Age Dating the Forest Service Branch Cores, Ministry of Environment, Government of Saskatchewan

Magali Furlan Nehemy, Scott Wood and Colin P. Laroque

MAD Lab Report 2016 – 04

University of Saskatchewan

Mistik Askiwin Dendrochronology Laboratory

Table of Contents

Abstract

During winter of 2016, the MAD Lab was contacted to examine tree cores and disk samples from a diverse number of species from various study sites across Saskatchewan. The purpose of the study was to determine the age of each sample using dendrochronological methods. Tree samples were sent to the MAD Lab from Saskatchewan Ministry of Environment, forest service Branch to be age dated.

Introduction

In the winter of 2016 the Mistik Askiwin Dendrochronology Laboratory (MAD Lab) was contacted by Steven Oldford and Lane Gelhorn to assess the age of 188 cores and 4 disk samples from different areas of Saskatchewan. The species analyzed include trembling aspen (*Populus tremuloides*), white spruce (*Picea glauca*), black spruce (*Picea mariana*), balsam poplar (*Populus balsamifera*), jack pine (*Pinus banksiana*), tamarack (*Larix laricina)* and white birch (*Betula papyrifera*).

Methods

The cores were identified and assigned each to a board according to a code represented on each straw. Each board and core received a number to keep track of them during the mounting and analysis processes (see Appendix I).

All cores samples were glued into slotted mounting boards and later sanded with progressively finer sandpaper grit: 80,120, 220, 320, 400, and 600-grit. Afterwards, the samples were smooth and their radial cell structures were clearly visibly under a microscope. Rings were then measured and counted using a Velmex stage system with a 63X microscope, precise to 0.001 mm. The age of each core was determined. For the cookies (disc) samples, the process were similar. They were first cut with a bandsaw, and then sanded using the same procedures outlined above.

Results

The measurement collected from the Velmex stage system of each tree sample provided a precise ring count for each core and cookie. However, some samples did not extend to the pith of the tree, or did not have bark present, while others were broken into several pieces, helping to explain the varying quality and accuracy of our results. Crossdating can often be crucial to determine the correct date of wood samples, but it could not be done in this case due to the absence of information about the site origin, and the young age of the majority of the cores (most less than 50 years old). Instead, the samples were measured more than once, even up to five times by up to three operators when any doubts arose to arrive at a conclusive date. That being said, there could still be some room for interpretation, specifically on the lower quality, more questionable cores delivered to the MAD Lab.

During the measurements, some important notes were taken related to some specific dendrochronological characteristic for each core. In most of the aspen cores, we were able to identify a small white ring often occurring in 1980 or 1981 depending on the plot. According to the literature, studies in western Canada have indicated a correlation between trembling aspen decline, past insect defoliation events and a narrow white-ring structure at this time period (Hogg

& Schwarz 1999; Hogg et al. 2002). This information was useful to help us correlate aspen samples from the same plot, assisting us to identify possible measuring mistakes during the analysis. Other observation can be observed in the Table 1.

Accuracy of the measurement according to core quality

	>		>	

Table 1 – Data analysis results.

Project	Plot	direction	species	date	height	BOARD	Core #	First year of growth	Last year of growth	Age	Dendro notes	Comments
MSPSP	PA-2003-03-sub	SE	WB	24/mai/14		BOARD 1	B11	2002	2013	11		
MSPSP	PA-2003-03-subA	SW	WB	24/mai/14		BOARD 1	B12	2004	2013	9		
MSPSP	PA-2003-03-sub	SE	TA	24/mai/14		BOARD 1	B13	2003	2013	10		
MSPSP	PA-2003-03-sub	NE	TA	24/mai/14		BOARD 1	B14	2003	2013	10		
MSPSP	PA-2003-03-subA	NE	TA	24/mai/14		BOARD 1	B15	2003	2013	10		No bark present
MSPSP	PA-2003-03-subA	SE	TA	24/mai/14		BOARD 1	B16	2003	2013	10		
MSPSP	PA-2003-03-subA	SW	TA	24/mai/14		BOARD 1	B17	2003	2013	10		
MSPSP	PA-2003-03-subA	NW	TA	24/mai/14		BOARD 1	B18	2004	2013	9		
MSPSP	PA-2003-03-subA	SE	BP	24/mai/14		BOARD 1	B19	2003	2013	10		
MSPSP	PA-2003-03-subA	SW	BP	24/mai/14		BOARD 1	B110	2004	2013	9		
MSPSP	PA-2003-05-subA	SE	TA	23/mai/14		BOARD 1	B111	2003	2013	10		
MSPSP	PA-2003-05-subA	NW	TA	23/mai/14		BOARD 1	B112	2003	2013	10		
MSPSP	PA-2003-05-sub	NE	TA	23/mai/14		BOARD 1	B113	2003	2013	10		
MSPSP	PA-2003-05-sub	NW	TA	23/mai/14		BOARD 1	B114	2005	2013	8		
MSPSP	PA-2003-05-subA	SW	TA	23/mai/14		BOARD 1	B115	2005	2013	8		
MSPSP	PA-2003-05-subA	NW	BP	23/mai/14		BOARD 1	B116	2006	2013	7		
MSPSP	PA-2003-14-sub	SW	TA	15/mai/14		BOARD 2	B21	2005	2013	8		
MSPSP	PA-2003-14-sub	NE	TA	15/mai/14		BOARD 2	B22	2007	2013	6		
MSPSP	PA-2003-14-sub	SE	TA	15/mai/14		BOARD 2	B23	2007	2013	6		
MSPSP	PA-2003-14-sub	SE	WB	15/mai/14		BOARD 2	B24	2005	2013	8		
MSPSP	PA-2003-14-sub	NE	WB	15/mai/14		BOARD 2	B25	2008	2013	5		
LiDAR	21-269007		1 JP	10/jun/15	14	BOARD 2	B26	1962	2014	52		No pith present
LiDAR	18-337960		7 TA	09/jun/15	17.1	BOARD 2	B27	1960	2014	54		
LiDAR	252051		51	11/jun/15		BOARD 2	B28	1954	2014	60		
LiDAR	13-113643		19 JP	28/mai/15	12.7	BOARD 2	B29	1948	2014	66		
LiDAR	21-252051		21 JP	11/jun/15	13.4	BOARD 2	B210	1989	2014	25		
LiDAR	21-252051		63 BS	11/jun/15	9.8	BOARD 2	B211	1977	2014	37		
MSPSP	9306B	SE	WS	30/mai/14		BOARD 3	B31	1980	2013	33		
MSPSP	9306B	SW	TA 1/2	30/mai/14		BOARD 3	B32	1973	2013	40	Small white ring in 1980	
MSPSP	9306B	SW	TA 2/2	30/mai/14		BOARD 3	B33	1972	2013	41	Small white ring in 1980	
MSPSP	9306B	SW	TA	30/mai/14		BOARD 3	B34	1972	2013	41		There was a note on the core: "vet"
MSPSP	9306B	SE	TA	30/mai/14		BOARD 3	B35	1974	2013	39	Small white ring in 1980	
MSPSP	9306A	SE	WS	29/mai/14		BOARD 3	B36	1980	2013	33		
MSPSP	9306B	SE	BF 1/2	30/mai/14		BOARD 3	B37	2002	2013	11		
MSPSP	9306B	SE	BF 2/2	30/mai/14		BOARD 3	B38	2002	2013	11		
MSPSP	SSA-TF-YA-2014	NE	TA 1/2	23/mai/14		BOARD 4	B41	1988	2013	25		
MSPSP	9306A	NW	TA 2/2	29/mai/14		BOARD 4	B42	1972	2013	41	Small white ring in 1980/ Small ring in 2002	
MSPSP	9306A	NW	TA 1/2	29/mai/14		BOARD 4	B43	1974	2013	39	Small white ring in 1980/ Small ring in 2002	
MSPSP	9306A	SW	TA	29/mai/14		BOARD 4	B44	1976	2013	37	Small ring in 2002/ Small ring in 1993	It is probably missing one ring
MSPSP	9306A	NE	TA	29/mai/14		BOARD 4	B45	1975	2013	38	Small white ring in 1980/ Small ring in 1993 and 2002	
MSPSP	9306A	SE	TA 1/2	29/mai/14		BOARD 4	B46	1971	2013	42	Small white ring in 1980/ Small ring in 2002	
MSPSP	9306A	SE	TA 2/2	29/mai/14		BOARD 4	B47	1984	2013	29	Small ring in 1991	It is probably missing two rings
MSPSP	9306A	SW	WB	29/mai/14		BOARD 4	B48	2000	2013	13	Small rings from 2000 to 2004	
MSPSP	9306A	NW	WS 1/2	29/mai/14		BOARD 4	B49	1987	2013	26		

Table 1 – Data analysis results (cont.)

MSPSP	9306A	NW		WS	2/2	29/mai/14		BOARD 4	B410	1988	2013	25	Small ring in 2002	
MSPSP	9306A	NE		WS		29/mai/14		BOARD 4	B411	1986	2013	27	Small ring in 2002	
MSPSP	9306A	SW		WS		29/mai/14		BOARD 4	B412	1977	2013	36	Small ring in 2002	
LiDAR	23-50000		19	JP		03/jun/15	18.5	BOARD 5	B51	1960	2014	54		Branch scar
LiDAR	15-184942		17	TA		12/jun/15	13.1	BOARD 5	B52	1999	2014	15		
LiDAR	20-207710		62	BS		11/jun/15	12.2	BOARD 5	B53	1960	2014	54		
LiDAR	20-207710		62	BS		11/jun/15	12.2	BOARD 5	B54	1906	2014	108	Tree not growing very well since 1970	
LiDAR	24-19212		2	BS		04/jun/15	15.2	BOARD 5	B55	1943	2014	71		
LiDAR	20-207710		45	TL		11/jun/15	18.2	BOARD 5	B56	1916	2014	98	Very small ring in 1952 and 1953; It was not growing well from 1933 to 1919	
LiDAR	23-154272		39	TA		10/jun/15	18.3	BOARD 5	B57	1930	2014	84	Small ring from 1981 to 1983	The core is probably missing a ring
LiDAR	6-25775		9	JP		26/mai/15	5.3	BOARD 5	B58	2005	2014	9		
LiDAR	13-206585		27	BS		10/jun/15	21.7	BOARD 6	B61	1923	2014	91	Small rings from 2002 to 2004	
LiDAR	23-50000		35	TA		03/jun/15	23.5	BOARD 6	B62	1962	2014	52	Small ring in 1981 and 1982/ Small ring in 1992 and 1993/ Small ring 2004	
LiDAR	11-149545		12	JP		10/jun/15	7.6	BOARD 6	B63	1965	2014	49	Small rings from 2002 to 2004	
LiDAR	4-132491		10	TA		28/mai/15	7.3	BOARD 6	B64	1991	2014	23	Small ring in 2002	
LiDAR	20-147119		12	WS		08/jun/15	19.8	BOARD 6	B65	1962	2014	52	Small ring in 2002	
LiDAR	17-194005		9	JP		11/jun/15	8.7	BOARD 6	B66	2002	2014	12	Growing very well	No bark present
LiDAR	8-137014		35	BS		08/jun/15	4.1	BOARD 6	B67	1957	2014	57	Small rings from 2002 to 2004	No bark present
LiDAR	12-250476		1	BP		08/jun/15	18.2	BOARD 6	B68	1917	2014	97	It was not growing very well from 1959 to 1976/ Very small ring in 2004	Flaky pith
MSPSP	GA1993005A	NW		WB		27/mai/13		BOARD 7	B71	2000	2012	12		
MSPSP	9305B	NE		TA		28/mai/14		BOARD 7	B72	1972	2013	41	Small white ring 1980/ Small rings from 2002 to 2004	
MSPSP	9305B	NW		TA		28/mai/14		BOARD 7	B73	1975	2013	38	Small white ring in 1980/ Small ring in 1993 and 2002	No bark present
MSPSP	9305B	SW		TA		28/mai/14		BOARD 7	B74	1971	2013	42	Small white ring in 1980/ Small ring 2002	
MSPSP	9305B	SW?		TA		28/mai/14		BOARD 7	B75	1971	2013	42	Small white ring in 1980/ Small ring 2002	
MSPSP	9305B	SW		WB		28/mai/14		BOARD 7	B76	1998	2013	15	Small ring in 2003	
MSPSP	9305B	NW		WB		28/mai/14		BOARD 7	B77	1996	2013	17		
MSPSP	9305B	SW		WS		28/mai/14		BOARD 7	B78	1977	2013	36		
MSPSP	9305B	NE		WS		28/mai/14		BOARD 7	B79	1997	2013	16		
MSPSP	9305B	NW		WS		28/mai/14		BOARD 7	B710	1984	2013	29		
MSPSP	MM-2000-05-subA	SW		TA		14/mai/14		BOARD 8	B81	1996	2013	17		
MSPSP	MM-2000-05-subA	NW		TA		14/mai/14		BOARD 8	B82	2003	2013	10		
MSPSP	MM-2000-05-subA	SE		TA		14/mai/14		BOARD 8	B83	2000	2013	13		Part of the core with twisted grain and pith is very flaky
MSPSP	MM-2000-05-subA	NE		TA		14/mai/14		BOARD 8	B84	2002	2013	11		
MSPSP	MM-2000-05-subB	SE		TA		14/mai/14		BOARD 8	B85	2004	2013	9		
MSPSP	MM-2000-05-subB	NE		TA		14/mai/14		BOARD 8	B86	2010	2013	3		
MSPSP	MM-2000-05-subA	NE		BP		14/mai/14		BOARD 8	B87	2005	2013	8		
MSPSP	MM-2000-05-subA	SW		BP		14/mai/14		BOARD 8	B88	2003	2013	10		
MSPSP	MM-2000-05-subB	NE		BP		14/mai/14		BOARD 8	B89	2004	2013	9		
MSPSP	MM-2000-05-sub	NW		BP		14/mai/14		BOARD 8	B810	2008	2013	5		
MSPSP	MM-2000-05-subB	SE	*sw	BP		14/mai/14		BOARD 8	B811	2005	2013	8		
MSPSP	MM-2000-05-subA	SE		BP		14/mai/14		BOARD 8	B812	1956	2013	57	Small white ring in 1980/ Tree is not growing well since 1991	Flaky core with no precise pith
MSPSP	PA-2003-14-sub	SE		TA		15/mai/14		BOARD 8	B813	2005	2013	8		
MSPSP	PA-2003-14-sub	SE		TA		15/mai/14		BOARD 8	B814	2007	2013	6		
MSPSP	PA-2003-14-sub	NE		TA		15/mai/14		BOARD 8	B815	2007	2013	6		
MSPSP	PA-2003-14-sub	NW		TA		15/mai/14		BOARD 8	B816	2005	2013	8		
MSPSP	GA1993005A	SW		TA		27/mai/13		BOARD 9	B91	1972	2012	40	Small white ring 1979/ Small rings from 2003	
MSPSP	GA1993005A	NW		TA		27/mai/13		BOARD 9	B92	1970	2012	42	Small white ring in 1979/ Small ring in 1993 and 2003	
MSPSP	GA1993005A	SE		TA		27/mai/13		BOARD 9	B93	1970	2012	42	Small ring in 1980	broken core; the core is likely missing one ring
MSPSP	GA1993005A	NE		TA		27/mai/13		BOARD 9	B94	1969	2012	43	Small ring from 2001 to 2003	
MSPSP	GA1993005A	NW		WS		27/mai/13		BOARD 9	B95	1987	2012	25		

Table 1 – Data analysis results (cont.)

MSPSP	GA1993005A	NE	WS	27/mai/13	BOARD 9	B96	1985	2012	27		
MSPSP	GA1993005A	SE	WS	27/mai/13	BOARD 9	B97	1995	2012	17	Small ring in 2002	
MSPSP	GA1993005A	SW	WS	27/mai/13	BOARD 9	B98	1988	2012	24	Small ring in 1992	
MSPSP	GA1987007B	NW	TA	12/mai/14	BOARD 10	B101	1972	2013	41	Small white ring in 1981 / Small ring in 2000	No pith present
MSPSP	GA1987007B	SW	TA	12/mai/14	BOARD 10	B102	1973	2013	40	Small white ring in 1981	No pith present
MSPSP	GA1987007B	NE	TA	12/mai/14	BOARD 10	B103	1974	2013	26	Small white ring in 1981/2001	No pith present (but it looks close to it)
MSPSP	GA1987007B	NW	WS	12/mai/14	BOARD 10	B104	1987	2013	29	Since 2007 the tree has not been growing very well	
MSPSP	GA1987007B	SE	WS	12/mai/14	BOARD 10	B105	1984	2013	29	Since 2004 the tree has not been growing very well	
MSPSP	GA1987007B	SE	WB	12/mai/14	BOARD 10	B106	1996	2013	17	Since 2010 the tree has not been growing very well	
MSPSP	GA1987007B	SE	BF	12/mai/14	BOARD 10	B107	2003	2013	10		
MSPSP	GA1987007B	SW	BP	12/mai/14	BOARD 10	B108	1997	2013	16		Core in very bad condition
MSPSP	SSA-TF-YA-2014	SE	TA	23/mai/14	BOARD 10	B109	1990	2013	23		
MSPSP	SSA-TF-YA-2014	NE (2/2)	TA	23/mai/14	BOARD 10	B1010	1990	2013	23		
MSPSP	SSA-TF-YA-2014	SW	TA	23/mai/14	BOARD 10	B1011	1988	2013	25		
MSPSP	SSA-TF-YA-2014	NW	TA	23/mai/14	BOARD 10	B1012	1988	2013	25		
LiDAR	23-925	11	JP	01/jun/15	19 BOARD 11	B111	1938	2014	76	Since 1969 the tree has been growing very slowly	No bark present
LiDAR	23-154272	1	JP	10/jun/15	23 BOARD 11	B112	1934	2014	80		
LiDAR	22-393011	3	WS	16/jun/15	31.7 BOARD 11	B113	1934	2014	80		No pith present
LiDAR	2-168711	1	JP	23/jun/15	7.2 BOARD 11	B114	2002	2014	12		
LiDAR	8-6562	10	BS	17/jun/15	11.3 BOARD 11	B115	1973	2014	41		Core in very bad condition
LiDAR	22-1221	43	TA	03/jun/15	17.6 BOARD 11	B116	1979	2014	35		
LiDAR	2-71627	5	JP	22/jun/15	11.5 BOARD 12	B121	1976	2014	38	Small ring in 2001	
LiDAR	22-86451	34	WS	16/jun/15	18.7 BOARD 12	B122	1944	2014	70	Very small ring in 1964/ Small ring in 1992 and 1993	
LiDAR	2-168711	3	TA	23/jun/15	9.6 BOARD 12	B123	2000	2014	14	Small ring in 1981	
LiDAR	22-2132	25	TA	03/jun/15	23.4 BOARD 12	B124	1953	2014	61	The tree did not grow well in the first 5 years (small rings from 1970 to 1975)	
LiDAR	2-228608	1	TA	19/jun/15	6.5 BOARD 12	B125	2000	2014	14		
LiDAR	7-265627	4	TA	18/jun/15	10.5 BOARD 12	B126	1970	2014	44		
LiDAR	5-64195	4	JP	22/jun/15	15.1 BOARD 12	B127	1969	2014	45		
LiDAR	21-5909	58	JP	03/jun/15	21.4 BOARD 13	B131	1947	2014	67		No bark present
LiDAR	13-24136	25	TA	05/jun/15	17.1 BOARD 13	B132	1951	2014	63		
LiDAR	13-24136	59	BS	05/jun/15	16.1 BOARD 13	B133	1949	2014	65	Small ring from 1982 to 1984/ Small ring in 1992 and 1993	
LiDAR	9-3246	1	TA	04/jun/15	9 BOARD 13	B134	1974	2014	40		
LiDAR	16-196027	5	TA	10/jun/15	10.1 BOARD 13	B135	2002	2014	12		
LiDAR	17-115336	9	JP	11/jun/15	8.1 BOARD 13	B136	2000	2014	14		
LiDAR	11-268305	2	JP	10/jun/15	5.8 BOARD 13	B137	2007	2014	7		
LiDAR	8-195359	8	JP	18/jun/15	6.8 BOARD 13	B138	2004	2014	10		
LiDAR	23-925	65	WS	01/jun/15	6.5 BOARD 13	B139	2000	2014	14		
LiDAR	11-149545	12	JP	10/jun/15	7.6 BOARD 13	B1310	2002	2014	12		
LiDAR	23-14809	1	WS	03/jun/15	7.2 BOARD 13	B1311	1999	2014	15		No pith present
LiDAR	24-194418	32	BP	08/jun/15	15.9 BOARD 14	B141	1945	2014	69	Since 1991, tree has no growing very well	Broken pith
LiDAR	24-194418	15	BS	08/jun/15	12.5 BOARD 14	B142	1945	2014	69		
LiDAR	14-262758	12	TA	09/jun/15	11.2 BOARD 14	B143	1998	2014	16		
LiDAR	14-262758	5	BP	09/jun/15	11.1 BOARD 14	B144	1960	2014	54	Small white ring from 1981 to 1983	
LiDAR	24-11473	27	BS	05/jun/15	13.5 BOARD 14	B145	1975	2014	39		
LiDAR	24-11473	5	WS	05/jun/15	12.2 BOARD 14	B146	1975	2014	39	Small ring in 2002	
LiDAR	24-19212	16	TL	04/jun/15	18.3 BOARD 15	B151	1791	2014	223		SKIPPED #B5 (1,2,3,4,6,7,8,9)
LiDAR	22-370550	17	TA	09/jun/15	20.4 BOARD 15	B152	1962	2014	52	Small white ring in 1980 and 1981	
LiDAR	12-343306	1	TA	09/jun/15	16.9 BOARD 15	B153	1950	2014	64	Small ring in 1992	
LiDAR	19-267294	75	TA	10/jun/15	18.3 BOARD 15	B154	1972	2014	42		
LiDAR	9-88131	#	JP	12/jun/15	-9 BOARD 15	B156	2008	2014	6		

Table 1 – Data analysis results (cont.)

LiDAR	5-360740		4	TA	18/jun/15	11.4	BOARD 15	B157	1996	2014	18		
LiDAR	8-137014		44	TL	08/jun/15	16.6	BOARD 15	B158	1938	2014	76		
LiDAR	10-250316		1	JP	11/jun/15	9.1	BOARD 15	B159	1996	2014	18	Small rings from 1991 to 1995	
LiDAR	10-10133		7	JP	17/jun/15	15.7	BOARD 16	B161	1979	2014	35		
LiDAR	15-345942		1	TA	18/jun/15	11.1	BOARD 16	B162	1999	2014	15		
LiDAR	21-252051		51	TA	11/jun/15	14.7	BOARD 16	B163	2008	2014	6	* core did not match the description of 15.3 cm of DBH.	Core has only 2.5 cm from bark to pith (Appendix I)/ Core is broken
LiDAR	4-10023		1	TA	23/jun/15	10.7	BOARD 16	B164	1997	2014	17		
LiDAR	22-368498		39	TA	17/jun/15	12.2	BOARD 16	B165	1993	2014	21		
LiDAR	5-360740		3	JP	18/jun/15	8.3	BOARD 16	B166	1997	2014	17		
LiDAR	2-305630		9	TA	18/jun/15	7.3	BOARD 16	B167	2006	2014	8		
LiDAR	2-305630		9	JP	18/jun/15	7.3	BOARD 16	B168	2005	2014	9		
LiDAR	22-409126		1	TA	17/jun/15	26.5	BOARD 17	B171	1955	2014	59		No pith present
LiDAR	22-319536		4	WS	16/jun/15	24.7	BOARD 17	B172	1942	2014	72		Flaky core
LiDAR	22-409126		12	TA	17/jun/15	15.7	BOARD 17	B173	1993	2014	21		
LiDAR	22-319536		15	BP	16/jun/15	21.2	BOARD 17	B174	1940	2014	74		Grain is twisted in the beginning
LiDAR	13-275262		6	JP	18/jun/15	20.9	BOARD 17	B175	1932	2014	82		There is probably pieces missing
LiDAR	2-285430		4	JP	18/jun/15	6.9	BOARD 17	B176	2002	2014	12		
MSPSP	92DT03	NW		TA	29/mai/13		BOARD 18	B181	1992	2012	20		
MSPSP	92DT03	NW		JP	29/mai/13		BOARD 18	B182	1995	2012	17		
MSPSP	92DT03	NW		WB	29/mai/13		BOARD 18	B183	1991	2012	21		
MSPSP	92DT03	NW		WB	29/mai/13	#2	BOARD 18	B184	1996	2012	16		
MSPSP	92DT03	NW		WS	29/mai/13		BOARD 18	B185	1997	2012	15		
MSPSP	92DT03	SE		WS	29/mai/13		BOARD 18	B186	1997	2012	15		
MSPSP	92DT03	SE		TA	29/mai/13		BOARD 18	B187	1992	2012	20		No bark present
MSPSP	92DT03	SE		JP	29/mai/13		BOARD 18	B188	1992	2012	20		
LiDAR	21-2740	5		WS	01/jun/15	25.1	BOARD 19	B191	1957	2014	57		Big branch, rings are not very precise
MSPSP	92DT10	NW		WB	05/jun/13		BOARD 19	B192	2000	2012	12		Flacky core
MSPSP	92DT10	NW		WB	05/jun/13		BOARD 19	B193	2000	2012	12		
MSPSP	92DT10	NW		JP	05/jun/13		BOARD 19	B194	1996	2012	16		
MSPSP	92DT10	NE		JP	05/jun/13		BOARD 19	B195	1991	2012	21		
MSPSP	92DT10	SE		JP	04/jun/13		BOARD 19	B196	1989	2012	23		
MSPSP	92DT10	NW		TA	05/jun/13		BOARD 19	B197	1988	2012	24		
MSPSP	94BR11	NW		JP	30/mai/13		BOARD 20	B201	1989	2012	23		
MSPSP	94BR11	NE		TA	30/mai/13		BOARD 20	B202	1984	2012	28		around 1986 big branch scar
MSPSP	94BR11	SE		TA	30/mai/13		BOARD 20	B203	1992	2012	20	Small ring in 2001	
MSPSP	94BR11	NW		WS	30/mai/13		BOARD 20	B204	1996	2012	16		
MSPSP	94BR11	NW		WB	30/mai/13		BOARD 20	B205	1994	2012	18	Small ring in 2005	
MSPSP	94BR11	SE		JP	30/mai/13		BOARD 20	B206	1989	2012	23		
MSPSP	94BR11	SE		WB	30/mai/13		BOARD 20	B207	1990	2012	22		
MSPSP	92DT12	SE		TA	28/mai/13		BOARD 20	B208	1995	2012	17		
MSPSP	92DT12	SE		JP	28/mai/13		BOARD 20	B209	1996	2012	16		
MSPSP	92DT12	NW		JP	28/mai/13		BOARD 20	B2010	1994	2012	18		
MSPSP	92DT12	NW		TA	28/mai/13		BOARD 20	B2011	1995	2012	17		
MSPSP	92DT10	SE		TA	05/jun/13		BOARD 20	B2012	1991	2012	21		No bark present
MSPSP	92DT10	SE		WS (Cookie)	05/jun/13				2003	2012	9		
MSPSP	92DT10	NW		WS (Cookie)	05/jun/13				2000	2012	12		
MSPSP	92DT10	NE		BF (Cookie)	05/jun/13				2000	2012	12		
MSPSP	94BR11	SW		WS (Cookie)	30/mai/13				2006	2012	6		

References

Hogg, E.H.; Schwarz, A.G. 1999. Tree-ring analysis of declining aspen stands in west-central Saskatchewan. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, Alberta. Inf. Rep. NORX-359.

Hogg, E.H; M. Hart; Lieffers, V.J. 2002. White tree rings formed in trembling aspen saplings following experimental defoliation. Can. J. For. Res. 32: 1929-1934.

Appendix I

Board Images

Board 1 – Front showing the cores and back showing the plots information and board number.

Board 2 – Front showing the cores and back showing the plots information and board number.

Board 3 – Front showing the cores and back showing the plots information and board number.

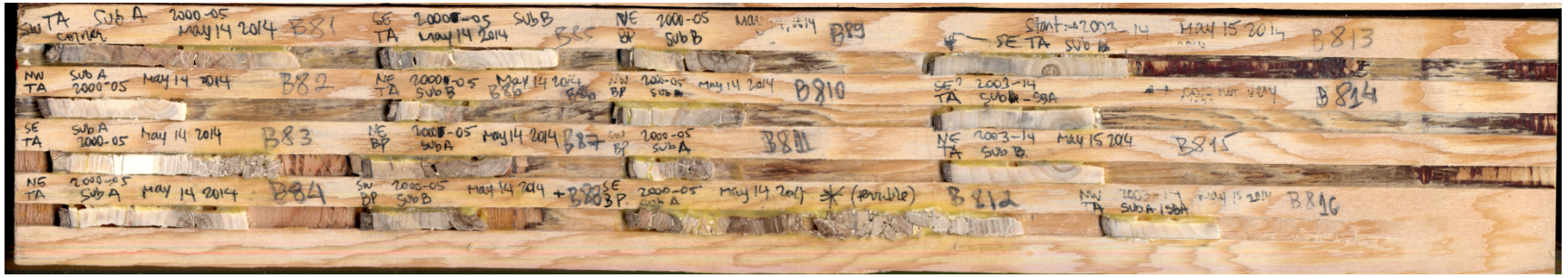
Board 4 – Front showing the cores and back showing the plots information and board number.

Board 5 – Front showing the cores and back showing the plots information and board number.

Board 6 – Front showing the cores and back showing the plots information and board number.

Board 7 – Front showing the cores and back showing the plots information and board number.

Board 8 – Front showing the cores and back showing the plots information and board number.



Board 9 – Front showing the cores and back showing the plots information and board number.

Board 10 – Front showing the cores and back showing the plots information and board number.

Board 11 – Front showing the cores and back showing the plots information and board number.

Board 12 – Front showing the cores and back showing the plots information and board number.

Board 13 – Front showing the cores and back showing the plots information and board number.

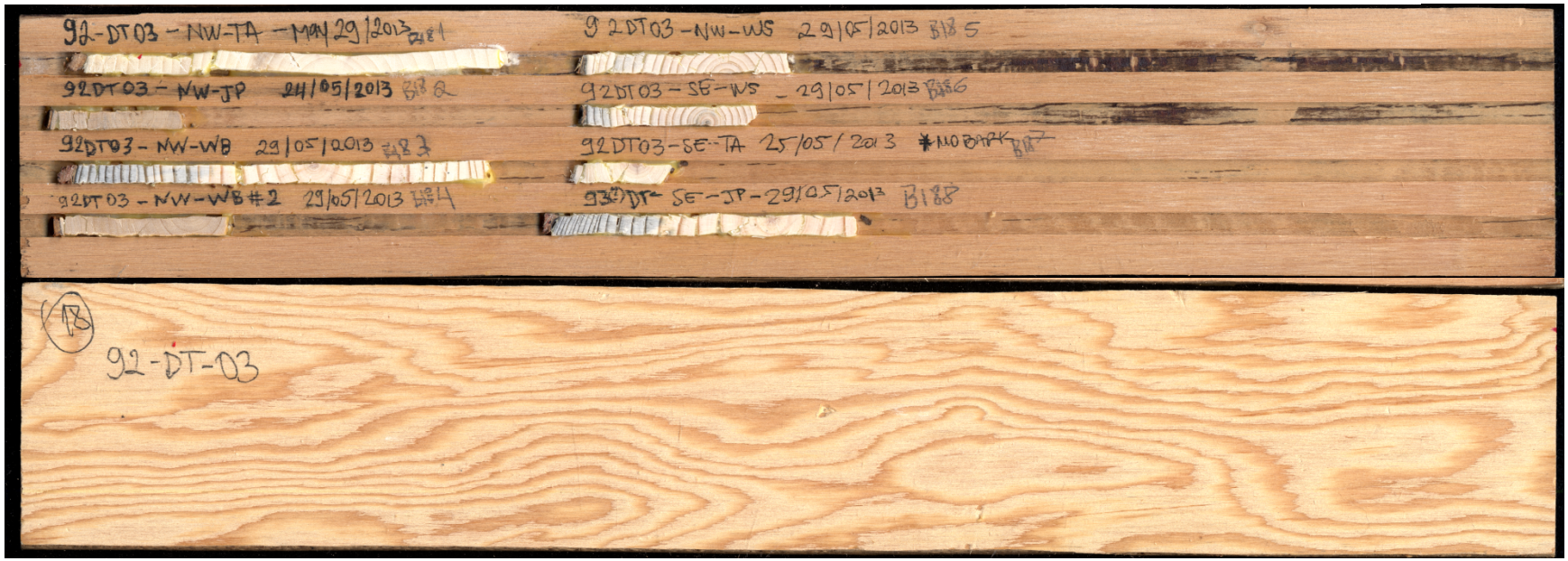
Board 14 – Front showing the cores and back showing the plots information and board number.

Board 15 – Front showing the cores and back showing the plots information and board number.

Board 16 – Front showing the cores and back showing the plots information and board number.

Board 17 – Front showing the cores and back showing the plots information and board number.

Board 18 – Front showing the cores and back showing the plots information and board number.



Board 19 – Front showing the cores and back showing the plots information and board number.

Board 20 – Front showing the cores and back showing the plots information and board number.


20
94 BR11
92 DT 12

Cookies – The four cookies and the respective identification code.