



***OTN Senior Management Report***

***to the OTN Council***

***3 November 2014***

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**Financial**

OTN spending is given in the table and graphics at the end of the report. Spending is proceeding as budgeted.

CFI and the Province of NS have agreed to an additional funding infusion to OTN of about $1.7M to make up for the projected funding shortfall that would resulted in the termination of a number of key OTN positions as soon as 31 Dec 2014. All positions are now fully funded through the end of Phase 1 funding of OTN, which should carry us into early 2017.

With the provision of this funding, OTN now appears to be recognized as an MSI (Major Science Initiative) by CFI. This is beneficial because certain funding categories that were ineligible expenses for OTN in its original status are permitted to MSIs. A major concern was finding funding mechanisms to pay for insurance for our gliders while at sea. This is now an eligible expense.

**Human Resources**

Ms. Lenore Bajona, OTN Director of Data Management, was previously working for OTN on loan from the Department of Fisheries and Oceans on a Canada Interchange Agreement. The current phase of this agreement expired during the last quarter, and DFO did not agree to renew it. Ms. Bajona chose to leave DFO to continue in her position with OTN.

Kyle McKenzie, Network Manager (NM) for the NSERC-funded OTN science grant, has taken an extended leave of absence (as of 1 October) for medical reasons. At this time, the leave is presumed to be at least 3 months. Amy Ryan who, has worked for Sara Iverson’s lab for several years, has stepped in as acting NM to assist especially with the annual fall reporting due for submission in mid-November to NSERC and the Scientific Advisory Committee (SAC). The position of NSERC NM and its reappointment is one that is reviewed annually and discussions are underway about potentially redefining the roles of the two NSERC funded positions (NM and Communications/PR).

Mr. Jon Pye, OTN Portal Manager, has welcomed the arrival of a new son, Theodore.

Mr. Duc Cuong Dinh has joined OTN as an electrical engineering co-op student working with the data management group assisting with data loading processes. He is also assisting the glider team with some stray electrical current challenges, and investigating the causes of failure for several faulty Benthos acoustic releases.

**Operations**

***Line Status***

Currently deployed lines are generally operating as planned and scheduled (complete line list given at the end of the report). Of note are circumstances pertaining to the following lines:

**Gibraltar**

Based on the absence of progress with our Gibraltar partners, we began alternate plans to deploy the equipment originally purchased for this line elsewhere. Consistent with our agreed strategic focus on Europe, some of these VR4s will be targeted for use by a team from Herriot Watt University in Scotland (PI Lea-Anne Henry) for deployment on the Mingulay Reef Complex, a deep-water coral site and Marine Protected Area in the North Atlantic Ocean off Scotland’s coast. The site is well positioned to pick up a variety of migratory animals (tuna, sharks, salmon). The equipment loan will be of great assistance to the Heriot Watt research team as they leverage operating funding for their work. The remaining equipment will find a home either on a new line off the Pacific Coast of North America, or potentially in a line between Labrador and Greenland (see below). The Gibraltar effort may still have a pulse. Antonio Medina of the University of Cadiz is trying a last time to find support for the line from the academic community and ICCAT. However, we have had no positive news, and it seems highly unlikely that a breakthrough will occur. All parties are aware of the time constraints on OTN and that we cannot afford to wait much longer to deploy this equipment.

**OTN West Coast lines**

The Pacific Salmon Foundation, with international support from the USA and including funding from private and industry donors, has launched a new $10M Salish Sea Marine Survival Program (<https://www.psf.ca/what-we-do/salish-sea-marine-survival-initiative>) to investigate the movements and survival of Pacific salmon. The program among other activities will specifically address a number of recommendations stemming from the Cohen Commission requiring the investigation of early life movements and survival of juvenile Pacific salmon, especially in relation to salmon cage farming in the region. OTN has been requested to provide a loan of VR4s to create a line in the Queen Charlotte Straits that would fill a critical gap in the current Queen Charlotte Straits receiver coverage to answer these research questions. OTN is proposing to use some of the Gibraltar equipment to meet this need. ONC is also a participant in this program.

**Perth Line**

The renewed collaboration agreement and modifications to the data management plan with Western Australia Fisheries has been signed by all parties and is now in force. The shark cull in Western Australia has been stopped following a ruling from the Australian Environmental Protection Authority (http://www.epa.wa.gov.au/Pages/default.aspx). This ruling was greatly influenced by the intervention of the international scientific community. OTN’s submission to the Australian government in opposition to the cull was an important argument used by the international scientists, which included OTN members.

**Tasmania Line**

The recovery mission planned for 4 June 2014 to recover the stuck Tasmania line receivers did not succeed due to poor winter weather. A new attempt will be made some time in the Australian summer.

**Arctic: Lancaster Sound**

The vessel employed to retrieve the equipment deployed approximately 100 km to the east of Resolute arrived at the site too late in the season, and was unable to reach the line due to ice formation. We believe that the release batteries will still have enough power to bring the units to the surface next summer. We are now attempting to line up shiptime support for a rescue mission in 2015. After 2015, the units most probably will not be recoverable.

***Gliders***

**Slocum Gliders**

Gliderpalooza II, “Glide Harder”, is underway. OTN is anchoring the northern component of the study, deploying two Slocum gliders, one in our regular sampling along the Halifax line (which is an Atlantic Zonal Monitoring Program (AZMP) sampling site for DFO), and the second in the Roseway Basin off of southern NS. We have again provided mobile acoustic receivers to a number of the other participants in Gliderpalooza II.

The Roseway Basin work is a collaboration with MEOPAR and WHOI, and is investigating the factors determining the distribution of endangered Right Whales in this area. The glider team has been “formation” flying the OTN Slocum glider which is measuring oceanographic parameters and using our new on-board sonar to estimate zooplankton abundance, in concert with a WHOI glider equipped with passive acoustic monitoring equipment to document the presence of the whales. So far, so good.

In a collaboration of the Florida Fish and Wildlife Research Institute (FWRI), the University of South Florida (USF), and the Ocean Tracking Network (OTN) an Autonomous Underwater Glider (AUG) equipped with a suite of environmental sensors, a passive acoustic recorder, and a Vemco Mobile Transceiver has been launched in nearshore red drum spawning habitat in the Gulf of Mexico to compare detection rates by this mobile platform versus the traditional passive receivers. This study is profiting from a large population of acoustically tagged red drum (n=100) released by Dr. Sue Barbieri (FWRI).

**Wave Glider**

Repairs to the Wave Glider tow cable have been completed, and it is at sea. After a trial on the Halifax line to confirm data downloading is working as planned, the vessel is heading to Sable Island to download the VR4 array there. Following this, the plan is to send it to the most offshore portion of the Halifax line, and have it move its way inshore down the line, downloading receivers as it proceeds. Much of the piloting of the Wave Glider will be done in-house by a suite of newly minted Dalhousie pilots.

***Infrastructure Developmental Initiatives***

***Europe:***

Work continues on the preparation of a Northern Periphery Program proposal that will monitor wild and farmed Atlantic salmon. The grant request is $2-3M Euros. OTN has reserved $100K worth of receivers as leverage for this proposal. The proposal is due in November 2014.

OTN is included in the AtlanOS BG-8 submission to Horizon 2020 to lead the development of the European Telemetry Network. The submission does not include capital funding for new telemetry equipment or operations and maintenance, but rather aims to begin coordinating existing European trackers into a telemetry work. Notification on the status of the application is expected by 29 Nov 2014, and if approved money should start flowing in March 2015.

The North Atlantic Salmon Conservation Organization (NASCO) is hosting a workshop on orienting its research efforts towards telemetry to document Atlantic salmon biology and survival at sea in London in the first week of December. OTN will participate. We are also exploring the possibility of two additional deployments of equipment in association with tidal power development, and offshore wind power sites, in northern Scotland.

***Brazil:***

OTN completed deployment of receivers on the PIRATA (Pilot Research Moored Array in the Tropical Atlantic) -Atlas Buoy Network, a joint initiative of the USA, Brazil and France.

An OTN telemetry workshop is planned for the first week of February 2015 in Recife in conjunction with a large national conference. Excellent attendance is expected, as there is a great deal of interest now in building the Brazilian OTN Node, incorporating both new and existing telemetry initiatives across the entire east coast of Brazil and into the Amazon. Vemco will send staff to the workshop to provide technical training. Sara Iverson will undertake her second sojurn as a Special Visiting Researcher Fellowship sponsored by the Brazilian Government at this time.

***USA:***

Deployments of the cabled VR2C at Catalina Sea Ranch Inc. have been delayed due to the late arrival of the borrowed oceanographic buoy that the firm will use for its monitoring program. That buoy is now on site, and fit-up of it is commencing.

Progress continues on building an acoustic telemetry network for the Gulf of Mexico region (iTAG), ably led by Susan Barbieri of Florida Fish and Wildlife. Gulf investigators are drafting a coordinated science plan, a local schoolgirl (daughter of one of the investigators) has undertaken an on-line fundraising effort for tags, and OTN plans to provide $400K of telemetry equipment to cement coordination of the network.

Planning has begun for collaborative USA-Mexico-OTN lines in the Pacific Ocean. A first meeting of the potential partners has occurred, and the vision is to place a line spanning the continental shelf to pick up cross-border movements of species, and also to place equipment in the Gulf of California to monitor large pelagics including sharks, game-fish, and manta rays. However, there has been no recent progress.

Mid-Atlantic Bight: OTN commitment to the Atlantic Cooperative Telemetry Network’s (ACT’s) Cape Hatteras line (Roger Rulifson, PI) is being used as a match for a request for funding for a new coastal research vessel.

Labrador-Greenland line (funded by NSF, USA): OTN is being included in a proposal submitted by the University of Washington (Dr. Craig Lee) to establish a line of oceanographic buoys across the Davis Strait between northern Labrador, and Greenland. If the proposal is accepted, OTN will provide VR4 receivers to provide coverage in this area.

OTN is working collaboratively with Emera on their snow crab tracking program, part of the environmental monitoring program for the Maritime Fixed Link cable (moving power from Churchill Falls, Labrador, across the Gulf of St. Lawrence’s Strait of Belle Isle, then across the Cabot Strait) has closed. OTN’s pilot work with DFO independent of Emera in 2012 successfully tracked 10 of 16 crabs. All crossed the Cabot Strait line between stations 2 and 14. We are using our partnership with Emera now as a test of new VR2AR technology. Deployments were delayed when the charter vessel Emera engaged sank at the dock during rough weather.

***Other sites:***

Bahamas: Deployment has successfully occurred of a line of receivers at Tiger Beach. This will complement coverage provided by mainland USA receivers maintained by the partners of the Florida Acoustic Cooperative Telemetry (FACT) and ACT, and facilitate ongoing telemetry research in the Caribbean especially on large predators such as the tiger shark.

Magdalene Islands, Canada: The joint industry-government initiative examining the impacts of mussel farms upon lobsters has been completed. Personnel are now struggling to find a good weather window to retrieve the equipment.

RAMA and TRITON/TAO buoy network: Similar to PIRATA, a network of weather warning buoys has been deployed in the Indian and Pacific Ocean, and offers opportunities to add acoustic telemetry receivers and provide valuable receiver stations for global investigators. Zdenka Willis has brokered an introduction of OTN to the RAMA and TRITON/TAO networks, and we are now exploring the possibility of adding OTN receivers to these buoys.

**Information Technology**

Dalhousie University continues to organize an oceans sector application for the anticipated CFI $50 - 75M Cyber-infrastructure call. A number of teleconferences, and face-to-face meetings have been held.

**Communications and Network Building Activities**

Since last June 2014 Council Meeting:

The OTN $25K NSERC Partnership Workshop entitled “An Ocean of Opportunity: Mutual goals, shared resources, effective outcomes”, took place on June 6th in Ottawa, and was a success. Participants discussed how major ocean-focused Canadian science networks can share resources and build collaborations among themselves, and with industry. The outcomes of this workshop and OTN’s efforts were featured in the 2-day meeting organized by CCORU (Canadian Consortium of Oceans Research Universities) in October in Ottawa to discuss national strategies for ocean science in Canada.

OTN hosted a successful session at the Coastal Zone Canada meetings in Halifax in June 2014.

Two telemetry symposia were held at the American Fisheries Society Annual Meetings in Quebec City in August 2014. Both were strongly tied to OTN. The first, is *Telemetry on the Atlantic Coast: Tagging Locally and Observing Globally*, was organized by John Kocik and colleagues. The second is *Fish Migration and OTN*, and was proposed by Melanie Beguer, Martin Castonguay, and colleagues. Both were very well attended.

Led by Nikki Beauchamp, with the help of a summer co-op student, the OTN website has undergone a complete face-lift and moved to a more user friendly program format.

Sara submitted the solicited review, entitled "Telemetry tracking of aquatic animals and their environment across spatial and temporal scales: discovery, applications and relevance” to *Science* in September*.* It is currently undergoing “in-depth evaluation”.

OTN organized a panel on “Big Problems, Big Networks, Big Data”, for the Canadian Science Policy Conference in October in Halifax.

Rick Mercer joined the OTN this summer to go tagging and tracking of blue sharks off of Halifax. The program aired on 21 October 20141, and generated a great deal of very positive publicity for OTN. It can be accessed on-line at:

<https://fileshare.dal.ca/public.php?service=files&t=4b65a6eb62e3dcbed027b84228bd54e0>. OTN website traffic quadrupled after the program aired.

The OTN SAC will meet in the first week of December to review investigator reports and authorize continued funding for deserving projects. A major focus of the meeting will also be on longer-term vision and the Network’s future post 2016.

Work continues on developing international strategies to coordinate US-Canada-EU work in the Atlantic Ocean under the Galway Statement and Horizon 2020. Meetings have been held in Brussels on 12-13 June 2014 (“Strengthening Science, Technology and Innovation Partnerships between Canada and Europe”), and a Canadian Implementation Working group is meeting by teleconference or face-to-face regularly. Meetings were also held in Brest, France in September, to discuss potential collaborations for Horizon 2020. OTN is a major component of Canadian participation in this international initiative.

The next meeting of the Canadian Network of Northern Research Operators (CNNRO; OTN is an associate member) will occur in December in association with the ArcticNet meetings.

The OTN article in the Canadian Naval Review was very well received, and used by the editors to document a broader vison of the national security interests for Canada in the ocean beyond the traditional projection of military power.

The OTN newsletters and Bulletins are being produced regularly, and strong media coverage has been obtained on OTN following the issuing of a number of press releases. A decision was made to henceforth produce the OTN Public Annual Report in conjunction with the submissions of the NSERC Network activities to make the process of producing the Report more streamlined and to make it the most up to date. The next Report will be produced in December.

| Ocean Tracking Network Line Status | | | | |
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|  | Array Name | Line location(s) | Deployment date (initial/  *projected*) | Status (VR2/3/4) |
| **International Lines** | Perth | Australia | January 2009 | Operational (53 VR2) |
| Cape of Good Hope | Algoa Bay, Mossel Bay, South Africa | October 2011 | Operational (60 VR2) |
| Azores | Portugal | February 2012 | Operational (16 VR2, 3 VR4) |
| Bass Strait | Maria Island, Tasmania, Australia | January 2012 | Operational (81 VR2) |
| ~~Strait of Gibraltar~~ | ~~Spain-Morocco~~ | ~~June 2012~~ | Reallocated due to lack of operational support |
| Hawaii | USA | April 2012 | Operational (24 VR2) |
| Sør-Trøndelag, Hemnefjorden\* | Norway | April 2012 | Operational (40 VR2) |
| Juan de Fuca Strait | USA/Canada | October 2012 | Operational (88 VR3) |
| Gliderpalooza | NE Atlantic | May 2013 | 9 VMTs are functioning as mobile transmitters on Slocum gliders |
| Prince William Sound, AK | USA | March 2013 | Operational (27 VR4) |
| Great Lakes Fishery Commission\* | USA | August 2013 | Operational (45 VR2) |
| Angola\* | West Africa | September 2013 | Operational (40 VR2) |
| PIRATA\* | Brazil- Africa | November 2013 | Deployed (17 VR2). USA-Brazil-France-Canada collaboration |
| USA | Florida | 2014 May | Deployed (5 VR2) |
| USA | California | 2014 October | Catalina Sea Ranch. Deployed (1VR2C) |
| Indian Ocean | Reunion Island, France | June 2013 | Deployed (5 VR2) |
| Bahamas | Little Bahama Bank, Tiger Beach, Bahamas | May 2014 | Deployed (17 VR2) |
| Denmark | Denmark | *October 2014* | Shipped, awaiting deployment (25 VR2) |
| Bahamas - Philipp | Bahamas | *December 2014* | Application received (32 VR2) |
| South Africa - Dicken | South Africa | *January 2015* | Application received (12 VR2) |
| Eliat | Red Sea | *January 2015* | Application received (22VR2) |
| The Scottish Project | Aberdeen | *April 2015* | Inquiry received (50 VR2) |
| Northern Periphery Program | Ireland, Norway. Scotland and Iceland | *2015* | Letter of intent successful. OTN has committed $100,000 in receivers. Application to be submitted by Nov 2014 |
| Kerguelan Islands | France | *January 2016* | Inquiry received. Coapplication submitted to French Government |
| Greenland Buoys | Greenland | *2015* | (12 VR4) |
| Tao/Triton Buoys | Equatorial Pacific Ocean | *2015* | Inquiry made (40-80 VR2) |
| Oman | Oman | *?* | Inquiry received |
| Culebra, Puerto Rico\* | USA | *?* | Project plan received, working on deployment committee recommendations (30 VR2) |
| Mozambique | West Africa | *?* | On hold (political challenges) (24 VR2) |
| Kaust\* | Saudi Arabia | *?* | Inquiry received |
| Cape Hatteras | USA | *?* | Inquiry received |
| Brazil | Brazil | *2015* | (?) |
| USA-Mexico | TBD, Trans-border line between CA and Mexico, plus possible sites in Gulf of California | 2014-15 | Partnership with Monterey Bay Aquarium Research Institute, University of California Long Beach, Laboratorio de Ecologia Pesquera CICSE, Centro Interdisciplinario de Ciencias Marinas La Paz, U Cal Santa Cruz. |
| Bermuda | Bermuda | *?* | (6 VR4) |

\*Equipment pool (short term loans) updated

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| --- | --- | --- | --- |
| Ocean Tracking Network Line Status (cont.) | | | |
|  | Array Name | Deployment date (initial/*projected)* | Status |
| **Canadian Lines** | Halifax | April 2008 | Operational (55 VR2, 162 VR4) |
| Cabot Strait (Incl. Canso) | October 2009 | Operational (89 VR2, 96 VR4) |
| Antigonish | March 2010 | Operational (18 VR2) |
| Minas Basin (Gulf of Maine) | April 2010 | Operational (12 VR2) |
| Vancouver-Fraser | April 2010 | Operational (14 VR2, 8 VR4) |
| Resolute 1 | August 2010 | Operational (130 VR2) |
| Resolute-Maxwell Bay | September 2011 | Operational (21 VR4) |
| Cumberland Sound (Pangnirtung/Scott Inlet) | July 2011 | Operational (26VR2) |
| Strait of Belle Isle (seasonal) | June 2011 | Operational (4 VR4) |
| Venus | 2011 | Trial phase completed |
| Vancouver-Northern Strait of Georgia | January 2012 | Operational (25 VR3) |
| Queen Charlotte Strait | October 2012 | Operational (27 VR3) |
| Buoys of opportunity – Gulf of St. Lawrence | April 2012 | Operational (9 VR2) |
| Buoys of opportunity – Oceans Network Canada | April 2013 | Operational (3 VR2) |
| Sable Island | July 2013 | Operational 5 VR2 |
| Oceans Network Canada Cambridge Bay | November 2013 | Operational 1 VR2C |
| Fraser River | April 2014 | 16 VR2 |
| Campbellton River | May 2014 | 30 VR2 |
| Parkers Brook | June 2014 | 10 VR2 |
| AMEC | September 2014 | 15 VR2AR |
| Pacific Salmon Foundation | *May 2015* | 35 VR4 |

\*Equipment pool (short term loan)



