

**CONSTRUCTION'S**  
**ECONOMIC CONTRIBUTION**  
**TO**  
**WISCONSIN**

**Dennis K. Winters**  
**Principal Investigator**  
**Vice President, Director of Research**



**October 2003**

## **TABLE OF CONTENTS**

Forward	3
HIGHLIGHTS OF FINDINGS	4
INTRODUCTION	5
THE CONSTRUCTION INDUSTRY IN WISCONSIN	5
SIZE OF CONSTRUCTION SUBSET	6
TOTAL ECONOMIC CONTRIBUTION OF THE CONSTRUCTION INDUSTRY	8
JOB CREATION	10
TAX REVENUE GENERATION	11
ECONOMIC ACTIVITY RECIPIENTS	13
METHODOLOGY	14
Bibliography	16

## **Forward**

We would like to thank the Allied Construction Employers Association of Wisconsin for commissioning this economic contribution study. A study such as this requires the coordinated efforts of several people. We very much appreciate the assistance given by the Mike Fabishak of the Association of General Contractors-Greater Milwaukee for serving as the lead contact with the ACEA and their board. We also appreciate the AGC-GM members that submitted data for the study.

This study, undertaken in the fall of 2003, was led by Dennis K. Winters, Vice President and Director of Research of NorthStar Economics, Inc., Madison, WI.

We accept full responsibility for any errors of omission or commission.

Dennis K. Winters  
Vice President & Director of Research  
NorthStar Economics, Inc.

## **HIGHLIGHTS OF FINDINGS**

- The construction industry subset considered in this analysis contributes over \$7.4 billion to the Wisconsin economy in 2001, over 4% of Wisconsin gross state product.
- The construction industry subset activities are responsible for over 114,000 jobs statewide.
- The construction industry subset presence in the state generates over \$260 million in state income and sales tax revenue annually.
- Gross payroll for the construction industry subset is over \$1.4 billion.
- Construction workers average annual earnings are \$39,011, which is 24% more than the average Wisconsin worker wage of \$31,546.
- Over 92% of construction industry subset economic activity flows into private businesses in the state.
- The construction industry is one of the largest industries in the state under NAICS classification.
- Construction industry employment growth is among the highest in the state, increasing by 43% in a decade.

## **INTRODUCTION**

The construction industry is one of the largest industries in the U.S. and in Wisconsin. Total construction volume in Wisconsin in 2001 amounted to almost \$11 billion dollars. The construction industry is the seventh largest employer among the twenty-one NAICS industry classifications in Wisconsin.

Construction workers are among the highest paid in the state. The construction industry average annual wage is 24% higher than the state average. The industry generates almost 7% of total annual Wisconsin employment payroll with under 5% of the state's workers.

This report presents the economic contribution the construction industry made to Wisconsin's economy in the year 2001. The study's inputs are limited to those construction subindustries that are represented by the Associated General Contractors: multi-family residential, commercial and industrial building. While this segment of the construction industry represents a subset of the total construction industry in the state, its contribution is nevertheless substantial, some \$7.4 billion in 2001.

## **THE CONSTRUCTION INDUSTRY IN WISCONSIN**

The construction industry in Wisconsin is the seventh largest private employer in the state in terms of the twenty-one NAICS industry employment sectors. The construction industry employed 119,934 people in Wisconsin in 2001, almost 5% of the state's workers.<sup>1</sup> It ranks right behind the finance and insurance industry in number of employees.

The state's construction employee's above average annual earnings, however, raises the industry's payroll rank to fifth in the state, right behind the finance and insurance industry, with almost \$5.2 billion in total payroll in 2001. Annual wages paid to construction industry workers in 2001 averaged \$39,011, which is 24% percent higher than the state average annual wage of \$31,546.<sup>2</sup>

Figure 1

### **Wisconsin's Construction Industry** (2001)

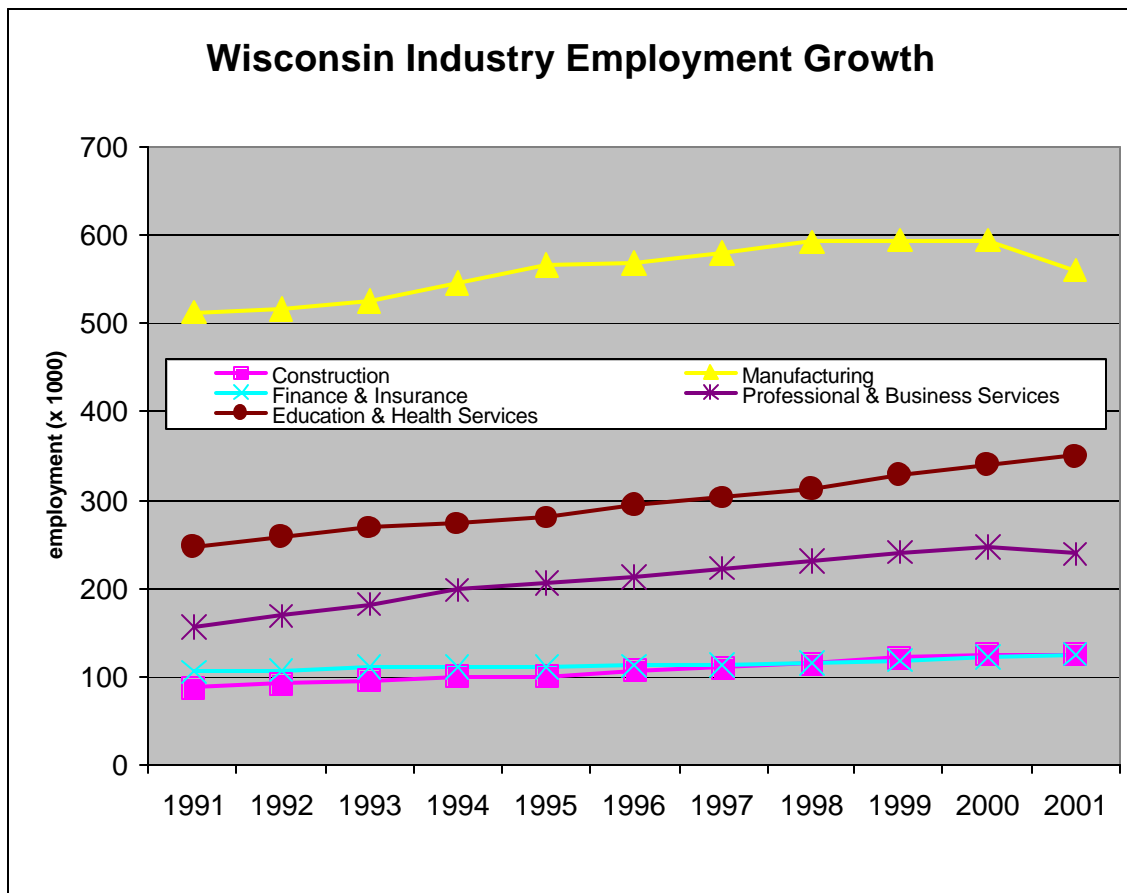
Construction Volume	\$10,993,692,786
Employment	119,934
Payroll	\$5,165,921,000
Average Annual Wage	\$39,011

<sup>1</sup> U.S. Department of the Census, County Business Patterns, 2001.

<sup>2</sup> Wisconsin Department of Workforce Development, Labor Market Information, Covered Employment and Wages, 2001.

Over the last decade, growth in the state's construction industry employment outpaced many of Wisconsin's other industries. Construction industry employment grew 43% from 1991 to 2001. Employment growth rates in other Wisconsin industries were considerably less. Total Wisconsin employment over the period grew by 22%. Manufacturing employment increased by only 9%, while Finance & Insurance industry employment increased by 18%. Professional & Business Services and Education & Health Services grew faster than Construction during the period in Wisconsin, 52% and 41%, respectively.<sup>3</sup>

Figure 2



**SIZE OF CONSTRUCTION SUBSET**

This study focuses on the size and economic contribution made by just a subset of the state's construction industry. Only construction activity involved in multi-family residential, commercial, and industrial markets is considered. Land development, single-

<sup>3</sup> U.S. Department of Labor, Bureau of Labor Statistics, State and Local Employment 1991 – 2001.

family residential, and heavy construction (utilities and roads) are not included in the analysis.

The subset of the multi-family residential, commercial, and industrial markets is still substantial. This market subset accounted for almost \$4.4 billion of the \$11 billion in total construction volume in Wisconsin in 2001. Employment in the subset amounted to over 31,000 workers in almost 1,700 establishments. The gross payroll for these workers totaled to nearly \$1.5 billion.

Figure 3

**Construction Industry Subset Metrics**  
(2001)

Construction Volume	\$ 4,374,755,052
Employment	31,512
Establishments	1,682
Gross Payroll	\$1,469,338,494

The payroll of the construction subsector was calculated by summing the data for multi-family residential, commercial, industrial and the corresponding employment share of the special trades subsector. Total gross payroll for the subsector is almost \$1.5 billion.

Figure 4

**Construction Industry Payroll by Subsector**  
(million \$)

<b><u>Construction Subsector</u></b>	<b><u>Payroll</u></b>
Land Development	\$ 25.1
Single-family Residential	449.8
Multi-family Residential	53.9
Commercial	62.2
Manufacturing/Industrial	808.9
Heavy	725.8
Special Trades	<u>3,040.2</u>
<b>Total</b>	<b>\$5,165.9</b>
<b>Payroll of Subsector</b>	<b>\$1,469.3</b>
Source: County Business Patterns; NorthStar Economics, Inc.	

Employment in the subsector is calculated in much the same way. Multi-family residential, commercial, industrial and a proportion of the special trades subsectors employment are summed, yielding some 31,000 workers.

Figure 5

**Construction Industry Employment by Subsector**

<b><u>Construction Subsector</u></b>	<b><u>Employment</u></b>
Land Development	525
Single-family Residential	13,911
Multi-family Residential	1,478
Commercial	1,509
Manufacturing/Industrial	16,364
Heavy	10,773
Special Trades	<u>75,374</u>
<b>Total</b>	<b>119,934</b>
<b>Employment of Subsector</b>	<b>31,512</b>
Source: County Business Patterns; NorthStar Economics, Inc.	

**TOTAL ECONOMIC CONTRIBUTION OF THE CONSTRUCTION INDUSTRY**

The purpose of this study is to measure the economic contribution of a subset of the Wisconsin construction industry. The construction industry purchases goods and services from private businesses and pays wages to its employees, who in turn spend their income in the regional economy. All these expenditures are magnified throughout the local economy as the business expenditures and employee compensation are further cycled through the regional economy, multiplying the economic impact to the region.

Payroll expenditures are separated from non-payroll expenditures (goods, services, materials, etc.) to account for the economic contribution of each. The total economic contribution of each is then calculated and summed to yield the total economic contribution the construction industry subset makes to the state.

**Payroll Expenditures**

Gross Wisconsin construction industry payroll amounted to almost \$5.2 billion in 2001. Gross payroll for the construction industry subset of this study amounts to almost \$1.5 billion. However, not all of that money is spent in the state. Federal and state withholding taxes are deducted from gross payroll. There are also leakages as employees spend money out of state on such items as vacations and other imported goods. Total adjusted payroll is therefore reduced from \$1.5 billion to \$1.1 billion.

Figure 6

**Contributory Payroll Spending**

Gross Payroll	\$1,469,338,494
Withholdings	361,482,843
Leakages	<u>54,308,647</u>
<b>Contributory Payroll</b>	<b>\$1,053,547,004</b>

Against the contributory payroll figure are applied the Strang sales multipliers to calculate the total economic contribution attributable to the construction industry subset employees.<sup>4</sup> That figure amounts to some \$2.7 billion.

Figure 7

**Total Economic Contribution of Wisconsin Construction Industry Subset Payroll**

Contributory Payroll	\$1,053,547,004
Weighted Average Sales Multiplier	2.540
<b>Total Economic Contribution</b>	<b>\$2,675,587,737</b>

The weighted sales multiplier in this case is 2.540. Note that state income tax withholding has been added back in to the contributory payroll figure as state income tax revenues are assumed to be entirely spent back in the state.

**Non-Payroll Expenditures**

Non-payroll expenditures are the monies that are spent on goods and services from other businesses, this excludes employee wages and benefits. Non-payroll expenditures are calculated as the difference between total value put in place of the construction industry subset minus its gross payroll.

Wisconsin construction industry subset value put in place amounts to about 40% per cent of the total state construction value put in place, \$4.4 billion of \$11.0 billion.

Figure 8

**Subset Industry Non-payroll Expenditures**  
(2001)

State Industry Total Value Put in Place	\$10,993,692,786
Subset Industry Value Put in Place	4,374,755,052
Subset Industry Gross Payroll	<u>1,469,338,494</u>
<b>Subset Industry Non-payroll Expenditures</b>	<b>\$2,905,416,557</b>

<sup>4</sup> See Methodology chapter for explanation of Strang multipliers.

Total subset industry non-payroll expenditures amount to almost \$3.0 billion. This spending has little leakage outside the state according to the survey data collected from construction companies, only about 2%. It is against this figure that we applied the IMPLAN output multipliers.<sup>5</sup>

Figure 9

**Total Economic Contribution of Wisconsin Construction Industry  
Subset Non-payroll Expenditures**

Subset Industry Non-payroll Expenditures	\$2,905,416,557
Out of State Leakages @ 2%	58,108,331
Total In-state Non-payroll Expenditures	\$2,847,308,226
IMPLAN output multiplier	1.6693
<b>Total Economic Contribution</b>	<b>\$4,752,931,897</b>

The total economic contribution attributable to construction subset industry non-payroll spending amount to almost \$5 billion. Adding in the figure from the payroll spending term of the equation, the total economic contribution of the construction industry subset rises to \$7.4 billion dollars.

Figure 10

**Total Economic Contribution of Wisconsin Construction Industry Subset  
(2001)**

Payroll Attributable Contribution	\$2,675,587,737
Non-payroll Attributable Contribution	4,752,931,897
<b>Total Economic Contribution</b>	<b>\$7,428,519,634</b>

The \$7.4 billion contribution attributable to the subset construction industry amounts to about 4.3% of Wisconsin's gross state product of roughly \$173 billion in 2001.

**JOB CREATION**

Not only does this construction industry subset spending flow through the state economy generating further economic activity as demonstrated above, it also creates jobs with the suppliers of goods and services to the industry. As is the case for economic multipliers that expand direct spending to greater economic activity, there are also employment multipliers that translate spending into job creation. Wisconsin construction subset industry non-payroll, in-state spending during 2001 totaled \$2.8 billion. Applying the corresponding IMPLAN employment multiplier to this figure, yields a calculation of the jobs created due to the subset industry's non-payroll spending.

<sup>5</sup> See Methodology chapter for explanation of IMPLAN multipliers.

The employment multipliers are applied to the direct spending figures at a specific rate per million dollars spent. The employment multiplier for construction spending in Wisconsin is 17.007228.<sup>6</sup> That is to say that 17 jobs will be created in Wisconsin for every \$1 million dollars spent on construction. The corresponding employment multipliers were applied to the construction subset industry non-payroll spending to yield a figure of over 49,000 jobs.

Figure 11

**Non-payroll Spending Job Creation**

<b><u>Non-payroll Spending</u></b>	<b><u>Employment Multiplier</u></b>	<b><u>Added Jobs</u></b>
\$2,905,416,557	17.007228	49,413

Obviously, the construction industry creates jobs directly by the number of employees on the job. More jobs are created in the region to service the construction industry employees in their professional and personal lives. There are employment multipliers that translate full-time positions into support job creation. Construction subset industry employment during 2001 totaled 31,512.

Employment multipliers for positions are industry specific. Applying the corresponding employment multiplier, 1.068234, to construction subset industry employment levels yields the number of additional jobs created in the district due to the industry employees. The 31,512 sitting positions in the subset industry are responsible for creating another 33,663 jobs in Wisconsin.

Figure 12

**Construction Industry Jobs Creation**

<b><u>Industry Employment</u></b>	<b><u>Employment Multiplier</u></b>	<b><u>Jobs Created</u></b>	<b><u>Total Jobs</u></b>
31,512	1.068234	33,663	65,175

Total industry jobs attributable to the construction subset industry in Wisconsin are the sum of all the above component parts and totals over 114,000 jobs.

<sup>6</sup> Source: IMPLAN Multiplier Reports for Wisconsin.

Figure 13

**Jobs Attributable to the Construction Subset Industry**

<b><u>Employment Contributor</u></b>	<b><u>Attributable Jobs</u></b>
Non-payroll Spending	49,413
Subset Industry Employment	31,512
Employment Created Jobs	<u>33,663</u>
<b>Total Jobs</b>	<b>114,588</b>

**TAX REVENUE GENERATION**

The presence of the construction industry contributes to economic activity and jobs creation. It is also the pump prime for state tax revenue. While the construction industry paid over \$12 million in corporate income tax in the year 2000 (the latest data available), the state income and sales tax revenue generated by the direct and indirect employment in the state is considerably higher, over \$260 million.

**Income Tax Revenue**

State income tax revenues are compiled from construction subset industry corporate income taxes, industry employee state income tax withholding, plus the product of the number of jobs the construction subset industry spending creates times their average income times the Wisconsin income tax rate.

The construction industry subset corporate income tax is estimated at over \$12 million.<sup>7</sup> The construction industry subset employs over 31,000 workers. Their state income tax withholding equals \$74 million. The industry also creates another 83,000 jobs in the state. The state average wage in 2001 was \$30,839.<sup>8</sup> The average income tax rate paid by Wisconsin taxpayers is 3.4% of personal income.<sup>9</sup> Annual income tax payments made by holders of these indirectly created jobs averaged \$1,039 for average Wisconsin residents. Applying the mathematics yields state income tax revenue of \$86 million for jobs created across the state. In total, the state of Wisconsin collects \$165 million in annual income tax revenue from Wisconsin construction industry subset activity.

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<sup>7</sup> Source: Wisconsin Department of Revenue, Division of Research and Policy, The Wisconsin Corporate and Franchise Taxes, Table 4, 2000 Wisconsin Corporate Income and Franchise Tax Liability by Two-digit SIC Code, January 23, 2003, and NorthStar Economics, Inc. calculations.

<sup>8</sup> Source: U.S. Bureau of Labor Statistics

<sup>9</sup> Source: Wisconsin Department of Revenue, Wisconsin Taxpayers Alliance, Bureau of Economic Analysis

Figure 14

**Construction Industry Subset State Income Tax Revenue Generation**

<b><u>Taxed Entity</u></b>	<b><u>Tax Revenue</u></b>
Corporate Income Taxes	\$ 4,799,472
Employee Withholding	74,179,868
Employee Created Jobs Income Taxes	34,998,923
Non-payroll Spending Created Jobs Income Taxes	<u>51,374,676</u>
<b>Total State Income Tax Revenue Generated</b>	<b>\$165,352,939</b>

**Sales Tax Revenue**

Not only state income taxes flow to state coffers, but state sales tax do as well. Each job created by the construction industry earns income that is spent on goods and services that collect sales taxes against the value of the product. Wisconsin’s state sales tax rate is 5.0%. The average sales tax paid as a percentage of personal income is 2.36%.<sup>10</sup>

Personal income of the direct and indirect jobs created by the construction industry subset amounts to over \$4.0 billion. The average Wisconsin sales tax generated is 2.36% of personal income. Wisconsin collects an additional \$95 million in annual sales tax revenue as a result of the subset industry’s presence in the state.

Figure 15

**Construction Industry Subset State Sales Tax Revenue Generation**

	<b><u>Direct Jobs</u></b>	<b><u>Indirect Jobs</u></b>	<b><u>Total</u></b>
Annual Personal Income	\$1,469,338,494	\$2,561,970,635	\$4,031,309,129
Average Wisconsin Sales Tax Rate	2.36%	2.36%	
<b>Annual Sales Tax Revenue</b>	\$34,678,512	\$60,466,209	<b>\$95,144,720</b>
Annual Income Tax Revenue		From Figure 14	<u>165,352,939</u>
<b>Total State Tax Revenue</b>			<b>\$260,497,659</b>

Total additional tax revenue generated from the construction industry subset in Wisconsin is over \$260 million.

**ECONOMIC ACTIVITY RECIPIENTS**

It is often noteworthy to follow the fiscal flows through the economic sectors. In this study, the recipients of economic activity are broken down into four industry classes to track the flow of spending through the state’s economy. The four industry classes are: Private Business, Not-for-Profits, Households, and Government. (Households refer to

<sup>10</sup> Source: Ibid.

payments paid directly to people in private households for services such as dependent care, lawn care, etc.)

Private businesses are the largest benefactors of construction activity, receiving 92%, or almost \$6.9 billion dollars of state construction related spending of this construction industry subset. Not-for-profits, households, and state and local government receive lesser shares, but significant allotments.

Figure 16

**Construction Activity Recipients**

Private Business	\$6,885,594,746
Households	18,013,638
Not-for-Profits	96,345,241
Local Government	<u>428,566,008</u>
<b>Total</b>	<b>\$7,428,519,634</b>

**METHODOLOGY**

In order to identify and estimate the total economic contribution the construction industry makes to the state, one has to look beyond the direct expenditures made by the industry itself. There is a ripple effect of the expenditures made for goods and services supplied to the industry. Furthermore, wages paid to construction industry workers are spent by the employees on housing, food, clothing, entertainment, etc. Likewise, business revenues generated from supplying goods and services to the construction industry are paid out in wages, and material costs, which in turn are spent on living costs. This multiplier effect enlarges the economic impact of the initial construction industry expenditures.<sup>11</sup>

This study quantifies the total economic contribution the construction industry subset makes to the region by collecting data, analyzing spending patterns, applying multiplier coefficients and calculating the final fiscal, job, and tax revenue effects. The construction industry subset consists of multi-family residential construction, commercial and industrial construction, and the share of special trades determined by relative levels of employment, establishments, and payroll in the subset industries from 2001 County

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<sup>11</sup> The “multiplier effect” refers to the recurrent economic activity generated by an initial expenditure. For example, \$100 spent directly on construction will cycle through the local economy again as wages to the tradesman, purchases of construction materials such as lumber, tools and nails, gasoline for machinery and worker transportation. The initial wave of spending generates a second and third wave of spending as wages paid and profits made on the direct construction spending spins through the economy in several cycles. Thus, the original direct expenditure yields a greater economic impact than just the \$100 initially spent. Some money leaks out of the local economy at each level as some spending is done outside the region, the lumber may originate in Georgia or Canada, for example. As a result, the subsequent spending cycles decrease in impact.

Business Patterns data. This is the best and latest data source to breakdown employment, establishment, and payroll by the relevant subset industries.

A model was constructed to organize and segment the data, calculate impacts on spending categories and estimate the direct and total regional economic contribution attributable to the construction industry subset.

Direct construction subset industry employment spending was determined by the gross payroll numbers of the corresponding subset industries for County Business Patterns data for 2000. Tax withholding were subtracted from gross payroll figures to determine disposable income. Disposable income was further reduce by a “leakage” factor for out-of-state spending, based upon previous studies using primary data.<sup>12</sup> Direct construction subset industry non-payroll expenditures were expanded using the IMPLAN output multipliers.

Different multipliers apply to different industry spending categories. Employment multipliers are also vastly different than those multipliers applied to monetary flows. Output multipliers and employment multipliers from IMPLAN are applied to the industry expenditures and employment figures.<sup>13</sup> The sales multipliers used to expand the direct spending of construction industry employee spending (disposable payroll) were drawn from the comprehensive input/output model constructed by Dr. Strang for Door County, WI.<sup>14</sup> The estimates made for the construction employee spending are conservative, due to the fact that the state constitutes a more complex local economy than Door County, cycling the flow of funds at a higher degree within the state and lessening the leakage out of the state. The state income and sales tax factors were calculated using data from the Wisconsin Department of Revenue, Wisconsin Taxpayers Alliance and the Bureau of Economic Analysis.

Spending in the recipient industry categories were aggregated into four industry classes: Private Businesses, Households, Not-for-Profits, and Government. The class shares were determined by work done in previous studies using primary data.<sup>15</sup>

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<sup>12</sup> See Winters, Dennis K., MATC's Economic Contribution to the Region, June 2000, and Winters, Dennis K., University of Wisconsin-Madison's Economic Contribution to the Region, June 2003 and, Winters, Dennis K., Community Collaboration: A Market Profile of the University of Wisconsin Oshkosh, July 2003.

<sup>13</sup> IMPLAN Multiplier Reports for Wisconsin.

<sup>14</sup> Strang, William A., Recreation and the Local Economy, An Input-Output Model of a Recreation-Oriented Economy, Graduate School of Business Administration, University of Wisconsin – Madison, Sea Grant Technical Report #4, WIS-SG-71-204, June 1971, second printing.

<sup>15</sup> Ibid.

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