

Upper Lemon Bay Condition Report for 2016

CAUTION



1 out of 3 indicators were rated as PASS.

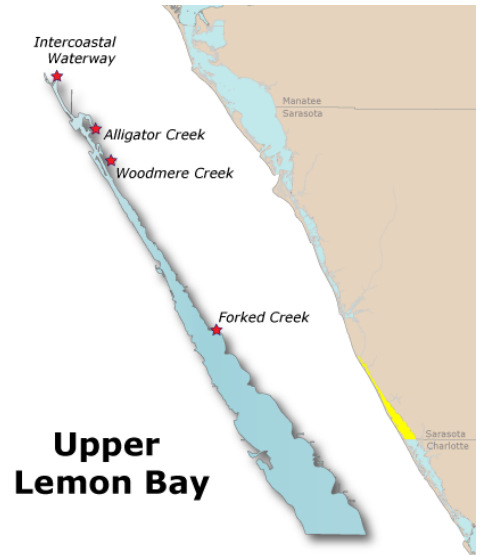
All three indicators must pass for the bay to be rated as PASS.

Summary:

Water quality indicators for Upper Lemon Bay showed deterioration in 2016. After an improvement in chlorophyll a concentration in 2014, this water quality measure continued the worsening trend observed in 2015 with further increases in 2016. The mean concentration of both total nitrogen and total phosphorus also showed an increasing trend. The higher chlorophyll a and nitrogen levels continued the rating for those water quality measures as "Caution", causing the overall rating for Upper Lemon Bay also to remain as "Caution".

Water Quality: Chlorophyll a mean concentration in 2016 was of 0.0136 mg/l, exceeding the threshold of 0.0089 mg/l. Mean nitrogen concentration increased to 0.6362 mg/l, exceeding the threshold of 0.560 mg/l. Mean phosphorus concentration also elevated, and at 0.138 mg/l is "Excellent". The mean for chlorophyll a was calculated as an arithmetic mean and the means for nitrogen and phosphorus were calculated as geometric means (per the Numeric Nutrient Criteria outlined in the Florida Administrative Code, section 62-302.532).

Biotic Indicator: Measurement of the biotic indicator, seagrass, was performed in 2016 by the Southwest Florida Water Management District. Between 2014 to 2016, seagrass coverage in Lemon Bay (including both the Upper and Lower segments) remained at 3,913 acres, exceeding the combined target value of 3,890 acres. Lower Lemon Bay was not surveyed separately, but has a target level of 1,010 acres.



Bays included in this report: Lemon Bay

Water Chemistry Ratings

Total nitrogen, total phosphorus, and chlorophyll a levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along with their target and threshold values. A target value is a desirable goal to be attained, while a threshold is an undesirable level which is to be avoided.

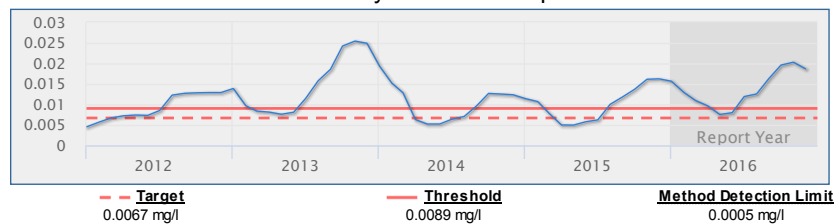
The Five-year Trend Graphs below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.

Chlorophyll a

Score: Caution

Units: mg/l	Year 2016	Historical period of record
High	0.0603	0.088
Mean	0.0136	0.0094
Low	0.0025	0.0004
No. of Samples	82	1,636

Five-year Trend Graph

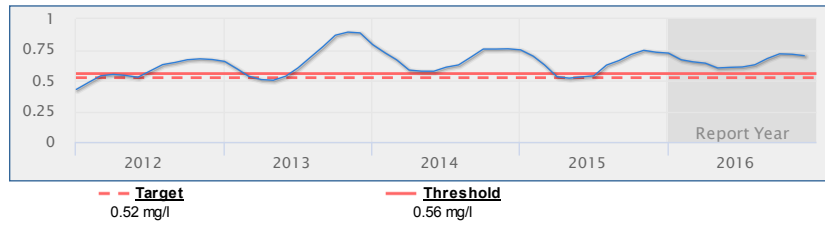


Nitrogen, Total

Score: Caution

Units: mg/l	Year 2016	Historical period of record
High	1.266	2.80
Mean	0.6362	0.5749
Low	0.385	0.00
No. of Samples	82	1,635

Five-year Trend Graph

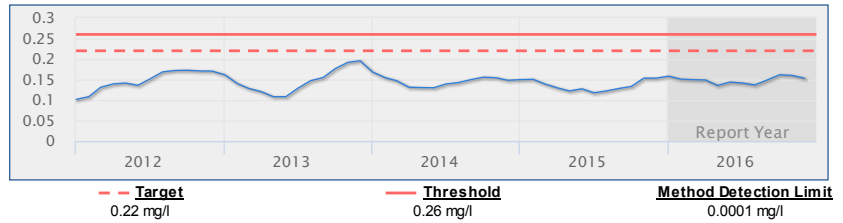


Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2016	Historical period of record
High	0.30	1.08
Mean	0.138	0.1651
Low	0.05	0.016
No. of Samples	82	1,633

Five-year Trend Graph



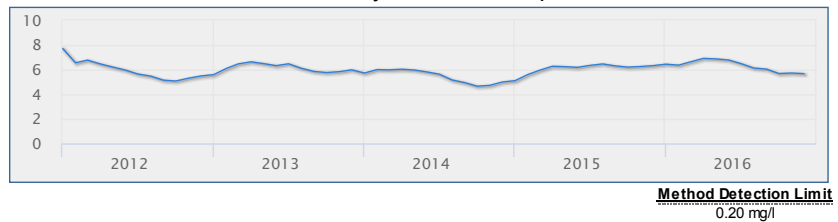
Other Measures of Bay Health

In addition to nutrient levels and chlorophyll concentration, dissolved oxygen levels, and water clarity are also objective indicators of bay health. These have complex interactive cycles which are affected by rainfall, temperature, and tidal action, as well as other factors. High nutrient levels (nitrogen and phosphorus) can stimulate excessive growth of marine algae (indicated by chlorophyll a level), resulting in reduced water clarity (and increased light attenuation) and depleted oxygen levels. Both plants and animals in a bay need oxygen to survive, and the seagrasses which provide food and cover for bay creatures need light for photosynthesis.

Dissolved Oxygen

Units: mg/l	Year 2016	Historical period of record
High	10.10	12.00
Mean	6.33	6.04
Low	1.60	1.20
No. of Samples	78	3,121

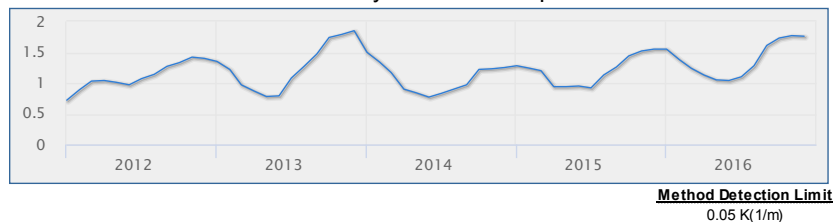
Five-year Trend Graph



Light Attenuation

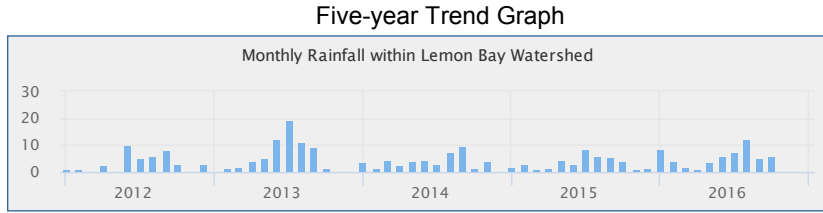
Units: K(1/m)	Year 2016	Historical period of record
High	3.79	3.85
Mean	1.39	1.12
Low	0.53	0.16
No. of Samples	54	1,100

Five-year Trend Graph



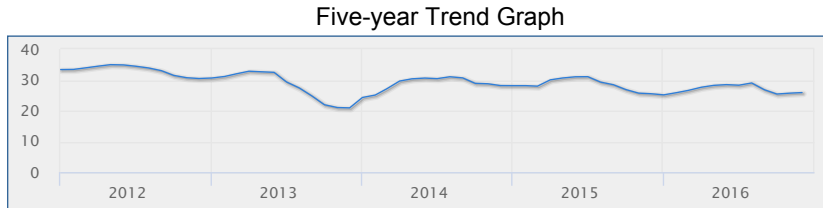
Rainfall

Units: inches/yr	Year 2016	Historical period of record
High	57.00	66.85
Mean		37.6
Low		9.42
No. of Samples	366	4,660



Salinity

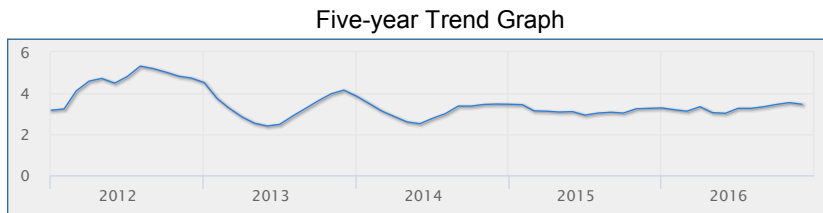
Units: PSS	Year 2016	Historical period of record
High	35.80	41.50
Mean	28.01	29.86
Low	9.60	2.80
No. of Samples	81	3,444



Method Detection Limit
0.10 PSS

Turbidity

Units: NTU	Year 2016	Historical period of record
High	7.60	66.00
Mean	3.27	2.97
Low	0.92	0.21
No. of Samples	82	2,881



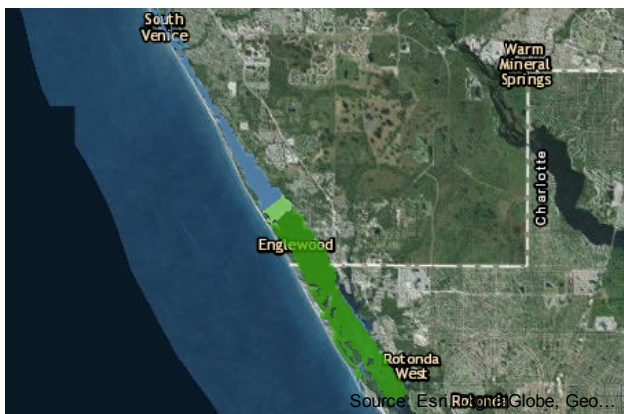
Method Detection Limit
0.20 NTU

Bay Contour Maps (2016)

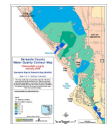
Contour mapping is one of the best ways to visualize spatial differences in coastal water quality. The interactive map shown below presents monthly data for one selected water quality indicator atop an aerial view of the bay. Choose a different water quality parameter from the list at the top to change the map.

Showing 2016 Monthly Contour Maps for: Chlorophyll a

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec



Visit the [Water Quality Contour Mapping Tool](#) to view and compare monthly water quality contour maps for ten different water quality indicators. In addition, you can generate your own custom maps.



Contour Legend:

- Less than 1 mg/l
- 1.0 - 5.9 mg/l
- 6.0 - 10.9 mg/l
- 11.0 - 17.9 mg/l
- Greater than 18 mg/l

Seagrasses

Among the most important habitats in Florida's estuarine environments, seagrass beds are indispensable for the role they play in cycling nutrients, supplying food for wildlife, stabilizing sediments, and providing habitat for juvenile and adult finfish and shellfish. Use the interactive map below to observe the size, density and location of seagrass beds from year to year. The graph shows how the total amount of seagrass in the bay has changed over time.



Seagrass Acreage Variation within Lemon Bay*



*Note: Seagrass acreage values shown above are for Lemon Bay in its entirety. The target for seagrass acreage for Upper Lemon Bay is 1,010 acres; for Lower Lemon Bay it is 2,880 acres.

Land Use / Land Cover

Land use within a bay's watershed has a major effect on its water quality. In general, less development means better water quality. Land Cover/Land Use classifications categorize land in terms of its observed physical surface characteristics (upland or wetland, e.g.), and also reflect the types of activity that are taking place on it (agriculture, urban/built-up, utilities, etc.). Florida uses as its standard a set of statewide classifications which were developed by the Florida Department of Transportation.

Upper Lemon Bay is located within the Lemon Bay Watershed. The chart below shows the land use / land cover characteristics for Lemon Bay Watershed within the boundary of this Water Atlas. [View details about the Lemon Bay Watershed »](#)

2011 Land Use / Land Cover for Lemon Bay Watershed

as a percentage of land area for this watershed

