

Antigua and Barbuda

Around 2400 *BC* Antigua was settled by the “Siboney” people, an Arawak word meaning stone-people. Numerous shell and stone tools have been found throughout the island. The Venezuelan Arawak culture later populated the island from about 35 until 1100 *AD* when they were displaced by the Caribs, the cannibal warriors of the Caribbean. However, the Caribs did not settle on either Antigua or Barbuda. During his second voyage to the New World Christopher Columbus landed on the islands in 1493, naming the larger one Santa Maria de la Antigua in honor of the cathedral in Seville, Spain. However, Antigua had a dearth of fresh water and a number of unfriendly Caribs, so European settlement was not immediate. In 1682, a group of Englishmen from St. Kitts established a successful settlement. Two years later, Sir Christopher Codrington came to the island and initiated sugar cane cultivation, a commercial crop already flourishing in other islands of the Caribbean. Codrington later leased the island of Barbuda from the English Crown in order to raise provisions for his plantations. Barbuda’s only town is named after him. West African slaves were brought to the plantations of Antigua by Codrington and others. By the end of the 18th century, Antigua had become an important strategic port as well as a valuable commercial colony. Horatio Nelson arrived in 1784 at the head of the Squadron of the Leeward Island to develop the British naval facilities at English Harbor and to enforce English shipping laws. Nelson spent almost the entire time on board ship, declaring the island to be a “vile place” and a “dreadful hole.” Serving under Nelson while in Antigua was William IV, the future king of England. Later during the reign of King William IV, slaves were emancipated in 1834, but in Antigua and Barbuda, they remained economically dependant on the plantations. There was no surplus of farmland, no access to credit, and the economy was built on agriculture rather than manufacturing. Poor labor conditions persisted until just before WWII when a trade union movement was prompted by a member of a royal commission. Antigua became independent in 1967, with Barbuda and the small isle of Redonda as dependencies. Antigua became an associated state of the Commonwealth, and in 1981, it achieved full independent status.

The combined area of the three islands is 440 sq km, which is approximately 2.5 times the size of the District of Colombia. The two

main islands lie northeast of Montserrat, and are comprised mostly of low-lying limestone and coral islands with some higher volcanic areas. The lowest point is the Caribbean Sea, and the highest point is Boggy Peak at 402 meters.

Antigua Island Astro 1943 Datum was observed at the U.S. Navy “astro” point named Bowditch 1943 (station A-14) where, thanks to John W. Hager, $\Phi_0 = 17^\circ 10' 35.633'' \text{ N}$, $\Lambda_0 = 61^\circ 47' 45.268'' \text{ W}$, and the orientation is based on the azimuth from James (station A-13) to Pointed Hill (station A-12) as $\alpha_0 = 268^\circ 33' 09.8''$ from north. That “astro” point is located at the northernmost point of land on Antigua Island. The ellipsoid of reference is the Clarke 1880 where $a = 6,378,249.145 \text{ m}$ and $1/f = 293.465$. Hager went on to mention that, “Also found are (seconds only) latitude = ... $36.371'' \text{ N}$ and longitude = ... $45.268'' \text{ W}$ and values marked U.S.C.&G.S. 1943 of latitude = ... $35.506'' \text{ N}$ and longitude = ... $45.380'' \text{ W}$. I make the difference on the first at 1.2 meters and on the second at 4.9 meters, but have no idea of the significance. Possibly the astro was observed a short distance from the trig station.” The British West Indies “BWI Grid” for Antigua and Barbuda is based on the Transverse Mercator where the central meridian, $\lambda_0 = 62^\circ \text{ W}$, the latitude of origin ϕ_0 is the equator, the scale factor at the latitude of origin $m_0 = 0.9995$, False Easting = 400 km, and False Northing = nil. The formulae are the Gauss-Krüger, but for such a small span of latitude and longitude that includes all three islands; the distinction in this case is irrelevant. The National Imagery and Mapping Agency (NIMA) lists the three-parameter datum shift values (dated 1991) from Antigua Island Astro 1943 Datum (Clarke 1880) to WGS 84 Datum as $\Delta a = -112.145 \text{ m}$, $\Delta f \times 10^4 = -0.54750714$, $\Delta X = -270 \text{ m} \pm 25 \text{ m}$, $\Delta Y = +13 \text{ m} \pm 25 \text{ m}$, and $\Delta Z = +62 \text{ m} \pm 25 \text{ m}$, and the solution is based on one station.

The U.S. Army Map Service formed the Inter American Geodetic Survey (IAGS) in the 1950s and established the headquarters at Fort Clayton, Canal Zone. The associated IAGS School was established at Fort Curundu,

Canal Zone, and I remember my father driving me past the facility when I was still in high school. At the time, all I was aware of was the fact that the school trained cartographers in Spanish. By educating local nationals of the nations in the Caribbean region, the IAGS was able to enlist technical workers to help in the classical triangulation and photogrammetric mapping of the Caribbean and Latin America. The IAGS extended the classical triangulation net of North America to south of the border and computed the North American Datum of 1927 (NAD27) throughout Central America and the Caribbean. The NAD27 as realized in the Caribbean Islands that include Antigua and Barbuda is listed by NIMA for the three-parameter datum shift values (dated 1991) from North American Datum of 1927 (Clarke 18676) to WGS 84 Datum as: $\Delta a = -69.4 \text{ m}$, $\Delta f \times 10^4 = -0.37264639$, $\Delta X = -3 \text{ m} \pm 3 \text{ m}$, $\Delta Y = +142 \text{ m} \pm 9 \text{ m}$, and $\Delta Z = +183 \text{ m} \pm 12 \text{ m}$, and the solution is based on 15 stations in the region.

The U.S. National Geodetic Survey (NGS) performed a high precision geodetic quality GPS survey of Antigua and Barbuda in 1996 for the position determination of airport runways and appurtenances. Alas, with four points surveyed on Antigua and three points surveyed on Barbuda, no local datum position coordinates were requested (as usual) by NGS from the Surveys Division in the capital of St. John’s.

Thanks to Perkins and Parry, *World Mapping Today, Second Edition*, “Antigua

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was one of the first Caribbean islands to be mapped by the Directorate of Colonial Surveys with publication of a 1:25,000 scale map (DCS 6) in 1946 based on U.S. Army Air

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Corps air photography with military ground control.” A number of different scales have been produced since then, and current large-scale topographic maps of Antigua and Barbuda are available from government

sources as well as commercial map sellers. According to Perkins and Parry, a military edition series at 1:50,000 scale utilizes a UTM Grid but apparently (to me), it is on the Antigua Island Astro 1943 Datum because the ellipsoid is reported to be the Clarke 1880.

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