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# 3D sedimentary architecture of the Nidelva delta (Trondheim, Norway): Implications for regional slope instability assessment

**J.S. L'Heureux (1), O. Longva (2), L. Hansen (2), K. Sand (3)**

(1)Norwegian University of Science and Technology (NTNU), Department of Civil and Transport Engineering, Geotechnical Division, Høgskoleringen 7A, 7491 Trondheim, Norway, e-mail: jean.s.lheureux@ntnu.no

(2) Norwegian Geological Survey (NGU), Leiv Eirikssons vei 39, Trondheim, Norway.

(3) SWECO Grøner AS, Olav Tryggvassons gate 24b, 7011 Trondheim, Norway.

The city of Trondheim, Norway is built on a delta plain and urban development over the last hundred years has extended on the submarine part of the delta. A number of coastal flow slides are known, and some fairly well documented. The materials involved in the mass movement are thick deposits of loose fine sand and silt of Holocene age. These slides have resulted in damage to railways, roads, houses and industrial plants in addition to flood waves and loss of life.

This poster presents the preliminary results in assessing the regional stability along the coast of Trondheim and simulating future loading from new urban activities. The study includes the construction of a 3D geological model of the Nidelva delta based on a large data set comprising cone penetration tests (CPT), rotary pressure drilling tests, core sampling, detailed seismic profiles and swath bathymetry. The river dominated Nidelva delta is composed of many coarsening upwards sequences of soil ranging from silty clay to sandy gravel. It reposes partly on bedrock, moraine material and on marine clays. The outskirts of the delta laps onto marine clays which form to today's land surface. The model shows that the delta has prograded in a direction NNE since the end of the last glaciation (ca. 10,000 years B.P.). An important aspect in the model is the fact that, the land has been rising 180 m relatively to sea level in the Trondheim area during the last 10,000 years. This has played an important role for in the delta development, erosion and sliding activities. Bathymetry reveals numerous slide scars on the delta front and seismic profiles show buried scars and slide masses. This emphasizes the fact that slope instability is a fundamental part of delta development

and that it represents a hazard for urbanized areas situated on such coastal deposits. Coring and dating of organic material will help to estimate slide frequency.