

Pacific Islands - Online Climate Outlook Forum (OCOF) No. 139

Country: Tonga

TABLE 1: Monthly Rainfall

| Station (include data period) | Jan-2019   | Feb-2019   | Mar-2019      |         |         |        | Rank  |
|-------------------------------|------------|------------|---------------|---------|---------|--------|-------|
|                               |            |            | Total (mm)    | 33%tile | 67%tile | Median |       |
|                               | Total (mm) | Total (mm) | Rainfall (mm) |         |         |        |       |
| <i>Northern Division</i>      |            |            |               |         |         |        |       |
| Niuafu'ou (1971-2019)         | 578.0      | 603.6      | 351.6         | 211.0   | 341.3   | 270.0  | 36/48 |
| Niuatoputapu (1947-2019)      | 399.1      | 403.5      | 71.5          | 179.5   | 283.3   | 229.5  | 4/69  |
| <i>Central Division</i>       |            |            |               |         |         |        |       |
| Vava'u (1947-2019)            | 800.2      | 526.2      | 308.9         | 228.6   | 358.0   | 301.0  | 39/73 |
| Ha'apai (1947-2019)           | 461.2      | 524.0      | 170.8         | 194.0   | 313.0   | 233.9  | 22/73 |
| <i>Southern Division</i>      |            |            |               |         |         |        |       |
| Fua'amotu (1979-2019)         | 228.4      | 162.4      | 358.2         | 152.7   | 239.3   | 190.0  | 36/40 |
| Nuku'alofa (1944-2019)        | 202.9      | 209.4      | 451.1         | 170.7   | 261.1   | 211.5  | 71/75 |

**TABLE 2: Three-month Rainfall for January to March 2019**

| Station                   | Three-month Total | 33%tile      | 67%tile | Median | Rank  | SCOPIC forecast probabilities*<br>based on NINO3.4 October-November 2018 |    |     |      | Verification:<br>Consistent,<br>Near-<br>consistent,<br>Inconsistent? |                 |
|---------------------------|-------------------|--------------|---------|--------|-------|--|----|-----|------|---|-----------------|
|                           | Rainfall (mm)     |              |         |        |       | B-N  | N  | A-N | LEPS |   |                 |
| <i>Northern Division</i>  |                   |              |         |        |       |  |    |     |      |   |                 |
| Niuafo'ou (1971-2019)     | 1533.2            | Above normal | 732.0   | 953.6  | 893.5 | 42/43  | 52 | 25  | 23   | -30   | Inconsistent    |
| Niuaatoputapu (1947-2019) | 874.1             | Normal       | 650.0   | 926.5  | 805.4 | 43/69  | 57 | 33  | 10   | -2  | Near-consistent |
| <i>Central Division</i>   |                   |              |         |        |       |  |    |     |      |   |                 |
| Vava'u (1947-2019)        | 1635.3            | Above normal | 720.3   | 937.3  | 854.3 | 73/73  | 46 | 34  | 20   | 3   | Inconsistent    |
| Ha'apai (1947-2019)       | 1156.0            | Above normal | 566.2   | 764.0  | 660.5 | 71/73  | 56 | 31  | 13   | 3   | Inconsistent    |
| <i>Southern Division</i>  |                   |              |         |        |       |  |    |     |      |   |                 |
| Fua'amotu (1979-2019)     | 749.0             | Normal       | 465.9   | 791.0  | 623.0 | 23/40  | 54 | 38  | 8    | 4   | Near-consistent |
| Nuku'alofa (1944-2019)    | 863.4             | Above normal | 512.6   | 831.3  | 640.5 | 57/75  | 50 | 37  | 13   | 6   | Inconsistent    |

**TABLE 3: Seasonal Climate Outlooks using SCOPIC for May to July 2019**

Predictor and Period used: NINO3.4 for February to March 2019

| Station                   | Below Median (prob) | Median Rainfall (mm) | Above Median (prob) |  | LEPS (%) [whole numbers] | Hit-rate (%) [whole numbers] |
|---------------------------|---------------------|----------------------|---------------------|--|--------------------------|------------------------------|
| <i>Northern Division</i>  |                     |                      |                     |  |                          |                              |
| Niuafo'ou (1971-2019)     | 62                  | 427.5                | 38                  |  | 4                        | 64                           |
| Niuaotoputapu (1947-2019) | 58                  | 360.6                | 42                  |  | 0                        | 57                           |
| <i>Central Division</i>   |                     |                      |                     |  |                          |                              |
| Vava'u (1947-2019)        | 67                  | 361.0                | 33                  |  | 7                        | 58                           |
| Ha'apai (1947-2019)       | 67                  | 244.0                | 33                  |  | 7                        | 56                           |
| <i>Southern Division</i>  |                     |                      |                     |  |                          |                              |
| Fua'amotu (1979-2019)     | 64                  | 343.5                | 36                  |  | 6                        | 51                           |
| Nuku'alofa (1944-2019)    | 64                  | 297.5                | 36                  |  | 4                        | 54                           |

| Station                   | Below Normal (prob) | 33%ile Rainfall (mm) | Normal (prob) | 67%ile Rainfall (mm) | Above Normal (prob) | LEPS (%) [whole numbers] | Hit-rate (%) [whole numbers] |
|---------------------------|---------------------|----------------------|---------------|----------------------|---------------------|--------------------------|------------------------------|
| <i>Northern Division</i>  |                     |                      |               |                      |                     |                          |                              |
| Niuafo'ou (1971-2019)     | 38                  | 359.7                | 40            | 464.6                | 22                  | 1                        | 41                           |
| Niuaotoputapu (1947-2019) | 42                  | 320.7                | 37            | 416.3                | 21                  | 3                        | 40                           |
| <i>Central Division</i>   |                     |                      |               |                      |                     |                          |                              |
| Vava'u (1947-2019)        | 47                  | 300.0                | 31            | 405.0                | 22                  | 4                        | 39                           |
| Ha'apai (1947-2019)       | 45                  | 212.7                | 30            | 307.7                | 25                  | 2                        | 50                           |
| <i>Southern Division</i>  |                     |                      |               |                      |                     |                          |                              |
| Fua'amotu (1979-2019)     | 53                  | 263.9                | 19            | 428.1                | 28                  | 7                        | 51                           |
| Nuku'alofa (1944-2019)    | 55                  | 237.3                | 20            | 343.0                | 25                  | 7                        | 44                           |

**TABLE 4: Seasonal Climate Outlooks using POAMA2 for May to July 2019**

| Station       | Below Normal (prob) | 33%ile Rainfall (mm) | Normal (prob) | 67%ile Rainfall (mm) | Above Normal (prob) |
|---------------|---------------------|----------------------|---------------|----------------------|---------------------|
| Niuafu'ou     | 79                  | 354.0                | 6             | 477.0                | 15                  |
| Niuaotoputapu | 79                  | 320.0                | 6             | 410.0                | 15                  |
| Vava'u        | 82                  | 343.0                | 13            | 473.0                | 5                   |
| Ha'apai       | 82                  | 210.0                | 13            | 329.0                | 5                   |
| Nuku'alofa    | 76                  | 220.0                | 19            | 359.0                | 5                   |

## **Summary Statements**

### **Rainfall for March 2019:**

Above normal rainfall was recorded over Niuafu'ou, Fua'amotu and Nuku'alofa, while below normal rainfall was recorded in Niuaotoputapu and Ha'apai. Fua'amotu and Nuku'alofa recorded 5<sup>th</sup> highest rainfall since their record started while Niuaotoputapu recorded its 4<sup>th</sup> lowest March rainfall since its record started.

### **Accumulated rainfall for January to March 2019, including outlook verification:**

Above normal rainfall was recorded over Niuafu'ou, Vava'u, Ha'apai and Nuku'alofa, while normal rainfall was recorded in Niuaotoputapu and Fua'amotu. Niuafu'ou recorded its second highest rainfall, Vava'u recorded its highest rainfall and Ha'apai its third highest rainfall during the January to March period. The outlook was near consistent for Niuaotoputapu and Fua'amotu and inconsistent elsewhere.

### **Outlooks for May to July 2019:**

#### **1. SCOPIC:**

For Fua'amotu and Nuku'alofa, the outlook for season' favours below normal.

For Niuaotoputapu, Vava'u and Ha'apai, the outlook for 'season' shows below normal as the most likely outcome, with normal the next most likely.

For Niuafu'ou, the outlook for 'season' shows a near-equal likelihood of below-normal and normal rainfall. Above normal is the least likely.

The skill of the outlook is low for all stations except for the southern division which is moderate.

#### **2. POAMA:**

The outlook favours below normal rainfall across the country.

**NB: The X LEPS % score has been categorised as follows:**

Very Low:  $X < 0.0$       Low:  $0 \leq X < 5$       Moderate  $5 \leq X < 10$       Good:  $10 \leq X < 15$       High:  $15 \leq X < 25$

Very High:  $25 \leq X < 35$  Exceptional:  $X \geq 35$

**Table: 5 Stakeholder Engagement- Evaluations of how effective NMS engage with stakeholders**

| <b>Product</b>           | <b>Date:</b><br><b>March 2019</b> | <b>Stakeholder</b>                               | <b>Total Number<br/>of Participants</b> | <b>Number of<br/>male</b> | <b>Number of<br/>female</b> |
|--------------------------|-----------------------------------|--|---|---------------------------|-----------------------------|
| Climate Bulletin         |                                   | Agr, Water, Health, NGOs, Gov Ministries, Media, | 175                                     | 93                        | 82                          |
| EAR Watch                |                                   |  |   |                           |                             |
| Monthly Climate Briefing |                                   |  |   |                           |                             |
| Ocean Bulletin           |                                   | Agr, Water, Health, NGOs, Gov Ministries, Media, | 175                                     | 93                        | 82                          |
| <b>Total</b>             |                                   |  | 350                                     | 93                        | 82                          |