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# Economic Impact of Northwestern Michigan College: Final Report

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## **Final Report**

### **Economic Impact of Northwestern Michigan College**

**May 27, 2014**

**George Erickcek**

#### **Introduction and Findings**

This report provides an estimation of the total economic contribution that Northwestern Michigan College (NMC) makes on its surrounding region. Of course, the full comprehensive impact of the college on the region's social and cultural environment is much larger than its economic influence. Since its founding in 1951, the college has changed the social environment of the greater Grand Traverse region. This change has occurred informally by the simple presence of more young adults staying in the community to pursue their education, and formally through activities such as the Denmos Museum Center, WNMC 90.7 FM, and the Rogers Observatory which have increased both the cultural offerings and cultural expectations of the region. The purpose of this report is to document the college's economic contributions to the region which, while an important measure, reflects only a portion of the college's total impact.

The report's findings are presented in three sections. First, we provide an estimate of the economic presence of Northwestern Michigan College. The college's economic presence is the level of annual economic activity generated in its service region because of its ongoing operations, the consumer expenditures of its students, and the resulting spinoff that occurs in the region due to these direct expenditures.

Second, we present an estimate of Northwestern Michigan College's economic impact. Estimating economic impact is a conceptual exercise that involves making valuations of the status quo compared to a counterfactual situation in which the college is absent from the region. In measuring the impact of a new facility to a region, such as a factory, the level of economic activity with the facility in full operation is compared to the level of economic activity in the region before the facility was constructed. Similarly, to measure the economic impact of an existing facility, a strictly hypothetical level of the region's economic activity without the facility must be estimated.

The final part of the report estimates the impact of Northwestern Michigan College on the potential earnings of its graduates. During the course of their working career, associate-degree holders in northern Michigan earn \$460,000 more than persons who only have a high school diploma. The net present value of the return on investment for a student successfully completing

a two-year associate's degree, which discounts the value of future earnings, is estimated to be between \$7.93 and \$11.14 for each dollar he/she spent on tuition and foregone income while attending school. The student's return on investment depends on whether he/she receives federal aid and attends school full or part time. This is a conservative estimate as it does not factor in the unique, high-demand technical degrees that the college offers.

Northwestern Michigan College's economic contribution is estimated by an economic simulation model especially constructed for the communities served by the college by Regional Economic Models Incorporated (REMI). The REMI model is considered one of the best regional impact models available due to its flexibility and structure. A brief description of the model is provided in the Appendix.

NMC's impact on the region's economy is multi-faceted and includes the impact of:

- The purchases of goods and services made by the college in its ongoing operations;
- The regional consumer expenditures made by its faculty and staff;
- The regional consumer expenditures of its students; and
- The growth in business activity due to its technical assistance to area businesses as well as the increased competitiveness of its businesses due to the college's technical training programs and a more educated regional employment base.

NMC's economic contribution is measured by its impact on:

- Total year-round employment in the regions, both full and part time;
- Personal income of the regions' full-time residents which includes earned income, such as wages and salaries, and unearned income such as pensions and dividends; note that personal income is based on where someone lives while wages are based on where someone works;
- The increase in total sales: the purchase of all goods and services in the regions including purchases made by businesses to suppliers; and
- The change in the regions' Gross Regional Product (GRP).

The last measure, the region's GRP, equals the increase in the purchases of goods and services generated by NMC minus the value of all intermediate goods and services that are either shipped or provided outside the region. For example, the purchase price of a text book would be included in total sales, while only the "mark-up" earned by the local seller is included in the GRP.

This study estimates the economic contribution of Northwestern Michigan College on the following regions:

Region 1: Grand Traverse County;

Region 2: Grand Traverse, Antrim, Benzie, Kalkaska, Leelanau, and Wexford Counties

Region 3: Grand Traverse, Antrim, Benzie, Kalkaska, Leelanau, Wexford, Charlevoix, Emmet, Manistee, and Missaukee Counties

The presence of Northwestern Michigan College contributes \$130.9 million in total sales, \$62.6 million in personal income, and generates 1,822 jobs in the 10-county region of Northwestern Michigan as shown in Table 1.

On average, each employee of the college (full- and part-time) supports:

- 0.6 additional job positions in the region
- \$118,900 in total sales
- \$56,900 in total personal income of residents living in the region.

The economic impact of Northwestern Michigan College is an increase in 1,060 jobs and a rise in total sales of \$55.2 million. Personal income is \$32.7 million greater and the region's Gross Regional Product is \$33.0 million larger. This is the regional economic impact that is supported by \$9.1 million in property taxes paid to NMC in FY'13.

The students attending Northwestern Michigan College can also expect a significant increase in their lifelong earnings.

- Individuals holding an associate's degree in Northern Michigan had a low 3.8 percent unemployment rate in 2012 (most current data available) compared to a high 14.9 percent rate for persons with only a high school degree.
- Annual earnings for associate-degree holders in Northern Michigan were \$31,800 in 2012 compared to \$24,110 for individuals with only a high school diploma.

**Table 1 Summary of Economic Presence and Impact of Northwestern Michigan College**

	Total employment	Total personal income (\$ mil)	Total sales in the region (\$ mil)	Total Gross Regional Product (\$ mil)
<b>Economic presence</b>				
Region 1	1,664	43.7	111.0	63.8
Region 2	1,788	60.6	124.7	70.8
Region 3	1,822	62.6	130.9	73.6
<b>Economic impact</b>				
Region 1	962	23.7	43.4	27.2
Region 2	1,032	33.9	50.3	31.0
Region 3	1,060	32.7	55.2	33.0

## Economic Presence

The economic presence of NMC is defined as the level of economic activity in the region that is supported by the existence of the college. As highlighted above, the economic presence is very

diverse, ranging from the college's purchases of locally generated services, to the consumer spending of its employees and students, and to the increased competitiveness of local businesses.

In 2012, Northwestern Michigan College employed 1,092 employees, of whom 314 were full time. The additional 778 employees are adjunct instructors, student workers, and other part-time workers. It should be noted that the annual number of workers at the college includes short-time workers as well, persons who only work for a semester or less. In any given month over the course of 2012, NMC employed in the range of 553–811 workers. That same year the college reported a point-in-time employment level of 655 for the fall semester, excluding student workers. Due to the employment definitions required by the REMI model (see Appendix), the annual full-, part- and short-time employment estimate was used for this analysis. Annual payroll at the college was \$22.3 million in 2012. These values are used in generating the college's economic presence.<sup>1</sup> Finally, the total college employment figure used in the analysis—1,101 employees—includes contracted security personnel.

As shown in Table 2 below, the ongoing operation of Northwestern Michigan College, which includes the consumption expenditures of its staff and faculty, generates 386 additional jobs in the 10-county region beyond the 1,101 jobs at the college for a total employment impact of 1,487. Not surprisingly, the major share of these jobs (96 percent) is located in Grand Traverse County—322 positions. The jobs generated in Regions 2 and 3, outside of Grand Traverse County, are due primarily to the local consumption expenditures of the college's staff and faculty who reside in these regions.

The college's operations increase total sales in the 10-county region by \$75.8 million annually. Since most of these sales are for goods and services that are generated outside the region, the college's impact on the region's Gross Regional Product—the value of goods and services generated in the region—is less, \$48.5 million.

The economic presence of Northwestern Michigan College also includes the economic contribution of the consumption expenditures of its students that are associated with their attendance at the college. In this study we used the complete enrollment data for 2012-2013 (Fall '12, Spring '13, Summer '13) which is shown in Table 3.

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<sup>1</sup> The REMI model uses the college's employment level to estimate the level of demand for local goods and services the community college would require based on national statistics. We adjusted the REMI model's estimate by including its payroll—the college's payroll and its outsourcing of security services.

**Table 2 Economic Presence of Northwestern Michigan College**

	Grand Traverse	Region 2	Region 3
<b>Ongoing Operations</b>			
Direct employment*	1,101	1,101	1,101
Full impact on the region			
Employment	1,423	1,478	1,487
Personal income (\$ mil 2012)	35.9	48.9	49.8
Sales (\$ mil 2012)	70.9	74.9	75.8
Gross Regional Product (\$ mil 2012)	45.4	48.0	48.5
<b>Student Expenditures (NMC and University Center)</b>			
Employment	67	87	90
Personal income (\$ mil 2012)	2.1	2.8	2.9
Sales (\$ mil 2012)	5.9	7.5	7.8
Gross Regional Product (\$ mil 2012)	3.9	4.9	5.1
<b>NMC Training Division</b>			
Employment	150	180	182
Personal income (\$ mil 2012)	4.9	7.3	7.3
Sales (\$ mil 2012)	30.2	35.2	35.2
Gross Regional Product (\$ mil 2012)	12.6	14.7	14.7
<b>Business Competitiveness</b>			
Employment	24	43	63
Personal income (\$ mil 2012)	0.7	1.6	2.7
Sales (\$ mil 2012)	4.0	7.1	12.2
Gross Regional Product (\$ mil 2012)	1.8	3.1	5.3
<b>Total Presence Impact</b>			
Employment	1,664	1,788	1,822
Personal income (\$ mil 2012)	43.7	60.6	62.6
Sales (\$ mil 2012)	111.0	124.7	130.9
Gross Regional Product (\$ mil 2012)	63.8	70.8	73.6

\*By place of work and includes contracted security personnel

**Table 3 2012–2013 Student Enrollment**

	Fall 2012	Spring 2013	Summer 2013
Northwestern Michigan College			
Grand Traverse (Region 1)	3,058	2,954	865
Percent 3/4 time or more	55	56	13
Region 2 excluding GT	1,208	1,192	281
Percent 3/4 time or more	57	58	13
Region 3 excluding Region 2	164	140	34
Percent 3/4 time or more	67	68	13
Other	414	344	147
Total	4,844	4,630	1,327
Percent 3/4 time or more	58	59	13

SOURCE: Northwestern Michigan College.

Moreover, the consumer expenditures of University Center’s students are included in estimating the NMC economic presence. University Center enrollment expressed in contact hours generated, were converted to estimated student headcount as shown in Table 4.

**Table 4 University Center Student Enrollment**

Semester	Total credit hours (CH)	Undergraduate students (70% of CH at 9 CH per student)	Graduate students (30% of CH at 6 CH per student)
Fall 2012	5,041	392	168
Spring 2013	4,819	375	241
Summer 2013	2,290	178	115

According to the finding of a study prepared by Geoffrey Paulin, full-time college students spend \$3,700 per quarter.<sup>2</sup> However, roughly 40 percent of NMC students are less than three-quarter time during fall and spring semesters and 87 percent of the college’s summer students are less than three-quarter. These individuals can include working adults taking career advancement courses and/or retirees taking classes for personal enrichment as well as credential seeking students. Since, for these individuals, attending class is not their primary activity, their consumer expenditures are excluded from estimating both NMC’s economic presence and economic impact.<sup>3</sup> In addition, some full-time and three-quarter-time students attending NMC live at home with their parents and do not pay rent. While we do not know the percentage of NMC students living at their parents’ residence, we do know that only 36 percent of the college’s full-time students are under 21 years old and only 21 percent of the college’s three-quarter-time students are under 21 years of age. We subtracted housing costs (rent) from the expenditures of students who are under 21 years of age.

As shown again in Table 2, the economic presence of student expenditures generated 90 jobs in the 10-county region, contributed \$7.8 million in total sales, and generated \$5.1 million in the region’s Gross Regional Product.

### *Business Community Impact*

Northwestern Michigan College is a vital economic asset for the regional business community. Having NMC in the region is advantageous to both employers and county residents who are potential members of the workforce for at least two reasons. First the college imparts skills and knowledge that enhance workers’ productivity and employability. Second, it tends to retain workers in the region. Many local employers interact with the college through internships, advisory committees, or in other ways, which promotes the hiring of NMC students and simultaneously promotes the retention of county residents by providing good employment opportunities within the region.

All communities compete on the strength of the talent of their workforce. In addition to the overall contribution of the NMC programs in increasing the base of educated and trained workers

<sup>2</sup> Geoffrey D. Paulin, “Expenditures of College-Age Students and Nonstudents,” *Monthly Labor Review*, July 2001, pp. 46–50. He found that in the 1996–1998 period, college students spent \$2,584 per quarter. In our calculations, we subtracted housing expenditures from this total since we assume many NMC students live at home and used an inflation factor of 43.2 percent.

<sup>3</sup> While this step is required for this study, it is unfortunate because it neglects the importance of the college to the area’s quality of life. However, the business impact of workers enhancing their workplace skills is estimated in the next section.

in the region, NMC's technical training programs and the NMC Training Division (part of the Michigan Manufacturing Technology Center), play a significant role in improving the competitiveness of the region's base industries—industries that sell their goods or services to customers outside the region.

The direct impact of the NMC Training Division is also shown in Table 2. In total, its activities contributed 182 jobs to the greater 10-county Grand Traverse region as well as \$35.2 million in total sales and a \$14.7 million increase in the region's Gross Regional Product.

In addition, Northwestern Michigan College offers courses and certificates in welding, auto tech, construction trades, renewable energy programs, advanced manufacturing, manufacturing tech, engineering, electronics tech, and CAD operations. These are skills that are in high demand from the region's base industries. It is impossible to estimate the competitiveness gained by the region's base industries because of these programs; however, if they lower production costs for the region's manufacturers by just 1.0 percent, they would generate 63 jobs in the region and generate \$12.2 million in sales, again shown in Table 2.

The total economic contribution of NMC to the region is also shown in Table 2. The presence of NMC generated more than 1,800 jobs in the 10-county region, increased personal income by \$62.6 million and total sales by \$130.9 million.

Often an employment multiplier is calculated to illustrate the total employment impact of a facility or organization. The multiplier is derived by dividing the total employment impact of the organization, in this case 1,822 for the 10-County Region by the college's direct annual employment in the region, 1,101. The multiplier for NMC's ongoing operations in the 10-County Region is 1.6. In other words, every 10 employees at the college support another 6 jobs in the region.

A more detailed illustration of the college's contribution to the regions' employment is shown in Table 5. As expected, the college's presence has a large impact on the regions' retailers; however, it also supports 82 jobs in its health care sector due, in large part, to the health care benefit package utilized by NMC employees.



**Table 5 Detailed Employment Breakdown of NMC’s Economic Presence**

	Grand Traverse	Region 2	Region 3
Northwestern Michigan College	1,101	1,101	1,101
Construction	77	93	96
Manufacturing	94	117	126
Wholesale trade	18	20	21
Retail trade	79	99	103
Real estate	44	52	54
Prof., scientific, & technical serv.	19	21	22
Administrative	29	35	37
Health care	64	78	82
Arts	9	11	11
Food service	29	37	39
Other services	41	49	51
State and local government	61	73	79
Total	1,664	1,787	1,821

## Economic Impact

To measure the economic impact of Northwestern Michigan College we must measure the difference between NMC as a comprehensive community college and a community without NMC. Grand Traverse County—with a population of nearly 90,000—is too large to not be served by a public or private higher educational institution. Therefore this analysis assumes the following assumptions:

- A much smaller higher-education entity would provide a limited, core offering to the region and receive no property tax support.
- Many of the current activities and unique training programs at NMC exist because NMC is a comprehensive community college with strategic priorities tailored to the needs and assets of the community. Specifically, this analysis assumes that the following activities exist primarily for these reasons and would, therefore, likely not exist under the hypothetical counterfactual scenario.
  - Hagerty Center
  - Great Lakes Culinary Institute
  - University Center
  - Great Lakes Maritime Academy
  - Dennis Museum Center
  - Aviation Division, Technical Division
  - Extended Educational Services (including music and physical education)
  - Bridge Program
  - Great Lakes Water Studies Institute
  - NMC Training Division
- The staffing and payroll of the hypothetical, alternative educational provider would be much smaller. Including not offering the activities cited above, we assume that the “core” activities of a higher education institution offering services in the region under the counterfactual scenario would be reduced by two-thirds with a staff estimated at 270 FTE’s.
- Without NMC, its current students would have to decide whether to discontinue their education or select a different higher education institute which would likely necessitate

leaving the area. In fact, we have assumed that all of NMC's current students living outside Grand Traverse County would attend school elsewhere because of the counterfactual institution's limited course offerings. For students living in Grand Traverse County, we have assumed that 50 percent would decide not to advance their education beyond high school and remain in the county.

- At the same time, in estimating the economic impact of the college's presence in the region, we must consider the local tax support for NMC's ongoing operational budget of \$55 million (FY'13 actual). Without NMC all or, at least, a portion of these property tax dollars would be returned to the region's property owners. In short, the \$9.1 million in local property taxes would be returned to taxpayers in this scenario. The reduction in property taxes for residents would have a positive impact on consumption expenditures. For businesses, the decrease in property taxes would lower their capital costs on plant and equipment, making the county marginally more cost competitive. As shown in Table 6, the combined impact to residents and businesses of the lower property taxes would generate an estimated 179 jobs in the 10-county region. Since this is an offsetting impact to the college's economic presence, it is entered as a negative impact.

As shown in Table 6, the direct impact of NMC employment is reduced to 831, because the hypothetical higher education entity would be staffed by an estimated 270 instructors and administrators. Again, the economic impact of NMC is the difference between its current level of operations and this hypothetical educational institution. This total economic impact of NMC can be measured in several ways: an increase of 1,060 jobs, \$55.2 million in sales, \$37.2 million in the region's personal income or a \$33.0 million in the region's Gross Regional Product. In the following section, we break out the individual components that make up NMC's economic impact.

We estimate that the economic impact of NMC's ongoing operations generates 1,123 jobs in the 10-county region, contributes \$56.5 million in extra sales, and \$36.2 million to the region's Gross Regional Product.

**Table 6 Economic Impact of Northwestern Michigan College**

	Grand Traverse	Region 2	Region 3
<b>Ongoing Operations</b>			
Direct employment	1,101	1,101	1,101
Alternative institute	-270	-270	-270
Net institute impact	831	831	831
Full impact on the regions			
Employment	1,074	1,116	1,123
Personal income (\$ mil 2012)	27.3	37.1	34.9
Sales (\$ mil 2012)	53.6	56.7	56.5
Gross Regional Product (\$ mil 2012)	34.3	36.3	36.2
<b>Student Expenditures (NMC and University Center)</b>			
Employment	34	51	53
Personal income (\$ mil 2012)	1.1	1.6	1.7
Sales (\$ mil 2012)	3.0	4.4	4.6
Gross Regional Product (\$ mil 2012)	1.9	2.9	3.0
<b>Business Competitiveness</b>			
Employment	24	43	63
Personal income (\$ mil 2012)	0.7	1.6	2.7
Sales (\$ mil 2012)	4.0	7.1	12.2
Gross Regional Product (\$ mil 2012)	1.8	3.1	5.3
<b>Tax Impact</b>			
Employment	-170	-178	-179
Personal income (\$ mil 2012)	-5.4	-6.5	-6.6
Sales (\$ mil 2012)	-17.2	-17.8	-18.1
Gross Regional Product (\$ mil 2012)	-10.9	-11.3	-11.5
<b>Total Economic Impact</b>			
Employment	962	1,032	1,060
Personal income (\$ mil 2012)	23.7	33.9	32.7
Sales (\$ mil 2012)	43.4	50.3	55.2
Gross Regional Product (\$ mil 2012)	27.2	31.0	33.0

The economic impact of student expenditures is determined by estimating the percentage of students who would either leave the area to attend college elsewhere, or not attend college because of the absence of a more comprehensive and potentially more affordable option. The hypothetical institution's course offering would be limited; however, some students in Grand Traverse County would remain.

Finally, since it is assumed that the counterfactual institution would not provide the technical career programs being offered by NMC, the college's economic impact would include its positive impact on the competitiveness of the regions' businesses. However, it is very likely that the local MMTC operations would move to a different host and, therefore, its contribution is not included in the college's economic impact.

The full economic impact of the college is shown in Table 6. In total, the economic impact of Northwestern Michigan College compared to a private transfer institution is an increase in 1,060 jobs and a rise in total sales of \$55.2 million. Personal income is \$32.7 million greater and the

region's Gross Regional Product is \$33.0 million larger. In other words this is the regional economic impact that is supported by \$9.1 million in property taxes paid to NMC.

Finally, Table 7 provides a detailed breakdown of the college's employment impact on the region's industrial sectors.

**Table 7 Detailed Employment Breakdown of Northwestern Michigan College's Economic Impact**

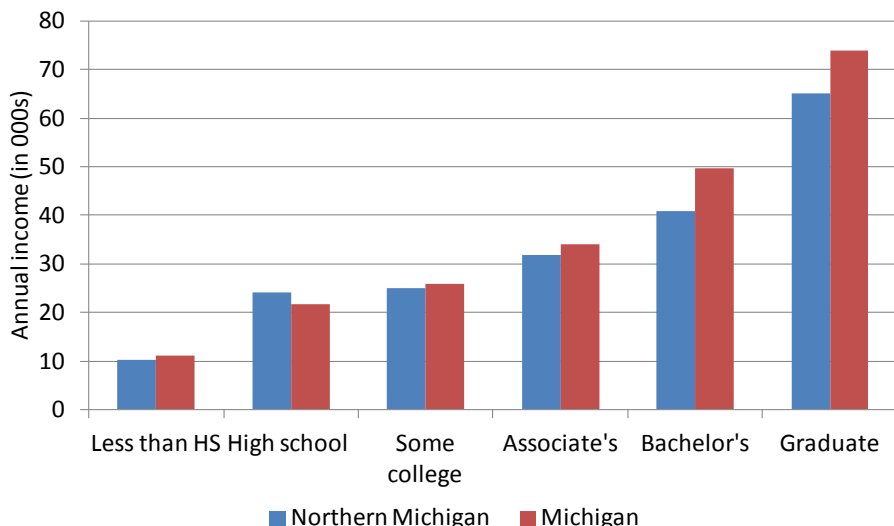
	Grand Traverse	Region 2	Region 3
Northwestern Michigan College	1,101	1,101	1,101
Alternative Institute	-270	-270	-270
Net Direct	831	831	831
Construction	21	30	32
Manufacturing	8	17	26
Wholesale trade	5	6	7
Retail trade	23	37	40
Real estate	5	10	12
Prof., scientific, & technical serv.	4	5	6
Administrative	11	14	15
Education services	821	820	820
Health care	16	25	27
Arts	3	4	4
Food service	4	10	11
Other services	9	13	15
State and local government	31	39	44
Total	962	1,031	1,060

### Impact on Potential Graduate Earnings

If young adults decide not to further their academic careers because of the absence of Northwestern Michigan College, it would significantly lower their lifetime earning potential. In the following figures, we show the 2012 average annual earnings and unemployment rates for working age adults living in Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Missaukee, and Wexford counties.<sup>4</sup> As can be seen in Figure 1, the average annual income of individuals with an associate's degree is 30 percent higher than that of a person who holds only a high school diploma. Moreover, as seen in Figure 2, associate-degree holders also face lower unemployment rates than persons with only a high school diploma.

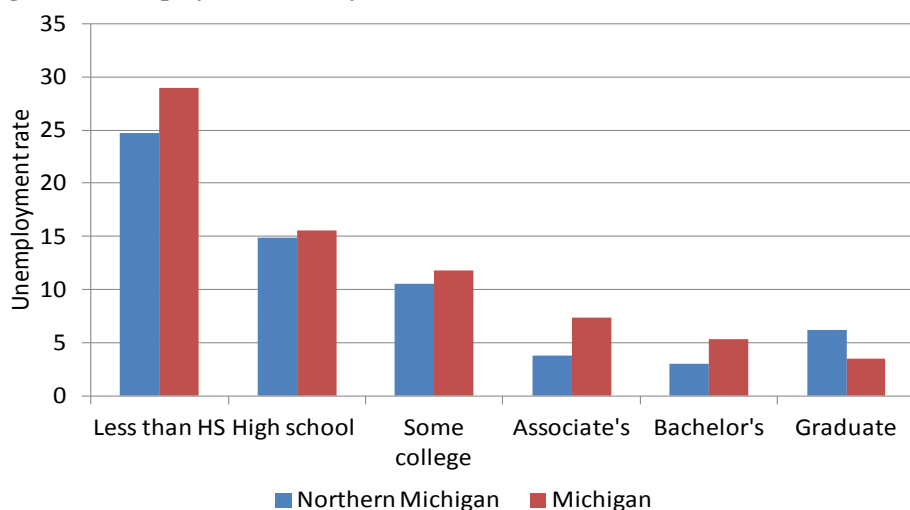
<sup>4</sup> The geographic limitation of the iPUMS database, which provides a five percent sample of individual records from the 2012 U.S. American Community Survey, requires this large geographic area. Note that Manistee County is excluded from this region based on available data.

**Figure 1 Average Annual Income by Educational Attainment**



SOURCE: Ruggles et al, IPUMS USA 2012.

**Figure 2 Unemployment Rate by Educational Attainment**



SOURCE: Ruggles et al, IPUMS USA 2012.

It should be noted that the above data do not specifically reflect the value of an NMC associate's degree but rather an associate's degree from any institution of those employed in the Northern Michigan region.

It is difficult to estimate the average return on investment (ROI) of a student attending Northwestern Michigan College for several reasons. First, some do not complete a certificate or degree program and yet receive economic benefits from attending classes which upgrade their skills. Second, NMC offers a wide selection of unique programs that charge differential tuition rates based on higher program costs. Therefore there is increasing variability in the cost of attendance depending on the program pursued. Third, students may take longer than two years to complete, and may not be successful in finding a career that uses their training to its utmost. Fourth, the opportunity cost of attending college—the loss of income from not working full time—varies greatly between students and their economic conditions. Finally, in estimating a lifetime flow of earnings generated by attending college, a proper discount rate must be used.

There is much debate on this topic: too low of a discount rate will overvalue long-term returns, while the opposite is true if the discount rate is set too high.

As shown in Table 8, we provide three separate estimates for the return on investment for students completing their associate degrees at NMC. These three scenarios are as follows:

- Scenario 1: A student completes a general associate’s degree from Northwestern Michigan College in two years, without receiving any financial support.
- Scenario 2: A student completes a general associate’s degree from NMC and receives financial support (Federal Pell Grant)

In both of the scenarios above, the student would forego the opportunity to earn \$9,600 per year for the 30 weeks that he/she is attending class for the two years. This is based on the student working full-time for \$8.00 per hour for 30 weeks each year.

Scenario 3: A student goes to NMC on a part-time basis, taking 11 credit hours each semester and completes in three years. During these three years he/she is also working part-time, 20 hours per week, earning \$4,800 per year.

As shown in Table 8, we estimate that the student paying full tuition would see a \$7.93 return for every dollar spent attending college (2012 dollars); including foregoing earned income during the two years. For students receiving the average federal assistance package (Pell Grants) who completes in two years, the return is \$11.14 per every dollar invested. Finally for the student who works and attends NMC on a part-time basis, completing in three years, the return on his/her investment is \$9.85. Under scenario 1 and 2, the average associate-degree holder earns \$460,000 more during their working career than a high school graduate. In the third scenario it is slightly lower. To estimate the current value of this difference in earning streams between an associate-degree holder and a high school graduate, a three percent discount rate was used to adjust for time preferences, current earnings are valued more than future earnings even when accounting for inflation.

It is clear that the student’s ROI for attending college will vary greatly depending on the courses taken, parental support, and career success. Nevertheless, even under the conservative conditions stated above, attending NMC is a smart move.

**Table 8 Return on Investment for Attending and Completing an Associate Degree at Northwestern Michigan College**

Scenario	Total tuition (2013 dollars)	Total amount of federal assistance	Foregone earnings due to attending NMC	Earning difference between associate's degree and high school diploma (2013 dollars)				Net present value	Return on investment
				20 to 34	35 to 44	45 to 54	55 to 64		
Full-time student completing in two years without financial support	\$ 5,523	\$ -	\$ 19,200	\$ 6,237	\$ 9,605	\$ 13,970	\$ 12,987	\$ 193,199	\$ 7.93
Full-time student completing in two years with federal Pell Grant assistance	\$ 5,523	\$ 6,534	\$ 19,200	\$ 6,237	\$ 9,605	\$ 13,970	\$ 12,987	\$ 199,638	\$ 11.14
Part-time student completing in three years working full time	\$ 5,696	\$ -	\$ 14,400	\$ 6,237	\$ 9,605	\$ 13,970	\$ 12,987	\$ 192,248	\$ 9.85

### Other Considerations

Dollars and cents are an important but incomplete unit of measurement when it comes to evaluating the importance of Northwestern Michigan College to the greater Grand Traverse

community. Last year, more than 7,200 individuals visited the Dennon Museum Center and only 50 percent resided in Grand Traverse County. In addition, more than 1,200 K–12 students and nearly 700 college students attended programs at the Dennon. Unfortunately, it is difficult to find empirical data on which to estimate the economic impact of these events. These types of visits are often associated with other activities, such as visiting friends or family or multi-destination vacations.

Additionally, NMC retirees overwhelmingly (86 percent of current retirees) stay in the region following retirement. It seems likely that the educational and cultural contributions of NMC to the community play a significant role in their decision to remain and to use their retirement savings in this local region.

NMC's non-credit Extended Education enrollment is not included in this economic analysis. It is noteworthy that a full 39 percent of the Extended Education (non-credit) enrollment is comprised of adults age 65 or older in the region (2,346 individuals). Clearly this is an offering that appeals to and likely enriches the community at all ages but particularly the life-long learners.

## **Summary**

This analysis quantifies the significant economic presence of Northwestern Michigan College in the region. With \$9.1 million in local property tax support (FY'13 actual) funding 17 percent of their overall \$55 million operating budget, NMC contributed \$130.9 million in total sales, \$62.6 million in personal income and \$73.6 million in total Gross Regional Product. Every NMC job supports .6 additional jobs in the 10-county region. NMC is a net positive investment for the community. Local businesses are more competitive because NMC contributes to a trained workforce. At the student level, attaining an associate's degree yields a return on investment of \$7.94 to \$11.15 and historically offers lower levels of unemployment.

NMC contributes far more to the cultural enrichment of the region in ways that are difficult to quantify, and yet local residents experience a higher quality of life because of NMC's presence. Finally, the region benefits from these aspects of NMC's operations:

- Providing economic activity during the off-season. Most of the college's economic impact, including the expenditures of its students, occurs during the tourism off-season months. The college provides balance to an economy that is highly dependent upon tourism.
- Increasing the number of retirees residing in the region. Currently, 175 former NMC full-time employees live in the greater Grand Traverse 10-county region.

Clearly Northwestern Michigan College is an integral part of the greater Grand Traverse regional economy. Moreover, its role will only grow in importance as the region's industries continue to compete on the global stage. In a world environment where transportation costs continue to decline in importance, the quality of a region's workforce and the caliber of its education system will play a more crucial role.

## Appendix

### Description of the REMI Model

The W.E. Upjohn Institute maintains an economic computer model specially designed to estimate the economic impact of changes in the greater Grand Traverse region. The model was constructed by Regional Economic Models Incorporated (REMI) and contains three separate components that together capture the resulting total impact to the local economy due to a change in employment. These components are:

- An input-output model that estimates the impact of changes in inter-industry purchases on the local economy. This component of the model captures the impact of an increase in orders to local suppliers of goods and services, as well as the impact of households increasing their purchases of consumer goods and services.
- A relative wage component that estimates the impact of the expected changes in the area's cost structure due to changes in economic activity. For instance, when a major employer moves into the area, it can cause wages to increase across almost all industries due to the increased demand for workers and other local resources. This boost in wages, while generating additional consumption expenditures, increases the cost of doing business in the area, making the area slightly less attractive to other industries. On the other hand, an increase in the number of skilled workers enhances the area's productivity, and thereby lowers the cost per unit of production, making the region more competitive.
- A forecasting and demographic component that forecasts the resulting changes in future employment and population levels due to a change in economic activity. The model generates an annual forecast which averages seasonal jobs by their duration. For example, four summer jobs that have durations of three months each are modeled as only one year-round job in REMI.

The model is particularly suited to measure the economic impact of higher-education institutions because:

- It contains a highly detailed breakdown of expenditures made by higher-education institutions. Other models use a more general breakdown that includes expenditures made by all education institutions including K-12 public and private schools.
- It allows for estimating the unique consumption expenditures made by students and the college's faculty and staff.
- Finally, it includes a residential component that allows for the modeling of the impact of students, faculty, and staff staying in the county and working outside the county. Other models mistakenly assume that once an employer has left the county, all of the workers would leave as well.

Finally, the model has been rigorously reviewed in numerous academic journals.