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Geospatial Analysis of Construction Labor Wage Rates in the United States of America

Steven L. Mackinder

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**GEOSPATIAL ANALYSIS OF CONSTRUCTION LABOR WAGE RATES IN
THE UNITED STATES OF AMERICA**

THESIS

Steven L. Mackinder, Captain, USAF

AFIT-ENV-14-M-36

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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AFIT-ENV-14-M-36

GEOSPATIAL ANALYSIS OF CONSTRUCTION LABOR WAGE RATES IN THE
UNITED STATES OF AMERICA

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

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Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Engineering Management

Steven L. Mackinder, BS, MHR

Captain, USAF

March 2014

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UNITED STATES OF AMERICA

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Abstract

The United States government spends millions of dollars on construction every year, and each construction project is subject to the requirements of the Davis-Bacon Act (DBA). The DBA is a federal law that sets minimum wages, called prevailing wages, for construction workers. These prevailing wages are determined based on the specific trade and the geographic location of the work being conducted.

This research used a geographic information system (GIS) to compare wages based on DBA requirements to wages earned by construction workers on non-federal projects not subject to DBA requirements. The research studied wages of eight different construction trades at all active military installations in the United States to determine if there was a significant difference between the two wage rates. It determined the existence of any spatial relationships between the wage differences. The research applied its findings to the U.S. Air Force's construction budget for Fiscal Year 2012 to determine the amount spend based on DBA requirements.

The research found that DBA wages are statistically higher for seven of the eight trades, by amounts that differ based on the trade. It also confirmed the existence of multiple spatial relationships, such as higher wages in large cities and along the west coast. The research concluded that the Air Force spent over \$20 million in Fiscal Year 2012 based solely on DBA requirements.

This document is dedicated to my wonderful wife, who supported me throughout the research process, always offered encouragement and advice, and was extremely patient through long hours of researching and writing. Thank you and I love you.

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Steve Mackinder

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Geospatial Analysis of Construction Labor Wage Rates in the United States of America

I: Introduction

The federal government spends billions of dollars on construction every year. Unlike some private corporations and citizens, it is governed by a vast array of rules and regulations that limit what it can and cannot do. These rules and regulations are put in place to protect the American public from potential abuses by the government and by other citizens. One such regulation is the Davis-Bacon Act (DBA).

In the construction industry, if two workers are doing the same work on two different buildings—installing electrical wiring for example—in the same location, with only a chain link fence separating them, it would be logical to assume that they would each be paid the same amount for that work. If however, that chain link fence marked the boundary of United States (U.S.) government property, such as a military installation, that assumption could be inaccurate. One possible reason for that inaccuracy is the Davis-Bacon Act. Any construction for the U.S. government must be done in accordance with the DBA. This act sets minimum wages for construction workers specific to both the individual construction trade and geographic location of the project. Often, these minimum wages are different than the average wages paid to workers on non-U.S. government projects.

The purpose of this chapter is to introduce the reader to military construction cost premiums. This includes a description of cost premiums and examples of cost premiums from previous studies. The chapter will also familiarize the reader with the Davis-Bacon

Act and how it contributes to cost premiums. The chapter then introduces the research problem and briefly outlines the methodology before discussing some assumptions and limitations and outlining the organization of this research document.

Background

Many studies have analyzed the military construction (MILCON) program and process, determining that several factors contribute to the cost of a MILCON project being higher than similar work done for private companies. These factors are known as cost premiums, which stem from “certain inherent features of DoD acquisition that drive prices” (L3 Stratis Cost Engineering Services, 2013, p. 5). In 2011, the House Committee on Armed Services found that these premiums “generally add between 25-40% in construction costs above private-sector construction requirements,” a number which the committee deemed “excessive” and which “limited the purchasing ability of the department” (112th Congress, 1st Session, 2011).

An L3 Stratis report on construction unit costs analyzed 15 components of the military acquisition process and identified 9 factors affecting MILCON costs: Sustainability and Energy Requirements, DBA Wage Requirements, Bonding and Insurance Requirements, Anti-Terror/Force Protection (AT/FP) Requirements, Federal Design Practices, Base Security and Access Requirements, Subcontracting Goals, Special Staffing Requirements, and Limited Procurement Options (L3 Stratis Cost Engineering Services, 2013, p. 2). These factors increase the cost of MILCON projects because they require extra systems like geothermal and photovoltaic, limit the use of innovative construction delivery methods, force contractors to comply with non-standard practices,

and require designers to adhere to government specific building codes, such as the Unified Facilities Criteria (L3 Stratis Cost Engineering Services, 2013). Without these requirements, military construction would be much easier for designers and contractors, thereby lowering the cost of projects.

In their study, Blomberg, Cotelleso, Sitzabee, and Thal (2013) found five themes affecting MILCON cost premium. The themes are failing to balance risk, additional public sector requirements, stifling or not applying innovation, selection of construction specifications, and parameterization of the execution process. Their research found that often the construction agents shifted too much risk to the contractor, resulting in increased costs for the contractor to handle that risk. Additionally, contractors were also subject to myriad federal laws, rules, and regulations pertaining to construction projects such as the DBA, meeting AT/FP requirements, and small business policies. All of these requirements increase contractors' costs which are then passed on to the government.

Further, the current acquisition process sometimes prevents innovative thinking in construction. Blomberg et al. (2013) also suggests that projects with very detailed specifications may prevent the contractor from using experiential knowledge which could save money in the long term. Specifications based on performance allow the contractor much more leeway in choosing how to conduct the work, thereby enabling methods that might be less expensive and more effective. Blomberg et al. (2013) also suggests the government often is overly involved from a regulatory standpoint in the construction process. Blomberg et al. (2013) also provides examples of design-build MILCON projects where the government prevented the contractor from starting construction until the final design was approved. The purpose of a design-build project is to allow a more

efficient construction process by starting construction before the final design is approved, reducing “costs and expediting project delivery” (MassHighway, 2006, p. 5). The cost premium factors found in the Blomberg et al. study are different in name but closely match the factors found in the L3 Stratis study, such as acquisition requirements and the selection of specifications, and it is clear that there are a number of factors that cause the costs of construction on military installations to eclipse those of private sector construction (Blomberg et al., 2013).

A 2011 study by the Defense Acquisition University that looked at MILCON cost premiums solely from the perspective of risk management analyzed 53 MILCON projects, valued between \$1.4 and \$45 million, from 2004 and 2005. These projects were managed by the United States Army Corps of Engineers using standard construction management practices and resulted in a mean cost premium of 7.493% over the baseline contract value (Stuban, Mazzuchi, & Sarkani, 2011). The study offered a comparison of these projects using construction of the National Geospatial-Intelligence Agency’s (NGA) NGA Campus East, a \$260+ million dollar program with four different projects. These projects were managed by NGA personnel using innovative risk management techniques such as Fast-Track Design Build, Early Contractor Involvement, and a Fixed Price Incentive with Successive Targets contracting method. These techniques resulted in a cost premium of -1.04%, bringing the final cost below the baseline contract value (Stuban et al., 2011).

Unfortunately, there are very few factors that consistently lower the final cost of a MILCON project; cost increases are more common, and the House Armed Services Committee noted a number of variables that increased MILCON costs for the Department

of Defense. Specifically cited as causes were “Federal contracting requirements (including Davis-Bacon wages, Federal sub-contracting and small-business goals, bonding requirements per the Miller Act), Federal design requirements (including Anti-Terrorism/Force Protection measures), energy efficiency objectives, and a robust quality-assurance capacity to manage construction contracts” (112th Congress, 1st Session, 2011, p. 291). The committee also recognized that these factors can add “25–40 percent in construction costs above private-sector construction requirements” to MILCON projects (112th Congress, 1st Session, 2011, p. 292).

The Davis-Bacon Act

Despite these many factors, the single cause found by the L3 Stratis study to have the highest potential impact on the cost of MILCON projects is the Davis-Bacon Act (L3 Stratis Cost Engineering Services, 2013). The Davis-Bacon Act applies to all construction paid for by the federal government. This includes the construction of new dams, flood-control projects, buildings for government agencies such as the Federal Bureau of Investigation, and any construction for any branch of the United States military. It also applies to state or local projects fully or partially paid for by the federal government. The L3 Stratis report determined “that mandated Davis-Bacon rates add...between 1.99% and 44.24% to the cost premium” and in an extreme example, the Davis-Bacon wages in Boston “are 146% higher than prevailing market rates” (L3 Stratis Cost Engineering Services, 2013, p. 19). The study, however, was not without its limitations. The authors analyzed a sample of eight projects in what they determined to

be a representative sample of all MILCON projects, rather than a statistically significant sample (L3 Stratis Cost Engineering Services, 2013).

Assertions that the DBA increases costs to the government are not new. In 1979, the General Accounting Office (GAO, forerunner of today's Government Accountability Office) issued a report to Congress titled "The Davis-Bacon Act Should be Repealed" (The Comptroller General, 1979). The report argued that the economic conditions and labor laws at the time made the DBA irrelevant and impractical to administer, resulting in inaccurate wages. The GAO analyzed a random sample of 30 projects around the United States and conducted their own wage determinations. They found on average that construction costs on federal projects (of all types, not just MILCON) were increased by 3.4%, ranging from 1% to 9%. The report estimated from these results that the government spent approximately \$513 million in 1977 due to DBA requirements (The Comptroller General, 1979). In a 1971 study mentioned in the same report, the GAO found construction costs in the United States were increased by 5% to 15% over the prevailing wage. The increased costs in both studies were attributed to "minimum wages being established at rates higher than those actually prevailing in the area of the project (The Comptroller General, 1979, pp. 76-77)

The GAO again studied DBA wages in 1980 when it reviewed construction of the Washington, D.C., Metro public transportation system (Ahart, 1980). The cost estimate for the Metro project in this report was \$8.3 billion, and the GAO found that out of 13 construction trades, 11 had DBA wages that were significantly higher than the prevailing wages in the area. The average wage for Metro contracts was 33.9% higher than the

prevailing wage, increasing the overall project cost by about 6.8%. This translated to a cost increase of approximately \$149 million in 1980 dollars (Ahart, 1980).

In 1999, the Congressional Budget Office “concluded that Davis Bacon inflates construction costs” and estimated that repealing it would save the government over \$5.5 billion over 5 years (U.S. General Accounting Office, 1999, pp. 229-230). Additionally, repealing the act or lowering the \$2,000 threshold of applicability would increase “the opportunities for employment of less skilled workers” (U.S. General Accounting Office, 1999, pp. 229-230). Any project over this \$2,000 limit must adhere to the DBA. This limit has been unchanged since it was amended in 1935, shortly after the law’s passage (Whittaker, 2007). In 1935, \$2,000 had the same buying power as \$34,008 had as of January, 2014 (U.S. Bureau of Labor Statistics, 2013 c). There have been multiple attempts in Congress to raise the \$2,000 limit, including 1988 legislation that would have increased the limit to \$25,000; however, each of these attempts has been unsuccessful (Pope, 1990). This extremely low limit is another contributor to the increased costs of the DBA. While there are very few federal construction projects under \$2,000 that would not fall under the DBA, there are many projects that are less than \$34,000, or even \$25,000 (the proposed 1988 floor). A higher limit for DBA applicability would excuse a greater number of projects, thereby allowing the government to save money.

Problem Statement

Unnecessary spending by the government is cause for concern, and it is even more disconcerting when it appears the government is requiring itself to overspend. This investigation attempts to determine if this problem exists, and, if so, the size of the

problem, by answering the overarching research question: How are Davis-Bacon Act wages different from Bureau of Labor Statistics wages? There are three investigative questions supporting this research question:

- (1) How much of a difference exists between the two types of wages?
- (2) What kind of spatial relationship exists between the two wage types?
- (3) How much of its appropriated MILCON funds did the U.S. Air Force spend because of Davis-Bacon Act requirements in Fiscal Year 2012?

The purpose of this research was to determine whether the Wage and Hour Division wages are significantly different from the BLS wages and the magnitude, if any, of that difference. Based on the existing literature, the prevailing hypothesis for this research is that DBA wages are higher than BLS wages. Since the federal government is required to pay DBA wages on any construction it funds, a finding that DBA wages are higher than BLS wages would indicate that the government pays extra money—called a cost premium—because of the DBA wages.

Another purpose of this research is to determine if there is a spatial relationship between the wage differences. Determining a spatial relationship between the wage differences would allow estimation of differences at construction sites not analyzed in this study, and it could also help officials determine any trends and causes of wage differences by location. It seems intuitive that a project's proximity to large cities or to the coast would increase the cost, while projects in the country's interior would cost less.

One final purpose of this research is to determine the amount of money the Air Force spent due to the DBA requirements. This question will be answered based on actual MILCON cost data provided by the United States Air Force Civil Engineer Center

(AFCEC) at Lackland Air Force Base, Texas, which is the sponsor of this research. The results of the geospatial analysis portion of this research will be applied to the MILCON cost data to determine the portion spent on DBA requirements.

Methodology

The methodology is discussed thoroughly in Chapter III. This research used ArcGIS™, a common geographic information system, to analyze the DBA wages for various construction trades on United States military installations. These wages were compared to wage data collected by the BLS. The two types of wages were compared both statistically and spatially to determine if there are any relationships. ArcGIS™ analysis uses a geostatistical analysis procedure called the Kriging method to produce maps that show the predicted wage difference in all areas of the United States. Other maps produced in ArcGIS™ allow graphical comparison of wages, with DBA wages overlaid on BLS wages. DBA wage data were retrieved from the Wage Determinations Online site, which is the government's repository for DBA wages. The BLS wages were retrieved from the Bureau of Labor Statistics website; both types of wage data are open source, meaning they are freely available to the public at no cost. The wage differences were also analyzed with statistical software called JMP to determine statistical significance.

Assumptions and Limitations

Assumptions and limitations of this research will be discussed in more detail in Chapter V. The research is limited to only eight construction trades: carpenter, cement mason, electrician, common laborer, equipment operator, painter, plumber/pipefitter, and

roofer; there are multiple other trades not studied to limit the scope of the research. Additionally, only military installations were analyzed, and non-military government projects were not considered. Another limitation concerns the DBA wage reporting website. DBA wages are not reported consistently across all counties in the U.S., and some counties are missing wage data for certain trades. These wages are only a snapshot in time, which is another limitation. The BLS and Wage and Hour Division (WHD), which is the organization that determines DBA prevailing wages, continually update their wage information, so the wages reported in this study could be different than they were one year ago or one year from now. Finally, the fringe rate was not studied in this research and the term “DBA wage” used in this document refers only to the base rate. DBA wages are reported with both a base rate and a fringe rate. Companies that do not provide benefits to their employees such as medical insurance are required to pay both the base rate and the fringe rate, while those that do provide benefits need only pay the base rate.

One assumption made in this research is that the differences in wages will be consistent between the categories of DBA wages, which are broken into Building, Heavy, Highway, and Resident. The Building category was primarily analyzed in this research, and the other categories were only used when the Building category wage was not reported. Another assumption made is that Air Force MILCON funding data obtained from AFCEC is valid and usable for the purposes of estimating the amount of money spent on DBA requirements.

Thesis Organization

This thesis is organized in five separate chapters. Chapter II serves to review relevant literature and determine where gaps in the body of knowledge exist. Chapter III provides a detailed explanation of the methodology that was used to conduct the research. Chapter IV presents the results of the research, and Chapter V analyzes the results and draws conclusions from them. Following Chapter V is an appendix that presents additional information, to include a detailed, step-by-step process description of collecting and analyzing the data.

II. Literature Review

The purpose of this chapter is to investigate the existing literature for background information and gaps in knowledge related to this research project. It begins by detailing the government's obligations to spend money responsibly while also assisting citizens, and the paradox that results when these two responsibilities compete. The chapter then examines this predicament specifically in the realm of construction before analyzing literature relating to military construction (MILCON). It then moves into an in-depth survey of literature on the Davis-Bacon Act (DBA), to include how unions impact the DBA. Finally, the chapter then discusses literature involving the Bureau of Labor Statistics (BLS) before concluding with a discussion of typical construction costs.

Government Spending

In November 2011, President Obama signed Executive Order 13589, Promoting Efficient Spending. This Executive Order specifies the President's priority that the federal government cut wasteful spending and find "opportunities to promote efficient and effective spending" (U.S. President, 2011). In an attempt to control the nation's climbing debt, the President mandated that all federal departments and agencies reduce their Fiscal Year (FY) 2013 budgets by 20% compared to FY 2010 budgets. Primarily, this was to be done by reducing spending in the areas of travel, conference attendance and hosting, real property, and fleet management (Zients, 2012). This Executive Order underscores the importance of the federal government acting in a fiscally conservative manner. The Budget Control Act of 2011, passed by Congress in 2011, is estimated to

“reduce budget deficits by about \$1.1 trillion between 2012 and 2021” by establishing new budget procedures and modifying existing budget rules (Elmendorf, 2011). As guardians and benefactors of America’s tax dollars, the federal government should obtain maximum benefit from every dollar spent; it has a responsibility to efficiently manage the money entrusted to it by the taxpayers.

Despite this responsibility, examples of waste in government spending abound. Senator Coburn (R-OK) annually compiles 100 of the most noticeable examples of wasteful spending. His 2012 edition detailed over \$18 billion dollars of government expenditures that could have been better spent elsewhere. These examples include \$10,000 spent by the Michigan State Police on talking urinal cakes warning bar patrons not to drink and drive and \$35.6 million spent on a streetcar system in St. Louis, Missouri, that duplicates existing light-rail and bus service (Coburn, 2012). In a more publicized event, the General Services Administration spent over \$820,000 on a conference in Las Vegas, Nevada, while violating multiple agency policies and Federal Acquisition Regulations (Office of Investigations, 2012). This scandal was widely reported on and cast the federal government in a negative light with the American public. Ten officials were fired as a result of the conference while one was allowed to retire and 34 were “suspended, warned, or reprimanded” (Rein, 2013).

One reason for the difficulties of reining in government spending is the military-industrial complex. Two recent, highly publicized examples of the military-industrial complex have resulted in the expenditures of large amounts of taxpayer money. According to a Center for Public Integrity article by Swellenbach (2010), The United States Air Force has a fleet of 213 C-17 Globemaster III cargo aircraft, a number that Air

Force and Defense Department officials maintain is adequate for the service's needs. Congressional leaders agree the Air Force has enough C-17s, as "neither the House or Senate Armed Service Committee authorized funding for the C-17 program, yet it still received approximately \$2.5 billion in the annual Pentagon spending bill approved by appropriators" in 2009 (Schwellenbach, 2010). This happened despite the assurances of ample C-17s by senior Air Force leadership. The staunchest supporters of extra C-17 funding include Senators Bond (R-MO) and Feinstein (D-CA), whose states both employ thousands of workers on C-17 assembly lines. These senators are opposed to any legislation that would cause job losses for their constituents, even if that legislation results in billions of dollars of unnecessary spending (Schwellenbach, 2010).

As reported in another Center for Public Integrity article, by Mehta & Mulvany (2012), the United States Army has over 2,300 M-1 Abrams main battle tanks deployed around the world. There are also approximately 3,000 sitting in mothballs in California, unused and unneeded. These tanks are manufactured and refurbished by General Dynamics in Lima, Ohio. Army and Defense Department officials both agree that they have sufficient tanks in the inventory to maintain national security and would like to freeze manufacture and refurbishment of the M-1 until 2017 so they can concentrate on designing a new version of the M-1 more suited to today's battlefield. The Army estimates it can save up to \$3 billion by doing so (Mehta & Mulvany, 2012).

Despite the Army's stance on the M-1, Congress appropriated over \$250 million in 2012 for the Army to refurbish "280 tanks that we simply do not need," as described by Army Chief of Staff General Odierno (Mehta & Mulvany, 2012). One reason that Congress authorized this money is General Dynamics' lobbyists, who pressure

lawmakers on the House and Senate Armed Service Committees and the House and Senate Defense Appropriations Subcommittees. These lobbyists have contributed over \$5.3 million from the General Dynamics Political Action Committee and employee funds to the reelection campaigns of members of the four committees since 2001. These donations tended to spike during key votes in the committees; for example when Army budget hearings were being held. The results of these donations are clear: in April of 2012, 173 Members of Congress signed a letter to the Secretary of Defense “decrying the decision to freeze work on the tanks” (Mehta & Mulvany, 2012). Over 130 of the signers have “received contributions totaling over \$2 million from General Dynamics since 2001,” a clear sign that many congressional leaders are less concerned with saving America’s budget than they are with padding their reelection coffers (Mehta & Mulvany, 2012). The preceding examples, combined with the United States’ total public debt outstanding of over \$17.2 trillion dollars as of February 13, 2014, show why the federal government needs to control spending and operate as efficiently as possible (U.S. Department of the Treasury, 2013).

Assisting American Citizens

In addition to spending taxpayer dollars wisely, the federal government has another responsibility, which is to help its citizens succeed. The preamble to the Constitution obligates the government to, among other things, “promote the general welfare, and secure the Blessings of Liberty to ourselves and our posterity” (U.S. Const., pmb.). As there is no greater charge to the government than from the document that created it, the government should be keenly aware of its responsibilities in this area.

There are multiple laws, regulations, and agencies in place to assist people in the United States. Welfare, unemployment, Medicare and Medicaid, and housing organizations such as Fannie Mae and Freddie Mac are all examples of government-created organizations that exist to help people. Even though there are many organizations and regulations meant to take care of the American people, occasionally there are conflicts between the regulations. These conflicts can require the government to spend additional money to follow the rules it created to take care of Americans.

One specific organization that has a dramatic impact on the lives of millions of Americans is the Department of Veterans Affairs (VA). The VA has existed in various forms since 1811, but was created in its current form in 1989; it provides medical care to veterans of America's Armed Forces and their families and survivors. The VA secretary is a cabinet-level position in the President's administration, and currently oversees over 150 hospitals and almost 1,000 outpatient clinics and other facilities. The VA's mission is embodied in 16 major initiatives, a few of which include eliminating veteran homelessness, improving veterans' mental health, enhancing the veteran experience and access to healthcare, and improving the quality of healthcare while reducing costs (U.S. Department of Veterans Affairs, 2013). The President recognized that "the Nation has a solemn obligation to take care of our Veterans as well as they took care of us," and increased the 2013 VA budget by 4.5% over 2012 levels to \$64 billion in the President's Budget (White House Budget Office, 2012). The Department of Veterans Affairs is a prime example of an organization created specifically to care for the American people.

The Small Business Administration (SBA) is another organization that was developed by the federal government to further its mandate to take care of the populace.

The SBA was started in 1953, stemming from the Small Business Act, and is a part of the Department of Commerce. There are four main functions the SBA provides to small business owners (U.S. Bureau of Labor Statistics, 2013 a). Business financing is the first function, and the SBA provides an array of options from microloans to venture capital. The second function is entrepreneurial development, which consists of education, information, technical assistance, and training. These services are provided face-to-face in over 1,800 locations nationwide. Government contracting is the third function provided by the SBA. The agency works with other government entities to reach the goal of 23% of prime contract dollars going to small businesses as set forth in the Small Business Act (U.S. Small Business Administration, 2013 a). A prime contract is any contract awarded directly by the federal government.

The fourth function of the SBA is advocacy. The SBA trains small businesses to negotiate the confusing process of government contracting. Since 1978, the SBA Advocacy Office has worked with Congress to review legislation, testify to Congress on behalf of small business, and ensure legislation does not have too much of an impact on small businesses. As a testament to the importance placed by the government on this office, the Chief Counsel of the SBA Advocacy Office is directly appointed by the President (U.S. Small Business Administration, 2013 a). The SBA has a large impact on small businesses in the United States, giving many of them the tools to succeed in a capitalist society where they might otherwise struggle or even fail.

The Small Business Act's caveat that 23% of all prime contract dollars go to small businesses is sometimes counterproductive to the government saving money. Small businesses are not always as efficient as large corporations. They require more

overhead and, in some cases, greater mobilization costs than large businesses because they have fewer people to accomplish the work and they have less income from contracts. Small businesses also may have less experience and expertise than their large competitors. All of these factors combine to create an environment where small businesses are sometimes forced to submit higher bids for contracts than large corporations. While this is not a universal truth, it is often the case, and the Small Business Act requires the government to accept those bids for 23% of its spending (U.S. Small Business Administration, 2013 a). This requirement once again puts the federal government at odds with itself, forcing it to be less efficient in its spending.

Another piece of legislation that assists American citizens is the Buy American Act, which was enacted in 1933. This act helps citizens by requiring the federal government, when making any purchases over \$3,000, to only purchase items made in the United States. Additionally, manufactured products must contain at least 50% of American-made components. There are some exceptions to this law, such as when needed materials are not available in sufficient quantities from American manufacturers, but in general at least 50% of materials and supplies must be produced in the United States (Defense Acquisition University, 2013). This act was put in place to support the American economy and keep federal dollars from going overseas. Without it, foreign companies could easily outbid American companies for supplies and materials.

While there are provisions in the act that allow the government to bypass the regulation in certain circumstances, those are only applicable when the criteria are met. One of these provisions states that the regulations can be bypassed if purchasing the item from an American company is likely to “burden the government with an unreasonable

cost” (Defense Acquisition University, 2013). This provision allows the government to save money if it is triggered. However, if purchasing the item or materials from an American company increases the project cost significantly, but not enough that it is determined to be an unreasonable amount, the government is still forced to buy American. That puts the Buy American Act directly at odds with the federal government’s priority of “promoting efficient and effective spending” (U.S. President, 2011).

The McNamara-O’Hara Service Contract Act (SCA) is another example of a government regulation that was put in place to assist citizens and ends up costing the government extra money. The SCA mandates that contractors hired by the federal government must pay prevailing wages to the workers they hire to fulfill their contracts. Service contracts covered by the SCA include, but are not limited to, custodial services, food services, and security. A prevailing wage is defined by the U.S. Department of Labor as “the average wage paid to similarly employed workers in a specific occupation in the area of intended employment” (U.S. Department of Labor, 2013 b). The prevailing wage system is tantamount to the government mandating the salaries of contractor employees who are fulfilling federal contracts (U.S. Department of Labor, 2013 a). This system can cause the government to pay more money when the prevailing wage set by the government is higher than the wage the workers would earn doing the same work on a non-government contract.

Construction Predicament

There are number of regulations that must be followed on construction procured by, or paid for with, federal dollars. Some of these regulations, like the examples described in the preceding section, require the government to take actions that sometimes cause it to spend money it would not otherwise spend. Federal construction is heavily regulated by the Federal Acquisition Regulations (FAR) in terms of contracting and procurement. Often the government selects the lowest bid for a project. However, the low bid frequently balloons due to changes, items left out, and/or poor workmanship (Ioannou & Leu, 1993). When this happens, especially if it is done on purpose by the bidder, the final project cost ends up higher than the other bids (Ioannou & Leu, 1993). If the FAR encouraged the selection of the higher bids based on information other than the cost estimate, the government could save money in the long run. This type of selection, known as “best value,” is becoming more common, but contracting officials are still limited on which projects they can use it (OSD Source Selection Joint Analysis Team, 2011).

Other contradictory regulations the federal government must follow relate to the Small Business Act. According to the U.S. Small Business Administration (2013 b), in addition to the 23% of prime contract dollars that should be awarded to small businesses, there are specific small businesses to which those dollars should be awarded. For example, of the 23%, 5% should go to women-owned small businesses and 5% should go to Small Disadvantaged Businesses, such as a minority-owned business or a business owned by a young entrepreneur or a disabled person. Additionally, 3% should go to a service-disabled veteran-owned small business and 3% should go to a business in a

Historically Underutilized Business Zone. These goals are extremely valuable to the small business owners, but as described above, they have potential to result in higher bids due to the small size of the businesses. These goals apply to all government contracts, and they are frequently applied to construction contracts (U. S. Small Business Administration, 2013 b).

One final example of a contradictory law the federal government must follow regarding construction is the Davis-Bacon Act (DBA). The DBA is a prevailing wage law along the same lines as the SCA, whereby all construction paid for by the federal government must be done in accordance with the DBA. The wage paid depends on both the specific construction trade, like plumber or electrician, and the region of the country in which the work is taking place. The wages paid in accordance with this act are determined by the United States Department of Labor's Wage and Hour Division (Wage and Hour Division, 2013). These wages generally vary from the average local wages collected by the Department of Labor's Bureau of Labor Statistics (BLS). Given that the Wage and Hour Division (WHD) and the Bureau of Labor Statistics (BLS) are both branches of the Department of Labor, it would be logical to assume that their data collection results in the same wage figures. Previous research (e.g. L3 Stratis, the GAO, and Blomberg, Cotelleso, Sitzabee, and Thal) has concluded, however, that their results are sometimes different, which can result in a wage disparity, thereby causing the government to pay construction workers more than the workers would make for the same work on a non-government project. Blomberg, et al. (2013) showed that there is a significant increase in total cost for military construction (MILCON) projects due to the DBA requirement. They determined that DBA wages for carpenters on US Air Force

bases are an average of \$5.17 higher than BLS wage rates, and DBA wages for electricians on Air Force bases are an average of \$5.88 higher than BLS wages; these were the only two construction trades they analyzed. The DBA will be discussed in more detail later in this chapter.

Military Construction

In the spring of 2013, the DoD released The Overview Book, a report on the FY 2014 Defense Budget request. The request involved key themes based on the President's Budget. One of these themes is that the DoD should be good stewards of taxpayer dollars. The department has committed to six key initiatives to better care for those dollars. These initiatives include more disciplined use of resources, improving the financial management workforce, achieving audit readiness, audit and contract management oversight, better buying power, and controlling costs throughout the product lifecycle (Office of the Undersecretary of Defense (Comptroller)/Chief Financial Officer, 2013).

The military's mission of protecting the vital interests of the United States is not put on hold because of decreased funding; therefore, each service is charged with implementing these initiatives to make the most efficient use of the money appropriated to it. "Do more with less" has been the mantra for service members in recent years, as available funds dwindle and the responsibilities placed on each individual increase. With the 2013 implementation of sequestration, the military was forced to slash its budget by over \$450 billion over nine years (Congressional Budget Office, 2011).

This cut is resulting in mandatory civilian furloughs and reductions in force of military members. The Army is in the process of reducing its Active Duty end strength by 80,000 troops by FY 2017 (Hammack, 2013), and the Marine Corps is facing the possibility of losing 8,000 troops if sequestration effects continue into FY 2014 (Parrish, 2013). Additionally, Secretary of Defense Hagel has asked Congress for another round of the Base Closure and Realignment Commission in 2015 to save money on infrastructure (Garamone, 2013). These unprecedented effects of a smaller budget are some of the reasons for the DoD developing its priority of being good stewards of taxpayer dollars (something the DoD has always strived for, but is now codifying as a departmental priority).

Military construction (MILCON) is any construction on a military installation that costs \$750,000 or more. In some circumstances, repair or regular maintenance can be classified as MILCON, although in most cases only new construction is considered MILCON. While each military branch is responsible for its own program, all services report to the DoD. Due to sequestration and the austere fiscal environment, the Air Force was forced to take a “deliberate pause” in MILCON funding, receiving only approximately \$400 million in the FY 2013 budget (Ferguson, 2013). The Air Force has requested a total of \$1.3 billion for military construction in FY 2014 for the Total Force, which includes active duty, Air National Guard, and the Air Force Reserves. Because of this large dollar amount, it is imperative that the Air Force use it in the most efficient way possible. Indeed, the Acting Assistant Secretary of the Air Force for Installations, Environment, and Logistics testified before Congress that the Air Force “will continue to

work hard to identify opportunities and initiatives with high rates of return that will maximize the impact of every dollar” (Ferguson, 2013).

The Army submitted its MILCON request to Congress asking for approximately \$1.6 billion for the Active Duty Army, the Army National Guard, and the Army Reserve. This is a 34% reduction of the Army’s FY 2013 request, and officials are planning on using the requested funds to “to enable the future force of the All-Volunteer Army of 2020 in a constrained fiscal environment” (Hammack, 2013, p. 2). The Department of the Navy, which includes the Marine Corps, submitted an FY 2014 MILCON request of slightly over \$1.7 billion for both the Active and Reserve components of both services. This is just slightly lower than the Navy’s FY 2013 request (Natsuhara, 2013, p. 3). The Navy, like the Air Force and Army, invested its limited MILCON funds in projects that support the key objectives of the Defense Strategic Guidance of 2012. These objectives include “enhance warfighting capabilities in the Asia-Pacific region” and “projecting power in anti-access and area denial environments” (Natsuhara, 2013). Using MILCON funds for supporting strategic objectives will allow the Department of Defense to make the best use of limited funds.

Davis-Bacon Act

Congress passed the Davis-Bacon Act in 1931 to protect local workers from non-local contractors who used African-Americans as their labor force and paid them extremely low wages (Bullock & Frantz, 1996). These contractors often prevented local workers from being hired and treated their own workers poorly. The DBA was meant to prevent both of these problems by requiring contractors to pay workers the prevailing

wage. As stated earlier in this chapter, a prevailing wage is defined by the U.S. Department of Labor as “the average wage paid to similarly employed workers in a specific occupation in the area of intended employment” (U.S. Department of Labor, 2013 b). The Act has gone through many revisions in its history, and at present, it is in effect on all federal construction contracts over \$2,000 (Weingroff, 2011).

Currently, the Wage and Hour Division (WHD) of the Department of Labor is in charge of making the determination for DBA wages. The wages “are determined based on wages paid to various classes of laborers and mechanics employed on specific types of construction projects in an area” (Wage and Hour Division, 2009). The current method of determining these wages is by conducting “voluntary surveys of construction contractors and interested third parties on both federal and nonfederal projects to obtain information on wages paid to workers in each construction job classification by locality” (Sherrill, 2011, p. 4). These interested third parties can include labor unions, other government associations, contractor associations, and even members of Congress. Using these surveys, if there is one wage that stands out as the wage paid to the majority of workers in an area, that wage is deemed to be prevailing. If there is no majority wage, then “a weighted average of all the rates that had been submitted, accounting for number of workers covered and hours worked” is used to set the prevailing wage (Kersey, 2007, p. 5).

The WHD has been investigated in recent years because of problems found with its wage determination methodology. Since 1996, the United States Government Accountability Office and the Department of Labor Inspector General’s office have both found discrepancies within the wage determination process, including the fact that “much

of the data it examined [was] inaccurate and potentially biased due to weaknesses in survey methodology” (Sherrill, 2011, p. 5). Throughout the remainder of the 1990s and the 2000s, reviews by the Department of Labor Inspector General (IG) attempted to reform the wage determination methodology, but the IG found in 2004 that the reforms implemented by the WHD had not solved the problems. The WHD currently still uses the methodology described above to gather prevailing wage rates.

One reason that the DBA increases the cost of MILCON projects is the very competition that the act was written to prevent. Because the act was created to reduce wage competition from laborers from outside the local area, “the government authorities responsible for calculating the prevailing wage are under pressure to use methods for calculating the wage that are biased upward” (Glassman, Head, Tuerck, & Bachman, 2008, p. 4). Glassman et al. (2008) determined that the methods employed by WHD to calculate DBA wages inflate workers’ wages by 22% on average and total construction costs by 9.91% on average, while costing taxpayers an extra \$8.6 billion annually.

Thieblot (2005) found the cause of these rising wages to be the surveys used to determine the wages. He noted that “taking any rate from a survey distribution other than the lowest and setting it as the new minimum effectively dismisses all lesser rates in the old distribution from future consideration...requiring wages to rise” (Thieblot, 2005, p. 100). He determined that an increase in project costs of only 0.1% due to prevailing wage laws would result in a total increase of \$125 million to the national total of the annual U.S. public construction market of \$215 billion, while a 3% increase would add over \$3 billion (Thieblot, 2005).

Members of the Association of Builders and Contractors testified before a Senate committee in 2009 that “Davis-Bacon costs taxpayers approximately \$10 billion per year in added construction costs” (Ozanne, 2012, p. 60). They added that the percentage of cost increase varied between 5% and 38% above what would be paid in the private sector (Ozanne, 2012). Additionally, the U.S. Chamber of Commerce estimates that DBA requirements can add up to 15% to the cost of federal construction annually (Ozanne, 2012). Another study found that DBA requirements impact awarded federal contracts by over 20%, resulting in an impact to the Air Force of over \$216 million in FY 92 (Carpenter, 1992).

In addition to the federal Davis-Bacon Act, 32 states and the District of Columbia have similar prevailing wage laws applicable to state government funded projects (Glassman et al., 2008). These laws, commonly called “Little Davis-Bacon Acts,” have proven to be controversial, as numerous lawsuits and challenges have taken place in recent years (Clark, 2005). Clark (2005) studied workers in Kentucky and found that 60% of those surveyed were paid higher on prevailing wage projects than non-prevailing wage projects, at an average of \$3.68 more per hour. Governor Johnson of New Mexico said in his 1996 State of the State address that “without the constraint of the Little-Davis-Bacon Act, we could build four schools instead of three for the same amount of money” (Azari-Rad, Philips, & Prus, 2003, p. 446).

The state of Michigan has one of the most stringent Little DBA laws in the country (Kersey, 2007). The law was suspended from December 1994 to June 1997 due to a court ruling, and construction during this period was analyzed and compared with

construction before and after it. The analysis found that in FY 1995, when the law was not enforced, the state saved approximately \$275 million (Vedder, 1999).

Not all studies have shown that prevailing wage laws increase construction costs, however. The province of British Columbia, Canada, introduced its own prevailing wage law, called the Skills Development and Fair Wage (SDFW) policy, in 1992, and it affects all provincially funded projects over CA\$250,000. Duncan, Philips, and Prus (2009) studied public school construction in British Columbia to determine what kind of effect the introduction of the SDFW had on construction costs. Their study concentrated on the efficiency of construction rather than cost, and they found that efficiency initially decreased and then increased sharply with the introduction of the policy (Duncan, Philips, & Prus, 2009). After only 17 months, “the technical efficiency of covered projects was substantially higher than other public school projects,” and overall “the results indicate that the construction wage requirements did not have a meaningful impact on construction efficiency” (Duncan et al., 2009, 75).

Azari-Rad, Phillips, and Prus (2009) also studied construction at 4,986 new schools in the United States costing over \$750,000 from 1991-1999. They compared the cost of new public school construction in states that have prevailing wage laws to the cost of new public school construction in states without prevailing wage laws. They also compared the cost of private school construction, which is not affected by Little DBAs, to public school construction that does fall under Little DBAs. The study found that the average accepted bid price was 1.2% higher in states with Little DBAs than in states without them, which is not statistically significant (although the statistical test to determine significance was not included). Additionally, public school construction cost

15.5% more than private school construction in prevailing wage law states, while the same comparison in non-prevailing wage law states showed that public schools cost 15.6% more than private schools (Azari-Rad, Philips, & Prus, 2003).

Some of the most vocal academic proponents of the DBA were the authors of a 1995 study at the University of Utah, who examined the repeal of nine Little DBAs and found a number of negative economic effects. One effect of the repeal in Utah was that the average annual earnings of construction workers decreased by over \$1,800 when the laws were repealed. This was found to directly translate to a loss of income tax to the state of up to \$4 million in 1991 dollars (Philips, Mangum, Waitzman, & Yeagle, 1995). The authors extrapolated this finding to determine that if the federal Davis-Bacon Act was repealed, the federal budget would suffer a decrease of approximately \$1-2 billion in 1994 dollars due to the loss of income that would result (Philips, Mangum, Waitzman, & Yeagle, 1995).

Shortly after their study was published, however, their research was reanalyzed by Thieblot (1996), who found errors and inaccuracies. He determined, using the data provided by Philips et al. (1995) that not only would repealing the federal DBA not cost the government \$1-2 billion annually in lost tax revenue, but that it would save \$1.8 billion per year. The author showed that while construction industry income decreased in states where prevailing wage laws were repealed, it also decreased comparably in states where prevailing wage laws remained in place or did not exist. Additionally, he showed how the Utah study authors “had to misstate substantially every fact” in regards to employment numbers, time-value of money use, and tax calculations to arrive at the conclusions they reached (Thieblot, 1996, p. 307). He also found that if all state and

local governments repealed their own prevailing wage legislation, the total savings at all levels of government in the United States could surpass \$4 billion dollars (Thieblot, 1996). He determined that rather than increase, construction workplace injuries would dramatically decrease if the DBA was repealed. Interestingly, the lead author of the Utah study was a contributing author of the other pro-DBA literature found in this analysis.

Unions and the Davis-Bacon Act

There are 24 states that allow workers to choose whether or not to join a union and pay union dues. These states are known as Right-to-Work states and are generally clustered in the south, the mountain west region, and the line of states from North Dakota to Texas. The remaining 26 states are non-Right-to-Work states. These states have laws making it mandatory for workers to pay the portion of union dues that go towards legal representation and collective bargaining, but the employee is not required to actually join the union (Lam & Harcourt, 2007).

Regardless of the labor status of the state, some states have Little DBAs that are based on the unions. One example of this is Michigan, which became a Right-to-Work state in late 2012; it is one of only four states that require the prevailing wage to be based on the collective bargaining agreement of the local union (Kersey, 2007). These laws allow unions to influence prevailing wages even in areas where the majority of workers are non-union, thereby artificially inflating wages. According to a study by Thieblot (2005), in one county in Pennsylvania, wages for drywall finishers were determined to be approximately \$10 higher because of union influence. There are many reasons that union wages become prevailing wages, but one major reason is that the wage specialists who

determine wages do not always follow the DBA regulations pertaining to union wages. When this incorrect determination occurs, high union wages that should not necessarily be used to determine the prevailing wage are used anyway, which results in higher wages for both union and non-union workers (Thieblot, 2005).

It is not only state prevailing wage laws that see influence from the union. As discussed earlier, the WHD uses a set methodology to determine the prevailing DBA wages in a particular area. Prior to 1985 when the rule was changed, if the wage surveys did not show one wage as prevailing, the wage that was paid to at least 30% of workers was set as the prevailing wage (Kersey, 2007). When the 30% rule was in effect, it was significantly easier for a union wage to be set as prevailing, as the union only needed to provide 30% of a trade's workers in an area to set the prevailing wage. Since the rule has been changed, the union needs to provide a true majority of workers in order to set the union rate as prevailing (Kersey, 2007).

There are other ways for union influence to creep into the wage determinations, some of which are “sanctioned by Davis-Bacon administrative procedures” (Thieblot, 2005, p. 111). One example of this influence springs from the Department of Labor itself, which retains a file of union contracts that note the wages paid to workers for all trades. The specialists who make the wage determinations can select any wage that has been used in past union contracts to use as the current prevailing wage (Thieblot, 2005). Selecting a past wage to use as the current wage conceals the need for new surveys to be accomplished, resulting in the fact that “genuine updates made by surveys are rare, and most determinations are hopelessly outdated” (Thieblot, 2005, p. 111). Thieblot (2005) found that in Pennsylvania, unions represent approximately 20% of the construction

workforce; however, their union wages dominated in 81% of published rates, a figure that is inordinately high. It is clear that unions have an influence on the determination of prevailing wages. The federal government, in supporting the DBA, has consciously or unconsciously continued to support organized labor, and “without Davis-Bacon the building trades unions in America would quickly collapse” (Ozanne, 2012, p. 60).

Bureau of Labor Statistics

The Bureau of Labor Statistics is another division of the United States Department of Labor. It is “the principal Federal agency responsible for measuring labor market activity, working conditions, and price changes in the economy” whose mission is to “collect, analyze, and disseminate essential economic information to support public and private decision-making” (U.S. Bureau of Labor Statistics, 2013 a). One of the main reports the BLS publishes is the Occupational Earnings Statistics, which is a comprehensive list of the mean wages that workers earn in “over 800 occupations” (U.S. Bureau of Labor Statistics, 2013 b). These wages are geographically divided into metropolitan and nonmetropolitan areas throughout the entire United States.

Unlike the Wage and Hour Division, the BLS does not gather wage data from volunteers alone. It uses a mail survey to gather information from many different establishments, and “establishments to be surveyed are selected in order to obtain data from every metropolitan and nonmetropolitan area in every state, across all surveyed industries, and from establishments of varying sizes” (U.S. Bureau of Labor Statistics, 2013 b). The BLS also uses state workforce agencies to make follow-up calls to those establishments failing to respond to the surveys. In this manner, the BLS ensures

accurate wage data from all industries and in all locations. Where the Wage and Hour Division relies only on people who have a vested interest in reporting their wage data and want to report it—with the potential effect of skewing wage data—the BLS collects data from everyone, regardless of interest in reporting. Follow-up calls ensure that even those establishments that would not otherwise report data end up reporting and completing the data.

As discussed earlier, multiple reports from the GAO and the Department of Labor IG have cited problems with the collection methodology of wages by the WHD. One solution would be to use survey results from the BLS. Since it already collects wage data, “the BLS can adjust its sampling methods and surveys to fit the needs of the [WHD] as it generates wage data” (Ozanne, 2012, pp. 59-60). Using results from a BLS-issued survey would allow the WHD to stop using its unreliable system and use current, credible data to determine prevailing wages.

Construction Costs

There are many factors that contribute to the cost of construction. There are also many factors that can cause the initial cost estimate for a construction project to increase. A number of these, applied specifically to MILCON projects, are identified in Chapter I. It is not just MILCON projects that are subject to price increases though. A study by Chang (2002) analyzed the design and environmental phases of four road construction projects but found ten factors causing cost increases of almost 25%. The factors are: the owner requesting additional work, an overly optimistic schedule, work initially being omitted by the owner, the owner failing to provide information or make decisions, third-

party consultants (designers or engineers) failing to provide information on time, incompetent or ineffective consultants, consultants not understanding the scope of work, necessary work growing in scope without owner request, outside stakeholders (such as permitting agencies) requiring more information, and other reasons beyond the owner's or consultant's control (Chang, 2002).

A study by Olawale and Sun (2010) identified five main factors that influenced cost in construction projects. Their study was based on questionnaires and interviews of the top contractors and project manager consultants in the United Kingdom. The five factors identified are design changes, risks and uncertainties, inaccurate evaluation of project time/duration, complexity of works, and non-performance of subcontractors (Olawale & Sun, 2010). While the results of these studies do not match up completely, there are some factors found in both, such as overly optimistic schedules, as well as one that is also found in these studies and Blomberg et al (2013); design changes. There are many different factors influencing construction costs, but some factors, like design changes, are so influential that they are captured in almost every study conducted on the subject.

Construction costs are broken into multiple different categories, common ones being materials, labor, equipment, overhead, and profit. Literature shows that the typical labor portion of the overall building cost for a commercial building to be between 20% and 30% (Vedder, 1999), with a specific estimate of 26.7% (Bingham, 1982).

Additionally, a survey of federal construction in 1976 found the portions of the overall labor for the following trades: carpenter, 13.9%; cement finisher (cement mason), 3.3%; electrician, 11.5%; laborer, 21.4%; operating engineer (equipment operator), 3.6%;

painter, 1.6%; plumbers and pipefitters, 7.9%; and roofers, 1% (Olsen, 1981). These percentages are almost 40 years old, and although the study has not been repeated recently they, along with the total portion of labor costs, provide a general estimate of how the cost of construction is divided among the different trades.

Conclusion

This chapter featured discussions of a number of topics related to this thesis; among them, military construction, the Davis-Bacon Act, and the Bureau of Labor Statistics. The government faces competing responsibilities to both spend limited resources effectively and follow sometimes costly regulations that were put in place to protect and assist the citizenry. The military is not immune to these competing responsibilities; with multi-million dollar construction budgets the military is responsible for spending each dollar as effectively as possible while still adhering to all regulations.

One such regulation is the Davis-Bacon Act, which is a controversial piece of legislation. There is much debate over its effectiveness, and certain studies have found construction under prevailing wage laws like the DBA to be just as, or more effective than, construction without prevailing wages. The remainder of the literature suggests, however, that the DBA imparts a major cost premium on construction projects, although there is a great difference on findings of the size of the cost premium.

III. Methodology

This chapter contains the methodology for analyzing the Davis-Bacon Act (DBA) and Bureau of Labor Statistics (BLS) wage data using geospatial and statistical means. The procedure is partially adapted from Blomberg et al. (2013). This chapter provides an overview of the procedures used in this research, and a step-by-step list of procedures is located in Appendix A. The chapter contains a discussion of the data used in the study and how they were obtained as well as an explanation of the procedures used to generate results.

Data Collection

Table 1 shows the data collected for the analysis of BLS and DBA wage rates. Data were collected from four sources: the U.S. Census Bureau, data.gov, the U.S. Bureau of Labor Statistics, and the Wage & Hour Division's Wage Determination Online website. All data listed in Table 1 is free and available to the public online. It is also periodically updated and the most current data are used in this analysis.

The data from the U.S. Census Bureau are Topologically Integrated Geographic Encoding and Referencing, or TIGER, Shapefiles (U.S. Census Bureau, 2013 a). The Census Bureau provides three groups of data for use in this research. U.S. States is used to generate the map of the United States. U.S. Counties is used in conjunction with DBA wages. The DBA wages are reported by county, so the file of counties is important. Finally, the Metropolitan and Micropolitan Statistical Areas (MSA) data are used to determine reporting areas for BLS wages. Micropolitan statistical areas are urban areas

with populations above 10,000 and below 50,000 people. These differ from metropolitan statistical areas which are urban areas with populations over 50,000 people (U.S. Census Bureau, 2013 b). The MSA file lists both categories together.

Table 1. List of Data Sources for this Analysis

Data Name	Source	File Type	Link
U.S. States	U.S. Census Bureau Tiger 2012	Shapefile	File Download
U.S. Counties	U.S. Census Bureau Tiger 2012	Shapefile	File Download
Metropolitan/Micropolitan Statistical Areas	U.S. Census Bureau Tiger 2012	Shapefile	File Download
Military Installations, Ranges, & Training Areas	Data.gov Dec 2011	Shapefile	Website
Nonmetropolitan Area Definitions	U.S. Bureau of Labor Statistics May 2012	Excel File	File Download or Website
BLS Wage Data	U.S. Bureau of Labor Statistics May 2012	Excel File	File Download or Website
DBA Wage Data by State	Wage & Hour Division 2013	Website	Website

Data.gov is the U.S. Government's online repository for various geospatial data from many government sources. The Shapefile retrieved from Data.gov is a file of military installations, ranges, and training areas. The website has two separate files available: one listing the boundaries of the installations and one listing the installations as a point. This analysis required the use of the boundaries file, which required extensive

editing once opened in ArcGIS™ because it contained extraneous data not required for this research. Examples of this extraneous data are installations that have been closed under the Base Realignment and Closure Commission (BRAC) and separate listings for family housing annexes, auxiliary airfields, and radar sites. These entries should be deleted because, even though MILCON is performed at these other sites, this research involved only active-duty military installations.

Two data files were retrieved from the Bureau of Labor Statistics. One was a Microsoft Excel file of the BLS wages, which also required extensive editing. The file contained wages for all occupations analyzed by the BLS, for all areas of the country. There are thousands of wages reported, and the file was reduced to only those construction trades under study. The easiest way to reduce the file was to first delete all trades with an occupation code prefix of anything other than 47, which left only construction trade wages in the file. Because each trade is individually reported for each geographical area, each area has one entry for each trade. Creating a pivot table in Excel is an easy method for combining all wages for each geographical area onto one line. Organized in this manner, with locations as row headings and trades as column headings, the wages populate the table and are easier to work with and analyze. The second Excel file obtained from the U.S. Census Bureau was a list of non-metropolitan areas (non-MSA). These data represent the rural areas of the United States and were combined with the list of metro- and micropolitan statistical areas, resulting in BLS wage reporting for all areas of the United States.

The final source of data for this research was the Wage Determinations Online, or WDOL, website. This site is published by the Wage & Hour Division, and it reports the

wage determinations for all construction trades. Wages are organized by state and county. Retrieving this data was the most time consuming step of the research, as there is a separate web page for each county. The pages are not consistently organized from county to county, resulting in inefficient data gathering. Some counties have an easily accessible list of wages for all construction trades, while others contain wages organized in very poor fashion. The wages retrieved from the WDOL website were entered in an Excel file, with each county listed in one row with multiple columns for each trade.

The final data required for this research was the total amount of money that the U.S. Air Force spent on military construction in recent fiscal years. These data were received from the Air Force Civil Engineer Center at Lackland Air Force Base, Texas. The calculations used for these data are described in the next section.

Procedures

Two different methods of examination were used in the analysis of wages. The first was a geospatial investigation using ArcGIS™. The intent of this analysis was to develop an initial breakdown of the wage differences as well as to create a visual representation of the wages. The second method was a statistical analysis using the JMP statistical program. The JMP program facilitated a thorough examination of the results found in ArcGIS™ to determine if the results were statistically significant or not.

The geospatial analysis was conducted using the data obtained from and described in the Data Collection section above and listed in Table 1. The state, county, MSA, and non-MSA files created the geospatial field within which the wage data was analyzed.

The BLS wages were all linked to a specific geographic area; therefore, these wages were

easily transferred into the geospatial field. The DBA wage data, however, was obtained from the WDOL website, which is a standalone product and not linked to anything. The DBA wages had to be transferred one-by-one from the WDOL website and manually linked to the geographic field. The data in the WDOL website also proved difficult in terms of how it was presented. DBA wages are not uniform in every locality; for example, one county may have wages for carpenter, cement mason, plumber, backhoe operator, structural ironworker, and roofer, however, another county, even one located nearby, may only have wages listed for carpenter, plumber, backhoe operator, and roofer.

Because of this inconsistent data, when wages from the “building” category of WDOL were not available for a given trade in a particular location, wages from either the “heavy,” “highway,” or “residential” category were used if they were available. While the wages from these other categories did not always completely match the “building” category wages (as determined by comparing “building” category wages with other category wages when all were available), the differences were generally small. To have continuity of data, it was preferable to use data from other categories with small differences rather than having gaps in the data.

WDOL wages were obtained for 17 different trades: bricklayer, carpenter, cement mason, electrician, reinforcing ironworker, structural ironworker, common/construction laborer, backhoe operator, bulldozer operator, excavator operator, grader operator, loader operator, painter, pipefitter, plumber, roofer, and sheet metal worker. These wages were only obtained for counties, based on ArcGIS™ containing a military installation. This resulted in 225 locations, for a total of 3,825 different wages. Of these wages, 48 (or 1.25%) had no reported wage in any of the four wage categories. Additionally, 308

wages from categories other than “building” were used, which is 8.05% of the total wages. These wages are denoted by yellow highlight and bold black outline in the wage spreadsheets in Appendix B, while in the same spreadsheets a lack of available wage is denoted by a cell that is greyed out so that no wage is visible in the cell. Additionally, the BLS wages obtained from the Bureau of Labor Statistics are included in Appendix C; unavailable wages are denoted by blank cells.

Once all of the wages were input into ArcGIS™, they were analyzed geospatially using simple buffering and map overlays (de Smith, Goodchild, & Longley, 2013). ArcGIS™ was used to generate maps that graphically show the differences in wages across the entire country. This allowed for quick visual comparison. The classification used for all comparison maps is Natural Break (Jenks) with six breaks (there were technically seven breaks used for the BLS wages, but the first break only contained wages of \$0.00, which were non-reported wages). Natural Breaks is the default classification method in ArcGIS™ and it groups data into classes based on “groupings and patterns inherent in the data set” (Arlinghaus & Kerski, 2014, p. 133). This classification method was used over the other available options because it attempts to “maximize the difference between the classes” (Esri, Inc., 2012). With class differences maximized, the wage differences will become more apparent. Additionally, based on the histograms of the wages presented by ArcGIS™ when selecting the classification method, Natural Breaks appeared to be the most appropriate method.

ArcGIS™ also generated Kriging interpolation maps. ArcGIS™ is capable of multiple other methods of interpolation, such as Inverse-Distance Weighting (IDW). Each method has benefits, but the main methods applicable to this analysis are IDW and

Kriging. The Kriging method uses a weighted moving average to interpolate, and it generally results in more accurate estimations than any of the other interpolation methods listed within ArcGIS™ (Hu, 1995). The Kriging process used the differences between the BLS and DBA wages to interpolate throughout the entire country what the wage difference would be at any particular point.

The final examination method consisted of a statistical analysis using JMP software to determine if the differences between DBA and BLS wages were statistically significant. Using a 95% confidence interval, the software performed a basic distribution on a column of differences between wage types to generate a p-value that determined the significance of the wage differences. The significance determined with this examination gives credibility to the results found by ArcGIS™.

The last area of research for this project is a determination of the actual funds spent by the U.S. Air Force because of the DBA. The total dollar amount spent on MILCON was received from the Air Force Civil Engineer Center. This was combined with the construction cost breakdown discussed in Chapter II and each trade's average wage difference, which resulted in an approximation of the total spent due to DBA requirements. The formula for determining the dollar amount spent on DBA requirements is: $(M \times L) \times (TL \times CP) = S_{DBA}$, where M is the total MILCON amount spent by the Air Force, L is the overall percentage of a construction project spent on labor, TL is the percentage of total labor costs of each trade, CP is the cost premium determined for each trade as a result of this study, and S_{DBA} is the dollar amount spent on DBA requirements.

Conclusion

The procedures described above were conducted to answer the investigative questions listed in Chapter I. It is important to note that while the maps generated by ArcGIS™ make the DBA wage data appear to be point data that is not the case. Both BLS and DBA wages are valid across areas, not points; BLS wages are valid for each MSA or non-MSA and DBA wages are valid for each county. The military installations show the locations of the counties where DBA wages were taken rather than representing point data. Therefore the comparison made between DBA and BLS wages is valid.

IV. Results

The purpose of this chapter is to present the results of the analysis found using the methodology described in Chapter III. The chapter begins with a brief description of changes made to the methodology as the research was conducted. It then presents the results of the wage analysis before presenting the wage maps generated by ArcGIS™. It then presents the interpolation maps generated by ArcGIS™ and concludes with presenting the actual military construction (MILCON) cost data provided by the Air Force Civil Engineer Center.

Changes to Methodology

DBA wages were collected for 17 different trades. Of those, five were related: backhoe operator, excavator operator, grader operator, dozer operator, and loader operator. The wages for these five trades were averaged for each location to get an “operator” wage. Similarly, the wages for plumber and pipefitter were averaged to get a wage for the combined “plumpipe” trade. These modifications were done to align the DBA wages with the available BLS wages, which only reports construction equipment operators and plumbers/pipefitters. Averaging the DBA wages allows for a direct comparison between the DBA and BLS wages, which is the objective of this research.

In some cases, multiple DBA wages were reported for the same location for almost the same trade, such as wages for multiple different sizes of backhoes or loaders. In these cases, the different wages were averaged into one wage for backhoe or loader.

Another example is painter (brush and roller) and painter (spray). These two wages were averaged because they are both the wage for painter.

Once the averaging was accomplished, both sets of wages were reviewed to determine whether the wages collected provided enough data points to make a valid comparison. There were a number of trades that had very few reported BLS wages. Even though there were enough DBA wages reported for these trades, the lack of available BLS wages precluded direct comparison. Because of this, bricklayers, sheet metal workers, structural ironworkers, and reinforcing ironworkers were removed from consideration for this research. The remaining trades that were analyzed were carpenter, cement mason, electrician, common laborer, equipment operator, painter, plumber/pipefitter, and roofer.

The BLS wages and DBA wages were analyzed separately before being examined together. Within each set of wages, trades were evaluated individually by service (Air Force, Army, and Navy/Marine Corps) before being studied altogether. Navy and Marine Corps wages were reviewed together because the Marine Corps belongs to the Department of the Navy. In the individual analysis, each set of wages was examined in ArcGIS™ for minimum, maximum, average, and standard deviation. In the combined analysis, the difference between both types of wages was found, along with the percent difference. Finally, using the statistical software JMP, the upper and lower 95% means were determined along with a p-value to determine statistical significance.

Wage Analysis

Table 2 shows the individual and combined analysis of DBA and BLS wages for eight trades at U.S. Air Force bases. The “Avg. Diff.” column represents the mean of wage differences at individual bases. A positive difference indicates a higher DBA wage, while a negative difference (denoted by parentheses) indicates a higher BLS wage. In all but one trade, the average difference shows higher DBA wages, ranging from \$1.63 to \$7.34 higher than BLS wages. BLS wages for the eighth trade, laborer, are higher, but only by \$0.07.

Table 3 shows the results of the significance tests in JMP. A 95% confidence interval was used to make the analysis, so a p-value of less than 0.05 shows that a difference was statistically significant. There was only one trade that resulted in a p-value of over 0.05; common laborer. This finding of non-significance correlates with the extremely small average difference found in Table 2. Even though the difference for the laborer is higher in favor of BLS, it is so small as to be statistically insignificant.

The standard deviations, as shown in Table 2, of the DBA wages are higher than the standard deviations of BLS wages. This shows that the distribution of DBA is wider than the distribution of BLS wages. This is likely a result of the methodologies used to calculate each type of wages; the methodology for calculating BLS wages is more standardized and consistent than the methodology for calculating DBA wages. Because of the high number of data points, however, the shape of the distribution—whether it is normally distributed or not—does not have an impact on statistical significance (White, 2014). The Central Limit Theorem applies because the number of data points is well over 30 (Devore, 2004). The distributions of the wage differences are shown in

Appendix D, which shows the results of the JMP program running the data for each service.

Table 2. Statistical Summary of Wages at U.S. Air Force Installations

U. S. Air Force Installations										
Trade	DBA Min	DBA Max	DBA Avg.	DBA StDev	BLS Min	BLS Max	BLS Avg.	BLS StDev	Avg. Diff.	Avg. % Diff.
Carpenter	\$10.64	\$41.49	\$22.26	\$9.06	\$14.00	\$33.44	\$19.13	\$4.16	\$3.31	14.66
C. Mason	\$9.85	\$38.37	\$20.32	\$7.91	\$11.05	\$29.90	\$17.21	\$3.97	\$3.33	17.25
Electrician	\$12.27	\$45.89	\$27.89	\$8.62	\$15.87	\$38.19	\$23.52	\$4.86	\$4.44	17.94
Laborer	\$7.25	\$31.76	\$15.10	\$7.01	\$10.97	\$27.38	\$15.20	\$3.47	(\$0.07)	(3.08)
Operator	\$10.46	\$44.89	\$22.66	\$9.13	\$12.23	\$42.48	\$21.22	\$5.46	\$1.63	5.69
Painter	\$8.01	\$38.45	\$19.29	\$7.99	\$11.12	\$28.17	\$17.17	\$3.46	\$1.87	9.40
PlumPipe	\$12.27	\$48.35	\$29.24	\$8.16	\$14.89	\$35.17	\$22.34	\$4.91	\$7.34	34.43
Roofer	\$8.13	\$36.41	\$18.13	\$7.45	\$9.90	\$27.96	\$16.36	\$3.88	\$2.09	10.92

Table 3. Results of Statistical Significance Tests for U.S. Air Force Installations

Air Force Wages			
Trade	Upper 95% Mean	Lower 95% Mean	P-value
Carpenter	4.70	1.91	<.0001
Cement Mason	4.58	2.09	<.0001
Electrician	5.74	3.13	<.0001
Laborer	1.06	-0.93	0.4458
Operator	2.87	.039	0.0053
Painter	3.16	0.57	0.0026
PlumPipe	8.72	5.96	<.0001
Roofer	3.46	0.71	0.0018

Table 4 shows the individual and combined wage analysis of U.S. Army posts. The difference between wages showed that DBA wages were higher than BLS wages in all eight trades, ranging from a difference of \$0.17 to \$5.54. Because the difference in laborer wages is so low, however, it is unlikely to make a statistical difference.

Table 4. Statistical Summary of Wages at U.S. Army Installations

U.S. Army Installations										
Trade	DBA Min	DBA Max	DBA Avg.	DBA StDev	BLS Min	BLS Max	BLS Avg.	BLS StDev	Avg. Diff.	Avg. % Diff.
Carpenter	\$10.64	\$41.49	\$21.79	\$7.45	\$12.16	\$33.44	\$19.41	\$4.78	\$2.52	12.75
C. Mason	\$8.47	\$40.30	\$20.18	\$7.44	\$12.24	\$29.90	\$17.66	\$4.36	\$3.41	12.91
Electrician	\$12.66	\$50.15	\$28.08	\$8.26	\$17.03	\$38.19	\$23.46	\$5.00	\$4.55	19.29
Laborer	\$7.25	\$34.00	\$15.01	\$6.89	\$10.16	\$27.38	\$14.75	\$3.77	\$0.17	1.76
Operator	\$9.48	\$44.95	\$22.67	\$8.33	\$14.85	\$42.48	\$20.40	\$5.61	\$2.28	9.68
Painter	\$8.01	\$36.60	\$18.28	\$6.37	\$11.58	\$28.17	\$17.16	\$3.45	\$1.26	6.10
PlumPipe	\$10.07	\$54.10	\$28.52	\$8.35	\$13.50	\$38.93	\$22.83	\$5.05	\$5.54	26.09
Roofer	\$7.25	\$39.00	\$19.23	\$7.62	\$11.61	\$25.67	\$17.70	\$4.23	\$3.74	18.93

Table 5 shows the results of the JMP analysis for Army wages. In all trades except laborer the p-value calculated in JMP is below 0.05. This means that the wage difference for the laborer trade is not statistically significant, while the wage differences for the other seven trades are significant.

Table 5. Results of Statistical Significance Tests for U.S. Army Installations

Army Wages			
Trade	Upper 95% Mean	Lower 95% Mean	P-value
Carpenter	3.64	1.40	<.0001
Cement Mason	3.66	1.44	<.0001
Electrician	5.92	3.18	<.0001
Laborer	1.07	-0.74	0.3580
Operator	3.40	1.17	0.0001
Painter	2.54	0.27	0.0082
PlumPipe	7.29	4.04	<.0001
Roofer	5.61	2.38	<.0001

Table 6 shows the wage analysis for U.S. Navy and Marine Corps installations. As with the Army wages in Table 4, the DBA wages are higher in all eight trades,

ranging from \$1.61 to \$8.24. These differences are higher than both Air Force and Army wage differences.

Table 7 shows the results of the JMP analysis done on the Navy and Marine Corps wages. Unlike the Air Force and Army wages, the differences for all eight trades are statistically significant. This is indicated in the p-values that range from <.0001 to 0.0309, all of which are lower than the alpha of 0.05. Additionally, zero is not contained in any of the 95% confidence intervals indicated by the Upper 95% Mean and Lower 95% Mean columns. In Tables 3 and 5, the confidence interval for the laborer contained zero, further indicating statistical insignificance.

Table 6. Statistical Summary of Wages at U.S. Navy and Marine Corps Installations

U.S. Navy/Marine Corps Installations										
Trade	DBA Min	DBA Max	DBA Avg.	DBA StDev	BLS Min	BLS Max	BLS Avg.	BLS StDev	Avg. Diff.	Avg. % Diff.
Carpenter	\$9.96	\$42.52	\$24.55	\$9.48	\$14.10	\$33.44	\$20.77	\$4.88	\$4.03	16.40
C. Mason	\$10.46	\$40.30	\$22.02	\$8.50	\$11.97	\$30.87	\$18.67	\$4.70	\$2.74	12.03
Electrician	\$15.85	\$47.00	\$30.67	\$9.40	\$17.59	\$38.19	\$24.60	\$4.80	\$6.36	24.71
Laborer	\$7.25	\$35.20	\$16.82	\$8.69	\$10.77	\$27.38	\$15.51	\$3.78	\$1.61	5.68
Operator	\$11.90	\$45.22	\$25.85	\$11.02	\$14.27	\$42.48	\$21.93	\$6.40	\$3.72	14.35
Painter	\$12.26	\$40.75	\$21.72	\$7.63	\$12.08	\$25.52	\$18.47	\$3.12	\$3.17	15.98
PlumPipe	\$10.05	\$51.07	\$31.71	\$10.61	\$14.89	\$34.04	\$23.06	\$4.83	\$8.24	34.88
Roofer	\$9.96	\$42.52	\$24.55	\$9.48	\$9.85	\$25.67	\$17.21	\$4.08	\$7.03	40.80

Table 7. Results of Statistical Significance Tests for U.S. Navy and Marine Corps Installations

Navy/Marine Corps Wages			
Trade	Upper 95% Mean	Lower 95% Mean	P-value
Carpenter	5.63	2.42	<.0001
Cement Mason	4.25	1.23	0.0003
Electrician	8.10	4.62	<.0001
Laborer	3.30	0.08	0.0309
Operator	5.66	1.79	0.0002
Painter	4.86	1.49	0.0002
PlumPipe	10.33	6.14	<.0001
Roofer	9.27	4.79	<.0001

Table 8 shows the analysis of wages for all services combined. The average wage differences for all services range from \$0.50 to \$6.85. The lowest wage difference is in the laborer trade and the highest difference is in the plumber/pipefitter trade, which is consistent with the results from each of the individual services.

Table 9 shows the JMP results for the combined services. The results show that the \$0.50 wage difference for laborer is too low to make the wages statistically different. The other seven trades have p-values of <.0001 and have statistically significant differences between DBA and BLS wages. Given the results of the individual services, it is not surprising that the combined laborer wages would not result in a statistical difference.

Table 8. Statistical Summary of Wages at all U.S. Military Installations

All U.S. Military Installations										
Trade	DBA Min	DBA Max	DBA Avg.	DBA StDev	BLS Min	BLS Max	BLS Avg.	BLS StDev	Avg. Diff.	Avg. % Diff.
Carpenter	\$9.96	\$42.52	\$22.62	\$8.74	\$12.16	\$33.44	\$19.65	\$4.73	\$3.17	14.22
C. Mason	\$8.47	\$40.30	\$20.70	\$7.97	\$11.05	\$30.87	\$17.74	\$4.43	\$3.45	14.31
Electrician	\$12.27	\$50.15	\$28.62	\$8.70	\$15.87	\$38.19	\$23.77	\$4.96	\$4.91	19.97
Laborer	\$7.25	\$35.20	\$15.51	\$7.53	\$10.16	\$27.38	\$15.11	\$3.74	\$0.50	2.65
Operator	\$9.48	\$45.22	\$23.48	\$9.50	\$12.23	\$42.48	\$21.08	\$5.88	\$2.40	9.36
Painter	\$8.01	\$40.75	\$19.52	\$7.46	\$11.12	\$28.17	\$17.50	\$3.45	\$1.97	9.83
PlumPipe	\$10.05	\$51.07	\$29.57	\$9.03	\$13.50	\$38.93	\$22.71	\$4.97	\$6.85	31.24
Roofer	\$7.25	\$39.00	\$19.58	\$7.95	\$9.85	\$27.96	\$17.02	\$4.09	\$3.61	19.42

Table 9. Results of Statistical Significance Tests for all U.S. Military Installations

All U.S. Military Installations			
Trade	Upper 95% Mean	Lower 95% Mean	P-value
Carpenter	3.94	2.39	<.0001
Cement Mason	3.80	2.26	<.0001
Electrician	5.73	4.09	<.0001
Laborer	1.06	-0.93	0.4458
Operator	3.18	1.62	<.0001
Painter	2.73	1.21	<.0001
PlumPipe	7.80	5.90	<.0001
Roofer	4.48	2.59	<.0001

ArcGIS™ Maps

ArcGIS™ was used to generate multiple maps. These maps show the DBA wages overlaid onto the BLS wages. The BLS wages are continuous data, valid in the respective MSA or non-MSA, covering most, if not all, of the United States. The DBA wages are continuous data valid only in the counties where the respective military installations are located. Therefore, the DBA wages are represented as colored stars at the locations of military installations. The color of the stars is based on the DBA wage (denoted in the legend). The BLS wages are represented as colored background, varying

with the wage and also denoted in the legend. Each color is also spelled out in the legend for black and white viewing.

Wage maps of individual services (i.e. Air Force maps, Army maps, and Navy/Marine Corps maps) were not generated. Instead, only a map of all four military services combined was generated. Since the map is only a visual representation of the wages and not an analysis, showing individual services separately would not provide a benefit. In the wage maps, if an area is in all white, it means that the wage was not reported for that location. For readability purposes, all eight wage maps are shown in Appendix E, while this chapter only shows two of the maps.

Figure 1 shows the comparison of electrician wages. The west coast of the United States is the largest area with noticeable differences. The DBA wages there are mostly in the red category and the majority of BLS wages are in the yellow or orange categories.

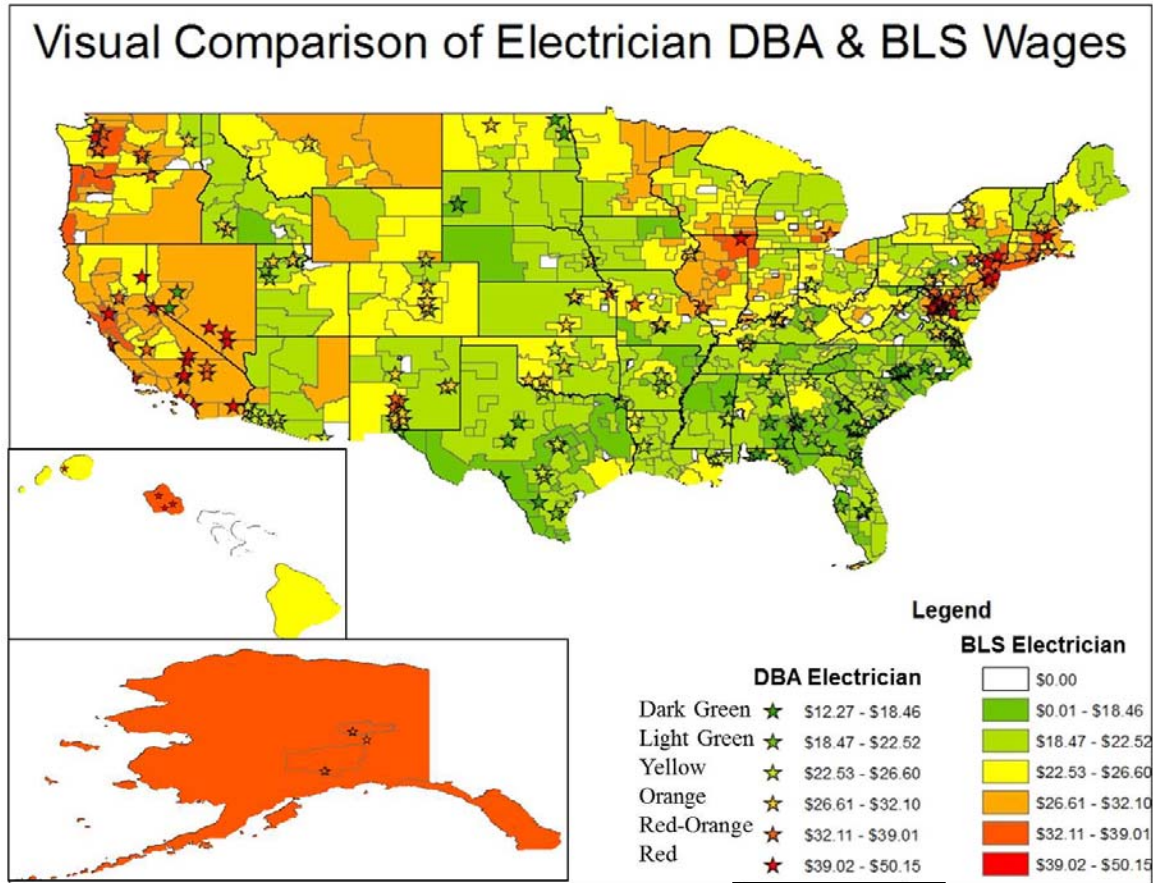


Figure 1. Electrician Wage Comparison Map

Figure 2 shows the comparison of wages for plumbers and pipefitters.

Although the numbers are different, this map is similar to Figure 1. The area with the largest noticeable differences is on the west coast of the United States, while the majority of the east coast has wages that are in the same wage classification. The entire state of Alaska also has a large difference.

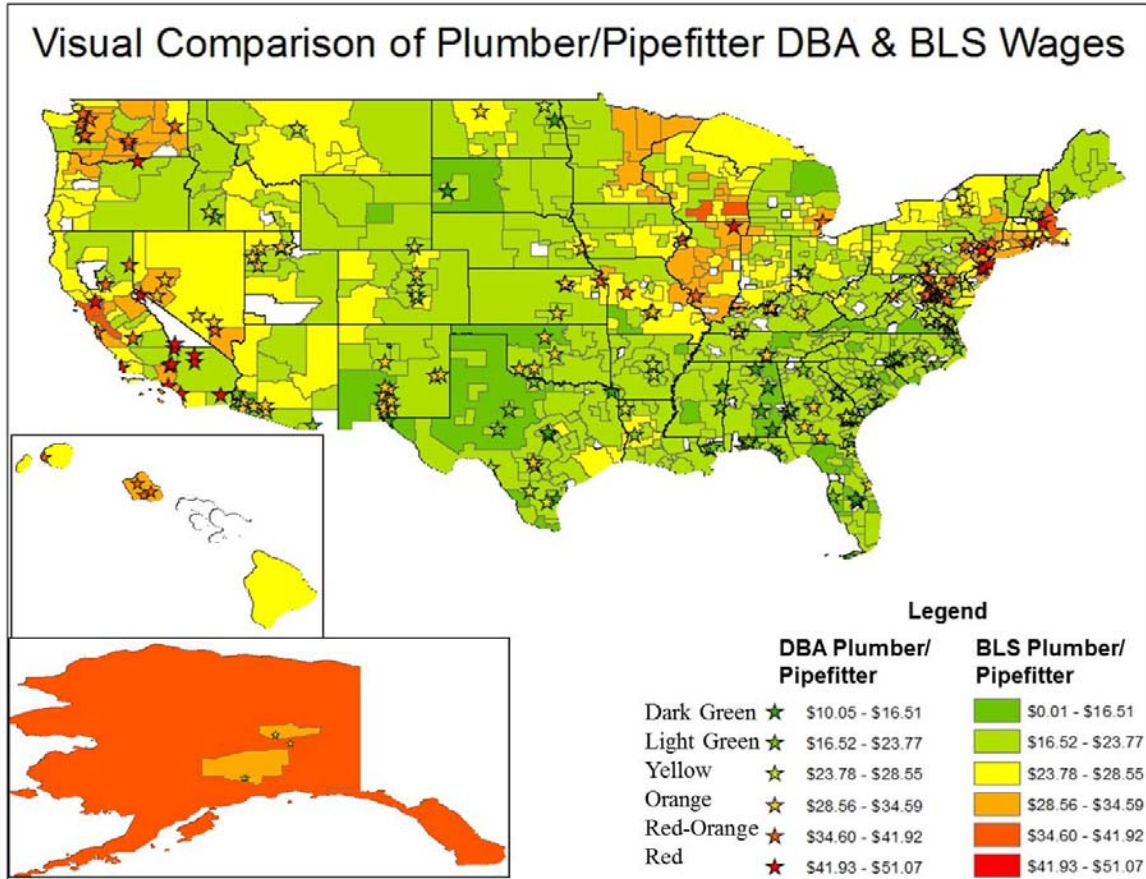


Figure 2. Plumber and Pipefitter Comparison Map

The next two figures are interpolation maps generated by ArcGIS™. These maps were created using the Kriging method, as discussed in Chapter III. Only the combined data of all military branches were used to create the Kriging maps. This is because the Kriging method uses existing data points to interpolate for the entire country. The combined data were used because they provide the most existing data for the algorithm to use in interpolation, which will provide the most accurate results possible.

The Kriging maps estimate what the difference in wages will be at any given point in the United States. The legend shows the differences that the colors represent. The colors are also spelled out in the legend for black and white viewing. Negative differences (those shown in parentheses) represent areas where the BLS wage will be higher than the DBA wage, while positive differences indicate higher DBA wages. For readability purposes, only two of the maps are shown in this chapter; all maps are presented in Appendix F.

Figure 3 shows the Kriging interpolation map for electrician wage differences. It shows higher DBA wages on the west coast, the northeast, and the very center of the country, while showing higher BLS wages in the south and Midwest. The reasoning for the results of the maps in Figures 3 and 4 is discussed in Chapter V. Using this map, one could assume that on a federally funded project in Buffalo, NY, for example, an electrician would make approximately \$8 to \$12 more than on a private sector project in Buffalo.

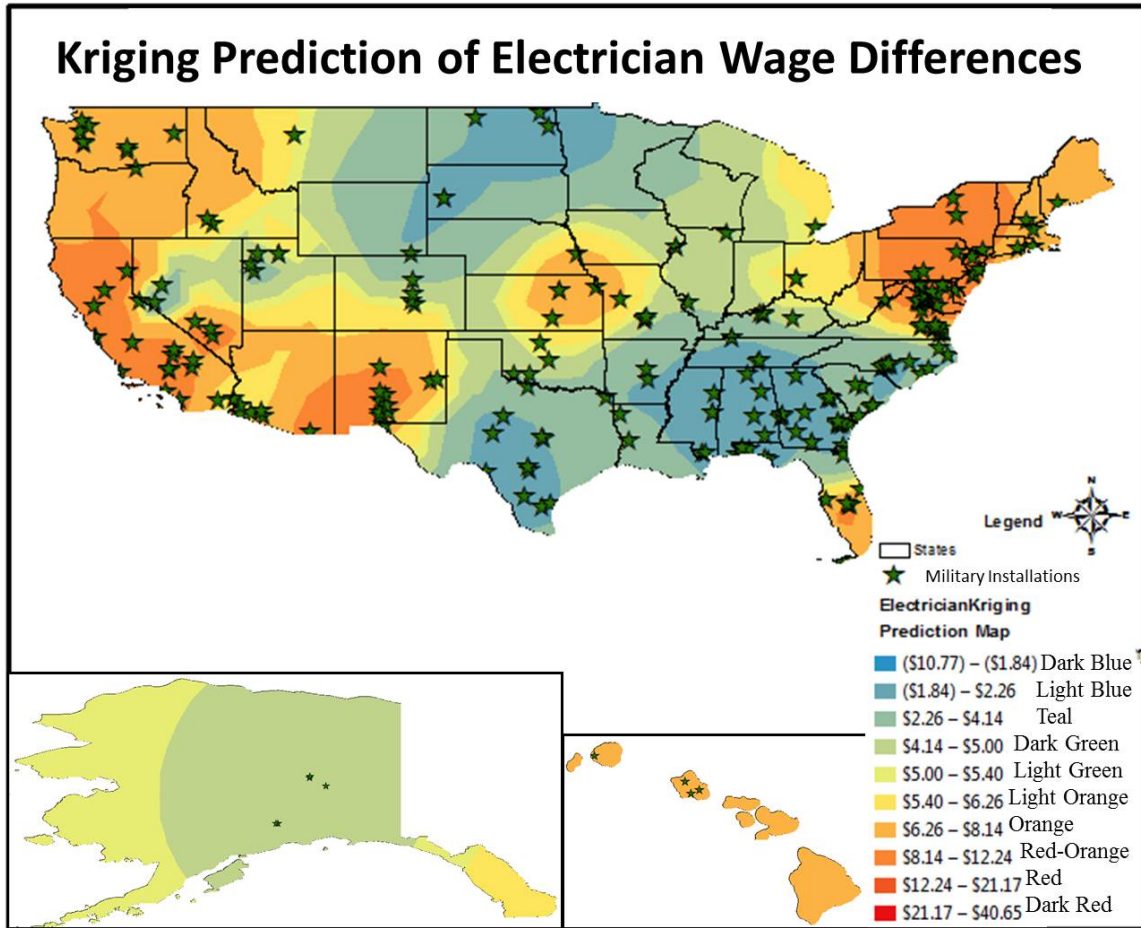


Figure 3. Kriging Map of Electrician Wage Differences

Figure 4 shows the Kriging interpolation map for Plumber and Pipefitter wage differences. This map is similar to the electrician Kriging map, with significantly higher DBA wages on the west coast and northeast/Great Lakes region, with higher BLS wages or slightly higher DBA wages in the Dakotas and the Texas/Gulf Coast region. This map also shows higher BLS wages in Alaska.

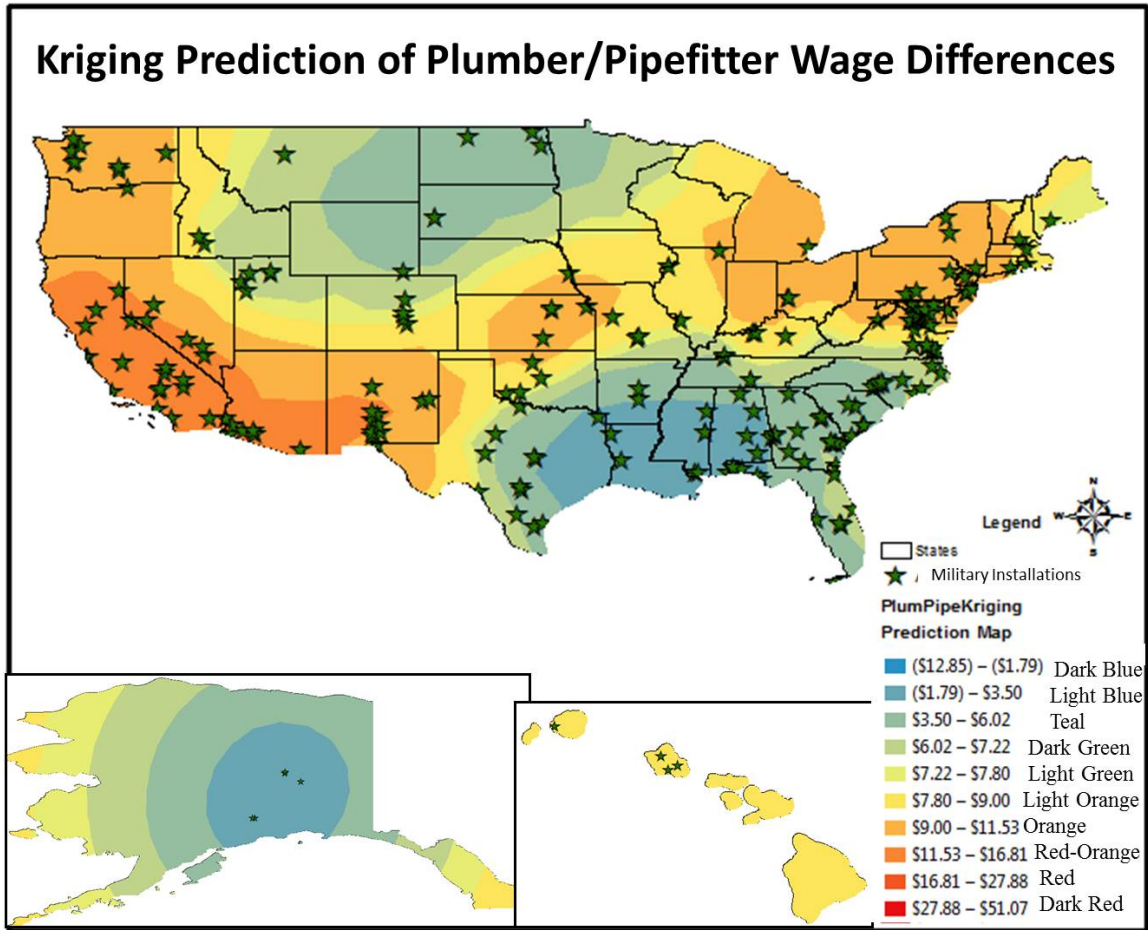


Figure 4. Kriging Map of Plumber and Pipefitter Wage Differences

MILCON Cost Data

The U.S. Air Force, like the federal government in general, did not conduct nearly as much construction in Fiscal Year (FY) 2013 as it does in normal years. Due to the sequestration imposed by Congress that year, the Air Force took a “deliberate pause” in MILCON funding (Ferguson, 2013), with only \$266 million received for projects (Maltais, 2014). FY 2012 was considerably more typical of a federal spending year when the Air Force received \$922 million for MILCON spending (Maltais, 2014). The cost

breakdown for typical residential construction that was discussed in Chapter II was used to estimate the amount of money spent by the U.S. Air Force because of DBA requirements. Using the average of the three total labor estimates provided in Chapter II (20%, 30%, and 26.7%), the overall project labor estimate was 25.57%. Applied to the \$922 million MILCON funds, the total labor cost to the Air Force was \$235.76 million. In the Percent of Total Labor column, Table 10 summarizes the construction cost breakdowns as discussed in Chapter II (Olsen, 1981). It shows the amount of the total Air Force FY 2012 MILCON labor portion spent on each trade (Amount of Total Labor column), as well as the average cost premium by trade resulting from the use of DBA (Avg. DBA Cost Premium column). The average cost premium is taken from Table 8. The last column of Table 10 (Amount Paid b/c of DBA column) is the approximate amount paid, by trade, as a result of the DBA requirements. The total of the last column is \$20.07 million. Despite the other factors listed in Chapter II that contribute to MILCON cost premiums, the \$20.07 million can be attributed to the DBA because it was calculated using only the DBA cost premium calculated in this research.

Table 10. Summary of Typical Construction Labor Costs

Trade	Percent of Total Labor	Amount of Total Labor	Avg. DBA Cost Premium	Amount Paid b/c of DBA
Carpenter	13.9%	\$33.52M	14.22%	\$4.77M
C. Mason	3.3%	\$7.78M	14.31%	\$1.11M
Electrician	11.5%	\$27.11M	19.97%	\$5.41M
Laborer	21.4%	\$50.45M	2.65%	\$1.34M
Operator	3.6%	\$8.49M	9.36%	\$0.79M
Painter	1.6%	\$3.77M	9.83%	\$0.37M
PlumPipe	7.9%	\$18.63M	31.24%	\$5.82M
Roofer	1.0%	\$2.36M	19.42%	\$0.46M
Total	64.2%	\$152.11	N/A	\$20.07M

V. Conclusion

The results presented in Chapter IV are very useful for answering the research questions presented in Chapter I. Once again, the overarching question for this research was: How are Davis-Bacon Act (DBA) wages different from Bureau of Labor Statistics (BLS) wages? The three investigative questions supporting this research question were: (1) How much of a difference exists between the two types of wages? (2) What kind of spatial relationship exists between the two wage types? (3) How much of its appropriated military construction (MILCON) funds did the U.S. Air Force spend because of the requirements of the Davis-Bacon Act?

This chapter answers each of the three investigative questions using the results presented in Chapter IV. It then discusses the limitations placed on this research and discusses areas of future research. Finally, overall conclusions are discussed.

Investigative Question 1

Investigative question 1 was: How much of a difference exists between the two types of wages? Based on the 32 sets of data analyzed (eight different trades each for the Air Force, Army, Navy/Marine Corps, and combined services), 29 had a statistically significant difference between the DBA and BLS wages. Only the wages for the laborer trade for the Air Force, Army, and combined services were statistically equivalent. The differences ranged from a low of \$1.26 (painters at U.S. Army installations) to a high of \$8.24 (plumbers and pipefitters at Navy and Marine Corps installations). The mean difference of all 29 statistically different data sets was \$3.81. In each service category

(Air Force, Army, Navy/Marine Corps, and combined services), the trade with the highest difference was plumber and pipefitter. The trade with the lowest difference was painter in the combined services category and the Army, while operator had the lowest difference for the Air Force and cement mason had the lowest difference for the Navy and Marine Corps.

The answer to investigative question 1 depends on the trade. All trades except laborer have a statistically significant difference (and the laborer wage difference is statistical for the Navy and Marine Corps) but the amount of difference varies by trade. The combined services differences give the best representation of the actual differences as they are determined using the most data points possible. To answer investigative question 1, Table 11 summarizes the wage differences based on the combined services wage differences.

Table 11. Summary of Wage Differences by Trade

Trade	Average Difference
Carpenter	\$3.17
Cement Mason	\$3.45
Electrician	\$4.91
Laborer	Statistically Equivalent
Equipment Operator	\$2.40
Painter	\$1.97
Plumber/Pipefitter	\$6.85
Roofer	\$3.61

Investigative Question 2

Investigative question 2 was: What kind of spatial relationship exists between the two wage types? There are multiple spatial relationships found in the DBA and BLS wage differences. These are visible in the comparative wage maps and the Kriging maps, which are found in Appendices D and E, respectively.

Many of the spatial relationships identified in the comparative wage maps are intuitive. For example, in each of the eight maps, the coastal region roughly between Washington, D.C., and Boston, MA, represents either of the highest two wage classifications for both BLS and DBA wages. This is likely due to the fact that the region includes many of the largest cities in the United States: Boston, New York City, Philadelphia, Baltimore, and Washington, D.C. Generally, the cost of living is higher in urban areas (Kurre, 2003), so wages would be similarly higher to compensate for the high cost of living (Winters, 2009).

The west coast of the United States, from southern California to Seattle, is another area of consistently high wages. DBA wages for all trades are in one of the two highest wage classifications throughout all of California and western Washington. There is more variability in the BLS wages, however. Some areas show wages in the lower three wage classifications, but many are in the highest three; regardless of the BLS wage classification, the DBA wages are all high in these areas. This area of the country also includes many large cities: Los Angeles, San Francisco, and Seattle, although the high wages also include many rural areas.

Alaska and Hawaii are other areas with consistent relationships. When reported, BLS wages are in one of the highest two classifications for Alaska and the highest three

for Hawaii. DBA wages for Hawaii are consistently in either of the highest two wage classifications, while DBA wages for Alaska vary considerably. Most are in one of the highest two classifications, but plumber and pipefitter wages, for example, are in the third lowest classification. The mostly high wages in these areas likely stem from their remoteness. Goods and services cost more in these areas; therefore, workers need to earn more to live there.

The southern United States, from New Mexico to the Atlantic Ocean and from North Carolina, Tennessee, Arkansas, and Oklahoma to the Gulf of Mexico is consistently in the lower three wage classifications for all trades. This area also often (although not always) includes the center of the country, from the Dakotas south to Texas. Even though this region includes many large cities (e.g. Dallas, San Antonio, New Orleans, Atlanta, Miami), it is not surprising that the wages are lower here because of the mostly rural, agricultural nature and low cost of living in the southern United States.

A final spatial relationship can be seen in Table 12. Looking at the “Avg. Diff.” column for each service, the Navy and Marine Corps differences are highest in seven of the eight trades. A likely reason for these higher differences is that the majority of Navy and Marine Corps installations are in coastal areas. As discussed earlier in this section, some coastal regions have high DBA and/or BLS wages, which can result in larger differences than in the interior of the country.

Table 12. Average Wage Difference for Each Service

Trade	Air Force Avg. Diff.	Army Avg. Diff	Navy/Marine Corps Avg. Diff.	Combined Avg. Diff.
Carpenter	\$3.31	\$2.52	\$4.03	\$3.17
Cement Mason	\$3.33	\$3.41	\$2.74	\$3.45
Electrician	\$4.44	\$4.55	\$6.36	\$4.91
Laborer	(\$0.07)	\$0.17	\$1.61	\$0.50
Operator	\$1.63	\$2.28	\$3.72	\$2.40
Painter	\$1.87	\$1.26	\$3.17	\$1.97
PlumPipe	\$7.34	\$5.54	\$8.24	\$6.85
Roofer	\$2.09	\$3.74	\$7.03	\$3.61

Investigative Question 3

Investigative question 3 was: How much of its appropriated MILCON funds did the U.S. Air Force spend because of the requirements of the Davis-Bacon Act? As reported in Chapter IV, Fiscal Year (FY) 2012 was considerably more representative of a typical FY than FY13 in terms of MILCON spending, so FY 12 data was used for this question. The Air Force received \$922 million for MILCON funding in FY 12 (Maltais, 2014). Using a labor estimate of 25.57% of the total cost, \$235.76 million of the \$922 million was spent on labor.

As discussed in Chapter IV, the Air Force spent over \$20 million in FY 12 solely on Davis-Bacon Act wages. It should be noted that this amount could be used to fund badly needed facilities on Air Force bases worldwide such as dormitories, intelligence facilities, and work centers. The answer to investigative question 3 is thus over \$20 million, or 2.2%, of the \$922 million was spent on DBA requirements. It should be noted that multiple trades were not addressed in this study and therefore the actual number

attributed to DBA requirements can be assumed to be higher than the \$20 million estimate if all other trades are included in the calculation.

Limitations

This research faced a number of limitations, which were briefly outlined in Chapter I. The first limitation is the fact that only eight trades were studied. The fact that DBA wages for 17 trades were obtained from the Wage Determinations Online (WDOL) website is indicative of this limitation. There are many more than eight trades on any given construction site, all doing important work. The eight trades studied in this research were chosen because they are the trades with the largest number of reported wages in common between BLS and DBA. Some trades (like ironworkers) had high wage availability in WDOL; unfortunately, there was sparse reporting of ironworker wages to the BLS, resulting in insufficient data for analysis. Additionally, some wages in WDOL were broken out into great detail (such as with backhoe, bulldozer, and loader operators) but the BLS combined them into equipment operators. This lack of detail necessitated averaging the detailed DBA wages into a combined operator trade resulting in less detail than would otherwise be possible.

Another limitation faced by this research is the fact that only military installations were studied. There is an enormous amount of federally funded construction that occurs around the country that is not on a military installation, but none of those projects were studied in this research. Military installations were chosen because of the desire to determine how much extra money the Air Force spends because of DBA requirements (investigative question 3) and also because the publically available shapefile of military

installations provided an easy link to determine which DBA file codes were needed from WDOL.

The third limitation of this research is that DBA and BLS wages are snapshots in time. The BLS publishes a new file of wages approximately annually. The Wage and Hour Division (WHD) that determines DBA wages publishes updates every Friday throughout the year. The DBA wages presented and analyzed in this research were obtained from WDOL in September and October of 2013 and were current as of that time. The BLS wages analyzed in this research were published in May 2012 and obtained in October 2013; new data has not been made public. The results presented in Chapter IV and discussed in Chapter V are based on that data and may not apply when new wages are published for the areas analyzed.

Although published in different years, the wages analyzed in this study were not adjusted to a common baseline year. It is possible that the wage differences calculated in this study were due to inflation between publishing dates. The Ohio Department of Transportation, however, measured the construction-specific rate of inflation in the Construction Cost Index at 1.1% for FY 2013 (Bid Analysis and Review Team, 2013). That means that any differences in wages at 1.1% or below could be the result of inflation, but differences over 1.1% must be due to other factors. The results show that only one wage difference was below 1.1%: laborers on Air Force bases. All other differences are over 1.1%, and the lowest difference that was found to be statistically significant was laborers on Navy and Marine Corps installations, which was found to have a difference of 5.68%. Therefore none of the differences reported in this study can be attributed to inflation.

A final limitation for this study was the availability of wages on the WDOL website. The construction of the website makes it very difficult to obtain wages for a large number of geographic areas, such as for this research project. Each county (or parish) in the United States has its own page that lists the wage determinations for that area in a plain text format. To obtain wages for 25 different areas, for example, 25 different pages must be opened. Additionally, wages are presented in a very inconsistent manner. Wages for the same trades are not always presented, even in areas that are geographically close. Because of this inconsistency, 8% of the wages analyzed were taken from wage categories other than “Building.”

Sometimes wage determinations resulted in multiple different wages for the same trade within the same county, which made selecting the appropriate wage difficult. An example of this is shown in the WDOL snapshot for Greene County, Ohio, in Figure 5. The top wage applies to Belmont County and Monroe County (north of Route 78). The bottom wage applies to Monroe County (south of Route 78), Morgan County (south of Route 78), and all of Washington County. These wages are different by over \$8 and only separated by one road. Unless the researcher knows exactly where in the county the project is located, selecting the appropriate wage is not an easy task.

Another inconsistency highlighted in Figure 5 is the labeling of trades. The first wage applies to Plumber and Steamfitter; the second applies to Plumber/Pipefitter; the third applies to Plumber, Pipefitter, Steamfitter; and the fourth wage applies to Plumber/Pipefitter. Even wages in the same county apply to different trades; north of Route 78 in Monroe County applies to Plumber and Steamfitter, while south of Route 78 in Monroe County applies to Plumber/ Pipefitter. Therefore, there are no reported wages

for a pipefitter north of Route 78 or for a steamfitter south of Route 78 in Monroe County, Ohio.

PLUM0083-001 07/01/2013		
BELMONT & MONROE (North of Rte. #78)		
	Rates	Fringes
Plumber and Steamfitter.....	\$ 25.42	27.83

PLUM0094-001 05/01/2013		
WAYNE COUNTY		
	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 32.08	16.04

PLUM0162-001 06/01/2013		
CLINTON, FAYETTE, GREENE, MIAMI, MONTGOMERY & PREBLE		
	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 27.95	19.57

PLUM0168-001 06/01/2013		
MONROE (South of Rte. #78), MORGAN (South of Rte. #78) & WASHINGTON		
	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 33.83	18.47

Figure 5. Example of WDOL Inconsistency (www.WDOL.gov)

In some areas of the country, especially in California, the wages are placed into groups based on their trades. Figure 6 shows a list of groups and their associated wages for Inyo County, California; some wages differ by as little as 3 cents. Figure 6 is only a

partial list; there are 24 different classifications. Figure 7 shows the list of associated trades that belong to each group. The list breaks the trades down in excruciating detail, making it extremely difficult to find the appropriate trade. One example is loaders that are listed in different categories based on whether the bucket holds up to $\frac{3}{4}$ yards of material, $\frac{3}{4}$ to 1 yard, 1 to 5 yards, or over 5 yards.

OPERATOR: Power Equipment	
(All Other Work)	
GROUP 1.....	\$ 38.20
GROUP 2.....	\$ 38.98
GROUP 3.....	\$ 39.27
GROUP 4.....	\$ 40.76
GROUP 5.....	\$ 41.86
GROUP 6.....	\$ 40.98
GROUP 8.....	\$ 41.09
GROUP 9.....	\$ 42.19
GROUP 10.....	\$ 41.21
GROUP 11.....	\$ 42.31
GROUP 12.....	\$ 41.38

Figure 6. Operator Group Classifications (www.WDOL.gov)

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
<p>GROUP 1: Bargeman; Brakeman; Compressor operator; Ditch Witch, with seat or similar type equipment; Elevator operator-inside; Engineer Oiler; Forklift operator (includes loed, lull or similar types under 5 tons; Generator operator; Generator, pump or compressor plant operator; Pump operator; Signalman; Switchman</p>
<p>GROUP 2: Asphalt-rubber plant operator (nurse tank operator); Concrete mixer operator-skip type; Conveyor operator; Fireman; Forklift operator (includes loed, lull or similar types over 5 tons; Hydrostatic pump operator; oiler crusher (asphalt or concrete plant); Petromat laydown machine; PJU side dum jack; Screening and conveyor machine operator (or similar types); Skiploader (wheel type up to 3/4 yd. without attachment); Tar pot fireman; Temporary heating plant operator; Trenching machine oiler</p>
<p>GROUP 3: Asphalt-rubber blend operator; Bobcat or similar type (Skid steer); Equipment greaser (rack); Ford Ferguson (with dragtype attachments); Helicopter radioman (ground); Stationary pipe wrapping and cleaning machine operator</p>

Figure 7. Operator Group Listing (www.WDOL.gov)

The construction of the WDOL website was a limitation to this research that drastically increased the amount of time required to obtain DBA wages. It was also much more difficult to find and select the proper trade in cases where the page resembled Figure 7. More importantly, the website is likely confusing for contractors who rely on it to determine what to pay their workers. A contractor can find itself in legal trouble if it pays a worker an incorrect wage that was based on information from a hard-to-use website.

A final limitation in this research is that the fringe rate was not studied. Each reported wage includes a base rate and a fringe rate. Companies that provide benefits such as medical insurance to their employees pay the base rate. Companies that do not provide any benefits must pay their employees both the base rate and the fringe rate. The

assumption in this research is that contractors provide benefits and only pay the base rate. This assumption levels the playing field, because it is impossible to know whether contractors in a given area are paying just the base rate or both the base rate and fringe rate. By only studying the base rate, any differences that might appear because of the fringe rate were negated. Studying only the base rate also gives the added benefit of an understatement in results. If companies are paying the fringe rate, they will be paying much more than with the base rate alone. For example, the reported \$60 million that the Air Force spent on DBA requirements in FY 12 would be significantly higher if fringe rates were included.

Future Research

There are a number of ways that this research could be expanded on in the future. One would be conducting comparisons that were not made in this document. For example, studying the wage difference between military installations that are located in Metro- and Micropolitan Statistical Areas (MSAs) and those installations that are located in non-MSAs would provide interesting insight into the impact of rural versus urban areas on the wage differences.

Another area of possible future research would be to analyze federally funded projects at locations other than military installations, such as federal office buildings. To pursue this line of research, an ArcGIS™ shapefile with the locations of federally funded projects would be necessary, although it may not currently exist. Studying non-military projects, however, would provide data points at many more areas around the United States to determine the true scope of DBA cost premiums.

Another area of future research would be to include the fringe rate in the calculations. While it is not possible to determine which contractors are paying the fringe rate and which contractors are not, the researcher could assume that all contractors pay the fringe rate. In that case, the differences in wage types including fringe rates would provide an interesting contrast with this study, which does not include fringe rates.

A final area of future research would be to study the effects of the recent Executive Order signed by President Obama that raises the federal minimum wage for federal employees to \$10.10 beginning in 2015 and contains provisions for annual increases thereafter (U.S. President, 2014). This rate will affect workers whose DBA wage is less than the minimum wage, and the results from a study after this law takes effect would be interesting, especially if the increase of lower wages started a ripple effect that caused higher wages to increase as well.

Overall Conclusions

This research was successful in answering the three investigative questions. In line with the majority of the published literature, the results presented in Chapter IV clearly show that there is a cost premium associated with the Davis-Bacon Act requirements. While the cost premium varies based on the construction trade, seven of eight trades analyzed had a statistically significant cost premium; depending on the size of a project, these premiums could add millions of dollars to the overall cost.

Determining the true impact of the DBA on an individual project would require extensive details of the project, especially the exact trades that were utilized and the percentage of the overall cost that each trade comprised. This is not a feasible analysis to

conduct on a large number of projects, but the research presented here is an alternative that provides a valid estimate of the cost premium. Actual premiums are likely to be higher than what is reported here if they include a greater number of trades in the analysis. Given the non-availability of wage data for some trades, this research was conducted with the greatest possible accuracy. As discussed previously in this chapter however, there are a number of limitations that were applicable to this research. It is possible that these limitations influence the wage differences. The differences found in Chapter IV cannot be perfectly attributed to the factors studied in this research because of the possibility of the limitations influencing the wages. Given the unknowable influences of the limitations however, the differences found are as accurate as possible.

The spatial relationships of wage differences determined through ArcGIS™ provide a visual representation of the discrepancies between DBA and BLS wages. The maps showing the spatial relationships show that the highs and lows of DBA wages are located in the same general areas as the highs and lows, respectively, of BLS wages. This can be interpreted to mean that using the BLS wage data as a means of determining prevailing wages (instead of relying on the WHD to determine DBA wages) would provide an accurate alternative. Since the WHD determinations result in higher wages, setting BLS determinations as the prevailing wage would likely keep DBA wages close to the market level. Additionally, the Kriging maps generated in ArcGIS™ provide a reliable indication of the differences in wages at a given location in the United States. These maps could potentially be used by planners and programmers to determine how much of an increase they could expect to have on a given project. Depending on the

availability of funds, the difference in wages due to the DBA could potentially cause a project to be cancelled if the extra funds are not considered from the beginning.

The available literature for construction cost breakdowns was limited to residential construction, which does not align completely with the commercial-type construction focused on in this research. It does, however, allow comparison that gives a relatively comparable estimate of what is found in commercial construction. Using actual MILCON data provided by the Air Force Civil Engineer Center, an estimate of \$20.07 million spent on DBA requirements in FY 12 is a reasonable figure. In the current fiscally-constrained environment, any amount of money spent unnecessarily is troublesome, but a figure as large as this deserves attention from national legislators.

Appendix A. Step-by-Step Methodology

This section provides a detailed methodology listing of how the ArcGIS™ and JMP analyses were completed.

Bureau of Labor Statistics Data

This section involves using the US Census Bureau's Tiger files for State, County and Metropolitan/Micropolitan Statistical Areas to create a map of the United States of Non MSAs. This map will be used later for BLS wage analysis.

- 1) In ArcMap, load US States and US Counties; format their display properties so they will be hollow.
- 2) Add the Metropolitan/Micropolitan Statistical Areas file to the map; rename the file MSAs to eliminate any confusion.
- 3) Start *editor* on the MSAs file.
- 4) *Select by attributes* all areas where MEMI equals 2.
- 5) Delete these areas from the table. There should be 388 fields remaining.
- 6) Save the edits and close the *editor*.
- 7) Open the *clip* tool; select the counties file as the input and the MSAs layer as clip features. Save the file as counties_clipped.
- 8) Make a copy of the County layer, paste it as a new layer, and save it as counties_no_msa.
- 9) *Select by location* all counties in counties_no_msa that are within the source layer of MSAs.

10) Start *editor* and delete the selected counties; save the edits and close *editor*.

There should be 1976 fields remaining.

11) The `counties_no_msa` file will be used to create a file of nonmetropolitan areas.

12) Use Excel to open the area definitions file: `area_definitions_m2012.xls`.

13) Create a new column called `Non_MSA` and enter the following formula:

`=IF(LEN(TRIM(C2))=7,"Y","")`. Nonmetropolitan areas have an MSA code (with divisions) that is seven digits long, whereas metropolitan areas have five digits. This formula enters a Y if the code is seven digits long, signifying a nonmetropolitan area.

14) Sort the `Non_MSA` column (expanding the selection to all data), then delete all entries without a Y in the `Non_MSA` column. Delete also the 13 rows of data from Puerto Rico, which is outside the scope of this research. There should be 3147 rows of data remaining.

15) Delete any spaces or parentheses from column names.

16) Create a new column called `StateCountyCode` and enter the following formula:

`=CONCATENATE(A2,"-",G2)`. Change the “A2” and “G2” to reflect the columns containing the state code (the FIPS column) and county codes, respectively. This will create a unique identifying value for each nonmetropolitan area.

17) Save changes and close Excel

18) Add the sheet to ArcMap.

19) Open the attribute table for `counties_no_msa` and create a new field called `state_coun`. Ensure the type is set to text.

- 20) Use the *field calculator* to set state_coun to equal [STATEFP] & “-” & [COUNTYFP].
- 21) Join the area_definitions_m2012 file to counties_no_msa, linking them by state_coun in counties_no_msa and StateCountyCode in area_definitions_m2012.
- 22) Use the dissolve tool to dissolve counties_no_msa into a file called NonMSAs, using “MSA_code_w/divisions” as the dissolve field.
- 23) Join the NonMSAs file to area_definitions_m2012 using “MSA_code_w/divisions” as the common field.
- 24) Export this joined file to a new file called Non_MSAs. Then delete the old NonMSAs file. This will ensure the integrity of the joined file.

There is now a file of MSAs and a file of Non_MSAs that will be joined to get a comprehensive map of all MSAs and Non_MSAs in the United States.

- 1) Open the *merge* function to combine the two files.
- 2) Name the output file BLSAreas.
- 3) In the field map at the bottom of the dialogue box, remove all outputs except for Non_MSAs.
- 4) Add a new output and title it AreaCode; select the inputs for this as MSAs.CBSAFP and NonMSA.MSA_code_with_divisions.
- 5) Add a new output and title it FullName; select a length of 150. The inputs for this output should be MSAs.NAMEALSAD and NonMSAs.MSASName_with_MSA_divisions.

- 6) Add a new output and title it ShortName; select a length of 150. The inputs for this output should be MSAs.NAME and NonMSAs.MSASName_with_MSA_divisions.
- 7) The metropolitan and nonmetropolitan areas are now combined into one file called BLSAreas and are ready for use.

Military Installation Data

The following procedures will ensure only Active Duty military installations are added to the map.

- 1) Add the MILITARY_INSTALLATIONS_RANGES_TRAINING_AREAS_BND file to the map.
- 2) Open the *select by attributes* function. Enter the following text: "COMPONENT" = 'AF Active' OR "JOINT_BASE" = 'Joint Base Charleston' OR "JOINT_BASE" = 'Joint Base Elmendorf - Richardson' OR "JOINT_BASE" = 'Joint Base Andrews - Naval Air Facility Washington' OR "JOINT_BASE" = 'Joint Base McGuire - Dix - Lakehurst' OR "JOINT_BASE" = 'Joint Base McGuire-Dix-Lakehurst' OR "JOINT_BASE" = 'Joint Base Langley - Eustis' OR "JOINT_BASE" = 'Joint Base San Antonio'. This will select only active duty bases and joint bases where the Air Force is the lead service. Joint Base McGuire-Dix-Lakehurst is entered twice because of extra spaces entered into one entry.
- 3) Export this file to a new file called AFBases.

- 4) Open the *select by attributes* function. Enter the following text: "COMPONENT" = 'Army Active' OR "JOINT_BASE" = 'Joint Base Lewis - McChord' OR "JOINT_BASE" = 'Joint Base Myer - Henderson Hall'. This will select only active duty bases and joint bases where the Air Force is the lead service.
- 5) Export this file to a new file called ArmyBases.
- 6) Open the *select by attributes* function. Enter the following text: "COMPONENT" = 'MC Active' OR "COMPONENT" = 'Navy Active' OR "JOINT_BASE" = 'Joint Base Anacostia - Bolling' OR "JOINT_BASE" = 'Joint Expeditionary Base Little Creek - Fort Story' OR "JOINT_BASE" = 'Joint Base Pearl Harbor - Hickam'. This will select only active duty bases and joint bases where the Navy or Marine Corps is the lead service.
- 7) Export this file to a new file called NavyMCBases.
- 8) Start *editor* on AFBases and delete any entries that do not have AF Active as the component. Also delete any entries that have FH Annex as part of the SITE_NAME field. These are family housing annexes that do not need to be analyzed, as their associated base will be analyzed. Also delete the ten bases that have been closed due to the Base Realignment and Closure Committee. They are denoted by a YES in the BRAC_SITE field. Also closed but not marked with a YES are Myrtle Beach AFB, Onizuka AFB, Eareckson AS, Galena Airport, Point Arena AFS, St Louis AFS, Pillar Point AFS, King Salmon Airport, and Kelly AFB; these need to be deleted as well. Delete any entries that are not actual bases, such as auxiliary fields, recreation areas, radar sites, annexes, tracking stations, estates, or research sites (with the exception of Rome Laboratory).

- Finally delete all installations in Puerto Rico and Guam, as they are outside the scope of this research. Save the edits and close *editor*. There should be 82 installations remaining in the list.
- 9) Start *editor* on ArmyBases and delete any entries that do not have Army Active as the component. Also delete any entries that have YES in the BRAC_SITE column. Delete also any sites that are not actual major bases such as Stagefields, Basefields, Defense Supply Centers or Distribution Regions, annexes, support facilities, sites in Puerto Rico, and AAPs (Army Ammunition Plants). Single entries to delete are the Pupukeya Paalaa Uka Mil Road, Pinion Canyon, Military Ocean Tml Sunny Point, Umatilla Chemical Depot, and HQBN Henderson Hall Arlington. All of these entries either belong to a larger military installation nearby, are not a major installation, or have closed. Save the edits and close *editor*. There should be 82 installations remaining in the list.
- 10) Start *editor* on NavyMCBases and delete any entries that do not have Navy Active or MC Active. Also delete any entries with YES in the BRAC_SITE column. Delete any entries that are NOLFs, OLFs, or ALFs (Naval Outlying Fields, Outlying Fields or Auxiliary Landing Fields), sites in Guam, housing sites, support facilities, annexes, sites other than the main base (such as MCB Camp Lejune West Site or MCLB Barstow Yermo Area) when the main base is listed by itself, NSAs (Naval Support Activities), fuel depots, fields, NSWCs and NSYs (Naval Surface Warfare Centers and Naval Shipyards), and targets. Single entries to delete include Bayview Idaho, Manchester, Craney Island, Fort Adams RI, Jim Creek, NAVMAG Indian Island, Hawthorne Nevada, and all Joint Base Pearl

Harbor-Hickam sites except NS Pearl Harbor. Save the edits and close *editor*.

There should be 89 installations remaining in the list.

Davis-Bacon Wage Data

Davis-Bacon wages do not come prepared as spatial data usable in a geographic information system. This section will list the steps necessary for preparing this data for analysis. DBA wages are catalogued by county, with a separate web page for each county in the United States. In order to efficiently retrieve this data, only counties containing Air Force bases will be used. The first step is to determine what those counties are.

- 1) Use the *merge* function to combine the counties layer with counties_clipped and rename it All_Counties. This is the one layer that contains all counties together.
- 2) Use *select by location* to select counties that intersect Air Force bases. Use All_Counties as the target layer, AF_Bases as the source layer, and select target features that intersect the source layer.
- 3) Export this selection to a new shapefile and call it AFCounties.
- 4) Start *editor* and edit AFCounties. Delete the following counties: Denali Borough, AK; San Bernadino Co, CA; Santa Rosa, Walton, and Bibb Cos, FL; Barnstable Co, MA; Elko Co, NV; Hyde Co, NC; and Clark Co, OH. These counties were erroneously selected by ArcGIS™ as containing installations meeting the criteria for this study, but in fact should not be analyzed. Stop *editor* and save the edits.
- 5) Use Excel to open the .dbf version of AFCounties.

- 6) Extract the following columns from this sheet to a new sheet: STATEFP, COUNTYFP, COUNTYNS, GEOID, NAME, NAMELSAD.
- 7) Add new columns to this sheet called DVBFileCode and LookUp.
- 8) Enter the following formula in the LookUp column: =CONCATENATE(A2,"-",B2). This will ensure the state and county codes combine so the sheet can be joined with other files. Save this file and close Excel.
- 9) Open the website in the last row in Table 1. This is the Wage Determinations On-Line website, which lists the WHD determinations for DBA wages for each county in the United States. Table 2 below shows the list of states and their applicable state code, as this is not readily available information in ArcGIS™.
- 10) If any counties have two files under the Buildings column, open both and only select the one that is applicable to the military installation.
- 11) In the DVBFileCode column, enter the file code for that particular county (e.g. TX245). Copy both the DVBFileCode and LookUp columns and paste them in a separate Excel sheet. Then enter the hourly wages for the following trades for the counties being analyzed (taken from the WDOL website): Bricklayer, Carpenter, Concrete Mason/Cement Finisher, Electrician, Reinforcing Ironworker, Structural Ironworker, Common Laborer, Backhoe Operator, Bulldozer Operator, Excavator Operator, Grader Operator, Loader Operator, Painter, Pipefitter, Plumber, Roofer, and Sheet Metal Worker. Some counties may not have a wage for every trade. If a county does not have a wage for a particular trade in the Building category of DBA wages, it likely has a wage for that trade in the Heavy, Highway, or Residential category. Copy the missing wages from one of those categories on

the appropriate spreadsheet and highlight that wage to distinguish it from Building category wages. Only use wages from other categories if they are not listed in the Building category. Save this sheet as AFWages.

Table 13. List of States and Applicable State Codes

Code	State	Code	State	Code	State	Code	State
01	Alabama	17	Illinois	30	Montana	44	Rhode Island
02	Alaska	18	Indiana	31	Nebraska	45	South Carolina
04	Arizona	19	Iowa	32	Nevada	46	South Dakota
05	Arkansas	20	Kansas	33	New Hampshire	47	Tennessee
06	California	21	Kentucky	34	New Jersey	48	Texas
08	Colorado	22	Louisiana	35	New Mexico	49	Utah
09	Connecticut	23	Maine	36	New York	50	Vermont
10	Delaware	24	Maryland	37	North Carolina	51	Virginia
11	District of Columbia	25	Massachusetts	38	North Dakota	53	Washington
12	Florida	26	Michigan	39	Ohio	54	West Virginia
13	Georgia	27	Minnesota	40	Oklahoma	55	Wisconsin
15	Hawaii	28	Mississippi	41	Oregon	56	Wyoming
16	Idaho	29	Missouri	42	Pennsylvania		

12) Add one new tab to AFWages for each trade being analyzed. Rename the tab “AF[Trade].” Enter only two columns in each tab; the LookUp column and the column of DBA wages for that particular trade. Add each of these tabs to ArcMap.

- 13) Open the *clip* tool and clip AFCounties to only the bases. For input features, select AFCounties, for Clip Features select AF_Bases, and for Output Feature Class select AFBase_Clip.
- 14) Use the *spatial join* feature to join AFBase_Clip with counties_clipped. Select AFBase_clip as the Target Features and counties_clipped as the Join Features. Title the Output Feature Class AFBase_with_County.
- 15) Open the Attribute Table for AFBase_with_County and add a new field (ensure it is a text field) and call it StateCount.
- 16) Open the *field calculator* and enter the following phrase to populate the StateCount field: *[STATEFP] &"-" & [COUNTYFP]*.
- 17) Repeat steps 2-16 thrice; once for Army data, once for Navy/Marine Corps data, and once for combined data. Rename the files appropriately based on the branch of service being analyzed. Delete the following counties from the ArmyCounties file: Yukon-Koyukuk Census Area and Denali Borough, AK; Coffee Co, AL; Fremont Co, CO; Marion, Dawson, Union, Talbot, Fannin, and Gilmer Cos, GA; Hawaii Co, HI; Clay Co, KS; Trigg Co, KY; Sabine and Natchitoches Parishes, LA; Prince George, Montgomery, Charles, Kent, and Baltimore Cos, MD; Monmouth Co, NJ; Albany, Putnam, Kings, St. Lawrence, and Lewis Cos, NY; Stewart Co, TN; Comal and Hudspeth Cos, TX; Juab, Emery, and Grand Cos, UT; Essex Co, VA; and Thurston Co, WA. Delete the following counties from the NavyMCCounties file: Santa Barbara, Los Angeles, Contra Costa, Riverside, Fresno, and Santa Clara Cos, CA; Lake and Marion Cos, FL; Plaquemines Parish, LA; and Tarrant and Jim Wells Cos, TX. These counties were erroneously

selected by ArcGIS™ as containing installations meeting the criteria for this study, but should not be analyzed.

The Davis-Bacon Wage data is now ready for use in ArcMap.

Bureau of Labor Statistics Data Preparation

This section details the steps necessary to add the BLS wage data to ArcMap for comparison the DBA wage data.

- 1) Open the MSA_M2012 Excel sheet. Combine it with the BOS_M2012 Excel sheet. Sort the data by OCC_CODE and delete all data except data from the 47- series. Then delete all columns except PRIM_STATE, AREA, AREA_NAME, OCC_CODE, OCC_TITLE, AND H_MEAN.
- 2) Create a Pivot Table in Excel in order to organize the data in a useful manner; only the area names, area codes, and hourly mean wages are needed. Use AREA_NAME and AREA as row headings and OCC_TITLE as column headings. Select H_MEAN as the values and set it to use the sum of H_MEAN.
- 3) Copy the pivot table and paste it to another sheet (edits in the actual pivot table are not permitted). The pivot table causes extra lines to be added; an additional row for each entry is added with the word “Total” at the end in the AREA_NAME column. Delete each of these extra rows. BLS wage data is not available for the following Metropolitan Statistical Areas, as the BLS does not include these areas in its surveys: California-Lexington Park, MD; Carbondale-Marion, IL; Chambersburg-Waynesboro, PA; Daphne-Fairhope-Foley, AL; East Stroudsburg, PA; Grand Island, NE; Grants Pass, OR;

Hammond, LA; Hilton Head Island-Bluffton-Beaufort, SC; Homosassa Springs, FL; Kahului-Wailuku-Lahaina, HI; Midland, MI; New Bern, NC; Sebring, FL; Sierra Vista-Douglas, AZ; Staunton-Waynesboro, VA; The Villages, FL; Walla Walla, WA; and Watertown-Fort Drum, NY.

3) Make a separate tab in Excel for each trade being analyzed, and rename each tab “BLS[Trade].” Enter only the AREA column and the column of wages for the particular trade in each tab. Save this spreadsheet as BLSData.

4) Add each tab from BLSData to Arc Map. Open ArcCatalog and scroll through the list of files to where BLSAreas is located. Export this file once for each trade under consideration. Rename each as BLS and an abbreviation for the respective trade; for example BLSPaint or BLSRoof. Then join the respective tab from BLSData to the new layer, using AREA as the join column from the Excel file and AreaCode as the join column in the layer. Then export each layer as a new layer and title it BLS and the full trade name; for example BLSPainter or BLSRoofer.

5) Change the symbology of these new layers to reflect graduated colors; red to green works well. Select quantile for the classification with six classes. Change the label to show currency.

Davis-Bacon Act Data Preparation

This section details the steps necessary to prepare the DBA wage data for comparison to BLS wages.

- 1) Join AFWages to AFBase_with_County, using StateCount as the join feature in AFBase_with_county and LookUp as the join feature in AFWages.
- 2) Use the *feature to point* tool to convert AFBase_with_County to point; select AFBase_with_County as the input and title the output as AFDBAPoints.
- 3) Open ArcCatalog and scroll to AFDBAPoints. Export this to a new layer one time for each trade being studied. Title each new layer AFDBA[Trade], as in AFDBALaborer.
- 4) Open the new layer's properties to change the symbols. Select graduated colors in the quantities section and change the symbols to stars or another symbol that is easy to see. Select Slope as the color ramp –the same one used for the BLS data – for easy comparison. For the classification use Natural Breaks (Jenks) with six classes. Select any trade from the Field Values drop down, and then click on Label. Select Format Labels and select Currency.

Repeat steps 1-4 for Army wages, Navy/Marine Corps wages, and combined wages.

Data Comparison

This section details the procedures for comparing the BLS and DBA data.

- 1) Using the *intersect* tool, select as input features BLS Laborers and AFDBALaborer. Call the output AFLaborerIntersect.
- 2) Join the Excel tab with DBA wages for Laborer to AFLaborerIntersect using LookUp and StateCount as the common join features.
- 3) Add a new column to the attribute table called WageDiff and select type as float.

- 4) Use the *field calculator* to set WageDiff to equal the DBA wage column-BLS wage column.
- 5) Add a new column to the attribute table called DiffPercen and select type as float.
- 6) Use the *field calculator* to set DiffPercen to $(\text{DBA wage} / \text{BLS wage}) * 100$.
- 7) Repeat steps 1-6 for each trade being studied.
- 8) Repeat steps 1-7 for each service and for the layer with all services.
- 9) To get the BLS and DBA wages on one map, turn off all layers in the table of contents. Ensure all BLS layers are below the DBA trade layers, and turn on one BLS layer.
- 10) Turn on the corresponding DBA layer for the service to analyze.

The active view should now be the color coded map showing BLS wages for the US with the DBA wages represented as colored symbols on top.

At this time the maps are visually comparable, so turn on the AllDBAPoints layer for laborer (which has the most data points) and go through the BLS layers one by one to determine which trades have the most points in common between DBA and BLS wages.

Visual Comparison

- 1) Turn on the BLS layer for the trade to be analyzed.
- 2) Turn on one DBA layer for the same trade; the Air Force, Army, Navy/Marine Corps, or combined layers.

3) It is now possible to view where the high and low wages of each kind are located. If the wages are high in the same places and low in the same places, the colors will be similar. They may not be exact because the scales are different.

Geostatistical Comparison

- 1) The Kriging method of geospatial analysis will be used for this comparison. Ensure the layer of states is in the map being used for the Kriging analysis. Change the symbol to hollow, with a solid black line of 1 width. Ensure that the states layer is always at the top of the Table of Contents.
- 2) Open the Geostatistical Wizard, which is in the Geostatistical Analyst tab in ArcMap.
- 3) Select Kriging/Cokriging in the left column. On the right side, select AllCarpenterIntersect as the source dataset (the same of the layer from 3.3.6 with carpenter wages from all services) and WageDiff as the data field. In step 3, change the number of bins to 9. In step 4, click the button next to Optimize model in the General box and ensure the Variable is set to Covariance. On the left side of step 5, click the cursor in the middle of the data points to ensure that the search neighborhood is set in the center of the United States. Then select Finish and hit OK.
- 4) Double click on the Kriging layer just created in the Table of Contents. In the General tab, change the name to CarpenterKriging. In the Extent tab, set the extent to the rectangular extent of States. In the Symbology tab, change the label to currency.
- 5) In the main ArcGIS™ window, click on View and then Data Frame Properties. Under clip options, select clip to shape. Click on specify shape and select the states

layer. This will ensure that the Kriging maps created stay within the borders of the United States map.

6) Repeat steps 1-4 for each trade. Use only the combined wages for this analysis, as it provides the most data points, which allows for the most accurate results. Each trade now has a Kriging map that interpolates what the wage difference will be at any point in the United States.

Statistical Analysis

1) Using the JMP statistical program, add each set of BLS and DBA wages (combined wages only) to a new JMP file. There should be one column for BLS wages and one column for DBA wages for each trade. Create a new column after each set and populate it with the difference between the two wages. DBA-BLS will result in higher BLS wages making a negative difference, which is easier to detect.

2) Run a distribution of the difference column by entering that column into the Y column box.

3) When the distribution box appears, click the red arrow and select Test Mean. Specify a hypothesized mean of zero for this test.

Appendix B. DBA Wage Data

AL58	\$17.00	\$11.64	\$11.85	\$12.27	\$10.87	\$16.00	\$8.01	\$10.85	\$38.28	\$38.28	\$9.50	\$12.61	\$38.28	\$38.28	\$14.97	\$29.72	\$12.72	\$13.94	\$13.33	\$12.01	\$13.00	Montgomery 01-01	LookUp	
AL59	\$39.03	\$36.59	\$34.56	\$38.12	\$33.55	\$33.55	\$29.25	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.15	\$26.08	\$19.27	\$41.78	Anchororage Wl.02-020		
AK1	\$39.03	\$36.59	\$34.56	\$38.12	\$33.55	\$33.55	\$29.25	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.28	\$38.15	\$26.08	\$19.27	\$41.78	Fairbanks Nor.02-090		
AZ22	\$24.62	\$23.00	\$22.84	\$25.64	\$14.92	\$26.52	\$13.80	\$19.20	\$21.12	\$19.20	\$19.20	\$18.55	\$19.81	\$16.53	\$33.55	\$33.55	\$33.55	\$33.55	\$33.55	\$16.71	\$17.42	\$30.42	Martinez County 04-013	
AZ33	\$21.00	\$20.25	\$19.16	\$24.00	\$15.19	\$26.52	\$12.95	\$16.79	\$20.54	\$16.79	\$21.99	\$15.00	\$18.10	\$16.31	\$30.30	\$30.30	\$30.30	\$30.30	\$30.30	\$15.32	\$15.32	\$17.12	Pima County 04-019	
AZ36	\$21.00	\$20.18	\$19.72	\$24.00	\$15.19	\$26.52	\$12.32	\$16.79	\$20.54	\$16.79	\$21.99	\$15.00	\$18.10	\$16.44	\$33.55	\$33.55	\$33.55	\$33.55	\$33.55	\$15.38	\$17.00	\$30.42	Yuma County 04-027	
CA11	\$35.80	\$36.78	\$30.85	\$40.90	\$33.00	\$39.00	\$30.45	\$44.51	\$45.13	\$45.13	\$44.99	\$45.13	\$44.99	\$45.13	\$44.99	\$45.13	\$44.99	\$47.57	\$47.57	\$27.65	\$31.38	\$31.38	Kern County 06-029	
CA23	\$36.05	\$37.35	\$30.85	\$38.60	\$33.00	\$39.00	\$30.45	\$44.51	\$45.13	\$45.13	\$44.99	\$45.13	\$44.99	\$45.13	\$44.99	\$45.13	\$44.99	\$47.57	\$47.57	\$27.65	\$31.38	\$31.38	Los Angeles C.06-097	
CA9	\$39.85	\$39.35	\$28.65	\$43.12	\$33.00	\$33.00	\$26.12	\$36.01	\$36.01	\$38.26	\$34.63	\$36.01	\$36.18	\$33.86	\$47.50	\$47.50	\$47.50	\$47.50	\$47.50	\$33.16	\$52.80	\$52.80	Salt Lake County 06-095	
CA9	\$35.11	\$32.12	\$28.65	\$38.93	\$33.00	\$33.00	\$26.12	\$36.01	\$36.01	\$38.26	\$34.63	\$36.01	\$36.18	\$33.86	\$47.50	\$47.50	\$47.50	\$47.50	\$47.50	\$33.16	\$52.80	\$52.80	Salt Lake County 06-095	
CO2	\$23.68	\$26.60	\$23.25	\$32.10	\$23.80	\$23.80	\$16.52	\$16.36	\$24.27	\$24.42	\$24.42	\$17.24	\$21.34	\$17.99	\$33.35	\$33.18	\$33.27	\$36.70	\$36.70	\$32.33	\$34.73	\$31.77	Apache County 08-005	
CO6	\$23.88	\$26.60	\$23.25	\$32.10	\$23.80	\$23.80	\$16.52	\$16.36	\$24.27	\$24.42	\$24.42	\$17.24	\$21.34	\$17.99	\$33.35	\$33.18	\$33.27	\$36.70	\$36.70	\$32.33	\$34.73	\$31.77	El Paso County 08-041	
DE4	\$28.90	\$30.57	\$30.79	\$36.44	\$33.60	\$33.60	\$22.75	\$32.40	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	\$35.02	Kent County 10-001	
DC2	\$28.17	\$26.81	\$27.15	\$40.65	\$26.50	\$30.00	\$13.04	\$32.40	\$31.65	\$24.40	\$31.65	\$32.02	\$33.01	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$26.90	\$30.00	\$32.27	\$31.77	District of Col.11-001	
FL7	\$17.59	\$13.73	\$12.92	\$23.08	\$22.03	\$16.00	\$9.00	\$11.00	\$11.00	\$11.00	\$11.00	\$13.80	\$13.80	\$14.75	\$18.11	\$13.25	\$15.68	\$11.00	\$11.00	\$11.00	\$11.00	\$14.61	Bay County 12-005	
FL1	\$20.83	\$23.21	\$20.83	\$23.85	\$24.28	\$24.28	\$17.35	\$24.14	\$23.00	\$13.12	\$24.14	\$23.00	\$21.48	\$24.00	\$32.34	\$32.34	\$32.34	\$32.34	\$32.34	\$14.50	\$24.81	\$24.81	Brevard County 12-009	
FL18	\$18.00	\$17.23	\$13.76	\$22.51	\$27.67	\$27.67	\$12.23	\$11.00	\$15.01	\$11.00	\$11.00	\$13.73	\$13.80	\$12.91	\$16.25	\$23.65	\$14.39	\$19.02	\$19.02	\$13.97	\$20.95	\$20.95	Hillsborough 12-057	
FL29	\$17.08	\$12.96	\$12.90	\$13.91	\$22.03	\$14.10	\$8.50	\$11.00	\$15.01	\$11.00	\$13.73	\$13.80	\$12.91	\$14.73	\$22.36	\$15.51	\$18.94	\$15.51	\$18.94	\$14.03	\$12.68	\$12.68	Oakwood Cou.12-091	
FL56	\$15.08	\$12.45	\$12.45	\$22.51	\$27.67	\$27.67	\$8.62	\$16.98	\$13.30	\$16.98	\$16.08	\$14.13	\$15.49	\$14.36	\$16.59	\$12.27	\$19.02	\$12.27	\$19.02	\$14.33	\$20.95	\$20.95	Highlands Col.12-055	
FL64	\$18.99	\$15.19	\$13.50	\$22.51	\$27.67	\$27.67	\$10.24	\$14.68	\$15.00	\$14.68	\$13.44	\$12.20	\$14.00	\$17.50	\$16.02	\$17.00	\$16.51	\$12.27	\$12.27	\$14.33	\$19.92	\$19.92	Okechobee 12-093	
FL55	\$15.09	\$15.00	\$15.18	\$23.10	\$20.47	\$24.04	\$10.99	\$14.63	\$22.72	\$14.63	\$17.52	\$8.00	\$15.50	\$16.00	\$29.90	\$29.90	\$29.90	\$29.90	\$29.90	\$14.48	\$20.95	\$20.95	Polk County 12-105	
GA155	\$15.09	\$15.26	\$15.18	\$23.10	\$20.47	\$24.04	\$10.80	\$14.63	\$22.72	\$14.63	\$17.52	\$8.00	\$15.50	\$16.00	\$29.90	\$29.90	\$29.90	\$29.90	\$29.90	\$14.48	\$20.95	\$20.95	Houston Coun.13-173	
GA157	\$15.09	\$15.26	\$15.18	\$23.10	\$20.47	\$24.04	\$10.80	\$14.63	\$22.72	\$14.63	\$17.52	\$8.00	\$15.50	\$16.00	\$29.90	\$29.90	\$29.90	\$29.90	\$29.90	\$14.48	\$20.95	\$20.95	Lamar County 13-185	
H11	\$35.35	\$40.75	\$35.30	\$41.55	\$34.75	\$34.75	\$29.70	\$37.95	\$39.18	\$39.62	\$38.25	\$38.49	\$38.70	\$34.10	\$38.10	\$38.10	\$38.10	\$38.10	\$38.10	\$37.25	\$37.25	\$37.25	Honolulu Cou.15-003	
ID23	\$25.38	\$23.68	\$19.43	\$27.70	\$27.22	\$26.00	\$15.44	\$20.75	\$27.69	\$20.75	\$26.92	\$26.75	\$24.57	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$23.10	\$23.45	\$23.45	Elmore Count.16-039	
ID36	\$25.38	\$27.27	\$21.01	\$27.70	\$27.70	\$26.00	\$13.05	\$21.92	\$24.52	\$21.92	\$27.20	\$32.70	\$32.70	\$31.68	\$31.68	\$31.68	\$31.68	\$31.68	\$31.68	\$23.00	\$23.45	\$23.45	Owyhee Coun.16-073	
IU7	\$30.29	\$34.97	\$31.00	\$36.51	\$31.50	\$31.50	\$29.30	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$32.70	\$29.00	\$33.28	\$33.28	St. Clair Count.17-163	
KS7	\$13.81	\$14.18	\$14.18	\$30.56	\$15.48	\$13.26	\$9.69	\$14.54	\$9.50	\$8.00	\$9.19	\$11.06	\$11.06	\$12.82	\$30.10	\$30.10	\$30.10	\$30.10	\$30.10	\$12.26	\$23.00	\$23.00	Setdwick Cou.20-173	
LA9	\$27.89	\$26.81	\$27.15	\$40.65	\$26.50	\$30.00	\$15.45	\$32.40	\$31.65	\$20.00	\$14.50	\$24.00	\$24.51	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$26.90	\$30.11	\$26.09	\$26.09	Bossier Parish 22-015	
MD58	\$47.41	\$34.28	\$35.50	\$43.96	\$40.12	\$40.12	\$29.60	\$40.34	\$39.96	\$40.34	\$39.96	\$40.34	\$40.19	\$35.21	\$48.64	\$48.06	\$48.35	\$48.35	\$48.35	\$36.41	\$40.79	\$40.79	Prince George 24-033	
MS119	\$22.00	\$13.41	\$10.91	\$23.80	\$19.60	\$19.60	\$8.64	\$15.58	\$13.50	\$11.33	\$12.50	\$12.27	\$13.04	\$12.75	\$21.83	\$23.56	\$22.70	\$14.50	\$14.50	\$25.65	\$25.65	\$25.65	Harrison Coun.28-047	
MS90	\$18.00	\$15.58	\$12.80	\$14.26	\$9.67	\$14.49	\$11.33	\$13.97	\$12.87	\$15.07	\$13.00	\$10.48	\$13.08	\$13.30	\$18.00	\$13.63	\$15.82	\$11.16	\$11.16	\$9.69	\$9.69	\$9.69	Lauderdale Coun.28-087	
MO12	\$33.40	\$31.53	\$17.95	\$34.83	\$29.90	\$29.90	\$16.18	\$23.55	\$35.84	\$35.84	\$36.65	\$35.84	\$32.97	\$28.58	\$40.58	\$38.75	\$39.67	\$32.25	\$32.25	\$38.39	\$38.39	\$38.39	Johnson Coun.29-101	



	Bricklayer	Carpenter	C. Mason	Electrician	IW Rebar	IW Struc	Laborer	Backhoe	Dozer	Excavator	Grader	Loader	DBAOpera	Painter	Pipefitter	Plumber	DBAPlump	Roofer	Sh. Metal	County	lookUp
MT63	\$25.16	\$20.74	\$21.37	\$29.06	\$26.50	\$26.50	\$14.62	\$20.56	\$23.55	\$24.79	\$23.55	\$24.32	\$23.35	\$22.00	\$28.32	\$28.32	\$28.32	\$14.68	\$27.33	Cascade Coun	30-013
NE59	\$23.80	\$23.64	\$19.05	\$31.75	\$24.40	\$26.38	\$15.41	\$21.20	\$20.21	\$40.27	\$39.92	\$19.01	\$20.39	\$14.26	\$29.34	\$34.12	\$33.53	\$13.57	\$31.71	Searry County	31-153
NV1	\$34.02	\$38.76	\$45.62	\$45.62	\$33.00	\$33.00	\$25.31	\$39.97	\$39.87	\$41.40	\$39.97	\$39.97	\$400.04	\$37.97	\$39.66	\$39.66	\$39.66	\$24.11	\$42.61	Clark County	32-003
NV4	\$34.02	\$41.26	\$34.17	\$40.39	\$33.00	\$33.00	\$16.49	\$16.02	\$42.97	\$17.64	\$42.92	\$23.62	\$28.63	\$37.97	\$46.07	\$33.11	\$34.59	\$12.73	\$45.11	Lincoln Count	32-017
NV4	\$34.02	\$41.26	\$34.17	\$40.39	\$33.00	\$33.00	\$16.49	\$16.02	\$42.97	\$17.64	\$42.92	\$23.62	\$28.63	\$37.97	\$46.07	\$33.11	\$34.59	\$12.73	\$45.11	Nye County	32-023
NH12	\$25.43	\$24.31	\$21.50	\$27.75	\$22.75	\$22.75	\$15.88	\$19.37	\$25.39	\$20.45	\$25.75	\$22.08	\$22.60	\$36.45	\$43.23	\$43.30	\$43.30	\$17.55	\$28.35	Hillsborough	33-001
NH27	\$36.95	\$41.49	\$38.37	\$43.83	\$40.74	\$43.83	\$29.35	\$43.07	\$39.57	\$43.07	\$41.48	\$42.28	\$41.89	\$38.45	\$43.23	\$43.23	\$43.23	\$30.00	\$43.08	Ocean County	34-029
NM39	\$36.95	\$41.49	\$38.37	\$43.83	\$40.74	\$43.83	\$29.35	\$43.07	\$39.57	\$43.07	\$41.48	\$42.28	\$41.89	\$38.45	\$43.23	\$43.23	\$43.23	\$30.00	\$43.08	Ocean County	34-029
NM40	\$24.62	\$21.03	\$17.56	\$29.90	\$21.55	\$25.57	\$13.91	\$25.05	\$21.97	\$20.10	\$21.97	\$21.97	\$22.21	\$16.51	\$31.14	\$31.14	\$31.14	\$13.64	\$30.17	Bernalillo Cou	35-001
NM23	\$20.36	\$20.32	\$17.72	\$29.80	\$20.84	\$22.20	\$15.15	\$22.13	\$16.25	\$19.92	\$21.06	\$20.46	\$16.58	\$31.14	\$31.14	\$31.14	\$31.14	\$13.24	\$30.17	Curry County	35-009
NM32	\$20.36	\$20.66	\$17.72	\$28.80	\$19.75	\$22.00	\$13.61	\$20.55	\$16.25	\$19.92	\$21.06	\$21.55	\$20.01	\$16.10	\$31.14	\$31.14	\$31.14	\$13.24	\$30.17	Otero County	35-005
NM34	\$20.36	\$19.79	\$17.72	\$29.90	\$20.84	\$22.20	\$13.12	\$22.13	\$16.25	\$19.92	\$21.39	\$21.97	\$20.33	\$16.58	\$31.14	\$31.14	\$31.14	\$13.24	\$30.17	Roosevelt Cou	35-041
NY13	\$29.63	\$24.50	\$29.63	\$33.25	\$25.00	\$25.00	\$20.00	\$31.43	\$31.43	\$34.45	\$34.45	\$29.55	\$32.26	\$23.25	\$31.75	\$31.75	\$31.75	\$25.30	\$27.44	Oneida Count	36-065
NC25	\$19.00	\$13.38	\$15.80	\$20.64	\$14.88	\$21.80	\$10.54	\$18.47	\$16.00	\$14.71	\$15.72	\$16.17	\$16.97	\$12.36	\$24.85	\$24.85	\$24.85	\$11.75	\$15.81	Cumberland	37-051
NC65	\$19.38	\$14.42	\$14.02	\$17.10	\$13.90	\$18.75	\$10.57	\$14.71	\$14.42	\$14.71	\$15.72	\$14.08	\$14.73	\$14.36	\$24.85	\$17.15	\$21.00	\$13.55	\$13.09	Dare County	37-055
NC41	\$19.00	\$16.11	\$15.50	\$18.31	\$14.88	\$21.80	\$10.20	\$18.23	\$16.00	\$18.23	\$15.72	\$16.17	\$16.87	\$12.32	\$24.85	\$19.70	\$22.28	\$11.06	\$15.81	Wayne County	37-191
NO3	\$30.58	\$11.33	\$9.85	\$14.68	\$27.30	\$27.30	\$8.44	\$15.74	\$14.41		\$18.10	\$14.99	\$15.80	\$10.88	\$15.26	\$14.56	\$14.91	\$8.13	\$28.33	Grand Forks C	38-035
ND7	\$30.58	\$11.20	\$10.96	\$14.48	\$27.30	\$27.30	\$8.41	\$11.75	\$14.06	\$12.05	\$13.10	\$14.55	\$13.10	\$8.77	\$14.03	\$37.99	\$26.01	\$11.61	\$28.33	Pembina Cou	38-067
ND5	\$28.96	\$21.72	\$26.00	\$30.19	\$27.30	\$27.30	\$8.70	\$14.00	\$14.06	\$12.05	\$14.74	\$13.15	\$13.60	\$12.05	\$37.99	\$26.26	\$32.13	\$27.29	\$27.29	Ward County	38-101
OH16	\$25.29	\$23.60	\$21.33	\$26.60	\$26.23	\$26.23	\$21.75	\$25.25	\$30.92	\$25.25	\$30.92	\$31.04	\$28.68	\$22.89	\$27.95	\$27.95	\$27.95	\$22.74	\$26.41	Greene Count	39-057
OH16	\$25.29	\$23.60	\$21.33	\$26.60	\$26.23	\$26.23	\$21.75	\$25.25	\$30.92	\$25.25	\$30.92	\$31.04	\$28.68	\$22.89	\$27.95	\$27.95	\$27.95	\$22.74	\$26.41	Montgomery	39-113
OK38	\$23.41	\$12.96	\$16.10	\$23.36	\$13.63	\$20.05	\$10.87	\$19.34	\$22.70	\$19.34	\$14.82	\$12.82	\$17.80	\$13.32	\$30.33	\$30.33	\$30.33	\$15.00	\$29.70	Garfield Coun	40-047
OK39	\$23.41	\$15.71	\$16.10	\$27.75	\$13.63	\$23.10	\$11.60	\$19.34	\$22.70	\$19.34	\$13.30	\$12.21	\$17.38	\$12.15	\$30.33	\$30.33	\$30.33	\$15.00	\$29.70	Jackson Count	40-065
OK49	\$23.41	\$19.24	\$16.75	\$27.75	\$17.11	\$23.10	\$21.25	\$21.25	\$20.64	\$21.25	\$14.28	\$16.18	\$18.72	\$12.42	\$30.33	\$30.33	\$30.33	\$20.19	\$29.70	Oklahoma Co	40-109
SC30	\$18.00	\$15.48	\$14.77	\$15.86	\$15.35	\$21.55	\$11.06	\$19.62	\$17.07	\$19.62	\$17.59	\$14.18	\$17.62	\$12.74	\$24.85	\$18.95	\$21.90	\$11.92	\$7.25	Charleston Co	45-019
SC37	\$18.00	\$14.19	\$14.63	\$23.77	\$15.02	\$21.55	\$10.14	\$16.81	\$17.07	\$16.81	\$17.50	\$14.18	\$16.47	\$12.00	\$24.85	\$16.86	\$20.86	\$12.21	\$7.25	Sumter Count	45-085
SD4	\$32.02	\$10.92	\$10.58	\$13.96			\$7.74	\$19.33	\$19.33	\$19.33	\$19.33	\$10.42	\$17.55	\$12.00	\$14.02	\$14.02	\$14.02	\$18.68	\$18.68	Meade Count	46-093
SD3	\$32.02	\$11.55	\$11.88	\$20.82	\$9.93	\$11.96	\$7.34	\$10.50	\$19.33	\$19.33	\$19.33	\$10.13	\$14.56	\$11.50	\$27.46	\$27.46	\$27.46	\$10.00	\$18.68	Pemnington C	46-103
TN37	\$23.03	\$18.29	\$12.67	\$22.20	\$23.00	\$23.00	\$10.63	\$15.77	\$25.09	\$15.77	\$13.50	\$17.14	\$17.45	\$12.00	\$33.85	\$33.85	\$33.85	\$13.50	\$23.80	Coffee County	47-031
TN41	\$23.03	\$20.05	\$12.67	\$19.72	\$24.93	\$24.93	\$11.12	\$15.77	\$25.09	\$15.77	\$13.50	\$17.14	\$17.45	\$13.54	\$26.20	\$26.20	\$26.20	\$13.50	\$23.80	Franklin Coun	47-051
TX2	\$24.50	\$10.64	\$11.46	\$25.60	\$10.19	\$19.00	\$7.25	\$14.12	\$18.82	\$15.30	\$16.57	\$7.36	\$14.43	\$8.01	\$29.78	\$29.78	\$29.78	\$8.14	\$25.18	Bexar County	48-029
TX266	\$20.75	\$12.49	\$12.33	\$16.10	\$21.85	\$18.85	\$8.75	\$12.42	\$17.54	\$12.42	\$13.06	\$13.30	\$13.75	\$15.81	\$22.50	\$22.50	\$22.50	\$11.42	\$10.88	Taylor County	48-441
TX267	\$18.00	\$13.82	\$13.89	\$21.85	\$21.85	\$10.84	\$9.06	\$13.81	\$17.54	\$13.81	\$12.97	\$12.23	\$14.07	\$15.81	\$22.50	\$22.50	\$22.50	\$12.06	\$10.88	Tom Green Co	48-451
TX218	\$17.76	\$15.50	\$13.27	\$15.85	\$19.00	\$19.00	\$7.66	\$13.75	\$12.80	\$13.75	\$17.59	\$10.54	\$13.69	\$15.80	\$36.49	\$19.10	\$27.80	\$15.20	\$12.00	Val Verde Cou	48-465
TX268	\$24.57	\$13.20	\$12.98	\$23.09	\$21.85	\$19.00	\$8.63	\$13.81	\$13.00	\$13.81	\$13.06	\$13.30	\$13.40	\$15.81	\$23.52	\$23.52	\$23.52	\$11.42	\$12.35	Wichita Count	48-485
UT18	\$22.23	\$12.00	\$15.76	\$29.34	\$26.61	\$26.18	\$10.00	\$25.17	\$24.17	\$25.17	\$25.69	\$24.17	\$24.87	\$12.50	\$30.05	\$30.05	\$30.05	\$15.50		Box Elder Cou	49-003
UT10	\$22.23	\$20.19	\$22.70	\$19.80	\$26.61	\$26.18	\$10.25	\$15.56	\$24.17	\$15.56	\$25.69	\$24.17	\$21.03	\$13.86	\$30.05	\$30.05	\$30.05	\$13.70	\$14.43	Tooele Count	49-045

	Bricklayer	Carpenter	C. Mason	Electrician	IW Rebar	IW Struc	Laborer	Backhoe	Dorzer	Excavator	Grader	Loader	DBA/Opera	Painter	Pipefitter	Plumber	JBAP/ump	Roofer	Sh. Metal	County	lookup
UT7	\$22.23	\$20.19	\$15.33	\$29.34	\$26.61	\$26.13	\$12.06	\$16.28	\$24.17	\$16.28	\$25.69	\$24.17	\$21.32	\$18.75	\$30.05	\$30.05	\$30.05	\$13.70	\$30.71	Davis County	49-011
UT16	\$22.23	\$15.88	\$15.68	\$29.34	\$26.61	\$26.18	\$12.02	\$16.28	\$24.17	\$16.28	\$25.69	\$24.17	\$21.32	\$18.75	\$30.05	\$30.05	\$30.05	\$13.70	\$30.71	Weber County	49-057
VA112	\$19.00	\$21.51	\$17.75	\$24.58	\$29.80	\$24.04	\$10.07	\$17.67	\$21.50	\$16.43	\$18.00	\$20.63	\$18.85	\$19.18	\$25.95	\$25.95	\$25.95	\$21.55	\$23.13	Hampton city	51-650
WA38	\$35.10	\$35.97	\$36.63	\$34.28	\$38.14	\$38.14	\$31.76	\$26.34	\$26.63	\$36.91	\$36.84	\$30.40	\$31.42	\$28.15	\$41.12	\$41.12	\$41.12	\$29.25	\$44.44	Pierce County	53-053
WA42	\$27.32	\$26.06	\$26.63	\$29.07	\$31.06	\$31.06	\$24.10	\$27.09	\$26.79	\$27.09	\$27.96	\$26.65	\$27.00	\$19.36	\$35.81	\$35.81	\$35.81	\$23.10	\$28.25	Spokane County	53-063
WA23	\$19.37	\$19.37	\$25.44	\$25.24	\$22.24	\$26.00	\$12.83	\$19.16	\$20.87	\$19.16	\$17.45	\$20.87	\$19.50	\$16.05	\$26.46	\$21.45	\$23.96	\$16.92	\$22.80	Laramie Coun	56-021
AZ36	\$21.00	\$20.18	\$19.72	\$24.00	\$15.19	\$26.52	\$12.32	\$16.79	\$20.54	\$16.79	\$21.39	\$15.00	\$18.10	\$16.44	\$33.55	\$33.55	\$33.55	\$15.38	\$17.00	Yuma County	04-027
CA25	\$33.91	\$37.35	\$30.85	\$38.91	\$35.00	\$35.00	\$28.99	\$40.39	\$41.03	\$41.45	\$40.48	\$41.15	\$41.01	\$27.86	\$43.60	\$43.60	\$43.60	\$34.65	\$40.50	Ventura Coun	06-111
CA29	\$34.11	\$31.27	\$28.65	\$33.35	\$33.00	\$33.00	\$26.89	\$35.32	\$43.63	\$37.51	\$37.49	\$35.32	\$36.05	\$25.67	\$36.05	\$36.40	\$36.40	\$27.65	\$34.49	Kings County	06-031
CA1	\$33.75	\$32.30	\$28.45	\$43.00	\$33.00	\$30.96	\$26.98	\$40.92	\$41.03	\$41.45	\$41.23	\$41.15	\$41.16	\$25.82	\$43.60	\$43.60	\$43.60	\$25.08	\$33.05	San Diego Cou	06-073
CA29	\$35.91	\$32.62	\$28.65	\$41.50	\$37.00	\$37.00	\$25.89	\$36.01	\$36.01	\$36.01	\$37.49	\$36.01	\$36.31	\$33.86	\$43.60	\$41.05	\$41.05	\$36.62	\$40.26	Monterrey Cou	06-053
CA37	\$36.41	\$37.35	\$30.85	\$35.00	\$39.00	\$39.00	\$30.45	\$44.51	\$44.73	\$45.13	\$45.13	\$44.96	\$44.89	\$29.82	\$50.60	\$50.60	\$50.60	\$34.65	\$40.74	San Bernardino	06-071
CA31	\$35.80	\$36.78	\$30.85	\$40.90	\$39.00	\$39.00	\$30.45	\$44.51	\$44.73	\$45.13	\$45.13	\$44.96	\$44.89	\$29.82	\$47.57	\$47.57	\$47.57	\$27.65	\$31.28	Kern County	06-029
CA35	\$35.71	\$37.35	\$30.85	\$41.14	\$33.00	\$33.00	\$28.99	\$40.92	\$41.03	\$41.45	\$41.23	\$41.15	\$41.16	\$29.82	\$42.73	\$42.73	\$42.73	\$34.65	\$40.74	Orange County	06-059
CA2	\$37.75	\$37.35	\$30.85	\$39.75	\$33.00	\$33.00	\$28.99	\$40.92	\$41.03	\$41.45	\$41.23	\$41.15	\$41.16	\$29.82	\$48.10	\$48.10	\$48.10	\$25.08	\$33.05	Imperial Coun	06-025
CA31	\$38.80	\$36.78	\$30.85	\$40.90	\$39.00	\$39.00	\$28.99	\$40.92	\$41.03	\$41.45	\$41.23	\$41.15	\$41.16	\$29.82	\$51.07	\$51.07	\$51.07	\$27.65	\$40.74	Inyo County	06-027
CA31	\$35.80	\$36.78	\$30.85	\$47.00	\$33.00	\$33.00	\$28.99	\$40.92	\$41.03	\$41.45	\$41.23	\$41.15	\$41.16	\$29.82	\$51.07	\$51.07	\$51.07	\$31.95	\$40.74	Mono County	06-051
CT24	\$32.50	\$32.50	\$32.50	\$36.75	\$33.50	\$33.50	\$26.40	\$34.01	\$34.35	\$35.36	\$34.99	\$34.09	\$34.56	\$32.12	\$39.91	\$39.91	\$39.91	\$31.95	\$33.84	New London	09-011
DC2	\$28.17	\$26.81	\$27.15	\$40.65	\$26.50	\$30.00	\$13.04	\$32.40	\$31.65	\$24.40	\$31.65	\$32.02	\$30.42	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$39.93	District of Col	11-001
FL13	\$18.93	\$16.33	\$12.00	\$18.00	\$21.76	\$15.50	\$9.48	\$13.15	\$15.01	\$13.15	\$13.73	\$12.20	\$13.45	\$17.50	\$26.64	\$26.64	\$26.64	\$14.63	\$22.52	Duval County	12-031
FL14	\$17.59	\$14.00	\$12.92	\$20.95	\$22.03	\$16.00	\$8.76	\$11.27	\$15.01	\$11.27	\$13.73	\$13.80	\$13.02	\$14.95	\$22.36	\$13.86	\$18.11	\$12.63	\$11.53	Escambia Cou	12-033
FL7	\$17.59	\$13.73	\$12.92	\$23.08	\$22.03	\$16.00	\$9.00	\$11.00	\$15.01	\$11.00	\$13.73	\$13.80	\$12.91	\$14.75	\$18.11	\$13.25	\$15.68	\$11.00	\$14.61	Bay County	12-005
FL36	\$17.59	\$14.00	\$12.92	\$16.37	\$22.03	\$16.00	\$10.00	\$11.27	\$15.01	\$11.27	\$13.73	\$13.80	\$13.02	\$14.95	\$22.36	\$17.00	\$19.68	\$12.63	\$16.99	Santa Rosa Co	12-113
FL63	\$15.08	\$12.45	\$28.63	\$23.59	\$23.59	\$8.62	\$16.98	\$13.90	\$16.98	\$16.98	\$16.08	\$16.59	\$16.11	\$13.48	\$12.27	\$12.27	\$14.33	\$23.65	\$23.65	Monroe Coun	12-087
GA139	\$15.09	\$14.57	\$15.18	\$20.65	\$20.47	\$24.04	\$12.00	\$14.63	\$22.72	\$14.63	\$17.52	\$8.00	\$15.50	\$16.00	\$29.90	\$29.90	\$29.90	\$13.62	\$29.34	Dougherty Co	13-095
GA99	\$15.09	\$19.75	\$11.75	\$22.52	\$17.72	\$16.75	\$12.06	\$15.00	\$12.69	\$15.00	\$18.88	\$15.92	\$15.50	\$16.00	\$21.29	\$18.55	\$19.92	\$13.62	\$15.09	Camden Coun	13-039
H11	\$35.35	\$40.75	\$35.30	\$41.55	\$34.75	\$34.75	\$29.70	\$37.95	\$39.18	\$39.62	\$38.25	\$38.49	\$38.70	\$34.10	\$38.10	\$38.10	\$38.10	\$36.10	\$37.25	Honolulu Cou	15-003
H11	\$35.35	\$40.75	\$35.30	\$41.55	\$34.75	\$34.75	\$29.70	\$37.95	\$39.18	\$39.62	\$38.25	\$38.49	\$38.70	\$34.10	\$38.10	\$38.10	\$38.10	\$36.10	\$37.25	Kauai County	15-007
I18	\$39.78	\$42.52	\$40.30	\$42.07	\$42.07	\$42.07	\$35.20	\$46.10	\$44.80	\$44.30	\$46.10	\$44.80	\$45.22	\$40.75	\$45.05	\$44.50	\$44.78	\$38.35	\$40.56	Lake County	17-097
MD53	\$24.20	\$26.01	\$27.15	\$33.40	\$26.88	\$26.88	\$9.64	\$22.78	\$26.88	\$26.68	\$16.75	\$17.25	\$22.03	\$24.89	\$36.49	\$27.91	\$32.40	\$24.39	\$30.26	Anne Arundel	24-003
MD57	\$27.89	\$26.81	\$27.15	\$40.65	\$26.50	\$30.00	\$14.15	\$19.82	\$31.65	\$20.00	\$14.50	\$32.02	\$23.60	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$39.93	Montgomery	24-031
MD22	\$21.38	\$23.52	\$21.38	\$40.65	\$17.69	\$30.00	\$12.74	\$17.34	\$25.75	\$25.38	\$26.75	\$25.75	\$24.19	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$39.93	St. Mary's Cou	24-037
MD55	\$27.89	\$26.81	\$27.15	\$40.65	\$26.50	\$30.00	\$11.38	\$32.40	\$31.65	\$20.00	\$14.50	\$22.75	\$24.26	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$39.93	Charles Count	24-017
ME34	\$30.35	\$21.26	\$16.94	\$23.80	\$22.57	\$22.57	\$13.35	\$18.58	\$18.57	\$30.39	\$11.33	\$16.40	\$22.27	\$14.73	\$25.00	\$21.79	\$23.40	\$16.76	\$23.38	Cumberland C	23-005
MS119	\$22.00	\$13.41	\$10.91	\$23.80	\$22.57	\$19.60	\$8.64	\$15.58	\$13.50	\$11.33	\$12.50	\$12.27	\$13.04	\$14.73	\$23.56	\$22.70	\$22.70	\$14.50	\$25.65	Harrison Coun	28-047
MS110	\$18.88	\$12.25	\$11.45	\$23.05	\$10.38	\$15.21	\$8.15	\$12.41	\$10.88	\$15.07	\$11.00	\$10.15	\$11.90	\$13.96	\$15.75	\$20.60	\$18.18	\$12.83	\$11.13	Kemper Coun	28-069
MS87	\$17.75	\$14.84	\$10.46	\$23.05	\$10.38	\$15.21	\$7.76	\$12.41	\$10.88	\$15.07	\$11.00	\$10.15	\$11.90	\$15.00	\$15.75	\$14.25	\$15.00	\$12.83	\$11.13	Lauderdale Cc	28-075
NC65	\$19.38	\$14.42	\$14.02	\$17.10	\$13.90	\$18.75	\$10.57	\$14.71	\$14.56	\$14.71	\$15.71	\$14.08	\$14.75	\$14.36	\$24.85	\$17.15	\$21.00	\$13.55	\$13.09	Craven County	37-049

	Bricklayer/Carpenter	C. Mason	Electrician	IW Rebar	IW Struc	Laborer	Backhoe	Dozer	Excavator	Grader	Loader	DBA/Opera	Painter	Pipefitter	plumber	DBA/Plump	Roofier	Sh. Metal	County	LookUp
NC34	\$19.00	\$18.12	\$15.80	\$20.64	\$14.88	\$21.80	\$16.47	\$18.47	\$16.00	\$18.47	\$15.72	\$16.17	\$16.97	\$12.35	\$24.85	\$18.13	\$21.49	\$11.75	\$15.81	Hoke County 37-093
NC63	\$19.09	\$15.93	\$14.02	\$17.36	\$13.90	\$18.75	\$10.53	\$17.98	\$15.32	\$17.98	\$15.71	\$13.93	\$16.18	\$14.60	\$24.85	\$17.42	\$21.14	\$13.55	\$15.29	Richmond Cou 37-153
NC63	\$19.09	\$15.93	\$14.02	\$17.36	\$13.90	\$18.75	\$10.53	\$17.98	\$15.32	\$17.98	\$15.71	\$13.93	\$16.18	\$14.60	\$24.85	\$17.42	\$21.14	\$13.55	\$15.29	Schotland Cou 37-165
NC66	\$19.09	\$15.93	\$14.02	\$17.36	\$13.90	\$18.75	\$10.53	\$17.98	\$15.32	\$17.98	\$15.71	\$13.93	\$16.18	\$14.60	\$24.85	\$17.42	\$21.14	\$13.55	\$15.29	Harrett Count 37-085
NC66	\$19.09	\$15.93	\$14.02	\$17.36	\$13.90	\$18.75	\$10.53	\$17.98	\$15.32	\$17.98	\$15.71	\$13.93	\$16.18	\$14.60	\$24.85	\$17.42	\$21.14	\$13.55	\$15.29	Moore County 37-125
NC81	\$36.95	\$41.49	\$40.30	\$50.15	\$22.77	\$43.54	\$27.60	\$42.28	\$39.57	\$43.07	\$41.64	\$40.32	\$41.38	\$36.60	\$48.76	\$48.36	\$48.56	\$34.07	\$44.11	Dona Ann Cou 35-013
NM41	\$24.62	\$22.04	\$17.72	\$28.80	\$22.72	\$25.57	\$15.44	\$21.96	\$21.97	\$21.64	\$21.97	\$21.06	\$21.06	\$16.10	\$31.14	\$31.14	\$31.14	\$13.27	\$31.14	Otero County 35-027
NM32	\$20.36	\$20.66	\$17.72	\$28.80	\$19.75	\$13.61	\$20.95	\$16.25	\$19.92	\$21.40	\$21.55	\$20.01	\$16.10	\$31.14	\$31.14	\$31.14	\$31.24	\$13.24	\$30.17	Otero County 35-035
NM36	\$20.36	\$21.37	\$17.72	\$28.80	\$20.84	\$23.89	\$13.12	\$22.13	\$16.25	\$21.59	\$21.97	\$20.33	\$16.58	\$31.14	\$31.14	\$31.14	\$13.24	\$31.14	\$30.17	Socorro County 35-053
NM28	\$20.36	\$23.64	\$24.47	\$37.67	\$20.84	\$27.46	\$13.12	\$22.83	\$16.25	\$21.99	\$21.97	\$20.68	\$17.89	\$31.14	\$31.14	\$31.14	\$13.24	\$31.14	\$30.17	Lincoln County 35-027
NM39	\$20.36	\$21.62	\$17.72	\$37.67	\$20.84	\$23.89	\$13.12	\$22.13	\$16.25	\$21.99	\$21.97	\$20.33	\$16.58	\$31.14	\$31.14	\$31.14	\$13.24	\$31.14	\$30.17	Sierra County 35-051
NV15	\$38.05	\$25.84	\$25.98	\$18.46	\$33.00	\$30.10	\$22.40	\$34.19	\$50.69	\$50.69	\$35.00	\$44.44	\$23.72	\$34.34	\$34.34	\$34.34	\$21.60	\$31.24	\$31.24	Mineral Count 32-021
NV85	\$19.75	\$25.75	\$19.75	\$32.00	\$27.50	\$27.50	\$18.72	\$25.05	\$29.55	\$34.45	\$18.00	\$27.70	\$18.98	\$28.79	\$23.48	\$26.14	\$21.00	\$27.46	\$27.46	Jefferson Cou 36-045
NV7	\$37.53	\$29.09	\$37.53	\$41.00	\$41.00	\$37.27	\$34.00	\$40.23	\$37.52	\$41.02	\$37.88	\$39.16	\$39.94	\$33.22	\$33.22	\$37.20	\$39.00	\$43.41	\$43.41	Orange County 36-071
OK43	\$23.41	\$15.50	\$16.72	\$27.75	\$17.11	\$31.11	\$9.31	\$21.25	\$20.64	\$14.28	\$16.18	\$18.72	\$12.91	\$30.33	\$30.33	\$30.33	\$20.19	\$29.70	\$29.70	Comanche Cou 40-031
PA29	\$31.41	\$27.26	\$17.13	\$34.25	\$33.30	\$31.07	\$23.24	\$22.20	\$22.70	\$28.51	\$26.05	\$24.87	\$15.50	\$39.89	\$39.89	\$39.89	\$25.50	\$29.89	\$29.89	Monroe Coun 42-089
PA10	\$30.27	\$26.88	\$25.20	\$28.00	\$30.02	\$30.02	\$31.77	\$31.77	\$31.77	\$27.72	\$31.77	\$30.76	\$23.57	\$33.22	\$33.22	\$33.22	\$30.75	\$30.61	\$30.61	Cumberland C 42-041
PA16	\$30.27	\$26.09	\$28.60	\$28.00	\$30.02	\$30.02	\$18.32	\$14.71	\$14.27	\$28.19	\$17.50	\$19.06	\$22.17	\$33.22	\$33.22	\$33.22	\$30.00	\$30.00	\$30.00	Franklin Count 42-055
SC35	\$18.00	\$16.32	\$15.29	\$23.77	\$15.02	\$23.55	\$10.73	\$16.81	\$15.32	\$15.00	\$14.18	\$16.47	\$12.24	\$24.85	\$16.86	\$20.86	\$12.21	\$15.35	\$15.35	Richland Cour 45-079
TN98	\$23.52	\$14.94	\$16.68	\$18.00	\$23.00	\$20.55	\$12.44	\$15.00	\$15.32	\$15.00	\$13.50	\$14.71	\$13.10	\$24.85	\$20.03	\$20.03	\$20.03	\$15.35	\$15.35	Montgomery 47-125
TX39	\$14.00	\$11.58	\$10.50	\$24.00	\$11.00	\$20.55	\$7.25	\$8.54	\$7.30	\$8.70	\$7.55	\$9.48	\$8.32	\$10.07	\$10.07	\$10.07	\$7.78	\$9.79	\$9.79	Bell County 48-027
TX2	\$24.50	\$10.64	\$11.46	\$25.60	\$10.19	\$19.00	\$7.25	\$14.12	\$18.82	\$15.30	\$16.57	\$14.43	\$8.01	\$29.78	\$29.78	\$29.78	\$8.14	\$25.18	\$25.18	Bexar County 48-029
TX39	\$14.00	\$11.58	\$10.50	\$24.00	\$11.00	\$20.55	\$7.25	\$8.54	\$7.30	\$8.70	\$7.55	\$9.48	\$8.32	\$10.07	\$10.07	\$10.07	\$7.78	\$9.79	\$9.79	Coryell County 48-099
TX3	\$11.31	\$12.20	\$8.47	\$22.50	\$10.25	\$10.25	\$7.25	\$7.25	\$7.25	\$12.86	\$12.86	\$11.46	\$8.50	\$12.65	\$12.65	\$12.65	\$7.25	\$9.18	\$9.18	Bowie County 48-037
TX93	\$13.45	\$12.73	\$11.91	\$21.45	\$8.83	\$10.23	\$7.95	\$11.00	\$13.00	\$13.49	\$11.19	\$11.78	\$9.17	\$18.15	\$13.52	\$15.84	\$7.25	\$9.18	\$9.18	El Paso County 48-141
UT10	\$22.23	\$20.19	\$22.70	\$19.80	\$26.61	\$10.25	\$15.56	\$24.17	\$15.56	\$25.69	\$24.17	\$21.03	\$13.86	\$30.05	\$30.05	\$30.05	\$13.70	\$14.43	\$14.43	Tooele County 49-045
VA115	\$21.05	\$23.72	\$17.75	\$29.10	\$24.04	\$10.71	\$17.67	\$21.50	\$16.43	\$18.00	\$20.63	\$18.85	\$19.17	\$25.95	\$25.95	\$25.95	\$21.55	\$23.13	\$23.13	James City Co 51-095
VA97	\$28.17	\$26.38	\$27.15	\$40.00	\$34.18	\$14.30	\$19.20	\$21.50	\$32.40	\$20.47	\$20.63	\$24.87	\$24.89	\$37.62	\$38.17	\$37.90	\$26.90	\$39.93	\$39.93	Arlington Cou 51-013
VA118	\$19.00	\$18.96	\$16.99	\$24.58	\$29.80	\$9.28	\$17.00	\$21.50	\$18.38	\$18.00	\$20.63	\$19.10	\$13.76	\$25.95	\$25.95	\$26.90	\$23.13	\$23.13	\$23.13	Newport New 51-700
VA122	\$22.88	\$16.11	\$13.29	\$29.10	\$29.80	\$8.90	\$17.67	\$21.50	\$18.38	\$18.36	\$20.63	\$19.31	\$19.50	\$28.00	\$28.00	\$28.00	\$21.55	\$26.03	\$26.03	Hopewell city 51-670
VA136	\$22.88	\$16.11	\$13.29	\$29.10	\$24.98	\$11.16	\$17.67	\$21.50	\$18.38	\$18.36	\$20.63	\$19.31	\$19.50	\$28.00	\$28.00	\$28.00	\$21.55	\$26.03	\$26.03	Petersburg cit 51-730
VA106	\$28.17	\$26.38	\$18.85	\$40.00	\$34.18	\$13.20	\$19.20	\$21.50	\$32.40	\$20.42	\$20.63	\$24.86	\$24.89	\$37.62	\$38.17	\$37.90	\$21.55	\$29.93	\$29.93	Fairfax Count 51-059
VA122	\$22.88	\$16.11	\$13.29	\$29.10	\$29.80	\$8.90	\$17.67	\$21.50	\$18.38	\$18.36	\$20.63	\$19.31	\$19.50	\$24.88	\$24.88	\$24.88	\$21.55	\$26.03	\$26.03	Prince George 51-149
VA101	\$22.88	\$16.11	\$13.29	\$29.10	\$18.00	\$11.16	\$17.67	\$21.50	\$18.38	\$15.13	\$20.63	\$18.66	\$19.50	\$28.00	\$28.00	\$28.00	\$21.55	\$26.03	\$26.03	Caroline Coun 51-033
WA45	\$28.32	\$26.83	\$26.01	\$38.05	\$32.60	\$15.50	\$20.59	\$37.84	\$26.02	\$37.84	\$37.86	\$32.03	\$16.58	\$41.12	\$47.85	\$36.37	\$25.16	\$33.83	\$33.83	Yakima Count 53-077
WA38	\$35.10	\$35.97	\$36.63	\$34.28	\$38.14	\$31.76	\$26.34	\$26.63	\$36.91	\$36.84	\$30.40	\$31.42	\$28.15	\$41.12	\$41.12	\$41.12	\$29.25	\$44.44	\$44.44	Pierce County 53-053
WA55	\$36.10	\$26.83	\$26.44	\$38.05	\$32.60	\$24.51	\$37.40	\$36.39	\$36.89	\$36.35	\$36.86	\$36.78	\$20.69	\$47.85	\$36.00	\$41.93	\$25.16	\$33.83	\$33.83	Kititas Count 53-037



Appendix C. BLS Wage Data

AREA NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	Plum/Pipe	Rebar IW	Roofers	S. Metal	Struc IW
Northwest Alabama nonmetropolitan area	0100001		\$12.50	\$14.75	\$10.01	\$20.13	\$13.83	\$11.44	\$18.46		\$12.47	\$15.26	
Northeast Alabama nonmetropolitan area	0100002		\$15.01	\$15.66	\$11.02	\$19.07	\$15.71	\$15.00	\$15.24			\$13.84	
Southwest Alabama nonmetropolitan area	0100003		\$14.29	\$16.31	\$11.90	\$19.51	\$14.45	\$12.28	\$17.10		\$12.05	\$12.65	\$21.51
Southeast Alabama nonmetropolitan area	0100004		\$13.47	\$15.89	\$11.47	\$17.03	\$15.03	\$12.55	\$13.50				
Southeast Alaska nonmetropolitan area	0200001		\$29.44		\$22.48	\$35.55	\$29.02		\$39.15				
Railbelt / Southwest Alaska NMA	0200002		\$29.87		\$23.51	\$35.98	\$29.50	\$24.06	\$38.93				\$26.71
North Arizona nonmetropolitan area	0400001		\$14.87	\$15.60	\$13.62	\$27.25	\$20.92	\$16.67	\$28.22		\$17.29		
Southeast Arizona nonmetropolitan area	0400002	\$14.04	\$14.07	\$18.30	\$15.31	\$24.87	\$19.53	\$14.71	\$17.92			\$15.87	
Central Arkansas nonmetropolitan area	0500001	\$17.92	\$16.62	\$14.57	\$11.75	\$24.19	\$17.68	\$12.15	\$22.46			\$13.57	
East Arkansas nonmetropolitan area	0500002		\$15.61	\$13.98	\$11.26	\$18.06	\$14.55		\$16.72			\$13.05	
South Arkansas nonmetropolitan area	0500003	\$18.13	\$14.76	\$15.80	\$10.20	\$19.16	\$14.29	\$14.73	\$21.19		\$11.95	\$15.86	\$17.84
West Arkansas nonmetropolitan area	0500004		\$13.24	\$15.27	\$11.38	\$20.05	\$15.21	\$18.95	\$17.17				
Mother Lode Region of California NMA	0600001		\$25.44	\$20.92	\$18.81	\$31.66	\$25.57	\$22.28	\$29.21		\$25.74		
Eastern Sierra Region of California NMA	0600002		\$29.06		\$18.24	\$26.63		\$0.00					
North Coast Region of California NMA	0600003		\$25.20	\$22.25	\$17.62	\$27.87	\$32.54	\$20.59	\$25.09		\$20.37	\$17.54	
North Valley Region of California NMA	0600004		\$22.57		\$18.69	\$28.59	\$26.12						
Northern Mountains Region of CA NMA	0600005		\$26.04	\$29.58	\$20.39	\$23.48	\$21.77	\$21.92	\$21.25		\$24.41	\$23.19	
Eastern and Southern Colorado NMA	0800001		\$15.66	\$14.97	\$12.87	\$23.43	\$15.91		\$18.23				
Western Colorado nonmetropolitan area	0800002	\$20.82	\$20.60	\$18.43	\$15.73	\$26.52	\$23.63	\$18.82	\$24.33		\$16.50	\$20.11	\$20.09
North Central Colorado NMA	0800003	\$21.78	\$23.77	\$17.15	\$15.16	\$25.53	\$22.01	\$14.87	\$20.83		\$17.56	\$24.26	
Central Colorado nonmetropolitan area	0800004		\$15.90	\$16.84	\$14.06	\$24.26	\$20.38		\$19.58				
Northwestern Connecticut NMA	0900001		\$26.32		\$23.12	\$25.60	\$24.94	\$17.43	\$30.62			\$19.54	
Abilene, TX	10180		\$14.98	\$14.07	\$12.59	\$18.98	\$16.70	\$14.40	\$20.37				
Akron, OH	10420	\$29.14	\$19.77	\$22.34	\$18.99	\$26.87	\$25.49	\$21.52	\$24.24		\$18.48	\$16.91	\$27.86
Albany, GA	10500		\$14.85	\$11.97	\$12.53	\$20.11	\$15.54	\$19.62	\$21.31			\$17.42	
Albany-Schenectady-Troy, NY	10580	\$26.21	\$21.49	\$22.21	\$18.12	\$26.83	\$25.01	\$19.88	\$30.67		\$23.13	\$29.02	\$28.84
Albuquerque, NM	10740	\$16.16	\$19.11	\$17.50	\$14.12	\$21.96	\$17.40	\$16.11	\$22.77		\$14.79	\$19.72	\$24.01
Alexandria, LA	10780		\$14.98	\$15.22	\$13.59	\$20.97	\$15.84	\$17.05	\$17.89			\$16.35	
Allentown-Bethlehem-Easton, PA-NJ	10900	\$22.10	\$22.83	\$20.96	\$15.32	\$25.84	\$21.34	\$16.08	\$29.26		\$17.89	\$31.12	\$20.75
Altoona, PA	11020	\$26.08	\$16.00	\$16.59	\$14.12	\$23.21	\$21.57	\$14.09	\$23.55		\$9.81		
Amarillo, TX	11100	\$16.71	\$18.28	\$14.83	\$11.19	\$20.40	\$15.90	\$14.26	\$22.14		\$0.00	\$14.69	\$13.35
Ames, IA	11180		\$21.34	\$13.07	\$14.79	\$21.02	\$20.17	\$17.44	\$23.70				
Anchorage, AK	11260		\$30.04	\$29.90	\$20.42	\$35.23	\$30.59	\$22.84	\$32.35		\$25.27	\$26.85	\$31.96
Ann Arbor, MI	11460		\$23.83	\$20.11	\$18.18	\$32.85	\$23.13	\$22.79	\$28.47		\$17.57	\$26.52	
Anniston-Oxford, AL	11500		\$12.16		\$10.76	\$20.62	\$16.07	\$21.57	\$17.14				
Appleton, WI	11540		\$19.42	\$19.80	\$21.09	\$23.84	\$22.99	\$19.35	\$28.66		\$14.73	\$26.02	\$22.62
Asheville, NC	11700	\$16.23	\$15.70	\$14.83	\$12.22	\$16.75	\$16.00	\$15.01	\$20.23		\$12.81	\$17.39	
Northwest Florida nonmetropolitan area	1200001		\$14.26	\$15.87	\$10.40	\$17.09	\$14.61	\$15.72	\$18.67			\$15.84	\$9.62
Northeast Florida nonmetropolitan area	1200002		\$17.58	\$13.16	\$12.34	\$21.27	\$15.61	\$12.93	\$16.02		\$15.35	\$16.08	
South Florida nonmetropolitan area	1200003		\$16.37	\$16.14	\$13.12	\$22.14	\$16.42	\$13.74	\$19.92		\$15.75		
Athens-Clarke County, GA	12020		\$14.17		\$15.86	\$17.22	\$16.16	\$15.46	\$18.49			\$17.98	
Atlanta-Sandy Springs-Marietta, GA	12060	\$17.51	\$20.83	\$18.38	\$15.17	\$22.63	\$17.02	\$16.22	\$22.22	\$14.33	\$17.31	\$19.46	\$20.70
Atlantic City-Hammonton, NJ	12100	\$28.35	\$28.19	\$22.85	\$21.73	\$28.53	\$30.61	\$25.00	\$33.75		\$31.48	\$37.28	\$34.28
Auburn-Opelika, AL	12220		\$15.26		\$11.39	\$17.12	\$15.96	\$14.73					
Augusta-Richmond County, GA-SC	12260	\$16.89	\$21.11	\$18.46	\$14.66	\$19.77	\$19.96	\$16.84	\$21.55		\$11.73	\$17.30	\$25.64
Austin-Round Rock-San Marcos, TX	12420	\$17.95	\$16.55	\$14.51	\$11.89	\$20.33	\$16.00	\$13.20	\$22.29	\$15.63	\$14.23	\$19.67	\$17.65
Bakersfield-Delano, CA	12540	\$14.79	\$21.71	\$19.97	\$16.56	\$28.68	\$22.73	\$18.17	\$23.07	\$31.52	\$18.25	\$25.24	\$22.30
Baltimore-Towson, MD	12580	\$18.26	\$20.85	\$18.32	\$14.62	\$24.65	\$21.42	\$18.37	\$26.08	\$22.49	\$18.96	\$26.52	\$25.19
Baton Rouge, LA	12940		\$19.10	\$18.36	\$12.99	\$22.32	\$18.77	\$15.74	\$21.94	\$20.86	\$16.32	\$20.11	\$17.18
Battle Creek, MI	12980		\$21.49		\$15.54	\$24.57		\$20.74			\$16.02		
North Georgia nonmetropolitan area	1300001		\$17.58	\$13.74	\$13.73	\$19.09	\$15.09	\$14.86	\$18.38			\$12.47	\$13.15
Middle Georgia nonmetropolitan area	1300002	\$16.05	\$14.32	\$13.91	\$11.56	\$17.73	\$14.48	\$13.70	\$16.93		\$16.43		\$16.35
East Georgia nonmetropolitan area	1300003		\$22.21	\$13.11	\$11.50	\$18.30	\$15.01	\$13.07	\$18.18			\$13.54	
South Georgia nonmetropolitan area	1300004	\$16.68	\$15.99	\$15.75	\$11.78	\$18.46	\$14.27	\$15.71	\$20.27		\$10.52	\$17.29	
Bay City, MI	13020		\$16.51		\$16.33	\$20.71	\$18.79		\$26.07		\$17.44		
Beaumont-Port Arthur, TX	13140	\$25.60	\$22.23	\$16.78	\$15.22	\$25.71	\$21.93	\$17.74	\$27.85	\$22.84		\$22.70	\$26.86
Bellingham, WA	13380		\$24.00	\$22.84	\$23.88	\$27.17	\$30.53	\$18.61	\$26.67		\$21.82	\$17.04	\$26.20
Bend, OR	13460	\$21.22	\$21.77	\$22.29	\$17.55	\$26.20	\$20.63	\$14.22	\$26.37		\$12.67	\$22.87	\$39.52
Billings, MT	13740	\$18.78	\$18.33	\$16.35	\$19.69	\$26.27	\$20.67	\$19.33	\$26.78		\$16.49	\$21.44	
Binghamton, NY	13780		\$19.74		\$17.07	\$24.50	\$26.43	\$18.80	\$23.40		\$21.41	\$16.27	
Birmingham-Hoover, AL	13820	\$15.25	\$16.09	\$17.75	\$13.74	\$19.74	\$18.16	\$16.80	\$19.06	\$15.62	\$13.50	\$16.22	\$17.78
Bismarck, ND	13900		\$16.16	\$18.17	\$15.21	\$22.38	\$21.21	\$15.54	\$22.68		\$15.55	\$21.96	
Blacksburg-Christiansburg-Radford, VA	13980		\$16.74		\$11.49	\$20.30	\$15.71	\$14.88	\$18.80			\$19.61	
Bloomington, IN	14020	\$23.74	\$20.35	\$23.77	\$15.67	\$25.53	\$25.25	\$17.84	\$18.30			\$30.46	
Bloomington-Normal, IL	14010	\$20.94	\$27.48		\$22.12	\$32.65	\$29.07	\$24.58	\$25.85				
Boise City-Nampa, ID	14260	\$20.68	\$14.74	\$14.51	\$15.17	\$21.15	\$21.49	\$13.76	\$20.74	\$19.64	\$14.48	\$16.07	
Boulder, CO	14500	\$24.91	\$19.67	\$14.90	\$15.39	\$21.61	\$19.35	\$17.08	\$22.33		\$17.84	\$17.19	
Bowling Green, KY	14540	\$18.14	\$16.60	\$16.23	\$12.81	\$20.24	\$16.09	\$15.07	\$0.00				
Bremerton-Silverdale, WA	14740		\$26.56	\$19.27	\$17.68	\$27.23	\$28.06	\$23.61	\$29.43		\$17.73	\$31.98	
Hawaii / Maui / Kauai NMA	1500001	\$31.97	\$28.87	\$30.87	\$23.79	\$26.14	\$27.76	\$24.21	\$26.62			\$29.01	
Brownsville-Harlingen, TX	15180		\$13.08	\$11.07	\$10.48	\$15.75	\$11.59	\$11.71	\$15.79		\$12.30	\$0.00	
Brunswick, GA	15260		\$20.79		\$10.85	\$19.50	\$15.66	\$14.59	\$16.90				
Buffalo-Niagara Falls, NY	15380	\$25.50	\$19.76	\$20.63	\$20.62	\$25.14	\$27.11	\$19.72	\$27.02		\$19.27	\$20.71	\$27.81
Burlington, NC	15500		\$15.35	\$16.03	\$12.42	\$18.78	\$15.24	\$15.67	\$16.03				



AREA_NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	PlumPipe	Rebar IW	Roofers	S. Metal	Struc IW
Canton-Massillon, OH	15940	\$23.62	\$19.38	\$23.95	\$18.24	\$24.93	\$23.63	\$21.11	\$26.94		\$19.93	\$22.60	
Cape Coral-Fort Myers, FL	15980	\$13.22	\$19.64	\$14.60	\$13.08	\$16.62	\$18.10	\$13.86	\$17.78		\$15.76	\$15.55	\$15.79
North Idaho nonmetropolitan area	1600001		\$16.92	\$15.26	\$16.83	\$18.96	\$18.58	\$14.88	\$20.58				
Southwest Idaho nonmetropolitan area	1600002		\$14.54		\$13.56	\$18.96	\$19.86	\$12.15	\$19.08				
Southcentral Idaho nonmetropolitan area	1600003		\$19.22	\$14.65	\$11.78	\$17.89	\$17.68	\$13.43	\$23.91		\$17.74	\$17.30	
East Idaho nonmetropolitan area	1600004		\$19.82	\$14.58	\$14.00	\$22.49	\$22.31	\$19.85	\$26.07			\$19.05	
Cape Girardeau-Jackson, MO-IL	16020		\$18.38		\$16.42	\$22.60	\$17.91		\$24.49			\$27.35	
Carson City, NV	16180		\$22.39		\$13.68	\$20.78	\$18.54	\$17.26	\$23.31				
Casper, WY	16220		\$18.88	\$18.83	\$13.98	\$23.71	\$19.52	\$18.80	\$16.27			\$19.24	\$19.04
Cedar Rapids, IA	16300	\$22.02	\$18.53	\$18.66	\$16.63	\$27.53	\$20.87	\$18.42	\$27.20		\$15.85	\$21.00	
Champaign-Urbana, IL	16580	\$24.24	\$24.01	\$28.95	\$19.44	\$31.58	\$28.26	\$29.58	\$30.82		\$23.98	\$32.72	
Charleston, WV	16620	\$15.91	\$18.05	\$17.24	\$18.51	\$26.83	\$24.06	\$21.16	\$22.31		\$15.13	\$23.09	\$24.01
Charleston-N. Charleston-Summerville, SC	16700	\$19.65	\$17.23	\$12.48	\$13.45	\$18.69	\$18.02	\$15.24	\$17.90	\$0.00	\$19.14	\$15.58	\$23.45
Charlotte-Gastonia-Rock Hill, NC-SC	16740	\$16.76	\$16.81	\$15.92	\$12.64	\$18.75	\$16.35	\$17.33	\$19.23		\$16.28	\$15.98	\$17.95
Charlottesville, VA	16820	\$21.07	\$18.53	\$14.96	\$12.30	\$19.59	\$17.88	\$15.47	\$20.09		\$16.94	\$17.50	
Chattanooga, TN-GA	16860	\$21.51	\$17.98	\$15.20	\$13.03	\$21.68	\$18.27	\$14.23	\$18.31			\$18.92	\$21.56
Cheyenne, WY	16940		\$19.49	\$15.62	\$13.14	\$30.57	\$19.63	\$14.43	\$23.09			\$20.51	
Chicago-Joliet-Naperville, IL Metro	16980	\$32.06	\$28.14	\$29.26	\$18.78	\$36.12	\$36.18	\$25.52	\$34.04	\$35.36	\$23.09	\$28.96	\$35.38
Northwest Illinois nonmetropolitan area	1700001	\$23.12	\$24.16	\$29.38	\$17.77	\$30.80	\$32.56	\$19.08	\$23.73		\$0.00	\$25.37	\$26.67
West Central Illinois NMA	1700002	\$23.10	\$17.08	\$19.20	\$13.76	\$26.62	\$24.33	\$17.79	\$30.46		\$19.22	\$23.77	
East Central Illinois NMA	1700003	\$20.32	\$16.69	\$18.72	\$16.45	\$24.93	\$22.17	\$19.50	\$24.22		\$12.60	\$18.14	\$28.00
South Illinois nonmetropolitan area	1700004	\$24.14	\$22.80	\$21.32	\$21.24	\$26.58	\$27.48	\$23.25	\$31.77			\$18.65	\$25.02
Chico, CA	17020		\$25.13	\$24.14	\$22.21	\$24.02	\$23.20	\$18.22	\$21.60		\$21.08	\$14.77	
Cincinnati-Middletown, OH-KY-IN	17140	\$20.44	\$20.35	\$20.32	\$19.27	\$23.87	\$20.50	\$18.35	\$24.11	\$28.46	\$16.87	\$20.55	\$24.49
Clarksville, TN-KY	17300		\$18.58	\$18.93	\$14.07	\$18.38	\$17.79	\$14.17	\$19.99			\$23.35	
Cleveland, TN	17420		\$17.01		\$13.21	\$20.80	\$18.95	\$15.96				\$17.30	
Cleveland-Elyria-Mentor, OH	17460	\$29.08	\$22.74	\$22.45	\$18.99	\$27.34	\$26.54	\$20.77	\$25.95		\$18.08	\$24.34	\$28.68
Coeur d'Alene, ID	17660		\$17.09	\$19.14	\$15.00	\$19.95	\$19.42	\$17.17	\$17.82		\$16.37	\$18.66	
College Station-Bryan, TX	17780	\$15.16	\$17.05	\$13.48	\$12.52	\$18.59	\$17.64	\$14.53	\$19.94			\$18.91	
Colorado Springs, CO	17820		\$19.74	\$16.08	\$14.29	\$23.09	\$20.98	\$17.40	\$20.74		\$18.35	\$19.81	\$20.58
Columbia, MO	17860		\$20.79	\$20.43	\$16.85	\$23.98	\$23.17	\$19.06	\$21.59			\$18.74	\$30.64
Columbia, SC	17900	\$18.42	\$17.44	\$15.17	\$12.51	\$20.74	\$20.55	\$15.41	\$17.40	\$19.44	\$14.68	\$17.12	\$17.64
Columbus, GA-AL	17980		\$15.30	\$15.50	\$10.57	\$18.40	\$15.43	\$13.39	\$18.38		\$0.00	\$15.49	
Northern Indiana nonmetropolitan area	1800001	\$25.97	\$17.09	\$14.42	\$14.22	\$21.09	\$20.52	\$14.86	\$19.66		\$18.86	\$18.23	\$17.90
Central Indiana nonmetropolitan area	1800002		\$14.40	\$12.66	\$15.92	\$25.24	\$16.52	\$17.09	\$23.81		\$17.12		\$16.27
Southern Indiana nonmetropolitan area	1800003	\$17.91	\$16.58	\$15.80	\$16.74	\$24.31	\$21.97	\$15.38	\$24.03		\$15.33		
Columbus, IN	18020		\$20.84		\$16.83	\$21.95	\$23.07	\$21.16	\$21.51		\$19.39	\$19.44	
Columbus, OH	18140	\$21.55	\$21.10	\$20.32	\$19.14	\$21.67	\$27.13	\$16.63	\$26.34		\$18.88	\$20.60	\$23.01
Corpus Christi, TX	18580	\$17.70	\$15.45	\$15.29	\$12.27	\$19.65	\$16.80	\$18.43	\$19.31		\$13.91	\$25.21	\$20.18
Corvallis, OR	18700		\$22.39		\$14.63	\$28.94			\$27.79			\$21.99	
Crestview-Fort Walton Beach-Destin, FL	18880		\$16.25	\$13.22	\$13.66	\$23.32	\$19.57	\$16.25	\$19.22			\$17.35	
Northeast Iowa nonmetropolitan area	1900001	\$23.35	\$18.13	\$16.05	\$14.04	\$18.31	\$18.00	\$16.47	\$17.82		\$13.67		
Northwest Iowa nonmetropolitan area	1900002	\$19.91	\$17.34	\$19.97	\$13.27	\$20.78	\$16.94	\$14.16	\$19.48		\$13.08	\$20.54	\$16.16
Southwest Iowa nonmetropolitan area	1900003	\$27.34	\$14.42	\$13.42	\$13.70	\$19.60	\$16.51		\$18.85		\$13.52	\$21.64	
Southeast Iowa nonmetropolitan area	1900004	\$21.40	\$17.49	\$16.42	\$14.22	\$24.69	\$18.09	\$18.18	\$23.87		\$15.14	\$24.08	\$30.70
Cumberland, MD-WV	19060		\$18.90	\$23.82	\$13.92	\$17.33	\$18.25	\$17.27	\$19.99		\$15.46		
Dallas-Plano-Irving, TX Metro	19100	\$17.02	\$15.18	\$14.56	\$12.48	\$19.70	\$16.27	\$14.40	\$21.39	\$17.34	\$13.98	\$17.23	\$18.16
Dalton, GA	19140		\$16.61	\$13.05	\$13.73	\$20.86	\$14.21						
Danville, IL	19180		\$18.31		\$18.95	\$22.50	\$27.33						
Davenport-Moline-Rock Island, IA-IL	19340	\$21.80	\$20.35	\$21.42	\$17.48	\$29.56	\$22.67	\$18.63	\$28.52		\$14.00	\$22.37	\$0.00
Dayton, OH	19380	\$23.61	\$20.69	\$18.85	\$17.85	\$21.52	\$23.48	\$17.29	\$16.57		\$17.08	\$22.49	\$25.92
Decatur, AL	19460		\$0.00		\$12.48	\$19.93	\$15.88		\$18.99			\$16.27	
Decatur, IL	19500		\$20.46		\$18.91	\$26.56	\$26.06	\$21.75	\$0.00			\$16.66	\$0.00
Daytona Beach-Ormond Beach, FL	19660		\$16.32	\$15.17	\$13.76	\$19.71	\$16.45	\$13.68	\$18.72		\$11.50	\$12.62	\$12.48
Denver-Aurora-Broomfield, CO	19740	\$23.14	\$18.84	\$17.81	\$15.36	\$24.24	\$22.24	\$17.59	\$22.78		\$20.04	\$26.06	\$21.24
Des Moines-West Des Moines, IA	19780	\$23.12	\$20.21	\$19.68	\$17.47	\$21.66	\$24.98	\$19.51	\$23.92			\$32.03	
Detroit-Livonia-Dearborn, MI Metro	19820	\$28.95	\$26.55	\$22.26	\$21.31	\$31.73	\$26.19	\$24.87	\$29.81		\$25.00	\$24.00	\$29.13
Kansas nonmetropolitan area	2000001	\$26.19	\$17.38	\$15.16	\$12.22	\$20.36	\$15.29	\$13.60	\$21.78		\$13.38	\$17.15	\$18.82
Dothan, AL	20020		\$16.45	\$12.65	\$11.16	\$16.06	\$16.77	\$15.65	\$22.17		\$13.16	\$13.44	
Dover, DE	20100		\$18.72	\$19.82	\$17.22	\$23.37	\$17.05	\$11.12	\$20.55				
Dubuque, IA	20220	\$17.44	\$18.65	\$16.75	\$15.19	\$22.89	\$22.41	\$16.46	\$23.55		\$17.21	\$23.64	
Duluth, MN-WI	20260	\$34.65	\$22.64	\$25.54	\$20.24	\$30.24	\$25.18	\$20.48	\$32.42		\$25.59	\$30.52	
Durham-Chapel Hill, NC	20500		\$17.25	\$13.72	\$13.09	\$20.21	\$16.22	\$15.26	\$21.80		\$16.60	\$16.24	
Eau Claire, WI	20740		\$18.49	\$18.38	\$17.84	\$25.28	\$22.26	\$15.65	\$28.16		\$16.41	\$26.65	
El Centro, CA	20940		\$21.96		\$17.02	\$32.04	\$24.48	\$22.18	\$22.48				
West Kentucky nonmetropolitan area	2100001	\$22.62	\$16.64	\$17.91	\$16.86	\$24.17	\$19.02	\$14.17	\$21.57		\$15.26	\$20.15	
South Central Kentucky NMA	2100002	\$19.14	\$13.22	\$14.40	\$16.48	\$19.79	\$19.11		\$18.03		\$16.96	\$15.53	
West Central Kentucky NMA	2100003	\$22.03	\$12.86	\$12.24	\$12.63	\$18.24	\$17.64	\$15.17	\$22.33			\$20.59	\$21.35
East Kentucky nonmetropolitan area	2100004	\$22.44	\$18.56	\$15.11	\$15.96	\$25.39	\$18.42		\$16.79				
Elizabethtown, KY	21060	\$19.73	\$16.95		\$16.33	\$21.61	\$18.62		\$19.31				
Elkhart-Goshen, IN	21140	\$18.58	\$17.36	\$20.23	\$21.07	\$22.39	\$28.31	\$19.45	\$27.83		\$16.13	\$17.88	
Elmira, NY	21300		\$21.49		\$13.84	\$23.22	\$21.80	\$18.49	\$28.45		\$20.16	\$22.42	
El Paso, TX	21340	\$19.20	\$12.93	\$12.60	\$10.16	\$18.20	\$15.40	\$11.58	\$15.48	\$13.38	\$11.61	\$16.62	\$15.32
Erie, PA	21500	\$15.23	\$18.50	\$21.86	\$16.74	\$20.10	\$20.59	\$17.60	\$22.77		\$18.99	\$19.49	\$14.86
Eugene-Springfield, OR	21660		\$20.23	\$17.92	\$16.76	\$26.31	\$23.36	\$14.46	\$28.35		\$18.74	\$19.79	

AREA_NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electriciar	Operator	Painters	PlumPipe	Rebar IW	Roofers	S. Metal	Struc IW
Evansville, IN-KY	21780	\$22.09	\$21.74	\$21.29	\$18.08	\$27.83	\$24.11	\$17.86	\$29.18		\$0.00	\$25.36	\$24.70
Fairbanks, AK	21820		\$30.41		\$22.04	\$36.84	\$28.97	\$28.17	\$30.39			\$34.09	
Hammond nonmetropolitan area	2200001		\$16.87		\$11.27	\$19.75	\$17.58		\$21.18				
Natchitoches nonmetropolitan area	2200002		\$16.83	\$15.58	\$10.81	\$19.19	\$16.02	\$14.56	\$25.66				
Winnsboro nonmetropolitan area	2200003		\$15.35	\$16.75	\$11.69	\$19.99	\$17.63		\$16.84				
New Iberia nonmetropolitan area	2200004		\$16.74	\$15.08	\$16.06	\$21.64	\$16.53	\$16.28	\$20.78			\$18.46	\$14.40
Fargo, ND-MN	22020	\$27.32	\$18.38	\$18.48	\$13.58	\$21.99	\$20.31	\$16.22	\$22.35	\$14.72		\$16.72	\$16.36
Farmington, NM	22140		\$18.59	\$17.30	\$12.40	\$25.37	\$19.58	\$16.32	\$25.49				
Fayetteville, NC	22180	\$17.09	\$14.45	\$14.17	\$11.46	\$19.58	\$16.05	\$12.91	\$19.34			\$17.99	
Fayetteville-Springdale-Rogers, AR-MO	22220	\$15.79	\$15.96	\$14.96	\$11.76	\$19.36	\$16.92	\$14.68	\$21.75	\$17.82		\$16.25	\$18.38
Flagstaff, AZ	22380		\$19.46	\$16.78	\$13.11	\$20.72	\$19.86	\$15.86	\$18.44	\$12.39			
Flint, MI	22420		\$21.39	\$22.78	\$20.36		\$22.24	\$21.31	\$25.68				\$30.61
Florence, SC	22500		\$17.20	\$13.73	\$11.42	\$18.48	\$13.76	\$10.42	\$16.19			\$14.78	
Florence-Muscle Shoals, AL	22520		\$18.85		\$13.15	\$18.41	\$18.66	\$12.95	\$23.02			\$19.05	
Fond du Lac, WI	22540		\$19.54		\$17.75	\$25.73	\$27.91	\$17.33	\$33.26				
Fort Collins-Loveland, CO	22660	\$22.82	\$17.53	\$16.31	\$15.95	\$22.16	\$20.56	\$15.58	\$21.96	\$18.27		\$20.69	\$22.48
Fort Smith, AR-OK	22900		\$16.13	\$14.63	\$12.18	\$18.65	\$17.82	\$14.23	\$18.89			\$17.62	
Northeast Maine nonmetropolitan area	2300001	\$21.81	\$18.12	\$15.24	\$12.48	\$21.02	\$16.59	\$18.79	\$18.49				
Southwest Maine nonmetropolitan area	2300002	\$17.31	\$17.73	\$16.51	\$14.24	\$22.98	\$17.95	\$23.09	\$21.91	\$15.91		\$22.64	\$19.00
Fort Wayne, IN	23060	\$23.54	\$17.28	\$19.54	\$18.62	\$25.89	\$24.51	\$14.65	\$27.76	\$19.01		\$23.34	\$25.04
Fresno, CA	23420	\$27.86	\$21.36	\$18.50	\$18.45	\$25.18	\$31.49	\$19.10	\$25.94	\$22.58		\$22.79	\$22.11
Gadsden, AL	23460				\$13.88	\$21.34	\$13.55		\$16.63			\$15.60	
Gainesville, FL	23540	\$15.62	\$16.19	\$14.25	\$11.95	\$20.08	\$14.70	\$11.83	\$17.66	\$13.28		\$20.75	\$0.00
Gainesville, GA	23580		\$21.40	\$13.15	\$12.44	\$19.32	\$15.44		\$19.58			\$17.82	\$14.48
Upper Eastern Shore NMA	2400001		\$17.87	\$17.75	\$13.98	\$21.69	\$16.68	\$13.33	\$20.23				\$19.11
Garrett County, Maryland NMA	2400002		\$14.11		\$14.27	\$19.14	\$21.90	\$13.48					
Glens Falls, NY	24020		\$19.33	\$16.37	\$15.34	\$23.93	\$22.66	\$18.07	\$22.90				
Goldsboro, NC	24140		\$15.60		\$11.24	\$19.45	\$15.03	\$13.54	\$16.20				
Grand Forks, ND-MN	24220		\$17.68	\$16.44	\$16.15	\$23.29	\$19.36	\$18.14	\$22.11	\$14.92		\$19.84	\$19.80
Grand Junction, CO	24300		\$23.78	\$13.90	\$16.17	\$20.90	\$19.47	\$17.00	\$20.62			\$22.69	
Grand Rapids-Wyoming, MI	24340	\$24.12	\$19.25	\$17.30	\$15.55	\$22.71	\$19.01	\$17.84	\$21.47	\$14.85		\$20.25	
Great Falls, MT	24500		\$19.59	\$14.10	\$15.23	\$23.43	\$18.95	\$17.87	\$22.63	\$10.79		\$21.51	
Greeley, CO	24540	\$19.47	\$16.30	\$16.56	\$15.02	\$21.95	\$19.12	\$16.87	\$25.09	\$17.25		\$19.51	\$21.82
Green Bay, WI	24580	\$28.90	\$22.60	\$20.60	\$18.79	\$24.32	\$29.16	\$17.91	\$25.01	\$17.44		\$26.02	
Greensboro-High Point, NC	24660	\$14.76	\$15.11	\$13.61	\$11.94	\$18.32	\$16.57	\$13.37	\$17.50	\$14.33		\$16.26	\$17.74
Greenville, NC	24780	\$15.93	\$14.49	\$12.46	\$11.14	\$19.91	\$16.03	\$13.98	\$16.78	\$16.35			
Greenville-Mauldin-Easley, SC	24860	\$17.17	\$17.52	\$13.17	\$13.92	\$20.29	\$16.71	\$14.09	\$19.56	\$14.73		\$17.00	\$17.53
Nantucket Is./Martha's Vineyard NMA	2500001		\$30.86		\$16.83	\$34.97		\$22.65	\$38.38				
North Central Massachusetts NMA	2500004		\$22.44		\$22.76	\$26.81		\$18.31					
Gulfport-Biloxi, MS	25060	\$20.42	\$16.44	\$15.56	\$12.16	\$20.69	\$15.53	\$15.93	\$18.07	\$13.68		\$19.29	
Hagerstown-Martinsburg, MD-WV	25180	\$18.39	\$17.93	\$19.06	\$14.37	\$20.68	\$18.68	\$14.41	\$19.86	\$16.85		\$16.50	
Hanford-Corcoran, CA	25260		\$0.00		\$12.99	\$28.82	\$24.36	\$19.94	\$23.58			\$24.63	
Harrisburg-Carlisle, PA	25420	\$25.24	\$19.06	\$18.97	\$15.72	\$22.59	\$20.47	\$19.51	\$23.00	\$18.30		\$21.72	\$31.82
Harrisonburg, VA	25500	\$19.00	\$16.68	\$14.68	\$12.24	\$19.35	\$14.36	\$16.98	\$18.90	\$16.61		\$18.33	\$15.98
Hattiesburg, MS	25620		\$14.22		\$12.06	\$18.96	\$16.49	\$14.76	\$17.42				
Hickory-Lenoir-Morganton, NC	25860	\$21.41	\$16.58	\$13.58	\$12.59	\$19.64	\$16.16	\$15.02	\$15.42	\$13.45		\$17.11	
Hinesville-Fort Stewart, GA	25980				\$15.63	\$22.07	\$19.33	\$18.23	\$23.35				
Upper Peninsula of MI NMA	2600001	\$21.79	\$19.07	\$19.56	\$14.77	\$25.03	\$19.83	\$22.39	\$24.93	\$15.26		\$39.51	
Northeast Lower Peninsula of MI NMA	2600002		\$16.20	\$18.90	\$15.10	\$19.49	\$18.16	\$11.82	\$16.20			\$18.10	\$16.97
Northwest Lower Peninsula of MI NMA	2600003	\$23.41	\$16.50	\$16.70	\$15.87	\$20.88	\$17.43	\$16.30	\$16.96	\$15.02		\$22.82	\$15.82
Balance of Lower Peninsula of MI NMA	2600004	\$22.66	\$19.38	\$15.91	\$17.54	\$21.84	\$24.62	\$18.34	\$22.46	\$17.84		\$17.13	\$24.21
Honolulu, HI	46520	\$31.53	\$33.44	\$29.88	\$25.16	\$33.95	\$36.56	\$24.27	\$30.00	\$33.77	\$23.19	\$31.10	\$31.25
Hot Springs, AR	26300		\$15.40	\$18.08	\$11.03	\$17.42	\$14.93		\$16.78			\$14.81	
Houma-Bayou Cane-Thibodaux, LA	26380		\$19.80	\$15.71	\$12.28	\$22.79	\$19.09	\$16.92	\$23.31			\$17.85	\$17.39
Houston-Sugar Land-Baytown, TX	26420	\$21.26	\$16.15	\$14.05	\$13.01	\$22.53	\$18.94	\$15.25	\$24.62	\$19.08	\$14.20	\$17.70	\$19.29
Huntington-Ashland, WV-KY-OH	26580	\$27.85	\$18.51	\$12.23	\$18.02	\$22.84	\$27.27	\$16.99	\$25.36	\$13.34		\$23.30	
Huntsville, AL	26620		\$17.05	\$15.14	\$14.14	\$21.61	\$17.04	\$13.98	\$20.58	\$12.97		\$18.85	\$21.04
Idaho Falls, ID	26820		\$15.20	\$15.89	\$12.70	\$24.45		\$14.51	\$17.17			\$14.43	
Indianapolis-Carmel, IN	26900	\$24.69	\$22.27	\$19.42	\$17.24	\$28.01	\$26.54	\$19.14	\$27.14	\$23.39		\$24.27	\$18.37
Iowa City, IA	26980	\$18.73	\$17.92	\$18.80	\$15.49	\$23.44	\$19.58	\$16.48	\$18.06	\$11.84		\$27.04	\$23.69
Northwest Minn. NMA	2700001	\$0.00	\$16.46	\$17.73	\$15.90	\$22.93	\$20.15	\$16.12	\$20.87	\$18.26		\$25.38	
Northeast Minn. NMA	2700002		\$21.21	\$20.16	\$19.77	\$27.57	\$22.80	\$16.60	\$30.59				
Southwest Minn. NMA	2700003	\$27.40	\$17.63	\$17.67	\$15.01	\$21.08	\$19.56		\$18.66			\$23.64	
Southeast Minn. NMA	2700004	\$29.37	\$18.24	\$21.74	\$16.88	\$24.11	\$21.42	\$19.91	\$25.87		\$18.07	\$19.89	
Ithaca, NY	27060		\$21.06		\$16.02	\$21.92	\$22.29	\$17.18	\$31.13				
Jackson, MI	27100		\$22.82	\$15.01	\$16.73	\$23.03	\$21.14		\$26.67			\$16.52	
Jackson, MS	27140	\$17.32	\$15.40	\$14.08	\$11.90	\$20.14	\$17.65	\$14.49	\$15.28	\$15.58		\$14.98	\$19.00
Jackson, TN	27180		\$18.26	\$13.11	\$10.97	\$21.20	\$16.24	\$14.98	\$0.00			\$15.74	
Jacksonville, FL	27260	\$21.07	\$16.60	\$17.10	\$12.81	\$19.66	\$19.97	\$13.42	\$19.76	\$22.17	\$15.06	\$20.87	\$20.73
Jacksonville, NC	27340	\$19.16	\$18.10		\$10.77	\$18.75	\$16.66	\$16.30	\$18.39	\$13.15		\$15.39	
Janesville, WI	27500	\$32.26	\$18.16	\$26.29	\$17.84	\$26.84	\$22.46	\$13.82	\$27.29			\$22.05	
Jefferson City, MO	27620	\$25.42	\$21.44	\$17.02	\$19.62	\$20.95	\$24.71	\$20.49	\$25.91	\$22.28		\$28.52	
Johnson City, TN	27740		\$13.70	\$14.68	\$13.02	\$19.69	\$14.59	\$14.44	\$18.14			\$16.59	
Johnstown, PA	27780		\$18.82	\$16.50	\$15.14	\$25.07	\$22.13	\$15.72	\$19.38			\$17.22	
Jonesboro, AR	27860	\$19.39	\$13.51	\$13.38	\$10.36	\$18.09	\$15.76	\$13.61	\$15.91	\$12.90		\$15.03	
Joplin, MO	27900		\$16.46	\$18.35	\$15.48	\$23.44	\$20.41	\$14.16	\$24.79	\$14.75		\$20.39	\$17.38
Northeast Mississippi NMA	2800001	\$18.40	\$14.06	\$13.47	\$11.61	\$18.16	\$16.48	\$13.40	\$18.17	\$12.51		\$17.41	\$22.60
Northwest Mississippi NMA	2800002		\$14.44	\$12.21	\$9.64	\$18.23	\$16.20	\$12.86	\$18.70			\$15.17	\$13.17
Southeast Mississippi NMA	2800003		\$14.90	\$14.35	\$11.75	\$22.43	\$16.90	\$12.54	\$17.81	\$12.20		\$14.54	\$26.32
Southwest Mississippi NMA	2800004	\$23.02	\$18.11	\$14.34	\$14.09	\$20.30	\$16.80	\$15.53	\$17.77	\$13.30		\$12.66	\$15.68

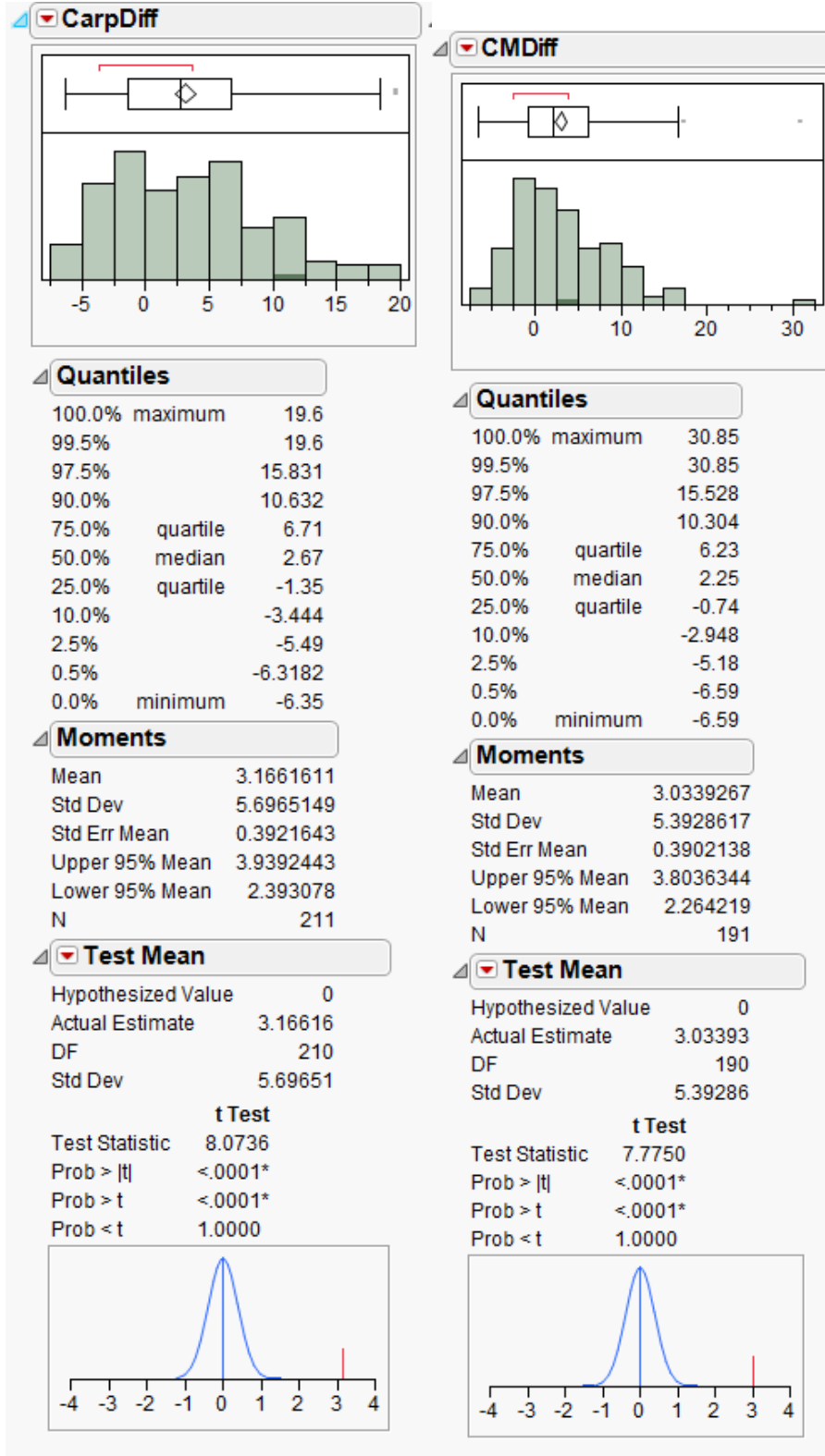
AREA NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	Plum	Pipe Rebar	IW	Roofers	S. Metal	Struc IW
Kalamazoo-Portage, MI	28020		\$20.47	\$17.79	\$16.64	\$22.28	\$21.32	\$16.25	\$23.73			\$16.25	\$22.33	
Kankakee-Bradley, IL	28100		\$21.95	\$21.93	\$23.25	\$25.83	\$29.32	\$35.89	\$33.25				\$25.55	
Kansas City, MO-KS	28140	\$31.24	\$23.13	\$22.22	\$19.41	\$26.50	\$24.82	\$18.65	\$27.65	\$23.72	\$21.15	\$26.16	\$25.70	
Kennewick-Pasco-Richland, WA	28420	\$29.72	\$19.25	\$18.56	\$20.03	\$30.37	\$30.63	\$24.17	\$30.53		\$20.35	\$25.96		
Killeen-Temple-Fort Hood, TX	28660	\$13.90	\$15.78	\$14.21	\$12.05	\$22.40	\$16.83	\$14.01	\$20.73					\$12.57
Kingsport-Bristol-Bristol, TN-VA	28700	\$21.25	\$16.82	\$13.37	\$11.02	\$20.29	\$15.63	\$14.16	\$19.46		\$16.25	\$14.34	\$21.04	
Kingston, NY	28740		\$20.39	\$16.44	\$19.41	\$20.08	\$25.67		\$18.34		\$16.51			
Knoxville, TN	28940	\$20.47	\$17.35	\$16.39	\$13.40	\$19.07	\$18.47	\$14.54	\$16.89		\$15.26	\$16.44	\$18.53	
Central Missouri NMA	2900001	\$23.27	\$17.13	\$17.43	\$17.35	\$24.54	\$21.20	\$20.06	\$24.50		\$17.52	\$24.72	\$22.60	
North Missouri NMA	2900002	\$25.50	\$15.70	\$19.98	\$17.49	\$20.37	\$16.04		\$20.58			\$15.17		
Southeast Missouri NMA	2900003	\$22.07	\$14.90	\$13.88	\$15.06	\$21.92	\$19.76	\$14.18	\$23.94			\$23.90	\$24.42	
Southwest Missouri NMA	2900004		\$14.88	\$15.69	\$14.13	\$17.03	\$17.94	\$19.08	\$14.13			\$14.72		
Kokomo, IN	29020		\$21.12		\$12.81	\$0.00	\$18.40	\$23.16	\$30.63					
La Crosse, WI-MN	29100		\$20.86	\$19.55	\$20.59	\$29.75	\$27.27	\$17.23	\$32.12		\$18.91	\$23.34		
Lafayette, IN	29200	\$27.80	\$20.74	\$20.39	\$14.03	\$24.05	\$23.96	\$16.38	\$21.66			\$26.09		
Lafayette, LA	29180		\$16.48	\$14.64	\$13.09	\$22.02	\$18.43	\$16.39	\$20.61		\$16.62	\$20.75	\$19.33	
Lake Charles, LA	29340	\$16.42	\$16.23	\$17.02	\$14.48	\$20.78	\$18.69	\$15.29	\$20.81			\$19.13	\$0.00	
Lake Havasu City - Kingman, AZ	29420		\$16.29	\$20.33	\$15.52	\$20.70	\$20.47	\$15.40	\$25.48		\$15.18			
Lakeland-Winter Haven, FL	29460	\$17.79	\$16.40	\$14.24	\$12.03	\$18.76	\$21.28	\$14.94	\$15.57		\$13.79	\$14.64	\$15.41	
Lancaster, PA	29540	\$22.37	\$18.24	\$20.41	\$15.09	\$19.88	\$22.38	\$17.63	\$21.69		\$16.85	\$21.25	\$21.84	
Lansing-East Lansing, MI	29620	\$25.85	\$22.91	\$21.32	\$17.78	\$27.41	\$20.04	\$19.01	\$24.34		\$17.97	\$21.66		
Laredo, TX	29700		\$13.95	\$12.04	\$9.86	\$13.36	\$13.91		\$12.48				\$9.64	
Las Cruces, NM	29740		\$14.10	\$14.12	\$11.60	\$20.45	\$16.03	\$12.08	\$18.81		\$13.85	\$17.09		
Las Vegas-Paradise, NV	29820	\$26.47	\$25.96	\$22.90	\$18.10	\$30.01	\$27.29	\$23.56	\$33.12	\$27.18	\$18.86	\$24.99	\$31.21	
Lawrence, KS	29940		\$17.52	\$20.46	\$13.76	\$21.02	\$18.59	\$15.14	\$18.57		\$13.55			
Eastern Montana NMA	3000001		\$17.50		\$15.24	\$29.09	\$20.02		\$18.26					
Central Montana NMA	3000002		\$16.75	\$27.66	\$16.25	\$27.36	\$23.86		\$27.79			\$15.66		
Southwestern Montana NMA	3000003	\$20.34	\$16.98	\$18.80	\$15.24	\$25.43	\$22.16	\$17.32	\$26.26		\$16.53	\$19.92		
Western Montana NMA	3000004	\$19.83	\$17.94		\$15.69	\$23.53	\$19.68	\$15.55	\$19.07		\$12.42			
Lawton, OK	30020		\$15.36	\$13.93	\$12.27	\$22.54	\$15.51	\$15.92	\$19.75					
Lebanon, PA	30140	\$21.75	\$17.84	\$16.76	\$16.09	\$20.03	\$21.25	\$18.74	\$23.15				\$25.29	
Lewiston, ID-WA	30300		\$17.56	\$17.40	\$14.80	\$0.00	\$21.69		\$19.33					
Lexington-Fayette, KY	30460	\$22.09	\$16.38	\$14.86	\$12.93	\$20.71	\$18.25	\$15.19	\$21.80		\$17.20	\$17.45	\$22.30	
Lima, OH	30620	\$18.43	\$21.07		\$14.74	\$27.23	\$17.45	\$19.69	\$22.80		\$13.28	\$22.59	\$25.52	
Lincoln, NE	30700	\$24.59	\$16.80	\$16.48	\$12.52	\$22.29	\$18.30	\$15.07	\$17.05		\$17.82	\$19.84	\$21.21	
Little Rock-N. Little Rock-Conway, AR	30780		\$17.37	\$14.83	\$11.32	\$19.70	\$15.98	\$15.82	\$21.68		\$16.03	\$15.87	\$17.19	
Logan, UT-ID	30860		\$16.95	\$15.20	\$12.77	\$23.03	\$15.05	\$12.71	\$20.22					
Longview, TX	30980		\$16.10	\$16.81	\$11.80	\$22.27	\$17.49	\$14.14	\$20.67			\$16.54	\$21.97	
Western Nebraska NMA	3100001	\$17.70	\$19.55	\$16.01	\$10.84	\$17.80	\$14.25		\$18.99		\$12.70	\$16.70	\$16.63	
Central Nebraska NMA	3100002	\$17.14	\$14.74	\$13.57	\$11.60	\$18.80	\$16.70	\$15.13	\$21.17		\$12.68		\$12.33	
Northeastern Nebraska NMA	3100003		\$14.97	\$14.64	\$11.92	\$20.58	\$16.25	\$12.29	\$19.57			\$17.25	\$16.07	
Southeastern Nebraska NMA	3100004		\$15.30	\$14.25	\$10.87	\$18.75	\$18.55		\$20.13			\$13.25		
Longview, WA	31020		\$23.17		\$22.14	\$27.64	\$26.01	\$18.15	\$29.00			\$31.93		
Los Angeles-Long Beach-Glendale, CA	31080	\$29.63	\$25.02	\$22.54	\$20.26	\$30.82	\$36.45	\$20.15	\$31.89	\$31.81	\$21.22	\$26.38	\$24.71	
Louisville-Jefferson County, KY-IN	31140	\$20.88	\$17.75	\$16.33	\$14.20	\$23.71	\$19.99	\$16.84	\$22.52		\$19.14	\$22.04	\$23.45	
Lubbock, TX	31180	\$17.74	\$16.18	\$12.46	\$12.18	\$19.47	\$14.91	\$13.78	\$18.13		\$11.92	\$14.70		
Lynchburg, VA	31340		\$14.27	\$14.93	\$11.97	\$20.59	\$15.52	\$14.21	\$16.92		\$14.61	\$18.33	\$16.07	
Macon, GA	31420		\$21.08	\$13.99	\$11.95	\$19.96	\$15.17	\$13.63	\$16.50		\$14.37	\$18.24		
Madera-Chowchilla, CA	31460		\$0.00		\$23.38	\$27.49		\$17.93	\$21.17					
Madison, WI	31540	\$24.37	\$23.14	\$23.99	\$20.08	\$28.08	\$28.99	\$17.72	\$36.19		\$17.36	\$28.85	\$24.28	
Manhattan, KS	31740		\$17.77	\$16.93	\$15.30	\$25.85	\$16.77	\$17.05	\$25.99		\$21.50	\$22.08		
Mankato-North Mankato, MN	31860		\$18.96	\$18.50	\$17.50	\$29.04	\$22.74		\$26.56		\$16.72	\$16.60		
Mansfield, OH	31900	\$18.90	\$17.90	\$18.05	\$16.72	\$22.68	\$23.14		\$20.62		\$16.53			
Western Central Nevada NMA	3200001	\$24.66	\$24.95	\$21.56	\$14.91	\$29.23	\$21.22	\$15.83	\$29.33		\$23.90			
Other Nevada nonmetropolitan area	3200002		\$21.66	\$18.81	\$18.70	\$28.20	\$24.58		\$25.14					
McAllen-Edinburg-Mission, TX	32580		\$13.20	\$13.27	\$10.81	\$14.19	\$12.65	\$13.48	\$16.06		\$9.29	\$12.99		
Medford, OR	32780		\$21.28	\$21.15	\$18.70	\$28.09	\$23.30	\$17.42	\$25.25		\$16.96			
Memphis, TN-MS-AR	32820	\$19.41	\$17.63	\$15.58	\$12.10	\$20.88	\$18.66	\$16.66	\$20.38		\$18.07	\$18.93	\$19.74	
Merced, CA	32900		\$25.15	\$14.20	\$15.36	\$24.35	\$21.93	\$18.27	\$22.77					
Northern New Hampshire NMA	3300001		\$19.55		\$15.60	\$20.01	\$17.51	\$15.40	\$24.25					
Other New Hampshire NMA	3300002	\$21.85	\$18.44	\$23.10	\$15.65	\$22.09	\$22.22	\$15.21	\$22.18			\$21.84	\$18.76	
Western New Hampshire NMA	3300003		\$21.95		\$15.66	\$24.92	\$19.99	\$16.70	\$26.57					
Southwestern New Hampshire NMA	3300004		\$19.00		\$14.96	\$20.22	\$19.43	\$14.66	\$22.32		\$19.79			
Miami-Miami Beach-Kendall, FL Metro	33100	\$17.04	\$17.62	\$15.58	\$13.21	\$20.16	\$19.18	\$15.62	\$21.27		\$15.71	\$16.49	\$16.10	
Michigan City-La Porte, IN	33140		\$23.94	\$22.77	\$19.31	\$24.11	\$28.66		\$28.13		\$16.09	\$21.81		
Midland, TX	33260		\$16.78		\$14.82	\$20.13	\$16.88	\$16.34	\$17.34					
Milwaukee-Waukesha-West Allis, WI	33340	\$28.92	\$26.79	\$23.92	\$20.04	\$26.87	\$30.18	\$19.83	\$36.11	\$31.85	\$20.40	\$28.00	\$27.55	
Minneapolis-St. Paul-Bloomington, MN-WI	33460	\$30.61	\$25.60	\$24.15	\$22.99	\$31.64	\$27.07	\$19.06	\$32.08	\$26.96	\$25.29	\$34.82	\$29.08	
Missoula, MT	33540		\$15.27	\$17.41	\$18.32	\$17.95	\$25.78	\$24.57	\$16.52	\$25.51	\$16.14	\$21.80		
Mobile, AL	33660	\$17.76	\$17.38	\$17.06	\$12.17	\$21.61	\$16.92	\$14.62	\$17.95		\$16.18	\$15.97	\$20.50	
Modesto, CA	33700		\$20.91	\$19.89	\$19.59	\$27.06	\$26.08	\$18.78	\$25.37		\$24.38	\$20.98		
Monroe, LA	33740		\$16.18	\$14.65	\$11.49	\$21.71	\$15.80	\$15.28	\$19.00		\$13.99	\$16.45	\$15.06	
Monroe, MI	33780		\$18.57	\$15.24	\$18.33	\$24.76	\$23.10		\$34.48					
Montgomery, AL	33860		\$14.66	\$14.42	\$11.50	\$18.40	\$14.37	\$13.84	\$18.64		\$12.30	\$20.68		
Morgantown, WV	34060		\$15.63	\$23.59	\$15.13	\$17.38	\$20.59	\$14.82	\$19.33					
Morristown, TN	34100		\$14.85	\$14.84	\$12.18	\$22.95	\$17.31	\$13.60	\$16.93		\$13.91			
Mount Vernon-Anacortes, WA	34580		\$23.54		\$18.04	\$31.41	\$23.61	\$21.51	\$32.93		\$17.94			
Muncie, IN	34620		\$19.65		\$18.17	\$21.74	\$22.36	\$19.42	\$20.86					
Muskegon-Norton Shores, MI	34740		\$16.90		\$17.47	\$26.95	\$19.24	\$16.35	\$21.12			\$23.09		
Myrtle Beach-N. Myrtle Beach-Conway, SC	34820	\$16.24	\$17.25	\$13.74	\$13.92	\$16.64	\$15.39	\$13.07	\$16.50		\$14.59	\$15.47		

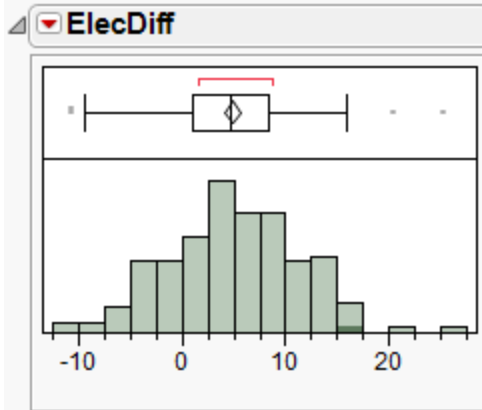
AREA_NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	Plum	Pipe	Rebar	IW	Roofers	S. Metal	Struc	IW
Napa, CA	34900		\$27.42	\$25.43	\$21.00	\$32.74	\$32.40	\$21.67	\$28.54				\$22.16			
Naples-Marco Island, FL	34940	\$16.75	\$19.06	\$13.21	\$12.35	\$17.97	\$17.15	\$14.03	\$21.14					\$17.85		
Nashville-Davidson--Murfreesboro, TN	34980	\$21.94	\$17.50	\$17.74	\$13.54	\$20.48	\$18.27	\$15.96	\$22.82				\$17.94	\$18.05	\$18.51	
North/West Central New Mexico NMA	3500001		\$14.81	\$16.36	\$12.10	\$22.00	\$18.28	\$14.04	\$17.37							
Eastern New Mexico NMA	3500002	\$15.44	\$17.99	\$14.11	\$12.53	\$21.97	\$20.90	\$14.99	\$18.05				\$12.84	\$22.36	\$13.08	
Southwestern New Mexico NMA	3500003		\$17.24		\$11.27	\$23.23	\$19.71		\$14.89							
Los Alamos County, New Mexico NMA	3500004				\$15.12											
New Orleans-Metairie-Kenner, LA	35380	\$20.81	\$18.16	\$16.66	\$14.64	\$22.99	\$19.73	\$16.60	\$21.03	\$18.11	\$22.35	\$21.52	\$15.64			
New York-White Plains, NY-NJ Metro	35620	\$33.82	\$30.94	\$29.18	\$27.38	\$38.19	\$42.48	\$23.30	\$33.28	\$39.93	\$25.67	\$29.07	\$40.36			
Niles-Benton Harbor, MI	35660		\$18.58		\$17.26	\$22.89	\$24.50	\$14.67	\$29.59					\$14.26		
North Port-Bradenton-Sarasota, FL	35840	\$16.63	\$16.86	\$13.68	\$13.19	\$20.14	\$16.14	\$16.15	\$16.32				\$15.69	\$12.15	\$19.82	
Capital/Northern New York NMA	3600001	\$26.19	\$20.12	\$20.77	\$19.37	\$26.60	\$23.35	\$21.55	\$25.31				\$18.00	\$27.39	\$37.07	
East Central New York NMA	3600002		\$19.57		\$15.15	\$21.03	\$22.85	\$18.76	\$23.37							
Central New York NMA	3600003		\$19.75	\$19.84	\$16.34	\$19.56	\$23.00	\$18.21	\$22.41				\$14.92	\$16.12	\$33.56	
Southwest New York NMA	3600004	\$23.28	\$19.12	\$24.29	\$20.00	\$23.19	\$21.69	\$13.16	\$24.48				\$16.77	\$26.39	\$21.44	
Ocala, FL	36100		\$13.77	\$14.08	\$15.06	\$17.70	\$17.76	\$14.06	\$15.73				\$15.42	\$16.49		
Ocean City, NJ	36140		\$24.34		\$15.20	\$27.18	\$22.59	\$17.25	\$22.93							
Odessa, TX	36220		\$15.63	\$14.01	\$13.69	\$20.49	\$20.27	\$14.71	\$18.25					\$18.12	\$20.68	
Ogden-Clearfield, UT	36260	\$18.92	\$16.90	\$14.22	\$13.48	\$21.67	\$20.75	\$20.50	\$24.25				\$14.49	\$24.72	\$20.32	
Oklahoma City, OK	36420	\$17.22	\$16.63	\$14.70	\$14.20	\$19.36	\$18.61	\$18.55	\$19.23	\$15.55	\$15.35	\$24.37	\$14.85			
Olympia, WA	36500		\$23.72		\$20.59	\$27.30	\$25.26	\$18.65	\$27.82				\$14.82			
Omaha-Council Bluffs, NE-IA	36540	\$21.50	\$16.93	\$16.31	\$13.25	\$22.45	\$21.77	\$16.02	\$26.92				\$14.81	\$28.00	\$28.91	
Orlando-Kissimmee-Sanford, FL	36740	\$15.04	\$16.90	\$13.79	\$12.67	\$18.59	\$17.11	\$17.31	\$17.49				\$16.46	\$18.37	\$19.50	
Oshkosh-Neenah, WI	36780		\$21.24	\$25.48	\$14.84	\$25.41	\$20.49	\$15.27	\$32.44					\$20.92		
Owensboro, KY	36980	\$23.96	\$15.14	\$11.53	\$10.87	\$21.71	\$18.33		\$20.62					\$14.65		
Northeastern North Carolina NMA	3700001	\$17.85	\$15.71	\$14.38	\$12.40	\$21.89	\$16.27	\$18.26	\$16.77				\$13.78	\$23.81	\$15.95	
Other North Carolina NMA	3700002	\$16.54	\$13.45	\$12.71	\$12.83	\$17.71	\$15.32	\$13.78	\$19.30				\$13.17	\$15.08	\$15.44	
Western Central North Carolina NMA	3700003	\$18.96	\$16.44	\$15.08	\$12.89	\$19.14	\$18.78	\$14.34	\$18.97				\$14.95	\$17.02	\$15.98	
Western North Carolina NMA	3700004	\$18.19	\$15.46	\$13.87	\$13.07	\$18.00	\$16.98	\$14.40	\$16.54				\$10.59	\$13.43		
Oxnard-Thousand Oaks-Ventura, CA	37100	\$18.73	\$24.25	\$23.08	\$19.60	\$28.64	\$34.01	\$18.06	\$21.87				\$21.70	\$22.70		
Palm Bay-Melbourne-Titusville, FL	37340	\$18.33	\$16.95	\$14.39	\$16.48	\$20.34	\$19.02	\$17.06	\$21.52				\$17.88	\$17.64	\$24.23	
Panama City-Lynn Haven, FL	37460		\$19.53	\$14.38	\$15.19	\$17.59	\$17.00	\$14.52	\$17.14				\$15.79	\$15.74	\$17.34	
Parkersburg-Marietta-Vienna, WV-OH	37620	\$16.91	\$16.41	\$17.36	\$15.37	\$26.14	\$21.20	\$15.78	\$25.25				\$14.37	\$24.45	\$26.00	
Pensacola-Ferry Pass-Brent, FL	37860	\$15.26	\$17.61	\$15.93	\$13.14	\$20.19	\$15.34	\$15.39	\$17.88				\$11.91	\$16.36		
Peoria, IL	37900	\$28.27	\$24.19	\$19.25	\$19.33	\$28.59	\$25.55	\$22.63	\$31.35				\$16.00	\$21.04	\$28.67	
Philadelphia, PA Metro	37980	\$29.62	\$23.04	\$21.19	\$19.91	\$30.60	\$27.21	\$22.24	\$27.64				\$21.35	\$25.93	\$23.42	
Far Western North Dakota NMA	3800001		\$17.46	\$17.06	\$16.46	\$25.39	\$24.23		\$20.90					\$20.18		
West Central North Dakota NMA	3800002	\$28.77	\$18.52	\$19.44	\$16.60	\$25.99	\$24.75	\$13.78	\$25.94							
East Central North Dakota	3800003		\$16.41	\$15.07	\$14.82	\$24.51	\$23.62		\$19.40				\$16.63		\$13.27	
Far Eastern North Dakota NMA	3800004		\$15.87	\$17.08	\$14.07	\$20.98	\$17.36		\$22.21				\$15.59			
Phoenix-Mesa-Glendale, AZ	38060	\$17.82	\$18.09	\$18.00	\$14.12	\$20.01	\$21.82	\$16.44	\$25.39				\$15.37	\$18.91	\$19.22	
Pine Bluff, AR	38220		\$15.47		\$10.66	\$24.63	\$15.52		\$18.85					\$14.85		
Pittsburgh, PA	38300	\$23.09	\$21.35	\$22.26	\$17.97	\$25.86	\$22.59	\$21.18	\$25.11	\$29.49	\$18.10	\$24.67	\$26.56			
Pocatello, ID	38540		\$13.72		\$13.20	\$21.61	\$19.48		\$19.18							
Portland-Vancouver-Hillsboro, OR-WA	38900	\$31.76	\$21.52	\$23.22	\$18.28	\$34.82	\$28.98	\$18.59	\$31.69				\$19.39	\$24.51	\$26.99	
Port St. Lucie, FL	38940		\$16.01	\$12.68	\$13.07	\$18.96	\$16.38	\$13.19	\$15.46	\$15.70	\$16.36			\$15.06		
West Northwestern Ohio NMA	3900001	\$23.52	\$16.43	\$17.55	\$17.67	\$22.85	\$19.67	\$16.44	\$22.05				\$13.55	\$17.99		
Other Ohio nonmetropolitan area	3900002	\$17.63	\$15.30	\$17.75	\$17.53	\$20.58	\$22.67	\$17.08	\$18.68				\$15.84	\$19.23	\$24.74	
Eastern Ohio nonmetropolitan area	3900003	\$19.09	\$18.59	\$18.79	\$15.48	\$21.31	\$18.36	\$16.00	\$22.12				\$17.12	\$19.12	\$23.22	
Southern Ohio nonmetropolitan area	3900004	\$23.14	\$19.04	\$17.59	\$16.78	\$22.68	\$20.12	\$21.77	\$19.98				\$14.07	\$14.22	\$24.60	
Prescott, AZ	39140	\$15.25	\$19.29	\$18.78	\$13.98	\$22.24	\$19.02	\$15.66	\$22.06				\$19.09	\$17.78		
Provo-Orem, UT	39340	\$21.23	\$17.88	\$16.14	\$13.08	\$26.03	\$16.90	\$14.00	\$22.92				\$18.64	\$20.24	\$18.72	
Pueblo, CO	39380		\$18.87	\$18.47	\$14.50	\$23.96	\$20.12	\$17.10	\$25.46				\$13.17	\$19.00	\$16.72	
Punta Gorda, FL	39460	\$13.63	\$21.53	\$14.49	\$13.34	\$17.82	\$15.65	\$20.95	\$16.14				\$12.41	\$11.02		
Racine, WI	39540		\$21.91	\$24.43	\$18.94	\$28.51	\$24.47	\$23.62	\$27.16				\$19.68	\$30.54		
Raleigh-Cary, NC	39580	\$19.07	\$16.05	\$15.82	\$12.11	\$19.30	\$16.32	\$14.02	\$21.33				\$16.56	\$17.28	\$18.71	
Rapid City, SD	39660	\$22.30	\$16.41	\$14.74	\$12.30	\$18.34	\$17.67	\$15.14	\$20.23				\$13.71		\$19.39	
Reading, PA	39740	\$22.39	\$19.75	\$20.62	\$16.73	\$25.59	\$20.91	\$17.99	\$20.71				\$18.66	\$23.30	\$26.44	
Redding, CA	39820		\$18.67	\$35.36	\$22.87	\$30.33	\$22.96	\$14.61	\$24.27				\$18.61	\$22.79		
Reno-Sparks, NV	39900	\$27.72	\$23.70	\$23.63	\$18.57	\$25.76	\$24.96	\$19.31	\$24.75				\$16.95	\$22.27		
Northeastern Oklahoma NMA	4000001	\$19.82	\$14.99	\$13.84	\$12.96	\$23.41	\$16.51	\$14.56	\$18.21				\$12.66	\$15.44	\$17.23	
Northwestern Oklahoma NMA	4000002		\$16.24	\$11.45	\$13.95	\$23.36	\$17.39	\$14.77	\$16.12				\$14.31	\$20.45		
Southwestern Oklahoma NMA	4000003		\$16.73	\$14.45	\$12.79	\$23.50	\$17.01	\$13.42	\$17.43				\$14.22	\$19.64		
Southeastern Oklahoma NMA	4000004	\$18.40	\$15.32	\$15.59	\$12.46	\$21.94	\$19.14	\$14.48	\$20.07					\$20.18		
Richmond, VA	40060	\$23.37	\$18.25	\$15.72	\$12.71	\$21.35	\$17.95	\$15.72	\$22.45				\$18.18	\$21.79	\$19.13	
Riverside-San Bernardino-Ontario, CA	40140	\$37.98	\$27.25	\$25.13	\$20.48	\$28.67	\$31.76	\$22.57	\$22.02	\$27.60	\$21.31	\$25.77	\$35.11			
Roanoke, VA	40220	\$18.40	\$16.32	\$15.91	\$11.66	\$18.55	\$15.29	\$12.88	\$17.85				\$14.94	\$16.38	\$18.32	
Rochester, MN	40340		\$22.41	\$22.99	\$19.11	\$26.11	\$23.80	\$21.61	\$32.56				\$18.04	\$26.07		
Rochester, NY	40380	\$21.78	\$19.54	\$22.45	\$17.47	\$23.91	\$23.07	\$17.77	\$25.96				\$16.41	\$22.98	\$22.02	
Rockford, IL	40420	\$33.81	\$25.22	\$23.47	\$22.70	\$33.19	\$30.00	\$16.28	\$30.67				\$24.42	\$28.45	\$39.73	
Rocky Mount, NC	40580		\$18.19	\$14.84	\$11.93	\$19.00	\$15.56	\$14.79	\$17.79					\$17.16	\$17.00	
Rome, GA	40660		\$16.56		\$14.05	\$24.54	\$14.98		\$22.08							
Sacramento/Arden-Arcade/Roseville, CA	40900	\$24.20	\$25.22	\$24.36	\$21.03	\$29.06	\$31.89	\$18.30	\$24.04	\$16.95	\$25.63	\$26.62	\$31.01			
Saginaw-Saginaw Township North, MI	40980	\$23.52	\$22.22	\$21.12	\$17.94	\$24.52	\$26.39	\$19.26	\$27.44				\$24.36	\$27.60		
Coastal Oregon nonmetropolitan area	4100001		\$25.15	\$18.08	\$15.05	\$32.46	\$23.42	\$22.90	\$26.00</							

AREA_NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	Plum	Pipe	Rebar	IW	Roofers	S. Metal	Struc	IW
St. Joseph, MO-KS	41140		\$18.93	\$20.65	\$19.69	\$25.92	\$22.03	\$18.56	\$28.95				\$15.68	\$28.62		
St. Louis, MO-IL	41180	\$31.13	\$26.03	\$27.12	\$21.84	\$30.48	\$28.32	\$23.92	\$31.79	\$31.74			\$21.28	\$30.35	\$24.76	
Salem, OR	41420	\$28.13	\$22.18	\$22.34	\$17.47	\$29.43	\$25.51	\$14.06	\$26.68				\$17.04	\$23.93		
Salinas, CA	41500	\$37.78	\$29.25	\$23.74	\$19.39	\$27.74	\$29.52	\$16.51	\$28.68				\$22.85	\$30.35	\$30.66	
Salisbury, MD	41540		\$17.16	\$19.46	\$13.87	\$21.81	\$18.53	\$14.89	\$27.30							
Salt Lake City, UT	41620	\$23.56	\$17.57	\$17.57	\$14.08	\$21.95	\$22.47	\$16.74	\$23.07	\$21.08			\$17.22	\$20.45	\$21.31	
San Angelo, TX	41660	\$11.87	\$14.00		\$11.53	\$19.67	\$15.45	\$13.73	\$19.79							
San Antonio-New Braunfels, TX	41700	\$18.84	\$16.10	\$13.83	\$11.84	\$20.47	\$16.88	\$13.93	\$18.67	\$14.03			\$12.84	\$16.48	\$15.54	
San Diego-Carlsbad-San Marcos, CA	41740	\$32.72	\$24.74	\$23.99	\$20.10	\$27.20	\$29.99	\$22.11	\$28.27	\$30.49			\$23.76	\$27.36	\$31.75	
San Francisco-San Mateo, CA Metro	41860	\$46.91	\$29.84	\$25.19	\$22.77	\$38.67	\$35.50	\$23.06	\$35.92				\$23.67	\$35.06	\$28.96	
San Jose-Sunnyvale-Santa Clara, CA	41940	\$31.22	\$30.16	\$26.49	\$21.88	\$34.79	\$33.69	\$24.65	\$38.24	\$33.26			\$24.91	\$32.18	\$33.22	
Far Western Pennsylvania	4200001	\$18.01	\$17.06	\$15.72	\$16.00	\$21.00	\$21.63	\$14.92	\$24.41				\$18.64	\$17.40	\$15.09	
West Central Pennsylvania NMA	4200002	\$21.59	\$16.50	\$17.35	\$13.69	\$20.26	\$19.20	\$11.57	\$16.94	\$0.00			\$12.09	\$14.12	\$24.02	
Northeastern Pennsylvania NMA	4200003	\$25.25	\$16.89	\$13.76	\$13.67	\$24.15	\$17.48	\$18.17	\$19.32					\$21.55		
East Central Pennsylvania NMA	4200004	\$20.41	\$16.21	\$19.02	\$13.81	\$17.73	\$19.17	\$16.71	\$19.54				\$15.50	\$20.86	\$20.11	
San Luis Obispo-Paso Robles, CA	42020	\$25.87	\$22.74	\$0.00	\$19.24	\$31.82	\$33.42	\$23.51	\$25.16				\$24.31	\$23.96	\$21.80	
Santa Barbara-Santa Maria-Goleta, CA	42200	\$29.87	\$27.00	\$20.77	\$18.87	\$28.88	\$31.79	\$19.83	\$27.87				\$19.62	\$33.63		
Santa Cruz-Watsonville, CA	42100		\$32.59	\$22.42	\$18.28	\$29.92	\$31.16	\$24.05	\$25.87				\$25.10	\$26.85		
Santa Fe, NM	42140	\$16.43	\$18.09	\$15.79	\$14.56	\$0.00	\$19.19	\$16.67	\$20.31				\$14.36	\$20.54		
Santa Rosa-Petaluma, CA	42220		\$31.85	\$25.48	\$21.54	\$31.00	\$30.88	\$20.11	\$26.96				\$21.37	\$30.12	\$30.93	
Savannah, GA	42340	\$18.40	\$20.19	\$15.90	\$13.23	\$23.02	\$15.52	\$20.43	\$22.50				\$13.99	\$22.44	\$15.74	
Scranton-Wilkes-Barre, PA	42540		\$18.18	\$22.40	\$15.02	\$22.47	\$21.20	\$15.89	\$23.64				\$16.67	\$24.63		
Seattle-Bellevue-Everett, WA Metro	42660	\$32.78	\$26.60	\$24.21	\$20.71	\$32.29	\$29.27	\$19.67	\$32.71	\$35.05			\$22.12	\$28.67	\$32.21	
Sebastian-Vero Beach, FL	42680		\$20.86	\$13.76	\$12.81	\$19.17	\$20.59	\$13.50	\$18.24				\$15.87	\$16.19		
Sheboygan, WI	43100	\$30.36	\$21.52	\$23.53	\$17.45	\$24.38	\$17.96	\$17.26	\$29.94				\$16.23			
Sherman-Denison, TX	43300		\$14.06		\$12.21	\$20.75	\$14.68	\$11.97	\$20.25							
Shreveport-Bossier City, LA	43340		\$16.98	\$16.43	\$12.40	\$23.32	\$18.33	\$16.14	\$22.44			\$13.20	\$19.44	\$18.27		
Sioux City, IA-NE-SD	43580		\$16.00	\$12.31	\$13.20	\$20.77	\$21.16	\$15.91	\$22.53					\$20.68		
Sioux Falls, SD	43620	\$23.70	\$15.89	\$15.59	\$12.73	\$22.43	\$18.06	\$14.37	\$20.23			\$15.41	\$21.90	\$19.73		
South Bend-Mishawaka, IN-MI	43780	\$24.18	\$19.47	\$21.63	\$19.79	\$25.02	\$28.04	\$17.15	\$26.31				\$21.72	\$26.91		
Spartanburg, SC	43900	\$18.46	\$15.63	\$15.47	\$13.94	\$17.47	\$15.83	\$13.81	\$18.47				\$15.08	\$16.32		
Spokane, WA	44060	\$23.98	\$21.93	\$21.28	\$18.04	\$20.93	\$22.26	\$17.17	\$25.17				\$21.53	\$16.91	\$24.43	
Springfield, IL	44100	\$29.37	\$20.53	\$22.12	\$20.73	\$29.15	\$28.18	\$21.33	\$29.97				\$14.42	\$28.28		
Springfield, MO	44180	\$19.21	\$19.58	\$18.23	\$19.52	\$19.76	\$21.62	\$14.50	\$21.30				\$20.63	\$16.67	\$19.34	
Springfield, OH	44220		\$18.14		\$15.21	\$24.38	\$20.01		\$21.00						\$24.98	
State College, PA	44300		\$18.55	\$20.71	\$16.13	\$23.79	\$18.85	\$18.54	\$22.97						\$26.37	
Steubenville-Weirton, OH-WV	48260		\$18.86		\$15.71	\$24.43	\$22.30		\$21.68					\$22.98		
Stockton, CA	44700		\$23.97	\$26.68	\$19.65	\$29.47	\$28.83	\$24.20	\$30.80				\$22.12	\$27.21	\$26.02	
Sumter, SC	44940		\$17.19	\$14.55	\$13.46	\$19.12	\$15.44	\$12.30	\$17.14				\$17.10			
Low Country South Carolina NMA	4500001	\$17.94	\$15.21	\$12.89	\$14.67	\$21.14	\$17.42	\$13.83	\$20.33				\$16.62			
Upper Savannah South Carolina NMA	4500002	\$18.52	\$16.45	\$17.49	\$14.12	\$21.26	\$15.68	\$12.63	\$16.59				\$12.27	\$17.59	\$18.87	
Pee Dee South Carolina NMA	4500003		\$12.06		\$13.06	\$17.66	\$15.97	\$11.16	\$17.32							
Lower Savannah South Carolina NMA	4500004		\$14.36	\$11.80	\$12.80	\$20.41	\$14.27	\$14.62	\$17.74			\$13.51	\$11.72			
Syracuse, NY	45060	\$23.28	\$20.08	\$19.51	\$15.84	\$25.32	\$22.89	\$16.49	\$24.98	\$28.20			\$21.75	\$22.03	\$23.10	
Tallahassee, FL	45220	\$14.66	\$17.18	\$12.36	\$11.31	\$17.16	\$15.81	\$15.21	\$20.81				\$14.80	\$16.00	\$14.09	
Tampa-St. Petersburg-Clearwater, FL	45300	\$14.78	\$18.11	\$15.33	\$12.83	\$18.28	\$17.06	\$14.72	\$18.98				\$14.35	\$16.75	\$16.09	
Terre Haute, IN	45460	\$22.34	\$20.32	\$17.41	\$14.62	\$28.44	\$21.81	\$18.24					\$17.33		\$21.09	
Texarkana-Texarkana, TX-AR	45500		\$16.28	\$13.05	\$11.62	\$21.27	\$14.85	\$19.53	\$20.66					\$19.07		
Toledo, OH	45780	\$25.44	\$23.23	\$25.61	\$19.60	\$26.20	\$25.27	\$22.20	\$28.00				\$22.78	\$27.48	\$27.69	
Topeka, KS	45820	\$29.84	\$18.71	\$19.32	\$16.26	\$22.91	\$18.02	\$19.28	\$25.24				\$13.34	\$22.64		
Trenton-Ewing, NJ	45940	\$23.25	\$25.07	\$24.43	\$24.32	\$39.11	\$31.74	\$21.34	\$34.80				\$29.05		\$41.60	
Central South Dakota NMA	4600001		\$13.73	\$13.13	\$11.71	\$19.71	\$17.96		\$20.20							
Eastern South Dakota NMA	4600002	\$18.32	\$15.06	\$13.48	\$12.51	\$19.85	\$17.51	\$12.50	\$16.85			\$13.27	\$22.30	\$16.26		
Western South Dakota NMA	4600003		\$15.00	\$14.38	\$11.34	\$20.61	\$18.28	\$13.75	\$16.09							
Tucson, AZ	46060	\$14.96	\$18.40	\$18.19	\$12.80	\$18.96	\$20.22	\$14.56	\$20.12	\$20.90			\$14.97	\$18.63	\$16.28	
Tulsa, OK	46140	\$17.02	\$14.54	\$14.89	\$12.11	\$22.48	\$17.41	\$16.08	\$19.66				\$12.24	\$17.11	\$18.81	
Tuscaloosa, AL	46220	\$16.85	\$13.88	\$15.52	\$12.17	\$23.60	\$17.24	\$16.98	\$20.75				\$14.90	\$16.72	\$19.62	
Tyler, TX	46340	\$16.84	\$14.43	\$13.44	\$11.73	\$17.40	\$22.93	\$13.26	\$22.63				\$15.29	\$17.18		
Utica-Rome, NY	46540	\$24.68	\$19.02	\$19.20	\$16.90	\$27.30	\$24.26	\$17.22	\$24.82				\$20.06			
Valdosta, GA	46660		\$14.13		\$12.70	\$17.17	\$16.40	\$14.25	\$15.80				\$11.83		\$21.49	
Vallejo-Fairfield, CA	46700		\$28.28	\$26.91	\$22.21	\$32.85	\$31.97	\$25.65	\$30.21					\$22.03	\$32.72	
Western Tennessee NMA	4700001		\$15.74	\$14.36	\$13.07	\$20.89	\$17.63	\$16.25	\$20.28				\$14.80	\$12.92		
South Central Tennessee NMA	4700002	\$21.98	\$14.77	\$13.97	\$12.76	\$25.36	\$16.44	\$15.33	\$18.31				\$12.35	\$16.23	\$19.17	
North Central Tennessee NMA	4700003		\$16.28	\$17.13	\$13.52	\$16.64	\$16.97	\$12.60	\$15.10				\$13.18	\$19.24		
Eastern Tennessee NMA	4700004		\$16.68	\$14.52	\$15.33	\$19.28	\$16.48	\$15.08	\$17.75					\$15.17		
Victoria, TX	47020		\$16.17	\$13.81	\$12.75	\$21.08	\$15.63	\$14.30	\$22.06				\$15.04			
Vineland-Millville-Bridgeton, NJ	47220		\$21.21	\$24.46	\$21.03	\$28.06	\$21.39	\$17.31								
Virginia Beach-Norfolk-Newport News, VA	47260	\$20.51	\$17.83	\$17.20	\$12.29	\$20.36	\$18.34	\$18.63	\$20.95	\$24.03			\$14.29	\$20.89	\$20.95	
Visalia-Porterville, CA	47300		\$21.16	\$19.49	\$14.27	\$23.22	\$22.79	\$16.59	\$19.21				\$21.38	\$21.92	\$19.36	
Waco, TX	47380	\$18.47	\$14.48	\$14.13	\$11.89	\$17.66	\$14.03	\$13.98	\$25.54						\$14.72	
Warner Robins, GA	47580		\$18.65	\$11.05	\$11.96	\$23.30	\$15.59	\$23.61	\$19.39					\$24.17		
Washington-Arlington, DC-VA-MD Metro	47900	\$21.02	\$21.76	\$18.96	\$15.66	\$27.07	\$23.32	\$19.41	\$26.87	\$24.76			\$19.58	\$24.19	\$21.79	
Waterloo-Cedar Falls, IA	47940	\$24.77	\$16.80	\$15.35	\$14.34	\$22.45	\$23.23	\$19.49	\$20.57						\$19.24	
Northwestern Texas NMA	4800001	\$17.31	\$15.76	\$13.65	\$12.94	\$19.02	\$17.97	\$13.33	\$15.64				\$12.05	\$15.46		
North Central Texas NMA	4800002	\$17.35	\$15.45	\$14.97	\$11.34	\$19.23	\$16.20	\$16.35</								

AREA_NAME	AREA	Bricklayer	Carpenter	C. Mason	Laborer	Electrician	Operator	Painters	PlumPipe	Rebar IW	Roofers	S. Metal	Struc IW
Wenatchee-East Wenatchee, WA	48300		\$21.54	\$17.12	\$16.46	\$26.12	\$23.02	\$20.19	\$21.47			\$21.81	
Wheeling, WV-OH	48540	\$19.03	\$18.76		\$15.43	\$23.37	\$17.42	\$10.97	\$21.88		\$17.87	\$21.35	
Wichita, KS	48620	\$21.70	\$16.66	\$16.68	\$12.75	\$22.98	\$16.70	\$16.00	\$23.33		\$12.38	\$17.97	\$21.62
Wichita Falls, TX	48660		\$14.96	\$13.83	\$12.05	\$18.49	\$15.44	\$14.58	\$21.40		\$9.90	\$19.18	
Williamsport, PA	48700		\$17.34	\$17.83	\$14.84	\$20.54	\$19.49		\$16.81		\$15.67	\$17.73	
Wilmington, NC	48900	\$16.88	\$16.52	\$14.09	\$13.84	\$19.08	\$17.99	\$14.51	\$19.19		\$15.21	\$14.29	
Northern Utah nonmetropolitan area	4900001		\$17.06	\$19.49	\$13.29		\$18.76						
West Central Utah nonmetropolitan area	4900002		\$16.66		\$11.98	\$19.44	\$19.64		\$23.78				
South Western Utah NMA	4900003		\$13.89	\$14.80	\$12.55	\$22.27	\$19.77						
Eastern Utah nonmetropolitan area	4900004	\$16.87	\$17.27	\$20.12	\$15.43	\$25.26	\$20.28		\$20.17			\$17.40	
Winchester, VA-WV	49020		\$18.54	\$17.92	\$12.49	\$19.29	\$17.19	\$16.78	\$18.48			\$20.15	\$18.61
Winston-Salem, NC	49180	\$14.84	\$15.24	\$14.37	\$12.20	\$20.73	\$17.09	\$13.77	\$20.18		\$14.61	\$16.42	\$16.45
Yakima, WA	49420		\$21.63	\$19.95	\$15.34	\$23.00	\$24.46	\$17.97	\$34.02			\$37.80	
York-Hanover, PA	49620	\$20.19	\$19.33	\$21.03	\$15.42	\$22.58	\$21.26	\$16.26	\$21.35		\$16.04	\$22.59	
Youngstown-Warren-Boardman, OH-PA	49660	\$24.35	\$20.18	\$20.83	\$19.47	\$22.63	\$24.43	\$23.94	\$25.12		\$14.15	\$22.98	\$26.55
Yuba City, CA	49700		\$21.27		\$21.23	\$26.58	\$32.14	\$21.64	\$26.62				
Yuma, AZ	49740		\$17.28	\$17.47	\$12.72	\$20.34	\$19.54	\$16.07	\$14.89			\$16.01	
Southern Vermont nonmetropolitan area	5000001		\$20.75	\$19.90	\$14.86	\$19.37	\$17.99	\$17.18	\$18.29		\$15.74	\$0.00	
Northern Vermont nonmetropolitan area	5000002		\$18.47		\$14.68	\$20.29	\$16.46	\$15.35	\$21.54		\$17.09		
Southwestern Virginia NMA	5100001	\$18.74	\$14.19	\$22.41	\$13.80	\$22.81	\$16.68	\$11.56	\$16.18		\$13.70	\$14.53	\$19.13
Southside Virginia nonmetropolitan area	5100002	\$18.38	\$14.64	\$15.33	\$11.96	\$18.84	\$17.88	\$17.00	\$16.50		\$14.35	\$15.91	\$16.62
Northeastern Virginia NMA	5100003	\$18.45	\$16.67	\$16.80	\$13.48	\$23.28	\$15.52	\$16.55	\$18.92			\$13.84	
Northwestern Virginia NMA	5100004	\$22.31	\$16.71	\$16.15	\$13.57	\$20.87	\$17.32	\$13.44	\$20.03		\$17.64	\$19.56	
Northwestern Washington NMA	5300001		\$22.99	\$19.95	\$18.00	\$25.75	\$25.83	\$20.40	\$24.58		\$15.27	\$24.35	
Southwestern Washington NMA	5300002		\$20.80		\$18.17	\$26.48	\$25.46	\$19.18	\$22.24		\$19.12		
Central Washington nonmetropolitan area	5300003		\$18.07	\$20.02	\$17.92	\$27.96	\$22.04	\$18.25	\$28.69				
Eastern Washington nonmetropolitan area	5300004		\$20.12	\$20.29	\$16.87	\$25.79	\$22.59	\$20.41	\$28.57			\$28.85	
Southern West Virginia NMA	5400001	\$16.81	\$14.94	\$18.54	\$16.63	\$25.28	\$19.42	\$15.69	\$20.88		\$10.31	\$21.40	\$25.11
North Central West Virginia NMA	5400002	\$17.19	\$16.61	\$17.15	\$16.13	\$24.55	\$20.37	\$17.17	\$21.99		\$9.85	\$21.46	\$24.04
Eastern Wisconsin nonmetropolitan area	5500001	\$24.59	\$20.05	\$22.80	\$17.02	\$24.92	\$24.92	\$16.50	\$26.61		\$16.88	\$22.80	
West Central Wisconsin NMA	5500002	\$24.83	\$20.98	\$18.37	\$17.67	\$23.90	\$23.46	\$15.56	\$17.64		\$17.07	\$24.71	\$24.63
South Central Wisconsin NMA	5500003		\$19.76	\$16.57	\$17.09	\$23.71	\$22.98	\$19.07	\$21.65		\$16.40	\$19.35	\$29.09
Southwestern Wisconsin NMA	5500004		\$17.60	\$22.68	\$18.87	\$22.49	\$27.05	\$16.87	\$27.14				
Northern Wisconsin nonmetropolitan area	5500005		\$17.41	\$21.03	\$13.44	\$22.34	\$19.90	\$16.66	\$24.53				
Northwestern Wyoming NMA	5600001	\$19.43	\$19.28	\$18.08	\$15.97	\$22.31	\$20.52	\$16.44	\$21.81		\$20.43	\$16.73	
Southwestern Wyoming NMA	5600002	\$24.57	\$22.78	\$19.60	\$15.00	\$27.04	\$21.73	\$19.22	\$21.06				
Northeastern Wyoming NMA	5600003	\$20.78	\$18.28	\$17.31	\$14.54	\$26.52	\$24.15	\$16.68	\$23.59			\$20.98	\$24.56
Southeastern Wyoming NMA	5600004	\$23.28	\$17.23	\$14.29	\$13.29	\$25.18	\$20.97	\$19.12	\$18.84		\$17.96		
Bangor, ME	12620		\$16.81		\$13.62	\$21.03	\$16.55	\$15.93	\$20.63			\$16.68	
Barnstable Town, MA	12700		\$23.76	\$20.80	\$18.51	\$25.86	\$24.78	\$18.38	\$27.33			\$22.04	
Boston-Cambridge-Quincy, MA Metro	14460	\$41.05	\$29.23	\$22.44	\$25.26	\$31.46	\$30.25	\$22.42	\$35.17		\$27.96	\$31.54	\$33.90
Bridgeport-Stamford-Norwalk, CT	14860	\$31.16	\$28.67	\$27.07	\$22.36	\$28.24	\$32.02	\$16.91	\$28.01		\$27.21	\$22.66	
Burlington-South Burlington, VT	15540	\$24.02	\$21.55		\$14.73	\$19.93	\$19.31	\$16.55	\$21.06			\$22.69	
Hartford-West Hartford-East Hartford, CT	25540	\$28.19	\$23.53	\$24.11	\$21.65	\$27.05	\$26.82	\$19.63	\$29.30	\$26.17	\$26.57	\$25.77	\$29.29
Lewiston-Auburn, ME	30340		\$16.81		\$13.41	\$17.25	\$16.24		\$17.20		\$15.86	\$19.93	
Manchester, NH	31700		\$21.88	\$13.30	\$15.31	\$24.54	\$21.89	\$17.33	\$23.23		\$15.42	\$24.72	
New Haven, CT	35300	\$31.76	\$24.56	\$21.64	\$21.55	\$32.01	\$27.69	\$19.15	\$29.23		\$26.67	\$30.14	\$30.19
Norwich-New London, CT-RI	35980		\$21.91		\$19.98	\$30.24	\$23.47	\$20.99	\$25.96			\$26.62	
Pittsfield, MA	38340		\$23.51		\$16.47	\$24.34		\$15.66	\$25.18				
Portland-South Portland-Biddeford, ME	38860	\$17.07	\$18.29	\$15.78	\$14.59	\$20.82	\$20.52	\$17.04	\$20.41		\$20.93	\$18.16	\$18.46
Providence-Fall River-Warwick, RI-MA	39300	\$30.59	\$23.12	\$24.92	\$21.74	\$25.27	\$24.93	\$17.99	\$27.32		\$20.11	\$22.86	\$28.92
Springfield, MA-CT	44140	\$33.85	\$24.01	\$16.93	\$21.34	\$26.43	\$28.28	\$16.56	\$27.57		\$25.28	\$23.71	
Worcester, MA-CT	49340	\$36.23	\$22.63	\$18.15	\$18.06	\$33.32	\$31.21	\$17.09	\$26.27		\$20.37	\$25.38	

Appendix D. JMP Printouts – Combined Services Wage Data





Quantiles

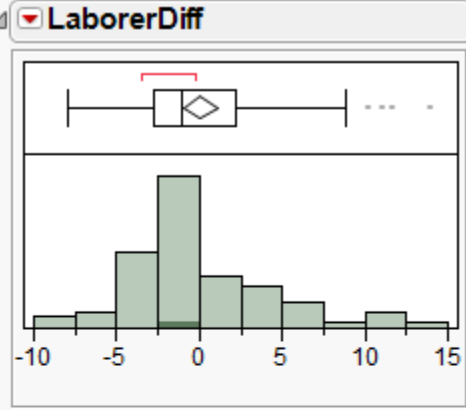
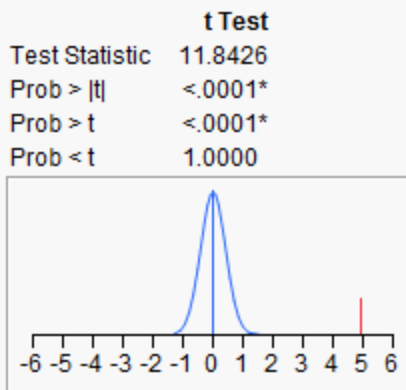
100.0%	maximum	25.18
99.5%		24.8193
97.5%		15.535
90.0%		13.165
75.0%	quartile	8.36
50.0%	median	4.74
25.0%	quartile	1.06
10.0%		-3.535
2.5%		-6.7938
0.5%		-10.77
0.0%	minimum	-10.77

Moments

Mean	4.91
Std Dev	6.0651584
Std Err Mean	0.4146057
Upper 95% Mean	5.7272558
Lower 95% Mean	4.0927442
N	214

Test Mean

Hypothesized Value	0
Actual Estimate	4.91
DF	213
Std Dev	6.06516



Quantiles

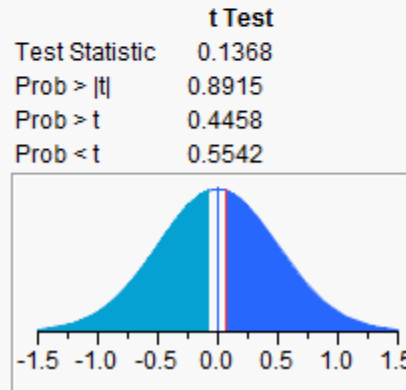
100.0%	maximum	13.89
99.5%		13.89
97.5%		11.6377
90.0%		7.21
75.0%	quartile	2.1775
50.0%	median	-1.005
25.0%	quartile	-2.73
10.0%		-4.563
2.5%		-7.7148
0.5%		-7.9
0.0%	minimum	-7.9

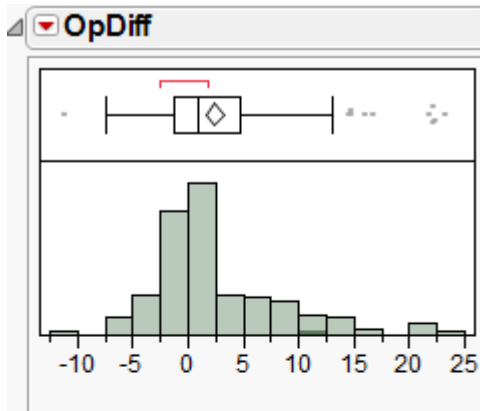
Moments

Mean	0.0683333
Std Dev	4.4107632
Std Err Mean	0.4994206
Upper 95% Mean	1.0628068
Lower 95% Mean	-0.92614
N	78

Test Mean

Hypothesized Value	0
Actual Estimate	0.06833
DF	77
Std Dev	4.41076





Quantiles

100.0%	maximum	23.22
99.5%		23.155
97.5%		20.0347
90.0%		10.215
75.0%	quartile	4.7925
50.0%	median	0.89
25.0%	quartile	-1.3275
10.0%		-3.101
2.5%		-6.6145
0.5%		-10.903
0.0%	minimum	-11.15

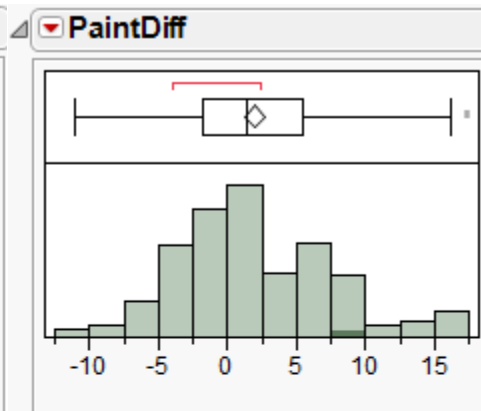
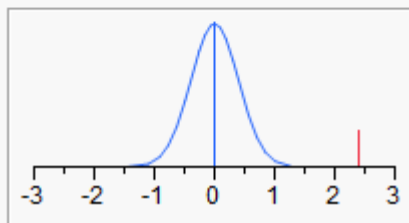
Moments

Mean	2.3954245
Std Dev	5.7634584
Std Err Mean	0.3958359
Upper 95% Mean	3.1757243
Lower 95% Mean	1.6151247
N	212

Test Mean

Hypothesized Value	0
Actual Estimate	2.39542
DF	211
Std Dev	5.76346

t Test	
Test Statistic	6.0516
Prob > t	<.0001*
Prob > t	<.0001*
Prob < t	1.0000



Quantiles

100.0%	maximum	17.35
99.5%		17.35
97.5%		15.22
90.0%		9.58
75.0%	quartile	5.48
50.0%	median	1.415
25.0%	quartile	-1.75
10.0%		-4.43
2.5%		-7.5663
0.5%		-11.01
0.0%	minimum	-11.03

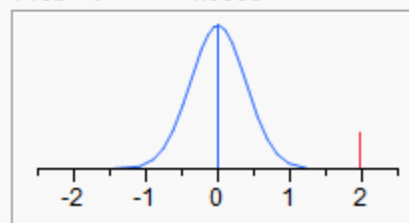
Moments

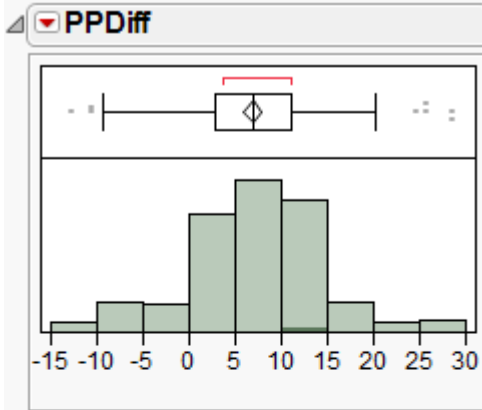
Mean	1.9688725
Std Dev	5.5041776
Std Err Mean	0.3853695
Upper 95% Mean	2.7287129
Lower 95% Mean	1.2090322
N	204

Test Mean

Hypothesized Value	0
Actual Estimate	1.96887
DF	203
Std Dev	5.50418

t Test	
Test Statistic	5.1091
Prob > t	<.0001*
Prob > t	<.0001*
Prob < t	1.0000





Quantiles

100.0%	maximum	28.58
99.5%		28.58
97.5%		24.5
90.0%		14.1
75.0%	quartile	11.03
50.0%	median	6.955
25.0%	quartile	2.85
10.0%		-1.572
2.5%		-7.893
0.5%		-12.708
0.0%	minimum	-12.85

Moments

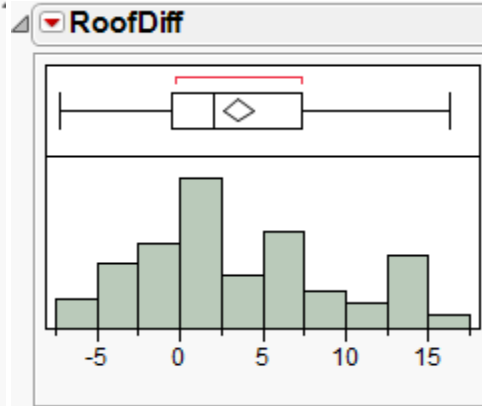
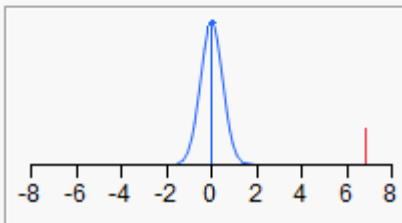
Mean	6.8498113
Std Dev	6.9872761
Std Err Mean	0.4798881
Upper 95% Mean	7.7958006
Lower 95% Mean	5.903822
N	212

Test Mean

Hypothesized Value	0
Actual Estimate	6.84981
DF	211
Std Dev	6.98728

t Test

Test Statistic	14.2738
Prob > t	<.0001*
Prob > t	<.0001*
Prob < t	1.0000



Quantiles

100.0%	maximum	16.3
99.5%		16.3
97.5%		14.7675
90.0%		12.91
75.0%	quartile	7.32
50.0%	median	2.05
25.0%	quartile	-0.4675
10.0%		-3.94
2.5%		-6.82
0.5%		-7.22
0.0%	minimum	-7.22

Moments

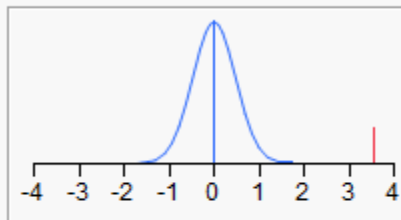
Mean	3.5374026
Std Dev	5.9199846
Std Err Mean	0.477046
Upper 95% Mean	4.47985
Lower 95% Mean	2.5949552
N	154

Test Mean

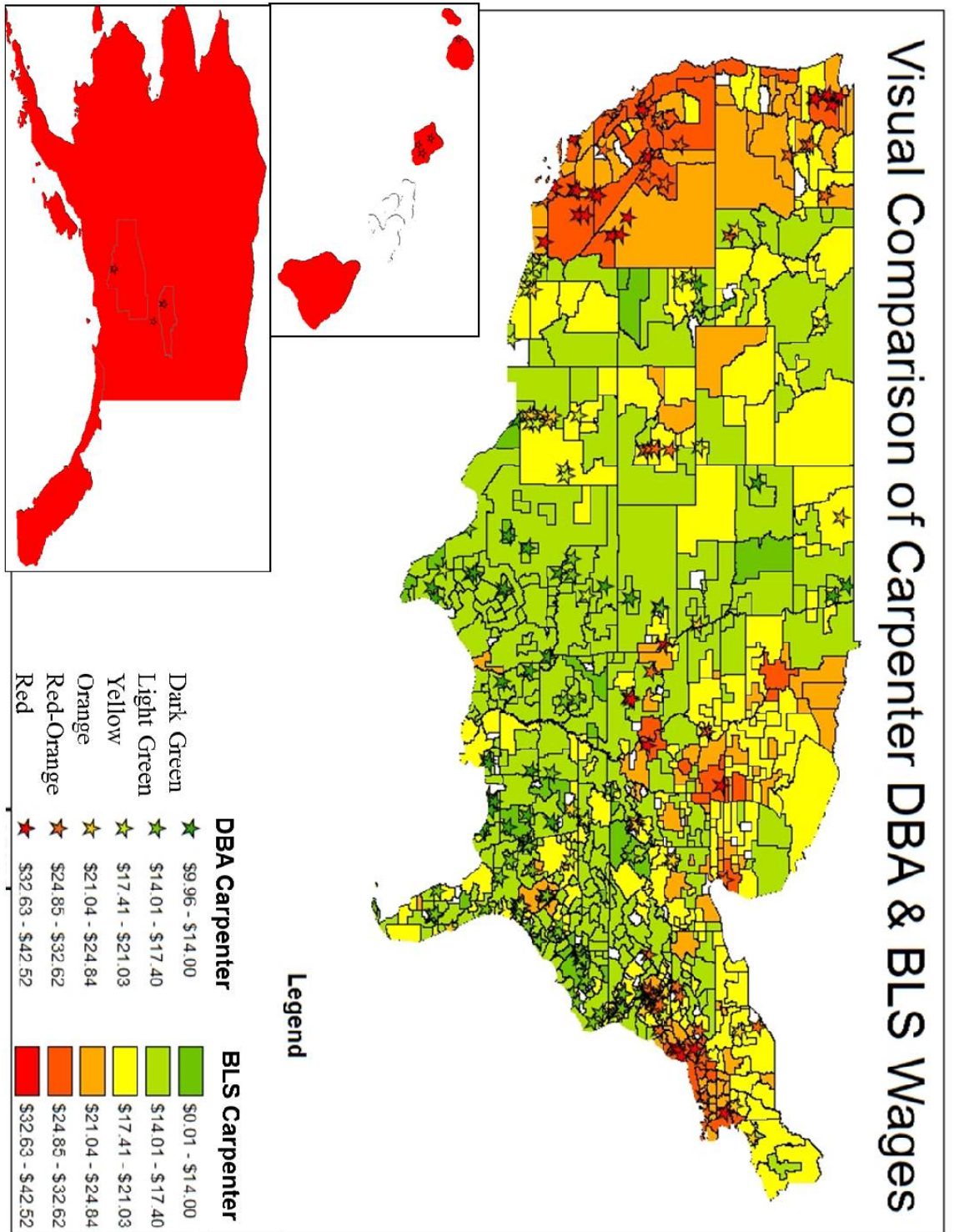
Hypothesized Value	0
Actual Estimate	3.5374
DF	153
Std Dev	5.91998

t Test

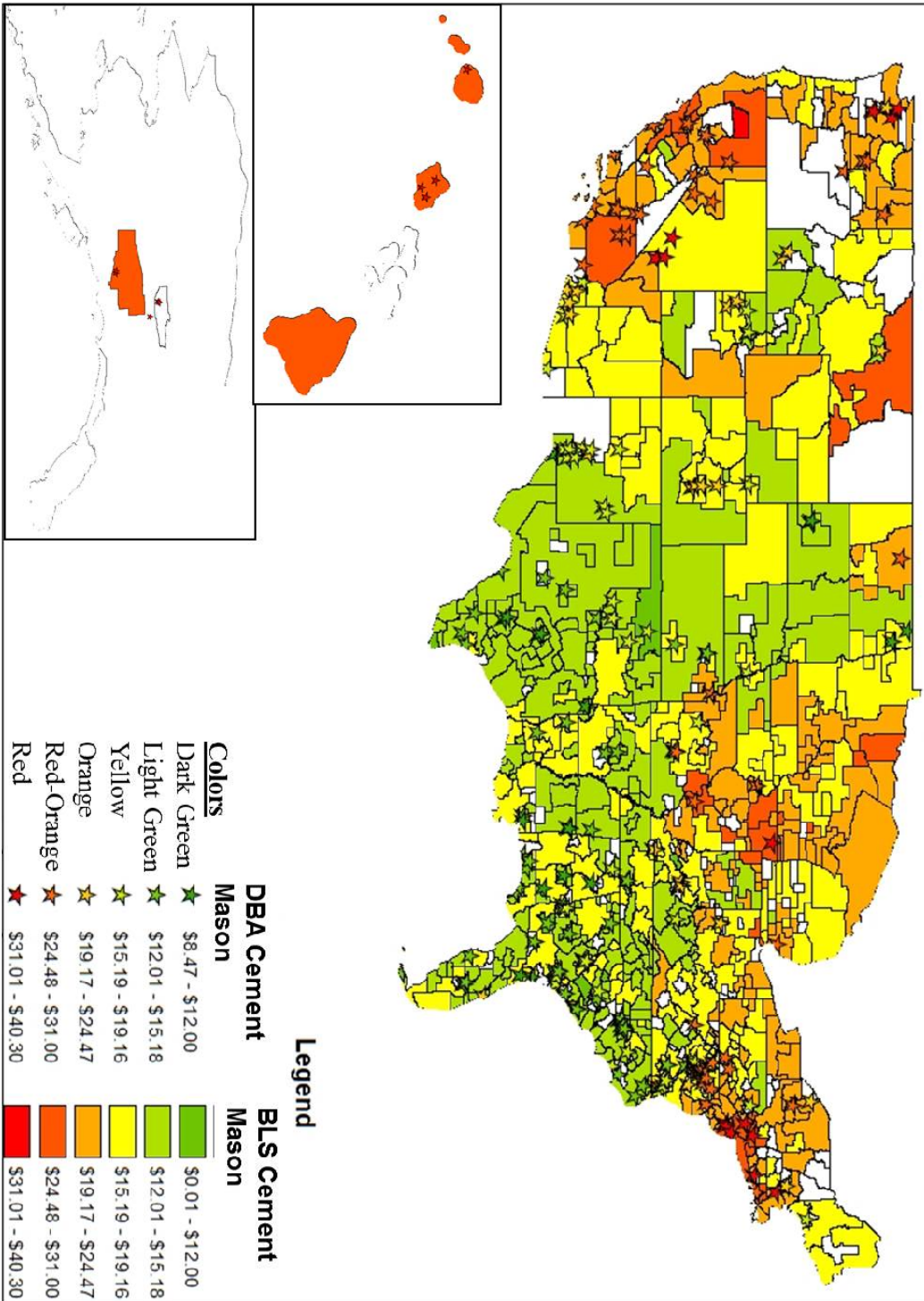
Test Statistic	7.4152
Prob > t	<.0001*
Prob > t	<.0001*
Prob < t	1.0000



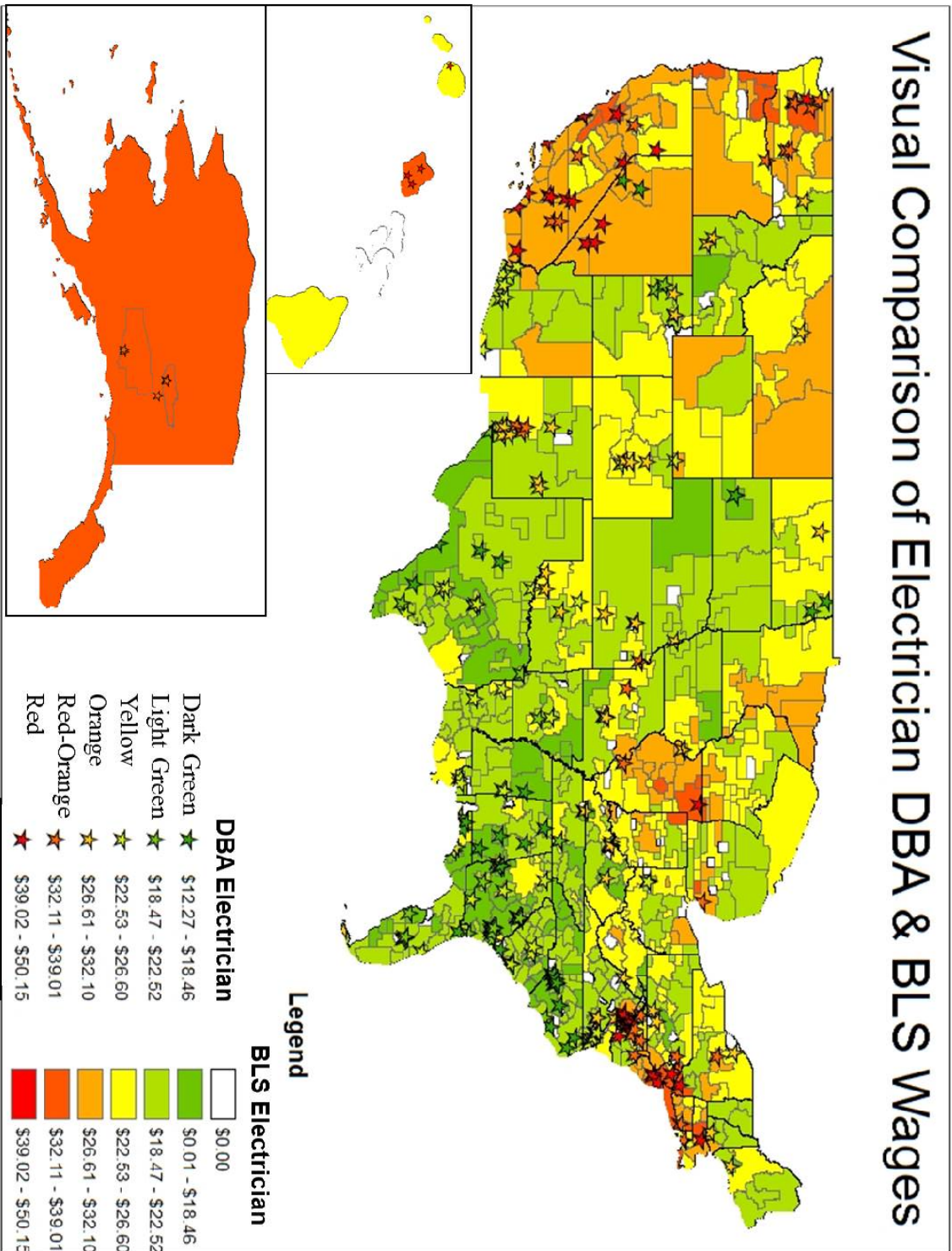
Appendix E. Comparison Maps for All Trades



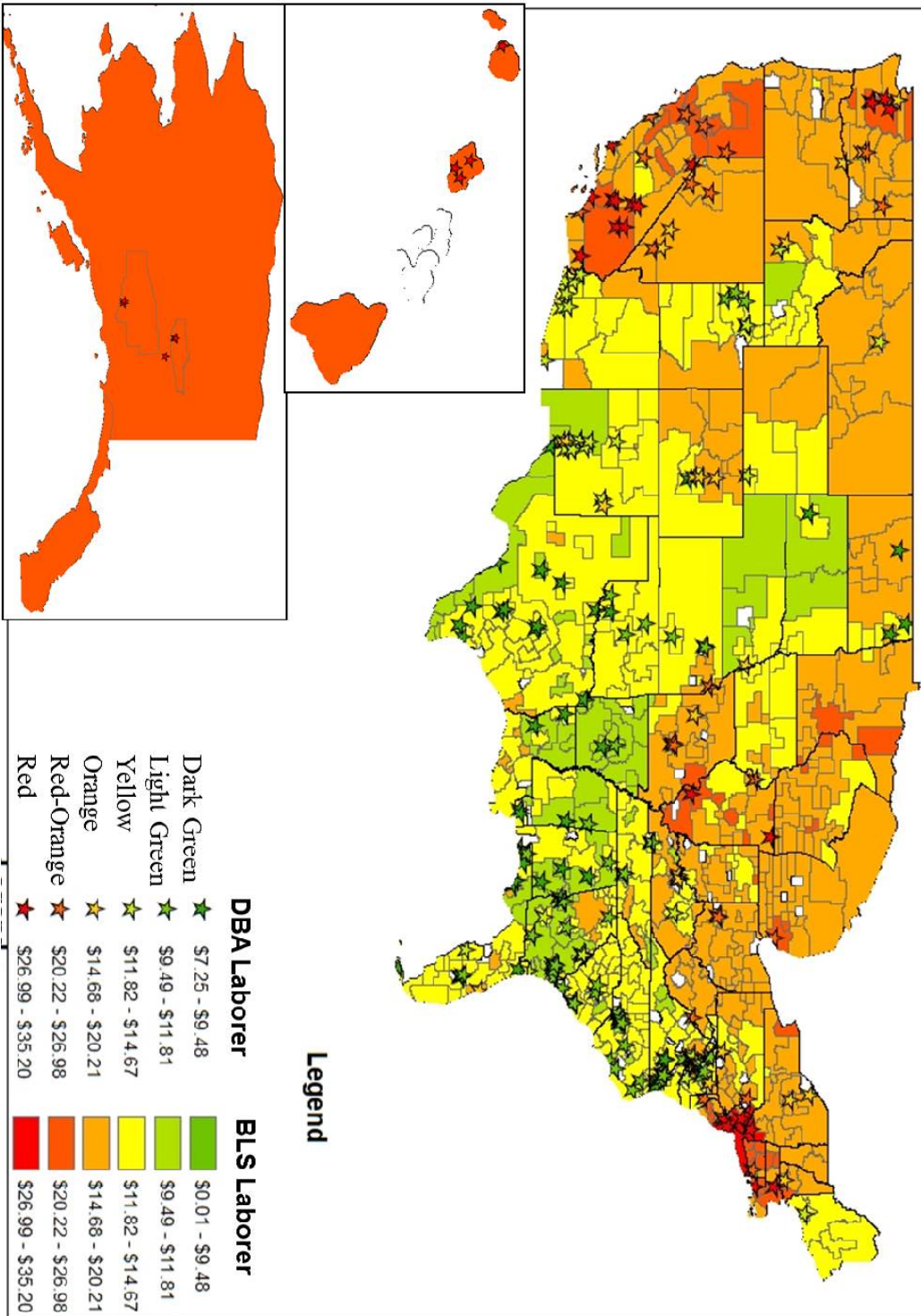
Visual Comparison of Cement Mason DBA & BLS Wages



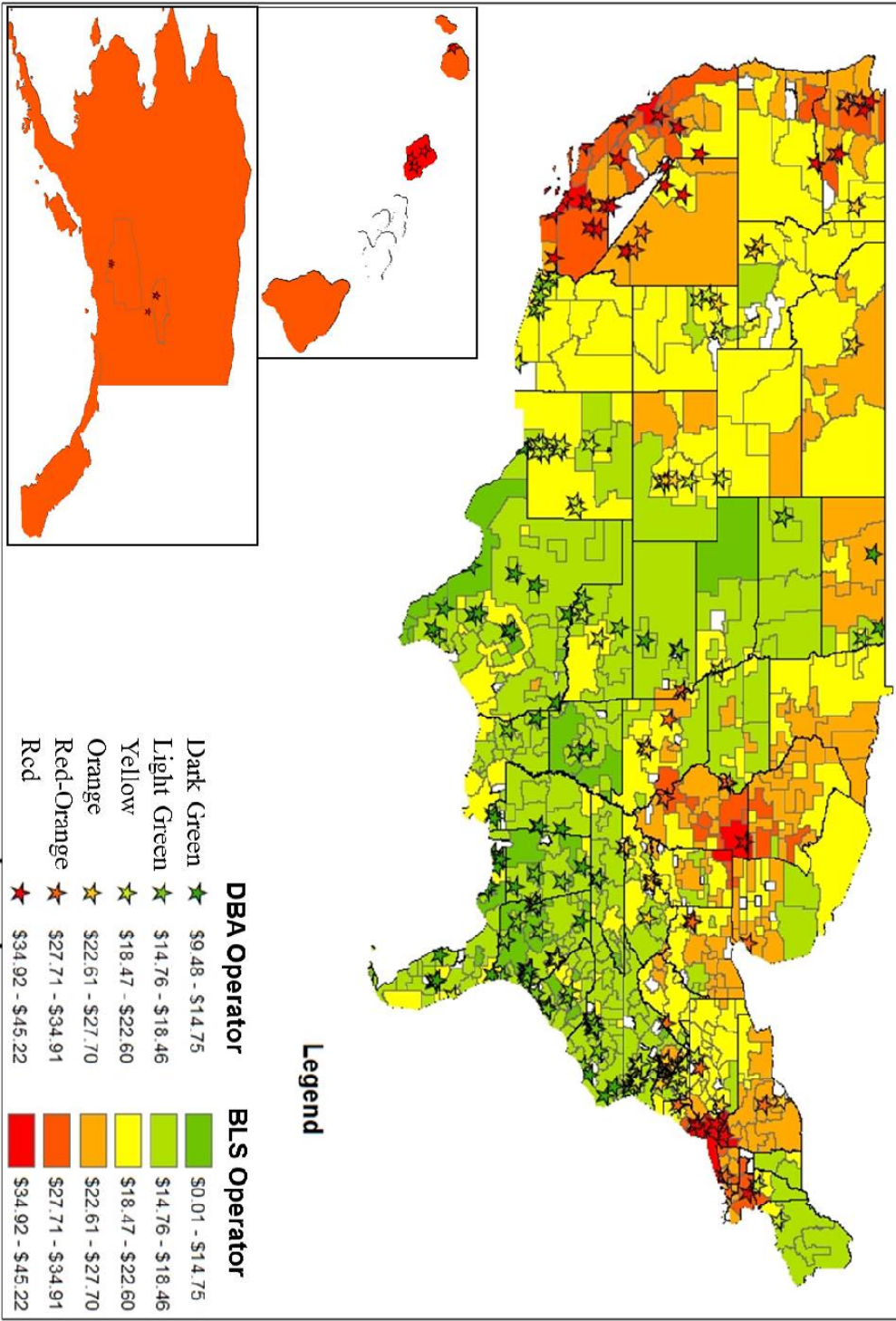
Visual Comparison of Electrician DBA & BLS Wages



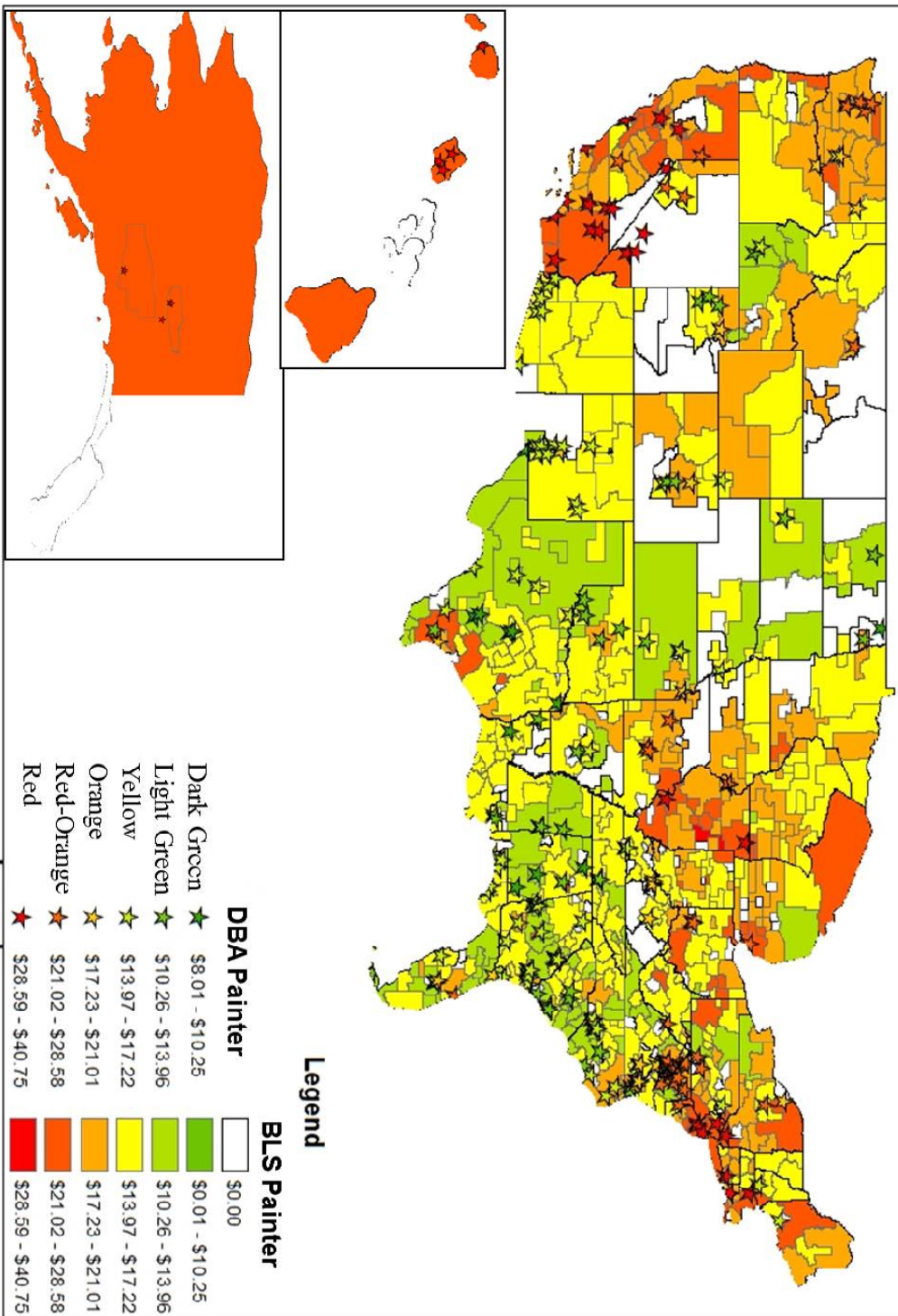
Visual Comparison of Laborer DBA & BLS Wages



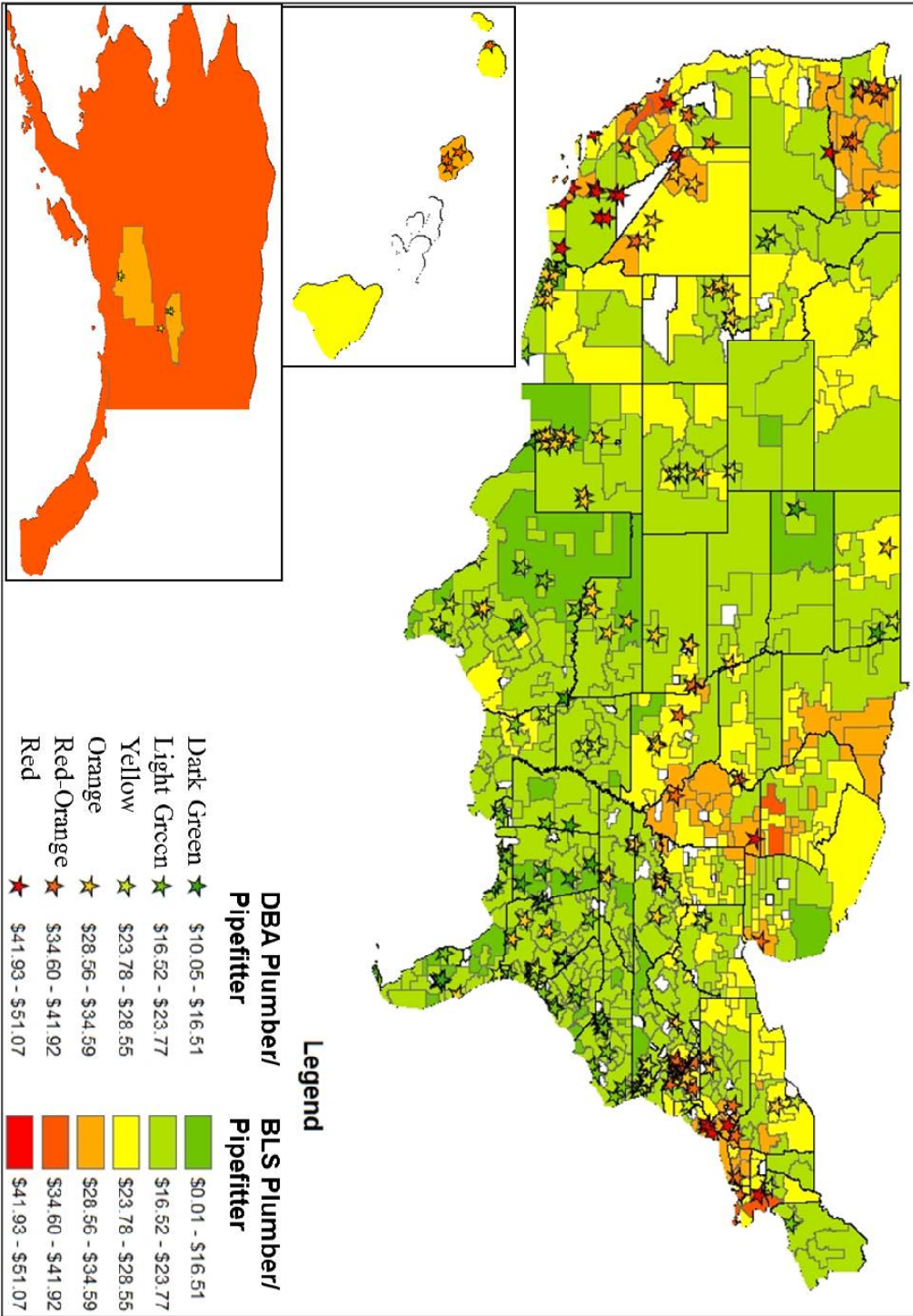
Visual Comparison of Operator DBA & BLS Wages



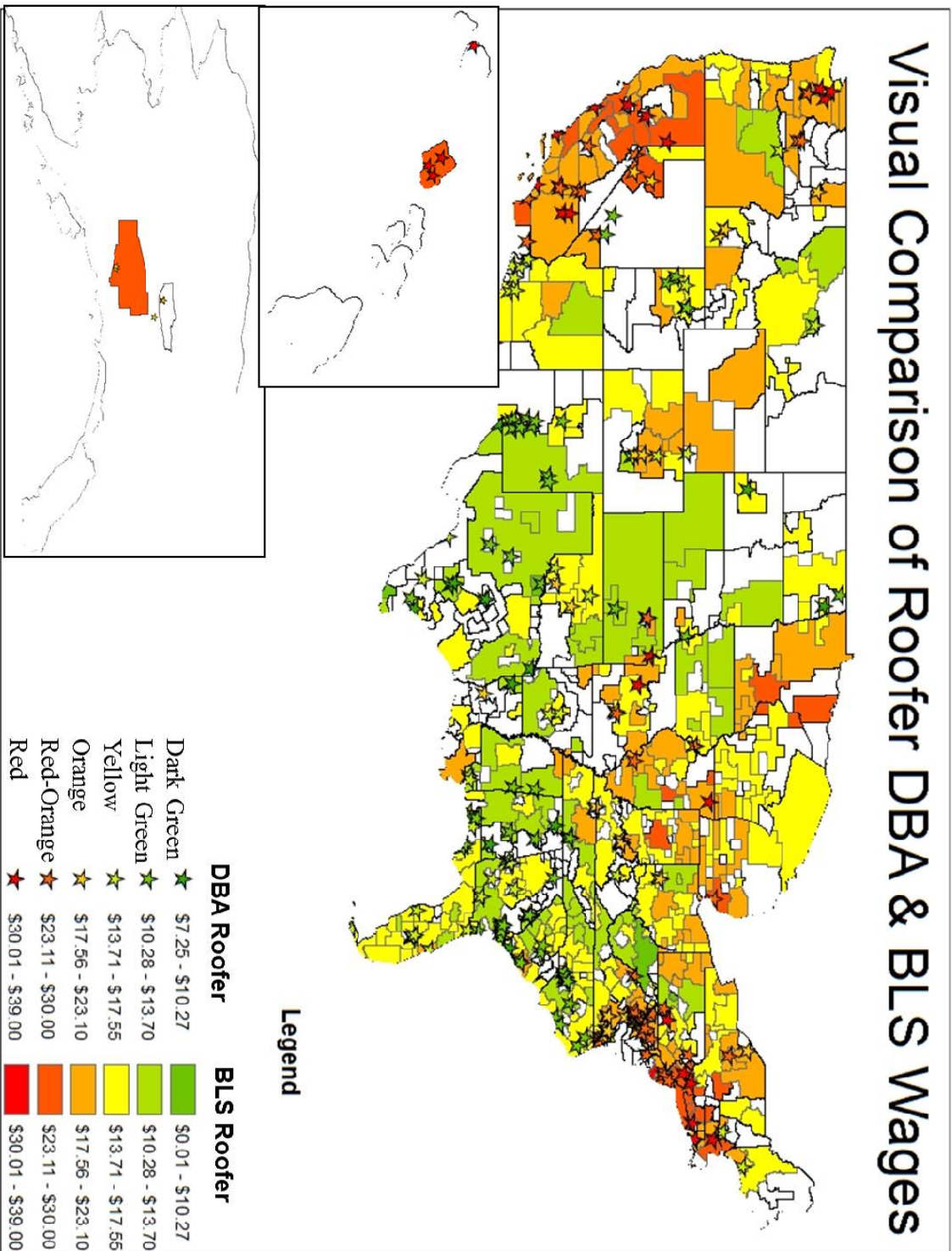
Visual Comparison of Painter DBA & BLS Wages



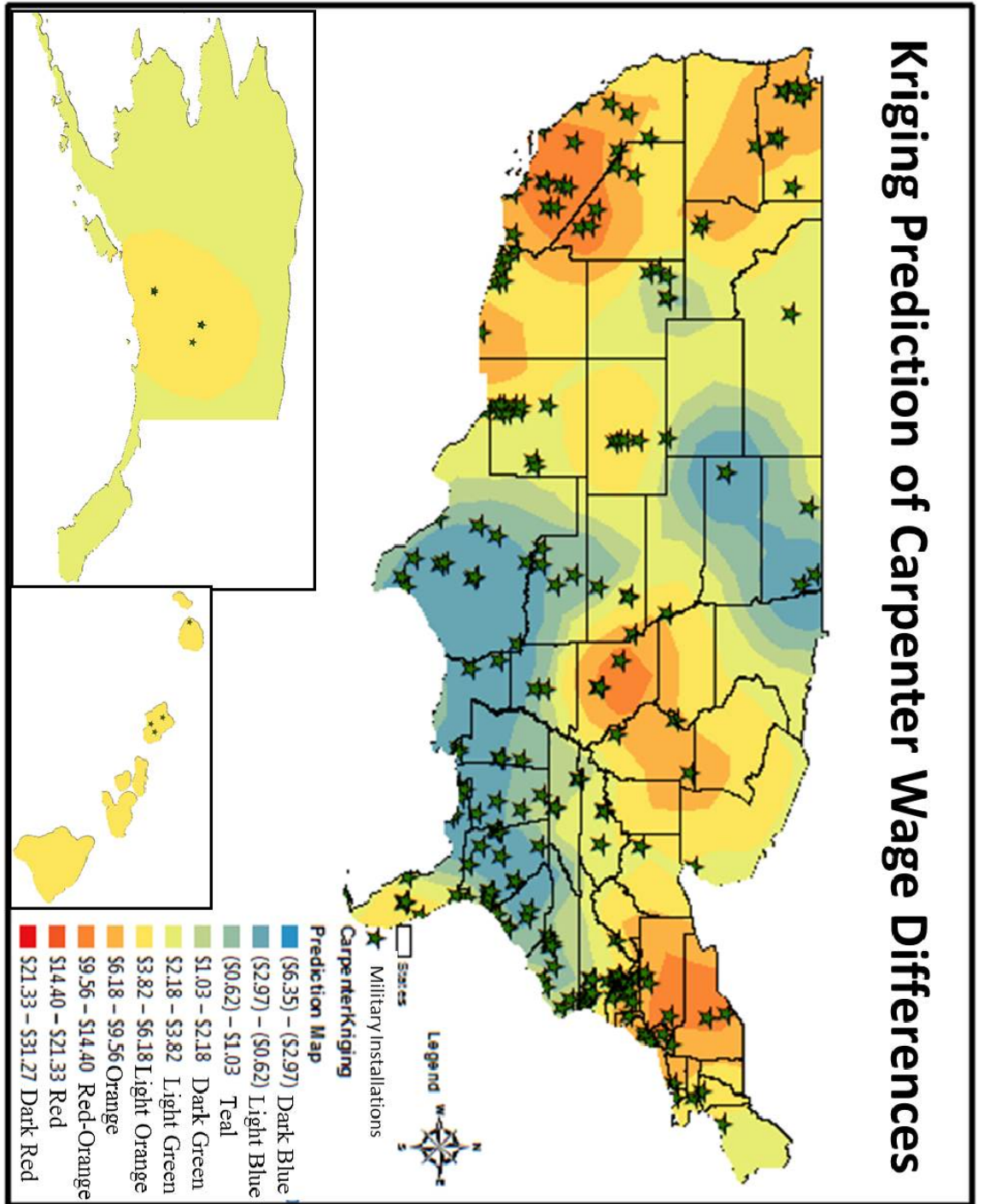
Visual Comparison of Plumber/Pipefitter DBA & BLS Wages



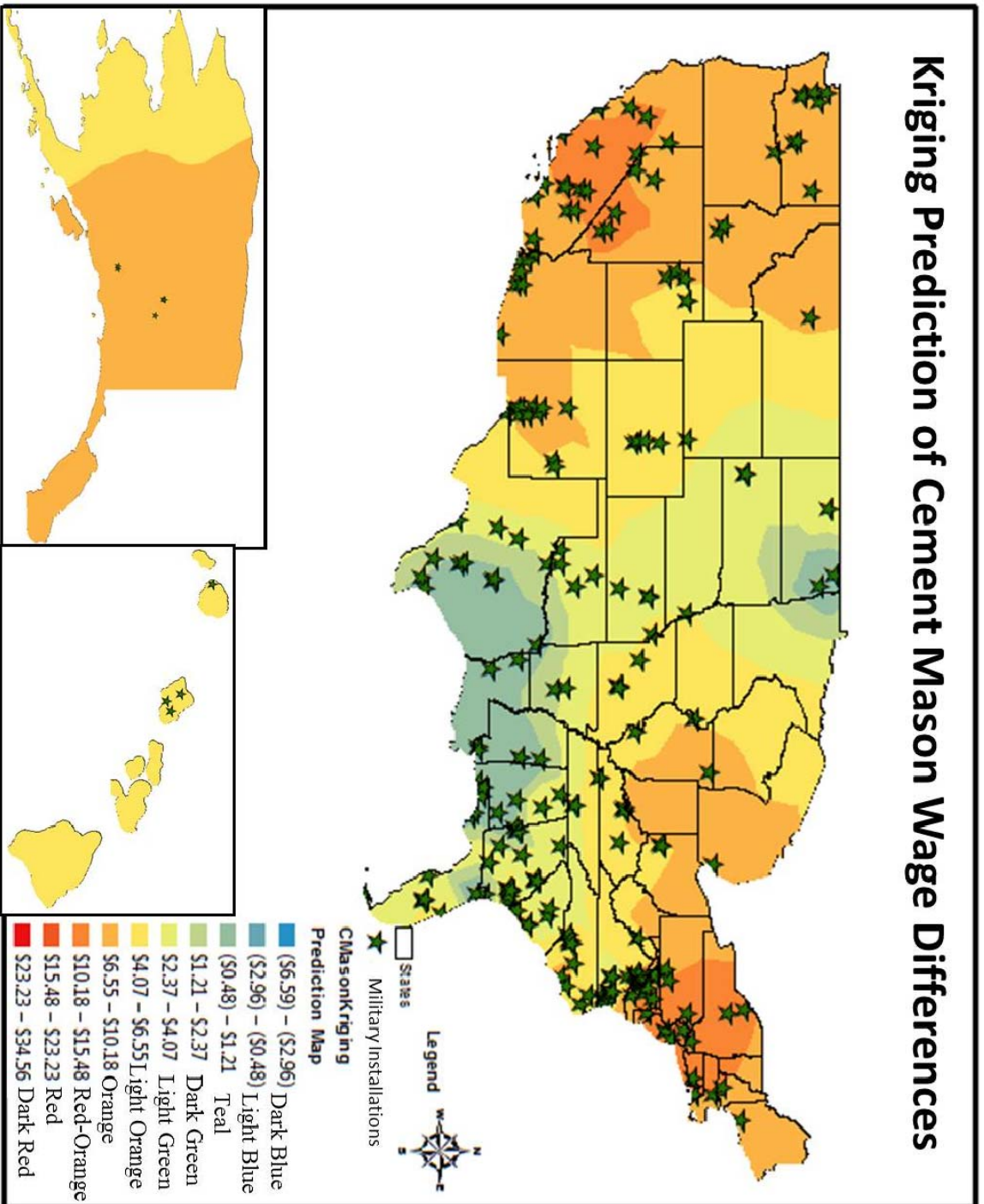
Visual Comparison of Roofer DBA & BLS Wages



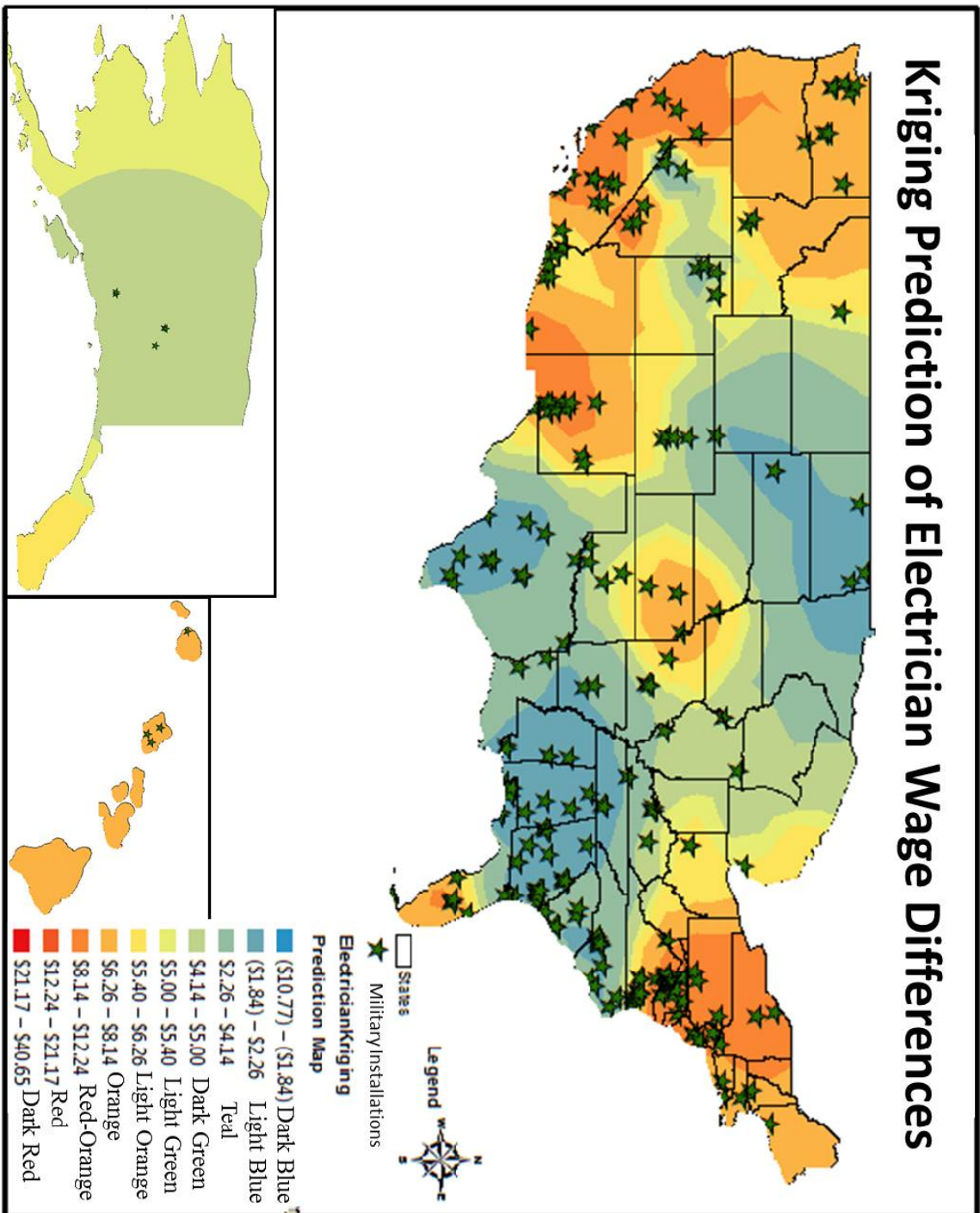
Appendix F. Kriging Maps for All Trades



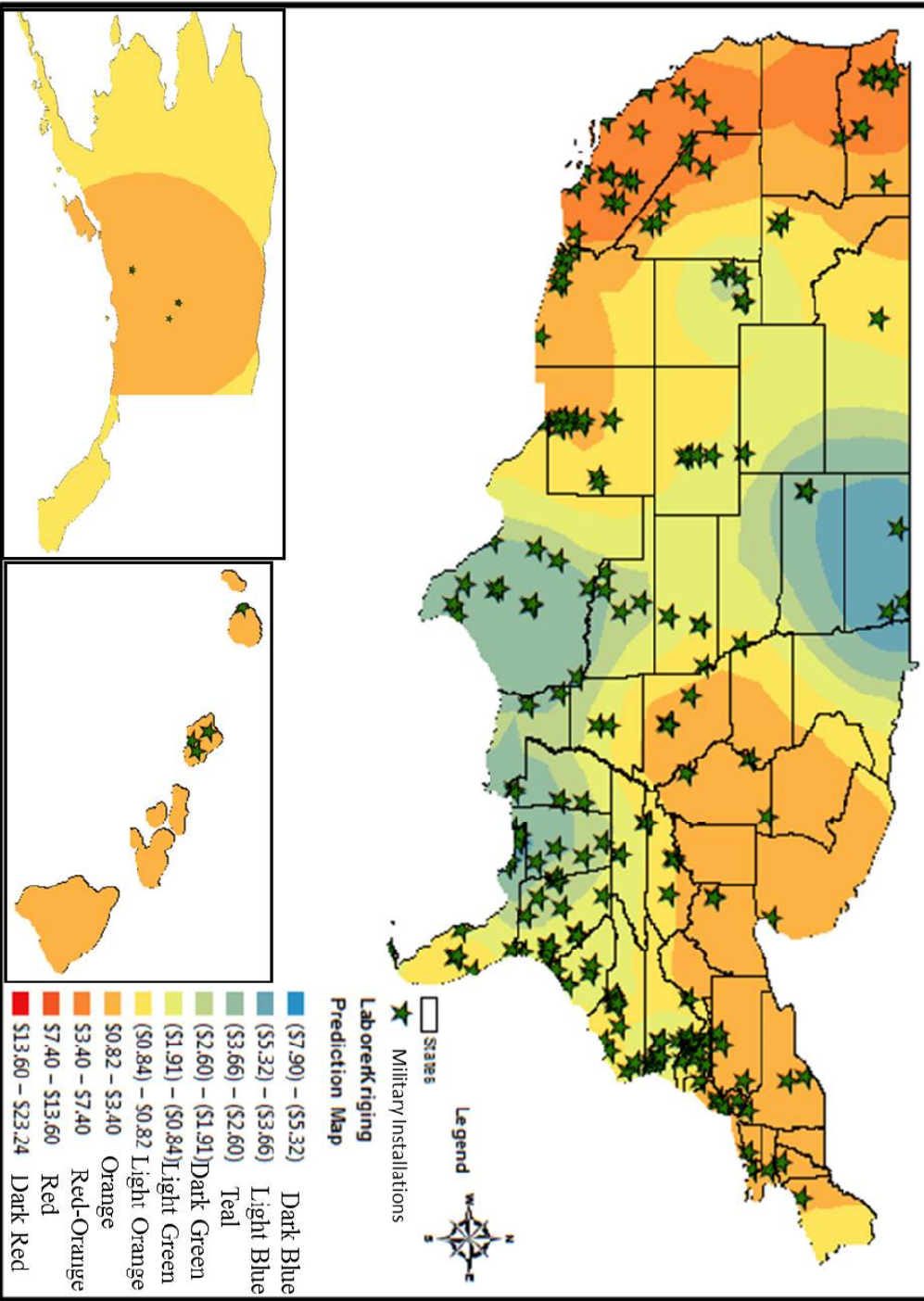
Kriging Prediction of Cement Mason Wage Differences



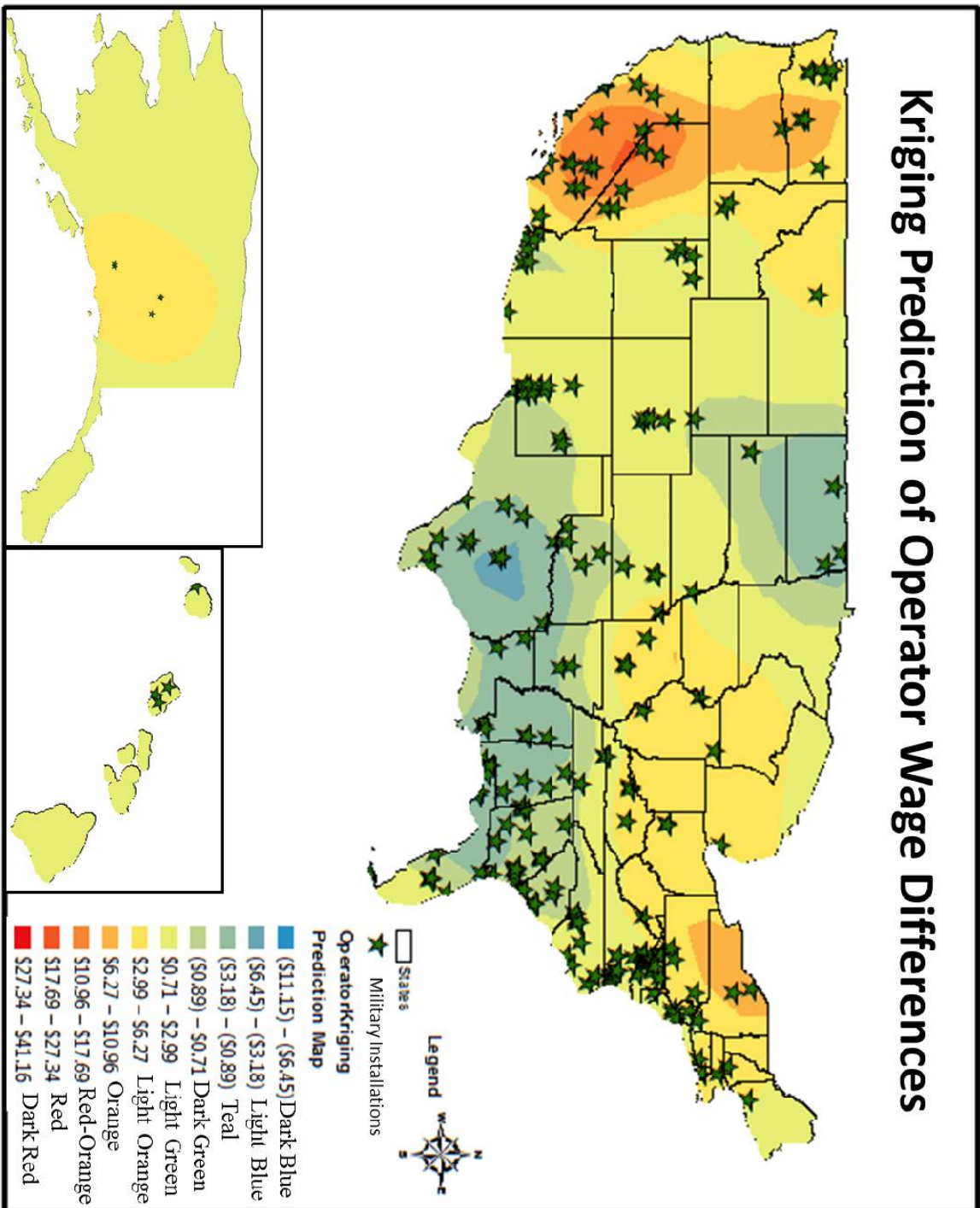
Kriging Prediction of Electrician Wage Differences



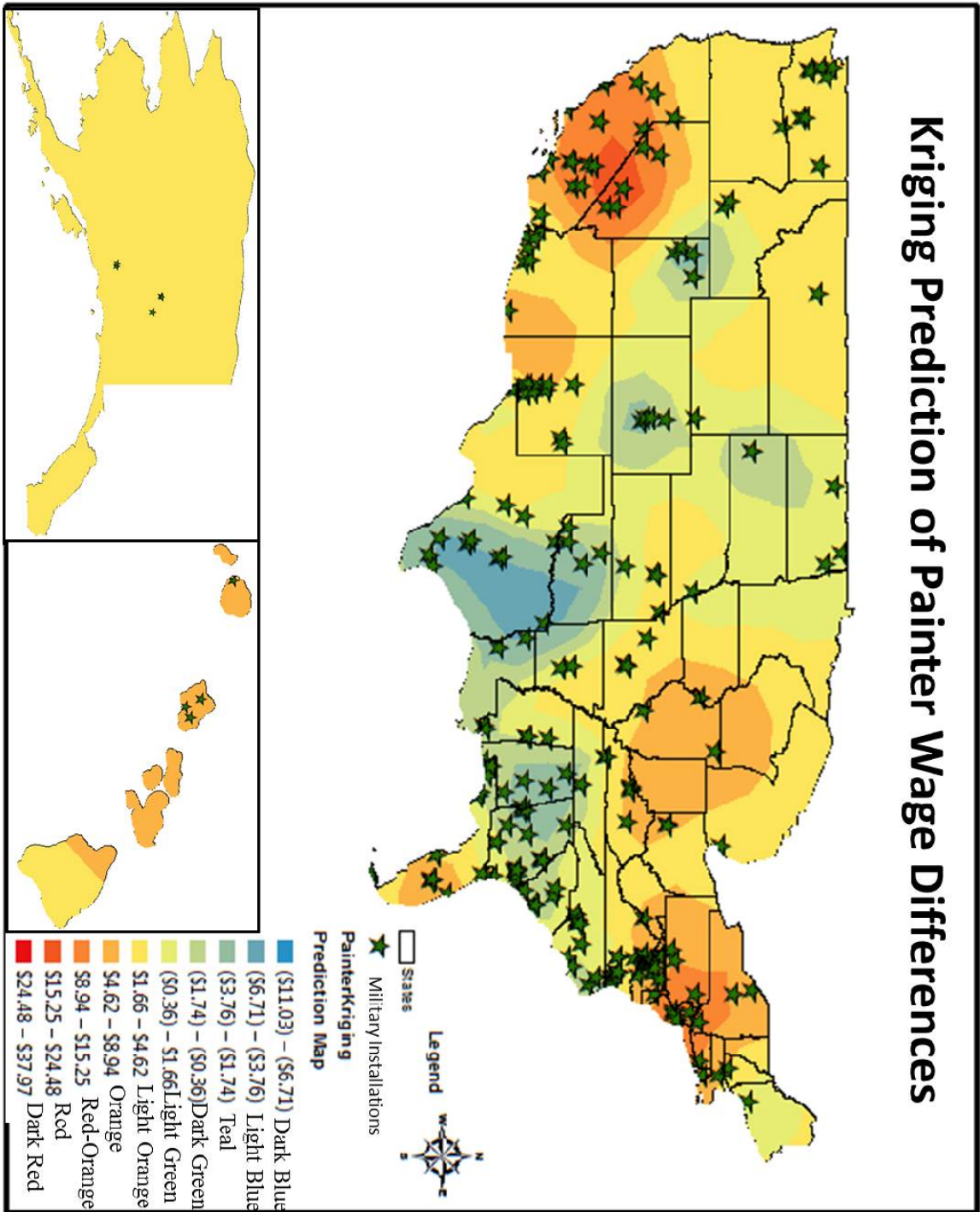
Kriging Prediction of Laborer Wage Differences



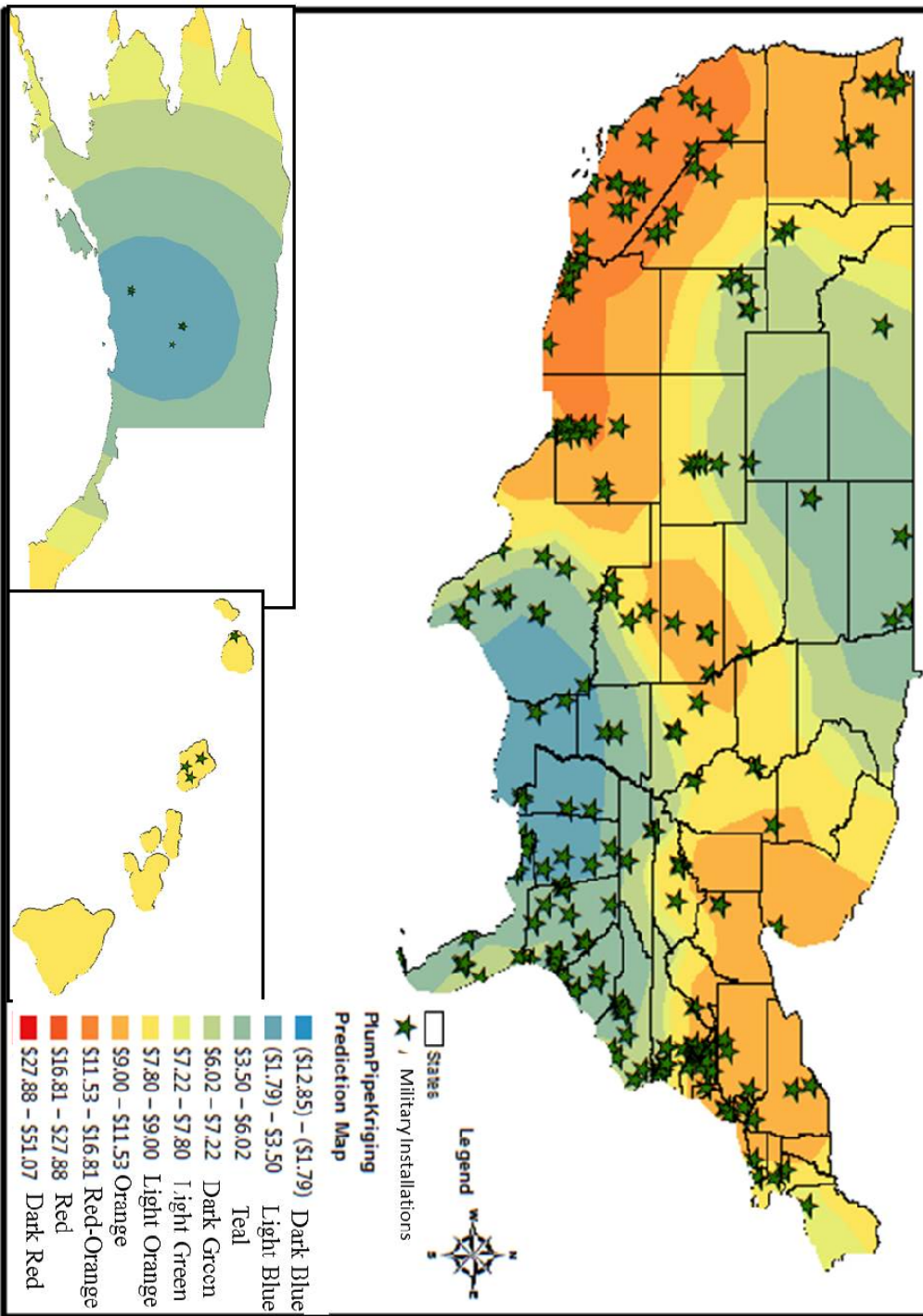
Kriging Prediction of Operator Wage Differences



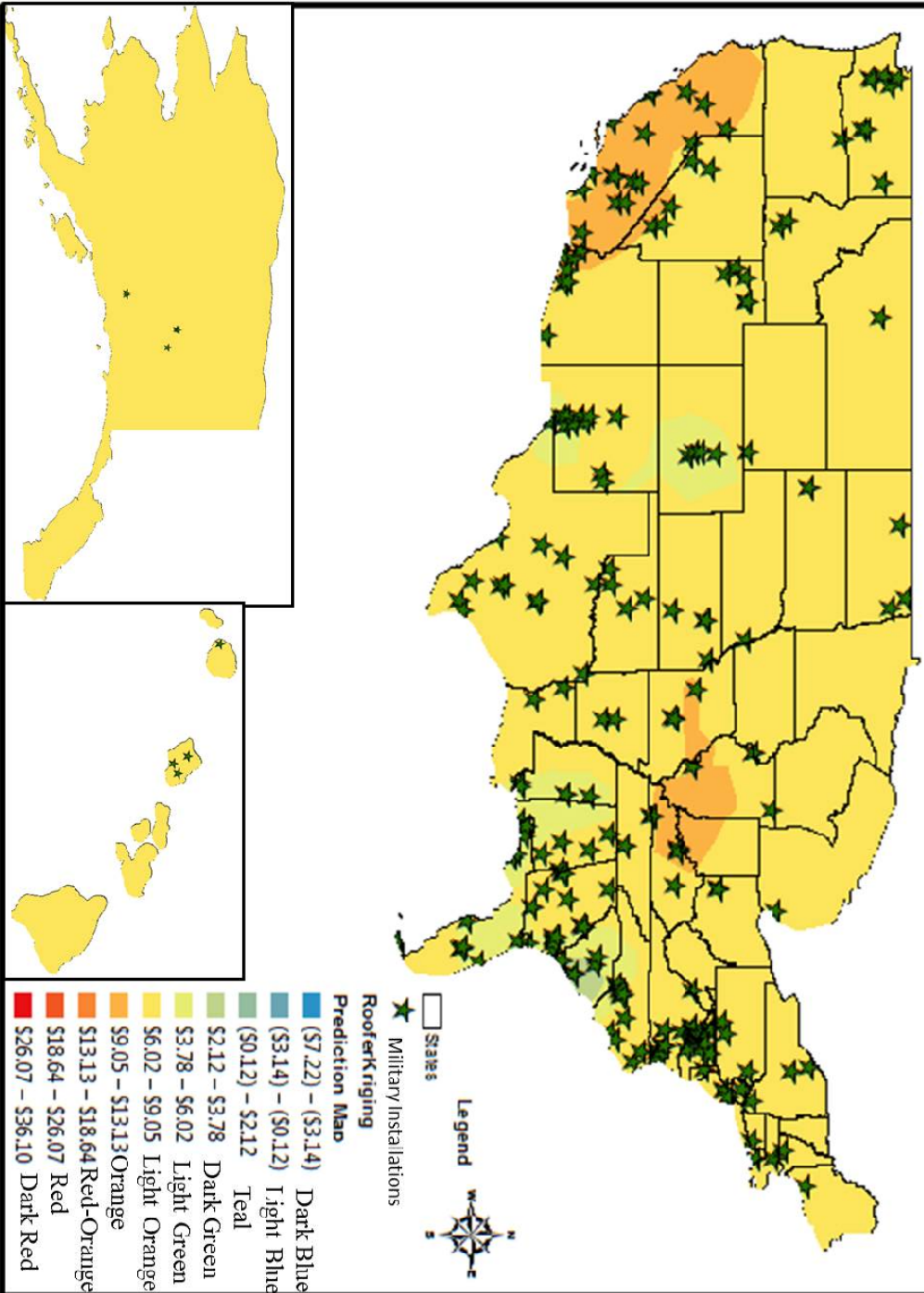
Kriging Prediction of Painter Wage Differences



Kriging Prediction of Plumber/Pipefitter Wage Differences



Kriging Prediction of Roofer Wage Differences



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14. ABSTRACT The United States government spends millions of dollars on construction every year. Each construction project paid for by the government is subject to the requirements of the Davis-Bacon Act (DBA). The DBA is a federal law that sets minimum wages, called prevailing wages, for construction workers. This research used the geographic information system ArcGIS™ to compare wages based on DBA requirements to wages earned by construction workers on non-federal projects not subject to DBA requirements. The research studied wages of eight different construction trades at all active military installations in the United States and compared the two wages to determine if there was a significant difference, and if so, what it was. It also determined the existence of any spatial relationships between the wage differences. The research also applied its findings to the U.S. Air Force's construction budget for Fiscal Year 2012 to determine the amount spend based on DBA requirements. The research found that DBA wages are statistically higher for seven of the eight trades, which differs based on the trade, and confirmed the existence of several spatial relationships. The research concluded that the Air Force spent over \$60 million in Fiscal Year 2012 based solely on DBA requirements.					
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