

Estimating Wellhead Elevation

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Eastern Snake Plain Aquifer Model Enhancement Project
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DESIGN DOCUMENTS

Design documents are a series of technical papers addressing specific design topics on the Eastern Snake Plain Aquifer Model Enhancement. Each design document will contain the following information: topic of the design document, how that topic fits into the whole project, which design alternatives were considered and which design alternative is proposed. In draft form, design documents are used to present proposed designs to reviewers. Reviewers are encouraged to submit suggested alternatives and comments to the design document. Reviewers include all members of the Eastern Snake Hydrologic Modeling (ESHM) Committee as well as selected experts outside of the committee. The design document author will consider all suggestions from reviewers, update the draft design document, and submit the design document to the SRPAM Model Upgrade Program Manager. The Program Manager will make a final decision regarding the technical design of the described component. The author will modify the design document and publish the document in its final form in .pdf format on the SRPAM Model Upgrade web site.

The goal of a draft design document is to allow all of the technical groups that are interested in the design of the SRPAM Model Upgrade to voice opinions on the upgrade design. The final design document serves the purpose of documenting the final design decision. Once the final design document has been published for a specific topic, that topic will no longer be open for reviewer comment. Many of the topics addressed in design documents are subjective in nature. It is acknowledged that some design decisions will be controversial. The goal of the Program Manager and the modeling team is to deliver a well-documented, defensible model that is as technically representative of the physical system as possible, given the practical constraints of time, funding and manpower. Through the mechanism of design documents, complicated design decisions will be finalized and documented.

Final model documentation will include all of the design documents, edited to ensure that the "as-built" condition is appropriately represented.

Introduction

This document proposes a method for obtaining elevations for unsurveyed observation wells on the Eastern Snake Plain. Hydrogeologists calculate aquifer head by referencing the depth to water measured in a well to an arbitrary datum, usually sea level. As a result, hydrogeologists only know aquifer head as accurately as they know the elevation of the well.

Problem Statement

During model calibration parameter optimization software compares observed aquifer heads to modeled heads (and other observations) while adjusting aquifer parameters to improve the match between field observations and modeled values. Thus

the resulting aquifer parameterization depends on the head match. Uncertainty regarding the target (observed heads) leads directly to uncertainty in model parameters such as transmissivity, riverbed conductance, and specific yield. The more uncertain the target, the more latitude the software has in producing parameter combinations that generate acceptable head matches. Consequently prudence dictates making the head observations as accurate as possible.

Errors in water level elevation result from a) error in estimating land surface elevation, b) errors in depth to water measurement, or c) borehole deviation from vertical. With trained technicians collecting the water levels, errors from item (b) should be on the order of a few hundredths of a foot. Borehole deviation, item (c), may generate errors on the order of a few feet (Wylie, 1993), but would be difficult and expensive to correct. Several different means exist for evaluating item (a), some of which could reduce the errors to a few hundredths of a foot. However, little is gained in reducing the errors from land surface elevation to a few hundredths of a foot when borehole deviation potentially introduces errors greater than a foot.

Considered Options

This section lists the considered options. Regarding obtaining well elevations the options include: 1) surveying by professional surveyors; 2) surveying using a professional grade global positioning system (GPS); 3) interpolating elevations from topographic maps; and 4) projecting well locations onto 10 meter digital elevation models (DEMs) to obtain elevation estimates at wells;

Effect

A professional surveyor would be able to survey the well elevations to within 0.01 ft. Surveying with a professional grade GPS system can also yield accuracy within 0.01 ft., depending on time and availability of bench marks for control. The accuracy of interpolating elevations from topographic maps depends on the contour interval on the map. The accuracy of projecting the wells onto a DEM is less certain.

Considerations other than accuracy include time and money. Surveying the wells using professional land surveyors will produce the most accurate and precise results at an unacceptable cost of time and money. Even with many of the wells located close together along the Snake River, surveying using state of the art GPS technology still costs more in time and money than the project can afford. The bulk of the cost for both of these options resides in field time as personnel must obtain access with each owner and then locate each well and control points along with the non-trivial process of obtaining accurate elevations for the wells.

The fourth option, projecting the wells onto a DEM, eliminates the field time and, therefore looks attractive, if it yields acceptably accurate elevations. Ten meter DEMs are produced by interpolating from vectors or digital line graph hypsographic and hydrographic data (<http://mac.usgs.gov/mac/isb/pubs/factsheets/fs04000.html>).

To estimate the elevation of a well one interpolates between the nearest satellite generated elevations. Conceptually, on the Snake Plain where elevation does not change rapidly, this process could yield reasonably accurate well elevation estimates.

To test this hypothesis, elevation estimates were obtained for a 206 surveyed wells

and compared to the surveyed elevations. Figure 1 shows the location of the wells and Table 1 contains the statistics summarizing the results of this experiment Appendix A contains the data. The 95% confidence interval for the well elevation estimate is 1.21 ft above the surveyed elevation ± 1.17 ft, much more accurate than the IDWR estimated accuracy of ± 11 ft using topographic maps.

Design Decision

Use 10 meter DEMs to estimate well elevations for all non-surveyed wells.

Table 1. Summary statistics for DEM well elevation estimates.

Statistics	Meters	Feet
Average	0.37	1.21
Maximum	15.08	49.47
Minimum	-4.76	-15.62
Skewnes	1.88	1.88
Variance	6.86	73.80
Standard deviation	2.62	8.59
95% confidence interval	0.36	± 1.17

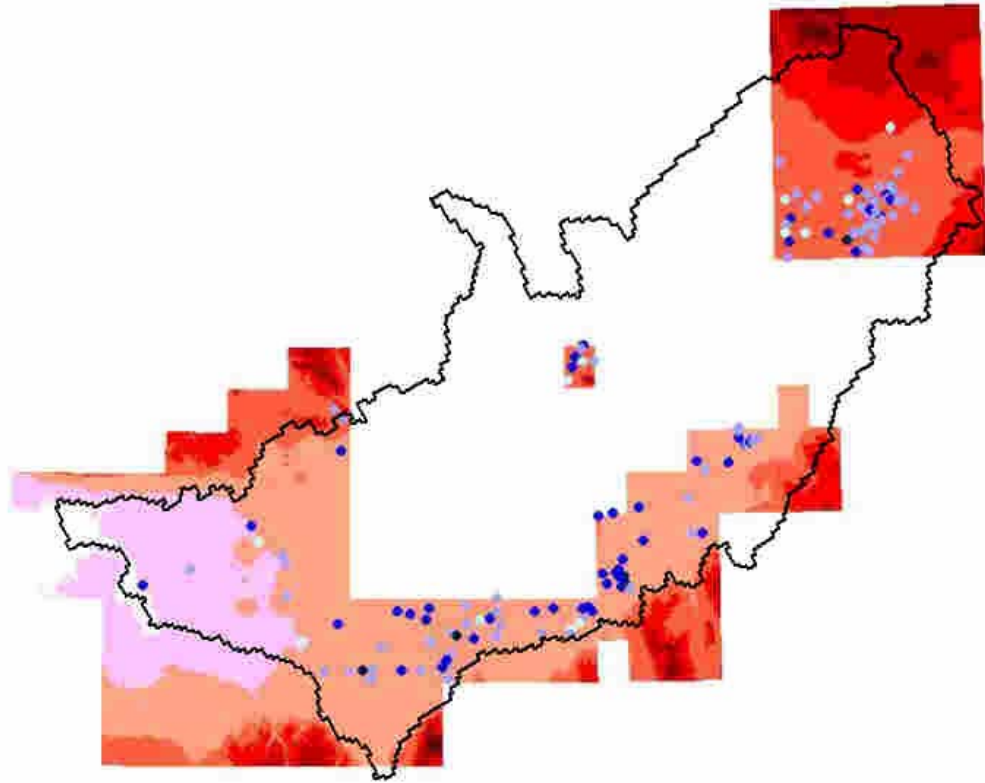


Figure 1. Well locations. Wells are dots, colored areas indicate DEM coverage.

References

Wylie, A. H., 1993. Gyroscopic Directional Survey of Central Facilities Area Ground Water Wells. ER-WAG4-31.

APPENDIX A

WELL_NUMBER	ALT_FT	ALT_M	ALT_FT	DEM_ALT_M	DEM_ALT_FT	DIFF_ALT_M	DIFF_ALT_FT
01N29E08BCD1	5050.71	1539.46	5050.71	1536.00	5039.35	3.46	11.35
01N29E30BBD1	5067.12	1544.46	5067.11	1549.00	5082.01	-4.54	-14.89
01S20E27BDA1	4828.78	1471.81	4828.76	1473.00	4832.66	-1.19	-3.90
02N28E35AAC1	5030.32	1533.24	5030.30	1530.00	5019.67	3.24	10.63
02N29E18CBA1	5011.35	1527.46	5011.34	1527.00	5009.83	0.46	1.51
02N29E18CBD1	5012.50	1527.81	5012.48	1527.00	5009.83	0.81	2.66
02N29E18CCD2	5022.94	1530.99	5022.92	1530.00	5019.67	0.99	3.25
02N29E18CCD2	5022.94	1530.99	5022.92	1530.00	5019.67	0.99	3.25
02N29E18DCA1	5012.42	1527.79	5012.42	1528.00	5013.11	-0.21	-0.69
02N29E18DCB1	5031.84	1533.70	5031.81	1529.00	5016.39	4.70	15.42
02N29E19BCB1	5040.43	1536.32	5040.40	1536.00	5039.35	0.32	1.05
02N29E31CDC1	5043.64	1537.30	5043.62	1542.00	5059.04	-4.70	-15.42
02N29E33DCC1	5095.12	1552.99	5095.10	1554.00	5098.41	-1.01	-3.31
02S20E01ACC2	4790.07	1460.01	4790.04	1462.00	4796.57	-1.99	-6.53
02S34E25ADD1	4481.70	1366.02	4481.68	1364.00	4475.05	2.02	6.63
02S35E18CBBA1	4481.06	1365.83	4481.06	1366.00	4481.61	-0.17	-0.56
02S35E18CCC1	4477.71	1364.81	4477.71	1366.00	4481.61	-1.19	-3.90
02S35E27DBDA1	4487.44	1367.77	4487.42	1369.00	4491.46	-1.23	-4.04
02S35E28DBAA1	4487.59	1367.82	4487.58	1368.00	4488.18	-0.18	-0.59
02S35E32CCCD1	4469.69	1362.36	4469.67	1362.00	4468.49	0.36	1.18
02S35E32CDAC1	4471.00	1362.76	4470.98	1362.00	4468.49	0.76	2.49
02S35E32DDCB1	4475.09	1364.01	4475.08	1364.00	4475.05	0.01	0.03
02S35E33BCBD1	4481.27	1365.89	4481.25	1366.00	4481.61	-0.11	-0.36
02S35E33BCBD2	4481.00	1365.81	4480.99	1366.00	4481.61	-0.19	-0.62
02S35E33CABC3	4482.01	1366.12	4482.01	1365.00	4478.33	1.12	3.67
02S35E33DABC1	4478.26	1364.97	4478.23	1365.00	4478.33	-0.03	-0.10
02S35E33DACB1	4477.88	1364.86	4477.87	1366.00	4481.61	-1.14	-3.74
03S20E02DDA1	4603.60	1403.18	4603.60	1402.00	4599.72	1.18	3.87
03S33E22BBA1	4484.31	1366.82	4484.30	1364.00	4475.05	2.82	9.25
03S33E22BBA1	4484.31	1366.82	4484.30	1364.00	4475.05	2.82	9.25
03S33E25CCC1	4450.43	1356.49	4450.41	1357.00	4452.09	-0.51	-1.67
03S33E25CCC2	4450.43	1356.49	4450.41	1357.00	4452.09	-0.51	-1.67
03S34E22DAB1	4439.61	1353.19	4439.59	1351.00	4432.40	2.19	7.19
04S33E29BCD1	4391.35	1338.48	4391.33	1338.00	4389.75	0.48	1.57
04S33E29BCD1	4391.35	1338.48	4391.33	1338.00	4389.75	0.48	1.57
05N36E02BDA1	4763.57	1451.94	4763.57	1451.00	4760.48	0.94	3.08
05N36E02BDA2	4763.57	1451.94	4763.57	1451.00	4760.48	0.94	3.08
05N36E02BDA3	4763.57	1451.94	4763.57	1451.00	4760.48	0.94	3.08
05N36E23CBB1	4760.66	1451.05	4760.65	1451.00	4760.48	0.05	0.16
05N38E02BAD1	4852.80	1479.13	4852.77	1472.00	4829.38	7.13	23.39
05N38E02BAD1	4852.80	1479.13	4852.77	1472.00	4829.38	7.13	23.39
05N39E08DAD1	4830.36	1472.29	4830.33	1472.00	4829.38	0.29	0.95
05N39E15CBB1	4845.95	1477.05	4845.95	1477.00	4845.79	0.05	0.16
05N39E18CAC1	4823.49	1470.20	4823.48	1469.00	4819.54	1.20	3.94
05S17E26ACA1	3972.64	1210.86	3972.63	1210.00	3969.80	0.86	2.82
05S30E10DCA1	4554.78	1388.30	4554.78	1384.00	4540.67	4.30	14.11
05S30E10DCA1	4554.78	1388.30	4554.78	1384.00	4540.67	4.30	14.11
05S30E18ACA1	4740.05	1444.77	4740.04	1442.00	4730.96	2.77	9.09

05S30E18ACA1	4740.05	1444.77	4740.04	1442.00	4730.96	2.77	9.09
05S31E04DAD1	4448.80	1355.99	4448.77	1353.00	4438.96	2.99	9.81
05S33E35CDC1	4424.58	1348.61	4424.56	1346.00	4416.00	2.61	8.56
06N36E11ABA1	4817.90	1468.50	4817.90	1466.00	4809.70	2.50	8.20
06N36E11ABA3	4817.90	1468.50	4817.90	1466.00	4809.70	2.50	8.20
06N36E11ABA4	4817.90	1468.50	4817.90	1466.00	4809.70	2.50	8.20
06N36E15ACA1	4875.14	1485.94	4875.12	1486.00	4875.31	-0.06	-0.20
06N36E27BAA1	4884.31	1488.74	4884.30	1492.00	4895.00	-3.26	-10.70
06N37E29ACA1	4823.62	1470.24	4823.61	1475.00	4839.22	-4.76	-15.62
06N37E29ACA2	4823.62	1470.24	4823.61	1475.00	4839.22	-4.76	-15.62
06N37E29ACA3	4823.62	1470.24	4823.61	1475.00	4839.22	-4.76	-15.62
06N37E29ACA4	4823.62	1470.24	4823.61	1475.00	4839.22	-4.76	-15.62
06N38E02DBD1	4884.70	1488.86	4884.70	1490.00	4888.44	-1.14	-3.74
06N38E02DBD2	4884.70	1488.86	4884.70	1490.00	4888.44	-1.14	-3.74
06N38E25ACB4	4826.70	1471.18	4826.69	1472.00	4829.38	-0.82	-2.69
06N38E30BAD2	4874.35	1485.70	4874.33	1485.00	4872.03	0.70	2.30
06N38E30BAD3	4874.35	1485.70	4874.33	1485.00	4872.03	0.70	2.30
06N38E30BAD4	4874.35	1485.70	4874.33	1485.00	4872.03	0.70	2.30
06N39E04ABC1	4827.64	1471.46	4827.61	1472.00	4829.38	-0.54	-1.77
06N39E10BBB1	4834.20	1473.46	4834.17	1473.00	4832.66	0.46	1.51
06N39E10BBB2	4834.20	1473.46	4834.17	1473.00	4832.66	0.46	1.51
06N39E10BBB3	4834.20	1473.46	4834.17	1473.00	4832.66	0.46	1.51
06N39E10BBB4	4834.20	1473.46	4834.17	1473.00	4832.66	0.46	1.51
06N39E12BBA1	4860.68	1481.54	4860.68	1481.00	4858.91	0.54	1.77
06N39E13ABA1	4863.51	1482.40	4863.50	1483.00	4865.47	-0.60	-1.97
06N39E16DAA1	4834.85	1473.66	4834.83	1474.00	4835.94	-0.34	-1.12
06N39E23AAC2	4843.84	1476.40	4843.82	1477.00	4845.79	-0.60	-1.97
06N39E23AAC3	4844.16	1476.50	4844.15	1477.00	4845.79	-0.50	-1.64
06N39E23AAC3	4844.16	1476.50	4844.15	1477.00	4845.79	-0.50	-1.64
06N39E28BBB1	4828.69	1471.78	4828.66	1472.00	4829.38	-0.22	-0.72
06N39E30ADC1	4816.92	1468.20	4816.91	1468.00	4816.26	0.20	0.66
06N39E30ADC2	4816.92	1468.20	4816.91	1468.00	4816.26	0.20	0.66
06N39E35CBB2	4840.57	1475.41	4840.57	1475.00	4839.22	0.41	1.35
06N40E09BBB2	4886.80	1489.50	4886.80	1490.00	4888.44	-0.50	-1.64
06S18E07BCB1	3980.42	1213.23	3980.40	1216.00	3989.49	-2.77	-9.09
06S18E25BCC1	3974.07	1211.30	3974.07	1211.00	3973.09	0.30	0.98
06S18E25BCC1	3974.07	1211.30	3974.07	1211.00	3973.09	0.30	0.98
06S18E36DCC1	3996.52	1218.14	3996.51	1219.00	3999.33	-0.86	-2.82
06S18E36DCC1	3996.52	1218.14	3996.51	1219.00	3999.33	-0.86	-2.82
06S30E36ACB1	4427.06	1349.37	4427.05	1348.00	4422.56	1.37	4.49
06S30E36ACB1	4427.06	1349.37	4427.05	1348.00	4422.56	1.37	4.49
06S31E11BCC1	4398.01	1340.51	4397.99	1340.00	4396.31	0.51	1.67
06S31E11BCC1	4398.01	1340.51	4397.99	1340.00	4396.31	0.51	1.67
06S33E04BBA1	4416.00	1346.00	4416.00	1346.00	4416.00	0.00	0.00
06S33E04BBA1	4416.00	1346.00	4416.00	1346.00	4416.00	0.00	0.00
07N36E13AAB1	4852.75	1479.12	4852.74	1479.00	4852.35	0.12	0.39
07N36E13AAB1	4852.75	1479.12	4852.74	1479.00	4852.35	0.12	0.39
07N36E22ABD4	4791.73	1460.52	4791.72	1464.00	4803.14	-3.48	-11.42
07N37E14CBC1	4863.78	1482.48	4863.76	1484.00	4868.75	-1.52	-4.99
07N37E28CCD1	4848.92	1477.95	4848.90	1478.00	4849.07	-0.05	-0.16

07N38E23DBA1	4852.35	1479.00	4852.35	1482.00	4862.19	-3.00	-9.84
07N38E23DBA2	4852.38	1479.01	4852.38	1482.00	4862.19	-2.99	-9.81
07N38E23DBA3	4855.75	1480.03	4855.73	1484.00	4868.75	-3.97	-13.02
07N38E23DBA6	4855.75	1480.03	4855.73	1484.00	4868.75	-3.97	-13.02
07N39E01CCD1	4904.30	1494.83	4904.28	1495.00	4904.84	-0.17	-0.56
07N39E07BDA1	4874.50	1485.75	4874.49	1483.00	4865.47	2.75	9.02
07N39E16DBB1	4872.84	1485.24	4872.82	1485.00	4872.03	0.24	0.79
07N39E16DBB2	4872.64	1485.18	4872.62	1485.00	4872.03	0.18	0.59
07N39E16DBB3	4872.54	1485.15	4872.52	1485.00	4872.03	0.15	0.49
07N39E23CCA1	4845.50	1476.91	4845.49	1477.00	4845.79	-0.09	-0.30
07N39E23CCA1	4845.50	1476.91	4845.49	1477.00	4845.79	-0.09	-0.30
07N39E29CDC1	4849.95	1478.26	4849.92	1478.00	4849.07	0.26	0.85
07N39E34CCB1	4828.31	1471.67	4828.30	1471.00	4826.10	0.67	2.20
07N39E35CDD1	4842.53	1476.00	4842.51	1477.00	4845.79	-1.00	-3.28
07N40E05DBC1	4919.90	1499.59	4919.90	1500.00	4921.25	-0.41	-1.35
07N40E08DDD1	4897.99	1492.91	4897.98	1493.00	4898.28	-0.09	-0.30
07N40E18CAD1	4899.99	1493.52	4899.99	1491.00	4891.72	2.52	8.27
07N40E19ADD2	4856.33	1480.21	4856.32	1481.00	4858.91	-0.79	-2.59
07N40E19ADD3	4856.33	1480.21	4856.32	1481.00	4858.91	-0.79	-2.59
07N40E19ADD4	4856.93	1480.39	4856.91	1481.00	4858.91	-0.61	-2.00
07N40E20CDC2	4875.91	1486.18	4875.90	1484.00	4868.75	2.18	7.15
07N40E20CDC3	4875.91	1486.18	4875.90	1484.00	4868.75	2.18	7.15
07N40E23CCB1	4923.83	1500.78	4923.80	1501.00	4924.53	-0.22	-0.72
07N40E28AAB1	4913.51	1497.64	4913.50	1498.00	4914.68	-0.36	-1.18
07N41E31DBC2	4947.90	1508.12	4947.89	1510.00	4954.05	-1.88	-6.17
07N41E31DBC2	4947.90	1508.12	4947.89	1510.00	4954.05	-1.88	-6.17
07S14E29CDC1	3266.87	995.74	3266.85	993.00	3257.86	2.74	8.99
07S15E12CBA2	3599.93	1097.26	3599.92	1099.00	3605.63	-1.74	-5.71
07S15E12CBA3	3599.93	1097.26	3599.92	1099.00	3605.63	-1.74	-5.71
07S15E12CBA4	3599.93	1097.26	3599.92	1099.00	3605.63	-1.74	-5.71
07S15E12CBA5	3599.93	1097.26	3599.92	1099.00	3605.63	-1.74	-5.71
07S30E11BDA1	4462.32	1360.12	4462.32	1359.00	4458.65	1.12	3.67
07S30E11BDA1	4462.32	1360.12	4462.32	1359.00	4458.65	1.12	3.67
07S30E13DCA1	4386.08	1336.88	4386.08	1327.00	4353.66	9.88	32.41
07S30E14DCC1	4415.13	1345.73	4415.11	1343.00	4406.15	2.73	8.96
07S30E15AAA1	4468.31	1361.94	4468.29	1361.00	4465.21	0.94	3.08
07S30E17BDB1	4604.18	1403.35	4604.15	1401.00	4596.44	2.35	7.71
07S30E17BDB1	4604.18	1403.35	4604.15	1401.00	4596.44	2.35	7.71
07S30E24DDC1	4394.33	1339.39	4394.31	1338.00	4389.75	1.39	4.56
07S30E25ADD1	4394.36	1339.40	4394.34	1338.00	4389.75	1.40	4.59
07S30E26DDD1	4395.42	1339.72	4395.39	1339.00	4393.03	0.72	2.36
07S30E28BBC1	4533.55	1381.83	4533.55	1380.00	4527.55	1.83	6.00
07S31E30CBA1	4395.28	1339.68	4395.26	1327.00	4353.66	12.68	41.60
07S31E31AAD1	4350.11	1325.91	4350.09	1327.00	4353.66	-1.09	-3.58
08N36E09ACC1	4842.00	1475.84	4841.98	1477.00	4845.79	-1.16	-3.81
08N40E01CAD1	5161.00	1573.07	5160.98	1573.00	5160.75	0.07	0.23
08N40E21DDD2	4963.64	1512.92	4963.63	1514.00	4967.18	-1.08	-3.54
08N40E21DDD3	4963.64	1512.92	4963.63	1514.00	4967.18	-1.08	-3.54
08S19E05DAB1	4075.54	1242.22	4075.51	1242.00	4074.79	0.22	0.72
08S23E19DBC1	4266.16	1300.33	4266.16	1297.00	4255.24	3.33	10.93

08S23E27BDC1	4234.52	1290.68	4234.50	1290.00	4232.27	0.68	2.23
08S24E20BDA1	4217.98	1285.64	4217.97	1284.00	4212.59	1.64	5.38
08S24E31DAC1	4226.54	1288.25	4226.53	1287.00	4222.43	1.25	4.10
08S25E16DAC1	4243.40	1293.39	4243.39	1293.00	4242.11	0.39	1.28
08S25E36DAA1	4209.00	1282.90	4208.98	1286.00	4219.15	-3.10	-10.17
08S26E03DCC1	4346.52	1324.82	4346.51	1326.00	4350.38	-1.18	-3.87
08S26E27ABA1	4238.50	1291.89	4238.47	1293.00	4242.11	-1.11	-3.64
08S26E33BCB1	4212.73	1284.04	4212.72	1280.00	4199.46	4.04	13.25
08S26E33BCB2	4212.73	1284.04	4212.72	1280.00	4199.46	4.04	13.25
08S27E23DDD1	4296.34	1309.52	4296.31	1308.00	4291.33	1.52	4.99
08S28E21AAC1	4398.00	1340.51	4397.99	1338.00	4389.75	2.51	8.23
08S28E21AAC1	4398.00	1340.51	4397.99	1338.00	4389.75	2.51	8.23
08S29E21ADD2	4436.45	1352.23	4436.44	1351.00	4432.40	1.23	4.04
08S29E23BAB1	4447.04	1355.46	4447.03	1353.00	4438.96	2.46	8.07
08S29E23BAB1	4447.04	1355.46	4447.03	1353.00	4438.96	2.46	8.07
08S29E26AAA1	4501.81	1372.15	4501.79	1368.00	4488.18	4.15	13.62
08S29E26AAA1	4501.81	1372.15	4501.79	1368.00	4488.18	4.15	13.62
08S29E34CBC1	4389.34	1337.87	4389.32	1338.00	4389.75	-0.13	-0.43
08S29E34CBC2	4389.35	1337.87	4389.32	1338.00	4389.75	-0.13	-0.43
08S29E34CBC3	4389.34	1337.87	4389.32	1338.00	4389.75	-0.13	-0.43
09N40E05DDD1	5535.40	1687.19	5535.38	1690.00	5544.60	-2.81	-9.22
09S19E25BBC1	3932.37	1198.59	3932.37	1203.00	3946.84	-4.41	-14.47
09S20E01DAA1	4211.31	1283.61	4211.31	1283.00	4209.30	0.61	2.00
09S22E33ADA1	4192.42	1277.85	4192.41	1278.00	4192.90	-0.15	-0.49
09S24E29AAB1	4154.61	1266.33	4154.61	1267.00	4156.81	-0.67	-2.20
09S24E29AAB1	4154.61	1266.33	4154.61	1267.00	4156.81	-0.67	-2.20
09S25E03CAC1	4156.68	1266.96	4156.68	1268.00	4160.09	-1.04	-3.41
09S25E18BCB1	4155.76	1266.68	4155.76	1268.00	4160.09	-1.32	-4.33
09S25E18BCB1	4155.76	1266.68	4155.76	1268.00	4160.09	-1.32	-4.33
09S25E18DDA1	4206.29	1282.08	4206.29	1267.00	4156.81	15.08	49.47
09S25E23DBA1	4266.97	1300.57	4266.95	1299.00	4261.80	1.57	5.15
09S26E10AAA1	4221.01	1286.56	4220.98	1288.00	4225.71	-1.44	-4.72
09S26E22BBB1	4251.16	1295.75	4251.14	1298.00	4258.52	-2.25	-7.38
09S26E22BBB1	4251.16	1295.75	4251.14	1298.00	4258.52	-2.25	-7.38
09S28E18BAD1	4216.80	1285.28	4216.79	1287.00	4222.43	-1.72	-5.64
09S28E18BAD2	4216.80	1285.28	4216.79	1287.00	4222.43	-1.72	-5.64
09S29E04BCA1	4226.66	1288.29	4226.66	1292.00	4238.83	-3.71	-12.17
09S29E07CDA1	4209.58	1283.08	4209.57	1286.00	4219.15	-2.92	-9.58
09S29E18CDA1	4249.34	1295.20	4249.33	1296.00	4251.96	-0.80	-2.62
10S20E27BCC1	4182.13	1274.71	4182.11	1277.00	4189.62	-2.29	-7.51
10S21E26AAA2	4197.00	1279.25	4197.00	1268.00	4160.09	11.25	36.91
10S21E28BCB1	4157.26	1267.13	4157.24	1267.00	4156.81	0.13	0.43
10S22E20CDC1	4149.52	1264.77	4149.50	1265.00	4150.25	-0.23	-0.75
10S22E32CBC1	4374.24	1333.27	4374.23	1333.00	4373.35	0.27	0.89
10S22E32CBC1	4374.24	1333.27	4374.23	1333.00	4373.35	0.27	0.89
10S23E20DCC2	4163.00	1268.88	4162.98	1268.00	4160.09	0.88	2.89
10S23E20DCC2	4163.00	1268.88	4162.98	1268.00	4160.09	0.88	2.89
10S23E25BAA1	4149.92	1264.90	4149.92	1265.00	4150.25	-0.10	-0.33
10S23E25BAA1	4149.92	1264.90	4149.92	1265.00	4150.25	-0.10	-0.33
10S24E01DDB1	4197.76	1279.48	4197.76	1280.00	4199.46	-0.52	-1.71

10S24E01DDB1	4197.76	1279.48	4197.76	1280.00	4199.46	-0.52	-1.71
10S24E13CCB1	4189.24	1276.88	4189.23	1278.00	4192.90	-1.12	-3.67
10S24E13CCB1	4189.24	1276.88	4189.23	1278.00	4192.90	-1.12	-3.67
10S24E14AAB1	4181.43	1274.50	4181.42	1274.00	4179.78	0.50	1.64
10S24E14AAB1	4181.43	1274.50	4181.42	1274.00	4179.78	0.50	1.64
10S24E23BCB1	4205.37	1281.80	4205.37	1280.00	4199.46	1.80	5.91
10S24E23BCB1	4205.37	1281.80	4205.37	1280.00	4199.46	1.80	5.91
10S24E36CDC1	4257.90	1297.81	4257.89	1300.00	4265.08	-2.19	-7.19

count	206	206
average	0.37	1.21
maximum	15.08	49.47
minimum	-4.76	-15.62
skew	1.88	1.88
variance	6.86	73.80
std	2.62	8.59
95% CI	0.36	1.17