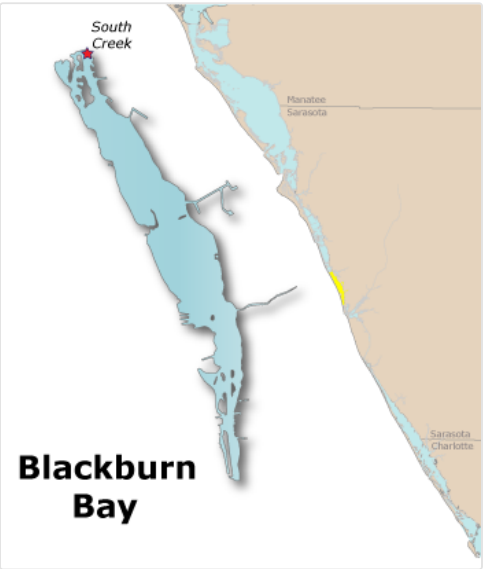
Blackburn Bay Condition Report for 2016

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:
Blackburn Bay

Summary:

The overall health of Blackburn Bay deteriorated slightly in 2016. Chlorophyll *a* increased significantly with the mean value increasing to 0.0108 mg/l, exceeding the threshold value. Nitrogen concentration also increased remaining in the "Good" range, between target and threshold levels. The mean value for phosphorus concentration increased only very slightly, and is still well below the target.

Water Quality: While two of the three water quality indicators (nitrogen, and phosphorus) were rated as pass, chlorophyll *a*'s rating changed from "Good" to "Caution" because of its continued increase in value. 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). The mean chlorophyll *a* level was 0.0108 mg/l, exceeding the threshold concentration of 0.0082 mg/l . The mean nitrogen level increased to 0.4276 mg/l, exceeding the target value of 0.36 mg/l. Phosphorus

concentrations in the bay showed an increase as well, with a mean in 2016 of 0.0821 mg/l, well below the target (0.170 mg/l) and threshold (0.210 mg/l) levels and earning a score of "Excellent".

Biotic Indicator: Measurement of the biotic indicator, seagrass, was performed in 2016 by the Southwest Florida Water Management District. Total seagrass acreage in Blackburn Bay was measured to be 314 acres, a decrease in coverage from 344 acres in 2014. Seagrass acreage remains below the target level of 447 acres.

Water Chemistry Ratings

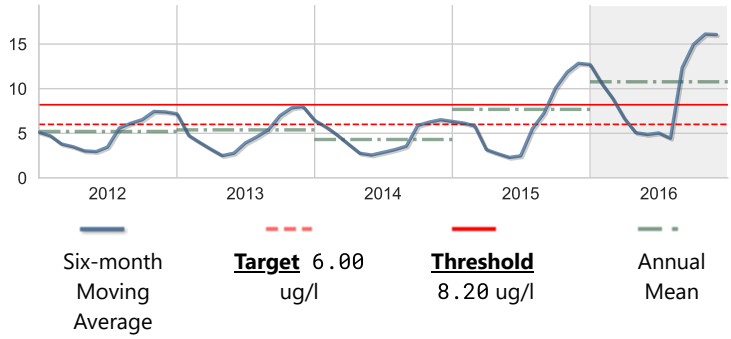
Total nitrogen, total phosphorus, and chlorophyll *a* levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along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

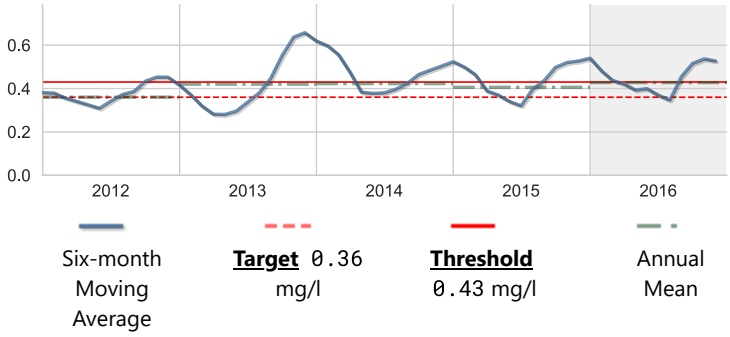
Units: ug/l	Year 2016	Historical period of record
High	59.70	59.70
Mean	10.77	5.45
Low	2.32	0.20
No. of Samples	57	1016



N Nitrogen, Total

Score: Good

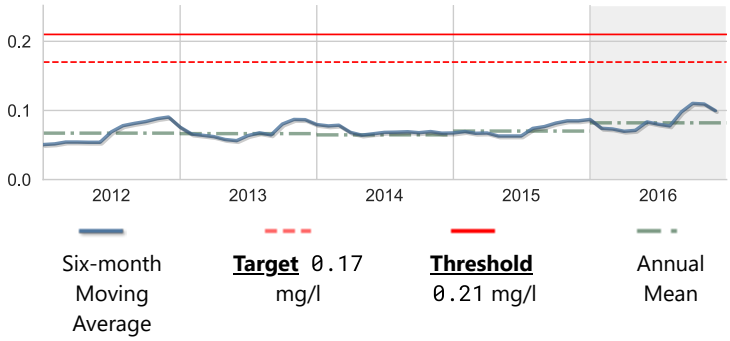
Units: mg/l	Year 2016	Historical period of record
High	1.185	2.205
Mean	0.428	0.325
Low	0.205	0.055
No. of Samples	57	1010



P Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2016	Historical period of record
High	0.220	0.530
Mean	0.082	0.099
Low	0.050	0.050
No. of Samples	57	1026

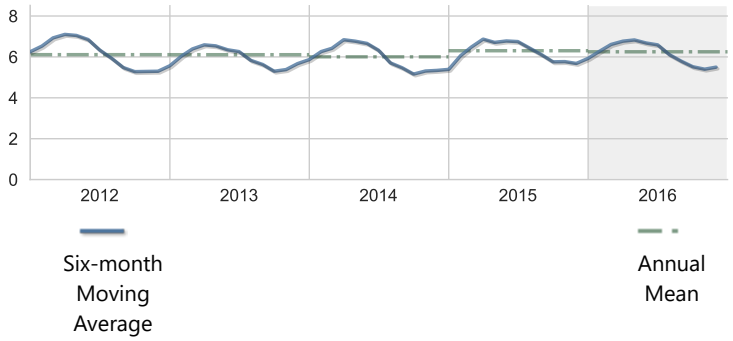


Other Measures of Bay Health

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.

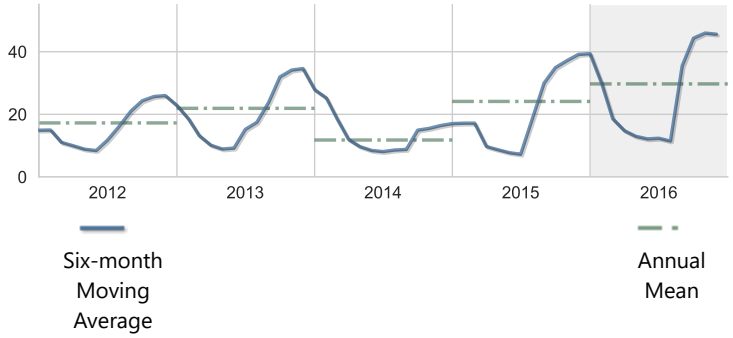
Dissolved Oxygen

Units: mg/l	Year 2016	Historical period of record
High	8.70	11.90
Mean	6.25	6.46
Low	4.40	1.60
No. of Samples	48	1052



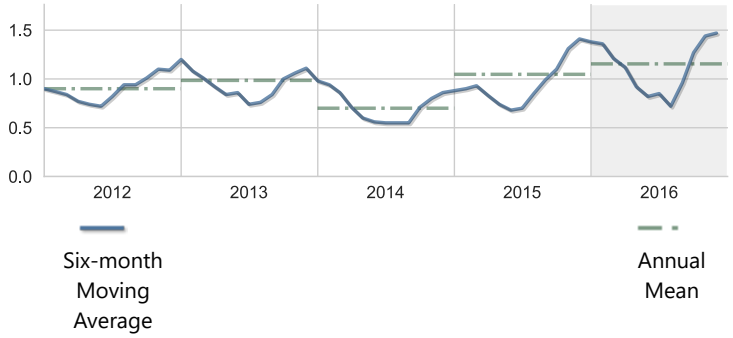
Apparent Color

Units: PCU	Year 2016	Historical period of record
High	200.00	250.00
Mean	29.72	19.86
Low	2.00	2.00
No. of Samples	57	1026



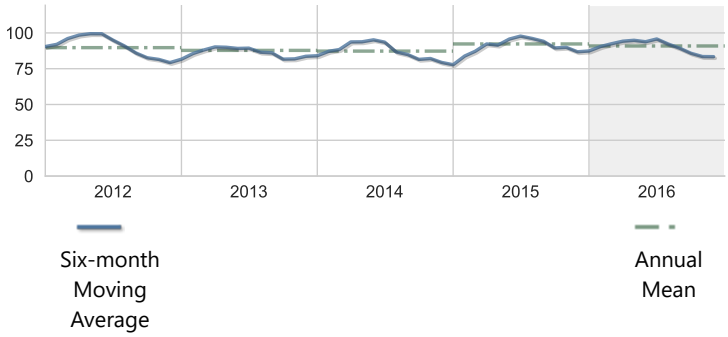
BOD, Biochemical oxygen demand

Units: mg/l	Year 2016	Historical period of record
High	3.70	7.10
Mean	1.15	1.07
Low	0.50	0.50
No. of Samples	57	915



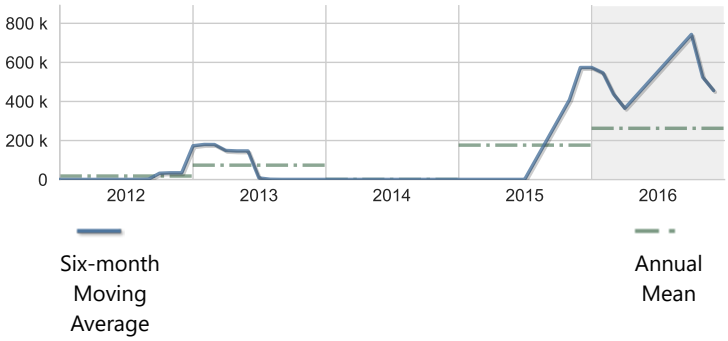
Dissolved oxygen saturation

Units: percent (%)	Year 2016	Historical period of record
High	117.00	198.00
Mean	90.88	94.41
Low	73.00	26.00
No. of Samples	48	1052



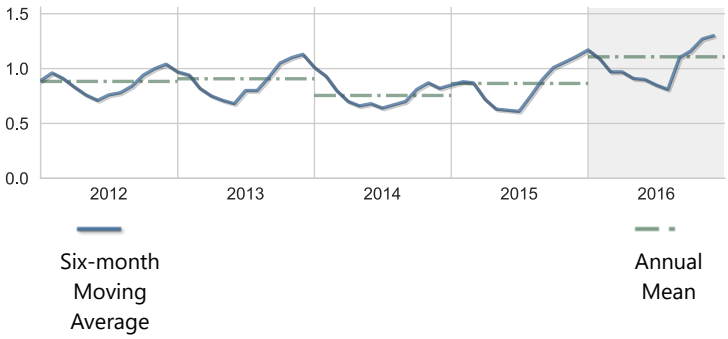
Karenia brevis ("red tide")

Units: #/l	Year 2016	Historical period of record
High	2240000.00	2280000.00
Mean	262625.00	57466.78
Low	1000.00	1000.00
No. of Samples	32	602



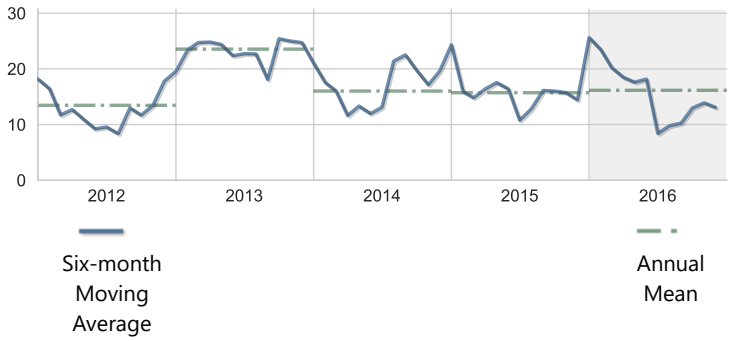
Light Attenuation

Units: K(1/m)	Year 2016	Historical period of record
High	3.27	5.03
Mean	1.11	0.87
Low	0.28	0.16
No. of Samples	44	886



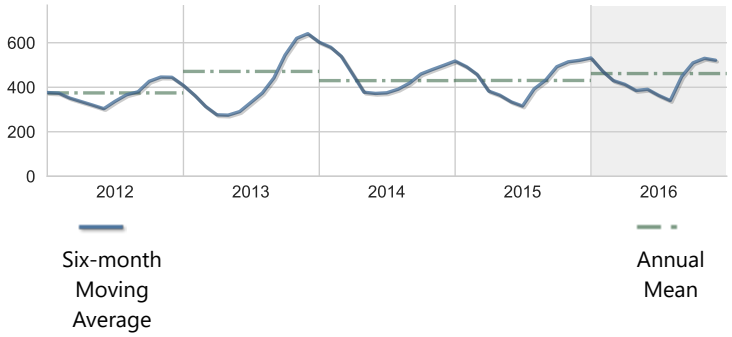
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2016	Historical period of record
High	132.00	132.00
Mean	16.16	15.42
Low	5.00	5.00
No. of Samples	57	1028



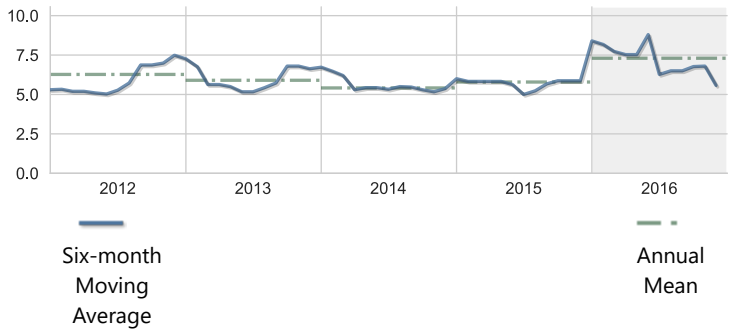
Nitrogen, Kjeldahl

Units: ug/l	Year 2016	Historical period of record
High	1180.00	2200.00
Mean	461.58	357.17
Low	200.00	0.05
No. of Samples	57	1027



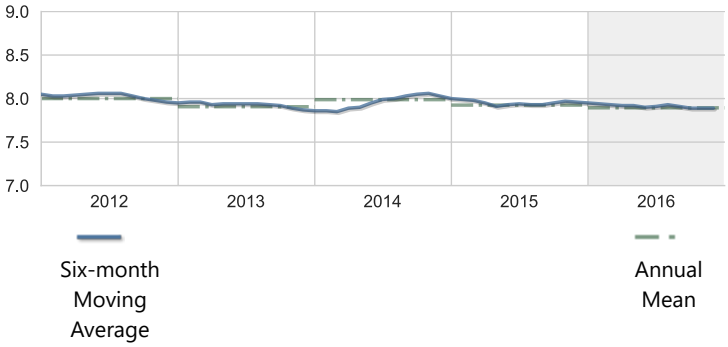
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2016	Historical period of record
High	27.00	65.00
Mean	7.30	6.04
Low	5.00	5.00
No. of Samples	57	1348



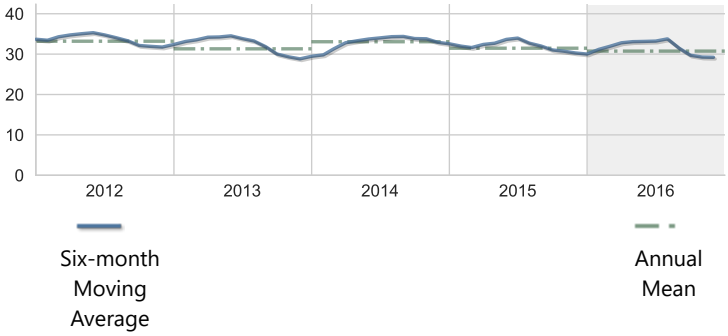
pH

Units: None	Year 2016	Historical period of record
High	8.30	8.40
Mean	7.89	7.94
Low	7.50	6.10
No. of Samples	48	1052



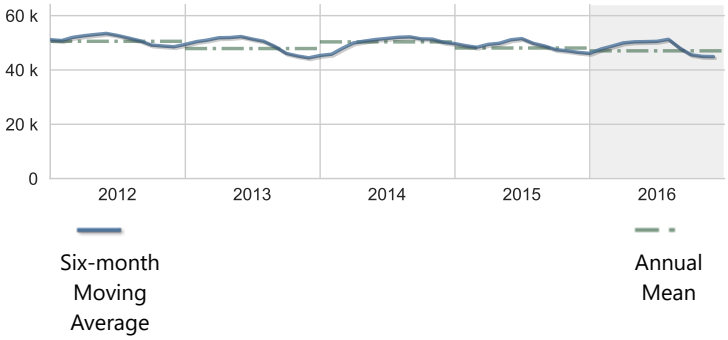
Salinity

Units: PSS	Year 2016	Historical period of record
High	35.70	39.30
Mean	30.74	33.05
Low	10.90	5.70
No. of Samples	48	1052



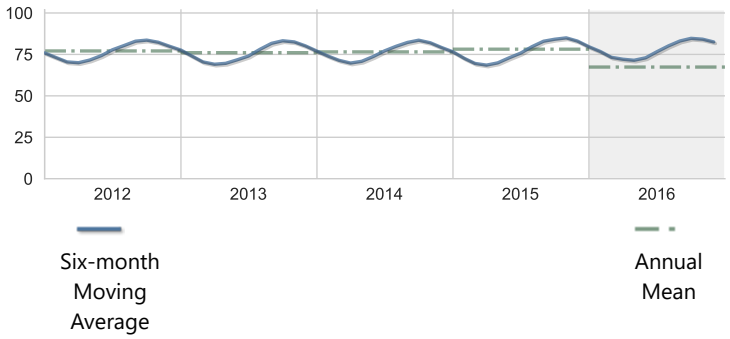
Specific conductance

Units: umho	Year 2016	Historical period of record
High	53900.00	58760.00
Mean	47038.75	50289.67
Low	18400.00	10130.00
No. of Samples	48	1052



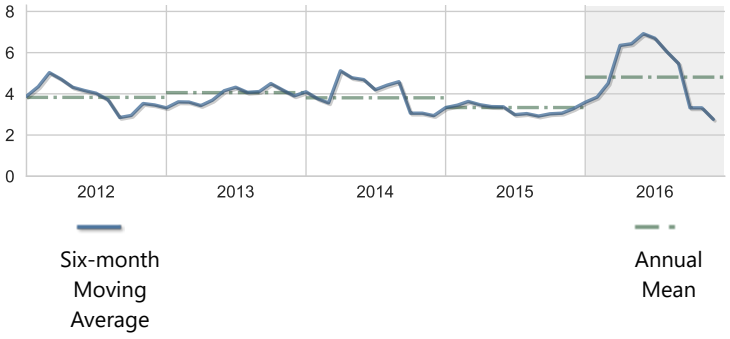
Temperature, water

Units: deg F	Year 2016	Historical period of record
High	68.90	92.84
Mean	67.37	76.43
Low	64.76	47.84
No. of Samples	8	1012



Turbidity

Units: NTU	Year 2016	Historical period of record
High	25.00	39.00
Mean	4.81	3.98
Low	1.20	0.20
No. of Samples	57	1017



Annual Averages

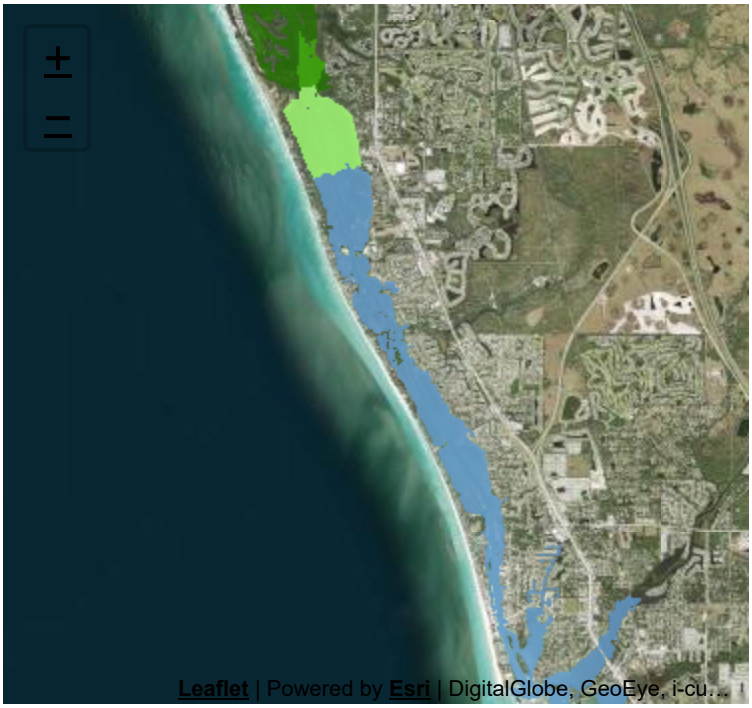
Indicator	Units	2012	2013	2014	2015	2016	Trend
Dissolved Oxygen	mg/l	6.11	6.11	6.00	6.30	6.25	
Dissolved oxygen saturation	percent (%)	89.71	87.79	87.29	92.29	90.88	
Light Attenuation	K(1/m)	0.88	0.91	0.75	0.86	1.11	
Salinity	PSS	33.19	31.31	33.07	31.46	30.74	
Turbidity	NTU	3.83	4.06	3.81	3.34	4.81	

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

January



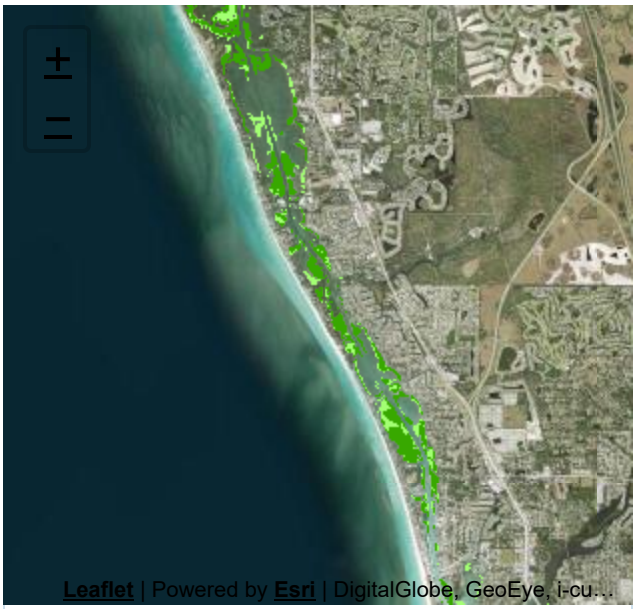
Contour Legend:

- 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

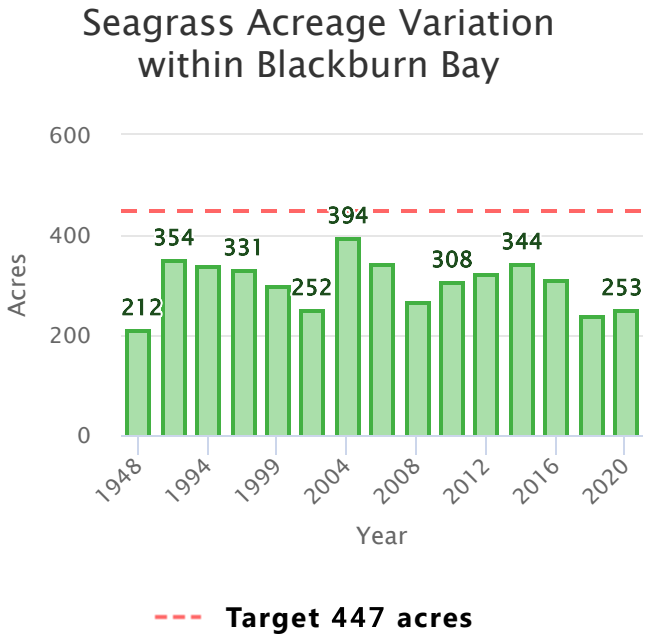
Seagrasses

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:



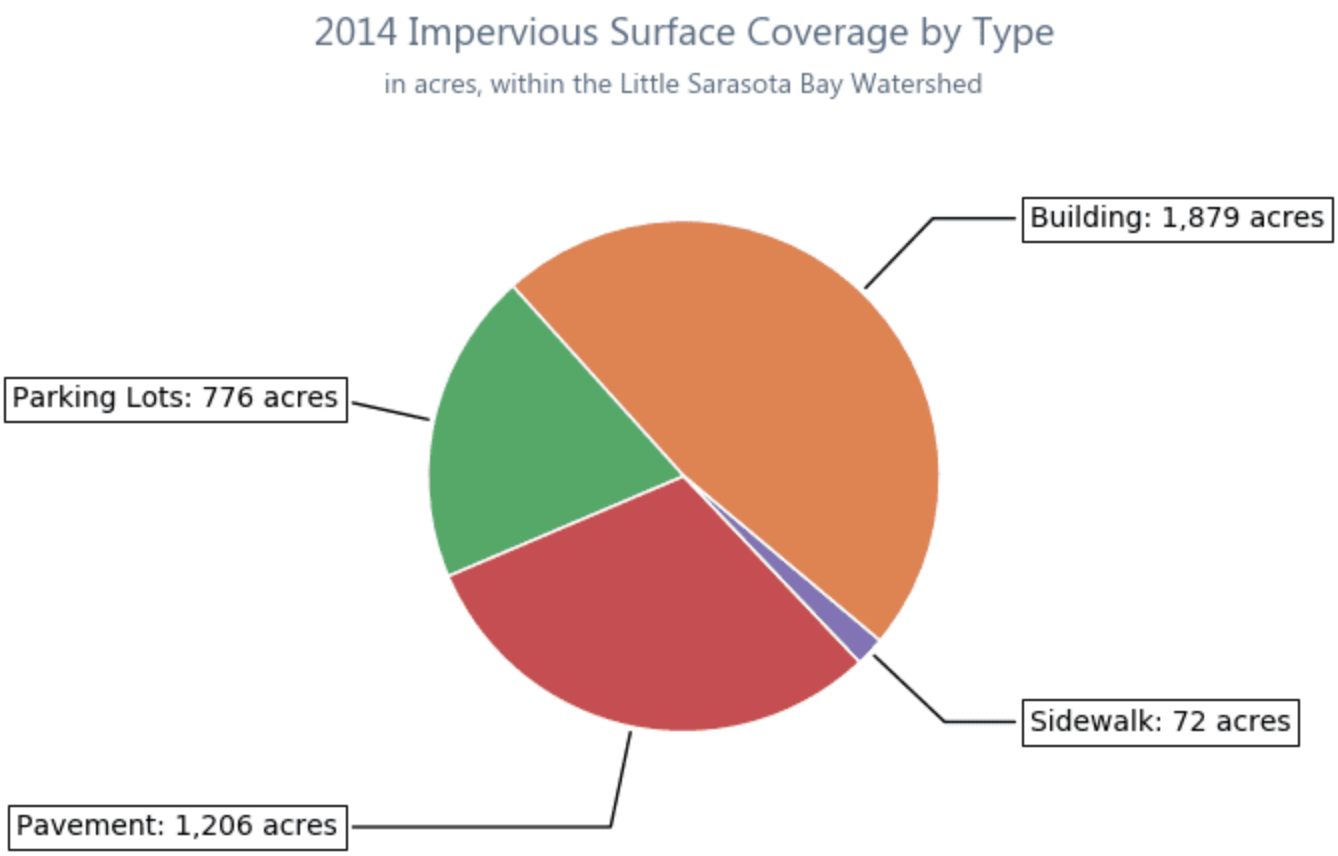
Legend:
Continuous Seagrass Patchy Seagrass



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.

14% of the land area within the **Little Sarasota Bay Watershed** is covered by impervious surfaces



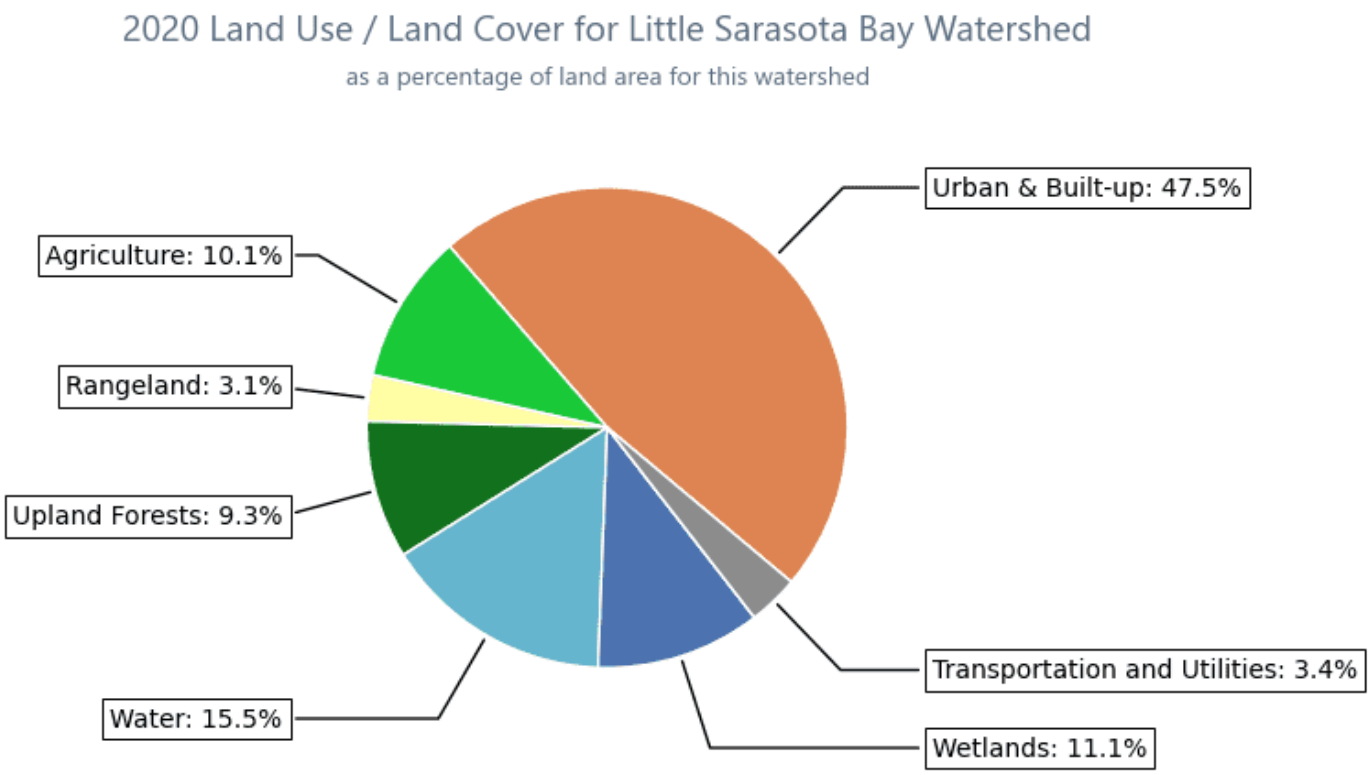
Land Use / Land Cover

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.

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

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

Land Use Classification	1990	2005	2011	2014	2017	2020	Trend
Urban & Built-up	8,943 **31.9%**	11,834 **42.2%**	12,102 **43.1%**	12,162 **43.3%**	12,777 **45.5%**	13,343 **47.5%**	
Agriculture	3,550 **12.6%**	3,228 **11.5%**	3,258 **11.6%**	4,223 **15%**	3,124 **11.1%**	2,837 **10.1%**	
Rangeland	825 **2.9%**	1,822 **6.5%**	1,474 **5.3%**	579 **2.1%**	1,233 **4.4%**	877 **3.1%**	
Upland Forests	7,098 **25.3%**	3,066 **10.9%**	2,981 **10.6%**	2,725 **9.7%**	2,687 **9.6%**	2,603 **9.3%**	
Water	3,429 **12.2%**	4,123 **14.7%**	4,147 **14.8%**	4,175 **14.9%**	4,227 **15.1%**	4,337 **15.5%**	
Wetlands	3,490 **12.4%**	3,133 **11.2%**	3,191 **11.4%**	3,227 **11.5%**	3,121 **11.1%**	3,120 **11.1%**	
Barren Land	62 **0.2%**	18 **0.1%**	19 **0.1%**	20 **0.1%**	6 **0%**	6 **0%**	
Transportation and Utilities	675 **2.4%**	841 **3%**	892 **3.2%**	952 **3.4%**	898 **3.2%**	948 **3.4%**	


2020 Land Use / Land Cover for Little Sarasota Bay Watershed
as a percentage of land area for this watershed
Urban & Built-up: 47.5%
Agriculture: 10.1%
Rangeland: 3.1%
Upland Forests: 9.3%
Water: 15.5%
Transportation and Utilities: 3.4%
Wetlands: 11.1%