GEODETIC ACTIVITIES DEVELOPED BY THE REPUBLIC OF ECUADOR IN COORDINATION WITH SIRGAS.

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The Military Geographical Institute (IGM), the Ecuadorian institution in charge of cartography, has as a main objective to establish a modern Geodetic Reference Frame compatible with modern measurement techniques such as Global Navigation Satellite Systems (GPS, GLONASS and Galileo).

With this objective in mind, Ecuador, in coordination with SIRGAS, has implemented the following activities:

- **Establish the National GPS Network as a national densification of SIRGAS95 (ITRF94, epoch 1995.4). This network consists of 135 stations distributed throughout the country. Applying the Bernese software, with support of the German Geodesic Research Institute (DGFI), has performed processing and adjustments. (Fig. 1)**
- **Installation of the Ecuadorian GNSS Network for continuous monitoring (REGME). It is currently composed of 8 stations: QUI1, RIOP, GLPS, CUEC, PTEC, GYEC, LJEC, ESMR. These stations are also part of the continental network SIRGAS-CON and are officially processed by the DGFI and the Brazilian Institute of Geography and Statistics (IBGE). (Fig. 1)**
- **Implementation of the Ecuadorian GNSS Data Processing Center (CEPGE) equipped with the scientific Bernese software version 5.0, thanks to a cooperation agreement between the DGFI, the University of Bern, and the IGM. This center processes 33 SIRGAS-CON stations and generates loosely constrained weekly solutions that are sent to SIRGAS for evaluation. At present, CEPGE acts as a SIRGAS Experimental Processing Center, within a year of training and strictly observance of the SIRGAS guidelines for processing, CEPGE is expected to become an official SIRGAS Analysis Center.**
- **GPS positioning on the old geodetic points, part of the Conventional Geodesic Network (PSAD56) in order to determine regional transformation parameters between PSAD56 and SIRGAS95. This will allow integrate the existing geodata into SIRGAS.**

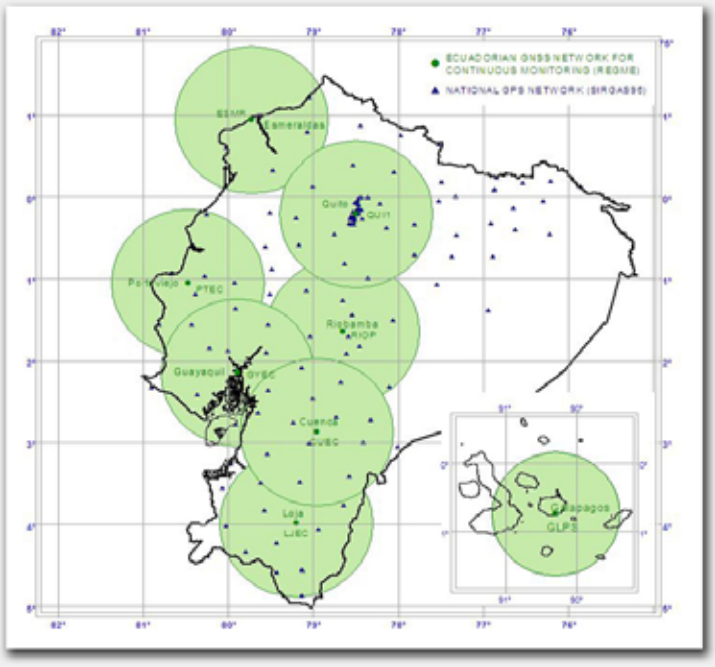

Fig .1 National Geodetic Reference Frame

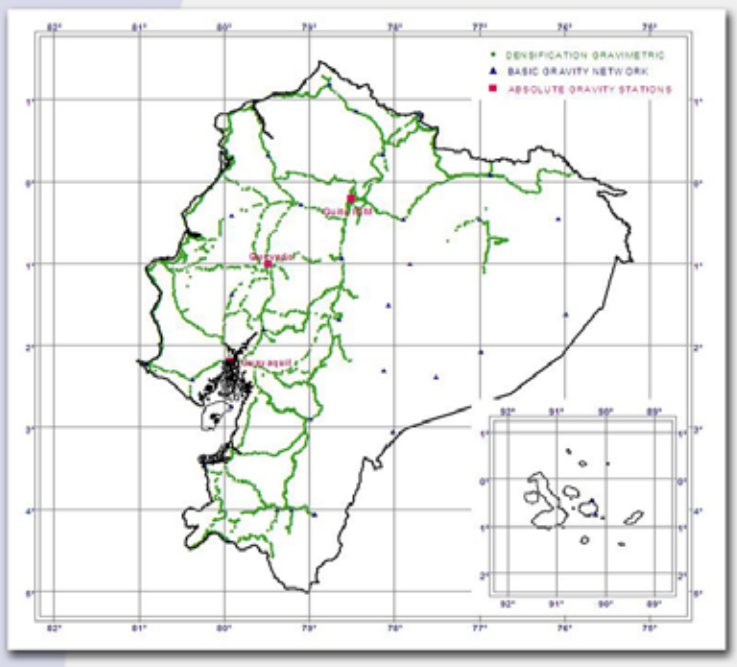

Fig .2 National Gravimetric Network

At the same time, Ecuador is modernizing its Vertical Reference Frame following the recommendations of SIRGAS by implementing the following activities:

- **Establishing the Basic Gravity Network in Ecuador, comprising 37 stations distributed throughout the country. The Network is linked to the gravity datum IGSN71. This activity was conducted with support of University of Sao Paulo (USP) and IBGE. (Fig. 2)**
- **Determining three absolute gravity stations in cooperation with NGA (National Geospatial-Intelligence Agency) with the use of a A-10 absolute gravimeter. (Fig.2)**
- **Densification of 2866 gravity points along the leveling lines of the vertical network. (Fig. 2)**
- **Connection of the leveling networks between Ecuador, Peru, and Colombia.**

Additionally, in order to maintain the National Geodetic Reference Frame, Ecuador has the following short-term goals:

- **To densify the REGME network by including more GNSS stations for continuous monitoring.**
- **To model a local velocity field.**
- **To link the relative gravimetric measurements to the three absolute gravimetric points.**
- **To calculate a high resolution geoidal model for the country.**
- **To modernize the Vertical Reference Frame by the adoption of physical heights in coordination with SIRGAS.**

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