Annual Report 2006—2007



WESTERN BOREAL GROWTH AND YIELD ASSOCIATION April 2007

CONTENTS

Executive Summary and Highlights	2
Message from the Chair	3
Mission Statement and Goals	4
5-Year Objectives	5
5-Year Program (2007-2011)	6
Current Research Projects	7
Membership	8
Research Progress in 2006	9
2006-2007 Long Term Study	10
MGM Development	11
Silviculture and Ecology	14
Meetings in 2006 and 2007	18
History of Meetings	19
Financial Statements	20
Member Contact Information	21



Executive Summary and Highlights

The Western Boreal Growth and Yield Association first met in the mid 1980's as an informal group of agencies involved in forest growth, yield, inventory and planning in western Canada. The association works to: encourage member agencies to work in a coordinated fashion to improve the efficiency of their research and development efforts; facilitate data sharing; and, provides a forum for communication. We are focused on development and dissemination of growth and yield modeling technology and information for both natural and regenerated stands in the western boreal mixedwood region, primarily aspen and spruce.

Current membership in the association includes seven forest companies and three provincial/territorial governments (Alberta, Saskatchewan and the Northwest Territories).

Continuing work on the long-term study designed to examine the effects of manipulating aspen density on growth and yield of mixedwood stands during 2006 has focussed on cleaning and archiving of all data collected through 2006. Work on the Mixedwood Growth Model continues, with support received from the Forest Resource Improvement Association of Alberta (FRIAA) and the Mixedwood Management Association and the release of a new version and a workshop in May of 2007. In addition, a number of studies are underway that will contribute to better or more efficient tending of young mixedwood stands. Two papers were completed for publication in the past year.

This Annual Report presents highlights of work accomplished during 2006, and briefly outlines plans for 2007.



April 2007

Substantial progress continues to be made on several WESBOGY priorities during 2006. The database for the long-term study now contains all current data through 2006, with final corrections only now required to deal with aging of replanted trees. We have energetic plans to complete compilation and analysis of this data (a priority for 2007!). Work on MGM, funded by the Forest Resource Improvement Association of Alberta, the Alberta Mixed-wood Management Association, and WESBOGY, has focused on completion of an updated release that provides realistic representations of mixed stand dynamics. Mike Bokalo, Steve Titus and Ken Stadt are leading work on MGM.

We had a successful and well attended fall meeting in Dawson Creek in August of 2006. Work on a number of student projects is progressing well. You will find information on some of the research that Cosmin Filipescu, Sheelah Griffith, Cosmin Tansanu, and Fang Ye are doing in the report.

During the winter, I have had the priviledge to be involved as a team member in development of an NSERC Proposal for establishment of a ForValue Strategic Network. The objective of this network is to develop a series of new and integrated models to support better decision making in support of improving the economic value gained from Canadian boreal forests. Dr. Alain Cloutier (Univ. Laval) and Dr. Tony Zhang (FPInnovations) are the leaders of this project, which will involve researchers from several universities and research agencies across Canada.

The coming year holds new promises as we continue work on the LTS data, on MGM and on many of the associated projects that we have underway. This report contains information on several of our projects. If you require any further information please contact Mike Bokalo or myself.



Phil Comeau Chair, WESBOGY Dept. of Renewable Resources University of Alberta 442 Earth Sciences Bldg. Edmonton, AB T6G 2E3 Email: phil.comeau@ualberta.ca The purpose of the WESBOGY Association is to conduct research projects that contribute to the development and dissemination of growth and yield information and modeling technology for both natural and regenerated stands growing in the boreal mixedwood region, primarily aspen and spruce.

Individual projects and/or students sponsored with Association resources should make progress in achieving this mission. Sponsored projects include those supported using Association resources. Associated projects are identified with the Association but are funded by individual (or groups of) members or other sources. A business plan outlining project priorities and allocation of resources to accomplish the mission has been developed and periodically reviewed with the participation of Steering Committee members.

GOALS

- 1. To develop and implement a program of research in the study of growth and yield and stand dynamics focused on problems of interest to members of the Association. Projects will have defined goals and products, and will be completed in a timely manner.
- 2. To increase knowledge and awareness of growth and yield relationships, as they exist in western and northern Canada.
- 3. To foster communication, cooperation and exchange of information among the members as well as various agencies and groups concerned with management and development of boreal forests.
- 4. To focus on the dynamics of mixedwood stands of aspen and white spruce growing in the boreal forest. Basic relations to be studied will include establishment, ingrowth, growth, and mortality. While the major species of interest are aspen and white spruce, other species such as balsam poplar, lodgepole pine, black spruce, and jack pine will also be studied. In developing simulation models based on these relations, provision will be made for projecting stands subject to multiple interventions (treatments) through the life of the stand. Differences between Natural Subregions (Ecoregions) and site productivity will also be evaluated where there is sufficient data.
- 5. To encourage the establishment and continued monitoring of standardized permanent sample plots (PSPs) to quantify the effects of forest management practices in natural and regenerated stands, and in general to coordinate the acquisition of high priority growth and yield data.
- 6. To identify, evaluate, rank and address areas of research which are: of regional importance, of shared mutual interest, and most effectively approached cooperatively by the Association rather than by individual efforts;
- 7. To facilitate the dissemination of growth and yield data through the development of appropriate procedures, standards and databases for members' use.

The following table lists measurable objectives identified for the 2006-2011 Agreement. It also includes links to the overall goals of the WESBOGY Association.

5-Year Objectives	Related Goals
1. To maintain the WESBOGY long-term study designed to evaluate the effect of spruce and aspen density levels on the development of plan- tations from establishment to final harvest. Maintain and update the database for the WESBOGY long-term study. Complete analysis of data. Encourage new members to participate in the long-term study.	Goal #1 and #5
2. To develop and refine growth and mortality relationships and incorporate these new relationships into the MGM growth simulator.	Goal #1 and #2
3. To expand the scope of the MGM growth simulator as a tool for the development of managed stand yield projections for the major commercial tree species in the region. This will also include providing support for studies required to develop models of tree and stand response to establishment, tending and harvesting practices.	Goal #4, #5, and #6
4. To maintain a website that will identify, evaluate and disseminate infor- mation on trends in growth and yield research;	Goal #3 and #7
5. To hold annual field and technical meetings for dissemination of informa- tion obtained from ongoing research projects as well as other speakers invited to address other relevant growth and yield issues.	Goal #3 and #7
6. To expand the scope of WESBOGY activities by recruiting new members and seeking opportunities to augment the research component by secur- ing funding from other granting agencies.	Goal #1, #2, #3 and #6
7. To identify and summarize regional PSP database standards and protocols for data exchange and use with regional growth models.	Goal #2, #3, #5 and #7
8. To collaborate with other agencies and organizations in the development of research and acquisition of data to support a better understanding of and development of models to estimate effects of silviculture on yield.	Goal #1, #2, #3 and #4
9. To identify and prioritize research needs and to initiate new projects as appropriate under the direction of the Steering Committee and members.	Goal #1, #2 and #6

5-Year Program (2007-2011)

- 1. To continue analysis of the WESBOGY long-term study data including:
 - Height, diameter, and density patterns for aspen in the natural plots.
 - Height and diameter growth of spruce and aspen in treated plots.
 - Mortality of spruce and aspen in treated plots.
 - Recruitment (ingress) of new trees into natural and treated plots.
 - Preparation of manuals and reports for distribution to members and for journal publication.
- 2. To continue development of MGM to improve its ability to represent stand responses to silviculture. This will include;
 - Partial cutting amount and method.
 - Site preparation.
 - Brushing and vegetation management
 - Influence of site, age and other factors on aspen-conifer interactions..
- 3. To update the WESBOGY long-term study data collection manual and the WESBOGY web site.
- 4. To seek to expand the scope of WESBOGY activities and influence.
 - To identify and approach potential new members;
 - To seek opportunities and develop proposals for potential complementary funding from other agencies.
 - To work with other groups and co-operatives and to promote WESBOGY activities in both silviculture practices and growth modeling.
- 5. To organize the WESBOGY Fall, Spring, and Steering Committee meetings each year. Prepare the meeting minutes and WESBOGY annual reports.
- 6. To develop height, diameter, and mortality functions for other species.
 - To develop relationships for poplar and black spruce using available PSP data.
 - To prepare manuals and reports for distribution to members and for journal publication.
- 7. Review, summarize, and prepare a report of regional PSP database standards and protocols for data exchange and use in regional growth models.
- 8. To review and update the list of priority and ongoing projects.
- 9. To undertake high priority research projects as recommended by the Steering Committee and approved by the members.



The following table *summarizes* current projects and their respective priorities. For a complete description of projects and proposed projects see the WESBOGY 2005 Annual report.

Current Research Projects

	Subject/Title	Status and Priority
1.	Development of MGM	Status: Underway Researchers: Mike Bokalo, Ken Stadt, Steve Titus, Phil Comeau
2.	Maintenance of Long Term Study Database	Status : Underway Researchers : Mike Bokalo, Phil Comeau, Susan Humphries
3.	Analysis of Long Term Study Data	Status : Underway Researchers : Mike Bokalo, Phil Comeau
4.	MGM-Volume Loss Factor development	Status : Near Completion Researchers : Cosmin Tansanu (M.Sc.). Mike Bokalo and Phil Comeau
5.	Competition dynamics in young mixedwood stands	Status : Initiated 2001 Researcher : Cosmin Filipescu (PhD) and Phil Comeau;
6.	Evaluation of competition indexes using LTS data	Status: underway Researcher: Phil Comeau
7.	Evaluating the predictive performance of sev- eral growth models calibrated for Saskatchewan	Status : Near Completion Researchers : Cosmin Tansanu (MSc), Mike Bokalo and Phil Comeau
8.	Grass and aspen competition for water	Status: Initiated 2004 Researcher: Phil Comeau
9.	Effects of aspen density and basal area on un- derstory LAI and plant community diversity.	Status: Initiated in 2006. Researcher: Sheelah Griffith (M.Sc.) Phil Comeau
10.	Competitive effects of willow and aspen on white spruce growth in mixedwood stands	Status: Initiated 2006 Researcher: Fang Ye, Phil Comeau
11.	Stand Density and its relationships with produc- tivity and understory vegetation	Status : Initiated 2007 Researcher : Valentin Reyes-Hernandes, Phil Comeau
12.	Benchmarking Natural (fire origin) stand regeneration.	Status: Initiated 2007 Researcher: MSc Student, Mike Bokalo, Ken Stadt and Ellen Macdonald

Agency/Company	Current Membership
Alberta Sustainable Resource	Since 1985
Alberta-Pacific Forest Industries Inc.	Since 1990
Alberta Plywood	Since 1985
British Columbia Ministry of Forests	1985-2003
Canadian Forest Products	Since 1985
Daishowa-Marubeni International Ltd.	Since 1990
Louisiana-Pacific Canada Ltd.,, British Columbia	Since 1997
Louisiana-Pacific Canada Ltd., Manitoba	Since 1996
Manning Diversified Forest Industries Ltd.	Since 1997
Northwest Territories Resources, Wildlife and Economic Development	Since 1985
Saskatchewan Environment and Resource Management	Since 1985
University of Alberta	Since 1985
Weyerhaeuser Company, Alberta Forestlands	Since 1985
Weyerhaeuser Company, Saskatchewan Forestlands	Since 1985

Steering Committee Members

A Steering Committee, consisting of three members elected to the Committee at the Annual Fall meeting, and the Chair and the Research Scientist sets policy, develops strategic objectives and priorities, reviews work plans, adjusts annual membership assessments in light of planned activities, and deals with other items which may arise.

2000 Titus, Wang, Behuniak, Niemi, Weeks 2001 Titus, Behuniak, Niemi, Nichol, Ewan 2002 Titus, Bokalo, Comeau, Behuniak, Niemi, Nichol, Ewan 2003 Comeau, Bokalo, Titus, Behuniak, Niemi, Nichol, Ewan/Ashley 2004 Comeau, Bokalo, Titus, Behuniak, Nichol, Ashley, Whittaker 2005 Comeau, Bokalo, Titus, Behuniak, Nichol, Ashley, Whittaker 2006 Comeau, Bokalo, Behuniak, Nichol, Blue/Ashley, Whittaker/Whitmore

Long Term Study of Aspen/Spruce Stand Development

The design of the Long-Term Study involves planting white spruce seedlings in recently clearcut areas where aspen regeneration had already been established. Spruce seedlings were planted in both the plot and buffer areas. For the first 5 years, vegetation is controlled by clipping or using plastic mulch mats within a 40 to 50 cm radius of the spruce. After 5 years, both the spruce and aspen are thinned to desired treatment densities. The objectives of the thinning are to achieve desired densities but retain potential crop trees at relatively uniform spacing. The study uses a randomized block design with each agency setting up and maintaining one block, comprised of two installations. Each installation consists of two replications of a series of 15 plots.

In 2006, along with the annual collection of tree data, the main focus was the continued cleaning and checking of the data collected to 2005. The focus moved from single record checking to validating the re-measurements of single trees over time. Because each individual agency had subtle differences in the year the spruce was planted relative to the year the aspen was harvested, the stock type used and the month and year the treatment was done, a standard approach to consistently date each installation was needed. At the 2006 fall meeting in Dawson Creek, the morning session was dedicated to dealing with all the long terms study database issues including dating. Protocols for the measurement of the spatial, ecological, site and soils data was also reviewed and agreed upon. The first draft of the new data collection manual was made available to the members for review.

The first publication of analyses relating to the Long Term Study was published in early 2007.

Bokalo, M., Comeau, P.G., and Titus, S.J., 2007. Early development of tended mixtures of aspen and spruce in western Canadian boreal forests. For. Ecol. Manage. 242, 175-184.

The plans for 2007 include the first distribution of complete databases to the members and the first summaries and analyses.



Company or Agency	Agency Code	Site	Year Spruce Established	Measurements Including 2006
Alberta Sustainable Resource Development	SRD	Med	1992	15
Alberta Sustainable Resource Development	SKD	Ivicu	2001	6
Alberta Pacific Forest Industries Inc.		High	1994	10
Alberta-1 active Porest industries file.	ALI	Med	2001	5
Canadian Forast Products I td	CEP	High	2000	6
Canadian Porest Products Etd.	CFK	Med	2001	5
Deishowa Mambani International I to	DMI	High	1992	15
Daisnowa-Marubeni international Ltd.	DIVII	Med	1992	15
Louisiana Daoifia Canada Ltd. Manitaha	LDC	High	1998	9
Louisiana-Facine Canada Ltd., Maintoba	LPC	Med	1998	9
Louisiana Pacific Canada Ltd. Dawson Craak	נים ז	High	2001	6
Louisiana-racine Canada Ltd., Dawson Creek		Med	2004	3
Northwest Territories Resources, Wildlife and	NWT	High	1993	14
Economic Development		Med	1993	14
Alberta Divisionad	A DI	High	1992	15
Alberta Flywood	APL	Med	1993	14
Wayarhaayar Company Alberta Forastlands	WCP	High	1991	16
weyernaeuser Company, Arberta Forestrands	WOF	Med	1991	16
		PA High	1990	17
Weyerhaeuser Company, Saskatchewan	WDA	PA Med	1990	17
Forestlands	WPA	BR High	1992	16
		BR Med	1992	16



Forest Resource Improvement Association of Alberta Open Funds Initiative to further develop MGM's capabilities.

In 2006 the development of MGM was in its third and final year of a 3 year project supported by the Forest Resource Improvement Association of Alberta (FRIAA) - Open Funds Initiative to further develop MGM's capabilities. The project ended with the submission of our final report to FRIAA on December 31st, 2006.

This collaborative project involved the University of Alberta Department of Renewable Resources, the Government of Alberta, the Western Boreal Growth and Yield Association and the Alberta Mixedwood Management Association (MWMA) is lead by Phil Comeau (Principle Investigator) and Mike Bokalo (Project Leader). The project was designed to incorporate into MGM the flexibility and functions that were needed to model and assess growth and yield implications of current and future forest management strategies and silvicultural prescriptions in Alberta's boreal mixedwood forests. The project was directed by a Strategic Development Team whose members are: Phil Comeau, Steve Titus, Mike Bokalo, Ken Stadt, Greg Behuniak, Gitte Grover, Ken Greenway, Yuqing Yang and Willi Fast. This committee has agreed to continue to act as an advisory body in the continued development of MGM.

Mixedwood Growth Model (MGM) Development

Mike Bokalo, Ken Stadt, Phil Comeau, and Steve Titus

The project was originally envisioned to 1) improve the juvenile stage of the model with new data, 2) enhance silvicultural treatment modeling, and 3) develop volume loss factors to account for differences between PSP-based model yield and landscape strata average yield. Each of these areas was addressed. Significant additional mid-rotation modeling work was also completed in response to strong industrial interest in alternative regeneration standards (ARS), and the need for MGM to link juvenile performance with future yield. The final product is a growth and yield model which produces unbiased predictions in terms of the industrial and provincial PSP data available. Although there are little data for developing and testing a growth and yield model at mid-rotation, MGM now better reflects growth dynamics in this region. Juvenile post-harvest modeling and silvicultural treatment responses have been enhanced through some significant improvements to the model architecture. Our understanding of the sources of yield differences between PSP-based models to the landscape average has also been improved, and a mechanism built to evaluate block level patchiness.

In 2007 plans include an MGM User workshop linked to a model release, the continued development and testing of growth and mortality relationships and the continued development of the MGM multistrata model.

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Volume Loss Factor (VLF) Study

Cosmin Tansanu, Mike Bokalo and Phil Comeau

The VLF project was designed to better understand how within stand structure and variability was linked to volume variation. It was felt that the major reason for the differences in stand volume variation and landscape level yield was that most stands are not fully stocked due to natural "holes" or "patches". These patches may be caused by poor establishment or natural events such as insect and disease, wind-throw or landscape features (wet areas or rock). Many of these patches are too small to be delineated during the mapping process and are accepted as part of the natural variability within a stand.

The main objectives of the project focused specifically on understanding how volume differed within a single AVI type call (stratum) using canopy cover as the independent variable. Canopy cover was chosen because it was easily obtained from aerial photo and therefore easily applied in practice.

Main Research Questions

- 1. Is there is a relationship between canopy cover and stand volume and could this relationship be used to adjust MGM predictions?
- 2. Do less fragmented stands (homogeneous) have higher volumes than highly fragmented stands (heterogeneous)?
- 3. How much heterogeneity exists in stands that are considered homogeneous?
- 4. Can a fragmentation index be developed to be used in adjusting down the model predictions?
- 5. Does modeling several cohorts, representing different stand fragments, better predict the stand volume than a single cohort representing the average of the stand?

Study Design and Sampling:

Twenty two AVI polygons (12 pure aspen and 10 spruce dominated) were selected from two different geographic locations in the province. The polygons were similar by type call and considered similar in all aspects (height and species composition were considered constants). From aerial photos, the selected polygons were further stratified into 10% canopy cover classes referred to as fragments. Each fragment was then intensively sampled using randomly placed TSPs. A total of 425 plots were established and measured (14080 trees). In Grande Prairie 111 plots were used to sample six aspen dominated stands and 89 plots were used to sample the five spruce dominated stands. In Lac La Biche, 125 plots were used to sample six aspen dominated stands and 100 plots for five spruce dominated stands. The relationship between volume and canopy cover was investigated.

Preliminary Results

In relation to research question 1, the linear model expressing volume as a function of canopy cover explains only a small portion of the variation within the polygons and between polygons (Figure 1), although according to the literature this relationship should have been strong. The addition of other independent variables such as height, site index, age, and measures of stand structure significantly improve this relationship but practically are difficult to obtain.

The results indicate that there is large variation within a single AVI polygon or type call. It also shows that canopy cover which is assumed to represent stocking, cannot in itself adequately explain the volume variation with a polygon. The main implication is that inventory polygons are often considered equivalent to biological stands and thus treated as though they are homogeneous units. This does not hold true for the stands sampled and if this trend is maintaned over the inventory as a whole, has important management implications.



Figure 1 shows the relationship between photo interpreted canopy cover and volume for plots from both aspen and spruce stands. All locations show trends however the relationships in general are weak.

Benchmarking Natural Origin Stand Development

Mike Bokalo, Ken Stadt and Ellen Macdonald

In 2006 a project proposal to Forest Resource Improvement Association of Alberta (FRIAA) - Open Funds Initiative was approved. The project supported by the Mixedwood Management Association and WESBOGY is to begin in mid 2007. The objective of this project is to obtain benchmark data from natural (fire) origin pure and mixedwood stands and compare this to post-harvest stand data. A secondary objective is to provide a range of juvenile natural origin stand conditions (density, stocking, size distribution) to assist in initializing growth and yield models. This will allow more appropriate testing of these models against the natural origin mature data (PSPs, TSPs) which are currently used for final yield evaluation.

Evaluating the effects of aspen density manipulation on understory light and spruce growth across a range of boreal mixedwood sites in Western Canada

Cosmin Filipescu and Phil Comeau

The study was initiated in 2002 to evaluate the ability of competition indices to predict light and spruce growth following precommercial thinning of young aspen stands. WESBOGY installations established by WeyCo Grande Prairie, WeyCo Prince Albert, HWP Hinton, and DMI Peace River were used. The emphasis of the study was to explore the regional variation of relationships between competition, light and spruce growth.

Main findings:

- Light transmittance was predicted most effectively by competition indices including crown information (i.e. aspen crown surface area and volume), followed closely by indices based on density, such as aspen basal area;
- Relationships between competition indices and transmittance were similar across the range of sites, however significant differences were detected (Fig. 1);
- Models of spruce growth as a function of competition explained less than 60% of growth variation. Stem volume increment was a better response variable than diameter and height growth;
- The addition of initial size to competition increased the predictive ability of growth models up to 90%. Initial diameter provided better results than initial height or crown size. Best models were provided by models combining basal area and initial diameter (Fig. 2), followed by light transmittance and initial diameter;
- Models of spruce growth differed significantly between geographical locations, suggesting the need to develop local models relating spruce to competition.

Funding for the study was provided by WESBOGY, NSERC and University of Alberta. In January 2007 a manuscript was accepted for publication in Canadian Journal of Forest Research. Following publication, an extension note summarizing main findings and their practical implications will be prepared and made available to industry partners.



Figure 1. Relationships between light transmittance (DIFM) and basal area (BA) of overstory aspen for the studied sites. Lines shown are based on nonlinear regressions fit to data. Tests indicated significant differences between locations (PR = Peace River, PA = Prince Albert, GP = Grande Prairie, EDm = Edson medium, EDs = Edson superior) (adapted from Filipescu and Comeau 2007, in press)



Figure 2. Relationships between stem volume increment of spruce and aspen basal area and initial spruce diameter (Dsw) for Peace River medium. Lines shown are based on nonlinear regressions fit to data for 3 selected size classes (adapted from Filipescu and Comeau 2007, in press)



Effects of aspen thinning on plant community diversity and leaf area index.

Sheelah Griffith and Phil Comeau

Pre-commercial thinning is used by forest managers implementing mixedwood stands to improve early spruce growth under the aspen by increasing resource availability to the understory. However, the impacts of thinning on understory plant community diversity in western boreal forests are not well understood.

During the summer of 2006, data were collected from the Western Boreal Growth and Yield (WESBOGY) long term study site near Grande Prairie to evaluate the effect of pre-commercial thinning on the development of understory plant community diversity in a spruce aspen stand. Results indicate that overstory leaf area was not significantly correlated with understory diversity or richness, total cover or height. Willow and grass height were found to be positively correlated with aspen basal area. Tree richness was negatively correlated with aspen basal area. Understory cover, richness and diversity were not related to aspen basal area.



Figure 1. Relationship between aspen basal area (m2/plot) and total percent cover.

An ordination (Redundancy Analysis) suggested a shift in species composition towards shade intolerant species (Betula papyrifera, Fragaria virginiana) in the most heavily thinned sites and shade tolerant species (Actaea rubra, Cornus stolonifera) in the densest stands. Increasing spruce density also seemed to cause a shift in species composition towards the shade intolerant species.

These results suggest that pre-commercial thinning has had little effect on the understory plant community at the Grande Prairie WESBOGY site, 10 years after the initial thinning. Reducing the overstory density will cause a shift towards shade intolerant, ruderal species but over time, the aspen canopy will close and the differences become less prominent.



Figure 2. Relationship between aspen basal area (m2/plot) and modal grass height (cm).

Evaluation of competitive effects of willow and aspen on white spruce growth in western boreal mixedwood stands

Fang Ye and Phil Comeau

On the WESBOGY LTS sites in Grand Prairie there is a considerable amount of willow present. Understanding how willow and aspen influence resource availability and growth of white spruce is of potential value in developing management strategies and in refining regeneration standards. At this site we are examining the effects of neighbouring aspen and willow on spruce growth and light. In addition, data collected at this site are being used to examine; 1) whether the effects of aspen on spruce growth change over time between ages 5 and 16; and, 2) whether optimum neighbourhood search radius and zone of influence of aspen changes over time.

Current Graduate Students and Their Thesis Project Titles

Cosmin Filipescu (Ph.D.) - Effects of competition, site, and age on white spruce growth.

Cosmin Tansanu (M.Sc.) – The role of gaps and stand fragmentation in estimating stand yields.

Sheelah Griffith (M.Sc.) – Characterization of plant community leaf area index and understory vegetation development following pre-commercial thinning in boreal mixedwood forests

Valentin Reyes-Hernandez (Ph.D.) - Stand Density and its relationships with productivity and understory vegetation in the boreal mixedwoods in Western Canada

Fang Ye (M.Sc.) - Evaluation of competitive effects of willow and aspen on white spruce growth in western boreal mixedwood stands

WESBOGY Annual Fall Meeting August 28 - 30, 2006 Hosted by: Louisiana-Pacific Canada Ltd. Dawson Creek, B.C.

August 28th	
Evening	Arrival - Evening Ice Breaker
August 29th	
8:00 am	Welcome
8:15 - 11:00 am	Long Term Study Workshop
	LTS Database
	New Data Collection Manual
	Data collection protocols for Site, Soils, Vegetation and Spatial data
11:00 - 12:00 pm	WESBOGY Business Meeting
12:00 - 1:00 pm	Lunch
1:00 - 5:00 pm	Growth & Yield Presentations
	Guest Speaker - Dan MacIsaac - Hotchkiss Study
	Student Presentations
	WESBOGY Research Update
6:30 pm	Evening Hosted Dinner
August 30th	
	Site Visits
	Bear Mountain
	Underplanting Trial - Craig Delong

Planned WESBOGY Meetings in 2007

The 2007 Annual Spring Meeting is planned for April 25, 2007

The 2007 Annual Fall Conference, hosted by Alberta-Pacific Forest Industries Ltd., Lac La Biche, Alberta. Sept 4th, 5th and 6th, 2007

Date	Sponsor	Location	
2006 Aug 29-Sept 1	Louisiana Pacific Canada Ltd.	Dawson Creek, BC	
2005 Aug 29 - Sept 1	Northwest Territories Resources, Wildlife	Hay River, NWT	
	and Economic Development		
2004 Aug 30 - Sept 1	Saskatchewan Environment – Forest Ser-	Prince Albert, SK	
	vice		
2003 Sept 9-11	Canadian Forest Products Ltd.	Grande Prairie, AB	
2002 Sept 9-11	Louisiana-Pacific Canada Ltd.	Riding Mountain, MB	
2001 Sept 9-11	Daishowa-Marubeni International Ltd.	Peace River, AB	
2000 Sept 6-8	Weyerhaeuser Company, Drayton Valley	Edson, AB	
1999 Sept 23-25	Weyerhaeuser Company, Prince Albert	Anglin Lake, SK	
1998 Oct 7-9	Alberta-Pacific Forest Industries Ltd.	Athabasca, AB	
1997 Oct 7-9	British Columbia Ministry of Forests	Dawson Creek, BC	
1996 Nov 6-8	Daishowa-Marubeni International Ltd.	Peace River, AB	
1995 Oct 11-13	Weldwood of Canada Ltd.	Hinton, AB	
1994 Oct 12-14	Weyerhaeuser Company, Alberta Forest-	Big River, SK	
	lands		
1993 Nov 4	University of Alberta	Edmonton, AB	
1992 Oct 6-7	Weyerhaeuser Company, Grande Prairie	Grande Prairie, AB	
1991 Oct 24-25	Weyerhaeuser Company, Prince Albert	Prince Albert, SK	
1990 Nov 22	University of Alberta	Edmonton, AB	
1989 Mar 15	Canadian Forest Service	Saskatoon, SK	
1988 Nov 4	Canadian Forest Service	Whitecourt, AB	
1998 Feb 4-5	Canadian Forest Service	HInton, AB	
1987 Mar 27	Canadian Forest Service	Edmonton, AB	
1986 Feb	Canadian Forest Service	Edmonton, AB	
1985 Nov 15	Canadian Forest Service	Edmonton, AB	
1985 Oct 24	Canadian Forest Service	Banff, AB	
1985 Mar 23	Canadian Forest Service	Edmonton, AB	

WESBOGY Website

With the assistance of Judy Jacobs (U of A, Department of Renewable Resources Webmaster / Multimedia Technician) our website is up and running. Changes include: having our own web address, a secure members area, and inclusion of both historical and current documents in readily accessible formats.

Check out our website at: http://www.wesbogy.rr.ualberta.ca/

April 1 2006-March 31, 2007

2006/2007 Expendtiures			
Description	Budget Amount	Expenditures	
Personnel:			
1. Research Scientist (including benefits)	\$70,000	\$74,430	
2. Graduate student stipend and/or independent research projects	\$15,000	\$1,321	
3. Field and office technical support	\$12,000	\$11,381	(2.5 months)
Travel, subsistence, and accommodation	\$7,000	\$12,854	\$8,000 Travel and Vehicle for LAI-2000 measurements
Computer software, equipment, maintenance	\$5,000	\$4,523	
Overhead (15%)	\$16,000	\$22,826	
Total	\$125,000	\$127,335	

Balance	
Opening Balance on account April 1, 2006	\$257,032
Member contributions	\$119,000
Total Expenditures 2006/2007	\$127,335
Balance at March 31, 2007	\$248,697

WESBOGY 2007/2008 Budget		
Description	Budget Amount	
Salaries & Benefits		
1. Research Scientist (including benefits)	\$73,500	(1 month of teaching paid by Dept)
2. Graduate student stipend and/or independent research projects	\$20,000	
3. Field and office technical support (LTS data and LAI measurements)	\$18,000	\$12,000 for RA, \$6,000 for LAI
4. Programmer/Analyst Support (MGM)	\$8,000	MGM (Steve Titus)
Travel, subsistence, and accommodation	\$11,000	
Computer software, equipment, maintenance	\$5,000	
Overhead (15%)	\$18,750	
Total	\$154,250	

Projected Balance at March 31, 2008	
Opening Balance on account April 1, 2008	\$248,697
Member contributions	\$125,000
Estimated Total Expenditures 2007/2008	\$154,250
Balance at March 31, 2008	\$219,447

Company or Agency	Contact	Email
Alberta Sustainable Resource	Dave Morgan (780) 422-5295	Dave.Morgan@gov.ab.ca
Development	Daryl Gilday (780) 422-5257	Daryl.Gilday@gov.ab.ca
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Canadian Forest Products Ltd.	Jill Ashley (780) 538-7793 Shayla Blue (780) 538-7740	Jill.Ashley@canfor.com Shayla.Blue@canfor.com
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University of Alberta	Phil Comeau (780) 492-1879 Mike Bokalo (780) 492-9038	Phil.Comeau@ualberta.ca Mike.Bokalo@ualberta.ca
Alberta Plywood Ltd.	Gary Harmata (780) 805-3718	Gharm@westfrasertimber.ca
A Division of West Fraser Mills Ltd	Gordon Sanders (780) 849-4145	Gordon.Sanders@westfraser.com
Weyerhaeuser Company,	Greg Behuniak (780) 539-8207	Greg.Behuniak@weyerhaeuser.com
Alberta Forestlands	Wendy Crosina (780) 451-9783	Wendy.Crosina@weyerhaeuser.com
Weyerhaeuser Company, Saskatchewan Forestlands	John Doucette (306) 953-5069	John.Doucette@weyerhaeuser.com

Western Boreal Growth and Yield Cooperative (WESBOGY)

c/o Department of Renewable Resources **University of Alberta 751 General Services Building** Edmonton, Alberta T6G 2H1

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Northwest Territories Resources, Wildlife and Economic Development

