

WASHINGTON STATE UNIVERSITY NATURAL RADIOCARBON MEASUREMENTS II

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This list of radiocarbon age measurements is for the period 1972-1974. Most of the samples are of archaeological interest. The pretreatments of samples used are basically those described by Ralph and Michael (1971). All samples were converted to methane using the method developed by Fairhall, Schell, and Takashima (1961) and counted in .5L counting tubes at 2 to 4atm of pressure. The WSU Radiocarbon Laboratory has been relocated to the basement of Dana Hall (three stories) and additional shielding has been added. The backgrounds of the counting tubes are .90 counts/min and have an atmospheric pressure dependence of $-.035$ counts/min/cm Hg.

All ages were calculated using a ^{14}C half-life of 5568 years and NBS oxalic acid as contemporary reference material. Nineteenth century oak obtained from E Ralph was used as a secondary standard. The standard deviations reported represent counting errors of the sample, oxalate standard, and backgrounds. Corrections for isotopic fractionation or long-term variations of the ^{14}C production rate (Damon *et al*, 1972) were not made.

Samples WSU-1259-1328 were processed under the direction of R M Chatters, who retired in 1972. The remainder were processed under the direction of J C Sheppard. Samples were processed by Y Welter. M A Gass prepared much of the manuscript.

SAMPLE DESCRIPTIONS

I. ARCHAEOLOGIC SAMPLES

Wasden site series, Idaho

The Wasden site is a large, loess-filled volcanic blister 29km W of Idaho Falls, Idaho, at the foot of Kettle Butte (43° N, $112^{\circ} 23'$ W) and contains a long sequence of faunal and cultural remains (Butler, 1972). Fragments of elephant (genus and species unknown) bone were recovered between 4.8 and 5.3m (bedrock) below surface of fill. The upper elephant bone material consisted of naturally weathered neural arch fragments, while that resting on the bedrock floor of the cave consisted mainly of a scapula lacking the articular end and of cracked, broken, partially roasted and charred long bones.

WSU-1259. Owl Cave, Snake River Plain, Idaho **12,250 \pm 200**
10,300 BC

Neural arch fragments from ca 5cm below surface of fill. Coll 1971 by members of the Upper Snake River Prehistoric Soc, Inc; subm 1971 by B R Butler, Idaho State Univ Mus, Pocatello, Idaho.

WSU-1281. Owl Cave, Idaho**12,850 ± 150**
10,900 BC

Charred long bone resting on bedrock 5.25cm below surface. Coll 1971 by B R Butler and members of the Upper Snake River Soc, Inc; subm 1971 by B R Butler.

Redfish Lake Overhang series, Idaho

Redfish Lake Overhang is located N of Little Redfish Lake, Custer Co, Idaho (44° 10' N, 114° 54' W).

WSU-1395. Redfish Lake, Idaho**9860 ± 180**
7910 BC

Charcoal sample from hearth 95 to 100cm below surface and at interface of sandy loam and hard-packed layer. Sample was from a cache of 9 point blanks, 1 semi-finished projectile point (tentatively id as "Haskett-Lake Mojave") and 3 scrapers. Coll 1972 by K Sargeant; subm 1972 by K Sargeant and B R Butler.

WSU-1396. Redfish Lake, Idaho**10,500 ± 180**
8550 BC

Charcoal from a possible fireplace, 80 to 105cm below surface, and at extreme rear of cave. Sample was enclosed in coarse sandy loam mixed with cobbles and boulders redeposited from a glacial moraine. Coll 1972 by K Sargeant; subm 1972 by K Sargeant and B R Butler.

WSU-1397. Redfish Lake, Idaho**8060 ± 190**
6110 BC

Charcoal from organic stratum 69 to 77cm below surface and 170cm N and 130cm W of WSU-1396. Coll 1972 by M Dahlstrom; subm 1972 by K Sargeant and B R Butler.

WSU-1410. Redfish Lake, Idaho**670 ± 130**
AD 1280

Charcoal from coarse sandy stratum underlying glacial till near WSU-1397 and 120cm below surface of WSU-1395. Coll and subm 1972 by K Sargeant and B R Butler.

WSU-1423. American Falls Reservoir, Idaho**21,500 ± 700**
19,550 BC

Bone from Bronco Jim Point, Pierce Co, Idaho (42° 56' N, 112° 41' W), from sand and gravel layer 1.5 to 1.8m below surface. Fauna from this layer includes horse, camel, bison, ground sloth, mammoth, bear, dire wolf, and saber-tooth cat. Coll 1973 by H Emry; subm 1973 by B R Butler.

WSU-1424. American Falls Reservoir, Idaho**31,300 ± 2300**
29,350 BC

Bone fragments from Rainbow Beach, Power Co, Idaho (42° 53' N, 112° 43' W), from sand and gravel layer 1.5 to 1.8m below surface. Fauna from this layer includes horse, camel, bison, ground sloth, mammoth, bear, dire wolf, and saber-tooth cat. Coll 1973 by G McDonald; subm 1973 by B R Butler.

- WSU-1441. Blackfoot Reservoir, Idaho** **450 ± 80**
AD 1500
Charcoal from campsite, Feature 3, Site 10-BM-50 (Poison Creek), on a tributary of Blackfoot R (111° 40' N, 43° 0' W). Coll and subm 1973 by B R Butler. *Comment* (BRB): sample coll during 1973 test excavations of Blackfoot Reservoir Project and came from hearth of well-defined pottery-bearing occupation that should date between AD 1450 and AD 1750, *ie*, after appearance of pottery in region but prior to introduction of the horse.
- WSU-1323. Kamiah, Idaho** **1170 ± 170**
AD 780
Charcoal from hearth 50 to 60cm below surface 14.5km downriver from Kamiah. Dates upper limit for assoc with Cascade and Side-Notched points. Coll 1970 by V Platt; subm 1972 by Idaho State Univ, Pocatello, Idaho.
- WSU-1324. Kamiah, Idaho** **4710 ± 180**
2760 BC
Charcoal from same trench as WSU-1323, 140 to 160cm below surface. Dates lower limit for assoc of Cascade and Side-Notched points. Coll 1970 by V Platt; subm 1972 by Idaho State Univ.
- WSU-1277. North Fork Clearwater River, Idaho** **3770 ± 170**
1820 BC
Charcoal from basal gravel of lower terrace of Big I., North Fork Clearwater R, Clearwater Co (46° 38' N, 116° W). Coll 1971 by D Corliss; subm 1971 by E Swanson, Idaho State Univ Mus, Pocatello, Idaho.
- WSU-1278. North Fork Clearwater River, Idaho** **2120 ± 165**
170 BC
Charcoal, 40cm below surface of Big I. site, upper terrace. Coll 1971 by D Corliss; subm 1971 by E Swanson.
- WSU-1305. North Fork Clearwater River, Idaho** **1250 ± 120**
AD 700
Charcoal, 40 to 50cm below surface of Big I. site, middle terrace. Sample with cobble tools. Coll 1971 by D Corliss; subm 1972 by E Swanson.
- WSU-1302. Lenore site, Idaho** **640 ± 140**
AD 1310
Charcoal from site .65km W of Lenore, Nez Perce Co, Idaho (46° 31' N, 116° 35' W). Sample was 246cm below surface, in House D, assoc with fire-cracked rubble. Coll 1971 by R Warner; subm by E Swanson.
- WSU-1303. Lenore site, Idaho** **1310 ± 140**
AD 640
Charcoal taken from site .65km W of Lenore, Nez Perce Co (46° 31' N, 116° 35' W). Sample was from uppermost fireplace in Floor I, House J. Coll 1967 by D Morse; subm 1971 by E Swanson.

7960 ± 120

WSU-1408B. Antelope Overhang, Oregon

6010 BC

Pieces of twisted fiber from inner bark of an unknown tree or shrub used in construction of prehistoric sandals at a large overhang on Antelope Creek, tributary of S Fork of the Owyhee R, Malheur Co, Oregon, 56.4km S SW of Jordan Valley. Sample assoc with a sandal of the same material underlying what appeared to be modern horse or cattle dung. Coll and subm 1969 by B R Butler. This sample dates cordage from the Antelope Overhang analyzed and described by Adavasio (1970).

940 ± 150

WSU-1326. Hells Canyon, Oregon

AD 1010

Bones of *Ovis canadensis* and *Odocoileus hemiosus* from Hells Canyon Creek rockshelter, 56.4km SE of Enterprise, Wallowa Co (45° 15' N, 116° 40' W). Sample dates rockfall believed to be of Gannett Peak stage (Richmond, 1965). Coll 1967 by J Bross and F Turner; subm 1972 by M G Pavesic, Idaho State Univ, Pocatello, Idaho.

590 ± 110

WSU-1327. Hells Canyon, Oregon

AD 1360

Charcoal, 96cm below surface of Hells Canyon Creek rockshelter. Coll 1967 by S Troutman and C Sims; subm 1972 by M G Pavesic.

1240 ± 140

WSU-1328. Hells Canyon, Oregon

AD 710

Bones of *Ovis canadensis* and *Odocoileus hemiosus* from Hells Canyon Creek rockshelter, 175cm below surface. Coll 1967 by J Gross and J Todd; subm 1972 by M G Pavesic.

8600 ± 65

WSU-1422. Lind Coulee, Washington

6650 BC

Humus from Slot Trench 7 to 9cm below datum of Lind Coulee site, 45-GR-97 (46° 09' N, 119° 00' W). Date represents an "apparent mean residence time" of carbon in this soil layer (Scharpenseel, 1972). Coll and subm 1972 by R Fryxell.

Asotin series, Washington

Charcoal excavated from sites in Asotin Co, Washington (46° N, 117° W). Coll and subm 1973 by F C Leonhardy, Anthropol Dept, Washington State Univ, Pullman, Washington.

1480 ± 80

WSU-1437. Asotin, Washington

AD 470

Sample 73L2 was charcoal presumably assoc with fill in House 3 at Site 45AS82, Asotin Co. Cultural material from house was same as that dated by WSU-1438; estimated date: 4000 to 5000 yr BP. Area was badly disturbed both in historic and prehistoric times. Charcoal was found adjacent to an intrusive pit. Sample age indicates it was assoc with a prehistoric intrusion and not with House 3.

WSU-1438. Asotin, Washington**4060 ± 130****2110 BC**

Sample 73L1 was charcoal from a geologic stratum designated informally "The Calcareous Sand" at Site 45AS82, Asotin Co. Based on geologic position and known age of underlying geologic strata and cultural materials, estimated age: between 4000 and 5000 yr BP. Sample provides a single date for an archaeologic assemblage not previously recognized as distinctive in Lower Snake River culture sequence (Leonhardy and Rice, 1970). Material probably represents a culture ancestral to that of the Tucannon phase, with a minimum initial date of 3000 BP and a terminal date of 2500 BP. Date of WSU-1438 is consistent with estimates based on both regional geologic sequence and regional cultural sequence.

WSU-1439. Asotin, Washington**1410 ± 80****AD 540**

Sample 73L3 was charcoal from upper floor of House 2, Site 45AS82, Asotin Co. Estimated date: 2000 BP.

WSU-1440. Asotin, Washington**1330 ± 110****AD 620**

Sample 73L4 was charcoal (burned grass and annual herbs) from lower floor of House 1, Site 45AS80, Asotin Co. Estimated date 2000 BP. *Comment* (FCL): WSU-1439 and -1440 date 2 different houses containing identical cultural materials. Dates confirm approx contemporaneity of houses and are somewhat later than estimated.

WSU-1443. Sekiu, Washington**2750 ± 90****800 BC**

Wood from Sq II, Level II, Site 45-CA-213, Sekiu, Clallam Co (48° 17' N, 124° 21' W). Coll 1973 and subm 1974 by D Croes and R Daugherty, Anthropol Dept, Washington State Univ, Pullman, Wash.

WSU-1442. Sekiu, Washington**2210 ± 70****260 BC**

Wooden fishhook from Sq I, Level III, Site 45-CA-213, 2.42km W of Sekiu, Clallam Co (48° 17' N, 124° 21' W). Coll 1973 and subm 1974 by D Croes and R Daugherty.

WSU-1318. Putu site, Alaska**8450 ± 150****6500 BC**

Charcoal from Putu site, Sagavanirktok Valley, Brooks Range, Alaska (68° 21' N, 148° 50' W). Sample .5m below surface, S 7.3m, W .6m from datum. The Putu site appears to be a single-component, short-term occupation. Artifacts from site include 4 fragments of fluted points, burins, blades, blade cores, large bi-faces, end-scraper on a blade, and utilized flakes. Occupation zone rests directly on glacial gravels covered by .3 to .6m light brown soil. Coll 1970; subm 1972 by H L Alexander, Simon Fraser Univ, British Columbia.

WSU-1420. Kettle Falls, Washington **2960 ± 60**
1010 BC

Carbon from Stratum 5, Site 45-FE-45, Kettle Falls I., Columbia R near Kettle Falls, Washington (48° 07' N, 118° 07' W). Sample from between 1 and 1.30m below surface of midden. Site has been flooded by Lake Roosevelt since 1940. Coll 1972 and subm 1973 by D Chance and D Rice, Univ Idaho, Dept Anthropol, Moscow, Idaho.

WSU-1421. Hanford, Washington **1860 ± 60**
AD 90

Shell (*Margaritifera*) from base of Stratum 3B at archeol Site 45-BN-179 on S bank of Columbia R, USAEC Reservation, Hanford (46° 39' N, 119° 47' W). Sample from midden at an alt 98.3 to 98.2m, grid coordinates 39-41 N, 74-76 E. Coll and subm 1973 by D Rice.

WSU-1456. Richland, Washington **Modern, pre-bomb**

Charcoal and carbonized wood, from Site 45-BN-161, Sq V-19, Level II, 1.5 to 1.7m below datum, at Columbia Park I., Richland (46° 38' N, 119° 45' W). Coll 1969; subm 1974 by D Rice.

WSU-1457. Pasco, Washington **450 ± 60**
AD 1500

Charcoal from a burned house plank from Site 45-FR-101, Sq U-33-S, Level 4, .5m below datum, at Chiawana Park, Pasco (46° 38' N, 119° 45' W). Coll 1967 by Brooks; subm 1974 by D Rice.

WSU-1458. Umatilla, Oregon **210 ± 60**
AD 1740

Charcoal from Site 35-UM-35C/X-656-66, Sq 6F, 18-19, Level 10, 1.3 to 1.5m below datum, Umatilla (45° 53' N, 119° 20' W). Coll 1974 by V Eaton; subm 1974 by D Rice.

WSU-1431. Last Supper Cave, Nevada **8630 ± 195**
6680 BC

Shell from basal shell and stratum at Last Supper Cave, Site 26-Hu-102, Humbolt Co, Nevada. Coll and subm 1973 by T N Layton, Nevada State Mus, Carson City, Nevada.

WSU-1454. Gearhart, Oregon **860 ± 100**
AD 1090

Charcoal from firepit .75m below surface of Site 35-CLT-8, on E side of sand dune ca 1.21km from Pacific Ocean, Gearhart (46° 03' 16" N, 123° 54' 53" W). The site, left by Clatsop Indians (Lower Chinook), is composed of alternating layers of razor clam shells and sand. Coll 1973; subm 1974 by F Hasle, Clatsop Comm Coll, Astoria, Oregon.

WSU-1455. Gearhart, Oregon **730 ± 110**
AD 1220

Charcoal from firepit 1.95m below surface of Site 35-CLT-8. Coll 1974 by Shrakey, Sanford, Lotterer, and Gillette; subm 1974 by F Hasle.

II. SEDIMENT SAMPLES

710 ± 80
AD 1240

WSU-1429. Blue Lake, Idaho

Charcoal, twigs, and wood fragments separated from gyttja at sediment depth 1.43 to 1.48m of Blue Lake, Nez Perce Co, Idaho (46° 13' N, 116° 51' W). Coll and subm 1973 by P J Mehringer and K L Petersen, Washington State Univ Anthropol Dept, Pullman, Wash.

1340 ± 80
AD 610

WSU-1430. Blue Lake, Idaho

Charcoal, twigs, wood fragments and gyttja at sediment depth 2.42 to 2.47m of Blue Lake, Nez Perce, Idaho (46° 13' N, 116° 51' W). Coll and subm 1973 by P J Mehringer and K L Petersen.

Wildcat Lake series, Washington

Whole sediment core samples, primarily algal gyttja, from Wildcat Lake, Whitman Co, Washington (46° 44' N, 118° 10' W). Dates were used to confirm tephra chronology of Mt St Helens (Crandall and Mullineaux, 1973) and Mt Mazama (Kittelman, 1973) eruptions and for fossil pollen studies. Coll 1972 by P J Mehringer and K L Petersen; subm by P J Mehringer.

General Comment: 1445 SI and SII provide an upper limit radiocarbon age estimate for Mt St Helens "W" tephra layer at 1.50m. 1451 S and H provide an upper limit radiocarbon age for Mt St Helens "Y" tephra layer at 9m. WSU-1452 S is above a Mt Mazama tephra layer.

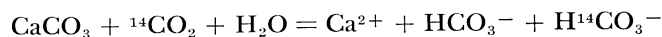
Sample	Material	Depth	Age
WSU-1445 SI	Sediment	1.58-1.68m	390 ± 100 AD 1560
WSU-1445 SII	Sediment	1.58-1.68m	400 ± 60 AD 1550
WSU-1448 S	Sediment	3.21-3.29m	900 ± 100 AD 1050
WSU-1449 S	Sediment	4.76-4.84m	1140 ± 100 AD 810
WSU-1446	Sediment	5.92-5.99m	1800 ± 100 AD 150
WSU-1450 S	Sediment	7.61-7.69m	2300 ± 100 350 BC
WSU-1451 H	Humic acid	9.41-9.45m	3690 ± 90 1740 BC
WSU-1451 S	Sediment	9.41-9.45m	4180 ± 90 2230 BC
WSU-1452 S	Sediment	11.25-11.34m	5380 ± 130 3430 BC

Little Lake series, California

Whole sediment core samples of *Chara* ooze or peat from Little Lake, California (36° 57' N, 117° 54' W) to provide a chronology for fossil pollen and sediment studies. Coll 1974 by P J Mehringer and E L Davis; subm 1974 by P J Mehringer.

Sample	Material	Depth	Age	% Modern
WSU-1460	<i>Chara</i> sp			63.4 ± 2.1
WSU-1473	<i>Potamogeton</i> sp			68.7 ± 1.8
WSU-1461	<i>Chara</i> ooze	1.26-1.34m		40.9 ± 0.6
WSU-1490	Carbonate	1.26-1.34m		40.3 ± 0.6
WSU-1462	<i>Chara</i> ooze	3.58-3.48m		47.2 ± 1.0
WSU-1462H	Humic acid	3.58-3.48m		47.2 ± 1.0
WSU-1465	<i>Chara</i> ooze	5.00-5.11m		45.2 ± 1.1
WSU-1474	Peat	5.91-6.01m	3020 ± 120 1070 BC	
WSU-1466	Peat	7.96-8.06m	3920 ± 120 1970 BC	
WSU-1463	<i>Chara</i> ooze	8.40-8.50m		30.7 ± 0.6
WSU-1464	Peat	11.30-11.37m	5060 ± 140 3110 BC	
WSU-1464H	Humic acid	11.30-11.37m	5000 ± 140 3050 BC	

General Comment: (JCS & PJM): ¹⁴C ages for modern *Potamogeton* and *Chara* grown in Little Lake and the lake sediment derived from these aquatic plants were anomalously old. ¹⁴C ages of peat samples are reasonable. Results are very similar to those observed by Deevey *et al* (1954) and can be explained on the basis that *Chara* and *Potamogeton* metabolized "old" HCO₃⁻, while emergent aquatics (*Typha* and *Scirpus*), which produced the peat, metabolized atmospheric CO₂. Calculations, based on peat data and assumption of a constant sedimentary deposition rate, indicate that the HCO₃⁻ metabolized by the *Chara* and *Potamogeton* was initially 50% "old" carbon, suggesting reaction:



is important. Mixing of "old" spring water with atmospheric CO₂ cannot be excluded. Analysis of ¹⁴C content of the spring water, which feeds Little Lake, should clarify the situation.

III. WATER SAMPLES

52.0 ± 1.0%**WSU-1432. Giant Springs****Modern**

Water (BaCO₃) Sample 1 from spring near Missouri R at Great Falls, Madison I., Montana (47° 31' N, 111° 15' W). Coll and subm 1973 by G Grimestad, Missoula, Montana.

- WSU-1433. General Mills Well** **66.3 ± 2.6%**
Modern
Water (BaCO₃) Sample 2 from domestic well, Madison I. (47° 25' N, 111° 09' W). Coll and subm 1973 by G Grimestad.
- WSU-1435. J Bryant Well** **42.6 ± 1.1%**
Modern
Water (BaCO₃) Sample 4 from domestic well, Madison I. (47° 30' N, 111° 16' W). Coll and subm 1973 by G Grimestad.
- WSU-1436. Giant Springs** **54.1 ± 1.5%**
Modern
Water (BaCO₃) Sample 5, duplicate of WSU-1432, from spring near Missouri R in Great Falls, Madison I., Montana (47° 31' N, 111° 15' W). Coll and subm 1973 by G Grimestad.

IV. MISCELLANEOUS SAMPLES

- WSU-1428. Prudhoe Bay, Alaska** **29,200 ± 2000**
27,250 BC
Tamarack wood fragment from British Petroleum oil well at ca 122m level, Prudhoe Bay, Alaska (70° 30' N, 148° 30' W). Specimen represents underside of a branch, evidenced by compression wood, which is characteristic of branches and strongly leaning trees. Subm 1973 by F R Johnson, State Forester's Office, Alaska Dept Nat Resources, Anchorage, Alaska.
- WSU-1426. Prudhoe Bay, Alaska** **25,500 ± 1000**
23,550 BC
Tamarack wood fragment from British Petroleum oil well at ca 122m level, Prudhoe Bay, Alaska (70° 30' N, 148° 30' W). Sample appears to be part of bole near ground line. Subm 1973 by F R Johnson.
- WSU-1453. Chewelah, Washington** **2300 ± 120**
350 BC
Log (*Pinus Ponderosa*) underlying bison skull excavated from bog at Chewelah, Washington (48° 15' N, 117° 45' W). Coll and subm 1973 by C Gustafson, Anthropol Dept, Washington State Univ, Pullman, Wash.

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