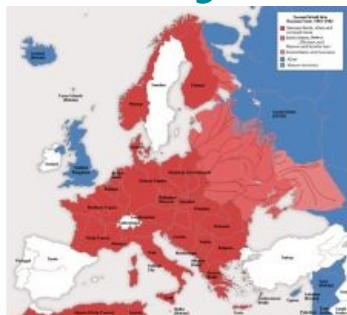


European Datum 1950 - A History



The European datum of 1950 (ED50) is the first common datum developed for the European Continent. It remains the de facto datum used in offshore operations in the North Sea and has legal status in the determination of some international borders in that sea. This article explores the history of ED50 to understand how it became the first European-wide datum.

Prior to World War Two (WW2) Europe was divided into independent national and sub-national geodetic datums. Nearly every country and their provinces had their own triangulation networks and ellipsoids that only sometimes connected.

With the establishment of the Nazi Party in the 1930s, Germany disregarded the military restrictions imposed by the Treaty of Versailles and established the Military Survey (*Reichsamt der Kriegskarten und Vermessungswesen, RKV*) which dealt with the collection, evaluation and cataloguing of foreign maps and geodetic data. The RKV attempted to combine the German states triangulation networks into a single Central European Datum.

With the beginning of WW2 in September 1939, the RKV was mobilised and attached to the individual commanding authorities within the Germany Army. These geodetic units followed the German army into the field operations which, by 1942, occupied the majority of Europe and Northern Africa (Figure 1). The RKV worked on establishing a unified geodetic framework for the continent which was possible as they had control of nearly every geodetic institute in mainland Europe.

Born out of War

The U.S Office of the Chief of Engineers was deployed in WW2 with a commitment to create battlefield situation maps. This would be achieved with the cooperation of other Allied groups through revisions and position readings. Millions of maps were produced by the Allies throughout the war which kept the military command informed of the operational situation.

As the war progressed, the lack of geodetic control that the Allies had over Europe, particularly Germany and the Balkans, quickly became apparent. This lack of control was particularly noticeable for the artillery, resulting with inaccurate bombardment. Consequently, the Allies created a secret intelligence unit in 1944. It was formed from the US Army Mapping Service (AMS) and operated throughout the European Theatre without restrictions. This unit was known as the HOUGHTTEAM, named after U.S. Army Major Floyd W. Hough.

Their task was to follow Allied infantry advancements, gathering cartographic and geodetic information from the enemy. They would calculate geodetic transformations and input these into the military mapping system.

The Horde

The HOUGHTTEAM moved into Europe in September 1944. By the spring of 1945, the unit was in Germany, working with the US 3rd and 7th armies, when its most famous raid occurred.

A rumour of a secret horde of geodetic data and instruments was confirmed by chance when visiting a hospital for wounded German soldiers. The horde was discovered in the village of Saalfeld, Thuringia, in a remote warehouse on 17 April 1945 and happened to include the entire geodetic archives of the German Army!

With the end of hostilities within the region, the Soviet Army advanced into the pre-defined Soviet Occupation Zone, as agreed at the Yalta Conference in 1945. With the Soviets approaching Saalfeld, the loot needed to be transported out of the area swiftly and to the USA without the Soviets noticing.

Ninety tons of material was successfully moved to Washington from Saalfeld for evaluation and archiving. The horde of information was huge and included triangulation surveys running from Moscow to Vladivostok carried out by Germans in the 1900's and first-order surveys completed by the German army deep within the Soviet Union.

The discovery of this horde, along with other significant data gathered by the HOUGHTTEAM, formed the beginning of ED50.

The Central European Net

ED50 started life as the Central European Adjustment project. The project began in April 1945 after the U.S 3rd Army captured the trigonometrical section of the Germany Army in the town of Friedrichsroda, Thuringia. This group was taken to Bamberg, in the United States Occupation Zone, for interrogation.

The captured Germans had been working on an adjustment of the first-order triangulation of the 'Greater German Reich', with the intent of expanding the project across the German-occupied territories. Understanding the value of this work, the Allies allowed the captured team to continue the project.

The project incorporated data gathered by the HOUGHTTEAM and resulted in a list of triangulation points from which arcs were constructed, appearing like a net over north and north-east Germany. This Central European Net (CEN) would form the framework for the triangulation adjustment of Europe.

The HOUGHTTEAM was disbanded in September 1945 having completed a hugely successful operation for the war effort.

Creating a European Datum

Work continued on CEN until the First International Geodetic Conference on the Adjustment of European Triangulation on 7 August 1946 in Paris. Here the decision was made to solve the triangulation adjustment problem of Europe and create a European triangulation network.

The project was managed by the U.S Army and used CEN (completed in June 1947) as the anchor to join other triangulation nets together. Working with European nations, some 1,500 first-order survey points were combined to create a continent-wide triangulation network. The North, South-West, South East and East European Nets were joined to CEN. The project required significant amounts of calculations and processing, which encouraged Charles Whitten, the Chief Geodesist at NOAA, to introduce new computing methods to process the geodetic computations.

The readjustment of the Western European Net was completed on 30 June 30 1950, resulting in a European Datum (Figure 2).

The readjusted triangulation data was tied to the International Ellipsoid 1924 and built upon hundreds of astronomic latitudes, longitudes and azimuths. No single survey station can be designated as the datum origin, rather a fundamental point is designated at the Helmert Tower in Potsdam, Germany.

ED50 and GNSS

The first interactions of ED50 with a GNSS came during the 1970s. The offshore industry utilised the U.S Navy Navigation Satellite System (NNSS) to confirm positions in the North Sea. GPS became operational in the 1980's and by 1987 both GPS and NNSS had transitioned onto the WGS84 datums.

With the ever increasing popularity of GPS, the offshore industry declared a need for a common transformation between ED50 and WGS84. A transformation was published in 1990 by the Norwegian Mapping Authority.

The creation of ED50 resulted in a continent-wide standard in cartography, positional science and the study of the shape of the Earth. It is still used by governments across Europe to define the positions of Continental Shelf Boundaries.

Further Reading

Dive deeper into the history of The European Datum 1950 by exploring the blog series written by Simon Kettle on the ESRI Community Blog:

[The European Datum: A History \(Part 1\)](#)

[The European Datum: A History \(Part 2\)](#)

[The European Datum: A History \(Part 3\)](#)

<https://www.gim-international.com/content/article/european-datum-1950-a-history>
