Impacts of Water Quality on the Southwest Florida Economy

Executive Summary

Prepared for:

SCCF SANIBEL-CAPTIVA CONSERVATION FOUNDATION

CAPTAINS FOR CLEAN WATER

CONSERVANCY of Southwest Florida
OUR WATER, LAND, WILDLIFE, FUTURE.

CONNECTING OUR WATER, ECONOMY AND QUALITY OF LIFE

GREENE ECONOMICS

Prepared by: Greene Economics LLC
3316 NW 289th Street
Ridgefield, WA 98642
Email: ggreene@greeneeconomics.com
Website: greeneeconomics.com

Contents

Table of Tables

Table of Figures

Executive Summary

The coastal ecosystems of southwest Florida support local economies and lifestyles in the region through tourist and visitor revenues stimulating jobs and income, fisheries, property values, and general access to recreation and the outdoors. When large detrimental water quality events occur – like the harmful algal bloom (HAB) that occurred in Southwest Florida in 2018 – the economy contracts as estuaries, beaches, and canals are impacted by toxic algae. Hence water quality is fundamental to both the ecosystem and economic system. Captains for Clean Water, the Conservancy of Southwest Florida, and the Sanibel Captiva Conservation Foundation retained Greene Economics to quantify the economic impacts of harmful water quality events and degraded water quality on the southwest Florida economy. The goal of this report is to measure the impact of poor water quality on the economies of Charlotte, Lee, and Collier counties. These economic impacts also shine light on the fact that good water quality has a positive economic impact, and financial investments in projects and policies that improve water quality will pay off through a more robust economy.

> *"Water is the heart of everything here, everyone is here for the water, one way or another."*
>
> *architect, developer, fisher*

The results of the analysis show that with another event in Charlotte, Lee, and Collier Counties similar to the HABs experienced in 2005/6 and 2018, the study area would lose over $460 million in commercial and recreational fishing, over 43,000 jobs, $5.2 billion in local economic output, $17.8 billion in property values with an associated $60 million in property tax revenue, and finally $8.1 billion in the value of outdoor recreation (or, quality of life). Results are presented below in Table ES-1.

Table ES-1: Summary of Annual Economic Losses from HAB Event

Type of Economic Asset	Charlotte	Lee	Collier	Study Area
Fishing (Commercial and Recreational)	$24 million	$194 million	$243 million	**$460 million**
Coastal Economy – Jobs	4,353	24,808	13,933	**43,094**
Coastal Economy - Output	$466 million	$3.0 billion	$1.7 billion	**$5.2 billion**
Property Values	$1,715	$6,700	$9,400	**$17.8 billion**
Property Tax Revenue	$3.2 million	21.4 million	35.7 million	**$60.3 million**
Value of Outdoor Recreation (Quality of Life)	$518.6 million	$5.3 billion	$2.3 billion	**$8.1 billion**

Each of the economic assets analyzed in this report has a different kind of importance, and that is why each has been analyzed – with the goal of demonstrating a comprehensive economic assessment. Details

of the approaches to estimate economic loss, the sources of data, and the reasoning behind each of the analyses are provided in the main body of the report. Some key points include,

- Both recreational and commercial fishing estimates are a subset of the coastal economy jobs and output estimates.
- The jobs and output estimates (the Coastal Economy in Table ES-1) deal with just the six sectors of the economy that are directly affected by the ocean following the approach used by National Oceanic and Atmospheric Administration (NOAA) in the Economics: National Ocean Watch, or ENOW data set, and therefore may be considered conservative estimates of the impact of water quality on jobs and output.
- Property values are not part of the job losses and output impacts to the Coastal Economy.
- The Value of Outdoor Recreation, or Quality of Life results, are estimates of what is known as the 'non-market' value of outdoor recreation, because people don't have to pay to take a walk on the beach or a swim in the Gulf of Mexico typically. However, these estimates are appropriate for use in a federal, or state regulatory benefit cost analysis.

This analysis focuses on the impacts in Charlotte, Lee, and Collier Counties, as shown below in Figure ES-1, although the impacts are not confined to this geography. Each county was evaluated based on the unique set of economic and environmental assets in the county. As a result, the degree to which poor water quality impacts each county differs. Results of the estimated economic impacts of another HAB in each county is provided below followed by an overview of how these impacts could play out in the future under different scenarios.

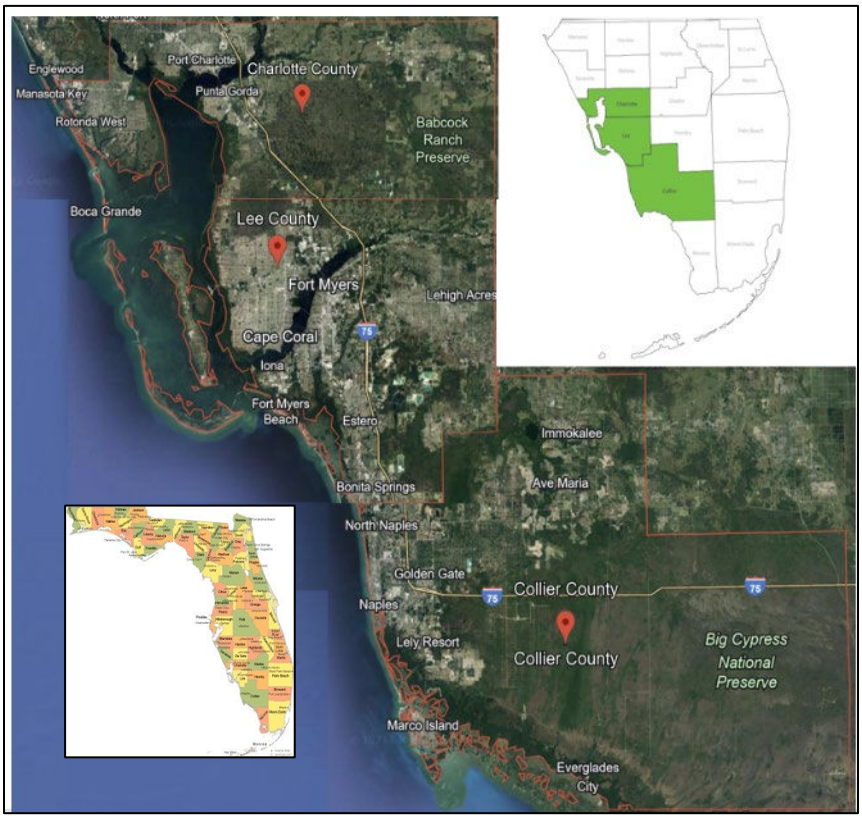

Figure ES-1: Map of Study Area

Charlotte County

Charlotte County is the northernmost county in the Study Area, home to a population of nearly 203,000, and with annual visitors estimated at over a million in 2023. For Charlotte County, the estimated losses from a HAB total $24 million in recreational and commercial fishing revenues and expenditures. The potential jobs lost in one year is estimated to be 4,353, and the loss in output is estimated to be $466 million. Property value losses are estimated to be a loss of $847 million with an associated $3 million in lost property tax revenue. The non-market value of outdoor recreation (or, quality of life) lost would be $518 million. Table ES-2 shows the estimated losses to Charlotte County. For each category of loss, the total value of the economic asset is shown, followed by the expected loss.

Table ES-2: Asset Value and Loss Expected from a HAB in Charlotte County

Type of Economic Asset	Value	Loss
Fishing– Recreational/Commercial	$76.3 million	**$24.1 million**
Coastal Economy – Jobs	15,404	**4,353**
Coastal Economy – Output	$1.7 billion	**$466 million**
Property Value Near Coast	$4.2 billion	**$847.2 million**
Property Tax Revenue	$18.7 million	**$3.2 million**
Value of Outdoor Recreation (Quality of Life)	$1.6 billion	**$518.6 million**

Lee County

Lee County sits between Charlotte and Collier County and is the most populous of the three, with over 822,000 permanent residents and over 5.1 million visitors estimated in 2023. In Lee County, the estimated losses from another HAB total $195 million in recreational and commercial fishing revenues and expenditures. The potential jobs lost in one year is estimated to be 24,808, and the loss in output is estimated to be $3 billion. Property value losses are estimated to lose $3.8 billion with an associated $21.4 million in lost property tax revenue. The value of non-market recreation (or, quality of life) lost is estimated to be $5.3 billion. Table ES-3 summarizes the losses to Lee County.

Table ES-3: Asset Value and Loss Expected from a HAB in Lee County

Type of Economic Asset	Value	Loss
Fishing – Recreational/Commercial	$618 million	**$195 million**
Coastal Economy – Jobs	87,300	**24,808**
Coastal Economy – Output	$11.1 billion	**$3.0 billion**
Property Value Near Coast	$19.1 billion	**$3.8 billion**
Property Tax Revenue	$122.4 million	**$21.4 million**
Value of Outdoor Recreation (Quality of Life)	$16.6 billion	**$5.3 billion**

Collier County

Collier County is the southernmost county in the study area, with 397,994 permanent residents, and over 2.5 million visitors estimated in 2023. In Collier County, the estimated losses from another HAB total $245 million in recreational and commercial fishing revenues and expenditures. The potential jobs lost in one year is estimated to be 13,933, and the loss in output is estimated to be $1.7 billion. Property value losses are estimated to decline by $6.8 billion with an associated $35.7 million in lost property tax revenue. The value of non-market recreation (or, quality of life) lost would be $2.3 billion. Table ES-4 summarizes the losses to Collier County.

Table ES-4: Asset Value and Loss Expected from a HAB in Collier County

Type of Economic Asset	Value	Loss
Fishing – Recreational/Commercial	$773.1 million	**$245.5 million**
Coastal Economy – Jobs	48,576	**13,933**
Coastal Economy – Output	$6 billion	**$1.7 billion**
Property Value Near Coast	$33.9 billion	**$6.8 billion**
Property Tax Revenue	$195.3 million	**$35.7 million**
Value of Outdoor Recreation (Quality of Life)	$7.3 billion	**$2.3 billion**

Approach

The analysis in this study depends heavily on the wealth of related information and previous work that has been produced establishing connections between water quality and the economies of southwest Florida and other regions. The research team conducted a literature review of over 100 documents, reports, presentations, and articles related to water quality, many of which focused on the economic impact of HABs both in Florida and other locations around the US. Though data sources and study regions differ, across the board these studies have used a similar approach to measuring economic impacts from HABs. This involves establishing a baseline economy, determining to what degree harmful algal blooms impact economic sectors of interest, and calculating the monetary losses from these types of events. The methodologies utilized in these reports both inform and align with our approach to measuring water quality impacts on the southwest Florida economy.

The research team also considered other chronic water quality issues that exacerbate the frequency and duration of harmful algal blooms, and in turn, amplify local economic losses. Some examples include failing stormwater and wastewater infrastructure, saltwater intrusion, and hypoxia, which are often intensified by climate change and increased storm/hurricane intensity and frequency. Finally, the team reviewed and used several local datasets for our analysis. Much of the data used in the analysis was produced or shared through the Florida Statewide Comprehensive Outdoor Recreation Plan (SCORP), Florida Fish and Wildlife Conservation Commission (FWC), and National Oceanic and Atmospheric Administration (NOAA).

In addition to the extensive literature review, the team conducted multiple interviews with local stakeholders impacted by water quality, including developers, elected officials, real estate professionals, regulators, wildlife biologists, local business owners, and established fishing guides and fishermen. The goal of the interviews was to better understand the impacts of discrete and chronic water quality events on the regional economy and environment. After speaking with these individuals, it is clear that southwest Florida is a "water community;" the water draws both tourists and residents to the region and is an essential part of everyday life.

Looking Ahead

The economic impact of HABs is expected to continue, and in the long run, it is critical to understand how these economic losses could compound in the future. As the ecosystem changes with the changing climate and other forces, HABs and events that are harmful to water quality may be increasing in frequency and neither the environment nor the economy may be able to recover between events. Such repeated events could result in potentially irreversible downward trends in the economies of the region. The goal of developing the economic information in this report is so that communities may better understand what is at risk from poor water quality, and decision-makers can assess the costs associated with a 'do nothing', or 'business as usual' approach, versus taking the steps necessary to invest in improved water quality.

> *"It takes two to three years to recover from an event, people go to nearby counties instead."*
> *Chamber of Commerce*

Because it is difficult to know how the chance of having a HAB, or the reduced magnitude of a HAB might be affected by investing in water quality improvement programs, economists often consider several

different scenarios. For example, the graph below (Figure ES-2) shows how a HAB like the 2018 HAB would cause losses if it were to reoccur in 2025; and assuming, for the sake of this specific scenario analysis, the ecosystem and economy were to recover within a period of one year. The graph has two components because the magnitude of the dollar values is different for the different types of economic assets at risk. For total fishing values (in orange) the value is about $1.5 billion in 2022, and about $860 million for property taxes (in yellow). In the lower portion of the figure, economic activity (in blue) starts at about $19.1 billion for the study area and quality of life (in green) starts at $25.6 billion. The dotted lines in these figures show the baseline economic expectation without a HAB.

Figure ES-2: HAB in 2025 Assuming One Year Recovery Period

Given that poor water quality comes from many sources, it is also plausible that the ecosystem might take three years to fully recover, and in such a scenario, the economic losses would persist for an additional two years. Another scenario could be that a second HAB occurred on the heels of the first one and could then further delay the ecologic recovery and increase the economic losses. For example, suppose a HAB

were to occur in 2025 with the assumed three-year recovery period, and then in 2027, before the economy has recovered fully, a second HAB occurs, further delaying, and calling into question the economic recovery at all. This is portrayed graphically in Figure ES – 3.

These scenarios are developed to illustrate how the uncertainty of HABs and underlying water quality could play out over time and affect the economies of these counties into the future. This consideration lays the groundwork for thinking about investment decisions. A spreadsheet tool has been developed so that local decision-makers might view and interpret results for a variety of scenarios related to economic growth and development, HAB occurrences and frequencies, and ecologic recovery periods.

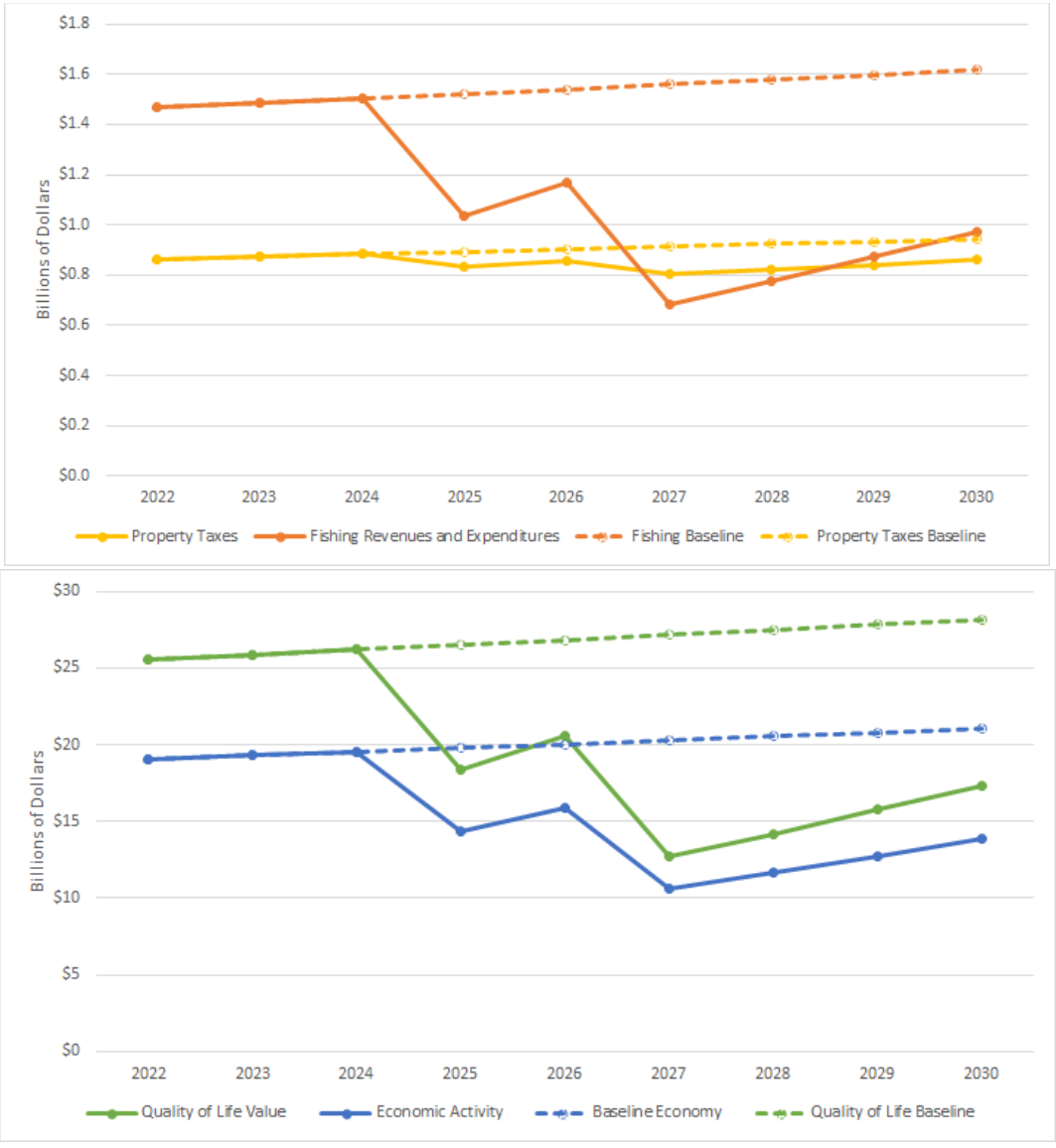

Figure ES-3: Potential Economic Impacts of HAB in 2025, and again in 2027 Assuming Three Year Recovery Period

The purpose of this report is to analyze the economic value of water quality in southwest Florida. Overwhelmingly, the available research concludes that HABs are a major threat to economic prosperity, severely impacting several industries which serve as key elements of the regional economy. Due to the abundance of data, much of this report is dedicated to HABs and their various effects. However, there are other chronic water quality issues which have been shown to have significant economic impacts but have been studied to a much lesser degree. Topics like these, such as wastewater infrastructure, saltwater intrusion, and hypoxia, are deserving of greater focus, but insufficient data makes reporting on them a difficult task. Therefore, this report attempts to identify the full impact of water quality issues relevant to the economies of Charlotte, Lee, and Collier Counties, with an emphasis on HABs, and suggestions for further research regarding the future health and security of the region.

The ultimate analysis confirms that negative water quality events have clear quantifiable impacts on all sectors of the local and regional economies, that the magnitude of those negative impacts is likely to increase as the frequency and intensity of events compound on an already weakened ecosystem, and that over time the ramifications of continued degradation will threaten the overall character of the region and the quality of life that residents and visitors have come to expect from it.