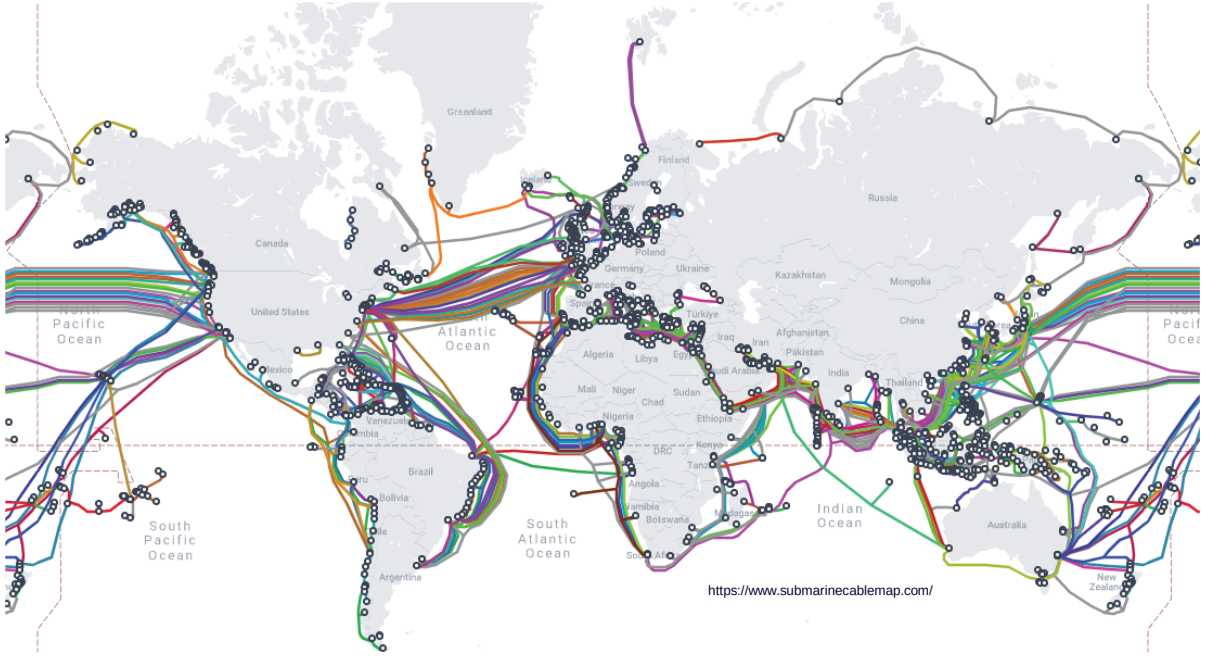
Sikt: sensing activities on optical fiber communication cable

Kurosh Bozorgebrahimi
Senior Advisor, Optical Network

Sikt, Norwegian Agency for Shared Services in Education and Research

TNC23
Lightning Talk Plenaries - Second Strike
Wednesday, June 7th

Deployed fiber optic cables



- The total length of submarine fiber optic cables laid worldwide was estimated to be over 1.3 million kilometers.
- Terrestrial deployment is 100s times higher

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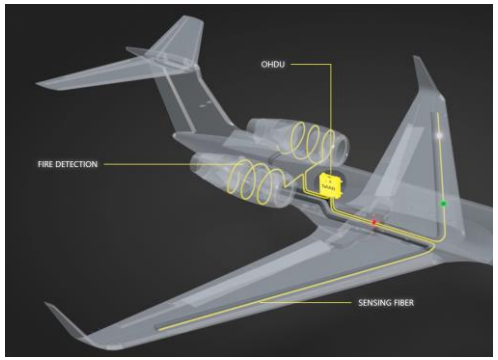
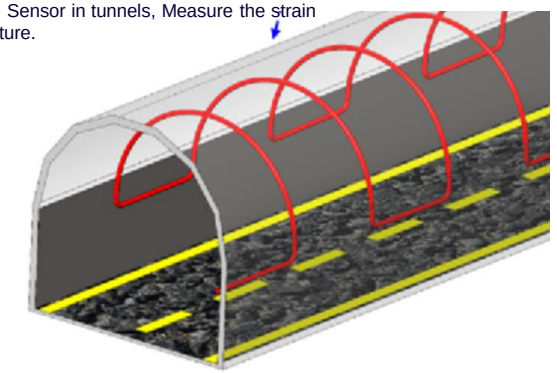
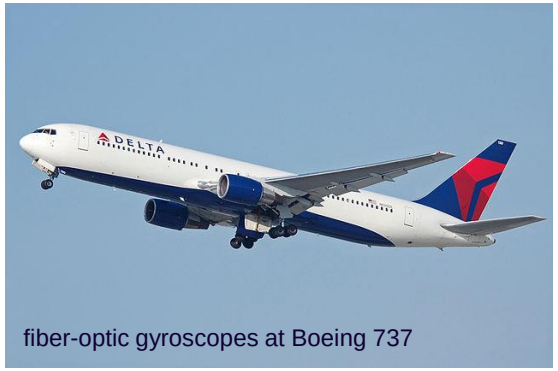
Fiber Optic Sensing Applications



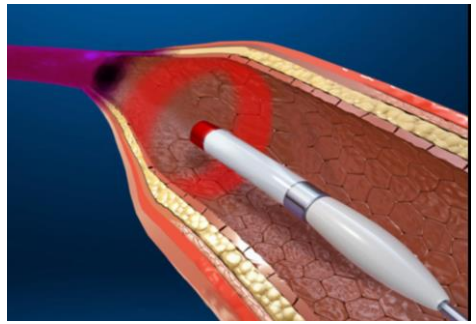
Civil engineering:. E.g. Raman Distributed Temperature Sensor in tunnels, Measure the strain and temperature.



Sensing strain, temperature, pressure, smoke, gas …



fiber-optic gyroscopes at Boeing 737



Health care: surgeons to repair organs, diagnose joint problems, and remove diseased tissues

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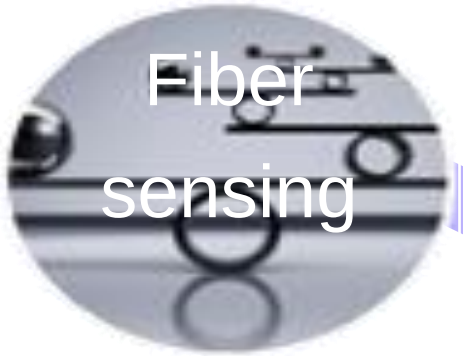
Merging two worlds: fiber optic communication and fiber optic sensing



SUBMERSE

Thursday: SENSEATIONAL NETWORKING
14.00 - 15.30 | Underground B

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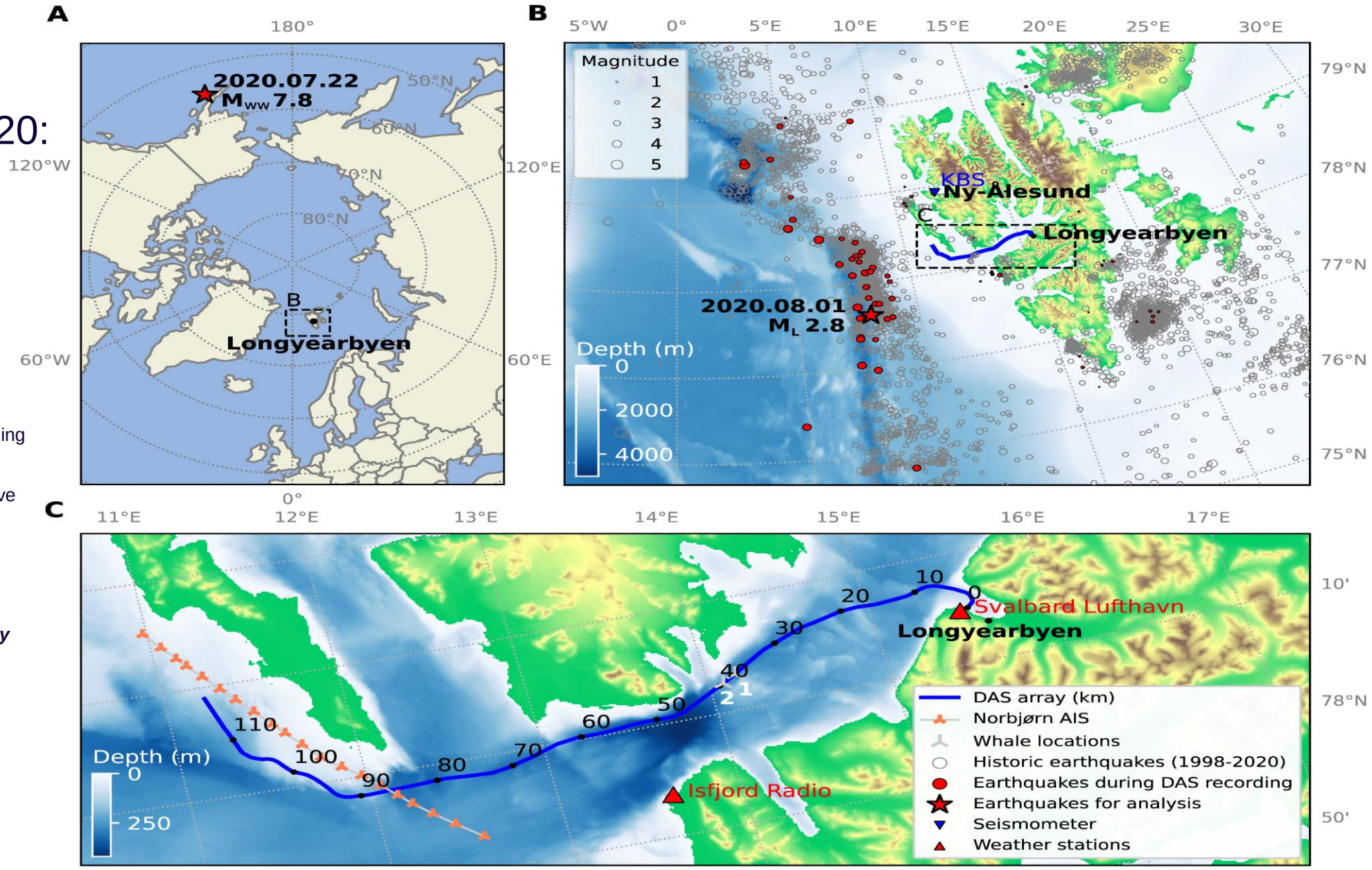
Field test in 2020: Wild life monitoring in Svalbard



Using Distributed Acoustic Sensing (DAS)

During 44 days of testing we have been able to detect:

- ***100s of whale calls***
- ***10s of Earthquake***
- ***Thunderstorm far away***
- ***Tracking the vessels passing over cable***

Source: Martin Landrø et al., Sensing whales, storms, ships and earthquakes using an Arctic fibre optic cable, Nature Published: 10 November 2022, https://www.nature.com/articles/s41598-022-23606-x

NTNU Sikt CGF SFI Centre for Geophysical Forecasting ALCATEL SUBMARINE NETWORKS

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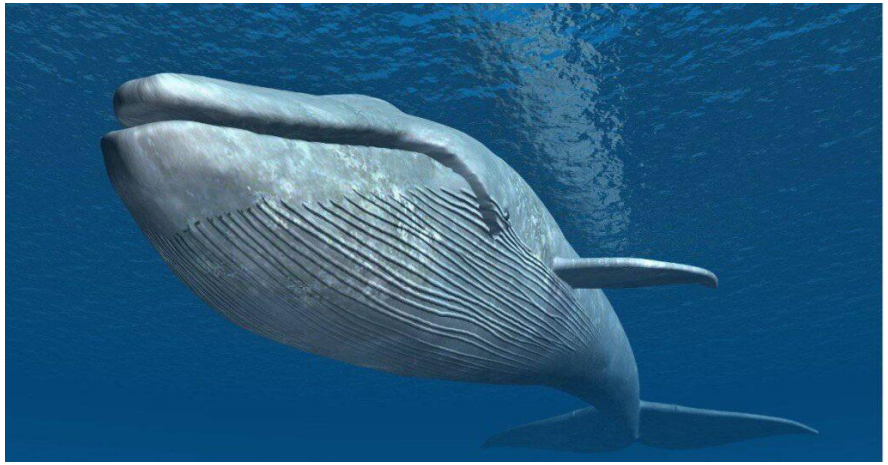
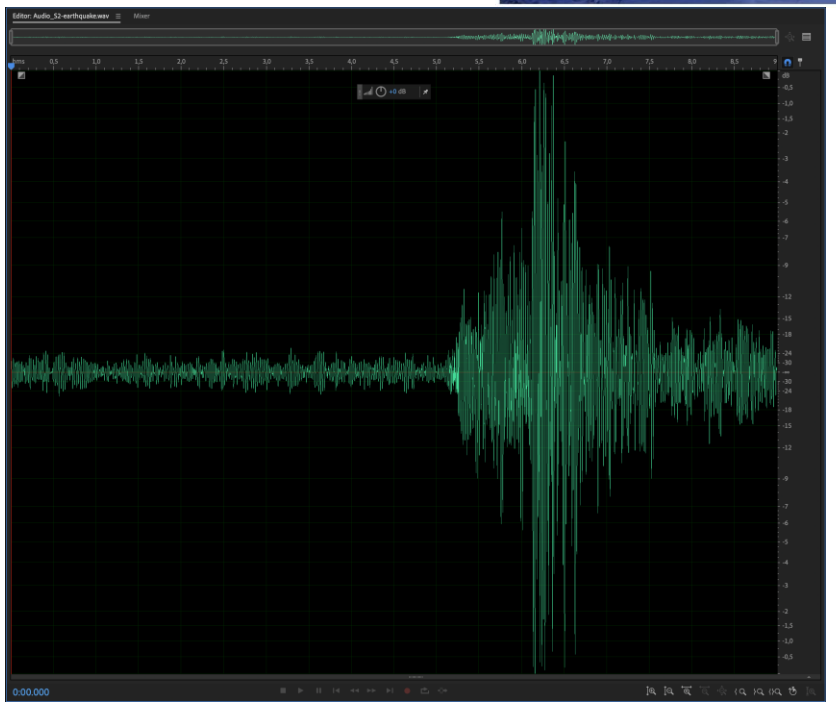
Sound samples from Whale call and earthquake





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Data streaming

We live-streamed 250 TB of DAS data from Svalbard to mid-Norway over 40 days of test period (7TB per day)

This technique make it possible for researcher to study whales and their sound production, their calls and their vocalizations from everywhere almost instantly.

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THURSDAY **8 JUNE**

SENSEATIONAL NETWORKING

14.00 - 15.30 | Underground B

Field test at arctic area done with multiple interrogators on two parallel cables (2022)

Coexistence between DAS and DWDM

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Thank you!

kurosh@sikt.no