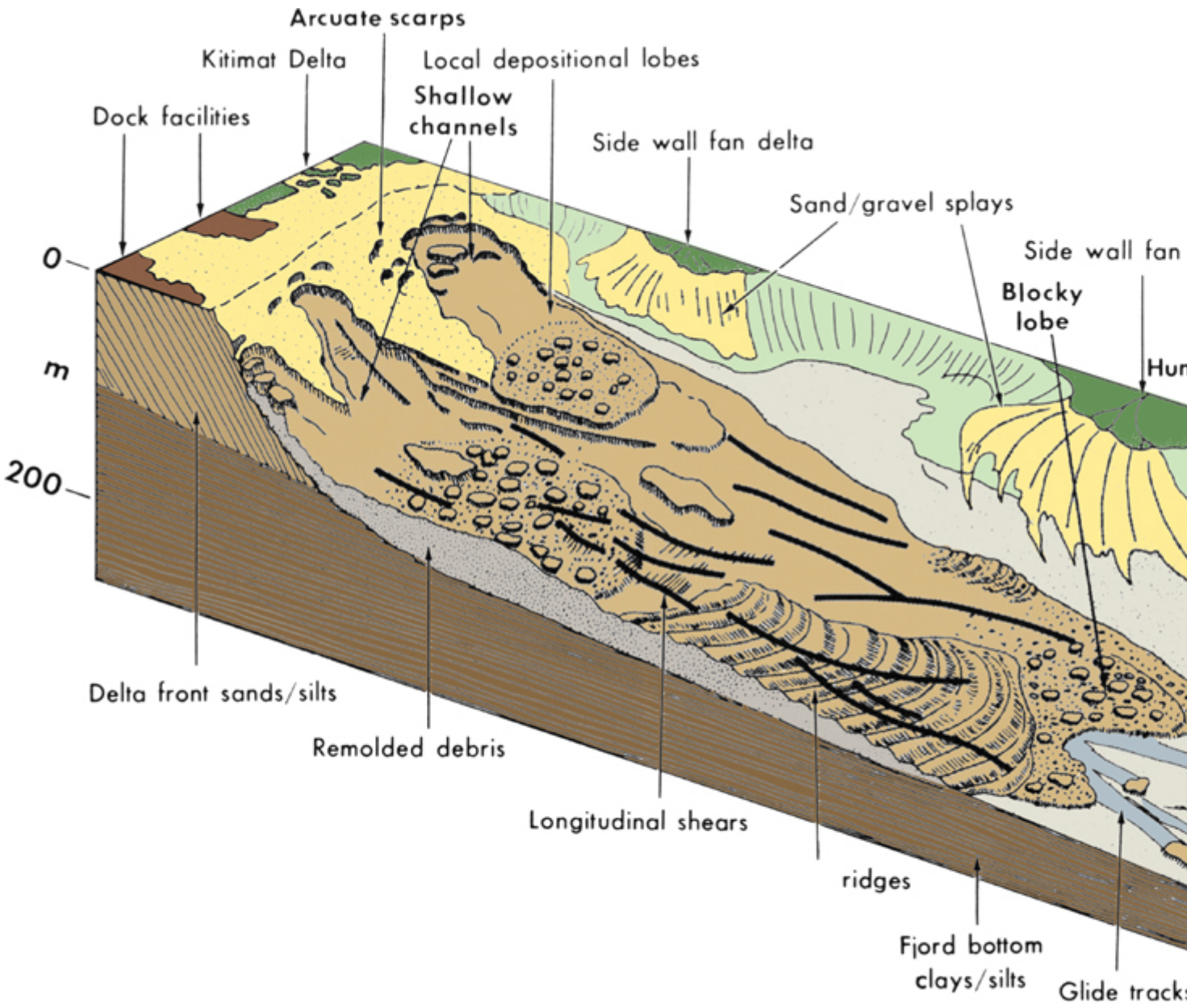
# Hazards Beneath the Surface

Submitted by Katie Shoemaker Wed, 2018-06-06 10:19




Underwater landslides, also known as submarine landslides, are mass movements of sediment that pose a threat to coastal regions and can have extreme consequences. In May, 100 scientists from over 20 different countries gathered in Victoria, British Columbia, to discuss the latest developments in the science behind these potentially devastating events.

A major submarine event occurred in Kitimat Inlet, located on the coast of British Columbia on 27 April, 1975. The slide started at the fjord sidewall continuing down the slope to the centre of the deep inlet (Figure 1). Debris travelled 5 kilometres down the inlet, displacing enough water to cause a local tsunami with waves 8 ? 10 metres high, damaging the harbour area.

Martin Scherwath, is a geophysical staff scientist at Ocean Networks Canada (ONC), who answered a few questions about underwater landslides and the potential impact on residents of coastal communities.

**Q: In simple terms, what is a submarine landslide?**

**A:** Similar to landslides onshore, underwater slides are typically sediments moving down a slope, which will eventually run out and settle down. Offshore, the sediments replace water as they move, sometimes washing out coastal infrastructure or causing destructive tsunamis.

**Q: How are submarine landslides caused?**

**A:** Unstable conditions trigger slides. There are many possible causes, such as fresh, additional sediment deposits from rivers (like the Fraser River near Vancouver) or an over-steepening of the seafloor from seafloor uplift. Other triggers include disappearing gas hydrates that initially stabilized the seafloor, sea-level change, construction in the area or even earthquake shaking.

**Q: How do underwater slides generate tsunamis?**

**A:** If the moving sediment masses are large enough, they replace so much water that a tsunami wave is generated. This wave can be small and not necessarily devastating, but it can also be huge, depending on the volume of water that is replaced.

**Q: How does ocean science contribute to our understanding on this geohazard? What is ONC?s role?**

**A:** Detailed mapping of the seafloor can help us understand the risks. When scars or deposits from underwater landslides are clearly visible the size and impact can be calculated. Sampling of the sediment can even produce an estimated time of occurrence.

Ocean Network Canada helps marine geoscientists, like Gwyn Lintern from Natural Resources Canada, to place instruments on the seafloor where we know these mass movements are occurring, to monitor the sediments and their speed during the event. Theoretical studies and modelling help to estimate the hazard potential.

**Q: How else are underwater landslides being studied and monitored?**

**A:** There is some scientific overlap with land-based equivalents, such as rock slides, volcanic mud flows or snow avalanches. Experts in these fields are often part of the submarine landslide discussions.

**Q: What are some of the most well-known submarine landslides?**

**A:** A famous underwater landslide example from the end of the last ice age¬?about 8,000 years ago?happened in the North Sea off Norway. The Storegga slide put thousands of cubic kilometers of sediment in motion, triggering a gigantic tsunami. Traces have been found 80 kilometres inland, and it is believed to have wiped out Britain?s first civilization, the Mesolithic people.

In 1958, an earthquake triggered a landslide in Alaska?s Lituya Bay, causing a tsunami splash than ran over 500 m uphill. Canada?s East Coast is also prone to this hazard; for instance, in 1929 a large underwater landslide broke 12 undersea cables, and then up to 8 metres high tsunami wave caused 28 fatalities in Newfoundland and Nova Scotia.

**Q: Are we vulnerable to slides on the British Columbia coast?**

**A:** Yes, British Columbia has some unstable coastal areas, in particular its fjords, with a history of damaging underwater failures. For example, the Douglas Channel is currently being investigated by Natural Resources Canada to assess the exact hazard potential for coastal development planning purposes. The Strait of Georgia hazard is less clear, as the known underwater mass movements have been small and have not yet caused tsunamis.

**Q: What is the most important takeaway for coastal residents?**

**A:** It is important to know that these potentially hazardous events occur on our coasts. Slides can be integrated into plans when designing coastal infrastructure. Also, people should know what to do, especially if a tsunami is generated. Moving to high ground is the best advice when a tsunami is suspected. For example, people should take precautions after a large earthquake or if the tide recedes suddenly, which can be a first sign of an incoming tsunami.

**Q: Tell us about the 8th International Symposium on Submarine Mass Movements and Their Consequences.**

**A:** Scientists from as far as Papua New Guinea and New Zealand came to Victoria to discuss topics ranging from past events, regional hazard assessment, and building large databases to collect global data to improve statistical analysis.

As part of this symposium, over 40 scientific papers were written especially for this meeting and published by the Journal of the Geological Society of London. Highlights were two keynote presentations, one on the complex northern New Zealand east coast margin, and one on new methods and technologies for marine observations.

We are looking forward to the next International Symposium on Submarine Mass Movements and Their Consequences and further understanding hazards beneath the surface.

# Tags:

- underwater landslides
- tsunami
- Martin Scherwath
- submarine landslides

# Categories:

- News Stories
- Science Highlights

// FIXES AMPERSAND IN BREADCRUMB var ONC_breadcrumb = document.getElementById("breadcrumb"); if (ONC_breadcrumb) { var ONC_innerHTML = ONC_breadcrumb.innerHTML; ONC_innerHTML = ONC_innerHTML.replace("&", "&"); ONC_breadcrumb.innerHTML = ONC_innerHTML; }

## Highlights

- Audio
- Data
- Learning
- Science
- Video

## Reading Room

- Active Research
- Backgrounders
- FAQs
- Glossary
- News Briefs
- News Stories
- Newsletters
- Publications

## Cool Stuff

- Apps
- Digital Fishers
- iBooks & e-Pubs
- Live Video
- Maps
- Images
- State of the Ocean

## Data & Tools

- Apps
- Data Plots
- Data Search
- Data Policy
- Data Help
- OPeNDAP Web Services

## Opportunities

- Calendar
- Educator Opportunities
- Global Partnerships
- Industry Network
- Jobs
- Staff List
- Technology Services

## Sites & Instruments

- Arctic Sites
- Northeast Pacific Sites
- Salish Sea Sites
- Notice to Mariners

## Follow Us

Sign up for our newsletter

## Feedback

Send us your questions and comments *

How could we improve this page?

Your Name

Your Email *

Your Location

CAPTCHA
This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.


What code is in the image? *
Enter the characters shown in the image.





(function () { var d = new Date; var year = d.getFullYear();
document.getElementById("copyright-date").innerHTML = year; })();

---

**Source URL:** https://www.oceannetworks.ca/hazards-beneath-surface