

Universities and Hospitals as Agents of Economic Stability and Growth in Small Cities: A Comparative Analysis

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Abstract

Institutions of higher education and health care ('Eds and Meds') have become increasingly recognized as stable centers of employment and important contributors to urban economic development. Existing research into the contributions of Eds and Meds on regional economies focus primarily on large research-based universities and health care facilities based in larger cities. These institutions and the cities in which they are based offer significant resources like access to global streams of financial and intellectual capital. In contrast, smaller teaching-based institutions of higher education and service-oriented health care facilities are largely overlooked, presumably because a lack of significant research monies would mean limited impacts in the regional economy. However, any cursory look at the economic base of various smaller cities and regional centers in the U.S. would indicate that the stature of non-research health care and higher education institutions are likewise growing in importance for regional economies. The purpose of this paper is to trace the rise of health care and higher education as agents of economic stability and growth, and their spatial impacts on urban land use, in two smaller regional centers, namely Green Bay, Wisconsin, and Salisbury, Maryland – two cities with different cultural and economic histories whose economic trajectories nevertheless are converging in which Eds and Meds play an increasingly prominent role.

Keywords: Higher education, health care, economic development, small cities.

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Introduction

In recent decades, institutions of higher education and health care ('Eds and Meds') have become increasingly recognized as stable centers of employment and important contributors to urban economies and economic development. Health care in particular is an increasingly important economic sector in the United States, with national health expenditures rising from 7.2% of GDP in 1970 to 17.8% of GDP in 2010 (Centers for Medicare & Medicaid Services 2012). Expenditures in higher education have risen more modestly, from 2.3% of GDP in 1970 to 3.2% of GDP in 2010 (National Center for Education Statistics 2011). Growth in both sectors, however, has meant significant land use changes in urban centers. For example, two 'rust belt' cities in northeast Ohio, Akron and Cleveland, have seen significant investments in reorienting older manufacturing-based land uses into facilities serving local universities and hospitals (de Socio 2012, 2010, 2007). Other cities as well have seen the rise of 'Eds and Meds' as important agents of regional employment stability and growth. In Baltimore, 10 of the top 25 employers are in the health care sector, and 6 of the top 25 employers are institutions of higher education (Economic Alliance of Greater Baltimore 2012). In Philadelphia, 9 of the city's top 20 employers are in the health care sector, and 3 of the top 20 are institutions of higher education (Select Greater Philadelphia 2011). And in Boston, Eds and Meds represent two of the top three employment sectors with more than 83,000 workers combined (Boston Redevelopment Authority 2011). Indeed, Harkavy and Zuckerman (1999) found Eds

and Meds to be among the top 10 employers in the largest 20 U.S. cities.

Eds and Meds are more than significant local employers and land developers; they have become indispensable actors in urban economic growth amid industrial consolidation and employment declines in manufacturing and other sectors. Further, as agglomerations of both intellectual and technical innovation, local political and civic leaders are finding ways to partner with these institutions as a way to stabilize employment, direct inward capital flows, and spur regional economic development (de Socio 2012, 2010, 2007; Gurwitt 2008; Bartik & Erickcek 2008; Adams 2003). Existing research into the contributions of Eds and Meds on urban and regional economies focus primarily upon large research-based universities, and large research-based health care facilities based in cities like Baltimore, Cleveland, and Philadelphia, to name a few (de Socio 2012, 2010, 2007; Uyarra 2010, Nelson 2009; Carlson 2009; Gurwitt 2008; Arbo and Benneworth 2007; Perry and Wiewel 2005; Adams 2003). These institutions and the cities in which they are based offer significant resources such as access to global streams of financial and intellectual capital. In contrast, smaller, often teaching-based institutions of higher education are largely overlooked, presumably because a lack of significant research monies would mean limited impacts in the local and regional economy, including limited impacts on urban land use. Yet, in smaller cities and regions devoid of government research institutions and/or large companies with research and development functions, universities often serve as the sole repository of knowledge,

making them central actors in local and regional economic development efforts, including shaping urban land use patterns (Boucher, Conway and Van der Meer 2003: 890).

Likewise for hospitals and health care institutions where service-oriented facilities based in smaller cities and regional centers also presumably generate few research dollars and have limited impacts on the local and regional economy. However, any cursory look at the economic base of various smaller cities and regional centers in the United States would indicate that the stature of non-research based health care and higher education institutions are likewise growing in importance for local and regional economies – particularly those in which *both* types of facilities (Eds and Meds) are present, suggesting a synergism at play that serves as a catalyst for urban economic development and land use change (Cummings et al 2005: 150). The purpose of this paper, then, is to analyze the growing importance of health care and higher education as agents of urban economic stability and growth, and to explore their spatial impacts in two smaller regional centers, namely Green Bay, Wisconsin, and Salisbury, Maryland. These two cities have vastly different economic traditions – manufacturing, for example, in Green Bay, and agriculture in Salisbury. Yet, institutions of higher education and health care appear to play an increasingly prominent role in both cities' (changing) base economies and in spatially (re)organizing each city's urban land use.

The paper is organized as follows. The following section reviews literature regarding the impacts of Eds and Meds on regional economies, including work exploring the role of hospitals and universities as export-based industries. An introduction and review of the base economies of Green Bay, Wisconsin, and Salisbury, Maryland, follows, including an examination of the changing economic base of both cities by reviewing employment data by economic sector. Data and methodology – namely, longitudinal mean center analyses of medical facility locations and student enrollments at institutions of higher education to explore the spatial impacts of each sector on the two cities' regional economies – are then presented followed by a discussion and concluding remarks.

Economic Impacts of 'Eds and Meds' on Regional Economic Development

Literature on the economic impacts of institutions of higher education on their local and regional economies is robust and spans across various themes of inquiry. For example, universities and institutions of higher education are recognized as pivotal components of technology-based economic development. The proximity of Stanford University and the University of California – Berkeley to Silicon Valley on the West Coast, and the proximity of Duke University, University of North Carolina – Chapel Hill, and North Carolina State University to Research Triangle Park on the East Coast, are two classic examples. Regarding Silicon Valley, Huffman and Quigley (2002) contend that Berkeley and Stanford helped contribute to a

geographically concentrated, highly educated and skilled labor force as graduates of the universities remained and settled in the area following graduation. This concentration did not happen passively; rather, in the 1950s, the Dean of the Stanford University College of Engineering actively promoted interaction between students and faculty and nearby firms via tours, research trips, internships, making faculty research available to local firms, encouraging firms' engineers to enroll in graduate courses at Stanford, and sponsoring the Stanford Industrial Park that by the early 1960s would house 25 companies and employ 11,000 workers (Huffman & Quigley 2002: 405; Saxenian 1994).

Beyond proximity to, and relations with, Stanford University, Silicon Valley came to embody a type of network-based synergism in which valley firms themselves were "porous" and specialized; that is, firms in many aspects were outgrowths of the informal networks nurtured through institutional frameworks like Stanford University (Saxenian 1995). Startup niche firms were created to meet technology and production challenges faced by firms they would come to supply, challenges shared by firms with university students and faculty in order to efficiently overcome them and allowing firms to be more flexible. Moreover, Silicon Valley firms often cooperated with each other either informally by employees contacting friends in competitor firms for help in overcoming some technological obstacle, or formally via joint ventures, technology agreements, cross-licensing, second-sourcing, and the like – all facilitated through the informal and institutional networks developed

around Stanford University and UC Berkeley (Saxenian 1996: 44-45). And these networks are by no means entirely local or regional. For example, Taiwanese engineers of Silicon Valley – themselves graduates of Stanford and Berkeley – were later tapped by officials in Taiwan in efforts to cultivate venture capital firms and encourage cross-Pacific ties between Taiwanese firms and Silicon Valley (Saxenian & Sabel 2008). Adams (2011), meanwhile, finds that Silicon Valley's networks extend across economic sectors as well, deriving much of its startup capital and technical know-how from large and long-established companies in the electronics, aerospace, and other industries.

Florida et al (2006) contend that as the United States continues to transition from an older industrial economy towards a service-based high technology 'creative' economy, institutions of higher education are increasingly important for economic development. Universities are key to developing new technologies as the Silicon Valley example demonstrates, but universities are also important for developing the kinds of talent required in the service and high technology-oriented creative economy. Indeed, research universities are particularly important in this regard with their concentrations of research faculty, graduate students and laboratories, which in turn lead to technology transfers to regional firms, the creation of startup and spin-off firms from university-based research, and the commercialization of university intellectual property – all of which are important to local economic development (Bagchi-Sen & Smith 2012). In addition to

being centers of technological innovation and intellectual capital, universities also contribute to an environment of tolerance (Florida et al 2006). College towns are typically among the most diverse of regions and tend to be open to a range of ideas and lifestyles, which in turn contributes to an environment in which new ways of thinking are encouraged and from which innovation arguably flows (Florida et al 2006: 29).

While work on the impacts of research-based universities and institutions of higher education is quite robust, there is a dearth of research on the impacts of smaller and less research-oriented institutions of higher education on their local and regional economies. There are, however, a plethora of studies of individual universities and their economic impacts on their localities, much of them produced for university administrations (Ambargis, McComb & Robbins 2011; Siegfried, Sanderson and McHenry 2006; Ohme 2004). Most of these include large research-based universities, but smaller teaching-oriented universities also conduct such studies. Most studies explore the impacts of university expenditures on their local and regional economies using criteria established by Caffrey and Isaacs (1971) – primarily expenditures by students, faculty and staff, and university purchases from local suppliers and vendors (see also Bhadury et al 2010; Boucher, Conway and Van der Meer 2003: 889). Carroll and Smith (2006), for example, explore the economic impacts of Bowling Green State University (BGSU) on Bowling Green, Ohio, and its surroundings. Limiting their study to direct economic impacts such as capital improvements, operational

spending, student spending, faculty and staff spending, and visitor spending, Carroll and Smith (2006: 8) report that BGSU generates \$8 in economic activity for every one dollar received from state support, and conservatively calculate that BGSU produces a job multiplier effect of 1.56. Carroll and Smith refrained from incorporating measures of BGSU's impact on human capital in the region in order to avoid multiplier inflation (see, for example, Siegfried, Sanderson & McHenry 2006), but BGSU is by far the largest employer in Wood County, Ohio, with more than 5,300 employees (the second largest employer is Owens Community College, with 1,525 employees). Murray (1972) performed a similar study three decades earlier reviewing the economic impact of the University of Wisconsin – Green Bay (UWGB) on the city of Green Bay and its surrounding areas, also using criteria established by Caffrey and Isaacs (1971).

Regarding health care institutions, Erickson, Gavin and Cordes (1987: 18) report that eighty to ninety percent of total hospital revenues are typically accounted for by “patient revenue.” Consequently, hospitals and health care facilities are generally regarded as institutions that serve local markets and are not typically seen as export industries (Erickson, Gavin & Cordes 1987: 25; Nelson 2009). However, due to a range of factors including the geographical size of markets, the proximity of other hospitals, reputations and specializations of hospitals, and even the state of a region's transportation infrastructure, patients are often drawn from beyond a hospital's defined service area (Erickson, Gavin & Cordes 1987: 19). Moore (1974: 127), for

example, found that more than half of the patients in a Syracuse-based hospital came from outside of the city, and more than 35% came from outside of the county; 82% of patient revenue, meanwhile, originated from outside of the city of Syracuse. Further, Moore (1974: 129) found that the Syracuse-based hospital generated a multiplier of \$2.63 for every dollar in revenue it received from outside of the city. In their study of the hospital sector in Pittsburgh, Erickson, Gavin and Cordes (1987: 26) found that more than a fifth of the city's hospitals revenues originated from outside of Pittsburgh, producing a multiplier of \$2.69 for every dollar in revenue received from outside of the city.

These studies suggest that hospitals and the health care sector more generally are export-based industries and should be counted as part of a city's and region's economic base since they draw revenues in from outside of their market areas and infuse money into local circulation (see also Bartik & Erickcek 2008). Nelson (2009) directly addresses whether hospitals and health care facilities are export industries. In a comprehensive comparative study examining five cities and regions experiencing slow growth in traditional export sectors, Nelson (2009: 250) finds that the hospital sector of each city drew substantial patients from outside of their respective defined market areas, marking them as part of the export base of their respective local economies. Further, employment in the hospital sector in each of the five cities proved resilient and robust amid declining employment in traditional export sectors. Nelson (2009: 250) further concludes that various hospital characteristics increase the likelihood of

drawing patients from outside of the market area, including teaching status, residency programs, and specializations (see also Whiteis 1992).

That Eds and Meds act as export industries by attracting students and patients from outside presumed market areas, bring in research dollars and are centers of technical innovation, and are economically resilient amid employment declines in traditional export sectors like manufacturing, both sectors have become increasingly important to economic development policy-makers (McKee 2010; Bartik & Erickcek 2008; Feller 2004; Goddard & Chatterton 1999). Adams (2003), for example, documents the rise of Eds and Meds as anchors of employment and as agents of economic development in Pennsylvania, and compares the state's policies toward Eds and Meds and local policies towards Eds and Meds among the state's two largest cities, Philadelphia and Pittsburgh. The state and municipalities in Pennsylvania have largely viewed universities and hospitals as land developers, with positive effects of being anchors of employment in neighborhoods in distress and positively impacting neighboring property values, but also taking large tracts of land out of municipal property tax rolls due to their tax exempt status – a problem that was particularly pervasive in Philadelphia where more than a quarter of the city's properties in the mid-1990s were tax-exempt (Adams 2003: 573, 578). Consequently, policies toward Eds and Meds varied between Philadelphia and Pittsburgh. Adams (2003) argues that, in Philadelphia, Eds and Meds have largely been overlooked as comprehensive developmental assets

(largely due to an overabundance of tax exempt properties) compared to other cities, like Pittsburgh, that have successfully pursued economic development policies around Eds and Meds. Adams (2003: 585) contends that, unlike Philadelphia, precipitous deindustrialization in Pittsburgh and other rust belt cities provided the incentive for reformist urban governments to direct resources towards the non-profit sector, particularly research universities and medical facilities.

De Socio (2012) documents how the city of Akron, Ohio, encouraged the transformation of its downtown land uses away from traditional manufacturing (primarily in tires and rubber) into facilities serving local hospitals and the University of Akron. Faced with declining revenues, employment and population following the collapse of the tire industry for which Akron served as the headquarters to several of the world's largest tire manufacturers, the city struggled to identify private sector partners around which to build an economic development strategy. With much of its downtown abandoned and blighted, and local private sector firms failing, the University of Akron and two local hospitals proved to be pillars of employment stability and growth amid a declining industrial economic base. Consequently, the city encouraged institutions affiliated with both sectors, Eds and Meds, to expand their operations into much of the downtown buildings left blighted from declines in the manufacturing sector, and has developed a policy platform aimed at further enhancing the Meds sector in particular by

designating portions of its downtown as a 'biomedical corridor' where city and county location incentives are concentrated specifically for firms affiliated with the health care sector (de Socio 2012). Likewise, Cleveland has seen dramatic revitalization efforts centered on Eds and Meds, primarily around Case Western University and Cleveland State University, and around the city's famous Cleveland Clinic hospital complex (de Socio 2010).

Regarding the economic impacts of policies specifically geared towards Eds and Meds as agents of economic development, Bartik and Erickcek (2008) find that investments aimed at expanding Eds and Meds in metropolitan areas have various empirically measurable positive effects impacting human capital in particular. The expansion of universities, for example, tends to attract more students from outside of a metropolitan area than the expansion of a hospital does in attracting patients from outside of a metropolitan area. Further, the proportion of students who remain in the area following graduation boosts the skill level of a region's labor force (Bartik & Erickcek 2008: 13). The expansion of research universities in particular often translates into increased technology transfer and spinoff activities (see also Huffman & Quigley 2002). The construction or expansion of a hospital, meanwhile, tends to put upward pressures on local wages because the health care sector tends to pay more, and for a wide range of skills and education, than other sectors, thus raising wages in general (Bartik & Erickcek 2008: 17-18).

Despite these impacts, the magnitude of effects of Eds and Meds is not entirely clear. The impacts of community colleges versus larger universities on their local and regional economies, or the impacts of Eds and Meds on small cities and regions, are not well known (Bartik & Erickcet 2008: 19), nor is the extent to which ever-increasing levels of higher education training drives local and regional economies well understood (Grubb 2008). Consequently, Grubb (2008) cautions against what he calls the ‘education gospel’ in which higher education serves as a panacea for economic development policy-makers. Further, Grubb contends that institutions of higher education often lack effective responsiveness to regional labor demands and that there is a need to improve coordination within institutions and with the state towards more integrated programs. Despite his critiques, Grubb (2008) nevertheless acknowledges positive implications for economic growth when institutions of higher education work in concert with local or regional development organizations.

Study Areas

The objective of this paper is to explore the increasing prominence of Eds and Meds in the regional economies of two small cities: Green Bay, Wisconsin, and Salisbury, Maryland (Figures 1 and 2). These cities have economic foundations that are quite different from each other; Green Bay has a long history of manufacturing, particularly in paper and food processing, and in machinery production (Schenker & Geiger 1972; Gandre, Murray, and Richards 1985; Bay-Lake Regional Planning Commission,

1987). Green Bay is also home to the NFL’s Green Bay Packers, which has drawn an average of nearly 71,000 fans per game from nearby Milwaukee and across Wisconsin and beyond over the last decade (ESPN 2014). Salisbury, meanwhile, is known primarily for poultry and its processing, and other agricultural activities. Despite their different historical base economies and economic genealogy, Eds and Meds appear to be growing in importance in both cities in terms of employment stability and growth, and in terms of land use. In Green Bay, for example, total freight traffic of the port decreased by 23.3% from 1960 to 1970 even as the population in surrounding Brown County increased 26.5% – an early indicator of the transition away from employment in manufacturing and towards services. The proportion of total employment in agriculture and manufacturing both decreased, 5.0% to 2.9% and 28.4% to 26.0%, respectively, while employment in services increased from 21.0% to 24.5%, with those in health service increasing from 5.2% to 7.2% of total employment.

These trends continue into the present, with health care and higher education both increasing in importance for the Green Bay region. While paper products and food processing remain prominent in Green Bay’s regional economy, six of the top fifteen private employers in the Green Bay MSA in 2012 are now in the health care sector. Green Bay is also home to several colleges and universities, all of which have grown in recent decades. UWGB is by far the largest with approximately 7,000 students enrolled. In terms of overall employment, however, no single college or

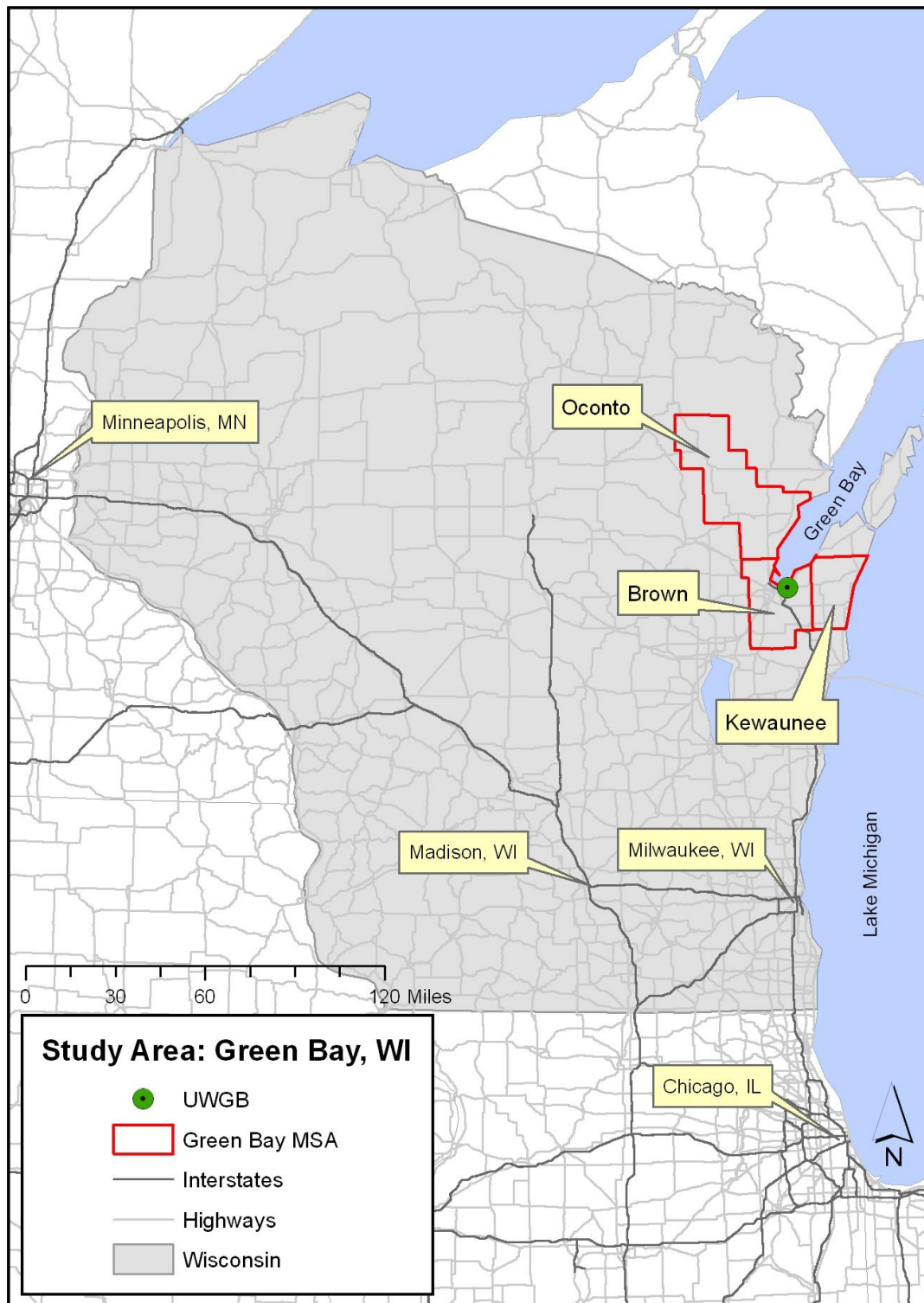


FIGURE 1: Study Area – Green Bay, WI

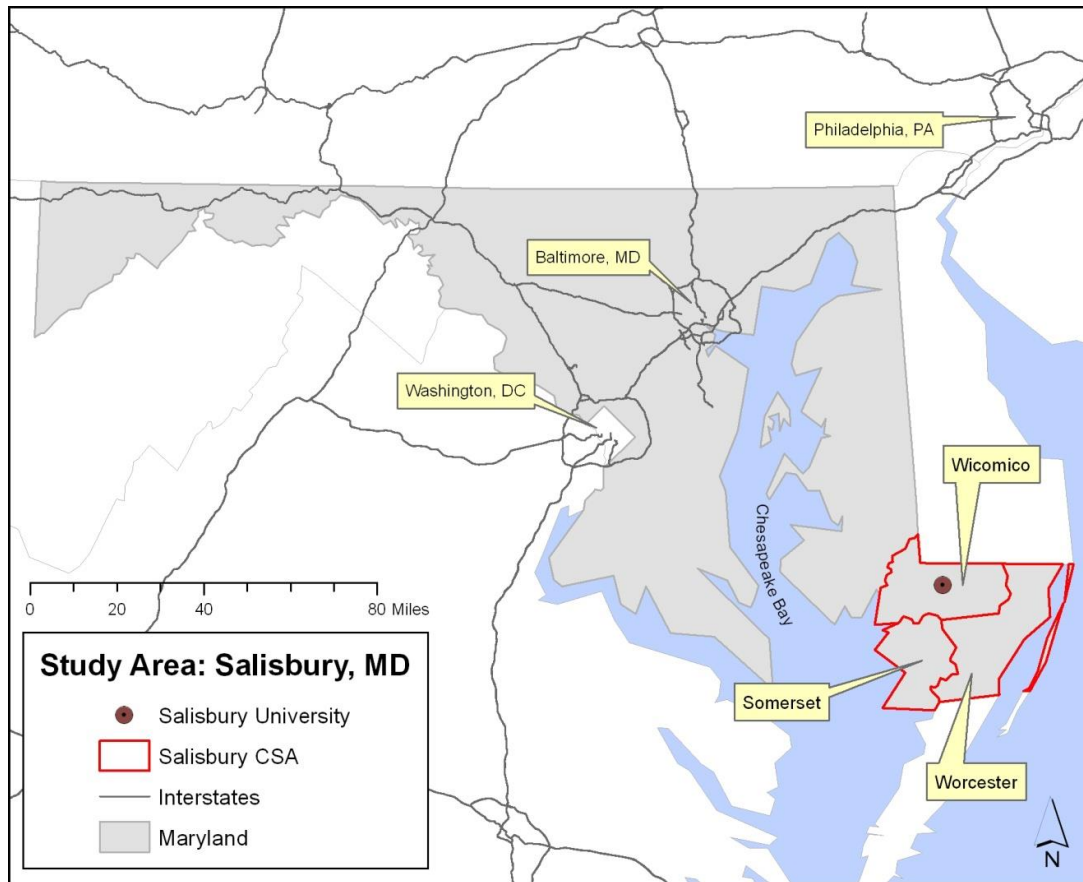


FIGURE 2: Study Area – Salisbury, MD

university ranks among the top twenty of the region's employers, nor do they as a combined sector. Nevertheless, the Green Bay MSA experienced a 6.6% increase from 61.2% to 67.8% of total employment in the Service Providing sector, including an increase of 19.4% in Educational and Health Services (Table 1). Educational Services as a standalone sector grew at a rate of 23.6%. In contrast, manufacturing decreased by 16%.

Salisbury, Maryland, meanwhile, is centrally located on the Delmarva Peninsula and is nearly equidistant from the coasts of the Chesapeake Bay, roughly

20 miles to the west, and the Atlantic Ocean, under 30 miles to the east. Salisbury (population 30,400) is at the center of a wider combined statistical area (CSA) that includes the counties of Somerset, Wicomico and Worcester (the total CSA population is 176,657). The Delmarva Peninsula is roughly 60 miles across at its widest point and 180 miles in length, stretching southward from a narrow isthmus between the Susquehanna and Delaware Rivers. The Chesapeake Bay, meanwhile, is more than 20 miles in average width and presents a significant barrier to social and economic interaction between Delmarva and the heavily

TABLE 1: Employment by Sector

Employment by Sector			
Green Bay, WI	2001 (% of Total)	2009 (% of Total)	Change (%)
MSA Total	158,256	159,374	+0.7
Natural Resources and Mining	1,083 (0.7)	1,834 (1.2)	+69.3
Manufacturing	33,036 (10.5)	27,764 (6.7)	-16.0
Construction	8,838 (5.3)	6,661 (4.2)	-24.6
Service Providing	101,258 (64.0)	107,979 (67.8)	+6.6
Educational and Health Services	25,144 (15.9)	30,032 (18.8)	+19.4
Educational Services	8,109 (5.1)	10,020 (6.3)	+23.6
Health Care and Social Asst.	17,042 (10.8)	19,859 (12.5)	+16.5
Hospitals	5,663 (3.6)	6,576 (4.1)	+16.1
Salisbury, MD	2001 (% of Total)	2009 (% of Total)	Change (%)
CSA Total	73,142	74,689	+2.1
Natural Resources and Mining	784 (1.1)	770 (1.0)	-1.8
Manufacturing	7,693 (10.5)	5,029 (6.7)	-34.6
Construction	4,408 (6.0)	3,629 (4.9)	-17.7
Service Providing	57,605 (78.8)	62,058 (83.1)	+7.7
Educational and Health Services	14,364 (19.6)	17,194 (23.0)	+19.7
Educational Services	2,150 (2.9)	2,504(3.4)	+16.5
Health Care and Social Asst.	7,939 (10.9)	10,399 (13.9)	+31.0
Hospitals	No Data	No Data	

Sources: US Department of Labor, Bureau of Labor Statistics 2011

populated Washington-Baltimore-Philadelphia corridor along the Eastern Seaboard. Consequently, the Delmarva Peninsula has remained largely rural and isolated from the more populous regions of Maryland and northern Delaware and its economic base has traditionally been comprised of agriculture (primarily poultry production, but also tomatoes, soy beans, and corn feed) and Chesapeake Bay fisheries (e.g., blue crabs, oysters, and rockfish) (Macpherson & de Socio 2013). Ocean City, located just 27 miles east of Salisbury on Maryland's Atlantic Coast, has meanwhile served as a popular seaside resort town for more than a hundred years, drawing tourists primarily from the Baltimore-Washington corridor, but also from the greater Philadelphia and New York City areas.

Various industrial production facilities, however, were located in and around the Salisbury area including a soda bottling factory, a canning facility, an apparel manufacturer, a gas pump production facility, and boat construction facilities for three separate manufacturers. All of these industries have closed their operations at some point over the last three decades as a result of broader economic forces (e.g., increased global competition) representing the loss of more than a thousand jobs in the region (Salisbury-Wicomico Economic Development 2012). Despite these losses, the small industrial base (apart from still-dominate poultry production, agriculture, and other primary sector activities) of the Salisbury region remains relatively diverse. Various electronics manufacturers – primarily defense contractors – have located to the region, including a small agglomeration economy

of radio microwave filter manufacturers. And while Perdue Farms (poultry production) remains as the region's largest private employer, it is no longer *the* largest employer. That distinction now belongs to Peninsula Regional Medical Center (PRMC), the local hospital that has seen steady growth particularly in recent years. Indeed, the health care sector in general has seen robust growth in the Salisbury region over the last two decades and has been a pillar of economic stability and growth for the region. While employment in manufacturing declined by 34.6%, for example, Educational and Health Services increased 19.7%. Likewise, Salisbury University has remained a pillar of economic stability over the years and, like PRMC, has seen particularly robust growth in more recent years. It is now the region's third largest employer behind PRMC and Perdue Farms and is primed for even more growth in the coming decade.

Data and Methodology

To explore the spatial impacts of higher education in the regional economies of both cities' economic base, we utilize student enrollment data for every decade spanning the last 40 years provided by the registrar's offices of the University of Wisconsin – Green Bay and Salisbury University (Table 2). The enrollment data is spatial by including the home addresses of all incoming freshmen for each decade. Consequently, student enrollment data provides a longitudinal view of the geographical reach of each university. As higher education has grown in prominence in terms of employment in both cities, we would expect also that the increased

TABLE 2: Student Enrollments

Student Enrollments						
<i>University of Wisconsin – Green Bay</i>						
	1973	1980	1990	2000	2010	Overall Change (%)
<i>Total</i>	<i>3,661</i>	<i>4,674</i>	<i>5,695</i>	<i>6,093</i>	<i>6,714</i>	<i>+83.39</i>
Brown County (%)	55.3	61.4	52.1	38.2	28.8	
Local MSA (%)	60.4	65.9	57.5	43.1	35.1	
In-State (%)	91.8	93.8	95.8	94.6	92.7	
Out-of-State (%)	8.2	6.2	4.2	5.4	7.3	
International (%)	0.3	1.8	1.1	0.9	1.1	
<i>Salisbury University</i>						
	1970	1980	1990	2000	2010	Overall Change (%)
<i>Total</i>	<i>1,567</i>	<i>4,423</i>	<i>5,828</i>	<i>6,239</i>	<i>8,374</i>	<i>+434.4</i>
Local CSA (%)	22.1	23.6	19.3	25.6	15.4	
In-State (%)	85.6	82.1	72.9	80.7	86.5	
Out-of-State (%)	14.4	17.8	27.1	19.1	13.2	
International (%)	0.0	0.1	0.1	0.2	0.3	

Sources: UWGB Registrar, Salisbury University Registrar

prominence of universities would translate into larger market areas. In other words, we would expect that each university would draw students from a wider geographical area. To test this, we map the home addresses of all incoming freshmen and perform mean center analyses for both universities across decades, demonstrating the growing geographical reach of each university. Salisbury's enrollment data begins with 1970; the data for UWGB begins with 1973, the year of the merger of four-year comprehensive institutions with former teachers colleges and technical colleges making what is known as the University of Wisconsin System. Additionally, 1973 was the first year that comprehensive student enrollment data was separated by geographic areas (University of Wisconsin – Green Bay 1974). Finally, we compare and discuss the physical growth of each university and other local institutions of higher education in terms of their expanding campuses and their impacts on surrounding land use.

Health care has also grown in prominence in terms of employment in both cities. Consequently, we would expect a similar increase in market size and geographical reach of each city's health care sector akin to universities. Similar data – for example, locational data of patients – is largely proprietary and not available for the health care sector. Additionally, the health care sector is comprised of multiple firms and health care providers, unlike higher education, making such data collection (if available) unwieldy. Hence, in lieu of patient data akin to student enrollment data, we explore locational data of health care providers themselves

by utilizing telephone directories from 1970 through 2010 to identify and map all health care facilities found in each metropolitan area by decade, and perform mean center analyses. This allows us to assess the spatial impacts of a growing health care sector for each city, including changes in land use.

Results: Student Enrollment Patterns

Both universities experienced growth in student enrollment; indeed, as student enrollment increased, other associated activities also increased leading to changes in land use on and around campus. Such changes include campus construction projects such as housing, lecture halls, etc., and the rehabilitation of older facilities; increased local housing demand for both students and increased numbers of faculty and staff; and changing local retailing and professional services centered on a growing student and university staff population thus impacting surrounding land use (Austrian & Norton 2005; Murray 1972).

Over the four decades from the 1970s through 2010, both universities saw fast growth in student enrollments (Table 2). Enrollments at UWGB increased by 83.3% from 3,661 to 6,714. Salisbury's increase of 434.4% from 1,567 to 8,374 was more dramatic. The pace of growth in enrollments is similar for both universities from 1980 through 2000, but Salisbury grew at a much faster pace than UWGB from 1970 to 1980, and again from 2000 to 2010.

As part of a state university system, UWGB draws heavily from the state. In-

state enrollment was above 90% in 1973 with levels maintained across the full time span with a peak of in-state enrollment of 95.8% in 1990. Salisbury, also part of a state system, draws the majority of students from the state as well, though not to the same degree as UWGB. Salisbury's in-state enrollment was 85.6% in 1970 with a similar level of 86.5% in 2010. Interestingly, Salisbury's in-state draw decreased to a low of 72.9% in 1990, a different pattern than seen in the UWGB in-state enrollment pattern. In the end, both institutions rely primarily upon in-state draws for the majority of their enrollment numbers (Figures 3 and 4).

Compared to Salisbury, UWGB draws heavily from its immediate region. However, the trend for both institutions over time was to draw less from their immediate regions. The UWGB data pattern for both Brown County (former MSA) and the currently defined MSA (Brown, Kewaunee, and Oconto counties) mirror each other with general declines in enrollment percentage with decreases in the mid-twenty percent. Salisbury, on the other hand, drew only 22.1% from the currently defined CSA (Somerset, Wicomico, and Worcester counties) in 1970 with a decrease to 15.4% in 2010 after some increases in 1980 and 2000.

In terms of out-of-state enrollment, both institutions draw relatively small proportions of students from other states and miniscule proportions of students from abroad. The overall out-of-state enrollment for both institutions remains fairly consistent over this time span, with Salisbury drawing a higher proportion of students from other states.

UWGB's more localized market is clear throughout the decades (Figure 3), with increasing draws from Wisconsin regions outside of the Green Bay MSA. Clusters that develop for UWGB student origins other than the Green Bay MSA include the Fox River Cities (Appleton to Oshkosh) along State Highway 41, small towns in central and western Wisconsin and Minneapolis, Minnesota, along state highway 29, Manitowoc, Sheboygan, and Milwaukee along I-43 in Wisconsin, and Madison, Wisconsin, and Chicago, Illinois, along I-94. Figure 5 displays the mean centers standard distances of UWGB student origins for 1980-2010, which reinforce the progressive distributional change. The mean centers track to the west and slightly south showing the general expansion of drawing students from smaller towns in western Wisconsin outside of the Green Bay MSA. With the rise of the service economy and decline in industrial employment which served as a foundation for smaller towns in Wisconsin, it appears that more of the population (reflecting national trends) pursued degrees in higher education, thereby expanding the customer base for even smaller institutions like UWGB. Interestingly, the standard distance first contract, reinforcing the peak of in-state enrollment in 1990, and then expand to its largest distance in 2010 highlighting the increasing enrollment at more distant in-state and out-of-state areas.

Salisbury distributions (Figure 4) highlight the relatively lower levels of draw for students from the Salisbury CSA in Maryland's Eastern Shore. It is clear that the major clusters for in-state student

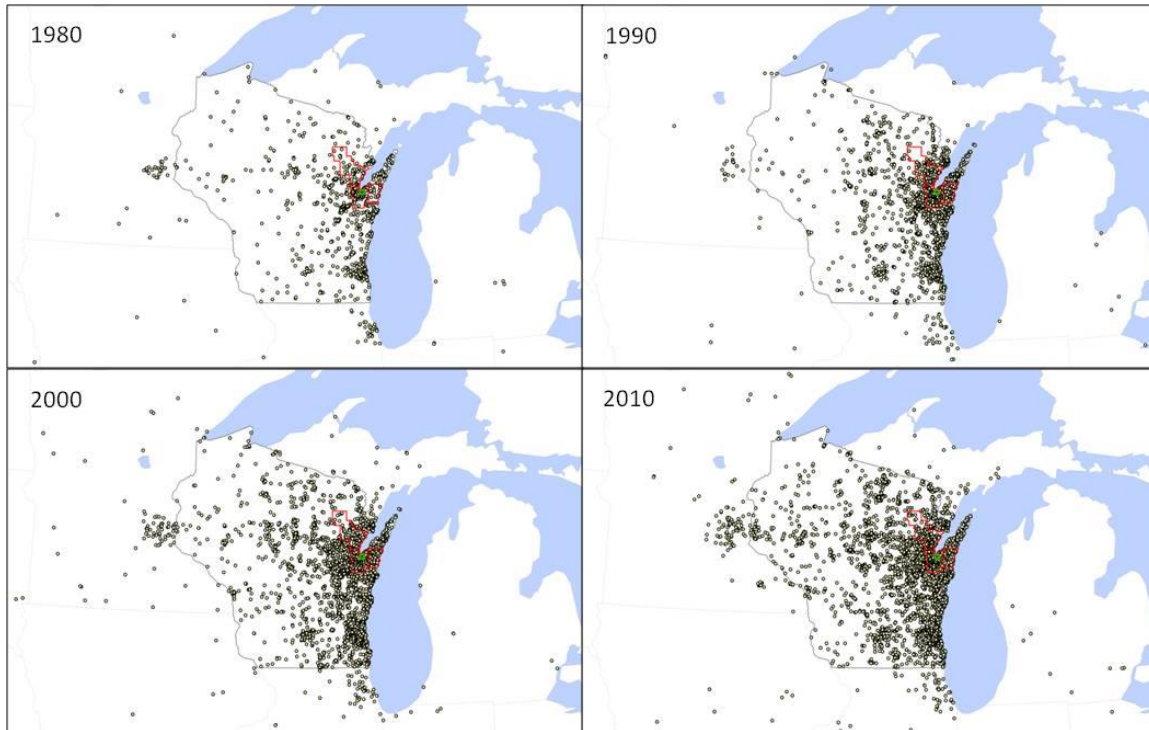


FIGURE 3: UWGB Student Origin Distributions, 1980-2010

origins for all years are in central Maryland around the Baltimore and Washington, DC, metropolitan areas. Figure 6 displays the standard distance for Salisbury student origins for all years, showing a pattern where distance increases until 2000 where a higher density concentration emerges in central Maryland and continues to 2010.

These distributions for Salisbury also display the further out-of-state student origins that appear over time in areas along the I-95 corridor. In fact, it appears that the economic growth around the I-95 corridor and its related population growth serve as the primary customer base for Salisbury. Linear clusters appear and become more pronounced by 2000 from Baltimore to New York City and Long Island, including Wilmington, Delaware,

Philadelphia, Pennsylvania, and New Jersey. Interestingly, while this pattern remains in 2010, some of the clustering along this route diminishes amid even more clustering in central Maryland. Consider the mean center displays for Salisbury University in Figure 6. The mean center first tracks west highlighting the draw of the Washington, DC, area until 2000 where the mean center is pulled to the northeast, displaying the increasing draw of New Jersey and New York along the I-95 corridor.

Overall, both institutions display similar patterns of increased enrollment, with Salisbury experiencing a more pronounced increase from 2000 to 2010. Both institutions draw more heavily from in-state rather than out-of-state regions, with UWGB having higher proportions of in-

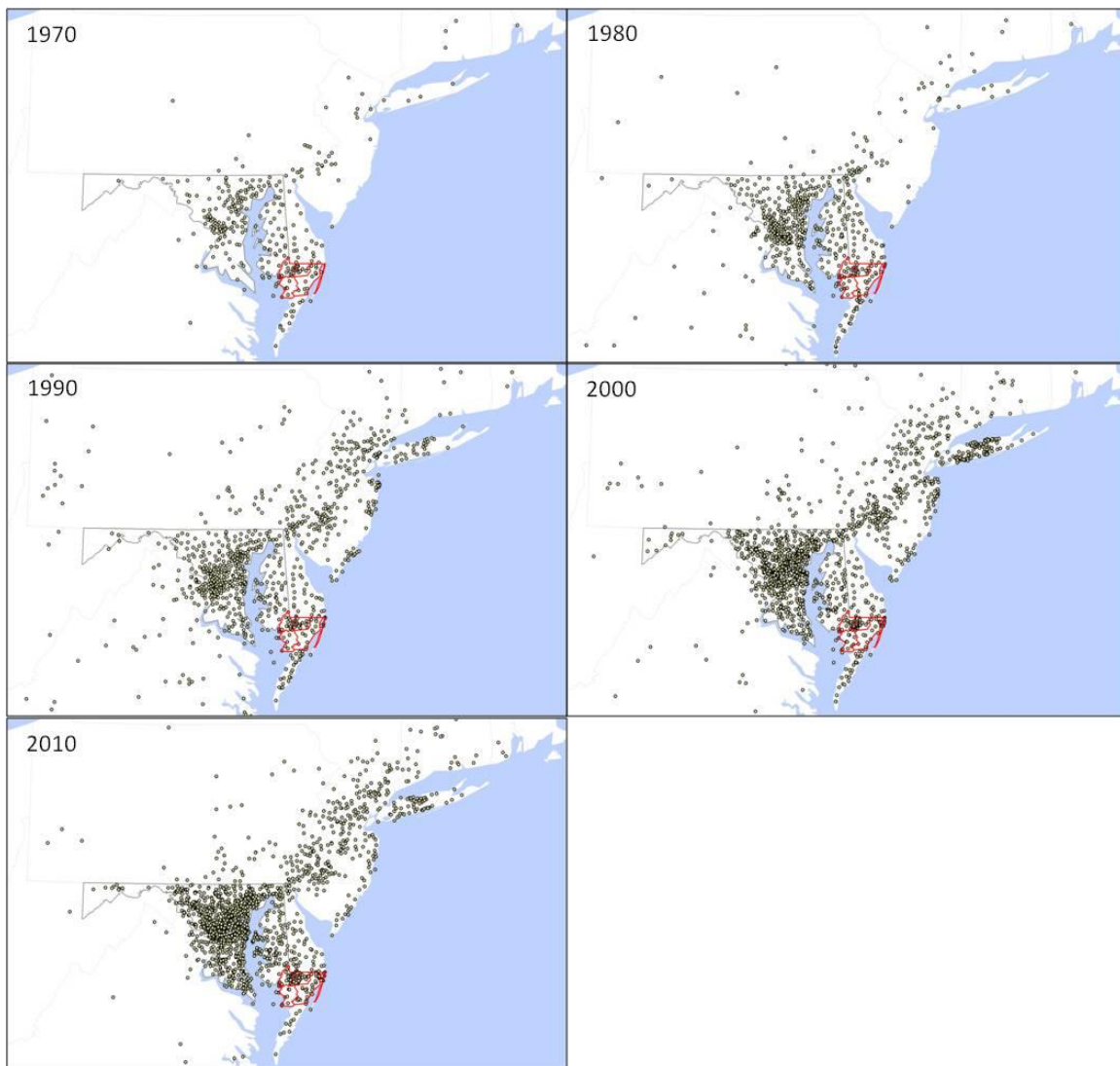


FIGURE 4: Salisbury University Student Origin Distributions, 1980-2010

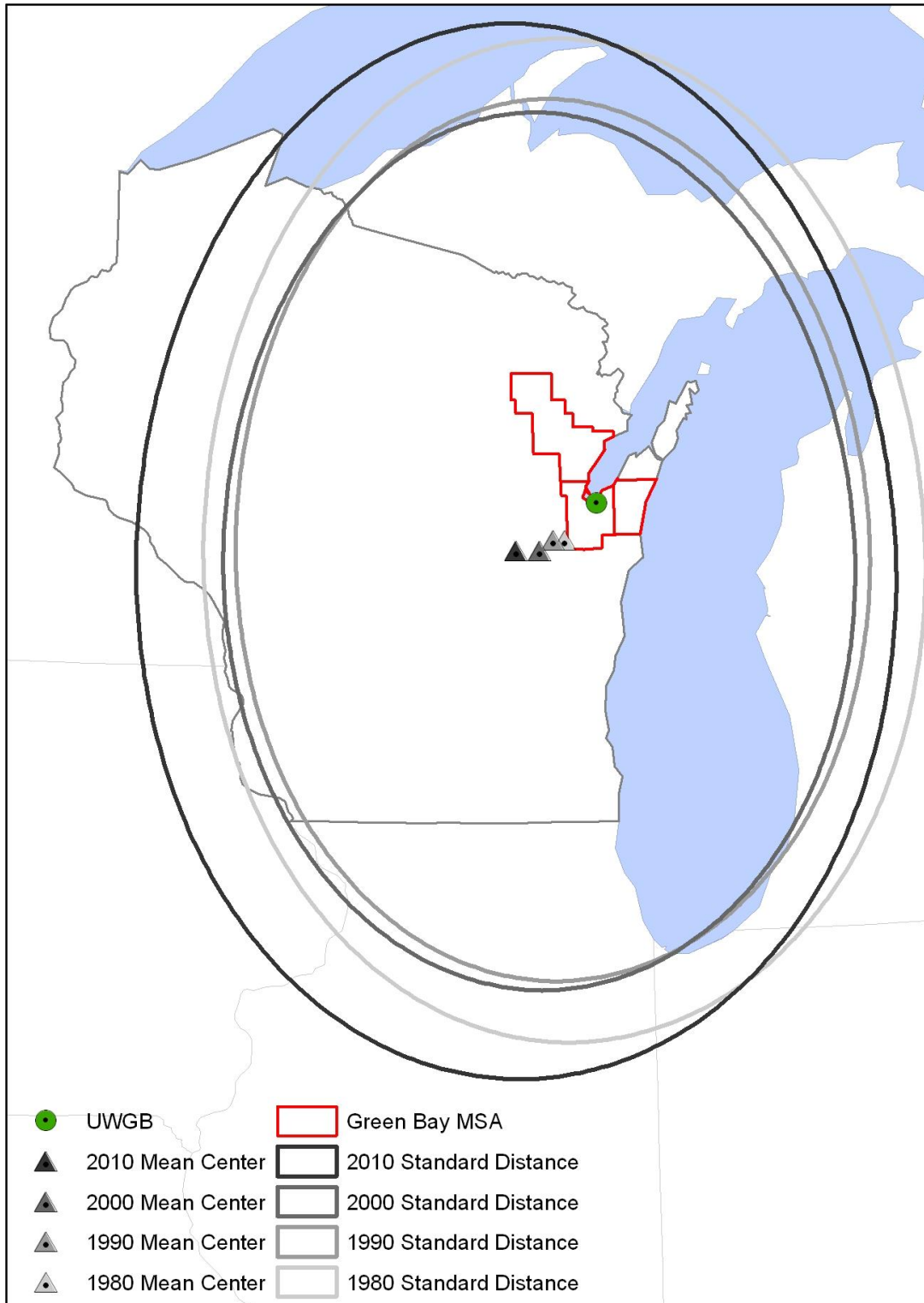


FIGURE 5: UWGB Student Origin Mean Centers and Standard Distances, 1980-2010

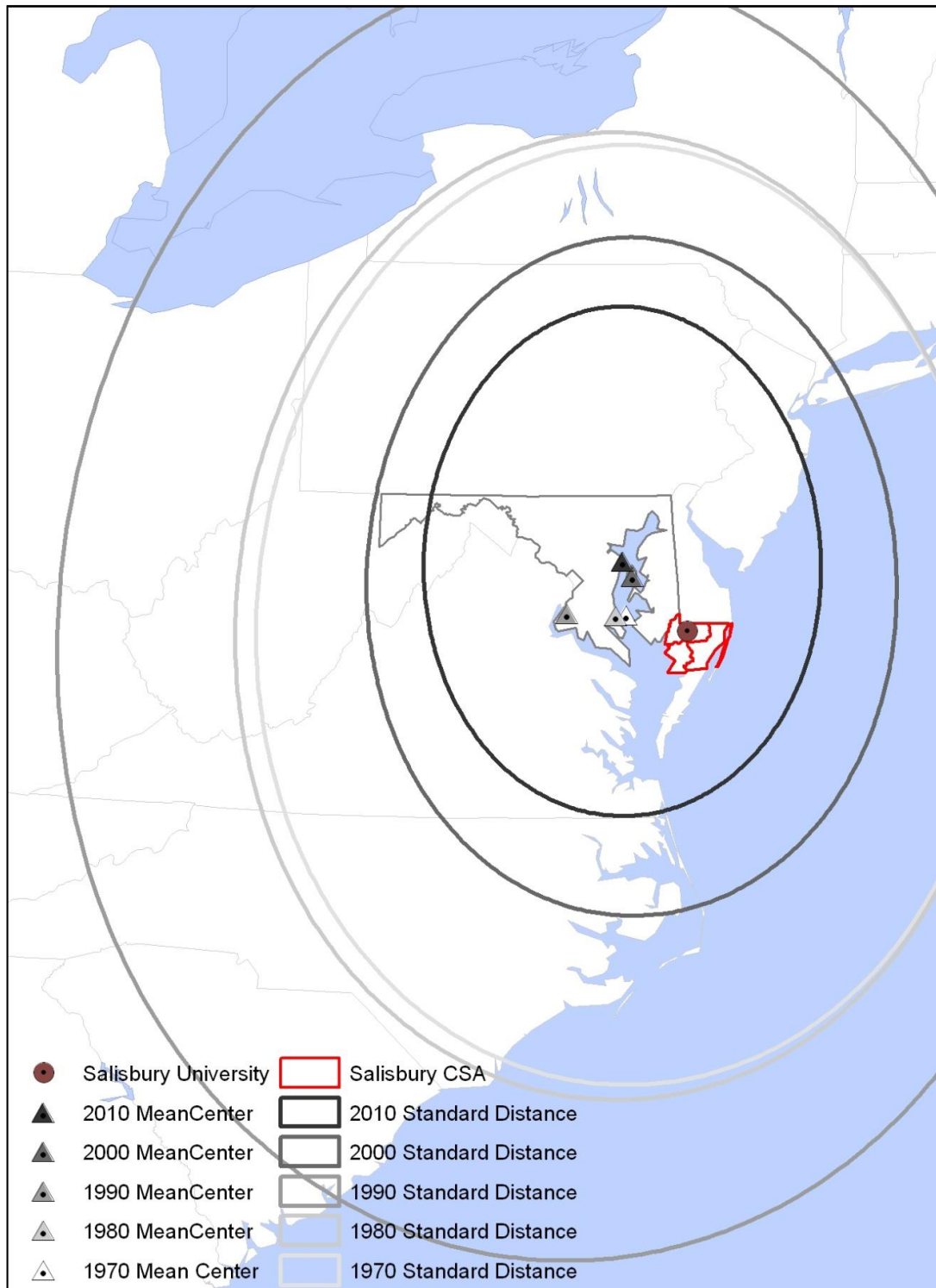


FIGURE 6: Salisbury University Student Origin Mean Centers and Standard Distances, 1970-2010

state enrollment. Finally, UWGB draws much more heavily from its immediate metropolitan region than does Salisbury, with both having a lesser proportion from these more immediate regions over time. Therefore, both institutions have increased enrollment while at the same time drawing less from their immediate metropolitan areas and more from other nearby states.

Results: Health Care Location Patterns

Regarding land use, Green Bay and Salisbury have seen robust growth in health care facilities. Utilizing telephone directories for both cities for the years 1971, 1980, 1990, and 2010, we mapped standard distance ellipses and mean centers of physician offices for both cities for each decade (Figures 7 and 8). Both cities experienced a dramatic increase in their standard distances as the number of physicians and their facilities expanded in both time and space. For Salisbury, the standard distances grew more dramatically and has a specific directional orientation, with the mean center tracking east into Worcester County along the Atlantic coast where many retirees have moved to in recent years. Indeed, Worcester County has a large percentage of population age 65 and older (22.9%) versus the City of Salisbury (11.1%) and the counties of Somerset (14.1%) and Wicomico (13.3%). With the exception of Salisbury city, each of the counties' population age 65 and older is larger than the state average for Maryland (12.5%). Further, Worcester County's population age 65 and older grew at a faster rate (2.8%) over the previous decade than the

state average for Maryland (1.1%). In Green Bay, the mean center does not move much at all even as its standard distances increased to encompass most of the MSA. Two of the Green Bay MSA's counties, Oconto to the north and Kewaunee to the south, have higher percentages of population age 65 and older (16.2% and 17%, respectively) than the City of Green Bay (11.3%) or the state average for Wisconsin (13.9%).

Discussion and Conclusion

Perhaps the most interesting phenomenon is that both cities have very different economic traditions, with Green Bay largely a manufacturing town dominated by paper and meat packing, and Salisbury as an agricultural community dominated by poultry and its processing. However, both of these regions currently are quite similar in terms of employment by sector. In both cities, the growth of Educational and Health Services account for a bulk of the growth in Service-providing industries, while manufacturing declined to the same proportional level of total employment. So, in two metropolitan areas, in different states, with very different cultural, political, and economic histories, the economic restructuring of the last thirty years has shaped these economies in very similar ways.

In Salisbury, evidence of the region's transformation towards Eds and Meds is apparent in the urban landscape. Poultry still dominates with thousands of acres of surrounding rural lands dedicated to chicken houses, chicken feed, processing facilities, and other related activities, but

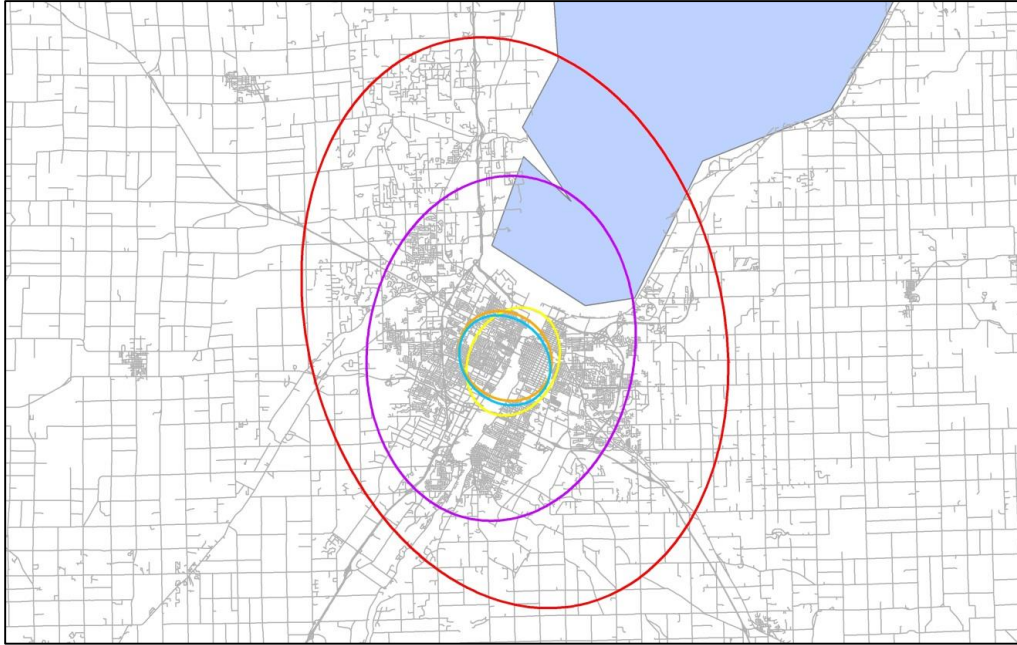


Figure 7: Mean Centers and Standard Distances, 1970-2010, of medical facilities in Green Bay MSA.

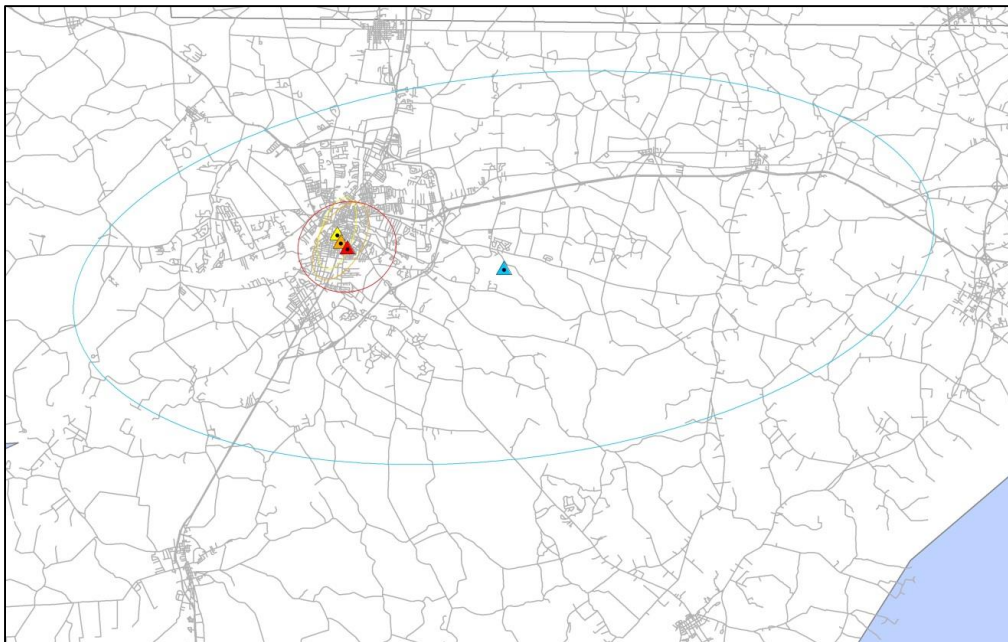


Figure 8: Mean Centers and Standard Distances, 1970-2010, of medical facilities in Salisbury CSA.

in the city of Salisbury, growth in the health care and higher education sectors is apparent as health care facilities in particular dominate urban land uses. PRMC is currently the region's largest employer, and its sprawling (and busy) campus looms astride the city's fledgling downtown. Medical facilities including doctor's offices, dental offices, walk-in clinics, and various specialized treatment centers meanwhile are located around the sprawling PRMC campus and beyond. However, unlike other cities – for example, Atlanta (Kelley & Patton 2005; Stone 1989), Akron and Cleveland (de Socio 2012, 2010, 2007), Pittsburgh (Adams 2003), Buffalo (Carlson 2009), and others – Salisbury's municipal government appears to be largely *laissez-faire* given the sprawling nature of health care facilities away from the city center. Indeed, while the growth in the number of physicians and their facilities in the Salisbury region has been steady since 1971, growing at an astonishing rate of 104% decade-over-decade (or 442% since 1971), much of that growth has tended to be located in more suburban settings and along major arterial roadways. The newest facilities are mostly located along U.S. Route 50, the main thoroughfare running east-west through Salisbury and linking the Baltimore-Washington area to the Atlantic coast, and in towns farther east along U.S. 50 in Worcester County, home of the region's largest and growing community of retirees (Figure 8). Other facilities are clustered near Salisbury University, although growth of that institution has forced some physician offices to relocate as the university assumed control over facilities adjacent to its growing campus.

Salisbury University, meanwhile, has physically grown along with its growing student population. First established in 1925 as a one-building state normal school for the training of teachers for Maryland's Eastern Shore, the one-building campus was surrounded primarily by farmlands. Since then, the city itself has largely grown up around it with commercial, industrial, and residential developments surrounding the campus. However, as manufacturing declined vis-à-vis service industries like health care and higher education, the Salisbury University campus has grown to incorporate adjacent properties previously occupied by industrial and commercial land uses. In more recent decades, the university has grown to encompass 140 acres (and counting), including the absorption of three separate physician office complexes, a former gasoline pump production facility, a plumbing firm facility, a warehouse, and other former land uses previously adjacent to campus. In the last three years alone, the university built more than 507,000 square feet of lecture halls and student housing. The land uses off-campus but surrounding the campus are consequently in a state of flux. Land uses surrounding the growth areas of the Salisbury campus are currently transitioning away from automobile service garages and other non-student-oriented businesses into facilities aimed primarily at the student market – facilities like restaurants, boutique shops, sporting goods stores, and the like. Indeed, the steady growth of the university – and of physicians and health care facilities – has led both PRMC and Salisbury University to become among the top three employers in the region.

In Green Bay, a more urbanized and industrialized landscape than that of Salisbury, Eds and Meds have likewise grown in importance. As its manufacturing base declined, Eds and Meds experienced the opposite, both growing steadily (if less dramatically than Salisbury). Health care has had the greater impact in both cities, but like Salisbury, much of the impact in Green Bay is not confined to the city's downtown. Green Bay is home to four major hospitals – the St. Vincent and Bellin Hospital complexes adjacent to the city center, St. Mary's Hospital located in the city's western suburbs, and the newer 167-bed Aurora BayCare Medical Center (opened in 2001) located on Green Bay's eastern flank along I-43, with multiple physician offices and facilities located near each hospital. UWGB, meanwhile, is located in suburbs northeast of the city along the shores of Green Bay. Established in 1965, the campus occupies a sprawling suburban campus of more than 700 acres northeast of the city of Green Bay with much green space and room for on-campus growth without needing to spread into the suburban and rural properties adjacent to campus (Austrian & Norton 2005; Brown 1990). And while the student population of UWGB is growing steadily, its pace of growth is far less than that of Salisbury University. Consequently, UWGB's greater isolation and slower growth than Salisbury University means less of an impact on surrounding land uses.

None of the hospitals or universities in either Green Bay or Salisbury are especially research-focused. The hospitals are largely community hospitals serving their local regions. And yet they are each

at the center of a growing health care sector in both cities as they act more as export industries with patients increasingly drawn from outside of their market areas. Likewise for the universities: neither UWGB nor Salisbury University is a research-focused institution. UWGB's Carnegie classification is "Master's S: Master's Colleges and Universities (smaller programs)," and Salisbury's classification is "Master's L: Master's Colleges and Universities (larger programs)" – both designated in a classification entirely separate from research-focused institutions. In other words, UWGB and Salisbury University are primarily teaching-focused institutions. Yet their impacts in both cities are profound in terms of employment stability and growth, in the growth of their student enrollments and in the distances from which students are drawn – and, in the case of Salisbury University, the physical growth of its campus and its subsequent impacts on adjacent land uses.

In summary, institutions of health care and higher education are increasingly recognized as important contributors to regional economic development, particularly as the United States continues to transition from an older industrial-based economy towards a service-based high-technology 'creative' economy (Florida et al 2006). Most studies focus primarily on research-based universities and hospitals, and also on larger cities; indeed, there is a dearth of research examining the importance of teaching-focused institutions of higher education and service-based community hospitals to the regional economies of smaller U.S.

cities and regional centers. By examining longitudinal employment data, student enrollment patterns, and locational patterns of health care facilities in two small cities – Green Bay, Wisconsin, and Salisbury, Maryland – this study traces the growing spatial importance of ‘Eds and Meds’ to the regional economies of two small cities with vastly different economic histories. Hence, there is more to the story of Eds and Meds than large institutions and the research monies they generate. Rather, this study suggests that structural changes in the wider economy are at work in which the health care and higher education sectors play particularly prominent roles in cities large and small (see, for example, Bell & Jayne 2009). While this study is a first step, clearly more research needs to be done to explore the roles and impacts of Eds and Meds on the regional economies of small cities.

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