

International Geoscience Programme

IGCP

SPANISH NATIONAL COMMITTEE



Instituto Geológico y Minero de España. Madrid.

Annual Report for 2008

January, 2009

ANNUAL REPORT for 2008
IGCP Spanish National Committee

1. Prof. Dr. Marcos A. Lamolda (Chairman)
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(since 1999, pioner website of national committees)

2. Dr. V. Gabaldón and Dr^a. C. Antón-Pacheco (Instituto Geológico y Minero de España-IGME); Dr. B. Andreo (513); Dr. D. Brown (524); Dr. P. Domínguez (503); Dr. J. A. Gámez (493); Dr. A. García-Casco (546); Dr. A. Márquez (506); Dr. R. Mediavilla (CEICAG); D. C. Quesada (497); Dr. R. Sáez (502); Dr. J. I. Valenzuela (499); Prof. Dr. F. Vilas (526); Prof. Dr. C. Zazo (495).

3. IGCP projects in which Spanish Working Groups have participated

b) Project with Spaniard project co-leader

Project no. 502: 'Global comparison of Volcanic-hosted Massive Sulphide Districts'

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Spaniard co-leader: Dr. Fernando Tornos, IGME, Salamanca.

Abstract: According the guidelines of the IGCP 502, during the third year of the project, the Spanish Working Group had addressed their research activities to the progress and international correlation on the knowledge of geological mechanisms involved in the genesis of massive sulphide deposits and their preservation in the geological record. New interpretations have been proposed for the relationship between basin evolution and ore genesis in different massive sulphide provinces. Apart the previously reported results on massive sulphide deposits from the Iberian Pyrite Belt, other areas have been included as targets for the IGCP 502. These include ore deposits from Cuba, Perú and Maroc. Unscrambling the depositional environments has been attempted by means of stratigraphic, geochemical and mineralogical studies of massive sulphides and hosting rocks. Palynological studies on hosting dark shales have been applied for dating and palaeogeographical reconstructions. Outstanding results have been given to the scientific community by means of publications and congress communications, both national and

international. The main results of the IGCP 502 were discussed on a special symposium and a field trip to the Bergslaggen region (Sweden) in August 2008 during the 33rd International Geological Congress (Oslo, Norway).

Publications and contributions to congresses

The working group has a total of 8 publications. Three chapters of a book published by the Universidad de Huelva, and two contribution to international congress.



Participants of the visit to the Garpenberg mine (Bergslaggen, Sweden).
A field-trip organised by IGCP Project no. 502, during the 33th IGC, Oslo.

Project no. 513: 'Karst Aquifers and Water Resources'

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Spaniard co-leader: Dr. Bartolomé Andreo Navarro

Abstract: During 2008, the Spanish Chapter of IGCP 513 Project of UNESCO (GTE-513) has actively participated in the organization of several national and international events. Among the first ones, reference should be done to one symposium organized specifically by GTE on the investigations in Spanish karst sites included in the IGCP-513 project and one congress on tourist caves. At international level, it should be emphasized the special session on the IGCP-513 project in the frame of 33rd International Geological Congress. Besides, participation in training courses has been carried out. Investigations on caves have been performed with interesting results on: 1) geomorphological evolution in several Spanish regions; 2) hydrogeochemical processes controlling the genesis and alteration of speleothems and the inherent paleoclimatic interpretations; 3) infiltration processes and the role of unsaturated zone in the functioning of karst aquifer; 4) the use of radiolocation to know the rock thickness above a cave. The investigations on karst aquifers concerning the groundwater focused on the hydrogeological

characterization and the water resources assessment by means of hydrodynamic, hydrochemical and isotopic tools. In many carbonate aquifers from south Spain (from Alicante, Murcia and Almería, Sevilla and Jaén provinces), the water resources are scarce and the aquifers are intensively exploited, which have been investigated by GTE-513 members. Moreover, the GTE-513 has worked on protection of groundwater by vulnerability mapping and a method (COP+K) has been proposed to delineate protection zones around springs and wells used for water supply. The main results obtained by GTE 513 have been presented in national and international meetings and congresses and they have been published in international journals.

Meeting organization

- Symposium on “Investigaciones en Áreas Kársticas”, during the VIIth Spanish Geological Congress, at Las Palmas, Gran Canaria, Canary Islands. July 14-18, 2008.



The Hundred Spouts Spring, in the high Guadalhorce river (Málaga)

Invited talk

- Dr. B. Andreo was a guest speaker, in the “Vº Curso de perímetros de protección”, organised by the Colegio Oficial de Geólogos.

Publications and contributions to congresses

- Karst Hydrology in Caves (B. Andreo, ed.), in the Journal of Speleology.

The working group has a total of 17 publications in journals, and 36 contributions to congresses.

Project no. 524: ‘Arc-Continent Collision’

Dr. Dennis Brown

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Spaniard co-leader: Dr. Dennis Brown
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Abstract: In January of this year the first meeting of the project was held in Taiwan. Funding for the meeting was provided by the National Science Council of Taiwan (c. \$6,000USD), National Cheng Kung University, Tainan (c. \$6,000), and the Ministry of Education and Science of Spain (c. \$12,000). No IGCP money was accepted for this meeting.

The major achievement of the project in 2008 was to bring together a large number of scientists who have largely been working alone on topics of arc-continent collision. The meeting in Taiwan set in motion a number of initiatives that will be developed over the coming 2 years. Perhaps the most important of which is to produce a book (book proposal has been accepted by Springer under its Frontiers in Earth Sciences Series) devoted to arc-continent collision. Significantly, we have approached a number of experts in related fields, such as geodynamic modeling, mineral deposits and so on, to present chapters that will be integrated into the general theme. This type of cross-platform approach will give the book a broader appeal to both scientist interested in the theme and to industry professionals looking to refine exploration models.

Meeting organization

- Meeting: Arc-Continent Collision, 13 to 20 January, 2008, Taiwan.

Itinerary: 13th-14th January: Oral presentations at NCKU, Tainan. 15th to 20th January: Field excursion in Taiwan.

- A joint workshop of the IGCP 524 and the Center for Russian and Central Eurasian Mineral Studies (CERCAMS) of the Natural History Museum, London, April 28th, 2008. Guest speaker: D. Brown "*Arc-continent collision and mineral deposits -lessons from the Urals and Taiwan - applicable to the Tethys terranes?*"

Publications and contributions to congresses

Since the project is just finishing up its first full year of activity there have not been any publications directly related to it. The results of the Taiwan meeting are to be published in a special issue of Tectonophysics being edited by D. Brown and C-Y Huang. As of this date (11/2008) 15 manuscripts have been received and all have now been reviewed and are back with the authors for revision. Publication is expected mid-2009.

The working group presented three contributions to Taiwan meeting.

Project no. 546: 'Subduction zones of the Caribbean'

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Spaniard co-leader: Dr. Antonio García Casco
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Siete Cabezas Formation, Dominican Republic

Abstract: The Working Group of the IGCP Project nº 546 has organised scientific meetings and Field Workshops, in order to emphasised our knowledge on the subduction zones from the Caribbean Region (Dominican Republic, March 2008), and a seminary related to metamorphic petrology, geothermobarometry and P-T paths, organised for latinoamerican students at Granada, Spain, May 2008.

Meeting organization

As a part of the 18th Caribbean Geological Conference, Santo Domingo (República Dominicana), 24–31 March 2008:

- Symposium #2. “Caribbean Subduction in time and space: An integrated petrological, geochemical, tectonic, and geophysical approach”.
- Post Conference Field Trip # 4 – In the Cordillera Central and subduction complexes of the northern belt. 29-31 March, 2008.

See details at the website: <http://www.ugr.es/agcasco/igcp546/>

Post-graduated courses

Geothermobarometry and T-P paths, addressed to latinamerican student at the Universidad de Granada, by Dr. A. García Casco. Granada 5–15 May, 2008.

The working group published 13 papers in journals, and presented 13 contributions to meetings, and produced two field-trip guides for an international congress.

c) Projects with active working groups

Project no. 495: ‘Quaternary Land–Ocean Interaction’

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2nd Internacional Tsunami Symposium. Rocks probably originated by a tsunami, in the Puglia coast, Italy

Abstract: The general theme of the project is to investigate vertical changes of the sea level and the lateral displacements of the coastline, analyzing the mechanisms causes of these variations. The scales used are: geographical (including local, regional, and global data), and temporal (from years to thousands of years).

The GTE (Spanish Working Group) investigate mainly sea level changes along the Spanish – Portuguese coasts, North Africa, and the Cabo Verde Islands. The chronological framework, is focused not only in the Present Interglacial (last 11,500 years), but also in the last quaternary interglacials (until ca. 400.000 years) with possibilities of use precise dating methods.

Various scientific works on superficial oceanic and atmospheric circulations are being carried out by means of data obtained from marine macrofauna migrations, and their isotopic composition variability (mainly on molluscs and corals). Moreover mineralogical and textural data on sediments are been used to deduced the “dust content” from African sources in sediment from Cabo Verde and Canary Islands. The research area is centred in Subtropical North-Atlantic Gyre and Azores High Pressure Center, with special interest in its modifications regarding intensity, morphology, and location, during different Quaternary interglacial periods.

Related with Natural Hazards the effects, characterization and recurrence of high energy episodes on the coasts are also a mainly research objective, particularly Tsunamis and Storms events affecting the SW Iberian coast.

Meeting organization

- Field-trip excursion “Geomorfología volcánica y cambio del nivel del mar en Lanzarote y Fuerteventura, Plio-Cuaternario”, as a part of the VIIº Congreso Geológico de España, Canary Islands, 14–18 July, 2008.

Publications and contributions to congresses

The working group has a total of 7 publications in journals, and 5 contributions to meetings.

Project no. 499: ‘Devonian land–sea interaction: Evolution of Ecosystems and Climate in the Devonian’

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The GSSP of the lower boundary of the Emsian Stage,
is included in the white line between the first and second persons to right

Summary: Major contribution of the Spanish Working Group (SWG) has been in the field of fine biostratigraphy, as this aspect of Geology is basic for other endeavours, such as precise chronologic arrangement of geological events that in turn is fundamental for, both palaeogeographical reconstructions and basin evolution. In spite of the fact, that, in many occasions, plate kinematics reconstructions neglect biostratigraphic (or even palaeontological) sound data, as we have seen even in closely related IGCP projects, the need for such scientific effort is unquestionable. Without a sound basis, many interpretations are just nice histories that, may be, by chance can approach reality, but don't expect them to be as beautiful as "fairy tales". The need for cooperation among geological disciplines is obvious and neglect one of them is just, to be blind and to discard (without any ground) important and relevant information. In this respect, basic palaeontology and its applications to biostratigraphy, chronostratigraphy and palaeogeography, is mandatory, as it has been done by the SWG.

The SWG is composed of 25 scientists (10 women), from 7 universities and IGME. 6 are Ph. D students, and 1 has finished his Ph. D. within the frame of the project. 5 special annual meetings have been organised, including 5 indoor sessions, annual business meeting and 2 field trips. Some special publications have also been produced in some of the meetings. The total number of presentations has been 67 (34 at international meetings) and 33 at the special annual meetings hold in Spain (Alcalá 5; Sevilla 7; León 8; Caravaca 6 y MUJA 7). Also participation in International meetings has been important (Göttingen, Siberia, China, Paris, Nevada, Saint Petersburg, Lille, Uzbekistan and Frankfurt). In other meetings (San Juan, Libya) papers were co-authored.

The total number of publications by the group has also been important: already 51; an about 10 more will be by-product of this cooperation in the next year or two years. Also, the group has organised two specific field-trips within the frame of the Spanish Palaeontological Society, both in the Cantabrian Mountains. Cooperation with colleagues and friends from many countries and institutions (USA, France, Germany, Czech Republic, Siberia, Poland, Italy) has been carried out within this UNESCO frame, and with other countries and colleagues will also start in the near future.

Founded research projects have also been directly related to the IGCP-499, and others were submitted, but not supported.

Last summer the local Government of Aragón has resolved the complete protection of three Devonian sections (two lower Devonian encompassing the P/E boundary and one Givetian-Renanué) and the need of exhaustive palaeontological sampling and field-work before other Devonian sections can be affected in the course of a megalomania project of a giant enterprise who wants to build extraordinary Sky resorts (and the corresponding Malls, parking lots,...). This protection is possible, because local politicians understood the relevance of these tiny fossils known as conodonts.

Last but no least, internal reports were produced each year and published by the IGCP Spanish Committee.

The main areas the SWG has focused its work are Cantabrian Mountains (CM) Iberian Chains (IC) Pyrenees (P), Ossa Morena (OM), Catalanian Coastal Ranges (CCC) and Andorra (A).

Of these, the two better known at the beginning of the project were the CM and the IC, for this reason, work in these two main areas were focused on particular problems, like studying reefal development, migration patterns of certain fossils, mainly brachiopods, palaeogeography comments against a wide-open Rheic ocean between, for instance NW Spain and Armorica, during the Devonian.

Among important progress in key regions, the achievements in the Pyrenees stand out. There, the main stratigraphic frame-work has been established for the central Pyrenees, still there is a lot of work to be done, but now we have a reference that can be modified in the future. This has been carried out within the frame of the ambitious Devonian Correlation Table project chaired by Karsten Weddige (Frankfurt).

Related to the Pyrenees, stand out the recent results (still preliminary) in the Tor-Casamanya Sincline in Andorra, where a joint group of researches from the IGME, and from the University of Valencia with the help of the CRECIT (Research Center of the Earth Sciences of Andorra) have been working in the last two years. Preliminary results demonstrate the most complete sequence of Devonian in Sierra Negra subfacies, and its independence from Renanué Subfacies, as Valenzuela-Ríos & Liao (2006) have already postulated.

South of Andorra, its worthy to briefly comment the achievement in the Pyrenees, where all the Stage boundaries can be identified in several sections, and in fact, the Valencia group is working out these boundaries. It is important to note that most of the work has been carried out by means of conodonts, but research on other groups has recently started and promising results on ostracods, brachiopods and fish remains has been already obtained. Within the latter, stands out faunas around the L/P boundary in section CP-I, which helps to bracket the boundary. Also Givetian yields are very important, and the presence, for first time in Europe, of *Antarctilamna* is remarkable.

Ostracods record is also very important and a fine zonation independently controlled by conodonts, which also ensures correlation, is being working out for the Lower Devonian.

Other region, we have just started is the set of Silurian and Lower Devonian outcrops around Barcelona in the Catalanian Coastal Ranges. Work here has been developed in collaboration with the Geological Survey of Catalunya. The most important achievement, until now is the location of the S/D boundary that will fell close to the top of the Santa Creu Fm. This is important

because during the last 15 years has been a debate in placing the boundary. Important is also the establishment of the Lower Devonian biostratigraphical sequence near Gavá.

Finally, a briefly comment on the results from the Ossa Morena Zone, where a multidisciplinary group (brachiopods, corals, stromatoporoids, conodonts, fish, ostracods) has started to jointly work. The two main achievements in this area are: 1) the establishment of the Devonian stratigraphic sequence, and 2) the characterization of the palaeontological Lower Devonian sequence, which allows precise correlation among relevant sections.

Meeting organisation

Symposium on project topics, as a part of the XXIV^a Jornadas de la Sociedad española de Paleontología, Colunga, Asturias, October 15–18, 2008.

Visiting researchers

- Dr. Nadyezha Izokh, Siberian Branco, Russian Academia of Sciences, Novosibirsk, 4 months at the Universidad de Valencia.

- Sofie Gouwy, Università di Modena, Italy, 5 weeks at the Universidad de Valencia.

Publications and contributions to congresses

The working group has a total of 5 publications in journals, 11 contributions to meetings, and one contribution in the *Newsletter of the International Subcommission on Devonian Stratigraphy (SDS)* **23**: 71-74.

Project no. 503: 'Ordovician Palaeogeography and Palaeoclimate'

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Abstract: Three main lines of investigation have been pursued by this working group. The group first focused on the Hirnantian glaciation and its influence in the Iberian and Moroccan Anti-Atlas domains. Subsequently the group enlarged its work to include research on the stratigraphy, paleoclimatology and biodiversity of the Iberian Peninsula, Morocco and South America. The third research line has been focused on the Cambro-Ordovician transition and the evolutionary replacement of benthic communities in the Iberian Chain and the Montagne Noire.

During this period (2003–2008) there have been more than 48 communications at congresses, national as well as international. A highlight has been participation of the working group in the Workshops of the SEP and in the Annual Meetings, IGCP 503 Ordovician Palaeogeography and Palaeoclimate and in the organization of the IGCP Project 503 Regional Meeting and fieldtrip in 2007, as well as the summer courses of the University Complutense in El Escorial (Madrid). More than 72 articles have been published.

In addition, three theses have been completed, and collaborations have been undertaken with other organizations such as the Instituto Geológico Minero y Metalúrgico of Peru, Ministerio de Medioambiente of Spain, University Complutense of Madrid, Relações Internacionais da Ciência e do Ensino Superior of Portugal and Balgarska akademija na naukite (Bulgarian Academy of Sciences).

Meeting organization

Symposium on project topics, as a part of the XXIV^a Jornadas de la Sociedad española de Paleontología, Colunga, Asturias, October 15–18, 2008.

Publications and contributions to congresses

The working group has a total of 6 publications in journals, and 12 contributions to meetings during 2008.

Project no. 506: ‘Marine and Non-marine Jurassic’

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Abstract: During the year 2008, the researches of the Spanish Working Group of the IGCP 506 have been engaged on several topics, which are directly related to the different working areas of the Triassic and Jurassic basins of the Iberian Peninsula (Iberian Chains, Betic Chains, Catalanian Coastal Ranges, Pyrenean Basin and Basq-Cantabrian Basin). During the period 2006-2008 the Spanish Working Group (SWG 506) has presented original works in *The 5 th International Symposium of the IGCP 506*. Two doctoral dissertations (the first about Triassic Conodonts of the Iberian Peninsula and the second one about Triassic-Lower Jurassic bivalve genera revision), near one hundred National and International Publications and Congress communications are the results of our research activities as SWG of the IGCP 506. The twenty six actual members of the group are in disposition to keep in these topics in a future project.



A view of the Jurassic in the southern Tunisian desert

Meeting organization

Symposium on project topics, as a part of the XXIV^a Jornadas de la Sociedad española de Paleontología, Colunga, Asturias, October 15–18, 2008.

Publications and contributions to congresses

The working group has a total of 29 publications in journals, and 18 contributions to meetings.

Project no. 526: ‘Risks, resources and Record of the Past on the Continental Shelf’

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Abstract: The different groups involved in the GTE 526 have participated in National and international programs and projects contributing with several multi-disciplinary approaches to a global knowledge of the continental shelf processes and characteristics. Among them it must be highlighted those related to environmental conditions, sediment dispersion, paleoclimatic evolution and the application of various technologies, among others. The Spanish Working Group has 34 members, from 9 institutions (universities and research centers).

Meeting Organization

A session about the project topics, during the VII Congreso Geológico de España, held at Las Palmas de Gran Canaria, Canary Islands, July 2008.

Publications and contributions to congresses

The working group has a total of 20 publications (13 in SCI journals), and 34 contributions to meetings.

Project no. 567: 'Earthquake Archaeology'

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Summary: The research of the IGCP-567 Spanish Working Group is focused on three main geographic areas: Ancient roman City of Baelo Claudia (Bolanos, Cádiz); Roman to Arab Archaeological remains of Minateda (Albacete) and different archaeological sites at the northern sector of Andalusia. Initially this working group is formed by about 20 scientist belonging to different scientific fields, such as, geology, seismology, archaeology, architecture and geography. Special mention is the participation of members ascribed to the Seismological Dept. of the Instituto Geográfico Nacional (IGN) and the Geo-risk Dept. of the Spanish Geological Survey (IGME). In spite of the IGCP-567 initiative just only work from this year, this working group presented the main results in relevant scientific forums, such as, the European Geosciences Union Meeting 2008 (EGU-08, Vienna, Austria), 33th International Geological Congress (33th IGC, Oslo, Norway), and the 31st General Assembly of the European Seismological Commission (31st ESC, Heronios, Greece), as well as in the specific Symposium on Paleoseismology included in the VII Congreso Geológico de España (Las Palmas de Gran Canaria). Some of the presented contributions are currently "in press" to be included in specific thematic publications, such as "*Paleoseismology: Historical and prehistorical records of earthquake ground effects for seismic hazard assessment*" (K. Reicherter, A. Michetti, P.G. Silva, eds.), which will be edited with the number 316 (year 2009) in the Special Publications Series of the Geological Society of London. Other contribution, will be included in another Spec. Vol. of the Geological Society of America (GSA) edited by the leaders of the ICCP-567. Finally, the Spanish Working Group is actually involved in the organization of the *1st INQUA-IGCP567 International Workshop on Earthquake Archaeology and Paleoseismicity*, to be held on September 2009 in Baelo Claudia Spain. The event is included in the program of activities of INQUA and IGCP-567 and will be organised in cooperation with researchers of the RWTH Aachen University (Germany). The event will be organised with the institutional support of AEQUA and Junta de Andalucía.

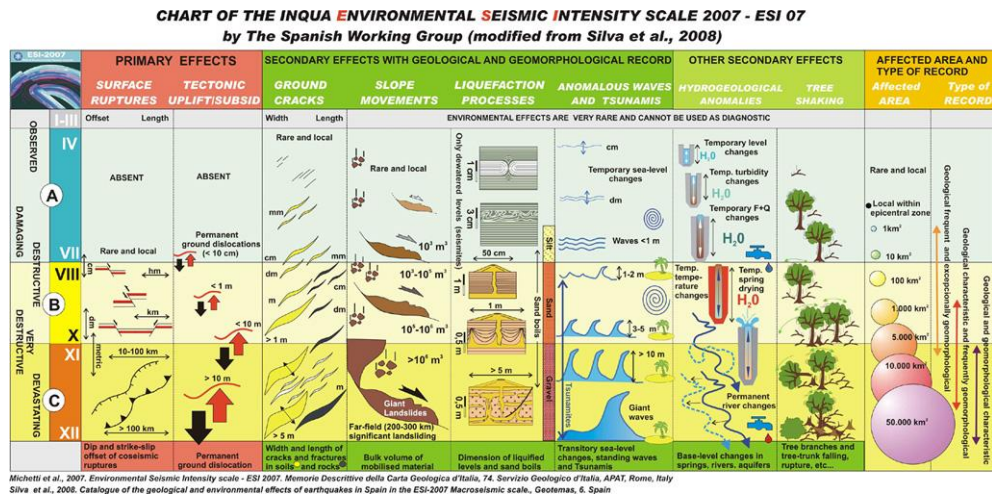
Meeting organization

A session on Palaeosismology, as a part of the VII Congreso Geológico de España held at Las Palmas de Gran Canaria, Canary Islands. July 2008.

Publications and contributions to congresses

A chart on Macrosismic Scales: *ESI-07: Environmentla Seismic Intensity*, and a catalog on Earthquakes environmental consequences have been published, of interest to the society (both English and Spanish versions are available).

This informal working group has a total of 5 publications, and 7 contributions to meetings.



4. National Committee activities, including summaries of research meetings, symposia, workshops, etc. held under the aegis of the Committee, and assistance (financial or in kind) extended to national project participants.

The Spanish National Committee (SNC) annual meeting was held at Madrid on May 4th 2008 with Prof. M. A. Lamolda in the chair. The Geological Survey of Spain (IGME) allowed a site and other facilities to us. This meeting was attended by 13 participants, who were welcome by Prof. José Pedro Calvo Sorando, Director General of the IGME. A representative of the Sudirección General de Programas y Organismos Internacionales of the Spanish Ministry of Education and Science, Sr. Severino Falcón, attended the meeting, giving us news about the policy of the ministry, and support to our activities.

The committee reviewed the projects newly adopted by the IGCP Scientific Board during its last session in middle February 2008 at Paris. Both, a proposal, Spanish Working Group, Project no. 525 "Risks, Resources and Record of the Past on the Continental Shelf", and a correspondent of the Project no. 555 "Rapid Environmental /Climate Change in the Cretaceous Greenhouse World" were approved.

The Chairman of the SNC, according to the promotion policy of GTEs, of interest to Spaniard researchers, has nominated a correspondent of the IGCP Project no. 567 "Earthquake Archaeology", as there are a relevant number of researchers working in such a topic. This informal group intends to become a regular Working Group as soon as possible.

The Chairman of the SNC gave a supporting letter to Dr. Gabriel Gutiérrez Alonso, Universidad de Salamanca, for his proposal of a new Project, in collaboration with other two colleagues.

This year has been a total of 13 working groups: GTEs project no. 493, 495, 497, 499, 502, 503, 506, 513, 524*, 526, 546*, 555*, and 567* (* informal group, correspondent)

As results of working group activities, four monographies have been edited:

- Andreo, B. (Ed.), 2008. Karst Hydrology in Caves. International Journal of Speleology.
- Gracia, F.G., (Ed.), 2008. Geomorfología de los espacios naturales protegidos de la provincia de Cádiz.
- López Geta, *et al.* (eds), 2008. Investigación y gestión de los recursos del Subsuelo. Publicaciones del IGME. Serie Hidrogeología y Aguas subterráneas 27.
- Silva, P.G. *et al.*, 2008. Escala de Intensidades Macrosísmicas (ESI-7).

In addition, three contributions of members of the SWG of the Project no. 502, to the monography: Geología de Hueva, Guía de lugares de interés geológico (M. Olías *et al.*, eds), Servicio de Publicaciones de la Universidad de Hueva.

SWGs have produced a total of 129 papers (74 in SCI journals). A total of 127 contributions to congress were presented (57 in international meetings).

A Field excursion *Median Belt and subduction zone rocks, Dominican Republic*, 18th Caribbean Geological Conference, Santo Domingo, 24 – 31 March 2008, was co-authored by Dr. A. Pérez Estaun, a Spanish Working Group member of the IGCP Project no. 546. It is available at: http://www.ugr.es/~agcasco/igcp546/DomRep08/Excursion_4_guide_CaribConf_DR_2008.pdf

Dr. A. García Casco, co-leader of the IGCP Project 546 was one of the co-advisors of the M. Lobón Mazo's PhD thesis, Universidad Nacional de Colombia, Medellín.

Two researchers paid sabbatic visits to the Universidad de Valencia, Project 499, Dr. Nadyezka Izokh, Russian Academy of Sciences (Novosibirsk) spent 4 months, and Dr. Sofie Gouwy, Modena University, spent 5 weeks.

Two researchers paid visits to the University of Málaga, Dr. J. Mudry (Univ. Franche-Comté, France) to collaborate in aquifer hydrochemistry, and Dr. Ch. Neukum (Univ. Aachen, Germany) to collaborate in aquifers from the Alta Cadena and Serranía de Ronda (Betic Cordillera).

International Year of Planet Earth

The chairman as representative of the IGCP Spanish Committee is a member of the Spanish Committee for the International Year of Planet Earth (IYPE), whose main achievement have been as follow:

- Special call for Acciones Complementarias, focused on IYPE topics, within the Plan Nacional de I+D+i
- Information leaflet about the IYPE
- Didactic CD and a propotional DVD about the IYPE
- Itinerary Exposition "Planeta Tierra", visiting several Spanish localities
- Talks about the 10 priority topic of the IYPE
- Summer courses "Planet Earth", one in El Escorial (Universidad Complutense de Madrid), and a second one in the International Univesity 'Menéndez Pelayo', at Santander.
- Round Table, during the VIIth Geological Congress of Spain, at Las Palmas de Gran Canaria.

5. IGCP meetings held during the year in Spain

A Post-graduate course "*Hidrogeología Kárstica, HYDROKARST-2008*" was organised at the

University of Málaga in collaboration with the Spanish Geological Survey (IGME), 5 to 9 May 2008, by B. Andreo and J.J. Durán. Twenty participants attended this post-graduate course.

A Post-graduate course "*Geotermobarometry and P-T paths*" was organised at the University of Granada, 5–16 May, by Dr. Antonio García Casco, co-leader of the IGCP Project no. 546 *Subduction zones of the Caribbean*, Six students from Colombia, Cuba, Mexico and Spain, attended the course.

The Spanish Working Group of the IGCP project no. 503 *Ordovician Palaeogeography and Palaeoclimate*, organised a session in the International Trilobite Conference, Toledo, 17–24 June, 2008. A total of 2 contribution were presented.

The Spanish Working Group of IGCP project no. 495 *Quaternary Land-Ocean Interactions*, organised the Field excursion: Geomorfología volcánica y cambio del nivel del mar en Lanzarote y Fuerteventura, Plio-Cuaternario, in the VII^o Congreso Geológico de España, held at las Las Palmas de Gran Canaria, Canary Island, July 14–18, 2008.

The Spanish Working Groups of IGCP projects no.513 *Karst Aquifers and Water Resources*, and 526 *Risks, Resources and Record of the Past on the Continental Shelf*, organised their respective sessions during the VIIth Spanish Geological Congress, held at Las Palmas de Gran Canaria, Canary Island, July 14–18, 2008. A total of 25 contributions were presented.

A field-trip to study the karst of Sierras de Grazalema and Libar, organised by the Working Group of IGCP Project no. 513, was held during two days: 14 and 15 September, 2008.

The Spanish Working Groups of IGCP projects no.513 *Karst Aquifers and Water Resources*, and 526 *Risks, Resources and Record of the Past on the Continental Shelf*, organised respective session during the VIIth Spanish Geological Society, held at Las Palmas de Gran Canaria, Canary Island, July 14–18, 2008. A total of 25 contributions were presented.

A field-trip to study the karst of Sierras de Grazalema and Libar, organised by the Working Group of IGCP Project no. 513, was held during two days: 14 and 15 September, 2008.

A session on Palaeosismology, in the VII Congreso Geológico de España, was organised by Spanish correspondents of the IGCP Project no 567. Las Palmas de Gran Canaria, Canary Island, 14-18 July, 2008.

A symposium with topics of IGCP project no. 493 *The Rise and Fall of the Vendian Biota*, no. 499 *Devonian land-sea interaction: Evolution of Ecosystems and Climate in the Devonian*, no. 503 *Ordovician Palaeogeography and Palaeoclimate*, and no. 506 *Marine and Non-marine Jurassic*, was organized in the XXIVth Jornadas de la Sociedad española de Paleontología, held at the Museo del Jurásico de Asturias, at Colunga, 15th–18th October 2008. A total of 24 contributions were presented.

The Spanish Working Group of IGCP Project no. 499 *Devonian land-sea interaction: Evolution of Ecosystems and Climate in the Devonian*, organised a Field excursion on Devonian Rifts, in the XXIV Jornadas de la Sociedad española de Paleontología, held at the Museo del Jurásico de Asturias, at Colunga, 15th–18th October 2008.

6. IGCP meetings planned for the following year

- 1st International Workshop on *Earthquake Archeology and Paleoseismology*, organised by Spanish members of the IGCP Project no. 567 in the Archaeological Site of Baelo Claudia (Bolonia Bay, Cádiz, Spain), from 7 to 14 September, 2009. This meeting is a collaboration between IGCP Project no. 567 and INQUA, Focus Group on Paleoseismicity and Active Tectonics.

- Workshop on techniques applied to *Archaeosismology*. Three days of field works. September 2009, during the above mentioned international workshop.

Spanish National Committee

- Annual Meeting at Zaragoza, March 2009.
- Autumn meeting at Granada, October 2009.

8. Forthcoming events available in connection with the Programme

* The IGCP Project no. 495 will held a special session, with a joint meeting of the Spanish and Portuguese working groups, during the Reunión del Cuaternario Ibérico at Faro (Portugal), 2009.

* The SWG of IGCP project no. 499 will held its annual meeting at Ronda (Málaga), October 2009, during the XXV^a Jornadas de la Sociedad española de Paleontología. A special session will be organized by the SWG with topics of that project.

* The SWG of IGCP project no. 506 will held its annual meeting at Ronda (Málaga), October 2009, during the XXV^a Jornadas de la Sociedad española de Paleontología. A special session will be organized by the SWG with topics of this project.

* The SWG of IGCP project no. 513 will held its annual meeting in Cantabria, Cueva de El Soplao, organized by Dr. Pedro Robledo, IGME.

* It is also a task of this working group the organization of the 4th International Symposium on Karst at Málaga, 27-30 April, 2010.

35th Anniversary of the IGCP Spanish Committee, Caravaca, 2010

The Major of Caravaca de la Cruz, Murcia Region, Mr. Domingo Aranda, asked to this chairman to organise an international scientific meeting, whose topics are of interest both to the IGCP and the Earth Sciences community. This event could be similar to the International Conference Bioevents, hold at Caravaca in 2003 focused on bioevents in the stratigraphic record.

On January 22nd this chairman accepted the invitation and proposed a preliminary programme, with the support of the IGME, the Spanish National Commission for Cooperation with UNESCO, the University of Granada (Dept. of Stratigraphy and Palaeontology), the Geological Heritage Commission of the Spanish Geological Society, the European Association for the Conservation of the Geological Heritage 'ProGeo', and the Dinopolis Foundation.

This international Conference would have several symposia:

- 35th Anniversary of the Spanish Committee, IGCP
- Geoevents: learning on the Global Change
- IGCP European Regional Meeting
- ProGeo SW Europe Regional Meeting

The event will have a duration of 3 or 4 days, in September 2010, with invited talks, oral and poster contributions. Field-trips to visit interesting geological localities will be organised,

including some Spanish Geoparks.

A preliminary proposal about the IGCP European Regional Meeting, and the whole event programme, was submitted to the Secretariat of the IGCP, and was presented during the 36th Session of the IGCP Scientific Meeting, in February 2008.

9. Suggestions relating to the conduct and improvement of the Programme

The collaboration between National Committees and proposers of new project must be improved. New proposals should be circulate to National Committee chairpersons whose countries would be involved in such a project. Frequently, this chairman has the first news about such an interesting topic for Spanish researchers, when the request to support the proposal is received.

The leaders of projects have to send regular information to National Committee chairpersons, especially those with a participation in their respective projects, and/or where activities will be organized. It is important getting a balance between project activities and National Working Group inputs.

It would be appreciated a regular information from the IGCP Secretariat to National Committees, especially when new information is or will be available in the IGCP website.

10. Financial support received for the activities of this National Committee, and given to IGCP projects and their activities

Committee activities have been financed by a grant, ACI no. PCI2006-A5-0584 (18000 euro, a part is for financing the first half of year 2009 activities), Ministerio de Educación y Ciencia, and a grant of the Instituto Geológico y Minero de España with an amount of 2314 euro, for the following actions:

- A representative of the Spanish Working Group Project no. 506, Dr. Ana Márquez attended the Vth Internacional Annual Meeting of this Project at Tunisia, and a field trip to visit Jurassic out-crops in the Southern Desert, March 2008.
- Annual meeting of this National Committee held at Madrid, on April 4th, 2008, with 13 participants.
- Seven representatives (3 graduate students) of the Spanish Working Group, project no. 513, attended the *VII Congreso Geológico de España*. Las Palmas de Gran Canaria. July 2008.
- Two graduate students, members of the Spanish Working Group IGCP Project no. 526, attended both the annual meeting of the SWG, and the *VII Congreso Geológico de España*. Las Palmas de Gran Canaria. July 2008.
- A representative of the SWG of the IGCP Project no. 413, attended the special session *HYH-09-International Perspectives on karst aquifers and water resources*, 33rd International Geological Congress. Oslo, August 2008.
- A graduate student, member of the SWG, project no. 499, attended the Internacional Annual meeting of the Project at Frankfurt, September 2008.
- Two graduate students, members of the SWGs Project no. 499 and 506, attended their respective annual meeting, and contributed to the Symposium PICG, during the XXIV^a Jornadas de la Sociedad española de Paleontología, at Colunga (Asturias), October 2008.
- Reprint of the 24 contributions of the Symposium PICG, XXIV Jornadas de la Sociedad española de Paleontología, cited above.

The Spanish Working Group of project no. 502 grant (Ministerio de Educación y Ciencia) allowed the participation of two representatives in the special session of the Project at Oslo, 33rd International Geological Congress, August 2008.

The Spanish Working Group of Project no. 524, 12000 euro grant (Ministerio de Educación y Ciencia) allowed the organisation (a part) of the International Annual Meeting of the Project at Taiwan, January 2008. The attendance of one representative in the 33rd International Geological Congress, Oslo, August 2008, and a workshop co-sponsored by the Project at the Center for Russian and Central Eurasian Mineral Studies, in April 2008, London.

The printing cost of the “*Boletín Informativo*” no. 32 February 2008, was financed by the Instituto Geológico y Minero de España (IGME), as it did during the last years. Mail distribution costs were allowed by both the IGME, and the University of Granada.

The University of Granada (Depto. de Estratigrafía y Paleontología), provides general services what allowed to this Chairman to accomplish his duty appropriately.

Most of the activities related to Spanish Working Groups have been financed directly by research projects of the participants, granted by the Spanish government, Regional governments, and other institutions.

Granada, January 29th 2009

Marcos A. Lamolda
Chairman, Spanish National Committee, IGCP