

CHAPTER 5 – CLIMATE CHANGE

Updates to the Wicomico County Chapter 5 – Climate Change included the following:

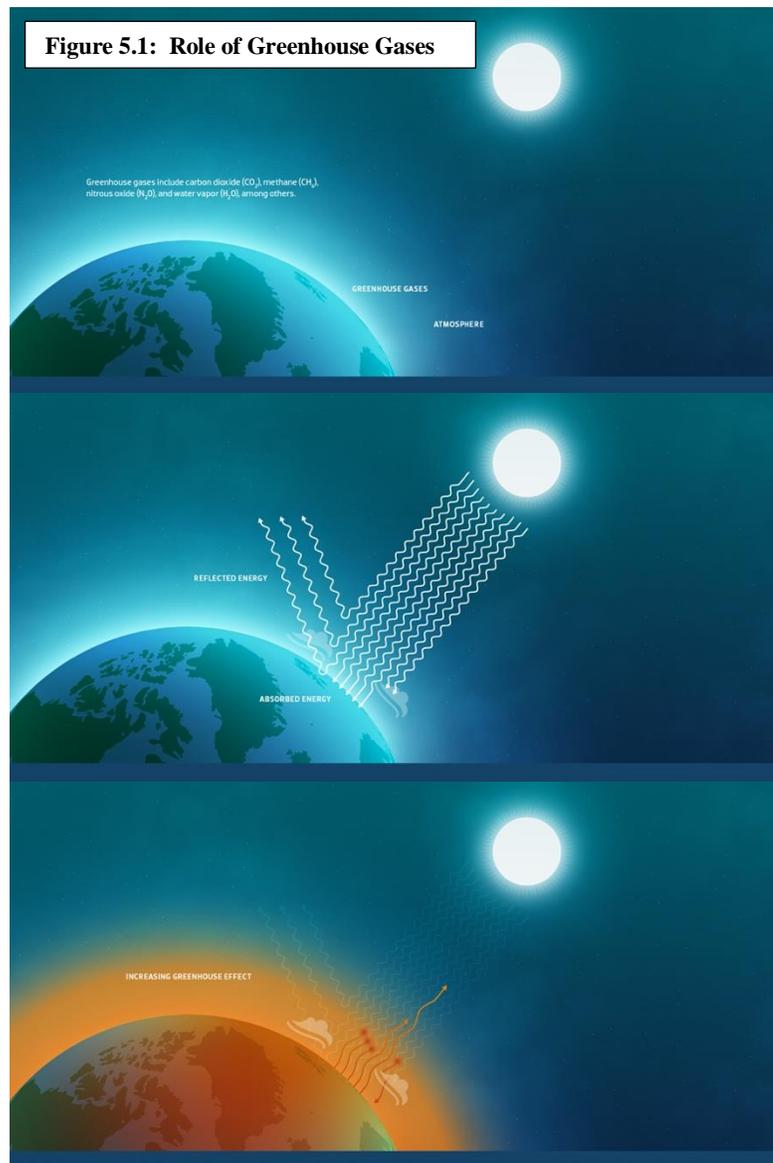
- Updated chapter with information from 2020 Annual Report of the Maryland Commission on Climate Change (MCCC)
- Updated chapter with information from 2030 Greenhouse Gas Emissions Reduction Act (GGRA) Plan
- Update solar panel permit data from the Wicomico County Permit & Inspections Division
- Updated chapter with information from July 2020 Center for Disease Control (CDC) Climate and Health Program
- Added new Plan Integration Section

CHAPTER 5 – CLIMATE CHANGE

5.1 HAZARD CHARACTERIZATION

According to the Environmental Protection Agency (EPA), Climate change is caused by both natural and human factors. Natural factors include earth's orbit, solar activity or volcanic eruptions. The major human factor affecting climate change is the accumulation of greenhouse gases in the atmosphere. The earth's temperature is a balance between energy being absorbed (heating) and released (cooling). Greenhouse gases (GHG) cause heat to be retained, therefore prohibiting energy to be released and allowing the earth to cool. According to the EPA, most of the observed warming since the mid-20th century is attributed to human-induced greenhouse gas emissions.

Figure 5.1 illustrates how greenhouse gases are absorbing the energy emitted from the earth's surface, preventing heat from escaping, hence causing the energy to be re-emitted and warming the earth's surface.



Source: www.epa.gov/climatechange/science/causes.html

5.2 HAZARD RISK & HISTORY

In April of 2016, the Greenhouse Gas Emissions Reduction Act – Reauthorization (GGRA of 2016) was signed into law. Expanding on the requirements of the original GGRA (2009), the new law mandates the state to achieve a minimum of a 40% reduction in statewide greenhouse gas emissions from 2006 levels by 2030. In order to achieve this goal, MDE developed a statewide GHG reduction plan entitled the 2030 Maryland Greenhouse Gas Reduction Plan (2030 GGRA Plan).

The Executive Summary of the 2020 Annual Report of the Maryland Commission on Climate Change (MCCC), states that the Intergovernmental Panel on Climate Change (IPCC) concluded that “human drivers, including GHG emissions, are extremely likely to have been the dominant cause of the observed warming since the mid-20th century, recently estimating that human

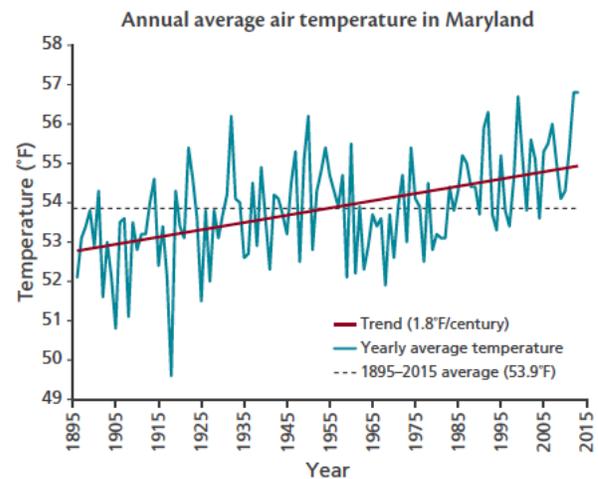
activities have contributed to approximately 1.8 degree Fahrenheit of global warming above pre-industrial levels, particularly the emission of heat-trapping GHG's into the atmosphere.”

Long-term temperature data show that average temperatures in Maryland have risen in the last century and will continue to rise in the future (NOAA, NCEI). Marylanders around the State are already noticing warmer winter days, more intense heat and humidity in the summer, and increased damage due to storms.

According to the Maryland Department of Natural Resources (MD-DNR), over the next century (100-years), Maryland expects increased winter-spring precipitation and run-off, warmer air and water temperatures, and relative sea level rise of approximately 3.7 feet,

<http://www.mdsg.umd.edu/news/scientists-unveil-new-projections-sea-level-rise-maryland>.

Coastal areas are predicted to experience approximately 2.1 feet of seal level rise by the year 2050. One hundred years of data confirms that Maryland is warming on average by 1.8 degrees Fahrenheit and by as much as 3.6 degrees Fahrenheit in the winter. Wetter conditions have become prevalent in March and September, while July and August have become drier. These trends will impact the success and efficiency of restoration practices along Maryland's dynamic coast.



According to the *July 2020 Center for Disease Control (CDC) Climate and Health Program*, the health impacts from climate change in the Northeastern United States include:

- Temperature-Related Death and Illness;
- Extreme Events;
- Water-Related Illness;
- Food Safety, Nutrition and Distribution;
- Mental Health and Well-Being; and,
- Populations of Concern.

The Maryland Department of Health is a CDC funded jurisdiction since 2012 and is a Climate-Ready States and Cities Initiative (CRSCI) recipient.

Maryland Department of Health, CRSCI Recipient, funded by CDC since 2012

The Maryland Climate Change Health Adaptation Program is the lead for integration of health adaptation into the state's response to a changing climate. Located in the Maryland Department of Health, the program provides a health focus to climate response efforts across the state, through technical assistance, development of epidemiologic tools and data products, and education and outreach. The program primarily addresses extreme heat, air quality and respiratory illness, water-borne diseases, and extreme weather events, such as hurricanes and tornadoes. The program, which is closely integrated with the Maryland Commission on Climate Change, includes education and outreach for school age youth (K-12), minority groups, community health workers, and informal healthcare networks. Among the products of the program is a climate change training curriculum for community health workers and extension workers. The training increases competency among informal healthcare networks in order to advise patients and community members on how to understand climate impact on themselves and their health. The program's Climate Ambassador program, which is a program targeted at school age youth in Maryland, provides students with tools and information to educate and empower themselves and their communities to respond to the impacts of a changing climate.

5.3 VULNERABILITY

According to the EPA, the climate for the northeast has changed with an approximate average temperature increase of 2 degrees Fahrenheit and an increase of 4 degrees Fahrenheit in winter temperatures. Precipitation events have also increased in magnitude and frequency. Rain events now exceed snow events for the northeast region of the United States. With an increase in rain events, influences to sea level rise are likely to increase as well. Sea level rise, storm surge, erosion, and the destruction of important coastal ecosystems will likely contribute to an increase in coastal flooding events, including the frequency of the current "1% annual chance flood hazard (100-year flood)" levels.

With 3,100 miles of shoreline, Maryland is the fourth most vulnerable state to suffer the effects of sea-level rise associated with climate change (MDE). Rising sea levels, along with increased storm intensity, will have devastating and far-reaching environmental and economic impacts on the Chesapeake Bay and on the quality of life Marylanders enjoy. Maryland's sizable farming community could suffer costly losses during extreme droughts and heat waves. Marylanders everywhere will face increased risk of flooding and significant property damage as a result of heavier precipitation and other extreme weather events. The effects of heat waves and increased air pollution are of particular concern in vulnerable populations such as children, the elderly, and other at-risk populations.

5.4 CONTRIBUTING FACTORS

In terms of implementing the 2030 Greenhouse Gas Reduction Plan, as an example, options for reductions in the energy sector have been reviewed. Electricity consumption is one of the highest factors contributing to greenhouse gas emissions. Electricity supply sector accounts for greenhouse gas emissions occurring as a result of the combustion of fossil fuels at electricity-generating facilities located within the State. The majority of power plants in Maryland are using fossil fuels such as coal, which adds carbon dioxide and other emissions into the atmosphere. Reducing energy use is a major part of the Greenhouse Gas Reduction Plan. Therefore, three important programs within the energy sector target the reduction of carbon dioxide emissions from electricity generating plants. These programs include:

- Regional Greenhouse Gas Initiative (RGGI);
- EmPOWER Maryland Initiative; and
- Renewable Portfolio Standard.

Excerpts from: <https://www.marylandmatters.org/2021/03/08/bipartisan-coal-transition-bill-withdrawn-by-house-sponsor/>- *Department of the Environment Releases a Climate Action Plan — 14 Months After Deadline*
By **Elizabeth Shwe**-February 20, 2021

The Coal Community Transition Act of 2021 establishes a timeline for remaining coal power plants in Maryland to shut down and create a fund to assist displaced workers. The General Assembly refused again to take action; it was withdrawn during a committee work session. A similar bill was proposed in 2020.

Maryland's coal-fired power plants generated less than 6% of the electricity that was consumed by the state in 2020 but emitted around 4.4 million metric tons of climate-polluting carbon dioxide, according to David Smedick, Maryland Chapter of the Sierra Club. "In the year in which the operations and Maryland's coal plants were at historic lows, they still produced the climate pollution equivalent of nearly 1,000,000 cars," he said.

5.5 PLAN INTEGRATION

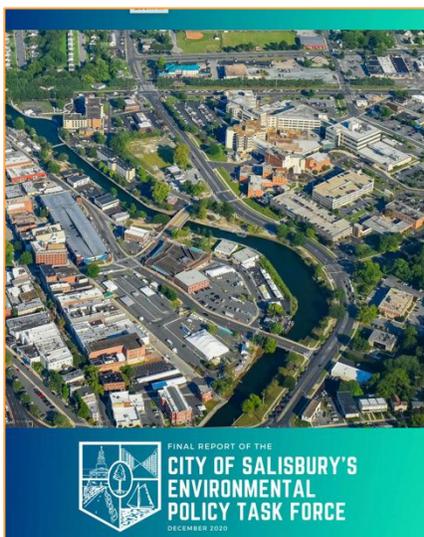
In addition to climate change planning documents published by the State of Maryland, local climate change planning initiatives have been undertaken.

Wicomico County developed and published an ESRI ArcGIS StoryMap entitled Climate Change in Wicomico County. The site includes Wicomico County specific information, such as:

- Cool climate change facts;
- Land use related climate change issues;
- Wildlife climate change impacts;
- Economic climate change impacts and adaptation strategies; and,
- Public health climate change impacts.



Source: <https://www.arcgis.com/apps/Cascade/index.html?appid=a8594f585a0246dc863638c918a68f5b>



The City of Salisbury Environmental Policy Task Force Report includes an energy use and emissions section include:

1. Embedding energy and emissions assessments into city planning, which is a prerequisite for being able to adequately implement and track these efforts into the future;
2. Building usage, which in 2009 accounted for nearly 20% of the City's emissions (2,057 tons);
3. Transportation usage, which in 2009 accounted for more than 19% of the City's emissions (2,059 tons) and the most expensive category at \$435,813 per year; and
4. Sustainable energy sources, which are critical for moving the needle forward.

5.6 MITIGATING GREENHOUSE GAS

In Wicomico County, INGENCO's operates a gas-to-energy power plant at the County's Newland Park Landfill, which generates 6 megawatts (MWe) of electricity daily for local use. The process used by this power plant involves the incineration of waste, which generates energy in the form of electricity and/or heat. This process of generating energy reduces the release of carbon dioxide, helping to reduce greenhouse gas emissions.

Businesses and residents also recognize the importance of reducing GHG's and converting to the utilization of renewable energy sources where practical. The use and implementation of solar energy has advanced to be both efficient and economical in supplementing conventional energy demands. Commercial and residential permit data was obtained from the Wicomico County Building Inspection Department to evaluate the prevalence of businesses and residents applying to install solar panels. Data was updated for this plan to include the years since the adoption of the previous plan. As shown in Table 5.1, solar panel installation permits have increased significantly since 2010, however, the number of permits issued for solar panel installations has ebbed somewhat since 2018.

Table 5.1: Solar Panel Projects

WICOMICO COUNTY PERMIT DATA	
YEAR	SOLAR PANEL PERMITS ISSUED
2010	1
2011	14
2012	10
2013	26
2014	74
2015	161
2021 HMP UPDATE	
2016	241
2017	200
2018	149
2019	114

Source: Wicomico County Permit Data, www.wicomicocounty.org

Additionally, Maryland's *Climate Action Plan* includes two climate change adaptation strategies that are currently being used to guide state-level adaptation planning efforts. The first strategy addresses the impacts associated with sea level rise and coastal storms. The second strategy, released as a complement to the Climate Action Plan, addresses changes in precipitation patterns and increased temperature, and the likely impacts to human health, agriculture, forest and terrestrial ecosystems, bay and aquatic environments, water resources, and population growth and infrastructure. Together, more than 100 experts from the governmental, nonprofit, and private sectors participated in a series of meetings from the purpose of interpreting the most recent climate change literature, evaluating adaptation options, and recommending strategies to reduce Maryland's overall climate change vulnerability.

Consideration of land use and transportation systems such as parks and open space as well alternative modes of travel promote climate change actions at the local government level. Promoting community design that incorporates open space, pedestrian and bicycle use, and tree plantings have the co-benefit of improving public health.