Middle States Geographer, 2012, 44:9-17

THE DYNAMIC HINTERLAND OF NEW YORK CITY: THE TRANSITION FROM FARMING TO WATERSHED PROTECTION AND RECREATION IN DELAWARE COUNTY, NY

Claire Jantz
Department of Geography-Earth Science
Shippensburg University
1871 Old Main Dr.
Shippensburg, PA 17257
E-mail: cajant@ship.edu
Phone: 717-477-1399
Fax: 717-477-4029

Abstract: *Delaware County, New York is located roughly 150 miles from New York City and is within the Upper Delaware River Basin. The northern part of the Basin, and roughly two-thirds of Delaware County, comprise the Catskill/Delaware watersheds, which provide clean drinking water to half the population of New York State. Delaware County's landscape reflects a unique and dynamic core-hinterland relationship. Delaware County and New York City once exhibited a traditional and tightly coupled system in terms of their economic interdependency, where timber and farm production (primarily dairying) formed the basis of the hinterland economy. These economic relationships changed as New York's economy and markets globalized, leaving the farming economy in Delaware County faltering. At the same time, New York began to form new relationships with its hinterland that focus on ecosystem services (water supply and recreation), creating an ecologic and economic interdependency. Delaware County stands out from other rural counties in the region because of its large role in source water protection. The primary objectives of this study are to 1) understand how the core-hinterland relationship between New York City and Delaware County has evolved within the regional context of the Upper Delaware River Basin; and 2) demonstrate the shift in this relationship using historical data and a regional approach. Trends in agriculture, seasonal housing, and commuting patterns show that the relationship between Delaware County and New York City has fundamentally changed during the 20th century. At the beginning of the century, Delaware County's agricultural industry was strong, providing primarily dairy products to the largest urban market in the United States. By mid-century, Delaware County's dairy economy was in decline and the relationship between the city and the county is now almost wholly based on the county's provision of clean drinking water and, to a lesser extent, recreational resources to the city.*

Keywords: *Delaware County, New York; ecosystem services; water supply; hinterland*

INTRODUCTION

Delaware County, NY lies on the northwestern fringe of the New York City metropolitan area. Located roughly 150 miles from the city, Delaware County has long served as a critical hinterland area for New York City, but this core-hinterland relationship has been dynamic over time. For example, Delaware County's economy was once dominated by the dairy industry (in 1933 it was the nation's third largest dairy producer) and New York City was its primary market. Today, the dairy industry has been marginalized and Delaware County's primary role with respect to New York City is one of watershed protection and outdoor recreation. These profound economic changes in Delaware County, and the county's new role as a provider of ecosystem services to the city, have implications for contemporary trends in landscape patterns, economic activities and demographic characteristics.

The primary objectives of this study are to 1) understand how the core-hinterland relationship between New York City and Delaware County has evolved within the regional context of the Upper Delaware River Basin; and 2) demonstrate the shift in this relationship using historical data, primarily from the U.S. Census.

REGIONAL STUDY AREA: THE UPPER DELAWARE RIVER BASIN

The Upper Delaware River Basin lies at the intersection of New York, New Jersey and Pennsylvania. It has two National Park Service Units (the Upper Delaware Scenic and Recreational River and the Delaware Water Gap National Recreation Area), which along with many state and privately owned recreational lands—most notably the

Catskills Park—has made this area an attractive destination for residents of the New York City metropolitan region. There are four main counties in the Basin: Delaware and Sullivan in New York and Pike and Wayne in Pennsylvania (Figure 1).

The northern part of the Basin also encompasses the watersheds referred to as the Catskill/Delaware watersheds, which provide clean drinking water to half the population of New York State: eight million in New York City, one million in upstate counties, plus all the commuters and tourists in the region. New York City's Catskill/Delaware System is one of the largest unfiltered surface water supplies in the world, and is closely monitored by both the City and the federal Environmental Protection Agency (EPA) (New York City Department of Environmental Protection 2011a). In fact, New York City has received a waiver, or Filtration Avoidance Determination (FAD), from the EPA, which usually requires that drinking water from surface water sources must be filtered to remove microbial contaminants. By focusing conservation efforts and funds in the Catskill/Delaware watersheds, New York City avoids the construction of a costly filtration plant, estimated to cost $4 – $8 billion with an annual operating expense of $200 - $300 million (Landers 2002).

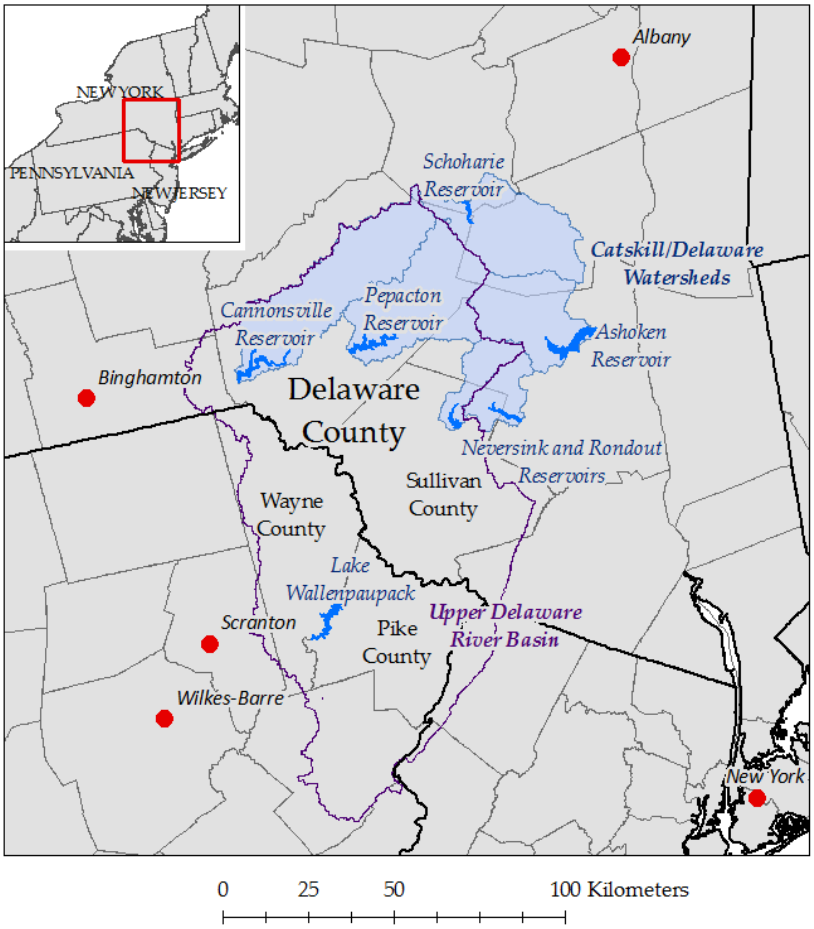

Figure 1: Location of Delaware County within the Upper Delaware River Basin (outlined in purple). The Catskill/Delaware watersheds are also shown in light blue, along with major reservoirs in the region.

A key component of New York City's water supply system is a series of reservoirs that were constructed between 1915 and 1965. The eastern reservoirs were the first to be built (Ashoken, Schoharie, Neversink and Rondout) and the Pepacton and Cannonsville reservoirs were added later, completed in 1949 and 1965 respectively. In Delaware County, the construction of the Pepacton and Cannonsville reservoirs was extremely contentious as it

involved the exercise of eminent domain powers by New York State, submersion of nine communities, and the relocation of hundreds of residents (Glenna 2010; Duerden 2007). In the decades since the construction of the reservoirs, tensions still exist between the County and the City (Glenna 2010); some compensation claims for real estate and business losses due to the construction of the reservoirs were resolved as late as the early 1990s (Duerden 2007).

In broad terms, population growth trends over the past century mirror regional and national trends in industrialization, deindustrialization, and post-World War II urban sprawl. As seen in Figures 2 and 3, changes in population and population density for counties in the region between 1900 and 1950 show the growth of the industrial cities of Binghamton, NY in Broome County, Scranton, PA in Lackawanna County and Allentown, PA (adjacent to Northampton County) and an influence of New York City's metropolitan expansion in the southeast, as evidenced in Orange County, NY. Declines are noted in Pike, Wayne, and Delaware counties between 1900 and 1950 as the farm economies there diminished. Trends between 1950 and 2000 highlight the decline of the industrial economies of Binghamton, NY and Scranton, PA and the suburban boom related to the expansion of the greater New York City metropolitan area, which spurred rapid growth in the southern counties of the study region, especially Orange County, NY.

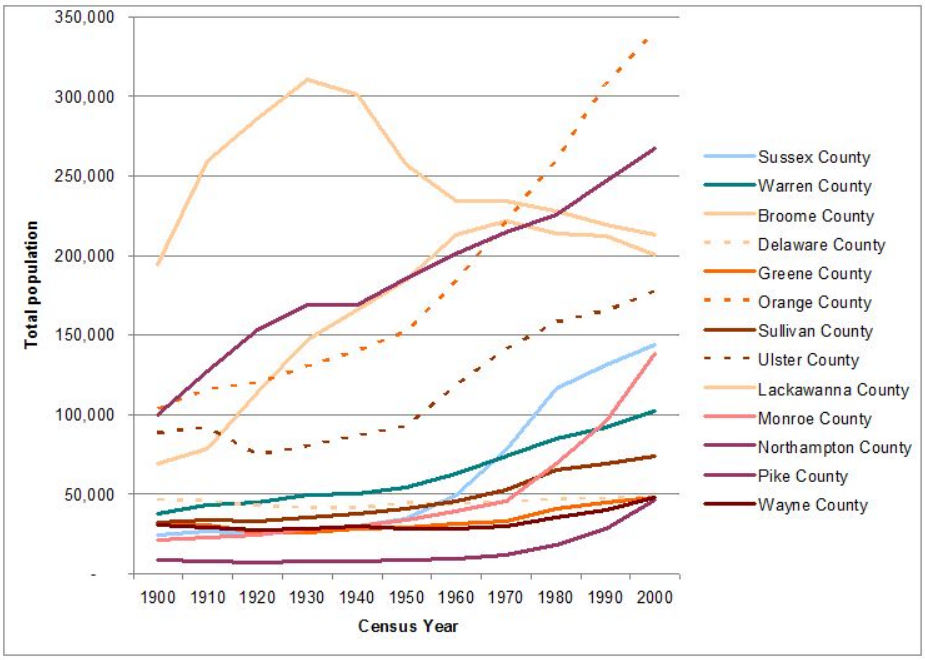

Figure 2: Changes in total population 1900 – 2000 for counties in the region. Source: GeoLytics Inc (2001)

In recent decades, Delaware County stands out from the other three primary counties in the basin due to its slow growth. In fact, Delaware County has lost population since 2000, with most of those leaving being in the 20-35 year age range. Delaware County's demographic structure is now top-heavy, dominated by the elderly and lacking a productive young work force (Downeast Development Consulting Group 2009).

Nearly two-thirds of the county comprises the watershed protection area for the City's water supply (Duerden 2007). Within these watersheds, development, agricultural and recreational activities are tightly regulated, but the City provides economic assistance to compensate for the increased land-use regulations, in accordance with the Catskill Watershed Memorandum of Agreement (MOA) (Pires 2004). The MOA was adopted in 1997 and incorporates multiple stakeholders in watershed management, including the EPA, New York City, and municipalities within the Catskill/Delaware watersheds. The MOA remains controversial locally, but it was the involvement of local stakeholders that encouraged New York City to adopt economic assistance programs in order to share the economic costs of watershed management (Glenna 2010). The City now invests millions of dollars in

the watersheds on efforts that include land acquisition, upgrading of municipal water treatment facilities, septic system replacements and repairs, and support for businesses that are compatible with watershed preservation (Hoffman 2008).

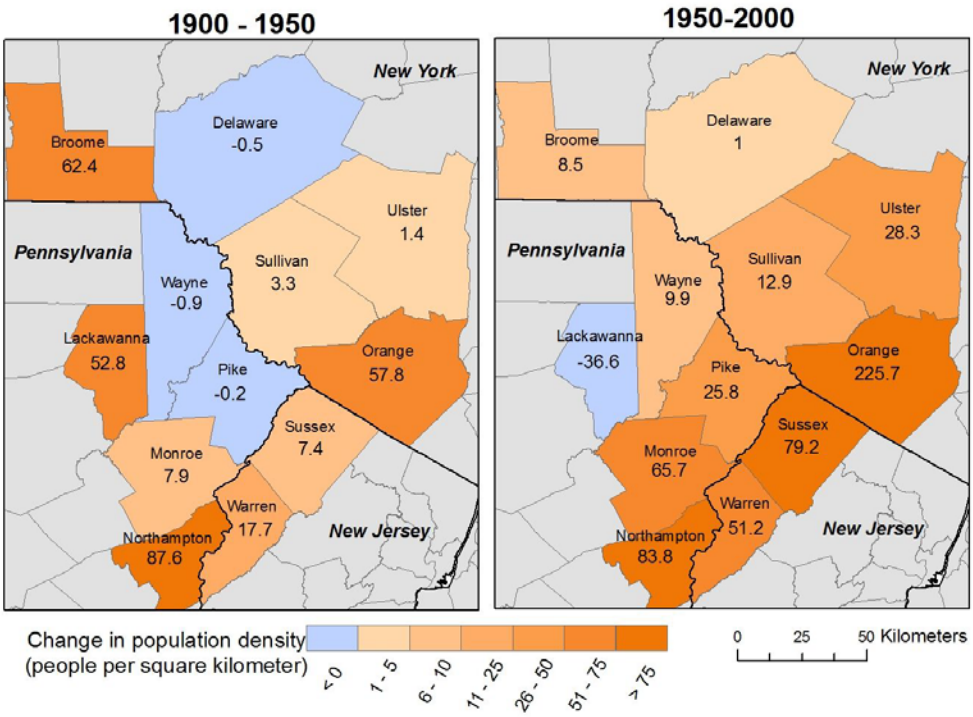

Figure 3: Changes in population density between 1900 and 1950 (left) and 1950 and 2000 (right) for the counties in the region. Source: GeoLytics Inc (2001)

A HISTORY OF DELAWARE COUNTY'S RELATIONSHIP TO NEW YORK CITY

An overview of the history of this county will inform an understanding of Delaware County's functional relationship with New York City. Delaware County was formed in 1797, after the end of the Revolutionary War, and its history is probably not unique for a frontier county near a growing urban center (Rasmussen 2009). Initial economic activity was related to resource extraction, in this case timber, but Delaware County soon became known for its dairy production, opening the nation's first pasteurization plant in 1892 and becoming the nation's third largest dairy producer by 1933 (Duerden 2007). This growth in the dairy industry was directly related to Delaware's proximity to the enormous market for these products in New York City's. Early advancements in transportation, such as turnpikes and rail, strengthened connections to the city. During this time Delaware County's economy reflected a classic and mutually beneficial core-hinterland relationship.

By the 1950s, Delaware County's function began to change. Dairy farming moved west (Duerden 2007; Rasmussen 2009) and at the same time, the area's role in protecting New York City's water supply was realized, resulting in the construction of the reservoirs, stronger protection of land, and, eventually, the Catskill Watershed Memorandum of Agreement (MOA). This represents a major shift in terms of core-hinterland relationships and put Delaware County on a different trajectory from its neighbors in the Upper Delaware Basin. Below, evidence drawn from data showing the continued decline of agriculture, patterns in seasonal housing, and regional commuting patterns highlight this shift and the uniqueness of Delaware County.

Decline of Agriculture

Agriculture, which was once the foundation of Delaware County's economy, is showing signs of continued decline. Individuals involved in farming, forestry, and fishing occupations dropped from 1,296 in 1990 to 939 in 2008 (U.S. Bureau of the Census 1990; U.S. Bureau of the Census 2010). The number of farms decreased from 788 in 2002 to 747 in 2007. Average farm size also decreased. Dairy remains the strongest agricultural sector, but Delaware County now ranks 210th nationally in terms of dairy production (U.S. Department of Agriculture 2007). Hoffman (2008) refers to the contemporary economy of the New York City watersheds as a "thin market economy" (p. 145). In 2003, over half of the jobs were in the low wage service industry sector and most local businesses were small.

In terms of watershed protection, agriculture is one of the preferred land uses and comprises about 1/3 of the county's land area (Irani and Claggett 2010). Aside from restrictions on the use and application of pesticides, herbicides, and fertilizer, agriculture is not as tightly regulated as land development (City of New York 2010). However, the New York City Department of Environmental Protection heavily invests in land owner education programs, riparian management programs, farm planning, and conservation easements through the Watershed Agricultural Council (Watershed Agricultural Council 2012).

Patterns of Seasonal Housing

The tourist industry in Delaware County in the nineteenth and early twentieth centuries was small but present, offering "sweltering city residents pure air, cool climate, picturesque scenery, shady groves, fine drives, hunting and trout fishing and boating" (Thomson, quoted in (Duerden 2007, 88). In regional terms, the Catskills has long been a tourist destination for New Yorkers. The late 19th and early 20th centuries represent the height of famous Catskills resorts in the Hudson Valley, such as the Mountain House, Hotel Kaaterskill, Laurel House and the Grand Hotel. These resorts catered to wealthy New Yorkers, who came to the Catskills to enjoy the impressive scenery in accommodations that catered to urban tastes (Stradling 2008). Stradling (2008) points out that this early tourist economy created strong cultural, social, and economic ties between the Catskill natives and the city that remain strong today.

While the early tourist industry relied on trains and early automobiles, as road networks were improved and cars became the primary mode of travel, the Catskills have become "a suburb of New York" (Stradling 2008). This is particularly evident in the southern part of the study region (Figure 3). Building on this trend and the attraction of amenities, Delaware County is becoming an area of second homes for New Yorkers.

It's possible that this trend is intensifying. As Delaware County's resident population decreases, housing units are increasing, with almost 30% of the housing units in the county being utilized as seasonal/vacation homes. While this county-scale statistic indicates the potential strength of the tourist economy in Delaware County, spatial patterns of seasonal housing at the regional scale show a different perspective. In Figure 4, housing unit density for U.S. Census tracts in 2000 is shown on the left and seasonal housing unit density is shown on the right. In terms of housing unit density, across the Catskill/Delaware watersheds it is low, with less than 25 housing units per square kilometer. Housing unit density is highest in the southeast in the areas closest to New York City. Seasonal housing unit density highlights a swath that runs from the southwest to the northeast (Figure 4).

These patterns reflect the regional evolution of tourism in the Catskills. The slightly higher densities of seasonal housing in Greene and Ulster counties indicate the remnants of the Victorian tourist era centered on the Hudson River and the town of Woodstock, NY. This area is also the heart of the Catskills Park and more recently this region has become known for its winter ski resorts, such as the Belleayre Ski Center. In central Sullivan County, between the towns of Liberty and Monticello, high densities of seasonal housing are connected to the area of the Catskills known as the "Borscht Belt," bungalow resort colonies established in the 1940s, 50s and 60s by the Hasidim, a Hasidic Jewish sect rooted in New York City (Stradling 2008). In the southwestern section of the study area, more recent seasonal housing communities have developed around the many lakes in this region. Lake Wallenpaupack at the border of Pike and Wayne County is one of the most striking examples of this. Comparatively speaking, seasonal housing densities within the New York City watersheds are minimal.

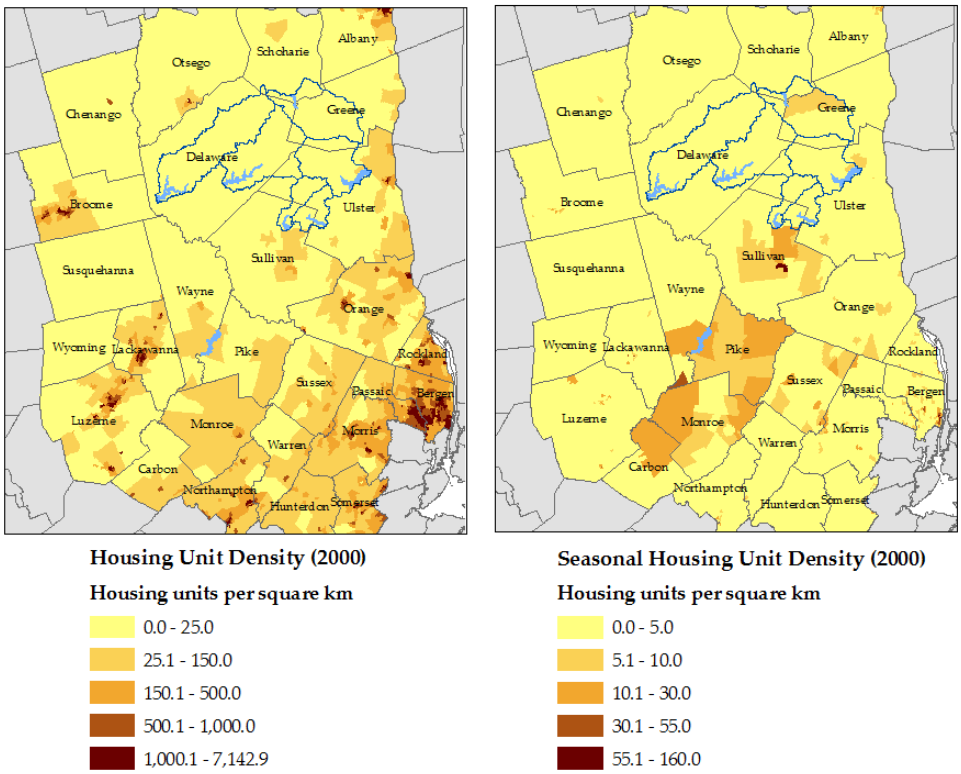

Figure 4: Housing unit density (left) and seasonal housing unit density (right) in 2000. Source: U.S. Bureau of the Census (2000)

This regional perspective on seasonal housing highlights some important points with respect to Delaware County's functional relationship to New York City. The relatively high proportion of seasonal housing indicates the presence of a tourist economy that is focused on outdoor recreation. As Hoffman (2008) points out, this is an important and growing sector in Delaware County and is driven primarily by the New York City market. At the same time, by observing seasonal housing unit patterns at the regional scale, there may be some justification to the local concern that the regulations pertaining to land use and recreation are preventing Delaware County from developing its tourism base as fully as some of its neighboring counties (Pires 2004; Glenna 2010). While recreational tourism is one of the economic activities deemed compatible with watershed protection in the MOA (Pires 2004), from the perspective of water quality preservation, limiting seasonal housing development is viewed as important (Germain, Brazil, and Stehman 2006). Indeed, there are strong restrictions on development within the New York City watersheds in order to minimize impacts on water resources. For example, no septic systems or new impervious surfaces are allowed within 100 feet of a stream or within 300 feet of a reservoir or reservoir stream (City of New York 2010). These points highlight the fact that Delaware County's current functional relationship to New York City is complex, perhaps more so than other counties in the region, since so much of the county is devoted to watershed protection while, at the same time, there is a growing focus on the role of recreational tourism. While these two functions may at first glance seem to be compatible, there are in fact many opportunities for competition and conflict.

Regional Commuting Patterns

Another indicator of the functional shift in Delaware County's relationship to New York City can be observed in changes in commuting patterns. In this case, using the Census Bureau's journey to work data set (U.S. Bureau of the Census 1980; U.S. Bureau of the Census 2000), commuter flows in and out of Delaware County to the surrounding adjacent, non-metro municipalities, and to the adjacent metropolitan and micropolitan areas can be observed between 1980 and 2000.

As expected, the bulk of workers live and work within Delaware County, but there are some significant changes in commuting patterns. One important observation is that between 1980 and 2000 fewer people are staying in the county to work (60.3% in 1980 vs. 55.3% in 2000), indicating a decentralization of Delaware County's job base. Also in this time period, the adjacent micropolitan area of Oneonta receives the highest flows, and its role intensifies between 1980 and 2000 (6.7% in 1980 vs. 11.1% in 2000), along with that of New York City's (1.2% in 1980 vs. 3.6% in 2000), at the expense of other counties (Table 1). In terms of worker flows into the county, it is relatively balanced with workers coming in. Again, Oneonta's role is important, as is the role of adjacent non-MSA counties, for sending in workers. It is interesting to note that in 1980 the New York metropolitan area only comprised 0.3 % of incoming workers and by 2000 this share had risen to 1.9%. While this makes up a small share of incoming commuters, the findings related to commuting connections to New York City are consistent with other research that has found New York City's economic influence across the metro and near-metro region is increasing (Bram and McKay 2005).

Table 1: Summary of commuting flows in and out of Delaware County for 1980 and 2000. In 1980 there were 22,398 total workers and 26,023 total workers in 2000. Sources: U.S. Bureau of the Census 1980 and 2000.

	Workers coming in to Delaware County (% of total)		**Workers leaving Delaware County (% of total)**	
Destination	**1980**	**2000**	**1980**	**2000**
Albany-Schenectady-Troy, NY	2.2	2.8	0.7	1.3
Bingham, NY	2.6	2.9	2.0	3.0
Kingston, NY	0.2	0.6	0.9	2.2
New York-Northern New Jersey-Long Island, NY-NJ-PA	0.3	1.9	1.2	3.6
Oneonta, NY	9.1	9.2	6.7	11.1
Poughkeepsie-Newburgh-Middletown, NY	0.1	0.2	0.3	0.5
Scranton-Wilkes-Barre, PA	0.0	0.0	0.0	0.1
Adjacent non-MSA counties	10.2	9.8	3.4	5.2
Other	1.0	1.3	8.6	2.1

CONCLUSIONS

Given this historical analysis and recent trends in Census variables, there is ample evidence to show that Delaware's functional role with New York City has fundamentally changed during the 20th century. At the beginning of the century, Delaware County's agricultural industry was strong, providing primarily dairy products to the largest urban market in the United States. By mid-century, Delaware County's dairy economy was in a steep decline and the relationship between the city and the county is now almost wholly based on the County's provision of clean drinking water and recreational resources to the City. The population decline and economic decline that Delaware County is still experiencing must be at least partly due to the changes in these economic relationships.

An underlying question is the extent that watershed protection contributes to the economic stagnation in Delaware County. Some local residents argue strongly that the regulations applying to recreation and land use are burdensome enough to stifle the tourist economy (Duerden 2007). For example, along with restrictions on land development as noted above, boating on the reservoirs is permitted in designated areas for fishing only and anglers must have their boats approved and registered with the New York City Department of Environmental Protection. In addition, their boats must be steam cleaned by the DEP prior to use in a reservoir (New York City Department of Environmental Protection 2011b).

Large development projects to enhance tourism in the Catskills spark heated debates between environmental groups and groups supporting economic development. The proposed Belleayre Resort at Catskill Park in Shandanken (Ulster County), NY is one recent example. Located just inside the New York City watershed boundaries and adjacent to the Belleayre Ski Center, the project as originally proposed in 2003 entailed the development of almost 600 acres and would have included hotels, spa facilities, golf courses, expanded ski facilities, and residential subdivisions (Crossroads Ventures 2011). This project represents millions of dollars of private

investment funds, increased tax revenues, and multiple employment opportunities ranging from construction jobs to spa therapists. However, due to widespread criticisms centered on environmental concerns the development corporation, Crossroads Ventures, has dramatically downscaled their proposal (Crossroads Ventures 2011) and has recently transferred ownership of nearly 1,200 acres, nearly 61% of their 2003 landholdings, to the state for permanent preservation as part of the Catskills Park (Navarro 2011). These modifications were made as part of an Agreement in Principle, which resulted from negotiations between Crossroads Ventures, the State of New York, the New York City Department of Environmental Protection, and several environmental groups, such as the Natural Resources Defense Council, Trout Unlimited, and Riverkeeper (Agreement in Principle 2007).

Proponents of economic development in Delaware County have watched the Belleayre Resort debate with interest and concern, especially given the announcement in 2007 that the City was initiating a 10-year, $300 million land acquisition plan (LAP) as part of its 2007 Filtration Avoidance Determination (FAD). Given that roughly two-thirds of Delaware County's area is part of the New York City watersheds, the County funded an impact assessment to investigate how the LAP might affect the County's economic development prospects (Downeast Development Consulting Group 2009). The findings generally confirmed the concerns in Delaware County. If the LAP is fully implemented, the County could experience a loss of nearly 600 jobs in the natural resource based industry (i.e. mining) and affiliated manufacturing sectors. Growth of jobs in tourism would offset these losses to a certain extent, but the authors point out that these are typically lower-wage employment opportunities and would be contingent on a broadening of recreational activities on the reservoirs beyond what is currently permitted. Furthermore, the impact assessment notes a potential for a scarcity of developable land parcels, inflated land values, and decreased real estate tax revenue.

Despite these issues Hoffman (2008) found evidence that the investments that New York City has made since the 1997 MOA, including grants for small businesses, have had a net *positive* impact on the economies of the New York City watersheds. This finding does not negate concerns expressed by local stakeholders, however, since watershed protection regulations have been in place and influencing Delaware County's economy and landscape since the middle of the 20th century. Furthermore, Delaware County holds a unique place within the region, since so much of its land area is given over to watershed protection. Overwhelmingly, the role of watershed protection seems to define the interconnections between the County and the City.

ACKNOWLEDGEMENTS

I would like to thank the National Park Service and Delaware County for funding research related to the issues addressed in this paper, research that eventually led me to explore these issues in more detail. I would also like to thank the anonymous reviewers who provided many helpful comments on an earlier draft of this manuscript.

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