

# 2021 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 | R   | R  | R   | G   |
| 1976 | R   | R  | R   | Y   |
| 1977 | R   | R  | R   | R   |
| 1978 | R   | R  | R   | Y   |
| 1979 | R   | R  | R   | R   |
| 1980 | R   | R  | R   | R   |
| 1981 | R   | R  | R   | R   |
| 1982 | R   | R  | R   | R   |
| 1983 | R   | Y  | R   | R   |
| 1984 | R   | G  | R   | Y   |
| 1985 | R   | R  | R   | Y   |
| 1986 | R   | Y  | R   | G   |
| 1987 | R   | Y  | R   | G   |
| 1988 | Y   | G  | Y   | G   |
| 1989 | R   | Y  | R   | Y   |
| 1990 | R   | G  | R   | Y   |
| 1991 | G   | Y  | Y   | Y   |
| 1992 | Y   | G  | Y   | Y   |
| 1993 | Y   | G  | Y   | Y   |
| 1994 | Y   | Y  | R   | R   |
| 1995 | R   | Y  | R   | Y   |
| 1996 | Y   | G  | Y   | G   |
| 1997 | Y   | G  | R   | Y   |
| 1998 | R   | R  | R   | R   |
| 1999 | Y   | G  | Y   | Y   |
| 2000 | G   | G  | Y   | Y   |
| 2001 | Y   | G  | Y   | Y   |
| 2002 | Y   | G  | G   | G   |
| 2003 | R   | Y  | G   | Y   |
| 2004 | R   | G  | G   | Y   |
| 2005 | G   | G  | Y   | Y   |
| 2006 | G   | G  | G   | G   |
| 2007 | G   | G  | G   | G   |
| 2008 | Y   | G  | G   | Y   |
| 2009 | Y   | Y  | G   | G   |
| 2010 | G   | G  | G   | G   |
| 2011 | R   | G  | Y   | G   |
| 2012 | G   | G  | G   | G   |
| 2013 | G   | G  | G   | G   |
| 2014 | G   | G  | G   | G   |
| 2015 | Y   | G  | Y   | G   |
| 2016 | Y   | G  | G   | G   |
| 2017 | Y   | G  | G   | G   |
| 2018 | Y   | G  | G   | G   |
| 2019 | Y   | G  | G   | G   |
| 2020 | Y   | G  | G   | G   |
| 2021 | Y   | G  | G   | G   |

\*Incomplete data for 2021 estimated by five year average

## 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 2) 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).



Figure 2: Seagrass restoration with N management.

## Decision Support Approach

Year to year algae abundance (measured as chlorophyll-a concentrations) and visible light penetration through the water column (secchi disk depth 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.

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

## 2021 Decision Matrix Results

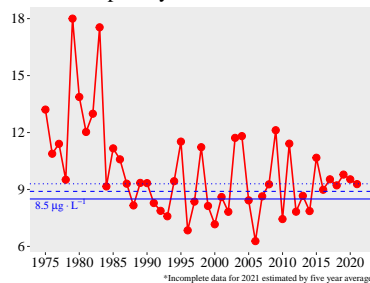
Water quality (chlorophyll-a and light penetration) remained supportive of seagrass in Hillsborough Bay (HB), Middle Tampa Bay (MTB), and Lower Tampa Bay (LTB)(Table 1, Figure 3). The nuisance alga, *Pyrodinium bahamense*, was again reported in Old Tampa Bay (OTB) during June - Sept 2020, contributing to a large magnitude chlorophyll-a exceedance that has persisted for a long duration (6 yrs). However, it should be noted that effective light penetration was still observed to be supportive of seagrass in all bay segments, including OTB (Table 1).

Table 1: Water quality outcomes for 2021.

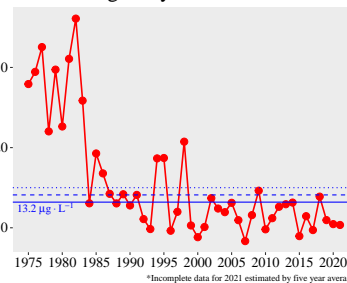
| Segment | Chl-a (ug/L) |        | Light Penetration ( $m^{-1}$ ) |        |
|---------|--------------|--------|--------------------------------|--------|
|         | 2021         | target | 2021                           | target |
| OTB     | 9.3          | 8.5    | 0.74                           | 0.83   |
| HB      | 10.4         | 13.2   | 1.03                           | 1.58   |
| MTB     | 5.2          | 7.4    | 0.58                           | 0.83   |
| LTB     | 3.4          | 4.6    | 0.62                           | 0.63   |

— Annual Mean — Management Target — +1 se (small exceedance) — +2 se (large exceedance)

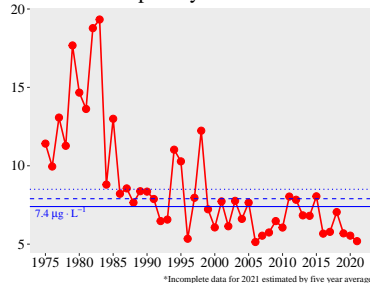
### Old Tampa Bay\*



### Hillsborough Bay\*



### Middle Tampa Bay\*



### Lower Tampa Bay\*

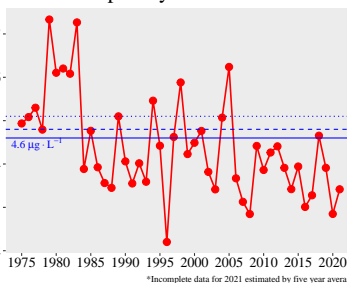
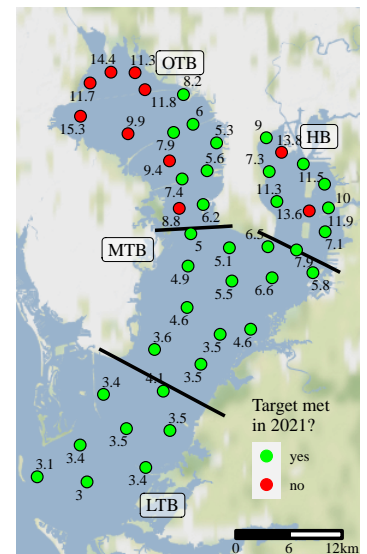


Figure 3: Historic chlorophyll-a annual averages for the four bay segments.

**Note:** 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 et al. 2000. TBEP Technical Report #04-00. Points in map above show site-specific attainment of a bay segment target and are for reference only.



\*Incomplete data for 2021 estimated by five year average

Figure 4: Chlorophyll attainment outcomes by site for 2021.

Figure 1: Decision matrix results for 1975 to 2021 (April, May data missing for 2020).