

## UNIVERSITY OF WISCONSIN RADIOCARBON DATES XXVI

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Procedures and equipment used in the University of Wisconsin laboratory have been described in previous date lists (Bender, Bryson & Baerreis 1965; Steventon & Kutzbach 1986). Except as otherwise indicated, wood, charcoal and peat samples are pretreated with dilute NaOH- $\text{Na}_4\text{P}_2\text{O}_7$  and dilute  $\text{H}_3\text{PO}_4$  before conversion to counting gas methane; when noted, marls and lake cores are treated with acid only. Very calcareous materials are treated with HCL instead of  $\text{H}_3\text{PO}_4$ .

The dates reported have been calculated using 5568 yr as the half-life of  $^{14}\text{C}$ . The standard deviation quoted includes only  $1\sigma$  of the counting statistics of background, sample and standard counts. Background methane is prepared from anthracite; standard methane from NBS oxalic acid. The activities of the dated samples for which  $\delta^{13}\text{C}$  values are listed have been corrected to correspond to a  $\delta^{13}\text{C}$  value of  $-25\text{‰}$ ; the activity of the standard methane has been corrected to  $-25\text{‰}$ .

Sample descriptions are based on information supplied by those who submitted samples.

### ACKNOWLEDGMENTS

This research is supported by the National Science Foundation under Grant #ATM-8902849. We thank the UW-Madison Geology and Geophysics Department, Gas Research Institute Grant #133-P287, for use of the Finnegan MAT 251 isotope ratio mass spectrometer and for the assistance of its operator, Kevin Baker. We also wish to thank Jodie O'Gorman and Joe Ezzo for laboratory assistance.

### ARCHAEOLOGIC SAMPLES

#### *United States*

#### *Iowa*

#### **Turkey River Mound Group (13CT1) series**

Wood charcoal coll 1964 from Turkey River Mounds, Clayton Co ( $42^\circ 43'\text{N}$ ,  $91^\circ 02'\text{W}$ ) by M McKusick and subm by W Green, Univ Iowa (Green 1988a; McKusick 1964).

**WIS-2049.**

**$2550 \pm 60$**   
 **$\delta^{13}\text{C} = -26.9\text{‰}$**

Sample from Burial 4, Mound 37, an extended adult who was decapitated *post mortem* or *perimortem*. Red Ocher was directly associated.

<sup>1</sup>Raymond L Steventon retired in 1989 as Director of the University of Wisconsin Radiocarbon Laboratory. Dr Christine Prior assumed responsibility of the Radiocarbon Laboratory December 1, 1989.

**WIS-2050.****1490 ± 50** $\delta^{13}C = -22.9\text{‰}$ 

Sample from Burial 1 and 2, Mound 38 (cremated skulls), probably part of same mortuary program as articulated burials 3-11 located at base of mound in association with Red Ocher grave goods.

**WIS-2051. Archaeological site 13CT228****2580 ± 60** $\delta^{13}C = -25.0\text{‰}$ 

Wood charcoal coll Nov 1987 from site in Clayton Co (42°44'N, 91°08'W) by W Green and J Cordell and subm by W Green. Dates a Durst phase occupation situated within a Holocene terrace along Turkey River, NE Iowa. First date for non-rockshelter Late Archaic occupation in region.

**WIS-2069. Archaeological site 13TM173****9550 ± 100**

Soil horizon from site in Tama Co (42°57'N, 92°34'W) coll by D Richardson and J D Anderson and subm by W Green. Dates paleosol in alluvial fan deposit in which microdebitage was found. Underlain by main-valley flood deposits of Iowa River.

**WIS-2076. Archaeological site 13ML176****1200 ± 70** $\delta^{13}C = -25.7\text{‰}$ 

Red elm (*Ulmus rubra*) charcoal from site 13ML176, Mills Co (41°07'N, 95°47'W), coll June 1984 by S Schermer and subm by W Green. Sample from outer rings of a central support post (Feature 12) of a Nebraska phase (Glenwood locality) earthlodge (Green 1988b).

*Wisconsin***Camp Indianola site (47Da533) series**

Wood charcoal coll May-July 1986 from Camp Indianola, Dane Co (43°07'N, 89°26'W) by S L Stand, S K Salzsider, M L Propson and J A Clark, and subm by V Dirst, Wisconsin Dept Nat Resources, Madison.

**WIS-1993.****1840 ± 60** $\delta^{13}C = -26.6\text{‰}$ 

Sample from Feature 7, a Middle Woodland trash pit containing Kegonsa Stamped sherds, chert flakes and fire-cracked rock.

**WIS-1994.****Modern** $\delta^{13}C = -26.7\text{‰}$ 

Sample from hearth believed to be associated with Kegonsa Stamped ceramics in adjacent living space.

**WIS-1995.****1420 ± 70** $\delta^{13}C = -26.3\text{‰}$ 

Sample from Feature P. Dates Late Woodland occupation believed contemporary with stockade.

**Ot site (47Lc262) series**

Charcoal coll 1986-1987 from Ot site, La Crosse Co (43°56'30"N, 91°15'30"W) by D M Stemper, N Meinholtz and J A O'Gorman and subm by J T Penman, State Hist Soc, Madison. Ot is a small habitation site with adjacent cemetery probably serving as burial ground for inhabitants of Ot and Tremaine (47Lc95) village (Broihahn, Penman & Rusch 1987). Previously dated (Steventon & Kutzbach 1988: 371).

*Comment:* a total of 193 storage pits were excavated on a ridge north of cemetery; majority are contemporary with each other.

<b>WIS-1979.</b>	<b>380 ± 70</b> $\delta^{13}C = -26.6\text{‰}$
Sample from Feature 1, S01 W97, 32cm below surface. Burial goods were found with each of three individuals recovered during limited testing.	
<b>WIS-2027.</b>	<b>420 ± 70</b> $\delta^{13}C = -26.9\text{‰}$
Sample from Feature 1, S01 W97, 70 - 80cm depth.	
<b>WIS-2028.</b>	<b>470 ± 70</b> $\delta^{13}C = -27.3\text{‰}$
Sample from Feature 1, S01 W97, 80 - 90cm depth.	
<b>WIS-2029.</b>	<b>310 ± 70</b> $\delta^{13}C = -27.0\text{‰}$
Sample from Feature 1, S01 97, 40 - 50cm depth.	
<b>WIS-2030.</b>	<b>400 ± 60</b> $\delta^{13}C = -27.0\text{‰}$
Sample from Feature 1, S01 W97, 50 - 60cm depth.	
<b>WIS-2031.</b>	<b>450 ± 50</b> $\delta^{13}C = -27.1\text{‰}$
Sample from Feature 1, S01 W97, 60 - 70cm depth.	
<b>WIS-1980.</b>	<b>500 ± 60</b> $\delta^{13}C = -25.8\text{‰}$
Sample from Feature 3, N97 W56, 90 - 100cm depth.	
<b>WIS-1981.</b>	<b>360 ± 60</b> $\delta^{13}C = -25.9\text{‰}$
Sample from Feature 7, N99 W56, 100 - 110cm depth.	
<b>WIS-2015.</b>	<b>480 ± 190</b> $\delta^{13}C = -26.5\text{‰}$
Sample from Feature 11, N64 W47, refuse pit, 20 - 70cm depth.	
<b>WIS-2016.</b>	<b>240 ± 50</b> $\delta^{13}C = -25.3\text{‰}$
Sample from Feature 1, N54 W39, 30 - 40cm depth.	

**Tremaine site (47Lc95) series**

Charcoal coll 1987-1988 from Tremaine site, LaCrosse Co (43°56'48"N, 91°15'50"W) by J A Evanson, K Kachel, D Kluth, M O'Malley, S Osborn, S Salzsieder and D Witkowski and subm by J T Penman. Ceramics recovered from features at Tremaine site are similar to Oneota wares at Ot site, above (Penman 1984).

*Comment:* Tremaine village complex covers ca 48ha and incorporates various site numbers (47Lc95, Lc149, Lc262 and Lc359). Since no European trade goods were found, complex is assumed to be prehistoric.

**WIS-2042.** **560 ± 60**

Sample from Feature 9, S31 E170, 30 - 90cm depth.  $\delta^{13}C = -27.0\text{‰}$

**WIS-2026.** **760 ± 70**

Sample from Feature 5, N12 W8, 100 - 110cm depth.  $\delta^{13}C = -22.3\text{‰}$

**WIS-2039.** **480 ± 60**

Sample from Feature 1, N12 W16, 70 - 80cm depth.  $\delta^{13}C = -27.1\text{‰}$

**WIS-2040.** **590 ± 50**

Sample from Feature 5, N12 W8, 80 - 100cm depth.  $\delta^{13}C = -26.5\text{‰}$

**WIS-2041.** **350 ± 60**

Sample from Feature 3, N18 W6, 50 - 100cm depth.  $\delta^{13}C = -26.9\text{‰}$

**WIS-2068.** **540 ± 70**

Sample from Feature 5, N12 W8, 100 - 120cm depth.  $\delta^{13}C = -26.1\text{‰}$

**WIS-2052.** **1470 ± 50**  
 $\delta^{13}C = -26.1\text{‰}$

Sample from Feature 8, N142 W50, 50 - 60cm depth. No diagnostic artifacts.

**WIS-2063.** **1630 ± 50**  
 $\delta^{13}C = -26.2\text{‰}$

Sample from Feature 8, N140 W50, 50 - 60cm depth. No diagnostic artifacts.

**Bachmann site (47Sb202) series**

Charcoal coll 1986-1987 from Bachmann site, Sheboygan Co (43°43'N, 87°48'W) by L A Rusch and S K Osborn and subm by J T Penman (Rusch & Penman 1984; Steventon & Kutzbach 1986: 1211; 1987: 402; 1988: 371).

**WIS-1982.** **250 ± 50**

Sample from Feature 33.  $\delta^{13}C = -27.7\text{‰}$

**WIS-1983.****1100 ± 70**

Sample from Feature 73.

 $\delta^{13}C = -26.2\text{‰}$ **WIS-2038. Double site (47Pi81)****890 ± 220**

Charcoal from Double site, Pierce Co (44°39'N, 92°38'W) coll July 1984 and subm by J T Penman. Oak charcoal from Mound "A", 50-70cm depth. Site contained 35 linear and conical mounds when mapped in 1887. Previously dated (Steventon & Kutzbach 1987: 401; Penman 1984).

**Fred Edwards site (47Gt377) series**

Wood charcoal coll Aug 1987 from Fred Edwards site, Grant Co (42°43'30"N, 90°50'58"W) by F Finney and subm by J B Stoltman, Dept Anthropol, Univ Wisconsin-Madison. Samples date Middle Mississippi/Late Woodland contact in SW Wisconsin (Steventon & Kutzbach 1986: 1211; 1987: 403; 1988: 371).

**WIS-2044.****840 ± 70** $\delta^{13}C = -27.2\text{‰}$ 

Sample from Feature 155, a structure with a basin 30m deep containing two distinct fill episodes and five ceramic vessels.

**WIS-2061.****840 ± 70** $\delta^{13}C = -26.7\text{‰}$ 

Sample from Feature 148, Post 11, a palisade line located at S end of site. Twenty posts were excavated during 1987 field season.

**WIS-2062.****1040 ± 50**

Sample from Feature 148, Post 12 (same as WIS-2061, above).

 $\delta^{13}C = -26.5\text{‰}$ **Viola Rockshelter site (47Ve640)**

Wood charcoal coll Sept 1980 from Viola Rockshelter, Vernon Co (43°28'38"N, 90°41'15"W) and subm by J Theler, Mississippi Valley Archaeology Center, La Crosse.

**WIS-2105.****1220 ± 70** $\delta^{13}C = -26.5\text{‰}$ 

Sample from Feature 3, a deep pit with west half eroded down a slump bank. Ceramics exhibit Havana-ware characteristics.

**WIS-2106.****1810 ± 80** $\delta^{13}C = -26.3\text{‰}$ 

Sample from Test Pit F, area B, a neatly stratified burned layer containing large sherds from a single vessel that compares to Prairie ware with grit temper rather than sand temper.

**Midway Village site (47Lc19) series**

Wood charcoal coll 1984-1988 from Midway Village site, La Crosse Co (43°56'35"N,

91°16'53"W) by J Gallagher, R Boszhardt, R Rodell and A La Fond and subm by R Boszhardt, Mississippi Valley Archaeology Center, La Crosse.

**WIS-2107.****300 ± 50** $\delta^{13}C = -26.2\text{‰}$ 

Sample from Feature 2 (W 1/2), Zone A, containing large quantities of refuse representing last usage. Pit contained 2 Oneota vessels, 1 with bold vertical finger trails and 1 with a unique variety of Allamakee trailed of the Valley View phase.

**WIS-2108.****650 ± 50** $\delta^{13}C = -26.2\text{‰}$ 

Sample from Feature 89, Zones A and B, a stratified basin-shaped pit containing a large section of an Oneota vessel that compares with Brice Prairie phase type Perrot Punctated.

**WIS-2109.****470 ± 50** $\delta^{13}C = -26.1\text{‰}$ 

Sample from Feature 222, Level 7, underlying a layer of ash and charcoal containing an Oneota rim section of a Perrot Punctate vessel that represents a Brice Prairie phase occupation.

**WIS-2110.****440 ± 50** $\delta^{13}C = -26.9\text{‰}$ 

Sample from Feature 234, a large shallow basin pit containing Valley View phase Allamakee trailed ceramics.

**WIS-2111.****610 ± 50** $\delta^{13}C = -26.0\text{‰}$ 

Sample from Feature 276, a shallow basin pit containing a large section of an Oneota vessel with Allamakee trailed and Lake Winnebago trailed attributes.

**WIS-2112.****570 ± 50** $\delta^{13}C = -21.1\text{‰}$ 

Sample from Feature 2(W 1/2), Zone B, representing the lower portion of a large storage/processing pit. See WIS-2107, above.

**Old Spring site series (47Wn350)**

Charred wood coll July 1987 from Old Spring site, Winnebago (44°10'N, 88°52'W) and subm by D F Overstreet, Great Lakes Archaeological Research Center, Inc, Milwaukee. Samples from burned structural timbers in semi-subterranean houses and from single-episode storage/refuse pits. Occupation represents earliest well-defined Oneota complex (McKern phase) in E Wisconsin. Dates clarify relationship between Emergent Mississippian and Oneota.

**WIS-2087.****730 ± 50**

Sample from Feature 200, storage/refuse pit.

 $\delta^{13}C = -25.8\text{‰}$

<b>WIS-2088.</b>	<b>770 ± 50</b>
Sample from Feature 167, storage/refuse pit.	$\delta^{13}C = -26.3\text{‰}$
<b>WIS-2092.</b>	<b>730 ± 60</b>
Sample from Feature 117, storage/refuse pit.	$\delta^{13}C = -25.7\text{‰}$
<b>WIS-2093.</b>	<b>880 ± 50</b>
Sample from Feature 110, storage/refuse pit.	$\delta^{13}C = -26.4\text{‰}$
<b>WIS-2094.</b>	<b>810 ± 50</b>
Sample from Feature 158, storage/refuse pit.	$\delta^{13}C = -26.8\text{‰}$
<b>WIS-2095.</b>	<b>750 ± 50</b>
Sample from Feature 156, storage/refuse pit.	$\delta^{13}C = -25.7\text{‰}$
<b>WIS-2096.</b>	<b>700 ± 50</b>
Sample from Feature 179E, burial pit in house floor.	$\delta^{13}C = -25.7\text{‰}$

*Algeria*

<b>WIS-2067. Khanguet-el-Mouhaad site</b>	<b>7170 ± 80</b>
	$\delta^{13}C = -24.5\text{‰}$

Charcoal coll 1928 from Ain Mouhaad, Tebessa near Algerian-Tunisian border (35°39'N, 08°25'W) by P Nesbitt and DeBrue. Subm by D E Shea, Logan Mus, Beloit Coll, Wisconsin (Pond *et al* 1938; Briggs 1955; Lubell 1984).

*Comment:* sample was submitted as upper Capsian 6000-9500 BP and dated to add information on the archaeology of the Algerian Sahara.

*Pakistan***Harappa site series**

Wood charcoal coll 1987 from Harappa, Dist Sahiwal, Punjab (30°38'N, 72°52'E) by expedition from Univ California-Berkeley, directed by G F Doles. Samples subm by Asst Dir, J M Kenoyer, Univ Wisconsin-Madison.

<b>WIS-2043.</b>	<b>3770 ± 70</b>
	$\delta^{13}C = -25.5\text{‰}$
Sample from Lot 526, upper level of mature Harappan habitation on Mound AB.	
<b>WIS-2053.</b>	<b>3920 ± 210</b>
Sample from Lot 309 and 311, topmost layers of mature Harappan habitation on Mound E.	

**WIS-2074.**

**3700 ± 60**  
 $\delta^{13}C = -25.9\text{‰}$

Sample from Lot 798, Feature 7b, lower layer of a hearth filled with ash and charcoal. Upper and lower layers were divided by mud plaster which was burned red and had chaff impressions.

**WIS-2075.**

**3830 ± 60**  
 $\delta^{13}C = -23.0\text{‰}$

Sample from Lot 547, Feature 25, fill above Floor 25.

*Portugal***Agroal site series**

Charcoal coll July 1988 from Agroal, Vila Nova de Ourém (39°40'45"N, 08°26'15"W) and subm by K T Lillios, Dept Anthropology, Yale Univ, New Haven, Connecticut. Three samples coll from levels associated with flint and quartzite cores, flakes and bladelets, and handmade ceramics.

*Comment:* believed to be contemporary with site's Bronze-Age occupation. Dates, however, which range from the 13th - 17th centuries AD are contemporary with much of excavated ceramics and coins recovered in later levels of site. Significant disturbance of site's Bronze-Age levels, perhaps due to tilling, must account for association of recent charcoal with prehistoric artifacts.

**WIS-2081.**

**310 ± 50**

Sample from Pits 16-23, Level 5 (70cm depth), 147m elevation.

$\delta^{13}C = -24.8\text{‰}$

**WIS-2082.**

**450 ± 50**

Sample from Pit 14, Level 3a (45cm depth), 145m elevation.

$\delta^{13}C = -25.3\text{‰}$

**WIS-2083.**

**670 ± 50**

$\delta^{13}C = -24.8\text{‰}$

*Olea* sp and *Crataegus* sp from Pits 12 and 13, Level 3a (45cm depth), 145m elevation. Charcoal identified by L McWeeney, Yale Univ.

**GEOLOGIC SAMPLES***United States**Alaska***Sitkinak Island series**

Samples coll July 1988 from Sitkinak Island (56°35'N, 154°05'W) and subm by T Byrne, Geological Science Dept, Brown Univ, Providence, Rhode Island. Dated to provide information on a recently active fault zone.



**WIS-2077.** **2060 ± 50**

Intertidal mud and surf grass (*Phyllospadix*) from uplifted marine terrace 2m above mean sea level.

**WIS-2078.** **3140 ± 60**

Intertidal mud and surf grass (*Phyllospadix*) from uplifted marine terrace 5m above mean sea level.

**Pleasant Island site series**

Cores coll Sept 1988 from small lake area in Tongass Natl Forest (58°21'N, 135°39'W) by D R Engstrom, J Almendinger and J Janssens and subm by D R Engstrom, Univ Minnesota, Minneapolis. All depths from peat surface; elevation 150m. Previously dated (Stevenson & Kutzbach 1988: 375).

**WIS-2089.** **9440 ± 100**

Bryophyte peat, 195 - 200cm depth overlying contact with mineral soil. Core taken 40cm above lake level, 15m E of E drain.

**WIS-2098.** **850 ± 50**

Bryophyte peat, 83.8 - 88.8cm depth. Same core as WIS-2089, above.

**WIS-2099.** **4060 ± 70**

Bryophyte peat, 159.7 - 164.7cm depth. Same core as WIS-2089, above.

**WIS-2090.** **7680 ± 80**

Sedge peat, 245 - 250cm depth, overlying contact with mineral soil. Core taken 392cm above lake level, 35m SE of shore.

**WIS-2091.** **8300 ± 100**

Sedge peat, 345 - 350cm depth, overlying contact with mineral soil. Core taken 333cm above lake level, 40m SW of shore.

**WIS-2100.** **10,530 ± 110**

Light brown gyttja, 574 - 582cm below lake surface, water depth 3.64m.

**WIS-2080. La Perouse** **2690 ± 60**

Core coll July 1988 from a small lake between lateral moraines of Dagelet and La Perouse Glaciers, Glacier Bay Natl Park and Preserve (58°31'N, 137°18'W) by H E Wright, Jr and D R Engstrom and subm by D R Engstrom. Peat, 86 - 92cm from water/sediment interface, water depth 5.3m. Dates minimum age of lake basin and ice retreat from early Neoglacial advance.

**WIS-2101. Dagelet** **1080 ± 60**

Core coll July 1988 from a small lake at terminus of Dagelet Glacier, Glacier Bay Natl Park

and Preserve (58°31'N, 137°20'W) by H E Wright, Jr and D R Engstrom and subm by D R Engstrom. Limnic sediment, 22 - 31cm from water/sediment interface, water depth 3.8m. Dates minimum age of lake basin and ice retreat from early Neoglacial advance.

**WIS-2104. Brady****1230 ± 50**

Core coll July 1988 from a small lake at terminus of Brady Glacier, Glacier Bay Natl Park and Preserve (58°19'N, 136°41'W) by H E Wright, Jr and D R Engstrom and subm by D R Engstrom. Limnic sediment, 35 - 44cm below water/sediment interface, water depth 7.7m. Dates minimum age of lake basin and ice retreat from early Neoglacial advance.

*California***WIS-2086. Gumboot Lake****11,510 ± 110**

Core coll Sept 1988 from Gumboot Lake, Shasta Co (41°12'30"N, 122°30'30"W) and subm by M Edwards, Dept Geography, Univ Oregon, Eugene. Basal sample dates minimum age for local deglaciation in Trinity Alps.

*Connecticut***Cedar Swamp series**

Core coll May 1988 from Cedar Swamp, Pequot Indian Reservation (41°27'30"N, 71°57'30"W) and subm by R S Webb, Brown Univ. Depths in cm below surface. Previously dated (Steventon & Kutzbach 1988: 376).

**WIS-2054.****2370 ± 70**

Fine-grained peat, 33 - 39cm depth.

**WIS-2055.****3930 ± 80**

Fine-grained peat, 68 - 73cm depth.

**WIS-2056.****7580 ± 80**

Fine-grained peat, 96 - 102cm depth.

*Delaware***Longhauser Pond series**

Core, 10cm diam, coll June 1987 from Longhauser Pond, New Castle Co (39°23'05"N, 75°40'30"W) and subm by R S Webb. Sampled to provide sediment accumulation rate above and below a major stratigraphic hiatus at 70cm, first noticed in Walters Puddle series (Steventon & Kutzbach 1987: 403-404). All depths from water/sediment interface, water depth 40cm.

**WIS-2007.****3410 ± 80**

Organic silt to clay, 30 - 35.5cm depth.

**WIS-2008.** **6190 ± 90**

Organic silt; rootlets removed by sieving, 64 - 69cm depth.

**WIS-2009.** **10,820 ± 100**

Inorganic to organic poor silt, 71 - 78cm depth.

**WIS-2010.** **11,610 ± 100**

Inorganic silt, sand and clay, 86 - 92cm depth.

#### **Leipsig Salt Marsh series**

Core coll June 1987 from Leipsig Salt Marsh, Kent Co (39°14'25"N, 75°31'15"W) and subm by A J Smith, Brown Univ. Dated to provide temporal control within core.

**WIS-2013.** **2230 ± 70**

Peat with silt, 316 - 321cm depth.

**WIS-2014.** **2120 ± 70**

Organic silty mud containing plant fibers, 269 - 274cm depth.

#### **Prison Pond series**

Core coll June 1987 from Prison Pond, Walker Co (39°20'20"N, 75°36'45"W) and subm by R S Webb. Measurements from water/sediment interface, water depth 55cm.

**WIS-2022.** **2650 ± 80**

Organic silt to clay, 24 - 26.5cm depth.

**WIS-2023.** **11,760 ± 150**

Inorganic to organic-poor silts, 34 - 41cm depth.

**WIS-2024. Walters Puddle** **2370 ± 80**

Core coll June 1988 from Walters Puddle, New Castle Co (39°24'N, 75°41'30"W) and subm by R S Webb. Fine silt and clay, organic-rich sediment, 25 - 28.5cm below water/sediment interface, water depth 1m. Previously dated (Steventon & Kutzbach 1987: 403-404).

#### **St Jones River series**

Core coll June 1987 from St Jones River, Kent Co (39°08'N, 75°30'W) by J E Pizzuto and subm by E E Whallon, Univ Delaware, Newark. Measurements from surface. Site contains archaeological artifacts. Dates useful for paleoenvironmental reconstruction.

**WIS-2037.** **1890 ± 220**

Matted fiber ball, 300cm depth.

**WIS-2033.****3460 ± 80**

Peaty mud, 330 - 334cm depth.

**WIS-2034. Duck Creek****11,480 ± 150**

Core coll June 1987 from Duck Creek, Kent Co (39°18'30"N, 75°36'W) by J E Pizzuto and subm by E E Whallon. Peat, 200 - 203cm depth. Deepest basal marsh peat in locality. Shows initiation at transgression of brackish tidal marsh into area.

**WIS-2035. Mill Creek****1730 ± 60**

Core coll Aug 1987 from Mill Creek, Kent Co (39°18'N, 75°34'30"W) by J E Pizzuto and subm by E E Whallon. Muddy peat from 193cm below surface. Deepest evidence for marsh environment along this tidal stream.

**WIS-2036. Leipsig River site****8020 ± 100**

Core coll Aug 1987 from Leipsig River site, Kent Co (39°14'30"N, 75°35'W) by J E Pizzuto and subm by E E Whallon. Muddy peat, 217 - 220cm below surface. Deepest evidence for marsh deposit, may mark transgression of saline tidal waters into area.

**Nowakowski Pond series**

Core, 10cm diam, coll June 1987 from Nowakowski Pond, New Castle Co (39°23'9"N, 75°40'40"W) and subm by R S Webb. Sampled to provide dates above and below a stratigraphic hiatus at 60cm, first noticed in Walters Puddle (Steventon & Kutzbach 1987: 403-404). All depths from water/sediment interface, water depth 32cm.

**WIS-2011.****6190 ± 100**

Organic silt to clay, sieved to remove rootlets, 57 - 59cm depth.

**WIS-2012.****10,580 ± 100**

Inorganic to organic poor silt, 64 - 67cm depth.

*Florida***WIS-1984. Phosphate mine site****> 33,000**

Highly decomposed peat from open-pit phosphate mine near Bartow, Polk Co (27°51'N, 81°50'W) coll by T Ager, USGS and subm by L Shane and H E Wright, Jr, Univ Minnesota, Minneapolis. Sample dates top of 30m peat deposit under 11m of sand.

**WIS-2057. Barchampe Lake****7290 ± 80**

Core coll March 1986 from Barchampe Lake, Jefferson Co (30°08'N, 80°08'W) by E Grimm and W A Watts and subm by W A Watts, Trinity Coll, Dublin, Ireland. Sandy lake peat, 890 - 897cm below surface. Dated to provide information on vegetation and climate history of Florida and SE United States.

*Georgia***WIS-2058. Langdale Pond****7890 ± 80**

Core coll March 1986 from Langdale Pond, Lowndes Co, near Georgia-Florida border (30°48'36"N, 83°16'59"W) by E Grimm and W A Watts and subm by W A Watts. Humified peat, 760 - 767cm below surface. Dated to provide information on vegetation and climate history of Florida and SE United States.

*Illinois***WIS-2097. Spring Hill Bog site****9780 ± 100** $\delta^{13}C = -26.4\text{‰}$ 

Wood coll 1980 from Spring Hill Bog, Whiteside Co (41°75'N, 90°00'W) by A Swain, R Steventon, K Gajewski and M Winkler and subm by M Winkler, Univ Wisconsin-Madison. Sample dates Late Glacial/Early Holocene water-level change in Rock River drainage basin.

*Massachusetts***Herring River Marsh-Estuary series**

Cores coll Oct 1986 from Herring River Marsh, Barnstable Co (41°06'N, 70°04'W) by R A Orsen and C T Roman, Center for Coastal and Environmental Studies, Rutgers Univ, New Brunswick, New Jersey. Samples subm by M Winkler, Univ Wisconsin-Madison. Dated to determine long-term accretion rates in both salt and brackish-freshwater systems. Acid treatment only.

**WIS-1986.****1610 ± 70**

Brown silt with clay, roots and rhizomes, 236 - 240cm depth. Sample HR-1-240.

**WIS-1996.****2330 ± 240**

Gray clays with sand, roots and rhizomes, 326 - 330cm depth. Sample HR-1-330.

**WIS-1997.****Modern**

Gray clays with sand, roots and rhizomes, 29 - 33cm depth. Sample BB-2-D33.

**WIS-2017.****1290 ± 190**

Gray clays with sand, silt, roots and rhizomes, 151 - 155cm depth. Sample HR-3-155.

**WIS-2025.****760 ± 190**

Brown/gray clays with silt, sand, roots and rhizomes, 68 - 72cm depth. Sample DH-1-072.

**WIS-2032.****380 ± 90**

Gray clays with silt, roots and rhizomes, 46 - 50cm depth. Sample HR-5-050.

**Nipmuck Pond series**

Core coll Sept 1984 from Nipmuck Pond, Worcester Co (41°58'71"N, 71°07'30"W) by J T Overpeck, R S Thompson, and R S Webb and subm by P Tsadekis, Brown Univ. Core is being used for Holocene pollen analysis. All depths from water/sediment interface, water depth 6.3m.

**WIS-1987.** **2540 ± 70**

Gyttja, 39.1 - 57.1cm depth.

**WIS-1988.** **4900 ± 70**

Gyttja, 131 - 150cm depth.

**WIS-1989.** **8590 ± 80**

Gyttja, 181 - 195cm depth.

**WIS-1990.** **9390 ± 100**

Gyttja, 206 - 221cm depth.

**WIS-1991.** **10,200 ± 100**

Gyttja, 276 - 285cm depth.

**WIS-1992.** **12,750 ± 120**

Gyttja, 456 - 495cm depth.

**Great Pond, Truro series**

Livingstone core coll Sept 1986 from Great Pond, Truro, Barnstable Co (41°58'26"N, 70°01'59"W) by M Winkler, R Webb, J Overpeck, J Portnoy, K Gajewski and subm by M Winkler, Univ Wisconsin-Madison. All depths from water/sediment interface, water depth 9.88m. Previously dated (Steventon & Kutzbach 1988: 376). Acid treatment only.

**WIS-1976.** **13,790 ± 130**

Gyttja, 418 - 427cm depth.  $\delta^{13}C = -28.9\text{‰}$

**WIS-2018.** **9950 ± 90**

Gyttja, 374 - 380cm depth.

**WIS-2019.** **12,520 ± 120**

Clayey gyttja, 413 - 423cm depth.

**WIS-2071.** **1970 ± 50**

Gyttja, 142 - 147cm depth.  $\delta^{13}C = -29.6\text{‰}$

**WIS-2072.****840 ± 50**

Gyttja, 66 - 71cm depth.

 $\delta^{13}C = -30.3\text{‰}$ **Great Pond, Wellfleet series**

Livingstone core coll Oct 1986 from Great Pond, Wellfleet, Barnstable Co (41°56'25"N, 70°00'03"W) by M Winkler, R Webb, J Overpeck, J Portnoy, K Gajewski and subm by M Winkler. All depths from water/sediment interface, water depth 16.2m. Acid treatment only.

**WIS-1977.****11,670 ± 100**

Gyttja, 690 - 711cm depth. Basal date.

**WIS-2065.****4950 ± 70**

Gyttja, 186 - 194cm depth.

 $\delta^{13}C = -28.3\text{‰}$ **WIS-2066.****9910 ± 100**

Gyttja, 441 - 449cm depth.

 $\delta^{13}C = -26.6\text{‰}$ **Dyer Pond series**

Livingstone core coll Oct 1986 from Dyer Pond, Wellfleet, Barnstable Co (41°56'19"N, 70°00'35"W) by M Winkler, R Webb, J Overpeck, J Portnoy, K Gajewski and subm by M Winkler. All depths from water/sediment interface, water depth 10.5cm. Acid treatment only.

**WIS-1978.****12,530 ± 120**

Silty gyttja, 710 - 717.5cm depth. Basal date.

 $\delta^{13}C = -26.8\text{‰}$ **WIS-2070.****2960 ± 60**

Gyttja, 450 - 457cm depth.

 $\delta^{13}C = -27.9\text{‰}$ **WIS-2103.****490 ± 110**

Gyttja, 51 - 56cm depth.

 $\delta^{13}C = -28.4\text{‰}$ **WIS-2005. Duck Pond, Provincetown****960 ± 60** $\delta^{13}C = -28.4\text{‰}$ 

Core coll Oct 1986 from Duck Pond, Barnstable Co (42°03'00"N, 70°11'30"W) and subm by M Winkler. Peaty gyttja, 103 - 103.5cm below water surface, water depth 50cm. Acid treatment only.

**WIS-2006. Bennett Pond, Provincetown****910 ± 70** $\delta^{13}C = -27.7\text{‰}$ 

Core coll Oct 1986 from Bennett Pond, Barnstable Co (42°03'30"N, 70°12'00"W) and subm by M Winkler. Gyttja from 90cm below water surface, water depth 70cm. Acid treatment only.

**McKusker's Pond series**

Livingstone core coll Aug 1985 from McKusker's Pond, Barnstable Co (941°49'23"N, 69°58'03") by R S Webb, E A Scharf, J Karb and S Clemens and subm by P Newby, Brown Univ. Measurements from water/sediment interface, water depth 48cm. Acid treatment only.

**WIS-2020.** **8500 ± 90**

Organic lake sediment, 248 - 253cm depth.

**WIS-2021.** **8330 ± 80**

Organic lake sediment, 263 - 267cm depth.

**High Head Dune Bog series**

Samples coll Nov 1987 from High Head area, Cape Cod Natl Seashore, Barnstable Co (42°03'30"N, 70°07'30"W) and subm by M Winkler. Acid treatment only.

**WIS-2084.** **Modern**

Sandy peat from Dune Bog #4, 7.5 - 8.5cm below surface.

**WIS-2102.** **Modern**

Organic sand from Dune Bog #5, 5 - 6cm below surface.

*Michigan***Lake Sixteen series**

Core coll Feb 1987 from Lake Sixteen, Cheboygan Co (45°35'N, 84°20'W) and subm by R P Futyma, New York State Museum, Albany. For previous dates from site, see Futyma and Miller (1986). Depth in cm from water/sediment interface, water depth 105cm. Acid treatment only.

**WIS-1999.** **7630 ± 100**

Gyttja, 192 - 196cm depth.

**WIS-2000.** **10,690 ± 100**

Silt mixed with organic lake sediment, 225 - 231cm depth.

*Ohio***East Twin Lake site series**

Core from East Twin Lake, Portage Co (41°11'50"N, 81°20'W) coll April 1988 by L C K Shane and H E Wright, Jr and subm by L C K Shane, Univ Minnesota, Minneapolis. Dated to provide vegetation/climate history of NE Ohio. Depths from water surface, water depth 11m.

**WIS-2045.** **990 ± 50**

Gyttja, 1170 - 1179cm depth.



**WIS-2046.** **2980 ± 60**

Gyttja, 1344 - 1352cm depth.

**WIS-2047.** **9290 ± 90**

Gyttja, 1802 - 1810cm depth.

**WIS-2048.** **13,660 ± 140**

Clay/silt limnic sediment, 2046 - 2058cm depth.

**WIS-2064. Andreas site** **4500 ± 70**  
 $\delta^{13}C = -26.4\text{‰}$

Core coll April 1988 from Andreas site, Portage Co (41°12'50"N, 81°21'53") by L C K Shane and H E Wright, Jr and subm by L C K Shane. Wood, 174 - 177cm below hummock surface. Dated to provide vegetation/climate history of NE Ohio.

### *Oregon*

#### **Bolan Lake series**

Core coll Sept 1988 from Bolan Lake, Josephine Co (42°01'30"N, 123°27'30"W) and subm by M Edwards, Dept Geography, Univ Oregon, Eugene. Dated to determine sedimentation rate. Depths in cm from water surface, water depth 10.9m.

**WIS-2079.** **9600 ± 100**  
 $\delta^{13}C = -26.5\text{‰}$

Wood, fir (*Abies*) identified by D Christensen, US Forest Products Lab, Madison, Wisconsin; 1841 - 1846cm depth.

**WIS-2085.** **12,360 ± 120**

Gyttja, 1967 - 1972cm depth.

### *Rhode Island*

#### **Fresh Pond series**

Core coll Jan 1988 from Fresh Pond, Block Island (41°09'30"N, 71°34'30"W) by P W Dunwiddie and R S Webb and subm by P W Dunwiddie, Massachusetts Audubon Society. All measurements from water/sediment interface, water depth 6.7m.

**WIS-2059.** **6720 ± 80**

Silty organic gyttja, 264 - 272cm depth.

**WIS-2060.** **9570 ± 100**

Silty organic gyttja, 362 - 372cm depth.

*Wisconsin***Devil's Island Bog series**

Core coll from Devil's Island, Apostle Islands, Ashland Co (47°04'N, 90°43'W) and subm by A M Swain, Univ Wisconsin-Madison.

**WIS-2002.** **5010 ± 80**

Peat and peaty clay, 95 - 105cm depth. Dates initiation of peat growth in bog.

**WIS-2073.** **1990 ± 50**

Peat, 65 - 70cm depth. Dates beginning of increase in spruce and alder pollen and decrease in birch pollen.

*Wyoming*

**WIS-2001. Soda Lake** **9750 ± 90**

Two adjacent cores coll Aug 1987 from Soda Lake, Teton Natl Forest (43°31'15"N, 110°15'W) and subm by C Barnosky, Carnegie Museum, Pittsburgh, Pennsylvania. Organic silt with shell, 1787 - 1802cm below water surface, water depth 10.65m, alt 2384m. Acid treatment only.

*Peru***Tunsho site**

Sample coll Sept 1986 from Tunsho site, Junin Prov (11°50'S, 75°06'W) and subm by H E Wright, Jr. Peat growth at this site started as soon as glacier retreated from terminal moraine.

**WIS-1969.** **250 ± 60**

Peat, 139 - 144cm depth.

**WIS-1998.** **920 ± 200**

Organic detritus from base of gravels deposited by glacial outwash from terminal moraine.

**WIS-1970. Huaytapallana Stream cut** **650 ± 60**

Sample coll Sept 1986 from stream in Nevada Huaytapallana, Junin Prov (11°50'S, 75°06'W) and subm by H E Wright, Jr. Organic detritus in silts related to retreat of Late Pleistocene glacier overlain by Late Holocene moraine.

**WIS-1971. Verdecocha B** **610 ± 70**

Basal peat coll Sept 1986 from Verdecocha, 45km S W of LaOroya, Junin Prov (11°55'S, 76°03'W) and subm by H E Wright, Jr. Peat, at 92 - 97cm depth, dates recession of Late Holocene ice from terminal moraine.

**WIS-1972. Pucuta B****420 ± 60**

Basal peat coll Sept 1986 from Pucuta, 45km SW of LaOroya, Junin Prov (11°54'S, 76°01'W) and subm by H E Wright, Jr. Peat, at 269 - 274cm depth, was formed as Late Holocene glacier retreated from terminal moraine.

**WIS-1973. Laguna Tranca Grande****11,830 ± 110**

Basal lake sediment coll Sept 1986 from Laguna Tranca Grande, Junin Prov (11°45'S, 75°45'W) and subm by H E Wright, Jr. Dates time of glacial recession from terminal moraine.

**WIS-1985. Laguna Tipicocha****7320 ± 80**

Basal lake sediment coll Sept 1987 from Laguna Tipicocha, Junin Prov (11°45'S, 75°13'W) and subm by H E Wright, Jr. Sample, at 1059 - 1067cm depth, dates time of glacial recessional lake formation.

**Lake Tuctua series**

Core coll Sept 1986 from Laguna Tuctua, Junin Prov (11°43'S, 74°57'W) and subm by H E Wright, Jr. Samples provide sediment accumulation rate and pollen influx. Previous date, WIS-1940 (Stevenson & Kutzbach 1988: 382). Depth measurements from water surface, water depth 8.7m

**WIS-2003.****3880 ± 80**

Organic lake sediment, 1000 - 1005cm depth.

**WIS-2004.****6060 ± 80**

Organic lake sediment, 1145 - 1155cm depth.

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