



## CREWS PROJECT PROGRESS REPORT

(July – December 2021)

<b>1. Project title</b>	Caribbean - Strengthening Hydro-Meteorological and Early Warning Services	<b>2. Project reference</b> CREWS/CProj/04/Regional Caribbean
<b>3. Implementing Partners involved in the project</b>	World Bank (Lead) World Meteorological Organization UNDRR	<b>4. Regional/National Partners involved in the project</b> Caribbean Disaster Emergency Management Agency (CDEMA) Caribbean Institute for Meteorology and Hydrology (CIMH) Caribbean Meteorological Organization (CMO)
<b>5. Project Duration/Timeframe (from year – to year)</b>	June 2018 – December 2022	<b>6. Total Funding Approved by Steering Committee (in US dollars), including fees</b> 5,500,000
<b>7. Reporting focal point(s) from Implementing Partners</b>	Anna Maria Bogdanova – <a href="mailto:ambogdanova@worldbank.org">ambogdanova@worldbank.org</a>  Other IP focal points: Jair Torres- <a href="mailto:jtorres@eird.org">jtorres@eird.org</a> <a href="mailto:Lina.Sjaavik@wmo.int">Lina Sjaavik – lsjaavik@wmo.int</a>	
<b>8. Project overview</b>	<p><b>Please include objectives, key project deliverables, leveraging, contextual information/statistics, significant events during the reporting period <u>in bullet points</u>. (max 250 words)</b></p> <p><b>Objectives:</b> To strengthen and streamline regional and national systems and capacity related to weather forecasting, hydrological services, multi-hazard impact-based warnings and service delivery for enhanced decision-making.</p>	



	<p><b>Key Deliverables:</b> (i) Regional roadmap to strengthen and streamline early warning and hydromet services; (ii) Institutional strengthening and streamlining of early warning and hydromet services; (iii) Piloting high priority national activities on end-to-end EWS including impact-based forecasting.</p> <p><b>Leveraging:</b> This project is complemented with US\$ 1.5 million from the CREWS contribution from Canada to WMO.</p> <p><b>Significant events during the reporting period:</b></p> <ul style="list-style-type: none"> <li>• 4th Project Steering Committee held on October 6th</li> <li>• Presentation of the Regional Roadmap to the partners</li> <li>• Launch of several Priority Activities</li> <li>• Contributions to the VII Regional Platform for Disaster Risk Reduction in the Americas and the Caribbean (1-4 Nov.):             <ul style="list-style-type: none"> <li>○ Learning Lab “From Early Warning Systems to Impact-based Forecasting: Strengthening people-centred Multi-Hazard Early Warning Services in the Caribbean region” organized and held by Implementing Partners of CREWS Caribbean project</li> <li>○ Presentation of “Highlights of CREWS in the Caribbean” (WMO-led component 2) by Dr. Arlene Laing (Coordinating Director, CMO) at Swiss stand (<a href="#">Presentation</a>)</li> </ul> </li> </ul>
<p>9. Progress summary</p>	<p><b>What has been achieved during this reporting period? – Please list in bullet points the most significant and tangible outcomes? (Highlight at least 1 key achievement that can be elaborated in the 2021 Annual Report). (max 250 words)</b></p> <p><b>Component I:</b></p> <ul style="list-style-type: none"> <li>• An updated draft of the regional MHEWS roadmap was shared with regional stakeholders (CDEMA, CIMH and CMO Hq) and implementing partners. It was reviewed and discussed in the Project Steering Committee Meeting held in October 2021. A final draft version was produced and will be submitted for the regional consultations via REWS Consortium in February 2022.</li> </ul>



- An economic analysis for the regional MHEWS roadmap in the Caribbean was carried out. A summary with the main conclusions of this study will be incorporated to the roadmap document.
- Dissemination of project results in the framework of the Regional Platform for Disaster Risk Reduction in the Innovation Platform.
- EW Checklists with national gap analysis reports for Barbados, Trinidad and Tobago and Guyana completed by CDEMA.

**Component II:**

- Model Meteorological Legislation and Policy endorsed (June). Adaption to national circumstances for Antigua and Barbuda, Belize, Grenada, Jamaica, St Kitts and Nevis, Saint Lucia, and St Vincent and the Grenadines. Met-Bills submitted to Governments of Belize and Grenada in Sept. Adaptions for Anguilla and Barbados initiated (to be finalized Q1/2022).
- Endorsement of eight National Strategic Plans and Frameworks for Weather, Water and Climate Services 2021 – 2025 (Anguilla, Antigua and Barbuda, Dominica, Grenada, Guyana Jamaica, St. Kitts and Nevis, and St Vincent and the Grenadines) by national NHMS.
- New agreement with CIMH finalized (USD 90,000 ) to strengthen early warning marine products and services delivery of CIMH through the establishment of a Regional Marine Forecast Support Centre.
- Amendment of existing agreement with CIMH to re-allocate funding planned for travel and DSA towards organization of virtual CARICOFs and EWISACTs, vegetation stress monitoring, additional capacity in climatology, upgrade and maintenance of databases and networks.
- Virtual dry season CariCOF held in Nov. which delivered seasonal forecasts, collected and analyzed user and provider insights on existing Caribbean climate services, user feedback on the transition of CariCOF heat outlooks from experimental to fully operational status and assessed existing climate information support for sectoral decision-making.
- Desk study to review and develop model SOPs and adapt to national circumstances in Bahamas, Barbados, Antigua and Barbuda, Trinidad and Tobago initiated by CDEMA.

- Caribbean-Pacific exchange and knowledge transfer re-initiated. Ongoing activities:
  - Development of Phase II of WMO Marine Services Course for SIDS
  - Adaptation of existing videos (Costal Inundation & Ocean Buoy) to Caribbean context in English, Spanish and Créole French
- BretCat sub-project: SmartMet Server and Workstation procured. Delivery expected in Jan. 2022, trainings to start in February 2022. Discussion on provision of additional funding to sub-project (150.000 USD) initiated.
- Integrated Riverine Flood Forecasting, including established synergies with other (WMO and partner-) products (e.g. SWFP, FFGS, CIFI) in finalization for the Dominican Republic. This includes improvement of existing national hydrological forecasting systems as well as development of impact-based flood forecasting in the Yaque de Norte basin (finished) and the Haina basin (under completion).




**Component III:**




- Of the four priority/pilot activities, two are under implementation in this period, namely (i) the development of a precipitation grid prototype in the Eastern Caribbean, and (ii) transition to the impact-based forecasting. The other two activities, (iii) the technical analysis for the development of a regional emergency alert system and (iv) integrated approach to flooding, have been defined in scope and reach and will begin their implementation in February 2022.
- Agreements with CMO HQ and CIMH have been finalized for the technical and institutional support to the pilots implementation.
- Organization of a learning lab in the framework of the Regional Platform for Disaster Risk Reduction in the Americas and the Caribbean, on the topic of “From Early Warning Systems to Impact-based Forecasting: Strengthening people-centred Multi-Hazard Early Warning Services in the Caribbean region”



--	--

**10. Project Performance**

Interpretation of color coding		
<b>High</b>		Good progress; on track in most or all aspects of delivery
<b>Medium</b>		Moderate progress or on track in some aspects of delivery
<b>Low</b>		Less than moderate or poor progress. Not on track in critical areas of its delivery. Requires remedial attention

	Rate of expenditure	Rate of delivery	Alignment of Objectives
<b>Coding</b>			
<b>Narrative</b>	Disbursement December, 2021  From WB side: Disbursed \$1,479,932 (57% of total amount)  Committed \$556,405  From WMO side: Disbursed is \$ 1,025,255	The rate of the delivery has picked up overall though the review and consultation processes of the developed products take more time due to the fully virtual work modality that has been followed since the beginning of the Covid19 pandemic.  While several activities have been delayed due to travel restrictions during the covid pandemic, currently all key activities are	The project remains strongly aligned to the objectives.



	<p>(44% of total amount)</p> <p>From UNDRR side: Disbursement is \$ 232,193 (71% of total amount) Committed \$ 12,000</p>	<p>underway – roadmap is being finalized, all pilots have been defined and are at the different stage of implementation. With the no-cost extension granted, WMO has amended agreements with partners to allow for completion of activities before 31 Dec 2022. (For more details see remarks in section 7 and 10.)</p>	
--	---	---	--

### 11. Risk Management Status

<p><b>Risk Status</b></p>	<p>What is the current risk status as compared to what was identified in the project proposal?</p> <p>The overall risk of the project has increased since the development of the project proposal from low to moderate. Overall project implementation has been lower than expected over the last two years, particularly due to the pandemic. At the time of reporting, the Caribbean 2021 Hurricane Season has come to an end with no particular impact on the execution of the project. Going forward, the development of the COVID-19 pandemic, with the impact of Omicron variant, creates some uncertainty for the further progress of the project.</p>
<p><b>Measures to address</b></p>	<p>What mitigation measures have been developed to address the risk status?</p> <p>To count for current and future delays as well as the uncertainty moving forward, most activities required readjustment in scope and timeline, as well as way of delivery (e.g. change from in-person to virtual interaction). The granted project extension to 2022 gave the opportunity for this timeline readjustment and we plan to complete outstanding activities by 31 Dec 2022.</p>

### 12. Contributions to CREWS Output(s)

(use number for activities and products and % for project component completion)



### 11.1 National Output(s)

<b>CREWS Output(s) 1: National Meteorological and Hydrological Services service delivery improved, including the development of long-term service delivery strategies and development plans</b>				
<b>State Project Output(s) in this section</b>	<b>Overall Project Target</b>	<b>Progress by July 2021</b>	<b>Target for reporting period</b>	<b>Progress by December 2021</b>
National Strategic Plans Developed	8	60%	100%	100%
Model Meteorological Legislation & Policy (Met-Bill) Drafted	1	100%	100%	100%
Meteorological Bills adapted at national level	<b>Prior plan: 2 countries Revised IA WMO &amp; CMO: 8 countries</b>	0	7	7
<p><b>Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). <u>Please list in bullet points.</u></b></p> <p>Contribution to (selected) CREWS value propositions:</p> <ul style="list-style-type: none"> <li>• <i>Gender responsive &amp; people centered:</i> The legislation, policy and NSPs enable countries to strengthen EWS in a way that will reach more people - specifically the ones most at risk, and further contribute to the concept of people-centered EWS.</li> <li>• <i>Multiplier:</i> The existence of a legislation and policy with clearly defined roles and mandates for the NHMS with corresponding strategies enable NHMS to improve their service delivery which contributes to a more favourable environment for EWS. The associated action plan identifies further needs for external funding.</li> <li>• <i>Promote coherence, unique &amp; solution oriented:</i> Country specific circumstances and initiatives were taken into consideration in the development of the NSPs &amp; Met-Bills. The activities promote building sustained institutional capacity by creating defined legal</li> </ul>				



mandates and identifying gaps in capacity. Additional Caribbean countries already expressed a wish to develop a legislation and policy adapted to their own needs and circumstances.

**CREWS Output(s) 2: Risk Information to guide early warning systems and climate and weather service developed and accessible**

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
Hydrological observation, data management and flood forecasting strengthened	Implementation of a River Flood Forecasting System (IRFF) in the Dominican Republic	90%	100%	98%
WMO cascading initiatives implemented	2 SWFDP RSMT Meetings	1	2	2
	10 SWFP Regional Trainings conducted			
Caribbean Climate Outlook Fora (Biannual)	6 CariCOFs held	5 CARICOF	6 CARICOF (dry season)	6 CARICOF (dry season)





Multi-hazard early warning systems and impact-based forecasting introduced to target groups <i>(Trainings/ Workshops)</i>	3 regional training events on hurricane forecasting	1	1	1
	2 Regional Training events on Impact-based forecasting	1	1	1

**Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list in bullet points.**

Contribution to (selected) CREWS value propositions:

- *Gender responsive, people centered:* IRFF seeks to provide reliable information about floods especially to the most vulnerable groups. Depending on the content, trainings further include most vulnerable groups (e.g. women), users as well as providers and emphasize engagement of local organizations to ensure inclusion.
- *Promote coherence:* Most planned workshops (e.g. SWFP, Hurricane Forecasting, ...) are part of larger, cross-regional initiatives and as such contribute to coherence and regional capacity building. IRFF is a system established also with synergies with WMO system products such as SWFP, FFGS and CIFI.
- *Solution oriented:* The project seeks to find innovative approaches/best practices to substitute trainings that should be held face to face e.g. through the development of online training modules or webinars.

**CREWS Output(s) 3: Information and Communication Technology, including common alerting protocol, strengthened**

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
---	------------------------	-----------------------	---------------------------------	---------------------------



Weather mobile app to increase the accessibility and use of weather information available for Jamaica	<ul style="list-style-type: none"> <li>• SmartMet Server &amp; Workstation procured</li> <li>• Technical trainings &amp; assistance provided</li> <li>• Data updated (SmartMet to MSJ website &amp; app)</li> </ul>	Procurement initiated	Procurement finalized, products delivered	Procurement finalized, delays in delivery (expected Jan 2022)
<p><b>Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). <u>Please list in bullet points.</u></b></p> <p>Contribution to (selected) CREWS value propositions:</p> <ul style="list-style-type: none"> <li>• <i>Gender responsive, people centered:</i> The provision of a mobile app for weather information will improve/support a quick dissemination of warning alerts as basis for decision making in a way that is easy to understand and access, especially for most vulnerable groups.</li> <li>• <i>Solution oriented:</i> The activity addresses critical gaps in the dissemination of warning alerts in a modern, solution-oriented, pragmatic manner.</li> <li>• <i>Promote coherence:</i> The activity is part of a larger initiative undertaken between the Meteorological Service in Jamaica, the Finnish Meteorological Institute, UK Resurgence and the Caribbean Climate Innovation Centre.</li> </ul>				

**CREWS Output(s) 4: Preparedness and response plans with operational procedures that outline early warning dissemination processes developed and accessible**

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
---	------------------------	-----------------------	---------------------------------	---------------------------



Review and development of model for standing operational procedures and adaption to 4 countries.	SOP model revised, adjusted & adapted to four countries	Consultant for review & adaptation selected, hiring in process.	Consultant hired; inception report received	Consultant hired as of July 2021; inception report received
<p><b>Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). <u>Please list in bullet points.</u></b></p> <p>Contribution to (selected) CREWS value propositions:</p> <ul style="list-style-type: none"> <li>• <i>Gender responsive &amp; people centered:</i> Ensuring security of people and especially most vulnerable groups are the core reason why functional SOPs are needed. The activity supports a better collaboration between different actors in EWS and thus enhanced security in hazardous situations.</li> <li>• <i>Promote coherence:</i> The review, adjustment and harmonization of SOPs across four target countries promotes coherence and coordination the environment for EWS in the region. It further helps building sustained institutional capacity by defining roles and responsibilities.</li> </ul>				

### CREWS Output(s) 5: Knowledge products and awareness programmes on early warnings developed

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
Awareness videos (Ocean Buoys and Costal Inundation) adapted to Caribbean context & available in English, Spanish and French Créole	2 videos available in three languages	N/A (activity not started)	Contract video-production company, identify translators	Video-production company contracted, translators identified



**Additional information: briefly indicate the contributions, with concrete examples, to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list bullet points.**

Contribution to (selected) CREWS value propositions:

- *Gender responsive & people centered:* The videos specifically target most vulnerable groups and seek to change and educate behavior in the context of Marine hazards. Through providing videos in the most important languages in the Caribbean region, a broad audience can be reached.
- *Solution oriented & promote coherence:* The provision of awareness videos is a best practice which has been applied successfully in the Pacific (specifically Fiji). Through the provision of simple and pragmatic explanations and recommendations to a large target group, they further promote regional coherence and shared common knowledge.

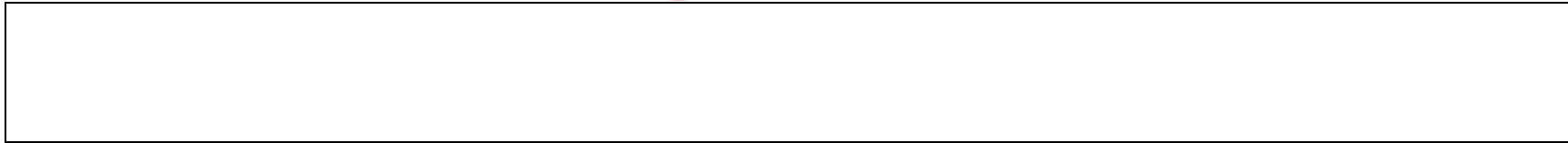
### CREWS Output(s) 6: Gender-sensitive training, capacity building programmes provided

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
National workshops for 'gender and vulnerable groups in early warning system' training with regional strategy consultation implemented	3 national workshops	4 national workshops		

**Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list in bullet points.**

The national workshops for 'gender and vulnerable groups in early warning system' has allowed to:

1. Enable dialogue among different actors working with either gender or EWS, and to increase the knowledge of gender and EWS at the national level;
2. Fill in the gender and vulnerable groups gaps in EWS (EWS checklist as a starting point);
3. Further define how does gender, age and vulnerable groups status affect the 4 pillars of the EWS in the Caribbean;
4. Pre-identify what is needed in order to fill in these gaps at the national and regional levels.



### 11.2 Regional Output(s) (for Regional Projects)

#### **CREWS Regional Output(s): Institutional and human capacities at Regional WMO and Intergovernmental organizations to provide regional climate and weather services to LDCs and SIDS increased**

State Project Output(s) in this section	Overall Project Target	Progress by July 2021	Target for the reporting period	Progress by December 2021
Strategic roadmap on strengthening MHIEWS	Development of a Regional MHEWS Roadmap	Roadmap V11 prepared and ready to be sent to by REWS consortium for comments in July 2021.	Draft fully reviewed and ready for peer review and editing by the WB.  V12 prepared.	Draft fully reviewed and ready for peer review and editing by the WB.  Summary of Economic Analysis and Preface to be included.
Assessment of socio-economic benefits of better hydromet services and EWS	Developed the complete economic analysis of regional MHEWS in the Caribbean.	Initiated the elaboration of the economic analysis of regional MHEWS in the Caribbean	Developed the complete economic analysis of regional MHEWS in the Caribbean.	Developed the complete economic analysis of regional MHEWS in the Caribbean.



Priority Activities implemented as pilots.	Set of Priority Activities implemented.	Defined the content and reach of Priority Activities to be implemented.  Two Priority Activities in process of being contracted	Hired and initiated the implementation of at least 2 Priority Activities.  Defined and agreed with Regional and National partners the other two.	Rain Grid Priority Activity is under implementation  IBF Pilot agreed and is under implementation  Two additional Priority Activities defined and agreed and will begin in February 2022
CIMH capacity in climatology and early warning marine products and services delivery to the region strengthened	CIMH supported through provision of funds	N/A	Implementing Arrangement with CIMH finalized	Implementing Arrangement with CIMH finalized
<p><b>Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). <u>Please list in bullet points.</u></b></p> <p>Contribution to (selected) CREWS value propositions:</p> <p><i>Gender responsive &amp; people centered:</i> Strengthening the service delivery for the marine environment, which is a source of significant natural hazards in the region, will be especially beneficial to the most vulnerable population. Regional stakeholders will be involved in the development of marine products.</p> <p><i>Multiplier &amp; promote coherence:</i> The activity is part of a larger initiative with CIMH which involves several regional partners such as the Caribbean Community Climate Change Center, CDEMA, etc.</p>				



### 13. Certification on Use of Resources

This is for authorized representatives from the Implementing Partners to certify that the resources allocated are used for their intended purpose. Please fill one table per Implementing Partner.

Has there been any cases of non-compliance with the financial rules, regulations and procedures of your institution? If yes, please fill below			<input type="checkbox"/> Yes <input type="checkbox"/> No
Issue	Response Measures Taken	Date of Response	Active/Closed
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
<b>Institution</b>	Choose an item.		
<b>Firstname, LASTNAME of authorized representative</b>			
<b>Position Title</b>			
<b>Date and Signature:</b>			

Has there been any cases of non-compliance with the financial rules, regulations and procedures of your institution? If yes, please fill below			<input type="checkbox"/> Yes <input type="checkbox"/> No
Issue	Response Measures Taken	Date of Response	Active/Closed
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
<b>Institution</b>	Choose an item.		
<b>Firstname, LASTNAME of authorized representative</b>			



<b>Position Title</b>	
<b>Date and Signature:</b>	

<b>Has there been any cases of non-compliance with the financial rules, regulations and procedures of your institution? If yes, please fill below</b>			<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Issue</b>	<b>Response Measures Taken</b>	<b>Date of Response</b>	<b>Active/Closed</b>
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
		Click or tap to enter a date.	Choose an item.
<b>Institution</b>	Choose an item.		
<b>Firstname, LASTNAME of authorized representative</b>			
<b>Position Title</b>			
<b>Date and Signature:</b>			

## 14. Visibility products

- a. *Insert or copy any links to press releases, videos or communication items and/or social media links produced during the reporting period only*

Project Component 2

- Communication on the development and endorsement of the model legislation and policy as well as on the National Strategic Plans and Frameworks
  - [Press release CMO](#)
  - [Press release WMO](#)

## 15. Supporting documents





- a. *List and annex to the report any documents providing details on project activities conducted during the reporting period such as reports of training sessions, assessment reports, online solutions and tools, manuals, summaries of high-level discussions etc.*

## 16. Project History

- a. *Highlight key achievements since project started in bullet points, include all visibility and supporting documents other than those from the last 12 months*

### Component 1:

- *Revised draft of the regional MHEWS roadmap has been produced and shared: Consultation process on going.*
- *Economic Analysis of MHEWS first draft developed.*
- *EW Checklists with national gap analysis reports for Barbados, Trinidad and Tobago and Guyana completed.*

### Component 2:

- *Model met-bill & policy finalized; adaptation for 8 countries ongoing; Belize & Grenada already under ministerial review.*
- *8 national strategic plans finalized; officially endorsed by Anguilla, Antigua & Barbuda, Dominica, Grenada, Jamaica, St. Kitts & Nevis, SVG. Implementation ongoing. Pending: Guyana*

### Component 3:

- *Priority Activities (pilots) at different stage of preparation/implementation:*
  - ✓ *Multi-sensor precipitation grid under implementation (15-month contract signed)*
  - ✓ *Feasibility Study for a regional Emergency Alert System (ongoing selection)*
  - ✓ *Developed an outline of an IBF implementation plan (consultation process)*
  - ✓ *Integrated approach to flooding pilot in Saint Lucia (consultation process)*