Abstract: The Census Atlas of the United States is the first comprehensive print collection of population and housing maps from the U.S. Census Bureau since the 1920s. This paper describes the atlas format and content. It explains how we developed the body of maps into demographically-themed chapters. It shows how we balanced maps for thematic coverage for representation of groups (whether race categories, family types, or foreign-born and native populations) and for historical perspective. The paper demonstrates how we relied on multi-map templated page design using just a few base maps for efficient production and review.

BACKGROUND

The Census Atlas of the United States is intended for a general interest audience. It comprises maps, text, and figures, all selected and organized to increase public understanding of population and housing characteristics across the U.S. It is a high quality reference book that presents graphically what the U.S. Census Bureau does—collects data that provide a continuous record of the U.S. population and captures the cultural era.

Until Census 2000, the Census Bureau had not published a statistical atlas since the 1920s. (The U.S. Library of Congress does hold a portfolio of maps on the 1950 census.) For the 1950, 1960, 1970, and 1980 censuses, thematic maps were integrated with print reports of tabular data on characteristics of the U.S. population. In 1990, print products in general were abundant but separated by content type: books of tabular data (which included reference maps only); analysis in topical reports (for instance, the foreign born, the elderly, and each race group); and a few thematic maps on single sheets. In 2001, the impact of a collection of maps, including 10-year change maps, was demonstrated in Mapping Census 2000: The Geography of U.S. Diversity (Brewer and Suchan, 2001) which provided experience with the data, design, and organization aspects of preparing a full color, maps-dependent report that enabled us to produce the much larger Census Atlas.

ATLAS FORMAT
This is a print atlas. The page size is 31 by 39 cm (12-1/4 by 15-1/4 inches) to accommodate multiple maps on each page. It has 350 pages with 789 maps and an introduction to each of the 14 chapters comprising approximately 2000 words, several figures, and a salient map series for the U.S. by states (Figure 1). The atlas includes reference maps, a notes section with source and data details for each map, and a glossary.

**COMPILING THE ATLAS**

For *Mapping Census 2000: The Geography of U.S. Diversity*, a review of thematic atlases was conducted and a list of shared, basic demographic topics compiled (Brewer, 2001). The *Census Atlas* uses that model of basic topics. Thereafter, but still three years in advance of publication of the *Census Atlas*, subject-matter experts at the Census Bureau, then immersed in the pre-release Census 2000 results, were interviewed for map ideas. They contributed a sense of the current, compelling stories from Census 2000. Also, past censuses were reviewed in light of contemporary census results to learn the topics that could include a historical comparison or series of maps (U.S. Census Bureau, 2002).

**Organizing the Atlas**

The first chapters generally describe “who we are,” the next cluster, “where we came from,” and a final few on “what we do.” These divisions are not distinct enough to warrant book sections, but organized the flow of topics through the atlas (Figure 2). To begin a chapter, approximately 2000 words give highlights of national and regional patterns and trends. Several figures support the national discussion (Figure 3). Maps follow. Because maps normally are presented in pairs or series, a chapter will have relatively few narrative threads but double, triple, or more that number of maps (Figure 4). The number of maps per chapter is affected by the breadth of the topic. The housing chapter has 71 maps. The military service chapter has 31 maps.

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Figure 2. *Census Atlas of the United States* table of contents.
Figure 3. Typical atlas figure. From Chapter 12, Military Service. Percentage of civilian veterans aged 18 and over, percent female by period of service, 2000.

Increase in High School Completion, 1950 to 2000 (1)
Characteristics of School-Age Population, 2000 (4)
Private School Enrollment, 2000 (3)
Percent Completed College, 2000, by Race and Hispanic Group (7)
Percent Completed High School, 1950 and 2000 (2)
Percent Completed College, 1950 and 2000 (2)
Percent Completed College, Men and Women, 1950 and 2000 (4)
Percent Completed College, 2000/Largest Metropolitan Areas by Census Tract (10)
Percent Completed Master’s Degree, 2000 (1)
Percent Completed Professional or Doctorate Degree, 2000 (1)

Figure 4. Map topics (number of maps in topic series). From Chapter 10, Education.

Populating the Atlas

We drafted some 1500 maps. Maps were selected or eliminated at the earliest stage possible based on whether a clear or interesting spatial component appeared; whether maps contributed to the logical progression of chapter content; and with the broad idea of balancing race categories, family types, foreign-born and native populations, age groups, etc throughout the atlas (Figure 5). Late in the process maps were moved, added, and eliminated to conform to the multi-map pages and overall book design (e.g., chapters each start on a left page and end on a right page).
### ATLAS DATA

All population data are from the decennial censuses of 1790 to 2000. Housing data first were collected as part of the census in 1940, so the atlas incorporates 60 years of housing information. Most maps are from Census 2000 and use data available to the public through American FactFinder (http://factfinder.census.gov). Special data sorts were needed for some topics such as two-worker military couples, detailed ancestry categories, and characteristics of the foreign born population. Despite limiting the source of data to decennial censuses, data acquisition for the hundreds of maps drafted at least once was the most time consuming of any of the project components.

The Census Bureau does not have a significant digital repository of historical data for 1970 or earlier. Some of these data were obtained from the Inter-university Consortium for Political and Social Research (ICPSR) (www.icpsr.umich.edu:8080/ICPSR-STUDY/0003.xml). Where neither Census nor ICPSR had digital data for a particularly compelling topic, data were entered into a database from old print census volumes. For example, data for maps on male and female college completion rates in 1950 were hand entered.

For 1980 and earlier, base maps were developed specifically for the atlas; historical maps depict boundaries as they existed at the time of each decennial census. Change, then, usually is shown by pairing an historical map (or using a series of historical maps) with a Census 2000 map. County change maps 1990 to 2000 were possible, however, because Census programmers could re-aggregate 1990 data from the household record level to Census 2000 geographic units.

### GEOGRAPHIC AREAS

The Census Atlas interprets population and housing data using primarily nationwide maps at the county scale but including treatment of other geographic areas:

- U.S. by states.
- U.S. by counties.
- Metropolitan areas over 4,000,000 population by census tract.
- Cities over 1,000,000 population by census tract.
- Largest American Indian reservations and cities with largest American Indian and Alaska Native population.

Eleven metropolitan areas with more than four million people each are mapped together on two pages, all areas at the same map scale (Figure 6). The ten largest cities are similarly presented. The geographic unit for the metropolitan area and city maps is the census tract (Figure 7); data for census tracts approximate neighborhood characteristics.
Figure 6. Metropolitan areas page layout.

Figure 7. Metropolitan area by tract detail.
PAGES TEMPLATES

From a few base maps we arrayed thematic maps on eight page templates; most are multi-map pages (e.g., Figures 8 and 9) although we use sparingly a one-map page layout as well. By limiting the number of base maps and page templates, the production advantage of GIS was used to its capability. Then, for accurate representation of the data together with visual variety, we employed a range of symbology—choropleth, graduated symbol, dot density, flow, and bar maps, among others. Some map types still were labor intensive. For example, to match a reprint of a hand-drawn, sepia-toned isopleth map from a 19th century census atlas (Hewes and Gannett, 1883), a similar map of Census 2000 data was created using the digital base template but with thematic information added by drawing isolines (connecting data at centroids of census tracts in a vector-drawing program).

IN CLOSING

We expect the Census Atlas of the United States to be on press at the time of this conference. It will be sold online by the Census Bureau and, like all current Census Bureau publications, will be available in PDF at the website (www.census.gov).

REFERENCES


Figure 8. Page template, two maps per page.
Figure 9. Page template, four maps per page.
BIOGRAPHY FOR TRUDY A. SUCHAN

Trudy A. Suchan has geography degrees from The Pennsylvania State University (PhD, 1998) and The University of Washington (MA, 1991). She has been a Geographer with the U.S. Census Bureau since 1998. In addition to managing the multi-year project described in this paper, she recently led a working group that developed presentation graphics standards for the agency and has managed design and deployment of web pages for the intercensal population estimates program. She was awarded the U.S. Department of Commerce Bronze Medal in 2001 for her work on *Mapping Census 2000: The Geography of U.S. Diversity* (Brewer and Suchan, 2001). She was a collaborator on the three year, multi-university, multi-agency research project “Quality Graphics for Statistical Summaries” funded by the National Science Foundation Digital Government program.

Trudy currently is president of the North American Cartographic Information Society and has held other board positions for the organization continuously since 2000. In the 6-1/2 years she has worked for the Census Bureau, she has presented over 25 papers to professional organizations and as guest lecturer at universities.