

## Dona/Roberts Bay Condition Report for 2016

**!**

# CAUTION

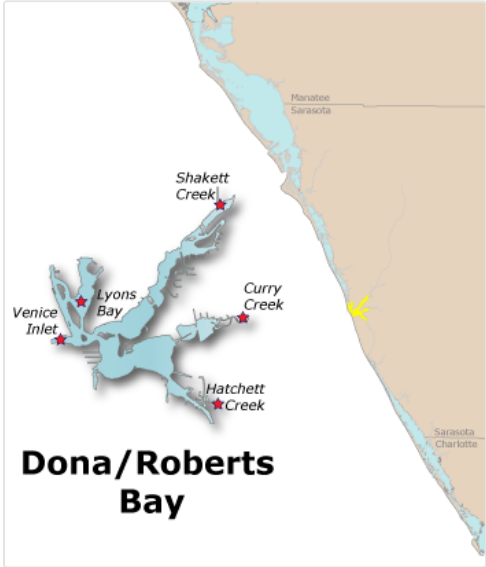
Chl-a

N

P

1 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:**  
**Dona Bay, Lyons Bay, Roberts Bay Venice**

### Summary:

The overall health of Dona/Roberts Bay continued to deteriorate in 2016. Chlorophyll a increased significantly to a mean concentration of 0.0094 mg/l, above the threshold concentration of 0.0049 mg/l. Nitrogen concentration also increased, reaching the "Caution" range, exceeding target and threshold levels. The mean value for phosphorus concentration increased but is still well below the target.

*Water Quality:* All three nutrient measures used in scoring water quality increased in 2016, a worsening trend. The mean chlorophyll a concentration in 2016 was 0.0094 mg/l, exceeding the threshold value of 0.0049 mg/l. Mean nitrogen concentration was 0.5533 mg/l, higher than the threshold of 0.420 mg/l. The annual mean concentration of phosphorus, although higher than in 2016, remained well below the threshold of 0.180 mg/l, at 0.1022 mg/l. 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). In 2016,

Dona/Roberts Bay retains its "Caution" rating, with two out of three water quality measures exceeding threshold values.

*Biotic Indicator:* Measurement of the biotic indicator, seagrass, was performed in 2016 by the Southwest Florida Water Management District. The increase in total seagrass acreage in Dona/Roberts Bay was slight. Between 2014 and 2016 it increased from 99 to 101 acres, remaining below the target level of 112 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.

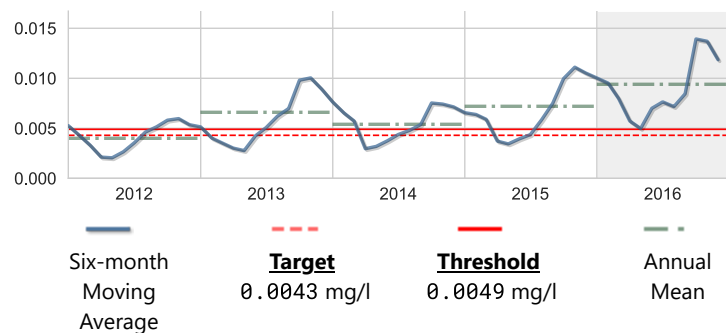
The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.



### Chlorophyll a

**Score:** Caution

Units: mg/l	Year 2016	Historical period of record
<b>High</b>	0.059	0.061
<b>Mean</b>	0.009	0.006
<b>Low</b>	0.002	0.000
<b>No. of Samples</b>	49	690

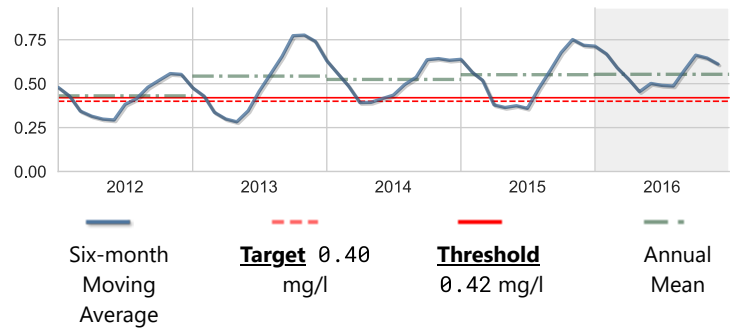


**N**

**Nitrogen, Total**

Score: Caution

Units: mg/l	Year 2016	Historical period of record
<b>High</b>	1.310	1.715
<b>Mean</b>	0.553	0.447
<b>Low</b>	0.165	0.055
<b>No. of Samples</b>	49	686

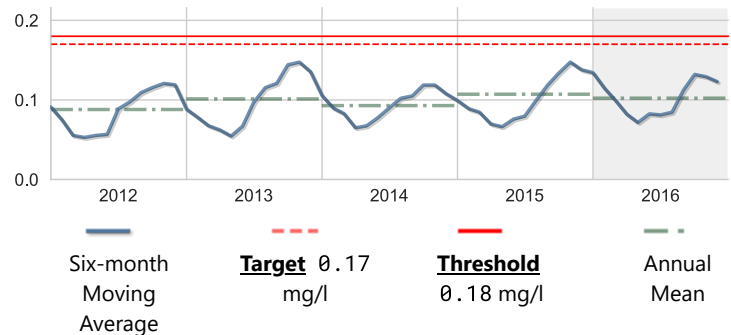


**P**

**Phosphorus, Total**

Score: Excellent

Units: mg/l	Year 2016	Historical period of record
<b>High</b>	0.290	0.470
<b>Mean</b>	0.102	0.122
<b>Low</b>	0.050	0.050
<b>No. of Samples</b>	49	697

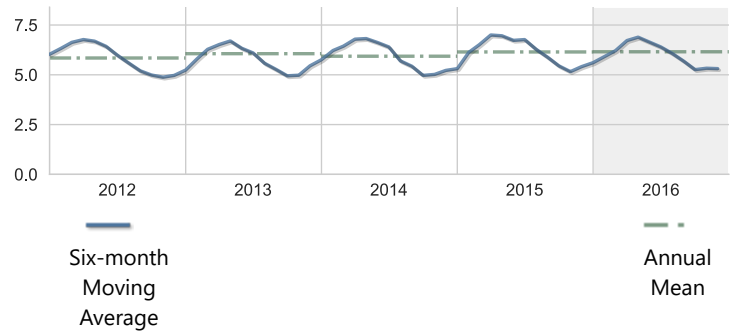


**Other Measures of Bay Health**

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.

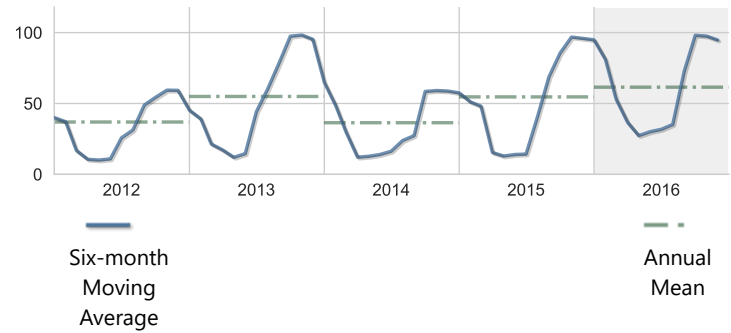
## Dissolved Oxygen

Units: mg/l	Year 2016	Historical period of record
<b>High</b>	7.90	9.20
<b>Mean</b>	6.16	6.19
<b>Low</b>	3.80	2.10
<b>No. of Samples</b>	48	656



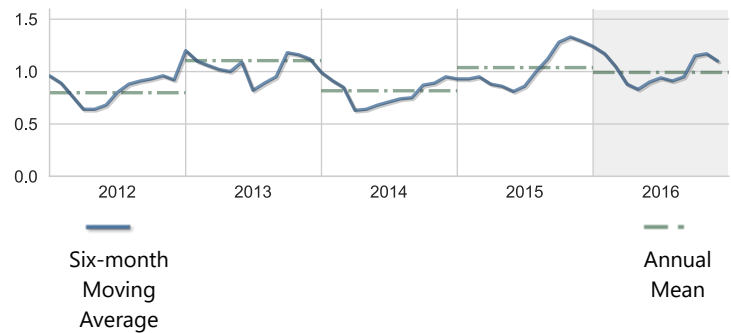
## Apparent Color

Units: PCU	Year 2016	Historical period of record
<b>High</b>	340.00	400.00
<b>Mean</b>	61.51	39.55
<b>Low</b>	2.00	2.00
<b>No. of Samples</b>	49	696



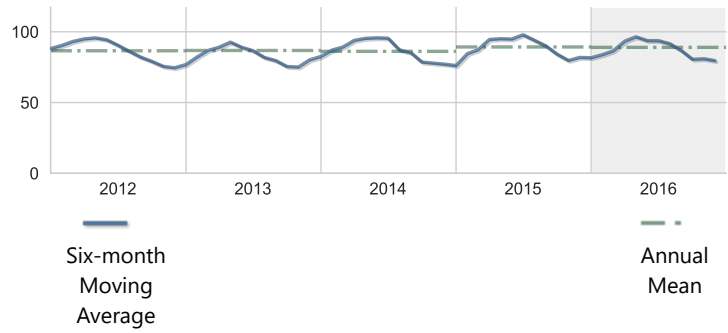
## BOD, Biochemical oxygen demand

Units: mg/l	Year 2016	Historical period of record
<b>High</b>	3.90	8.50
<b>Mean</b>	0.99	1.03
<b>Low</b>	0.50	0.50
<b>No. of Samples</b>	49	593



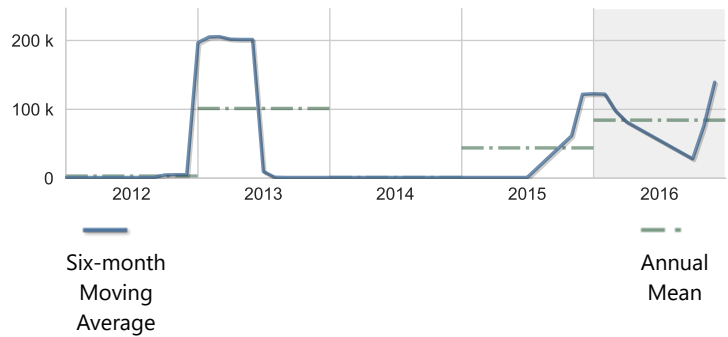
## Dissolved oxygen saturation

Units: percent (%)	Year 2016	Historical period of record
<b>High</b>	117.00	129.00
<b>Mean</b>	89.00	90.17
<b>Low</b>	60.00	33.00
<b>No. of Samples</b>	52	660



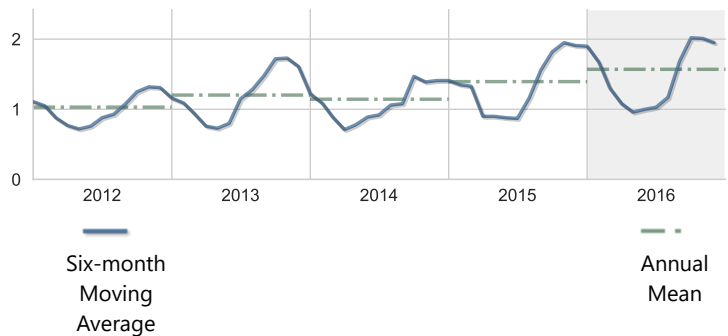
## Karenia brevis ("red tide")

Units: #/l	Year 2016	Historical period of record
<b>High</b>	526000.00	2460000.00
<b>Mean</b>	84275.86	30853.33
<b>Low</b>	1000.00	1000.00
<b>No. of Samples</b>	29	525



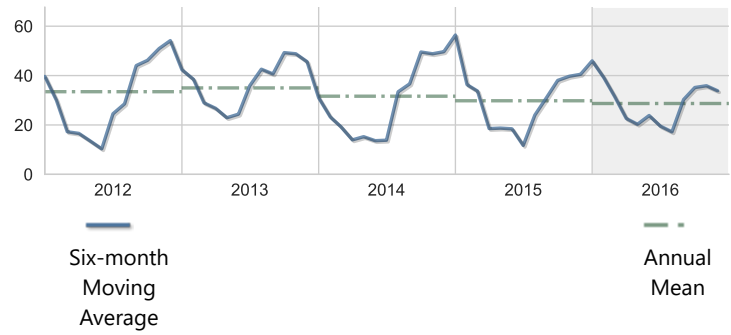
## Light Attenuation

Units: K(1/m)	Year 2016	Historical period of record
<b>High</b>	6.46	9.04
<b>Mean</b>	1.57	1.14
<b>Low</b>	0.29	0.06
<b>No. of Samples</b>	42	642



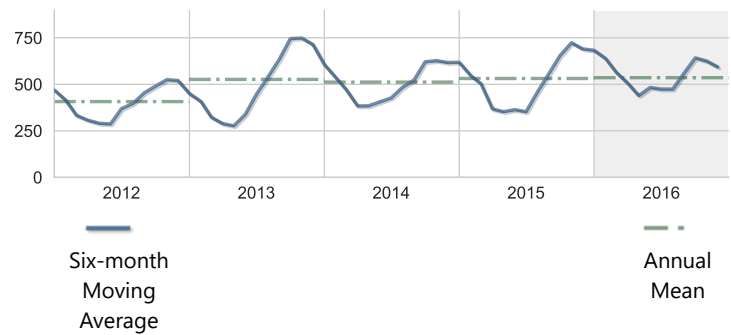
## Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2016	Historical period of record
<b>High</b>	120.00	326.00
<b>Mean</b>	28.69	27.88
<b>Low</b>	5.00	5.00
<b>No. of Samples</b>	49	697



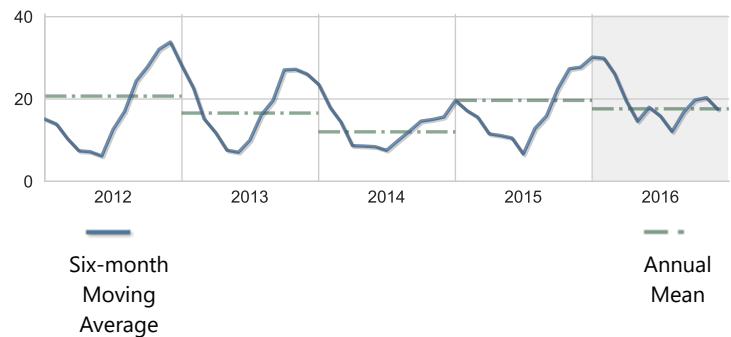
## Nitrogen, Kjeldahl

Units: ug/l	Year 2016	Historical period of record
<b>High</b>	1270.00	1680.00
<b>Mean</b>	535.71	434.82
<b>Low</b>	160.00	50.00
<b>No. of Samples</b>	49	697



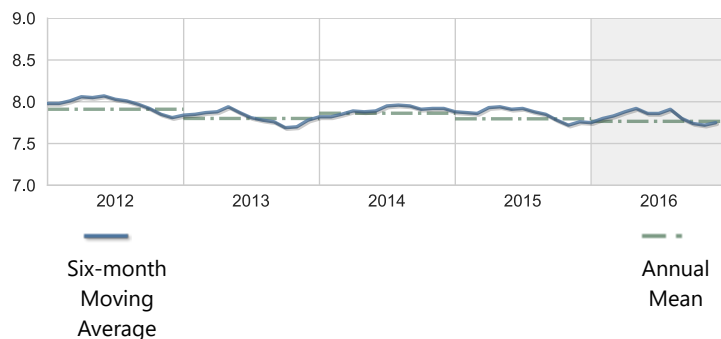
## Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2016	Historical period of record
<b>High</b>	67.00	108.00
<b>Mean</b>	17.61	12.80
<b>Low</b>	5.00	5.00
<b>No. of Samples</b>	49	784



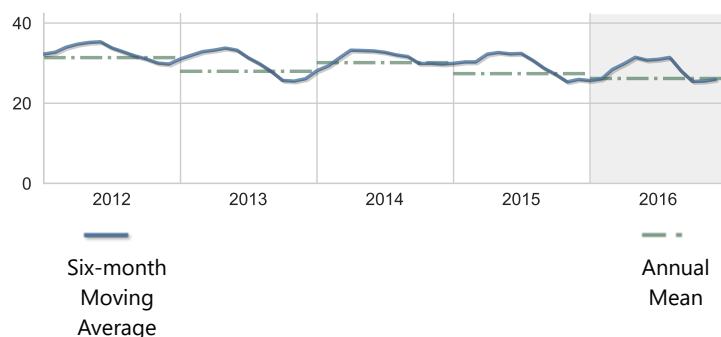
## pH

Units: None	Year 2016	Historical period of record
<b>High</b>	8.30	8.30
<b>Mean</b>	7.77	7.82
<b>Low</b>	7.10	6.70
<b>No. of Samples</b>	52	660



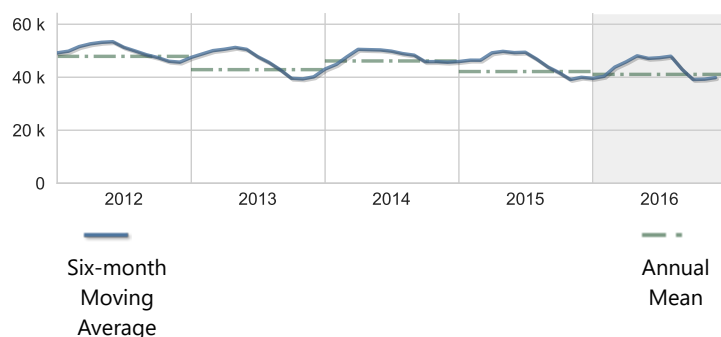
## Salinity

Units: PSS	Year 2016	Historical period of record
<b>High</b>	36.00	38.50
<b>Mean</b>	26.18	30.24
<b>Low</b>	0.16	0.10
<b>No. of Samples</b>	48	656



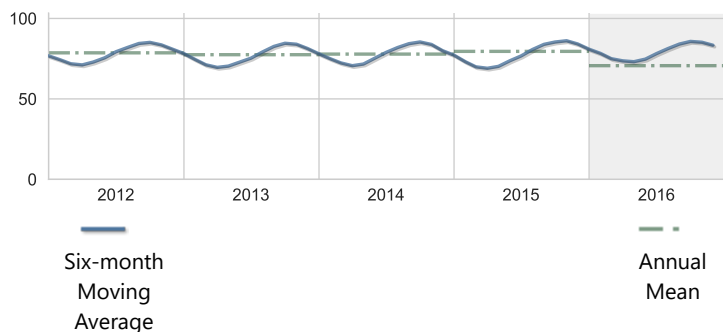
## Specific conductance

Units: umho	Year 2016	Historical period of record
<b>High</b>	54270.00	57710.00
<b>Mean</b>	41075.50	46224.35
<b>Low</b>	326.00	280.00
<b>No. of Samples</b>	52	660



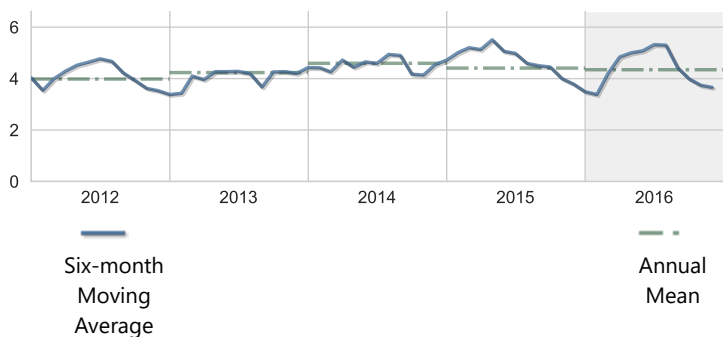
## Temperature, water

Units: deg F	Year 2016	Historical period of record
<b>High</b>	73.94	94.46
<b>Mean</b>	70.66	77.82
<b>Low</b>	66.92	50.90
<b>No. of Samples</b>	8	616



## Turbidity

Units: NTU	Year 2016	Historical period of record
<b>High</b>	14.00	23.00
<b>Mean</b>	4.34	4.24
<b>Low</b>	1.10	0.35
<b>No. of Samples</b>	49	689



## Annual Averages

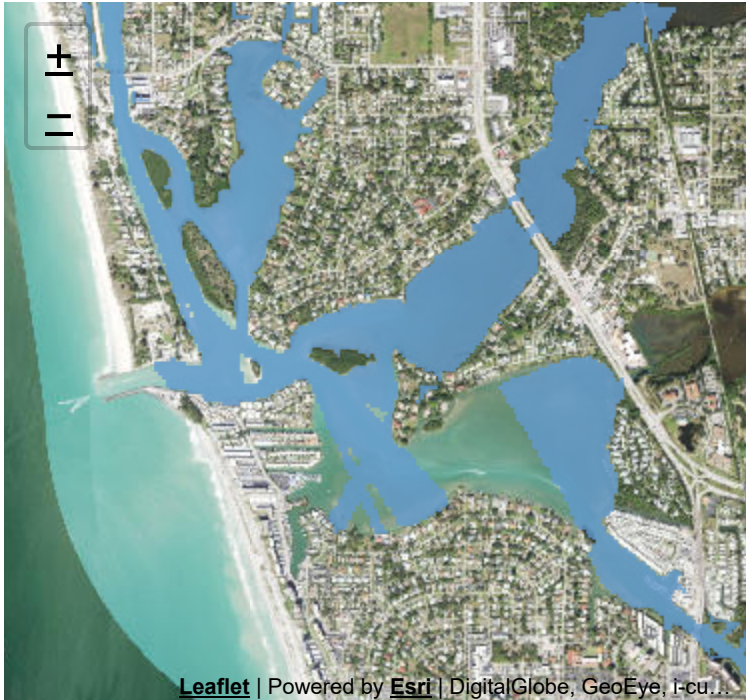
Indicator	Units	2012	2013	2014	2015	2016	Trend
Dissolved Oxygen	mg/l	5.84	6.06	5.93	6.15	6.16	
Dissolved oxygen saturation	percent (%)	86.58	86.79	86.19	89.27	89.00	
Light Attenuation	K(1/m)	1.03	1.20	1.14	1.39	1.57	
Salinity	PSS	31.38	27.97	30.13	27.39	26.18	
Turbidity	NTU	3.98	4.23	4.59	4.41	4.34	



## 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



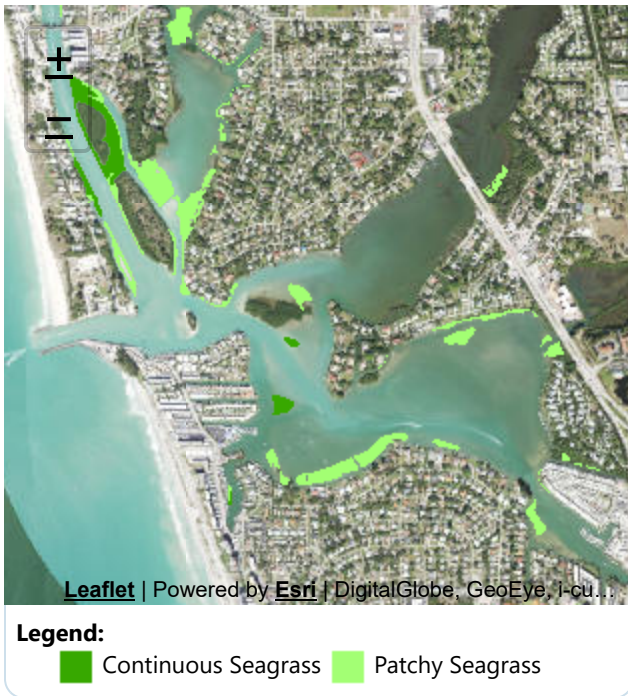
### Contour Legend:

- 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

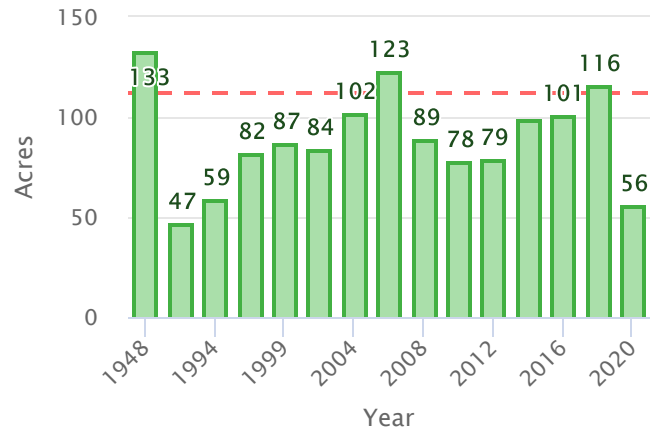
## Seagrasses

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:



Seagrass Acreage Variation within Dona/Roberts Bay



--- Target 112 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.

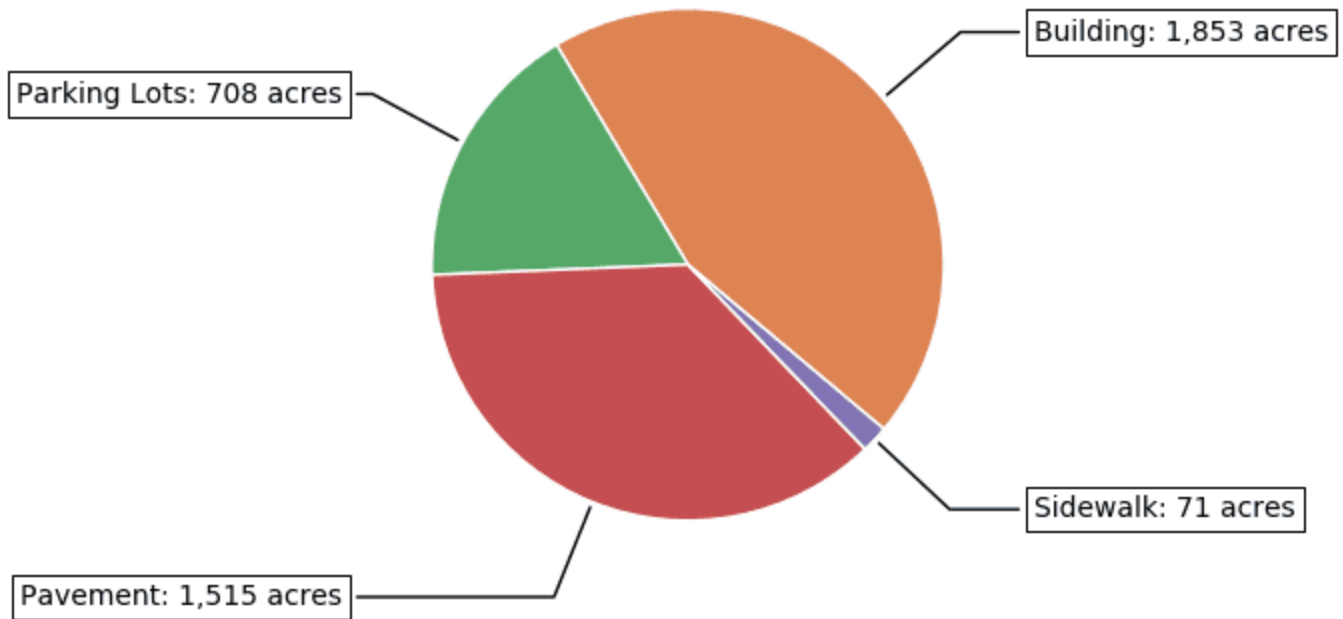


**7%** of the land area within the **Dona and Roberts Bay Watershed** is covered by

impervious surfaces

## 2014 Impervious Surface Coverage by Type

in acres, within the Dona and Roberts Bay Watershed







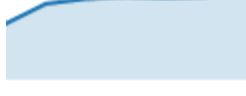
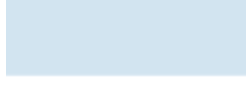

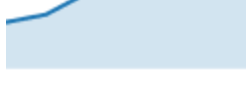
### Land Use / Land Cover

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.

Dona/Roberts Bay is located within the Dona and Roberts Bay Watershed. The chart below shows the land use / land cover characteristics for Dona and Roberts Bay Watershed within the boundary of this Water Atlas. **[View details about the Dona and Roberts Bay Watershed »](#)**

**Acreeage and Percentage within each Land Use / Land Cover Category for Dona and Roberts Bay Watershed**

2016 Bay Conditions Report for Dona/Roberts Bay

Land Use Classification	1990	2005	2011	2014	2017	Trend
<b>Urban &amp; Built-up</b>	11,519 20.6%	17,101 30.6%	17,697 31.6%	17,841 31.9%	18,538 33.1%	
<b>Agriculture</b>	14,257 25.5%	14,438 25.8%	13,410 24%	13,170 23.5%	12,994 23.2%	
<b>Rangeland</b>	3,989 7.1%	1,715 3.1%	2,104 3.8%	2,309 4.1%	1,792 3.2%	
<b>Upland Forests</b>	12,688 22.7%	7,906 14.1%	7,742 13.8%	7,701 13.8%	7,480 13.4%	
<b>Water</b>	1,931 3.5%	2,865 5.1%	2,813 5%	2,866 5.1%	3,009 5.4%	
<b>Wetlands</b>	10,349 18.5%	9,808 17.5%	9,907 17.7%	9,795 17.5%	9,839 17.6%	
<b>Barren Land</b>	22 0%	10 0%	84 0.2%	51 0.1%	46 0.1%	
<b>Transportation and Utilities</b>	1,202 2.1%	2,099 3.8%	2,185 3.9%	2,209 3.9%	2,262 4%	

### 2017 Land Use / Land Cover for Dona and Roberts Bay Watershed

as a percentage of land area for this watershed

