



Sediment Gets a Thorough Vetting at Workshop

Erosion. It's one of the bad boys of poor water quality. With erosion comes sediment — particles of sand, silt and clay that cloud Bay and tributary waters, diminish sunlight penetration into the water, inhibit the growth of submerged aquatic plants and smother oyster beds.

When the Chesapeake Bay Program's Sediment Workgroup and the Chesapeake Bay Program's Scientific and Technical Advisory Committee convened a workshop in Annapolis on January 30 and 31 to discuss sediment and erosion problems in the Chesapeake Bay, the general assumption going in was that both are bad. So, it came as a bit of a surprise when the participants reached the consensus that some erosion and some sediments are actually good.

Like most scientific problems, the situation is a bit more complicated than apparent at first blush. The coarser particles — primarily sands — are quite important for submerged plant growth. These plants, in turn, are critical to proper functioning of the Bay ecosystem. Processes that replenish nearshore areas with sands, largely through erosion, can help maintain or re-establish aquatic plants. Fine silts and clays deposited in marshes also help these lands keep pace with sea level rise. These conclusions, and others like them, emerged during the dynamic and spirited discussions of the two-day gathering.

The workshop took place to address the recently crafted draft report, "An Introduction to Sedimentsheds: Sediment and its Relationship to Chesapeake Bay Water Clarity." The Sediment Workgroup is defining and delineating sedimentsheds — the sedimentary equivalent to watersheds — to help manage sediment flowing into the Bay. The draft report concluded that defining the sedimentshed concept is possible; delineating specific sedimentsheds, however, is not currently feasible. Workshop participants agreed with this conclusion, but pointed out that forthcoming modeling tools and sediment studies will further the effort.

The group of scientists, modelers and managers spent ample time discussing the relative importance of the four sources of sediment coming into the Chesapeake Bay and its tributaries: the watershed (particles coming from the land and stream corridor that drain into the Bay); the ocean; shore erosion; and other internal processes such as suspended particles created by the remains of tiny organisms. Participants reaffirmed that identifying, understanding and managing sediment sources are critical for improving water clarity and bringing about conditions conducive to the growth of underwater grasses.

The smallest particles (clays, algae and microscopic remains of organisms) that stay suspended in Bay and tributary waters for days or weeks at a time are most responsible for elevated turbidity, causing serious problems for the plants and animals trying to make a living in these waters. Previous studies point to a somewhat unexpected relationship between nutrients and these suspended particles: phosphorus binds to the surface of the particles. The scientists suspect that further reduction of nutrients coming into Bay waters could significantly decrease levels of suspended particles and increase water clarity — a primary goal of Bay restoration efforts — greatly enhancing the effectiveness of sediment controls.

To make sense of the factors that ultimately determine water clarity along the margins of the Bay where submerged plants grow, a refined and more rigorous water quality model will help determine where and on what to focus restoration efforts most effectively. This new model will deal with suspended sediments more realistically and provide the opportunity to tackle new questions and concerns. The revised model will be ready for action as a management tool later this year.

Workshop participants were enthusiastic about the use of the refined model both to address management issues and to further define the historical conditions that once sustained a healthy Bay. Identifying suspended sediments by their geochemical “fingerprint” will also point the finger at the sources of these particles.

Although the workshop’s scientific revelations were sufficient to keep the researchers engaged and talking, ultimately the translation of the science into concrete management actions will prove key. To this end, the participants will develop and endorse a set of workshop recommendations within the next few weeks that will help define the path ahead in tackling some of the most troublesome issues to plague the Bay.

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