As many of you know, VENUS has a provisional award from Canada Foundation for Innovation (CFI) to extend the observatory. “Provisional” because we still have to confirm matching funding from the Province and other partners.

We are currently working with the proposal proponents to assess how to realise our dreams. A major feature of the new concept is to extend the research footprint to the water surface and to encompass greater experimentation capacity to a wider region without having to install more cables. Thus, there are three main components in the proposal: i) we will upgrade capacity in the current VENUS nodes and SIIMs to accommodate more instruments; ii) design of bottom modules for mix’n’match instruments dedicated to specific ‘missions’; and iii) roving instrumentation, AUVs, Ferries and coastal radar plus a joint project with NEPTUNE Canada to integrate sea gliders.

The net result will be a capacity to support research programmes that investigate atmosphere to seafloor processes in a region of heavy use by humans yet with a rich and diverse ecosystem. Watch this space as we grow the ideas over the coming year.
On October 1, we submitted a proposal to NSERC to renew support for VENUS operations. The Major Resource Support Program provided about 60% of VENUS expenses in the past three years. NSERC is the lead agency in Canada supporting science and engineering research; training and education is another important mandate. Thus a major part of the submission documented the character and growth of the research community using VENUS. A major challenge we face is to provide ocean access to users with a wide range of interests, backgrounds and capabilities. Thus, we serve data in many formats from images to Matlab files, from text files to audio files.

We have tracked the use of VENUS in several ways since inception in 2006. For example:

- We produce many types of data representation on our website (try it! http://venus.uvic.ca/data/data_plots.php#SI); hits on our data pages and image galleries alone were over 100,000 this year.
- Users wanting to download their own data must register and give us some information about themselves. In 2009, we can see that over 360 people have downloaded data already.
- And then there are the users who contact us for instrument and experiment deployment or because they need interactive access with instruments. This year, over 40 researchers contacted VENUS for these detailed interactions.

Although VENUS was conceived mostly to address research in the sciences, it also serves users in the fields of social science, engineering, computer science and art. As we expand data representation with new CFI funding, we hope to attract more users in non-science disciplines.
VENUS has completed the first stage of our new and improved data interface referred to as Download/Search Screen Version 2.0. New features include:
1) Users can now request data by selecting an instrument and sensor at one of our sites or,
2) by selecting a water property if they want to observe a sensor from one of our study areas over a longer time period.
3) Large data sets are no longer truncated, these sets are now packaged up, uploaded to an ftp server and an email is sent to the user when the data are ready to download.

The new interface seems simple, but the processes behind it are very complex and required a lot of work and effort from the DMAS Development Team and the VENUS Web and Data Management Group. The new architecture behind Download/Search Screen Version 2.0 allows new features to be added easily which will enhance our data delivery services for the science community. Soon users will be able to download:

- Time series data from more than one sensor on a common time base;
- Processed data (for example, select an averaging interval);
- Data products from our more complex instruments such as ADCP, Hydrophone and ZAP;
- New data products such as netCDF and MP3 (for hydrophone).

We also plan to create maps and present more descriptive information about our locations. Stay tuned!

Recent Research Products

Data delivery has been central to the VENUS mandate. As terabytes of data routinely accessed and downloaded from our archive feeding young and seasoned researchers, we are pleased to see that those data appear in research publications, such as:


Sharing Data with World

VENUS took a major step in its development when it joined the Northwest Association of Networked Ocean Observing Systems (NANOOS). The ocean does not see borders - nor should our observations. By linking facilities under the umbrella of NANOOS, we can expose our research communities to a greater combined international database and more opportunities for collaboration. Equally important is the ability to share observations with educators and the public in both the US and Canada at a time when ocean change on the west coast of the continent is increasing in intensity and concern.

Following the initial step of data sharing, our connection is about to become more complex yet user friendly—as VENUS becomes integrated as part of the NANOOS visualization system (NVS). NVS will provide a Google map interface of all data linked through NANOOS, with near real time data in an easy to use user interface with common data products available to all. See www.nanoos.org for more information.
Working with the Ocean Tracking Network (OTN)

VENUS is working with the Dalhousie University “OTN” group to test the new VR4 receivers that are in development by Vemco of Amirix Systems Inc. These fish receivers are the backbone technology of the Dalhousie-based Ocean Tracking Network which is a `sister’ CFI facility to tag ocean animals and track movements on a global scale. This deployment on VENUS is a test of the VR4 technology in conjunction with a cabled observatory. In September, VENUS and OTN staff deployed two VR4 fish receiver moorings to the seabed at 300m and 500m distant from the VENUS instrument platform at 95m depth. An underwater modem was placed on the instrument platform during the subsequent VENUS cruise and we are testing communications with the VR4s. The purpose of the receiver is to register a signal emanating from a tag or ‘transmitter’ on a fish. These transmitters are very small and have been successfully implanted in several fish species. Engineers at VEMCO can now log on remotely to a computer in the VENUS shore station. From the comfort of their offices in Halifax, they control the modem, download data from the moorings, and even release a recovery float. A harbinger of good things to come for research into real time tracking of fish and marine mammal movements.

Creating Business Opportunities on VENUS

Ocean Networks Canada Centre for Enterprise and Engagement (ONCCEE) is a newly funded Centre of Excellence in Commercialization and Research (CECR). ONCCEE’s role is to position Canada as an international leader in ocean observing system science and technology, maximizing the associated economic and social benefits through commercialization and outreach programs in partnership with the VENUS and NEPTUNE Canada projects. One of ONCCEE’s focus areas is the demonstration of new sensor technologies on cabled observing systems. Initial sensor demonstrations will be in areas where new technologies are rapidly being developed for understanding biogeochemical cycles and those which may have significant commercial, scientific and public outreach applications such as geophysical, chemical, and biological sensors; and acoustic/video imaging technologies. For those companies interested in demonstrating technologies, ONCCEE may be able to assist in funding and coordinating the integration of new systems into VENUS or NEPTUNE Canada. Interested parties should contact the ONCCEE Director, Scott McLean (sdmclean@uvic.ca).

In partnership with the VENUS team the first two sensor demonstrations are underway on the Strait of Georgia array. One is to demonstrate the new multi-frequency, extended range ASL Multi-Frequency Water Column Profiler (MFWCP) to increase Zooplankton Acoustic Profiler (ZAP) applications to distinguish a wider range of organisms in depths of up to 300m. The other is to demonstrate the new Weir Jones Seismic Liquefaction In-situ Penetrometer (SLIP) to monitor and help predict sub-sea slope failures in coastal environments that can trigger tsunamis.