NGU
Norges geologiske undersøkelse
Geological Survey of Norway

FOCUS

At the bottom of the Oslofjord

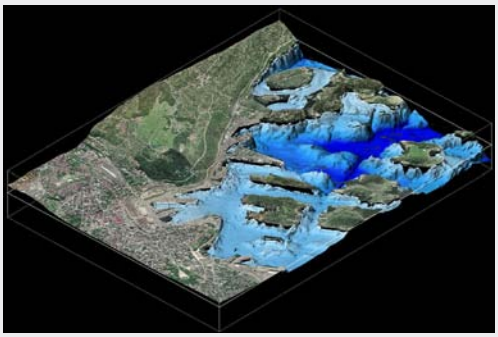
The GEOS Oslofjord Project

Knowledge of our ocean and seabed resources, together with an understanding of the natural and anthropogenic processes which affect them, are essential for sustainable management.

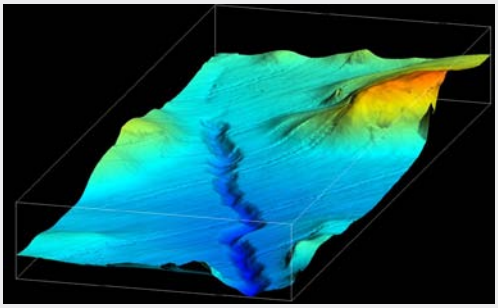
A major task in the GEOS Oslofjorden project is mapping of seabed sediments. This includes determination of sediment type and distribution, the physical and chemical properties of the sediments, and sedimentation rates. Such information is used to examine environmental status, to figure out how the seabed has changed over the past hundreds or thousands of years, and if changes are natural or anthropogenic.

The data can also be used for mapping of seabed habitats, which depend on the relationships between seabed types (e.g., clay, sand, gravel or bedrock) and living organisms. This is important information for ecosystem-based management of the seabed and oceans. We also map geological resources at and below the seabed, e.g. carbonate sand, and sand and gravel.

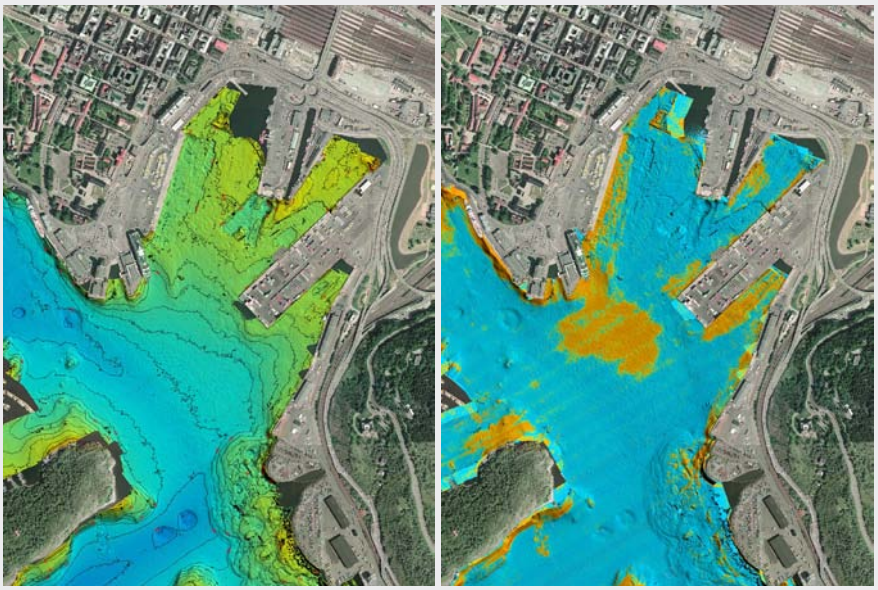
Detailed seabed data are needed for stability evaluations and risk analysis in connection with submarine constructions. Submarine slide scars and slide deposits on the seabed may indicate unstable seabed conditions. Similarly, sediment thickness and type are important parameters for construction purposes both in the fjords, in the coastal zone and offshore.



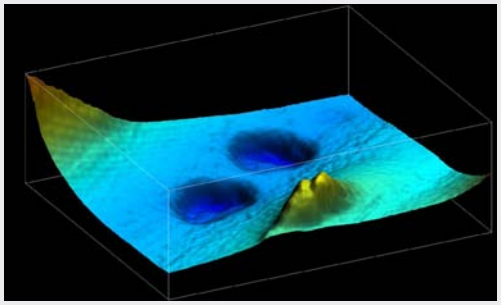
Bathymetry of the Oslofjord outside Oslo's new opera house in Bjørvika.



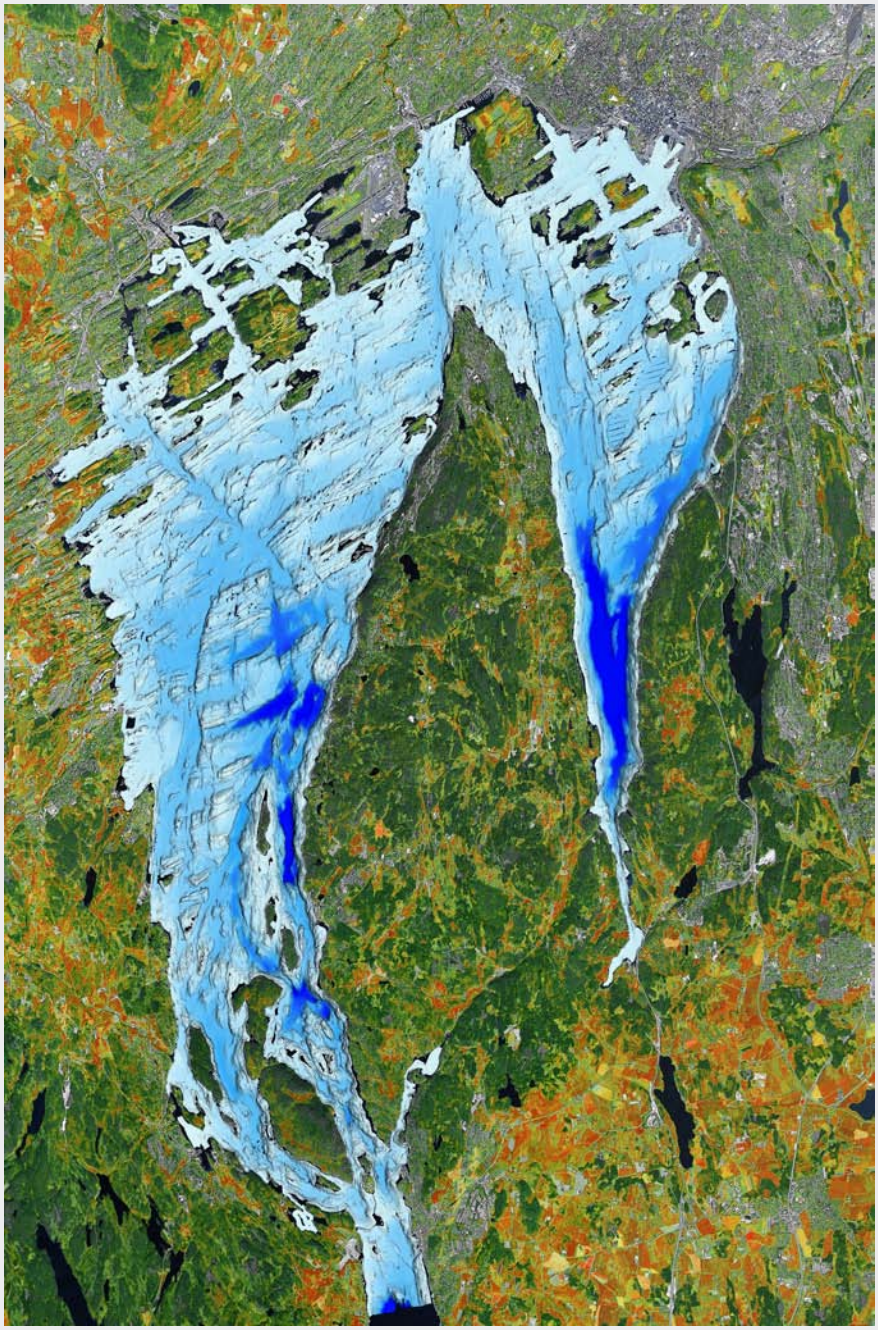
Channel in seabed sediments above a subsurface fault in the Bekkelaget Basin, inner Oslofjord. This channel occurs close to a storage site for polluted sediments.



Example of seabed data collected with NGU's research vessel FF Seisma in the inner part of the Oslofjord. The image to the left shows bathymetry in Bjørvika. Yellow colours indicate shallow areas; blue colours show water depths of more than 20 metres. The image to the right shows seabed sediment properties. Blue colours indicate soft seabed sediments (mud) while yellow colours indicate hard seabed sediments (gravel). The picture shows that ship propellers have blown away the most fine-grained sediments on the seabed.



Pockmarks are common at the seabed in Oslo's inner harbour area. Pockmarks indicate leaking gas or fluids (ground water) from the underground. Leakage usually occurs along open fractures and falts in the underlying bedrock. The pockmarks are several tens of metres in diameter and up to seven metres deep. They occur all over the Oslofjord.



In the inner part of the Oslofjord, topography and depths are strongly influenced by the Cambro-Silurian bedrock, which creates a pattern of ridges and valleys in NE-SW-direction, along the strike of the bedding. Another set of valleys trend NW-SE, along faults and fractures.

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