Economic Indicators Report

Prepared for: The Washington Coastal Marine Advisory Council

Prepared by:
Kevin Decker

Sea Grant
Washington

Table of Contents

Marine Spatial Planning

Marine Spatial Planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine environments to achieve ecological, economic, and social objectives. The goals of the plan are to protect existing uses, protect cultural uses and resources, preserve the environment, integrate the plan into existing decision-making, and provide new economic opportunities. As part of the MSP process, Washington Sea Grant (WSG) is developing economic indicators to measure a wide range of important factors associated with human economic wellbeing and the health of regional economies.

Economic Indicators

When it comes to economic indicators, there is no single number that provides a comprehensive measure of a region's economic health or addresses all of a community's concerns. To answer questions about economic health, it is typically necessary to evaluate multiple economic indicators that help you to understand different pieces of the economy. By looking at all of the pieces together, you can begin to develop a more comprehensive assessment of the economic health of the region. It is also important to go beyond just the numbers and to understand the history and the stories behind the numbers. It is important to make comparisons across similar communities to increase the legitimacy of the analysis. Tracking changes over time is also important to understand the direction of change, the degree of change, and to compare changes over time. Economic indicators can be a useful tool, but only if you look at the whole story. There are many different types of economic activity that depend on the resources of the oceans, so it is often asked if one kind of activity is more important than another. It depends, some economic sectors, like tourism, create lots of jobs. However, this figure can be misleading because jobs are often measured in terms of employment. In commercial fishing, about half of the workers are self-employed and these workers don't show up in the data on employees. Other sectors, like offshore oil and gas aren't as impressive in terms of jobs, but the workers tend to have higher incomes. Trying to squeeze too much information out of one or two indicators can also give you the

wrong idea about the importance of an industry. Many indicators that help to complete the story of a region may not necessarily appear to be economic at all, but are more social in nature. This makes sense since economics is a social science and does not exist in a vacuum. It is important to capture all of these indicators so that the complete story is captured. The economy is made of lots of small pieces, and they are all important. No single number can tell the whole story. Economic indicators can be helpful, but it is important to assess lots of different information if you really want to understand the economy. A number of indicators determine the economic health of a place. No single indicator should be used by itself. Rather, a range of indicators should be analyzed together to get a comprehensive view of the economy.

Methods

In order to determine the appropriate economic indicators that measure the economic health of a region, multiple steps were taken. A review of the literature was completed to determine the measures most frequently used and referenced in textbooks, peer reviewed journal articles, and popular internet sites. Interviews were held with local economic development council (EDC) directors and a list was requested from them of currently used measures. A comprehensive list was developed from these resources and consolidated to remove redundancy.

Defining your Region

Defining the region under analysis is extremely important to an economic analysis. Goods and services that are bought outside of the region are considered imports and goods and services sold outside of the region are considered exports. If an industry purchases a large amount of their supplies from a neighboring community, and that community is considered outside of the study region, then those purchases are considered imports and that could have a profound impact on the overall analysis. Larger populations and communities tend to be more diverse and have larger multipliers (defined later) than smaller, less populated areas. This is important to understand when you are comparing your region to other

regions. For some measures, such as population, it is easy to evaluate at different scales such as city, county, state, etc. For other measures this becomes more difficult and is often not available below a certain scale, or accuracy is compromised. In economics, it is common to define the region under study at the county level or larger.

A list of top indicators is provided for convenience. These indicators provide a snapshot from a spectrum of categories to provide as simple, yet relatively comprehensive analysis of a community. These indicators may provide insight into characteristics about the community that should be explored in more detail to understand underlying causes. The list is divided into 5 categories of indicators: (1) Demographic, (2) Housing, (3) Employment, (4) Labor Earnings, and (5) Competitiveness.

Top Indicators

1) Gross Regional Product
2) Month-to-Month Unemployment
3) Per Capita Income
4) Job Diversity
5) Poverty Rate

Demographic Indicators

Population Change

Long-term steady growth of a population is generally an indication of a healthy prosperous economy. Erratic growth, no-growth, or long-term decline in this indicator is generally an indication of a struggling economy. Population should be tracked over time and compared against similar regions.

MEASURES: Total number of people, percent change in population.
INTERPRETATION: An increase in population indicates a positive change in economic wellbeing.

SOURCE: US Census Bureau – American Community Survey, table DP05 Demographic and Housing Estimates

Components of Population Change

The number of deaths, births, and migration to and from the area determines change in population. It is useful to understand these components because it offers insight into the causes of growth or decline in the population and can help bring attention to areas that need additional analysis. A region with a relatively high number of births is likely an area that is attractive to young families and an area with a relatively high number of deaths could be an indicator of a region that attracts retirees. Increases in population caused by people moving into the region indicate that it is attracting people from outside the region.

MEASURES: Births, deaths, in-migration, out-migration, percent natural change (births minus deaths), and net migration (in-migration minus out-migration). All measure can be assessed year over year and as an average.
INTERPRETATION: Deaths, births, and natural change are neutral indicators. An increase in net migration indicates a positive change in economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table PEPTCOMP Estimates of the Components of Resident Population Change

Population Characteristics

Population characteristic indicators include variables such as age, race, and gender and provide insight into the composition of the community and help to provide a better understanding of the region.

MEASURES: Total number of people in each category, percent of people in each category.
INTERPRETATION: Theses measures are neutral indicators.
SOURCE: US Census Bureau – American Community Survey, table DP05 Demographic and Housing Estimates

Educational Attainment

Education is one of the most important indicators of the potential for economic success, and lack of education is closely linked to poverty. Studies show that geographies with a higher than average educated workforce grow faster, have higher incomes, and suffer less during economic downturns than other geographies. Educational attainment measures the highest level of education achieved for members of the population that are twenty-five years or older.

MEASURES: Total number of people at each level of education and percent of total population at each level of education.
INTERPRETATION: An increase in educational attainment is considered a positive change in economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table S1501 Educational Attainment

Educational Enrollment

Educational enrollment measures the population enrolled in school at different levels and can help predict what educational attainment might look like in the future.

MEASURES: Total number of people enrolled at each level of education and percent of total population enrolled at each level of education.
INTERPRETATION: An increase in educational enrollment is considered a positive change in economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table S1401 School Enrollment

Housing Indicators

Housing Cost as a Percent of Income

An important indicator of economic hardship is whether housing is affordable. This indicator measures housing affordability in terms of the share of household income that is devoted to mortgage and related costs (for homeowners) and rent and related costs (for renters). The income share devoted to housing that is below 15 percent is a good proxy for highly affordable, while the income share devoted to housing that is above 30 percent is a good proxy for unaffordable.

MEASURES: Number and percent of owner-occupied housing units with mortgage cost less than 15 percent of household income, number and percent of owner-occupied housing units with mortgage costs greater than 30 percent of household income, number and percent of renter-occupied units with gross rent less than 15 percent of household income, and number and percent of renter-occupied units with gross rent greater than 30 percent of household income.

INTERPRETATION: An increase in monthly mortgage cost and gross rent that is less that 15 percent of household income is considered a positive change in economic wellbeing. An increase in monthly mortgage cost and gross rent that is greater than 30 percent of household income is considered a negative change in economic wellbeing.

SOURCE: US Census Bureau – American Community Survey, table DP04 Selected Housing Characteristics

Housing - Occupied/Vacant

Vacancy status is an indicator of the housing market and provides information on the stability and quality of housing for certain areas. The data is used to assess the demand for housing, to identify housing turnover within areas, and to better understand the population within the housing market over time. These data also serve to aid in the development of housing programs to meet the needs of persons at different economic levels.

MEASURES: Number of units and percent of total units for occupied and vacant. Vacant should also be broken down into: for rent, rented but not occupied, for sale, sold but not occupied, seasonal recreational and occasional use, for migrant workers, and other.
INTERPRETATION: An increase in occupied units is considered a positive indicator of economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table DP04 Selected Housing Characteristics & table B25004 Vacancy Status

Building Permits

These numbers provide a general indication of the amount of new housing stock that may have been added to the housing inventory. Since not all permits become actual housing starts and starts lag the permit stage of construction, these numbers do not represent total new construction, but should provide a general indicator on construction activity and the local real estate market.

MEASURE: Number of building permits.
INTERPRETATION: An increase in the number of building permits is a positive indicator of economic wellbeing.
SOURCE: US Census Bureau – Building Permits Survey

Employment Indicators

Month-to-Month Unemployment Rate

There can be significant seasonal variations in unemployment. It is important to know how the unemployment rate has changed over time, whether there are periods of the year where the rate is higher or lower, and if this seasonality of unemployment has changed over time. Geographies that are heavily dependent on the tourism industry, for example, may show higher rates of unemployment during Spring and Fall "shoulder seasons." Places that rely heavily on the construction industry, for example, may have lower unemployment

rates during the non-winter months. Public land agencies sometimes provide seasonal employment and may have an effect on the local rate of unemployment.

MEASURE: Percent of people in the labor force that are unemployed.
INTERPRETATION: An increase in the unemployment rate is considered a negative indicator of economic wellbeing.
SOURCE: US Bureau of Labor Statistics – Local Area Unemployment Statistics (LAUS)

Average Annual Unemployment Rate

The rate of unemployment is an important indicator of economic wellbeing. It is the percentage of the total labor force that is unemployed but actively seeking employment and willing to work. The unemployment rate is considered a lagging indicator, confirming but not foreshadowing long-term market trends.

MEASURE: percent of people in the labor force that are unemployed.
INTERPRETATION: An increase in the unemployment rate is considered a negative indicator of economic wellbeing.
SOURCE: US Bureau of Labor Statistics – Local Area Unemployment Statistics (LAUS)

Change in Employment

Long-term, steady growth of employment is generally an indication of a healthy, prosperous economy. Erratic growth, no-growth, or long-term decline in this indicator is generally an indication of a struggling economy.

MEASURE: Number of individuals employed in the region.
INTERPRETATION: An increase in the number of individuals employed is considered a positive indicator of economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table DP03 Selected Economic Characteristics & US Bureau of Economic Analysis, table CA30 Economic Profiles

Components of Employment Change (wage/salary vs proprietors)

A high level of growth in proprietors' employment could be interpreted as a sign of entrepreneurial activity, which is a positive indicator of economic health. However, in some areas, particularly in remote rural areas, it is possible that a high proportion of self-employed is an indication that there are few jobs available. People may work for themselves because it is the only alternative and they may work for themselves in addition to holding a wage and salary job.

MEASURE: Number and percent of total wage and salary jobs, number and percent of total of proprietors.
INTERPRETATION: One way to see whether growth and a high-level of proprietors' employment is a positive sign for the local economy is to look at the long-term trends in proprietors' personal income. If proprietors' employment and real personal income are both rising, this is a positive indicator of entrepreneurial activity and of economic wellbeing. If, on the other hand, proprietors' employment is rising and real personal income is falling, this can be a sign of economic stress and negative indicator of economic wellbeing.
SOURCE: US Bureau of Economic Analysis, table CA30 Economic Profiles

Employment by Industry

Understanding which industries are responsible for the most jobs and which sectors are growing or declining is key to grasping the type of economy that exists, how it has changed over time, and evolving competitive strengths. Industries are categorized as sectors or supersectors. Employment data until 2000 are classified based on the Standard Industrial Classification (SIC) system. In 2001, the Bureau of Economic Analysis switched to the North American Industrial Classification System (NAICS). The SIC and NAICS cannot be directly measured against each other. Choose multiple time periods of interest to identify trends.

MEASURE: Number and percent of total employment in each industry.

INTERPRETATION: An increase in employment in a given industry is considered a positive indicator of economic wellbeing.
SOURCE: US Bureau of Economic Analysis, table CA25, CA25N Total Full-Time and Part-Time Employment by Industry, National Ocean Economics Program, County Business Patterns

Employment by Occupation

Employment by occupation offers additional information that describes what people do for a living and the type of work they do, regardless of the industry. For example, management and professional occupations are generally of higher wage and require formal education, and these occupations could exist in any number of industries (for example, managers could be working for a software firm, a mine, or a construction company). Occupation information describes what people do, while employment by industry describes where people work.

MEASURE: Number and percent of total employment in each occupation. An example of occupation classification might include: management, professional and related; service; sales and office; farming, fishing, and forestry; construction, extraction, maintenance, and repair; and production, transportation, and material.
INTERPRETATION: An increase in employment in a given occupation is considered a positive indicator of economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table DP03 Selected Economic Characteristics, US Bureau of Labor Statistics – Occupational Employment Statistics, EMSI

Labor Participation (weeks/hours worked)

Often, if too few hours are worked per week or weeks worked per year, the local economy may suffer from underemployment of labor and human capital, translating to lower real incomes and a lower standard of living. However, shorter workweeks and fewer weeks worked per year can be indicative of worker preference. Part-time jobs (those that average less than 35 hours/week) are often ideal for students, people who are responsible for taking care of their dependents, and the elderly who wish to remain active in the workplace

but do not want to work a full schedule. Advances in computer technologies have also enabled workers to telecommute and work shorter and more flexible hours. And, in some cases, young adults seek out seasonal, tourism, or recreation related employment by choice. Since the 1960s, during periods of economic stability, the vast majority of part-time workers have been voluntary.

MEASURE: Number and percent of labor force grouped by how many weeks out of the year they worked and how many hours per week they worked. Weeks worked in a year might be grouped as: 50 – 52 weeks, 27 – 49 weeks, 1 – 26 weeks, and did not work. Hours worked per week might be grouped as: 35 or more hours, 15 – 34 hours, 1 – 14 hours, and did not work.

INTERPRETATION: Whether or not this indicator is a positive or negative indicator of economic wellbeing is determined by the characteristics of the community and whether part-time jobs are desirable.

SOURCE: US Census Bureau – American Community Survey, table S2303 Work Status in the Past 12 Months

Population-Employment Ratio

This measure provides the number of people in the local market per job in a particular trade or service sector. It is used to make intercommunity comparisons of trade and service sectors. When analyzing Population/Employment Ratios, population serves as a surrogate for regional demand, and employment can be considered regional supply. For this reason, it can be said that the Population/ Employment Ratio represents a simple measure of regional supply and demand. When local ratios are compared with statewide or national ratios, it can be determined whether or not local demand is being met, if there are local expansion opportunities, or if the area is importing demand from surrounding regions. A second interpretation of the Population/ Employment Ratio is that it provides a measure of relative dependence on specific industries. A Population/ Employment Ratio that is relatively small (i.e., high levels of employment given the region's population) indicates

higher levels of dependence. Conversely, a Population/ Employment Ratio that is relatively large indicates lower levels of dependence.

MEASURE: Population of the region and the number of employees in a particular industry.
INTERPRETATION: Whether or not this indicator is a positive or negative indicator of economic wellbeing is determined by the characteristics of the community. Typically, and increase in the Population/ Employment Ratio indicates a growing industry or region, as more individuals from the community are employed.
SOURCE: US Bureau of Economic Analysis, table CA25, CA25N Total Full-Time and Part-Time Employment by Industry & CA1 Personal Income Summary

Unemployment Change During Recessions

This figure can go up during national recessions and/or when more localized economies are affected by area downturns. As the economy of a place diversifies, it can become more resilient and less affected by downturns and rising unemployment rates. This is particularly true of places that are able to attract in-migration, retain manufacturing, and support a high-tech economy. A stability coefficient such as a coefficient of variation can assist in measuring stability in employment over time.

MEASURE: Percent of people in the labor force that are unemployed during periods of recession. Typically compared to other regions to evaluate economic resilience.
INTERPRETATION: An increase in unemployment is a negative indicator of economic wellbeing, but an increase that is relatively less than other similar communities is a positive indicator of economic wellbeing.
SOURCE: US Bureau of Labor Statistics – Local Area Unemployment Statistics (LAUS)

Local Firm Employment

An analysis of local employers provides insight into the types of larger businesses in the area that may provide drawing power. In addition to this, large employers set the

precedent of success within a community, which may reassure other prospective businesses. Furthermore, identifying these employers, their number of employees, and their locations may help in later analysis, as they aid in determining daytime employee populations for the trade area.

MEASURE: Number of jobs at local firms.
INTERPRETATION: An increase in the number of jobs at local firms is a positive indicator of economic wellbeing.
SOURCE: Local chamber of commerce, EMSI

Labor Earnings (Wage) Indicators

Components of Labor Earnings

In many geographies, non-labor income is often the largest source of personal income and also the fastest growing. This is particularly the case in some rural areas and small cities. An aging population, stock market and investment growth, and a highly mobile population are some of the reasons behind the rapid growth in non-labor income. The growth in non-labor income can be an indication that a place is an attractive place to live and retire. The in-migration of people who bring investment and retirement income with them is associated with a high quality of life (for example, local recreation opportunities), good health care facilities, and affordable housing (important for those on a fixed income). Non-labor income can also be important to places with struggling economies, either as a source of income maintenance for the poor or as a more stable form of income in areas with declining industries and labor markets. When investigating non-labor income some important issues for public land managers include whether the area is attracting retirees and people with investment income, the role public lands play in attracting and retaining people with non-labor income, how these people use or enjoy public lands, and whether these uses or ways of enjoying public lands are at odds with current uses or management. If public lands resources are one of the reasons growing areas are able to attract and retain

non-labor sources of income, then public lands are important to local economic well-being by contributing to economic growth and per capita income. If, on the other hand, contracting populations or industries result in a shrinking labor market, non-labor income may be important as a remaining source of income and can help stabilize downturns.

MEASURE: Value of wages and percent of total wages in different time periods separated by wage and salary disbursements, supplements to salaries and wages, and proprietor's income.
INTERPRETATION: An increase in these measure are positive indicators of economic wellbeing.
SOURCE: US Bureau of Economic Analysis, table CA30 Economic Profiles, Line codes 180, 190, 200, and 210

Source of Income

Income can come from labor, Social Security, retirement income, Supplemental Security Income, public assistance and food stamps/SNAP. Understanding the sources of income in your area can help you understand how susceptible the region is to fluctuation in the economy. It can also help to understand the degree to which residents within the region are dependent on public support for their income.

MEASURE: Number and percent of total households receiving income by source. Sources include: labor earnings, Social Security, retirement income, Supplemental Security Income, cash public assistance income, and food stamps/SNAP.
INTERPRETATION: Increases in earnings from labor earnings, Social Security, and retirement income are positive indicators of economic wellbeing and increases in Supplemental Security Income, cash public assistance income, and food stamps/SNAP are considered negative indicators of economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table S1101 Households and Families, table B19051 Earnings in the Past 12 Months for Households, table B19055 Social Security Income in the Past 12 Months for Households, B19059 Retirement Income in the

Past 12 Months for Households, table B19056 Supplemental Security Income (SSI) in the past 12 Months for Households, table B19057 Public Assistance Income in the Past 12 Months for Households, and table S2201 Food Stamps/SNAP

Income by Industry

Historical trend data for personal income by major industry categories are useful for understanding how the economy has evolved. They are also useful to see how the economy performed in the past (growth vs. decline, response to recessions, etc.), and whether the relationship between sectors has changed. If there has been a shift from non-services related industries to services related industries over time, this could signal a change in the competitive position of the local or regional economy.

MEASURE: Income and percent of total income in each industry over multiple time periods to evaluate growth or decline over time.
INTERPRETATION: An increase in income in an industry is a positive indicator of economic wellbeing.
SOURCE: US Bureau of Labor Statistics – Quarterly Census of Employment and Wages. The Bureau of Labor Statistics does not count the self-employed, so the employment numbers may differ from figures provided by other data sources. US Bureau of Economic Analysis, table CA5N Personal Income by Major Component and Earnings by Industry. National Ocean Economics Program.

Average Earnings per Job

Average earnings per job is a measure of the compensation of the average job. It is total earnings divided by total employment. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included. It serves as an indicator of the quality of local employment. A higher average earnings per job indicates that there are relatively more high-wage occupations. It can be useful to consider earnings against local cost of living indicators. There are a number of reasons why average earnings per job may decline. These include: (1) more part-time and/or seasonal workers entering

the workforce; (2) a rise in low-wage industries, such as tourism-related sectors; (3) a decline of high-wage industries, such as manufacturing; (4) more lower-paid workers entering the workforce; (5) the presence of a university with an increasing enrollment of relatively low-wage students; (6) an influx of workers with low education levels that are paid less; (7) the in-migration of semi-retired workers who work part-time and/or seasonally; and (8) an influx of people who move to an area for quality of life rather than profit-maximizing reasons.

MEASURE: Average earnings per job. Evaluate over time using inflation-adjusted dollars to see if average earnings have increased or decreased over time.
INTERPRETATION: An increase in average earnings per job is a positive indicator of economic wellbeing.
SOURCE: US Bureau of Economic Analysis, table CA34 Wage and Salary Summary,

Per Capita Income

Per capita income is considered one of the most important measures of economic wellbeing. However, this measure can be misleading. Per capita income is total personal income divided by population. Because total personal income includes non-labor income sources (dividends, interest, rent and transfer payments), it is possible for per capita income to be relatively high due to the presence of retirees and people with investment income. And because per capita income is calculated using total population and not the labor force as in average earnings per job, it is possible for per capita income to be relatively low when there are a disproportionate number of children and/or elderly people in the population.

MEASURE: Per capita income. Evaluate over time using inflation-adjusted dollars to determine if per-capita income is increasing or decreasing over time.
INTERPRETATION: An increase in per capita income is a positive indicator of economic wellbeing.

SOURCE: US Bureau of Economic Analysis, table CA1 Personal Income Summary: Personal Income, Population, per Capita Personal Income

Cross-County Earnings (Net Residential Adjustment)

One indicator of economic health for a county is whether it is able to attract workers from nearby counties. This could be the case if a county has a surplus of jobs and serves as a magnet for workers in adjacent counties and would be indicated by a negative net residential adjustment. Another possibility is that housing in the county has driven some workers to live in relatively more affordable neighboring counties that have become "bedroom communities." Alternatively, it is possible that a county with a positive net residential adjustment is a more desirable place to live (people are willing to commute and/or telecommute to work in order to live there for quality of life reasons). Commuting and telecommuting workers may also contribute to the economy by spending their money in the local area (essentially exporting work and importing wages). Long-term trends in inflow, outflow, and net residential adjustment help to describe the role that the county's economy has played over time in a multi-county area.

MEASURE: Earnings from residents that work in neighboring regions and bring money home into your region (inflow) and earnings from residents that live outside your region and work in your region (outflow). The net residential adjustment is the difference between these two measures.
INTERPRETATION: Net residential adjustment is a neutral indicator of economic wellbeing, but it helps to provide context and support for other indicators and what is being observed.
SOURCE: US Bureau of Economic Analysis, table CA91 Gross Flow of Earnings

Income Distribution

Income distribution is a measure of how a region's income is distributed among its population. The distribution of income can help to highlight several important aspects of economic wellbeing. A large number of households in the lower end of income distribution indicates economic hardship. A bulge in the middle distribution can be interpreted as the

size of the middle class. A figure that shows a proportionally large number of households at both extremes indicates a geography characterized by “haves” and "have-nots.” Two common methods for assessing income distribution are the Lorenz curve and the Gini coefficient.

Lorenz curve

The Lorenz curve is a graphic representation comparing income distribution in the geography selected to the hypothetical lines of perfect equality and perfect inequality. Every point on the Lorenz curve can be used to develop statements such as “the bottom __% of households have __% of all income,” or “the top __% of households have __% of all income.”

Gini coefficient

The Gini coefficient provides a summary value of the inequality of income distribution. A value of 0 represents perfect equality and a value of 1 represents perfect inequality. The lower the Gini coefficient, the more equal the income distribution.

MEASURES: Total income, income divided into quintiles (20%/40%/60%/80%/100% of income earners make $X total income), percent of total income in each quintile, cumulative percent of income in each quintile.
INTERPRETATION: Relative to the starting point: being at the low end of the spectrum or the high end of the spectrum is undesirable.
SOURCE: US Census Bureau – American Community Survey, table B19082 Shares of Aggregate Household Income by Quintile

Poverty

Poverty is an important indicator of economic wellbeing. Poverty rates are often reported in aggregate, which can hide important differences. This is important because aggregate poverty rates (for example, families below poverty) may hide some important information (for example, the poverty rate for single mothers with children).

MEASURE: Percent of the population that is living below the poverty level threshold. This value can be further reduced according to demographics such as age, gender, race, etc.
INTERPRETATION: An increase in poverty in a negative indicator of economic wellbeing.
SOURCE: US Census Bureau – American Community Survey, table DP03 Selected Economic Characteristics

Competitiveness Indicators

Growth Rate

Economic growth rate is a measure of economic growth from one period to another in percentage terms. This measure is expressed in nominal terms and does not adjust for inflation. Gross regional product is the most common measure of tracking the growth rate of a region over time.

Gross Regional Product

Gross regional product is similar to gross domestic product for the US, but measured at a smaller regional scale. This number by itself doesn't always tell you very much, however, it can be used to compare the size of the economy relative to other regional economies and it can be used to track growth over time. Gross regional product is derived from the income paid to the owners of the factors of production in the model year. It consists of employee compensation, proprietor's income, other property type income, and tax on production and imports.

MEASURE: Gross Regional Product (GRP) tracked over time to assess growth or decline in revenue for the region.
INTERPRETATION: An increase in GRP is a positive indicator of economic wellbeing.
SOURCE: IMPLAN, EMSI, Bureau of Economic Analysis, National Ocean Economics Program

Economic Base Analysis

Economic base analysis is a method to evaluate how exports in one sector of an economy bring about additional economic activity in other sectors. The analysis helps to describe the local economy and to identify economic drivers for the region. There are two ways of assessing economic contribution, gross and base. The gross measure quantifies sales, employment, wages, and value added generated by each sector. Gross measures are the reports on economic activity compiled by government agencies and published as economic statistics. These non-basic (gross) industries serve other industries in the region and circulate economic activity within the region. The base measure quantifies economic activity by giving credit to the industry that brings new dollars into the region through its exports. The base measure encompasses all the exports of a sector plus inputs produced by others. The base measure reveals linkages among all sectors of the economy needed to produce export sales that are not evident in the gross measure. These basic industries are driven by export demand and correspondingly drive regional output or jobs. The base measure can be further defined as direct or indirect. Direct measures are economic activity generated by exports of any industrial sector. Indirect measures are economic activity that is generated by industries purchasing inputs from other local businesses that support the sales of exports, and generated by industries paying wages to employees who are involved in export activities. The wages are used to purchase goods and services from other local businesses. Output, jobs, and wage data can be used to create a dependency score, which is the overall contribution of an industry to the region.

MEASURE: Output and jobs by industry categorized into base and gross. This analysis needs to be performed by a qualified individual as extensive data analysis and interpretation is required.

INTERPRETATION: An increase in base and gross measures are a positive indicator of economic wellbeing.

SOURCE: IMPLAN, EMSI, US Bureau of Economic Analysis RIMS II

Diversity

A diversified economy is less sensitive to the ups and downs associated with a particular industry because the risk is spread more evenly across a number of industries. With diversification, even if some industries are suffering, other stronger industries will help the economy maintain healthy growth. The presence of many industries would be expected to offer opportunities for employment in growing sectors to compensate for employment losses in declining sectors. Diversity can be measure in many different ways. A common measure of diversity includes the Shannon-Weaver Diversity Index,

Shannon-Weaver Diversity Index

The Shannon-Weaver Diversity Index is a measure of the extent to which the employment of a region is distributed among its industries. It ranges from 0 (perfect inequality or no diversity) to 1 (perfect equality or diversity).

MEASURE: Number of jobs in each industry. The diversity measure must be calculated using the appropriate formula.
INTERPRETATION: Typically, an increase in diversity is a positive indicator of economic wellbeing as it creates resilience. The overall economy is impacted less if there is a downturn in a specific industry. However, perfect equality is not necessarily desirable, as communities should identify areas in which they have a competitive advantage and support those industries, leading to more jobs in those industries.
SOURCE: US Bureau of Economic Analysis, table CA25 and CA25N Total Full-Time and Part-Time Employment by Industry

Location Quotient

The location quotient (LQ) measures the relative concentration of a given industry in the region, which allows you to assess the region's specialization in an industry using the United States as a benchmark. A value of 1 indicates that local production can just satisfy local consumption, a value > 1 indicates local production can satisfy local consumption and

the excess is exported, and a value < 1 indicates that local production cannot satisfy local consumption and the difference must be imported. Location quotients can be misleading for small communities, where small changes in an industry can appear to have large effects.

MEASURE: Output for each industry. The location quotient must be calculated using the appropriate formula.
INTERPRETATION: An increase in the location quotient is a positive indicator of economic wellbeing.
SOURCE: IMPLAN, EMSI, National Ocean Economics Program

Cluster Analysis

Industry cluster analysis undertakes a sequence of steps to identify and locate the clusters present in a region's economy, as well as providing a way to gauge the clusters' strengths and weaknesses compared to the national economy. Such insights can assist in maintaining or increasing cluster strengths by strategic resource targeting. Industry cluster analysis can also help identify new and emerging clusters to replace old and fading ones. Specifically, this tool allows practitioners to: describe how industries in a region compare to each other, identify growth trends through regional location-quotient analysis of industry clusters, reveal emerging industries in a region, analyze the mix of clusters in a diverse region that might include both rural and urban areas, apply a cluster matrix analysis to evaluate potential growth opportunities, rethink business expansion strategies using cluster analysis, reveal groups of industries that have similar workforce needs, build sustained business-to-business connections, prioritize groups of firms that have growth potential, create regional identities and improve marketing effectiveness.

MEASURE: output and jobs in each industry and location quotient of each industry. Aggregated output and jobs based on cluster definitions.
INTERPRETATION: An increase in output and jobs in each cluster in a positive indicator of economic wellbeing.

SOURCE: IMPLAN, EMSI, US Bureau of Economic Analysis RIMS II, National Ocean Economics Program

Shift Share

Shift share is used to measure how many new jobs were created locally due to national economic trends and how much growth can be attributed to unique regional factors. Employment data must be available for two different time periods and should be from the same data source. Shift share analysis can be separated into three components: 1) industrial mix, 2) national growth, and 3) regional competitiveness.

Industrial Mix

The industrial mix represents the share of regional industry growth explained by the growth of the specific industry at the national level. It is used to determine whether the local economy is concentrated in industries that are growing slower or faster than the national average.

National Growth

The national growth effect explains how much of the regional industry's growth is explained by the overall growth of the national economy. If the nation's whole economy is growing, you would generally expect to see some positive change in each industry in the local region.

Regional Competitiveness

Regional competitiveness explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole.

MEASURES: Local jobs in each industry, national jobs in each industry.
INTERPRETATION: An increase in shift share is a positive indicator of economic wellbeing.

SOURCE: IMPLAN, EMSI, US Bureau of Economic Analysis RIMS II, National Ocean Economics Program

Multipliers

A multiplier is a measure of the amount of output, jobs, or labor income that are created (or lost) in the area. Each multiplier is made up of different components, direct, indirect, and induced effects. Direct effects are related to the specific industry, while indirect effects are those that support the industry. Induced effects are those that are a result of direct and indirect employee's spending money in the community. Multipliers can vary widely by industry and area. Multipliers are higher for regions with a diverse industry mix. Industries that make extensive use of materials from within the region will have higher regional multipliers. Industries that buy most of their material from outside the region tend to have lower multipliers. Multipliers tend to be higher for industries located in large urban areas, because more of the spending by the industry stays within the area. Smaller, rural areas generally have lower multipliers, because industries must use firms outside the area for supplies and services. Multipliers for the entire state are larger than sub-state multipliers, because the initial gains (or losses) in an industry are magnified over a larger geographic area.

MEASURE: Multipliers are calculated based on an input-output model and should be determined and analyzed by a trained professional.
INTERPRETATION: An increase in a multiplier is considered a positive indicator of economic wellbeing.
SOURCE: IMPLAN, EMSI, US Bureau of Economic Analysis RIMS II

Resources

American Community Survey: The American Community Survey (ACS) is an ongoing survey that provides data every year -- giving communities the current information they need to plan investments and services. Information from the survey generates data that help determine how more than $400 billion in federal and state funds are distributed each year. Data is gathered on age, sex, race, family and relationships, income and benefits, health insurance, education, veteran status, disabilities, where you work and how you get there, and where you live and how much you pay for some essentials.

- http://factfinder2.census.gov/

Bureau of Economic Analysis (BEA): BEA produces economic accounts statistics that enable government and business decision-makers, researchers, and the American public to follow and understand the performance of the Nation's economy. To do this, BEA collects source data, conducts research and analysis, develops and implements estimation methodologies, and disseminates statistics to the public.

- http://www.bea.gov/

Bureau of Labor Statistics (BLS): The Bureau of Labor Statistics of the U.S. Department of Labor is the principal Federal agency responsible for measuring labor market activity, working conditions, and price changes in the economy. Its mission is to collect, analyze, and disseminate essential economic information to support public and private decision-making. As an independent statistical agency, BLS serves its diverse user communities by providing products and services that are objective, timely, accurate, and relevant.

- http://www.bls.gov/

BLS - Local Area Unemployment Statistics: The Local Area Unemployment Statistics (LAUS) program produces monthly and annual employment, unemployment, and labor force data for Census regions and divisions, States, counties, metropolitan areas, and many cities, by place of residence.

- http://www.bls.gov/lau/

BLS - Quarterly Census of Employment and Wages (QCEW): The Quarterly Census of Employment and Wages (QCEW) program publishes a quarterly count of employment and wages reported by employers covering 98 percent of U.S. jobs, available at the county, MSA, state and national levels by industry.

- http://www.bls.gov/cew/

BLS – Statistics on Pay and Benefits: BLS publishes a large amount of information on the wages, earnings, and benefits of workers. Generally, this information is categorized in one or more of the following ways: Geographic area (national, regional, state, metropolitan area, or county data), Occupation (such as teacher or carpenter), Industry (such as manufacturing or retail trade).

- http://www.bls.gov/bls/wages.htm

Bureau of Indian Affairs: Indian Affairs (IA) is the oldest bureau of the United States Department of the Interior. Established in 1824, IA currently provides services (directly or through contracts, grants, or compacts) to approximately 1.9 million American Indians and Alaska Natives. There are 566 federally recognized American Indian tribes and Alaska Natives in the United States. Bureau of Indian Affairs (BIA) is responsible for the administration and management of 55 million surface acres and 57 million acres of subsurface minerals estates held in trust by the United States for American Indian, Indian tribes, and Alaska Natives.

- http://www.bia.gov

Census Bureau: The US Census Bureau conducts multiple censuses to provide data about the people and the economy of the US. They collect data for the Population and Housing Census, Economic Census, Census of Governments, American Community Survey, economic indicators, and collects data for other agencies.

- http://www.census.gov/

Census - Small Area Income and Poverty Estimates: Small Area Income and Poverty Estimates (SAIPE) are produced for school districts, counties, and states. The main objective of this program is to provide updated estimates of income and poverty statistics for the administration of federal programs and the allocation of federal funds to local jurisdictions. These estimates combine data from administrative records, postcensal population estimates, and the decennial census with direct estimates from the American Community Survey to provide consistent and reliable single-year estimates. These model-based single-year estimates are more reflective of current conditions than multi-year survey estimates.

- http://www.census.gov/did/www/saipe/

Center for Economic Studies (CES): CES conducts research in economics and other social sciences, and creates new public-use data from existing data. CES partners with stakeholders within and outside the Census Bureau to improve measures of the economy and people of the United States through research and the development of innovative data products.

- http://www.census.gov/ces/

County Business Patterns: County Business Patterns (CBP) is an annual series that provides subnational economic data by industry. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. This data is useful for studying the economic activity of small areas; analyzing economic changes over time; and as a benchmark for other statistical series, surveys, and databases between economic censuses. Businesses use the data for analyzing market potential, measuring the effectiveness of sales and advertising programs, setting sales quotas, and developing budgets. Government agencies use the data for administration and planning.

- http://www.census.gov/econ/cbp/index.html

County Health Rankings: The annual *County Health Rankings* measure vital health factors, including high school graduation rates, obesity, smoking, unemployment, access to healthy foods, the quality of air and water, income, and teen births in nearly every county in America. The annual *Rankings* provide a revealing snapshot of how health is influenced by where we live, learn, work and play. They provide a starting point for change in communities.

- http://www.countyhealthrankings.org/

US Department of Agriculture: The Census of Agriculture is the leading source of facts and figures about American agriculture. Conducted every five years, the Census provides a detailed picture of U.S. farms and ranches and the people who operate them. It is the only source of uniform, comprehensive agricultural data for every state and county in the United States. Participation by every farmer and rancher, regardless of the size or type of operation, is vitally important. By responding to the Census, producers are helping themselves, their communities and all of U.S. agriculture. The 2012 Census of Agriculture collected information concerning all areas of farming and ranching operations, including production expenses, market value of products, and operator characteristics. This information is used by everyone who provides services to farmers and rural communities - including federal, state and local governments, agribusinesses, and many others.

- http://www.agcensus.usda.gov/index.php

Economic Research Service: The ERS mission is to inform and enhance public and private decision making on economic and policy issues related to agriculture, food, the environment, and rural development. RS staff disseminates economic information and research results through an array of outlets, including: agency-published research reports, market analysis and outlook reports, economic briefs, and data products; an award-winning magazine, Amber Waves, covering the entire range of ERS work (available online); the website, which provides access to all ERS products and which links users directly with ERS analysts; oral briefings, written staff analyses, and congressionally mandated studies delivered directly to executive and legislative branch policymakers and program

administrators; and articles in professional journals, and papers presented to academic colleagues at conferences and meetings.

- http://www.ers.usda.gov/

EMSI (Economic Modeling Specialists Intl.): a CareerBuilder company, turns labor market data into useful information that helps organizations understand the connection between economies, people, and work. Using sound economic principles and good data, we build user-friendly services that help educational institutions, workforce planners, and regional developers (such as WIBs, EDOs, chambers, utilities) build a better workforce and improve the economic conditions in their regions.

Impact analysis for PLANning (IMPLAN): IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics which are specialized by region, not estimated from national averages and can be used to measure the effect on a regional or local economy of a given change or event in the economy's activity.

- http://www.implan.com/

Input-Output Model for Pacific Coast Fisheries (IO-PAC): The Northwest Fisheries Science Center's Input-Output model for Pacific Coast Fisheries (IO-PAC) is designed to estimate the changes in economic contributions and economic impacts resulting from policy, environmental, or other changes that affect fishery harvest. IO-PAC was built by customizing the Impact Analysis for Planning (IMPLAN) regional input-output software.

- Point of Contact: Jerry.Leonard@noaa.gov; (206) 302-1742

Living Wage Calculator: A calculator that estimates the cost of living in your community or region. The calculator lists typical expenses, the living wage and typical wages for the selected location.

- http://livingwage.mit.edu/

National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Office of Science and Technology: The Office of Science and Technology is part of the National Marine Fisheries Service (abbreviated "NMFS" and informally known as "NOAA Fisheries"). The Office advocates and ensures the sound scientific basis for NOAA Fisheries science programs and resource conservation and management decisions. Data on commercial and recreational fisheries can be found through this resource.

- http://www.st.nmfs.noaa.gov

National Ocean Economics Program (NOEP): The National Ocean Economics Program (NOEP) provides a full range of the most current policy-relevant economic and demographic information available on changes and trends along the U.S. coast, Great Lakes, and coastal waters. NOEP will soon expand to international datasets to support the broader mission of its new host, the Center for the Blue Economy(CBE) to "promote ocean and coastal sustainability."

- http://www.oceaneconomics.org/

PacFIN: The Pacific Fisheries Information Network (PacFIN) is the nation's first regional fisheries data network. Funded by a grant from the National Marine Fisheries Service (NMFS), PacFIN is a joint federal and state project focused on fisheries data collection and information management. PacFIN provides timely and accurate data to aid effective management of fisheries and fishery resources. Data from fisheries occurring in ocean areas off the coasts of Washington, Oregon, California, Alaska, and British Columbia are provided to the PacFIN central database. The PacFIN central database includes fish-ticket and vessel registration data provided by the Washington, Oregon, and California (W-O-C) state fishery agencies. In addition the W-O-C data sources supply species-composition and catch-by-area proportions developed from their port sampling and trawl logbook data systems.

- http://pacfin.psmfc.org

Regional Economic Information System (REIS): The regional economic accounts tell us about the geographic distribution of U.S. economic activity and growth. The estimates of gross domestic product by state and state and local area personal income, and the accompanying detail, provide a consistent framework for analyzing and comparing individual state and local area economies.

- http://www.bea.gov/regional/index.htm

Regional Input/Output Modeling System (RIMS II): RIMS II input-output multipliers show how local demand shocks affect total gross output, value added, earnings, and employment in the region.

- https://www.bea.gov/regional/rims/rimsii/

Self-Sufficiency Calculator for Washington State: This Calculator includes a variety of resources, including the Self Sufficiency Standard. The Self Sufficiency Standard measures how much income is needed for a family of a given composition - ranging from a one person household to a large family - in a given place, to adequately meet its basic needs without any public or private assistance. Using the Calculator you can look at your overall budget, see the Self Sufficiency Standard cost-of-living approximation for your family type, and learn about resources that can assist you in planning and making progress toward economic Self Sufficiency.

- http://www.thecalculator.org/

WA Department of Commerce: The Department of Commerce has a mission to grow and improve jobs in Washington State by championing thriving communities, a prosperous economy, and sustainable infrastructure.

- http://www.commerce.wa.gov

WA Department of Revenue: The Department of Revenue's mission is to fairly and efficiently collect revenues and administer programs to fund public services and advocate for sound tax policy.

- http://www.dor.wa.gov

WA Employment Security Department: Data and analysis of Washington State's employment conditions, economy, job market and work force.

- http://www.esd.wa.gov

WA Office of Financial Management (OFM): The Office of Financial Management provides vital information, fiscal services and policy support that the Governor, Legislature and state agencies need to serve the people of Washington State. OFM provides estimates of state and local population, monitor changes in the state economy and labor force, and conduct research on a variety of issues affecting the state budget and public policy.

- http://www.ofm.wa.gov/

Washington Regional Economic Analysis Project: The Pacific Northwest Regional Economic Analysis Project (PNREAP) is a not-for-profit 501(c)(3) corporation organized to foster and further sound regional economic research, analysis, education, outreach and decision-making. By exploiting web-enabled technologies PNREAP endeavors to empower people to expedite the distillation, portrayal, analysis and interpretation of regional economic data. The regional economic research tools and analytical techniques created by PNREAP offer users a portal to more quickly and efficiently explore, discover and understand our fluctuating, dynamic and ever-changing regional economies. PNREAP supports and collaborates with local and regional economic development, research, and educational institutions nationwide.

- https://washington.reaproject.org/

Bibliography

Bendavid, Avrom. 1974. "Industrial Composition Analysis." Chapter 5. *Regional Economic Analysis for Practitioners.* New York.

Bendavid, Avrom. 1974. "Introduction to Economic Base Theory and Method." Chapter 4. *Regional Economic Analysis for Practitioners*. New York: Praeger.

Bendavid, Avrom. 1974. "Regional Input-Output Analysis." Chapter 7. *Regional Economic Analysis for Practitioners.* New York: Praeger.

Bendavid, Avrom. 1974. "Relative Regional Industrial Composition Analysis." Chapter 5, 81-93. *Regional Economic Analysis for Practitioners.* New York: Praeger.

Braschler, Curtis, John A. Kuehn and John Croll. 1977. *The Community Economic Base: How to Compute, Evaluate and Use.* Guide DM 3005. Columbia, MO: University of Missouri Extension.

Buck, T. W. 1970. "Shift and Share Analysis—A Guide to Regional Policy." *Regional Studies* 4 (December):445-450.

Chase, Robert A. and Glen C. Pulver. 1981. *The Impact of Shopping Centers on the Downtowns of Rural Communities.* Res. Bul. R3148, December. Madison, WI: University of Wisconsin-Madison, College of Agriculture and Life Sciences.

Cortright, J., & Reamer, A. (1998). *Socioeconomic Data for Understanding Your Regional Economy: A User's Guide*. Economic Development Administration, US Department of Commerce.

Curtis, Wayne C. 1972. "Shift-Share Analysis as a Technique in Rural Development Research." *American Journal of Agricultural Economics* 54 (May):267-270.

Dawson, John A. (ed.) 1980. *Retail Geography.* New York: John Wiley.

Doeksen, Gerald A. and Dean F. Schreiner. 1974. *Interindustry Models for Rural Development Research.* Technical Bulletin T-139, September. Stillwater, OK: Oklahoma State University, Agricultural Experiment Station.

Dunn, Edgar S. 1960. "A Statistical and Analytical Technique for Regional Analysis." *Papers Regional Science Association* 6:97-112.

Erickson, Rodney A. 1978. "Purchasing Patterns and the Regional Trade Multiplier." *Growth and Change* 9 (April):49-51.

Gibson, Lay James and Marshall A. Warden. 1981. "Estimating the Economic Base Multiplier: A Test of Alternative Procedures." *Economic Geography* 57:146-159.

Goldman, George E. 1975. *Explanation and Application of County Input-Output Multipliers*. Spec. Pub. 3013, May. Berkeley, CA: University of California-Berkeley, Division of Agricultural Sciences.

Goldstein, Benjamin and Ross Davis (eds.) 1977. *Neighborhoods in the Urban Economy: Dynamics of Decline and Revitalization.* Lexington, MA: Lexington Books.

Gordon, John and David Mulkey. 1978. "Income Multipliers for Community Impact Analysis—What Size is Reasonable?" *Journal of the Community Development Society* 9 (Fall):85-93.

Greater Grays Harbor Inc. 2014. Grays Harbor Economic Vitality Index. Retrieved December 12, 2014 from http://www.graysharbor.org/downloads/GH_Economic_Vitality_Index.pdf

Greytak, David. 1969. "A Statistical Analysis of Regional Export Estimating Techniques." *Journal of Regional Science* 9 (December):387-395.

Houston, David B. 1967. "The Shift-Share Analysis of Regional Growth: A Critique." *Southern Economics Journal* 33 (April):577-581. (See also Ashby, same Journal, January 1968).

Huff, David L. 1964. "Defining and Estimating a Trading Area." *Journal of Marketing* 28 (July):34-38.

Hushak, Leroy J. and George Morse (eds.). October 1979. "Estimating Local Income Multipliers: A Review and Evaluation of the Techniques for Ex-Ante Use" by Ron Shaffer, p. 43. *Proceedings of the Ex-Ante Growth Impact Models Conference*. Ames, IA: North Central Regional Center for Rural Development.

Hustedde, Ronald J., Ron Shaffer, and Glen Pulver. 1993. *Community Economic Analysis: A How To Manual*. Ames, IA: Iowa State University Printing Services.

Isserman, Andrew. 1977. "A Bracketing Approach for Estimating Regional Economic Impact Multipliers and a Procedure for Assessing Their Accuracy." *Environment and Planning A* 9:1003-1011.

Isserman, Andrew. 1977. "The Location Quotient Approach to Estimating Regional Economic Impacts." *Journal American Institute of Planners* 43 (January):33-41.

Jensen, R.C. 1980. "The Concept of Accuracy in Regional Input-Output Models." *International Regional Science Review* 5 (Winter):139-154.

Jensen, R.C. and S. MacDonald. 1982. "Technique and Technology in Regional Input-Output." *Annals of Regional Science* XVI (July):27-45.

Kruekleberg, Donald A. and Arthur L. Silvers. 1974. "Location and Travel Behavior." Chapter 9. *Urban Planning Analysis: Methods and Models.* New York: John Wiley.

Kruekleberg, Donald A. and Arthur L. Silvers. 1974. "Regional Income and Employment Analysis." Chapter 12:400-406. *Urban Planning Analysis: Methods and Models.* New York: John Wiley.

Lewis, Eugene, Russell Youmans, George Goldman and Garnet Premer. October 1979. *Economic Multipliers: Can a Rural Community Use Them.* WREP 24, Coping with Growth Series. Corvallis, OR: Western Rural Development Center.

Lewis, W. C. 1976. "Export Base Theory and Multiplier Estimators: A Critique." *The Annals of Regional Science* X (July):58-70.

Loehman, Edna T. and Robert McElroy. 1976. *Input-Output Analysis as a Tool for Regional Development Planning.* Econ. Prt. 77, February. Gainesville, FL: University of Florida, Institute of Food and Agricultural Sciences.

Mayer, W. and S. Pleeter. 1975. "A Theoretical Justification for the Use of Location Quotients." *Regional Science and Urban Economics* 5:343-355.

McDonough, Carol C. and Balbir S. Sihag. 1991. "The Incorporation of Multiple Bases Into Shift-Share Analysis." *Growth and Change* 22, no. 1 (Winter):1-9.

Miernyk, William H. 1965. *The Elements of Input-Output Analysis*, New York: Random House.

Murray, James. 1978. "Population-Employment Ratios as a Supplement to Location Quotients and Threshold Estimates." *Community Economics* 21 (June). Madison, WI: University of Wisconsin-Madison, Department of Agricultural Economics.

Murray, James and James Harris. 1978. *A Regional Economic Analysis of the Turtle Mountain Indian Reservation: Determining Potential for Commercial Development.* Grand Forks, ND: University of North Dakota, Bureau of Business and Economic Research.

O'Kelley, M.E. and H.J. Miller. 1989. "A Synthesis of Some Market Area Delimitation Models." *Growth and Change* 20, no. 3 (Summer):14-33.

Pfouts, Ralph (ed.) 1960. *Techniques of Urban Economic Analysis.* West Trenton, NJ: Chandler-Davis.

Pleeter, Saul (ed.) 1980. "Alternative Economic Base Bifurcation Techniques: Theory, Implementation and Results." Chapter 2, by Andrew Isserman. *Economic Impact Analysis: Methodology and Applications.* Boston: Martinus Nijhoff Publishing.

Richardson, Harry W. 1972. *Input-Output and Regional Economics*, New York: Halstead Press.

Salant, Priscilla. 1990. *A Community Researcher's Guide to Rural Data*. Washington, D.C.: Island Press and The Aspen Institute.

Stevens, Benjamin H. and Craig L. Moore. 1980. "A Critical Review of the Literature on Shift-Share as a Forecasting Technique." *Journal of Regional Science* 20 (November):419-438.

Stone, Kenneth E. and James C. McConnon. 1983. "Analyzing Retail Trade Potential For Counties and Towns." Unpublished paper available from author. Iowa State University, Department of Economics.

Thurston County Economic Development Council. 2014. Thurston Economic Vitality Index. Retrieved December 12, 2014 from http://www.thurstonedc.com/wp-content/uploads/2015/01/EVI_2014_vFinal.pdf

Ullman, E.L. 1968. "Minimum Requirements After a Decade: A Critique and an Appraisal." *Economic Geography* 44:364-369.

Wagner, William B. 1974. "An Empirical Test of Reilly's Law of Retail Gravitation." *Growth and Change* 5 (July):30-35.