Sarasota Bay Condition Report for 2011

PASS

Chl-a N P

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

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

Bays included in this report: Bayou Louise, Brushy Bayou, Pansy Bayou, Sarasota Bay

Summary:

The overall health in Sarasota Bay has remained high. Water quality metrics remained relatively constant with a slight decrease in mean value of chlorophyll *a*, nitrogen, and phosphorus. Acreage of seagrass has increased.

Water Quality: All three water quality indicators (chlorophyll *a*, nitrogen, and phosphorus) were rated as pass (below the threshold). 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). Both nitrogen and phosphorus indicators remained in excellent condition (nitrogen mean = 0.3679 mg/l, phosphorus mean = 0.0526 mg/l) and were below the target levels of 0.490 mg/l and 0.150 mg/l, respectively. Chlorophyll *a* levels decreased and improved from a rating of good in 2010 to a rating of excellent in 2011, the mean (0.004 mg/l) was below the desired target level of 0.0052 mg/l.

Biotic Indicator: Measurement of the biotic indicator, seagrass, was performed by the Southwest Florida Water Management District in 2010. The total area of seagrass in lower Sarasota Bay (that portion within Sarasota County) was estimated to be 2,995 acres. The total for the whole of Sarasota Bay was estimated to be 9,800 acres. This is well above the target threshold of 7,269 acres and reflects a 50% increase in seagrass coverage from 2004, when the acreage was estimated to be 6,515 acres.

Water Chemistry Ratings

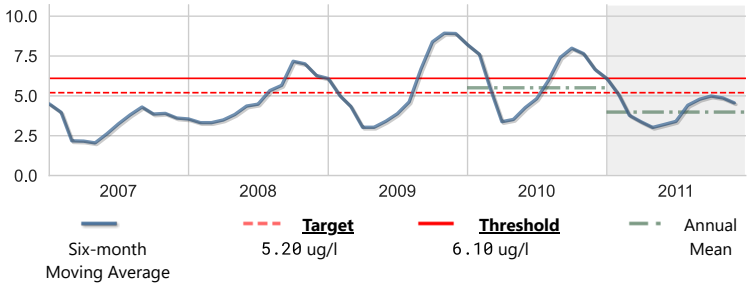
Total nitrogen, total phosphorus, and chlorophyll *a* levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along 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.

Chl-a Chlorophyll a

Score: Excellent

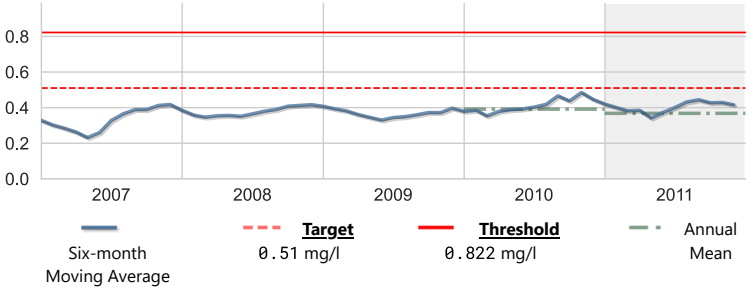
Units: ug/l	Year 2011	Historical period of record
High	19.40	49.00
Mean	3.98	4.86
Low	0.78	0.15
No. of Samples	228	3217



N Nitrogen, Total

Score: Excellent

Units: mg/l	Year 2011	Historical period of record
High	0.930	1.870
Mean	0.368	
Low	0.100	0.030
No. of Samples	240	3016

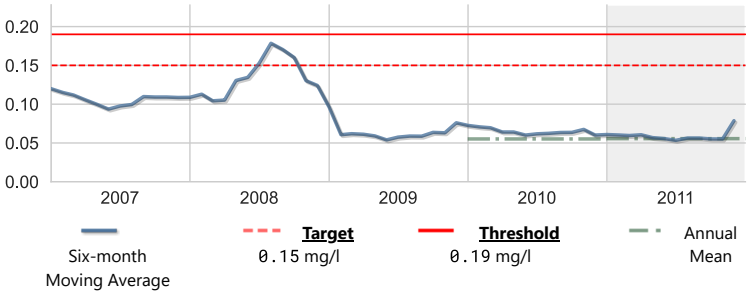


Targets and thresholds shown on this graph are advisory approximations computed by Sarasot
recent data. Regulatory thresholds have not been established.

P Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2011	Historical period of record
High	1.140	4.400
Mean	0.056	0.096
Low	0.050	0.002
No. of Samples	296	3588

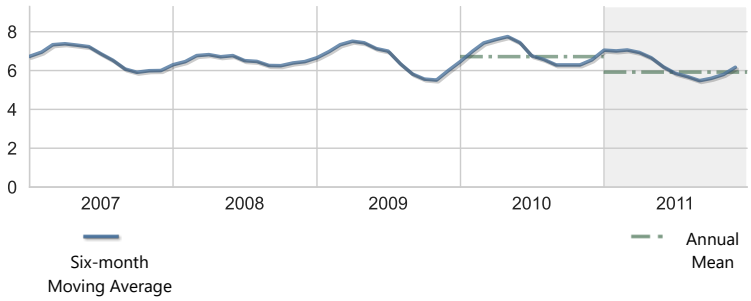


Other Measures of Bay Health

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.

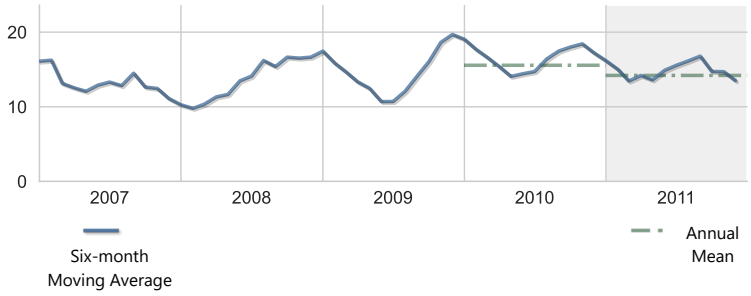
Dissolved Oxygen

Units: mg/l	Year 2011	Historical period of record
High	10.20	26.00
Mean	5.92	6.75
Low	2.60	1.48
No. of Samples	399	6843



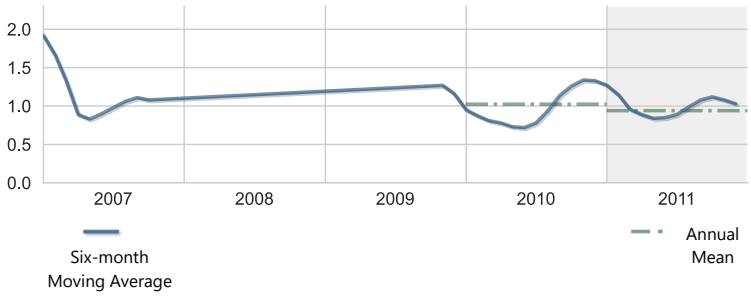
Apparent Color

Units: PCU	Year 2011	Historical period of record
High	75.00	95.00
Mean	14.20	13.57
Low	3.00	0.00
No. of Samples	299	3685



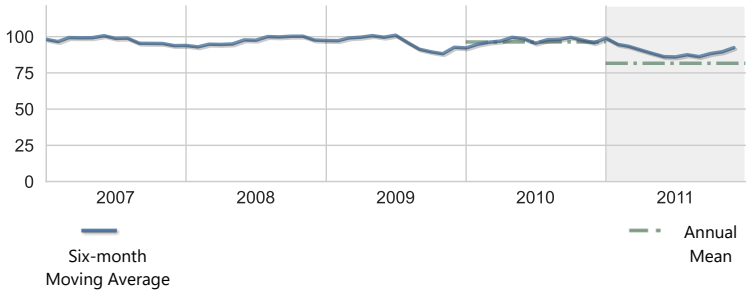
BOD, Biochemical oxygen demand

Units: mg/l	Year 2011	Historical period of record
High	2.00	9.20
Mean	0.94	1.21
Low	0.50	0.50
No. of Samples	252	2366



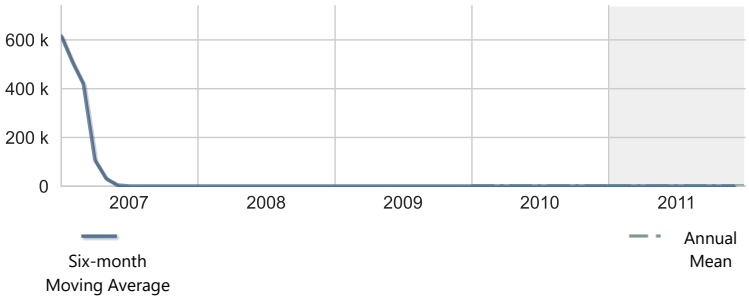
Dissolved oxygen saturation

Units: percent (%)	Year 2011	Historical period of record
High	151.06	214.71
Mean	81.63	97.73
Low	31.60	21.92
No. of Samples	697	14350



Karenia brevis ("red tide")

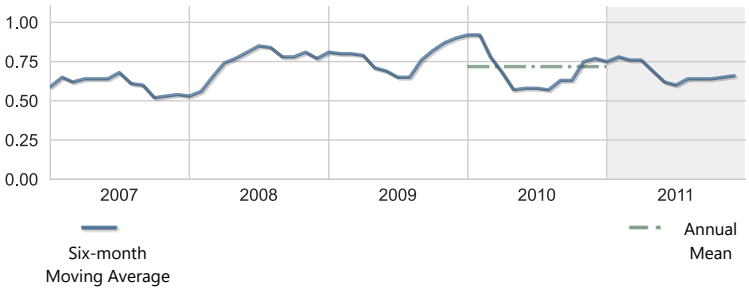
Units: #/l	Year 2011	Historical period of record
High	4000.00	6380000.00
Mean	1031.75	78979.22
Low	1000.00	1000.00
No. of Samples	252	1588



Light Attenuation

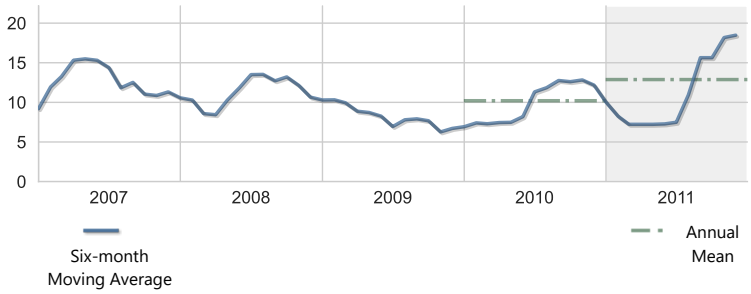
Note: Light attenuation data reported for years prior to 2012 are from only the southern half of Sarasota Bay. Data for the nothern half are unavailable.

Units: K(1/m)	Year 2011	Historical period of record
High	1606.00	4350.00
Mean	578.00	492.60
Low	0.05	0.05
No. of Samples	446	6822



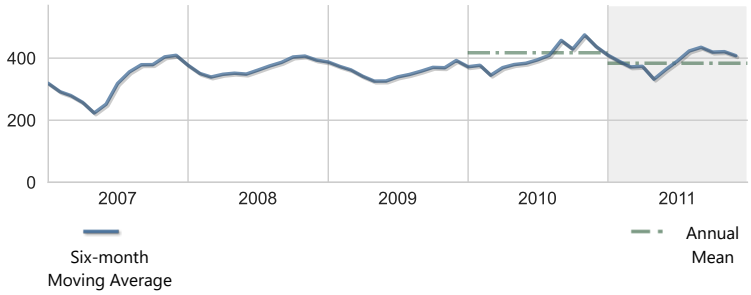
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2011	Historical period of record
High	49.00	159.00
Mean	12.88	11.49
Low	5.00	5.00
No. of Samples	252	2880



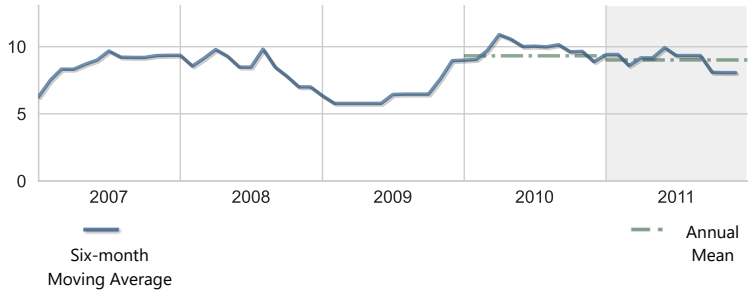
Nitrogen, Kjeldahl

Units: ug/l	Year 2011	Historical period of record
High	900.00	1850.00
Mean	383.55	365.76
Low	70.00	0.01
No. of Samples	301	3687



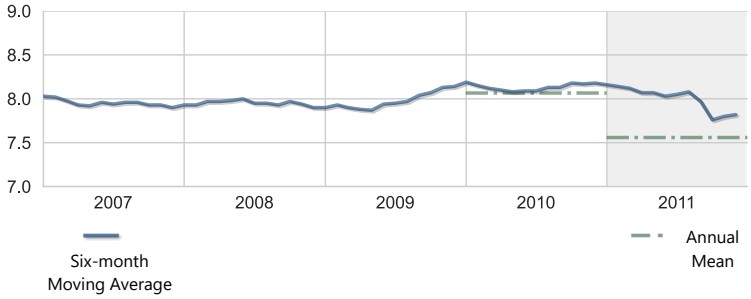
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2011	Historical period of record
High	30.00	210.00
Mean	9.01	8.53
Low	5.00	1.00
No. of Samples	300	4561



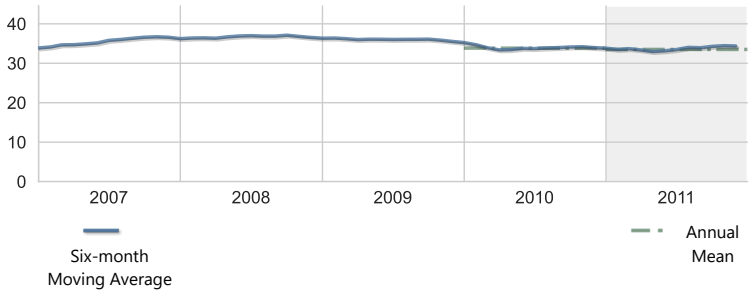
pH

Units: None	Year 2011	Historical period of record
High	8.50	9.62
Mean	7.56	8.07
Low	3.90	3.90
No. of Samples	498	11995



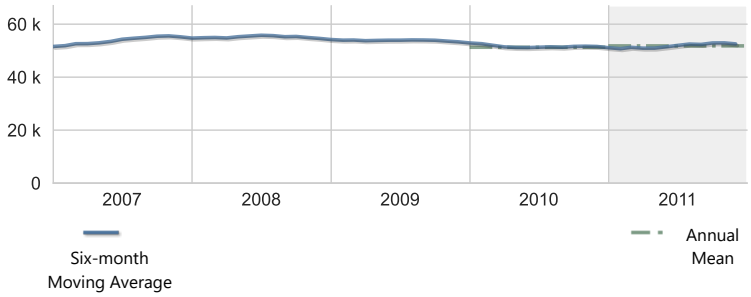
Salinity

Units: PSS	Year 2011	Historical period of record
High	36.60	42.30
Mean	33.51	33.63
Low	12.20	4.00
No. of Samples	396	7343



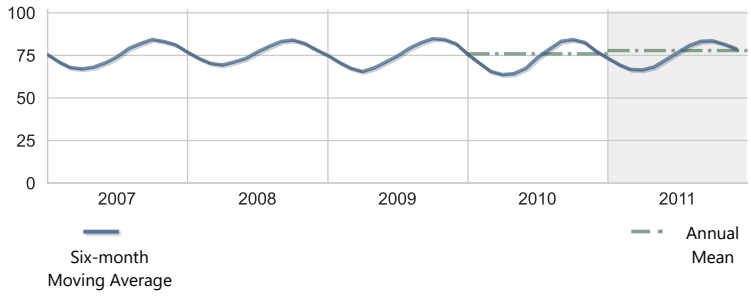
Specific conductance

Units: umho	Year 2011	Historical period of record
High	55520.00	62750.00
Mean	51803.02	51920.55
Low	20370.00	31.20
No. of Samples	291	3948



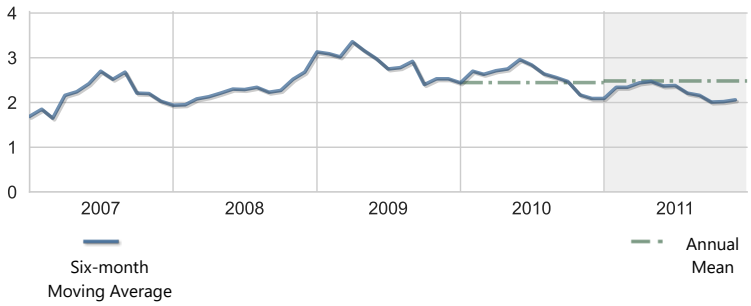
Temperature, water

Units: deg F	Year 2011	Historical period of record
High	91.40	100.40
Mean	77.85	77.03
Low	44.06	35.24
No. of Samples	705	16334



Turbidity

Units: NTU	Year 2011	Historical period of record
High	24.00	39.00
Mean	2.48	2.84
Low	0.40	0.03
No. of Samples	325	6297



Annual Averages

Indicator	Units	2007	2008	2009	2010	2011	Trend
Dissolved Oxygen	**mg/l**				6.72	5.92	
Dissolved oxygen saturation	**percent (%)**				96.32	81.63	
Light Attenuation	**K(1/m)**				0.72	578.00	
Salinity	**PSS**				33.83	33.51	
Turbidity	**NTU**				2.45	2.48	

Bay Contour Maps (2011)

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.

Contour Legend:

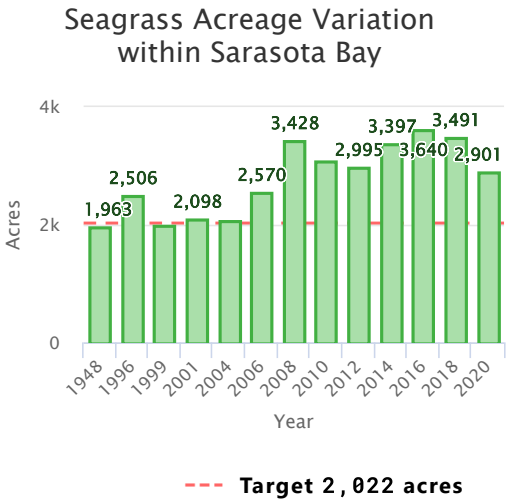
- Less than 1 mg/l
- 1.0 - 5.9 mg/l
- 6.0 - 10.9 mg/l
- 11.0 - 17.9 mg/l
- Greater than 18 mg/l

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:

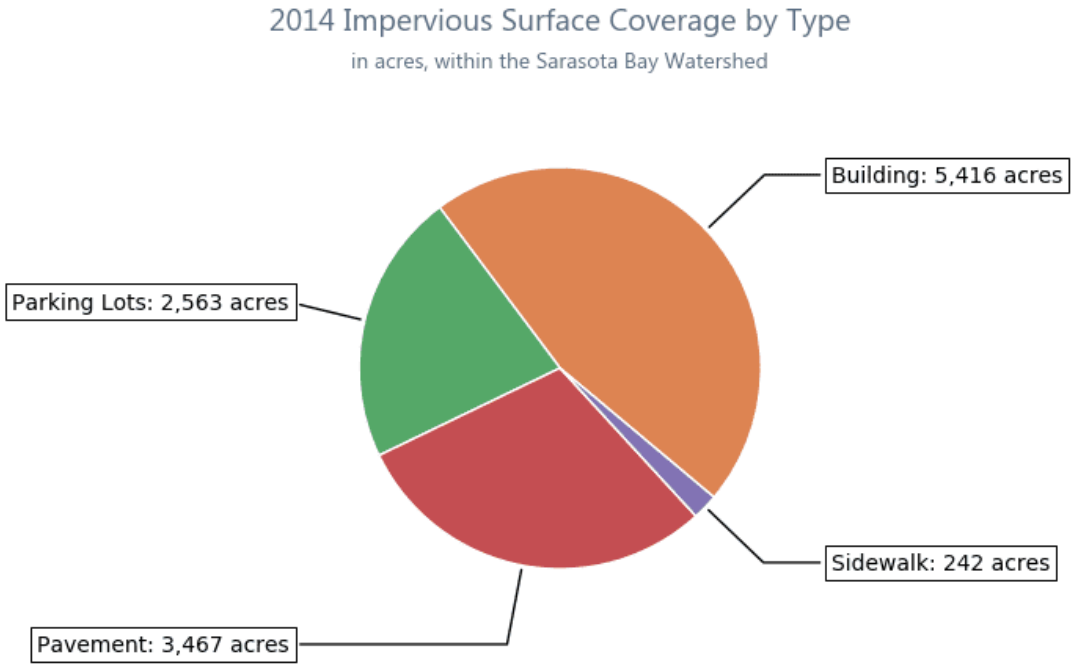
Legend:
Continuous Seagrass Patchy Seagrass



Impervious Features

Rain that falls on land that is in a natural state is absorbed and filtered by soils and vegetation as it makes it 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.

19% of the land area within the **Sarasota Bay Watershed** is covered by impervious surfaces



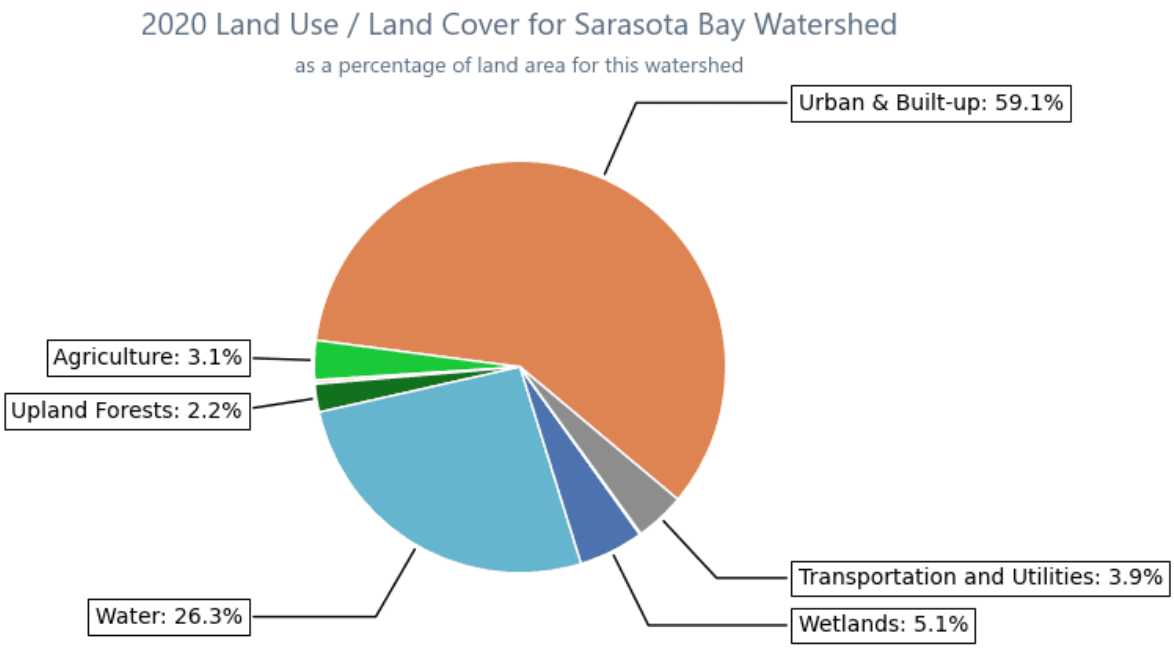
Land Use / Land Cover

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.

Sarasota Bay is located within the Sarasota Bay Watershed. The chart below shows the land use / land cover characteristics for Sarasota Bay Watershed within the boundary of this Water Atlas. **View details about the Sarasota Bay Watershed »**

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

Land Use Classification	1990	2005	2011	2014	2017	2020	Trend
Urban & Built-up	32,908 **53.3%**	37,844 **61.3%**	38,343 **62.1%**	37,987 **61.6%**	38,749 **62.8%**	56,970 **59.1%**	
Agriculture	6,338 **10.3%**	2,497 **4%**	2,215 **3.6%**	2,309 **3.7%**	1,822 **3%**	2,986 **3.1%**	
Rangeland	547 **0.9%**	199 **0.3%**	225 **0.4%**	430 **0.7%**	208 **0.3%**	261 **0.3%**	
Upland Forests	3,588 **5.8%**	2,109 **3.4%**	1,874 **3%**	1,923 **3.1%**	1,756 **2.8%**	2,075 **2.2%**	
Water	13,350 **21.6%**	14,227 **23.1%**	14,278 **23.1%**	14,131 **22.9%**	14,255 **23.1%**	25,360 **26.3%**	
Wetlands	2,870 **4.7%**	2,227 **3.6%**	2,229 **3.6%**	2,372 **3.8%**	2,327 **3.8%**	4,889 **5.1%**	
Barren Land	29 **0%**	9 **0%**	99 **0.2%**	109 **0.2%**	100 **0.2%**	76 **0.1%**	
Transportation and Utilities	1,845 **3%**	2,602 **4.2%**	2,452 **4%**	2,453 **4%**	2,511 **4.1%**	3,783 **3.9%**	


2020 Land Use / Land Cover for Sarasota Bay Watershed
as a percentage of land area for this watershed
Urban & Built-up: 59.1%
Agriculture: 3.1%
Upland Forests: 2.2%
Water: 26.3%
Transportation and Utilities: 3.9%
Wetlands: 5.1%