

# Redundancy, graceful degradation and good engineering practice

Submitted by Lindsay Wallace Mon, 2017-07-17 10:31

## **Upgrading power sources and data backups for ocean observation**

Monitoring the ocean in real-time requires platforms, instruments, cables and sensors in the deep sea. This ocean observing hardware requires high voltage power inputs from shore and delivers big data outputs. All of it needs to be regularly serviced and good engineering practices keep the systems running smoothly.

Every year Ocean Networks Canada (ONC) goes to sea to maintain and upgrade the hardware deployed in the ocean. And this year, power and data backup systems on shore are being overhauled after a decade of operations.

### **Power systems upgrade**

In July 2017, ONC's offshore and inshore power systems received upgrades to ensure that the design goals of redundancy?duplicate devices?and graceful degradation?systems that maintain limited functionality in the event of component or system failure?continue to be met.

The Port Alberni shore station upgrade includes the overhaul of the two power systems that provide high voltage DC power?10,000 volts?to each of the six offshore NEPTUNE sites (Figure 1). The overhaul was conducted by Heinzinger Electronic of Germany.

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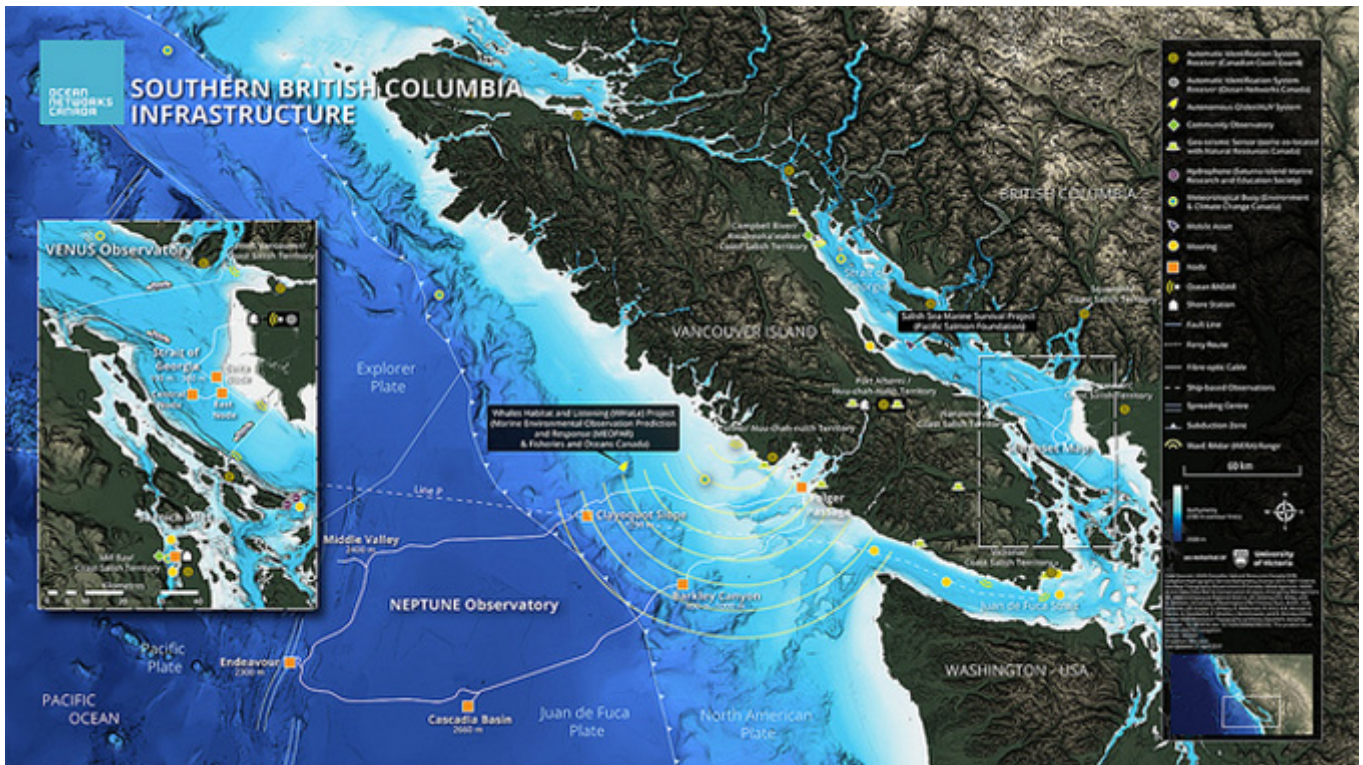


Figure 1. ONC's offshore and inshore infrastructure in southern British Columbia.

The Strait of Georgia shore station upgrade consisted of a new 1,200 volt power system design that enhances system maintainability through the use of commercial-off-the-shelf technology. The new system was supplied by OceanWorks International in Vancouver.

## Data backup move

Redundancy is also vital when it comes to ensuring that ONC's firehose of free open ocean data are archived and available for scientists and decision-makers and for communities in the event of an earthquake or similar catastrophe.

Since 2009, thanks to support from Compute Canada, the University of Saskatchewan has kept a full backup of ONC data—eight terabytes each month. In 2017, Compute Canada streamlined its centralized backup configuration, re-assigning ONC's new backup location to the University of Waterloo.

Just as it is important to keep a backup of your computer or of your family pictures so that you don't lose everything when your computer dies, it is also important to keep multiple copies of irreplaceable scientific data. comments Benoit Pirene, ONC's Director of User Engagement.

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