

Actual Stage of Geodesic and Hydrographic Activities of the Cuban Republic

Yalex Guerra CASTELLINI and Pedro Luis Garcia PÉREZ, Cuba

Key words:

SUMMARY

The present work has purpose of showing in general way the development and actual stage of government activities of Geodesic and Hydrographic Cuba and how they have passed any since XIX century up to this date.

This work show in a structural way the obtained results in these specialities in Cuba, and different works that have been developed and that are developed at the present time and perspective for the next future.

As a politic we have always taken into account to procure a technological development according to the progress that we are obtaining in the following activities: Geodesic, Topography, Cadastres, Cartography, Hydrographic, Geographic Information System, Geographical names, Photogrammetry and Teledetection.

The close task that we plan is to give the information about the patrimony and to continue its development.

Nowadays we are engaged in the study of feasibily for the creation of a spatial substructure in the country. Having these results we foresee the development of some projects directed to reach the expected general the creation of Cuba Substructure of Spatial Dates.

RESUMEN

El presente trabajo tiene como objetivo mostrar de forma general el desarrollo y estado actual de las actividades Estatales de Geodesia y la Hidrografía en Cuba y el transcurrir de ella, desde el siglo XIX hasta la fecha, impacto económico y social.

El mismo muestra de forma estructural los resultados alcanzados en estas especialidades en Cuba, así como los diferentes trabajos que se han desarrollado y se desarrollaran en la actualidad y las perspectivas para el futuro inmediato..

Como política, siempre ha estado presente lograr un desarrollo tecnológico en consonancia con los progresos que se van alcanzando en las actividades: Geodésicas, Topografía, Catastrales, Cartografía, Hidrografía, Sistema de Información Geográfica, Nombres Geográficos, Fotogrametría y Teledetección

Informatizar el patrimonio y continuar su desarrollo es el objetivo inmediato que nos proponemos.

En la actualidad nos encontramos enfrascados en el estudio de factibilidad para la creación de la infraestructura espaciales en el país. A partir de sus resultados se prevé desarrollar, varios proyectos, encaminados todos a lograr la meta esperada, o sea, la creación de la Infraestructura Cubana de Datos Espaciales.

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1. INTRODUCTION

The Hydrographic and Geodesic patrimony has been created in the fields of Geodesy, Cadastre, Topography, Maritime Studies and the assistance to the navigation with a hard utilization of aerial Survey, Photogrammetry, Teledetection and Computer Techniques. This patrimony has continued its development with the main objective of satisfying the informative demands on different national professionals, supporting the process of making decisions in the context of the economical and social development, and also talking the necessary measures in order to protect the environment.

In 1995 the Cuban Institute of Geodesic and Cartography and the Cuban Institute of Hydrographic were integrated in the Hydrographic and Geodetic direction. This office takes the state functions of both Institutes and GEOCUBA as a management system starts the development of production, research and trading activities.

According to the 179 decree from October 28th, 1997 the hydrographic and Geodetic Service was created it is part of the state organ and GEOCUBA, This service includes the hydrographic, geodesic, topographic, cartographic, cadastre and maritime signaling activities and it make an uniformed system of geographical names. This recently created service shows a favorable situation in relation to the rationalization of material financial and human resource which are necessary to continue working in these fields. Project of main importance is the observation Campaign GPS and the 4th General Aerial Cartographic Surveying of the country could be performed since 1997. The results of both projects have allowed to complete and to make up to date the geodesic and cartographic bases required for the support of the actions created to fulfill the National Environmental Strategy and other aspects contained in the Cuban version to the 21 memorandum, mainly referred to the protection and rehabilitation of the original hydrographical bases and shore ecosystems.

Lately, with the wide introduction of computer techniques, the seating ups of the global positioning systems and the Teledetection detectors with high resolutions, the costs and executive date of works have been diversified, even more the applications. At the same time, the processing and analysis of the information let us obtain a better incorporation of hydrographic and geodesic products in other informative systems and other works about projection, performance, control and monitoring

Howsoever, the overtaken process was not the expected it can be considered significant, taken into an account that it showed be developed under severe economical restriction.

2. DEVELOPMENT

2.1 Actual stage

2.1.1 Geodesy

The National Geodesic Network (NGN) is well developed because it guarantee the topographic mapification up to 1:10 000 scale and the cities mapification to a 1:200 scale. In this period the geodesic activity has been centered in the ransom to the created network and the development of the GPS campaign in the country. With the adoption by the OACI of the World Geodesic System WGS-84 as a reference for GPS determinations with high precision. The net has 20 stations distributed uniformly in all the national territory.



The realized work permitted:

- Determine the 7th transformation parameters between the WGS-84 and Clarke 1886, starting from GPS measurements coincident in stations of the NGN of 1st order.
- Improve the precision of the initial datums of our NGN.
- Determine the ondulation values of the Geoide in these stations.
- Realize a more rigorous evaluation of the remainder mistakes in the NGN.

In the 2000 year we finished the research project and was made a methodology for the creation of the Basic National Geodesic Net. Now It starts a modernization stage of our geodesic nets it includes: the altimetric links of our islands and keys; the establishment of the basic net and the creation of a Geodesic Data Basis which permits the establishment of an informatic system that correspond with the user's necessities. Moreover the Geodynamic studies continue its development in Santiago de Cuba's polygon, in order to evaluate the recent tectonics activities and its incidence in the evaluation of the mains geological risks.

2.1.2 National Cadastre

The National cadastre finished and it keeps up to date realized in rural zones 98% of the National territory of all the land municipalities at a scale of 1: 10 000 and 1:25 000 fundamentally having an economical conception statistic and agricultural in the essential.

The development of the rural cadastre's informatic system on a superior program basis has made possible to obtain the necessary abridgments for the land's balance and other statistic economical and agricultural interests.

Since the middle of 1999 has been an effort directed to obtain the creation of the urban cadastre in the next ten or fifteen years developed. It has been initiated the cadastral advance in the whole country, starting from this moment the creation of the organ Cadastre, justly georeferred to the geodesic System and completely computerized will be completed

2.1.3 Topographical Mapification

Cuba count up on topographical maps at 1:25 000, 1:50 000 y 1:100 000. During this period the work has been directed to boring up to date them.

From the year 1999 year we have been working in the project for the creation of the Digital Topographic Map (DTM) with the use of DIAP station of the Cuban republic at a 1:25 000 scale, this will be main task in the next years.



The topographical maps scales 1:250 000, 1:500 000 and 1: 1000 000 are created and they cover the whole national territory bringing them up to date. We have a digital version of the map at 1:250 000 scale and we work.

Our country presents his disposition to work in the Global Map Project. The sustained work developed during this years in the cartography field, made possible that we can be inserted in it and contribute to its development.

In the 2000 year the 4th Aerial Cartographic Survey of the whole country at a 1: 30 000 scale was concluded and permitted to have a recent information, mainly to bring up to date the realizing of the cadastral and topographic mapification.

2.1.4 Industrial Topography

Special attention to the industrial topography has been dedicated in the last years, developing group of technologies with great importance for the national economy. Among them we have: the technology for controlling the deformations in the sugarhouse machinery; the calibration of vertical cylindrical tanks with high capacity; deformation control in engineering works; survey of underground technical networks and areas; works related to the terrestrial Photogrammetry as a support to the works for the restoration of cultural patrimony.

2.1.5 Thematic Cartographic

As result of the united work done by specialists from different organisms and institutions during several years, a numerous group of World, continental, national thematic maps, and atlas was created. Among then prominent ones are: National Atlas from Cuba, Historical Biographic of José Martí Pérez, Simón Bolivar and Ernesto Ché Guevara de la Serna, and educational maps.

The gradual introduction of the computerized system in the specialty has contributed in the last years to obtain a greater rapidity in the productive process and an increment in the quality of the produced cartographic works.

In 2000 years the geographical, economical and cultural synthesis of Cuba was finished and began to create the General Geographical Map of Cuba in digital format at scale 1:300 000. In this period of time the edition of maps for tourism has continued, these works show and explain the characteristics of several interesting locations.

In the next five years the development and perfecting of cartographic works that contribute to increase the geographical and historical knowledge of our people. At the same time we will continue working in multimedias of historical and geographical atlas that have been foreseen to create in this stage.

2.1.6 Geographical names

Since the creation of the National Commission of Geographical Names (GNNC) the work developed in 1980 has permitted to count upon the revised and arrowed lists that show: the principal littoral names, the main accidents of the litorania, great units and subunits of the relief, the name of the countries, seas and oceans of the world. Moreover the periodical publication of the informative bulletins began.

The Technical Adviser Group of Provincial Geographic Names has been working hard on the municipal uniformation and on the preparation of this Toponymic Nomenclators, which will allow them to have all the names of their territory put into uniformed. This work made possible begin, the works for the creation of the national nomenclator.

An important group of works has been carried out during 2000 year. They had increased the quality of works in order to put the country uniformed. Among these works can be mentioned the following: Geographical Cuban Dictionary and conclusions of the Cuban Toponymic catalogue and the beginning of the works for the edition of Toponymic digital maps of Cuba, Central America, The Caribbean and the whole world.

During these years it has been working to create a system, which enable the automatization, processing and the resulting from the work uniformation and the resulting of a Geographical Information System (GIS), which has as an initial content the information colleted in the Cuban Geographical Dictionary should be immediately undertaken.

2.1.7 Hydrographic and Nautical Cartography

There is a collection of more than 140 Cuban charts, which includes the interior waters, territorial seas and an exclusive economic zone in paper and raster formats. In this period the following works related to important projects began:

- The conclusion of the 80 % of Hydrographical surveying for the edition of 25 new nautical charts.
- The realization of the hydrographic surveying for new editions of the Habana, Santiago de Cuba, Matanzas, Cienfuegos, Cabañas and Nipe bay charts.

In 1988 began with the series of Yat Cuban's charts, the mass production of the first generation of Cuban electronic charts in raster format. Afterward it was extended to all the official nautical charts collection.

Cuba has participated actively in the scheme's proposal of INT charts of the International Hydrographic Organization as a member of the INT cartography B region. Also has worked in the regional project of the International Bathymetric Chart of the Caribbean Sea and Gulf of Mexico (IBCCA) assuming the compilation works and revision of pages 07 and 08, which will be located at 1:1000 000 scale.

In the next five years we propose to execute hydrographical surveying in areas of the insular platform, ports and bays that permit to obtain the necessary information to update and edit nautical charts at appropriate scales.

The final objective is that the charts and nautical publications embrace totality Cuban waters in electronic and paper formats with a high update degree. Like wise we go through to modernize the equipment in a way, which mad possible to raise the drawings.

3. CONCLUSION

The hydrographic and Geodesic patrimony produced in this years satisfy the country necessities, not withstanding the obstinate blockade policy applied by the USA Government with respect to access to technologies and equipments necessary for develop the mentioned specialities.

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CONTACTS

Yalexty Guerra Castellini
Cuban National Union of Architects and Engineers of the Construction.
Humboldt 104 e/ Infanta y P, Vedado, Plaza de la Revolución
Habana
CUBA
Tel. + 53 878 2863 / 879 75 32, ext. 110
Email: unaicc@enet.cu, unaevent@enet.cu, yale1213@web.correosdecuba.cu