



# & GRIDS DATUMS

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The Grids & Datums column has completed an exploration of every country on the Earth. For those who did not get to enjoy this world tour the first time, *PE&RS* is reprinting prior articles from the column. This month's article on the Federal Islamic Republic of the Comores was originally printed in 2004 but contains updates to their coordinate system since then.

According to the Library of Congress Country Studies, the Comoros is an archipelago comprised of Grand Comore (Njazidja), Anjouan (Nzwani), and Mohéli (Mwali). Mahoré (Mayotte) is administered by France but is claimed by the Comoros. The islands are situated in the western Indian Ocean, about midway between the island of Madagascar (PE&RS, February 2000) and the coast of East Africa at the northern end of the Mozambique Channel (PE&RS, September 1999) Channel. The archipelago has served in past centuries as a stepping stone between the African continent and Madagascar, as a southern out-post for Arab traders operating along the East African coast, and as a center of Islamic culture. The name “Comoros” is derived from the Arabic *kamar* or *kumr*, meaning “moon”, although this name was first applied by Arab geographers to Madagascar. In the nineteenth century, Comoros was absorbed into the French overseas empire, but it unilaterally proclaimed independence from France on July 6, 1975. The island republic has since had 19 coups or coup attempts since its independence.

Little is known of the first inhabitants of the archipelago, although a sixth-century settlement has been uncovered on Nzwani by archaeologists. Historians speculated that Indonesian immigrants used the islands as stepping-stones on the way to Madagascar prior to A.D. 1000. Because the Comoros lay at the juncture of African, Malayo-Indonesian, and Arab spheres of influence, the present population reflects a blend of these elements in its physical characteristics, language, culture, social structure, and religion. Local legend cites the first settlement of the archipelago by two families from Arabia after the death of Solomon. Legend also tells of a

## FEDERAL ISLAMIC REPUBLIC OF THE COMORES



Persian king, Hussein ibn Ali, who established a settlement on Comoros around the beginning of the 11<sup>th</sup> century. Bantu peoples apparently moved to Comoros before the 14<sup>th</sup> century, principally from the coast of what is now southern Mozambique; on the island of Nzwani they apparently encountered an earlier group of inhabitants, a Malayo-Indonesian people. A number of chieftains bearing African titles established settlements on Njazidja and Nzwani, and by the 15<sup>th</sup> century they probably had contact with Arab merchants and traders who brought the Islamic faith to the islands. A watershed in the history of the islands was the arrival of the Shirazi Arabs in the 15<sup>th</sup> and 16<sup>th</sup> centuries.

The first Europeans to visit the islands were the Portuguese, who landed on Njazidja around 1505. The islands first appear on a European map in 1527, by Portuguese cartographer Diogo Roberos. Dutch 16<sup>th</sup> century accounts describe the Comoros sultanates as prosperous trade centers with the African coast and Madagascar. Intense competition for this trade, and, increasingly, for European commerce, resulted in constant

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warfare among the sultanates, a situation that persisted until the French occupation. The sultans of Njazidja only occasionally recognized the supremacy of one of their number as *tibe*, or supreme ruler. By the early 17<sup>th</sup> century, slaves had become Comoros' most important export commodity, although the market for the islands' other products also continued to expand, mainly in response to the growing European presence in the region. To meet this increased demand, the sultans began using slave labor themselves following common practice along the East African coast. Beginning in 1785, the Sakalava of the west coast of Madagascar began slaving raids on Comoros. They captured thousands of inhabitants and carried them off in outrigger canoes to be sold in French-occupied Madagascar, Mauritius, or Réunion to work on the sugar plantations, many of which were owned by French investors. The island of Mahoré, closest of the group to Madagascar, was virtually de-populated. Comoran pleas for aid from the French and the other European powers went unanswered, and the raids ceased only after the Sakalava kingdoms were conquered by the Merina of Madagascar's central highlands. After the Merina conquest, groups of Sakalava and Betsimisaraka peoples left Madagascar and settled on Mahoré and Mwali. Prosperity was restored as Comoran traders again became involved in transporting slaves from the East African coast to Réunion and Madagascar. Dhows carrying slaves brought in huge profits for their investors. On Comoros, it was estimated in 1865 that as much as 40 percent of the population consisted of slaves! For the elite, owning a large number of slaves to perform fieldwork and household service was a mark of status. On the eve of the French occupation, Comoran society consisted of three classes: the elite of the Shirazi sultans and their families, a middle class of free persons or commoners, and a slave class consisting of those who had been brought from the African coast or their descendants. There is a long history of inter-island hostility, reflected in a Comoran saying: "Grand Comore rules, Anjouan works and Mohéli sleeps." The Comoros is slightly larger than 12 times the size of Washington, D.C. The coastline is 340 km, the lowest point is the Indian Ocean (0 m), and the highest point is Mount Kartala (2,360 m), a volcano that last erupted in 1977.

Datum origin points, thanks to John W. Hager are: "On Île Mohéli is Bangoma (east base) at  $\Phi_0 = 12^\circ 16' 55.1''$  S,  $\Lambda_0 = 43^\circ 45' 03.9''$  E,  $\alpha_0 = 247^\circ 02' 29.544''$  to Ditsoni from north, International (ellipsoid),  $H_0 = 2.56$  meters. On Île d'Anjouan is Chanda at  $\Phi_0 = 12^\circ 11' 06.6''$  S,  $\Lambda_0 = 44^\circ 27' 24.6''$  E,  $\alpha_0 = 144^\circ 25' 31.84''$  to Dziani from north, International (ellipsoid),  $H_0 = 823.8$  meters. On Grande Comore is M'Tsaoueni (north base) at  $\Phi_0 = 11^\circ 28' 32.2''$  S,  $\Lambda_0 = 43^\circ 15' 42.15''$  E,  $\alpha_0 = 175^\circ 31' 53.886''$  to Hahaia from north, International (ellipsoid),  $H_0 = 5.47$  meters." John W. Hager states, "All of these are from *Archipel des Comores, Répertoire des Coordonnées et Altitudes des Pointes Géodésiques*, Paris, 1974. My intuition is that these were published by I.G.N. and probably taken from *Annales Hydrographiques*." Thanks to Mark Nettles, the station for the south base is station Domoni and the length of the baseline is 2746.387 m. The IGM Brigade determined 29 fundamental points (first order triangulation), five second

order points, and 20 detail points (third order triangulation). All of these islands are on the UTM Grid, thanks to the policy of the French Institut Géographique National since 1950.

Although France administers the Island of Mayotte, the Comores still claim the island. Therefore, I decided to include the island in this column. The 3-parameter datum shift published by I.G.N. from the Combani 1950 Datum to WGS84 is:  $\Delta X = -382$  m,  $\Delta Y = -59$  m,  $\Delta Z = -251$  m. Mayotte is also on the UTM Grid.

## Federal Islamic Republic of the Comores Update

The maritime boundary between the Comores and Seychelles was established in a 2012 agreement and extends for 169 nautical miles along a series of geodesic segments that were constructed based on the principle of equidistance. The boundary also includes a tripoint with Tanzania that was created in a separate, trilateral 2012 Agreement. Both of these Agreements have yet to be entered into force.

The configuration of the baselines does depart to an appreciable extent from the general configuration of the archipelago due to the use of baseline point B on Banc Vailheu. Banc Vailheu is more than 10 nm from the closest point on the island of Grand Comore. None of the baselines appear to be drawn using low tide elevations. The baselines are not drawn in a way that would cut off from the high seas or EEZ the territorial sea of another State (except France; see below regarding Mayotte). In conclusion, the archipelagic baseline system of Comoros does not appear to be consistent with the LOS (Law of the Sea – Ed) Convention. Baseline point B on Banc Vailheu, a submerged feature, is not consistent with either (specifying that the baselines join the outermost points of the outermost islands and drying reefs of the archipelago) or (requiring that the baselines not depart from the general configuration of the archipelago). Finally, as noted above, the sovereignty of Mayotte is disputed between Comoros and France. Mayotte is administered as a Department and region of France. Six of the 13 baseline points in Comoros' archipelagic baseline system are used to enclose Mayotte. France has protested this use of baseline points on Mayotte as "not compatible with the status of Mayotte and . . . without legal effect." In December 2013, by Decree No. 2013-1177, France promulgated baselines, including straight baselines and closing lines, from which the territorial sea of Mayotte is measured.

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