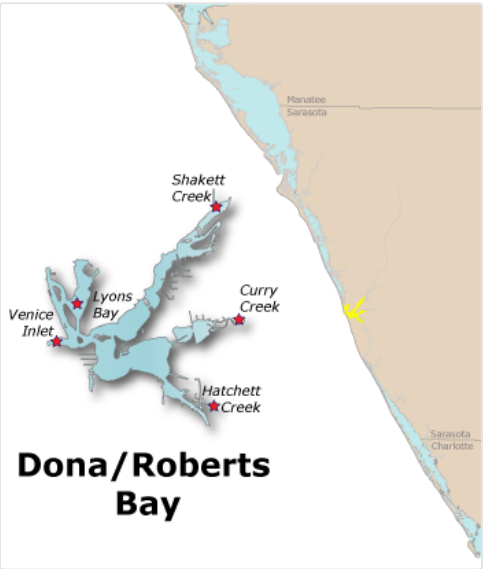
Dona/Roberts Bay Condition Report for 2011

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 has remained in fair condition. Two water quality indicators, chlorophyll *a* and nitrogen, were scored as caution (levels above threshold). However, the biotic indicator, seagrass, has increased in coverage and was now above the target acreage.

Water quality: 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).Only one water quality indicator, phosphorus, was rated as pass (below the threshold) and remained in excellent condition. The mean phosphorus level (0.0747 mg/l) has decreased since 2010 and remains below the target (0.170 mg/l) and threshold (0.180 mg/l) levels. The mean nitrogen and mean chlorophyll *a* levels were both scored as caution due to levels exceeding the threshold level (nitrogen threshold level = 0.420 mg/l, chlorophyll *a* threshold level = 0.0049 mg/l). The mean nitrogen level was calculated as 395.5ug/l and the mean chlorophyll *a* level was calculated as 0.0057 mg/l).

Biotic Indicator: The biotic indicator, seagrass, was in good condition with a continued increase in acreage since 1988. In 2010 the total acreage was 138, a 194% increase since 1988.

Water Chemistry Ratings

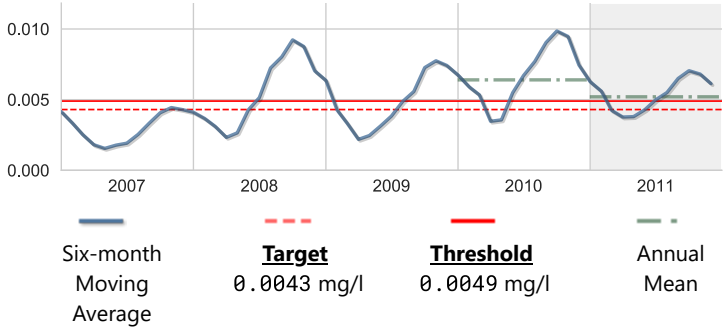
Total nitrogen, total phosphorus, and chlorophyll *a* levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along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

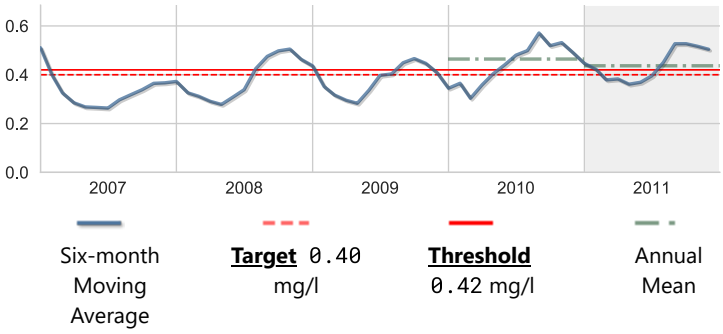
Units: mg/l	Year 2011	Historical period of record
High	0.015	0.043
Mean	0.005	0.005
Low	0.001	0.000
No. of Samples	48	445



N Nitrogen, Total

Score: Caution

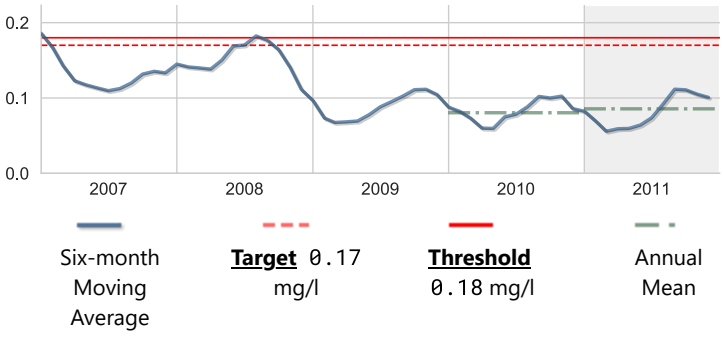
Units: mg/l	Year 2011	Historical period of record
High	1.686	1.686
Mean	0.437	0.408
Low	0.205	0.055
No. of Samples	48	438



P Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2011	Historical period of record
High	0.340	0.470
Mean	0.086	0.136
Low	0.050	0.050
No. of Samples	50	451

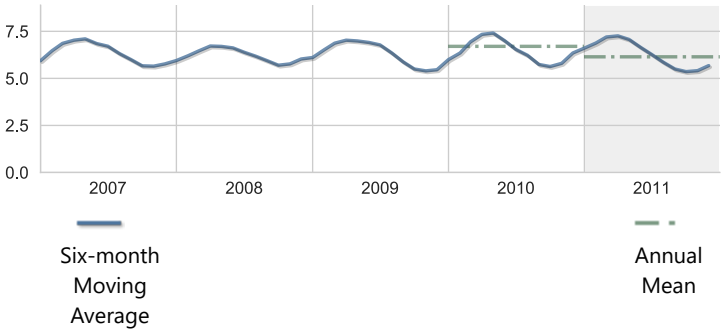


Other Measures of Bay Health

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.

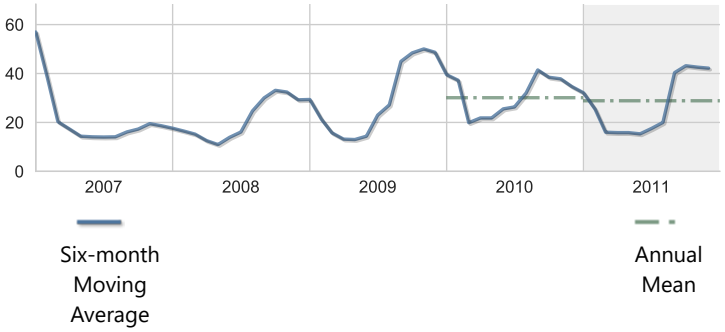
Dissolved Oxygen

Units: mg/l	Year 2011	Historical period of record
High	8.50	9.20
Mean	6.15	6.28
Low	3.90	2.90
No. of Samples	48	416



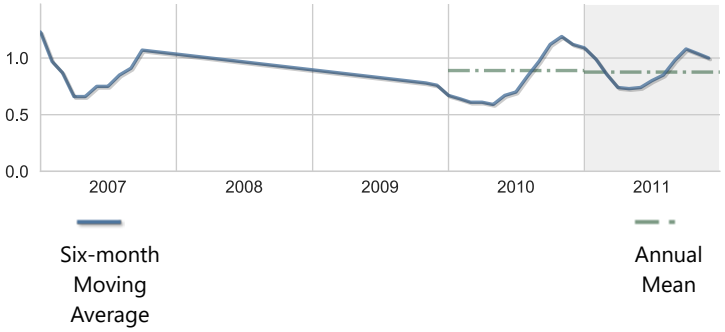
Apparent Color

Units: PCU	Year 2011	Historical period of record
High	360.00	380.00
Mean	28.86	34.48
Low	5.00	2.00
No. of Samples	50	451



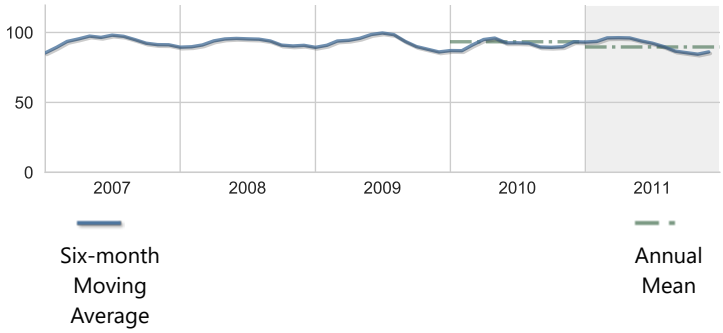
BOD, Biochemical oxygen demand

Units: mg/l	Year 2011	Historical period of record
High	2.10	8.50
Mean	0.88	1.08
Low	0.50	0.50
No. of Samples	50	349



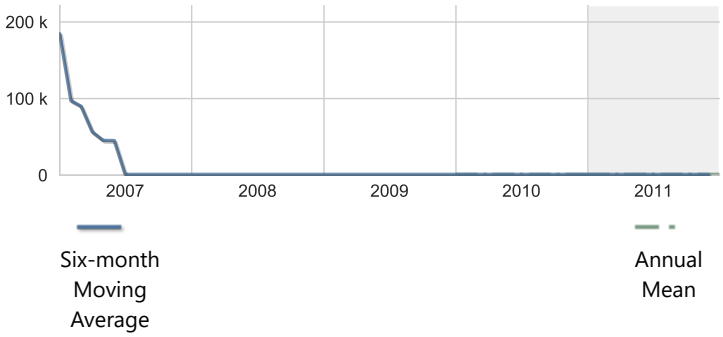
Dissolved oxygen saturation

Units: percent (%)	Year 2011	Historical period of record
High	108.00	129.00
Mean	89.63	91.68
Low	56.00	37.00
No. of Samples	48	416



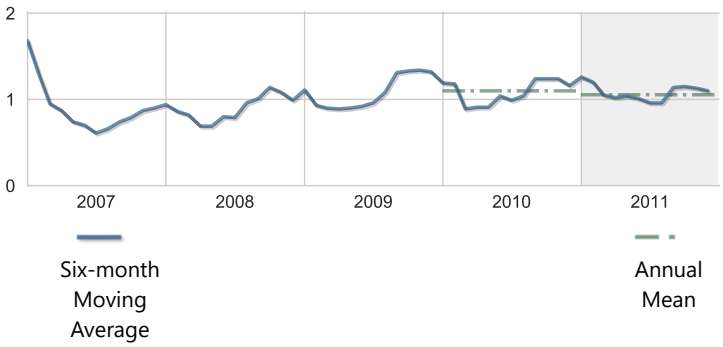
Karenia brevis ("red tide")

Units: #/l	Year 2011	Historical period of record
High	1000.00	1570000.00
Mean	1000.00	22522.44
Low	1000.00	1000.00
No. of Samples	48	312



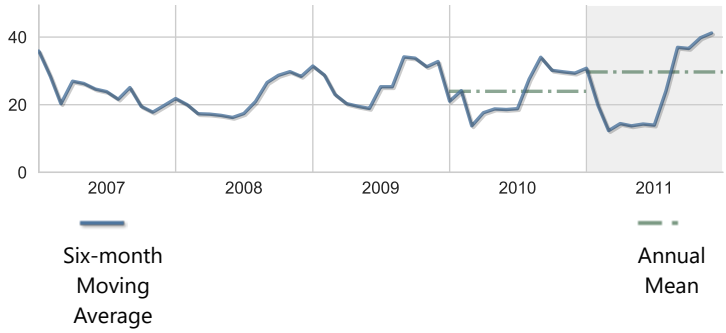
Light Attenuation

Units: K(1/m)	Year 2011	Historical period of record
High	3.59	9.04
Mean	1.05	1.07
Low	0.43	0.06
No. of Samples	48	408



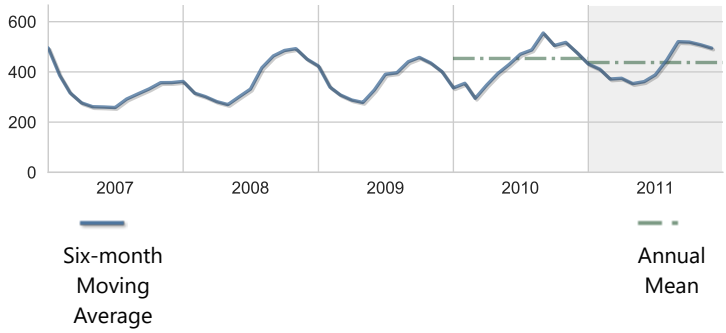
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2011	Historical period of record
High	193.00	326.00
Mean	29.68	25.78
Low	5.00	5.00
No. of Samples	50	451



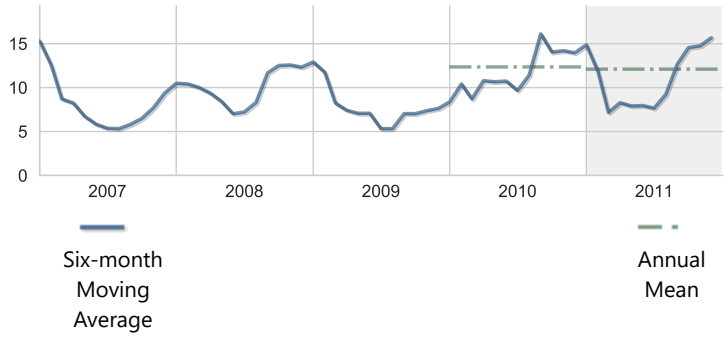
Nitrogen, Kjeldahl

Units: ug/l	Year 2011	Historical period of record
High	1620.00	1620.00
Mean	437.40	398.29
Low	200.00	50.00
No. of Samples	50	451



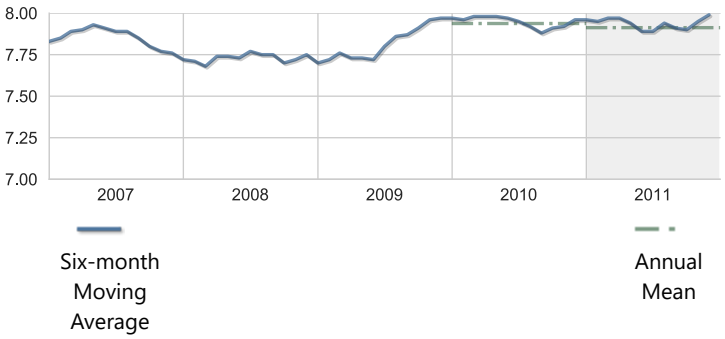
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2011	Historical period of record
High	66.00	88.00
Mean	12.10	10.71
Low	5.00	5.00
No. of Samples	50	538



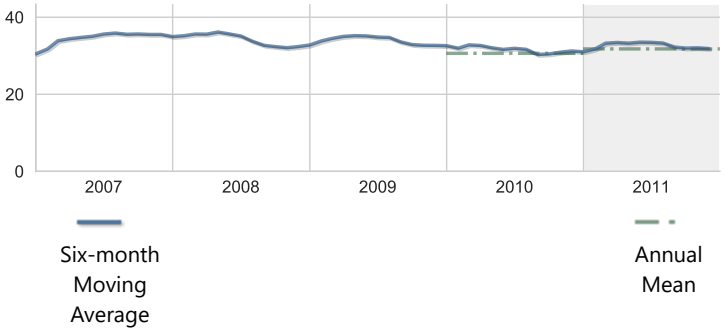
pH

Units: None	Year 2011	Historical period of record
High	8.20	8.30
Mean	7.91	7.82
Low	7.20	6.70
No. of Samples	48	416



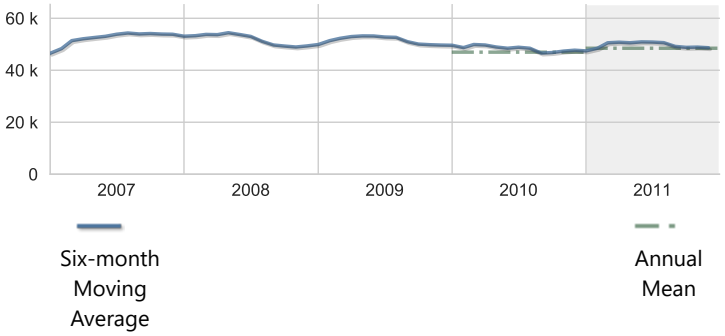
Salinity

Units: PSS	Year 2011	Historical period of record
High	35.40	38.50
Mean	31.78	31.17
Low	4.30	0.10
No. of Samples	48	416



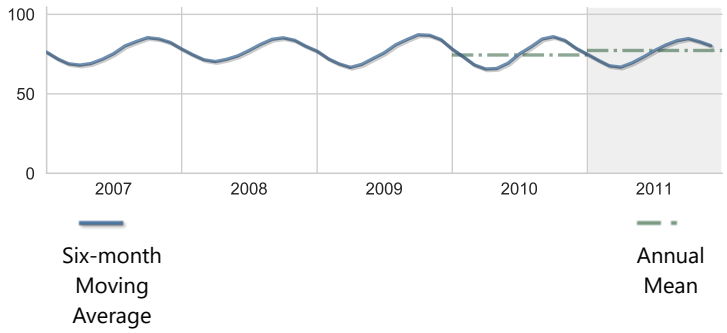
Specific conductance

Units: umho	Year 2011	Historical period of record
High	53530.00	57710.00
Mean	48468.75	47544.71
Low	7910.00	280.00
No. of Samples	48	416



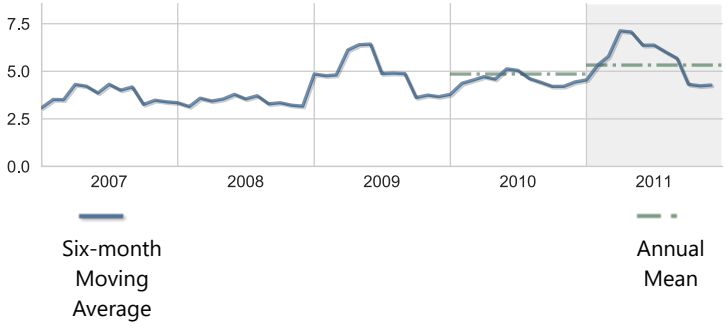
Temperature, water

Units: deg F	Year 2011	Historical period of record
High	89.42	94.46
Mean	77.27	77.70
Low	60.44	50.90
No. of Samples	48	416



Turbidity

Units: NTU	Year 2011	Historical period of record
High	20.00	23.00
Mean	5.33	4.21
Low	1.40	0.35
No. of Samples	48	444



Annual Averages

Indicator	Units	2007	2008	2009	2010	2011	Trend
Dissolved Oxygen	mg/l				6.70	6.15	
Dissolved oxygen saturation	percent (%)				93.35	89.63	
Light Attenuation	K(1/m)				1.10	1.05	
Salinity	PSS				30.63	31.78	
Turbidity	NTU				4.86	5.33	

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.

Showing 2011 Monthly Contour Maps for: Chlorophyll a

January

Contour Legend:

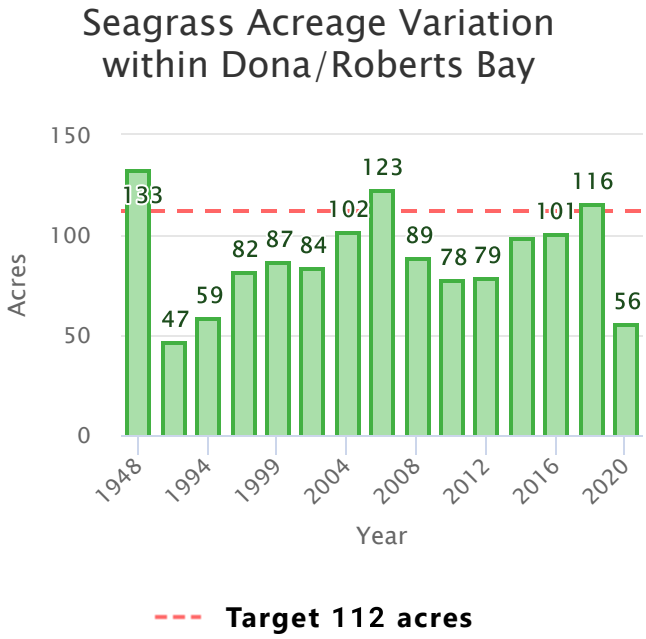
- Less than 1 mg/l
- 1.0 - 5.9 mg/l
- 6.0 - 10.9 mg/l
- 11.0 - 17.9 mg/l
- Greater than 18 mg/l

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:

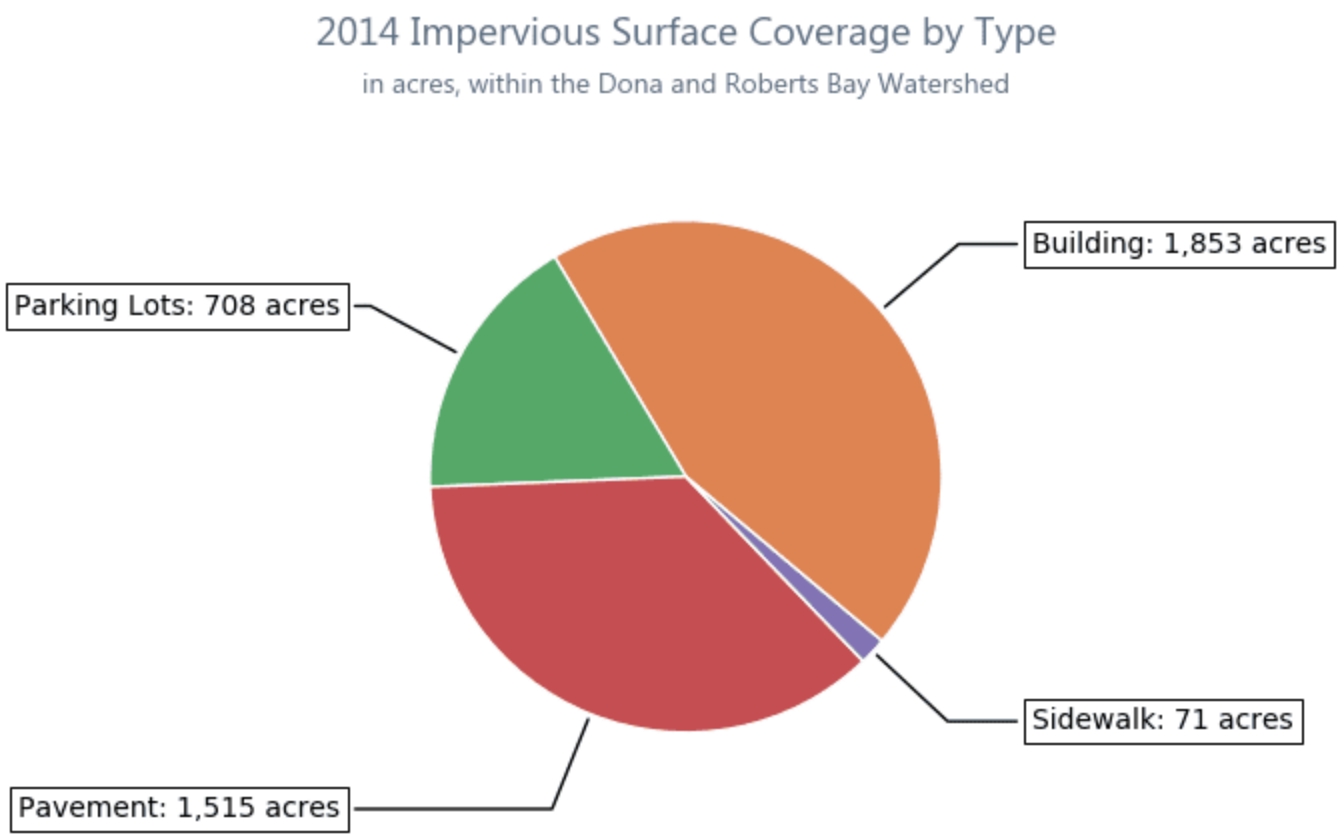
Legend:
Continuous Seagrass Patchy Seagrass



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.

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



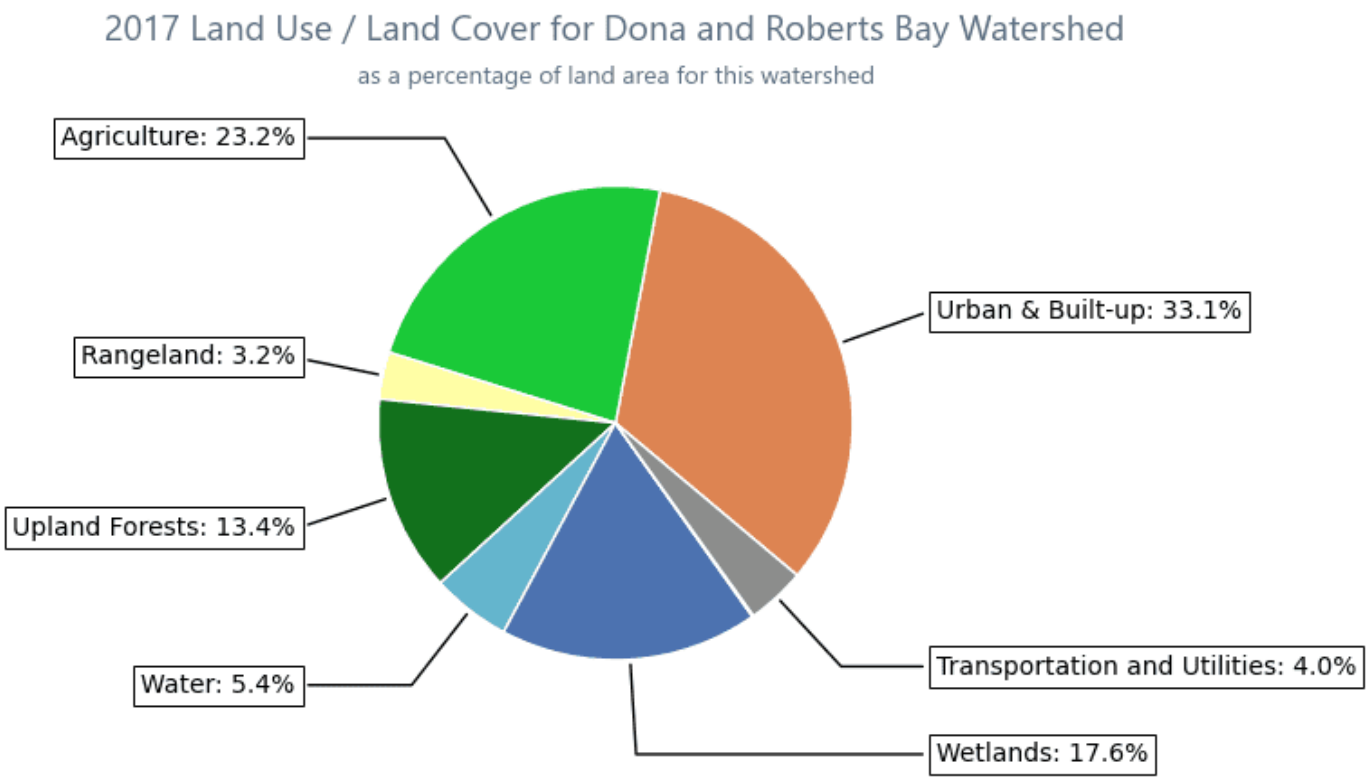
Land Use / Land Cover

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.

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 »**

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

Land Use Classification	1990	2005	2011	2014	2017	Trend
Urban & Built-up	11,519 **20.6%**	17,101 **30.6%**	17,697 **31.6%**	17,841 **31.9%**	18,538 **33.1%**	
Agriculture	14,257 **25.5%**	14,438 **25.8%**	13,410 **24%**	13,170 **23.5%**	12,994 **23.2%**	
Rangeland	3,989 **7.1%**	1,715 **3.1%**	2,104 **3.8%**	2,309 **4.1%**	1,792 **3.2%**	
Upland Forests	12,688 **22.7%**	7,906 **14.1%**	7,742 **13.8%**	7,701 **13.8%**	7,480 **13.4%**	
Water	1,931 **3.5%**	2,865 **5.1%**	2,813 **5%**	2,866 **5.1%**	3,009 **5.4%**	
Wetlands	10,349 **18.5%**	9,808 **17.5%**	9,907 **17.7%**	9,795 **17.5%**	9,839 **17.6%**	
Barren Land	22 **0%**	10 **0%**	84 **0.2%**	51 **0.1%**	46 **0.1%**	
Transportation and Utilities	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
Agriculture: 23.2%
Urban & Built-up: 33.1%
Rangeland: 3.2%
Upland Forests: 13.4%
Water: 5.4%
Transportation and Utilities: 4.0%
Wetlands: 17.6%