

# 2019 Tampa Bay Water Quality Assessments

A Tampa Bay Estuary Program Initiative to Maintain and Restore the Bay's Seagrass Resources



## Historic results:

|      | OTB    | HB     | MTB    | LTB    |
|------|--------|--------|--------|--------|
| 1975 | red    | red    | yellow | yellow |
| 1976 | red    | red    | yellow | yellow |
| 1977 | red    | red    | red    | red    |
| 1978 | red    | red    | red    | yellow |
| 1979 | red    | red    | red    | red    |
| 1980 | red    | red    | red    | red    |
| 1981 | red    | red    | red    | red    |
| 1982 | red    | red    | red    | red    |
| 1983 | red    | yellow | red    | red    |
| 1984 | red    | green  | red    | yellow |
| 1985 | red    | red    | red    | yellow |
| 1986 | red    | yellow | yellow | green  |
| 1987 | yellow | yellow | yellow | green  |
| 1988 | green  | green  | green  | green  |
| 1989 | red    | yellow | yellow | yellow |
| 1990 | yellow | green  | yellow | green  |
| 1991 | green  | yellow | green  | yellow |
| 1992 | green  | green  | green  | yellow |
| 1993 | yellow | green  | green  | yellow |
| 1994 | yellow | yellow | yellow | red    |
| 1995 | red    | yellow | yellow | yellow |
| 1996 | yellow | green  | green  | green  |
| 1997 | green  | green  | yellow | green  |
| 1998 | red    | yellow | red    | red    |
| 1999 | yellow | green  | green  | yellow |
| 2000 | green  | green  | green  | yellow |
| 2001 | yellow | green  | yellow | yellow |
| 2002 | yellow | green  | green  | green  |
| 2003 | red    | green  | green  | green  |
| 2004 | yellow | green  | green  | yellow |
| 2005 | green  | green  | green  | yellow |
| 2006 | green  | green  | green  | green  |
| 2007 | green  | green  | green  | green  |
| 2008 | yellow | green  | green  | yellow |
| 2009 | yellow | yellow | green  | green  |
| 2010 | green  | green  | green  | green  |
| 2011 | red    | green  | yellow | green  |
| 2012 | green  | green  | green  | green  |
| 2013 | green  | green  | green  | green  |
| 2014 | green  | green  | green  | green  |
| 2015 | yellow | green  | yellow | green  |
| 2016 | yellow | green  | green  | green  |
| 2017 | yellow | green  | green  | green  |
| 2018 | yellow | green  | green  | green  |
| 2019 | yellow | green  | green  | green  |

## Background

Light availability to seagrass is the guiding paradigm for TBEP's Nitrogen Management Strategy. Because excessive nitrogen loads to the bay generally lead to increased algae blooms (higher chlorophyll-a levels) (Figure 1) and reduce light penetration to seagrass, an evaluation method was developed to assess whether load reduction strategies are achieving desired water quality results (i.e. reduced chlorophyll-a concentrations and increased water clarity).



## Decision Support Approach

Year to year algae abundance (measured as chlorophyll-a concentrations) and visible light penetration through the water column (depth of secchi disk visibility) have been identified as critical water quality indicators in Tampa Bay. Tracking the attainment of bay segment specific targets for these indicators provides the framework for developing and initiating bay management actions. TBEP management actions adopted in response to the annually-assessed decision support results are shown to the right.

|        |  |
|--------|--|
| Green  | "Stay the Course" Continue planned projects. Report data via annual progress reports and Baywide Environmental Monitoring Report.                            |
| Yellow | "Caution" Review monitoring data and nitrogen loading estimates. Begin/continue TAC and Management Board development of specific management recommendations. |
| Red    | "On Alert" Finalize development and implement appropriate management actions to get back on track.   |

## 2019 Decision Matrix Results

Water quality (chlorophyll-a and light penetration) remained supportive of seagrass in Hillsborough Bay (HB), Middle Tampa Bay (MTB), and Lower Tampa Bay (LTB) (Table 1, Figure 3). The nuisance alga, *Pyrodinium bahamense*, was again reported in Old Tampa Bay (OTB) during the Summer and Fall 2019, contributing to a small magnitude chlorophyll-a exceedance. In all bay segments, separate algal bloom events contributed to individual stations exceeding the bay segment chlorophyll-a targets (Figure 4). However, effective light penetration was supportive of seagrass in all bay segments (Table 1).

Table 1: Observed water quality indicators & recommended management outcomes for 2019.

| Bay segment | Chl-a (ug/L) |        | Effective Light Penetration ( $m^{-1}$ ) |        | outcome |
|-------------|--------------|--------|--|--------|---------|
|             | 2019         | target | 2019                                     | target |         |
| OTB         | 10.64        | 8.5    | 0.76                                     | 0.83   | yellow  |
| HB          | 11.31        | 13.2   | 0.97                                     | 1.58   | green   |
| MTB         | 5.83         | 7.4    | 0.59                                     | 0.83   | green   |
| LTB         | 4.05         | 4.6    | 0.61                                     | 0.63   | green   |



Figure 3: Historic chlorophyll-a annual averages for the four bay segments.

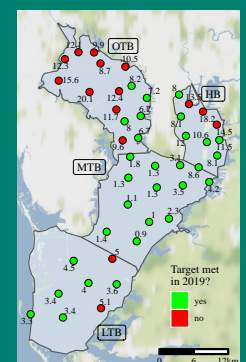


Figure 4: Chlorophyll-a attainment outcomes by site for 2019.

Figure 2: Decision matrix results for 1975 to 2019.

**Acknowledgments:** Continuing water quality monitoring support provided by the Environmental Protection Commission of Hillsborough County. Consulting support provided by Janicki Environmental, Inc. Full methods in Janicki, A., Wade, D., Pribble, R.J. 2000. TBEP Technical Report #0400.