FLORIDA — Facts and Fallacies

- Lakewood: Highest point in Florida (345')
- St. Johns River: Frequently described as only North-flowing river in the U.S.
- Northern extent of coral (Agassiz): 28°N
- Bok Tower (Iron Mountain): For years thought to be the highest point in Florida (325) (actually 290-300')
- Lake Okeechobee: Largest lake in Florida, one of 7712 lakes (not one of 30,000)
The Florida Geographer is the official publication of the Florida Society of Geographers, and is distributed without cost to members of the Society. One number per year will be published, pending receipt of an adequate number of acceptable manuscripts.

The Florida Geographer is a state-wide journal, with broad coverage of geographical topics relating to the state and its several regions. No restrictions are placed on the content of articles, providing that they deal with some aspect of the geography of Florida, i.e., local studies within the state, matters of the state generally, or studies of the U.S. South, of which Florida is a part.

Manuscripts are solicited from all who feel they have research worthy of dissemination. No specific format requirements are presently in force, although the editor would prefer manuscripts to be typed double-spaced following the general format of the articles in the present number. However, authors should not be dissuaded from submitting manuscripts because of format considerations; the editor is willing to undertake extensive revisions. As this number demonstrates, we are able to reproduce maps, charts, and tables.

We would like to publish an original map on the cover of each number, so a special request is made to all who have maps of the state or regions of the state which would be of interest to the Society's membership.

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(ISSN 0739-0041)
THE EFFECTS OF FLUORIDE POLLUTANTS
ON AGRICULTURE IN WEST CENTRAL FLORIDA

D. H. Stover and M. L. LeVasseur

For the past few decades, environmentalists have concentrated their air pollution studies on the formation and dispersal of sulfur dioxide, nitrogen oxides and ozone. Since the mid 1950's, environmentalists have become increasingly aware of the present and potential dangers of air-borne fluorides in west central Florida, due to the mining and processing of phosphate. The damage to various agricultural pursuits was first observed in cattle in the form of fluorosis which resulted from the foraging on pasture grasses. Damage to citrus and certain flowering plants was also found. Since 1960, many studies have been published which indicated specific effects of fluorides upon the plants and animals of the area. In addition, these studies established that this region was one of the prime areas of fluoride pollution in the United States.

Nature of the Problem

The primary source of air-borne fluoride in this region is from the intensive mining and processing of phosphates (Fig. 1). Since the discovery of phosphate bearing rocks in central Florida in 1881 near Fort Meade, the industry expanded to become a major world supplier of phosphate by the mid-twentieth century. Secondary sources of fluorides in the region are attributed to aluminum, cement and coal-combustion industries.

Although phosphate mines and plants are scattered throughout west central Florida, the largest concentration of chemical plants (approximately twelve) are located in southeastern Polk and southern Hillsborough counties (Fig. 2). Except under abnormal weather conditions, the area of possible fluoride pollution is limited to approximately five miles diameter around each installation (Fig. 3).

The principal phosphate concentration mined in this region for the production of fertilizer is fluorapatite (Ca₅(PO₄)₃F) which can contain up to 4 percent fluoride (Urgo, 1953, p. 1). Fluorapatite occurs in soils with high silicon content. This ore was originally deposited by sea water in beds near the surface. It is mined today by the strip mining process which incorporates the use of giant earth moving machines.

During the production of fertilizer, fluorapatite is combined
FLORIDA PHOSPHATE MINE SITES

FLORIDA PHOSPHATE PLANT SITES
with sulfuric acid which results in the formation of phosphoric acid, hydrofluoric acid (HF) and gypsum. The HF then reacts with the silicon in the ore to produce tetrafluoride gas (SiF₄) (Urem, 1983, p. 1). This gas in turn is removed from the stack emissions by scrubbers, which are anti-pollution devices commonly attached to or located adjacent to smokestacks. Originally, the resultant aqueous solution was then released into waste ponds, where it decomposed into HF, subsequently escaping into the atmosphere. The incorporation of a new generation of scrubbers now removes a large percentage of the fluorides and converts it into a marketable by-product, thus reducing the amount released into the ponds.

There are three fertilizer products produced, given the abbreviations of DAP, MAP, and GTSP (Fig. 4). The basic difference between MAP and DAP processes is the relationship of the amount of ammonia (NH₃) added in the reactor process. The GTSP process involves recycling the phosphoric acid with ore to provide a more concentrated result.

For many years GTSP was the leading fertilizer produced. The processing of GTSP produced large quantities of HF. However, approximately ten years ago, the production of GTSP was significantly reduced in favor of DAP, which produces significantly less HF. This is shown clearly in the production figures of January 1984 (Table 1). This shift to an emphasis upon the primary

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*Figure approximate

Source: Chemical Marketing Reporter, 1984, p. 4

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THE PRINCIPAL PHOSPHATE PRODUCTS

MONO AMMONIUM PHOSPHATE (MAP)  
\[(\text{NH}_4) \text{H}_2 \text{PO}_4\]

DI AMMONIUM PHOSPHATE (DAP)  
\[(\text{NH}_4)_2 \text{HPO}_4\]

GRANULAR TRIPLE SUPERPHOSPHATE (GTSP)  
\[\text{Ca(H}_2\text{PO}_4)_2\]
production of DAP has reduced significantly the presence of both gaseous and particulate HF emissions over the area. Also, new manufacturing techniques, such as enclosing the reactor and adding more efficient stack scrubbers, have reduced HF from escaping during processing.

Attempts at Solutions

Establishing of Standards

It is important to recognize that fluoride pollution is not basically a national problem. Relatively few areas of the country are affected. Thus, any action to establish standards is consummated on a state and/or local level.

This problem was addressed by the Florida Department of Environmental Regulation (FDER) in conjunction with local county pollution commissions in 1961. Although a dry weight pasture grass standard of 45 ppm fluoride was adopted, it was later eliminated in 1972 because of dramatic reduction in fluoride emissions and improvements in production processes made by the phosphate industry (Sanderson, 1983, p. 1). During this period the fluoride level in the grass actually averaged below the recommended 45 ppm (Fig. 5).

By 1976, the ambient fluoride levels elevated significantly as phosphate production increased. Consequently, the FDER proposed a fluoride rule for pasture grass and ambient air (Sanderson, 1983, p. 1): (1) for ambient air, 0.9 ppb for twelve months, 1.8 ppb for 30 days, and 5.6 ppb for 24 hours; and (2) for pasture grass, 45 ppm for a twelve month average. Unfortunately, however, due to the lack of supportive research, and because of intense lobbying by the Florida Phosphate Council, no rule was adopted for fluoride standards by Florida. Notwithstanding, local EPC commissions generally did follow the proposed standards. It is interesting to note that today, of the two coun-
ties most affected, only Hillsborough County has its own EPC. In Polk County
the monitoring is done by the FDEP. There are at present ten fluoride moni-
toring sites in Hillsborough County and three in Polk County.

Monitoring Systems

In 1981, the Hillsborough County EPC received a $33,800 grant from the
United States Environmental Protection Agency (EPA) (Sanderson, 1983, p. 3).
This grant was used to purchase monitoring and laboratory equipment to pursue
the study. The equipment was operating by the spring of 1982.

Two methods are employed to measure gaseous ambient fluorides: (1)
fluoride static plate, and (2) continuous ambient fluoride analyzer. Both
methods are currently in use by the Hillsborough County EPC and FDEP in this
region.

The fluoride plate method of passive static sampling that is in use was
developed by the Alcoa Aluminum Company. These plates consist of a pad made
from cellulose which is filled with a fluoride absorber which is placed inside
a disposable plastic petri dish (Sanderson, 1983, p. 6). This unit is placed
on an eight foot pole over the grass or in a grove. The plates are inexpen-
sive and easy to locate, and the results are easy to evaluate chemically.

The most widely used gaseous fluoride analyzer is the Model 765 pro-
duced by Tesa-Cow, Inc. While this analyzer is EPA approved, its use has re-
vealed several recurrent problems inherent in wet systems. After being
scrubbed in de-ionized water mist, the measured sample is delivered to a mixing
chamber where a constant amount of buffering reagent is added to fix the pH of
the sample and to eliminate hydroxide ion interference. The sample is then in-
troduced into a cooled temperature block (180°C) and passed on a surface of a
fluoride measuring electrode creating a potential difference (Sanderson, 1983,
p. 7). This difference between sample and electrode is fed by voltage to an
electronic package for amplification to a chart recording system.

Use of this analyzer has revealed a high maintenance problem, particu-
larly in reference to the vacuum pump. It is likely that if gaseous fluoride
pollution continues to be a major problem in identified sites, a dry sys-
tem such as utilized in SO2 analyzers will be developed. In addition to the main-
tenance problems encountered with this wet system there are problems of ex-
 pense and difficulty in installation and calibration.

The results of these measurements, analyzed in conjunction with appli-
cable standards in current use, provide accurate means to measure fluoride
pollution levels and possible damage to adjacent plant and animal life.

Cause and Effect of Fluoride Toxicity

Fluoride toxicity in vegetation is caused primarily by the gaseous com-
pounds hydrogen fluoride (HF) and silicon tetrafluoride (SiF4). The particu-
late materials are deposited on leaf surfaces where it appears to have little
effect upon the plant, unless dissolved by moisture and absorbed by plant
tissues.

Injury to any plant occurs from a gradual accumulation of fluorides
within the plant leaf tissues and is manifested in several ways. Some species
exhibit observable damage at ambient air concentrations as low as 1 ppb
(Grono, 1983, p. 2). Damage from fluoride exposure at low concentrations in-
cludes modified growth and lowered resistance to insect and disease, as well
as chlorosis. Chlorosis is an abnormally yellow color of plant tissues, re-
sulting from partial failure to develop chlorophyll, caused by nutrient defi-
ciency or activities of a pathogen. Emphasis has been placed upon gladiola
plants because they are very sensitive to air-borne fluorides and they are an
important commercial flower crop. Gladiolas exhibit leaf injury of the tip-
burn type known as "leaf scorch," and red flowers exhibit a bluing effect.
High leaf fluoride has been associated with leaf scorch which has been observed at Ruskin and Sun City and throughout the southwestern part of Hillsborough County (Woltz, Magie, and Geraldson, 1954, p. 308; Woltz and Waters, 1980). Studies with gladiolus have established this plant as an indicator species for fluorides and standards have been tentatively set at 40 ppm for gladiolus (Woltz and Waters, 1980, p. 2). Broad-leaf plants exhibit injury along the margin and in other plants injury appears as spots or chlorosis.

In 1955, a new type of chlorosis was found on the leaves of citrus trees near Bartow in Polk County, which was attributed to air-borne gaseous fluoride compounds from a nearby phosphate plant (Wander and McBride, 1955, 23-24). Polk County is not only the center of the phosphate industry but is the leading producer in Florida’s citrus industry. To evaluate the situation, citrus groves were monitored and experiments conducted during the 1960’s and 70’s to determine the extent and effect of fluoride on citrus (Leonard and Graves, 1969, pp. 717-22; Leonard and Graves, 1972, pp. 13-18; Woltz, Waters, and Leonard, 1971, pp. 30-36; Leonard and Graves, 1970, pp. 34-41). Experiments and field studies have shown that chlorophyll and leaf development are inhibited severely in young leaves by relatively low levels of \( F^- \), 20-50 ppm. Injury during the time of flower bloom and early fruit set may cause blossom drop or fruit drop, severely reducing yields. Mature leaves may accumulate large amounts of \( F^- \) without much apparent damage, although the long-term effects are not known. The various species of citrus differ considerably in their tolerance of \( F^- \). The lemon, clementine, and tangelo are very sensitive; the Valencia orange is moderately sensitive, whereas the Hamlin and Pineapple orange and grapefruit are most tolerant.

Fluoride poisoning in livestock, especially beef cattle and dairy cows, is usually encountered as chronic fluorosis which involves the hard tissues of the body. Approximately 96 percent of all fluoride retained in the body is found in bones and teeth. The most common source of the fluoride is pasture grass subject to air-borne contamination. The current pasture grass standard is 45 ppm, reflecting an accepted belief that cattle can be successfully raised on grass containing 45 ppm \( F^- \) or less on an average annual basis (Crum, 1980). However, fluorosis is a chronic disease caused by an excess of fluoride over prolonged periods and there is cause for concern when levels exceed 45 ppm. Dental lesions may develop as well as mottled enamel and brown teeth which are susceptible to abnormal and uneven wear. The bone lesions result in enlargement and roughening of the bone which may lead to spurring at joints and subsequent stiffness and lameness. The major economic losses are due to the general unthriftiness of the animals rather than to death. Most of the fluorosis reported in central Florida occurred during the 1960’s and is not as prevalent today. There are currently large numbers of beef cattle pastured on phosphate industry land. Most of these herds are privately owned and are commercially profitable.

During the past two decades significant gaseous and particulate fluoride pollution have been observed in west central Florida, with damage primarily to cattle and various plants such as citrus and ornamentals. In the past ten years the introduction of new types of stack scrubbers, modern processing techniques, the change to primary production of PAP, and the decrease in phosphate production resulting form a depressed market have reduced the effect of gaseous and particulate fluoride damage. More research on this topic is needed, and meaningful state standards should be established. A complete and fair evaluation of the Florida fluoride pollution problem only then can be ascertained.


Incorrect assumptions, perceptions and ideas often become so intertwined with actual situations that through time the truth seems less factual than the folklore. Florida, being inaccessible until almost the 20th century, fostered many perceptions and ideas that were later proved incorrect. Even until recently geological and popular historical literature contained several fallacies that still find their way into present-day literature and conversation. Four of these fallacies are examined here (Fig. 1, cover).

Florida—A Coral Formation

One of the more interesting of the fallacies relates to the area of the state underlain by coral rock. A survey made along the Florida Reef in 1846 by Timothy Abbott Conrad, and later by Louis Agassiz, gave some grounds for the belief that the entire peninsula of Florida was a coral formation. Agassiz, the eminent Swiss naturalist, reported that Florida had been extended southward from a line represented by the parallel of 28° 3 by the growth of a succession of coral reefs across a sea bottom not deeper than twelve to twenty fathoms and by the burial of the reefs beneath an accumulation of detritus cast up by the sea to heights a few feet above sea level. The growth of the reefs and the accumulation of the detritus was completed without change in the relative level of the sea and the Floridian Platform. He further supposed that Florida could not grow beyond the present living reef, for the water was too deep for coral to take hold and grow. This theory was incorporated by Joseph Le Conte in his textbook, Elements of Geology, in 1878, and was generally accepted for many years. Little was known about the interior of Florida when this theory was formulated, and facts since discovered have shown it to be false. Actually it was Angelo Keilprin in 1886 who determined that the progressive growth of the peninsula as far south as Lake Okeechobee was due to a combination of sedimentation and upheaval.

Florida’s Highest Point

A long held belief concerning the location of the highest point in Florida may have been a result of wishful thinking. Because Florida is, for all practical purposes extremely low and flat, the high ridge, averaging 150 feet above sea level, that runs through the center of the state is called the Central Highlands. This highland area extending from the Georgia state line in the north to the vicinity of Glades County, a distance of approximately 250 miles, appears to be the logical place for the highest point in Florida. In fact, in The Scenery of Florida, Geological Bulletin No. 17, Cooke, (1939), stated that the Lake Region, the southern part of the Central Highlands, rose higher than anywhere else in Florida. He therefore placed the highest point at Iron Mountain (325 feet above sea level) near Lake Wales, Polk County. Interestingly, on the summit of this “mountain” stands the attractive carnival called the Sok Singing Tower, perhaps helping to perpetuate this fallacy. It is interesting to note that not only was Iron Mountain not the correct location neither was the elevation 325 feet. The 325 feet was recorded by a private survey and actually the elevation is between 290-300 feet above sea level.
Even as late as 1964, The Florida Handbook (Morris, 1964), included in the inside cover a reference to Brooksville in Hernando County as being the highest point in Florida. Fortunately Morris contradicts this statement on a later page correctly placing the highest elevation in Walton County at 343 feet just south of the town of Lakeview.

Florida—Land of 30,000 Lakes

Perhaps because lakes are a very visible part of the scenery of Florida it does seem as though Florida has at least 30,000 lakes. Part of this perception may be a result of the landscape of Florida, particularly in the Lake Region, where there are numerous solution basins. Many of these stand above the water table and are quite dry. Some protrude below the water table and are more or less permanent lakes. During the wettest seasons of the year, these depressions contain water, but during times of drought when the water table drops they are transformed into grassy ponds, and sometimes become completely dry.

In 1969, the Florida Board of Conservation under the direction of Randolph Hedges published the Gazetteer of Florida’s Lakes (Florida Board of Conservation, 1969). This gazetteer lists alphabetically and by principal river basins all of the fresh-water lakes in Florida named on the topographic sheets of the U.S. Geological Survey and unnamed lakes which were at least 10 acres or more in size. There are 7,712 lakes listed and their sizes ranged from one acre to almost one-half million acres. Lake Okeechobee is the largest of the 7,712 lakes and the largest fresh-water lake in the United States that is located entirely within one state—738 square miles.

The Unique St. Johns River

The St. Johns River has long been described as the only navigable river wholly within the United States that flows north. For many years it was assumed that this statement is true, especially when John M. Molten included it in his Facts to Know, Florida, (Molten, 1935). The truth is that this “fact” is yet another fallacy concerning Florida that many people still believe. There are a number of rivers in the United States that flow north, among them the Tennessee, Red and Yellowstone.

The unique aspect of the St. Johns River is that it flows northward for nearly 200 miles entirely within one state, and that its headwaters lie less than 20 feet above sea level. No other river in the United States can equal those two features. The northward flowing characteristic also led some people to believe that it also must be flowing uphill. This fallacy probably originated in the colloquial language of many Americans who have the misconception that up is north and down is south, when geographically up is away from, and down is toward the center of the earth.

Ideas and assumptions can be incorrect, even though many people believe them. This is especially true concerning these four mistaken ideas about different physical features of Florida. The facts are now known and it is time that the literature and conversations concerning Florida reflect the true situation.
References


The P. S. G. congratulates Edward Fernald, Florida's State Geographer

FLORIDA DEPARTMENT OF STATE
George Firestone
Secretary of State

September 15, 1983

Edward A. Fernald, Ph.D.
Director, Institute of Sciences
and Public Affairs
The Florida State University
341 Mr. Muller Building
Tallahassee, Florida 32306

Dear Dr. Fernald:

It gives me great pleasure to designate you as State Geographer for the Florida Department of State.

As State Geographer you will serve as my principal advisor on matters dealing with State geography, including but not limited to the geographic characteristics of state lands; advocacy for geographic studies in public schools; and custodians of place and natural feature names and special relationships.

The accomplishments of you and your Institute are a credit to the State of Florida and the Florida State University. I look forward to a long and prosperous cooperative relationship between our offices in this very important area of state responsibility.

Sincerely,

[Signature]

Secretary of State

cc: Bernard F. Sliger, Ph.D.
CASSADAGA

JUST A MEDIUM PLACE

Harry J. Schalmann, Jr.

Relatively unaffected by the congested highways of east central Florida that serve such popular attractions as Disney World, EPCOT, the Daytona 500, and Kennedy Space Center, Cassadaga is a small, secluded, quiet community that is one of the state's more interesting rural settlements. Cassadaga is the largest community of Spiritualists per capita in the South, and one of the oldest in the country, with a history dating back to the late nineteenth century (Larcher and Hutchinson, 1980, p. vii). Reflecting this, the community differs in external physical appearance as well as internal demographic makeup from other Florida towns of comparable size.

Fig. 1 Location of Cassadaga, Florida

Modern Spiritualism in the U.S.A. is usually attributed to the Fox sisters of Hydesville, New York, who in 1848 stunned the world with a much publicized communication with the dead (Harvold, 1979, p. 15). By the 1870s, the popularity of Spiritualism had attracted an estimated one and a half million adherents (Magida, 1983, p. 83). Scattered throughout the country are a
few other Spiritualist communities, the oldest and most notable being the Lily Dale Assembly of Cassadaga in New York state, and Camp Chesterfield in Indiana (Harrold, 1979, preface).

Today, automobile bumper stickers and tee-shirts carry the slogan "Cassadaga—just a medium place," a play on words, since Cassadaga is a place for "mediums" in the Spiritualist definition of the word. A hundred or more members of the community, including healers, mediums, and psychics, practice and/or profess their beliefs in Spiritualism (Marcher, 1982, p. 1-5). The population of the unincorporated village fluctuates from about three to five hundred, mostly middle-age to elderly residents, reflecting the seasonal impact of visitors and tourists (Karbebeck, 1982, p. 73). From mid-December through March Cassadaga becomes a lively mecca for the assemblage of Spiritualist visitors from all over the U.S.A. and abroad.

Cassadaga is in many ways the story of one man, George F. Colby—bachelor, teacher, lecturer, foster parent, Spiritualist—who arrived on this site in 1875. According to legend, Colby was spiritually inspired "to found a religious retreat in the wilderness" (Southerland, 1972, p. 28). He was born in Pike, New York, in 1848. His talent as a medium surfaced as he entered his teenage years, and his reputation as a popular speaker and Spiritualist spread. He traveled extensively in the East and Midwest and became a favorite in upstate New York at the Cassadaga Lakes Free Association (today named the Lily Dale Assembly). Experiencing frequent ill health, Colby was advised to seek a more favorable climate. According to legend, Colby was in Iowa conducting a seance when "Seneca," an Indian spirit guide with whom he had previously been in contact, directed him to rendezvous in Eau Claire, Wisconsin, with the T. G. Gidding family. There, both were instructed by "Seneca" to travel to Florida to establish a Spiritualist outpost. In 1875, Colby, Gidding, and others left from the Twin Cities area of Minnesota and traveled via train south through Chicago, Louisville, and Montgomery, then down the Chattahoochee by boat, and finally once more by train from Tallahassee to Jacksonville. There, following a brief layover, Colby and a few followers boarded the steamboat, The Volupta, sailed south to Blue Springs near Orange City, Florida, and camped out on the river bank unaware of their next move. During the night, "Seneca" once more appeared to Colby and revealed a vision in which a small community of Spiritualists that would someday serve as a great learning center for the faithful would be established in Central Florida. Sharing these revelations with his followers, Colby and associates traveled the next day via mule wagon to the site that today is Cassadaga. Here "Seneca" and Colby were satisfied that this was the place (Marcher and Hutchinson, 1980, pp. 67-6). To deference to the locale of his earlier Spiritualist success, and also because of close geographic similarity, the area was named Cassadaga by Colby, as it reminded him of the pine bluffs and a chain of several small lakes in the Cassadaga Hills area of New York. (Wallace, 1972, p. 3).

Colby built a home adjacent to a lake later named in his honor and there he lived out his life, raising fifteen homeless children, working in the lumber business, and actively pursuing his interests in Spiritualism. Today his home, varnated for years, stands deteriorating amid a dense thicket of trees and undergrowth, adding a further gothic reference to the already haunting reputation of the community.

Colby's dream of a Spiritualist center materialized in 1894 when he encouraged a group of prominent northern Spiritualists to settle on his property, thereby founding the Southern Cassadaga Spiritualist Camp Meeting Association (Harrold, 1979, pp. 21-22). Only the year before, Spiritualism had been accepted as a bona fide religion in the U.S.A. by Congress (Marcher and Hutchinson, 1980, p. 69).

In 1895, he deeded a tract of thirty-five acres to the Association, thereby establishing the campsite of today (Southern Cassadaga Spiritualist Camp Meeting Association, 1983-84, p. 1). Records indicate that Colby died— or in Spiritualist terms, "passed over to the other side"— in 1933 in nearby Deland, and was subsequently buried in a small cemetery between the communities of Lake Helen and Cassadaga.
Located between Orlando and Daytona Beach, Cassadaga lies on County Road 4139 in western Volusia County. Like the community itself, the physical setting is an anomaly for the region. Low hills shaded by thick covers of tall pine, camphor, and oaks draped with Spanish moss, as well as numerous cabbage palms, create a dark, cool mystique that is in striking contrast to the bright, sunny flatness so much a part of the Florida stereotype. The land slopes eastward down toward small lakes and ponds, named appropriately Spirit Pond, Lake Colby, and Giddings Lake.

Cassadaga today is two villages separated physically and spiritually by the main street, the narrow, two-lane County Road 4139. The non-Spiritualists part of the community is north of the highway, while across the street is the Spiritualist campsite. The character of the community is reflected by its residents who live in relative harmony, most of whom are from Florida and neighboring states; others are from the U. S. East and Midwest. The non-Spiritualists residents are mostly Baptist and Methodist living in some seventy houses that resemble other old, comfortable Florida rural homes. Like its Spiritualist counterpart, the area is quiet, hilly, and wooded. With the exception of a few new houses, the area and structures remain relatively unchanged, reflecting construction of the 1920's and 30's. A number of the residents are employed in the nearby village of Lake Helen at the Nautilus plant, while others work at a variety of jobs reflective of any small town.

Across the street is the Spiritualist campsite, with entry between two white, weathered concrete pillars that formerly supported iron gates, affording the residents privacy. Now the gates are gone, and psychics, healers, and mediums live inside on property owned by the Southern Cassadaga Spiritualist Camp Meeting Association. Residents must be stockholders in the Association and lease property, usually for a ninety-nine year period. To qualify for residence, one must achieve "certification" in the Spiritualist field through standards set up by the Association. Most residents belong to Colby Memorial Temple, the only church on the campsite. Many elderly residents are retired. Others advertise their expertise via small signs on the fronts of their cottages and live on income from "readings" to believers, doubters, and the curious who stop by.
The campsite is square in shape and is platted in a compact fashion on seven streets. Houses number about sixty and many resemble small, wooden-shingled, New England beach-style cottages, with steeply inclined tin roofs atypical of Florida construction. Because of the prevalence of mosquitoes from the nearby lakes, screened-in porches are common. Narrow, oak-lined streets wind down from the camp entrance to the church and shore of Spirit Pond. Moss-covered trees, colorful flower beds, and gravel walks add charm. At the far end of the campsite on a knoll overlooking Spirit Pond is a large, white, two-story house that serves as the library for the National Spiritualist Association of Churches. The collection specializes in publications on Spiritualism and related subjects and is available to residents and students of the faith.

The business area of Cassadaga is limited, dominated by the Cassadaga Hotel. This forty-two room, two-story, pseudo-Mediterranean structure of cinder blocks was built in 1927, replacing an earlier wooden hotel which was destroyed by fire. The present hostelry is cream-colored stucco with a long porch and large wicker rockers. Several other large structures cluster near the hotel and entrance area, just inside the campsite: namely, the Andrew Jackson Davis Educational Building, Harmony Hall, and Brightside Hall — all of which are of early 1920 vintage. The former, named after a 19th century mystical philosopher and writer, is a sizeable one-story white frame structure that serves as a meeting hall and learning center. The latter two buildings, both white, wooden, two-story residential structures fronted with screened-in porches, were built by the Association as early boarding houses. Today, more than sixty years later, both still serve as seasonal and yearly residences for Spiritualists. On the north, non-Spiritualist side of the street, are several small businesses: the grocery, beauty saloon, and post office. The tavern, recently destroyed by fire of mysterious origin, had long served as an area for social exchange for both Spiritualist and non-Spiritualist residents. Its mere presence was considered a nuisance to some of the more conservative members of the community, and an arson investigation is currently in progress.

Visitors arrive by thousands each year seeking guidance, Spiritualist inspiration, warm weather, solitude, and community. In the 1930's, Cassadaga was receiving international notice, as famous mediums "wintered" and held highly-publicized seances here. This "golden age" for Cassadaga led to some fraudulent practices, as charlatans on occasion produced and even photographed "spirits from beyond" (Saint Petersburg Times, 1981, p. 8). Exposure of such practices resulted in adverse publicity and brought irreparable harm to the reputation of the community and its residents. Reaction was swift, as certification standards were strengthened within the camp and a sincere, concerted effort was made to restore legitimacy and confidence to community and profession.

Today, Cassadaga continues to serve residents and followers by hosting national, regional, and local Spiritualist conferences, and providing a comfortable settlement for those wishing to retire in Florida in relative seclusion with neighbors of similar beliefs and interests. It is very much a passive recluse community which attempts to avoid publicity and is the antithesis of many other religious groups that aggressively and sometimes fanatically express their beliefs with missionary zeal. Cassadaga prefers to linger in the shadows.

Skeptics and non-believers mock the community as the "town of the living dead" or the "town that talks to the dear departed," but healthy curiosity remains. It is estimated that as many as 50,000 visitors arrive annually from all parts of the country to "communicate with the dead" or to receive "readings" based on a patron's "aura" or spirit energy (Yother, 1972, p. 8-2). It may be "Spookstown" to some, but it is home, a viable community, and a religious haven for others.
References


RELATIVE GROWTH AND DISTRIBUTION OF FLORIDA'S EUROPEAN BORN

Norton D. Waisberg

Florida's status as an immigrant state rests largely on the fact that in the past twenty-five years it has absorbed hundreds of thousands from the Caribbean, particularly Cuba. Few are aware that coincident with the Caribbean migration there was a quickening of the flow of the European born into the state. Whereas in 1950 there were only 73,123 residents of the state born in Europe, in 1980 their numbers had risen to 369,362. The European born constituted 3.3 percent of the state's population in 1980, which was larger than the percentage that European born constituted of the population of the United States as a whole, 2.3 percent.

Unlike the majority of immigrants who arrived from the Caribbean to live in Florida, most of the European born did not come directly to the state from their homelands. A large share spent their productive years in northern states, or Canada, but chose to retire to Florida. Since European immigration

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<tbody>
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<tr>
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<td>0.00</td>
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<tr>
<td>Total</td>
<td>1.15</td>
<td>1.20</td>
<td>1.25</td>
<td>1.30</td>
<td>1.35</td>
<td>1.40</td>
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<td>1.50</td>
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</tr>
</tbody>
</table>

to the United States in the past twenty years has been greatly reduced from earlier years, populations from European countries who live in the United States have been aging rapidly. Although imprecise, and with several exceptions, in 1980 the degree to which European-born group's total United States population has chosen to reside in Florida can serve as an indication of how well the group has established itself economically within the nation. This study first seeks to examine the growth in the relative importance of Florida as the home of the European born, and second to establish where in 1980 within the state people from individual European nations have concentrated beyond what would be predicted from knowing the total population of the place.

The statistic used in this study to determine the level of concentration of individual European-born groups in Florida between 1850 and 1980 is the index of concentration, also known as the location quotient. The index of concentration here compares the state's or an individual city's share of the nation's population of an individual European group with the state's or individual city's share of the nation's total population. In 1980, for example, there were 51,073 people born in the United Kingdom living in Florida, or 3.266 percent of the group's United States population. In that year Florida's share of the nation's total population was 4.303 percent. By dividing Florida's share of the total United States population into Florida's share of the United States population of people born in the United Kingdom, the index of concentration is derived (1.92). Any index above 1.00 signifies that in that year a group was overrepresented in the state (or city). Below that figure the group was underrepresented. Indexes of concentration were calculated for twenty-six European countries for the years 1850 to 1980 (Table 1).

Florida's immigrant history between 1850 (the first census which enumerated the foreign born by state) and 1900 was typical of other southern states. People came in the belief that Florida was as much an economic frontier as the nation's west. The migrants were mainly from elsewhere in the nation, and not from Europe. Southern Europeans, notably the Greeks and the Spaniards, were the only European born who before 1900 normally attained indexes of concentration in Florida above 1.00. Even before the establishment of the Greek community in Tarpon Springs, people from that nation were settling in relatively large numbers along Florida's coast, where they mainly fished. The Spaniards who arrived primarily came from Cuba, refugees from the long civil war that raged on that island throughout the last half of the nineteenth century. Most Spaniards concentrated in Tampa, and to a lesser degree in Key West, where many worked in the cigar industry. In the nineteenth century, the Portuguese and the Italians were better represented in the state than most other European-born groups, though neither group produced indexes as large as either the Greeks or Spaniards. Portuguese mainly lived in coastal towns and were engaged in fishing, while a disproportionately large number of Italians lived in the interior (Marion and Orange counties) and worked on railroad and drainage projects.

Florida's importance as a home for the European born did not really grow until after World War II, when the state's total population also began a rapid numerical increase. Although the census does not report the European born by age, strong circumstantial evidence supports the belief that many of those Florida residents who were born in Europe came to retire from productive lives in other parts of the nation. The 1980 census does indicate the year that the foreign born immigrated to the United States. In Florida in that year, 56 percent of all European-born residents had immigrated to the United States in 1950 or earlier, compared to 44 percent for the nation. Among the twenty-six individual European countries for which census data are available only the Spanish had a more youthful population living in Florida than did the entire nation. Spanish immigration to the United States in recent years has been among the largest in Europe, and many who have come have chosen to go directly to Florida.

Further support for the belief that a high proportion of Florida's European born are retirees is found in identifying where they live. Those counties with the highest percentage of people 65 years of age and older in
their white populations usually have percentages of European born in their white populations far above the national average. In the case of Broward (Fort Lauderdale-Hollywood), Palm Beach (Boca Raton-West Palm Beach) and Pinellas (St. Petersburg-Clearwater), over twice the national average. On the city level, there is a close association of the European born and retirement communities on Florida's Gold Coast.

If one accepts the circumstantial evidence that many of Florida's European born are retirees, changes in the index of concentration within Florida of most European-born groups provides a measure of the ability of their members to retire to Florida from elsewhere in the United States or Canada. In 1940 Spaniards were highly overrepresented in the state, greatly inflating the average index of concentration of the Southern European group of nations. Excluding the Southern European group, the United Kingdom group of countries in 1940 had the highest indexes of concentration, followed by those born in Western Europe and Scandinavia. After 1950 the flow to Florida of people born in Europe greatly increased. The fastest rate of growth of the indexes was among the Scandinavians, followed by the Eastern Europeans. Among the Scandinavians the Finns and Swedes experienced the most rapid increase in their indexes, while among the Eastern Europeans the rise was general, except for the Yugoslavians. Jews have constituted the majority of those who have come to Florida from Eastern Europe, but Yugoslavia has never had a large Jewish population, and the index for Yugoslavia is among the smallest of all nations.

Since 1950 the European-born populations whose concentration indexes in Florida have grown the slowest have been the Irish, Greeks, Italians, Yugoslavians and Portuguese. This cannot be attributed to their early settlement in sections of the nation remote from Florida. Like most of the other European born, their original areas of settlement in the nation were busiest in the northeastern states. In great measure, it is due to the sustained large immigration of most of these groups from their homelands, even during the 1970s. The majority of new immigrants who have arrived have gone to the northeastern states, diminishing the relative importance of Florida's populations of these groups.

The European born who have settled in Florida have been selective in their choice of where to live. Table 2 provides the level of concentration above 2.00 in 1980 for seventeen European-born populations living in the urbanized areas of the state's Standard Metropolitan Statistical Areas (SMSAs) or urbanized areas outside of SMSAs with populations 50,000 or larger. No European-born group in 1980 had attained an index of concentration of 2.00 or larger in any SMSA in the state's interior nor in Jacksonville. Furthermore, few groups had attained such high indexes in cities on the state's North Coast.

The high indexes of concentration have largely been confined to East Coast and West Coast cities, many closely identified with retirees. Central and Eastern Europeans (principally Jews) have become highly overrepresented in cities on the East Coast, particularly Miami and Fort Lauderdale. People born in the United Kingdom; in 1980 were highly overrepresented more frequently within West Coast cities than those on the East Coast. St. Petersburg in particular had exceptionally high indexes of all four groups from the United Kingdom, and was the only city in Florida with an index of concentration of the Irish above 2.00. More East Coast cities had high indexes of the French than did West Coast cities, but the reverse was true of the Dutch.

Data for two European-born populations, the Finns and the Spaniards, were available only for Florida's largest SMSAs. Sufficient data are available, however, to ascertain where they were most overrepresented in 1980. In that year Florida had an 11.7 percent share of the nation's Finnish born, the majority living in West Palm Beach SMSA, principally in the Lake Worth-Lantana area. The Spanish in 1980 were enormously overrepresented in the Miami SMSA, where their concentration produced an index of concentration of 17.38. In that SMSA lived 69 percent of all of Florida's Spaniards.
Data for a more reduced number of the European-born populations are available for towns with populations between 10,000 and 50,000, permitting an enlargement of the scale of the study. The Gold Coast (Dade, Broward and Palm Beach counties) was chosen for detailed examination, since in 1980 the region contained 44 percent of the state’s European-born (Table 3). The examination was limited to five groups, which together constituted a 66 percent share of the Gold Coast’s European born; people in Germany, the United Kingdom, Italy, Poland and the USSR. The Poland and USSR born were combined since most were Jewish and were distributed in the same manner.

Communities with high indexes of concentration of people born in the United Kingdom are distributed quite evenly throughout the Gold Coast. Furthermore, there is little difference between communities in the degree of overrepresentation. Communities with high concentrations of those born in Germany are only slightly less evenly distributed than those where people from the United Kingdom are overrepresented. The combined Poland and USSR born, as well as those born in Italy, were overrepresented in much fewer communities.
## TABLE 3

**COMMUNITIES 10,000 OR MORE ON THE FLORIDA GOLD COAST WHICH IN 1980 HAD**

**AT LEAST ONE EUROPEAN BORN GROUP AMONG A SELECTED FOUR WITH AN INDEX**

**OF CONCENTRATION OF 2.00 OR HIGHER**

<table>
<thead>
<tr>
<th>Communities Listed from South to North</th>
<th>Index of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Population</td>
</tr>
<tr>
<td>Jasmine County</td>
<td></td>
</tr>
<tr>
<td>Cutler Ridge</td>
<td>20,984</td>
</tr>
<tr>
<td>Cutler</td>
<td>15,593</td>
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<tr>
<td>Lindgren Acres</td>
<td>17,286</td>
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<td>Kaubas</td>
<td>75,350</td>
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<td>Cape Cables</td>
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<tr>
<td>Miami</td>
<td>356,885</td>
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<tr>
<td>Miami Beach</td>
<td>36,289</td>
</tr>
<tr>
<td>North Miami</td>
<td>130,966</td>
</tr>
<tr>
<td>Coral Gables</td>
<td>36,533</td>
</tr>
<tr>
<td>Sunny Isles</td>
<td>11,979</td>
</tr>
<tr>
<td>Scottie Lake</td>
<td>14,174</td>
</tr>
<tr>
<td>Ojus</td>
<td>17,129</td>
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<tr>
<td>Ives Estate</td>
<td>19,471</td>
</tr>
<tr>
<td>Broward County</td>
<td></td>
</tr>
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<td>Miramar</td>
<td>32,313</td>
</tr>
<tr>
<td>Hallandale</td>
<td>36,911</td>
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<tr>
<td>Pembroke Pines</td>
<td>55,776</td>
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<tr>
<td>Plantation</td>
<td>48,301</td>
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<tr>
<td>Hollywood</td>
<td>121,327</td>
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<tr>
<td>Cooper City</td>
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<td>Dela###</td>
<td>11,871</td>
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<tr>
<td>Davie</td>
<td>28,877</td>
</tr>
<tr>
<td>Fort Lauderdale</td>
<td>151,279</td>
</tr>
<tr>
<td>Wilton Manor</td>
<td>12,744</td>
</tr>
<tr>
<td>Sunrise</td>
<td>39,091</td>
</tr>
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<tr>
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</tr>
<tr>
<td>Lighthouse Point</td>
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</tr>
<tr>
<td>Pompano Beach Highlands</td>
<td>16,156</td>
</tr>
<tr>
<td>Deerfield Beach</td>
<td>39,183</td>
</tr>
</tbody>
</table>

**Palm Beach County**

| Boca Raton                            | 49,505            | 13.7                                     | 2.02        | 2.15    | 3.68           | 2.37   |     |       |
| Delray Beach                          | 34,224            | 29.9                                     | 1.59        | 3.33    |               |        |     |       |
| Boynton Beach                         | 35,624            | 36.1                                     | 2.88        | 4.19    | 4.20           | 2.40   |     |       |
| Lake Worth                            | 27,048            | 12.6                                     | 4.23        | 2.40    |               |        |     |       |
| West Palm Beach                       | 65,905            | 20.3                                     | 1.60        | 2.56    |               |        |     |       |
| Palm Beach Gardens                    | 14,407            | 10.9                                     | 1.06        | 2.65    |               |        |     |       |
| Century Village                       | 12,040            | 87.7                                     | 1.29        | 3.42    | 7.33           | 49.86  |     |       |
| Riviera Beach                         | 26,915            | 15.9                                     | 1.08        | 2.62    |               |        |     |       |
| North Palm Beach                      | 11,244            | 11.4                                     | 1.66        | 2.70    | 3.63           |        |     |       |
than either the Germany or United Kingdom born. The Jewish retirement communities of the Gold Coast, identified on Table 3 by communities with large percentages of people 65 years of age and older where people born in Poland or the USSR are heavily overrepresented, are mainly found in northern Bade County, Broward County, and one outlier in northern Palm Beach County (Century Village). It might be added that other communities where the European-born were highly overrepresented existed on the Gold Coast in 1980 but were not recognized in the records and their inhabitants were identified only in the county data.

The European-born population of Florida has grown rapidly since 1950. Whereas in 1930 the state, like most in the South, had few European-born groups that were overrepresented, by 1980 most were. Although the evidence is circumstantial, the growth in relative importance of so many European-born groups within the state is principally the result of the retirees from elsewhere in the nation or Canada. Some European-born groups have been more successful than others in establishing themselves in the state, but few groups today are underrepresented. Since the age distribution of the foreign born is not known, we can only surmise why there is such variation. It appears due to the degree of aging among the various European-born groups. Those which are aging, due largely to a lack of young replacements from the homeland, now frequently have disproportionately large numbers who have retired to Florida.

Most communities in which the European born have become overrepresented are situated along the east and west coasts of the southern half of the peninsula. Clearly Florida has not been a "waiting pot" for the European born. Groups have tended to concentrate in certain communities. In most cases, however, their actual numbers have been insufficient for them to have an impact upon the landscape. Communities such as Nassau, a settlement in Nassau County with visible Czech elements (Stowers and Schleman, 1982), are exceptional, and generally it would be impossible from the visual evidence to identify where Europeans, and more specifically Europeans born in the USSR, are situated. The European-born groups are situated to Florida generally have long been assimilated into the nation's culture. Although members of these groups tend to concentrate in certain cities, and in some cases even within certain sections of cities, except for their clubs and some ethnic commercial establishments, their is little evidence of their presence.

Since for years most European groups within the United States have not been able to replace their numbers, reduced by death through immigration from their homelands, their populations have steadily aged. As a European-born group ages many among the population select Florida as a retirement home. It is likely that by the 1990 census the state will be the home of a larger share of the members of most groups than in 1980. Nevertheless, because of the many European groups, although Florida's share of many will rise, the absolute numbers of those living within state will decline, as will their role in shaping the state's cultural environment.

References
HURRICANE HAZARDS: PERCEPTIONS OF NEW HOMEOWNERS IN THE LOWER KEYS

John A. Cross

The concerns of newcomers to a hazard-prone area to such hazards is of considerable interest to geographers and planners. In the mid 1970's it was estimated that over 75 percent of the population on the Atlantic and Gulf coast had never experienced a major hurricane (Herbert and Taylor, 1975, p. 9). This coastal population subsequently grew rapidly, and now Baker (1979a) estimates that less than 10 percent of the coastal residents have experienced a major hurricane. Thus it is not surprising that "With the rapid buildup of population in coastal areas, concerns are growing that hurricane disasters involving thousands of casualties may be in the nation's not-so-distant future" (Baker, 1979b, p. 9).

Considerable interest has been expressed in the perceptions of new inexperienced residents of their vulnerability. Models of adjustment behavior indicate that migration actions result after a population's perception of a hazardous event has reached a threshold (Kates, 1971, p. 446); hence the necessity for perception research.

Hazard perception has been defined by Mileti, Drabek, and Hane (1979, p. 23) as

an individual's understanding of the character and relevance of a hazard for self and/or community. The perception may include notions about speed of onset, scope, intensity, duration, frequency, temporal spacing, causal mechanisms, and predictability.

Geographers have recognized that coastal inhabitants are more aware of the coastal flood hazard than are urban dwellers on river floodplains (Barton and Kates, 1964, p. 384), and that residents of various coastal communities differ in their perceptions of the hurricane threat (Baker and Barton, 1974, p. 34). Social scientists have described the development of "disaster cultures" among long-term residents (Moore, 1964, p. 195; Osborn, 1970), and newer residents have been observed to be more likely to evacuate in the face of storms (Windham, et al, 1977, p. 30). This paper, which examines hazard perceptions among recent homeowners of the Lower Florida Keys, is a follow-up to earlier studies (Cross, 1981; Cross, 1982).

Lower Florida Keys Study, 1983

Homeowners in the Lower Keys study area (ten to thirty-five miles east of Key West) who purchased their homes between January 1980 and August 1982 were mailed questionnaires in August and September 1983, the height of the hurricane season. Responses were received from 237 individuals, a 68 percent response rate.

The Lower Keys, 96 percent of which lies below the five foot contour, has one of the greatest probabilities of being hit by hurricanes of any area in the United States. These islands have experienced hurricanes once every seven years on the average (Simpson and Niebu, 1981, p. 272). Nevertheless, since the early 60's when the Florida Keys were struck three times, this area has gone unscathed, although it has been threatened by storms in the past several years.
Perceptions of Hurricane Winds and Flooding

Most new residents appear well aware that the area can expect at least some hurricane damage within the next decade. In response to the question, "How likely do you think it is that a damaging hurricane will occur within the Lower Florida Keys during the next 10 years?" 64 percent of the new homeowners indicated that it was "very likely" or "likely." Only one percent said it was "very unlikely."

The importance of the hurricane hazard to the newer households in the 1983 study was greater than that discerned in a 1976 survey (Cross, 1980) or a 1982 resurvey of long-term residents (Cross, 1983). Of the new residents, 71.3 percent felt that hurricane winds were either a "major problem" or "somewhat a problem" to their households, while only 5.7 percent stated that hurricane winds were "not a problem at all" (Table 1). Their evaluation of the hurricane wave and flooding hazard was nearly as high as their concern about hurricane winds. When compared with other problems within the Lower Keys, including such diverse items as the safety of highways and bridges, garbage disposal, police and fire protection, water supplies, and mosquitoes, over 20 percent of the respondents felt that hurricanes were the most important problems to their households. In the 1976 survey, less than 10 percent of the respondents expressed this concern.

### Table 1

<table>
<thead>
<tr>
<th>Perception of Hurricane Winds</th>
<th>Hurricane Waves and Flooding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Problem (n / %)</td>
<td>64 / 27.8%</td>
</tr>
<tr>
<td>Somewhat a Problem (n / %)</td>
<td>100 / 43.5%</td>
</tr>
<tr>
<td>Minor Problem (n / %)</td>
<td>53 / 23.8%</td>
</tr>
<tr>
<td>Not a Problem at All (n / %)</td>
<td>13 / 05.7%</td>
</tr>
</tbody>
</table>

Perception of Lower Key Risk Compared with Risk in Other Locales

New homeowners, although aware that hurricanes are possible, do not consider their location more hazardous than other coastal locations (Table 2). Fully 71.7 percent of these homeowners felt that the Lower Keys were equally likely to be hit by a hurricane as were other locations along the Gulf and Atlantic coasts. Two-thirds of the remaining homeowners stated that the Keys had a lower probability of experiencing hurricanes, not a greater probability, when compared with other locations along the Gulf and Atlantic coasts of the U.S.

In comparing the vulnerability of the Lower Florida Keys to property damage should a hurricane occur, nearly half (47.2 percent) of the new homeowners expected damage equal to that which other coastal locations would experience. However, 34 percent felt that a "hurricane in the Keys was more likely to cause damage," compared with 18.7 percent who expected less damage. On the local scale, when asked to compare the hurricane vulnerability of the Lower Florida Keys with locations in the Middle and Upper Florida Keys, 63.6 percent of the Lower Florida Keys newcomers felt that they were equally likely
to suffer hurricane damage as the other areas of the Keys. Twenty-eight percent stated that the Lower Keys were less vulnerable, and 8.5 percent felt that they were more likely to suffer damage. In a small pretest of the survey questionnaire within the Middle Keys, similar responses were obtained.

Perception of Flood Damage

The perceived importance of hurricane wind and flooding hazards to the households was significantly related to the new residents’ attitudes concerning how the damage vulnerability of the Florida Keys compared with other coastal locations (Table 3). For example, 41.6 percent of those who felt that hurricanes in the Keys are more likely to cause damage stated that hurricane flooding was a “major problem” in living in the area. Conversely, 62.8 percent of those new homeowners who claimed that the Keys are less likely to receive damage indicated that hurricane flooding was either a “minor problem” or “not a problem at all.”

One half of those residents who believed that hurricanes are less likely to strike the Keys than other areas felt that hurricane flooding is either “not a problem” or a “minor problem.” In contrast, among new homeowners who viewed the Keys as equally or more likely to be hit than other coastal areas, less than a quarter had such perceptions about the importance of hurricane flooding to their households.

Similar statistical associations exist between the perceptions of new homeowners about the importance of the hurricane wind problem and their perceptions about their comparative vulnerability to coastal storm damage. Thus the attitudes which new residents have concerning their hazard exposure compares with that in other coastal locations are of significance in their perceptions of the importance of the hazard to their households within their home area.
TABLE 3
HURRICANE FLOOD HAZARD PERCEPTIONS AND THE PERCEPTION OF THE COMPARATIVE DAMAGE VULNERABILITY OF THE LOWER FLORIDA KEYS

<table>
<thead>
<tr>
<th>Hurricane Waves and Flooding Are Considered:</th>
<th>More Likely</th>
<th>Less Likely</th>
<th>Equally Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Major Problem (N / %)</td>
<td>32</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>41.6%</td>
<td>14.0%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Somewhat a Problem (N / %)</td>
<td>33</td>
<td>10</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>42.9%</td>
<td>23.3%</td>
<td>49.1%</td>
</tr>
<tr>
<td>A Minor Problem (N / %)</td>
<td>12</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>15.6%</td>
<td>41.9%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Not a Problem at All (N / %)</td>
<td>0</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>20.9%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Total (N / %)</td>
<td>77</td>
<td>43</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Perception of Immediacy of Hurricanes

The new homeowners' expectation of a damaging hurricane within the next decade is not statistically associated with the importance of either the hurricane wind or flooding hazards to their households. Nevertheless, the data do suggest that residents who expressed greater concern about hurricane problems tend to believe that a damaging hurricane is more likely during the next ten years. Significant statistical relationships do exist, however, between the residents' evaluation of hurricane winds and flooding as problems and the new homeowners' evaluation of the vulnerability of their homes to hurricane destruction.

Experience with Hurricanes

Nearly two-thirds of the new homeowners within the Lower Florida Keys claim to have experienced at least one hurricane within the Keys or elsewhere. Although this figure is far higher than what might be expected based upon estimates for the entire American shore, several explanations should be considered. Immigrants to the Florida Keys are disproportionately drawn from other coastal communities (Cross, 1979). The previous "experience" claimed range from individuals who experienced the 1938 New England hurricane or Hurricane Donna within the Keys in 1960 to those individuals who noted the recent hurricanes which threatened the Keys before skirting around the area.

Previous hurricane experience is not statistically associated with the new homeowners' perceived importance of either the hurricane wind or flood hazards. Although the data show that individuals who lack hurricane experience are slightly more likely to consider hurricane winds a major problem (14.2
percent to 24.0 percent), the concerns of both sets about hurricane flooding were virtually identical. Thus, while experience may be important in the development of individual hazard perceptions, its role is difficult to evaluate within a population with such a heterogeneous set of experiences as is found within the Lower Florida Keys.

Earlier research, both within the Keys and elsewhere, has demonstrated that the level of perceived concern changes with the passage of time. Numerous hazards researchers have written that hazard concerns diminish as either the time following a hazardous event, or length of residence increase (Palm, 1981, p. 48; Saarinen, 1966, p. 71; White and Haas, 1975, p. 100). Notwithstanding, no lessening of concern was evident in the Lower Keys when respondents to a 1976 survey were resurveyed in 1982. With respect to the threat from hurricane flooding, 37.5 percent of the long-term residents expressed increased concern, whereas 26.7 percent indicated diminished concerns. Over two-fifths of new homeowners surveyed in 1983 indicated that their concerns about the potential for hurricane damage had also changed since they first began living in the Lower Florida Keys, with those who felt more concern outnumbering those who were less concerned by 30.5 to 11.6 percent. It is interesting to note that 46.3 percent of the "inexperienced" respondents stated that they were now more concerned, while over two-thirds of the "experienced" respondents were unchanged in their concerns. The roles of several near misses by hurricanes and greater activity by the county's civil defense office over the past several years in these changing hurricane concerns deserve further attention.

Conclusion

New homeowners within a highly vulnerable coastal locale are not unaware that damaging hurricane may occur. Nevertheless, their community is not viewed as being any more hazardous than most other coastal locations by the major portion of these individuals. However, those new residents who perceive their community as more vulnerable than other coastal locations are more likely to perceive hurricanes as being a major local problem. Since residents who minimize the local threat are also the least concerned about hurricanes, it appears that public awareness programs should emphasize the greater risk of highly vulnerable coastal sites. While the majority of the new homeowners claim at least some hurricane experience, this experience has not increased the hazard concerns of the population. Comparative research in other growing coastal communities should permit greater understanding about how residents of highly vulnerable communities compare with coastal residents in general.

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1. This paper is based upon work supported by the National Science Foundation under Grant No. CEE-8211441.

2. For example, urban occupation of barrier islands from Maine through Texas increased by 153 percent over the two decades preceding the mid 1970's and urban land uses of Florida's barrier islands increased by 219 percent over the same period (Lina, 1990, p. 5).
References


Osborn, C. E., Jr. 1970. The disaster culture concept: a study of elements which comprise the notion of a separate culture which is unique to hurricane-prone areas. Unpublished M.A. thesis, Mississippi State University.

BOOK REVIEW


Small as its title, this softcover booklet was intended for British students presumably at some point between high school and introductory college levels. The contents are arranged around data measurement and analysis, stream flow, sediments in river systems, river channels, and channel changes. There is an abridged glossary and index. References cited and suggested additional readings are mildly chauvinistic. The editors tell us the book is particularly suited for classes intending to become involved in field studies and projects.

To this end, Petts provides instructions for making a quaint homemade plane table and alidade and offers a section on lichenometry that is especially useful if you happen to recognize English lichens on your river boulders.

Illustrations of river features are mostly taken from small, rather tame English streams and do not convey the inherent power of the hydraulic forms we are accustomed to seeing in less domesticated rivers of the world.

The text is crisp and lucid -- it moves ahead smartly using simple mathematics and elementary statistics to good advantage. In sum, Rivers proves to be as useful a text-reference book as can be published without colors, whether it will be widely read in this country is another matter.

Alan Craig
Organized Crime Activity and the Spatial Variation

Of Property and Violent Crime Rates

Raymond K. Oldakowski

Most empirical generalizations of the spatial variation of crime rates have focused on population and environment. Population characteristics are most commonly analyzed in sociological studies of the distribution of crime. This research argues that concentrations of residents possessing certain socioeconomic and demographic characteristics influence areal crime rates by creating crime-prone populations. Factors examined most frequently are age structure, poverty, race, and unemployment (Brown, 1972; Markides and Tracy, 1976; Wiadenka and Hill, 1977).

Environmental characteristics have received equal attention, most commonly in research with an ecological perspective. These studies hypothesize that the physical properties of an area affect crime rates by creating atmospheres conducive to crime. This research focuses on factors such as population size and density, land use patterns, residential deterioration, and environmental design (Barrie, 1961; Stahura, 1966; Pyle, 1974; Jeffery, 1971; Boggs, 1965).

Together these two research perspectives have made significant strides in explaining the spatial variation of crime rates, and have resulted in several pragmatic benefits. Planners and policy makers have incorporated researchers' empirical evidence to attempt to prevent crime. However, traditional factors such as age structure, population size, or population density are temporally persistent, and hence difficult to change. Whereas this does not suggest the abandonment of analyses of population and environmental characteristics, it does argue for additional studies which incorporate factors that may be of greater applied value for policy makers. Initial studies have already been undertaken concerning factors of this nature, including police patrols (Sherman, 1983) and criminogenic commodities (Moore, 1983). Their results suggest continued research of similar "controllable determinants" of crime.

The purpose of this study is to reexamine the relationships between areal crime rates, and environmental and population characteristics, while also examining the influence exerted by a factor with potentially greater applied value: organized crime activities. Two questions are addressed: (1) do organized crime activities serve to mediate the influence of population and environmental characteristics on areal crime rates; and (2) do organized crime activities play a direct role in determining the distribution of crime rates across geographical units?

A path analytic approach is employed to test the existence, direction, and strength of the hypothesized causal links between the environmental, population, and organized crime factors, and the areal crime rates. Violent and property crime rates by counties are examined.

The relationship between organized crime activities and property and violent crime may appear obvious, but this relationship has been little studied empirically. Further, a formal examination of the influence of organized crime on other criminal offenses can produce results beyond a simply confirmation of the presence or absence of a relationship. If the influence of organized crime is primarily spurious, or interactive with the traditional determinants, it can be concluded that organized crime is merely an additional consequence of crime-prone populations and environments. If the strength of the relationship is weak or insignificant, it can be concluded that the presence of organized crime activities does not result in an increase in other
criminal offenses, and hence not worthy of any special attention from policy makers. However, if the causal influence of organized crime is demonstrated as direct and strong, policy makers will have a determinant which when controlled may lead to a decrease in other crimes.

Study Area and Data Source

The sixty-seven counties of Florida were chosen for analysis. Counties are used to minimize the "spatial spillover" of crime rates. Previous research has suggested that the journey to crime experiences friction of distance (Wakim, 1980). Most crimes appear to take place within a mile or two of the criminal's residence (Melvin, 1961; Pyle, 1974). However, the spillover phenomenon continues to be a problem in analyses using small units of observation such as municipalities (Wakim, 1979). This is most notable when crimes occur beyond the official boundaries of the criminal's place of residence. The use of larger spatial units, here counties, should reduce the effects of spatial spillover, although tests for spatial autocorrelation will be conducted.

The selection of counties of the same state, rather than a cross-sectional sample of counties across the nation, was maintained to maintain consistency in the identification and recording of criminal offenses. Florida was selected because Florida's counties provide a diverse sample of the population and the environmental characteristics used in this analysis; and because Florida, unequivocally, has a high crime rate. Furthermore, organized crime activity, by no means unique to Florida, is extremely conspicuous in the state, and has long been a major concern of local, state, and federal law enforcement agencies.

The environmental and population characteristics used in this analysis were ascertained from the Florida Statistical Abstract for 1979. The violent and property crime rates were obtained from the state Uniform Crime Report for 1980. Data concerning organized crime activities were also obtained from this source for 1979. Whereas several problems arise from the use of UCR statistics, most notably the underrepresentation of white collar crimes, they do represent the most consistent, timely, and complete data source available (Decker, 1977; Hindelang, 1974).

Development of Causal Links

The causal model to be tested (Fig. 1) attempts to explain spatial variation in violent and property crime rates of Florida counties. It utilizes several population and environmental characteristics, and the presence of organized crime activities as explanatory factors. The model is recursive and consists of six exogenous and three endogenous variables. Single headed arrows represent a hypothesized positive relationship between the variables.

Specific population subgroups have been shown to represent crime prone or generating populations. High crime rates are disproportionately found in areas of high unemployment, low socioeconomic status, and concentrations of minorities and young adults. Three variables represent population characteristics in this analysis: unemployment rate (UNEMPLOY), percent black (PCTBLACK), and percent males aged 15-24 (THYIPERS). UNEMPLOY, defined as the average annual employment rate, and PCTBLACK, defined as the percentage of black population, are utilized to represent the degree of poverty and low personal resources among residents. Previous studies have documented the influence of these factors on crime rates within the context of economic needs (Beasley and Antunes, 1974). Moreover, it has been suggested that certain social accompaniments of poverty and low income, when considered geographically, may result in crime (Sutherland and Cressey, 1978). THYIPERS, the percentage of resident males aged 15-24, is used as a surrogate of age structure. The findings
of previous research, and empirical evidence from street data, have shown that
the age composition of a population plays a critical role in determining the
distribution of crime rates (Markides and Tracy, 1976). More specifically,
crime rates have been found to be higher in areas with large youth popula-
tions, especially males in their teens and twenties. Thus, it is hypothesized
that UNEMPLOY, FEMALE, and YOUNGREN will exert a positive causal influence
often the violent and property crime rates.

Certain environmental characteristics have been shown to create oppor-
tunities for, and atmospheres conducive to crime. Criminal activity has been
found to be most frequent in older deteriorating urban areas with large het-
terogeneous populations. Three variables are used to represent the environ-
mental characteristics of counties: population density (POPDEN), level of urban-
ization (METRO), and substandard housing (SUBSTAND). POPDEN, defined as the
resident population per square, is employed to represent the physical popula-
density of the county. Previous analyses utilizing this variable have
generated ambiguous results concerning its effect on crime rates. However,
several studies have shown that high density at certain geographic scales re-
results in social pathologies, including crime, due to the greater levels of stress
and anxiety it creates (Coucours, 1972; Winsborough, 1955). Furthermore, population density per square mile provides a crude approximation of the age of political units within counties, another factor which may influ-
ence crime rates (Brown and Oldakowski, 1983).1 METRO, a dummy variable which
distinguishes between SMSA core counties and contiguous and non-SMSA counties,
is a surrogate of the general level of urbanization and population size of an
area. Whereas crime rates do not necessarily increase or decrease with propor-
tional changes in urban population, the loss of local autonomy and fragmenta-
tion of local normative order in large urban areas can result in an increase in crime (Stahura, 1980). SUBSTAND, the percentage of population residing in
housing units with inadequate plumbing facilities, represses the degree of
physical deterioration in a county.2 Physical deterioration creates crime con-
ductive environments in several ways. Most notably, it represents dwelling
units which are less secure, and housing which is commonly occupied by the
crime prone population subgroups noted above. Thus, POPDEN, METRO, and
SUBSTAND are hypothesized to exert a positive causal influence on violent and
property crime rates.
The inclusion of organized crime activities in the hypothesized model represents an attempt to introduce a "controllable determinate" into a causal analysis of crime rates. Although this factor has received little attention as a determinant of actual crime rates, sociological and criminological literature does provide some guidance concerning the activities it encompasses, and its relationship to other criminal offenses. Organized crime can be conceptualized in several contexts (Abadinsky, 1981): (1) as a corporate bureaucracy, (2) as a kinship network, and (3) as a patron-client relationship. Whereas the first two dominate among popular perceptions, the latter is in reality most frequent. As a patron-client relationship, organized crime provides goods and services that are illegal yet in demand among certain elements of society (Albanese, 1971). Thus organized crime is present whenever and wherever an attempt is made to gain money and/or power without regard for law, in an extension of the free enterprise system (Wessing and Goldblatt, 1972).

Traditionally, organized crime has operated in areas of illicit behavior, such as loan sharking, extortion, gambling, prostitution, and narcotics (Quinney, 1975). Data concerning the latter three offenses, commonly called vice crimes, are easily obtainable. Hence ORCRIME, a surrogate for the presence of organized crime activities in an area, is defined as the number of narcotics possessions, narcotics sales, illegal gambling, and prostitution offenses per 10,000 population.

Because the majority of these offenses are classified as misdemeanors and are hypothetically "victimless crimes," they often receive limited attention from researchers and law enforcement officials. However, research of criminal behavior has shown that persons involved in these activities often commit other more serious criminal offenses, such as those classified as property and violent crimes in UCR statistics. For example, drug addiction has been shown to be an important motivational factor in crimes such as robbery or burglary (Harries, 1981). The very nature of organized crime also suggests the use of force or violence whenever necessary (U.S. Senate, Governmental Affairs Committee, 1980). Furthermore, many communities have begun rigorously to enforce laws against vice crimes such as prostitution or narcotics to reduce overall crime rates. Thus ORCRIME is hypothesized to have a positive causal influence on the violent and property crime rates. ORCRIME is also hypothesized to be positively affected by the population and environmental characteristics, because these factors, which are thought to be positively related to the violent and property crime rates, should also result in a greater abundance of organized crime activities.

The dependent variables, property and violent crime rates (PROPCRM and VIOLCRM), are operationalized on the basis of their Uniform Crime Report definitions, which is the precedent of past studies. PROPCRM is the number of burglaries, thefts (of $50 or more), and auto thefts per 10,000 population. VIOLCRM is the number of murders, forcible rapes, robberies, and aggravated assaults per 10,000 population.

Methodology

Before performing a path analysis, the hypothesized links of the causal model are tested by the Simon-Blalock method. This method determines, if the partial correlation between two variables provides sufficient evidence of the existence of a path. Both the Simon-Blalock method and path analysis are based on regression procedures, thus the standard conditions of ordinary least squares regression should be met. Multiple regression is utilized to obtain the necessary correlation and path coefficients, and to determine their significance levels. Three multiple regressions will be executed, one for each endogenous variable. Independent variables will be entered in a simple stepwise fashion, and residuals will be calculated to facilitate the tests for spatial autocorrelation.
Results

The Simon-Blalock method resulted in the removal of eight of the thirteen originally hypothesized causal links in both the property and violent crime models. Concerning the property crime rates (Fig. 2), the variables YNGPERcen, PCTBLACK, and SUBSTAND were found not to be significantly different from zero. The links between POPDEN and PROPREN, and UNEMPLOY and ORGCRIME were also removed for this reason. Regarding the violent crime rates (Fig. 3), the variables YNGPERcen, UNEMPLOY, and SUBSTAND were removed from the model. The links between POPDEN and VIOLCRIM, and PCTBLACK and ORGCRIME were also deleted.

These results indicate that at the county level, age structure does not significantly influence either organized crime activity or the property and violent crime rates. It is suspected that the causal effect of this variable was represented by the general level of urbanization (METRO), as Florida’s largest youth populations are found in metropolitan areas. Similarly, SUBSTAND exerted no significant influence on either of the three crime rates. This is not surprising in the case of property crime, as substandard housing represents for the most part low valued rewards. The inclusion of UNEMPLOY in the property crime model, and PCTBLACK in the violent crime model, indicates that poverty does add significance crime rates. However, violent and property crimes may be affected by different dimensions of economic need. The absence of a direct relationship between population density and the property and violent crime rates, and the presence of a direct link between population density
and organized crime activities, raises further questions regarding the influence of that factor on crime. Finally, the lack of significant links between ORGCRIME and both POORBK and UNEMPLOY indicates that organized crime activities are not spatially restricted to poverty areas. In fact, the bivariate correlations between ORGCRIME and POORBK (-.027) and UNEMPLOY (-.136) suggest that organized crime may be more common in areas where there is a significant amount of income to support these activities.

The overall R-squares (Table 1) indicate that the revised models are quite successful at explaining rates of property, violent, and organized crime. METRO, UNEMPLOY, and ORGCRIME account for slightly more than 40 percent of the variance in the property crime rates. Over 50 percent of the variance in the violent crime rates is explained by METRO, ORGCRIME, and POORBK. Concerning organized crime activities, POPDEN and METRO accounted for over 41 percent of the variance.

The individual path coefficients generated by the path analyses (Table 1) represent the direct causal influence of the independent variable upon the dependent variable. These coefficients indicate that all significant links represent a positive direct influence on the crime rates, as was hypothesized. In the analyses of both violent and property crime, ORGCRIME was found to have the largest direct causal influence (B= .470 and B= .351 respectively). METRO demonstrated the next largest direct influence, and was also slightly more powerful in explaining the violent crime rates than the property crime rates (B= .330 and B= .267 respectively). The surrogate measures of poverty demonstrated the weakest causal influence in these two analyses, although the influences of UNEMPLOY of ORGCRIM (B= .180) was slightly greater than that of POORBK on VIOCRIM (B= .142). Concerning organized crime activities, POPDEN was found to have the greatest direct causal influence (B= .533), while a moderate influence was exerted by METRO (B= .196).

### TABLE 1

<table>
<thead>
<tr>
<th>Path Coefficients</th>
<th>PROCPHM</th>
<th>VIOLCRIM</th>
<th>ORGCRIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>METRO</td>
<td>.269</td>
<td>.330</td>
<td>.196</td>
</tr>
<tr>
<td>ORGCRIME</td>
<td>.351</td>
<td>.470</td>
<td></td>
</tr>
<tr>
<td>UNEMPLOY</td>
<td>.180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POPDEN</td>
<td></td>
<td></td>
<td>.533</td>
</tr>
<tr>
<td>POORBK</td>
<td></td>
<td>.162</td>
<td></td>
</tr>
<tr>
<td>R-Square</td>
<td>.401</td>
<td>.504</td>
<td>.410</td>
</tr>
<tr>
<td>Residual</td>
<td>.773</td>
<td>.704</td>
<td>.758</td>
</tr>
</tbody>
</table>

*All coefficients significant at .05 level

These path coefficients were then used to decompose the original correlation between the linked variables into direct causal, indirect causal, and spurious components. The direct causal influence is the path coefficient itself. The indirect causal influence represents the effect of the independent variable upon the dependent variable through intervening variables. The spurious influence represents the effect of missing links, and is utilized as an indicator of the validity of the causal model.
The decomposed coefficients for the hypothesized models (Table 2) indicate that in all but two instances the original correlation between linked variables was comprised primarily of causal influence. Thus for the most part, the models consist of factors which do affect the crime rates. Concerning

<table>
<thead>
<tr>
<th>PROGRAM with:</th>
<th>METRO</th>
<th>OROCRIME</th>
<th>UNEMPLOY</th>
<th>POPDEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Original r</td>
<td>.533</td>
<td>.511</td>
<td>.358</td>
<td>.425</td>
</tr>
<tr>
<td>b) Direct Causal</td>
<td>.267</td>
<td>.351</td>
<td>.180</td>
<td>—</td>
</tr>
<tr>
<td>c) Indirect Causal</td>
<td>.070</td>
<td>—</td>
<td>—</td>
<td>.187</td>
</tr>
<tr>
<td>d) Total Causal (b+c)</td>
<td>.337</td>
<td>.351</td>
<td>.180</td>
<td>.187</td>
</tr>
<tr>
<td>e) Spurious (a-d)</td>
<td>.226</td>
<td>.160</td>
<td>.178</td>
<td>.238</td>
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<table>
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<tr>
<th>VIOLCRIME with:</th>
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<th>OROCRIME</th>
<th>FCTBLK</th>
<th>POPDEN</th>
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<tbody>
<tr>
<td>a) Original r</td>
<td>.593</td>
<td>.627</td>
<td>.292</td>
<td>.422</td>
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<tr>
<td>b) Direct Causal</td>
<td>.330</td>
<td>.470</td>
<td>.162</td>
<td>—</td>
</tr>
<tr>
<td>c) Indirect Causal</td>
<td>.092</td>
<td>—</td>
<td>—</td>
<td>.251</td>
</tr>
<tr>
<td>d) Total Causal (b+c)</td>
<td>.422</td>
<td>.470</td>
<td>.162</td>
<td>.251</td>
</tr>
<tr>
<td>e) Spurious (a-d)</td>
<td>.171</td>
<td>.157</td>
<td>.130</td>
<td>.171</td>
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<table>
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<th>OROCRIME with:</th>
<th>METRO</th>
<th>POPDEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Original r</td>
<td>.432</td>
<td>.618</td>
</tr>
<tr>
<td>b) Direct Causal</td>
<td>.196</td>
<td>.533</td>
</tr>
<tr>
<td>c) Indirect Causal</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>d) Total Causal (b+c)</td>
<td>.196</td>
<td>.533</td>
</tr>
<tr>
<td>e) Spurious (a-d)</td>
<td>.236</td>
<td>.085</td>
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</table>
property crime, these factors include METRO, ORGCRIME, and UNEMPLOY. The total causal effect of the latter two was due solely to direct links, whereas the total causal effect of METRO on PROPGRIM also included its indirect causal influence through ORGCRIME. The majority of the correlation between PROPGRIM and POPDEN was due to spurious influences. Regarding violent crime, all correlation coefficients were comprised primarily of causal influence. The total causal effect of ORGCRIME and PCTBLACK was due solely to direct links, whereas the total causal effect of METRO once again included its indirect influence through ORGCRIME. The correlation between POPDEN and VIOLECRIM, despite no direct link, was primarily due to indirect causal influences through ORGCRIME. Concerning organized crime activities, the original correlation between ORGCRIME and POPDEN was predominantly a result of direct causal influence. The majority of the correlation between METRO and ORGCRIME, however, was due to spurious influences. This suggests that a missing variable may be affecting both METRO and ORGCRIME, resulting in their covariation.

Lastly, the efficiency of the direct causal links and the accuracy of the overall explanatory power of the causal models were evaluated by testing the independence of the residuals obtained from the three multiple regression equations. Using county contiguity (represented by values of 0 or 1) as weights, a Moran's I statistic was calculated for each of the sets of residuals. The results (Table 3) indicate that no spatial autocorrelation exists among the distribution of the three sets of regression residuals. Thus, the

<table>
<thead>
<tr>
<th></th>
<th>Moran's I</th>
<th>Expected I</th>
<th>Deviation of I</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIOLECRIM</td>
<td>-.037</td>
<td>-.015</td>
<td>.044</td>
<td>.79</td>
</tr>
<tr>
<td>PROPGRIM</td>
<td>-.012</td>
<td>-.015</td>
<td>.042</td>
<td>.62</td>
</tr>
<tr>
<td>ORGCRIME</td>
<td>-.064</td>
<td>-.015</td>
<td>.044</td>
<td>.97</td>
</tr>
</tbody>
</table>

path coefficients and overall $R^2$-squares may be interpreted confidently. Furthermore, it has been confirmed that using counties as units of analysis helps to alleviate the problem of spatial spillover of crime rates.

Discussion and Conclusion

This study provides preliminary answers to two research questions posited above. Organized crime activities do serve as a mediator of the influence of certain population and environmental characteristics on crime rates. This was most clearly evident in the relationships between population density, and violent and property crimes. Population density does not directly influence crime rates through the stress and anxiety it creates; rather, its effect on crime may be the result of an indirect relationship through organized crime activities, by generating the threshold population necessary for free enterprise illicit behavior to exist. A similar situation was demonstrated concerning the relationship between the general level of urbanization and the crime rates, although to a lesser degree.
Organized crime activities also exert a direct causal influence on crime rates. On both violent and property crime, the organized crime variable demonstrated the greatest direct and total causal influence. These findings support several contentions: first, patrons of organized crime may also be involved in other criminal offenses necessary for the survival of their enterprise; and secondly, the need to obtain goods and services offered by organized crime may serve as a motive for other criminal offenses committed by clients.

This study shows that traditional environmental and population characteristics such as general level of urbanization and poverty influence crime rates directly. These factors should continue to be used in future analyses. The influence of other traditional characteristics such as age structure remains debatable, as little or no influence on violent and property crime rates was demonstrated. However, they also should continue to be considered because their influence on crime may be mediated through other factors not included in this analysis.

Finally, the significant influence of organized crime demonstrated here has created the potential for future research. The causal effects of this factor should be examined in subsequent analyses utilizing different spatial scales or individual crime rates. Also, this study has produced a preliminary indication that a decrease in the incidence of organized crime activities (more specifically, vice crimes) may lead to a significant decrease in the rate of other criminal offenses.

1. The author wishes to thank Marilyn Brown and Curtis Borenau for their comments on earlier drafts of this paper, and all anonymous reviewers for their constructive evaluations.

2. Florida ranked second only to Nevada in the index crime rate for 1980 (U.S. Federal Bureau of Investigation, 1981). The state has had a consistently high ranking in both violent and property crime for over a decade.

3. It is not possible (nor is it the intent of this research) to resolve the debate over the validity of population density as a determinant of crime. However, because this research attempts to reexamine the relationships between population and environmental characteristics and area crime rates, and because population density measures have frequently been utilized in past studies, its inclusion appears relevant.

4. A single measure, inadequate plumbing, has been chosen rather than an index to represent substandard housing. This is because variables commonly used in conjunction with inadequate plumbing to formulate indices (e.g., age of housing unit and persons per room) have received considerable criticism as accurate measures of substandard housing.

5. Unfortunately, neither FBI statistics nor victimization surveys provide adequate data on other illegal offenses appropriate in developing an organized crime activities index.

6. Because of their "victimless" nature, vice crimes are rarely reported. Thus, offense rates for these activities were estimated from county arrest data and offense/arrest ratios.

7 Path analysis is a method of decomposing and interpreting linear relationships among sets of variables. The procedure is comprised of (1) generating one structural equation for each endogenous variable in the causal model, (2) utilizing regression procedures to ascertain the appropriate correlation and path coefficients, (3) using the F-test to determine significance levels, and (4) decomposing correlation coefficients into their direct causal, indirect causal, and spurious components.
References


CONTRIBUTORS TO THIS ISSUE

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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 a 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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