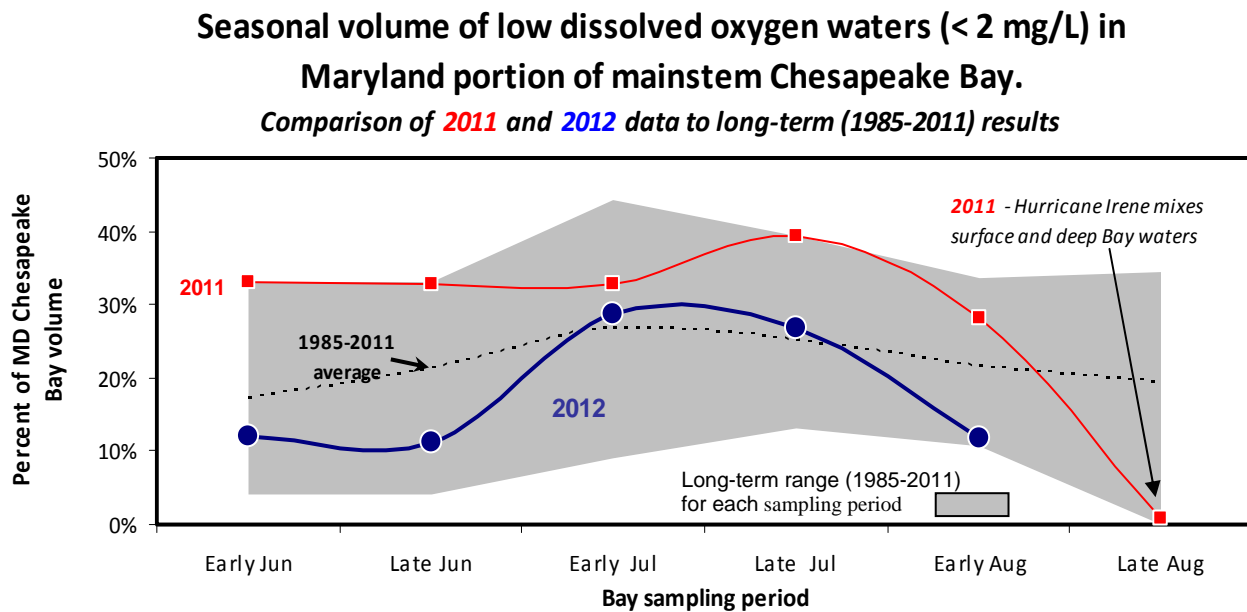


## Keeping tabs on Chesapeake Bay's summer *Dead Zone* - early August 2012 update

**SUMMARY:** As of early August 2012, the volume of water with low oxygen levels in the Chesapeake Bay in Maryland has declined significantly since high volumes of low oxygen water were observed in July. At present, 11.8 percent of the volume of the Maryland Bay has poor oxygen levels. This is nearly half of the long term (1985-2011) average for this time of year. The better-than-average oxygen levels observed this year confirms that there is little carryover impact from the extremely high flow conditions to the Bay that occurred in 2011. In spite of this improvement, a significant part of the Bay still cannot provide suitable habitat where fish, shellfish and crabs can live.

Based upon water quality data collected in the first half of August by the Maryland Department of Natural Resources' (DNR) Chesapeake Bay Monitoring program, 11.8 percent of the volume of Maryland portion of Chesapeake Bay has low dissolved oxygen levels (less than 2 milligrams of oxygen per liter of water). Since 1985, this is the second lowest volume of low oxygen waters recorded in Maryland for this summer period and is well below the long-term (1985-2011) average volume of low oxygen levels (21.7 percent) (Figure 1). This represents a sharp decline in poor oxygen levels after above average volumes of low oxygen conditions were observed in July.

**Figure 1.**



The volume of low oxygen observed throughout July is within the 2012 summer forecast range that was released in June by the University of Maryland-NOAA EcoCheck partnership in collaboration with researchers from the University of Michigan (<http://ian.umces.edu/ecocheck/forecast/chesapeake-bay/2012/>). That forecast is based on lower than average nitrogen levels flowing into Chesapeake Bay from the Susquehanna River this winter and spring. It should be noted that the forecast volume encompasses portions of the Bay in Virginia that are not included in DNR's assessment.

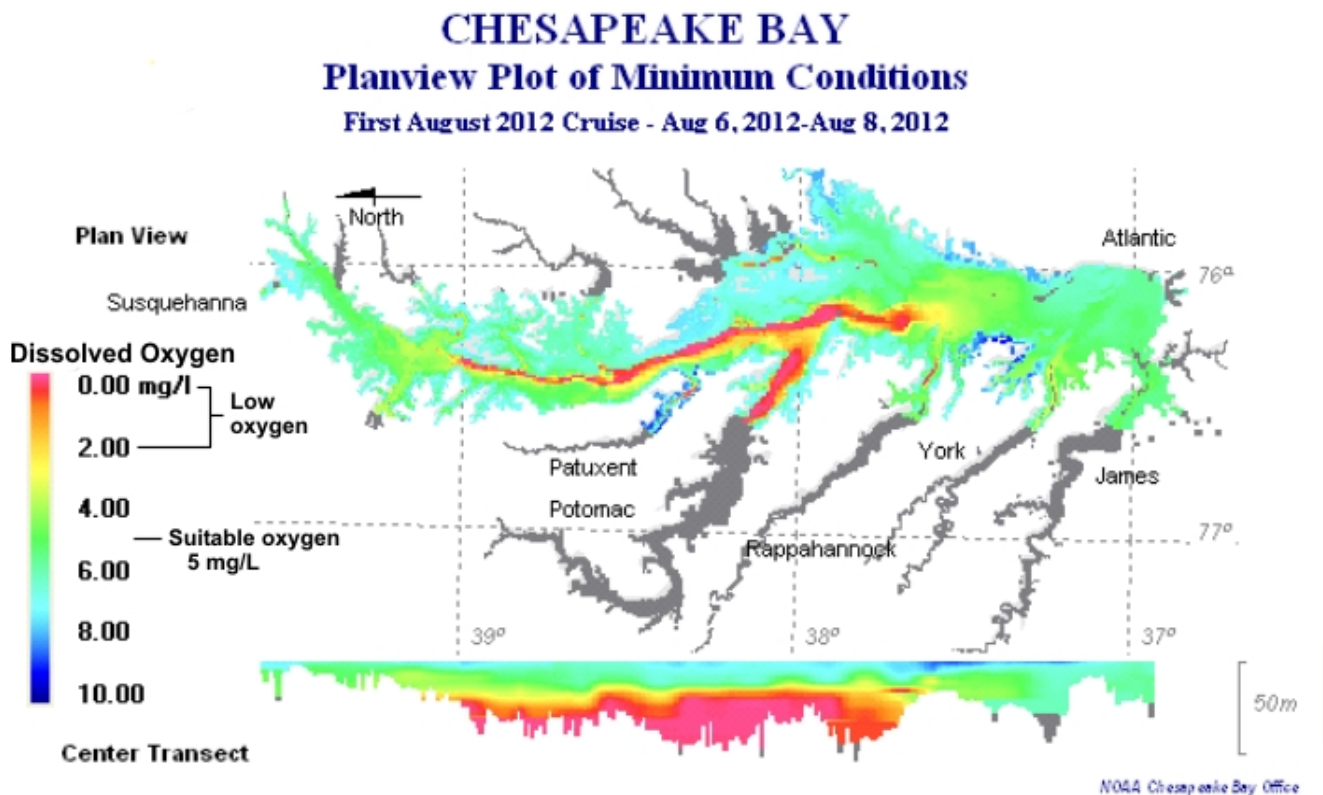
### **What are Dead Zones?**

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 and deeper waters. Algae and plants can't create oxygen by photosynthesis in deeper waters and respiration by animals, plants and bacteria gradually consumes available oxygen. 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 only anaerobic bacteria can survive. As the summer progresses, long-term data

shows that the volume of low oxygen waters in the Bay will increase to a peak in July. These conditions can continue into the early fall, when cooler temperatures and fall storms mix the waters. As witnessed last year, strong winds from the nearby passage of a hurricane can mix the surface and deep waters and, at least temporarily, reoxygenate deep waters of the Bay.

Combining Maryland’s Bay data with lower Bay data collected for the VA Department of Environmental Quality for the same period can help provide a more complete picture of oxygen conditions throughout the Bay. With the NOAA - Chesapeake Bay Program Office’s INTERPOLATOR program and these mainstem Bay datasets, a snapshot of dissolved oxygen conditions and distribution throughout the main Bay can be developed. The distribution of oxygen across the Bay’s bottom waters and as a vertical profile from the head of tide to the Bay mouth are shown for early August 2012 (**Figure 2**). Colors from orange to red indicate low oxygen levels. Compared to late July observations, anoxic conditions (oxygen levels less than 0.2 mg/L and shown in bright pink colors) have narrowed significantly and are found at deeper levels and have moved south in the Bay extending from the Bay Bridge to below the Virginia line.

**Figure 2**



Maryland DNR will continue to monitor the oxygen conditions of the Bay and lower tidal rivers every two weeks through August and will provide updates of oxygen conditions on the Eyes On The Bay website. While present dissolved oxygen conditions have not been impacted by the nutrients, sediments and freshwater from last fall’s Tropical Storm Lee, DNR will continue to evaluate the potential carryover impacts of this storm on other water quality issues, 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’.

For more information:

- Real-time Maryland Tidal Water Quality Conditions: [www.eyesonthebay.net](http://www.eyesonthebay.net) Twitter: @eyesonthebay
- Restoring the Chesapeake Bay: Maryland’s Actions & Progress: [www.baystat.maryland.gov/](http://www.baystat.maryland.gov/)
- What You Can Do to Help the Bay: [www.baystat.maryland.gov/what\\_you\\_can\\_do.html](http://www.baystat.maryland.gov/what_you_can_do.html)