

REPORT OF INQUA COMMISSION

TERRESTRIAL PROCESSES, HISTORY, & DEPOSITS TERPRO

For Intercongress period 2007-2011

Jim Teller, Commission President

31 January 2011***

The 2007-2011 rpt is very much like my annual report for 2010

Introduction

The objectives of TERPRO for the 2007-2011 intercongress period have been:

(1) To stimulate and promote research on topics related to terrestrial processes, deposits, and history, especially in areas that investigate new frontiers in Quaternary science and incorporate multiple and cross-disciplinary research efforts, multi-national research, and involve Developing Countries.

(2) To encourage the development of projects that link continental environments together and to oceans and climate, and which place them into a chronological framework and incorporate the ecological and human environment.

The TERPRO web site is: <http://www.terpro.dri.edu> .

In principle, TERPRO encouraged projects and activities in all aspects of the Quaternary terrestrial world, and considered all project proposals submitted. However, for the 2007-2011 inter-congress period we identified 6 **Focus Areas** of special interest. These topical areas of research concentration became International Focus Groups and were led by individuals who expressed an interest in overseeing that area. In fact, all leaders submitted project proposals within the Focus Area.

Focus Groups and their leaders

- 1) Hydrological change and climate (Gerardo Benito, Spain)
- 2) Aeolian history of deserts and arid regions (Nick Lancaster, USA)
- 3) Glaciation and its control on hydrology (Jasper Knight, Neil Glaser, UK)
- 4) Rapid changes during the last glacial-interglacial transition (Lev Tarasov, Canada)
- 5) Hazards and humans (Suzanne Leroy, UK)
- 6) Paleoseismicity and active tectonics (Alessandro Michetti, Italy)

Officers

Officers were nominated at the TERPRO meeting at the INQUA Congress in Cairns, and in the months immediately following the Congress. A list of nominees names was distributed to ??all who signed the attendance list at the TERPRO meeting, or who expressed an interest in helping govern TERPRO during the next inter-congress period. An electronic ballot was sent out in ??November 2007, and the following people were elected as officers. Candidates for office who were not elected, and all leaders of Focus Groups, were placed on the TERPRO Advisory Council. This was different from the previous inter-congress period (2003-2007),

where a large number of individuals were placed on the Advisory Council from a list I inherited in 2003 from the INQUA executive; I was told that few of these individuals had been contacted about their interest in serving on the Advisory Council. I sent out personal emails to all individuals in 2003, inviting them to serve and share their ideas for the new INQUA structure. Indeed these Advisors reflected a broad group of terrestrial specialties as well as a good geographic distribution, and I think that is good. In fact, I added still more people to further broaden specialty and nationality representation. On many occasions I sent out information about TERPRO and INQUA activities, deadlines, etc. and also sought their advice on specific issues, as well as their participation in projects. However, during the 2003-2007 inter-congress period, only a few ever responded to communications I sent out, except for those I had invited personally to be on the Council. However, during the 2003-2007 inter-congress period, only a few ever responded to communications I sent out, except for those I had personally added to Advisory Council. Thus, I concluded that a “volunteer” Advisory Council was preferable for the 2007-2010 period.

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The following are **Links** to details about the **Focus Area Groups**:

1. [Hydrological change and climate](#). (Gerardo Benito). This focus area builds on the extensive research conducted by GLOCOPH ([Global Continental Palaeohydrology Project](#)) from 1991 to 2007 by focusing initially on the effects of past climate and environmental changes on the hydrological cycle and on river catchment dynamics.
2. [Aeolian history of deserts and arid regions](#). (Nick Lancaster). This group will focus on bringing together the vast amount of data recently developed on dune chronology in desert regions, largely through the development of a [Digital atlas of Quaternary dune fields and sand seas](#).
3. [Glaciation and its control on hydrology](#). (Jasper Knight, Neil Glaser).
4. Rapid changes during the last glacial-interglacial transition (Lev Tarasov). This group will establish a well-constrained history of meltwater discharge for the Northern Hemisphere during the last deglaciation. Using real-world geo-data, modelling will lead to an understanding of the dynamics and impact of these freshwaters (and icebergs) on oceans, atmosphere, and cryosphere, and on the role of these interactive systems in climate change.
5. [Hazards and humans](#). (Suzanne Leroy).
6. [Paleoseismology and active tectonics](#). (Alessandro Michetti).

Year-by-year activities of Focus Areas

****I STOPPED REVISING MY ANNUAL REPORT HERE.**

2010 activities

Four of the six TERPRO Focus Areas were active in 2010:

Focus Area #1, Hydrological change and climate:

Haldorsen: “Palaeogroundwater: Long-term groundwater dynamic and its relation to terrestrial palaeoenvironments” (Project 0908)

Benito: “Understanding regional and global palaeohydrological responses to climate change” (Project 0810)

Jackson: “Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network” (Project 0804, joint with PALCOMM)

Focus Area #2, Aeolian history of deserts and arid regions:

Lancaster: “Sand seas and dune fields of the world: a digital Quaternary atlas” (Project 0704).

Focus Area #4, Rapid changes during the last glacial-interglacial transition:

Tarasov: “Meltwater routing and ocean-cryosphere-atmosphere response (MOCA)” (Project 0803, joint with PALCOMM).

Focus Area #6, Paleoseismology and active tectonics:

Michetti: “A Global Catalogue and Mapping of Earthquake Environmental Effects” (Project 0811).

Knight has not developed the project plans he put forward for Project 0812 in 2008 (Focus Area #3), and did not submit a request for funding for 2010 nor 2011, nor did he submit a report on activities. One project, 0810 (Benito), was not funded in 2010, but that group continued to be active and plans to submit a proposal for 2012 in concert with Project 0908.

Annual Project Reports for 2010 were received from Haldorsen (0908), Michetti (0811), Lancaster (0704), and Tarasov (0803); I received no report from Jackson (0804), who may only have sent it to PALCOMM.

Reports from Focus Group Leaders for the 2007-2011 inter-congress period were only received from Michetti (“Paleoseismicity and active tectonics”), Benito (“Hydrological change and climate”), and Tarasov (“Rapid changes during the and Ocean-Cryosphere-Atmosphere Response (MOCA)”. No inter-congress reports were received from Lancaster (“Aeolian history of deserts and arid regions”), Leroy (“Hazards and humans”), or Knight and Glaser (“Glaciation and its control on hydrology”) for their Focus Areas, although these may be forthcoming in 2011 and some of the Annual Reports include short summaries of activities for the entire inter-congress period.

In the following **Table**, all TERPRO (or joint TERPRO) projects funded since 2004 are listed, showing the Project No., Leader(s), and Project title, with monies allocated in parentheses. Given first in this Table are the **projects proposed for 2011** by Haldorsen (0908), Michetti (0811), Leroy (new), and Lancaster (0704); Tarasov (0803) indicated that he will be sending one. All reports and proposals for these projects were distributed to INQUA Council members.

TERPRO Projects PROPOSED for 2011

INQUA Project #	Name	Project Title (Euros requested/received)
INQUA 0811	Michetti (Spain), Amit (Israel), Barroso (Spain)	A Global Catalogue and Mapping of Earthquake Environmental Effects (€ 6000/5000)
INQUA 0803	Tarasov (Canada)	Meltwater routing and Ocean-Cryosphere-Atmosphere Response (MOCA) (€4817/4000)
INQUA 0704	Lancaster (USA)	Sand seas and dune fields of the world: a digital Quaternary atlas (requested only €2923 carry over)
INQUA 0908	Haldorsen (Norway)	Palaeogroundwater: Long-term groundwater dynamic and its relation to terrestrial palaeoenvironments(€2000/2000)
INQUA 0804	Jackson (USA)	Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network (€ 3000/5000 carry over)
New	Leroy (UK)	Rapidly changing large lakes and human response (€ 4000/0)

TERPRO Projects Funded in 2010

INQUA Project #	Name	Project Title (Euros allocated)
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INQUA 0811	Michetti (Spain), Amit (Israel), Barroso (Spain)	A Global Catalogue and Mapping of Earthquake Environmental Effects (€ 4000)
INQUA 0803	Tarasov (Canada)	Meltwater routing and Ocean- Cryosphere-Atmosphere Response (MOCA) (€ 4000+2190 carryover)
INQUA 0704	Lancaster (USA)	Sand seas and dune fields of the world: a digital Quaternary atlas (€ 3000+3044 carryover)
INQUA 0908	Haldorsen (Norway)	Palaeogroundwater: Long-term groundwater dynamic and its relation to terrestrial palaeoenvironments (€ 2000)
INQUA 0804	Jackson (USA)	Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network (€ 3000)

TERPRO Projects Funded in 2009

INQUA Project #	Name	Project Title
INQUA 0812 (cont.)	Knight (UK)	Developing international research collaboration and capacity in investigations of subglacial processes and environments (€ 2000*)
INQUA 0811	Michetti (Spain), Amit (Israel), Barroso (Spain)	A Global Catalogue and Mapping of Earthquake Environmental Effects (€ 4000)
INQUA 0803	Tarasov (Canada)	Meltwater routing and Ocean- Cryosphere-Atmosphere Response (MOCA) (€ 4000+2190 carryover)
INQUA 0704	Lancaster (USA)	Sand seas and dune fields of the world: a digital Quaternary atlas (€ 3000+3044carryover)
INQUA 0908	Haldorsen (Norway)	Palaeogroundwater: Long-term groundwater dynamic and its relation to terrestrial palaeoenvironments (€ 1000*)
INQUA 0804	Jackson (USA)	Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network (€ 3000*)

* Funds awarded in 2008, spent in 2009.

TERPRO Projects Funded 2008

INQUA Project #	Name	Project Title
INQUA 0704	Lancaster (USA)	Sand seas and dune fields of the world: a digital Quaternary atlas (€ 3000)
INQUA 0803	Tarasov (Canada)	Meltwater routing and Ocean-Cryosphere-Atmosphere Response (MOCA) (€ 3000)
INQUA 0804	Jackson (USA)	Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network (??)
INQUA 0810	Benito (Spain)	Understanding regional and global palaeohydrological responses to climate change (€ 2500)
INQUA 0811	Michetti (Italy), Amit (Israel), Barroso (Spain)	A Global Catalogue and Mapping of Earthquake Environmental Effects (€ 3500)
INQUA 0812	Knight (UK)	Developing international research collaboration and capacity in investigations of subglacial processes and environments

TERPRO Projects Funded during previous intercongress period, 2004-2007.

INQUA Project#	Name	Project Title
2007		
INQUA 0418 (cont.)	Michetti (Italy), Okumura (Japan), &	An innovative approach for assessing earthquake intensities: the INQUA Scale, based on seismically-induced ground

	Barroso (Spain)	effects in the environment; \$6000
INQUA 0512 (cont.)	Gregory (UK) & Benito (Spain)	Significance of past hydrological events: using existing ¹⁴ C data to reconstruct Holocene fluvial activity in temperate and tropical regions: <i>carry-over funds approved.</i>
INQUA 0704	Lancaster (USA)	Sand seas and dune fields of the world: a digital Quaternary atlas: \$6000
2006		
INQUA 0416 (cont)	Russell (UK)	Field conference in Alberta on "Large- scale meltwater processes and products"; \$1500
INQUA 0418 (cont)	Michetti (Italy), Okumura (Japan), & Barroso (Spain)	Meetings for "An innovative approach for assessing earthquake intensities: the INQUA Scale, based on seismically- induced ground effects in the environment"; \$6000
INQUA 0503	Yang (China)	Geomorphological processes and paleoclimatology in the desert margins of China: <i>Endorsed but not funded.</i>
INQUA 0511	Audemard (Venezuela)	Meeting in Apartaderos, Venezuela, on "The geomorphic and geologic signature of active blind dip-slip faulting"; \$3000
INQUA 0512 (cont)	Gregory (UK), & Benito (Spain)	Workshop on "The significance of past hydrological events, using existing ¹⁴ C data to reconstruct Holocene fluvial activity in temperate and tropical regions"; \$4323
INQUA 0604	Kashima (Japan) and Demir (Turkey)	Palaeo-environmental and palaeo- hydrologic changes in Anatolia Plateau and surroundings during the Quaternary; <i>Endorsed but not funded.</i>
INQUA 0605	Brown (USA)	Workshop after Asian Conference on Permafrost (in Lanzhou, China) in Qinghai-Tibet Plateau to visit and discuss borehole sites of Cryospheric monitoring Network; \$3000

2005

INQUA 0414 (cont)	Glasser (UK)	Glacial sedimentary processes and landforms (continuing).
INQUA 0415	Leroy (UK)	Environmental catastrophes in the Holocene (year 2); \$4000
INQUA 0416 (cont)	Russell (UK) and Fisher (USA)	Large-scale meltwater processes and products (continuing).
INQUA 0418	Michetti (Italy)	An innovative approach for assessing earthquake intensities: the INQUA Scale, based on seismically-induced ground effects in the environment (year 2); \$2000
INQUA 0503	Yang (China)	Geomorphological process and Paleoclimatology in the desert margins of China; \$1000
INQUA 0510	Kolka (Russia)	The last ice sheet and sea level fluctuations on the kola Peninsula, NW Russia; \$2000
INQUA 0512	Gregory (UK)	Significance of past hydrological events; using existing 14C dates to reconstruct Holocene effluvial activity in temperate and tropical regions; \$4000

2004

INQUA 0414 (cont)	Glasser (UK)	Glacial sedimentary processes and landforms; \$2000
INQUA 0415	Leroy (UK)	Environmental catastrophes in the Holocene; \$4000
INQUA 0416	Russell (UK) and Fisher (USA)	Large-scale meltwater processes and products; \$1500
INQUA 0417	Zelchs (Latvia)	The international field symposium on Quaternary geology and modern terrestrial processes in western Latvia; \$2000
INQUA 0418	Michetti (Italy)	An innovative approach for assessing earthquake intensities: the INQUA Scale, based on seismically-induced ground effects in the environment; \$3000

Communication with those interested in TERPRO

Several times in 2010, as in all previous years, an email was sent to about 400 geoscientists who had expressed an interest in TERPRO activities, using a mailing list Nick Lancaster maintains. My email notes attempted to mention TERPRO & INQUA deadlines, encourage researchers to consider formulating new TERPRO projects, and to call their attention to information and deadlines that are posted on the TERPRO web site.

In early November an email was sent to those on this large mailing list, reminding them about 5 important deadlines that were coming up: (1) INQUA abstracts for the Bern meeting, (2) submitting applications for financial support to attend the Bern meeting, (3) submitting proposals for funding of projects in 2011, (4) submitting annual reports for funded projects, and (5) sending nominations for TERPRO and INQUA officers and Focus Areas. An abridged version of message is as follows:

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1) The XVIII INQUA Congress will be held in Bern, Switzerland, July 20-27, 2011. Details about the Congress, including registration, accomodation, fieldtrips, scientific sessions, events, and abstract submission details can be found at the INQUA website or the Congress web site <<http://www.inqua2011.ch>>. Note that the Congress is structured so that all sessions and talks will be assigned to one of the 5 INQUA Commision topic areas. All 27 approved TERPRO sessions are listed on the INQUA Congress web site at <<http://www.inqua2011.ch/?a=programme&subnavi=sessions>>. Please note that the DEADLINE for submitting Abstracts is 30 November 2010.

2) We would also like to remind you that the Deadline for submitting Project Proposals and Progress Reports for TERPRO projects (e.g. see "Guidelines for ") is January 7, 2011. These must be submitted to the TERPRO President, Jim Teller (<tellerjt@ms.umanitoba.ca>) no later than January 7 before being submitted to the Executive Council on January 14.

3) Please be thinking about new TERPRO Focus Areas and Leaders for the next InterCongress period (2011-2015). Information about submitting nominations and offering suggestions for changes in advance of the Bern meeting can be found on the INQUA web site.

4) APPLICATION FOR FINANCIAL SUPPORT TO ATTEND THE INQUA CONGRESS IN BERN, 20-27 July 2010.

INQUA will offer some limited financial assistance for early-career scientists (less than 7 years since PhD) and scientists from countries with low GDP. The INQUA support will partially cover the travel and registration costs. Note that these INQUA grants are not normally intended to support the attendance of keynote and plenary speakers. See the INQUA Congress web site for more information.

Deadline for receipt of applications is 3 December 2010. Requirements for applying can be found on the web site, and are as follows: etc.

Your completed response should be forwarded to Allan Chivas (toschi@uow.edu.au<<mailto:toschi@uow.edu.au>>) by the deadline of Friday 3 December 2010.

The Committee considering these applications will attempt to complete its deliberations

by mid-December 2010, so that successful applicants can begin the process of making their travel plans.

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All this information was posted on the TERPRO web site.

I followed this up in December by sending an email to all TERPRO officers, Advisory Council members, and grant recipients, reminding them of the deadlines and encouraging them to think about nominating people for office in TERPRO and submitting ideas for TERPRO Focus Areas in the 2011-2015 inter-congress period. Selected reminders were sent out again in mid-January.

The TERPRO web site was updated in December with the following information about *TERPRO sessions approved for the INQUA Congress in Bern*, as follows:

The INQUA Congress in Bern, Switzerland, promises to be an excellent scientific meeting.

2993 abstracts were received by the deadline, of which 816 (27%) were submitted for inclusion in TERPRO Commission presentations. "Oral blocks" were then assigned by the Scientific Program Committee for each session, and TERPRO received 47 blocks of time, which translates into 282 talks (27%), with the rest of the abstracts being placed in the poster sessions. Terrestrial Processes, Deposits, and History research is alive and well.

The approved TERPRO session #s for the INQUA Congress are the following; details will be posted on the INQUA Congress web site early in 2011:

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2, 4, 51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 86, 87, 88, 89, 90, 96, and 104.

Thoughts on the future

I recommend that Executive Council examine whether the TERPRO Commission should be divided into several Commissions. I think the extremely broad spectrum of topics that are related to "Terrestrial Processes, History, and Deposits" argues that it might be appropriate that more than a single Commission represent that large and diverse area. Unlike other Commissions, the "roots" of TERPRO (prior to 2003) were multifaceted, consisting of 6 "Subcommissions": Subcom. on Paleoseismicity; Subcom. on Global paleohydrology; Subcom. on Neotectonics; Subcom. on Paleosols and weathering; Subcom. on Glaciation; Subcom. on Global carbon, plus many other Subcommissions before 2003. Ultimately all of these were folded into TERPRO. Initially this was a contentious issue for some of those Subcommissions, and some of them have ended their link with INQUA, carrying on their own activities—I don't think is good for INQUA.

Perhaps there is merit in considering the amalgamation of the Stratigraphy and Chronology Commission (SACCOM) with TERPRO, and then subdividing it, perhaps

into more than 2 Commissions. Chronology is part of TERPRO, and so is stratigraphy. Aeolian aspects are part of both of these Commissions, but it seems they should be together in one Commission.

TERPRO officers and Advisory Council members chosen for the next inter-congress period (2011-2015) will need to consider what areas of special interest (Focus Areas) should be developed. Some Focus Areas established in the past 8 years have been very successful, others not. The leaders of several Focus Areas (and projects within them) have not established true research projects, only applying for funds for meetings where people present papers; this was not the intent of TERPRO nor of INQUA for the Focus Areas, and I think this is clearly spelled out in our Bye-Laws. Leaders of largely inactive Focus Areas should be removed. The new officers and Advisory Council members of TERPRO should consider whether those Focus Areas should continue with new leaders or be replaced with other topic focuses. Those leading TERPRO in 2011-2015 should even consider whether successful Focus Areas should be continued, establishing their own priorities. However, I feel strongly that project proposals from any part of the terrestrial system should be considered for endorsement and funding, even if they do not neatly fit within the new Focus Areas.

Recommendations

1) I recommend continuing the “Terrestrial Processes, Deposits, and History” (TERPRO) Commission during the next Inter-Congress period. *However*, consolidation and reorganizing TERPRO, SACCOM, CMP, and HaBCom should be considered, given the many similar interests and overlap of these Commissions. Regardless, Commissions must continue to work together to promote areas of interest across Commission boundary lines.

2) A slate of Advisory Council members should/could be identified by the INQUA Executive and Commission presidents after receiving and discussing nominations from the TERPRO president, National Committees, and members at large. Officers in the TERPRO Advisory Council should be selected by members of the *incoming* Advisory Council, possibly except for the President, who should be chosen in advance by the outgoing INQUA Executive Council, because the success of a Commission depends in a major way on the president and I think Council is in the best position to judge this. A TERPRO President should be chosen who has a broad knowledge of terrestrial research and who expresses a strong commitment to promoting TERPRO activity.

3) I recommend that the 2011-2015 TERPRO Advisory Council be selected from a broad spectrum of terrestrial “disciplines” (see #4), similar to those in the previous inter-Congress period, which I feel represent most major niches in the terrestrial world. Permafrost might be added. Potential **Focus Areas** for research initiatives in the next inter-Congress period should be identified by the outgoing TERPRO Advisory Council, INQUA Executive Council, and other Commission presidents, and recommended to the incoming TERPRO Advisory Council. The incoming Advisory Council and their elected

officers can then incorporate this into their decisions for 2011-2015. This is likely to lead to the creation of new **Focus Groups**. I believe this approach will allow new and dynamic ideas to be developed in TERPRO, and may encourage new ideas for focusing research in frontier areas outside of traditional thinking; collaborative focuses with other Commissions should be encouraged. Each Advisory Council representative should be charged with promoting one of the focus areas identified.

4) A breadth of disciplines should be represented on the Advisory Council, and I recommend that at least the following general areas be represented in 2011-2015: (1) Paleoseismicity and neotectonics, (2) Paleohydrology, (3) Paleosols and weathering, (4) Glaciation, (5) Permafrost, (6) Aeolian and deserts, and (7) Natural hazards. Additional members could be selected on the basis of an identified Focus Area of research during the next inter-Congress period. Finally, it is important to have an Advisory Council that reflects not only a broad spectrum of the geosciences, but also one that has broad geographic representation; if possible, there should be members from Developing Countries.

5) An active TERPRO website is essential, and should have a committed Webmaster, who actively updates the site and solicits input from others.

6) The current TERPRO email list of >400 people, who expressed an interest in Terrestrial Processes, History, and Deposits at the INQUA Congress in Cairns, should be retained and updated. This is a vital link to the broad TERPRO community, which can advertise, announce, and encourage involvement in INQUA activities.

Budget and budgeting for 2011-2015

INQUA statutes call for a proposed budget and request for funding by each Commission for the next inter-congress period. This is difficult to do, given that each Commission and the INQUA executive need to respond to a new set of proposals each year. I think the current approach for allocating funds has been good, and provides flexibility. Decisions have been made, and should continue to be made, on the basis of proposal merit, filtered first by the appropriate Commission(s), and discussed together by the Executive Council and Commission presidents. There should be an emphasis on funding projects (Focus Areas) that lay the foundation for (and carry out) innovative and collaborative research, not just in support of meetings. I feel that the total monies given to each Commission should be based on proposal merit, rather than on any fixed percentage to each. Of course, availability of funds will control the total amount allocated.

I *recommend* that Projects be allowed to spend a limited amount of their grant monies on “senior scientists” to allow them to participate in Project planning (and synthesis) activities. Given that some senior scientists may not be able to use their own grant funds for participation in an INQUA project, I think our current policies (Bye-Laws) have been

(and will continue to be) a limiting factor in involving them in INQUA projects. Perhaps a maximum of 20% of any Project budget would be appropriate, but then only if justified in the research proposal.

The INQUA Congress is an important event. Many INQUA Projects use this occasion to present summaries of their research and to hold business/planning meetings. Our current Bye-Laws prohibit the use of Project grant monies to attend the Congress, even if it is for Project business. *This should be changed.*