

INVITATION

Underwater Mining Institute:
NEW PERSPECTIVES ON
SEABED MINERAL DEPOSITS
13-18 NOVEMBER 2002
TE PAPA, WELLINGTON, NEW ZEALAND



Could exploration of the more than 20,000 km of volcanic arc of the Western Pacific seabed represent the next staking rush for mining companies?

The 32nd Annual Conference of the Underwater Mining Institute (UMI) invites you to participate in a forum for serious discussion of this and other topics in Te Papa—New Zealand's national museum.

Presentations on the following topics will be featured:

- ◆ Submarine hydrothermal deposits, with an emphasis on volcanic arcs
- ◆ Engineering applications of interest to the development of seabed minerals
- ◆ Other topics of interest to marine minerals development and study

Program Sections

The UMI 2002 Focus

The UMI 2002 Program

The UMI 2002 Lodging

The UMI 2002 Registration Information and Form

The UMI 2002 White Island Field Tour Information and Motel Reservation Form

Technical Chair

Charles L. Morgan • Morgan & Associates • Email: sauchai@aol.com

Technical Co-Chair and Host

Institute of Geological and Nuclear Sciences, Lower Hutt, New Zealand

- Alexander Malahoff, CEO
- Cornel de Ronde • Email: C.deRonde@gns.cri.nz

Sponsor

International Marine Minerals Society

• James R. Hein, President • Email: jhein@usgs.gov

Conference Contact and Coordinator:

Ms. Karynne Chong Morgan, Conference Coordinator

Underwater Mining Institute, Hawai`i Undersea Research Laboratory

University of Hawai`i, 1000 Pope Road, MSB 303, Honolulu, HI 96822 USA

Phone: 808.956.6036 • Fax: 808.956.9772 • Email: karynnem@hawaii.edu

UNDERWATER MINING INSTITUTE 2002



FOCUS

**Underwater Mining Institute:
NEW PERSPECTIVES ON SEABED MINERAL DEPOSITS
13-18 NOVEMBER 2002
TE PAPA, WELLINGTON, NEW ZEALAND**

The Focus

The major focus for the 32nd annual Underwater Mining Institute is on formation processes that lead to significant accumulations of potentially commercial metal sulfide minerals on the seafloor. Currently, commercial exploration for such deposits is underway in the Territorial Waters of Papua New Guinea, while scientific interest has led to discoveries of promising deposits and to significant new insights into the processes that form this major class of ore-forming minerals. An international group of eminent and active researchers in this area will present **NEW PERSPECTIVES ON SEABED MINERAL DEPOSITS** at the Institute and will lead discussions of the issues that are at the forefront of research and exploration.

The UMI provides perhaps the most appropriate setting to discuss these issues. The Institute has an established history of fostering multidisciplinary debate on complex topics related to seabed development. Also, the Institute's primary sponsor, the International Marine Minerals Society, owes no allegiance to any particular commercial, academic, or government body.

In addition to this primary focus, the UMI will also include timely presentations on several other aspects of marine minerals development and study. This year, unpublished scientific and engineering advances and environmental impact analysis related to marine minerals will also be presented and discussed within the informal, comfortable structure that is the essence of the UMI.

The Institute

The UMI has drawn on the expertise of researchers, industry professionals, and environmental, resource, and policy managers worldwide to provide the latest information relevant to seabed minerals. Since the first UMI was held in Milwaukee, Wisconsin in 1970, the Institute's primary goal has remained constant--to encourage prudent and responsible development of marine mineral resources through technical presentations in venues that promote informal and free exchange.

The theme varies each year, as does the location and host. Proceedings are not published nor are recordings of the sessions permitted without prior permission from the contributors. Presentations are scrutinized to ensure that the content and interactions of the UMI remain stimulating and fresh. International participation (to date by more than 25 nations) is promoted and supported. This unique and multidisciplinary approach is attributed to the Institute's founder, the late J. Robert "Robby" Moore, whose vision and contributions have laid the groundwork for the continued success of the UMI far beyond the borders of Wisconsin.

The Venue

Wellington--the meeting site of the UMI-- is the financial, political, and cultural capital of New Zealand and offers a sophisticated yet casual experience for all to enjoy. The city boasts of great views, a distinct mix of graceful promenades and landscaping, excellent cafes and performing arts, and a multitude of outdoor and adventure experiences.

The UMI begins with an evening registration followed by two days of technical sessions, an evening banquet, and field tour. The banquet will feature a special guest speaker and be held at the Duxton Wellington Hotel. The final event is a geotechnical tour of several of the most exciting geothermal and volcanic sites on the North Island.

The Host and Program Chair

The New Zealand Institute of Geological and Nuclear Sciences (GNS) hosts the UMI this year. Technical program assistance is provided by CEO Dr. Alexander Malahoff and Dr. Cornel de Ronde of GNS. Charles L. Morgan, a former President of IMMS and longtime worker in the area of seabed minerals, has served as UMI Program Chair since 1994.

The Sponsor

The International Marine Minerals Society (IMMS) is a professional society whose members share a common interest in various aspects of marine minerals. Founded in 1987, the IMMS now includes a worldwide membership of individuals from industry, government agencies, and academic institutions. The primary objective of the IMMS are: (1) to promote and improve the understanding of marine mineral deposits within the province of the global ocean; (2) to aid in the interchange of information among members through networking and formal symposia; (3) to encourage the prudent development of marine mineral resources, including concern for the environment; (4) to encourage research in all aspects of marine minerals development.

The IMMS is a co-sponsor of the Underwater Mining Institute (UMI) and holds its annual meetings in conjunction with the UMI. Members of the IMMS receive a bi-annual newsletter, which includes summaries of the latest developments in the field of marine minerals. On occasion the IMMS presents the Moore Medal award to an individual who has contributed notably to the goals and initiatives of the Society in the areas of research, development and management. The Moore Medal is named in honor of the late Professor J. Robert "Robby" Moore. Professor Moore spent a long and distinguished career dedicated to the goals that are now followed by IMMS. He founded the UMI in 1970, and with the collaboration of several colleagues, initiated IMMS in 1987.

New and continued membership (<http://www.ngdc.noaa.gov/mgg/imms/imms.HTML>) to IMMS is encouraged. Also, contributions to *SOUNDINGS*, the bi-annual newsletter, are welcome at any time. Please keep us informed of your interests and your addresses so that future announcements on IMMS and the UMI can reach you.

PROGRAM

Underwater Mining Institute:
NEW PERSPECTIVES ON SEABED MINERAL DEPOSITS
13-18 NOVEMBER 2002
TE PAPA, WELLINGTON, NEW ZEALAND

13 November 2002 (Wednesday)

Welcoming Reception and Registration

West Plaza Hotel (*Cornish Room*)
110-116 Wakefield Street
8:00 to 9:30 PM

14 AND 15 NOVEMBER 2002 (THURSDAY AND FRIDAY)

Technical Sessions I, II, and III

Te Papa (Museum of New Zealand Te Papa Tongarewa)
Cable Street, Wellington
Rangimarie Room
8:30 AM to 5:00 PM

WELCOME

Call to Order

Charles L. Morgan, UMI Chair

Host Overview

Alexander Malahoff, CEO, Institute of Geological and Nuclear Sciences

Sponsor Overview

James R. Hein, President, International Marine Minerals Society

**SOUTHWESTERN PACIFIC SUBMARINE HYDROTHERMAL DEPOSITS,
WITH AN EMPHASIS ON VOLCANIC ARCS**

Cornel de Ronde, Session Chair

**Exploring the Third Dimension of an Active Seafloor Hydrothermal System Hosted by
Felsic Volcanic Rocks: ODP Leg 193 at PACMANUS, Papua New Guinea**

Raymond A. Binns

CSIRO Exploration and Mining, New South Wales, Australia

**Comparative Investigations on Submarine Hydrothermal Mineralization in the S.W. Pacific
and Eastern Caribbean**

David S. Cronan

Royal School of Mines, Imperial College, London, United Kingdom

The Kermadec Arc: A Hot Prospect for Gold-rich Massive Sulfide Deposits?

Cornel E.J. de Ronde

Institute for Geological & Nuclear Sciences, Lower Hutt, New Zealand

**An Exotic Au- and Ag-enriched Massive Sulfide Deposit from Mt. Jourdanne, Southwest
Indian Ridge—Composition and Genetic Implications**

Peter E. Halbach

Free University, Berlin, Germany

Continental Margin Hydrothermal Mineralization: Southern California Borderland

James R. Hein

U.S. Geological Survey

Menlo Park, California USA

Kuroko-type Deposits from the Izu-Ogasawara (Bonin) Arc, Japan

Kokichi Iizasa

National Institute of Advanced Industrial Science and Technology, Japan

Exploring Submarine Volcanic Arcs from the Hydrothermal Plume Perspective

Gary J. Massoth

Institute for Geological & Nuclear Sciences, Lower Hutt, New Zealand

**Investigations of Seafloor Hydrothermal Mineralization in Volcanic Arcs, Back Arcs and
Continental Shelf Settings in SW Pacific and SE Asia**

Timothy F. McConachy

Division of Exploration and Mining, CSIRO, New South Wales, Australia

**The Japan/SOPAC Co-operative Deep-sea Mineral Resources Study Project – Report on Results of
Activities Between 2000 to 2002, with an Emphasis on Results of Marine Drilling in the North Fiji
Basin, Fiji's EEZ**

Nobuyuki Okamoto et al.

SOPAC (South Pacific Applied Geoscience Commission), Fiji

**ENGINEERING APPLICATIONS OF INTEREST TO THE
DEVELOPMENT OF SEABED MINERALS**

Charles L. Morgan, Session Chair

Assessment of the Rehabilitation of the Sea-Bed Following Marine Aggregate Dredging

Sian Boyd

*The Centre for Environment, Fisheries and Aquaculture Science
Essex, United Kingdom*

Number 8 Wire Technology – Keeping the Costs Down

Keith Gordon

SeaROV Technologies Ltd., Whangarei, New Zealand

**Development of a Virtual Reality Model Focusing on Reducing the Environmental Impact
of Deep-Sea Mining**

Jayne Holden

*Mining Research Centre
The University of New South Wales, Australia*

**A Geologic Survey of the Near-shore Regions Around White Island, New Zealand; Sidescan
Imagery, Rock and Gas Samples from the 1995 MMTC-WIS Survey**

Gregory J. Kurras

*Department of Geology & Geophysics
University of Hawai'i, USA*

Examining Extraction Options for Mining Seafloor Massive Sulphide Deposits

Cameron Rees

*Mining Research Centre
The University of New South Wales, Australia*

**OTHER TOPICS OF INTEREST TO
MARINE MINERALS DEVELOPMENT AND STUDY**

Development of an Oceans Policy for New Zealand: A Perspective

Mac Beggs

GeoSphere Exploration, Ltd., Lower Hutt, New Zealand

**Correlation Between Mineralogical and Chemical Compositions of the Micro-Textures in
Manganese Nodules**

Hunsoo Choi

*Petroleum and Marine Resources Division
Korea Institute of Geoscience and Mineral Resources, Korea*

**A Chemical Evaluation of Ilmenite from Chavara and Manavalakurichi Deposits,
Southwest Coast of India**

K.T. Damodaran

Department of Marine Geology

Cochin University of Science and Technology, Kochi, India

Nature and Origin of the Vani Manganese Deposit, Milos, Greece

Geoff P. Glasby

Victoria University of Wellington, New Zealand

Gas Hydrates of the West Coast of India

Subramanian Rajendran

Department of Marine Geology

Cochin University of Science and Technology, Kochi, India

**Fine-scale Dating and Chemical Profiles of Deep-sea Ferromanganese Crusts in the
Western and Central Pacific**

Akira Usui¹ and Ian Graham²

¹*National Institute of Advanced Industrial Science and Technology, Japan*

²*Institute for Geological & Nuclear Sciences, New Zealand*

15 November 2002 (Friday)

BANQUET

Duxton Hotel Wellington

170 Wakefield Street

Duxton II and III

6:00 to 9:00 PM

16 to 18 November 2002 (Saturday - Monday)

GEOTECHNICAL TOUR OF WHITE ISLAND

16 November

Bus tour from Wellington to Lake Taupo then onto the Waiotapu geothermal field;
overnight in Whakatane

17 November

White Island Tour (5-hour tour includes morning tea, surface transportation, 2-hour guided tour on the
island, and lunch); overnight in Rotorua

18 November

Return to Wellington

Cost: US\$160, prepaid by 30 September 2002. This includes surface transportation and White Island Tour only. Reservations for lodging in Whakatane and Rotorua will be made by the UMI, but participants will cover their expenses directly with the motel proprietor. Meals and incidentals will be on each participant's own. Please complete the Motel Registration Form. Number of Persons: 20 min., 25 max.

For More Information, Contact:

Ms. Karynne Chong Morgan, Conference Coordinator

Underwater Mining Institute, Hawai'i Undersea Research Laboratory

University of Hawai'i, 1000 Pope Road, MSB 303, Honolulu, HI 96822 USA

Phone: 808.956.6036 · Fax: 808.956.9772 · Email: karynnem@hawaii.edu

REGISTRATION FORM

Underwater Mining Institute:
NEW PERSPECTIVES ON SEABED MINERAL DEPOSITS
13-18 NOVEMBER 2002
TE PAPA, WELLINGTON, NEW ZEALAND

NAME and TITLE _____
COMPANY/AGENCY _____
MAILING ADDRESS _____
CITY _____ STATE _____ POSTAL CODE _____ COUNTRY _____
PHONE _____ FAX _____ EMAIL _____

REGISTRATION FEE OPTIONS (due by September 30, 2002)

- STANDARD FEE US\$320** \$ _____
[Welcoming reception, technical sessions, banquet, and 2003 membership to the International Marine Minerals Society.]
- SINGLE-DAY FEE US\$225** \$ _____
 Thursday, November 14, 2002 Friday, November 15, 2002
[One technical session and 2003 membership to the International Marine Minerals Society.]
- STUDENT FEE US\$75** \$ _____
[Welcoming reception, technical sessions, and banquet.]
- ADD LATE REGISTRATION FEE US\$25 (if registering after September 30)** \$ _____

OTHER FEE OPTIONS

- BANQUET FOR SINGLE-DAY REGISTRANTS and GUESTS US\$35** \$ _____
Friday, November 15, 6:00 - 9:00 PM, No. of Adults _____ x US\$35
- OPTIONAL GEOTECHNICAL FIELD TOUR: White Island** \$ _____
Saturday to Monday, November 16-18, 8:00 AM - 4:00 PM. Please complete Motel Reservation Form.
 Covers bus transportation and visit to White Island. No. of Adults: _____ x \$160
 Covers bus transportation, but **no** visit to White Island. No. of Adults _____ x \$100

THE DEADLINE FOR TOUR REGISTRATION AND PAYMENT IS 30 SEPTEMBER 2002.

TOTAL UMI PAYMENT ENCLOSED

US\$ _____

METHOD OF PAYMENT

- Purchase Order (attach authorized copy)
- Check made payable to: *Research Corporation of the University of Hawai'i*
(In U.S. currency drawn on a U.S. bank. Cashier's check or money order also accepted.)
- Wire Transfer (see Registration Information for details)
- Credit Card VISA or MASTERCARD

Card No. _____ Expiration Date _____

Signature _____

Submit Registration Form & Payment by 30 September 2002

To: Ms. Karynne Chong Morgan, Conference Coordinator
Underwater Mining Institute, Hawai'i Undersea Research Laboratory
University of Hawai'i, 1000 Pope Road, MSB 303, Honolulu, HI 96822 USA
Phone: 808.956.6036 · Fax: 808.956.9772 · Email: karynnem@hawaii.edu

REGISTRATION INFORMATION

Fees

Standard Fee. The standard fee to register for the 32nd Underwater Mining Institute is US\$320, if prepaid by September 30, 2002. This fee covers welcoming reception and registration, technical sessions, UMI banquet, and 2003 membership to the International Marine Minerals Society, a non profit professional organization promoting interchange between government, academic, and industry expertise on marine minerals interests.

Single Day Fee. The single-day fee is US\$225, if prepaid by September 30, 2002.

Student Fee. The student fee is US\$75. This includes the welcoming reception and registration, both technical sessions, and the UMI banquet. Students must provide verification of student status and be willing to assist during the conference, if needed.

Late Registration Fee. A late fee of US\$25 will be added to registrations received after September 20, 2002.

Banquet Fee. The banquet fee of US\$35 is an additional cost for single-day registrants and guests to the UMI.

Geotechnical Field Tour. This optional feature of the UMI includes a visit to Lake Taupo, Waiotapu geothermal field, overnight in Whakatane, visit to White Island, and overnight in Rotorua. Please read the GeoTechnical Tour Information and complete the Motel Reservation Form by 30 September 2002.

Payments

Please submit the enclosed Registration Form (and Motel Reservation Form, if applicable) with your payment by 30 September 2002. Checks in U.S. currency drawn on a U.S. bank, or bank drafts, should be made payable to *Research Corporation of the University of Hawaii* or *RCUH* and mailed to the UMI conference coordinator.

Payments may also be made by credit card, cashier's check, or money order. For wire transfer, send funds to First Hawaiian Bank, Account No. 48-048084, Bank ABA Routing No. 121301015, RCUH Federal ID No. 99-0115254, Payee is Research Corporation of the University of Hawaii (RCUH), and you must reference **RCUH 1783** on your wire.

Refunds

Refunds will be made for written cancellations received by October 15, 2002.

Lodging

Special rates are offered to UMI guests at the following Plaza hotels, both within a 5-10 minute walk to Te Papa:

West Plaza Hotel • 110-116 Wakefield Street • Wellington

Monday-Thursday NZD139.00 + 12.5% GST (~US\$66), Friday-Sunday NZD110 + 12.5% GST (~US\$52)

Reservations Phone: +64 4 473 1490 • Fax: +64 4 473 1454 • Email: reservations@westplaza.co.nz

USE BOOKING REFERENCE: WPH/UMI/1102, Website: <http://www.westplaza.co.nz/>

Bay Plaza Hotel • 40-44 Oriental Parade • Wellington

Monday-Thursday NZD115.00 + 12.5% GST (~US\$55), Friday-Sunday NZD85.00 + 12.5% GST (~US\$41)

Reservations Phone: +64 4 385 7799 • Fax: +64 4 385 2936 • Email: reservations@bayplaza.co.nz

USE BOOKING REFERENCE: BPH/UMI/1102, Website: <http://www.bayplaza.co.nz/>

Exhibits

Commercial exhibits are welcome at the cost of the standard UMI registration. For arrangements, please inquire with the UMI Conference Coordinator.

Related Websites About New Zealand

New Zealand Tourism www.purenz.com

New Zealand Tourism www.tourisminfo.govt.nz

Your Guide to Wellington www.wellingtonnz.com

About Rotorua www.rotoruanz.com

GEO TECHNICAL TOUR INFORMATION

Underwater Mining Institute:
NEW PERSPECTIVES ON SEABED MINERAL DEPOSITS
TOUR: 16-18 NOVEMBER 2002, WELLINGTON/WHAKATANE/ROTORUA

Who: UMI Participants and Guests (25 maximum)

Where: Wellington to Lake Taupo then onto the Waiotapu geothermal field, overnight in Whakatane to White Island (guided tour); overnight in Rotorua, and return to Wellington

When: November 16 (Saturday), return to Wellington November 18 (Monday) afternoon.

Cost: \$160 (prepayment by September 30, 2002) to cover bus transportation and the White Island Tour, or US\$100 if you are just coming along for the ride and not going to the Island. Additional costs for lodging in Whakatane (estimate NZ\$100) and Rotorua (estimate NZ\$110), as well as for meals and incidentals will be handled individually by participants.

WHITE ISLAND

Surface Transportation: A bus has been chartered for a minimum of 20/maximum of 25 persons.

Cost per person is US\$100, prepaid by 30 September 2002.

White Island Tour: White Island Tours offer professional marine operators with the *PeeJay IV*, a 60-foot launch. Its semi-planing hull gives a very smooth ride in extreme comfort during the 80-minute trek to the Island. The jet-powered inflatable required to ferry passengers to the island from the *PeeJay IV* also has high safety standards. Everyone will be issued a hard hat and a gas mask for comfort and safety while on the island. You need to be 8 years old or older and able to walk at least 2 hours on an uneven surface. There are no rest areas available on the island. The tour begins promptly at 6:45 AM and ends shortly after Noon. Lunch will be served onboard the *PeeJay IV*. *Cost per person is US\$60, prepaid by 30 September 2002.*

Lodging. White Island Tours also offers a motel comprising of 25 non smoking units with full laundry facilities, TV, phones, data port connections, fridge, heating and hair dryers. Reservations are based on *double accommodations at NZ\$100 per person. If you have a preference for a roommate, or if you prefer a unit to yourself, please make that indication on the Motel Registration Form and submit it to the UMI by 30 September.* When we have a final rooming list, specific units will be assigned and the actual cost per person/unit will be determined (the range of cost is between NZ\$80 and NZ\$100). Payment may be made upon your arrival to the motel.

Meals. On site is "PeeJays Coffee House" that serves "awesome coffee and great food" and is open from 6:30 AM to 5:00 PM daily. Across the street are two licensed restaurants and many more within walking distance.

For more details about White Island Tours (boat trip and motel), please see www.whiteisland.co.nz.

ROTORUA

Single/double accommodations are being arranged for Capri Court in Rotorua at a cost of NZ\$110 per night. For more details, please see http://www.jasons.co.nz/brochure Rack/capri_court/.

GEO TECHNICAL TOUR MOTEL RESERVATION FORM

Underwater Mining Institute:
New Perspectives On Seabed Mineral Deposits
TOUR: 16-18 NOVEMBER 2002, WELLINGTON/WHAKATANE/ROTORUA

NAME OF UMI PARTICIPANT: _____

I have read the GeoTechnical Tour Information and understand that motel reservations in Whakatane are based on double accommodations at an estimated NZ\$100 per person/night and in Rotorua are based on single/double accommodations at an estimated NZ\$110 per night. I will cover my expenses directly with each motel. Please make the following reservations on my behalf.

Signature _____

MOTEL RESERVATIONS

- WHITE ISLAND TOURS MOTEL: NZ\$100 per person based on double occupancy.**
Saturday, November 16, 2002
 - My preference for a roommate is: _____
 - Assign me a roommate to the best of your ability. The following are some considerations:

 - I prefer a unit to myself and will pay the full cost of NZ\$200 for it.

- ROTORUA MOTEL RESERVATION: NZ\$110 per person based on single/double occupancy**
Sunday, November 17, 2002

Submit This Form No Later Than 30 September 2002

TO: Ms. Karynne Chong Morgan, Conference Coordinator
Underwater Mining Institute, Hawai'i Undersea Research Laboratory
University of Hawai'i, 1000 Pope Road, MSB 303, Honolulu, HI 96822 USA
Phone: 808.956.6036 · Fax: 808.956.9772 · Email: karynnem@hawaii.edu