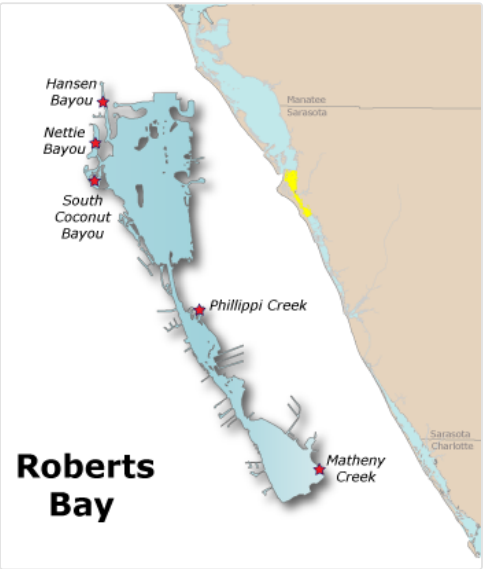
Roberts Bay Condition Report for 2017

CAUTION

Chl-a N P

2 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:
Grand Canal, **Hansen Bayou**, **Nettie Bayou**, **Roberts Bay**
Sarasota, **South Coconut Bayou**

Summary:

The overall health of Roberts Bay improved in 2017, with two of the three water quality indicators improving over the previous year. Despite improvements in both nitrogen and phosphorus concentrations, chlorophyll *a* levels increased slightly, keeping its rating at "Caution". Nitrogen concentration showed significant improvement, resulting in its rating being upgraded to "Good". Phosphorus concentration continued to be "Excellent", its concentration was already quite low, but it decreased from the previous year.

Water Quality: Chlorophyll *a* concentration increased only slightly, from 0.0117 to 0,014 mg/l, but its annual mean value was already above the threshold. Mean nitrogen concentration fell from 0.554 mg/l in 2016 to 0.4978 mg/l, bringing it below the desired target value. Already very good, phosphorus concentrations improved slightly, falling to 0.111 mg/l, well below the target value of 0.19 mg/l. The mean for chlorophyll *a* 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. Total seagrass acreage in Roberts Bay increased slightly to 356 acres from its previous value exceeding the desired target of 348 acres.

Water Chemistry Ratings

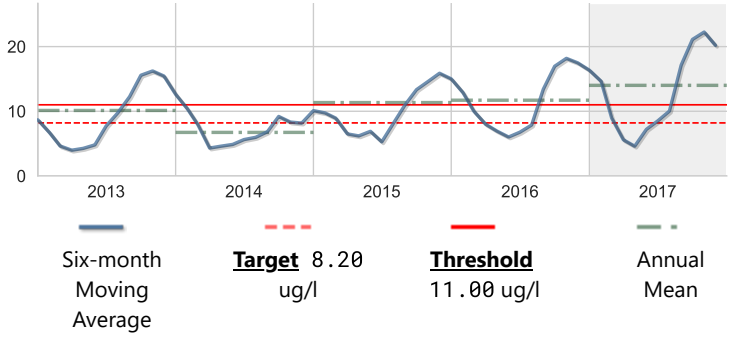
Total nitrogen, total phosphorus, and chlorophyll *a* levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along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

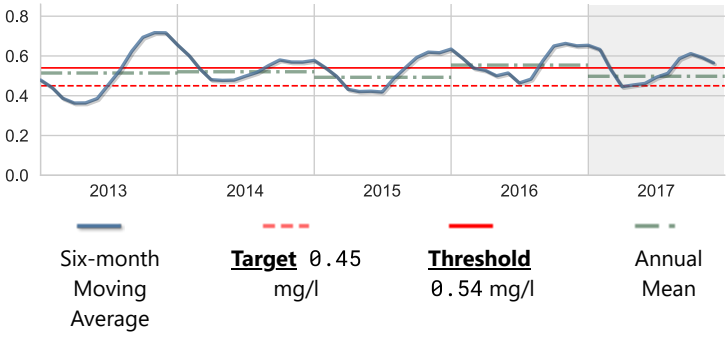
Units: ug/l	Year 2017	Historical period of record
High	57.70	57.70
Mean	14.01	8.34
Low	1.88	0.33
No. of Samples	64	2234



N Nitrogen, Total

Score: Good

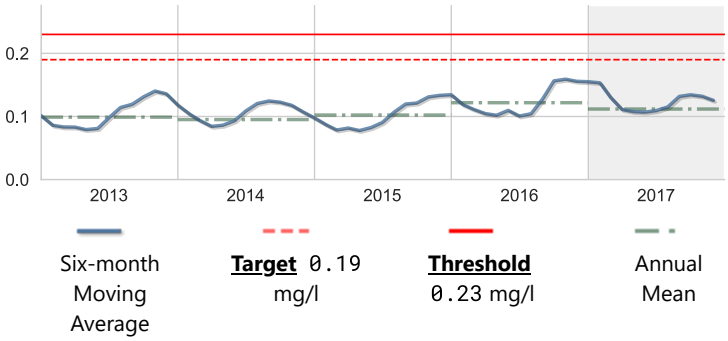
Units: mg/l	Year 2017	Historical period of record
High	1.195	1.376
Mean	0.498	0.437
Low	0.265	0.065
No. of Samples	64	1275



P Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2017	Historical period of record
High	0.260	0.480
Mean	0.112	0.132
Low	0.050	0.050
No. of Samples	84	1310

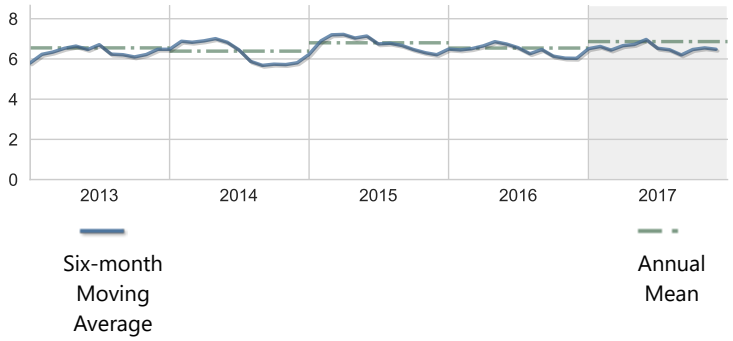


Other Measures of Bay Health

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.

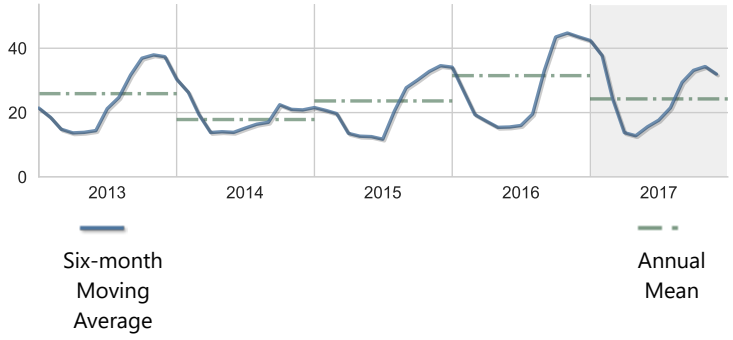
Dissolved Oxygen

Units: mg/l	Year 2017	Historical period of record
High	9.60	11.60
Mean	6.86	6.49
Low	5.35	3.50
No. of Samples	60	1406



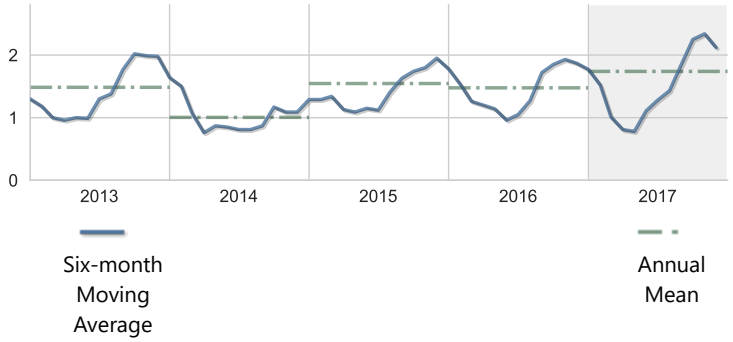
Apparent Color

Units: PCU	Year 2017	Historical period of record
High	70.00	150.00
Mean	24.25	23.50
Low	8.00	2.00
No. of Samples	79	1305



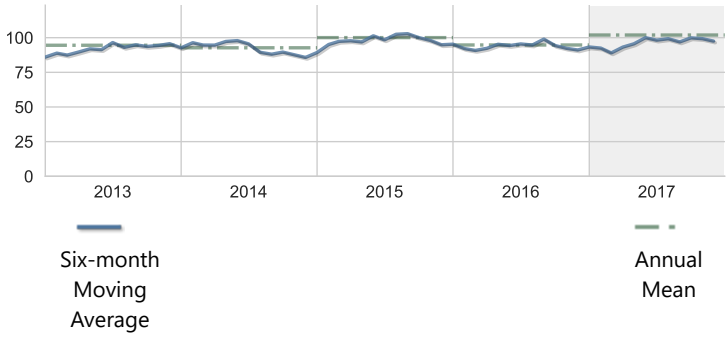
BOD, Biochemical oxygen demand

Units: mg/l	Year 2017	Historical period of record
High	4.10	5.90
Mean	1.74	1.43
Low	0.50	0.50
No. of Samples	79	1169



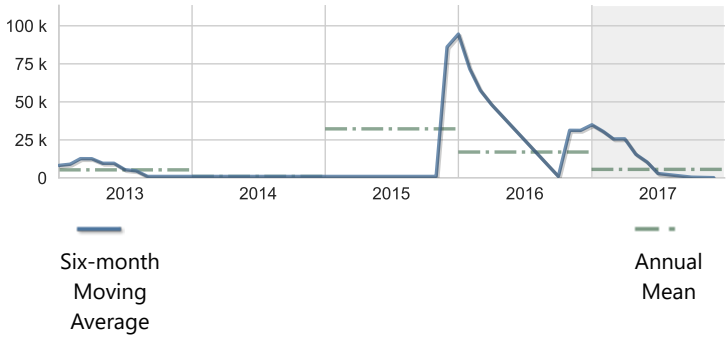
Dissolved oxygen saturation

Units: percent (%)	Year 2017	Historical period of record
High	136.00	173.00
Mean	101.91	94.59
Low	79.00	50.00
No. of Samples	80	1426



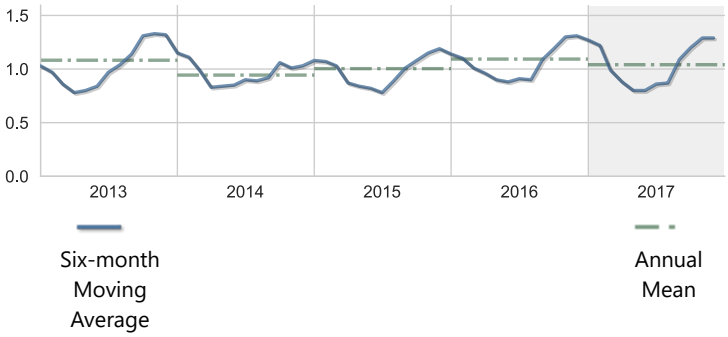
Karenia brevis ("red tide")

Units: #/l	Year 2017	Historical period of record
High	96000.00	912000.00
Mean	5622.81	9599.32
Low	0.00	0.00
No. of Samples	57	730



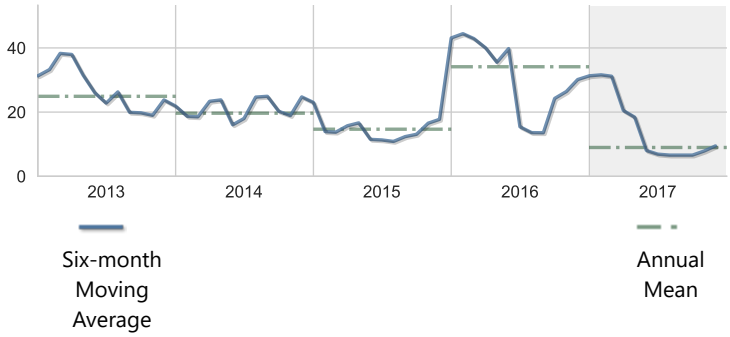
Light Attenuation

Units: K(1/m)	Year 2017	Historical period of record
High	2.48	3.56
Mean	1.04	1.02
Low	0.15	0.15
No. of Samples	60	1207



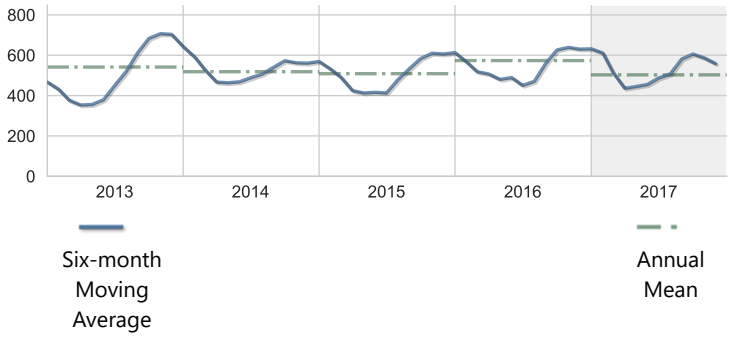
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2017	Historical period of record
High	50.00	243.00
Mean	8.97	23.43
Low	5.00	5.00
No. of Samples	79	1305



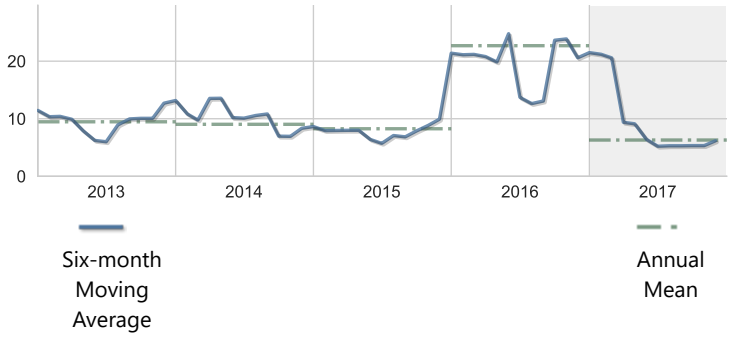
Nitrogen, Kjeldahl

Units: ug/l	Year 2017	Historical period of record
High	1190.00	1320.00
Mean	502.74	457.01
Low	260.00	60.00
No. of Samples	84	1310



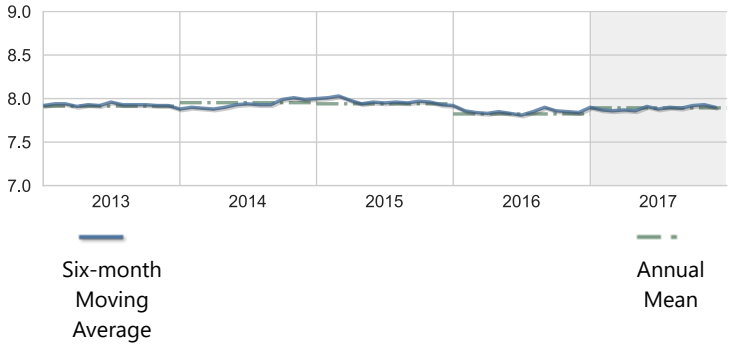
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2017	Historical period of record
High	24.00	339.00
Mean	6.30	11.78
Low	5.00	5.00
No. of Samples	84	1742



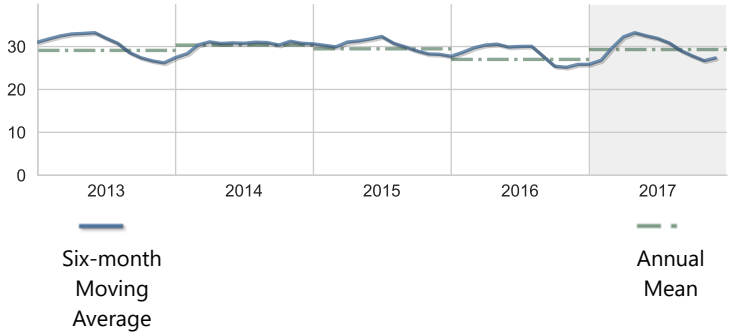
pH

Units: None	Year 2017	Historical period of record
High	8.20	8.40
Mean	7.89	7.88
Low	7.63	7.10
No. of Samples	80	1426



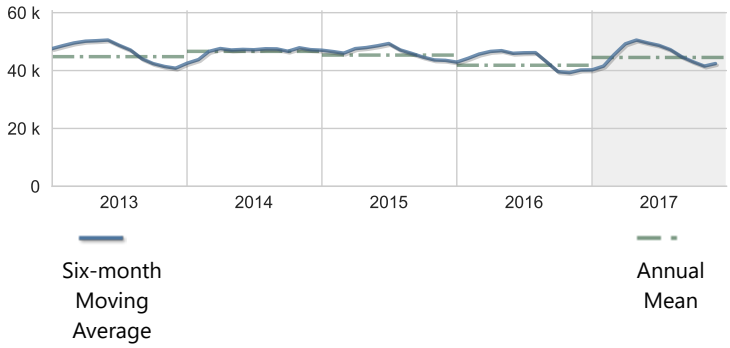
Salinity

Units: PSS	Year 2017	Historical period of record
High	35.50	38.80
Mean	29.30	30.34
Low	14.90	1.80
No. of Samples	60	1406



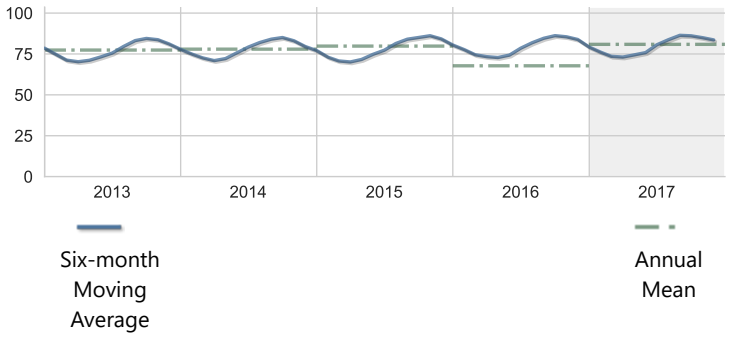
Specific conductance

Units: umho	Year 2017	Historical period of record
High	53600.00	58320.00
Mean	44527.50	46498.78
Low	24500.00	3370.00
No. of Samples	80	1426



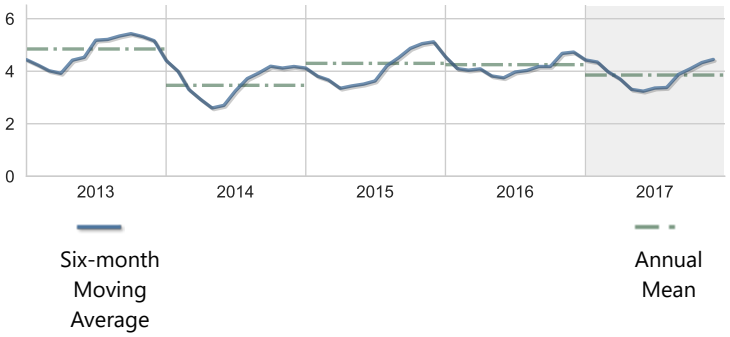
Temperature, water

Units: deg F	Year 2017	Historical period of record
High	91.76	92.48
Mean	80.89	77.81
Low	70.52	48.56
No. of Samples	75	1371



Turbidity

Units: NTU	Year 2017	Historical period of record
High	8.00	24.00
Mean	3.85	4.24
Low	1.30	0.85
No. of Samples	64	1290



Annual Averages

Indicator	Units	2013	2014	2015	2016	2017	Trend
Dissolved Oxygen	mg/l	6.55	6.39	6.80	6.54	6.86	
Dissolved oxygen saturation	percent (%)	94.53	92.70	100.05	94.73	101.91	
Light Attenuation	K(1/m)	1.08	0.94	1.00	1.09	1.04	
Salinity	PSS	29.10	30.35	29.46	27.00	29.30	
Turbidity	NTU	4.85	3.46	4.30	4.25	3.85	

Bay Contour Maps (2017)

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 2017 Monthly Contour Maps for: Chlorophyll a

January

Contour Legend:

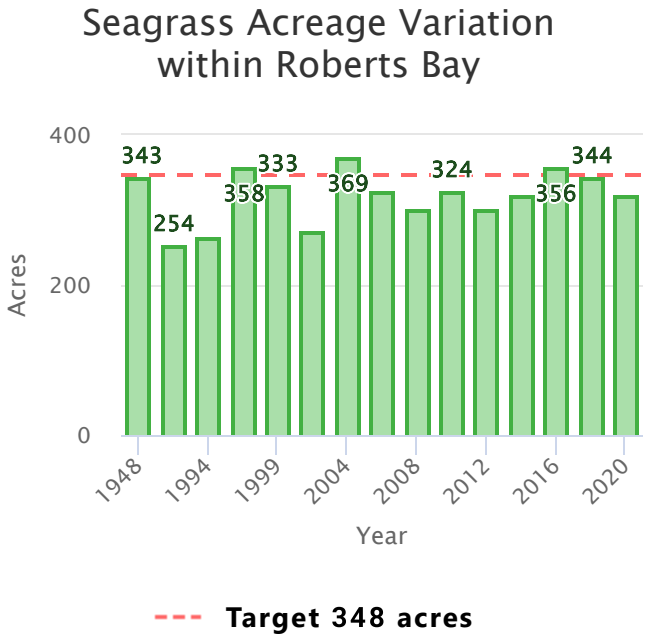
- Less than 1 mg/l
- 1.0 - 5.9 mg/l
- 6.0 - 10.9 mg/l
- 11.0 - 17.9 mg/l
- Greater than 18 mg/l

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:

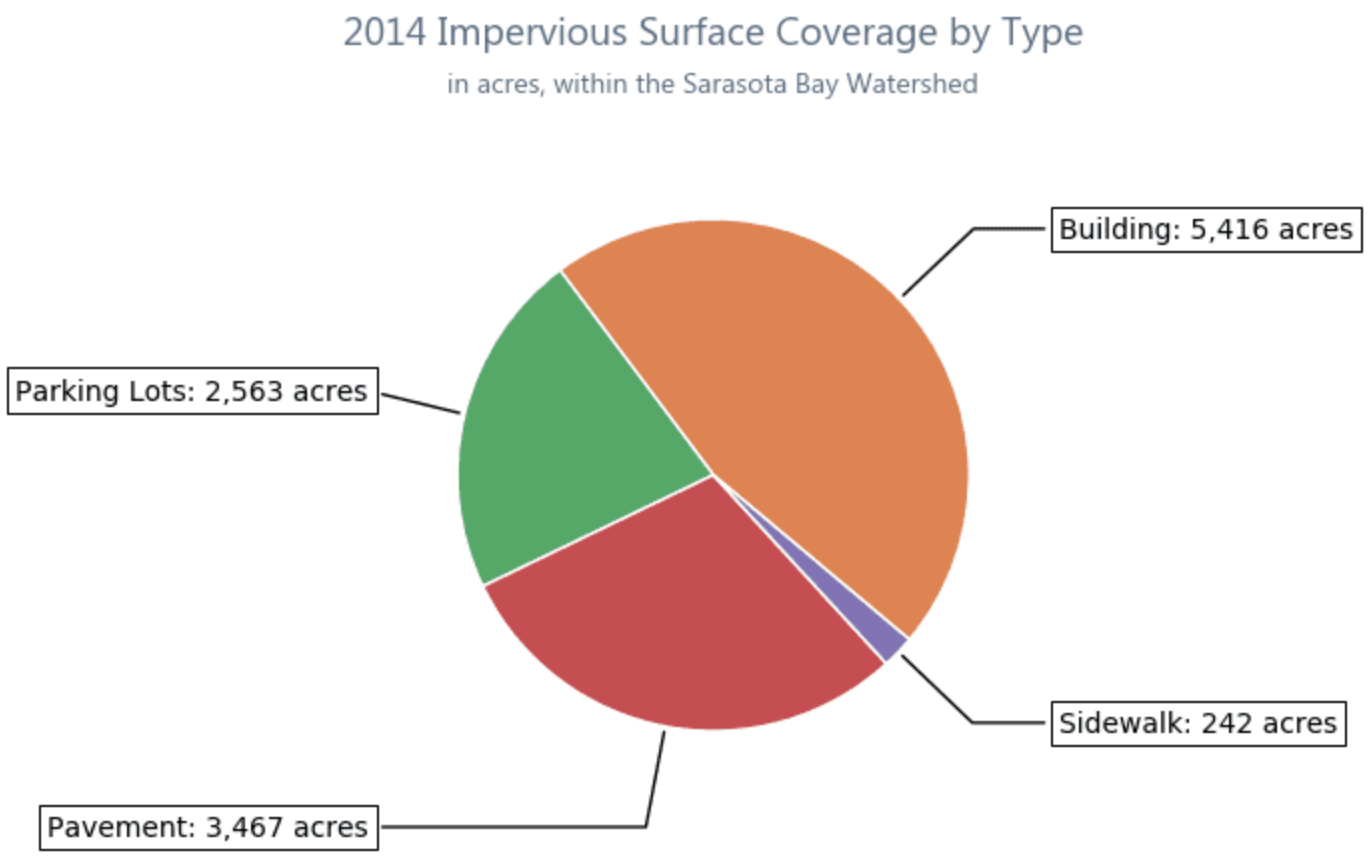
Legend:
Continuous Seagrass Patchy Seagrass



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



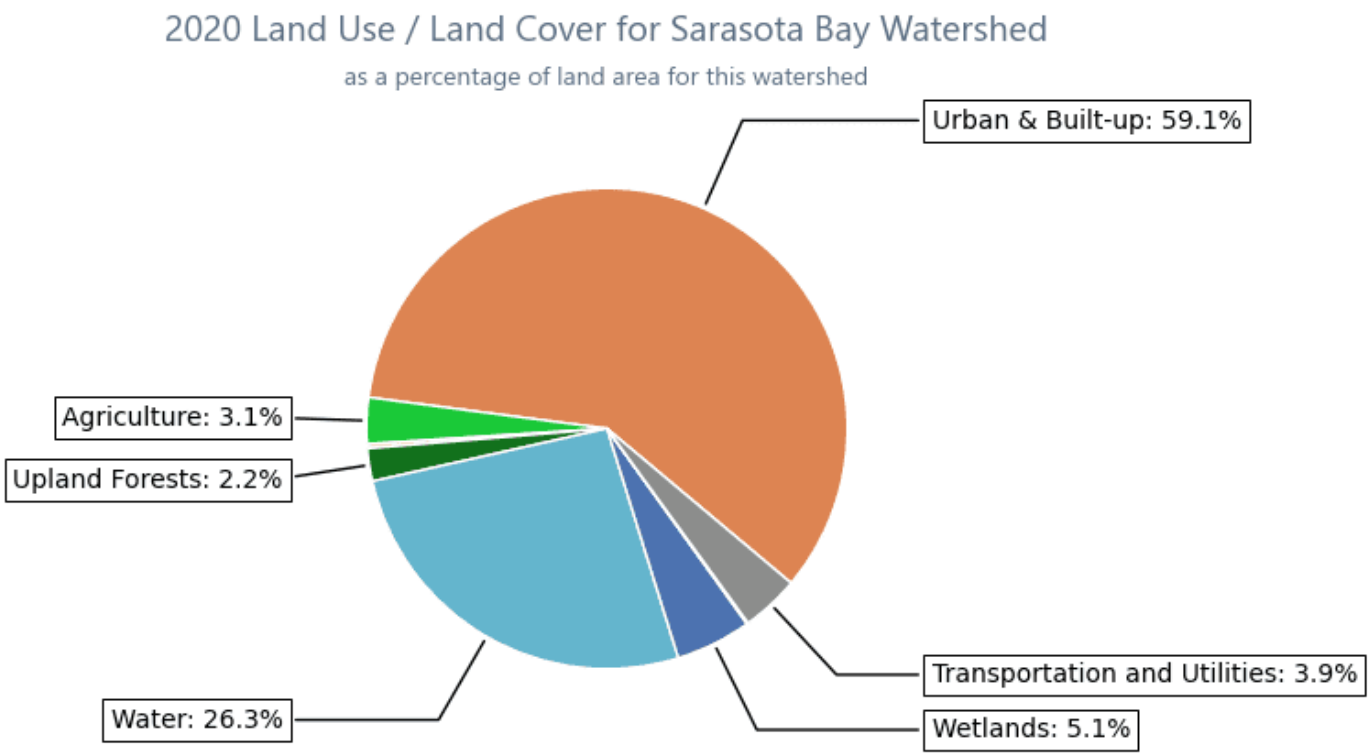
Land Use / Land Cover

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.

Roberts 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%