertile, tested at nearly 1% nitrogen.

The flood of September 12, 1971 occurred at a point in the levee where the Tennessee Gas had a pipe going through it. He also had problems with the Intracoastal Waterway levees. "The Intracoastal was a pain. I had enough trouble. When these big tugs would come and the swell would be this high and go over the levee and we had to continuously do work on that levee because of it." He said that "When they would dredge to take out sand from the Intracoastal... I would make them put half on each side."

He remarked that, "The land is going to sink and the water is coming up. Nature took thousands and thousands of years to build and overflow this land and its going down, it's sinking." Mr. Crenshaw discussed how changes on the property were evident even while he worked there, and that occasionally the levees would spring leaks. But the levees needed more experienced engineers to assess it then he had available. The levees were about four to four and a half feet above sea level. The property had two 24 inch pumps and one 44 inch pump, both were diesel and they were capable of pumping an inch of the property in 24 hours. There were also low areas on the property that would flood up to a foot high from heavy rainfall.

After the final flood in 1971, some of the people lost the income from their cattle, but he allowed the lumber from the flooded houses to be used for properties in Larose. When the levee broke, a barge with a dragline was brought in to try to repair the levee but the water was so strong that it flipped the barge. Several offers were made to re-drain the property, but all were over 1 million dollars. He stated that the area known as Dixie was operated for 10-15 years then flooded and was abandoned. It was now an average of 4 ft. deep compared to Delta Farms with an average of 8 ft. depth.

While harvesting corn, they would burn the shucks and he said the land would catch fire and the peat would burn. If they didn't extinguish the flames with water, it would burn for over 50 ft.

Alton Jones died in 1962 (from a plane crash), and his wife and daughter inherited the property. In 1980, one of the daughters, Ms. Edgington, asked to see the property and became more involved in the day-to-day activities. He recalled charging locals \$200 to lease hunting camps, but by 1992 was told by the owners to increase it to \$2000. The alligator trapping

business was very profitable and Delta Farms had over 450 tags. They also sold over 3 or 4 thousand alligator eggs.

“I don’t think I could move back to north Louisiana after moving down here. People enjoy their life down here and I had a good life.”





Figure A.3.3. Barbara Fournier, former resident of Delta Farms from 1938-1943. Interviewed September 20, 2013 in Larose, Louisiana.

Ms. Barbara Fournier was born in 1938 and lived on Delta Farms until the age of five. She had seven siblings and, while she didn't remember much because of her young age at the time, she did recall having to help the family pick cotton, as did her older sister Theresa. They lived off the land, but one of the ways her dad supplemented his income was by picking cotton. She recalled being lost in the cotton occasionally because she was so small. They had many family members living there, including aunts and uncles. When recounting the times that hurricanes were coming, they did not have a weather forecast, but a white flag was raised and they knew they had to evacuate to higher ground on the property. When it rained a lot some areas of the land would flood and her mother allowed them to swim in the water. One day while swimming, Ms. Fournier accidentally fell into a ditch and nearly drowned. "I had fond memories, but it was hard work." She recalled having to walk three miles to church at the Holy Rosary Church in Larose. This walking prompted her as a child to state that she would have a car someday and give everyone rides who wanted one. She and her mother collected eggs from the chickens; she would also kill and clean the chickens to cook for them. Her parents were living on Delta Farms during both the 1961 and 1971 flood. After the flood of 1961, they gathered everything they could and moved to CutOff, LA to live at one of her sister's houses. Then, after the 1971 flood, they stayed at a house they owned in Larose. She remembered that they got all of their water from a cistern and that while it was filthy, she didn't recall being sick very often. She thought it was kind of sad that the Delta Farm went under water, mainly because of the fond memories she had with her children visiting their grandparents. She said that now people go fishing and crabbing on Delta Farms.



Figure A.3.4. Theresa Fournier- former resident of Delta Farms from 1934-1943. Interviewed October 4, 2013 in Houma, Louisiana.

Ms. Theresa Fournier's daughters joined her for this interview at her home. She was born on April 4, 1934, on Delta Farms and lived there until she was ten years old. She recalled going to school at Delta Farms where they had 1<sup>st</sup> through 5<sup>th</sup> grade - all in one room. She recalled the school closing around 1942. She also recalled taking the old hand-pulled ferry across the bayou. They moved about three times while living on Delta Farms and always had big houses on blocks. On Sundays they would often go to the store and theatre in town and to church. She remembered that her father had a certain acreage to care for and that at night it was so hot that they played outside where they caught fireflies. At the time when they lived on Delta Farms, there was no electricity or running water. They shampooed their hair on Sunday underneath the cistern using Octagon soap. Her mom would then braid her hair for the week. Her older siblings had to work certain areas of the garden and, while she was too young to help with that, she did help pick cotton. They grew beans, potatoes, corn, tomatoes, cucumber, and watermelons. "It was a very, very fertile area. The dirt was black, they called it black jack." They were living off the land, and her dad was a rabbit and duck hunter. He hunted ducks in marsh areas around the farm and rabbits from the garden. She said they never went hungry and always had nice clothes because her mom was a seamstress. Using fabric from old feed bags, she was able to make their school clothes without a pattern. Her family was originally from Thibodeaux, but had migrated down to Larose. When living in the back of the property during hurricanes they would have to evacuate to higher ground. Her mother would make homemade bread and bring a jar of peanut butter which Ms. Fournier still buys during hurricane season. They didn't have a grocery truck in Delta Farms, but once they moved to Larose there was a grocery truck. Her dad made about \$1.40/ day, but that was about the average amount for most farmers at that time. Sharecroppers had to give a certain percentage of their crop to the owners.

Her parents moved from Delta Farms in 1943, but returned around 1958 when the cattle business picked up there. Her dad helped on the cattle ranch and again maintained a garden and some livestock for himself. They moved back to Larose after the flood of 1971. She said she spoke French until she went to school and still speaks French. Her daughters said that Ms. Fournier and her husband often spoke French so the children couldn't understand what they were saying.

While living with her parents they made their own butter and ice cream from the milk their cows produced. "We thought we had a good life because we had a mom who could cook and comb hair and took care of us." She said that they ate very little seafood because it made her mom ill. "The first Christmas tree I had, I won it at school in fifth grade! They pulled names in class and I won."

She recalled many bridges on the property with gates on them to keep cattle out of the crops. When asked about any views on the land or changes that have occurred, she said: "We in Terrebonne Parish started trying to save our land too late. Cause Terrebonne Parish was a beautiful parish, but with all the drilling and lack of interest in levees.... we had such high land we didn't think it would deteriorate like it did and now we're scrambling to try and save our parish and it's half gone." She said that her dad would always say they built the Mississippi River levees way too soon, and the land would have been much higher if that silt had been allowed to build up the country. And that people always try to control Mother Nature, but nature is going to take its course and the river will go where it wants to. His advice to his daughters was: move north and to not invest in any more property this far south.



Figure A.3.5. Kathleen Chiasson Hunter, resident of Delta Farms from 1957-1971.  
Interviewed September 20, 2013 in Golden Meadows, Louisiana.

Ms. Hunter's uncle Gracien Guess Ongeron, and her mom's sister Garnet Ongeron, lived in the back of the Delta Farms property from 1957 to 1971. She was fourteen when the final flood occurred in 1971. She recalled her time there as being very peaceful. They were 2 miles away from any neighbors and her uncle kept chickens, and cows and a bull named Big Red. She recounted one story of a run in with the bull: "Basically we had chickens, eggs, hogs, pigs, ducks, cows; we had a bull that didn't like the color red. Andy Crockett found that out.

**\*\*laughs\*\*** Any minute even if it was a thin strip about that big his name was Big Red and it was for a reason, he didn't like red. Andy Crockett had come down with Tommy Casanova, Wayne Matherne, whole bunch of the LSU 'long' and they would practice plays on their time off. Andy had a habit of going in the pen where the cows and the bull was. We kept telling, I kept telling him. But I was little and they used to call me princess, because I ruled. We kept telling him "Andy you need to get out of the pen. Andy you need to get out of the pen, you have a red stripe on your shirt." And he just kept looking at him. All of a sudden I saw Big Red push one foot like that and I started hollering at Crockett - "Crockett get over here!" he said "What's the matter?" I said "You're not going to have a quarterback for this weekend" I said "Best get him off the pen" The bull charged, he dove through the barb wired fence. I was like "When you going to listen to me!?"

She helped out by milking cows and collecting eggs. Being the only child, she felt that the animals were her friends and spent lots of times playing and interacting with them. They had four crawfish ponds and she recalled one producing crawfish that were 4-5 per pound. There was a swing set that swung over the bayou. "My grandfather used to have a little walkway that he built going like this. Then he had him a little stand, a little deck. And he used to trap nutria and we would...he would skin them, and at four years old, I was sticking them on the pelts. I was

four or five years old. We did, I swear to God; my grandma must've fed us nutria and didn't tell us. Cause now know how they were back then, you eat everything."

She recalled fishing in a canal in a pirogue and seeing a gar fish larger than the pirogue. "It's a place I miss to this day; it's a place that has my heart and always will. Sad thing is my kids and grandkids will never experience it." Ms. Hunter felt that he kids and grandkids could have learned so much more being outdoors and working with the animals.

"My uncle, Wick Bird, made purses, wallets, belts-embossed them, painted them. My grandfather, Xavier Bird was the shoe maker of Larose. He use to fix everybody's shoes, put new soles, put new heels, polish and shine them. My job was to lace the wallets, and the belts, and everything, the purses to pass the lace on the end to connect the two pieces of leather, snake, whatever, alligator. Whatever Uncle Wick had that's what it was made out of. And a lot of the stuff, they would kill, skin, let it dry, and then he would do it from there. Some stuff he bought, but 90% of the gator and rabbit purses and stuff, that was stuff we killed. Not me, but you know the family."

When asked how she felt about the flood of 1971, she responded with: "Oh, it killed my heart. I remember us trying to take some little wagons for a very long time, and we would go and we would try to repair the levee wherever we could where we saw water seeping in. But I mean it was all the way from where the dock was. Coming all the way.. now I'm lost again. That's the Intracoastal (points to map). Well, from where we were here, going all the way to wherever it is that you came by the dock. Like right there. It was like all messed up, all over. Nobody wanted to help us other than the people that were back there. Um, we tried for months, and months, and months. I mean we were just little people trying to do a job the state should do, and later on in years we all figured out why. Because there was oil underneath there and if the land flooded, it became state land; they had the rights. So legally, not legally, literally they took everything away from us, each and every one of us. They took our livelihoods, they took my childhood, they took my land, they took everything. We lost it all, everybody did that was back there. Everybody. It was a peaceful place, no trouble. I mean you could, I could take off and go walk a mile and half by myself on the road. The age I was, I turn around and walk back."

After the flood the only way to reach her uncle's camp was by boat and so she stopped going after dad because it upset her so much. The first time she went back by boat, she says she cried all the way there and her heart broke. "My heart went when it flooded."

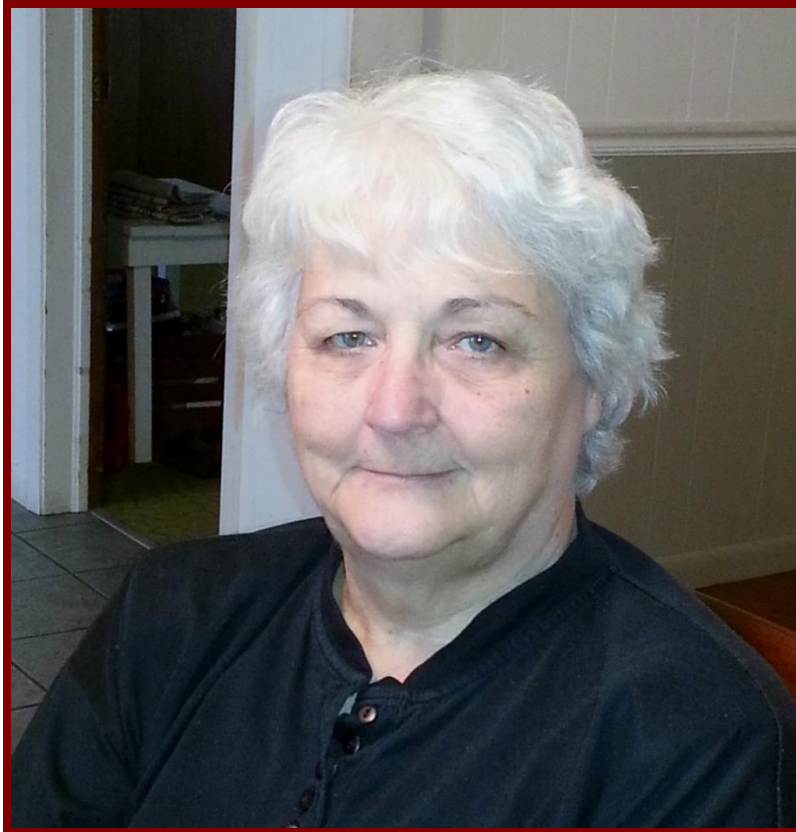


Figure A.3.6. Marilyn Ledet. Her family was employed and lived on Delta Farms 1920s-1940s. Interviewed at her home in Larose, Louisiana July 2014.

Ms. Marilyn Ledet was the only girl in the family and has seven brothers. She has been researching her genealogy for several years and found many interesting details about her family's history. Her grandfather, Joseph Marselline Guidry, was a share cropper who farmed watermelons and green beans on Delta Farms. Her grandfather had land near Cut-Off, but lost it when he couldn't pay the taxes during the yellow fever epidemic. He moved to Bayou Blue and then to Delta Farms. She said when viewing her grandparents' house from Bayou Blue, they could tell her grandparents were very poor, but they were happy. Her grandfather had dug a canal by hand from their house to the Cut Off Church so they could get there by boat.

She and her parents lived on Delta Farms Road which led to the entrance of the property. She recalled her life as a child living on Delta farms Road, "Down in Delta Farms road there was a butcher, a baker, they had stores. It was a community, we never had to leave." She said that "Down here we're such a mixture of so many different people, a melting pot."

Her father told of how he would ride on the truck with her grandfather to sell watermelons around Delta Farms and they would say "Watermelons! Watermelons! Red to the rind! Twenty-five cents." The watermelons were loaded on barges and shipped to the French Market in New Orleans, but he also would take truckloads of green beans to the market.

Her father often told a story of a lady he would see at the French Market, who would walk behind his truck and pick up green beans off the ground. He felt bad for her and asked about her situation. He discovered that she was a 'carpet bagger' who was a millionaire and lived in a large house, but went to the French Market and picked up free vegetables off the ground.



She remembered as a child going to the back of Delta Farms with her father near a reservoir and her father telling her that this was the location of the hotel. Her father was an avid hunter and trapper and had several camps along the canal at the back of Delta Farms. He caught mostly nutria and muskrats, skinned them, and dried them.

A very important element to her family and the community was the Holy Rosary Church. “It was such a positive thing for everyone in the community at that time.”

When the final flood happened, she said everyone’s hearts were broken and it was very eerie. Everyone came out and tried to move the cattle as quickly as possible to prevent any of them from drowning. But everyone watched as the land flooded and filled up. After the flood, she would go ride with her family to go see the flooded lands many times.



Figure A.3.7. Ronald Richoux Sr. featured with wife, Becky Richoux, Lived in Larose, La in the 1930's and 40's. His Family worked at Delta Farms. Interviewed in Gretna, LA, February 2014 (photo courtesy of Ronald Richoux.)

Mr. Richoux was born and raised on sugar cane farm in Larose, Louisiana just 8 miles south of Delta Farms. He is a published author and wrote and published a book on the genealogy of his family the Richoux's called *Reshoe on the Bayou*. He started writing his book when his wife, Becky Reshous, went back to school for nursing. He said research and writing took about nine years to complete. He said he never went to college or took a formal writing class, but always loved writing and telling stories. He is also a Korean War veteran and didn't leave Larose until he joined the Marine Corps.

His Uncle Wilton was employed at Delta Farms and was the overseer of the Dixie Hunting Club. He cooked for the hunters, and cleaned and kept the property up while it was not hunting season. He remembered as a child visiting Delta Farms and going in a large store on the property. He recalled it being a very productive sugar cane farm. Sharecroppers paid a third of the profits to the property owners. When asked about the general atmosphere in the town during hurricanes, he said it was fun for the children because they didn't have school and couldn't perceive of the danger, but that he didn't recall extensive flooding problem after a hurricane as a child. "What has happened in that area is the development of the houses and business..the more you build up and lay slabs, the more unnatural drainage there is. When I was young all the land drained naturally". He stated that as a child he worked with his uncle on a boat and watched as oil companies dredged large canals through the marsh criss-crossing the land and it was an invitation to erosion. He felt that oil companies should be responsible for backfilling all the canals, and restoring the marshes they tore up. "I'm 100% for restoration, but it will never be as good or as productive or as beautiful as it was then, but there is a whole lot that can be done." And, "Anything you destroy, you should rebuild."



Figure A.3.8. Caroline Smith, Former resident of Delta Farms, with her father, Clarence Breaux. Interviewed in Larose, Louisiana September 2013.

Ms. Caroline Smith is the daughter of Clarence Breaux, and is an active member of the Lafourche Parish Genealogical Society. She has played an important role in researching many archival documents on Delta Farms. “You could see when you get off the bridge in Delta Farms, you’d go down. Even though it wasn’t flooded at the time, you could tell it was like a bowl.” She discussed how after the land flooded, people with cattle were disappointed because they had to move their cattle. “People enjoyed Delta Farms, while it was there.”

## **Memoirs & Personal Stories:**

Andrew Cheramie- Memoirs written in 1989 sent by Elizabeth Plaisance in September 2013.

Andrew Cheramie's family was one of the first to live Delta Farms and he lived there most of his life. He learned to read as an adult and wrote a memoir of his life on Delta Farms and afterwards for his children and grandchildren in 1989. He also drew a picture of Delta Farms as it looked in the 30s. Mr. Cheramie recounted details of what they farmed including: cotton, sugar cane, potatoes, corn and hay, their salaries and the first flood on the property in 1927. According to Clarence Breaux his brother Louis ran the store on Delta Farms and they stayed nearly all of their life on Delta Farms, not far from the hotel.

"I was born and reared on Delta Farms and can assure you that although very poor in material things we were always rich in friends and caring people. We were all alike—no such thing as living up to the Joneses—there were no Joneses- only poor working class people who knew how to enjoy life inspite of their poor surroundings."

"Cities Service Oil Company decided that the swamp land owned by them could be drained by building canals all around their property, installing large pumps and building reservoirs strategically located to drain when rain spells hit them and back up the pumps to fill the reservoirs with water to irrigate during dry spells. It was a known fact that about 15to 20 inches below the surface of the swamps there was a layer of rich peat moss and if the swamp was drained and dried the land could produce a tremendous crop of just about anything they planted. The company known as Louisiana Delta Farms Company was operated by people from up North such as M.M. Malory, later his son Ernest Malory, then his wife and finally by Hugh Hawthorne. The farm was very successful until it started flooding, the levees would break due to muskrats boring holes into the levee and weakening them. The farm flooded 4 or 5 times and every time more and more water grass grew which was bad for all crops. So they finally abandoned it and now it's only a very large lake with good fishing."

Elizabeth Plaisance. From an email September 18, 2013.

"My Mom, Enola Cheramie Plaisance, lived and grew up on the Delta Farms Plantation. She was born in 1913. Her parents were Evetia (Evecia) Ledet Cheramie and Patrick Cheramie. My grandfather was a blacksmith and mechanic on the plantation and some of his children worked at the store. In fact, when Mom was sixteen, she became the "Postmistress" on Delta Farms. (She was selected by "Old Man Mallory.") Unfortunately, all of her family have passed away. Her brother, Andrew Cheramie, wrote a story about their life on Delta Farms. His main purpose was to let his children and grandchildren know about life in his generation. He also drew a map, from memory, of the plantation. The story is mostly about his perspective as the youngest surviving child. It also goes into details about his struggles with his religion and his diagnosis of cancer. I don't think that would be appropriate for your research, but there are some tidbits that I'm sure you'd be interested in."

Rosita Adams. From a social media messenger on several occasions in 2014.

Rosita Adams is the daughter of Lawrence Dufrene who is one of the men in the most

notable Delta Farms photo of two men standing at the entrance of Delta Farms with a sign, seen in Figure 2.3. “I lived there until the National Guard came to help the few people living there get out. The water was coming in so fast in the canals, that we couldn't do it alone. This happened twice. The last time it was not pumped out. The Whites did not want to pay to redo it.” When she was asked about the residents living there during the final flood, Mrs. Adams responded: “Near the bridge were the Crenshaws (5-people lived there). House in back of pump were the Chiassons (5-people lived there) 1st of 5 houses were Dufrene (1 person there) 2nd house Rodrigues (2 people lived there) 3rd house Theriots (6 people lived there) 4th house Dufren's (3 people lived there) and 5th house Theriots (4 people lived there) I think that covers it .. That's 26 people. There was another house right when you crossed the bridge and went straight to the back, The Powells lived there. But I do believe they moved away after the first flood (1961).” She said this about the flood: “Now it was a hard thing to stand there and watch, the water coming toward the houses, we had to hurry and pack our things, and had to leave some things behind. But everyone got out and we all left so many memories behind.”

#### Appendix IV. Sand, Silt, Clay Measurements

<b>Sample Number</b>	<b>Sand %</b>	<b>Silt%</b>	<b>Clay%</b>
1	1.8	34.5	63.7
2	3.2	35.2	61.7
3	2.7	32.8	64.5
4	1.1	35.8	63.2
5	2.9	29.9	68.1
6	0	31.1	68.9
7	1	30.2	68.8
8	0.6	89.2	10.3
9	0	30.9	69.2
10	0.6	25.6	73.8
11	0	20.5	79.4
12	1.3	26.6	72.1



## Appendix V. Interview Release Form & Certification

### INTERVIEWEE RELEASE FORM

#### Recordings and Transcripts

I, \_\_\_\_\_, do hereby give to Stacy N Peterson and the LSU School of the Coast and Environment, the rights, titles, or interest in the digitally-recorded interviews conducted by Stacy N. Peterson on \_\_\_\_\_. (Date)

I understand that the photographs, recordings, and transcripts may be used in public presentations including but not limited to, audio or video documentaries, presentations, online publications, plays, or exhibits. This form does not limit any use that I myself may want to make of the information in these recordings.

#### CHECK ONE:

Recordings, photos, and transcripts may be used without restriction \_\_\_\_.

Recordings, photos, and transcripts are subject to the listed restrictions \_\_\_\_.

I would like to restrict the following:

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Signature of Interviewee \_\_\_\_\_ Date \_\_\_\_\_

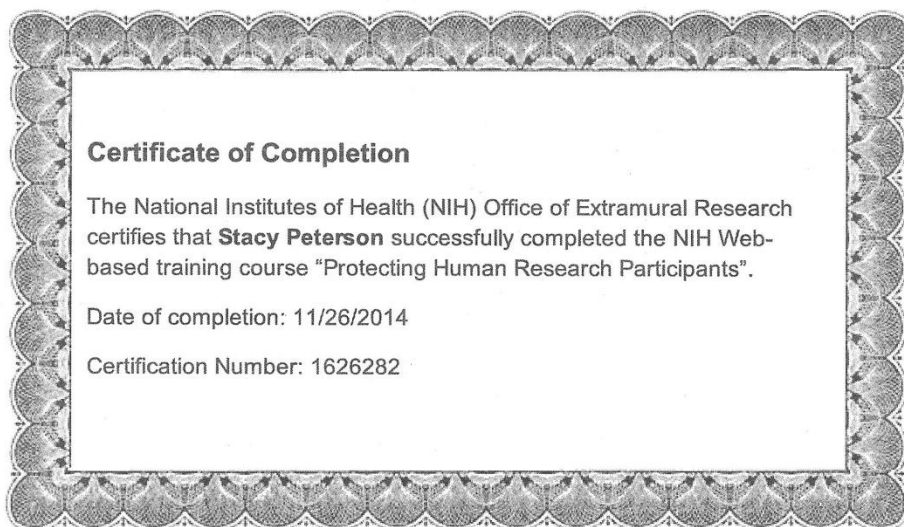
#### Address

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Phone \_\_\_\_\_



## Appendix VI. IRB Information

### IRB #E9108

Institutional R Board <irb@lsu.edu>

Mon, Dec 1, 2014 at 11:39 AM

To: Stacy N Peterson <spete32@tigers.lsu.edu>, R Eugene Turner <euturne@lsu.edu>

We have completed the review of your study, Failed Agricultural Impoundments: An Interdisciplinary Assessment of Community Structure and Social Resilience. It was determined that IRB approval is not needed for this study.

Also, seeking an *apriori* opinion before the study has begun is the proper procedure for future projects of this type.

Thank you,

**Institutional Review Board**  
**Louisiana State University**  
**Jason Pasqua, Coordinator**  
**130 David Boyd Hall**  
**P: (225) 578-8692**  
**F: (225) 578-5983**  
[irb@lsu.edu](mailto:irb@lsu.edu) | [www.lsu.edu/irb](http://www.lsu.edu/irb)

*LSU Research - The Constant Pursuit of Discovery*

## Vita

Stacy N. Peterson was born in Lake Charles, Louisiana. She soon moved to Laplace, Louisiana with her parents and three siblings, where she spent most of her formative years. Her mother, being a kindergarten teacher greatly emphasized learning and curiosity in the world. Her father, with a background in science, encouraged a pursuit in science. His favorite response to her questions was “Look it up.”, which is advice she utilizes to this day. Throughout her academic and personal life, Stacy found a great affinity for helping animals and asking questions, which led to a Bachelor’s degree in Animal Science at Louisiana State University from 2003-2007. In addition to her interest in science, Stacy also enjoyed learning and utilizing different languages. Starting with French in third grade, Spanish was added in high school and finally Japanese in college. While pursuing her undergraduate degree, Stacy performed undergraduate research in the LSU Museum of Natural History, herpetology collection. Her main topic of research was phylogenetic variability in wild and captive bred species of the indigenous New Guinea snake, *Morelia boleni*. After graduation she worked at the Baton Rouge Zoo as an educator where she came to understand the importance of connecting the public with scientific facts. That was one motivation to return to school for her Master’s degree.