

## COMPARISON OF LATITUDES

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Latitude</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 June - 23 August, 1579</td>
<td>Drakes Bay, Coast of California.</td>
<td>38° 02' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>38° 39' N</td>
<td>28'</td>
</tr>
<tr>
<td></td>
<td>Famous Voyage and other accounts</td>
<td>38° - N</td>
<td>2'</td>
</tr>
</tbody>
</table>

The true position given here is for the landing site. World Encompassed implies that an observation for latitude was taken on shore.

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<tbody>
<tr>
<td>16 October, 1579</td>
<td>Palau Islands (approximate middle of group.)</td>
<td>7° 15' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>7° 05' N</td>
<td>10'</td>
</tr>
<tr>
<td>25 October, 1579</td>
<td>Sangi Island, Celebes Sea. (Center of Island)</td>
<td>3° 32' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>3° 40' N</td>
<td>8'</td>
</tr>
</tbody>
</table>

"... we passed by the Island named Talao in 3 deg. 40 min."

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<tr>
<td>25 October, 1579</td>
<td>Siao Island, Celebes Sea.</td>
<td>30° 43' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>30° - N</td>
<td>17'</td>
</tr>
</tbody>
</table>

The identification of this island is made certain by an account from Francisco de Duñas. See Wagner, Sir Francis Drake’s Voyage, pp. 172-175. Two Indian fishermen were taken on board here to act as pilots for the Moluccas.

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<tbody>
<tr>
<td>1 November, 1579</td>
<td>Maju Island, Molucca Sea.</td>
<td>10° 19' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>10° 30' N</td>
<td>11'</td>
</tr>
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This island, seen in passing, was called Ille Suaro in World Encompassed.

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<tr>
<td>5-9 November, 1579</td>
<td>Ternate, Islands of Molucca.</td>
<td>0° 48' N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Encompassed</td>
<td>0° 27' N</td>
<td>21'</td>
</tr>
</tbody>
</table>

The account states that Drake did not go ashore here.
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<tr>
<td>14 November - 12 December, 1579</td>
<td>Poti Islet, northeast tip of Banggai, Celebes.</td>
<td>1° 28' S</td>
<td>1° 40' S</td>
<td>12'</td>
</tr>
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Camp was set up ashore and the Golden Hind careened here. Identification is made on the basis of descriptions given in the accounts.

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<tbody>
<tr>
<td>9-10 January, 1580</td>
<td>Vesuvius Reef, Banggai Archipelago, Celebes.</td>
<td>1° 56' S</td>
<td>2° 07' S</td>
<td>11'</td>
</tr>
</tbody>
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The account gives the latitude as "2 deg., lacking three or four minutes South latitude." The identification of the reef is based upon descriptions from the account.

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<tbody>
<tr>
<td>12 January, 1580</td>
<td>Shoal cast of Matarape Bay, Celebes.</td>
<td>3° 30' S</td>
<td>3° 15' S</td>
<td>15'</td>
</tr>
</tbody>
</table>

The account states "being not able to beare our sayles, by reason of the tempest, and fearing of the dangers, we let fall our anchors upon a shoale in 3 deg. 30 min." No landmarks are given by which to pinpoint the place on the shoal where anchorage was made. The true position given above is the mean latitude of this shoal and the difference of latitude could vary several minutes.

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<tbody>
<tr>
<td>14 January, 1580</td>
<td>Wowoni Island, Celebes. (Assumed anchorage)</td>
<td>4° 06' S</td>
<td>4° 02' S</td>
<td>4'</td>
</tr>
</tbody>
</table>

The account states that "at an Island in 4 deg. 6 min., we again cast anchor, and spent a day in watering and wooding." It seems probable that this anchorage was found on the north side of the island where there is a bay and a stream. The weather at this time was apparently clear as the account goes on to say that "After this wee met with foule weather."
COMPARISON OF LATITUDES

6-10 February, 1580
Damar Island, Banda Sea

World Encompassed

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<tbody>
<tr>
<td>7° 09' S</td>
<td></td>
</tr>
<tr>
<td>7° 13' S</td>
<td>4'</td>
</tr>
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</table>

A landing was made on this island for water and wood, and trade for fresh food was conducted at the principal town, probably on the east side.

12 February, 1580
Moa Island, north shore, Banda Sea

World Encompassed states that "When we were come into the height of 8 deg. 4 min., Feb. 12, in the morning we espied a greene Iland to the Southward," Retracing Drake's course makes this Moa Island and the position given would have placed him five miles offshore. However, it seems probable that he was between ten and fifteen miles offshore and his latitude 5' to 10' too high, but consistent with the errors above.

9 March, 1580
South Coast of Java, vicinity of Tjilatjap

World Encompassed states that on this date "... in the morning wee espied land, some part thereof very high, in 8 deg. 20 min South latitude." This latitude would have placed Drake about 33 miles offshore, which is reasonable, but it is probable that he was somewhat closer consistent with his previous errors making his latitudes a few minutes too high.

A latitude for Java is given in World Encompassed as follows: "This Iland we found to be the Iland Java, the middle whereof stands in 7 deg. and 30 min. beyond the equator." The center of the island in this vicinity stands in about 7° 15' S, making Drake's latitude about 15' too high, but the location of the middle of the island could only have been approximated, possibly on the information that Mt. Slamet, easily visible on the coast, stood in about the middle.

In summary, the average error in latitude for places that can be reasonably pinpointed (36), excluding the doubtful latitudes of Valparaiso and Arica, is about 16'. Of these, the average error for latitudes that
were probably obtained on shore is about 69' with nearly half of them being of less than 10' error. The average error of latitudes probably taken at sea is about 21'.
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