

A decade of discovery in Saanich Inlet

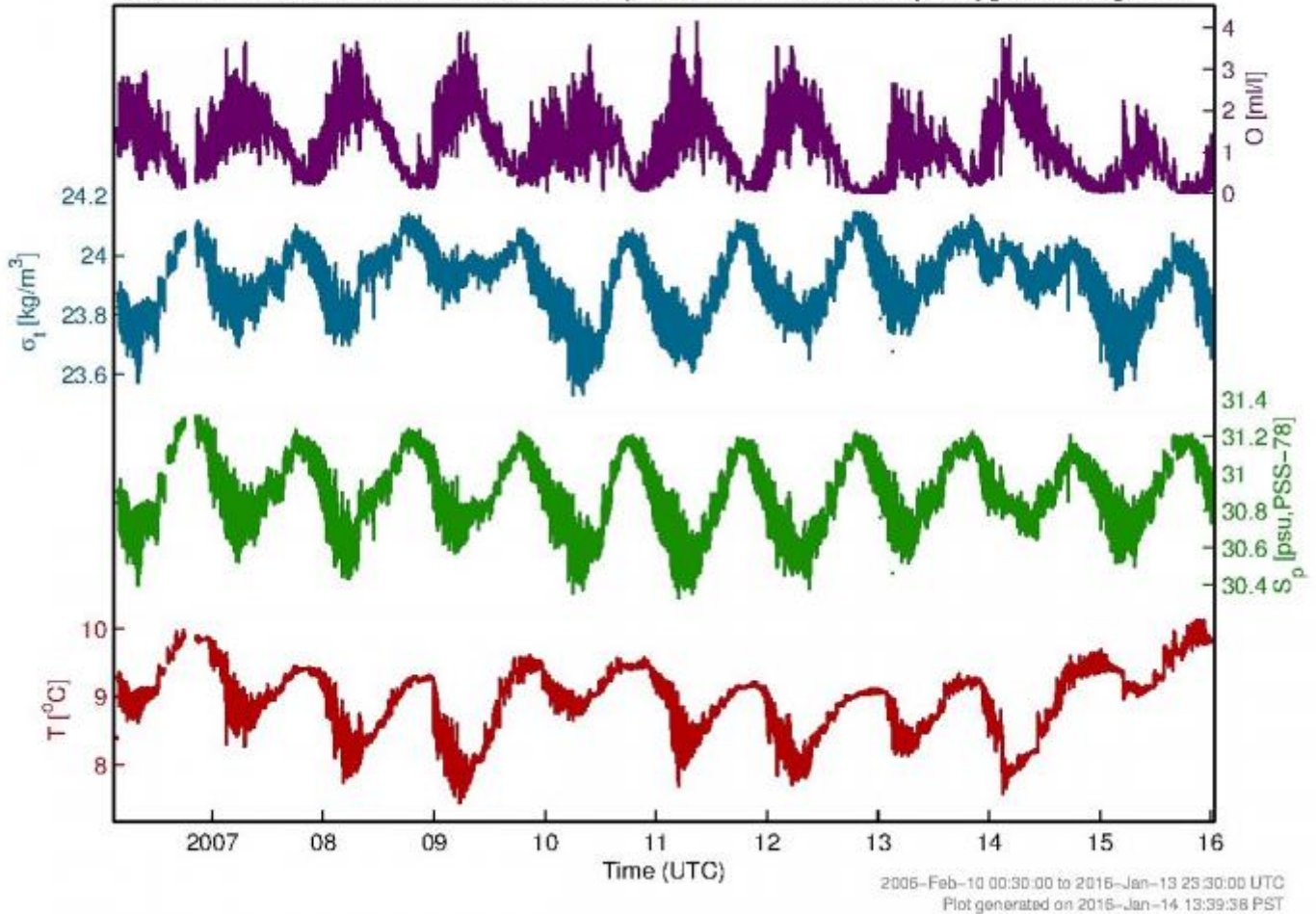
Submitted by Virginia Keast Sun, 2016-02-28 12:56

Ten years ago, the world's first complex, cabled seafloor observatory was installed in Saanich Inlet near Victoria, British Columbia. On 8 February 2006, live data began streaming from instruments on the seafloor to computers around the world. This around-the-clock access to the ocean revolutionized the way ocean research is conducted.

Previously, gathering ocean data was limited to research expeditions; ocean scientists on board research vessels taking isolated measurements that provided a snap-shot perspective of the ocean. Now, after 10 years of observatory science, Ocean Networks Canada (ONC) has accumulated the longest high resolution time-series of data that monitors the physical health of the ocean.

OCEAN NETWORKS CANADA VENUS

Saanich Inlet Central Node VIP at 96m: Temperature, Practical Salinity, Oxygen and Sigma-T



The longest high resolution time-series of data monitoring the State of the Ocean, including: (from the top) temperature, salinity, oxygen and density.

To celebrate this significant milestone, over 50 ocean researchers convened at the University of Victoria campus on 10-11 February 2016. The Saanich Symposium was the perfect opportunity to bring the research community together to share past accomplishments, discuss current projects and draw up a wish list for the next decade.



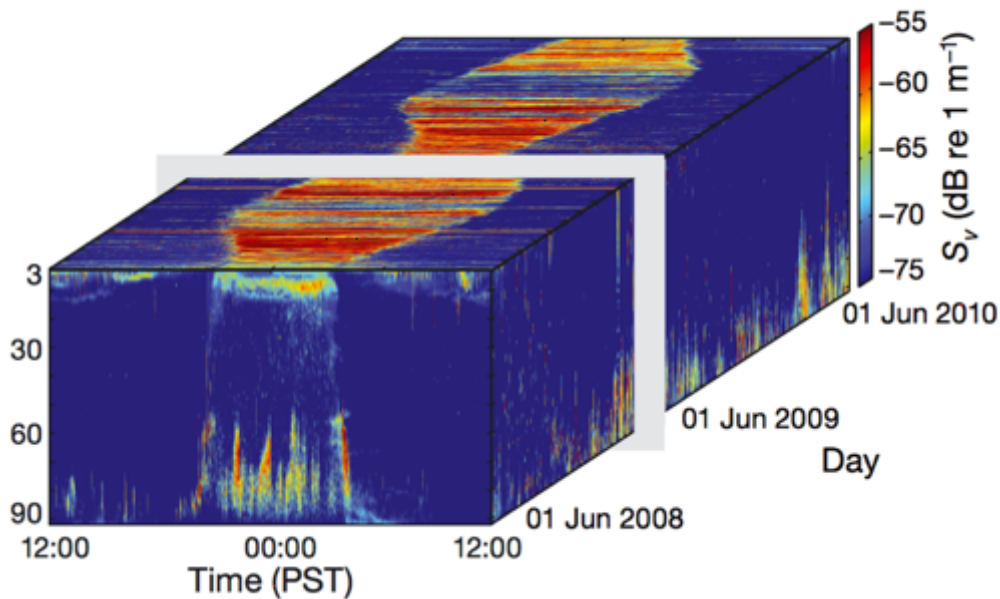
Research and technology evolving hand in hand

Fifteen years ago, Paul Snelgrove was one of the pioneers involved in discussions that led to the creation of ONC's VENUS and NEPTUNE observatories. Today, as both a professor with Memorial University of Newfoundland and Network Director of the Canadian Healthy Oceans Network, he sees science and technology evolving together.

"The sensors are getting better and better, and ONC is at the cutting edge of that development," he says. "I hope that, as these new tools become available, we'll be able to adapt them to really accelerate our research and continue to move away from 'snapshot' ocean science constrained by ship availability, which we know is inefficient and misses a whole range of processes."

Training the next generation

ONC offers ocean science students opportunities to develop their skills in managing big data sets, which they can take to major research facilities around the world. Just ask Mei Sato, who used data from ONC's Zooplankton Acoustic Profiler for her PhD thesis in animal behaviour at the University of Victoria. Today, Mei is a postdoctoral research associate with Oregon State University, currently working on data from the Ocean Observatories Initiative.



This 3D image reveals the vertical migration (over two years) of tiny krill; the zooplankton rise to the surface of Saanich Inlet at night to feed. Source: Using Echo-sounder data to examine migration timing of euphausiids (Sato et al.).

Due to their unlimited power supply, the ONC cabled observatories provide unprecedented ability to collect continuous data sets with high resolutions, says Mei. And that is a key to unravelling biological and physical effects of animal behaviour.

Forensic experiments help criminal investigations

The Saanich Inlet observatory has also provided an opportunity for new and innovative studies. In 2006, forensic entomologist Gail Anderson was invited to further her homicide research by positioning a pig carcass under a camera on the sea floor. By observing the body decomposition process streamed live to her computer, Dr. Anderson has been able to better understand what happens to a dead body in sea water. This research has contributed to solving the mystery of the severed feet that have been washing up on BC shores since 2007.

The ONC observatory has supported Gail's forensic research in ways not previously possible. With 17 pigs and counting, this research project continues to evolve as ONC engineers and scientists improve the process and technology.

Scientists shaping the future

New research projects at Saanich Inlet are also underway. Roberta Hamme, Associate Professor at the University of Victoria, is leading a two-year project to study oxygen utilization and re-mineralization throughout the year. Currently working with eight principal investigators, she'll be using the data streaming from sensors on ONC's inshore vertical profiler system, along with water samples taken during regularly scheduled ship expeditions. The profiler's data may even help scientists determine the best times and frequency to schedule ship expeditions.

During the two-day symposium, attendees had a rare opportunity to network and discuss future collaborations. Everyone agreed that the Saanich Inlet observatory is proving its value as a model system for long-term studies on ocean health.

"With these 10 years as evidence, it's vital that we use science as the base for understanding the ocean so that wise decisions can be made about our future," says Kate Moran, ONC's President and CEO. "We're looking forward to supporting important scientific accomplishments from Saanich Inlet for decades to come."



Saanich Inlet data are freely available for preview and can be downloaded via [Oceans 2.0](#)

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