The ATLAS OF FLORIDA

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The Atlas of Florida was prepared by the Florida State University and published in November, 1981. Intended as a basic reference volume that can be used by a wide segment of the population, the atlas is the most comprehensive compiled to date for Florida. It is 276 pages long, and contains over 800 maps, graphs, drawings, and photographs. This paper briefly describes the contents and production organization of the atlas and some of the cartographic problems encountered in the course of production. These problems are not unique to atlases, and may occur in any cartographic project, large or small.

Organization and Production

The atlas is organized into eight sections. The Introductory section contains basic reference maps, a mileage chart, and several indices for obtaining more detailed map and aerial photo information. The natural environment section details Florida's geology, climate, soils, flora and fauna, minerals, and water resources. The distribution, density, and characteristics of the state's population ---as well as the distribution of services such as health care and education---are presented in the next section. Florida's history and culture are well documented in the atlas with major historical and political events. Included are the Spanish influence, the Seminole Wars, the Civil War, and the growth of tourism. A section on the economy describes the economic structure of Florida, emphasizing manufacturing, agriculture, trade, financial institutions, and government. Because of their exceptional importance, recreation and tourism are treated separately. The atlas contains a wide range of information on recreation sites and activities, tourist attractions, and seasonal patterns of tourism. The transportation and communication section examines how people, goods and ideas move to, from, and within the state. The final section on energy and planning focuses on population growth, energy, and water, three problems Florida will have to solve to insure its future well-being.

The planning, research, and production of the atlas spanned several years. Faculty members at Florida State University were asked to serve as section editors and to participate on the atlas steering committee. Each editor was given wide latitude in planning the contents of his section and in selecting additional contributors. Graduate students assisted in data collection.

Once the data were collected, the cartographic staff prepared individual page layouts which were consistent with overall design philosophy of the book. An attempt was made to align all map and text material in columns to enhance readability. The layout was shown to the author for approval if changes were made that affected the presentation of the data. After review by the author, the page was then assigned to a cartographer for full map presentation.

Three full-time cartographers and a number of student cartographers were employed in the production phase. The entire atlas was scribed at actual size. Once base maps were stripped in position and special information scribed, overlays were photomechanically prepared for each color to be used. Lettering was typeset and a type negative was prepared. Process color percentages were assigned to the various overlays so that the printer could do screening and composing. The printer stripped signatures, prepared plates, and did the final printing and binding.
Problems and Solutions

In a project of this magnitude problems arise that are not anticipated in the planning phase. These range from the broad problems of time pressures and financing to the more specific problems of data handling and manipulation and space constraints dictated by the book size.

Metric Vs. English

One particularly difficult problem was deciding on the units of measurement to use on particular maps or graphs. In 1975 Congress passed the Metric Conversion Act. This act calls for the gradual changeover from the English to the metric system under a flexible program that encourages the various sectors of the economy to deal with their particular problems voluntarily. This desired trend toward metric leaves the cartographer with a dilemma regarding choice of units. In the production of the atlas, this choice was influenced by considerations of space, ease of conversion, and comprehension.

The atlas was intended to appeal to a wide audience and to present information as clearly and concisely as possible. The physical limitations of the page format also necessitated generalizing data in some instances. For example, in the weather and climate section we provided maps of dew point. Monthly dew point temperatures were indicated by bar graphs, the scales of which were in degrees Fahrenheit. We found that adding the celsius temperature scale to each bar graph limited map legibility. To simplify the presentation we added a single scale bar showing both units of measurement, degrees Fahrenheit and celsius (Fig. 1).

Data collected for map presentation are nearly always measured in one particular unit. We found that accommodating both metric and English units on a single map sometimes presented problems. An example can be drawn from the map of relief. The data were originally collected in meters. Conversion led to awkward class boundaries for the scale in feet: 2.0 to 6.9 meters converts to 6.6 to 22.6 feet, for example. This requires the reader to think in terms of tenths of feet rather than the more usual inches. Further, there is room for some misconception concerning the overall accuracy of the measurements: although the intervals are rounded to tenths of a foot, the original metric data from which the map was constructed were rounded to the nearest meter.

A final question concerns the overall familiarity of the general public with the metric system. We had to ask if the reader would avoid pages on which information was expressed in unfamiliar units. For example, on the maps dealing with geophysics the geothermal gradient was expressed in degrees celsius per one hundred meters of depth from the surface. We questioned: does a temperature gradient expressed in metric units detract from the value of the map? It was our conclusion that this particular page would appeal to a specialized audience who would likely be familiar with metric units, so we did not convert to English units. In other instances data were shown strictly in English units where it was felt that the audience would better comprehend this system. Until all data are collected in standard units, this problem will continue to confront cartographers.

Availability of Data

Another problem encountered during the course of atlas production was data availability. A project of this magnitude requires the compilation of a detailed table of contents before any cartography can begin. After the table is complete, layouts of each page were prepared to meet each author's specifications. These initial steps were necessary to insure continuity in the graphic presentations throughout the book and to maintain a smooth flow through the production phase. After going to great lengths to create a page design that accommodated the anticipated information, we were forced to redo layouts when the data were subsequently found to be
Fig. 1. Annual Average, and Three of Four Seasonal Dew Point Maps from Atlas of Florida, p. 51.

unavailable. Data problems were particularly troublesome when the needed information was to be drawn from the 1980 census. Census information was not released as scheduled because of accusations by many large cities that their populations had been undercounted. In some instances, estimates rather than final census statistics were used in order to prevent further delays in the completion of the project.

Computer generated isoline maps displaying temperature and rainfall statistics were also complicated by problems of data availability. These statistics were compiled from weather records kept throughout the state spanning the twenty-one years from 1959 through 1979. The data collected for 1959 came from 120 reporting stations. However, over the course of the twenty-one year span, twenty-eight of the 120 stations had inter-
ruptured or discontinuous reports. The loss of data from these stations may have introduced some error into the contouring results. An additional problem with climatic data is that certain data were collected at only a few stations. In these cases, data were displayed by point locations.

The type of data available also affects the choice of map type. In some cases, a choropleth map is made in place of another type even though the choropleth map may not be the best way to illustrate a subject. Such was the case with Florida's historical population density.° Probably the best way to map population is with a dot map (Fig. 2, cover). This was not possible in most cases because the historical county population figures did not include where the people lived within the county. Therefore, we chose to construct choropleth maps of persons per square mile despite the shortcomings. In the earliest years, some counties, such as Alachua and Hamilton, differed greatly in size. A large county with a relatively large population (Alachua, for example), may fall into a class below a small county (e.g., Hamilton) with a significantly smaller population. This is the problem of mapping density rather than gross numbers; a false impression of the population characteristics of a county may result. Also, the populations of some counties were extremely concentrated. In Monroe County, for example, large areas of uninhabited land were included in computing density, although the great majority of the people lived in Key West. To try to moderate these effects, special symbols were used to pinpoint the locations of very high population concentra-

Class Boundaries

The division of the data into classes is of practical concern to anyone making a choropleth map. This can be done in several ways. The method used will determine the appearance and accuracy of the map. An accurate choropleth map can be thought of as one in which each individual observation is represented by a class most closely approximating the observation's value. A haphazard method will probably produce an ambiguous map, while careful consideration and selection of classes will greatly improve map accuracy.

What options are available? The most basic might be called the counting number method, in which divisions are made in the range of values at points of equal intervals, a second commonly used method generates classes according to natural breaks occurring in the range of numbers. A third way is to subdivide the data equally into quartile or quintile groupings. Each of these methods produces a different map although the same data set is used. A number of tests can be used to determine the accuracy of these techniques.
In the production of the Atlas of Florida, a counting routine developed at the University of Kansas was used. This method uses a computer program that determines the class breaks by statistical procedures. This program creates statistically more accurate categories that minimize the within-class and maximize the between-class variance.7

Conclusion

Problems such as these were encountered throughout the atlas. Numerous other technical and data-portrayal problems arose on individual pages. Although we do not pretend to have found the only answer to these problems, we feel that the end result was the best to be achieved under our particular set of circumstances.

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Editor's Note:
The Atlas of Florida can be ordered from:
The Atlas of Florida
361 Bellamy
Florida State University
Tallahassee, FL 32306

The cost (including postage and handling) is $18.50 for FSG members, and $29.50 for non-members.

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