Preliminary Ideas for MCCC Annual Report - Discussion Document

The MCCC would like the report to be concise, easy-to -follow with a few actionable recommendations.

Update of the Science - Relevant to Maryland [1-2 pages in total]

Suggestions for leads from the STWG are in parentheses but all members are encuraged to submit ideas and review the draft summary.

Global warming: July 2023 and temperature projections for 2023. Emergence of weather attribution science and concern for climate anomalies.

Maryland did not experience the same level of extreme heat records as has been experienced in other parts of the US - but the risks are clear.

Human health consequences
[Given the national attention on heat extremes and climate anomalies - with several books published this summer is there anything of importance to Maryland? *[Amir and Jane]*

2023 Sea Level Rise [*Don* - a short conclusion of the 2023 update]

GHG monitoring [*Russ* - any important observations or comment]

Any updates on biomass? Given the Maui disaster - is there an increasing risk of wildfire in Maryland? [*Adel, Eric, Matt, David, others*?]

Any other suggestions for the science update from STWG members?

Draft: STWG Recommendations

The 2022 recommendations are listed below. Some of these recommendations have been fully or partially implemented. What are the 1-3 recommendations for 2023 that are critical to Maryland for achieving the CSNA goals?

Significant steps have been taken toward Recommendation 1. The UMD Global Sustainability Center is working with MDE to build the Pathways model.

Consideration should be given to Recommendation 2 and refining Recommendation 3.

2022 Recommendation 1: Build agency capacity to address Maryland's Climate Response

Background: Maryland's agencies have talented scientists, engineers and planners working to implement the requirements of CSNA and other laws and policies related to climate change. Many staff members have experience in federal government, the private sector, NGO or other state agencies. However, the additional burden on staff associated with achieving the climate goals is significant and there are substantial gaps in expertise required to implement such a comprehensive and ambitious agenda.

Recommendation: *Conduct a personnel needs assessment and identify the most expedient way to ensure the success of Maryland's climate team. Actions from this assessment could include:*

1. *Hire new agency staff that fill critical gaps in expertise and provide additional experience to current employees on issues related to climate and its impact on Maryland communities.*
2. *Expand the current Maryland Sea Grant Science-Policy Fellows program. This program places a current or recent PhD for one year at a high level in state government to assist senior personnel. The program targets under-represented minorities and these Fellows gain an appreciation of the pressing issues faced by state agencies whether they return to academia or join state agencies following the fellowship.*
3. *Establish a dedicated funding pool to retain experts from the private sector, NGOs or academia to support agency staff on specific short-term climate priorities.*
4. *Examine if the monitoring sites and state infrastructure is optimum to capture and forecast change and impact. In particular, equity with respect to capturing the impact of climate change (for example: risk of flooding or heat islands) on Maryland's urban dwellers and underserved communities.*

2022 Recommendation 2: Create a Climate Change Mitigation Accelerator:

Background: There needs to be significant investment from the state to catalyze the public-private partnerships, state-federal-local government collaborations , and university and innovation company research to implement actions at scale to accelerate the most promising emerging technologies and scientific research that will help Maryland achieve the 2031 and 2045 goals. This investment should be established with clear performance metrics linked to CSNA and other relevant legislation that specifically focuses on mitigation and climate justice.

Recommendation: *The General Assembly and Governor's office should consider a targeted Climate and Equity Innovation Fund that will directly provide the scientific and engineering basis for action. This fund should be commensurate with the magnitude of the challenge (for example, a 10-year program with an initial allocation of $30m for the first year) with the express purpose of innovation that positions Maryland as a national leader in energy and climate technology. Priority topics would be established by the leaders of the cognizant state agencies and include:*

> *1. Support partnerships between industry, other elements of the private sector, NGOs, governmental entities and academia.*
>
> *2. Establish seed grants to advance proof-of-concepts that have the potential to scale and leverage related programs that already run peer-reviewed competitive grant programs. For example: a competitive program for adaptation measures could be administered by Maryland Sea Grant and for mitigation innovations through the Maryland Energy Innovation Institute, the Maryland Clean Energy Center, and the Maryland Energy Innovation Accelerator previously created by the Maryland legislation.*
>
> *3. Foster development of a diverse workforce. There are too few professionals that reflect the under-served and most vulnerable communities. This program will leverage the existing efforts of the STEM pipeline and DEI initiatives that focus on the leadership and expertise needed to address Maryland's climate challenges. This could be achieved through paid internships, structured mentorship and other programs that specifically lead to career opportunities.*

All funds would be distributed on a competitive basis that relies on peer-review, rigorous performance metrics and demonstration of synergies between the priorities of industry, academe, local governments, NGOs, communities and the state.

2022 Recommendation 3: Addressing Critical Scientific and Engineering Knowledge Needs

In order to address climate mitigation, guide the response of communities and inform the recovery of Chesapeake Bay, the following emerging issues should be made a focus for 2023.

3.1   Building the modeling and assessment capacity in Maryland

Background: Maryland is making decisions that transform the infrastructure and quality of life of residents. The implications are significant across many sectors and the best-available, transparent, and replicable models are essential. These models should quantify levels of confidence and track progress in a rigorous scientific manner. These models should be open-source and accessible to MCCC and agencies with expertise housed in the agencies, private sector and universities to guide the application and future enhancements to the models

Recommendation: *A plan should be developed that defines the suite of models to be used by the state in addressing climate change mitigation and adaptation. These models should be open source. The plan should identify key new positions needed in state agencies to oversee the models and articulate how the models will be sustained and enhanced over time through support or in partnership with Maryland's higher education institutions, consultants, NGOs and the private sector. The goal is to create a community of experts that drive innovation and implementation of actions that can be scaled. This plan should also include how monitoring updates to supplement existing data collection programs that support model projections and verification of progress being made.*

3.2   Enacting Maryland's Ocean and Coastal Acidification Plan

Background: The 2021 MCCC Annual Report: Recommendation #42 stated
'The state should work with STWG in reviewing and supporting the Ocean Acidification Research and Monitoring Action Plan as part of the state's membership in the International Alliance to Combat Ocean Acidification.'

Recommendation: *Based on work conducted in 2022, MDE, MDP and DNR, in coordination with the EPA Chesapeake Bay Program, the state of Virginia and other partners should execute a tributary and main stem carbonate system monitoring plan within the Chesapeake Bay. Monitoring the carbonate system chemistry affected by climate change is necessary to improve scientific understanding of potential ecosystem effects, natural and anthropogenic controls, and to establish a more robust baseline for assessing future trends.*

3.3 Monitoring GHG - particularly point sources of methane

Background: Methane is the second strongest driver of radiative forcing causing climate change but may be the most easily controlled. The rate of emissions is variable and the uncertainty in inventories high. The new MDE inventory is much improved, but much remains to be learned about the relative roles of major sources including natural gas wells, transport and usage,

landfills, wastewater treatment facilities, agriculture, emissions associated with coal, and natural emissions such as wetlands. Engineering solutions such as pipe replacement and soil cover on municipal waste are readily implemented.

Recommendation: Support a variety of top-down (atmospheric-observation based) methods for evaluating methane flux to identify major sources for emissions reductions and for comparison to bottom-up (activity-based) methods and to improve inventories.

3.4 Enhance public health adaptation to threats of climate change

Background: Despite mitigation efforts, communities across Maryland will continue to be exposed to increasing number of extreme weather events that will increase their risk of morbidity and mortality. There needs to be a significant investment from the state to help community prepare for these threats ahead and time and respond to them.

Recommendation: State should consider developing a Ready-Set-Go framework for public health adaptation based on early warning systems with a combination of i) sub seasonal to seasonal, and ii) weekly lead time anchoring the "Ready" and "Set" phase of the framework.

Recommendation: The state should compensate for the loss of CDC funding for the Climate and Health program within the Maryland Department of Health to enhance Maryland's public health preparedness to climate change.

Recommendation: Maryland Climate and Health Profile Report, published in 2016 should be updated to accommodate more recent scientific evidence and provide relevant future projections of health burden in Maryland, with a particular emphasis on climate justice.

3.5: Establishing common hydrologic methodology for stormwater and flood design.

Background: Direct application of the historic record to hydrologic analyses is no longer an accurate estimator of future precipitation characteristics and the changing climate must be included in future projections. There are a diverse range of methodologies currently being deployed but the methods should be standardized to ensure consistency in infrastructure design.

Recommendation: Design precipitation and flow characteristics will vary across the state but guidance should be developed on the methodology and presented in a manner that is easily implemented by local government. This methodology and updates of design criteria for stormwater management and flood risk should be subject to a 5-year review process to capture the latest scientific understanding and best engineering practice.