



THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS Bulletin

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CSEB Bulletin SCBE

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CSEB BULLETIN 2018

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The Canadian Society of Environmental Biologists Bulletin is a quarterly publication. The Bulletin keeps members informed of the Society's activities and updates members on the current affairs and advances in the field of environmental biology. This publication draws together the widely diverse group of Canadian environmental biologists through a national exchange of ideas. Members are invited to contribute papers, photos or announcements that are of a national biological and environmental interest. Letters to the editor are welcome. This is a volunteer non-profit organization and we rely on your participation to make the Bulletin a productive forum for ideas and discussion.

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LE BULLETIN de la SCBE 2017

Vol. 75, Numéro 2, Été 2018

Le Bulletin de la SCBE est une publication trimestriel de la Société Canadienne des Biologistes de l'Environnement. Le Bulletin informe les membres des activités de la Société sur événements courant ainsi que les progrès qui font en sciences de l'environnement. Par un échange d'idées au niveau national, cette publication intéresse un groupe très diversifié d'environnementalistes Canadien. Les membres sont invités à contribuer des articles, photos (noir et blanc) ou des messages qui sont d'intérêt nationale en sciences biologiques et environnementales. Les lettres à l'éditeur sont bienvenues.

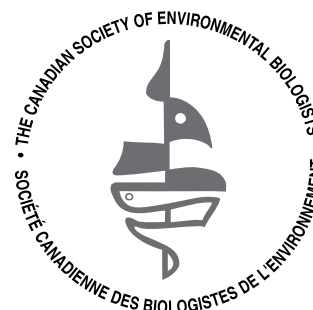
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The views expressed herein are the writer's of the articles and are not necessarily endorsed by CSEB, which welcomes a broad range of viewpoints. To submit a piece for consideration, email newslettereditor@cseb-scbe.org.

The Canadian Society of Environmental Biologists

**CSEB OBJECTIVES**

The Canadian Society of Environmental Biologists (CSEB) is a national non-profit organization. Its primary objectives are:

- to further the conservation of Canadian natural resources.
- to ensure the prudent management of these resources so as to minimize environmental effects.
- to maintain high professional standards in education, research and management related to natural resources and the environment.

OBJECTIFS de la SOCIÉTÉ

La Société Canadienne des Biologistes de l'Environnement (SCBE) est une organisation nationale sans but lucratif. Ses objectifs premiers sont:

- de conserver les ressources naturelles canadiennes.
- d'assurer l'aménagement rationnel de ces ressources tout en minimisant les effets sur l'environnement.
- de maintenir des normes professionnels élevés en enseignement, recherche, et aménagement en relation avec la notion de durabilité des ressources naturelles et de l'environnement, et cela pour le bénéfice de la communauté.

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NATIONAL News

PRESIDENT'S Report

By Curt Schroeder, CSEB President

Hello members
With many members already out in the field, in the lab or library, I just want to update some recent activities of the Board. Our membership stands at just over 100 and lately has been growing partly as a result of a renewed membership drive to attract post-secondary students. Student membership is free for any student registered in a Canadian University, and it comes with a digital copy of our quarterly bulletin. Register online at www.cseb-scbe.org. With the assistance of a contract consultant, so far 15 institutions have been contacted to promote our new student membership benefit and it's paying off. If you are in a position to promote student membership, your efforts are greatly appreciated.

We are looking for two new Regional Directors and Board members from Quebec. Thank you to our former Quebec Regional Director Eloise Boileau for your service to the CSEB.

Loys Maingon continues to serve up interesting webinars for members. The most recent webinar was titled "Changes to Federal Environmental and Regulatory Legislation". These webinars present excellent opportunities for professional development for our members. Please consider joining these webinars. Go to our website for a schedule of webinars: www.cseb-scbe.org/category/news-and-events/

Hope the summer season is productive. See you all in the fall.

SCIENCE TIDBITS

Submitted by John Retallack, CSEB Alberta Member

This is the first of a planned regular set of columns for the CSEB. These capsule summaries are intended to be light, and all of them have an environmental component – sometimes they will be full-on environmental but other times they might be towards the “outer edges” and an environmental science connection may seem elusive. BTW, any continuity between the stories is purely coincidental!

Have fun reading them.

*“Remember to look up at the stars and not down at your feet. Try to make sense of what you see and wonder about what makes the universe exist. Be curious. And however difficult life may seem, there is always something you can do and succeed at. It matters that you don't just give up.”
RIP Stephen Hawking!*

As we all know the practice of environmental science is fuelled by coffee. The following two summaries deal with attacks on coffee — we need to watch the outcomes VERY closely.

Rust Never Sleeps and That May Affect Your Coffee

Coffee rust is caused by a fungus and has plagued Colombia's coffee farmers for more than a century. The disease affects the leaves of certain types of coffee plants and, in the extreme, causes coffee plants to lose their leaves and their ability to produce beans. Coffee rust affects the prime species of coffee plants in Columbia (*C. arabica*) but has less effect on the less desired, and cheaper, variety of *C. canephora* (also referred to as Robusta). Arabica is what has given Colombia its reputation for high quality coffee and coffee rust has been rampaging through the high quality plants – and potentially diluting the quality of beans being produced.

In the late 1800s, coffee rust hit parts of Asia and effectively stopped the production of coffee in that part of the world. Colombia is highly dependent on quality coffee to maintain its economy.

Enter the Geneticists! The solution came from an improbable location, on the island of Timor, north of Australia. There, the normally sexually uncooperative species of Arabica and Canephora/Robusta created a naturally occurring hybrid that could be interbred with the Colombian Arabica to create a rust-resistant coffee (named Colombia) that maintained superior taste. But rusts marches on and has evolved to affect the previously immune hybrids. It seems geneticists never sleep either and they are in a running battle with coffee rust—but so far about ¾ of Colombia's coffee plants seem to retain resistance to rust.

And So Might This!

California has recently determined that purveyors of coffee must alert consumers to the cancer risk related to its consumption. The issue is acrylamide – acrylamide is found in products like potato chips, cookies, cereal, crackers, and other high-carbohydrate foods that are baked, fried or roasted. Acrylamide enters the coffee chain when raw beans are roasted. The levels of acrylamide found in coffee ranged from 175 – 351 ppb. Fast-food french fries have similar levels and some foods have levels considerably higher.

But remember the old toxicity adage...the dose makes the poison!

The non-profit Council for Education and Research on Toxics (CERT) initiated the lawsuit claiming coffee purveyors were not warning consumers about the simple presence of acrylamide. After some years of back-and-forth challenges, the judge in the current case ruled that the coffee purveyors had failed to prove that the chemical didn't pose a threat for coffee drinkers.

The overarching law that allowed the challenge was initiated in 1986 (Proposition 65) and has been useful in educating manufacturers and the public on harmful substances in consumer products and helping to eliminate, substitute or reduce harmful ingredients. The law has also allowed the proliferation of legal activity specializing in Proposition 65 lawsuits.

Unfortunately, CERT does not appear to have a website to get more information but, if you are interested in pursuing this issue further you can contact the lawyer who represents CERT at 1-877-tox-tort...and btw he seems to share the same office space.

Are Manta Rays Self-Aware?

Do fishermen ever consider the “encephalization quotient” of their target fish species? Probably not and may even hope for poorly developed EC to help enhance their catch rate. But some recent research might make one think twice, at least for some species. Not that I would ever intentionally try to catch a Manta Ray but authors of a recent article in *The Journal of Ethology* (May 2016 Vol 34/2 C. Ari and D. D’Agostino) suggests giant manta rays (*Manta birostris*) do have a high encephalization quotient and may be self-aware.

Using a mirror test to try to differentiate socialization vs self-awareness, the authors discovered that captive giant mantas exhibited some of the behaviours considered to be prerequisite of self-awareness.

With that potential for self-awareness, consider the following:

BTW DYK – There is a thriving, and growing, market for manta ray gill rakers! Commercially fished in various locations around the world, the trade and consumption of manta ray gills as “medicinal” products are centered in China.

Manta rays tend to mature slowly and have a low birth rate. Manta rays were placed on the CITES list in 2013.

Invasive Species

The first global register of alien species shows that 20% of the invasive plants and animals catalogued are causing harm. Invasive species are fungi, plants, and animals that are not native to a specific location, and have a tendency to spread to a degree that may cause damage to the environment, human economy or human health. Release of ballast water from ships (for marine environments) and trade in ornamental plants (for land areas) are considered two of the most common sources of these introduced species.

The study released data for 20 countries this week - heavy on islands (including Cuba, Seychelles, Cook Islands, Vanuatu) that are very susceptible to effects of invasive species, but also a few larger states (e.g., Republic of Ireland, South Africa, Mongolia). The study continues and aims to complete the register by the end of this year.

Related - Red Squirrels and Pine Marten

Pine marten were nearly rendered extinct in Scotland and other parts of the UK. After formal protection in the early 1980s they have been making a comeback, with some added benefits to native red squirrels!

Red squirrels have also been having a hard time of it due to the introduction of grey squirrels to UK in the late 1800s as embellishments to rich estates. Grey squirrels are larger than their red squirrel cousins and can survive tougher winter conditions. In addition, grey squirrels live in higher densities and tend to have larger broods. Grey squirrels are now considered the main threat to the future of native red squirrels.

In a study by scientists at the University of Aberdeen, the resurgence of marten populations due to their protected status has been at the expense of grey squirrels. Since marten are a relatively new experience for the introduced grey squirrels, they appear to be less able to deal with the predation by martens. Red squirrels, on the other hand, having co-evolved with marten, are better able to deal with marten predation and the decreasing number of grey squirrels has allowed red squirrel numbers to rise in the UK.

Now to end this column for this issue, remember how I told you this might be on the edge of science...

Saudi Camel Pageant Hit by Scandal

The King Abdulaziz Camel Festival was held recently and included camel racing and milk tasting. This is no two-bit festival, with combined prize money was \$57M.

The festival included a competitive camel conformation show. The judges were forced to intervene and issue disqualifications after a dozen entries were found “augmented” with Botox injections in the lips, noses, and jaws to enhance their appearance.

Somehow I want to provide further comment but instead I will just step away!

The Earl Would Be Astounded

The true cause of climate change has been discovered—the carbon footprint of sandwiches is apparently quite high. Named in 1762 by Edward Gibbon (after John Montagu, 4th Earl of Sandwich), you may look at the humble sandwich a bit differently after reading this!

In a new study (full-cycle assessment), to be published by N. Espinoza-Oria and A. Azapagic (University of Manchester) in the *Journal of Sustainable Production and Consumption* (July 2018), researchers have calculated the carbon footprints of 40 varieties of sandwiches and concluded the worst offender is the breakfast sandwich containing eggs, bacon, and sausage (1,441 grams of carbon dioxide equivalent) – that apparently equals the volume of CO₂ emitted by a car driving 19 kilometres. I’m going on faith here and don’t intend to check their numbers.

The best results were provided by a simple homemade ham and cheese sandwich (399 and 843 grams CO₂ equivalent - depending on the recipe). Using the UK as an example, the authors concluded the 11.5 billion sandwiches consumed annually generates about 9.5 million tonnes of CO₂ equivalent, equal to the emissions of about 8.6 million cars.

According to the authors, generally, homemade sandwiches account for about ½ the CO₂ equivalent of store-bought equivalents. Here’s something I can agree on...don’t buy those pre-made ones and make them yourself. BUT, (spoiler alert) a Wonder Bread sandwich made with bacon, cheese, egg, and mayo is infinitely better than one made from some \$10 crusty “artisanal” bread.

I bet the UN Intergovernmental Panel on Climate Change (UNIPCC) didn’t consider the effect of sandwiches in their models!

REGIONAL News

BRITISH COLUMBIA News

Submitted by Loys Maingon, CSEB BC Director

The Need to Convince - The ENGOs' Necessary Leadership

"Mountains are sentinels for larger global change"

(Zac Robinson, U. Of Alberta)

While the most notorious environmental event in BC this spring may appear to be the federal acquisition of the Kinder Morgan pipeline, which the media pitches as a confrontation between Alberta and BC, this political circus may just be a subtext to more important over-arching biological and environmental concerns. Indeed, the media-focused announcement of the Prime Minister's acquisition of a controversial pipeline in the name of "the national interest" has overshadowed the much-more important, if more matter-of-fact, release by the Alpine Club of Canada and the University of Alberta of the *2018 State of the Mountains Report*¹, which underlines the fact that science knows no borders and is always in "the public interest." This important document comes in the wake of Australian research published the previous week in *Science* indicating that at least a third of global protected lands is under intense human pressure, and that its preservation depends primarily on the work of ENGOs.²

This is part of a succession of disturbing revelations that governments around the world are announcing with great fanfare the creation of protected areas which bona fide scientists note are, "*Just for show*."³ Brazil's creation of new "marine protected areas" in which drilling will be allowed is just one slightly more glaring example of many potential examples in which science is not simply not welcome in government,⁴ but rather has an uncertain relationship with government. There appears to be a growing divorce between science and government, which is shifting science's relationship with the public.

The practice of "*Just for Show*," which is just as evident in the contradictions of Canada's climate change plan as it is in BC's renewed support of the LNG industry,⁵ appears to be part of a global trend. The creation of protected areas of low biodiversity value, or of "environmental restorations" of low biodiversity to accommodate development is inconsistent with stated goals of "protecting nature."⁶

These practices are Orwellian "double-speak," in which the public interest in the environment is becoming marginalized from political discourse. This was substantiated this month by yet another report pointing out that species decline in Australia is tacitly accelerated through a lack of government support for effective monitoring.⁷ It is simply part of a growing trend in double-speak, bandying the notion that one can have one's cake and eat it. This childish notion is only slightly less self-contradictory than Brazil's recent passage of legislation purporting to protect biodiversity with legislation, which its

own scientists note is simply a system of regulations aiming to frustrate biodiversity research when it is considered inconsistent with government and corporate interests.⁸ Under these new regulations, researchers undertaking biodiversity research face fines, prosecutions, and jail terms if they proceed without government permission. The biodiversity research permitting system itself is deliberately designed to act as a roadblock. (Given current working conditions at the US EPA, this Brazilian aberration could easily become a global norm.)

What is noteworthy in these examples is that, as in the case of the *2018 State of the Mountains Report*, it is Environmental Non-Governmental Organizations (i.e., ENGOs, in this case the Alpine Club of Canada) that have assumed the real leadership and research responsibilities in these difficult times, where government responsibility is becoming ambiguous. Notwithstanding the opinion of Canada's Science Advisor, Mona Nemer, if science does not bridge public aspirations, its institutions are at the mercy of changing political whims.⁹ It is not government or industry that is providing public environmental leadership, but ad hoc ENGO's. Whether it be in Canada, Australia, or Brazil, or for that matter anywhere in a world in which corporate interests are becoming increasingly indistinguishable from government interests, environmental leadership comes from ENGO's, which carry out research and publish reports on shoestring budgets. There is very little public funding for ENGO's, which are often excluded or barred from government grant applications, or only considered if they have corporate or academic partners. As implied by the findings of the Australian report, in a world in which governments increasingly no longer assume biodiversity monitoring, and universities rely extensively on government or corporate funding and, therefore, are largely constrained in the research that they will carry out, it is ENGOs, which still do the necessary independent science, and hopefully provide a bridge to government action:

*"a number of species had "very effective" monitoring programs conducted by NGOs or Indigenous corporations, which covered a particular portion of the species' range, but few species had monitoring that covered their entire range"*¹⁰

It is of particular note in the *2018 State of the Mountains Report* that while the report is supported by the University of Alberta, it is prepared by members, with the support of the general membership of the Alpine Club of Canada: "*produced by the ACC in collaboration with mountain researchers, community members, and partner organizations.*"¹¹ It is this ability, and the urgent need, to remain independent from both industry and government that is giving rise to important independent "institutes" around North America, such as the Geos Institute in Ashland Oregon and the Hakai Institute in BC.¹²

Such contributions are important because they move beyond the media-driven political chicanery that dominates environmental discussions. They highlight the fact that the national community is concerned with the developing climate change impacts that are affecting the mountain ecosystems of Alberta and British

Columbia. It leaves no doubt that the development of climate change in this century will be impacting the hydrology, the flora and fauna and the future biodiversity of both provinces. It links our common future and interests, as Louis Pasteur said: "Science knows no country, because knowledge belongs to humanity."

Contrary to mainstream thinking that dominates government and political discourse, the priority of the scientific community is not the economy—it is the state of the environment that makes possible and supports the economy. Without simple requirements such as a steady supply of clean water, provided to lower elevations by climate-dependent alpine environments, the cultural and economic foundations of our communities become unsustainable—as witnessed by the demise of California's Salton Sea, which is a less publicized repetition of the tragedy of the Aral Sea and countless other saline lakes, such as Chile's Lake Poopo.¹³ As Shugar and Clague note in their assessment of glacier and river re-organization, where the data has been collected, we are witnessing the beginnings of major watersheds events happening "in a matter of days". It is clear that big changes are underway:

"There are numerous locations in the mountains of northwest North America where drainage will be perturbed, and possibly re-routed, as glaciers continue to retreat. Lakes that are currently dammed by glacier ice will disappear and the meltwater that feeds them will take different routes."

The problems raised by the Kinder Morgan pipeline should really be considered in that greater context, as they are in the *2018 State of the Mountains Report*. The Kinder Morgan pipeline is not an "intractable" problem. It is a simple two-fold question of whether one wishes to continue to support an economy reliant on fossil fuel energy, and if so, if the risks implicit in the transportation of oil and gas along the coast of BC can be managed. The ongoing lessons of the 1989 Exxon Valdez spill, where excessive contamination continues to impact economic and environmental recovery, all financial compensation has been exhausted and where the impacts can now be no longer adequately monitored, answer the first part of the question. The recent (and customary) under-reporting of the magnitude of a spill from the pipeline, which highlights causes for a lack of public trust in proposed risk management plan,¹⁵ answers the second part.

The marginalization of dialogue in favour of authoritarian approaches forecloses discussion of the risk management question, just as the now defunct, National Energy Board marginalized public climate change concerns. One of the reasons why ENGOs are assuming leadership where government and industry are failing is because governments increasingly at all levels are "losing their social license," by foreclosing reasoned dialogue. To lose social license is to lose the argument. This is disturbingly frequent. Nowhere is this more evident than in the recent move to re-draw the park boundaries of Tetrahedron Provincial Park, BC.

In the wake of a decade of successive summer droughts and a major increase in population, the Sunshine Coast Regional District (SCRD) has applied to have the large main lake, Chapman Lake in Tetrahedron Provincial Park, removed from the park so that it can be pumped as a water supply for the regional district. Tetrahedron Provincial Park is a Class A park, that is, a conservation area dedicated for preservation of natural areas.

Following the Liberal government's revised *Parks Act* (Bill 4), which the former NDP opposition then vociferously opposed, the new NDP government, with the support of Parks staff, is now moving to "re-draw" this conservation area's borders. The matter is strongly opposed by residents of the Sunshine coast, including the Sunshine Coast Conservation Association, and Friends of Tetrahedron Park, as well as the Canadian Parks and Wilderness Society and the BC Federation of Mountain Clubs of BC. As noted by Barry Janyk, the Executive Director of BCFMC, and former mayor of Gibson's BC:

*"The SCRD has made an application to BC Parks to find the ways and means to accommodate their scheme. Under the Park Management Plan there is to be "comprehensive public consultation." According to Jennie Aikman, BC Parks Regional Director, rather than hosting a facilitated community meeting (or meetings) this will consist of an informal "open house." When asked why there would be no community meetings to discuss this critical issue, Ms. Aikman maintained that they can often turn into confrontational disputes. In any event, the process appears to be counter to some of the key principles of the province's own guidelines around adjusting park boundaries."*¹⁶

While staff may be inconvenienced to find that people become "confrontational" about environmental issues that the public considers important, the practice of circumventing legal obligations and avoiding discussions entails that meaningful consultation is avoided in favour of an authoritarian approach, dismissive of the legal framework which exists to protect "the public interest." Authoritarianism may expedite decision-making, however it does so without first presenting convincing arguments necessary for the legitimate exercise of power. The lack of the necessary connection between reason and power means that the public interest is increasingly represented almost exclusively by the ENGO's.

This authoritarian approach in which government decisions, effectively purporting to know what is best for a community, without first convincing the public, become divorced from the exercise of public will through public consultation, is regrettably becoming a normal practice across BC, and it seems, Canada. A recent example in this writer's own backyard further references and illustrates this point and the kinds of overarching authoritarianism that promotes environmental outrage in BC. The recent application for a license to bottle water from the Merville aquifer has mobilized both local government and The Farmer's Institute.¹⁷ This agricultural area experiences water shortages every summer, causing a near-drying of local fish-bearing streams and rivers. Concerns for water availability and water usage run high. A family discovered that the local aquifer had a desirable mineral balance. They, therefore, applied for a small license to bottle and sell this water. Against the recommendations of local government staff, the Ministry of Lands and Forests staff not only authorized a license, but doubled the volume applied for, without any public consultation. Apart from the commercial problems associated with that license, once the operation becomes effective, the property can be sold and the initial pumping volume further increased. In other words, a family operation could be sold to a giant such as Nestle. This could conceivably severely impact the local aquifer's future capacity. It is also felt that this could have a large impact on river recharge rates and the future of local farming operations as climate change evolves.

There is a growing public recognition that our environmental resources are no longer infinite, which is reflected in the public support for and growth of ENGOs. Against this growing environmental awareness we elect governments who promise change, but who are unwilling to confront the unsustainability of the economy. This creates some interesting disconnects. Thus, to its credit the current government is moving to write BC's first *Species at Risk Act*.¹⁸ However, just as the act is being written, the government Centre for Data Conservation has just released a major overhaul of species status.¹⁹ The overhaul reduces the number of "at risk" species and suggests that biodiversity may be in better shape in BC than elsewhere in the world. While this appears to be good news reflecting the increased efforts of many biologists and naturalists, the timing of this release may appear to make the legislation less urgent and alleviate pressures on the government to prioritize biodiversity protection measures over economic development.

Government ambiguity in environmental protection received unwanted national attention this week with renewed old growth logging in the Nahmint Valley near Port Alberni, particularly with the falling of BC's 5th widest Douglas fir. In spite of decades of advocacy to preserve the 1% of the original old-growth Douglas fir forests that remain on Vancouver Island, which has broad public support of pulp and paper workers' unions, as well as Chambers of Commerce and the Union of BC Mayors, the NDP has broken its own electoral promises to put an end to old-growth logging. The Horgen government has sold timber licences to some of the most ecologically important remaining parcels and allowed renewed logging in environmentally sensitive areas. Once again, ENGOs, which have assumed the information and data collection, will be burdened with advocating for the public interest in the absence of government support of the public interest. As summarized by Ancient Forest Alliance executive director Ken Wu:

"So far, the new NDP government has, disappointingly, supported the destructive status quo of high-grade old-growth forest liquidation, raw log exports, mill closures, and unsustainable forestry in general. They need to break away from the old unsustainable mindset that has driven the increasing collapse of both ecosystems and rural communities in this province. When it comes to forestry, the NDP have not distinguished themselves from the BC Liberals in terms of any new laws or regulations..."

Such events indicate that there continues to be in BC a de-regulated approach to the environment, and a general lack of stringent regulatory oversight and enforcement. It is the growing realization of the problem and the increasing willingness, or unavoidability, that we need to engage in a public discussion, which comes largely from the work of ENGOs, that gives some hope. Of note on this matter is the public information that is coming from the work of the Agricultural Land Commission, in collaboration with ENGOs. Among the glaring revelations that are coming out of these discussions is the scandalous "black market" in "waste landfill material" excavated by the construction industry and illegally dumped on prime agricultural land. The construction and development boom in BC has created a lucrative "trash crop", which is expensive to dispose of legally, but which farmers and landowners can be paid to take in order to fill wetlands and cover organic soil. The practice is more lucrative for farmers

than harvesting crops. The practice also effectively sterilizes agricultural land by covering it with waste concrete, asphalt and clay, and is very difficult to remediate as it is effectively the creation of "contaminated land." Given the relatively small area of agricultural land in BC, this is a major virtually unregulated problem, with huge environmental implications.²¹

Those implications were the object of my last report.²² As I pointed out then, farmland drainage in BC is virtually unregulated, and often violates basic Common Law principles. These "trash crops" are regularly used as an impervious fill for pervious surfaces and wetlands to "improve drainage," and provide relief from surface saturation resulting from winter West Coast rains. The quality of this run-off is rarely—if ever—tested. Agricultural ditches are regularly connected, without explicit permits, to the Ministry of Transportation ditching system, which is itself directly connected to our fish-bearing rivers. Contaminants from "trash crop" dumps, therefore, flow into the Salish Sea as untreated waste waters. It should, therefore, come as no surprise to learn, less than a month after a cholera outbreak in Qualicum, that this month, in the midst of an opioid crisis in Canada and the United States, mussels tested positive for opioids, less than 100 km away in Puget Sound.²³

While the practices and intentions of the current coalition NDP/Green government are undoubtedly an improvement over the many abuses of the previous administration, the environmental problems that British Columbians face remain those of administrations that are not adept at listening to the public's interpretation of its interests. The problems that are emerging make the disconnection between the public and government administration and industry increasingly glaring. Within that environment, ENGO's increasingly play an important role assisting government to recall the public interest and restrain a growing authoritarianism.

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ALBERTA News

Submitted by Bob Gainer, CSEB Member

Farley Mowat is Canada's Most Important Writer of the Twentieth Century: My Opinion

I've just read Graham Greene's memoir "Ways of Escape", 1981 by Penguin. He, and fellow British writers such as Evelyn Waugh, Peter Fleming and maybe even Lawrence of Arabia and Winston Churchill, were inclined to make uncomfortable journeys in search of bizarre writing material often involving various wars and Intelligence Services for the first two thirds of the Twentieth century. In the United States, the most obvious comparisons would be Jack London and Ernest Hemingway, the latter has often been called the most influential writer of the twentieth century. Ernest was involved in as many wars as he could, in whatever capacity that would work for him, sometimes involving the Intelligence Service, plus he could not resist journeys to bizarre locations for no other reason than adventure.

In Canada, who else but Farley Mowat? Uncomfortable journeys, bizarre material, war zones, Intelligence Service, prolific writer, by far the most successful Canadian writer (17 million books sold in 52 languages). He had similar inspirational and motivational material to these other authors; what else was involved? This is where Greene's memoir suggests further common ground, mental health issues, and alcohol abuse.

Now in his 80s at the time of his memoir, Greene openly admitted to an unhappy childhood and bullying at school. His father had him psychoanalyzed at great expense, only to have him start playing Russian roulette with his older brother's revolver. Luckily about this time, Greene discovered writing and found it to be incredibly therapeutic. In his preface, he says he doesn't know how non-writers survive. He also mentions the need for escape for no good reason but to survive. The reason he was so prolific was because writing kept him from depression and suicide his whole life; he lived until 86 and wrote till his end. When manic, he drank, abused substances, indulged himself without control, and got into trouble much like we would think of what is termed bipolar today. Writing was his lithium, but being manic

provided so much material. He talked about how easy it was to write character descriptions from the people he met in real life. Sometimes he would think about his next days' writing before he went to bed, dream all night long, and when he woke up, all that he needed was ready waiting for him. Alcohol always seemed to be a factor.

Ole Farl also talked about an unhappy childhood and being bullied at school. He was a small man (less than 5'6" as an adult), an only child, and a product of a dysfunctional family (parents he only found fault with), had a large menagerie for friends, and was writing natural history columns for local newspapers. Before he was out of high school, he had enlisted for service in World War II, which didn't contribute to his problem with alienation, mostly because he was too young and too small for officer material. His alcohol and tobacco use continued to rise. Overseas in Britain, Italy, and Holland, he was an Intelligence Officer. In Italy, he also saw front line duty. From his writing, it is implied to me that he was loaded with PTSD. Excessive use of alcohol usually exacerbates it, and anger is the primary symptom, characteristics he displayed. In his travelogues, the enormous consumption by him and his companions always seemed a source of pride. He lived to be 92 and wrote until his end.

Greene quotes Kipling about what having a favourite place, a soul paradise means: "We only have one virginity to lose, where we lost it there our hearts will always be". For Farl, it was the tree-line around Churchill. When 15, his Uncle Frank Farley, a noted scientific biologist, took him on the "muskeg express" railroad to see the splendours of the north. Farl was completely besotted and the two of them agreed to go again the next year but his horrible mother and father moved the family back to Ontario. All he could think of for the next 11 years (a few years in high school, six years in the military, two years post war university) was to make the trip he was supposed to have gone on. Somehow he managed to achieve it and actually repeat it again the following summer. These "Kiplingesque" journeys were the inspiration and material he needed for his first book. The PTSD and alcohol were the fuel. He lashed out in an uncontrolled fury against the world and it was an instant success. A few critics spoke up but what they quickly learned was that if you were a writer of smaller talent, it was not wise to denigrate one of larger talent while he was still alive; he publicly shamed them and sales of his books went through the roof. Then he outlived them all.

As an adversary, his energy, vitriol, wit, and particularly ungracious personal attacks were ferocious. Now demand for his books and offers for writing assignments poured in. Everything he produced sold well. His writing was colourful and inflammatory, he was a born storyteller; the public loved his style. As Greene pointed out about his own career, "just because my stories were embellished by a lack of respect for people's reputations, the facts, plagiarism, or that it was influenced by alcohol, mental illness, or criminal behaviour did not mean it wasn't the truth". However, like Mowat, Greene admitted to a spiritualism that wasn't religious, which may have somehow steered their courses. Their books always seemed to be proven right in the end.

About 1967, after moving back to Ontario into one of his family's original homes, Farl wrote "*The Sea of Slaughter*". He became a champion of the earth, economic development was

bad, wilderness was good, civilization and cities bad, and native societies good. The fact that for him to go up to the eastern arctic required a railroad, generous use of aircraft, ships, even outboard motors, sophisticated modern equipment like radios, or now that he was living in southern Ontario in comfortable quarters with electricity, flush toilets, vehicles, roads, unlimited tobacco and alcohol and every amenity you can imagine provided by a modern society didn't actually matter.

In 1969, he toured Siberia, wrote two mostly glowing books about the Soviets but was shocked by the carnage he saw of their resource development. During the last World Wars, the Russians had learned that their best defense against European aggression was to move east, and so they made a conscious effort to move as much resource development, manufacturing, and population as they could into Siberia. When he told them how appalling this looked to him, a committed, hard-core socialist, their reply was: "Surely you agree it is man's duty to develop the physical world. There can be no higher achievement".

I was in northern Siberia two years ago, it is surprising how perceptive he was. For one, his Russian issue of "Never Cry Wolf" (as "Wolves, Please Don't Cry" in Russian) was on most of the good-sized book-shelves, an incredible best seller and influence for environmental stewardship with the Government. Also he described how the Russian Government has a much more respectful and comfortable relationship with its native groups, which I agree with him on. Old Farl also pointed out that the object of resource development shouldn't be to rape the environment for the benefit of far off communities (like say Ottawa, Toronto, Montreal in Canada) but to first benefit the locals: build a good place for them to live for generations to come, and then secondarily to benefit the central communities.

I have read most of his books, several many times. He inspired me as a young small man to prove that I was good enough. I lived many bizarre places, drank excessively, have many of the flaws Greene described but never in his or Farl's league for self-medication, and I never achieved the tiniest fraction of what Greene and old Farl did. A couple of times during low points in my life, I would read his latest book or reread "*People of the Deer*" and would feel inspired.

It really is true that he was Canada's Hemingway and was never recognized for it. For most of the last century, we had a small population and were a "new" country. We wouldn't have recognized him for what he was worth because we didn't value what talent we had. His choice of topics were timely and good, and his style colourful and flamboyant. He had lots of flaws, but so did most great writers. Hemingway (6') and Greene (6'3") were at least as flawed but tall and handsome with plenty of lady-friends that made for great publicity. Farl was short, ugly, smelly, abrasive, falling down drunk, chaotic, and clashed personalities with normal people to be able to schmooze in literary circles and not draw as much positive publicity, but that shouldn't disqualify him. At least not to me, farmer, outdoorsman, lifelong birdwatcher, biologist, world traveler, small town veterinarian, environmentalist, old man with 75 years' life experience, husband, father, grandfather, and beaten-up social crusader.

My wife's advice to him would have been to not strut around in his kilt with a big scruffy beard so much. In Scotland a kilt

is only for special occasions, unless you are a "wannabe" over from Canada or America. It just emphasized how short he was and what a bad attitude he had.

My wife is an immigrant scot and a psychiatrist. She told me once that a friend had mentioned that her father was an immigrant scot. "What do you remember of him?" asked my wife. "Not much, just that he was small and always seemed angry." Farl was a wannabe scot, kilt, nay breeks, and all. Maybe this explains him more than my essay? That is, a small man in a small country (as regards population and history)?

My wife also calls bullsh...! on him delivering a young native girl's baby that was breach and required his use of high forceps, with no training or experienced medical assistance, in his recent book "*Otherwise*". A "wannabe" can b.s. me but not someone who has actually delivered babies (human) for 10 years in northern, native communities (my wife). Still, he had the desire and imagination (or the assistance of mental health issues and substances) that made him want to turn the baby's supposed presentation in order to "mine the base metal of ordinary life into the gold of adventure writing."

I agree he was flawed, but so are all the others. I have read an awful lot of books in my life and his really stand out for me. No writer even comes close to being the Hemingway of the north like he does. As Wilbur Smith, adventure writer extraordinaire for Africa was wont to say, "my sins are scarlet but my books are read."

SASKATCHEWAN News

Submitted by Robert Stedwill, CSEB Saskatchewan Director

Musings From Saskatchewan

Although I'm now retired. I do keep my eyes and ears open for things happening with respect to environmental issues in Saskatchewan. Although I can do this, I think it behooves active biologists in the province who are members of the CSEB to share some of their work with other members within the Society.

I have just learned that Husky Oil, the owners of the pipeline that leaked in excess of 225 000 litres of oil into the North Saskatchewan River in July of 2016 is planning to replace the line. In addition to the \$107 million cleanup costs associated with the spill, the company has learned much from their experience, and is unlikely to want a repeat performance.

The proposed new line, which has been the subject of two open houses, is designed to be bored at a higher elevation, and presumably farther back from the river's unstable banks. Further, new operating procedures and monitoring will be installed, and also will be incorporating a newer design using better and thicker steel.

I have not heard of any studies, beyond the initial studies, of the impact of the spill on the river. Anyone?

On another subject, I think Saskatchewan has an active environmental community, which keeps the environment foremost in their minds. Three that readily come to mind (but

there are many others) are the Saskatchewan Environmental Society (SES), The Prairie Conservation Action Plan (PCAP), and The Friends of Wascana Marsh.

The SES has been active in Saskatchewan for many years, and came to the forefront when uranium mining was just beginning and certainly made their presence known when Saskatchewan was giving consideration to nuclear electrical generation. PCAP is a partnership bringing together 30 agencies representing all levels of government, industry, non-government environmental organizations, and research and educational institutions; their common vision being prairie and species at risk conservation. PCAP regularly holds webinars, not unlike our own, the most recent being *"Comparing the Population Benefits of Habitat Restoration Options - Greater Sage Grouse in Alberta"*.

The Friends of Wascana Marsh is committed to protecting a diverse and productive Wascana Marsh ecosystem. The marsh is a 200+ hectare component of Wascana Park, which is second only to Stanley Park in terms of Canadian urban parks. The Friends provide outdoor, nature-based educational and interpretive opportunities and promotes environmental sustainability within an urban setting. Through partnerships and community engagement, Friends of Wascana Marsh is developing a legacy for future generations.

ONTARIO News

Submitted by Barbara Hard, CSEB Ontario Director

Federal Contaminated Sites Workshop

The Real Property Institute of Canada (RPIC) Federal Contaminated Sites Workshop took place from June 13 to 15, 2018, in Toronto, Ontario. The workshop consisted of a professional development day followed by two days of presentations and posters by staff from federal agencies and consultants. Of particular interest for ecological risk assessment (ERA) was the introduction of a risk assessment guidance document (Federal Contaminated Sites Action Plan, FCSAP ERA Module 6) on "Assessing Risk to Amphibians on Contaminated Sites in Canada" presented by Elissa Liu and Ute Pott from Environment and Climate Change Canada (ECCC) and Francesca Knight from Fisheries and Oceans Canada (DFO). Risk to amphibians has been excluded from ERAs in the past due to lack of information and data. However, using the guidance, risk to amphibians that are present at federal contaminated sites can now be assessed by using one or more of the following four different categories of lines of evidence:

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1. site-specific toxicological evidence;
2. indirect toxicological evidence (e.g., literature-based toxicity data);
3. site-specific biological evidence (e.g., field studies at the site of interest); or,
4. indirect biological evidence (e.g., biological field studies reported in the scientific literature) for which this module provides guidance and case studies.

QUEBEC News

Arethusa bulbosa Populations in the Vicinity of a Rural Airport in Quebec

Submitted by Barbara Hard, PhD, Arcadis Canada Inc, and CSEB Ontario Director

For the planned construction activities at an airport in a small town on the north shore of the Saint Lawrence River in Quebec, the assessment, characterization, and delineation of large area wetlands and the development of mitigation measures for protection of identified sensitive wetland areas were required. Expansions were scheduled for the runways and airport buildings.

The airport is surrounded by numerous peat wetlands and a woodlot to the north. The main wetland classes in the area are bogs with bog pools, fens and shallow water wetlands.

One species of concern, *Arethusa bulbosa* (Dragon's mouth) is listed to occur within a 5 km radius of the airport. Dragon's mouth is a native orchid that is found in acidic, boggy conditions, generally at the edges of fragile bog areas, typically growing from Sphagnum moss. The conservation status for this species is listed as "may be at risk" in surrounding provinces, "rare" in most of its range, and "endangered/threatened" in Saskatchewan (USASK, 2018) and the USA (USDA, 2018). It was reported for the first time in Alberta in 2014 (Iris, 2016). The major threat to this plant is loss of habitat from development and over-collecting.



During the vegetation inventory, several populations of *Arethusa bulbosa* were recorded in the vicinity of the airport. The number of plants ranged from 3 to 473 at the time of the site visit (end of June). The populations were found in fen-like graminoid areas within

the bog landscape as well as next to bog pools, often growing on Sphagnum hammocks. Individuals of other native orchids were encountered, but these were not identified as species of concern. Species at Risk were not identified on or in the vicinity of the Site.

As *Arethusa bulbosa* is presently considered secure in Quebec, but is likely to be designated (Tardiff et al. 2005; SCM HQ 2005), it was recommended to protect the populations in the vicinity of the airport:

- This native orchid only occurs in a very specialized habitat and requires certain growing conditions;
- The habitat types (fens/bogs) are vulnerable to disturbance and only slowly recover, if at all;
- Bogs and fens generally are threatened by development and encroachment;
- Because of its attractiveness this plant is susceptible to picking and removal by collectors;
- The success rate of transplanting *Arethusa bulbosa* is considered low because of its special habitat requirements; and
- It is considered threatened, endangered or rare in other Provinces and in many States of the US and therefore, seemingly secure populations should also be protected.



A Management Plan with suitable mitigation measures for construction works at the airport was developed. Measures recommended included installing silt fencing, equipment exclusion zones and retaining vegetation buffers of varying widths around high and medium sensitivity wetlands to

protect wetlands, their functions, as well as to protect identified Dragon's mouth populations

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ATLANTIC News

Submitted by Peter Wells, CSEB Atlantic Member

The 12th BoFEP Bay of Fundy Science Workshop, Held May 9-12, 2018

The BoFEP (the Bay of Fundy Ecosystem Partnership), formed in 1997 from the Fundy Marine Ecosystem Science Project of Environment Canada, held its 12th BoFEP Bay of Fundy Science Workshop in Truro NS, in May, 2018. The theme of the Workshop was “A Changing Fundy Environment: Emerging issues, Challenges and Priorities”. Primary sponsors of the workshop were Fisheries and Oceans Canada (a major supporter), the Fundy Ocean Research Center for Energy, and Mountain Equipment Co-op. The workshop was attended by just over 100 people (the count is still coming in), almost 30 of whom were graduate students giving both talks and posters.

Key note talks were given by Dr. Kimberley Davies, Dalhousie University (An Uncertain Future: The Right Whale's Fight Against Environment, Biology and Ocean Urbanization); Dr. Graham Daborn, Acadia University (Reflections on the Bay of Fundy and its Future); and Dr. Tony Walker, Dalhousie University (Drowning in Debris: Solutions for a Global Pervasive Marine Pollution Problem). A talk was also given on Emerging Issues.

Sessions of talks were held on Fisheries Ecology and Management; Integrated Coastal Management; Tidal and Renewable Energy; Dykelands and Tidal Wetland Restoration; Monitoring and Contaminants; and Ocean Protection Plan and Marine Protected Areas. **Panels** were held on Ocean Literacy and Awareness; Information Use at the Science-Policy Interface in Decision Making in the Bay of Fundy Region; and Future Research in the Bay of Fundy and BoFEP's Role. A very active poster session was held throughout the meeting.

The Program and Abstracts are all on the BoFEP website (www.bofep.org). The full **Proceedings** will be available shortly, joining the full complement of past Proceedings (e.g. the 11th Workshop, held in Fredericton in June 2016) and various reports on the website. Discussions are already underway as to the location of the next BoFEP workshop, in New Brunswick in 2020.

Gulf of Maine-Bay of Fundy Chemical Contaminants Studies Continue

An initiative of members of two groups, ESIP (Ecosystem Indicators Program) and Gulfwatch (a Gulf of Maine Council contaminants monitoring program), started some time ago to determine if there was a correlation between the information obtained on mussel tissue contaminant presence and levels, and sediment contaminant presence and levels, in the same locations (as approximately as possible) in the Gulf of Maine, including the Bay of Fundy. According to Dr. Gareth Harding, a Gulfwatch member, “Environment Canada, now ECCC, funded the contract to fill in the void on sediment contaminants in the Gulf of Maine on the Canadian side at Gulfwatch sites”, and these data have been incorporated into this study. A working group, led by Dr.

Jim Latimer (US EPA) and Dr. Adria Elskus (USGS), has been meeting regularly by conference call to assemble the data sets and evaluate them. This work is in its early phase. However, a talk was recently prepared by the group, led by Dr. Elskus, for the 12th BoFEP Bay of Fundy Science Workshop (Truro, NS, May 9-12th 2018), entitled: “Mussels and sediment as monitoring tools for contaminants: which to use when?”. The talk was presented by Dr. Peter Wells at the Workshop and the abstract will be included in the upcoming Workshop Proceedings. This project is continuing and will result in a full progress report later in 2018.



Dr. Peter Wells, CSEB Atlantic Member

TERRITORIES News

Submitted by Sharleen Hamm, RPBio, CSEB Territories Director.

I'd like to start this article off with a shout out to **DeBeers Canada** (DeBeers), the operator of the Gahcho Kué and Snap Lake mines in NWT and a HeForShe Thematic Champion: two scholarships will be awarded to female, Indigenous undergraduate students from the NWT entering full time studies in the Faculty of Science at the University of Calgary. The scholarships are part of DeBeers' commitment to provide over \$500,000 in science, technology, engineering and math (STEM) scholarships to female students across Canada by 2020. Scholarships are also available to female students entering the School of Engineering in Calgary and those studying Earth Sciences, Environmental Science, Chemical Engineering, Geological Engineering, Environmental Engineering, Electrical Engineering, and Mechanical Engineering at the University of Waterloo. For further information on the awards see <https://www.debeersgroup.com/canada/en/news/company-news/de-beers-stem-scholarships-expanded-to-university-of-calgary.html>.

HeForShe is the United Nations solidarity movement for gender equality, providing a platform on which men and boys can become change agents towards achieving gender equality. Thematic Champions are local leaders who commit to leveraging their resources to realize concrete progress towards gender equality and women's empowerment within their organizations. To read more about DeBeers' commitment see <http://www.heforshe.org/en/thematic/bruce-cleaver>.

Elsewhere in Arctic biology.....the **CCGC Amundsen** (the Amundsen) has set sail for another year of Arctic

research. The Amundsen is a research icebreaker deployed annually by Université Laval (representing the Consortium of Canadian Universities) and the Government of Canada. The Amundsen, named after the Arctic explorer Roald Amundsen, is a Class-1200 medium-size ice breaker, that sleeps up to 80 persons and can navigate at 3 knots in ice greater than 1 m thick. The Amundsen hosts myriad of scientific equipment including wet and dry laboratories, oceanographic samplers, ice equipment, oceanographic mooring instrumentation, ocean-sea ice-atmosphere instrumentation, sonars and remote sensing instruments. This year, the Amundsen departed Quebec City on May 25 for a journey north broken into 5 segments, returning to port around September 7:

1. **Leg 1, Quebec City, QC to Churchill MB:** sampling aimed at understanding the role of freshwater in the marine and coastal systems of Hudson Bay;
2. **Leg 2a, Churchill, MB to Iqaluit, NU:** continuation of Leg 1 sampling, further sampling at stations in Hudson Strait and Ungava Bay;
3. **Leg 2b, Iqaluit, NU to Iqaluit, NU:** deploying samplers and sensors along a transect near Qikirtarjuaq aimed at providing researchers with hands-on experience under the supervision of renowned researchers;
4. **Leg 2c, Iqaluit, NU to Resolute Bay, NU:** conducting multibeam, ROV and coring operations in Frobisher Bay and various studies in Baffin Bay as a part of the Vulnerable Marine Ecosystem ROV program, and some baseline data collection as a part of DFO's Marine Protected Areas program;
5. **Leg 3, Resolute Bay, NU to Quebec City, QC:** sampling in Queen Maud Gulf as part of the Kitikmeot Marine Ecosystems Study, and further sampling in Baffin Bay.

Follow the Amundsen's journey across Canada here: <https://data.amundsen.ulaval.ca/>

Northern Update

Submitted by Anne Wilson, Territories Director and CSEB Secretary

Some highlights from across the three territories:

Yukon

Community consultations are underway in the Yukon as Canada seeks input on how best to clean up one of the country's largest environmental liabilities. The Faro zinc-lead mine operated from 1969 to 1998. It was once the largest open pit mine of its kind in the world, with a footprint that is roughly the size of Victoria, B.C. The former owners abandoned the mine site after filing for bankruptcy. Remediation is being led by the Government of Canada, in consultation with the Kaska Nations, Selkirk First Nation, and the Yukon Government. Cleanup of the site, which includes 70 million tonnes of tailings and 320 million tonnes of waste rock, will be a complex, lengthy, and expensive process.

Northwest Territories

Arsenic and Yellowknife:

The N.W.T.'s chief public health officer has issued an updated public health advisory on arsenic levels in lakes around

Yellowknife. It includes information about several additional small lakes (Niven Lake, Range Lake and Fiddler's Lake) along with information about consuming plants and mushrooms. Officials said current information indicates occasionally eating berries or wild plants won't cause harm, but they still advise people to avoid doing so within Yellowknife city limits, because of its industrial history. Mushrooms picked within 10 to 25 kilometres of Giant Mine pose a low health risk, the advisory states. However, mushrooms shouldn't be eaten within 10 kilometres of Giant Mine, it says.

Health Canada's guidelines state that water is safe for drinking if it has a concentration of less than 10 parts per billion of dissolved arsenic.

While the water and flora may warrant cautions, a report from the Giant Mine Remediation Project shows the site isn't stirring much up in terms of dust or arsenic. From CBC News North:

A director with the Giant Mine Oversight Board said the results are very similar to what he's seen in his year and a half on the board. "This air quality monitoring, it's a good-news story," said Ken Froese, director of the Giant Mine Oversight Board. "It gives us confidence that the activities on the site are taking care of air quality."



The report found there were no concerning levels of dust or contaminants in the air. (Chantal Dubuc/CBC)

The remediation project is tracking the level of "particulate matter less than 10 microns in diameter" in the air — or, as it's more commonly called, dust.

The report did find one instance on May 29 where the dust in the air exceeded the acceptable level, but Froese said this was likely because of fog. The instruments use light to measure the number of particles in the air, and when fog enters the instrument, it mimics dust — altering the results.

Froese said if the level of dust in the air gets too high because of remediation activities, workers will either stop the activity or find a solution, like using water to control the dust.

It also tracks the levels of contaminants found in the dust, including arsenic, asbestos, and nitrogen dioxide.

"In terms of the analyses for arsenic, it's been below detection for every report I've seen," said Froese.

The report found the level of arsenic in the dust was so low that the instruments couldn't accurately measure it, which was the same for the presence asbestos and nitrogen dioxide.

"There's nothing of concern," said Froese.

Fire Season:

North Slave rainfall records have been broken for several dates in June, and Yellowknife came within a mm of breaking the all-time record! However, Richard Olsen, manager of fire operations with the Department of Environment and Natural Resources, said that it wasn't enough to change the forest fire forecast. ENR is still predicting the traditional start to the main fire season. So far, eight forest fires have happened in the territory in 2018 — six caused by lightning and two caused by people, and 2,068 hectares have burned. Last year by this date, there were 19 fires and 851 hectares had burned.

Wind Energy:

Northwest Territories government officials gave an update on a wind farm project during the Arctic Energy and Emerging Technologies Conference and Tradeshow in Inuvik. The GNWT could file for a permit to start a wind farm in Inuvik, N.W.T., this fall, pending completion of the feasibility study for the project, which is set to wrap up shortly.

Environmental Assessment and Regulatory news in the NWT:

- The Mackenzie Valley Land and Water Board (MVLWB) is inviting reviewers to submit comments on Draft Guidelines for Aquatic Effects Monitoring Programs. To participate: http://lwbors.yk.com/LWB_IMS/ReviewComment.aspx?appid=12346;
- Ongoing environmental assessments (EAs) underway include:
 - **Prairie Creek Mine** (Canadian Zinc Corp.): The Board's Environmental Assessment decision was released Sept. 12 and next steps are waiting on the INAC Minister's sign-off of the decision. A recent news release targets 2020 for starting production, and notes that the company needs to raise \$279 million for construction costs.
 - **The Tlicho All Season Road**: The Review Board released its decision report March 29, 2018, which includes the Board's findings and measures to be taken to mitigate potential adverse impacts. Many of the impacts relate to cultural and socioeconomic factors; the environmental impacts centre on caribou, species at risk (birds), and fishing pressure. This infrastructure is a key factor in the ability of Fortune Minerals to construct and operate the NICO gold project. Once the EA decision is signed off, an agreement must be reached between the Tlicho Government and Fortune Minerals for the spur road to the mine project.
- Ongoing activity for various proponents, whether they are moving towards development or have applied for amendments to their water licences, or renewals, or are in the regulatory process with routine requirements for submissions includes:
 - **The Ekati Diamond Mine** has applied for two licence amendments to: mine deep deposits in the Misery Pipe; amend potassium effluent discharge criteria. Public hearings will be held in February 2018.

- **DDMI** has announced that the Jay Project, which has been assessed and permitted, will not proceed; further work on costs and feasibility will be done.
- **Diavik Diamond Mine Inc.** has submitted their Closure and Reclamation Plan (V. 4.0) and this is out for review. Of interest will be the closure of the in-lake structures, particularly the North Inlet, which has been used for treatment waste disposal.
- **DeBeers Canada Gahcho Kué Diamond Mine** started production late in 2016, becoming the third operating diamond mine in the NWT. Rock conditions brought the unwelcome surprise that benches will need to be much larger than originally thought. A licence amendment process is underway, with public hearings scheduled for July 25-26, 2018 in Yellowknife.
- **Avalon Advanced Minerals Inc.** is doing further exploration at the already-assessed Thor Lake site, a rare earth elements deposit. While the mine development was put on hold at the water licence stage, commodity demand may revive interest in this project.
- **Miramar Northern Mining Ltd.** has applied to renew their water licence, for the closure of the historic Con Mine in Yellowknife. Public hearings are scheduled for Sept. 12 & 13, 2018.
- **Mines and municipalities** have filed their annual reports, which provide operational information as well as monitoring data for the previous year.

- Full details for current environmental assessments are available on the Boards' web sites at <http://www.reviewboard.ca/registry> and regulatory files at <http://www.mvlwb.ca/Boards/mv/SitePages/registry.aspx>.

Nunavut

Members of the Nunavut Legislature have chosen Joe Savikataaq to become the next premier of Nunavut, after Paul Quassa was ousted in a non-confidence vote earlier on June 14, 2018. Savikataaq has served as deputy premier previously.

One of the strengths of the Nunavut Impact Review Board environmental assessment process is the follow-up requirements. Proponents are issued a Project Certificate which includes terms and conditions, which are designed to prevent impacts, and include environmental monitoring. Results are reported by March 31st of each year, and are reviewed by stakeholders as well as the NIRB. Among the Annual Reports filed for developments, Baffinland's Mary River mine has been flagged as having room for some improvements with waste management and socio-economic aspects. The company receives the NIRB recommendations and is working to address concerns.



Environmental Assessment and Regulatory news in Nunavut:

- Public comment period for the Nunavut Impact Review Board's (NIRB) strategic environmental assessment in Baffin Bay and Davis Strait Issues Scoping has just wrapped up. The NIRB has now moved on to the next step, which is the analysis of possible development scenarios. To follow the project visit file # 17SN034 on the NIRB public registry <http://www.nirb.ca/application>.
- Ongoing environmental assessments (EAs) underway include the following:
 - Baffinland's **Mary River** project has submitted a modified Phase 2 EIS submission, which covers development of a rail line and additional marine port for ore transport. This appears to have stalled in the EA process.
- Ongoing activity for various proponents, whether they are moving towards development or have applied for amendments to their water licences, or renewals, or are in the regulatory process with routine requirements for submissions includes:
 - Agnico Eagle Mines' **Meadowbank Gold Mine** is in production and has less than two years mine life left, pending issuance of the water licence for mining the Whale Tail deposit. Milling and tailings disposal will be done at the Meadowbank mill and TIA, but a recent proposal by AEM is looking at tailings deposit into mined out pits. These pits will be flooded eventually, and reconnected to lakes, so this proposal is being closely examined.
 - Sabina is proceeding to water licencing hearings for their **Back River gold project**. These will be held in Cambridge Bay, August 8-9, 2018.
 - Preparation is underway for the TMAC **Boston/Madrid** (Hope Bay) project water licencing process; hearings have not been scheduled yet.
- Full details for current environmental assessments are available on the Boards' web sites at <http://www.nirb.ca/application?strP=r> and regulatory files at <http://www.nwb-oen.ca/content/public-registry>.

Closing:

If you are connected to activities in the Yukon, Northwest Territories or Nunavut, doing work north of 60 that you would like to highlight in the newsletter, or running some seminars or other training opportunities, please let us know. The CSEB provides a valuable networking and communication forum, and a voice for biologists if there are any issues to be raised. There is also the option of instigating other CSEB activities – both of the fun and/or of the educational variety - with colleagues in the North. Please email your thoughts to Anne Wilson at anne.wilson2@canada.ca or Sharleen Hamm at sharleen@sharleenhamm.com.

CSEB Research Webinars

Check the CSEB Website at www.cseb-scbe.org for upcoming webinars and registration information.

Thinking Mountains Interdisciplinary Summit, Banff, Alberta, October 2-5th, 2018.

This upcoming conference is the third in the series, following conferences in 2012 in Edmonton, and in 2015 in Jasper, Alberta.

It is an ongoing initiative of the interdisciplinary Mountain Research and Initiatives program of the University of Alberta in Edmonton.

The conference attracts researchers and other interested parties who are conducting or otherwise involved in research on mountains, in Canada, North America as a whole, and globally. Hence papers are given on topics such as glaciology, mountain ecology and wildlife, environmental and wildlife management, history of exploration, tourism and recreation, mountaineering, mountain literature, climate change and its impacts, etc. Field trips are a pivotal part of each conference. A number of plenary talks will be presented by widely known mountain experts. This year's meeting is being held at the Banff Centre for Arts and Creativity. All CSEB members are encouraged to attend, as many talks will likely address aspects of environmental biology in mountain landscapes.

CSEB VOLUNTEERS NEEDED**Social Media Coordinator:**

CSEB requires a volunteer to manage our social media (e.g., Facebook, Twitter, etc.). The volunteer should be familiar with social media, have a good command of the English language, and willing to spend the time to post new items, keep the social media current, and communicate with our members.

If interested, please contact President Curt Schroeder at schroederc@saskpolytech.ca.

Website Assistant:

CSEB requires a volunteer to assist our Webmaster Brian Free with managing the CSEB Website. You should be familiar with using WordPress for website management, and able to gather relevant material for posting on the site. It would also be useful to have experience with MailChimp for sending out webinar and other notices, but training can be provided. For more information, please contact Brian Free at bfree@cseb-scbe.org

Regional Directors

CSEB Requires Regional Directors for the following Regions:

Alberta (1), Saskatchewan (1), Manitoba (2), Ontario (1), Quebec (2), Atlantic (1), and Territories (1).

Duties involve promoting CSEB in the Region, participating in monthly Board conference calls (1 h/mo), and providing regional news for the CSEB Bulletin four times per year.

For more information, contact President Curt Schroeder at schroederc@saskpolytech.ca.

CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS

LA SOCIÉTÉ CANADIENNE DES BIOLOGISTES DE L'ENVIRONNEMENT

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Regular Members: persons who have graduated from a college or university in a discipline of biological sciences, and who are or have been professionally engaged in teaching, management, or research related to natural resources and environment.

Student Members: persons who are enrolled in an accredited college or university in a discipline of the biological sciences, and who are preparing themselves for professional work in teaching, management, or research related to natural resources and to the application of sound ecological principles to management of the environment.

Associate Members: persons who support the purposes and activities of the Society but who do not qualify for Regular or Student membership.

*Complete this form and return with cheque payable to:
The Canadian Society of Environmental Biologists*

Membres Réguliers: les personnes ayant un degré ou diplôme d'un collège ou une université dans une discipline des sciences biologiques et qui sont ou qui ont déjà été engagé professionnellement en aménagement, enseignement ou recherche tenant à l'environnement ainsi que ressources naturelles.

Membres Étudiants: les personnes qui étudient dans un collège ou une université reconnu dans une discipline des sciences biologiques, et qui se préparent à travailler comme professionnel soit en enseignement, aménagement ou recherche tenant aux ressources naturelles et à l'application de principes écologiques à l'aménagement de l'environnement.

Membres Associés: les personnes qui supportent les activités et les objectifs de la Société mais qui ne se qualifient pas comme membre régulier ou étudiant.

*Complétez cette formule et retournez avec un chèque payable à:
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