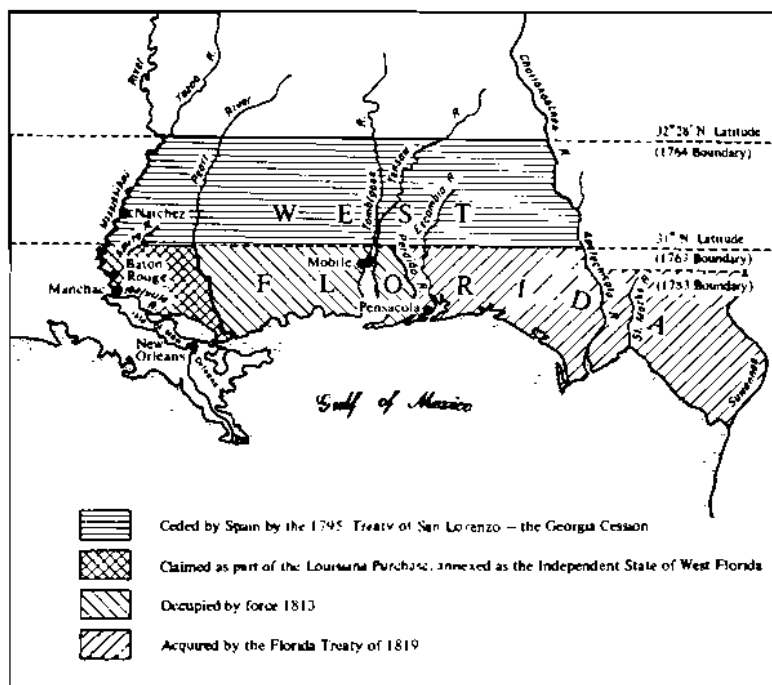


# The FLORIDA GEOGRAPHER

Vol. 14 No. 2



Colonial West Florida and the Sequence of U.S. Annexation



THE FLORIDA

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## THE OBLITERATION OF COLONIAL WEST FLORIDA

Craig Miller and Patrick O'Sullivan

When a territory has been occupied by a succession of societies with strong institutions geared to the achievement of explicit geographical goals, our expectation is that relics of past imprints would be obvious in the landscape palimpsest. Most usually in such circumstances, the application of the current set of objectives and their mapping onto the land are modified by past usage and structure. Thus, the lines and villages of the manorial system guide the fields and farms of lowland Britain's commercial agriculture, while the plans of Puritan oligarchies laid out the landscape now occupied by commercial horticulture and dairying in New England.

The most marked institutional influence on the pattern of American human geography is postulated to be the Northwest Ordinance and the rectangular land system it inaugurated.<sup>1</sup> The system was designed for the interior lowlands and it erased the light hand of Indian occupation there fairly thoroughly. West Florida was the first area where this system was imposed displacing significant European colonial occupation. Here, then, we might expect to see concrete remnants of a lengthy colonial heritage showing through, as for example in California.<sup>2</sup> West Florida was invested twice by Spanish and once by British imperial control (Fig.1, cover). Imperial land allocation policies with overt political aims were in operation in the area for considerable periods. These have, however, left little signature on the land. The incorporation of this area in the USA successfully eradicated the vestiges of previous occupation, heralding the triumph of the competitive society and "manifest destiny" and their precursor in the Ordinance of 1785.

### *The Political Succession*

#### *Spain 1602-1763*

For more than a century after its discovery Spain's possession of the Gulf coast served the empire as a wilderness buffer zone, protecting New Spain from European percolation in North America. The military post of Pensacola was founded in 1699 to hold the coast for Spain but it failed to establish a firm foothold of settlement. While French posts along the Mississippi and as far east as Mobile Bay thrived, Pensacola was considered one of the least desirable postings in the empire. Conditions were often desperate, as in 1704 when British raids from the Carolina frontier destroyed the Franciscan Apalachee missions, eliminating the only local source of food. Spanish troops were forced to depend on the French of Mobile for sustenance. The Creeks resisted penetration beyond the shores of Pensacola Bay and Indian raids, incited by the British, inhibited agriculture. When the British occupied Pensacola, however, they attributed the "few paltry gardens" to "Spanish indolence."<sup>3</sup>

The Spanish reciprocated this cultural animosity by leaving en masse when the 1763 Treaty of Paris transferred Florida to Britain, despite assurances that "the new Roman Catholic subjects may profess the worship of their religion . . . as far as the laws of Great Britain permit."<sup>4</sup> Along with the Spaniards went the remnants of the Yamassee nation which had come to them seeking refuge from British slave raids. This exodus left the British with a deserted town and a paper claim to a territory in the real possession of powerful Indian nations.

#### *Britain 1763-1783*

The British government acquired Florida out of a combination of traditional mercantilist and new imperialist motives. The mercantilists perceived a mild climate similar to the valuable colonies of Carolina and Georgia and perhaps even far south enough to compare with the Indies. British energy would convert the savage land into plantations providing rice, indigo, cochineal, and sugar. Possession of Florida would also provide a monopoly on trade with the Chickasaw, Choctaw and Creek nations, and its spacious harbors would provide a base from which to capture trade with Spanish America.<sup>5</sup>

For imperial strategists, the treaty of 1763 provided Britain with undisputed control of Canada and all the land east of the Mississippi with the exception of the Isle of Orleans. Thus, a natural boundary served also as a transport route connecting settlements along the western frontier from the Gulf to Illinois country. West Florida was particularly important as it bounded the only frontier with the Spanish empire occupied by Europeans. In addition, the land of Florida could be used to relieve land hunger in the older Atlantic colonies and divert settlers away from conflict with the nations of the interior.

#### *Spain 1763-1819*

Bernardo de Galvez's reacquisition of the Floridas satisfied Spain's long-standing objective of an unbroken rim of possession around the Gulf. Combined under the Captaincy-General of Louisiana and West Florida, these two provinces provided Mexico's defense against the encroachment of individualistic frontiersmen loosely associated with a newly established republican government. In West Florida there was the complication that the population and settlement landscape were of British origin. This occasioned a radical departure from the principles of colonization followed for over 200 years in the "Reconquista de las Indias."

By the Treaty of San Lorenzo, 1795, West Florida suffered its first loss of territory to the United States. In 1781 de Galvez had conquered the entire British province whose northern boundary since 1764 had been the parallel of 32°28'N. In the treaty of 1783 Britain agreed that Spain would "retain" West Florida as a conquered province but, at the same time, ceded to the United States her claim to lands extending south to the 31st parallel. This cession to the United States, therefore, included much of the territory which Spain possessed by conquest. In the years which followed the United States and the State of Georgia disputed jurisdiction over this strip while Spain retained de facto control. The most fertile lands of the province were in the disputed territory. There, in the valleys of the Tensaw district north of Mobile Bay and along the Mississippi and its bayous in the west, a majority of the former British subjects had chosen to remain on their land. Writing to Galvez, Governor General Miró reported that many of the British from Mobile and Pensacola had migrated to the rich lands of the Natchez district.<sup>6</sup> Even before Anglo-Americans were permitted to settle in West Florida officially, the population of the Natchez area consisted almost entirely of people who had settled in British West Florida before and during the American Revolution. Many of the plantation families who later controlled Mississippi were descended from settlers of the British period. The British settlements in clearings scattered amidst the forest were insulated from Spanish cultural influence and avoided Spanish efforts at assimilation.

With Napoleon's sale of Louisiana to the United States, an Anglo-American wedge replaced the keystone of Spain's arch over the Gulf. West Florida became an outlier not a bulwark. It was clear, to the governor of West Florida at least, that this was merely a first step as southern states clamored for access to the Gulf down West Florida's rivers.<sup>7</sup>

The beginning of the nineteenth century found Baton Rouge the least secure of the province's districts. The Mobile and Baton Rouge districts were ceded from French Louisiana to Britain in 1763 and became part of British West Florida. The United States exploited an ambiguity in the Louisiana Purchase agreement to lay claim to these districts. With the relocation of the provincial government from New Orleans to Pensacola in 1803, Baton Rouge became the most remote district surrounded on three sides by the United States. The residents of this most populous section were 40% French, 40% Anglo-American and only 20% Spanish. In 1810 the United States fomented a rebellion in the district.<sup>8</sup> In rapid succession the free and independent state of West Florida was proclaimed; it seceded from the Spanish province; annexation by the United States was requested and the area was admitted as the "Florida Parishes" of Louisiana. In 1813, the United States pressed its claim to the Mobile district with troops under Andrew Jackson. All that remained of West Florida was the land east of the Perdido River, encompassing the town of Pensacola and the military outpost of San Marcos. By the Adams-Onís treaty of 1819, both East and West Florida were sold in their entirety to the United States.

#### *Colonial Land Policy and Practice*

##### *British West Florida*

The first substantial settlement of the area took place as a latter-day and unique British colony west of the Appalachians. In designing the land policy for the colony, administrators were conscious of the need to populate it quickly. It was intended to distribute land only to permanent settlers and to attract small farmers who could not get land in older colonies. The governor was discouraged from offering large tracts and creating a class of absentee landlords rather than a permanent establishment of middle class owner-occupiers.<sup>9</sup> The wilderness, Spain's protection in Florida for 160 years, was now Britain's enemy. The more quickly West Florida could emerge from its pioneer fringe of British settlement, the sooner its inhabitants would satisfy mercantilist demands for raw materials and become selfsupporting, contented, loyal British subjects.

No sooner was the Treaty of Paris signed, and even before British troops landed, then speculators rushed to Pensacola to buy what improved land there was from evacuating Spaniards and Indians. The treaty guaranteed the right of the Spanish to sell their estates within a year and a half of the treaty's ratification, but all sales made before the arrival of occupying forces were eventually invalidated to ensure crown control of land distribution.<sup>10</sup> In the early days the governor and council's attention was concentrated on the existing fabric in Mobile and Pensacola. Rural development progressed slowly spreading around the shores of the bay.<sup>11</sup> Immigration was not encouraged by the unhealthy reputation which reports gave Pensacola as swampy and fever-ridden and Mobile as a "graveyard for Britons."<sup>12</sup> The first years of development were given to draining swamps, building up Pensacola and Mobile and connecting them by road as trade centers with the Indian nations. As a western defense, a chain of forts was built from Natchez to Fort Bute along the Mississippi. As settlement around the initial foci consolidated, the emphasis shifted to more distant portions of the colony, especially to the Natchez country where towns were planned at Natchez, Manchac and Dartmouth at the confluence of the Iberville and Atchafalaya Rivers.

Despite the precautions taken to discourage large accumulations of land, speculation was rife in the colony. Officials acquired vast tracts under grants by mandamus, family right, purchase right, and collusion, as their wives petitioned and received grants. After the Spanish conquest the colony's surveyor general and one-time acting governor Elias Durnford lost 57,717 acres in eight lots.<sup>13</sup> Officials encouraged speculation because obtaining title generated fees. Hundreds of thousands of acres reserved by promoters for colonization schemes actually succeeded only in removing vast stretches of the most

fertile land from the reach of sincere settlers. The situation became so serious that the London government forbade Governor Chester to make grants in 1773. This ban, however, was lifted as West Florida was declared a refuge for loyalists. The resulting wave of immigration encouraged further indiscriminant granting of large tracts as refugees were compensated for the price of their fidelity.

In practice politicians and administrators lost sight of the clear and explicit intent calculated to fit West Florida into the imperial scheme. After directing the British defense of Pensacola, General Campbell expressed his disgust with this loss of vision as follows: "What interpretation can the whole bear, but that it was considered no object of national concern, and left as a geegaw to amuse and divert the ambition of Spain and prevent it from attending to objects of greater moment and importance."<sup>14</sup>

#### *Spanish West Florida*

The settlement policy which evolved after 1763 represented an unprecedented liberalization of Spain's colonial doctrine. This modification began in Louisiana with Governor O'Reilly's efforts to fend off Anglo-American advances by attracting non-Spanish, but nonetheless Catholic, immigrants. Displaced Acadians, Swiss and German Catholics were encouraged to settle in Louisiana. Land was granted free to each newly arrived family in proportion to the means of cultivators, with land reverting to the King if certain cultivation and enclosure requirements were not met.<sup>15</sup> A plan of defense was based on a colonial militia and Frenchmen were appointed to colonial offices.

The collapse of British power permitted a flood of Americans to cross the Appalachians into the heart of the continent formerly reserved for the Indian nations. The government of the United States, through a secret treaty with Britain, claimed all of West Florida above the thirty-first parallel. Feeling the pressures mounting against the northern boundary, Miró sought to populate the frontier against the republican onslaught. British Protestants were granted permission to remain on their lands provided they swore allegiance to the King. The royal order assured the settlers they would not be disturbed in religious matters, though their children would be indoctrinated in Catholicism. English-speaking Irish priests were brought in to begin the first stage in a slow task of Hispanicizing the Anglos.<sup>16</sup> Following the establishment in Natchez of a small colony of Maryland Catholics, Miró realized that Anglos would emigrate to West Florida at no expense whatsoever, attracted by free, fertile land. Amicable relations with the resident Anglos calmed fears of governing a province of aliens and heretics to such an extent that it seemed rational to swell the population with the very immigrants who were providing the United States with the excuse for territorial aggression. Miró came to believe that the Anglo-American tide could be harnessed under the paternal care of His Catholic Majesty with the benefits of free land and free commerce on the Mississippi.

Miró's successor, Baron de Carondelet, fearing the ambitions of the United States, banned Anglo-American settlement north of Pointe Coupée in the Baton Rouge district. He sought to strengthen Spain's position in the Mississippi valley by fortifying military posts and securing alliances with the Indian nations who were experiencing American expansion. His fears were well-founded and in 1795, Spain was induced to surrender her claim to West Florida north of the thirty-first parallel.

In 1797 Governor General Gayoso de Lemos issued a set of regulations governing the granting of lands in Louisiana and West Florida. Speculation was inhibited by an upper limit of 300 arpents (680 acres) on grants and the prohibition of title transfer before substantial improvements were made.

Immigrants were directed to settle contiguously in the interests of defense and political and social coherence. The intent was to create a population permanently attached to their land. These efforts to establish a human barricade between Mexico and the United States failed because the political turmoil of Napoleonic wars retarded European immigration; because the United States proved a more powerful magnet for immigrants; and because of the short time given Spanish officials to do much before the advance of the republic overcame them.

#### *The Dismemberment Of West Florida*

The three territorial acquisitions which brought West Florida into the possession of the United States were among the earliest extensions of its new national land policy. The factors which shaped that policy were quite independent of the conditions in British and Spanish West Florida. The objectives underlying the formation of the American land system were peculiar to the unprecedented republican politics of a nascent nation with a seemingly limitless supply of land. Though the West Florida territory played no part in this development, the subsequent application of the land settlement system devised, overwhelmed all prior influences in the region's human landscape.

American land policy resulted from the compromise of two diametrically opposed goals. Jefferson was intent on colonizing the interior. Hamilton sought revenue to pay off the war debt and insure the survival of the new government, and the public domain was the obvious asset with which to resolve the nation's financial problem. On the contrary, Jefferson projected the frontier attitude proclaiming that, "By selling land you will disgust them and cause an avulsion of them from the common union. They will settle the land in spite of everybody."<sup>17</sup> In this he identified the inertial force which could not be turned aside by laws. Accommodating the desire to "make the government secure and great through the spread of people over millions of acres of the great central valley"<sup>18</sup> to the desperate need for revenue, the Congress produced the Ordinance of 1785. This provided the legal framework for the evolution of the Gulf Coast landscape which obliterated colonial West Florida.

Not only the township system of rectangular surveys, to which all prior claims had to be reconciled and which shaped the allotment of the public domain, but also the piecemeal acquisition of the territory by the United States served to bury the traditions of the colony. The pieces were variously distributed between Louisiana, Mississippi, Alabama and Florida. After dispersal of over two thirds of West Florida to three other states, the remainder was occupied and merged with the former colony of East Florida. Application of the national land policy to that combined Florida territory retarded the growth of the established colonial settlements and opened the previously unsettled lands of Middle Florida to a burgeoning immigration which soon surpassed the older settlements in both population and political power, eclipsing the colonial identity.

#### *The Georgia Cession 1802*

The United States claimed the strip of land lying north of the 31st parallel on the grounds that the treaty of 1795 with Great Britain named the older boundary of West Florida at 31°N as the southern limit of her cession. This included the lush lands of the Natchez and Tombigbee districts. Spain relinquished her claim in 1795 by the Treaty of San Lorenzo but remained in possession for three more years as the States of Georgia and South Carolina disputed ownership of the acquisition. In 1802 Georgia finally ceded her colonially derived western lands to the federal government, and the Mississippi Territory, as it had been dubbed, became part of the public domain. This cession required the United States to accept the burden of adjudicating a



morass of land claims made under British, Spanish and Georgian jurisdiction. As late as 1844 the Supreme Court was still sorting the mess out.<sup>18</sup>

#### *The Louisiana Purchase 1803*

Basing a claim upon the wording of Spain's retrocession of Louisiana to France by the Treaty of San Ildefonso, the United States insisted that their purchase included all the land north of the Iberville and east of the Mississippi as far as the Perdido, a region which had been called West Florida since 1763 when the British acquired it from the French. France had never re-occupied the territory and Spain refused to relinquish it in 1803. In 1810 the area from the Mississippi to the Pearl River was wrested from her as the "Independent State of West Florida" and added to Louisiana in 1812.

In 1813 the United States occupied all of the province lying west of the Perdido. This was annexed to the Mississippi Territory. In 1817 this was divided between the state of Mississippi and the territory of Alabama, thus connecting Mobile with its hinterland in the Tensaw-Tombigbee basin.

Spain's retention of the land and granting of claims subsequent to 1803 presented particular problems of incorporation into the United States land system. The tangle was finally settled in favor of accepting the grants of the de facto government by an Act of Congress passed in 1860, amended in 1867 and extended in 1872.<sup>20</sup>

#### *The Florida Treaty 1819*

The remaining portion of West Florida, from Pensacola two hundred miles east to the fort of San Marcos (St. Marks), was obtained along with East Florida (Fig. 2). The land east of the Perdido and south of 31°N was acquired

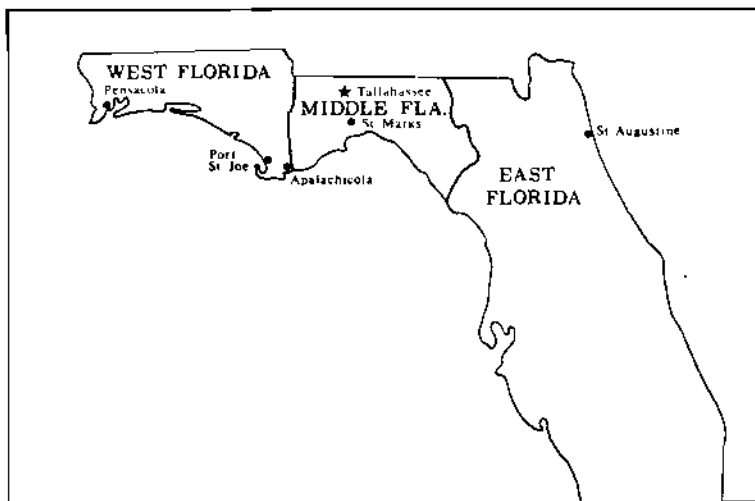


Fig. 2. Florida Territory 1822-1845

with recognition of the full prior sovereignty of Spain. This last part of West Florida to enter the public domain thus experienced a smoother transition. A board of commissioners was appointed in 1822 to deal with existing claims and finished its work by 1826. The only exception was Colin Mitchell's claim to over 1,250,000 acres.<sup>21</sup> This stemmed from an Indian cession made to the trading firm of Pantón Leslie and Company in recompense for tribal debts. This firm had served the colonial government by managing Indian affairs and the claim had been condoned by the Spanish administration. The area included the port of Apalachicola and a Supreme Court decision in favor of the appellant scared the inhabitants into shifting their activities onto the undisputed public domain, founding the community of St. Joseph.<sup>22</sup>

The Surveyor General, Robert Butler, began subdividing the public domain in the near wilderness region which had been practically devoid of European settlement since the Franciscans were driven out. West Florida's identity on the political map vanished when East and West Florida were merged into the Florida Territory in 1822. Nevertheless the tradition of two separate provinces remained a strong force in politics throughout the territorial period. While confirmation of prior claims held up occupation of previously settled areas, the opening of the West Florida public lands between the Suwannee and Apalachicola gave rise to a third region, Middle Florida, whose geographic and economic distinction was recognized by its 1824 designation as a separate judicial district. The area, with Tallahassee as its focus, attracted many settlers when Florida's first public land sale made it available in the Spring of 1825. "It was soon apparent that Middle Florida was to be the center of the Territory in every sense -- economic, social, and political as well as geographical -- the East and West, while retaining some of their mutual distrust, promptly transferred most of their jealousy to Middle Florida."<sup>23</sup> In a poll in May of 1837, residents of Seminole War-torn East Florida and agriculturally poor West Florida joined in opposition against the majority vote from Middle Florida which advocated Florida's admission to the Union as one unified Territory. The cause for territorial division was fervently argued both within the state and before Congress. Whereas Middle Florida favored entrance into the Union as one state, both the conservative colonial settlements of Pensacola and St. Augustine upheld their tradition of separation.<sup>24</sup>

Sentiment in Pensacola strongly favored a proposal made by the Alabama legislature to politically reunite the geographically and economically tied settlements of Alabama and West Florida. According to Bailey <sup>25</sup>

Even before the Alabama territory came into being the inhabitants of the area north of West Florida coveted the land which lies west of the Apalachicola River. As early as 1811, two hundred sixty three residents of the Mississippi Territory petitioned the Congress of the United States to add West Florida to their jurisdiction. Not only would this give the Mississippi territory sufficient population for admission to statehood, they asserted, but it would promote the interests of the people of both sections.

Political union of the Floridas became an object of national concern as the territory considered applying for statehood. Middle Florida's desire to enter the Union was augmented by national pressures since a southern, slave-holding territory was sought to balance the admission of Iowa, a northern territory, into the Union. Although Florida retained the right of division (and many believed the Florida Treaty actually required such), the population at that critical period was not sufficient for admission to statehood if any such territorial division were achieved. Furthermore if Florida did not enter the Union paired with Iowa, it was feared that the opportunity for statehood would be delayed for many years. Therefore pressure from the populous and politically powerful Middle Florida combined with external persuasion to further the union of the Floridas in preparation for admission into the Union.

The struggle against West Florida's political union with East Florida continued even after Florida was granted statehood in 1845, for the annexation issue was renewed in the 1850's and again during the reconstruction period following the War Between the States when Alabama's attempted annexation of Florida territory west of the Apalachicola River was nearly realized.

The theme of the chief negotiator's address was that cession of West Florida to Alabama would be mutually advantageous. He pointed out that the geometrical outlines of both states would be improved and that the homogeneity of the peoples of each would be increased. His trump card was the argument that annexation would facilitate the prosperity of West Florida. Once the cession had taken place, he envisioned the coal and iron of central Alabama finding its world outlet through the port of Pensacola which would become one of the world's great cities.<sup>26</sup>

The terms of cession were agreed upon by both states with Alabama offering to pay \$1,000,000 in exchange for the territory. Though a referendum in West Florida proved a majority of the population favored annexation the movement was eventually defeated. In 1874, Alabama abandoned the attempt, and likewise the tradition of separate Floridas was forgotten.

#### *The Outcome*

It appears that in the last resort what was important was the demand for cotton of industrial England and New England, which created Middle Florida and overwhelmed the political significance of West Florida. In historical terms, the traces of centuries were wiped away in short order. West Florida's piecemeal incorporation into the United State, the settlement of prior claims, and especially, the national land system dismembered the colony and expunged the traces of imperial objectives and efforts from the landscape. The vestiges are only to be seen in place and motel names, a few empty bottles, clay pipes, buttons, and wall foundations housed in museums, and signs set up by the Beaugardus chapter of the Colonial Dames celebrating events strangely out of keeping with the current state of their setting. The streets of Pensacola do reflect Spanish design and lines of trees show up on air-photos, following colonial boundaries cutting across the square fields of today. There are some road alignments coincident with their colonial originals.<sup>27</sup> In general, however, little remains in the organization of the land to tell of the imperial past.

\* \* \*

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## PREFERENTIAL AND EVALUATIVE RESPONSES TO FLORIDA HIGHWAYS<sup>1</sup>

John Paul Jones III

How highways are perceived, both evaluatively and preferentially, is the subject of this paper. Specifically, it attempts to determine if highways are differentially preferred, and if so, what criteria are most important in highway assessment. In addition, it asks to what extent does the manager-user group dichotomy perceived by some permeate other facets of the environment, notably, highways.<sup>2</sup>

### *Research Design*

#### *The Highways*

Seven major Florida highways were selected for the study: Interstate-10, Interstate-4, Interstate-95, Interstate-75, the Florida Turnpike, US 27, and the Everglades Parkway, or Alligator Alley. The respondents ranked the highways from this list with which they were familiar in terms of their preference for driving on that highway. After they ranked highways, the respondents used an adjective checklist (ACL) to evaluate their most and least preferred highways. Following the completion of the ACL (consisting of twenty-three pairs of word opposites), they circled five words in the list that most contributed to their like or dislike for that highway. Such a format has been used successfully by geographers to obtain both preference and evaluative information of the environment.<sup>3</sup>

Since only the most and least preferred highways were evaluated for each respondent, some "gaps" occurred in the data. For example, Interstate-95 was most preferred by one respondent, and least preferred by one respondent. To make an evaluative/preferential judgment on such limited information would be spurious. (Further efforts could proceed in the direction of evaluating moderately preferred highways, introducing a larger sample size, or by concentrating on one highway.)

#### *The Respondents*

Much has been made in recent years of the differences in perceptions between resource managers and various user groups. Differences have been verified empirically in forest management, as well as for an urban arboretum.<sup>4</sup> One of the objectives of this study is to determine what differences exist between highway design engineers, and the user group, those who drive on the highways. Twelve design engineers from the Florida Department of Transportation were included among the twenty-seven respondents to the survey. The engineers were instructed that they were chosen to complete the questionnaire because of their professional status. They were not instructed, however, to complete the questionnaire from an "engineering standpoint" or from a "driver standpoint." The extent to which this affects the results is unknown.

The remaining fifteen respondents included four truck drivers, two Florida State Highway Patrolmen, two long-distance bus drivers, and seven car drivers known to be familiar with most of Florida's highways. Although no suggestion of randomness is made, the small sample does include the most important types of vehicular traffic.

#### *Additional Information Collected*

To augment the preference ratings and the results of the ACL, the respondents were asked to what extent they enjoy the following activities while driving: listening to music; listening to or talking on the CB; reading billboards and signs; and looking at the land. They were also instructed to imagine their idea of the "perfect" highway, and from this mental construct to respond to the

question, which of the following would best describe the amount of billboards [on the "perfect" highway]: (1) no billboards, (2) one or two at intersections only, (3) one or two every five miles, (4) one or two every mile, or (5) three or more per mile?

### The Results

#### Designers vs. Users?

No significant differences were recorded between the design engineers and the respondents consisting of the user group. Nearly every highway was evaluated identically for both groups. For those highways evaluated somewhat differently, the number of responses was too small to uncover anything more than minor aberrations. Furthermore, the designers coincided well with the user group on the things they like to do while driving, as well as for the preferred number of billboards. Small differences that did occur will be noted but for the purpose of evaluating the highways, the two groups are combined.

#### Highway Rankings

*The Most Preferred Highway.* Interstate-10 was overwhelmingly the most preferred highway studied (Table 1). I-10's mode response on the rank was "1," and the average rank response was a favorable 2.04. I-10 was ranked most preferred by fifteen of the respondents. The ACL's given by these fifteen individuals indicate why I-10 is preferred. It was generally viewed as very quiet, smooth, open, energy efficient, beautiful, safe, clean, and new. It was perceived as fairly quick, pleasant, fast-paced, natural, rural, uniform, ordered, and empty. No consensus was reached on the following word pairs: boring/interesting, heavy traffic/light traffic, few police/many police, hilly/flat, or adequate facilities/inadequate facilities. The highway was weak with regard to the vivid/drab word pair as well. This may explain why two of the twenty-seven respondents regarded it as their least preferred highway. Both indicated that the highway was drab, and both felt that one of the five most important words contributing to their disdain for I-10 was "boring."

TABLE 1  
HIGHWAY PREFERENCE RANKINGS

Highway	Number of Respondents							N	$\bar{x}$
	1st*	2nd	3rd	4th	5th	6th	7th		
I-10	15	3	2	2	2	1	0	25	2.04
I-75	4	8	5	4	1	1	0	23	2.69
Florida Turnpike	3	5	3	1	2	2	0	16	3.00
I-4	1	4	2	7	3	0	0	17	3.41
I-95	1	3	6	4	5	1	0	20	3.60
US 27	2	7	2	3	2	5	1	22	3.68
Alligator Alley	0	0	4	0	0	3	5	12	5.15

\* Number of respondents who ranked highway first (most preferred)

Positive respondents felt the most important descriptors of I-10 were: smooth, open, pleasant, fast-paced, rural, safe, and efficient. The fact that the highway was perceived as fairly rural and "natural" indicates that a certain amount of countryside satisfaction may be gleaned from driving I-10 through North Florida.

The design engineers and the user group differed somewhat on the ACL. Engineers tended to find the Interstate more bounded, quicker, and more efficient (certainly "efficient" is common in engineering jargon). Users perceived the Interstate as more open and smoother than the engineers, but not quite as quick or efficient.

*The Least Preferred Highway.* The Everglades Parkway, or Alligator Alley, was the least preferred highway for seven of the respondents. Three others ranked it as their second-most disliked highway. Only one outlying group ranked Alligator Alley as being their third-most preferred, but two of the four in this group only ranked four highways. Alligator Alley was perceived as very drab, flat, natural, uniform and rural. It was perceived as fairly quiet, smooth, boring, unpleasant, clean, ordered, and with little traffic, police, or facilities. Clearly there are some common descriptors to both I-10 and Alligator Alley. Among these are clean, natural, rural, quiet, uniform, smooth, and ordered. The uncommon descriptors concentrate on Alligator Alley's drabness, flatness, and boringness. However, no consensus was reached on these descriptors for I-10. Only "unpleasant" stands out as a truly uncommon descriptor, compared to I-10's characterization as "pleasant." Unfortunately, "unpleasant" does little to increase our understanding of the difference between the two roads.

No consensus was reached in the word pairs describing Alligator Alley as: expensive/cheap, slow-paced/fast-paced, energy efficient/energy inefficient, ugly/beautiful, dangerous/safe, or old/new. The most common words contributing to the highway's unfavorable perception are: boring, flat, drab, inadequate facilities, unpleasant, open, ugly, dangerous, and uniform.

*The Other Highways.* Interstate-75, the Florida Turnpike, Interstate-4, Interstate-95, and US 27 were variously preferred by the respondents. I-75 was ranked as most preferred by four of the respondents (three of whom were engineers) and least preferred by four of the respondents (all of whom were users). Both the favorable and unfavorable responses noted that the Interstate is congested, but the positive respondents must have found solace in its quickness, safety, hilliness, and beauty. Negative responses concentrated on rough, artificial, noisy, and chaotic.

The Florida Turnpike averaged as the third most preferred highway, although again some disagreement among respondents was noted. Three respondents preferred it the most, three preferred it the least. Both groups did agree on a few adjectives: expensive, quick, fast-paced, clean, natural, rural, and heavily policed. The negative respondents disliked the Turnpike because it is congested and bounded. The positive respondents found it quick, smooth, and open. The discrepancy between bounded and open may arise from the different connotations the word pair may elicit. The Turnpike may be "open" with respect to a field-of-view, but its limited access may render it "bounded" to others.

Interstate-4 was most preferred by one user and least preferred by two engineers. In short, it elicited little comment. To the engineers it was seen as urban, artificial, unpleasant, and flat. The user, a car driver, found it quiet, natural, uniform, and vivid. More research is needed to describe this Interstate adequately.

Similarly, Interstate-95 was rather weak in its affective component for the respondents. One perceived it as most preferred, one as least preferred. Both found I-95 to be urban and artificial; to one respondent, an engineer, this either did not matter or was viewed as favorable.

I-95's rank average was very close to that of US 27's (mean = 3.60 and 3.68, respectively), however, US 27 elicited much stronger comment from the respondents. Two of the respondents preferred US 27 the most, considering it quiet, rural, natural, pleasant, interesting, clean and hilly. Five respondents considered it to be their second-most preferred highway. For twelve of the respondents, however, it was either the least favored (n=4), or the second least favored (n=3). They perceived the highway as congested, rough, old, and dangerous (possibly alluding to its direct access). The difference in perceptions was not related to the engineer-user group classification.

#### *Activities Enjoyed*

The "Looking at the Land" question was designed to be as unromantic as possible, without having to rely on an innocuous-sounding "Looking at the surroundings." Other activities were included primarily to anesthetize the respondents. Nevertheless, looking at the land was the most preferred activity while driving. Nineteen respondents enjoyed looking at the land "a great deal," seven "sometimes," and only one respondent replied "not at all." The response to this question has implications for the "Reading billboards and signs" query. Only one respondent enjoyed reading billboards and signs "a great deal," while sixteen responded "sometimes" and ten "not at all." (The results of this question are discussed below.)

#### *The Perfect Highway*

The abundance of billboards on our highways has irked at least one geographer from an aesthetic standpoint.<sup>2</sup> However, the federal Department of Transportation has curtailed funding for billboard removal and easements on federally funded highways. This study indicates that there is some moderate stance preferred by both design engineers and users regarding billboards. Billboards should not interfere with looking at the land, a favorite pastime for the respondents. And yet, the majority of the respondents enjoyed reading billboards and signs "sometimes."

The respondents were asked to consider their "perfect" highway when determining the amount of billboards they preferred. Surely if there were adequate sentiment for billboard removal it would show up in such a biased question. Yet only eight of the respondents favored no billboards. Eight more favored one or two at intersections only, a plan similar to that being tested on Virginia highways. Six preferred one or two every five miles, four preferred one or two per mile, and one respondent preferred three or more per mile. Thus, while there is some sentiment for no billboards, 70 percent of the respondents of this study preferred highways to have at least a few billboards.

#### *Conclusion*

Florida's modern four-lane highways tend to be evaluated as quiet, smooth, and safe. Seldom are they perceived as having too many, or too few police or facilities. Yet preferentially, highways may differ greatly. The roadbeds do not differ greatly, so one must infer that other factors, including the highway's environment, are the causes of preferential differences. Referring to Alligator Alley again, the low ranking of this highway cannot be explained for example as a function of traffic congestion. Alligator Alley was perceived by most as having light traffic. It seems to be the everglades



landscape, not Alligator Alley itself, which is perceived as boring and drab, despite its naturalness.<sup>6</sup> Other of Florida's natural settings fared better by those groups who most often used the state's four-lane highways.

\* \* \*

1. The author expresses thanks to Dr. Donald Patton, Florida State University, who offered comments on an earlier draft of this paper.

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3. D. Lowenthal and M. Riel, *Environmental Assessment: A Case Study of New York City* ("Publications in Environmental Perception," No. 1) New York: American Geographical Society, 1972.

4. R. Lucas, "Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area," *Natural Resources Journal* 3 (1963): pp. 394-411; B. W. Twight and W. R. Catton, Jr., "The Politics of Images: Forest Managers vs. Recreation Publics," *Natural Resources Journal* 15 (1975): 297-305.

5. P. F. Lewis, "The Geographer as Landscape Critic," in *Visual Blight in America*, Association of American Geographers, Commission on College Geography, Resource Paper No. 23, (Washington, D.C., 1973), pp. 7-23.

6. Others have emphasized the importance of relative relief in landscape appreciation. This study supports their conclusions. K. D. Fines, "Landscape Evaluation: A Research Project in East Sussex," *Regional Studies* 2 (1968): 41-55; D. L. Linton, "The Assessment of Scenery as a Natural Resource," *Scottish Geographical Magazine* 84 (1973): 1-23; E. Zube, D. Pitt, and T. Anderson, "Perception and Prediction of Scenic Resource Values of the Northeast," in *Landscape Assessment: Values, Perceptions, and Resources* ed. Zube, Bruch, and Fabos (Stroudsburg, Pa.: Dowden, Hutchinson, and Ross, distributed by Halstead Press, New York, 1975), pp. 151-67.

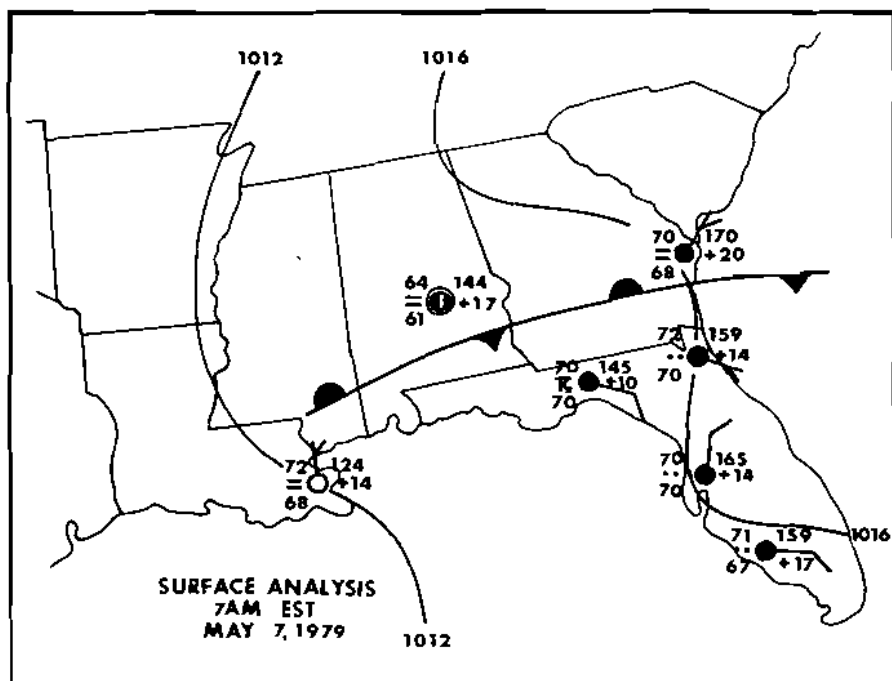


FIGURE 1

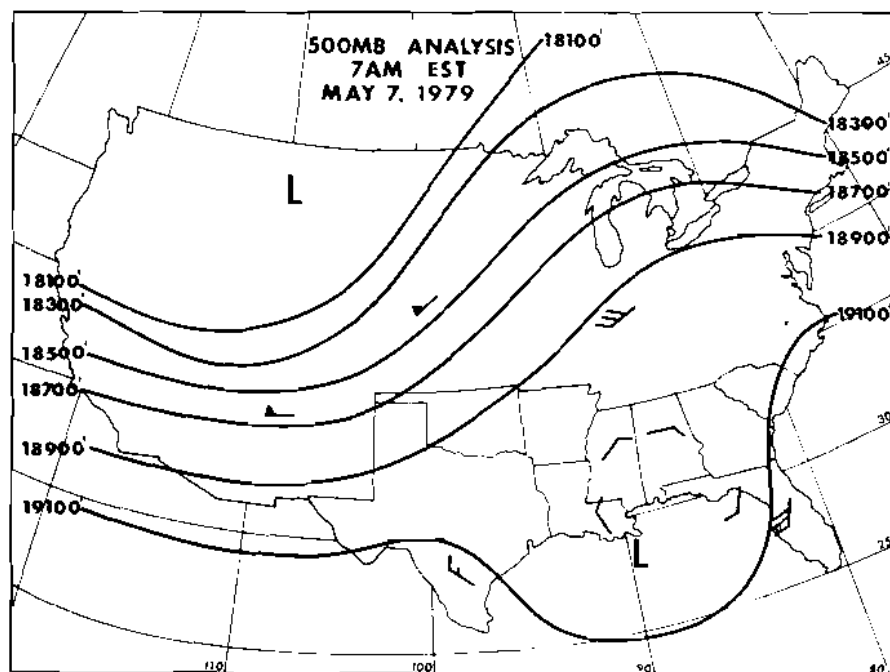


FIGURE 2

## THE TAMPA BAY STORM OF MAY 8, 1979

D. M. Stowers, Jr., and Michael Levasseur

The first six months of 1979 provided the Tampa Bay area with its share of anomalous weather patterns that not only confused and amazed professional meteorologists, but served the complacent public with notice that "it can happen here!" While all of the climatic variances that occurred during this period are noteworthy, the subject of this paper is the anomalous storm that occurred along a narrow band of unforecastable convergence in Pinellas and Hillsborough counties on Tuesday, May 8, 1979.

### *The Storm and Its Causes*

To fully comprehend the meteorological complexity of the May 8th storm, it was necessary to investigate the weather conditions that existed on the previous day. This was accomplished by comparing surface and upper level charts for May 7, 1979. An examination of the 0700 (EDT) United States Weather Service surface chart of May 7 reveals no significant variation from a normal late spring day<sup>1</sup> (Fig. 1). Although a weak stationary front was located immediately north of Florida, extending from New Orleans to the Atlantic Coast, no unusual weather resulted from its presence. A relatively weak ridge of high pressure extended over most of the peninsula, causing a general southeast flow of moist tropical air across the state and resulting in seasonal afternoon thundershowers. One tenth of an inch of precipitation was recorded at the official Weather Service station at the Tampa International Airport. These conditions, in conjunction with an above-normal surface barometric pressure average, gave no indication of the impending severe weather change.

A study of the May 7, 0700 (EDT), 500 mb chart reveals a normal westerly flow across most of the continental United States, with one important exception<sup>2</sup> (Fig. 2). The 19,100' contour shows a definite convergence area located over the northern Gulf of Mexico and extending southward approximately 300 miles from the Mississippi border. While the convergence circulation was weak (convergence less than fifteen knots) and no closed isobars are in evidence, this strong dip in the westerlies does not normally occur this late in the spring season. This convergence area was also visible on the 300 mb chart and confirmed by the U.S. Weather Service radiosonde soundings taken at Ruskin, Florida, on this date.

Utilizing these charts and other available meteorological information, the official forecast for Tuesday was for typical late spring weather in regard to both temperature and pressure, with a slight increase in the possibility of precipitation. This official forecast was affirmed by local television weather forecasters during the Monday evening programs.

During the early morning hours of Tuesday, May 8, the weather pattern changed (Fig. 3). A low pressure area developed at the surface in the central Gulf region, approximately 500 miles west of the Tampa Bay area, and

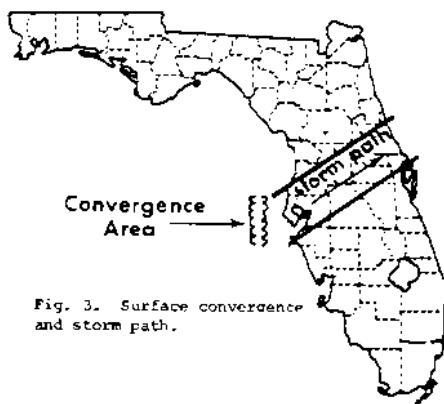


Fig. 3. Surface convergence and storm path.

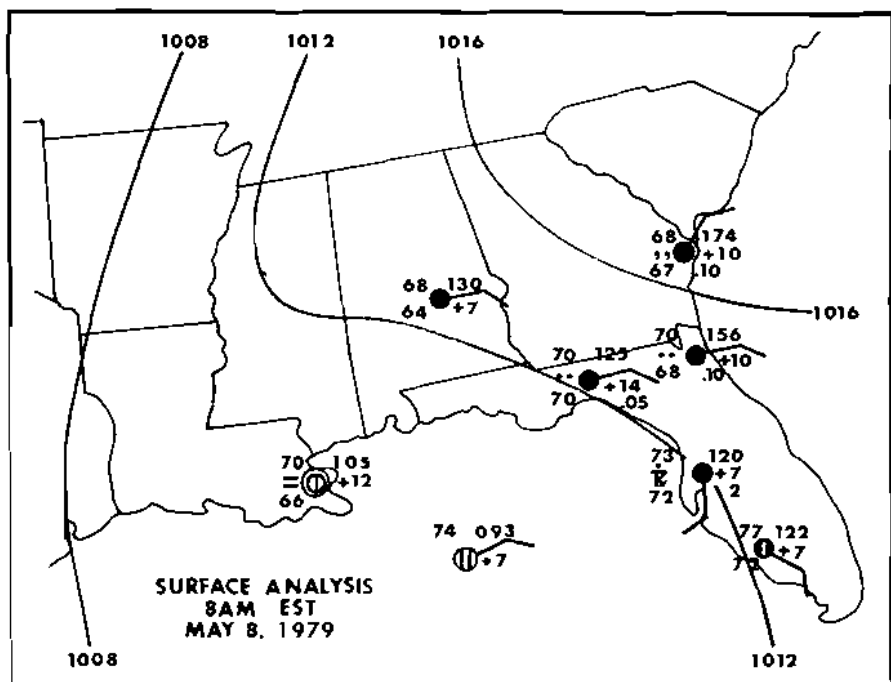


FIGURE 4

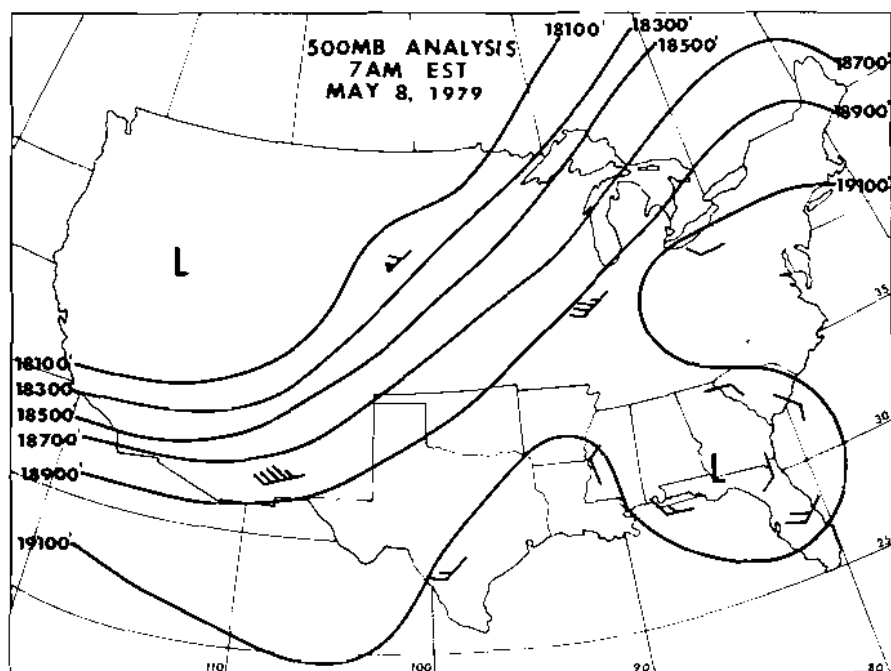


FIGURE 5

a narrow surface convergence zone developed thirty to fifty miles offshore, directly west of St. Petersburg. The first wave from the zone reached the coast at approximately 0400 (EDT) Tuesday morning. This wave was followed by three additional ones extending over a twelve-hour period. Although heavy precipitation was recorded during these waves, intermittent rain continued throughout the twelve hours.

It is interesting to note the geographical extent of this convergence zone. It extended from the northern section of Manatee County northward to the southern part of Pasco County, a distance of approximately forty miles. This narrow band then extended in a northwesterly direction across the state. The three succeeding waves also were confined to this region. The heaviest precipitation occurred along the immediate coastal sections during all of the waves and declined rapidly after reaching the eastern border of Hillsborough County, thus confining the main damage from the storm to an area of approximately forty square miles.

The effects of the first wave continued in the area for about an hour and ten minutes (0400-0510 EDT). During this period wind speeds that were officially measured exceeded thirty knots and were accompanied by 0.93 inches of rain.<sup>3</sup> Many coastal residents were awakened by machine-gun-like claps of thunder and strong strokes of lightning, resulting from numerous cumulonimbus clouds whose tops were estimated to have exceeded 30,000 feet.

The Weather Service surface facsimile map received at the University of South Florida Weather Station at 0800 (EDT) confirmed the developing weather pattern\* (Fig. 4). The map showed the lowest center of barometric pressure to be 1009.3 mb. This center was located at 26°N. latitude and 90° W. longitude. An examination of the 0700 (EDT) 500 mb chart (Fig. 5) reveals the convergence area was still well developed and the dip extended to approximately fifty miles south of the Tampa Bay area.<sup>5</sup>

The second wave arrived over the coast at about 0715 (EDT) and continued until approximately 0815 (EDT). The heaviest concentration of rain, 3.23 inches, was officially recorded during this time.<sup>6</sup> Shortly after 0900 (EDT) the third wave arrived and brought 2.97 inches of rain.<sup>7</sup> A tornado touched down at Tampa International Airport, causing the air traffic controllers to leave the tower posts for approximately fifteen minutes. During this period, several of the local weather communications systems ceased functioning, either temporarily or for the remainder of the storm.

A total of nineteen tornadoes were reported from various local sources, although only fourteen were confirmed by the United States Weather Service in Ruskin, Florida (Fig. 6). Multiple touch-

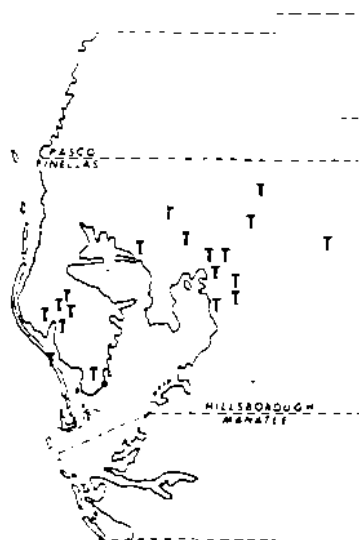


Fig. 6. Tornado damage areas.  
T = reported tornado touch-downs.

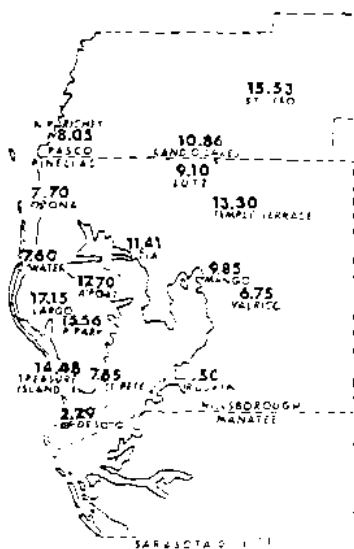


Fig. 7. 24-hour precipitation totals, May 8, 1979.

downs of the same tornado would explain the discrepancy. These severe storms were present in each of the four waves, but the most destructive ones occurred between 0730 and 1200 (EDT) hours Tuesday morning. One of the most destructive touchdowns occurred near Fowler Avenue, about four miles east of the University and was confirmed by the barograph chart at the University's Weather Station. The damage was extensive and will be discussed later.

This storm, in summary, broke all of the existing precipitation records for storms occurring in the month of May in Tampa. Tampa normally averages 2.85 inches of precipitation, making May the sixth driest month of the year. The total official precipitation recorded at the Tampa airport was 11.41 inches, approximately four times the normal average for this month<sup>9</sup> (Fig. 7). The previous official twenty-four-hour precipitation maximum for May was 2.97 inches, established in 1971.<sup>10</sup> Although the total official precipitation was 11.41 inches, rainfall totals varied over the four-county

area from a low recording of 0.10 inches in Sarasota to 17.70 inches at the Pinellas County Airport.<sup>11</sup> This diversity of rainfall within the storm band was the result of the differing precipitation potential of individual storm cells.

The storm originated from a convergence area which formed in a dip of the southern flow of the westerlies at the 500 mb level, which, in turn, caused the formation of a low pressure area in the northern Gulf. This series of causal meteorological phenomena, in conjunction with the storm pattern, must be considered a noteworthy seasonal anomaly.

#### *Consequences of the Storm*

The subsequent storm damage was extensive within the prescribed geographical area. As a result of three deaths, millions of dollars in damage, and extensive cost of evacuation and rebuilding, Governor Robert Graham succeeded in having Pinellas and Hillsborough counties declared a Federal Disaster Area on May 15, 1979.

Throughout the two-county area thousands of cars were abandoned as flooding closed streets, highways, and several major exits of I-275. Over 100 homes were destroyed and close to 2,000 damaged by water and wind.<sup>12</sup> Businesses were literally swept away. Electric and telephone service was disrupted. SPCA "animal rescue" teams cruised the area. And, funseekers at Busch Gardens were turned away for the first time since 1973.

In Pinellas County heavy rains combined with low terrain, inadequate drainage and high tides to produce the most severe flooding. The geographical makeup of the region was the single most important causal factor. Pinellas County ranges in elevation from seventy-eight feet above sea level in the north

to a few feet above sea level in the south. The presence of extensive Gulf-connected waters in this region (Tampa Bay, Hillsborough Bay, Boca Ciega Bay, etc.) plus lowlying causeways make the surrounding environs particularly vulnerable to flooding that results from strong storm tides.

The landscape includes a maze of swamps, marshes, bayous, small lakes, canals, and porous soils which contribute to the overall run-off problem. Local drainage systems were designed to accommodate 6.68 inches in a twenty-four-hour period. County-wide systems were designated to accommodate eight inches of precipitation during the same period.<sup>13</sup> In addition, recent urban development has altered the natural drainage pattern by covering much open land with concrete and asphalt.

These factors, in conjunction with a precipitation that exceeded planned expectancy by at least 3.5 inches, resulted in general flooding. Many areas were submerged by two or three feet of water, and some areas were waist-deep with the additional overflow from lakes, creeks, and canals.

Hillsborough County sustained less flood damage than Pinellas County due to higher elevation, although 111 people were evacuated to three public shelters. The heaviest flooding occurred in the Interbay and East Tampa areas. In the northeast part of the county the new Tampa By-Pass Canal, though only eighty-five percent complete, helped minimize flooding.

The first confirmed tornado was sighted on the ground at Treasure Island (Pinellas County) with the storm's first onshore movement at 0400 (EDT). A full ensued until the second storm wave of 0700 (EDT), when a tornado partially destroyed the Lamplighter Trailer Park on Fowler Avenue in Tampa. The tornado destroyed twelve and damaged 300 of the 600 trailers in the park before skipping through the adjacent area selectively damaging homes and businesses.<sup>14</sup> During the third wave, tornado activity began in eastern Hillsborough County where dozens of homes were razed, three chicken farms were destroyed, and Brooker Elementary School in Brandon was damaged. Most tornado activity closed with a flurry at noon in East Tampa and central Pinellas County. Ironically, the last confirmed touchdown occurred on Treasure Island at 1330 (EDT).

In the storm's aftermath the immediate concern was clean-up and the availability of aid. The Red Cross set up several shelters and would ultimately expend \$270,000 in assistance grants.<sup>15</sup> National Flood Insurance protected many homes and businesses, but for those who thought they were safe because they "weren't low enough" coverage now amounted to two feet of water rather than a check. On May 17, 1979, federal and state agencies were mobilized under the FDAA to process applications for Federal Disaster assistance. Of 979 applications in the two counties, 395 loans were approved for approximately \$2 million.<sup>16</sup>

#### *Conclusion*

This anomalous storm of May 8, 1979, which brought to the Tampa Bay area record rainfall and fourteen accompanying tornadoes, delivered an ominous warning. The "it can't happen here" attitude has at least temporarily been squelched. The resulting flooding and tornado damage has placed the populace on notice that proper storm preparedness is essential. City and county planning commissions are being forced by public clamor to take a second look at existing drainage systems and building codes. If propitious steps are taken, then the lessons learned from this unforecastable storm of May 8, 1979, could be a blessing in disguise.

\* \* \*

1. U.S. Department of Commerce, *Daily Weather Maps--Weekly Series* Washington, D. C.: Government Printing Office, 7 May, 1979).
2. Ibid.
3. U.S. Weather Service, *Officials Records* (Ruskin, Florida, 8 May 1979).
4. National Weather Service, *Surface Analysis Facsimile Map No. 75* (12Z Tues., 8 May 1979).
5. Department of Commerce, *Weather Maps*, 8 May 1979.
6. Weather Service, *Official Records*.
7. Ibid.
8. Ibid.
9. Ibid.
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12. *St. Petersburg Times*, 16 May 1979, p. A12.
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15. Interview with Bill Scarpitta, Hillsborough County Emergency Preparedness Office, Tampa, Florida, 5 September 1979; *St. Petersburg Times*, 26 May 1979, p. B5.
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## ADAPTIVE FEATURES OF "CRACKER" HOUSING IN NORTH-CENTRAL FLORIDA

Storm L. Richards  
With Donald Brandes, Illustrator

During the period from about 1880 to 1920, a style of folk housing called "cracker architecture" evolved in the Southeastern United States. Such houses are characterized by having highly-pitched roofs, porches on several sides, and breezeways between sections of the house. Often the houses were built in several parts at different times and a section of porch might become a breezeway separating an older section from a later addition.

This study examines cracker houses in North-Central Florida and considers cracker-style architecture as an adaptation to the Florida climate. Four houses were analyzed in Marion and Alachua Counties (Figs. 1, 2, 3, 4, 5). The four are similar in design, although two are two-story and two are single-story structures. The plan of the E. L. Smith house is typical (Fig. 2).

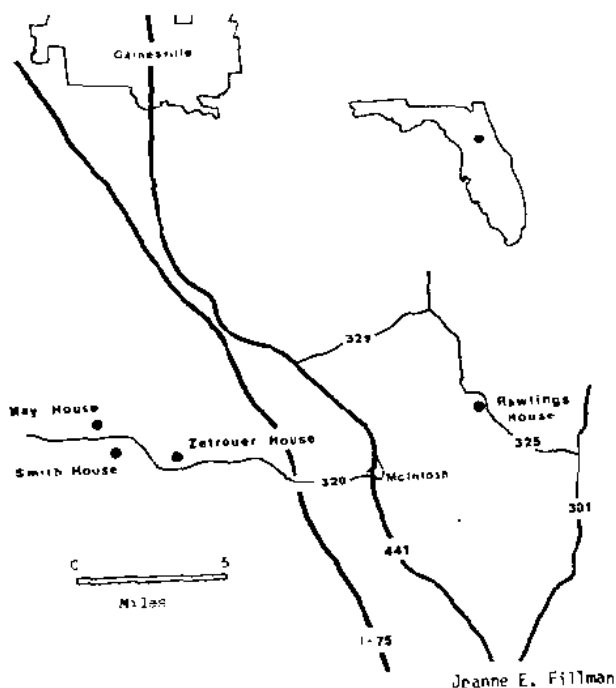


Fig. 1. Location of study sites.

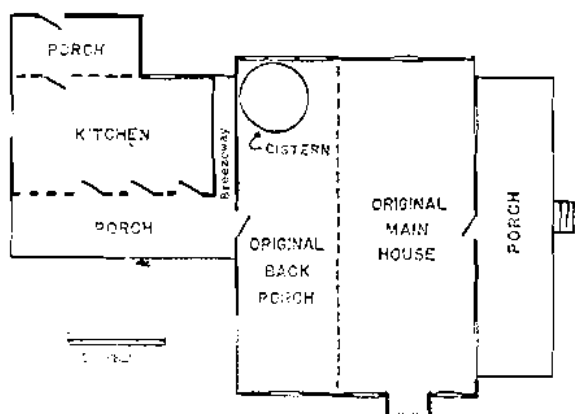


Fig. 1. Floor plan of the D. L. Smith house, showing the location of the cistern which is located on the roof of the original back porch.

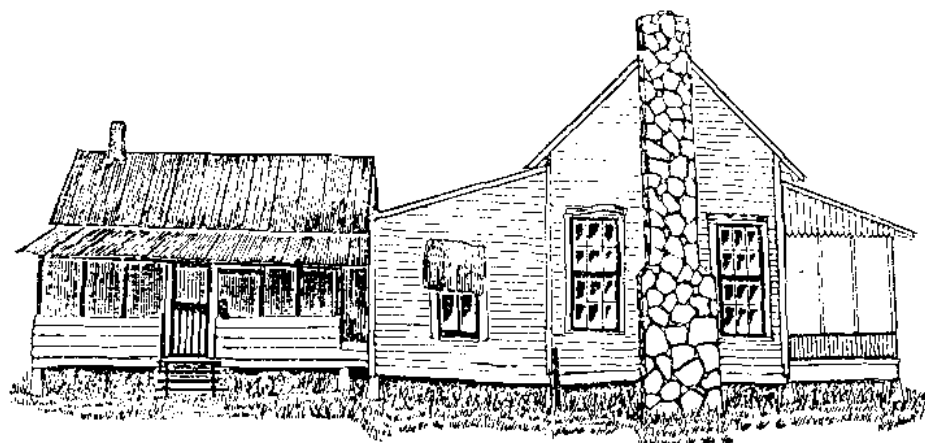


Fig. 2. The D. L. Smith house, view looking north.

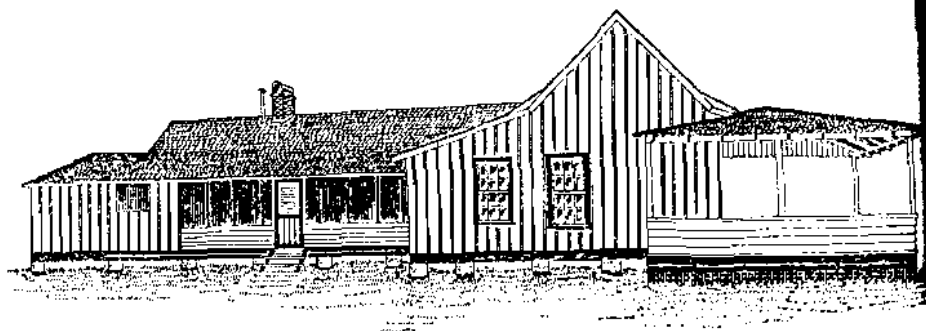


FIG. 4. The Martine Kennan Rawlings house, view looking north. The two-story, peak-roofed section was the original house. The section to the left is a kitchen and dining addition separated by a breezeway. Other additions are north of the original house.

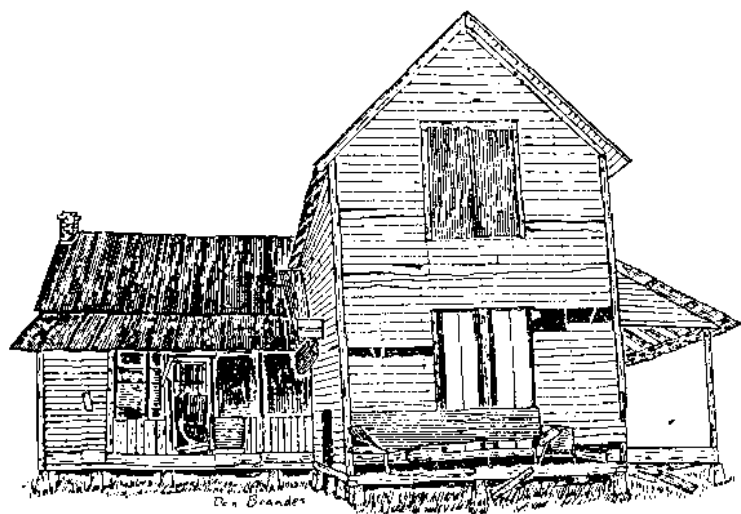


FIG. 5. The May house, view looking east. A kitchen section (left) was added to the original two-story section.

The houses rested on wooden pilings. Pilings served three purposes: ventilation, protection from standing water, and protection from termites and other pests. The pilings on which the Smith house currently stands are a mix of original live oak blocks and concrete blocks. Concrete pilings replaced many original wooden blocks in the 1930's after severe weather destroyed some structures.

The walls of the houses are oriented along cardinal directions. Walls were made of local timber, such as cypress, heart pine, and oak. Heart pine, found in abundance in North-Central Florida, was the predominant building material of the late nineteenth and early twentieth century. Mr. E. L. Smith remembers his grandfather, who built the farm, saying that the house lumber came from a small mill two miles from the farmstead. For working in the mill, he received finished wood in lieu of money.

Simple board-and-batten or clapboard construction was used in all four houses. These styles required little board preparation (as opposed, for example, to tongue-and-groove), yet insured good insulation. Wet weather would swell boards, resulting in a tight fit.

The walls were pierced by many windows for cross-ventilation. Window frames were wide, long, and spaced close together. Breezeways also promoted ventilation, and were found separating the kitchen from the main house. Some consider the kitchen separation a response to fire hazard, but persons interviewed in this study reported the separation was an adaptation to climate (i.e., ventilation function).

Though windows and breezeways helped cool the houses, notwithstanding interior rooms would become uncomfortably hot, and porches provided some relief. Wide and open porches, sometimes covering almost the entire length of the houses, are found in the study houses, and were typical of cracker architecture generally. On the Rawlins house, a wide porch shades the walls on the east side from the rising sun, and in the afternoon, a west side porch shades the late sun.

The high pitch of the cracker-house roof was also an adaptive feature to the Florida summer heat. The steep pitch provided air space above the living areas which acted as insulation. Originally the roofs were covered with cypress shakes, but later corrugated metal roofs became common.

The architectural features examined thus far show adaptation to the hot, humid Florida summer. But winter cold also had to be considered. For heating the sitting and bedrooms there were chimneys. These varied in style and design. In the Zetrouer house a massive (ten by six feet) chert and mud-base mortar chimney was built inside the original building some four feet from the wall. Other chimneys of different design were found in other parts of the house. An unusual feature of the May house is a chimney on the second floor, used apparently to heat second floor rear rooms. No first-floor base could be located for this construction. Trees and decorative vegetation also helped ameliorate temperature extremes. Deciduous trees, such as the pecan, provided summer shade, but allowed sunshine to fall on the house in the winter.

The features of cracker-style architecture in North-Central Florida are many. Floor plans varied among the four houses of the study, though multiple additions to the original dwelling were common to the plans of all. Other recurring elements include extensive use of porches, windows, and breezeways for ventilation; high pitched roofs of wooden shakes (later replaced with metal); and pilings of live oak, cypress, or heart pine. In the days before cheap centralized heating and air conditioning, these houses were well suited to the Florida climate.

## SOCIAL WELL-BEING AND NET MIGRATION IN FLORIDA COUNTIES<sup>1</sup>

Ronald R. Schultz

What has been defined as the social indicator "movement" of applied social research blossomed over the past decade as social scientists, policy makers, and concerned citizens sought answers to fundamental questions concerning the enhancement of social well-being and the quality of life. The early efforts in social indicator research were directed toward measurement of the effectiveness of national programs initiated to bring about social change.<sup>2</sup> These studies were largely nonspatial in content although the idea of local or regional "territorial indicators has been a part of the social indicators movement from the beginning."<sup>3</sup> Later, however, geographers and others with spatial perspectives took interest in this broad research area, focusing on the measurement and interpretation of spatial variation in social well-being and related constructs.<sup>4</sup>

Current research on social well-being or the quality of life has dichotomized along two lines. Arising directly from the early interest in social indicators as measures or accounts of the level of well-being, the objective-aggregate approach aims at development of a modeling ability similar in structure to econometric models of economic systems.<sup>5</sup> This approach contrasts with the subjective-individualistic analyses of perceived quality of life and social well-being.<sup>6</sup> In a comment on quality of life as a topic for geographical inquiry, Smith noted that the subjective-individualistic approach is both practically and conceptually difficult for the geographer.<sup>7</sup>

On the practical side is the expense involved in conducting large-scale survey research with a sample large enough to provide a reliable guide to quality-of-life variations among neighborhoods (e.g. census tracts). On the conceptual side is the extreme difficulty of finding out anything at all of substance about how two groups of people differ with respect to quality-of-life experience. It may be possible to say that people in one area believe that their city services (for example) are generally 'good' while in another area they are judged 'poor.' But these are relative evaluations rooted in the life experience of the individuals concerned, not measures on some uniform areally-comparative scale. What is 'good' to the people of one neighborhood may be considered poor to those in another....

But the more macro-scale aggregate approach may provide a way out. While the components of the good life are highly personal to individuals, there may well be common feelings among groups--a broad consensus as to what matters in life, if not complete agreement. This assumption is at the base of attempts to identify areal variations in the quality of life from 'hard' numerical data measuring aggregate experience on a number of specific criteria.

It follows that if such general consensus exists among the population it should be discernable in the broad pattern of the locational choice of migrants. This study seeks to evaluate constructs of social well-being, defined on the basis of aggregate data, as explanators of the county pattern of net migration rates in Florida, a state where positive net migration has been strong. The underlying hypothesis is that the difference between in and out migration (in minus out) is a function of the level of social well-being in the region. In other words more migrants should be attracted to and fewer migrants should leave regions of high social well-being, and few migrants should be attracted to and more should leave places of low or poor social well-being conditions.

### *Methodology*

The question of the best approach to the construction of social well-being indicators is unresolved. Given a theoretically based set of functions specifying the interrelationships between specific underlying factors and level of social well-being we could more easily choose among alternative approaches. These functions, however, are not yet adequately specified and their eventual likelihood is clouded because of the perplexing complexities and trade-offs among the underlying factors contributing to individual and community well-being. Nevertheless, a general consensus may be said to exist on the importance to the level of social well-being of income, education, housing conditions, incidence of crime, disease and death rates, the provision of public services, and a pleasant environment. County level data for these variables were obtained from U.S. Census sources and numerous state agency reports and statistical series (Table 1). Two methods of analysis were used to determine the level of social well-being in Florida counties. An additive  $z$  score model where variables were grouped in broad classes was compared to a principal components factor analytic technique. These descriptive models of social well-being were then evaluated as explanators of the pattern of the 1960-1970 county net migration rates. Finally the analysis focused on age specific net migration.

### *Social Well-Being Criteria*

Five criteria of social well-being were developed (Table 1). They are typical of indicators found in social well-being and quality of life studies and they capture a wide range of conditions thought to affect levels of community well-being. Only a very brief rationale is presented here.

The public expenditure and participation criteria captures a community's willingness to participate in the political process (1-2; numbers in parentheses refer to variables in Table 1) and their willingness to support education (3-4). Both factors are positive indicators of social well-being. Social pathology and disorganization factors such as crime and arrest rates (5-10), suicides (11), divorce (12), and illegitimate births (13-14) are generally perceived negative indices of social conditions. Disease and death rates suggest the level of physical health within a community (15-35) and admissions to mental hospitals (36) are indicators of serious mental health problems. The availability of physicians and hospital beds (37-38) index the community's degree of access to medical care. A pleasant environment also contributes to well-being and it is evaluated here on the basis of temperature (39-41) and miles of coastline (42). The final criteria defined in this study is a community's level of economic development. Income, wealth, and education (43-56) are key factors identifying a community's status on this criteria of well-being, and the ratio of non-white to white income (57) suggests the relative openness of the community to equality issues. This large set of variables captures a wide variety of conditions thought to affect the level of social well-being within communities. The following analysis relates these conditions to the pattern of net migration rates.

### *Standard Scores*

A simple approach to social indicator construction is the computation of a standard score additive model. All variables are transformed to  $z$  scores and summed within a category (after reversing signs on those variables of opposite interpretation) to obtain composite indices of social well-being.

TABLE I  
CRITERIA OF SOCIAL WELL-BEING

CRITERIA AND VARIABLES*	DIRECTION	SOURCE
PUBLIC EXPENDITURE AND PARTICIPATION (PEP)		
1. Ratio of registered voters to population > age 21	+	7
2. Ratio of actual voters to registered voters, 1973 gubernatorial	+	7
3. Per capita local government expenditure	+	10
4. Percent expenditure on education	+	10
SOCIAL PATHOLOGY AND DISORGANIZATION (SOCIAL)		
5. Higher law violations, arrest rate	-	5
6. Drug sales, arrest rate	-	5
7. Drug possession, arrest rate	-	5
8. Juvenile, arrest rate	-	5
9. Murder rate	-	5
10. Crime rate	-	5
11. Suicide rate	-	5
12. Divorce rate	-	3
13. Illegitimate births per 100 live births, white	-	3
14. Illegitimate births per 100 live births, non-white	-	3
HEALTH		
15. Dysentery, case rate**	-	2
16. Hepatitis, case rate	-	2
17. Tuberculosis, case rate	-	2
18. Syphilis, case rate	-	2
19. Gonorrhea, case rate	-	2
20. Heart disease, death rate	-	3
21. Cancer, death rate	-	3
22. Cerebral vascular, death rate	-	3
23. Nephritis, death rate	-	3
24. Diabetes, death rate	-	3
25. Tuberculosis, death rate	-	3
26. Cardio-vascular, death rate	-	3
27. Arteriosclerosis, death rate	-	3
28. Aortic aneurysms, death rate	-	3
29. Bronchitis, emphysema, asthma, death rate	-	3
30. Peptic ulcer, death rate	-	3
31. Cirrhosis of the liver, death rate	-	3
32. Motor vehicle accident, death rate	-	3
33. All non-motor vehicle accidents, death rate	-	3
34. Fetal deaths per 1000 live births	-	3
35. Infant deaths per 1000 live births	-	3
36. Resident admissions to state mental health hospitals, case rate	-	4
37. Physician ratio	+	1
38. Hospital bed ratio	+	1
ENVIRONMENT (ENVIR)		
39. Annual average August temperature	+	8
40. Annual average January temperature	+	8
41. Annual average total heating degree days	-	8
42. Miles of coast line	+	6

Table 1 (cont.)

## Criteria and Variables (cont.)

CRITERIA AND VARIABLES*	DIRECTION	SOURCE
ECONOMIC DEVELOPMENT (ECON)		
43. Percent of males $\geq$ age 25 with 4 years high school	+	9
44. Percent of females $\geq$ age 25 with 4 years high school	+	9
45. Percent unemployed, male	-	9
46. Percent unemployed, female	-	9
47. Median family income	+	9
48. Per capita income	+	9
49. Percent of families below poverty level	-	10
50. Percent of families with income $<$ \$3000	-	10
51. Per capita savings	+	10
52. Median value owner occupied single family units	+	10
53. Percent employed, white collar	+	10
54. Percent housing units lacking complete plumbing facilities	-	10
55. Percent housing units with 1.01 or more persons per room	-	10
56. Percent housing units with air conditioning	+	10
57. Ratio of non-white to white median income	+	9

\*All ratios and rates are per 100,000 population unless otherwise specified.

\*\*All case rates are 1968-1972 annual averages.

## SOURCES OF DATA

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The social well-being indicators are given by:

$$z_{ij} = \frac{x_{ij} - \bar{x}_i}{SD_i} \quad \begin{matrix} i = 1, 2, 3, 4, 5 \\ j = 1, 2, \dots, n \end{matrix} \quad (1)$$

where:  $x_{ij}$  is the raw value for variable  $i$  on case  $j$ ,  $\bar{x}_i$  is the mean of variable  $i$  and  $SD_i$  is its standard deviation,  $z_{ij}$  is the standard score for variable  $i$  on case  $j$ ,  $k$  is the number of variables in criteria  $\ell$ , and  $n$  equals the 67 counties of Florida. Five indicators of social well-being, as defined in Table 1, were obtained for each county. These indicators were treated as independent variables in a multiple regression with the net migration rate. The net migration estimates were "expressed as percentages of the 1970 expected survivors of the 1960 population and births during the decade."<sup>8</sup> All variables in the regression were in standardized form. Ordinary least squares results were:

$$\begin{aligned} \text{NMR} = & .4912 \text{ ECON} + .3287 \text{ ENVIR} - .2501 \text{ HEALTH} + .1947 \text{ SOCIAL} \\ & (3.7941) \quad (2.7548) \quad (2.5385) \quad (1.5966) \\ \bar{R}^2 = & .4492 \quad F = 14.4553 \quad S = .7422 \end{aligned} \quad (2)$$

where: NMR is the net migration rate,  $\bar{R}^2$  is the coefficient of determination adjusted for degrees of freedom,  $F$  is the ratio of mean square explained to mean square unexplained, and  $S$  is the standard error of estimate. The  $t$  ratios are written in parentheses below the regression coefficients.

Economic development and the physical environment were both statistically significant (.05 level) with the hypothesized sign. Migrants prefer areas with a developed economy and a warm, coastal location. The health indicator although significant entered with a negative sign implying migrants were choosing to settle in regions of poor health. The social pathology and disorganization indicator was positively related to the net migration rate suggesting regions of few social problems experienced the largest rates of net migration once the economic, environmental, and health components of social well-being were controlled for. However, it was not a statistically significant explainer. Thus, the model as a whole was only moderately successful in explaining the variation in the net migration rate. Further discussion of these results follows presentation of the principal components model below.

#### *Principal Components*

The value of a principal components approach to identifying the underlying dimensions of variability in large data sets is well known,<sup>9</sup> as are some of the problems associated with use of the technique.<sup>10</sup> The revealed dimensions are statistically independent components of social well-being from which territorial social indicators can be obtained.<sup>11</sup> In this analysis, all factors with eigenvalues  $\geq 1.5$  were extracted and given a varimax rotation for ease of interpretation (Table 2). Clearly, the most important dimension in terms of variance accounted for (23.5%) is an economic development component. All of the variables defined *a priori* as measuring level of economic development (Table 1), except unemployment and the ratio of non-white median income, loaded highly on this dimension. The second dimension revealed

TABLE 2

STRUCTURE OF LEADING COMPONENTS OF SOCIAL WELL-BEING  
IN FLORIDA COUNTIES

Component I: Economic Development - ECON (explained variance: 23.5%)

*Highest loadings:*

.95350	Percent of females > age 25 with 4 years high school
.94819	Percent housing units with air conditioning
.94123	Percent of males > age 25 with 4 years high school
.92439	Median value owner occupied single family units
-.90736	Percent of families below poverty level
.90651	Per capita income
.87260	Percent employed, white collar
-.85457	Percent of families with income < \$3000
-.81462	Percent housing units lacking complete plumbing facilities
.78314	Median family income
.77326	Crime rate
.65384	Juvenile arrest rate
.60914	Physician ratio
-.60428	Percent housing units with 1.01 or more persons per room
-.60417	Motor vehicle accident, death rate
.53373	Per capita savings
.52917	Hepatitis, case rate
.52477	Ratio of actual voters to registered voters, 1970 gubernatorial
.49896	Suicide rate

Component II: Circulatory Disease and Cancer - CIRCUL (explained variance: 9.6%)

*Highest loadings:*

.93846	Cardio-vascular, death rate
.88207	Heart disease, death rate
.78545	Cancer, death rate
.74920	Cerebral vascular, death rate
.47661	Aortic aneurysms, death rate
.47006	Arteriosclerosis, death rate
.45993	Ratio of non-white to white median income
-.45358	Percent housing units with 1.01 or more persons per room
-.45131	Median family income
.42287	Suicide rate
.40831	Cirrhosis of the liver, death rate

Component III: Social Pathology (explained variance: 6.6%)

*Highest loadings:*

.86095	Murder rate
.84147	Tuberculosis, case rate
.64302	Syphilis, case rate
.57399	Illegitimate births per 100 live births, non-white
.52430	All non-motor vehicle accidents, death rate
.47821	Divorce rate
.31960	Motor vehicle accident, death rate

Table 2 (cont.)

Component IV: Public Health (explained variance: 5.2%)

*highest loadings:*

.85189	Peptic ulcer, death rate
.78311	Tuberculosis, death rate
.70291	Infant deaths per 1000 live births
.40566	Syphilis, case rate

Component V: Lung Disease - LUNG (explained variance: 4.9%)

*highest loadings:*

.86050	Bronchitis, emphysema, asthma, death rate
.45287	Illegitimate births per 100 live births, non-white
-.42813	Hospital bed ratio
-.42306	Divorce rate
.36235	Tuberculosis, death rate

Component VI: Temperature - TEMP (explained variance: 4.4%)

*highest loadings:*

-.66070	Annual average total heating degree days
.65755	Annual average January temperature
.62467	Annual average August temperature
.50555	Ratio of non-white to white median income
.50556	Gonorrhea, case rate

Component VII: Arrests, liquor and drugs (explained variance: 2.9%)

*highest loadings:*

.80303	Liquor law violations, arrest rate
.51242	Drug possession, arrest rate
.44814	Drug sales, arrest rate
.31020	Juvenile, arrest rate

Component VIII: Unemployment (explained variance: 2.7%)

*highest loadings:*

.79524	Percent unemployed, female
.52509	Percent unemployed, male
.50129	All non-motor vehicle accidents, death rate
.26997	Arteriosclerosis, death rate
.23934	Infant deaths per 1000 live births
-.22616	Per capita savings
-.21435	Physician ratio

Component IX: Fetal Deaths - FTLD (explained variance: 2.5%)

*highest loadings:*

.85439	Fetal deaths per 1000 live births
.37873	Ratio of non-white to white median income
.32950	Ratio of actual voters to registered voters, 1970 Gubernatorial

Table 2 (cont.)

Component X: Public Expenditure - PUBEXP (explained variance: 2.7%)

*highest loadings:*

.85315	Per capita local government expenditure
.33008	Ratio of registered voters to population $\geq$ age 21
-.50195	Percent unemployed, female

Component XI: Coastline (explained variance: 2.7%)

*highest loadings:*

-.60564	Miles of coastline
.43266	Resident admissions to state mental health hospitals, case rate
-.39274	Drug possession, arrest rate
.36167	Drug sales, arrest rate
.35295	Physician ratio
.29559	Illegitimate births per 100 live births, non-white
-.29261	Ratio of registered voters to population $\geq$ age 21
.27331	Juvenile, arrest rate

was primarily diseases of the circulatory system and cancer. This factor represented almost 10 percent of the variance. In decreasing order of explained variance the remaining dimensions were: social pathology (6.6%), public health (5.2%), lung disease (4.9%), temperature (4.4%), liquor and drug arrests (2.9%), unemployment (2.9%), fetal deaths (2.8%), coastline (2.7%), and public expenditure (2.7%). In all, 68.4 percent of the variance in the fifty-seven variables is associated with these eleven dimensions.

From the rotated factor matrix factor scores for each county were computed and entered as independent variables in a regression with the net migration rate. A stepwise procedure entered the factors until the  $t$  ratio was insufficient (.05 level) for further entry. The results were:

$$\begin{aligned} \text{NMR} = & .5013 \text{ ECON} + .3479 \text{ CIRCAN} + .2685 \text{ TEMP} + .2547 \text{ FTLD} - .1735 \text{ PUBEXP} \\ & (.57695) \quad (.40040) \quad (.30897) \quad (.29307) \quad (1.9970) \end{aligned}$$

(3)

$$\bar{R}^2 = .5017 \quad F = 14.2885 \quad S = .7059$$

Again economic development dominates the regression. Migrants are also drawn to areas of the state with the warmest climate and low levels of local government expenditure. The two disease factors that entered the equation, however, were of the "wrong" sign. It seems net migration rates are higher in areas with a high incidence of circulatory disease and cancer and fetal deaths. Thus, the fact that the above circulatory disease and cancer component and the health indicator in the  $z$  score model were of opposite sign than expected may result because certain diseases and specific causes of death are associated with increased age, and a community's age structure is highly affected by past migration decisions. Therefore in Florida the positive relationship between certain diseases and causes of death and the net migration rate may occur because both have positive relationships with age. Since age adjusted disease and death rates by county are not available, median age of the county population was used as a control. This variable had a range from 23.1 to 58.3 years with a mean of 31.7 and a standard deviation of 7.7. The regression results were:

$$\begin{aligned} \text{NMR} = & 1.400 \text{ MEDAGE} - .5471 \text{ CIRCAN} + .2115 \text{ ECON} - .1303 \text{ LUNG} \\ & (8.6460) \quad (4.4507) \quad (2.8462) \quad (1.7493) \end{aligned}$$

(4)

$$\bar{R}^2 = .7099 \quad F = 41.3768 \quad S = .5386$$

The two disease components to enter, circulatory disease and cancer and lung disease, were negatively signed implying once age structure is controlled for, migrants avoid areas of poor health. Again the level of economic development is a significant explainer of the net migration rate.

TABLE 3

AGE SPECIFIC MIGRATION RATE WITH SOCIAL WELL-BEING FACTORS AND MEDIAN AGE

VARIABLE OR COMPONENT	AGE GROUPS													
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75	
MEDIAN	$\beta$			.3996	.7669	.4879	.4769	.9507	.9936	1.2217	1.2468	1.2214	1.2214	1.1412
	t			2.7322	4.3191	4.3081	4.6993	6.1752	7.7065	9.9149	11.8141	11.6742	11.7523	8.9766
FOUR	$\beta$	.5369	.6529	.5928	.1849	.2124	.2920							.2369
	t	5.5465	8.1780	6.9119	1.6814	2.2503	2.8772							3.7240
CIRCUM	$\beta$		.3413	.5139	.4159			-.4791	.3869	.5212	-.4725	-.4242	-.4749	-.5403
	t		4.3132	3.7134	2.4222			3.1129	2.8064	4.3665	4.6340	4.1957	4.1308	4.4738
LINE	$\beta$									-.1573	-.1542	-.1671	-.1555	-.1932
	t									2.0560	2.5592	2.5784	2.4152	2.5511
TEMP	$\beta$	.4667		.1710										
	t	2.7359		2.5695										
PUREXP	$\beta$	.2748	.2317											
	t	2.3273	2.9021											
$R^2$		.3817	.5794	.6056	.3364	.5017	.3612	.3909	.5187	.6603	.7667	.7701	.7737	.7303
	F	14.5831	31.5018	26.3545	17.1522	15.1480	19.9655	22.9921	36.5660	47.8104	73.2083	74.9289	76.2066	45.6866
S		.7863	.6532	.6279	.8146	.8357	.7974	.7747	.6238	.5654	.4810	.4789	.4757	.5193

When median age was included in the additive  $z$  score regression, the results were:

$$\begin{aligned} \text{NMR} = & .6277 \text{ MEDAGE} + .2714 \text{ ECON} + .1852 \text{ ENVIR} + .1118 \text{ HEALTH} + .0485 \text{ SOCIAL} \\ & (5.9346) \quad (2.4601) \quad (1.8788) \quad (1.1194) \quad (0.4817) \quad (5) \\ R^2 = & .6451 \quad F = 24.9905 \quad S = .5558 \end{aligned}$$

The health and social pathology and disorganization indicators were correctly signed but insignificant in the equation. Level of economic development and the warmer, coastal areas of Florida were again the more important explanators of the rate of net migration.

#### *Age Specific Net Migration Rates*

Migrants can be differentiated in a number of meaningful ways.<sup>12</sup> Age of migrant is likely to be an especially significant characteristic influencing the pattern of net migration in Florida.<sup>13</sup> Different age cohorts may respond to dimensions of social well-being in significantly different ways. To test this general hypothesis age specific net migration rates were regressed against the principal components previously identified. Median age was again used as a control variable with respect to disease and death rates.

The results (Table 3) were quite similar to the aggregate regression given in equation 4. Economic development, circulatory disease and cancer, and lung disease components were the most frequently entered variables across age cohorts. Economic development entered the six youngest cohort regressions (ages 15-19 to 40-44) with a positive sign and was also significant in the age seventy-five and older cohort regression. Both the younger and the oldest migrants are likely tied to the developed, urban centers for livelihood opportunities in the former case and dependency on others for total or partial care in the latter. From age 45-49 to age 70-74 the community's level of economic development was not a significant determinant of the pattern of the net migration rates. These middle age and older migrants seem to be less influenced by the level of development within a county than are the younger migrants. This probably reflects less concern among these older migrants with general employment opportunities in the local region.

Having controlled for age effects on disease and death rates, the negative signs on the circulatory disease and cancer and lung disease components suggest that net migration rates are negative or only slightly positive in areas of a high incidence of these diseases and that they are highly positive in areas with a low rate of occurrence of these diseases. Regions of poor air quality and thus an above average probability of lung disease, are highly visible and therefore potential migrants may easily avoid such areas. However, the incidence of circulatory disease and cancer is not as readily known and thus the causal mechanism whereby potential migrants avoid such areas is unclear. Perhaps the sensitivity of the pattern of the net migration rates to disease and death rates is more of an effect of migration than a cause. It seems plausible that migrants may be in general healthier than non-migrants. Hence, disease and death rates would be lower in regions impacted by high positive rates of net migration and likewise disease and death rates would be higher in regions of negative net migration rates.

Temperature (TEMP) and per capita local government expenditure (PUBEXP) were the only other components to enter the age specific regressions, and then only twice each in the younger age cohorts. Young migrants seem to prefer the

warmer areas of the state and areas where per capita local government expenditures are low. This latter effect may be due to the location of Florida's two major universities. Both are located in small cities in otherwise rural counties. Thus, the high rate of net migration for the 15-19 and 20-24 age cohorts, due to the expansion of these universities during the 1960s, occurred in counties that had low levels of per capita local government expenditures.

Finally it is noteworthy that in general there is a trade off between the importance of economic development in the younger age specific regressions and disease and death rates in the older. This is consistent with current notions of amenity oriented retirement migration.

#### Conclusions

The results of this study point to the level of economic development as the dominant explainer of a county's aggregate net migration rate. Other criteria of social-well being of importance were disease specific death rates and an environment or temperature indicator/component. The poor performance of the social pathology and disorganization criterion is revealing. In both the aggregate and all the age specific net migration rate models neither the social pathology and disorganization indicator nor the several derived components (social pathology, liquor and drug arrests, and unemployment) ever attained statistical significance. Perhaps the county level of aggregation is too coarse to capture the impact of social pathology and disorganization on net migration patterns. Such effects may operate principally within communities. At the county level, however, they were overpowered by economic, health, and environmental factors in explaining the pattern of net migration rates in Florida, and these results were relatively stable across age cohorts.

\* \* \*

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## AREAS OF MEDICAL UNDERSERVICE IN THE SOUTH AND IN FLORIDA

Dana R. Tolsen

Increased public awareness and interest, together with government financing of health services, have created a need for measures of health status that can aid in planning and evaluating health care delivery systems. From a developmental perspective, the general consensus among health researchers is that traditional measures of health status, morbidity and mortality, are too insensitive to other outside influences to be of much use in evaluating health services. Therefore, a more comprehensive method of measuring health status is needed.

The Federal government is moving to utilize health indicators as a basis for national health planning. One Federal program which evaluates several health and social indicators identifies medically underserved areas. The U. S. Public Health Service Act defines a "medically underserved population" as the population of a rural or urban area with a shortage of personal health services.<sup>1</sup> Such designated areas receive national priority in meeting their health care needs and are targets for special Federal health initiative programs.

A medically underserved area (MUA) is determined through use of an index of medical underservice (IMU). The IMU is calculated by applying a weighted value to the following indicators: infant mortality rate, ratio of primary care physicians to the population, and the percentage of the population age 65 and over. The sum of the weighted indicators then becomes the IMU score.

The median IMU score for all U. S. counties in 1975 was 62.0. Those counties with an IMU below 62.0 were designated by the Secretary of the U. S. Department of Health, Education, and Welfare as medically underserved. In metropolitan areas, the IMU was calculated for each individual census tract. If one or more census tract scored below 62.0, the entire metropolitan area was designated as partially underserved medically.

The IMU, on which the MUA list was based, was calculated using data from the following sources:

Center for Health Services Research and Development, 1975 Physician County Summary File, American Medical Association, Chicago, 1977.

Master File of Osteopathic Physicians, American Osteopathic Association, Chicago, 1975.

U. S. Bureau of the Census, 1970 Census of Population, 2nd and 4th count files.

Maternal and Child Health Studies Project, 1975 Infant Mortality County Summary File, Information Research Institute, 1976.

It must be noted that the MUA designation refers to specific geographic areas (counties, census tracts, and minor civil divisions) and may not easily correlate with population. Therefore, it is necessary to compare the percentage of the population residing in the area of medical underservice with the percentage of the counties designated as medically underserved. For example, 71 percent of the counties in thirteen southern states are designated as medically underserved. However, only 33.2 percent (18.3 million) of the population in those states resides in the MUA (Table 1). Only 19.2 percent of the counties in

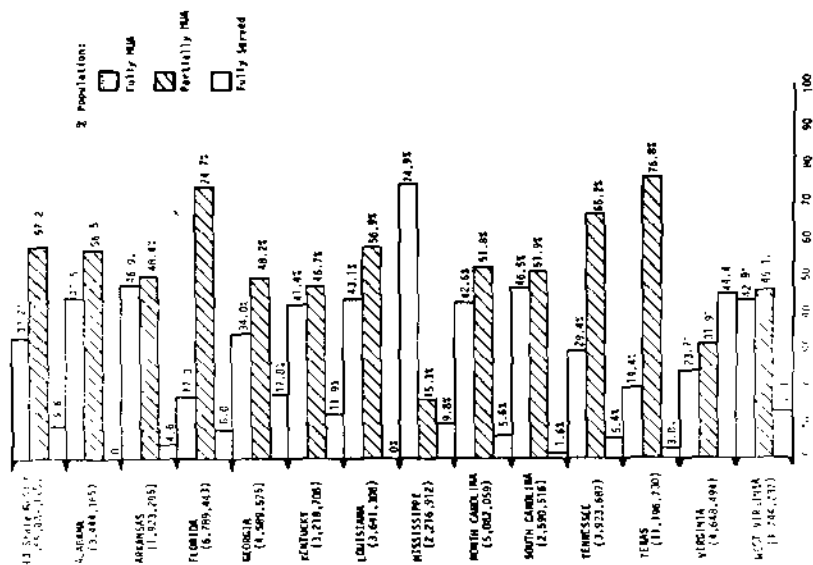


Fig. 1. Comparison of the Degree of Medical Underservice in Thirteen Southern States

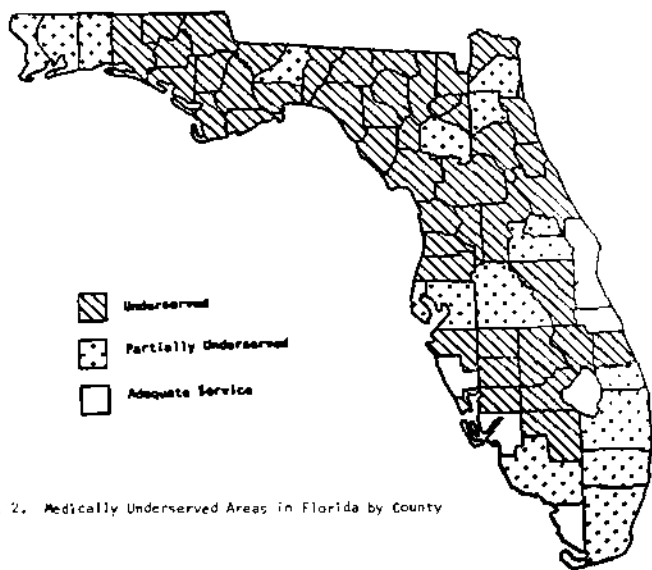


Fig. 2. Medically Underserved Areas in Florida by County

TABLE 1  
MEDICAL UNDERSERVICE IN THIRTEEN SOUTHERN STATES AND IN FLORIDA\*

	Percentage Fully MOA	Percentage Partially MOA	Percentage Fully Served
Population (55,009,125) <i>( 8,739,416 )</i>	33.2 (17.3)	57.1 (74.7)	9.6 (9.0)
Counties (1,280; 87)	71.0 (67.2)	19.3 (26.5)	9.7 (7.4)

\* Florida figures in italics

thirteen states are considered partially underserved medically, but 57.2 percent (31.6 million) of the population reside there. Lastly, the remaining 9.7 percent of the counties that are designated as fully served medically, include only 9.6 percent of the population.

The degree of medical underservice in the thirteen southern state region varied from 74.7 percent of the population in Mississippi to 17.3 percent of the population in Florida (Fig. 1). Partial medical underservice ranged from 76.7 percent of the population of Texas to 15.3 percent of the population in Mississippi. The percent of the population which was considered to be fully served medically varied from 44.4 percent in Virginia to 0 percent in Alabama and Louisiana.

In the State of Florida, 67.2 percent of the counties are designated as medically underserved (Table 1), however, only 17.3 percent of the population resides in these medically underserved areas. Some 26.3 percent of the counties in Florida are considered as partially underserved medically; 74.7 percent of Florida's population is included in this category. Only a small portion (7.5 percent of Florida's counties and 8.0 percent of the population) is designated as fully served medically.

When the degree of medical underservice is mapped, several patterns become evident immediately (Fig. 2). Counties designated as medically underserved are distributed throughout the state. However, they do appear to have a positive correlation with those counties with a large rural population. The partially underserved and fully served counties are associated with denser population.

The IMU represents only the most basic information needed to evaluate the health status of the residents of Florida. It is recognized that there are other indicators of health status such as disability days (i.e., work loss and restricted activity), death rates, and life expectancy which are not yet addressed by the IMU. It is, however, a positive step forward in the quest for more appropriate indicators regarding the effectiveness of health care services in Florida.

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# *Florida Society of* **GEOGRAPHERS**

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The Florida Society of Geographers was chartered in 1964 as a non-profit organization for the purpose of furthering professionalism in geography through the application of geographic techniques in all areas of education, government, and business in Florida.

The society supports these objectives by promoting acquaintance and discussion among its members and with scholars and practitioners in related fields by stimulating research and field investigation, by encouraging publication of scholarly studies, and by performing services to aid the advancement of its members and the field of geography in Florida.

The society holds its annual meeting once a year, usually in February. At this meeting papers are presented and matters of mutual concern are discussed.

Persons interested in membership in The Florida Society of Geographers should contact:

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Regular membership is \$5.00 for a calendar year; student membership is \$2.50.



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