

## ***Imperiled Water Quality of Biscayne Bay*** **The Economics of What's at Stake**

The Miami-Dade County economy is a powerhouse and is characterized by these selected attributes<sup>1</sup>:

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Annual Gross Regional Product → **\$199 billion**  
Total Employment Base → **1.5 million jobs**  
Annual Personal Incomes → **\$97 billion**

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The Miami-Dade County economy is a vital source of growth and stability within the south Florida region. In fact, the combined Miami-Dade/Ft. Lauderdale region is the **8<sup>th</sup> largest metropolitan statistical area in the US**, in terms of total population, with a per capita GRP of \$41,000. The Miami-Dade County economy is *extremely diverse* and is driven by numerous industry sectors, the most important of which are real estate, government services, wholesale trade, health care, professional services, finance and insurance.

However, one of the key assets within the Miami-Dade County portfolio is the **natural environment in which it is cradled**. The county is bordered by the Everglades to the west, the Florida Keys to the south, and the beaches and Biscayne Bay to the east. These natural amenities, and their inherent quality, play a key role in attracting an estimated annual total of **14 million overnight visitors** to the area. And of the various activities pursued by these domestic and international visitors, approximately **80% of visitors experienced the beaches, Key Biscayne, and/or local water sports/activities**.<sup>2</sup> The estimated economic impact of all visitors to the Miami-Dade County economy is **\$34.2**



Biscayne Bay dominates the vista of northern Miami-Dade County, the most populous county in Florida. (Florida Sea Grant stock photo)

**billion**, with the *enjoyment of local natural amenities* being of importance to **80% of these visitors**.

More specifically, visitation to and use of Biscayne Bay contributes significantly to the Miami-Dade County economy. For example, a study by Hazen & Sawyer estimated that **65.5 million person-days\*** are spent recreating annually on Biscayne Bay. Collectively, the economic activities associated with Biscayne Bay-related uses contributed **10.2 % of the total Miami-Dade County economy**, as well as **4% of the southeast Florida economy**.<sup>3</sup> Biscayne Bay-related activities generated **\$12.7 billion in economic output**, **\$6.3 billion in incomes (10.2% of the County total)**, **138,000 jobs**,

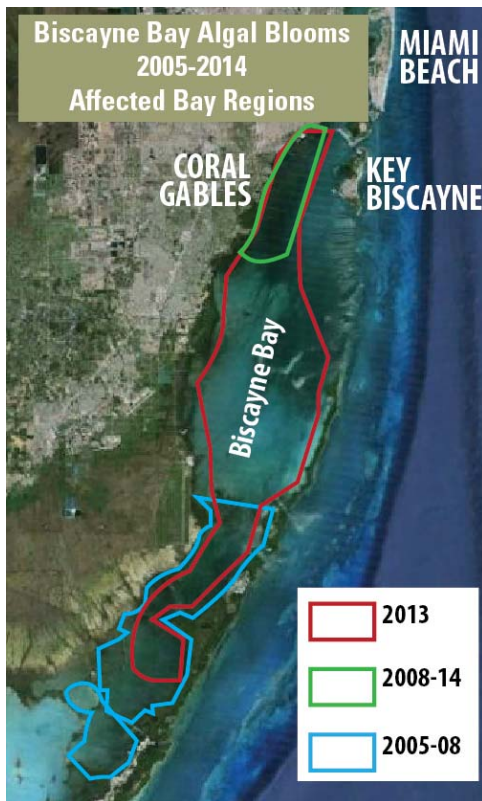
and **\$627 million in tax revenue** within the local economy.

Other indicators of the value associated with recreational uses of Biscayne Bay attest to the vital role the Bay plays in the Miami-Dade County economy. The Rosenstiel School of Marine and Atmospheric Science (RSMAS) found that **1.6 million individuals annually visit the National Park and three State Parks that surround Biscayne Bay**.<sup>4</sup> The expenditures by these visitors are vital to the local *recreational* business complex that exists within the proximity of Biscayne Bay. Hazen and Sawyer found that Bay-related recreational activities created **\$3.8 billion in economic output**, **\$2.1 billion in incomes**, and **57,000 jobs**. The RSMAS study further found **71% of local**,

recreational business owners feel that the aesthetic qualities of Biscayne Bay are vital to the economic values created by the Bay. In addition, the National Park Service found that 476,077 visitors to Biscayne National Park spent \$34.3 million within the communities surrounding the Park, supporting 422 jobs in the local area.<sup>5</sup>

## Algal Blooms in Biscayne Bay

Although Biscayne Bay remains relatively healthy, natural and man-induced events can negatively impact water quality and bay bottom resources. Three such events have occurred in Biscayne Bay during the past decade (see figure below), which resulted in algal blooms of unprecedented scale and duration that impacted over 10,000 acres of bay bottom habitat. These recent algal blooms may signal a diminished ability of the Bay to handle what were previously tolerable events.



These events were:

- 1) A micro-algal bloom that initiated in 2005 in the southern end of Biscayne Bay and persisted for 3 years. The bloom caused reduced visibility and resulted in a loss of up to 51% of sea grasses and bay bottom organisms within the bloom region.



Biscayne Bay water clarity in normal vs. bloom periods. Normal visibility (left) is greater than 30 ft. During a June 2013 diatom algal bloom (right) visibility is less than 2 ft. Photos are not taken at the same location, and are provided for illustration purposes only. (Photos courtesy Stephen Blair, Miami-Dade DERM)

- 2) A macro-algal bloom that initiated in 2008 that continues today, although diminished. The impacted area runs along the western shore south of Rickenbacker Causeway to south of Coral Gables and out to mid-bay. This bloom has impacted over 7500 acres of bay bottom, including the loss of sea grass and bay bottom habitat.
- 3) A micro-algal bloom that initiated in the summer of 2013 and persisted for 2-3 months across the south-central and southern regions of the Bay. It is striking that this bloom occurred in a large, open region of the Bay, in an area where a bloom had not previously occurred.

The exact causes of these blooms remain unknown. **These events may indicate that Biscayne Bay is showing a decreased capacity, or resilience, to withstand such episodic events, whether caused by natural or human factors.** These warning signs emphasize the importance of maintaining vigilance in assessment and monitoring of conditions in the Bay, to identify changes in the Bay and understand how these changes may affect the Bay's long-term health, and its environmental and economic sustainability.

In summary, what's at stake? Biscayne Bay is vital to the Miami-Dade economy. Further, the existence of consistent, good water quality is likely the linchpin that couples economic activity with the Bay itself. If the quality of the water and natural amenities decline, as has been witnessed during recent algal blooms, so too will the economic activities critically dependent on a healthy bay.



## References

<sup>1</sup> Cruz, D. and R. Hesler. 2013. "Miami-Dade County Economic & Demographic Profile 2013". Dept. of Regulatory & Economic Resources. Economic Analysis & Policy. Miami-Dade County. [http://www.nature.nps.gov/socialscience/docs/NPSVSE2012\\_final\\_nrss.pdf](http://www.nature.nps.gov/socialscience/docs/NPSVSE2012_final_nrss.pdf).

<sup>2</sup> Greater Miami Convention & Visitors Bureau. "2013 Visitor Industry Overview". Miami, FL. [http://www.miamilandbeaches.com/~media/files/gm\\_cvb/partners/research%20statistics/annual\\_report\\_2013](http://www.miamilandbeaches.com/~media/files/gm_cvb/partners/research%20statistics/annual_report_2013).

<sup>3</sup> Hazen and Sawyer. 2005. "Biscayne Bay Economic Study – Part 1, Baseline and Trend Report". [http://www.sfrestore.org/trct/bbay/documents/Economic\\_Study\\_Executive\\_Summar.pdf](http://www.sfrestore.org/trct/bbay/documents/Economic_Study_Executive_Summar.pdf).

<sup>4</sup> Youngquist, A. 2013. "The Value of Biscayne Bay to Local Recreational Businesses". Rosenstiel School of Marine and Atmospheric Science, University of Miami. [http://www.sfrestore.org/trct/bbay/meetings/2014\\_meetings/021914/BB\\_value\\_to\\_local\\_bus.pdf](http://www.sfrestore.org/trct/bbay/meetings/2014_meetings/021914/BB_value_to_local_bus.pdf).

<sup>5</sup> US Department of the Interior. 2014. "2012 National Park Visitor Spending Effects." National Resource Report NPS/NRSS/EQD/NRR-2014/765. National Park Service. [http://www.nature.nps.gov/socialscience/docs/NPSVSE2012\\_final\\_nrss.pdf](http://www.nature.nps.gov/socialscience/docs/NPSVSE2012_final_nrss.pdf).

\*Number of visitors times the number of days per visitor.

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