TEMPERATURE DATA SETS FOR NEARSHORE AND OFFSHORE WATERS OF AMERICAN SAMOA

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The purpose of this brief report is to identify sources of information that present water temperature data in American Samoa.

NEARSHORE COASTAL WATERS

1. Afao Bay. Craig (1995) gathered nearshore water temperature data from 1990-95. Measurements were made at varying times of day using a mercury thermometer with a presumed accuracy of ± 0.1°C. The sample site was located approximately 100 m west of the main svaa and temperature was measured at a depth of 0.3 m. This site was beyond the svaa's outflow of warm water from the reeftop. Figure 1 shows the seasonal pattern of temperatures at this site. Monthly means (°C), for all years combined, were:

<table>
<thead>
<tr>
<th>Month</th>
<th>Mean</th>
<th>SE</th>
<th>Range</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>29.3</td>
<td>0.10</td>
<td>28.0-31.0</td>
<td>37</td>
</tr>
<tr>
<td>Feb</td>
<td>29.6</td>
<td>0.09</td>
<td>28.0-30.3</td>
<td>29</td>
</tr>
<tr>
<td>Mar</td>
<td>29.5</td>
<td>0.09</td>
<td>28.0-30.0</td>
<td>24</td>
</tr>
<tr>
<td>Apr</td>
<td>29.6</td>
<td>0.09</td>
<td>28.0-30.7</td>
<td>29</td>
</tr>
<tr>
<td>May</td>
<td>29.8</td>
<td>0.11</td>
<td>28.0-30.6</td>
<td>28</td>
</tr>
<tr>
<td>Jun</td>
<td>28.1</td>
<td>0.10</td>
<td>27.5-28.9</td>
<td>15</td>
</tr>
<tr>
<td>Jul</td>
<td>27.9</td>
<td>0.12</td>
<td>27.0-28.6</td>
<td>11</td>
</tr>
<tr>
<td>Aug</td>
<td>27.1</td>
<td>0.14</td>
<td>26.2-28.6</td>
<td>20</td>
</tr>
<tr>
<td>Sep</td>
<td>27.6</td>
<td>0.12</td>
<td>26.4-28.5</td>
<td>30</td>
</tr>
<tr>
<td>Oct</td>
<td>28.0</td>
<td>0.07</td>
<td>27.5-28.6</td>
<td>21</td>
</tr>
<tr>
<td>Nov</td>
<td>28.5</td>
<td>0.11</td>
<td>27.8-29.4</td>
<td>27</td>
</tr>
<tr>
<td>Dec</td>
<td>29.0</td>
<td>0.10</td>
<td>26.0-30.0</td>
<td>24</td>
</tr>
</tbody>
</table>

2. Vaitogi. Sesepasara (1975) presented monthly surface samples collected at Vaitogi in 1973-75 (Fig. 2). Water samples were collected by bucket from the cliff and temperatures were measured with a mercury thermometer.

3. Fagatele National Marine Sanctuary. In 1992, FMMS deployed constant recording thermographs in Fagatele Bay at two depths (4 and 12 m). Figures 3 and 4 show examples of these data sets (N. Daschbach, pers. comm.).
4. Taima Bank. FNMS also put a constant recording thermograph on Taima Bank (15 m depth), approximately 100 m east of the bank’s navigation buoy, beginning in 1992. Figure 5 shows an example of this data set (N. Daschbach, pers. comm.).

5. Pago Pago Harbor. NOAA has monitored surface water temperatures in the harbor at the main dock since at least 1980 (Fig. 6). Salinities were also recorded (Fig. 7). In 1993, sampling was automated and relocated to DNWR’s dock, primarily to monitor changes in water height. DNWR has access to these data. In addition, the American Samoa Environmental Protection Agency has a monthly monitoring program (primarily for nutrient levels) in the harbor. While harbor data sets are extensive, it should be noted that water temperatures in the harbor are probably not representative of nearshore water temperatures elsewhere around the island. Harbor conditions probably cause increased water temperatures due to limited circulation (water residency time of about 15-30 days) and heat absorption due heavy sedimentation (after rainfalls) and phytoplankton blooms (from eutrophic conditions).

OFFSHORE WATERS

1. Near Tutuila Island. NOAA National Ocean Service measured XBT temperature profiles on two dates. On March 20, 1993, profiles were measured at 2 sites 1-5 miles south of Tutuila (Figs. 8 and 9). On November 16, 1993, profiles were taken at varying distances from Tutuila Island: 1, 5, 10, 20, 50, 100, and 200 nautical miles (Figs. 10-16).

2. Away from Tutuila Island. Fisheries Forum Agency (?) has a data set that includes some temperature profiles for this general region.

STREAMS

Stream temperature data were not located, but USGS has extensive data on stream flows at several locations on Tutuila Island.

References:

Craig, P. 1995. Life history and harvest of the surgeonfish Acanthurus lineatus in American Samoa.
Figure 1.
Figure 2
(Vantage Shoreline)
Daily sea surface temperature readings taken at the Pago tide station

Figure 6

Daily sea surface salinity readings taken at the Pago tide station

Figure 7
NOAA
National Ocean Service

Drop 002
Latitude: 14 20.5 S
Longitude: 170 40.8 W
Probe T-04
Date: 93/03/20
Time: 19:12 GMT
Bottom depth: 800 m
Cruise: TOGA/TAO 1993
Bucket Temp: 99.9 C

~ 1 mile south of Taima Bank
NOAA
National Ocean Service

Drop 003
Latitude: 14 27.4 S
Longitude: 170 45.6 W
Probe T-07
Date 93/03/20
Time 19:37 GMT
Bottom depth: 1000 m
Cruise: TOGA/TAO 1993
Bucket Temp: 99.9 C

~5 miles north
7 Vautii
NOAA
National Ocean Service

Drop 013
Latitude: 14 14.2 S
Longitude: 170 29.3 W
Probe T-07
Date 93/11/16
Time 02:00 GMT
Bottom depth: 1200 m
Cruise: 810
Bucket Temp: 99.9 C

~ 1 mile from Tutuila Island
NOAA
National
Ocean
Service

Drop 089
Latitude : 14 03.7 S
Longitude: 170 29.3 W
Probe T-07
Date 93/11/16
Time 01:03 GMT
Bottom depth: 3685 m
Cruise: 810
Bucket Temp: 30.4 C

LAUNCH THE PROBE!
NOAA
National Ocean Service

Drop 007
Latitude: 13 23.3 S
Longitude: 170 25.8 W
Probe T-07
Date 93/11/15
Time 22:22 GMT
Bottom depth: 4049 m
Cruise: 810
Bucket Temp: 38.3 C

LAUNCH THE PROBE!

~ 50 miles away from Tutuila
NOAA
National Ocean Service

Drop 886
Latitude: 12 33.6 S
Longitude: 178 22.1 W
Probe T-07
Date 93/11/15
Time 18:55 GMT
Bottom depth: 4952 m
Cruise: 010
Bucket Temp: 28.9 C

LAUNCH THE PROBE!
NOAA
National Ocean Service

Drop 085
Latitude: 11 05.0 S
Longitude: 170 18.0 W
Probe 1-07
Date 93/11/15
Time 12:47 GMT
Bottom depth: 5083 m
Cruise: 610
Bucket Temp: 23.3 C

~ 200 miles from Tutuila