Caribbean Health Climatic Bulletin

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This Bulletin is a joint effort between the Caribbean Public Health Agency (CARPHA), the Pan American/World Health Organization (PAHO/WHO) and the Caribbean Institute for Meteorology and Hydrology (CIMH). It aims to help health professionals identify and prepare health interventions for favorable or inclement climate conditions in the Caribbean. The period covered is December 2020 - February 2021. It is recommended that health stakeholders should use the combination of monitoring (August - October 2020) and forecast (December 2020 - February 2021) climate information presented in this Bulletin in tandem with weather forecasts (1-7 days). This suite of information is intended to guide strategic and operational decisions related to health interventions and the management of health care systems.

What are the Key Climate Messages for December 2020 - February 2021?

- As of December 1st, the **2020 Hurricane Season** -- *which was the busiest on record with 30 named storms* -- is officially finished, but storms and hurricanes can occur and have occurred after the official end date. Severe weather systems, which can come with a range of hazards, including high winds, landslides, flash floods, coastal flooding, among others, may still affect Caribbean territories. From January onward, this risk should be strongly reduced throughout the islands and Belize.
- Climatically, December to February forms the first half of the **Caribbean Dry Season** in Belize and the Caribbean Islands, characterized by a steady decrease in the frequency of wet days and the intensity of heavy showers. Conversely, the number of dry days and dry spells typically increases steadily towards February, drying the surface and foliage, which may increase the potential for wildfires and airborne particulates. By contrast, in the Guianas, this period forms the secondary wet season.
- In September 2020, **La Niña** conditions developed. La Niña tilts the odds towards an intense secondary wet season in the Guianas. La Niña also favours a less intense early dry season in much of the Antilles, with the exception of the far north (i.e. the Bahamas and Cuba) where even drier than usual conditions become more likely.
- In the Guianas, intense and frequent heavy showers clustered in **very wet spells** and **extreme wet spells** throughout the period results in **high potential for long-term flooding** in flood-prone areas, as well as, **flash floods** *(high confidence)*. Although Belize and the Caribbean have entered their dry season, moderate potential for flooding and flash floods remains until late-December or early-January, after which the potential becomes very limited. Besides often resulting in flash floods, extreme wet spells may coincide with thunderstorms and high winds, land slippage or rockfall, soil erosion, power outages and possible contamination of food and water supplies. It should be emphasized that, while tropical cyclones typically produce extreme wet spells, a majority of extreme wet spells occur during the passage of other weather systems.
- The forecasts suggest that the early dry season may be even drier than usual in the Bahamas and Cuba, but potentially wetter than usual elsewhere. In the Guianas, rainfall totals may be much higher than usual. Within the period, a higher than usual number of wet days, wet spells, very wet spells and a higher chance for extreme wet spells is forecasted in the Guianas and the islands south and east of Hispaniola. This will further **increase the potential for flood-related hazards**, particularly in the Guianas *(medium to high confidence)*. The higher number of wet days in the Guianas suggests that surfaces may remain damp and moist for prolonged periods of time.
- By contrast, the potentially very dry conditions forecasted for the Bahamas and Cuba, including frequent short dry spells, are likely to steadily increase **wildfire potential**.
- The 2019-2020 regional **drought** has largely subsided and should generally not be a significant concern during this period.
- **Short term drought** (on a 3-6 months timescale) is unlikely to be a major concern by the end of February, apart from western Belize and northwest Puerto Rico, where it is likely to evolve, and in Antigua, Belize, the Dominican Rep. and southern Puerto Rico, where it is possible *(medium confidence)*. Short term drought may impact food production, water quality and quantity from small streams and small ponds and other surface sources.
- **Long term drought** (on a 12 months timescale), which may affect water availability across a multitude of socio-economic sectors in a country, should not be a significant concern by the end of May. However, long term drought should evolve in southern parts of Belize and northwest Puerto Rico, and may possibly develop or persist in eastern Cuba, eastern Dominican Republic, and southeast Puerto Rico *(medium to high confidence)*.
- This period forms the core of the **cool season**, during which night-time and day-time **temperatures** in the Caribbean are comfortable *(high confidence)*. The forecast suggests that a number of cold nights may be expected in Belize and high-altitude locations across the region *(medium confidence)*. **Heat waves** are virtually nonexistent during the coolest three months of the year in any area of the Caribbean *(high confidence)*.
- The frequency of **Saharan dust** incursions into the Caribbean tends to be relatively low during this period. It should be noted that, in some years, significant Saharan dust episodes occur as early as February. (Access more detailed forecast information on dust and air quality in the Caribbean here: http://dafc.cimh.edu.bb/). Though initially low, local dust levels may increase towards February.
- The **UV index** on sunny days will start increasing from high (6-7) in the northern Bahamas and very high (8-10) elsewhere in December and January, to very high (8-10) and extremely high (11-12) by the end of February (on a scale from 1 to 12. For more information, see: https://www.epa.gov/sunsafety/uv-index-scale-1). UV exposure is set to be dangerously elevated by February.

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What are the Health Implications for December 2020 - February 2021?

Respiratory Illness

- Less frequent episodes of Saharan dust incursions into the Caribbean in the coming season may reduce risk of exacerbations of **allergic rhinitis** and **asthma** in susceptible persons. In the Bahamas and Cuba, where drying of the surface and foliage is expected to increase the concentration of local dust, this risk may be enhanced. This risk may be further exacerbated during wildfires.

- Increased humidity in the coastal Guianas during the wet season may promote mold growth in damp and poorly ventilated buildings, leading to increased respiratory symptoms.

Gastrointestinal Illness

- Where episodes of flooding occur, cases of **gastroenteritis** and **ENT** complications may increase, where persons wade in flood waters (which could also result in skin-disease), or consume foods contaminated by these waters. This is particularly the case in the Guianas.

Non-communicable Diseases

- Morbidity from excessive heat due to high temperatures across the region should not be an issue in the period of interest.

- UV radiation will be at its annual minimum in December and January, though still high and increasing to extremely high in February. Excessive UV exposure can cause skin damage across the population on sunny days if unprotected (for more information, see: https://www.epa.gov/sunsafety/uv-index-scale-1).

- There is a possibility of **skin infections** due to contact with contaminated, stagnant and/or floodwaters, particularly in the Guianas.

Vector-Borne Illness

- Where episodes of flooding may occur, particularly in the Guianas, there is increased risk of **Leptospirosis** due to displacement of vectors such as rodents into houses, increasing the risk of contamination of household surfaces and food-stores.

- The presence of stagnant water in the aftermath of a flood may promote the breeding of mosquitoes. However, note that in the case of flash floods, flood waters may sweep away mosquito eggs, larvae and pupae, potentially reducing mosquito populations.

- During the early dry season, recurrent dry spells are expected in the ABC Islands, the Bahamas, Belize and the Greater Antilles. Increased use of containers for water storage may potentially create more breeding sites for mosquitoes, especially those associated with mosquito borne diseases, such as **Dengue**, **Chikungunya** and **Zika** which are of great concern for Caribbean territories. Proper management of water storage containers eg. covering with protective mesh, helps to reduce this risk.

- Access useful materials on mosquito control measures here: https://www.paho.org/en/campaigns/caribbean-mosquito-awareness-week-2020 http://missionmosquito.carpha.org/

Well-Being and Mental Health

- Severe weather systems, which can come with a range of hazards, including high winds, landslides, flash floods, among others, may possibly affect Caribbean territories, particularly in the Guianas. Although the 2020 Hurricane Season has come to an end, health practitioners and administrators should still maintain a state of readiness.

- Food insecurity would be a concern due to the potential for extensive crop damage and/or loss due to frequent dry spells in the ABC Islands, the Bahamas, Belize and the Greater Antilles. A similar concern arises as a result of the high flood potential in the Guianas. When impactful hazards have seasonal patterns, like extreme weather events, floods and drought, mental health effects may increase as alerts and events arise. Health Care Professionals are therefore advised to be aware of these issues, as they interact with patients.

COVID-19 and Climate Impacts

- Due to the ongoing COVID-19 pandemic, water availability is critical to support **prevention strategies** to combat the COVID-19 pandemic, especially with regards to safe water availability for hygiene purposes.

- Flooding in the Guianas may affect water quality, which is critical to support **prevention strategies** to combat the COVID-19 pandemic. Likewise, areas where flooding has occurred in recent months may still experience water quality issues. Special attention should be paid to communities with interrupted or limited access to safe water.

- Any disaster occurring will compound **psychosocial** impacts related to the COVID-19 pandemic particularly disasters arising from extreme weather events.

- Extreme weather events or disasters may cause an increased burden on already stressed **healthcare services**.

- When an impending extreme weather event occurs, **shelters** will require reorganisation to accommodate COVID-19 prevention strategies.

Disclaimer

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For More Health Information:
CARPHA
http://carpha.org

PAHO
http://www.paho.org

For More Climate Information:
Caribbean Regional Climate Centre (RCC)
http://rcc.cimh.edu.bb

For a Glossary of Technical Climate Terms:
https://rcc.cimh.edu.bb/glossary-of-terms/

More on Climate

Looking Back: August - October 2020

Rainfall

- Much of the Caribbean has recorded at least the usual rainfall accumulations over August to October, with northwestern parts to The Bahamas, parts of Barbados, Western Cuba, parts of French Guiana, Jamaica and Trinidad were very wet to exceptionally wet. By contrast, severe (or worse) shorter term drought has developed in western Puerto Rico, but eased in previously affected areas.

Temperature

- With the period forming the second half of the Caribbean heat season, temperatures remained high across virtually the entire Caribbean. The Bahamas, Grenada, Martinique and locations in Guyana, Puerto Rico and Suriname observed their warmest daytime maximum, daily mean or nighttime minimum temperatures averaged over the three-month period. By contrast, Antigua and parts of Guadeloupe were the only areas where slightly below-average temperatures were recorded over these three months.

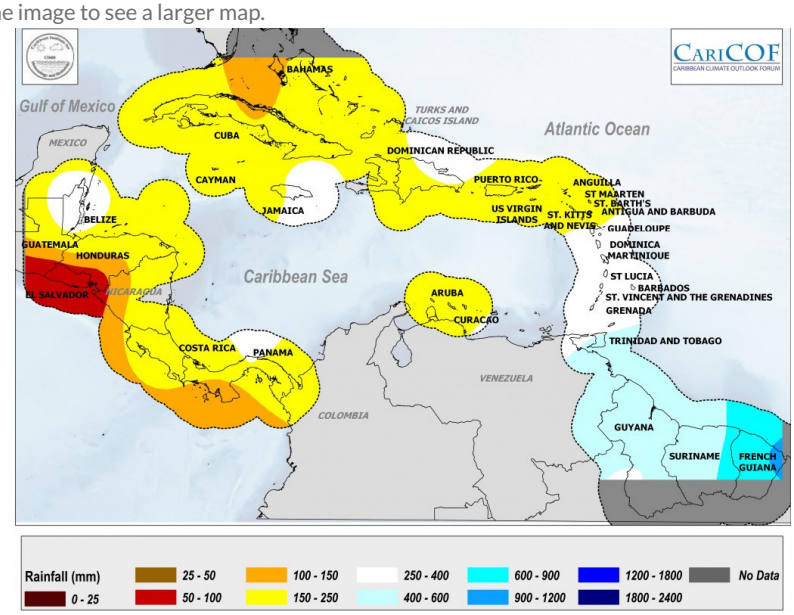
Climate Conditions and Dengue in 2020

- Recent research (e.g. Lowe et al., 2018) on the link between climate conditions and dengue cases in eastern Caribbean countries suggests that drought conditions followed 4-5 months later by warmer than usual temperatures and excessive rainfall, increases the chance of Dengue outbreaks.
- In that regard, climate conditions in the Caribbean have been optimal for mosquito proliferation and dengue outbreaks throughout 2020, particularly in the eastern Caribbean. A regional drought implied increased water storage in the first half of 2020. This was followed by an intense heat season, particularly in the eastern Caribbean. Higher temperatures lead to increased rates of mosquito breeding, biting and disease transmission. The 2020 Caribbean wet season further brought episodes of excessive rainfall and flooding in many parts of the region, which contributed to an increase in mosquito breeding sites. Increased dengue case confirmations were recorded in several of the Eastern Caribbean states.

What do we Usually Expect for December to February?

Rainfall

- This period typically marks the early dry season in Belize and the Caribbean Islands, but the secondary wet season in the Guianas and the transition into the long dry season in the ABC Islands. This is illustrated in the Figure below (Historical Average Rainfall Totals). Click on the image to see a larger map.



Temperature

- December to February forms the coolest part of the year across the region, with generally comfortable 'feels-like' temperatures and an absence of heat waves.

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