

# Mixedwood Growth Model

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Prince George, BC

# MGM

- MGM is a distance independent individual tree model.
- Developed by S. J. Titus, U of A.
- Developed, calibrated and validated using ASRD permanent sample plot data.
- The model is also “localized” (site/tree volume functions/species codes) for use in other regions.
- Operates behind an Excel interface.

# MGM Strategic Development Team

- Phil Comeau – Principal Investigator, U of A
- Mike Bokalo – Project Leader, U of A
- Ken Stadt – Silvicultural and juvenile modeling, U of A
- Steve Titus – MGM Developer, U of A
- Vic Lieffers – U of A
- Greg Behuniak – WESBOGY
- Gitte Grover – MWMA
- Willi Fast – MWMA
- Ken Greenway – ASRD

# MGM Strategic Development

FRIAA, MWMA, WESBOGY funded redevelopment project: Jan 2004 – Dec 2006

- Update MGM juvenile functions (2004)
- Model silvicultural treatments (2005-2006)
  - Aspen density management
  - White spruce underplanting, understory protection harvesting
  - Site preparation, herbicide and brushing response
- Account for volume loss (OAFs) (2006)
  - Spatial dispersion and unstocked holes

# New Version of MGM (MGM2005A)

- Official release ....April, 2005
  - Fully functional
  - Validation against PSPs (long-term), RYSI, regeneration survey network (juvenile)
- Highlights
  - All components are driven by visual basic code
    - No install/uninstall procedure, a copy of the workbooks is all you need
    - User interface unchanged
  - New juvenile functions for aspen and white spruce
- MGM2005A on our website ....
  - Public assess freeware. Check regularly for updates:  
<http://www.rr2.ualberta.ca/research/mgm/mgm.htm>

# Juvenile Growth and Mortality

## ■ Aspen

- Height Increment – Ht, DecDenAbove, SI
- Basal Increment – BA, RH, JuvDen, JuvHt
- Mortality
  - Exponential Decay Function (initial density)
  - Max Size-Density Function
  - Survival Probability Function (allocate mortality)

# Juvenile Growth and Mortality

- Spruce
  - Height Increment – Ht, SFDec
  - Basal Increment – Ht, DecViewabove (JuvDecDen, JuvDecHt)
  - Mortality
    - Light – BA (Comeau 2001)
    - Radial Increment – L (Wright et al 1998)
    - Probability of Mortality – Growth (RI) (Kobe and Coates 1997)

# General Comments

- Juvenile validation –
  - Aspen - WESBOGY and SRD SDS data suggest juvenile aspen mortality and growth is doing well
  - Sw juvenile mortality too low but more responsive to aspen density
  - Sw growth is doing well
- Transition between post harvest and mature (fire origin) is supported by little or no data
  - Yield expectations and timing are unknown
  - Juvenile conditions are different (silviculture)
- Juvenile utilities (now need more work)
  - Juvenile models are now very sensitive
- Volumes are too high (growing PSPs)



# Current Initiatives

- Short Term – more detailed (larger dataset) validation of mature and juvenile models
- Long Term – depending on results of mature validation, further pursuit of modeling treatment effects.

# Volume Loss Factor (VLF) Project

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and Phil Comeau

June 29, 2005

Prince George, B.C.

# Objectives

- Develop for Alberta volume adjustment factors to bring MGM estimates in line with actual stand volumes.
  - Mature Stands
    - Natural
  - Juvenile Stands
    - Natural
    - Post Harvest
- Account for and quantify the volume loss from the different sources
  - Gaps
  - Clumpy distributions
  - MGM Modeling Assumptions

# Evaluating the predictive performance of several growth models calibrated for Saskatchewan

Mike Bokalo, Cosmin Tansanu and Phil Comeau

# Project Objectives

- Compare and evaluate the predictive performance of:
  - Saskatchewan Provincial Empirical Yield Curves, Golder and Associates Ltd, 2001.
  - Dendron and Flewelling Growth models; Preliminary natural stand growth and yield estimation for Saskatchewan, 1995.
  - Mixedwood Growth Model (MGM). S.J.Titus, University of Alberta
  - Saskatchewan re-measured permanent sample plot data.

# Partners

- Forest Development Fund (FDF)
  - Saskatchewan Forest Centre
- Saskatchewan Environment – Forest Service
- Weyerhaeuser – Prince Albert, Saskatchewan
- WESBOGY
- University of Alberta











