

Roberts Bay Condition Report for 2015



CAUTION



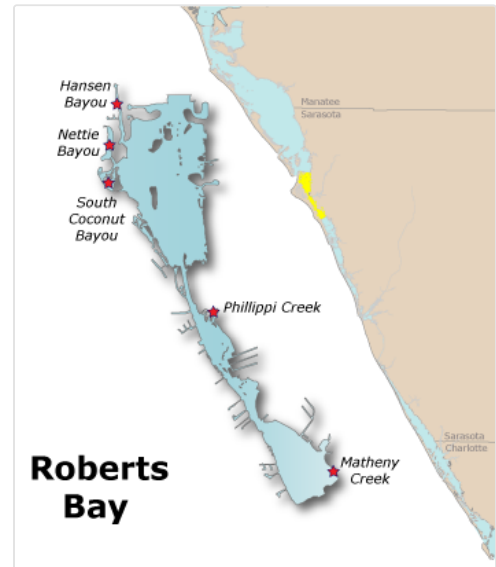
2 out of 3
indicators were
rated as **PASS**.

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

Summary:

The overall health of Roberts Bay was good in 2015, despite an increase in chlorophyll *a* concentration of 68.7%, compared to 2014. This increase caused it to exceed the threshold level. On a more positive note, mean nitrogen concentration decreased slightly. And while phosphorus concentration increased somewhat, it is still well below the target value of 0.23 mg/l.

Water Quality: Nitrogen and phosphorus retained their ratings from 2013 and 2014 ("Good" and "Excellent", respectively). Mean nitrogen concentration was 0.4927 mg/l and mean phosphorus concentration was 0.1023 mg/l. While chlorophyll *a* concentration had improved in 2014 to an "Excellent" rating, its significant increase pushed its 2015 rating down two notches, to "Caution." 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).



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

Biotic Indicator: Measurement of the biotic indicator, seagrass, was performed in 2014 by the Southwest Florida Water Management District. Total seagrass acreage in Roberts Bay increased slightly to 321 acres from its previous value and is creeping toward 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.

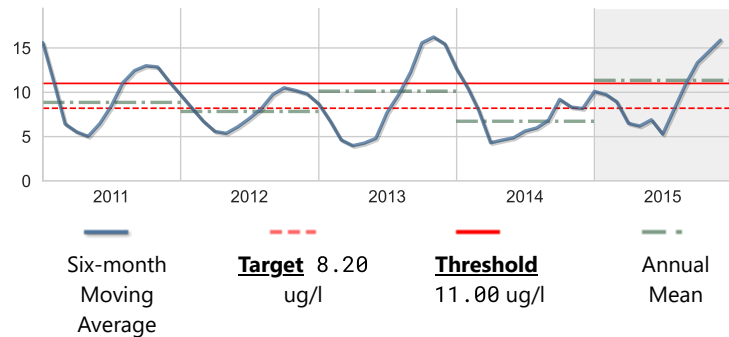
The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.



Chlorophyll a

Score: Caution

| Units: ug/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 31.84 | 48.42 |
| Mean | 11.35 | 8.03 |
| Low | 1.77 | 0.33 |
| No. of Samples | 66 | 1139 |

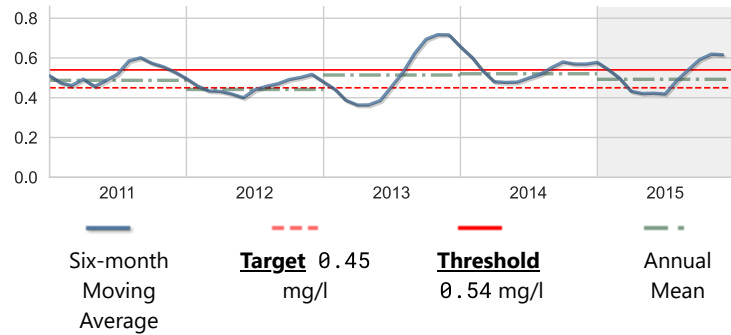


N

Nitrogen, Total

Score: Good

| Units: mg/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 0.997 | 1.376 |
| Mean | 0.493 | |
| Low | 0.235 | 0.065 |
| No. of Samples | 66 | 1131 |

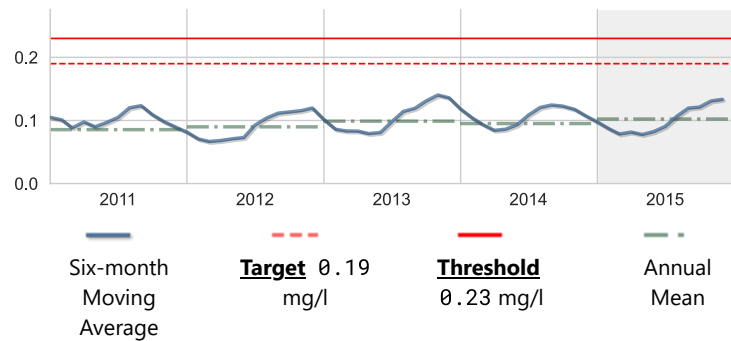


P

Phosphorus, Total

Score: Excellent

| Units: mg/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 0.230 | 0.480 |
| Mean | 0.102 | 0.134 |
| Low | 0.050 | 0.050 |
| No. of Samples | 66 | 1158 |

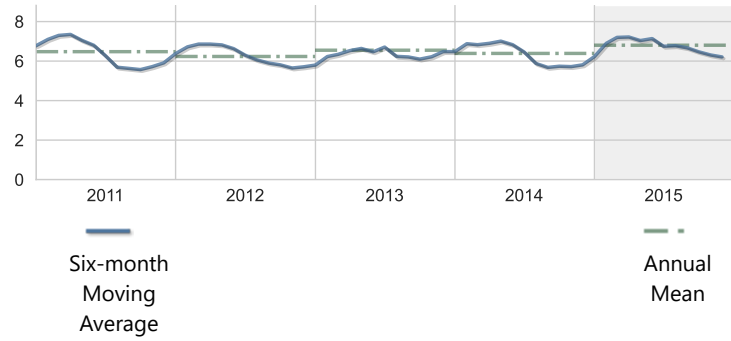


Other Measures of Bay Health

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.

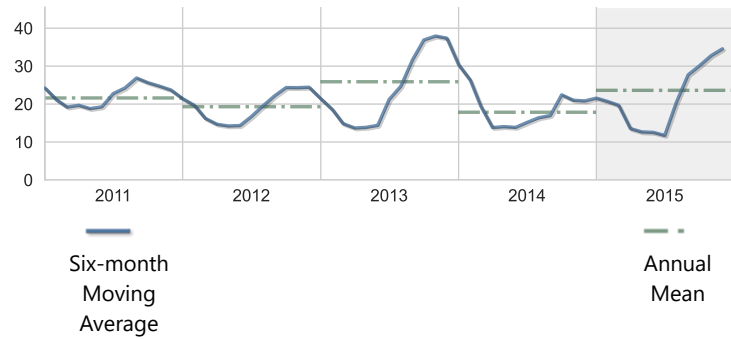
Dissolved Oxygen

| Units: mg/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 10.00 | 11.40 |
| Mean | 6.80 | 6.47 |
| Low | 4.70 | 3.50 |
| No. of Samples | 60 | 1270 |



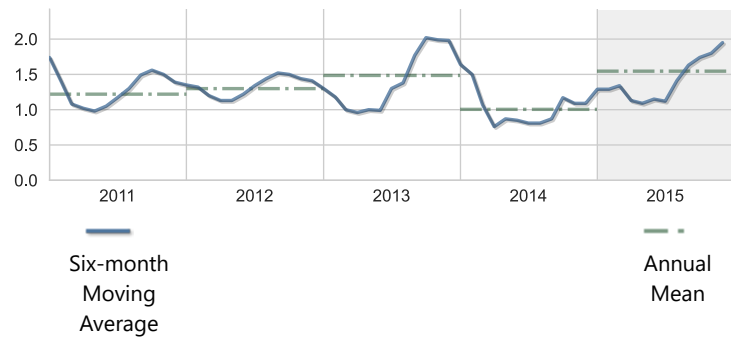
Apparent Color

| Units: PCU | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 110.00 | 150.00 |
| Mean | 23.62 | 22.98 |
| Low | 5.00 | 2.00 |
| No. of Samples | 66 | 1158 |



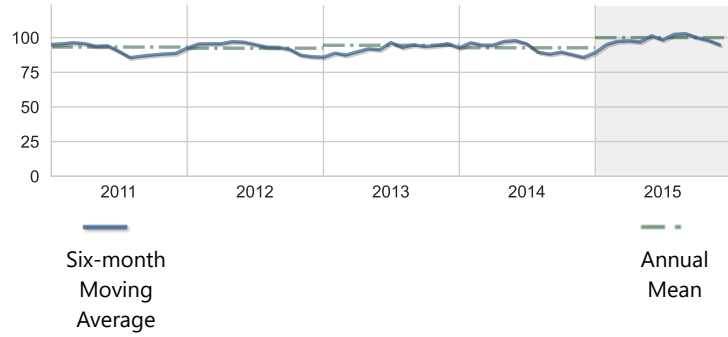
BOD, Biochemical oxygen demand

| Units: mg/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 3.40 | 5.90 |
| Mean | 1.55 | 1.41 |
| Low | 0.60 | 0.50 |
| No. of Samples | 66 | 1022 |



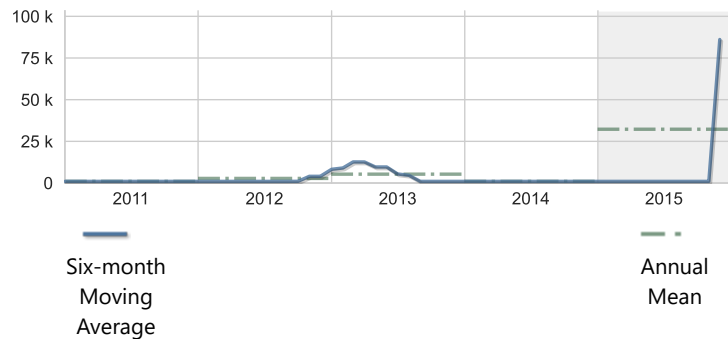
Dissolved oxygen saturation

| Units: percent (%) | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 154.00 | 173.00 |
| Mean | 100.05 | 94.12 |
| Low | 75.00 | 50.00 |
| No. of Samples | 60 | 1286 |



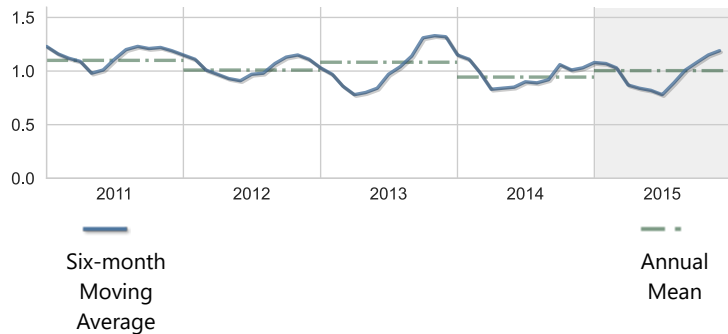
Karenia brevis ("red tide")

| Units: #/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 813000.00 | 912000.00 |
| Mean | 32265.31 | 9500.00 |
| Low | 1000.00 | 1000.00 |
| No. of Samples | 49 | 634 |



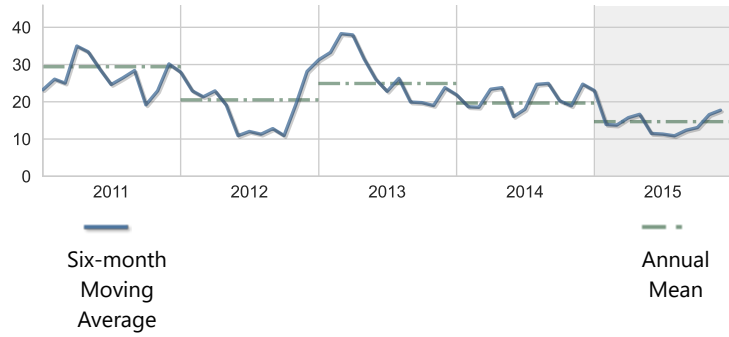
Light Attenuation

| Units: K(1/m) | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 1.88 | 3.56 |
| Mean | 1.00 | 1.02 |
| Low | 0.42 | 0.19 |
| No. of Samples | 60 | 1069 |



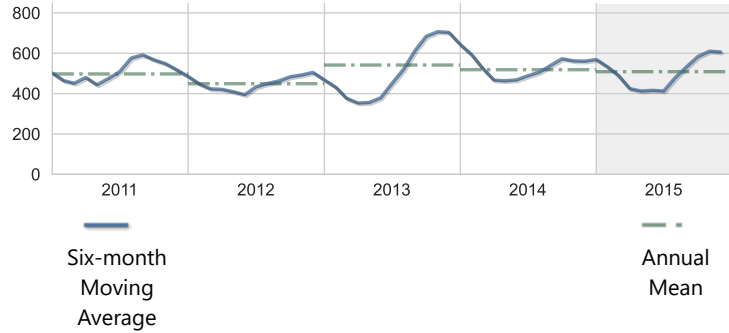
Nitrogen, Ammonia + Ammonium as N

| Units: ug/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 61.00 | 243.00 |
| Mean | 14.67 | 23.79 |
| Low | 5.00 | 5.00 |
| No. of Samples | 66 | 1158 |



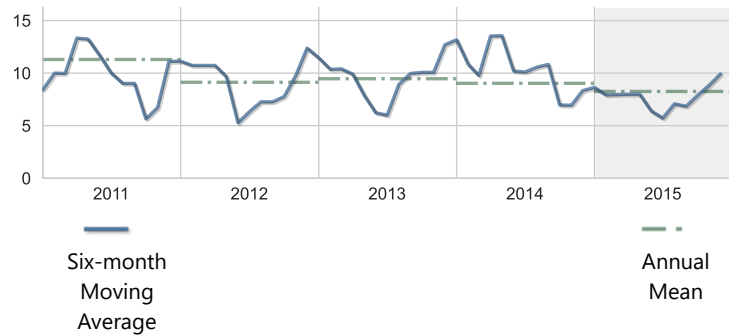
Nitrogen, Kjeldahl

| Units: ug/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 960.00 | 1320.00 |
| Mean | 508.64 | 446.84 |
| Low | 230.00 | 60.00 |
| No. of Samples | 66 | 1158 |



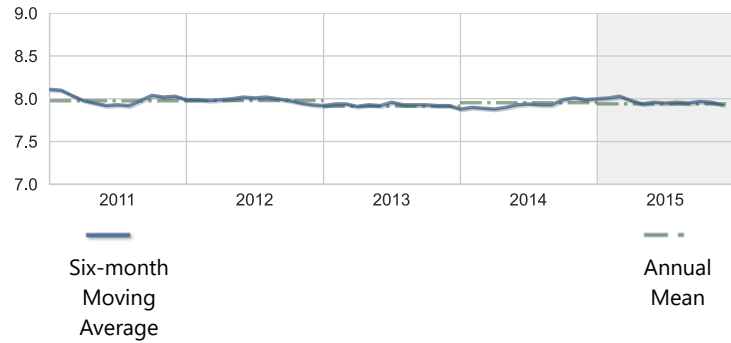
Nitrogen, Nitrite + Nitrate as N

| Units: ug/l | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 67.00 | 339.00 |
| Mean | 8.26 | 11.60 |
| Low | 5.00 | 5.00 |
| No. of Samples | 66 | 1590 |



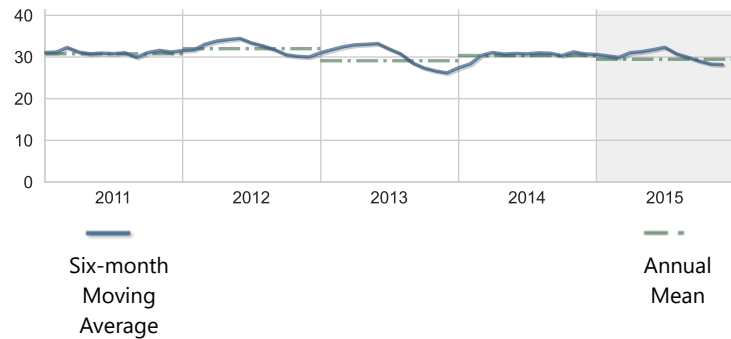
pH

| Units: None | Year 2015 | Historical period of record |
|-----------------------|--------------|--------------------------------|
| High | 8.20 | 8.40 |
| Mean | 7.94 | 7.88 |
| Low | 7.70 | 7.10 |
| No. of Samples | 60 | 1286 |



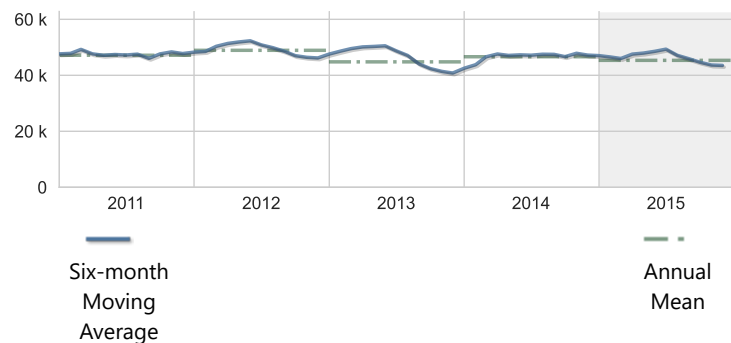
Salinity

| Units: PSS | Year 2015 | Historical period of record |
|-----------------------|--------------|--------------------------------|
| High | 34.80 | 38.80 |
| Mean | 29.46 | 30.59 |
| Low | 12.10 | 1.80 |
| No. of Samples | 60 | 1270 |



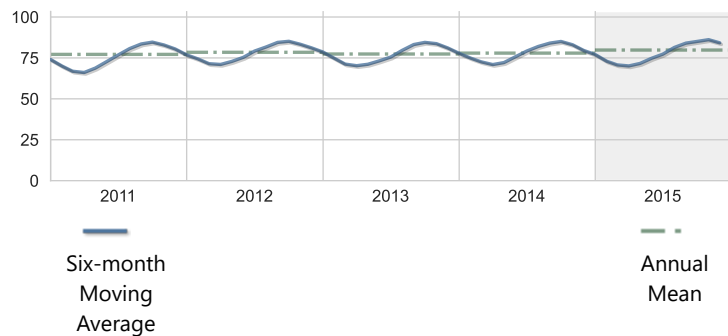
Specific conductance

| Units: umho | Year 2015 | Historical period of record |
|---------------------------|--------------|-----------------------------------|
| High | 52730.00 | 58320.00 |
| Mean | 45346.00 | 46839.04 |
| Low | 20270.00 | 3370.00 |
| No. of Samples | 60 | 1286 |



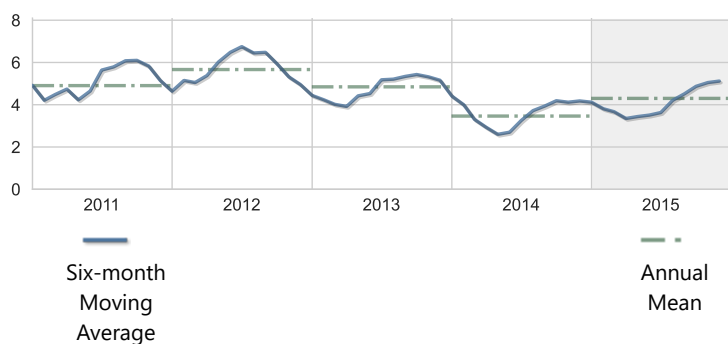
Temperature, water

| Units: deg F | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 90.14 | 92.48 |
| Mean | 79.81 | 77.70 |
| Low | 62.60 | 48.56 |
| No. of Samples | 60 | 1286 |



Turbidity

| Units: NTU | Year 2015 | Historical period of record |
|-----------------------|-----------|-----------------------------|
| High | 8.40 | 24.00 |
| Mean | 4.30 | 4.26 |
| Low | 1.70 | 0.85 |
| No. of Samples | 66 | 1140 |



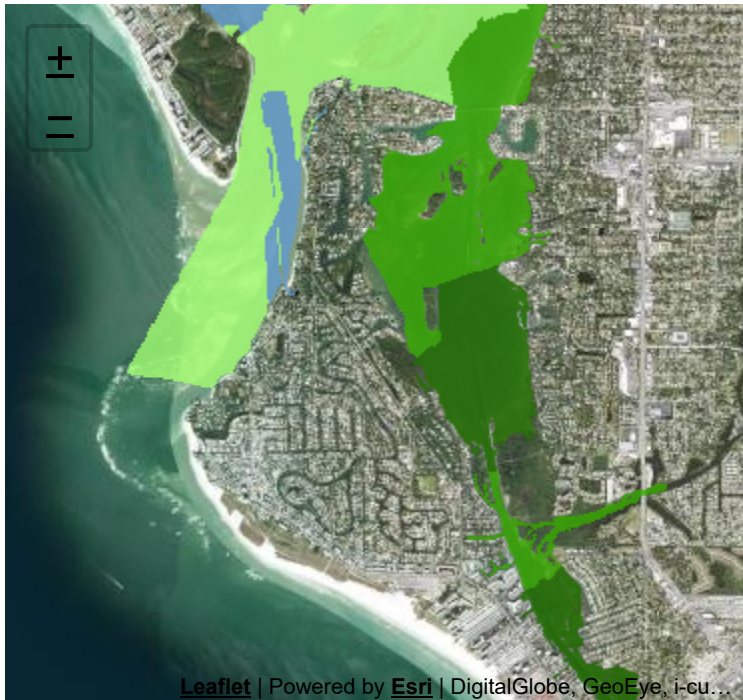
Annual Averages

| Indicator | Units | 2011 | 2012 | 2013 | 2014 | 2015 | Trend |
|-----------------------------|-------------|-------|-------|-------|-------|--------|-------|
| Dissolved Oxygen | mg/l | 6.48 | 6.23 | 6.55 | 6.39 | 6.80 | |
| Dissolved oxygen saturation | percent (%) | 93.23 | 92.40 | 94.53 | 92.70 | 100.05 | |
| Light Attenuation | K(1/m) | 1.10 | 1.01 | 1.08 | 0.94 | 1.00 | |
| Salinity | PSS | 30.77 | 32.00 | 29.10 | 30.35 | 29.46 | |
| Turbidity | NTU | 4.91 | 5.67 | 4.85 | 3.46 | 4.30 | |

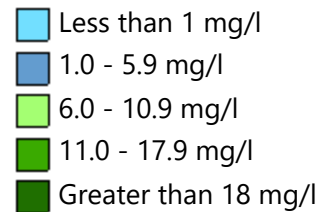
Bay Contour Maps (2015)

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 2015 Monthly Contour Maps for: Chlorophyll a
January



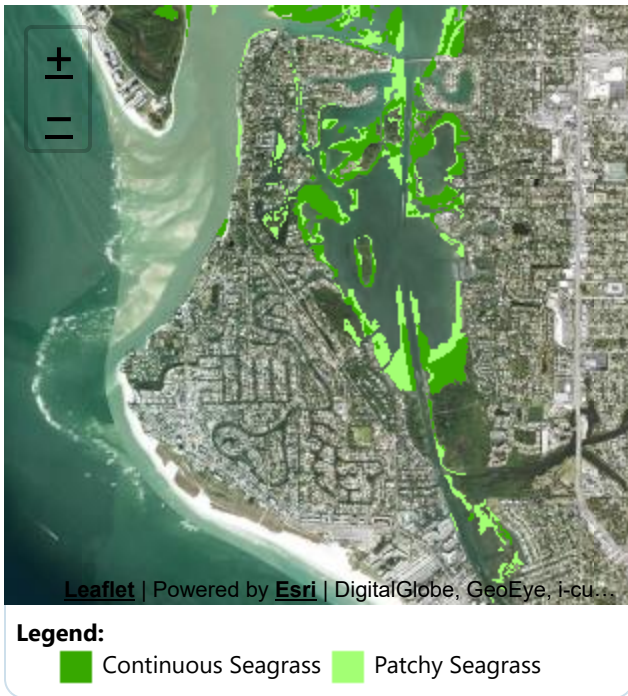
Contour Legend:



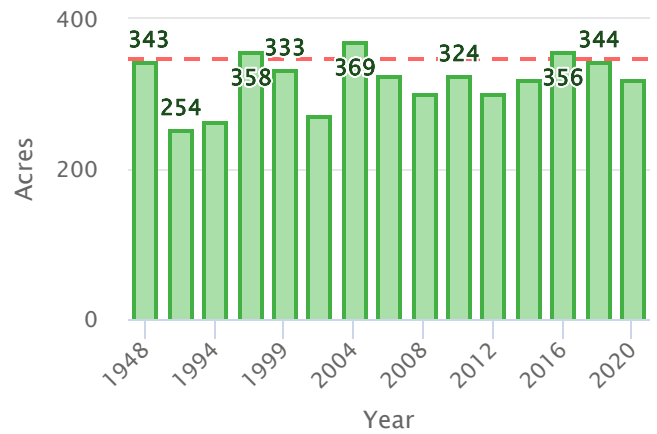
Seagrasses

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.

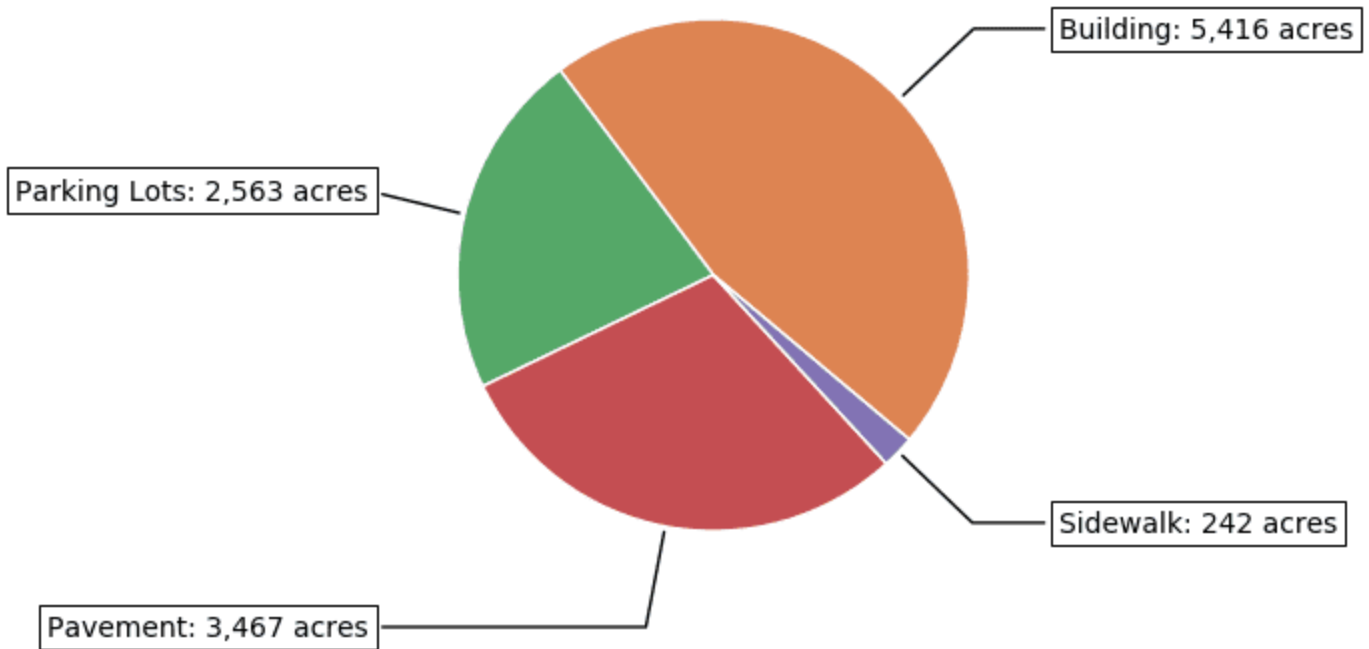


19% of the land area within the **Sarasota Bay Watershed** is covered by

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

2015 Bay Conditions Report for Roberts Bay

| 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

