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UVic

News

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Message

from the Director

May we wish all our readers an enjoyable, productive and interesting New Year! It should be one of considerable developments for NEPTUNE Canada as we commence on the initial phases of installing the cable system, with the awarding of the major contract and many other instrument development awards.

In fall 2003, full Canadian funding of \$62.4 million for NEPTUNE Canada was announced. Funding came from the Canada Foundation for Innovation (\$31.9 million) and the British Columbia Knowledge Development Fund (\$30.5 million), and was awarded to the University of Victoria, which leads a consortium of 12 Canadian Universities from coast to coast.



Over the previous twelve months, there has been considerable activity in staffing, organization, Science Workshops, issuing a major Request For Proposal (RFP) for the "Wet Plant", initial design work on the Data Management and Archiving System (DMAS), purchase of a Shore Station, and improved formal links with the USA National Science Foundation (NSF) and its Ocean Research Interactive Observatory Networks (ORION) Office.

Most of these activities and plans are reported in this issue of the Newsletter – intended both for information and to elicit comments, assistance and advice. General comments can be sent to neptune@uvic.ca or messages through Nancy Kwong at: (250) 472-5400 or fax: (250) 472-5370. 

Staff

Hiring

Chris Barnes

Recent Appointments

In the summer of 2004 the two (half-time) *Co-Chief Scientists* were appointed: *Brian Bornhold* and *Kim Juniper*. Brian had a distinguished career as a marine geoscientist with the Geological Survey of Canada in Sidney, British Columbia, and is currently Vice President of Coastal and Ocean Resources Inc. Kim Juniper is a leading biological oceanographer at the University of Quebec at Montreal (UQAM), and is the current Director of GEOTOP.

In October 2004, *Benoît Pirenne* joined us as *Assistant Director, Information Technology* from the European Southern Observatory (ESO), where he was responsible for the development and operation of the data management systems, especially handling much of the real-time data from the Hubble Telescope.

Additional appointments have been made to the Engineering Project Team during the summer: *Paul Hansen* and *Cheryl Katnick*. Paul is *Project Quality Assurance Manager*, he will cover aspects which involve the many observing systems and instruments to be deployed on the facility; he was formerly with 360Networks. Cheryl is *Manager, Permits and Rights of Way*, and will be closely involved in the detailed location of the cables and observatory nodes; her previous position was with the Alberta Supernet Project.

A change in Secretary occurred in June 2004 with *Nancy Kwong* replacing Christine McLaren; Nancy was formerly with Royal Roads University.

Current Vacancies

New advertisements are being placed this month which include the following:

- *Manager, Cost Control (Engineering and Operations)*
- *DMAS Development Systems Manager*
- *Manager, DMAS Instrument Data Acquisition Developer.*

A copy of these advertisements and full position descriptions can be found through either of the following websites:

www.uvic.ca/careers/index.html, and
www.neptunecanada.ca 



University of Victoria / National Science Foundation

Memorandum of Understanding

Chris Barnes

We intend that the planning and installation phases of Stage 1 of NEPTUNE, funded by NEPTUNE Canada will be in partnership with the USA agencies/institutions that will provide and receive future funding through the ORION Office.

The installation of Stage 2 of the Regional Cabled Observatory (RCO) in the North-East Pacific should be funded from the NSF

MREFC (Major Research Equipment Facilities and Construction) account once officially approved. All being well, the Ocean Observatories Initiative (OOI) will appear in the President's Budget as submitted to Congress in February (as it has for the past two years, last year being at a total of US \$245 Million).

To assist in the ongoing collaboration between Canada and the US for

the installation of the RCO, the University of Victoria (UVic) and the USA National Science Foundation (NSF) signed a Memorandum of Understanding (MOU) in September 2004. UVic Vice-Presidents and NEPTUNE Canada and VENUS staff

also met with the Executive Steering Committee of ORION in Seattle in late October 2004 to report on progress. Good cooperation exists

at the operational level between the offices of NEPTUNE Canada and ORION.

As noted elsewhere in this Newsletter, joint staffing of three current Review Committees has been arranged, and a RCO Joint Advisory Committee is currently being arranged to advise both offices on critical developments, contracts and policies.



“The University of Victoria and the USA National Science Foundation signed a Memorandum of Understanding in September 2004.”

Observing Systems and Equipment:

Three Community Experiments Science Workshops to Formulate Proposals for the Available \$13 Million CDN

Brian Bornhold and Kim Juniper

NEPTUNE Canada recently completed the third and last in the series of the Science Workshops designed to develop the first suite of Community Experiments to be deployed on the network in 2008. This last Workshop was held in Halifax on November 22–23, 2004 and was intended primarily to address issues related to deployment of experiments, layout of instruments at the many sites of interest, and engineering issues such as: potential conflicts among users working at the same site, power demands and communications. This meeting was attended by a subset of investigators (attendance was about 50) representing the main Research Theme areas. Considerable progress was made at this meeting in terms of node layout and the development of collaborations among Researchers from different disciplines working at the same sites.

Throughout the Science Planning process the broad unifying theme areas have been:

- Plate Tectonic Processes and Earthquake Dynamics
- Dynamic Processes of Fluid Fluxes and Gas Hydrates in the Seabed

- Dynamic Processes of Fluid Fluxes at Mid–Ocean Ridges
- Regional Ocean/Climate Dynamics and Effects on Marine Biota
- Deep Sea Ecosystem Dynamics
- Engineering and Computational Research

Proposal
Deadline for
Submission:
Tuesday,
January 18,
2005 at
1700 hrs
PST

The first Science Workshop held in Victoria, B.C. (May 3–5, 2004), with an attendance of about 130, was primarily an opportunity to introduce Researchers to the concept and opportunities that NEPTUNE Canada offered. The general goal of the meeting was to build on the ideas developed at the March 2000 NEPTUNE Canada Science Planning Workshop.

Following initial discussions that were wide-ranging and exploratory in character, Theme groups began focusing on a defined set of science objectives on the Juan de Fuca Plate that could be addressed by a cabled observatory network. Theme groups were encouraged to develop Proposals over the summer and these preliminary Proposal ideas formed the basis for a second Workshop held in Victoria, on

Please see *OOS Workshops* on page 5

September 27–29, 2004. This second meeting, (attendance about 120), crystallized these initial ideas into well–conceived research programs that can be developed within the time frame 2005–2008, leading up to the first observing system deployment, and using instruments that could be realistically acquired or developed.

As a result of these three Workshops, plus discussions held independently among investigators, a number of Proposals are currently in development including:

- Regional Seismic Network
- Geodetic Measurements of Absolute Plate Motion
- Towards Real–Time Observations and Modelling of Tsunamis and Storm Surges off the West Coast of Canada
- Heat Flow Observatory Network (HEFLON) Probes
- Water Column Properties at Endeavour Ridge
- Gas Hydrates – Physical, Geophysical, Geochemical and Biological Properties
- Ocean Dynamics and Effects on Marine Biota off Southern Vancouver Island
- The Effects of Temporal and Spatial Variation in Upper Ocean Processes on Benthic Boundary Layer Biology and Material Flux
- Hybrid Underwater Vehicle
- Integrated Acoustics System
- VENUS Engineering Testbed
- High Definition Video
- Materials, Biofouling and Corrosion

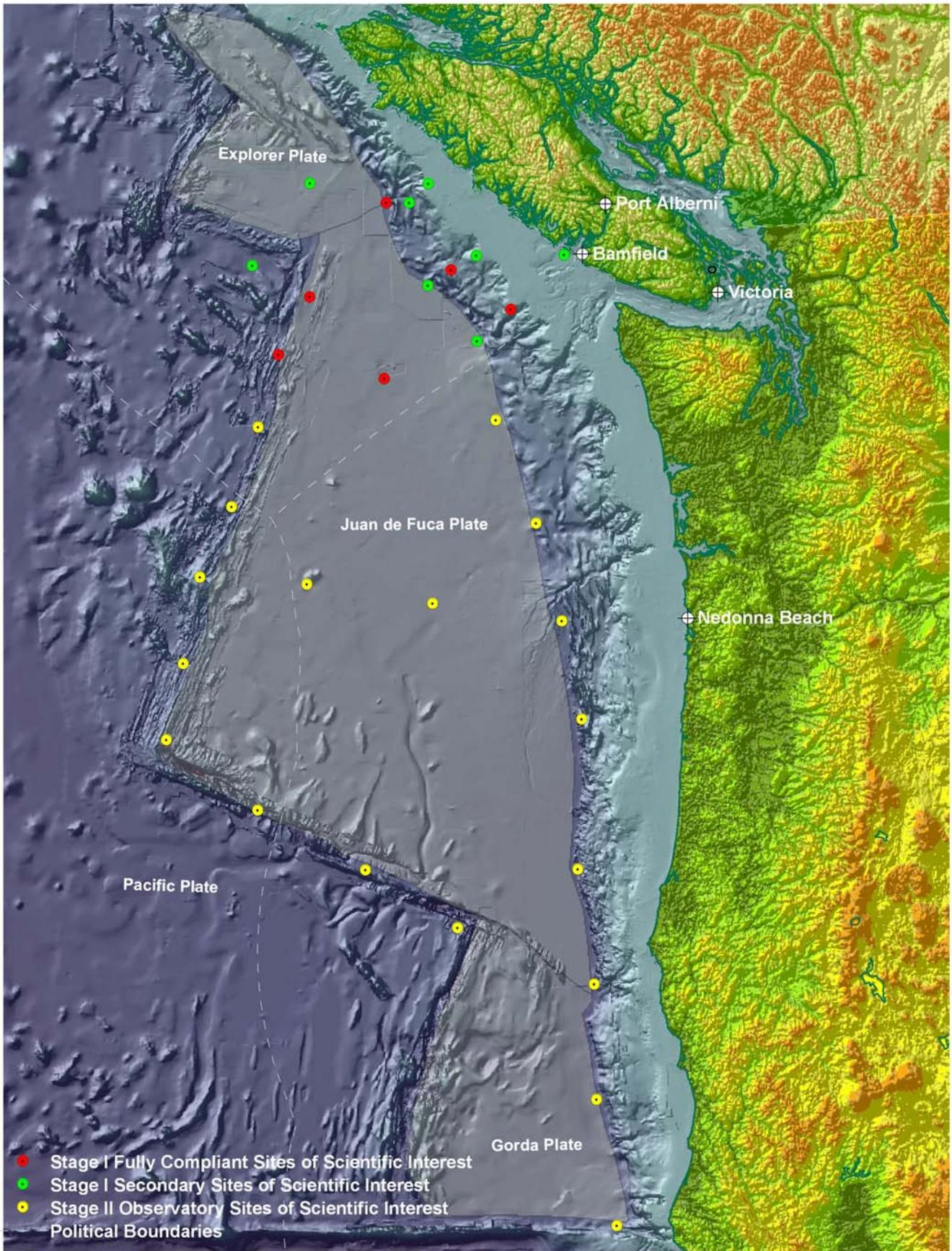
- Fluid processes at Endeavour Ridge and Middle Valley
- Electromagnetic Measurements of the Seabed
- Barkley Sound Marine Ecology Node

These Proposals and others will be submitted by the **deadline of January 18, 2005 (1700 hrs, PST)** for review by an external Committee of Scientists. To submit a Proposal please visit our information page :

www.neptunecanada.ca/scienceProposal.html

for the relevant Application forms and related details. These reviews and rankings will take place between February and April 2005, after which the NEPTUNE Canada Executive Committee will consider the Science Committee’s recommendations and make decisions with respect to maturity of Proposals and Funding.

Announcement of the first successful Proposals are expected to be in May–June, 2005. The funding of the Observing Systems will naturally be tied to the scope of the affordable cable/node systems which are presently being defined through the University of Victoria’s RFP 262 process (see next article); details of this should become clear concurrently with the Community Experiments Review. 



Proposed Sites of Scientific Interest
(Map: Cheryl Katnick)

Issuance of a Request For Proposal

for the “Wet Plant”

Peter Phibbs

A Request For Proposal (RFP) for the underwater infrastructure for NEPTUNE Stage 1 was issued in September 2004 (see

web.finance.uvic.ca/UVICProcurement/2G/rfp.asp

for details). We expect to receive the Proposals by the **deadline of Thursday, January 13, 2005 (1630 hrs, PST)**, and to move towards selecting a supplier in mid-summer 2005.

The project has generated a lot of excitement from suppliers around the world, and we expect to receive some interesting, innovative and competitive proposals. The latter will be evaluated in detail by a RFP Review

Team (chaired by Peter Phibbs), and this process and the Team’s recommendations will be reviewed by a RFP Oversight Committee (chaired by Chris

Barnes), which in turn will make a final recommendation to the UVic Vice-Presidents. NEPTUNE Canada has consulted with the NSF ORION Office to select some US specialists to serve on both committees for this important contract to install the “Wet Plant”. The cable/node components, with some instruments, will be installed in the summer of 2007, and after testing and commissioning the majority of

the instruments will be added in mid-2008. 

RFP 262
Proposal
Deadline for
Submission:
Thursday,
January 13,
2005 at
1630 hrs
PST

Offshore

Seabed Mapping

Cheryl Katnick and Peter Phibbs

We have been gathering existing survey data to help us to start planning the cable routes — our thanks to all, but in particular the Pacific Geosciences Centre (PGC) – Sidney, British Columbia, the University of Washington (UW) – Seattle, Washington, and University of Bremen (UB) – Germany. This data will be invaluable in helping us to locate the science ports and the cable in safe sites or, if not safe, at least interesting!

In November 2004, Deb Kelley from the University of Washington was able to acquire use of the R/V Thomson, UW's research ship, for five days on-site surveying (with EM 300): from the shelfbreak to the base of the slope, from the EEZ line north to close to the Nootka Fault Zone, thereby filling in a large gap in the detailed data set. Additional survey work is currently being planned for the summer of 2005.



“Additional survey work is currently being planned for the summer of 2005.”



R/V Thomson G. Thompson

(Photo http://martech.ocean.washington.edu/picture_gallery/pictures/tombow.html)

UVic Purchases a Shore Station at Port Alberni

for NEPTUNE Canada

Cheryl Katnick

August 2004 was an exciting month for NEPTUNE Canada as the University of Victoria purchased Teleglobe Canada's out of service Cable/Shore Station in Port Alberni, British Columbia solidifying the landing site for Stage 1 of NEPTUNE. A second Shore Station is expected to be located at or close to Nedonna Beach, Oregon, when Stage 2 is installed upon receipt of the major USA funding.



Port Alberni Shore Station Eastern Half from Mallory Road
(Photo: Chris Barnes)

The Port Alberni Shore Station's one-acre lot overlooking but high above the Alberni Inlet was previously the Landing Station of Teleglobe's ANZCAN and TPC4 networks. The purchase of this site afforded the University of Victoria an opportunity to put sustainable development practices to work. As the building (three storey, 1200m², built in late 1980s) is purpose built for

telecommunication networks, it is equally well suited for NEPTUNE Canada, therefore further extending the life of the building for many years.



Front Entrance of the Port Alberni Shore Station
(Photo: Chris Barnes)

With curiosity increasing within the Port Alberni community, UVic and NEPTUNE Canada felt that it was important to let their new neighbours know that the change of ownership had occurred, to inform them of the planned property use, and offer an opportunity to answer their questions about the project. On November 18, 2004 an Open House was held at the Shore Station, and

Please see *Port Alberni* on page 10

approximately 100 residents local attended. There was keen interest in the proposed use of the facility, curiosity about NEPTUNE, offers of support for the project and excitement for the opportunities that NEPTUNE might have in store for the City of Port Alberni.



Brian Bornhold answering local residents' questions
(Photo: Deb Sexsmith)

The Shore Station will see many changes in 2006 when the equipment necessary to operate and maintain NEPTUNE will start to be installed. The types of equipment will include batteries, power feed equipment, computer monitoring systems and data storage systems. NEPTUNE Canada is examining other possible collaborative uses for the Shore Station, including local public outreach activities, and will continue to keep the community well informed through further informational sessions and events. 

“The Shore Station will see many changes in 2006 when the equipment necessary to operate and maintain NEPTUNE will start to be installed.”

Early Data Management and Archiving System (DMAS)

Development Plan

Benoît Pirenne

Early DMAS Studies

In order to understand the issues pertaining to the NEPTUNE and VENUS Data Management and Archiving, a number of preliminary studies were carried out with the help of the Herzberg Institute of Astrophysics (HIA), the National Research Council (NRC), as well as with Barrodale Computing Services Ltd. (BCS).

The contribution of HIA, through the work of Séverin Gaudet and Norm Hill, included the production of a number of documents culminating with a System Design Requirements. BCS contributed a significant amount of information as

they produced a document that thoroughly reviewed a representative set of instruments with potential use for VENUS and NEPTUNE. The instruments were analyzed in terms of data volumes, data formats, metadata and impact on the network.

These reports (both available on our website www.neptunecanada.ca) served as input and education to Benoît Pirenne our new Assistant Director, Information Technology in charge of DMAS development, and have helped him in quickly coming to terms with the challenges.

A DMAS Roadmap

In the past two months, a DMAS roadmap has been charted. It calls for three major Stages (the prototyping phase, the VENUS phase and the final implementation phase). The first two Stages will help us identify and understand the various requirements the system will have to satisfy. They will also hopefully serve in helping VENUS with its own data management needs. On the roadmap calendar, the three phases will be somewhat overlapping, with the prototype development starting now and continuing well into the first half

of 2005, but already offering VENUS with gradually improving functionality around March 2005. While VENUS will collect data, the prototype will continue to offer more and improved functionality, and a NEPTUNE operational plan will be drafted based on the information collected. With this information and the operational plan, we will be in a good position to finalize the system design of the full-fledged DMAS and invite partners to contribute to its implementation.

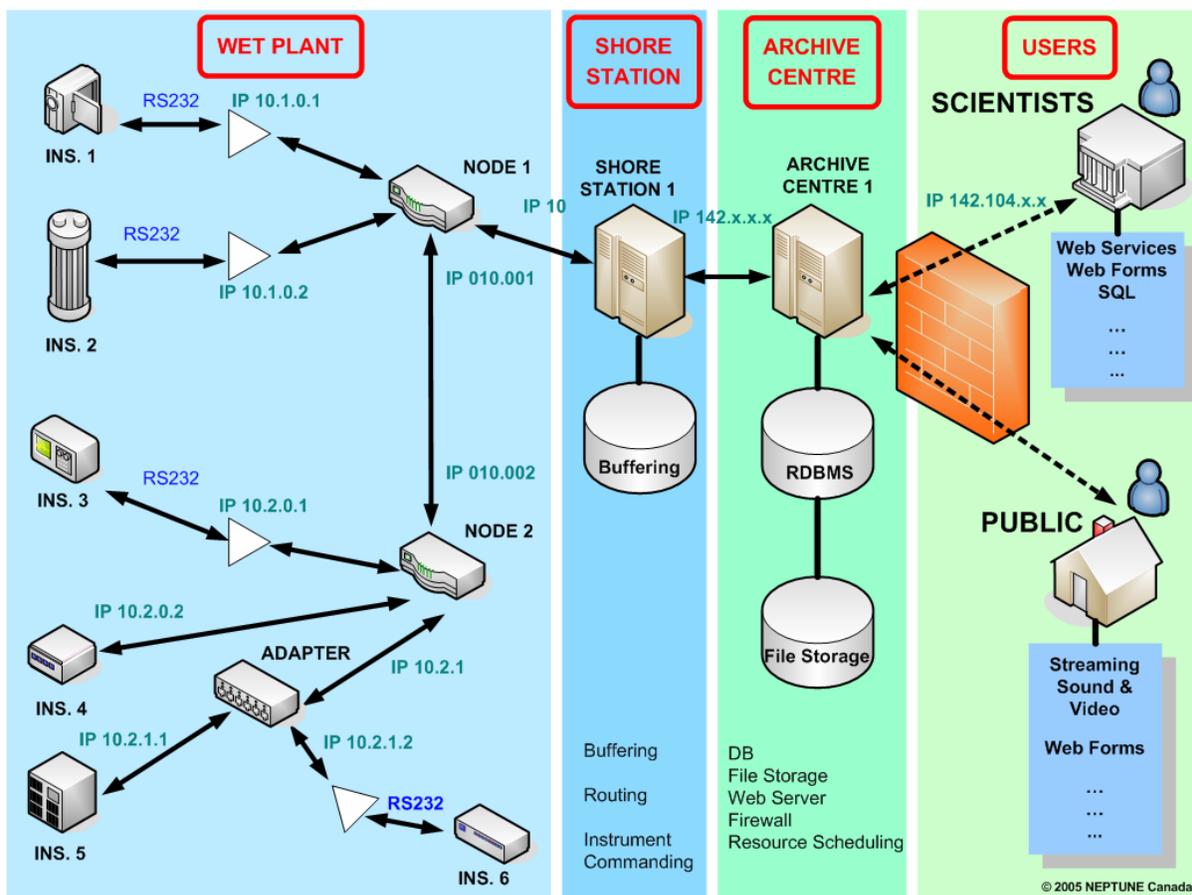
Please see *DMAS* on page 12

Inside the DMAS Prototype

The DMAS prototype is intended to reflect the structure of the overall NEPTUNE (or VENUS) system, and its functionality should mimic what we expect the real system will eventually offer: data acquisition, instrument commanding, resource management and, of course, data retrieval by users and other automated systems.

The prototype, like the real system, will have three different components: the "Wet Plant" — or the

actual network — with the cable, nodes and instruments; the Shore Station, and the Archive Centre. For the sake of simplicity, this entire set-up is placed in a single equipment rack and will contain two computers: one will represent the Shore Station and implement its DMAS functions, while the other will represent the Archive Centre. The set-up is shown in the figure below.



Please see *Inside DMAS* on page 13

The Shore Station functions include the following capabilities:

- Direct communication with the network of instruments (commanding, data acquisition);
- Transformation of the instrument's own private data format into an open format for database storage (for both the metadata and the actual data when required);
- Route network traffic between the instruments and the archive centre;
- Provide a buffer for the data en route to the archive centre in case of backhaul line problems.

The Archive Centre functions will include:

- A database to contain the description of all the measurements and observations (metadata);
- A data warehouse to provide direct access

to all scalar values reported by the instruments;

- A file storage and retrieval system to handle streaming data and more complex, specialized data structures (still images, video, acoustic data, etc.);
- A resource scheduling module which will prevent instrument re-configuration that could harm the health of the entire network;
- A firewall to isolate the system and the network of instruments from harmful external disruptions;
- Web forms to interactively search the archive, retrieve series of values from any instrument and files from streaming devices;
- Specific automated query interfaces returning results in a form abiding to international standards for easy exchange with various applications.

Current Status

At present, the prototype is being assembled. Test and development equipment has been acquired and is being configured. Soon, the first elements of the prototype will be active and ready to perform their mission. We hope to be able to demonstrate a complete data flow for a particular

“At present,
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is being
assembled.”

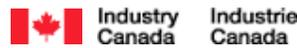
instrument in early 2005, soon to be followed by more instruments. Instrument commanding capabilities and specific search mechanisms will follow shortly, at which point the system should be ready for delivery to VENUS. Watch this space for regular progress reports. 

Industry

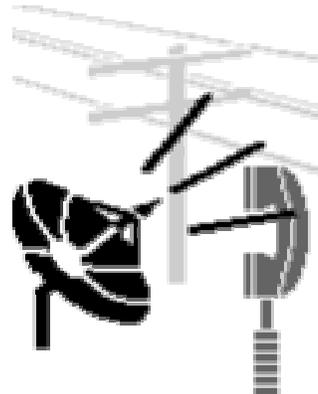
Contacts

Chris Barnes

With the funding awards to NEPTUNE Canada, considerable interest has been shown by the industrial sector in all aspects of the project. There have been many meetings to share information and discuss potential collaboration or contracts. NEPTUNE Canada is particularly interested in developing partnerships that can attract additional funding and/or



in-kind support. Considerable help has been provided by both Industry Canada and Western Economic Diversification in arranging meetings of Canadian marine companies with various agencies, including recent events in Victoria, Seattle and San Francisco, and in promoting the socio-economic benefits of the NEPTUNE Project. 



Staff Profile:

Fern Johnson

Chris Barnes and Fern Johnson

In our Newsletter issues we will be providing a brief profile of our staff members, starting in this issue with Fern Johnson.

Fern joined NEPTUNE Canada in October 2004 as the Manager of Finance and Administration. Previously, she was the Controller of Greenlight Power Technologies Inc., and has held various other accounting positions at Island Medical Labs, Mazda Motors of Canada, and School District #62. During her time at Greenlight, she was an active participant on the management team that achieved Greenlight's recognition as a leading supplier of fuel cell testing equipment worldwide, and assisted in the integration of business functions resulting from a strategic sale. Fern is a graduate of the Camosun College Accounting Program and a Certified General Accountant.



Within NEPTUNE Canada, Fern is responsible for keeping track of all expenditures within the cost model and deals extensively with other financial staff at UVic, with those at the funding agencies (Canada Foundation for Innovation and BC Knowledge Development Fund), and with auditors. She has a range of other administrative responsibilities, including oversight of the central office operation and facilities, and can be reached at fjohnson@uvic.ca and at (250) 472-5363. 

Pass It On

We encourage the sharing of information. NEPTUNE Canada takes no responsibility for views expressed herein, nor do they necessarily reflect those of the organization, partners, funders or the University of Victoria.



The Back Page

Elizabeth Redpath and Nancy Kwong

We welcome any comments and invite you to make contact through the various links and addresses that can be found in our Staff list or on our website (www.neptunecanada.ca). Please also visit: the VENUS website at www.venus.uvic.ca, the MARS website at www.mbari.org/mars, and the ORION Office at www.orionprogram.org.

Components of this issue were prepared by several staff members. Elizabeth Redpath and Nancy Kwong arranged the formatting and distribution. 

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