

Project Statement

BC Coastal Forest Sector Development Initiative

Program	Harvesting and Conversion
Project Title	Quantifying Impacts of Variability in Chip Supply on Pulp and Paper Processing
Project Number	H.05 (merged with project H.06)
Project Leader	Paul Bicho
Project Team	Barbara Dalpke, Faraz Zaidi
Start Date	October 2007
Completion Date	March 2009

Rationale:

Inherent variability in the BC coast hem-fir resource has been identified by industry as having a disproportionate influence on pulp mill operations and pulp/paper quality. This affects the efficiency of pulp mill operations and product quality which, in turn impact mill profitability and viability. The variation in furnish quality is affected by several factors such as the inherent wood quality, as influenced by site of growth, species mix, levels of decay, whether the wood in question is old growth or secondary growth, and whether the chips are from whole logs, sawmill residual or generated by some other process. Several other factors may also impact chip quality. Understanding how these different factors affect pulping and pulp quality, for both chemical and mechanical pulp mills, is key if maximizing value recovery from this significant wood volume is to be realized. This project focuses on identifying sources of furnish variability, assessing how to minimize swings in furnish variability in order to improve pulping and pulp quality, and, if warranted, to identify strategies for directing specific chip furnishes to target mills where value recovery can be maximized. In addition, this project also incorporates project H.06 “Demonstrate the effects of modern sawmills on chip quality”. This project addresses how industrial chipping affects chip quality, extending the scope of H.05 from the pulp mill back to source of the chips.

Key Objectives:

- Quantify the impact of wood/chip quality factors affecting pulping and pulp quality from the coastal hem-fir resource to determine the economic benefit, if any, of wood/chip segregation on the BC Coast
- Correlate chip furnish variability with pulp mill variability to quantify the impact of variability
- Assess what tools and options can be used to minimize swings in furnish variability
- Identify strategies, if warranted, for directing specific chips to targeted mills or process streams to maximize value recovery
- Evaluate the pulpability and pulp quality of residual chips generated by selected solid processing options and identify opportunities for maximizing the benefit from high quality chips (yield, pulp strength)

Project Methodology:

The project will utilize a VIS/NIR chip sensor developed by FPInnovations Paprican at a BC coastal pulp mill. The sensor can acquire chip quality information, on-line, at rates of 10 measurements per second and can estimate moisture content, species mixes, chip brightness and wood density. Calibrations for other chip quality attributes, such as bark content or intrinsic wood quality properties, are under development. In addition, other on-line, rapid assessment technologies will be reviewed. The data generated from these tools, coupled with knowledge about chip and wood quality gathered from chip suppliers (formerly project H.06), will be correlated with fluctuations in pulping and product quality and the economic implications of this will be assessed. This information will be used to assess whether further work on the segregation of chips based on wood/chip quality is warranted. If it is deemed that there are economic benefits to the pulp sector in controlling furnish quality via segregation, then this project will help define the economic parameters under which such strategies will be need to operate. If warranted, further projects on the segregation and tracking of wood and chips from forest to through to pulping will be developed.

Chips generated during this BC Coastal Initiative (Harvesting and Conversion Program – Solid Wood and Residual Products) will be evaluated for chip quality and pulped, both chemically and mechanically, and the quality of the ensuing pulps, including handsheet properties, will be determined. Residual chips from selected solid wood processing options will be sampled and characterized in a similar manner to determine if and how these chips deviate from expected baselines.

Project Milestones:

Activities	Planned Completion Date
Install chip sensor at TMP mills and calibrate Vis/NIR sensor Install at mill and validate	May 2008
Calibrate chip imaging system • calibrate with in-house chips and/or available chips from sampling	June 2008
Gather chip samples (5 sawmills and TMP mill) • gather samples from select chipping operations and chips from the TMP mill	July 2008
Analyze chips	August 2008
Kraft and TMP pulping (correlate chip quality with pulping) TMP bleaching trials (correlate bleaching with chip brightness)	October 2008 November 2008
Chip quality modeling	February 2009
Process modeling	February 2009
Reporting	March 2009

Key Deliverables:

- Chip quality and TMP process models correlating furnish quality with TMP processing and pulp quality.
- Strategies for maximizing chip value for the BC coastal pulp and paper industry

Expected Long-term Outcomes:

Reduced process and product variability leading to lower energy consumption in TMP refining of hemlock, reduced bleaching chemical demands for hemlock TMP.

Potential Impact:

Lower pulping and bleaching costs, less variability in pulp quality.

Collaboration:

Catalyst TMP mill at Elk Falls, VTT (chip sensor probe head manufacturer), C-CORE (image analysis), local chip consultants. Linked to other BC Coastal Initiative projects including H.02.