



# SAINT PETERSBURG, FLORIDA, USA UNDERWATER MINING CONFERENCE

## FINAL PROGRAM

1 NOVEMBER 2015 (SUNDAY)

WELCOMING RECEPTION & REGISTRATION  
(POOLSIDE; IF RAIN, GRAND BAY SOUTH BALLROOM)

Hilton St. Petersburg Bayfront Hotel

333 1st St S, St Petersburg, FL 33701, Tel: +1 (727) 894-5000

**19:00 – 21:30**

*UMC participants and guests are welcome*

*Prior to Reception*

SEABED MINERAL RESOURCE ESTIMATION  
AND SAMPLING COURSE  
(ST. PETERSBURG I)

09:00 – 16:00 (NO HOST LUNCH)

by Rene Sterk, Managing Director, RSC Global for pre-registered participants

EXECUTIVE BOARD MEETING  
INTERNATIONAL MARINE MINERALS SOCIETY  
(BOARDROOM)

15:00 – 18:00

for Board Members only

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*Prior to November 1*

31 OCTOBER 2015 (SATURDAY)

UMC STRATEGIC PLANNING MEETING  
(POOLSIDE)

09:00 – 16:00

for Committee Members or by invitation



Exhibits and the Poster Session will be held in Williams/Demens

2 NOVEMBER 2015 (MONDAY)

TECHNICAL SESSION I

(ST. PETERSBURG I AND II)

Hilton St. Petersburg Bayfront Hotel

**08:30 – 17:30**

*Participants staying at the Hilton St. Petersburg should enjoy breakfast before coming to the conference room.*

**08:30 INTRODUCTION**

**Call to Order**

*Charles L. Morgan, UMC Program Chair*

**Hosts' Welcome (08:40)**

*Greg Stemm, Co-Founder, Odyssey Marine Exploration*

*John Oppermann, UMC Program Co-chair and Host*

*Vice President, Director of Research and Scientific Services*

*Odyssey Marine Exploration*

*Tampa, Florida USA*

Presentations

**09:10 Marine investments - Unlocking the potential of nearshore underwater mining**

*Sander van den Burg, Wageningen University and Research Institute, The Netherlands*

**09:30 Mineral policy & legislative reviews: Offshore mining in Papua New Guinea**

*Winterford Iriohé Eko, Department of Mineral Policy, Papua New Guinea*

**09:50 Resolving inter-industry marine resource use conflicts: Nearshore marine mining and fisheries**

*Paul Holthus, World Ocean Council, USA*

**10:10 A study of technology transfer and diffusion pertaining to underwater mining**

*Yao Zhou, University of Wisconsin-Madison Law School, USA*

**10:30 Break – 30 minutes**

**11:00 Seafloor diamond and placer metal exploration, and seawater capacitance as a hydrocarbon proxy - Applications of marine induced polarization**

*Jeff Wynn, U.S. Geological Survey, USA*

**11:20 Underwater mining of inland resources**

*Michael Hausner, Underwater Mining Solutions, South Africa*

**11:40 An integrated geological model approach for offshore placer mineral exploration**

*John Youngson, Marine Minerals Group, New Zealand*

**12:00 Mineral resources and underwater deposits of solid minerals in the shelf regions of the Arctic zone of Russian Federation**

*Svetlana Babaeva, Institute for Geology and Mineral Resources of the Ocean, Russia*

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**12:20 Break (2 hrs): Lunch (1 hr) followed by Poster Session (45 min), break (15 min)**

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**13:30 Poster Session (45 minutes), William/Demens Room**

### Poster Presentations

**Origin of Co and Ni in Cu-rich seafloor massive sulfides**

*Svetlana Babaeva, VNIIOkeangeologia (Institute for Geology and Mineral Resources of the Ocean), Russia*

**Resource potential of ferromanganese crusts on central and southern California Seamounts and comparison with the Pacific Prime Crust Zone**

*Tracey Conrad, University of California-Santa Cruz, USA*

**Evaluation of re-suspended sediment to sinking particles by benthic disturbance in manganese nodule fields of the Northeastern Pacific**

*Hyung Jeek Kim, Korea Institute of Ocean Science and Technology, Korea*

**Paleomagnetism and rock-magnetic property of the younger generation ferromanganese crust in the Western Pacific**

*Wonnyon Kim, Korea Institute of Ocean Science and Technology, Korea*

**Seafloor tectonics and hydrothermal activity between 12S and 14.0S segment of the southern Mid-Atlantic Ridge**

*Bing Li, First Institute of Oceanography, China*

**Chemical composition of metalliferous sediments from the Southern Mid-Atlantic Ridge**

*Chuanshun Li, First Institute of Oceanography, China*

**Issues for the assessment of sediment plumes arising from deep sea mining operations**

*Tom Matthewson, HR Wallingford, UK*

**Mineral survey payload for AUV**

*Christopher S. Moore, Phoenix International Holdings, USA*

**Flexible material transfer systems for seabed mining**

*Peter Neale, ContiTech Oil & Gas, UK*

**The factors controlling the variation of Ce, La and Y concentration in ferromanganese crusts from the Magellan Seamount Cluster in the Western Pacific**

*Xiangwen Ren, First Institute of Oceanography, China*

**Using self-potential to explore for submarine massive sulfides: Palinuro Seamount, Tyrrhenian Sea**

*Roxana Safipour, Colorado School of Mines, USA*

**Seabed mineral resources: A review of current mineral resources and future developments**

*Rene Sterk, RSC Global, New Zealand*

**Waste rejection on seafloor by hydro-cyclone for economic seafloor massive sulfide mining**

*Yosuke Takeda, Osaka Prefecture University, Japan*

**Image analyses for estimation of polymetallic nodule abundance in Korean contract area**

*Chan Min Yoo, Korea Institute of Ocean Science and Technology, Korea*



Oral Presentations - continued

**14:20 Geological characterization of hydrogenetic ferromanganese crusts over the NW Pacific Seamounts: Contribution to the forthcoming exploration and economic estimation?**

*Akira Usui, Kochi University, Japan*

**14:40 Ferromanganese crusts from the Great Meteor seamounts chain (North Atlantic Ocean): Textures, composition and variability**

*Pedro Madureira, EMEPC (Task Group for the Extension of the Continental Shelf), Portugal*

**15:00 Ferromanganese crusts from the Mendeleev Ridge (Arctic Ocean): New data of the chemical and mineral composition**

*Natalia Konstantinova, VNIIOkeangeologia (Institute for Geology and Mineral Resources of the Ocean), Russia*

**15:20 Use of parametric modeling for economic assessments of seabed mining ventures – A rare earth element case study**

*Laurie Meyer, Deep Reach Technology, USA*

**15:40 Economic seafloor massive sulfide mining by Japan's model**

*Tetsuo Yamazaki, Osaka Prefecture University, Japan*

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**16:00 Break (30 minutes)**

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**16:30 How to find buried and inactive seafloor massive sulfides using transient electromagnetics**

*Sebastian Hoelz, GEOMAR (Helmholtz Centre for Ocean Research Kiel), Germany*

**16:50 Rare elements in SMS: Mineralogical control and geochemical associations**

*Anna Firstova, VNIIOkeangeologia (Institute for Geology and Mineral Resources of the Ocean), Russia*

**17:10 The metal endowment of seafloor massive sulfides: A global perspective**

*Sven Petersen, GEOMAR (Helmholtz Centre for Ocean Research Kiel), Germany*

**17:30 MINI PRESENTATION: Collaborative Test for Nodule Collector**

*Ted Brockett, Sound Ocean System, USA*

**17:40 End of Technical Session I, Closing Remarks**

*Charles Morgan*

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2 NOVEMBER 2015 (MONDAY EVENING)

UMC 2015 BANQUET

18:00

It's a pleasant walk to the venue, or hop on the bus (50 riders only) compliments of St. Petersburg/Clearwater Tourism. Departs from the Hilton St. Petersburg Bayfront Hotel to the **Museum of Fine Arts**.



*Cocktails* – 18:30 to 19:30 in the Marley Room

*Welcome and Dinner* – 19:30 to 22:00 in the Conservatory

*Banquet Address – **Dave Huber***

We are honored to have this year's UMC banquet address be given by Dave Huber (BSME, MSOcE) Sr VP Operations and Projects for Deep Gulf Energy, a private Houston based deepwater oil exploration and production company he co-founded in 2005. He joined Exxon in 1974 as a deepwater drilling engineer and has worked in 15 countries around the world including all the deepwater petroleum basins. He has been on the Board for Neptune Minerals for the past four years.

Dave will give a history of the deepwater oil business and how it has survived and thrived the considerable technical, environmental and economic challenges over the past 40 years. He will highlight the parallels to the ocean mining industry and provide his own thoughts on the future of mineral exploration and mining system development, and what this industry can learn from the lessons of offshore oil and gas.



3 NOVEMBER 2015 (TUESDAY)

TECHNICAL SESSION II

(ST. PETERSBURG I AND II)

Hilton St. Petersburg Bayfront Hotel

**08:30 – 17:30**

*Participants staying at the Hilton St. Petersburg Hotel should enjoy breakfast prior to coming to the conference room.*



Spouses Tour: Concurrent with Technical Session II is an Art Walk through parts of St. Petersburg — designed for spouses and guests. Early registration and prepayment are required.

**08:30 International Marine Minerals Society: Annual General Membership Meeting**  
*Samantha Smith, President*

### Presentations

**09:00 Seabed mineral deposits: An overview of sampling techniques and future developments**

*Rene Sterk, RSC Global, New Zealand*

**09:20 Nautilus Minerals: Momentum builds for our Solwara 1 project in Papua New Guinea**

*John Parianos, Nautilus Minerals, Australia*

**09:40 Underwater mining - Without making waves**

*Stef Kapusniak, Soil Machine Dynamics, UK*

**10:00 Streamer and laboratory experiments in marine induced polarization**

*Curtis Clement, Williamson & Associates, USA*

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**10:20 Break (30 minutes)**

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**10:50 Deep sea mining: Environmental impacts compared to onshore mining**

*Sophie Davidsson, DNV-GL, Norway*



**11:10 Environmental permitting, stakeholder and political considerations for advancing marine projects to commercialization**

*Jim Bolleter, Ecology and Environment, USA*

**11:30 A cradle to grave analysis of environmental impacts from nearshore underwater mining**

*Jens Laugusen, DNV-GL, Norway*

**11:50 The importance of early and continued consideration of environmental factors within the pre-consenting application project development process**

*Andrew Matkin, Gardline, USA*

**12:10 JPIOceans — Ecological Aspects of Deep-Sea Mining (MiningImpact)**

*Kristin Hamann, GEOMAR (Helmholtz Centre for Ocean Research Kiel), Germany*

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**12:30 Lunch (1.0 hr)**

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**13:30 Benthic impact experiment DISCOL in the manganese nodule area of the Peru Basin - first results of a revisit after 26 years**

*Johannes Post, DeepSea Mining Alliance/HYDROMOD Service, Germany*

**13:50 Suspended sediment concentration monitoring: What moving from high to low concentration environments can mean**

*Mark Lee, HR Wallingford, UK*

**14:10 Dredger sound impact assessment considerations**

*Tom Matthewson, HR Wallingford, UK*

**14:30 Assessing the deep-sea environmental impacts of mining**

*Lindsay Vare, SAMS Research Services, UK*

**14:50 Technical developments to establish a world class data platform for seabed minerals exploration licensing in the Cook Islands**

*Marino Wichman, Seabed Minerals Authority, Cook Islands*

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**15:10 Break (30 minutes)**

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- 15:40 Resources evaluation of polymetallic nodules - results of AUV survey**  
*Tadayuki Ishiyama, Deep Ocean Resources Development Company, Japan*
- 16:00 Tectonic/paleoceanographic controls on the formation of phosphorite and ferromanganese deposits from Galicia Bank, NE Atlantic Ocean**  
*Francisco Javier Gonzalez, Geological Survey of Spain, Spain*
- 16:20 Rare earth element resources hosted by marine phosphorites**  
*James Hein, U.S. Geological Survey, USA*
- 16:40 Marine placers: Reconnaissance to Reality**  
*Richard H.T. Garnett, Valrik Enterprises, Canada*
- 17:20 Closing Remarks**  
*John Oppermann and Charles Morgan*
- Invitation to UMC 2016 in Korea**  
*Korea Institute of Ocean Science and Technology*
- 17:30 Adjournment of UMC 2015**
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3 NOVEMBER 2015 (TUESDAY)

EVENING ACTIVITY

The evening is free for participants to dine at their leisure. If you're interested, at **21:30 (9:30 PM)**, join us at the **Ringside Café, 16 2<sup>nd</sup> Street North** for no-host live music (some of the best rock and blues Florida has to offer), dancing, and cash bar.



## UMC GEOTECHNICAL FIELD TOUR

4 AND 5 NOVEMBER 2015

(WEDNESDAY, DEPARTS HILTON AT 7:45 AND ENDS ~ 20:00 THURSDAY  
AT THE HOLIDAY INN WESTSHORE TAMPA)

*Field Tour to Phosphate Country, led by Mark Mussett, Manager of Minerals Research, Odyssey Marine Exploration with Bay Area Destinations providing tour services. Bus leaves from the Hilton St. Petersburg Bayfront lobby at 07:45 AM. Tour may involve dirt roads and perhaps muddy conditions, so please dress appropriately.*

<b>Mark Mussett (HOST)</b>	Wonnyon Kim, KIOST
Chris Castle, Chatham Rise	Pedro Madureira, EMEPC
Georgy Cherkashov, VNIIO	Charles and Karynne Morgan
Tracey Conrad, U of California, Santa Cruz	Xiangwen Ren, First Institute of Oceanography
Taco de Boer, IHC Mining	Akuila Tawake, SPC
Laurens de Jonge, IHC Mining	Lindsay Vare, SAMS Research Services
Camillia Garae, SPC	Toru Yamasaki, Geological Survey of Japan
Javier Gonzalez, Geological Survey of Spain	Chan Min Yoo, KIOST
Robert Goodden, Subsea Minerals	Yao Zhou, U of Wisconsin, Law School
Winterford Irioho Eko, Papua New Guinea	
Jung-Keuk Kang, KIOST	
Hyung Jeek Kim, KIOST	<b>Total: 22 persons + driver</b>



6 NOVEMBER 2015  
CONCLUSION OF UMC 2015

UMC Colleagues and Friends:

We hope that you have benefitted professionally and personally from your time with us at the 44<sup>th</sup> Underwater Mining Conference in Florida USA. Please send us your comments, if any, to address any concerns or considerations for improving your conference experience.

We look forward to seeing you at the 45<sup>th</sup> UMC 2016 in Korea.

*Samantha Smith*

IMMS President and UMC Chair for 2016

[samantha@blueglobesolutions.com](mailto:samantha@blueglobesolutions.com)

[www.underwatermining.org](http://www.underwatermining.org)

[www.IMMSoc.org](http://www.IMMSoc.org)

*Charles L. Morgan*

UMC Technical Program Chair

[cmorgan@psi-hi.com](mailto:cmorgan@psi-hi.com)



*Final Program (as of 10/26/15) · 12*

*UMC 2015 · Hilton St. Petersburg, Florida · USA · 1-6 November 2015*