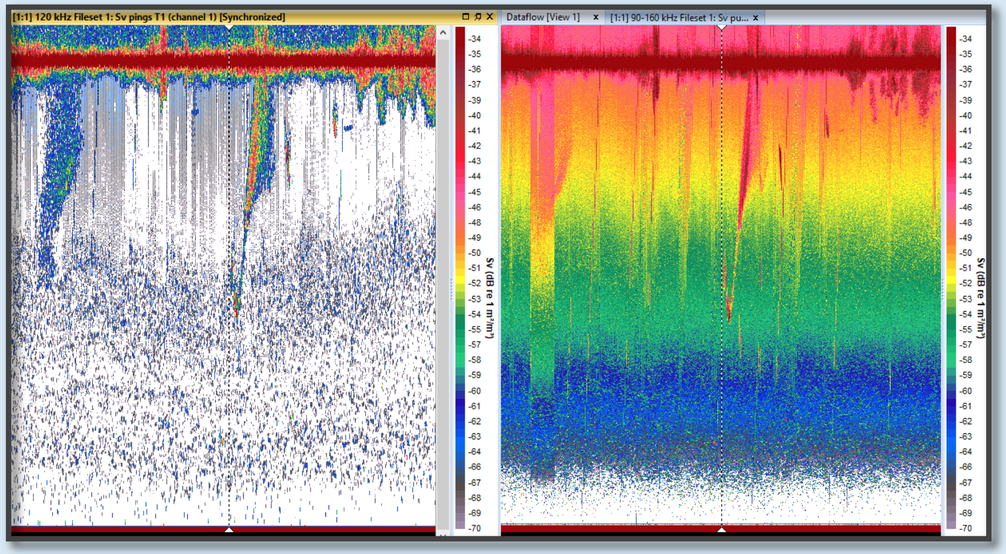
RCA Instrument Refresh - New Kongsberg EK80 Echo Sounders Installed

Single Frequency (CW)

Broadband (FM)



120khz (CW)

120khz (FM)

Mei Sato (WHOI)

NOAA: FM Allows much better estimates of size and number of fish

Capabilities:

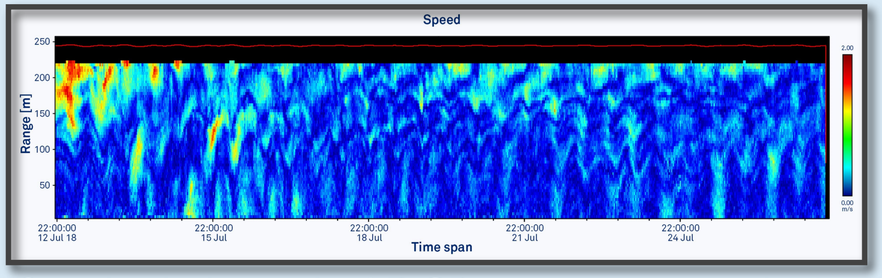
- Wide-Frequency "Broadband" capability (FM mode)
- Interleaved ping capability to collect both CW and FM
- Allows continuing access to single frequency (CW) data and extends the unique, continuous OOI time-series
- Allows for reprocessing of CW data if new calibration values are acquired
- Produces higher-resolution broadband (FM) data for advanced users (and a growing community of sonar researchers)
- Allows direct comparison of FM and CW mode data, (which very few programs provide)

Impact to OOI (if FM mode is used):

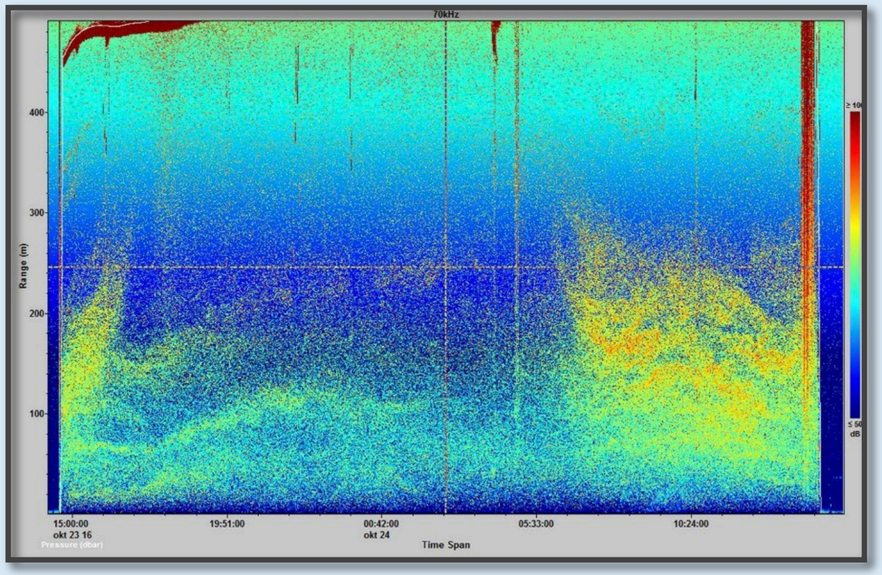
- Moderate development effort to modify existing code to split and process the interleaved complex data .raw files
- Increase in processing to concatenate CW and FM .raw files via Echopype-based CI processing and echogram creation
- Increased data storage volume to store and serve raw data, split data, processed NetCDF files, and echograms

RCA Instrument Refresh - 2 New VADCPs installed

VADCP-B: Nortek Signature500 ADCP



Standard binned ADCP current speed & direction output



Mesopelagic fish in the North Sea mapped using the Nortek Signature's echo sounder capability. *Credit: Nortek manual*

Refresh for custom Teledyne RDI 5-beam instrument (VADCP-A) no longer supported by vendor

Planned Operational Mode VADCP-B:

- Currently sampling in burst mode at 4Hz every 4 seconds over a 70 m range with 1-meter bins; 5th beam designed to better measure turbulent flow
- Working with the vendor to reduce power supply noise; seeing the same with the EK80's. Modification to the junction box for future deployments.
- Recording in .ad2cp data format. The driver is using ASCII output to deliver data to upcoming algorithm (under development)

Future Capabilities:

- Burst sampling of high-resolution data to measure turbulence (short-term variations in the current velocity)

Echosounder mode

- Measures magnitude of the echo generated after transmitting a ping
- Traveling time of the pulse gives an estimate of the
- distance to the particles reflecting the signal
- Can be used to study biological activity (fish or plankton) or internal waves by observing density gradients

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