

## Readme file for the OOI RCN 2001 DAS/DTS experiment

Information for understanding the organization and accessing the data from the Ocean Observatories Initiative (OOI) Regional Cabled Array test of distributed acoustic sensing (DAS) and distributed temperature sensing (DTS).

### Optasense

Two OptaSense QuantX DAS systems were used to acquire data on the northern and southern cables.

Directory processed/metadata/Optasense contains the following:

Summary-UW-OOI-QuantX-DataAcquisition-October2021 - Issue 2.pdf  
– A report prepared by Optasense of the experiment configuration and file naming conventions.

OOI\_RCA\_OptaSense\_DAS\_intro.ipynb – A Jupyter Notebook prepared by Ethan Williams at Caltech illustrating how to read and manipulate the Optasense HDF5 format data.

This can also be accessed as a Github Gist at

<https://gist.github.com/ethanwilliams/c7c952220ac329db48f8ef159f0b169f>

The Optasense data can be found in /data/Optasense. The organization and volumes of data are shown below and should be self-explanatory after reading the Optasense acquisition report.

```
1.8T  Optasense/NorthCable/TransmitFiber/North-C1-LR-P1kHz-GL50m-Sp2m-
      FS200Hz_2021-11-03T15_06_51-0700
2.6T  Optasense/NorthCable/TransmitFiber/North-C2-HF-P1kHz-GL30m-Sp2m-
      FS500Hz_2021-11-02T14_51_53-0700
5.3T  Optasense/NorthCable/TransmitFiber/North-C3-HF-P1kHz-GL30m-Sp2m_2021-
      11-01T14_51_37-0700
114G  Optasense/NorthCable/ReceiveFiber/North-C1-LR-P1kHz-GL50m-Sp2m-FS200Hz-
      ReceiveFiber_2021-11-05T07_31_00-0700

4.4T  Optasense/SouthCable/TransmitFiber/South-C1-LR-95km-P1kHz-GL50m-SP2m-
      FS200Hz_2021-11-01T16_09_15-0700
804G  Optasense/SouthCable/TransmitFiber/South-C1-LR-95km-P1kHz-GL50m-SP2m-
      FS200Hz_2021-11-04T10_37_24-0700_part1
597G  Optasense/SouthCable/TransmitFiber/South-C1-LR-95km-P1kHz-GL50m-SP2m-
      FS200Hz_2021-11-04T10_37_24-0700_part2
180G  Optasense/SouthCable/ReceiveFiber/South-C1-LR-95km-P1kHz-GL50m-SP2m-
      FS200Hz-ReceiveFiber_2021-11-05T07_21_18-0700
```

### Short Duration Testing

```
4.2G  Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL1-
      -m-Sp2m-test1_2021-11-01T09_16_11-0700
2.9G  Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-
      GL100m-Sp2m-test1_2021-11-01T09_17_41-0700
336G  Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-
      GL100m-Sp2m-test1_2021-11-01T09_18_44-0700
```

45G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL100m-Sp2m-test2\_2021-11-01T12\_28\_30-0700

242G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL14m-Sp2m-test1\_2021-11-01T10\_54\_10-0700

35G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL200m-Sp2m-test2\_2021-11-01T12\_40\_31-0700

29G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL20m-Sp2m-test1\_2021-11-01T11\_58\_48-0700

677G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL30m-Sp1m-test1\_2021-11-01T12\_50\_46-0700

31G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL30m-Sp2m-test1\_2021-11-01T12\_07\_48-0700

39G Optasense/NorthCable/TransmitFiber/ShortDuration/North-C1-LR-P1kHz-GL50m-Sp2m-test1\_2021-11-01T12\_17\_40-0700

59G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL100m-SP2m-FS1000Hz-test\_2021-11-01T12\_29\_47-0700

3.5G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL100m-SP2m-FS200Hz-test\_2021-11-01T09\_23\_30-0700

17G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL100m-SP2m-test\_2021-11-01T09\_12\_24-0700

35G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL14m-SP2m-FS1000Hz-test\_2021-11-01T11\_51\_33-0700

31G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL200m-SP2m-FS1000Hz-test\_2021-11-01T12\_43\_24-0700

26G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL200m-SP2m-test\_2021-11-01T09\_05\_24-0700

37G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL20m-SP2m-FS1000Hz-test\_2021-11-01T11\_59\_46-0700

32G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL30m-SP1m-FS1000Hz-test\_2021-11-01T12\_51\_05-0700

643G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL30m-SP1m-FS1000Hz-test\_2021-11-01T12\_59\_21-0700

26G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL30m-SP2m-FS1000Hz-test\_2021-11-01T12\_11\_31-0700

260G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL50m-SP2m-FS1000Hz-test\_2021-11-01T10\_57\_03-0700

46G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL50m-SP2m-FS1000Hz-test\_2021-11-01T12\_19\_45-0700

3.6G Optasense/SouthCable/TransmitFiber/ShortDuration/C1-LR-95km-P1kHz-GL50m-SP2m-FS200Hz-test\_2021-11-01T10\_05\_33-0700

## Silixa

One Silixa iDASv3 DAS system and one Silixa ULTIMA SM DTS system were used to acquire data on the northern and southern cables.

Directory `processed/metadata/Silixa` contains the following:

`OOIdelivery.pdf` – A report prepared by Silixa describing the experiment configuration and acquisition schedule

`readTDMS.py` – A Python file illustrating how to read the TDMS format data files.

`TDMS_Adv_Read.m` – A MATLAB function to read the TDMS format data files

The MATLAB file exchange also provides a TDMS reader

<https://www.mathworks.com/matlabcentral/fileexchange/30023-tdms-reader>

`OOIDASacqnotes.xlsx` – A Excel spreadsheet with notes about the acquisition parameters. This is mostly a duplicate of the report but has information on the times of discontinuous noise checks on the south cable. Noise checks on the north cable are in a separate directory.

DTS – A directory that contains the DTS data converted from the native xml format to csv files

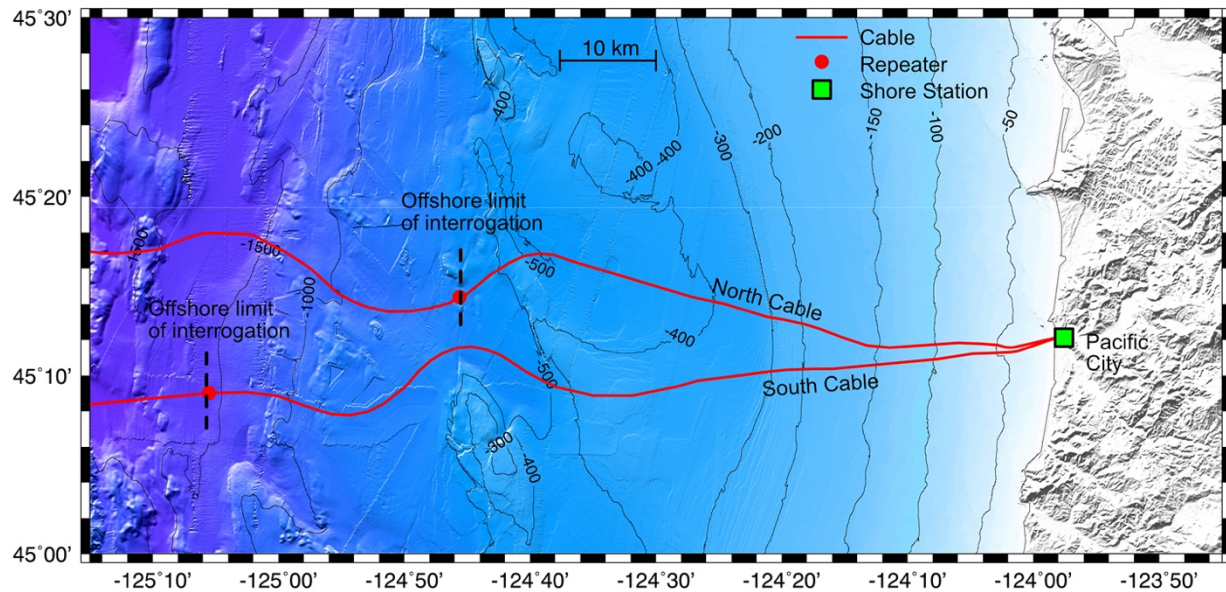
The Silixa data can be found in `/data/Silixa`. The organization and volumes of data are shown below and should be largely self-explanatory after reading the Silixa acquisition report.

```
79G   Silixa/DAS/North65km/acquisition
2.0G  Silixa/DAS/North65km/noisecheck/P7
376M  Silixa/DAS/North65km/noisecheck/P9

723G  Silixa/DAS/South90km/2021-11-01
1.3T  Silixa/DAS/South90km/2021-11-02
1.3T  Silixa/DAS/South90km/2021-11-03
2.3T  Silixa/DAS/South90km/2021-11-04
1.1T  Silixa/DAS/South90km/2021-11-05

634M  Silixa/DTS
```

## Cable Geometry



There are two cables whose locations are shown in the map above

Directory processed/metadata/geometry contains the following:

RCA\_RPL (Segment S1 and S5) .xlsx – A Microsoft Excel Spreadsheet with the geometry of the two cables. Segment 1 is the southern cable and segment 5 is the northern cable.

OOI\_RCA\_DAS\_channel\_location – A directory with text files of the cable geometries and preliminary channel locations for the Optasense data (2 m channel spacing) derived by Ethan Williams at Caltech and Python scripts to utilize these

OOI\_RCA\_DAS\_channel\_location\_with\_depth – A directory with text files of the preliminary channel locations for the Optasense data (2 m channel spacing) with depth from the Global Multi-Resolution Topography (GMRT) Synthesis added

## Changes

Note that as of 3/23/2022 there is a changes .pdf file that documents changes to the database.