

## Roberts Bay Condition Report for 2011



# PASS



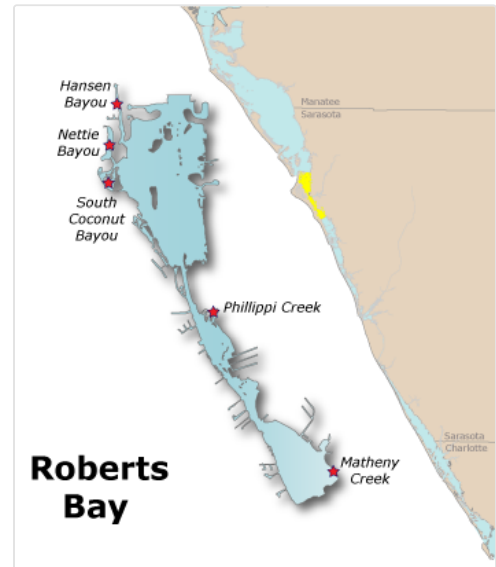
3 out of 3  
indicators were  
rated as **PASS**.

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

### Summary:

The overall health of Roberts Bay has improved since 2010 with all water quality parameters below the threshold levels, the caution alert for chlorophyll *a* has been removed. However, levels of seagrass still remain below the target level.

*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). The mean chlorophyll *a* level in Roberts Bay has improved since 2010 (0.0098 mg/l) and was scored as good (scored as caution in 2010), below the threshold (0.011 mg/l). The nitrogen level has increased, although the mean nitrogen level was below the threshold (0.540 mg/l), it exceeds the target level (0.450 mg/l) and was scored as good. The phosphorus level has slightly increased, however the mean level (0.0923 mg/l) was still below the target level (0.190 mg/l) and was scored as excellent.



**Bays included in this report:**  
**Grand Canal, Hansen Bayou,**  
**Nettie Bayou, Roberts Bay,**  
**Sarasota, South Coconut**  
**Bayou**

*Biotic Indicator:* The total acreage of seagrass has remained relatively constant since 1988 but in 2010 the average level of seagrass (283 acres) was still below the 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.

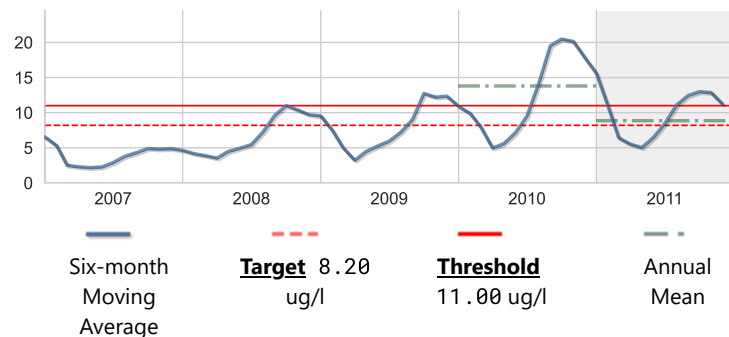
The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.



### Chlorophyll a

**Score:** Good

| Units: ug/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 24.62     | 48.42                       |
| <b>Mean</b>           | 8.86      | 7.75                        |
| <b>Low</b>            | 0.74      | 0.33                        |
| <b>No. of Samples</b> | 60        | 885                         |

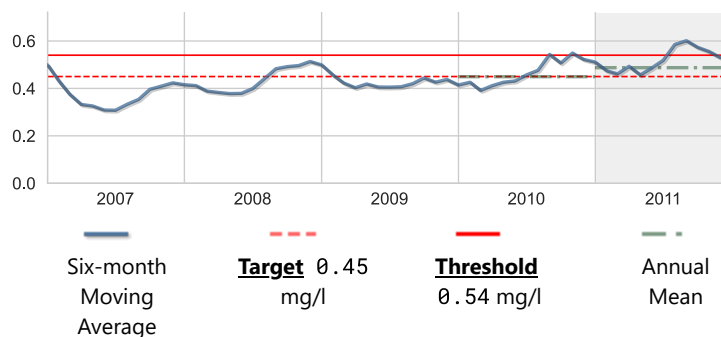


N

**Nitrogen, Total**

Score: Good

| Units: mg/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 0.791     | 1.376                       |
| <b>Mean</b>           | 0.487     |                             |
| <b>Low</b>            | 0.245     | 0.065                       |
| <b>No. of Samples</b> | 60        | 876                         |

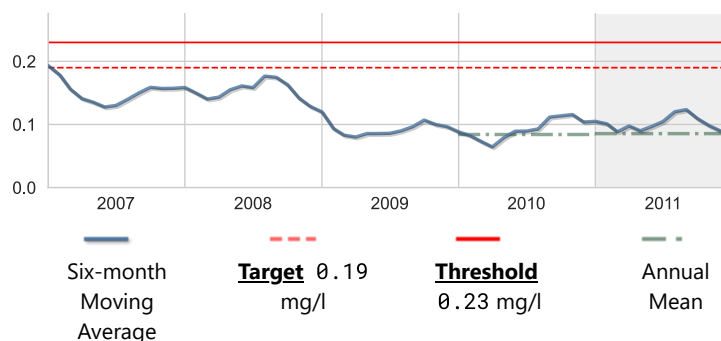


P

**Phosphorus, Total**

Score: Excellent

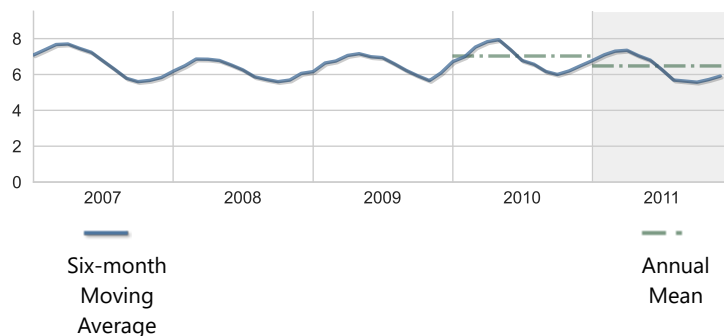
| Units: mg/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 0.260     | 0.480                       |
| <b>Mean</b>           | 0.085     | 0.148                       |
| <b>Low</b>            | 0.050     | 0.050                       |
| <b>No. of Samples</b> | 61        | 905                         |

**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.

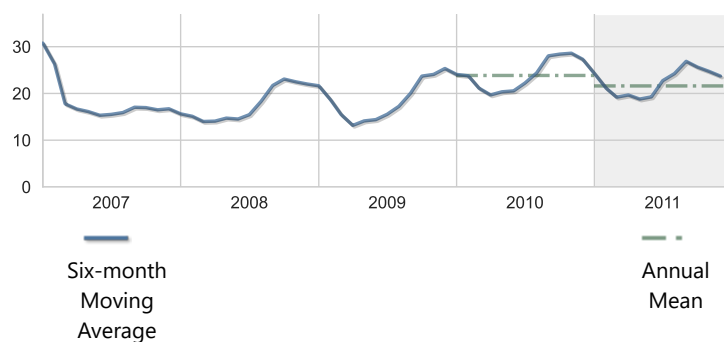
## Dissolved Oxygen

| Units: mg/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 9.70      | 11.40                       |
| <b>Mean</b>           | 6.48      | 6.47                        |
| <b>Low</b>            | 4.50      | 3.60                        |
| <b>No. of Samples</b> | 60        | 1021                        |



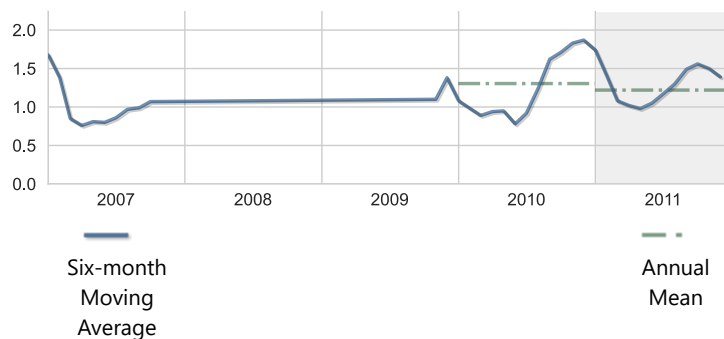
## Apparent Color

| Units: PCU            | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 50.00     | 150.00                      |
| <b>Mean</b>           | 21.61     | 23.36                       |
| <b>Low</b>            | 5.00      | 2.00                        |
| <b>No. of Samples</b> | 61        | 905                         |



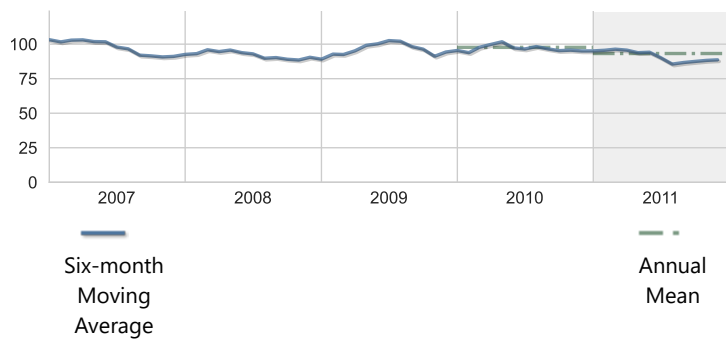
## BOD, Biochemical oxygen demand

| Units: mg/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 2.50      | 5.90                        |
| <b>Mean</b>           | 1.22      | 1.43                        |
| <b>Low</b>            | 0.50      | 0.50                        |
| <b>No. of Samples</b> | 61        | 769                         |



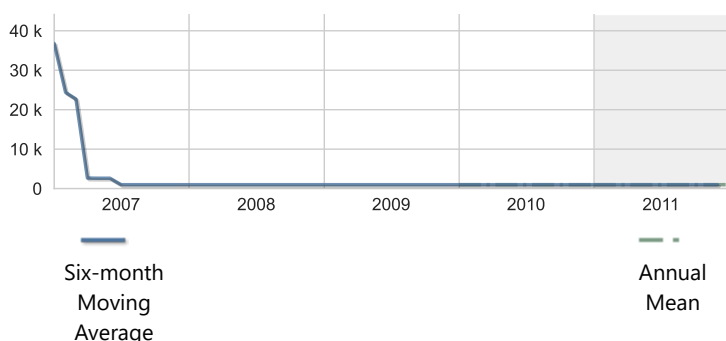
## Dissolved oxygen saturation

| Units: percent (%)    | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 123.00    | 173.00                      |
| <b>Mean</b>           | 93.23     | 93.94                       |
| <b>Low</b>            | 70.00     | 50.00                       |
| <b>No. of Samples</b> | 61        | 1046                        |



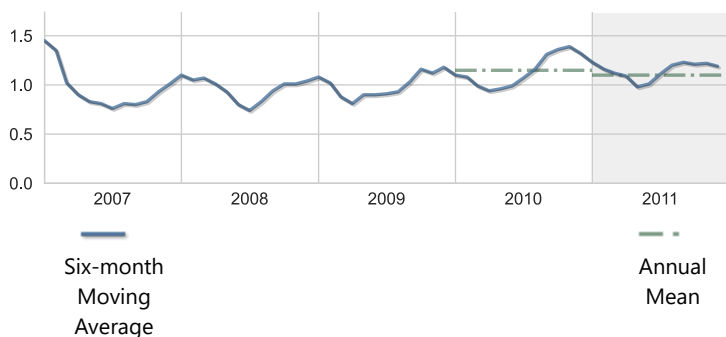
## Karenia brevis ("red tide")

| Units: #/l            | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 1000.00   | 912000.00                   |
| <b>Mean</b>           | 1000.00   | 9722.50                     |
| <b>Low</b>            | 1000.00   | 1000.00                     |
| <b>No. of Samples</b> | 61        | 400                         |



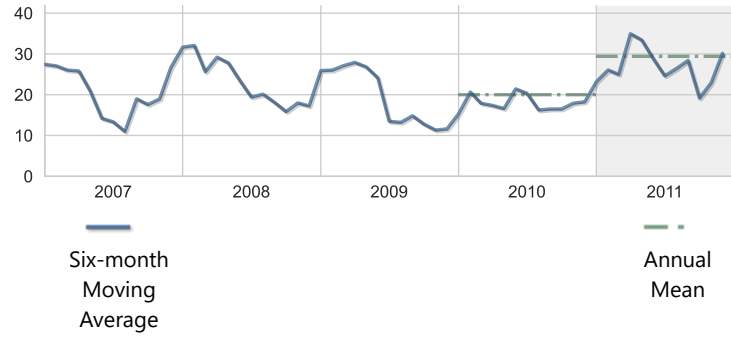
## Light Attenuation

| Units: K(1/m)         | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 1.89      | 3.56                        |
| <b>Mean</b>           | 1.10      | 1.02                        |
| <b>Low</b>            | 0.36      | 0.19                        |
| <b>No. of Samples</b> | 60        | 827                         |



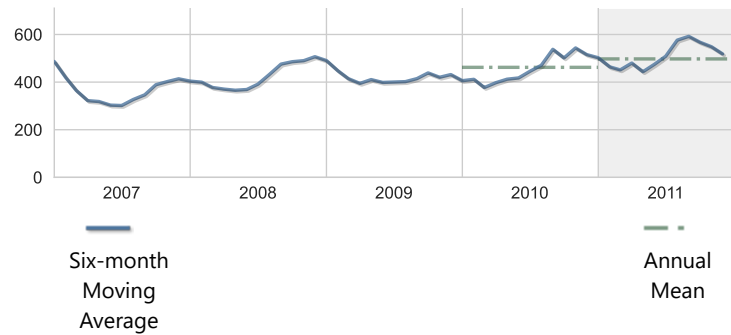
## Nitrogen, Ammonia + Ammonium as N

| Units: ug/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 109.00    | 243.00                      |
| <b>Mean</b>           | 29.41     | 24.90                       |
| <b>Low</b>            | 5.00      | 5.00                        |
| <b>No. of Samples</b> | 61        | 905                         |



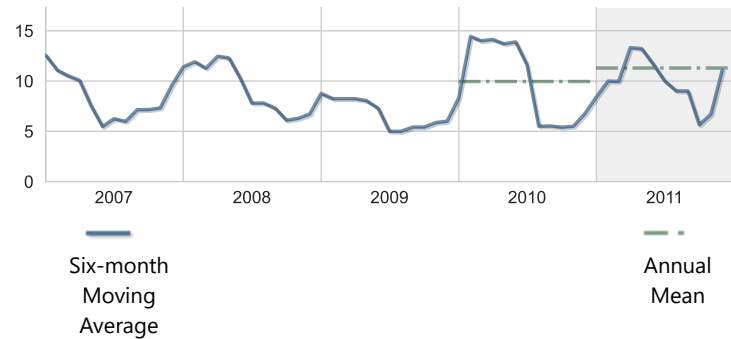
## Nitrogen, Kjeldahl

| Units: ug/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 770.00    | 1320.00                     |
| <b>Mean</b>           | 497.38    | 430.84                      |
| <b>Low</b>            | 240.00    | 60.00                       |
| <b>No. of Samples</b> | 61        | 905                         |



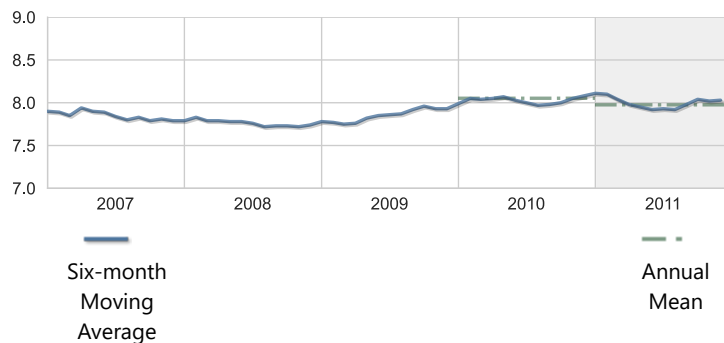
## Nitrogen, Nitrite + Nitrate as N

| Units: ug/l           | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 62.00     | 339.00                      |
| <b>Mean</b>           | 11.30     | 12.10                       |
| <b>Low</b>            | 5.00      | 5.00                        |
| <b>No. of Samples</b> | 61        | 1337                        |



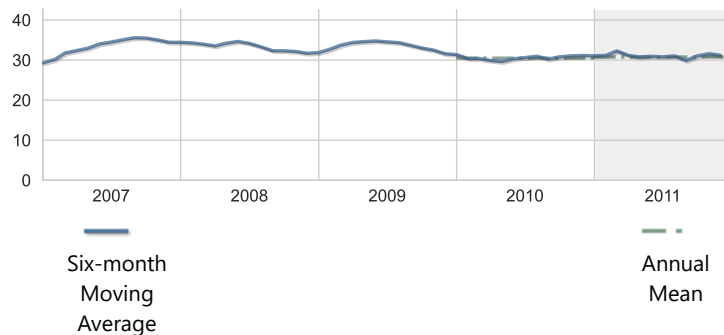
## pH

| Units: None           | Year<br>2011 | Historical<br>period of record |
|-----------------------|--------------|--------------------------------|
| <b>High</b>           | 8.30         | 8.40                           |
| <b>Mean</b>           | 7.98         | 7.87                           |
| <b>Low</b>            | 7.60         | 7.10                           |
| <b>No. of Samples</b> | 61           | 1046                           |



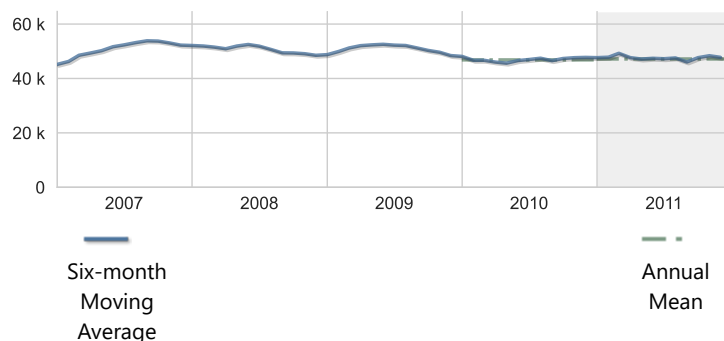
## Salinity

| Units: PSS            | Year<br>2011 | Historical<br>period of record |
|-----------------------|--------------|--------------------------------|
| <b>High</b>           | 35.40        | 38.80                          |
| <b>Mean</b>           | 30.77        | 30.68                          |
| <b>Low</b>            | 19.80        | 1.80                           |
| <b>No. of Samples</b> | 60           | 1023                           |



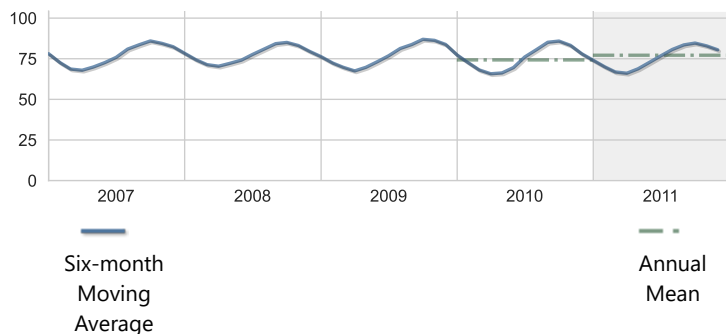
## Specific conductance

| Units: umho               | Year<br>2011 | Historical<br>period of<br>record |
|---------------------------|--------------|-----------------------------------|
| <b>High</b>               | 53820.00     | 58320.00                          |
| <b>Mean</b>               | 47166.23     | 46933.43                          |
| <b>Low</b>                | 31760.00     | 3370.00                           |
| <b>No. of<br/>Samples</b> | 61           | 1046                              |



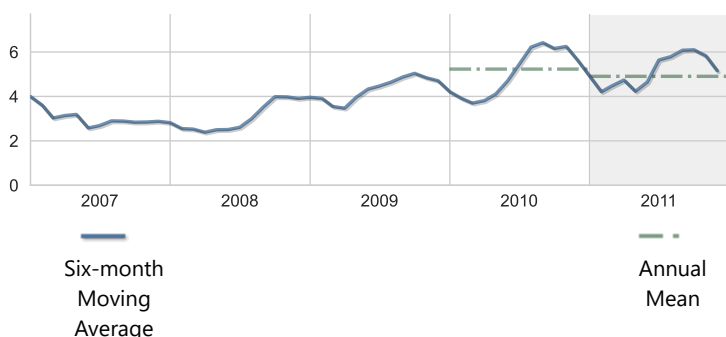
## Temperature, water

| Units: deg F          | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 88.52     | 92.48                       |
| <b>Mean</b>           | 77.16     | 77.55                       |
| <b>Low</b>            | 62.42     | 48.56                       |
| <b>No. of Samples</b> | 61        | 1046                        |



## Turbidity

| Units: NTU            | Year 2011 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| <b>High</b>           | 9.50      | 24.00                       |
| <b>Mean</b>           | 4.91      | 4.19                        |
| <b>Low</b>            | 0.85      | 0.85                        |
| <b>No. of Samples</b> | 60        | 880                         |



## Annual Averages

| Indicator                   | Units       | 2007 | 2008 | 2009 | 2010  | 2011  | Trend |
|-----------------------------|-------------|------|------|------|-------|-------|-------|
| Dissolved Oxygen            | mg/l        |      |      |      | 7.03  | 6.48  |       |
| Dissolved oxygen saturation | percent (%) |      |      |      | 97.69 | 93.23 |       |
| Light Attenuation           | K(1/m)      |      |      |      | 1.15  | 1.10  |       |
| Salinity                    | PSS         |      |      |      | 30.48 | 30.77 |       |
| Turbidity                   | NTU         |      |      |      | 5.23  | 4.91  |       |



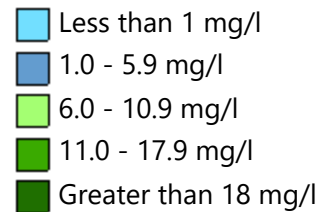
## Bay Contour Maps (2011)

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



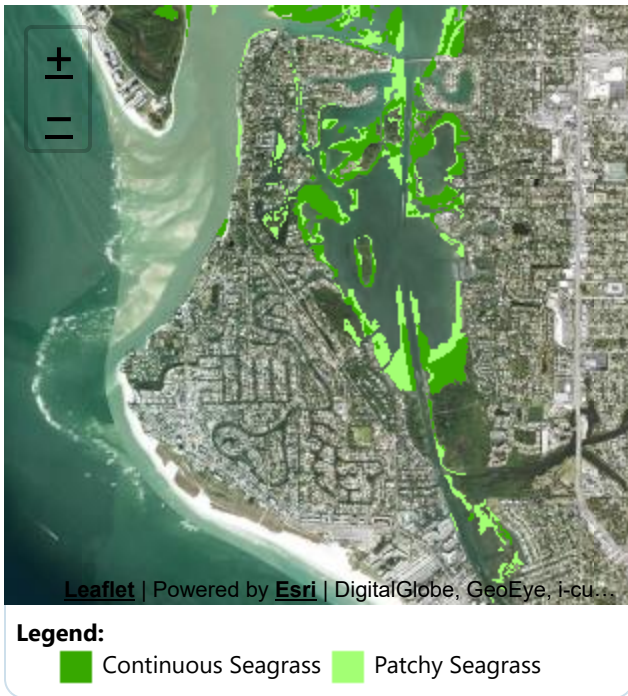
### Contour Legend:



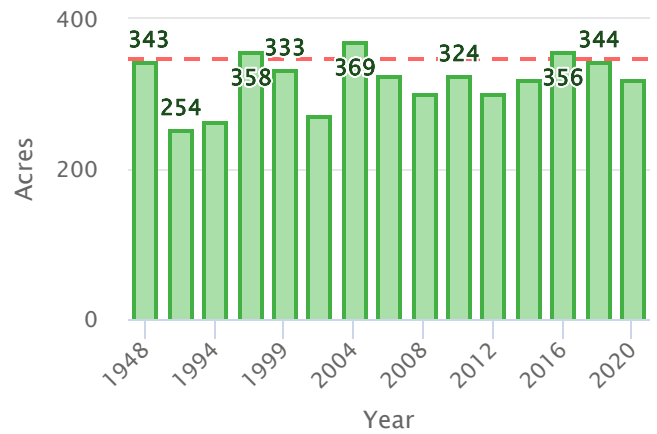
## Seagrasses

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 Roberts Bay



--- Target 348 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.

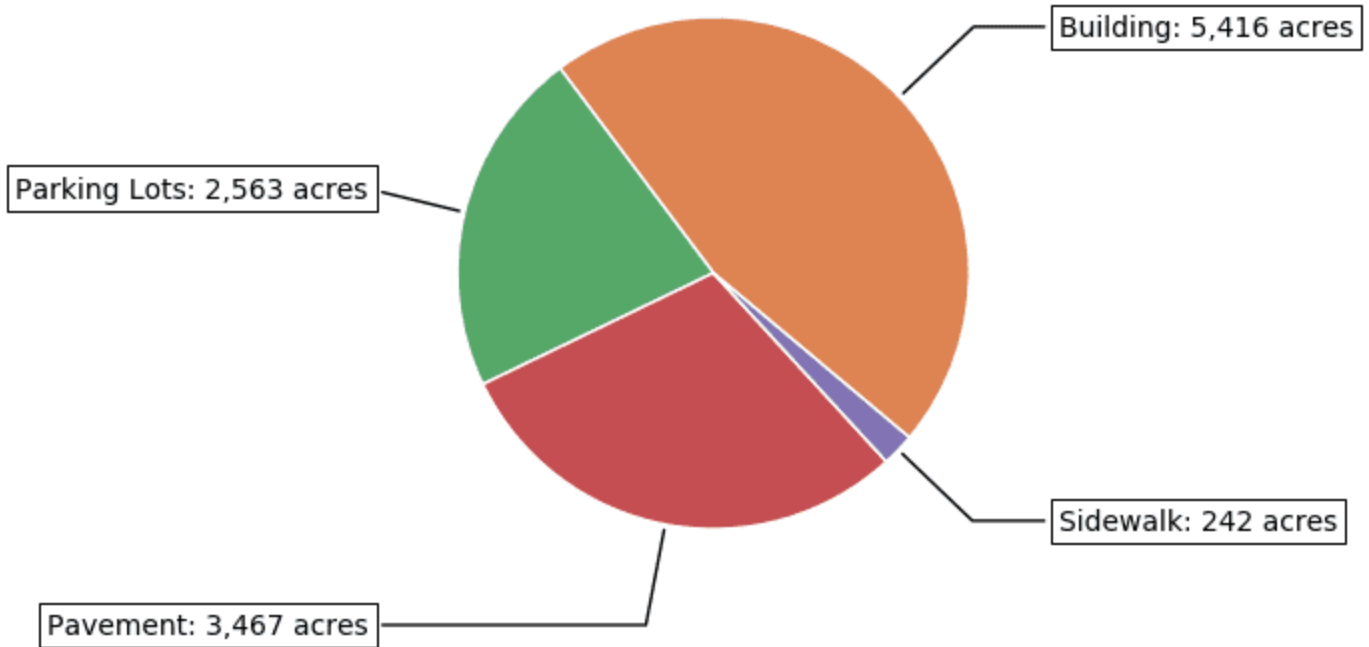


**19%** of the land area within the **Sarasota Bay Watershed** is covered by

impervious surfaces

## 2014 Impervious Surface Coverage by Type

in acres, within the Sarasota 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.

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 »](#)**

#### **Acreege and Percentage within each Land Use / Land Cover Category for Sarasota Bay Watershed**

2011 Bay Conditions Report for Roberts Bay

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

## 2020 Land Use / Land Cover for Sarasota Bay Watershed

as a percentage of land area for this watershed

