Forestry Dialogue

Developing a pathway for the long-term management of BC's forests

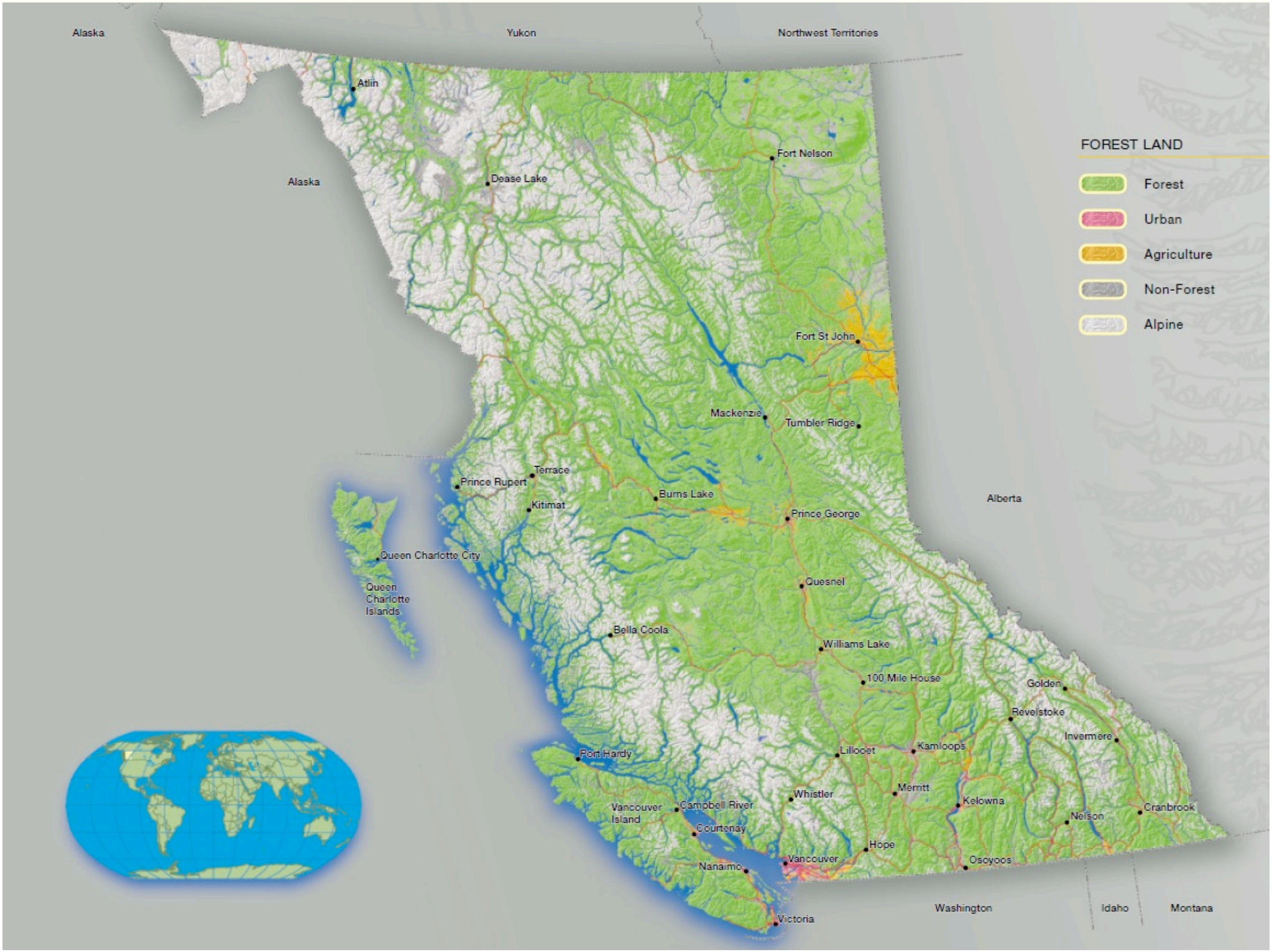
An academic perspective

John Innes
Faculty of Forestry
University of British Columbia

Key themes

An “academic” perspective on:

- Strengths of British Columbia’s forests
- Weaknesses of British Columbia’s forest products industry
- Opportunities in the sector
- Threats facing the sector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Yukon
Northwest Territories
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Fort Nelson
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Tumbler Ridge
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Prince Rupert
Burns Lake
Kitimat
Alberta
Prince George
Queen Charlotte City
Queen Charlotte Islands
Quesnel
Bella Coola
Williams Lake
100 Mile House
Golden
Revelstoke
Invermere
Port Hardy
Lillooet
Kamloops
Merritt
Whistler
Vancouver Island
Campbell River
Kelowna
Cranbrook
Nelson
Courtenay
Hope
Vancouver
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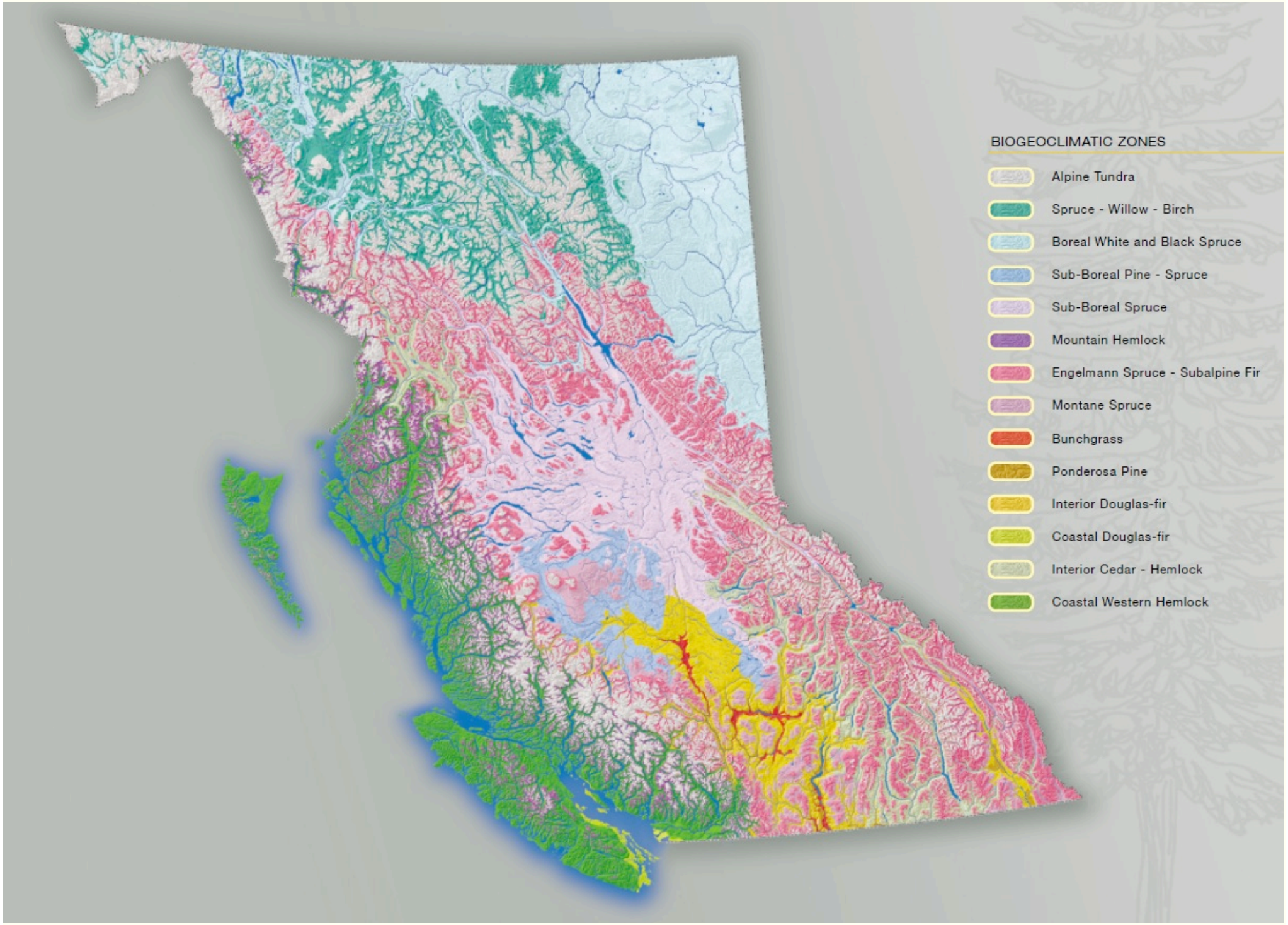
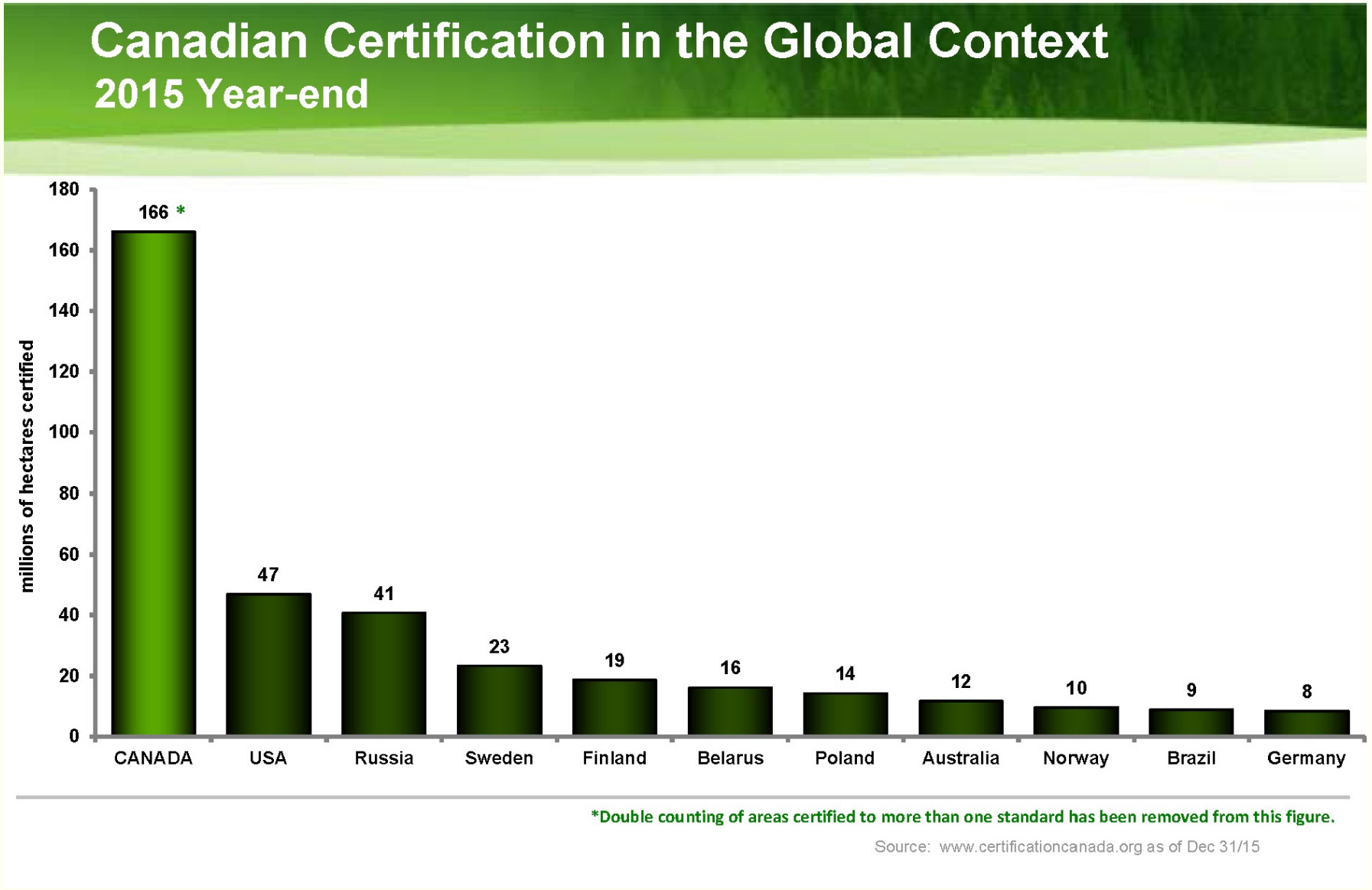

BIOGEOCLIMATIC ZONES
Alpine Tundra
Spruce - Willow - Birch
Boreal White and Black Spruce
Sub-Boreal Pine - Spruce
Sub-Boreal Spruce
Mountain Hemlock
Engelmann Spruce - Subalpine Fir
Montane Spruce
Bunchgrass
Ponderosa Pine
Interior Douglas-fir
Coastal Douglas-fir
Interior Cedar - Hemlock
Coastal Western Hemlock

The happy – official – view of the BC forest sector

Canada has the highest area of certified forest anywhere, and much of this is in BC. This means that it has the best forest management in the world.



Canada's Vision 2020 (now forgotten?)

"By 2020, the Canadian forest products industry will power Canada's new economy by being green, innovative, and open to the world. It is a place to grow and prosper".

- Generate an additional $20 billion in economic activity from new innovations and new markets
- Deliver a further 35% improvement in the sector's environmental footprint
- Renew the workforce with at least 60,000 new recruits including women, Aboriginals and new Canadians

BC's approach (according to the Government of BC)

- "Conserve vast areas of forests
- Balance environmental, economic social values
- Involve British Columbians in decision-making
- Strive for continual improvement in forest management
- Welcome independent observation"

Canada's forest economy in perspective

Forestry in B.C. and Canada contributes 2.5% and 1.25% to GDP, respectively (5% in Finland, 4% in New Zealand, 3% in Chile). In some Finnish regions, forestry contributes >10% to GDP.

Why so little in BC?

The BC focus has always been on sawmills producing low-value commodity products

Dimensional lumber dominates

and the derivative industries

Pulp


W45 - AMBIENT
CLO2 MONITOR
NO ACCESS IF FLASHING
431-030
WASHER 35

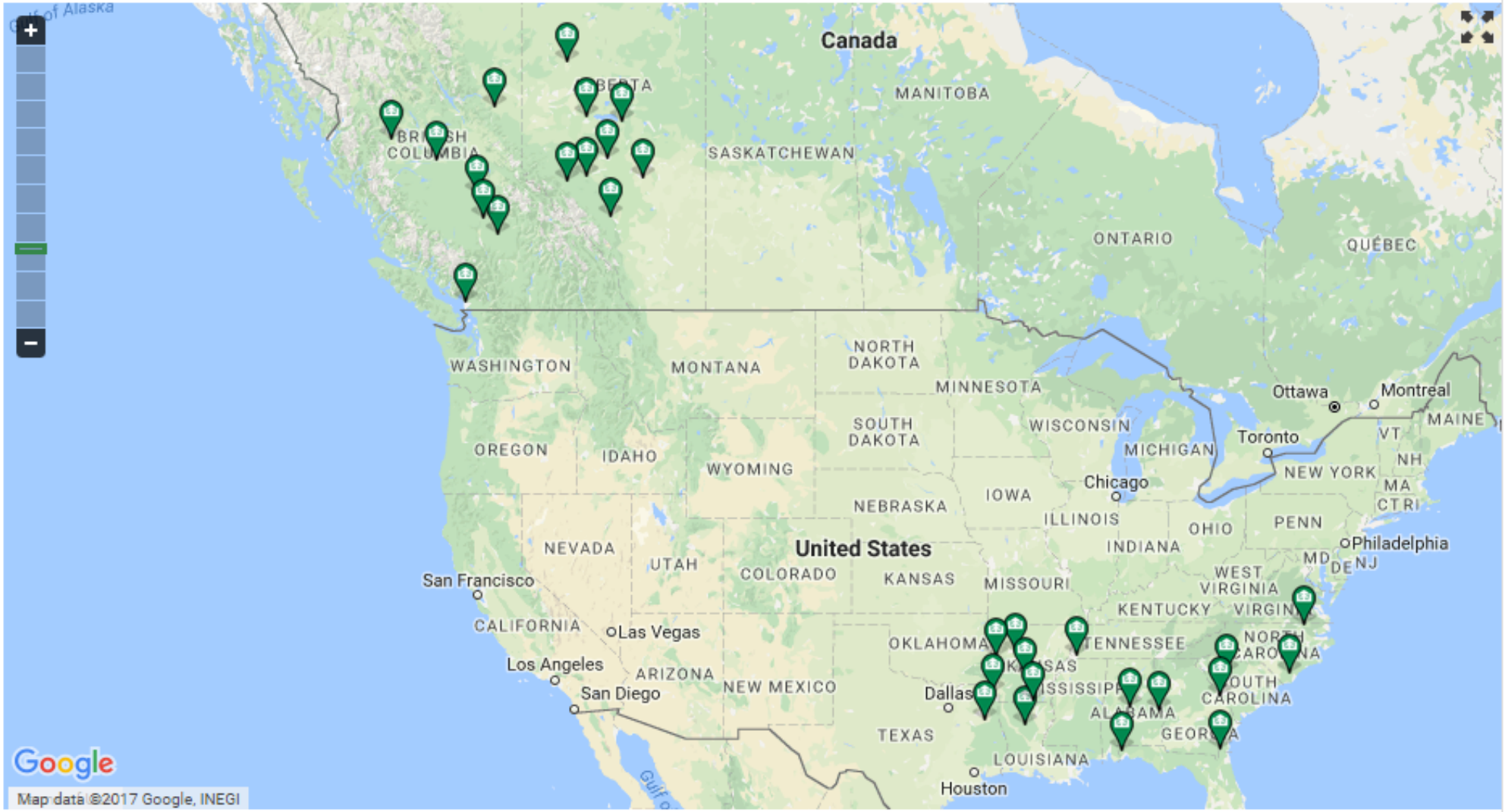
The Annual Allowable Cut

- The forest industry is based on having an adequate supply of sawlogs (currently ca. 64 million m^3)
- We've known for a long time (>50 years) that current levels of harvest will have to be reduced as we move from old growth harvesting to re-growth
- The mountain pine beetle, wildfires, the spruce beetle and other pests and diseases are affecting the AAC
- For example, in the Prince George Timber Supply Area (7.97 million ha), the 2016 AAC of 12.5 million m^3 dropped to 8.35 million m^3 in 2017.

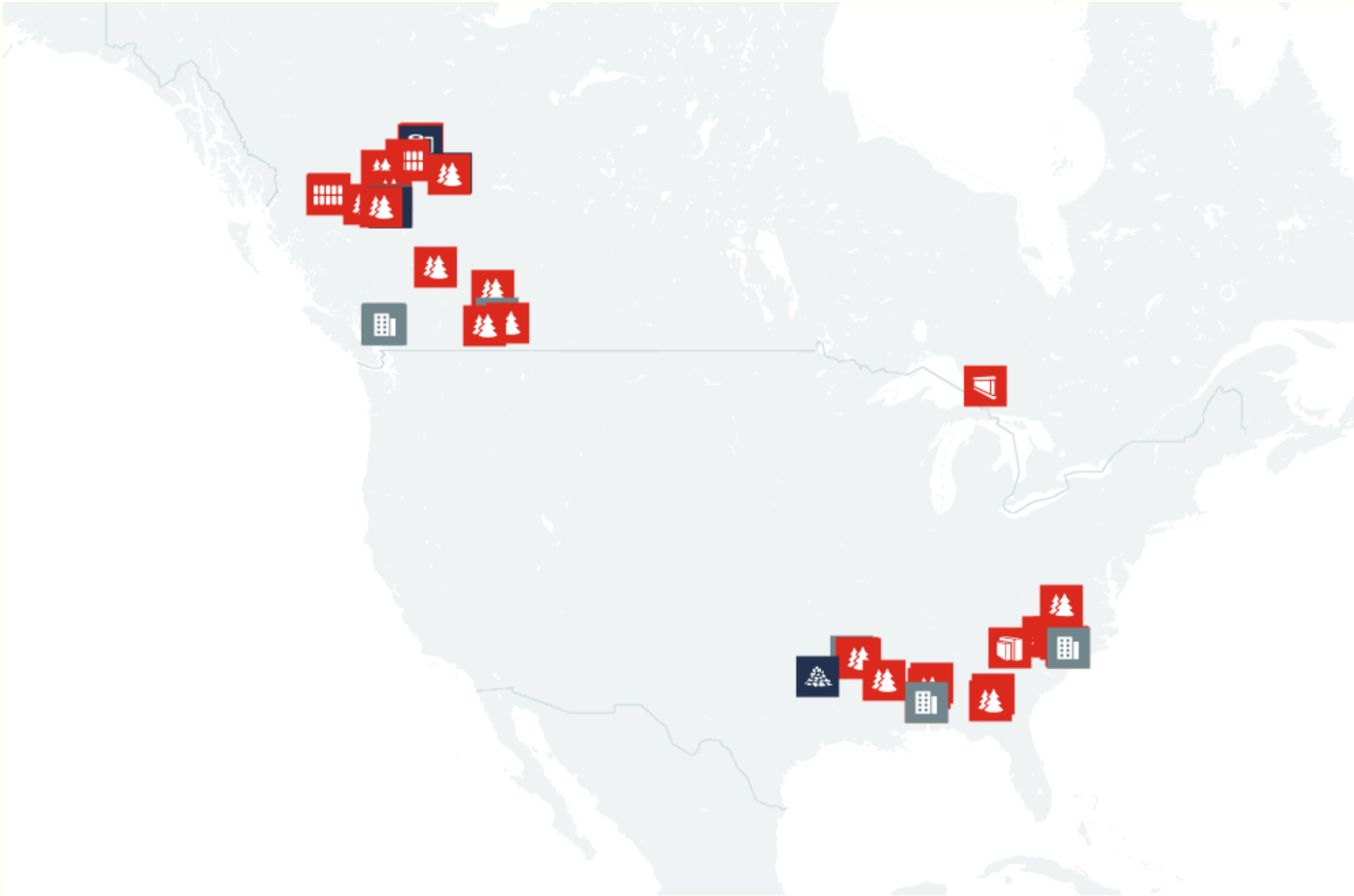
Sawlog Supply

- The single biggest uncertainty for the forest products manufacturing sector is sawlog supply
  - Natural disturbances, such as bark beetles
  - Wildfire
  - Climate change
- Uncertainty is leading major lumber manufacturers to invest elsewhere

West Fraser locations



Canfor Operations



Why the move away?

- Uncertainty over future sawlog supply
- High costs: “the highest wood costs in North America” – Don Kayne, CEO, Canfor
- Availability of sawlogs elsewhere (Alberta, USA)
- Problems getting the products to markets (railcars, tariffs)

Wildfire in BC

- 2017 was a record, 1.21 million ha burnt in 1351 fires. Suppression costs alone exceeded >$562 million
- 2018, surpassed 2017, 1.35 million ha burnt.
- Overall, fire seasons are getting longer, and the fires are getting more intense
- Many communities are at risk: the Filmon report in 2004, which followed the 2003 Kelowna fire, identified areas at highest risk
- By mid-2016, only 4-10% of these areas had been treated. Those sites treated earliest will have already returned to a high risk status.
- Treatment involves removing (and burning) fuel – the same material that is in short supply for pellet plants, biomass plants and pulpmills

Fire suppression costs are increasing

The costs of fire

- Most reports only refer to fire suppression costs.
- In 2014, 136,000 ha of the Timber Harvesting Land Base were burned, amounting to 24 million m^3, or 30% of the provincial Annual Allowable Cut. Only about 3 million m^3 of this will be salvaged. The losses were valued at over $1 billion
- Data on the full costs of wildfires are elusive

Mountain Pine Beetle in BC

- The worst year of observed red-attack, at a provincial scale, was 2005 with approximately 140 million m^3 attacked
- Approximately 731 million m^3 (54%) of B.C.'s merchantable pine volume was killed
- The annual volume of mature merchantable red-attack pine on the THLB is projected to remain below 1 million m^3
- >$1 billion from federal and provincial sources spent on ‘dealing’ with the damage

Red attack, Barkerville, BC

Grey attack, Quesnel, BC

Logs can only be harvested for a limited time (Quesnel)

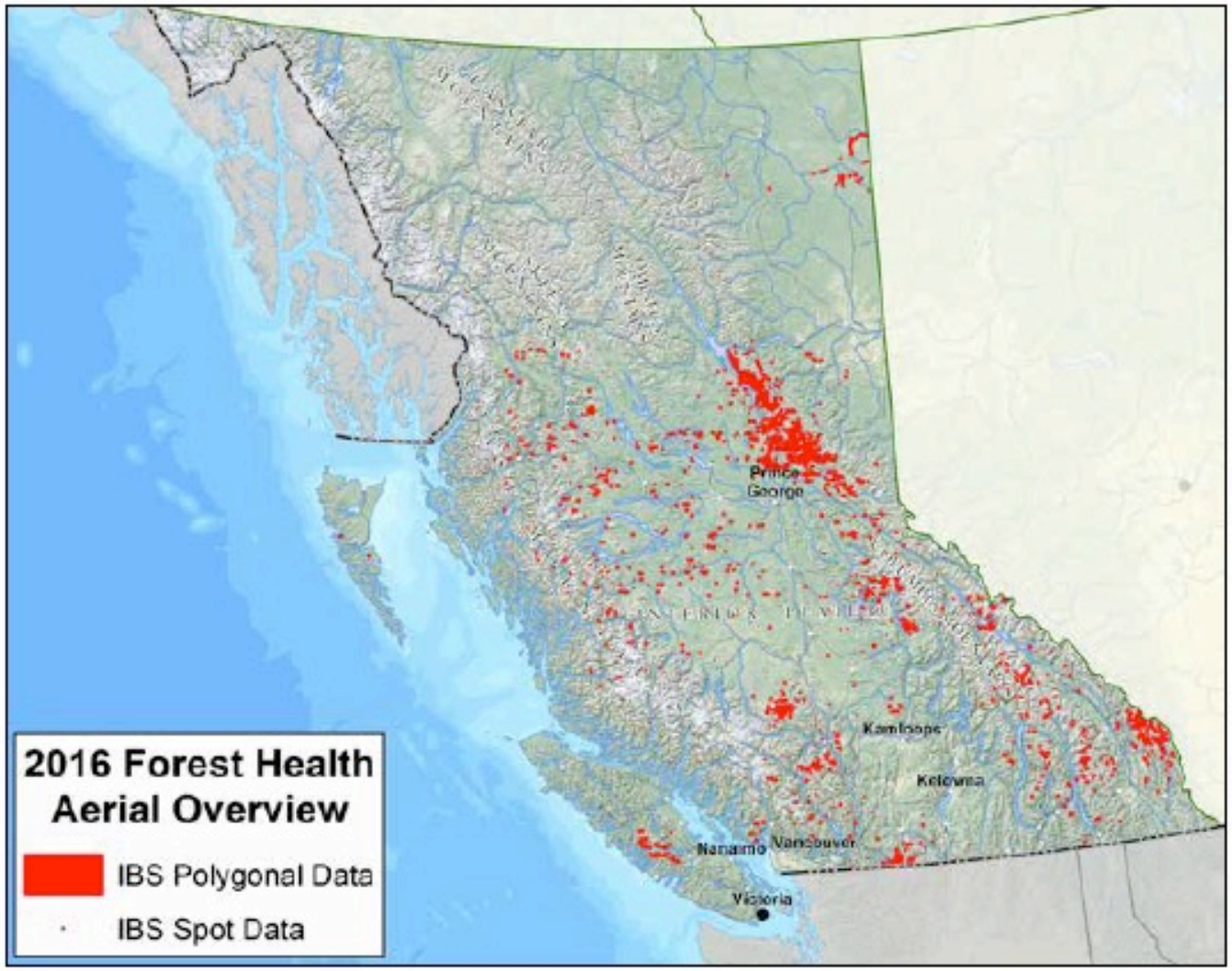
Much of the impacted area is being replanted … with lodgepole pine, and with the approval of the BC Government

Other Beetles in BC

- Western pine beetle – attacking Ponderosa Pine in southern BC
- Spruce beetle – attacking White Spruce in central and northern BC
- Douglas-fir beetle – attacking Douglas-firs
- Western cedar borer – attacking western red-cedar
- Many other insects could explode (especially invasive species – emerald ash borer is an example of what can happen)

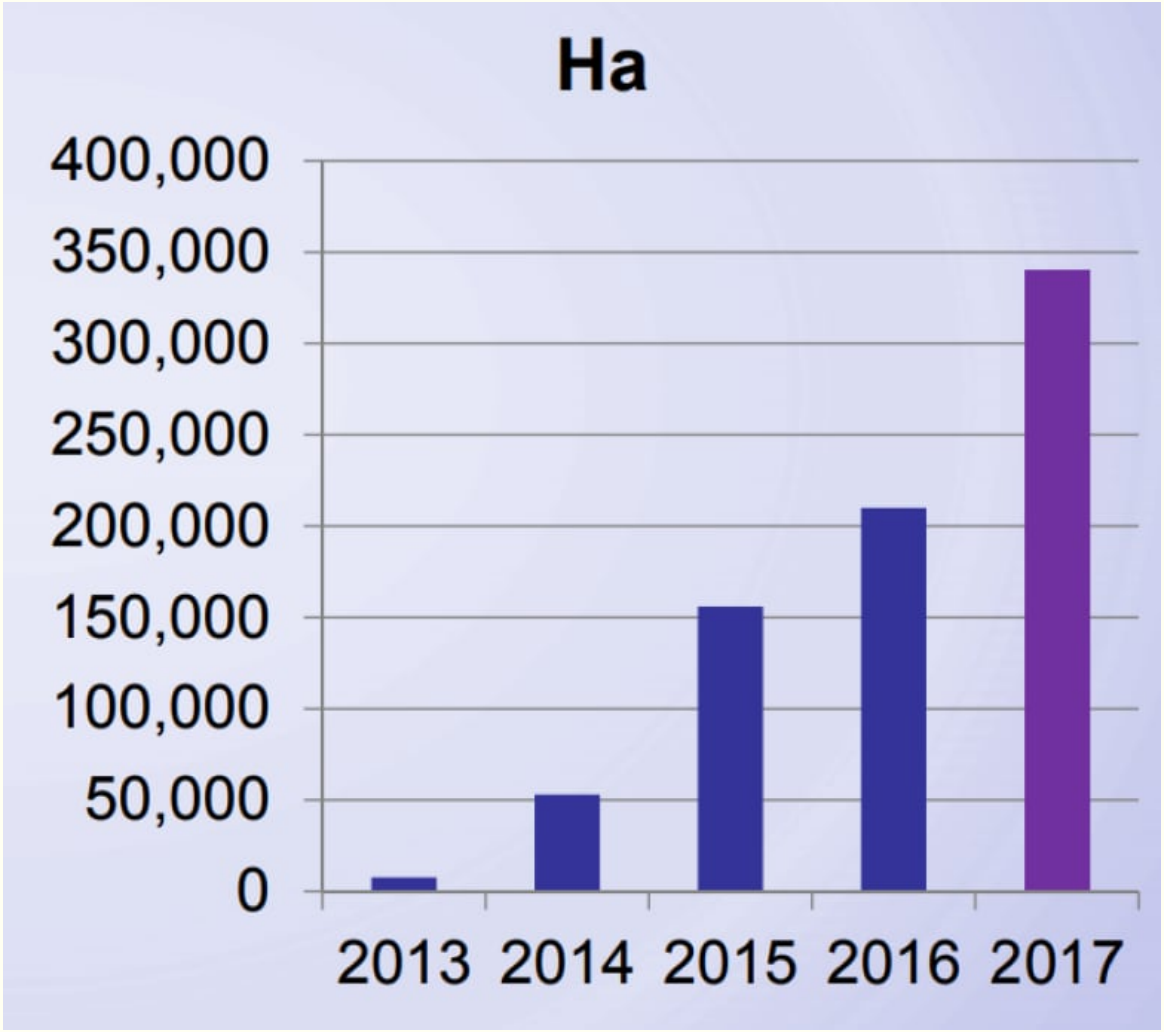
Spruce beetle in BC

- About 500,000 hectares of forest are now affected by the spruce beetle in the Omineca region, up from 210,000 ha in 2016.
- Provincial reaction: “the rise of this pest over the past year is not as concerning as mountain pine beetle” (2016)
- In 2016, $1 million was devoted to strategies to control the outbreak



The current outbreak is centred near Mackenzie. Since 2016, the infestation has spread north toward the Yukon border, west into the Smithers region, and east into the Robson Valley, as well as worsening in the Prince George-Mackenzie region.

Source: Ministry of Forests, Lands, and Natural Resource Operations



BC’s regional entomologist now says “This is a significant concern” – January 2018.

Spruce beetle damage, Haines Junction, Yukon

Spruce beetle damage, Kenai Peninsula, Alaska

Forest-related species

- A big concern associated with deforestation and forest degradation is the loss of forest-dependent species.
- Many vertebrates in BC are now threatened by loss of habitat (no information for most invertebrates)
- BC is particularly important for some species and sub-species – e.g., Barrow's Goldeneye

Forest-related species

- Caribou
  - Lack of good quality science
  - Lack of early consultation on management actions
  - Failure to address the important issues, particularly habitat modification and loss
  - Fixation on particular aspects, such as culling wolves. Cause and effect?

“In British Columbia, all Mountain and Boreal Caribou herds and 15 of 31 Northern Caribou herds are listed as *threatened.* Threats to Caribou may vary based on ecotype; however, human activities associated with resource extraction are the ultimate threats to caribou in British Columbia.”

BC Ministry of Environment 2015

Governance

Increasingly, the Crown's rights to land is being challenged by First Nations, and settlements are being made either through the Treaty Process or through the courts. This is removing forest area from the industrial Timber Harvesting Land Base.

2017 Huu-ay-aht decision awarding compensation for logging that took place on former Numukamis IR1 between 1948 and 1969 has further implications

Tsilhqot'in Decision (June 2014)

This decision has raised the question of whether logging done on what has been believed to be "crown" land is legal.

UN Declaration of the Rights of Indigenous Peoples, Article 28:
Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent.

Tsilhqot'in Decision*: the issuance of timber licences on Aboriginal title land is a direct transfer of Aboriginal property rights to a third party and will plainly be a meaningful diminution in the Aboriginal group's ownership right amounting to an infringement that must be justified in cases where it is done without Aboriginal consent*

Affirmation of the Nemiah Declaration

SCHEDULE A

Nemiah Declaration

Let it be known that:

Within the Nemiah Aboriginal Wilderness Preserve:

1. There shall be no commercial logging. Only local cutting of trees for our own needs. i.e. firewood, housing, fencing, native uses, etc.
2. There shall be no mining or mining explorations.
3. There shall be no commercial road building.
4. All terrain vehicles and skidoos shall only be permitted for trapping purposes.
5. There shall be no flooding or dam construction on Chilko, Taseko, and Tatlayoko Lakes.
6. This is the spiritual and economic homeland of our people. We will continue in perpetuity:
    a. To have and exercise our traditional rights of hunting, fishing, trapping, gathering, and natural resources;
    b. To carry on our traditional ranching way of life;
    c. To practice our traditional native medicine, religion, sacred, and spiritual ways.

Social license

The government believes that it has social licence for forestry, including harvesting old-growth on Vancouver Island. Others disagree:

“The B.C. auditor general, the B.C. ombudsperson and the Forest Practices Board have all written reports in recent years on the failures associated with the practice of relying on professionals employed by resource companies to manage the province’s forests”.

Business in Vancouver 2014

BCTS cutblock visible from the Hope landslide scenic area, considered by the Forest Practices Board to be a significant non-compliance

Social license

- Logging companies have traditionally believed that certification confers social license
- Generally, there has been a failure to recognize that the voting public is increasingly located in cities, and their sources of information are more likely to be "*The Nature of Things*" than (confidential) certification audits
- The urban public is divorced from the resource-based economy: understanding how the urban public thinks and sees the world is important as it will determine future governments

Implications

- In April 2016, the Association of Vancouver Island and Coastal Communities voted in favour of halting the harvesting of old growth trees, stating that old growth has more value left standing
- In May 2016, the BC Chamber of Commerce endorsed "support for the increased protection of old-growth forests in areas of the province where they have or can likely have a greater net economic value to communities if they are left standing"
- The move was endorsed by the Union of BC Municipalities in September 2016

Old growth logging in the Nahmint Valley by the BC Government

Photo: Ancient Forest Alliance

“There is desire on the public’s part to regain some control of forestry and the management of old growth on Vancouver Island”

John Allan, 4 April 2019

The aesthetics of old growth?

The MacMillan Bloedel building. It “suggests the tapering verticality of the west coast rain forest, as reflected by the paintings of Emily Carr, which were a source of inspiration to Erickson. Erickson was also influenced by the Japanese love for surfaces that express the nature of material. The MacMillan Bloedel Building is a prime example of the unique blending of Modernist and Far-eastern aesthetics”

Canada’s Historic Places register

Professional Reliance

- An inquiry was launched in Fall 2017 and reported in summer 2018. It was very critical of the concept of professional reliance and has proposed many recommendations, including government oversight
- Some of these recommendations now being implemented, but is the government really capable of this? (It has been suggested that the worst forest practices in BC are associated with the BC Timber Sales)
- The government/forest product manufacturers continue to claim that BC has the world-leading forest management practices

Scientific Reliance

- Arguments are frequently made that AAC determinations and other current forest policies are based on sound science
- Very little discussion of the quality of this science occurs, despite major deficiencies in models such as TIPSY, a serious lack of knowledge in many areas, and regulations that put sawlog supply above everything else
- There has been a failure to invest in the research needed to support new policy, jeopardizing the validity of many decisions

(Belated) government recognition of the problems

John Horgan, January 17, 2019:

“the government will reform raw log export policy, discourage high grading and curtail the export of minimally processed lumber”

Doug Donaldson, April 1, 2019:

“We are making overdue changes to how we do things in the woods”

John Allan , April 4, 2019

“Under the previous government, forestry was an engine that was allowed to take over. The status quo is not acceptable. There are high expectations for the industry to make changes.

Huge choice available for forest sector investors

- The new forest economy (bioeconomy) represents a growing investment opportunity. It is being encouraged by both government policy and commercial opportunities
- Because of the potential rewards, and the very rapid development, there are multiple players globally, and some are moving very quickly (e.g., large chemical companies)
- Many technologies are untested, or in a pre-commercialization phase, and for some, markets have yet to be established
- The majority of higher-value products are based on small quantities of source material

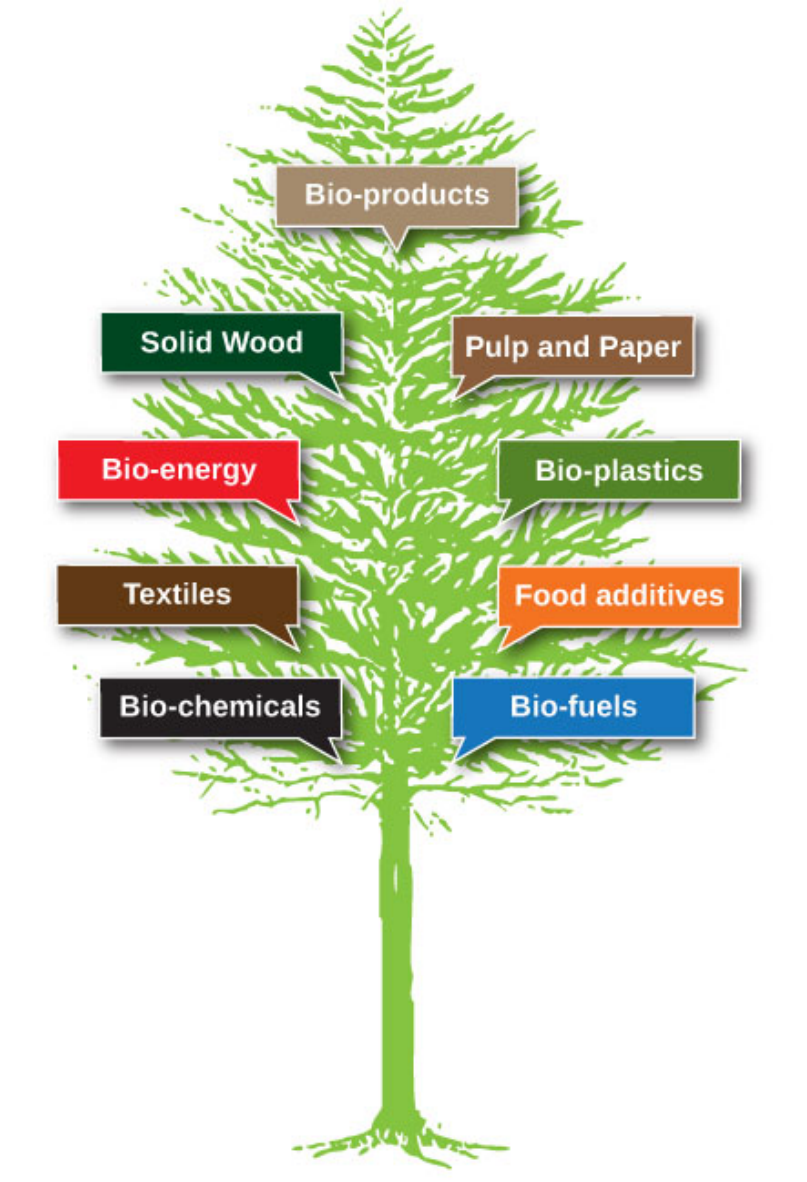
John Horgan, 5 April 2019 (at COFI Convention)

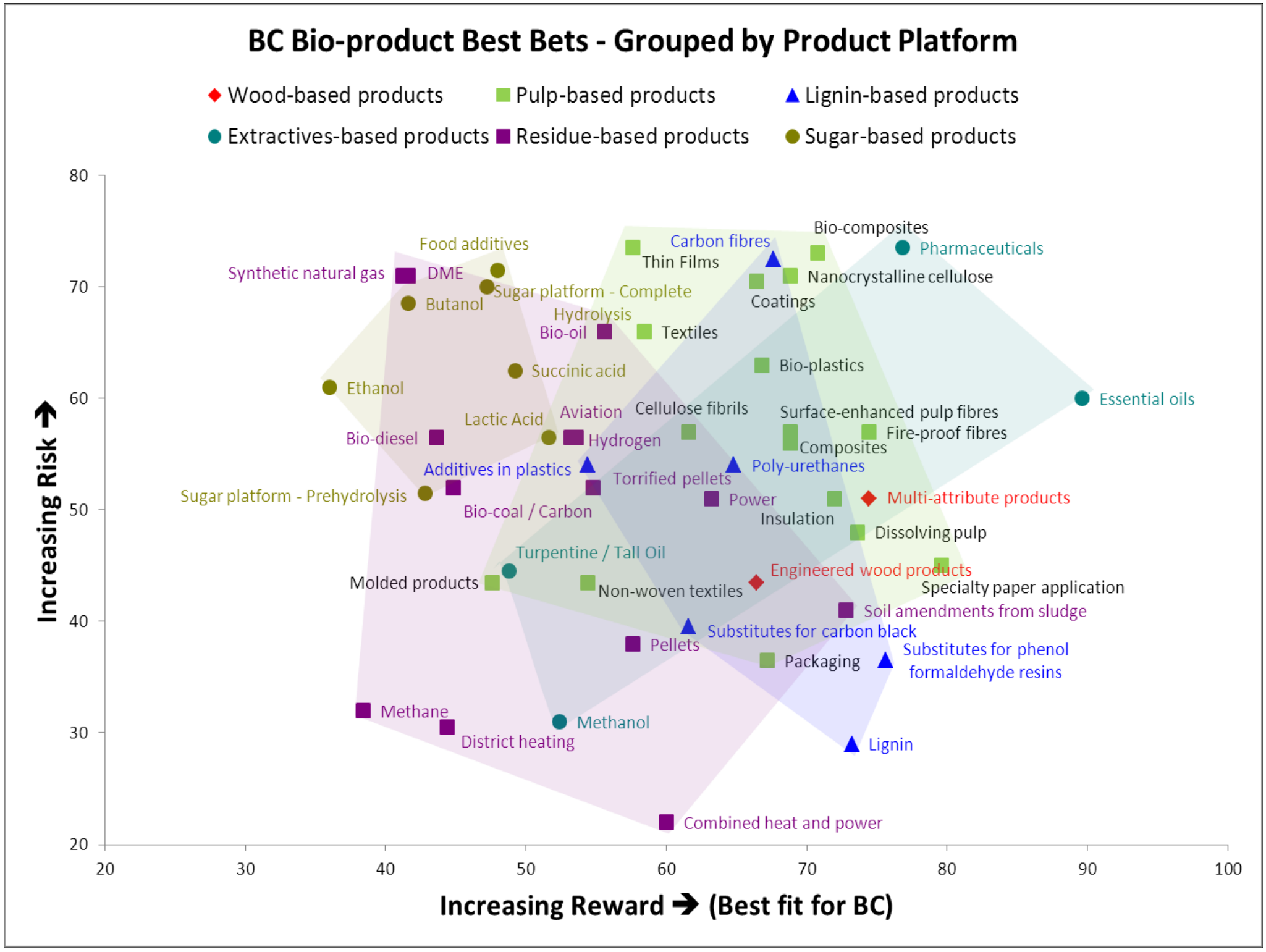
“More high value, less high volume. I’m going to give you the incentives you need to transition between high volume and high value. These are opportunities, not obligations. It’s on you to take this challenge.”

What are those opportunities?

Forest products

Includes bio-products, engineered wood products and building systems.




BC Bio-product Best Bets - Grouped by Product Platform
Wood-based products
Pulp-based products
Lignin-based products
Extractives-based products
Residue-based products
Sugar-based products
Increasing Risk
Increasing Reward → (Best fit for BC)
80
70
60
50
40
30
20
20
30
40
50
60
70
80
90
100
Food additives
Synthetic natural gas
DME
Butanol
Sugar platform - Complete
Hydrolysis
Bio-oil
Succinic acid
Ethanol
Lactic Acid
Aviation
Bio-diesel
Hydrogen
Additives in plastics
Sugar platform - Prehydrolysis
Bio-coal / Carbon
Torrified pellets
Power
Turpentine / Tall Oil
Molded products
Non-woven textiles
Pellets
Methane
District heating
Methanol
Combined heat and power
Carbon fibres
Thin Films
Textiles
Bio-composites
Pharmaceuticals
Nanocrystalline cellulose
Coatings
Bio-plastics
Cellulose fibrils
Surface-enhanced pulp fibres
Fire-proof fibres
Composites
Poly-urethanes
Insulation
Multi-attribute products
Dissolving pulp
Engineered wood products
Specialty paper application
Soil amendments from sludge
Substitutes for carbon black
Packaging
Substitutes for phenol formaldehyde resins
Lignin
Essential oils

Wood products

Focus has been on standard lumber grades, a commodity subject to considerable price variations

More recent emphasis is on engineered wood products (glulam, cross-laminated timber, veneer strand lumber, etc.). "Latest" product is dowel-laminated timber which uses 0.5% of the glue used in CLT.

Major emphasis on increased use of wood, particularly in non-residential buildings

Recent lumber prices (US$ per thousand board feet)

The provincial and federal governments continue to spend large amounts on increasing the markets for dimensional limber (ca. 10x what is spent on research)


TO
LIBRARY AT THE DOCK

Modern construction with wood will likely be increasingly pre-fabricated, will use robots, and will be increasingly competitive against steel.

Zurich, Switzerland

Pulp and Paper

Demand is changing significantly, with growing demand for packaging, tissues, fluff pulp and new biochemical industries

China's consumption of wood pulp increased by about 10.3% annually from 2007 to 2017, and is now 35% of global demand. Most pulp mills in China are independent (i.e. unassociated with sawmills)

Major investment by China in BC pulpmills: Paper Excellence will shortly take over Catalyst's operations (Port Alberni, Crofton, Powell River). They already own mills in BC at Howe Sound, Mackenzie and Skookumchick

Catalyst’s paper mill, Crofton

APP Mill, Hainan, China

Wood as fuel

Four key variables shape the economics of investing in bio-refiners:

1. The delivered cost of biomass (50%-70% of the variable cost)
2. The conversion technology
3. The price of fossil fuels
4. Public policy (including the price on carbon)

The long-term outlook for bio-energy/chemicals is positive, but in the short-term, there is considerable uncertainty in each of these variables

Biomass processors claim that BC forest products companies would rather burn “waste” piles such as these than sell the fibre

Wood Pellets

Wood pellet industry in BC that has grown from zero to >2 million tonnes annually. 94% is exported. Global demand in 2018 was 30 million tonnes: 14% annual growth since 2006

Estimates suggest that Japan and South Korea will add 24 million tonnes to current demand by 2025

The Drax plant in the UK alone needs 7 million tonnes annually (3 of 6 generating units converted to biomass). Has 10-year contracts with suppliers, and has established DraxBiomass in Louisiana to supply pellets

Amite BioEnergy, Gloster, Mississippi. 525,000 tonnes pellets yr^{-1}

Bioenergy: major developments

New waste-to-energy technology will use a mixture of feedstocks: blended waste wood, scrap tires and sewage sludge

Downdraft gasification plant is being developed in Lebanon, Tennessee, that will cleanly convert up to 64 tons per day of waste into a fuel gas that will generate up to 300Kw of electricity.

Such investments will mostly be driven by national policies, such as the Swiss 2000-Watt policy

UPM Biofuels. Construction of the Lappeenranta biorefinery at UPM's Kaukas mill site began in 2012; commercial production began in January 2015. UPM's total investment was EUR 175 million. 120 million litres renewable diesel production annually. Raw material is crude tall oil (a by-product of pulp making)

SEKAB’s Domsjö biorefinery in northern Sweden produces products based on ethanol, including thermol, a heat transfer fluid used in geothermal and other heating and cooling systems.

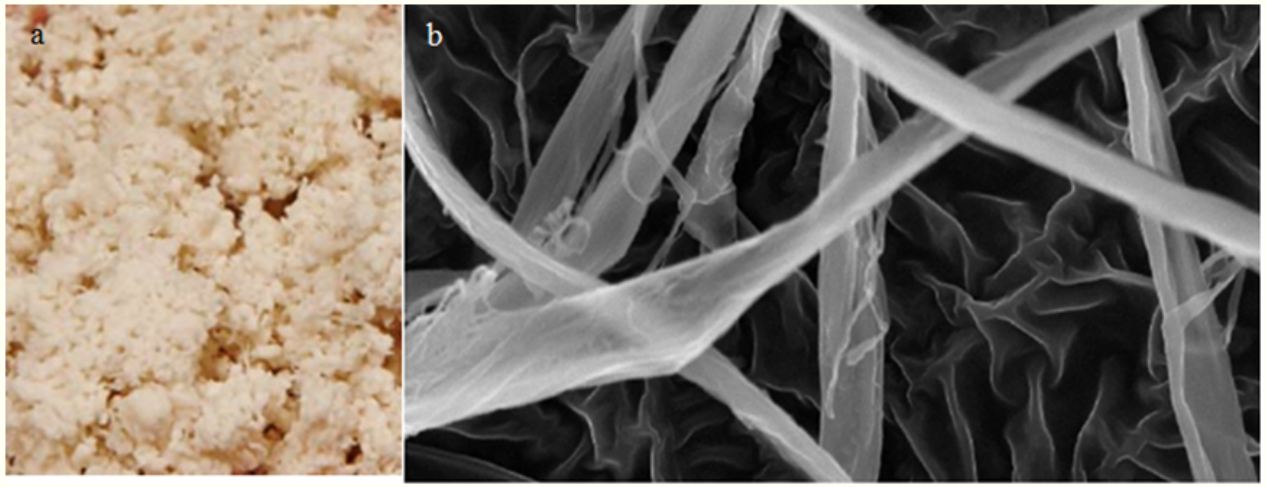
The market for biofuels is substantial and projected to increase. In 2017 in Sweden, biofuels accounted for 20.8% of all fuels supplied for vehicle operations and biodiesel accounted for 26.6% of all diesel used.

Cellulose Filaments

North American market for CF as a strength reinforcing agent for pulp and paper products is 120,000 tonnes annually

Similar market for thermoplastics, reinforced plastics, thermosets, adhesives, non-woven fabric and coatings

Combined, represents a market value of $500 million annually. This figure is expected to grow rapidly



Biotextiles

Wood-derived viscose accounts for 6% of the world fabric market (it occupies third place, behind synthetics and cotton but ahead of wool)

Traditional viscose problematic because of the chemicals used in production. New ‘closed loop’ systems and second-generation fabrics such as produced by the Lyocell process are greener.

Wood-derived fibres are a close substitute for cotton, which has its own environmental problems. Future restrictions on cotton production will open up opportunities for wood-derived fibres


WAMSUTTA
THE PERFECT PINPOINT
100% Egyptian Cotton
Extra Deep Fitted Sheet
WAMSUTTA
THE PERFECT PINPOINT
100% Egyptian Cotton
Extra Deep Fitted Sheet
WAMSUTTA
DAMASK STRIPE
Collection
500 Thread Count
WAMSUTTA
DAMASK STRIPE
Collection
500 Thread Count
Materials
• 100% Tencel® Lyocell.
• Tencel® fibers are produced from the wood pulp of Eucalyptus trees, creating a high strength, natural fiber that is also biodegradable.
• Will continue to soften with repeated washing.
Benefits
• 400 thread count.
• Soft and smooth.
• Moisture control to keep you cool and comfortable.
• Resistant to fading, shrinking and pilling.
• Luxurious Jacquard
Fit
• Fits mattresses up to 18 inches deep.
• Fully elasticized fitted sheet.
Set Includes
• Queen: 1 flat sheet, 1 fitted sheet and 2 Standard / Queen pillowcases.
• King and Cal King: 1 flat sheet, 1 fitted sheet and 2 King pillowcases.
EUCALYPTUS ORIGINS™
100% TENCEL® LYOCELL
400 THREAD COUNT
EUCA-LYPTUS SHEET SETS
400 THREAD COUNT
•Fits mattresses up to 18" deep
Full $119.99
Queen $129.99
King $159.99
Standard pillowcase $49.99
King pillowcases $59.99
Sheet set includes 1 flat, 1 fitted & 2

ORLY Bed Premium Birch Fibre Bedding

The global market for medical biotextiles is expected to reach US$ 7.3 billion by 2023, Includes both medical textiles (such as wound dressings, bandages, medical clothing etc.) and BioTextiles used in implants because of their biocompatibility and biostability

Speciality Biochemicals

Options include:

Lignin-based products for resins, adhesives, plastics additives etc.

Sugar-based platforms for butanol or for various plastics or chemical precursors such as succinic acid, lactic acid, xylose etc.

Fibre-based products for composites, fibre-reinforced plastics, novel paper or construction products etc.

Not just a dream: MetsäFibre's Äänekoski bioproduct mill in Finland is valued at EUR1.2 billion. It uses 6.5 million m^3 of wood annually. It produces a range of products in additional to pulp, including tall oil, turpentine, bioelectricity, product gas, sulphuric acid and biogas. Research at the mill on the upgrading of lignin and the manufacture of biotextiles, as well as other products, is ongoing.

Bioplastics and paper – potential alternatives to single-use plastics. Lhasa banned plastic bags from production to sales in 2011. Victoria did so in 2018, GVRD and most BC cities are yet to do so.

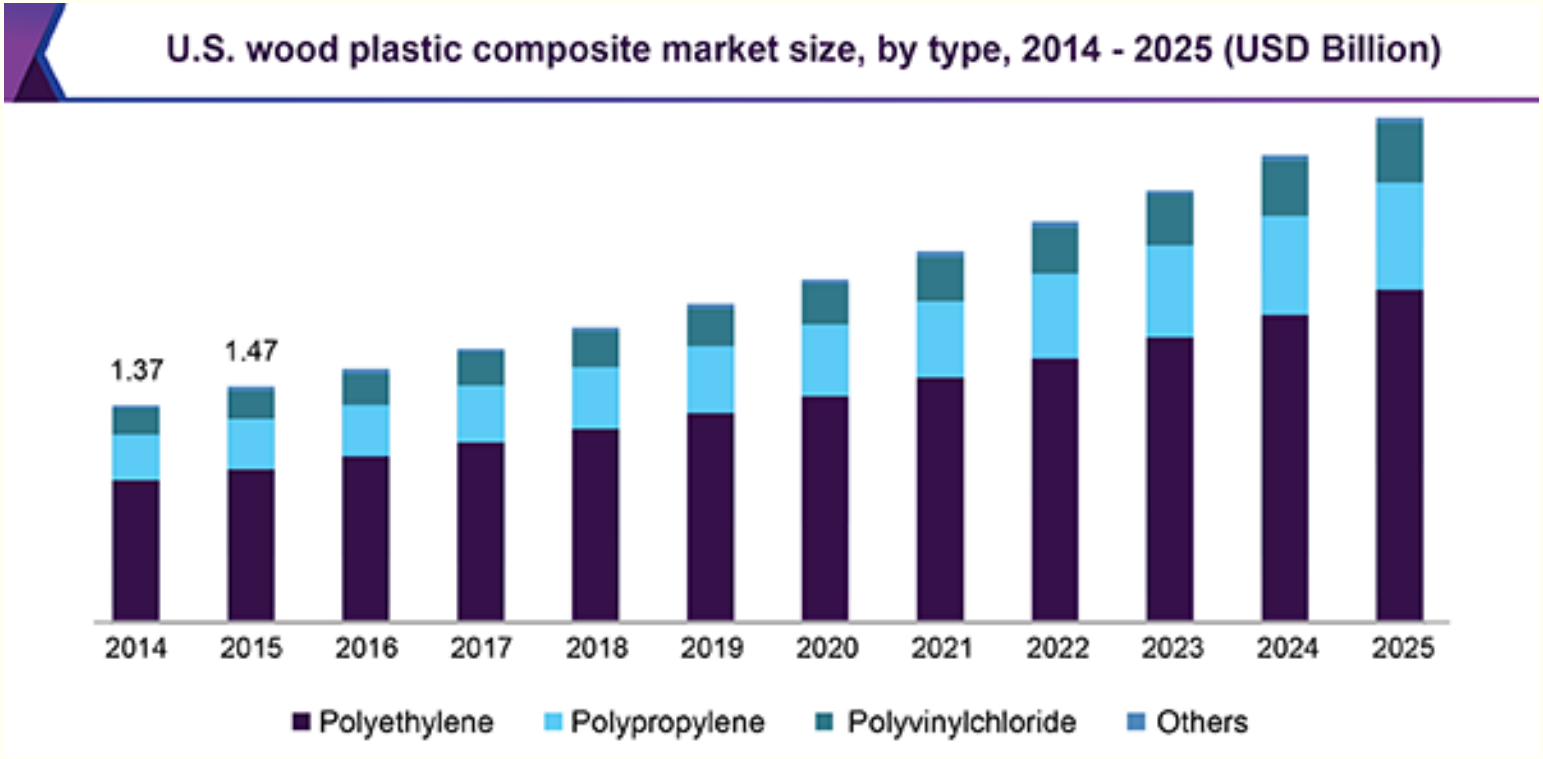
Bioplastics and plastic resins

Annual growth rate of 23.7% , growing to US$ 3.6 billion

Lineo™, is a lignin product that is replacing the oil-based phenolic materials used in resins for plywood, oriented strand board, LVL, paper lamination and insulation material. It is produced commercially by Stora Enso at its Sunila Mill in Finland, with the production level being 50,000 tonnes annually. Stora Enso claim that all fossil-based materials could be replaced by products based on wood and other renewable materials.

Natural Fibre Plastic Composites

Wood Plastic Composites and other Natural Fibre Plastic Composites both growing rapidly. Used for decking, fencing facades, furniture, automotive applications, etc.



Food additives

Cellulose – commonly used as a filler

Xylan (from birch pulp) used to create smoother yoghurts

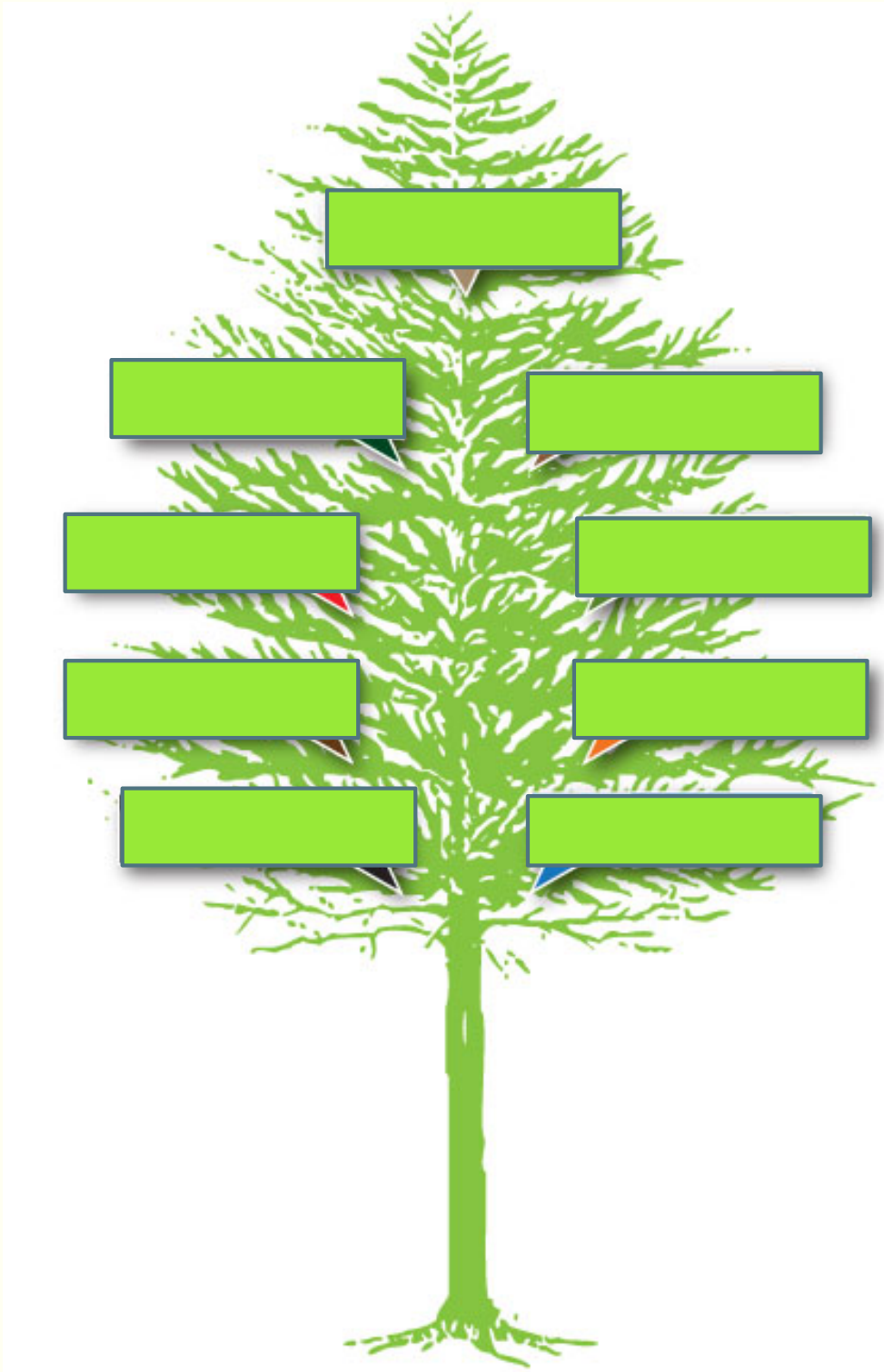
Fibrillated cellulose – used as a thickening agent

Lignin – used as an egg substitute in baking and as an emulsifier in mayonnaise

Food Additives

100% parmesan cheese, with 3% cellulose content

Products from SMEs – local, low investment, labour-intensive



Habitat has a value

- British Columbia's forests are crucial for a range of environmental values, including their role in the province's biodiversity.
- While we constantly hear how many jobs are associated with the forest sawlog industry, we rarely hear how many jobs are associated with other forest-based activities
- The timber is valued (sometimes), but there has been a failure to place value on other aspects of the ecosystem (other than carbon). Although these values are difficult to calculate, it is being done in many places.



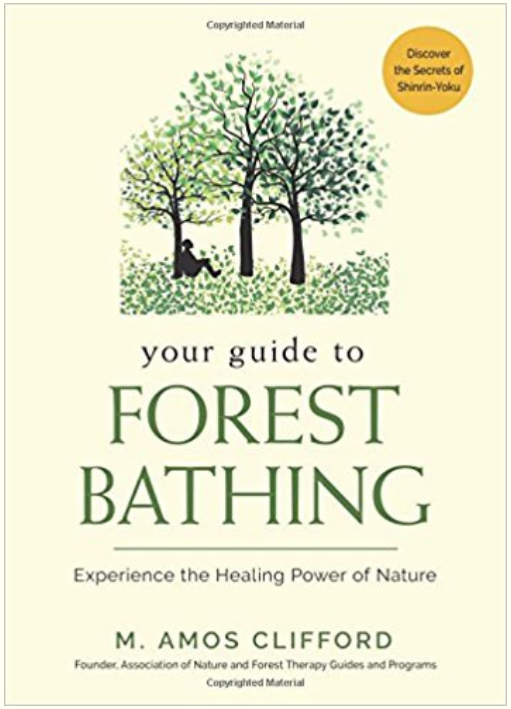





Something is missing!

- In many parts of the world, forests are seen as an important component of human health
- Eastern Asia: healing properties of forests long recognized in China, Japan and Korea
- Concept of “forest bathing” – getting out into a forest as both a means of preventing illness and promoting recovery
- Largely subsumed under the broader concept of “recreation”

Forest bathing site on Jeju Island, Korea, dominated by *Torrey nucifera*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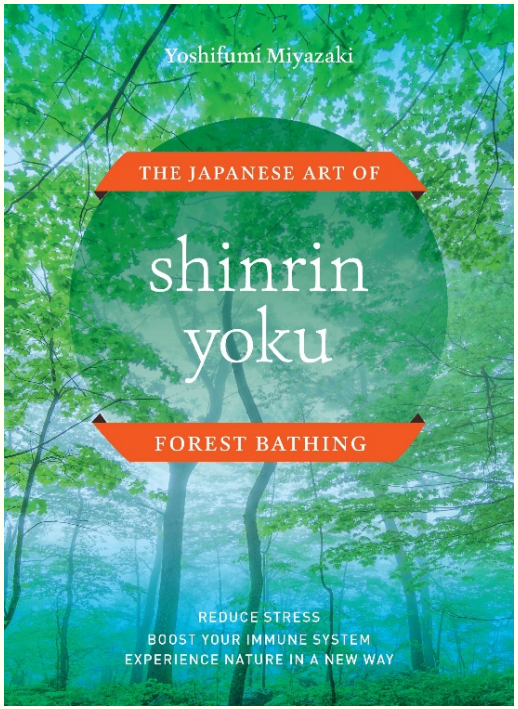
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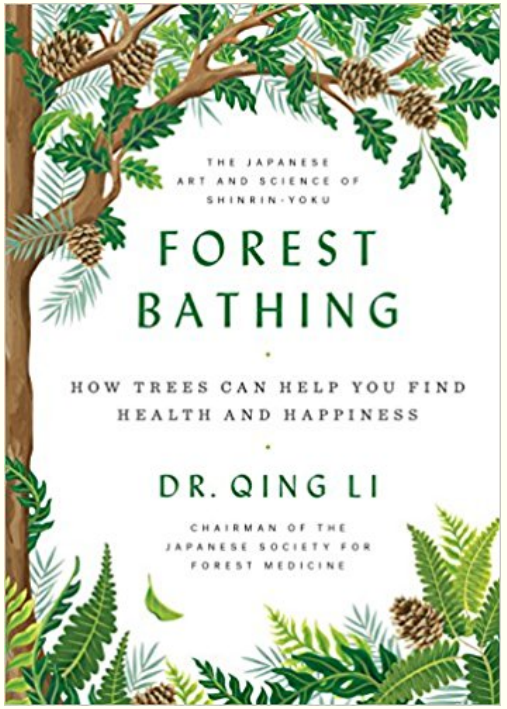
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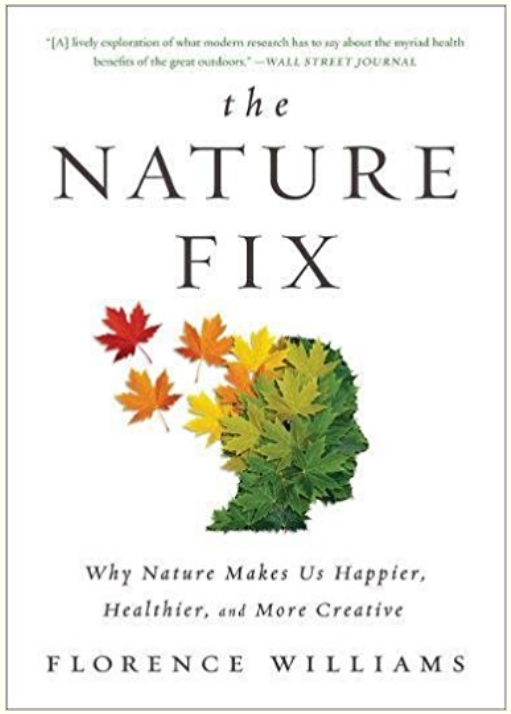
"[A] lively exploration of what modern research has to say about the myriad health benefits of the great outdoors." —WALL STREET JOURNAL
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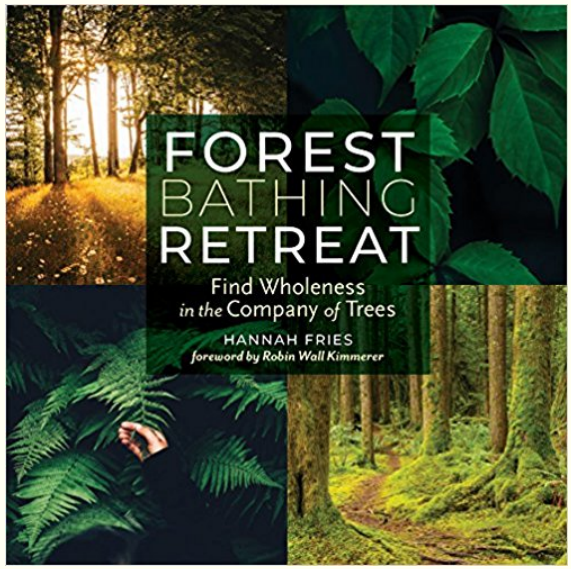
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HANNAH FRIES
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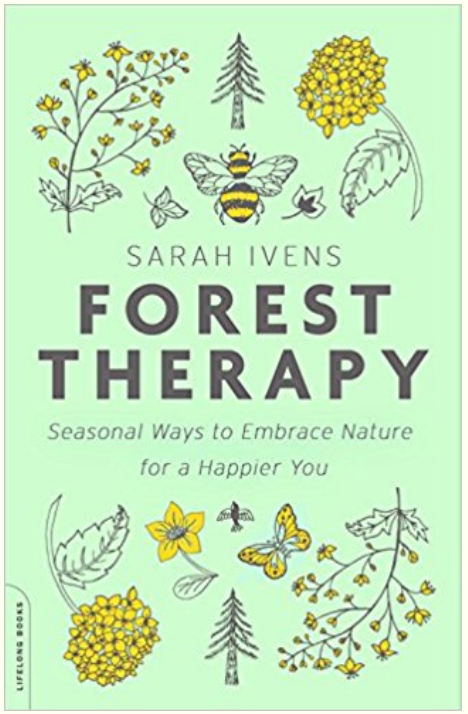
SARAH IVENS
FOREST THERAPY
Seasonal Ways to Embrace Nature for a Happier You
LIFELONG BOOKS

What does this all mean?

- Demand for wood-based products is strong and will likely grow in the future. We need to grow trees to meet these demands
- We will have to manage forests for a variety of goods and services: in some cases, wood may not be the primary product. This will require foresters to have a much broader education than ever before
- Climate change means that many aspects of forestry will change, and we need to incorporate new approaches to decision-making

New approaches to plantations supported by WWF are conserving biodiversity

NEW GENERATION PLANTATIONS platform

10 YEARS CELEBRATING DIVERSITY

What does this all mean?

- We will have to get much better at working with people, especially people who live in cities and have little knowledge of forestry
- Learning how to communicate effectively will be critical: face-to-face, in traditional writing, and using social media (see for example #forestproud). Fine line between education and ‘green-washing’
- Forestry may need to be re-defined to include ‘urban forestry’, ‘wildlife habitat management’, ‘restoration and rehabilitation’ and other areas that have until now been seen as peripheral to ‘true’ forestry

Herbicide application and social license

What does this all mean?

- In some areas, we will be co-managing forests with Indigenous Peoples. We need to understand better how to manage forests on Indigenous territories using a blend of Indigenous and ‘western’ knowledge
- While this presentation has focused on BC, foresters are becoming much more global in their skills. Many countries have similar problems to those faced in BC, and BC has the opportunity to learn – but this requires a change in attitude

Understanding Indigenous politics is increasingly important for foresters

What does this all mean?

- Decision-making is becoming increasingly complex because of increasing levels of uncertainty
- Even basic decisions, such as what to plant where, are becoming increasingly uncertain and will require careful planning.
- Today's models are no longer valid – the past can't be used to predict the future
- Planning techniques based on linear programming, 'constraints' etc. are no longer be appropriate
- Newer techniques that can take into account multiple options and huge uncertainty are increasingly being adopted (outside BC).

In my ‘academic’ view

- The BC forest sector suffers from regulatory capture, with the forest products industry having undue impact on policy and regulations
- The current tenure system is a major impediment to progress and needs to completely re-designed
- Forest products manufacturers should be separated from the management of crown forest lands, creating open log and fibre markets
- Most forest lands in BC will most likely be managed in the future by or for First Nations – but by Indian Act ‘Nations’ as opposed to the pre-colonial Nations (such as the Secwepemc), making SFM difficult, and maybe impossible

In my ‘academic’ view (2)

- Crown forest lands should be managed according to the principles of sustainable forest management, not by the requirements of forest products companies
- The current use of the AAC as a planning tool should be seriously re-thought, with appropriate harvest levels being determined locally and based on ecological capacity and appropriate MRV
- The federal and provincial governments, NGOs and others should start investing in R&D that supports a future circular bioeconomy in BC and Canada
- For forests, we will need to decide what to leave, and what we want to use to replace our unsustainable economy. This includes deciding how, where and when we use the forest

In my ‘academic’ view, we need to:

- Move to a new model of forest management in BC that is within ecological limits, sustainable and landscape-based
- Ensure a transition from the current management lacuna to genuine stewardship of the forests
- Move away from single-issue activism and NIMBYism
- Attack specific problems at their roots
- Recognize that some benefits come with costs and develop the necessary compromises
- Invest far more in R&D so that decisions can be based on knowledge rather than opinions and deeply-held beliefs
- Think beyond BC – we can learn from the rest of the world

Conclusions

- The forests of BC are in a phase of rapid change. Timber supply will be greatly reduced, forcing mill closures and disrupting the sawlog-based economy
- Higher value products are being developed that could create wealth from our forests, but not by the existing corporations
- Increasing pressures will come to pursue non-extractive forest uses, and to restore forest ecosystems
- Future foresters will need to be able to work in a much more complex, and increasingly uncertain, environment.