Economic Impact Analysis of Shawano Lake

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Executive Summary

Shawano Lake in Northeastern Wisconsin makes significant contributions to local economic vitality. With 8 public boat landings, a public beach, 14 walk-in locations, and more than 250 parking spaces for boat trailers, the lake is easily accessed by Shawano residents and tourists. A local public good, the lake supports a wide variety of outdoor recreational activities, including fishing, boating, and camping.

To establish the economic impact of Shawano Lake, we estimate direct spending on lake-related activities. We also consider the local economic impact of those who own second homes or cabins on the lake. Last, we estimate the impact that lake frontage has on property values and property taxes.

In 2021, total direct and indirect lake spending contributed more than $29 million to the local economy. The previous year, lake use accounted for 46% of total tourism spending in Shawano County. Direct tourism spending is augmented by second-home owner spending in the community. While the impact of the changing residential patterns around the lake, driven by a significant increase in out-of-state buyers, is difficult to quantify, we estimate these homeowners contribute an additional $3.58 million to the local economy. Further, lake frontage adds approximately $220,000 to the assessed value of a home – or more than $179 million in additional home value for property owners. This translates into nearly $6 million in additional property tax revenue each year.

In addition to direct private sector market-based contributions of non-local visitor spending to regional businesses and their spinoff multiplier, the lake provides eco-system and natural benefits that accrue to those in proximity of the lake. Perhaps the largest is the role the lake plays as a conduit for outdoor recreation. The lake's playgrounds, beaches, picnic spaces, public docks, boating facilities, and walking and biking trails all contribute significantly to the health and wellness of community members. While difficult to measure, these benefits are nonetheless of vital importance.

Estimated Economic Impact of Shawano Lake

	2018	2019	2020	2021
Total Direct and Indirect Spending by Lake Visitors	$25,426,850	$26,156,892	$25,175,174	$29,444,636
Hotels	$1,169,514	$1,190,603	$932,299	$1,573,252
Camping	$3,548,031	$3,815,928	$4,421,764	$4,862,008
Restaurants & Bars	$19,959,794	$20,321,461	$19,007,881	$22,235,647
Boating	$113,679	$246,331	$317,954	$301,017
Fishing	$635,832	$582,569	$495,276	$472,621
Total Direct and Indirect Spending by Second Homeowners	$3,324,407	$3,384,644	$3,426,400	$3,587,373
Estimated Increase in Property Values Attributable to Lake Frontage	$166,210,722	$169,222,421	$171,358,279	$179,358,279
Additional Property Tax Revenues Attributable to Lake Frontage	$5,659,963	$5,762,520	$5,833,612	$6,107,676
Total Impact (excluding the increase in home values attributable to lake frontage)	**$34,411,220**	**$35,304,056**	**$34,435,186**	**$39,139,685**

Economic Impact Analysis Shawano Lake

1. Introduction to Shawano Lake

Located in Northeast Wisconsin, Shawano Lake is comprised of 6215 acres or 9.65 square miles. The lake has a mean depth of 9 feet and a maximum depth of 39.5 feet. An assessment of the water quality of Shawano Lake was recently completed as a part of a comprehensive lake management plan formulated by the Shawano Area Waterways Management. The assessment examined three main factors: phosphorus, chlorophyll-α, and secchi disk transparency. It also compared Shawano Lake to other similar lakes in the region (Heath et al., 12). Based on samples from 1999 - 2019, the phosphorus and chlorophyll-α averages indicate that Shawano Lake rates as "good" for shallow drainage lakes in Wisconsin (Heath et al., 18 - 19). Water clarity is indicated by an average of the secchi disk transparency. Based on samples from 1993 - 2019, Shawano Lake was found to be "excellent" (Heath et al., 20).

The classification of a lake is based on both water flow and water depth. Shawano Lake is a shallow lowland drainage lake (Heath et al., 16). It is connected to one major outlet, which is the Wolf River. Additionally notable is that the lake has 18.33 miles of main shoreline but just 0.37 miles of island shoreline. Furthermore, the lake bottom consists of 88% sand and 12% muck.

The primary lake-use issues are shoreline run-off and invasive species. A shoreline assessment of Shawano Lake was completed in 2019 (Shawano Lake Comprehensive Management Plan). It concluded that "the largest concerns around Shawano Lake are stairs, trails, or roads leading to the lake and lawn or soil sloping towards the lake" (Shoreline Assessment, 11). Another contributing factor is point sources that send water towards the lake. One recommended remediation strategy is to ask homeowners to redirect downspouts to a buffer away from the lake (Shoreline Assessment, 12).

The second lake-use issue is the presence of invasive species. There are 11 confirmed invasive species in Shawano Lake. Invasive plants include Eurasian watermilfoil/hybrid milfoil, purple loosestrife, curly-leaf pondweed, reed canary grass, and giant reed. For invasive invertebrate species Shawano Lake has zebra mussels, rusty crayfish, Chinese mystery snails, banded mystery snails, and faucet snails. Additionally, there is one invasive fish species, which is the common carp (Heath et al., 87). These plant and animal species can negatively affect lake navigation, swimming, and fishing. There are plans to combat some of the invasive species; see the Shawano County Invasive Species Strategic Management Plan (SCISSMP) that includes options for chemical, physical and biological control projects (Bartsch).

Shawano Lake hosts vast range of tourism and recreational activities throughout the year. The lake is highly accessible with 8 public boat landings, 14 walk in locations, and more than 250 parking spaces for boat trailers (Heath et al., 6). There are also 3 public lands/parks within 1000 feet of the lake and one public beach. Residents and visitors take part in many activities, including boating, fishing, and camping. In particular, the lake sees a lot of recreational fishing activity, with tournaments hosted both during the regular and ice fishing seasons (Heath et al., 6).

There are several options for accommodation near Shawano Lake. These include 5 campgrounds and 19 resorts/rental businesses in proximity to the lake (Heath et al. 6). Surrounding Shawano Lake

are also numerous restaurants and bars. Some of the most popular establishments include Brother's Pub and Classic's Restaurant & Lounge (see Figure 1).

**Figure 1. Map of Recreational Amenities on Shawano Lake**
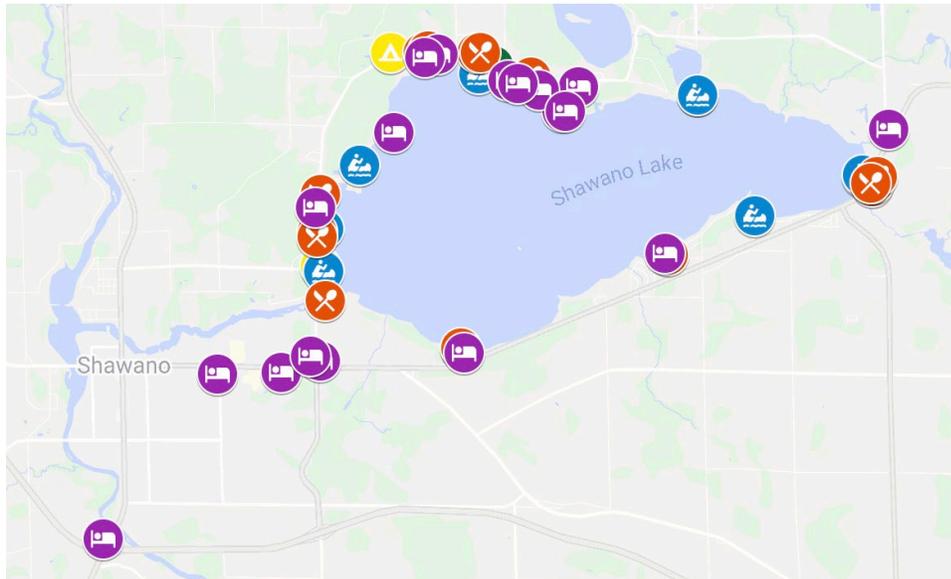
In recent years, the water level of Shawano Lake has been a concern for local parties. In May 2021, North Eastern Wisconsin Hydro, a Wolf River Dam operator, and Shawano Area Waterways Management, a property owners' group, applied to permanently raise Shawano Lake water levels (Hurley). Since then, the Federal government has approved an increase in Shawano Lake levels from 802.5 feet mean sea level to 802.9 feet mean sea level (Kerhin). However, the increase approved in July 2021 is set to expire after 2 years, which leaves those affected seeking a more permanent solution. The lake level is an important issue for many because low water levels have been associated with disrupted navigation and increased boater and swimming safety concerns (Heath et al., 17). In fact, a stakeholder survey completed by the Shawano Area Waterways Management group found that a significant majority of respondents preferred higher water levels (Heath et al., 18).

Last, we note that the economic conditions of the Shawano Lake community provide some important context for our findings. The U.S. Census Bureau estimates Shawano County's 2021 population as 40,859 people. The median household income is approximately $57,322. Unemployment in March 2022 was 3.4%. Overall, 92% of the county's population has a high school degree or equivalent; 16.3% of the population has attained a bachelor's degree or higher.

2. Methodology

Our research suggests that Shawano Lake influences the local economy through several distinct pathways (Figure 2). The first is through direct spending by community members, tourists, and secondary homeowners on activities associated with lake use. Since we know the Covid-19 pandemic had a significant impact on tourism-related spending, when possible, we provide estimates of direct spending for 2018, 2019, 2020, and 2021 to allow for a more wholistic picture. The second pathway is the induced or indirect effects of this spending. Third, the existence of Shawano Lake also impacts local property values, which in turn affect property tax revenues and local government spending.

Figure 2. Approach Used to Estimate the Economic Impact of Shawano Lake
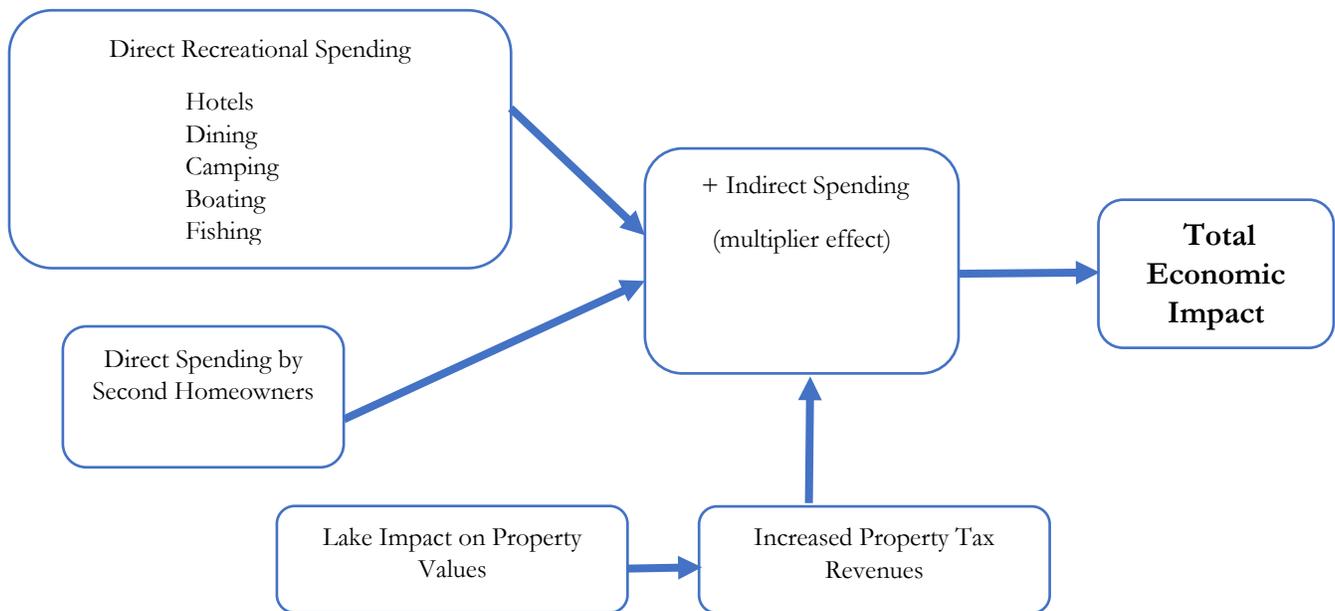
The Wisconsin Department of Tourism provides estimates of the tourism impact by county. The data are generated by the research vendor Tourism Economics. In 2019, direct visitor spending to Shawano County was estimated at $68.9 million, supporting 938 jobs. In the first year of the Covid-19 pandemic, this to fall to $54.3 million (a decrease of 21.2%). Some rebound in spending is anticipated for 2021, but these estimates are not yet available.

Table 1. Total Tourism Impact for Shawano County

	Direct Visitor Spending (in millions)	Total Business Sales (in millions)	Employment	Total Labor Income (in millions)	State and Local Taxes (in millions)
2018	$68.5	$103.8	936	$20.8	$7.6
2019	$68.9	$105.4	938	$21.8	$7.6
2020	$54.3	$ 86.0	763	$20.0	$6.0
2021	Not Yet Available	Not Yet Available	Not Yet Available	Not Yet Available	Not Yet Available

To attempt to isolate the impact of Shawano Lake from total county tourism, we adopt a tri-pronged approach: (i) estimating direct recreational spending induced by the lake, (ii) estimating the impact of spending by second homeowners, and (iii) estimating the impact of the lake on property values in Shawano County. The methodology for each will be discussed the following sections.

Direct recreational spending for hotels and resorts, dining, camping, fishing, and boating are examined in detail. Once we estimate direct visitor spending, we calculate the additional business or service spending brought on by these activities, including business-to-business spending and/or spending along the supply chain. For example, boaters dining in lakeside restaurants causes the restaurant to hire local staff, to contract with local laundry services, and to purchase supplies of food and drink (Figure 3).

Figure 3. Economic Multipliers
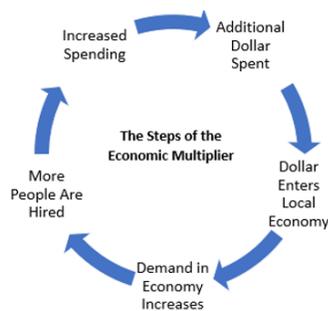
We calculate the indirect effects using IMPLAN Social Account Matrix (SAM) multipliers. IMPLAN is an input-output modeling system that uses annual, regional data to map buying/selling relationships so that users can estimate the total impact of a specific economic activity. In other words, IMPLAN multipliers estimate the ripple effect of a given economic activity through input purchases and labor payments. While there are hundreds of different multipliers for different activities, those that we use are reported in Table 2.

Table 2. Shawano County Multipliers

Industry Code	Description	Indirect Multiplier	SAM Multiplier
406	Retail food and beverages	1.0026	1.0246
408	Retail gas	1.0559	1.0683
410	Retail sporting goods, hobby, musical instruments, and bookstores	1.0004	1.0004
411	General retail	1.0007	1.0375
477	Landscaping and grounds services	1.0356	1.0378
504	Other amusement and recreation	1.0018	1.0058
507	Hotels and motels	1.0048	1.0052
509	Full-service restaurants and bars	1.0762	1.1153
534	Local government	1.9281	1.9914

In addition, we rely on estimates from an Economic Impact Analysis of the Wisconsin Park System to calculate daily spending by recreational visitors. For example, Wisconsin campers spend an average of $41.19 per person, per day in the local community they visit, inclusive of accommodation, dining, gasoline, groceries, entertainment, admissions, fees, licenses, and equipment rentals. Wisconsin boaters spend an average of $85.60/day and anglers spend approximately $62.03/day.

While we attempt to capture most of the economic activity associated with Shawano Lake, we exclude from our analysis the following.

- We do not include activity by the Shawano Wisconsin Airport and Seaplane Base. Because our focus is specifically on Shawano Lake, general airport transport is not relevant. Current seaplane use remains highly limited because of silting in the turning basin. Until the basin is dredged and fueling capability at the seaplane dock is improved, it the economic impact of seaplanes will remain small. Future airport investments designed to support seaplanes would be highly beneficial, as Shawano Wisconsin Airport is one of only two in the state where the airport is within walking distance of tourism amenities.
- We exclude the economic impact of Camp Tekawitha, an outdoor ministry of the Catholic Diocese of Green Bay for two reasons. First, the camp's water access is on Loon Lake, not Shawano Lake. Second, it is not clear how much revenue generated by the camp stays in the community versus flows to Green Bay. We note that between June and August, the camp typically has 230 individuals onsite and using the facilities each day. This includes 1300 summer campers, 60 staff members, and 5000 short-term visitors. While it is likely some of these people participate in activities related to Shawano Lake and/or spend money in the Shawano community, we cannot effectively capture the impact.
- The impact of ice fishing is included in our analysis of anglers' community impact (via fishing license purchases). We do not include estimates of deer hunters, as they are unlikely to be using the lake. We also exclude cross-country skiers and snowmobilers because while trails are lake adjacent in some places, these individuals' visits were likely motivated by factors other than the lake.
- We exclude two other trends that are yet small but likely to have a larger impact in the future. The first is the transition by private campgrounds from daily to seasonal site rental. While we know this is occurring, the private campgrounds were unwilling to provide us with any data. Second, we also know that there has been an increase in the vacation or short-term stay housing market. Airbnb lists twelve cabins or houses for rent directly on the lake. Vrbo lists thirteen houses and cabins for rent, though there is some overlap between the two. That said, only five percent of second homeowners reported renting their house to third parties; their estimated revenues were quite small.

3. Direct and Indirect Spending by Lake Visitors

3.1 Spending on Hotel Accommodations

Shawano County is home to 17 hotels and resorts. Of these, 14 are within 5 miles of the lake. These have a total capacity of 349 rooms. The remaining 3 are farther from the lake. Their total capacity is 71 rooms. The average listed hotel rate was $76. Cottages and resort rates average $166. A list of

hotels can be found in the appendix.[1] Based on occupancy levels and lake proximity, we estimate that as much as 83% of room capacity can be attributed to lake users.

We determined the total amount spent on accommodation in Shawano County in each of the past 3 years (2021, 2020, 2019; data on 2018 is pending). This information is available from the Wisconsin Division of Research and Policy. After filtering by county, the appropriate data was found under the *accommodation* industry.[2]

Next, we estimate the difference in room spending between the summer and winter months. Total hotel accommodation spending from December to April is used as a baseline for non-lake-related hotel spending in Shawano County. Next, we calculate total spending from May through November each year. Taking the difference between the two provides a high-end estimate of direct hotel spending related to lake visits (Table 3, column 2). However, given that we estimate only 83% of county hotel capacity is reasonably near the lake to be counted as lake tourism, we can multiply column by 0.83 to get a more reasonable estimate for direct lake spending on accommodation (column 3).

Last, we calculate the direct and indirect spending attributable to lake-use hotel accommodation using a SAM multiplier of 1.0052 (columns 4 and 5). In 2021, we therefore estimate that lake-use hotel spending amounted to between $1.57 and $1.90 million.

Table 3. Total Accommodation Spending Attributable to Lake-Use

	Direct Lake Spending (High Estimate)	Direct Lake Spending (Low Estimate)	Direct + Indirect Spending (High Estimate)	Direct + Indirect Spending (Low Estimate)
2018	NA	NA	NA	NA
2019	$1,427,041	$1,184,444	$1,434, 462	$1,190,603
2020	$1,117,441	$927,476	$1,123, 252	$932,299
2021	$1,885,678	$1,565,113	$1,895,484	$1,573,252

Covid-19 had a significant impact on travel and tourism spending. Gursoy and Chi (2020) reported that more than half of Americans sampled were unwilling to travel to a destination and stay at a hotel in the early months of the pandemic. Examining monthly spending in Shawano County, we can see a steep decline in hotel spending between 2019 and 2020. Tourism began to rebound in April 2021. Tourism declined again between December 2021 and March 2022 with the Omicron wave, before increasing throughout the summer.

3.2 Spending Related to Camping

Campers on Shawano Lake account for a significant amount of direct tourist spending. There are a total of 5 campgrounds on the lake with approximately 510 usable sites. These campgrounds range from sites oriented towards large RV campers to smaller campgrounds that advertise their boating

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[1] We found that each hotel had a different amount of information readily available. For some, we had to call or email to find out capacity information. Others had Facebook pages or fully developed websites. The more traditional hotels had information on listed on Tripadvisor, Expedia, or similar websites.

[2] https://public.tableau.com/app/profile/research.policy/viz/CountyTaxableSalesComparison/Story

docks and fishing. Average prices for these campsites are approximately $40/night, with prices ranging from $36 to $57 per night.

To estimate the economic impact that campers have on the Shawano community, we first need to develop an estimate of the total number of annual campers (annual camper nights). We begin by calculating estimates of total occupancy for all the campsites surrounding Shawano Lake based on campground revenues. We use the information provided by Shawano County Park to scale estimates for the private campgrounds. Note that Shawano County Park has 125 sites (Table 4).

Table 4. Estimating Revenues and Spending at Private Campgrounds

	Shawano County Park	Fawn Lake	Kellogg Kampsites	Pine Grove	Lakeview	Total Annual Revenues
Number of Sites	125	100	50	200	35	510
Total Revenue in 2018	$357,266	005	$117,593	$517,624	$90,249	$1,346,782
Total Revenue 2019	$336,543	$269,234.40	$134,617.20	$538,468.80	$94,232.04	$1,373,095
Total Revenue 2020	$430,922	$344,737.60	$172,368.80	$689,475.20	$120,658.16	$1,758,162
Total Revenue 2021	$446,934	$357,547.20	$178,773.60	$715,094.40	$125,141.52	$1,823,491
Multiplier for Scaling Data Estimates	125/125 =1.0	100/125 =0.8	50/125 = 0.4	200/125 =1.6	35/125 = 0.28	

Next, we can estimate average camper spending per day. The Wisconsin DNR State Park System finds that, on average, campers spend $41.19 per day in Wisconsin, $3.08 of which goes to accommodation. Since we already account for site revenues, we use an average per day camper spending of $38.11 (inclusive of spending on restaurants, gasoline, groceries, entertainment, misc. retail, admissions, fees, licenses, equipment rentals). See Table 5.

Table 5. Estimated Total Community Spending from Campers

	Total Camp Site Revenue	Additional Discretionary Campsite Revenues[3]	Total Estimated Number of Campers (Camper Nights)	Direct Camper Spending in the Community	Total Direct + Indirect Spending
2018	$1,346,782	$129,720	38,466	$1,465,939	$3,548,031
2019	$1,373,095	$117,863	39,482	$1,504,659	$3,815,928
2020	$1,758,162	$167,743	41,710	$1,589,568	$4,421,764
2021	$1,823,491	$167,151	43,432	$1,655,194	$4,862,008

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[3] This includes firewood purchases, dumping fees, electric fees, etc.

We calculate indirect spending using a multiplier of 1.048 for direct camper spending and private campground revenues (a weighted average of the relevant multipliers for spending on groceries, restaurants, gas, etc.). For Shawano County Park revenues, we use a local government multiplier of 1.9914. For private campgrounds, we use 1.0052.

While the pandemic had a negative effect on hotel accommodations over the past two years, the opposite was true for camping. In 2021, camping accounted for nearly $5 million in community spending.

3.3 Spending in Restaurants and Bars

Shawano County is home to an estimated 40 bars and restaurants, of which 13 are in close proximity to the lake (32.5%). Using calculations of total direct spending on *food services and drinking places* as provided by the Wisconsin Division of Research and Policy for Shawano County, we estimate the proportion associated with lake-use. Data was available for 2021, 2020, and 2019. We discount 2019 values by the inflation rate to estimate 2018 food service and drinking spending.[4] Values are reported in Table 6.

Next, we calculate the direct plus indirect spending attributable to lake-use hotel accommodation using a SAM multiplier of 1.1153. Although not as dramatic as for hotel spending, it is evident that the pandemic also significantly impacted restaurant and bar spending, leading to a decline of more than $1.3 million in 2020 compared to 2019. By 2022, we can see that dining and bar spending has rebounded, contributing more than $22 million to the local Shawano economy.

Table 6. Total Restaurant and Bar Spending Attributable to Lake-Use

	Direct Spending on Restaurants and Bars	Estimated Direct Spending at Lakefront Restaurants and Bars	Direct + Indirect Spending
2018	$55,065,679	$17,896,346	$19,959,794
2019	$56,063,456	$18,220,623	$20,321,461
2020	$52,439,513	$17,042,842	$19,007,881
2021	$61,344,370	$19,936,920	$22,235,647

3.4 Spending on Boats and Boat Rentals

Boating makes an important contribution to the tourism economy in Wisconsin, and its impact has only increased throughout the pandemic, as boating has provided a safe recreational and socializing option. According to the *Milwaukee Journal Sentinel*, boat sales in Wisconsin increased by 9% in 2020, and boat registrations rose by 2%. Overall boating generates approximately $4 billion in economic activity for the state, once manufacturing, sales, and service are considered.

Boating landing fees and dockage account for a significant source of revenue for Shawano County (Table 7).

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[4] https://public.tableau.com/app/profile/research.policy/viz/CountyTaxableSalesComparison/Story

Table 7. Shawano County Boat Launch and Docking Revenues

	Annual Boat Launch Stickers	Number of Daily Passes	Total Launch Revenues	Boat Landing Fees	Boat Dock (Slip) Rentals	Total Direct Spending	Direct + Indirect Spending
2018	69	2025	$10,425	$16,471	$8977	$35,873	$71,437
2019	63	2343	$9,661	$15,557	$9000	$34,218	$68,142
2020	118	1483	$15,275	$20,247	$9651	$45,173	$89,958
2021	102	1611	$13,906	$18,393	$10,108	$42,407	$84,449

In addition to private boat use, Shawano Lake has several rental options, including those available from Shawano County Park and American Marine. In 2021, Shawano County Park offered five pontoon boats for rent, one fishing boat, and a number of small paddle craft.[5] American Marine offered three pontoon boats, one ski boat, and one fishing boat for rental in addition to some smaller craft options. There are also several single craft rental options on the lake through resorts and private individuals. As we did for camping, we scale revenues reported by Shawano County Park to provide an estimate of the total direct boat rental spending. We do the same for estimating the impact of boat slip rentals.

In addition to boat rentals, boaters may eat in lakeside restaurants, purchase fuel, and otherwise spend money in the community. The Wisconsin Department of Natural Resources estimates the average boater spends $85.60 per outing, of which $14.15 is rental expenses, yielding net-of-rental spending of $71.45. To calculate the number of boat rentals, we assume an average rental price of $150/day and an average number of boaters per boat of 2.5 people. We use a multiplier of 1.048 (a weighted average of the relevant multipliers) for boater spending, a multiplier of 1.0058 for private rental spending and 1.9914 for rentals through Shawano County Park.

Table 8. Estimated Community Spending by Boaters Using Rentals

	Direct Boat Rental Spending	Estimated Number of Annual Rental Days	Direct Spending Assuming 2.5 Boaters Per Rental Outing	Direct + Indirect Spending From Boat Renters
2018	$ 17,874	119	$21,285	$42,242
2019	$ 72,526	517	$92,321	$178,189
2020	$ 89,925	600	$107,086	$227,996
2021	$ 81,785	545	$97,391	$216,568

In 2021, boat-related expenditures by non-lakefront homeowners added nearly a quarter of a million dollars in local spending.

3.5 Spending on Fishing

In the state of Wisconsin, fishing ranges from a calming pastime to a competitive sport. In fact, it is estimated that 25% of Wisconsinites fish at least once per season. These Wisconsin anglers catch an estimated 88 million fish annually. Sportfishing generates approximately $2.3 billion in economic

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[5] In 2018, Shawano County Park offered a single pontoon boat for rent. They added two additional boats 2020 and another in 2021.

benefits for the state and supports nearly 22,000 jobs (Burkett and Winkler 2017; *LaCrosse Tribune* 2014).

Anglers on Shawano Lake fish for bass, walleye, perch, bluegill, pike, and muskies (dba AA Fishing 2020). Table 9 reports data for the number of Shawano County fishing permits and licenses sold each year from 2018 through 2021. Data were provided by the Wisconsin Department of Natural Resources (WDNR).[6] This data includes fishing permits for single day use and annual permits. Based on estimates of the average fishing days per permitted angler, we develop an approximate count of the total angler days on Shawano Lake per year.[7]

The report on the Economic Impacts of the Wisconsin State Park System estimates the average Wisconsin angler spends $81.58 per day, including overnight accommodations, food and drink, fuel, entertainment, retail, and equipment rentals and purchases (calculated based on a weighted multiplier 1.048).

Table 9. Estimates of Anglers and Direct and Indirect Spending

	Number of Daily Permits	Number of Annual Permits	Participation Estimates of Annual Permit Holders	Total Permit Revenue	Estimate of Total Direct Spending by Anglers	Total of Direct + Indirect
2018	207	7,230	87	$145,322.75	$606,710	$635,832
2019	210	6,604	83	$128,267.50	$555,886	$582,569
2020	131	5,662	73	$105,038.50	$472,592	$495,276
2021	111	5,417	71	$100,463.50	$450,974	$472,621

Since permit revenue accrues to the state DNR, we do not include these dollars in estimates of the total direct and indirect effect of anglers on Shawano Lake. We do note, however, that some of these funds return to the community through WDNR efforts at fish restocking, water and fish quality investments, and permit and fishing limit enforcement.

While we witness some decline in permits and days out fishing throughout the pandemic, anglers are still estimated to contribute nearly a half a million dollars to the local community annually.

4. Direct Spending by Second Homeowners

Out of 814 private homes on Shawano Lake, 516 are second homes. Using information provided by the United States Geologic Survey (USGS) Graphic Information System (GIS), we identify all the lots with lakefront footage.[8] The website provides publicly available information on land parcel ownership data as well as property taxes. We prune the data, removing any commercial or

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[6] Data was provided by Kimberly Currie of the Wisconsin Department of Natural Resources.
[7] To adapt the data to estimate the economic impact that Shawano Lake anglers have on the local community, we make several simplifying assumptions. First, all permits registered in Shawano County are used for recreation on Shawano Lake at some point during the season. Second, all permits registered in Shawano County are an accurate representation of total recreational use by anglers of Shawano Lake (e.g., there is no unlicensed fishing).
[8] The website can be found at: https://maps.co.shawano.wi.us/scgisviewer/.

government-owned parcels of land. We then separated the parcels into primary or secondary residencies by comparing the site address to the ownership mailing addresses, with matching pairs of information labeled as primary residence and nonmatching pairs labeled as secondary. This led to our count of 815 lakefront houses, 300 of which are primary residences (36.8%) and 515 of which are secondary residences (63.2%).

Next, we created a digital survey accessible via QR code or website address. The survey asked secondary homeowners how many days they spend per year at their lake residence, and in which season they use their home most often. Furthermore, if they rent their lake residence, we asked which platform they use and how many nights per year other individuals occupy it. Last, we asked for an estimate of their annual personal lake house expenditures, including groceries and gas but excluding property taxes. Survey respondents were asked to estimate how their spending was allocated between such things as restaurants and bars, groceries and gas, recreational activities, and local events.

The survey was mailed to 498 usable addresses as identified by through the GIS. We received a total of 78 responses. Second homeowners use their lake house an average of 86.93 days per year or approximately 23.82% of the time. On average, this varies by 52.15 days (Table 10).

Table 10. Second Homeowner Survey Statistics

Survey Question	Mean or Percent (Standard Deviation)
How many days per year do you estimate you spend in residence at your lake house?	86.93 days (52.15)
In which season do you use the house most? Summer Fall	96.05% 3.95%
Do you rent your lake house? Yes No	5.33% 94.67%
What is your estimated total annual spending in the Shawano community?	$6,115.00 ($5319.62)
Spending by category Bars and restaurants	$1,465.77 ($1000.41)
Groceries, gas, local purchases	$2,392.80 ($1,309.83)
Local recreational activities	$1,159.40 ($1,051.17)
Local events	$494.09 ($441.50)
Other	$1,172.25 ($1,116.60)

Further, 94.67% of respondents state that they do not rent out their secondary residence during the year. For those that rent, Vrbo and AirBnB were equally identified as renting platforms used. The small number of houses rented, suggests the impact of private person-to-person rentals is not significant and we, therefore, exclude this from our final analysis.

Secondary residents indicate that their household spends an average of $6115.00 annually in the Shawano community; it is worth noting there is a high variation in spending. On average, spending deviates from the mean by more than $5319. Of this annual total, respondents indicate they spend the most on groceries, gas, and local purchases followed by restaurants and bars. Second homeowners spend an average of $1,172 a year on things such as lawn service, snow removals, and repairs.

Using these values, we estimate total direct spending by all second homeowners (Table 11).

Table 11. Direct, Indirect, and Total Spending

Spending Category	Total Direct Spending[9]	Total Spending = Direct + Indirect
Bars and restaurants	$754,869	$841,905
Groceries, gas, and local purchases	$1,232,292	$1,262,606
Local recreational	$597,093	$600,556
Local events	$254,457	$255,780
Maintenance, lawn services, snow services	$603,706.43	$626,526
Aggregate Impact	$3,442,417.84	$3,587,373

It is evident that second homeowners have a sizable impact on the local economy, amounting to more than $3.5 million in 2021. In particular, we find it encouraging that second homeowners to value Shawano restaurants and maintenance and repair services. Note that spending on recreational activities may appear low in our data since we did not ask for expenditures over time. For example, most second homeowners likely had already invested in fishing equipment, boats, snowmobiles, skis, and other "one-time" expenditure goods. The spending we capture was primarily for maintenance and updating. Note that we discount the total impact by the inflation rate to estimate spending for the previous three years.

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[9] This is calculated by taking the average amount spent per resident ($6115) times the proportion of income spent on each category, then multiplying this value by 515 second homes.

5. The Impact of the Lake on Property Values and Property Tax Revenues

Homes with lake frontage fetch a premium in the housing market in Wisconsin. These higher prices in turn affect property tax collections in their communities. Shawano Lake's proximity to the Chicago-metro area makes it a particularly attractive option for many Illinois residents. In fact, according to property tax records, 26 homes on Shawano Lake are owned by individuals from Illinois. An additional 6 are owned by people who claim Florida as a primary residence; ten others are owned by individuals who reside in Arizona, Connecticut, Indiana, Kansas, New York, North Carolina, and Texas.

To estimate the impact that lake frontage has on property values in Shawano County, we use data from the Shawano County GIS map. From the map, we identified all the lots with lakefront footage.

Once the initial data was categorized, we found information via Shawano County tax records and realtor websites like Zillow.com, on the assessed value of the home, as well as the lot size, year built, livable square footage, number of bedrooms, number of bathrooms, and frontage for a subset of the data. When data were missing, most commonly for frontage, we referred to the GIS map or manual measuring methods. We have complete data on the 300 primary residences. Of the 515 secondary residences, we took a random sample of 50 and collected similar data for these houses, which allows us to compare the features of secondary homes to primary residences. To determine the impact of lakefront property on assessment values, we randomly selected another 50 properties from Shawano County that are not on the lake by using a random number generator to provide random lot numbers. If the resulting parcel was one of the excludable categories (e.g., government-owned, commercial, etc.) another number was generated until 50 residential parcels were found. However, after collecting data for these parcels, there were many holes in the data, and without handpicking the parcels and removing complete randomness, we opted to compare our regressions and data points to the county average for those values, which was collected via realtor websites like redfin.com and point2homes.com, which yielded a median assessed home value of $140,000, and median year built of 1975.

The average assessed value for all lakefront properties was $419,665. Primary residences average $429,590 and secondary residences average $388,182. However, at a 95% confidence level, the difference between primary and secondary house values is not statistically significant. When comparing the lakefront assessed value mean to the county data, we do find that the difference is statistically significant, and by quite a large margin. Summary Statistics are provided in Table 12.

Table 12. Summary Statistics for Lakefront Properties (Means; Standard Deviation in Parenthesis)

	All Lakefront Properties	Primary Residences	Secondary Residences
Total Assessed Value ($)	419,665.26 (159,323.24)	429,590.40 (163,502.60)	383,731.81 (163,398.33)
Lot Size (square feet)	15,268.58 (11,963.87)	14,775.90 (9,835.80)	15,322.48 (13,413.38)

Year Built	1965.43 (30.04)	1967.04 (28.45)	1957.08 (34.73)
Square footage	1748.43 (767.07)	1781.15 (752.40)	1605.33 (831.04)
Bedrooms	3.03 (0.95)	2.97 (0.91)	3.20 (1.08)
Bathrooms	1.94 (0.86)	1.96 (0.86)	1.74 (0.79)
Frontage (feet)	67.67 (40.45)	67.50 (30.58)	63.36 (22.70)
Second Home (Y=1/N=0)	79%	--	--

Running a simple regression of assessed property values conditional on whether the home is lakefront yields an average premium of $220,072 for those houses on the lake.

$$Y = 199593.72 + 220071.53 LakeFr$$

To find the property added value of the lakefront houses in Shawano County, we multiplied the premium by the total number of houses on the lake (815 houses). The results suggest a $179,358,297 of property value is added to Shawano County from the lake. Given the county property tax rate of 1.71%, this generates an additional $3,067,027 in tax revenues for the county, compared to an equivalent number of houses not on the lake. We then took the original premium multiplied by the county tax rate (1.71%) to get an average tax revenue per property of $3,763.22 compared to the county average of $2,336. Dividing the lakefront revenue to the county average revenue, we found that it is 1.61 times the county average in tax revenue.

Table 13. Added Value from Lakefront Properties

Total Increase in Property Values from Lake Frontage	Total Increase in Property Tax Revenues	Direct and Indirect Property Tax Impact
$179,358,279	$3,067,026	= tax revenues * 1.9914 = $6,107,676

Using the multiplier for local government activity of 1.9914 times the total increase in property values from lake frontage and the total increase in property tax revenues, we analyze the total direct and indirect property tax impact. Lakefront properties contribute an additional $6 million in property taxes to the county in 2021, as represented in Table 5. We discount the total impact by the inflation rate to estimate values for the previous three years.

Higher home values may also affect consumer spending. If consumers' homes increase in value, there is a wealth effect created, making consumers feel wealthier and want to spend more in their local community (Berger et al. 2018; Guo and Hardin 2017). This could include eating out more often, engaging in more recreational activities, or spending more on their property or home improvements. Higher home assessments can also generate funds for consumer spending, if homeowners extract value through home equity loans or other similar financial maneuvers.

6. Conclusions

Shawano Lake is an important asset to the local communities in the area. In addition to direct private sector market-based contributions of non-local visitor spending to regional businesses and their spinoff multiplier, the lake provides eco-system and natural benefits that accrue to Wisconsin residents at large. The applied research reported here outlines the market-based benefits associated with Shawano Lake use. While significant, we argue that these are in fact a conservative estimate of the overall value o the lake to Shawano County and the state of Wisconsin.

To estimate the impact of visitor spending, we use taxable sales of hotel accommodation and restaurant and bar spending provided by the Wisconsin Department of Revenue. We estimate spending on camping and boating using revenue data provided by Shawano County Park. Estimates of anglers were calculated based on information provided by the Wisconsin Department of Natural Resources.

We estimate that resident use of lake amenities combined with visitor spending contributed nearly $30 million to the communities proximate to Shawano Lake. The public properties of Shawano Lake are important drivers of local economic vitality, particularly Shawano County Park and publicly operated boat access points. Altogether, Shawano County Park activities generate nearly $5 million in direct spending on camping, fishing, and boating. Beyond their capacity to generate revenues as government enterprises, local parks serve as important conduits for outdoor recreation. Playgrounds, beaches, picnic spaces, public docks, and walking and biking trails all contribute to the health and wellness of community members in important ways, though it is difficult to assign specific monetary values to these benefits.

Second homeowners on Shawano Lake make significant purchases in the local community, including spending on groceries, dining out, and home service maintenance. In 2021, local expenditures were estimated at more than $3.5 million. Lake frontage is also one of the largest determinants of home prices; houses on Shawano Lake command an average $220,000 more in assessed value compared to otherwise comparable homes in Shawano County not on the lake. This value translates into $6.1 million more in local property tax revenues annually,

Appendix

Table 1A. Monthly Accommodation Spending

	2018	2019	2020	2021
Jan		421,297	406,138	401,098
Feb		478,344	445,626	364,074
Mar		543,881	313,006	440,113
Apr		447,249	267,657	489,530
May		484,809	288,619	505,339
June		561,412	488,036	635,473
July		768,693	532,823	733,046
Aug		717,501	526,521	698,188
Sept		803,341	494,209	672,878
Oct		372,591	237,981	450,351
Nov		269,836	154,524	299,831
Dec		347,117	195,206	364,757
Total for Dec-Apr:		2,237,888	1,627,633	1,695,498
Total for May-Nov:		3,978,183	2,990,370	3,995,106
Difference = Lake Induced Spending		1,444,444.85	1,131,071.71	1,908,674.64

Discussion of Hedonic Pricing Models

Reviewing Table 2A, we are able to account for and analyze the economic impact that the certain factors have on the Assessed Value of homes on Lake Shawano. Analyzing the Adjusted R^2 we can see that approximately 68% of the Assessed Values (Y) are explained by our X-values. In this case we would utilize the Adjusted R instead of R^2 to account for the multiple X-values. The Multiple R (0.83) illustrates a strong linear relationship between the correlated values. Looking at the p-values, using a 95% confidence interval, we can view that Lot Size, Square Footage, Bathrooms, and Frontage are all statistically significant in explaining the Assessed Value, while Year Built, Bedrooms, and Second Home, are all statistically insignificant in explaining the Assessed Value. Utilizing the coefficients in Table 2A, we can see that the regression data can be interpreted into the following equation:

$$Y = 51212.12 + 2.74Lot + 4.80Year + 111.55Sqr - 3363.59Bdr + 38715.46Bth + 650.72Frn + 14812.62Sec$$

Table 2A. Initial Hedonic Pricing Model for Lakefront Homes

SUMMARY OUTPUT

Regression Statistics								
Multiple R	0.830995919							
R Square	0.690554217							
Adjusted R Square	0.681011836							
Standard Error	89984.22538							
Observations	235							

ANOVA

	df	SS	MS	F	Significance F			
Regression	7	4.10178E+12	5.85968E+11	72.36707681	2.60678E-54			
Residual	227	1.83806E+12	8097160818					
Total	234	5.93983E+12						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	51212.1248	26926.17664	1.90194566	0.05844427	-1845.08537	104269.335	-1845.08537	104269.335
Lot Size (sq ft)	2.744381868	0.556263617	4.933599436	1.56098E-06	1.648281369	3.840482366	1.648281369	3.840482366
Year Built	4.795451151	5.045163399	0.950504626	0.3428668	-5.145889512	14.73679181	-5.145889512	14.73679181
Square Footage	111.5486473	12.4239309	8.97853089	1.06979E-16	87.06767028	136.0296244	87.06767028	136.0296244
Bedrooms	-3363.594812	8232.838506	-0.408558337	0.683248959	-19586.15209	12858.96247	-19586.15209	12858.96247
Bathrooms	38715.45902	10066.6111	3.845927756	0.000156041	18879.50876	58551.40928	18879.50876	58551.40928
Second Home (Y/N)	14812.61841	14873.21768	0.995925611	0.320346722	-14494.60359	44119.84041	-14494.60359	44119.84041
Frontage (ft)	650.7221802	163.6499304	3.976305878	9.41151E-05	328.2549816	973.1893789	328.2549816	973.1893789

From the X coefficients we can conclude that the base Assessed Value for a home on Lake Shawano is $51,212.12. We can see that Lot Size has a positive correlation with the Assessed Value, increasing $2.74 to the home's value for each square foot of the lot. There is a $4.80 increase in value for every year the home was built. Square Footage adds a $111.55 increase in value for every square foot of interior livable area. The number of Bedrooms surprisingly had a negative correlation with the Assessed Value, decreasing by $3,363.59 per bedroom added to the home. This could be because there are a variety of homes with different price points with the average amount of bedrooms being 3. Meaning that there is little to no effect in increasing the Assessed Value, as supported by Bedrooms being statistically insignificant. On the other hand, Bathrooms have a large positive correlation with Assessed Value, increasing the by $38,715.46 for every bathroom added to the property. The Frontage also increases the home's value by $650.72 per foot of frontage. Surprisingly, if the home was not a secondary home, represented by 1 in the dataset, it had a significant increase on the home's value, increasing by $14,812.62 if it is not a secondary property. This may be due to the idea of vacation homes. They are usually not lived in on a daily basis, so the idea of renovations is rarer, compared to a home that is lived in quite often and has more wear-and-tear.

Running the regression again, we can see the economic impact of adding 50 randomized non-frontage homes into the dataset to get a basis on how much value is added by being on the lake. We then put in "0" for the Frontage value. Looking at Table 3A, the new Adjusted R^2 decreased by a small margin to explaining only 66% of Assessed Values (Y) by our X-values. The Multiple R also decreases to 0.82, interpreting a still strong linear correlation between the Y and X-values. Analyzing the p-values, we can see that Square Footage, Bedrooms, Bathrooms, and Frontage are statistically significant while, Lot Size, Year Built, and Second Home are statistically insignificant. To see the actual economic impact of the frontage and non-frontage homes in Shawano on the Assessed Value, we can view that the new formula is:

$$Y = 129637.89 + 0.02Lot + 5.34Year + 103.07Sqr - 19973.91Bdr + 41948.13Bth + 1090.19Frn + 2649.26Sec$$

Table 3A. Refined Hedonic Model with Additional Nonlakefront Homes

SUMMARY OUTPUT

Regression Statistics								
Multiple R	0.818132688							
R Square	0.669341095							
Adjusted R Square	0.660985094							
Standard Error	101623.2721							
Observations	285							

ANOVA

	df	SS	MS	F	Significance F			
Regression	7	5.79073E+12	8.27247E+11	80.10303969	7.04363E-63			
Residual	277	2.86066E+12	10327289432					
Total	284	8.65139E+12						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	129637.885	23701.34606	5.469642301	1.00815E-07	82980.2436	176295.5264	82980.2436	176295.5264
Lot Size (sq ft)	0.021749358	0.018895361	1.151042203	0.250707481	-0.01544739	0.058946106	-0.01544739	0.058946106
Year Built	5.343381428	5.26190615	1.015483985	0.310761327	-5.015023098	15.70178595	-5.015023098	15.70178595
Square Footage	103.0661916	12.73142341	8.095417794	1.81864E-14	78.00355649	128.1288267	78.00355649	128.1288267
Bedrooms	-19973.90554	8421.46823	-2.371784229	0.018386172	-36552.11354	-3395.69754	-36552.11354	-3395.69754
Bathrooms	41948.12751	10716.9284	3.914193128	0.000114241	20851.15685	63045.09816	20851.15685	63045.09816
Second Home (Y/N)	2649.255444	16554.87663	0.160028704	0.872975096	-29940.09604	35238.60693	-29940.09604	35238.60693
Frontage (ft)	1090.194261	155.9759915	6.989500437	2.06002E-11	783.1453757	1397.243146	783.1453757	1397.243146

When looking at the adjustments to the regression equation and the X coefficients, we can see a significant adjustment for most variables. The base Assessed Value (Y-intercept) has increased to $129,637.89 as the lowest value for a property without any adjustments. The Lot Size has decreased to $0.02 per square footage on the property, but remains positively correlated to the Assessed Value. Year Built has increased to $5.34 per year that the home was built. Square Footage of the interior livable area has decreased to $103.07 per square foot added. Bedrooms remain as a negative correlation to the Assessed Value but have dramatically increased to $19,973.91 per bedroom added to a property. Bathrooms have also increased by a fair margin to $41,948.13 per bathroom added to the property. Frontage has almost doubled, bringing the coefficient to $1,090.19 per foot of frontage added to the property. The adjustment for the correlation of a Secondary Home has also dramatically decreased to $2,649.26 if the home is a secondary residence. Overall, Frontage does seem to have a large effect on the value of a home as comparing both equations and their coefficients.

To find the property added value of the lakefront houses in Shawano County, we multiplied the premium from regression output (Table 4A), focused on lakefront compared to non-lakefront properties on the Assessed Value, by the total number of houses on the lake (815 houses). The results showed a $179,358,297 of value added to Shawano County. We then took the original premium multiplied by the county tax rate (1.71%) to get a tax revenue of $3,763 compared to the county average of $2,336. Dividing the lakefront revenue to the county average revenue, we found that it is 1.61 times the county average in tax revenue.

Table 4A. One Variable Regression Model for Impact of Lake Frontage

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.480415962
R Square	0.230799497
Adjusted R Square	0.228081474
Standard Error	153344.9611
Observations	285

ANOVA

	df	SS	MS	F	Significance F
Regression	1	1.99674E+12	1.99674E+12	84.914476	7.30641E-18
Residual	283	6.65465E+12	23514677087		
Total	284	8.65139E+12			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	199593.72	21686.25237	9.203698113	7.91748E-18	156906.8929	242280.5471	156906.8929	242280.5471
Lakefront Property (Y/N	220071.5353	23882.12715	9.2149051	7.30641E-18	173062.3879	267080.6827	173062.3879	267080.6827

References

Bartsch, Anna. (2021) Shawano County Invasive Species Strategic Management Plan Revisions Approved, *Fox-Wolf Watershed Alliance*, Fox-Wolf Watershed Alliance, (9 Feb.). https://fwwa.org/2021/02/09/shawano-county-invasive-species-strategic-management-plan-revisions-approved/

Burkett, Erin M. and Richelle L. Winkler. (2017) Recreational Fishing in Wisconsin: Using an Age-Period-Cohort Approach to Understand Fishing Participation. Michigan Technological University. Houghton, MI.

dba AA Fishing. (2020) Fishing at Shawano Lake *All About Fishing*, The Guru Group, Inc. https://www.aa-fishing.com/wi/wi-fishing-lake-shawano.html.

Fox-Wolf Watershed Alliance, and Waterways Association of Menominee and Shawano Counties, Inc. (2019). *Shawano Lake, Shawano County Shoreline Assessment*.

Heath, Eddie, et al. (2021) *Shawano Lake; Shawano County, Wisconsin; Comprehensive Management Plan*. Onterra, LLC.

Hurley, Scott. (2021). Shawano Lake Groups Want Higher Water Allowed Permanently, *Fox 11 News* (3 May). https://fox11online.com/sports/outdoors/shawano-lake-groups-want-higher-water-allowed-permanently?src=link

Kerhin, Brian. (2021) Higher Shawano Lake Water Levels Get 2-Year OK, *Fox 11 News* (21 July). https://fox11online.com/news/local/shawano-lake-levels-permitted-to-be-higher

Shawano Lake: Facts and Figures. (No date) *Shawano Lake*, Wisconsin Department of Natural Resources. https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=322800&page=facts.

Shawano Lake; Overview. (No date) *Shawano Lake*, Wisconsin Department of Natural Resources. https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=322800.

Smith, Paul. (2021) Boat Sales are Climbing Nationwide and Watercraft Use Has Grown in Wisconsin During Pandemic, *Milwaukee Journal Sentinel* (January 23). https://www.jsonline.com/story/sports/outdoors/2021/01/23/wisconsin-boat-sales-and-registrations-up-during-coronavirus-pandemic/6664556002/

Smith, Paul. (2020) Pandemic spurs broad increases in outdoor recreation in Wisconsin. *Milwaukee Journal Sentinel* (August 24). https://www.jsonline.com/story/sports/outdoors/2020/08/24/coronavirus-pandemic-spurs-increase-outdoor-recreation-wisconsin/3401478001/

U.S. Bureau of Labor Statistics, Unemployment Rate in Shawano County, WI [WISHAW5URN], retrieved from FRED, Federal Reserve Bank of St. Louis. Retrieved May 4, 2022. https://fred.stlouisfed.org/series/WISHAW5URN

U.S. Census Bureau Quickfacts: Shawano County, Wisconsin. *United States Census Bureau*, U.S. Department of Commerce. Retrieved May 4, 2022. https://www.census.gov/quickfacts/fact/table/shawanocountywisconsin/BZA110220.

Wisconsin Fishing Facts. (2014) *La Crosse Tribune* (7 May). https://lacrossetribune.com/wisconsin-fishing-facts/article_2d4785db-425e-5620-981b-94699665afd3.html

Wisconsin Department of Revenue Division of Research and Policy. County Taxable Sales Comparison. https://public.tableau.com/app/profile/research.policy/viz/CountyTaxableSalesComparison/Story

Economic Impact Analyses

Economic Impact of Tourism report, Tourism Economics, Travel Wisconsin.

Carey, Bob, Lori Dickes, and Elizabeth Crouch. (2016) The Economic Impact of Changing Water Levels: A Regional Economic Impact Analysis of Lake Thurmond, *Journal of Policy Management and Social Policy* 23(2): 38 – 50.

Economic Assessment of Sylvan Lake Tourism. (2014) CMBAC Trusted Advisors, Inc. https://www.sylvanlake.ca/uploads/1052/Doc_636232809430059813.pdf?ts=637359204568781323

Economic Impact Assessment of Sanford Lake, Midland County, Michigan. (2013) Public Sector Consultants, Inc. and the Center for Economic Analysis, Michigan State University. https://www.four-lakes-taskforce-mi.com/uploads/1/2/3/1/123199575/04.a_sanford-lake-economic-analysis-report_120313.pdf

Economic Impacts of the Wisconsin State Park System: Connections to Gateway Communities. (2013) Wisconsin Department of Natural Resources.

IMPLAN. www.implan.com.

Lake Sidney Lanier Economic Impact Analysis. (2010) 1071 Coalition, Bleakly Advisory Group. https://lakelanier.org/wp-content/uploads/2012/03/Lake-Lanier-Economic-Impact-Analysis-Final-Report.pdf

Measuring the Economic Impact of Water Quality Initiatives. (No date given) University of Wisconsin Whitewater Fiscal and Economic Research Center and Institute for Water Business. https://www.uww.edu/Documents/colleges/cobe/ferc/FundforLakeMichigan.pdf

Research Papers

Dogan Gursoy and Christina G. Chi. (2020) Effects of COVID-19 Pandemic on the Hospitality Industry: Review of the Current Situation and a Research Agenda, *Journal of Hospitality Marketing & Management* 29(5): 527-529.

Guo, Sheng, and William G. Hardin. (2017) Financial and Housing Wealth, Expenditures and the Dividend to Ownership, *Journal of Real Estate Finance and Economics* 54(1): 58-96.

Berger, David, Veronica Guerrieri, Guido Lorenzoni, and Joseph Vavra. (2018) House Prices and Consumer Spending, The Review of Economic Studies 85(3): 1502–1542.

Campgrounds

Shawano County Website. *Shawano County.* Accessed 24 April 2022.
https://www.co.shawano.wi.us/departments/county-parks/county-campground/

Camping and Reservations Wisconsin State Park System. *Wisconsin Department of Natural Resources.* Accessed 24 April 2022.
https://dnr.wisconsin.gov/topic/parks/camping.