

PRESIDENT'S MESSAGE

By Al Tucker



Most environmental groups in the Chesapeake Bay region focus on the cleanup of the Bay. CEPA has been no exception since its founding over 50 years ago. We have noted that the primary cause of the Bay's degradation has been uncontrolled development coupled with poor stormwater management, poor agricultural practices, and minimally treated wastewater. Now the acceleration of climate change represents an even greater challenge to the Bay's cleanup efforts.

In 1983, the EPA and the Bay's watershed states recognized that solving the Bay's "dirty water" problem required a holistic or systems approach. They agreed to reduce the total maximum daily load (TMDL) of three major pollutants¹, namely, sediment, nitrogen, and phosphorus. Each state agreed to reduce its proportionate share of these pollutants to levels that the current Bay's ecosystem could consume through natural processes. While some progress has been made, the Bay still receives a grade of D overall. It remains an open question whether or not the current approaches will succeed when another environmental driver emerges as an even greater threat to the Bay's ecosystem. Specifically, climate change.

Climate Change is Real! We know that carbon dioxide, methane and hydrofluorocarbons increase the heat trapping effects of the atmosphere. The increases in carbon dioxide and methane are related to burning fossil fuels, and, ironically, hydrofluorocarbons are used in cooling for refrigeration and air conditioning. The major indicators of these greenhouse gas effects were outlined in the fifth International Climate Change Committee Assessment Report:

Global Warming: Since the 19th century, the average air temperature has risen about 1.2 °C (2 °F). The predictions now show that the 1.5 °C Paris agreement limit will be exceeded in the period between 2026 to 2042. And the 2°C limit will occur during the period from 2038 to 2072, if no intervention is taken. The focus on day-time high temperatures belies the rise in average night-time temperatures, which have the greatest impact on the length of growing seasons. Extended growing seasons disrupt normal cycles as well as invite invasive species that thrive in higher temperatures. Animals that live by temporal cycles will migrate to their normal territories only to find food supplies depleted or nonexistent when they arrive.

Warming Oceans: While the ocean temperature has risen only 0.33 °C, it is the primary cause of sea level rise through thermal expansion. Currently, oceans store 90% of the earth's excess energy. What that storage limit is before the atmospheric temperature begins to rise rapidly remains an open question.

Shrinking Ice Sheets: Greenland loses about 279 billion tons of ice per year while Antarctica loses an additional 148 billion tons. At some point their contribution to sea level rise will dominate that of thermal expansion. Greenland alone can contribute up to 20ft of rise. If the 2 °C limit is reached, one could expect a meter or more of rise in the Bay. The northeast coast of the US

including the Bay is experiencing one of the fastest rises due to a combination of subsidence and the impact of Greenland meltwater on the Gulf Stream. Anne Arundel will lose almost 3000 acres of forest to sea level rise.

Ocean Acidification: The ocean is one of the primary carbon sinks. Carbon dioxide in seawater creates carbonic acid. This natural process has caused a 30% increase in acidification, resulting in destruction of coral reefs and impacting calciferous marine life. In the Bay, crabs and oysters will be affected.

Extreme Events: As one watched the development of hurricanes this summer and fall, we saw them move over land and back over warm water, where they increased quickly in intensity, some to category 5 storms. Warmer air holds more water, and this year may be the wettest year in our weather history. More water means that current stormwater practices may be inadequate. While global warming implies hotter temperatures on average, it also means some of the coldest. With 22 events causing 95 billion dollars of damage, the year 2020 represents the sixth consecutive year of climate related losses exceeding a billion dollars. From 1980 to now, the US has averaged 7.2 events per year. From 2015 to now the average is 16.2 events. For the Bay, significant storm surges during hurricanes can be expected. Under appropriate conditions, a surge in the Bay that exceeds 18ft can occur at Fells Point in Baltimore.

Within two generations, climate change will rapidly change our local environment. The question is, what should we do? First and foremost, without a reduction of greenhouse gases, the eventual results will be catastrophic. At the national and global level, we should advocate for decarbonizing our society. That means we will need a new energy infrastructure independent of fossil fuels. Without making this change, all other attempts to adapt will be futile.

Some recent reports indicate that the 2°C increase is already “baked in.” At the regional level of the Bay, that fact implies that extreme events will occur within our lifetime. Blackwater refuge will lose 50% of its land to inundation. Large tracts of the Eastern Shore cropland already exhibit saltwater intrusion in plant root zones. Well water in some areas also shows signs of saltwater intrusion.

All these effects imply that we in the Bay’s watershed will need to change our strategies from preventing change and preserving the status quo to ones of adapting to a changed environment. Hard decisions will have to be made. Land and homes will have to be abandoned, critical infrastructure like roads, wastewater facilities, and wells will have to be hardened against storm surges. New building codes will need to be developed for areas that will become subject to future flooding. It is not just the low-lying areas that will be affected. The whole state will have to bear the economic, societal and ecological costs associated with the unforeseen, myriad effects of climate change. The Maryland Commission on Climate Change produced an excellent summary in 2011². Unfortunately, little has resulted from these recommendations; perhaps because they are too far reaching and the cost to implement them is too daunting. Even more daunting, though, is the fundamental change in attitudes and lifestyle choices that we will have to accept. These

choices can be ours to make or the climate inevitably will make unpleasant choices for us. We need to tell our decision makers that the time is now to start preparing for the inevitable.

¹ *Technically these pollutants are nutrients. Nitrogen and phosphorus are required by all living things, but too much of either causes imbalances in the ecosystem, especially at the microscopic level which affects the food and environment for larger marine life. Sediment is important also. The natural function of rivers transports sediment, think of the formerly rich ecosystems of the Nile, Mekong, and Mississippi Deltas. In the Bay, the larger sediment particles are critical support to underwater grasses. But dams impede this “good” sediment and allow suspended sediment to flow past and ultimately to block the photosynthetic light required by underwater grasses.*

² *Comprehensive Strategy for Reducing Maryland’s Vulnerability to Climate Change Phase II: Building societal, economic, and ecological resilience, <<https://climatechange.maryland.gov/reducing-marylands-vulnerability-to-climate-change-phase-ii-executive-summary/>>*