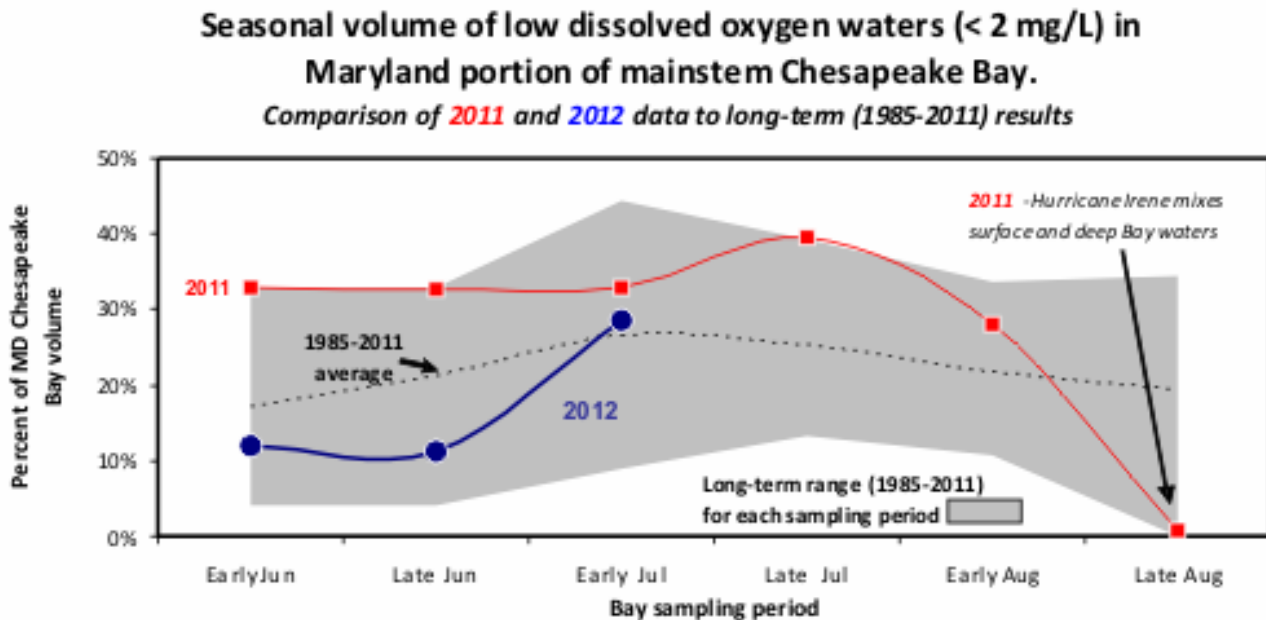


## Keeping tabs on Chesapeake Bay's summer *Dead Zone* - early July 2012 update

Between late June and early July 2012, poor oxygen levels in the deep portions of Chesapeake Bay in Maryland rose substantially and are now slightly worse than the long-term (1985-2011) average for this time of the year in the Bay. A significant portion of the Bay in Maryland - nearly 30 percent - cannot provide suitable habitat for fish, shellfish and crabs to live.

Water quality data collected in the second week of July by the Maryland Department of Natural Resources' (DNR) Chesapeake Bay Monitoring program shows 28.6 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). This is slightly worse than the long-term (1985-2011) average low-oxygen volume for this summer period (26.9 percent) (Figure 1). The increase in poor dissolved oxygen conditions was expected as this volume historically peaks in July. Overall, the volume of water with oxygen levels too low to support most fish, crabs, clams and worms in the Bay in early July 2012 ranked 16<sup>th</sup> out of the last 28 years of monitoring effort in the Bay

Figure 1.



The volume of low oxygen observed in early July (6.1 cubic kilometers) 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.

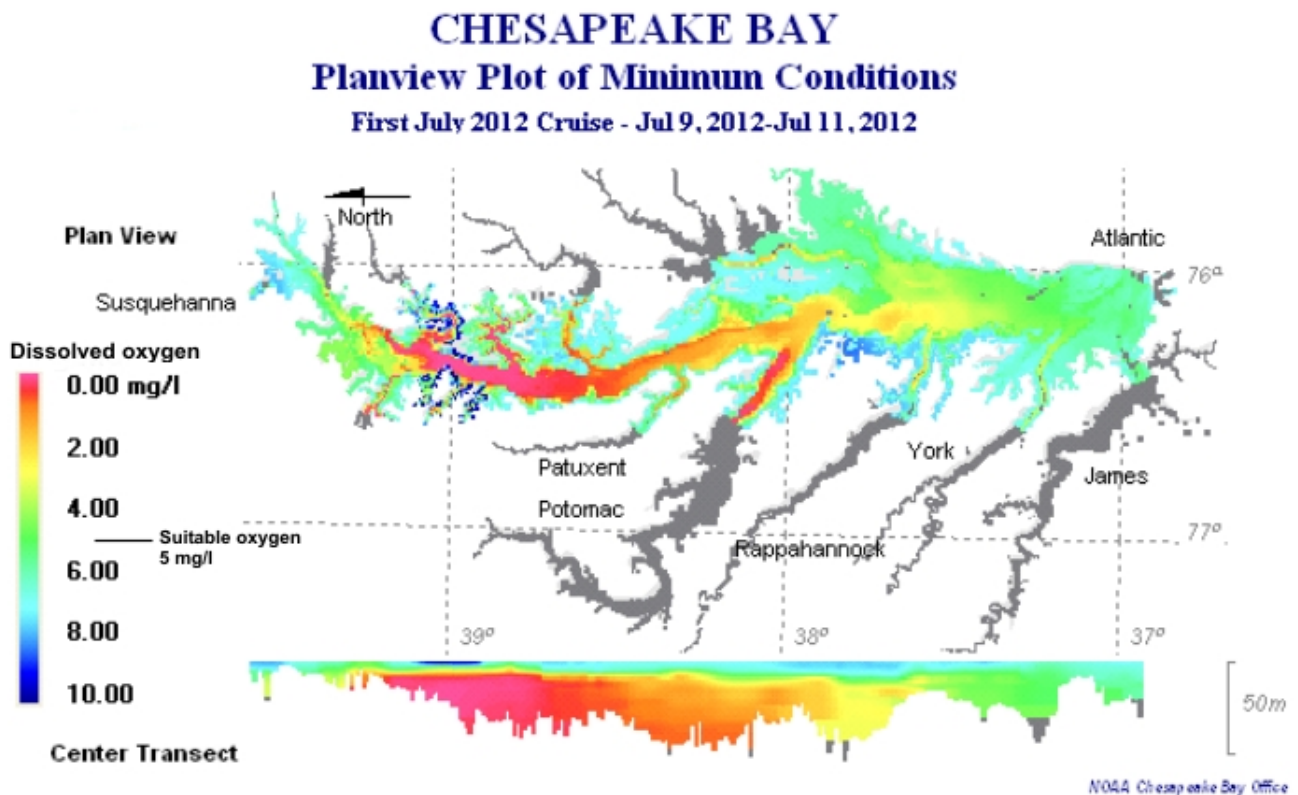
### What are Dead Zones?

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 deeper in the Bay. Algae and plants can't create oxygen by photosynthesis in deeper waters and oxygen here is gradually consumed through respiration by animals, plants and bacteria. 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 July 2012 (**Figure 2**). Colors from orange to red indicate low oxygen levels. Anoxic conditions (less than 0.2 mg/L in bright pink colors) have widened and are extended in the Bay from the Baltimore Harbor to Herring Bay. Low oxygen levels in the Bay have extended as far south as Potomac River.

**Figure 2**



Maryland DNR will continue to monitor the oxygen conditions of the Bay and lower tidal rivers every two weeks this summer and will provide updates of oxygen conditions on the Eyes On The Bay website. While current dissolved oxygen conditions do not appear to have been impacted by the nutrients, sediments and freshwater from last year'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)
- 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)