

ECONOMIC AND SOCIAL COUNCIL

**Ninth United Nations Regional Cartographic
Conference for the Americas
New York, 10-14 August 2009
Item 5(b) of the provisional agenda
Country Reports**

National Report of Algeria 2005 – 2009*

* Prepared by the National Institute of Cartography and Remote Sensing (INCT)



Ninth United Nations Regional Cartographic
Conference for the Americas

New York, 10-14 August 2009



[june 2009]

National Report of Algeria 2005 - 2009

National Institute of Cartography and Remote Sensing

Sub Direction of Research & Development

123, Tripoli street, Post Office Box 430, Hussein Dey - Algiers.

Tel : 213 (0) 21 47 09 19 / 213 (0) 21 47 09 20 / 213 (0) 21 47 00 30

Fax : 213 (0) 21 23 43 81 E-mail : inct99@wissal.dz

NATIONAL REPORT OF ALGERIA 2005 – 2009

The present document describes in a non exhaustive way the activities and progress achieved in Algeria in the domain of the cartography and the related domains covering the period 2005 - 2009.

This report is devoted to the presentation of the main products achieved by the National institute of Cartography and Remote Sensing, in charge of the geographical information to the national level. It is in particular about the basic geodetic facilities, the geographical databases, the basic mapping works, the cartography from the satellite images, the thematic cartography works as well as Research & Development.

NATIONAL INSTITUTE OF CARTOGRAPHY AND REMOTE SENSING - INCT

The National institute of Cartography and Remote Sensing (INCT), create in 1967, has for mission in its quality of national organism in charge of the geographical information :

- To achieve and to maintain on the national territory, basic geodetic, levelling and gravimetric networks;
- To cover the territory in aerial photography;
- To establish and to update the topographical basic maps in 1/50 000, 1/200 000 and those that are drifted from it;
- To collect and to preserve the satellite data;
- To achieve geographical databases;
- To preserve the archives.



The activities of Research & Development are also taken in charge by the INCT through the Research & Development Sub-management. This one is assigned to lead the works of development and applications in the geographical sciences domains and to bring the scientific and technical support necessary to the production structures of the institute.

Since its creation in 1967, INCT works at the realization of the missions which are assigned to it in mapping and in basic equipment. The computerization of its production chain gave a new growth to the acquisition, processing and to the presentation of its products. This way of doing, allowed the institute to multiply its output, to vary its production and also to organize and to structure its products for an efficient exploitation.

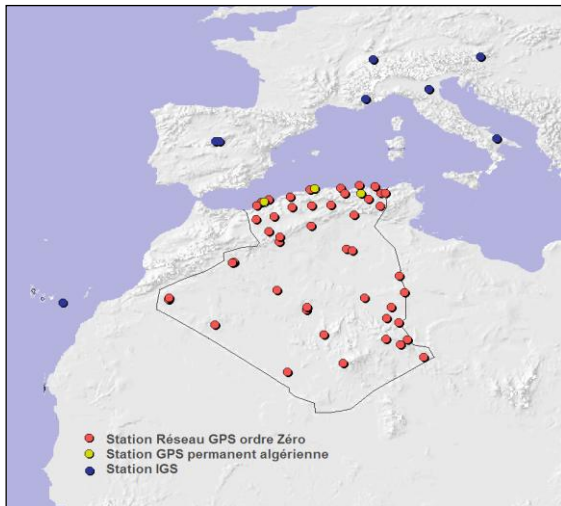
WORKS OF BASIC FACILITIES

1. GPS Network

1.1. Zero order GPS Network

Seizing the technical opportunity of the Tyrean Geodetic NETWORK project, the National institute of Cartography and remote sensing observed simultaneously in 1998 its network with the TyrGeoNet observation campaign. Thus, twelve points have been observed during 72 hours and processed thereafter with precise ephemerides, using the Bernese software. The obtained precision in the determination of these twelve points is centimetric. Other observation campaigns intended to the densification of this network has been done in 2005 and 2007.

In 2007, the National institute of Cartography and Remote Sensing started works aiming the reprocessing of the data of these different Zero order campaigns as well as of the campaigns of unification by using the Bernese 5.0 research software.



The method of resolution of the ambiguities used is based on the strategy called QIF (Quasi Ionosphere Free) devoted to the processing of the long bases lines. The different daily solutions of the Algerian fundamental GPS network have been combined adapting the minimal constraints (Minimum Constraint Solution) strategy. The coordinates of the IGS stations are considered like fixed. Thus, the precision of the obtained results for the set of 67 stations' coordinates is in the order of 1-5 mm for the planimetric components and 1-10 mm for the vertical component.

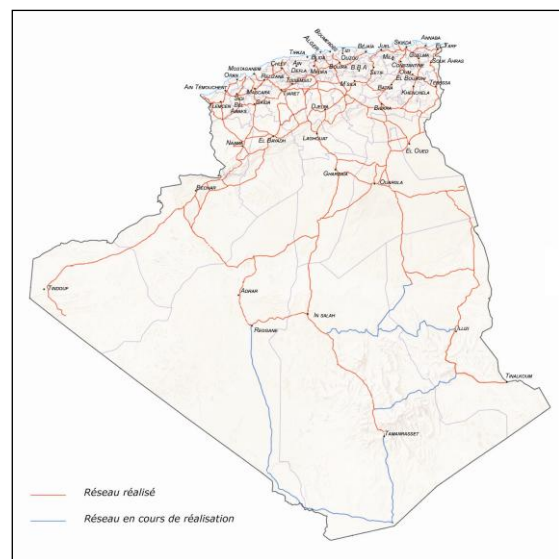
1.2. 1st order GPS network (densification's network by GPS)

This network coming to complete the North classical geodetic network, will serve to pursue the equipment of the national territory. This network is composed of 1180 points where distances are between 25 and 50 km. The observations are made with bi-frequencies receivers on two hours. The relative precision of this network is in order of 3 cm.

2. Levelling Network

The origin of levelling in Algeria dated back to the French colonial period. It was confided to the Geographical Service of the army (GSA) then taken in charge by the National Geographical institute - France. Provided with a similar material to the one used by the Service of the General Levelling of France (NGF), its operators elaborated from 1887 a geometric levelling network of limited precision to the first and second order.

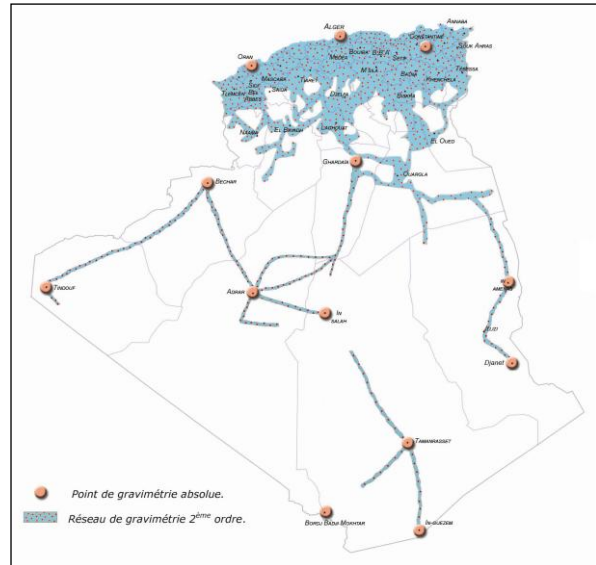
Between 1953 and 1954, the levelling works were led in parallel with the re-observation of the North parallel and the 1st order complementary of the coastline. The lines of precision levelling executed since 1976 by the National Institute of Cartography and Remote Sensing (INCT) followed in parallel the works of the geodesy by the densification of the North parallel. Nowadays, the levelling network includes 33757 Km levelled.



3. Gravimetric Network

The national gravimetric network is composed of two networks, namely:

- The fundamental Network: composed of 12 absolute points observed in 2001 with the FG5-111 gravimeter of the National Science foundation of United States. The observations have been processed with the software provided by the Micro-g solution Inc company. The International conventions used in this domain are used. The mean precision of this Network is of 1.5 microgal.
- The secondary network: composed of 1301 determined points by relative measurements of gravity by using the Lacoste & Romberg gravimeters. The distance between points are on average about 30 Km. the gravimetric points are levelled using the precise levelling process. The precision of this network is in order of 0.02 mGal.

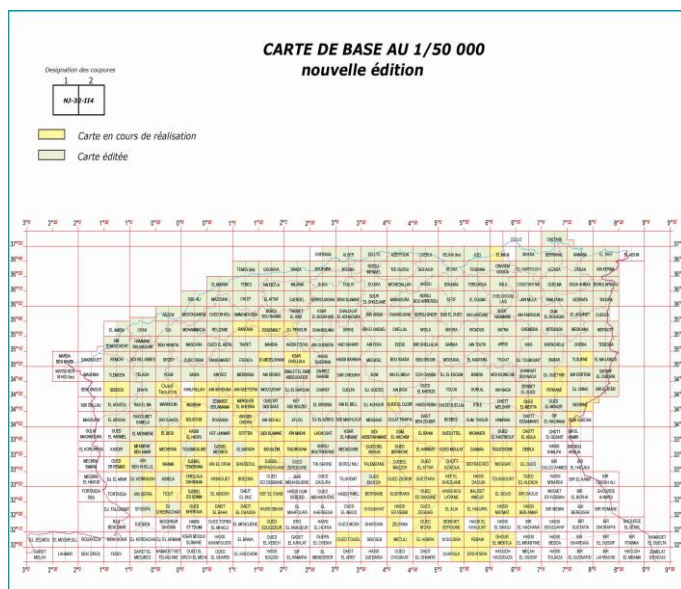


Works of maintenance and of densification of this network, notably on the new road axes, are regularly implemented.

WORKS OF BASE CARTOGRAPHY

1. Base map 1/50 000 - New edition

During the last decades, an important technological evolution concerning management and processing of the geographical information entailed some changes in the technical of cartographic production. Conscious of this technological contribution and in order to improve the cartographic production process, the National Institute of Cartography and Remote Sensing adopted an operational step to integrate these new technical in the edition of new maps and the revision of those old.

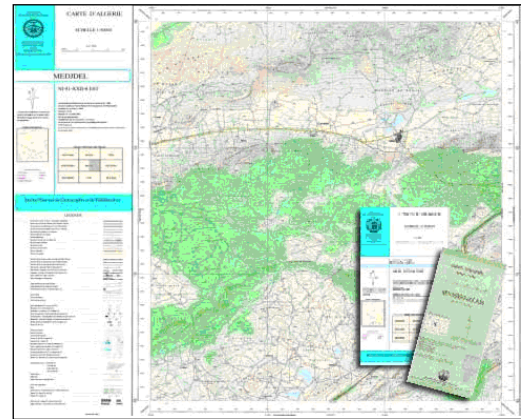


Indeed, the process of establishment of the map within the National Institute of Cartography and Remote Sensing is currently automated entirely, since the acquisition of the cartographic data until its graphic representation.

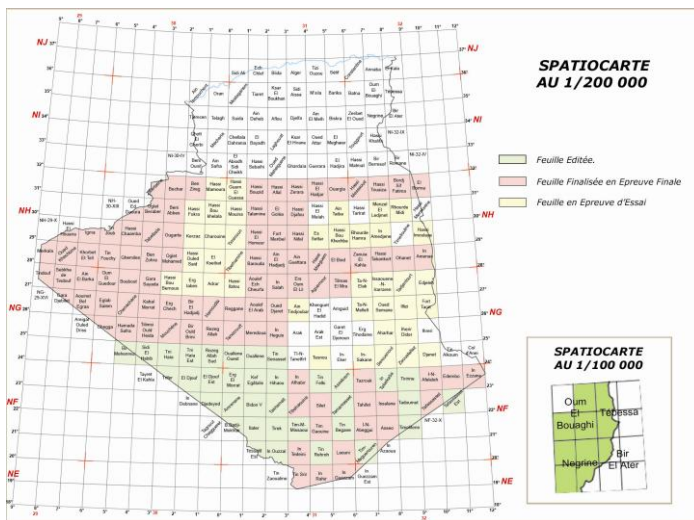
The National Institute of Cartography and Remote Sensing launched, in the beginning of the 1980 a new program of base regular topographic cartography to the scale of the 1/50000, substitute thus the former cartography that became obsolete, as well as for the maps at 1/200 000. The system of conical Lambert projection has been abandoned for the UTM system and a new (geographical) cutting was adopted.

Technical features of the new edition:

- Source: photogrammetric survey from aerial photography to the 1:63 000 (for planimetry revision) or 1:75 000 (for the new edition),
- Projection: UTM,
- UTM Zone: 29, 30, 31 and 32,
- Ellipsoid: Clarke 1880 English,
- Cutting maps: geographical 15' x 15' in longitude and in latitude.



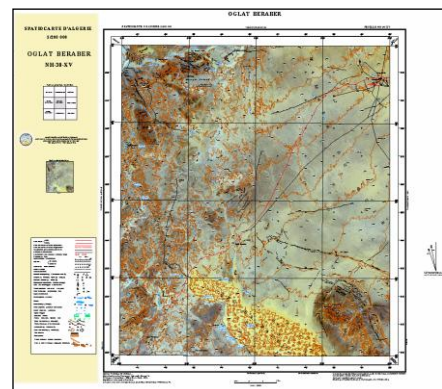
2. Cartography from satellite imagery



The National institute of Cartography and Remote Sensing, via its Remote Sensing Center is also active in spatial cartography. It introduced in its chain of production the tool of the satellite imagery at different resolutions, particularly the SPOT and Landsat ETM+ images for the establishment and the updating of the topographic maps to 1/200000 and those that are drifted from it, as well as the IKONOS and QUICKBIRD images in very high resolution for the urban cartography and the management of the urban data bases.

The spatio-map (map on bottom SPOT and Landsat ETM+ images) is produced in a regular way to cover the whole of the national territory to the scale of 1/200 000. This type of map is especially adapted to the desert land of the south of the country.

These cartographic works with the satellite imagery as well as those of the classical process are achieved on the basis of the specifications and official norms.



3. Geographical data bases

The National institute of Cartography and remote sensing has resolutely involved since one decade to set up the means and the technical procedures appropriated for the acquisition, processing and the updating of the geographical data in the perspective of a better charge of the needs of the users more demanding on its quality, its coherence and its exhaustiveness.

Currently, the INCT puts at the disposal of its customers several products structured as geographical data bases: geodetic data base, toponymic data base, topographic data base (1/50 000) as well as the Raster data base (at different scales).

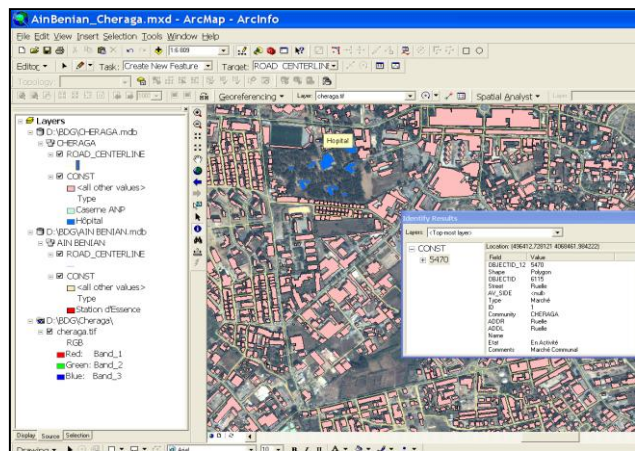
Other data bases are currently in the process of development: cartographical data base (with the data of the vectorisation of the old cartography 1/200000), roads data base, altimetric data base and the images data base (satellite images, digital orthos.)

The objectives retained as for the setting up of the cartographical data base 1/50 000 are the following:

- To put at the disposal of the public a reliable and structured geographical information integrable in a GIS,
- To permit a general consultation of all information bound to the cartography at medium scale,
- To assure division of the geographical information between the different users of this data base (the cartographic writing, research, the specific works.),
- Generalization of the products drifted to market (MNT, sectorial GIS, Road DB, Alti D.).

Technical features of the cartographic data base:

- Origin of the data: photogrammetric survey to the scale 1/50 000 completed on the land,
- Projection: UTM,
- Geodesic system: North Sahara 1959,
- Ellipsoid: Clarke 1880 English,
- Structure in entry: Spaguetti (DXF),
- Structure in exit: Topological GIS.



THEMATIC CARTOGRAPHY

The National Institute of Cartography and Remote Sensing also recorded several products in this domain by the realization of school maps, relief maps, thematic Atlas, etc.

1. School Atlas

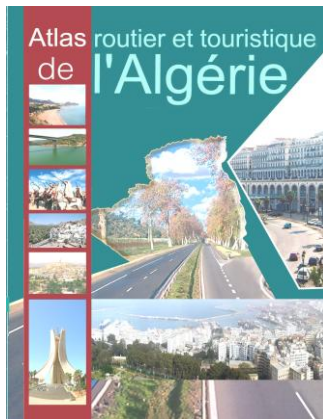


The school atlas has for objective to put at the disposal of the readers a supplementary tool of thematic and geographical information.

This atlas of consultation of maps elaborated by the National Institute of Cartography and Remote Sensing in 2006, contribute mainly in the education of the pupils concerning cartography of Algeria as well as the rest of the world. It includes for this, a set of physical and thematic maps of national territory of the other continents and some countries. This school atlas is in conformity with the program of teaching of the geography of the secondary cycle in the colleges of medium teaching in Algeria.

It has for aim to fill mainly emptiness in this domain; it is certainly a contribution for the pupils and teachers of geography and for those who the domains interest them.

2. Road Atlas



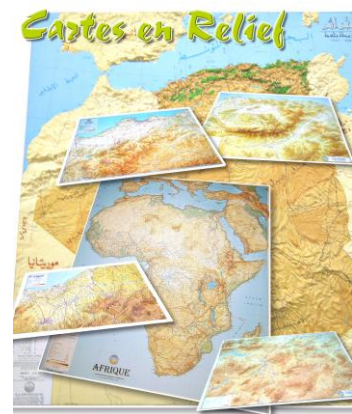
The road and tourist Atlas of Algeria published in 2008 present a general cartography at 1/500 000 for the North of Algeria, 1/2 300 000 for the South of Algeria, regional maps at the scale 1/200 000 and 1/50000, as well as of the fragments of cities plans accompanied by convenient information to facilitate the professional ways and of leisure.

This Atlas is the insurance of one journey without hitch. as much as an exhaustive index of the townships of Algeria, it permits to situate precisely each among them.

3. Relief map

The National Institute of Cartography and Remote Sensing produces relief maps thermoformed. At a time didactic and practical, these maps allow to discover from a simple look the exceptional wealth and the physical dimension of a territory.

The relief maps cover among others the main cities of Algeria and include a detailed information level with different scales.



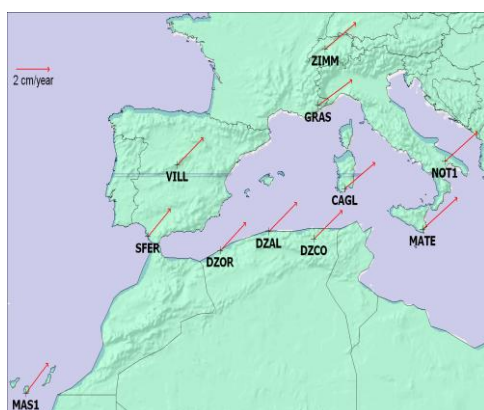
RESEARCH & DEVELOPEMENT

1. GPS/GIS cartographic update

In the aim to reduce the delays of the cartographic updating process, the INCT has newly introduced in its production chain the GPS/GIS (PDA) solution, associating a GPS receiver and tools of collection of GIS data.

The processing of GPS data are make in real time by the use of the EGNOS corrections (for the North of the Algerian territory) or in post processing (for the south part of Algeria). The INCT foresees in a near future, the generalization of the GPS/GIS solution in its updating works.

2. New national three-dimensional geodetic system



In the frame of the determination of the new national three-dimensional geodetic system compatible with the ITRS (International Terrestrial Reference System), some actions have been launched by the INCT to equip the Algerian territory with permanent GPS stations in order to collect the data necessary to the determination of the components of coordinates and speeds that describe the reference system.

The Algerian permanent GPS network has been initiated in 2006 by the national institute of cartography and remote sensing and it is constituted currently of three operational stations: Algiers, Oran and Constantine. This network will be reinforced with six other stations which will be well distributed on all national territory.

Also, we note that the INCT, in its quality of national organism in charge of this interest domain, participate in the name of Algeria to the project of realization of the AFrican Reference Frame (AFREF) unified system.

3. Bulletin of the Geographical Sciences

The National institute of Cartography and remote sensing (INCT) publishes regularly since 1998 a semestrial scientific magazine: "Bulletin of the Geographical Sciences" - ISSN 1112-3745. This scientific bulletin is a space of reflection, exchange of information and discussion, in which the national and international geographical community will find the last novelties in the domain of the geographical sciences.

SCIENTIFIC AND TECHNICAL MANIFESTATIONS

1. Open days on the geographical information. Oran, 22-26 march 2009

The National institute of Cartography and remote sensing organized an open days on the geographical information in Oran from 22 to 26 March, 2009. This event, intended to a varied public (firms, public authorities, researchers, students.), was the opportunity for the INCT to make known its cartographic products.

On the margin of these days, a conference has been organized around the theme: " Spatial applications to the Service of the Lasting Development ". This conference regrouped several national experts exercising in the domain of the geographical information.

2. Seminar on the Unification of Geodetic Systems of the countries of the "5+5 Defence" Initiative. Algiers, 23-24 June 2009



A unified system of the geodetic systems linking the countries of the north bank with those of the south bank of the Mediterranean Sea was debated on the occasion of the seminar of the countries members of the "5+5 Defence" initiative, organized by Algeria from 23 to 24 June 2009.

The seminar regrouped the ten countries members of the "5+5 Defence" initiative namely Algeria, Libya, Morocco, Mauritania, Tunisia, Spain, France, Italy, Malta and Portugal as well as a panel of national and international experts.

Besides practical modalities for the implementation of the unification of the geodetic systems, the seminar recommended to take advantage of the experience acquired in the domain of the unification of the systems for its generalization to the whole of the countries of the initiative.

The participants proposed to encourage trainings on the techniques of space and physical geodesy to allow all the countries of the "5+5 Defence" initiative to benefit from the technological development and expertises in this domain.