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Submarine Mass Movements and Their Consequences, edited by Jacques Locat & Jürgen Mienert, 2003. Kluwer, P.O. Box 17, 3300 AA Dordrecht, The Netherlands. Hardbound, 540 pages. Price USD 149.00; GBP 93.00; EUR 135.00. ISBN 1-4020-1244-6.

This book is volume 19 in Kluwer's publication series "Advances in Natural and Technological Hazards Research" (ANTHR19), for which the editors, Jacques Locat and Jürgen Mienert, compiled scientific data presented at the 1st International Symposium of the Continental Slope Stability (COSTA) programme, held in April 2003 in Nice, France. COSTA is a large international marine geological research programme, financed largely by the European Union (COSTA-Europe) and the Engineering Research Council of Canada (COSTA-Canada).

The editorial foreword of ANTHR19 is rather ambiguous about the research aims of COSTA. The two websites dedicated to the programme, www.ig.uit.no/costa/main.htm and www.costa-canada.ggl.ulaval.ca, are more useful. There, the following objectives are given: (1) assessment of historical records of slope instabilities in the Northern Atlantic Ocean, Northern Pacific Ocean and Mediterranean Sea; (2) understanding of the dynamics of seafloor failure through 3D imaging of their geometry and architecture; (3) understanding of geotechnical properties of slip planes and risk assessment of areas prone to slope sliding; (4) determination of presence of gas hydrate and its significance for slope stability; (5) modelling of forces and mechanical processes that control the initiation of slope instabilities, flow dynamics and initiation of tsunamis. These diverse and ambitious goals are reflected in the breadth of subjects presented in ANTHR19.

The first section of the book is devoted to fundamental aspects of submarine mass movements, including trigger mechanisms (e.g., static sediment loading, cyclic wave loading, earthquakes, slope oversteepening and tides), rheological properties of in-situ and displaced sediments (mostly associated with (over)pressure of pore fluid and gas, liquification processes and gas-hydrate dissociation), and the ability of slope failures to generate tsunamis. The section contains 22 papers, most of which investigate the above subjects by means of numerical modelling, physical experimental modelling or both. Some papers use probabilistic analysis.

The papers presented in Sections 2 through 5 are subdivided by geographical setting: Atlantic Ocean, Pacific Ocean, inland seas and fjords.

Section 2 comprises 14 papers geographically located along the continental margin of the northern and central Atlantic. The papers take a number of approaches, including 3D seismic, geotechnical and numerical modelling, to investigate a range of mass-transport complexes and their source areas. The majority of papers is descriptive, providing detailed overviews of seafloor morphology and geotechnical properties. There are, however, four stand-out papers in this chapter that offer generic insights into processes and controls on slope systems. These are the paper on slide run-out distance (by Issler et al.), the stability analysis of the Hudson Apron slope, which suggests that creep is likely (by Locat et al.), the synthesis of mass movements along SE Canada, which shows evidence for a strong geographic control on recurrence times (by Piper et al.), and the study on slope stability in the NW Gulf of Mexico, which investigates the interplay between mass transport complexes, salt movement and the last glacial maximum (by Tripsanas et al.).

Six papers from a range of Pacific locations make up Section 3. This disparate collection covers a wide range of topics including landslide evolution, tsunami generation, palaeoseismicity and new seafloor multibeam imagery. The paper on palaeoseismicity (by Skinner and Bornhold) is an excellent case study of well-dated modern turbidites with a clear seismogenic origin.

All 11 papers in Section 4 on inland seas (with the odd title 'Inners seas') discuss mass movements in the Mediterranean Sea. It can thus be argued that 'Mediterranean Sea' would have been a more appropriate title. Areas studied include the Ebro slope, Tyrrhenian Sea, Adriatic Sea and Gulf of Corinth. Most of the work is purely descriptive, hence primarily of regional interest. Notable exceptions are the papers on the so_called BIG'95 debris flow on the Ebro slope (by Casa, Urgeles, Lastras and co-workers) and earthquake-triggered prodelta slope instabilities in the Gulf of Corinth (by Lykousis et al.), because they provide interesting links between sea-floor and subsea-floor imaging data and geotechnical data.

The fifth and last section, on Fjords, can be divided into two geographical areas, the Finneindfjord in Norway and the Saguenay Fjord in Québec, Canada. The five papers that make up this shortest section use 3D seismic, eyewitness accounts and geotechnical analyses to develop models for the 1996 Finneindfjord Slide and the 1663 Pointe-Du-Fort flow_slide. The papers on the Finneindfjord Slide (by Best et al., and Longva et al.) provide excellent insights into failure processes associated with the 1996 event.

The quality of the scientific papers in ANTHR19 is highly variable. There are some real gems (highlighted above) and many average-quality papers. However, it is our opinion that other papers should not have passed editorial scrutiny. Overall, our view as reviewers is one of 'missed opportunities', primarily because quantity seems to have prevailed over quality in the editorial process. Perhaps as a result of this, the papers are short, often no more than 8 pages in length, which has restrained several authors from explaining and discussing their work in a way that appeals to a wide readership. This is particularly evident in Section 1, where readers unfamiliar with geotechnical jargon and the technical details of numerical modelling of, for example, slope stability mechanics and tsunamis will have a hard time grasping the undoubtedly valuable information presented.

Closely related to this point is the lack of cross-pollination between geotechnical records (Section 1) and field-based records (Sections 2 to 5). Few technical papers compare their numerical or empirical models to natural phenomena, and, conversely, less than 30% of the field-based papers present geotechnical data, let alone confront these with (sub)sea-surface data. A synthesis of available and new information is dearly missed. This is unfortunate, because better knowledge of the rheological properties of deep-marine sediment, and the expected changes in those properties as a result of various trigger mechanics, are key in solving the puzzle of the initiation and dynamics of submarine slides.

The fact that technical editing is below par does not help either. Many papers contain typos and grammatically flawed sentences. Several papers have been written so poorly that they are virtually illegible. The order of papers in the various sections is also questionable. Instead of choosing alphabetical order, it would have been more helpful to group the papers according to subject or geographical location. ANTHR19 does not contain a keyword index, merely a less than useful index of author names. The high price will not appeal to many scientists either.

The symposium, from which ANTHR19 materialised, was held when the COSTA programme was in full flow, so the book can be considered as an 'interim' publication. Comprehensive data integration may well have been planned for later stages in the programme. We hope that this will be reflected in a 'final' publication of the COSTA programme. Such a book may not be on the menu. In that case, we suggest that the interested reader waits for full-sized versions of the short papers to appear in regular marine geological and geotechnical journals.

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