APPENDIX 12

Task 12, Wertheim-Seatuck Retrospective Early Action Project Appendix (Figures and Tables)

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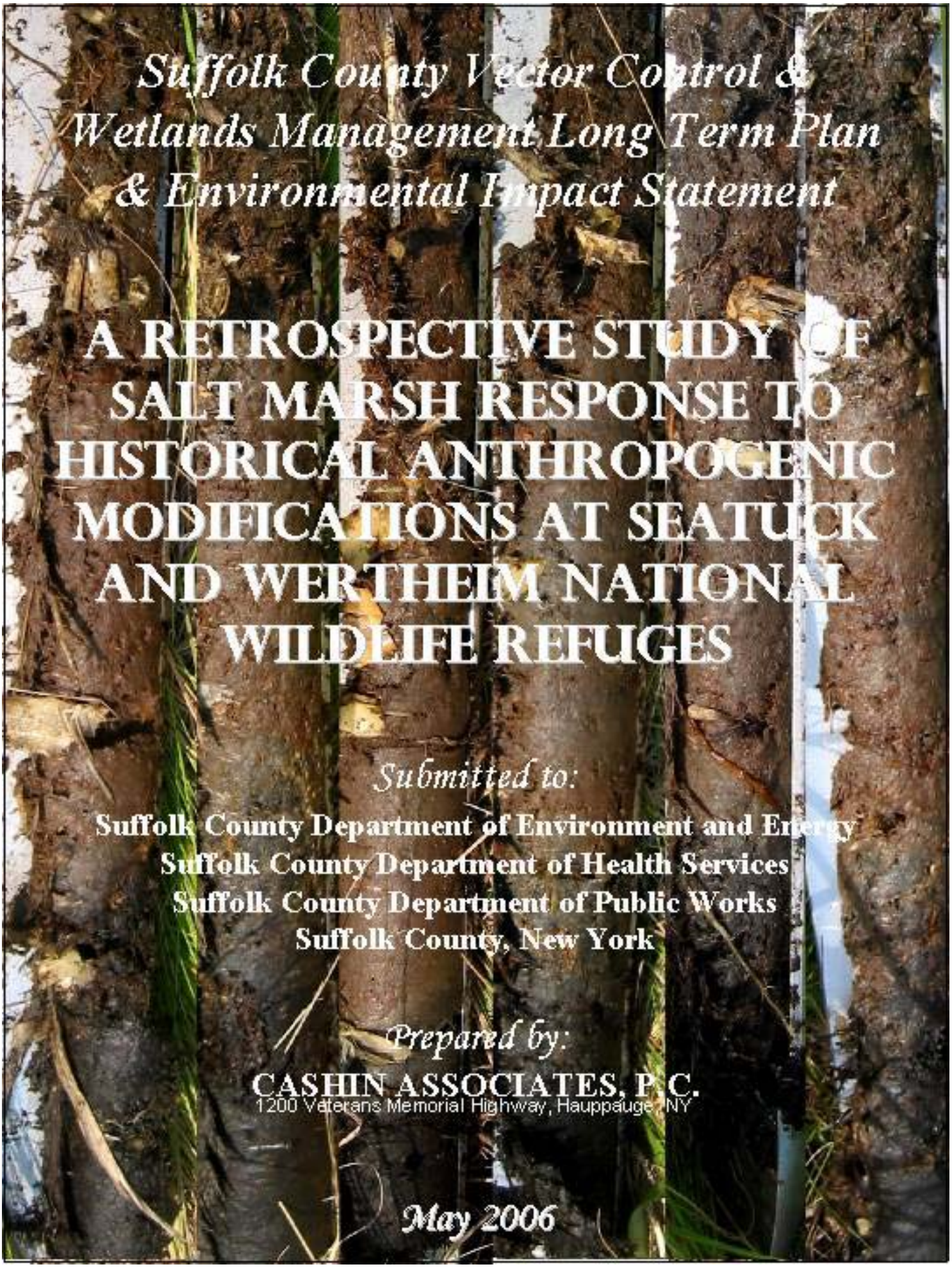

Suffolk County Vector Control & Wetlands Management Long Term Plan & Environmental Impact Statement

A RETROSPECTIVE STUDY OF SALT MARSH RESPONSE TO HISTORICAL ANTHROPOGENIC MODIFICATIONS AT SEATUCK AND WERTHEIM NATIONAL WILDLIFE REFUGES

Submitted to:

Suffolk County Department of Environment and Energy
Suffolk County Department of Health Services
Suffolk County Department of Public Works
Suffolk County, New York

Prepared by:

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1200 Veterans Memorial Highway, Hauppauge, NY

May 2006

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SUFFOLK COUNTY VECTOR CONTROL AND WETLANDS MANAGEMENT LONG - TERM PLAN AND ENVIRONMENTAL IMPACT STATEMENT

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Primary research for this report was conducted by the Goodbred laboratory, Marine Sciences Research Center at Stony Brook University (personnel included Steven L. Goodbred, Ph.D. and Kathryn M. McLetchie). It was reviewed and edited by Cashin Associates (personnel including David Tonjes, PhD).

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Transect	Starting coordinates	Ending coordinates
Seatuck-A	N 40° 42.533′, W 73° 12.557′	N 40° 42.539′, W 73° 12.662′
Seatuck-B	N 40° 42.650′, W 73° 12.540′	N 40° 42.649′, W 73° 12.591′
Seatuck-C	N 40° 42.650′, W 73° 12.556′	N 40° 42.674′, W 73° 12.556′
Wertheim-A	N 40° 46.494′, W 72° 53.614′	N 40° 46.505′, W 72° 53.509′
Wertheim-B	N 40° 46.073′, W 72° 53.346′	N 40° 46.121′, W 72° 53.260′

Table 2. Locations of Marsh Cores

Core	Coordinates
SA-A	N 40° 42.532′, W 73° 12.586′
SA-B	N 40° 42.530′, W 73° 12.632′
WA-A	N 40° 46.512′, W 72° 53.581′
WA-B	N 40° 46.497′, W 72° 53.562′
WB-A	N 40° 46.099′, W 72° 53.294′
WB-B	N 40° 46.113′, W 72° 53.274′

Table 3. Excess Inventories for ^{210}Pb Activity

Core	*Inventory for excess ^{210}Pb activity (dpm/cm^2)*
WA-A	29.0 ±0.36
WA-B	28.8 ±0.27
WB-A	47.7 ±0.43
WB-B	34.1 ±0.32
SA-A	28.8 ±0.35
SA-B	27.8 ±0.32

Table 4. Average Long-Term Accretion Rates Derived from Radioisotope Dating

Core	*^{210}Pb (cm/yr)*	*^{137}Cs (cm/yr)*	*Average (cm/yr)*
WA-A	0.23	n/a	n/a
WA-B	0.27	0.29	0.28
WB-A	0.41	0.32	0.37
WB-B	0.24	0.20	0.22
SA-A	0.20	0.24	0.22
SA-B	0.25	0.17	0.21

Table 5. Comparison of Calendar Dates Derived by ^{137}Cs and ^{210}Pb Radioisotopes

Core	*Depth Interval (cm) for **1963** ^{137}Cs peak*	*^{210}Pb Constant Flux Date at same interval*
WA-B	10-12	1962
WB-A	12-14	1962
WB-B	6-8	1969
SA-A	8-10	1962
SA-B	6-8	1955

Table 6. Relative Importance of Factors Contributing to Marsh Change During the 20th Century (**1** = major influence, 2 = some influence, 3 = little influence)

Factor	Wertheim	Seatuck
Global Climate Change/SLR	3	3
Inlet Closings/Openings	2	3
Roadway/Upland Development	3	**1**
Duck Farming	2	3
Parallel Grid Ditching	**1**	2
OMWM Practices	n/a	2

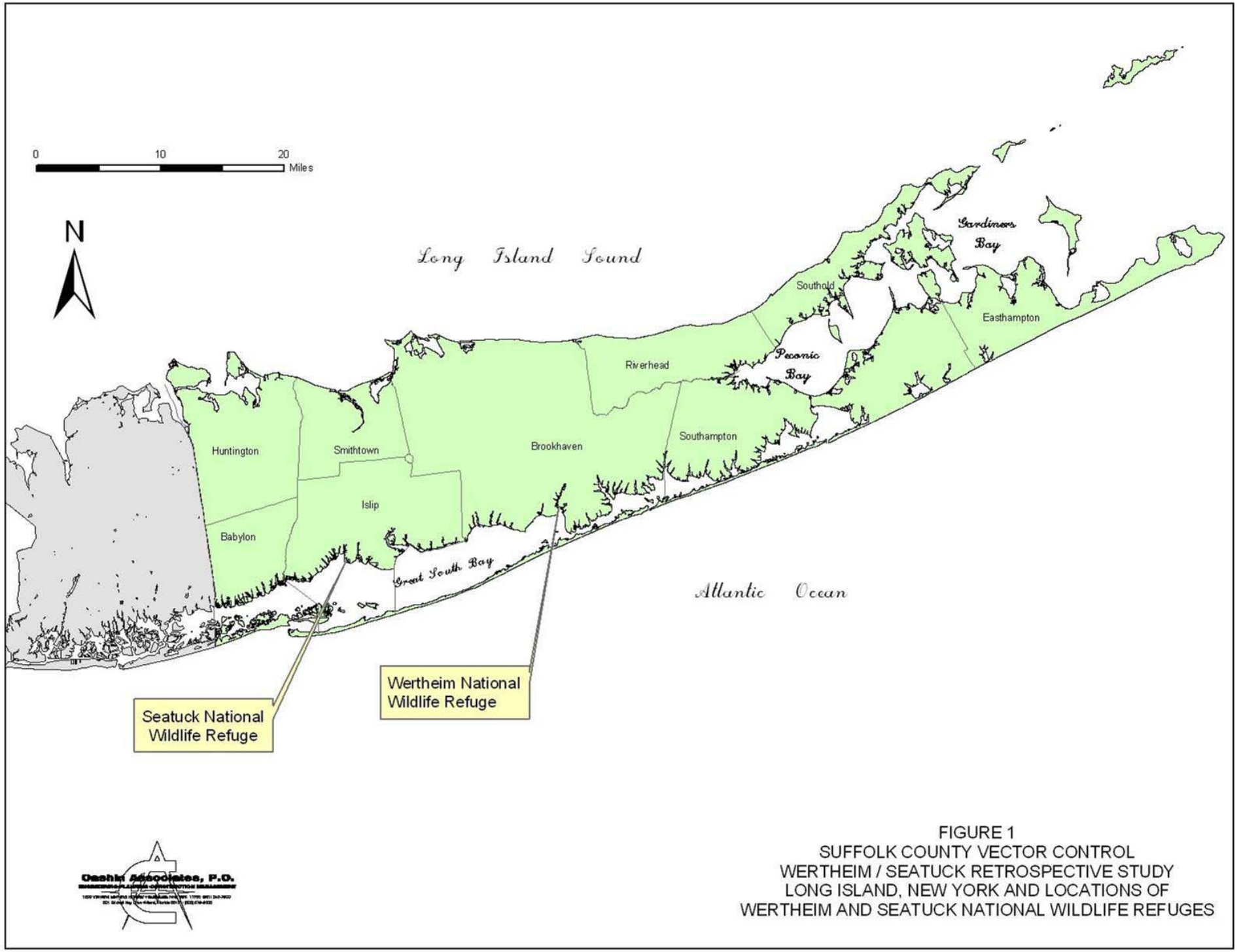


FIGURE 1
SUFFOLK COUNTY VECTOR CONTROL
WERTHEIM / SEATUCK RETROSPECTIVE STUDY
LONG ISLAND, NEW YORK AND LOCATIONS OF
WERTHEIM AND SEATUCK NATIONAL WILDLIFE REFUGES

0 240 480 720 960 Feet

N

FIGURE 2
SUFFOLK COUNTY VECTOR CONTROL
WERTHEIM / SEATUCK RETROSPECTIVE STUDY
WERTHIEM NATIONAL WILDLIFE REFUGE

0 250 500 750 1,000 Feet

N

FIGURE 3
SUFFOLK COUNTY VECTOR CONTROL
WERTHEIM / SEATUCK RETROSPECTIVE STUDY
SEATUCK NATIONAL WILDLIFE REFUGE

0 250 500 750 1,000 Feet

N

FIGURE 4
SUFFOLK COUNTY VECTOR CONTROL
WERTHEIM / SEATUCK RETROSPECTIVE STUDY
TRANSECT LOCATIONS FOR
WERTHIEM NATIONAL WILDLIFE REFUGE

FIGURE 5
SUFFOLK COUNTY VECTOR CONTROL
WERTHEIM / SEATUCK RETROSPECTIVE STUDY
TRANSECT LOCATIONS FOR
SEATUCK NATIONAL WILDLIFE REFUGE

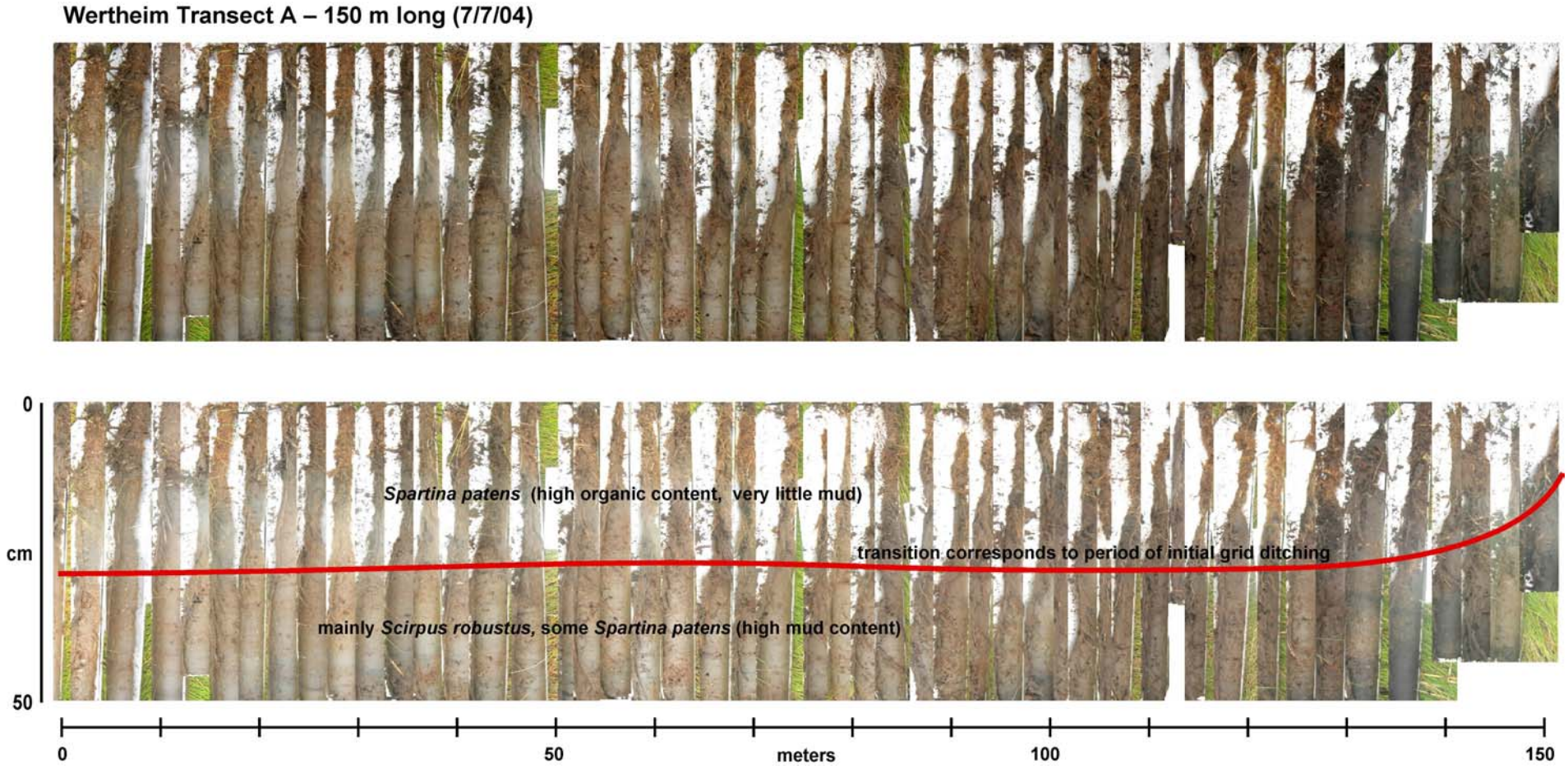


Figure 6: Russian Peat-Auger Photos and Interpretations for Transect A at Wertheim National Wildlife Refuge

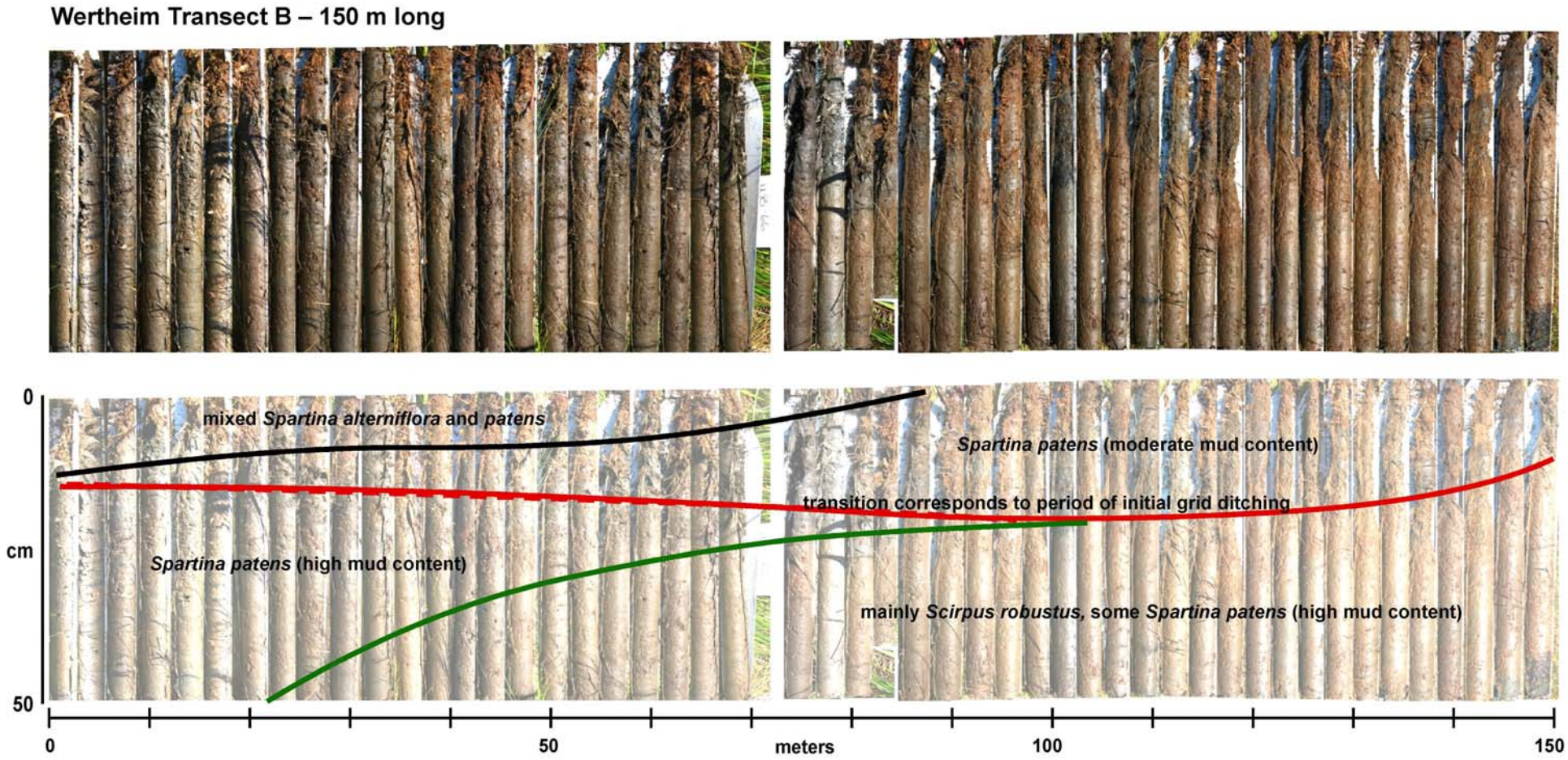


Figure 7: Russian Peat-Auger Photos and Interpretations for Transect B at Wertheim National Wildlife Refuge

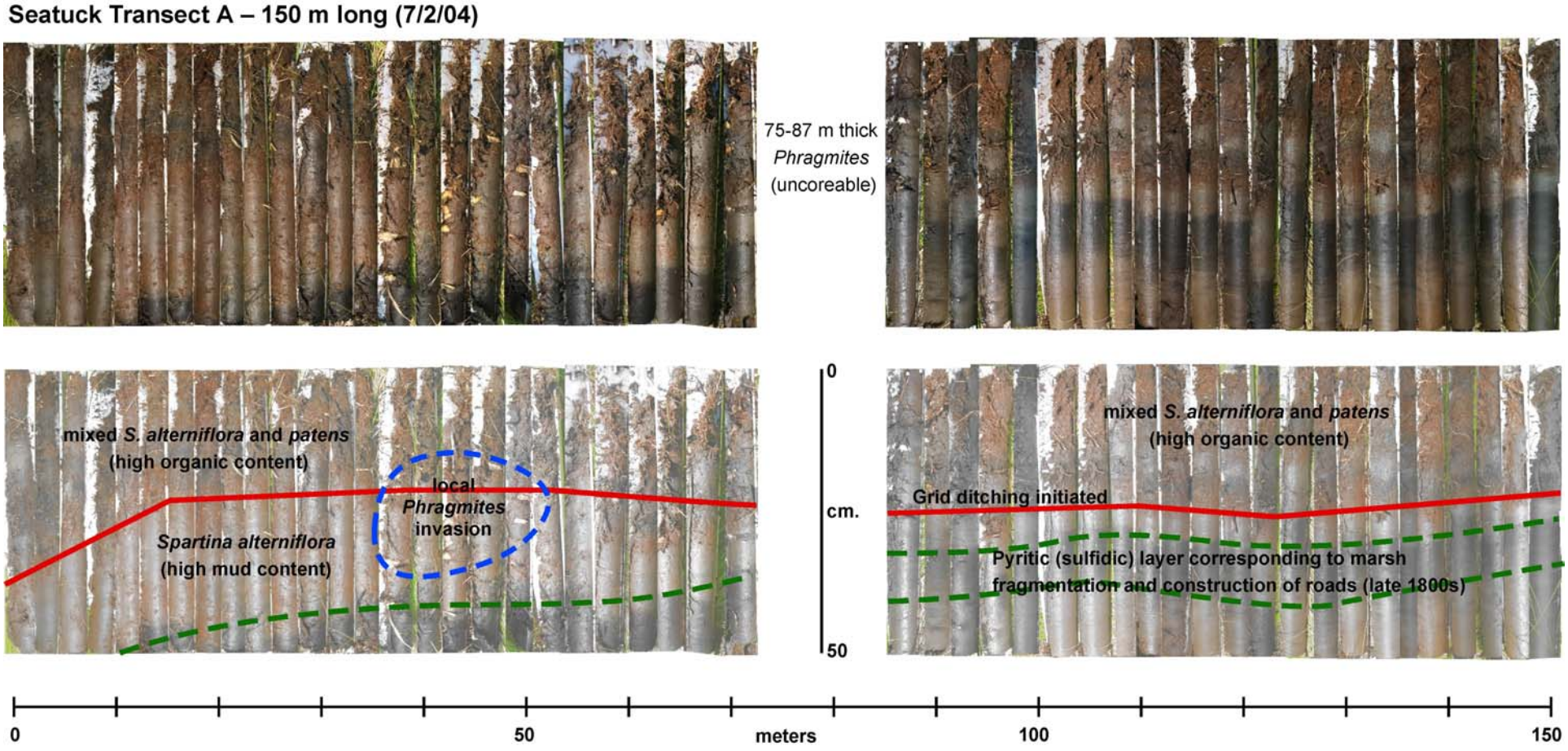


Figure 8: Russian Peat-Auger Photos and Interpretations for Transect A at Seatuck National Wildlife Refuge

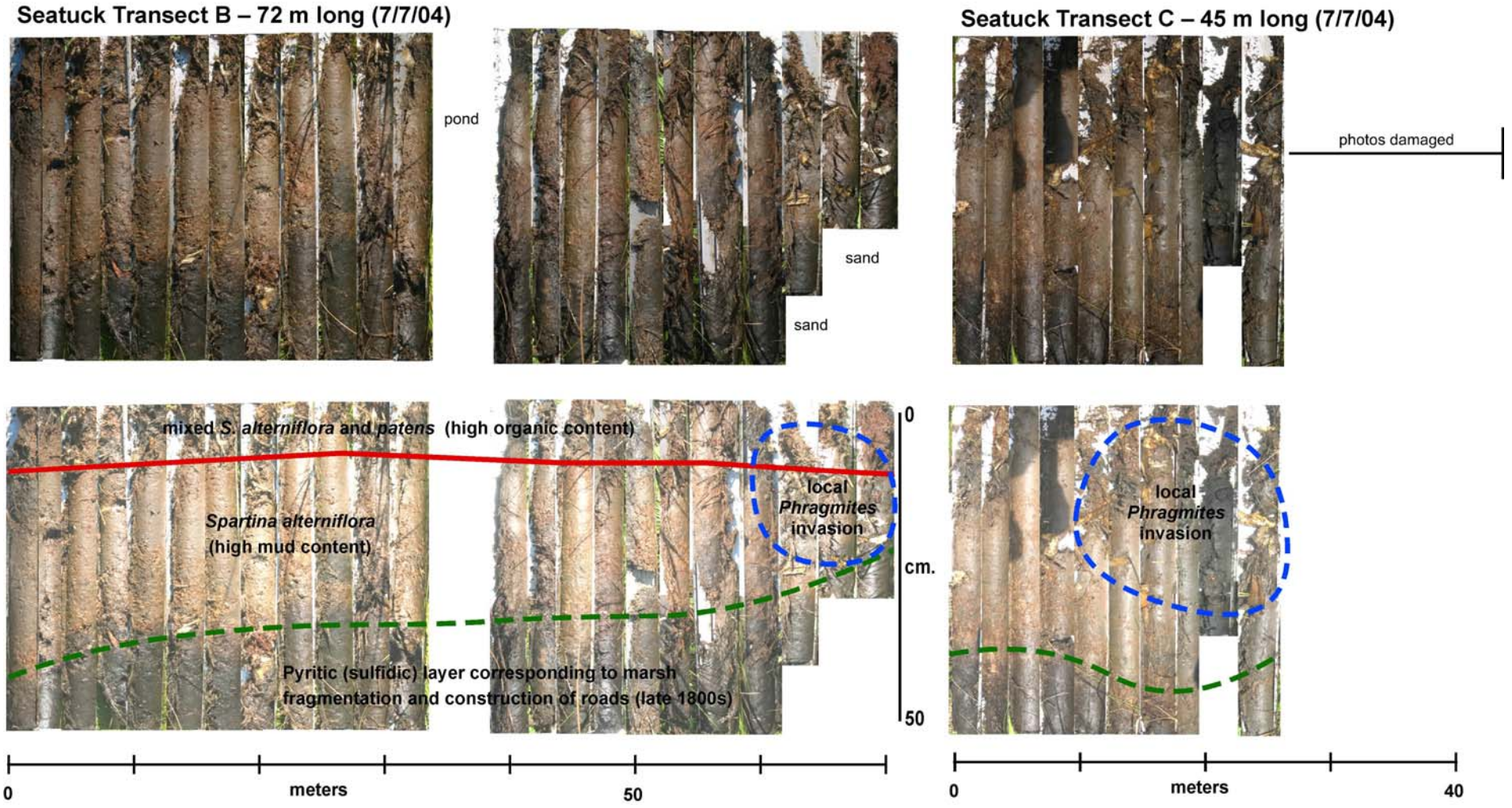
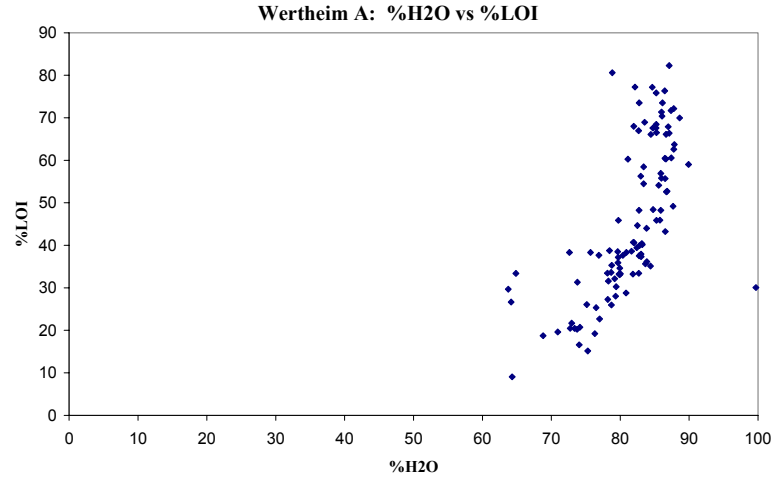
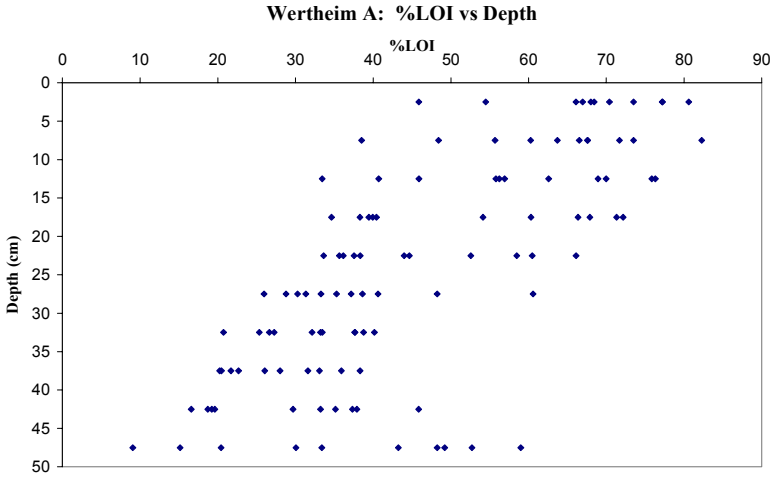


Figure 9: Russian Peat-Auger Photos and Interpretations for Transects B and C at Seatuck National Wildlife Refuge

Figure 10: Transect WA Percent H_2O & Percent LOI Data





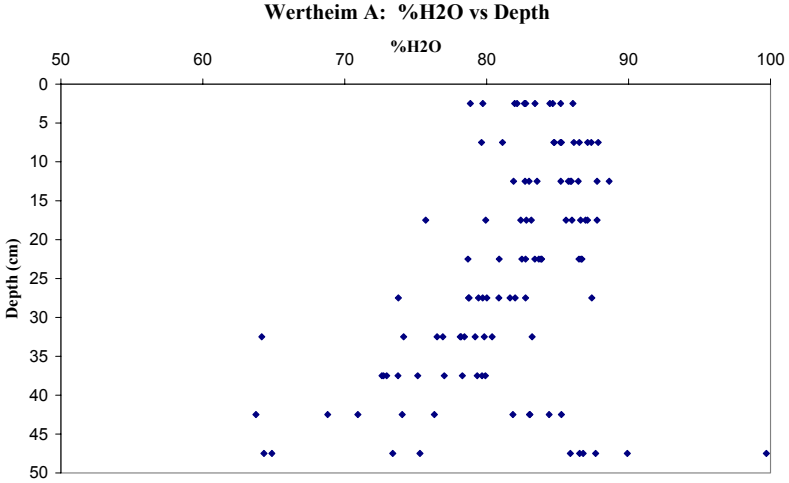
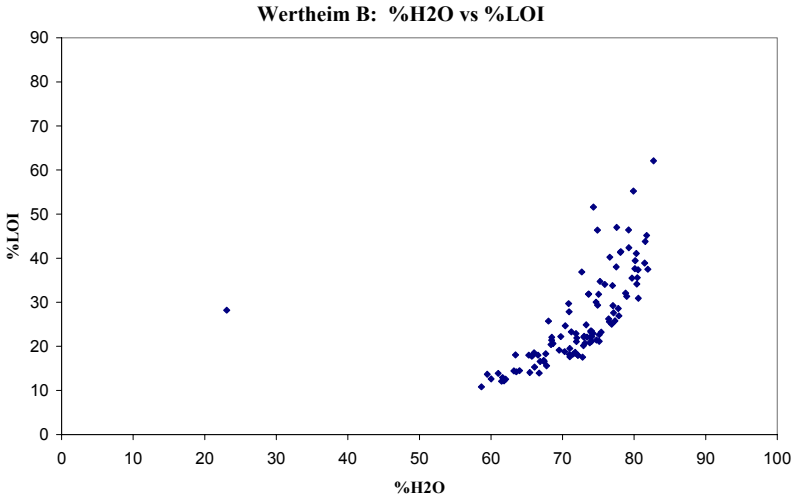
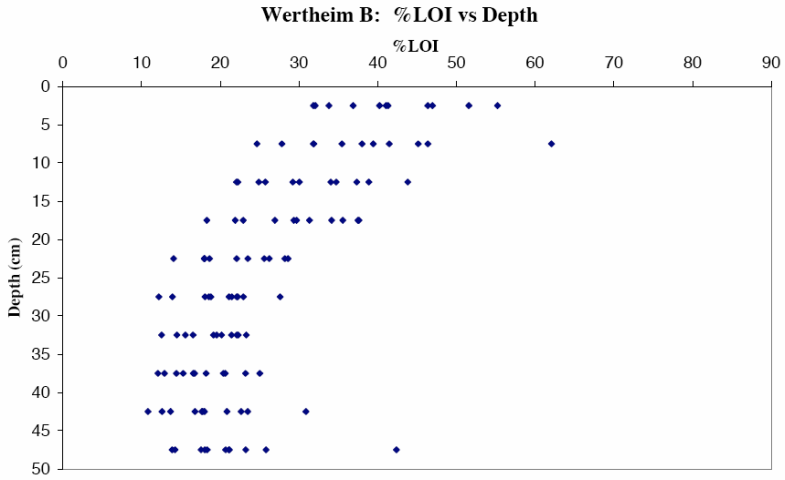


Figure 11: Transect WB Percent H_2O & Percent LOI Data





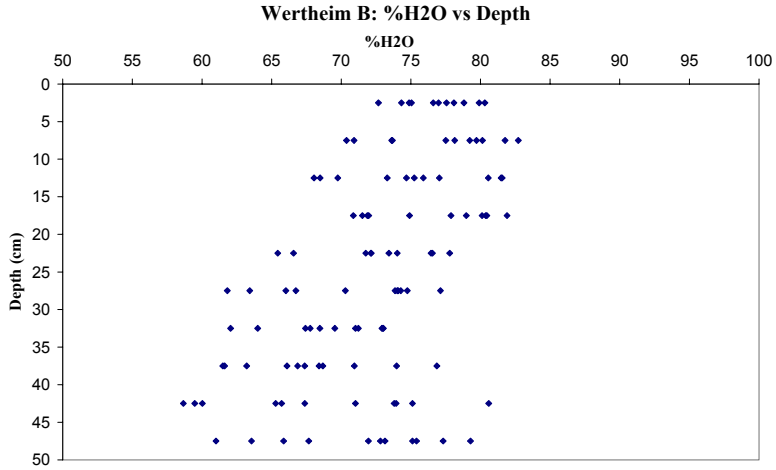
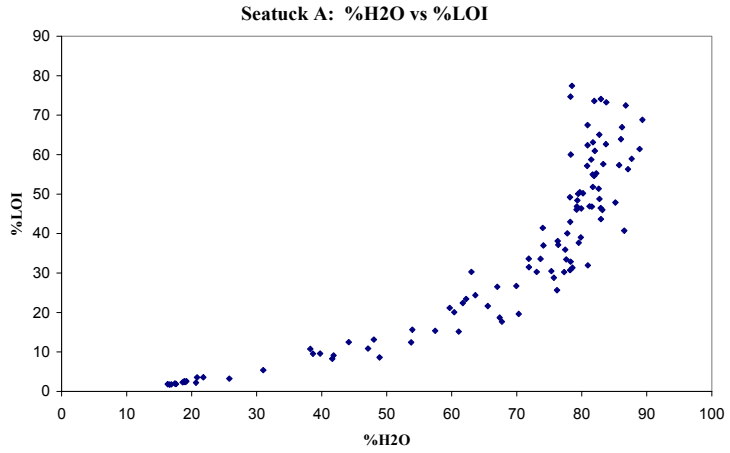
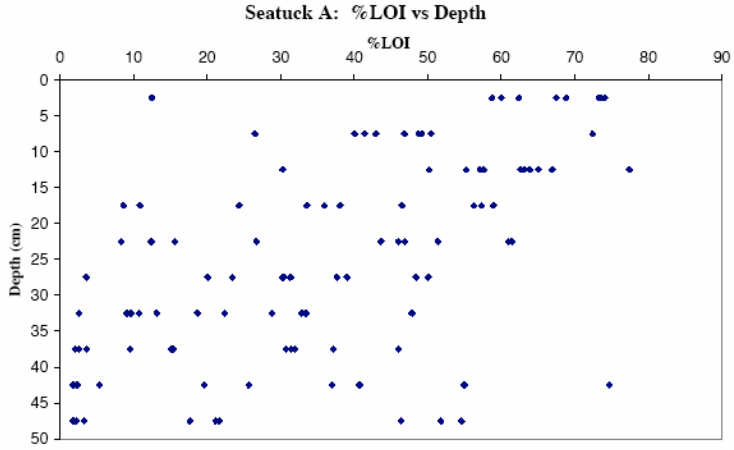


Figure 12: Transect SA Percent H_2O & Percent LOI Data





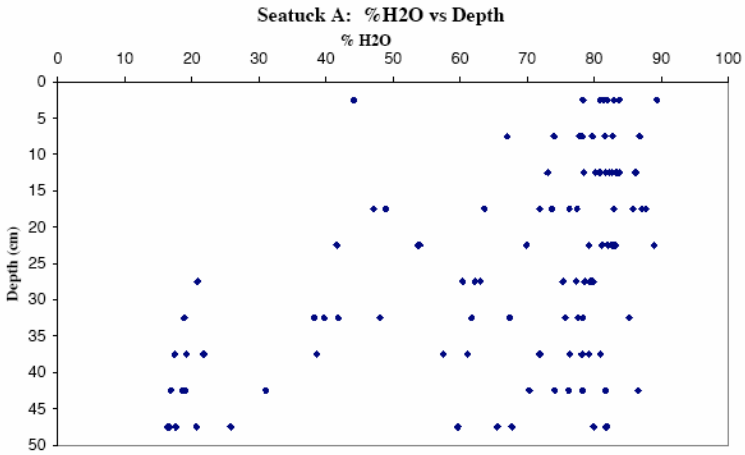
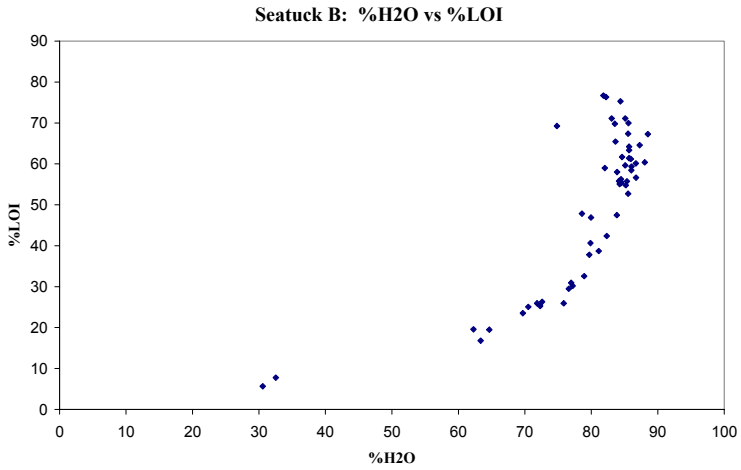
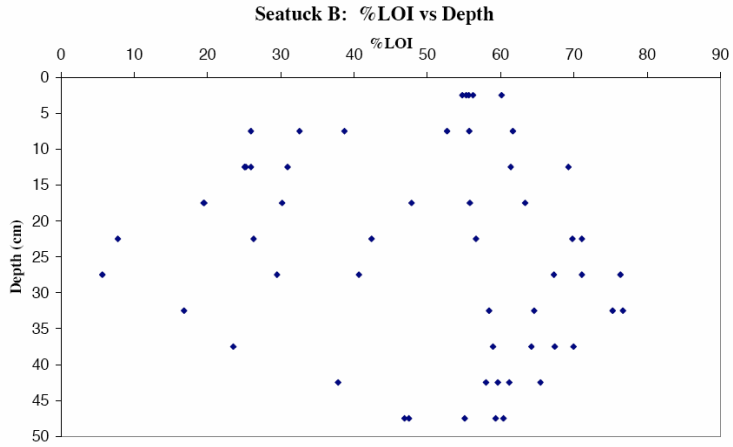


Figure 13: Transect SB Percent H_2O & Percent LOI Data





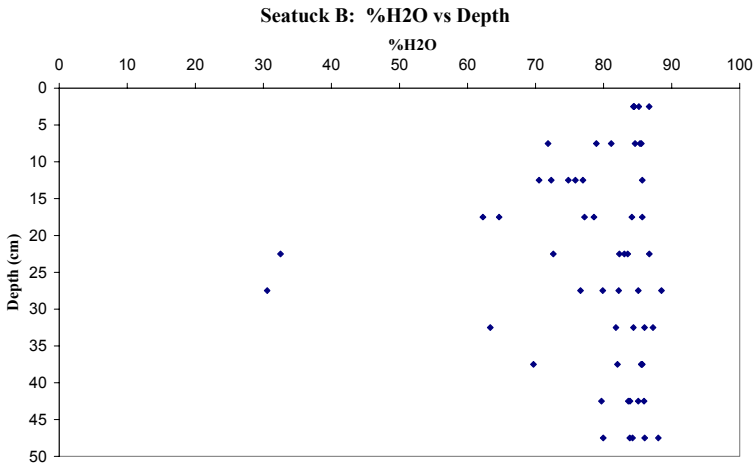
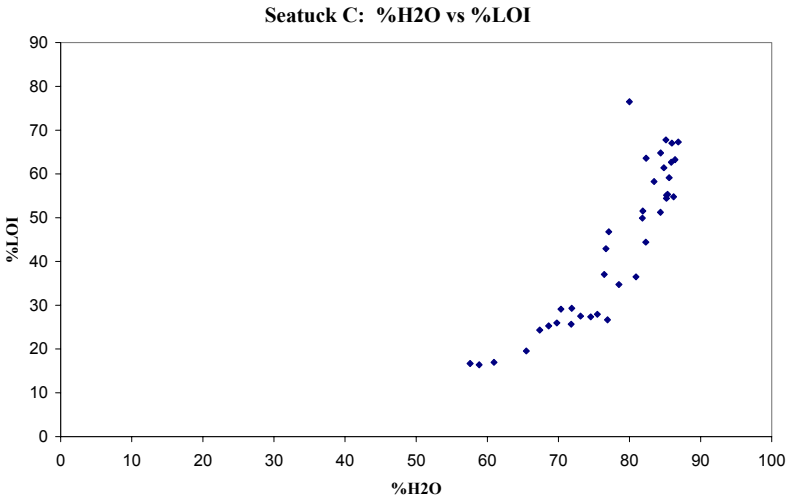
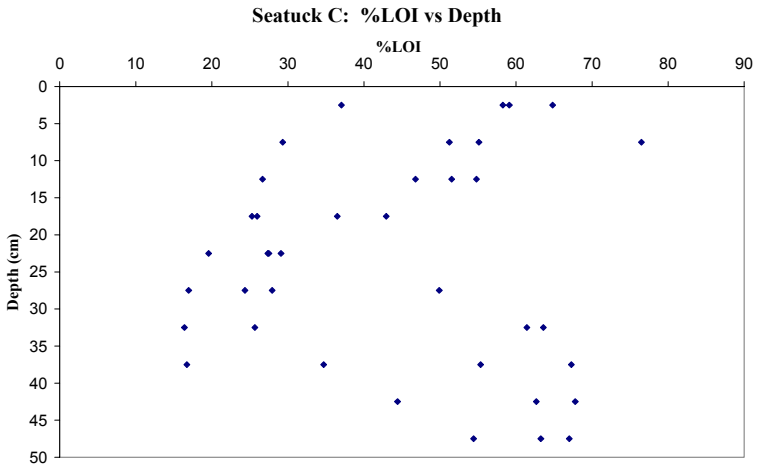


Figure 14: Transect SC Percent H_2O & Percent LOI Data





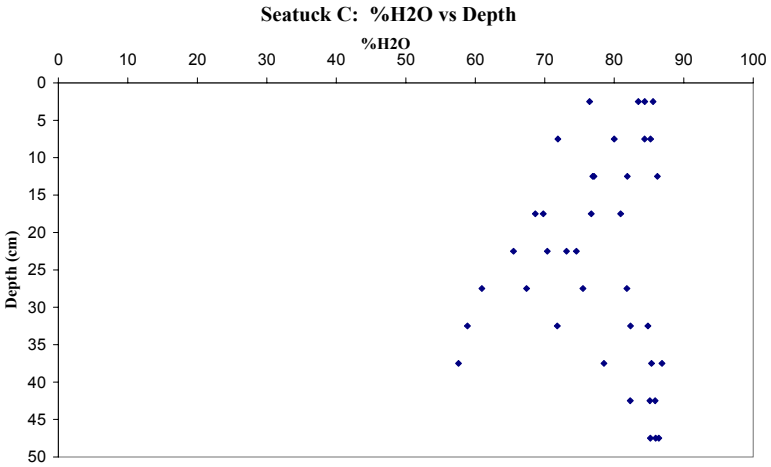
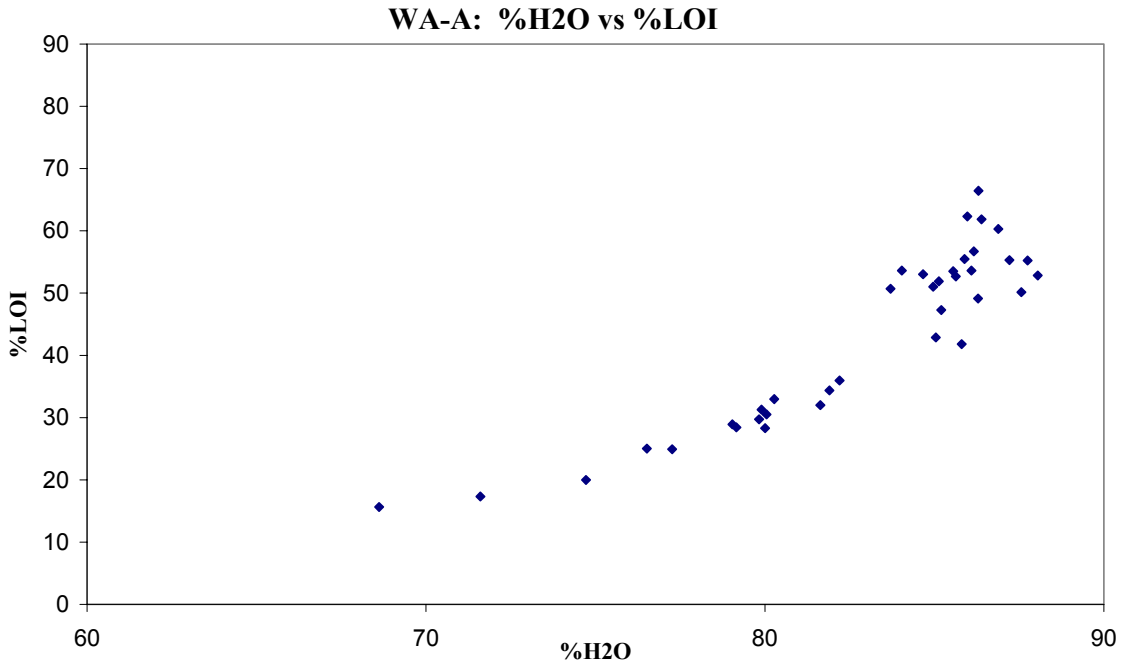


Figure 15a: Percent LOI vs Percent H_2O for Cores WA-A & WA-B



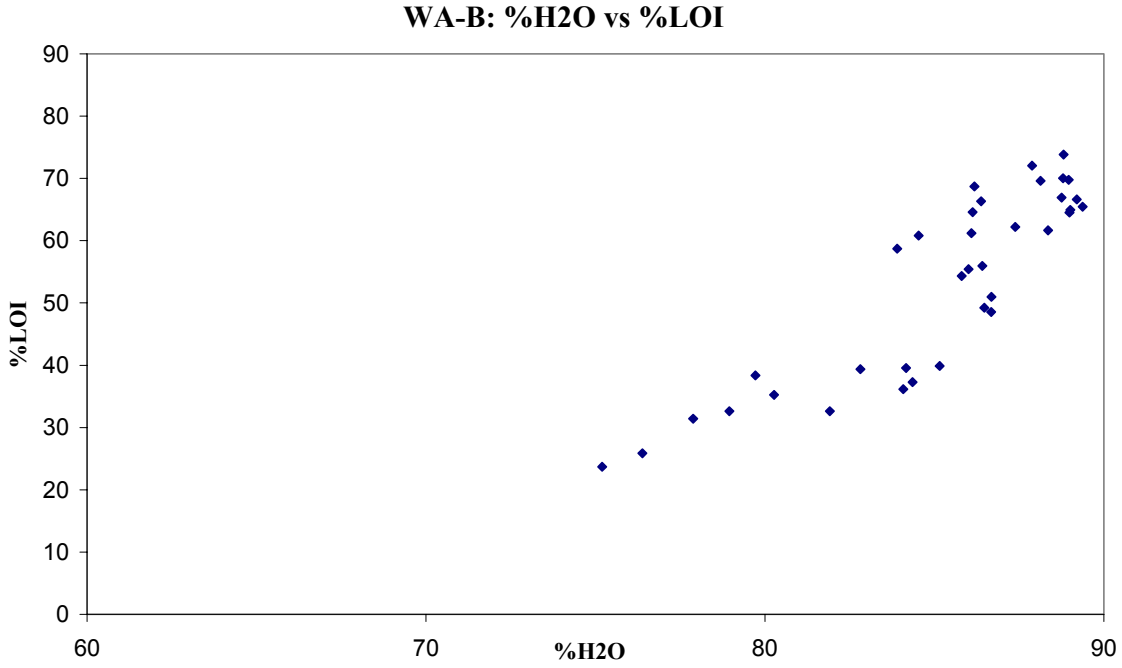
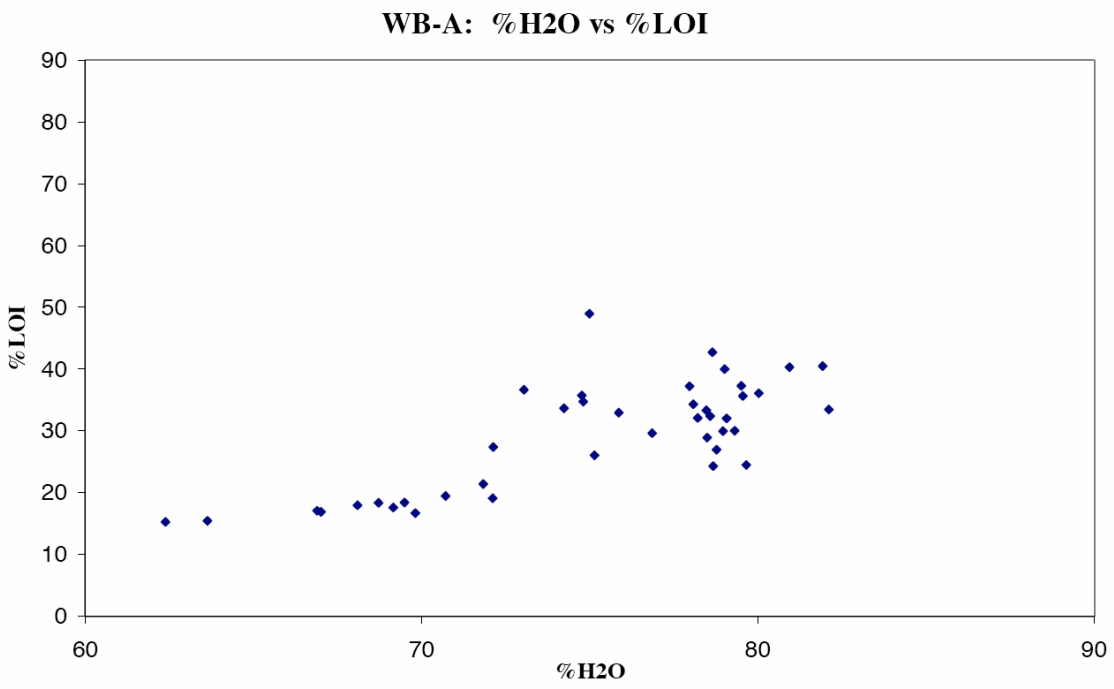


Figure 15b: Percent LOI vs Percent H_2O for Cores WB-A & WB-B



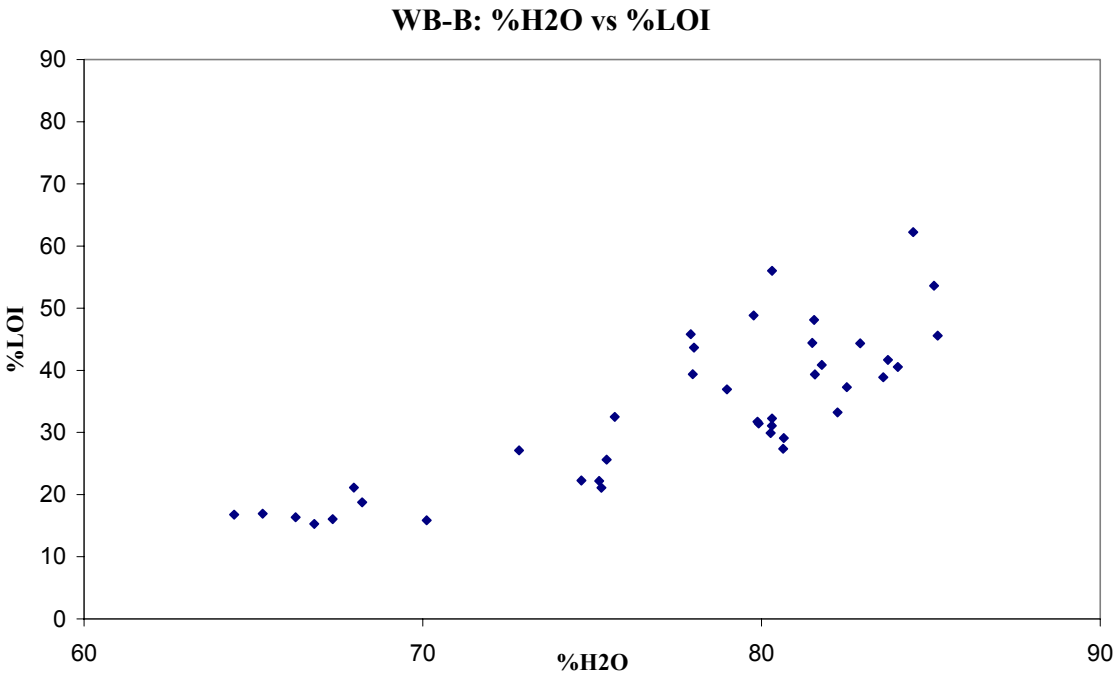
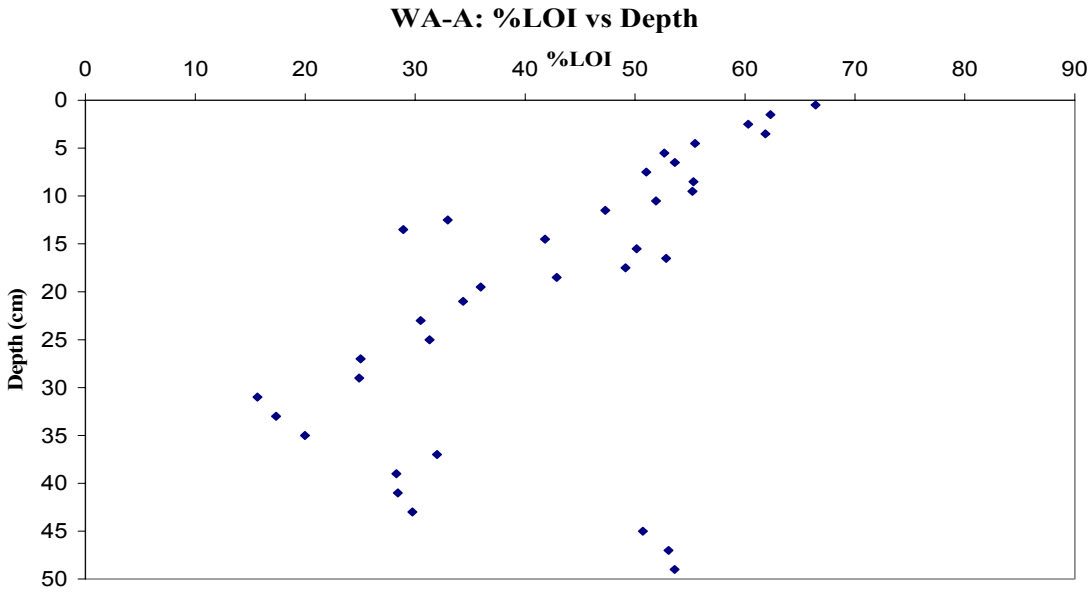


Figure 16a: Changes in Percent LOI with Depth for Cores WA-A & WA-B



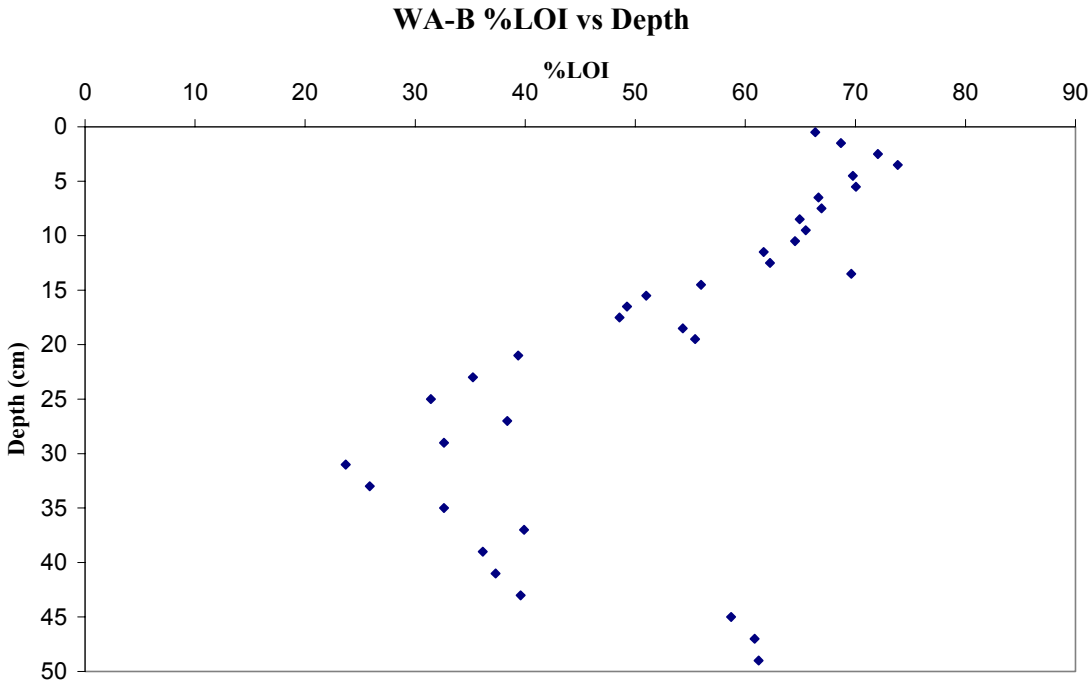
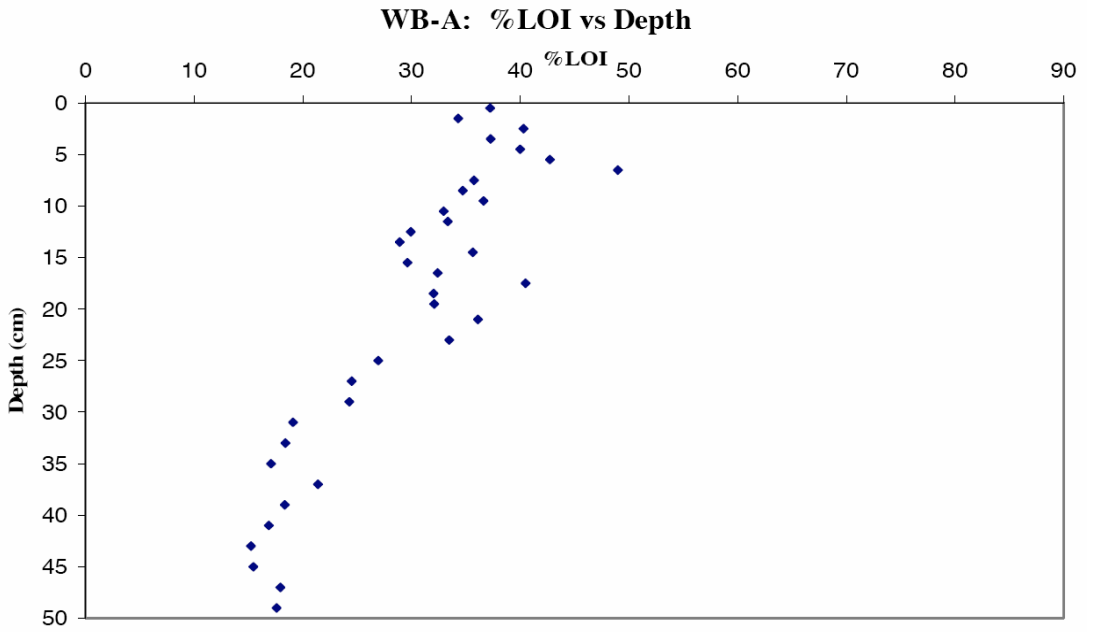


Figure 16b: Changes in Percent LOI with Depth for Cores WB-A & WB-B



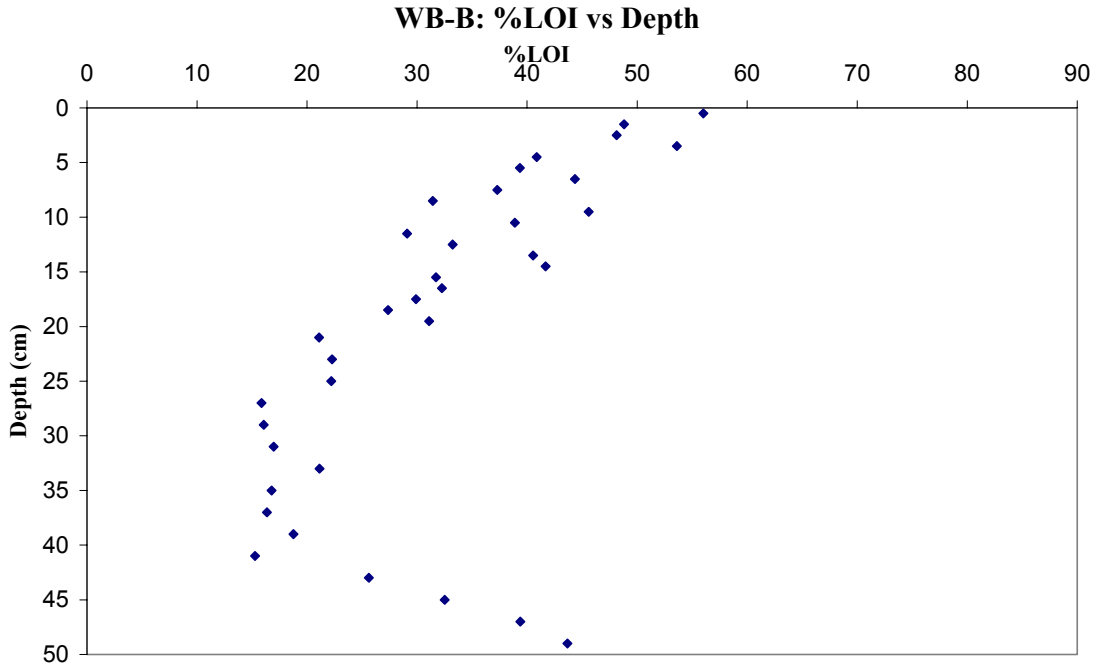
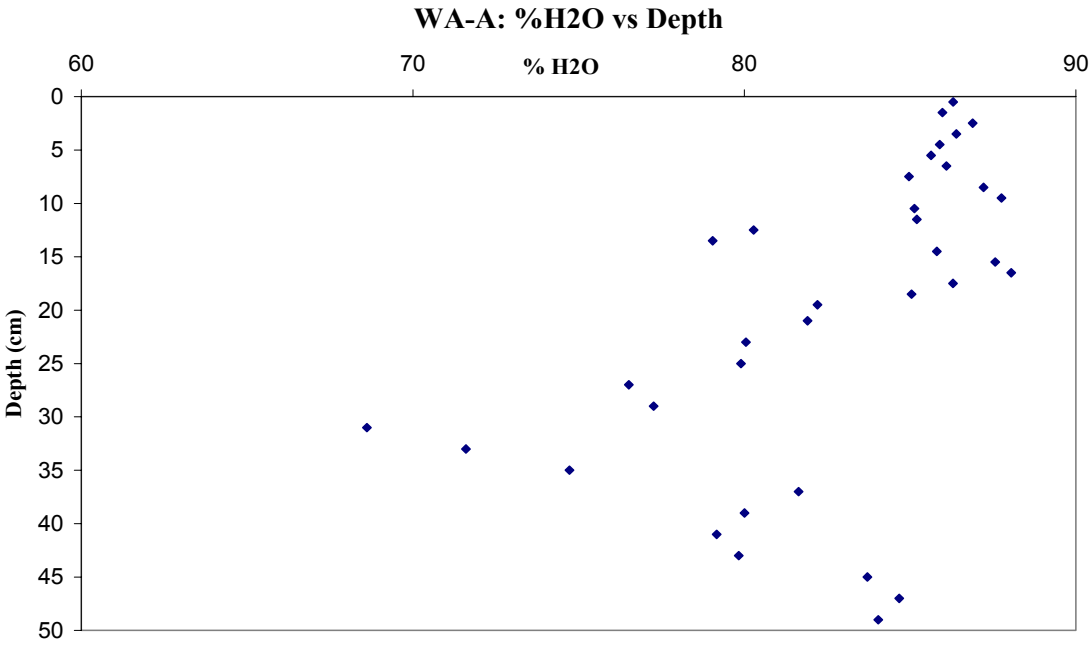


Figure 17a: Changes in Percent H_2O with Depth for Cores WA-A & WA-B



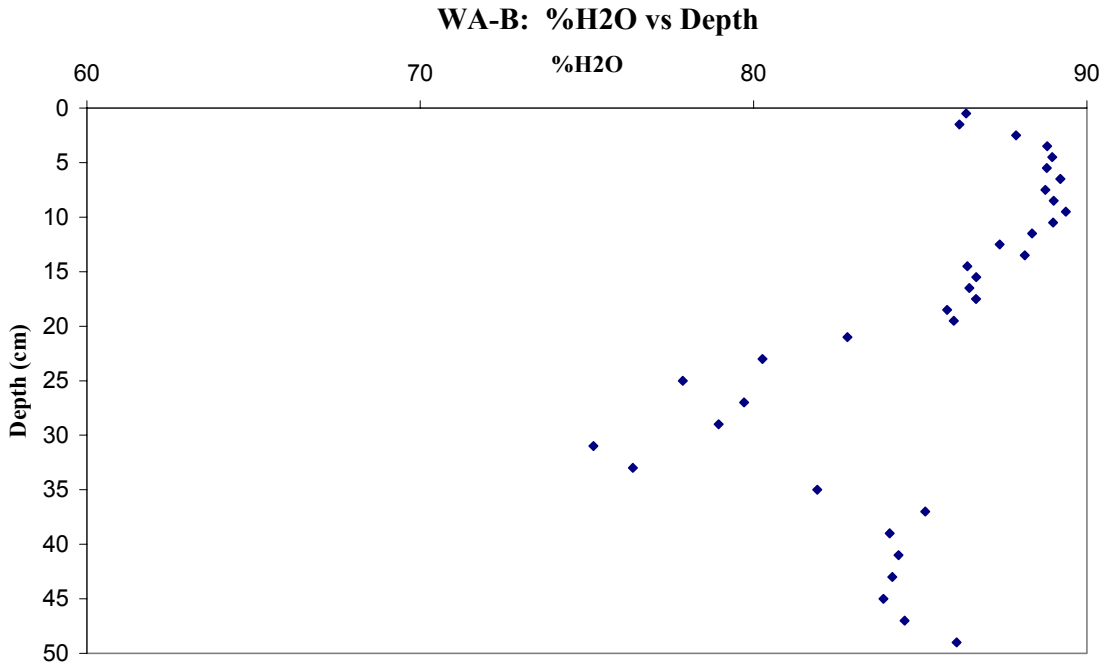
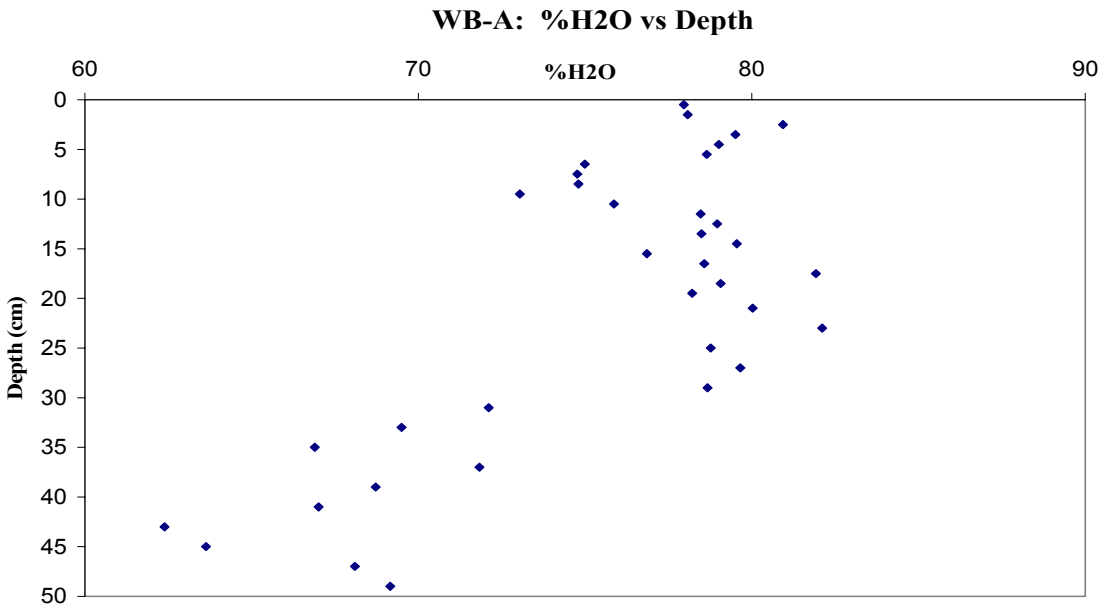


Figure 17b: Changes in Percent H_2O with Depth for Cores WB-A & WB-B



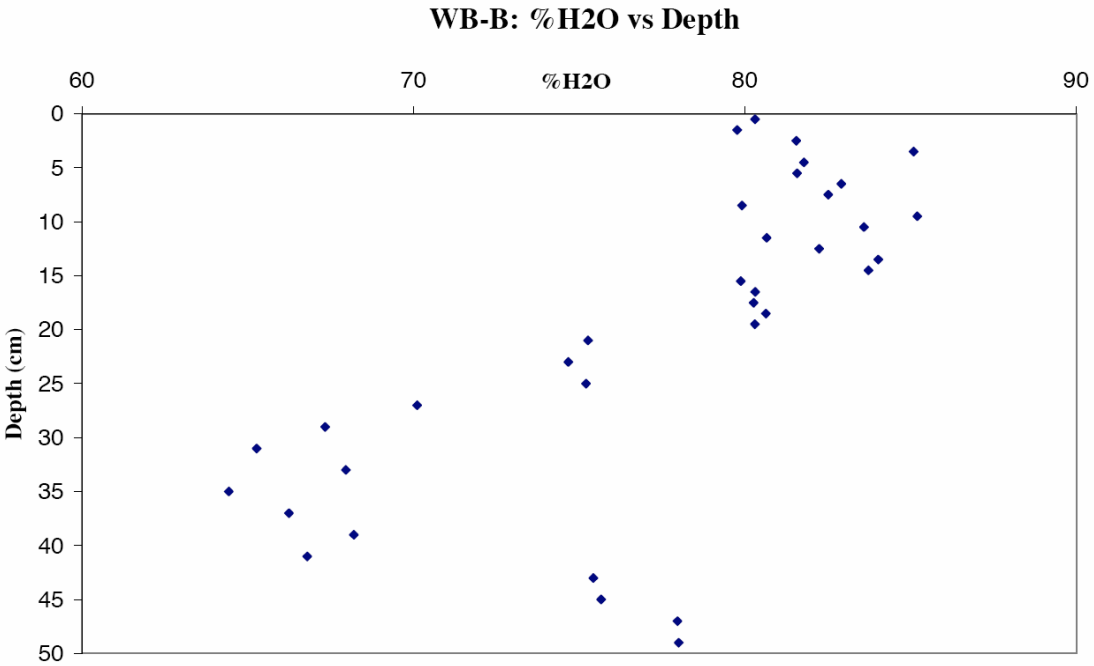
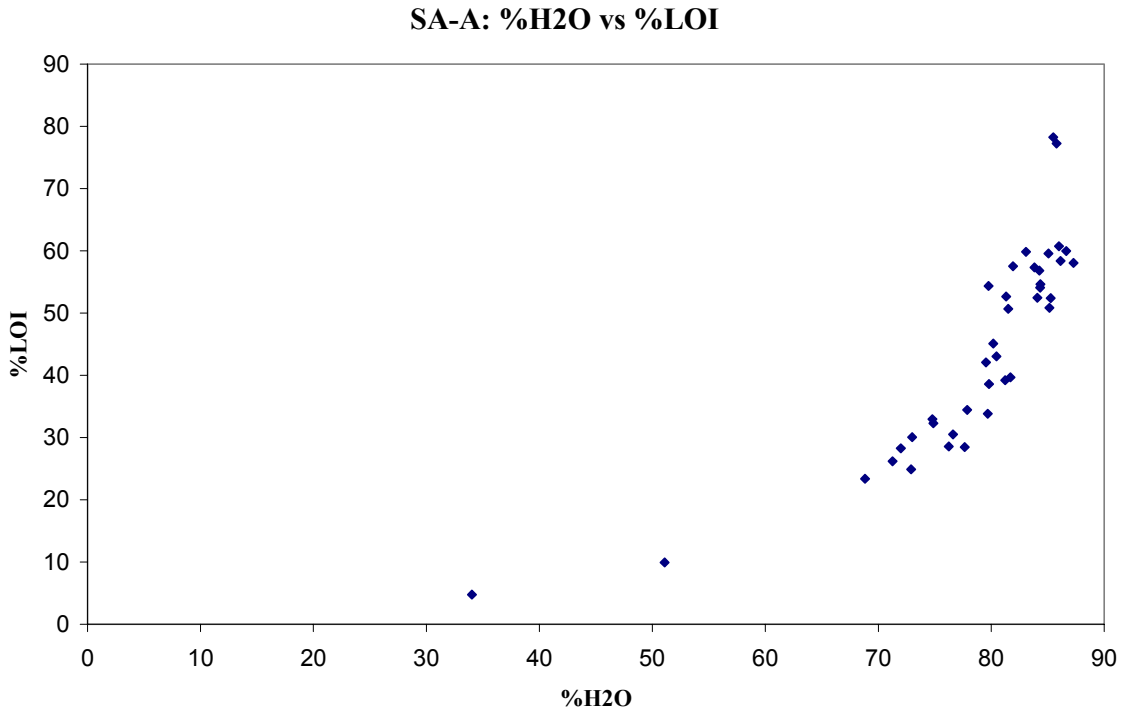


Figure 18: Percent LOI vs Percent H_2O for Cores SA-A & SA-B



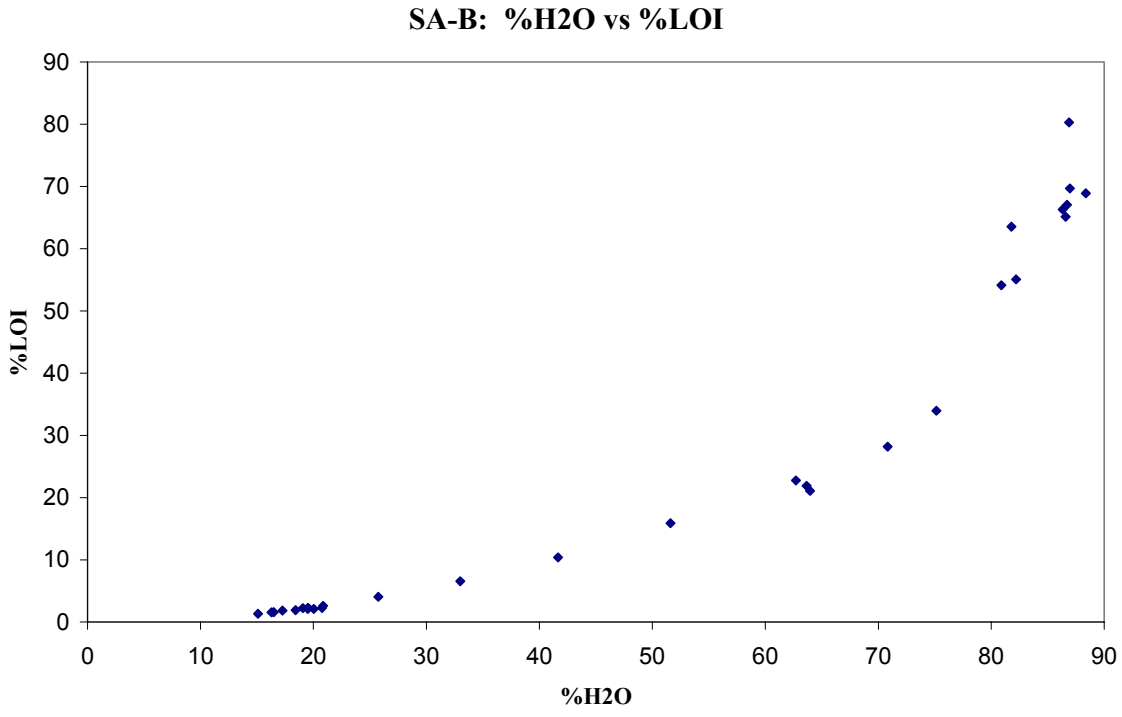
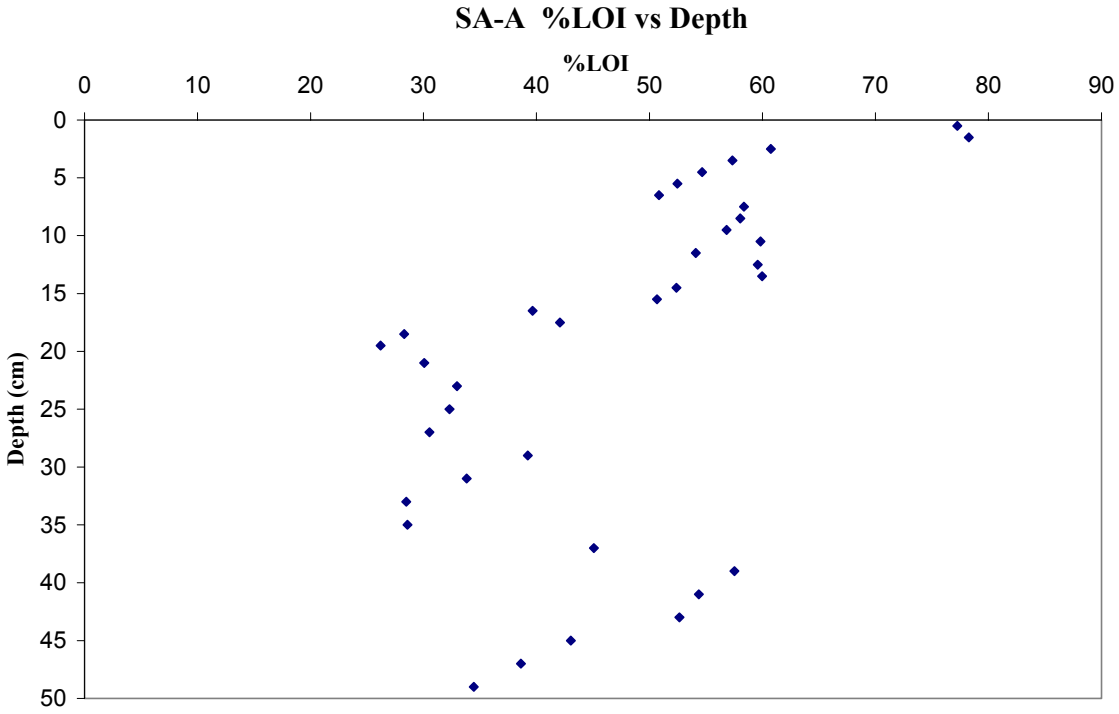


Figure 19: Changes in Percent LOI with Depth for Cores SA-A & SA-B



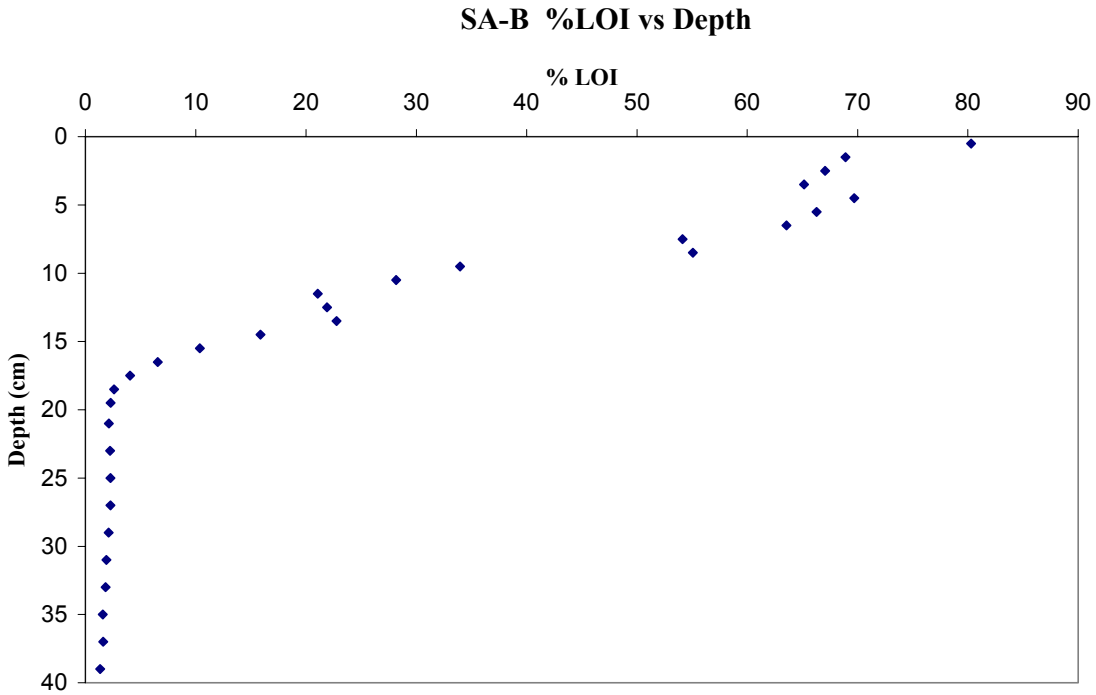


Figure 20: Changes in Percent H_2O with Depth for Cores SA-A & SA-B

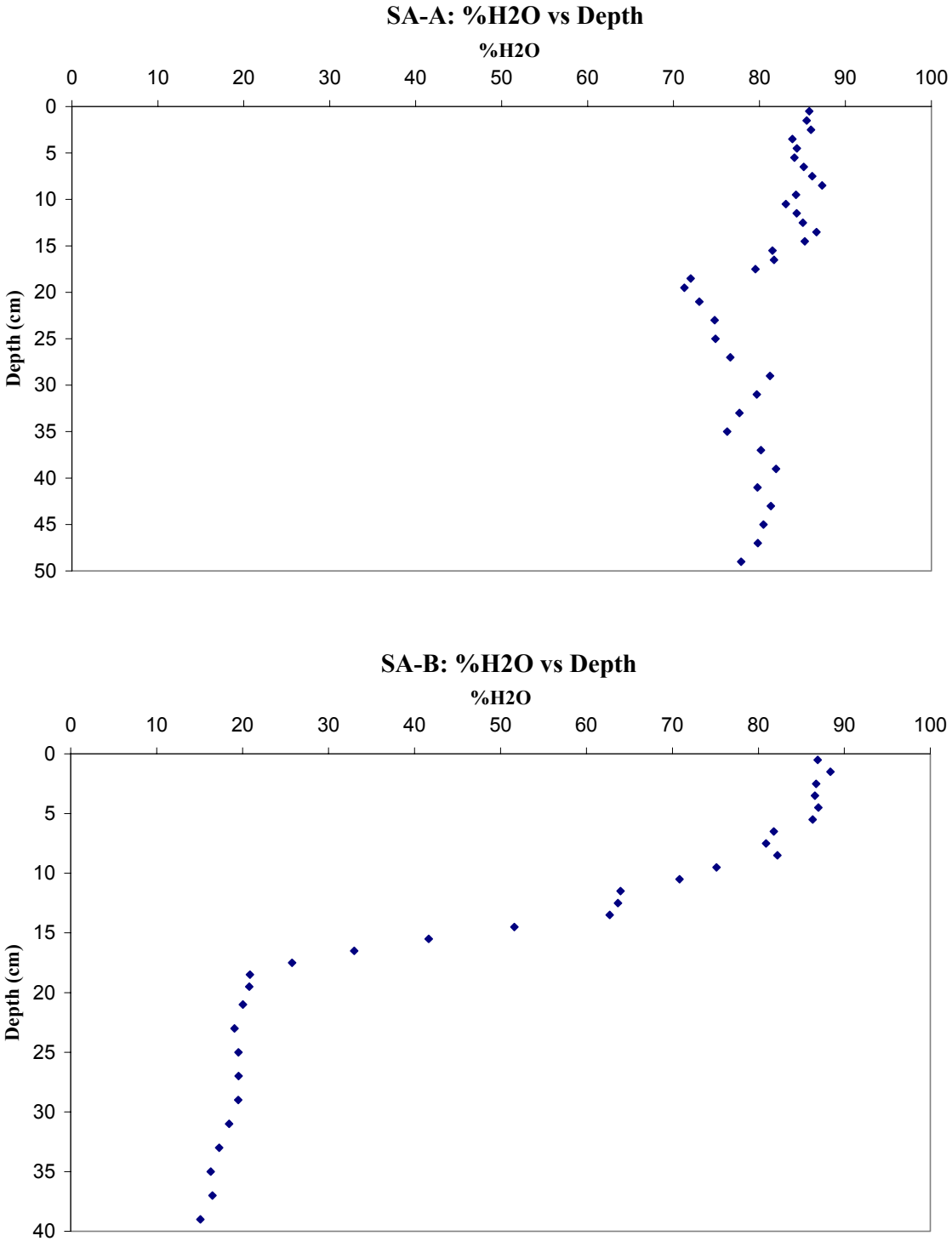
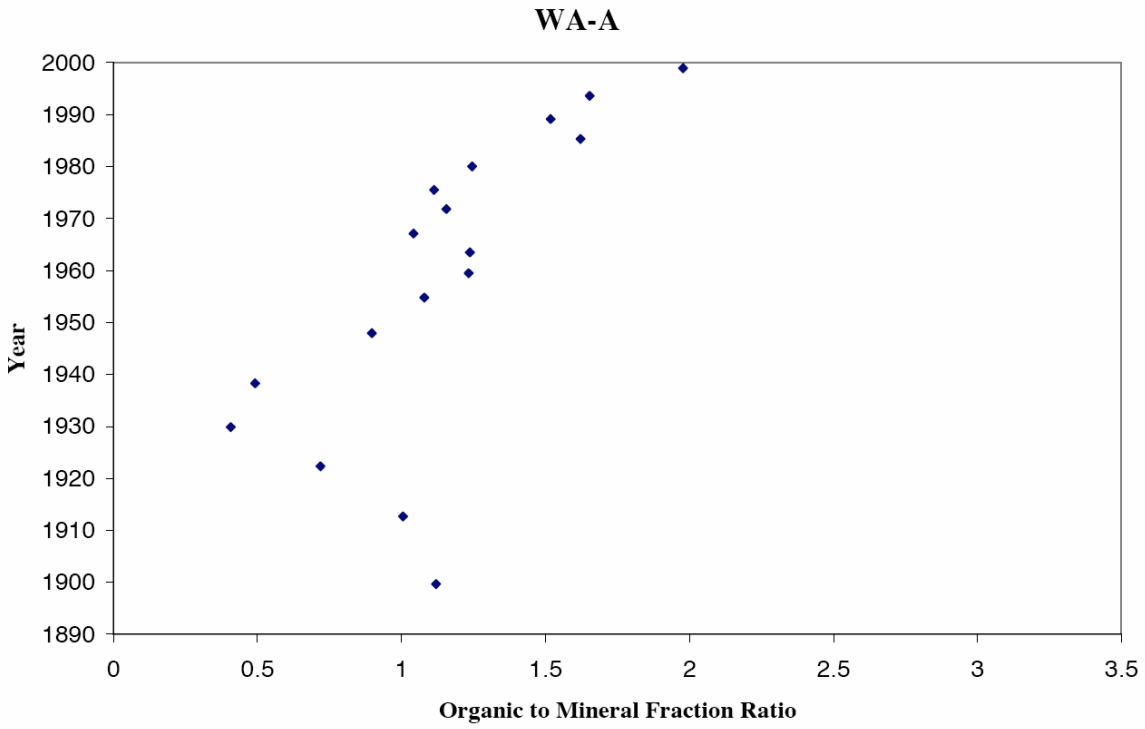


Figure 21a: Organic to Mineral Fraction Ratio for Cores WA-A & WA-B



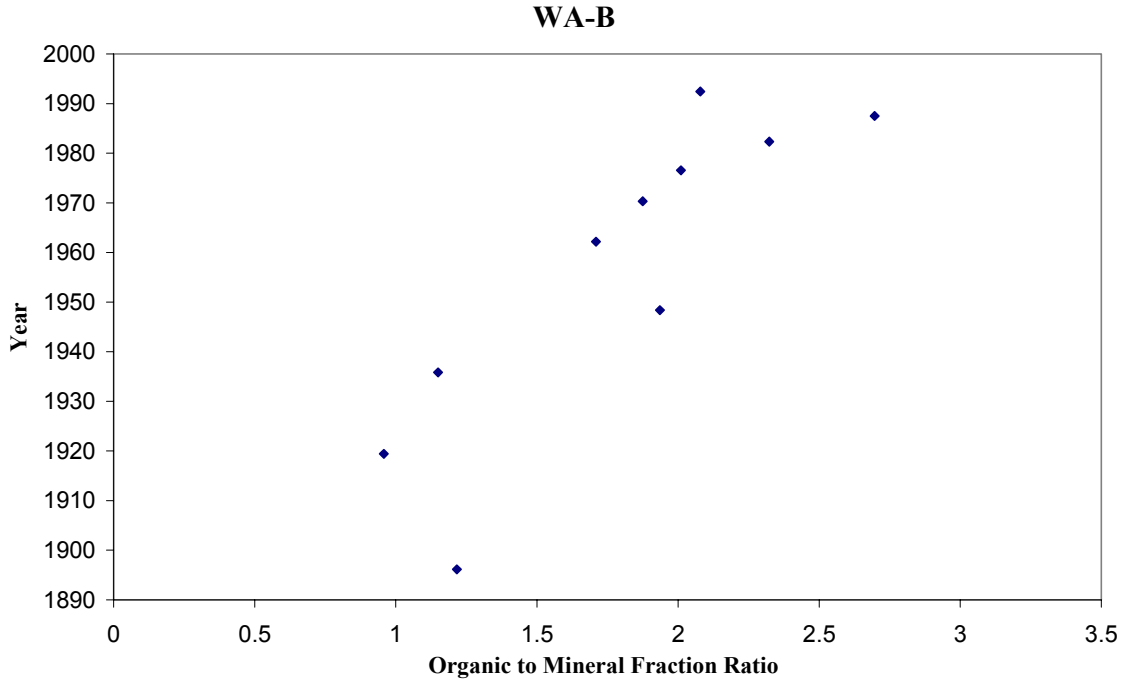
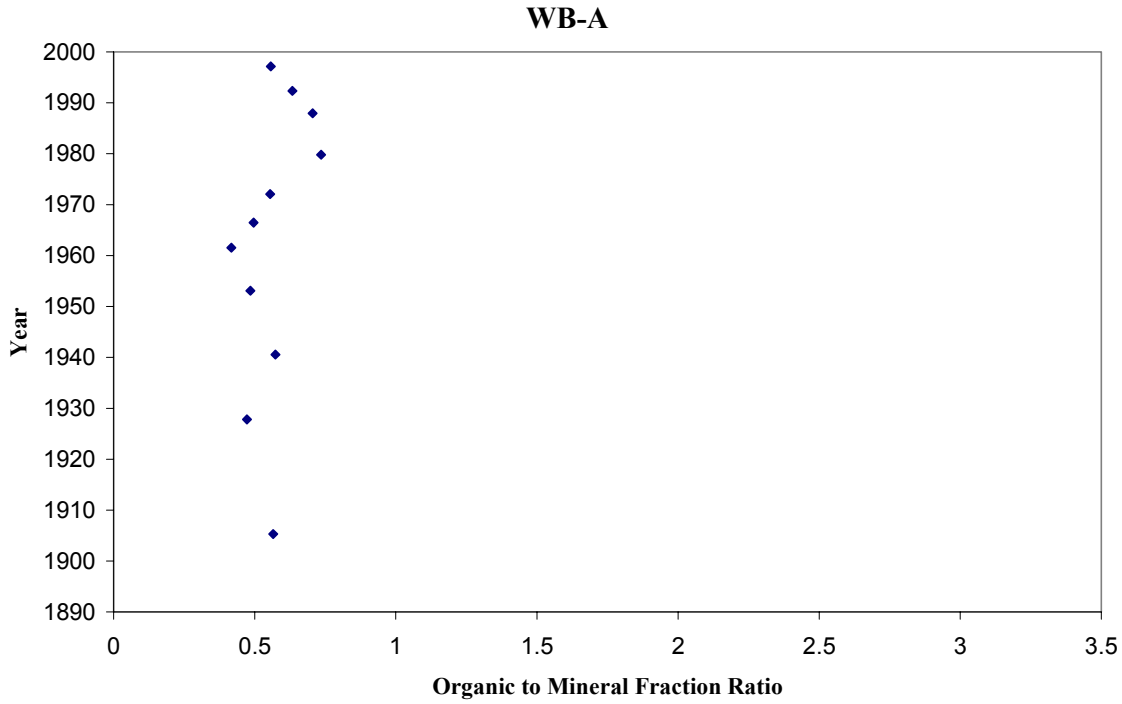


Figure 21b: Organic to Mineral Fraction Ratio for Cores WB-A & WB-B



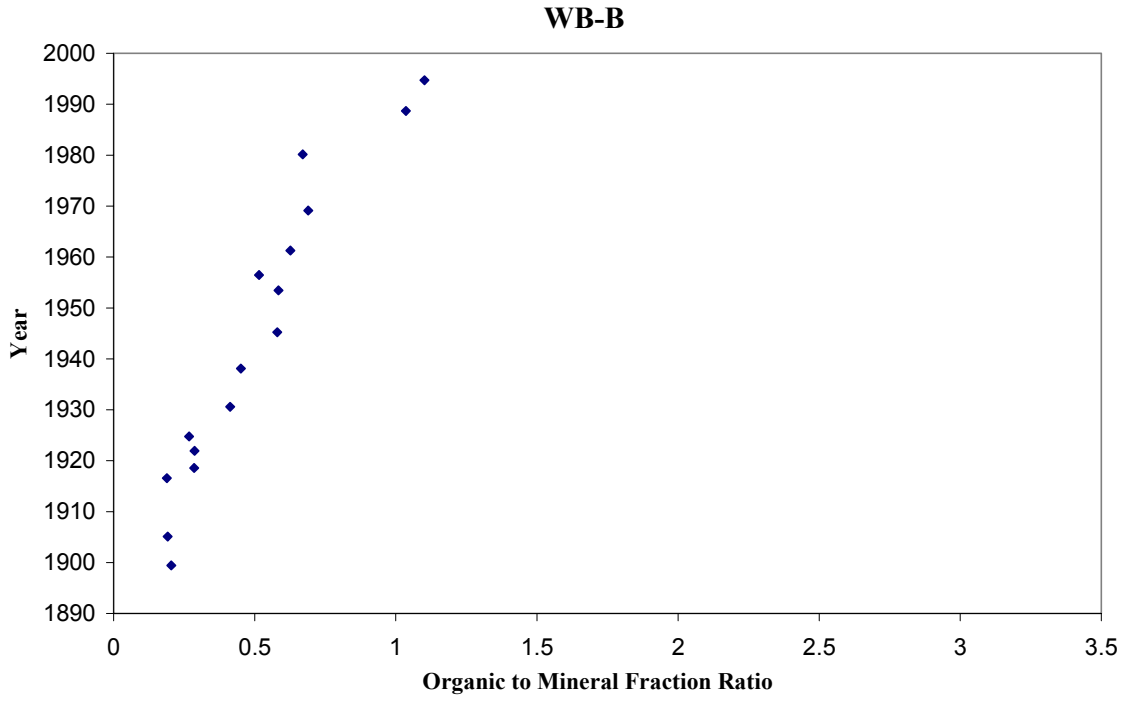
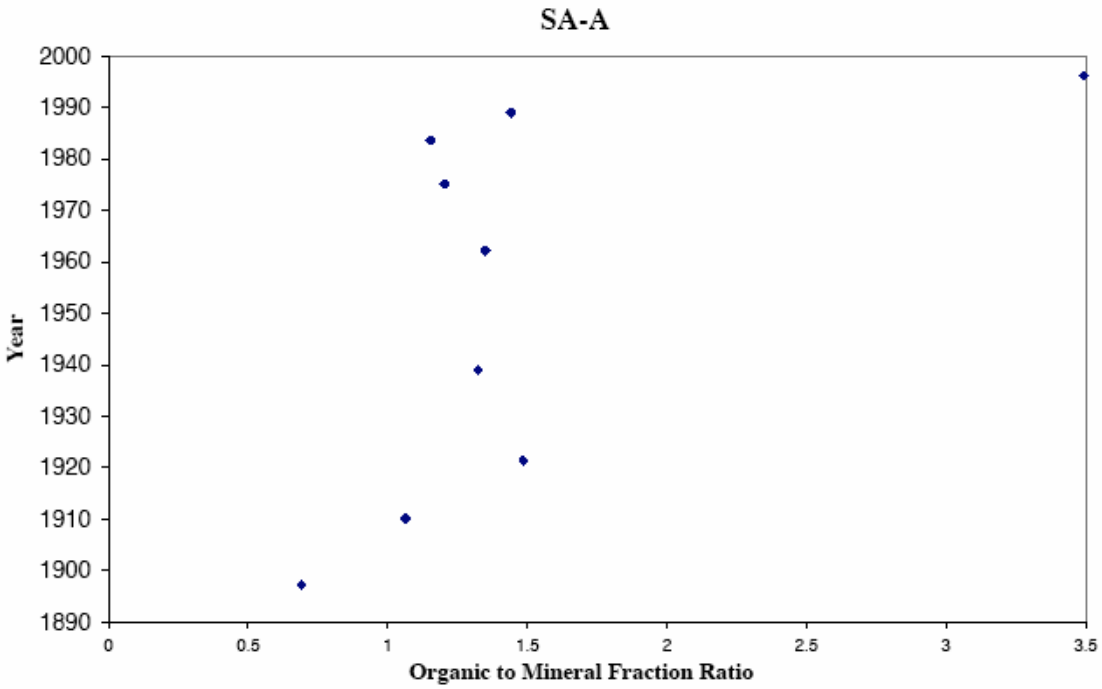


Figure 21c: Organic to Mineral Fraction Ratio for Cores SA-A & SA-B



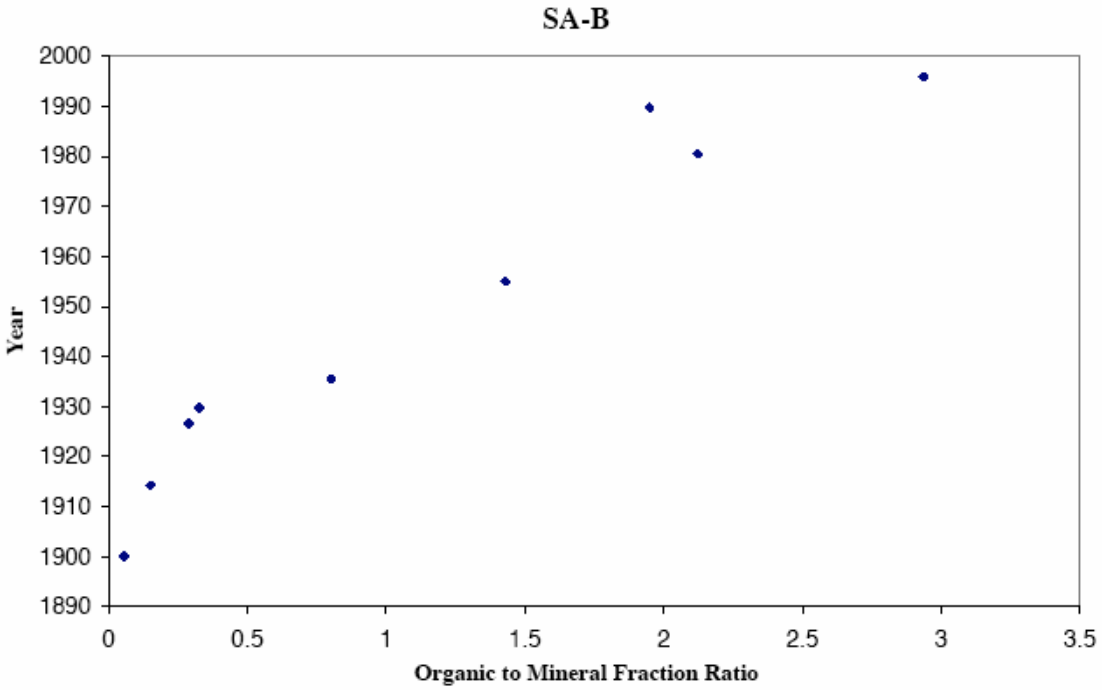
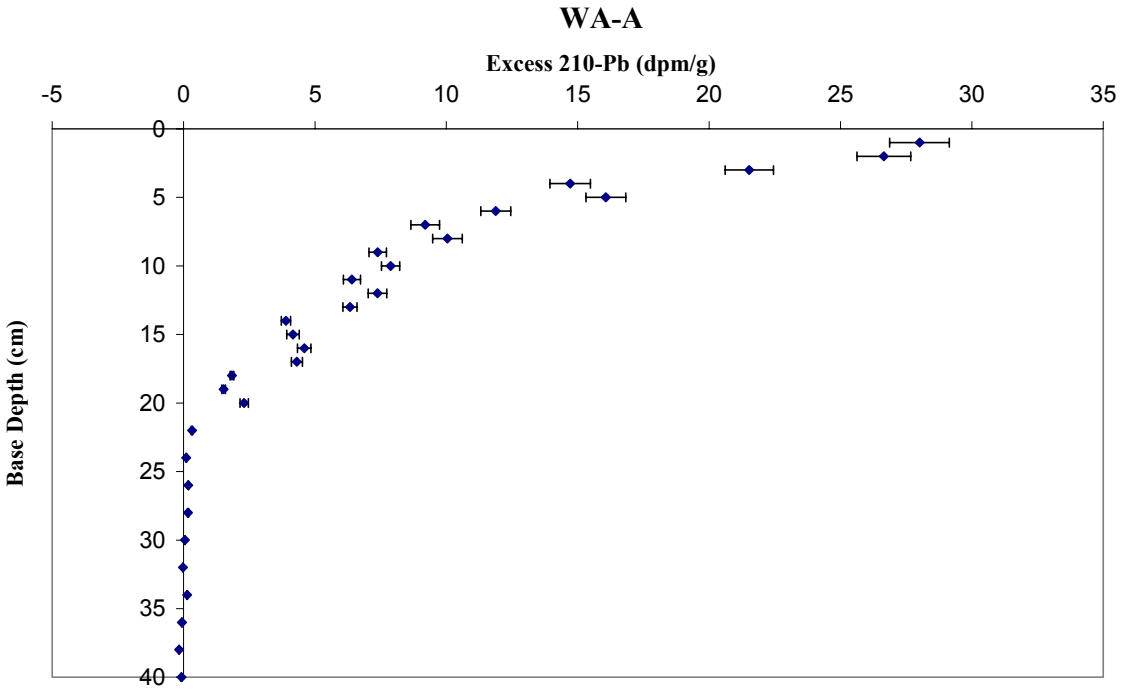


Figure 22a: Excess ^{210}Pb Activity for Cores WA-A & WA-B



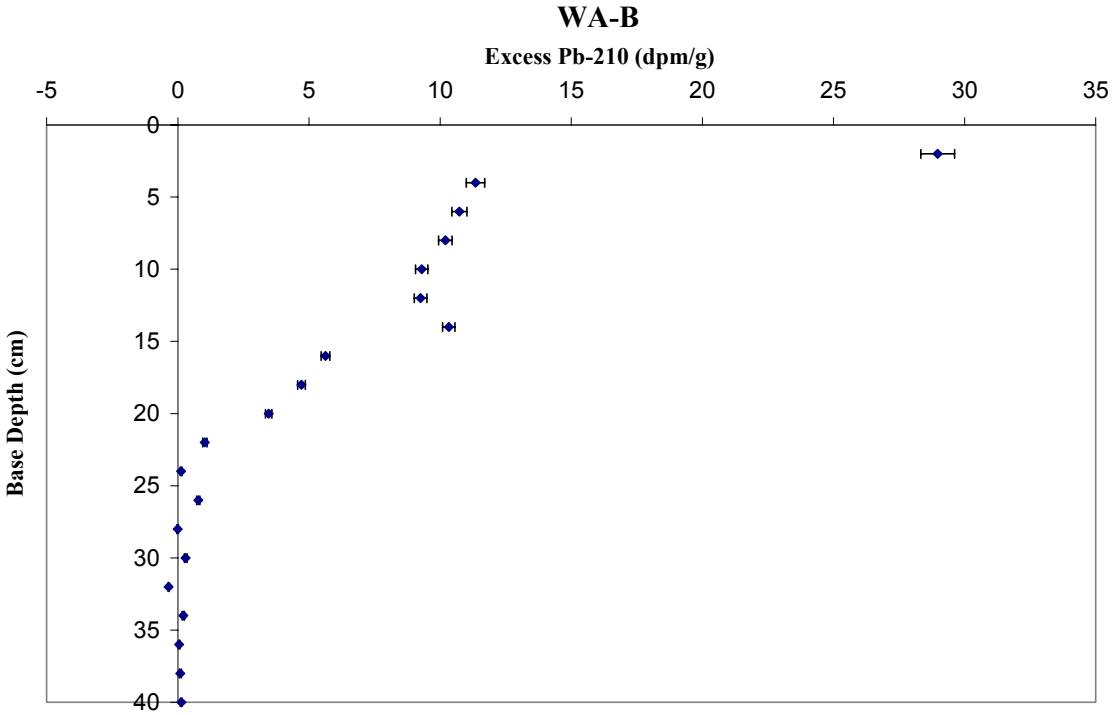
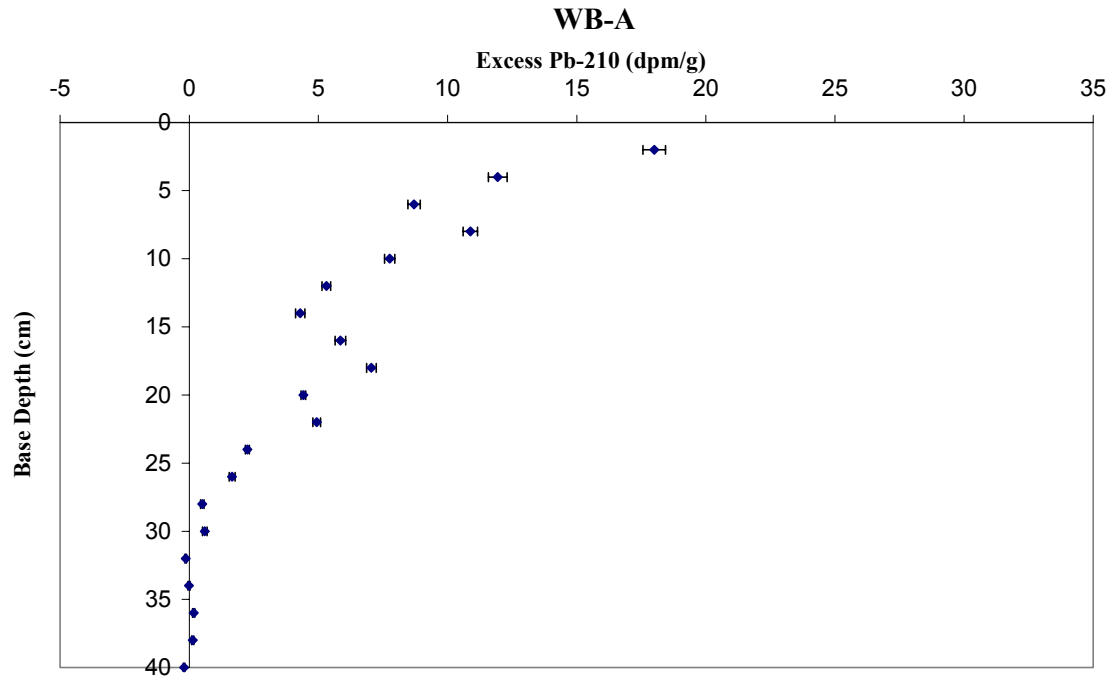


Figure 22b: Excess ^{210}Pb Activity for Cores WB-A & WB-B



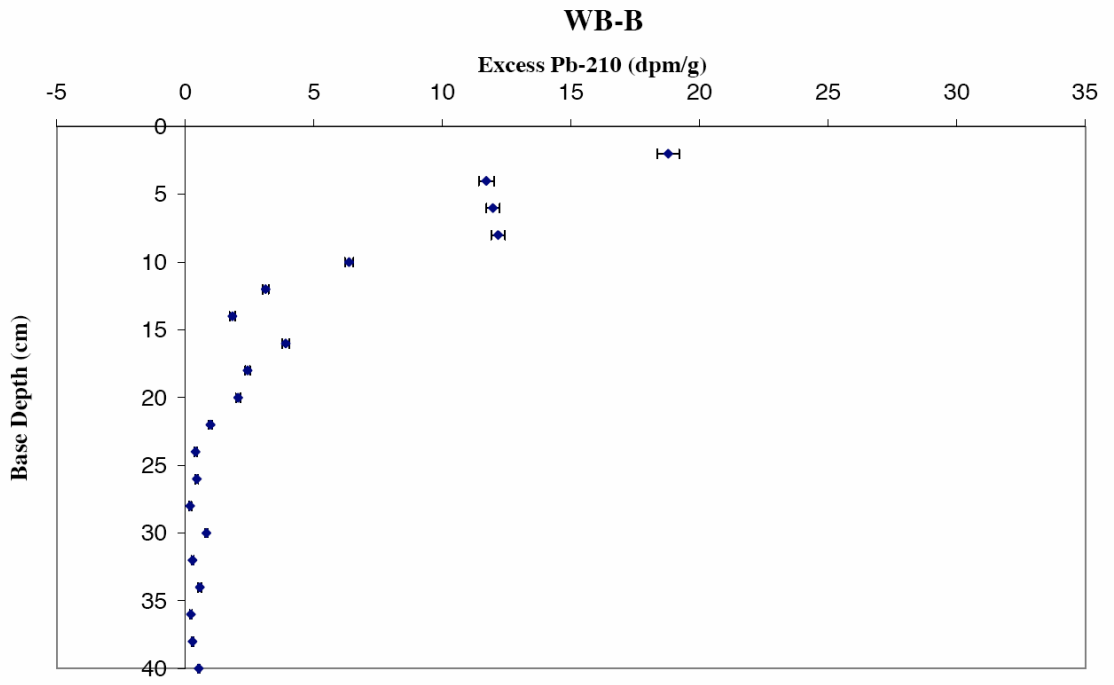
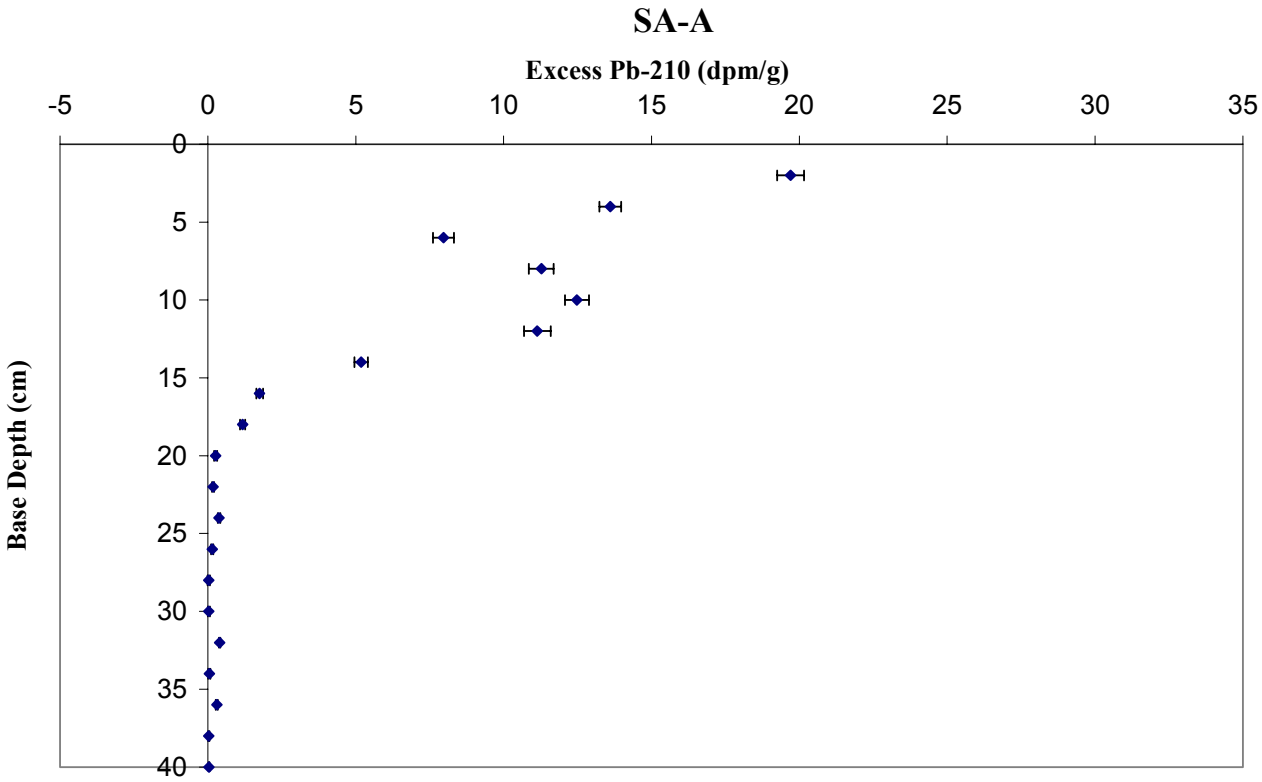


Figure 22c: Excess ^{210}Pb Activity for Cores SA-A & SA-B



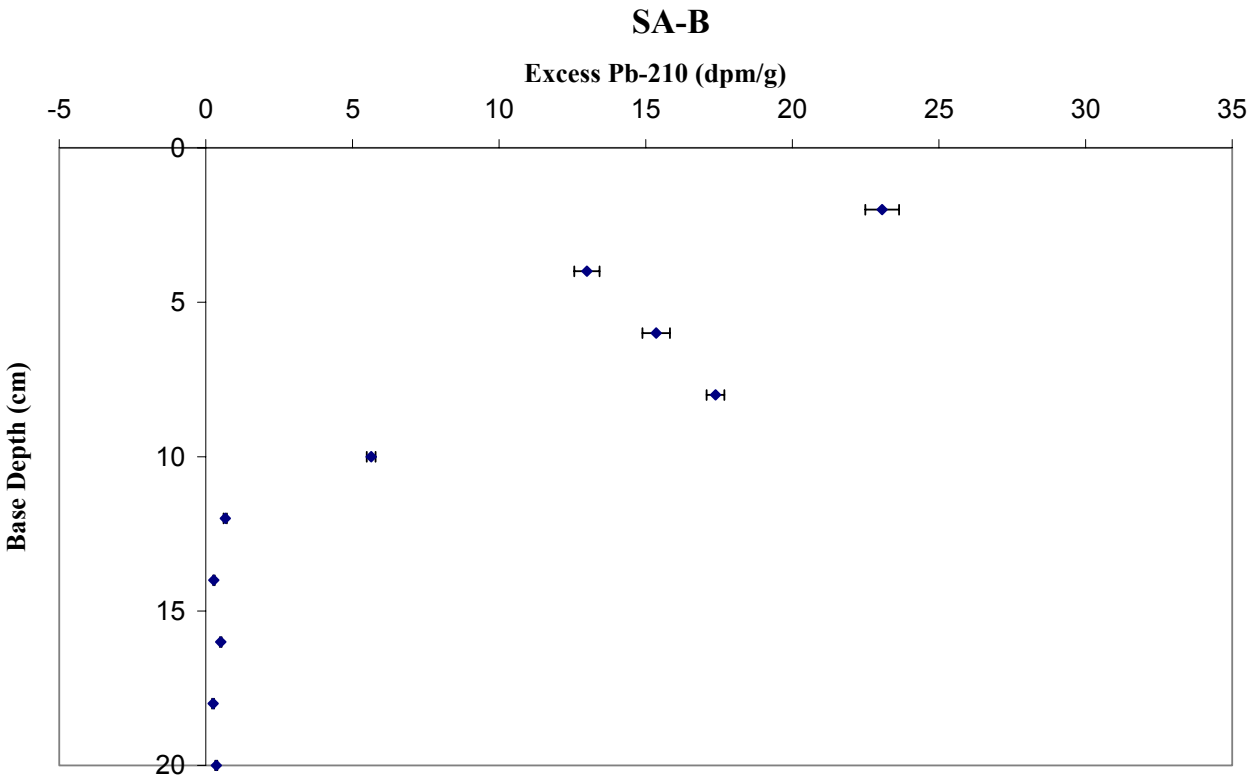
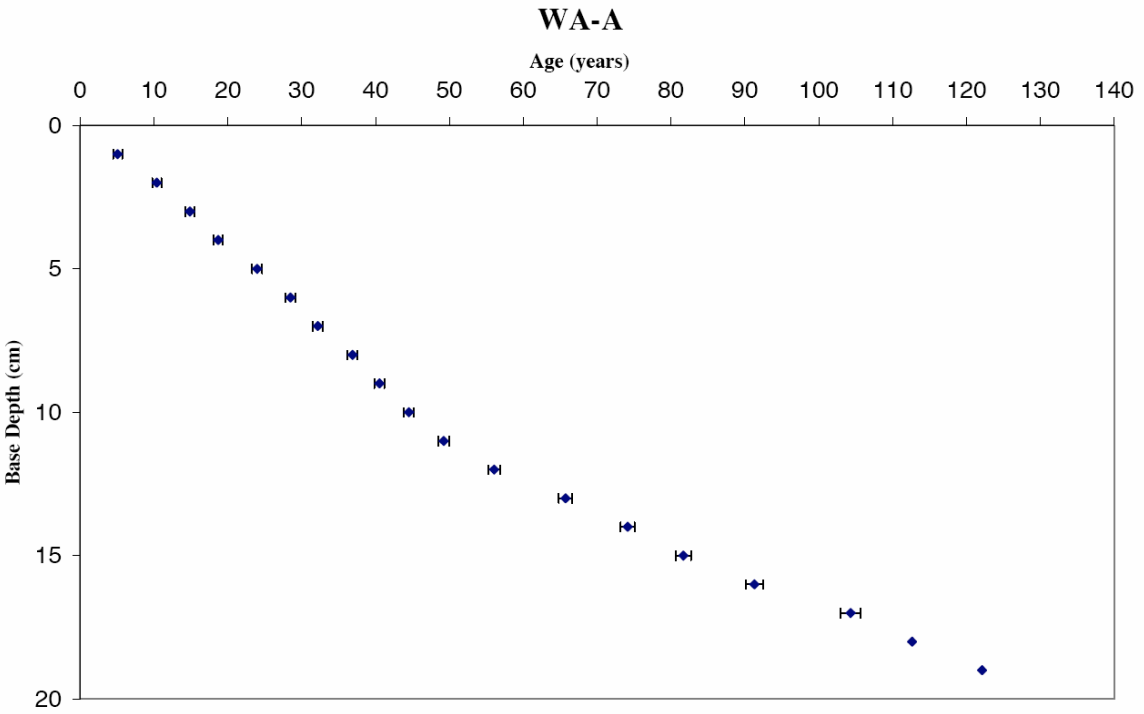


Figure 23a: Sediment Ages Derived from ^{210}Pb Activity for Cores WA-A & WA-B



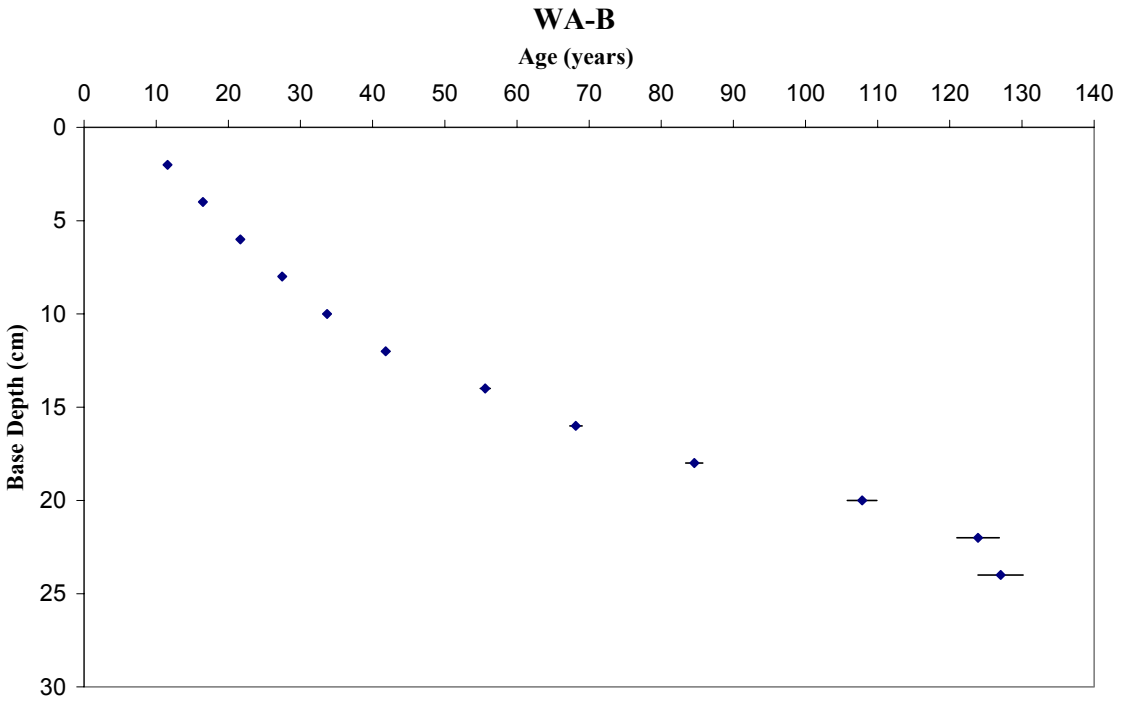
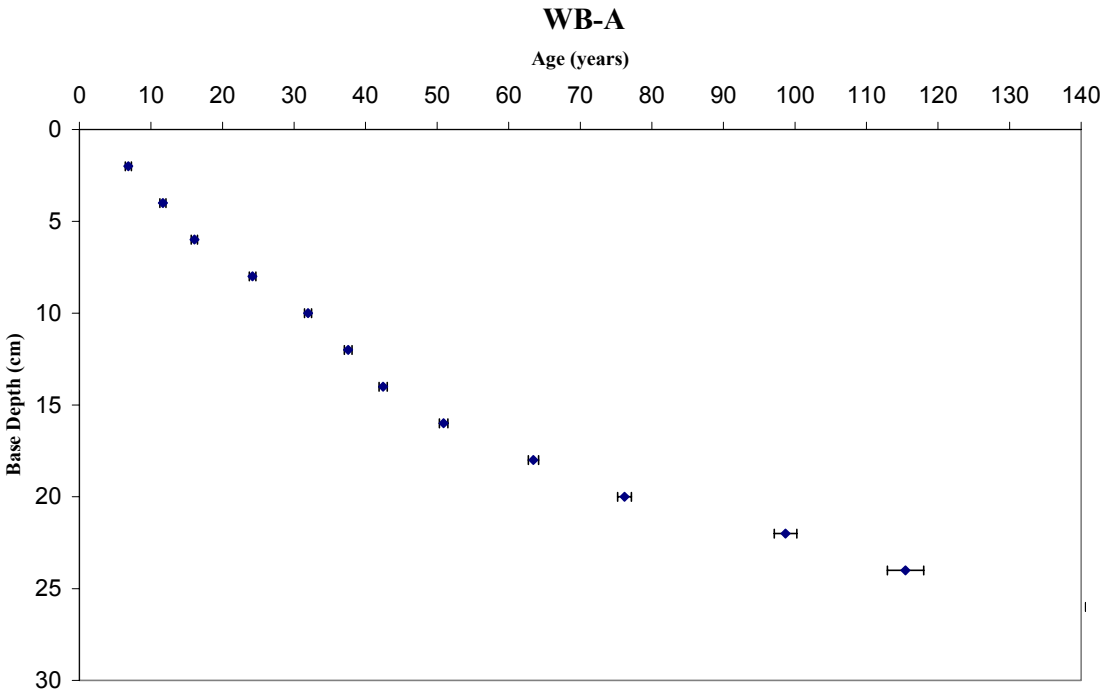


Figure 23b: Sediment Ages Derived from ^{210}Pb Activity for Cores WB-A & WB-B



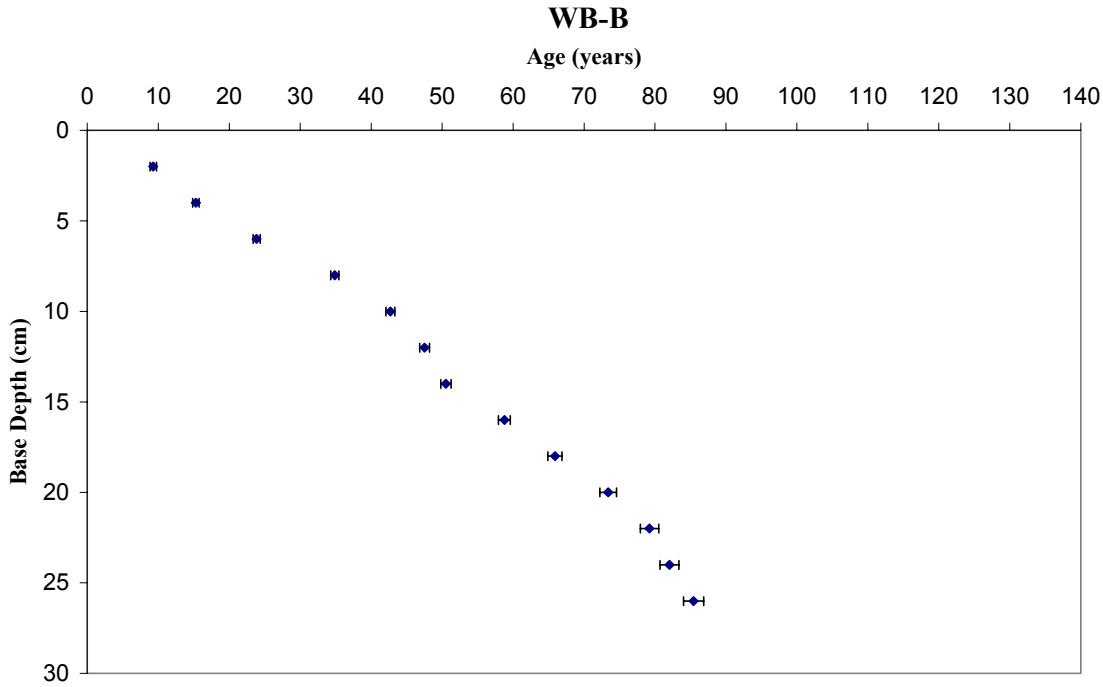
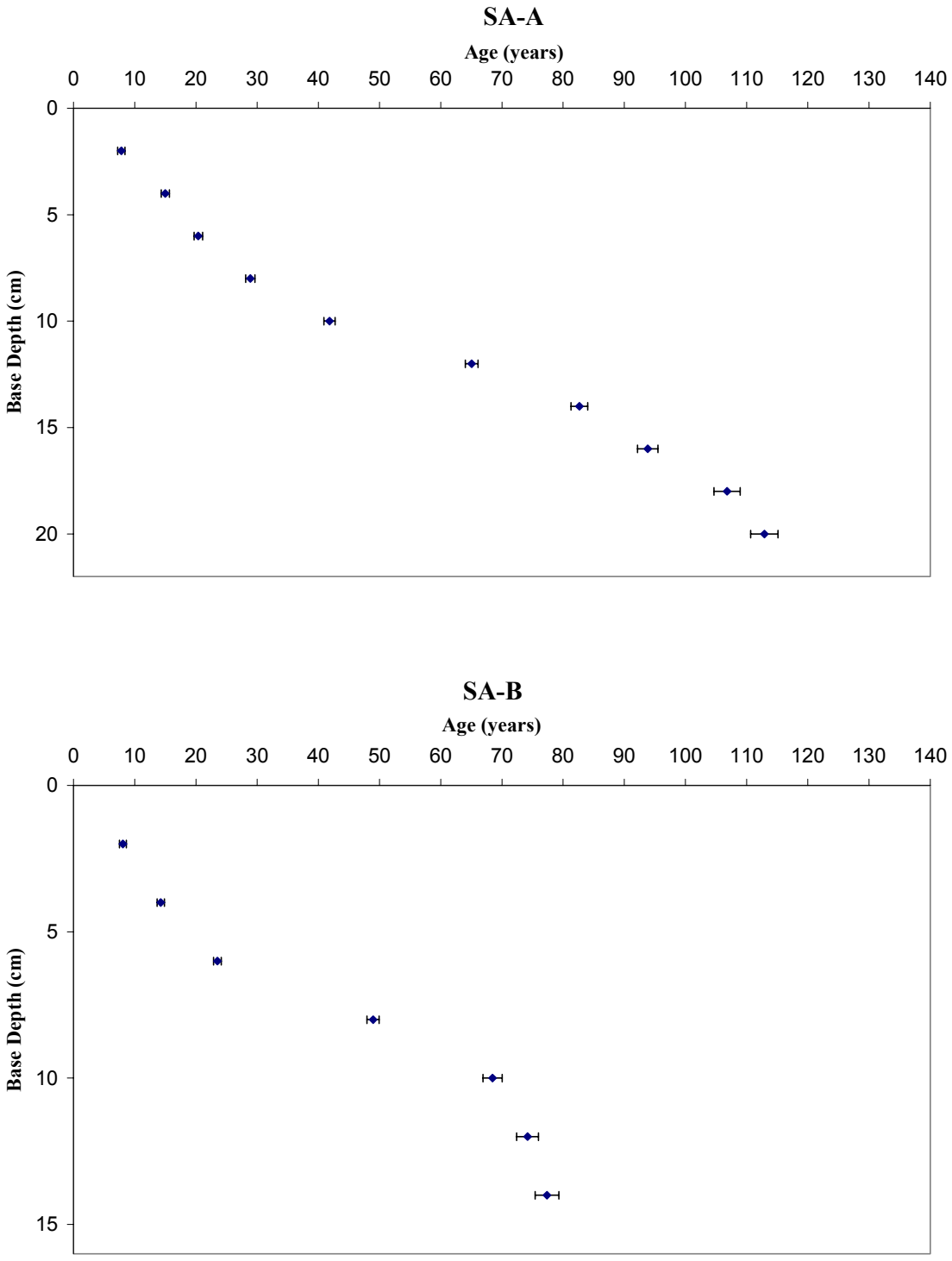


Figure 23c: Sediment Ages Derived from ^{210}Pb Activity for Cores SA-A & SA-B



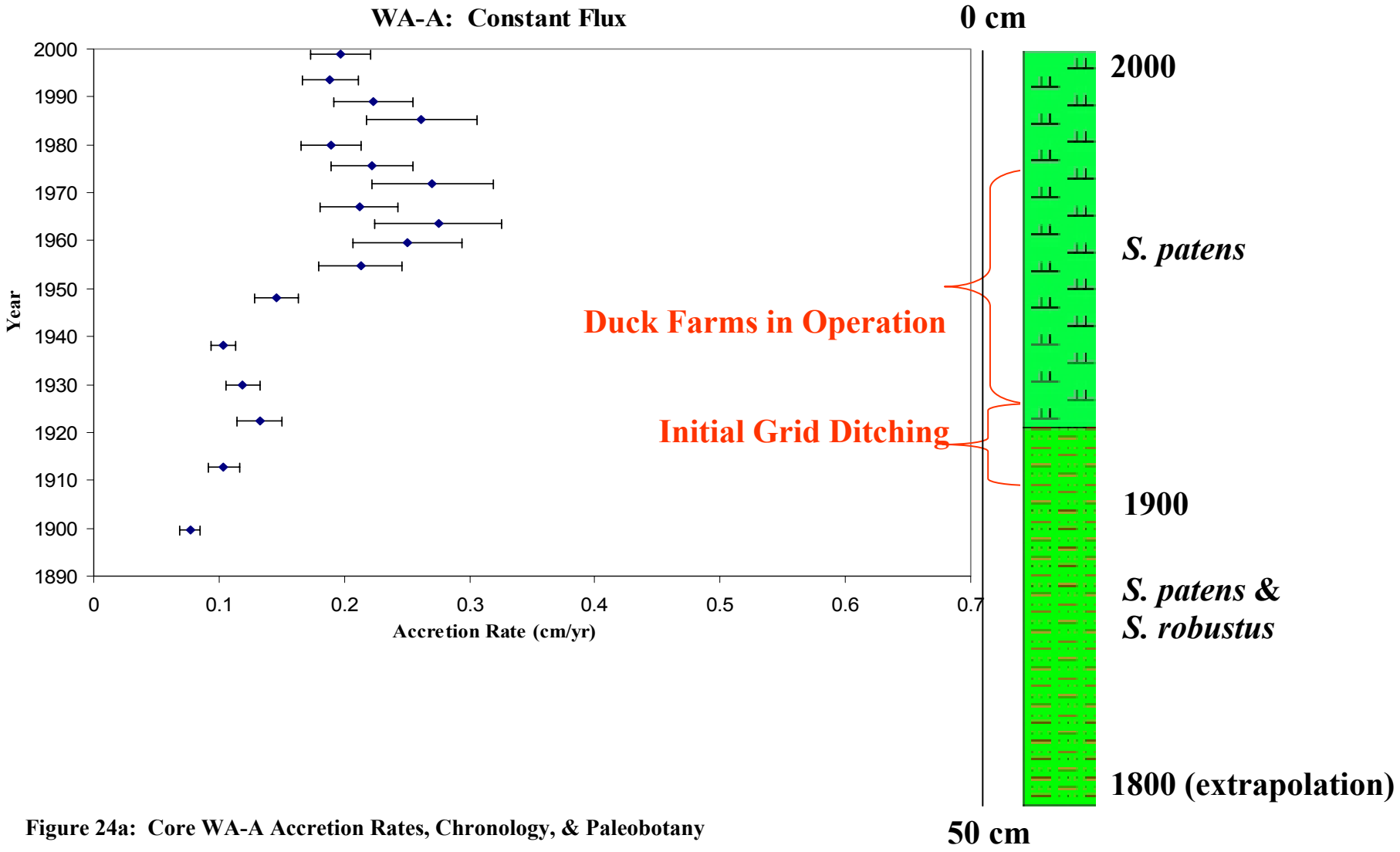


Figure 24a: Core WA-A Accretion Rates, Chronology, & Paleobotany

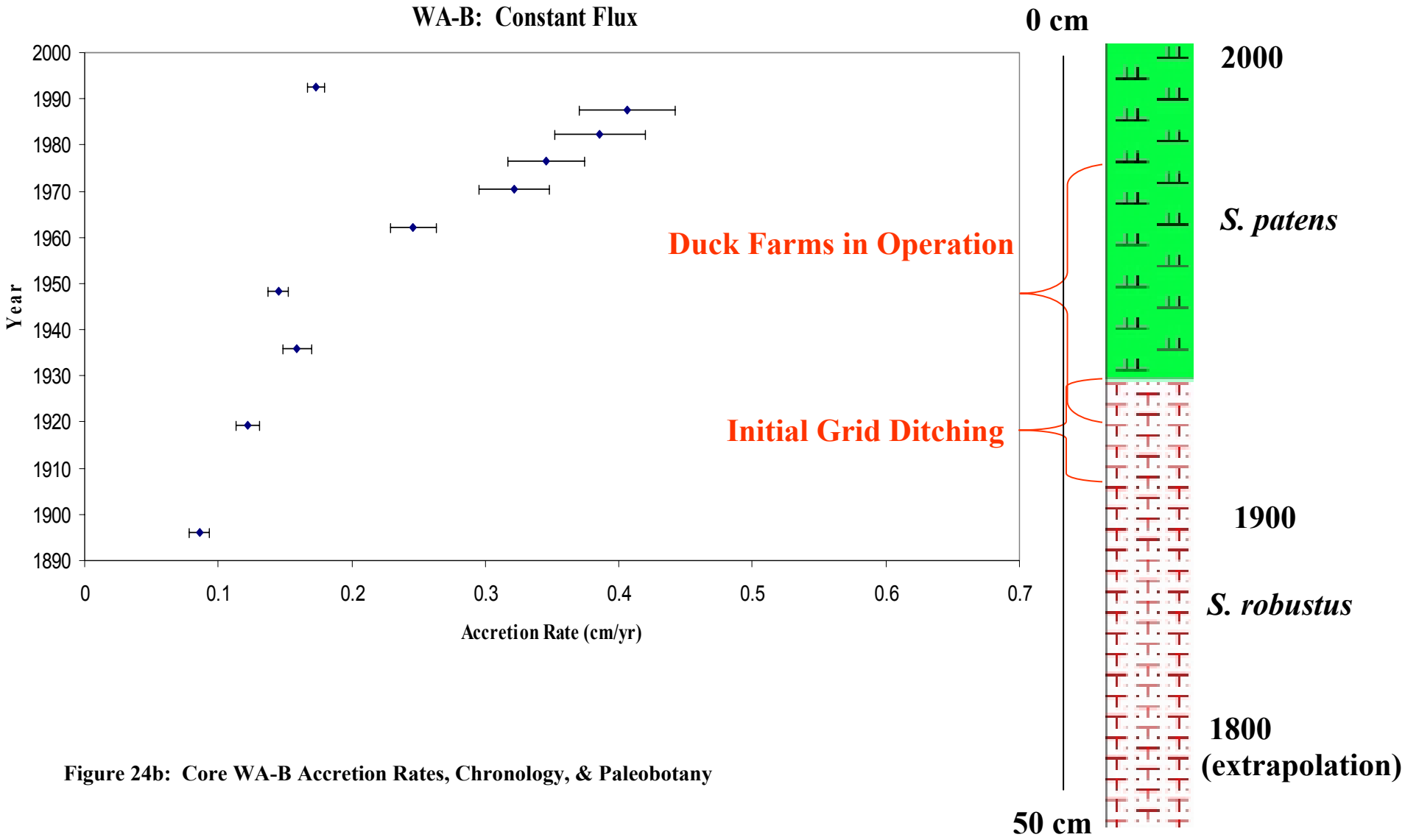


Figure 24b: Core WA-B Accretion Rates, Chronology, & Paleobotany

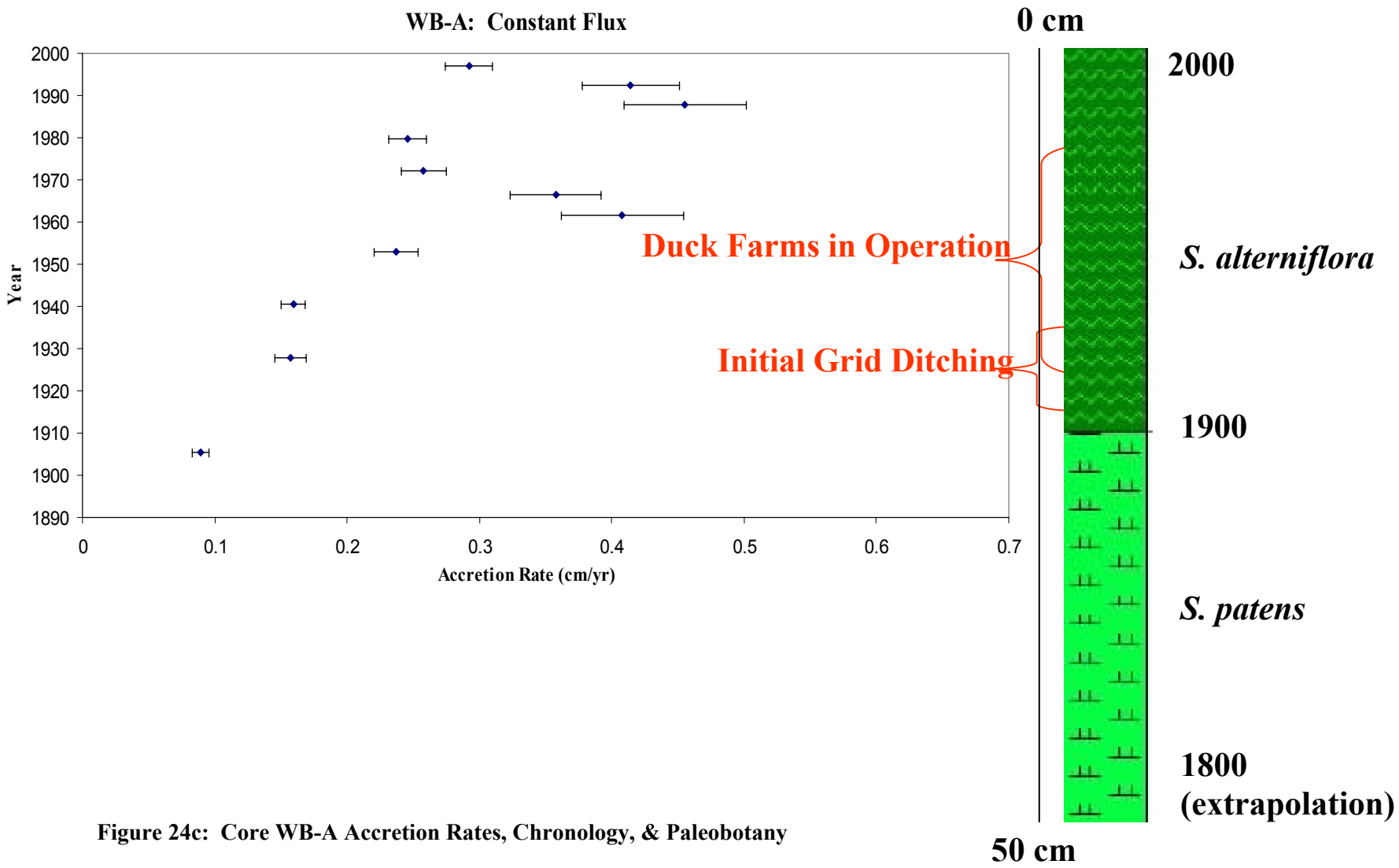


Figure 24c: Core WB-A Accretion Rates, Chronology, & Paleobotany

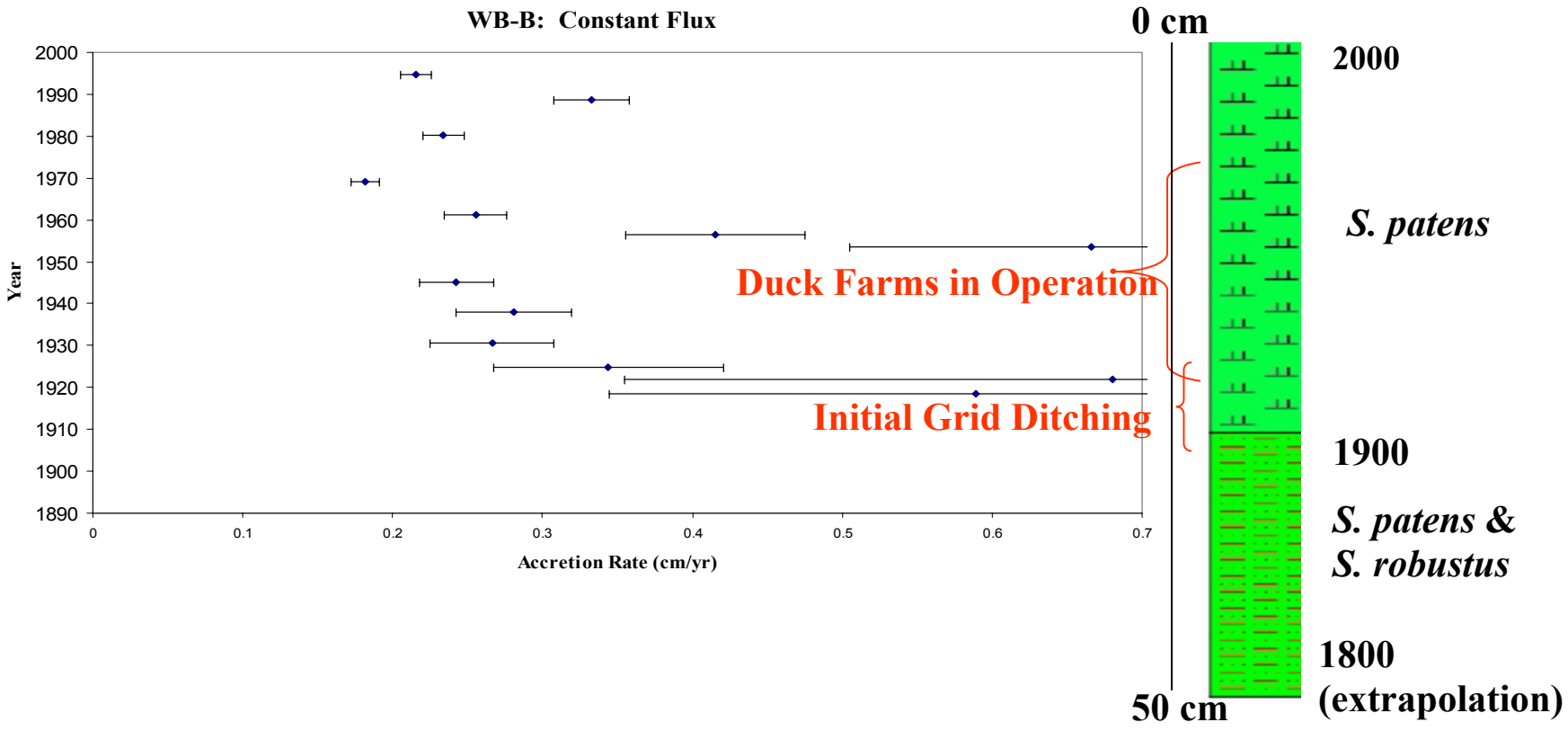


Figure 24d: Core WB-B Accretion Rates, Chronology, & Paleobotany

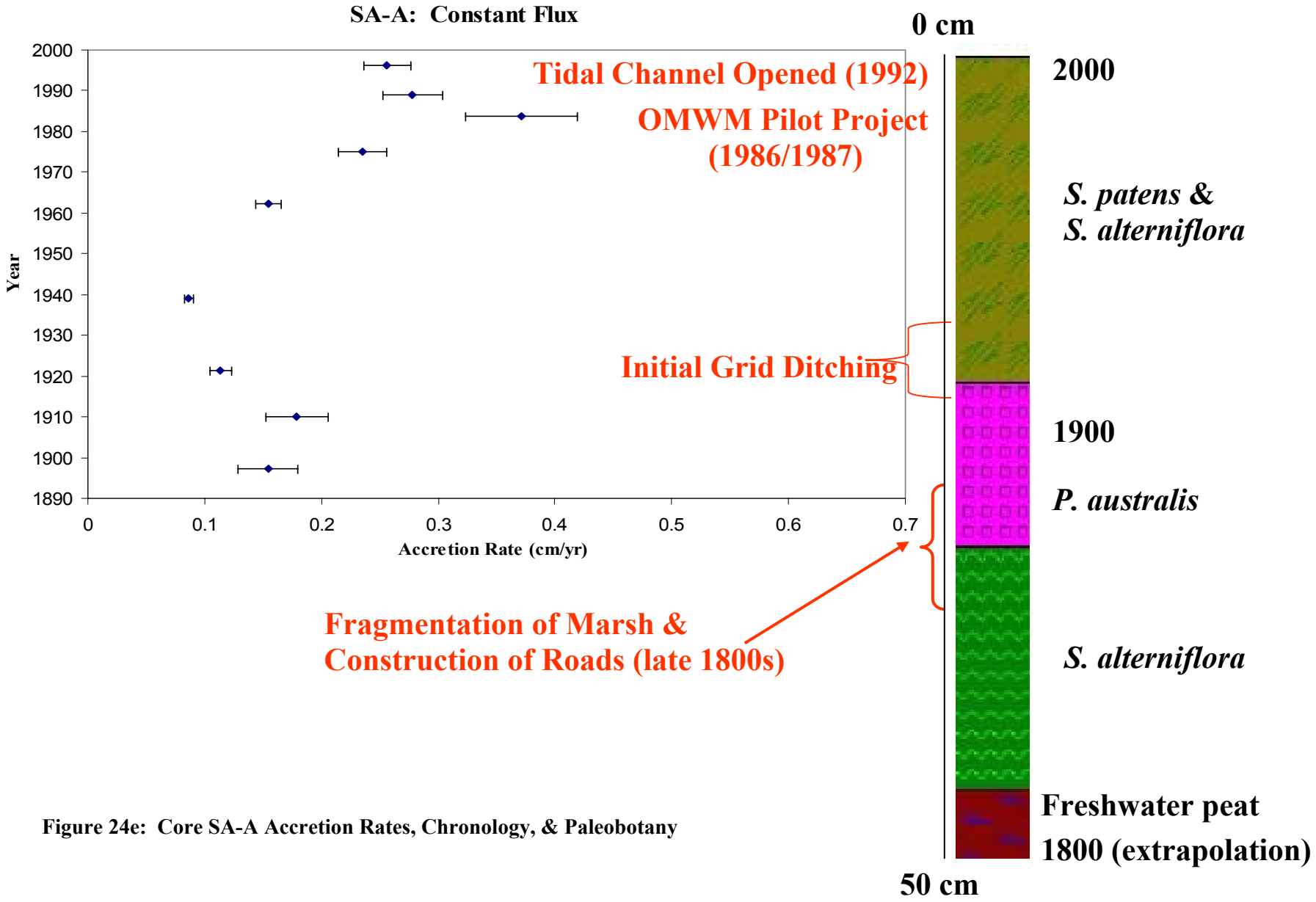


Figure 24e: Core SA-A Accretion Rates, Chronology, & Paleobotany

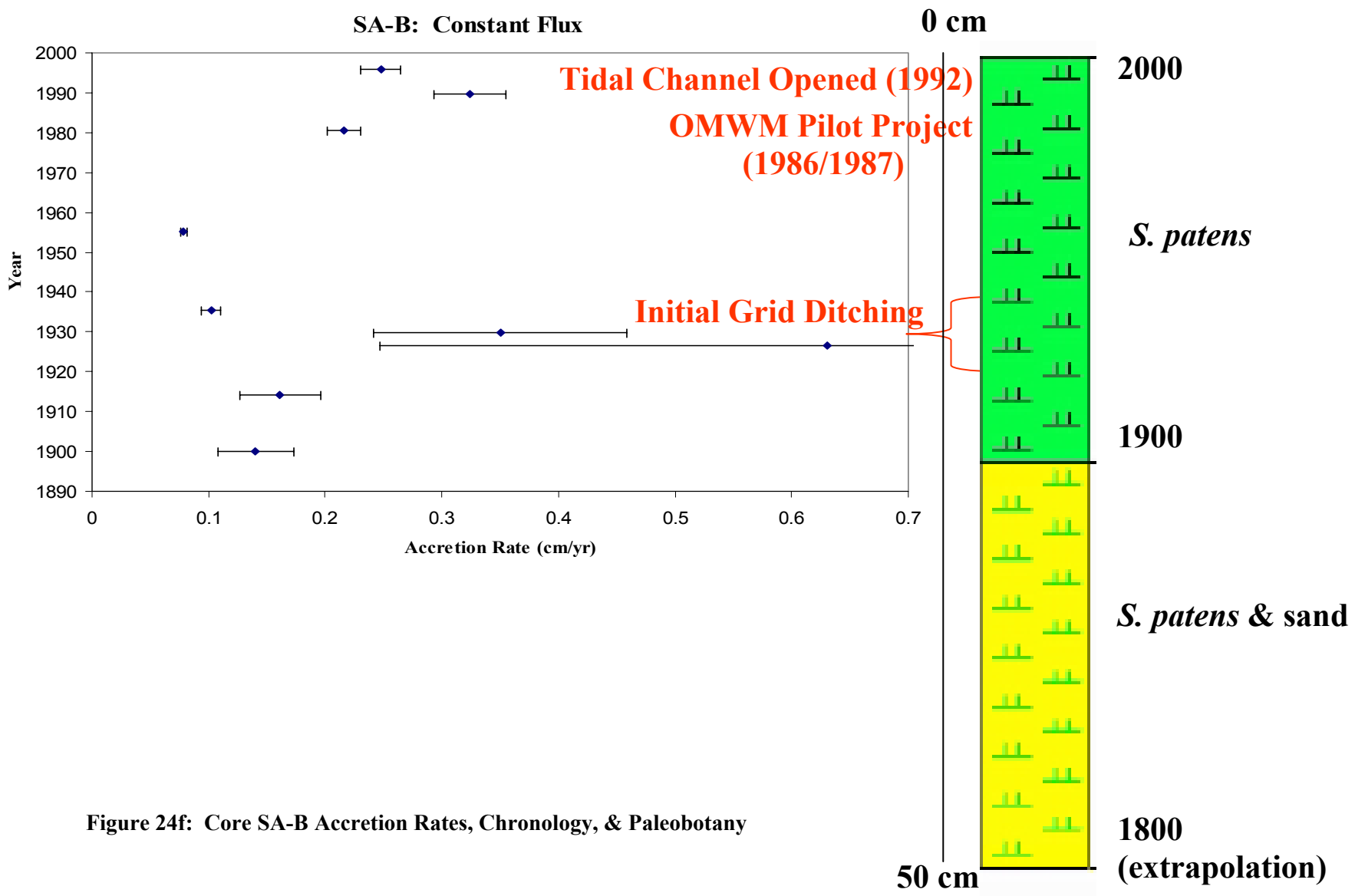


Figure 24f: Core SA-B Accretion Rates, Chronology, & Paleobotany

Figure 25: Battery Station (Manhattan, New York) Tide Gauge Record 1920-2004

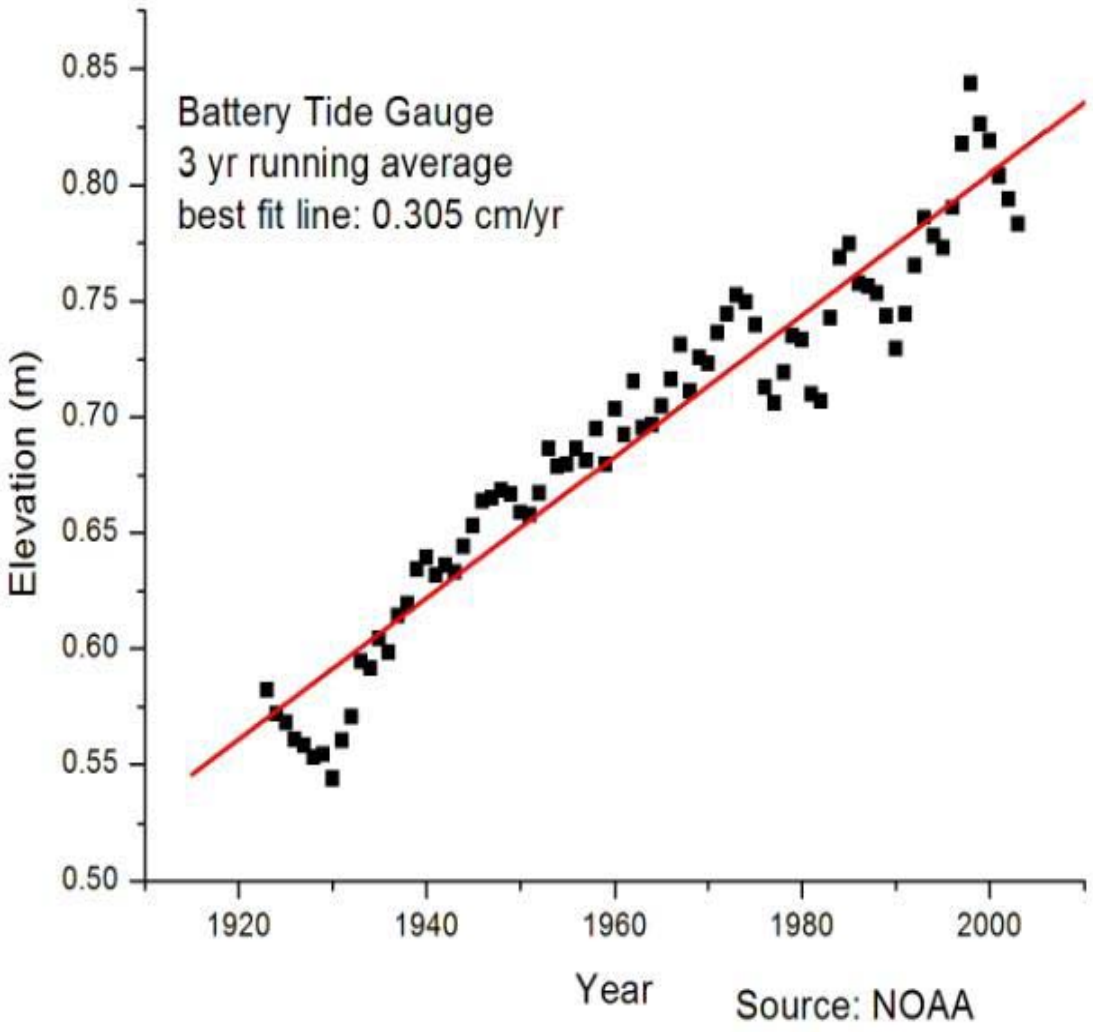


Figure 26a: ^{137}Cs Profile for Core WA-B

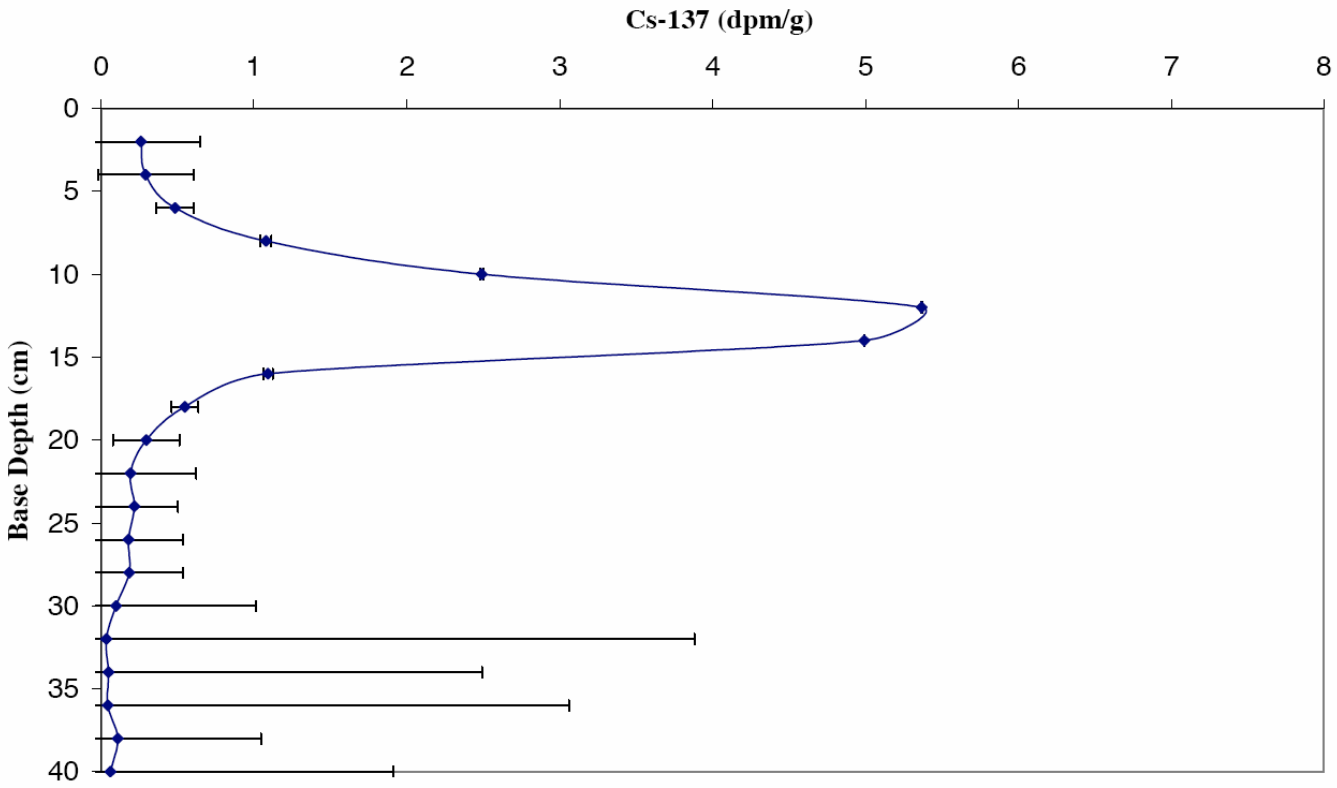
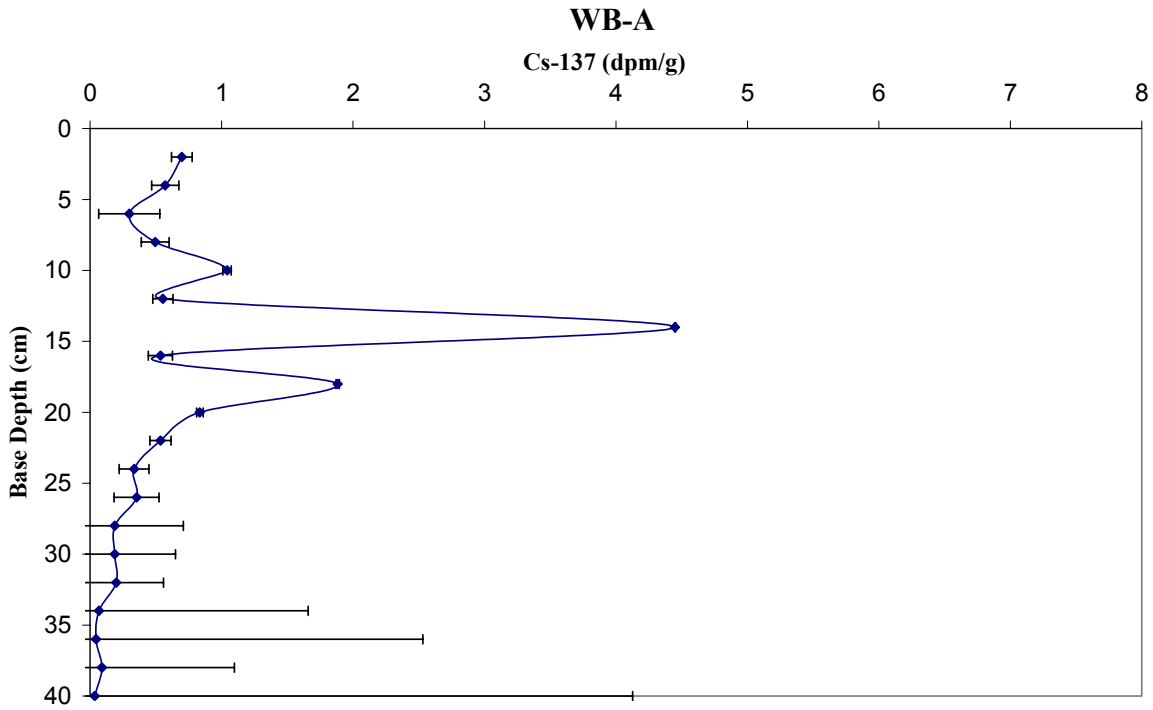


Figure 26b: ^{137}Cs Profiles for Cores WB-A & WB-B



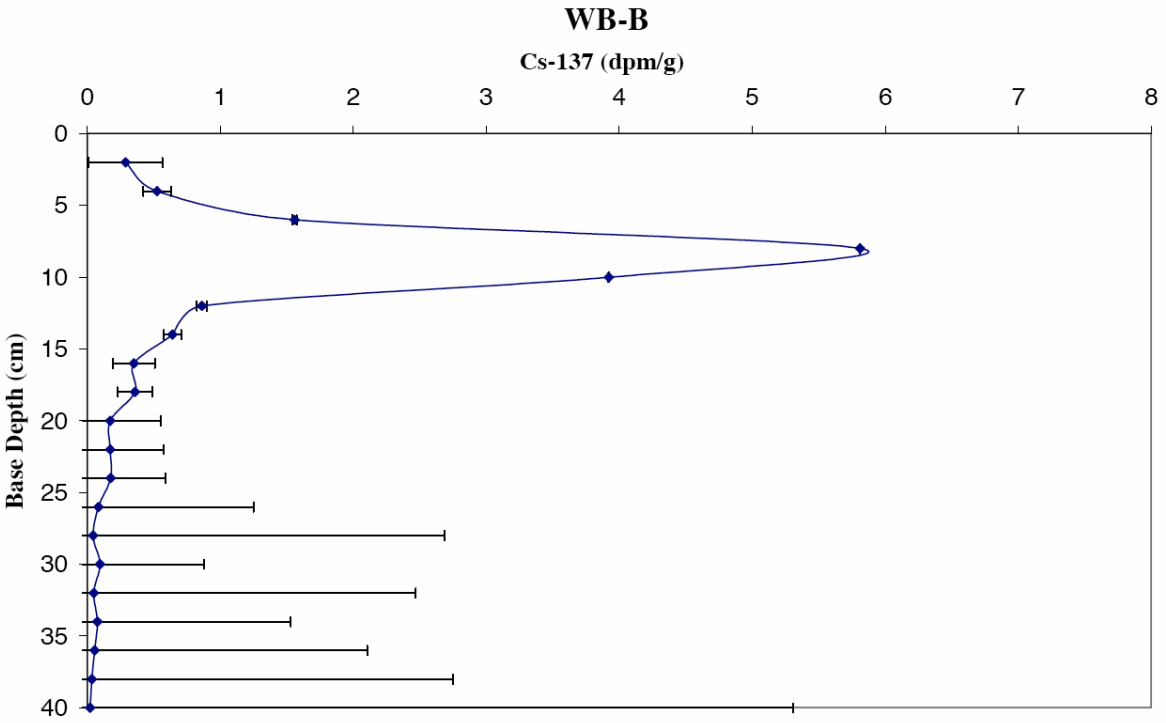


Figure 26c: ^{137}Cs Profiles for Cores SA-A & SA-B

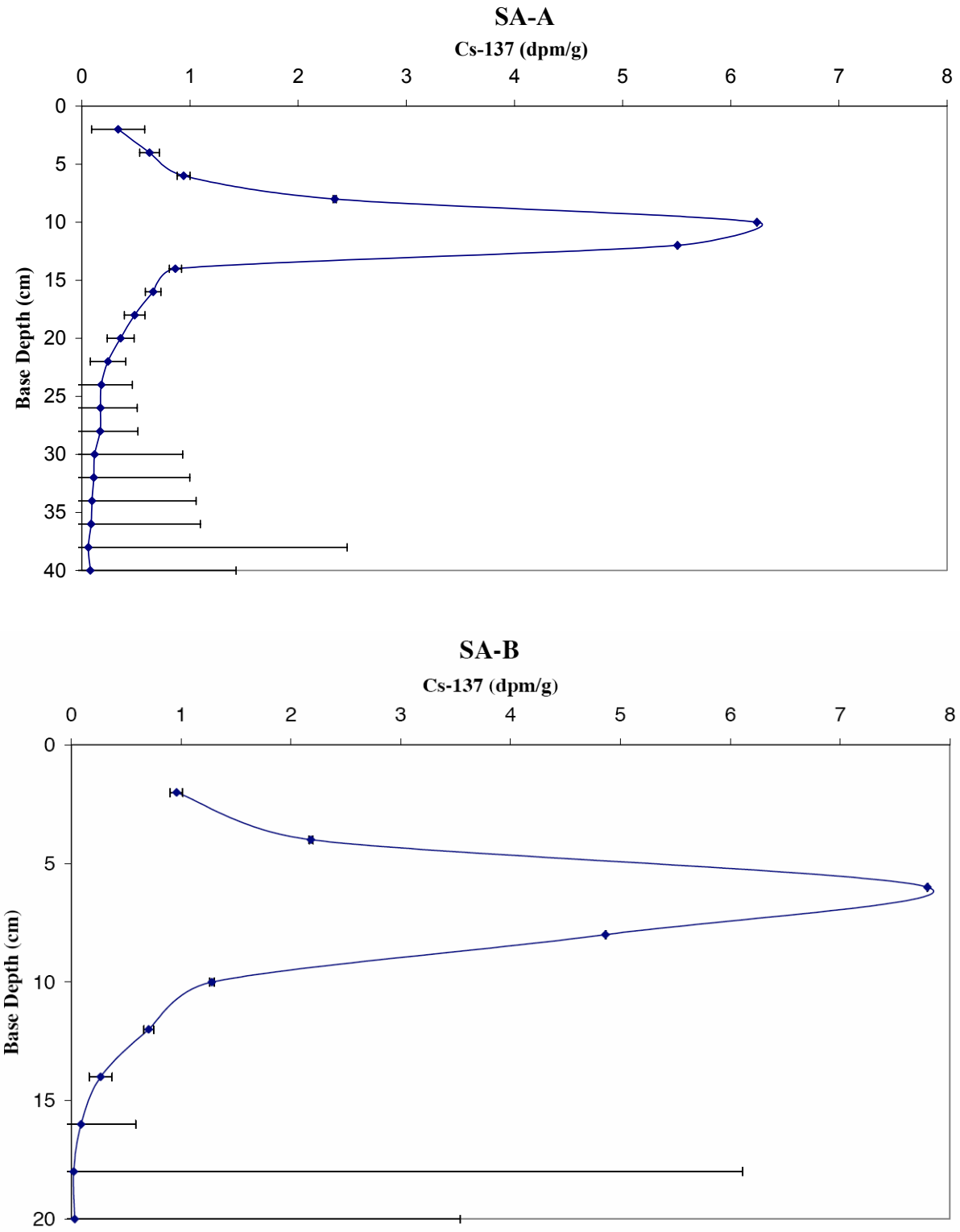


Figure 27a: Grain Size Analysis for Core WA-A

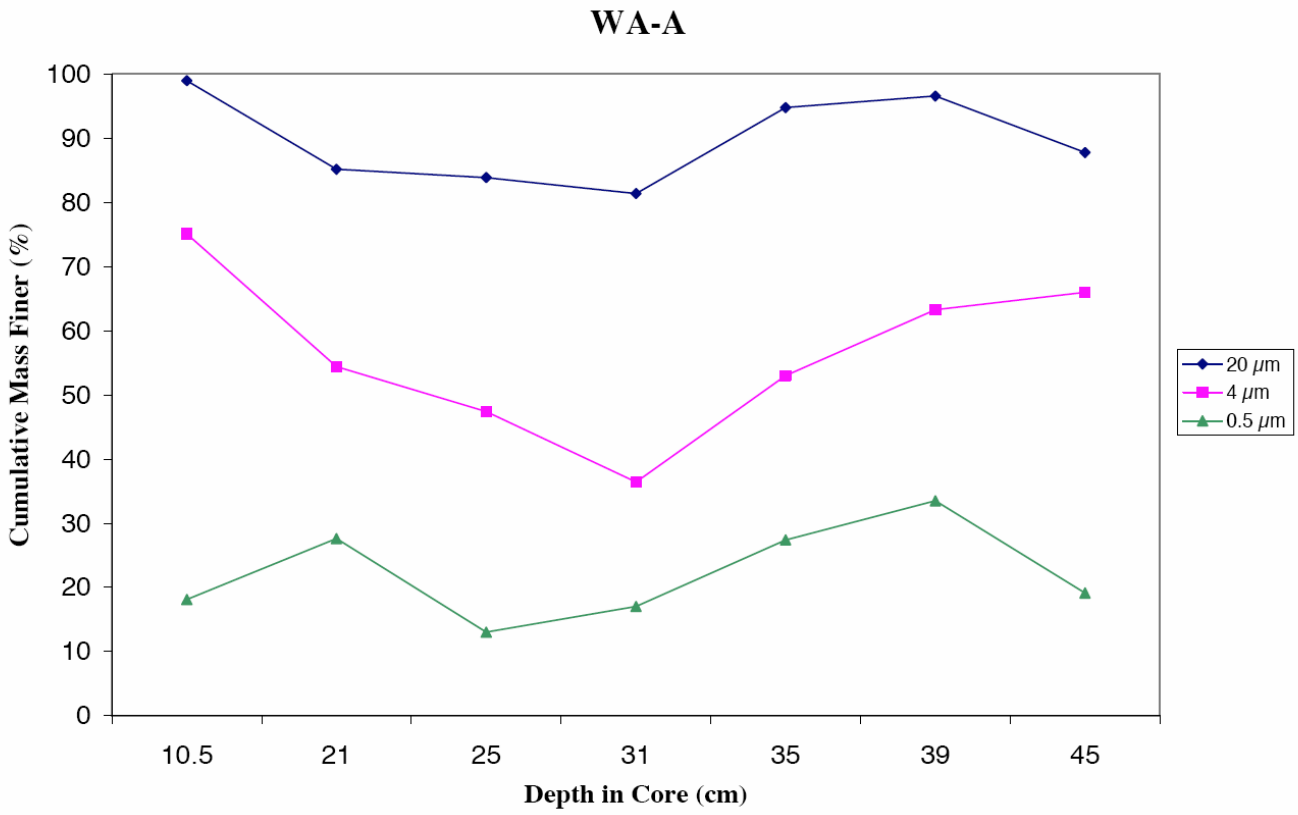
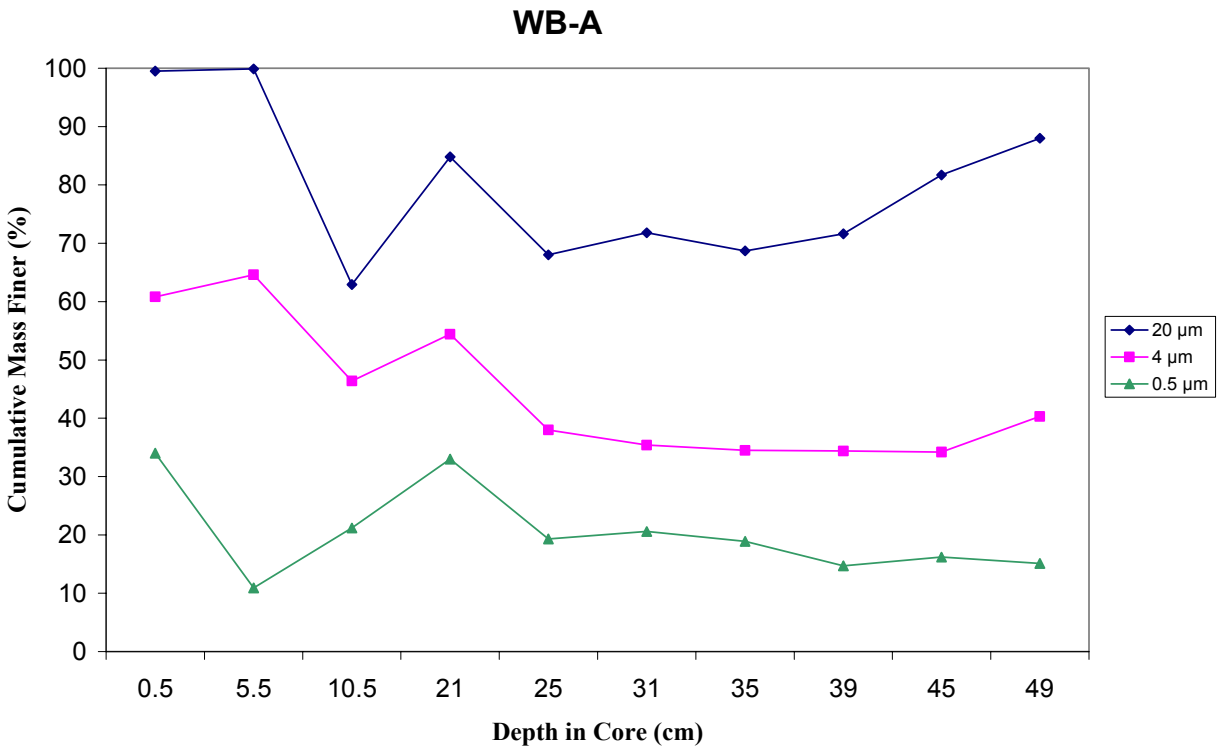


Figure 27b: Grain Size Analysis for Cores WB-A & WB-B



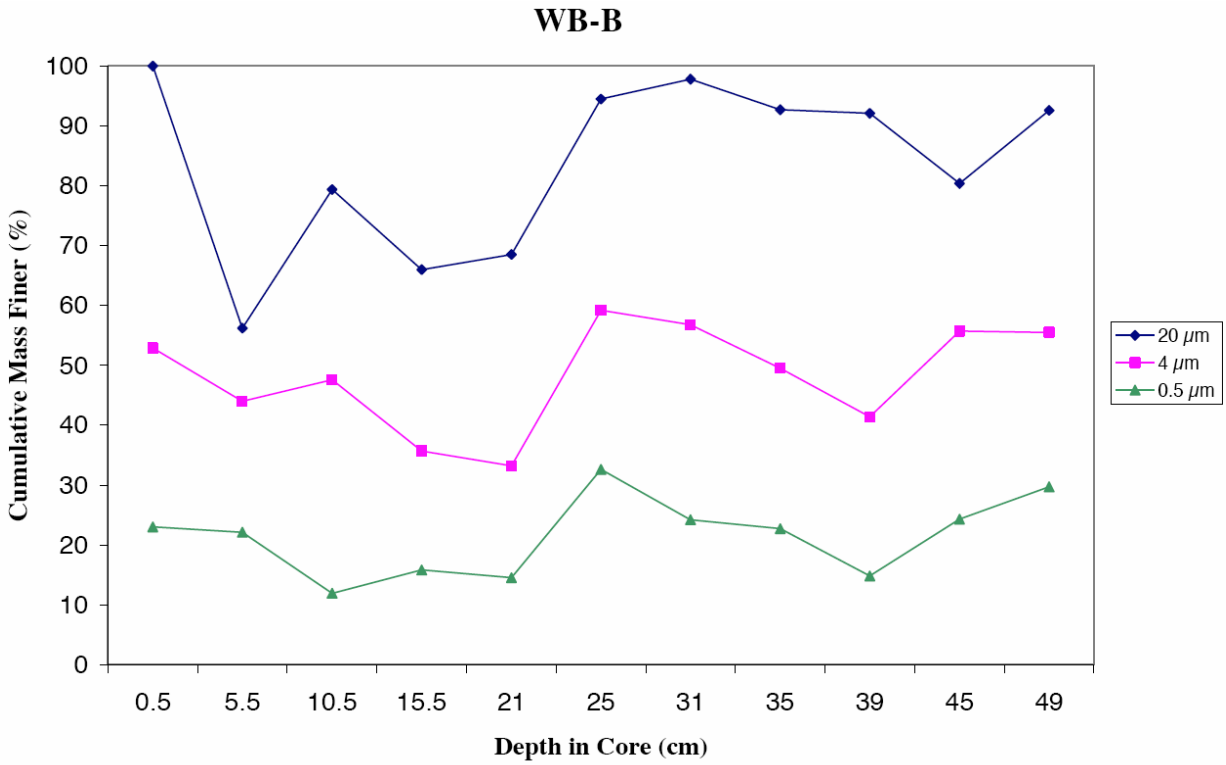
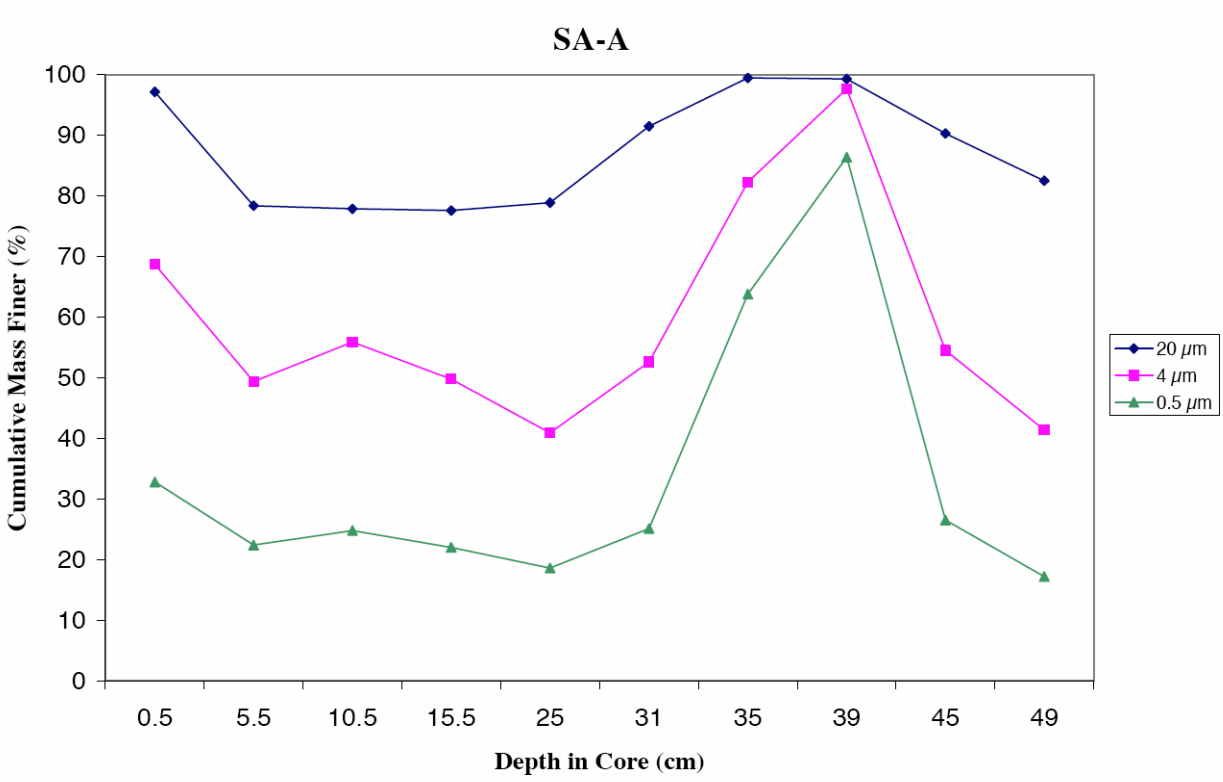
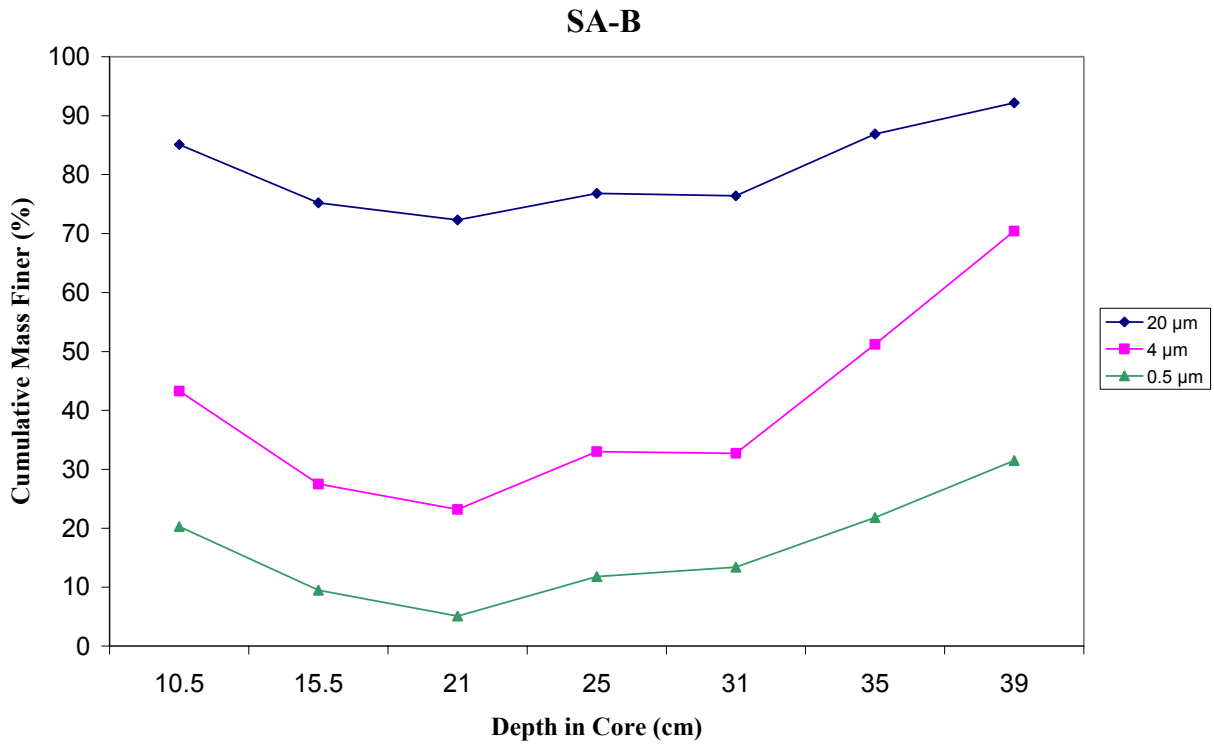


Figure 27c: Grain Size Analysis for Cores SA-A & SB-B





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