

Upper Lemon Bay Condition Report for 2014



CAUTION



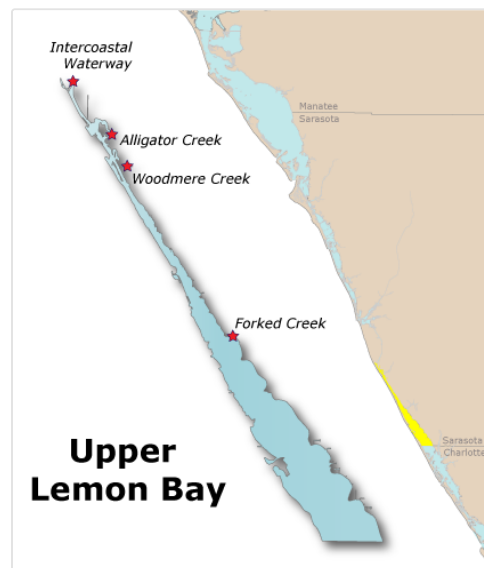
2 out of 3
indicators were
rated as **PASS**.

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

Summary:

The health of Upper Lemon Bay improved markedly in 2014. Chlorophyll *a* concentration was significantly lower, and the mean concentration of phosphorus also diminished somewhat. Although nitrogen concentration increased and is still in the "Caution" range, it was a very slight rise, and the trend line for nitrogen is much flatter than in 2014, indicating a lessening of the seasonal increase typical in late summer/fall.

Water Quality: The rating for chlorophyll *a* was upgraded from "Caution" to "Good", with the mean concentration of 0.0088 mg/l coming in just below the threshold of 0.0089 mg/l. Mean nitrogen concentration increased slightly, to 0.6455 mg/l, well above the threshold of 0.540 mg/l. Mean phosphorus concentration was slightly lower, and at 0.1323 mg/l is "Excellent", roughly half the threshold concentration. 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).



Bays included in this report:
Lemon Bay

Biotic Indicator: Measurement of the biotic indicator, seagrass, was performed in 2014 by the Southwest Florida Water Management District. Between 2012 to 2014, seagrass coverage in Lemon Bay (including both the Upper and Lower segments) increased from 3,727 to 3,913 acres, exceeding the combined target value of 3,890 acres. Upper Lemon Bay was not surveyed separately, but has a target level of 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.

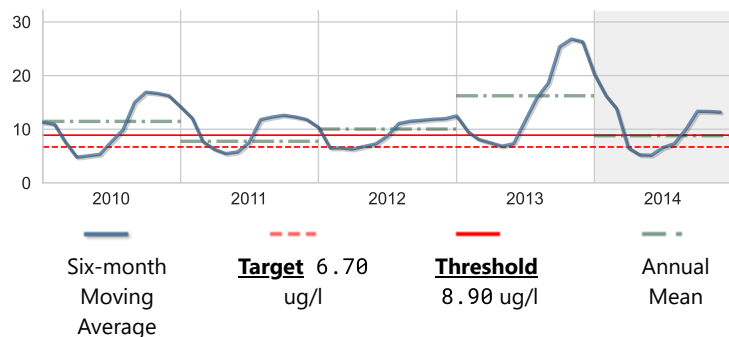
The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.



Chlorophyll a

Score: Good

Units: ug/l	Year 2014	Historical period of record
High	34.98	88.00
Mean	8.80	9.14
Low	1.58	0.37
No. of Samples	95	1473

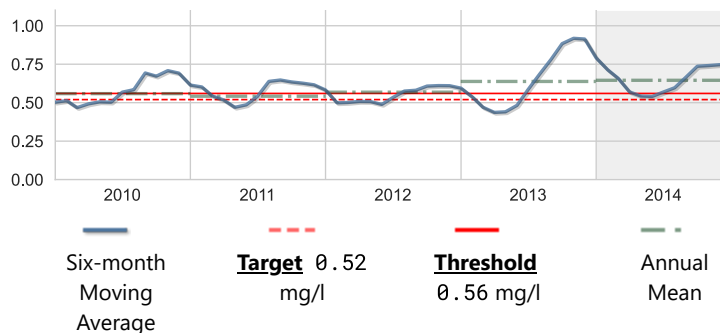




Nitrogen, Total

Score: Caution

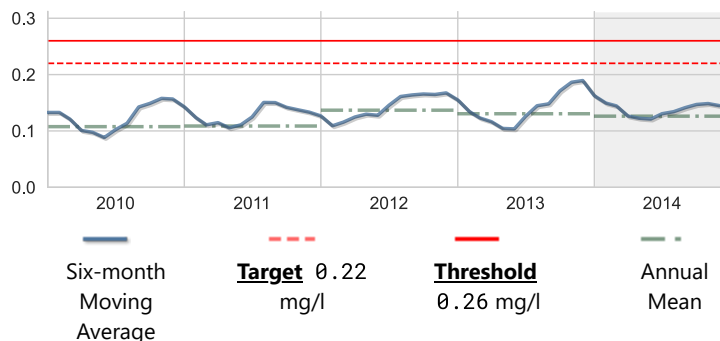
Units: mg/l	Year 2014	Historical period of record
High	1.120	2.800
Mean	0.646	
Low	0.405	0.000
No. of Samples	95	1467



Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2014	Historical period of record
High	0.230	0.880
Mean	0.126	0.175
Low	0.050	0.050
No. of Samples	72	1150

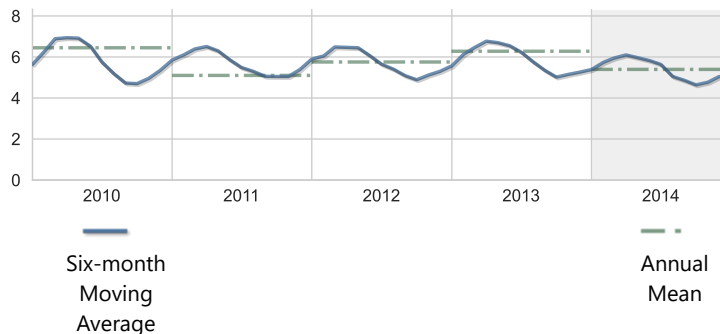


Other Measures of Bay Health

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.

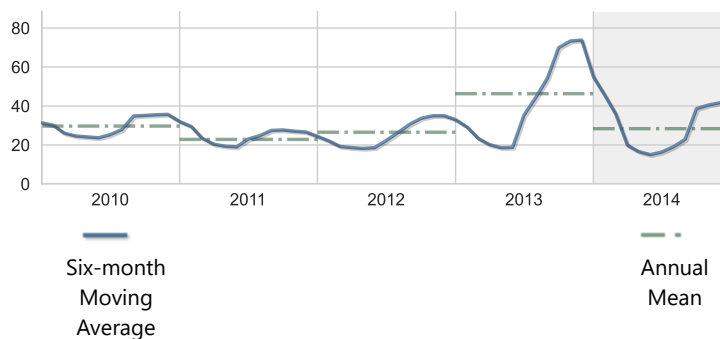
Dissolved Oxygen

Units: mg/l	Year 2014	Historical period of record
High	8.20	12.00
Mean	5.39	6.04
Low	1.20	1.20
No. of Samples	71	2933



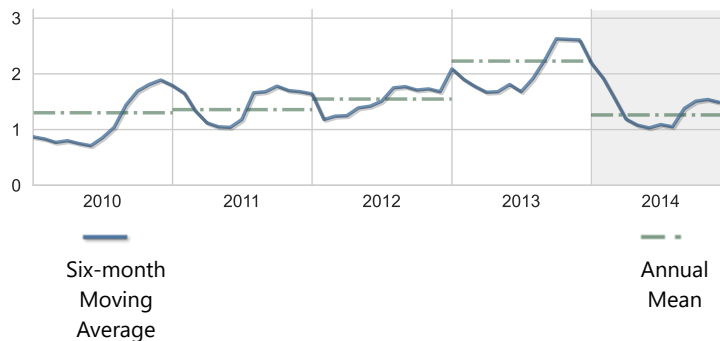
Apparent Color

Units: PCU	Year 2014	Historical period of record
High	140.00	280.00
Mean	28.35	31.25
Low	5.00	5.00
No. of Samples	72	1149



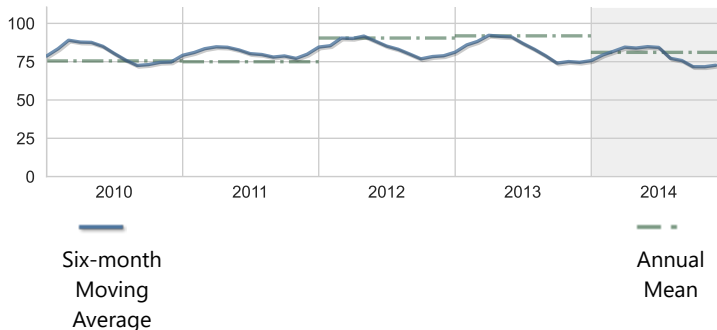
BOD, Biochemical oxygen demand

Units: mg/l	Year 2014	Historical period of record
High	4.00	7.60
Mean	1.26	1.77
Low	0.50	0.50
No. of Samples	72	1007



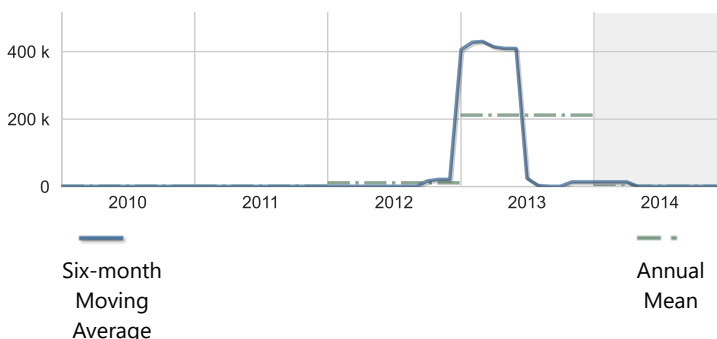
Dissolved oxygen saturation

Units: percent (%)	Year 2014	Historical period of record
High	113.00	180.07
Mean	81.08	89.27
Low	42.00	21.60
No. of Samples	60	2604



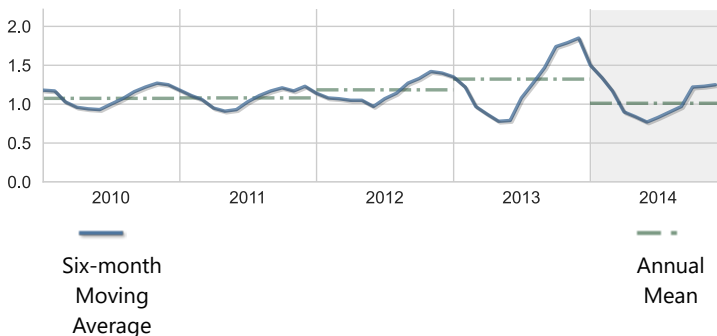
Karenia brevis ("red tide")

Units: #/l	Year 2014	Historical period of record
High	1000.00	4480000.00
Mean	1000.00	30276.23
Low	1000.00	1000.00
No. of Samples	72	648



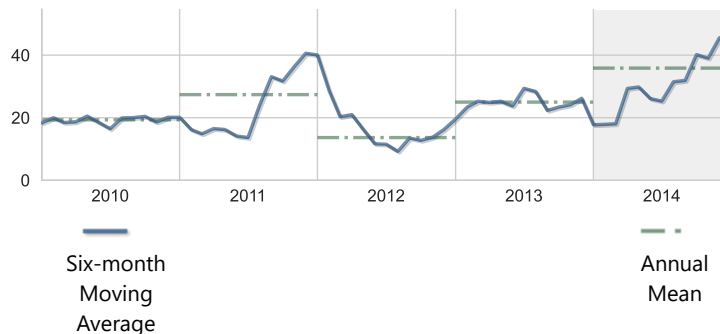
Light Attenuation

Units: K(1/m)	Year 2014	Historical period of record
High	2.78	3.85
Mean	1.01	1.09
Low	0.50	0.16
No. of Samples	60	986



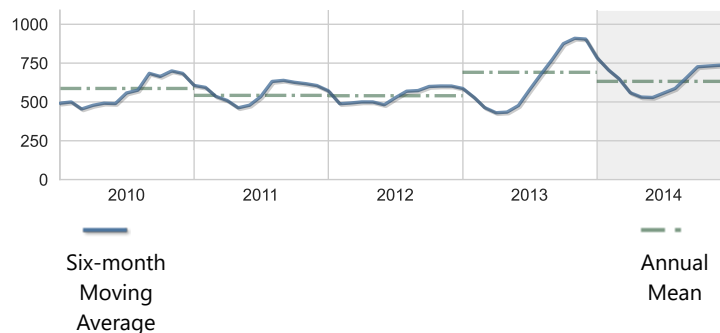
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2014	Historical period of record
High	244.00	359.00
Mean	35.85	26.49
Low	5.00	5.00
No. of Samples	72	1151



Nitrogen, Kjeldahl

Units: ug/l	Year 2014	Historical period of record
High	1100.00	1330.00
Mean	632.50	546.65
Low	400.00	0.05
No. of Samples	72	1150



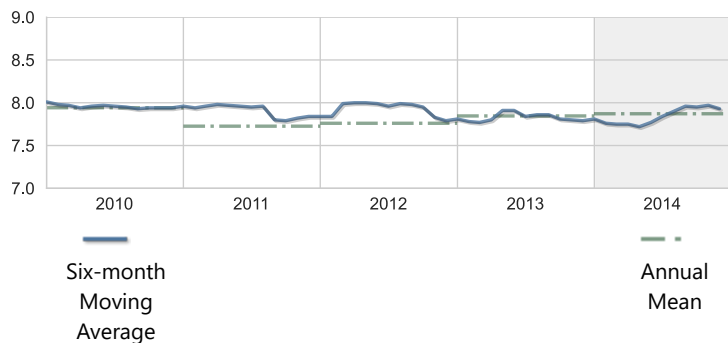
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2014	Historical period of record
High	80.00	130.00
Mean	11.15	9.08
Low	5.00	5.00
No. of Samples	72	1581



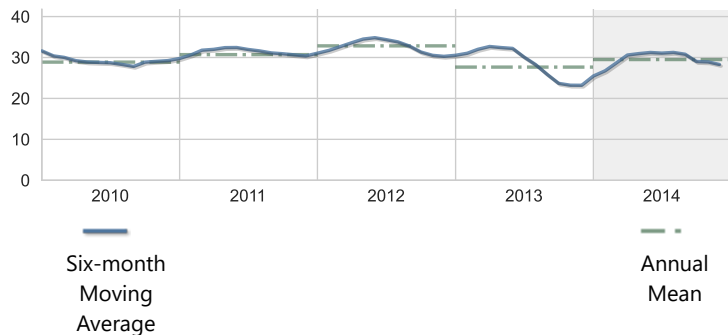
pH

Units: None	Year 2014	Historical period of record
High	8.50	8.90
Mean	7.87	7.97
Low	7.40	4.80
No. of Samples	66	2258



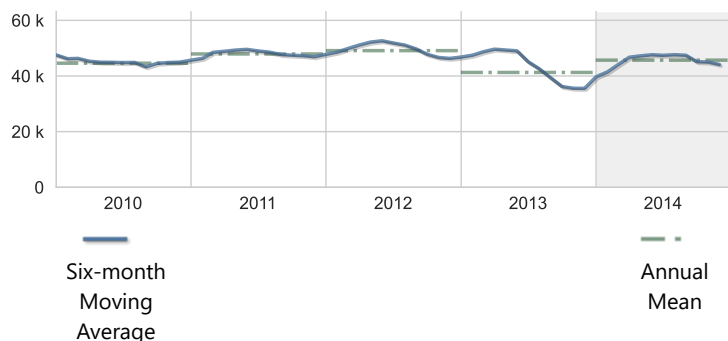
Salinity

Units: PSS	Year 2014	Historical period of record
High	35.00	41.50
Mean	29.50	29.96
Low	3.30	3.20
No. of Samples	80	3239



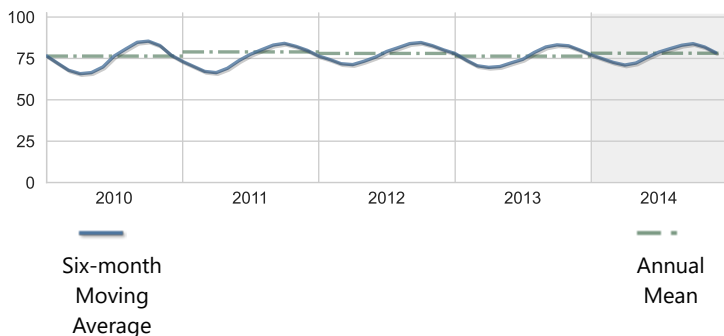
Specific conductance

Units: umho	Year 2014	Historical period of record
High	52730.00	60590.00
Mean	45691.17	46142.05
Low	27580.00	5800.00
No. of Samples	60	1183



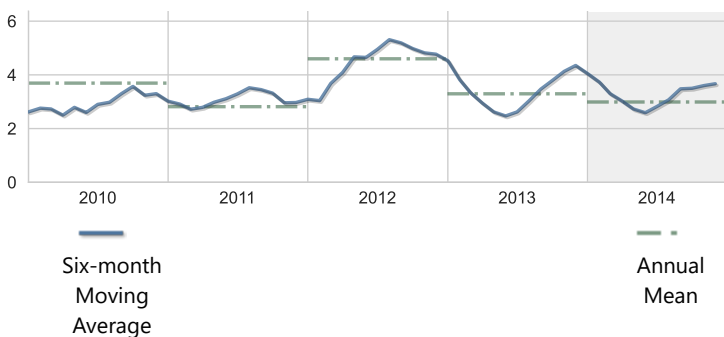
Temperature, water

Units: deg F	Year 2014	Historical period of record
High	89.78	93.02
Mean	78.15	77.73
Low	65.30	46.76
No. of Samples	72	2974



Turbidity

Units: NTU	Year 2014	Historical period of record
High	6.50	66.00
Mean	2.99	2.96
Low	1.00	0.21
No. of Samples	95	2718



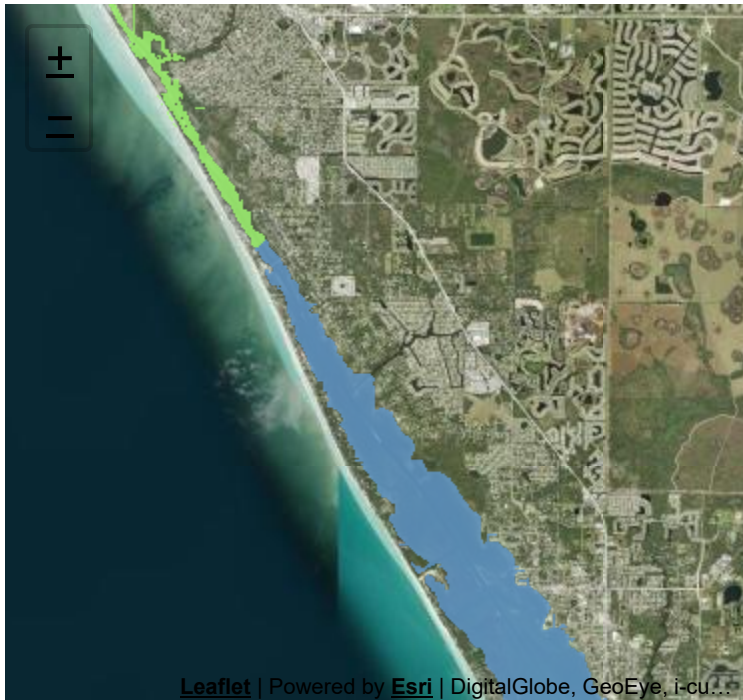
Annual Averages

Indicator	Units	2010	2011	2012	2013	2014	Trend
Dissolved Oxygen	mg/l	6.45	5.10	5.76	6.28	5.39	
Dissolved oxygen saturation	percent (%)	75.50	74.97	90.43	91.86	81.08	
Light Attenuation	K(1/m)	1.07	1.08	1.18	1.32	1.01	
Salinity	PSS	28.87	30.70	32.84	27.65	29.50	
Turbidity	NTU	3.69	2.81	4.60	3.29	2.99	

Bay Contour Maps (2014)

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 2014 Monthly Contour Maps for: Chlorophyll a
January



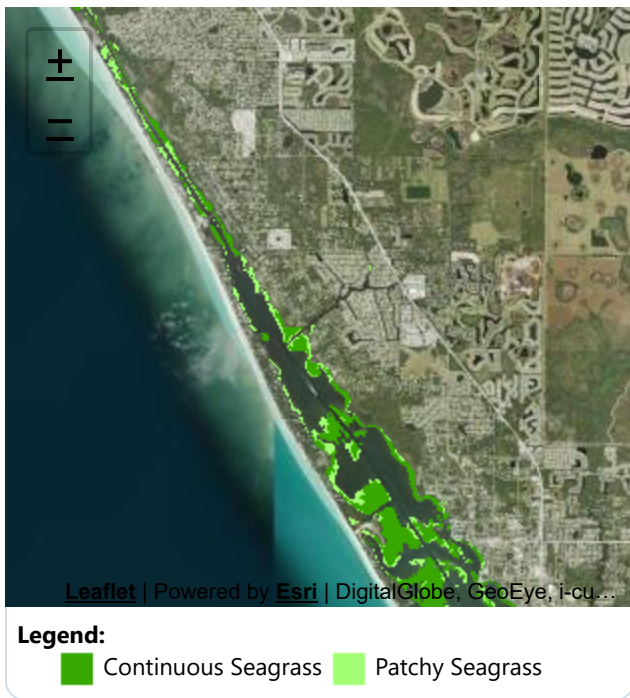
Contour Legend:

- 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

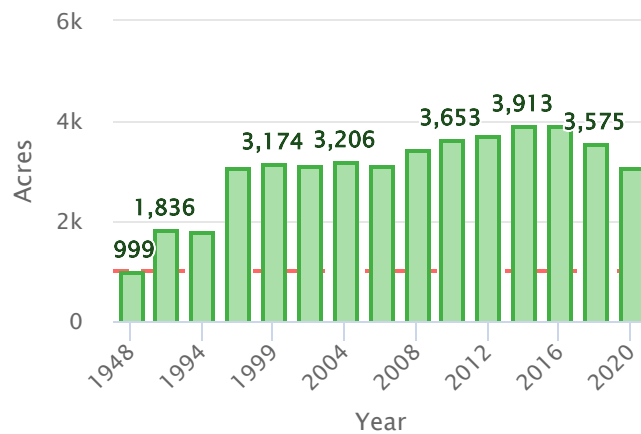
Seagrasses

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 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.

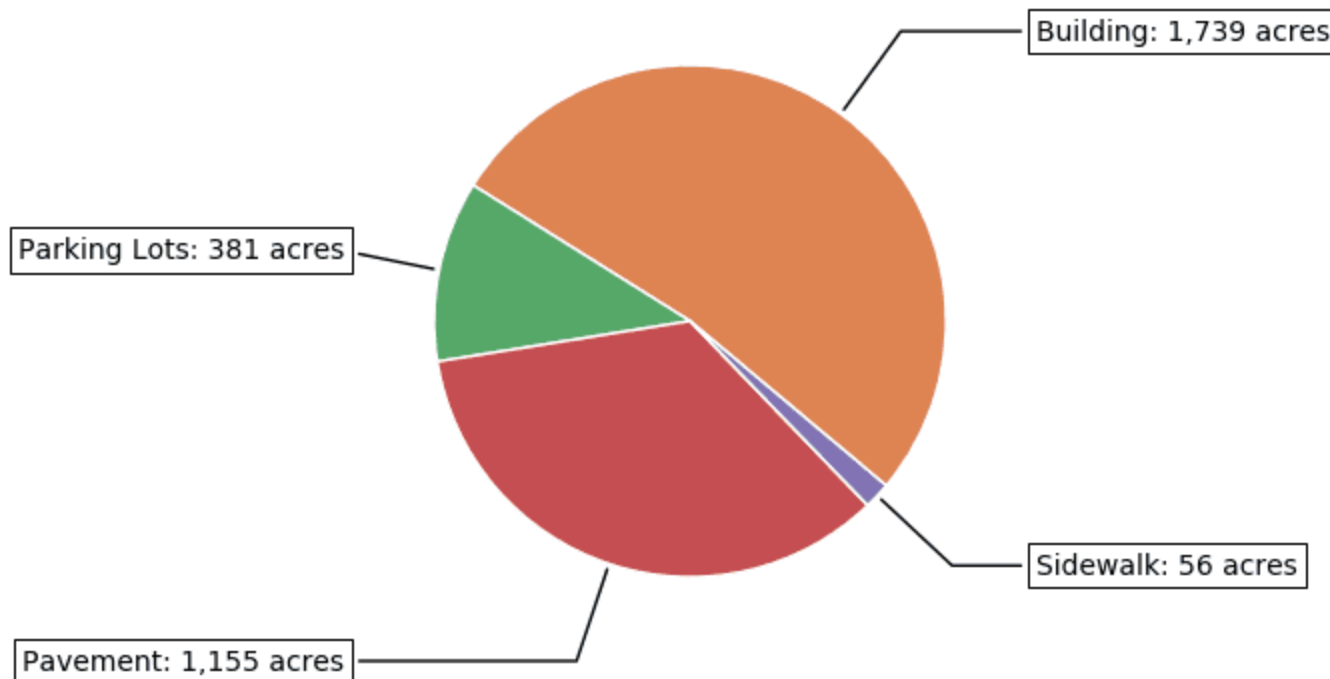


10% of the land area within the **Lemon Bay Watershed** is covered by impervious

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 »](#)

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

2014 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

