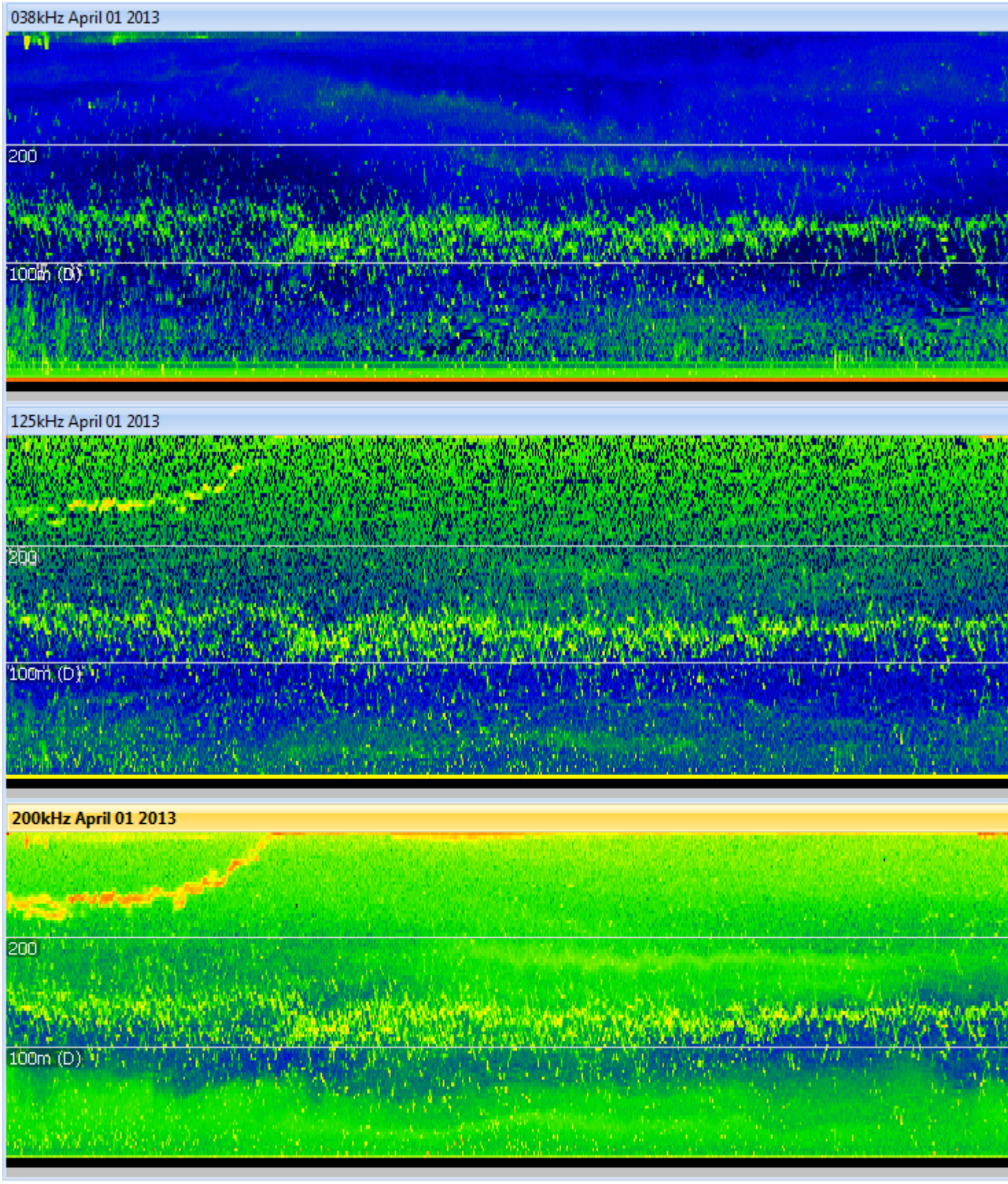
A Multi-Frequency Zooplankton Profiler Test [1]

Submitted by Lindsay Wallace Wed, 2013-04-17 00:00

An ongoing collaboration between Ocean Networks Canada and ASL Environmental Science resulted in a test deployment of the new echo-sounder at 300m on the VENUS Strait of Georgia array. The test-deployment is part of the technology demonstration led by Tom Dakin of the Ocean Networks Canada Innovation Centre.


038kHz April 01 2013
200
100m (D)
125kHz April 01 2013
200
100m (D)
200kHz April 01 2013
200
100m (D)

[2]

The image represents preliminary data from the test-deployment collected from April 1, 2013. The three 24-hour panels show back-scatter strength ? Sv, one for each of the three frequencies, 38, 23, and 200kHz (top to bottom). The AFZP is co-located with a 150kHz ADCP, which can be synchronized with the new profiler to interlace pings.

The advantage of a multi-frequency system over a single frequency instrument, like our long-standing 200 kHz ZAP echo-sounders, is that the different frequencies scatter sound from different size particulates and nekton. In particular, the lower frequencies have longer wave-lengths and scatter only from larger targets (fish, seals etc.). Although sound scattering is a complicated process depending on the material of the object, the presence of any gas bubbles, and the density of scattering material, the 38 kHz sounder has a wave-length of 4cm and will not scatter from small (~1cm) objects (e.g. zooplankton), while the 200kHz has a wave-length of ~1cm, and is particularly well tuned for small zooplankton. As an example, the bottom panel clearly shows the presence of a migrating layer of zooplankton from a depth of approximately 100m during the day up to the surface at night, followed by the decent of the zooplankton from the surface to 100m at dusk. The upper panel does not ?see? these zooplankton, and the middle panel (125kHz) has partial detection.

This type of data can be used to tease apart the presence of both zooplankton and fish, which both appear in the 200 kHz data, but are size-filtered in the lower frequencies which are biased to detect only fish and larger targets. Adjustments to the settings and synchronization are on-going in an effort to optimize the signal to noise, and minimize cross-talk interference with the co-located ADCP.

After adjustments and data verification is complete, VENUS plans for the data from the Multi Frequency Profiler to be available to our users via our data portal.

Tags:

- Zooplankton Acoustic Profiler [3]
- ZAP [4]
- Multi Frequency Profiler [5]
- ASL Environmental Science [6]

Categories:

- Data Highlights [7]

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