

Upper Lemon Bay Condition Report for 2010



CAUTION



2 out of 3
indicators were
rated as **PASS**.

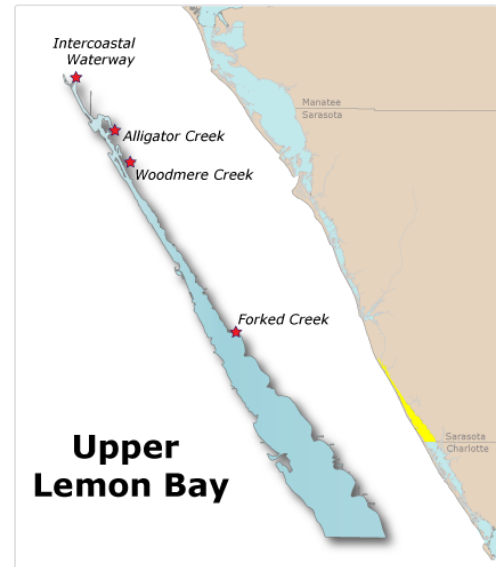
All three
indicators must pass for the bay to be rated as **PASS**.

Summary:

The overall health of Upper Lemon Bay has decreased due to an alert level of chlorophyll *a*. Nitrogen and phosphorus were rated as pass. Additionally, the mean acreage of seagrass is increasing and is above the target.

Water quality: The mean for chlorophyll *a* was calculated as an arithmetic mean and the means for nitrogen and phosphorus were calculated as geometric means (Numeric Nutrient Criteria Recommendations). The mean chlorophyll *a* level (mean = 0.0115 mg/l) was scored as "Caution" due to levels exceeding the threshold (threshold level = 0.0089 mg/l). The mean nitrogen level (0.5588 mg/l) was scored as good, mean value was below the threshold (0.560 mg/l) but above the target (0.520 mg/l) levels. The mean phosphorus level in Upper Lemon Bay was scored as excellent, with the mean (0.1093 mg/l) being below the target (0.220 mg/l) and the threshold (0.260 mg/l) values.

Biotic Indicator: The biotic indicator, seagrass, has remained in good condition. The total acreage of seagrass in both Upper and Lower segments of Lemon Bay is increasing. In 2010, total seagrass



Bays included in this report:
Lemon Bay

acreage in the bay was 3,652 acres, approaching the combined target of 3,890 acres. Upper Lemon Bay was not surveyed separately; the target acreage for it is 1,010 acres.

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. An individual indicator receives an "Excellent" rating if its mean value is below the target, a "Good" rating if its mean value is above the target but does not exceed the threshold, and a "Caution" rating if the mean value exceeds the threshold.

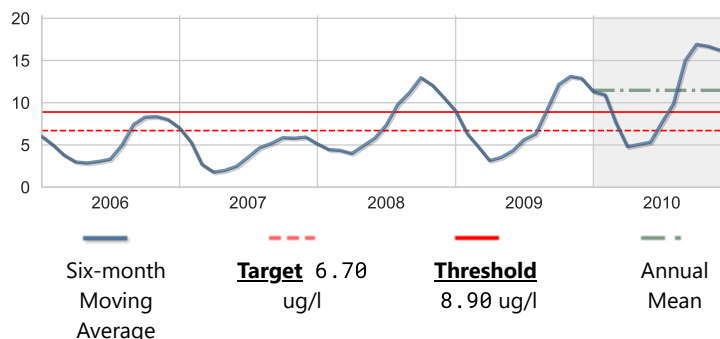
The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.



Chlorophyll a

Score: Caution

Units: ug/l	Year 2010	Historical period of record
High	40.15	60.13
Mean	11.47	8.64
Low	0.87	0.37
No. of Samples	93	1094

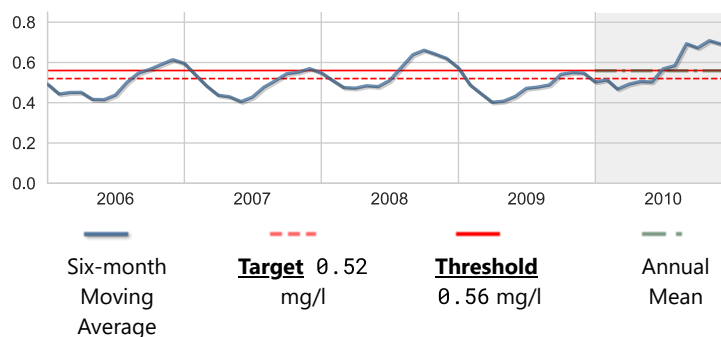


N

Nitrogen, Total

Score: Good

Units: mg/l	Year 2010	Historical period of record
High	1.125	1.354
Mean	0.559	
Low	0.255	0.055
No. of Samples	70	849

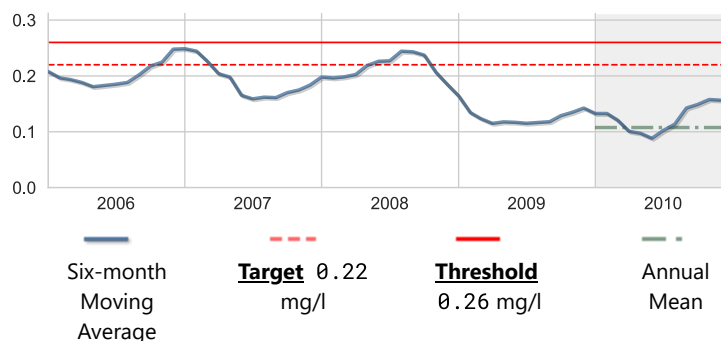


P

Phosphorus, Total

Score: Excellent

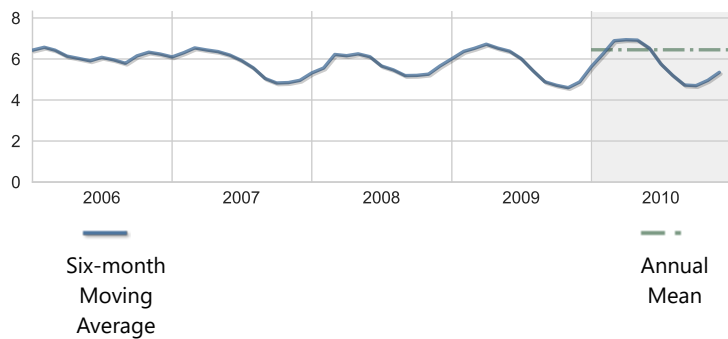
Units: mg/l	Year 2010	Historical period of record
High	0.260	0.880
Mean	0.108	0.195
Low	0.050	0.050
No. of Samples	72	863

**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.

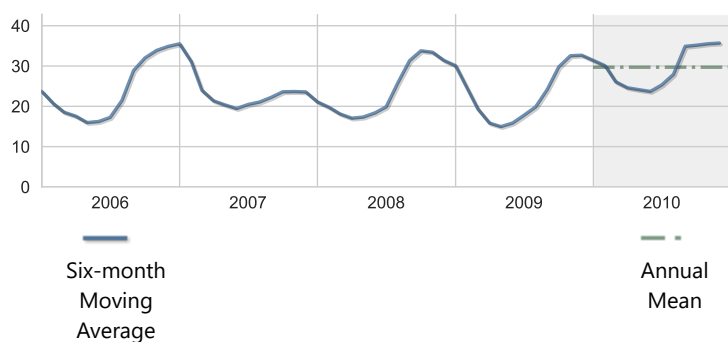
Dissolved Oxygen

Units: mg/l	Year 2010	Historical period of record
High	8.90	10.90
Mean	6.45	6.08
Low	3.70	1.70
No. of Samples	60	940



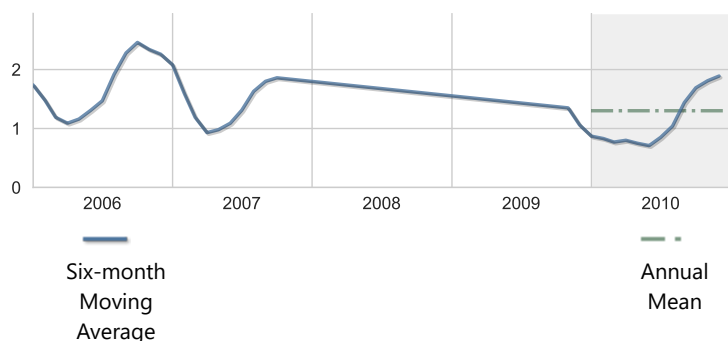
Apparent Color

Units: PCU	Year 2010	Historical period of record
High	65.00	280.00
Mean	29.69	31.32
Low	13.00	5.00
No. of Samples	72	862



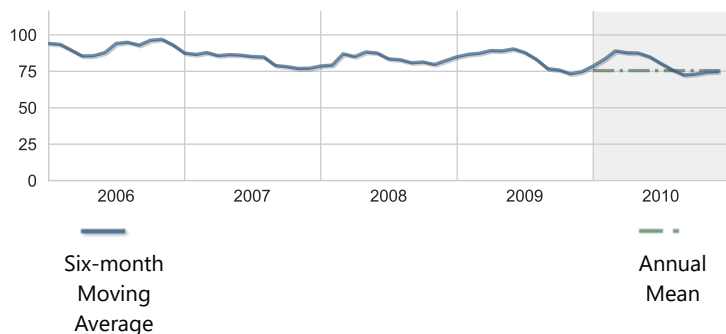
BOD, Biochemical oxygen demand

Units: mg/l	Year 2010	Historical period of record
High	4.40	7.60
Mean	1.30	1.84
Low	0.50	0.50
No. of Samples	72	721



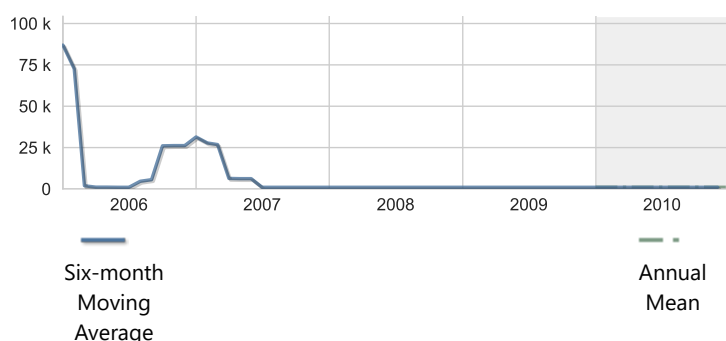
Dissolved oxygen saturation

Units: percent (%)	Year 2010	Historical period of record
High	135.56	180.07
Mean	75.50	90.25
Low	31.51	21.60
No. of Samples	176	2252



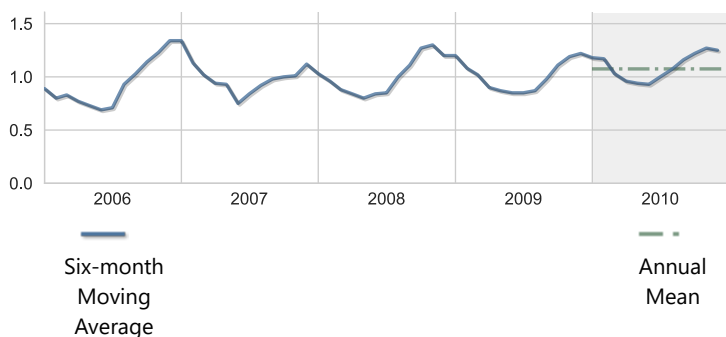
Karenia brevis ("red tide")

Units: #/l	Year 2010	Historical period of record
High	1000.00	785000.00
Mean	1000.00	9491.71
Low	1000.00	1000.00
No. of Samples	72	362



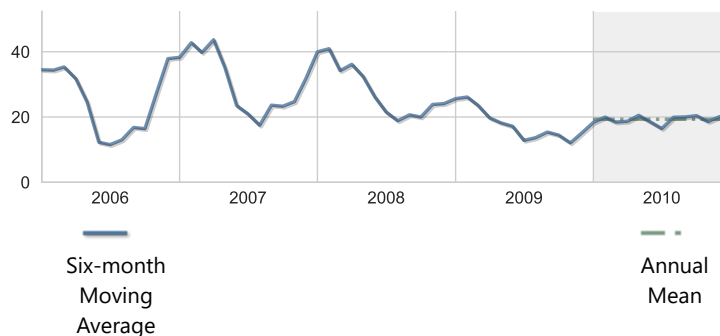
Light Attenuation

Units: K(1/m)	Year 2010	Historical period of record
High	2.00	3.39
Mean	1.07	1.07
Low	0.32	0.16
No. of Samples	57	746



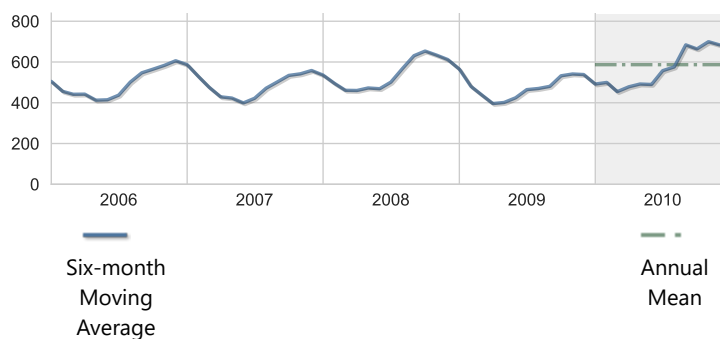
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2010	Historical period of record
High	70.00	359.00
Mean	19.32	26.82
Low	5.00	5.00
No. of Samples	72	864



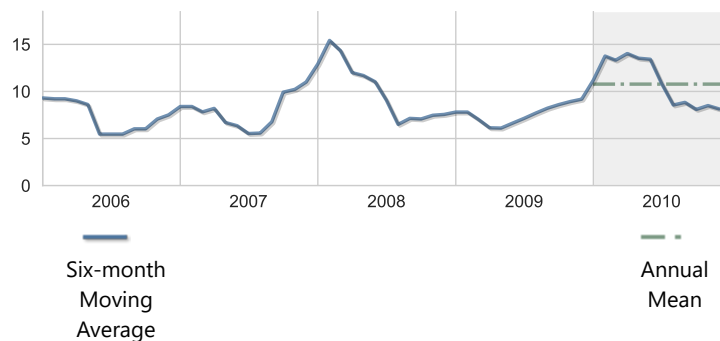
Nitrogen, Kjeldahl

Units: ug/l	Year 2010	Historical period of record
High	1120.00	1330.00
Mean	586.81	528.37
Low	250.00	0.05
No. of Samples	72	863



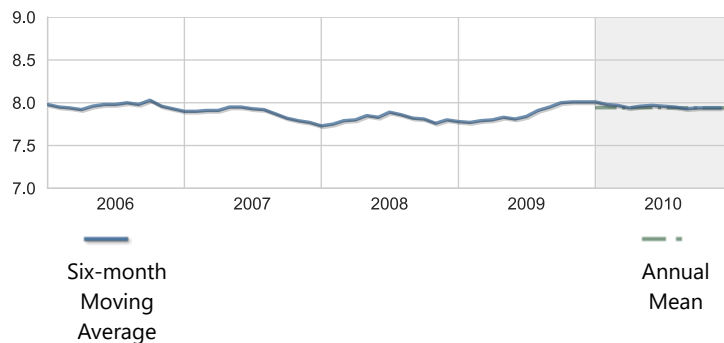
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2010	Historical period of record
High	79.00	130.00
Mean	10.78	9.18
Low	5.00	5.00
No. of Samples	72	1294



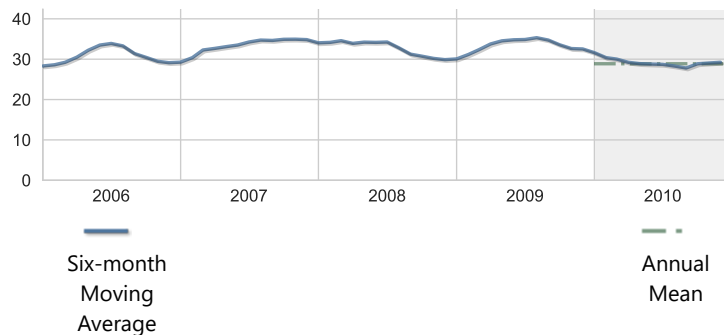
pH

Units: None	Year 2010	Historical period of record
High	8.40	8.90
Mean	7.94	8.00
Low	7.40	7.00
No. of Samples	118	1944



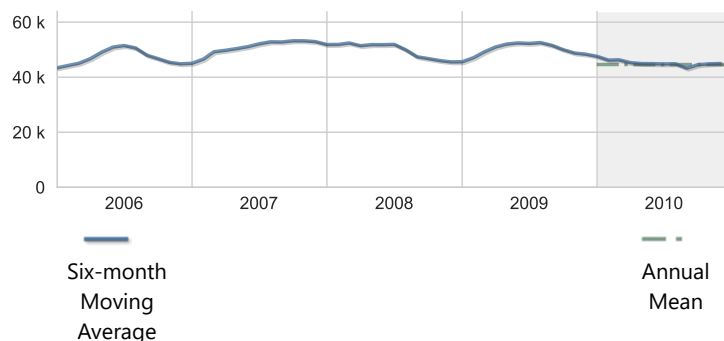
Salinity

Units: PSS	Year 2010	Historical period of record
High	34.00	40.60
Mean	28.87	30.04
Low	20.00	3.20
No. of Samples	60	921



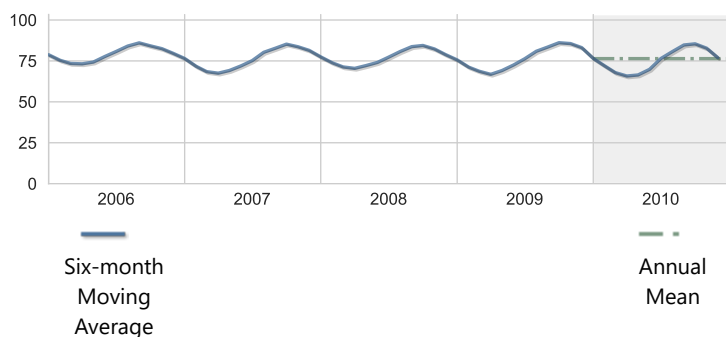
Specific conductance

Units: umho	Year 2010	Historical period of record
High	52140.00	60590.00
Mean	44594.50	46178.46
Low	32120.00	5800.00
No. of Samples	60	943



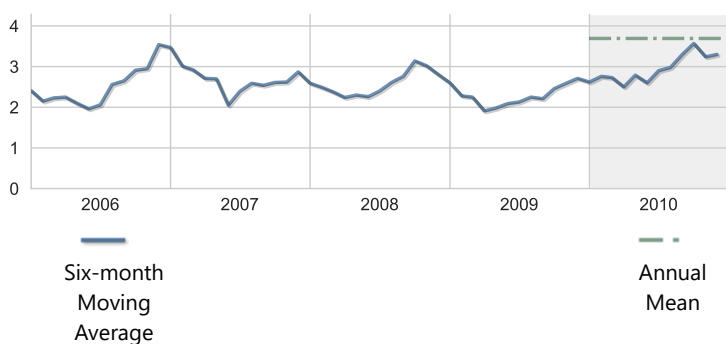
Temperature, water

Units: deg F	Year 2010	Historical period of record
High	91.94	93.02
Mean	76.42	77.68
Low	46.76	46.76
No. of Samples	176	2586



Turbidity

Units: NTU	Year 2010	Historical period of record
High	14.00	22.00
Mean	3.69	3.31
Low	1.00	0.75
No. of Samples	91	1084



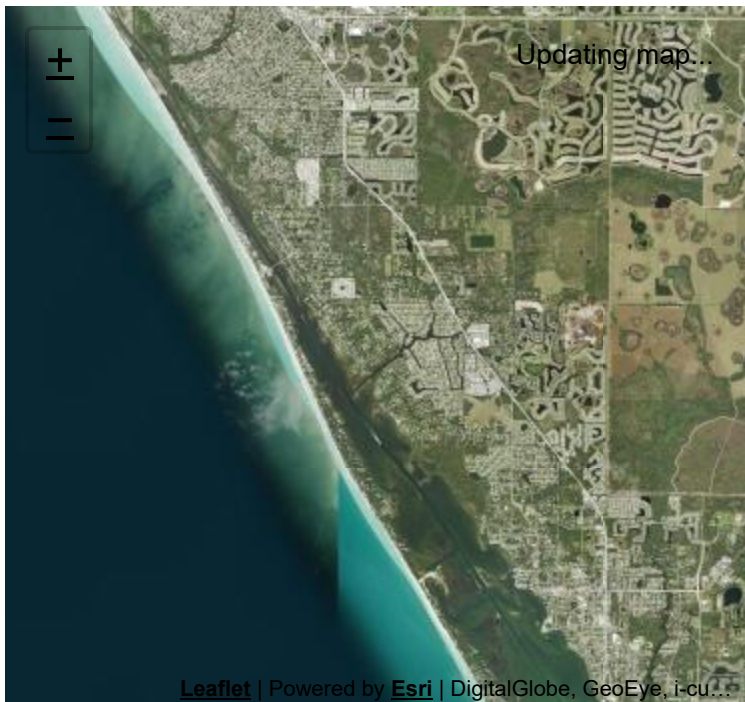
Annual Averages

Indicator	Units	2006	2007	2008	2009	2010	Trend
Dissolved Oxygen	mg/l					6.45	
Dissolved oxygen saturation	percent (%)					75.50	
Light Attenuation	K(1/m)					1.07	
Salinity	PSS					28.87	
Turbidity	NTU					3.69	

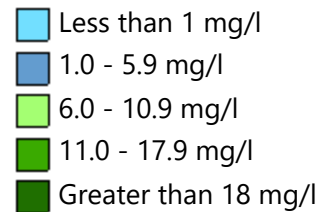
Bay Contour Maps (2010)

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 2010 Monthly Contour Maps for: Chlorophyll a ▼
January



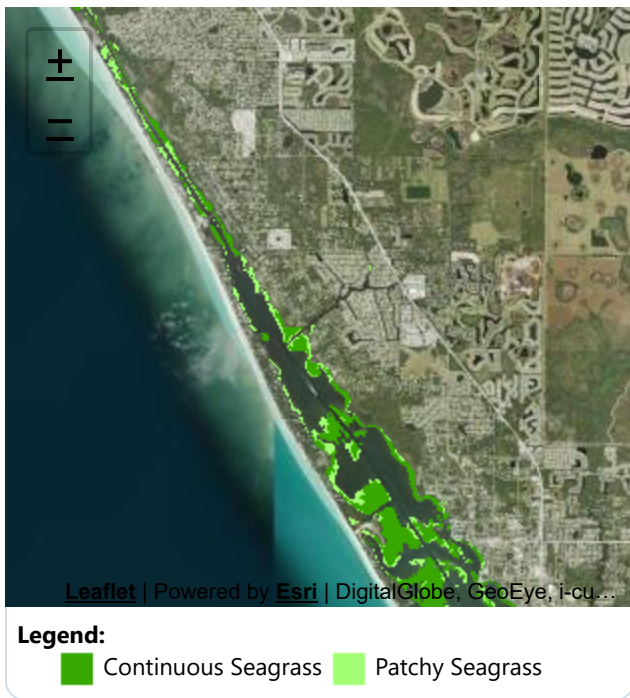
Contour Legend:



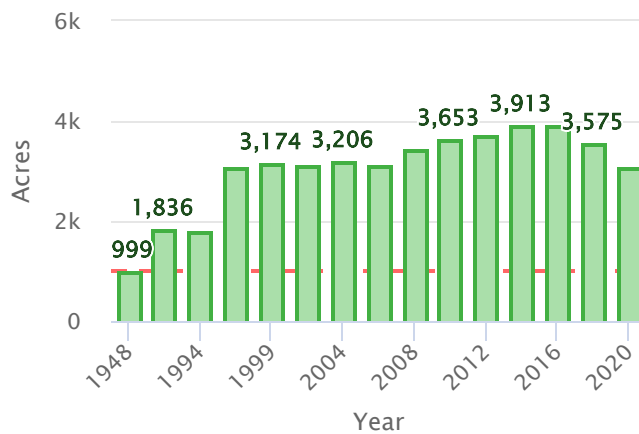
Seagrasses

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 calculations are aggregates of patchy and continuous seagrass measurements only. Recordings of attached algae are not included in these summaries.

Showing Seagrass Coverage for 2020:



Seagrass Acreage Variation within Lemon Bay*



--- Target 1,010 acres

***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.

Impervious Features

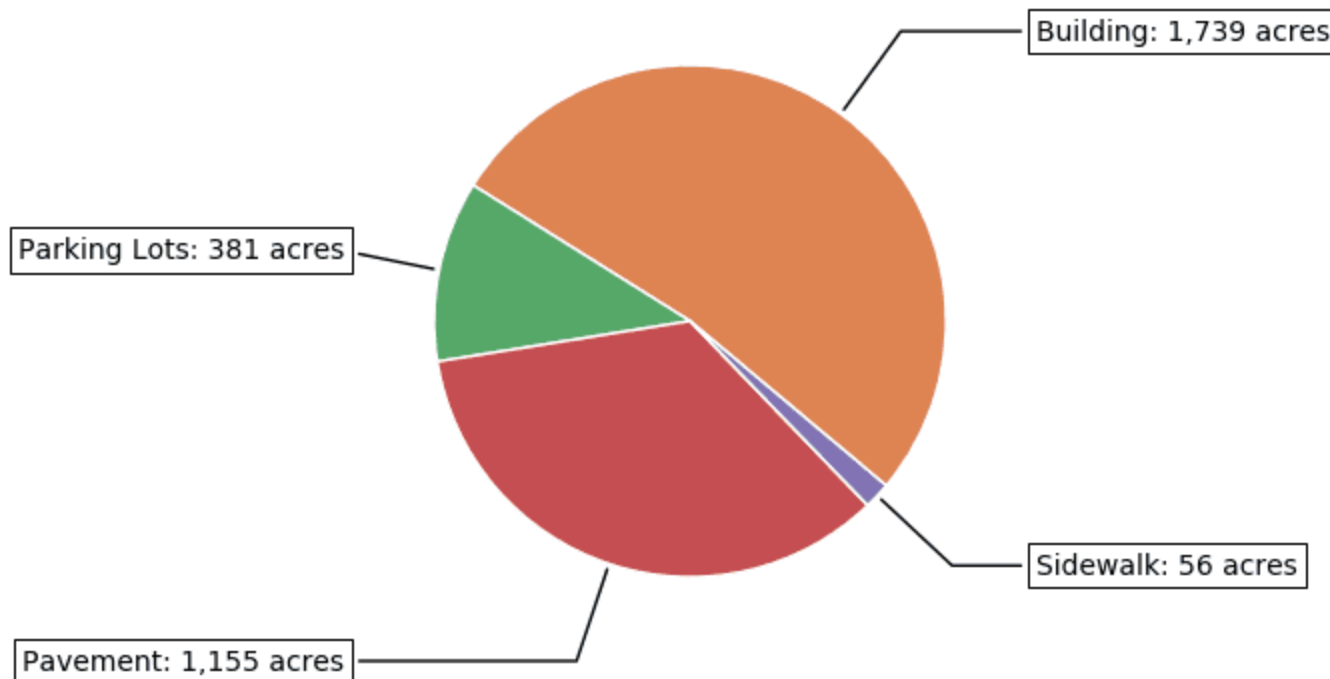
Rain that falls on land that is in a natural state is absorbed and filtered by soils and vegetation as it makes its way into underground aquifers. However, in developed areas, "impervious surfaces" impede this process and contribute to polluted urban runoff entering surface waters. These surfaces include human infrastructure like roads, sidewalks, driveways and parking lots that are covered by impenetrable materials such as asphalt, concrete, brick and stone, as well as buildings and other permanent structures. Soils that have been disturbed and compacted by urban development are often impervious as well.



10% of the land area within the **Lemon Bay Watershed** is covered by impervious surfaces

2014 Impervious Surface Coverage by Type

in acres, within the Lemon Bay Watershed











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 »**](#)

Acreage and Percentage within each Land Use / Land Cover Category for Lemon Bay Watershed

2010 Bay Conditions Report for Upper Lemon Bay

Land Use Classification	1990	2005	2011	2014	2017	2020	Trend
Urban & Built-up	11,331 33.6%	12,872 38.2%	13,589 40.4%	13,589 40.4%	14,050 41.7%	22,467 47.1%	
Agriculture	2,515 7.5%	2,325 6.9%	2,255 6.7%	2,255 6.7%	2,075 6.2%	2,023 4.2%	
Rangeland	2,209 6.6%	4,479 13.3%	4,115 12.2%	4,115 12.2%	3,662 10.9%	3,544 7.4%	
Upland Forests	9,360 27.8%	5,637 16.7%	5,109 15.2%	5,109 15.2%	5,231 15.5%	6,168 12.9%	
Water	3,104 9.2%	3,437 10.2%	3,501 10.4%	3,501 10.4%	3,586 10.6%	7,284 15.3%	
Wetlands	4,689 13.9%	4,265 12.7%	4,375 13%	4,375 13%	4,355 12.9%	5,144 10.8%	
Barren Land	29 0.1%	0 0%	0 0%	0 0%	0 0%	6 0%	
Transportation and Utilities	443 1.3%	655 1.9%	726 2.2%	726 2.2%	723 2.1%	1,071 2.2%	

2020 Land Use / Land Cover for Lemon Bay Watershed

as a percentage of land area for this watershed

