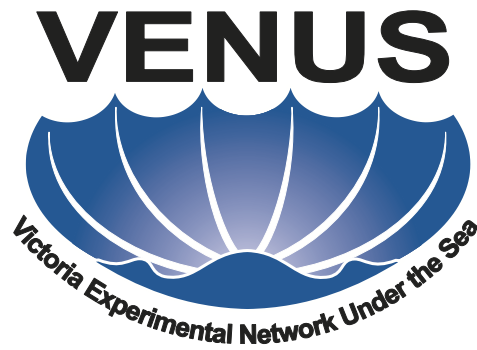


**Spring
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Cruise News — Fully Installed VENUS Serviced

In February 2010 we completed our eighth maintenance cruise. Our goals were to service five existing VENUS platforms at four distinct locations and redeploy the Delta Dynamics Laboratory (DDL) cable and platform, all in four operational days on the CGGS John P. Tully. ROPOS was configured with the Launch and Recovery System crane and mid-water winch system on the upper starboard deck, freeing up valuable and necessary space on the aft deck.

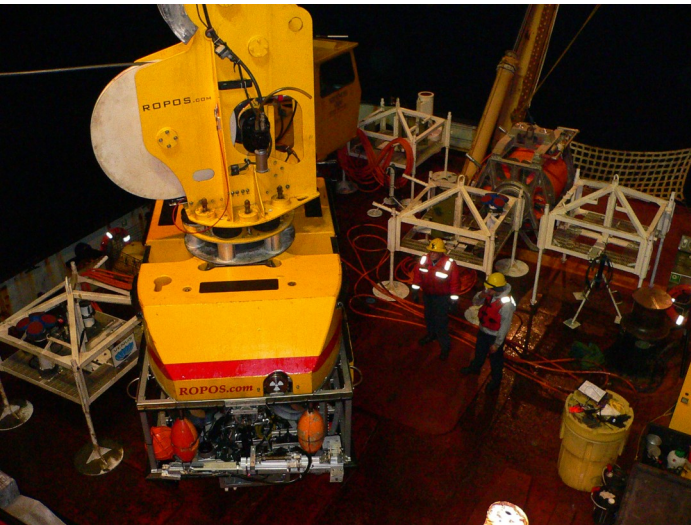


Fig. 1. ROPOS ROV below LARS, four VENUS Instrument Platforms (VIP), and ROCLS with the extension cable on the aft deck.

After a slow start, due to poor visibility in Saanich Inlet, we recovered the Saanich Inlet Digital still camera platform and VIP, and then all 3 VIPs from the Strait of Georgia in only 26 hours. This resulted in four VIP platforms on the aft deck of the Tully by the second day (Fig. 1). In addition to the standard instruments, we also mounted the VENUS eye-ball webcam on the SoG Central VIP, with Pig IV, as part of our continuing forensics research program with Dr. Gail Anderson (SFU). Six gill sharks found the carcass shortly after deployment (see video feature galleries on the web site), and the entire pig was gone within 20 hours.

The Delta Dynamics Laboratory (DDL) was re-established after laying the refurbished fiber optic extension cable northward from the East Node to the base of the Fraser River Delta Slope, at 107m (see SoG chart at [/www.venus.uvic.ca/notice-to-mariners](http://www.venus.uvic.ca/notice-to-mariners)). The DDL platform was loaded: hosting a CTD, Oxygen sensors, two Imagenex scanning sonars, two Nortek ADVs, a Vetrino and Vector, an RDI 300 kHz ADCP, a Wetlabs FLNTU, an ASL 200 kHz ZAP, a Burns/IOS hydrophone array, and a custom Webcam built by Gwyn Lintern (Fig. 2).

Unfortunately, since the cruise we have suffered two system failures. The CTD on the SoG Central VIP is no longer responding, and the entire DDL platform on the end of the extension cable is not reachable. Preparations are underway to supplement the SoG Central CTD with a stand-alone mooring: the CTD data will then be back-filled into the data base upon retrieval, and in April we will inspect the cable and DDL platform to evaluate what might have happened to the DDL.



Fig. 2. Paul Macoun and Denis Hedji prepare the "loaded" Delta Dynamics Laboratory platform.



Fig. 1. ADCP

One of the true workhorse instruments on the VENUS observatory are the Acoustic Doppler Current Profilers. They are sophisticated instruments that measure the 3-dimensional currents at numerous ranges, from near the bottom to the surface. The standard RDI ADCP has four Janus configured transducers (Fig. 1) that radiate acoustic beams upward through the water column. En-

Using ADCPs to Detect Fish

Len Zedel (MUN) and Richard Dewey (UVic)

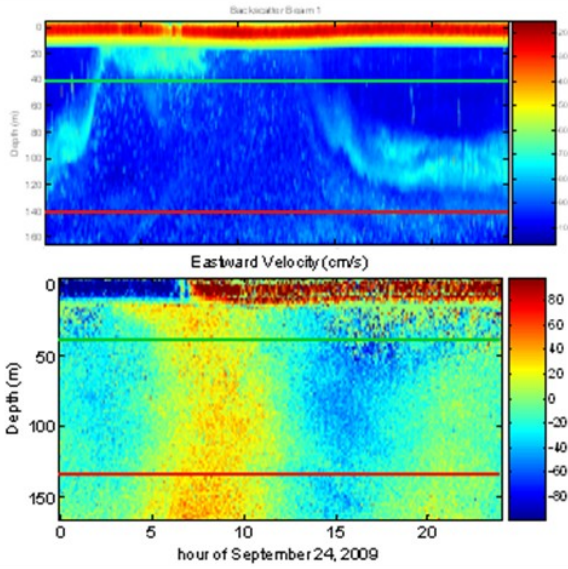


Fig. 2. Backscatter (top) and East-West current, ADCP products.

coded acoustic pulses are transmitted and received by each transducer, and after cross-correlation, the range gated signals are converted into estimates of the currents (U,V,W) at regular heights above the instrument. In a standard configuration, the instrument transforms the raw beam-coordinate Doppler velocities along each beam into orthogonal velocities, and then averages a set of profiles into a single, ensemble current profile. Using internal tilt and compass sensors, and the physical deployment orientation of the instrument platform as determined by the ROV ROPOS, the current profiles are converted to velocities relative to true north.

However, there are special configurations and capabilities of these ADCPs that allow for more sophisticated analysis and information extraction. If the raw single-ping beam-coordinate Doppler velocities are recorded, with no screening for “false” (fish) targets, coordinate transformation, or averaging, then one can extract at least two new interesting signals from the data. In one calculation, the beam-velocities are combined in specific combinations to give estimates of the turbulent Reynolds stresses (i.e. $\langle u'v' \rangle$) within the water column (revealing small scale momentum flux). In another calculation, the raw beam data are used to detect large “targets” (fish), and by tracking coherent targets through the beams, one can assume that the instrument has detected fish swimming through the beams. By tracking these targets, one can estimate both the range and velocity (speed and direction) of the fish.

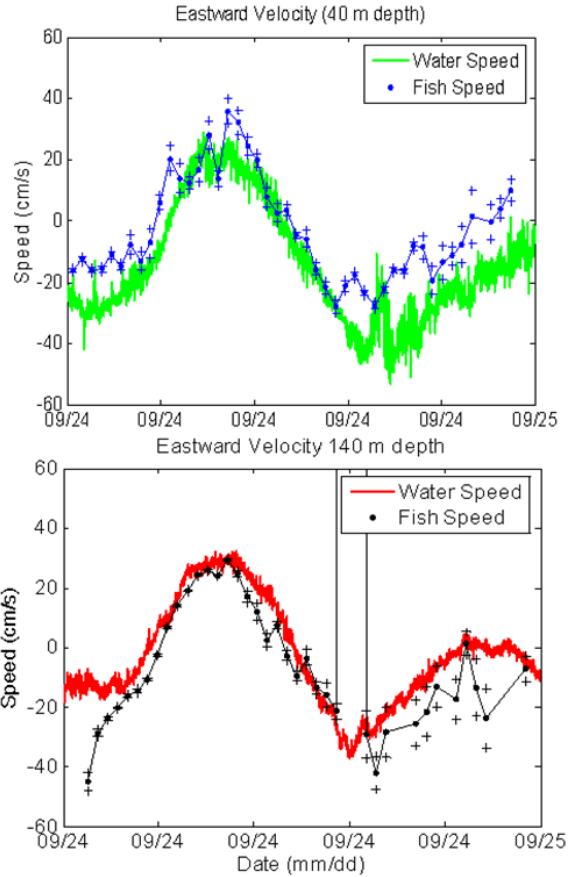


Fig. 3. Estimates of both the current (solid line) and fish swim velocities (symbols) at two depths (green 40m, red 141m) as determined from raw beam-coordinate ADCP data.

Shown here in Figure 2 are the colour images of acoustic backscatter and eastward velocity for a single day as recorded by the 150 kHz ADCP mounted on the SoG East VIP in 170m of water in late Sept. 2009. The upper panel shows the diel migration of the zooplankton and the bottom panel the flood and ebb of the tide. In Figure 3, the upper panel shows the east-west (U) current time series at a depth of approximately 40m (green lines in Fig. 2) as the solid green line, and in the lower panel, the east-west (U) current from 141m depth (red lines in Figure 2). Also shown in Figure 3 (symbols) are the estimates of fish velocities as calculated by tracking distinct targets through the raw beam intensity data. The fish are seen to swim generally with the same direction as the current, but are not entirely passive, but swim either faster or slower than the surrounding water.

To aid in such calculations and the research questions that can be addressed by these more primitive raw data formats, we will soon configure most of the ADCP instruments to record raw single-ping beam-coordinate data. Higher level data products, such as 30 second Earth-coordinate current velocity profiles [i.e. $U(z)$, $V(z)$, and $W(z)$] will still be available.

Virtual Observatory Makeover

Jason George (VENUS Web Developer)

If you have visited the VENUS Virtual Observatory website recently, you have probably noticed more than a few changes.

The Virtual Observatory is our primary method of data delivery, receiving over 36,000 visitors last year. As our data products increased in number and complexity, it was apparent that we needed a better way to manage the website content. So, on February 15th we flipped a virtual switch and completed migration to the WordPress Publishing Platform.

As a Content Management System (CMS), WordPress allows us to maximize use of the information we already publish. Regularly updated info, such as the System Status, News, and Research sections are now available as feeds. You can read “streams” individually, or together; or subscribe to updates via RSS.

We also took comments from our users, and combined with usage data, had a hard look at our information architecture. Access to most sections is still available from the main page, but you may find some sections moved or reorganized. This also provided an opportunity to review the general information pages, and streamline a lot of the more static content. We hope to take advantage of this new system and bring online more new features to facilitate use of the Virtual Observatory. One of the new features that is already online is a live glossary; linking terms throughout the site. The website is also more tightly integrated with the DMAS, something we'll be continuing to improve in the near term.

The many changes, large and small, are too numerous to list: updated presentation of existing data products, upgraded Live Data Applets (LDAs), a new tool for navigating the Data Plots, etc. Please explore the new Virtual Observatory, and don't hesitate to drop me a note with your suggestions, or just positive comments, jwg@uvic.ca.

VENUS Conference Presentations

AGU-Ocean Sciences Meeting, Portland Oregon, Feb 22-26, 2010

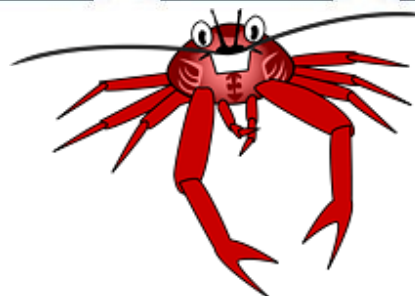
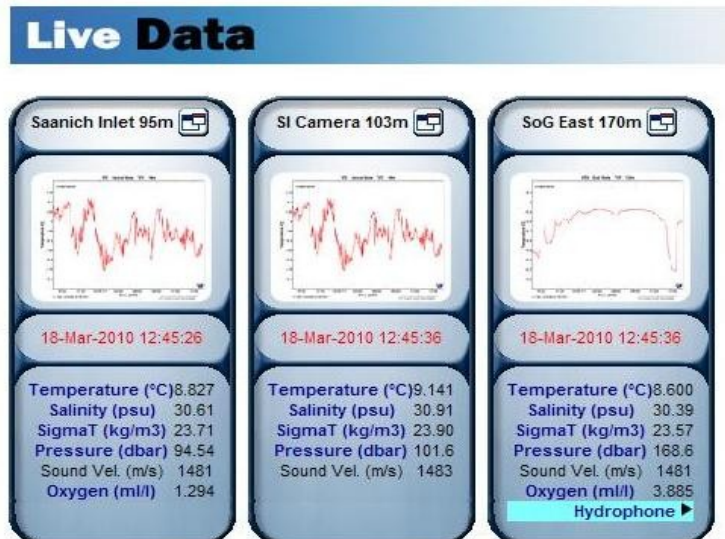
- Educational and Outreach Opportunities with a Web-Enabled Coastal Ocean Observatory, Nikolai Korniyuk;
- Cadavers in Support of Forensic and Hypoxia Research, Verena Tunnicliffe;
- Sediment resuspension by groundfish facilitates the transport and redistribution of sediments in deep coastal basins, John Crucius;
- The New Paradigm for Ocean Observing: Four Years of Interactive Research on the Cabled Ocean Observatory VENUS, Richard Dewey;

DFO-State of the Ocean, Nanaimo, BC Feb 16-19, 2010

- State of VENUS at the end of 2009, Frank Whitney;

American Fisheries Society, Nanaimo, BC, March 2-4, 2010

- Plankton and Nekton time series from permanent inverted Echo –sounders in the Salish Sea, Richard Dewey;
- One year record of variability in Diel vertical migration from the VENUS observatory in Saanich Inlet, Mei Sato.



We now have live data applets on the homepage for each active location displaying incoming data streams in real time.

Current active locations of VENUS are:

- Saanich Inlet 95m @ 48° 39.079 N, 123° 29.1808 W**
- Saanich Inlet 103m @ 48° 39.0456 N, 123° 29.2465 W**
- Strait of Georgia 170m @ 49° 02.532 N, 123° 19.056 W**
- Strait of Georgia 170m Hydrophone Array @ 49° 02.527 N, 123° 19.072 W**



VENUS Data News

Jaklyn Vervynck (VENUS Data Manager)

New Data Streams - February 2010

After the scheduled maintenance of the VENUS seafloor arrays during our last cruise, we had 33 instruments connected to the VENUS system and logging data: 12 - from two sites in Saanich Inlet and 22 - from four sites in Strait of Georgia. In addition to the existing instruments, serviced and redeployed during the cruise, several new instruments were connected to the VENUS observatory system.

In Saanich Inlet (95m):

- RBR XR-420 CTD;
- Alec Electronics with Rinko Oxygen sensor;

In Strait of Georgia East (170m):

- SeaPoint Turbidity;

In Strait of Georgia Central (300m):

- ASL AWCP;
- SeaPoint Turbidity;
- AXIS 214 PTZ Webcam.

The Strait of Georgia Delta Dynamics Laboratory (107m) was reinstalled on February 20 2010 and includes the following instruments: SeaBird CTD, WetLabs FLNTU, Imagenex Sector and Profile sonar's, RDI 100kHz ADCP, ASL ZAP, Nortek Vector and Vectrino Current Meters, StarDot Net-Cam Web camera, and a hydrophone system – 3 hydrophones with one hydrophone buried in the sediment

Challenges

Unfortunately, the SeaBird CTD at the Strait of Georgia Central (300m) site failed on February 24 2010. So, we are no longer collecting CTD, oxygen, or turbidity data from this location. The Delta Dynamics Laboratory platform was functioning normally until March 12 2010 when all sensors stopped streaming data and we lost communication with the platform. At the moment, VENUS team is considering options to re-establish connection with the lost platform in Fraser Delta. Stay tuned for updates.

Although, we are no longer collecting data from the devices mentioned above, however, for the first time since VENUS launched in February 2006, we were collecting data from all the proposed sites for 21 days!

VENUS - Cabled Ocean Observatory

Phone: 250-472-5366

Fax: 250-472-5370

Data Plots “By Instruments” vs. “by Water Property”

The Data Plots main page - <http://www.venus.uvic.ca/data/data-plots> - has been redesigned so that it allows our users to view the latest data streams more easily (we hope!). We have also made some major changes to the data plots themselves: now, the ‘By instrument’ plots represent data from a specific instrument at an active site.

We have maintenance cruises roughly every 6 months where instruments are recovered, cleaned/calibrated, replaced and/ redeployed. To ensure consistency of long-term time series data we aim to redeploy instruments in the same area where they were previously stationed. The ‘by water property’ data plots represent long time series data collected from an area (collection of platform site positions) – the water property data set may be pieced together from several different instruments. We are currently working on a better way to display the instruments used to generate our ‘by water property’ plots. Right now, users can see the instruments in the file header when Comma Separated Value or MATLAB mat file data formats are requested from our Download Data Interface: <http://www.venus.uvic.ca/data/data-archive>.

Multimedia Archive - Improved Functionality

VENUS Multimedia Archive has become a “to-go” place for a growing number of our users. The selection of photographs, video, and audio clips in the archive is considerable and counts 1000s. Dealing with such a selection of the multimedia can be extremely challenging. Our ongoing efforts to improve user experience have led to significant changes in the archive. Particularly, these changes affect downloading images, video and hydrophone data products. Users can now download several files at the same time. Also we now have made available data from all our hydrophone arrays in all locations. Users can examine hydrophone spectra images in the viewing window for a quick look at interesting features and then proceed to download files in MP3, PNG/PDF, Binary and MATLAB mat file formats for more in-depth analysis.

<http://www.venus.uvic.ca/data/multimedia-archive>

Multimedia

Logged in to DMAS as: Jaklyn Vervynck | [Logout](#)

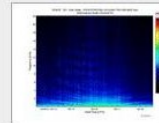
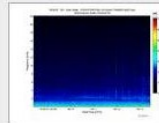
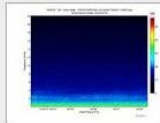
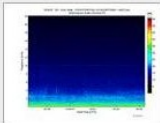
Region: Device Name:

Media: Channel/Hydrophone:

Date (UTC): Data Product:

Instrument Locations and Timelines

<< [previous](#) 60913 - 60924 of 65359 [next](#) >>



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