

THE NATIONAL ONE HEALTH

SURVEILLANCE REPORT

BELIZE





Overview:

The national One Health Initiative

The National One Health initiative focuses on issues related to zoonosis, antimicrobial resistance (AMR), food safety, Vector-Borne Diseases, Neglected Tropical Diseases, environmental health, and other health related threats that affect the human-animal, and the environment interface. It is the national platform where multiple sectors communicate and work together to achieve better public health outcomes.

Belize National One Health Collaborating Bodies:

Ministry of Agriculture, Food Security and Enterprise

Belize Agriculture Health Authority

Ministry of Health and Wellness

Ministry of Sustainable Development, Climate Change and Disaster Risk Management

The Department of the Environment (within the Ministry of Sustainable Development, Climate Change and Disaster Risk Management)

The National Meteorological Service of Belize (within the Ministry of Sustainable Development, Climate Change and Disaster Risk Management)

Selva Maya

Belize Vector Ecology Center



Abbreviations and Acronyms:

AMR	Antimicrobial Resistance
BCRC-Caribbean	Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean
CDC	Centers for Disease Control and Prevention
FAO	Food and Agriculture Organization
OH	One Health
OHHLEP	One Health High Level Expert Panel
PAHO/WHO	Pan American Health Organization/World Health Organization
WOAH (OIE)	World Organization for Animal Health
UNEP	United Nations Environment Program

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Introduction:

“ONE HEALTH IS AN INTEGRATED, UNIFYING APPROACH THAT AIMS TO SUSTAINABLY BALANCE AND OPTIMIZE THE HEALTH OF PEOPLE, ANIMALS AND ECOSYSTEMS.

It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent.

The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.”

-One Health High Level Expert Panel (OHHLEP, Dec 2021)

In line with the underlying ethic of ‘One Health’ (OH), the national OH Committee offers a unification of the medical and agricultural, veterinary, and environmental sectors with the establishment of collaborative ventures in clinical care, surveillance and control of cross-species disease, education, and research into disease pathogenesis, diagnosis, therapy and vaccination. The concept encompasses the human population, domestic animals and wildlife and the impact that environmental changes (‘environmental health’) such as climate change and variability will have on these populations.

Belize’s recent accomplishment to establishing an online National OH Platform on November 24th, 2022 (<https://onehealth.gov.bz/>) places it at the cutting edge of innovation and high-level adaptation of information exchange policy. The OH Committee involves stakeholders from the Ministry of Agriculture, Food Security, and Enterprises, Belize Agriculture Health Authority, Ministry of Health and Wellness, Ministry of Sustainable Development, Climate Change and Disaster Risk Management and the Department of the Environment, (DOE), National Meteorological Services, Selva Maya, Belize Vector and Ecology Center (BVEC) in partnership with the Pan American Health Organization/ World Health Organization (PAHO/WHO). The OH platform aims to “promote, improve, and defend the health and well-being of all species by enhancing cooperation and collaboration between physicians, veterinarians, agronomists, environmental scientists, and other relevant professionals by fostering strengths in leadership and management to achieve these goals.” It is currently being updated to serve as an alert platform for priority pathogens and major health threats in the country with support from international partners such as the Centers for Disease Control and Prevention (CDC), The Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean) and the World Organization for Animal Health (OIE).



This proposed report aims to strengthen cross-sectorial collaboration and transdisciplinary knowledge exchange in surveillance data integration and analysis, along with the One Health (OH) objective of improving health and well-being. It provides a national joint framework for data sharing to promote health at human animal-environment interface to address the need for targeted investments to prevent, prepare, detect, respond to, and recover from issues like diseases with pandemic potential, it facilitate efficient exchange of knowledge and sharing of resources, guidelines, tools and experiences promoting the adoption of the OH concept primarily in relation to surveillance data.

As a region, Latin America and the Caribbean has recorded overall increases in multidrug- and extensively drug-resistant organisms, which results in adverse outcomes in human health and increasing socioeconomic burden. The country has developed a National Action Plan on AMR (2018) and has received support from the Pan American Health Organization/ World Health Organization (PAHO/WHO) to detect and characterize resistance. It was one of the first countries in the Caribbean to contribute to the regional surveillance network, The Latin American and Caribbean Network for Antimicrobial Resistance Surveillance (RELAVRA+). As of 2022, there have been three additional CPE isolates of two other mechanisms (VIM and KPC) characterized using GeneXpert at CML. The country also continues to build capacity in infection prevention and control (IPC) and disease surveillance to bolster health services to detect and respond to significant outbreaks in the long-term.



The Ministry of Health Mission vision is to provide quality health care and wellbeing for all now and beyond. Its mission aims to provide quality, affordable, comprehensive health services: within a resilient environment that promotes equal health and wellbeing for all.

Vector-borne diseases

Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. The burden of these diseases is highest in tropical and subtropical areas, and they disproportionately affect the poorest populations. Therefore, major outbreaks of dengue, malaria, chikungunya, yellow fever and Zika have afflicted populations, claimed lives, and overwhelmed health systems in many countries. Distribution of vector-borne diseases is determined by a complex set of demographics, environmental and social factors.

List of vector-borne diseases, according to their vector

The following table is a non-exhaustive list of vector-borne disease, ordered according to the vector by which it is transmitted. The list also illustrates the type of pathogen that causes the disease in humans.

Vector	Disease caused	Type of pathogen	Number of cases	Location of cases
mosquitoes	Chikungunya	Virus	0	0
<i>Aedes albopictus</i>				
<i>Aedes aegypti</i>	Dengue	Virus	127	Corozal, Orange Walk, Belize,



Cayo, Stann
Creek, Toledo

Culex quinquefasciatus in the (Americas), in Africa (Anopheles)	Lymphatic filariasis	Parasite	0	0
Aedes and Culex mosquitoes	Rift Valley fever	Virus	0	0
Aedes or Haemagogus species mosquitoes	Yellow Fever	Virus	0	0
Aedes species mosquito (Ae. aegypti and Ae. albopictus). These are the same mosquitoes that spread dengue and chikungunya viruses.	Zika	Virus	0	0
Anopheles mosquito species	Malaria Lymphatic filariasis	Parasite	0	0
Culex species mosquitoes, particularly Culex tritaeniorhynchus.	Japanese encephalitis	Virus	0	0
In the Americas, it is Culex quinquefasciatus	Lymphatic filariasis	Parasite	0	0
Culex mosquitoes	West Nile fever	Virus	0	0



Aquatic snails	Schistosomiasis (bilharziasis)	Parasite	0	0
Blackflies	Onchocerciasis (river blindness)	Parasite	0	0
Fleas	Plague (transmitted from rats to humans)	Bacteria	0	0
Hematophagous fleas	Tungiasis	Ectoparasite	0	0
Lice	Typhus	Bacteria	0	0
Lice	Louse-borne relapsing fever	Bacteria	0	
Sandflies	Leishmaniasis	Parasite	11	All lab confirmed cases (5 Czl, 2 Belize, 2 Tol, 1 Cyo, 1 OW) (8Males,3Females,),(Range 22 to 69 years),(Jan 1 case, Feb 7 cases, March 3 cases)
Sandflies	Sandfly fever (phlebotomus fever)	Virus	0	0
Ticks	Crimean-Congo haemorrhagic fever	Virus	0	0
Ticks	Lyme disease	Bacteria	0	0
Ticks	Relapsing fever (borreliosis)	Bacteria	0	0



Ticks	Rickettsial diseases (eg: spotted fever and Q fever)	Bacteria	0	0
Ticks	Tick-borne encephalitis	Virus	0	0
Ticks	Tularaemia	Bacteria	0	0
Triatome bugs	Chagas disease (American trypanosomiasis)	Parasite	0	0
Tsetse flies	Sleeping sickness (African trypanosomiasis)	Parasite	0	0



MINISTRY OF HEALTH AND WELLNESS

NATIONAL DRINKING WATER QUALITY LABORATORY

Monthly Report

February 2023

National Drinking Water Quality Monitoring Program

This national program involves the collection and analysis of water samples collected from 4 routine major areas, namely:

- *Belize Water Services systems*
- *Rudimentary water systems*
- *Handpumps (These are rapidly becoming obsolete)*
- *Purified water Operations/Bottled Water Producers*

Water samples are also collected on a needs basis from Other Sources dictated by requests or as a part of investigation from:

- *Private wells*
- *Rainwater tanks*
- *Private water systems*
- *Rivers, creeks, etc.*
- *Recreational areas*



Table 1 – National Water Supply Systems for monitoring

Region	No. of BWS	No. of RWS	No. of BWP	No. of HP
Corozal (Northern)	1	12	16	19(approx.)
Orange Walk (Northern)	2	17	25	10(approx.)
Belize (Central)	5	5	27	20(approx.)
Cayo (Western)	4	21	21	28(approx.)
Stann Creek (Southern)	2	26	7	0
Toledo (Southern)	2	29	3	39(approx.)
Total	16	110	99	116(approx.)

BWS – Belize Water Services systems, RWS – rural water systems, BWP – bottled (purified) water plants, HP – handpumps.

Table 2 – Monitoring Frequency Schedule

Monitoring Programme	Monthly	Quarterly	Yearly
Urban Water Systems	X		
Rudimentary Water Systems	X	X	
Bottled Water	X		
Handpumps			X
Ice	X		



Other sources **As requested,
required**

Table 3 - Total No. of samples Collected by District

District	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec
Belize	84	104										
Corozal	22	19										
Orange Walk	85	73										
Cayo	49	92										
Stann Creek	45	31										
Toledo	8	0										
Total	293	319										

Table 4 - Total Number of samples collected (both bacteriological and chemical)

District	No. of bacteriological samples	No. of chemical samples	Total	Positives	Microorganisms
Belize	102 (185)	2 (3)	104 (188)		
Corozal	18 (40)	1	19 (41)		
Orange Walk	70 (151)	3 (7)	73 (158)		
Cayo					
San Ignacio	35 (57)	4 (5)	39 (62)		
Belmopan	37 (63)	4	41 (67)		
Benque Viejo	10 (10)	2	12 (12)		
Stann Creek					



Independence	12 (24)	0 (1)	12 (25)
Dangriga	18 (46)	1 (5)	19 (51)
Toledo	0 (6)	0 (2)	0 (8)
TOTAL	302 (582)	17 (30)	319 (612)

Table 5 – Total Number of samples collected from 4 Major Sources.

District	Belize Water Services	Rural Water Systems	Purified Water Operations	Hand Pump	Total
Belize		6 (19)	29 (59)		35 (78)
Belize District	35(66)				35 (66)
San Pedro	0				0
Caye Caulker	5				5
River Valley	13				13
Hattieville	5 (8)				5 (8)
Corozal	0	7+1 (8)	7+1(19)		16 (27)
Orange Walk		18 (43)	29 (60)		47 (103)
Orange Walk Town	2 (9)				2 (9)
C. Pine Ridge	2 (4)				2 (4)
Cayo					
San Ignacio	8 (15)	16 (25)	8+3 (16)	1+1 (2)	37 (58)
Belmopan	6+2 (16)	11(16)	10 (20)	1+1 (2)	31 (54)
Teakettle	5+1 (6)				6
Benque Viejo	4	3+1 (4)	2+1 (3)		11
Stann Creek					
Dangriga	0 (7)	12+1 (20)	2 (8)		15 (35)



Placencia/S. Bight	0			0
Independence		10 (18)	2 (6)	12 (24)
Toledo		(5)		(8)
Forest Home	0	0	0	0
Punta Gorda	0	0	0	0
TOTAL	88 (153)	86 (158)	94 (191)	4 (7) 272(509)

Bacteriological Quality of Systems tested.

Table 6 – Belize Water Services Systems

District	Samples collected	Samples positive for total coliforms, fecal coliforms & E. coli	Total negative samples for coliforms
Belize City	35 (65)	2 (4) TC, 1 FC	33 (60)
San Pedro	0		0
Caye Caulker	5		5
Hattieville	5 (8)	1 TC	4 (7)
River Valley	13	1 TC	12
Corozal	0		0
Orange Walk	2 (9)	1 TC	2 (8)
C. Pine Ridge	2 (4)	1 TC	1 (3)
S. Ignacio/Sta. Elena	8 (15)	3 TC	5 (12)
Belmopan	6 (14)	1 TC	6 (13)
Teakettle	5		5
Benque Viejo	4	2 TC	2
Placencia/Seine Bight	0		0
Dangriga	0 (6)	2 TC, 1 FC	0 (3)
Punta Gorda	0		0
Forest Home	0		0



TOTAL	85 (148)	10 (16) TC, 2 FC	75 (130)
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Table 7– Samples collected and tested from the different districts in Belize.

District	Bacteriological samples collected	Positive samples for fecal coliform/E.Coli	Negative samples for fecal coliform/E.Coli
Belize			
Corozal			
Orange Walk			
Cayo			
Belmopan	1	1 E. coli	0
San Ignacio/Santa Elena	1	1 FC	0
Benque Viejo			
Stann Creek			
Toledo	3		3
TOTAL	2 (5)	1 E. coli & 1 FC	0 (3)

Table 8 – Other drinking sources cont'd (Private water system & ice)

District	Positive samples for fecal coliform/E. coli (Private System)	Negative samples for fecal coliform/E. coli (Private System)	Positive samples for fecal coliform /E. coli (ICE)	Negative samples for fecal coliform /E. coli (ICE)	Location of ICE Plant/P. System
Belize	(0)	0 (2)	0	4 (6)	
Corozal		5			
Orange Walk					
Cayo					



San Ignacio/Santa Elena	(0)	0 (1)	1 FC	0	1 in Ice Age Ice Plant
Belmopan	1 FC	1		2 (3)	
				1	
Benque Viejo					
Independence	(3 E. coli)				
Dangriga	0 (7)				
Toledo					
TOTAL	(1 FC & 3 E. coli)	0 (16)	1 FC	7 (10)	

Table 9– Quality of Physical/Chemical water samples

District	No. of chemical samples collected	No. of samples acceptable to W.H.O. Guidelines for drinking water	No. of samples not acceptable to W.H.O. Guidelines for drinking water
Belize	2 (3)	1 (2)	1
Corozal	1	0	1
Orange Walk	3 (7)	1 (5)	2
Cayo	10 (11)	9 (10)	1
Stann Creek	1 (6)	0 (4)	1 (2)
Toledo	0 (2)	0 (2)	0
TOTAL	17 (30)	11 (23)	6 (7)



Table 10– Free Chlorine Monitoring

District	Free chlorine tests done in Urban areas	Acceptable Free chlorine results in Urban areas	Free chlorine tests done in Rural areas	Total No. of acceptable free chlorine results in Rural areas
Belize	36 (63)	27 (41)	29 (51)	14 (17)
Corozal	0	0	0	0
Orange Walk	0 (3)	0 (3)	0 (2)	0 (2)
Cayo				
San Ignacio	7 (13)	7 (12)	18 (29)	2
Belmopan	6 (11)	4 (6)	15 (21)	4 (7)
Benque Viejo	3	1	4	0
Stann Creek	0			
Independence			10 (14)	0
Dangriga	(5)	(5)	7 (16)	3 (5)
Toledo	0	0	0	0
TOTAL	52 (98)	39 (68)	83 (137)	23 (33)

Table 11– Free Chlorine Monitoring for BWS

District	Free chlorine tests done in BWSL systems	Acceptable Free chlorine results in BWSL systems 0.5 – 2.0 mg/L
Belize/S. Hill	34 (65)	27 (43)
San Pedro	0	0
Caye Caulker	5	0
Hattievile	5 (7)	3



River Valley	13	13
Corozal	0	0
Orange Walk Town	0 (5)	0 (5)
Chan Pine Ridge	0	0
San Ignacio/ Sta. Elena	8 (15)	8 (13)
Belmopan	4 (12)	4 (9)
Teakettle	4	4
Benque Viejo	4	1
Dangriga	0 (5)	0 (5)
Placencia/ Seine Right	0	0
Forest Home	0	0
Punta Gorda	0	0
TOTAL	77 (135)	60 (96)

Table 12– Free Chlorine Monitoring for RWS

District	Free chlorine tests done in RWS systems	Acceptable Free chlorine results in RWS 0.5- 2.0 mg/L
Belize	6 (19)	0 (1)
Corozal	0	0



Orange Walk	0	0
Cayo	30	0
S. Creek	13 (23)	3 (5)
Toledo	0	0
TOTAL	49 (72)	3 (6)

Comments

- No samples were received from San Pedro and Punta Gorda Units. The Toledo District continues to falter in its Water Quality Monitoring and San Pedro has not collected for the past 7 months any water samples.

BWS Monitoring

- San Pedro, Corozal, Placencia/Seine Bight, Dangriga, Forest Home & Punta Gorda System were not monitored during this month. This accounts for 6 systems out of 16 systems, this is 37.5 % of BWS systems were not monitored.

Rural Water System

- Contamination (E. coli) was found in 7 (9) rural systems, 7 in the Cayo District (B. Man Eddy/ Ontario, George ville, United ville, San Antonio, 7 Miles, Corozalito, Armenia and San Jose in Orange Walk and Dolores in Toledo These were reported to the Ministry of Rural Transformation for Super chlorination.
- Belize monitored 2 out of 5 systems, Corozal monitored 3 out of 12, Orange Walk 6 out of 17, Cayo 8 out of 21, Stann Creek 6 out of 26 and Toledo did not monitor any at all. There is a clear indication that monitoring of these systems needs to be strengthened.
- We encourage ALL districts to make an effort to continue with their monthly water sampling schedule. The Laboratory wishes to register its gratitude to all the health inspectorate units nationally for their support to the National Drinking Water Monitoring Program.



Table 13 Confirmed cases of reportable diseases surveillance by month

Reportable diseases	Number of monthly cases for 2023												Total for 2023	Rate	
	Jan	Feb	March	April	May	June	July	Au	Sept	Oct.	Nov	Dec	Jan		
AIDS															
Amebiasis															
Carbapenemase-Producing Enterobacteriaceae (CP)															
Chlamydia infections															
Cholera															
Encephalitis															
Food poisoning															
Gonorrhea															
Hepatitis A															
Hepatitis B															
Malaria	0	0	0	0											
Meningitis	0	0	0	0											
Rabies															
Rubella															
Siphilis															
List of vector-borne diseases	Number of monthly cases for 2023												Total for 2023	Rate	
	Jan	Feb	March	April	May	June	July	Au	Sept	Oct.	Nov	Dec	Jan		
Chikungunya		0													
Dengue		127													
Lymphatic filariasis															



Rift Valley fever	0													
Yellow Fever	0													
Zika	0													
Malaria	0													
Japanese encephalitis	0													
Lymphatic filariasis	0													
West Nile fever	0													
Schistosomiasis (bilharziasis)	0													
Onchocerciasis (river blindness)	0													
Plague (transmitted from rats to humans)	0													
Tungiasis	0													
Typhus	0													
Louse-borne relapsing fever	0													



List of vector-borne diseases	Number of monthly cases for 2023													Total for 2023	Rate
	Jan	Feb	March	April	May	June	July	Au	Sept	Oct.	Nov	Dec	Jan		
Anthrax		0													
Animal influenza		0													
Avian influenza		0													
Bovine tuberculosis		0													
Campylobacteriosis		0													
Cat scratch fever		0													
Cowpox		0													
Cryptosporidiosis		0													
Cysticercosis / Taeniasis		0													
Erysipeloid		0													
Fish tank / swimming pool granuloma		0													
Haemorrhagic colitis and haemolytic uraemic syndrome (HUS)			0												
Hantavirus syndromes		0													
Hepatitis E		0													
Hydatid disease		0													
Leptospirosis		0													
Listeriosis		0													
Louping ill		0													
Lyme disease		0													
Lymphocytic choriomeningitis		0													
Orf		0													



Ovine chlamydiosis	0																			
Pasteurellosis	0																			
Psittacosis	0																			
Q fever	0																			
Rabies	0																			
Rat bite fever	0																			
Ringworm	0																			
Salmonellosis	0																			
Streptococcal sepsis	0																			
Toxocariasis	0																			
Toxoplasmosis	0																			
Zoonotic diphtheria	0																			
Disease	0																			
Alveolar echinococcosis	0																			
Brucellosis	0																			
Crimean-Congo haemorrhagic fever (CCHF)	0																			
Ebola virus disease	0																			
Glanders	0																			
Hendra virus infection	0																			
Kyasanur Forest disease	0																			
Lassa fever	0																			
Marburg virus disease	0																			
Mers	0																			
Monkeypox	0																			
Nipah virus infection	0																			
Plaque	0																			



Rift Valley fever	0													
Tickborne encephalitis	0													
Trichinellosis	0													
Tularemia	0													
West Nile virus infection	0													
Yellow fever	0													



Prevent . Protect . Participate

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List of Zoonotic Diseases (Time frame of reporting February 2023)

Disease	Organism	Main reservoirs	Usual mode of transmission to humans	Number of cases	Location of cases
Anthrax	Bacillus anthracis	livestock, wild animals, environment	direct contact, ingestion, inhalation	0	
Animal influenza	Influenza A viruses	Pigs, other livestock, humans	direct contact	0	
Avian influenza	Influenza A virus	Poultry, ducks	direct contact	0	
Bovine tuberculosis	Mycobacterium bovis	cattle	unpasteurised milk, dairy products, meat or exposure to tuberculous animals	0	
Campylobacteriosis	Campylobacter spp	poultry, farm animals	direct animal contact, raw meat, milk, dairy products	0	
Cat scratch fever	Bartonella henselae	cats	bite, scratch	0	
Cowpox	Cowpox virus	rodents	direct contact (usually with cats)	0	
Cryptosporidiosis	Cryptosporidium spp	cattle, sheep, pets	contaminated water, direct contact	0	



Cysticercosis / Taeniasis	Taenia spp.	cattle, pigs	raw/undercooked meat	0
Erysipeloid	Erysipelothrix rhusiopathiae	pigs, fish, environment	direct contact, fomites, environment	*
Fish tank / swimming pool granuloma	Mycobacterium marinum	fish	contact with fish or contaminated water	0
Haemorrhagic colitis and haemolytic uraemic syndrome (HUS)	Shiga toxin-producing E. coli	ruminants	direct contact, foodborne	0
Hantavirus syndromes	Hantaviruses	rodents	aerosolised excreta	0
Hepatitis E	Hepatitis E virus	pigs, wild boar, deer	undercooked animal meats	0
Hydatid disease	Echinococcus granulosus	dogs, sheep	ingestion of eggs excreted by dog	0
Leptospirosis	Leptospira spp	rodents, ruminants	urine-contaminated water or direct contact	0
Listeriosis	Listeria spp.	cattle, sheep, soil	dairy produce, meat products	0
Louping ill	Louping ill virus	sheep, grouse	direct contact, tick bite	0
Lyme disease	Borrelia burgdorferi	ticks, rodents, deer, sheep, small mammals	tick bite	0
Lymphocytic choriomeningitis	Lymphocytic choriomeningitis virus (LCMV)	rodents	direct contact	0
Orf	Orf virus	sheep, goats	direct contact	0



Ovine chlamydiosis	Chlamydia abortus	sheep, farm animals	direct contact, aerosol	0	
Pasteurellosis	Pasteurella spp	dogs, cats, many mammals	bite/scratch, direct contact	0	
Psittacosis	Chlamydia psittaci	psittacine birds, poultry, ducks	aerosol, direct contact	0	
Q fever	Coxiella burnetii	cattle, sheep, goats, cats	aerosol, direct contact, products of conception, fomites	0	
Rabies	Rabies virus and other lyssaviruses	Bats/dogs	Bite, aerosol. saliva or scratch	2	Orange Walk District
Rat bite fever	Streptobacillus moniliformis	rats	bite/scratch, milk, water	0	
Ringworm	Dermatophyte fungi	many animal species	direct contact	0	
Salmonellosis	Salmonella spp.	poultry, farm animals	direct animal contact, raw meat, other raw foods	0	
Streptococcal sepsis	Streptococcus suis	pigs	direct contact, meat	0	
Streptococcal sepsis	Streptococcus zooepidemicus	horses	direct contact	0	
Toxocariasis	Toxocara canis/catis	dogs, cats	ingestion	0	
Toxoplasmosis	Toxoplasma gondii	cats, ruminants	ingestion of faecal oocysts, meat	0	
Zoonotic diphtheria	Corynebacterium ulcerans	cattle, farm animals, dogs	direct contact, milk	0	



Disease	Organism	Main reservoirs	Usual mode of transmission to humans	Number of cases	Location of cases
Alveolar echinococcosis	Echinococcus multilocularis	foxes	ingestion of eggs	0	
Brucellosis	Brucella spp.	cattle, goats, sheep, pigs	dairy products, milk	0	
Crimean-Congo haemorrhagic fever (CCHF)	CCHF virus	Livestock, ticks	Tick bite, direct contact animal blood	0	
Ebola virus disease	Ebola virus	Unknown, possibly bats	Wild animals	0	
Glanders	Burkholderia mallei	Horse, donkey mule	Direct contact, contaminated fomites, food and water	0	
Hendra virus infection	Hendra virus	Fruit bats, horses	exposure to body fluids	0	
Kyasanur Forest disease	Kyasanur Forest virus	rodents, shrews, and monkeys	tick bite, direct animal contact	0	
Lassa fever	Lassa virus	Multimammate rat	direct or indirect contact with infected rodent excreta	0	
Marburg virus disease	Marburg virus	bats	bats	0	
Mers	MERs Coronavirus	dromedary camels	direct and indirect contact	0	
Monkeypox	Monkeypox virus	rodents	direct contact	0	
Nipah virus infection	Nipah virus	fruit bats	Contaminated date palm sap, close contact with infected pigs	0	
Plaque	Yersinia pestis	Rats and their fleas	flea bite, scratches or bites from infected cats	0	



Rift Valley fever	Rift Valley fever virus	cattle, goats, sheep	direct contact, mosquito bite	0
Tickborne encephalitis	Tickborne encephalitis virus	rodents, small mammals, livestock	tick bite, unpasteurized milk products	0
Trichinellosis	Trichinella spiralis	pigs, wild game	undercooked or raw meat	0
Tularemia	Francisella tularensis	rabbits, wild animals, ticks	direct contact, aerosol, ticks, inoculation	0
West Nile virus infection	West Nile virus	wild birds, mosquitoes	mosquito bite	0
Yellow fever	Yellow fever virus	monkeys	mosquito bite	0



NATIONAL METEOROLOGICAL SERVICE OF BELIZE

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The National Meteorological Service of Belize under the Ministry of Sustainable Development, Climate Change and Disaster Risk Management surveillance reporting.

Monthly weather summaries are prepared by the Agro-climatic section of the National Meteorological Service (NMS) of Belize. The NMS of Belize maintains a network of manual and automatic weather stations across the country. The main weather elements measured at these stations are rainfall and temperature. These observations are used as inputs in compiling the monthly weather summaries and utilized to produce seasonal and sub-seasonal climate forecasts.

February is the last month of the cool transition period of the dry season where frontal activity begins to decrease. February 2023 started off relatively dry due to a high that was centered over the Northwestern Bahamas. This led to ridging over the Caribbean and supported an easterly airflow. On the 3rd, conditions began to transition and become moist, with moisture up to 800mb, while the upper levels were very dry due to a cold front over Florida extending to the Southern Gulf of Mexico. A pre-frontal trough over the Yucatan supported a northeasterly flow on the 4th and the 5th, and it continued to be moist around 700mb. On the 6th and the 7th, a low-level jet to the North and a low pressure to the South supported a northeasterly to southerly flow and slightly moist conditions. In the upper levels, conditions were generally dry and ridging over the Caribbean supported a west to southwesterly flow. On the 6th an anticyclone over the Southwestern Caribbean supported a zonal flow aloft and on the 7th an anticyclone over the Eastern Pacific supported a northwesterly flow at 300mb and a southwesterly flow at 200mb. The dry pattern at the start of the week led to mostly fair conditions during the first two days of the month and as the week progressed, most of the country began experiencing a few showers that became moderate to heavy showers. On the 6th, the Belize District and Punta Gorda experienced intense isolated showers while everywhere else experienced fair conditions. The southern and northern parts of the country experienced a few showers on February 7, 2023. The second week was relatively moist except for the 14th. A high pressure caused ridging over the area on the 8th and 9th and a stationery front across the southern USA extending to the Bay of Campeche supported a moderate east-southeasterly wind flow. The winds shifted to northwesterly on the 12th due to a stationery front over the Gulf of Honduras. On the 13th the dissipating frontal boundary over the Gulf of Honduras along with a high-pressure ridge over the Gulf of Mexico supported a Northeasterly flow supporting some moisture below 700mb. On the 14th, a high pressure supported ridging East of Florida resulting in an east to southeasterly airflow supporting relatively dry conditions. In the upper levels, ridging supported very dry conditions to be dry and the wind varied from west to southwesterly. The moist conditions in the earlier parts of the week resulted in showers affecting the northern and southern parts of the country from the 8th to the 11th. Mostly dry



conditions prevailed from the 12th to the 14th. The third week was generally dry in the low levels with the Atlantic high and a low trough over the Southwestern Gulf of Mexico supporting a moderate east to southeasterly airflow. On the 17th, a strong ridge west of a cold front that extended from the southeast of the USA to the Bay of Campeche supported a wind change from southeasterly to east northeasterly and lasted through to the 20th over the Northwestern Caribbean. On the 21st, a weak high-pressure ridge extended across the region supported a southerly airflow. The upper levels continued to dry due to ridging over the area, supporting winds ranging from northerly to westerly. The weather conditions were generally fair during this week with isolated showers mainly over the central and along the southern parts of the country. Throughout the last week, conditions were generally dry. A strong high-pressure ridge supported a gusty east to southeasterly flow throughout most of the week with wind conditions subsiding slightly and becoming moderate in the latter parts of the week. The little available moisture was capped below 700hPa with the upper levels being very dry during the week. These fair, dry, and occasionally windy conditions were supported by a high extending across the Gulf of Mexico and Caribbean Sea. Only isolated showers occurred from the 24th to the 28th and affected mostly the central and southern parts of the country.

The graph and maps below summarize the total rainfall and average maximum and minimum temperatures. They also give an indication of how these readings compare to the normal for the month across the stations sampled. As can be seen, most of the country experienced below normal rainfall over most areas except for some central, and southern locations in terms of temperatures, most of the stations sampled showed near normal maximum/daytime temperatures and slightly above normal minimum/night-time temperatures.

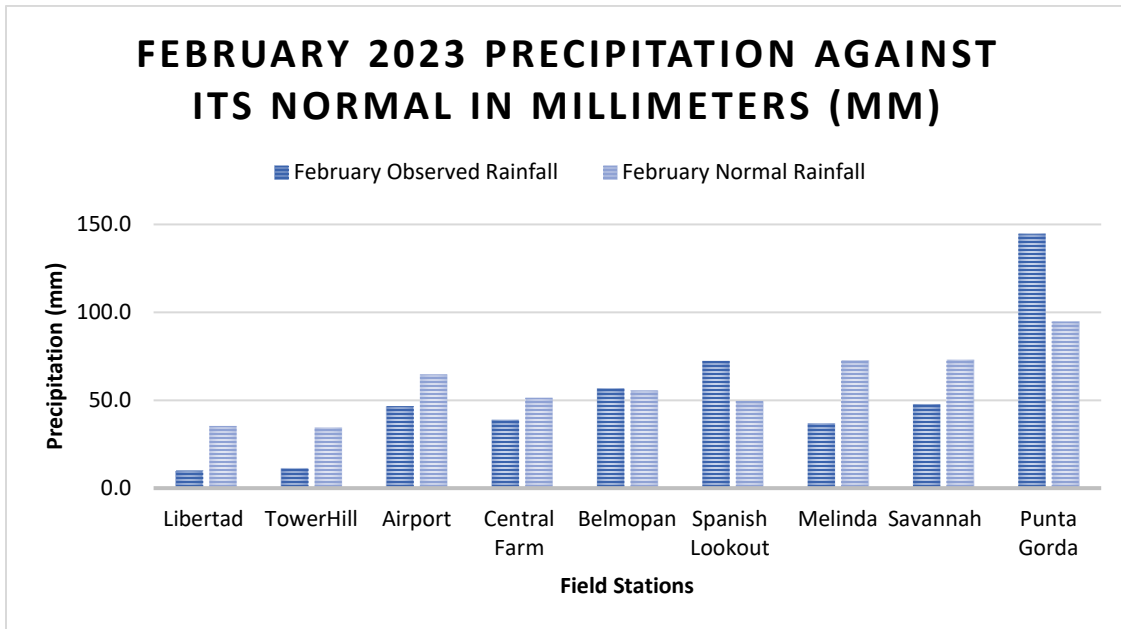


Figure 1: Comparison of the Accumulated Precipitation and the Climate Normals from some of the Field Stations for February 2023

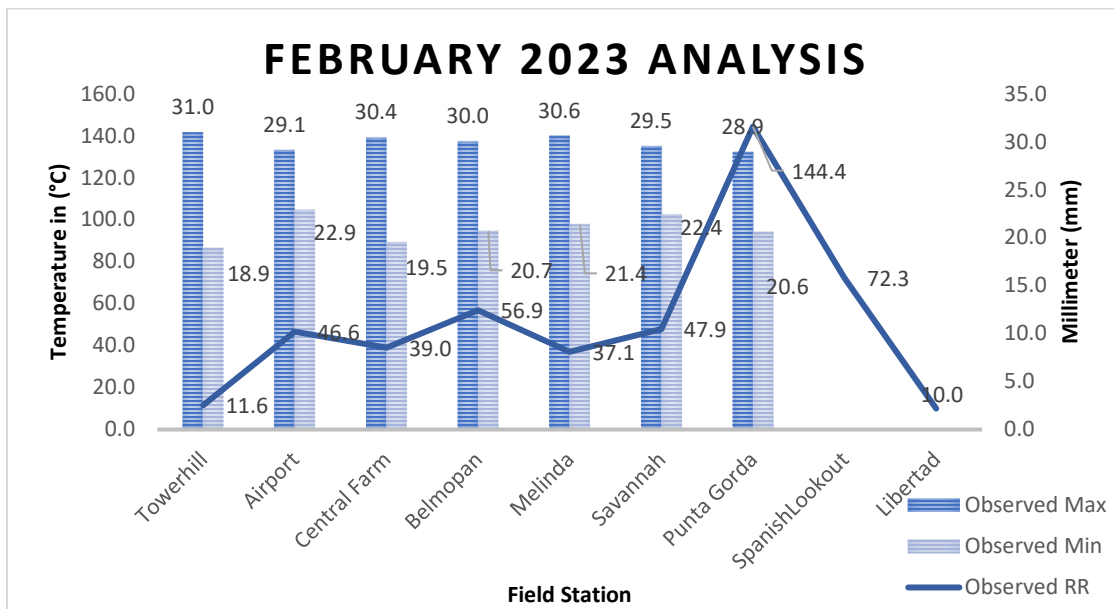


Figure 2: Comparison of the Mean Maximum Temperature and the Climate Normals from some of the Field Stations for February 2023

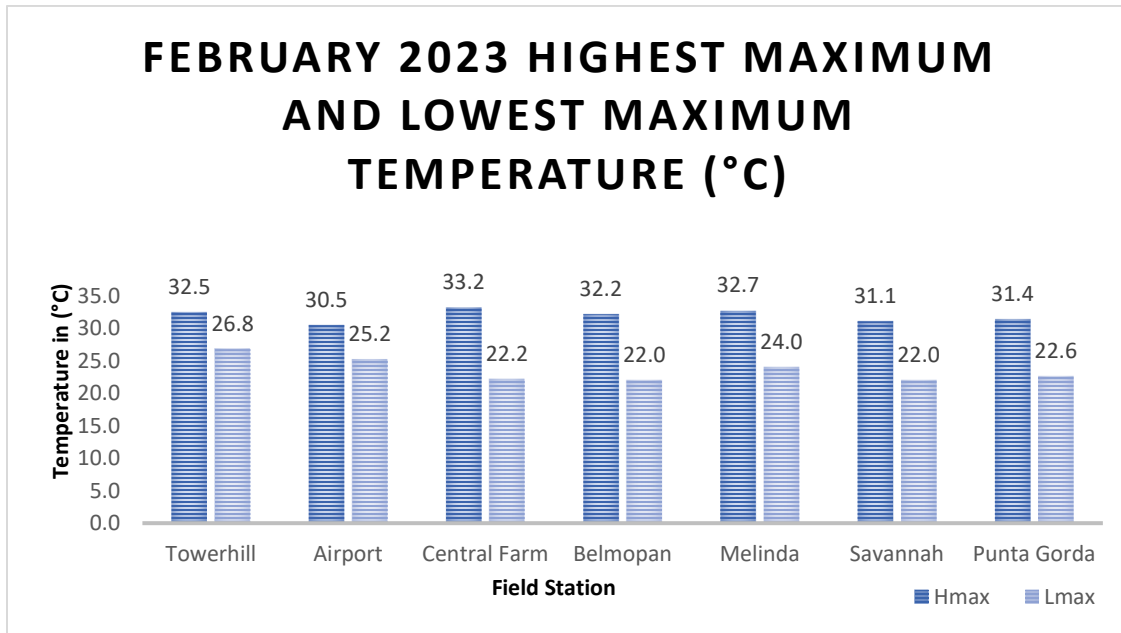


Figure 3: Comparison of the Mean Minimum Temperature and the Normals of some of the Field Stations for February 2023

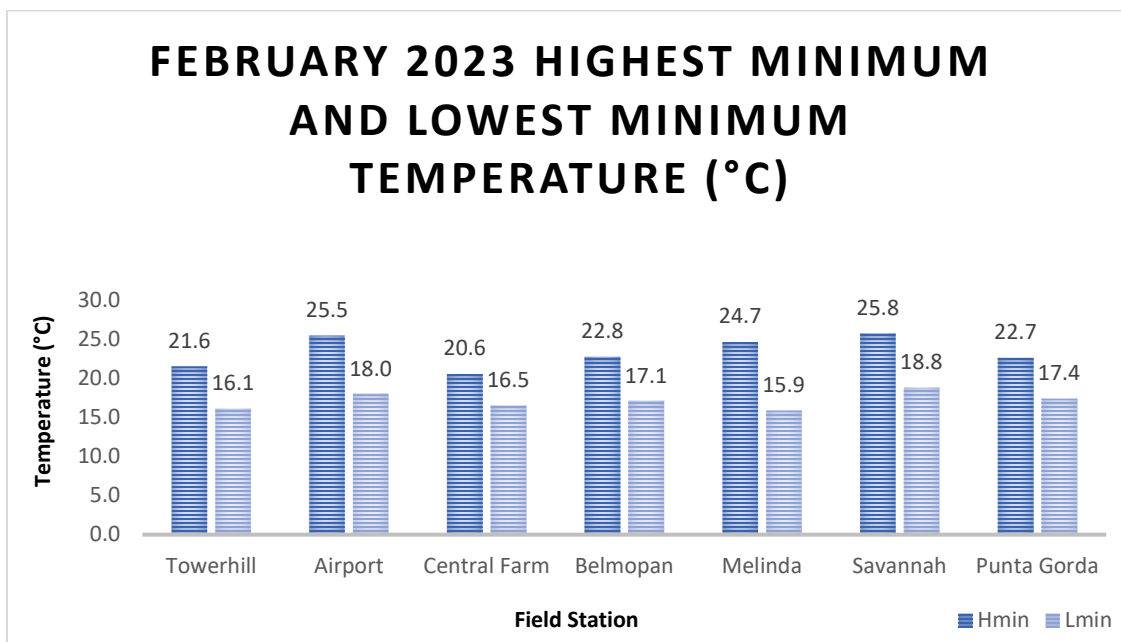


Figure 4: Comparison of the Highest Maximum Temperatures and the Lowest Maximum Temperatures Recorded in February 2023.

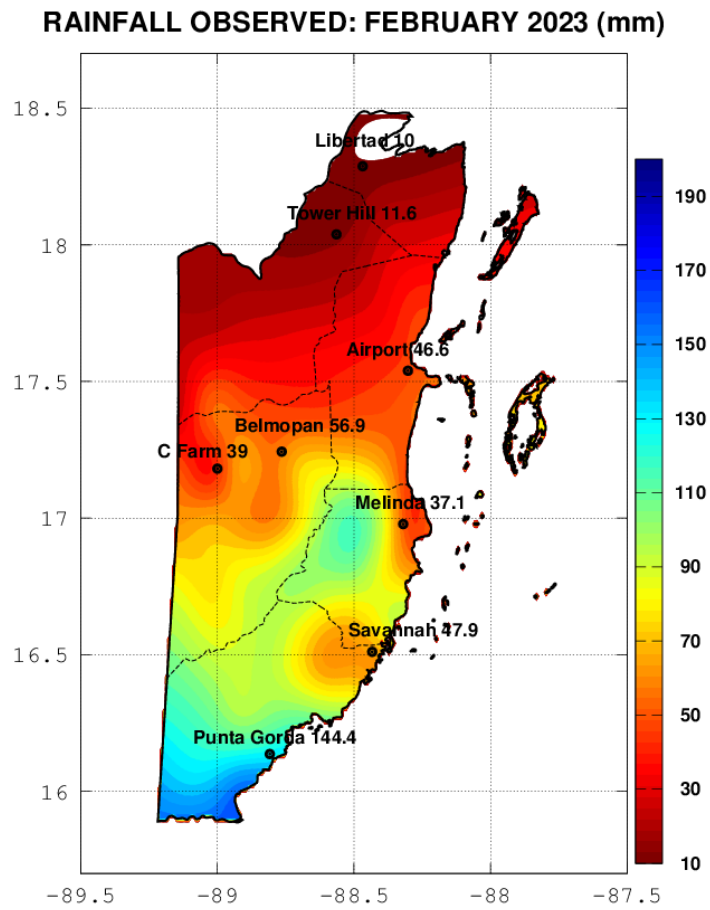


Figure 5: Comparison of the Highest Minimum Temperatures and the Lowest Minimum Temperatures Recorded in February 2023.



RAINFALL OBSERVED: FEBRUARY 2023 (%ABOVE/BELOW AVERAGE)

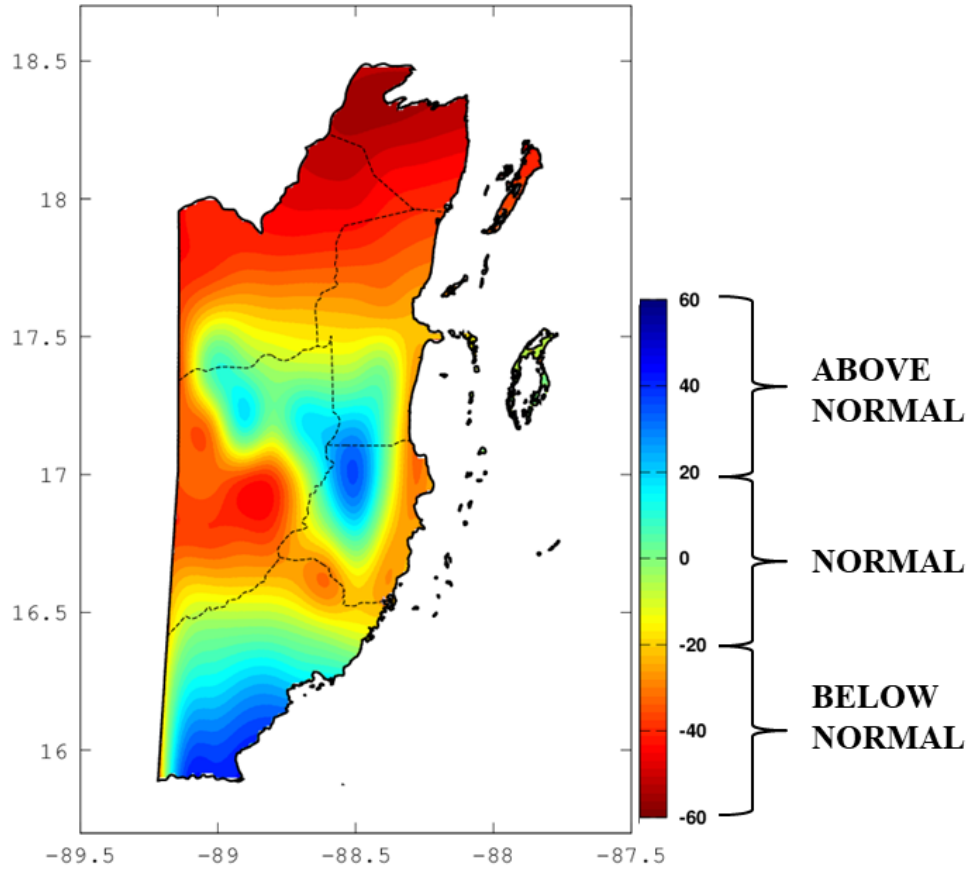


Figure 6: Observed Precipitation in Millimeter (mm) Distribution Map for February 2023

