21st Annual Workshop

Alberta Lake Management Society & Lesser Slave Watershed Council

"Exploring the Past, Planning for the Future"

Lesser Slave Lake - 2014

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Alberta Lake Management Society

The purpose of the Society is to promote understanding and comprehensive management of lakes and reservoirs and their watersheds. We work to build understanding and awareness among Albertans for responsible management through programs and information sharing.

Our programs strive to increase awareness of water resources through the local monitoring of Alberta's surface waters and to foster a sense of stewardship in Alberta's watersheds. ALMS and its members are active across Alberta in providing support to individuals, local communities, educational institutions, governments and industry that are interested in lake and watershed management. The Society organizes an annual workshop at a different Alberta community each fall. ALMS is also widely recognized through its two community-based lake water quality sampling programs called Lakewatch and Alberta Water Quality Awareness Day (AWQA Day).

Lakewatch

AWQA
Alberta Water Quality Awareness Day

For more information or to get involved in lake monitoring please contact us!

ALMS
Alberta Lake Management Society

www.alms.ca

780-702-2567

Lesser Slave Watershed Council

The Lesser Slave Watershed Council (LSWC) is a group of volunteers and board members who work with the provincial government to maintain the health of the Lesser Slave Watershed by delivering on the three Water for Life goals in our watershed. These include: safe, secure drinking water; healthy aquatic ecosystems; and reliable, quality water supplies for a sustainable future.

Members of the council are representatives from towns, municipalities, first nations communities, industries, cottage owners, non-profit organizations, as well as recreation and tourism groups who have an interest in how the waters of Lesser Slave Lake and its tributaries are managed.

LSWC's mission is to be a proactive organization working towards the sustainability of the Lesser Slave Lake watershed with regard to the economic, social and environmental health of the region and its citizens.

Lesser Slave Watershed Council

Dinner Speaker

Dwayne Nichols: A Tale of Lesser Slave Lake's Past

Many years ago, Duane Nichols was born at a ranger station near Salt Prairie, Alberta. His father was a forest ranger and his mother was born in a farm house in Salt Prairie. He grew up in the Grouard, Salt Prairie area, calling the ranger station home for many years.

Duane left home and attended NAIT and then University to become a professional surveyor. He returned north and spent many years working in the Peace Country. He and his brother Rodney started their own survey company and worked mainly in the Lesser Slave area. In 1977 they were hired to resurvey the Grouard area to clarify land ownership and this is when he became keenly interested in the history of the region. Duane is the past chair of the Grouard historical society, a long time cattle rancher, and sits on various advisory committees in the community.

Lesser Slave Ecology – Fish & Water

Myles Brown, Senior Fisheries Biologist - Environment and Sustainable Resource Development

A native Albertan, Myles is originally from Calgary. Myles attended Mount Royal College where he first became interested in pursuing a career in biological sciences. Myles quickly found that his interests lied with studying aquatic ecosystems. After completing his diploma program Myles moved on to the University of Saskatchewan where he then received his Bachelor of Science degree with a focus in vertebrate zoology. During his undergraduate program, Myles was fortunate to be able to complete a research project examining predator-prey interactions with Dr. Douglas Chivers and Dr. Michael Pollock. This cemented his passion for fisheries and upon completing his university studies, Myles moved back to Alberta where he began working with ESRD in fish culture. Myles worked at the Sam Livingston Fish Hatchery seasonally for a year before moving into a full time position at the Raven Brood Trout Station located near Caroline, AB. He worked at the Raven station for two years before moving up to Slave Lake and changing over from fish culture to fisheries management. Myles now has been in Slave Lake since 2009 and has greatly enjoyed the experience and challenges he has faced contributing to fisheries management in Alberta.

The LSWC and Watershed Planning

Meghan Payne, Lesser Slave Watershed Council

Lesser Slave Lake is the jewel of the North. The LSWC has been active as a WPAC since 2007 and has another decade of history prior. The LSWC has completed many projects over the years to gather information and assess the state of the watershed. The LSWC is now engaging stakeholders, governments and communities in the development of an Integrated Watershed Management Plan for the Watershed. This plan will outline outcomes and actions to guide us to achieving the vision of a healthy sustainable lake and watershed.

Meghan has been working as the Executive Director for the Lesser Slave Watershed Council since summer 2008 and has grown the organization as a WPAC since then. Meghan grew up in High Prairie, AB and after, obtained her Bachelor of Science Degree majoring in Geography from the University of Lethbridge in 2008. Prior work experience includes summer employment with the ESRD Fire Center in Slave Lake, and a Field Tech position at HAZCO Environmental Services. Meghan sits on the Prairie Region Grant Committee for the TD Friends of the Environment Foundation and is a past member of the Alberta Stewardship Network's grant selection committee. She is currently the President of the High Prairie Agricultural Society and a member of the Endurance Riders of Alberta Association.

Paleolimnology of Lesser Slave – A Changing Lake

Nathan Ballard, Environment and Sustainable Resource Development

How does the scientific method apply to the practice of paleolimnology? What do sediment samples represent? What are the underlying assumptions? What is the difference between direct and proxy evidence? These questions will be discussed using an overview of common (and some uncommon) analyses performed on sediment cores from Alberta lakes. The potential advantages of a multi-proxy approach will also be discussed spanning the topics of sediment chemistry, microfossils, organic matter, and sediment characterization

Originally from small town Northern Alberta, Nathan completed both a BSc. (Geology, 2007) and a MSc. (Earth & Atmospheric Science, 2011) at the University of Alberta. Under the supervision of Dr. Alex Wolfe, Nathan's Master's research focused on lakes in central Alberta with a goal of understanding the mechanisms of internal phosphorus loading. His thesis research characterized modern biogeochemical processes of early digenesis in lake sediments, their implications for internal phosphorus loading, and the application of these processes towards paleolimnology in eutrophic lakes. A Government of Alberta employee since 2012, Nathan was initially hired within the Informatics Branch of ESRD where he worked on several provincial biophysical inventories and knowledge system design for the Alberta Wetland Policy until accepting a limnologist position in the Lower Athabasca Region in June 2014.

BATHTUB Lake Modeling and Applications to Lake Management Planning

Dave Trew, North Saskatchewan Watershed Alliance

This presentation will provide a broad overview of watershed studies and lake eutrophication assessments conducted in Alberta between 1976 and 2013. Summary information will be presented on the following topics: stream studies; internal loading estimates; measured whole – lake nutrient budgets; monitoring programs; modeling approaches; and restoration concepts.

David Trew graduated from the University of Guelph in 1970, where he specialized in limnology and oceanography. He worked at the University of Strathclyde, Glasgow, Scotland from 1971 to 1974 as a research assistant on oceanographic projects. He moved to Alberta in 1974 and began his career here as a Professional Biologist with the Fisheries Branch, subsequently joining Alberta Environment as limnologist in 1976. Over the years David worked on a variety of limnological and water quality issues including: eutrophication and acidification of Alberta lakes; river basin and reservoir planning programs; agricultural non-point pollution; and trans-boundary water quality management issues.

David was the team leader for the limnology/water group in AENV from 1985 to 2002, and subsequently was Head of the Water Science and Standards Section from 2002 to 2005. David's team was also responsible for initial implementation of *Water for Life: Alberta's Strategy for Sustainability*.

David retired from the Public Service of Alberta in January 2007 to take up responsibilities as Executive Director of the North Saskatchewan Watershed Alliance (NSWA).

AEMERA and the Future of Lake Monitoring in Alberta

Ron Zurawell, Alberta Environmental Monitoring, Evaluation and Reporting Agency

With the establishment of the Alberta Environmental Monitoring, Evaluation and Reporting Agency, the business of environmental monitoring within the province is changing. Recognized as a key component of the Government's Integrated Resource Management System, AEMERA will be largely responsible for monitoring, evaluation and reporting (MER) of oilsands, provincial-scope networks and land use frameworks; and work is well underway to transition resources from ESRD to support AEMERA's mandate. As the lead coordinating agency for provincial MER, AEMERA will likely manage both long-term networks and regionally focused lake monitoring previously conducted by ESRD staff. In addition, the Agency will work directly with partner organizations like the Alberta Lake Management Society, to support volunteer-based lake monitoring programs. The transition of lake monitoring from ESRD to AEMERA represents an opportunity to develop and bolster not only lake monitoring, but comprehensive data evaluation and reporting across the province.

Dr. Ron Zurawell is a Limnologist/Water Quality Specialist with the Water Policy Branch of ESRD. He is currently on secondment to the Alberta Environmental Monitoring, Evaluation and Reporting Agency and is supporting the transition of surface water quality monitoring from ESRD to the agency. Also, Ron is currently serving his second term as Regional Director for the North American Lake Management Society and is co-chairing the 2016 NALMS Symposium in Banff.

Ecosystem Services Assessment in Alberta: What is Nature Worth?

Tom Habib, Alberta Biodiversity Monitoring Institute

Ecosystem services (ES) are the benefits that people receive from ecosystems that contribute to human well-being. ABMI's *Ecosystem Services Assessment* project has developed a set of integrated spatial models to map the supply and value of a handful of ecosystem services important to the well-being of Albertans: water purification, timber production, rangeland forage production, pollination, and carbon storage, as well as an index of biodiversity intactness. In addition to mapping the current supply of ES, we are also working to understand how ES are affected – both positively and negatively – by land-use management. These maps and information products can be deployed to bolster regional planning activities, including identifying priority conservation and management areas to support social and environmental objectives. Additionally, project results will be used in the development of market-based instruments that financially incent environmental stewardship of publicly enjoyed ES supplied by privately owned lands.

For more information, go to www.ecosystemservices.abmi.ca.

Tom works as a research coordinator for the Alberta Biodiversity Monitoring Institute. He has a background in landscape and wildlife ecology, and is also interested in spatial conservation planning for balancing environmental and economic objectives. His previous research at ABMI includes designing a framework for biodiversity offsets in Alberta that can be used to address regional conservation goals. Tom has an MSc from the University of Alberta and a BSc from the University of Guelph.

Science to Policy: Tools for Lake Health

Ryan van der Marel, Living Lakes Canada

Canadians have a love affair with water; however there is often a disconnection between how we relate to water socially and economically, and the actions we take to protect it. Living Lakes Canada provides tools to connect sound science to better management practices such as sensitive habitat inventory and mapping (SHIM). SHIM is being used across Canada by water stewardship

groups, various levels of government and First Nations to assess shoreline condition and vulnerability in order to provide detailed data to guide better decision making. It is a practical tool with multiple benefits to any lake management planning process.

Ryan's passion for freshwater systems has taken him from the Okavango's *Every River has its People* project in sub-Saharan Africa to guiding canoe trips across Canada. After moving back to the Columbia Basin region, he began consulting on species-at-risk projects and lake management planning for Kootenay Lake. As program coordinator for Living Lakes Canada Ryan worked across the country to build capacity within communities to better understand and manage their home waters and advocate for their protection.

The Living Lakes programs focus on awareness and outreach, citizen science, and innovative policy and management planning. Building strategic and meaningful partnerships that embrace local input are critical to the successes of these projects. Ryan is also the chair of the Kootenay Lake Partnership and an active steering committee member of the Friends of Kootenay Lake and the Columbia Basin Watershed Network. He has received an Honors Bachelor of Global Development Studies and Geography from Queen's University in Kingston, Ontario, and a Masters of Resource and Environmental Management from Dalhousie University in Halifax, Nova Scotia.

Pigeon and Wabamun Paleolimnology: Historical Context for Lake Management

Dörte Köster, Hutchinson Environmental

Pigeon and Wabamun Lake are among the most heavily used recreational Alberta lakes and hold tremendous value as aquatic habitat, water source and for aesthetics and recreation. Concerns regarding water quality, in particular algae blooms in Pigeon Lake, have brought up a number of questions, such as: *Are algal blooms linked to human activities, such as increased nutrient inputs? How much has the lake changed? What can be done to mitigate any changes?* Given the lack of water quality and algae data for large periods of watershed development predating the monitoring record (~1900-1970), a sediment study was initiated to describe natural status of the lakes, identify changes in lake water quality over time and relate them to human activities. Using the analysis of carbon and nitrogen stable isotopes, fossil diatom algae and midge larvae and algal pigments in lake sediments, we confirmed that both lakes have had naturally high nutrient levels and abundant blue-green algae. Pigeon Lake showed minor signs of nutrient enrichment in the 1950s, but showed larger changes in diatom assemblages during the past ca. ten years, associated with increased salinity and possibly water column stability. Wabamun nutrient status decreased during the time when power plant cooling water was discharged (ca. 1970-2010) and returned to 1900s levels recently. Overall, nutrient input from watershed activities appeared to be only one amongst several factors controlling the lake ecosystems, with water quantity and source, climate and internal nutrient loads also playing key roles.

Dr. Dörte Köster is an Aquatic Scientist who has 15 years of experience investigating aquatic ecosystems in Alberta, Ontario, New England, and Germany, with a focus on monitoring and modeling surface water quality and lake history (paleolimnology). Dr. Dörte Köster completed a M.Sc. in Aquatic Ecology in Germany in 1999, a Ph.D. in Paleolimnology in Québec in 2004, worked as a post-doc on paleolimnology projects in Maine and Alberta before starting to work as an environmental consultant in 2007. She has conducted a number of water quality related studies across the Province of Alberta and is currently Senior Aquatic Scientist leading the Edmonton office of Hutchinson Environmental Sciences Ltd.

Application of the New Wetland Policy – How Will It Help Lakes?

Thorsten Hebben, Environment Sustainable Resource Development

Alberta's wetlands are highly diverse in form, function, use, and distribution across the province. This diversity was not adequately reflected in Alberta's previous wetland policy (Wetland Management in the Settled Area of Alberta: An Interim Policy, 1993), which applied only to mineral wetlands in the White (settled) Area of the province. The policy was not applicable to the

Green Area (crown lands), nor did it consider peatlands. Limitations of the previous wetland management system, as well as ongoing development and population growth in Alberta, were placing increasing pressures on the province's wetlands. In response to this, Alberta Environment and Sustainable Resource Development has begun to implement a new Wetland Policy that incorporates a diverse array of tools and data into a comprehensive wetland management system. Foundational to this system is the acknowledgement that the province's wetlands are highly varied in both the functions they perform and the benefits they provide. This inherent diversity is being applied in the derivation of relative value rankings for individual wetlands on the landscape. A broad assortment of metrics are being used to inform the value assessment system at both remote sensing and ground-level scales and will facilitate the execution of informed management decisions. The new Alberta Wetland Policy has been implemented in the White Area of the Province and will be implemented in the Green Area in September of 2015.

This presentation will briefly address Alberta's former interim wetland policy and some of the challenges encountered within the associated wetland management system. It will go on to focus on the new Alberta Wetland Policy, the corresponding shifts in wetland management, the various tools that support policy implementation, and the broader relationship to watershed management.

Thorsten is a Senior Manager with the Water Policy Branch of Alberta Environment and Sustainable Resource Development. In his ten years with the Department, Thorsten's focal areas have included long-term water quality monitoring programs, water quality trend assessment, emerging contaminants tracking, and water quality index reporting. For the past several years, Thorsten has been leading development and implementation of the Alberta Wetland Policy.

Alberta's Lake Management Framework

Dave Mussell, ESRD

Dave Mussell is an environmental planner working for Alberta Environment and Sustainable Resource Development (ESRD), in the Integrated Resource Management Planning Division, working out of the Spruce Grove regional office. Dave has a Bachelors' degree in zoology and a diploma in secondary education, both from the University of Alberta. He has been working in environmental research and education for over 30 years in private industry, government, and in the non-profit sector. Dave's current work with ESRD encompasses lake management planning,

supporting regional planning initiatives such as the Land Use Framework, and coordinating the work of some of the province's community partners in watershed planning under the Water For Life policy.

Dave and his wife Carol live on acreage near Spruce Grove where he happily pursues his off-hours interests in woodworking, gardening, astronomy, and music. Dave and Carol are avid outdoor sports enthusiasts, and enjoy paddling western Canada's lakes and rivers, cycling, birding, Nordic skiing, hiking, and nature photography. Dave also invests volunteer time in community-based recreation and environmental organizations as a member and director.

Watershed Community Engagement: Ten Steps to Setting Up a Community Stewardship Group

Jenna Curtis, Land Stewardship Centre

People often have the passion to take personal action on an environmental issue of concern to them but, more often than not, they are not sure how to get started and what to do. Forming a community stewardship group is one way to harness individuals' passion and put collective action to work for the community and the environment. Communities are often better positioned to say what their collective needs and priorities are relative to an environmental issue, and in many ways, community stewardship groups can be more adaptive and innovative in achieving environmental stewardship outcomes. This presentation outlines the important steps people need to consider to ensure their community stewardship group gets off to a good start. This information also provides the groundwork for established stewardship groups that need or want to reinvigorate their membership, refocus their vision, or expand the scope of their activities.

Jenna is dedicated to environmental conservation, especially within aquatic and riparian areas. Through experience gained working with watershed stewardship groups, Jenna endeavors to build programs which enable groups to improve their local watersheds. Using her degree from the University of Alberta in Biological sciences and a minor in English she places a high priority on fostering excellent communication with and among the environmental stewardship community. Jenna currently manages the Watershed Stewardship Grant program and the Alberta Stewardship Network Program including the Stewardship Directory, Resources for Stewards, and Stewards in Motion event series.

Watershed Stewardship in the Farming Community
Monika Benoit, Peace Country Beef and Forage

This presentation includes the following:

1. Introduction and brief overview of the Peace Country Beef & Forage Association
2. Impact of agriculture on the watershed
    a. Impact of livestock on the watershed
3. Environmental Farm Plans & Growing Forward projects
4. High Prairie Riparian Action Team involvement
5. Heart River Restoration Project
6. Whole Farm Nutrient Management Systems
7. Nutrient Budgeting Projects
8. Whole Farm Water Planning Program
    a. Projects
    b. Workshops
9. The good news stories of the ranchers in our watershed

Monika Benoit is with the Peace Country Beef and Forage Association, a producer group with the goal of improving the profitability and sustainability of the forage/beef industry in the Peace Region through innovative extension activities, demonstrations, and applied research projects. Monika is a lifetime resident of the Peace Country, and is a graduate of the University of Alberta agriculture faculty. She is passionate about the cattle business and loves to promote the good news stories of how ranchers are great stewards of the land.

Awareness to Action: Building Environmental Literacy from the Ground Up
Sharina Kennedy, Environment Sustainable Resource Dvt

Sharina is Regional Education and Outreach Specialist for Alberta Environment and Sustainable Resource Development (ESRD), in the Red Deer North Saskatchewan region. Her undergraduate degree is in Conservation Biology and she pursued graduate studies in Environmental Education and Communication at Royal Roads University. Before coming to Alberta, Sharina worked in BC, Ottawa, and Nunavut in the areas of wildlife and environmental management, planning, education, communication, and public engagement. In her current role with ESRD, Sharina works alongside ESRD's operations division as well as the many WPACs, municipalities and stewardship groups within the region to address key environmental literacy priorities and gaps. She co-chairs the Alberta Water Council Water Literacy Project Team, and is involved in a number of other provincial and regional initiatives including Alberta Wetland Policy Implementation, Fisheries Education, Respect our Lakes, and Aquatic Invasive Species.

Delivering Unpopular Messages: Don't Just Survive, Succeed!

Kerri O'Shaughnessy & Lorne Fitch, Alberta Riparian Habitat Management Society – Cows and Fish

We'd all like to deliver popular messages, the ones people want to hear, the positive and uncontroversial ones and those that evoke emotional responses like gratitude, pleasure and warmth. In a perfect world what other messages would there be to deliver? As someone who is going to deliver an unpopular message there needs to be recognition that some responses are predictable, unsurprising and not totally unjustified. How do we better provide the messages people do not want to hear initially? This presentation provides an introduction to a thinking pathway to allow message deliverers the opportunity to anticipate and recognize responses, prepare messages and focus on message delivery in order to increase the potential for the people hearing the message to receive it.

Kerri O'Shaughnessy is a Riparian Specialist with the Alberta Riparian Habitat Management Society (more commonly known as Cows and Fish). In this role she works with many different types of landowners, land managers and their communities on better understanding *riparian areas* and the benefits of these highly productive, sensitive but resilient water loving zones of the landscape for the producer, society, and the environment. Another part of this role is acknowledging the challenges around riparian management and recognising that a change in people's attitudes and behavior might be needed in order to achieve a common understanding of the importance of these areas and how our management decisions can influence their health.

Kerri began her career with Cows and Fish in 1999 after graduating from the University of Alberta with a B.Sc. Environmental and Conservation Science in 1998. She currently lives in Edmonton with her husband and enjoys riding her motorcycle, playing hockey, and travelling.

Slave Lake, AB
September 26 & 27, 2014

Day 1, Friday September 26		
7:30	Registration	
Session 1: Slave Lake – Alberta's Biggest Recreational Lake		
8:30	Welcome and Introduction	ALMS
9:00	Lesser Slave Ecology – Fish and Water	Myles Brown, ESRD
9:30	The LSWC and Watershed Planning	Meghan Payne, LSWC
Networking Break		
Session 2: Tools for Better Lake Management		
10:30	Paleolimnology of Lesser Slave - A Changing Lake	Nathan Ballard, ESRD
11:00	BATHTUB Lake Modeling and Applications to Lake Management Planning	Dave Trew, North Saskatchewan Watershed Alliance
11:30	AEMERA &the Future of Lake Monitoring in Alberta	Ron Zurawell, ESRD
Lunch		
Session 3: Information Supporting Lake Management		
1:00	Ecosystem Services Assessment Project	Tom Habib, Alberta Bio-monitoring Institute
1:30	Science to Policy – Tools for Lake Health	Ryan van der Marel, Living Lakes Canada
2:00	Pigeon and Wabamun Paleolimnology: Historical Context for Lake Management	Dörte Köster, Hutchinson Environmental
Networking Break		
Session 4: Lake Management Policy		
3:00	Application of the New Wetland Policy - How Will it Help Lakes?	Thorsten Hebben, ESRD
3:30	Alberta's Lake Management Framework	Dave Mussel, ESRD
4:00	Panel Discussion for input into Alberta Water Council Lake Management Project Team	Facilitated by ALMS
Banquet		
Cash Bar: *5:30 pm*, Dinner: *6:00 pm*		
After Dinner Speaker: Dwayne Nichols presents '"*A Tale of Lesser Slave Lake's Past*"		
8:00 – 10 pm Get Social!		

Day 2, Saturday September 27		
Session 6: Facilitating a Stewardship Ethic		
9:00	Watershed Community Engagement: Ten Steps To Setting Up a Community Stewardship Group	Jenna Curtis, Land Stewardship Center
9:30	Watershed Stewardship in the Farming Community	Monika Beniot, Peace Country Beef and Forage
10:00	Water Literacy and tools to motivate people to take action.	Sharina Kennedy, ESRD
10:30	Delivering Unpopular Messages: Don't Just Survive, Succeed!	Kerri O'Shaughnessy, Cows & Fish
BBQ Lunch – Big Fish Bay		
Field Tour		
12:30	South Shore Low Phosphorus Waste Water Treatment Facility Tour	Lyle Farris, MD of Lesser Slave River
2:00	Lesser Slave River Regulation Weir	ESRD & LSWC
2:30	Devonshire Beach & Lesser Slave Provincial Park	Unguided Exploration

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