

**Report of the
Meeting of the Paleontology Working Group under
the Scientific Measurements Panel (SciMP) of the IODP
March 15 -16, 2004
Smithsonian National Museum of Natural History
Washington, DC, USA**

Host

Brian Huber, Smithsonian National Museum of Natural History, Washington, DC, USA

Attendees

Paleo WG Members

*#Ellen Thomas, US, Wesleyan University, ethomas@wesleyan.edu
Brian Huber, US, Smithsonian National Museum of Natural History,
Huber.Brian@nmnh.si.edu
Mark Leckie, US, Univ. of Massachusetts, Amherst, mleckie@geo.umass.edu
Michael Knappertsbusch, Switzerland, Natural History Museum Basel,
Michael.Knappertsbusch@unibas.ch
David Lazarus, Germany, Natural History Museum Berlin, david.lazarus@rz.hu-berlin.de
*Yoshiaki Aita, Japan, Utsunomiya University, aida@cc.utsunomiya-u.ac.jp,
Masao Iwai, Japan, Kochi University, iwaim@cc.kochi-u.ac.jp
Noritoshi Suzuki, Japan, Tohoku University, suzuki.noritoshi@nifty.com
Felix Gradstein, Norway, Museum for Geology and Paleontology University of Oslo, felix.gradstein@nhm.uio.no

* = SciMP member or alternate

= unable to attend

Guests

#Eduardo Koutsoukos, Brazil, PETROBRAS-CENPES,
koutsoukos@cenpes.petrobras.com.br
Rick Murray, US, Boston University, Co-chair SciMP, rickm@bu.edu
Takashi Yuyama, Japan, Central Computer Services, tyuyama@ccs.co.jp
John Firth, IODP/TAMU, Firth@odpemail.tamu.edu

EXECUTIVE SUMMARY

Paleontology Working Group Recommendations

The meeting of the ad hoc Paleontology Working Group under the Scientific Measurements Panel (SciMP) of the IODP was held from March 15-16, 2004, at Smithsonian National Museum of Natural History, Washington, DC, USA with the PWG Member, Brian Huber serving as host. The Paleontology WG meeting resulted in the following 6 Recommendations, 1 Consensus Statement and 2 Action Items. These are reported to SciMP for review and comment.

Overviews of the Paleontology WG and integrated Micropaleontological Reference Centers (MRCs) are documented. Brief overviews are provided where appropriate in italics before each Recommendation.

Recommendations

General Overview of status of the Paleontology Working Group

Paleontologic identifications provide the primary source of shipboard and shorebased age determinations and, therefore, are the foundation of a broad array of the earth history studies that follow nearly every drilling cruise. Two problems were identified by the ad hoc Paleontology Working Group regarding the ability to effectively and accurately establish consistent shipboard and shorebased biostratigraphies. The first problem deals with the declining number of specialists who are training the next generation of micropaleontologists and biostratigraphers. The second problem pertains to inconsistencies which accumulate over time in the nomenclature, application and interpretation of biostratigraphic datums. Unless new emphasis is directed toward ensuring efficiency and reliability in paleontologic data collection and easy access to regularly updated post-drilling age determinations, this latter problem will surely worsen with the transition to a multiplatform drilling operation. The Paleontology Working Group met from 15-16 March 2004 at the Smithsonian Museum of Natural History to discuss these issues along with the future needs, activities, and oversight of paleontology in the future IODP. We also discussed the responsibilities, services, and potential provided by the Micropaleontological Reference Centers (MRCs) and their role within the IODP administrative structure. Below is a list of the recommendations from the Paleontology WG for IODP paleontology and for the MRCs:

Recommendation regarding Working Group establishment

The following recommendation results from detailed discussions through the Paleontology WG meeting regarding how paleontologic multiple issues on IODP are effectively resolved.

Recommendation PALEO-1: Working Group Establishment

The ad hoc Paleontology Working Group recommends the establishment of a Paleontology Working Group, perhaps as an IODP-MI task force. Membership should include appropriate persons from SciMP, at least one Micropaleontological Reference Center (MRC) curator and other experts as needed. Issues to be considered include: development of digital atlas and taxonomic dictionaries, acquisition of technical support on board drilling platforms, interaction of MRCs with scientific communities, sample preparation procedures, control of the quality of paleontologic data and other related matters.

Recommendation regarding MRCs continuation as IMRCs

The MRC collections and curators represent an important resource to IODP for the production of micropaleontologic training and public education materials, for maintaining quality control of paleontologic and biostratigraphic data within IODP, as a liaison to the broader micropaleontologic community, and for insuring an archival legacy of IODP micropaleontologic recovery. Thus, this recommendation was given high priority by the Paleontology WG.

Recommendation PALEO-2: MRCs should be renamed as Integrated MRCs (IMRCs)

The Paleontology Working Group recommends that the MRCs should (1) **be renamed as Integrated MRCs (IMRCs)** and (2) **continued in IODP as an integrated component**. Formal inclusion of IMRCs collections and curators will provide an important resource to IODP for the production of micropaleontologic training and public education materials, for maintaining quality control of paleontologic and biostratigraphic data within IODP, as a liaison to the broader micropaleontologic community, and for insuring an archival legacy of IODP micropaleontologic recovery. “Formal inclusion” could include participation as panel or task force representatives, making regularly scheduled presentations to SciMP, and other activities of the IODP.

Recommendation regarding Taxonomic Dictionaries with stratigraphic databases

The recommendation below results from discussions during the Paleontology WG regarding the needs of taxonomic dictionaries with stratigraphic databases for IODP drilling expeditions.

Development of image based digital taxonomic dictionaries is critical to reliable shipboard age and paleoenvironmental determinations, is essential to the quality control of the shipboard interpretations, and provides an efficient alternative to duplicating hard copy library resources that have been traditionally used by shipboard paleontologists. In order to achieve timely completion of image dictionaries and cyber atlases, associated with stratigraphic databases, incentives will need to be provided to working subgroup

leaders working together with IMRC curators to achieve information and image capture and research community input that are required.

Recommendation PALEO-3: Taxonomic Dictionaries with stratigraphic databases

IODP must coordinate their efforts regarding digital taxonomic dictionaries and cyber atlases and related issues with other national and international initiatives such as CHRONOS, NEPTUNE and et.al. The Paleontology Working Group recognizes the importance of international cooperation and interaction among the IOs and the micropaleontologists community and encourages collaborations with IMRC curators to develop these dictionaries to be used on the IODP drilling platforms

The microfossil groups to be covered should include calcareous nannofossils, planktic foraminifera, benthic foraminifera, diatoms, silicoflagellates, radiolarians, and palynomorphs (dinoflagellates and pollen).

The taxonomic dictionaries for the Cenozoic and Mesozoic should be updated and expanded on a regular basis (e.g., once per year).

Recommendation regarding Post-cruise Data Capture

The most important data used for age determinations of the drill cores are generated during post-cruise studies and are primarily published in peer-reviewed journals. Improvements in biostratigraphic knowledge over time however cause older data to be increasingly difficult to use, particularly by non-specialists. In order to maintain currency in age-depth relationships for the DSDP/ODP/IODP cores. The Paleontology Wgof the SciMP realizes that we must have continual capture of these shore-based data and review /updating of older data.

Recommendation PALEO-4: Post-cruise Data Capture

The Paleontology Working Group recommends that post-cruise data capture and updating of older data become an ongoing activities of IODP, working in cooperation with relevant various expert groups, e.g. IMRCs, CHRONOS, NEPTUNE and ODSN. Both taxonomic dictionaries and chronology updates should be core products available via the proposed Information Services Center (ISC).

Two Recommendations regarding IMRC responsibilities

The Paleontology WG is taking reassessing IMRCs responsibilities for IODP activities. These two recommendations result from multiple discussions of the WG members.

MRC microfossil slides are essential to preparing training/ teaching/reference materials, and support other goals such as quality control and age model maintenance. With the exception of a few areas (Mesozoic, Arctic), current MRC sampling is adequate to fulfill

planned services. Preparation of these samples however has been inadequate: it has been underfunded and at current rates, completion may take a decade or more.

Recommendation PALEO-5: Incomplete IMRC slide sets should be completed promptly

The Paleontology Working Group endorses the request of the MRCs to reduce their sampling to recover only key remaining gaps in current coverage.

Recommendation PALEO-6: MRCs funding possibilities

The MRCs should explore funding possibilities to insure the timely completion of the IMRC sample set and on-line publication together with the relevant age information.

The following Consensus Statements results from detailed discussions through the Paleontology WG meeting regarding how paleontologic multiple issues on the SciMP are effectively resolved.

Consensus Statements : SciMP Membership

SciMP realizes the critical importance of chronostratigraphy in guiding drilling operations and interpreting earth history in the new multiplatform IODP structure. The SciMP therefore, stresses the importance of paleontologists' participation in the panel.

Appreciation

The SciMP acknowledges the effort of CDEX to develop enhanced tools for shipboard paleontologists. The Paleontology Working Group of SciMP thanks Mr. Takashi Yuyama from the Central Computer Services Ltd. for presenting the overview of J-CORES in the "Chikyu" vessel and the trial of the shipboard Paleontology tool "Stratigraphy" in J-CORES.

Two Action Items

Action item PALEO-1: IMRC Archival Responsibility

The MRCs, in consultation with SciMP, initiate discussions with IODP-MI and for funding agencies to explore how to grant permanent archival status in appropriate major Museums for one set of each of the current four collection types (foram, nanno, rad, diatom), as designated by the IMRC curators. The remaining 7 sets of each fossil group should retain their indefinite loan status.

Action Item PALEO-2: Evaluation and review of database content

The Paleontology WG of SciMP will work with the IOs to evaluate and review the common data content items of potential paleontological databases used by the IODP and will report their result at the next SciMP meeting.

PALEONTOLOGY WORKING GROUP MEETING OVERVIEW

(PWG subgroup-Brian Huber, Felix Gradstein, Noritoshi Suzuki, Masao Iwai, and Takashi Yuyama)

(IMRC subgroup-Michael Knappertsbusch, David Lazarus, John Firth, Yoshiaki Aita, Mark Leckie)

1) Determine relation to IODP structure

- PWG should be advisory to IMI
- IMRC should be associated with IODP Information Services Center (precise relationship to be determined later)

2) Meeting frequency

- 1/year, or upon demand, when convenient jointly

3) Participation

- i) PWG -3 European, 3 Japanese, 3 U.S. plus guests, at least one member of the Paleo WG be a curator from an IMRC
- ii) IMRC-by application to IMRC curators (as currently done)
- iii) SciMP should have at least one Paleo representative from Japan and one from U.S.
- iv) Paleo WG meetings should be attended by both SciMP representatives (or alternate)
- v) Link to CHRONOS project Life through Time Subgroups
 - (1) Taxonomic species list dictionary subgroup for planktic forams, benthic forams, diatoms, radiolarians, and dinoflagellates
 - (a) Networked and internet accessible
 - (b) Available on all IODP platforms and Core Repositories
 - (2) Datum zonal markers linked to images
 - (a) for ICS time scale: Jim Ogg
 - (b) BugCad: Mitch Covington
 - (c) Deep Water Agglutinated Forams: Mike Kaminski/Felix Gradstein
 - (d) Chronos-based databases
 - (3) In coordination with European funding agencies get money for summer students to build regional atlases

4) Leadership

- one of the SciMP representatives should be the leader of the Paleo WG
- IMRC leader chosen by vote of IMRC curators

5) Rotation frequency

- PWG and IMRC -3 years

6) PWG Responsibilities/activities

- i) Establish/oversee working subgroups, funneled through central clearinghouses such as IMRCs, IODP contractors and/or Chronos

- (1) Taxonomic species lists and image dictionaries created in coordination with IMRCs, Chronos Neptune, Janus, J-CORES and other available databases
 - (a) Neogene planktic forams: Michael Knappertsbusch
 - (b) Paleogene and Cretaceous planktic forams: Brian Huber and Mark Leckie
 - (c) Jurassic planktic forams: Felix Gradstein
 - (d) Cenozoic diatoms: Masao Iwai
 - (e) Cretaceous diatoms: Julianne Fenner
 - (f) Neogene radiolarians: David Lazarus
 - (g) Paleogene radiolarians: Chris Hollis
 - (h) Mesozoic radiolarians: Yoshiaki Aita and Noritoshi Suzuki
 - (i) Cenozoic and Mesozoic dinoflagellates: John Firth, Felix Gradstein, (also Yuji Kurita (kurita@sc.niigata-u.ac.jp))
 - (j) Cenozoic calcareous nannofossils: Jeremy Young
 - (k) Mesozoic calcareous nannofossils: Jackie Lees
- (2) Search for updates on web site activities (updated catalogue of sites for species dictionaries etc.): Felix Gradstein
- ii) Edit shipboard handbook
 - (1) major commitment of effort! Must consider legal and health implications when chemicals are involved
 - (2) Deadline: For MSP is open ended
- iii) Identify and review science resources needed for IODP platforms and land based IODP core repositories (i.e., new technology/instrumentation, software, hardware, laboratory equipment)
- iv) Age model updates
 - (1) Updating of species lists and datum ages used in age/depth plots:
 - (a) IMRC/Chronos's jointly developed Neptune database
 - (b) Shipboard databases
 - (c) Neogene age datum list for p.f. and nannos, magnetostratigraphy is complete up to GTS 2004: Felix Gradstein
 - (d) Cretaceous age datum list should be complete: Jim Ogg
 - (e) Mesozoic and Cenozoic dinoflagellate datums: Graham Williams
 - (2) Updating of age models based on new studies in peer reviewed literature
 - (3) Provide standard time scale and some regional time scale options and updates
 - (4) Consult on staffing issues (e.g., identify lead paleontologists for all legs that expect to recover sediments)
 - (5) Provide guidance for training needs of paleontologists prior to drilling cruises
- v) Outreach
 - (1) Encourage research community to contribute their DSDP/ODP/IODP data
 - (2) Public outreach (improve visibility of paleontology and credibility among IODP community: talks, listserver messages, workshops, popular articles in JOIDES Journal, etc., multi language availability)

- vi) Teaching and training
 - (1) Produce electronic/VR atlases of marine microfossils for professional training of micropaleontologists
 - (2) Training of less experienced shipboard micropaleontologists pre-cruise,
 - (3) Provide loanable university and professional micropaleontology teaching modules based on MRC materials (for example training collections of index species including documentation),
 - (4) Help in organizing or organize electronic products for or virtual micropaleo and stratigraphy courses and produce of the necessary electronic documents, texts, diagrams and images.
 - (5) Assist in providing image materials of microfossils for outreach, public relation, museum exhibits and various teaching materials for primary schools.

- 7) **IMRC Responsibilities**
 - a) Maintain and make accessible IMRC microfossil collections for research, teaching and training
 - b) Provide/arrange archival services for IODP, ODP and DSDP microfossil materials, particularly types
 - c) Assist PWG in carrying out teaching, training, and public outreach tasks

- 8) **Funding needs**
 - a) Average 1 meeting/year (for PWG 12 people, incl. guests) each PWG and IMRC
 - b) Student graduate assistants for each working subgroup leader listed above

- 9) **Funding strategies**
 - a) If SciMP considers our recommendations to be a high priority and approved by SPC each working subgroup leader would need to request funding through appropriate channels based on guidance by the oversight panel
 - b) Petroleum industry?
 - i) Age models would be very useful tailored to basins of interest
 - ii) Calibration of regional chronostratigraphies to standard international time scale
 - iii) Paleobathymetric lookup tables (regional and global)
 - iv) Taxonomic atlases would not likely get funded
 - c) NSF Environmental Biology informatics
 - d) European Union informatics initiative? (Dave Lazarus and Jeremy Young will check)
 - e) SOCs and co-mingled funds: programming funds to migrate data and data models for taxonomic dictionaries and species age assignments and applications to access data through the internet