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Everglades Regional Economy

Regional Economic Research Institute
Florida Gulf Coast University



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About the Regional Economic Research Institute

The Regional Economic Research Institute studies, analyzes and reports on the regional economy encompassing Collier, Lee, Charlotte, Hendry, and Glades counties. Established in 2005, it serves as a public service and economic development unit of the Lutgert College of Business' Dean's Office and strives to connect Southwest Florida to the resources of Florida Gulf Coast University.

In its many regular and occasional publications, and custom economic research, the RERI focuses on areas such as economic development and forecasting, economic impact analysis, secondary data analysis and surveys. The RERI often partner with different economic development organizations and chambers of commerce in our region and works closely with the Lucas Institute for Real Estate Development and Finance, the Small Business Development Center, the Southwest Florida Leadership Institute, all of which are housed in the Lutgert College of Business at FGCU, as well as the Institute for Entrepreneurship.

Project Information

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Project Staff

- Amir B. Ferreira Neto, PhD, *Director*
aborgesferreiraneto@fgcu.edu
- Johane Dikgang, PhD, *Associate Professor, Environmental Economics*
jdikgang@fgcu.edu
- John Shannon, *Research Economist*
jmshannon@fgcu.edu
- Renan Santos Barbosa, *Undergraduate Research Assistant*
resantosbarbosa@fgcu.edu

Everglades Foundation Contributors

- Paul Hindsley, PhD, *Chief Economist*
phindsley@evergladesfoundation.org

Executive Summary

The economy of the Greater Everglades System covers 16 counties in Florida -- Broward, Charlotte, Collier, Glades, Hendry, Highlands, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, and St. Lucie. This region represented approximately half of total establishments, employment, wages and Gross Domestic Product (GDP) in 2024, according to data from Lightcast and Bureau of Labor Statistics.

This report expands on the first report issued in 2024, which built upon previous literature to develop a conceptual framework for defining the Clean Water Economy in the Greater Everglades System. In this updated report, we've expanded our analysis to identify industries with the highest water usage impacts. Using our economic model, we calculated water usage multipliers to pinpoint sectors that have outsized effects on regional water consumption. We break the Clean Water Economy into three parts:

We break the Clean Water Economy into three parts:

- **Primary Clean Water Industries:** Industries that have a clear, direct relationship with water use or water quality.
- **Secondary Clean Water Industries:** Industries that did not have a clear, direct relationship with water use or water quality, but were identified as important in the academic literature.
- **Tertiary Clean Water Industries:** Industries not identified as having a clear, direct relationship with water use or water quality, but are either considered relatively important to operations of Primary Clean Water Industries or have larger water requirements to support their total expenditures.

We contextualize the Clean Water Economy in the Everglades Region and conduct an economic contribution analysis of the Clean Water Economy using IMPLAN, an input-output economic modelling program used by many universities, government agencies and private companies in the United States.

Key Economic Metrics

The IMPLAN model produces the following four outputs:

- **Employment:** The additional employment supported in the study region resulting from the Clean Water Economy.
- **Labor Income:** The additional wages, salaries and benefits paid to workers in the study region resulting from the supported employment.
- **Value Added:** The additional labor income, proprietors' income, other property income and indirect business taxes supported by the Clean Water Economy within the study region.
- **Expenditures:** The additional expenditures supported by the Clean Water Economy.

Main Findings

- In 2024, Clean Water Industries accounted for between 20 to 25 percent of total jobs, establishments and GDP in the Greater Everglades System.
- In 2024, the Clean Water Economy supported between 3.1 to 3.3 million jobs in the Greater Everglades System. Every 100 jobs directly from the Clean Water Economy contributed to an additional 46 to 51 supporting jobs.
- Between \$344.1 to \$368.8 billion in total value added was supported by the Clean Water Economy in the Greater Everglades System in 2024. Every \$100 in direct value added from the Clean Water Economy backed an additional \$43 to \$48 in indirect and induced value added.
- The Clean Water Economy supported between \$624.5 and \$670.0 billion in total expenditures in 2024. Every \$100 direct expenditure backed an additional \$40 to \$45 in indirect and induced expenditures.
- Total labor income directly supported by the Clean Water Economy ranged between \$164.3 and \$175.9 billion in 2024. Every \$100 dollars in direct labor income from the Clean Water Economy generated an additional \$61 to \$69 in indirect and induced labor income.

1. Introduction

Water scarcity is a global problem, and it calls for changes in management strategies. Rising populations particularly in urban areas, growing economies, and shifting consumption patterns have intensified the demand for water resources at a time when there has been underinvestment in water infrastructure in the United States for too long. According to the American Society of Civil Engineers - ASCE (2021) spending to repair water infrastructure fell \$81 billion short in 2019, and the need is projected to increase to \$136 billion by 2039. McBride and Berman (2023) argue that access to clean water is central to every aspect of the U.S. economy. This is evident in South Florida. The purpose of South Florida water infrastructure has evolved from primarily facilitating water delivery, flood control, and land development to a broader set of goals that include the restoration of natural infrastructure and the subsequent broad set of ecosystem goods and services. This paradigm shift towards sustainability and ecological resilience highlights the interconnections between ecosystems and society.

The current economic model can at best be interpreted as “linear” in that it typically involves economic agents harvesting and extracting natural resources, using them as inputs to manufacture final goods, and selling final goods to other economic agents, who then discard it when it no longer serves its purpose. While this model has generated unprecedented levels of growth and prosperity, it has led to resource scarcity, the generation of waste, and environmental degradation from a variety of climatic and non-climatic challenges (Brears, 2023). This model places a significant burden on the environment and contributes to current environmental problems such as pollution and biodiversity loss. A circular economy, however, is a possible solution, as it promotes sustainable use of natural resources such as water resources and minimization of waste. There is no consensus regarding the definition of a circular economy.

Delgado et al., (2021) state that there are competing definitions of a circular economy all emerged in response to the linear “take, make, consume, and waste” economic model. A comprehensive and widely used definition is the one developed by the Ellen MacArthur Foundation¹, which defines “a circular economy as a restorative or regenerative by intention and design which entails gradually decoupling economic activity from the consumption of finite resources and from environmental degradation. As an economic system, it seeks to minimize waste and make the most of resources. The circular economy approach replaces the end-of-life concept with restoration, eliminates the use of toxic chemicals that impair reuse and return to the biosphere, and aims to eliminate waste through superior design—of materials, products, systems, and business models. Underpinned by a transition to renewable energy sources and a more sustainable use of biodiversity and ecosystems, the circular model builds economic, natural, and social capital”.

Left to itself and undisturbed, water is a sustainable and circular natural resource. Yet so far, the water sector has not been systematically included in high-level circular economy strategy deliberations. Many circular economy strategies and policies have focused predominately on the manufacturing and solid waste industries – due to the origins of the concept. But interest in the water sector—one of the largest untapped sectors for the circular economy (IWA 2016)—is growing given its potential. Circular economy offers an opportunity to imitate and restore the natural cycle of water, where nothing is considered a waste but an input to another process. Circular economy can be adopted to transform consumption trends and help decouple economic growth from water use and water pollution (UNEP 2015). As such, the circular economy replaces the business-as-usual approach, which, if it continues unhindered, could lead to a 40 percent shortfall between forecasted demand for water and its available supply by 2030 (UNEP 2015). According to the Water Environment Federation, a circular water economy (CWE) recycles and recovers resources within the water use and treatment cycle to maximize value for people, nature, and businesses. Everglades restoration typifies this maximization of value by treating polluted water and reconnecting the flow of water to South Florida so it is available to sustain ecosystems and the economy.

Water is essential for socioeconomic development and is a contributing factor in nearly every Sustainable Development Goal (SDG). Access to safe clean water is vital for healthy and prosperous societies. Water supports healthy ecosystems and biodiversity. It is also key in producing food and energy, as well as most industrial processes, so the lack of access to clean water translates into slower economic growth (World Bank, 2016a). In this report, we focus on water as a circular resource. This is an attempt to systematically include the water sector in high-level circular economy discussions. We refer to this as the Clean Water Economy. Our area of focus is South Florida with special focus on the Greater Everglades region.

¹ <https://www.ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive>

The U.S. Bureau of Economic Analysis (2023) estimates that the 16 counties of the Everglades Region contributed approximately \$877.1 billion in GDP in 2023.

Data gaps limit the ability to disaggregate all contributions of the Everglades to the regional economy. Filling these gaps would benefit water resources management decisions in South Florida. We examine the direct impacts of industries (such as agriculture) that are dependent on water for irrigation, and tourism, driven by the Greater Everglades ecosystems' natural beauty, biodiversity, and recreational opportunities. Additionally, we consider the broader economic implications, emphasizing water quality and supply's importance for growth. It should also be noted that, while highly reliant on a clean, plentiful source of water, these industries may also impact water quality and quantity in the region. It is well documented that agriculture and urban areas contribute to both non-point and point sources of water pollution. As such, the longer-term goals of this larger effort will involve gaining a clear understanding of the reliance of these industries on clean, plentiful water as well and the how these industries activities affect the health of surrounding ecosystems. This work provides insight into how industries within the clean water economy can more effectively operate within a circular economy.

Hence, the objective of this report is to develop an initial framework to connect existing economic data to measure the economic activity connected to the water use, with a focus on the Everglades Region. For this we define the Clean Water Economy. The Clean Water Economy identifies the industries directly and indirectly connected the most to water use (consumptive and non-consumptive) in the Everglades Region. Water quality per se, is not measured nor used in this study and remain a topic for future research. The Clean Water Economy is derived from previous published studies on the economics of water supply and quality and supplemented by a data-driven approach. Our approach subdivides the Clean Water Economy into three parts: 1) Primary Clean Water Industries, 2) Secondary Clean Water Industries, and 3) Tertiary Clean Water Industries. The Primary Clean Water Industries are those considered a consensus across multiple studies. The Secondary Clean Water Industries are those that are not a consensus across previous studies but have been identified as connected to water quality and water use. Tertiary Clean Water Industries are identified using a data-driven approach (fields of influence). Our approach uses the geographical region of the Clean Water Economy based on the jurisdictional boundaries of the 16 counties of the Greater Everglades system as well as partial and full workforce regions.

Our goal is to provide insights for policymakers, stakeholders, and the public, underlining the economic stakes of the Everglades ecosystem restoration and water management. It is often said that Everglades restoration is "about getting the water right" (USACE 2020). Clean, plentiful water represents a key input into ecological and economic processes. By mapping the relationship between water resources and economic activity, we aim to support informed, data-driven decisions for the region's sustainable future.

2. Background

The historic Greater Everglades ecosystems originally spanned approximately 18,000 square miles across most of 16 modern Florida counties (Broward, Charlotte, Collier, Glades, Hendry, Highlands, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, and St. Lucie). The Everglades system is primarily a rain dominated system, with the region receiving, on average, between 50 to 60 inches of rain annually. Water originally flowed north to south, predominantly via sheet flow, starting in the Kissimmee River and the Chain of Lakes to Lake Okeechobee, through the renowned "River of Grass," and southward into Florida Bay. While sawgrass covers most of the northern Everglades, diverse plant communities span the greater region, including the Big Cypress Swamp, hardwood hammocks, pinelands, expansive mangroves, and coastal estuaries. Extensive barrier islands, including the Florida Keys, like the edges of this system, partially demarcating estuarine and marine environments. Water transitions through South Florida ecosystems, moving from freshwater systems, moving through and mixing in estuarine systems, and flowing into marine environments. This integrated flow helps maintain ecological health and connectivity within the diverse ecosystems of the Greater Everglades system.

Native Americans, including the Calusa, Tequesta, Seminole, and Miccosukee, long inhabited this region, developing cultures intricately embedded within South Florida's ecosystems. Subsequently, the quest for economic opportunities also attracted settlers of western descent, drawn by the area's favorable climate and abundant natural resources. Initially new inhabitants viewed water as an obstacle, launching extensive engineering projects to drain and compartmentalize the

Everglades. Efforts to drain the Everglades for flood protection and agricultural and urban development began in the late 19th century and continued through the mid 20th century. The most successful effort to drain and compartmentalize the system began when the US Army Corps of Engineers initiated the Central and Southern Florida (C&SF) Project in 1948 (Lodge, T. and Davis S.D., 2023). All combined efforts resulted in over 2,200 miles of canals, 2,100 miles of levees/berms, 84 pump stations, and 778 water control systems, managed by the South Florida Water Management District and the U.S. Army Corps of Engineers (SFWMD, n.d.). This infrastructure diverted billions of gallons of water daily from the Everglades to coastal estuaries, significantly altering the natural landscape. It converted wetland to agricultural development and marginal agriculture to urban development. This altered roughly half of the land uses within the Greater Everglades system from natural systems to other uses (NAS 2023).

In the late 20th century, awareness grew about the Everglades' vital role in the resiliency and sustainability of South Florida. South Florida communities became directly impacted by the environmental degradation from combined agricultural expansion, urban development, and water management practices. These activities not only led to the diversion of water away from the Everglades to coastal estuaries but also escalated nutrient pollution into the Everglades and coastal estuaries, fostering discharges of blue-green algae from Lake Okeechobee and exacerbating harmful algal blooms such as red tides (Lodge, T. and Davis S.D., 2023; Medina et al 2022). Moreover, the southern Everglades, Biscayne Bay, and Florida Bay experienced a marked reduction in freshwater flow, exacerbating ecological stress. This lack of flow negatively impacted wetland and estuarine ecosystems, increased wildfires, reduced groundwater recharge, altered flow to Biscayne Bay, and contributed to hypersaline conditions in Florida Bay. In response, the Florida Legislature passed the Everglades Forever Act in 1994 and authorized the South Florida Water Management District as the lead entity for restoration efforts by the state. In 2000, Congress passed the Comprehensive Everglades Restoration Plan (CERP), as part of the Water Resources Development Act (WRDA) reauthorization to address the degradation of this system. CERP represents state-federal collaborative effort to restore the Everglades ecosystem while protecting the communities of South Florida. Everglades restoration addresses the environmental harms by focusing on the quantity, quality, timing, and distribution of water moving through the Greater Everglades system in South Florida (National Academies Press 2022). Clean water represents a key input into both ecological and economic processes in our region. Today, the economic vitality of the 16 Everglades counties and associated workforce regions depends on clean, abundant water.

Water's role in South Florida's economy has evolved from its early reliance on agriculture and extractive industries to a more diverse economy emphasizing tourism, real estate, and outdoor recreation. These newer sectors, benefiting from different forms of nonconsumptive water use, underscore a shift in economic priorities toward sustainability and environmental conservation. This change in priorities necessitates a transition toward a circular economy that restores and protects natural capital in order to take advantage of the diverse Everglades ecosystem goods and services. This report acknowledges water's critical role across both extractive and non-extractive industries that depend on clean, plentiful water. By exploring these industries, we aim to begin to illustrate how water use and conservation dynamics can shape the economic landscape of South Florida.

3. Clean Water Economy

3.1 Context

This report focuses on the influence of water supply and water quality in several geographic regions tied to the Greater Everglades ecosystem. The Greater Everglades ecosystem has experienced significant historic stress. While efforts to drain the Everglades began well before 1948 (Grunwald 2006), Congress authorized the US Army Corps of Engineers (USACE) to implement the Central and South Florida Project (C&SF Project) under the Flood Control Acts of 1948 and 1954 (Lodge, T. and Davis S.D., 2023). The Florida Legislature authorized the SFWMD to be the local partner to the USACE in administration of the C&SF project (Guest 2000). The C&SF Project, which focused primarily on flood control and water supply, had numerous unintended environmental consequences, impacting water quality, water supply, and ecosystem health. Declining environmental conditions in the Everglades resulted in a 1987 Florida plan to reduce nutrient pollution, a 1988 US Department of Justice lawsuit for failure to enforce state and federal Clean Water Act regulations, and a 1992 consent decree between the State of Florida and the DOJ to address pollution (Milon 2019).

These events sparked numerous state and federal efforts to restore this ecosystem. For the state of Florida, the Florida Department of Environmental Protection (DEP) and the SFWMD lead restoration and water quality efforts. Their efforts are authorized under a range of laws including the Comprehensive Everglades Restoration Plan Regulation Act, the Everglades Forever Act, and the Northern Everglades and Estuaries Protection Act. On the Federal level, the Environmental Protection Agency (EPA) plays a key role in overseeing Clean Water Act requirements related to the 1992 consent decree. In 2000, Congress passed the Central Everglades Restoration Plan as part of the Water Resources Development Act (WRDA). CERP represents a state-federal collaboration to restore the Greater Everglades system by modifying the C&SF Project with an emphasis on improving water quality, reducing the loss of water from the system, improving the temporal and spatial delivery of water, and maintaining flood protection for residents and businesses. CERP has 50 projects with 68 individual components. The US Government and the state of Florida split the \$23.2 billion program cost with a 50/50 cost share².

Federal and Florida water quality laws have evolved over time based on increasing public awareness and the need for specific regulatory mechanisms. The first federal law in the United States covering water-pollution control was the 1899 Refuse Act which authorized U.S. Army Corps of Engineers permitting control over the disposal of refuse of any kind into navigable waterways. Today, under laws such as the Clean Water Act and the Safe Drinking Water Act, the EPA holds the primary responsibility for administering and regulating water quality at the federal level. The Clean Water Act, originally enacted as the 1948 Water Pollution Control Act (WPCA), regulates discharges of point source pollutants into US waters and sets surface water standards (see Field and Field, 2021). In the state of Florida, laws such as the Florida Watershed Restoration Act address water quality issues under the administration of the Florida Department of Environmental Protection with collaboration from other state agencies and the water management districts. Although the health of some waters has improved over the past decades due to these laws, numerous threats to Florida water bodies remain. We use the phrase Clean Water Economy to refer to economic sectors with identifiable links to water supply and quality as key inputs into the production of goods and services. Mohammad-Azari, Bozorg-Hadda and Biswas (2021) states that water economic value is the marginal value of one additional unit of water for one unit of production in scarcity condition.

Physical and economic data about water in many parts of the world are becoming more widely integrated through application of the System of Environmental-Economic Accounts for Water (SEEA-Water), which makes it possible to estimate the linkages between water supply, water quality and economic activity. In their study of SEEA-Water for the United States, they found that water-use reductions, combined with economic growth, led to increases in water productivity for the overall economy of 65 percent, increases of around 99 percent in mining, and around 68 percent in agriculture. Surface-water quality patterns were most evident at regional levels and differed by water-quality constituent and region (Bagstad et al., 2020). The water accounts are useful as they can be merged with other datasets such as land (see Wentland et al., 2020) and ecosystem accounts (see Heris et al., 2021; Warnell et al., 2020), economic production and employment, using various geographic aggregations, including watersheds (National Academy of Sciences, 2002).

² 2015 - 2020 Central and Southern Florida Project, Report to Congress, Comprehensive Everglades Restoration Plan, at 6, available at: https://issuu.com/usace_saj/docs/final_2020_report_to_congress_on_cerp_progress_hig.

Simonovic (2002) developed a model of the global world water resources sector (quantity and quality) using system dynamics based on five factors that drive industrial growth. Simonovic not only found that there was a strong relationship between water resources and future industrial growth but also that water pollution was the most important future water issue on the global level. Declining water quality decreases the available clean water supply for industrial and residential water users, posing a risk to economic output. This water use may be either consumptive or nonconsumptive. The origin of water pollution may be multicausal in nature, often derived from multiple sources. In many cases, water pollution represents an externalized cost of other types of economic activity (Ali and Puppim de Oliveira, 2018). It is challenging to isolate the negative effects of pollution alone and to fully estimate the total value of clean water by simple econometric techniques (Keiser et al., 2019). Most of the previous research assessing the significance of clean water mainly focuses on the health benefits, such as estimating the reduced premature deaths associated with elevated water quality (Knobeloch et al., 2000; Smith et al., 2011). Only recently, Russ et al. (2022) adopted a quasi-experimental approach, leveraging the unidirectional flow of rivers to alleviate confounding or omitted variable bias, to assess the relationship between upstream water quality and downstream economic growth (Yang et al., 2024).

According to Russ et al. (2022) unclean water can adversely impact the economy in several ways. Polluted water can affect public health causing reduced labor productivity. Poor water quality also reduces agricultural yield and adversely affects tourism, real estate, aquaculture/fisheries and other sectors which rely on environmental quality and ecosystem services. Analysis of cross-country data (i.e., 17 countries) from 1990 to 2014 found that when rivers become highly polluted, regions downstream see reductions in economic growth, losing between 1.4 percent to 2.5 percent of economic growth, depending on developmental level and the level of pollution. Generally, these statistical techniques do a very good job of explaining the complex channels through which water affects economic growth (Coury et al., 2022; Keeler et al., 2016; Keiser and Shapiro, 2019). However, they were mostly regional studies or tended to focus on certain industries. Therefore, the findings cannot be generalized and are hard to compare (Akhmouch et al., 2018). Although our study is also regional, we focus on the economy at large. This can easily be scaled up or applied in new locations.

We define the Clean Water Economy as those sectors and subsectors of the economy which are directly or indirectly impacted by changes in water quality and supply. As such, this concept relies on water as a direct and indirect input into economic activity. Our approach begins with a focus on sectors of the economy with identified economic impacts associated with changes in water quality and quantity within the peer reviewed literature and the grey literature. We then use a data-driven approach to expand our understanding of high probability economic impacts within the Greater Everglades region. At some level, most industries will be impacted by significant changes in water quality and quantity; however, we focus on clear, quantifiable relationships with the understanding that industries included in the Clean Water Economy may change with advancements in linkages within socioecological systems. Water represents an ecological endpoint that acts as a direct input into the production of goods and services in our economy. Water can also act as an input to other important ecological processes that influence economies, such as habitat quality and biodiversity. As a result, changes in the quality and quantity of water has both direct and indirect economic consequences. It impacts the consumption of goods, the *in situ* provision of goods and services, and has cascading impacts in our economy.

Our approach builds upon and is complementary to studies of the coastal and ocean economies (Colgan 2013). The coastal economy represents all economic activity within counties under the jurisdiction of a given state's coastal zone management program or counties within USGS defined coastal watersheds (Colgan et al. (2016)). In this way, coastal economies tend to be defined based on geographic regions and contain all economic activity within those regions. Based on this definition, all Florida counties are also coastal counties. Colgan et al. (2016) go on to subdivide the Florida coastal economy between shore adjacent and inland counties. By this definition, the entire economy of the Everglades Region falls within the coastal economy with 7 counties represented as inland counties and 9 counties represented as shore adjacent counties.

Unlike the coastal economy, the definition of the ocean economy comes from direct and indirect use of ocean resources as inputs into economic activity (Colgan 2013). The ocean economy also has geographic bounds as it occurs in locations where the geography implies a connection to the ocean. In this way, the ocean economy is nested within the coastal economy and includes the following six sectors: marine construction, living resources, minerals, ship & boat building, tourism & recreation, and transportation (Colgan 2013).

A growing literature connects changes in water quality and water supply to micro-economic behavior. While water is rarely valued as a commodity, both water supply and quality impact market behavior through consumptive and non-consumptive uses (Barbier 2022). Several papers provide reviews of the literature on the economics of water supply (Olmstead 2010) and water quality (Olmstead 2010; Griffiths et al 2012; Kroetz et al 2020). Water quality impacts market behavior by limiting water availability as an input, through supply chain disruptions, and by reducing the quality of goods and services (Yang et al., 2024). Research has shown clear links between water supply, water quality, and economic sectors. Numerous studies have linked water quality to real estate prices in Florida (Walsh et al 2011; Bin and Czajkowski 2013; Bin et al. 2017; Kuwayama et al 2022). Water quality also impacts recreation (Wolf et al 2019), drinking water treatment costs (Mosheim and Ribaud 2017), and public health (Stroming et al. 2020). Alvarez et al. (2024) estimates a multi-billion-dollar reduction in tourism and hospitality revenue due to the 2017-18 red tide event in Florida while Court et al. (2017) estimated over \$2 billion dollar in regional economic losses in Northwest Florida associated with changes in recreational trips in light of the Deepwater Horizon oil spill in 2010.

A common method used to evaluate the economic impact of environmental and water resources is through input-output analyses such as the IMPLAN model. In our evaluation of the economic impact literature, we draw upon 16 Florida economic impact studies relevant to the Clean Water Economy. While some papers examined the entire state of Florida as their study region (Seidel et al., 2017a; Botta et al., 2021), others focused on specific areas within the state, including the Florida Keys (Leeworthy, 2002; Wallmo et al., 2021b,a), the Florida Gulf Coast (Seeteram et al., 2019; The Balmoral Group, 2020), Southwest Florida (Court et al., 2021) and Palm Beach County (Seidel et al., 2017b). Additional studies examined Biscayne Bay (Hazen and Sawyer, 2023), Indian River Lagoon (ECFRPC & TCRPC, 2016), Tampa Bay (Todd et al., 2023) Pensacola and Pedido Bays Estuary Program (Harrington et al., 2022), Florida Bay (Stainback, et al., 2019), Lake Okeechobee (Johns 2002) and Northwest Florida (Court et al., 2017).

After identifying which impacts are going to be evaluated, it is important to know the breakdown of spending for the inputs, as this information provides direct inputs for the models. In the analysis of Palm Beach County district waterways, total spending was broken down into four categories: food and beverage stores, transportation and accommodation, fees and recurring costs, and gear or special equipment (Seidel et al., 2017).

So far, we have not distinguished the difference between freshwater and saltwater quality and resources, both of which are very much present in the Greater Everglades system. From the several studies above, we should expect that freshwater and saltwater to affect different parts of the economy and have different spillover effects. While water quality in freshwater resources is more closely connected with consumptive activities such as agriculture, fisheries, and residential use, water quality in saltwater resources is more closely connected with non-consumptive activities such as tourism and recreation. Nevertheless, both freshwater and saltwater resources are important for consumptive and non-consumptive activities and further differentiating their economic contribution to the Everglades Region remain a topic for future research.

3.2 Conceptualization

The Clean Water Economy concept combines previous literature on related topics with a data-driven approach. Table 1 presents a summary of industries that are connected to the Clean Water Economy in both academic and non-academic setting as being focus for previous measurements. We first identify the **Primary Clean Water Industries** as the industries that have a clear direct relationship with water use or water quality. Next, we conduct a literature review of economic impact studies that focus on environmental and water resources to identify additional industries that were not clearly connected to water usage but identified as important in the literature. These industries are classified as our **Secondary Clean Water Industries**.

To operationalize this concept and develop a comprehensive measure of the Clean Water Economy through industry activity, we cross-reference these industries identified as Primary Clean Water Industries or Secondary Clean Water Industries with 2022 NAICS codes. Table 1 presents the NAICS codes for each of the industries identified, as well as the corresponding IMPLAN 528 Industry Codes. Ten NAICS industries totaling 23 IMPLAN codes make up the Primary Clean Water Industry, while 9 NAICS industries representing 22 IMPLAN codes encompass the Secondary Clean Water Industry.

Table 1. Primary, Secondary and Tertiary Clean Water Industries

Industry	2022 NAICS Code	IMPLAN 528 Industry Code(s)
Primary Clean Water Industries		
Crop Production	111000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Animal Production and Aquaculture	112000	11, 12, 13, 14
Fishing, Hunting and Trapping	114000	17, 18
Hydroelectric Power Generation	221111	34
Water, Sewage and Other System	221300	44
Ship Building and Repairing	336611	343
Boat Building	336612	344
Water Transportation	483000	398
Car Washes	811192	495
Drycleaning and Laundry Services	812300	501
Secondary Clean Water Industries		
Forestry and Logging	113000	15, 16
Support Activities for Agriculture and Forestry	115000	19
Air Transportation	481000	396
Real Estate	531000	429, 430
Performing Arts, Spectator Sports, and Related Industries	711000	478, 479, 480, 481, 482
Museums, Historical Sites, and Similar Institutions	712000	483
Amusement, Gambling, and Recreation Industries	713000	484, 485, 486, 487, 488
Accommodation	721000	489, 490
Food Services and Drinking Places	722000	491, 492, 493
Tertiary Clean Water Industries		
Merchant Wholesalers, Durable Goods	423000	375, 376, 377, 378, 379
Merchant Wholesalers, Nondurable Goods	424000	380, 381, 382, 383
Wholesale Trade Agents and Brokers	425000	384
Scenic and Sightseeing Transportation	487000	402 ³
Motion Picture and Sound Recording Industries	512000	411, 412

Lastly, we use a data-driven approach to identify the so-called **Tertiary Clean Water Industries**, industries that have not been identified as having a clear direct relationship with water use or water quality in the literature but have important ties with to water usage in the Everglades Region. To derive the Tertiary Clean Water Industries, we first define the Everglades Region as the region encompassing the following counties: Broward, Charlotte, Collier, Glades, Hendry, Highlands, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk and St. Lucie. These 16 counties cover five entire workforce regions and partially cover three additional workforce regions. Table 2 shows the Workforce Regions used in the study, along with whether our working definition of the Workforce Region only contains some of the counties (partial) or all of the counties (full). For the partial Workforce Regions, the table further breaks down which counties are used and not used in the Everglades Region.⁴

We perform two separate analyses to identify Tertiary Clean Water Industries. First, we use IMPLAN to obtain an input-output table for the Everglades Region and perform fields of influence analysis. Second, we calculate water usage multipliers to determine industries with the largest water requirements to support their total expenditure.

³ IMPLAN Code 402 - Scenic and sightseeing transportation and support activities for transportation also includes NAICS 488 – Support activities for transportation

⁴ As part of the Reimagining Education and Career Help (REACH) Act, workforce regions were realigned on July 1, 2024 to minimize duplication, improve consistency and maximize resources. As part of this realignment, Monroe County [was moved](#) from CareerSource South Florida to CareerSource Southwest Florida. Readers should exercise caution when comparing results for these two workforce regions to the 2024 report.

Fields of Influence Analysis

The fields of influence (Sonis and Hewings, 1992; Miller and Blair, 2009) is a linkage index that enables us to determine the most important links across industries in the regional production structure. While Primary Clean Water Industries are based on the relationship between industry and water dependency identified in the literature, the use of fields of influence analysis helps account for how these industries are connected within the regional production structure.

The fields of influence analysis was conducted using input-output tables aggregated at the 3-digit NAICS level. The use of 3-digit NAICS provides enough disaggregation to capture nuances both within and across concepts and is aggregated enough to have data reported across regions (County or Workforce Region⁵) by different private and public agencies on a consistent basis. The use of 3-digit NAICS codes also easily bridges to other datasets such as IMPLAN, allowing for a more concise yet comprehensive model of the regional production structure.

We count how many relative important interindustry connections each industry has as both a buyer and seller with Primary Clean Water Industries. We define important connections as those above the average plus one standard deviation of the index value. If the number of total important connections is greater than the average number of important connections, we identify that industry as a Tertiary Clean Water Industry.

Water Usage Multiplier Analysis

We calculate water usage multipliers for the Everglades Region using the input-output tables and water usage data from IMPLAN. In this context, a water usage multiplier represents the total amount of water used or required (in kilograms) through indirect and induced effects per kilogram of water directly used by the industry. For instance, if an industry in the Everglades Region has a multiplier of 4.0, this can be interpreted as a total of for every one 1 kilogram of water directly used by an industry it requires another 4 kilogram of water from indirect and induced uses.

Water usage multipliers were calculated for all industries at the 3-digit NAICS level. Any industry with a water usage multiplier one standard deviation above the average multiplier which is not identified as Primary, Secondary, or Tertiary, is re-classified as a Tertiary Clean Water Industry.

Table 2. Workforce Region-to-County Crosswalk

Workforce Region	Partial or Full Region?	In Everglades Region	Not in Everglades Region
CareerSource Central Florida	Partial	Orange County Osceola County	Lake County Seminole County Sumter County
CareerSource Polk	Full	Polk County	N/A
CareerSource Heartland	Partial	Highlands County Okeechobee County	DeSoto County Hardee County
CareerSource Research Coast	Partial	Martin County St. Lucie County	Indian River County
CareerSource Palm Beach County	Full	Palm Beach County	N/A
CareerSource Broward	Full	Broward County	N/A
CareerSource South Florida	Full	Miami-Dade County	N/A
CareerSource Southwest Florida	Full	Charlotte County Collier County Glades County Hendry County Lee County Monroe County	N/A

Source: RERI analysis of the FloridaCommerce website

⁵ Workforce Regions in Florida represent workforce investment areas designated under the Workforce Innovation and Opportunity Act (WIOA).

4. Data and Methodology

An economic contribution analysis was conducted to determine how much economic activity is supported by the Clean Water Economy. The primary tool used to conduct this analysis is IMPLAN, an economic modelling program used by many universities, government agencies and private companies in the United States. The model includes an input-output dataset that allows one to estimate the economic contributions of a firm's expenditures and employment in a region based on linkages across industries within a region.

Because the Everglades Region defined in this study encompasses multiple workforce regions with varying regional production structures, we run three models with different study regions. In Model 1, all 16 Everglades Region counties were grouped together to form a single region. In Model 2, the eight Workforce Regions in the Everglades Region (including counties not considered in the Everglades Region) were incorporated and modeled as a Multi-Regional Input Output (MRIO) model. Lastly, in Model 3, the 16 Everglades Region counties were broken into their respective Workforce Regions and modelled as an MRIO. A graphical illustration showing how regions were defined in all three models can be found in Chart 1.

Information on the number of establishments is obtained from the Quarterly Census of Employment and Wages (QCEW). QCEW data reports employment, wage and establishment information at a national, state and county level. The underlying data is gathered from Unemployment Insurance programs in the United States and covers approximately 95 percent of all employers in the nation.

Employment and wage information reported by the QCEW is sometimes suppressed to maintain the confidentiality of employers. These suppression issues are more commonplace as an analysis becomes more disaggregated (either through a smaller geographic region, use of more detailed industry codes, or combination thereof). To overcome this hurdle, we supplement our analysis with data from Lightcast, a Labor Market Information analytics firms. Lightcast pulls data from many different sources, including QCEW, to provide unsuppressed estimates of labor market information.

Finally, the U.S. Consumer Price Index for all urban consumers (CPI-U) is used to adjust all dollars for inflation. All dollars mentioned in this report are measured in 2024 dollars.

Key Economic Metrics

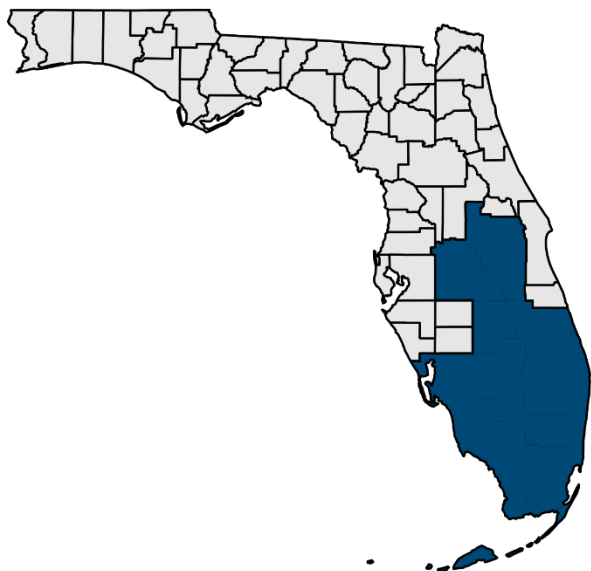
The IMPLAN model produces the following four outputs:

- **Employment:** The additional employment supported in the study region resulting from the Clean Water Economy.
- **Labor Income:** Includes both employee compensation and proprietary income. Represents the additional wages, salaries and benefits paid to workers in the study region resulting from the supported employment.
- **Value Added:** The additional labor income, proprietors' income, other property income and indirect business taxes supported by the Clean Water Economy within the study region.
- **Expenditures:** The additional expenditures supported by the Clean Water Economy. Expenditures include spending on both intermediate inputs and value added.

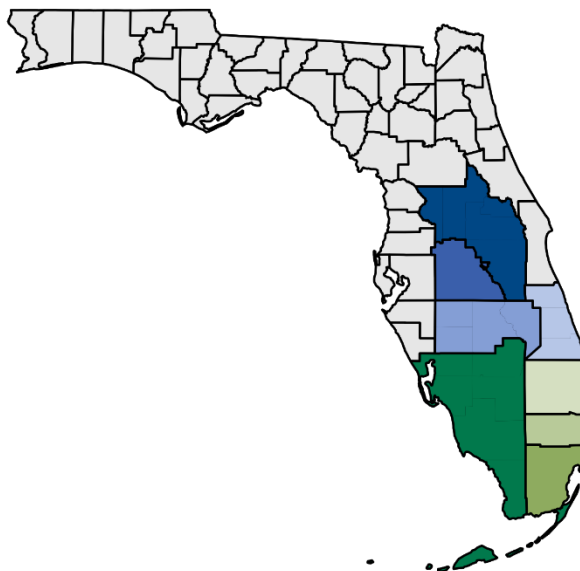
The model accounts not only for the direct contribution by the Clean Water Economy (direct effect), but also includes (i) indirect contributions created by other firms which are suppliers of services and products necessitated by the Clean Water Economy (indirect effect) and (ii) the economic contribution of expenditures by the employees at firms affected by the Clean Water Economy for housing, food and other goods and services (induced effect).

Chart 1. Everglades Region study area used in IMPLAN

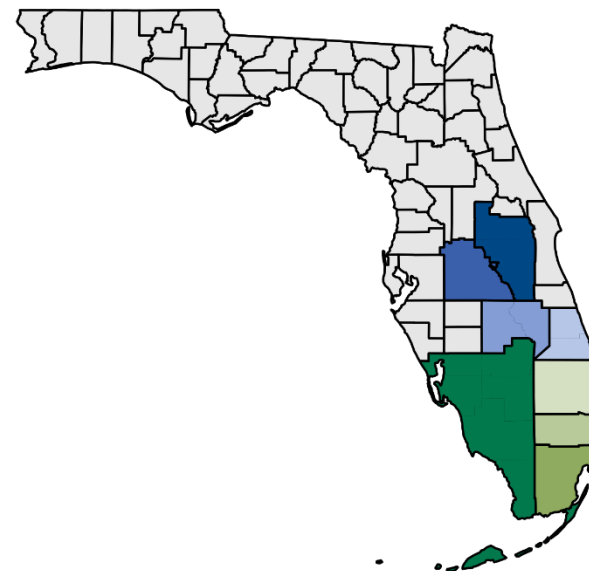
Model 1: Everglades Region



Model 2: Workforce Regions

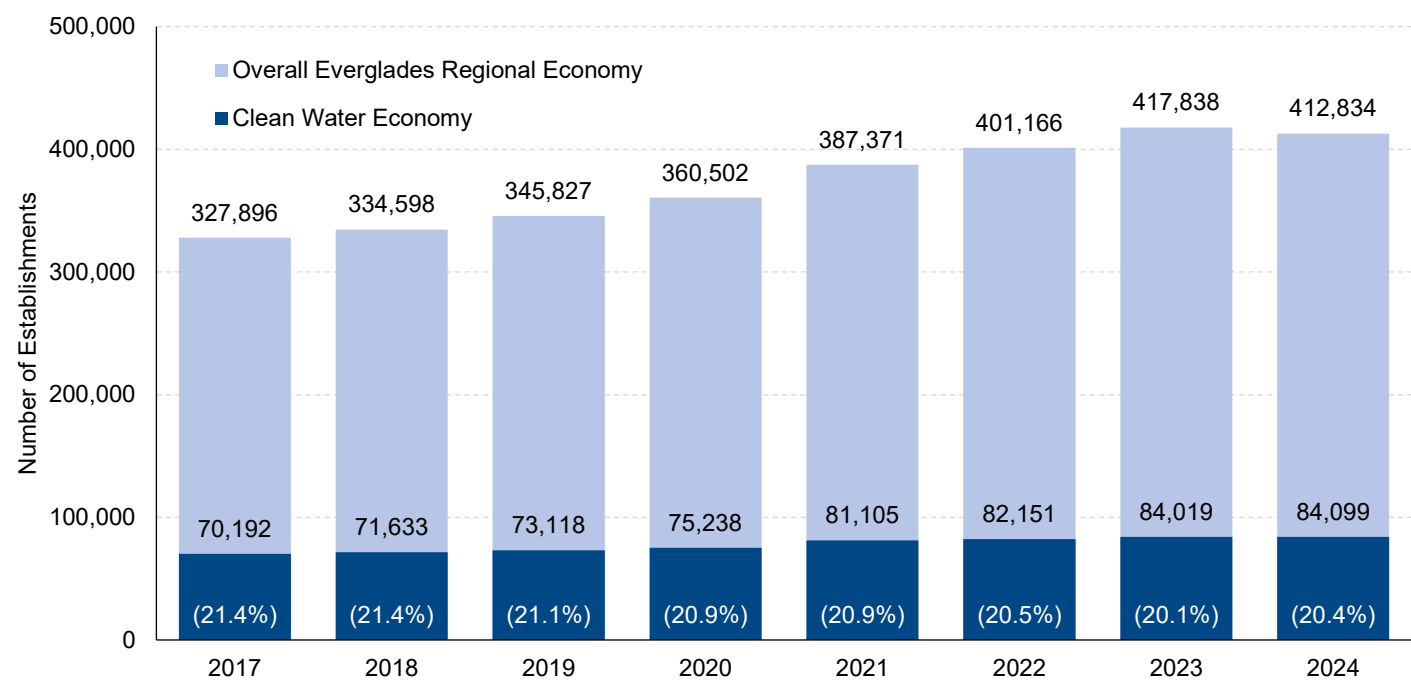


Model 3: Partial Workforce Regions



Note: In Model 1, all 16 Everglades Region counties were grouped together to form a single region in IMPLAN. In Model 2, the eight Workforce Regions encompassing the study area, including counties not considered in the Everglades Region, were incorporated and modeled as an MRIO. Lastly, in Model 3, the 16 Everglades Region counties were broken into their respective Workforce Regions and modelled as an MRIO.

Chart 2. Clean Water Economy Establishments, 2017 to 2024



Prepared by the Regional Economic Research Institute
Note: Clean Water Economy establishments as a percentage of total establishments in parenthesis.
Source: RERI Analysis of data obtained from the Bureau of Labor Statistics Quarterly Census of Employment and Wages

5. Results

Clean Water Economy Establishments

Table 3 and Chart 2 show the Clean Water Economy establishments in the Everglades Region from 2017 to 2024.

- The Clean Water Economy establishments accounted for 20.4 percent of total Everglades Region establishments in 2024.
- The South Florida Workforce Region had the greatest number of Clean Water Economy establishments in 2024, measured at 23,591.
- The Heartland Workforce Region had the fewest number of establishments in 2024, totaling 601.
- The largest percentage change over the eight-year period was in the Palm Beach County Workforce Region (29.5 percent increase).
- Secondary Clean Water Industries make up the largest share of establishments (65.9 percent), while Primary Clean Water Industries account for the smallest share (5.3 percent).
- Overall, Clean Water Economy establishments increased 19.8 percent over the eight-year period.

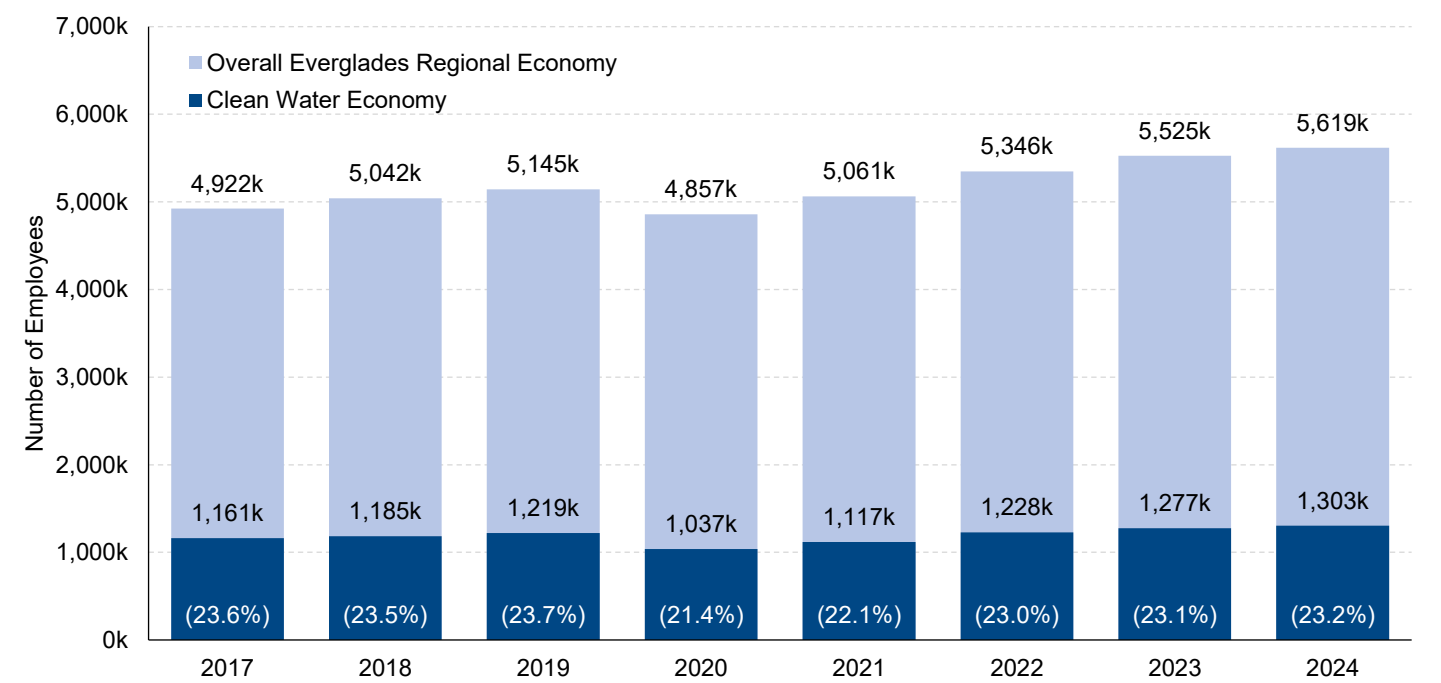
Table 3. Clean Water Economy Establishments in the Everglades Region, 2017 to 2024

Category	2017	2024	Change	Percent Change
Workforce Region				
CareerSource Palm Beach County	9,866	12,771	2,906	29.5%
CareerSource Central Florida ¹	10,196	12,591	2,396	23.5%
CareerSource Southwest Florida	9,915	12,220	2,306	23.3%
CareerSource Polk	2,694	3,287	593	22.0%
CareerSource South Florida	20,079	23,591	3,513	17.5%
CareerSource Research Coast ¹	2,707	3,176	469	17.3%
CareerSource Broward	14,184	15,861	1,677	11.8%
CareerSource Heartland ¹	553	601	49	8.8%
Industry				
Primary Clean Water Industries	3,953	4,434	481	12.2%
Secondary Clean Water Industries	42,983	55,408	12,424	28.9%
Tertiary Clean Water Industries	23,256	24,257	1,001	4.3%
Clean Water Economy	70,192	84,099	13,907	19.8%

¹Workforce Region only considers the counties in the Everglades Region.

Source: RERI Analysis of data obtained from the Bureau of Labor Statistics Quarterly Census of Employment and Wages

Chart 3. Clean Water Economy Employment, 2017 to 2024



Prepared by the Regional Economic Research Institute
Note: Clean Water economy employment as a percentage of overall employment in parenthesis.
Source: RERI Analysis of data obtained from Lightcast

Clean Water Economy Employment

Table 4 and Chart 3 shows the Clean Water Economy employment in the Everglades Region from 2017 to 2024.

- Employment in the Clean Water Economy accounted for 23.2 percent of total employment in the Everglades Region.
- The Central Florida Workforce Region had the highest employment in the Clean Water Economy among all the workforce regions, with 343,932 employees in 2024.
- The Heartland Workforce Region had the lowest employment in 2024, measured at 7,516 employees.
- The largest percentage change over the eight-year period was in the Central Florida Region (14.4 percent).
- Secondary Clean Water Industries made up the largest share of employment (76.4 percent), while Primary Clean Water Industries accounted for the smallest share (5.7 percent).
- Overall, Clean Water Economy employment in the Everglades Region increased 12.2 percent over the eight-year period.

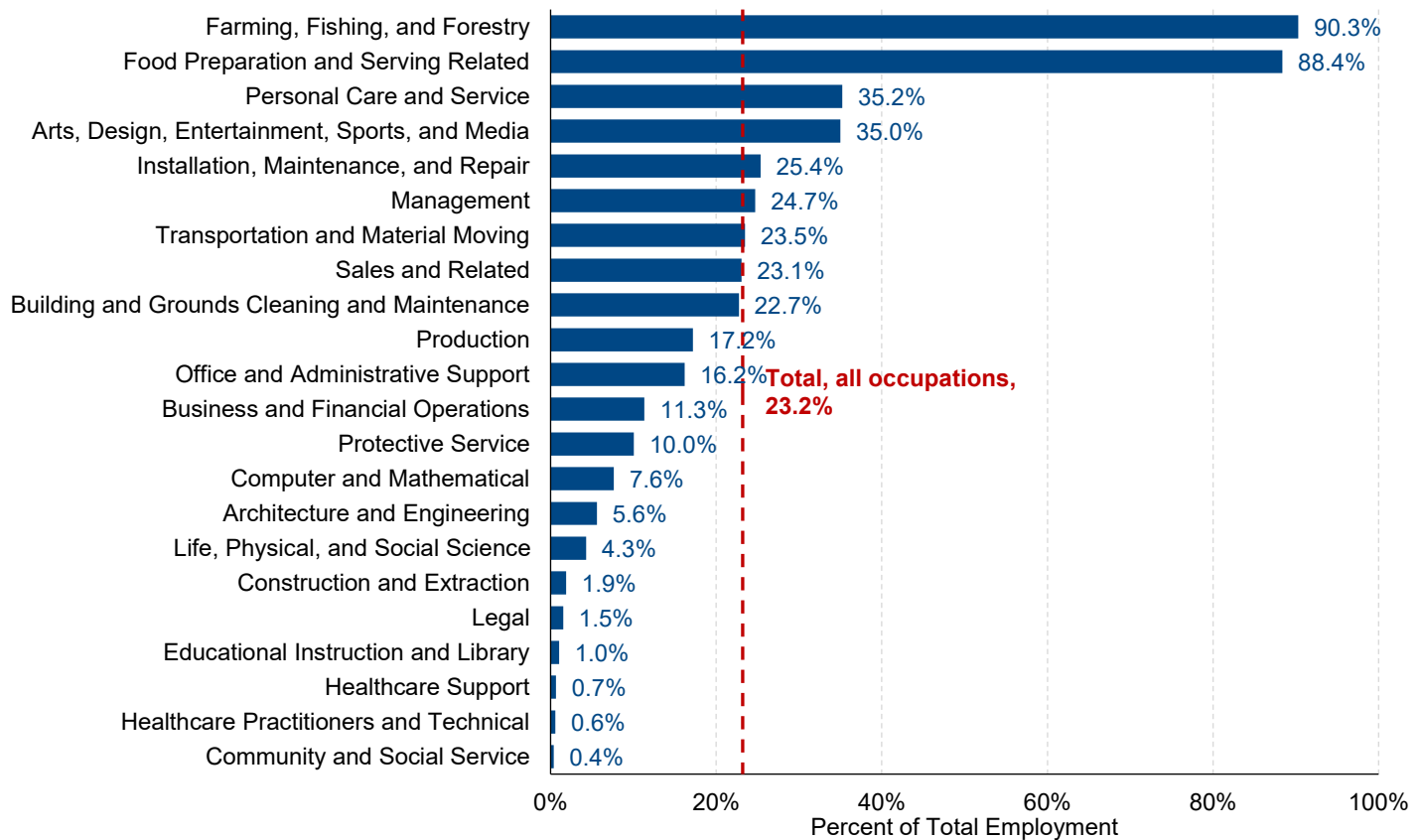
Table 4. Clean Water Economy Employment in the Everglades Region, 2017 to 2024

Category	2017	2024	Change	Percent Change
Workforce Region				
CareerSource Central Florida ¹	300,652	343,932	43,280	14.4%
CareerSource South Florida	299,397	339,314	39,918	13.3%
CareerSource Research Coast ¹	35,826	40,584	4,758	13.3%
CareerSource Broward	184,339	205,378	21,039	11.4%
CareerSource Polk	42,270	46,828	4,558	10.8%
CareerSource Southwest Florida	142,707	157,271	14,564	10.2%
CareerSource Palm Beach County	147,962	162,223	14,260	9.6%
CareerSource Heartland ¹	7,883	7,516	-367	-4.7%
Industry				
Primary Clean Water Industries	72,944	73,812	867	1.2%
Secondary Clean Water Industries	879,586	995,747	116,161	13.2%
Tertiary Clean Water Industries	208,505	233,488	24,982	12.0%
Clean Water Economy	1,161,036	1,303,046	142,010	12.2%

¹Workforce Region only considers the counties in the Everglades Region.

Source: RERI Analysis of data obtained from Lightcast

Chart 4. Share of Jobs in Clean Water Economy by Major Occupational Group, 2024
Everglades Regional Economy



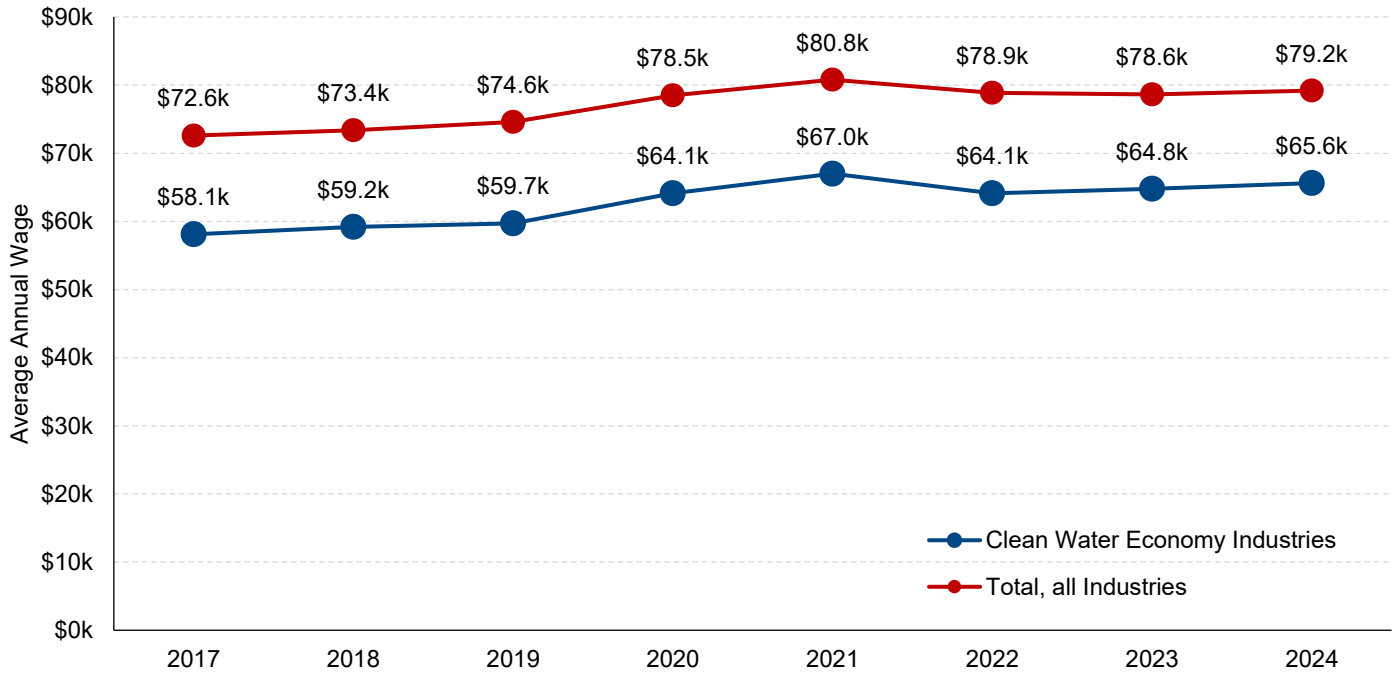
Prepared by the Regional Economic Research Institute
Source: RERI Analysis of data obtained from Lightcast

Clean Water Economy Employment by Major Occupational Group

Chart 4 shows the share of total jobs in the Everglades Region employed in an industry from the Clean Water Economy, broken down by major occupational group, in 2024.

- In 2024, 23.2 percent of total employment in the Everglades Region was considered part of the Clean Water Economy.
- The top two occupational groups with the highest share of employment in the Clean Water Economy were Farming, Fishing, and Forestry (90.3 percent) and Food Preparation and Serving Related (88.4 percent)
- Seven of the 22 occupational groups had Clean Water Economy shares above the total for all occupations, ranging from 23.5 percent to 90.3 percent.

Chart 5. Clean Water Economy Real Average Annual Wages, 2017 to 2024
Everglades Regional Economy



Prepared by the Regional Economic Research Institute

Note: All dollar values adjusted to 2024 dollars using the U.S. Bureau of Labor Statistics CPI (All Urban Consumers)

Source: RERI Analysis of data obtained from Lightcast

Clean Water Economy Real Average Annual Wages

Table 5 shows the Clean Water Economy real average annual wages in the Everglades Region from 2017 to 2024.

- The real average annual wage in the Clean Water Economy was \$13.6 thousand less than wages for the overall Everglades Region in 2024.
- Real average annual wages in the Clean Water Economy were highest in the South Florida Workforce Region (\$77,316) and lowest in the Heartland Workforce Region (\$39,512) in 2024.
- The Palm Beach County Workforce Region highest percent change in real average annual wages over the eight-year period, measured at 15.5 percent.
- Tertiary Clean Water Industries had the largest real average annual wages in 2024 (\$104,608), while Secondary Clean Water Industries had the lowest real average annual wages (\$55,666).
- Overall, real average annual wages in the Clean Water Economy grew 12.9 percent over the eight-year period.

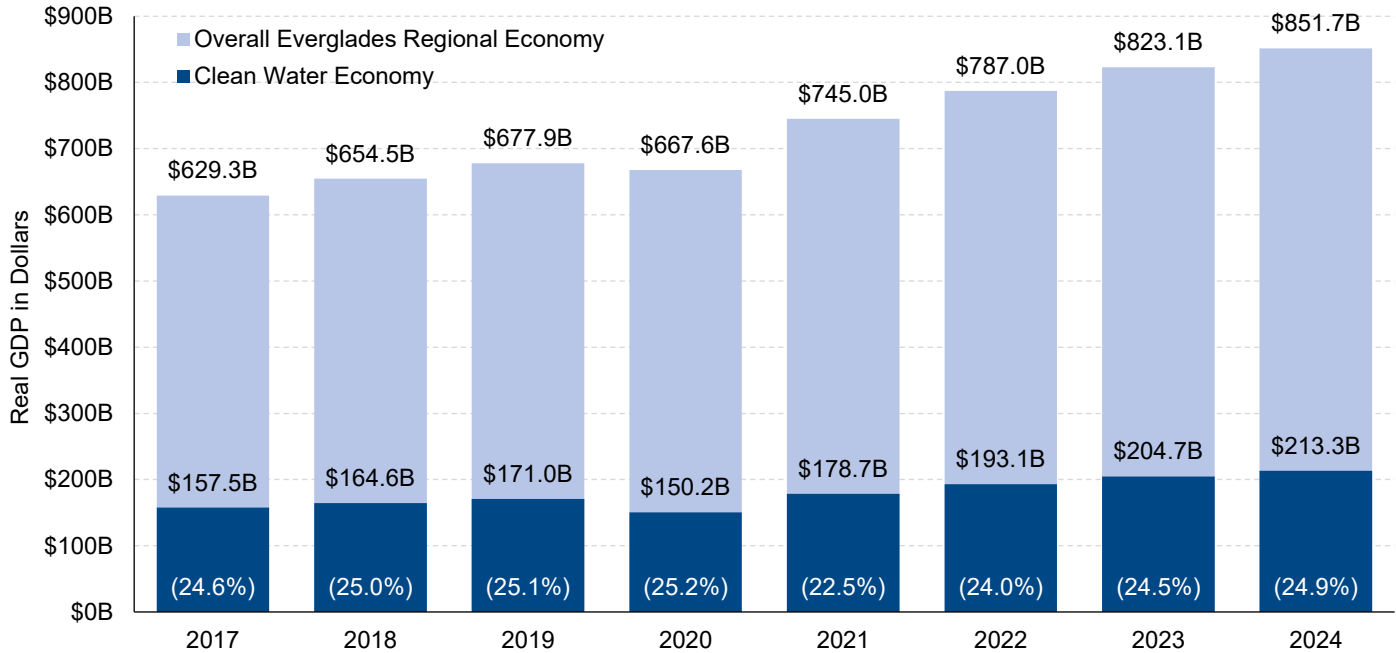
Table 5. Clean Water Economy Real Average Annual Wages in the Everglades Region, 2017 to 2024

Category	2017	2024	Change	Percent Change
Workforce Region				
CareerSource Palm Beach County	\$56,312	\$65,031	\$8,720	15.5%
CareerSource Broward	\$61,314	\$70,561	\$9,247	15.1%
CareerSource Central Florida ¹	\$53,274	\$60,937	\$7,663	14.4%
CareerSource Southwest Florida	\$48,565	\$55,073	\$6,508	13.4%
CareerSource Research Coast ¹	\$44,829	\$49,581	\$4,752	10.6%
CareerSource South Florida	\$70,015	\$77,316	\$7,301	10.4%
CareerSource Heartland ¹	\$36,793	\$39,512	\$2,719	7.4%
CareerSource Polk	\$47,576	\$48,790	\$1,214	2.6%
Industry				
Primary Clean Water Industries	\$63,171	\$76,351	\$13,180	20.9%
Secondary Clean Water Industries	\$48,207	\$55,666	\$7,459	15.5%
Tertiary Clean Water Industries	\$98,038	\$104,608	\$6,570	6.7%
Clean Water Economy	\$58,096	\$65,607	\$7,511	12.9%

¹Workforce Region only considers the counties in the Everglades Region.

Note: All dollar values adjusted to 2024 dollars using the U.S. Bureau of Labor Statistics CPI (All Urban Consumers)

Source: RERI Analysis of data obtained from Lightcast

Chart 6. Clean Water Economy Real GDP, 2017 to 2024

Prepared by the Regional Economic Research Institute

Note: Clean Water economy employment as a percentage of overall employment in parenthesis. All dollar values adjusted to 2024 dollars using the U.S. Bureau of Labor Statistics CPI (All Urban Consumers)

Source: RERI Analysis of data obtained from Lightcast

Clean Water Economy Real Gross Domestic Product

Table 6 and Chart 6 show the Clean Water Economy real Gross Domestic Product (GDP) in the Everglades Region from 2017 to 2024.

- Clean Water Economy real GDP accounted for 24.9 percent of real GDP for the total Everglades Region in 2024.
- The South Florida Workforce Region Clean Water Economy had the highest real GDP in 2024 (\$65.6 billion), while the lowest real GDP belonged to the Heartland Workforce Region (\$718.6 million).
- The Central Florida Workforce Region Clean Water Economy had the highest percentage change in real GDP over the eight-year period (42.4 percent).
- Secondary Clean Water Industries had the highest share of total real GDP (60.9 percent), while Primary Clean Water Industries had the lowest share (5.9 percent).
- Overall, Clean Water Economy real GDP grew by 35.4 percent over the eight-year period.

Table 6. Clean Water Economy Real Gross Domestic Product (Millions of Dollars), 2017 to 2024

Category	2017	2024	Change	Percent Change
Workforce Region				
CareerSource Central Florida ¹	\$34,758.5	\$49,505.8	\$14,747.3	42.4%
CareerSource Southwest Florida	\$15,575.2	\$21,649.2	\$6,074.1	39.0%
CareerSource Palm Beach County	\$19,387.4	\$26,471.0	\$7,083.6	36.5%
CareerSource Broward	\$27,980.3	\$37,942.2	\$9,961.9	35.6%
CareerSource Research Coast ¹	\$3,829.7	\$5,101.3	\$1,271.6	33.2%
CareerSource South Florida	\$49,841.2	\$65,598.7	\$15,757.5	31.6%
CareerSource Heartland ¹	\$621.4	\$718.6	\$97.2	15.6%
CareerSource Polk	\$5,507.5	\$6,335.6	\$828.1	15.0%
Industry				
Primary Clean Water Industries	\$8,370.2	\$12,525.8	\$4,155.5	49.6%
Secondary Clean Water Industries	\$92,347.3	\$129,883.6	\$37,536.3	40.6%
Tertiary Clean Water Industries	\$56,783.5	\$70,913.2	\$14,129.7	24.9%
Clean Water Economy	\$157,501.1	\$213,322.6	\$55,821.5	35.4%

¹Workforce Region only considers the counties in the Everglades Region.

Note: All dollar values adjusted to 2024 dollars using the U.S. Bureau of Labor Statistics CPI (All Urban Consumers)

Source: RERI Analysis of data obtained from Lightcast

Clean Water Economy Water Withdrawals

Table 7 shows total water withdrawal and water withdrawal per unit of output for the Clean Water Economy in the Everglades Region in 2024.

- Clean Water Economy water withdrawals accounted for 26.7 percent of total water withdrawals for the total Everglades Region in 2024.
- The Palm Beach County Workforce Region Clean Water Economy had the highest total water withdrawals (1.4 trillion kilograms), while the lowest total water withdrawals came to the Heartland Workforce Region Clean Water Economy (143.4 billion kilograms).
- The Heartland Workforce Region Clean Water Economy had the highest withdrawal per unit of output (58.3 kilograms per unit of output), while the Central Florida and Broward Workforce Regions Clean Water Economy had the lowest (1.9 kilograms per unit of output each).
- Primary Clean Water Industries withdrew 3.8 trillion kilograms of water in 2024, or 122.6 kilograms per unit of output.
- Overall, the Clean Water Economy withdrew 4.0 trillion kilograms of water in 2024, or 9.0 kilograms per unit of output.

Table 7. Clean Water Economy Water Withdrawals, 2024

Category	Total Water Withdrawals (kg)	Water Withdrawals per Unit of Output
Workforce Region		
CareerSource Broward	155,515,454,504	1.9
CareerSource Central Florida ¹	175,771,430,223	1.9
CareerSource Heartland ¹	143,384,812,731	58.3
CareerSource Palm Beach County	1,461,343,905,403	25.3
CareerSource Polk	238,635,796,288	16.8
CareerSource Research Coast ¹	153,802,841,267	14.7
CareerSource South Florida	281,014,631,167	2.0
CareerSource Southwest Florida	1,395,563,278,675	31.9
Industry		
Primary Clean Water Industries	3,780,546,405,225	122.6
Secondary Clean Water Industries	223,614,160,851	0.8
Tertiary Clean Water Industries	871,584,181	0.0
Clean Water Economy	4,005,032,150,257	9.0

¹Workforce Region only considers the counties in the Everglades Region.

Source: RERI Analysis of data obtained from IMPLAN

Clean Water Economy Economic Contribution Analysis

Table 8 highlights the economic contribution of the overall Clean Water Economy in the Everglades Region.

- The Clean Water Economy supported between 3.1 and 3.3 million jobs in 2024. Every 100 jobs directly supported by the Clean Water Economy backed 46 to 51 additional jobs through indirect and induced effects.
- In 2024, the Clean Water Economy supported between \$164.3 and \$175.9 billion in total labor income. Every \$100 in direct labor income supported between \$61 and \$69 in indirect and induced labor income.
- Total value added supported by the Clean Water Economy ranged between \$344.1 to \$368.8 billion. Every \$100 in direct value added backed an additional \$43 to \$48 additional indirect and induced value added.
- Total expenditures supported ranged from \$624.5 to \$670.0 billion in 2024. Every \$100 in direct expenditure supported an additional \$40 to \$45 in indirect and induced expenditures.

Table 8. Economic Contribution Analysis for Overall Clean Water Economy, 2024

Indicator	Model 1 – Everglades Region	Model 2 – Workforce Regions	Model 3 – Partial Workforce Regions
Employment			
Direct Effect	2.09 M	2.24 M	2.09 M
Indirect Effect	0.68 M	0.67 M	0.62 M
Induced Effect	0.39 M	0.39 M	0.35 M
Total Effect	3.16 M	3.30 M	3.06 M
Type I Multiplier	1.32	1.30	1.30
Type II Multiplier	1.51	1.48	1.46
Labor Income			
Direct Effect	\$ 101,771.0 M	\$ 107,465.8 M	\$ 101,771.0 M
Indirect Effect	\$ 46,044.3 M	\$ 44,857.9 M	\$ 41,658.1 M
Induced Effect	\$ 24,272.0 M	\$ 23,554.8 M	\$ 20,896.1 M
Total Effect	\$ 172,087.3 M	\$ 175,878.5 M	\$ 164,325.2 M
Type I Multiplier	1.45	1.42	1.41
Type II Multiplier	1.69	1.64	1.61
Value Added			
Direct Effect	\$ 239,920.0 M	\$ 254,201.1 M	\$ 239,920.0 M
Indirect Effect	\$ 68,709.0 M	\$ 66,890.7 M	\$ 61,894.8 M
Induced Effect	\$ 47,512.6 M	\$ 47,690.9 M	\$ 42,259.3 M
Total Effect	\$ 356,141.7 M	\$ 368,782.7 M	\$ 344,074.1 M
Type I Multiplier	1.29	1.26	1.26
Type II Multiplier	1.48	1.45	1.43
Expenditures			
Direct Effect	\$ 445,624.3 M	\$ 472,540.4 M	\$ 445,624.3 M
Indirect Effect	\$ 125,615.7 M	\$ 122,098.4 M	\$ 112,486.4 M
Induced Effect	\$ 76,365.0 M	\$ 75,334.6 M	\$ 66,434.3 M
Total Effect	\$ 647,605.0 M	\$ 669,973.4 M	\$ 624,544.9 M
Type I Multiplier	1.28	1.26	1.25
Type II Multiplier	1.45	1.42	1.40

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Table 9 depicts the economic contribution for the Primary Clean Water Industries in the Everglades Region.

- The Primary Clean Water Industries supported between 190 and 210 thousand total jobs in 2024. Every 100 jobs supported directly from Primary Clean Water Industries backed 53 to 61 additional jobs through indirect and induced effects.
- The Primary Clean Water Industries supported between \$11.4 and \$12.2 billion in total labor income in 2024. Every \$100 in direct labor income supported an additional \$63 to \$74 indirect and induced labor income.
- Total value added supported by the Primary Clean Water Industries ranged from \$19.7 to \$20.9 billion. Every \$100 in direct value added supported between \$63 and \$71 additional value added through supporting activities.
- Total expenditures from Primary Clean Water Industries ranged between \$44.4 to \$46.7 billion in 2024. Every \$100 in direct expenditure supported between \$44 and \$50 in additional indirect and induced expenditures.

Table 9. Economic Contribution Analysis for Primary Clean Water Industries, 2024

Indicator	Model 1 – Everglades Region	Model 2 – Workforce Regions	Model 3 – Partial Workforce Regions
Employment			
Direct Effect	0.12 M	0.14 M	0.12 M
Indirect Effect	0.05 M	0.05 M	0.04 M
Induced Effect	0.03 M	0.03 M	0.02 M
Total Effect	0.20 M	0.21 M	0.19 M
Type I Multiplier	1.39	1.33	1.36
Type II Multiplier	1.61	1.53	1.56
Labor Income			
Direct Effect	\$ 6,929.6 M	\$ 7,483.6 M	\$ 6,929.6 M
Indirect Effect	\$ 3,433.5 M	\$ 3,116.6 M	\$ 3,009.1 M
Induced Effect	\$ 1,715.1 M	\$ 1,627.6 M	\$ 1,485.7 M
Total Effect	\$ 12,078.1 M	\$ 12,227.8 M	\$ 11,424.4 M
Type I Multiplier	1.50	1.42	1.43
Type II Multiplier	1.74	1.63	1.65
Value Added			
Direct Effect	\$ 12,144.1 M	\$ 12,839.3 M	\$ 12,144.1 M
Indirect Effect	\$ 5,270.1 M	\$ 4,761.7 M	\$ 4,590.4 M
Induced Effect	\$ 3,357.6 M	\$ 3,298.6 M	\$ 3,001.7 M
Total Effect	\$ 20,771.8 M	\$ 20,899.6 M	\$ 19,736.2 M
Type I Multiplier	1.43	1.37	1.38
Type II Multiplier	1.71	1.63	1.63
Expenditures			
Direct Effect	\$ 30,845.4 M	\$ 32,328.7 M	\$ 30,845.4 M
Indirect Effect	\$ 10,132.7 M	\$ 9,159.7 M	\$ 8,811.0 M
Induced Effect	\$ 5,396.4 M	\$ 5,211.5 M	\$ 4,730.2 M
Total Effect	\$ 46,374.5 M	\$ 46,699.8 M	\$ 44,386.6 M
Type I Multiplier	1.33	1.28	1.29
Type II Multiplier	1.50	1.44	1.44

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Table 10 shows the economic contribution for the Secondary Clean Water Industries in the Everglades Region.

- The Secondary Clean Water Industries have supported between 2.2 and 2.3 million jobs in the Everglades Region. Every 100 jobs supported directly by the Secondary Clean Water Industries backed between 34 and 38 additional jobs through the indirect and induced effects.
- The Secondary Clean Water Industries supported \$94.7 and \$101.3 billion in total labor income for the Everglades Region. Every \$100 in direct labor income contributed to an additional \$63 to \$71 indirect and induced labor income.
- Total value added from the Secondary Clean Water Industries ranged from \$217.2 to \$232.7 billion in 2024. Every \$100 in direct value added supported between \$39 and \$44 in indirect and induced value added.
- Total expenditures ranged from \$394.5 to \$423.9 billion in 2024. Every \$100 in direct expenditure supported between \$37 and \$42 in additional indirect and induced expenditures.

Table 10. Economic Contribution Analysis for Secondary Clean Water Industries, 2024

Indicator	Model 1 – Everglades Region	Model 2 – Workforce Regions	Model 3 – Partial Workforce Regions
Employment			
Direct Effect	1.61 M	1.73 M	1.61 M
Indirect Effect	0.39 M	0.39 M	0.36 M
Induced Effect	0.23 M	0.23 M	0.20 M
Total Effect	2.23 M	2.34 M	2.17 M
Type I Multiplier	1.24	1.22	1.22
Type II Multiplier	1.38	1.36	1.34
Labor Income			
Direct Effect	\$ 58,053.3 M	\$ 60,937.1 M	\$ 58,053.3 M
Indirect Effect	\$ 27,262.0 M	\$ 26,717.0 M	\$ 24,662.0 M
Induced Effect	\$ 13,991.5 M	\$ 13,639.0 M	\$ 12,008.9 M
Total Effect	\$ 99,306.7 M	\$ 101,293.1 M	\$ 94,724.2 M
Type I Multiplier	1.47	1.44	1.42
Type II Multiplier	1.71	1.66	1.63
Value Added			
Direct Effect	\$ 155,887.8 M	\$ 164,733.6 M	\$ 155,887.8 M
Indirect Effect	\$ 41,193.7 M	\$ 40,352.9 M	\$ 37,036.5 M
Induced Effect	\$ 27,388.0 M	\$ 27,610.5 M	\$ 24,276.8 M
Total Effect	\$ 224,469.5 M	\$ 232,696.9 M	\$ 217,201.1 M
Type I Multiplier	1.26	1.24	1.24
Type II Multiplier	1.44	1.41	1.39
Expenditures			
Direct Effect	\$ 287,120.3 M	\$ 304,489.7 M	\$ 287,120.3 M
Indirect Effect	\$ 77,584.9 M	\$ 75,778.4 M	\$ 69,226.2 M
Induced Effect	\$ 44,019.8 M	\$ 43,638.0 M	\$ 38,159.6 M
Total Effect	\$ 408,725.0 M	\$ 423,906.2 M	\$ 394,506.1 M
Type I Multiplier	1.27	1.25	1.24
Type II Multiplier	1.42	1.39	1.37

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Table 11 illustrates the economic contribution for the Tertiary Clean Water Industries in the Everglades Region.

- The Tertiary Clean Water Industries supported between 690 and 750 thousand total jobs in 2024. Every 100 jobs directly supported by the Tertiary Clean Water Industries backed an additional 98 and 107 jobs through indirect and induced effects.
- Tertiary Clean Water Industries supported \$58.2 to \$62.4 billion in total labor income. Every \$100 in direct labor income supported an additional \$58 to \$65 in indirect and induced labor income.
- Total value added from the Tertiary Clean Water Industries ranged from \$107.1 to \$115.2 billion in 2024. Every \$100 in direct value added supported between \$49 and \$54 in indirect and induced value added.
- Total expenditures from the Tertiary Clean Water Industries ranged from \$185.7 to \$199.4 billion. Every \$100 in direct expenditures supported between \$45 and \$51 in additional indirect and induced expenditures.

Table 11. Economic Contribution Analysis for Tertiary Clean Water Industries, 2024

Indicator	Model 1 – Everglades Region	Model 2 – Workforce Regions	Model 3 – Partial Workforce Regions
Employment			
Direct Effect	0.35 M	0.37 M	0.35 M
Indirect Effect	0.24 M	0.24 M	0.22 M
Induced Effect	0.14 M	0.14 M	0.12 M
Total Effect	0.73 M	0.75 M	0.69 M
Type I Multiplier	1.68	1.65	1.63
Type II Multiplier	2.07	2.02	1.98
Labor Income			
Direct Effect	\$ 36,788.2 M	\$ 39,045.1 M	\$ 36,788.2 M
Indirect Effect	\$ 15,348.9 M	\$ 15,024.3 M	\$ 13,986.9 M
Induced Effect	\$ 8,565.4 M	\$ 8,288.1 M	\$ 7,401.5 M
Total Effect	\$ 60,702.5 M	\$ 62,357.5 M	\$ 58,176.6 M
Type I Multiplier	1.42	1.38	1.38
Type II Multiplier	1.65	1.60	1.58
Value Added			
Direct Effect	\$ 71,888.1 M	\$ 76,628.2 M	\$ 71,888.1 M
Indirect Effect	\$ 22,245.2 M	\$ 21,776.1 M	\$ 20,267.9 M
Induced Effect	\$ 16,767.0 M	\$ 16,781.9 M	\$ 14,980.8 M
Total Effect	\$ 110,900.3 M	\$ 115,186.2 M	\$ 107,136.8 M
Type I Multiplier	1.31	1.28	1.28
Type II Multiplier	1.54	1.50	1.49
Expenditures			
Direct Effect	\$ 127,658.5 M	\$ 135,722.1 M	\$ 127,658.5 M
Indirect Effect	\$ 37,898.0 M	\$ 37,160.3 M	\$ 34,449.2 M
Induced Effect	\$ 26,948.9 M	\$ 26,485.1 M	\$ 23,544.4 M
Total Effect	\$ 192,505.5 M	\$ 199,367.4 M	\$ 185,652.2 M
Type I Multiplier	1.30	1.27	1.27
Type II Multiplier	1.51	1.47	1.45

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Table 12 provides a comparison of total labor income, value added, and expenditures contributed by the Clean Water Economy as a share of total study area value added. This comparison provides the reader with a sense of scope for how large these values are relative to the overall economy.⁶

- Total labor income from the Clean Water Economy represented between 17.5 to 18.6 percent of total GDP for the study area.
- When looking at total value added, the overall contribution from the Clean Water Economy ranged from 36.8 to 38.4 percent of total GDP of the study area.
- Expenditures, which includes both value added as well as purchases from intermediate inputs, resulting from the Clean Water Economy ranged between 66.8 to 69.9 percent of total study area GDP.
- For all three economic metrics, the Secondary Clean Water Industries had the highest share, followed by the Tertiary Clean Water Industries.

Table 12. Total contribution of Clean Water Economy as a percentage of Study Area Value Added, 2024

Indicator	Model 1 – Everglades Region	Model 2 – Workforce Regions	Model 3 – Partial Workforce Regions
Labor Income			
Primary Clean Water Industries	1.3%	1.2%	1.2%
Secondary Clean Water Industries	10.7%	10.1%	10.2%
Tertiary Clean Water Industries	6.6%	6.2%	6.3%
Overall Clean Water Economy	18.6%	17.5%	17.7%
Value Added			
Primary Clean Water Industries	2.2%	2.1%	2.1%
Secondary Clean Water Industries	24.2%	23.2%	23.4%
Tertiary Clean Water Industries	12.0%	11.5%	11.6%
Overall Clean Water Economy	38.4%	36.8%	37.1%
Expenditures			
Primary Clean Water Industries	5.0%	4.7%	4.8%
Secondary Clean Water Industries	44.1%	42.3%	42.6%
Tertiary Clean Water Industries	20.8%	19.9%	20.0%
Overall Clean Water Economy	69.9%	66.8%	67.4%

Source: RERI Analysis of data obtained from IMPLAN

⁶ Note that because Model 2 uses a slightly larger study area, these values are compared to a larger value added relative to Models 1 and 3.

6. Conclusion

Economic activity and water pollution are intrinsically linked. Industry is both affected by and affects water quantity and quality (Global Institute for Water Security, 2022). In this way, the economic relationship between industry and water is bi-directional. Water pollution is largely a by-product of economic activity. Yet, deteriorating water quality can adversely affect economic activity in several ways. Impacts in the case of South Florida can be found in reduced agricultural yield, declining revenue from tourism and real estate sectors, and a range of impacts on other economic sectors that depend on water quality and ecosystem services. Despite the well-documented importance of clean water in the economy, identifying sector-wide linkage effects of water quality on economic activity can be elusive. In this report, we attempt to fill this gap by assessing the scale and scope of the industries directly or indirectly impacted by changes in water quantity and quality, what we are calling the Clean Water Economy.

In this report, we focus on the Clean Water Economy within the Greater Everglades system (Everglades Region), an area covering 16 counties in South Florida. The historic Everglades system once covered 18,000 square miles in South Florida and now roughly half of that area has been converted to other land uses. Freshwater, driven by 50-60 inches of rainfall per year, feeds these ecosystems. This initial attempt to define the scale and scope of the Clean Water Economy uses a data-driven approach. First, we identify industries with a clean connection between water usage and outcomes (**Primary Clean Water Industries**). Next, we conduct a literature review of economic impact studies that focus on environmental and water resources to identify industries that were not clearly connected to water usage but were identified as important in the literature (**Secondary Clean Water Industries**). Finally, using fields of influence technique and water multipliers within an input-output framework, we are able to identify the **Tertiary Clean Water Industries**, those industries that were not identified as having a clear, direct relationship with water use or water quality but are relatively important to the operations (purchases and sales) of Primary Clean Water Industries.

Future work should focus on continuing to refine the process of data collection and identification of the Clean Water Economy. Refining the concept of Clean Water Economy could include accounting for water usage in the industry and in their supply chain, accounting for presence of watershed in the geographical region, and further breaking the industries into consumptive and non-consumptive use. The current framework allows researchers to study how changes in water quality and quantity impact economic outcomes. For instance, using the input-output framework of the Everglades Region and the Clean Water Economy one can estimate the impact of shocks into the economic system from access to water quality/quantity or harmful algal bloom on economic activity and jobs. Future work should also include developing environmental satellite accounts for the input output framework and developing a computable general equilibrium model that accounts for price effects from economic shocks.

7. Appendix: Economic Contribution by Industry

Total Impact

Table 13. Overall Economic Contribution Analysis for Clean Water Economy by Industry, 2024

Industry	Employment			Labor Income		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	42,056	49,727	40,839	\$ 2,376.7 M	\$ 2,724.8 M	\$ 2,284.9 M
Animal Production and Aquaculture	4,914	6,862	4,789	\$ 199.9 M	\$ 238.9 M	\$ 187.2 M
Fishing, Hunting and Trapping	4,013	4,375	4,004	\$ 18.8 M	\$ 18.6 M	\$ 18.1 M
Hydroelectric Power Generation	173	164	163	\$ 24.5 M	\$ 23.6 M	\$ 23.6 M
Water, Sewage and Other System	3,318	3,957	3,083	\$ 296.2 M	\$ 340.0 M	\$ 276.5 M
Ship Building and Repairing	2,119	2,049	1,995	\$ 160.8 M	\$ 155.5 M	\$ 152.1 M
Boat Building	9,359	9,261	9,003	\$ 716.5 M	\$ 685.6 M	\$ 668.7 M
Water Transportation	67,028	64,503	63,613	\$ 5,920.3 M	\$ 5,583.7 M	\$ 5,525.7 M
Car Washes	19,086	20,274	18,630	\$ 936.8 M	\$ 982.8 M	\$ 897.7 M
Drycleaning and Laundry Services	48,009	50,083	47,553	\$ 1,427.6 M	\$ 1,474.4 M	\$ 1,389.9 M
Secondary Clean Water Industries						
Forestry and Logging	1,638	1,821	1,510	\$ 260.2 M	\$ 269.7 M	\$ 251.0 M
Support Activities for Agriculture and Forestry	25,866	31,015	25,197	\$ 1,390.7 M	\$ 1,610.0 M	\$ 1,341.6 M
Air Transportation	103,364	103,467	99,994	\$ 11,889.4 M	\$ 11,840.2 M	\$ 11,577.1 M
Real Estate	948,300	987,301	915,112	\$ 29,920.0 M	\$ 30,118.2 M	\$ 27,852.2 M
Performing Arts, Spectator Sports, and Related Industries	99,664	106,438	97,458	\$ 4,656.8 M	\$ 4,770.7 M	\$ 4,529.3 M
Museums, Historical Sites, and Similar Institutions	6,605	6,833	6,388	\$ 424.4 M	\$ 430.9 M	\$ 408.7 M
Amusement, Gambling, and Recreation Industries	192,535	201,070	187,948	\$ 10,231.6 M	\$ 10,471.2 M	\$ 9,904.8 M
Accommodation	156,973	160,403	153,006	\$ 9,238.4 M	\$ 9,306.1 M	\$ 8,938.4 M
Food Services and Drinking Places	696,479	744,987	680,195	\$ 31,295.2 M	\$ 32,476.0 M	\$ 29,921.0 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	336,557	349,841	319,805	\$ 29,306.3 M	\$ 30,562.0 M	\$ 27,971.4 M
Merchant Wholesalers, Nondurable Goods	264,174	266,822	252,417	\$ 21,414.9 M	\$ 21,561.3 M	\$ 20,445.4 M
Wholesale Trade Agents and Brokers	25,525	26,393	24,575	\$ 2,489.0 M	\$ 2,587.6 M	\$ 2,421.3 M
Scenic and Sightseeing Transportation	77,790	79,640	76,261	\$ 5,897.3 M	\$ 6,005.5 M	\$ 5,770.9 M
Motion Picture and Sound Recording Industries	22,265	23,396	21,813	\$ 1,595.0 M	\$ 1,641.1 M	\$ 1,567.6 M
Industry	Value Added			Expenditures		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	\$ 3,531.7 M	\$ 3,896.1 M	\$ 3,360.1 M	\$ 7,890.7 M	\$ 8,514.0 M	\$ 7,497.7 M
Animal Production and Aquaculture	\$ 432.9 M	\$ 557.1 M	\$ 414.9 M	\$ 1,155.2 M	\$ 1,440.2 M	\$ 1,083.4 M
Fishing, Hunting and Trapping	\$ 353.5 M	\$ 366.5 M	\$ 352.4 M	\$ 363.7 M	\$ 377.3 M	\$ 361.5 M
Hydroelectric Power Generation	\$ 72.5 M	\$ 73.2 M	\$ 73.2 M	\$ 121.4 M	\$ 121.9 M	\$ 121.9 M
Water, Sewage and Other System	\$ 510.2 M	\$ 598.7 M	\$ 480.4 M	\$ 876.2 M	\$ 1,039.4 M	\$ 824.1 M
Ship Building and Repairing	\$ 257.7 M	\$ 250.3 M	\$ 244.9 M	\$ 523.7 M	\$ 509.2 M	\$ 497.2 M
Boat Building	\$ 1,077.8 M	\$ 1,034.1 M	\$ 1,005.0 M	\$ 3,011.3 M	\$ 2,937.7 M	\$ 2,870.7 M
Water Transportation	\$ 11,859.9 M	\$ 11,349.1 M	\$ 11,245.8 M	\$ 27,748.9 M	\$ 26,922.6 M	\$ 26,664.4 M
Car Washes	\$ 1,279.3 M	\$ 1,342.0 M	\$ 1,219.9 M	\$ 2,330.6 M	\$ 2,439.7 M	\$ 2,221.3 M
Drycleaning and Laundry Services	\$ 1,396.3 M	\$ 1,432.5 M	\$ 1,339.8 M	\$ 2,352.7 M	\$ 2,397.7 M	\$ 2,244.5 M
Secondary Clean Water Industries						
Forestry and Logging	\$ 302.0 M	\$ 311.4 M	\$ 288.4 M	\$ 366.8 M	\$ 372.0 M	\$ 341.8 M
Support Activities for Agriculture and Forestry	\$ 1,587.8 M	\$ 1,821.1 M	\$ 1,511.7 M	\$ 1,821.5 M	\$ 2,035.5 M	\$ 1,683.1 M
Air Transportation	\$ 20,029.4 M	\$ 20,050.8 M	\$ 19,578.6 M	\$ 38,290.8 M	\$ 38,317.0 M	\$ 37,408.8 M
Real Estate	\$ 105,790.8 M	\$ 110,407.6 M	\$ 102,484.7 M	\$ 208,473.6 M	\$ 217,456.2 M	\$ 201,899.3 M
Performing Arts, Spectator Sports, and Related Industries	\$ 7,698.6 M	\$ 7,980.9 M	\$ 7,502.0 M	\$ 12,918.2 M	\$ 13,634.5 M	\$ 12,527.7 M
Museums, Historical Sites, and Similar Institutions	\$ 581.3 M	\$ 589.0 M	\$ 556.1 M	\$ 978.1 M	\$ 990.4 M	\$ 929.7 M
Amusement, Gambling, and Recreation Industries	\$ 17,137.7 M	\$ 17,534.0 M	\$ 16,590.0 M	\$ 26,918.7 M	\$ 27,567.8 M	\$ 25,877.0 M
Accommodation	\$ 18,981.1 M	\$ 19,261.5 M	\$ 18,478.6 M	\$ 28,890.7 M	\$ 29,270.6 M	\$ 27,936.8 M
Food Services and Drinking Places	\$ 52,360.8 M	\$ 54,740.6 M	\$ 50,211.0 M	\$ 90,066.5 M	\$ 94,262.3 M	\$ 85,901.8 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	\$ 51,348.4 M	\$ 53,971.7 M	\$ 49,388.4 M	\$ 90,787.4 M	\$ 95,269.8 M	\$ 87,261.1 M
Merchant Wholesalers, Nondurable Goods	\$ 48,327.6 M	\$ 49,772.6 M	\$ 46,860.1 M	\$ 83,257.1 M	\$ 85,266.7 M	\$ 80,577.6 M
Wholesale Trade Agents and Brokers	\$ 1,611.5 M	\$ 1,638.0 M	\$ 1,507.9 M	\$ 2,849.1 M	\$ 2,880.0 M	\$ 2,652.2 M
Scenic and Sightseeing Transportation	\$ 6,347.2 M	\$ 6,442.4 M	\$ 6,157.0 M	\$ 9,024.8 M	\$ 9,094.1 M	\$ 8,666.5 M
Motion Picture and Sound Recording Industries	\$ 3,265.6 M	\$ 3,361.5 M	\$ 3,223.5 M	\$ 6,587.0 M	\$ 6,856.8 M	\$ 6,494.8 M

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Direct Impact

Table 14. Direct Economic Contribution Analysis for Clean Water Economy by Industry, 2024

Industry	Employment			Labor Income		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	32,971	40,389	32,971	\$ 1,759.7 M	\$ 2,111.6 M	\$ 1,759.7 M
Animal Production and Aquaculture	3,995	5,814	3,995	\$ 140.1 M	\$ 176.8 M	\$ 140.1 M
Fishing, Hunting and Trapping	3,961	4,327	3,961	\$ 15.5 M	\$ 15.8 M	\$ 15.5 M
Hydroelectric Power Generation	51	51	51	\$ 14.0 M	\$ 14.0 M	\$ 14.0 M
Water, Sewage and Other System	1,821	2,291	1,821	\$ 190.5 M	\$ 226.5 M	\$ 190.5 M
Ship Building and Repairing	1,098	1,126	1,098	\$ 96.8 M	\$ 98.5 M	\$ 96.8 M
Boat Building	5,503	5,566	5,503	\$ 434.4 M	\$ 437.8 M	\$ 434.4 M
Water Transportation	16,751	16,875	16,751	\$ 2,520.3 M	\$ 2,529.7 M	\$ 2,520.3 M
Car Washes	14,752	15,899	14,752	\$ 638.5 M	\$ 691.7 M	\$ 638.5 M
Drycleaning and Laundry Services	43,390	45,544	43,390	\$ 1,119.8 M	\$ 1,181.2 M	\$ 1,119.8 M
Secondary Clean Water Industries						
Forestry and Logging	1,009	1,271	1,009	\$ 221.3 M	\$ 237.2 M	\$ 221.3 M
Support Activities for Agriculture and Forestry	22,706	27,928	22,706	\$ 1,195.1 M	\$ 1,430.4 M	\$ 1,195.1 M
Air Transportation	54,993	55,703	54,993	\$ 8,618.7 M	\$ 8,722.7 M	\$ 8,618.7 M
Real Estate	623,750	668,057	623,750	\$ 8,949.7 M	\$ 9,509.0 M	\$ 8,949.7 M
Performing Arts, Spectator Sports, and Related Industries	76,597	82,815	76,597	\$ 3,281.1 M	\$ 3,366.5 M	\$ 3,281.1 M
Museums, Historical Sites, and Similar Institutions	4,799	5,100	4,799	\$ 308.3 M	\$ 321.9 M	\$ 308.3 M
Amusement, Gambling, and Recreation Industries	151,476	159,580	151,476	\$ 7,434.8 M	\$ 7,704.7 M	\$ 7,434.8 M
Accommodation	118,014	121,733	118,014	\$ 6,508.1 M	\$ 6,657.1 M	\$ 6,508.1 M
Food Services and Drinking Places	559,407	607,067	559,407	\$ 21,536.1 M	\$ 22,987.6 M	\$ 21,536.1 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	143,703	153,879	143,703	\$ 17,055.7 M	\$ 18,443.4 M	\$ 17,055.7 M
Merchant Wholesalers, Nondurable Goods	115,291	120,077	115,291	\$ 11,933.1 M	\$ 12,479.7 M	\$ 11,933.1 M
Wholesale Trade Agents and Brokers	17,014	18,045	17,014	\$ 1,961.8 M	\$ 2,081.5 M	\$ 1,961.8 M
Scenic and Sightseeing Transportation	59,221	61,406	59,221	\$ 4,733.6 M	\$ 4,897.9 M	\$ 4,733.6 M
Motion Picture and Sound Recording Industries	14,994	16,015	14,994	\$ 1,104.0 M	\$ 1,142.5 M	\$ 1,104.0 M
Industry	Value Added			Expenditures		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	\$ 2,382.2 M	\$ 2,738.6 M	\$ 2,382.2 M	\$ 5,788.9 M	\$ 6,493.3 M	\$ 5,788.9 M
Animal Production and Aquaculture	\$ 327.0 M	\$ 440.0 M	\$ 327.0 M	\$ 887.4 M	\$ 1,184.9 M	\$ 887.4 M
Fishing, Hunting and Trapping	\$ 347.3 M	\$ 360.9 M	\$ 347.3 M	\$ 353.0 M	\$ 367.8 M	\$ 353.0 M
Hydroelectric Power Generation	\$ 48.8 M	\$ 48.8 M	\$ 48.8 M	\$ 79.4 M	\$ 79.4 M	\$ 79.4 M
Water, Sewage and Other System	\$ 336.5 M	\$ 408.7 M	\$ 336.5 M	\$ 579.3 M	\$ 714.1 M	\$ 579.3 M
Ship Building and Repairing	\$ 154.8 M	\$ 157.5 M	\$ 154.8 M	\$ 347.5 M	\$ 354.9 M	\$ 347.5 M
Boat Building	\$ 590.0 M	\$ 594.6 M	\$ 590.0 M	\$ 2,147.8 M	\$ 2,170.3 M	\$ 2,147.8 M
Water Transportation	\$ 6,346.9 M	\$ 6,368.3 M	\$ 6,346.9 M	\$ 17,757.9 M	\$ 17,864.2 M	\$ 17,757.9 M
Car Washes	\$ 773.4 M	\$ 837.3 M	\$ 773.4 M	\$ 1,481.8 M	\$ 1,600.8 M	\$ 1,481.8 M
Drycleaning and Laundry Services	\$ 837.3 M	\$ 884.7 M	\$ 837.3 M	\$ 1,422.5 M	\$ 1,498.9 M	\$ 1,422.5 M
Secondary Clean Water Industries						
Forestry and Logging	\$ 226.0 M	\$ 243.1 M	\$ 226.0 M	\$ 244.5 M	\$ 265.2 M	\$ 244.5 M
Support Activities for Agriculture and Forestry	\$ 1,205.0 M	\$ 1,442.9 M	\$ 1,205.0 M	\$ 1,206.2 M	\$ 1,444.4 M	\$ 1,206.2 M
Air Transportation	\$ 14,298.5 M	\$ 14,464.3 M	\$ 14,298.5 M	\$ 28,141.1 M	\$ 28,485.3 M	\$ 28,141.1 M
Real Estate	\$ 72,189.8 M	\$ 77,164.7 M	\$ 72,189.8 M	\$ 147,131.0 M	\$ 157,221.8 M	\$ 147,131.0 M
Performing Arts, Spectator Sports, and Related Industries	\$ 5,386.0 M	\$ 5,607.2 M	\$ 5,386.0 M	\$ 8,951.6 M	\$ 9,600.1 M	\$ 8,951.6 M
Museums, Historical Sites, and Similar Institutions	\$ 378.3 M	\$ 395.3 M	\$ 378.3 M	\$ 633.2 M	\$ 666.2 M	\$ 633.2 M
Amusement, Gambling, and Recreation Industries	\$ 12,268.1 M	\$ 12,628.2 M	\$ 12,268.1 M	\$ 18,627.0 M	\$ 19,278.3 M	\$ 18,627.0 M
Accommodation	\$ 14,275.4 M	\$ 14,617.5 M	\$ 14,275.4 M	\$ 20,731.4 M	\$ 21,277.8 M	\$ 20,731.4 M
Food Services and Drinking Places	\$ 35,660.7 M	\$ 38,170.4 M	\$ 35,660.7 M	\$ 61,454.5 M	\$ 66,250.6 M	\$ 61,454.5 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	\$ 31,611.5 M	\$ 34,158.7 M	\$ 31,611.5 M	\$ 58,141.4 M	\$ 62,700.5 M	\$ 58,141.4 M
Merchant Wholesalers, Nondurable Goods	\$ 32,916.0 M	\$ 34,841.1 M	\$ 32,916.0 M	\$ 57,489.4 M	\$ 60,462.9 M	\$ 57,489.4 M
Wholesale Trade Agents and Brokers	\$ 669.4 M	\$ 711.2 M	\$ 669.4 M	\$ 1,294.3 M	\$ 1,374.0 M	\$ 1,294.3 M
Scenic and Sightseeing Transportation	\$ 4,261.2 M	\$ 4,411.1 M	\$ 4,261.2 M	\$ 5,561.2 M	\$ 5,759.0 M	\$ 5,561.2 M
Motion Picture and Sound Recording Industries	\$ 2,430.0 M	\$ 2,506.2 M	\$ 2,430.0 M	\$ 5,172.2 M	\$ 5,425.7 M	\$ 5,172.2 M

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Indirect Impact

Table 15. Indirect Economic Contribution Analysis for Clean Water Economy by Industry, 2024

Industry	Employment			Labor Income		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	3,594	3,551	3,183	\$ 277.3 M	\$ 270.2 M	\$ 244.3 M
Animal Production and Aquaculture	449	506	380	\$ 30.8 M	\$ 31.4 M	\$ 23.5 M
Fishing, Hunting and Trapping	11	11	9	\$ 0.8 M	\$ 0.7 M	\$ 0.6 M
Hydroelectric Power Generation	65	64	64	\$ 7.0 M	\$ 6.7 M	\$ 6.7 M
Water, Sewage and Other System	816	947	719	\$ 63.5 M	\$ 70.7 M	\$ 53.5 M
Ship Building and Repairing	655	598	581	\$ 41.4 M	\$ 37.6 M	\$ 36.6 M
Boat Building	2,226	2,111	2,046	\$ 181.2 M	\$ 155.1 M	\$ 149.3 M
Water Transportation	36,803	34,892	34,451	\$ 2,566.2 M	\$ 2,286.4 M	\$ 2,256.7 M
Car Washes	2,175	2,203	2,002	\$ 164.8 M	\$ 161.2 M	\$ 146.8 M
Drycleaning and Laundry Services	1,266	1,261	1,186	\$ 100.5 M	\$ 96.7 M	\$ 91.2 M
Secondary Clean Water Industries						
Forestry and Logging	6	7	6	\$ 0.4 M	\$ 0.4 M	\$ 0.4 M
Support Activities for Agriculture and Forestry	2	2	1	\$ 0.1 M	\$ 0.1 M	\$ 0.1 M
Air Transportation	21,304	20,479	19,799	\$ 1,595.8 M	\$ 1,471.4 M	\$ 1,432.0 M
Real Estate	256,304	251,497	231,641	\$ 16,747.2 M	\$ 16,526.6 M	\$ 15,291.8 M
Performing Arts, Spectator Sports, and Related Industries	12,437	13,002	11,261	\$ 717.9 M	\$ 764.0 M	\$ 667.3 M
Museums, Historical Sites, and Similar Institutions	839	819	756	\$ 56.3 M	\$ 54.1 M	\$ 50.2 M
Amusement, Gambling, and Recreation Industries	17,848	17,787	16,497	\$ 1,360.5 M	\$ 1,335.3 M	\$ 1,252.4 M
Accommodation	17,930	17,724	16,607	\$ 1,429.0 M	\$ 1,383.7 M	\$ 1,311.6 M
Food Services and Drinking Places	65,898	66,239	58,974	\$ 5,354.8 M	\$ 5,181.3 M	\$ 4,656.2 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	126,064	128,128	117,064	\$ 8,117.7 M	\$ 8,043.2 M	\$ 7,361.7 M
Merchant Wholesalers, Nondurable Goods	100,070	99,032	93,833	\$ 6,461.4 M	\$ 6,216.6 M	\$ 5,903.5 M
Wholesale Trade Agents and Brokers	2,839	2,816	2,622	\$ 176.2 M	\$ 172.9 M	\$ 161.3 M
Scenic and Sightseeing Transportation	5,048	4,952	4,732	\$ 327.2 M	\$ 309.5 M	\$ 295.9 M
Motion Picture and Sound Recording Industries	3,643	3,816	3,547	\$ 266.5 M	\$ 282.2 M	\$ 264.6 M
Industry	Value Added			Expenditures		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	\$ 484.6 M	\$ 449.0 M	\$ 403.2 M	\$ 1,033.1 M	\$ 907.7 M	\$ 809.8 M
Animal Production and Aquaculture	\$ 49.0 M	\$ 51.1 M	\$ 37.5 M	\$ 176.5 M	\$ 151.2 M	\$ 117.1 M
Fishing, Hunting and Trapping	\$ 1.2 M	\$ 1.2 M	\$ 0.9 M	\$ 2.6 M	\$ 2.5 M	\$ 1.9 M
Hydroelectric Power Generation	\$ 16.8 M	\$ 18.5 M	\$ 18.4 M	\$ 31.0 M	\$ 33.3 M	\$ 33.3 M
Water, Sewage and Other System	\$ 91.2 M	\$ 102.0 M	\$ 76.7 M	\$ 164.3 M	\$ 186.9 M	\$ 140.1 M
Ship Building and Repairing	\$ 58.6 M	\$ 52.8 M	\$ 51.3 M	\$ 105.0 M	\$ 91.8 M	\$ 89.2 M
Boat Building	\$ 290.4 M	\$ 250.6 M	\$ 241.3 M	\$ 546.3 M	\$ 467.1 M	\$ 448.0 M
Water Transportation	\$ 3,880.9 M	\$ 3,447.8 M	\$ 3,404.3 M	\$ 7,367.8 M	\$ 6,629.4 M	\$ 6,541.1 M
Car Washes	\$ 244.5 M	\$ 240.3 M	\$ 217.5 M	\$ 428.6 M	\$ 421.4 M	\$ 379.7 M
Drycleaning and Laundry Services	\$ 153.0 M	\$ 148.5 M	\$ 139.1 M	\$ 277.6 M	\$ 268.4 M	\$ 250.7 M
Secondary Clean Water Industries						
Forestry and Logging	\$ 0.5 M	\$ 0.6 M	\$ 0.5 M	\$ 1.1 M	\$ 1.3 M	\$ 1.0 M
Support Activities for Agriculture and Forestry	\$ 0.2 M	\$ 0.2 M	\$ 0.2 M	\$ 0.5 M	\$ 0.4 M	\$ 0.3 M
Air Transportation	\$ 2,452.3 M	\$ 2,275.4 M	\$ 2,215.5 M	\$ 4,880.1 M	\$ 4,585.0 M	\$ 4,432.7 M
Real Estate	\$ 25,334.5 M	\$ 24,972.1 M	\$ 22,982.2 M	\$ 48,056.2 M	\$ 47,202.0 M	\$ 43,298.0 M
Performing Arts, Spectator Sports, and Related Industries	\$ 1,025.0 M	\$ 1,085.6 M	\$ 949.0 M	\$ 1,897.0 M	\$ 1,994.9 M	\$ 1,736.3 M
Museums, Historical Sites, and Similar Institutions	\$ 85.9 M	\$ 82.2 M	\$ 76.0 M	\$ 156.6 M	\$ 148.5 M	\$ 136.7 M
Amusement, Gambling, and Recreation Industries	\$ 2,058.0 M	\$ 2,012.4 M	\$ 1,868.5 M	\$ 3,772.8 M	\$ 3,697.6 M	\$ 3,389.9 M
Accommodation	\$ 2,158.5 M	\$ 2,090.5 M	\$ 1,952.7 M	\$ 4,065.4 M	\$ 3,942.8 M	\$ 3,660.4 M
Food Services and Drinking Places	\$ 8,078.8 M	\$ 7,833.8 M	\$ 6,991.9 M	\$ 14,755.2 M	\$ 14,205.9 M	\$ 12,570.7 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	\$ 11,646.6 M	\$ 11,548.9 M	\$ 10,567.8 M	\$ 19,642.9 M	\$ 19,529.7 M	\$ 17,797.7 M
Merchant Wholesalers, Nondurable Goods	\$ 9,499.0 M	\$ 9,130.8 M	\$ 8,667.6 M	\$ 16,264.6 M	\$ 15,651.5 M	\$ 14,794.8 M
Wholesale Trade Agents and Brokers	\$ 255.1 M	\$ 251.8 M	\$ 234.4 M	\$ 450.5 M	\$ 442.8 M	\$ 410.4 M
Scenic and Sightseeing Transportation	\$ 448.2 M	\$ 424.8 M	\$ 405.1 M	\$ 831.4 M	\$ 790.5 M	\$ 751.7 M
Motion Picture and Sound Recording Industries	\$ 396.3 M	\$ 419.8 M	\$ 393.1 M	\$ 708.5 M	\$ 745.7 M	\$ 694.7 M

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

Induced Impact

Table 16. Induced Economic Contribution Analysis for Clean Water Economy by Industry, 2024

Industry	Employment			Labor Income		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	5,490	5,786	4,684	\$ 339.6 M	\$ 343.0 M	\$ 280.9 M
Animal Production and Aquaculture	470	542	415	\$ 29.0 M	\$ 30.7 M	\$ 23.6 M
Fishing, Hunting and Trapping	42	36	34	\$ 2.6 M	\$ 2.1 M	\$ 2.0 M
Hydroelectric Power Generation	57	48	48	\$ 3.5 M	\$ 3.0 M	\$ 3.0 M
Water, Sewage and Other System	681	718	544	\$ 42.1 M	\$ 42.8 M	\$ 32.4 M
Ship Building and Repairing	366	326	315	\$ 22.6 M	\$ 19.4 M	\$ 18.8 M
Boat Building	1,629	1,584	1,454	\$ 100.8 M	\$ 92.7 M	\$ 85.0 M
Water Transportation	13,474	12,736	12,412	\$ 833.8 M	\$ 767.5 M	\$ 748.7 M
Car Washes	2,159	2,172	1,877	\$ 133.6 M	\$ 129.9 M	\$ 112.4 M
Drycleaning and Laundry Services	3,353	3,279	2,977	\$ 207.4 M	\$ 196.5 M	\$ 178.9 M
Secondary Clean Water Industries						
Forestry and Logging	623	543	496	\$ 38.5 M	\$ 32.0 M	\$ 29.4 M
Support Activities for Agriculture and Forestry	3,158	3,085	2,489	\$ 195.4 M	\$ 179.5 M	\$ 146.4 M
Air Transportation	27,067	27,285	25,202	\$ 1,674.9 M	\$ 1,646.1 M	\$ 1,526.4 M
Real Estate	68,246	67,748	59,721	\$ 4,223.0 M	\$ 4,082.6 M	\$ 3,610.6 M
Performing Arts, Spectator Sports, and Related Industries	10,630	10,621	9,599	\$ 657.8 M	\$ 640.2 M	\$ 580.9 M
Museums, Historical Sites, and Similar Institutions	967	915	832	\$ 59.8 M	\$ 54.8 M	\$ 50.1 M
Amusement, Gambling, and Recreation Industries	23,211	23,703	19,974	\$ 1,436.4 M	\$ 1,431.2 M	\$ 1,217.7 M
Accommodation	21,029	20,945	18,385	\$ 1,301.3 M	\$ 1,265.3 M	\$ 1,118.7 M
Food Services and Drinking Places	71,174	71,681	61,814	\$ 4,404.4 M	\$ 4,307.2 M	\$ 3,728.7 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	66,791	67,835	59,038	\$ 4,132.9 M	\$ 4,075.3 M	\$ 3,554.0 M
Merchant Wholesalers, Nondurable Goods	48,812	47,712	43,293	\$ 3,020.5 M	\$ 2,865.0 M	\$ 2,608.8 M
Wholesale Trade Agents and Brokers	5,672	5,531	4,939	\$ 351.0 M	\$ 333.2 M	\$ 298.2 M
Scenic and Sightseeing Transportation	13,521	13,282	12,308	\$ 836.6 M	\$ 798.1 M	\$ 741.4 M
Motion Picture and Sound Recording Industries	3,628	3,565	3,272	\$ 224.5 M	\$ 216.4 M	\$ 199.0 M
Industry	Value Added			Expenditures		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Primary Clean Water Industries						
Crop Production	\$ 664.9 M	\$ 708.5 M	\$ 574.7 M	\$ 1,068.7 M	\$ 1,113.0 M	\$ 899.0 M
Animal Production and Aquaculture	\$ 56.9 M	\$ 66.0 M	\$ 50.3 M	\$ 91.4 M	\$ 104.0 M	\$ 78.9 M
Fishing, Hunting and Trapping	\$ 5.1 M	\$ 4.5 M	\$ 4.2 M	\$ 8.1 M	\$ 7.0 M	\$ 6.6 M
Hydroelectric Power Generation	\$ 6.9 M	\$ 5.9 M	\$ 5.9 M	\$ 11.0 M	\$ 9.3 M	\$ 9.2 M
Water, Sewage and Other System	\$ 82.5 M	\$ 88.1 M	\$ 67.1 M	\$ 132.5 M	\$ 138.4 M	\$ 104.6 M
Ship Building and Repairing	\$ 44.3 M	\$ 40.0 M	\$ 38.8 M	\$ 71.2 M	\$ 62.5 M	\$ 60.5 M
Boat Building	\$ 197.4 M	\$ 188.9 M	\$ 173.7 M	\$ 317.2 M	\$ 300.4 M	\$ 275.0 M
Water Transportation	\$ 1,632.1 M	\$ 1,533.1 M	\$ 1,494.6 M	\$ 2,623.3 M	\$ 2,429.0 M	\$ 2,365.4 M
Car Washes	\$ 261.5 M	\$ 264.4 M	\$ 229.0 M	\$ 420.2 M	\$ 417.5 M	\$ 359.8 M
Drycleaning and Laundry Services	\$ 406.1 M	\$ 399.3 M	\$ 363.3 M	\$ 652.6 M	\$ 630.4 M	\$ 571.2 M
Secondary Clean Water Industries						
Forestry and Logging	\$ 75.5 M	\$ 67.6 M	\$ 61.9 M	\$ 121.3 M	\$ 105.5 M	\$ 96.3 M
Support Activities for Agriculture and Forestry	\$ 382.5 M	\$ 378.0 M	\$ 306.5 M	\$ 614.8 M	\$ 590.7 M	\$ 476.6 M
Air Transportation	\$ 3,278.6 M	\$ 3,311.1 M	\$ 3,064.6 M	\$ 5,269.6 M	\$ 5,246.7 M	\$ 4,835.0 M
Real Estate	\$ 8,266.5 M	\$ 8,270.9 M	\$ 7,312.8 M	\$ 13,286.5 M	\$ 13,032.4 M	\$ 11,470.3 M
Performing Arts, Spectator Sports, and Related Industries	\$ 1,287.6 M	\$ 1,288.2 M	\$ 1,167.0 M	\$ 2,069.5 M	\$ 2,039.5 M	\$ 1,839.8 M
Museums, Historical Sites, and Similar Institutions	\$ 117.1 M	\$ 111.5 M	\$ 101.8 M	\$ 188.2 M	\$ 175.7 M	\$ 159.8 M
Amusement, Gambling, and Recreation Industries	\$ 2,811.6 M	\$ 2,893.4 M	\$ 2,453.4 M	\$ 4,519.0 M	\$ 4,591.9 M	\$ 3,860.1 M
Accommodation	\$ 2,547.2 M	\$ 2,553.4 M	\$ 2,250.5 M	\$ 4,094.0 M	\$ 4,049.9 M	\$ 3,545.1 M
Food Services and Drinking Places	\$ 8,621.4 M	\$ 8,736.4 M	\$ 7,558.4 M	\$ 13,856.8 M	\$ 13,805.7 M	\$ 11,876.7 M
Tertiary Clean Water Industries						
Merchant Wholesalers, Durable Goods	\$ 8,090.2 M	\$ 8,264.1 M	\$ 7,209.1 M	\$ 13,003.1 M	\$ 13,039.6 M	\$ 11,322.0 M
Merchant Wholesalers, Nondurable Goods	\$ 5,912.6 M	\$ 5,800.7 M	\$ 5,276.5 M	\$ 9,503.0 M	\$ 9,152.3 M	\$ 8,293.4 M
Wholesale Trade Agents and Brokers	\$ 687.1 M	\$ 675.0 M	\$ 604.1 M	\$ 1,104.3 M	\$ 1,063.2 M	\$ 947.5 M
Scenic and Sightseeing Transportation	\$ 1,637.7 M	\$ 1,606.5 M	\$ 1,490.7 M	\$ 2,632.2 M	\$ 2,544.6 M	\$ 2,353.6 M
Motion Picture and Sound Recording Industries	\$ 439.4 M	\$ 435.5 M	\$ 400.5 M	\$ 706.2 M	\$ 685.4 M	\$ 627.9 M

Source: RERI Analysis of data obtained from IMPLAN

Note: All dollar values reported in 2024 dollars.

8. About IMPLAN

The primary tool used in the current study is IMPLAN, an economic modelling program used by many universities, government agencies, and private companies in the United States. The model is based on an understanding of inter-industry relationships. Input-Output Models were first developed by Wassily Leontief for which he received the Nobel Prize in Economics in 1973. The model includes a mathematical framework that allows the research team to estimate the economic impact of any particular industry on the regional economy through the derivation of multipliers and linkages across industries. Employees need to purchase various products and services within the regional economy, leading to additional spending and jobs. The IMPLAN model provides potential effects on four different outcomes – expenditures, employment, value added and labor income.

- **Employment:** The additional employment supported in the study region resulting from the Clean Water Economy.
- **Labor Income:** The additional wages, salaries and benefits paid to workers in the study region resulting from the supported employment.
- **Value Added:** The additional labor income, proprietors' income, other property income and indirect business taxes supported by the Clean Water Economy within the study region.
- **Expenditures:** The additional expenditures supported by the Clean Water Economy.

The model accounts three types of effects that the Clean Water Economy provides to the Everglades Region: the direct effect, indirect effect and induced effect.

- **Direct effect:** The effect on the region as a result of the direct spending from the Clean Water Economy;
- **Indirect effect:** The effect on region related to the spending from vendors and suppliers of goods and services necessitated from the spending of the Clean Water Economy; and
- **Induced effect:** The effect on region resulting from the spending by employees for housing, food and other goods and services.
- **Total effect:** The sum of direct, indirect and induced effect of the Clean Water Economy on the region.

In addition to the effects, multipliers were generated for each outcome. Two types of multipliers are displayed in this report – Type I and Type II – and are defined as follows:

$$\text{Type I multiplier} = (\text{Direct Effect} + \text{Indirect Effect}) / \text{Direct Effect}$$

$$\text{Type II multiplier} = (\text{Direct Effect} + \text{Indirect Effect} + \text{Induced Effect}) / \text{Direct Effect}$$

The Type I multiplier describes any direct effects from the Clean Water Economy, as well as any indirect effects that occur as a result of the spending within the supply chain. On the other hand, Type II multipliers (also sometimes referred as Social Accounting Matrix (SAM) multipliers) account for everything in the Type I multiplier, along with any impacts that occur due to a change in discretionary household income.

Both multipliers are useful in helping the reader better understand the connection that the Clean Water Economy has on the region. It helps describe the additional indirect and induced activity generated by the direct activity. For example, if labor income has a Type I multiplier of 1.3, this means that every dollar in labor income supported by the Clean Water Economy results in an additional 30 cents in indirect contributions to the area. Moreover, if employment had a Type II multiplier of 1.2, this means that every five jobs directly supported by the Clean Water Economy results in one additional job supported through the indirect and induced effects.

Input-Output Models Assumptions and Caveats

There are three fundamental (underlying) assumptions in an input-output model that are important to understand its results and how to interpret them:

1. **The production technology each industry uses is based on its purchases of inputs.** Hence, each production technology is based on the relative importance of input purchased to the output outcome. This input-to-output ratio is called the technical coefficient. For example, if to produce \$1 in car output you need \$0.25 dollars in steel input, an additional \$100 in car output will require \$25 in steel. This relationship between input and output produces a technology with constant returns to scale.
2. **There is no supply constraint, which implies that there is no restriction in the availability of inputs, such as raw material, labor, etc., to produce the goods and services necessary.** This can be a somewhat strong assumption, especially when considering smaller regional economies.
3. **There are no price adjustments, which implies that the model is static in terms of substitution.** Because there are no price changes, relative prices remain the same; therefore, there are no changes in the production structure or technology (technical coefficients) in each industry, nor changes in the industry by-products (goods and services produced by each industry).

All three assumptions make the input-output analysis very suitable for short-term to mid-term analysis when the production processes (technology) of industries do not vary much.

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