Radiocarbon Dating the Arctic Small Tool Tradition in Alaska

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Abstract: This paper presents an annotated list of Alaskan Arctic Small Tool tradition dates. The goal is to assemble all extant Alaskan ASTt dates. In view of unpublished dates and a vast amount of gray literature, it seems unlikely that this goal was achieved. The paper does, however, present a large number of dates in a single source along with as much data as the constraints of the table format permit.

Key words: Alaska prehistory, mid-Holocene, human migration

The Arctic Small Tool tradition[1] (ASTt) is remarkable not only for small, exquisitely made tools, but also for its immense geographic range. As presently understood, the ASTt ranges from Kachemak Bay and the Alaska Peninsula northward and eastward to the northern tip of Greenland - a region that is not only at the edge of the habitable earth, but at the edge of earth itself. Perhaps even more remarkable is the fact that the oldest site at the southern extreme of that range dates within a century or two of the oldest securely dated sites at the northern extreme.

This paper presents a roster of 86 radiocarbon dates from ASTt sites in Alaska, the presumed home of the tradition. An attempt was made to assemble all Alaskan ASTt dates. The key word, of course, is attempt. There are probably published dates that were overlooked; there is little doubt that there are unpublished dates and dates in the gray literature and other obscure sources that are not included.

The dating of the ASTt in Alaska hardly had auspicious beginnings and it is instructive to reflect upon the dating of the type site before proceeding with the paper.

DATING THE FIRST ALASKAN ASTt SITE

Nearly sixty years ago, on the very eve of the advent of radiocarbon dating, J. Louis Giddings uncovered the small, superbly fashioned tools of the Denbigh Flint Complex at Iyatayet on Cape Denbigh (Giddings 1949). The Denbigh Flint Complex, now an integral component of the Arctic Small Tool tradition, was initially thought to be at least 8500 years old and possibly as old as 12000 years (Hopkins and Giddings 1953:29).

Understandably, little charcoal was collected when Iyatayet was excavated and the single sample submitted to the University of Chicago in 1951 was too small to date. Consequently, the site was revisited in 1952 to collect charcoal for radiocarbon dating (Giddings 1955:375). When the samples were dated – by Willard Libby himself, incidentally – the results were far younger than Giddings had anticipated (see below [Table 1, Numbers 54-57]). The title of Giddings (1955) response to the dates "The Denbigh Flint Complex is Not Yet Dated" is a masterpiece – one hardly needs to read the paper. Not only did Giddings disagree with the dates, he was "somewhat dismayed" that they had been made public without comment from him.

Giddings soon abandoned claims of great antiquity for Iyatayet, but even in the Cape Denbigh monograph Giddings (1964) clearly still felt that the Denbigh Flint Complex was older than radiocarbon dating indicated, as did some of his colleagues (Larsen 1968; Rainey and Ralph 1959). For example, in the monograph, Giddings (1964:246) alluded to a 6000 year old date from Trail Creek Caves[2] "in levels where Denbigh-like microblades occurred" and expressed the hope of finding more satis-

[1]Arctic Small Tool tradition is used here as originally conceived by Irving (1962), i.e., it is limited to the Denbigh Flint Complex and the suite of more or less coeval and typologically similar cultures occurring in Alaska, northern Canada, and Greenland. This definition eliminates Choris, Norton, and Ipiutak dates from consideration.

[2]This date, 5993±280 BP (C-560), could not be confidently associated with artifacts from the same level (Larsen 1968:71).

factory dates at Cape Krusenstern and at stratified sites in the interior. This was not to be – the ASTt sites at Cape Krusenstern remain undated (Giddings and Anderson 1986 [Figure 19]) and the oldest dates from Onion Portage are younger than the oldest Iyatayet dates. Ironically, if one accepts solid carbon dates at face value, Giddings' Iyatayet dates are among the oldest ASTt dates ever obtained.

The intent of this paper is not to argue for or against the great antiquity of the ASTt in Alaska, but rather to present a comprehensive roster of Alaskan ASTt dates that will, hopefully, allow readers to form their own conclusions.

THE DATE ROSTER

The annotated dates are presented in Table 1 and the locations of dated sites are shown in Figure 1. Each date in the table is assigned a number in the first column. This is done primarily to simplify discussion of specific dates or groups of dates in the text. The second column contains the site name, if one occurs in the literature, and the Alaska Heritage Resources Survey (AHRS) designation consisting of a three letter designation for the US Geological Survey Quadrangle Map the site occurs on and a three number site identifier. An exception to this occurs with several sites excavated by Dumond (1981) in the Naknek River drainage that are all subsumed under XMK-001. Here individual site identifiers are appended to the AHRS designation (e.g., XMK-001-BR4 is Dumond's Brooks River Site 4). Sites are listed in the column from north to south and west to east.

The third column contains the lettered radiocarbon laboratory identification code and the laboratory assigned sample number. The fourth column list the date in uncalibrated radiocarbon years before the present (^{14}C yrs BP). The following, fifth, column identifies the type of material dated by lettered code; a key to the codes is found at the bottom of each page in Table 1. The sixth column provides references. Each reference is assigned a number and the key to the references is provided by Table 2.

The final column, Remarks, is a catchall that requires considerable explanation. The first entry in this column is the location since this is not always apparent from the site name. At best this gives a precise location to a person unfamiliar with the site (e.g., Cape Denbigh), at worst it provides a "ballpark" region (e.g., Killik River).

The assigning of assemblages to the ASTt is the most subjective aspect of the table. Generally, cultural assessments in the literature are taken at face value and phase names or other designations given by authors are enclosed in quotes. Assemblages that appear to contain only ASTt materials are simply listed as ASTt in the column. Assemblages containing a mixture of ASTt artifacts and those from other cultures are listed as ASTt and examples of extraneous elements are listed.

Dates from the purported ASTt sites at Russell Creek on Cold Bay (Maschner 1999; Maschner and Jordan 2001) and Margaret Bay (Knecht et al. 2001) on Unalaska Island are not included in the table. These sites indeed exhibit some ASTt traits, but these assemblages are sufficiently different from those listed that it seems inadvisable to include them. Similarly, several apparent ASTt dates from the Gallagher Flint Station (PSM-050) were not included because they do not appear to be associated with ASTt materials (Gal 1982).

As a final note on this column, an attempt is made to provide the general provenience from which the dated sample was obtained, although this was not always possible. As much information is given as the constraints of the table format permit. The phrase containing this information begins with "from" (e. g., from hearth in house, from lowermost level, etc.).

DISCUSSION

Although this paper is primarily a date roster, some discussion is in order. Recent research by Reuther (2003) has a bearing on dating the ASTt in Alaska. That work will be briefly discussed here since many readers may not yet be aware of it. Several authors have noted that dates by the now defunct Dicarb Radioisotope Company, or Dicarb (DIC), on the Croxton Site are incongruously young when compared to dates from that site rendered by other laboratories (Gerlach and Mason 1992; Minc and Smith 1989; Reanier 1992). Joshua Reuther (2003) recently examined this problem by resubmitting samples of material dated by Dicarb (as well as new samples from the same provenience as Dicarb-dated material) to Beta Analytic, Inc. and NSF-University of Arizona for accelerator mass spectrometry dating. Although the bulk of Reuther's work concerned the Ipiutak component at Croxton, a number of samples were from the smaller ASTt component, as shown in Table 3.

Table 1. An annotated listing of Alaskan ASTt dates

No.	Site Name AHRS No.	Lab. No.	^{14}C yrs BP	Mat'l Dated	Reference	Remarks
1	Walakpa BAR-013	GAK-2290	3400±520	BO	23	Walakpa Bay, ASTt plus ceramics, ground jade and discoids, "Walakpa Phase, L. Denbigh-Choris transition", from lowest occupational surface.
2	Walakpa BAR-013	GAK-2300	2260±300	BO	23	See No. 1.
3	Putuligayak R. XBP-007	UGA-3719	2075±70	B	16	Simpson Lagoon, L. ASTt?, small assemblage, bipointed endblade, burinated biface and sideblade, microblades, flakeknife.
4	Central Cr. Pingo XBP-008	Beta-50661	4060±130	C	17	Prudhoe Bay, Loc. 2, small assemblage, sideblade, mitten-shaped burins, and microblades.
5	Central Cr. Pingo XBP-008	Beta-50662	3580±80	C	17	Loc. 8, contained debitage only.
6	Jack's Last Pingo XBP-044	Beta-149167	2140±40	C	18	Prudhoe Bay, L. ASTt?, small assemblage, edge-ground endblade, microblade.
7	Croxton, Loc. J XHP-311	GX-8636	1670±160	C	6, 19	Tukuto Lake. ASTt, from level 2 hearth, same hearth as No. 8.
8	Croxton, Loc. J XHP-311	Beta-129944	1410±40	C	19	See No. 7.
9	Croxton, Loc. J XHP-311	DIC-2464	290±100	C	6, 19, 20	Level 2, ASTt plus discoids, organic artifacts; sample may be mixed by cryoturbation, same sample as No. 10.
10	Croxton, Loc. J XHP-311	Beta-138715	3620±40	C	19	See No. 9.

Key to material dated: A - antler; B - terrestrial bone; BO – burned organic matter; BR – bark; C – Charcoal; CW – charred wood; N/A – not available; W – wood; T – twigs

Table 1 (continued). An annotated listing of Alaskan ASTt dates

No.	Site Name AHRS No.	Lab. No.	^{14}C yrs BP	Mat'l Dated	Refer-ence	Remarks
11	Croxton, Loc. J XHP-311	GX-8637	3680±205	C	6, 19	ASTt, level 6, combined sample, from same charcoal deposit as No. 12.
12	Croxton, Loc. J XHP-311	Beta-138716	3420+40	C	19	See No. 11.
13	Croxton, Loc. J XHP-311	Beta-154782	3630±40	C	6, 19	Level 3, associated with microblade and burin spall.
14	Croxton, Loc. J XHP-311	DIC-2204	4420±410/430	C	6, 19	Level 5, ASTt, from charcoal stain.
15	Croxton, Loc. J XHP-311	DIC-2465	2210±155	C	6, 19	Level 5, from hearth containing mitten-shaped burin, microblade, same hearth as No. 16.
16	Croxton, Loc. J XHP-311	Beta-136257	3650±50	C	6, 19	See No. 15.
17	Croxton. Loc. J XHP-311	DIC-2469	3350±60	W	6, 19	ASTt, level 5, from same charcoal deposit as No. 18 and 19.
18	Croxton, Loc. J XHP-311	Beta-134995	3760±40	W	19	See No.17.
19	Croxton, Loc. J XHP-311	Beta-134996	3700±40	T	19	See No. 17.
20	Punyik Point XHP-308	P-64	2600 ± ?	C	13	Etivlik Lake, ASTt, "Punyik Complex", solid carbon?, rejected by excavator, from hearth in house H'54A
21	Punyik Point XHP-308	GSC-712	3660±150	C	1	ASTt, date referenced Irving n.d. without further comment
22	Punyik Point XHP-311	Beta-193789	3490±40	C	26	ASTt, hearth in house H'61J
23	Punyik Point XHP-308	Beta-193799	3350±40	C	26	ASTt, open hearth
24	Punyik Point XHP-308	Beta-193794	3460±40	C	26	ASTt, from eroding midden on lake terrace

25	Punyik Point XHP-308	Beta-193795	3310±40	C	26	ASTt, from hearth in house H'54A.
26	KIR-124	WSU- 2532	3540±80	C	22	Kurupa Lake, ASTt, "Cascade Phase", from house fill .
27	KIR-124	DIC-2660	3450±230	C	22	See No. 26, date also listed as 3480±110 in same source.
28	Tingmiukpuk KIR-273	Beta-49165	3380±55	A	21	ASTt, from surficial antler.
29	Tingmiukpuk KIR-273	Beta-49164	3425±60	B	21	ASTt, from surficial bone.
30	Mosquito Lake PSM-049	Beta-4080	2135±160	C	14	"Mosquito Lake" near Galbraith Lake, Loc. 3, ASTt, from open hearth.
31	Mosquito Lake. PSM-049	GX-4079	2425±160	C	14	Loc. 4, ASTt from open hearth.
32	Mosquito Lake PSM-049	GX-4104	2665±155	C	14	Loc. 5, ASTt, from open hearth.
33	Mosquito Lake PSM-049	GX-4075	2705±160	C	14	Loc. 2, ASTt, from open hearth.
34	Mosquito Lake PSM-049	GX-4250	3515±160	C	14	Loc. 8, ASTt, from open hearth.
35	Mosquito Lake PSM-049	Beta-36802	3410±75	C	26	Loc. Annex, ASTt, from open hearth.
36	No NameKnob PSM-049	GX-4072	3855±155	C	6	Near Gallagher Flint Station, Loc 4, from hearth, ASTt plus medial labret, burins on thick flakes.
37	No Name Knob PSM-058	GX-4071	3440±160	C	6	See No. 38

Key to material dated: A - antler; B - terrestrial bone; BO – burned organic matter; BR – bark; C – Charcoal; CW – charred wood; N/A – not available; W – wood; T – twigs

Table 1 (continued). An annotated listing of Alaskan ASTt dates

No.	Site Name AHRS No.	Lab. No.	^{14}C yrs BP	Mat'l Dated	Refer-ence	Remarks
38	Blip PSM 037	GX-4084	3480±180	C	6	Near Gallagher Flint Station, North Kame Loc., ASTt plus historic material.
39	AMR-041	Beta-14648	3655±85	C	15	Kipmik Lake, ASTt, from open hearth.
40	Onion Portage AMR-001	P-1068	3530±60	C	2	Kobuk River, Band 3/4, ASTt,"Late Denbigh", burinated bifaces present, ASTt flaking absent.
41	Onion Portage AMR-001	P-1069A	3640±60	C	2	Band 4, level 1, ASTt, "Classic Denbigh:"
42	Onion Portage AMR-001	P-1801	3642±63	N/A	1	Band 4, Level 1, House 1, ASTt, may be based on 5370 half-life, date appears in Anderson 1970:10, but not in Anderson 1988: Figure 44.
43	Onion Portage AMR-001	P-987	3860±70	C	2	Band 4, Level 2, ASTt,"Classic Denbigh"
44	Onion Portage AMR-001	P-1109	3700±60	C	2	Band 4, Level 3, ASTt, "Classic Denbigh"
45	Onion Portage AMR-001	P-988	3850±70	C	2	Band 4, Level 4, ASTt, "Classic Denbigh"
46	Onion Portage AMR-001	P-998	3950±70	C	2	Band 4/5, ASTt, "Classic Denbigh"
47	Onion Portage AMR-001	P-1070	3710±60	C	2	Band 5, Level 1, ASTt, "Proto-Denbigh"; ASTt flaking, ground burins and burin spalls absent, stemmed end-scrapers, large semi-lunar bifaces present
48	Onion Portage AMR-001	P-1071	3710±60	C	2	See No. 47
49	KTZ-122	ETH-5945	3750±80	C	10	Cape Espenberg, no ASTt diagnostics, material "not inconsistent with ASTt", ASTt sites nearby.
50	BEN-053	Beta-39517	3770±80	C	10	Kuzitrin Lake, Feature 37, ASTt, from combined samples, inconsistent with stratigraphic position.

51	BEN-053	Beta-39518	4750±170	C	10	Feature 37, ASTt, from combined samples, inconsistent with stratigraphic position.
52	BEN-053	ETH-70378	3810±65	C	10	Feature 43, ASTt, from lowest portion of deposit.
53	BEN-053	Beta-39514	4770±260	C	10	Feature 43, ASTt, from "lowest extent" of deposit.
54	Iyatayet NOB-002	C-792	3477±310	C	9	Cape Denbigh, ASTt, "Denbigh Flint Complex", solid carbon, from hearth in Cut Z-5B.
55	Iyatayet NOB-002	C-792	3541±315	C	9	Second assay of No. 54 after acid treatment.
56	Iyatayet NOB-002	C-793	4253±290	C, T	9	ASTt, "Denbigh Flint Complex" solid carbon date from Cut R.
57	Iyatayet NOB-002	C-793	5063±340	C, T	9	Second assay of No. 56 after acid treatment.
58	Iyatayet	P-103	3430±280	C, T	9	ASTt, "Denbigh Flint Complex", solid carbon date from Cut R.
59	Iyatayet NOB-002	P-103	3520±290	C, T	9	Second assay of No. 58.
60	Iyatayet NOB-002	P-102	3290±290	C, T	9	Solid carbon, same sample as No. 55, 56.
61	Iyatayet NOB-002	P-102	3320±200	C, T	9	Second assay of No. 60.
62	Iyatayet NOB-002	W-298	3974±600	C	9	ASTt, "Denbigh Flint Complex", apparently the only Iyatayet CO_2 determination, from same layer that produced No. 54, 55, 58, 59.
63	DIL-153	Beta-34417	3220±80	C	3	Beverly Lake, Wood-Tikchik Lakes, ASTt.

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Table 1 (continued). An annotated listing of Alaskan ASTt dates

No.	Site Name AHRS No.	Lab. No.	^{14}C yrs BP	Mat'l Dated	Reference	Remarks
64	DIL-153	Beta-85193	3450±60	C	3	See No. 63.
65	DIL-153	Beta-34416	3460±90	C	3	See No. 63.
66	DIL-153	Beta-85194	3490±40	C	3	See No. 63.
67	DIL-153	Beta-34421	3540±90	C	3	See No. 63.
68	ILI-002	Beta-76533	3350±60		12	Igiugig, ASTt, similar to Brooks River Gravels, from hearth.
69	SEL-033	WSU-4303	4005±100	BR	24, 25	Chugachik Island, Kachemak Bay, ASTt, similar to Brooks River Gravels, from basal component.
70	SEL-033	Beta-87008	4220±110	C	25	See No. 71.
71	XMK-001-BR4	I-1159	3052±250	CW	4	Brooks River, ASTt, "Brooks River Gravels phase", open(?) hearth.
72	XMK-001-BR5	I-517	3125±200	CW	4	ASTt, Brooks River Gravels phase", from an open (?) hearth.
73	XMK-012-BR5	I-518	3250±200	C	4	See No. 74.
74	XMK-001-R10-3	I-1629	3900±130	CW	4	ASTt, "Brooks River Gravels phase", from open hearth, rejected by excavator, see No. 75.
75	XMK-001-BR10	Beta-97078	3170±120	C	5	Redating of No. 74.
76	XMK-001-BR15	I-1157	3088±200	C	4	ASTt, "Brooks River Gravels phase", from house floor.
77	XMK-001-BR15	I-3115	3390±110	C, CW	4	ASTt, "Brooks River Gravels phase", from hearth charcoal and house structural wood.
78	XMK-001-BR16	SI-1857	3100±105	C	4	ASTt, "Brooks River Gravels phase", from hearth in house.
79	XMK-001-BR16	SI-1860	3280±60	C	4	ASTt, "Brooks River Gravels phase", from hearth in house.
80	XMK-001-BR16	I-1947	3450±110	CW	4	See No. 79.

81	XMK-001-BR16	SI-1859	3470±65	C	4	See No. 79.
82	XMK-001-BR16	SI-1856	3610±85	C	4	See No. 79.
83	UGA-001	SI-2644	3460±75	C	11	Ugashgik Narrows, ASTt, "Ugashik Hilltop Phase."
84	UGA-001	SI-3200	3525±80	C	11	Listed in Henn 1978: Table 2, but not discussed in text.
85	UGA-001	SI-2551	3615±60	C	11	ASTt, "Ugashik Narows Phase" from slightly above house floor.
86	UGA-002	SI-2552	3880±60	C	11	ASTt, "Ugashik Narrows Phase", from house floor.

Key to material dated: A - antler; B - terrestrial bone; BO – burned organic matter; BR – bark; C – Charcoal; CW – charred wood; N/A – not available; W – wood; T – twigs

Table 2. Key to author codes used in Table 1

1	Anderson 1970	10	Harritt 1994	19	Reuther 2003
2	Anderson 1988	11	Henn 1978	20	Reuther and Gerlach 2005
3	DePew and Biddle n.d.	12	Holmes and McMahan 1996	21	Robertson 2003
4	Dumond 1981	13	Irving 1964	22	Schoenberg 1985
5	Dumond 2001	14	Kunz 1977	23	Stanford 1971
6	Gal 1982	15	Kunz 1986	24	Workman 1996
7	Gerlach 1989	16	Lobdell 1981	25	Workman and Zollars 2001
8	Gerlach and Hall 1988	17	Lobdell 1995	26	This volume
9	Giddings 1964	18	Reanier and Wenzel 2002		

Table 3. Comparison of Dicarb and Beta Analytical radiocarbon dates from Locality J of the Croxton site

NO.	LAB. NO.	^{14}C YRS BP	MAT'L DATED	REFERENCE	COMMENTS
9	DIC-2464	290±100	charcoal	Gal 1982 Reuther 2003	Sample may have been mixed by cryoturbation. Reuther and Gerlach 2005: note 1
10	Beta-138715	3620±40	charcoal	Reuther 2003	Same charcoal deposit as No. 9
15	DIC-2465	2210±155	charcoal	Gal 1982 Reuther 2003	From hearth
16	Beta-136257	3650±50	charcoal	Reuther 2003	From same hearth as No. 15
17	DIC-2469	3350±60	charcoal	Gal 1982 Reuther 2003	
18	Beta-134995	3760±40	wood	Reuther 2003	From same wood/charcoal deposit as No. 17
19	Beta-134996	3700±40	charcoal	Reuther 2003	From same wood/charcoal deposit as No. 17

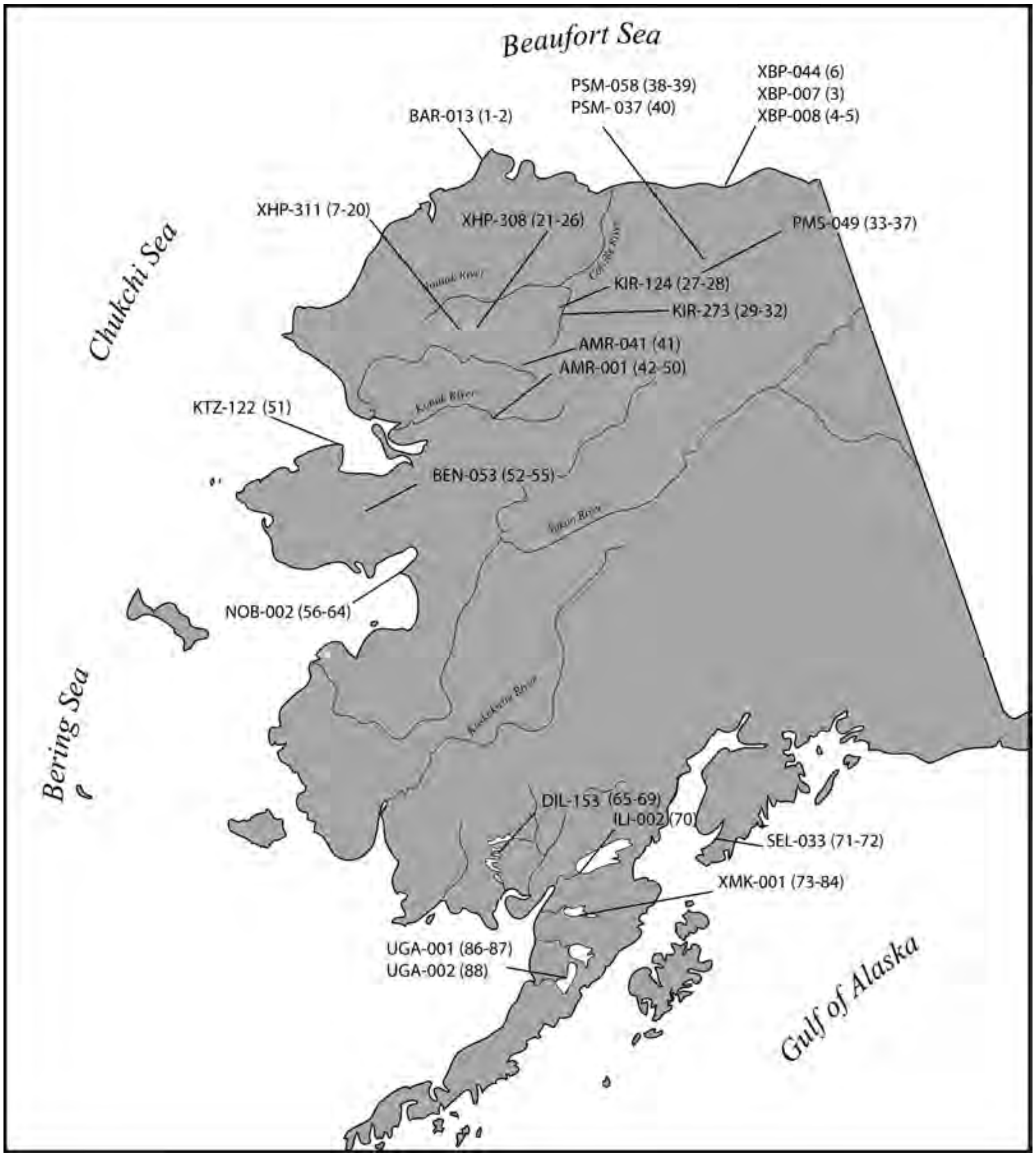

Figure 1. Map showing locations of sites discussed in text

As apparent in Table 3, samples used in the first comparison were from a heavily cyroturbated unit; the exceedingly young Dicarb date may actually have been derived from younger carbon than the Beta Analytical date. This does not seem to be the case with the two remaining two sets of dates, however. The Dicarb dates are consistently younger than those produced by Beta, in one case by over 1400 years. It should be pointed out that similar results were obtained with the larger sample of Ipiutak dates. Unfortunately, Reuther (2003:99-100) was unable to find any material correlating to the oldest Croxton sample (#14) that has an excessively large standard deviation. Reuther's work and a recently published synopsis of that work (Reuther and Gerlach 2005) strongly suggest that all Dicarb dates be viewed with caution. Fortunately, apart from the Croxton site dates, only one other Dicarb date (# 27) appears in Table 1.

Eighteen (21%) of the dates in the table are from coastal locations but, with two possible exceptions, none of the dates are derived from sea mammal products. The likely exceptions are the two dates from Walakpa Bay, where the dated material is given as "burned organic matter" without further comment (Stanford 1971:6). One of the coastal dates (#3) is from terrestrial bone, but the remaining dates were probably obtained from driftwood or a combination of driftwood and twigs. While driftwood is far from an ideal source for radiocarbon dating, it seems unlikely driftwood lying on relatively humid and warm beaches of Alaska for centuries or even millennia could be used for fuel as is the case in the High Arctic (McGhee and Tuck 1976:6).

Some comment also seems warranted on the temporal extremes of the table. Eleven dates are less than

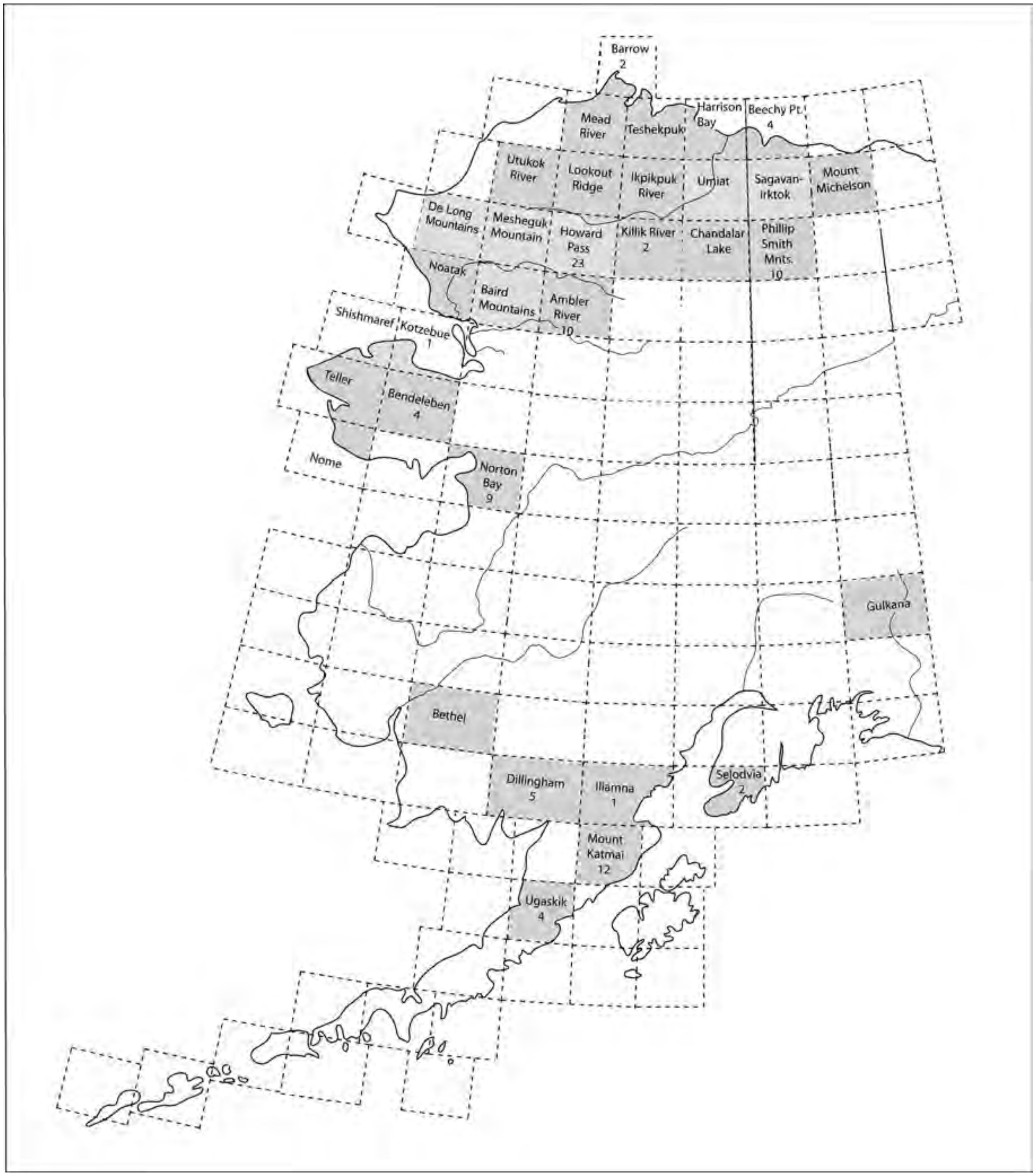

Figure 2. Map showing distribution of Alaskan ASTt sites by quadrangle; shaded quadrangles contain ASTt sites, numbers indicate the number of radiocarbon dates obtained

3000 years old (Numbers 2, 3, 6, 7, 8, 15, 20, and 30-33). Of these, Number 2 is from the "transitional Denbigh-Choris level" at Walakpa Bay that also produced a typical ASTt date (i.e., #1). It seems best to disregard this date since it is likely, as suggested by Dumond (2000:90), that the transitional level is actually a mixture of ASTt and Norton components. Similarly, Numbers 7 and 8, both from the Croxton site, perhaps should be disregarded even though both seem to be from a solid ASTt context, because the ages are anomalously young even to one who accepts a late ASTt presence in northern Alaska. Another Croxton date (#15), noted above, was found to be too young when compared to a date on the same sample by another laboratory. Lastly, Number 20, gathered from an ASTt house at Punyik Point, apparently was correctly rejected by the excavator since recent work there by the Bureau of Land Management obtained a "typical" ASTt date (# 25) from the same structure.

Still remaining, however, are six ASTt dates, all from northern Alaska, all less than 3000 years old. The strongest case for a late ASTt presence lies with the Mosquito Lake localities (Numbers 30-33). These localities produced a substantial amount of apparently unmixed ASTt materials in clear association with the charcoal used to date them.

Turning to the older dates, nine ages in the table are 4000 years old or older. Two dates are solid carbon assays of a single sample from Iyatayet (Numbers 56 and 57), will not be further considered. Interestingly, Number 4 from Prudhoe Bay and Numbers 69 and 70 from Kachemak Bay constitute the northernmost and southernmost dates in the table. All three dates are from coastal settings, bringing up the possibility of a bias due to the use of driftwood. The Prudhoe Bay date is almost certainly on driftwood. The Kachemak Bay dates may also be on driftwood: birch(?) bark, which apparently would not have been locally available 4000 years ago (Workman and Zollars 2003:42), was dated for one of them (#69). The other date (#70) is from small flecks of unidentified charcoal.

The other dates are from interior locations. The two oldest dates (Numbers 51 and 53) are from Kuzitrin Lake on the Seward Peninsula. One of these (#51) is somewhat compromised in that it is from a combined carbon sample and out of stratigraphic position with other dates from that unit. However, if Harritt (1994:214-229) is correct in his stratigraphic interpretations, there is little reason to question the ASTt context of either dates.

The occurrence of seven 4000 year old ASTt dates provided some much needed theoretical wiggle-room for those who believe that the ASTt originated in Alaska and subsequently spread eastward. There are few, if any, dates from the Canadian High Arctic or Greenland in excess of 4000 years are not from sea mammal products or driftwood. On the other hand, dates in excess of 3800 years are available on short-lived willow charcoal from both Greenland (Grønnow and Jensen 2003:329) and High Arctic Canada (Helmer 1991: Table II; Schledermann 1990:26).

Lastly, several interesting trends arise from examining the spatial distribution of dated ASTt sites in Alaska. Figure 2 shows the pertinent portion of Alaska, along with the quadrangle map boundaries. The quadrangle maps in which ASTt sites occur are shaded gray and the number of dated sites from each quadrangle is inset. The ASTt finds in the Gulkana quadrangle, the most isolated ASTt-bearing quadrangle, are limited to a small collection found near the Tyone River by Irving (1957). The most conspicuous feature of the distribution of ASTt sites is the large gap between the Norton Bay quadrangle that contains Iyatayet and the Bethel quadrangle; bearing in mind that the ASTt presence in the Bethel quadrangle is limited to a single site consisting of a few undated ASTt end blades found in a mixed assemblage at Eek Lake (Ackerman 1979). Shaw (1982:61) suggested that Norton people were the first to colonize the Yukon-Kuskokwim delta in substantial numbers and any ASTt presence was transitory. Certainly, it is difficult to disagree with Shaw on the basis of the present archaeological record. On the other hand, southwestern Alaska in general, and the Yukon-Kuskokwim delta in particular, seem to be the unwanted stepchildren of Alaskan archaeology: the region has been sorely neglected and we have much to learn about its culture history. Further, as noted by Dumond (1982:44), the advent of Norton culture brought about increased sedentism and profound changes in economic focus. By extension, this suggests that ASTt remains would not *necessarily* be found underlying Late Prehistoric and Norton settlements; the only sites thus far excavated in this region, but will be found elsewhere.

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