Keeping tabs on Chesapeake Bay's summer DEAD ZONE - 2012 - update

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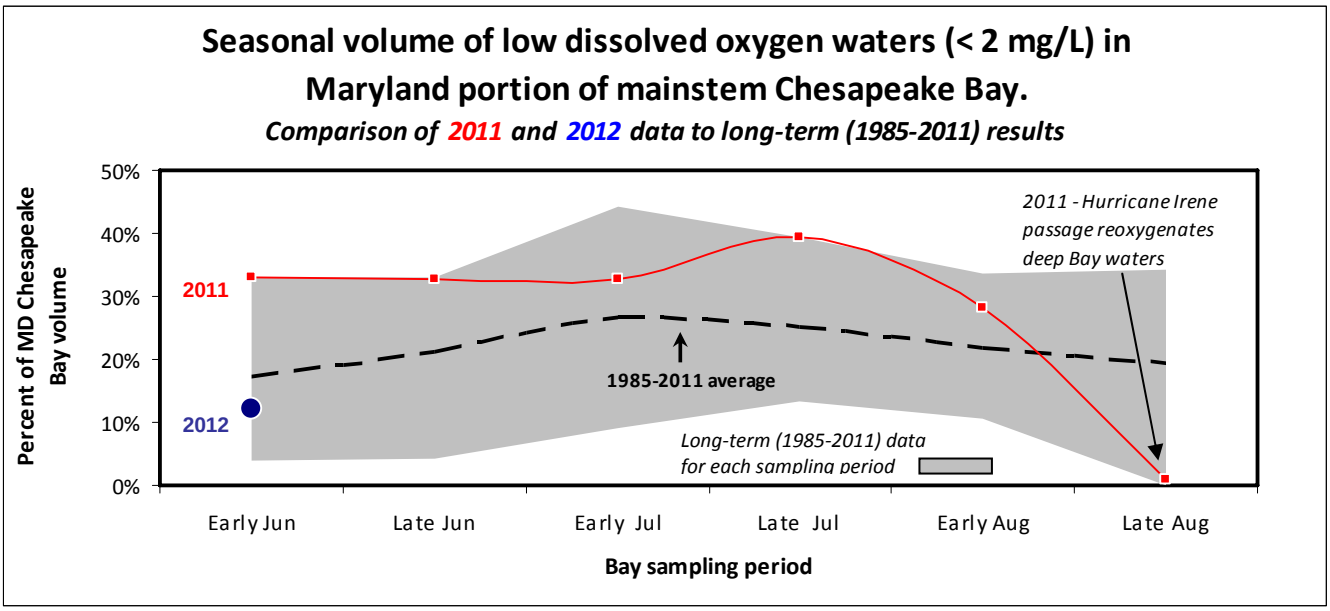
Oxygen levels in the deep portions of Chesapeake Bay are better than in 2011, providing more suitable habitat for fish, shellfish and crabs. From samples collected by Maryland Department of Natural Resources in early June, 12 percent of the volume of Chesapeake Bay in Maryland has low dissolved oxygen levels (less than 2 milligrams per liter), which is **better** than the long-term (1985-2011) average volume of low dissolved oxygen of 17.1 percent for this time of the year. This improvement may be a result of the drier, warmer conditions during Feb-Apr and the wetter cooler, late spring. In contrast, the estimated volume of low dissolved oxygen in the Maryland Bay at this time last year after an extremely wet spring, was the highest since 1985 (33 percent) - essentially, one-third of the Bay was not available as living space for the Bay's aquatic animals.

The University of Maryland-NOAA EcoCheck partnership recently provided a Chesapeake Bay summer hypoxia forecast in collaboration with researchers from the University of Michigan. This 2012 prediction calls for moderate hypoxia conditions in the Bay in July and is based on nitrogen loading from the Susquehanna River during January-May 2012 (*http://ian.umces.edu/ecocheck/forecast/chesapeake-bay/2012/*).

What are Dead Zones?
In the Chesapeake Bay, surface and deep waters are naturally separated each summer as warmer and less salty surface waters float on top of cooler, more salty waters deeper in the Bay. These deeper waters are too dark for plants to grow and create oxygen by photosynthesis so, cut off from the atmosphere, oxygen is consumed through respiration by animals, plants and bacteria. If not replaced, oxygen levels in deep areas of the Bay begin to decline in the late spring, sometimes to the point where there is no oxygen (anoxia) and where only anaerobic bacteria can survive. As the summer progresses, long-term data shows that the low oxygen-volume of the Bay will increase to a peak in July-August. As witnessed last year, strong storms, like the passage of a Hurricane Irene in late August, can mix the surface and deep waters and, at least temporarily, reoxygenate deep waters and provide more habitat for fish and crabs. Typically though, stratification and deep 'dead zones' can continue into the early fall, when cooler temperatures and fall storms will break up this 'dead zone' by mixing the water and reducing low dissolved oxygen areas.

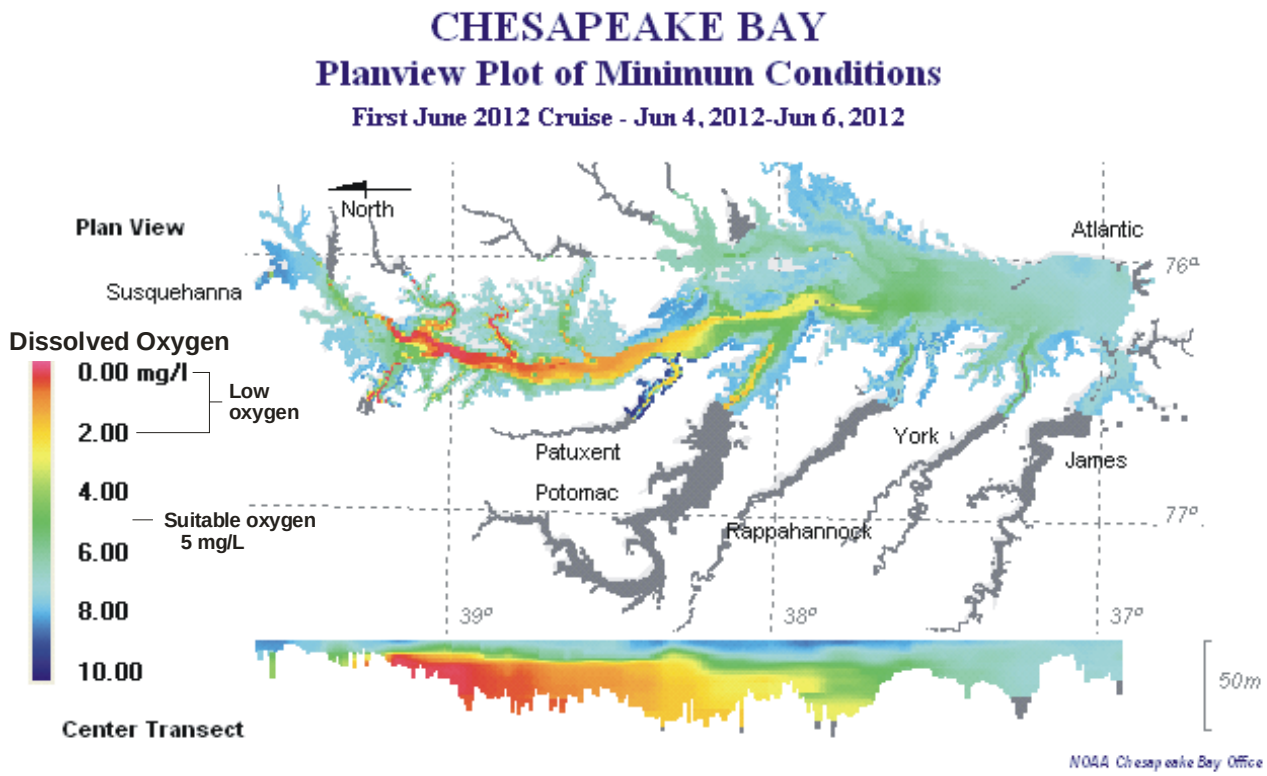
The Maryland Department of Natural Resources has a long-term and extensive water monitoring program in Chesapeake Bay and its tidal rivers. During this summer, water conditions will be monitored every two weeks. On average, the volume of water in the Maryland portion of the Bay with oxygen levels below 2 milligrams of oxygen in a liter of water (2 mg/L) - increases during summer to a peak in July (**Figure 1**).

Figure 1.



Combining Maryland's Bay data with that of the Virginia portion of the Bay from the VA Department of Environmental Quality for the same period and using the NOAA - Chesapeake Bay Program Office's INTERPOLATOR program provides a snapshot of dissolved oxygen conditions throughout the main Bay. Results for early June 2012 are shown below, as a distribution of oxygen across the Bay's bottom waters and as a vertical profile from the head of tide to the Bay mouth (**Figure 2**). Colors from orange to red indicate low oxygen levels.

Figure 2.



DNR will continue to monitor the oxygen conditions of the Bay and its tributaries and will provide updates through the summer. In addition, we will be evaluating the potential carryover impacts of last year's Tropical Storm Lee on water quality, Bay grasses, fish and shellfish. Implementation of the Baywide TMDL commits Maryland and the other Bay watershed States to accelerate their nutrient and sediment reduction strategies which should reduce the size and duration of the Bay's 'dead zone'.

What you can do:

Responsible Marylanders know that reducing polluted runoff is the key to a healthier Chesapeake Bay. Here's how you can do your part now and make a difference:

- Limit your use of lawn fertilizers
- Maintain your septic system
- Drive less
- Plant a tree

For more information:

- Real-time Maryland Tidal Water Quality Conditions: *www.eyesonthebay.net*
- Restoring the Chesapeake Bay: Maryland's Actions & Progress: *www.baystat.maryland.gov/*
- What You Can Do to Help the Bay: *www.baystat.maryland.gov/what_you_can_do.html*