WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Report to the Community

WINTER 2012

INSIDE...

Terrestrial Environmental Effects Monitoring
2011 Forest Health Monitoring Project

Dr. Ken Foster, WBEA-Terrestrial Environmental Effects Monitoring (TEEM) Program Manager

Once every six years, TEEM completes an extensive series of integrated measurement and sampling of the plots in its jack pine monitoring site network in the RMWB. This program was completed in 2011, and involved a large team of scientific and technical professionals. Planning began in May of 2010, with the actual field program being conducted in the summer of 2011. The information and data collected will be evaluated to determine if forest health is being affected by air emissions.

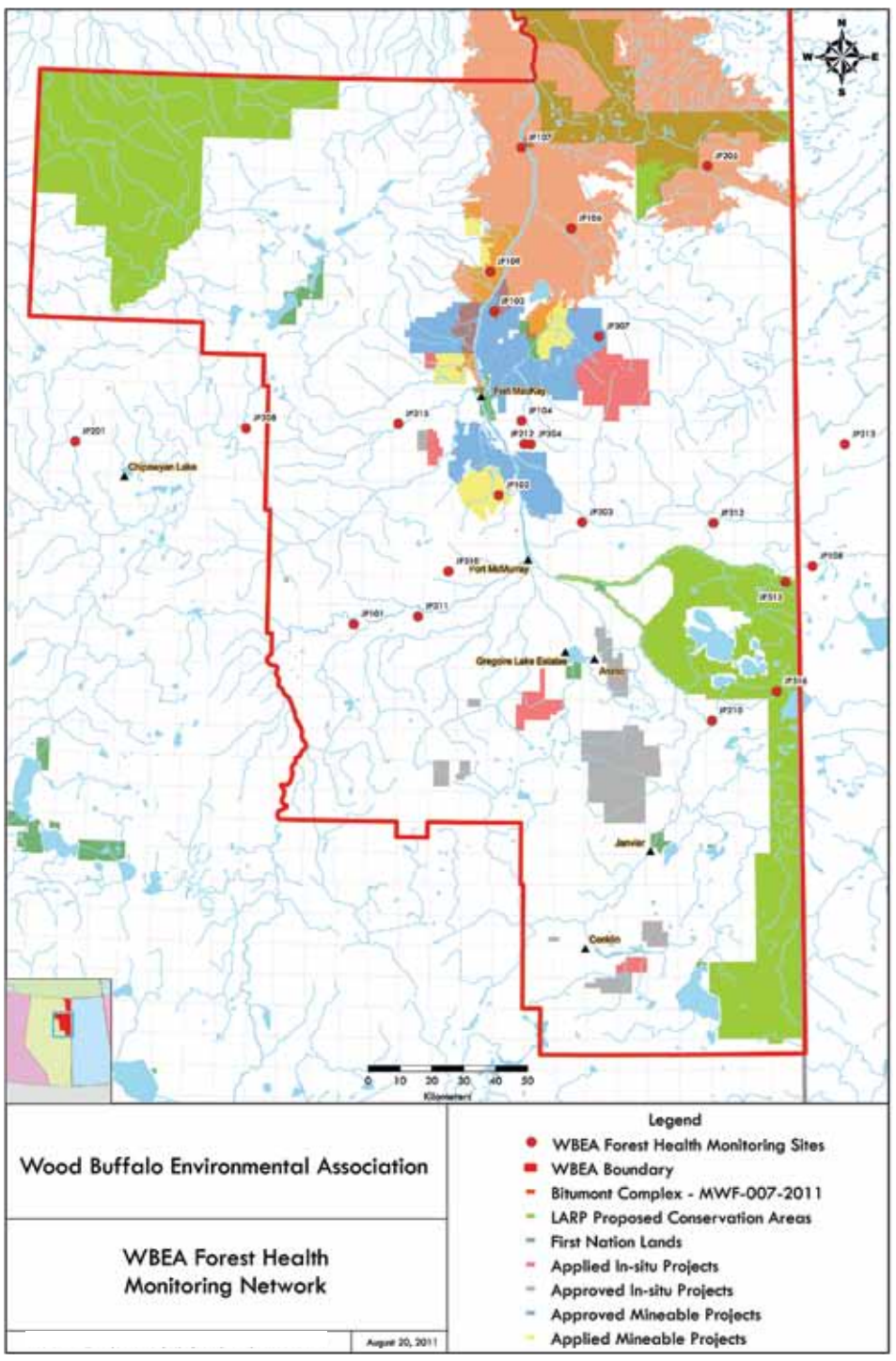
In May of 2010, TEEM hosted a scientific workshop and each of the measurements and samples included in the Forest Health Monitoring Program were reviewed. Workshop participants included a number of world authorities on air pollution and its effects on forest ecosystems. A number of new measurements and/or sampling programs were recommended, and several were included in the 2011 program.

Top: Survey coordinator Dr. Ken Foster, Owl Moon Environmental Inc., and Prabal Roy, AEW, discuss the recent forest health survey at JP104.

Bottom: Ken Foster and Dennis Jaques during a forest health site identification trip in the spring.

Last winter WBEA prepared a detailed, comprehensive Procedures Manual that specifies the field and laboratory methods to be used during the Forest Health Monitoring Program, including methods for the new measurements and sampling programs. Every sampling and measurement method used in the Forest Health Survey is based on scientific sampling protocols. Standardization of field procedures, laboratory analyses, and record keeping ensure that data collected in one year are compatible with the data collected in past and future years. The selection of similar jack pine stands helps to reduce variability and improve the ability to detect effects, in the same way standardizing field methods and data collection reduces variability and the potential for errors. This makes the data more robust and increases our ability to detect changes at one or more sites.

The network of monitoring sites was expanded in 2011. New monitoring plots were selected on the basis of several years of evaluation by Dennis Jaques, Ecosat Geobotanical Surveys Inc., in consultation with WBEA scientists. A substantial effort was made to select new sites that are very similar to each other, and to add to the sites already in the monitoring program. As a result of this effort, 10 new sites were accepted into the program, increasing the total number of sites to 23. Monitoring sites are spread through the region, at locations near and far from emission sources, and in every direction from them.



Map of the WBEA's 2011 Forest Health Monitoring Sites.

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WBEA Membership

WBEA is an independent, not-for-profit, consensus-based organization located in the Regional Municipality of Wood Buffalo with 28 members.

WBEA's multi-stakeholder membership includes:

Alberta Environment and Water
Alberta Health Services
Alberta Sustainable Resource Development
Canadian Natural Resources Ltd
Cenovus Energy Inc.
Conoco Phillips Canada
Devon Canada
Energy Resources Conservation Board
Environment Canada
Finning Canada Ltd.
Fort McKay First Nation
Fort McKay Métis Local #63
Fort McMurray Environmental Association
Hammerstone Corporation
Health Canada
Husky Energy Inc.
Imperial Oil
MEG Energy
Nexen Inc.
Pembina Institute for Appropriate Development
Regional Municipality of Wood Buffalo
Saskatchewan Environment
Shell Canada Ltd.
Statoil
Suncor Energy Inc.
Syncrude Canada Ltd
Total E&P Canada Ltd.
Williams Energy

TEEM'S FOREST HEALTH MONITORING PROJECT CONTINUED FROM **PREVIOUS PAGE**

The Richardson backcountry wildfire that was burning in the spring burned through five of the 13 existing forest health monitoring sites. A smaller fire also affected a sixth site. Forest fire is a natural process in jack pine forest ecology, and therefore, these sites remain a part of the program and were included in the 2011 program.

Veronica Chisholm, Speedwell Environmental Associates Ltd., spent many hours and much effort constructing the 2011 program plan, paving the way for a successful season. Veronica's efforts were substantial, making sure that each of the program components were assigned to qualified, experienced teams. Six field teams were commissioned for the program, one each tasked with staking/restaking of plots, soil sampling, vegetation measurement and sampling, lichen sampling, tree health assessment, and soil microbiology sampling.

Plots were staked at the new sites, and restaked at the existing sites, by teams comprising Veronica, Amanda Horning, Sarah Eaton, Zach Eastman, Melissa Le May, Chris Godwin-Sheppard, Alana DeBusschere and Marcus Phillips (University of Saskatchewan), and myself. Finding the plots at the burned sites proved challenging, but with a little detective work and some creative thinking, the original plots were found and restaked.

Mike Solohub and Robert Anderson, BioSynch Consulting Inc., completed the soil sampling component of the program. In order to confirm that the soils at the new sites were pedogenically similar to the existing sites, a soil pit was dug at each new site and soils described and sampled. Separate from the soil pit, a series of soil samples were taken from the soil plots. These samples will be analysed in the Canadian Forest Service laboratory in Victoria BC. The results of these analyses will tell us if the soil at one or more sites is being affected by acid deposition. Over 1,700 samples were collected and the laboratory has begun the analyses. Data are expected in 2012.

Dean MacKenzie, Kevin Renkema, Erin Belva, Ashley Craig, and Jamie Lypowy from Navus Environmental Inc. completed the vegetation component of the program. Jack pine tree heights were measured using a laser device, and trunk diameters were measured using a special tape measure.

At the new sites, a set of tree cores were taken to determine tree age, which is necessary to properly interpret the results of the field measurements and laboratory analyses.

A pole pruner was used to cut a branch from near the top of five trees at each site, and detailed growth measurements were taken on these branches. About 400 samples of needles were collected for chemical analyses at the CFS laboratory in Victoria, BC.

Needles may be affected by exposure to air emissions; therefore the chemical composition of these needles will be measured. Another set of 200 needle samples was collected and sent to Dr. Sirkku Manninen in the Department of Environmental Sciences at the University of Helsinki, Finland. The structure and chemical composition of the waxy layer on the needle surface will be examined, providing early warning of change in tree condition following air emission exposure.

The Navus crew also completed a survey of the species growing in each plot at each monitoring site. Species composition can change over time in response to stress, including stress created by air emissions and deposition. Comparing the soil chemistry, needle chemistry and species composition data is a means by which environmental responses to air emissions can be identified and quantified.

Dr. Keith Puckett, lichenologist, ECOFIN, completed the lichen sampling component. Keith's 30-year career includes tenure as a research scientist looking at the impacts of air pollutant emissions on plants and particularly lichens, which later evolved into a position as Director of the Air Quality Research Division of Environment Canada. Lichens are small, slow-growing, long-lived organisms found on rocks, trees and soil. Lichens have a long history in air pollution monitoring, as several lichen species accumulate substances emitted into the air, and/or respond very strongly to air emissions. Samples of *Hypogymnia physodes* and *Evernia mesomorpha* were collected from the branches of trees at each site (except where they had been burned). Each of the 40 samples was sorted, cleaned, packaged, and sent for chemical analysis at two laboratories in North Carolina.

Tom Hutchinson, Regional Forest Health Officer with Alberta Sustainable Resource Development, examined the trees at each site for the presence of insects and diseases, and determined the health of each individual tree. Observations in other forests have led to the understanding that trees exposed to air emissions may become more susceptible to insect infestation or disease. Tom, assisted by Marty Robillard (ASRD), Sarah and Amanda, WBEA, looked at nearly 1,000 trees in this forest health assessment component of the program.

Soil is a complex system of minerals, organic material, roots, and microorganisms. Dr. Sue Grayston, Professor and Canada Research Chair in Soil Microbial Ecology, at the University of British Columbia, and graduate student Carolyn Churchland, collected soil samples at each of the 23 monitoring sites for an analysis of bacteria and fungal composition. These 345 samples are now being analyzed by Kate Del Bel in Dr. Grayston's UBC laboratory.

Scientific input and oversight is an important feature of the TEEM Forest Health Monitoring Program. Scientific credibility of the program means that the results are reliable, and can be used in the management of air emissions in the region. Some of the scientists involved in the program have been with TEEM since the beginning, while others have been welcomed into the program in 2011. In addition to those mentioned above, the following scientists are key members of the TEEM team...

Robert Anderson and Mike Solohub sample soil at JP201.

Soil samples from each plane of a soil pit.

Jaimie Lypowy measures tree height.

Dr. Doug Maynard, CFS-NRCan, WBEA Science Advisor

Top left: A tree core provides information about age and growing conditions. Bottom left: Pole pruners were used to cut branches from the tree crown Middle: Measuring branches. Top Right: Erin Belva completed the survey of forest plant species at each site. Bottom Right: Dr. Keith Puckett, ECOFIN, samples lichens at JP104

Dr. Kevin Percy, science advisor to TEEM since 2006, Lead Scientist 2009-2011, and now Executive Director of WBEA has published extensively on air pollution-forest response and on monitoring designs for forest health. Kevin proposed the forest health model to TEEM in 2007 and has been involved since in its implementation.

Dr. Doug Maynard, Canadian Forest Service, Natural Resources Canada, soil scientist and WBEA science advisor, has been involved in the region since 1998. Doug leads the soil disturbance working group at Pacific Forestry Centre (Victoria BC) focusing on a variety of issues related to forest soil disturbance. Doug provides scientific oversight to WBEA's field sampling protocols and laboratory analytical procedures. He is overseeing the analyses of soil and plant samples at the CFS laboratory, managed by David Dunn and Grace Ross, and will be examining the data generated and providing key input into the statistical analyses of the data.

Dr. Allan Legge's involvement in environmental matters in the oil sands region predates the founding of WBEA and TEEM. Allan is an ecologist and President of BioSphere Solutions, and is a member of the WBEA science advisory team. Allan's experience in environmental responses to air emissions is extensive, including the experimental work at Whitecourt, AB, where many of the procedures applied in the TEEM Forest Health Monitoring Program were first developed. Allan continues to bring a wealth of local, provincial, Canadian and international expertise to the programs.

This year, TEEM and WBEA welcomed Dr. Ellen Macdonald to the program. Ellen is Professor of Forest Ecology in the Department of Renewable Resources at the University of Alberta. Ellen's research focuses on the influence of natural and anthropogenic disturbances on the ecology and plant biodiversity of the boreal forest, regeneration processes and successional dynamics of boreal mixed wood forests, and environmental impacts of forest management. Ellen worked collaboratively with the Navus Environmental Inc. vegetation team, providing insight and guidance to the measurement of composition and abundance of each plant species present at each of the monitoring sites. Ellen will be assisting in the statistical analyses and interpretation of these data, and pine needle analysis data.

The most significant logistical challenge of the program is the remote location of the monitoring sites. Only one of the plots is accessible by road, and it is a 2-hour drive from Fort McMurray. Access to the rest of the plots requires helicopter flights ranging from 10 minutes to one hour, one-way. Moving multiple crews to and from Fort McMurray, or between sites, required substantial planning and most importantly, flexibility and adaptation by all program participants. Lakeshore Helicopter pilots Don Cleveland, Al Menard, and Greg Mahon were very helpful in guiding our flight planning, and very skilled at getting the field teams to, from, and between sites.

Each component of the program began with a safety briefing, and safety matters were discussed and addressed throughout the program. Safety items raised by the field crews were addressed so that risks were constantly reduced. The 2011 Program was completed injury-free.

The results of the 2011 Forest Health Monitoring Program will be compared with those obtained during the 1998 and 2004 sampling programs. This comparison will allow us to determine if the jack pine forest is changing over time, and if so, if air emissions and deposition are the cause of the change(s). Because of the number of laboratory analyses to be completed, and the volume of data to be processed, we expect that the report will take at least a year to prepare.

Tom Hutchinson, ASRD, during the forest health survey at JP201.

Dr Sue Grayston and Carolyn Churchland, UBC, sample soil for microorganisms.

Dr. Ellen Macdonald (l) and the Navus Environmental Crew.

Dr. Allan Legge, Biosphere Solutions, WBEA Science Advisor.

CASA and WBEA are on the Same Wavelength

Jean Moses, Clean Air Strategic Alliance

As the largest airshed zone in Alberta, the Wood Buffalo Environment Association doesn't operate in a vacuum. It's one of eight airshed zones throughout Alberta, and all of them have been endorsed by the Clean Air Strategic Alliance (CASA). Endorsement for a ninth airshed is pending.

The Clean Air what, you say? An understandable response. Although the non-profit Clean Air Strategic Alliance (CASA) has been around since 1994, it remains a well-kept secret outside of those directly involved with air quality management.

In the late 1970s, more and more people around the world became concerned about acid deposition, climate change, smog and toxic air pollutants. The same concerns were being voiced closer to home at Alberta Energy Resource Conservation Board (ERCB) hearings. In response, the provincial government initiated an 18-month public consultation into energy and air quality. Called the *Clean Air Strategy for Alberta*, the final report identified a need for a more comprehensive system for managing air quality.

In 1994, after wrestling with various solutions for two years, CASA was born. A dynamic multi-stakeholder partnership dedicated to improving air quality in Alberta, CASA is composed of representatives from industry, government and non-government organizations. Its board of directors, and every team, includes representatives from each of these three sectors.

CASA's strength was, and still is, its collaborative consensus-building/problem-solving approach. With an alliance of different viewpoints and interests sitting around the table, the solutions are often creative and more long-lasting than those rising from the traditional confrontational and adversarial approach used in the past.

At the same time that CASA was being created, the Regional Air Quality Coordinating Committee (RAQCC) was formed in the northeastern corner of Alberta as a response to environmental concerns there. At first, RAQCC operated under the CASA umbrella. As expertise and resources grew, the monitoring program there became the second in Alberta to be endorsed by CASA. The West Central Airshed Society in southeastern Alberta was first in 1995.

Later, when the RAQCC became WBEA, CASA stepped out of the picture. Today, though, CASA still provides support to WBEA when requested, and similar goals make the two organizations partners in the promotion of improved air quality.

Not surprisingly, the operational styles of both organizations are similar. Both are multi-stakeholder groups, using collaborative problem-solving. Both are aware of the need to ensure diverse groups and viewpoints are considered, and joint solutions are vital to success. Both concentrate on the quality of Alberta air, although where WBEA concentrates on monitoring and management, CASA provides policy advice to the provincial government.

In the past 17 years, CASA has become a trusted and successful advocate for air quality. Its project teams have addressed complex, sometimes thorny, issues and have produced definitive recommendations to the Government of Alberta. In fact, almost 80% of those recommendations have been used to inform emissions guidelines and government policy. Each final project report includes implementation checks and balances, clearly identifying who is responsible for what portion of implementation. Other teams, as prescribed in the final reports, are created as necessary to confirm that recommendations are acted upon. As of March 2011, 51 final project team reports have been published.

CASA has received many awards and formal recognition for its work, beginning with a Premier's Award in 2000 for the *Acid Deposition Management Framework (1999)*. A second Premier's Award went to the *Multi-Stakeholder Group for Particulate Matter and Ozone (1999)* in 2001. The *Emissions Management Framework for the Alberta Electricity Sector (2003)* won an Alberta Emerald Award. In 2005, the *CASA Consensus Decision-making Model* received the Carleton University Arthur Kroeger College Award for Policy Leadership.

CASA's air quality management goals:

1. **Protect the environment by preventing short-and long-term adverse effects on people, animals and the ecosystem**
2. **Optimize economic efficiency**
3. **Promote pollution prevention and continuous improvement**

Dr. Kevin Percy Appointed as WBEA's Executive Director

Dr. Kevin Percy was appointed Executive Director of WBEA on July 18th, 2011. Kevin's 35 year career in air pollution research, his experience in program coordination and in delivering practical science-based solutions, make him well suited to his new position.

Above: Dr Kevin Percy with jack pine needles he collected for analysis during the recent WBEA-TEEM forest health survey.

Dr. Percy holds a BSc. in Forestry (Silviculture) and an MSc. in Botany; both from the University of New Brunswick. His MSc. thesis examined the effects of SO_2 on the needle anatomy and biochemistry of white and jack pine, both in the field and in controlled fumigations.

In 1979, Kevin was hired as part of the federal interdepartmental acid rain research and monitoring program by the Canadian Forestry Service (CFS), now part of Natural Resources Canada (NRCan). For the next five years he contributed the terrestrial component to the multidisciplinary (air, land, water) calibrated watershed project in Kejimkujik National Park, in south west Nova Scotia. From 1984-1987, Kevin had the opportunity to pursue a PhD at the Long Ashton Research Station, University of Bristol, England. His research focused on the effects of simulated acid rain on the leaf surface of crops and trees. Radioisotope tracers, electron microscopy, and gas chromatography-mass spectrometry techniques were used to examine the complex mixture of long-chain hydrocarbons on leaf surfaces.

Following his studies in England, Kevin returned to the Atlantic Forestry Centre lab in Fredericton, N.B., where he was involved in collaborative air pollution/climate change studies with scientists in over 20 countries. During his 35 year career, he was author or co-author of over 130 peer-reviewed articles in scientific journals and books. Kevin was the only Canadian principal investigator, and a member of the steering committee of the world's largest greenhouse gas-forest experiment. The Aspen FACE (Free Air Carbon Dioxide Enrichment) User Facility is located in Rhinelander; Wisconsin **(www.aspenface.mtu.edu**). Aspen FACE, primarily supported by grants from the US Department of Energy, ran for 11 years and over 100 scientists from 10 countries conducted research there. In 2009, Aspen FACE was cited by Scientific American (**www.scientificamerican.com/article.cfm?id=10-climate-experiments**) as one of the world's 10 important atmospheric science experiments.

Left: Aerial photo of Aspen FACE, Rhinelander, Wisconsin, USA.

Top: WBEA contributes air quality data to CASA, with data used to calculate the hourly AQHI for the RMWB also provided by WBEA.

Bottom: The CASA Board held a retreat this spring to determine CASA's future direction.

DID YOU KNOW... Almost 1,000 different people have participated on CASA teams since 1994, many of them on multiple teams.

The *Management of Routine Solution Gas Flaring in Alberta (1998)* was the big winner, beginning with an Alberta Emerald Award in 2001, and a Pollution Prevention Award from the Canadian Council of Ministers of the Environment in 2005. It was also mentioned as a World Best Practice in 2003.

The Comprehensive Air Quality Management System (CAMS) is CASA's basic decision-making tool. It clearly describes criteria and steps used to address complex or potentially controversial issues, addressing them in a credible, consistent, transparent and objective manner. Health, environment, energy and economics all affect air quality decisions.

The process encourages innovation and is truly a better way to manage air quality in Alberta. It is a fundamentally sound tool that, like CASA, has matured and evolved through experience. It offers clear guidance, yet can be adapted to a wide range of issues and situations. Priorities can be established on an ongoing, strategic basis by the CASA board. The full CAMS document is available on the CASA website under publications.

In Alberta, air quality is monitored by a comprehensive network of stations operated by Alberta Environment, air quality management zones, Environment Canada and industry. All of them provide data to the CASA Data Warehouse, and WBEA is a valuable contributor.

The CASA Data Warehouse is the public face of air quality data, a central repository for Alberta ambient air quality data. That data includes information fed into the system from continuous analyzers at stationary and mobile sites, from laboratories, and from bio-receptors. WBEA operates 15 monitoring stations that channel data to the CASA Data Warehouse, where it's analyzed and archived in graphical or tabular form. Near real-time data is also available through a CASA Data Warehouse link.

The CASA Data Warehouse also contains historical data from stations that have been moved, decommissioned or shut down. Even though Alberta Environment has transferred operation of many stations to airsheds, data is still found under the original station name. If the station has been moved to another site, the station name may have changed, but collection only ends if the monitoring program is discontinued.

Recently, the Air Quality Index was replaced by the Air Quality Health Index, and WBEA continues to be a major contributor. The AQHI is measured in more than 20 communities across Alberta, providing hourly comparisons of individual pollutants. It also provides community-based messages when odour or visibility events occur, even if the concentrations are not likely to cause a health issue for most people.

Recently CASA's direction has shifted, with strategic leadership an important facet in the future. By identifying emerging air issues early, the organization may be able to influence future air quality management. It will also promote collaboration through development of a toolkit, thereby improving stakeholders' ability to understand and contribute to air quality issues. Project teams will become more effective by spending more time on the front end of the process, leading to increased trust and understanding among the various stakeholders.

To learn more about the Clean Air Strategic Alliance, go to www.casahome.org, or contact CASA by mail: 10th floor, 10035 – 108 Street; Edmonton, AB; T5J 3E1.

Left: Dr Kevin Percy inspects an Annular Denuder, which measures acidic and basic gases at AMS #1 Fort McKay.

Over the course of his career with the Canadian Forestry Service, Kevin served on several national and international forest health science processes and working groups. IUFRO, the International Union of Forest Research Organizations, is the "Global Network for Forest Science Cooperation", and the world's largest forestry NGO, with 15,000 scientists, and 700 member organizations from over 110 countries (www.iufro.org). Kevin's IUFRO appointments included:

- The expert panel on "Adaptation of Forests to Climate Change"
- Coordinator of the Research Group "Impacts of Air Pollution and Climate Change on Forest Ecosystems"
- Coordinator of the Task Force on "Forests and Carbon Sequestration"

Kevin's appointments with the Canadian Council of Ministers of the Environment (CCME) and Canadian Council of Forest Ministers (CCFM) included:

- Federal Co-Chair of the "Vegetation Working Group, Canadian Multi-stakeholder NOx/VOC Science Program" (CCME)
- Federal Co-chair of the "Long Range Transport of Air Pollutants (LRTAP) Terrestrial Effects Research and Monitoring Coordinating Committee" (CCME)
- Coordinator of the "Forest Condition Criterion, Criteria and Indicators for Sustainable Forest Development" (CCFM)

Kevin began working with WBEA in 2006 as a science advisor. In 2008, he was on secondment to WBEA from NRCan. He retired from NRCan in January 2009 as Senior Scientist-Global Change, and moved to Fort McMurray to become WBEA's Lead Scientist, a position he held until his appointment to Executive Director in July.

In 2007, along with WBEA science advisors Dr. Allan Legge, Biosphere Solutions, and Dr. Doug Maynard, NRCan, Kevin proposed a scientific enhancement of WBEA's Terrestrial Environmental Effects Monitoring (TEEM) program.

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DR. KEVIN PERCY CONTINUED FROM **PREVIOUS PAGE**

Kevin explains, "Since 2008 at WBEA, we have been building a high quality, international team of staff and contracted technical and scientific specialists targeted at delivering improved, timely and science based monitoring, so that our stakeholders can make informed decisions around airshed management and planning."

With the foresight and support of WBEA's membership, TEEM expanded significantly, focused around taking measurements along the air pollutant pathway using an emissions "source" to terrestrial receptor "sink" approach.

Kevin adds, "In fact WBEA Members told us, in 2007, that they wanted more science... the best science we could achieve. Therefore, two years ahead of the recent provincial and federal panels, WBEA had already identified the need and begun to move ahead on science enhancement of its programs in the Athabasca Oil Sands Region."

The Ambient Air quality monitoring program remains a core activity within WBEA. "Capacity to measure ambient air has been strenghtened through new instrument technologies, including a new ability to measure ambient air in the field to sub parts per billion levels, and to better discriminate concentrations measured between, say, forest fires and regional oil sands processing activities."

"WBEA has increased our capacity to monitor ambient air, while at the same time strengthening our essential capacity to measure and report for compliance purposes."

Kevin is proud of new partnerships developed with Environment Canada (mercury and PAH measurement), and Alberta SRD (forest condition) to provide needed monitoring support in key areas where WBEA did not have the capacity.

Kevin has recently been directly involved with other initiatives of note for the organization including:

- Implementation of a full air quality network assessment now in progress. This was a key milestone committed to in the WBEA 2011-2015 Strategic Plan, developed by Members during 2010.
- Installation of new, specialized instrumentation now operating at the WBEA Fort McKay air monitoring station to gather new, much needed data around odour frequency, intensity and odour compound speciation, as part of the re-configured WBEA Human Exposure Monitoring Program.
- Developing the scientific programme and hosting the International Symposium "Alberta Oil Sands: Energy, Industry and the Environment", as well as the 43rd annual Air Pollution Workshop last May. The meetings attracted 120 scientists to Fort McMurray and provided an opportunity to present some of WBEA's science-based monitoring to a wider audience. Many of WBEA's team of 35 scientists will be publishing shortly on their findings in our region in international peer-reviewed literature.
- WBEA's presentation to the Alberta Environmental Monitoring Panel followed by recognition in the panel's July 4th report that WBEA "... demonstrates many of the attributes that the Panel considers essential for a world-class monitoring, evaluation, and reporting system."

Kevin acknowledges the value of identifying opportunities to create new knowledge, particularly in applied science settings where it can be put to practical application.

Left: Dr. Kevin Percy (l) and Dr. Keith Puckett, Lichenologist, (r) discuss lichen composition on jack pine at plot 104 during the 2011 WBEA forest health survey.

Kevin states that under his leadership, and with the support of WBEA Members and staff, "We will continue to look for the best methods, and to attract the best people to help us achieve the goals set by the Membership. WBEA is always looking for opportunities to improve the way we do things."

"I anticipate that, building upon favourable comments made about WBEA in federal and provincial panel reports on monitoring in the AOSR, WBEA will continue to play a significant role in regional environmental monitoring. We are currently awaiting direction from key stakeholders following recommendations made by the Alberta Environmental Monitoring Panel. Ultimately, of course, the WBEA Membership will set the future direction and staff will continue to execute upon that direction."

Air Quality Health Index

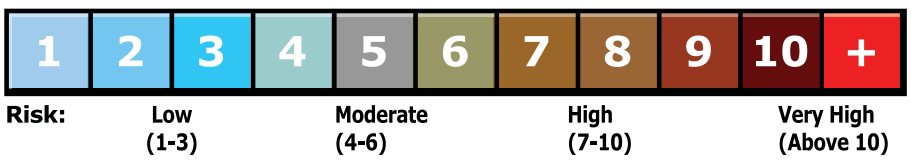
Alberta's Air Quality Health Index: Know the New Air Quality Numbers

Alberta Environment and Water

Alberta recently adopted a modified federal Air Quality Health Index (AQHI) to give Albertans the most timely and relevant information to plan their outdoor activities. This index also allows people to better understand the health risks associated with poor air quality.

Alberta enjoys good air quality most of the time, but it's important that those who are especially vulnerable to the effects of air pollution have information at their fingertips to take precautions should air quality deteriorate.

The AQHI works on a scale from 1 to 10 to determine the health risk for the general population and for those with respiratory conditions. The lower the number, the lower the health risks.



While the index gives Albertans current air quality information, this tailor-made index also provides a forecast of air quality for the days ahead.

The Governments of Canada and Alberta worked together to develop this unique reporting system for the province.

Alberta's former Air Quality Index measured two additional components over the federal system's in order to address the province's unique air quality issues resulting from our oil and gas industry. Data in the AQHI is also reported hourly under Alberta's system, rather than the federal system's practice of reporting every three hours. Under Alberta's adoption of the AQHI, these additional components and two others – hydrogen sulphide and total reduced sulphur – will be measured, while also giving Albertans notice when visibility is a concern and when odours may be detected.

The AQHI is now available in over 20 communities across Alberta. The forecast component will first be available in Edmonton, Calgary, Red Deer, Fort McKay and Fort McMurray, with the remaining communities added later this year and in early 2012.

For more information on the AQHI, visit www.airquality.alberta.ca

DID YOU KNOW...

WBEA air monitoring station #6 in Timberlea is named "Patricia McInnes" in honour of the late, prominent Fort McMurray environmentalist

WBEA Air Monitoring Network

WBEA assumed responsibility for our air quality monitoring network operations and maintenance on July 1st, 2011. Under this initiative, all activities required to support the network, and several pilot projects, are now being carried out by WBEA staff.

Above: WBEA staff is responsible for operation and maintenance of the ambient air monitoring network.

Sanjay Prasad, Ambient Air Technical Committee (AATC) Program Manager, along with retired Executive Director Carna MacEachern, was responsible for the planning and implementation of this very complex and significant undertaking.

In the lead up to July1st, WBEA hired senior ambient air quality specialists with many years experience in ambient air quality monitoring:

- Gary Cross
- Kelly Baragar
- Dean MacLanders

Also hired and trained were three locally based Ambient Air Field technicians:

- Zach Eastman
- Melissa LeMay
- Emilie Rainville

WBEA operates 15 monitoring stations from Fort Chipewyan in the north, to Anzac in the south. Some 84 analzyers continuously measure and report concentrations of the region's major air pollutants, meteorology, and time-integrated concentrations of other ambient air constituents of concern to human health or the environment.

The main tasks carried out by WBEA's air quality team include:

- Daily calibration and systems checks on all analyzers
- Monthly multipoint calibrations as required by government
- Filter and sample change out
- Daily data capture and processing
- Daily primary data quality control
- Monthly secondary quality control
- Delivery of quality assured data to the provincial data repository (Clean Air Strategic Alliance)
- Delivery of data to the WBEA database
- Ensuring hourly transfer of data to government for AQHI calculation
- Remote hourly maintenance and troubleshooting
- Cooperation on annual network audits conducted by AEW

In support of this initiative, WBEA leased and finished two large bays at the TaigaNova Industrial Park in Fort McMurray, to house both air, and terrestrial technical staff and their equipment. The new space provides rooms to store and repair air analyzers, bays to hold WBEA's Mobile Monitoring van and the new portable monitoring station, office space, a clean lab in support of the Ambient Ion Monitor and other specialized equipment, and space for samples collected during terrestrial monitoring work.

AATC's objective is to collect air quality data related to human and ecosystem health and report it to the public. WBEA strives to maintain high quality measurements and datasets in support of user needs and this was evident during the Alberta Environment and Water's recent audit of the air quality analyzers in the WBEA air monitoring network.

Training of new staff was provided by Ray Brassard, a former AEW Auditor, and by Campbell Scientific. The senior WBEA air monitoring staff has 75 combined years of experience.

Monique Lapalme (l) and Rachel Mintz (r), Environment Canada, at AMS 1 with Environment Canada BTEX monitor for installation.

WBEA and Environment Canada Partner on BTEX Monitoring

Every 12 days WBEA has been routinely collecting 24-hour samples of air in stainless steel canisters at eight of our air monitoring stations. This ambient air measurement technique is routinely used in North America, and is usually conducted every sixth or twelfth day, depending upon network objectives.

The air captured in the canisters is withdrawn by gas desorption into a gas chromatograph-mass spectrometer for analysis of 60 volatile organic compounds (VOC). Among the compounds WBEA monitors are benzene, toluene, ethylbenzene, and xylenes. These are commonly referred to in ambient or occupational health monitoring as a class of compounds abbreviated as BTEX.

According to Alberta Environment and Water, motor vehicle emissions are the main source of benzene in Alberta, followed by industrial emissions and other combustion sources. The other BTEX compounds are natural components of fossil fuels, and can be formed during combustion of organic materials. One-hour averaged Alberta Ambient Air Quality Objectives (AAAQO) effective June 15, 2011 exist for benzene (9 ppbv), toluene (499 ppbv), ethylbenzene (460 ppbv), and xylenes (530 ppbv).

On October 18th, WBEA and Environment Canada partnered to install an Environment Canada BTEX analyzer into air monitoring station #1 in Fort McKay. The analyzer will be maintained and calibrated by WBEA technical staff. Prior to this installation WBEA did not have the capacity to measure BTEX concentrations on a continuous basis in order to report hourly concentrations.

Recent Air Quality Health Index Numbers for the RMWB

Alberta Environment and Water has adopted an Air Quality Health Index (AQHI) to report current, and forecast upcoming, air quality. Story on page 6.

The AQHI provides a number from 1 to 10+ to indicate the level of health risk associated with local air quality. The AQHI is a guide to the relative risk presented by a mixture of air pollutants. Not all odour-causing compounds are included in the mixture used to calculate the AQHI.

The hourly AQHI values from four of the regional communities where WBEA operates air monitoring stations have been analyzed for the period January 1, 2011 through September 30, 2011. WBEA was involved in this AQHI pilot project prior to the rollout of the provincial program in September. Percentages shown have been rounded.

Data from the nine month pilot program show:

A low risk (AQHI numbers 1 to 3) to health was reported:

- 92.4% of the time at Fort McMurray (WBEA station 7)
- 91.6% at Fort McKay (WBEA station 1)
- 92.5% at Fort McKay South (WBEA station 13)
- 98.9% at Fort Chipewyan (WBEA station 8)

A moderate risk (AQHI numbers 4 to 6) to health was reported:

- 4.4% of the time at Fort McMurray
- 4.3% at Fort McKay
- 4.3% at Fort McKay South
- 1.2% at Fort Chipewyan

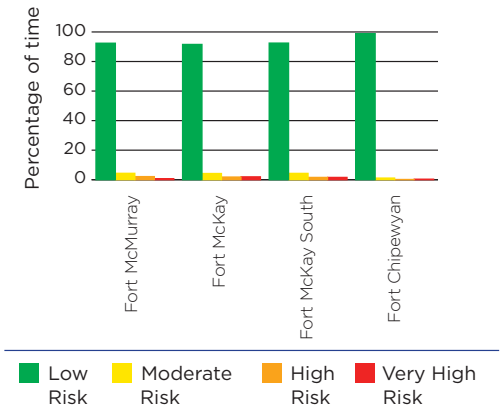
Almost all AQHI numbers indicating moderate (4 to 6) to high (7 to 10) risks from air quality were reported during the extended 2011 regional wildfire episode, which consumed some 700,000 hectares.

A high risk (AQHI numbers 7 to 10) to health was reported:

- 2.2% of the time at Fort McMurray
- 1.9% at Fort McKay
- 1.6% at Fort McKay South
- less than 1% at Fort Chipewyan

According to Alberta Environment and Water, occasionally, when the amount of air pollution is abnormally high, the number may exceed 10, such as air quality associated with wild fire smoke. Very high health risk AQHI numbers, above 10, from local air quality occurred between 0.7 and 2 % of the time at Fort McMurray, Fort McKay, and Fort McKay South. All hours with numbers above 10 occurred during the most intense portions of the regional fire smoke episode that lasted between mid May and end of June, 2011. Extremely high concentrations of fine particulate matter, causing reduced visibility, were measured by WBEA during this event, as well as occasional elevated levels of ground level ozone. Visit www.wbea.org to view current regional AQHI numbers.

Summary of AQHI numbers at 4 WBEA Air Monitoring Stations from Jan.1st to Sept. 30th, 2011.



Network Evaluation of WBEA's Air Monitoring Capacity Underway

WBEA's Strategic Plan 2011-2015, adopted in December 2010, recognized the need to examine our network within the context of current and future oil sands regional development. Accordingly, WBEA commissioned a comprehensive scientific and technical evaluation of our air quality monitoring network. WBEA's network is one of the most extensive in the country, encompassing the 68,000 km^2 Regional Municipality of Wood Buffalo.

A network evaluation assesses the current status of an air quality monitoring network in terms of the number of monitoring stations, their locations and the parameters measured at each.

WBEA asked two well respected experts on the operation of North American air quality networks to carry out the evaluation:

- Tom Dann retired in November 2010 from Environment Canada following a 37 year career. As head of Air Toxics, Tom oversaw one of the national air pollution networks, the National Air Pollution Surveillance Program (NAPS) (**www.ec.gc.ca/rnspa-naps**).
- Eric Edgerton is president of Atmospheric Research and Analysis, Inc, in Raleigh, NC, USA (**www.atmospheric-research.com**). Eric has operated and managed a number of networks in the USA, including the United States Environmental Protection Agency (USEPA) Clean Air Status and Trends Network (CASTNET). Eric also sits on several science advisory committees which advise the USEPA administrator on air quality standards.

The investigators were asked to complete a considered and thorough scientific evaluation of WBEA's current network capacity and to recommend, through design actions, the future direction of the network in consideration of regional plans and provincial/national contexts for air monitoring.

From May 2nd-5th, the investigators visited the Fort McMurray region and interviewed a number of WBEA's key regional stakeholders. They have also studied approvals to operate, federal and provincial air quality policies, development scenarios for the region, and frameworks such as the Lower Athabasca Regional Plan (LARP) (**http://environment.alberta.ca/03422.html**)

Top: Kevin Percy, Eric Edgerton and Tom Dann during the air shed evaluation in early May.

Bottom: WBEA's Patricia McInnes air monitoring station #6, located in Timberlea, Fort McMurray

The report and recommendations were presented to WBEA's Ambient Air Technical Committee (AATC), in October.

The report contains an evaluation of the network's current status, as well as recommendations for future enhancements in light off expected developments and announced government policies. During 2012, WBEA committees and members will evaluate the report's recommendations with a view to having decisions in place going forward to the 2013 budget year.

Preliminary Results of WBEA's Multi-Year Lichen Project

Lichens are plants made up of fungal and algal parts. In the RMWB they grow on rocks, soil, trees and in bogs. Lichens have been used successfully in the northern hemisphere for over 50 years as a reliable and inexpensive way to monitor pollution patterns in remote areas. Some species of lichens are particularly good bio-accumulators for sulphur and trace metals in the air. WBEA has been using lichens as bio-accumulators of air pollutants since 2002.

In 2008, WBEA collected two lichen species at 359 sites extending outwards in all directions from Fort McMurray. The lichens were chemically analyzed using exacting laboratory protocols for sulphur, nitrogen, and 43 trace metals.

- The first objective of the multi-year project was to map the spatial distribution of sulphur and nitrogen concentrations in lichens across the RMWB. For instance, "Where are sulphur concentrations highest or lowest?"
- A second objective was to use the trace metal concentrations measured in the lichens to carry out scientifically credible receptor modeling. This well-established high-level statistical analysis attributes concentrations measured in the lichens to various industrial, urban, and natural sources. WBEA is also comparing natural, stable isotopes for sulphur, nitrogen, lead and mercury, and polycyclic aromatic hydrocarbons in source fingerprints and in lichens to further attribute to source type.
- The third objective of this WBEA project was to statistically compare the sulphur and nitrogen concentrations measured in the lichens with the pattern of deposition predicted by regional dispersion models. Dispersion model results are central to industrial approvals and the environmental impact assessment process.

In the following two articles scientists working with WBEA on the lichen project relate some preliminary results.

Scientists Present Early Results on Receptor Modeling

Dr. Sagar Krupa, University of Minnesota, MN, USA

The WBEA-TEEM "Receptor Modeling" project is coming to closure. Receptor modeling is a statistical method for identifying and determining the contribution to a given geographic location of air emissions from various source types or groups.

A team of researchers from the academic community and the private sector jointly conducted the work. Their preliminary results were presented at WBEA's International Symposium "Alberta Oil Sands: Energy, Industry, and the Environment" in Fort McMurray, May 2011. The scientists will present their final results to WBEA-TEEM members and publish those findings in international scientific literature.

In receptor modeling, tissue elemental concentrations accumulating in an epiphytic (growing on trees) lichen in the region were used as biological indicators of relative air quality at 359 locations, up to 160 km from the oil sands. The levels of 43 elements including sulphur and nitrogen were measured in those tissue samples. Lichen samples were collected by Dr. Shanti Berryman and Justin Straker, who reported previously to WBEA on the sulphur and nitrogen concentrations.

Above: Epiphytic lichens growing on trees were collected for WBEA Receptor Modeling.

At the same time, emission source elemental profiles (fingerprints) were developed for a variety of stacks, heavy-duty vehicles, and bulk materials representing the various stages of oil sands processing operations. Those profiles are being matched with the corresponding elemental profiles in the lichen tissue at each location for attributing elemental concentrations in the lichens to source type.

Early results suggest three main groupings of sources:

(a) large dust particles from mining close to the operations,

(b) small microscopic particles and gases from oil processing, and

(c) both large and small particles and gases from wild fires and nutrient inputs farther away from the industrial complex.

These results were independently verified at various distances from the industrial complex by using stable lead isotopes as a tracer for the overall emissions.

There are still other emission types in the oil sands, such as other long range, regional, and urban sources as well as dust from roads/heavy-duty vehicles. When the final analysis is completed, it will provide information on the percent contribution of individual emission types at each lichen sampling location. Geographic maps produced from such data will form one of the very important platforms for future WBEA-TEEM studies.

Research Triangle Institute (RTI) of North Carolina, USA, Contributes Knowledge of Organic Compounds in the RMWB

Drs. Bill Studabaker[1], Jim Raymer[1], R.K.M. Jayanty[1] and Sagar Krupa[2]

1 Research Triangle Institute, Raleigh NC, USA
2 University of Minnesota, MN, USA

Understanding potential impacts of oil sands development on regional air quality requires novel ways to monitor pollution in remote locations. In areas without access to electric power, typical air sampling methods, which rely on large pumps, filters, absorbent beds, and other equipment to measure pollutants, are impractical. In addition, standard methods collect samples over short time frames, one to two days, providing only a snapshot of air pollution. Developing useful data on regional air quality hinges on gathering data about seasonal and longer-term pollutant concentrations and trends.

RTI International (Research Triangle Park, North Carolina, USA), the University of Minnesota, and WBEA are conducting pilot studies to address these needs by taking advantage of the ability of plants to absorb a class of pollutants called poly-nuclear aromatic hydrocarbons (PAHs). PAHs include a number of toxic compounds and are generated by combustion of certain fossil fuels such as diesel or coal. PAHs also occur naturally as components of the bitumen in the oil sands.

As part of one pilot study, WBEA scientists collected samples of lichen from trees growing in the vicinity of the oil sands mining operations, as well as from more remote locations up to 160 km away. These samples were analyzed at RTI using a technique called gas chromatography with mass spectrometric detection (GC-MS). Using GC-MS, RTI was able to identify and measure individual PAH compounds in the lichen samples at concentrations as low as 25 parts per billion.

The investigators found that PAH concentrations in the lichens were higher near the oil sands mining operations than at remote locations. They also found that it is possible to distinguish between contributions from combustion sources and contributions from natural bitumen deposits. The data are now being incorporated into modeling studies to show how these pollutants are transported across the RMWB.

As it is extremely difficult to determine a lichen's age, a disadvantage of using lichens is that recent uptake of pollutants can't be distinguished from long-term uptake. WBEA and RTI have recently begun work on a similar study using needles from jack pine trees. It is possible to identify and separate pine needles from different growing seasons, and the investigators hope to demonstrate that pine needles can provide information comparable to that from the lichens study, while generating a more detailed picture of annual pollution patterns.

WBEA's New Boreal Forest Health Vignette

WBEA's recently completed forest health survey presented an opportunity to document field crews and scientists engaged in sampling and measurement activities in our region.

Filmed on August 23rd and 24th, the vignette was shot primarily at WBEA-TEEM forest health plot JP104, located off the Firebag Road, southeast of Shell Albian Sands. Entitled "Boreal Health Forest Survey - Phase 1 Field Sample Collection", the vignette features:

- Dr. Kevin Percy introducing forest health and explaining why WBEA is engaged in this monitoring.
- Dr. Keith Puckett, ECOFIN, collecting samples of lichens for use in pollution mapping. Comparative studies of lichens in various jurisdictions such as the RMWB, Northern Ontario, Fenno-Scandinavia, Russia, and Alaska will put WBEA's data into a global context.
- Dr. Sue Grayston, Professor and Canada Research Chair in Soil Microbial Ecology, University of British Columbia, describing the vital role of soil microorganisms in nutrient cycling in the boreal forest ecosystem.
- Dr. Ellen Macdonald, Professor of Forest Ecology, Department of Renewable Resources, University of Alberta, describing the role of vegetation sampling in assessing future changes in relation to atmospheric pollution.

Striking aerial footage of JP104, including the 30 meter solar-powered tower for continuous measurement of meteorology and pollutant concentrations, is featured.

The data generated from the forest health project will contribute to WBEA's understanding of the state of terrestrial ecosystems in the region and assist stakeholders, policymakers, and government to make sound decisions around industrial development in the RMWB.

View the Boreal Forest Health vignette at www.wbea.org

In 2012, WBEA will produce a follow-up "Phase 2" vignette illustrating the lab analysis component of the forest health survey, featuring footage from each of the participating analytical labs.

WBEA Staff Profile - Amanda Horning

Terrestrial Environmental Effects Monitoring (TEEM) program field technician, Amanda Horning, has been working with WBEA in Fort McMurray since February 2011.

Amanda grew up in Prince George, British Columbia, but some features of Fort McMurray, such as the confluence of rivers and the resource based economy often remind her of home. Forestry is central to the economy of Prince George and both of Amanda's parents worked in this industry.

"I've always loved forests," Amanda says. "All throughout school in Prince George, I had the opportunity to participate in some memorable forestry interpretive programs that were not only fun but really highlighted the diversity of forestry career options." Amanda credits these school programs as an early influence in her decision to pursue a forestry career.

Amanda completed a two year forest technology program at the Prince George campus of the College of New Caledonia. Amanda explains, "This program was a great combination of classroom courses and practical forestry. The small class size allowed us to have lots of hands-on field experience and really discover if a career in forestry was for us." Interestingly, in a predominately male dominated field, Amanda's forestry technology class at New Caledonia was made up of an equal number of men and women students.

Following her forest technology diploma, Amanda completed a BSc. in Forestry at the University of Alberta. During her studies, she had several opportunities to travel and take part in forestry and environmental field trips. Two trips were sponsored by the Canadian Institute of Forestry. "In northern Ontario I saw a peat land ecosystem for the first time which differed greatly from the lodge pole pine ecosystem I was familiar with around Prince George. During a New Brunswick trip I learned about intensive silviculture practices and saw a hardwood ecosystem."

"With SAF, the Society of American Foresters, I was able to travel to Oregon and Washington State, view some different US forestry practices, and see a costal forest ecosystem."

During a visit to Zhejiang A & F University, Lin'an City, China, Amanda attended classes and participated in field trips with Chinese forestry students to bamboo plantations and mills.

"It's really worthwhile to join professional organizations when you're a student," Amanda says. "It opens up great opportunities to network within your field and to travel and attend conferences."

Prior to joining WBEA, Amanda worked in a broad spectrum of silviculture jobs in BC. She describes silviculture as the art and science of growing healthy, quality forests.

Top: Amanda Horning and her dog Karl. Bottom Left: Amanda checks for sawyer beetles at WBEA-TEEM forest health site JP106 in the aftermath of the Richardson wildfire.
Bottom right: Amanda and Dr. Keith Puckett during lichen collection survey in August.

Amanda, centre, consults a map of WBEA-TEEM forest health survey sites with from left to right Dr. Sue Grayston and Carolyn Churchland, UBC, and WBEA colleague Sarah Eaton.

At WBEA, Amanda helps to facilitate and complete the programs of WBEA's terrestrial environmental monitoring (TEEM) program. Some of her diverse duties include:

- 2011 Forest Health Survey- Forest plot work in preparation for the survey and assisting Dr. Keith Puckett with lichen collection and the Alberta Sustainable Resource Development personnel with the forest insect and disease assessment.
- Passive Monitoring- Changing and collecting filters at WBEA's numerous passive monitoring sites, which are located all over the RMWB. Helicopter travel is required to reach each site, several times, throughout the year.
- Ion Exchange Resins- Maintaining and collecting samples of wet deposition throughout the ion exchange resin network.
- Investigative programs- Collecting bark, jack pine needles and other samples for analysis. Installing plant root simulators.

Amanda loves working outdoors and she sees this as one of the many positive features of her job with WBEA. She mentions, however, that all field activities are supported by planning and preparation, followed by careful sample handling protocols at WBEA's Field Operations Centre.

Some of the challenges of working in the field include biting insects and always being aware of wildlife. Amanda explains, "Bears, especially, seem to be attracted to some of WBEA's terrestrial monitoring equipment. I experienced many encounters with bears during the 2011 field season. I had appropriate bear safety training prior to going into the field, and all required safety precautions during field work were in place, so none of the encounters were serious."

The need to travel by helicopter to remote sites provides rewards and challenges. Sometimes it is difficult to fit all the gear required for a day's work into the helicopter. "It's very important to be organized! The short days of winter limit flight time and, as a result, the length of the working day." Still, Amanda appreciates the chance to see the beautiful and often remote corners of the RMWB as she travels in the course of her duties.

Amanda relates another rewarding aspect of her job, "I really like working with and learning from the different scientists and specialists that conduct work for WBEA. During the forest health survey, I enjoyed working with Dr. Keith Puckett. We collected two species of lichen at the twenty-three forest health plots across the region."

"The chance to see the diverse populations of birds and wildlife in the region is another great bonus of my job. This past summer I saw pelicans, cranes and many different waterfowl."

Currently, Amanda is a forester-in-training with the College of Alberta Professional Foresters (**http://www.capf.ca/favicon.ico**) She is working towards achieving the designation of Professional Forester and feels it is important to remain current in the field of forestry.

Amanda concludes by saying, "I really enjoy being involved with something important like monitoring the environment in the oil sands region."

Out and About with WBEA

The Alberta Environmental Monitoring Panel report *"A World Class Environmental Monitoring, Evaluation and Reporting System for Alberta"* was released June 30th. WBEA participated in the panel hearings. On page 27, the report states, "The Panel is of the view that certain existing monitoring programs should continue while others may need to be restructured or replaced. The Wood Buffalo Environmental Association, for example, monitors air quality and terrestrial ecosystems in the Lower Athabasca region and demonstrates many of the operational and scientific attributes that the Panel considers essential for a world class monitoring, evaluation and reporting system." View the Alberta Environmental Monitoring Panel report on the Alberta Environment website at **http://environment.alberta.ca/03289.html**

On July 1st, WBEA assumed responsibility for operations and maintenance of our air quality monitoring network. Story on page 7.

On July 15th, WBEA met briefly with the Honourable Peter Kent, Minister of the Environment, and Deputy Minister Paul Boothe in Fort McMurray.

Ann Dort MacLean, WBEA President, represented WBEA at "The Energy Ministers' Reception", an event in association with the annual meeting of the provincial ministers of energy, at the Oil Sands Discovery Centre in Fort McMurray on July 17th.

In late July, WBEA took delivery of a new building to replace an older model at Athabasca Valley (AMS #7) air monitoring station in downtown Fort McMurray. The new building was supplied by Alberta Environment and Water, who supplied the equipment jointly with Environment Canada. In early September, the mobile building housing the Ambient Ion Monitor was re-located to the Athabasca Valley station compound.

Left: AMS# 7 Athabasca Valley.

On Aug. 10th, then Alberta Environment Minister, the Honourable Rob Renner, and AENV staff visited the WBEA Forest Health Monitoring plot JP104.

Kendra Thomas, WBEA summer student with the Ambient Air Program, has returned to her second year of the Environmental Technology program at Keyano College. All the best Kendra!

The 2010 Annual Report is available on line at **http://www.wbea.org/library/annual-reports**. Paper copies can be supplied by request.

On Sept. 13th, WBEA President Ann Dort-McLean and Executive Director, Dr. Kevin Percy, met with Fort McMurray Wood Buffalo MLA Guy Boutilier to update him on recent developments within our organization.

Kevin Percy (r) was a guest on Mix 103.7 McMurray Matters with host Leithan Slade (l), on Sept. 22nd.

WBEA's Human Exposure Monitoring Program (HEMP) Committee held an Odour Workshop on Sept. 28th. In attendance were HEMP committee members, WBEA scientific consultants and CEMA Air Working Group representatives.

Left: Workshop attendees (l to r) Shamini Samuel, Suncor; Sunny Cho, AEW; Jane Percy, WBEA; Kim Carnochan, WBEA; Prabal Roy, AEW; Mark Anderson, Husky; Angela Pohl, Suncor; Lori Adamache, AEW; Wally Qin, AEW; Brooke Bennett, Syncrude; John Dennis, Fort McKay and WBEA-HEMP Alternate Chair; Allan Legge, WBEA; back row (l to r) Bob O'Brien, VOC Technologies; Randy Visser, Nexen and WBEA-HEMP Chair; David Spink, Fort McKay; Thierry Pagé, Odotech; Lance Miller, Devon; Kevin Percy, WBEA; Nick Veriotes, Total; Asish Mohapatra, Health Canada.

CONTINUED ON **NEXT PAGE**

WBEA's Classroom Visit Program for Grade School and College Students

Teachers and Instructors...
Would you and your students like to learn more about WBEA's air quality and terrestrial environmental monitoring in the RMWB?

WBEA scientists and technicians will come to your classroom and present an informative program explaining our science based monitoring work in the region. Our Mobile Monitoring Unit can give students a first-hand look at air quality monitoring in action.

Additionally, WBEA's classroom visit program will allow students to:

Discover how our regional air quality is monitored and reported:

- Where WBEA's air monitoring stations are located and why
- Which pollutant specific instruments and analyzers are in use
- How you can access our hourly air quality data

Learn more about our terrestrial environmental monitoring:

- How our recent intensive forest health survey was conducted
- How trees, plants and lichens provide evidence of pollution dispersion

Hear about our emphasis on regional odour investigation:

- Unique instruments WBEA has installed in the region to decipher odour composition
- How our air quality data are used to calculate the Air Quality Health Index

Enquire about working in the environmental field:

- Ask our scientists and technicians about their educational and career experience
- Find out how our staff perform their duties

Tour our Mobile Monitoring Unit:

- See air monitoring equipment in action

For more information on WBEA's school visit program, please contact Jane Percy, WBEA Communications, jpercy@wbea.org, 780-747-8212

Above: Mobile Monitoring Unit.

On Oct. 6th, WBEA issued a response to the 2011 October Report of the Commissioner of the Environment and Sustainable Development. The response outlined our organizations strong science foundation and our important role in environmental air monitoring in the Athabasca Oil Sands Region. Read the response in the News Room section of WBEA's website (**www.wbea.org/news-room/media-releases**).

WBEA held the 1st Annual Member's Open House on Oct. 18th. Members had the opportunity to visit and learn more about the operation of an air monitoring station, a forest plot and the new WBEA Field Operations Centre.

On Oct. 25th, WBEA hosted representatives of the North East States for Coordination of Air Use Management (NESCAUM **http://www.nescaum.org/**). Arthur Marin, Executive Director, Paul Miller, Deputy Executive Director, and Andrew Dick, Environmental Analyst toured WBEA's Patricia McInnes air monitoring station in Timberlea.

Above: (l to r) Kevin Percy, WBEA, Paul Miller, Andrew Dick and Arthur Marin, NESCAUM, and Kelly Baragar, WBEA, during a tour of AMS 6.

Above: Kevin Percy at OSIP Press Conference with Minister McQueen.

WBEA distributed the electronic newsletter WBEA@Work, our third quarter update of news and developments, on Nov. 1st. View the newsletter at **http://www.wbea.org/library/wbeawork-quarterly-newsletter.**

On Nov. 9th, a meeting of the Berry Focus group of community members of Fort McKay was held.

The MP for Etobicoke North, Kirsty Duncan, and Legislative Assistant, Ryan Murphy visited WBEA, on Nov. 9th.

Kevin Percy represented WBEA at the launch of the online information portal for environmental information and data related to Alberta's oil sands, on Nov. 10th, at the University of Alberta in Edmonton. Kevin participated in the launch and press conference with the Honourable Diana McQueen, Minister of Environment and Water and Dr. Andrew Leach, University of Alberta. WBEA's air monitoring data may be accessed via the portal at **http://environment.alberta.ca/apps/osip**

WBEA's Website Redesign

WBEA's website has recently been transformed with a fresh new look, improved functionality, and added features.

Central to the redesign was a desire to have science "front and centre" on the website, which is a vital gateway to programs and data for Members, stakeholders and the public. Profiles of scientists working with WBEA are being populated in the "Meet Our Scientists" section, which can be accessed from a quick-link button on the home page. Additionally, a revolving photo display showcases scientists and staff in the field performing essential monitoring activities for WBEA.

Alberta's recently adopted Air Quality Health Index (AQHI) is displayed in the upper left corner of the home page with clickable access to a table explaining the Index, identifying the numerical health risks and providing enhanced health messages. Links to the Alberta Environment and Water website provide additional information on the Index. WBEA's air monitoring stations at Fort Chipewyan (AMS 8), Fort McKay (AMS 1), Fort McKay South (AMS 13), and Athabasca Valley (AMS 7) are presently included in the calculation of the regional, hourly updated, AQHI.

Check out additional features of the website redesign, including an updated interactive map of air monitoring stations, links to WBEA's promotional vignettes and You Tube page, and a re-structured "What's New" section.

WBEA's new website will continue to evolve with our programs and activities, so visit **www.wbea.org** often for news and updates.

FOR MORE INFO ON THIS PUBLICATION OR OUR WORK, CONTACT:

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