

VOICEPIPE

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The Newsletter of the BIO-Oceans Association



Barry MacDonald chosen 2015 Beluga Award Recipient



Andrew Cogswell (left), Chair of the BIO-OA Beluga Award Committee presents the 2015 Beluga Award to Barry MacDonald (right). Photo: Claudia Currie.

During his 19 years with DFO, Barry MacDonald has had a hand in a diverse array of projects and initiatives. Barry started out as a scallop technician with Dr. Ginette Robert at the Halifax Lab on Lower Water Street and later accepted an indeterminate position with Dr. Ellen Kenchington. Barry's roots are in aquaculture where he has built long standing relationships with every

shellfish grower in the province. He's also played a key role in the success of the Eskasoni Fish and Wildlife First Nations oyster aquaculture program, helping design their lab and develop procedures for feeding, spawning and rearing. Barry is very adaptable and has molded his expertise to match ever evolving research priorities. Over the past few years, Barry has seamlessly

**BIO-OA Summer Cruise
and Luncheon
5 August 2015**

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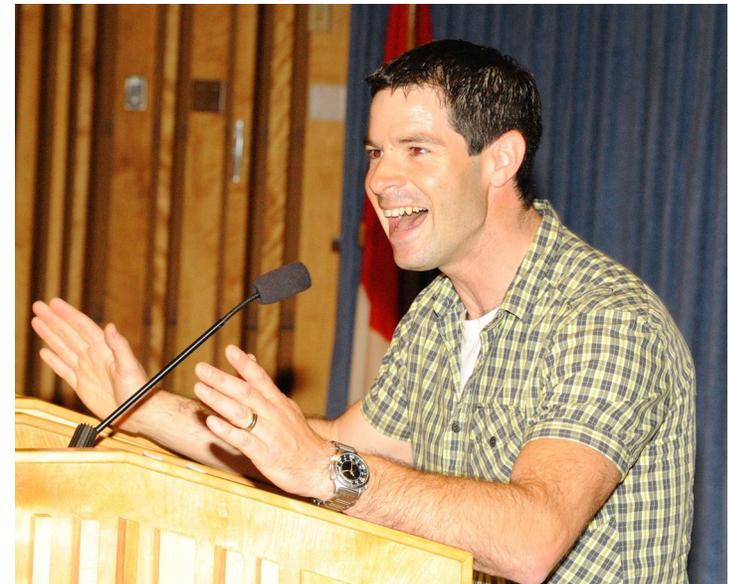
taken over lead roles at-sea off the Atlantic and Arctic coasts deploying and maintaining scientific gear, and compiling accurate data for the Benthic Ecology Program.

Barry is a natural leader and possesses the ability to make others feel welcome. He is honest and open and always encourages others to cooperate and work as a team in an environment where all opinions count and everyone's efforts are expected. Barry is reliable, knowledgeable and likeable and is one of those people that everyone gravitates towards. He is known throughout the institute and across departments as a "go to guy" and can be counted on to solve your problem or find someone who can.

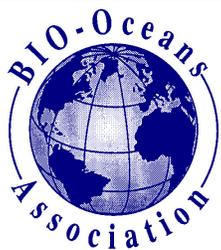
During his time at BIO, Barry has contributed to Open House displays, contributes to committee work (including the Beluga Awards Committee) and volunteers every year with the Parker Street Food and Furniture Bank. He is honest, hardworking and competent, attributes that continue to gain him respect and evoke confidence from his peers and managers. Barry truly possess all of the qualities and characteristics the Beluga Award embodies.

One nomination letter stated "Despite all the skills and abilities that make him a successful biologist, his greatest assets are his reliability and willingness to go out of his way to help colleagues. He is unassuming, welcoming and very easy to approach, self-motivated, extremely competent and efficient.... It's clear that Barry is a highly respected biologist and a valuable resource even to people outside the BIO community."

Barry deservedly joins a long list of exceptional Beluga Award recipients. We are proud to recognize Barry as this year's recipient of the Beluga Award.



Photos (clockwise from top left): Barry MacDonald (right) sits with his family, his wife, Kelly (left) and their daughter, Emma (middle); Dr. Ellen Kenchington delivers a testimonial; Shawn Roach gestures during his speech at the Award ceremony; and participants in the award luncheon held at Salty's in Halifax. Barry is at the back on the right. Photos: Claudia Currie.



FROM THE PRESIDENT

Two years have slipped by and now the President's gavel has been handed over to Mike Murphy. I want to thank everyone for helping my tenure run so smoothly over those two years. I wish Mike

all the best over the next two years and that everything will run smoothly for him.

The BIO-OA has been active for seventeen years now, providing a continual contact between present and former employees of BIO. I have heard rumors that the BIO-OA is an "old fogies" group. This is not so, as there are many younger members who are still working or have recently retired. The First and Second Vice President's positions are still vacant and filling these positions with "younger fogies" would be a start to end this stigma. So naysayers, step up to the plate. The BIO-OA still has a keen interest in a "younger" BIO with the Be-luga Award being a fine example.

Without the BIO-OA, the first fifty years of Oceanographic Research history at BIO, as told through the 'Voyage of Discovery', would not exist. Another contribution to the history of BIO is the archiving and displaying of old research equipment and artifacts, so newer employees and the general public can see how we have advanced in oceanographic research over the years.

This publication, *Voicpipe*, is distributed to all members and through the BIO-OA website, to the world. This is another tool in promoting continuing interest in the BIO-OA.

I look forward to seeing everyone at this summer's get together, which is slated for 5 August 2015 and will include a boat tour on St. Margaret's Bay and a luncheon at White Sails Bakery and Deli in Tantallon. See the announcement included with this newsletter.

Mike Hughes
Past President

In Memoriam

Maureen Patricia Kelly Vine, died 29 May 2015, wife of Dick Vine.

Letter to the Editor

Dear All,

I find it shaming that *Voicpipe* would use text from an environmental journalist to keep us up-to-date as regards sea-level rise - surely there's someone left at BIO who could have done better?

The statement that "For centuries before 1800 sea level rise was essential zero" is complete nonsense - it varies according to the amount of water frozen into glaciers ashore: always has, always will.

Then, consider the attached graphic [showing sea level rise projections] from IPCC AR5 in connection to his statement concerning changes in 20th century rate and the consequences of the 40s-60s glacier advances. One doesn't hide information to make a point in science, however much one is concerned about our poor planet.

Sincerely,

Alan Longhurst

[Editors Note: Responding to Alan's suggestion, readers are referred to the recent Geological Survey of Canada Publication "Relative sea-level projections in Canada and the adjacent mainland United States" (2014) by James, T. S.; Henton, J. A.; Leonard, L. J.; Darlington, A.; Forbes, D. L.; Craymer, M., Geological Survey of Canada, Open File 7737, 2014; 72 pages. Don Forbes is an emeritus scientist at BIO. The lead author, Thomas James, is a research scientist at GSC Pacific at the Institute of Ocean Science in Sidney, BC. The publication can be downloaded from <http://geoscan.nrcan.gc.ca/>

Historical sea-level rise is discussed in Church, J.A. and White, N.J., (2011). Sea level rise from late 19th to early 20th century, *Surveys in Geophysics*, September 2011, Volume 32, Issue 4-5, pp 585-602.]

This Lighthouse Matters

The National Trust of Canada and the Nova Scotia Lighthouse Preservation Society have initiated a competition and crowd-source campaign to raise funds for projects to preserve 25 lighthouses across Nova Scotia.

All of the competitors are non-profit community groups working to save their lighthouses. You can vote once a day, every day, for as many projects as you like up until 15 July 2015. To vote and contribute visit:

<http://thisplacematters.ca/competition/this-lighthouse-matters/>

**BIO-OA 'SPRING TREAT' EVENT
Maple Lecture - Luncheon Feast - Tour
of ACADIAN MAPLE PRODUCTS Facility
14 May 2015**

by Bob and Heather Cook

The weather cooperated and a sunny day welcomed the BIO-Oceans Association visitors to this wonderful Acadian Maple Products (AMP) "temple" of all things maple

on the Peggy's Cove Road in Upper Tantallon, Nova Scotia. Brian Allaway, our host, gave a personal account of how he started his maple products business 33 years ago and how it has grown, expanded, and diversified over the years. He was once a High School principal who had to retire early due to health problems. It was suggested he start a hobby, advice he followed by converting the family's backyard hobby of producing maple



Lecture, luncheon feast, and tour of the Acadian Maple Products facility (14 May 2015): (upper & lower rows) feasting and shopping; (middle row) speaker Brian Allaway (left) and David Nettleship introducing the speaker (right). Photos: Heather Cook

sugar products into a significant enterprise and industry leader, recently recognized by AMP being inducted into the 'Hall of Fame' by the Maple Producers Association of Nova Scotia. We were given insight as to the production of maple syrup, including collection methods, standards and grades, and distribution by AMP both domestically and worldwide including Switzerland, Norway, Netherlands, United Kingdom, Ireland and China. His facility is a popular stop for tourists on bus tours visiting Peggy's Cove, a number that exceeded 30,000 people in 2014.

After the informative and stimulating lecture and 'Question & Answer' session, we were all primed up for the outstanding buffet luncheon that followed with opportunities to sample different syrups with pancakes and

toast, special Cavicchi maple sausages and Meadowbrook maple smoked bacon. The coffees, all roasted on site, also included a maple flavoured version. Adjacent to the spacious lecture and luncheon area was a gift shop with a broad assortment of maple products (sugar, fudge, cookies, peanuts), as well as fruit jams and preserves, and maple wine! We were invited by store manager Crystal Cadeau to taste many of the products prepared on site and view the local crafts that were on display, including a book section comprising works by Nova Scotian authors (e.g., our own '*Voyage of Discovery*').

On behalf of the thirty-two BIO-OA members who attended this enjoyable event, our thanks go out to David Nettleship who organized this special occasion.

BUY VOD TODAY!

BIO-Oceans Association has published a major treatise reviewing the history and marine research accomplishments at Canada's Bedford Institute of Oceanography (BIO) over five decades, primarily in the Atlantic and Arctic oceans.

'*Voyage of Discovery*' (VOD), a massive hardcover volume comprising 460 pages printed on premium 8.5 x 11 inch Sterling 100-lb glossy paper with sewn binding, was released on 6 October 2014 with an official 'VOD Book Launch' at BIO in the Ford Auditorium on 20 November 2014. The book's well-written text (almost half-million words) and illustrations (total of 566, mostly in colour) will appeal to a broad readership from professional oceanographers, environmental/resource managers and decision-makers, to marine science students and lay persons interested in the Atlantic and Arctic oceans. This publication is a 'must-have' book for any student of Canadian ocean science.

'*Voyage of Discovery*' is available at BIO or by mail at \$35.00 per copy plus shipping (for mail orders). For pre-paid mail-orders (by cheque, money order, credit card), contact BIO-OA for cost of shipping and/or credit card usage (902-826-2360 or 902-469-2798), and then send payment to: BIO-Oceans Association (VOD), c/o Bedford Institute of Oceanography, P.O. Box 1006, Dartmouth, NS, Canada B2Y 4A2. Also available at Binnacle, Bookmark, Chapters Dartmouth, JWD Doull Books, NS Museum of Natural History, NS Maritime Museum of the Atlantic, Schooner Books, and other retail outlets.

Once obtained, it's cast-off time into the '*Voyage of Discovery*' volume for exciting and stimulating reading of some extraordinary research findings derived from 50 years of study by BIO scientists and associates. Enjoy and discover a sample of the many special characteristics of the marine waters that surround us!

VOYAGE OF DISCOVERY

Fifty Years of Marine Research at Canada's
Bedford Institute of Oceanography

Edited by

D.N. Nettleship
D.C. Gordon, C.F.M. Lewis
and M.P. Latremouille



Bedford Institute of Oceanography
Oceans Association

Coastal South Africa

by Andy Sherin

At the end of April my wife, Sheila, and I were able to experience the south coast of South Africa. Our flight path from London, England to Cape Town, South Africa took us over the South Atlantic Ocean overnight, arriving with a spectacular aerial tour of Table Bay, the city, the Cape of Good Hope, and False Bay as we landed. Our journey to South Africa fulfilled my wife's dream of visiting Africa and included my participation in the 7th workshop of the International Coastal Atlas Network

Ashton Maherry, a geohydrologist from CSIR described the geological history and rock layers that composed Table Mountain. Unlike the mountains that surround Cape Town which are highly folded, the rock layers of Table Mountain are flat lying due to the underpinning of granite at the base.

At the first stop, Laurie talked about the impact of the construction of the container terminal on the coastal dynamics. The change in coastal circulation has exacerbated erosion of the foredune at this site. South African law requires that as the shoreline recedes, ownership of the coastal land transfers to the government. Landowners at

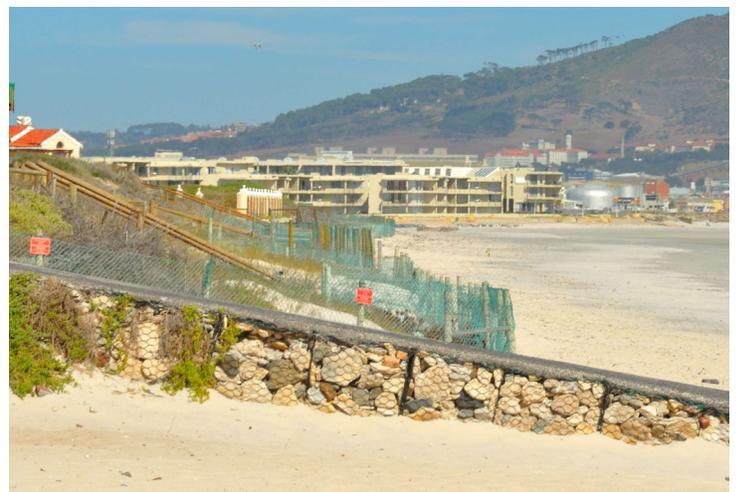


and the 2015 CoastGIS symposium, both being held in Africa for the first time.

The meetings were held in the Breakwater Lodge Hotel, on the Cape Town waterfront, which like parts of the Halifax waterfront has been transformed from a run-down industrial site into a major tourist attraction.

The CoastGIS conference included a half day field trip along Table Bay, the bay where Cape Town is located. The field trip was led by Laurie Barwell, a retired coastal engineer from the Council for Scientific and Industrial Research (CSIR), one of the South African hosts for CoastGIS, and Darryl Colenbrander, Coastal Coordinator for the City of Cape Town.

We visited several coastal sites along Table Bay and learned about the coastal dynamics of the bay and the coastal management issues that challenged the city. With the city and Table Mountain in the distance,



Photos: (top) View of Cape Town and Table Mountain from the last stop on the CoastGIS Table Bay field trip; (bottom) Landowner fencing at the first stop on the field trip also showing extensive coastal development in the background and in the foreground, the exposure of the shoreward section of a groin, a hard shoreline structure used to trap sand on the beach.

this site had erected fences along their former property lines and hired security guards to maintain a claim on the land they once owned and deny the public access to what was now part of a public beach.

The next stop was the site of what was an active dune management program that for twenty years had prevented the dune from migrating across a road. The program was so “successful” that it was felt the program was no longer necessary. Of course, as soon as the active management program was ended, the dune started to encroach on the road once again.

Our last stop on the trip was for refreshments and a group photograph with Table Mountain in the background. A surfing school was located at this stop and a brace of surfers was in the water.

We returned to the city for a banquet on Cape Town’s waterfront with the sun setting to the sound of African drums.

With the end of my work commitments, Sheila and I set out on the Garden Route along the south coast with an overnight stay in Plettenburg Bay, a popular beach resort on the Indian Ocean coast. The coastline is highly developed with houses immediately behind the foredune. A large hotel was the only obvious blemish on the beach itself. The beach at Plettenburg Bay is only one of the long sandy beaches which attracts visitors from all over South Africa and beyond in the summer.

After our stay at the main rest camp of the Addo National Elephant Reserve, we stopped at the Woody Cape section of the reserve, just east of Port Elizabeth, Eastern Cape, South Africa. Where other reserves claim the capability of seeing the ‘Big Five’ African animals, Addo claims the ‘Big Seven’, adding the Southern Right Whale and the Great White Shark to the usual five of elephant, lion, leopard, rhinoceros, and buffalo.

The Woody Cape section encompasses the Alexandria dunefield, the largest dunefield in the southern hemisphere, stretching over 50 km of coastline and over 15,000 hectares. The section includes an unspoilt coastline of mainly sandy beaches. We entered the coastal section of the reserve at the mouth of the Sunday River. In the distance we could see Bird Island. Bird Island is home to the largest Cape Gannet breeding colony in the



Photos (top): Robberg Beach at Plettenburg Bay, Eastern Cape, South Africa; (middle) Modern dunes at Woody Cape Reserve, note the couple standing at the top of the dune; and (bottom) Older vegetated dunes at Woody Cape reserve.

world (some 160,000 birds) .

South Africa is a spectacularly beautiful country and the coast line reflects that beauty but not without challenges, since like Canada, coastal development is placing or has placed pressure on coastal ecosystems, effective planning, and public access.



NOTEWORTHY READS: BOOK REVIEWS IN BRIEF

David N. Nettleship
Book Review Editor

The *Noteworthy Reads* section is an effort by BIO-OA to produce a representative list of recent noteworthy book publications related to the marine sciences and other subjects of general interest. The listing is not intended to be comprehensive or complete, but merely an attempt to highlight a number of 'good reads' that may be of interest to OA members and associates. Most books listed are available at local bookstores and public libraries. Book prices are regular retail in Canadian funds, but discounts of 20-30% are normally available on line at: e.g., amazon.ca or chapters.indigo.ca. Contributions of book reviews to 'Noteworthy Reads' are welcome – send via e-mail to David Nettleship: dnmlundy@navnet.net (phone: 902-826-2360).

'NEW READS FOR SPRING & SUMMER ENJOYMENT'

SPECIAL PUBLICATION:

EARLY DAYS OF OCEANOGRAPHY

Cooper, William B. 2014. *Atlantis Stories: Before the Mast on a Sailing Research Vessel, 1944-1948.* Woods Hole Historical Museum, Woods Hole, MA. 283 pp. Hardcover, \$47.90 (ISBN 0961137495; for details: www.woodsholemuseum.org & available for \$39.95US at WHH Museum, P.O. Box 185, Woods Hole, MA 02543).- William Cooper was a seaman for four years on the RV *Atlantis* which was the principal research vessel in the early years of the Woods Hole Oceanographic Institution. His memoirs provide a wonderful insight into life on board the largest ketch in the world and provide a detailed account of the vessel, the people who sailed on her (both crew and scientists) and the scientific programs carried out. Reference is made to both Gordon Riley and William L. Ford who sailed on *Atlantis* during this time period, and later moved to Halifax, Nova Scotia, to become leading members of the Canadian oceanographic community. The book is well illustrated with vintage black and white photographs. William Cooper went on to work for many years in wooden boat shops on Cape Cod. He wrote these memoirs in longhand over a period of many years and they were later typed by his wife. After his death, his wife brought the manuscript to the Woods Hole Historical Museum. It quickly became evident that the memoirs presented a unique and skillfully written perspective of life aboard an oceanographic sailing vessel, and the decision was made to publish them. Editing was skillfully done by Arthur Gaines and Jay Burnett. This book is highly recommended to those who enjoy reading about the early days of oceanography. [D.C. Gordon]

General Reviews

Ackerman, Diane. 2014. *The Human Age: the World Shaped by Us.* HarperCollins, Toronto, ON. 344 pp. Hardcover, \$32.99 (ISBN 978-1443422994).- A book that 'rattles our chains' via a unique insight into the natural world and the place of *Homo sapiens* within it. A thought-provoking narrative, a series of essays presented in a structure that ranges from nature to technology to the human structure and form. The central message, conveyed by a myriad of examples, is to change how we view the world, from the age-old push to overcome nature to employing our scientific and technological knowledge to live in harmony with the natural world. A book full of revelations, ideas, and the challenges we face in the future.

Barrie, David. 2014. *Sextant: A Young Man's Daring Sea Voyage and the Men Who Mapped the World's Oceans.* William Morrow (HarperCollins), New York, NY. 288 pp. Hardcover, \$25.99 (ISBN 978-0062279347).- Are you interested in marine history and mariners of old? If so, then David Barrie's 'Sextant' is a must read! The overview is told through both the author's own personal experiences at sea and those of such legendary mariners/navigators such as Captains James Cook, George Vancouver, William Bligh, Robert FitzRoy, Joshua Slocum, and Ernest Shackleton. Overall, a compelling story of nautical history, wonder, and discovery that just might finally motivate even the most ardent procrastinator to figure out how a sextant actually works!

Barwell, Graham. 2014. *Albatross.* Reaktion Books, London, England. 224 pp. Softcover, \$25.00 (ISBN 978-1780231914).- Ever think of the role of the Albatross, a magnificent seabird that roams the world's oceans covering awe-inspiring distances in the air with apparent little effort? This book uncovers a great deal about this iconic bird from its biology and vulnerability in the modern world to the incredible part it has played in the different lives and cultures of humans in the past. An absorbing read!

Cornall, Jim and Genny Simard. 2014. *Seashore Life of Eastern Canada: A Guide to Identifying Intertidal Marine Species.* Nimbus Publishing, Halifax, NS. 112 pp. Softcover, \$19.95 (ISBN 978-1771081825).- With a focus on over 80 of the most common species found in the eastern Canadian intertidal zone - including seaweeds, crabs, anemones, sea stars, urchins, and seashells - this highly-visual field guide is a useful introduction to the wonders of the seashore community of living things.

Flannery, Tim. 2014. *An Explorer's Notebook: Essays on Life, History, and Climate.* Grove Press, New York, NY. 336 pp. Hardcover, \$32.00 (ISBN 978-0802122315).- A close-up examination of Tim Flannery, eminent Australian scientist and environmentalist, through a collection of 33 highly readable essays and

book reviews he published between 1985 and 2012. Together, they provide an amazing story of the author's development as a researcher from early studies of fossils and the evolution of kangaroos to living rain forests, and on how climate has influenced life on the planet both in the past and present. An informative and worthwhile read!

McCalman, Iain. 2014. *The Reef: A Passionate History - The Great Barrier Reef from Captain Cook to Climate Change*. Scientific American, New York, NY. 337 pp. Hardcover, \$31.00 (ISBN 978-0374248192).- Iain McCalman, British historian and accomplished writer, synthesizes the rich story of the Great Barrier Reef in Australia from its discovery in 1770 by Captain James Cook through the many human associations that followed including the recent impacts by human activities that are adversely affecting the marine environment and its living systems. *The Reef* presents a balanced and informative review of a global wonder including its present status, future welfare, and conservation requirements.

McCormick, Herb. 2014. *As Long as it's Fun: the Epic Voyages and Extraordinary Times of Lin and Larry Pardey*. Paradise Cay Publications, Arcata, CA. 320 pp. Softcover, \$22.80 (ISBN 978-1929214987).- For a good summer read, nothing beats an account of a love affair with the sea and the sea-faring life! This review of the lives of Lin and Larry Pardey, two sea-wanderers extraordinaire, captures both the romance and challenge of travelling more than 200,000 miles across oceans under sail in small boats. The Pardey's have done it all – from building their own vessels, coastal and offshore cruising – and author Herb McCormick accurately depicts this couple's personal philosophy of life and living: "Go simple, go small, go now". A great model for everyone to follow, especially if you love boats and sailing!

Middleton, Susan. 2014. *Spineless: Portraits of Marine Invertebrates, the Backbone of Life*. Harry N. Abrams, New York, NY. 256 pp. Hardcover, \$50.00 (ISBN 978-1419710070).- This outstanding collection of more than 250 images of largely Pacific invertebrates by acclaimed wildlife photographer and author

Susan Middleton vividly displays the incredible diversity and beauty (in form, structure, and colour) of marine invertebrates as a group. Short essays and profiles on the biology of each species presented in a special work, a successful union of art and science!

Sides, Hampton. 2014. *In the Kingdom of Ice: The Grand and Terrible Polar Voyage of the USS Jean-*

nette. Doubleday, New York, NY. 455 pp. Hardcover, \$34.00 (ISBN 978-0385535373).- A true story of a tragic Arctic exploratory expedition, the disappearance of the USS *Jeannette*, under command of George De Long, in Russian waters during the summer 1879. This well written and researched narrative focuses on events leading up to the gruesome end of captain and crew, and the principal factors responsible. A must read for any student of the history of polar exploration.

Thewissen, Hans. 2014. *The Walking Whales: From Land to Water in Eight Million Years*. University of California Press, Berkeley, CA. 256 pp. Hardcover, \$34.95 (ISBN 978-0520277069).- Here is a gripping account by whale paleontologist Hans Thewissen about his discoveries in India and Pakistan of the early fossil record of whales, transitional forms that show the evolutionary story of development from land mammals to modern whales and dolphins. *The Walking Whales* is an extraordinary first-person narrative of whale research, discovery, and invaluable rewards.

Tougias, Michael J. and Douglas A. Campbell. 2014. *Rescue of the Bounty: Disaster and Survival in Superstorm Sandy*. Simon and Schuster, New York, NY. 256 pp. Hardcover, \$30.00 (ISBN 978-1476746630).- An account of the sinking of the tall ship HMS *Bounty* on 29 October 2012 off the coast of North Carolina during 'Superstorm Sandy', a review that sheds considerable light on the tragedy. Many books have appeared since the sinking, but this review by Tougias and Campbell – divided into three parts: review of the captain, crew and ship; storm's build-up and failure of ship's systems, capsized and loss of ship; and incredible work by the US Coast Guard rescue team – provides a clear insight into what went wrong and why. An important read for anyone interested or involved in the decision-making process of when to leave port and the challenges the modern sailor faces once out in the open ocean.

Weis, Judith S. 2014. *Marine Pollution: What Everyone Needs to Know*. Oxford University Press, Oxford, England. 296 pp. Softcover, \$16.95 (ISBN 978-0199996681).- Looking for a well-written primer on marine pollution and its sources, suitable for the general public as well as the professional? This overview of a difficult and complex topic succeeds admirably by taking the reader from defining what pollution is and the wide range of pollutants, through to the complexities of food chains and biomagnification and much more. Altogether, this volume is an excellent tutorial and reference for anyone interested in marine pollution and the enormity of the problem.

World Oceans Day at the Maritime Museum of the Atlantic

Once again this year, the Maritime Museum of the Atlantic (MMA) hosted an exhibition and offered free admission to the museum on the Friday before World Oceans Day. World Oceans Day, held every 8 June, is the United Nations-recognized day of ocean celebration and action. People all over the world organize celebrations to support action to protect the ocean. This year, the theme was 'Healthy Oceans, Healthy Planet', and focussed on a special effort to stop plastic pollution.

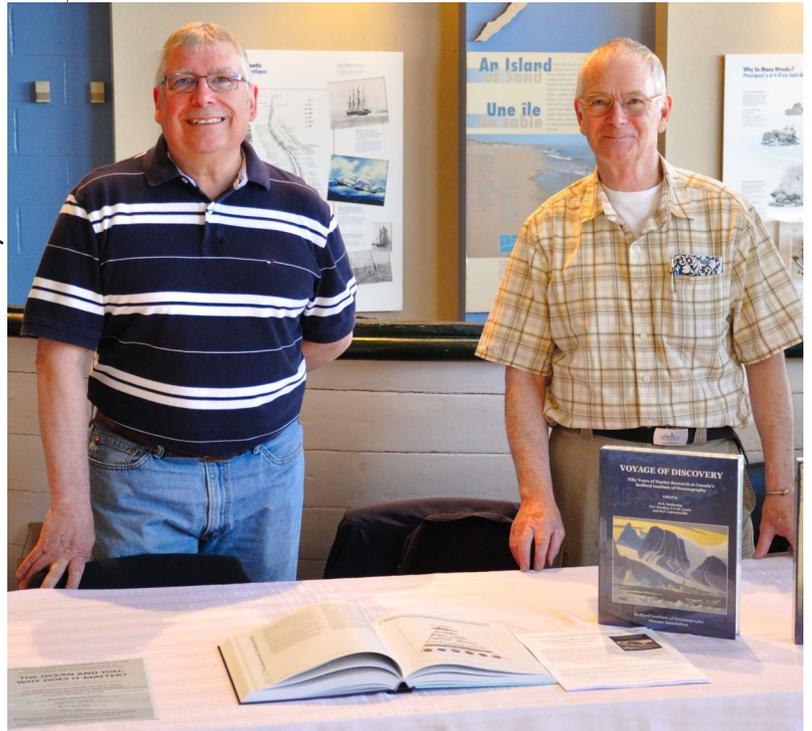
For 2015, the usual crowd of children from day care made their appearance, but younger and older adult visitors as well. Despite the sometimes disappointing turn out, the MMA's World Oceans Day exhibit is a great opportunity to network with staff and volunteers from many governmental and nongovernmental organizations.

This year a group of students from Dalhousie University collected marine trash to build a replica of the "The Wave" sculpture on the Halifax waterfront using the plastic bottles and other items they had collected. During the MMA exhibition, the students solicited pledges to protect the ocean and prepared their trash for the replica construction which was to occur on Saturday.

Also this year, the MMA celebration preceded Open Doors Halifax. This year Open Doors included rarely held tours below deck of the CSS *Acadia*. BIO-OA members and staff were invited to volunteer to assist visitors in the narrow passageways making the tours possible. Normally, the MMA has insufficient staff to permit safe tours of the *Acadia*'s panelled staterooms, engine room, and crew's quarters. Readers are reminded of the *Voicepipe* article on the special tour the MMA gave to the BIO-OA of the CSS *Acadia* in April 2013 (Issue 58).

A special BIO-OA feature this year was a display and sale of the 'Voyage of Discovery' and the beginning of sales of the book in the MMA's gift store.

BIO staff from the Department of Fisheries and Oceans were present with their ever popular 'dead fish' display on Marine Protected Areas and a new ROV that was



Mike Murphy (left) and Mike Hughes staff the BIO-OA VOD exhibit at the World Oceans Day exhibition at the Maritime Museum of the Atlantic, on 4 June 2015.



CSS *Acadia* with flags flying at the World Oceans Day exhibition at the Maritime Museum of the Atlantic, on 4 June 2015.



Photos (clockwise from top left): Farah Stevens, summer intern with DFO / BIO, shows a specimen to two future ocean scientists; Mark Wamboldt operates the new ROV HARV II in Halifax Harbour in front of the Maritime Museum of the Atlantic; and Elise Will (left) and Dereck Fenton, both DFO / BIO, hold up specimens from DFO’s Marine Protected Area display at the World Oceans Day exhibition at the Maritime Museum of the Atlantic, on 4 June 2015.

demonstrated in the harbour. Mark MacLean (DFO,BIO) commented “The new ROV is so powerful we can make it jump right out of the water”. Notably absent this year was a display from Natural Resources Canada at BIO.

The most popular exhibit, at least for the younger crowd, was the Halifax Mermaids. This year ‘Mermaid Mutiny’ and ‘Mermaid Nessy’ were regaling the younger visitors. See the separate article on the Halifax Mermaids on page 12.

Halifax Mermaids Information, Imagination, Inspiring



'Mermaid Mutiny', Krista Hill (left) and 'Mermaid Nessy', Lindsay Macaulay (right), enthralled young visitors to the Maritime Museum of the Atlantic on 4 June 2015 for World Oceans Day.

The Halifax Mermaids were present again this year at the Maritime Museum of the Atlantic's celebration of World Oceans Day on Friday, 4 June 2015. They attracted the younger visitors relaying information about our oceans using a play-based approach. The mermaids use the imagination as a tool to teach, engaging the kids as "characters" and encouraging them to use their imagination in play, learning, and for healthy development. Finally, the mermaids seek to inspire. Their work is based on these three "I's", information, imagination and inspiring.

'Mermaid Riana' swam in a research tank at Dalhousie University during the Open Doors Halifax event held 5 and 6 June 2015.

Halifax Mermaids is a company owned by 'Mermaid Riana', Stephanie Brown, and Sean Norman. Brown has a degree in education and child development. The company has recently been awarded an ADP Small Business Grant. Part of their mission is to inform and educate everyone about the state of our ocean while empowering them to make a change. Halifax Mermaids can be booked for a variety of events, appearances, packages, and performances. Their website states "Your only limit is your imagination."

2015 Elisabeth Mann Borgese Ocean Lecture



Panel members at the 11th Annual Elisabeth Mann Borgese Ocean Lecture, from the left, Heather Kelday, Kumiko Azetsu-Scott, Bud Streeter, Boris Worm, and Doug Wallace. Photo: Chen Ning.

The 11th Annual Elisabeth Mann Borgese Ocean Lecture was held at the Museum of Natural History in Halifax on World Oceans Day, 8 June 2015. The theme of the panel discussion was "The Ocean and You: Why does it matter?". The event was sponsored by the International Ocean Institute-Canada, the Ecology Action Centre, and the museum. Elisabeth Mann Borgese was the founder of the International Ocean Institute. The lecture series commemorates and celebrates her life and work.

The panel was chaired by Dr. Douglas Wallace, Dalhousie University. Panel members included Dr. Boris Worm, professor in marine conservation biology at Dalhousie University; Mr. Bud Streeter, President of Lloyd's Register Canada; Dr. Kumiko Azetsu-Scott, a



Dr. Kumiko Azetsu-Scott, one of the panelists, research scientist with the Oceanography and Climate Section of the Department of Fisheries and Oceans at the Bedford Institute of Oceanography. Photo: Chen Ning.



Some of the attendees at the Elisabeth Mann Borgese Lecture at the Museum of Natural History, including in the front row two BIO-OA Executive members, Mike Murphy, President and Peter Wells, NSIS Liaison. Photo: Chen Ning.

research scientist with the Department of Fisheries and Oceans at the Bedford Institute of Oceanography; and Ms. Heather Kelday, singer/songwriter and Executive Director, Nova Scotia Sea School.

Dr. Susanna Fuller, Marine Conservation Coordinator for the Ecology Action Centre, closed the lecture with the following concluding remarks:

“Take a child to the ocean, take them out of school if you have to, because the best way to learn about something is to experience it. Explore tide pools, bring a microscope, tell ocean stories and that child will have learned something important.

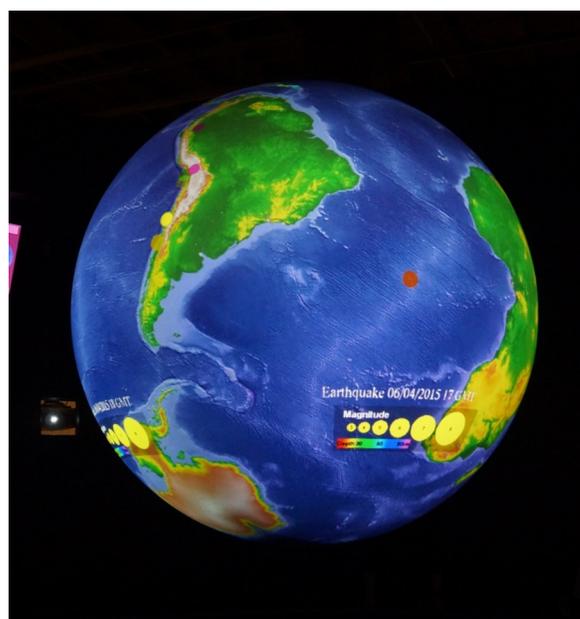
In your every day lives, reduce the amount of plastic you use every chance you get. So much of it ends up in the ocean and the only way to truly stem that tide is to stop using plastic, particularly single use plastic and anything with microbeads.

Think about the fish you eat, and every time you purchase seafood, ask where it was caught, how it was caught and by whom.

Take an elected official to lunch and let them know why the oceans are important, to you, your community and to Canada. Advocate for their protection so they can continue to give all that they do.”

Dr. Fuller ended her remarks on an optimistic note with the good news about a new implementing agreement for the protection of high seas biodiversity that is being discussed at the United Nations that is closer to reality than ever before.

The lecture was followed by a reception and free rein in the museum for the lecture’s attendees.



The ‘Science on a Sphere’ exhibit at the Museum of Natural History. Photo: Chen Ning.

An Ocean in the Sky – Exploring The Burgess Shale

by Peter Wells

A paleontological gem known as the Burgess Shale lies high in the Canadian Rockies of Yoho National Park, BC, above the stunningly beautiful Emerald Lake. The Shale was discovered in 1909 by the famed American paleontologist, Charles Walcott, and quarried between 1910 and 1924. The Walcott Quarry and others nearby have been excavated since by many scientists, especially from the Geological Survey of Canada and the Royal Ontario Museum (ROM). The Shale is known globally for its outstanding deposits of Middle-Cambrian marine invertebrate fossils and is now a World Heritage Site (Fig. 1). In recent years, it gained public fame due to the interpretive jottings of Stephen Jay Gould in his book *Wonderful Life* (Gould 1989) and new discoveries in a similar geological formation in Kootenay NP.

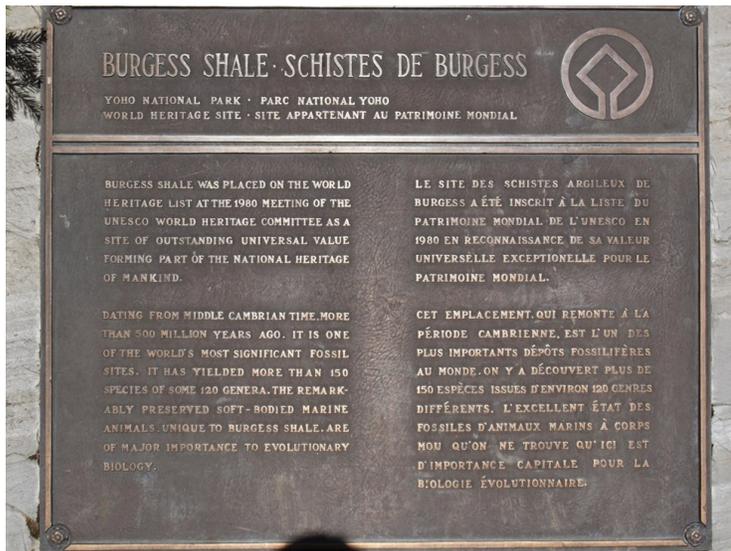


Figure 1. The Burgess Shale plaque on the shores of Emerald Lake, Yoho National Park, BC.

During August, 2012, three western relatives and I visited the Park and backpacked up a ridge to Yoho Lake, situated high above Takakkaw Falls and the Yoho valley, and a jumping off spot for a trip to the Shale. We camped at the lake, site of the first mountaineering camp of the Alpine Club of Canada held in 1906. Our objective was to join the Parks Canada interpretive hike to the Shale; we had signed up many months before, a requirement as access is highly restricted to prevent looting of highly sought-after fossils. At 0830 hr on the following morning, the intrepid interpreter-guide with 10 other participants in tow arrived at our campsite, having tramped up from the valley below. After friendly introductions, we hoisted daypacks and began the day-long trip (Fig. 2).

The Burgess Shale, in the Walcott Quarry, is located high



Figure 2. The Parks Canada guide and interpreter points to our location and the route to the Burgess Shale. Let the hike begin!



Figure 3. View of Emerald Lake from the trail along the north-western flank of Mount Wapta.

(2286m) on Fossil Ridge between Mounts Wapta and Field (Fig. 3). The hike from Yoho Lake is 11km (3hr) one way, with an 800 m elevation gain, and is fairly strenuous, especially at the Parks Canada pace (Fig.4). By late morning, we arrived on the NW side of Fossil Ridge just below the Quarry (Fig. 4), and clambered up a steep scree slope into it (Fig. 5). After an excellent briefing from the interpreter, we started the search for fossils embedded in fallen slabs of shale, examined some sample finds left for visitors, and enjoyed a high altitude lunch.

Fossil Ridge is an exposed portion of compressed ocean sediments with animals well preserved from the Middle-Cambrian era, 500-550 million years old. It is literally “an ocean in the sky”, as are all the Rocky Mountains. The Burgess Shale Formation mudstones were deposited over two million years in an ancient tropical sea, fortuitously against a submarine limestone cliff, the conditions of sedi-



Figure 4. A welcome rest and water stop along the flank of Mount Wapta, and close to Fossil Ridge.

mentation making the formation and preservation of both hard and soft bodied fossils possible. Many of the fossils are of early arthropods, some in a unique group requiring new classification which is still underway. The arthropods (e.g. *Marrella*) and polychaete fossils are very abundant. Many bizarre looking organisms inhabited the seas during this period, including many trilobites (Fig.6), and more than 100 new species to science have been described to date. The ROM now has a large repository of Burgess Shale fossils. Also of great interest is that new theories of how evolution operates have come from considering the rich diversity of the Shale fossils, that is, what factors influence the branching of the tree of life and given a second run, would life have evolved in the same way?

By mid-afternoon, we were “fossiled out” so we began the return hike to Yoho Lake and valley (Fig. 7). A thunder storm threatened, so the pace was quick and steady. Arriving safely back at the lake, we thanked our guide for a



Figure 5. In the Walcott Quarry, examining fossils, with Mount Wapta in the background. Note the camera pod, which provides 24 hr surveillance.



Fig 6. A trilobite – *Olenoides* sp. (possibly *O. serratus*, common in the Burgess Shale).



Figure 7. Hiking back to Yoho Lake, with a thunderstorm threatening to dampen the intrepid group. The glaciated President Range is in the background.

wonderful day and visit to one of Canada’s truly spectacular, natural wonders. A trip to the Burgess Shale, and nearby exhibits in the town of Field, is highly recommended to anyone with a passion for superb mountain scenery, an exhilarating hike, and seeing evidence first-hand of some of the ancient inhabitants of our ocean planet.

References

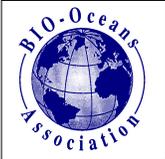
Coppold, M. and W. Powell. 2006. A Geoscience Guide to The Burgess Shale. Geology and Paleontology in Yoho National Park. The Burgess Shale Geoscience Foundation. 2nd Ed. Field, BC. 76p.

Gould, S.J. 1989. Wonderful Life. The Burgess Shale and the Nature of History. Hutchinson Radius, London. 347p.

Photos: P.G. Wells

Editor's Keyboard: Welcome Readers to the combined spring / summer issue of the *Voicepipe*. I was in South Africa at the usual time of the publication of the spring issue. We have some new faces on the executive and some older faces are taking on new roles. Two articles in this issue bring an important message. I admire the ingenuity of Stephanie Brown, the co-owner of the Halifax Mermaids. She is using fantasy and imagination to bring a message of how central the health of the ocean is to humankind. The panel at the EMB lecture

and Susanna Fuller bring a similar if more intellectual message. It comes down to individuals being inspired or motivated to change behaviours and attitudes. I have always found the World Oceans Day celebration at the Maritime Museum of the Atlantic an energizing event; although often not well attended by the public, it provides an opportunity to meet and talk with staff and volunteers from many organizations with a passion for the health of the oceans. I would encourage the BIO-OA to participate more fully in the future. *Andy Sherin*



ABOUT THE BIO-OCEANS ASSOCIATION

The Bedford Institute of Oceanography Oceans Association (BIO-OA) was established in 1998 to foster the continued fellowship of its members; to help preserve, in cooperation with the Institute's managers and staff, BIO's history and spirit; and to support

efforts to increase public understanding of the oceans and ocean science. Membership is open to all those who share our objectives. Most current members are present or past employees of BIO or of the federal departments of Environment, Fisheries and Oceans,

and Natural Resources (or their predecessors) located in the Halifax Regional Municipality. Membership is \$10.00 per year, \$40.00 for five years, or \$150.00 for a lifetime membership.

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