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BCTOX is now shared with 200 professionals in BC. It can increase your works' visibility!

You may contribute to BCTOX by providing 400 word abstracts of a toxicology related problem or an initiative that you have taken!

These "Abstracts" of BCTOX are peer reviewed and referenceable. How to cite abstracts of the current issue?

Authors' surname, Initials, Title. *BCTOX* 2017; 2(8): Pages.

BC Toxicology Pictures of the Month



BCCDC released the new BC overdose action exchange II (August 2017)

It includes 10 areas to reverse overdose deaths in BC; released in this August ([Ctrl Click here](#)) (see more on page 110) (BCCDC 2017-Aug)



Equivalent area of forest burning in 2017 in BC so far is unprecedented & even larger than certain countries!

For example, since April 1, 2017 till August 28, 10,545 km² of forest has burned in BC (BC-Wildfire-Service), equal to **35% of the Belgium** area (30, 528 km²). [BCTOX graph]

What are the harmful components of wildfire?

Smoke particulate matter), aftermath debris (Pyrolyzed debris), and long-term fire retardant (Phos-chek).

About Us



Aims and Scope

BC Toxicology News Monthly Bulletin (BCTOX) aims to popularise the knowledge of toxicology and expand use and the awareness of Toxicology News in British Columbia, Canada. It tries to engage health and environmental professionals with online published toxicology news, publicly available information, and by providing short communications. BCTOX mainly focuses on adapting or summarizing relevant toxicology news in BC. The Bulletin accepts and welcomes contributions from professionals and the public as long as they meet BCTOX standards.

How to access the original news items? If you click on the link related to each one of the provided stories, it will take you to the original site of the news.

Publication Frequency: BCTOX is published monthly in English by Reza Afshari.

Provided information in [GRAY](#) is not related to the current issue, but could be of interest.

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Policies:

Open Access Policy: This bulletin provides open access to all its content.

Fee: BCTOX is free-of-charge for readers and contributors.

Copyright Statement

BCTOX's content is currently prepared by Reza Afshari. The bulletin retains the copyright of their articles and will be able to archive pre-print, post-print, and publisher's versions.

This bulletin is not official and for the most parts is not peer-reviewed. It does not cover all the news, and is not liable for the accuracy of the news from media. It is, however, BC related, informative, handpicked and fun to read. The provided contents are not necessarily BCTOX's views.

BCTOX has been modified since (BCTOX 2017 June 2(6)) issue. It is now accepting 400 words educational material, commentaries, and research abstracts (with data) as long as they are within the scope of the bulletin and meets our standards. We are going to publish up to four short [but not full papers] abstracts in each issue. This section of the journal is peer reviewed.

Archiving. Digital Archiving: In addition to indexing database this Bulletin utilizes digital archive as well as hard copies to guarantee long-term preservation and restoration.

Publication Ethics

This bulletin follows International Committee of Medical Journal Editors (ICMJE)'s Recommendations. Authors (i) must declare any conflict of interest in a given manuscript, and we utilize COPE workflow to transparently handle it, (ii) follow ICMJE definition of author and contribution, and (iii) accept the ethical policy including regulation and malpractice statement.

Guide for Authors

From June 2017 (BCTOX 2017 2(6)) we publish original research, mini reviews, short communications, letters, case reports, and case series as long as they are limited to 400 words and the content is British Columbia related. These publications are peer reviewed.

References

References should be given in the Vancouver style and numbered consecutively in the order which they are first mentioned in the text. Citation in the text should be in line with text in parenthesis with Arabic numbering style.

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BCTOX does not have a professional website yet, but materials could be found from <https://plus.google.com/105713713266879554108>

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New subscribers will be added to the mailing list upon their request.

If this bulletin is not of interest to you, let us know please so we do not to fill up your mailbox in future.

Toxicology news in this month was focused on Wildfire and Fentanyl overdose, followed by food recall and drinking water quality.

How to cite BCTOX's articles:

AUTHOURS. TITLE, BCTOX 2017;2(8): PAGES.

Acknowledgment

BCTOX respectfully acknowledges that it is published on the ancestral homelands of the Coast Salish peoples, including the territories of the x^wməθkwəy̓ əm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō and Səl̓ílwətaʔ/Selilwitulh (Tsleil-Waututh) Nations. [Adopted from (BCCDC 2017-Aug).]

Erratum from the previous issues None received in August.

Summary of the Toxicology News in BC (August 2017)

Reza Afshari*, Environmental Health Services, BC Centre for Disease Control, BC. Reza.Afshari@bccdc.ca [Editorial 2017-08-29]

Housekeeping notices *BCTOX* has been modified since June. It is now accepting 400 word educational material, commentaries, and research abstracts (with data) as long as they are within the scope of the bulletin and meets our standards. This section of the journal is peer reviewed. We also have included a section for health authorities to focus on more local news below the provincial level. More information is available in *Guide for Authors'* section. Any additional information could be obtained by direct communication with *BCTOX's* office.

We are trying to aggregate related news for a particular toxicology issue, and report them under one subheading. References are given at the end of each issue to present the bulletin as an exciting review article. Based on the feedback we received and as far as possible, news will no longer be reported as tables with independent references.

Mode of news Similar to July, BC toxicology news in August was dominated by both fentanyl overdoses and deaths and wildfire induced exposure to air pollution. Due to wide coverage of wildfire news in July *BCTOX* issue, they are not focused in the current one.

Major toxicological statistics in August

Mortalities

❖ In total, over 700 premature deaths could be attributed to toxic exposures in BC in August including ACUTE exposures; 111 due to illicit drug overdose and around 10 due to suicides (CO, drugs and alcohol), and CHRONIC current and past exposures; 500 due to smoking and tobacco use, 81 (air pollution), 11 (radon) and 6 (asbestos). These are equal to overall 15×10^5 toxic exposure induced deaths in August alone including 2.4×10^5 acute and 13×10^5 chronic toxicities (estimations are subjected to assumptions and limitations and overlaps are possible).

Morbidities

❖ Around 2150 cases were reported to BC-DPIC [estimated from BC-DPIC fact sheet] (subjected to assumption) (BC-DPIC)

Macro level actions/strategies

- ❖ BC government to join legal challenges against Kinder Morgan Trans Mountain Pipeline
- ❖ BCCDC released the new BC overdose action exchange II

Wildfire

❖ A total of 10,545 km² of wildland forest area has already burned in the current fiscal year (up to Aug 23), which is by far unprecedented.

Toxic exposure via AIR

Air quality got worse in August due to large scale wildfires. Quality of Daily air pollutants in Vancouver International Airport (Jan to Aug 2017) suggest that perhaps recent forest fires in BC has affected

- ✓ PM₁₀ and PM_{2.5},
- ✓ And to a lesser extend SO₂, CO, NO₂,
- ✓ But not NO and O₃.

Toxic exposure via PRODUCTS

Among other recalls, MixBin Electronics, LLC recalled Liquid Glitter iPhone Case [Joint recall of Health Canada and the United States Consumer Product Safety Commission]. Liquid and glitter can leak out of the case if it breaks or cracks which could cause skin irritation, blisters or burns.

Toxic exposure via FOOD - Marine biotoxins

Bi weekly marine bio-toxin monitoring in West Coast BC in August shows:

- ✓ Below regulatory limits Domoic acid [Amnesic Shellfish Poisoning] is reported again after 2 months
- ✓ Below regulatory limits of Okadaic acid and dinophys toxins [Diarrhetic Shellfish Poisoning] are on rise
- ✓ Above regulatory limits of Saxitoxin [Paralytic shellfish poisoning] concentrations are on decline

Toxic exposure via WATER and SOIL

The City of White Rock has published water-testing results from 107 samples. Accordingly since January 2016, a total of six arsenic testing results were above the 0.010 mg/L MAC at three different sampling locations

Illicit drug [fentanyl] overdose crisis

In June (last update), 111 cases died as a result of illicit drug overdoses in BC, which is 61% higher than June last year and 14% lower than last month. The pattern of overdose deaths suggests that the sharp increase in deaths has reached a plateau, if not decreased in recent months (see page 110).

BCCDC released the new BC overdose action exchange II this August, in which engaging peers, addressing contamination of the drug supply, supporting appropriate pain management therapies were stressed to be built on the success of Overdose Prevention Sites. It also focuses on improving addiction treatment aligning law enforcement efforts and reforming drug laws. In addition, the strategic plan includes addressing structural barriers and upstream factors, countering stigma and implementing targeted research, surveillance and evaluation initiatives. (BCCDC 2017-Aug)

In this month, new strategies/goals were also reported including treatment on demand by the Minister of Mental Health and Addiction, expansion of prescription opioids in place of contaminated street drugs by BCCDC Medical Director, a new mandate to collect comprehensive information by the BC Chief Coroner, and modeling Portugal's experience as an example for BC by the Provincial Health Officer. Dr. João Goulão, The architect of Portugal's drug-policy framework, offered advice on the fentanyl crisis ahead of his first visit to Vancouver. "Legalization and the regulation of markets, controlling the quality of the substances, and making them available only in appropriate places".

--- Fine for Poisoning a tree!

Court has ordered a couple in North Vancouver to pay \$25,000 for poisoning their neighbours' 60-year-old red cedar tree.

SOLA DOSIS FACIT VENENUM

Only the dose makes the poison!

Paracelsus (1493 – 1541 CE)

--- Majority of the News related to Wildfire is not reported here

First Nations Health Authority

The most important toxicology news was the release of new data for **opioid (fatal and non-fatal) overdoses** among the First Nation population.

The First Nations population has disproportionately been affected by opioid public health emergency due to the ongoing legacy of colonization. While First Nations population make up 3.4% of the population in BC, over 10% of all overdose deaths in BC were First Nations people. (MyPrinceGeorgeNow 2017-08-03)

The FNHA identified 1,903 fatal and non-fatal overdoses involving First Nations people from Jan. 1, 2015, to Nov. 30, 2016; and 60 fatal overdoses from Jan. 1, 2015, to July 31, 2016. (TheGlobal&Mail 2017-08-03)

Racism, intergenerational trauma and a reported lack of access to mental health services have been attributed to this finding according to the FNHA. (MyPrinceGeorgeNow 2017-08-03) According to Dr Shannon McDonald "root cause rests in colonization, displacement, connection that has been broken (TheGlobal&Mail 2017-08-03)

Fraser Health Authority

Discarded needles Chilliwack council [July 18] asks FHA to address the "gaps in service" since Chilliwack has borne the brunt of the public's ire over dramatic increases in discarded needles and increased numbers of people shooting up in the streets and parks. (BCLocalNews 2017-07-28)

Among other actions, FHA have made investment in Chilliwack, including expanding Chilliwack's outreach team to provide services seven days per week, 12 hours per day. (BCLocalNews 2017-07-28)

FHA has a new outreach position for Indigenous people -funded by FNHA - with mental health and substance use issues, funded by First Nations Health Authority.(BCLocalNews 2017-07-28)

Too many men working in trades are overdosing on opioids, and men who are injured on the job may be ensnared into dependence on illicit substances after being prescribed pain medication according to Dr. Victoria Lee (CMHO) of Fraser Health. (News1130 2017-08-29)

"Fraser Health is planning a workshop next month for employees, employers and trades representatives to explore interventions that would help men who don't reach out when they're struggling with substance-use issues. (News1130 2017-08-29)

Interior Health Authority

Potential water contamination from the proposed Ajax mine. A Kamloops community group seeks IHA to issue a protection order preventing possible water contamination from the Ajax mine arguing that the environmental assessment of the project was inadequate.

The Ajax mine proposal is for \$1.3 billion open-pit copper-gold mine on 17 Km² in the southern limits of Kamloops municipal boundaries, a couple of kilometres away from residential neighbourhoods.

The mine would involve carving 65,000 tonnes per rock per day out of the ground to produce some 64,000 tonnes of copper and 130,000 ounces of gold over a 23-year mine life. (VancouverSun 2017-08-14)

Woman and dog both ill following swim near Summerland dog beach. Association to water is under question.

(PentictoNwesternNews 2017-08-04)

Northern Health Authority

Fatal overdoses in Northeast BC remain down. There have been seven illicit drug overdose deaths in Northeast BC, in 2017, down from 17 in 2016. This includes five fentanyl-detected deaths thus far in 2017. (AlaskaHighwayNews 2017-08-16)

There have been 28 drug overdose deaths including 23 fentanyl-detected deaths in NHA from Jan to May 2017. In 2016 there were 51 deaths over that year. (AlaskaHighwayNews 2017-08-16)

Vancouver Coastal Health Authority

--- City braces for **extreme weather**

In summer 2009, over seven days, 110 more people died than would be seen in an average summer week in the region due to unprecedented heat wave, according to Dr. Sarah Henderson. This could happen this year. (CBCNews 2017-08-01)

BC health workers are dealing with a **surge in cases related to smoke** from the province's wildfires according to Dr. Bonnie Henry. (GlobalNews 2017-08-05b)

There has been a recent up to **50% rise** - more than the past 10 years in the same area - **in emergency calls and hospital visits** with people suffering from respiratory and other health conditions related to the smoke and heat, particularly in the Lower Mainland. (VancouverSun 2017-08-05)

Court has ordered a couple in North Vancouver to pay \$25,000 for **poisoning their neighbours' 60-year-old red cedar tree.**

The top three townships where illicit drug overdose deaths occurred are Vancouver, Surrey and Victoria. (ChekNews 2017-08-04)

Advocacy It has been six weeks since Vancouver Coastal Health launched an online program for drug users, Real-time Drug Alert and Response (RADAR), to report overdose-causing drugs, but the system need to be more popularised. We've really had few reports and we've only sent out one alert according to Dr. Mark Lysyshyn MHO. "The system is only as good as the people providing reports". (CBCNews 2017-08-22)

Vancouver Island Health Authority

First **supervised drug-use site** in Victoria [named the Pandora Community Health and Wellness Centre] approved by Health Canada. This site is part of a broader strategy of offering people a safe place to use drugs according to Judy Darcy, (TheGlobal&Mail 2017-08-03)

The VIHA has issued a public service announcement aimed at festival attendees who use drugs; according which there are drugs contaminated with fentanyl, increasing the possibility an overdose. (Global-News 2017-08-08)

The City of Nanaimo placed a clean-up order on Rapton's Howard Avenue property for garbage, wood and shingle scraps and discarded furniture. Soil was found contaminated with lead, zinc and tin. The City has come up with a \$92,000 bill to clean up that the landowner should pay. (BC-Local-News 2017-08-08)

Toxicology related mortalities could be due to acute or chronic exposure to xenobiotics. It is possible that morbidities and mortalities manifest long after exposure e.g. asbestos exposure.

In this issue radon exposure have been discussed in more detail. The population of Canada and BC are considered to be 36.29 and 4.31 million respectively in the following estimations. These estimates are subjected to the wide range of assumptions and effects of confounding factors from their original source of data as well as our estimation. Overlaps are also plausible.

Acute

Illicit drug overdose

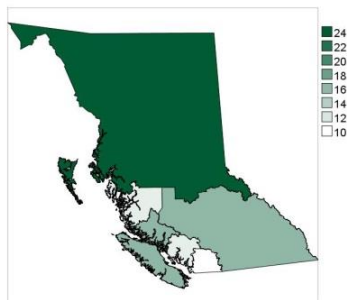
The number of Illicit drug overdose deaths in August was 99 cases, assuming August and June 2017 were equal.

Suicide Death due to Carbon Monoxide (CO) poisoning

According to Coroners Services, an annual average of 29 Suicide Deaths in BC (2006 – 2014) were due to Carbon Monoxide (CO) poisoning. (Coroners-Services 2017) Assuming a similar distribution, 2.4 deaths attributed to each month.

Suicide Death due to Poisoning: Alcohol/Drugs/Other

According to Coroners Services, an annual average of 101.6 Suicide Deaths in BC (2006 – 2014) were due to Alcohol/Drugs/Other poisonings. (Coroners-Services 2017) Assuming a similar distribution, 8.5 deaths attributed to each month.



Rate of Suicide Deaths [all] in BC by Health Authority per 100,000 persons, 2006 – 2015. (Coroners-Services 2017) [BCTOX Graph]

Chronic exposure

Smoking & Tobacco Use

Tobacco-related illness cause up to 6,000 deaths in BC each year, which is the leading cause of preventable death in the province.

(Quitting-Smoking-&-Tobacco-Use) This is equal to 500 premature deaths in each month.

Air pollution

It is estimated that air pollution results in 7,700 premature deaths in Canada each year. (IISD 2017-06) Assuming the population of Canada and BC are 36.29 and 4.63 million respectively and a similar distribution exists, 982 premature deaths per year could be attributed to air pollution in BC. That is equal to 81 premature deaths in August alone.

Radon

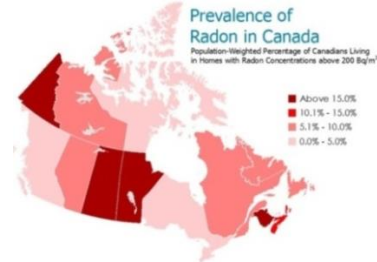
Canadians living in homes with radon concentrations above 200 Bq/m3 in BC are 0.0 to 5.0%, which is lower than other provinces.

Different rates have also reported. (Copes R and Summers A 2016) New Brunswick, Manitoba, Saskatchewan and Yukon have the highest rates of above 15%. (Statistics-Canada 2016Update)

Radon is the second-leading cause of lung cancer, after smoking,

accounting for 16% of lung cancer deaths, or 3,200 deaths in Canada, annually. (Chen, Moir et al. 2012) (Statistics-Canada 2016Update)

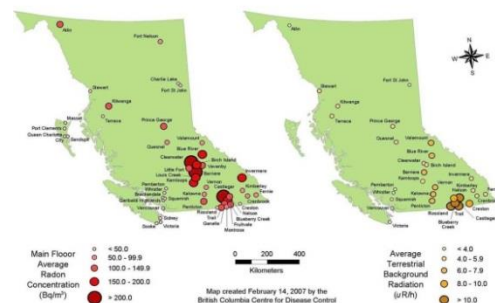
- Assuming a modification factor of 0.33 due to lower exposure in BC
- Assuming all other factors are the same in BC and Canada



Graph adopted from (Statistics-Canada 2016Update)

11 premature deaths could be monthly attributed to radon exposure in BC. This estimation is not accurate and should be treated with caution.

Main Floor Radon Concentrations and Terrestrial Background Radiation in British Columbia Communities



Map adopted from (BCCDC 2007)

The above radon maps for homes were created by BCCDC based on a survey performed in 2007 for radon in BC cities to suggest the radon prone areas within the province. (BCCDC 2007)

Asbestos

In 2014, asbestos-related disease resulted in 77 deaths. Fatalities resulting from occupational diseases accounted for 57% of all work-related deaths in BC. (Work-Safe-BC 2014) (This is equal to 6 deaths per months).

BC Drug and Poison Information Centre

Over 26,000 poisonings are annually reported to the B.C. Poison Control Centre from BC that includes both unintentional and intentional poisonings and overdoses. This is roughly equal to 2,150 cases in each month. [Telephone interpreting in over 150 languages available] (BC-DPEC)

Laboratory toxicology

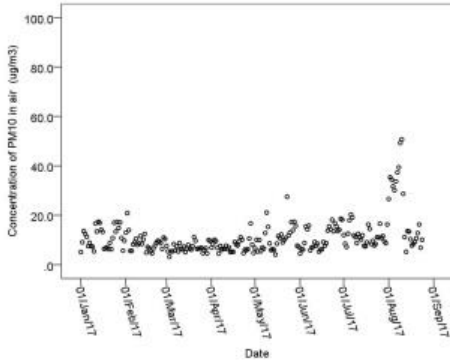
On average 2738 blood lead concentration were measured during 2009 and 2010 that is equal to 6×10^5 / year or 228 for August.

Toxicology related hospital admission No reference was found.

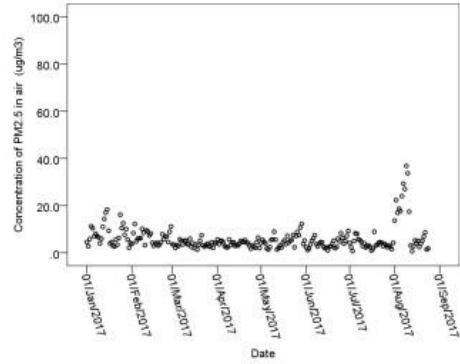
In total, over 700 premature deaths could be attributed to toxic exposures in BC in August including ACUTE exposure; 99 due to Illicit drug overdose and around 10 due to suicides (CO, drugs and alcohol), and CHRONIC; 500 due to smoking and tobacco use, 81 (air pollution), 11 (radon) and 6 (asbestos). [Overlaps are possible]

These are equal to overall 15×10^5 toxic exposures in August alone including 2.4×10^5 acute and 13×10^5 chronic toxicities (subjected to assumptions and limitations).

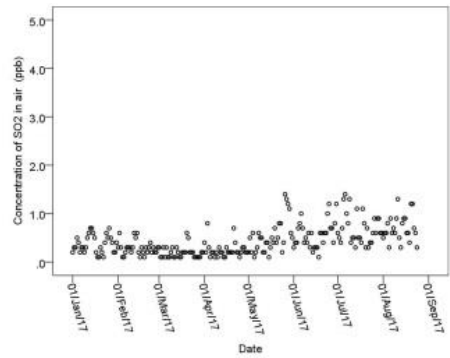
**Toxic exposure mediated via AIR (I) in BC– Data from Ministry of Environment, BCTOX Graph
Average daily air pollutants in Vancouver international airport (Jan to Aug 2017)**



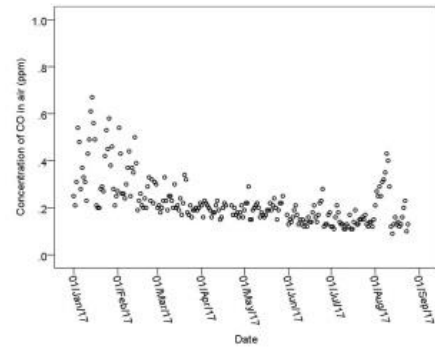
PM₁₀ (µg/m³) (Jan – Aug 2017)



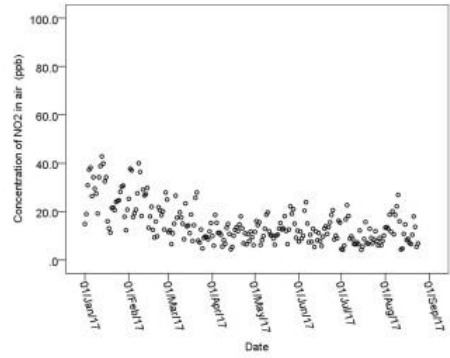
PM_{2.5} (µg/m³) (Jan – Aug 2017)



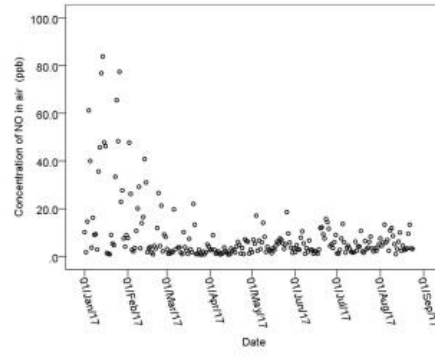
SO₂ (ppb) (Jan – Aug 2017)



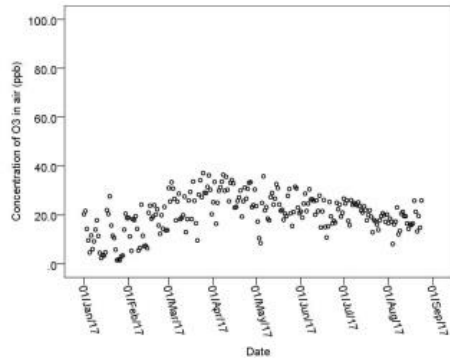
CO (ppm) (Jan – Aug 2017)



NO₂ (ppb) (Jan – Aug 2017)



NO (ppb) (Jan – Aug 2017)



O₃ (ppb) (Jan – Aug 2017)

**Daily air pollutants in Vancouver international airport
Jan to Aug 2017**

Apparently, recent forest fires in BC has affected

- ✓ PM₁₀ and PM_{2.5},
- ✓ And to a lesser extent SO₂, CO, NO₂,
- ✓ But not NO and O₃.

Wildfires in BC since 2006

Mean (min - max) wildfire in BC from 2006 to 2016 are:

- Total fires was 1844 (653 (2011) - 3064 (2009)),
- Total hectares 154944 (12604 (2011)-369 (2014))
- Total cost 182 (54 (2011) - 297 (2014)) millions dollars

Among them 39% caused by people and 61% caused by lightning.

Total wildfire from April 1, 2017 to August 28, 2017 (current fiscal year) in BC is 10,545 km².

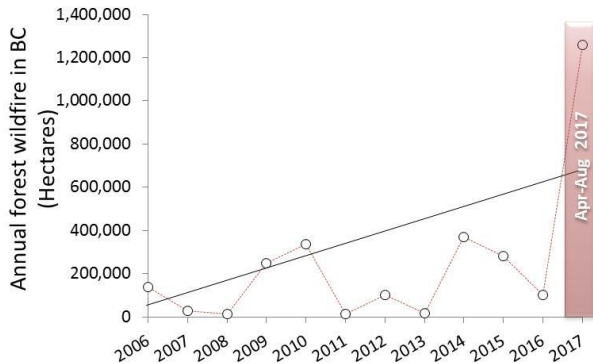
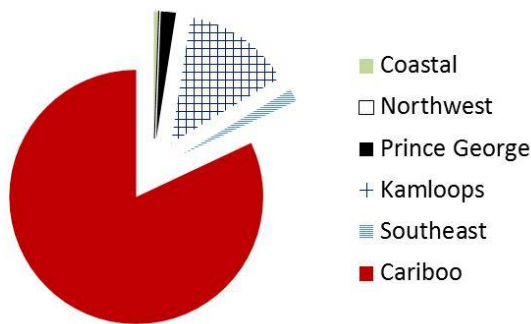


Figure. Annual forest wildfire in BC (Hectares) (2006 to 2016) Depicts wildfire from April 1, 2017 to August 28, 2017 (current fiscal year) (10,545 km²) Source of data BC Wildfire Service [BCTOX Graph]

Over 12, 588 square kilometres of forests have burned since spring which is the worst BC wildfire since 1958 according to Kevin Skrepnek of the BC Wildfire Service. (CBCNews 2017-08-03)

Distribution of wildfire in BC



Current Statistics from BC Wildfire service shows that a total of 1,258,828 hectares burned from April 1, 2017 to August 23, 2017 (current fiscal year) in BC.

Distribution of wildfires in BC from April 1, 2017 to August 23, 2017 is shown in the figure. Source of data BC Wildfire Service [BCTOX Graph] (BC-Wildfire-Service)

Consequences of wildfire in August in BC

The provincial government is banning recreational off-road vehicle use in the backcountry across most of Southeast BC due to extreme fire risk. (CASTANET 2017-08-07)

Hospital visits have increased due to wildfire

There has been a recent 20% to 50% rise - more than the past 10 years in the same area - in emergency calls and hospital visits with people suffering from respiratory and other health conditions related to the smoke and heat, particularly in the Lower Mainland according to *Dr. Bonnie Henry*. (VancouverSun 2017-08-05)

The air quality in parts of B.C. is worse than Beijing according to one of Vancouver's top respirologists. Health officials reported a significant increase in the number of people seeking medical attention because of poor air quality. (GlobalNews 2017-08-05a)

Large smoke events" can result in a doubling or even quadrupling of people visiting BC pharmacies to obtain Ventolin according to Dr Sarah Henderson. (Straight 2017-08-09)

Useful Links

(ECCC 2016)

General information

[B.C. Wildfire Service website](#)

The BC government [list of resources](#)

Information on emergency alerts and evacuation orders

- [Emergency Info B.C.](#)
- [Emergency Info B.C. on Twitter](#)

Weather

- [Weather alerts from Environment Canada](#)

Traffic and roads

- Some highways are closed due to the fires. Check [Drive B.C.](#) for details

- The [Transportation Ministry has a list of travel advisories](#)

View [B.C. HighwayCams](#) to see current highway conditions



[Public Weather Alerts for British Columbia](#) [Ctrl click] (Public-Weather-Alerts 2017-07-14)

[Emergency info BC](#) [official] provides emergency alerts including Evacuation alerts, evacuation orders, and updates. (EmergencyInfoBC 2017-07-14)



Latest Special Weather Statement could be obtained from the following website

[Latest Special Weather](#) [Ctrl click] Statement: (Alert-Environment-Canada 2017-07-14)



Forecast Wildfire Smoke in BC ([FireSmoke Canada](#)) [Ctrl click]. It forecasts smoke from wildland fires (ground-level concentrations of smoke particles PM_{2.5}) using the BlueSky Canada system and for up to 48 hours into the future. It is experimental, and should be used "at your own Risk". PM_{2.5}. (FireSmoke-Canada)

Toxic Exposure Mediated via PRODUCTS –

BCTOX

Toxicological related product recalls

(Recalls-and-safety-alerts) - Updated 2017-08-24

Date	Items	--- Reasons to recall
2017-08-24	Advisory	Unauthorized product containing synthetic cannabinoids sold from stores in Edmonton ---Due to unauthorized Potpourri or Brainfreeze Herbal Incense that is labeled as an herbal product and contains synthetic cannabinoids.
2017-08-24	Recall	Bumble and bumble recalls various Bumble and bumble hair products in pressurized containers that do not have required labelling --- Due to no required labelling
2017-08-24	Recall	Recall of Cannabis for Medical Purposes- Broken Coast Cannabis Ltd. --- Due to due to presence of myclobutanil and spinosad
2017-08-24	Recall	Dr. Martens AirWair USA, LLC recalls Dr. Martens 1460 Vegan Cherry Red 8-eye boot --- The dye used to color the tongue lining of the Dr. Martens "Vegan" boot model contains traces of the chemical benzidine
2017-08-23	Recall	Kirkland Signature brand Organic Fortified Soy Beverage Original ---Due to swelling Tetra Pak cartons
2017-08-22	Recall	Peach Blossom Powder for Beautifying Face Due to not declared soy on the label
2017-08-23	Recall	Nutralife Plant Products recalls 4L (1 Gallon) Bottles of H2O2 (hydrogen peroxide) Liquid 29% Oxidizer --- Due to burn hazard
2017-08-17	Recall	Ngoma brand Palm Oil recalled --- Due to Sudan IV
2017-08-17	Recall	Unauthorized sexual enhancement products
2017-08-16	Recall	Western Family brand Cranberry Chipotle Spread --- Due to mould
2017-08-14	Recall	Nabati brand Chocolate Cookies --- Due to mould
2017-08-11	Recall	Psychotic by Insane Labz (2017-08-11) Product (no market authorization) Due to containing undeclared levels of caffeine that in combination with other stimulants may pose a risk to health
2017-08-04	Recall	Unauthorized product "Aerobic Oxygen" sold by online retailer "Good For You" --- Due to containing sodium chlorite, a bleach-like chemical that is not listed on the product label that leads to poisoning and kidney failure.
2017-08-03	Recall	Fluffy Unicorn (2017-08-03) --- due to containing undeclared synephrine that in combination with caffeine may pose a risk to health.
2017-08-01	Recall	Selekta Pregnenolone (2017-08-01) --- Due to Product labelled to contain pregnenolone, an ingredient listed on the prescription drug list.
2017-08-01	Recall	MixBin Electronics, LLC recalls Liquid Glitter iPhone Case (Ctrl Click for more information) [Joint recall with Health Canada and the United States Consumer Product Safety Commission (US CPSC)] Liquid and glitter can leak out of the case if it breaks or cracks which could cause skin irritation, blisters or burns.



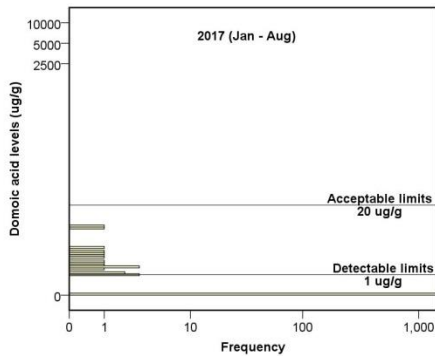
Toxicological related food recalls				
Dates	Food (Company / Firm)	Reason to recall	Class	Link
2017-08-11	Maple Lodge Farms brand Chicken Frankfurters and Zabiha Halal brand Chicken Frankfurters	Potential presence of bone fragments	2	National

Marine biotoxins (January to Aug 2017) in BC

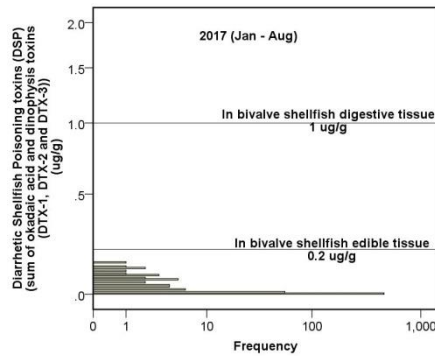
Domoic acid (ug/g)
Amnesic shellfish poisoning (ASP)

Sum of okadaic acid and dinophysis toxins (DTX-1, DTX-2 and DTX-3) (ug/g)
Diarrhetic Shellfish Poisoning toxins (DSP)

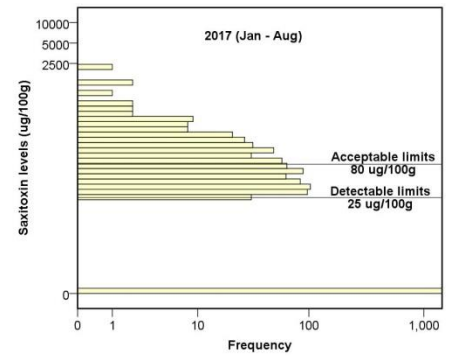
Saxitoxin (ugeq/100g)
Paralytic shellfish poisoning



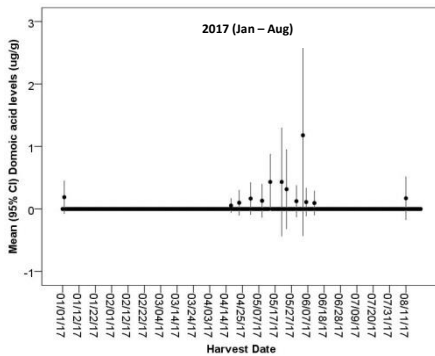
Histogram of Domoic acid concentrations among [shellfish] samples in BC (January to Aug 2017) (n=19 detected out of 2109 samples) [BCTOX Graph]



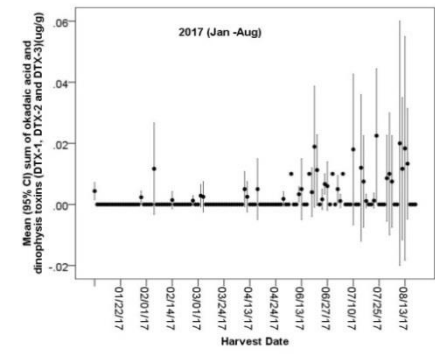
Histogram of DSP (sum of okadaic acid and dinophysis toxins (DTX-1, DTX-2 and DTX-3) concentrations among [shellfish] samples in BC (January to Aug 2017) (n=88 out of 548 samples) [BCTOX Graph]



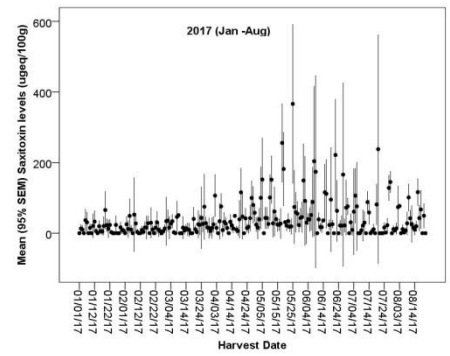
Histogram of Saxitoxin concentrations among [shellfish] samples in BC (January to Aug 2017) (n=784 detected out of 2377 samples) [BCTOX Graph]



Mean (95% SEM) concentrations of Domoic acid (ug/g) among detected shellfish samples in BC (January to Aug 2017) (n=19) [This graph is prepared to imply the trend, and it should be interpreted with caution] [BCTOX Graph]



Mean (95% SEM) concentrations of detected DSP (sum of okadaic acid and dinophysis toxins (DTX-1, DTX-2 and DTX-3)) among shellfish samples in BC (Jan to Aug 2017) (n=88) [This graph is prepared to imply the trend, and it should be interpreted with caution] [BCTOX Graph]



Mean (95% SEM) concentrations of Saxitoxin (ugeq/100g) among detected shellfish samples in BC (January to Aug 2017) (n=784) [This graph is prepared to imply the trend, and it should be interpreted with caution] [BCTOX Graph]

Bi weekly marine bio-toxin monitoring in West Coast BC in August shows:

- ✓ Below regulatory limits Domoic acid [Amnesic Shellfish Poisoning] is reported again after 2 months
- ✓ Below regulatory limits of Okadaic acid and dinophysis toxins [Diarrhetic Shellfish Poisoning] are on rise
- ✓ Above regulatory limits of Saxitoxin [Paralytic shellfish poisoning] concentrations are on decline

Outside BC

- ✓ Marine experts in the *San Francisco Bay Area* say an alarming number of sea lions (68 suffering from domoic acid poisoning, compared with 70 in all of 2016) are being treated for poisoning linked to toxic algae blooms. (San-Francisco-Chronicle 2017-08-12)
- ✓ The smell near *Pismo Beach (US)* could be caused in part by an algae bloom according to Officials from the Southern California Coastal Ocean Observing System. (KVEC 2017-08-09)
- ✓ **How to identify a sea lion sick with domoic acid toxicity, which causes brain damage?** A clip is available from (TheTribune 2017-08-06)
- ✓ Blue-green algae warning issued for ChipLake, 130km west of Edmonton/Alberta. Cyanobacteria bloom detected(CBCNews 2017-08-18)

Toxic exposure mediated via SOIL in BC BCTOX

The City of Nanaimo placed a clean-up order on Rapton's Howard Avenue property for garbage, wood and shingle scraps and discarded furniture. Soil was found contaminated with lead, zinc and tin. The City has come up with a \$92,000 bill to clean up that the landowner should pay. (BC-Local-News 2017-08-08)

Toxic exposure mediated via WATER in BC BCTOX

The *City of White Rock* has published water-testing results from January 2016 from several locations of the city (n=107). Average *arsenic* concentration was 0.0074 mg/L. Among them, 57 samples tested at 0.007 mg/L or above and 10 (9.3%) at 0.005 mg/L or less. Since January 2016, a total of six testing results were above the 0.010 mg/L MAC at three different sampling locations. (BC-Local-News 2017-08-02)

Arsenic maximum acceptable concentration (MAC) and essentially negligible (i.e. one new cancer case per 100,000 people) health impacts, in drinking water by Health Canada is 0.010 mg/L and 0.003 mg/L or less. (BC-Local-News 2017-08-02)

If my drinking water was consistently at 0.007 mg/L or 0.008 mg/L, then I would probably move to bottled water according to Dr Trevor Dummer (BC-Local-News 2017-08-02)

Toxic Spills/Dumps

If you do experience a "small spill", contain it with a spill kit or report it at 1.800.OILS.911. (100MileFreePress 2017-08-04)

[Spill Incidents in August](#) (Spill-Incidents 2017) has reported no event until 24 August.

According to (BCLocalNews 2017-08-08) a minor accident happened in Prince Rupert

Incident date	Source	Nearest Community	Content
2017-08-08	Vehicle accident	Along Highway 16 - Prince Rupert	100 L of diesel

Spills of salmon in the States. Officials in Canada are closely monitoring a spill of Atlantic salmon from an aquaculture facility off the coast of Washington state according to Canada's Fisheries Minister. 1,360 tonnes of Atlantic salmon were in the net when it imploded — a spill attributed to unusually high tides. Many of the escaped fish won't adapt to the natural feeding practices needed for this ecosystem. (DurhamRegion 2017-08-24) The fish are about 4.5 kg each and the Washington state's Department of Fish and Wildlife is asking people to catch them with no limit on size or number.

First Nation (Lummi Nation- located near Bellingham, Wash.) declares state of emergency after the events. (CTVNews 2017-08-24) Fin Donnelly, the MP for the BC riding of Port Moody-Coquitlam said that he is "alarmed to hear thousands of farmed Atlantic salmon have escaped into our Pacific waters". (VancouverSun 2017-08-22)

Tree poisoning in North Vancouver!

Court has ordered a couple in North Vancouver to pay \$25,000 for poisoning their neighbours' 60-year-old red cedar tree.

The couple wanted the tree down because it cast a shadow on their backyard pool, they drilled holes in the trunk of the 20-metre tree and applied a toxic substance, which caused it to slowly

die. The fine was attributed to destroying a living organism property with inherent value to the surrounding ecosystem. (CBCNews 2017-08-05)

Occupational toxicology

Asbestos

Asbestos-related work site violations on the rise in BC

WorkSafeBC has issued more asbestos-related stop work orders and fines in the first eight months of 2017 than in all of 2016. (NorthShoreNews 2017-08-22)

Once described as a miracle mineral, Chrysotile, or white asbestos, was frequently used in BC prior to 1991. WorkSafeBC tries to raise the level of awareness to get people to think about asbestos each and every time they do some work, whether it's renovation or demolition. (CBCNews 2017-08-16) If a worker sees a chemical release, they can call WorkSafeBC at 604-276-3100.

Frequency of deaths

According to Al Johnson, vice-president of prevention services at WorkSafeBC, 44 workers died of asbestos-related disease in the first half of 2017 alone, and that 605 have died in the last 10 years. (CBCNews 2017-08-16) In 2016, more than one-third of the 164 construction deaths in B.C. stemmed from asbestos-related illness. (NorthShoreNews 2017-08-22)

Asbestos fibres (CBCNews 2017-08-16)

- Are so small that can float around for a long time
- You can't see them
- They don't smell
- They don't taste funny
- They can be found in drywall, floor tiles, ceiling tiles, stipple and anything plaster-like.

What to do?

Home owners and workers are encouraged to ask to see the lab results of any asbestos tests their contractors do and make sure they dispose of it safely if it is found. (CBCNews 2017-08-16)

Heat exhaustion and stroke

According to WorkSafeBC, there were a total of 16 accepted claims for work-related injuries caused by heat exhaustion and heat stroke in the province in 2016.(EnergeticCity 2017-08-09)

Toxicology Surveillance

BC Drug and Poison Information Centre

Poison Information (24-Hour Line) is available:

604-682-5050 for the lower mainland and 1-800-567-8911 for the lower mainland.

Adverse Reaction Reporting Canada Vigilance Program

Consumers/patients and health professionals can report adverse reactions (also known as side effects) to health products, including prescription and non-prescription medications, biologics, natural health products and radiopharmaceuticals, to the Canada Vigilance Program. (Health-Canada 2016-02-24 (modified)) (Canada-Vigilance-Program 2016-02-19)

Epidemiology and statistics

According to BC Coroners Service, there were 111 suspected drug overdose deaths in **June** - 61% increase from June 2016. The total of deaths in BC was 780 in 2017 as compared to 414 at the same time last year. (Global-News 2017-08-08) This is, however, the lowest number of deaths for any month to date in 2017. (GlobalNews 2017-08-04)

Four out of five who died were **male** and almost three-quarters of all illicit drug deaths were people between the **ages of 30 and 59** years, nine in 10 drug overdose deaths happened **inside** with 57% being in a **private residence**. (GlobalNews 2017-08-04)

The top three townships where illicit drug overdose deaths occurred are **Vancouver, Surrey and Victoria**. (ChekNews 2017-08-04)

As of August 14, there were 232 suspected drug-overdose deaths in 2017 in the city of **Vancouver**, which is higher than the whole 2016. Mayor Gregor Robertson quoted in an August 21 media release. (Straight 2017-08-21)

Data has shown that **First Nations population** are five times more likely to overdose in BC, which could be attributed to racism, stigma and intergenerational trauma in the higher number of women affected. (CBC-News 2017-08-03)

Young natives who were chronic alcoholics die from overdoses, and I had no idea they even used, Shirley Jones from the Tseshaht First Nation said. "It was hidden." (TimesColonist 2017-08-03)

Despite the fact that 80% of the overdoses in the general public are men, the **ratio of men to women is closer to 50-50 in Indigenous communities**. First Nations women in their 40s had the highest rates of overdose deaths. (TimesColonist 2017-08-03)

Federal correctional officers - inmates According to one union official, at least nine federal correctional officers have been exposed to the lethal drug with no report of fatalities involving correctional officers, but several inmate deaths owing to fentanyl exposure have occurred. [Canada] (TheGlobal&Mail 2017-08-08)

Fentanyl was present in 5% of drug overdose deaths in 2012 and increased to 31% in 2015. (GlobalNews 2017-08-04)

Too many men working in trades are overdosing on opioids and men who are injured on the job may be ensnared into dependence on illicit substances after being prescribed pain medication Dr. Victoria Lee of Fraser Health. (News1130 2017-08-29)

Information

Social determinants of addiction "When people are overly stressed about finance or housing or jobs, they tend to use alcohol or opioids to ease the stress and that can be deadly says **Dr John Millar**. (VancouverCourier 2017-08-01) The new BC government's planned poverty reduction strategy and boost in services for the ministry of children and families will ease that despair (VancouverCourier 2017-08-01)

Criminalisation versus Decriminalisation (?) The drugs are free for all now! It's a totally unregulated, unsupervised, uncontrolled market Decriminalisation is the opposite: a highly regulated situation where people have access to drugs at known dosage and in many cases supervised use according to Donald MacPherson. (MetroVancouver 2017-08-23)

Marijuana

The Liberal government is legalizing marijuana for two reasons: to protect children from drugs and to minimize the involvement of organized crime in its trade. (Straight 2017-08-01)

Strategies / Actions

New BC Overdose Action Exchange II (Ctrl Click)

New **BC Overdose Action Exchange II** including 10 areas to reverse overdose death in BC was published in Aug 2017. (BCCDC 2017-Aug)

BCCDC is calling for **the expansion of prescription opioids** in place of contaminated street drugs. The overdose crisis is about more than just drugs BCCDC is hopeful that the recommendations of new report of 10 areas to help reverse overdose death toll in BC will be used as a guide to action according to **Dr Mark Tyndall**. (VancouverSun 2017-08-16)

This report calls for **decriminalization of illicit drugs** to quell the opioid epidemic

A new mandate to collect comprehensive information on all fatal overdose victims has been introduced in BC. It requires coroners to fill out an 11-page document for cases who die of a suspected overdose. The protocol includes past medical issues to economic status to help curbing problematic drug use and prevent overdose deaths. To identify patterns and trends, having a clearer picture of who is dying and why and ultimately inform practice and legislation and prevent similar deaths according to Chief Coroner Lisa Lapointe. (Globe&Mail 2017-08-08)

Not regulate hard drugs **Justin Trudeau** maintains that the fentanyl crisis is still no reason to regulate hard drugs, despite BC setting new records for overdose deaths. (Straight 2017-08-01) The government is not looking at decriminalization or legalization of any other drugs, as there is a lot of other tools that they are using right now instead according to Prime Minister Trudeau. (Staight 2017-08-01)

Treatment on demand **Mrs. Judy Darcy** (Minister of mental health and addiction): Treatment on demand is one of her goals. Services should be available for them where they need them and when they need them. Short term fixes are safe injection sites, fentanyl testing strips, legal morphine but the problem won't go away until the root cause is addressed. (VancouverCourier 2017-08-01) She said "The key is to give people hope, but it's not just hope, you have to give them a pathway to hope". (VancouverCourier 2017-08-01)

Portugal experience as an example. BC looks to Portugal to combat opioid crisis. **Dr Perry Kendall** recommended considering Portugal's approach to drug policy, including the decriminalization of personal possession of limited amounts while offering education and social supports. (TheGlobal&Mail 2019-08-09) The architect of Portugal's drug-policy framework, Dr. João Goulão offers advice on the fentanyl crisis ahead of his first visit to Vancouver. "Legalization and the regulation of markets, controlling the quality of the substances, and making them available only in appropriate places, it would be positive,"(Straight, 2017-08-31 #1161)

A total rethink of strategies. Donald MacPherson, who developed the City of Vancouver's Four Pillars drug strategy in 2001. This policy emphasized on concepts like harm reduction as well as addictions prevention, treatment and drug trafficking enforcement. He believes now that we need a totalrethink.(MetroVancouver 2017-08-23)

Requests

Although you often hear: 'You have to talk to the kids.', Shirley Jones from the Tseshaht First Nation believe that we have to talk to mom and dad and maybe even grandma and grandpa,' noting those who died of overdoses ranged in age from 15 to 69. (TimesColonist 2017-08-03)

BC Pharmacare is letting down British Columbians according to Dr Diane McIntosh of UBC. Treatment for mental health issues should be facilitated. For example, BC is the only province in the country without Pharmacare access to any long-acting stimulants for adults with ADHD. (TheProvince 2017-08-12)

[BC overdose action exchange II \(Ctrl Click\)](#)
(BCCDC 2017-Aug)



For more information, contact:
BC Centre for Disease Control Harm Reduction Program
655 West 12 Avenue Vancouver, B.C. V5Z 4R4

overdose@bccdc.ca

www.bccdc.ca/health-professionals/clinical-resources/harm-reduction



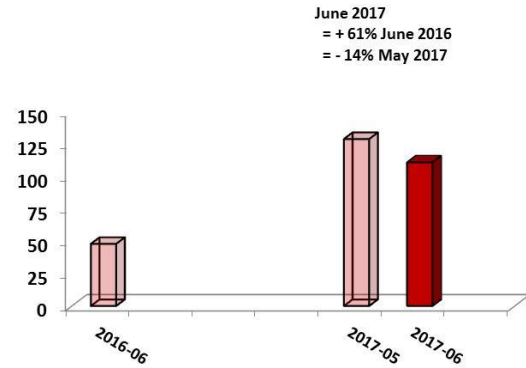
Supplying drug dealers with materials to test for contamination could be an effective tool in regulating the amount of fentanyl on the streets, according to the BCCDC report. (Courtesy Mark Lysyshyn, Vancouver Coastal Health) Photo adopted from (CBCNews 2017-08-17)

Advocacy It has been six weeks since Vancouver Coastal Health launched an online program for drug users, Real-time Drug Alert and Response (RADAR), to report overdose-causing drugs, but so far the system has used to an ideal rate. "We've really had very few reports and we've only sent out one alert" according to Dr. Mark Lysyshyn MHO. (CBCNews 2017-08-22)

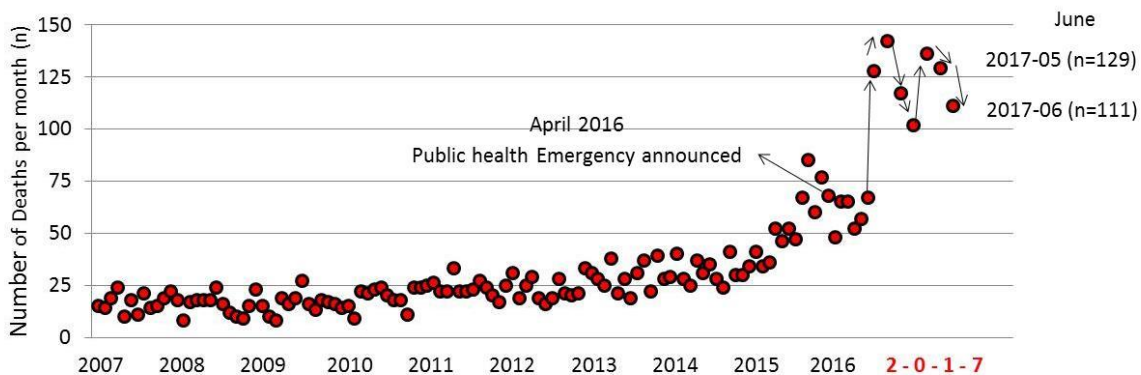
Estimation of Illicit drug overdose attributed deaths in BC in August 2017

BCCDC reported the following key actions based on a thematic analysis of ideas that were emphasized throughout an action exchange II meeting with 130 participants: (BCCDC 2017-Aug)

1. Engage peers in program development and leadership
2. Address contamination of the drug supply
3. Support appropriate pain management therapies
4. Build on the success of Overdose Prevention Sites
5. Expand and improve addiction treatment
6. Align law enforcement efforts with public health
7. Reform drug laws
8. Address structural barriers and upstream factors
9. Counter stigma against people who use drugs
10. Implement targeted research, surveillance and evaluation initiatives



The number of Illicit drug overdose deaths in June 2017 was 111 (61% is higher than June last year and 14% lower than last month) [BCTOX graph] [LAST UPDATE - June]



Illicit drug overdose deaths per month in BC (2007 to May 2017) [BCTOX graph] [LAST UPDATE - June]

The pattern of overdose deaths suggests that the sharp increase in deaths has reached a plateau, if not decreased in recent months.

Articles

The *MV Marathassa* Bunker C fuel spill in Vancouver on April 9, 2015: a modest but troubling incident

Peter S. Ross*, Ocean Pollution Research Program, Coastal Ocean Research Institute (Ocean Wise Conservation Association).
*Peter.Ross@ocean.org [Short article; 2017-08-28]

Oil spills provide poignant reminders of the fragility of aquatic ecosystems. Protecting ocean environments requires a mix of best practices, regulations, operational readiness and up-to-date scientific information.

Reliability of available data

Reliable data on the nature of the spilled oil is critically important as government agencies work with the responsible party to ensure a seamless response and recovery. Given the complex nature of hydrocarbon sources in any marine environment, such data are best generated in a way that enables a distinction between natural sources (e.g. plant materials, geological sources) and a long history of anthropogenic sources (e.g. petrogenic or pyrogenic sources).

What was the event?

Unexpected events can put agencies to the test in this regard. On the morning of April 9, 2015, many Vancouverites noticed a sharp odor in the air, black oil on popular beaches, and an extensive sheen on the surface of English Bay and Burrard Inlet. This followed a frenzied and confusing night that began with reports of an oily sheen at 4:48 pm on April 8. After initial denials by the captain of the suspect vessel (the *MV Marathassa*), and confusion about which agency was responsible for the lead response, evidence began to trickle in on the nature and extent of the spill.

What actions were taken?

News of the spill reached staff at the Vancouver Aquarium at 8:30 am on April 9, 15 hours after the first report of oil on the water. Researchers from the Vancouver Aquarium's Ocean Pollution Research Program deployed to the shoreline around Stanley Park (English Bay, Second Beach, Siwash Rock, Lumberman's Arch Beach) and further afield as the incident developed. Visual observations of oil droplets and surface sheen at Lumberman's Arch Beach, just above the seawater intakes for the Vancouver Aquarium, led to an operational decision to shut off all intake for four days. This required an adaptive response to ensure clean recycled water for several collections pending clarification of the source, nature and extent of oil in the environment around the Vancouver Aquarium.

Little to no information was forthcoming on the spilled oil, its dispersion and its impact on the environment, such that the Vancouver Aquarium researchers led the effort to obtain environmental samples for hydrocarbon analysis. These included samples of sheen, seawater, beach sediments, ocean sediments, mussels and the seawater from the Aquarium collection intakes for high-resolution analysis of polycyclic aromatic hydrocarbons (PAHs), n-alkanes, and isoprenoids. Results are detailed in a scientific paper published recently. (Morales-Caselles, Yunker et al. 2017)

What was found?

Some of the sediment samples exceeded environmental quality guidelines (EQGs) established by the Canadian Council of Ministers of the Environment (CCME; Interim Sediment Quality Guidelines and Probable Effects Levels), suggesting risks to biota in the affected area.

What was the challenge?

Given that hydrocarbons are routinely detected in busy harbours, distinguishing between pre-spill hydrocarbons and those emanating from the *Marathassa* was a necessary next step.

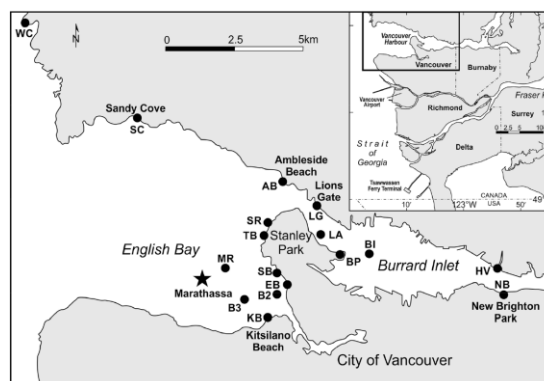


Figure: Samples of water, sediments and mussels were collected by Vancouver Aquarium researchers to track the Bunker C fuel spilled from the *MV Marathassa* in April 2015. We confirmed that the spilled oil reach as far as New Brighton Beach well inside Burrard Inlet. Figure adopted from (Morales-Caselles, Yunker et al. 2017)

Methyl fluoranthrene/pyrene series chromatograms revealed that the as-yet unidentified spill oil differed from the typical fuel oil used by vessels in Vancouver (Alberta Sweet Mixed Blend). In addition, several samples of oily sheen and beach sediments had the same unique hydrocarbon fingerprint as that of oil samples secured by Canadian Coast Guard officials aboard the *MV Marathassa*.

Two things are noteworthy: firstly, that oil from the *MV Marathassa* reached as far as New Brighton Beach, fully 13 km away and well east into Burrard Inlet. Secondly, mussel samples from several locations had hydrocarbon profiles that mirrored that of the *MV Marathassa* fuel oil, revealing biological uptake with likely consequences for biota.

What were the lessons learned?

While the incident helped to identify a number of operational deficiencies in oil spill response (see the Butler Report for an excellent overview of the incident and subsequent investigation (<http://www.ccg-gcc.gc.ca/independent-review-Marathassa-oil-spill-ER-operation>), our research helped to highlight the value of high-resolution hydrocarbon analysis and the power of fingerprinting techniques. Clearly defining the nature and scope of the spill with defensible, reproducible data provides unambiguous guidance for those overseeing clean up and longer term remediation. Such work also has the potential to dampen the rhetoric and clarify the expectations of the responsible party, thereby streamlining costs and allowing the real cleanup work to proceed as quickly as possible.

The *MV Marathassa* Bunker C fuel spill in Vancouver was a modest one (~3,000 L), but it took place in the busiest harbour in British Columbia, in close proximity to the best spill response capacity in the region, and with near-perfect weather conditions.

The value of the 'lessons learned' from this incident cannot be understated as we prepare for the next one.

Reference:

Morales-Caselles, C., Yunker, MB, & Ross, PS. 2017. Identification of spilled oil from the *MV Marathassa* (Vancouver, Canada 2015) using alkyl PAH isomer ratios. Archives of Environmental Contamination and Toxicology 73: 118-130.

Major environmentally challenged projects in BC in August are summarized below.

BC government to join legal challenges against Kinder Morgan Trans Mountain Pipeline

Background Kinder Morgan is one of the largest energy infrastructure companies in North America. Kinder Morgan owns an interest in or operates approximately 84,000 miles of pipeline and 155 terminals. (KinderMorganWebsite) The Kinder Morgan Trans Mountain Oil Pipeline System (KMTP) has operated since 1953, and includes 1,150 km of existing Trans Mountain Pipeline.

KMTP currently carries 300,000 barrels of crude and refined oil from Alberta to the west coast of BC per day. A \$5.4 billion expansion project has been proposed to increase the capacity of the pipeline to 890,000 barrels per day. (KinderMorganCanada)



Logo adopted from (KinderMorganWebsite)

This expansion has the potential to increase greenhouse gas emissions, other toxic emissions, oil spills, fires, and traffic [tankers] in BC. Crude oil contains a range of volatile organic compounds, including benzene and 1,3-butadiene. These toxic compounds can cause severe acute effects, increase the risk of childhood leukemia, and cause adverse developmental and neurological effects (Takaro T, Brubacher A et al. 2015)

In addition, a portion of this pipeline expansion is proposed to run through the geographically sensitive and heavily populated areas of Metro Vancouver; potential benzene exposure may arise.

Both BC NDP and BC Green parties, First Nation populations and environmentally concerned citizens are opposed to the expansion of KMTP. (Afshari R 2017)

2017-01-11 The previous BC Liberal government announced BC support for the pipeline expansion.

2017-05-09. BC general election

2017-05-29 Leaders of BC NDP and BC Green Parties agreed to topple the governing Liberals. (CTVNews 2017-05-29)

2017-06-18 New NDP government sworn in.

2017-08-10 BC government announces it will join legal challenges against KMTP. (Globe&Mail 2017-08-10) According to the BC Environment Minister "Not for our economy, our environment, or thousands of existing jobs, we will use all available tools to protect our coastal waters and our province's future. (NationalObserver 2017-08-10)

No Charges will Be Laid over Mount Polley Dam Failure

Background A subsidiary of Imperial Metals, Mount Polley Mining Corporation operates the Mount Polley open pit copper/gold mine (MPM) in Cariboo region, south-central BC.

(Mount-Polley-Mine-Website) A breach of a mine tailings pond on August 04, 2014 released years' worth of mining waste into Polley Lake, Hazeltine Creek, Quesnel Lake and Cariboo River, including 10 million cubic metres of water and 4.5 million cubic metres of fine sand. (Mount-Polley-Mine-Website) (Government-of-BC 2014-08-08)

This also resulted in the release of 18,400 tonnes of copper and its compounds, 326 tonnes of nickel, over 400 tonnes of arsenic, and 177 tonnes of lead that had been contained by the pond. At the time, the Cariboo Regional District declared a local state of emergency in several nearby communities. (CBCNews 2014-08-06)



- Logo adopted from (Mount-Polley-Mine-Website)

MPM resumed normal operations in June 2016, following authorizations from the Ministry of Energy and Mines and the Ministry of Environment. (Mount-Polley-Mine-Website)

Actions (i) No charges will be laid as a result of the Mount Polley dam failure. The three year deadline to lay provincial charges ended before the BC-federal investigation was completed in August 2017. (Vancouver-Sun 2017-08-02)

BC Premier John Horgan said that he was shocked to learn that provincial charges were not being laid. (CTVNews 2017-08-05) The federal NDP issued a statement indicating that Ottawa was to blame. (CastaNet 2017-08-04b) Amnesty International also issued a statement expressing its disappointment with the lack of charges, in which it accused the BC government of playing "Russian roulette with citizens' futures." (CastaNet 2017-08-04b)

Action (ii) After it was announced that provincial charges will not be laid, an Indigenous woman has filed private charges against MPM related to the 2014 collapse of the tailings dam at the Mount Polley mine. She said, "in my culture, we have a sacred responsibility not only to care for the land, waters, animals, and people living today, but also for the next seven generations to come". (CastaNet 2017-08-04a) (CTVNews 2017-08-05) (CBCNews 2017-08-06)

Potential Water Contamination from the Proposed Ajax Mine has Been Raised



- Logo adopted from (AjaxMineWebsite)

KGHM Polska Miedz S.A. is a global company that has been acting for over 50 years. The company focuses on ore mining, production of copper, silver, and other precious and non-ferrous metals in Europe and the Americas. KGHM currently has four projects in the pre/investment phase, including the *Ajax* and *Victoria* projects located in Kamloops. (AjaxMineWebsite)

The Ajax proposal is for a \$1.3 billion open-pit copper-gold mine on 17 Km² in the southern part of the Kamloops municipality, only a couple of kilometres from residential neighbourhoods. The mine would remove 65,000 tonnes of per rock per day to produce some 64,000 tonnes of copper and 130,000 ounces of gold over a 23-year mine lifespan. (VancouverSun 2017-08-14)

Potential water contamination from the proposed Ajax mine has been raised frequently. (VancouverSun 2017-08-14)

Death Cap Mushrooms; an Emerging Hazard in BC

Paul Kroeger*, Vancouver Mycological Society, Vancouver, BC.
*kroeger.paul@gmail.com Short communication; Accepted 2017-08-28]

Introduction

Autumn is mushroom season in BC when people encounter a variety of wild mushrooms, the death cap or *Amanita phalloides*, is and may be exposed to poisonous species. (Kroeger P 2017) A dangerous mushroom is emerging as a serious health hazard in populous areas of British Columbia. The death cap causes liver failure and is believed responsible for some 90% of mushroom poisoning fatalities around the world. A native of Europe, it has been unintentionally introduced into temperate regions of North America including British Columbia. It is believed to have been transported in the roots of imported trees.

It is ectomycorrhizal, meaning it grows in an intimate symbiotic association with roots of certain trees, and must have a suitable tree host to live and grow. (Wolfe, Richard et al. 2010) (Pringle, Adams et al. 2009)

Discovery in BC

Death cap mushrooms were first discovered growing in British Columbia in 1997 and in two decades since has been found in many urban and semirural locations of southern Vancouver Island and the Lower Mainland often growing in abundance under urban street trees. The presence of large numbers of these dangerous mushrooms in highly populated areas poses a high risk of ingestion by people or their pets.

Reported cases in BC

There have been three documented poisonings by BC death cap mushrooms.

- ✓ In 2003 a man in Victoria ate what he thought were edible puffballs growing under an English oak tree in his front yard.
- ✓ In 2009 an adult female of Asian origin ate death caps growing in an agricultural part of Langley believing they were the popular edible Asian straw mushroom (*Volvariella volvacea*). Both of these patients recovered after hospitalization.
- ✓ In 2016 a 3-year-old child died more than a week after eating mushrooms growing under hornbeam trees at a residential property in downtown Victoria.

Other mushroom poisonings have occurred in BC involving liver damage and other symptoms consistent with *a* amanitin toxin but either the mushroom was not identified, or was identified as another amatoxin containing mushroom such as *Lepiota subincarnata* (Willis GA 1989)

Scenarios that result in serious poisonings

Experience here and elsewhere in North America has revealed some scenarios that often result in poisonings by *Amanita phalloides*:

- ✓ Unfortunate resemblance to the cultivated oriental straw mushroom or *Volvariella volvacea* has caused serious death cap poisonings among people recently arrived from Asia. The straw mushroom does not grow wild in BC. Diverse Asian nationalities and languages involved in documented cases indicate that preventative education may be challenging.
- ✓ Young developing mushrooms emerge as egg-like 'buttons' that have been mistaken for edible puffball mushrooms.

- ✓ Cutting a death cap button lengthwise reveals a developing mushroom within, in contrast to a puffball's interior which has a uniform structure.
- ✓ Curious or grazing children or pets may encounter and eat them with severity of results depending on the amount ingested. Infants or toddlers and young puppies are especially vulnerable to dire or fatal consequences. In exposures of this sort it's often difficult to establish how much of the suspect material was actually ingested.
- ✓ Some people seem eager to eat mushrooms that grow in their own yard or home environment, though they wouldn't try wild mushrooms from a less familiar setting. This peculiar bias may also apply to random plants (some potentially toxic) but seems especially strong with mushrooms. Public education will be important to prevent such exposures because many death cap mushrooms are now appearing in residential areas.

Description

General *Amanita phalloides* are medium sized to somewhat large mushrooms that grow from the ground near trees. They often have a rather tall stature. They are found in late summer and the fall or rarely in late spring. They make white spore prints.

- ✓ **Cap** 5 to 15 cm wide, at first rounded and enclosed in a white membranous veil, then opening to convex or almost flat. The surface usually has a distinct greenish hue, olive yellowish to brownish to olive in the centre, near the edge becoming paler whitish or pale yellowish. The cap is often bare but when young white flat patches of veil may adhere to the surface. The cap surface is viscid or slippery when moist or wet but in dry conditions develops a distinct satiny or metallic sheen.
- ✓ **Gills** White, closely spaced and at first covered by a white veil, they are free or not attached to the stem's top but only to the cap's underside.
- ✓ **Stems** 5- 15 cm long and 1 – 3 cm wide, tapering slightly upward and expanding at the base to a soft bulb. In the upper portion there is a skirt-like hanging membranous veil or annulus that is white and slightly striate to smooth on the inside or upper surface and shaded with cap colour on the underside, the stem is whitish or shaded with cap colour below the veil and white above it. The expanded basal bulb is surrounded by a white membranous sac-like loose to sheathing cup or volva aptly often referred to as the "death cup". Unfortunately, the base is often deep in the ground and easily broken off so the diagnostic features of the stem base are easily missed.
- ✓ **Microscopic** Spores are 8.5-9.8 x 6.8-7.8 microns, subglobose to elliptic, smooth, thin-walled and hyaline, amyloid (blue in Melzer's iodine solution).

Habitat in BC

In Vancouver most death cap mushrooms grow under hornbeam street trees, in Victoria they are found under hornbeam, exotic oaks and linden trees. In the Fraser Valley they are found with old plantings of sweet chestnut and hazelnut trees and on Galiano Island with old hazelnuts. Death caps may be anticipated in other regions of British Columbia with mild winters and a history of imported tree cultivation, especially edible nuts, such as the Okanagan Valley. They have recently been found growing with native Garry oak in Saanich on Vancouver Island and may invade our native oak woodlands. (Berch SM, Kroeger P et al. 2017)

So far none have been found associated with conifers here, but in Eastern North America and elsewhere they grow with a variety of conifer species.

Table: Known *Amanita phalloides* host trees in British Columbia

Common name	Latin name	Plant Family: Order
European hornbeam	<i>Carpinusbetulus</i> L.	Betulaceae: Fagales
Sweet chestnut	<i>Castaneasativa</i> Mill.	Fagaceae: Fagales
Common hazelnut	<i>Corylusavellana</i> Gray	Betulaceae: Fagales
European beech	<i>Fagus sylvatica</i> L.	Fagaceae: Fagales
Garry oak (native)	<i>Quercusgarryana</i> Dougl.	Fagaceae: Fagales
English oak	<i>Quercusrobur</i> L.	Fagaceae: Fagales
Northern red oak	<i>Quercusrubra</i> L.	Fagaceae: Fagales
Basswood or linden	<i>Tilia</i> species	Malvaceae: Malvales

Toxins of *Amanitaphalloides* are bicyclic polypeptides called amatoxins and phallotoxins, with α -amanitin being the primary cause of morbidity and organ damage. Amatoxins are present in small brown mushrooms of the genera *Conocybe* and *Galerina* which might be consumed in mistake for “magic mushrooms” of the genus *Psilocybe*, and in a few small species of *Lepiota*. (Benjamin DR 1995) (BC-DPIC 2015)

Symptoms Time of onset is 6 to 12 hours (up to 36 hours) including initial colicky abdominal pain, vomiting and watery diarrhea. Symptoms subside after about one day, then about 72 hours post ingestion severe gastrointestinal symptoms recur along with signs of impending liver failure. In fatal cases death generally occurs 7 to 10 days after the first onset of symptoms. (Benjamin DR 1995) (BC-DPIC 2015)

Poisonings In *Amanita phalloides* exposures and poisonings early recognition and treatment are essential to prevent liver damage and reduce mortality. In most fatal cases patients present themselves for treatment three or four days after ingestion, when symptoms resume following the false remission that occurred about a day after symptoms first appeared. By this time damage to the liver may already be extensive. (Benjamin DR 1995)

Identification In cases of suspected mushroom poisonings prompt identification of the material involved may help guide treatment. Fresh samples should be obtained if possible and contact BC Drug and Poison Information Centre (1-800-567-8911) for referral to consulting mushroom identifiers. Poisonous mushrooms can be handled safely if hands are washed afterward with soap and running water.

Gathering samples Samples should be gathered as whole as possible with the base intact, loosely wrapped in waxed-paper or aluminum foil to allow air exchange, and placed in a rigid crush-proof container for transport. Small samples can be put in plastic vials or tubes with a little paper tissue on the bottom to cushion the sample and absorb excess moisture. Do not put fresh samples directly into plastic bags or film as this causes rapid deterioration.

Photographs may be useful for preliminary identification. To be most informative photos should be of the whole mushroom including the base from different angles, from the top, from the side and showing the gills or underside of the cap. Note should be made of the exact location and of habitat, including which trees are present in the area. Placing a few sample leaves in a picture of suspect mushrooms and in with a sample helps identify a host tree.

Prevention The deadly introduced death cap mushroom *Amanita phalloides* is now well established in urban and suburban areas of British Columbia. The presence and increasing abundance of this dangerous mushroom in heavily populated areas poses a high risk of poisoning in both humans and animals and public education will be important to prevent serious poisonings. Seasonal public information warnings in

various media and posting of warning signs in known Death Cap areas may help prevent intentional consumption and encourage prompt response in cases of accidental ingestion by children or pets

Health care personnel need to be aware of an increasing probability of serious amatoxin poisonings by death cap mushrooms in humans and their pets.

Recording known locations for *Amanita phalloides* helps document the spread of this introduced species in BC and may identify specific high risk areas to target for public education efforts.



Young death cap buttons resemble edible puffballs but in section the developing mushroom form is visible within. Photo P. Kroeger



Amanita phalloides have greenish caps, white gills, a ring on the stem and sack-like cup at stem base. Photo P. Kroeger



Amanita phalloides clustered with bases of some excavated to reveal hidden volva or “death cup”. Photo P. Kroeger



Straw mushrooms do not grow wild in BC but resemble young death caps leading to serious poisonings among recent Asian immigrants. Photo S. Notzel

Mushroom poisoning can be serious. In case of poisoning or for more information contact the BC Drug and Poison Information Centre (DPIC) at 604-682-5050 or 1-800-567-8911. DPIC’s website is NOT a substitute for talking with a trained Poison Specialist.

Articles Related to Toxicological Issues in BC that Published in August

For articles to be more clear from a local point of view, citation of each article is reported based on the following order within the text; *correspondence author or BC resident author* (multicentre articles), and first author. The real order of authors could be found from the references.

Indicators of Marine Pollution in the North Pacific Ocean

Brown TM (SFU) reviewed the indicators of marine pollution in the North Pacific ocean. Some of which include:

- ✓ Mussels,
- ✓ Molecular marker (linear alkylbenzenes, hopanes and polycyclic aromatic hydrocarbons),
- ✓ Plastic resin pellets,
- ✓ Glaucous-winged gull (*Larus glaucescens*),
- ✓ Biomarker approaches, including gene transcripts, oxidative stress, estradiol, hatchability,
- ✓ Respiration and swimming behavior abnormalities (Brown and Takada 2017)

Validity of "Food Environment" Data sets in Vancouver

Black J (UBC) assessed Sensitivity, positive predictive value and concordance were calculated by comparing two municipal and two commercial secondary data sets with ground-truthed data collected.

They found low levels of validity in all secondary data sets examined, but food environment measures constructed from secondary data sets remained highly correlated with ground-truthed data. (Daepf and Black 2017)

Barriers to the Development of Forest Carbon Offsetting (BC)

Hoberg et al (UBC) studied carbon financing and carbon offsetting - for forest carbon mitigation - to identify barriers. Authors highlighted recognised six main barriers:

1. Deficiencies of carbon markets,
2. Limited economic benefits,
3. Uncertain climate effectiveness,
4. Negative public opinion,
5. Limited and uncertain property rights,
6. Governance issues. (Peterson St-Laurent, Hagerman et al. 2017)

Experiences with Cutting Matrix Fentanyl Patches

Cheng and Hawley (UBC) reported that patch cutting offers (i) greater convenience, (ii) less potential for skin irritation, and (iii) reduced wastage as compared with blocking absorption with occlusive films.

They also observed that both halves remain usable after cutting.

They also acknowledged that for cut or not cut patches, there is

A potential risk from dropped pieces containing residual fentanyl. They could be diverted or inadvertently ingested by children, pets, or other people in the home. (Cheng and Hawley 2017)

Rationale for cannabis-based interventions in the opioid overdose crisis

According to Lucas P (UVIC), the medical use of cannabis as an adjunct or substitute for opioids is evidence-based. They could be useful in

1. Prior to opioid introduction in the treatment of chronic pain
2. As an opioid reduction strategy for those patients already using opioids
3. As an adjunct therapy to methadone or suboxone treatment in order to increase treatment success rates.

This rationale could be used by the governments, health care providers, and academic researchers to consider the implementation and assessment of cannabis-based interventions in the opioid crisis. (Lucas 2017)

Chronic pain and opioid misuse: a review of reviews

Kerr et al (UBC) reviewed 18 systematic reviews between 2000 and 2016 related to chronic non-cancer pain and prescription opioid or other substance misuse.

They concluded that a lack of high-quality evidence or consistent findings exists on the prevalence, risk factors, and optimal clinical assessment and treatment approaches related to concurrent chronic pain and substance misuse. This is likely to be due to widely varying definitions (Voon, Karamouzian et al. 2017)

High temperature ambient air increases retinal detachment

Kosatsky T et al (BCCDC) studied 14,302 individuals with inpatient procedures for retinal detachment from 2006 to 2013 in Quebec, and showed that relative to 15°C, a mean weekly temperature of 25°C was associated with an OR for traction detachment of around 2.7 before 64 years and 1.98 at 64-75 years. (Auger, Rheaume et al. 2017)

Contamination of soils and groundwater in North America Contamination as a result of remediation

Chong & Mayer (UBC) studied remediation of chlorinated solvents. Historical use of chlorinated solvents in conjunction with improper disposal practices and accidental releases has resulted in widespread contamination of soils and groundwater in North America.

Required remediation of chlorinated solvents including in-situ chemical oxidation and the enhancement of biodegradation at many sites lead to generation of CO₂, Methane, etc.

Authors conducted benchtop column experiments to quantify the effects, and provided evidence for the unintended spreading of contaminants as a result of remediation efforts. This can result in enhanced risks for soil vapour intrusion some. (Chong and Mayer 2017)

\$3 million fine since 1993

"Habitat Conservation Trust Foundation" has reaped a windfall of more than \$3 million from court fines levied against environmental offenders since 1993. According to them courts have had the option of ordering that fines under certain provincial laws including the Environmental Management Act, Wildlife Act and Water Act. The funds have been directed to fund various conservation projects offsetting environmental damage. (VancouverSun 2017-08-07)

New Copper-Gold mining project

Amarc and Hudbay Partner to Advance the JOY Copper-Gold Porphyry Project, which is located 25 km north of AuRico Metals Inc.'s Kemess South Mine and Kemess Underground Project site in north-central BC. (Markets-Insider 2017-08-22)

Upcoming meetings

Vancouver Mycological Society meeting, -- [Introduction to Mushroom Identification](#) – a 3-session course by Vancouver Mycological Society in Vancouver Sept. 21, 2017 7-9 pm, Sept. 27, 7-9 pm, Oct 4, 7-9 pm For registration email info@vanmyco.com

44th Canadian Ecotoxicity Workshop, 2017-10-01/04 in Guelph <https://ecotoxcan.ca/registration>

49th Annual Symposium of the Society of Toxicology of Canada, November 29 to December 1, 2017 in Montreal <http://www.stcweb.ca/en/events.shtml>

North American Congress of Clinical Toxicology (NACCT) 2017 - in Vancouver
PRE-MEETING - OCTOBER 11-12, 2017 MAIN CONGRESS - OCTOBER 13-15, 2017
<http://www.clintox.org/wp-content/uploads/2017/05/NACCT-BROCHURE-2017-FINAL.pdf>

Toxicology jobs in BC

- Senior Human Health Risk Assessment Specialist, Ministry of Health
Toxicology and Risk Assessment, Environmental Scientist - Toxicology Job. Golder Associates, BC Environmental Scientist – Toxicology

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