Geophysical Research Abstracts
Vol. 17, EGU2015-2231, 2015
EGU General Assembly 2015


# New insights into the timing, triggers and emplacement processes of prodigious submarine landslides in the Nordic Seas

Peter Talling (1), Ed Pope (1), James Hunt (1), Joshua Allin (1), Matthieu Cartigny (1), David Long (2), Alessandro Mozzato (1), Jennifer Stanford (3), David Tappin (2), and Camilla Watts (1)

(1) National Oceanography Centre, Southampton, United Kingdom (peter.talling@noc.ac.uk), (2) British Geologival Survey, Keyworth, United Kingdom , (3) Department of Geography, University of Swanea, Wales, United Kingdom

Submarine landslides can generate tsunamis with the potential to cause severe damage. This is illustrated by the huge (> 3,000 cubic km) Storegga landslide offshore Norway that occurred 8,200 years ago, and which produced a tsunami that ran up surrounding coastlines for up to 20m. Here we report on a 1 month research cruise on the RV Pelagia in July 2014 to the Nordic Seas, which collected 88 sediment cores totalling more than 500m, together with over 7,000 square km of swath bathymetry. The overall aim of this research expedition was to better understand the tsunami risk from large submarine landslides in the Nordic Seas. This includes a better understanding of the timing and frequency of submarine landslides, factors that potentially trigger or precondition slope failure, and the manner in which landslides are emplaced. Much of the expedition was then devoted to understanding the age and emplacement mechanism of the ~900 cubic km Traenadjupet landslide, located to the north of the Storegga Slide. This included sampling and mapping of the main Traenadjupet Slide, four lobes froming the distal Traenadjupet Slide deposit. A newly discovered debris flow deposit with large blocks was found to continue from the most westerly of these lobes, and it was mapped to its termination. If the previously established age of ~4ka for the Traenadjupet Slide is correct, then it does not appear to produced a major tsunami (unlike the Storegga Slide). Indeed, the morphology of the Traenadjupet Slide suggests much slower emplacement than the Storegga Slide, which would be consistent with such a lack of major tsunami. Turbidites in cores from the deep-water Lofoten Basin will help to understand the frequency and character of faster moving slope failures around the basin margin. Cores were collected from the Lofoten Contourite Drift located next to the Traenadjupet Slide, and these contouritic sediment may provide a paleoceanographic record that can be compared to slide timing, in order to determine whether climatic change can trigger major slope failure. A set of cores from the Bear Island Fan were taken to understand timing of deposition on very large volumes of sediment, and loading of continental slopes. This material may also help to understand the past history of the Barents Ice Sheet. Cores were collected in order to date movement on extensive cracklines on the seafloor near to the headwall of the Storegga Slide, to determine whether deformation has continued beyond 8.2ka. The final work off the Aegir Ridge successfully penetrated through a very large mega-turbidite that lies beneath a mega-turbidite formed by the Storegga Slide. Available geophysical data suggests that older mega-bed may be even more voluminous than the Storegga mega-bed, which itself contains ~1,000km3 of sediment. Further work will aim to date this earlier mega-event bed, which will help to understand large landslide timing in the region.