The National Aeronautics and Space Administration

Final Technical Report

Project Title: Atmospheric Soundings During the Washita-92 Campaign

Project Number: NAG5 - 1989

Period: From June 1, 1992 through September 30, 1992

Institution: Cornell University, Ithaca, New York

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Summary of Work

During the period June 9 through June 18, 1992, an intensive radiosounding program was conducted to measure atmospheric profiles of the wind velocity, the temperature and the specific humidity. The launch site was located near site MS000 in the northeastern part of the catchment of the Little Washita River; this location was selected in order to ensure that the measured profiles would reflect the catchment's surface features for the prevailing southwesterly winds during this time of the year. The launch times of the rawinsondes are shown in Table 1.

The measurements were carried out by a team from Cornell University consisting of Wilfried Brutsaert and Nelson Dias.

The radiosounding equipment used was manufactured by Atmospheric Instrumentation Research (AIR), Boulder, Colorado. The ground station was compact enough that it could be placed inside a 9 x 12 ft tent. The radiosonde system (AIR-3A, spin type) consisted of disposable sondes with dry- and wet-bulb temperature and pressure sensors, of a receiving unit on the ground, and of an optical theodolite to track the sonde. During flight the sonde, attached to a balloon, measures the data in cycles of approximately 4.8s in the following sequence: dry-bulb temperature is measured at time zero; 0.6 and 1.8s later, wet-bulb temperature and pressure are measured, respectively; then after approximately 3.0s the dry-bulb temperature measurement is made again to begin the next cycle. According to the manufacturer, the response of the pressure sensor is practically instantaneous, but the dry- and wet-bulb sensors have time constants of 3 and 12s, respectively. Because of these time constants, it is necessary to further process the data if they are to be used for analysis in the boundary layer. One possible procedure for this purpose was outlined by Sugita and Brutsaert (Journal of Geophysical Research, 95(D6), 7617-7624, 1990). The height, y, of the sonde can be obtained from the pressure, temperature and humidity. The horizontal distance between the sonde and the release point can be calculated from the elevation angle measured by the theodolite and from y. This, in turn, with the measured azimuth angle yields the horizontal position of the sonde. Finally, successive horizontal positions allow the calculation of average wind velocity and direction over the interval; these average values are then to be assigned to the midpoint of the interval. For 5s cycles, and with typical balloon ascent rates of around 3 to 4 m/s, the vertical resolution of the measurements was around 15 to 20 m. The sounding was generally aborted above 600 hPa (i.e., 600 mb). In Table 2, an example is shown of the data that were obtained from the rawinsonde ascents. These are level-zero, i.e., uncorrected measurements and processed in a preliminary fashion with the manufacturer's software.

Following time of day (CDST) and date, the raw or primary data shown are pressure (mb), dry bulb temperature (°C), wet bulb temperature, azimuth angle (degrees), elevation angle; the other data (namely height, mixing ratio, potential temperature, wind speed, wind direction, height of wind speed, and relative humidity) were calculated from the primary data. The profile data measured during this campaign are now available and ready for distribution.

Table 1

Actual Launch Times of the Soundings (CDST)

Day	Date					
161	92/06/09		1150		1540	1800
162	92/06/10	0931	1102	1307	1530	1800
163	92/06/11	0929	1059	1302	1531	1800
164	92/06/12	0932	1059	1308	1529	1800
165	92/06/13	0934	1102	1302	1530	1800
166	92/06/14	0927	1059	1302	1531	1757
167	92/06/15	0931	1056	1301	1530	1800
168	92/06/16	0932	1100	1303	1530	1805
169	92/06/17	0931	1102	1300	1530	1801
170	92/06/18	0931	1100	1302	1532	1800

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Table 2

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	0.	28.69	24.71	18.51	304.22	14.54	6.87	0.00	270.0	0.	75.0
093045	920618	972.9	-0.	28.69	25.71	20.51	304.22	14.54	6.87	0.00	270.0	0.	75.0
093050	920618	972.8	0.	28.72	25.10	19.42	304.26	14.54	6.87	0.00	270.0	0.	74.8
093054	920618	972.8	0.	28.52	24.74	18.89	304.06	14.54	6.87	0.00	270.0	0.	73.6
093059	920618	972.9	-0.	28.34	24.38	18.37	303.87	14.54	6.87	0.00	270.0	0.	72.4
093104	920618	972.9	0.	28.25	24.16	18.03	303.78	14.54	6.87	0.00	270.0	-0.	71.5
093108	920618	972.9	-0.	28.36	24.05	17.80	303.89	14.54	6.87	0.00	270.0	0.	70.2
093113	920618	972.9	-0.	28.23	23.91	17.62	303.75	14.54	6.87	0.00	270.0	-0.	70.0
093118	920618	972.9	-0.	28.22	23.81	17.48	303.74	15.68	6.25	0.00	270.0	-0.	69.5
093122	920618	972.9	-1.	28.12	23.71	17.36	303.64	15.88	6.88	0.00	270.0	-0.	69.4
093127	920618	972.9	-1.	27.93	23.57	17.20	303.45	15.84	6.47	0.00	270.0	-1.	69.6
093131	920618	972.9	-1.	27.66	23.36	16.99	303.18	15.83	6.47	0.00	270.0	-1.	69.8
093136	920618	971.4	13.	27.67	23.22	16.79	303.32	17.94	15.38	0.00	270.0	6.	68.9
093141	920618	969.1	35.	27.19	23.10	16.85	303.05	22.94	19.99	21.89	202.9	24.	70.9
093145	920618	967.4	50.	26.50	22.80	16.72	302.50	26.92	20.83	5.83	222.1	42.	72.2
093150	920618	965.5	67.	26.10	22.49	16.45	302.26	29.13	21.66	8.18	216.6	59.	73.6
093155	920618	963.7	84.	25.86	22.31	16.30	302.19	31.71	22.60	8.37	222.7	76.	73.9
093159	920618	962.0	99.	25.66	22.15	16.18	302.14	33.11	23.43	4.40	227.2	92.	74.1
093204	920618	960.5	113.	25.51	22.04	16.10	302.12	35.05	23.30	9.48	224.9	106.	74.3
093209	920618	958.8	129.	25.39	21.93	16.02	302.15	36.92	23.29	6.12	234.7	121.	74.3
093213	920618	957.2	143.	25.25	21.82	15.94	302.16	37.78	23.49	9.04	223.8	136.	74.4
093218	920618	955.4	160.	25.05	21.73	15.93	302.11	38.63	23.67	5.67	229.4	152.	75.1
093223	920618	954.1	172.	24.96	21.66	15.88	302.15	39.03	23.38	7.12	223.4	166.	75.2
093227	920618	952.5	187.	24.87	21.55	15.78	302.20	39.08	23.20	9.43	219.6	180.	75.0
093232	920618	951.0	201.	24.71	21.49	15.80	302.17	38.78	22.82	8.35	215.3	194.	75.7
093236	920618	949.5	215.	24.60	21.41	15.75	302.20	39.14	22.71	7.46	224.2	208.	75.8
093241	920618	947.9	229.	24.43	21.33	15.74	302.16	39.43	22.57	8.60	223.0	222.	76.5
093246	920618	946.4	244.	24.35	21.29	15.73	302.23	39.50	22.43	8.02	220.6	236.	76.6
093250	920618	945.0	257.	24.28	21.22	15.69	302.29	39.57	22.36	5.89	221.0	250.	76.6

093300	920618	942.2	282.	24.02	21.10	15.67	302.28	40.11	21.89	7.04	228.7	276.	77.5
093304	920618	940.7	295.	23.95	21.03	15.62	302.33	40.28	21.85	10.40	222.7	289.	77.8
093309	920618	939.0	312.	23.81	20.96	15.57	302.44	40.50	21.69	6.54	225.9	304.	77.0
093314	920618	937.6	325.	23.88	20.88	15.48	302.55	40.88	21.56	11.75	226.5	315.	76.9
093318	920618	936.3	338.	23.84	20.80	15.41	302.64	41.16	21.46	9.03	226.6	332.	76.6
093323	920618	934.8	351.	23.92	20.68	15.22	302.85	41.38	21.06	10.81	225.3	345.	75.2
093328	920618	933.3	366.	24.02	20.54	15.00	303.10	42.04	20.97	7.86	238.8	359.	73.6
093332	920618	932.0	376.	24.31	20.38	14.66	303.51	42.54	20.64	10.39	232.4	372.	70.6
093337	920618	930.8	389.	24.62	20.17	14.24	303.94	43.19	20.25	11.77	235.1	384.	67.3
093342	920618	929.4	403.	24.97	19.96	13.81	304.43	43.80	19.93	11.80	235.6	396.	63.8
093346	920618	928.0	415.	25.20	19.76	13.43	304.79	44.55	19.82	9.31	244.1	409.	61.2
093351	920618	926.6	429.	25.29	19.60	13.20	305.01	44.99	19.60	13.27	233.2	422.	59.8
093355	920618	925.3	441.	25.37	19.47	13.00	305.22	45.66	19.40	11.45	240.9	435.	58.6
093400	920618	924.0	454.	25.38	19.36	12.86	305.36	46.22	19.27	9.72	242.0	448.	57.8
093405	920618	922.6	467.	25.41	19.27	12.74	305.51	46.98	19.05	11.19	246.3	460.	57.1
093409	920618	921.3	480.	25.43	19.21	12.66	305.67	47.49	18.97	9.90	242.8	473.	56.6
093414	920618	919.9	492.	25.43	19.19	12.66	305.80	48.19	18.86	9.21	251.7	486.	56.5
093419	920618	918.8	504.	25.50	19.13	12.56	305.98	48.75	18.71	11.21	244.3	498.	55.7
093423	920618	917.3	517.	25.56	19.06	12.48	306.17	49.48	18.60	10.57	252.0	511.	55.1
093428	920618	916.2	529.	25.56	19.02	12.43	306.29	50.02	18.47	11.39	245.9	523.	54.8
093433	920618	914.9	541.	25.56	18.97	12.39	306.40	50.59	18.39	9.17	252.4	535.	54.6
093437	920618	913.6	553.	25.55	18.96	12.39	306.51	51.24	18.23	13.10	248.9	547.	54.6
093442	920618	912.4	565.	25.52	18.99	12.47	306.61	51.91	18.13	10.37	255.7	559.	54.9
093447	920618	911.2	577.	25.55	19.06	12.59	306.75	52.61	17.97	12.93	253.1	571.	55.2
093451	920618	910.0	588.	25.64	19.09	12.60	306.96	53.28	17.82	12.68	253.8	583.	54.9
093456	920618	908.8	600.	25.68	19.06	12.57	307.11	53.90	17.66	12.34	254.3	594.	54.6

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093505	920618	906.5	622.	25.80	18.94	12.46	307.29	55.38	17.43	9.31	247.9	616.	52.1
093510	920618	905.3	634.	25.82	18.86	12.37	307.40	55.73	17.33	10.66	262.8	629.	50.7
093514	920618	904.0	646.	25.90	18.67	12.05	307.70	56.52	17.27	12.14	266.1	640.	51.7
093519	920618	903.0	656.	25.86	18.47	11.76	307.86	57.22	17.18	12.01	261.9	651.	50.3
093524	920618	901.6	670.	25.89	18.29	11.52	308.03	57.88	17.15	10.75	267.5	663.	49.1
093528	920618	900.3	683.	26.02	18.07	11.18	308.29	58.46	17.15	9.16	269.2	676.	47.3
093533	920618	899.2	694.	26.08	17.92	10.98	308.47	59.10	17.13	10.53	269.3	688.	46.2
093538	920618	898.0	705.	26.12	17.85	10.88	308.63	59.58	17.12	10.03	263.5	700.	45.6
093542	920618	896.9	716.	26.10	17.80	10.84	308.72	60.06	17.12	8.87	267.5	711.	45.4
093547	920618	895.4	731.	26.06	17.79	10.86	308.82	60.54	17.15	8.99	268.5	724.	45.6
093552	920618	894.0	744.	26.01	17.76	10.87	308.90	60.94	17.19	7.89	267.7	737.	45.7
093556	920618	892.6	758.	25.91	17.71	10.86	308.94	61.33	17.23	11.49	258.8	751.	45.8
093601	920618	890.9	775.	25.83	17.68	10.90	309.02	61.63	17.28	11.04	256.0	767.	46.1
093605	920618	889.2	792.	25.73	17.65	10.93	309.09	61.79	17.40	8.24	259.2	783.	46.4
093610	920618	887.4	810.	25.60	17.63	10.99	309.14	62.01	17.59	5.99	262.0	801.	46.9
093615	920618	885.4	829.	25.48	17.65	11.09	309.20	62.14	17.75	10.31	249.2	820.	47.6
093619	920618	883.7	847.	25.36	17.66	11.19	309.26	62.33	17.90	4.79	265.2	838.	48.3
093624	920618	882.0	863.	25.23	17.69	11.31	309.28	62.46	18.05	7.54	251.8	855.	49.1
093629	920618	880.6	878.	25.12	17.68	11.38	309.32	62.54	18.13	4.58	253.0	870.	49.6
093633	920618	879.2	891.	24.98	17.66	11.43	309.31	62.63	18.27	8.44	248.9	884.	50.2
093638	920618	877.7	907.	24.87	17.64	11.47	309.35	62.72	18.38	2.60	261.8	899.	50.6
093643	920618	876.3	921.	24.77	17.62	11.52	309.39	62.78	18.48	8.83	246.6	914.	51.0
093647	920618	874.7	936.	24.65	17.62	11.59	309.42	62.81	18.59	4.77	247.0	928.	51.6
093652	920618	873.1	952.	24.52	17.63	11.68	309.45	62.74	18.76	4.95	234.7	944.	52.3
093657	920618	871.2	972.	24.36	17.62	11.78	309.48	62.61	19.00	4.41	224.0	962.	53.1
093701	920618	869.5	988.	24.18	17.63	11.89	309.46	62.62	19.21	3.11	244.3	980.	54.1
093706	920618	867.7	1007.	24.06	17.62	11.97	309.51	62.50	19.39	5.15	228.5	997.	54.7
093711	920618	866.2	1022.	23.91	17.58	12.00	309.52	62.34	19.55	3.33	211.6	1014.	55.3

093720	920618	863.5	1049.	22.62	17.48	12.[illegible]	309.50	62.08	19.82	[illegible]	[illegible]	1042.	56.[illegible]
[illegible]	920618	862.1	1064.	22.61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
093729	920618	860.9	1076.	22.47	17.47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	920618	859.6	1089.	22.34	17.48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
093736	920618	858.0	1105.	22.22	17.49	12.[illegible]	309.64	61.18	20.30	5.17	220.2	1097.	58.[illegible]
093743	920618	856.6	1119.	22.09	17.48	12.[illegible]	309.64	60.85	20.55	3.65	145.9	1112.	59.[illegible]
093748	920618	854.9	1136.	22.96	17.44	12.42	309.68	60.53	20.69	5.74	202.3	1128.	59.8
093752	920618	853.5	1151.	22.84	17.39	12.43	309.71	60.24	20.85	3.64	175.[illegible]	1147.	60.1
093757	920618	852.5	1161.	22.74	17.37	12.46	309.71	59.82	21.00	5.47	178.[illegible]	1156.	60.6
093802	920618	851.2	1175.	22.61	17.34	12.50	309.72	59.44	21.13	4.67	172.[illegible]	1168.	61.1
093806	920618	849.7	1189.	22.50	17.29	12.51	309.74	59.08	21.27	7.10	204.0	1182.	61.5
093811	920618	848.5	1202.	22.36	17.22	12.49	309.73	58.83	21.43	3.36	176.6	1196.	61.9
093816	920618	847.3	1215.	22.24	17.17	12.50	309.73	58.44	21.53	4.86	173.[illegible]	1208.	62.2
093820	920618	845.9	1228.	22.11	17.12	12.51	309.73	58.14	21.67	4.08	179.[illegible]	1222.	62.7
093825	920618	844.6	1242.	22.00	17.07	12.51	309.76	57.83	21.78	5.03	191.0	1235.	63.0
093830	920618	843.4	1255.	21.89	17.00	12.49	309.77	57.56	21.93	5.20	200.9	1248.	63.2
093834	920618	842.0	1269.	21.77	16.97	12.52	309.79	57.18	21.95	8.01	203.1	1262.	63.7
093839	920618	840.5	1284.	21.63	16.89	12.50	309.79	56.83	22.16	4.12	135.[illegible]	1277.	64.1
093843	920618	839.2	1298.	21.51	16.86	12.53	309.81	56.42	22.24	7.94	198.1	1291.	64.6
093848	920618	837.9	1311.	21.40	16.82	12.55	309.83	55.97	22.38	5.90	170.7	1305.	65.1
093853	920618	836.6	1325.	21.28	16.76	12.55	309.84	55.61	22.51	4.45	160.7	1318.	65.4
093857	920618	835.1	1340.	21.14	16.72	12.57	309.85	55.28	22.57	8.11	206.6	1333.	66.0
093902	920618	834.2	1350.	21.03	16.66	12.56	309.84	54.98	22.71	3.70	133.7	1345.	66.3
093907	920618	833.0	1362.	20.93	16.62	12.56	309.86	54.64	22.82	4.48	167.3	1356.	66.6
093911	920618	831.8	1375.	20.80	16.57	12.57	309.84	54.27	22.97	4.71	159.5	1369.	67.1
093916	920618	830.5	1388.	20.69	16.52	12.58	309.86	53.91	23.10	4.86	170.1	1381.	67.5

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[illegible]	920618	829.6	[illegible]	[illegible]	16.47	12.57	309.86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
093925	920618	825.3	1411.	20.48	16.42	12.58	309.88	53.11	23.23	5.65	168.9	1405.	68.2
093930	920618	827.1	1424.	20.36	16.38	12.59	309.88	52.72	23.39	4.90	149.7	1417.	68.6
093935	920618	826.0	1436.	20.25	16.32	12.58	309.89	52.38	23.40	7.30	197.2	1430.	69.0
093939	920618	824.8	1448.	20.13	16.26	12.57	309.89	51.99	23.53	4.91	155.7	1442.	69.4
093944	920618	823.5	1462.	20.01	16.23	12.60	309.91	51.71	23.65	6.18	196.9	1455.	69.9
093948	920618	822.3	1474.	19.90	16.17	12.59	309.92	51.23	23.73	6.93	171.9	1468.	70.2
093953	920618	821.0	1488.	19.80	16.12	12.59	309.95	51.01	23.87	3.10	164.5	1481.	70.6
093958	920618	819.9	1499.	19.68	16.06	12.58	309.94	50.68	23.97	4.43	159.1	1493.	70.9
094002	920618	818.9	1510.	19.57	16.01	12.57	309.94	50.26	24.00	8.22	190.4	1505.	71.3
094007	920618	817.6	1524.	19.44	15.95	12.57	309.94	50.03	24.13	2.98	137.0	1517.	71.8
094012	920618	816.3	1537.	19.34	15.89	12.56	309.97	49.70	24.20	5.71	183.2	1530.	72.0
094016	920618	815.1	1550.	19.21	15.84	12.57	309.96	49.38	24.33	4.33	154.9	1543.	72.5
094021	920618	814.1	1561.	19.08	15.79	12.58	309.94	48.93	24.46	6.06	156.4	1555.	73.1
094026	920618	812.9	1574.	18.96	15.73	12.57	309.95	48.58	24.54	5.07	165.6	1567.	73.4
094030	920618	811.7	1586.	18.86	15.68	12.56	309.96	48.28	24.60	5.87	187.1	1580.	73.8
094035	920618	810.5	1599.	18.74	15.63	12.57	309.97	48.04	24.68	4.47	185.2	1592.	74.3
094040	920618	809.4	1610.	18.62	15.58	12.58	309.96	47.76	24.78	4.23	166.8	1605.	74.8
094044	920618	808.4	1621.	18.52	15.50	12.53	309.96	47.43	24.83	5.82	178.9	1616.	74.9
094049	920618	807.3	1633.	18.41	15.46	12.55	309.97	47.10	24.97	4.43	152.2	1627.	75.4
094054	920618	806.3	1643.	18.30	15.39	12.52	309.96	46.76	24.98	6.71	184.8	1638.	75.7
094058	920618	805.3	1654.	18.18	15.33	12.50	309.95	46.41	25.10	4.89	118.1	1649.	76.0
094103	920618	804.2	1666.	18.08	15.27	12.49	309.96	46.13	25.10	6.45	190.5	1660.	76.4
094107	920618	803.2	1677.	17.96	15.23	12.51	309.94	45.71	25.12	7.69	179.6	1671.	77.0
094112	920618	802.1	1689.	17.84	15.18	12.51	309.94	45.56	25.17	4.26	197.4	1683.	77.4
094117	920618	801.0	1701.	17.74	15.13	12.50	309.96	45.13	25.23	6.39	158.7	1695.	77.7
094121	920618	799.9	1711.	17.62	15.08	12.51	309.93	44.81	25.25	6.83	186.0	1706.	78.3
094126	920618	798.9	1722.	17.51	15.03	12.51	309.94	44.54	25.34	3.67	125.7	1717.	78.7
094131	920618	797.7	1735.	17.41	14.99	12.53	309.96	44.31	25.39	7.14	197.8	1729	[illegible]

094135	920618	796.7	1748.	[illegible]	14.95	12.58	309.96	42.44	25.47	[illegible]	140.5	1740.	79.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
094145	920618	794.6	1769.	[illegible]	14.85	12.50	309.98	42.16	25.61	[illegible]	166.7	1760.	81.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
094154	920618	792.4	1787.	16.68	14.78	12.52	309.99	42.07	25.67	5.71	183.1	1787.	81.4
094159	920618	791.4	1804.	16.76	14.70	12.57	309.99	42.40	25.69	7.21	157.4	1798.	81.9
094203	920618	790.3	1816.	16.64	14.65	12.52	309.97	42.34	25.77	2.20	200.5	1810.	82.4
094208	920618	789.1	1829.	16.52	14.59	12.53	309.98	42.16	25.79	6.44	196.4	1822.	82.9
094213	920618	788.2	1838.	16.44	14.53	12.50	309.99	41.81	25.88	5.43	198.0	1833.	83.0
094217	920618	787.1	1850.	16.33	14.46	12.48	309.99	41.48	25.88	7.07	179.5	1844.	83.5
094222	920618	786.0	1862.	16.23	14.41	12.47	310.01	41.34	25.93	4.29	195.0	1856.	83.7
094226	920618	784.9	1874.	16.10	14.36	12.48	309.99	41.02	26.01	5.65	165.5	1868.	84.5
094231	920618	784.0	1884.	16.00	14.31	12.48	309.99	40.77	26.08	4.40	166.0	1879.	84.9
094236	920618	782.8	1897.	15.91	14.24	12.45	310.03	40.51	26.12	4.66	170.4	1890.	85.0
094240	920618	781.7	1908.	15.80	14.18	12.43	310.03	40.31	26.19	4.36	178.8	1902.	85.4
094245	920618	780.6	1920.	15.67	14.13	12.45	310.02	39.96	26.18	8.24	181.8	1914.	86.1
094250	920618	779.6	1931.	15.58	14.07	12.42	310.04	39.76	26.23	4.33	177.2	1926.	86.2
094254	920618	778.5	1944.	15.47	14.01	12.42	310.05	39.55	26.25	5.05	182.2	1937.	86.7
094259	920618	777.5	1955.	15.36	13.96	12.41	310.04	39.24	26.32	5.99	169.5	1949.	87.2
094304	920618	776.4	1966.	15.27	13.89	12.36	310.06	39.03	26.39	3.66	151.5	1960.	87.4
094308	920618	775.2	1979.	15.13	13.82	12.37	310.06	38.74	26.42	6.08	173.2	1973.	87.9
094313	920618	774.2	1990.	14.99	13.77	12.38	310.03	38.47	26.48	4.71	157.7	1985.	88.7
094318	920618	773.1	2003.	14.91	13.71	12.36	310.06	38.26	26.50	5.34	182.5	1997.	88.8
094322	920618	772.1	2014.	14.79	13.63	12.32	310.06	37.97	26.55	5.80	168.6	2008.	89.1
094327	920618	771.0	2025.	14.71	13.54	12.26	310.08	37.67	26.54	5.55	162.8	2020.	89.1
094332	920618	769.9	2038.	14.61	13.46	12.22	310.11	37.57	26.60	2.75	184.0	2031.	89.3
094336	920618	768.8	2050.	14.49	13.39	12.20	310.11	37.28	26.60	6.80	177.8	2044.	89.6