COUNTRY HYDROMET DIAGNOSTICS

Informing policy and investment decisions for high-quality weather forecasts, early warning systems, and climate information in developing countries.

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Dominica Peer Review Report

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Dominica Meteorological Service,

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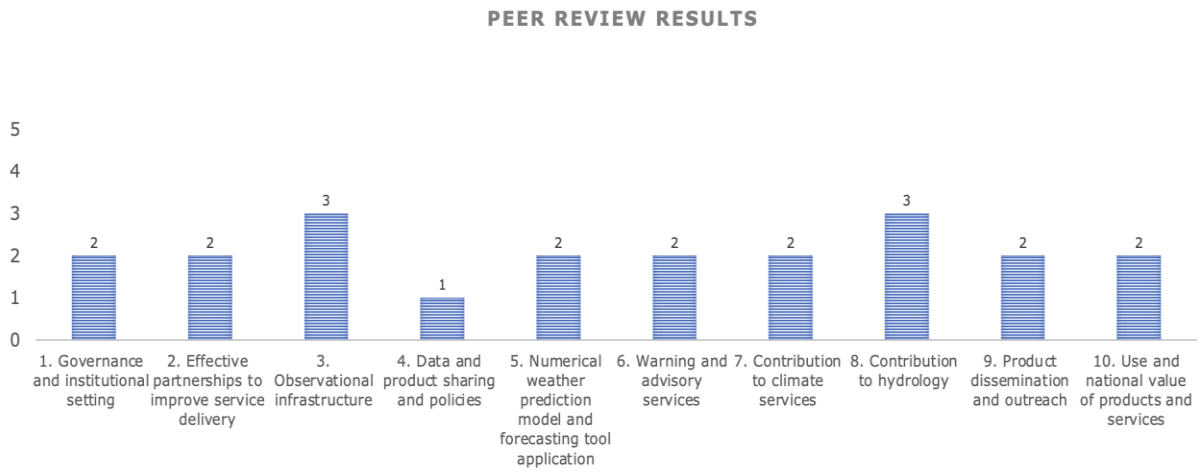
Executive Summary

The Dominica Meteorological Service (DMS) is the national meteorological and hydrological service agency of Dominica, currently sitting under the Ministry of National Security and Legal Affairs. Its competences expand in the areas of weather forecasting, climatology, hydrology, agro-meteorology, instrument & equipment maintenance and weather observations.

The Dominica Meteorological Service operates under the watch words: "Constantly Monitoring the Atmosphere".

With its extensive and as its role of national critical infrastructure, the DMS faces several challenges that require attention:

- Legal framework – currently DMS acts without a formal mandate and a legislative framework. These should include the new capacities, such as hydrological services.
- Staff capacity - with the current staff levels, DMS cannot operate as a robust NHMS and there is an urgent need to capacitate the service.
- Observational network – there is a need to find a sustainable solution for the maintenance operations of the meteorological and hydrological networks.
- Harmonized Data Management System – a single and operative (also such, which performs international data exchange) DMS is needed for the operations of DMS.
- Operational Centre – adaptations and changes are required to allow for 24/7 operations. This includes proper procurement of servers and tools to have a functioning operational room as well as additional staff to initiate a shift approach.
- Enhanced end-user centered approaches and stakeholder engagement – there is an internal drive to advance towards end-user centric approaches and extension towards impact-oriented services which should be largely supported, encouraged and reinforced with adequate capacities.



Element	Maturity level score
1. Governance and institutional setting	2
2. Effective partnerships to improve service delivery	2
3. Observational infrastructure	3
4. Data and product sharing and policies	1
5. Numerical weather prediction model and forecasting tool application	2
6. Warning and advisory services	2
7. Contribution to climate services	2
8. Contribution to hydrology	3
9. Product dissemination and outreach	2
10. Use and national value of products and services	2

Chapter 1: General information

Introduction

Dominica is an independent island state since 1978, located in in the Lesser Antilles archipelago in the Caribbean Sea, between Guadalupe to the north and Martinique to the south. Covering latitudes from 15.21º to 15.64º N and longitudes from -61.48 º to -61.23 º E with a total land area of about 750 km^2 and with a total coastline of circa 100 km, Dominica possesses a rather large marine Exclusive Economic Zone of about 29,000 km^2. The country has had some fluctuations in the population especially after major natural disasters (such as the Hurricane Maria in 2017), which generate temporary and permanent emigration from the country. Based on the latest information from the Central Statistics Office of Dominica[1], in 2017 the total population of Dominica was 67,407 – though more recent estimates provide for 2021 a population of 72,412[2], 73,040 in 2023[3], and 74,661 as of 2024[4]. Most of the population lives in the narrow coastal areas, especially in the western coast and around the capital, Roseau.

Dominica has a very complex topography, with very rugged terrain, high density of mountains, 9 active volcanoes and a high density of steep valleys, rivers, waterfalls and lakes. The island is covered mostly by thick tropical rainforests. Such an environment, as well as its location in the Caribbean Sea, poses a wide range of challenges and leads to significant vulnerability to geological and hydro-meteorological hazards which are exacerbated by limited infrastructure and accessibility limitations. As mentioned above, such an unfortunate example for the vulnerability of the nation occurred as the almost catastrophic results of the Hurricane Maria, back in 2017.

Due to its location, the climate of Dominica is a mostly marine tropical climate[5], with a wet season between June and November, coinciding with the Atlantic hurricane season, and a relatively dry season between December and May, with February to April being the driest. Since the island is very mountainous, a large number of micro-climates also occur often leading to orographically induced precipitation (and subsequent landslides). Dominica has an average annual rainfall ranging from about 2,000 m in the western coast to 5,000 mm in the inland regions reaching up to in excess of 7,620 mm[6]. Temperatures are warm all year around, with average temperature of 27 ºC, with daytime/nighttime average of 27º/18-22º degrees in coastal areas and down to 19 º/1'-12 º degrees Celsius at the higher elevations in the inland mountain ranges.

[1] https://stats.gov.dm

[2] https://en.wikipedia.org/wiki/Dominica, "World Population Prospects 2022". United Nations Department of Economic and Social Affairs, Population Division. Retrieved 17 July 2022.

[3] https://data.worldbank.org/country/dominica?view=chart

[4] CIA, Dominica Country Factsheet, https://www.cia.gov/the-world-factbook/countries/dominica/factsheets/

[5] https://rcc.cimh.edu.bb/files/2018/06/Country-Profile-Dominica.pdf

[6] DMS; UNFCCC 2012, http://carogen.cimh.edu.bb/

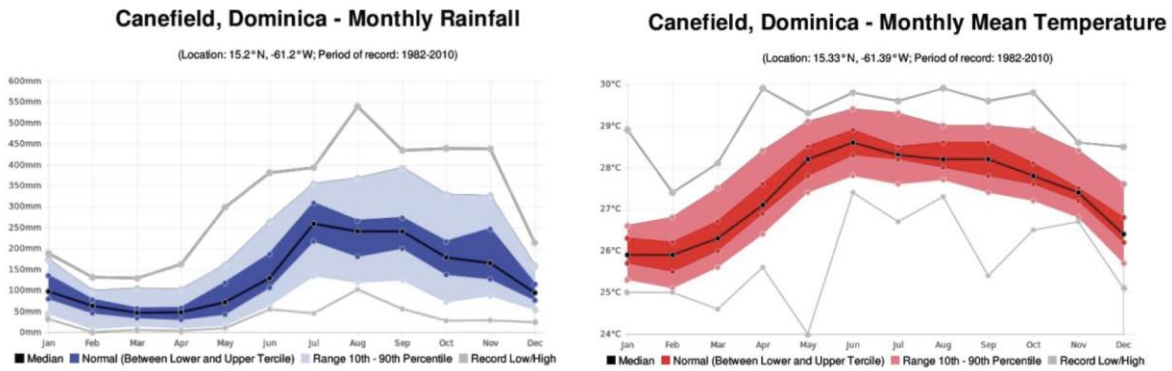


Figure 1: 1981-2010 reference climatology of monthly rainfall totals (left) and mean near-surface air temperature (right) at the Canefield airport station. Source: rcc.cimh.edu.bb (data from the Dominica Meteorological Service)

Inform Risk Index

The country has an Inform risk index of 2.9 (scale 0-10, 0 is optimum) and is thus positioned in the risk class "Low", meaning that the country, considering the Inform criteria, is at a low risk of a humanitarian crisis in case of natural or man-made disaster. The coping capacity of the country is relatively high as well. However, it is clear as already past disasters demonstrate, that disasters with major impacts occur and the country requires additional effort to be prepared for them. For more information, visit https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Results-and-data.

Hazard and exposure: 2.1 [0-10]

Vulnerability: 2.8 [0-10]

Lack of coping capacity: 4.0 [0-10]

The Dominica Weather Service

The Dominica Meteorological Service (DMS) was established in 1959 at the Douglas-Charles Airport, which then expanded in 1982 to the Canefield Airport. DMS initiated its services primarily to provide for the aviation sector under the International Civil Aviation Organisation (ICAO) standards. Currently, DMS sits under the Ministry of National Security and Home Affairs and has expanded its services in the areas of weather forecasting, climatology, hydrology, agro-meteorology, instrument & equipment maintenance and weather observations.

The DMS operates under the watch words: "Constantly Monitoring the Atmosphere".

CHD methodology

This report has been prepared using the methodology described in the 2022 update of the Country Hydromet Diagnostics (CHD). A joined workshop was organised in Barbados, with representatives of the Meteorological Services of Dominica. Saint Lucia and Saint Vincent and the Grenadines, as well as representatives from regional and international organisations. This workshop was followed by a country visit, followed by report revision and approval. The in-country visit included meetings in the different Weather Service locations (main office, Canfield airport and Douglas-Charles airport) as well as visits to

observational selected sites in different locations typology and stakeholder meetings at their respective locations.

This document is intended to provide crucial information for the SOFF initiative implementation phase, which in Dominica is coordinated by GeoSphere Austria together with the World Food Programme (WFP), as well as informing the ambitious Early Warnings for All (EW4All) initiative of the United Nations (UN). The assessment by GeoSphere Austria has been facilitated by an on-site visit as well as various remote consultations. Following the CHD structure, this report is presented along the ten most critical elements of the hydromet value cycles with an indication of their respective maturity level and some high-level recommendations to help lift up that maturity level, and as mentioned above, with special emphasis on monitoring, forecasting, climate projection and warning systems for climate-related hazards, across timescales.

The CHD provides a high-level strategic assessment of National Meteorological and Hydrological Services (NMHS), their operating environment, and their contribution to high-quality weather, climate, hydrological and environmental services and warnings. It integrates existing approaches, standards and data provided by WMO and partners, using a peer review approach. The CHD methodology (2022 update of the CHD) has been developed under WMO leadership and with guidance of a multi-party Working Group. The CHD aims at informing policy and investment decision-making, in particular guiding investments of the members of the Alliance for Hydromet Development. The Alliance brings together major development and climate finance partners behind a joint commitment to strengthen developing country hydromet capacity. Through the Diagnostics, developing countries are expected to benefit from better targeted and aligned financial and technical support.

This report is the one of the results of a much wider-scope project, coordinated by the Systematic Observations Financing Facility (SOFF) Secretariat under the World Meteorological Organization (WMO). SOFF aims at creating a sustainable process to enhance and strengthen the National Surface and Upper-Air observational networks and to bring them closer to the Global Basic Observations Network (GBON) criteria. In addition, the SOFF initiative is now a part of a much larger initiative, namely the EW4All, targeted at providing early warning information of weather and climate induced disasters to everybody on Earth by 2027. Following the defined methodology, the CHD is based on the ten most critical elements of the hydro-met value cycle, grouped under four categories – (i) enablers, (ii) observation and data processing system, (iii) service and product production and dissemination, and (iv) user and stakeholder interaction.

The 10 elements of the Diagnostic are defined as follows:

Enablers

(1). Governance and institutional setting - The formalization of the NMHS mandate and its implementation, oversight, and resourcing.

(2). Effective partnership to improve service delivery - Effectiveness of the NMHS in bringing together national and international partners therefore improving the service offering. This includes the academic, research, private sector and climate and development finance institutions.

Observation and data processing system

(3). Observational infrastructure - The level of compliance of the observational infrastructure and its data quality with prescribed standards.

(4). Data and product management, sharing, and policies - The nature of data and product sharing on a national, regional, and global level.

(5). Numerical model and forecasting tool application - The role of numerical model output and forecasting aids such as remotely sensed products in product generation; whether models are run internally and if the value-added compared to global models is determined.

Service and product production and dissemination

(6). Warning and advisory services - NMS role as the authoritative voice for weather related warnings and its operational relationship with disaster and water management structures.

(7). Contribution to climate services - NMS role in and /or contribution to a national climate framework according to the established climate services provision capacity. The assessment on this point will be based on, and complement the recently completed work on, the capacity assessment of climate information services in North Macedonia.

(8). Contribution to hydrology - NMS role in and contribution hydrological services according to mandate and country requirements.

(9). Product dissemination and outreach - Effectiveness of the NMS in reaching all public and private sector users and stakeholders.

User and stakeholder interaction

(10). Use and national value of products and services - Accommodation of public and private sector users and stakeholders in the service offering and its continuous improvement.

For each value cycle element, a limited number of standardized indicators is used, and each indicator uses explicitly defined data sources. The assessment of these critical elements of the National Meteorological Service should lead to their maturity level. Note that Level 5 is the highest attainable maturity level in the CHD assessment.

Chapter 2: Country Hydromet Diagnostics

Element 1: Governance and institutional setting

1.1 Existence of Act or Policy describing the NMHS legal mandate and its scope

Currently, there is no legislative framework that supports and details the DMS activities, roles or responsibilities. The Caribbean Meteorological Organization (CMO) prepared in 2021 (together with similar bills for other Members of CARICOM – the Caribbean Community) a draft for a general legislative bill that included contributions from Dominica representatives. While this bill exists, the national administrative and legislative procedure to nationally adopt it and implement it has not yet been initiated.

Such a situation does not facilitate the operations of the weather service, with limited national awareness of the mandate, responsibilities and boundaries of the DMS. Nevertheless, the DMS pursues and continues operations as if the existing mandate was to provide and maintain weather data (also for aviation), hydrological services (which have just been initiated) and climate services (at the sub-seasonal and seasonal timescales).

It is to be noted that DMS does not even appear on the website of the Ministry of National Security and Home Affairs, where it should be at the same level as the Office of Disaster Risk Management (ODM). While the current ministerial assignment and the co-location with ODM is good practice, the lack of legal umbrella hinders effectivity and proper establishment of the NHMS. In addition, during the last ten years, the DMS has switched between 5 different ministries, demonstrating an instability that prevents consolidated strategic approaches.

While there is no meteorological act established in Dominica, there are additional acts like the Water and Sewerage Act (1989), which regulates the development and control of water supply and sewerage facilities. It mandates the establishment of Dominica Water and Sewerage Company Limited, and outlines its responsibilities (disseminate information and advice with respect to the management, collection, production, transmission, treatment, storage, supply and distribution of water) – and while there is a strong collaboration with DMS, there is still no formal description of the role of DMS itself in the act related to hydrological services. Similarly, the National Policy for the Agriculture, Environment (Agri-Eco) System (2017-2025) relates to DMS activities, but it does not include a formalisation of the DMS role.

1.2 Existence of Strategic, Operational and Risk Management plans and their reporting as part of oversight and management.

In October 2021, also through CMO, a National Strategic Plan and Framework for Weather was delivered in the Climate Risk and Early Warning System (CREWS) Initiative's Caribbean Project[7]. While the document outlines the strategic directions to assists the DMS over the next five years in providing weather, water, and climate services, it has not yet fully been deployed or implemented. The institution has very limited human resources to address the implementation of such a plan.

Strategic, operational and risk management plans require an adequate number of staff. **Currently DMS has very limited human resources with each staff member performing diverse duties in various fields**. Structured approaches in this situation are not possible. On that note, it is to be highlighted that DMS's management functions are currently the responsibility of one single individual, i.e. the most senior officer.

[7] https://wmo.int/media/news-from-members/climate-risk-and-early-warning-system-initiatives-caribbean-project-strengthened

1.3 Government budget allocation consistently covers the needs of the NMHS in terms of its national, regional, and global responsibilities and based, among others, on cost-benefit analysis of the service. Evidence of sufficient staffing to cover core functions

The current budget of the DMS amounts to $736'000 East Caribbean Dollars (for 2024), out of which around $600'000 (80%) is spent for staffing and the rest goes, mostly, to facility maintenance and operations. Investments (e.g. for new AWSs), procurement of spare parts or IT services lack proper budgetary funding. The sole regular budget provider is the government and limited third party funding that offer non-sustained approaches. Although DMS is the authorized provider of meteorological services for aviation in the country, there is no direct cost recovery mechanism for this sector or any other business engagement.

The current budget is insufficient to even cover the current activities of the personnel and their responsibilities. It is to be noted, for instance, that maintenance and operations of the stations reside in a single individual that has to use her own private vehicle to reach the different locations in the island. A significant enlargement of the budget is needed to cover technical aspects but also, and very importantly, to staff DMS adequately.

There is no cost-benefit analysis available.

1.4 Proportion of staff (availability of in-house, seconded, contracted- out) with adequate training in relevant disciplines, including scientific, technical, and information and communication technologies (ICT). Institutional and policy arrangements in-country to support training needs of NMHS.

Currently, the DMS operates with 13 in-house staff members, with no secondments or contractors. This limited workforce is operating beyond full capacity, handling multiple tasks simultaneously, many of which are not directly related to their primary roles. This multitasking makes it difficult to provide the comprehensive training necessary to fully equip staff for their diverse duties.

Given the scope of DMS's mission and vision, the existing staffing levels are insufficient. The DMS undertakes critical tasks, including issuing weather alerts, providing climate services (seasonal and sub-seasonal forecasts), collecting and managing observation data, delivering hydrological services (such as monitoring river flow and water levels), maintaining and repairing instruments, conducting outreach and public education, and supporting disaster management initiatives.

To address these impeding challenges, the DMS has proposed a staffing increase to the government as of February, 2024. The proposal argues the need to grow the team from 13 (comprising four forecasters, one senior hydrology technician, two mid-level hydrology technicians, one mid-level instruments technician, four entry-level technicians, and one temporary staff member) to over 20 personnel. This expansion is essential to enhance the human capacity of the DMS, guarantee the fulfilment of its role, and ensure 24/7 service provision.

Moreover, it is important to address existing administrative barriers that hinder the recruitment of qualified candidates. Without removing these obstacles, reliance on on-the-job training becomes necessary, which can take several years to develop the required baseline knowledge and expertise.

The only major regional institute providing education and training for staff members is the Caribbean Institute for Meteorology and Hydrology (CIMH) in Barbados, of which the DMS is a member. No further educational or training possibilities in these technical areas exist in the country itself or in the region as a whole. Notably, one of the most senior staff members pursued a PhD abroad, which has enhanced the department's expertise but also temporarily reduced staffing capacity. As such, training must be strategically planned to account for its impact on the overall workload, and efforts should be made to incorporate in-house training whenever feasible.

Furthermore, ICT and QMS training is limited as well. Currently, there is no personnel strictly devoted to ICT and QMS, which are handled internally and in parallel to other staff activities.

With regard to gender balance, the organization employs 8 female and 4 male staff members.

1.5 Experience and track record in implementing internationally funded hydromet projects as well as research and development projects in general.

The DMS has participated in several internationally funded initiatives, including projects under the CREWS umbrella and the WMO-led "SIDS Caribbean Project: Preparedness to Climate Variability and Global Change in Small Island Developing States (SIDS) of the Caribbean Region." Additional support has come from organizations such as the UNDP, WFP, FAO, and the World Bank, which have spearheaded various initiatives focused on enhancing observational capacity, climate change adaptation, resilience, and food security.

One particularly significant initiative is the Disaster Vulnerability Reduction Project, launched in September 2014. This project is funded by the World Bank, the International Development Association (IDA), the Pilot Program for Climate Resilience (PPCR), the Strategic Climate Fund (SCF), and the Government of the Commonwealth of Dominica. Among its activities, it has established a network of monitoring stations that feed data into a developmental website providing (near) real-time information—resources that are potentially highly valuable for the DMS's operational responsibilities. Overall, these projects have generally been well-implemented when undertaken.

While capacity development activities and initiatives vary in focus and scope, the DMS currently benefits from strong leadership with a clear results-oriented mindset. This approach ensures that new initiatives, stations, and projects are strategically aligned with the institution's objectives and, ultimately, the broader needs of the country. This thoughtful and forward-looking outlook is uniquely positioned to provide long-term benefits to the nation while avoiding overstretching the absorptive capacity of the weather service.

Summary score and recommendations for Element 1

The CHD Element 1 score for the "Governance and Institutional Setting" assessed as Maturity Level 2 on the CHD scale, reflecting "Effort ongoing to formalize mandate, introduce improved governance, management processes and address resource challenges".

While the DMS is performing its understood roles and responsibilities with passion, there is a set of challenges that prevent it from operating at full capacity. The recommendations below follow a pragmatic approach and are aligned with the country's situation and the most relevant key players (see Elements below as well):

a. Formalize and advance the process of enacting legislation to establish the DMS' mandate, using the CMO legislative bill as a framework. In addition, review and update related governmental acts to align with the activities of a National Weather Service (NMS), ensuring compliance with WMO standards and guidelines where appropriate.

b. Strengthen collaboration with the aviation sector to explore opportunities for optimizing cost-recovery mechanisms that can support DMS activities. Additionally, other sectors may be approached for revenue-generating activities, such as marine operations, agriculture and tailored services for the tourism industry. However, it is essential to ensure that any increase in income is matched with the ability to hire additional staff to avoid overburdening the existing team.

c. As it is clear here and elsewhere in this document, the staffing limitations significantly constrain the institution's capacity, hinder services provision, prevent 24/7 operations, and stretches personnel. **Advocacy for increased staffing levels is highly needed, building on the formal request already submitted to the government.** It may be suitable to look for the support of key stakeholders (particularly from ODM) to strengthen the case for staff expansion. Additionally, explore trainee programs to recruit and develop talent early in their professional careers.

d. It is recommended to maintain the focused approach on capacity development projects, ensuring that new initiatives do not add stress to the system by capacitating the DMH with several additional infrastructure that could exceed the institution's ability to maintain and support them in the long term.

Element 2: Effective partnerships to improve service delivery

2.1. Effective partnerships for service delivery in place with other government institutions.

DMS has already functioning and strong cooperation with national stakeholders, though none of them are formalized through a legislative framework or an agreed MoU and they mostly rely on interpersonal relationships.

DMS is physically co-located with the Office of Disaster Management (ODM), which coordinates the implementation of comprehensive disaster management in the Commonwealth of Dominica through the National Emergency Planning Organization (NEPO). Such activities are done together with the DMH. Both organisations are within the same ministry and the National Disaster Coordinator of the Office of Disaster Management is in effect the WMO Permanent Representative and former director of the DMH. This setting facilitates a smooth and close permanent cooperation.

In recent years, the DMS has expanded its mandate to include responsibilities in the water sector. To support this, it has established close working relationships with the Dominica Water and Sewerage Company Limited (DOWASCO), with the shared goal of introducing hydrological modelling capabilities within the country. While meteorological data is routinely exchanged, there remains a need for further development of products related to drought monitoring, seasonal and sub-seasonal forecasts, and hydrological modelling. Additionally, the establishment of an alert system is currently under discussion, although specific trigger criteria have yet to be defined.

Beyond technical partnerships, the DMS also maintains linkages with key ministerial stakeholders. Historically, the Ministry of Agriculture collaborated closely with the DMS, notably through the joint production of a climate-agriculture bulletin. Although this cooperation is now less formal and occurs less frequently, the ministry continues to engage with the DMS on seasonal outlooks and during weather-sensitive periods.

Furthermore, the DMS and the aviation authorities used to operate under the same ministry, which facilitated coordination. However, following their separation, institutional boundaries became less defined—exacerbated by the DMS's still-undefined formal mandate. Although the DMS continues to meet ICAO-WMO requirements, it does not provide maintenance for meteorological stations outside its ownership, nor does it supply certain parameters specifically requested by the aviation sector, such as instantaneous wind speed and maximum wind gusts. This has led to operational challenges that underscore the need for more structured collaboration. The development of a Memorandum of Understanding (MoU) would serve to clearly define the DMS's mandate and responsibilities while explicitly outlining the meteorological needs of the aviation sector.

Efforts are also underway to strengthen collaboration with the Ministry of Environment and Health. The objective is to enhance the exchange of information and jointly develop impact-based products that are tailored to the needs of end-users. Although there is some level of cooperation at present, it remains informal and infrequent.

At the regional level, CARICOM (the Caribbean Community) serves as an overarching organizational framework, functioning in a manner similar to a United Nations body. Within this structure operates the Caribbean Meteorological Organization (CMO), which maintains formal relationships with the meteorological services of CARICOM member states, including Dominica. This regional affiliation supports coordination, policy alignment, and capacity-building efforts across the Caribbean.

2.2. Effective partnerships in place at the national and international level with the private sector, research centres and academia, including joint research and innovation projects.

Currently, there are no partnerships in place between DMS and the private sector. As for research centres and academia, the only partnership existing is with the CIMH. This relationship focuses on training, maintenance support, spare parts purchase and calibration (even if the latter is only on a partial base). CIMH covers such activities for most countries in the region, which stretches its own capacities.

In addition, the DMS collaborates with Cuba on the implementation of a nowcasting system, which is particularly valuable for monitoring tropical precipitation and identifying extreme weather events. There is also cooperation with Météo-France, providing the DMS with access to radar data from Martinique and Guadeloupe—an important asset for regional observation and forecasting capabilities.

2.3. Effective partnerships in place with international climate and development finance partners.

The DMS is a participant in the Intra-ACP Climate Services and Related Applications Programme (ClimSA), a EUR 85 million initiative led by the Organisation of African, Caribbean and Pacific States (OACPS) and the European Union. Implemented under the 11th European Development Fund (EDF), ClimSA represents a significant investment aimed at strengthening the entire climate services value chain—from data access and climate information generation to service delivery, user engagement, and capacity building to promote effective utilization.

Additionally, the DMS maintains project-based relationships—though not yet formalized partnerships—with several key organizations, including the CREWS Secretariat, the Caribbean Institute for Meteorology and Hydrology (CIMH), the Caribbean Meteorological Organization (CMO), USAID, and the Systematic Observations Financing Facility (SOFF), through various development initiatives.

2.4. New or enhanced products, services or dissemination techniques or new uses or applications of existing products and services that culminated from these relationships.

DMS's informal relationships with the NMHSs of Cuba and France may lead to the implementation of better nowcasting rainfall products for the country. However, this is not yet implemented and will require additional work.

On another note, collaboration with CIMH led to the development of seasonal and sub-seasonal forecasts, which are now currently jointly implemented and generated at DMS.

Former collaboration with the Ministry of Agriculture led to the production of a climate-agriculture bulletin with feedback of the farming community. While this product was appreciated on both sides, its production stopped several years ago.

Summary score, recommendations, and comments for Element 2

The CHD Element 2 score for "Effective partnerships to improve service delivery" is assessed as Maturity Level 2 on the CHD scale, reflecting "Limited partnerships and mostly excluded from relevant finance opportunities".

While there are some functioning existing relationships and cooperation, additional recommendations could be implemented:

a. Formalizing the existing partnerships with different governmental and semi-governmental entities through specific MoUs. Specifically important to build an effective MoU with the aviation authorities.

b. To explore possible partnerships with the private sector in the fields of tourism.

c. Dominica is especially susceptible to climate change and, while there is a strong commitment to prevent risks and mitigate their effects, especially from ODM, it would be important to seek relevant partnerships with international organizations and research institutions.

d. At the same time, it is important to try to develop additional products with national partners to position the DMS and further develop the end-user-oriented mindset already existing in the organization.

e. Seek regional partnerships to further capitalize the regional component in any research activity and to jointly develop potential services with regional scope that can benefit all countries.

Element 3: Observational infrastructure

3.1. Average horizontal resolution in km of both synoptic surface and upper-air observations, including compliance with the Global Basic Observing Network (GBON) regulations.

According to the GBON requirements, Dominica should operate at least one surface station and a single upper-air station, transmitting data 24/7 and on a real-time basis, at an hourly frequency for surface stations, and twice a day for upper-air observations. DMS currently operates a network of 34 (+2 at the two airports) automatic weather stations (AWSs). Out of the 34 stations one has been moved for repair. While all but those in the airport, are automatic, they do not collect all parameters and mostly only rainfall. Only 4 have all the parameters on an hourly basis. However, these data are currently not transferred or exchanged internationally via WIS, and it is a challenge to continuously maintain and to renew the network after capacity development projects end.

No upper air station is in place, and none was planned in the latest resource request made to the government. On that note, the upper-air observations performed in Barbados and partly also in Guadalupe provide sufficient coverage for the region.

3.2. Additional observations used for nowcasting and specialized purposes.

Nowcasting capabilities are still limited. As stated, there is ongoing cooperation with Cuba to implement a nowcasting system specifically useful for tropical precipitation and identification of extremes events, as well as with Météo-France for radar access from Barbados, Martinique and Guadeloupe. A clear timeline on its operationalisation is not yet clear.

Meanwhile, Trinidad and Tobago provides information about volcanic activity and earthquakes and its weather service operates seismic stations.

3.3. Standard Operating Practices in place for the deployment, maintenance, calibrations and quality assurance of the observational network.

Under the Disaster Vulnerability Reduction Project (DVRP), additional monitoring stations have been deployed across the country. Although regular maintenance is conducted approximately every three months, there is currently no formal Standard Operating Practices (SOP) in place. Furthermore, the limited workforce available for maintenance is a significant challenge. The one technician responsible for maintaining the network also manages a broad range of other duties at the DMS and relies on a private vehicle to access the stations. There is therefore a pressing need to enhance maintenance and operational capacity.

Calibration services for the equipment are available exclusively at the CIMH. However, these services are limited to a small subset of sensors—specifically, temperature, humidity, and precipitation sensors—and only for devices from a single manufacturer. There is a lack of formal calibration kits and procedures.

While basic data quality checks are performed on a best effort basis, there is not a formal or regularised (specially not automatised) quality management system. This remains an urgent necessity. In addition, there is no defined or clear approach to data management, which is a critical bottle neck for international data transmission (via WMO WIS, WIS 2.0). Two options are under consideration: MCH[8], which may not work with WIS2, and

[8] https://community.wmo.int/en/mch-meteorology-climatology-and-hydrology-database-management-system

OpenCDMS[9], both supported by WMO. The latter has a plugin for WIS 2.0. Currently, data can only be manually transferred to WIS.

3.4 Implementation of sustainable newer approaches to observations.

There is none at the moment. However, in order to rationalise the absorbing capacity of the DMS, there is a limitation of acceptance of capacity development projects that would stretch the capacities of the weather service without much added value. This approach is regarded as a strength, reflecting a prudent and strategic long-term perspective.

3.5. Percentage of the surface observations that depend on automatic techniques.

All the 34 surface stations are automatic and connected through satellite. However, none of the data is able to be transmitted internationally in near real time.

Summary score, recommendations, and comments for Element 3

The CHD Element 3 score for "Observational Infrastructure" is assessed as Maturity Level 3 on the CHD scale, "Moderate network with some gaps with respect to WMO regulations and guidance and with some data quality issues.".

Recommendations:

a. While there is real-time transmission of the network data to the website and headquarters, there is no capacity yet to internationally exchange the data and ensure the national transfer is robust and truly operational. Through different projects such as SOFF, the transmission of the data should be sorted out as long as whatever initiated for one single station is harmonized for all existing network stations.

b. **Due to the proximity to Barbados, it is not recommended to invest in procuring an upper-air station, at least not without having a coordinated approach at the region.** Should Dominica be considered as a back-up in the north to Barbados, then a different strategy could be considered (together with the upper air station in Guadalupe).

c. The installation and training of an integrated data management system that can cover all the needs of DMS is highly recommended.

d. The generation of SOPs and automatized – or at least regularized – quality management systems is encouraged.

e. Personnel is a critical component as well in this element. To maintain and operate the stations, additional manpower should be allocated to this activity without affecting the other tasks of DMS.

f. Furthermore, it is recommended to explore possibilities for the engagement of local observers, coming from the local communities in the vicinity of the station or/and joint efforts with some of the stakeholders (like DOWASCO) to perform basic maintenance of the stations.

[9] https://www.opencdms.org - https://community.wmo.int/en/open-cdms-strategy

Element 4: Data and product sharing and policies

4.1. Percentage of GBON compliance – for how many prescribed surface and upper-air stations are observations exchanged internationally. Usage of regional WIGOS centres.

Currently, none of the stations operated by DMS are GBON-compliant, mostly due to the fact that the data management system is not communicating with WIS 2.0, and therefore not being able to perform any international data exchange.

DMS does not operate any upper-air station but, as stated, it may be covered by the station in Barbados, which fulfils GBON compliance requirements for several countries in the region.

4.2. A formal policy and practice for the free and open sharing of observational data.

Currently there is no formal policy for data sharing and open data. However, data is exchanged regularly based on already existing informal working relationships with other national institutions (e.g. the water company).

4.3. Main data and products received from external sources in a national, regional and global context, such as model and satellite data.

The DMS has access to open web-based meteorological products, such as GFS (it is to be noted, though, that this model does not incorporate data from Dominica, since data is not yet exchanged internationally and therefore excluded from model assimilation), ECMWF, and information disseminated via websites from Barbados or the US National Hurricane Centre, among others.

Additionally, the DMS does not have the capacity for in-house modelling, whether for NWP, climate, or hydrological purposes, nor does it have the resources for post-processing or detailed data analysis. While some support is provided by CIMH, which employs the Weather Research and Forecasting Model (WRF), such information does not cover all the nation's needs. An agreement with Météo-France provides DMS access to the AROME model at a 0.25-degree resolution for the region.

The DMS makes use of web-based satellite data and provides images from the NOAA National Hurricane Center and satellite imagery from NASA on its website. Marine models provided by GFS and ECMWF are also used, as well as a 500m-scale WW3 (WaveWatch III) model, thanks to the recent operationalization of Cuba INSMET's SisPI.

Summary score, recommendations, and comments for Element 4

The CHD Element 4 score for the "Data and Product Sharing and Policies" assessed as Maturity Level 1 on the CHD scale, reflecting, "No observational data is shared internationally, either because not available to be shared or due to the lack of data sharing policies or practices, or the existing infrastructure does not allow data sharing.".

Recommendations:

a. To exploit existing or upcoming projects such as SOFF to initiate a robust mechanism (with a single process flow and system) to ensure real time international data exchange.

b. A decision on data management software should be made, and then the personnel should be trained and the systems adapted as required. The data management system should include, whenever possible, quality check as well as basic data access and visualization features.

c. To capitalize on the value chain of the institution, a formalized data policy/transfer should be established: either an overall legal act or framework (to define open data policy for specific uses, for instance), or with partner-specific MoUs that enable data sharing under a protected and regularized mechanism.

d. While establishing a full Numerical Weather Prediction (NWP) suite in-house may not be advisable due to resource constraints, it remains highly relevant for the DMS to develop in-house expertise in data analysis and post-processing. This capability would allow the effective use of raw NWP data to produce tailored products for end-users, stakeholders, and national needs. Furthermore, with the anticipated availability of real-time observational data, there is an opportunity to support both data assimilation and model verification processes—enhancing the overall accuracy and reliability of forecasting outputs.

Element 5: Numerical model and forecasting tool application

5.1. Model and remote sensed products form the primary source for products across the different forecasting timescales.

As stated in Element 4, DMS has access to web-based products that are openly available (GFS at 22 km and hourly, and ECMWF at 9 km also hourly) as well as the products from the US National Hurricane centre. DMS does not have the capacity to run in-house NWP, so products from AROME by Météo-France (at 2.5 km and hourly) are used instead. In addition, the results from SISPI from Cuba are also accessible at 600 m and 1 hour timesteps. Raw data is not reaching the institution and there are no data sciences procedure or post-processing system to further downstream and enhance these outputs. Additionally, radar data from Barbados is available.

5.2. a) Models run internally (and sustainably), b) Data assimilation and verification performed, c) appropriateness of horizontal and vertical resolution.

No model runs are run internally for any of the services other than the seasonal products produced jointly with CIMH.

Formal quantitative verification is not done. In addition, there is no system to allow the forecasters to visualize and overlay forecasts or observational datasets (also from the past).

5.3. Probabilistic forecasts produced and, if so, based on ensemble predictions.

Probabilistic/ensemble weather output provided publicly via website by GFS and ECMWF are used in the assessments.

Summary score, recommendations, and comments for Element 5

The CHD Element 5 score for the "Numerical Weather Prediction Model and Forecasting Tool Application" assessed as Maturity Level 2 on the CHD scale, reflecting, "Basic use of external model output and remote sensed products in the form of maps and figures, covering only a limited forecast time range.".

Recommendations:

a. Additional post-processing, analysis and visualization tools should be implemented with corresponding training. This would require that additional staff members are recruited.

b. To further investigate the ECMWF products available for capacity development projects, likely under some specific umbrellas such as SOFF.

c. It is not recommended to initiate an activity to deploy fully fledged NWP capabilities in-house. It is however recommended to pursue regional cooperation in this avenue, while striving to implement more effective post-processing techniques tailored to the national needs.

d. Basic verification should be implemented specifically to ensure the added value of the services, and strengthen end-user-oriented approaches.

Element 6: Warning and advisory services

6.1. Warning and alert service cover 24/7.

As background, the National Emergency Planning Organization (NEPO) is the umbrella organization comprising of all participants in national disaster management efforts in Dominica. NEPO membership includes representatives from Governmental and Non-Government Organizations (NGOs) as well as Private Voluntary Organizations (PVO's) and individual volunteers. The NEPO Advisory Committee develops and recommends policies, plans and guidelines for prevention, mitigation, preparedness, response, and recovery measures for Dominica. The Advisory Committee reports directly to the NEPO Chairman (the Prime Minister) who is responsible for activating the National Plan if necessary. ODM is the secretariat of NEPO, and DMS is as well part of NEPO. ODM speaks for the national system and is the voice for DMS, firefighters and all the disaster response players.

There are no 24/7 service provision capabilities in DMS, and extended coverage is only organized on an ad-hoc basis in case of an ongoing emergency. All staff members collaborate in forecasting activities, to the detriment of other specialized areas. Warnings and alerts are closely coordinated with the ODM, who is in charge of issuing the warnings and informing the population. Forecasts are produced daily, and daily radio bulletins are provided. Such information is also distributed through social media channels (Figure 2).

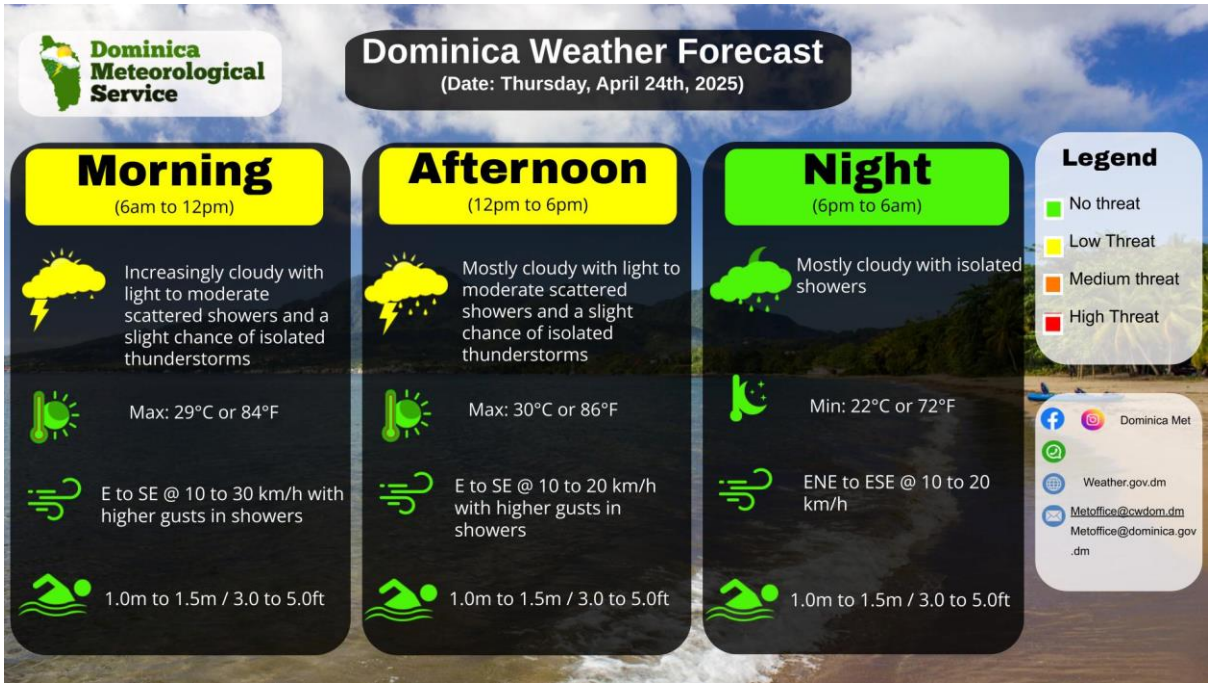


Figure 2: daily forecast, as disseminated on DMS's Facebook page[10] (April 24, 2025)

Extended (3-days) forecasts, according to warning levels, are also provided on the DMS website (Figure 3).

[10] https://www.facebook.com/dommet.service

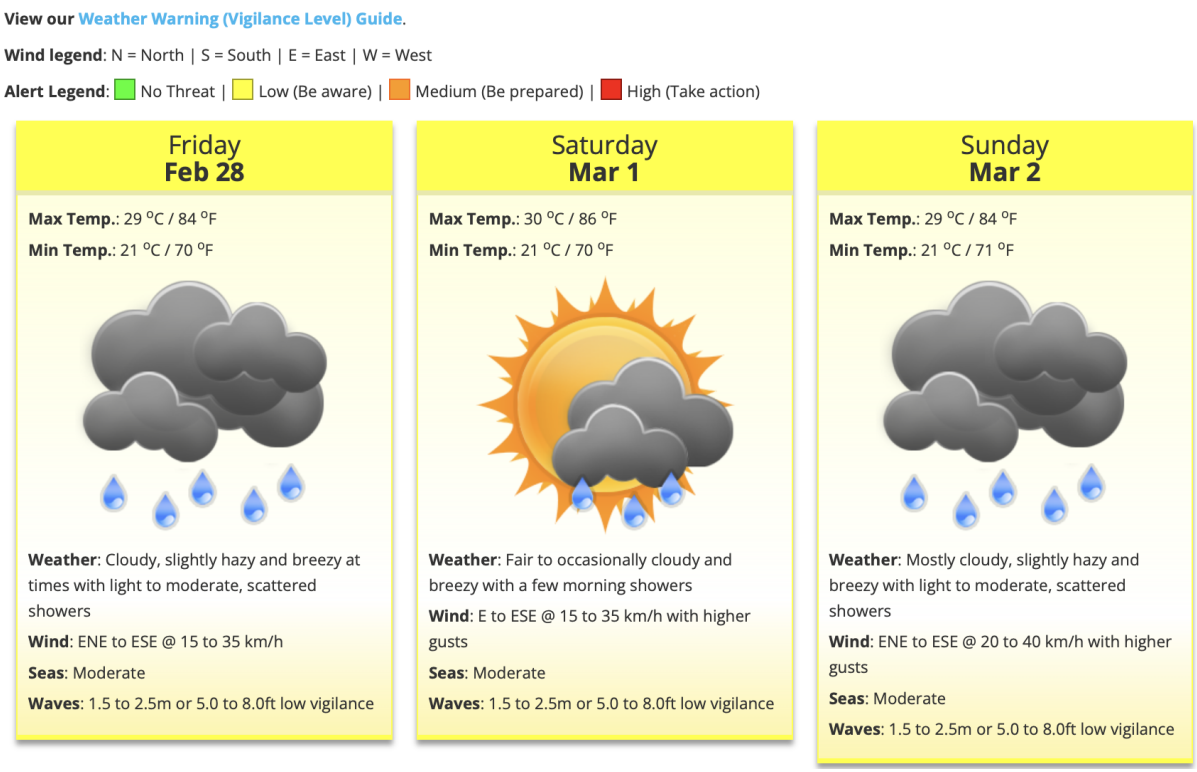


Figure 3: extended forecasts, as appearing on DMS's website (February 28, 2025)[11]

Though DMS has an operational room, it is currently not utilized. Most of the required equipment, including servers and video walls/screens, is still missing.

Warnings are not issued in CAP standard format. However, workshops on CAP have been done in the past under CREWS and one has recently been held again under the CREWS Caribbean 2.0 project.

Finally, under the ODM, the DMS coordinates with the Climate Resilience Execution Agency for Dominica (CREAD) to identify vulnerable areas and societal groups. This collaboration aims to enhance the effectiveness of early warning systems by ensuring they are tailored to the needs of the most at-risk populations.

6.2. Hydrometeorological hazards for which forecasting and warning capacity is available and whether feedback and lessons learned are included to improve warnings.

There is no structured or regularised warning verification, validation or feedback mechanism – any such activity is performed on an ad-hoc basis. In effect, formal certification is currently only performed for products provided for the aviation sector, in accordance with ICAO regulations and standards.

Currently, there is no systematic mechanism in place to gather feedback from end-users and stakeholders regarding their satisfaction with warnings or their usability. Nevertheless, any feedback that is collected—particularly through the Office of Disaster Management (ODM)—should be systematically shared with the DMS to support the joint enhancement of warning systems and related services.

[11] https://weather.gov.dm/forecast/extended-forecast

6.3. Common alerting procedures in place based on impact-based services and scenarios taking hazard, exposure and vulnerability information into account and with registered alerting authorities.

As previously mentioned, the warnings are generated directly by ODM, with contributions from DMS. ODM provides a wide range of information based on existing hazard maps and basic vulnerability data (i.e. ODM has flooding and storm surge risk maps).

DMS is keen on transitioning towards impact-based approaches. To this aim, they are engaging more actively with stakeholders, such as those in agriculture and environmental sectors, to develop pragmatic, impact-based services through collaborative discussions during the preparation of bulletins and information. Currently, quantitative impact-based forecasting is not part of the institution's short-term strategy.

There have been several attempts to implement CAP as a standardized mechanism for distributing alerts. However, these efforts have been unsuccessful due to the lack of customization to meet the specific needs of the country.

Summary score, recommendations, and comments for Element 6

The CHD Element 6 score for the "Warning and Advisory Services" assessed as Maturity Level 2 on the CHD scale, reflecting "Basic warning service is in place and operational but with limited public reach and lacking integration with other relevant institutions and services.".

Recommendations:

a. DMS currently does not offer 24/7 services, except on an ad-hoc basis when there is an emergency. There is an urgent need to enlarge the staff numbers and make it legally and financially possible to operate a regular 24/7 shift work schedule.

b. Closer work together with ODM towards the implementation of impact-based forecasting would be needed.

c. It is recommended that the existing exchanges with stakeholders be strengthened and translated into the development of demonstration products that pragmatically address climate and weather impacts. As a starting point, the production of regular bulletins—potentially on a monthly basis—in collaboration with the Ministry of Agriculture, the Ministry of Environment, and DOWASCO would serve as a practical and valuable initiative.

d. It is recommended to establish a validation and verification procedure, if additional staff is made available.

e. Initiate, likely in coordination with international players, a tailored approach towards CAP services, and potentially linking it to cell-broadcasting alerting mechanisms to reach the population in various ways.

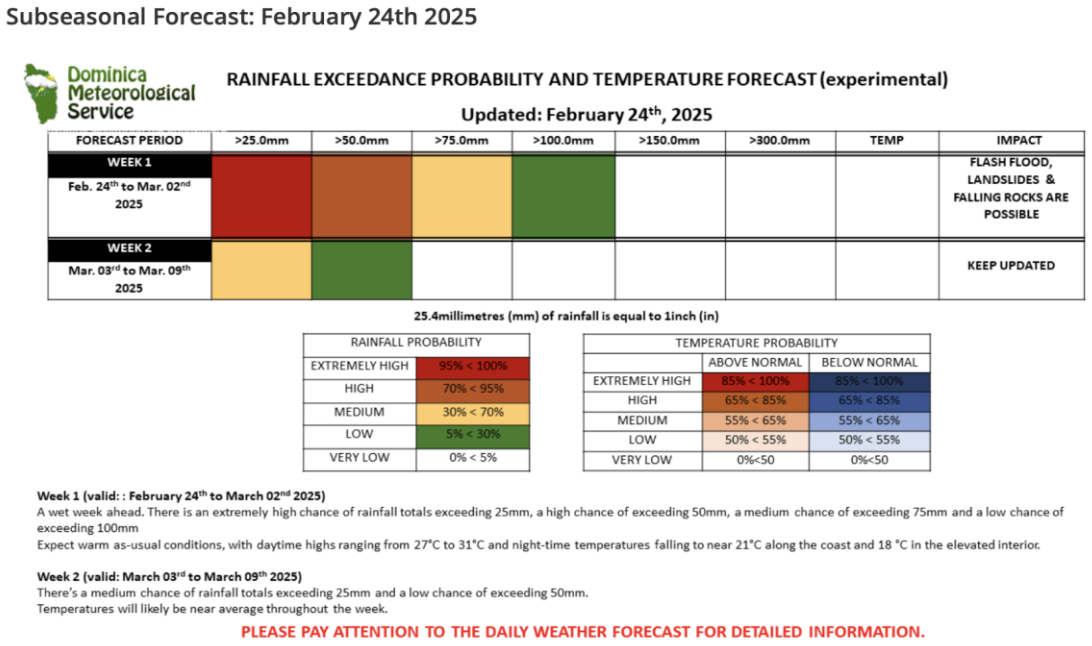
Element 7: Contribution to Climate Services

7.1. Where relevant, contribution to climate services according to the established capacity for the provision of climate services.

Climate services are performed in collaboration with CIMH. Only one person at DMS is in charge of all the climate aspects, in parallel to her forecasting and media duties. This once again demonstrates how the capacities of DMS are very much exploited to the limit.

Seasonal bulletins are produced once per month through a meeting with CIMH, where model output is discussed (CAROGEN)[12] and 3 month + 3 month information is generated. All reports are accessible via DMS website. The report includes rainfall, temperature, dry and wet spells, flash flooding potential, drought (6- and 12-month SPI) and a heat outlook. The bulletin is distributed via a distribution list as well. Examples of reports, about 4 pages each, can be found here at the following link: https://weather.gov.dm/climate/climate-forecast/seasonal-climate-forecast.

A sub-seasonal product is currently under development, also in cooperation with CIMH. This experimental product includes probability of exceedance of rainfall and temperature thresholds (Figure 4).


Subseasonal Forecast: February 24th 2025

Dominica Meteorological Service

RAINFALL EXCEEDANCE PROBABILITY AND TEMPERATURE FORECAST (experimental)

Updated: February 24th, 2025

FORECAST PERIOD	>25.0mm	>50.0mm	>75.0mm	>100.0mm	>150.0mm	>300.0mm	TEMP	IMPACT
WEEK 1 Feb. 24th to Mar. 02nd 2025								FLASH FLOOD, LANDSLIDES & FALLING ROCKS ARE POSSIBLE
WEEK 2 Mar. 03rd to Mar. 09th 2025								KEEP UPDATED

25.4millimetres (mm) of rainfall is equal to 1inch (in)

RAINFALL PROBABILITY	
EXTREMELY HIGH	95% < 100%
HIGH	70% < 95%
MEDIUM	30% < 70%
LOW	5% < 30%
VERY LOW	0% < 5%

TEMPERATURE PROBABILITY	ABOVE NORMAL	BELOW NORMAL
EXTREMELY HIGH	85% < 100%	85% < 100%
HIGH	65% < 85%	65% < 85%
MEDIUM	55% < 65%	55% < 65%
LOW	50% < 55%	50% < 55%
VERY LOW	0%<50	0%<50

Week 1 (valid: : February 24th to March 02nd 2025)
A wet week ahead. There is an extremely high chance of rainfall totals exceeding 25mm, a high chance of exceeding 50mm, a medium chance of exceeding 75mm and a low chance of exceeding 100mm
Expect warm as-usual conditions, with daytime highs ranging from 27°C to 31°C and night-time temperatures falling to near 21°C along the coast and 18 °C in the elevated interior.

Week 2 (valid: March 03rd to March 09th 2025)
There's a medium chance of rainfall totals exceeding 25mm and a low chance of exceeding 50mm.
Temperatures will likely be near average throughout the week.

PLEASE PAY ATTENTION TO THE DAILY WEATHER FORECAST FOR DETAILED INFORMATION.

Figure 4: subseasonal forecasts, as appearing on DMS's website (February 24, 2025)[13]

It is to be noted as well that a new National Disaster Plan is now in place including climate change adaptation, all under guidance of ODM and with contributions as required by DMS.

Some of the historical data is digitized with basic statistical interpretation. Time series and climatological averages are available on the website for the two respective airports[14]. Part of the historical data still requires digitalisation, which is an effort that the current staff resources cannot cover. Finally, monthly climate summaries for the airports are also available to the public (Figure 5).

[12] https://carogen.cimh.edu.bb/index.php/about
[13] https://weather.gov.dm/forecast/extended-forecast
[14] https://weather.gov.dm/climate/climate-data

Dominica Meteorological Service

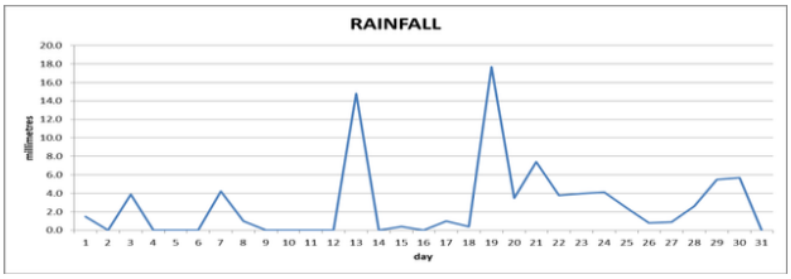
Canefield & Douglas-Charles Airport | (767) 449 1752/ 266 4490/94

www.dmsclimate@dominica.gov.dm | www.weather.gov.dm

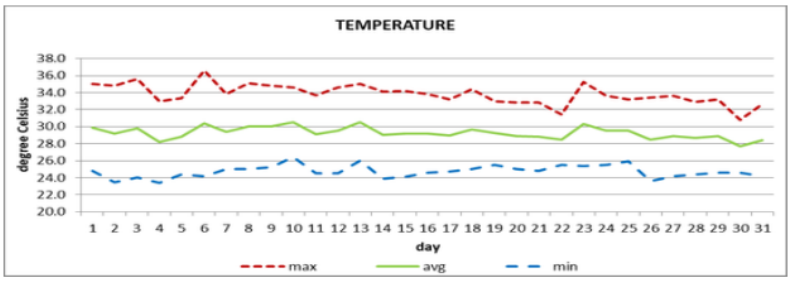
MONTHLY CLIMATE SUMMARY

CANEFIELD AIRPORT

October 2024



Total	85.6mm/ 3.37in
Normal	179.1mm/ 7.05in
Daily average	2.8mm/ 0.11in



Average	29.3°C/ 84°F
Normal	27.8°C/ 82°F

OTHER

Parameter	Month	Date	Average	Monthly Historical
Relative humidity	N/A			
Cloud cover	4 oktas			
Rainfall				
Rainfall total	85.6mm/ 3.35in	.		Max: 439.1mm / 17.29in (1985)
Cumulative yearly total	1294.5mm/ 50.96in			Min: 27.6mm / 1.09in (1992)
Maximum	17.7mm/ 0.70in	19th		
Number of rainfall days(≥1mm)	15			
Temperature				
Actual maximum	36.6°C/ 99°F	6th		36.6°C / 99°F (2024)
Actual minimum	23.4°C/ 73°F	4th		20.8°C / 70°F (1994)
Mean maximum	33.8°C / 93°F		31.9°C/ 90°F	33.8°C/ 93°F (2024)
Mean minimum	24.7°C / 77°F		23.8°C/ 75°F	22.9°C/ 73°F (2010)
Wind				
Direction	140° (south east)			
Speed	03kts/ 06km/h			
Maximum gust	23kts/ 43km/h	21st 22nd		
Sea-level pressure	1011.7mbs/ 29.88inHg		1013mbs	

REMARKS: climatological normal rainfall and temperature- 30-year average (1991-2020)

Below normal rainfall total with warmer than usual temperatures were observed. A high-pressure system and trough systems were the dominant features. Thunderstorms were recorded on 5 days. Dust haze was observed on a few days.

Doc.ID: PR-CL-CF-R001
Revision No. 000
Doc. Implementation: December 2012

Figure 5: DMS monthly climate summary (October 2024).

Summary score, recommendations, and comments for Element 7

The CHD Element 7 score for the "Contribution to Climate Services" assessed as Maturity Level 2 on the CHD scale, reflecting "Basic capacity to provide Climate Services".

Recommendations:

a. To strengthen data gathering, data management and analysis of existing historical data following the efforts of the CLIMSA project.

b. To enhance the staff capabilities (i.e. hire one climate expert) and ensure the climate services know-how is extended to more than one single individual in the institution.

c. If possible, to generate additional in-house capacity to generate seasonal and sub-seasonal information, especially in collaboration with users and tailored to the national stakeholder needs.

d. To strengthen the institutional position in the generation of climate adaptation plans.

Element 8: Contribution to hydrology

8.1. Where relevant, standard products such as quantitative precipitation estimation and forecasts are produced on a routine basis according to the requirements of the hydrological community.

DMS has extended its capabilities towards hydrology, hydrological data and the water cycle. Data has recently been started to be produced in-house, with a few water level and water flow monitoring stations for 17 rivers. This activity has just started and does not yet have a structure.

ODM has maps identifying high risk areas in the country and the Met Office data collected can be used to help in forecasting in the future. This should assist with improving early warning systems. Also, cooperation with DOWASCO, the water company, could help in developing hydrological models which could improve multi-hazard warnings. No formalisation or specific plan in this direction is existing.

As part of the Disaster Vulnerability Reduction Project (DVRP), a consultant was engaged to assess the requirements and resources necessary for effective hydrological modelling in the country. The initial assessment revealed that such modelling was not currently feasible, primarily due to a severe lack of observational hydrological data. Consequently, the report emphasized the importance of enhanced data sharing between the DMS and DOWASCO and supported the direction already being pursued by the DMS to strengthen national water level monitoring capabilities.

On that note, it is again worth mentioning that the **lack of staff is a severe limiting factor to the continuous operation of all DMS activities,** and even more so to their expansion.

CIMH cooperates with DMS as a guiding and training entity for the development of hydrological services.

8.2. SOPs in place to formalize the relation between Met Service and Hydrology Agency, showing evidence that the whole value chain is addressed.

The hydrological services are being developed and provided at the DMS. Currently there are no SOPs in place. However, the relationship with DAWASCO (water supply and sewage state company) is very close and there is data exchange, but not in a formalised manner.

8.3. Data sharing agreements (between local and national agencies, and across international borders as required) on hydrological data in place or under development.

Data is shared with the public and stakeholders via website or email. However, there is no formal agreement or data policy in place.

8.4 Joint projects/initiatives with hydrological community designed to build hydrometeorological cooperation.

The only project that fostered cooperation is the DVRP project, which already procured a consultant to evaluate the hydrological needs and systems existing. Cooperation with DOWASCO is close but not regularized.

Summary score, recommendations, and comments for Element 8

The CHD Element 8 score for the “Contribution to Hydrology” assessed as Maturity Level 3 on the CHD scale, reflecting "There is a moderately well-functioning relationship between the meteorological, hydrological and water resources communities but considerable room for formalizing the relationship and SOPs.”.

Recommendations:

a. To formalize the working relations between the DMS and DOWASCO.

b. To initiate the formalization of the DMS mandate to include its role as hydrological data/monitoring/modelling provider based on international criteria (WMO guidelines on the role, operation and management of National Hydrological Services).

c. To enhance the capacity for water level monitoring for additional relevant rivers.

d. To develop an exploitation strategy of hydrological services (within the NHMS value chain), as it is a new element in DMS.

Element 9: Product dissemination and outreach

9.1. Channels used for user-centred communication and ability to support those channels (for example, does the NMHS operate its own television, video or audio production facilities? Does it effectively use cutting-edge techniques?).

The DMS operates its own website and is active in social media (Facebook and WhatsApp groups). In addition, it has email distribution lists that are used for specific product distribution. The website provides access to the bulletins. It is expected that data from observations will be brought into the general website in the future, since it is currently available on a stand-alone platform[15], which is not yet linked to the DMS website. DMS performs regular radio briefings and has its own video/audio production studio. On that note, DMS has recently started issuing weather reports using videos, which are shared on YouTube via the Government information service (GIS) and on social media.

HDMS is aware that user-provider communication is critical and needs to be improved. For example, the seasonal report is made available to the ministry via the website but unfortunately, it does not reach the farming community and if reaching them, it is then considered too technical. More targeted and lighter information sharing approach via social media is being considered.

9.2. Education and awareness initiatives in place.

Education and awareness are recognised as important at DMS. There are educational activities taking place on an ad-hoc basis and based on the personnel capacity. DMS also collaborates in some of the awareness material produced by ODM.

9.3. Special measures in place to reach marginalized communities and indigenous people.

There are no structured or organised mechanisms to reach marginalised communities. In the past, there was outreach to farmers through the cooperation with the Ministry of Agriculture – this is however not existing anymore. However, efforts exist through radio broadcasts, WhatsApp groups and one-to-one exchanges. In addition, communication to those communities in relation to warnings is done through ODM.

Summary score, recommendations, and comments for Element 9

The CHD Element 9 score for the "Product Dissemination and Outreach" assessed as Maturity Level 2 on the CHD scale, reflecting, "Traditional communication channels and a basic dedicated website is used to disseminate forecasts and basic information".

Recommendations:

a. The DMS could continue to capitalize, if staff resources are available, on the in-house facilities to deploy additional and tailored dissemination products (short targeted videos for social media, small seasonal or sub-seasonal reports, etc). A light strategy should be developed around tailored and end-user centered dissemination mechanisms, in coordination with ODM to maximize impact.

b. The DMS should strive to make its different products more accessible for marginalized populations.

c. The DMS should, provided enough personnel resources are made available, enhance their role as a public awareness, education and outreach actor.

[15] https://monitoring.weather.gov.dm/Dominica/index.php

Element 10: Use and national value of products and services

10.1. Formalized platform to engage with users in order to co-design improved services.

There is currently none. However, due to DMS's good informal working relations with some stakeholders, ad-hoc discussions have sometimes triggered certain services improvements, although not in a structured and systematic way.

10.2. Independent user satisfaction surveys are conducted, and the results used to inform service improvement.

There are regular meetings with user groups, but not in a formalised or regularised approach. However, there is an internal vision in DMS to move closer to operate together with users at the time of generating services in a true end-user and co-design approach.

10.3. Quality management processes that satisfy key user needs and support continuous improvement.

There is an existing basic QMS but it requires further development and more resources. As an example, there is a designated officer to perform these duties, but she has many additional responsibilities, including forecasting shifts that prevent effective and focused quality management. There is no ISO standard in place for services outside aviation.

Summary score, recommendations, and comments for Element 10

The CHD Element 10 score for the "Use and National Value of Products and Services" assessed as Maturity Level 2 on the CHD scale, reflecting, "Service development draws on informal stakeholder input and feedback".

Recommendations:

a. Establish regular, structured meetings with key stakeholders—both individually and in joint settings—to review current services and collaboratively plan enhancements. This would support the adoption of a co-design approach, ensuring that services are better aligned with user needs.
b. Pursue the implementation of an ISO-compliant Quality Management System (QMS) as a strategic objective, to improve service consistency, accountability, and performance monitoring.
c. Allocate additional human resources—and where necessary, invest in dedicated software—in coordination with the DMS to prioritize and support the development of a robust Quality Management framework within the institution.

Annex 1 Consultations (including experts and stakeholder consultations)

Name	Organization	Role
Ithoma James	Dominica Meteorological Service	Interim Director General
Farrah Rocque-Carriere	Dominica Meteorological Service	Technician
Karen Bazil-Lawrence	Dominica Meteorological Service	Hydrologist
Marshall Alexander	Dominica Meteorological Service	Meteorologist and senior meteorological officer
Annie Carrette-Joseph	Dominica Meteorological Service	Applied meteorologist
Fitzroy Pascal	Office of disaster management:	National disaster coordinator
Louise Alfred	Dominica Water and Sewerage Company Limited	Water resources officer
Magnus Williams	Dominica Water and Sewerage Company Limited	Chief engineer
Cecilia Vital	Dominica air and seaport Authorities	Assistant Manager
Clara Charles	Environmental health	Senior environmental health officer
Isabella John	Environmental health	Senior environmental health officer
Clair-Ann Carbon	Environmental health	Environmental health officer

Annex 2 Urgent needs reported

The DMS faces a number of challenges that can be summarized as follows:

- Legal framework – currently DMS acts without a formal mandate and legislative framework. This should include the new capacities as hydrological service.
- Staff capacity - with the current staff levels, DMS cannot operate as a robust NHMS and there is the urgent need to capacitate the service.
- Observational network– there is a need to find a sustainable solution for the maintenance operations of the meteorological and hydrological network.
- Harmonized Data Management System – a single and operative (also performing international data exchange) DMS is needed for the operations of DMS.
- Operational Centre – adaptations and changes are required to allow for 24/7 operations. This includes proper procurement of servers and tools to have a functioning operational room as well as additional staff to initiate a shift approach.
- Enhanced end-user centered approaches and stakeholder engagement.

Annex 3 Information supplied through WMO

- 2022 WMO Global gap Analysis and updated 2023 table. WMO monitoring data
- WMO Monitoring System Data
- WMO EW4All Rapid Assessment for Pillar-2
- WMO Hydrology Survey
- Data from Checklist for Climate Services Implementation

Annex 4 List of materials used

- Country Hydromet Diagnostics, published by WMO, 2023
- CHD Operational Guidance for SOFF, 2023
- CMO Members Legislative Assessment Report, 2022
- *Dominica Meteorological Service,* National Strategic Plan and Framework for Weather, Water and Climate Service 2021-2025, October 2021.

Annex 5 List of Abbreviations

Abbreviation	Full Name
ASL	Above Sea Level
AWS	Automatic Weather Stations
CARICOM	The Caribbean Community
CHD	Country Hydromet Diagnostics
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive Disaster Management
CIMH	Caribbean Institute for Meteorology and Hydrology
CMO	Caribbean Meteorological Organisation
CREAD	Climate Resilience Execution Agency for Dominica
CREWS	Climate Risk and Early Warning Systems
DOWASCO	Dominica Water and Sewerage Company Limited
DVRP	Disaster Vulnerability Reduction Project
ECMWF	European Centre for Medium-range Weather Forecasts
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
EW4all	Early Warnings for all
FAO	Food and Agriculture Organization
GBON	Global Basic Observing Network
GDPFS	Global Data processing and Forecasting System
GISC	Global Information System Centre
ICT	Information and Communication technologies
NCAR	National Center for Atmospheric Research
NEMO	National Emergency Management Organisation
NMHS	National Meteorological and Hydrological Service
NWP	Numerical Weather Prediction
ODM	Office for Disaster Management
OECD	Organization for Economic Co-operation and Development
RTC	Regional Training Centre
RTH	Regional Telecommunication Hub
SOFF	Systematic Observation Funding Facilities

SOP	Standard Operating Procedure
TAFOR	Terminal Aerodrome Forecasts
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
WFP	World Food Programme
WMO	World Meteorological Organization