



A Demographic and Socio-economic Profile of the Region Surrounding the Big Thicket National Preserve

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**Texas A&M University
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**A DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE OF THE REGION
SURROUNDING THE BIG THICKET NATIONAL PRESERVE:
IMPLICATIONS FOR FUTURE MANAGEMENT STRATEGIES**

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Gulf Coast



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EXECUTIVE SUMMARY

The following study examined selected socio-economic and demographic variables from US Census data in the surrounding counties of the Big Thicket National Preserve (BITH). Data were examined using the 1990 and 2000 census from counties surrounding the BITH in a fifty-mile radius. Data changes were plotted on maps to illustrate the census data over the ten year period. The results provide critical information on social change in the Big Thicket region. Several key findings stand out in this study. Considerable population growth is taking place to the west of BITH which may impact the number and type of users who may choose to visit BITH. The findings also showed an increase in the Hispanic population around BITH as well. These two key findings show a potential "new" visitor to BITH that may or may not be visiting the area. The study results provide preliminary data for BITH managers about a dynamic environment surrounding the BITH. To improve communication to this growing population, enhanced interactions between BITH and the surrounding counties may come through new or continued existing stakeholder groups or voluntary associations. This information has implications for attracting "new users" to the park and learning more about shifts in visitor participation and activity choice. More current visitor data, beyond attendance, is needed to complement the overall picture of who is using the Big Thicket National Preserve. Current visitor data on activity choices and preferences is not readily available. This information will aid managers in more effectively implementing the General Management Plan for the BITH. Recommendations and additional sources are provided for research on visitor studies and to enhance the existing research focus at the BITH. This report will also provide federal and state land managers with a foundation for formulating strategies for addressing shifts in population and socio-economic change around public lands.

INTRODUCTION

Land managers increasingly find urban development creeping up to the borders of their protected areas, while existing development becomes denser over time. This expansion of the Wildland-Urban Interface (WUI) can impact management policies and plans, requiring managers to become more aware of the conditions found in their surrounding communities. The social and ecological implications of the changing boundaries that separate natural and human ecosystems at the WUI represent an increasing challenge for the management of protected areas (Field & Jensen, 2005). This report has been compiled in an effort to illustrate existing conditions and provide the managers of Big Thicket National Preserve (BITH) with various socio-economic and demographic data that will assist in their future planning efforts.

Southeast Texas has been identified as a major area at the Wildland-Urban Interface (Radeloff et al., 2005), while the South as a whole is considered one of "the fastest growing regions in the Nation with a 13.7 percent increase in population between 1990 and 2000" (Interface South, 2005). This intense growth pressure results in a myriad of human-environmental conflicts and opportunities along the edges of our protected areas. The ability to understand and predict change will be valuable to managers when dealing with resource issues such as habitat fragmentation, recreation carrying capacity, the introduction of invasive and exotic species, landowner concerns about prescribed burns, and impacts on regional biodiversity. The awareness and understanding of change contributes to the identification of stakeholders and constituents who are becoming more engaged in the planning and management of public lands.

Several factors have contributed to increased public involvement in natural resource management decision-making including declining trust in government, lack of confidence in government leaders, impasses in resource decisions, and an entrepreneurial attitude about "getting things done" (Wondolleck & Yaffee, 2000). Increasing threats to recreation areas through urban sprawl and development have led citizens and organized groups to get more involved in the stewardship of public lands and seek out relevant information sources. People choose to live and recreate in places that are near green spaces or close to protected areas and are increasingly concerned about any land use decisions that may impact their recreation opportunities and quality of life. Given the fact that Texas has a limited amount of public land, 2.6% federally managed and 3% state managed (Texas Environmental Profiles, 2004), any changes to land use or management would not go unnoticed.

DEFINITION:

The **Wildland-Urban Interface** is the area where houses meet or intermingle with undeveloped wildland vegetation.

– (USDA and USDI,
Federal Register, 2001).

Individuals representing specific interests, e.g., mountain bikers, bird watchers, disabled individuals, now understand the necessity of forming or joining national and local associations to access, secure, and maintain the use of public lands so their input will carry greater weight in land use planning decisions. Federal agencies and bureaucrats alone can no longer dictate what type of features will be included on a trail, who can float a river, or where the next subdivision will go without extensive input from voluntary associations, neighborhood groups, and interested stakeholders. Land managers realize that these groups have become a regular fixture in public land management and are not going away (Cestero, 1999; Schuett, Selin, & Carr, 2001).

Given the public's heightened interest in land management (Cestero, 1999) and the population growth that is taking place in Texas, recreation opportunities near large urban areas are becoming more highly valued. At the same time managers are being challenged to meet the demand for increases in services and programs. Eventually managers will need to respond to a potential change in visitation, density, and use patterns. The predicted shifts in ethnic, cultural and generational diversity in Texas will alter the range in the types of amenities, and recreational experiences desired by visitors. Traditional uses of resources and facilities will change, while management practices once routinely accepted may be viewed in a different light.

It is critical that managers be alert to the changes outside of their protected area. Growth and shifts in constituency groups will demand new strategies for gauging community concerns and soliciting stakeholder involvement. As large parcels of neighboring land become more fragmented, the increase in number of landowners and stakeholders bring varying land ethics, increased methods of land (non) management and new disturbance vectors. This proliferation of influences impacts the existing resources in a number of ways, such as 1.) new non-point source pollutants of air, water, and senses; 2.) depletion of biodiversity through loss of open space and habitat and, 3.) recreation activities and participation.

Communities can benefit from their close proximity to recreational and protected areas, which can actually stimulate growth, according to a recent study by Reeder (2005). He found that recreation and tourism development near rural communities, "...increased local employment, wage levels and income, reduced poverty, and improved education and health (p 2)." Populations in the wildland-urban interface of the southern United States are projected to be "better educated, more urbanized, wealthier, older and more ethnically and culturally diverse" (Interface South, 2005).

PURPOSE OF STUDY

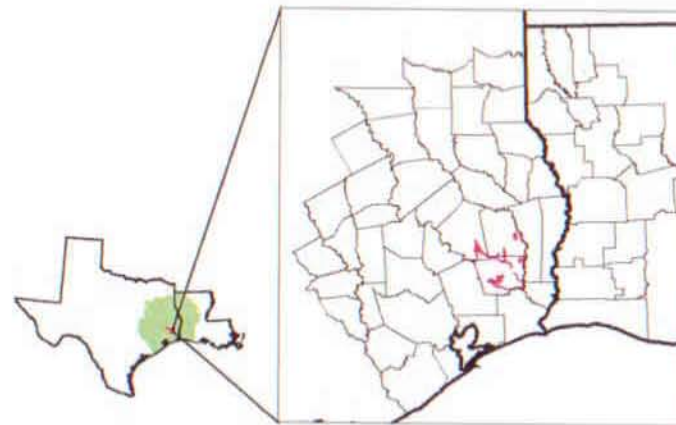
The purpose of this study is two-fold: 1) to examine the external environment of BITH park units by assessing socio-economic and demographic data changes to counties surrounding the park and 2) to examine past and current uses of the park, including park-sponsored activities and programs that occur inside the park boundaries.

STUDY AREA

Big Thicket National Preserve (BITH), the first preserve in the National Park System, was established October 11, 1974, under President Gerald Ford's administration. The Preserve consists of nine land units (Big Sandy Creek, Beech Creek, Turkey Creek, Hickory Creek Savannah, Loblolly, Lance Rosier, Visitor Center, Beaumont, and Jack Gore Baygall units) and six water corridors (Menard Creek, Pine Island/Little Pine Island Bayou, Lower Neches, Neches Bottom, Upper Neches and Village Creek corridors) that encompass more than 97,000 acres of public lands within or abutting seven counties in southeast Texas. The headquarters of Big Thicket are located in Beaumont, Texas, the largest town in the immediate vicinity of the park. However, the outskirts of Houston are only 50 miles from the western park boundary and will greatly affect future conditions in the communities around the park.

BITH is an area of some of the richest diversity in North America. During the last ice age, ecosystems converged – the Eastern hardwood forests, the Gulf coastal plains, and the Midwest prairies – resulting in a unique assemblage of species, some endangered or threatened. December 15, 1981, the United Nations Education, Scientific and Cultural Organization (UNESCO) designated the Preserve an International Biosphere Reserve, one of 47 US sites of the Man and the Biosphere (USMAB) program. The USMAB program is beneficial because it provides a wider reach of scientific knowledge through the international scientific community. On July 26, 2001, the American Bird Conservancy designated Big Thicket National Preserve a Globally Important Bird Area (IBA) in their efforts to conserve wild birds and their habitats.

Location of Big Thicket National Preserve



STAKEHOLDERS

The inclusion of interested parties in the decision-making aspects of park management has become a critical and necessary fact of life. Big Thicket National Preserve has successfully worked with several stakeholder groups in the region: Big Thicket Association; Western National Parks Association; Kountze, Texas; Economical Development Corporation; Rice University, Department of Ecology and Evolutionary Biology; National Parks and Conservation Association; Texas Parks and Wildlife Department; USGS Biological Resources Division; The Conservation Fund; USGS Water Resources Division; The Nature Conservancy of Texas; Lamar University, Departments of Geology and Biology, and Golden Triangle Audubon. These groups will continue to play an important role in the research, planning and management of the BITH.

DATA SOURCES

Resource management agencies face many similar issues when dealing with the wildland-urban interface. The budgetary constraints of recent times encourage regional collaboration and coordination among separate agencies. Therefore, in an effort to provide the managers of BITH with tools to foster this collaborative work, we have provided information portraying change around BITH and other surrounding federal lands. Socio-economic information is provided for 41 Texas counties and 17 Louisiana parishes, each within 50 miles of a federal property. This distance translates into about an hour's drive for a day trip visit. US Fish and Wildlife Service wildlife refuges, national forests managed by the US Forest Service and US Corp of Engineers recreational properties are delineated on each map for a rapid reference of which agencies and properties may be experiencing pressures similar to BITH. It should be noted that this report does not consider state, local and private conservation properties in the region.

All statistics used for the maps in this report were derived from U.S. Census data. Census figures were processed using ArcGIS to draw out pertinent information. Variables chosen for inclusion in this report (Table 1) were used based on the expertise of the authors and existing literature. These variables will assist managers to best define the key information used to enhance their decision-making and planning for the changes taking place around BITH. Relevant definitions for these variables are found in the glossary at the end of this report and are discussed in their respective map sections.

TABLE 1: List of map variables and categories.

VARIABLE	CATEGORIES
Population	% change in total population, 1990–2000 Total population, 1990 Total population, 2000 Total estimated population, 2004
Race/Ethnicity	% change of Anglo population, 1990–2000 % change of Black population, 1990–2000 % change of Hispanic population, 1990–2000
Education	% change with no high school diploma, 1990–2000 % change with high school diploma, 1990–2000 % change with bachelor's degree, 1990–2000 % change with post graduate degree, 1990–2000
Age	% change under 18 years, 1990–2000 % change 18 – 24 years, 1990–2000 % change 25 – 44 years, 1990–2000 % change 45 – 64 years, 1990–2000 % change 65 years and over, 1990–2000
Income	% change income < \$25K, 1990–2000 % change income \$25K–\$75K, 1990–2000 % change income \$75K–\$150K, 1990–2000 % change income > \$150K, 1990–2000 % change retirement income, 1990–2000
Housing	% change of owner occupied housing, 1990–2000 % change of renter occupied housing, 1990–2000 % change in housing units < \$100K, 1990–2000 % change in housing units \$200K–\$300K, 1990–2000 % change in housing units \$300K–\$500K, 1990–2000 % change in housing units > \$500K, 1990–2000
Farm acreage	% change of land in farms, 1992–2002 % of land in farms, 1992 % of land in farms, 2002
Employment	% change persons employed, 1990–2000 % change persons unemployed, 1990–2000 % change persons not in labor force, 1990–2000
Occupation	% change in sales & office occupations, 1990–2000 % change in production, transport & material moving occupations, 1990–2000 % change in service occupations, 1990–2000 % change in farming, fishing & forestry occupations, 1990–2000 % change in construction, extraction & maintenance occupations, 1990–2000 % change in management, professional & related occupations, 1990–2000

TABLE 1: List of map variables and categories. (continued)

VARIABLE	CATEGORIES
Industry	% change employees in professional, scientific, management, administrative & waste management industries, 1990–2000 % change employees in construction industries, 1990–2000 % change employees in agriculture, forestry, fishing/ hunting & mining industries, 1990–2000 % change employees in other service (except public administration) industries, 1990–2000 % change employees in public administration industries, 1990–2000 % change employees in transportation and warehousing & utility industries, 1990–2000 % change employees in arts, entertainment, recreation, accommodation & food services industries, 1990–2000 % change employees in educational, health & social service industries, 1990–2000 % change employees in finance, insurance, real estate & retail leasing industries, 1990–2000 % change employees in information industries, 1990–2000 % change employees in manufacturing industries, 1990–2000 % change employees in retail trade industries, 1990–2000 % change employees in wholesale trade industries, 1990–2000
Other	% change persons never married, 1990–2000 % change of married persons, 1990–2000 % change in average household size, 1990–2000 % change in average family size, 1990–2000 % change in households with individuals 65+ years, 1990–2000 % change of disabled persons 65+ years, 1990–2000

On September 24, 2005, the second-most powerful storm of the season hit the Texas coast near Sabine Pass. Category 3 Hurricane Rita made landfall with wind speeds of 120 mph and a 10-foot storm surge. Rita traveled up and over the Neches River units of BITH to the east, while western units along the Trinity River carried floodwaters of an emergency release from upstream Lake Livingston. As of November 10th, damage estimates for single family dwellings in Texas alone stood at 5,223 destroyed, 19,208 with major damage and 53,582 with minor damage. Damage to mobile homes and apartments resulted in 2,350 destroyed, 8,273 with major damage and 7,825 with minor damage (State of Texas Operations Center, 2005). It is a fact that counties immediately surrounding BITH have sustained severe damage, and it remains to be seen how this devastating storm will affect the trends pictured in this report.

RECREATIONAL USE

Recreational use data for the Big Thicket National Preserve is limited to the figures posted in the Public Use Statistics website of the National Park Service (<http://www2.nature.nps.gov/stats/>). Visitor use statistics for Big Thicket National Preserve have been reported since 1981. These statistics have been reported as recreational visits to BITH and backcountry permits issued at BITH. The only overnight camping allowed is in the backcountry with a permit. Recreational visits for 2004 were reported at 107,782, with 938 backcountry visits. Recreational visits since 1981 have fluctuated (Table 2), with a growth trend occurring since mid-2000. The number of visits for 2005, while continuing to show growth prior to Hurricane Katrina, will likely fall below the 2004 level due to the heavy damage suffered throughout the area during the fourth quarter of the reporting period.

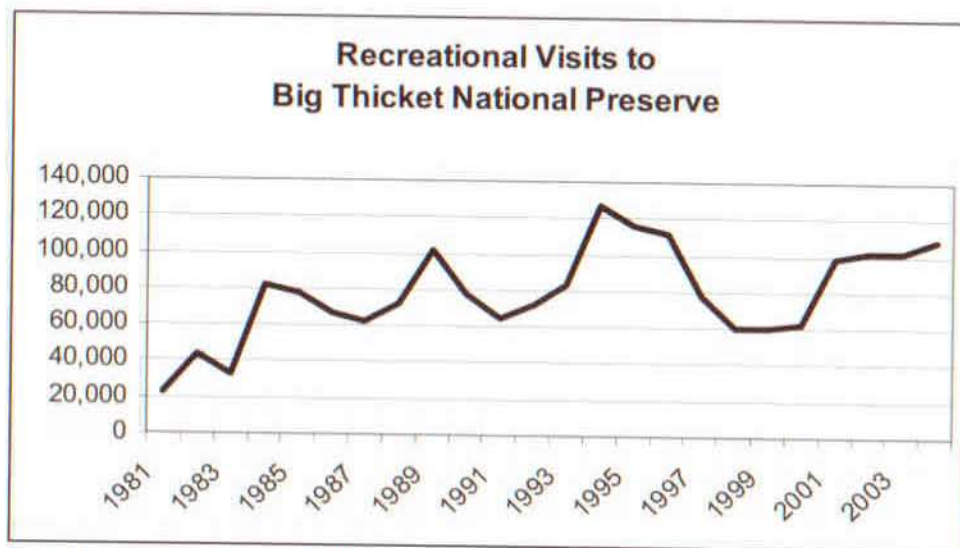


Table 2: Recreational visits to Big Thicket National Preserve. (Source: National Park Service Public Use Statistics)

Similar reporting has been done for backcountry permits necessary for primitive, overnight camping. The use pattern for backcountry permits is much more pronounced (Table 3), with obvious increases and declines. A sharp decline in permits began in 2003 and will undoubtedly continue through 2005 and possibly into 2006.

Note: The advent of Hurricane Katrina at the outset of our data gathering compounded the inability to find concise and detailed data about current park visitation and use from BITH. The extensive damage suffered by the park headquarters in Beaumont, Texas, and the subsequent temporary relocation of operations to Village Creek negated much of our efforts at pulling together pertinent information. In addition to the limited information gathered specifically for BITH, a quick overview of several other recent recreation surveys is offered to flesh out the current state of recreation demand in southeast Texas.

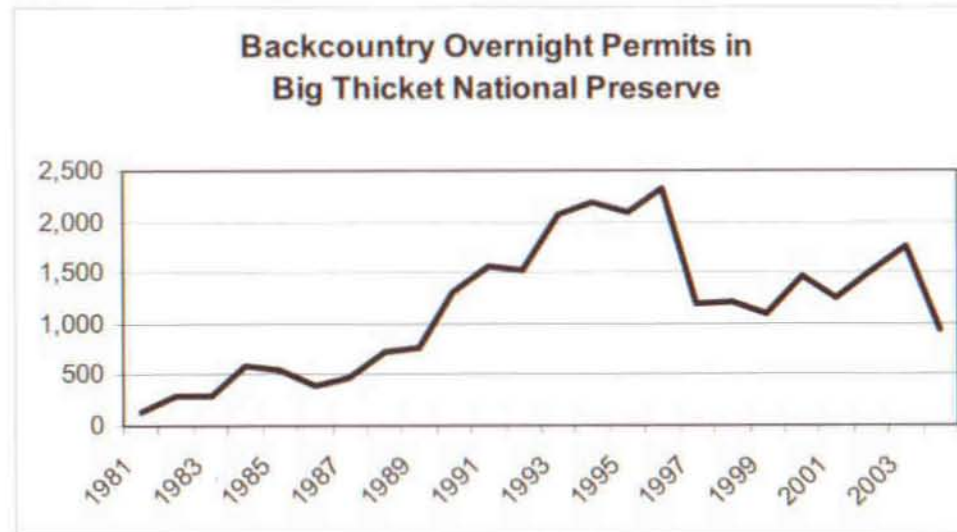


Table 3: Backcountry overnight permits in Big Thicket National Preserve. (Source: National Park Service Public Use Statistics)

The 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation published by the U.S. Fish and Wildlife Service (USFWS) documents participation and expenditures of U.S. residents 16 years of age and older. This in-depth survey, published every five years, is divided into two major categories: sportsmen (hunters and anglers) and wildlife watchers (residents whose activities took place within 1 mile of home and non-residents that traveled over 1 mile from home to participate in the activity). In 2001, the USFWS estimated that 82 million U.S. residents participated in wildlife-associated recreation: 34.1 million people fished, 13.0 million hunted, and 66.1 million participated in at least one type of wildlife-watching activity. In Texas, 29% (4,515,000) of the state population were involved in wildlife-related recreation. Sportspersons accounted for 18% (2,745,000) of

the population, while wildlife-watching participants accounted for 20% (3,088,000). Of even more interest was the determination of where these activities took place, as many people carried out their activities in states other than their place of residence. Of the 4,949,000 that chose Texas as their destination for wildlife-related activities, 58% (2,857,000) of that number represented sportsmen, while wildlife-watchers accounted for 65% (3,240,000).

The U.S. Forest Service (USFS) developed their National Visitor Use Monitoring (NVUM) program to determine how many people recreate on USFS land, the activities in which they participate and how long they stay, among other aspects. On a national basis, most visits to developed recreation sites are made by non-locals, while people who live in metropolitan areas account for 61% of national forests visits. The report for national forests in Texas was released in June of 2004 and includes data collected between October 2002 and September 2003 on the Caddo-Lyndon B. Johnson National Grasslands, Angelina National Forest, Davy Crockett National Forest, Sabine National Forest, and the Sam Houston National Forest. In Texas, national forest visits are estimated at 602,000. During their visit to Texas forests, the top five recreation activities of the visitors were hunting (42%), viewing wildlife (30%), fishing (21%), relaxing (20%), and hiking/walking (17%).

The National Survey on Recreation and the Environment is another in-depth survey conducted by the U.S. Forest Service to determine national attitudes toward the environment and the distribution of various types of recreational activities. Results are reported on a four region basis and the most recent survey highlighted some interesting aspects of recreational activity in the South. The number of trips spent visiting a prehistoric site was greatest in the South. Southerners took more trips to visit historic sites, bird-watching, wildlife viewing, and studying nature near water than the rest of the nation. Although the South had fewer active participants in these activities, they participated in viewing activities more often. People in the South take more big game hunting trips, the most off-road driving trips and the least hiking and horseback riding trips. Snorkeling and scuba diving is most often done in the South.

HOW TO READ THESE MAPS

In general, these maps represent the percent of change in a given variable from 1990 to 2000 in an endeavor to differentiate between steady or rapid growth and occasionally, decline. This change is represented by an indicator ramp of color, with the lightest color representing the least change and the darkest color the most change. In situations where there is both growth and decline represented, different colors are used for positive and negative numbers. While map colors will change between variables discussed, an attempt has been made to use a consistent color scale on maps within a variable. This should assist in a rapid assessment of general trends between classifications (e.g., those under 18 years of age, 18 to 24, 25 to 44, etc.). That being said, there are exceptions to this standard that will be explained in the introduction to each variable. Most often this was a result of drastic differences in the range of percentages. In addition to the color display of change, exact numbers of change are given for each county to provide more detail for managerial analysis.

It is important that managers carefully consider the relationships depicted in these maps. A county can show drastic change because the frequency of a variable was minimal at the start. A change of 100% represents the doubling of variable units, whether it was a change of 20 units to 40 units or of 2,000 units to 4,000 units.

It is hoped that these maps will provide the manager with a starting point in which to consider the change occurring around BITH and to explore the relationships between and within variables.

POPULATION

As population increases around protected areas so will the challenges for land managers. A larger population translates into a more diverse population in a number of ways. People's attitudes and perceptions toward natural resources are reflected in everything from private lands management to recreational demands. Land managers will need to identify the many diverse stakeholders that will now affect management and policy-making decisions, with a goal of establishing working relationships. The necessity to develop innovative partnerships will extend to neighboring communities where appropriate zoning and control of urban sprawl can be properly addressed. It will be critical to develop suitable outreach programs for the general population and stakeholders who are potential allies. The health of protected lands will need to be safeguarded from an influx of population that brings both invasive species and increased recreational demand. Rampant development can also bring about alterations in ecological systems, such as hydrology.

As is evidenced in the *Percent Change in Total Population, 1990-2000*, Houston and the surrounding counties continue to gain population at a dramatic rate, while all the Texas counties in the study area show growth. Counties to the west of BITH have experienced more than a 30% growth in population, while Hardin county and those to the east are growing at a slower pace of more than 10%. Actual population figures for each county are noted on the three maps for 1990, 2000 and 2004.

DEFINITION:

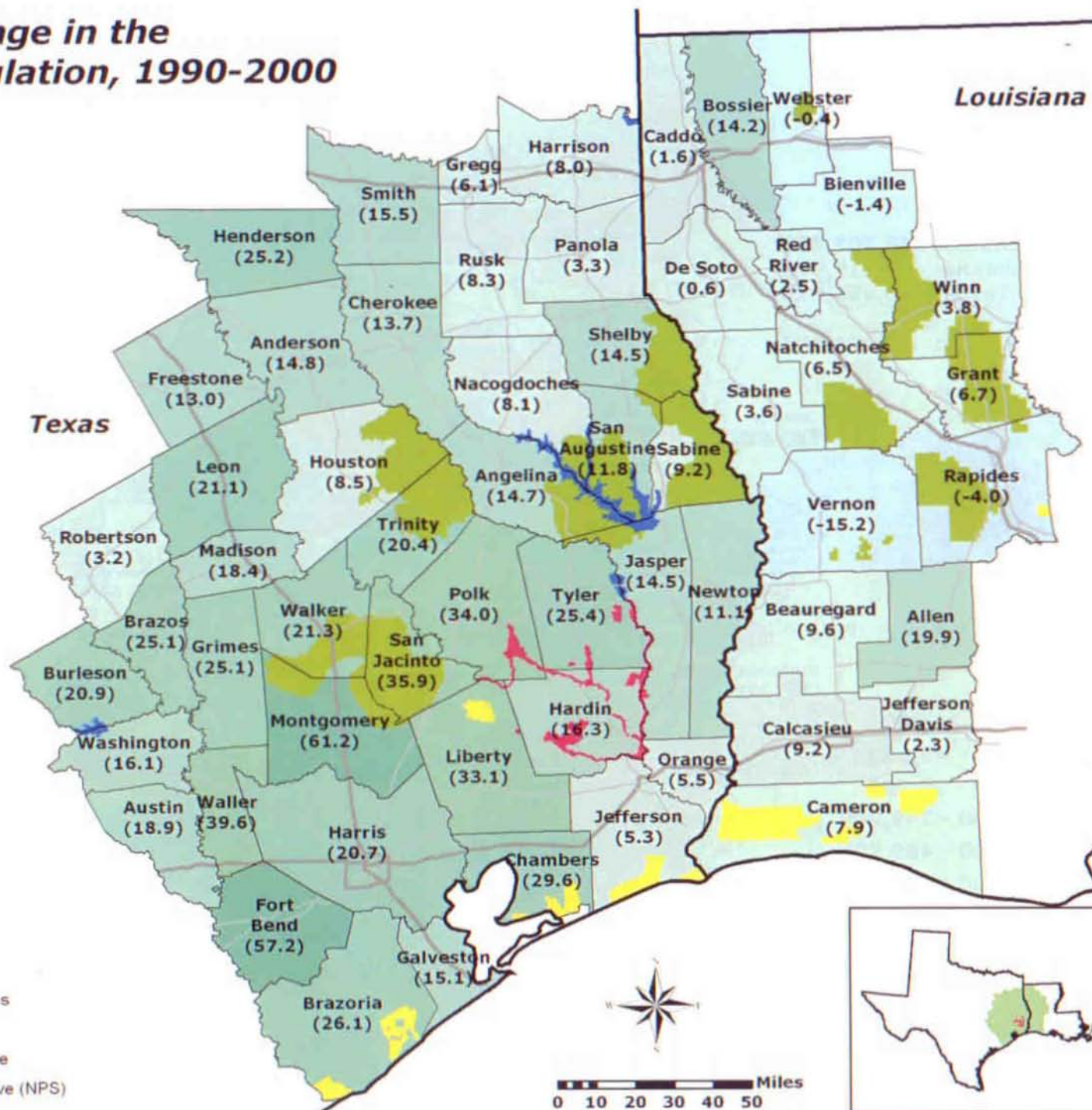
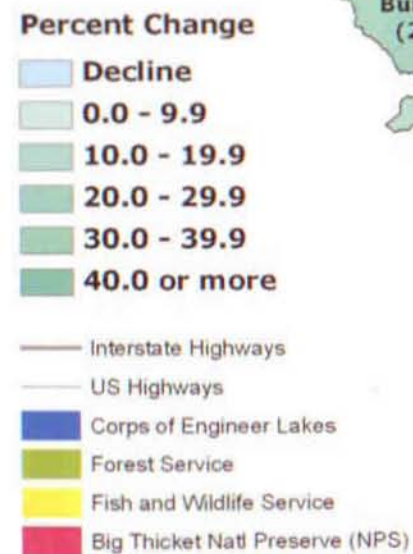
POPULATION ESTIMATES

The Census Bureau's Population Estimates Program publishes population numbers between censuses. Estimates usually are for the past, while projections are estimates of the population for future dates. July 1 estimates are published for years after the last decennial census (2000), as well as those for past decades. Data for births, deaths, and domestic and international migration are used to update the decennial census base counts. These estimates are used in federal funding allocations; as inputs to other federal agencies' statistics and per capita time series; as survey controls; and in monitoring recent demographic changes. With each new issue of July 1 estimates, the estimates for the years since the last census are revised.

— U.S. Census Bureau

Percent Change in the Total Population, 1990-2000

United States: 13.2
Louisiana: 5.9
Texas: 22.8
Study Area: 18.9



Total Population, 1990

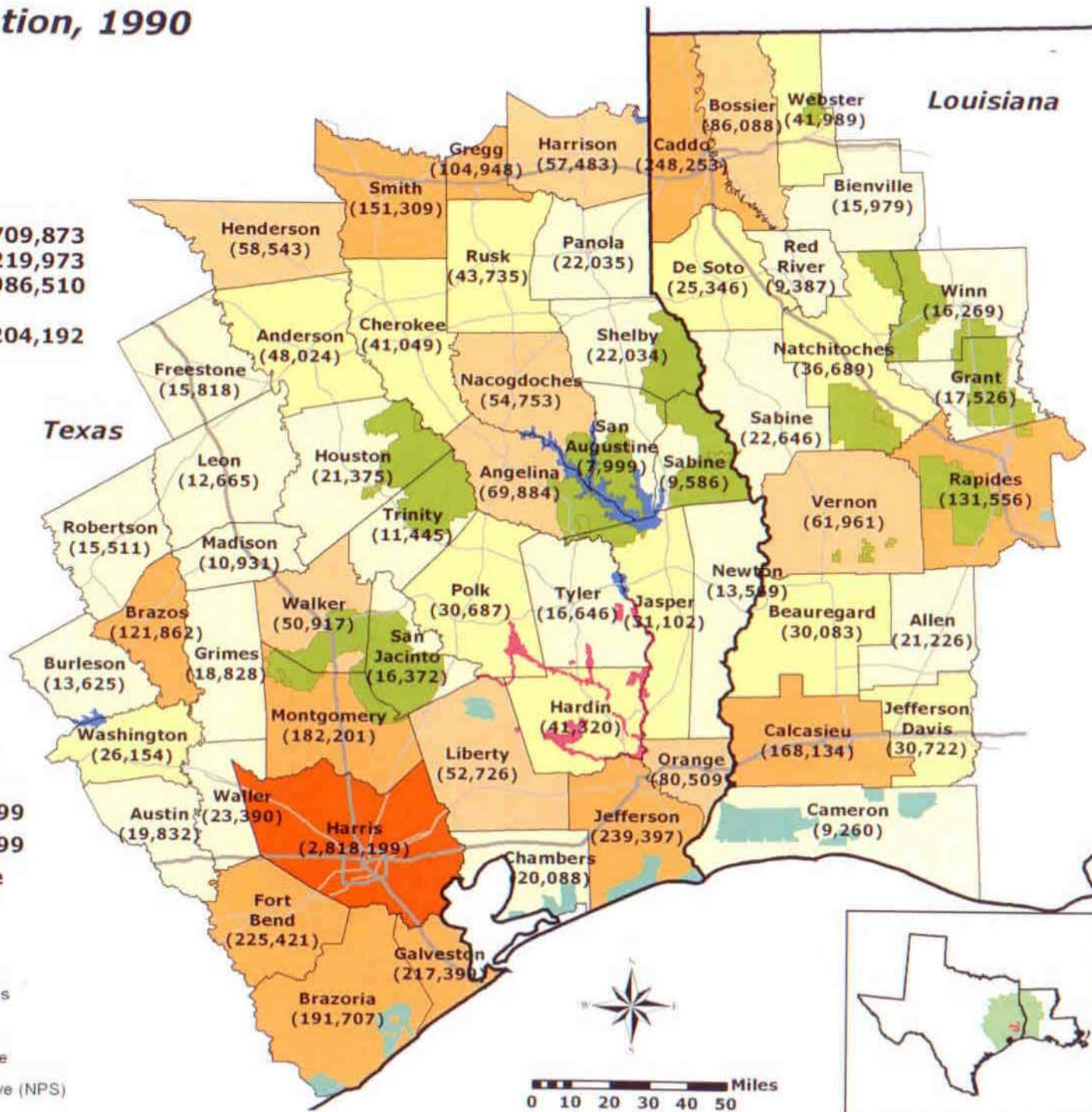
United States: 248,709,873
Louisiana: 4,219,973
Texas: 16,986,510

Study Area: 6,204,192

Population

- Zero to 24,999
- 25,000 - 49,999
- 50,000 - 99,999
- 100,000 - 249,999
- 250,000 - 499,999
- 500,000 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



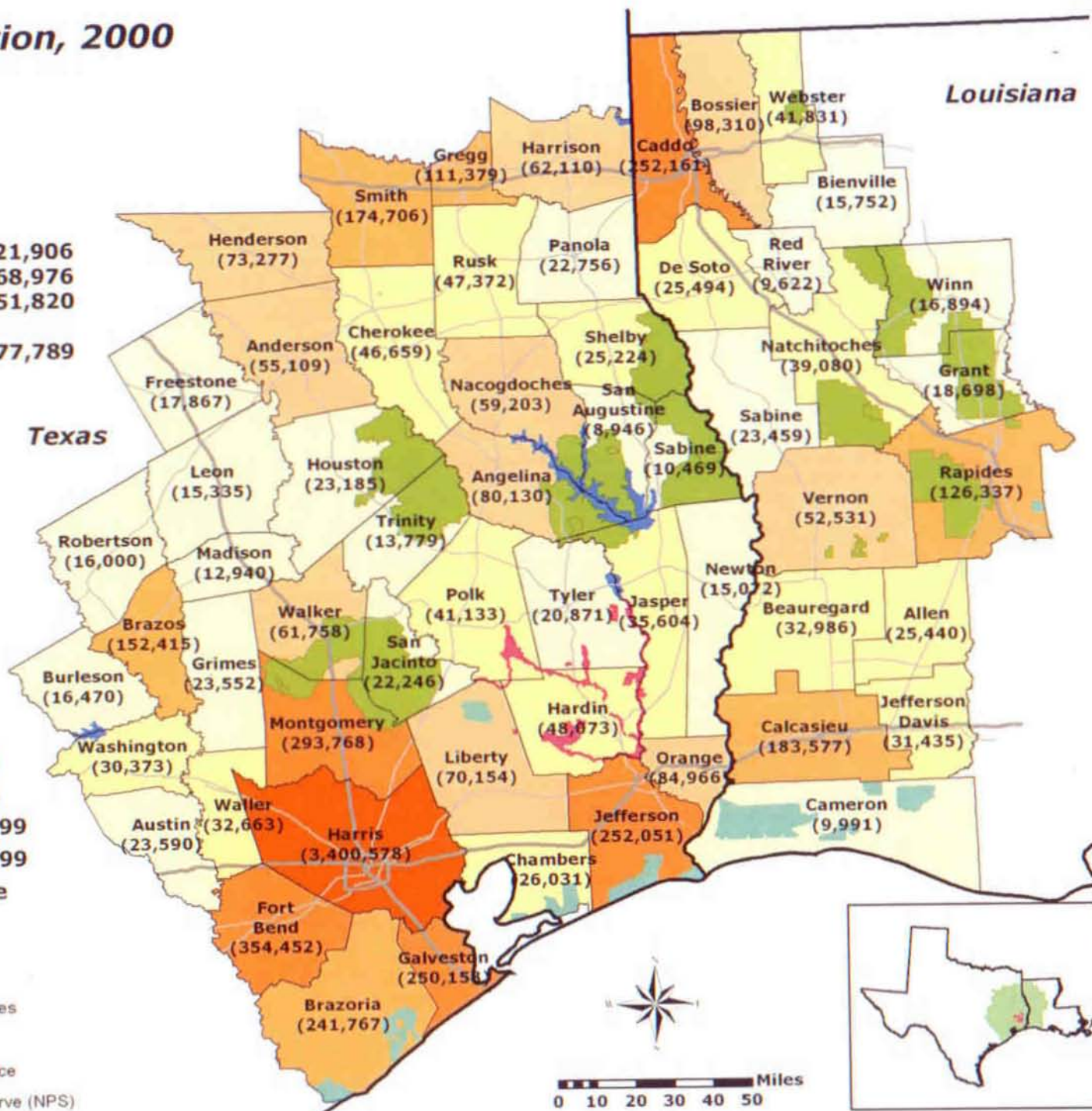
Total Population, 2000

United States: 281,421,906
 Louisiana: 4,468,976
 Texas: 20,851,820
 Study Area: 7,377,789

Population

- Zero to 24,999
- 25,000 - 49,999
- 50,000 - 99,999
- 100,000 - 249,999
- 250,000 - 499,999
- 500,000 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)

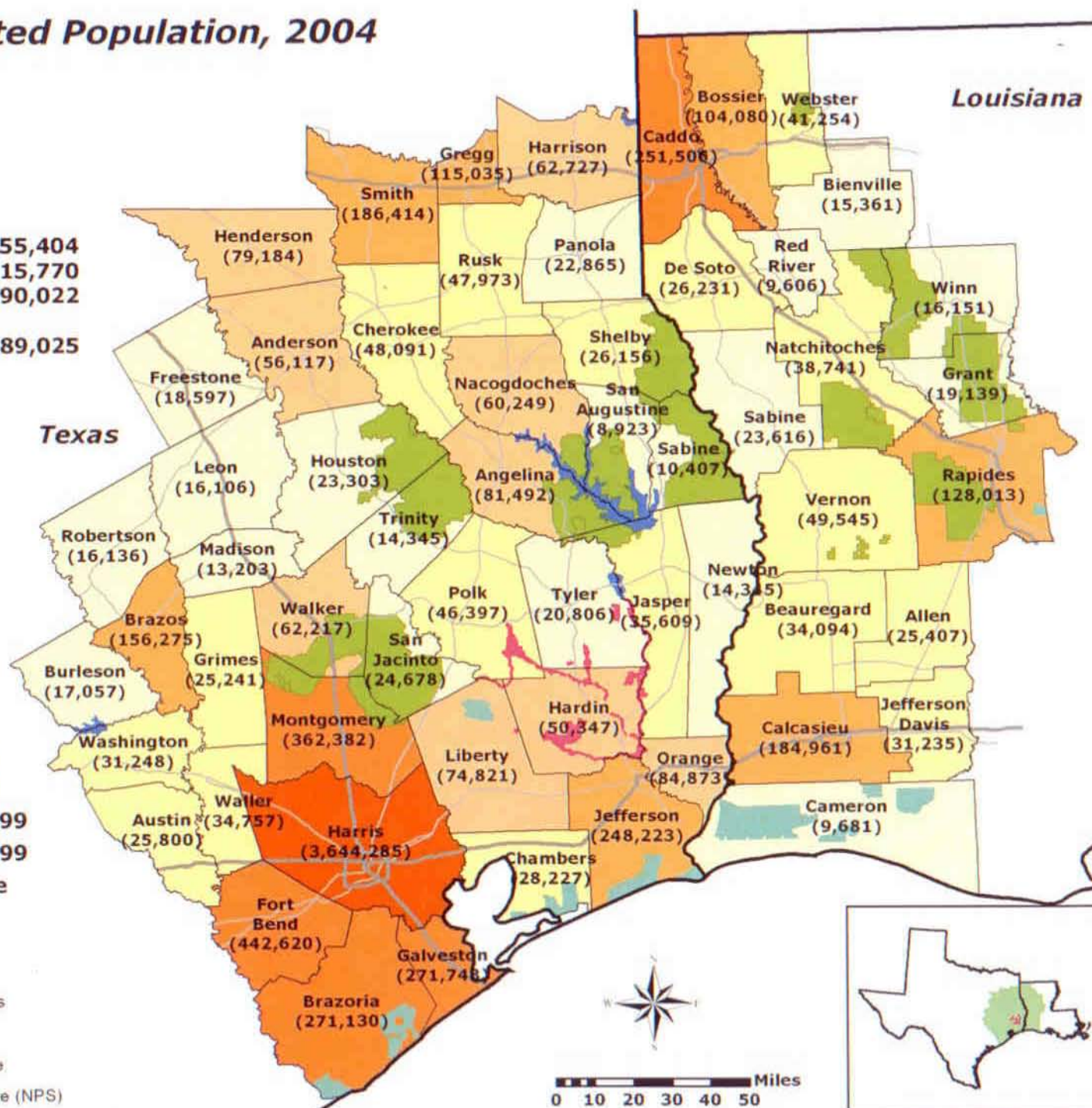


Total Estimated Population, 2004

United States: 293,655,404
 Louisiana: 4,515,770
 Texas: 22,490,022

 Study Area: 7,889,025

Population



RACE/ETHNICITY

It has become common knowledge that demographics in the United States, including Texas, are changing and becoming more diverse. As race and ethnic percentages shift, so will many of our preconceived notions regarding visitors' attitudes and motivations toward natural resources as well as recreational demands. Resource managers will be challenged to look at their lands and facilities in a new light, communicate management and conservation messages in different terms, and adapt to a new set of demands in planning and design efforts.

The following maps show the shift in race and ethnicity in the counties surrounding BITH quite clearly, evident in the percentages alone. The maps showing percent change in Anglo and Black populations are comparable in color scale, with percentages broken into groups of ten. Jefferson County has a decline in the Anglo population and an increase in the Black population, while Hardin county has a decline in its Black population. Other counties surrounding BITH show only modest gains in both Black and Anglo populations. The map of the Hispanic population is of a different color scale, showing phenomenal growth in some Texas counties of over 300%. While Hardin County shows a moderate increase of only 85%, all of the surrounding counties show much greater gains.

DEFINITION:

RACE

Race is a self-identification data item in which respondents choose the race or races with which they most closely identify. These categories are sociopolitical constructs and should not be interpreted as being scientific or anthropological in nature. Furthermore, the race categories include both racial and national-origin groups.

WHITE

A person having origins in any of the original peoples of Europe, the Middle East, or North Africa. It includes people who indicate their race as "White" or report entries such as Irish, German, Italian, Lebanese, Near Easterner, Arab, or Polish.

BLACK OR AFRICAN AMERICAN

A person having origins in any of the Black racial groups of Africa. It includes people who indicate their race as "Black, African Am., or Negro," or provide written entries such as African American, Afro-American, Kenyan, Nigerian, or Haitian.

HISPANIC ORIGIN

The terms "Spanish," "Hispanic origin," and "Latino" are used interchangeably. Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States. People who identify their origin as Spanish, Hispanic, or Latino may be of any race.

— U.S. Census Bureau

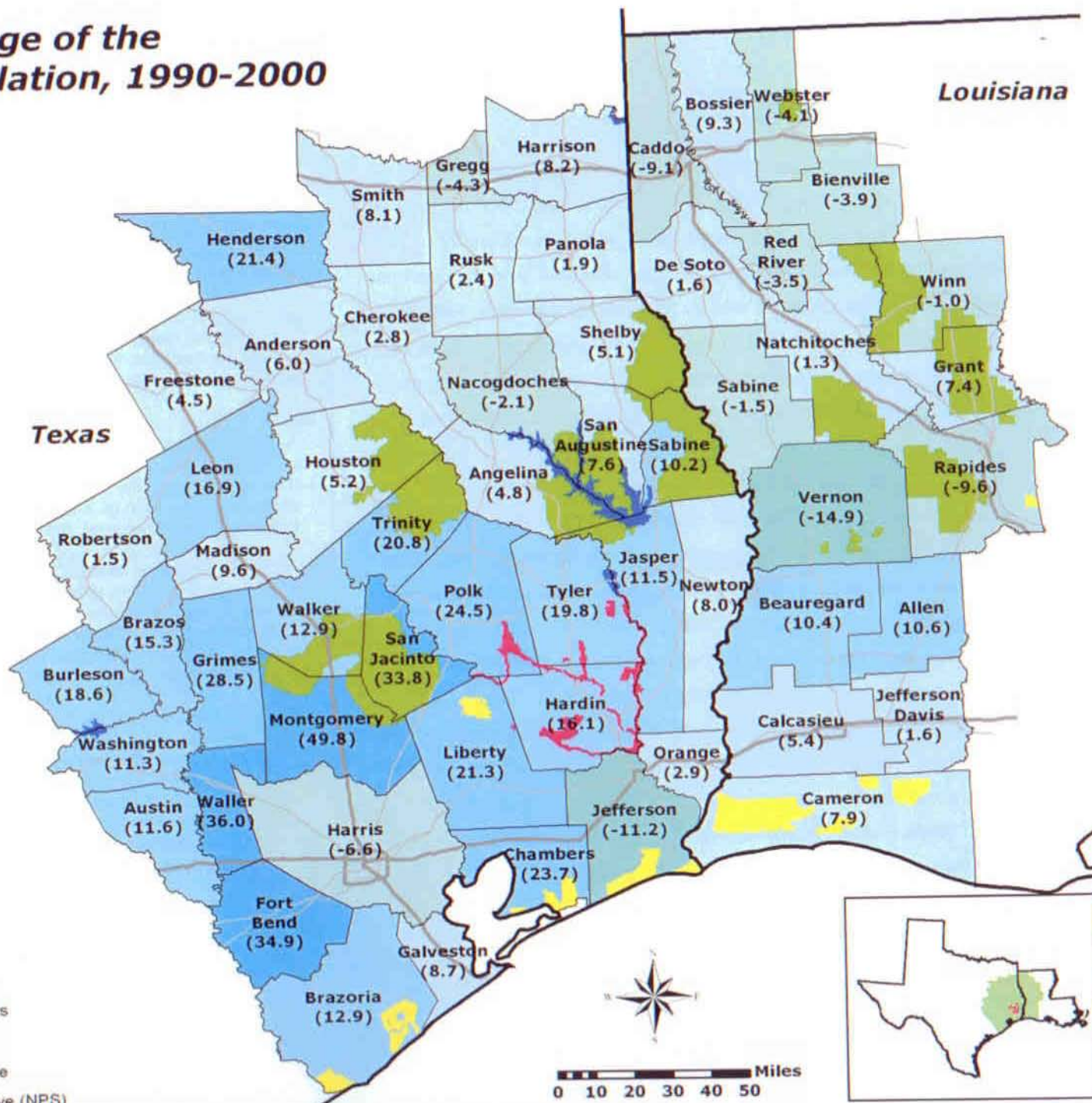
Percent Change of the Anglo Population, 1990-2000

United States: 4.5
Louisiana: -4.1
Texas: 14.8
Study Area: 10.4

Percent Change

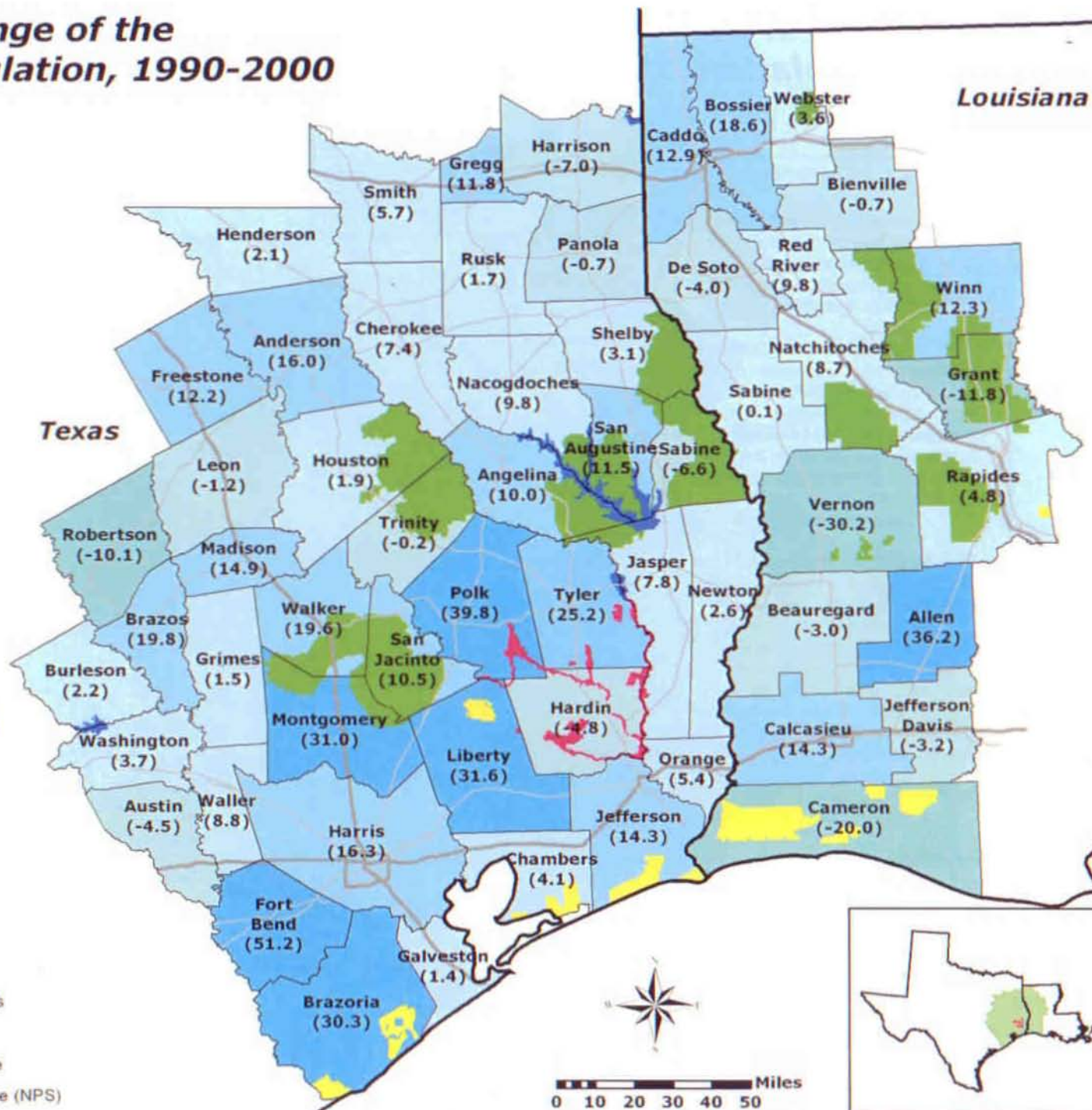


- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change of the Black Population, 1990-2000

United States: 15.8
Louisiana: 11.8
Texas: 19.1
Study Area: 13.9



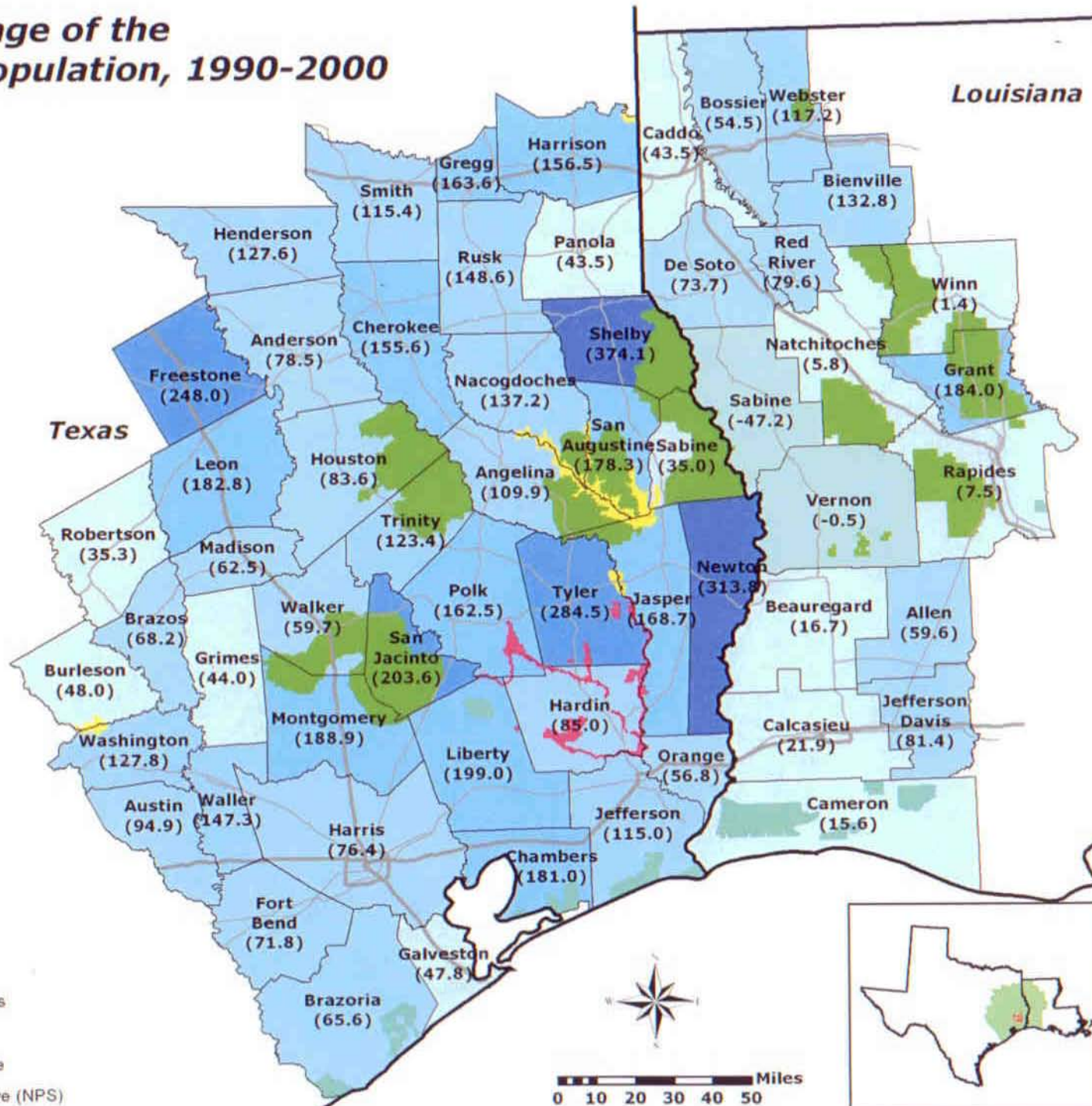
Percent Change of the Hispanic Population, 1990-2000

United States: 61.2
Louisiana: 18.9
Texas: 55.3
Study Area: 78.8

Percent Change

- Decline
- Zero - 49.9
- 50.0 - 99.9
- 100.0 - 149.9
- 150.0 - 199.9
- 200.0 - 299.9
- 300.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



EDUCATION

The education level of the communities surrounding protected areas will have a direct bearing on the effectiveness of conservation messages proffered by resource managers. Education level can affect the language of written communication and the use of technology. Reeder (2005) found that an educated populace, particularly those with a college education, is more involved in recreational activities. Many young, educated people become first adopters of new and extreme sports, often requiring new opportunities and facilities of their neighboring parks. An educated constituency will also be more familiar with the political system and willing to speak out about issues they find important.

The majority of the counties immediately surrounding BITH reflect a decline in the number of high school dropouts. Only the counties on the western boundary show a moderate increase, while the metropolitan areas of Houston suffer the greatest number of dropouts. Conversely, the number of residents with a college education has grown considerably in all immediate counties.

DEFINITION:

EDUCATIONAL ATTAINMENT

Refers to the highest level of education completed in terms of the highest degree or the highest level of schooling completed.

HIGH SCHOOL GRADUATE

This category includes people whose highest degree was a high school diploma or its equivalent; people who attended college but did not receive a degree, and, people who reported completing the 12th grade but not receiving a diploma are not included.

NOT HIGH SCHOOL GRADUATE

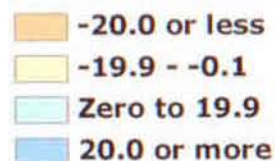
This category includes people of compulsory school attendance age or above who were not enrolled in school and were not high school graduates. These people may be taken to be "high school dropouts." There is no restriction on when they "dropped out" of school; therefore they may have dropped out before high school and never attended high school.

– U.S. Census Bureau

**Percent Change of Educational Attainment
With No High School Diploma,
1990-2000**

United States: -9.2
Louisiana: -13.0
Texas: 8.4

Study Area: 6.5



—— Interstate Highways

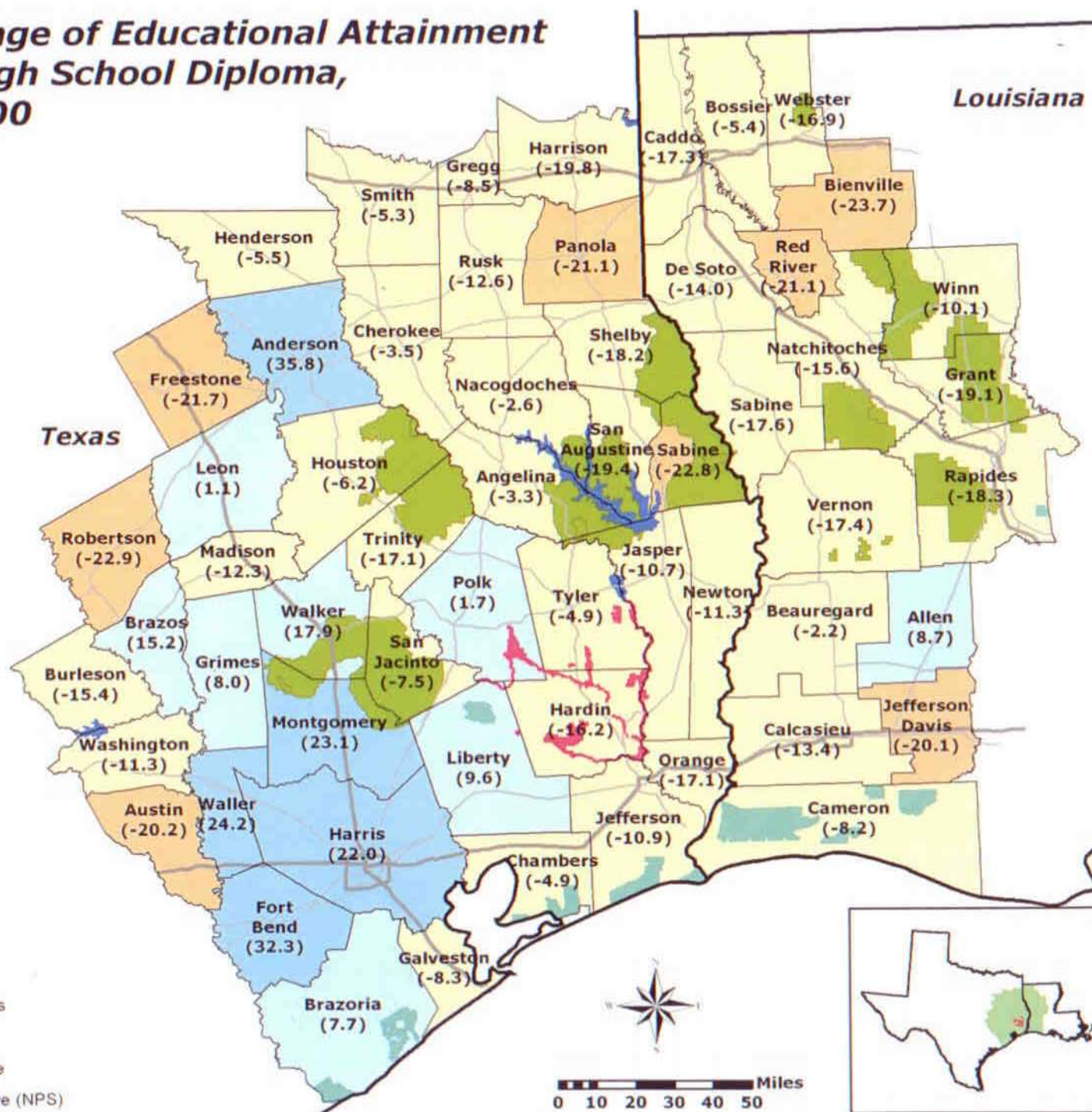
—— US Highways

Corps of Engineer Lakes

 Forest Service

Fish and Wildlife Service

Big Thicket Natl Preserve (NPS)



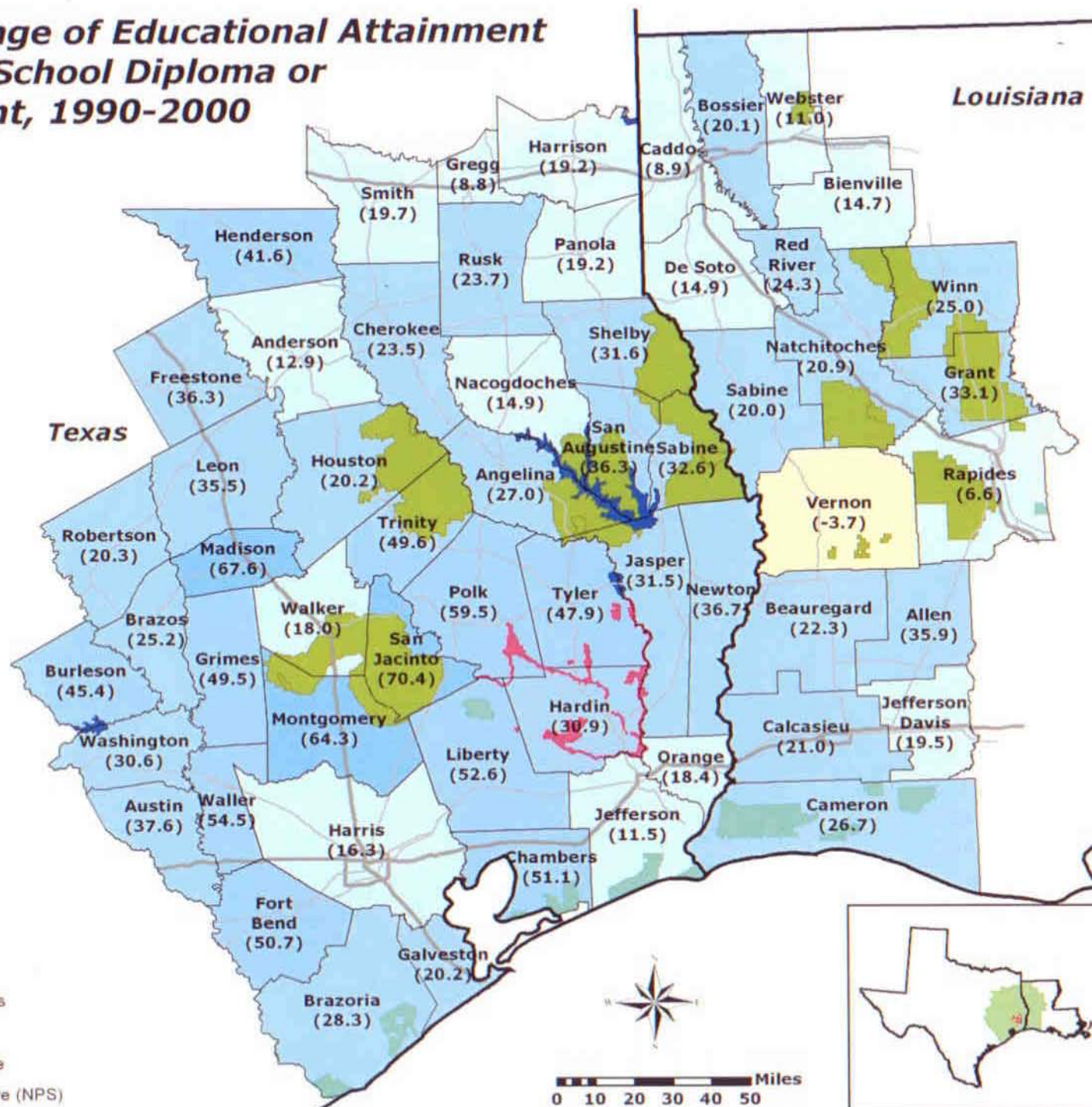
Percent Change of Educational Attainment With High School Diploma or Equivalent, 1990-2000

United States: 17.0
Louisiana: 17.6
Texas: 25.5
Study Area: 21.6

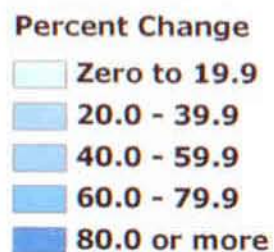
Percent Change

- 20.0 - -0.1
- Zero to 19.9
- 20.0 - 39.9
- 40.0 - 59.9
- 60.0 or more

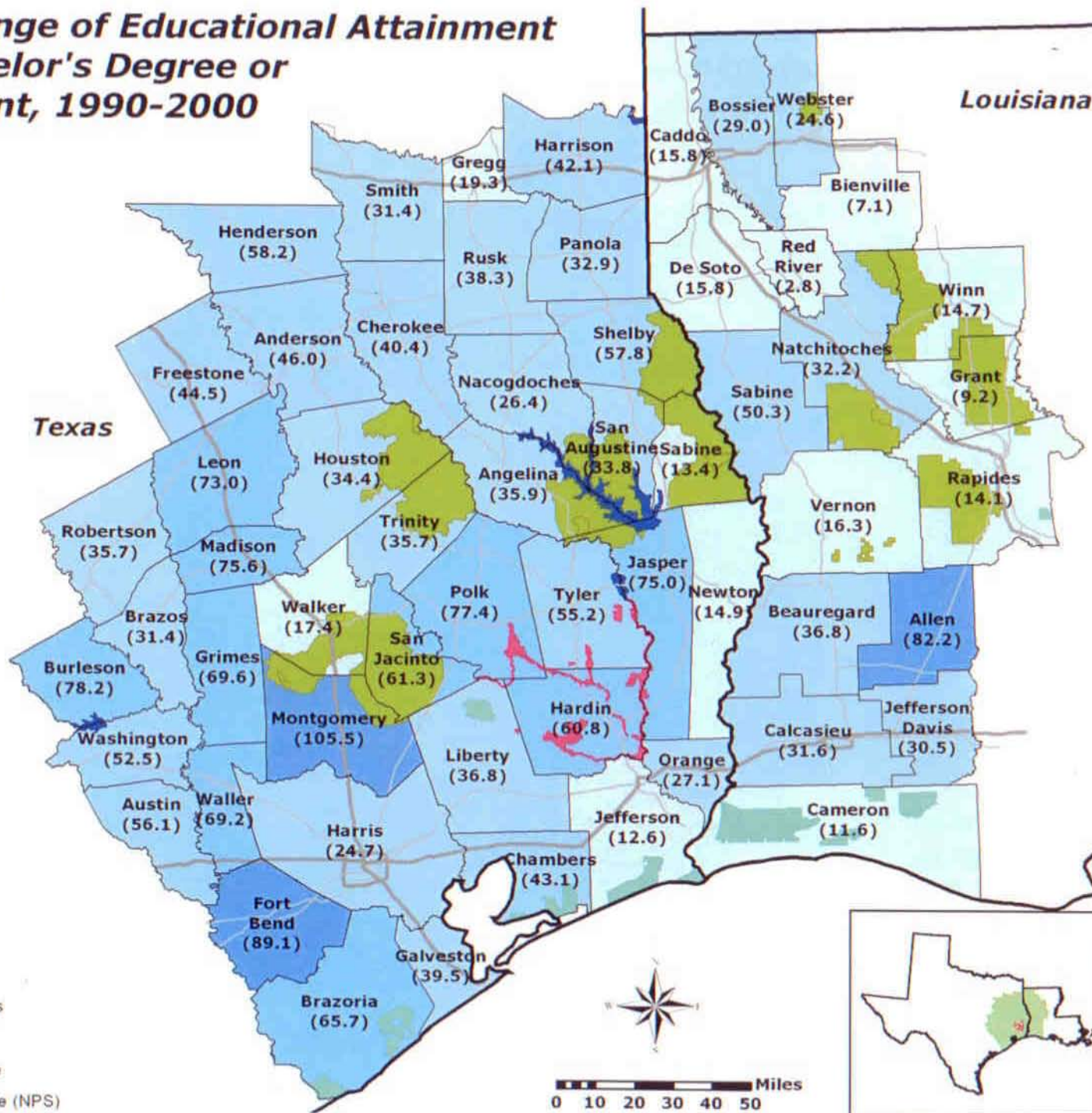
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



United States: 35.9
Louisiana: 27.2
Texas: 39.8
Study Area: 33.4



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)

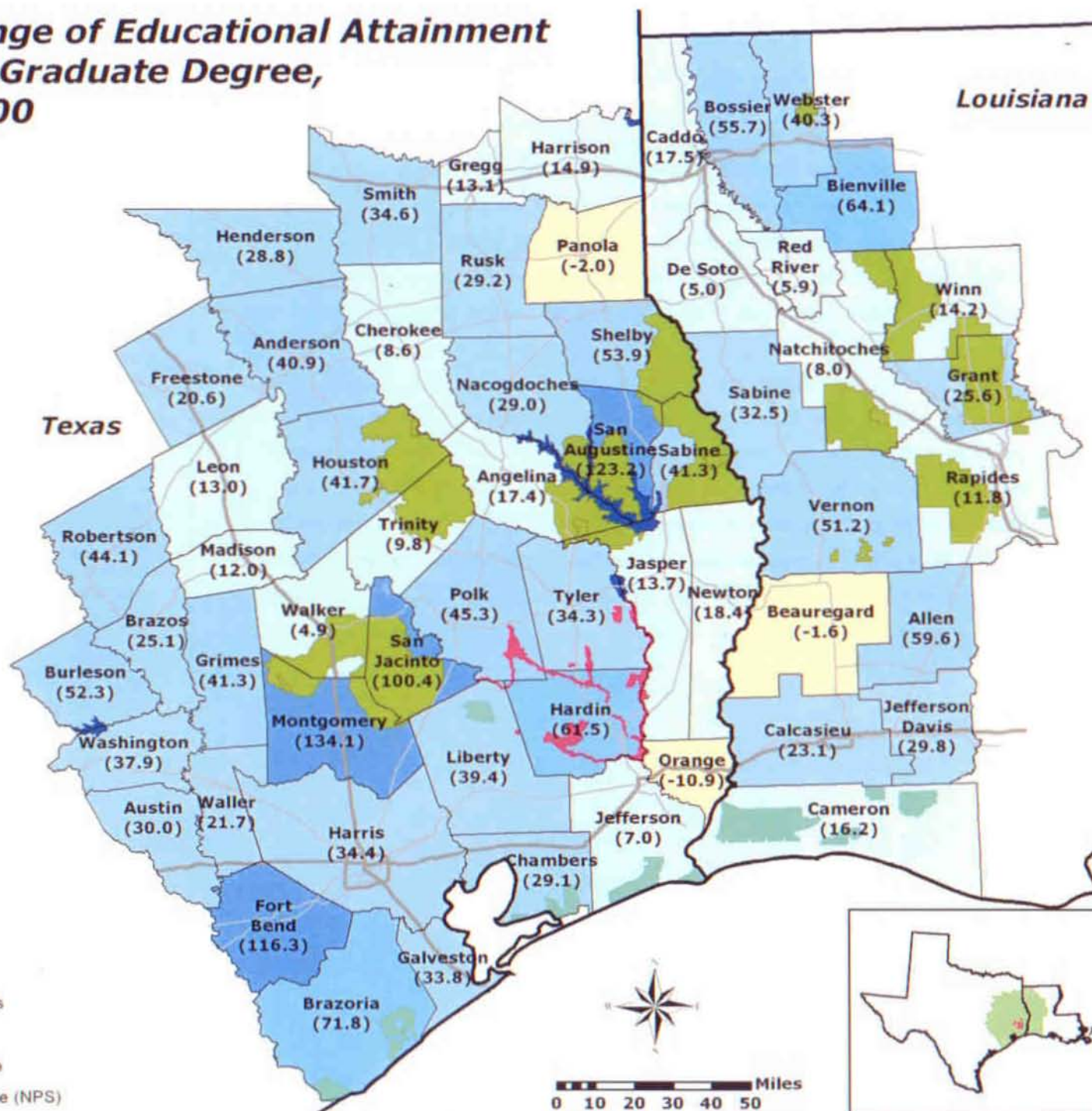


Percent Change of Educational Attainment With Post Graduate Degree, 1990-2000

United States: 40.7
Louisiana: 26.7
Texas: 46.4

Study Area: 37.5

Percent Change



AGE

The age of the surrounding population will have a bearing on management strategies for protected areas. Each group of cohorts will have their own recreational activities, attitudes, expectations and needs. In general, younger people will be more active and adventurous in their actions, while retirees will pursue more traditional activities. Outreach efforts will need to be tailored for the different audience age-groups.

In 2000, the median age of Texans was 32.5 years (U.S. Census Bureau). Four age groups were examined for this report: 18–24 years, 25–44 years, 45–64 years, and those over 65 years of age. All counties around BITH show growth in all categories except for Orange and Jefferson counties to the southeast. These two counties either lost population or made only minimal gains. Counties to the north and west of BITH show the greatest population gains. Hardin County appears popular with people over 45 years old, while Polk, Tyler and Liberty counties attract more people under 45 years old.

DEFINITION:

AGE

The age classification is based on the age of the person in complete years at the time of interview. Both age and date of birth are used in combination to calculate the most accurate age at the time of interview.

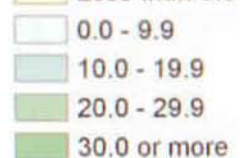
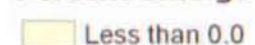
MEDIAN AGE

The median age is the age that divides the population into two equal-size groups. Half of the population is older than the median age and half is younger. Median age is based on a standard distribution of the population by single years of age and is shown to the nearest tenth of a year.

– U.S. Census Bureau

Percent Change in the Population Under Age 18, 1990-2000

United States: 13.7
Louisiana: -0.8
Texas: 21.7
Study Area: 17.5

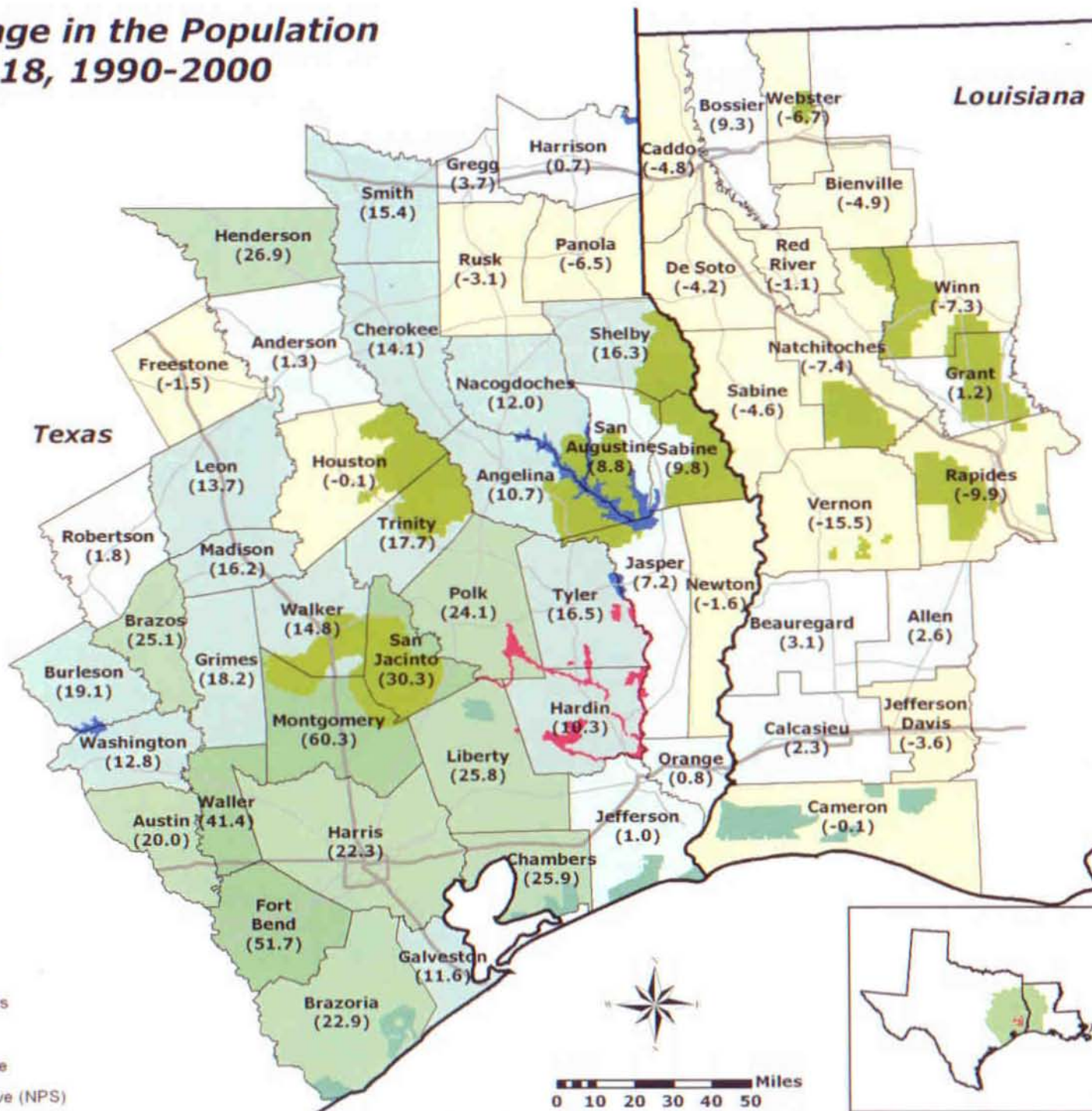


— US Highways

Forest Service

Big Thicket Na

100



Percent Change in the Population Ages 18 to 24, 1990-2000

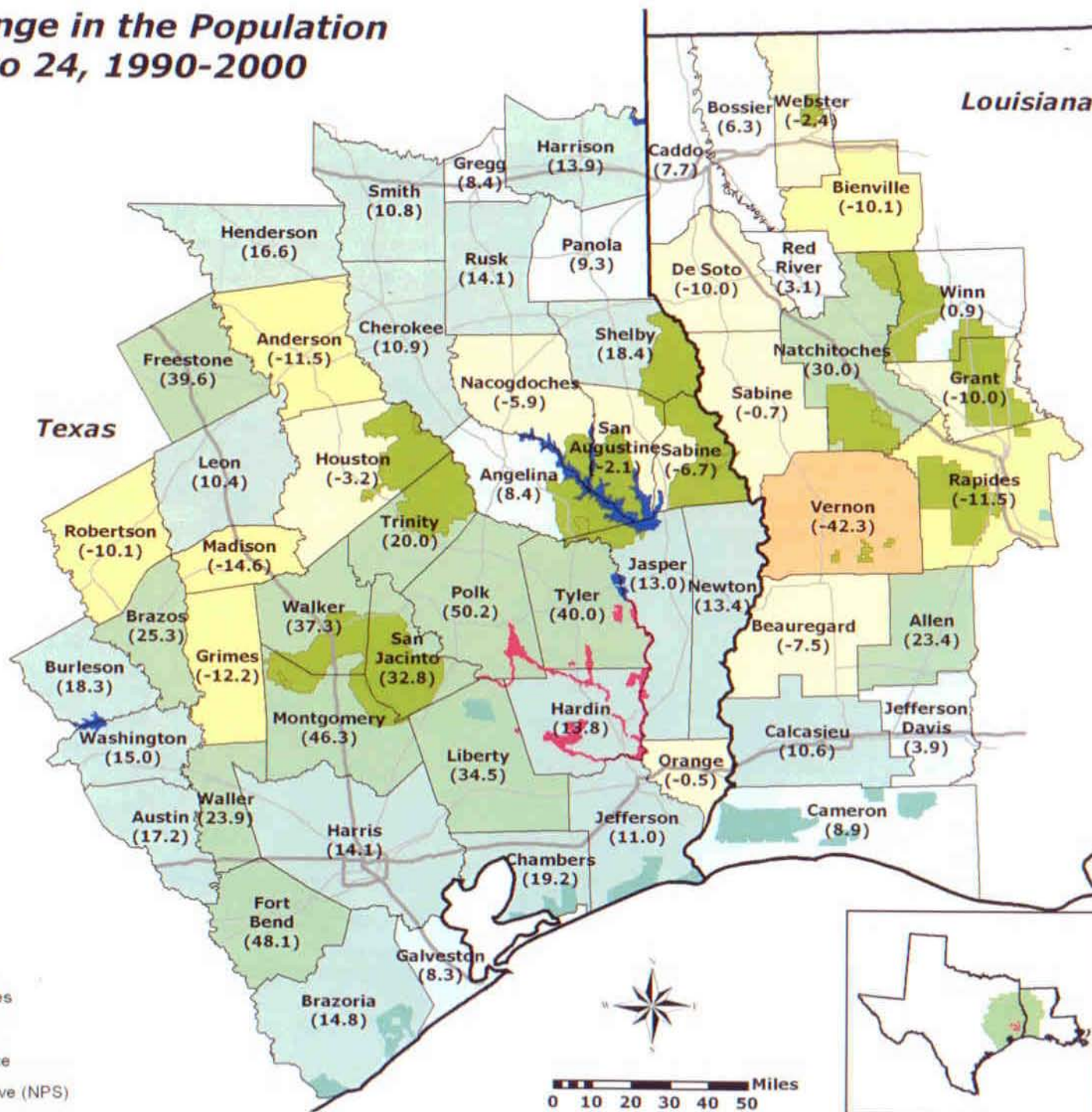
United States: 1.5
Louisiana: 2.0
Texas: 16.3

Study Area: 13.3

Percent Change



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)

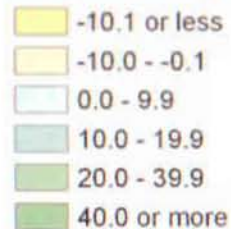


Percent Change in the Population Ages 25 to 44, 1990-2000

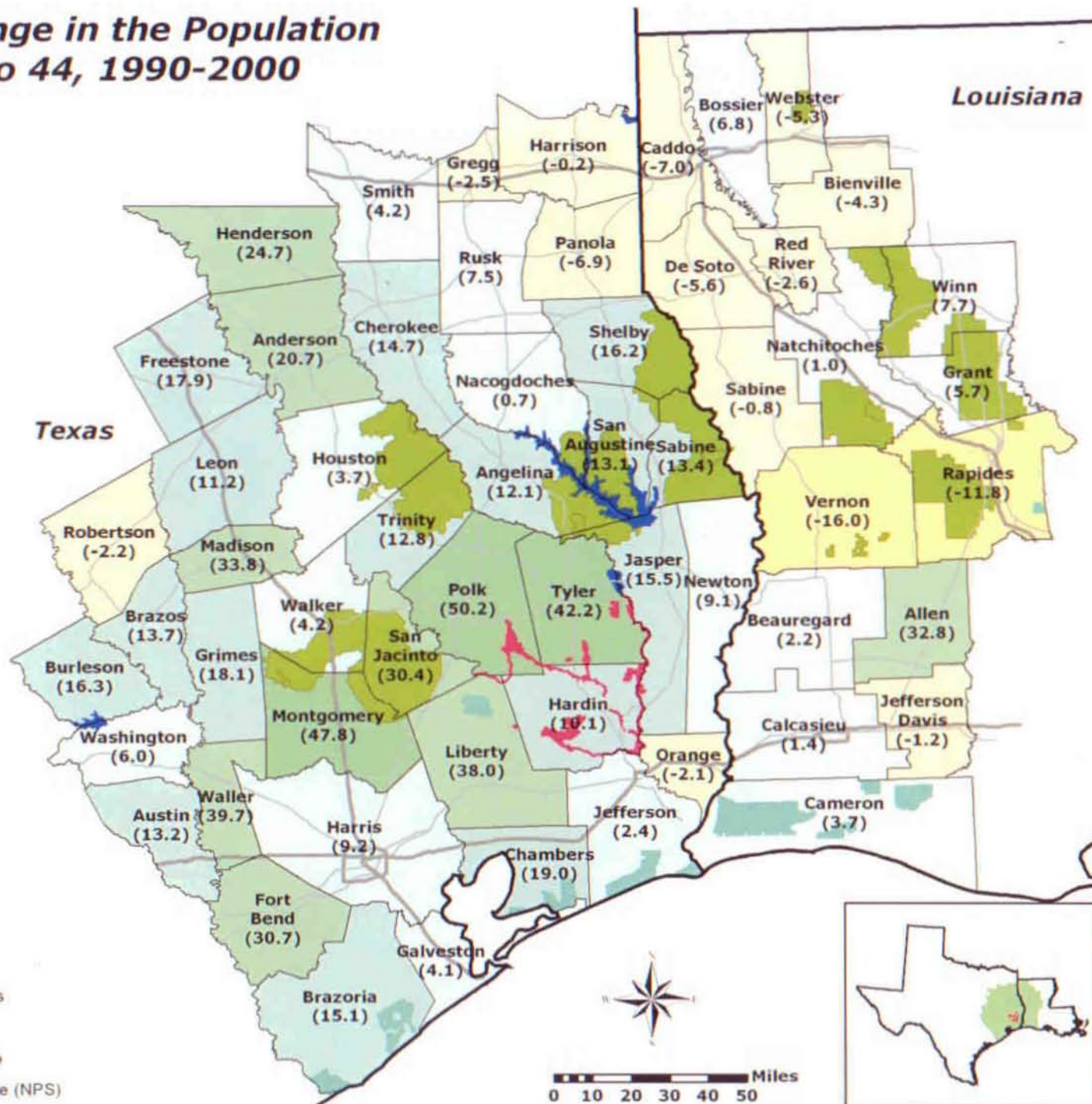
United States: 5.3
Louisiana: -1.3
Texas: 15.3

Study Area: 9.7

Percent Change



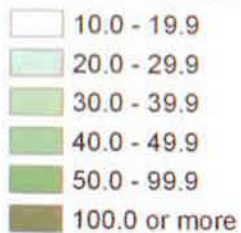
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



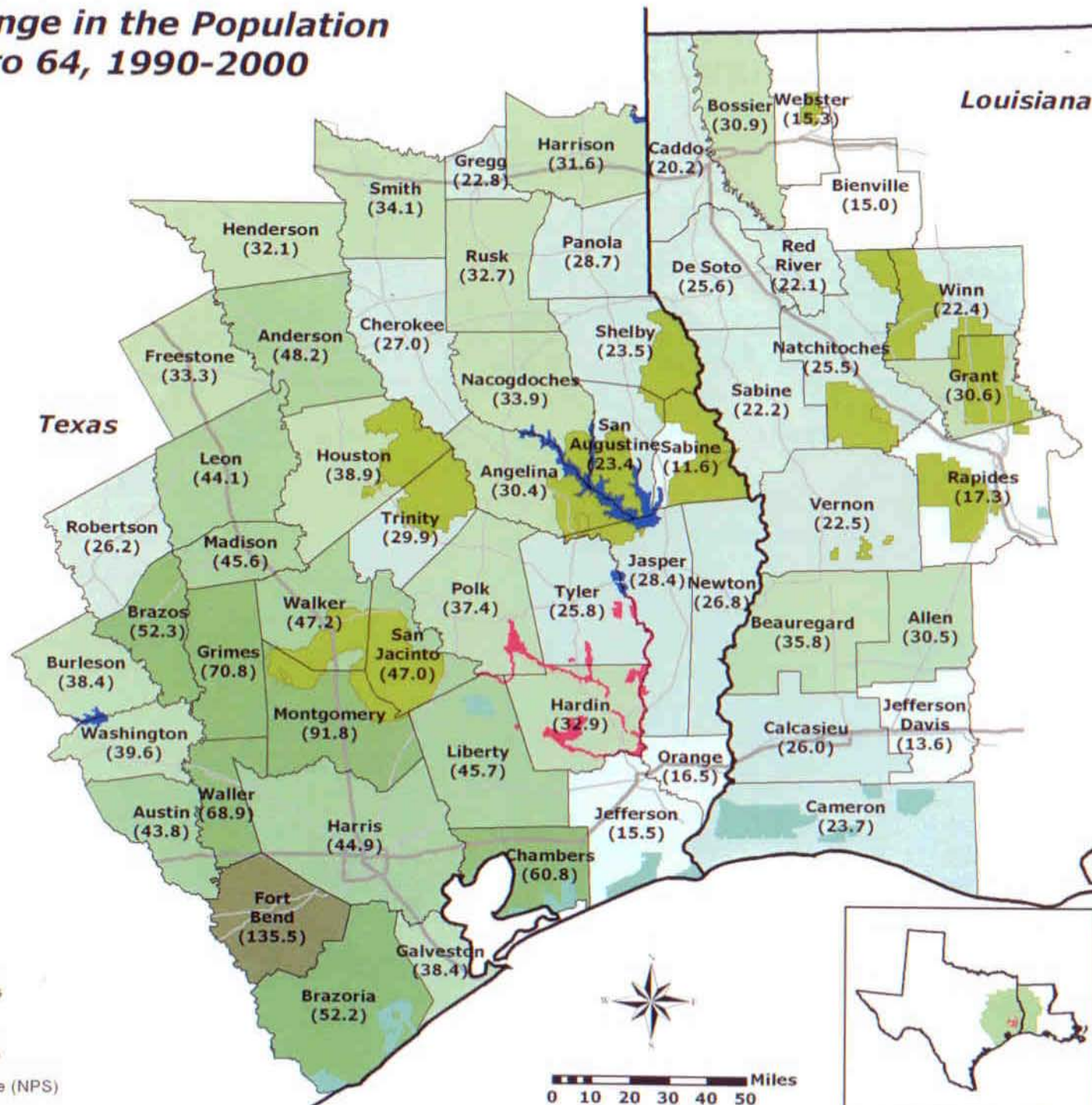
Percent Change in the Population Ages 45 to 64, 1990-2000

United States: 12.0
Louisiana: 10.2
Texas: 20.7
Study Area: 19.6

Percent Change



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in the Population Age 65 and Over, 1990-2000

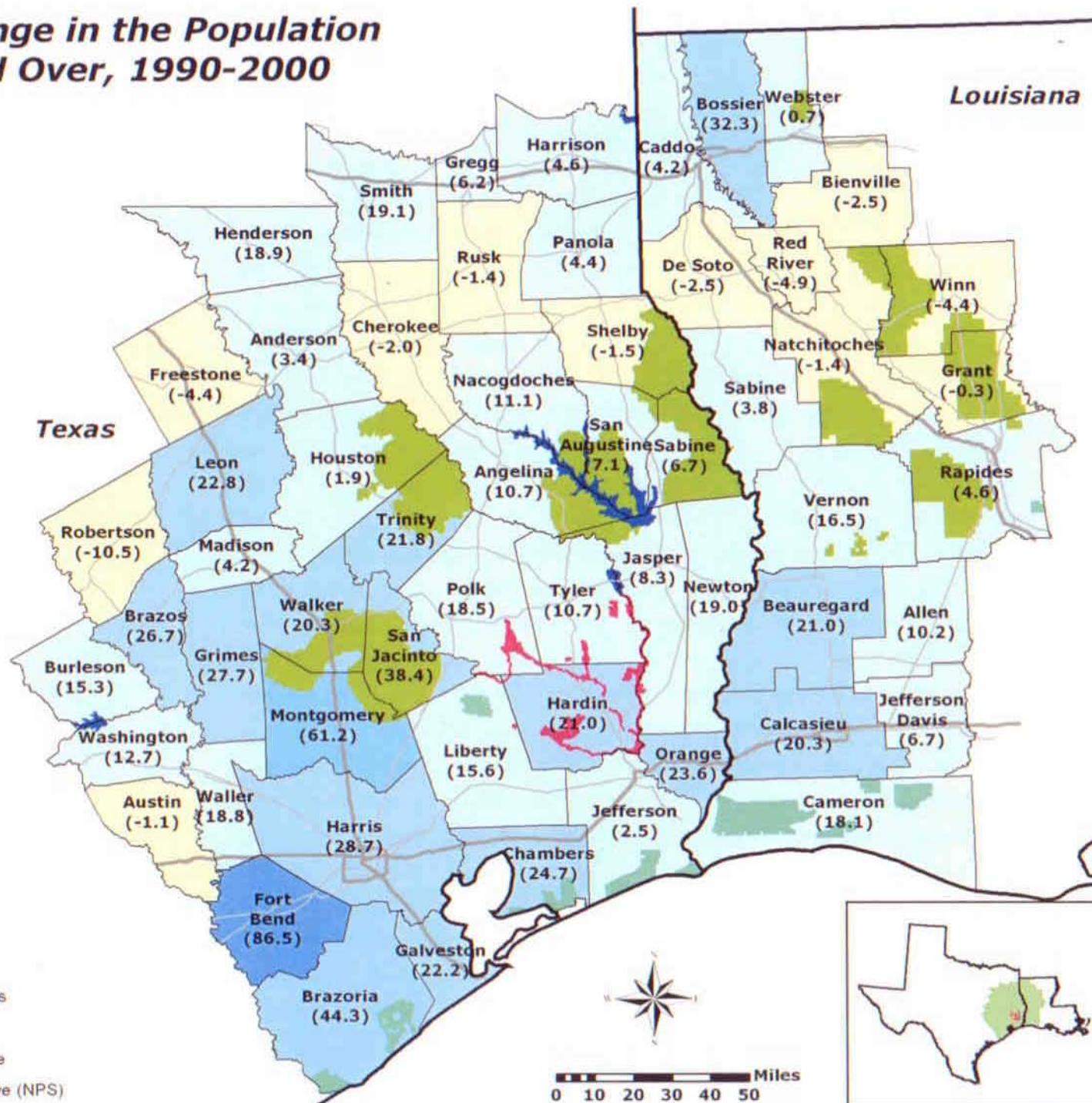
United States: 13.2
Louisiana: 5.9
Texas: 22.8

Study Area: 18.9

Percent Change

- Decline
- Zero - 19.9
- 20.0 - 39.9
- 40.0 - 59.9
- 60.0 - 79.9
- 80.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



INCOME

Income directly affects quality of life issues. Higher incomes provide the resources to move away from the city, often resulting in the sprawl that is fragmenting the countryside. Conversely, the cost of living is usually lower in rural areas than in metropolitan areas enabling those with low incomes to enhance their quality of life through subsistence activities. A disposable income facilitates participation in sports and other recreational activities that require a high investment in equipment, thus expanding the range and type of facilities needed to pursue these activities. R.J. Reeder released a study in 2005 discussing the effects of recreation on rural counties during the 1990s. He found that counties containing recreation opportunities had larger declines in their poverty rates as well as higher earnings per worker than other non-recreation rural counties. Reeder speculates that this may occur because recreation offers the possibility for part-time work and second jobs.

Analysis shows that, since 1990, there has been a strong decline in the number of households earning less than \$25,000 in all counties within the study area. Counties to the southern half of BITH and below have lost over 20% of low income households, while counties to the north have lost over 10% of those households. Conversely, the numbers of households with income of \$25,000 – \$75,000 have increased, in some cases substantially, in the BITH region. Hardin county middle-class households have increased by 35%, while surrounding counties to the southeast have increased by only 10% on average. However, the remaining counties surrounding BITH have increased by a minimum of 50%. Households with income over \$75,000 have also increased throughout the study area. The extreme percentages reflect low numbers of households in this category in 1990, although this strong positive trend bodes well for the communities surrounding BITH.

The percent of change in persons receiving retirement income is also included in this section. There has been an increase in all counties of the study area, with percentage growth of over 50% in Hardin and Polk counties.

DEFINITION:

HOUSEHOLD

A household includes all the people who occupy a housing unit as their usual place of residence.

INCOME

"Total income" is the sum of the amounts reported separately for wages, salary, commissions, bonuses, or tips; self-employment income from nonfarm or farm businesses, including proprietorships and partnerships; interest, dividends, net rental income, royalty income, or income from estates and trusts; Social Security or Railroad Retirement income; Supplemental Security Income (SSI); any public assistance or welfare payments from the state or local welfare office; retirement, survivor, or disability pensions; and any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony.

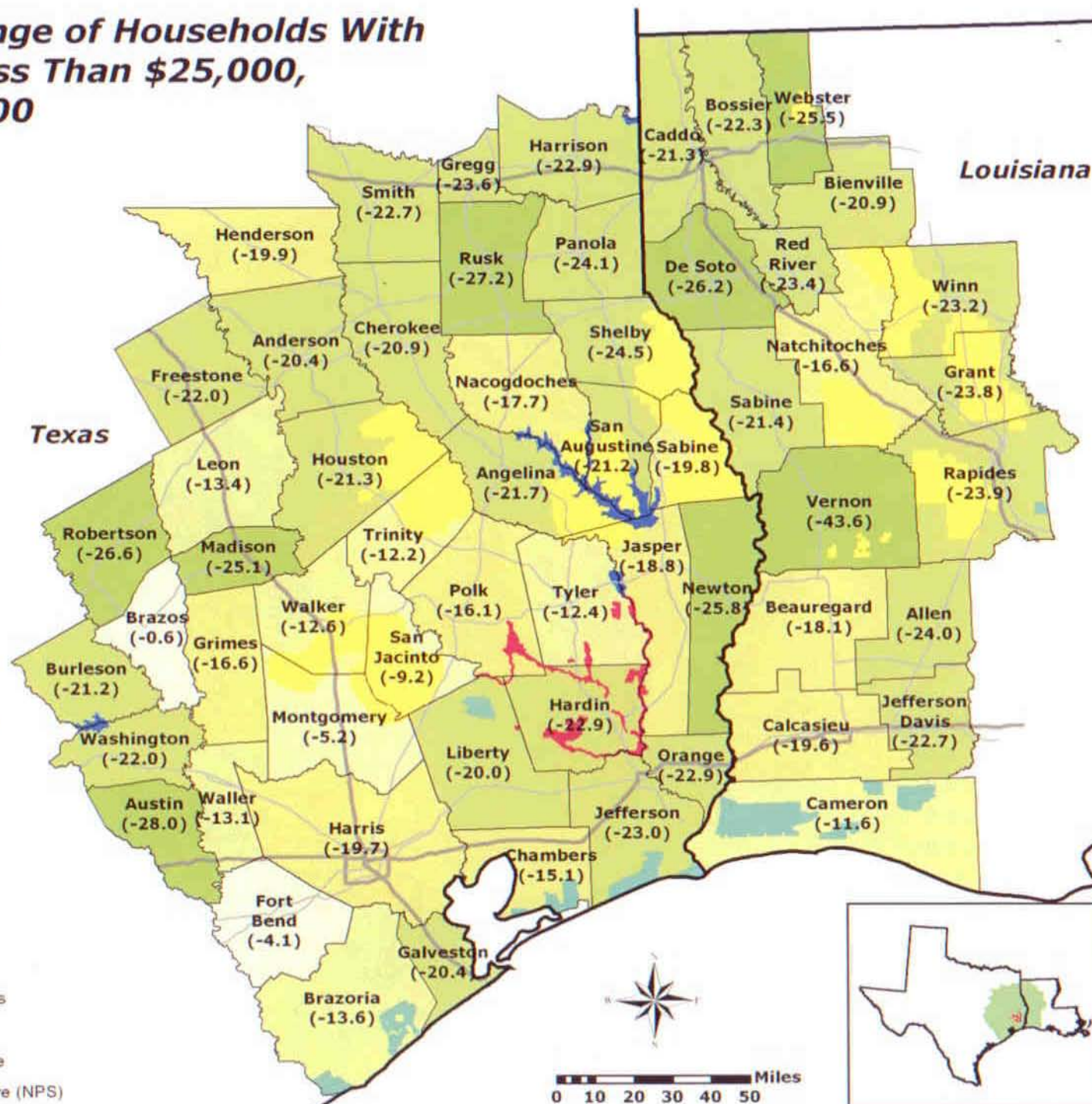
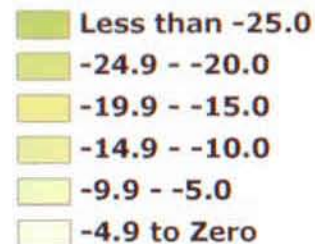
– U.S. Census Bureau

Percent Change of Households With Income Less Than \$25,000, 1990-2000

United States: -21.3
Louisiana: -21.5
Texas: -19.6

Study Area: -19.6

Percent Change

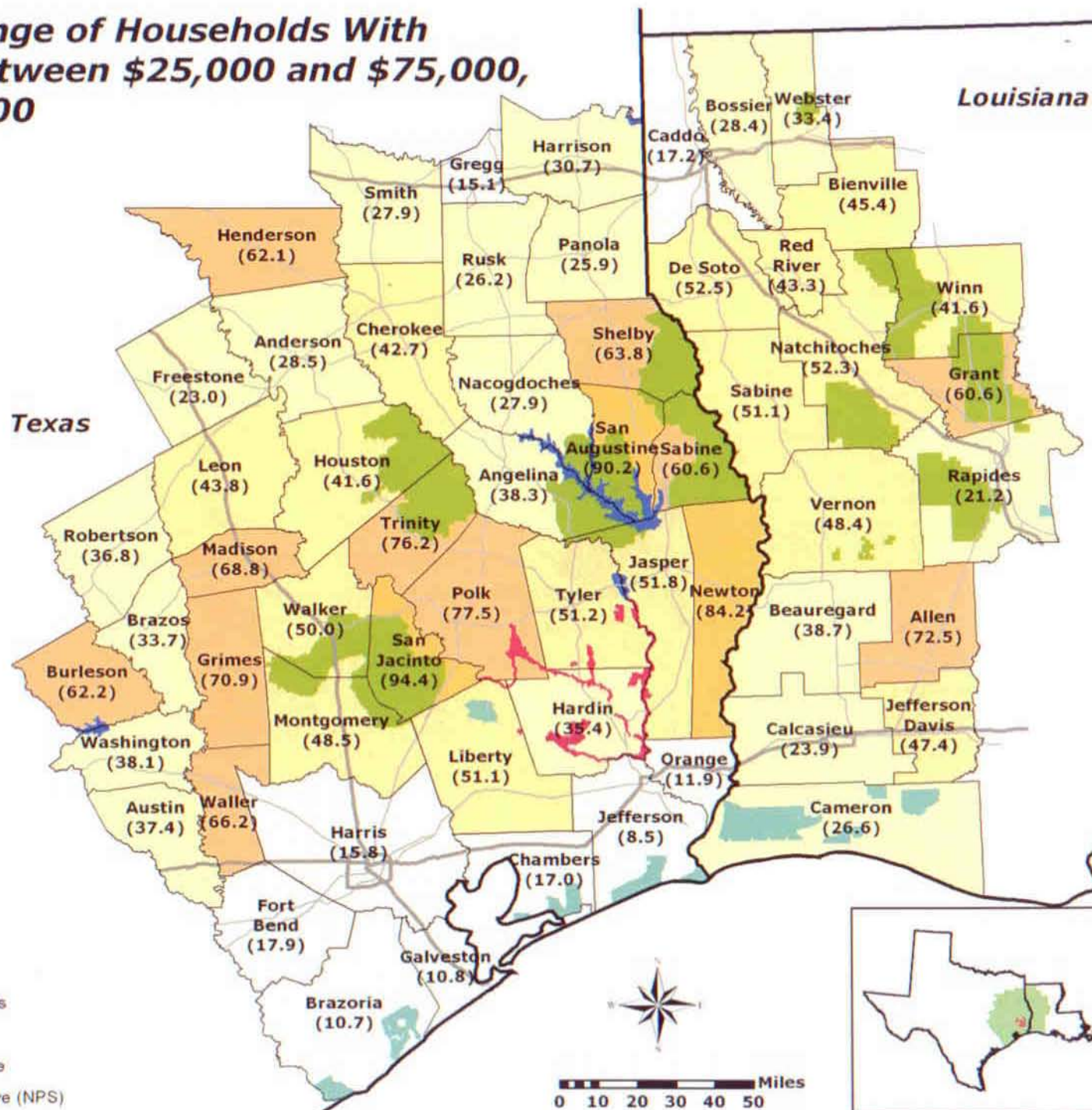
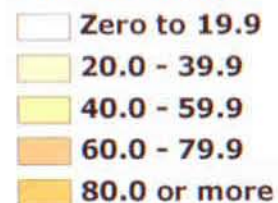


Percent Change of Households With Income Between \$25,000 and \$75,000, 1990-2000

United States: 15.0
Louisiana: 27.5
Texas: 28.8

Study Area: 22.1

Percent Change



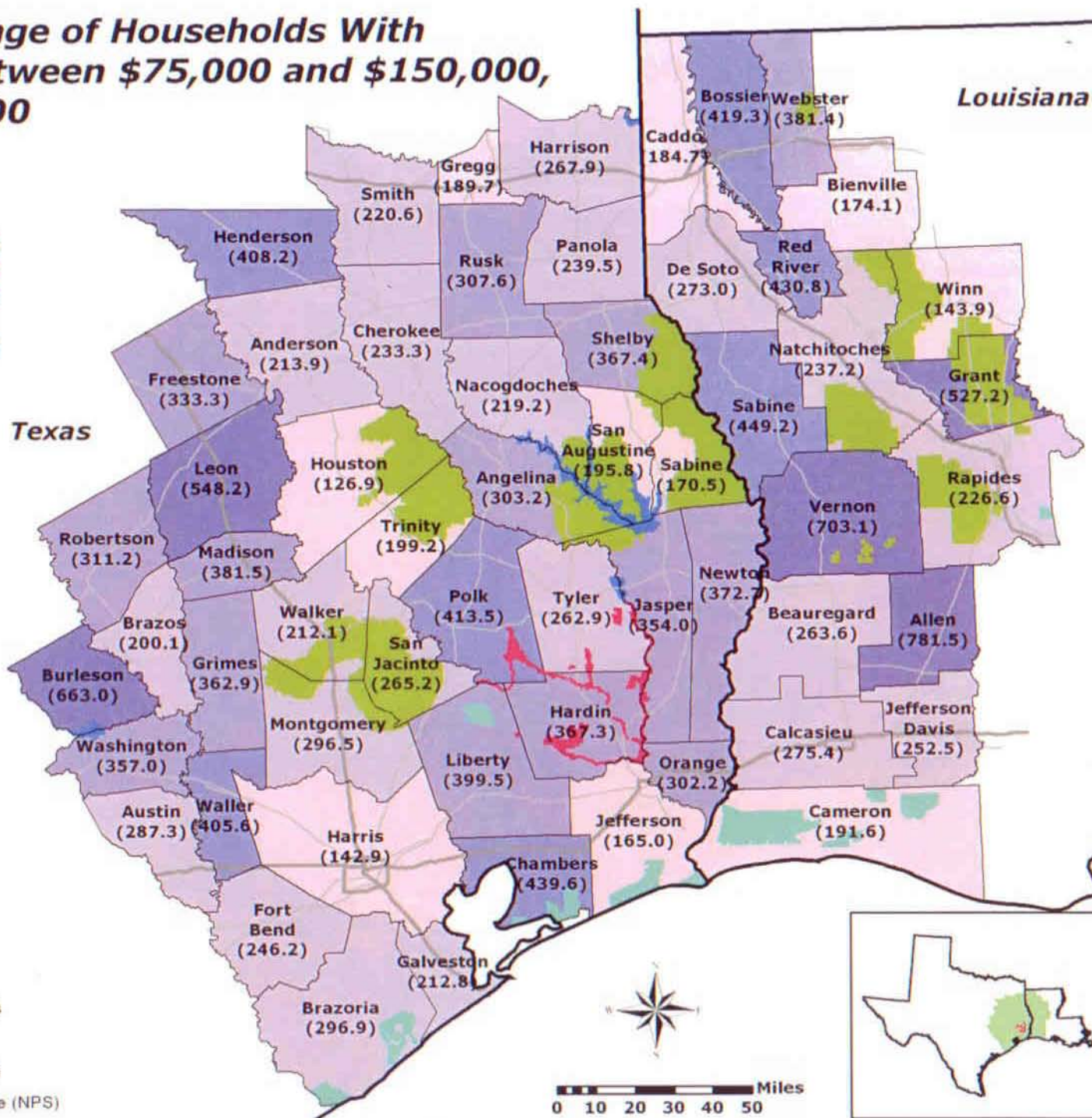
Percent Change of Households With Income Between \$75,000 and \$150,000, 1990-2000

United States: 159.6
Louisiana: 228.5
Texas: 208.2
Study Area: 187.5

Percent Change

- 100.0 - 199.9
- 200.0 - 299.9
- 300.0 - 399.9
- 400.0 - 499.9
- 500.0 or more

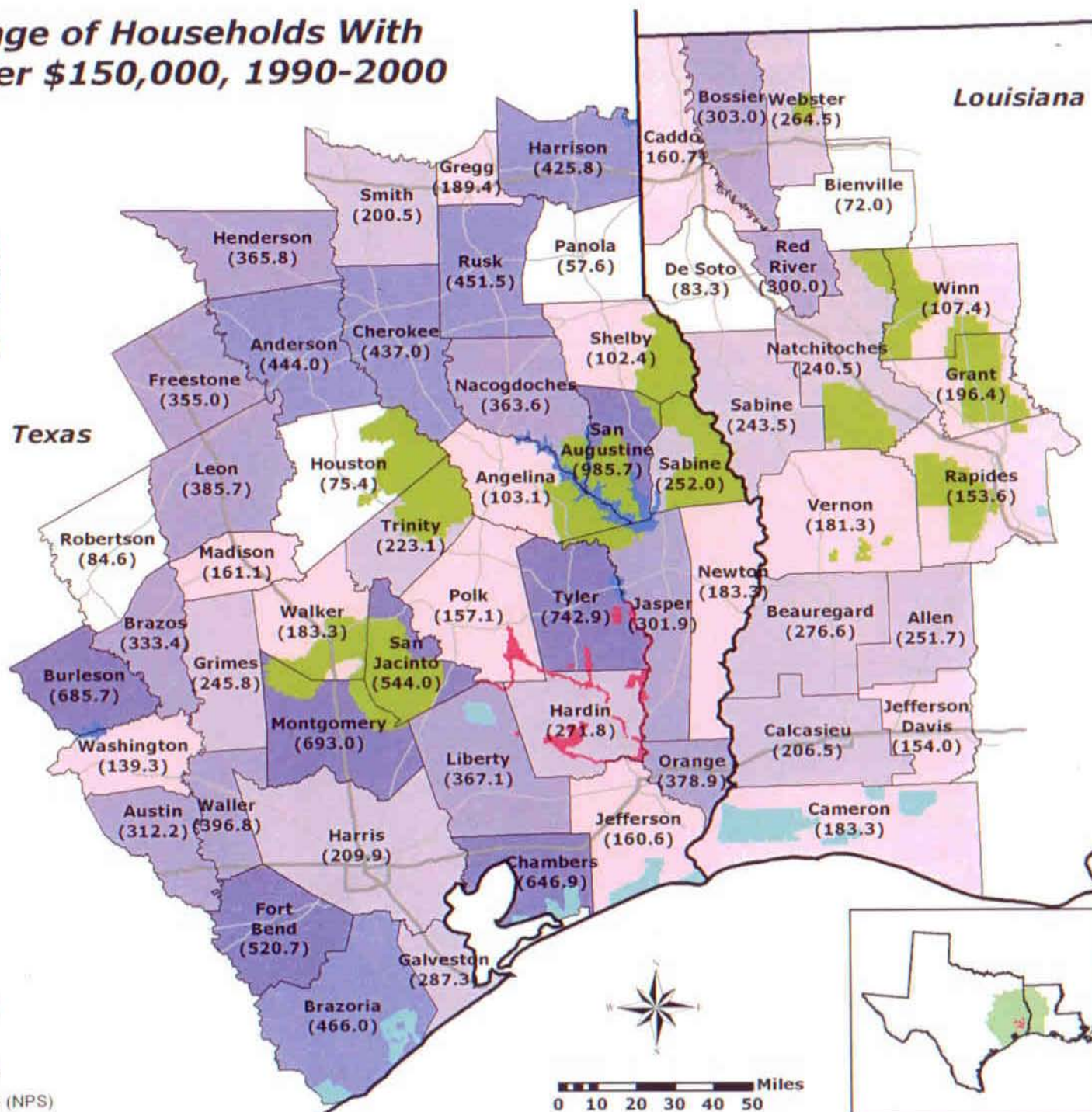
— Interstate Highways
— US Highways
■ Corps of Engineer Lakes
■ Forest Service
■ Fish and Wildlife Service
■ Big Thicket Natl Preserve (NPS)



Percent Change of Households With Income Over \$150,000, 1990-2000

United States: 234.6
Louisiana: 197.2
Texas: 273.2
Study Area: 248.8

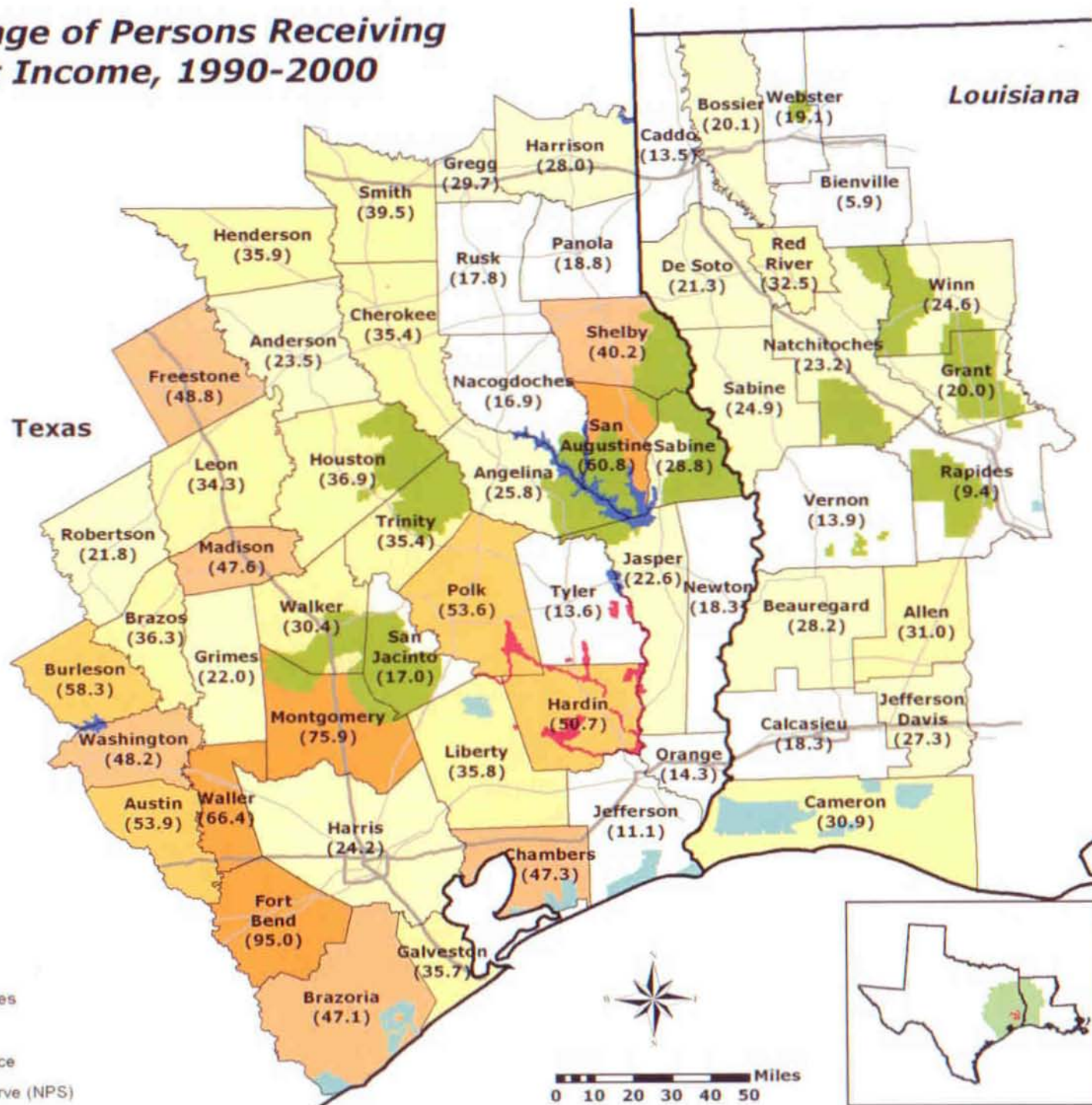
Percent Change



Percent Change of Persons Receiving Retirement Income, 1990-2000

United States: 23.0
Louisiana: 19.1
Texas: 32.2
Study Area: 28.2

Percent Change



HOUSING

The escalating cost of housing in an area combined with an increasing population signals economic growth for an area, often accompanied by sprawl and the subdivision of previously intact habitat. This fragmentation negatively impacts the biodiversity of the region, resulting in the loss of species richness while fostering the introduction of non-native and invasive plants. Alteration to the hydrology and other ecological services can also be impacted, not only at the building sites, but at proximate sites, including neighboring protected areas.

Maps of the counties surrounding BITH reveal that housing valued at less than \$100,000 has generally declined over the past decade, with only a few counties showing a modest gain. This particular map has a very different range of percentages from the other housing maps. Therefore, it cannot be directly compared to the other maps. There is evidence, however, of more expensive housing being built more frequently in all the immediate counties around BITH. These maps have similar color ranges and can be easily compared to each other. This map section also contains a comparison of owner-occupied housing versus rental housing. While both types of housing have increased, there is a greater increase in owner-occupied housing for all counties surrounding BITH.

DEFINITION:

HOUSING UNIT

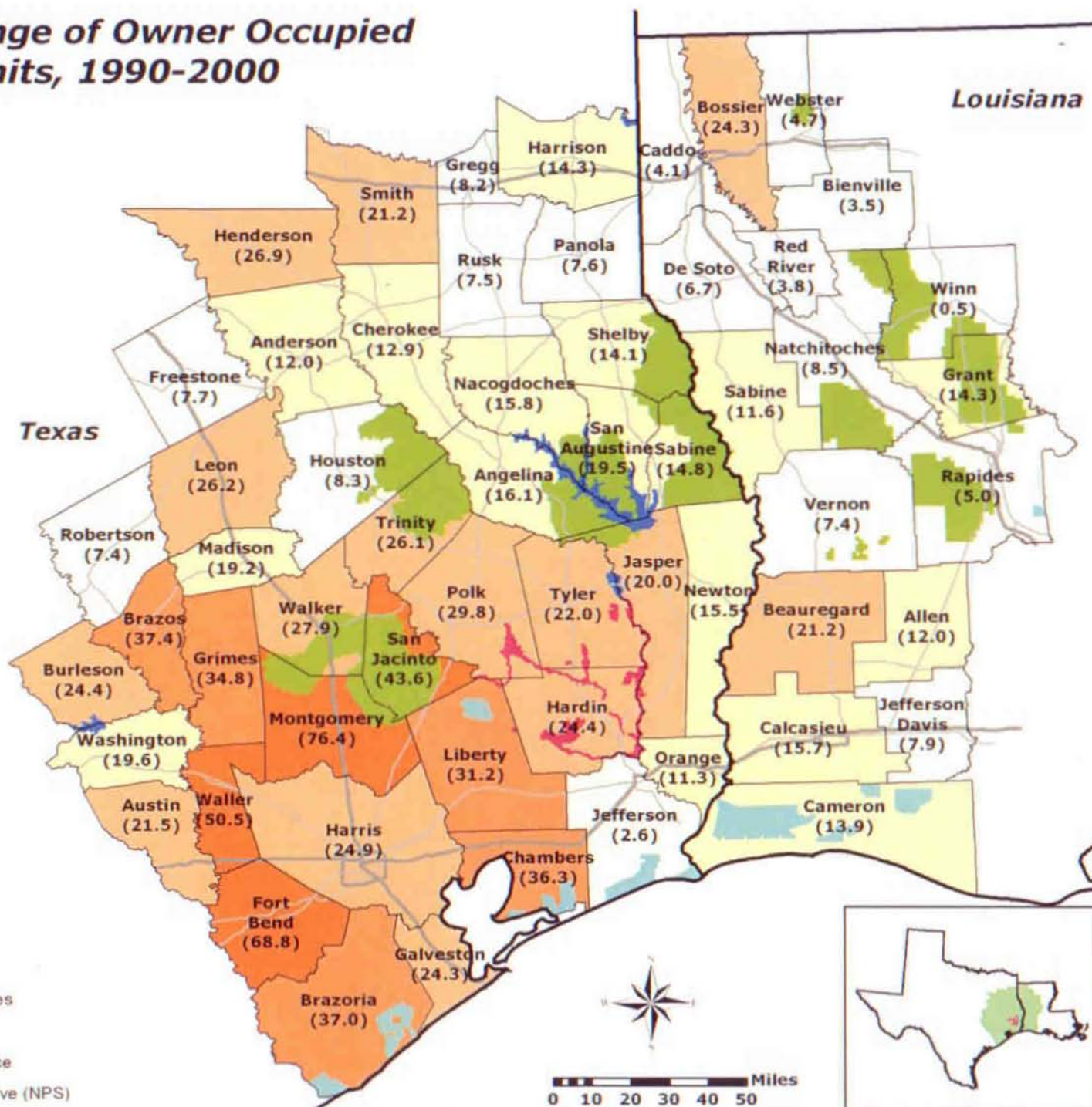
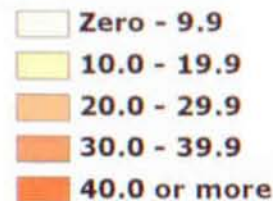
A house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have direct access from outside the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible.

– U.S. Census Bureau

Percent Change of Owner Occupied Housing Units, 1990-2000

United States: 18.3
Louisiana: 13.9
Texas: 27.7
Study Area: 23.9

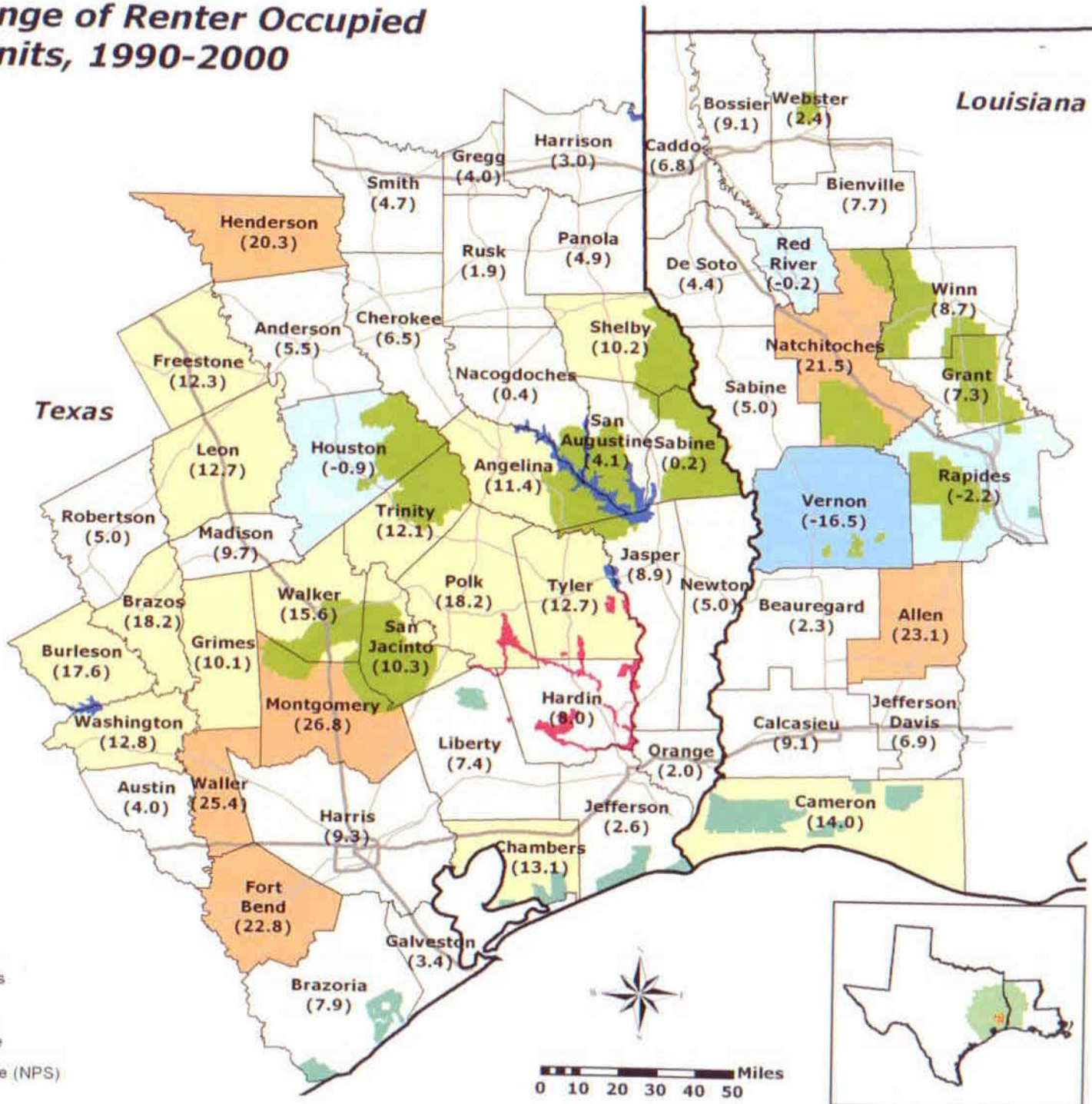
Percent Change



Percent Change of Renter Occupied Housing Units, 1990-2000

United States: 8.3
Louisiana: 3.8
Texas: 12.7

Study Area: 8.9



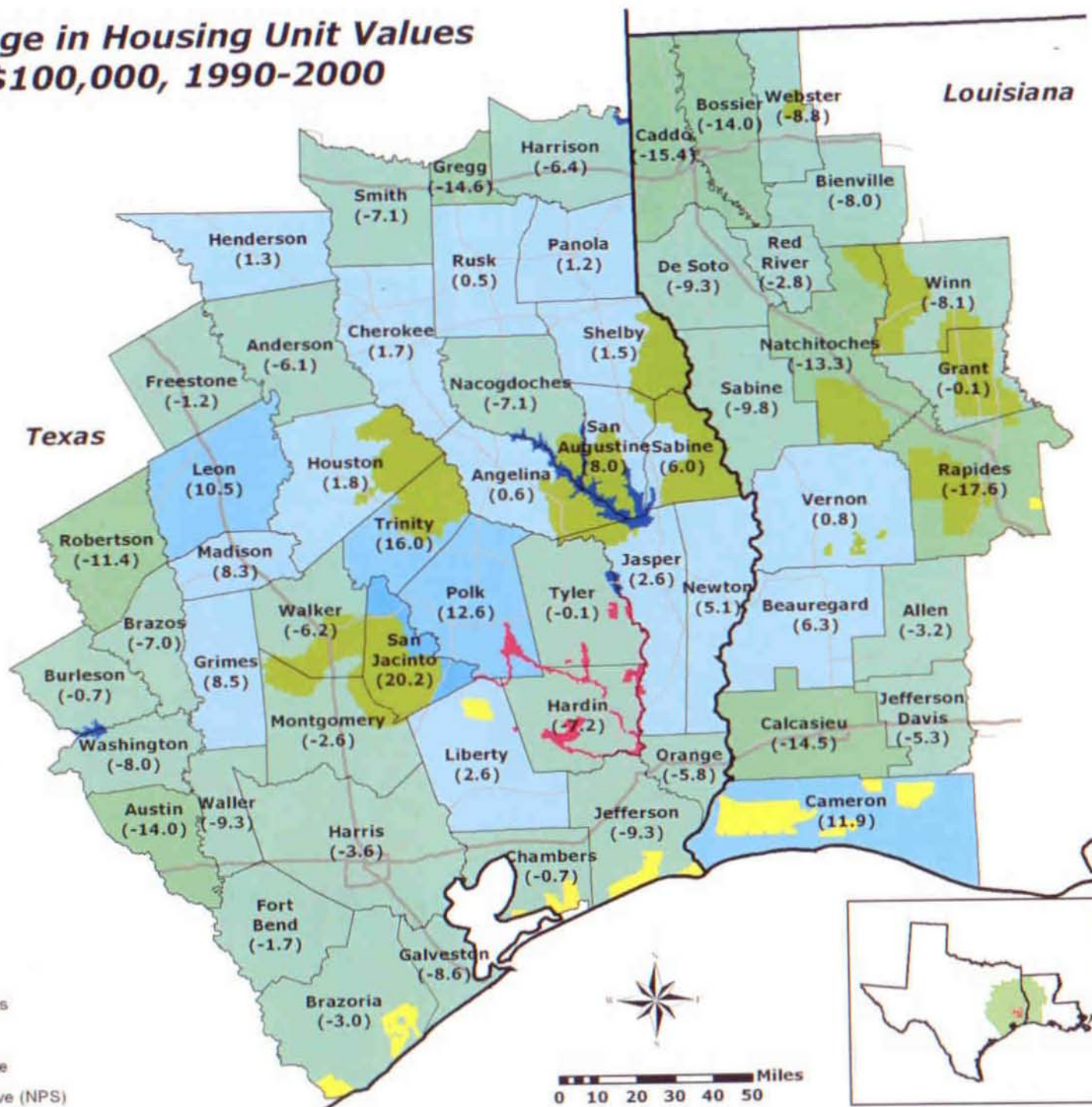
Percent Change in Housing Unit Values Less Than \$100,000, 1990-2000

United States: -23.1
Louisiana: -16.8
Texas: -1.4
Study Area: -5.4

Percent Change

- Less than -10.0
- 9.9 - -0.1
- Zero - 9.9
- 10.0 - 19.9
- 20.0 or more

— Interstate Highways
— US Highways
■ Corps of Engineer Lakes
■ Forest Service
■ Fish and Wildlife Service
■ Big Thicket Natl Preserve (NPS)



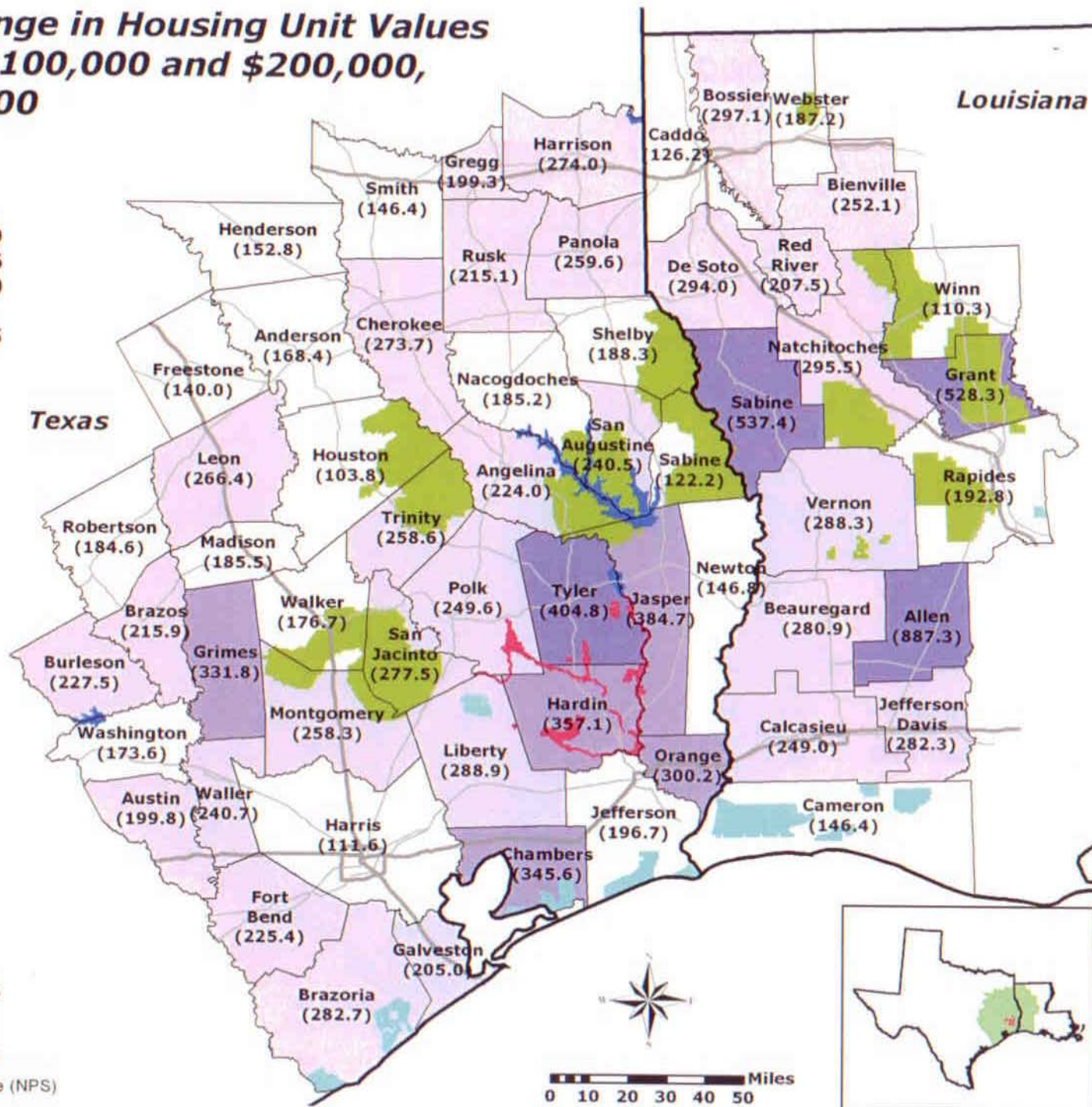
Percent Change in Housing Unit Values Between \$100,000 and \$200,000, 1990-2000

United States: 94.9
Louisiana: 207.6
Texas: 143.0
Study Area: 158.5

Percent Change

- 100 - 199
- 200 - 299
- 300 - 399
- 400 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



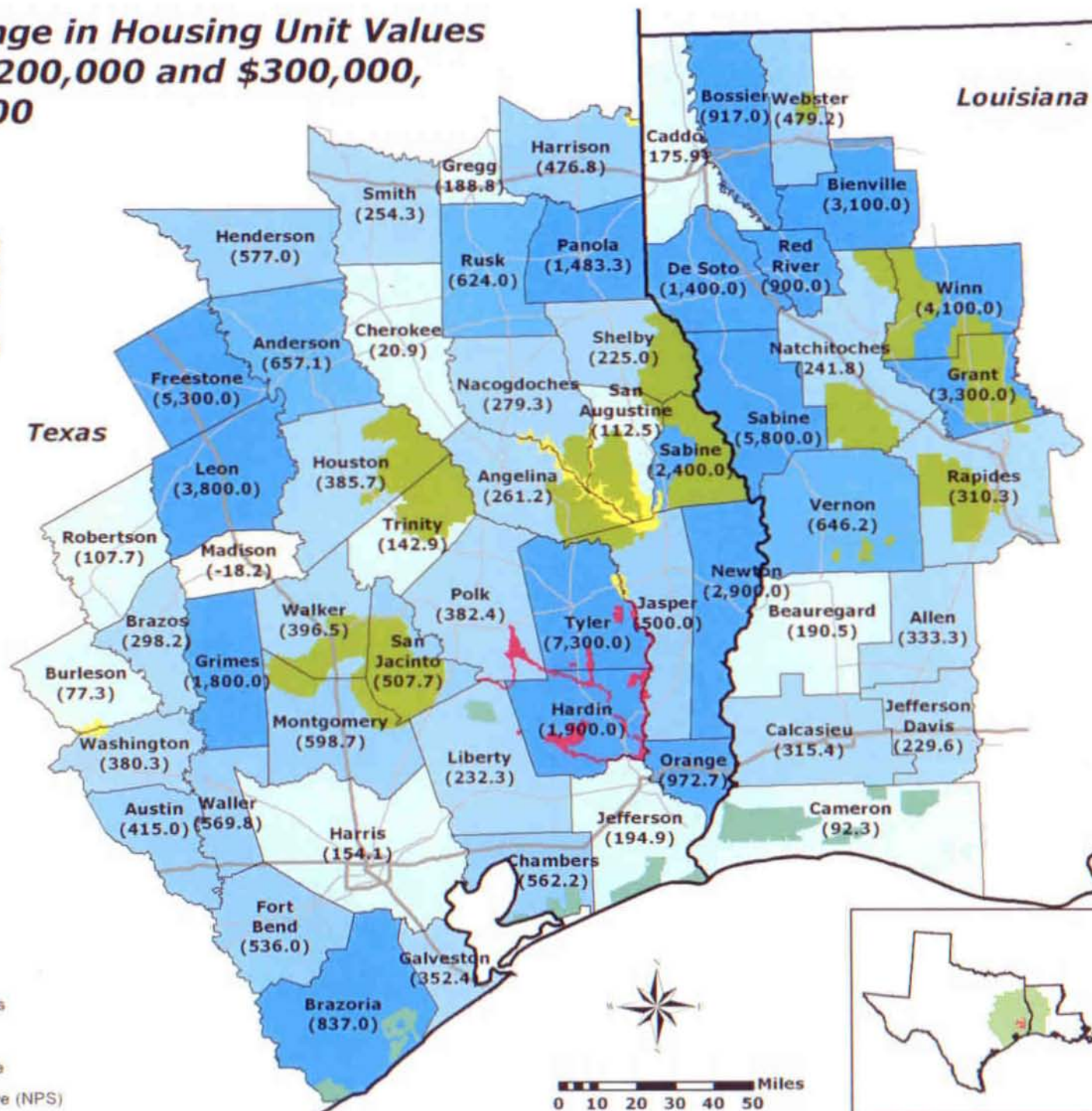
Percent Change in Housing Unit Values Between \$200,000 and \$300,000, 1990-2000

United States: 94.3
Louisiana: 330.6
Texas: 244.2
Study Area: 243.5

Percent Change

- Decline
- Zero - 199
- 200 - 399
- 400 - 599
- 600 - 799
- 800 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in Housing Unit Values Between \$300,000 and \$500,000, 1990-2000

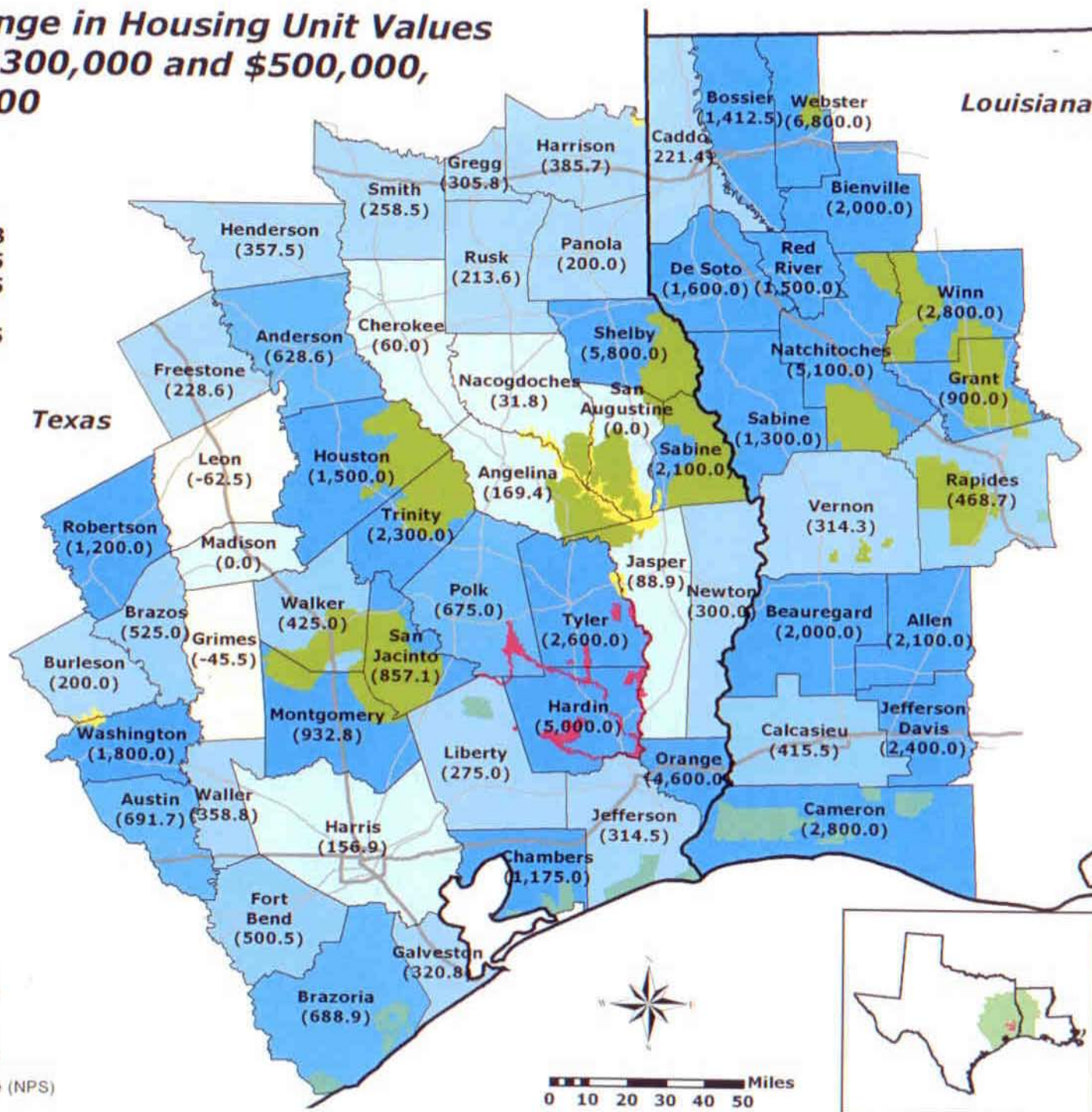
United States: 109.8
Louisiana: 326.5
Texas: 246.5

Study Area: 233.5

Percent Change

- Decline
- Zero - 199
- 200 - 399
- 400 - 599
- 600 - 799
- 800 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



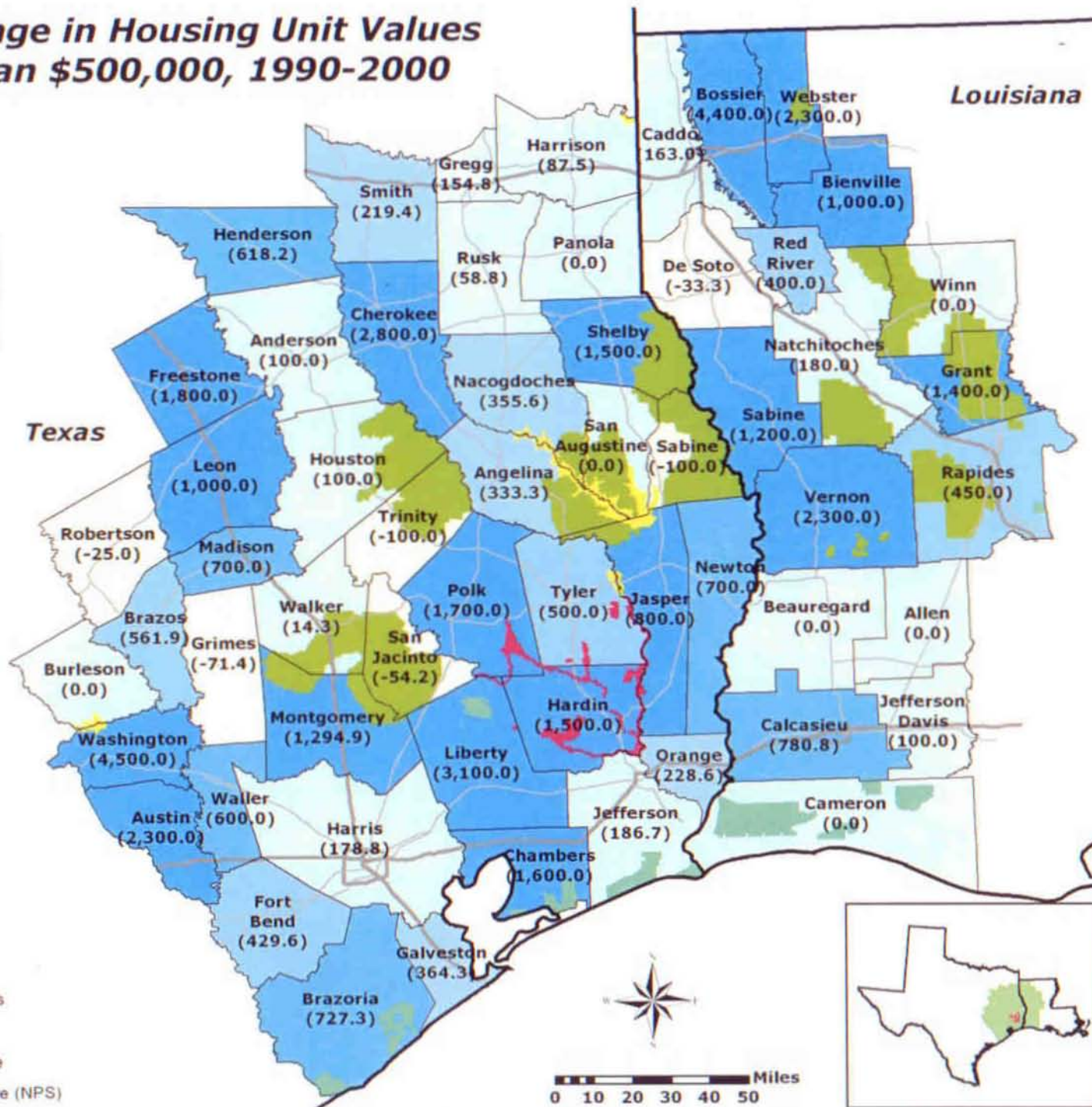
Percent Change in Housing Unit Values Greater Than \$500,000, 1990-2000

United States: 139.1
Louisiana: 404.4
Texas: 245.0
Study Area: 221.7

Percent Change

- Decline
- Zero to 199
- 200 - 399
- 400 - 599
- 600 - 799
- 800 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



FARM ACREAGE

The Census Bureau defines farm acreage as agricultural land used for crops, pasture, or grazing. Also woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator's total operation; acres set aside under annual commodity acreage programs as well as acres in the Conservation Reserve and Wetlands Reserve Programs; land owned and operated as well as land rented from others; and all grazing land, except land used under government permits on a per-head basis, provided it is part of a farm or ranch. (U.S. Census Bureau, 2004).

Conversion of agricultural open space to other uses arguably has the greatest impact on the wildland-urban interface and directly affects protected area management and increases the opportunity for conflict. Effects include:

- Increased vectors for insect and disease impact on protected **land health**
- Changes in protected **land management** practices, including increased difficulty of using prescribed burns as a management tool
- **Fragmentation** of the homogenous tracts increases ecotones or edge and impacts biodiversity
- Increased opportunity for the introduction of **non-native species**, including invasive plants
- Changes in the **hydrology** through land recontouring, siltation and channelization
- Increased **impervious cover** and non-point source pollution
- Shifting **political boundaries**, zoning changes and increased stakeholders
- Change of land **owner attitude** and values as retirees and suburbanites replace farmers and increase in number
- Outreach & stakeholder education, Increased need for stakeholder education and outreach

Interestingly enough, except for those counties between BITH and Houston, counties in and around BITH have gained farm acreage. While the percentages of agricultural land gains are great, the actual existing acreage is quite small, often accounting for less than 10% of the county.

DEFINITION:

FARM

Any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year. A place not having sufficient sales to qualify as a farm may qualify with potential sales based on livestock inventory and acres of crops harvested.

LAND IN FARMS

The acreage designated as "land in farms" consists primarily of agricultural land used for crops, pasture, or grazing. It also includes woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator's total operation. Large acreages of woodland or wasteland held for nonagricultural purposes were deleted from individual reports during the processing operations. Land in farms includes acres in the Conservation Reserve and Wetlands Reserve Programs.

— U.S. Census Bureau

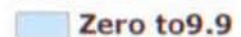
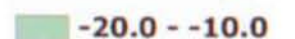
Percent Change of Land in Farms (Acres), 1992-2002

United States: -0.8

Louisiana: -0.1

Texas: -0.8

Study Area: 8.2



— Interstate Highways

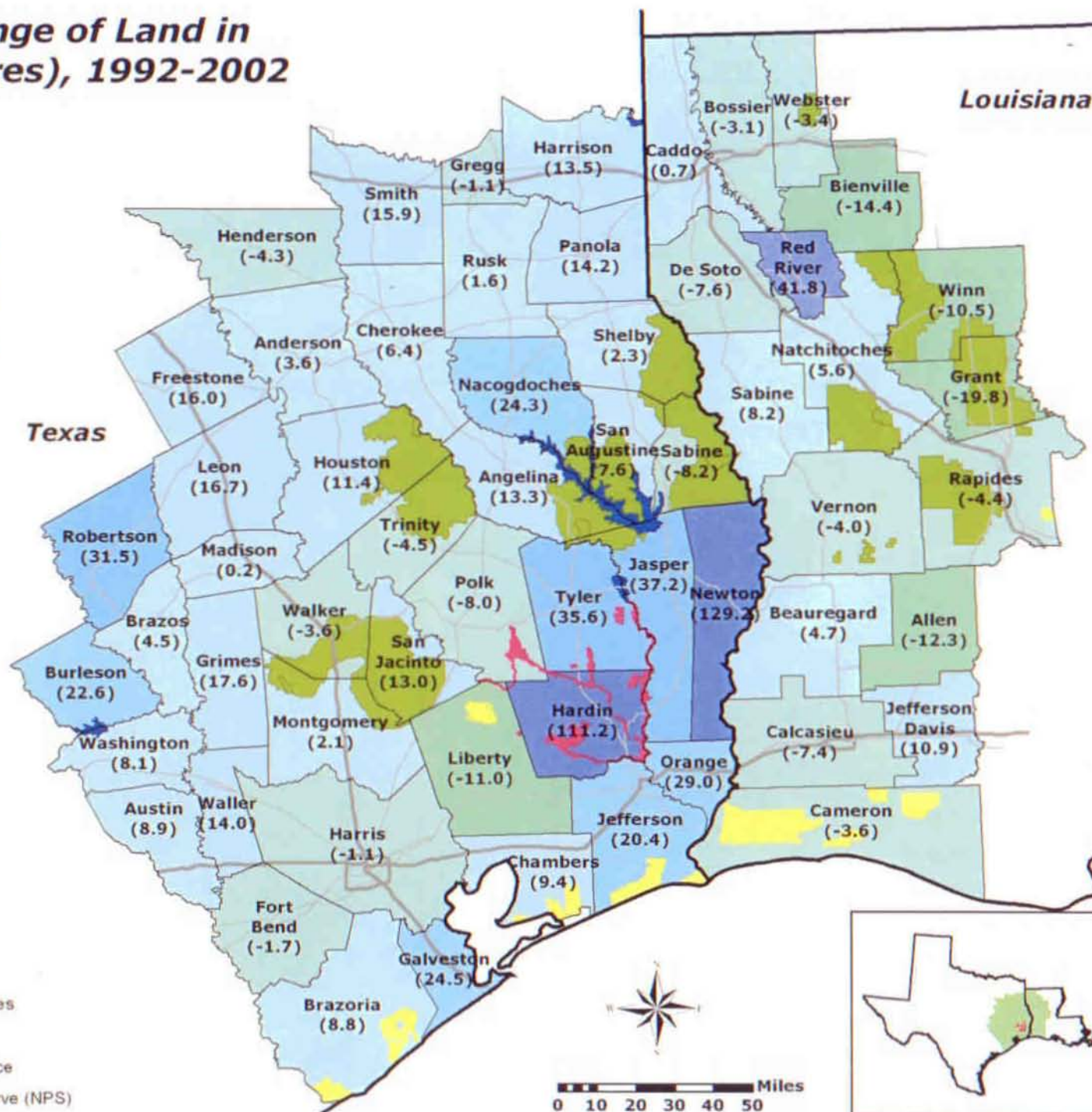
—— US Highways

Corps of Engineer Lakes

Forest Service

Fish and Wildlife Service

Big Thicket Natl Preserve (NPS)



Percentage of Land in Farms (Acres), 1992

United States: 38.9
Louisiana: 23.6
Texas: 76.1

Study Area: 35.4

☐ Zero to 19.9

20.0 - 39.9

40.0 - 59.9

60.0 - 79.9

80.0 or more

—— Interstate Highways

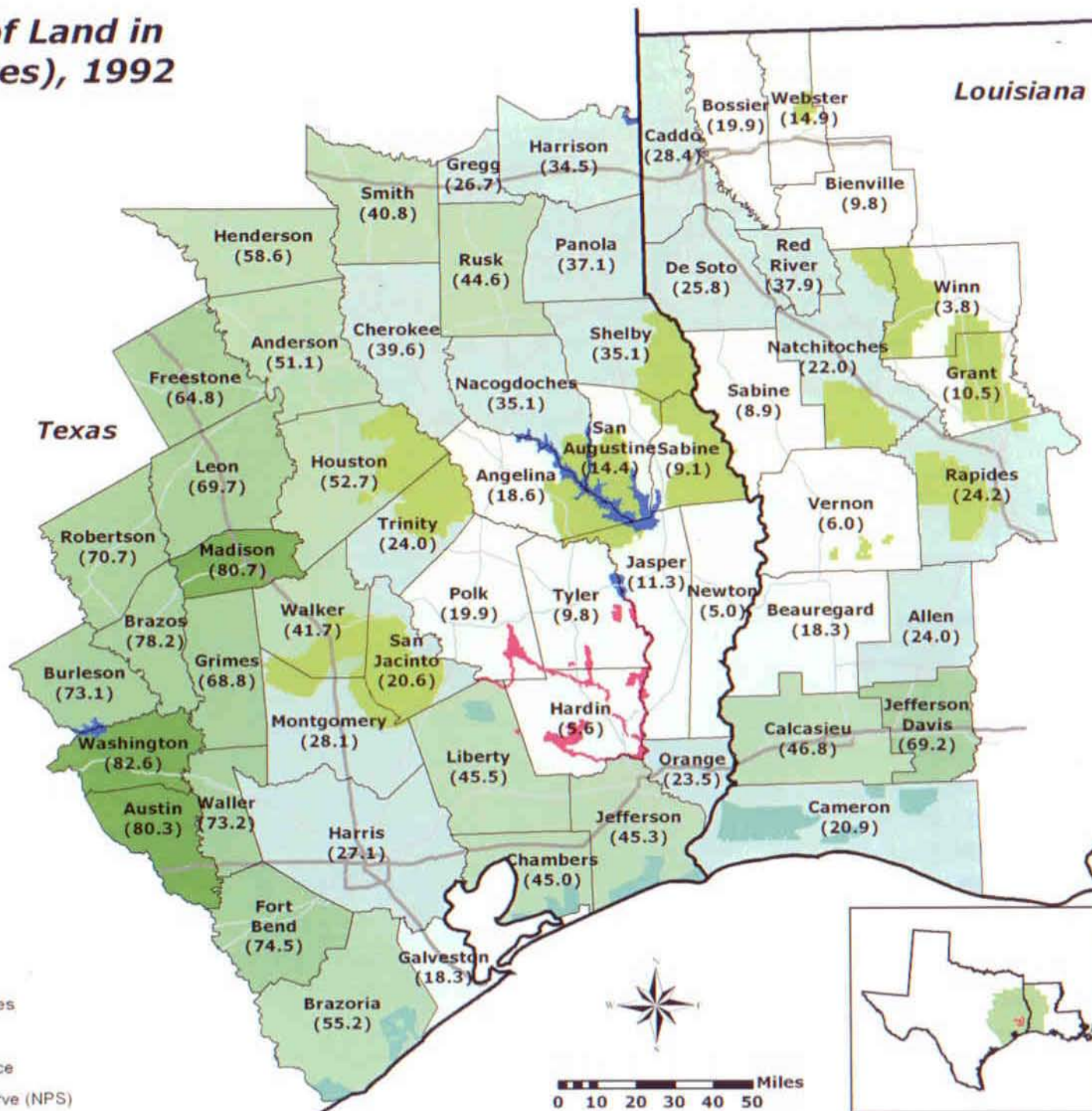
US Highways

Corps of Engineer Lakes

Forest Service

Fish and Wildlife Service

Big Thicket Natl Preserve (NPS)



Percentage of Land in Farms (Acres), 2002

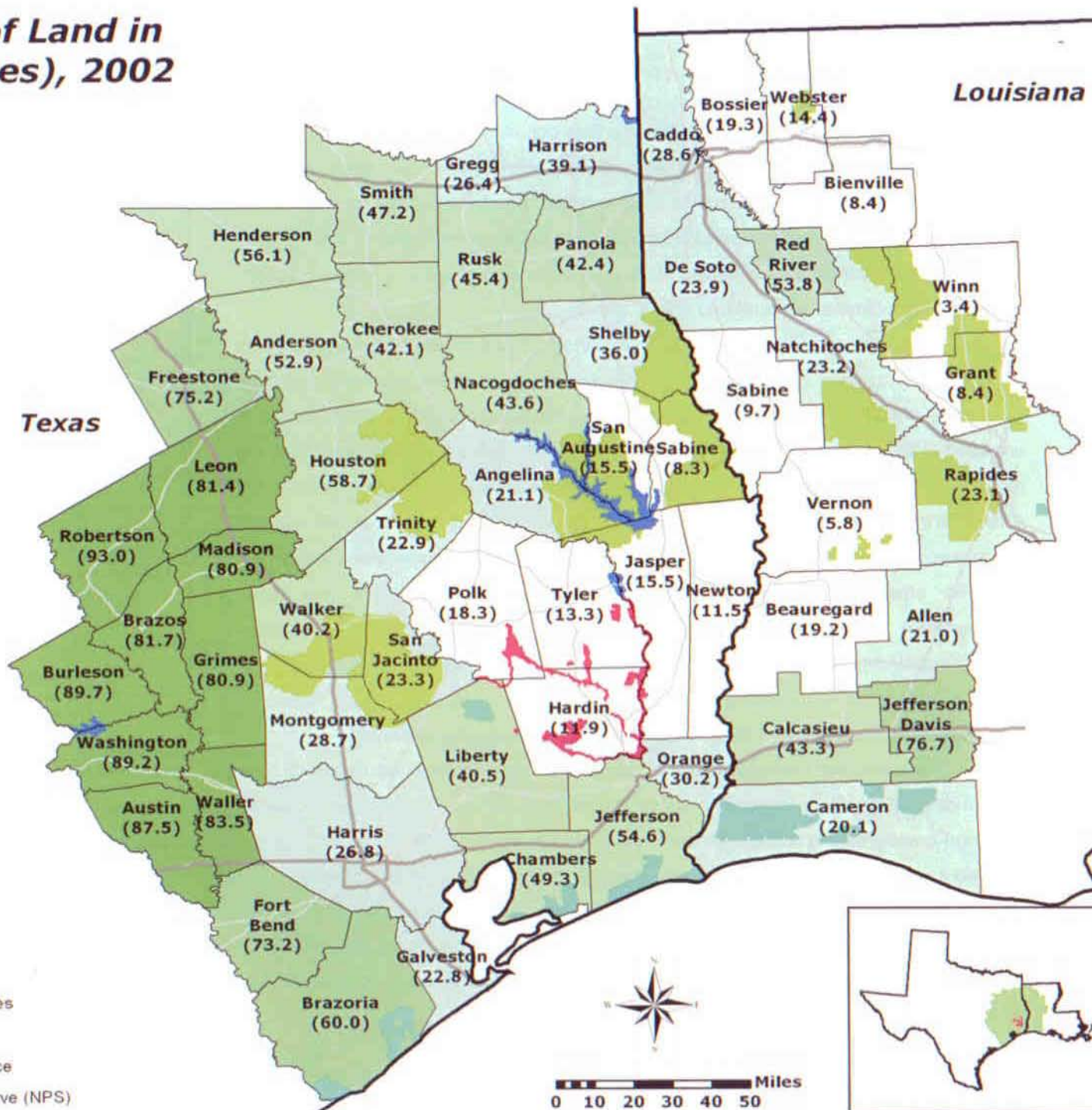
United States: 38.6
Louisiana: 23.6
Texas: 75.6

Study Area: 38.3

Percent

- Zero to 19.9
- 20.0 - 39.9
- 40.0 - 59.9
- 60.0 - 79.9
- 80.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



INDUSTRY

The types and numbers of industry that occur in a given area can have a dramatic effect on surroundings. The presence of industry can provide stable employment and income for otherwise impoverished areas, raising the local quality of life and becoming a valued community partner. However, some types of industry can have a negative effect on the surrounding area by adding to air and water pollution, resulting in the decline of visual and scenic quality.

While each map in this extensive section maintains the same color scale, with tan colors reflecting a decline and rose colors showing an increase; *the percentage scales will often vary between maps*. Generally, the most consistent industrial gains are seen in the service industries, while agriculture, manufacturing and retail show the most widespread losses. The greatest increases in persons employed are found in the Arts/Entertainment/Recreation/Accommodation/Food Services industries, all aspects of tourism. Two counties adjoining BITH lands show strong gains in these industries, with the other surrounding counties showing more modest gains (but gains nonetheless). This category is followed closely by the Professional/Scientific/Management/Administrative/Waste Management Services industries, which showed low to moderate gains in all of the BITH counties. Gains in the Information industries ranks third in the amount and distribution of increase in persons employed.

The strongest decreases in our study area occur in the industries of Manufacturing and Retail Trade. The counties surrounding BITH show low to moderate losses in these areas. Declines in the persons employed in Agriculture/Fishing and Hunting/Forestry/Mining industries were quite predominant in our study area, but most counties surrounding BITH to the north showed a good increase in numbers employed. Hardin County reported a minimal increase.

The remaining maps in this section compare various industries in the study area, with gains and losses distributed in different counties of the study area. In most instances, the counties surrounding BITH show modest increases in the number of people employed in these industries. One area of note is that of Public Administration, with BITH counties showing the strongest growth within the study area

DEFINITION:

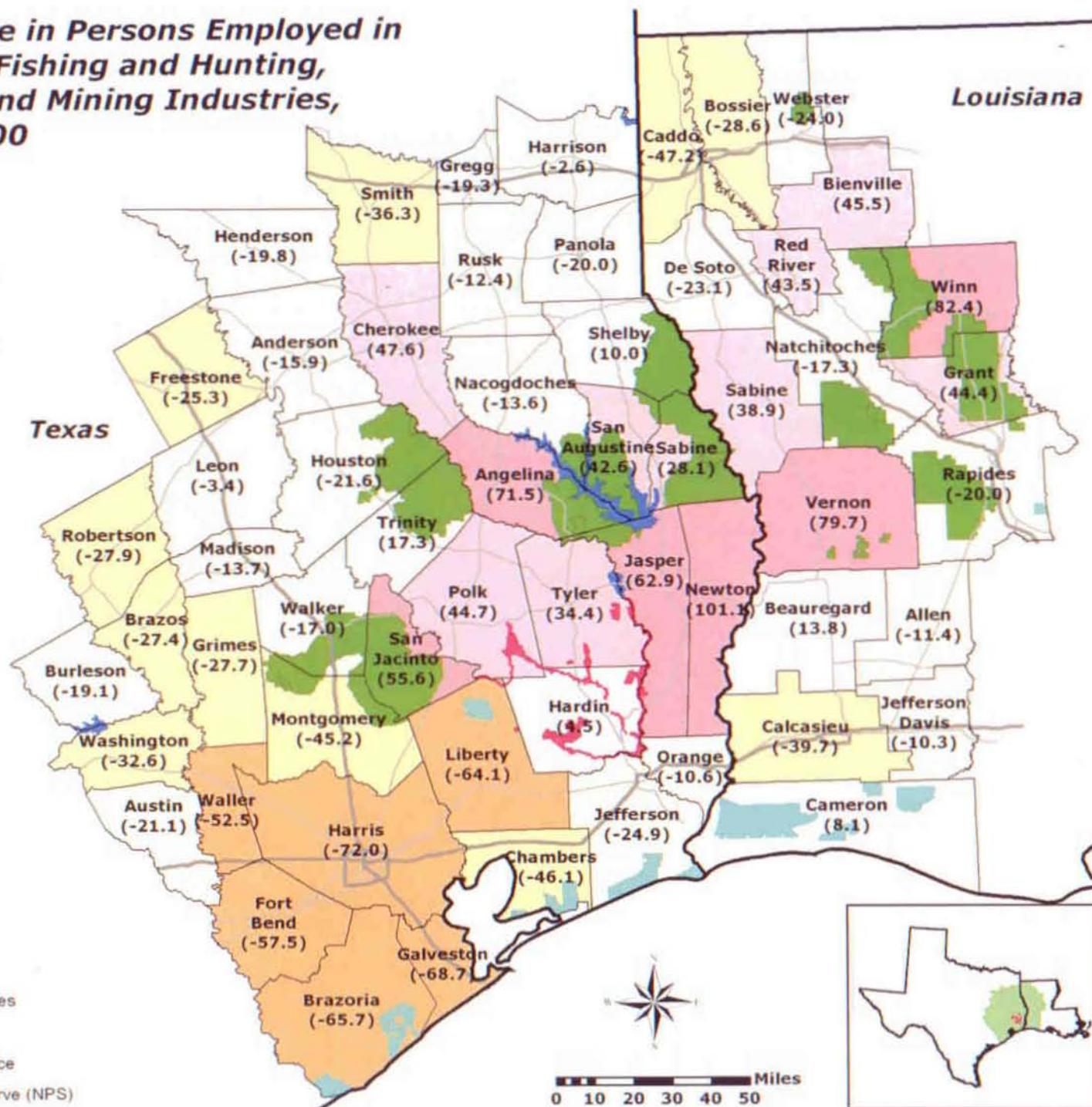
INDUSTRY (population data)

Information on industry relates to the kind of business conducted by a person's employing organization. For employed people these data refer to the person's job during the reference week. For those who worked at two or more jobs, these data refer to the job at which the person worked the greatest number of hours. Some examples of industrial groups shown in products include agriculture, forestry, and fisheries; construction; manufacturing; wholesale or retail trade; transportation and communication; personal, professional and entertainment services; and public administration.

— U.S. Census Bureau

Percent Change in Persons Employed in Agriculture, Fishing and Hunting, Forestry, and Mining Industries, 1990-2000

United States: -36.8
Louisiana: -17.0
Texas: -34.3
Study Area: -54.9



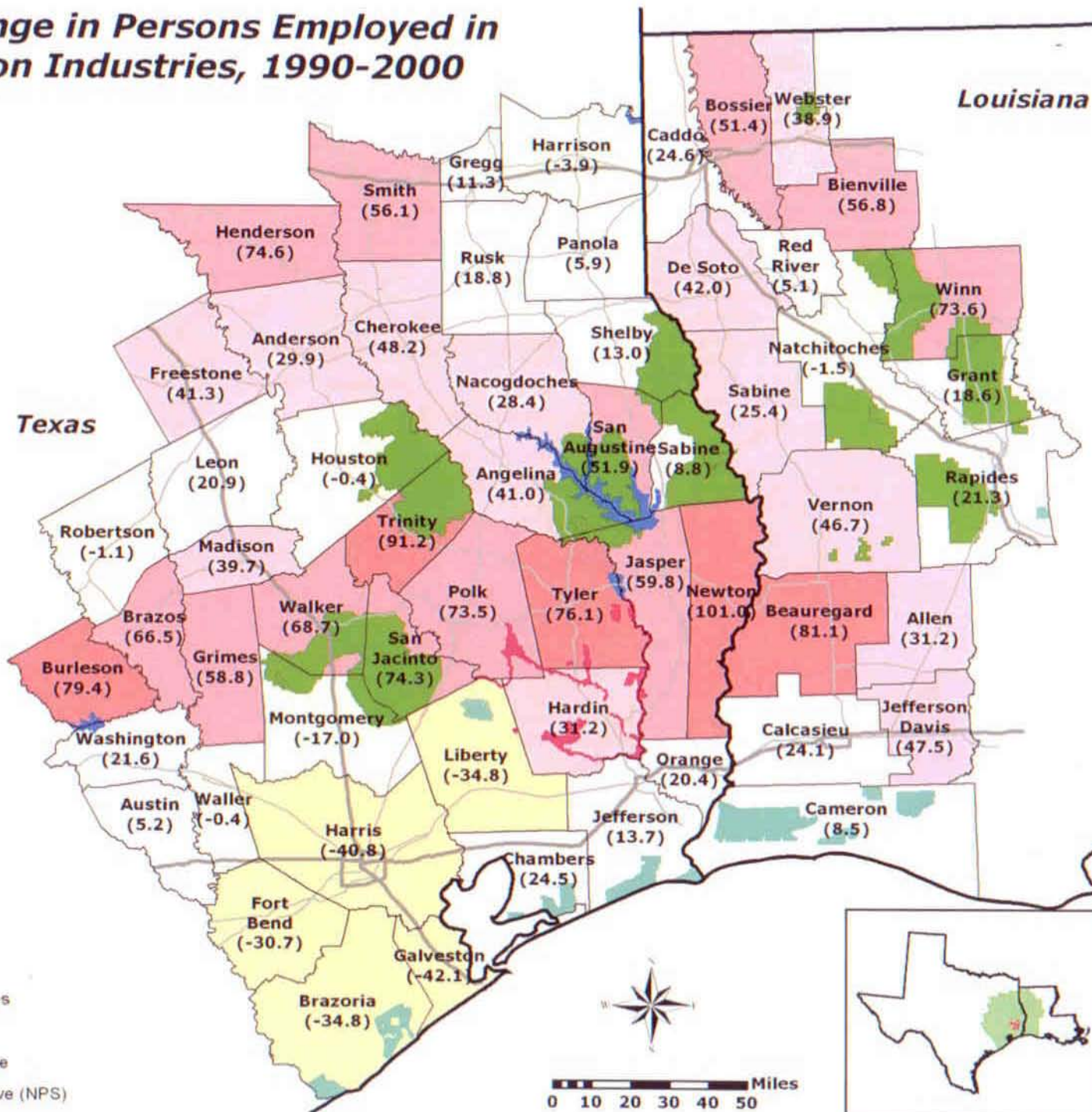
Percent Change in Persons Employed in Construction Industries, 1990-2000

United States: 22.0
 Louisiana: 31.2
 Texas: 44.6
 Study Area: -25.3

Percent Change



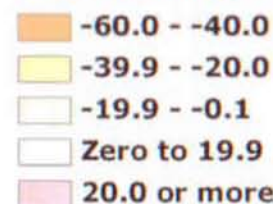
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in Persons Employed in Manufacturing Industries, 1990-2000

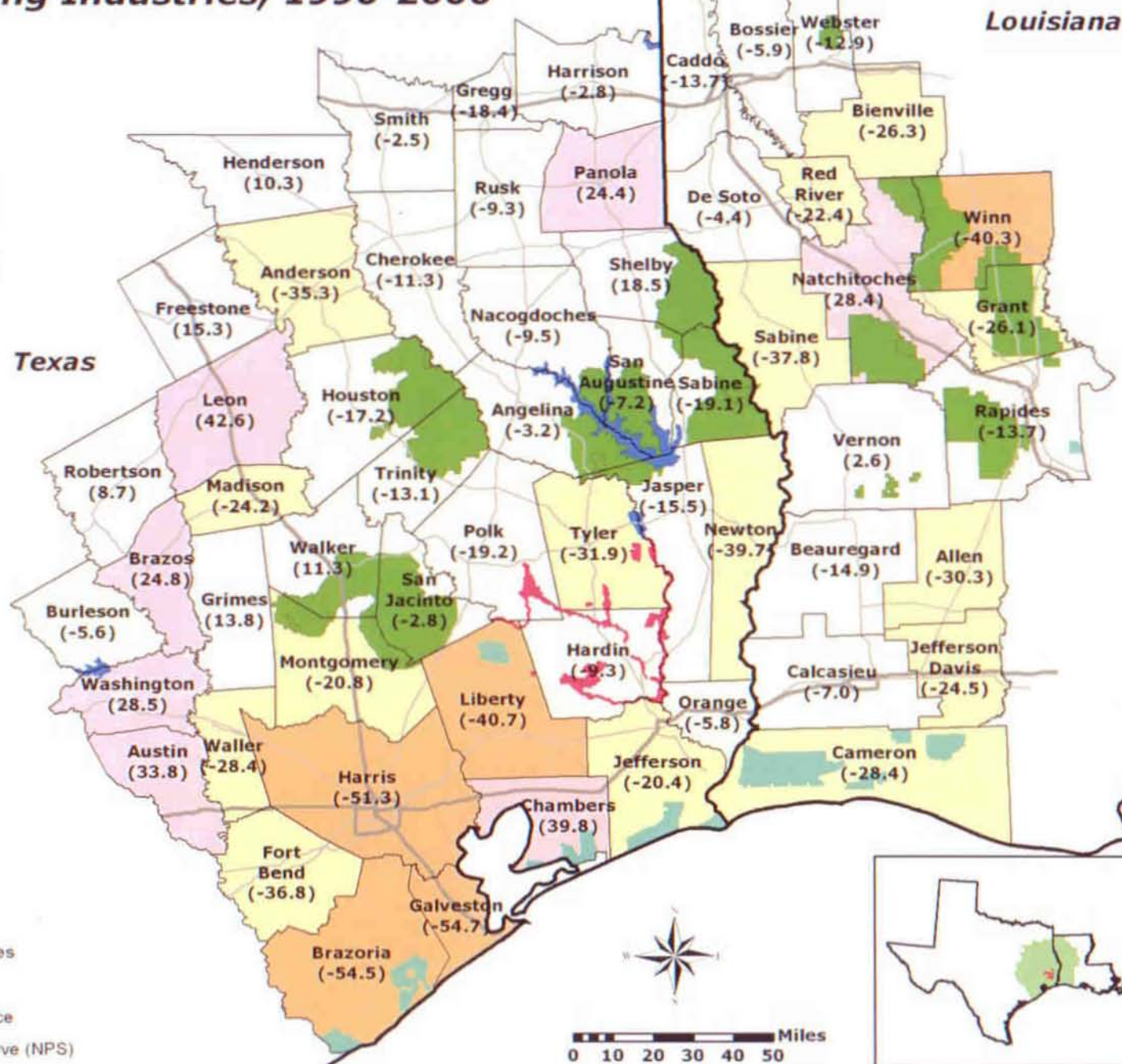
United States: -10.6
Louisiana: -8.7
Texas: -0.7
Study Area: -39.9

Percent Change



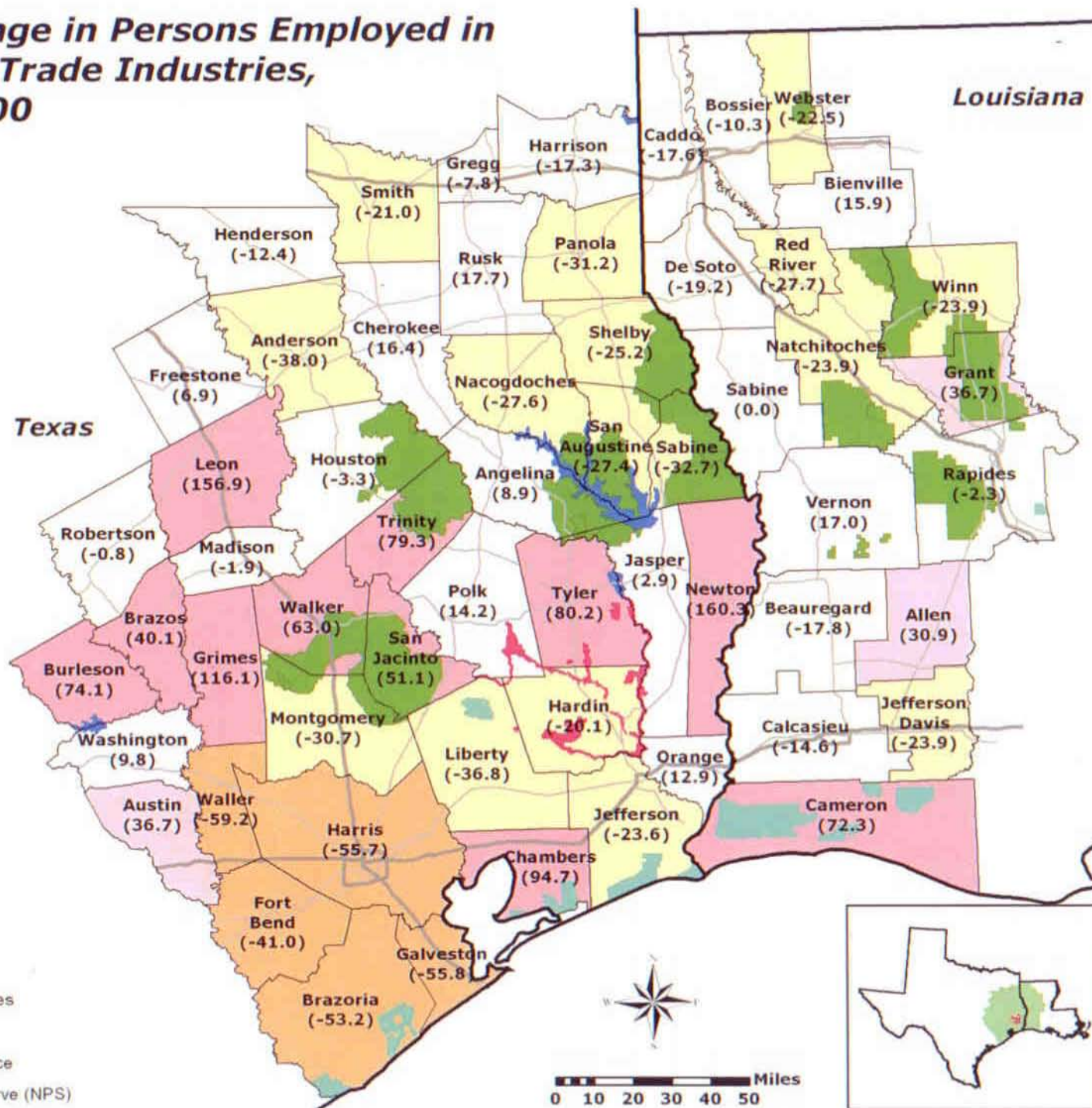
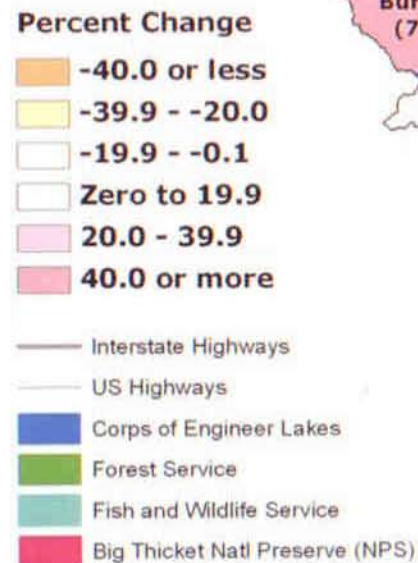
Texas

Louisiana



Percent Change in Persons Employed in Wholesale Trade Industries, 1990-2000

United States: -8.0
Louisiana: -11.0
Texas: -3.4
Study Area: -46.7



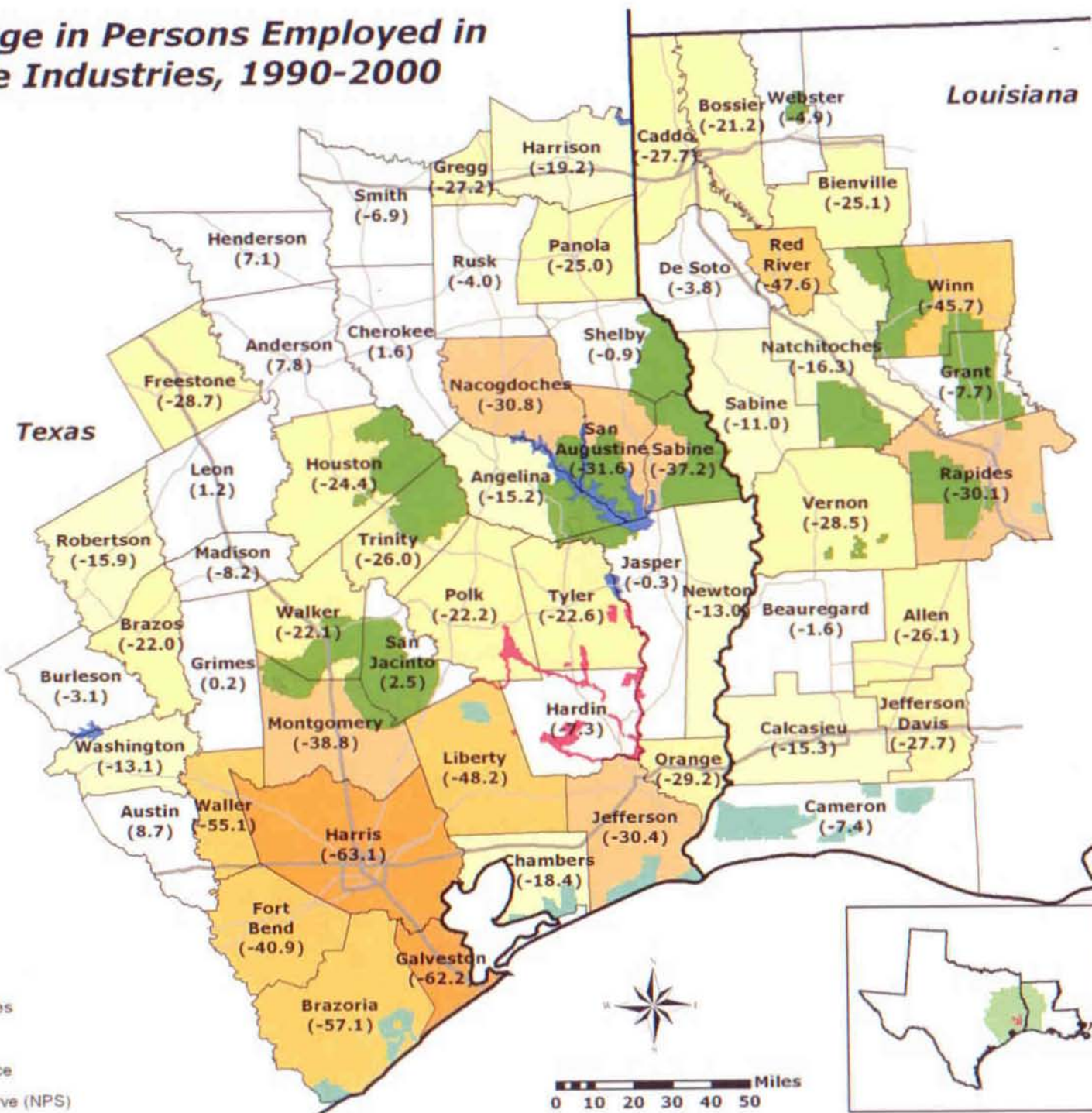
Percent Change in Persons Employed in Retail Trade Industries, 1990-2000

United States: -21.9
Louisiana: -23.4
Texas: -16.8
Study Area: -51.0

Percent Change

- 60.0 or less
- 59.9 - -40.0
- 39.9 - -30.0
- 29.9 - -20.0
- 19.9 - -10.0
- 9.9 - -0.1
- Zero to 10.0

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in Persons Employed in Transportation and Warehousing, and Utilities Industries, 1990-2000

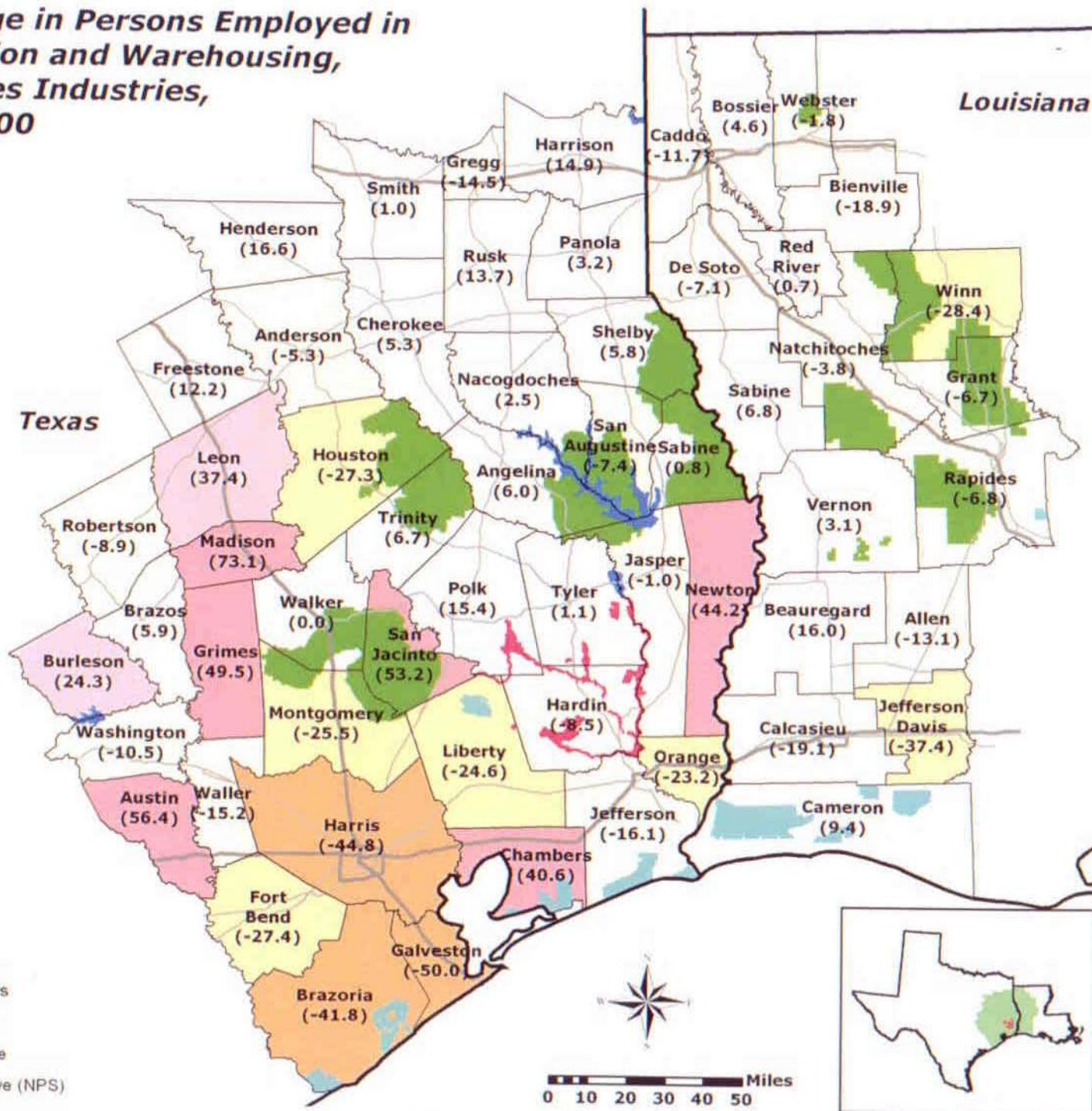
United States: 2.2
Louisiana: -7.8
Texas: 14.5

Study Area: -34.9

Percent Change

- 40.0 or less
- 39.9 - -20.0
- 19.9 - -0.1
- Zero to 19.9
- 20.0 - 39.9
- 40.0 or more

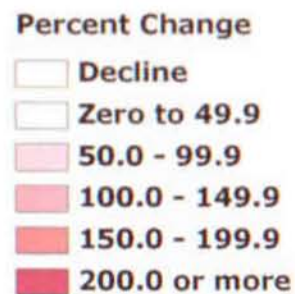
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



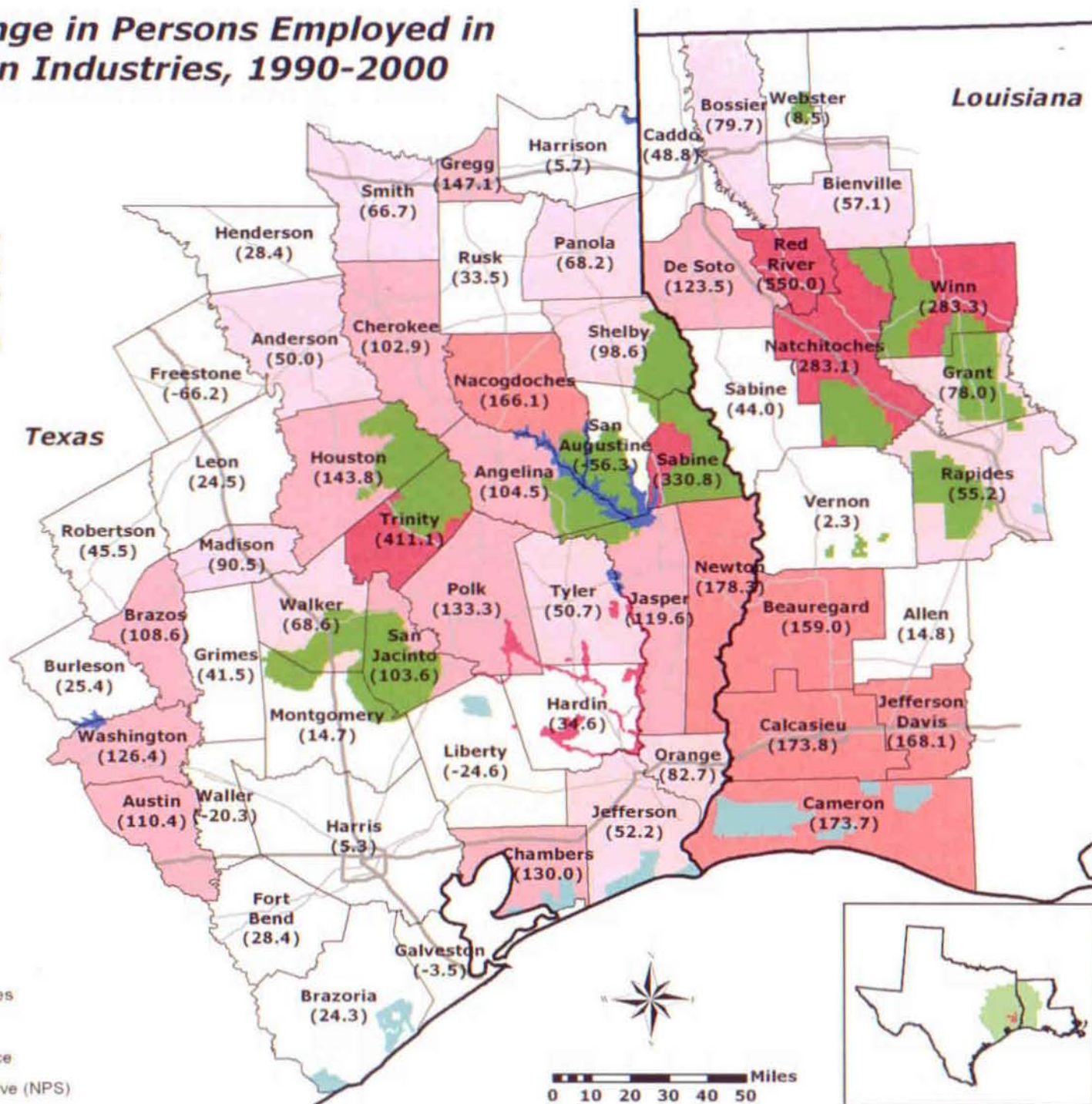
Percent Change in Persons Employed in Information Industries, 1990-2000

United States: 148.7
Louisiana: 74.2
Texas: 151.8

Study Area: 22.3



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



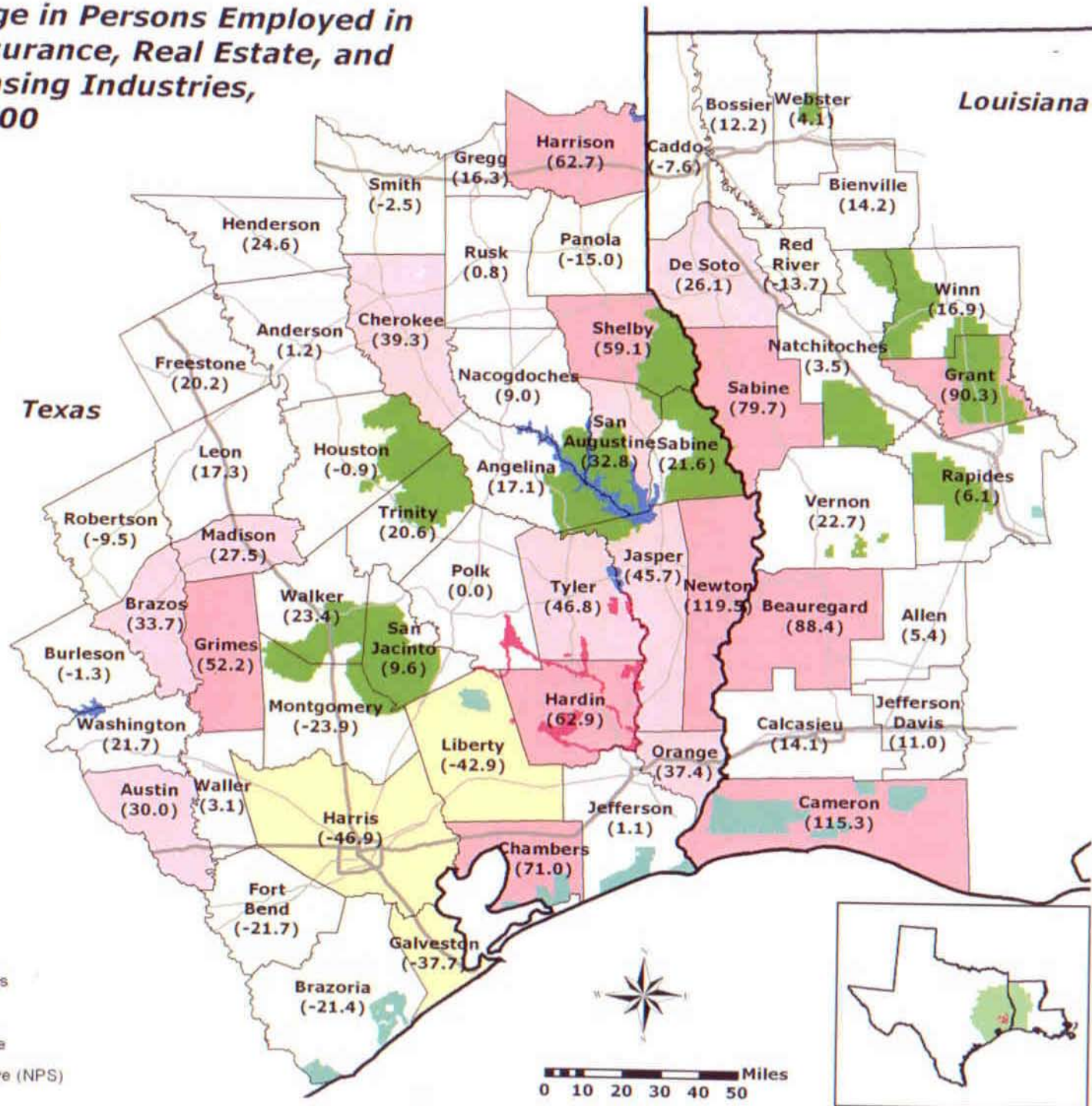
Percent Change in Persons Employed in Finance, Insurance, Real Estate, and Rental Leasing Industries, 1990-2000

United States: 11.9
Louisiana: 11.6
Texas: 20.8
Study Area: -34.3

Percent Change

- 25.0 or less
- 24.9 - -0.1
- Zero to 24.9
- 25.0 - 49.9
- 50.0 or more

— Interstate Highways
— US Highways
■ Corps of Engineer Lakes
■ Forest Service
■ Fish and Wildlife Service
■ Big Thicket Natl Preserve (NPS)



Percent Change in Persons Employed in Professional, Scientific, Management, Administrative, and Waste Management Services Industries, 1990-2000

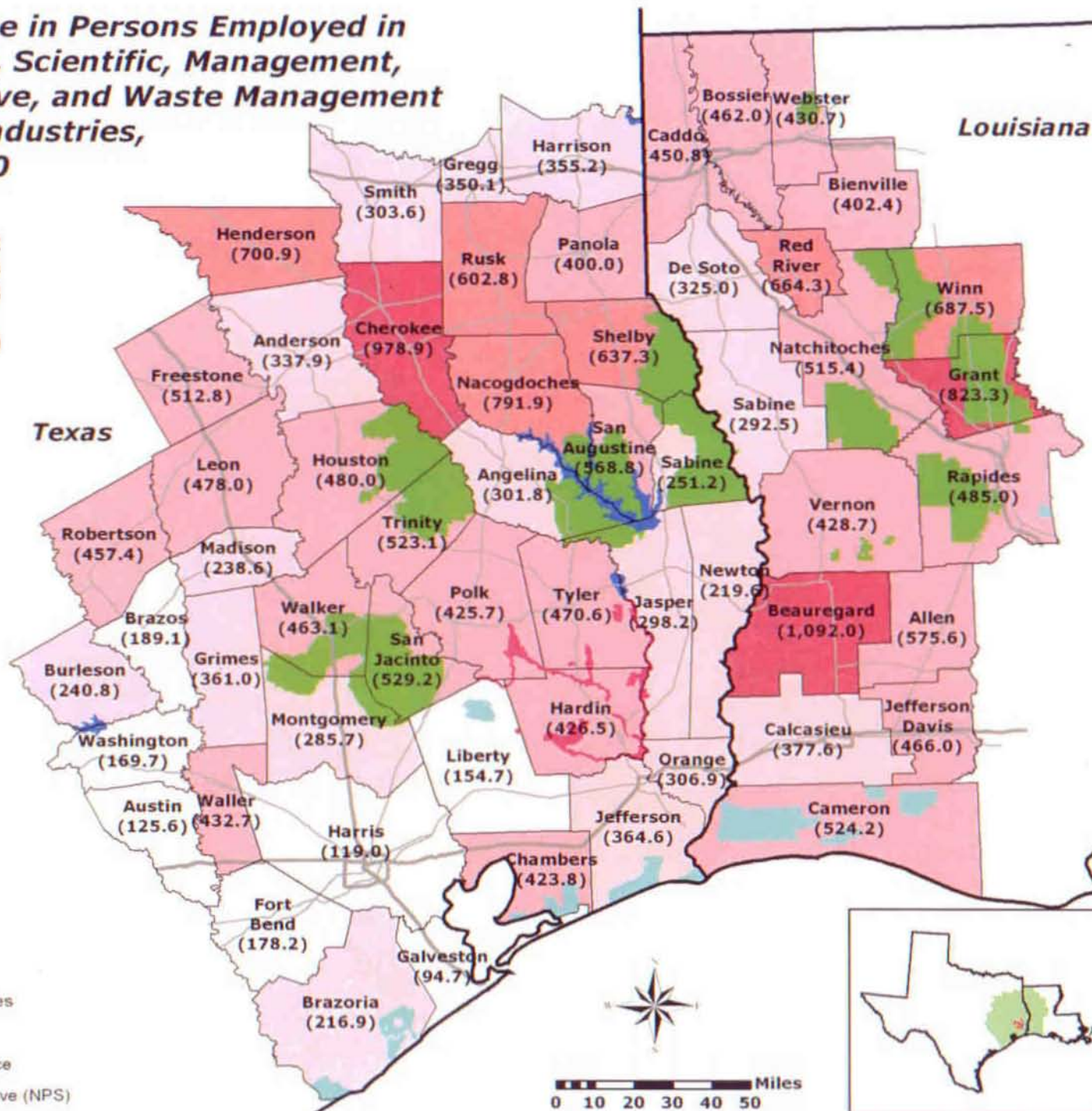
United States: 319.2
Louisiana: 372.4
Texas: 409.8

Study Area: 158.0

Percent Change

- Less than 200
- 200.0 - 399.9
- 400.0 - 599.9
- 600.0 - 799.9
- 800.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



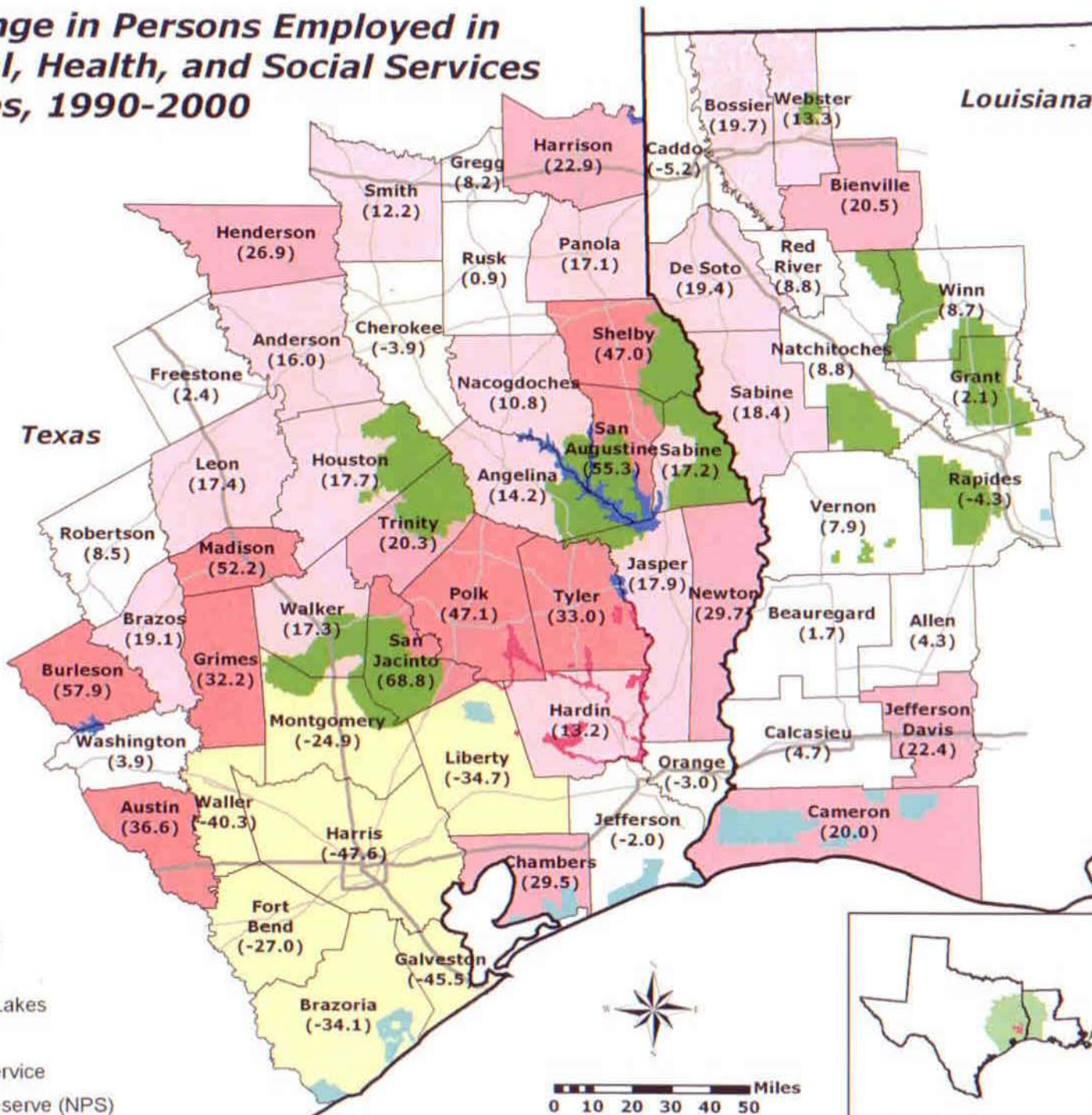
Percent Change in Persons Employed in Educational, Health, and Social Services Industries, 1990-2000

United States: 7.1
 Louisiana: 4.1
 Texas: 15.4
 Study Area: -30.4

Percent Change



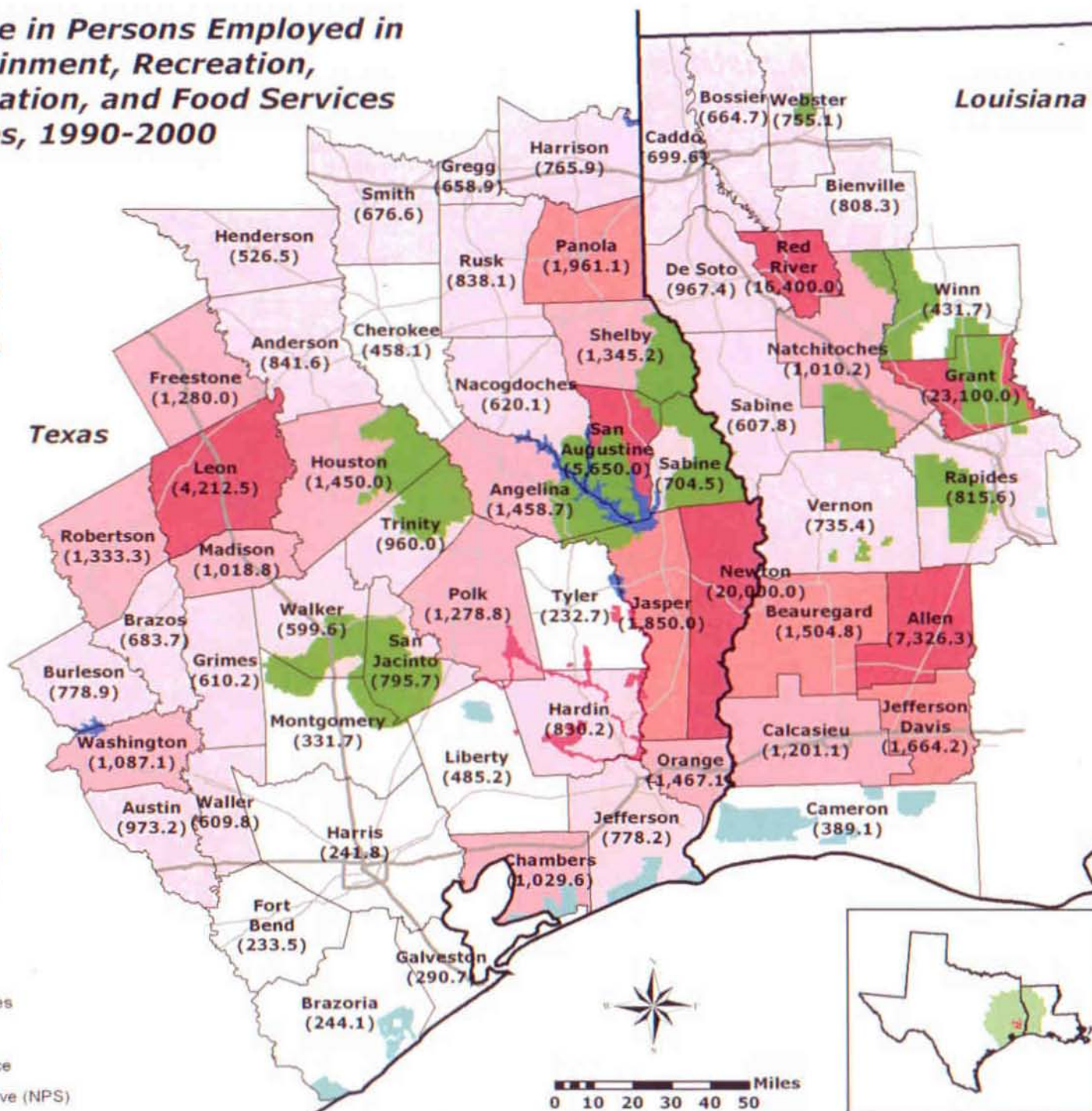
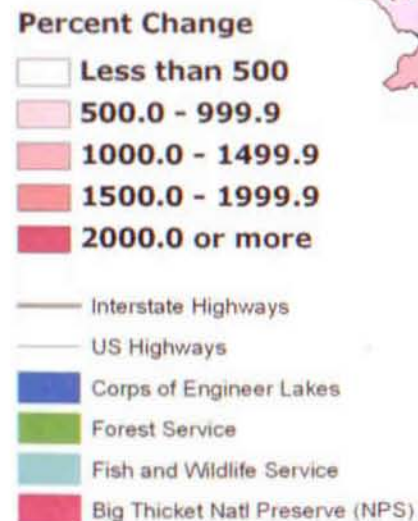
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in Persons Employed in Arts, Entertainment, Recreation, Accommodation, and Food Services Industries, 1990-2000

United States: 523.9
Louisiana: 825.6
Texas: 647.2

Study Area: 353.4



**Percent Change in Persons Employed in
Other Services Industries
(Except Public Administration),
1990-2000**

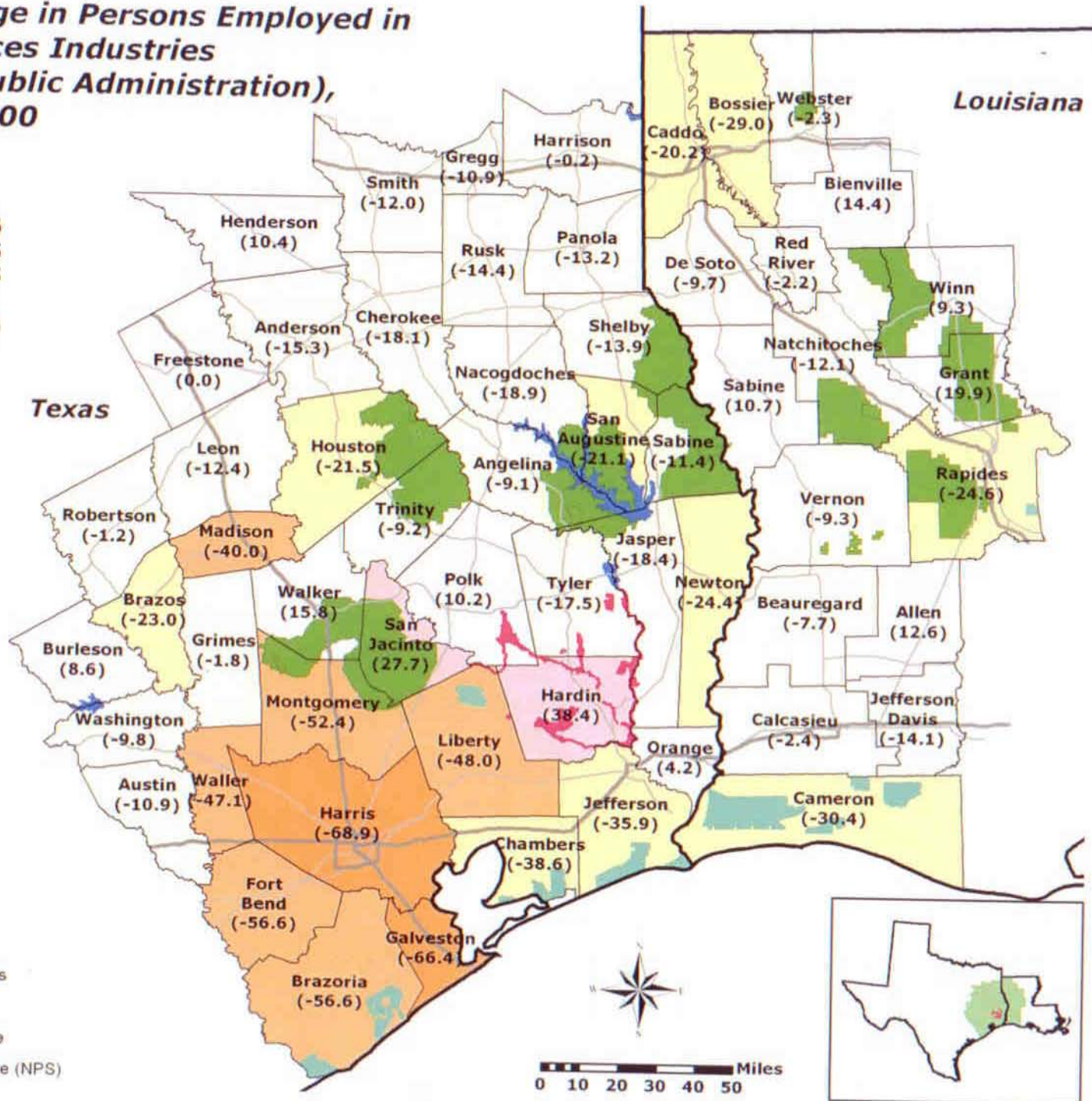
United States: -31.6
Louisiana: -25.5
Texas: -29.5

Study Area: -57.6

Percent Change

- 60.0 or less
- 59.9 - -40.0
- 39.9 - -20.0
- 19.9 - -0.1
- Zero to 19.9
- 20.0 - or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



United States: 12.2
Louisiana: 26.6
Texas: 20.9
Study Area: -16.7

Texas: 20.9

Study Area: -16.7



EMPLOYMENT/OCCUPATION

Level of employment is a direct measure of the business environment, viability found, and quality of life in an area. The number of jobs has increased more in the South than any other region of the U.S. (Moffat and Greene 2002). Proximity to areas with attractive natural amenities and protected areas can be beneficial for employment prospects in rural communities. Reeder (2005) found a significant relationship between the amount of recreation opportunity existing in a county and the percentage of employment of working-age people in the area.

The percentage of persons employed increased in every Texas county within the study area and in all but one Louisiana parish. The counties immediately surrounding BITH had moderate employment gains except for Jefferson and Orange counties who had minimal gains. More persons were unemployed in all BITH counties except for Hardin and Jasper Counties, which showed declines. Of particular note is the number of persons no longer in the labor force. These are people that are retired or are not looking for work. All counties surrounding BITH showed a moderate to strong increase in these percentages.

Persons employed in Management/ Professional-related occupations showed an increase in all counties of our study area, and a strong increase in most counties surrounding BITH. Service occupations also showed an increase in all but two counties, with a moderate to strong gain in BITH counties. Generally, counties surrounding BITH displayed modest occupational gains in all other sectors, with select counties in each sector showing a decline.

DEFINITION:

EMPLOYED

Employed includes all civilians 16 years old and over who were either (1) "at work" -- those who did any work at all during the reference week as paid employees, worked in their own business or profession, worked on their own farm, or worked 15 hours or more as unpaid workers on a family farm or in a family business; or (2) were "with a job but not at work" -- those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. Excluded from the employed are people whose only activity consisted of work around the house or unpaid volunteer work for religious, charitable, and similar organizations; also excluded are people on active duty in the United States Armed Forces. The reference week is the calendar week preceding the date on which the respondents completed their questionnaires or were interviewed. This week may not be the same for all respondents.

OCCUPATION

Occupation describes the kind of work the person does on the job. For employed people, these data refer to the person's job during the reference week. For those who worked at two or more jobs, these data refer to the job at which the person worked the greatest number of hours.

Percent Change of Persons Employed, 1990-2000

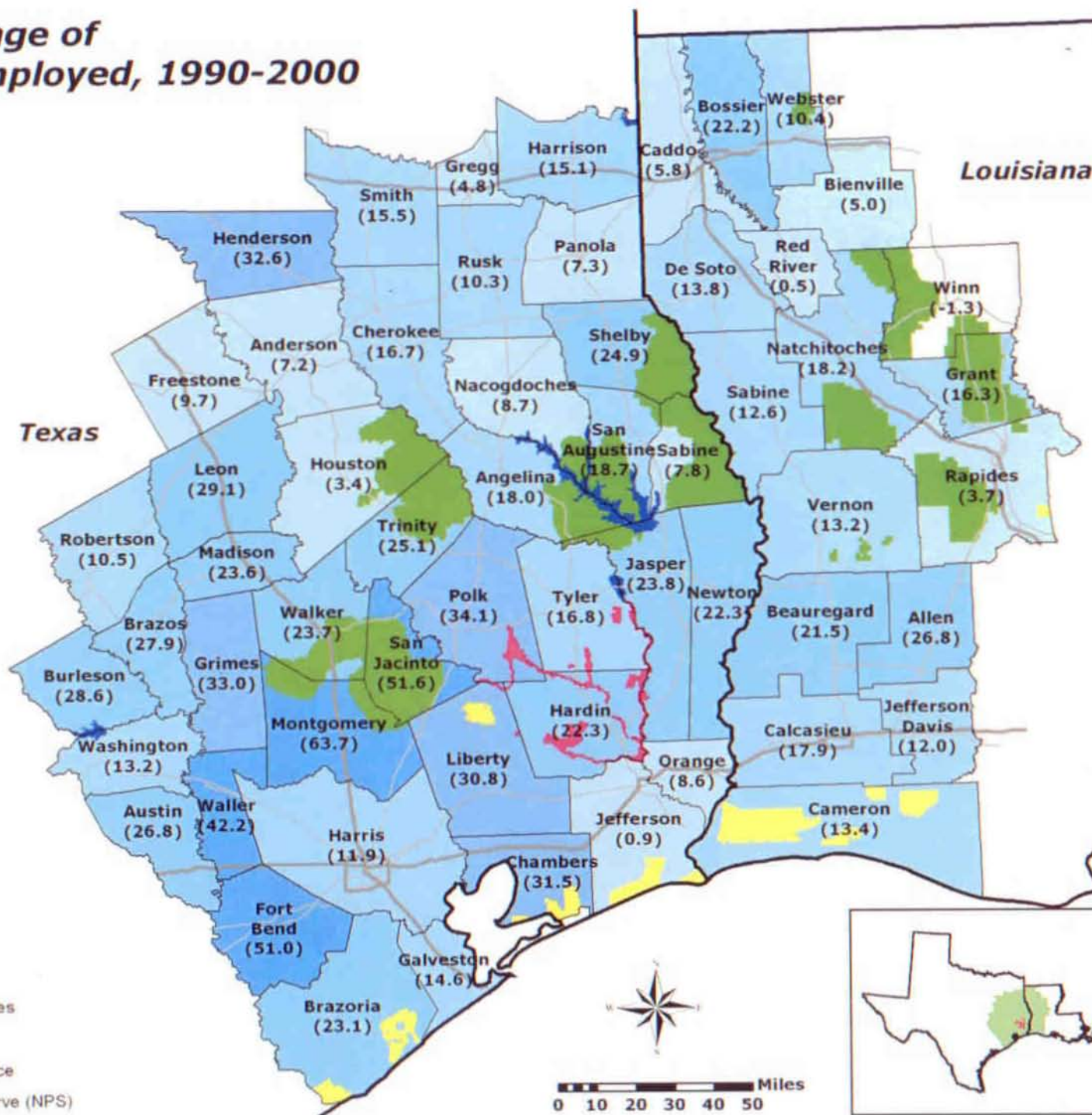
United States: 12.1
Louisiana: 12.8
Texas: 21.0

Study Area: 16.4

Percent Change

- Decline
- Zero to 9.9
- 10.0 - 19.9
- 20.0 - 29.9
- 30.0 - 39.9
- 40.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



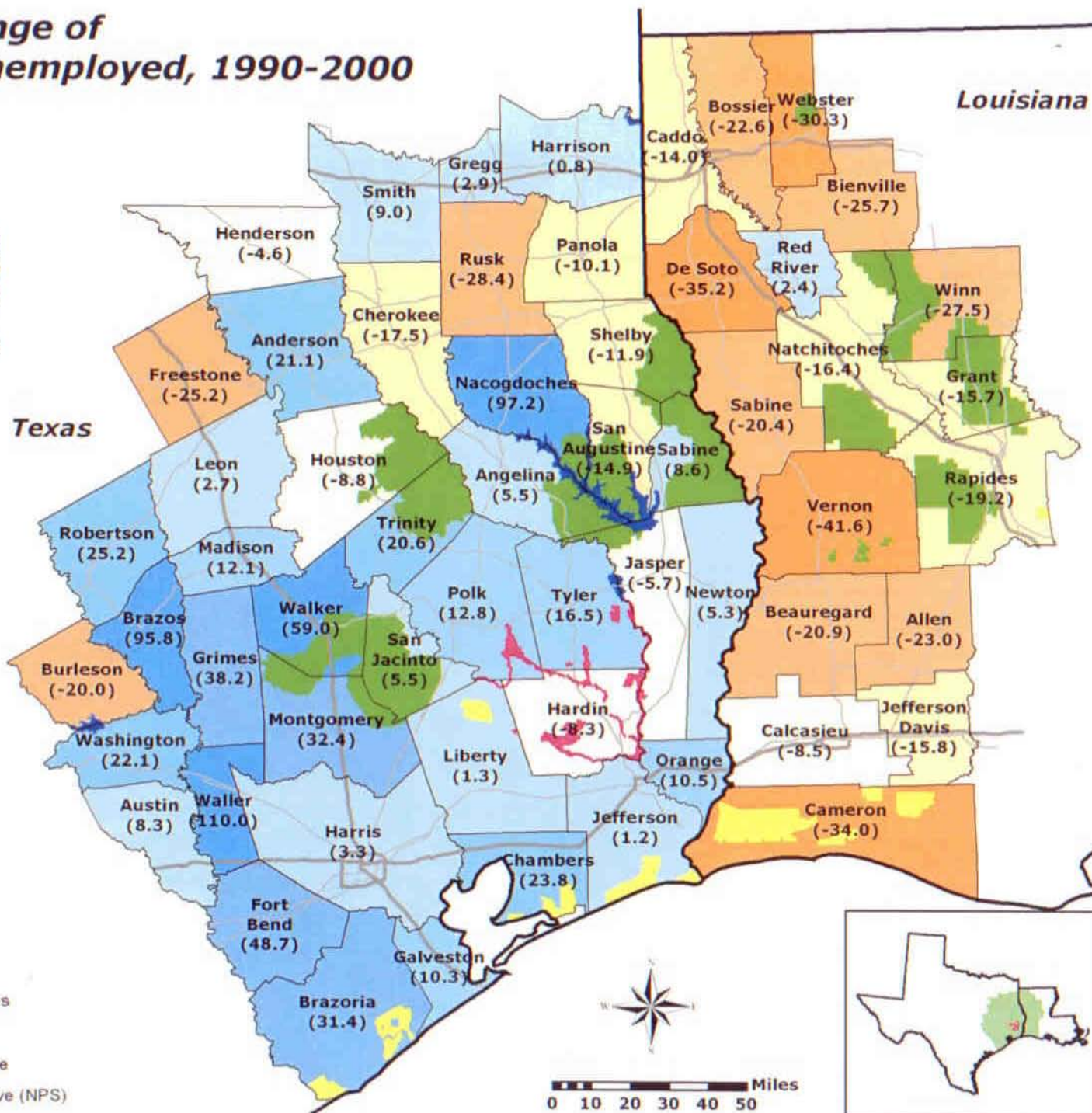
Percent Change of Persons Unemployed, 1990-2000

United States: 2.0
Louisiana: -16.6
Texas: 2.0
Study Area: 4.5

Percent Change

- 30.0 or less
- 29.9 - -20.0
- 19.9 - -10.0
- 9.9 - -0.1
- Zero to 9.9
- 10.0 - 19.9
- 20.0 - 29.9
- 30.0 - 49.9
- 50.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



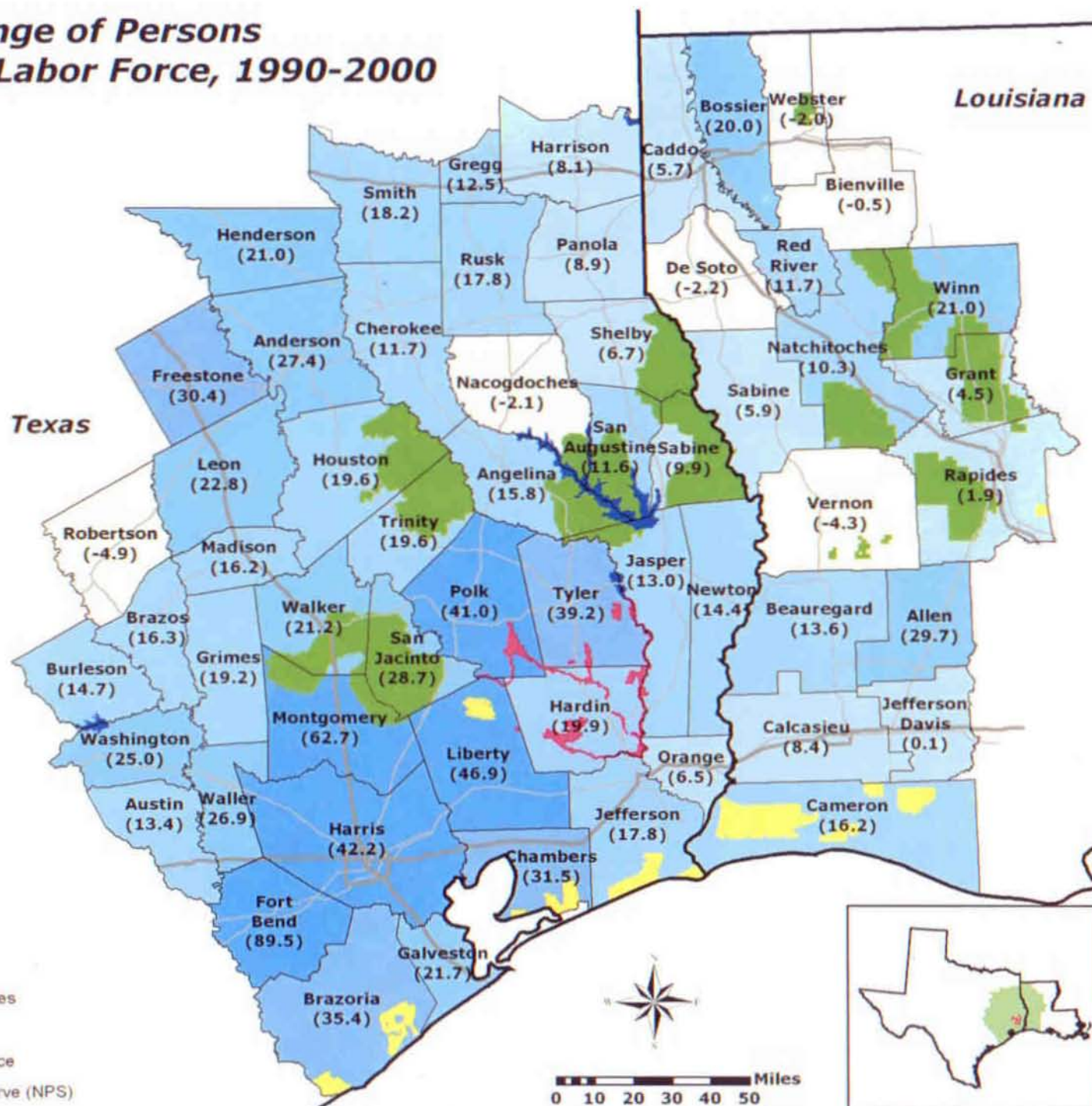
Percent Change of Persons Not in the Labor Force, 1990-2000

United States: 17.6
Louisiana: 8.6
Texas: 31.9
Study Area: 28.8

Percent Change

- Decline
- Zero to 9.9
- 10.0 - 19.9
- 20.0 - 29.9
- 30.0 - 39.9
- 40.0 or more

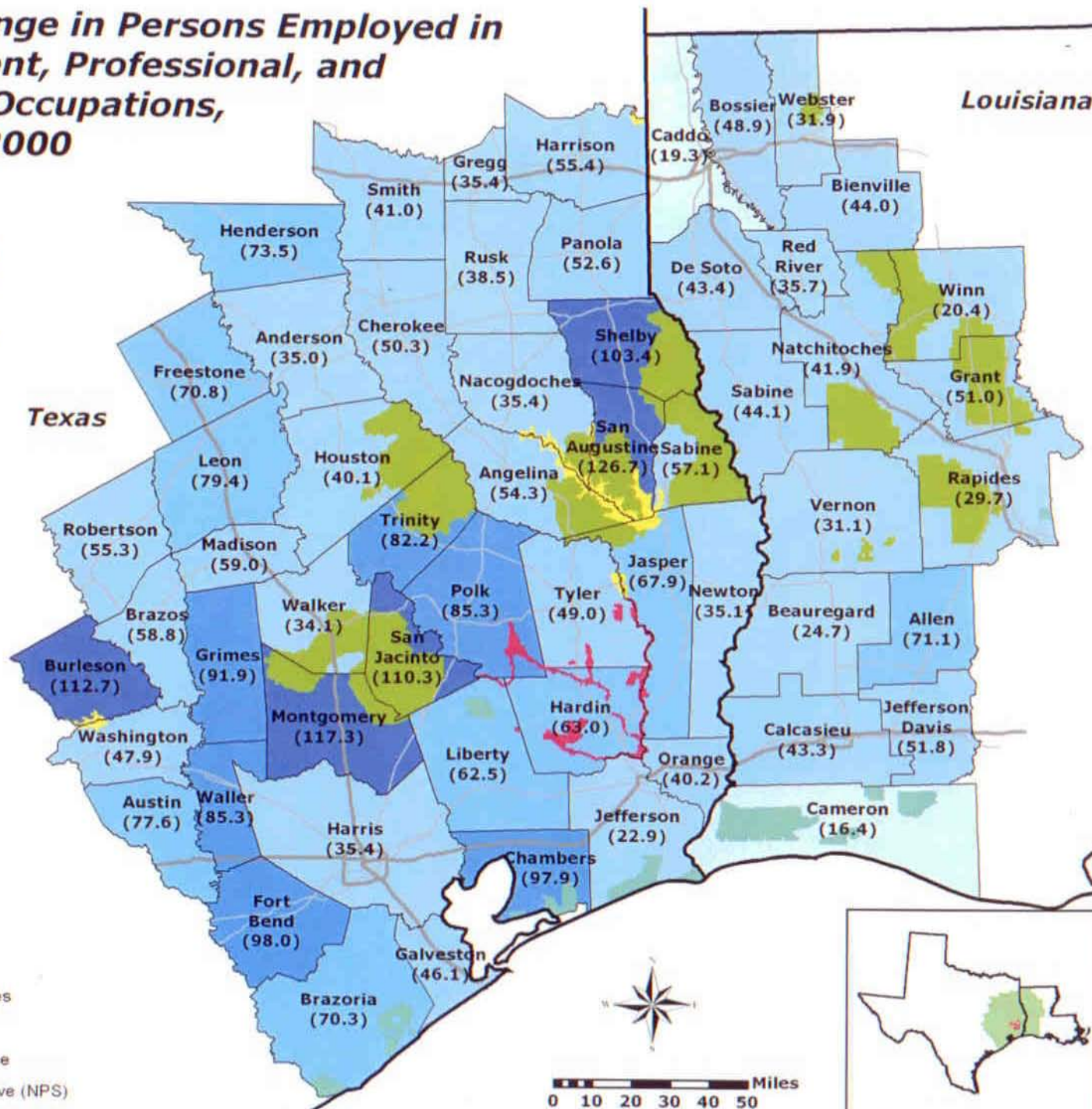
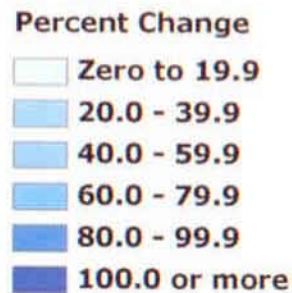
- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change in Persons Employed in Management, Professional, and Related Occupations, 1990-2000

United States: 42.9
Louisiana: 38.0
Texas: 54.7

Study Area: 44.6



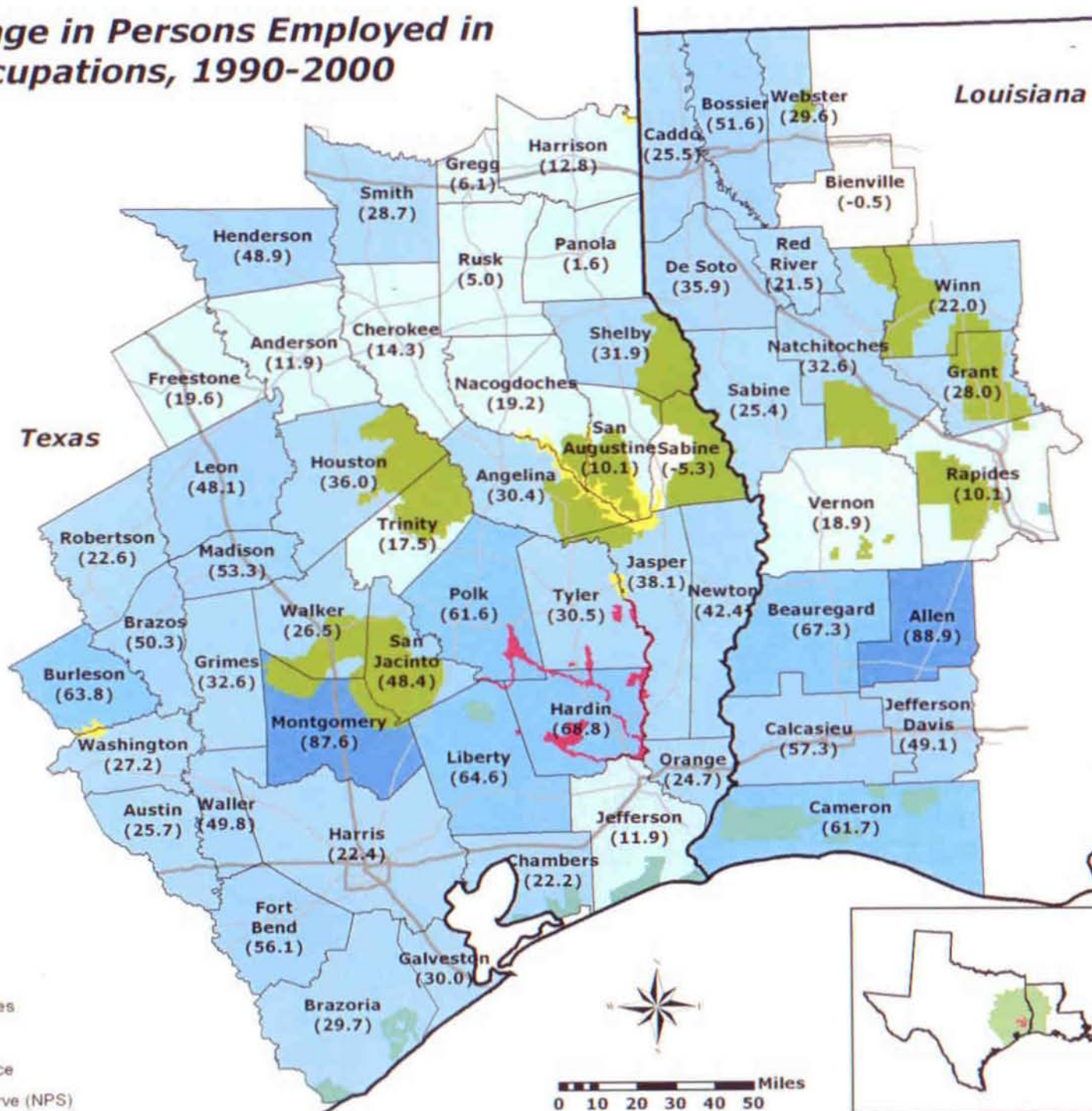
Percent Change in Persons Employed in Service Occupations, 1990-2000

United States: 26.0
Louisiana: 32.2
Texas: 31.1
Study Area: 28.4

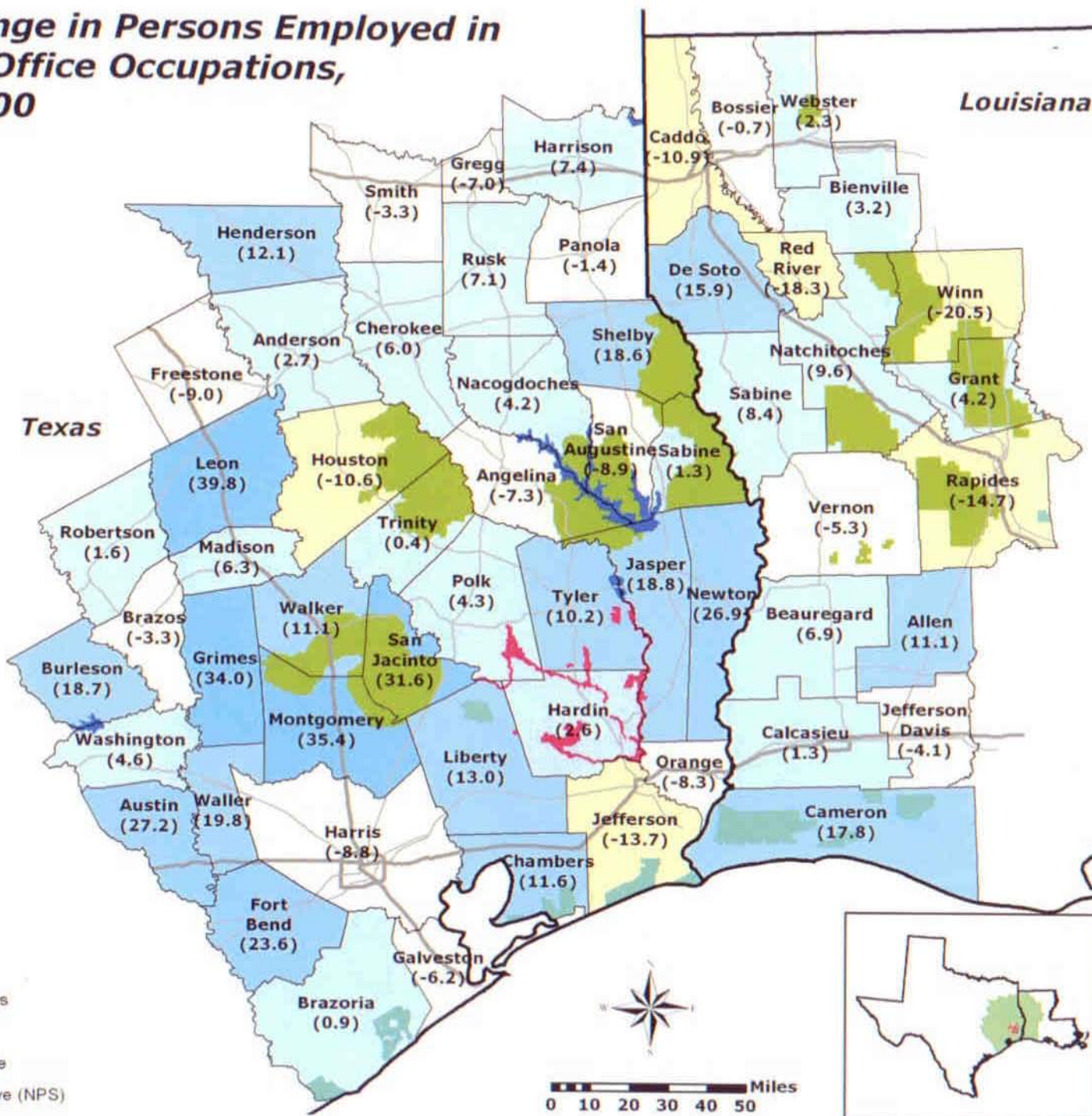
Percent Change

- Decline
- Zero to 19.9
- 20.0 - 39.9
- 40.0 - 59.9
- 60.0 - 79.9
- 80.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



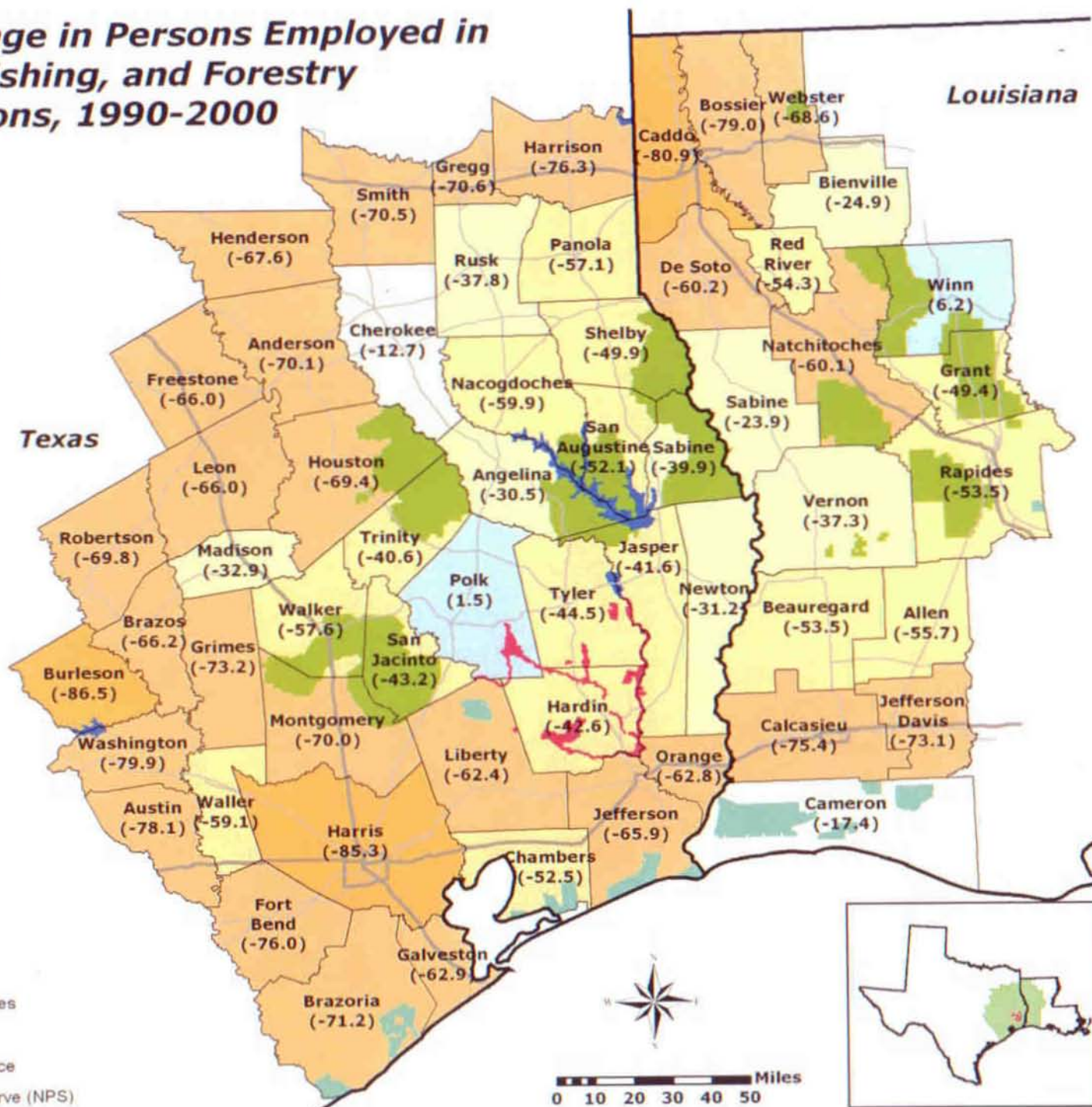
United States: -5.7
Louisiana: -4.1
Texas: 1.2
Study Area: -3.3



Percent Change in Persons Employed in Farming, Fishing, and Forestry Occupations, 1990-2000

United States: -66.5
Louisiana: -62.6
Texas: -68.7
Study Area: -67.1

Percent Change

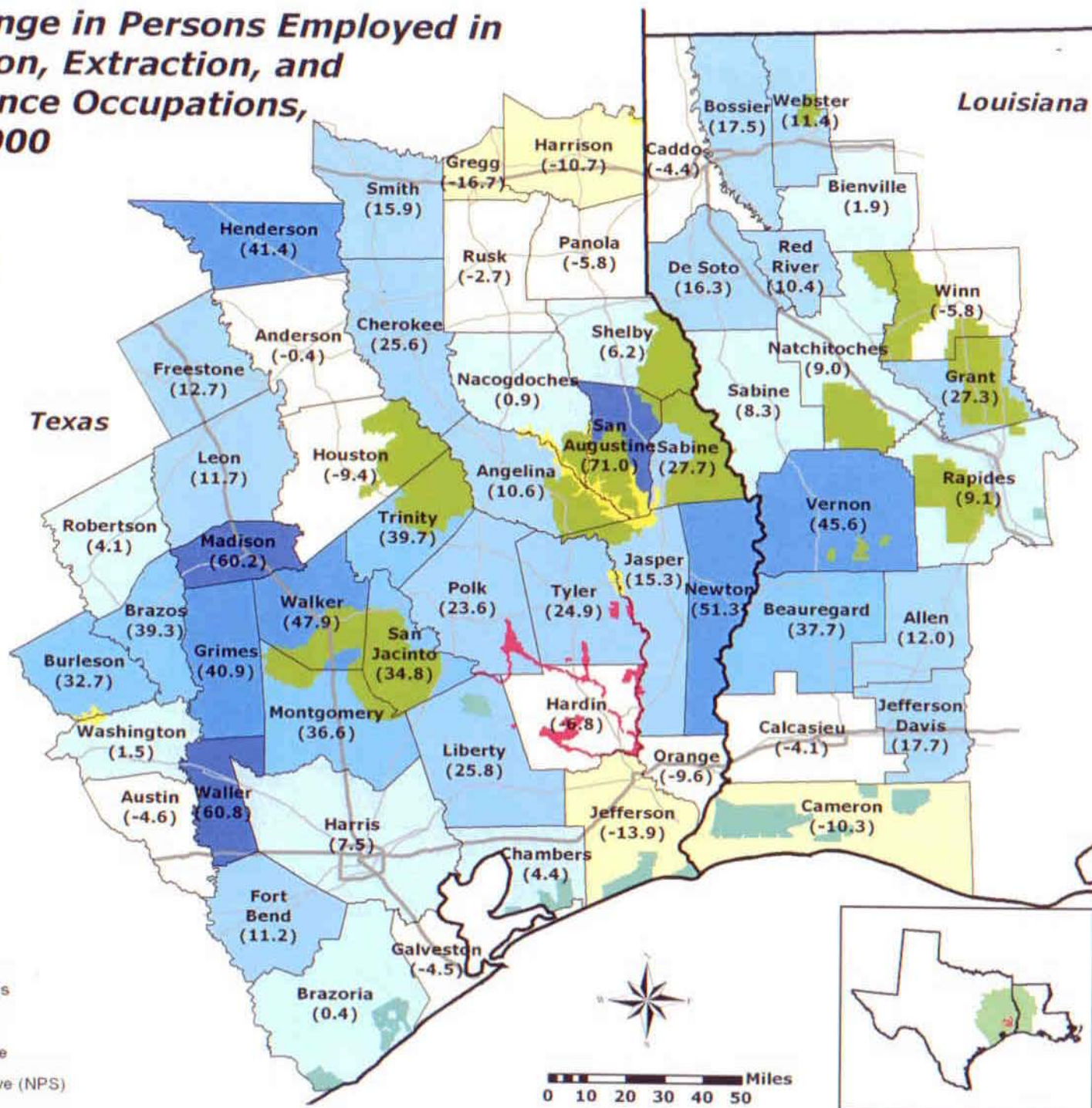


Percent Change in Persons Employed in Construction, Extraction, and Maintenance Occupations, 1990-2000

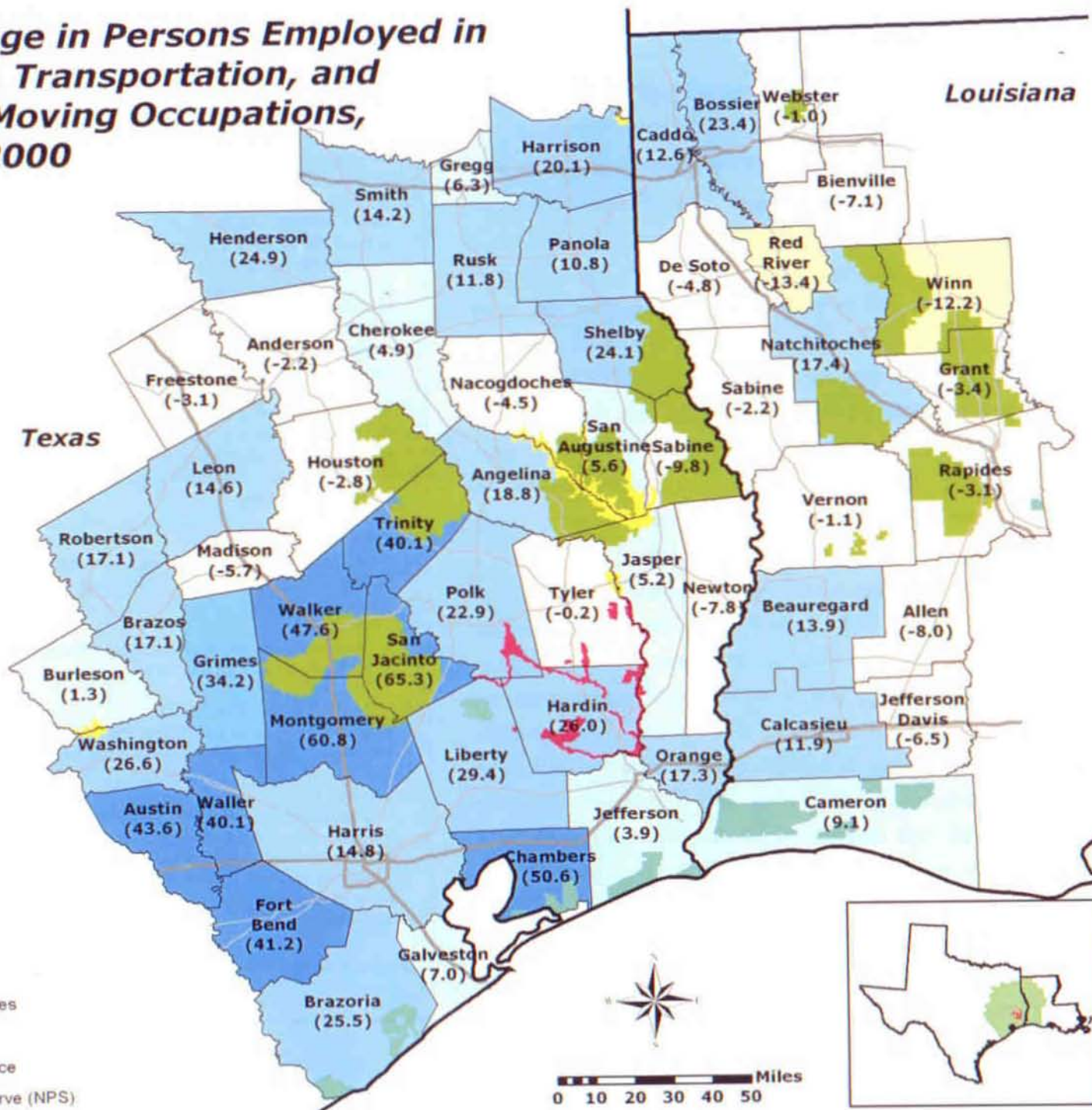
United States: -66.5
Louisiana: -62.6
Texas: -68.7

Study Area: -67.1

Percent Change



United States: 10.3
Louisiana: 7.4
Texas: 17.7
Study Area: 15.6



OTHER DEMOGRAPHIC VARIABLES

Information contained in these maps provides an additional nuance to the overall understanding of conditions found in the study area.

The first set of maps compares the number of married persons to those never married. This may have implications for population mobility and age range. All Texas counties in our study area display an increase in percentages of married persons, with a mix of percentages found in the counties surrounding BITH. These same counties also show an increase in percentages for the number of persons that never married, in many cases greater than percentages for married folk.

A second set of maps examines the changes in average family and household size, indicators of economic health. All counties within the study area show no change or declines in family size, while only four counties show an increase in household size. Jefferson and Liberty counties had no change in household size, while the remaining counties around BITH had strong declines. All BITH counties had declines in the average family size, with Jasper and Tyler counties having the strongest declines among Texas counties in our study area.

A third set illustrates the number of households with individuals over 65 years of age and the number in this age group that are disabled. All but one county and one parish

DEFINITIONS:

FAMILY HOUSEHOLD

A family includes a householder and one or more people living in the same household who are related to the householder by birth, marriage, or adoption. All people in a household who are related to the householder are regarded as members of his or her family. A family household may contain people not related to the householder, but those people are not included as part of the householder's family in census tabulations. Thus, the number of family households is equal to the number of families, but family households may include more members than do families. A household can contain only one family for purposes of census tabulations. Not all households contain families since a household may comprise a group of unrelated people or one person living alone.

AVERAGE FAMILY SIZE

A measure obtained by dividing the number of members of families by the total number of families.

HOUSEHOLD

A household includes all the people who occupy a housing unit as their usual place of residence.

AVERAGE HOUSEHOLD SIZE

A measure obtained by dividing the number of people in households by the total number of households.

DISABILITY

A long-lasting physical, mental, or emotional condition. This condition can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering. This condition can also impede a person from being able to go outside the home alone or to work at a job or business.

— U.S. Census Bureau

Demographic and Socio-economic Profile of Big Thicket

in our study area show an increase in households with a member older than 65. The counties surrounding BITH all have increases, although there is a mix of percentages. There is also an increase of disabled persons 65 and older in all of the study area and especially in the BITH counties, which have strong gains in percentage. This information may have a direct impact on the types of recreational facilities and opportunities offered by BITH.

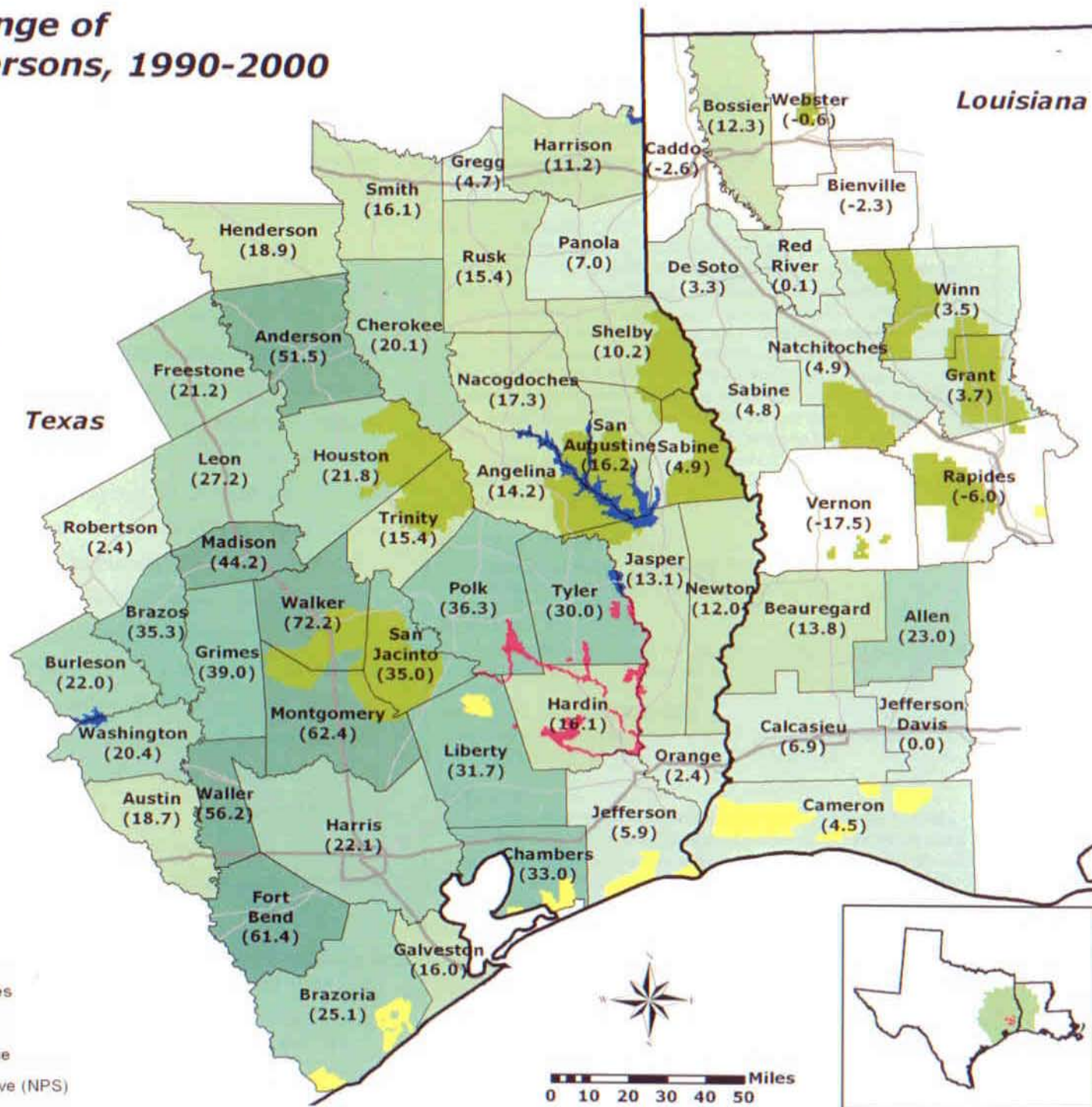
Percent Change of Married Persons, 1990-2000

United States: 12.4
Louisiana: 5.2
Texas: 23.3
Study Area: 20.8

Percent Change

- Decline
- Zero to 9.9
- 10.0 - 19.9
- 20.0 - 29.9
- 30.0 - 39.9
- 40.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



Percent Change of Persons That Never Married, 1990-2000

United States: 14.0
Louisiana: 13.6
Texas: 25.7

Study Area: 21.2



— Interstate Highways

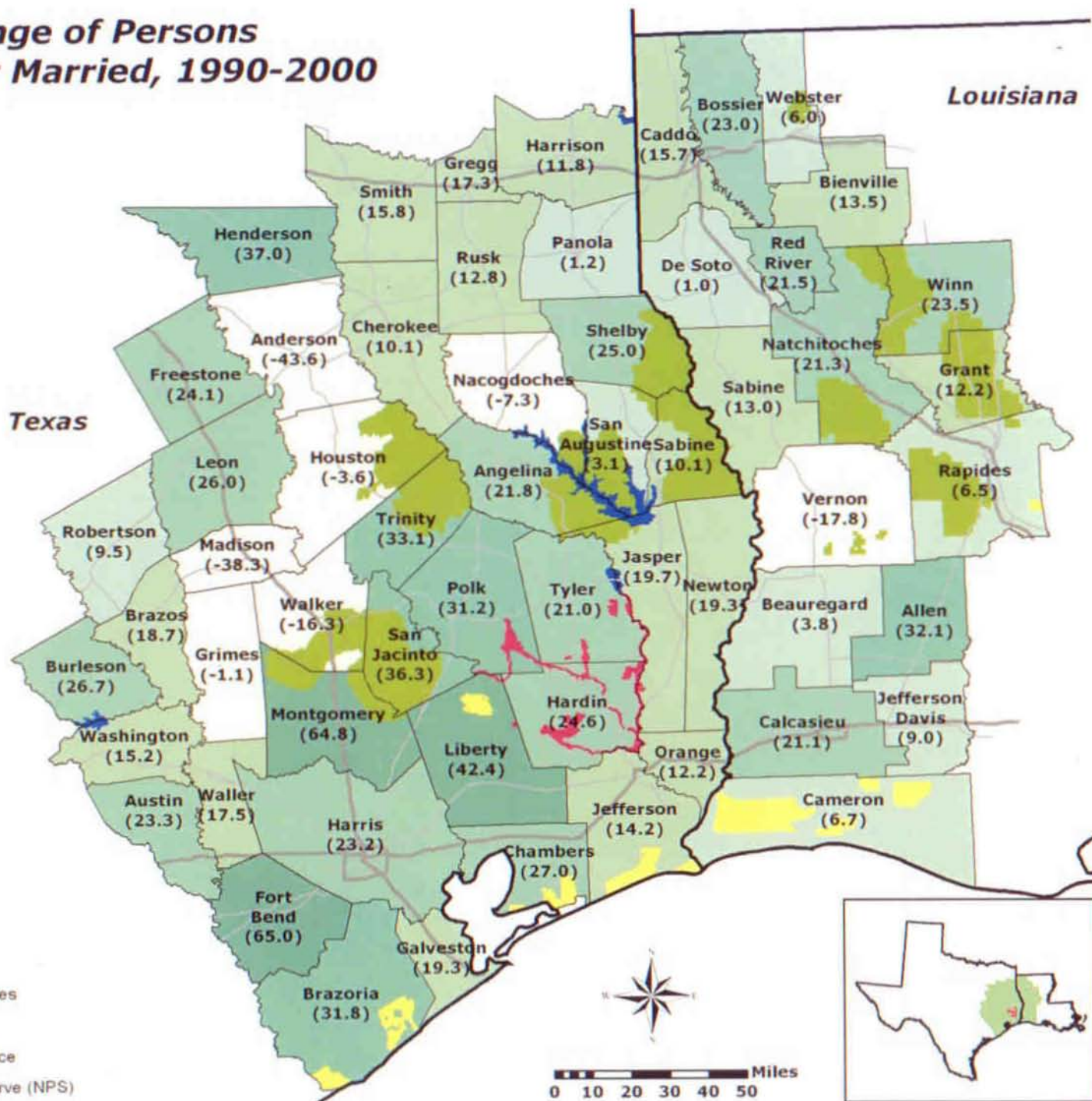
—— US Highways

Corps of Engineer Lakes

Forest Service

Fish and Wildlife Service

Big Thicket Natl Preserve (NPS)



Percent Change in the Average Family Size, 1990-2000

United States: -3.1

Louisiana: -3.0

Texas: 0.0

Study Area: -3.0



■ -6.0 or less

-5.9 - -4.0

-3.9 - -3.2

-3.1 - -3.0

☐ No change

———— Interstate Highways

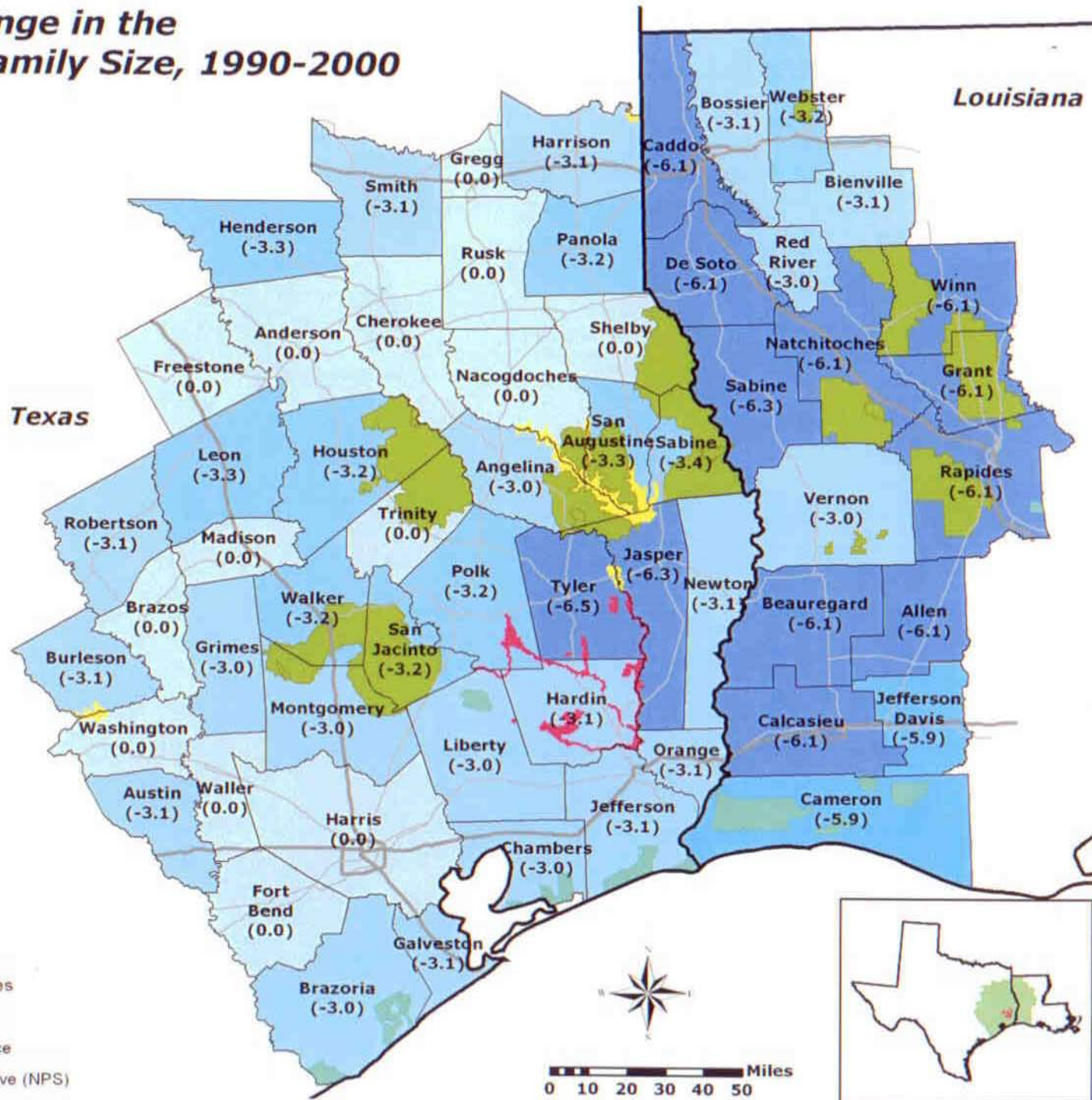
—— US Highways

Corps of Engineer Lakes

 Forest Service

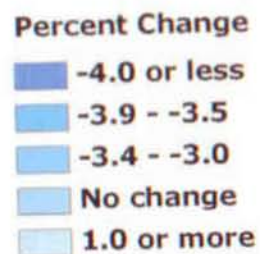
Fish and Wildlife Service

Big Thicket Natl Preserve (NPS)

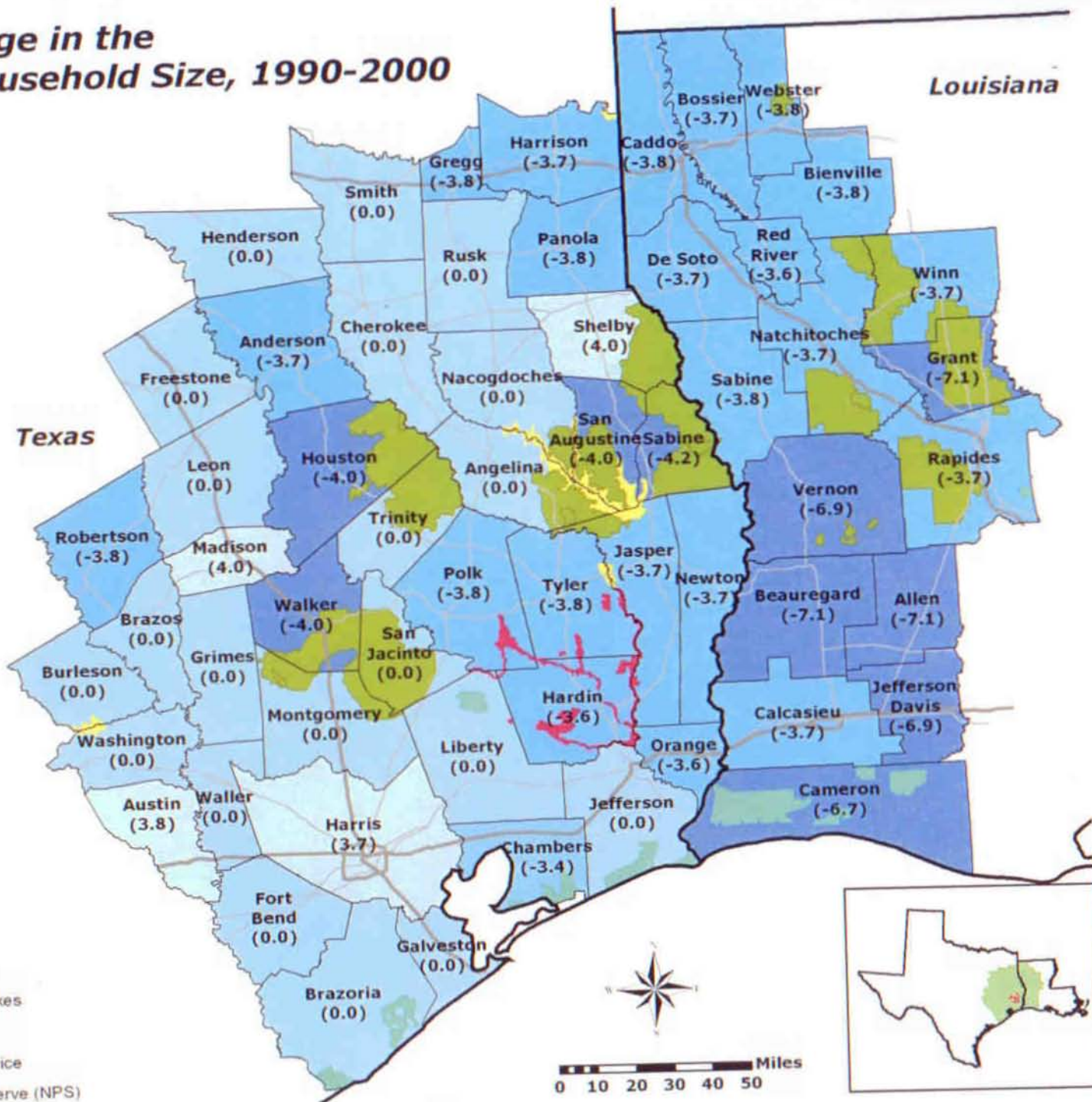


Percent Change in the Average Household Size, 1990-2000

United States: 0.0
Louisiana: -3.7
Texas: 0.0
Study Area: 0.0



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



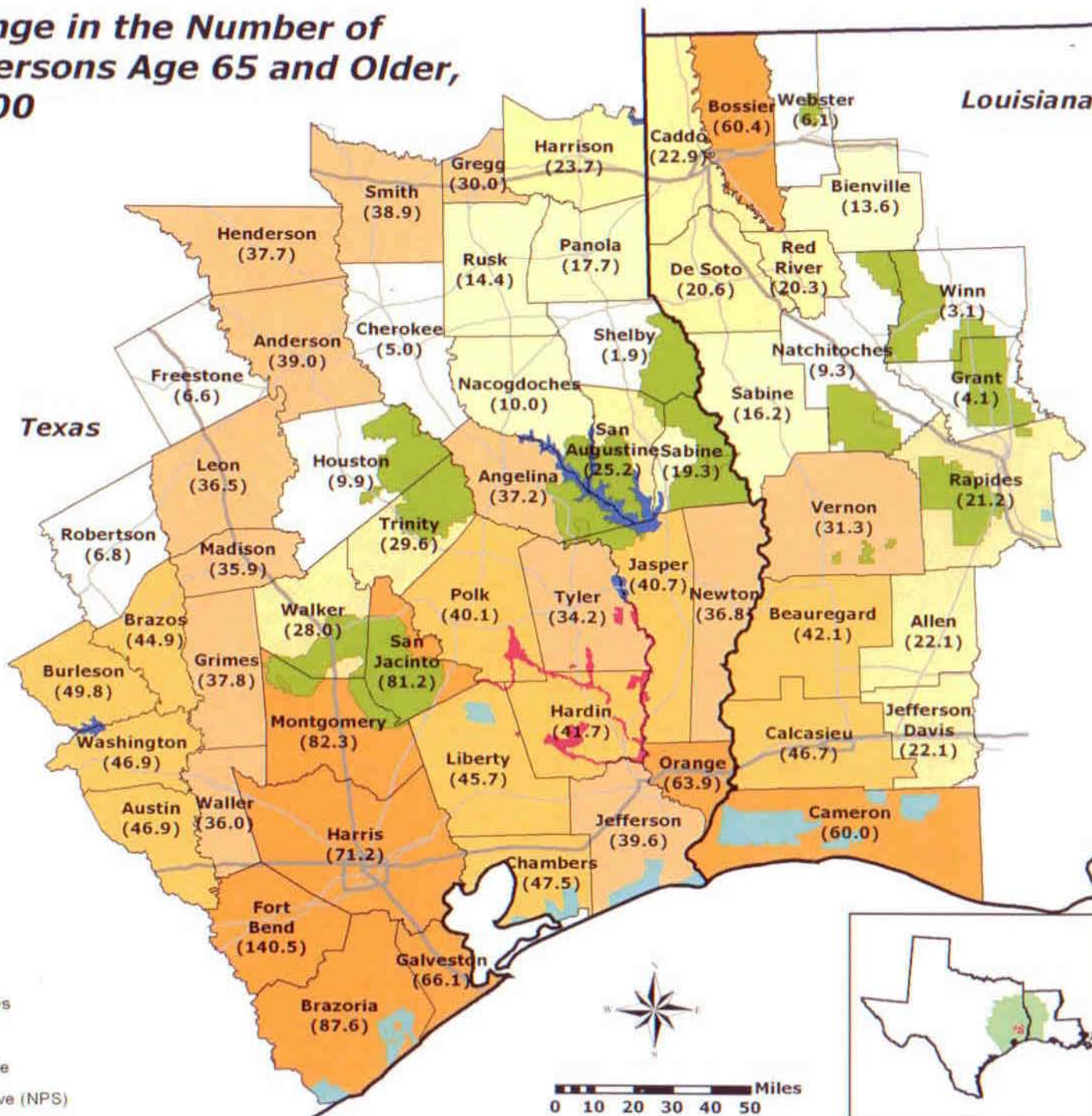
Percent Change in the Number of Disabled Persons Age 65 and Older, 1990-2000

United States: 43.9
Louisiana: 33.7
Texas: 54.1
Study Area: 48.3

Percent Change

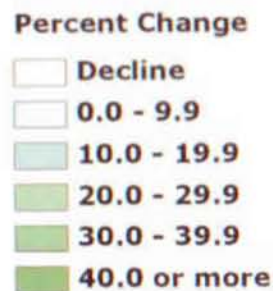
- Zero to 9.9
- 10.0 - 19.9
- 20.0 - 29.9
- 30.0 - 39.9
- 40.0 - 49.9
- 50.0 or more

- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)

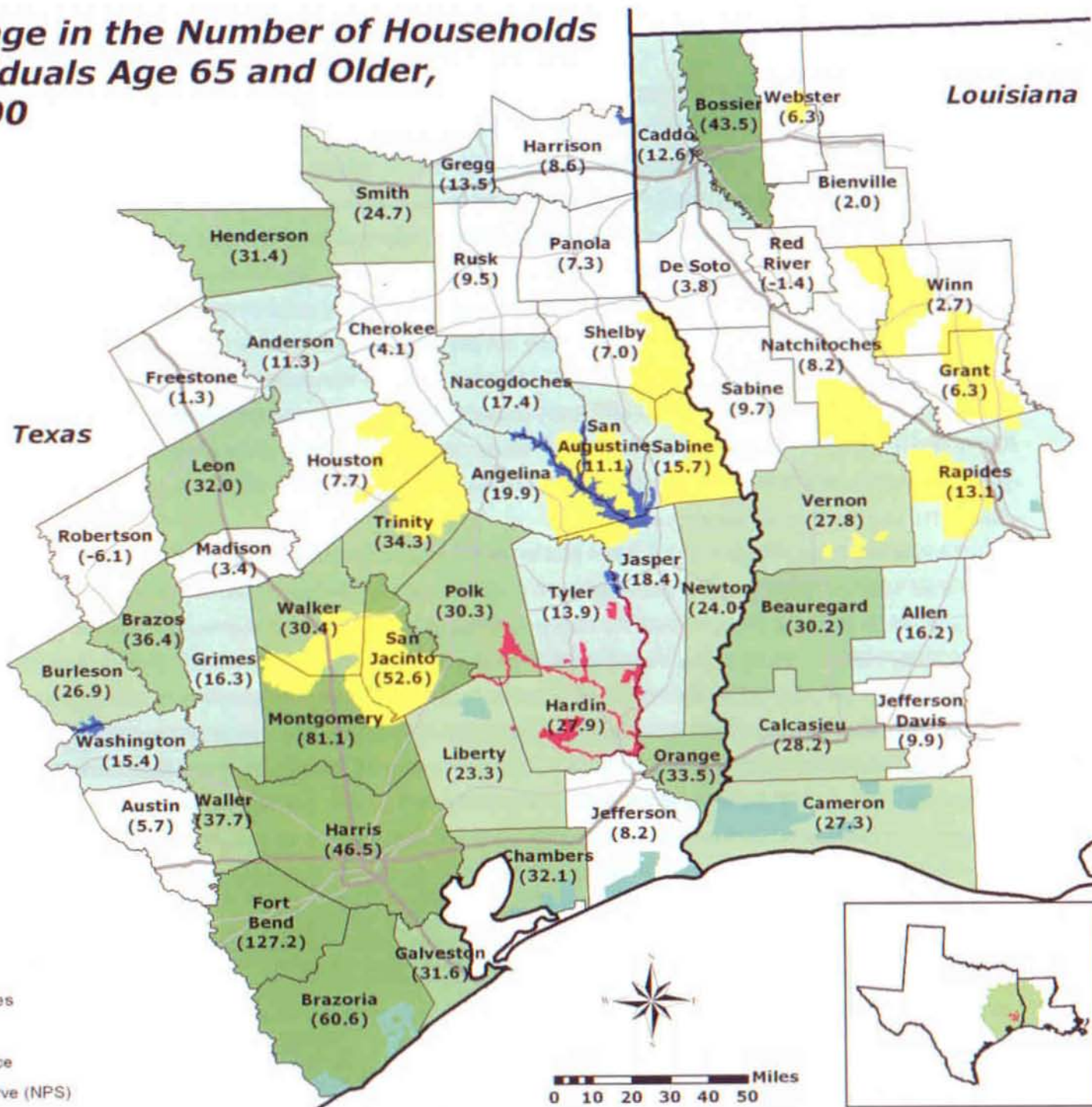


**Percent Change in the Number of Households
With Individuals Age 65 and Older,
1990-2000**

United States: 22.8
Louisiana: 19.7
Texas: 32.7
Study Area: 31.9



- Interstate Highways
- US Highways
- Corps of Engineer Lakes
- Forest Service
- Fish and Wildlife Service
- Big Thicket Natl Preserve (NPS)



LESSONS LEARNED AND FUTURE DIRECTIONS

The following study provides critical information for BITH managers on socio-economic and demographic variables in surrounding counties of the Big Thicket region. The study findings illustrate the need for managers to be more aware of the complexities of managing a park unit that is experiencing population and socio-economic change. This information has implications for attracting "new users" to the park and learning more about shifts in visitor participation and activity choice. Several findings stand out in the analysis. Considerable population growth is taking place in the counties to the west of BITH compared with those to the east. These findings may impact the number and type of new users who may choose to visit BITH and possibly decrease numbers of seasoned users of the BITH. As the population increases, BITH managers should try to reconnect with these counties, especially school-aged youth. BITH should promote itself and its programs by demonstrating to the community that it is an excellent source for environmental education and outdoor recreation activities. Community interaction and communication could be improved through voluntary associations and community groups that have an interest in the management of the BITH, i.e., Big Thicket Association.

In another finding related to population growth, only modest changes in the Anglo and African-American population were shown from 1990-2000 but dramatic increases were found for the Hispanic population in the counties around BITH. This result parallels a similar increase taking place in the state population of Texas as well. These two key findings shows a potentially "new" visitor to BITH that may or may not be visiting the area or aware of its offerings. What types of programs do these Hispanic visitors want? How do programs need to be modified to tell the BITH story to a "new" customer? More information is needed about these potential customers who may impact educational programs, promotional materials and activity/facility amenities.

Data used in this study are limited to Census data from the surrounding counties and illustrate what is taking place outside the park units. Unfortunately, current information about visitation and programs is less available. Specific information about activity participation or program evaluation (e.g., aside from hunting permits), was sparse and even inconsistent (prior to Katrina as well). Park visitation data were obtained from Public Use Statistics, available from the National Park Service, which showed a gradual rise in visitation since 2001.

Park staff or volunteers may need to conduct more targeted research about programs and activities in order to get a more detailed description of what visitors are looking for in and around the park. Given the fact that the BITH has many units and is spread out over a large area, it is even more important for input to be obtained on a systematic basis. This research may be done

through the assistance of a local college or university. Access to a host of expertise is available through the Gulf Coast Cooperative Ecosystems Studies Unit (GCCESU). Each CESU is structured as a working collaboration among federal agencies and universities. CESUs are based at universities and focused on bio-geographic regions of the country. Universities provide space, basic administrative support (secretarial, accounting, equipment), and access to university faculty, students, staff, and resources. Federal agencies contribute research scientists and/or other professionals. This current project was funded through the GCCESU. For more information about the GCCESU consult the website (<http://gccesu.tamu.edu/>).

Another option for BITH to obtain visitor data would be through the Visitor Services Project (VSP). This program is managed through the National Park Service's Social Science Program and coordinated through the University of Idaho (UI). The VSP provides park managers with usable knowledge about existing visitors. The UI program developed a technique that provides an easy-to-understand, consistent, and efficient means of studying visitors. Since 1988, the VSP has conducted over 140 in-depth visitor studies in 120 units of the National Park System. Through these studies, park staff obtains accurate customized information about visitors — who they are, what they do, their needs, and opinions. For more information about the VSP (<http://www.psu.uidaho.edu/vsp.htm>).

In closing, as socio-economic and demographic changes occur outside the BITH region, managers will also need to enhance and possibly reconnect with local NGOs and community-based conservation groups. Given the population shifts around the park area other stakeholder groups may become interested and want to get more engaged in the educational programs and outdoor recreation activities at the BITH. Feedback from stakeholder groups and visitors will be especially critical now and in the future as managers look to recover from the damage from Katrina. These interested citizens will be an important asset in assisting the BITH in bringing the facilities, trails and programs up to pre-Katrina standards to meet the needs of a potentially different constituency in years to come. From a broader perspective, data in this report will provide federal and state land managers with a foundation for formulating strategies for addressing shifts in population and socio-economic change around public lands in the region.

APPENDIX A: Map Metadata

The base map used in this report is a Lambert Conformal Conic projection with a NAD 83 coordinate system.

BITH BOUNDARY ADDITION:

National Park Service Intermountain Region GIS Center, Park Boundaries at Big Thicket National Preserve. Boundary Addition. Lakewood, CO. http://nrddata.nps.gov/bith/bithdata/bith_boundaries.zip

FEDERAL LANDS:

National Atlas of the United States, 200512, Federal Lands of the United States: National Atlas of the United States, Reston, VA. <http://nationalatlas.gov/atlasftp.html>.

COUNTY BOUNDARIES AND ROADS:

U.S. Department of Commerce. U.S. Census Bureau, Geography Division. TIGER/Line Files, 2005 First Edition. <http://www.census.gov/geo/www/tiger>

DEMOGRAPHIC DATA:

1. U.S. Census Bureau; Census 2000 Summary File 1: Texas; published October, 2002; http://www2.census.gov/census_2000/datasets/Summary_File_1/Texas/.
2. U.S. Census Bureau; Census 2000 Summary File 3: Texas; published October, 2002; http://www2.census.gov/census_2000/datasets/Summary_File_3/Texas/
3. U.S. Census Bureau; Census 1990 Summary File 1: Texas; downloaded and archived in 1992.
4. U.S. Census Bureau; Census 1990 Summary File 3: Texas; downloaded and archived in 1992.

AGRICULTURAL DATA:

1. U.S. Department of Agriculture. National Agricultural Statistics Service. 2002 Census of Agriculture. <http://www.nass.usda.gov/census/census02/volume1/us/index2.htm>
2. 1. U.S. Department of Agriculture. National Agricultural Statistics Service. 1992 Census of Agriculture. Downloaded and archived in 1995.

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- Cestero, B. (1999). *Beyond the hundredth meeting. A field guide to collaborative conservation on the West's public lands*. Tucson, AZ: Sonoran Institute.
- Field, D. R. & Jensen, D. A. (2005) Humans, fire and forests: Expanding the domain of wildfire research. *Society and Natural Resources*, 18: 355-362.
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