



# COAST MARKET PRICING SYSTEM

Update – 2018

**December 15, 2018**

Timber Pricing  
Branch



# Coast Market Pricing System – Update 2018

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## Table of Contents

1. Introduction .....	1
2. Auction Dataset.....	1
3. Benchmark and 4. Final Equations.....	1
5. Specified Operations .....	4
6. Tenure Obligation Adjustments .....	5
7. Summary.....	5
Appendix 1 .....	6
Final Estimated Winning Bid.....	7
Final Number of Bidders .....	8
Variables and Definitions .....	8
Appendix 2 .....	9
Specified Operations .....	12

# Coast Market Pricing System – Update 2018

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## 1. INTRODUCTION

The purpose of this paper is to provide an overview of the December 15, 2018 update to the Coast Market Pricing System (MPS).<sup>1</sup>

## 2. AUCTION DATASET

The auction dataset used in the update contains winning bids and data from 695 sales over the 12 year period July 1, 2006 through June 30, 2018.

## 3. BENCHMARK EQUATIONS

With the new auction dataset, the 2017 equations were re-estimated using the new dataset. No other changes were made.

The results are the benchmark equations, on the following pages.

## 4. FINAL EQUATIONS

After the major changes that came in the 2017 update, this year's update has been restricted to updating the auction dataset, the specified operations and tenure obligation adjustments. The structure of the estimated winning bid variables is unchanged.

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<sup>1</sup> This paper is not intended to provide the basis for calculating stumpage rates nor should it be used as guidance for interpreting the legal policies and procedures for calculating stumpage rates, which are contained in the *Coast Appraisal Manual (CAM)*. The *Coast Appraisal Manual* contains the policies and procedures referred to in Section 105 of the *Forest Act*.

## Coast Market Pricing System – Update 2018

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### EQUATIONS:

#### Winning Bid – 2017 and 2018 (benchmark)

Explanatory Variable	2017 Final		2018 Final (benchmark)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	-56.03	-12.14	-60.73	-12.81
3-Mo. Ave. Domestic Log Selling Price	0.6208	11.79	0.7969	16.83
Cedar Lumber	0.04081	7.642	0.02948	5.571
Fir Lumber	0.02708	3.246	0.01388	1.797
Hemlock Lumber	0.01403	1.942	0.01718	2.544
Cypress	36.27	4.404	34.26	4.132
Gambier Dist 400	-7.239	-3.681	-6.375	-3.168
Cruise Grades	6.444	4.382	8.149	5.587
Conventional Slope	-0.2664	-7.003	-0.2600	-6.789
Heli Land Drop	-43.11	-14.51	-45.28	-14.93
Heli Water Drop	-34.50	-8.177	-30.77	-7.683
Volume per Hectare/1000	20.63	7.499	17.66	6.368
Number of Bidders	2.812	13.95	2.976	14.82
Location	-0.07669	-6.345	-0.08412	-7.032
Second Growth Fir	7.579	2.288	9.322	2.964
Isolated	-7.744	-6.247	-8.284	-6.601
Lumpsum	-5.623	-4.165	-5.841	-4.275
Export Share * Non-Cedar-Cypress	31.31	4.966	36.61	5.658
Total Coast Harvest	0.8928	3.000	0.2369	1.211
<b>Number of Observations</b>	648		695	
<b>Adjusted R<sup>2</sup></b>	.785		0.803	

## Coast Market Pricing System – Update 2018

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### Number of Bidders – 2017 Final and 2018 Final (benchmark)

Explanatory Variable	2017 Final		2018 Final (benchmark)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	-1.901	-3.861	-1.792	-3.849
LN (Volume/1000)	0.2561	2.111	0.2469	2.120
Predicted Bid	0.05541	14.83	0.05511	17.05
Lumpsum	0.3252	2.111	0.2948	1.630
District Average Number of Bidders	0.7059	0.08456	0.6711	8.289
<b>Number of Observations</b>	648		695	
<b>Adjusted R<sup>2</sup></b>	0.370		0.402	

Note: LN means natural logarithm

## Coast Market Pricing System – Update 2018

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### 4. SPECIFIED OPERATIONS

The auction dataset used to develop MPS is comprised of 695 auctions. There are some harvesting situations that are not well represented in the auction dataset (for example, inland water transportation) and therefore, a specified operation cost estimate is used in the calculation of stumpage rates. See Appendix 2 for definitions of each specified operation.

The specified operations are shown below.

Specified Operations	December 2017 Update	December 2018 Update
Skyline Logging	Appraised as heli	Appraised as heli
Inland Water Log Transportation	\$6.75/m <sup>3</sup>	\$8.21/m <sup>3</sup>
Tree Crown Modification	\$35.05/tree (old growth)	\$38.22/tree (old growth)
	\$15.17/tree (2nd growth)	\$17.26/tree (2nd growth)
Clayoquot Sound Operating Costs	\$7.13/m <sup>3</sup>	\$8.47/m <sup>3</sup>
Helicopter Single Standing Stem Selection	\$37.78/m <sup>3</sup>	n/a
De-stumping for Root Disease Control	\$1,114/ha	n/a
Ecosystem Based Management	\$4.13/m <sup>3</sup>	\$6.67/m <sup>3</sup>
Haul Distance Above 100km	\$0.135/m <sup>3</sup> per km beyond 100km	\$0.135/m <sup>3</sup> per km beyond 100km
High Development Cost (only applies to BCTS upset rates)	See Section 4.4.9 of the Coast Appraisal Manual	See Section 4.4.7 of the Coast Appraisal Manual

## Coast Market Pricing System – Update 2018

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### 5. TENURE OBLIGATION ADJUSTMENTS

As outlined in the Coast Tenure Obligations Adjustment paper (dated July 1, 2012), the adjustments are based on cost surveys.

The tenure obligation adjustments are shown below.

Tenure Obligations	December 2017 Update	December 2018 Update
Forest Planning & Administration Cost	\$13.29/m <sup>3</sup>	\$13.51/m <sup>3</sup>
Low Volume Cost	\$7.51/m <sup>3</sup>	\$8.89/m <sup>3</sup>
Road Development Cost	See Section 5.3 of CAM	See Section 5.3 of CAM
Road Management Cost	\$1.90/m <sup>3</sup>	\$2.09/m <sup>3</sup>
Road Use Charges	Approved actuals	Approved actuals
Basic Silviculture Cost	\$3.01-\$10.64 /m <sup>3</sup>	\$2.84-\$10.95/m <sup>3</sup>
BCTS Infrastructure	\$0.18/m <sup>3</sup>	\$0.14/m <sup>3</sup>
Low Grade Adjustment	See Section 5.7 of CAM	See Section 5.7 of CAM
Return to Forest Management	1.070	1.074

### 6. SUMMARY

The new final equation, specified operations and tenure obligation adjustments will be used to calculate stumpage rates on the Coast, starting December 15, 2018.

**APPENDIX 1**

## Coast Market Pricing System – Update 2018

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### FINAL ESTIMATED WINNING BID

Dependent Variable: WB\*148/CPI  
 Method: Least Squares  
 Date: 10/04/18 Time: 12:56  
 Sample: 1 967 IF IN\_695=1  
 Included observations: 695

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-60.73210	4.740493	-12.81135	0.0000
NB	2.976253	0.200836	14.81928	0.0000
ALP_DOM*148/CPI	0.796857	0.047344	16.83134	0.0000
CEDAR*CEDAR_LUMBER_AMV*148/CPI	0.029475	0.005291	5.570836	0.0000
FIR*FIR_LUMBER_AMV*148/CPI	0.013875	0.007723	1.796506	0.0729
HEMLOCK*HEMLOCK_LUMBER_AMV*148/ CPI	0.017180	0.006752	2.544437	0.0112
CYPRESS	34.25539	8.290670	4.131800	0.0000
SLOPE*(1-HELI)	-0.260043	0.038301	-6.789446	0.0000
HELI_LAND	-45.28192	3.032325	-14.93307	0.0000
HELI_WATER	-30.76803	4.004590	-7.683192	0.0000
VPH/1000	17.66126	2.773627	6.367568	0.0000
LOCATION	-0.084117	0.011962	-7.032207	0.0000
FIR*SG	9.321908	3.144684	2.964338	0.0031
GAMB400_DUM	-6.375193	2.012490	-3.167814	0.0016
CRUISE_GRADES	8.148516	1.458549	5.586727	0.0000
ISOLATED	-8.283614	1.254843	-6.601315	0.0000
LUMPSUM	-5.840870	1.366437	-4.274526	0.0000
EXP_EXP_SHARE_12MR*(1-CEDAR- CYPRESS)	36.61118	6.470621	5.658062	0.0000
TOT_COAST_HARV_12MR	0.236928	0.195708	1.210623	0.2265
R-squared	0.807992	Mean dependent var		42.36422
Adjusted R-squared	0.802879	S.D. dependent var		25.69604

## Coast Market Pricing System – Update 2018

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### FINAL NUMBER OF BIDDERS

Dependent Variable: NB  
Method: Least Squares  
Date: 10/04/18 Time: 12:56  
Included observations: 695

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.792315	0.465633	-3.849198	0.0001
WBF*148/CPI	0.055107	0.003233	17.04692	0.0000
DANB_695	0.671146	0.080972	8.288659	0.0000
LOG(VOL/1000)	0.246889	0.116453	2.120073	0.0344
LUMPSUM	0.294768	0.180832	1.630065	0.1035
R-squared	0.405619	Mean dependent var		4.358273
Adjusted R-squared	0.402174	S.D. dependent var		2.428751

## Coast Market Pricing System – Update 2018

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### VARIABLES AND DEFINITIONS

PREDICTED BID	Used in the Number of Bidders equation: The estimated winning bid for the cutting authority from the corresponding winning bid equation, expressed in $\$/m^3$ .
3 MONTH AVERAGE LOG SELLING PRICE	Average coniferous log selling price estimate expressed in $\$/m^3$ . This is based upon a consideration of log grades and species for the cutting authority area, and schedules of log market values collected and published by the Timber Pricing Branch.
CEDAR LUMBER	A composite of cedar lumber prices times the fraction of cedar (C\$/mfbm, net of duties).
FIR LUMBER	A composite of fir lumber prices times the fraction of fir.
HEMLOCK LUMBER	A composite of hemlock lumber prices times the fraction of hemlock (C\$/mfbm, net of duties).
CYPRESS	The fraction of the coniferous cruise volume that is cypress.
SECOND GROWTH FIR	The fraction of the coniferous cruise volume that is Douglas fir, if the appraisal is classified as second growth. Zero if the appraisal is classified as old growth.
VOLUME PER HECTARE	Cruised volume of coniferous timber per hectare. Expressed in $m^3/ha$ and is rounded to 2 decimal places.
HELICOPTER LAND	For land drop only: The fraction of the total net cruise volume, including deciduous volume, of timber in a cutting authority area that must be helicopter yarded or yarded by skyline where logs are fully suspended more than 600 m in a straight line to the centre of the closest possible landing. This is calculated by dividing the total volume of timber that must be helicopter yarded or skyline yarded over 600 m by the total net cruise volume of the cutting authority area. HELILAND is in decimal form, rounded to 2 decimal places.
HELICOPTER WATER	As for HELICOPTER LAND but applies to water drop.

## Coast Market Pricing System – Update 2018

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CRUISE GRADES	If cruise is used as a source for log grades for the appraisal for greater than 50 percent of the total net cruise volume, then CRUISE GRADES = 1, otherwise CRUISE GRADES = 0
DISTANCE TO GAMBIER	POA distance is the average straight line distance, weighted by net cruise volume, between the geographic centre of each cutblock in the cutting authority area and Gambier Island.
GAMBDIST400	Where DISTANCE TO GAMBIER is greater than or equal to 400, GAMBDIST400 = 1, otherwise GAMBDIST400 = 0.
DISTRICT AVERAGE NUMBER OF BIDDERS	The average number of bidders for the forest district the cutting authority area is located within is listed in Table 4-2 of the CAM.
VOLUME	That part of the total net cruise volume in the cutting authority area that is coniferous timber except that where the cutting authority is a timber licence or is issued under a licence with an AAC greater than 10 000 m <sup>3</sup> , then VOL = 29,900. VOL is expressed in m <sup>3</sup> , rounded to the nearest whole number.
CPIF	The BC Consumer Price Index approved by the director for use on the effective date of the appraisal, reappraisal or quarterly adjustment, divided by the base CPI of 109.3.
LOCATION	The net cruise volume weighted average straight line distance measured in kilometres between the geographic centre of each part of a cutting authority area and the nearest support centre that is closest to that part of the cutting authority area.
ISOLATED	Isolated =1, if all parts of the cutting authority area are accessible by air or water only and is not serviced by public ferry service.
LUMPSUM	If the cutting authority is a cruise based competitive timber sale with a stand as a whole rate then LUMPSUM = 1, otherwise LUMPSUM = 0.
Export Share * Non-Cedar-Cypress	Export Share of non- cedar-cypress harvest (as published in monthly appraisal parameters) time the share of non-cedar-cypress.
Total Coast Harvest	Total Coast harvest (all lands and tenure types) in a recent 12 month period (million m <sup>3</sup> , as published in monthly appraisal parameters).

**APPENDIX 2**

## Coast Market Pricing System – Update 2018

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### SPECIFIED OPERATIONS

If sufficient auction data is not available, the ministry will, for those identified situations, implement specified operations.

The specified operations will be used to adjust the MPS stumpage rate for the estimated incremental cost of the identified situation. The explicit assumption is that if a bidder was faced with a similar situation he or she would lower the bid by the extra cost incurred because of the identified situation.

The situations that may be eligible for specified operations adjustment will be determined according to the following principles:

- The expectation that a bid would be influenced by this situation;
- representation (number of samples, if any, in the auction data set);
- materiality of estimated cost differential (supported by verifiable financial data); and,
- statistical analysis (including the premise that other represented situations and variables in the MPS database and equations may serve as a proxy for the situation in question).

The ministry, after considering the above and any other relevant technical information, may or may not designate the situation as an identified situation eligible for a specified operation and, if eligible, specify the dollars per cubic metre adjustment.

The ultimate objective is to have a representative auction database and hence, few, if any, specified operations adjustments.

The following are identified as specified operations for the Coast MPS.

**Cost estimates from the current *Coast Appraisal Manual* are used for a – g below.**

#### ***a) Skyline Logging***

For those areas within a cutblock that:

- are 600 metres or greater measured in a straight line horizontal distance from the centre of the closest possible landing or place where a landing may be located, and;
- are yarded by skyline.

#### ***b) Inland Water Transportation***

- Where logs must be towed on Great Central, Owikeno or Powell Lake or other authorized inland water location.

## Coast Market Pricing System – Update 2018

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### **c) *Clayoquot Sound***

- Recognizes the higher level of planning and engineering required by the scientific panel recommendations accepted by the government of British Columbia.
- Applies to Hesquiat Peninsula, Esowista Peninsula and the islands, sea and all waters draining into the Pacific Ocean from the height of land between Escalante Point and Quisitis Point.

### **d) *Tree Crown Modification***

- To protect the standing trees adjacent a harvested area by trimming tree crowns to reduce sail area and decrease the potential for windthrow damage.

### **e) *Ecosystem Based Management***

- Applies where Section 93.4 of the *Land Act* requires a higher level of land use planning and/or different harvesting methods as described in the *Coast Appraisal Manual*.

### **f) *Haul Distance Above 100km***

- A specified operation cost estimate for permits with haul distances greater than 100km from the cutting authority area to the final log dump.

### **g) *BCTS High Development Cost***

- Allows an upset rate reduction for BCTS auction sales with development costs exceeding \$14.99/m<sup>3</sup>.