

MONTHLY WEATHER REVIEW

Editor, EDGAR W. WOOLARD

VOL. 69, No. 7
W. B. No. 1332

JULY 1941

CLOSED SEPT. 3, 1941
ISSUED OCT. 14, 1941

THE AREAL DISTRIBUTION OF MEAN ANNUAL RAINFALL OVER THE ISLAND OF HISPANIOLA

By LEO ALPERT

[Clark University, Worcester, Mass., July 1940]

The new map of annual rainfall distribution over the island of Hispaniola here presented is based upon data for 162 stations and detailed information made available in recent years. It indicates that the areal distribution of mean annual rainfall over this island is the most irregular of any unit of the Greater Antilles, ranging from less than 20 inches on leeward lowlands and enclosed interior valleys to more than 100 inches on elevated mountain slopes and favorably located areas at low elevation.

INTRODUCTION

The areal distribution of rainfall over the island of Hispaniola has not previously been mapped in detail because of the inadequacy of the rainfall data, and the marked dependence of rainfall on local relief for which accurate topographic maps are not available. The only map of annual rainfall known to the author¹ was published in 1929 by Oliver L. Fassig. Referring to this map, Fassig wrote:

The accompanying chart is offered as only a first attempt to show the average distribution of rainfall over the entire island.

The distribution over Haiti is based upon the average annual values for 27 stations with records of 10 years or more and covering

¹ Fassig, Oliver L., A Tentative Chart of Annual Rainfall over the Island of Haiti-Santo Domingo, MONTHLY WEATHER REVIEW, July 1929, Vol. 57, p. 296.

an average period of 18 years. The distribution over Santo Domingo is based upon records at 50 stations, averaging 7 years.

In Fassig's study, limited data and lack of information about many sections of the island necessitated broad generalizations which failed to bring out the irregularity characteristic of rainfall distribution. The availability of data from more than twice as many stations, and records with longer periods of observation, now justify a new compilation of annual rainfall distribution.

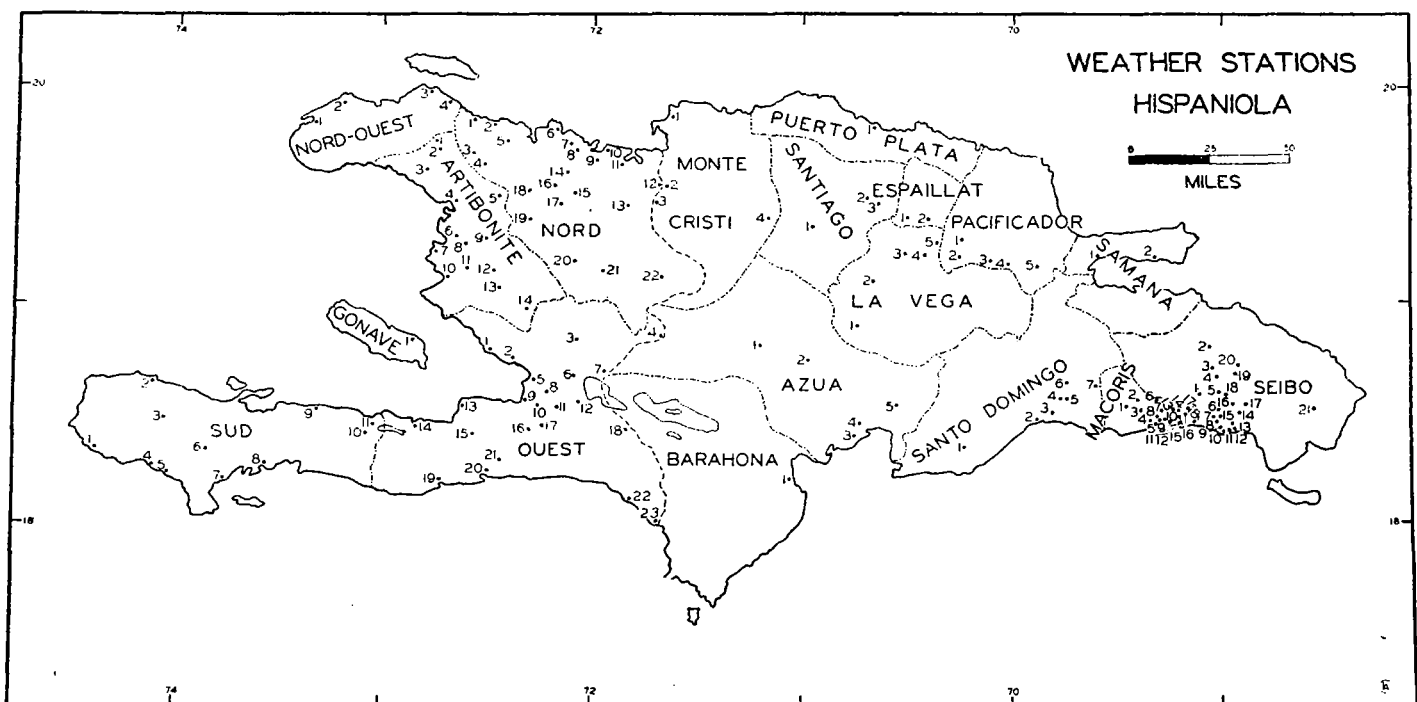
Records for 162 stations,² covering an average period of 14 years, form the basis for the accompanying map. For the Republic of Haiti 79 stations, covering an average period of 17 years, were used, of which 24 stations have records of 20 years or more, 36 stations have records of 10 to 19 years, and 19 stations have records of 4 to 9 years. For the Dominican Republic 83 stations, covering an average period of 11 years, were used, of which 2 stations have records of 30 and 31 years, respectively, 56 stations have records of 10 to 15 years, and 25 stations have records of 4 to 9 years.

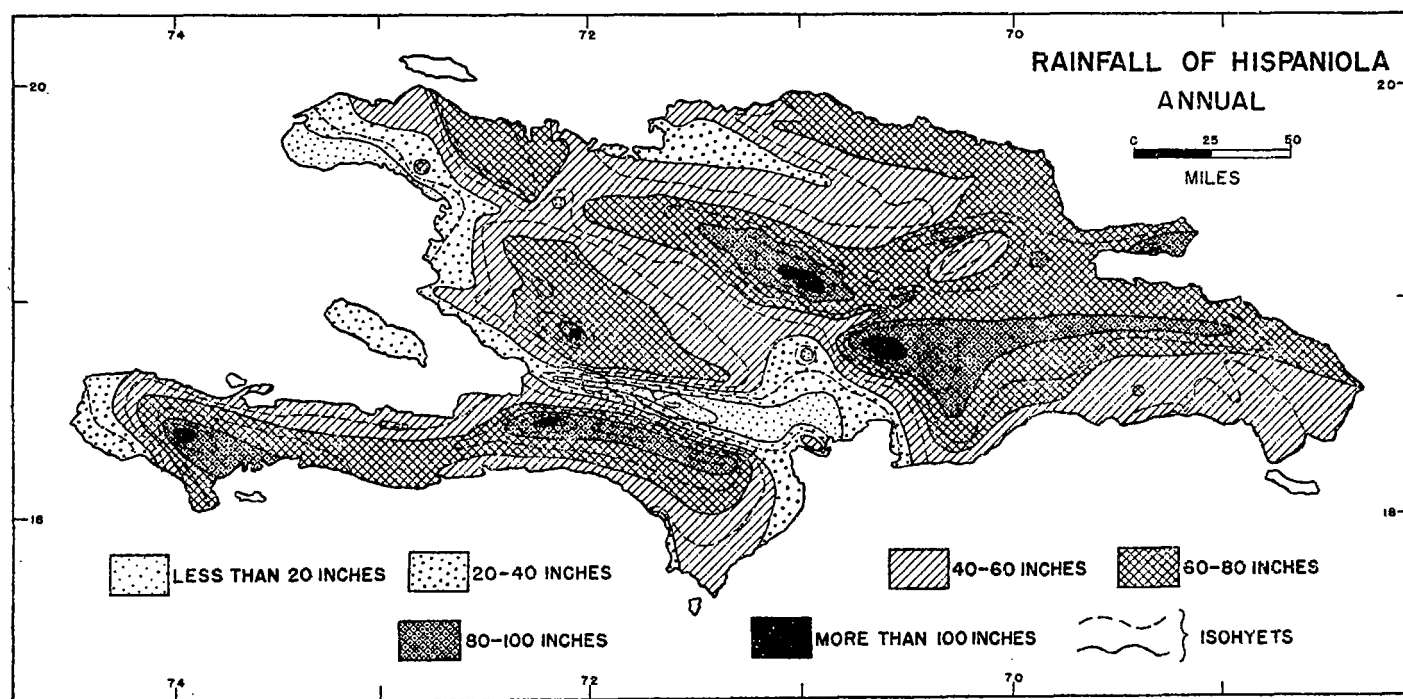
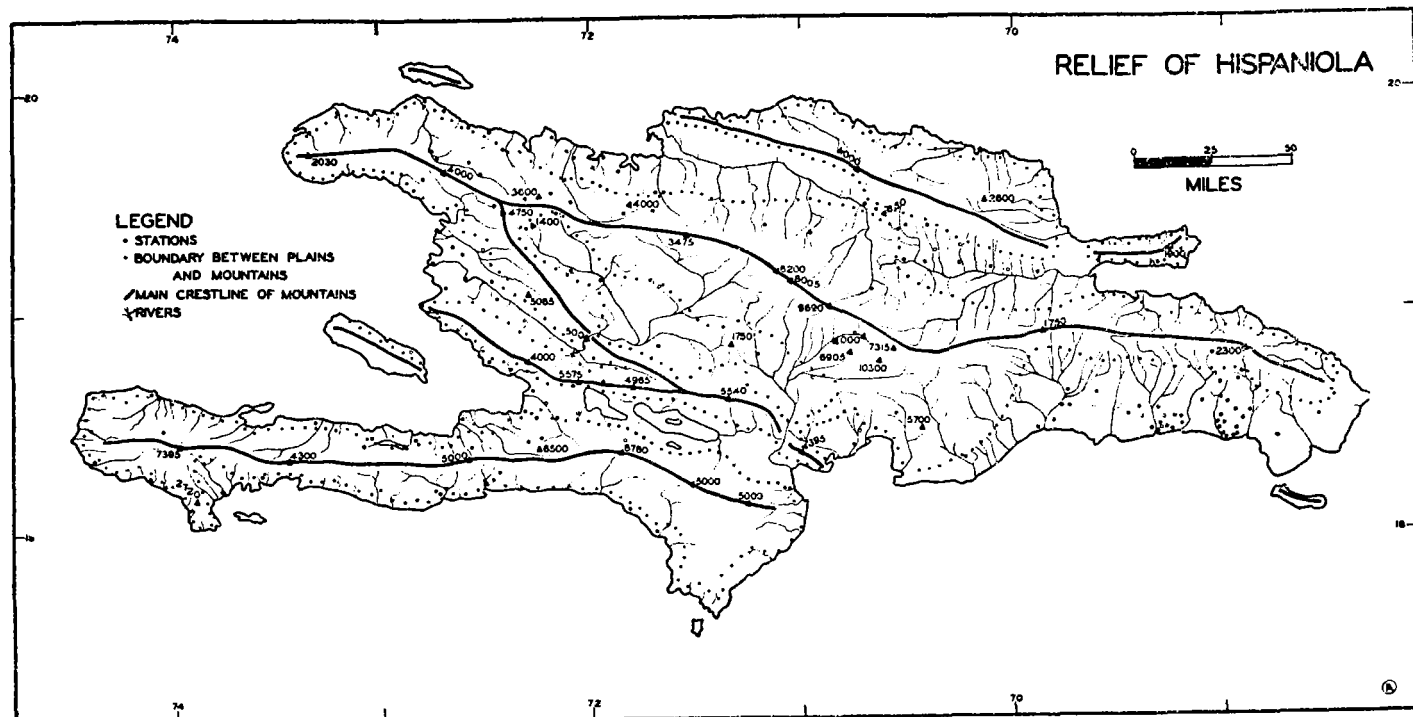
² U. S. Weather Bureau, *Climatological Data, West Indies and Caribbean Service*, San Juan, Puerto Rico.

Direction Generale Des Travaux Publics, "Les Eaux De Surface De La Republique D'Haiti," *Bulletin Hydrographique*, Port-au-Prince, Republique D'Haiti.

Seminaire College St. Martial, *Bulletin Annual De L'Observatoire Meteorologique*, Port-au-Prince, Republique D'Haiti.

Secretaria De Estado De Agricultura Y Trabajo, Seccion De Meteorologia, *Estadisticas De Las Lluvias En La Republica Dominicana*, Ciudad Trujillo, Republica Dominicana.





These additional data have made possible the delimitation of the 20, 30, 40, 50, 60, 70, 80, 90, and 100 inch isohyets.³ Because of the more limited information at hand Fassig included only the 15, 20, 40, 60, 70, and 75 inch isohyets.

ANNUAL RAINFALL DISTRIBUTION

The complex relief of the island accounts for much of the irregularity of rainfall distribution. Just as Hispaniola presents higher elevations and greater diversity of

³ Wherever rainfall stations are lacking, or records are unreliable due to the short period of observation, theoretical isohyets are derived from relief, wind direction, vegetation, and notes of travelers. No records are available for the higher parts of the mountains except at Furey and Kenscoff on the Sierra de la Selle and Constanza on the Sierra Del Cibao; the elevation of Furey is about 5,000 feet, Kenscoff about 5,000 feet, and Constanza about 4,000 feet.

relief than any of the other Greater Antillean Islands, so it displays the most irregular rainfall distribution.

The influence of surface features, especially mountain ranges, upon moisture-bearing winds in whose path they lie, is mainly responsible for local variations in annual rainfall over the island. Thus the isohyets trend east-west with the relief, being widely spaced on windward exposures and crowded together on leeward slopes. When winds strike high ridges of the northern mountains they precipitate a large portion of their moisture on the northern lowlands and mountains, especially on north-eastern slopes. From 60 to more than 100 inches of rainfall are recorded in these areas. The mountains of the interior and the south are high enough to cause further

rainfall on their upper slopes; but leeward slopes and lowlands, especially in the west and southwest, are less abundantly watered. The latter regions become increasingly drier as elevation decreases, several leeward lowland areas receiving less than 20 inches annually.

Wide extremes of rainfall are encountered over the island. Mirebalais (21-year record) receives 122 inches of rainfall, whereas Thomazeau (31-year record), less than 15 miles distant, receives only 32 inches. Gonaives (46-year record) receives only 22 inches, the least of any station with a long record, though Central Ocoa (6-year record) receives 16 inches and Anse-a-Pitre (4-year record) less than 12 inches.

WEATHER STATIONS OF HISPANIOLA

REPUBLICA DOMINICANA

- | | |
|---|-------------------------------------|
| Provincia de Barahona: | Provincia de Macoris—Con. |
| 1. Barahona. | 2. Quisqueya. |
| Provincia de Azúa: | 3. Olivari. |
| 1. San Juan. | 4. Central C. Colón. |
| 2. Central Ocoa. | 5. Macoris, San Pedro de. |
| 3. Central Azuano. | 6. Central Consuelo. |
| 4. Azúa. | 7. Escarraman. |
| 5. San José de Ocoa. | 8. Esperanza. |
| Provincia de Santiago: | 9. Central Porvenir. |
| 1. San José de las Matas. | 10. Porvenir. |
| 2. Santiago. | 11. Gran Peñón. |
| 3. Puntezueta. | 12. El Soco. |
| Provincia de Puerto Plata: | 13. Pico Blanco. |
| 1. Puerto Plata. | 14. Kelly. |
| Provincia Espaillat: | 15. Cumayaza. |
| 1. Moca. | 16. Jagual. |
| 2. Salcedo. | 17. Regajo. |
| Provincia de la Vega: | 18. Los Arados. |
| 1. Constanza. | Provincia del Seibo: |
| 2. Jarabacoa. | 1. Campiña. |
| 3. La Vega. | 2. Pedro Sánchez. |
| 4. Las Cabullas. | 3. Salado. |
| 5. La Jagua. | 4. Guanábanas. |
| Provincia Pacificador (Provincia Duarte): | 5. Guaymate. |
| 1. Macoris, San Francisco de. | 6. Espinillos. |
| 2. La Gina. | 7. La Noria. |
| 3. Pimentel. | 8. Higueral. |
| 4. La Ceiba. | 9. Campo Alegre. |
| 5. Villas Rivas. | 10. La Romana. |
| Provincia de Santo Domingo (Provincia Trujillo): | 11. Loading Sta. No. 29 (C. Primo). |
| 1. Central Italia. | 12. Rancho Viejo. |
| 2. Ciudad Trujillo (Santo Domingo). | 13. La Luisa. |
| 3. San Luis Col. "Santa Rita," El Cojibal. | 14. Los Mosquitos. |
| 4. San Luis. | 15. Guerrero. |
| 5. San Isidro. | 16. Nuevo Aleton. |
| 6. Mata Mamon. | 17. Chavón Abajo. |
| 7. San Isidro (Colonia C. Brujuela). | 18. Sabaná. |
| (8) San Isidro (Colonia C. Redonda). ¹ | 19. Bermejo. |
| (9) San Isidro (Colonia C. Tumba). ¹ | 20. Pintado. |
| Provincia de Samaná: | 21. La Gina. |
| 1. Sánchez. | (22) Cajujilles. ¹ |
| 2. Samaná. | (23) La Cacata. ¹ |
| Provincia de Macoris: | (24) Las Mercedes. ¹ |
| 1. San Isidro (Colonia C. Cayacoa). | (25) Nigua. ¹ |
| | (26) Pueblo Nuevo. ¹ |
| | Provincia de Monte Christi: |
| | 1. Monte Christi. |
| | 2. Dajabón. |
| | 3. Capotillo. |
| | 4. Monción. |

REPUBLIQUE D'HAITI

- | | |
|--------------------|------------------------|
| Department du Sud: | Department du Sud—Con. |
| 1. Tiburón. | 7. Cayes. |
| 2. Jérémie. | 8. Saint-Louis du Sud. |
| 3. Moron. | 9. Anse-à-Veau. |
| 4. Chardonnières. | 10. Fonds-des-Nègres. |
| 5. Port-à-Piment. | 11. Miragoane. |
| 6. Camp-Perrin. | |

Department de L'Ouest:

1. Arcahaie.
 2. Cabaret.
 3. Mirebalais.
 4. Belladère.
 5. Hatte Lathan.
 6. Thomazeau.
 7. Grand-Bois.
 8. Croix-des-Bouquets.
 9. Port-au-Prince.
 10. Pétion-Ville.
 11. Bassin Général Riv. Grise.
 12. Ganthier.
 13. Léogâne.
 14. Petit-Goâve.
 15. Trouin.
 16. Furcy.
 17. Kenscoff.
 18. Fonds-Verrettes.
 19. Bainet.
 20. Jaemel.
 21. Gaillard.
 22. Bodaire (Gr. Gosier).
 23. Anse-a-Pitre.
- Ile de la Gonaive:
1. Anse-à-Galets.
- Department de L'Artibonite:
1. Bassin-Bleu.
 2. Gros-Morne.
 3. Terre-Nueve.
 4. Gonaives.
 5. Ennery.
 6. Desdunes.
 7. Grande-Saline.
 8. Bocozell.

Department de L'Artibonite—Continued.

9. Dessalines.
 10. Saint-Marc.
 11. Pont-Sondé.
 12. Petite-Rivière.
 13. Verrettes.
 14. La Chapelle.
- Department du Nord-Ouest:
1. Môle St.-Nicolas.
 2. Jean-Rabel.
 3. Port-de-Paix.
 4. Saint-Louis du Nord.
- Department du Nord:
1. Borgne.
 2. Bayeux.
 3. Pilate.
 4. Plaisance.
 5. Limbé.
 6. Cap-Haitien.
 7. Bonnav.
 8. Limonade.
 9. Trou.
 10. Botany.
 11. Bonnement.
 12. Ouanaminthe.
 13. Vallières.
 14. Grande Rivière.
 15. Bahon.
 16. Dondon.
 17. Saint-Raphaël.
 18. Marmelade.
 19. Saint-Michel.
 20. Maïssade.
 21. Hinche.
 22. Cerce-la-Source.

REPUBLICA DOMINICANA

PROVINCIA DE BARAHONA

Station	Years of record	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1.....	14	0.70	0.52	0.71	2.08	6.17	4.53	1.47	2.70	4.74	6.43	2.44	0.84	33.33

PROVINCIA DE AZUA

1.....	5	0.74	0.67	1.31	3.53	3.93	3.32	5.17	6.22	6.83	6.78	3.19	0.79	42.38
2.....	6	.81	.12	.26	.73	2.79	1.44	1.44	1.42	1.80	2.14	2.69	.33	15.52
3.....	10	.47	.36	.57	1.83	2.93	1.47	2.45	1.35	4.23	4.57	3.65	.43	24.73
4.....	10	1.62	.39	.83	1.77	3.33	2.29	3.73	2.52	4.71	4.46	3.22	.58	29.45
5.....	6	5.28	1.75	.95	2.22	7.74	3.96	2.65	5.08	5.97	6.00	3.96	1.18	46.74

PROVINCIA DE SANTIAGO

1.....	9	2.60	2.63	3.85	5.13	8.75	4.59	1.78	2.17	4.96	4.56	7.14	3.49	51.65
2.....	11	2.11	1.10	2.67	3.96	7.28	3.25	2.31	3.40	5.06	4.75	6.74	3.17	45.80
3.....	7	3.16	.89	3.01	4.68	7.73	2.10	2.21	2.06	4.43	4.90	7.41	5.06	48.55

PROVINCIA DE PUERTO PLATA

1.....	31	7.31	5.82	4.12	5.34	4.33	1.75	2.86	2.98	4.35	4.35	14.03	9.88	67.14
--------	----	------	------	------	------	------	------	------	------	------	------	-------	------	-------

PROVINCIA ESPAILLAT

1.....	15	4.34	1.41	2.78	3.72	4.44	2.96	2.55	3.14	4.39	4.02	6.10	5.04	44.79
2.....	15	3.89	1.83	3.32	3.55	5.15	3.41	4.40	3.54	4.56	4.48	6.85	4.96	49.94

PROVINCIA DE LA VEGA

1.....	7	2.51	1.20	1.26	3.96	9.15	4.75	3.25	5.00	6.49	6.13	4.95	4.08	52.73
2.....	6	4.98	1.23	2.87	4.49	8.45	2.99	2.71	5.07	4.72	5.29	6.57	6.58	55.95
3.....	15	5.93	2.60	4.99	5.52	7.61	4.45	5.19	5.27	6.55	6.80	9.79	6.91	71.71
4.....	15	5.00	2.45	4.36	6.20	6.22	4.84	5.93	5.67	6.06	6.25	8.36	6.51	67.85
5.....	9	11.46	2.45	5.95	7.19	10.91	6.49	7.70	6.47	7.19	4.43	10.01	5.68	89.23

PROVINCIA PACIFICADOR (PROVINCIA DUARTE)

1.....	12	5.47	2.46	4.30	7.54	8.67	5.28	8.31	8.31	8.76	7.11	13.65	8.35	88.21
2.....	14	4.37	1.57	3.45	3.55	5.59	2.30	3.71	3.78	3.61	3.51	6.84	5.26	47.54
3.....	15	4.01	2.83	2.62	2.88	6.52	3.65	6.30	4.48	4.24	4.05	6.42	5.32	52.32
4.....	15	5.40	2.30	2.72	3.76	8.94	5.34	6.02	5.58	4.92	4.58	7.98	5.85	63.39
5.....	15	7.10	1.45	3.32	4.68	7.94	9.95	8.36	7.63	10.00	6.99	11.41	8.64	87.61

NOTE.—The stations are numbered according to political divisions the same as they appear on the sheets titled Weather Stations of Hispaniola. Thus, Provincia de Barahona station 1 is Barahona; Provincia de Azua station 1 is San Juan, station 2 is Central Ocoa, etc.

¹ Location unknown.

NOTE.—The political divisions and numbers used here refer to the political divisions and numbers shown on the map of Weather Stations of Hispaniola. Thus, number 1 in Provincia de Azúa is San Juan, number 2 is Central Ocoa, etc.

REPUBLICA DOMINICANA—Continued

PROVINCIA DE SANTO DOMINGO (PROVINCIA TRUJILLO)

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-9.

PROVINCIA DE SAMANA

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-2.

PROVINCIA DE MACORIS

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-18.

PROVINCIA DEL SEIBO

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-26.

PROVINCIA DE MONTE CHRISTI

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-4.

REPUBLIQUE D'HAITI

DEPARTMENT DU SUD

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-11.

REPUBLIQUE D'HAITI—Continued

DEPARTMENT DE L'OUEST

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-22.

ILE DE LA GONAVE

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-9.

DEPARTMENT DE L'ARTIBONITE

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-14.

DEPARTMENT DU NORD-OUEST

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-4.

DEPARTMENT DU NORD

Table with 13 columns: Station, Years of record, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Annual. Rows 1-22.