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CNR-IUGS-IGCP Italian Report

2012

Contents:

"Tales Set in Stone": the IGCP at age 40

The IGCP celebrated its 40th anniversary on 22 February 2012 at UNESCO headquarters in Paris with a series of publications, exhibitions and events. Over 335 projects in about 150 countries with contributions of thousands of Earth scientists attest to the scientific and applied quality of this programme since its inception in 1972. "Tales Set in Stone" is a volume published by the International Union of Geological Sciences (IUGS) and UNESCO to celebrate the IGCP 40th Anniversary with a selection of the Tales Set in Stone drawn from examples of excellent IGCP projects.

The Italian geocommunity and the 34th IGC

The 34th International Geological Congress attracted 6,012 delegates from 112 countries – a terrific outcome considering the economic challenges currently facing many nations, and the long distances the majority of delegates had to travel to get to Brisbane. The congress had a major focus on the private sector – the sector which is by far the biggest employer of geologists around the world. As in previous IGC's, the Brisbane Congress had a strong Technical Programme that included 3,232 oral presentations.

Fifty-nine fully registered delegates came from Italy. The official Italian delegation –designated by the Office for International Agreements and Relationships of CNR and led by Attilio Boriani (Accademia dei Lincei)- included also Marco Amanti (ISPRA), Antonio Brambati (Museo dell'Antartide), Carlo Doglioni (Università di Roma – La Sapienza), Domenico Rio (Università di Padova), Pierluigi Soddu (Protezione Civile) e Fabio Trincardi (CNR).

During the IGC-IUGS Council meeting Prof. Roland Oberhaensli was elected President of the International Union of Geological Sciences for 2012-2016. The next IGC's will be held in Cape Town (2016) and New Delhi (2020).

IGCP Projects with Italian leaders in 2012

Project No.540 – "Gold-bearing Hydrothermal Fluids of Orogenic Deposits". Leader: Paolo S. Garofalo (University of Bologna)

Project No.565 – "Geodetic Monitoring of the Global Water Cycle". Leader: Susanna Zerbini (University of Bologna)

Project No.591 – "The Early to Middle Paleozoic Revolution". Leader: Kathleen Histon

Project No. 619 – "Contourites: Processes and Products". Leader: Michele Rebesco (OGS, Trieste)

(see details inside)

Preface

This newsletter serves a double purpose: (i) it reports to the IGCP Headquarters at UNESCO what is the current status of the Italian involvement in the IGCP and (ii) provides the Italian geological community with information on ongoing IGCP projects and activities, in order to promote participation and dissemination of information. For these reasons, the newsletter has wide distribution within the Italian geological community.

This issue contains, among other items:
1. the Summary Report 2012 of the IGCP Italian National Committee;
2. the Summary Report 2012 of the IUGS Italian National Committee;
3. an outline of the new IGCP projects;
4. the complete list of IGCP projects active in 2012, with contact addresses of leaders and Italian coordinators.

If you have suggestions for improving this newsletter do not hesitate to get in touch with William Cavazza (william.cavazza@unibo.it).

Summary of IGCP guidelines

(full set of guidelines available online)

1. Purpose and objectives of the IGCP

The International Geoscience Programme (IGCP) - formerly International Geological Correlation Programme - is a joint endeavor of UNESCO (United Nations Educational, Scientific and Cultural Organization) and IUGS (International Union of Geological Sciences). The primary aims of IGCP are to facilitate international collaboration amongst scientists from around the world in research on geological problems, particularly between those individuals from more industrialized and those from developing countries. Through long-term joint research efforts, meetings, field trips, and workshops, IGCP aims to promote the use of geosciences in global issues.

IGCP pursues four broad objectives:

1. improving our understanding of the geoscientific factors affecting the global environment in order to improve human living conditions;
2. developing more effective methods to find and sustainably exploit natural resources of minerals, energy and ground water;
3. increasing understanding of geological processes and concepts of global importance, including an emphasis on socially relevant issues;
4. improving standards, methods and techniques of carrying out geological research, including the transfer of geological and geotechnological knowledge between industrialized and developing countries.

2. Operational policy

The objectives of IGCP are met through individual projects. The number of active projects in any given year depends on the current priorities of UNESCO and IUGS, the availability of funds, the success and progress of existing projects and the quality and merit of newly submitted proposals.

IGCP projects are approved for a period not exceeding five years. Individual projects are reviewed annually after the second year and may be terminated following review for their poor performance.

The annual allocation of support for each project depends upon its quality and, for an already funded project, upon its performance during the previous year. The financial support provided annually by

UNESCO and IUGS for IGCP projects covers part of the costs of organizing and managing research, meetings, and workshops, related to the project, as well as to facilitate participation by scientists from developing countries. These limited funds provide 'seed money' to assist in the acquisition of additional funds from other sources. Past experience indicates that successful IGCP projects are able to secure significant additional funding from other sources. The actual amount of funding provided annually all IGCP projects reflects the collective decisions of UNESCO and IUGS.

IGCP projects must successfully meet the following criteria:
1. focus on high-quality science relevant to the scientific objectives of the IGCP;
2. meet a need of international importance and societal relevance;
3 emphasize interdisciplinary cooperation;
4. constitute international participation including scientists from developing countries;
5. demonstrate potential for both long-term and short-term geoscientific and/or societal benefits;
6. explicitly acknowledge the sponsorship of UNESCO, IUGS, and IGCP; and,
7. promote global geoscience visibility. For example, through the publication of scientific results using internationally recognized journals or other media.

3. Topics for IGCP project proposals

IGCP welcomes proposals on the following topics:

(i) topics of particular interest to IGCP (as outlined in the following);
(ii) topics defined annually by UNESCO and IUGS;
(iii) other relevant topics in fundamental and applied geoscience.

(i) Topics of particular interest to IGCP

Geoscience of the Water Cycle
Life on Earth depends on water and its sustainable use is crucial for continued human existence. Earth's water resources include surface/ground water, ocean water, and ice. The study of Earth's water involves understanding and managing both surface and groundwater systems, including sources, contamination, vulnerability and history of water systems.

Geohazards: Mitigating the Risks
Geohazards include earthquakes, volcanic activity, landslides, tsunamis, floods, meteorite impacts and the health hazards of geologic materials. Geohazards can range from local events such as a debris slide or coastal erosion to events that threaten humankind (e.g., supervolcano eruption or meteorite impact). Earth scientists undertake research to better understand such hazards and contribute to risk reduction.

Earth Resources: Sustaining our Society
Earth resources include minerals, hydrocarbons, geothermal energy, air, and water. The future well-being of society depends on sustainable use of these resources. The environmentally responsible exploitation of these resources is a challenge for geoscience research. The progress of technological development is equally bound to this premise.

Global Change and Evolution of Life: Evidence from the geological record
Changes in the Earth's climate and of life on Earth are preserved in the rock record. Ice and dust records, terrestrial and ocean sediments, and sequences of fossil plant and animal assemblages all comprise parts of this record. Life has impacted Earth's atmosphere, oceans, and land surface. Several major extinctions have punctuated Earth's history, associated with dramatic environmental and ecosystem change. Past environmental lessons shed light on present and future challenges.

The Deep Earth: How it controls our environment
The Earth's surface, including our habitable environment, is a product of, and controlled by deep Earth processes. The study of this environment (ranging from changes in the Earth's magnetic field to plate tectonics) using for example, geophysical and geodynamical techniques, enhances our understanding of the working of System Earth.

(ii) Topics defined annually

These are specific topics identified cooperatively by UNESCO, IUGS and the IGCP Scientific Board that are perceived to be of timely relevance in any given year.

(iii) Other relevant topics in fundamental and applied geosciences

The IGCP encourages submission of project proposals in all aspects of the geosciences, provided they meet the requirements outlined above (see list of criteria in Section 2 - Operational Policy).

4. Project proposals

IGCP project proposals may be submitted by individual scientists or by a group of scientists. The IGCP Scientific Board is ready to advise project leaders, regarding the scientific quality, content, scope, viability, budget and relevance of potential project proposals (e.g., advice regarding the inclusion of other qualified scientists, bridging to other initiatives, outputs).

Assessments of proposals for new IGCP projects (and the Annual Reports of ongoing projects) are conducted once a year by selected representatives of the IGCP Scientific Board, usually during the first half of February. Assessments are based upon the criteria and objectives of IGCP (e.g. the scientific potential and feasibility of proposals, adherence to the overall goals of IGCP, qualifications of the proposers, scientific progress of the projects, significance of their results, adherence to an approved budget and so on). Projects are ranked into one of three funding levels: high, medium, or low.

The deadline for submission and receipt of new project proposals to the IGCP Secretariat is October 15th. Each project leader must include a letter of endorsement from his or her respective IGCP or IUGS National Committee. The IGCP Secretariat will promptly inform proponents of the decisions regarding individual proposals. Proposal forms are available from the IGCP website. It is strongly recommended that the proposers of a new IGCP project get in touch with the Italian IUGS-IGCP National Committee before submission.

5. Young Scientist Projects

The IGCP Young Scientist Project is a special type of IGCP Project which aims at fostering international cooperation between prospective young scientists from developing and developed countries early in their careers. It is expected that this will recruit and train young scientists to establish future cooperative projects. Proposals and projects should follow these guidelines:

- Proposers should be within 10 years of their PhD.
- Proposers should provide a CV and include a copy of at least one international peer-reviewed publication in their field.
- Proposers are encouraged (but not required) to find an experienced scientist as advisor to help guiding the project.
- Proposers need to demonstrate an affiliation to a research institute, university, geological survey, or equivalent organization for the duration of the project.
- Projects may, but do not need, to be linked to an existing IGCP project.
- The project duration is three years; the project should involve at least three young scientists from a minimum of two countries. The principal proposer must be from a developing country.
- The Young Scientist Project will be awarded a maximum of US$5,000 per year.
- These funds are provided to support:
  - field meetings with at least five participants, which should including the group leaders,
  - travel to IGCP-organized or any other international scientific conference,
  - participation in training courses,
  - research equipment (max. 20% of the allocated funds).

6. Funding

IGCP is not a funding programme. The annual allocation of support for each project will depend upon its quality and, for an already funded project, upon its performance during the previous year. The financial support provided annually by UNESCO and IUGS for IGCP projects covers part of the costs of organizing and managing research, meetings, and workshops, related to the project, as well as to facilitate participation by scientists from developing countries. These limited funds (average ca. 30,000 USD for the entire length of the project) provide 'seed money' to assist in the acquisition of additional funds from other sources. Past experience indicates that successful IGCP projects are able to secure significant additional funding from other sources.

Summary Report 2012 of the IGCP Italian National Committee

1. *Name, address, telephone, fax, e-mail address of the Chairperson of the National Committee:* see back cover.

2. *Members of the Committee:* see back cover.

3. *Projects led by Italian scientists during 2012:*
- Project No. 540 - Gold-bearing hydrothermal fluids of orogenic deposits (2007-2011; OET in 2012) (P.S. Garofalo, Italy; J.R.Ridley, USA; Vsevolod Prokof'ev, Russia)
- Project No. 565 - Geodetic Monitoring of the Global Water Cycle (2008-2012) **(**Hans-Peter Plag, USA; Richard S. Gross, USA; Markus Rothacher, Germany; Norman L. Miller, USA; Susanna Zerbini, Italy; Chris Rizos, Australia)
- Project No.591 – The Early to Middle Paleozoic Revolution (Kathleen Histon; Italy).

4. *Projects with active Italian Working Groups:*
During 2012 Italian geoscientists were active in at least six other IGCP projects.

5. *IGCP meetings held in Italy in 2012*
None was reported.

Summary Report 2012 of the IUGS Italian National Committee

1. Country: Italy

2. Name of IUGS Adhering Organization or National Committee:
Consiglio Nazionale delle Ricerche (CNR).

3. Name and address of person preparing form:
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4. Status of the IUGS National Committee:
The IUGS Italian National Committee is an official committee of C.N.R. (Consiglio Nazionale delle Ricerche), a public agency whose duty is to carry out, promote, spread, transfer, and improve research activities in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development of the country. C.N.R. is also the organization representing Italy in all major international scientific organizations and unions.

5. Number of people on Committee or body for IUGS:
Ten. The members of the Committee are: Dr. Marco Amanti, Prof. Attilio Boriani, Prof. Antonio Brambati, Prof. William Cavazza, Prof. Carlo Doglioni, Prof. Domenico Rio, Dr. Marco Sacchi, Dr. Pierluigi Soddu, Dr. Fabio Trincardi, Dr. Gianluca Valensise.

6. Number of meetings during the year:
Three. During 2012 the NC met officially on March 9th at C.N.R. headquarters in Rome, mostly to discuss the Italian participation in the coming International Geological Congress in Brisbane. The second and third meetings were held in Brisbane during the IGC in view of the participation in the Joint IUGS-IGS Council. Other informal meetings of the members of the IUGS Italian National Committee were held at national meetings and other gatherings.

7. Major scientific activities, e.g., congresses, symposia, workshops, courses:
The CNR is the Italian national agency representing Italy within the IUGS since its foundation. Officially, the Commission promotes the participation of CNR in IUGS activities (including the IGCP), *de facto* it stimulates the participation of the entire Italian Earth sciences community.

8. Main outreach activities, e.g. primary-secondary-tertiary education, community, media, etc.
The Commission itself did not directly produce outreach activities during 2012. A program of introductory geological fieldtrips for high-school teachers and student was run in cooperation with the Italian Federation of Earth Sciences (FIST).

9. Main publications (scientific, other):
The IUGS Italian National Committee publishes in electronic format a yearly report on the International Geoscience Programme (IGCP) which is distributed to the entire Italian Earth sciences community through the Italian Federation of Earth Sciences (FIST). The report reaches over 2,000 geoscientists.

10. Major initiatives currently underway:
The Commission is committed to a new drive to stimulate the participation of Italian geoscientists in the International Geoscience Programme (IGCP).

11. Important activities of other geology-related academic organization(s):
The current governmental budget squeeze makes investments in new initiatives very difficult. In cooperation with the Ministry for Economic Development and the Italian Association of Mining and Petroleum Industries, the Geological Society of Italy has released an improved version of the VIDEPI Project. The project aims at making easily available the technical documents on oil exploration in Italy. The web-based inventory of well data and seismic lines is having a profound impact on scientific research, making available data otherwise difficult to find and utilize.

12. Activities/achievements reported or to be reported in Episodes and/or in the IUGS website
None.

13. Participation in IUGS bodies, programmes, joint-initiatives, or other IUGS activities:

During 2012 three members of the IUGS Italian National Committee actively participated in the activities of IUGS bodies. Prof. William Cavazza was the IUGS Treasurer until August 2012, when the new IUGS Executive Committee was elected. Prof. Attilio Boriani is the Chair of the Strategic Planning Committee. Prof. Antonio Brambati is the Chair of the Finance Committee.

14. Activities related to the next IGC
During 2012 the IUGS Italian National Committee actively promoted the participation of Italian geoscientists in the IGC Brisbane.

Active IGCP Projects

You are invited to visit the UNESCO webpage listing all active IGCP projects. All Italian colleagues interested in joining the projects or just wishing to receive additional information are invited to visit the relevant webpages and/or get in touch with the project leader(s).

IGCP Projects Active in 2012
(30 active, 29 funded, 1 OET)

IGCP project number - title
Project leader(s),
Duration (OET – on extended term, one additional 6th year without funding)
website(s)

540 GOLD-BEARING HYDROTHERMAL FLUIDS OF OREGENIC DEPOSITS
Project leaders: P.S. Garofalo (Italy), J.R. Ridley (USA), Vsevolod Prokof'ev (Russia)
Duration: 2007-2011 (OET in 2012)
http://www.geomin.unibo.it/igcp%5F540/

559 CRUSTAL ARCHITECTURE AND LANDSCAPE EVOLUTION
Project leaders: Bruce R. Goleby (Australia)
Duration: 2008-2012
http://www.earthscrust.org

565 GEODETIC MONITORING OF THE GLOBAL WATER CYCLE
Project leaders: Hans-Peter Plag (USA), Richard S. Gross (USA), Markus Rothacher (Germany), Norman L. Miller (USA), Susanna Zerbini (Italy), Chris Rizos (Australia)
Duration: 2008-2012
http://www.iag-ggos.org/igcp565

567 EARTHQUAKE ARCHAEOLOGY – ARCHAEOSEISMOLOGY ALONG THE ALPINE-HIMALAYAN SEISMIC ZONE
Project leaders: Manuel Sintubin (Belgium), Iain Stewart (United Kingdom), Tina Niemi (USA), Erhan Altunel (Turkey)
Duration: 2008-2012
http://ees.kuleuven.be/igcp/567/

571 RADON, HEALTH AND NATURAL HAZARDS
Project leaders: Gavin K. Gillmore (United Kingdom), Robin G.M. Crockett (United Kingdom)

Duration: 2009-2013
http://www2.northampton.ac.uk/info/200272/radon-and-health-in-the-built-and-natural-

572 PERMIAN-TRIASSIC ECOSYSTEMS
Project leaders: Zhong Qiang Chen (Australia), Richard J. Twitchett (United Kingdom), Jinnan Tong (China), Margaret L. Fraiser (USA), Sylvie Crasquin (France), Steve Kershaw (United Kingdom), Thomas J. Algeo (USA), Kliti Grice (Australia)
Duration: 2008-2012
http://www.igcp572.org/

574 BENDING AND BENT OROGENS, AND CONTINENTAL RIBBONS
Project leaders: Stephen T. Johnston (Canada), Gabriel Gutierrez-Alonso (Spain), Arlo Weil (USA)
Duration: 2009-2013
http://www.brynmawr.edu/geology/faculty/aweil/IGCP-574/

575 PENNSYLVANIAN TERRESTRIAL HABITATS AND BIOTAS OF SOUTHEASTERN EURAMERICA
Project leaders: Christopher J. Cleal (United Kingdom), Stanislav Opluštil (Czech Republic), Isabel van Waveren (The Netherlands), Mihai E. Popa (Romania), Barry A. Thomas (United Kingdom)
Duration: 2010-2014
http://www.igcp575.org

580 APPLICATION OF MAGNETIC SUSCEPTIBILITY ON PALEOZOIC SEDIMENTARY ROCKS
Project leaders: Anne-Christine da Silva (Belgium), Michael T. Whalen (USA), Jindrich Hladil (Czech Republic), Daizhao Chen (China), Simo Spassov (Belgium), Frederic Boulvain (Belgium), Xavier Devleeschouwer (Belgium)
Duration: 2009-2013
http://www.ulg.ac.be/geolsed/MS

581 EVOLUTION OF ASIAN RIVER SYSTEMS
Project leaders: Hongbo Zheng (China), Ryuji Tada (Japan), Peter Clift (United Kingdom), Masood Ahmad (India), Zhengxiang Li (Australia)
Duration: 2009-2013
http://isg.nju.edu.cn/Exchange/Index.aspx

582 TROPICAL RIVERS: HYDRO-PHYSICAL PROCESSES, IMPACTS, HAZARDS AND MANAGEMENT
Project leaders: Edgardo M. Latrubesse (Argentina), Rajiv Sinha (India), Jose C. Stevaux (Brazil), Zhonguan Chen (China)
Duration: 2009-2013
http://www.igcp582.uem.br/

585 E-MARSHAL: EARTH'S CONTINENTAL MARGINS: ASSESSING THE GEOHAZARD FROM SUBMARINE LANDSLIDES
Project leaders: Roger Urgeles (Spain), David Mosher (Canada), Jason Chaytor (USA), Michael Strasser (Germany)
Duration: 2010-2014
http://www.igcp585.org

586-Y GEODYNAMIC PROCESSES IN THE ANDES 32°-34°S
Project leaders: Laura Giambiagi (Argentina), Luisa Pinto (Chile), Maisa Tunik (Argentina), Sergio Sepúlveda (Chile), Stella Maris Moreiras (Argentina), Marcelo Farías (Chile), Greg Hoke (USA), Sébastien Carretier (France), Julieta Suriano (Argentina), Maximiliano Naipauer (Argentina), Victor Garcia (Argentina), Daniel Yagupsky (Argentina), Andrés Tassara (Chile)
Duration: 2010-2012 (Young Scientist Project)
http://igcp586y.syr.edu/IGCP_586Y

587 ENTITY, FACIES AND TIME – THE EDIACARAN (VENDIAN) PUZZLE

Project leaders: Patricia Vickers-Rich (Australia), Mikhail Fedonkin (Russia), Jim Gehling (Australia), Guy Narbonne (Canada)
Duration: 2010-2014
http://www.geosci.monash.edu.au/precsite

588 PREPARING FOR COASTAL CHANGE
Project leaders: Adam D. Switzer (Malaysia), Craig Sloss (Australia), Benjamin Horton (USA), Yongqiang Zong (China)
Duration: 2010-2014
http://www.coastal-change.org

589 DEVELOPMENT OF THE ASIAN TETHYAN REALM
Project leaders: Xiaochi Jin (China), Katsumi Ueno (Japan), Graciano Yumul JR (Philippines), Pol Chaodumrong (Thailand)
Duration: 2012-2016
Web site in process

591 THE EARLY TO MIDDLE PALAEOZOIC REVOLUTION
Project leaders: Bradley D. Cramer (USA), Živile Žigaitė (Lithuania), Thijs R.A. Vanderbroucke (France), Kathleen Histon (Italy), Renbin Zhan (China), Guillermo L. Albanesi (Argentina), Michael J. Melchin (Canada), Mikael Calner (Sweden)
Duration: 2011-2015
http://igcp591.org/

592 CONTINENTAL CONSTRUCTION IN CENTRAL ASIA
Project leaders: Inna Safonova (Russia), Reimar Seltmann (UK), Min Sun (China)
Duration: 2012-2015
http://www.iagod.org/igcp/

594 IMPACT OF MINING ON THE ENVIRONMENT IN AFRICA *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*
Project leaders: Bohdan Kříbek (Czech Republic), Ewa Cukrowska (South Africa), Benjamin Mapani (Namibia), Imasiku Nyambe (Zambia)
Duration: 2011-2014 ***(4 years)***
http://www.geology.cz/igcp594

596 CLIMATE CHANGE AND BIODIVERSITY PATTERNS IN THE MID-PALEOZOIC
Project leaders: Peter Königshof (Germany), Thomas J. Suttner (Austria), Iliana A. Boncheva (Bulgaria), Nadezhda G. Izokh (Russia), Phuong Ta Hoa (Vietnam), Thasinee Charoentitirat (Thailand), Johny A. Waters (USA), Wolfgang Kiessling (Germany)
Duration: 2011-2015
Web site in process

597 AMALGAMATION AND BREAKUP PANGÆA: THE TYPE EXAMPLE OF THE SUPERCONTINENT CYCLE
Project leaders: J. Brendan Murphy (Canada), J. Duncan Keppie (Mexico), Cecilio Quesada (Spain), Bill Collins (Australia)
Duration: 2011-2015
http://www.wix.com/declan_15/test

598 ENVIRONMENTAL CHANGE AND SUSTAINABILITY IN KARST SYSTEMS *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*
Project leaders: Zhang Cheng (China), Augusto Auler (Brazil), Jiang Yongjun (China), Martin Knez (Slovenia), Bartolome Andreo-Navarro (Spain), Yuan Daoxian (China), Chris Groves (USA)
Duration: 2011-2014 ***(4 years)***
http://igcpkarst.com/

599 THE CHANGING EARLY EARTH *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*

Project leaders: Jaana Halla (Finland), Kent C. Condie (USA), Roberto Dall'Agnol (Brazil), Mudlappa Jayananda (India), Martin J. Van Kranendonk (Australia), Hugh Rollinson (UK), Gary Stevens (South Africa), Jin-Hui Yang (China)

Duration: 2011-2014 ***(4 years)***

https://sites.google.com/a/helsinki.fi/early-earth-tectonics/

600 METALLOGENESIS OF COLLISIONAL OROGENS *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*

Project leaders: Zenqian Hou (China), David Leach (USA), Jeremy Richards (Canada), Richard Goldfarb (USA)

Duration: 2011-2014 ***(4 years)***

Web site in process

601 SEISMOTECTONICS AND SEISMIC HAZARDS IN AFRICA *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*

Project leaders: Mustapha Meghraoui (France), Vunganai Midzi (South Africa), Atalay Ayele (Ethiopia), Djillali Benouar (Algeria)

Duration: 2011-2014 ***(4 years)***

http://eost.u-strasbg.fr/~igcp601/Documents.html

604 GROUNDWATER AND WETLANDS IN IBERO-AMERICA

Project leaders: Emilia Bocanegra (Argentina), Gerdon Cardoso (Brazil), Emilio Custodio (Spain), Teresita Betancur (Colombia), Marisol Manzano (Spain)

Duration: 2011-2015

http://www.mdp.edu.ar/hidrogeologia/IGCP604/description.php

606 ADRESSING ENVIRONMENTAL AND HEALTH IMPACTS OF MAJOR AND ABANDONED MINES IN SUB-SAHARAN AFRICA *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*

Project leaders: Theo C. Davies (South Africa), Benjamin Mapani (Namibia)

Duration: 2011-2014 ***(4 years)***

Web site in process

616 TECTONIC, PALEOCLIMATIC, LANDSCAPE EVOLUTION OF CENTRAL AFRICA *(SPONSORED BY THE SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY)*

Project leaders: Boniface Kankeu (Cameroon), R.O. Greiling (Germany), Jurgen Runge (Germany)

Duration: 2012-2014 ***(3 years)***

Web site in process

618 PALEOCLIMATE INFORMATION OBTAINED FROM PAST-RECHARGED GROUNDWATER

Project leaders: Dioni I. Cendón (Australia), Jianyao Chen (China), Jason J. Gurdak (USA), Ofelia Tujchneider (Argentina), Emerit. Sylvi Haldorsen (Norway), Ir. M.J (Martine) van der Ploeg (The Netherlands), Rein Vaikmäe (Estonia), Roland Purtschert (Switzerland) Najiba Chkir Ben Jemâa (Tunisia)

Duration: 2012-2016

Web site in process

619 CONTOURITES: PROCESSES & PRODUCTS

Project leaders: Dorrik A.V Stow (UK), David Van Rooij (Belgium), Francisco-Javier Hernández-Molina (Spain), Michele Rebesco (Italy), Pere Puig (Spain), Antje Voelker (Portugal), Adriano Viana (Brazil)

Duration: 2012-2016

http://contourites.org/igcp/

Italian Contributions to the IGCP - Year 2012

The following are short descriptions of the Italian participation in the IGCP during 2012. This year's report includes only the summaries of the activities of IGCP projects led by Italian geoscientists. All material included was received by December 31, 2012. Some Italian involvement in IGCP projects may not be documented in this publication because the National IGCP Committee of Italy did not receive the relevant information. If you are participating in an IGCP project –as project leader or participant- and your name does not appear in this list get in touch with W. Cavazza (see address and contact numbers on the back cover). All Italian colleagues interested in joining the projects or just wishing to receive additional information are invited to get in touch with the relevant project leader(s) or with the Italian coordinators.

Project No. 540 - Gold-bearing hydrothermal fluids of orogenic deposits (2007-2011: OET in 2012)

Project leaders:
P.S. Garofalo (Italy), J.R.Ridley (USA), Vsevolod Prokof'ev (Russia)

Contact:
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http://www.geomin.unibo.it/Personale/Pagine/template_docente.aspx?pagina=garofalo

Participating countries
Australia, Brazil, Canada, Chile, China, Czech Republic, Germany, Hungary, India, Italy, Ivory Coast, Russia, Slovakia, Switzerland, USA.

Overall achievements

Since 2007, our activity focused on **1)** the selection of orogenic and intrusion-related Au deposits for the construction of a database on the physical-chemical properties of Au-transporting hydrothermal fluids in the Earth's crust using fluid inclusions (FIs), and **2)** on the actual set-up of the database. As expected, among the large pool of deposits initially considered for our multi-technique study, only few showed fluid inclusions with good characteristics for being studied in detail. These deposits are from the Abitibi greenstone belt of Canada (Sigma), from different Australian terrains (Wattle Gully and Red Hill), from a Tertiary terrane of Alaska (Fairbanks district), from the Italian W Alps (Pestarena), and from different Russian terrains (Berezovskoye-Urals; Darasun-East Transbaikalia). The selection criteria of the samples have been very stringent, as they aimed at defining low-strain FI assemblages associated with Au precipitation, which are in general difficult to find especially in shear zone-hosted orogenic deposits.

Consistent with our plans, we collected microthermometric properties, Raman spectra, volume fraction of fluid phases via spindle stage measurements, and Laser Ablation-ICP-Mass Spectrometric analyses for a set of 25 *fluid inclusion assemblages* (*i.e.*, co-genetic groups of FIs) contained in several well-documented Au deposits belonging to the orogenic (Sigma-Canada; Wattle Gully and Red Hill-Australia; Berezovskoe-Russia; and Pestarena-Italy) and intrusion-related (Fairbanks district-Alaska; Teremkin and Talatui-Russia) classes. This dataset corresponds to thousand of

measurements of individual inclusions. In short, our database provides the following evidence: irrespective of geological location, the Au-bearing fluid of orogenic deposits is consistently a two- to three-phase fluid (H_2O-CO_2-NaCl model fluid made of aqueous liquid, carbonic liquid, and vapour phase), with a relatively low bulk salinity (<7.1 eq. wt% NaCl), a φ=13-50 vol% vapour fraction, and a relatively uniform vapour composition (CO_2±CH_4-N_2). A subordinate H_2O-NaCl fluid is also present within the Au veins. *T*h(total) range from values as low as 200°C (Wattle Gully) to 400°C (Sigma), and homogenization occurs by bubble and liquid disappearance. LA-ICP-MS data show that the most abundant analyte in this fluid is Na (4000-28000 µg/g), with subordinate K (300-4500 µg/g) and B (200-2800 µg/g), and minor to trace amounts of (in the most commonly recognized order of decreasing abundance) Cu, Sr, Rb, Mg, Mn, Li, Ba, Cs, Sb, and Pb (range: 1-450 µg/g). These trace components are not systematically determined in all the studied deposits or samples. Au has been determined only in few high-temperature assemblages from the Sigma deposits to be in the 0.5-5 µg/g range, which is a very high concentration.

Intrusion-related deposits contain two-phase aqueous (liquid, vapour) FIs, multi-phase aqueous inclusions with one or more solids (halite and opaque phases), and a two- to three-phase aqueous-carbonic fluid. Compared to the fluid from the orogenic deposits, these three fluid types correspond to a much broader range of bulk salinities (0.4-56 eq. wt% NaCl) of the ore fluid. The volume fraction of the vapour phase is similar to that of orogenic deposits, and its composition is dominated by CO_2 (±CH_4). The *T*h(total) documented in quartz associated with early- and main-stage Au range from about 300°C to 600°C, and homogenization occurs by bubble and liquid disappearance. LA-ICP-MS data show that the most abundant analyte in this fluid is Na (3500-55000 µg/g), with subordinate K (850-9000 µg/g) and B (400-1500 µg/g). With the exception of Fe, Zn, Pb, and Mn, which have a high bulk concentration in the halite-saturated fluid (*e.g.* 28000 µg/g of Fe), the subordinate components As, Cu, Sr, Rb, Mn, Li, Ba, Cs, and Pb have been determined in the liquid-vapour and vapour-rich inclusions to be in the 2-300 µg/g range.

The main insight provided by our work has been the remarkable compositional similarity between the ore fluids of orogenic and intrusion-related deposits. This similarity provides an unexpected relation between the two types of ore fluids, as it points to a possible genetic link between the magmatic sources that generate the intrusion-related Au deposits and the source region of orogenic deposits. The exact definitions of these relations represent the objective of future research; however, two general conclusions can be drawn from our results. First, our database might provide considerable new ideas to the current genetic and field exploration views of the two types of Au deposits. Second, our methodological approach of collecting high-resolution FI properties proved to be a useful working tool.

We stress that between 2007 and 2012, the project members published 57 papers and abstracts, which were published in a large number of international journals (Earth and Planetary Science Letters; Lithos, Precambrian Research; Chemical Geology; Journal of Petrology; Geological Society of London Special Publication no.297; Economic Geology, Mineralium Deposita; Ore Geology Reviews; Canadian Mineralogist; Journal of Earth System Sciences) and presented in 10 international meetings (**11th Biennial SGA Meeting**, Antofagasta, Chile, 26th-29th September 2011; **Goldschmidt2011 Conference**, Prague, Czech Republic 14th–19th August 2011; **XXI ECROFI meeting** Leoben, Austria, 9th–11th August 2011; **XX IMA2010 Meeting**, 21st-27th August 2010 Budapest, Hungary; **III ACROFI Biennial Conference** Novosibirsk, Russia, 15th-20th September 2010; **10th Biennial SGA Meeting**, Townsville, Australia, 17th-20th August 2009; **XX ECROFI Meeting**, Granada, Spain, 21st-30th September 2009; **XIII International conference on Thermo-baro-geochemistry**, Russian Academy of Science, Moscow, Russia, 22nd-25th September 2008; **XIX ECROFI meeting**, Bern, Switzerland, 17th-20th July 2007).

List of countries involved in the project

The project involved about 40 scientists from the following countries: Australia, Brazil, Canada, Chile, China, Czech Republic, Germany, Hungary, India (IGCP540 working group with 10 members), Italy, Ivory Coast (PhD student Zié Ouattara from University of Cocody, Abidjan), Russia, Slovakia, Switzerland, USA.

List of most important publications

In this last year of activity, the scientific achievements of the IGCP540 have been the preparation of the Special Publication of the Geological Society of London titled "*Gold-transporting hydrothermal fluids in the Earth's crust*", whose proposal was finally accepted by the GSL. We highlight that the

proposed book gathers 14 manuscripts co-authored by about 40 leading specialists from 16 different research institutes, some of which did not participate to the IGCP540 project in the first place. We consider this large involvement of colleagues a distinct measure of the importance of our scientific work, and a success of our initiative. The list of the contributions is the following:

1. Garofalo P.S. [1], Fricker, M. [2], Günther D. [2], Bersani, D. [3], Lottici P. [3]
[1] University of Bologna, Department of Earth and Environmental Sciences, Bologna, Italy
[2] ETH, Department of Chemistry and Applied Biosciences. Zurich, Switzerland
[3] University of Parma, Department of Physics, Parma, Italy

Physical-chemical properties and metal budget of Au-transporting hydrothermal fluids in orogenic deposits

2. Klein, E.L.
Geological Survey of Brazil, Superintendência Regional de Belém
Ore fluids of orogenic gold deposits of the Gurupi Belt, Brazil: physico-chemical properties, sources, and mechanisms of Au transport and deposition

3. Ridley J.R and Gibson J.D.
Colorado State University, Department of Geosciences, Warner College of Natural Resources, Ft Collins, CO 80523-1482, Colorado, USA
Multi-element ore-fluid chemistry of mid-Cretaceous intrusion-related gold deposits (IRGD's) and orogenic gold deposits in the Tintina Gold Belt, Alaska

4. Vaughn E.S and Ridley J.R.
Colorado State University, Department of Geosciences, Warner College of Natural Resources, Ft Collins, CO 80523-1482, Colorado, USA
Evidence for exsolution of Au-ore fluids from granites crystallized in the mid-crust, Archean Louis Lake Batholith, Wyoming

5. Moritz R. [1], Noverraz C. [1], Márton I. [1], Spikings R. [1], Fontignie D. [1], Marchev P. [2], Spangenberg J. [3], Venneman T. [3], Kolev K. [4]

[1] Institute of Earth and Environmental Sciences, University of Geneva, Switzerland
[2] Geological Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria
[3] Institute of Mineralogy and Geochemistry, University of Lausanne, Switzerland

[4] Balkan Mineral and Mining AD, Dundee Precious, Kardjali, Bulgaria
The Stremtsi gold prospect: a sedimentary rock-hosted, low-sulfidation epithermal system in the Tertiary Eastern Rhodopes, Bulgaria

6. Koděra, P. [1,2], Fallick, A.H. [4], Heinrich, C.A. [3], Wälle, M. [3], Lexa, J. [4]
[1]Department of Geology of Mineral Deposits, Comenius University, Slovakia
[2]Geological Institute, Slovak Academy of Sciences, Slovakia
[3]Institute of Geochemistry and Petrology, ETH Zurich, Switzerland
[4]Scottish Universities Environmental Research Centre, UK
Au-bearing fluids in epithermal and porphyry deposits in the Central Slovakia Neogene Volcanic Field

7. Fu B. [1], Mernagh T.P. [2], Fairmaid A.M. [3], Phillips D. [3]
[1] Research School of Earth Sciences, The Australian National University, Canberra, ACT 0200, Australia
[2] Geoscience Australia, PO Box 378, Canberra, ACT 2601, Australia
[3] School of Earth Sciences, The University of Melbourne, VIC 3010, Australia
A fluid inclusion study of the Maldon gold deposit, central Victoria, Australia: are reduced intrusion-related gold deposits overprinted orogenic gold deposits?

8. Zoheir B. [1] and Moritz R. [2]
[1]Department of Geology, Faculty of Science, Benha University, Benha 13518, Egypt,
[2] Institute of Earth and Environmental Sciences, University of Geneva, Switzerland
Evolution of the El-Sid lode gold deposit, Eastern Desert, Egypt

9. Isaac C., Biczok J., Hollings P.
Lakehead University, Department of Geology, Thunder Bay, Ontario, Canada
Stable isotope (N, O, H) geochemistry of biotite and quartz at Musselwhite Mine: implications for Au mineralization

10. Volkov, A.V.; Prokofiev, V.Yu.; Sidorov, V.A.
Institute of Ore Geology, Petrography, Mineralogy, and Geochemistry; RAS, Moskow, Russia
Mineralization conditions and fluid composition at the Rodionovskoe orogenic deposit (Northeast Russia)

11. Prokofiev, V.Yu.; Baksheev, I.A.; Svintitsky, I.L.; Vlasov, E.A.; and Nagornaya, E.V.
Institute of Ore Geology, Petrography, Mineralogy, and Geochemistry; RAS, Moskow, Russia
Conditions of formations and composition of ore-forming fluid of the Uderei gold-antimony deposit (Yenisey Ridge, Russia)

12. Mishra B. [1], Saravanan Chinnasamy S. [2]

[1] IIT Karaghpur, India;

[2] University of KwaZulu-Natal, Durban; South Africa
Genetic implications of disordered graphite in the Granodiorite-hosted Gold Deposit at Jonnagiri, Eastern Dharwar Craton, India

13. Upton P., Craw D.

Department of Geology, University of Otago, New Zealand

Modelling of lithological controls on mobility of gold and fluids in metamorphic belts, New Zealand

Project No. 565 – Geodetic Monitoring of the Global Water Cycle (2008-2012)

Project leaders:
H.P. Plag (USA), R.S. Gross (USA), M. Rothaker (Germania), N.L. Miller (USA), S. Zerbini (Italia), C. Rizos (Australia)

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Website: geodesy.unr.edu/igcp565/about_igcp/

List of countries involved in the project:
United States of America, Canada, Germany, Italy, Australia, Korea, South Africa.

Project No. 591 - **The Early to Middle Paleozoic Revolution** (2011 – 2015)

Project leaders:
Bradley D. Cramer (USA), Živilė Žigaitė (Lithuania), Thijs R.A. Vandenbroucke (France), Kathleen Histon (Italy), Renbin Zhan (China), Guillermo L. Albanesi (Argentina), Michael J. Melchin (Canada), Mikael Calner (Sweden)

Contact: Kathleen Histon
Università degli Studi di Modena e Reggio Emilia
Dipartimento di Scienze della Terra
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Website: www.igcp591.org

Project Summary
The Early Ordovician to Early Devonian interval contains several of the most significant paleoclimate and paleobiological events in Earth history. This interval of Earth history also contains the acme and amelioration of the Early Paleozoic Ice Age, which provides an important historical analogue for researchers of modern climate change. Additionally, this interval contains the roots of the invasion of life onto land. The Earth did not go quietly into the Middle Paleozoic and the primary research objective of IGCP 591 – *'The Early to Middle Paleozoic Revolution'* is to investigate this dynamic and important interval in the history and evolution of life and our planet.

Main Project Activities 2012
The 2012 annual meeting was held in July in Cincinnati (USA) with field excursions to the US Midcontinent. Related fieldguides were published. Symposia were held at the GSA North Central meeting in Dayton, Ohio, USA (April, 2012), EGU in Vienna (April 2012) and IGC in Brisbane (August 2012). The proceedings volume of the 2011 Annual Meeting was published as a Special Issue of the Bulletin of Geosciences, 2012. Details of all these activities may be found on the project website.

Italian participation in the project:

- Kathleen Histon (University of Modena and Reggio Emilia) – Project Leader
- Gabriela Bagnoli (University of Pisa)
- Carlo Corradini (University of Cagliari)
- Maria Corriga (University of Cagliari)
- Annalisa Ferretti (University of Modena and Reggio Emilia)
- Laura Gaggero (University of Genoa)
- Alfredo Loi (University of Cagliari)
- Gian Luigi Pillola (University of Cagliari)

Individual Research Activities of the Italian Participants in IGCP 591

Name **Kathleen Histon (Project leader)**
Affiliation Independent Researcher
Home Address Via Mazzini 4, 21039 Valganna, Varese, Italy
Contact Email only: hiscat@interfree.it

Research Focus: current research forms part of a study of sea-level changes, oceanic cycles and biotic response in the Ordovician/Silurian of the Carnic Alps and is focused on a systematic, taphonomic, paleoecologic and paleobiogeographic study of Silurian cephalopods with a view to defining the migrational pathways of pelagic faunas as a tool for timing of open seaways and microterrane position along the North Gondwana margin. I am also working on collections of Silurian nautiloids from the Graz Palaeozoic (Austria).

The early part of 2012 was spent preparing a funding application as Principal Investigator to the ERC IDEAS Program to finance a five-year contract for me and to obtain support for my research on the Silurian of the Carnic Alps. In particular funding was requested to sustain the DISP (refer to project website for details) activities planned within Europe under IGCP 591 (3D scanning of classic Silurian sections and Lower Palaeozoic GSSPs) and for the design and development of the related DISP stratigraphic correlation database by three teams: a 3D scanning team led by C. Aiken in Dallas (USA), a database design team led by E. Ferrari in Varese (Italy) and a stratigraphic research team led by K. Histon (Principal Investigator), also to have been based in Varese (University of Insubria). Refer to 2 conference abstracts Histon et al. (2012) below for details. However, this application was rejected in June 2012. Other funding sources have not been found.

My sincere thanks to Prof. Annalisa Ferretti (Università degli Studi di Modena e Reggio Emilia) for support provided for my research under MIUR-PRIN Project 2008PJP8FS *Gondwana to Mesoeuropa - Paleozoic Geodynamics of Peri-gondwanan Terranes: Biotic, Petrologic and Sedimentary evidence* (2010-2012).

As part of my research activities I spent two weeks studying collections of British Silurian nautiloids at the Natural History Museum London (May 2012) with a grant from the SYNTHESYS Program.

During 2012 I completed publication of 4 scientific articles and presented research at two conferences (7th EUREGEO in Bologna and the 34th IGC in Brisbane, Australia).

In addition a Special Issue: **Time Specific Facies: the color and texture of biotic events** in *Palaeogeography, Palaeoclimatology, Palaeoecology* co-edited with A.Ferretti, P.McLaughlin and C.E.Brett was completed (see references below).

I was co-convener of the IGCP 591 symposium at the 34th IGC (Brisbane, Australia, 2012). I was awarded a grant under the GEOHOST Funded Delegate Program (FDP) towards conference expenses.

Theme 3 Climate Change: Lessons from the past; implications for the future
3.7 Pre-Mesozoic climates and global change [IGCP 591]
Organized by Kathleen HISTON (Italy), Vinod TEWARI (India) and Michael MELCHIN (Canada).
Keynote speakers: David HARPER (U.K.), Alain PREAT (Belgium), David RAY (U.K.)

The symposium marked the debut of an IGCP 591 sponsored event within the many activities organized during the IUGS 34th International Geological Congress held in Brisbane (Australia).

The numerous oral presentations submitted to the symposium were divided into three thematic sessions (see website www.igcp591.org for more details and program on www.34igc.org), Thursday August 9th and Friday August 10th. We also had additional poster presentations.
The presenters included students, early career scientists and researchers from developing countries and represented 13 countries Bangladesh, Belgium, Czech Republic, France, Italy, U.K., Canada, China, India, Japan, Russia, Taiwan and the USA while research presented ranged across four continents (Africa, Asia, Europe and North America). Financial support to attend the 34th IGC was provided under IGCP Project 591 to 7 participants: these included 4 students and 1 early career scientist, 2 women scientists and 5 scientists from developing countries. I gave a presentation of the

aims and activities of IGCP Project 591 at the end of session 2 on Thursday afternoon (August 9th) which also included an update by Carl Brett of the 2012 Annual Meeting in Cincinnati and an overview of the proposed regional Meeting in Mendoza (Argentina, 2013) by Guillermo Albanesi.

A symposium proceedings volume is in preparation to be published in 2013 as a
Special Issue: Pre-Mesozoic Climates and Global Change
in *Palaeogeography, Palaeoclimatology, Palaeoecology*.
Edited by Kathleen Histon, Vinod Tewari and Michael Melchin

Name **Gabriela Bagnoli**
Affiliation Università di Pisa
Dipartimento di Scienze della Terra
Via S. Maria, 53 56126 PISA

Research Focus: Cambrian and Ordovician conodonts from North China, South China, and Sweden; potential GSSP for base of Cambrian Stage 10; Cambrian-Ordovician boundary. Cambrian acritarchs from Baltica. Ordovician biodiversity changes related to asteroid breakup from Baltic sections.

Name **Carlo Corradini**
Affiliation Università di Cagliari
Dipartimento di Scienze Chimiche e Geologiche ,
via Trentino 51, I-09127 Cagliari, Italy

Research Focus: My researches connected with IGCP 591 deal on Silurian sedimentary sequences of Sardinia, the Carnic Alps and other North Gondwana regions. Conodont biostratigraphy is the main topic. The depositional sequence of the Carnic Alps is investigated also from a lithostratigraphic point of view, within a large project involving colleagues from several Italian and foreigner institutions.

Name **Maria Corriga**
Affiliation Università di Cagliari
Dipartimento di Scienze Chimiche e Geologiche ,
via Trentino 51, I-09127 Cagliari, Italy

Research Focus: I'm working on conodont biostratigraphy across the Silurian/Devonian Boundary with the goal to propose a standard global zonation for the upper Silurian and lowermost Lochkovian in the near future. Researches are mainly focused on sequences cropping out in Sardinia, the Carnic Alps, Morocco, the Spanish Pyrenees and Montagne Noire.

Name **Annalisa Ferretti**
Affiliation Università degli Studi di Modena e Reggio Emilia
Dipartimento di Scienze Chimiche e Geologiche
l.go S. Eufemia 19, I-41121 Modena, Italy

Research Focus: Annalisa Ferretti has recently edited, together with K. Histon, P. McLaughlin and C. Brett, a Special Issue of Palaeogeography, Palaeoclimatology, Palaeoecology “Time-specific facies: the colour and texture of biotic events” (Ferretti, Histon, McLaughlin & Brett, 2012a, b, vol. 367-368, 280 pp.), a thematic set of papers arising from the Third International Palaeontological Congress IPC3 2010 Symposium: “Time-specific facies: the colour and texture of biotic events”. The concept of "Time-Specific Facies" is introduced and discussed (Brett, McLaughlin, Histon, Schindler & Ferretti, 2012). In the same issue, remarkable color patterns attributed to microbial activity in the Silurian of the Carnic Alps are described and interpreted (Ferretti, Cavalazzi, Barbieri, Westall, Foucher & Todesco, 2012). Fossilized ring-like structures with enigmatic function and taxonomic affiliation are described from the Upper Ordovician of the Carnic Alps and the Silurian of Bohemia (Ferretti, Cardini, Crampton,

Serpagli, Sheets & Storch, 2012). Finally, a provocative short discussion focusing on the term "black-shales" has been produced (Ferretti, Melchin & Negri, 2012).

Name **Laura Gaggero**
Affiliation Università degli Studi di Genova
Dipartimento per lo Studio del Territorio e delle sue Risorse
Corso Europa 26, I-16132 Genova, Italy

Research Focus: The research activity is addressed to detailed geochemical and radiometric analyses of Late Ordovician-early Silurian volcanic products enclosed in two key sections of the Lower Paleozoic sequences of the Carnic Alps (Austria). As a general statement, Upper Ordovician K-bentonites are rare and have few European equivalents. Histon et al., 2007 report 97 K-bentonites from the Upper Ordovician (Hirnantian) to Lower Devonian (Lochkov) sequences, constrained biostratigraphically within the international standard biozones. Volcanism belongs to a tectonically active terrane dominated by calc-alkaline mafic lavas of clear volcanic arc affinities, most samples fall within the andesite and rhyodacite/dacite fields. In order to carry out a finely tuned radiometric dating of the transition two successions (Nölblinggraben and Cellon) were addressed for sampling of bentonites and preliminarly characterized for clay mineralogy, petrography and geochemistry, confirming the literature features. In order to support the biostratigraphic record wth a high resolution radiometric stratigraphy, the U-Pb analyses are carried out at the Beijing SHRIMP Center within a bilateral agreement between the Research Center and the Italian Research Group on Gondwanan basement. Results are expected to support geotectonic and paleogeographic inferences and internationally important *time-lines* for chronostratigraphy within both a regional and global context.

Name: **Alfredo Loi**
Affiliation: Università degli Studi di Cagliari
Dipartimento di Scienze della Terra
Via Trentino, 51
09127 Cagliari (Italy)

Research Focus: The main research topics are focused on Sedimentology and Sequence Stratigraphy of terrigeneous successions of Ordovician platform.

Main research subjects are:

- genetic model of condensation for terrigenous and mixed shelves (facies analysis, taphonomy and geochemistry) in the Upper Ordovician sequences of Brittany, Morocco and Sardinia.

- facies analysis, eustatic control, and faunal content of the Upper Ordovician Veryarc'h section (Armoricain Massif, Crozon - France);

- eustatic curve at high, medium and low frequencies of the lower Palaeozoic of the north Gondwana domain (Sardinia, Armorican Massif and Marocco) based on facies analysis, sequence stratigraphiy and genetic stratigraphy.

Name: **Gian Luigi Pillola**
Affiliation: Università degli Studi di Cagliari
Dipartimento di Scienze Chimiche e Geologiche
Via Trentino, 51
09127 Cagliari (Italy)

Research Focus: Most of my activities in 2012 have been devoted to the 5th Trilobite Conference, especially in order to prepare the field trip excursion in SW Sardinia. Once again, an abstract on the endemic Upper Ordovician Naraoid *Taricciocia arrusensis* has been presented in Prague, just to explain some taphonomical aspects. I also started the study of the first remains of the ichnofossil *Rusophycus* from the Cambro/Ordovician Cabitza Fm., in collaboration with S. Gibb and G. Pemberton.

5th Trilobite Post-Conference Excursion Fieldguide (Ed. G.L. Pillola, 96pp.), Sardinia, 5-8th July, 2012. Excursion photo: Porto di Canalgrande, SW Sardinia July 2012. Lower Cambrian Punta Manna Fm., close to the famous *Dolerolenus zoppii* - *Metadoxides armatus* trilobite beds.

ITALIAN CONTRIBUTIONS TO IGCP PROJECT 591 FOR YEAR 2012 – CONFERENCE PRESENTATIONS

CORRADINI C., CORRIGA M.G., SUTTNER T.J., KIDO E., VODRÁŽKOVÁ S., KOPTÍKOVÁ L., DA SILVA A.C., PONDRELLI M. & SIMONETTO L., 2012. Facies development and MS across the Silurian/Devonian boundary in the Lake Wolayer area (Carnic Alps, Italy and Austria). *Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz*, 17: 13-14.

FERRETTI, A., CARDINI, A., CRAMPTON, J.S., RIGONI, C., SERPAGLI, E., SHEETS, H.D. & ŠTORCH, P., *2012, Rings without a lord? Enigmatic fossils from the Lower Paleozoic of Bohemia and the Carnic Alps. Catania, Giornate di Paleontologia XII edizione – Catania, 24-26 Maggio 2012 – Volume dei Riassunti, 1 pp.*

HISTON, K., AIKEN,C., CRAMER, B.D., FERRARI, E., TROMBETTA, A. Stratigraphic precision and correlation in the digital age. Session 11 Mapping data and information systems, 7th EUREGEO , Bologna, 13-15th June, 2012. Abstract volume 2, 761-762.

HISTON., K. Nautiloid Cephalopod distribution as an indicator of eustatic and climatic change during the Silurian. Symposium 3.6 Pre-Mesozoic climates and global change [IGCP 591] Theme 3. Climate change: lessons from the past; implications for the future. Proceedings of the 34th International Geological Congress, Brisbane, Australia, 5th-10th August, 2012, page 502, abstract 3715.

HISTON, K., AIKEN,C., CRAMER, B.D., FERRARI, E., TROMBETTA, A. Stratigraphic precision and correlation in the digital age: digitization and conservation of GSSPs. Symposium 35.1 GSSPs (Global boundary-stratotype section and point) as global geostandards), Theme 35. Geostandards. Proceedings of the 34th International Geological Congress, Brisbane, Australia, 5th-10th August, 2012, page 502, abstract 1511.

MANCOSU, A., CAMBULI F. & PILLOLA, G.L. (2012). The turbulent path of *Taricciola arrusensis*: palaeoecology of an Ordovician nektaspid endemic to Sardinia. In "The 5th Conference on Trilobites and their relatives" (Budil P. & Fatka O. Eds.), Czek Geological Survey & Charles University Prague: 39.

ITALIAN CONTRIBUTIONS TO IGCP PROJECT 591 FOR YEAR 2012 - PUBLICATIONS

BRETT, C.E., MCLAUGHLIN, P.I., HISTON, K., SCHINDLER, E. & FERRETTI, A., 2012. Time-specific aspects of facies: State of the art, examples, and possible causes. In: FERRETTI, A., HISTON, K., MCLAUGHLIN, P.I. & BRETT, C.E. (Eds), Time-specific facies: the colour and texture of biotic events. *Palaeogeography, Palaeoclimatology, Palaeoecology*, vol. 367-368: 6-18, Amsterdam (http://dx.doi.org/10.1016/j.palaeo.2012.10.009).

CORRADINI C., SCHÖNLAUB H.P., PONDRELLI M., SIMONETTO L., CORRIGA M.G., SUTTNER T.J. & KIDO E., 2012. A short overview on the Palaeozoic sequence of the Carnic Alps**.** *Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz*, 17: 65-70.

CORRADINI C., PONDRELLI M., CORRIGA M.G., SIMONETTO L., KIDO E., SUTTNER T.J., SPALLETTA C. & CARTA N., 2012. Geology and stratigraphy of the Cason di Lanza area (Mount Zermula, Carnic Alps, Italy)**.** *Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz*, 17: 83-103.

CORRADINI C. & CORRIGA M.G., 2012. A Pridoli-Lochkovian conodont zonation in Sardinia and the Carnic Alps: implications for a global zonation scheme. *Bulletin of Geosciences*, 87 (4): 635-650. DOI 10.3140/bull.geosci.1340

CORRIGA M.G., CORRADINI C., PONDRELLI M., & SIMONETTO L., 2012. Lochkovian (Lower Devonian) conodonts from the Rio Malinfier section (Carnic Alps, Italy). *Gortania Geologia, Paleontologia, Paletnologia*, 33: 8 pp. [in press].

FERRETTI, A., MELCHIN, M.J. & NEGRI, A., 2012. Are there black shales and black shales? *Bollettino della Società Paleontologica Italiana*, 51 (2): 149-150 (doi: 10.4435/BSPI.2012.16)

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Project No. 619 – **Contourites: Processes & Products** (2012 – 2016)

Project leaders:
Dorrik A.V Stow (UK), David Van Rooij (Belgium), Francisco-Javier Hernández-Molina (Spain), Michele Rebesco (Italy), Pere Puig (Spain), Antje Voelker (Portugal), Adriano Viana (Brazil)

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Website: http://contourites.org/igcp/

Italian participation in the project:
Michele Rebesco (OGS) (Leader of the theme Geohazards, see below in "Focus")
Ettore Salusti (Universita La Sapienza)
Giorgia Petroni (Universita La Sapienza)
Eleonora Martorelli (IGAG-CNR
Katrin Schroeder (ISMAR-CNR)
Fabio Trincardi (ISMAR-CNR)
Giorgio Tunis (Universita degli Studi di Trieste)

Participanting countries: Argentina, Belgium, Brazil, Canada, China, Denmark, France, Germany , Ireland, Italy, Japan, Mexico, Morocco , Norway , Poland , Portugal , Russia , South Africa , Spain , Sweden , United Kingdom , Usa

FOCUS:
Contourites are sediments deposited or significantly affected by bottom currents near continental margins. Although unknown by the public, contourite deposits are observed all over the Earth's

continental margin and are of importance in a wide range of processes. IGCP 619 "Contourites: processes & products" will improve our understanding of:

- Geohazards: Contourites may lie at the origin of major slope instabilities (such as the Storegga slide), creating Tsunami dangers. Their presence may prove to be critical if the hydrocarbon industry moves to deeper slopes.
- Earth resources: Contourites occur in nearly all complex environments and may act a source, a reservoir or cap rock for hydrocarbon resources. Also the role of deep-water circulation on the growth and distribution of ferro-manganese nodules is still under debate.
- Global Change: contouritic deposits are useful recorders of past climate changes and assist in understanding the modulating role of the deep ocean in our climate system.
- Deepwater ecosystems: deep-water ecosystems (cold-water corals) are highly influenced by deep-water circulation which deposits contourites. Any change in circulation may affect the "health status" of these reefs, which are also nurseries for our future fish stocks.

Activity in 2012:
Initial Bureau Meeting held at the 34th IGC in Brisbane (Australia). **Participants:** Dorrik Stow, F. Javier Hernández-Molina, Pere Puig, David Van Rooij. The meeting serverd to defiine the activities and meetings of the following years, identify gaps, seek additional sponsorship, plan dissemination, education and publications.

The first official meeting was held in 2013: **Dialogue Between Contourite & Oceanography Processes, International Workshop,** University of Hull on 28th & 29th January 2013.

2012 Report of the IGCP Executive Secretary Dr Patrick McKeever

1. IGCP Board members 2012

Following a long-term development and evolution of the IGCP, being now serving societal issues linked to geology, the Programme has evolved and has been partly restructured, comprising now of five thematic groups, and each of these groups are backed by a wider scientific board, which essentially acts as the scientific committee for IGCP. Over the last 5 years, there has been an aim of ideally reaching a total of 50 members in the Scientific Board, 10 in each thematic group. The nominations received after a call made to IGCP and IUGS contacts have been examined following criteria on the professional qualifications and international profiles of the candidates. A geographical and gender equality imbalance was noticed, however, this issue stems from the applications and quality of the candidates received which had built-in over-representation from men and some developed countries. The new Board members were endorsed by the IUGS President and submitted for endorsement to the Director-General of UNESCO.

Theme leaders of each thematic group are:
Earth Resources: Robert Moritz
Global Change: Guy Narbonne
Geohazards: Andrej Gosar
Hydrogeology: Gil Mahe
Geodynamics: George Gibson

2. Information on IGCP projects

In 2012 22 projects received financial support as well as seven projects under Sida.

IGCP Projects (receiving funding) according to their year of termination:

2012: 559, 565, 567, 572, 586-Y (five)
2013: 571, 574, 580, 581, 582 (five)
2014: 575, 585, 587, 588, 594 (Sida), 598 (Sida), 599 (Sida), 600 (Sida), 601 (Sida), 606 (Sida), 616 (Sida) (four plus seven Sida projects)
2015: 591, 592, 596, 597, 604 (five)
2016: 586, 618, 619 (three)

3. 40th Anniversary of IGCP

The IGCP celebrated its 40th anniversary on February 22, 2012 with a series of publications, exhibitions and events at UNESCO headquarters, showing the successes of IGCP for Earth Science in the Service of Society, as an outstanding and unique cooperative enterprise between UNESCO and the IUGS. We summarized 40 years of IGCP success stories but also discussed with interactive panels the future challenges for IGCP and geosciences for our planet. For the past 40 years, there have been **617** project proposals, out of which **340** have been funded as successful IGCP projects. These IGCP projects have been highly successful in connecting international research teams and developing early career scientists while producing high-quality scientific data utilizing multidisciplinary approach upon which to base planning for the Earth's future. We want to express great thanks to IUGS and William Cavazza for having helped us using part of the 30.000USD donation from IUGS to realize the IGCP 40 events. We would like to thank also Jacques Charvet (IUGS Vice President) who was our contact partner with IUGS for the IGCP40 preparations, enabling us to organize a number of meetings with him in UNESCO Headquarters which facilitated our work together. Also, we appreciate the kind support of the IUGS secretariat, as Rich Calnan and Nancy Zeigler have offered their assistance during the IGCP40 celebrations.

4. Finances

The Earth Sciences within UNESCO continue to play an important role in the framework of the work plan of UNESCO in 2012-13. The end of 2011 and the new year 2012 was marked by the withdrawal of the US contribution to the UNESCO budget. As a result in October 2011 and the following year 2012 we had considerable financial cuts. Currently our programmes receive reduced budget allocations from a *special UNESCO emergency fund* a number of Member States gave to UNESCO at the time of the Executive Board in April 2012. IGCP received 50.000USD for the funding of the 2012 IGCP projects out of this fund. This represents a reduction of 33.500USD of the UNESCO contribution compared to 2011 where the available UNESCO money for IGCP projects amounted 85.000USD because in 2011 we had also the UNESCO field offices contributing which was not possible in 2012.

We continue receiving 100.000USD for 4 years (2011-2014) from the Swedish International Development Cooperation Agency (Sida). In 2012, the IGCP acknowledges again a special contribution of 20,000USD from the People's Republic of China, which is since three years a regular annual contribution to the IGCP.

Last but not least we would like to acknowledge the generous **additional appropriation** to our regular programme funds which the IGCP received during the preparation phase of the IGCP Board and anniversary in January at the time where there were no regular funds available. It was thanks to the contribution from IUGS (30.000USD) and the Australian National Committee of IGCP (3.600USD) that we were able to hold the 40th IGCP Scientific Board and make the IGCP anniversary a success. We are glad for this great support and appreciate especially the fast and un-bureaucratic way that IUGS and its Executive Committee increased and approved this donation.

Recapitulation finances (1988 to 2012)

Year	UNESCO	IUGS + USA	Total	Number of Projects Overall	Funded	OET*	Average per project
Financial figures in US$1,000 units							
1988	173.3	104.0	277.5	53	50	3	5.5
1989	143.1	109.9	253.0	55	50	2+3	5.0
1990	185.0	121.0	306.0	61	54	6+1	5.6
1991	185.0	137.0	322.0	59	55	3+1	5.8
1992	170.0	137.0	307.0	56	50	5+1	6.1
1993	173.0	147.2	320.2	60	56	4	5.7
1994	190.3	137.0	327.3	54	50	4	6.5
1995	197.7	143.5	341.2	53	51	2	6.6
1996	199.8	130.0	329.8	56	49	7	6.7
1997	204.0	55.0	259.0	53	45	8	5.8
1998	205.0	90.0	295.0	49	40	9	7.4
1999	190.0	90.0	288.0	43	40	3	7.2
2000	187.7	90.0	277.7	45	40	5	6.9
2001	184.4	95.0	279.4	41	37	4	7.5
2002	170.0	95.0	265.0	39	33	4	8.0
2003	180.4	95.3	275.7	42	37	5	7.5
2004	180.5	95.5	276.0	39	37	2	7.5
2005	163.0	95.0	258.0	48	47	1	5.5

Year	UNESCO	IUGS	Total	Number of Projects Overall	Funded	OET *	Average per project
2006	135.5	61.5	198.0	44	40	4	4.9
2007	162.0	58.5	220.5	47	44	2	5.0
2008	105.0	60.0	165.0	38	33	5	5.0

Year	UNESCO	China / IYPE	IUGS	Total	Number of Projects Overall	Funded	OET *	Average per project
2009	91.5	20.0 / 50.0	28.0	189.5	37	30	7	6.6
2010	76.5	20.0	84.0	180.5	31	21	10	8.6
2011	85.0	20.0	70.0	175.0	29	27	2	6.3
	72.0 (S)			72.0 (S)	(+6 Sida)			12.0
2012	50.0	11.0	70.0	131.0	20	22	1	5.9
	74.0 (S)			74.0 (S)	(+7Sida)			10.6

* OET - on extended term (a sixth year of IGCP membership granted without funding)

Publications

New IGCP flyer (6 pages) in three languages (May 2012)

IGCP 40 book: Tales set in stone, in three languages (February 2012)

Great thanks go to our Editor in Chief for the IGCP40 book, Edward Derbyshire. It is thanks to his great editing experience and knowledge of the IGCP that we succeeded to put together interesting chapters for the IGCP40 book. His enthusiastic contribution was essential for the production of this wonderful landmark of 40 years of IGCP success stories.

UNESCO Earth Sciences affairs

We had some personnel changes during 2011/2012. The IGCP Executive Secretary Mr Robert Missotten (Chief of the Global Earth Observation Section) retired in June 2011. Mr Missotten expressed his satisfaction regarding the collaboration throughout many years with the IUGS, facilitating jointly international collaboration in Earth sciences. The recruitment of a successor was carried out under difficult conditions, UNESCO having many posts frozen. On 30 April 2012 Professor Patrick McKeever took up the post of Chief of the Global Earth Observation Section and IGCP Executive Secretary.

Ms Yolanda Berenguer another colleague from the Global Earth Observation Section retired in April 2012. Her successor is Mr Yann Gavillot, arrived in January 2012, a young geologist recruited through the UNESCO Young Professional Programme.

We would also like to highlight important improvements of the IGCP and geology websites, thanks to the great commitment of Marie-Laure Faber. This was an essential improvement especially in view of our enhanced visibility during the IGCP40 year.

Ms Margarete Patzak and Ms Sarah Gaines contributed largely to the smooth continuation of the Earth Sciences activities for one year at UNESCO while two of the staff were on recruitment.

6. Proposals received in 2012

PP	PP Title	Theme
Water		
629	**Development of Local Meteoric Water Line; a tool to improve isotope research and application,** Mengistu (South Africa), Abyie (South Africa), Demlie (South Africa), Nkhuwa (Zambia)	**Water**
Geohazards		
623	**Deformation and fracturing caused by explotation of subsurface resources,** Galloway (USGS), Carreon-Freyre (Mexico), Teatini (Italia	**Geohazards**, water, earth resources
625	**Hydrogeological ans socioeconomic linkages of geohazards,** Poudel (USA), Borrok (USA), Yantis (USA), Dhital (Nepal), Maskey (Nepal), Midmore (Australia	**Geohazards,** Hydrogeology
626	**Assessment of Volcanic Hazards Potential in Paektu Volcano,** Hun (Korea), Jun (Korea)	**Geohazards**
Resources		
627	**Development and Application of the Low-Enthalpy Geothermal Resources,** Chon Kum Chol (Korea)	**Resources,**
Global Change		
608 re	**Asia-Pacific Cretaceous Ecosystems,** Ando(Japan), Xiaoqiao (China), Cheong (Korea), Bajpai (India)	**Global change**
609 re	**Cretaceous sea-level changes,** .Wagreich (Austria), Hu (China), Voigt (Germany), Rahman (Bangladesh), Yilmaz (Turkey), Zorina (Russia)	**Global change**
610 re	**From Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary,**Yanko-Hombach (Ukraine), Panin (Romania), Celal ozdogan (Turkey), Smyntyna (Ukraine), Yanina (Russia)	**Global change,**
617 re	**Neutral atmosphere-ionsphere interaction,**Borgazi(Mexico), Abe Pacini (Brazil), Martinez (Mexico), Norabuena (Peru), Carlos (Argentina)..	**Global change,** Geohazards
Deep Earth		
622	**Tectonomagmatic Evolution of the Zagros Orogen,** Masoudi (Iran), Mehrabi (Iran), Corfu (Norway), Lustrino (Italia)	**Deep Earth,** earth resources
628	**Gondwana Map Project,** Schmitt (Brazil), De Wit (South Africa), Collins (Australia), Rossi (France), Reeves (NL), Milani (Brazil), Cordini (Brazil	**Deep Earth**, Global Change, Earth Resources
624	**One Geology,** Malahoff (GNS Science, Schneider (Namibia), Kimball (USGS), Tsukuda (Japan), Van der Muelen (Netherlands).	**All themes, Earth Resources**

Global Geopark Network (GGN)

As of January 2013 the Global Geoparks Network has 90 members in 26 countries.

The 11th European Geoparks Conference, which took place in the town of Arouca, Portugal, co-sponsored by the Portuguese UNESCO National Commission, was a contribution for a smart, inclusive and sustainable growth of European Geoparks, sharing the main aims of the "European Strategy 2020", focused on key areas such as: knowledge and innovation, a more sustainable economy, high employment and social inclusion. Patrick McKeever, the UNESCO representative gave a keynote and was involved in the festive ceremony for the new GGN members. The Conference had about 300 participants, mostly from across Europe but also from North America, South America and Asia. The Conference contributed to the smart, sustainable, inclusive growth of European Geoparks; sharing good experience on education programmes and projects; consolidating the European Geoparks as territories of excellence for Geo-tourism; exchanging new trends on geo-conservation strategies; presenting new public and private investments in Geoparks, and certifying Geoparks.

In the framework of the Conference the governing bodies of the European Geoparks Network (EGN) and the Global Geoparks Network (GGN) held their annual meetings. Important discussions took place on the recent consultation process within UNESCO and its Member States on a future formalized relationship between UNESCO and the GGN. UNESCO was able to engage with the EGN and GGN on specific issues such as the Guidelines, National Committees for Geoparks, national quotas, quality control and the need to avoid duplication of existing UNESCO programmes as well as at the same time ensuring complementarity and cohesion.

The above meetings were very timely with regard to the ongoing UNESCO-GGN consultations and resulted in sharing with the Geoparks community the possible implications of developments inside UNESCO and to gauge their response. As a direct follow-up it was agreed that the next meeting of the advisory and coordination committees of the European Geoparks Network will occur in UNESCO in Paris, 20-23 March 2013. This will provide UNESCO Member State delegates to observe the operation of the European Geoparks Network and will give them the opportunity to meet the Geopark communities directly.

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A Reminder:
If you participate in an IGCP Project do not forget to submit a short report by December 15th, 2013, to be included in the next issue of the IGCP Italian Report. The report should be <1,500 words long and should include the following information:
- number, title and duration of project;
- leader(s) and affiliation(s);
- name and affiliation of Italian correspondent;
- description of Italian involvement in the project during the year 2013 (including research interests and results, participation and organization of meetings, etc.);
- publications authored by Italian participants during the year 2013.

IGCP Italian Report
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