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P R E S S R E L E A S E
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SCIENTISTS REVEAL FIRST PHOTOGRAPHIC EVIDENCE OF THE CAUSE OF THE TSUNAMI

PHUCKET, THAILAND–– 26 May 2005 –– An international team of the world's leading scientists has just returned from the first ever scientific expedition to dive an amazing 4,500 metres deep into ocean water to explore the seabed site of the 2004 Asian Tsunami. They have revealed dramatic photographic evidence of seafloor ruptures that contributed to the deadly December 26 tsunami wave.

Since May 10, scientists have spent 17 days at sea exploring the seafloor off the coast of Sumatra in order to gain a better understanding of the forces that led to the devastating tsunami. Their results will help them to piece together the dramatic sequence of events of how the giant earthquake caused the tsunami. Using geophysical survey tools, operated by the Geological Survey of Canada, and a unique deep-water remotely-operated vehicle, operated by Oceaneering International Inc., the Sumatra Earthquake and Tsunami Offshore Survey (SEATOS) team's mission is the first time that marine scientists have been able to find and film such critical ruptures at such an incredible depth deep in the Indian ocean.

The project is being filmed exclusively for a BBC, Discovery and ProSieben documentary, by award-winning UK production company Darlow Smithson Productions, for broadcast later this year.

The mosaic of photographs the team has released today show a 3 metre high x 8 metre wide section of compacted sediment, only a small part of a huge cliff that was faulted and upthrust during the enormous earthquake and undoubtedly contributed to the creation of the tsunami wave.

Dr Don Fisher from Pennsylvania State University said: "The faults are absolutely fresh and it's mind-blowing that we were fortunate enough to find these faults nearly 3 miles down."

The faults, which were found on the outer edge of the continental shelf, provide important evidence for reconstructing the events of December 26. The observed seafloor fault surface is referred to by geologists as striated because it is smoothed by rocks moving against each other as the seafloor is ripped open. Leading the Census of Marine Life biologists, **Professor Paul Tyler** of the National Oceanography Centre, UK, was, "surprised to find absolutely no evidence of deep-

sea animals at the site during a 14h dive with the ROV submersible. This is unprecedented in 25 years of sampling the deep sea."

"This discovery is a critical piece of the puzzle for reconstructing the December 26 tsunami wave," said **Dave Tappin**, Co-chief Scientist of the expedition from the British Geological Survey. Seafloor models that re-create the motions from the measured earthquake energy are crude in terms of their ability to pinpoint exact locations of fault movements at the seabed. The SEATOS expedition is specifically designed to explore the seafloor in search of direct evidence for the critical locations where the seabed moved and generated the giant wave.

The SEATOS team, comprises a group of 22-strong scientists from six countries, combining a variety of scientific disciplines, including tsunami wave model experts, geophysicists, biologists, seismologists, engineers, geologists, and visualization experts. This unique range of experts enabled a fully integrated approach to the expedition. **Dr Kate Moran**, Co-chief Scientist from the University of Rhode Island, explained that "we've gathered an experienced and diverse team of specialists for SEATOS because its one of the essential ingredients for this challenging goal to find evidence of the sources that created this most devastating of tsunamis."

The data from the expedition will take months to analyse, and the full implications of the results will also take some time to gauge, but the scientific team are all delighted with the mission's success and are confident that their findings will enable them a far greater and detailed understanding of the forces that led to the tsunami. The team will re-convene later this year to draw their conclusions after initial analysis has taken place.

David L Mearns, Director of Blue Water Recoveries Ltd UK, who conceived the expedition and is acting as Marine Coordinator says: "Everyone involved in the project is thrilled that we have made such a significant scientific discovery in the relatively short period of time we have been at sea. We had a good scientific plan and our share of good fortune but we owe a great deal to the UK Hydrographic Ship **HMS Scott**, which surveyed the area earlier this year and provided a roadmap of seabed features that allowed us to zero-in with our high-resolution cameras on the most likely fault areas."

The expedition is being filmed on location for – ***Journey To The Heart Of The Tsunami*** – by Darlow Smithson Productions. Directed by Ed Wardle with Julian Ware as the executive producer, it will be broadcast later this year on BBC ONE, Discovery US, ProSieben in Germany and Discovery International. Also supporting the expedition is the National Science Foundation's ARMADA Project (http://www.armadaproject.org/), the Alfred P. Sloan Foundation for the Census of Marine Life Program (http://www.coml.org/), Oceaneering Inc, BP Marine Limited and Science Application International Corporation (SAIC).

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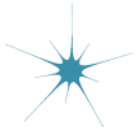
Note to Editors:



Background on Scientific Mission

Scientists will focus their investigation on the southern part of the earthquake rupture zone that caused the tsunami. The seafloor will be imaged with high-resolution seismic reflection techniques to identify, evaluate and interpret the size and character of the seafloor displacements that occurred during the 9.3M earthquake. Seafloor displacement features will be "ground-truthed" to confirm that they occurred on December 26th by studying their morphology and structure as well as any associated seafloor megafauna using ROV imagery and sampling. For example, co-seismic displacements will have disrupted the pre-earthquake seafloor ecology. In the case of landslides, the slide scar areas will have exposed a biologically barren seafloor.

Co-chief Scientists Dr. Kate Moran (Department of Ocean Engineering and Graduate School of Oceanography, University of Rhode Island) and Dr. David Tappin (British Geological Survey) will lead the expedition. Dr Moran is a geotechnical engineer with extensive experience in assessment of seafloor stability. Last summer, she led the IODP Arctic drilling expedition (ACEX; www.rcom-bremen.de/English/IODP.html) as Co-chief Scientist. Dr. Tappin is an expert in the study of geological processes inducing tsunamis. He has previously led major research cruises to study landslide generated tsunami events and recently returned from the HMS Scott expedition. The science party is comprised of four major teams: biology, geophysics, modelling, and visualization.

Targeted seafloor features such as landslides and fractures will be surveyed using the seismic equipment and a ROV and to investigate whether these events are recent. The biology team led by Dr. Paul Tyler (National Oceanography Centre Southampton and deep-sea expert with the Census of Marine Life) together with Dr. Baan Angola (National Oceanographic Institute of India), Dr. Joule Galeton, (IFREMER), and Dr Jon Copley (National Oceanography Centre Southampton). Dr. Cindy Lee VanDover (William and Mary College and Census of Marine Life ROV and submersibles expert) will provide support for the expedition from aboard RV Melville in the Lau Basin.

The geophysics team, led by Dr. David Mosher (Geological Survey of Canada, GSC), will conduct seismic reflection surveys that, in association with the Scott bathymetry, will be used to construct a 3D image of seafloor and interpret its characteristics, e.g. multiple landslides, level of complexity of seafloor disturbances, types of deformation, etc. These data will be collected by running a closely spaced survey grid over specific sites within the earthquake rupture zone. The scientific team includes Dr. Borden Chapman of GSC, Dr. Steffen Saustrup and Dr. James A. Austin, Jr. from the University of Texas at Austin, and, Dr. Tim Henstock and Lisa McNeill from the National Oceanography Centre, Southampton, UK. The GSC is providing the seismic equipment at no cost to the expedition.

Dr. Don Fisher, a Pennsylvania State University geologist who specializes in the tectonics of subduction zones, will lead the Tectonics and Seismology Team, whose mission is to interpret the seafloor displacements as input to an earthquake model that will provide better hindcasting of the overall seafloor displacements. His team includes Dr.Yang Shen from the University of Rhode Island, Tim Masterlark from Science Applications International Corporation, SAIC.

The interpretation and modelling efforts will be interactive and require constant interaction between the geophysics and the modelling teams. Prof. Stephan Grilli, a University of Rhode Island expert in wave and tsunami modelling and experiments, will lead the modelling team that includes Prof. Frédéric Dias (Ecole Normale Supérieure, Cachan, Paris, France), a wave modelling expert, Dr. Mansour Ioualanem (GéoScience Azur, Nice, France), a wave and tsunami modelling expert, Prof. James Kirby (Center for Applied Coastal Research, University of Delaware), a wave and tsunami modelling expert, and Kate Collins, a graduate student form the University of British Columbia. Mr. Aaron Bradshaw, an engineering graduate student from the University of Rhode Island, will work on slope stability. Prof. Chris Baxter (URI), a marine geo-mechanics and slope stability expert, will provide shore-based support.

Interaction among the teams is critical and relies on their ability to visualize the multi-beam, high-resolution seismic reflection data, and model results in a 3D visualization system. The visualization team led by Prof. Larry Mayer (Director, Center for Coastal and Ocean Mapping (CCOM, University of

New Hampshire, UNH) includes Roland Arsenault and Dr. Colin Ware. Prof. Mayer is a pioneer in seafloor imaging and visualization techniques CCOM is providing the visualization equipment at no cost.

Darlow Smithson Productions

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DSP has produced first rate factual programming including the award-winning HOW THE TWIN TOWERS COLLAPSED (*Channel 4*) and THE STRANGE WORLD OF BARRY WHO? (*BBC FOUR*). Its output also boasts consistent success on the global market, making programmes for international broadcasters including Discovery, National Geographic, HBO and The History Channel. With unrivalled experience in high-definition productions, DSP also specialises in the use of advanced computer graphics and quality dramatic reconstruction.

DSP's work has been honoured with over 20 international awards including a BAFTA, two British Independent Film awards, a US Emmy, an International Emmy, two Royal Television Society awards, and most recently an Indie Award for Best Science, Technology / Natural History Documentary for WHAT WE STILL DON'T KNOW (*Channel 4*). TOUCHING THE VOID *(Film Four, Film Council, PBS and Channel 4)* is DSP's most successful production to date, winning 12 major awards including a BAFTA for Best British Film 2004.

DSP have a number of high profile projects currently on air and in production, including the forthcoming star-studded docu-drama E=MC2 (*WGBH and Channel 4*). Their recent production THE LAST DRAGON (*Channel 4 and Discovery*) has just become the most watched programme ever broadcast on US Animal Planet channel.

For more information: http://www.darlowsmithson.com

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