Annual Report* of IGCP Project No. 572

*NOTE: MAXIMUM LENGTH OF THE TEXT REPORT IS 5 (FIVE) PAGES. SINGLE SPACE, 12 POINT FONT. REPORTS EXCEEDING THIS LENGTH WILL BE RETURNED TO THE AUTHOR(S) WITH THE REQUEST OF REDUCING THE TEXT TO THE ABOVE STANDARD.

The scientific information in this report will further be used for publication on the IGCP website under the new electronic version of 'Geological Correlation' (please feel free to attach any additional information you may consider relevant to the assessment of your project).

IGCP project short title: Permain-Triassic Ecosystems

Duration: 2008 to 2012

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1. **IGCP 572 Website address related to the project**

On the web-page [http://www.igcp572.org](http://www.igcp572.org) you can find general information about the project, recent announcements, photos from conferences and field excursions, lists and addresses of participants.

2. **Summary of major past achievements of the project**

Since 2008, we have achieved in following several aspects:

1. Early-Middle Triassic biostratigraphy: we have established comprehensive biostratigraphical and chronological frameworks for the Lower and Middle Triassic in several major regions: South China, Tibet, Australia, Spitsbergen-Greenland, western US, Turkey, and Oman.

2. Extinction and recovery of various fossil groups: P-Tr diversity dynamics of several fossil groups such as radiolarians, conodonts, ostracods, ammonoids, brachiopods, bryozoans, and sponges have been re-studied in details. In particular, ammonoid biodiversity underwent a fast recovery in Smithian, while others rebounded in Spathian or Middle Triassic. Thus, various fossil groups experienced different recovery rates after the end-Permian crisis.

3. Mass extinction pattern: New works support that the P-Tr crisis may comprise two episodes near the P-Tr boundary (PTB).

4. Microbial ecosystems: Global data reveal that proliferation of microbial ecosystems including microbialites, wrinkle structures and microbial mats is characteristic of the marine ecosystems in the aftermath of the P-Tr mass extinction.

5. Ichnofaunal communities: The rebound of ichnodiversity is believed to occur in Spathian. However, several ichnodiversity spikes were detected in Griesbachian and Smithian, indicating a fast recovery in the shoreface environment of the high-latitude regions.

6. Several severe events such as anoxia and volcanisms have been found in association with the P-Tr mass extinction and throughout the Early Triassic in some regions.

7. Ecologic response to Permian-Triassic events: Emerging evidence indicates that the recovery in the nektonic realm was much more rapid than that in the benthic realm.

8. Mass extinction and delayed recovery causes: Geochemical and palaeoecological data indicate that increased continental weathering played a role in the extinction and delayed recovery of marine organisms.

3. **Achievements of the project this year only**

3.1. **List of countries involved in the project (*countries were active in 2011*)**

To date, there are 156 members from the following countries participating in the IGCP 572:


3.2. **General scientific achievements and social benefits**
Many publications in 2011 contain new findings that deepen our understanding of the P-Tr environmental and biotic crises. Some highlights of the research include:

1. Geochemical and biostratigraphic data from South China indicate that the end-Permian mass extinction was geologically rapid and synchronous in the marine and terrestrial realms.

2. New evaluation of a Late Permian palynomorphs indicates that the strong ability of a soil fungus to cause disease in plants contributed to terrestrial extinctions.

3. Nitrogen fixation became the main source of biologically available nitrogen in the Permian Palaeotethys Ocean, suggesting that there were stratified anoxic water masses.

4. Evaluation of Early Triassic trace fossil assemblages reveals many ecologic similarities with early Paleozoic ones, and aids understanding of how organisms use ecospace.

Many members of IGCP 572 have made contributions to the public’s understanding of this project’s significance, including:

a. Dr. Z.Q. Chen was interviewed by BBC Radio, UK about marine ecosystem’s recovery from the end-Permian mass extinction undertaken by him and his colleagues from China and UK on December 23, 2010; and by Radio Australia (Asia Connection Program) on January 25, 2011 about a fossil discovery he and his colleagues from China and UK made (http://www.radioaustralia.net.au/connectasia/stories/201101/s3121143.htm). Dr. Z.Q. Chen and his team’s studies on the P-Tr mass extinction and recovery were reported by the Sunday Times (major newspaper in Western Australia), Jan. 23, 2011 (¼ page size).


3.3. List of meetings with approximate attendance and number of countries

- IGCP572 5th Annual Meeting: IGCP572 Symposium 3: Latest Permian Mass Extinction and IGCP572 Symposium 4: Ecosystem Recovery in Triassic”, joint with the XVII International Congress on Carboniferous and Permian, 3-8 July, 2011, Perth We have 2 plenary keynotes, 34 session oral presentation and 10 posters. ~70 members and 80 non-IGCP 572 participants from 20 countries took part in the Symposium 3; ~60 members and 50 non-IGCP 572 participants from 18 countries took part in the Symposium 4; ~75 members and 120 non-IGCP 572 participants from 22 countries took part in the IGCP572 plenary keynote lectures.

- IGCP572 Field Excursions and Field Workshop joint with Congress Excursions of the XVII ICCP2011: (1) Lake Clifton modern stromatolites, (2) Lake Thetis modern stromatolites and (3) Perth core library workshop, 6 July, Western Australia. 44 members and 80 non-IGCP572 participants from 15 countries participated in the field excursions and workshop.

- IGCP572 Field Excursions joint with post-Congress Excursions of ICCP2011: Perth-Carnarvon Basins (including Shark Bay modern stromatolites), 10-16 July, Western Australia. 32 members from 10 countries participated in this field.

3.4. Educational, training or capacity building activities

The most updated studies and understanding on the P-Tr mass extinction and recovery are introduced to all project members and publics through project website. Through the public media, the project members introduced our studies to publics. We also encourage young researcher to participate in our annual events. They are anticipated to obtain important training through workshops and face to face communication with the established researchers during these activities. We have organized a workshop/short course addressing the utilization of borehole data to explore subsurface geological information during the ICCP2011 in Perth during this July. Project member Dr. Arthur Mory demonstrated and trained project members how to utilize the borehole core data.
3.5. Participation of scientists from developing countries, and young and women scientists

One of the policies of the IGCP 572 is to attract junior researchers from the developing countries to participate in this international collaboration project. For example, 28 of 34 oral presenters at IGCP572 symposia in Perth were young researchers or postgraduate students. All presenters of these IGCP572 poster sessions were junior researchers and postgraduate students. Most of them came from the developing countries. About three-fourth participants attending IGCP572 events in 2011 are the young researchers or women members.

3.6. List of most important publications (including maps)

At the late stage of IGCP572, 2011 was a very productive year for the project, which has organized six thematic issues. Of these, one special issue was published in 2011 and three are under review or partly published online (see below). Other two journal special issues (in *Earth-Sciences Review* and *Palaios*, respectively) addressing the IGCP 572’s study goals are recruiting manuscripts at various stages. In addition, three guidebooks were published for field excursions and core library workshops during the XVII International Congress on Carboniferous and Permian, July 3-8, 2011, Perth, Australia. One abstract proceeding was published for the XVII ICCP in Perth. They are:

2. IGCP572 Special Issue: “Interactions between microorganism and environment” (partly published online) (edited by Shucheng Xie, Steve Kershaw)
5. IGCP572 Special Issue: “Global reviews on P-Tr mass extinction and its aftermath” in *Earth-Science Review* (recruiting manuscripts) (edited by Zhong Chen, Thomas Algeo, Dave Bottjer)

*Individual journal papers* (100 papers published by IGCP572 members are closely related to the project goals). The selected journal papers are listed as below (see the attached annual newsletter for more publications; authors with bold font names are IGCP572 members):


3.7. Activities involving other IGCP projects, UNESCO, IUGS or others

Most members have also participated in other IGCPs relevant to the Permian and Triassic geology.

4. Activities planned

4.1. General goals

In 2012, the project aims to examine the P-Tr ecosystems in Eastern Europe and to undertake global correlations of ecosystem’s restoration process and pattern by integrating multidisciplinary studies. At the closing conference, we communicate the final results on the global P-Tr ecosystems.

4.2. Tentative list of specific meetings and field trips (please list the participating countries)

1  IGCP572 Closing Conference: “Permian-Triassic Ecosystems: collapse and rebuilding” will be held on 1-3 June, 2012, Eger, Hungary.
2  The 6th Field Workshops “Sedimentary succession from Permian/Triassic boundary up to Ladinian in Balaton Highland, Romania” 30 May to 1 June, 2012.
3  The 6th Field excursion “P-Tr boundary to Middle Triassic successions in Bükk Mts regions, Hungary” 4-6 June, 2012.

Participation countries for these events include: Australia, Austria, Canada, China, France, Germany, Hungary, India, Iran, Japan, Romania, Russia, Switzerland, Thailand, Turkey, UK, USA.

5. Project funding requested

Total fund of USD12,000 was requested in 2011.

6. Request for extension, on-extended-term-status, or intention to propose successor project

We will discuss whether the IGCP572 needs to be extended or a successor project is proposed during the IGCP572 Closing Conference, May 30 to June 7, 2012, Eger, Hungary.

7. Financial statement ($ USD only)

7.1. Funds allocated from the IGCP office:

In 2011, total USD10,000 was allocated to IGCP 572. All funds were allocated to sponsor the IGCP572 Symposia and Annual Field workshop joint with the XVII ICCP2011, 3-16 July, 2011, Perth, Western Australia. Total A$9,360 was received due to international currency exchange rate changes.

- Ph.D. Students (each A$700): N. Goudemand, J. Chen, S. Takahashi, H. Song;
- Project members (each A$700): V. Vuks, L. Zhao, J.-P. Zonneveld, C.J. Huang, Z.H. Jia, I. Somerville;
- Keynote speaker (invited, each A$1000): Mike Benton, Charles Henderson;
- Organizing fee/international currency exchange loss: A$360

7.2. Funds from project co-leaders’ and members’ research grants

All co-leaders’ research grants covered their travel costs for attending the IGCP572 events in 2011.

8. Attach any information you may consider relevant

*IGCP 572 Annual Newsletter ‘11* is attached for your information.