

Morelia Urlaub

Contact

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Academic Background

Ph.D. in Ocean and Earth Science, University of Southampton, UK, 12/2012.

M.Sc. in Marine Geosciences, University of Bremen, Germany, 04/2009.

B.Sc. in Geosciences, University of Bremen, Germany, 07/2006.

Research Interests

My recent work aims to understand the causes of submarine landslides and the hazard they pose. Submarine landslides have caused devastating tsunamis and destroyed offshore constructions, such as oil rigs or telecommunication cables. These landslides preferably occur on nearly flat slopes ($< 2^\circ$), and it is believed that pore fluid is a key factor for failure on such low angles. By using geological and geophysical field observations, numerical modelling (coupled stress and fluid flow), and laboratory experiments (physical and mechanical properties of sediments) I aim to understand fluid/sediment dynamics in the shallow subsurface, and to identify processes that are critical for submarine slope stability.

Research Experience

from 06/2013 Postdoctoral Researcher at GEOMAR, Kiel (Marine Geodynamics Group)

01/2013 - 04/2013 Postdoctoral Research Assistant at the National Oceanography Centre Southampton

The position comprised to one part the management of a national consortium dedicated to the landslide-tsunami risk to the UK. The second part involved research within the Marine Geohazards and Sedimentology group at the National Oceanography Centre.

10/2009 - 12/2012 Ph.D. student at the National Oceanography Centre Southampton

I conducted my Ph.D. research in the Marine Geohazards and Sedimentology Research Group at the National Oceanography Centre, Southampton, in collaboration with the Geomechanics group at the University of Southampton. My aim was to bring together numerical modelling, soil mechanical theories and field data to conceptually understand why large landslides occur on shallow angle submarine slopes in areas with low sedimentation rates (*Thesis: The role of sedimentation rate on the stability of submarine continental slopes*). Results of this work have been published in ISI ranked journals and were presented at international conferences.

05/2009 - 09/2009: Research assistant in the Marine Technology-Sensors Group (University of Bremen)

I processed and managed long-term tilt and acceleration data recorded at a hydrothermal vent system at the Mid-Atlantic Ridge.

04/2007 - 09/2009: Postgraduate studies at the University of Bremen

Throughout my postgraduate studies I focused on subsurface fluid flow on land and at sea. Under supervision of Dr Fabian I investigated the influence of a fault on the poroelastic response of subsoil to pumping (*Thesis: Finite element modelling of pump induced tilt and pore pressure*), which I also published in an ISI ranked journal. I was responsible for heat flow measurements during RV Polarstern expedition ARKXXIII/3 and assisted in the collection of seismic reflection and airborne magnetic data. Throughout the course of the studies I assisted in the development of the Bremen Ocean Bottom Tiltmeter as student assistant in the Marine Technology - Sensors Group at the University of Bremen.

08/2006 - 04/2007: Research stays abroad

At the University of Concepción, Chile, I spent two months working with Professor Bataille on the processing and analysis of data from a superconductor gravimeter. I also conducted test measurements with tilt- and accelerometers as part of my research assistant project in the Marine Technology-Sensors Group (University of Bremen). I continued working on spatial and temporal gravity anomalies during a two months internship with Professor Chao at the National Central University in Jhongli, Taiwan, I prepared a data preparation scheme in Earth rotation series and geophysical fluid angular momentum. I was in charge of acquisition, processing and modelling of shipborne gravity data and assisted in the acquisition, processing and modelling of seismic refraction data as well as in the collection of airborne magnetic data during RV Polarstern expedition ANTXXIII/9.

10/2003 - 07/2006: Undergraduate studies at the University of Bremen

I conducted my Bachelor's thesis research at the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany, under guidance of Dr Wilfried Jokat. I used gravity anomalies to model the crustal structure of two Arctic Ocean basins adjacent to the world's slowest spreading Mid-Ocean Ridge (*Thesis: Crustal structure in the Nansen and Amundsen Basins, Arctic Ocean: Results from 2D gravity modelling*). I published this study in an ISI ranked journal. I took part in a research cruise looking at landslide processes off Northwest Africa and completed two placements in an oil exploration company and at the Alfred Wegener Institute, where I assisted in the sedimentologic and geochemical preparation of sediment cores.

Studentships and Awards

04/2012	IGCP585 Grant Award for EGU General Assembly, Vienna, Austria
10/2011	Nomination for the "Best Paper Award" at the 5 th International Symposium on Submarine Landslides and Their Consequences
10/2011	Student support for 5 th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan
10/2009 - 09/2012	National Oceanography Centre Southampton Studentship
08/2006 - 09/2006	German Academic Exchange Service (DAAD) Studentship
06/2009	Best M.Sc. Thesis in the Department of Earth Sciences, University of Bremen, Germany

Teaching and Administrative Experience

09/2011	Geophysical Field Methods - Field Course, University of Southampton
04/2010	Bathymetric Survey Data Analysis - Easter Field Trip, University of Southampton
10/2009	Computational Data Analysis - University of Southampton
06/2006	Introduction to Geophysical Exploration - Field Course, University of Bremen
08/2002 - 07/2003	German teacher at Village School in Guatemala City, Guatemala
11/2010 - 02/2012	Member of the NOCS Environmental Sub Committee

Languages

German (native speaker)
English (fluent)
Spanish (fluent)
French (average)

Publications (peer-reviewed)

Urlaub, M., Talling, P.J., Zervos, A. (2013), A numerical investigation of sediment destructuring as a potential widespread trigger for large submarine landslides on low gradients. Submarine Mass Movements and Their Consequences, 6th International Symposium.

Urlaub, M., Talling, P.J., Masson, D.G. (2013), Timing and frequency of large submarine landslides: Implications for understanding triggers and future geohazard. Quaternary Science Reviews, 72, 63-82.

Crutchley, G.J., Karstens, J., Berndt, C., Talling, P.J., Watt, S.F.L., Vardy, M.E., Huhnerbach, V., **Urlaub, M.**, Sarkar, S., Klaeschen, D., Paulatto, M., Le Friant, A., Lebas, E. and Maeno, F. (2013) Insights into the emplacement dynamics of volcanic landslides from high-resolution 3D seismic data acquired offshore Montserrat, Lesser Antilles, Marine Geology, 335, 1-15.

Urlaub, M., Talling, P.J., Zervos, A., Masson, D.G., Clayton, C.I. (2012), How do 2° slopes fail in areas of slow sedimentation? A sensitivity study on the influence of accumulation rate and permeability on submarine slope stability, Submarine Mass Movements and Their Consequences, 5th International Symposium.

Watt, S.F.L., Talling, P.J., Vardy, M.E., Masson, D.G., Henstock, T.J., Huhnerbach, V., Minshull, T.A., **Urlaub, M.**, Lebas, E., Le Friant, A., Berndt, C., Crutchley, G.J. and Karstens, J. (2012) Widespread and progressive seafloor-sediment failure following volcanic debris avalanche emplacement: Landslide dynamics and timing offshore Montserrat, Lesser Antilles, Marine Geology, 323-325, 69-94.

Watt, S.F.L., Talling, P.J., Vardy, M.E., Heller, V., Huhnerbach, V., **Urlaub, M.**, Sarkar, S., Masson, D.G., Henstock, T.J., Minshull, T.A., Paulatto, M., Le Friant, A., Lebas, E., Berndt, C., Crutchley, G., Karstens, J., Stinton, A., Maeno, F. (2012), Combinations of volcanic-flank and seafloor-sediment failure offshore Montserrat, and their implications for tsunami generation. Earth and Planetary Science Letters, 319-320.

Urlaub, M. and Fabian, M. (2011), Poroelasticity: Finite Element modelling of anomalous tilt and pore pressure caused by pumping in a sedimentary half space with fault, Journal of Geodynamics, 51(4), 219-232.

Urlaub, M., Schmidt-Aursch, M.C., Jokat, W., Kaul, N. (2009), Gravity crustal models and heat flow measurements for the Eurasia Basin, Arctic Ocean, Marine Geophysical Researches, 30(4), 277-292.

Kiel, July 11, 2013