University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Climate Solutions Act of 2020 – Greenhouse Gas Emissions Reduction Act

SB 926 – February 19, 2020 - Education, Health, and Environmental Affairs Committee

Peter Goodwin, President

Chairman Pinsky and members of the Committee, I am Peter Goodwin and have the honor of serving as the President of the University of Maryland Center for Environmental Science or better known as UMCES. I also am a member of the Maryland Commission on Climate Change and chair of its Scientific and Technical Working Group. I have also just completed two terms as President of the International Association of Hydro-Environment Engineering and Research (IAHR) that is the oldest professional international association for water research in the world which has given me a global perspective on the challenges and what other countries are achieving.

I will not try and presume to speak on behalf of the entire science community but my points are founded on the principle of rigorous peer-reviewed science and synthesis statements with multiple respected authors.

The Science is Irrefutable[1].
During the past 2000 years, the industrial era is the only time that there has been consistent heating (or cooling) trend across more than 98% of the planet[2]. The past decade was the hottest on record, 2019 the second hottest year, 2016 the hottest year - and Antarctica has just experienced the highest temperature on record of 65°C (February 6, 2020 at Esperanza Base).

The temperature rise since pre-industrial levels has just exceeded 1°C. A reasonable question is how good is our ability to predicting global warming going forward? In a 2019 retrospective analysis, a team lead by Hausfather[3] found that past computer models did a remarkably accurate job in predicting the temperature increase over the past few decades. These results imply that we can have confidence that scientists understand the underlying physics well and we can have confidence in projections of future increases in temperature.

Since the enactment of the 2016 GGRA, scientific evidence and projections have revised the implications of a 2°C rise and the IPCC has strongly advised that the rate of global rise should be limited to 1.5°C[4]. This challenge has been compounded by the 2018 Gap Report[5] that reported that some nationally declared commitments (NDCs) had fallen short of expectations and efforts are currently being

[1] More than 11,000 scientists from around the world co-signed a letter of the severity and urgency of the climate change threat. Bioscience November 5, 2019
[2] Neukom et al., 2019. Nature, 571(25). July.
[3] https://www.sciencemag.org/news/2019/12/even-50-year-old-climate-models-correctly-predicted-global-warming
[4] Intergovernmental Panel on Climate Change. 2018. Global Warming of 1.5°C: An IPCC Special Report. IPCC.
[5] UNEP (2018). The Emissions Gap Report 2018. United Nations Environment Programme.

strengthened. **Thus, a review of the original 40% reduction by 2030 is timely and consistent with many other States and nations.**

2: Maryland will be disproportionally affected by climate change

Sea Level Rise[6]

Sea Level Rise is tracked by Maryland's agencies and Legislature with projections updated at least every 5 years. Sea levels are expected to rise 1.2' – 4.2' by 2100 depending upon the global emission reductions but can be much higher (4'-7' feet) if ice loss approaches the worst case scenarios. Increase in storm surge, nuisance flooding, shoreline erosion and salinity intrusion (the latter being anticipated by the recent 2019 Department of Planning Report.)

Bay Temperatures

Chesapeake Bay is unique among the large estuaries of the world for being very large but shallow with a small tidal range. UMCES Chesapeake Biological Lab has been monitoring water temperatures since the early 1930's. Chesapeake Bay water temperatures have gone up approximately 3.5^{o}F Consequences include increased frequency of harmful algal blooms (HABS) and greater vulnerability to rapid changes in temperature as seasons change.

Precipitation

Scientific estimates do not anticipate significant changes in total annual precipitation but the duration and intensity of storms and droughts have changed. Since 1900, the frequency of larger storms has increased. These factors combine to impact Maryland's agriculture, water quality, recreation, flood risks, real and human health[7].

3: Maryland has the Capacity to Drive Change

Maryland's leadership on addressing climate challenge and the dissemination of expertise generated within agencies, the private sector, NGOs and universities has the capacity to meet standards beyond *'40-by-30'* and to encourage other states and nations to achieve their goals.

Collaborative activities between Maryland's agencies, universities and federal agencies are developing and applying the technologies to monitor greenhouse gases, understand the implications of a warming planet and the benefits of actions taken by the State.

Based upon the scientific evidence, UMCES supports the aggressive goals outlined in SB926 and recommends a favorable report.

[6] https://www.umces.edu/sea-level-rise-projections

[7] Details of consequences to Maryland can be found at the following links:
https://www.umces.edu/futureurbanclimates.
https://www.chesapeakebay.net/issues/climate_change and https://www.umces.edu/research-highlights/climate-change-already-affecting-chesapeake-bay-region
https://phpa.health.maryland.gov/OEHFP/EH/Pages/Climate_Change.aspx