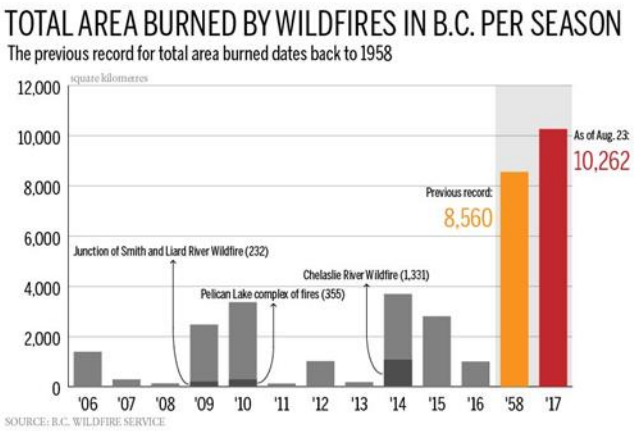
ClimateNews is a snapshot of new and emerging climate change adaptation and mitigation activities in BC's Natural Resource Sector.

This issue includes:



2017 Wildfire Season

BC Wildfire Statistics		
	# Hectares burned	Total # fires
2017 (to Oct 23)	1,215,744	1325
2016	100,366	1050
2006 – 2016 average	154,944	1844

In British Columbia, 2017 has been the worst wildfire year on record. As of October 23, 1.2 million hectares of forest had been affected by wildfire. This is a nearly tenfold increase over the average from 2007 – 2016.

Currently it is estimated the 2017 wildfires have emitted approximately 180 megatons of greenhouse gas emissions, or approximately three times the annual provincial fossil fuel emissions. Obviously, these are significant additions to carbon emissions in BC.

While it's difficult to pinpoint climate change as the primary factor in increased wildfires, it is clear that higher temperature and drought conditions have played a role in the worse-than-usual wildfire season.

Climate change doesn't necessarily trigger the fires, as many are started by lightning, unattended campfires, carelessly tossed cigarette butts and sparks from machinery, however, it creates conditions for more and larger fires. Lightning, which causes up to 35 per cent of Canada's wildfires and is responsible for 85 per cent of the area burned annually, increases as temperatures rise, with studies showing 12 per cent more lightning strikes for each degree Celsius of warming.

In the interior regions of BC, despite a wetter than normal spring, an abrupt drop in precipitation created drought conditions in early summer. This was followed by high temperatures, creating conditions ideal for the rapid spread of wildfire.

As the 2017 wildfire season moved into the recovery phase, staff in the B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) have been assessing impacts on timber supply, prioritizing areas for

reforestation, and determining areas to issue salvage licences. Reforestation will play a large role in not just ensuring the replacement of burned forests but also in the opportunity to contribute to future carbon sequestration of BC's forests. See the next item on the Forest Carbon Initiative for related information.

https://www2.gov.bc.ca/gov/content/safety/wildfire-status/wildfire-statistics

Forest Carbon Initiative

The Forest Carbon Initiative (FCI) is a broad ranging forest stewardship initiative to reduce net greenhouse gas (GHG) emissions. The initiative relies on a suite of forest carbon management strategies that deliver carbon and other co-benefits. FCI is not limited to discrete project areas, does not rely exclusively on proponent driven projects, nor is it a carbon offset program. FCI builds on partnerships between FLNRORD, forest companies, First Nations, communities, and the Forest Enhancement Society of B.C. to develop and implement forest activities that reduce emissions and sequester carbon in BC's provincial forests.

FCI applies a number of forest carbon strategies to rehabilitate and improve our public forest lands. This includes activities such as tree-planting, fertilization and other enhanced silviculture and forest carbon management approaches to grow and store more carbon. FCI will also use a number of strategies to support the inherent carbon-value of our working forests. Activities such as enhanced forest fibre utilization will reduce emissions on the land-base and make renewable forest biomass available to support the development of carbon-friendly products to meet the needs of society in a low-carbon economy. Projects are required to meet FCI criteria, but are also evaluated for their contribution to employment, habitat and timber supply among other co-benefits.

To help accomplish these goals and foster integrated planning of investments on BC's forested landbase, FLNRORD has hired regional Integrated Investment Specialists. Staff in these positions will work with Climate Change and Integrated Planning Branch (CCIPB) forest carbon advisors and other staff to develop and locate forest carbon projects on the land base. Capacity has also been added through hiring of carbon modelling staff, a manager of FCI, and formalization of Forest Carbon Advisors as part of the CCIPB team supporting the initiative.

FCI is delivered through existing programs and partnerships including Forests for Tomorrow, the Forest Enhancement Society and BC Timber Sales.

FCI has also been put forward as the Province's primary proposal for the federal Low Carbon Economy Leadership Fund and the outcome of that proposal process is pending.

For more information contact:
leith.mckenzie@gov.bc.ca

FESBC website: http://www.fesbc.ca/index.html

Climate Change Workshops

The FLNRORD Climate Change and Integrated Planning Branch (CCIPB) has now completed climate change adaptation workshops in Skeena, West Coast, Kootenay/Boundary and Omineca regions to move forward with embedding climate change considerations (both adaptation and mitigation) into the daily business of the ministry. Following on previous workshops that helped develop climate action plans and related implementation plans, the goal of these workshops is to show where climate

change needs to be incorporated in the way FLNRORD makes decisions and contributes to planning/policy processes. We are also identifying the information needs to enable climate change to be properly considered, as well as barriers that may impede incorporation of a climate change lens.

This is an important step in adjusting to day-to-day decision processes, as well as ensuring ministry staff have the information and tools needed to make sound decisions regarding adaptation and mitigation to climate change.

These workshops will continue through the 2017-18 fiscal year covering all the remaining FLNRORD regions and Victoria-based program areas.

For more information contact:
dave.aharonian@gov.bc.ca

Flood Risk for Dam Design

Accommodating the shifts in precipitation and runoff associated with climate change represents a significant challenge for the owners and operators of dams. Most dams are designed to operate for many decades, so understanding how climate change may impact extreme-rainfall and flood events is essential to ensuring that current and future dams can operate safely and efficiently well into the future.

A recent study published by Ouranos examines the methods used to estimate flood risk for dam design, incorporates projected climate change impacts to flood risk, and identifies potential adaptation options for five watersheds in Canada.

https://www.ouranos.ca/publication-scientifique/RapportFrigonKoenig2015_EN.pdf

Nature Conservancy study affirms Importance of Forests in Addressing Climate Change

Enhanced stewardship of the land could have a bigger role in fighting climate change than previously thought, according to the most comprehensive assessment to date of how greenhouse gas emissions can be reduced and stored in forests, farmland, grasslands and wetlands using natural climate solutions.

The peer-reviewed study led by scientists from *The Nature Conservancy* with fifteen other institutions, was published in October, 2017 in the journal *Proceedings of the National Academy of Sciences.* It expanded and refined the scope of land-based climate solutions previously assessed by the United Nations' Intergovernmental Panel for Climate Change (IPCC). The findings are expected to bolster efforts to ensure that large scale protection, restoration, and improved land management practices needed to stabilize climate change are achieved while meeting the demand for food and fiber from global lands.

The researchers found that trees have the greatest potential to cost-effectively reduce carbon emissions. This is because they absorb carbon dioxide as they grow, removing it from the atmosphere. The results of the study indicate that the three most impactful options for increasing the number and size of trees (reforestation, avoiding forest loss, and better forestry practices) could cost-effectively remove 7 billion tonnes of carbon dioxide annually by 2030, equivalent to taking 1.5 billion gasoline-burning cars off the roads.

https://global.nature.org/initiatives/natural-climate-solutions/natures-make-or-break-potential-for-climate-change

Landslides and Factors for Risk Assessment

In this study, Coe et al found more large rock avalanches occurring in periods of record-breaking warm winter and spring. The authors suggest it may be attributable at least in part to permafrost degradation, possibly combined with other things like thinning of glaciers, increased precipitation, and accumulating elastic strain.

The results of this study provide additional impetus for planning and risk assessment for down-slope infrastructure in permafrost areas.

https://link.springer.com/article/10.1007/s10346-017-0879-7

Climate change mitigation through adaptation: the effectiveness of forest diversification by novel tree planting regimes

Forest researchers with the University of Wisconsin (Anouschka Hof and David Mladenoff) and BC Ministry of FLNRORD (Caren Dymond), investigated what would happen if foresters adjusted existing reforestation strategies. They modelled a large, forested mountain valley called Copper-Pine Creek, near Smithers in northwestern BC and found that diversification of species in several new environments most consistently boosts carbon stocks and enhances ecosystem resilience, but not harvest rates.

Modeling also suggested that some species outside current stocking standards could potentially flourish in the new conditions. Of the new species modelled using the assumptions in the study, lodgepole pine gave the biggest boost to resilience in most of the ecotypes due to increases in diversity, growth, and aboveground biomass. In the simulation, introduction of lodgepole pine also boosted harvest rates, largely due to early maturation, as this species could be logged at age 50, while the other tested species would not be harvested until age 80. Researchers are nevertheless hesitant to cheer the lodgepole pine, as increasing the amount of pine may increase forest health risks. Researchers acknowledged that even though the modelling did account for some level of damage caused by mountain pine beetle outbreaks, the levels produced might be underestimated.

Next is to determine whether the modelling work can be replicated with actual planting trials, and see whether the impact of pests matches that seen in the simulations.

http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1981/full