Summer 2005 Newsletter

Project Overview ....................................................... 1
Keeping Current ........................................................ 1
Saanich Inlet Update ............................................. 1
Displaying Instrument Data ........................................ 2
Saanich Inlet’s Cyclops Camera System ............... 3
VENUS Website’s New Look ................................. 3
New Staff ................................................................. 3/4
VENUS Team & Contact Information ................. 4

The Victoria Experimental Network Under the Sea (VENUS) is a facility to support coastal oceanography in British Columbia waters. The VENUS network of instruments is dedicated to observing oceanographic processes in our marine environment.

The VENUS Data Archive will support data mining and communication among users. Measurements, images, and sound will be delivered to scientists, managers, the public, and a data archive via seafloor fibre-optic cables laid from two separate landfall sites. These cables will deliver power for instruments, lights, and robots, transmit commands from project scientists, as well as deliver information back on the state of our oceans. The VENUS Project will install interactive laboratories in Saanich Inlet and the Strait of Georgia to support new oceanographic experiments for long-term studies of our coastal waters.

Keeping Current

Saanich Inlet Update

The Saanich Inlet Array has marked another major milestone in late August with the completion of the Critical Design Review (CDR). Following a Preliminary Design Review (PDR) in July, the completion of the CDR marks the transition from the design phase into the production and testing phase. The Saanich Inlet design is now complete and has been “frozen” to allow Saanich Inlet Array materials to be ordered so that production can commence. The Array hardware is scheduled for acceptance testing in mid October, followed by installation in early November. Currently, we are hoping to deploy the VENUS Common Instrument Platform as part of the system commissioning efforts. Subsequent instrument systems will be deployed during the week of November 21st, 2005 using the CCGS Vector and ROPOS (Remotely Operated Platform for Ocean Science).

The planned cable landing for the Saanich Array has also been revised to take advantage of a soon to be...
constructed DND Range Building. The Range Building will be located on the Institute of Ocean Science (IOS) foreshore while the VENUS cable will be fed directly into a room dedicated to the VENUS shore station equipment.

Global Marine Systems Ltd./Ocean Works Node Design for VENUS.

Displaying Instrument Data

Scientists will be able to observe the properties of the ocean through the VENUS website by querying data within a desired time range and location or by viewing live data plots. Time series plots will be displayed as shown in the figure to the right in PNG (Portable Network Graphics) format, with the option to download a PS and PDF file. The data in the figure was collected between July 7 and July 17, 2005 in Saanich Inlet by a Seabird CTD (Conductivity, Temperature, and Depth) that was secured to the VENUS platform along with several other instruments. When VENUS is on-line, data will be displayed in local (PST/PDT) time. The depth stated in the Figure 1 (95m) is the depth of the platform from the seafloor.

When data begins to stream in from the instrument network, it will be stored in the Data Management and Archive System (DMAS). Data queries made through the website will be inputted into MATLAB routines that retrieve the data using MATLAB’s Database Toolbox functions. The data are imported into the MATLAB workspace where MATLAB’s analytic and plotting tools can be used. For scalar data, to reduce storage space in DMAS, only changes in the data values are stored along with a start and end time for each value. Therefore, the data are re-formatted using an interpolation routine modified from MATLAB’s interp1 function to display the data as if it were directly from the instrument itself. Routines have been written to set the file size (800x600 pixel PNG file), fix the plot position and axes limits, as well as structure the tiled plot panels to maximize space. Data product users will have the opportunity to make a variety of queries from different instruments, locations and time ranges, all displayed in the same figure for comparison and analysis. The live plots for each instrument and location will be automatically updated approximately every ten minutes during each day. Users will also have the option to observe data from the last day, last week, last month, last year and the entire record.

VENUS plans to offer a variety of data product types including scalar time series (shown below), depth profiles, power spectra, 2D contour plots for ADCP (Acoustic, Doppler, Current Profiler) and ZAP (Zooplankton Acoustic Profiler) data, 3D surface plots, digital images, animated time series and audio clips for hydrophone data. In the future, we hope to offer event detection as well as the ability to make more complicated scientific queries.

Figure 1 Sample data plot for displaying VENUS instrument data. Figure shows Seabird CTD data from Saanich Inlet between July 7 and 17, 2005.
**Saanich Inlet’s New Cyclops Camera System**

VENUS has taken possession of a sophisticated camera system designated for Saanich Inlet. C-Map System’s new hi-resolution robotic digital stills camera, also known as Cyclops, arrived in the arms of its manufacturer on June 22nd, 2005. Doug Smith from C-Map Systems provided the VENUS team and several other interested parties with a demonstration of the system’s capabilities.

![VENUS’s new Cyclops 8 Mega pixel digital stills camera.](image)

The Cyclops is an 8 Mega pixel digital stills camera that will be mounted on a pan and tilt device. Video stream from the camera could provide researchers with a tool for composing pictures along with an ability to explore the bottom of Saanich Inlet in real-time.

Initially the camera system will be accessible to registered users through a remote desktop protocol, but eventually it is envisioned that camera control will be provided through a secure webpage.

The camera system is scheduled to be deployed during the week of November 21st, 2005.

---

**VENUS Website’s New Look!**

New websites are in the works for both the VENUS and NEPTUNE Projects. UVic Web Architect Faye Hoffman worked with VENUS and NEPTUNE staff to help select navigation options and create appropriate sections and their corresponding labels. Graphic designs of the new sites, based on UVic templates, were created by UVic Web Designer Beth Doman. Each site will initially contain approximately sixty pages and serve three communities: Researchers and Technologists, Outreach, and the General Public.

Usability testing for the sites was about to begin at the time this article was submitted. This first test, which includes members of the target audiences, was focused on testing the general concept for the sites and the navigation system. No content was available for the site during this test, but a second test will be scheduled for September that will include content.

The VENUS site, which will debut when the first observatory is activated in November, will initially feature static content highlighting anticipated projects and research potential, along with easy access to data products such as graphs and data.

The goal in presenting both projects to the public is to create a window into the science activities and give ready access and understanding of the incoming information. The information will be presented in such a way that scientists, general public and students will gain meaningful insight from the VENUS website.

---

**New VENUS Staff**

As the date for the Saanich Inlet cable installation draws closer the number of VENUS staff is increasing. Over the last few months, we have added one full time and three half time employees to our roster. The three half time employees are shared jointly with NEPTUNE Canada.

Jaklyn Vervynck, a graduate from UVic’s BSc Physics and Astronomy and a VENUS summer Co-op student, started working full time as a Research Assistant in August, 2005. Jaklyn is preparing data retrieval tools and utilities for the purpose of plotting and displaying data products that will be used on the web. She is writing MATLAB scripts and functions to
retrieve and format data from DMAS. MATLAB is a mathematical computing language used for technical programming. As well, Jaklyn is researching other ocean observatories websites for ideas on designing the data query pages for VENUS’s new website.

On August 8th Don Moffatt, B.Sc. (Astronomy), joined the VENUS / NEPTUNE teams as the Web Specialist. Don has taught web technology at UVic’s Continuing Studies department for five years, has spent eight years in public outreach at the NRC’s Hertzberg Institute of Astrophysics and has written freelance features for The Globe and Mail. Don is developing the designs for the VENUS site and is working in concert with VENUS staff to produce content. He will also help to determine the appropriate server-side technology for the project and focus on building interfaces to view data and data products over the web.

Yigal Rachman has over twenty years of experience developing data acquisition, archiving, and control systems for the oil and gas industry. He was hired by the VENUS and NEPTUNE Projects as the DMAS Instrument Data Acquisition Developer in April 2005. Yigal is currently developing the software that interfaces with the scientific instruments. This software will provide the means to control the instruments, and will acquire and archive all relevant data from them. The intention is to re-use this work later on NEPTUNE. Yigal immigrated to Calgary in 1981 from Cape Town, South Africa. After braving the prairie winters for over two decades, he eventually fled West to Victoria in search of a climate more reminiscent of his former home.

Martin Hofmann started working with the VENUS and NEPTUNE Projects as the DMAS Development Systems Manager in April of 2005. He is currently working on DMAS to collect, archive and deliver the VENUS data received from observatory instruments. For over 20 years, Martin has used Unix for everything from web servers to real-time robotic control. Prior to moving to Victoria, he spent 7 years at the Centre for Visual Sciences, Australian National University, where he worked in a variety of vision and imaging projects and administered a number of Unix systems. He received his BSc in Astrophysics and his PhD in Zoology from the University of Toronto.