

PORTUGAL

NATIONAL REPORT

ICA 2003

12th General Assembly

21st International Cartographic Conference

Durban

10 – 16 August 2003

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Edition: Instituto Geográfico Português (IGP), 2003

Depósito Legal: 198218/03

ISBN: 972-9029-95-4

CD Reproduction: IGP

Editor's note: Each institutional report is the respective institution's exclusive responsibility.

FOREWORD

This National Report groups the institutional reports of eight Portuguese public bodies that have responsibilities in the production and management of official topographic, hydrographic and thematic mapping, giving an overall view of the main activities and of what has been achieved along these last years.

The interest and awareness on the importance of Geographical Information (GI) has been growing steadily and rapidly in Portugal during the last years, and several public institutions and major private companies become active partners in the GI market.

The Society is always in movement, constantly and rapidly changing, and it is necessary to adopt new ways for the process monitorisation and to help decision-makers to act. Necessarily, it is mandatory to produce and disseminate geographical information to organisations and individuals, making them a critical piece of the Information Society consolidation process. And, of course, Public Administration must also adopt new ways of considering its relationship with the citizen, creating infrastructures and modernizing its bodies.

In Portugal there is a long tradition related with geographical and cartographic information. Since remote ages, cartography was considered a very important way of knowledge communication and a very useful decision support tool. Not only during the discovery ages where, without any doubt, Portuguese cartographers developed their roots, but also in the following periods till modern times.

More recently, Portugal made also a giant step, related with Geographical Information, towards Information Society when, in 1995, decided to open the National Spatial Data Infrastructure (SNIG project) on the Internet. In fact Portugal was one of the first countries to support the development of a SDI and a pioneer regarding the use of Internet to implement data dissemination.

Looking forward to continuously better support the Geographical Information market and users, the Portuguese Government decided to restructure the Public Administration area of this sector in 2001, announcing the disappearance of the traditional National Mapping Agency (Portuguese Institute of Cartography and Cadastre – IPCC) and of the National Centre for Geographical Information (CNIG) and the creation of a single organization mixing and developing their roles: the Portuguese Geographical Institute (IGP).

So, IGP, officially created in 2002, results from a political decision of reorganizing and modernizing the Portuguese Public Administration and it succeeds to the National Centre for Geographical Information and the Portuguese Institute of Cartography and Cadastre.

IGP mission is to exercise the function of national authority of cartography, to produce official geographical information, to develop and to coordinate the national system of geographical information, to promote the formation and the investigation in the domains of the sciences and geographical information technologies and to contribute for information society, being assumed as the responsible organism by the execution of the politics of geographical information.

There are several major GI projects under development in Portugal, from which its essential to make a reference to new 1/10.000 Cartographic series and the Cadastral Information System.

In today's world it is mandatory to interact with partners. One much co-operate to better achieve objectives. That is why the cartographic and the cadastral production is been gradually foreseen as a joint project between municipalities and central administration.

Participating in national and international organisations, like the International Cartographic Association, is an important way of co-operating and promoting knowledge exchange, indeed crucial for the achievement of a better quality and valuable Geographical Information and making it easier the effort of building Information Society.

Lisboa, July 2003

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1 – INTRODUCTION

The Instituto Geográfico Português is the national geodetic, mapping, cadastre and geographical information agency of Portugal.

Heir to an institutional tradition that can be traced back to 1788, when the first systematic geodetic works began in Portugal with the purpose of “creating the general triangulation of the Kingdom, with the double purpose of establishing new bases for the theory on the figure of the earth and serve as sound and undisputed basis for the construction of the geographic map of the Kingdom at scale 1:100 000”, IGP is a public body with a national authority in the four fields above referred.

In this role it is responsible for licensing private companies for mapping and cadastral production and for the certification of mapping and cadastre produced by others organizations, with the exception of military and hidrographic cartography.

IGP has a staff of 350, with its head office in Lisboa and six regional offices on Portuguese mainland and autonomous region of Açores. The former office of the autonomous region of Madeira, since this year, is under the regional Government.

2 – RESEARCH AND DEVELOPMENT

IGP develops research activities related to the management of geographical information in areas like remote sensing, environment and socio-economic for support problem solving. The main projects that are being developed during this period are the following:

2.1 BEOT

Support for the implementation of a National scheme for the Bases for a director scheme of land use planning for Continent, financed by National Foundation for Science and Technology, in the scope of the program POCTI of the III Communitarian Framework (Project POCTI/ECM/2592/95).

2.2 CLC2000

Land Cover (2000) Cartographic Production - CORINE Land Cover for the Portuguese Continent, financed by the European Community.

2.3 Senses@Watch

Environmental Systems Collaborative Monitoring: Tools and modelling development in order to obtain and analyse environmental data financed by the National Foundation for Science and Technology—in the scope of the III Communitarian Framework (Project POCTI nº 35651/99).

2.4 GEOMETA

Minimal geographical elements for environmental and spatial analysis, by the National Foundation for Science and Technology–in the scope of the III Communitarian Framework (Project POCTI/1999/GEO/35129).

2.5 PREMFIRE

Prevention and Mitigation of Fire Hazard, financed by the European Spatial Agency. Implemented by a Consortium integrating IGP, Critical Software, SA and Serviço Nacional de Protecção Civil (Nacional Public Protection Agency). This project is based upon information available at the Rede de Informação de Situações de Emergência (Information Network of Emergency Situations).

2.6 LandWaterMed

Geo-Information for sustainable management of Land and Water resources in the MEDiterranean region, supported by INCO-MED –EC- European Commission.

2.7 Agreement with the Comissão Nacional Especializada de Fogos Florestais – CNEFF(National Specialized Commission on Forest Fires)

Forestall and Vegetal Biomass Cartography for the Portuguese Continent.

2.8 Modelling and Mapping Spatial Rainwater Allocation Applied to the Portuguese Continent

Project Developed in Cooperation with the Instituto da Água - INAG (National Water Institute).

2.9 Main Human Actions in the Metropolitan Area of Lisbon e their Effects on the Natural and Cultural Heritage

This is a co-financed project by the National Foundation for Science and Technology –in the scope of the III Communitarian Framework.

2.10 SDM

Sound Data Mining.

2.11 MUBISPI

Spatial Uncertainty: Biodiversity Indicators in the Scope of Physical Planning financed by the National Foundation for Science and Technology – in the scope of the III Communitarian Framework (POCTI/GEO/42351/2001).

2.12 SGIF

Management Information System on Forest Fires.

2.13 Co-Laboratory to Support Management and Monitoring of Watersheds

Web based tool that supports the efficient water resources and land use allocation and management.

2.14 Quality

IGP is, at the moment, implementing a system of quality management, according to ISO 9001:2000, with the objective to obtain the certification in 2005. Data quality and standards are under study, and gradually being implemented at a national level. At European level, trough EuroGeographics, a network of experts is created, in order to

discuss and promote experiences on data quality in geographical information field and quality management. A common specifications for reference data within Europe, regarding the European spatial data infrastructure is being implemented. Also a geographic metadata system, the EuroMapFinder is under development.

3 – EDUCATION AND TRAINING

Professional Education of technical level in the field of Geographical Sciences has been a tradition of all entities preceding the present “Instituto Geográfico Português (IGP)”. The first steps refer to the legislation published in 1833 and 1836, which committed the famous geodesist Filipe Folque to the task of organising a course in Geodesy in order to prepare the military officers involved in the Geodetic work in Portugal.

In a similar environment, emerging from the need to prepare technicians to carry out the tasks committed to the mission of the then called IGC, a professional school has been created in the early 1980s. Its main aims were to ensure the professional education of the Institute’s technical staff, namely in the field of Land Surveying, Cartography and Photogrammetry. Initially, the courses covered essentially the practical aspects, but later on, in 1983, were reformulated and framed in the Portuguese Professional Technical Education System.

In the sequence of the legal environment brought by new legislation and without forgetting the demands of this level of education – not covered by the former system – the school has been integrated in the Public Network Education System, giving birth to the present “Escola Profissional de Ciências Geográficas (EPCG)”, created in September 2000.

Thus EPCG is now installed in new premises, located in the IGP building. EPCG has a long experience and training expertise in this field, benefiting from its links to IGP, namely in terms of its technical team.

The main target of EPCG is to create, organize, promote and offer courses aiming at the education, training and updating of professional technicians, in the field of Planning and Land Management, Environment and Social Infrastructures, supporting the activities of Land Surveying, Mapping and GIS / LIS.

At present, EPCG provides initial education training in the following professional courses:

- a) Surveyor Technician;
- b) Cartographer Technician, which involves two streams or specialisation;
 - Cartographic Draftsman; or
 - Photogrammetric Operator;
- c) Geographical Information Systems (GIS) Technician.

These courses award a level 3 vocational qualification certificate. They are secondary courses and award diplomas equivalent to those awarded by regular secondary educational schools. In the current school year, the number of students is about 190.

Special up-dating courses, for technicians from others public organisations have also been organized, concerning subjects such as GPS, Cartography and GIS. We are looking forward to install some new training programmes for Local Administration staff, concerning new methodologies and digital technologies in Cartography and Cadastre.

In 2000 IGP, through its Formation Centre, was certified as an entity on formation by the Ministry of Social Security and Work. Several courses were given, mainly for Regional Directions, Municipalities and Utilities Services, in the fields of Digital Cartographic Production, Quality Evaluation in Cartography, GPS and Cadastre.

4 – PRODUCTION

4.1 GPS Permanent Stations Network (ReNep)

IGP have a total of eight GPS permanent reference stations. Four of them belong to the Euref Network (Cascais, Gaia, Lagos and Funchal), one is an IGS (International GPS Services) station (Ponta Delgada) and the others three are the densification of the National Network (Beja, Mirandela and Melriça).

4.2 GPS Road Data Base

Elaboration of a comprehensive data base on the national road network, resulting from surveying with kinematic GPS on vehicle.

4.3 Automated Aerotriangulation

For the production of the national topographic map and orthophotomap series at scale 1:10 000, from digital images.

4.4 Procarta

Operational program aimed to establish partnerships with regional and local public authorities for the purpose of large scale official topographic map production and updating.

4.5 Cartographic Information System

Elaboration and maintenance of a database of aerial photography, cartography and orthophotocartography.

4.6 Geodetic Information System

Elaboration and maintenance of a database of the geodetic, high precision leveling and gravimetric networks.

4.7 Cadastral Information System

Elaboration and maintenance of a real estate cadastral database and an administrative boundaries database.

4.8 Cadastre

Execution of real estate cadastre of the municipalities of Mira, Vagos, Ílhavo, Santa Maria da Feira, Cova da Beira, Murtoza and Vale do Vouga.
Rural cadastre maintenance and digital conversion is under way.

4.9 National Topographic Map Series 1:10 000

This map series was designed from the outset to be produced in digital form and to integrate GIS. It is based on a comprehensive object catalogue and multi-cod system. About 15% are under production through partnerships between IGP and several municipalities (see 4.4 Procarta). 35% of the areas of Continental Portugal were available to users in 2002.

4.10 National Orthophotomap Series 1:10 000

This series, started in the 70's, shares the geo-reference system and elevation model with Topo Map series at the same scale, thus assuring full interoperability and enabling the user to choose which data set is instantly more appropriate to its specific needs. Circa 5% of the area of Continental Portugal are currently being up-dated (the series does not cover Açores and Madeira). From 1998 on, production is made in colour film only.

4.11 National Topographic Map Series 1:50 000

Up dating and vectorisation is under way. A new reference system, ETRS89/Mercator Transverse, was introduced for all the sheets published after 2002. They also have a folded printed version.

4.12 National Topographic Map Series 1:100 000

Production of raster image of the 53 full sheets is completed.

4.13 National Topographic Map Series 1:200 000

The production of raster image of the 12 sheets is completed. Vectorisation of altimetry and hidrography of the 8 sheets of the Continent is under way.

4.14 Topographic Map of Continental Portugal 1:500 000

Publication yearly up-dated version of this vector map started in 1998. 2003 version is under way. Since 2002 a folded printed version is also available.

4.15 Administrative Map

Administrative boundaries surveying is under way. This information and other derived from existing maps, integrates the seamless administrative boundaries of Europe (SABE) dataset compiled from source data provided by 32 National Mapping Organizations. The SABE version 2001 is available.

4.16 International Map of the World 1:1 000 000

Production of raster image of the 3 sheets, under Portuguese responsibility, is completed

4.17 EuroGlobalMap

Portugal participates on the Global Map trough EuroGeographics. Portuguese information was completed this year.

4.18 Continental and Autonomous Regions of Portugal Map 1:2 500 000

Vectorisation and up-date was complete in 2002. Printed version published in 2003.

4.19 EuroRegionalMap

Portugal participates on this project, an European map at scale 1:250 000, trough EuroGeographics. Specifications study is under way in order to adapt them to Portuguese reality.

4.20 Systematic Aerial Photographic Coverage

Up dating of coverage at scale 1:15 000 initiated in the 60's. From 1999 on, production is made in colour film only. Since 2003, the scale changed to 1:22 500.

4.21 Information and library

O Centro para a Documentação e Informação – CDI (The Information and Library Department) is responsible for the preservation, maintenance, diffusion and reproduction of ancient maps and other IGP publications and also responsible for management of the scientific and technical information available in the area of geographical sciences. It includes a specialized Library and a Map Library.

The purpose of CDI is to make the Institute's scientific and cultural heritage accessible, and to bring the collections to everyone's knowledge. A digital data base on IGP historical map collection is being created, as well a digital data base on IGP available products, comprising both image and metadata description, enabling search and order through the Internet. (<http://www.igeo.pt/IGEO/portugues/servicos/Biblioteca.htm> / e-mail: cdi@igeo.pt).

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1 – INTRODUCTION

The Serviço Cartográfico do Exército (SCE) became the Instituto Geográfico do Exército (IGeoE) (The Army Geographic Institute) on 1 July 1993 upon order 72/MDN/93 of the Ministry of Defence, thus becoming the natural heir to the longstanding Portuguese military cartographic traditions. IGeoE became the organism responsible for the production of Military cartography under the aegis of the Logistic Command.

The Institute's mission are divided into two areas:

- **National Defense**
Respond to army needs and support all the other branches of the ARMED FORCES with cartographic documentation and information (including all the commitments with NATO policies).
- **Civilian Support**
Provide cartographic documentation and information, as well as co-operation in public projects.

2 – RESEARCH AND DEVELOPMENT

Since 1987 the IGeoE has been presenting projects geared to the conversion of the production line from traditional analogue methods to digital production, while simultaneously keeping pace with scientific forefront of national cartography. Thus since 1995, IGeoE has been developing nine projects, which, whilst independent, share the same goals: the exclusive use of digital processes in cartographic production.

2.1 The Geographical Digital Database – start in 1988

Corresponds to a topo-cartographic database pertaining to all cartographic produced by IGeoE, and the necessary means for its elaboration irrespective of whether this implies updating existing cartography or converting reproduction elements obtained by conventional methods.

2.2 Satellite Data in Small Scale Map Revision – start in 1990

Involves all the necessary means for satellite image processing with a view to updating small scale cartography (1/250 000) and obtaining orthoimages.

2.3 Global Positioning System – start in 1992

A set of means for the reception and processing of satellite signals leading to the obtention of tridimensional co-ordinates of topographic ground control points.

2.4 Military Geographic Information System – start in 1994

Will permit a more dynamic use of digital cartographic information by establishing interactive links with other non-cartographic information, thus producing a more realistic characterization of the said representation. Other military projects under the scope of the Geographic Information System will also be supported.

2.5 Digital Terrain Model – start in 1994

Includes the means necessary for building in automatic digital terrain model from digitized aerial photographs and the production of orthophoto maps.

2.6 Map Revision – start in 1995

Consolidates the material resources necessary to render the remaining projects viable and efficient with the purpose of accomplishing the goal of a complete digital cartography of Portugal at a 1/25 000 scale by the year 2004.

The project's conclusion was postponed due to several reduction budget.

2.7 Digital Orthophotomaps – start in 1996

This project is part of a protocol signed with the NGIC with the objective of carrying out the orthorectification of 4 500 photographs, of false colour areas. This involves the total coverage of Portuguese continental territory. The images have the following characteristics:

- Pixel: 1 meter;
- Control points: obtained from the 1/25 000 cartography;
- DTM: 1/25 000.

2.8 Census 2001 – start in 1997

This project had begun with a protocol signed with the National Institute of Statistics, aimed to provide cartographic support of the 2001 Census. In this project was involved more than 30 people, 25 workstations and 10 A0 plotters.

2.9 VMAP (Vector Smart Map) – start in 1996

This project involves several NATO countries in the field of Geographic Information Systems. The objective of this project is to produce digital cartography data of the terrestrial globe on a scale 1/250 000, linked to a non-graphical database.

The IGeoE is updating the areas of Portuguese territory.

2.10 CNEFF – start in 2002

This project has begun with a protocol signed with the “Comissão Nacional Especializada em Fogos Florestais (CNEFF)”. The aim of the project is to provide cartography on both scales 1/50 000 and 1/100 000, based on satellite images in order to prevent and combat fire forestry.

3 – EDUCATION AND TRAINING

The IGeoE educational program offers 4 courses in different areas:

- Photogrammetry;
- Cartography;
- Survey;
- Imagery Interpretation;
- Geographic Information System.

4 – PRODUCTION

4.1 Geographic Database

Data acquisition using digital stereo-plotters and colour aerial photographs digitized.

4.1.1 Series 1/25 000

Amongst the nine cartographic series on Continental and Insular Portugal for which IGeoE is responsible, the Military Map of Portugal at 1/25 000 scale (series M888, M889 and P821) is the most well known within the community.

4.1.2 Series 1/50 000

“Automatic” generation of the Geographical Database features.

4.1.3 Series 1/250 000

Up-to-date maps using satellite imagery.

4.1.4 Series 1/500 000

Up-to-date maps using satellite imagery.

4.1.5 Scanning and Digitizing

For all the series where digital information is not yet available using stereo-plotters, but only for the following six themes:

- Altimetry;
- Hydrography;
- Routes;
- Boundaries;
- Railroads;
- Toponym.

4.1.6 Military Applications

- Orthophotos
- DTM
- Slopes maps
- Interdiction and Restriction Areas
- Visibility and Non-Visibility Areas
- Other Themathic maps

5 – PUBLICATIONS

5.1 Manual on Photographic Interpretation

This manual is an adapted translation of the TM 30-245 (USA), published in 1954. It is geared to educational purposes as a study aid for participants in the Image Interpretation Courses taught at IGeoE attended by military staff from the three branches of the Armed Forces. In addition to basic theory on reading and interpreting aerial photographs, it also covers other areas such as:

- Techniques of measurement;
- Reading and Interpretation;
- Interpretation Reports;
- Maps Projection Systems;
- Referecing Systems;
- Photomaps and Mosaics.

5.2 Manual on Maps Reading

The main aim of this manual is to help the user to obtain the maximum information and benefit possible from any cartographic document.

It is a guide for every user of topographic maps containing general instructions on:

- Marginal information;
- Grids;
- Scales;

- Size/Dimensions;
- Relief;
- Bearing and direction assessment;
- Maps and relief-maps;
- Aerial photographs;
- Mosaics;
- Photomaps.

5.3 Gazetteers

These consist of an alphabetic list of the current toponyms used in the different series of maps published by IGeoE and other organisms. The toponyms present in the specific case of the gazetteer on Continental and Insular Portuguese territory, refer those contained in editions of the 1/25 000 Military Map of Portugal.

Each publication includes the following information:

- 1st column - toponyms
- 2nd column - abbreviations
- 3rd column - GAUSS coordinates (M)
- 4th column - GAUSS coordinates (P)
- 5th column - referencing code of territory
- 6th column - identification code of the cartographic document
- 7th column - sheet number and respective series

5.4 Manual for the Auxiliary Surveyor

This publication is intended for educational study and is a complement to the Topographic Courses taught at IGeoE. It can also be regarded as an aid for the surveyor, in that it covers not only basic concepts but also rather complex ones. It deals with subjects such as algebra, decimal logarithms and trigonometry. It focuses on the depiction of Earth's surface, the tools used in field work and also on the various methods of topographic survey used by the IGeoE.

5.5 Referencing Systems

This publication contains information describing the fundamental principles upon military referencing systems are used.

5.6 Complementary Data to the 1/250 000 scale Military Map of Portugal – series M586

This series represents an attempt to logically and coherently produce sets of information which cannot be portrayed on the map but are a fundamental tool for any spatial operation to which they refer. Data on physical, demographic, social, economic and transportation was collected from a varied bibliographical selection. The IGeoE is well aware that the work carried out is not as yet a complete one. However the hope is that an important contribution to Military Geographic Information has been made.

5.7 General Notions of Geodesy

This publication is intended to systematize and standardize a set of terms in the field of geodesy and which are deemed as being of the utmost importance for the basic training provided in the Cartographic Courses taught in IGeoE.

5.8 Complements of Topography

This publication is intended to systematize and standardize a set of terms in the field of topography and serves for educational study.

5.9 Routes Map of Continental Portugal, in Scale 1/250 000

This publication contains the same cartographic information as the series M586. The format and the size of this book allows an easy and quick view of main roads.

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1. INTRODUCTION

According to the Portuguese law the main mission of the *Instituto Hidrográfico* (IHPT) is:

- “The execution of the cartography of the interior and territorial waters and other waters of national interest (...);”
- “National Authority for the publication of official nautical chart and other official nautical publications (...);”
- “To conduct activities related with marine science and technology (...).”

2. RESEARCH AND DEVOPMENT

To respond to the demand of chart update, the IHPT maintains a program of enhancements of the chart updating software developed by IHPT in 1996 for HP-UX operating system.

At the same time a Microsoft Access database for all the Notice to Mariners was developed to assist the chart updating process.

After a period of time for personnel training, software testing and assessment of software capabilities, the year of 1999 was the final step when IHPT started the effective production, quality assurance/quality control (QC/QA) of ENC's as well as the update services. At the beginning, the team has four persons, but later on two more persons joining to the team.

In 2000 the European Electronic Navigational Chart Coordinating Centre PRIMAR was split in two. One was denominated PRIMAR-STAVANGER and the other one International Centre for ENC's (IC-ENC). The International Centre for ENC's is an association of national hydrographic organizations working together to harmonize the production and distribution of high quality official electronic charts. Our common goal is to promote safer navigation at sea.

The Portuguese contribution inside the International Centre for ENC (IC-ENC), includes:

- an active participation at the Transfer Standard Maintenance and Application Development (TSMAD) Working Group;
- an active participation at the IC-ENC Technical Experts Group;
- an active participation at the Committee on Hydrographic Requirements and Information Systems (CHRIS);
- the production, quality assurance and quality control of the ENC's;
- the delivery of the ENC's produced by IHPT to the IC-ENC;
- the delivery of the updates to the cells produced by the IHPT to IC-ENC;

3. EDUCATION AND TRAINING

During the period of 1999-2003, the IHPT organized some training with the new tools of the CARIS software:

- CARIS LAW OF THE SEA (LOTS)
- CARIS HIPS/SIPS
- CARIS HYDROGRAPHIC OBJECT MANAGER (HOM)
- CARIS RASTER CHART MAINTENANCE SYSTEM (RCMS)

And some training with other vendor tools which IHPT uses for some conversion purposes:

- ARC GIS
- ARC MAP
- ARC CATALOG
- ARC GIS 3D ANALYST

Regarding electronic charts and during the period concerned in this report, the IHPT still continue the training of personnel involved in ENC production and has made one training session in “ENC Tools – SevenCs” for refresh and upgrade purposes.

4. PRODUCTION

In the context of Nautical Charts Production from the Portuguese responsibility areas, production programs were created as follows:

- **New Charts:** The aim of this program is to cover, with New Charts, in different scales, all maritime areas of national responsibility, and other areas where Portugal assumed international commitments in the context of the International Hydrographic Organization (IHO).
- **New Editions:** The aim of this program is to ensure the coverage of the maritime areas of national interest and responsibility with updated editions of charts previously

The IHPT produces nautical charts either in paper form – Nautical Official Chart, or as electronic chart – Electronic Navigational Chart.

4.1 Paper Charts

4.1.1. Traditional Cartography

In the period concerned (1999/ present date), the traditional cartography production was focused namely in the production of New Charts. However, the production of nautical charts by traditional methods tends presently to be residual, as the computerized based cartography tends to assume all of the paper chart production.

4.1.2. Computer Assisted Cartography

Production of the Nautical and Thematic charts in the IHPT is carried out by modern computerized graphic methods. A vector system using CARIS GIS software is combined with a raster-based system.

The raster system used at IHPT is SCITEX 280 System. A high scanner is used for black and white line originals. The scanned files are transformed into vector format using CARIS SAMI software. After the information has been vectorized, it is transferred into the CARIS software for concatenation of lines, symbols and text to get their final shape, and to have the areas with correct colours and patterns. All colours, patterns, text fonts, lines and symbols are stored in a master file library. The vector information can be imported from external map systems.

4.2 Electronic Charts

Electronic Navigational Charts are official nautical charts produced by national hydrographic organizations which are designed primarily for use on Electronic Chart Display and Information Systems (ECDIS).

ENC's are produced in S-57, a data transfer standard. However because of the way it is written, this standard is often interpreted in different ways. It is therefore important that IHPT produces a consistent ENC product which, when used together, provide the mariner with a safe and reliable source of information from which to navigate. For that reason, the team creates a set of more prescriptive rules than S57 which are now the guidelines of production of ENC's at IHPT.

In the context of electronic charts and during the 1999-2002 periods, the production was namely focused in coastal areas and the main harbours of Continental Portugal. After the completion of those mentioned areas, the IHPT started with the production of ENC's from Madeira and Açores Archipelago. Here the production was focused in coastal areas and main harbours too.

For quality assurance of the ENC's produced, the IHPT organized two kinds of quality control:

- one kind of quality control is made by another person of the production team and using either automatic and manual tools;
- the other is made by another person outside the team and through manual verification. This verification is made by one well known and widely used ECDIS system on a desktop computer at the office.

All this process is complex and time consuming because all the data contained in the ENC file must be verified and codified with objects and with the respective attributes. The quality assurance process originates a list of errors and warnings that must be understood and what is the better way to correct them.

Until the end of the year, the IHPT estimates the production of a total of 46 ENC's and the respective updates as well as some new editions of some cells. The cells produced were delivered to IC-ENC for commercialization.

The production of Portuguese ENC's is made with two kinds of software:

- ENCDesigner and ENCOptimizer from SevenCs – Germany;
- CARIS Hydrographic Object Manager, from Universal Systems Ltd. – Canada.

The quality control of these cells is made with three kinds of software:

- ENCDesigner, from SevenCs – Germany;
- dKart Inspector, from Hydro Service – Norway;
- Navisailor 2400 ECDIS, from Transas – Russia.

The updates to the cells are made with one kind of software:

- ENCManager, from SevenCs – Germany.

5. PUBLICATIONS

The next tables show the Portuguese Nautical Chart Production from 1999 to 2002.

PUBLICATION OF ELECTRONIC NAVEGATIONAL CHARTS (1999 - 2002)

ENC Nr.	Paper chart nr.	Title	Compilation scale	Edition	Date of edition
PT 141101	41101	Azores Archipelago	500 000	1	DEC 00
				2	JUL 01
PT 243102	43102	Azores Archipelago – Central Group	150 000	1	SEPT 00
				2	JUL 01
PT 243103	43103	Azores Archipelago –Oriental Group	150 000	1	SEPT 00
				2	JUL 01
PT 324201	24201	Caminha to Aveiro	75 000	1	MAR 02
PT 324202	24202	Aveiro to Peniche	75 000	1	JAN 01
				2	JUL 01
PT 324203	24203	Nazaré to Lisboa	75 000	1	JUL 01
PT 324204	24204	Cabo da Roca to Sines	75 000	1	DEC 01
PT 324205	24205	Cabo de Sines to Lagos	75 000	1	JUL 00
				2	JUL 01
PT 324206	24206	Cabo de S. Vicente to Foz do Guadiana	75 000	1	JUL 00
				2	JUN 01
				3	OCT 01
PT 346405	46405	Terceira Island	37 500	1	JUL 02
PT 346406	46406	S. Miguel Island	50 000	1	JUL 02
PT 426401	26401	Approaches to Viana do Castelo	15 000	1	MAR 02
PT 426402	26402	Approaches to Leixões	15 000	1	NOV 00
PT 426408	26408	Approaches to Sines	15 000	1	JUN 01
PT 436402	36402	Câmara de Lobos to Ponta de S. Lourenço	15 000	1	NOV 02
PT 526303	26303	Entrance of Lisboa harbour and Cascais bay	7 500	1	AUG 98
				2	JAN 00
				3	JUN 01
PT 526304	26304	Lisboa harbour(Paço de Arcos to Terreiro do Trigo)	7 500	1	MAY 00
				2	JUN 01
PT 526305	26305	Lisboa harbour (Alcântara to Montijo)	7 500	1	JAN 01
				2	JUN 01
PT 526306	26306	Lisboa harbour (Cais do Sodré to Sacavém)	7 500	1	JAN 00
				2	JUN 01
				3	NOV 02
PT 526310	26310	Entrance and Portimão harbour	3 750	1	FEB 02
PT 528501	26401	Viana do Castelo harbour	3 750	1	MAR 02
PT 528505	26402	Leixões harbour and entrance of rio Douro	5 000	1	JUL 01
PT 528514	26408	Sines harbour	5 000	1	JAN 01
PT 538506	36402	Funchal harbour	5 000	1	NOV 02
PT 548514	46405	Angra do Heroísmo harbour	5 000	1	JUL 02
PT 548515	46405	Praia da Victoria harbour	5 000	1	NOV 02
PT 548519	46406	Ponta Delgada harbour	5 000	1	NOV 02

PUBLICATIONS OF OFFICIAL NAUTICAL CHARTS – PAPER CHARTS (1999 –2002)

	1999		2000		2001		2002	
	No		No		No		No	
New Charts	25R10	Ponta da Atalaia ao Burgau	25R01	Caminha a Leça da Palmeira	25R04	Figueira da Foz a S.Pedro de Muel	26407	Cabo Espichel ao Portinho da Arrábida (Plano do Porto de Sesimbra)
	25R11	Ponta de Sagres a Vilamoura	25R02	Leixões a Aveiro	25R05	S.Pedro de Muel a Peniche	11101	Portugal Continental, Arquipélago dos Açores e Arquipélago da Madeira
	25R12	Vilamoura à Foz do Guadiana	25R03	Aveiro à Figueira da Foz	25R06	Cabo Carvoeiro ao Cabo da Roca	36201	Ilha da Madeira e Ilhas Desertas
	24205	Cabo de Sines a Lagos	24P05	Cabo de Sines a Lagos	24P04	Cabo da Roca ao Cabo de Sines	36402	Câmara de Lobos à Ponta de S.Lourenço (planos dos Portos do Funchal e do Caniçal)
	24204	Cabo da Roca ao Cabo Espichel	46407	Ilha de Santa Maria e Ilhéus das Formigas	23202	Cabo Silleiro ao Cabo Carvoeiro	46401	Ilhas da Flores e do Corvo (Planos dos portos das Lajes, Santa Cruz das Flores e do Port da Casa)
	24P06	Cabo de São Vicente à Foz do RioGuadiana	46201	Canal de São Jorge (Ilhas de S.Jorge e do Pico)	24203	Nazaré a Lisboa		
	27502	Enseadas do Belixe, Sagres e Baleeira e Ponta da Piedade à Praia do Vau	26402	Aproximações a Leixões e à Barra do Rio Douro (Porto de Leixões e Barra do Rio Douro)	26401	Viana do Castelo (Barra e Porto de Viana do Castelo)		
	24201	Caminha a Aveiro	26405	Peniche e Ilhas Berlengas (Planos do Porto de Peniche, Farilhões e Berlenga)	26408	Sines (Porto de Sines)		
	46403	Ilha do Faial e Canal do Faial	24202	Aveiro a Peniche	36401	Ilha de Porto Santo (plano das Baía do Porto Santo e porto do Porto Santo)		
					46405	Ilha Terceira (planos dos Portos da Praia da Vitória e de Angra do Heroísmo)		
				46406	Ilha de S.Miguel (plano do Porto de Ponta Delgada)			

	1999		2000		2001		2002	
	No		No		No		No	
New Editions	23203	Lisboa ao Cabo de São Vicente	26305	Porto de Lisboa (de Alcântara ao Canal do Montijo)	26310	Barra e Porto de Portimão	21101	Portugal Continental
	96301	Macau- Portos de Macau, Taipa e Coloane	26307	Porto de Lisboa (de Sacavém a Vila Franca de Xira)	24206	Cabo de S.Vicente à Foz do Guadina	23204	Cabo de S.Vicente ao Estreito de Gibraltar
	26304	Porto de Lisboa (Paço de Arcos ao Terreiro do Trigo)	41101	Arquipélago dos Açores	25R07	Cabo da Roca ao Cabo Espichel	26306	Porto de Lisboa (do Cais do Sodré a Sacavém)
	43102	Arquipélago dos Açores-Grupo Central	26303	Baía de Cascais e Barras do Rio Tejo (Porto de Lisboa)	25R08	Cabo Espichel à Lagoa de Santo André	26308	Barra e Porto de Setúbal
	43103	Arquipélago dos Açores-Grupo Oriental			25R09	Lagoa de Santo André ao Cabo Sardão		
				25R11	Ponta de Sagres a Vilamoura			
				25R12	Vilamoura à Foz do Guadiana			

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	1999		2000		2001		2002	
	No		No		No		No	
New Reprints	36	Ponta da Atalaia ao Burgau	25R10	Ponta da Atalaia ao Burgau	26311	Barra e Portos de Faro e Olhão	24204	Cabo da Roca ao Cabo de Sines
	25R07	Cabo da Roca ao Cabo Espichel			24P06	Cabo de S.Vicente à Foz do Rio Guadiana	25R10	Ponta da Atalaia ao Burgau
	25R08	Cabo Espichel à Lagoa de Santo André			25R07	Cabo da Roca ao Cabo Espichel	24204	Cabo da Roca ao Cabo Espichel
	25R09	Lagoa de Santo André ao Cabo Sardão			25R08	Cabo Espichel à Lagoa de Santo André		
	25R11	Ponta da Piedade ao Cabo de Santa Maria			25R09	Lagoa de Santo André ao Cabo Sardão		
	25R12	Cabo de Santa Maria à Foz do Guadiana			25R11	Ponta de Sagres a Vilamoura		
	25R10	Ponta da Atalaia ao Burgau			25R12	Vilamoura à Foz do Guadiana		

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1- INTRODUCTION

The origin of the Tropical Sciences Research Institute (IICT) dates from 1883, when a “Cartography Commission” was created to promote the scientific study of the ancient Portuguese colonies in Africa and to establish the basis for their scientific occupation. It was the first Portuguese Institution devoted, in a permanent way, to develop scientific research in the tropics.

IICT is an important instrument of the Government’s policy concerning scientific, technical and cultural relations with the Portuguese – speaking country in Africa. The Institute includes 23 specialised research centers, integrated in 6 Scientific Departments which embraces areas such as: Agrarian Sciences, Geographic Engineering, Biological sciences, Historical, Economics and Sociological Sciences, and Ethnological Sciences.

The Department of Geographic Engineering is divided into the Cartographic Centre, The Photogrammetric Centre, and Geodetic Centre since the reorganization of the Colonial Geographical Centre and the Geographical Missions in April 1983. However the origin of the Department coincides with the origin of the Institute in 1883. However the origin of the Department coincides with the origin of the Institute in 1883 with the Cartography Commission which had amongst its objectives “(...) to make and publish maps and geographic news, representing the results of continuous investigations (...)”. Since then the structure of the Institute changed several times, maintaining always as one of its objectives to carry on with studies related with cartography and the production of maps of the Portuguese ex-colonies. Nowadays the Department of Geographic Engineering is concerned with the implementation and promotion of the automatic techniques connected with cartographic programs which include Remote Sensing, Digital Photogrammetry, Geographic Information Systems and Image Processing. The Department is also responsible for the unique geographic data archives of the Institute, and the development and the exchange of scientific activities.

2- RESEARCH AND DEVELOPMENT

The research activity in the cartographic and Photogrammetric Centres is related with the implementation of the research projects involving the most recent cartographic methodologies. The following list describes the projects presently under research:

2.1. Project Title: Digital mapping and its application in the management of water and land resources and the policy-making.

Institutions involved:

IICT - Instituto de Investigação Científica Tropical, PORTUGAL
Institute of Geography - Hebei Academy of Sciences, CHINA

The goal of this project is to set up a model to the management of land and water resources. The main objectives are to develop an erosion and a water model, to study the dynamic change of the water and land resources as well as, the environment, by using Remote Sensing techniques and Geographic Information Systems.

2.2. Automatic Methods For Cartographic Updating Using Satellite Imagery

Institutions involved:

CVRM - IST (Coordinator - F. Muge); IICT - Instituto de Investigação Científica Tropical; IDMEC - Instituto de Engenharia Mecânica; INESC - Instituto de Engenharia de Sistemas e Computadores.

The goal of this project is to develop and implement methodologies in order to:

- Update cartographic maps reducing production costs and time.
- Automatic identification of cartographic entities (urban areas, wetlands, shorelines, routes, forest boundaries), from Remote Sensing imagery by
 - scanning and processing selected maps.
- Cartographic layer's vectorization and its integration into a GIS.
- Pre-processing of satellite images.
- Automatic recognition of cartographic objects from satellite imagery, using Mathematical Morphology, Geostatistics and Artificial Neural Networks techniques.
- GIS integration of updated cartographic layers.

2.3. Photogrammetric archives integrated into a 3D city model for preservation of cultural heritage

Institutions Involved:

Secretaria Regional da Habitação e Equipamento – Azores
Direcção Nacional de Geografia e Cadastro (DINAGECA) – Mozambique
Direcção de Serviço de Cartografia e Cadastro (DSCC) – Cape Verde

Historical buildings and ancient monuments represent valuable cultural heritage that is in danger of damage or destruction because of the risk of some individual or multiple catastrophe caused by human or natural interference. The importance of creating photogrammetric archives for safeguard historical monuments is recognized.

The use of multimedia techniques to present and visualize geometric data, turns the conventional photogrammetric archive into a dynamic and more complex system. The combination of 3D data acquisition, 3D modeling and 3D visualization is a powerful tool which can be used to create the required photogrammetric archive to support the monument's conservation.

3- EDUCATION AND TRAINING

The Geographic Engineering Department is responsible for education and training concerning subjects such as cartography, digital photogrammetry, image processing, remote sensing and geographic information systems. Short and long term courses are provided to students and researchers from Portuguese universities and from other countries, namely Portuguese speaking countries in Africa.

4- PRODUCTION

Between 1883 and 1974 the institutions which proceeded IICT were responsible for the production of cartography of the Portuguese speaking countries. Since then IICT has been producing several thematic maps such as the hypsometric and the vegetation maps of Cape Verde and geological maps of Cape Verde, Guiné and Angola. The following list describes some of the work produced by the Institute concerning the geographical maps of the ex-portuguese colonies.

ANGOLA (1/5 000 000, 1:2 000 000, 1/1 000 000, 1/250 000, 1/100 000)

CABO VERDE (1/1 000 000, 1/500 000, 1/100 000, 1/75 000, 1/50 000)

INDIA – GOA, DAMÃO AND DIU (1/750 000, 1/300 000, 1/250 000, 1/60 000, 1/50 000)

GUINÉ-BISSAU (1/500 000, 1/50 000)

MACAU (1/25 000)

MOÇAMBIQUE (1/2 000 000, 1/500 000, 1/750 000, 1/250 000)

S. TOMÉ E PRÍNCIPE (1/75 000, 1/50 000, 1/25 000)

TIMOR (1/500 000, 1/50 000)

Maps produced after 1999:

- Hipsometric map of Maio island – Cape Verde, 1/50 000
- Hipsometric map of S. Vicente island – Cape Verde, 1/50 000
- Hipsometric map of Boavista island – Cape Verde, 1/50 000
- Soils map of Angola – District of Bié, 1/750 000
- Carta Agro-ecológica e da Vegetação de S. Tomé e Príncipe, 1/50 000

5- SCIENTIFIC PUBLICATIONS

Arino, O., I. Piccolini, E. Kasischke, F. Siegert, E. Chuvieco, P. Martin, Z. Li, R. H. Fraser, H. Eva, D. Stroppiana, J.M.C. Pereira, J. M. N. Silva, D. Roy and P. Barbosa (2001). Burn scars mapping methods. In: **Global and Regional Wildfire Monitoring from Space: Planning a Coordinated International Effort**, F. J. Ahern, J. Goldammer, and C. Justice, editores. SPB Academic Publishing, The Hague, Netherlands, in print

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Pereira, J.M.C., S. Flasse, A. Hoffman, J.A.R. Pereira, F. González-Alonso, S. Trigg, M.J.P. Vasconcelos, S. Bartalev, T.J. Lynham, G. Korovin, and B.S. Lee (2001) Operational use of remote sensing for fire management: regional case studies. In: **Global and Regional Wildfire Monitoring from Space: Planning a Coordinated International Effort**, F. J. Ahern, J. Goldammer, e C. Justice, editores. SPB Academic Publishing, The Hague, Netherlands, in print.

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Sá, A.C.L. ;J.M.N. Silva; J.M.C. Pereira; and M.J. Vasconcelos (2001) Burned Area Detection in the Miombo of Northern Mozambique using MODIS and Landsat Data. Accepted for publication and presentation at the **3rd International Workshop - Remote Sensing and GIS Applications to Forest Fire Management**. EARSeL and University of Alcalá, Paris May 17-18, 2001.

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1 – INTRODUCTION

The IDRHa belongs to the Ministry of Agriculture, Rural Development and Fisheries. It has a wide range of tasks to support development policies related with rural development, to increase the added value of traditional products, the agrarian and farmers association professional training as concerns the co-ordination and multifunction role related with the rural world, to support the setting-up of development policies related with the conservation and use of water resources in agriculture, the development of water board districts, the agricultural mechanisation and rural electrification, the rural-infrastructure, the use of soil and rural and development plan, and to achieve conservation and environmental sustainability on the rural world. Its detailed tasks are as follows:

- To prepare and set-up the National Irrigation Development Plan. To ensure the participation and to assure the improvement as a representative of the Ministry of Agriculture on the water resource's National Planning, river basins integrated plans and on the rural planning procedures.
- To propose the headlines and main strategic guidelines for a sustainable and global management of land and water resources, owing to their conservation through the application of correct agricultural technologies on the frame of a sustainable agriculture.
- To evaluate and propose technical economical and legal measures owing to the optimisation of the management of Irrigation areas.
- To promote the use of the agricultural components of the hydraulic infrastructures for multipurpose uses and to promote the development of the current used agricultural networks.
- To co-operate on the execution of preliminary studies and general plans for the agricultural hydraulic networks and to plan work development, irrigation network and infrastructures according to institutional responsibilities on the frame of the Ministry of Agriculture.
- To promote the launching of call for tenders, concerning irrigation and drainage projects, co-ordinating the participation of the different partners in the related projects.
- To supply technical information to the Regional Agricultural Directorates on irrigation projects, agricultural engineering and mechanisation actions.
- To ensure, in co-operation with other related institutions, the technical follow-up of land water use for agriculture purposes at national, EU and international level. To promote, in co-operation with the Regional Directorates of agriculture and agricultural associations, reallotment projects and new planning of agricultural holdings

On the frame of activities related with management of the Portuguese irrigation and drainage infrastructures under the responsibility of the IDRHa land use and infrastructures maps are available in conventional formats, mostly used for water management and tax payments.

The IDRHa is the entity who has the institutional attribution on frame of the Ministry of Agriculture for the publication of land use maps of Portugal at scale 1:25 000. By several reasons namely the improvement of new cartographic techniques (high altitude aerial photo, remote sensing, softcopy cartography) the cartographic data on conventional form have not been updated.

The IDRHa have, under execution (to be finished by the end of 2003), a modern digital cartography of soil and land use, in a scale 1:100 000, with a GIS associated, covering an area of 1 750 000 ha, in interior part of the country .

2 – RESEARCH AND DEVELOPMENT

Several Projects on the area of water management and environmental protection as it is the case of the ASTIMWr, MULINO and DEMETER UE Projects, concerning the use of detailed cartographic information, Remote Sensing and GIS Techniques for the sake of water and environmental management.

3 – EDUCATION AND TRAINING

Improvement of the management of digital cartography in different formats and structure of information.

Setting-up of an internal infra-structure for the purposes of the internal and external uses.

Setting-up of a team owing to manage data at different levels of approach, different infra-structures and softcopy photogrammetry formats

4 – PRODUCTION

Execution of aerial photo coverage, orthophoto production for:

- Cova da Beira Irrigation Projects scale 1:5000 with altimetry – 5 750 ha.
- Mondego Irrigation and Reallotment Project scale 1: 2000 with altimetry – 31 600 ha.

Detailed database exploration, to produce thematic cartography to support planning and decision in the purpose of water management and environmental protection,

Soil maps, to identify sensitive areas of the country to desertification.

Soil maps of Portugal (Continental area), scale 1:25 000, by identification n^os:

183, 184, 185, 186, 194, 195, 196, 197, 201, 202, 205, 205A, 206, 207, 208, 212, 213, 216, 217, 218, 219, 225, 226, 227B, 228, 229, 230, 238A, 239, 240, 241, 248B, 249, 250, 251, 252, 253, 260, 261, 262, 263, 264, 265, 266, 267, 268, 272, 273, 274, 275, 276, 277, 278, 279, 280, 284, 285, 286, 287, 288, 289, 290, 291, 292, 296, 297, 298, 299, 300, 301, 302, 203, 304, 308, 309, 318, 319.

Fisiographic map, scale 1:100 000, covering all the Alqueva Irrigation Project area.

Suitability for irrigation map, scale 1:100 000, covering all the Alqueva Irrigation Project area.

Suitability for irrigation map, scale 1:10 000, covering all the Alqueva Irrigation Project area.

Land reallotment maps, scales 1:2000 to 1:5 000, for agriculture development projects, in different rural areas of Portugal:

- Baixas de Óbidos e da Amoreira – 1370 ha
- Lis – 1045 ha
- Luz – 1980 ha
- Vale da Vila – 995 ha
- Vilarelho da Raia – 800 ha

5 – PUBLICATIONS

- ASTIMWR-Application of Space Techniques to the Integrated Management of a River Basin Water Resources- Final Report January 1999- EU-DG XII –Centre for Earth Observation.
- DEMETER-DEMonstration of Earth Observation TEChnologies in Routtne irrigation advisory services.- User Requirementst Document (URD)- Version 01- 39 March 2003

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1 – INTRODUCTION

The Directorate General of Forests (DGF) is a central body of the Ministry of Agriculture, Rural Development and Fisheries (MADRP) and has its head-office in Lisboa. DGF is the National Forest Authority and is responsible for the design of the national forest policy.

The major task of DGF is the coordination of forest plans/policies while sub-national/local forest public services have a more operational and practical role. This organizational framework, consisting of a central coordinating body and sub-national services, was introduced in 1996, when a new MADRP organizational structure was outlined.

DGF is also the Portuguese public authority responsible for the certification of forest thematic cartography, at the national and sub-national levels.

2 – RESEARCH AND DEVELOPMENT

According to what was stated in 1. and to the main tasks of DGF, no major research roles are committed to this central MADRP body. This includes cartographic research tasks. Forest investigation, including cartography, is committed to other public institutions.

Nevertheless, in order to carry out some important tasks with a cartographic dimension, DGF asks national/international expertises/institutions/universities to participate and contribute or even to develop the whole process.

In spite of what was stated above DGF is frequently asked by other private/public institutions to participate in broader framework scientific programmes, taking in account its position of Forest Authority and/or as a central body that will benefit with the final information.

For instance, DGF has co participated, with the former Civil Protection National Service (SNPC), the Army Geographic Institute (IGEOE) and the former Geographic Information National Centre (CNIG), in a two year cartographic development project (2000-2002) which produced sub-national cartography for forest fires prevention, at a national scale. This cartographic output had several information layers concerning vegetation types, forest fire prevention structures, different types of roads, water points, etc.

Using Remote Sensing, DGF is also designing a research and development project with Portuguese Geographic Institute (IGP), targeting the mapping of annual clear cuts and new plantations, connected (or not) with forest fires. In a near future, with the technical contributions of this project, DGF intends to establish automatic methods to produce forest thematic cartography, taking in account that fires, clear cuts and the forestation of agricultural lands are the main potential changes to forest lands.

This main purpose is connected with the Forest National Inventory figures, which have also some cartographic outputs, although until now, only in a digital form.

Since 1990, DGF has been developing an annual forest fire mapping and a research project with the Superior Institute of Agronomy (ISA) of the Technical University of Lisbon. Using satellite remote sensing data, one of the main purposes of these studies is the cartographic output of annual forest fires.

Since 1996, DGF has been developing its digital data infrastructure that comprises quite different levels of forest related information. It goes from the geographical database of forest estates managed by MADRP to information related with hunting associations. On what concerns forest estates managed by

MADRP, soil use and occupation cartography is being made since 1999, at a regional level. Until now, DGF has collected digital cartographic information connected with nearly 250.000 hectares.

3 – EDUCATION AND TRAINING

Since 1996, DGF has organized GIS and Remote Sensing programmes/courses, with the technical support of Lisboa universities. This education and training programmes were designed according to what was thought to be important tools to achieve the mains tasks of DGF.

Between 2000 and 2002, some short courses (maximum one week) were programmed to forest rangers and had to do with cartographic interpretation capacity building.

With other aims, nearly 20 technical staff of DGF and sub-national bodies have attended post-graduation remote sensing courses at the Technical University of Lisbon.

DGF has also provided training periods to recent forestry graduated students either from Portuguese or foreign universities, who planned to work with digital cartography. These training periods lasted between six months and one year.

4 – PRODUCTION

From a cartographic point of view, the main DGF production is connected to what was referred in 2., thought at a national, sub- national and local levels.

5 – PUBLICATIONS

The most important DGF publications with cartographic output is the 3rd Revision of the National Forest Inventory, that was finalized in 2000.

Several posters and technical publications were presented/produced either to national or international *fora*. These posters/articles were linked to the technical issues referred in 2.

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1. INTRODUCTION

IGM - Instituto Geológico e Mineiro (Geological and Mining Institute), is the present organisation successor of Comissões Geológicas, Serviços Geológicos de Portugal that, since 1848, have been in charge with the systematic scientific research and geological mapping of the National Territory. They have published a large and relevant set of scientific works, namely geological maps at different scales.

2 - RESEARCH AND DEVELOPMENT

The scientific activity of IGM and of the precedent organisms, includes research on Tectonics, Stratigraphy, Paleontology, Petrology, Geophysics, Hydrogeology, Marine Geology and Economic Geology.

Each geological map results from a detailed field work, with mapping, data and samples collecting, complemented by laboratorial research and analysis. All this work gives place to several scientific papers in national and international scientific reviews, congresses and seminars.

3 - EDUCATION AND TRAINING

IGM researchers involved in geological mapping attend specialized training courses in international research laboratories. IGM also promotes training and gives scientific assistance to master's and PhD's scientists.

4 - PRODUCTION

4.1. Mapping related to metallic ores and other minerals and rocks:

Please see appendix

5 - PUBLICATIONS

5.1- Carta Geológica de Portugal à esc.1/50.000

Folha 3-D Espinhosela (1999) e sua Notícia Explicativa

Folha 4-C Deilão (1999) e sua Notícia Explicativa

Folha 27-C Torres Novas (1999)

Folha 34-C Cascais (1999) e sua Notícia Explicativa

Folha 28-A Mação (2000)

Folha 5-D Braga (2000) e sua Notícia Explicativa

5.2- Carta Geológica de Portugal à esc.1/200.000

Folha 2 Trás-os-Montes (2000)

5.3- Carta das Fontes e do Risco de Contaminação da Região de Entre Douro e Minho, à esc.1/100.000 e sua Notícia explicativa

Folha Norte (1999)

Folha Sul (2000)

5.4- Other maps published under contract and on behalf of cooperation agreements

Carta Geológica Simplificada do Parque Natural da Serra da Estrela, à esc.1/25.000 (1999) e sua Notícia Explicativa, para o Instituto da Conservação da Natureza (Min. do Ambiente).

Carta Geológica do Parque Natural da Ria Formosa, Reserva Natural do Sapal de Castro Marim e Vila Real de Santo António e região envolvente, à esc.1/100.000 (2000), para o Instituto da Conservação da Natureza (Min. do Ambiente).

Carta Geológica Simplificada do Parque Arqueológico do Vale do Côa, à esc.1/80.000 (2000) e sua Notícia Explicativa, para o Ministério da Cultura.

Carta Geológica da Ilha da Inhaca-Moçambique – esc.1/25.000 (1999) e sua Notícia Explicativa, para os Serviços Geológicos de Moçambique.

Carta Geológica de Chogoroi, Angola, à esc.1/250.000 (2002) e sua Notícia Explicativa, para os Serviços Geológicos de Angola.

APPENDIX

Mapping related to metallic ores and other minerals and rocks produced in the period 1999-2003

Nome do Projecto	Carta 1:25000	Região	Trabalho produzido
Prospecção de ouro, prata e metais associados na Faixa Metalífera das Beiras. Sector de Albergaria-a-Velha	175	Albergaria-a-Velha	47 km2 de terreno com reconhecimentos geológicos na escala 1:25000
Projecto CRAFT- Poço Romano. Síntese da cartografia geológica. Área de prospecção da Empresa Connary Minerals	123	Valongo	2.5 km2 de terreno com cartografia geológica na escala de 1:25000
Projecto CRAFT- Covas de Castromil e Serra da Quinta	123	Valongo	<ul style="list-style-type: none"> • 12 km2 de terreno com cartografia geológica na escala de 1:25000 • 1.01 km2 de terreno com cartografia geológica na escala de 1:1000 • 21 galerias e trincheiras de acesso com um comprimento total de 1310m cartografados nas escalas 1:200 e 1:250
Programa Praxis XXI- Aspectos metalogenéticos da região de Castelo branco: Parâmetros controladores das mineralizações e abordagem dos impactos ambientais	257	Pedrogão (Penamacor)	0.56 km2 de terreno com cartografia geológica na escala de 1:2500
Programa Praxis XXI- Vila Verde. Área de Godinhaços.	42	Vila Verde	<ul style="list-style-type: none"> • 2.8 km2 de terreno com cartografia geológica na escala de 1:2500 • 0.1 km2 de terreno cartografado na escala de 1:200
Plano de Acção Nuclear (PAN). Cartografia das folhas localizadas na região das Beiras (centro-oeste de Portugal)	209	Mortágua	28 km2 de terreno com cartografia geológica na escala de 1:25000
Projecto Sapiens. Levantamento topográfico expedito e cartografia de detalhe de um filão aplito-pegmatítico mineralizado com espodumena e petalite	59	Dornela (Boticas)	0.17 km2 de terreno com cartografia geológica na escala de 1:500

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	271	Monfortinho (Idanha - A - Nova)	Carta Mineralométrica da Monazite Nodular, 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325	Póvoa e Meadas (Castelo de Vide)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325	Póvoa e Meadas (Castelo de Vide)	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325	Póvoa e Meadas (Castelo de Vide)	Carta Mineralométrica de Xenótimo
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325 - A	Retorta (Castelo de Vide)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325 - A	Retorta (Castelo de Vide)	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	325 - A	Retorta (Castelo de Vide)	Carta Mineralométrica de Xenótimo
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	336	Santo António das Areias (Marvão)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	336	Santo António das Areias (Marvão)	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	336	Santo António das Areias (Marvão)	Carta Mineralométrica de Xenótimo

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	348	Marvão	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	348	Marvão	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	348	Marvão	Carta Mineralométrica de Xenótimo
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	360	Alegrete (Portalegre)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	372	Assumar (Monforte)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	372	Assumar (Monforte)	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	372	Assumar (Monforte)	Carta Mineralométrica de Xenótimo
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	373	Esperança (Arronches)	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	383	Fronteira	Carta Mineralométrica da Monazite Nodular
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	383	Fronteira	Carta Mineralométrica da Monazite Clássica
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	359, 360, 372	Portalegre-Vale de Cavalos	Carta geológica da Faixa Portalegre-vale de Cavalos; 1:5000

	Todas	País inteiro	Carta mineira de Portugal; 1:500000
	Várias	DREN	Carta de ocorrências minerais da região norte; 1:250000
	Várias	DRELVLT	Carta de ocorrências minerais da região Lisboa e vale do tejo; 1:250000
	Várias	DREA	Carta de ocorrências minerais da região Alentejo; 1:250000
	Várias	DREAAlg	Carta de ocorrências minerais da região Algarve; 1:250000
	Várias	DREC	Carta de ocorrências minerais da região Centro; 1:250000
	Todas	País inteiro	Carta de concessões e contratos mineiros; 1:500000

		Sul	Carta metalogenética do Sul; 1:200000
Projecto Minas abandonadas		Sul	Cartografia de zonas mineiras abandonadas no sul; 1:10000
Doutoramento- Dr. C. Rosas	539-540	Albernoa	Cartografia geológica e de fácies vulcânicas; 1:10000
Parque Geomineiro Cova dos Mouros	574-582	Vaqueiros	Cartografia geológica e mineira – Parque mineiro Cova dos Mouros; 1:10000

	11A	V. Flor	Cartas geoq SedimCorrente Au, As, Cr, Nb, Co, Ni, W, Pb Rb, U, La, Ba, Th, Zn, Cu, Fe, Sb, Mo; 1:50000
	11B	V. Flor	Cartas geoq SedimCorrente Au, As, Cr, Nb, Co, Ni, W, Pb Rb, U, La, Ba, Th, Zn, Cu, Fe, Sb, Mo; 1:50000
	11C	V. Flor	Cartas geoq SedimCorrente Au, As, Cr, Nb, Co, Ni, W, Pb Rb, U, La, Ba, Th, Zn, Cu, Fe, Sb, Mo; 1:50000
	11D	V. Flor	Cartas geoq SedimCorrente Au, As, Cr, Nb, Co, Ni, W, Pb Rb, U, La, Ba, Th, Zn, Cu, Fe, Sb, Mo; 1:50000
	139	Penedono	Cartas geoq SedimCorrente de:As,B,Co,Cr,Cu,La,Li,Ni,Pb,Sn,Zn,Zr,W(anomalias), Factor2, Factor4; 1:25000
	140	Penedono	Cartas geoq SedimCorrente de:As,B,Co,Cr,Cu,La,Li,Ni,Pb,Sn,Zn,Zr,W(anomalias), Factor2, Factor4; 1:25000

	149	Penedono	Cartas geoq Sedim. Corrente de:As,B,Co,Cr,Cu,La,Li,Ni,Pb,Sn,Zn,Zr,W(anomalias), Factor2, Factor4; 1:25000
	150	Penedono	Cartas geoq Sedim. Corrente de:As,B,Co,Cr,Cu,La,Li,Ni,Pb,Sn,Zn,Zr,W(anomalias), Factor2, Factor4; 1:25000
	567	S.Domingos	Cartas geoq parciais de solos As, Cu, Pb, Zn, Hg, Sb, Factor 1; 1:25000
	559	S.Domingos	Cartas geoq parciais de solos As, Cu, Pb, Zn, Hg, Sb, Factor 1; 1:25000
	567	S.Domingos	Cartas geoq parciais de pH de águas superficiais; 1:25000
	559	S.Domingos	Cartas geoq parciais de pH de águas superficiais; 1:25000
	País inteiro	Portugal	Carta Geoquímica de Portugal – FOREGS; 1:1000000

Proj. Palma/Marateca	456	Marateca	Anomalia de Bouguer -; 1:25000
Proj. Palma/Marateca	467	Palma	Anomalia de Bouguer -; 1:25000
Proj. PAN	42A	Grândola	Anomalia de Bouguer (provisória); 1:50000
Proj. PAN	42B	Azinheira de Barros	Anomalia de Bouguer (em preparação); 1:50000
	Geral	Sul do País	Anomalia de Bouguer – A reunir e informatizar os valores
	497	Odivelas	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	498	Grega	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	499	Cuba	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	500	Selmes	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	509	Ferreira do Alentejo	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	521	Beja	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	522	Brinches	Informatizados os valores da Componente Vertical do Campo Magnético (em preparação); 1:25000
	Geral	Sul do País	Componente Vertical do Campo Magnético – A reunir e informatizar os valores

Parque Geomineiro Cova dos Mouros	574-582	Vaqueiros	Cartografia geológica de detalhe do Parque Mineiro da Cova dos Mouros na esc. 1/2000 - 0,25km ² .
Parque Geomineiro Cova dos Mouros	574-582	Vaqueiros	Cartografia geológica da área envolvente ao Parque Mineiro Cova dos Mouros na esc. 1/5000 - 8km ² .
Doutoramento – Dr. J.X. de Matos		Aljustrel	Cartografia de alterações hidrotermais e supergénicas nas cortas de S. Domingos e Algarés (Aljustrel), com apoio de espectrómetro portátil PIMA II nas escalas 1/1000 e 1/2000 – 3km ²
Projecto minas abandonadas	Várias	Sul do país	Cartografia de escombrelas e trabalhos mineiros no âmbito do Projecto Diagnóstico Preliminar de Minas Abandonadas, nas minas de: Zona Sul Portuguesa - Chança (Py), Montinho (Py), Lagoas do Paço (Mn), Ferragudo (Mn), Balança (Mn), Barrigão (Cu), Ferrarias (Cu), Corte Pereiras (Sb). Zona Ossa Morena - Tinoca (Cu), Azeiteiros (Cu), Balóco (Pb), Sta. Eulália (Sn, W, Ti), Caeirinha (Cu), Mostardeira (Cu), Miguel Vacas (Cu), Bugalho (Cu), Mociços (Cu), Botefa (Cu), Aparis (Cu), Defesa das Merções (Cu), Preguiça/V. Ruiva (Pb, Zn), Algarés (Pb, Zn), Orada (Fe) e Alvíto (Fe). (Área cartografada ~30 km ²)

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Au; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 281,282, 283, 294,295,304, 306, 306 ^A , 315B, 324, 325,	Norte Alentejo e Beira Baixa	Cartas geoquímicas da Ag; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do As; 1:25000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Cr; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Co; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Ni; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Mo; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Sb; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Ta; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do W; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Th; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do U; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Sc; 1:25000

Estudos de inventariação do potencial em recursos de Terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Y; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Cs; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do La; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Ce; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Nd; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Sm; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Eu; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Tb; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Yb; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Lu; 1:25000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Cu; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Pb; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Zn; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do V; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do P; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Ti; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 281, 282, 295, 304, 305, 306, 306 ^A , 315B, 325 ^A , 336, 348, 360, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas do Be; 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas das terras raras leves (LREE) 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas das terras raras médias (MREE) 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas das terras raras pesadas (HREE) 1:25000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Cartas geoquímicas das terras raras totais (Σ REE) 1:25000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Au, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> da Ag, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do As, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Cr, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Co, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Ni, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Mo, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Sb, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Se, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Sn, 1:100000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Ta, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do W, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Th, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do U, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Sc, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Y, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Cs, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do La, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Ce, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Nd, 1:100000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Sm, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Eu, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Tb, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Yb, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Lu, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Cu, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Pb, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Zn, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do V, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270,271,281,282, 283,293,294,295,304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do P, 1:100000

Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Ti, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> do Be, 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> das terras raras leves (LREE) 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> das terras raras médias (MREE) 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> das terras raras pesadas (HREE) 1:100000
Estudos de inventariação do potencial em recursos de terras raras e caracterização dos seus metalotectos	258, 259, 270, 271, 281, 282, 283, 293, 294, 295, 304, 305, 306, 306 ^A , 314, 315, 315 ^A , 315B, 324, 325, 325 ^A , 336, 348, 360, 372, 373, 383	Norte Alentejo e Beira Baixa	Carta geoquímica <u>conjunta</u> das terras raras totais (Σ REE) 1:100000

MINEO	559/567	Mértola/S. Domingos	Mapa de contaminação de materiais mineiros (1/25000 pixel=4,1m Temática= processamento de imagens hiperespectrais)
	399/497	Cuba/Odivelas	24km ² ; 1:5000; cartografia geológica
	488	Vila Nova da Baronia	21km ² ; 1:5000; cartografia geológica
	539	Albernoa	9km ² ; 1:5000; cartografia geológica
	540	Vale de Açôr	20km ² ; 1:5000; cartografia geológica
	521	Beja	4km ² ; 1:5000; cartografia geológica
	522	Baleizão	4km ² ; 1:5000; cartografia geológica
	540	Vale de Açôr	8km ² ; 1:25000; cartografia geológica
	531	Salvade	6km ² ; 1:25000; cartografia geológica
	495	Grândola	100km ² ; 1:25000; cartografia geológica
	506	S. Francisco da Serra	20km ² ; 1:25000; cartografia geológica
"Mármore de Viana/Alvito, Serpa/Ficalho e Trigaches"	479, 478	Viana do Alentejo / Alvito	Carta Litoestratigráfica Temática do Anticlinal de Viana do Alentejo/Alvito, na escala 1:10.000 (~50 Km ²)
"Valorização da "Brecha de Tavira"	598, 607, 608	São Brás de Alportel / Tavira	Carta Litoestratigráfica Temática na escala 1:25.000 e três na escala 1:10.000 (~50 Km ²) Cartas de pormenor, na escala 1:5.000, das áreas da Mesquita, Butoque e Perogil
Cartografia Geológica do Geo-Recurso "Brecha Algarvia" – Mestrado Dr. Paulo Henriques	598, 607, 608	São Brás de Alportel / Tavira	Mapa geológico e mapa das principais estruturas geológicas, na escala 1:25.000 (~50 Km ²)
"Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Industria Extractiva"	425, 426, 440	Estremoz, Borba e Vila Viçosa	Cartografia geológica e estrutural, na escala 1:2.000, dos núcleos de pedreiras de Estremoz - UNOR 1(7 folhas), Borba - UNOR 2 (7 folhas) e Vigária - UNOR 3 (6 folhas).
"Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Industria Extractiva"	425, 426, 440	Estremoz, Borba e Vila Viçosa	Cartografia geológica e estrutural, na escala 1:5.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).

“Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Indústria Extractiva”	425, 426, 440	Estremoz, Borba e Vila Viçosa	Carta de Risco Geoeconómico, na escala 1:5.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).
“Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Indústria Extractiva”	425, 426, 440	Estremoz, Borba e Vila Viçosa	Carta de Reordenamento, na escala 1:5.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).
“Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Indústria Extractiva”	425, 426, 440	Estremoz, Borba e Vila Viçosa	Carta do parâmetro Litologia, na escala 1:15.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).
“Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Indústria Extractiva”	425, 426, 440	Estremoz, Borba e Vila Viçosa	Carta do parâmetro Estrutura Geológica, na escala 1:15.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).
“Cartografia Temática do Anticlinal como Instrumento de Ordenamento do Território e Apoio à Indústria Extractiva”	425, 426, 440	Estremoz, Borba e Vila Viçosa	Carta do parâmetro Fracturação, na escala 1:15.000, dos núcleos de pedreiras de Estremoz - UNOR 1(1 folha), Borba - UNOR 2 (1 folha) e Vigária - UNOR 3 (1 folha).
Revisão dos Planos Directores Municipais	197, 208	Anadia	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	228, 238-A, 239, 249	Figueira da Foz	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	231, 232, 241, 242, 243, 251, 252	Lousã, Arganil, Vila Nova de Poiares e Miranda do Corvo	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	209, 220	Mortágua	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	189, 190, 200	Nelas e Mangualde	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	244, 253, 254	Pampilhosa da Serra	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	251, 263, 275	Penela	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	261, 262, 263, 273, 274, 285, 286, 287, 297, 298, 299, 309, 310	Pombal, Leiria e Ourém	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	221, 222, 232	Tábua	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	350, 361, 362, 374, 375	Torres Vedras	Carta de Recursos Minerais Não Metálicos
Revisão dos Planos Directores Municipais	176, 177, 187	Vouzela	Carta de Recursos Minerais Não Metálicos
PAN A7	Todas as cartas do Algarve	Algarve	Carta de Ordenamento Sectorial da Região do Algarve, na escala 1:200.000
PAN A7	Todas as cartas do Algarve	Algarve	Carta da Indústria Extractiva da Região do Algarve, na escala 1:200.000
Potencialidades em Xistos de Barrancos nas imediações da pedreira do Mestre André	504	Barrancos	Geologia da área envolvente à pedreira do Mestre André, na escala 1:2.000
Revisão do Plano de Ordenamento do PNSAC	308, 317, 318, 319, 327, 328, 329, 339	MCE	Áreas Potenciais para a Indústria Extractiva no PNSAC
Protocolo ICN – IGM: Avaliação das Áreas Produtoras de Calcários Ornamentais no MCE	318	MCE	Carta Litoestratigráfica e Estrutural Temática da Área do Codaçal (MCE) Escala 1/2000
Reconhecimento de Maciços Graníticos	179	Penalva do Castelo	Mapa Geológico do Maciço de Esmolfe – Estudo da Fracturação e Áreas com interesse para indústria extractiva. Escala 1/25 000
Reconhecimento de Maciços Graníticos	179, 180	Penalva do Castelo, Fornos de Algodres	Mapa Geológico do Maciço de Antas – Matança. Estudo da Fracturação e Áreas com interesse para indústria extractiva. Escala 1/25 000.
Reconhecimento de Maciços Graníticos	384, 385, 386, 398, 399,400	Monforte, Sta. Eulália, Arronches	Mapa temático dos principais litotipos ornamentais graníticos do Complexo Plutónico Monforte – Sta. Eulália. Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Argilas de Venilale (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Argilas de Aileu (Timor Leste) Escala 1/25 000

Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Mármore de Beuah (Manatuto - Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Calcários Ornamentais de Beheda (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial para Agregados entre Tibar e Liquiçá (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa de Localização da Área Potencial para Agregados na região de Maubara (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Calcários Industriais de Betecaiana - Ossu (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Calcários Industriais de Ossu (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Calcários Industriais de Ossu Norte (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Calcários Industriais de Loihuno (Timor Leste) Escala 1/25 000
Avaliação das Potencialidades em Rochas Ornamentais e Rochas e Minerais Industriais de Timor Leste		Timor Leste	Mapa Geológico da Área Potencial em Margas e Crés de Viqueque (Timor Leste) Escala 1/25 000

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1 – INTRODUCTION

The Institute for Environment is the central department of the Ministry for Urban Affairs, Spatial Planning and the Environment, of Portugal. It ensures the design, co-ordination, study, planning and technical support within the scope of environmental management.

Its main responsibilities are:

- to give support as regards the definition of environmental policy and follow-up the execution and assessment thereof ;
- to co-ordinate integrated pollution prevention and control measures, namely as regards environmental licencing, and assessment / prevention of industrial accidents or those related to high risk storage and contaminated soils;
- to promote and co-ordinate the prosecution of national strategies, plans and programmes as regards sustainable development;
- to co-ordinate national strategies within the framework of environmental issues of a global nature, such as climate change, protection of the ozone layer and bio-safety;
- to co-ordinate, execute and give general technical support as far as environmental impact assessment is concerned;
- to promote the strategies and co-ordinate the action programmes related to the prevention and control of noise pollution and air quality management;
- to promote and participate in the certification and standardisation of the environmental laboratories, as well as to develop studies and new analytical methodologies in the environmental domain;
- to co-ordinate the environmental information system and the production of statistical indicators on the state of the environment, namely through the promotion of studies, diagnosis, assessments and inventories;
- to insure the follow-up, together with the competent authorities, of environmental issues at EU and international levels;
- to promote the improvement of environmental performance of economic agents, stimulating the adoption of eco-management and audit systems;
- to promote the support to environment NGOs, implement environmental education and information awareness activities and insure public participation in decision-making;
- to carry out radioactivity surveillance and co-operate in the development and execution of emergency planning as far as environment is concerned.

2 – RESEARCH AND DEVELOPMENT

N/A

3 – EDUCATION AND TRAINING

N/A

4 – PRODUCTION

Maps:

Catchment Areas – Main Uses (I.19)

Predominant Fitogeographical Regions (III.6)

Tourism – Heritage and Equipment (IV.12.1)

Wetlands (V.2)

Classified Sites - Desertas e Selvagens (VII.9.B)

5 – PUBLICATIONS

Explanatory Notes:

Predominant Fitogeographical Regions (III.6)

Laurissilva (VII.8)