

The 7th Annual Kootenay Lake Summit

Presented by Friends of the Kootenay Lake

Notes by Alexandra Buhr

5:30 pm Welcome and Introduction

Chad Luke- Ktunaxa Welcome

Friends of Kootenay Lake Introduction

Opening remarks by Chad Luke in his traditional language, from “Where-The-Rock-Lies” near Creston. Chad has been a part of Friends of the Kootenay Lake (FOKL) for 9 years. Chad extended his genuine thanks for the grants, volunteers and the people who made the night possible. Flint mapping (flaking argillite rock into arrow heads) has been located on people’s personal properties, especially near the Duncan Dam. Chad asks to share any findings with the Ktunaxa in order to enhance your property as well as protect these archaeological sites.

FOKL has completed a 3 year water quality mapping and community value survey, with input from thousands of people residing in the watershed, in order to best support those values in conservation. Education, research and restoration is what the FOKL do!

Kootenay Co-op, Fish and Wildlife Compensation Program (FWCP), Nelson District Credit Union (NDCU), Fortis BC, Kootenay Savings, Columbia Power, Columbia Basin Trust (CBT), RDCK are among sponsors of the evenings.

5:40 pm Climate Change Trends and Predictions

Dr. Mel Reasoner- Climate Resources Consulting (CRC)

Dr. Mel Reasoner’s presentation began with an introduction to climate science. If you are looking at things too closely, you can’t always make out the full story; a broad perspective is required in climate science. The last 100 years in the SE corner of BC has shown a major shift in mean climate when studied. Most built and natural systems are not designed to withstand climate conditions that are being statistically projected. August 2017 was 2-4 degrees C warmer in western Canada than historical summer temperature data from the mid-20th century.

Projections of future climate: All seasons are warming and generally they are warming more quickly over the last 50 years than they were over the last 100.

The last 50 years of seasonal precipitation data in the SE Fire Center of BC show that spring and fall precipitation are increasing while summer and winter precipitation are decreasing.

Retreat of Kokanee Glacier as well as mid-elevation glaciers near Kaslo, which drain into Kootenay Lake, are happening at an alarming rate. Data shows that Kaslo hasn't had a "cold" winter since 1947, and cold winters play a vital role in limiting spread of pests such as defoliating bark beetles.

Climate models prove to be the best way to look forward and make predictions about our changing climate. The biggest uncertainty we face in the future, according to Reasoner, is which emissions model we take moving forward. What humanity does in the next 10-20 years will be crucial in order to meet the Paris Climate Agreement goals or pledges. A few degrees of temperature increase make the difference between an ice-age and an inter-glacial period. Future climate projections: hotter drier summers, warmer wetter winters, and more extreme annual precipitation events.

**CRC is involved in helping CBT present Climate Change workshops throughout the Columbia Basin.*

6:10 pm Climate Change Impacts on Ecosystem

Greg Utzig- Kutenai Nature Investigations Ltd

Greg's Utzig's presentation was focused on climate disruption and its ecological effects in the Kootenay Lake Basin. Summer map projections for 2050 show very dry seasons with little precipitation- *how will this impact fire regimes?*

Referencing Biogeoclimatic Zones (BEC), bioclimate envelopes (1 km²) and data from weather stations around BC, Utzig projects that the future climate in BC (2080) will be shifted dramatically. Using three projections of varying intensity, he generally forecasted that 1) low elevations like Creston will become grasslands, 2) Duncan and Kootenay Lake Zones will become similar to how Creston is today in 2019, and 3) upper elevations will become coastal BEC zones. The "worst-case" projection shows grasslands extending from the low elevation, and sprawling into mid-elevation or subalpine territory.

Hotter and drier with climates that support grasslands better than they support trees will become more ubiquitous. ESSF is projected to disappear entirely, therefore upper elevations will shift dramatically. (This poses important inquiries to what vegetation will appear, and what will cease to exist?) These applications are relevant for future forest harvesting needs, as well as strategic reforestation for a changing climate and continued timber industry. As an ecologist, Utzig spoke to how phenology can have a ripple effect in growing season and impact wildlife trophic level. Birch in the Nelson forest area is dying out extensively as they are budding earlier each year due to warmer seasonal temperatures.

The jet streams regulate global weather patterns, driven by difference in temperature between the arctic and temperate regions. Because the decreasing disparity between these temperatures, the jet stream is becoming less powerful and effective. The jet stream is becoming less effective at decreasing smoke concentrations during forest fire seasons.

Longer heat waves, more intense droughts, etc.

7:25 pm Wildfire Preparedness in a Changing Climate

John Cathro- Cathro Consulting

Fire history, broken down by decade, using hundreds of years of excellent data.

In the 50's, fire suppression was introduced. Interestingly, after nearly 50 years of low fire prevalence (1950-2000's), fire frequency and intensity is once again on the rise. This is due to the anthropogenic removal of the natural importance of fire and its role in ecosystem regulation.

Cathro says we must thin mature, mixed stands from below (remove what a low intensity fire would) and leave behind high resilience, old trees. Biodiversity is key to structure.

Typical forests are ~90-100% crown closer, this number needs to decrease significantly.

Consequently, adding shaded fuel breaks will create climate resilient forests.

This poses a question: what will we do with this biomass/ waste product? Cathro advises against pile burning and encourages biofuels, which are being researched by the RDCK.

Harrop-Procter Community Forest is doing an exceptional job of creating climate resilient forests; there is a lot of data on this. Additionally, he suggests we learn from indigenous historic use of fire and reintroduce low intensity, stand maintaining fires.

7:40 pm Climate Change Impacts to Hydrology

Dr. Martin Carver- Aqua Environmental Association

Hydrology, in this talk's context, refers to water quantity.

How is Kootenay Lake managed? We must consider both natural and managed inflows and outflows.

Present hydrology of Kootenay Lake Region show typical snowmelt-driven hydrological season governed by freshet in late spring/ early summer.

Corra Linn, Duncan and Libby dams all affect Kootenay Lake Water Levels.

Corra Linn added six million acre-feet (MAF) of storage for hydropower generation.

The Boundary Waters Treaty (1909) created the international joint commission to negotiate water backing up from the Kootenai River into Idaho.

The Corra Linn Dam moves control of water levels back and forth between the Kootenay Lake Levels and Grohman Narrows (mixed control on the outflow of Kootenay Lake).

The Duncan Dam's objective is to store water during freshet and then release it during the year. There can be up to 100 feet of variation during the year.

The Libby Dam was constructed for flood control, hydropower, species, recreation and navigation. Endangered species are considered spring and summer releases for salmon and steelhead.

Dredging of Grohman Narrows could allow for expanded options for flood management.

Effects of climate change on seasonal flows: higher winter flows (as winter precipitation increases, specifically winter rain-on-snow events), earlier freshet, higher peak flows (variable snowpack, earlier freshet), earlier peakflows, and decline of summer and fall flows.

Reduction in return period of extreme events, e.g., 1:100 may become 1:20 or 1:10. Systems are becoming harder to manage.

- 1) Natural inflows are already responding to climate change in the sense of magnitude and timing.
- 2) Dams on the two major inflows provide an opportunity to moderate some of the effects of climate change on Kootenay Lake.
- 3) Uncertainty and variability will make it increasingly difficult to manage lake water levels as we have in the past.

8:10 pm Invasive Species in a Changing Climate

Khaylish Fraser- Central Kootenay Invasive Species Society (CKISS)

Invasive species are species introduced into places outside of their natural range. They impact biodiversity, ecosystem services of human well-being. They are the second leading cause (after habitat loss) of biodiversity loss and species extinction.

Climate change is predicted to be a powerful stressor on freshwater ecosystems; climate change can cause vulnerability in species natural defences, which allow invasive to gain a foothold.

Freshwater systems which currently have thermal barriers that limit establishment of invasive species may become more suited to invasive species as the water bodies warm.

Human actions are the number one vector for the movement of invasive species, therefore humans are also the number one “hope” for preventing the spread of invasive species through best practices.

Clean, drain and dry your boat, be “plant-wise” and choose to plant native or non-invasive species in your garden, and refrain from flushing your pet fish or turtle down the toilet!

CKISS has developed a strategic plan for 2020-2025 which takes into consideration invasive species management in the face of climate change.

8:40 pm Stewardship Solutions Toolkit: Resources for Stewardship

Juliet Craig- Kootenay Conservation Program

Kootenay Conservation Program (KCP) coordinates and facilitates conservation efforts on private land. Private land makes up 8% of the Kootenay land-base, but about 25% of our remaining wetlands lie here. Private land is typically in low valley bottoms, in which species like Grizzly Bears require for corridors.

Many private land owners are not aware of what their options are for conservation and preservation. KCP has created stewardship solutions to help facilitate this, and to make it as easy as possible. Wetlands, wildfires, shorelines (archaeological Ktunaxa values), farm resources, etc are all examples of where KCP can help make a plan or grant funding to facilitate stewardship to land owners. You can also sell or donate ecologically significant land to the KCP.

8:55 pm Groundwater and Community Based Water Monitoring

Rory Gallaugher & Carol Luttmer- Living Lakes Canada

The groundwater monitoring program is carried out by Living Lakes Canada. Precipitation infiltration into groundwater will be affected by climate change. As populations grow, there will be an increased demand for water, and more communities will look to ground water extraction to use for drinking water.

How will we manage ground water and the arising uncertainties that come along with a changing climate?

Columbia Basin Groundwater Monitoring Program serves to:

- Identify suitable existing wells to monitor
- Install and maintain groundwater levels; collect hourly water level measurements
- Analyze data and share on BC Water Data Tool

Columbia Basin Water Monitoring Collaborative works with community based water monitoring groups in the Columbia Basin, and serves to make this data collected accessible through open source software.

How will this program help us with climate adaption? The more people that get involved with community based water monitoring, the more people that become involved and consequently use their voices to influence local policy.

9:15 pm Community Action to Address the Climate Crisis

Laura Sacks- Citizens Climate Lobby & Alyssa Taburiaux: Fridays for Future

Ending the night on a high, optimistic note:

We have a choice on how we can engage with the negativity that emerges in the face of climate change: we can choose to be discouraged, or we can choose to act now.

It is important to remember that the decisions that we make now and today, will have an impact on the children of now. Climate change can be an opportunity.

The local Fridays for Future chapter has 10 permanent members and each climate strike gathers more and more people. Since March, they have had six strikes with more than 100 people, with their largest strike having 1,500-2,000 people in attendance.

The evening ended in a chant in unison:

“We are unstoppable, another world is possible.”