

# *International Geoscience Programme*

## IGCP

### SPANISH NATIONAL COMMITTEE



A general view of Caravaca de la Cruz, where the 35th Anniversary of the Spanish National Committee, IGCP, and *Geoevents, Geological Heritage, and the role of the IGCP* was held, September 15th – 18th, 2010.  
( by Dr. Daria Ivanova)

## Annual Report for 2010

February, 2011

### ANNUAL REPORT for 2010 IGCP Spanish National Committee

1. Prof. Dr. Marcos A. Lamolda (Chairman)  
Departamento de Estratigrafía y Paleontología  
Facultad de Ciencias, Universidad de Granada, Avda. de Fuentenueva s/n, 18002 Granada, Spain.  
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Website: <http://www.ugr.es/~mlamolda/PICG>  
(since 1999, pioner website of national committees)
2. Dr. V. Gabaldón and Dr<sup>a</sup>. C. Antón-Pacheco (Instituto Geológico y Minero de España-IGME); Dr<sup>a</sup> A. Crespo (Sociedad Geológica de España-SGE); Dr. A. Márquez (506, and Sociedad española de Paleontología-SEP); Dr. S. Morales (Sociedad española de Mineralogía-SEM); Dr. M.A. Rodríguez Pascua (AEQUA); Dr. R. Mediavilla (CEICAG); Dr. B. Andreo (513); Dr. R. Carbonell (559); Dr. J. A. Gámez (587); Dr. A. García-Casco (546); Dr. G. Gutiérrez Alonso (574); Dr. Javier Lario (588); Dr. Pablo G. Silva (567); Dr. R. Urgeles (585); Prof. Dr. F. Vilas (526).

3. IGCP projects in which Spanish Working Groups have participated

b) Project with Spaniard project co-leader

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

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Spaniard co-leader: Dr. Bartolomé Andreo Navarro

**Abstract:**

During 2010, the Spanish Chapter of IGCP 513 Project of UNESCO (GTE-513) has actively participated in the main international meeting connected with the project: 4th International Symposium on Karst, Málaga (Spain), 27<sup>th</sup>-30<sup>th</sup> April 2010. In fact several GTE-513 members participated actively in the organization of this symposium and annual and closure meeting of IGP-513 project. Nevertheless several members participated in other Spanish and international conferences, one of these the 38<sup>th</sup> IAH Congress, Krakow (Poland), where a special session on Karst was organized.

Investigations have shown recent advances on karst hydrogeology: methods for groundwater recharge assessment, impact of climate change on karst aquifers, protection of karst aquifers, pollution and vulnerability in karst, time series analysis, hydrochemistry, dye tracer and stable isotope applications. Research on groundwater resources assessment is absolutely necessary but also the characterization of the hydrogeological functioning of the aquifers to exploit and manage the aquifer in a sustainable way, otherwise negative effects will appear as overexploitation, marine intrusion, contamination, etc. Advances on groundwater protection zoning and particularly on the validation of these protection zones are the best preventive tool for land use management. Improvements in Karst Geomorphology and natural heritage have also been done on karst development in wetlands, hypogene speleogenesis, sinkholes, fluviokarstic canyons and karst geosites. There are some areas where proposals of karst geosites are potentially suitable. Caves are the inner manifestation of the karst and they are associated to particular problems that were studied by GTE-513, such as CO<sub>2</sub> sources and atmosphere, condensation and corrosion, together with other aspects of karst (speleothems and other deposits in caves). In many cases, caves are a natural heritage but also an economical resource that should be exploited in a sustainable way. Thus, monitoring of the visited caves and analysis of the data to improve the management are necessary. 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

4th International Symposium on Karst, Málaga (Spain) 27<sup>th</sup>-30<sup>th</sup> April 2010.  
<http://cehiuma.uma.es/sika.asp>

- Post-graduated courses

4<sup>th</sup> edition of HYDROKARST 2010 Training Course on Groundwater recharge assessment and contamination vulnerability assessment in carbonate aquifers, 26<sup>th</sup> April 2010. This course was coordinated by Bartolomé Andreo (UMA) and Juan Jose Duran (IGME).  
<http://cehiuma.uma.es/hidrokarst.asp>

- PhD as product of the Spanish Working Group, IGCP project no. 513

Title: Hydrogeological characterization of carbonate aquifers from South Spain.

Author: Pablo Jiménez Gavilán

Date and place: 12th July 2010, University of Granada

Supervisors: Bartolomé Andreo and Francisco Carrasco (University of Málaga)



The Hierbabuena spring in the karst aquifer from Serranía de Ronda, southern Spain  
(by Juan A. Barberá Fornell)

#### Visiting researchers

Two invited researchers paid their visits to the Universidad de Málaga, for study of common interest on Karst aquifers: Dr. Natasa Ravbar (Karst Research Institute, Slovenia) and (Prof. Jacques Mudry (Franche-Comté University, France).

#### Publications and contributions to congresses

The working group has a total of 9 publications in journals, and 2 contributions to congresses, and one monograph

Andreo B., Carrasco F., Durán J.J. y LaMoreaux J.-Eds.-: Advances in Research in Karst Media: 526 pp. Springer, ISBN 978-3-642-12485-3. (with 10 contributions by members of the working group)

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

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Spaniard co-leader: Dr. Antonio García Casco  
<http://www.ugr.es/~agcasco/igcp546/>

#### **Abstract:**

As in past year, project 546 has worked very hard to offer activities that contribute to the education and training of Earth Sciences students and teachers in countries of the Caribbean area, Central America, Mexico, and Northern South America.

The short course on tectonics and paleomagnetism trained ca. 40 students from Guatemala, El Salvador, Nicaragua and Costa Rica in the principles and techniques used for paleogeographic reconstructions. Five professors who teach at the only university that offers an Earth Sciences degree in Northern Central America were specially invited to this session.

For the Venezuelan event, we extended a special invitation to two young professors from Universidad Central de Venezuela. The goal of this invitation was to have them establish contacts with international researchers who could offer a PhD opportunity. A possibility for doctoral studies of these two promising researchers, potentially in Spain, has been advanced. The idea has been supported by researchers that traditionally have worked in the geology of high-pressure belts in Venezuela.

Dr. David Buchs, a recent PhD from Lausanne University joined the leadership of IGCP546. We hope that the experience he will gain as a co-leader of the project will encourage him to lead future scientific events in the Caribbean Area.

In the Venezuela event two young Venezuelan professors were especially invited to attend: David Mendi and Ruthman Hurtado. David and Ruthman are currently finishing their Msc degree in geology. The discussion and interaction with world-class scientists during the field trip has given them important knowledge. Also, the establishment of contacts with European scientists will help them get a scholarship opportunity for a PhD degree. This certainly will translate into enhanced teaching and earth sciences research in Venezuela.

Young professors from the Geology Department of San Carlos National University in Guatemala were invited to the Guatemala 2010 event. Our support allowed them to attend a short course on paleomagnetism, palinspastic reconstruction and tectonics of South Mexico-Guatemala-Honduras. This knowledge will be carried over to students for years to come.

#### Meeting organization

- Panama 2010. "*Subduction Zones and Bent Orogenic Belts of the Caribbean*". February 8, 2010. Joint meeting of IGCP projects 546 "*Subduction Zones of the Caribbean*" and 574 "*Bending and Bent Orogens, and Continental Ribbons*".

- Antigua, Guatemala, 9-12 November, 2010. X Central American Geologic Conference. Special Session of the IGCP project no. 546: "*Caribbean and Central America Tectonics*".

#### Field-trip:

- "From arc growth to orocline formation: The record from the Panama Canal and East Panama" February 9-11. A basis for the description of the geologic architecture of the plate margin and associated basins in the region, with special focus on volcanic and plutonic products of subduction of the Nazca plate below the Caribbean plate. 38 participants attended this field-trip.

- High Pressure rocks of Margarita, Venezuela", November 11-15, attended by 14 participants.

- Active volcanism in the Central American Arc: the Pacaya Volcano", November 3, 2010.

- Curso de postgrado sobre *Petrología y Arqueología (Caribe precolombino)*, Granada March 19th 2010. Co-organised by the Doctoral Schools in Earth Sciences and Archaeology of the University of Granada. About 50 participants.

- Course on *Paleomagnetism and Tectonics*, Guatemala, 9th – 12nd November, 2010. About 40 participants.

- Geologic Map of Southern Mexico, Central America, and northern Andes. Dr. Carl Nelson and IGCP 546 organized a discussion on the advance of this UNESCO supported map.

The working group published 12 papers in journals, produced one field-trip guide for an international congress.

#### Project no. 574: 'Bending and Bent Orogens, and Continental Ribbons'

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Spaniard co-leader: Dr. Gabriel Gutiérrez-Alonso  
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**Abstract:**

The meetings in Panama and New Zealand afforded us the opportunity to educate students and the public about the geological and economic significance of ribbon continents. Graduate students were provided with a one day workshop in Panama aimed at assisting them in understanding, from project planning and definition all the way through the publication, the scientific endeavor. In New Zealand, our Symposium provided a forum for the discussion of the tectonic setting and seismic hazard of the Melanesian region. Interpretation of the region in terms of bending and buckling continental ribbons yields seismic risk estimates that vary significantly from those arrived at utilizing classic plate tectonic assumptions, including plate rigidity. In addition, the promotion of oroclinal interpretation of bent mountain belts has resulted in a growing number of papers addressing bends of the Variscan orogen, the Andes, the North American Cordillera, and other lesser orogenic belts (see list of publications attached below).

Meeting organization

- Subduction Zones and Bent Orogenic Belts of the Caribbean. IGCP projects 546 and 574 February 8-11, 2010. 34 participants representing 10 countries attended the workshop and subsequent field excursion.
- Symposium “Bent Orogens and Continental Ribbons and the related Field Trip “Geology of Northland”, convened as part of the GEONZ 2010 conference. 22 scientists representing 7 countries participated in the symposium and field trip.

Training course *Panama City Graduate Student Workshop*: A one day workshop for students was held, focussing on educating students about the scientific endeavour, from planning to publication, attended by 12 graduate students.

The working group published 2 papers in international journals.

Project no. 585: ‘E-MARSHAL’

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Spaniard co-leader: Dr. Roger Urgeles  
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**Summary:**

During year 2010 our major scientific achievement has been the successful IODP proposal APL-738 NANTROSLIDE, which has gone through all IODP panels and is starting to be drilled in the Nankai Trough with IODP Expedition 333 (WEB) just as this report is being written (Expedition scheduled to last from 13 december, 2010 to 10 January, 2011). APL-738 was proposed, amongst others by two co-chairs (M. Strasser and R. Urgeles) and various participants of IGCP-585. Site NTS-1 will address several scientific objectives of IGCP-585. IODP Expedition 333 will catalog a detailed submarine landslide event history along with clues on the depositional dynamics of MTDs as they relate to tsunamigenic potential. It will allow to constrain scales and landslide magnitude and correlation to seismicity and tectonic evolution of the margin.

IGCP-585 chairs and participants have also been actively lobbying in IODP and its successor program beyond 2013 in order to achieve proper consideration of geohazards and submarine landslides in the new science plan. We think this goal has been fully achieved.

Major efforts during year 2010 have been devoted to setup the project web page, which can be found on the address listed above and to enlarge the social base of the project. Currently, participation in IGCP-585 has more than doubled since the project started, and the project has 75 active participants of 21 different countries, spanning 4 continents.

A formal link has also been established with project IGCP-526 led by Francesco Chiocci, and also a participant in project IGCP-585. In this respect we actively supported participation in their 4th Conference on "Continental Shelves: Risks, Resources and Record of the Past" that was held in Vigo, Spain from September 28 to October 1<sup>st</sup>, 2010.

A formal link has also been established with the International Consortium on Landslides and the International Landslide Program, through Professor Kyoji Sassa. We are actively participating in constructing the program and in the advisory structure of the 2nd World Landslide Forum. This event is promoted by The International Consortium on Landslides and partners of the International Programme on Landslides (UNESCO, International Council for Science, World Federation of Engineering Organizations, World Meteorological Association, Food and Agriculture Organization of the United Nations, United Nations, International Strategy for Disaster Reduction and United Nations University).

#### Meeting organization

- Special session at the 2010 AGU Fall Meeting ( <http://www.agu.org/meetings/fm10/>; Ocean Sciences programme, session OS09) "Submarine Landslides: Characterization, Processes and their Sedimentary Record session (OS09)". Overall we have received 31 abstracts from 10 different countries (USA, Italy, Australia, Germany, Japan, Norway, Spain, UK and Canada).

- Course and workshop was organized in MARUM, Bremen, Germany, thanks to M. Strasser, on "Mass wasting on continental margins: Comparing modern and ancient settings". The course involved 23 young researchers from 5 countries (Germany, Norway, Spain, UK and Portugal). The course also included a field excursion to the Alpine Mountains in Bavaria.

#### c) Projects with active working groups

##### Project no. 506: 'Marine and Non-marine Jurassic'

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**Abstract:** During the year 2010, 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 2006-2010 the Spanish Working Group (SWG 506) has presented many original works and several doctoral dissertations on different research lines of the Triassic and Jurassic. Those are the results of our research activities as SWG of the IGCP 506 with thirty members, at the end of this project. Some members of this SWG have attend the The 8th International Congress on the Jurassic System in Shehong of Suining, Sichuan, China during the last August.





Lower Triassic, Chengdu, China, visited during a field-trip of the 8th International Congress on the Jurassic System.

#### Meeting organization

Symposium on project topics, as a part of the III Congreso Ibérico de Paleontología/XXVI<sup>a</sup> Jornadas de la Sociedad española de Paleontología, Lisboa, July 7<sup>th</sup> to 10<sup>th</sup>, 2010.

#### Publications and contributions to congresses

The working group has a total of 29 publications in journals, and 11 contributions to meetings.

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

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#### **Abstract:**

During the year 2010 one of the activities of the IGCP-526 spanish working group was focused on the preparation, organization and celebration of the IV IGCP 526 conference on "*Continental Shelves: Risks, Resources and Record of the Past*", that was held in Vigo (Spain), from Sept. 28 to Oct.1st, hosted by the University of Vigo, and organized by the Marine and Environmental Geology Group. About 100 researchers of several different countries attended this scientific meeting, resulting in a total of a high number of scientific contributions. Several invited conferences were held during the conference by relevant national and international researchers in the fields of geophysics, tectonic, geochemistry, environmental magnetism, etc.

The organization of the conference also included a short (one day) Marine Geology Course for a limited number of PhD students/young researchers. about "Techniques of sampling and geochemical analysis of marine sediments". This was attended by 15 of the 100 participants, most of them young scientist or researchers for developing countries.

It was also included a visit to the Island Cíes located in the ria de Vigo mouth.



Field trip to Island Cies as a part of the activities of the IGCP Project no. 526 meeting, at Vigo, Spain.

Invited researchers financed by the IGCP for the meeting were: Nadia Mhammedi (Marruecos) and Bijan Kumar Saha (India).

#### Publications and contributions to congresses

During 2010 the Spanish Group of the IGCP 526 has published about 20 international and national papers and more than 20 contributions to conferences, meetings and congresses.

#### Project no. 567: 'Earthquake Archaeology'

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#### **Summary:**

The project has organised a session in EGU meeting, at Vienna, whose aim was to broaden the scope to the archaeological environment and to other natural hazards. We therefore welcome submissions concerning the identification, parameterization and modelling of ancient events at and around archaeological sites, not only in the perspective of hazard assessment and future risk mitigation but also to learn more about the reaction of ancient societies to these palaeo-events. We encourage contributions from both natural, Engineering and social sciences to stimulate interdisciplinary discussions on the lessons to be learned from the past. In this session participated five members of the SWG and presented four contributions. Associated with this session took place the celebration of the Business Meeting of the IGCP-567 presided by M. Sintubin.

During the year 2010 part of the activities of the IGCP-567 Spanish Working Group (SPWG) were focused on the preparation and, organization of the 2<sup>nd</sup> INQUA-IGCP 567 International workshop on Active Tectonics, Earthquake Geology, Archaeology and Engineering, in Corinth (Greece). The workshop will be thematic and will include invited speakers, oral presentations, discussions and posters, as well as 2-day field trip in the active Corinth Gulf area, a boat trip



crossing the famous channel, and a 2-day workshop with thematic invited talks on very specific topics and practice. This meeting sponsored by the IGCP-567 will work as the Annual Meeting of the Project. Pablo G. Silva (Coordinator of the Spanish Working Group) is one of the organizers. Miguel Angel Rodríguez Pascua and Raúl Pérez López, members of the Spanish working Group are also involved in the organizing committee of the meeting.

The Iberfault workshop aims to enhance the interaction between the various researchers who study active faults and paleoseismology in the Iberian Peninsula. 107 researchers attended the meeting and presented 55 presentations on the recent tectonics of specific faults and synthetic analyses of pre-existing data, although those researchers who show advanced efforts in obtaining the seismogenic parameters along active faults (maximum magnitude, slip rate, level of activity, recurrence period, etc.) were given priority. The meeting also included some plenary sessions to be given by specialists on the use of geological data in seismic hazard analyses. All of these contributions were published in a monography entitled "1st Iberian Meeting on active Faults and Palaeoseismology. Geological contribution to seismic hazard analysis. One of the long-term goals of Iberfault was to construct a Database of the Active Faults in the Iberian Peninsula that will be hosted and maintained by the *Instituto Geológico y Minero de España (IGME)* and that will be open to the community. Another goal of the workshop is to start collecting and discussing all of the available data concerning seismogenic sources in the Iberian Peninsula, and to discuss some constraints of the database. the participants could introduce their results into the database. In the database, each seismogenic source or group of seismogenic sources reflect the author, the compiler (in the case of some synthetic papers) and the references (of published data). One of the important aspects of this database is that it will be open to researchers dealing with seismic hazard analysis. The inclusion of geologic data in the estimations of seismic hazard will enhance the quality of the seismic hazard assessments and, accordingly, will enhance the seismic risk and land use planning for mid- to long-term timescales for the Iberian Peninsula.

P.G. Silva and K. Reicherter, had a lecture in the University of Cadiz, on April 14<sup>th</sup>, 2010, untitled: *The New Methods in Archaeoseismology*.

#### Meeting organization

– European Geosciences Union General Assembly 2010, Vienna, Austria – Session NH9.14 Environmental hazards and Ancient Societies: Lessons from the Past? (2010/05/02-07). Convenors: Manuel Sintubin (K.U.Leuven, Belgium), Klaus-G. Hinzen (Universität Köln, Germany), Alessandro Michetti (Università dell'Insubria, Italy), Miguel A. Rodríguez-Pascua (IGME, Spain) and Iain S. Stewart (University of Plymouth, U.K.). It is a joined initiative of IGCP 567 and the INQUA Focus Area Group Palaeoseismology and Active Tectonics.

- 2<sup>nd</sup> INQUA-IGCP 567 International workshop on Active Tectonics, Earthquake Geology, Archaeology and Engineering. (2011/07/19-24). Organizers: Ioannis Papanikolaou (U. Athens, Greece), Klaus Reicherter (RWTH Aachen University, Germany), Pablo G. Silva (U. Salamanca, Spain), Andreas Vött (RWTH Aachen University, Germany). It is a joined initiative of IGCP 567 and the INQUA Focus Area Group Palaeoseismology and Active Tectonics.

- IBERFAULT 2010: 1st Iberian Meeting on active Faults and Palaeoseismology. Geological contribution to seismic hazard analysis. "*Primera Reunión Ibérica sobre las fallas activas y Paleosismología. Contribución de los datos geológicos al cálculo de la peligrosidad sísmica.*": 2010/10/27-30. Sigüenza (Guadalajara, Spain). The directive team of the workshop include one member of the SGW IGCP567 (M.A. Rodríguez Pascua) and two members of the organizing committee (R. Pérez López and X. Moreno).

#### Publications and contributions to congresses

This working group has a total of 3 publications, and 9 contributions to meetings.

Project no. 587: 'Entity, Facies and Time - the Ediacaran (Vendian) Puzzle'

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**Abstract:**

IGCP project 587 is the successor of project 493, hence the 493 Spanish Working Group is also involved in this new project. The group is composed of twenty one researchers from ten public Spanish institutions; they are specialists on Precambrian and lower Palaeozoic stratigraphy, geochemistry, palaeontology, petrology, sedimentology, tectonics and vulcanology from the Iberian Peninsula, Siberia and Australia. Results appeared during years 2009 (a bridge interval from project 493 to 587) and 2010 (first year of project 587) focused both on research and spreading. Particularly, research topics were sequence stratigraphy of Neoproterozoic rocks, and taxonomy, palaeobiology and evolution of Neoproterozoic organisms and their Cambrian descendants. Results on Neoproterozoic life and the subsequent Cambrian explosion were spread to students at all levels and the general public through a DVD documentary titled "*On the Trail of Primitive Life. (The Cambrian Period)*".

Meeting organization

The Spanish working Group has been constituted on July 9th, 2010, during the annual meeting of the Spanish Paleontological Society at Lisbon (Portugal), as a part of the 3rd Iberian Congress of Paleontology. The working group has a total of 21 members.

Publications and contributions to congresses

- Two publications by working group members, and 4 contribution to congresses were produced.
- A monography in English and Spanish has been published: "*On the trail of Primitive Life (The Cambrian Period)*". Prensas Universitarias, Universidad de Zaragoza.

Project no. 588: 'Preparing for Coastal Change'

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**Abstracts:**

Changes in relative sea level, coastal evolution and extreme events such as storms and tsunami are of local and global interest, which hinder individual well-being and intensify/enhance environmental degradation. An increased public awareness of predicted future sea-level rise combined with recent devastating extreme events has placed significant socioeconomic relevance on the understanding of human-land-ocean interaction and coastal dynamics. This project looks at records that will assist in assessing human interactions, coastal dynamics and vulnerability at different timescales which are immediately relevant to a variety of stakeholders interested in the future of coastal communities. They are: catastrophic or instantaneous events (minutes to hours);

measurable and predictable changes (hours to years) for planning scale decisions (years-decades) and; geological-scale changes (centuries to millennia).

The project started in 2010 and the Spanish Working Group was established in September 2010 with more than 29 researchers interested. The investigations cover areas from all the Spanish and Portugal coast as well as Tunisia, Açores, Cape Verde and Santo Domingo coasts.

#### Meeting organization and participation

International Workshop on Decoding the Last Interglacial in Western Mediterranean. Cagliari (Sardinia, Italy), 25th and 29th of October, 2010. Organized by INQUA Project 0911 with collaboration of GTE IGCP 588.

J. Lario, A. Cabero, T. Bardají, J. Rodruiguez Vidal, L. Cáceres.

1st Joint International Conference of IGCP 588 in Hong Kong, 30 Nov to 4 Dec 2010.

J.Lario

#### Publications and contributions to congresses

The working group has presented two contributions to congresses.

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 Granada on March 15th, 2010 with Prof. M. A. Lamolda in the chair. The University of Granada allowed a site, and other facilities to us. This meeting was attended by 8 participants.

The committee reviewed the projects newly adopted by the IGCP Scientific Board during its last session in middle February 2010 at Paris. A proposal for the Spanish Working Group, Project no. 585 “E-MARSHAL: Earth’s Continental Margins: Assessing the Geohazard from Submarine Landslides” was approved.

The Chairman of the SNC, according to the promotion policy of GTEs, of interest to Spaniard researchers, has nominated correspondents of both IGCP Project no. 587 “*Entity, Facies and Time, the Ediacaran (Vendian) Puzzle*”, and 588 “*Preparing for Coastal Change*”, as there are a relevant number of Spaniard researchers working in topics related with those projects.

The Chairman of the SNC gave a supporting letter to Dr. Peter Königshof, for his proposal of a new Project, in collaboration with Thomas J. Suttner, and other, untitled: *Climatic Change and Biodiversity patterns in the Mid-Paleozoic*.

The Chairman of the SNC gave a supporting letter to Dr. Zhang Cheng and other, for their proposal of a new Project, untitled: *Environmental Change and Sustainability in Karst Systems: Relations to Climate Change and Anthropogenic Activities*.

The Chairman of the SNC gave a supporting letter to Dr. Dorrik Stow and other, for their proposal of a new Project, untitled: *Contourites, processes and product*.

The Chairman of the SNC gave a supporting letter to MSc Emilia Bocanegra and other, for their proposal of a new Project, untitled: *Groundwater and Wetlands in Ibero-America*.

This year has been a total of 11 working groups: GTEs project no. 506, 513, 526, 546\*, 555\*, 559\*, 567, 574\*, 585\*, 587\* and 588 (\* informal group, correspondent)

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

\* Liñán, E., Bayón, J. M. 2009. *On the Trail of Primitive Life. (The Cambrian Period)*. Prensas Universitarias, Universidad de Zaragoza.

\* Andreo B., Carrasco F., Durán J.J. y LaMoreaux J., (Eds.) *Advances in Research in Karst Media*: 526 pp. Springer, ISBN 978-3-642-12485-3. (a total of 10 contributions by members of the working group)

\* Lamolda, M.A. (coor.) et al., 2010. *Geoevents, Geological Heritage, and the Role of the IGCP. Abstract Book*. Ayuntamiento de Caravaca de la Cruz, 285 pp.

\* Brown, D., Ryan, P.D., (Eds). *Arc-Continent Collision*. Springer, 988 pp. ISBN 978-3-540-88557-3.

\* García-Casco, A., Proenza, J.A., Iturralde-Vinent, M.A. (Editors). *Subduction Zones of the Caribbean*". Special volume of *Geologica Acta*. <http://www.geologica-acta.com/> (in press.)

\* Silva, P.G., Sintubin, M., Reicherter, K. (Eds.). *Earthquake Archaeology and Paleoseismology*. Special issue *Quaternary Internacional* (in press).

SWGs have produced a total of 83 papers, 6 special issues peer review, and 1 geological map. A total of 119 contributions to congress were presented. Two field-guides were produced, and 3 PhD Thesis have been finished as a part of the IGCP topics.

Field excursions:

\* Camilo Montes, Agustín Cardona, German Bayona, David Farris. *From arc growth to orocline formation: The record from the Panama Canal and East Panama*. Panama, February 9-11 2010.

\* Cies Island field-trip as a complement to the the short-course on "Techniques of sampling and geochemical análisis of marne sediments". Vigo September 2010.

\* Walter V. Maresch, Franco Urbani, Hans-Peter Schertl, Klaus P. Stanek. *Subduction/accretion-related high-pressure rocks of Margarita Island, Venezuela*. Isla Margarita, Venezuela, November 11-15 2010.

## 5. IGCP meetings held during the year in Spain

\* *Curso de postgrado sobre Petrología y Arqueología (Caribe precolombino)*, Granada March 19th 2010. Co-organised by the Doctoral Schools in Earth Sciences and Archaeology of the University of Granada. About 50 participants.

\* 4th International Symposium on Karst, Málaga (Spain) 27<sup>th</sup>-30<sup>th</sup> April 2010.

<http://cehuma.uma.es/sika.asp>

during it a post-graduated course, the 4<sup>th</sup> edition of *HYDROKARST 2010 Training Course on Groundwater recharge assessment and contamination vulnerability assessment in carbonate aquifers*, 26<sup>th</sup> April 2010, was organised, at the University of Málaga.

\* Two sessions during the IIIrd Iberian Congress on Paleontology, held at Lisbon, on July 7th – 10th, 2010, by the Spanish Working Groups projects no. 506 and 567, respectively.

\* 35<sup>th</sup> Anniversary of the Spanish National Committee Symposium. September 15<sup>th</sup> –18<sup>th</sup>, 2010, at Caravaca de la Cruz (Murcia). This symposium was a part of the International Conference on Geoevents, Geological Heritage, and the Role of the IGCP, sponsored by the Caravaca Municipal Council, and auspiced by the Secretariat of the IGCP and the Comisión Nacional de Geología (Spanish Representative of the IUGS).

This internacional Conference consisted on three symposia:

- Geoevents: learning on the Global Change
- IGCP European Regional Meeting
- ProGeo SW Europe Regional Meeting

Three keynotes about IGCP general topics, and 6 keynotes about Project topics were read by representatives of IGCP Secretariat, Scientific Board, and Project co-leaders, respectively. Six national reports about the last 5 years were contributed, and three round tables on IGCP development and its improvement were performed.

The participation was successful in general, nevertheless the IGCP European Regional Meeting had a scarce participation, with representatives from Austria, Bulgaria, Czech Republic, Germany, Poland, Russia, Serbia, Spain, Slovenia, and Sweden, only.

\* 4<sup>th</sup> Annual International Meeting of the IGCP Project no. 526 *Risks Resources and Record of the Past on the Continental Shelf*, organised by the Spanish Working Group in the Facultad de Ciencias del Mar, Universidad de Vigo (Pontevedra), from September 28<sup>th</sup> to October 1<sup>st</sup>, 2010. A course on Marine Geology for graduate students, Mytilus research ship, Ria de Vigo was a part of the meeting.

\* IBERFAULT 2010: *1st Iberian Meeting on active Faults and Palaeoseismology. Geological contribution to seismic hazard analysis*. Sigüenza (Guadalajara, Spain), 27 – 30 October, 2010.

## 6. IGCP meetings planned for the following year

- Annual meeting and Special Session on *Coastal Processes* of the Spanish Working Group IGCP Project no. 588, during the XIII<sup>a</sup> Reunión Anual del Cuaternario. Andorra, July 4<sup>th</sup> – 7<sup>th</sup>, 2011.

- Annual meeting and Special Scientific Session of the Spanish Working Group IGCP Project no. 587, during the XXVII<sup>a</sup> Jornadas de la Sociedad española de Paleontología. Sabadell (Barcelona), October 5<sup>th</sup> – 8<sup>th</sup>, 2011.

### Spanish National Committee

- Annual Meeting at Madrid, around middle April 2011.

## 8. Forthcoming events available in connection with the Programme

- Workshop on ICSU, organised by the Spanish Ministry of Science and Innovation, at Madrid on March 4<sup>th</sup>, 2011.
- XIII<sup>a</sup> Reunión Nacional del Cuaternario. Andorra, July 4<sup>th</sup> – 7<sup>th</sup>, 2011.
- XXVII<sup>a</sup> Jornadas de la Sociedad española de Paleontología “*Palaeobiology: new concepts and methods*”, to be held at Sabadell (Barcelona), October 5<sup>th</sup> – 8<sup>th</sup>, 2011.

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

Discussion about the IGCP and its National Committees during three round tables, at Caravaca meeting cited above, produced several conclusions for the improvement of the IGCP, such as follow:

A better information network between UNESCO's scientific programs (e.g., IHP, MAB and IGCP) and UNESCO itself is necessary to reduce shortcomings in the scientific community. We should strengthen synergies and forcing new co-operation (case studies) in order to prevent fragmentation and duplication.

We should critically review present themes (cooperation with other UNESCO Programs, number of projects etc.). Fundamental geoscience is becoming secondary topics in IGCP project priorities.

It would be necessary to develop a central platform of scientific data; many of the early IGCP documents are rapidly disappearing.

We should strengthen the links between science and policy by improving the accessibility of information, both international and national levels. The visibility of UNESCO and IGCP should be increased, increasing the involvement of national UNESCO representative and IGCP national committees on national scale (co-operation with scientific community).

To increase the participation of young scientists, strengthen the links between national IGCP and UNESCO representatives, and Universities.

The linkage between IGCP project proposal and scholarships programme, grant agencies and post-doctoral programme in Europe could be rewarding.

To make IGCP European Regional Meetings on regular basis possibly linked to regional conferences as EUG and/or IGC.

UNESCO/IUGS should foster participation of IGCP representatives, member and/or project leader, in other geo-related initiatives such as YES, Earth Observation, Remote Sensing Programme etc., in order to improve information and initiate cooperation.

Successful projects need more money to handle projects (e.g. travel expenses).

Discussion on climate change need further research. IGCP should focus on climate changes in the Earth history. Because without adequate knowledge of past climate changes forecasts of further climate change trends may not be achieved. Furthermore, we need to establish our own strategy, where is the difference between existing projects such as the World Climate Research Programme (WCRP).

Fostering co-operation with developing countries is important and a good relevant number of leader and/or co-leaders should be present in each IGCP Project.

Reducing bureaucracy: the present IGCP application form should be improved, e.g., focus on detailed aims and present knowledge, including references. Based on the annual evaluation it seems not necessary to provide a number of contributors and /or official endorsement letters.

IGCP secretariat needs more manpower to accelerate formal proceedings (e.g., money transfer).

#### 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 no. ACI2008-0796 (18000 euro, a part has been used for financing year 2010 activities), Ministerio de Ciencia e Innovación, and a grant of the Instituto Geológico y Minero de España (2314 euro), for the following actions:

- Annual meeting of the IGCP Spanish Committee, held at Granada on March 15th, 2010. The meeting was attended by 8 members, with representatives of Spanish Geological Society, Spanish Mineralogical Society, Spanish Paleontological Society, and AEQUA (Spanish Association for the study of the Quaternary). A representative of the IGME (Spanish Geological Survey), attended the meeting, too.
- Three meetings of the Chairman of the Spanish Committee with the Major of Caravaca de la Cruz to coordinate activities related to the above mentioned international conference.
- Participation of a Spanish National Committee representative in the annual meeting of IGCP project no. 513, at Málaga 26th – 30 April, 2010.
- Participation of a Spanish Committee representative in the EGU, symposium on the IGCP project no. 567, Vienna, May 5th - 8th, 2010.
- Two geological missions of the Chairman of the Spanish Committee to prepare the international conference above mentioned.
- Participation of a Spanish Committee representative in the annual meeting of IGCP project no. 506, and International Congress on Jurassic System, Nanjing, August 7th – 23rd, 2010.
- Organization and participation cost in the 35th Anniversary of the IGCP Spanish Committee, and the International Conference on Geoevents, Geological Heritage, and the Role of the IGCP, Caravaca de la Cruz (Murcia), September 15th – 18th, 2010.
- Xerocopies and stationary for the Spanish National Committee and its Working Groups.

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, February 10<sup>th</sup> 2011

Marcos A. Lamolda  
Chairman, Spanish National Committee, IGCP