

# **SegMaps: User's Guide and Documentation**

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## **Introduction**

America is a highly urbanized society and the vast majority of its population resides in urban and metropolitan centers. Indeed, more than half of the American population resides in a relatively small number of metropolitan areas.<sup>1</sup> Residential segregation is a fundamental fact of social life in US metropolitan areas. It structures daily life and has important consequences for the life chances of individuals and social groups living in different areas within cities.

Sociologists have developed highly refined methods for measuring segregation. They conceptualize it as having multiple dimensions and have identified procedures for obtaining rigorous, quantitative measurements of each dimension. Accordingly, empirical studies of residential segregation rely heavily on summary indices of segregation for basic description and comparisons over time and across areas.

Unfortunately, non-specialists often find these summary indices of segregation difficult to comprehend and interpret. The lay person understands the social fact of segregation not as the abstract, multi-dimensional, structural characteristic of urban areas that demographers and urban sociologists study, but rather as the readily discernable organization of urban space into different kinds of areas that can be readily characterized in terms such as "well-to-do", "poor", "safe", "unsafe", "white", "black", "rough", etc..

The goal of the SegMaps program is to provide a bridge between the social scientist's technical understanding of segregation and the lay person's more intuitive understanding. It does so by presenting depictions of segregation based on thematic maps that have been prepared to highlight certain patterns of population distribution. The maps draw on the same data used to develop standard, quantitative measurements of segregation, but present these data in a more intuitive way.

This document serves as a User's Guide for the SegMaps program. It provides a discussion of the program's features and capabilities and general instructions on how to use the program.

## **Program Description**

The SegMaps program is geared to undergraduate instruction focusing on residential segregation. The underlying motivation behind the program is to provide a tool for presenting data on resi-

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<sup>1</sup> According to the 2000 Census, the 30 largest megapolitan and metropolitan areas in the US contained just under half of the total US population.

dential segregation in an intuitive and readily accessible form to help illustrate and convey key findings about residential segregation to non-technical audiences.

To do this, SegMaps relies extensively on graphical presentations to describe patterns of segregation, neighborhood ethnic composition, and neighborhood change over time. It draws on GIS technologies to develop graphical depictions of these patterns in metropolitan areas. It also draws on the new technology of the World Wide Web and web-based software to make these graphical presentations available to instructors, students, and others via an easy-to-use presentation program that can be invoked by anyone with access to the World Wide Web via standard web browsers.<sup>2</sup>

The hope is that the program can be used to help give undergraduate students a first introduction to residential segregation patterns using graphical presentations that draw on the same data used in the research literature, but which present the data in a format that is more accessible to students with little or no background in quantitative measures of residential segregation.

The SegMaps program can be found on the web at the Virtual Laboratory in Racial and Ethnic Stratification and Inequality (VLAB-RESI), a site developed and supported with funding from the National Science Foundation and developed by Mark Fossett, Professor in the Department of Sociology and Research Affiliate at the Racial and Ethnic Studies Institutes at Texas A&M University, College Station, Texas. The web address for the site is:

<http://vlab-resi.tamu.edu/vlab.htm>

## Support

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<sup>2</sup> Specifically, SegMaps is a Java applet which is loaded from a web page and runs under Java-capable web browsers.

## System Requirements

The SegMaps program should run well on computers with the following capabilities and configurations:

*High- or medium-resolution display.* A display set to at least 800x600 resolution. (For best performance, the display should be 1024x768 or higher resolution.)

*Web browser software.* One of the following web-browsers: Microsoft Internet Explorer (version 5 or higher) (recommended); or Netscape Navigator (version 4.5 or higher).

*Java capability.* The web browser must be configured to run Java programs.

*Adequate memory.* The computer must have sufficient memory to store and manipulate graphic images. It is not possible to say exactly what amount of memory is needed for satisfactory performance (too many factors must be considered). However, symptoms of inadequate memory include slow performance, “blank” maps, and badly “behaved” map displays.

*Adequate processing power.* Most contemporary computers have more than adequate processing speed to provide satisfactory performance for SegMaps. Any CPU comparable in performance to a 450MHz Pentium III processor should be adequate.<sup>3</sup>

*High-speed internet access.* SegMaps presents previously prepared map images that are loaded from the VLAB-RESI web site. While the images have been saved in “compressed” formats to make them as small as possible for faster loading, they are not necessarily small files (most are 30-50K files). SegMaps performance may be poor for users with lower-speed internet connections (e.g., conventional dial-up modems). Users with higher-speed internet connections (e.g., Ethernet connections commonly found on college campuses and faster cable modem and DSL connections increasingly found in homes) should experience good performance.

## Program Organization

SegMaps divides the screen into four “frames”: a contact frame, a

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<sup>3</sup> At this time, we have not conducted performance tests using other “flavors” of computers (e.g., Macintosh, Unix workstations, etc.). Thus, we make no recommendations for other “platforms”. In principle, web pages and Java applets should work identically across platforms. In practice, this is not the case.

navigation frame, a notes frame, and a maps frame.

The **Contact** frame is in the upper left. It provides links to return to the home page for the SegMaps program and to e-mail comments about SegMaps to the webmaster for the VLAB-RESI web site..

The **Navigation** frame is in the middle left. It provides options for quitting the program, going forward and backward through screens, and invoking the help menu.

The **Notes** frame is in the lower left. It is reserved for presenting information about the maps SegMaps displays. It also is where most help information is presented.

The **Map** frame is on the right. It is the largest single frame. The SegMaps applet runs in this frame. It occupies most of the area in the frame and provides controls which allow the user to select and display various maps depicting patterns of residential segregation and neighborhood ethnic composition.

## SegMaps' Program Controls

The SegMaps program is operated by using "controls" placed along the top of the program's "frame". The controls consist of three "selection" boxes and several "buttons". The selection boxes are used for choosing metropolitan area, type of map, and level of magnification. The buttons are used for invoking the help system, or for modifying and enhancing the image by displaying (or hiding) a title, legend, map scale, and business district marker. Titles, legends, scales, etc., can be especially helpful for new users and for images that are being saved or printed. Experienced users will tend to turn off these visual enhancements in order to devote more screen space to the display of the map theme.

**Help.** The "Help" button brings up a help menu in the "notes" frame on the left side of the screen. A second help button is also found in the navigation frame on the left side of the screen. It also can be used to invoke the help system.

**MSA Selection Box.** The MSA selection box provides the means for choosing which city to examine. By default the list in this box contains the 40 largest metropolitan areas.

**Map Selection Box.** The map selection box provides the means for choosing which thematic map will be presented for the currently selected metropolitan areas. In all, over a dozen and a half thematic maps are available for each city. They are discussed below.

**Magnification.** The "magnification" selection box permits the user to "zoom" in or out on the map image. By default, the image is shown at normal size or "100%" magnification. Choosing higher levels

of magnification (e.g., 200%) "zooms" in on the location at the center of the image by enlarging this portion of the image to fill the display area.<sup>4</sup> Choosing lower levels of magnification (e.g., 50%) zooms out by shrinking the image to fit more of the map into the display area. Selecting 100% returns the map to its original scaling.

**Changing Map Center.** Any position on the map can be moved to the center of the display in order to view an area in the context of its surrounding region. This is accomplished by using the mouse (or other pointing device) to "point" to a location on the map and "clicking". The map will be redrawn, placing the location of interest at the center of the display area. (Note: to help orient the user, the center of the display is indicated by a small cross.) This permits the user to navigate the map "surface" and examine different regions of the city. When high levels are magnification are used, it can be particularly helpful to make sure that the area of interest is clearly visible.

**T – Title.** The "Title" button "toggles" the display of a brief title for the map consisting of the city name, the type of map, and the relevant time period.

**L – Legend.** The "Legend" button displays a map legend which aids in the substantive interpretation of the map. The legend is also presented in the "notes" frame of the SegMaps program and thus it is often redundant to place the legend on the map itself. However, it can be desirable to do so when saving or printing the map image.

**S – Scale.** The "Scale" button displays a map scale that helps convey the physical distances depicted by the map. This can be useful because the distances depicted vary from city to city and with level of magnification.

**B – Business District.** The "CBD" button highlights the city's "central business district" and draws "rings" around it at five mile intervals. This feature is helpful for maintaining spatial orientation when viewing different areas of the city and it is especially useful for helping interpret patterns of "centralization".

**C – Center.** As noted earlier, clicking on the map surface moves that location to the center of the map display area. The "Center" button provides a convenient way to return the map to its default center position.

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<sup>4</sup> Note that "zooming in" does not actually reveal more detail; it merely enlarges the image. Thus, while zooming makes it easier to "see" the detailed features of the map, no new features are revealed as the level of magnification increases.

## Depicting Neighborhood Patterns

This section describes the data and measurement strategies used to develop the maps that SegMaps presents depicting patterns of segregation in urban areas. It discusses how ethnicity and neighborhood are measured. Then it describes the types of maps that are developed to help highlight patterns of ethnic segregation.

### *Ethnic Categories*

SegMaps displays data for four racial-ethnic categories -- White, Black, Latino, and Asian.<sup>5</sup> These are “pan-ethnic” categories developed from racial and ethnic identifiers used in the 1980 and 1990 US Censuses of Population. These “racial” categories reflect social groupings. While they are connected in the lay public’s mind with stereotypes of physical appearance (phenotype), they do not identify meaningful biological categories. Instead, they reflect social groupings that correspond with ethnic distinctions that are generally recognized by the public at large and that historically have been salient in social interaction in the United States.

The data on ethnic distribution are generated by respondent’s answers to census questions regarding racial and ethnic identification. A thumbnail sketch of what the category labels reflect can be provided as follows.

*White.* Persons identifying with ancestors that originated in Europe (with the exception of Hispanic groups).

*Black.* Persons whose ancestors originated in Africa.

*Asian.* Persons whose ancestors originated in countries of Asia (including, for example, Japan, China, Korea, India, Viet Nam, and the Philippines).

*Latino.* Persons of Latino or Hispanic ancestry including groups originating in Mexico, Cuba, Puerto Rico, the Dominican Republic, and Central or South America.

*Nonwhite.* Persons of non-European and/or Hispanic ancestry including persons whose ancestors originated in Africa, Asia, and Latin and South America, or whose ancestors were indigenous peoples of the Americas.

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<sup>5</sup> We also developed data for a fifth category, Native Americans, but the representation of this population was too small to register in the ethnic mix maps.

## *Neighborhoods*

SegMaps defines neighborhoods based on either *census tracts* or, in some cases, *census block groups*.<sup>6</sup> Both are small geographic areas used in the census for the purpose of providing data on small areas.

These areas approximate “true” neighborhoods in some respects but not others. They are similar to neighborhoods in that their populations are small and somewhat homogeneous with regard to social characteristics. Typically, the population in a census tract numbers between 1,000 and 8,000. Block groups are smaller, and usually contain between 500 and 1,500 residents.

The boundaries of census tracts and block groups are established with the goal of delimiting small areas with populations that are similar with respect to social and economic characteristics. However, similarity on social characteristics does not necessarily mean a sense of “community” within the area and in that respect census tracts and block groups differ from “true” neighborhoods.

### *The Data Base*

SegMaps provides segregation maps for all consolidated metropolitan areas and metropolitan areas ranked among the 40 largest in the US as of the 2000 Census.<sup>7</sup> In addition, several “extra” metropolitan areas are included in the data on an *ad hoc* basis because they exhibit segregation patterns of special interest.<sup>8</sup>

While the metropolitan areas in the SegMaps data base represent

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<sup>6</sup> Block groups are used in some smaller metropolitan areas where the less numerous census tracts do not adequately capture spatial variations in residential patterns.

<sup>7</sup> Consolidated metropolitan areas (sometimes called “megapolitan areas”) include multiple metropolitan areas (termed “primary metropolitan areas in census terminology). In most cases, the SegMaps database features the largest PSMA in the CMSA by name and does not separately list other PMSAs within the CMSA. For example, the Galveston, TX and Brazoria, TX PMSAs are included in the Houston, TX CMSA. These PMSAs are not identified by name in the SegMaps list of metropolitan areas, but their geographic area and populations are represented in the maps developed for Houston, which is included in SegMaps’ list of metropolitan areas. In a few cases, multiple PMSAs within a CMSA are included separately in the city selection list. Examples include Dallas and Fort Worth, Baltimore and Washington, D.C..

<sup>8</sup> The list of 40 largest consolidated metropolitan areas and metropolitan areas was based on population size for the 2000 census. The additional maps include several metropolitan areas in Texas which are of special interest to students at Texas A&M University, the home of SegMaps.

only a small portion of all metropolitan areas (the 2000 Census identified 331 metropolitan areas), they contain approximately half of the total US population and even larger fractions of the country's principle ethnic minority populations.

## Types of Maps

The SegMaps program presents six kinds of maps to depict segregation and neighborhood change in urban areas:

- a. "Ethnic Mix" maps.
- b. "Group Percentage" maps.<sup>9</sup>
- c. "Group Change" maps.
- d. "SES" or Socioeconomic Status maps.
- e. "SES/Ethnic Mix" maps.
- f. "Population Density" maps.

The "Ethnic Mix" maps use a combination of colors and shadings to indicate what racial and ethnic groups predominated in the population of different areas of a city in 1990 and in 1980.<sup>10</sup>

The "Group Percentage" maps use monochromatic shading to indicate how a particular group is represented in the population of each area of the city in 1990 (darker shades indicate higher proportionate representation).

The "Group Change" maps use color to indicate the amount by which a particular group's percentage representation in an area changed between 1980 and 1990.

The "SES" maps use monochromatic shading to depict socioeconomic segregation based on the median income of families residing in the neighborhood.

The "SES/Ethnic Mix" maps that depict a combination of color and shading to depict the ethnic mix and socioeconomic level of the population in the neighborhood.

Finally, the "Population Density" maps depict neighborhood variation in population concentration per square mile.

## Conceptualizing and Assessing Segregation

Residential segregation concerns the spatially patterned distribu-

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<sup>9</sup> SegMaps also presents maps depicting patterns of neighborhood change. While interesting in their own right, they are not the best for illustrating patterns of segregation.

<sup>10</sup> At present SegMaps does not present data for ethnic segregation patterns in 2000. However, these maps will be developed in the near future.

tion of different social groups in urban areas. The sociological literature identifies five dimensions of segregation: uneven distribution, isolation, centralization, clustering, and concentration. When a group is highly segregated on three or more of these dimensions, it is said to be hyper-segregated.

**Uneven Distribution.** This aspect of segregation concerns the degree to which a group's percentage representation in different neighborhoods departs from the group's percentage representation in the city's overall population.

This is depicted in the "Ethnic Mix" and "Group Percentage" maps. If *all* groups are distributed "evenly" across neighborhoods of the city, the Ethnic Mix map will be a single color throughout the city (i.e., the color corresponding to the city's overall ethnic mix). Similarly, if a *particular* group is distributed evenly across neighborhoods of the city, the Group Percentage map for that group will be a single shade throughout the city.

In contrast, uneven distribution is registered when the Ethnic Mix maps are a "mosaic" or "patchwork" of different colors and the group percentage maps are characterized by varying light and dark shading.

**Isolation.** This aspect of segregation concerns the degree to which members of a group are residentially "isolated" because they tend to reside in areas where their group predominates.<sup>11</sup> The Group Percentage maps provide information relevant to isolation. Generally speaking, a group will be highly isolated when some areas of the city are depicted as having a high representation of the group (darkly shaded) while most other areas have a low representation of the group (lightly shaded). Isolation will be low for a group when there are few areas in the city where the group's representation is high.

Note that isolation can be high even under conditions of even distribution. This can occur, for example, if the group in question constitutes a large fraction of the city's overall population.

**Centralization.** This aspect of segregation concerns the degree to which members of a group are concentrated in central (rather than suburban) neighborhoods. This dimension of segregation is depicted

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<sup>11</sup> Isolation is a particular manifestation of the broader notion of "exposure" or contact which includes cross-group contact as well as the aspect of same-group contact registered by isolation. We focus on isolation for several reasons. First, it is seen as especially consequential. Second, with four major pan-ethnic groups, there are 6 cross-group contact comparisons and it is impractical to cover them all. Third, cross-group contact is difficult to depict in a thematic map.

in the “Ethnic Mix” and “Group Percent” maps.<sup>12</sup> For best effect, activate the display of the city center or central business district (CBD). If the Group Percentage map shows the central rings to be shaded darker than outlying rings, the group is centralized.

**Clustering.** This aspect of segregation concerns the degree to which the areas where a particular group predominates are located next to each other in urban space (e.g., adjacent to each other). Strong clustering produces **ghettoization**, the concentration of a group in a small number of adjacent areas that form ethnically homogeneous regions of the city. This dimension of segregation is depicted in the “Ethnic Mix” and especially the “Group Percentage” maps.

In the Group Percentage maps, clustering is high if darkly shaded areas are clustered together (adjacent to each other) rather than randomly distributed or “checker-boarded”. Clustering is also indicated when transitions from high to low representation are evident; that is when there is a progression across adjacent neighborhoods from high to medium to low representation for the group. If the transition is “abrupt” and there is only a few large areas of high representation, clustering is particularly pronounced and may be characterized as ghettoization.

**Concentration.** This concerns the degree to which members of a group are concentrated in a small, densely settled geographic space. Strictly speaking, this dimension of segregation is not depicted in these maps. However, central neighborhoods are often settled more densely than other neighborhoods. Thus, “concentration” tends to follow “centralization” which is depicted in the maps.

This assumption can be verified for each city by examining the “Population Density” maps which depict the variation in population density across the city’s neighborhoods.

**Hyper-Segregation.** The different dimensions of segregation do not necessarily occur together. For example, a group may be unevenly distributed but without being clustered into one large ghetto. Alternatively, a group may have high levels of isolation without being centralized or concentrated (e.g., whites). A group is said to be hyper-segregated in a particular city when high levels of segregation occur on at least three or more dimensions of segregation.

The Ethnic Mix maps are effective for indicating hyper-segregation because they can indicate uneven distribution, clustering, cen-

tralization, and, to a certain extent, isolation. Furthermore, they provide the visually dramatic contrast with other groups that helps drive home the significance of hyper-segregation.

The Group Percentage maps show only one group at a time and are less dramatic visually. In fact, however, they reveal hyper-segregation with greater clarity than the ethnic mix maps because they are better able to show that a group’s representation in outlying areas is very low.<sup>13</sup> In the group percentage maps, a hyper-segregated group will be shown as a few, centrally located regions of high group representation surrounded by a large region of low group representation.

### ***Assessing Socioeconomic Segregation***

The socioeconomic status (SES) maps are most relevant for assessing the residential separation of high-status and low-status groups (based on income) in the city. In the “classical” pattern, high-status residential areas will be located in the suburban ring and in isolated central neighborhoods immediately adjacent to the city center. (Activating the “business district” rings can help clarify this pattern.)

It is important to recognize, however, that cities have distinctive geographic characters. Thus, in any particular city, a high-status or low-status area may be “out of pattern” due to the fact that an attractive amenity (e.g., a view from a bluff) or an unattractive one (e.g., an area prone to flooding) may have a fixed geographic location.

Similarly, cities have distinctive histories of development and prior developments often have substantial “inertia”. For example, an exclusive, high-status residential area may be suburban when it is founded but then later may become a “mid-town” or even “central” neighborhood when the city grows rapidly and “encapsulates” it. A good example of this is the “River Oaks” area of Houston.

### ***Assessing the Combination of Ethnic and Socioeconomic Segregation***

SegMaps’ SES/Ethnic Mix maps depict the combination of ethnic and socioeconomic segregation. In these color signifies ethnic mix and shading signifies socioeconomic status based on family income.

Many cities manifest a “classical” pattern of ethnic sectoring or wedging with higher-status segments of the ethnic group concentrated in outer zones of the sector and lower status segments of the ethnic

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<sup>12</sup> Bear in mind that cities differ in their degree of overall “compactness”. Thus, a group that is “centralized” in a sprawling city like Houston, TX, might be physically spread out more than a less centralized group in a compact city like Boston, MA.

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<sup>13</sup> The ethnic mix map will only show that the group is less than a majority in outlying areas.

group concentrated in inner zones of the sector. (Again, activating the “business district” rings) can help clarify this pattern.) This complex pattern is only a “tendency” and may not be evident in all cities, or, when present, present for all groups.

### ***Limitations of Maps***

Maps are an effective tool for documenting segregation patterns, but they have some important limitations that should be recognized. Two are noted here. First, due to their emphasis of visual patterns, they can be misleading in certain respects. A good example of this is the greater visual impact that outlying neighborhoods have compared to central neighborhoods. By design census tracts and block groups are constructed to be similar in population size, but not necessarily geographic area and thus tend to be smaller in central areas where population density is higher. Consequently, smaller neighborhoods near the city center receive less “visual” weight (i.e., less screen area) even though their share of the city’s population is as large or larger than that of outlying neighborhoods that are larger in physical size and occupy more screen space. Knowing this, the reader should make a “mental adjustment” and give greater importance to central neighborhoods to compensate for the fact that they get less visual weight in the maps.<sup>14</sup>

A second limitation of maps is the “flip side” of their strength. They are geared to conveying quantitative information visually to make it intuitive and easy to interpret. However, to achieve this, they lose the ability to convey variation with the precision that is possible with quantification. This means, for example, that maps can readily convey differences between cities that vary markedly in their patterns of segregation. But they are much less useful for representing differences between cities that are not dramatically different.

The conclusion is a simple one. While maps provide a valuable intuitive introduction to patterns of segregation, it is necessary to examine quantitative measurements to obtain a fuller understanding of segregation patterns.

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<sup>14</sup> This is particularly important for isolation which is determined not only by the number of areas at the extremes on group representation, but also by the proportion of the group’s overall population residing in each type of area. This is shaped by area population size which is much more similar across areas than their physical size. Thus, central areas which are visually small in size are just as important as other areas for determining isolation.

## **Saving and Printing Images**

Notice that SegMaps does not have a program control for printing or capturing the images it displays. It is possible to print and/or capture its images, but this is not done directly through the SegMaps program. Instead, this is accomplished indirectly by using the capabilities of the browser program, or the operating system used in combination with programs that can manipulate and print graphics images.

This section outlines methods for saving and printing images. Similar instructions can be found in SegMaps’ “Help” system.

### ***Method 1: Direct Printing***

If you use the Microsoft Internet Explorer browser (version 5.0 or higher), you may be able to print displayed images directly from within your browser and get good results.<sup>15</sup> To do so, take the following actions.

- a. Move your pointer to the border region surrounding the applet. (Usually this will be a small yellow border around a maroon applet frame.)
- b. Next, right click on the border region. This will call up an Internet Explorer menu that includes an option to print. Choose that option.
- c. A print dialog box will appear. Under the “Print Frames” heading, check the option to print “Only the selected frame” (since the applet is running in a browser “frame”).
- d. Click on the “Properties” button of the print dialog box to configure your printer for printing graphics. (You can skip this step if the printer’s default settings are set appropriately for graphics printing.)
- e. Click on the “OK” button on the print dialog box to print. If all goes well, the applet image will print successfully.

This direct method of printing is convenient, but may not work predictably under some combinations of browser and printer configurations. Common problems include distorted images, poor image quality for the printed image, and poor matching between screen and printer colors. You may be able to overcome these problems by changing your browser or printer settings. So be prepared to experiment until you find a solution that is satisfactory.

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<sup>15</sup> Note: The direct method of printing is not available when using the Netscape Navigator browser.

## ***Method 2: Capture the Image, Then Print or Save***

The second method takes multiple steps but should work reliably on most systems. It relies on Windows' ability to copy images of either the active window or the entire screen to the Windows "clipboard" (a temporary area where the operating system can hold material). Once an image is copied to the clipboard, it can then be "pasted" into Windows programs that can accept graphics images.

### ***Step 1: Capture the Image***

Make sure the browser window is the active window. (It normally will be unless you are switching between programs while using your browser).

Copy the browser window contents to the clipboard by pressing **Alt-Print Screen** (i.e., press the "ALT" and "Print Screen" keys at the same time).

Alternatively, copy the entire screen to the clipboard by pressing **Print Screen**.

Windows does not provide any particular feedback to show that the window (or screen) has been successfully copied to the clipboard. So you cannot necessarily tell that you have accomplished your intended task. However, the process is highly reliable and in most cases the image is now copied to the clipboard and from there can be accessed by other Windows programs.

### ***Step 2: Paste the Image***

Start a Windows program that will accept graphics images from the clipboard. The Windows "Paint" program is one such program. Word and other popular word processing programs also will accept graphics images. And, of course, specialized graphics editing programs such as PhotoShop will work.

Click on the "Edit" option of the program's main menu.

Click on the "Paste" option on the Edit submenu.

At this point, the image should appear in the program and can be manipulated (e.g., edited, cropped, sized, etc.) as the program's capabilities permit.

### ***Step 3: Print and/or Save the Image***

Use the program's capabilities to either print the image or save it to disk as a graphics file.

### ***Note on Image Formats***

Graphics images are saved to the clipboard as "bitmap" images.

Also, after a program has imported an image from the clipboard, it will typically save the image to disk using the bitmap image format unless the user intervenes and specifically instructs the program to use a different image format.

The significance of this is that bitmap image files can be large (e.g., on the order of 2MB). The size of the graphics file can often be reduced dramatically by using the graphics editing program's ability to save the image to a format that uses "compression" to reduce the size of the file. For example, the "GIF" and "JPG" formats are graphics file formats that will greatly reduce the size of the file, perhaps by a factor of 20 or more. For this reason, they are widely used to create images for web documents and other applications where file size is an important consideration.

However, when using GIF, JPG, and other popular graphics file formats, be careful to note whether the format conversion preserves the image's original colors. If the colors are altered, key information may be lost. (Some programs' conversion routines perform better in this regard than others. For example, the Windows Paint program sometimes alters color schemes when it converts images to compressed formats.)

## **Concluding Comments**

The SegMaps program provides a useful way for the new student of residential segregation to gain an intuitive appreciation for many of the concepts used in segregation analysis and the major descriptive findings about segregation patterns. However, as noted above, maps have important limitations. Thus, I strongly encourage the reader to pursue their interest in residential segregation much further. A full understanding of residential segregation requires gaining familiarity with the conceptualization and measurement of segregation (Massey and Denton 1988), quantitative research findings regarding patterns and trends in segregation (e.g., Massey and Denton 1987; 1989; 1993; Farley and Frey 1994), the literature on the history of residential segregation (e.g., Massey and Denton 1993), the ethnographic literature detailing segregation dynamics and their consequences at the micro-level (e.g., Anderson 1990; De Sena 1990; 1994), and theories of segregation and neighborhood change (e.g., Farley and Allen 1986; Massey 1985; White 1986). Given the importance of residential segregation in American life, an educated person should get as broad a perspective on this sociological phenomenon as possible. For the reader who is new to the subject, Jaret (1995) provides a good introduction to many of the topics just noted.

## Recommended Readings

- Anderson, Elijah. 1990. *Streetwise: Race, Class, and Change in an Urban Community*. Chicago, IL: University of Chicago Press.
- DeSena, Judith N. 1990. *Protecting One's Turf: Social Strategies for Maintaining Urban Neighborhoods*. Lanham, MD: University Press of America.
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