Berbers moved south to Mauritania beginning in the third century. Modern exploitation of copper at Akjoujt and the more important ore deposits between Fdérïk and Zouïtât began after independence.

Bordered by Algeria (463 km), Senegal (813 km), Western Sahara (1,561 km), and the Atlantic Ocean (754 km), Mauritania is slightly larger than three times the size of New Mexico. The lowest point is Sebkhet T–n-Dghamcha (−5 m), and the highest point is Kedlet Ijill (915 m) (World Factbook, 2009).

The first hydrographic survey of the coasts of Mauritania and Senegal was performed by the corvette La Bayadere and the escort vessel Le Lévrier, commanded by the French Naval Captain Roussin and the Hydrographic Surveyor Giry in 1817. In 1910, Commandant L.V. Leball established two signal points at the Cape Blanc Lighthouse. The first published coodinates of the Mauritanian coastline were observed by Naval Ensign Y ayer in 1935 with an S.O.M. astrolabe for ve points: Chauve (cement monument) \( \Phi = 16^\circ 46' 33''N, \Lambda = 16^\circ 21' 10''W \), Nouakchott (post at Ofcers’ magazine) \( \Phi = 18^\circ 05' 53''N, \Lambda = 15^\circ 57' 23''W \), Angel (cement monument) \( \Phi = 18^\circ 38' 29''N, \Lambda = 16^\circ 07' 54''W \), Mahara (wood target in sand dune) \( \Phi = 19^\circ 06' 33''N, \Lambda = 16^\circ 17' 06''W \), and Timiris (house in the village of Memr har) \( \Phi = 19^\circ 21' 21''N, \Lambda = 16^\circ 31' 08''W \), with all longitudes referenced to Greenwich (Mission Hydrographique du Sénégal et de la Mauritanie, par M. P. Bonin, Annales Hydrographiques, 3e srie, Tome Quinzième, année 1927). The following year, an extensive survey of Cape Blanc was performed and the original signal points of Labail’s 1910 work were recovered and included in the survey. The Goëland Datum of 1910 originated at Signal Goëland (sea gull) of L.V. Leball’s 1910 observation where: \( \Phi = 20^\circ 54' 46.72''N, \Lambda = 17^\circ 03' 07.09''W \), and the ellipsoid of reference was the Germain 1865 where: \( a = 6,377,397.2 \) m, \( f = 299.15 \). Note that this ancient datum was later revised by the French and re-computed on a different ellipsoid in 1961. Apparently because of WWII, the results of this later survey were not published until after the war: (Annales Hydrographiques, 3e srie, Tome Seizième, années 1938-1939, 1946). From 20 January to 24 February of 1955, a hydrographic survey of the Noackhott region was performed based on new triangulation that was extended from Yayer’s original work of 1935 (Mission Hydrographique de la Côte Ouest Africaine, par M. Pierre Manney, pp. 43-51).

In 1961, the French Navy returned to Mauritania and performed 2nd-order geodetic surveys of the coast. Interestingly, they recovered some of the old monuments from earlier surveys and re-determined coodinates, both astronometrically and geodetically compensated for the local deflection of the vertical as well as re-continued on page 642
computed these positions on a different ellipsoid. The Goëland Datum of 1910, now re-computed on the Clarke 1880 ellipsoid where: $a = 6,378,249.145$ m, and $\frac{1}{f} = 293.465$ changed the astronomic coordinates to: $\Phi_o = 20^\circ 54' 46.7238''$N, $\Lambda_o = 17^\circ 03' 08.1820''$W, and the geodetic coordinates were now: $\phi_o = 20^\circ 54' 43.3490''$N, $\lambda_o = 17^\circ 03' 06.7295''$W.

A now-infamous monument and Datum used by oil companies for exploration and production for the coastal area of Mauritania north of Cape Timiris is “Jouik 1961.” Apparently unknown to the “oil patch” is that although the UTM coordinates of Jouik were published in 1961, the point was originally observed by Weber of the Institut Geographique National (IGN) in 1956 where: $\Phi_o = \phi_o = 20^\circ 30' 29.2626''$N, $\Lambda_o = \lambda_o = 16^\circ 13' 57.2743''$W, the ellipsoid of reference being of course, the Clarke 1880 (Mission Hydrographique de L’Atlantique Sud (6 Février 1961-18 Février 1963) par M. Antoine Demerliac. Annales Hydrographiques, 4e série, Tome Quatorzième, années 1967-1968, pp. 3-19). According to version 6.18 of the EPSG database, the transformation parameters from Jouik 1961 to WGS84 are: $\Delta X = -80.01$ m, $\Delta Y = +253.26$ m, $\Delta Z = +291.19$ m, with the transformation being reported accurate to ±1 m and was based on a 5-point solution in 2002 by “Woodside” (the centimeter precision is dubious – Ed.).

Other points of great interest in coastal Mauritania published in 1961 include the coordinate reference system originated at Cape Saint Anne and observed by Yayer in 1935 where: $\Phi_o = 20^\circ 41' 10.2266''$N, $\Lambda_o = \lambda_o = 16^\circ 40' 49.7288''$W, and the geodetic coordinates were now: $\phi_o = 20^\circ 41' 06.6298''$N, $\lambda_o = 16^\circ 40' 50.2925''$W. Also, in 1935 Yayer observed Nouamrhar (Maison de Timiris) where: $\Phi_o = 19^\circ 21' 21.0036''$N, $\Lambda_o = \lambda_o = 16^\circ 31' 07.9843''$W, and the geodetic coordinates were now: $\phi_o = 19^\circ 21' 20.8220''$N, $\lambda_o = 16^\circ 31' 06.2062''$W.

Also according to version 6.18 of the EPSG database, the transformation parameters from Nouakchott 1965 to WGS84 are: $\Delta X = +124.5$ m, $\Delta Y = -63.5$ m, $\Delta Z = -281$ m, with the transformation being reported accurate to ±5 m and was based on a 7-point solution in 1992 within Nouakchott City. The whopping differences in magnitude and sign between the transformation parameters for Cape Saint Anne and for Nouakchott are to be expected for local datums established by independent astronomical observations. Obviously, there is not a unified triangulation network that covers even the coastal regions of Mauritania much less the remainder of the republic.

On the other hand, according to version 6.18 of the EPSG database, the Mauritania 1999 Datum is based on a unified solution of 35 GPS stations of which 8 were originally observed by IGN in 1962. No further data seems to exist at present in the public domain.

The contents of this column reflect the views of the author, who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the American Society for Photogrammetry and Remote Sensing and/or the Louisiana State University Center for Geoinformatics (C4G).