

Contemporary deformation in the Yakima fold and thrust belt estimated with GPS

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Data

Survey-mode GPS observations used in this study, in addition to our own measurements, are from the US Geological Survey, Cascade Volcano Observatory, National Geodetic Survey, University of Washington, Central Washington University, Rensselaer Polytechnic Institute, and others. Most of the phase data are available at the UNAVCO archive. Continuous GPS data are from the Western Canada Deformation Array (Dragert & Hyndman 1995), the Pacific Northwest Geodetic Array (PANGA network; Miller et al., 1998; Khazaradze et al. 1999), Earthscope's Plate Boundary Observatory (PBO; <http://www.unavco.org/projects/major-projects/pbo/pbo.html>), Basin and Range Geodetic Network (Wernicke et al. 2000; https://www.cfa.harvard.edu/space_geodesy/BARGEN/), Yellowstone - Snake River Plain GPS Network (www.uusatrg.utah.edu/ts_ysrp.html), NGS Continuously Operating Reference Sites (www.ngs.noaa.gov), Bay Area Regional Deformation Array (www.ncedc.org/bard/) and Idaho National Laboratory Snake River Plain network (Payne et al., 2008).

We occupied 48 sGPS sites in 2012 and 62 in 2013 that had been previously occupied and hence provided velocities. We also established 13 new marks (Fig. S1). Additional details of the fieldwork are available at:
earthquake.usgs.gov/research/external/reports/G12AP20021.pdf.

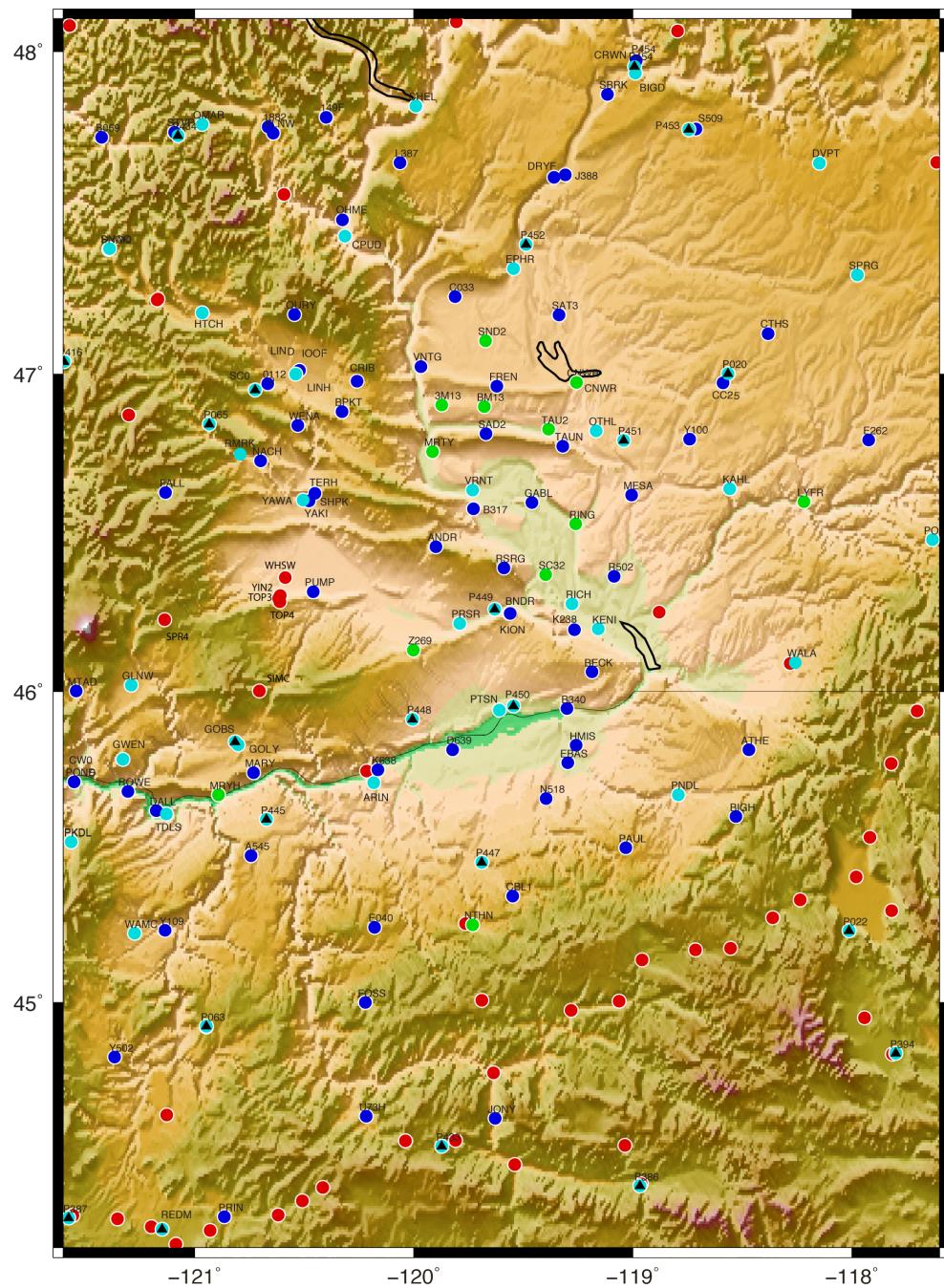


Figure S1. Map of the Yakima fold and thrust belt of Washington and Oregon showing GPS site locations. Blue dots show locations of survey-mode GPS sites occupied by us in 2012 and 2013; green are new survey-mode sites established by us in 2012 and 2013; turquoise dots are continuous GPS sites of the PANGA and PBO (with triangle) networks that we have included; and red dots are other survey-mode sites that we did not re-occupy.

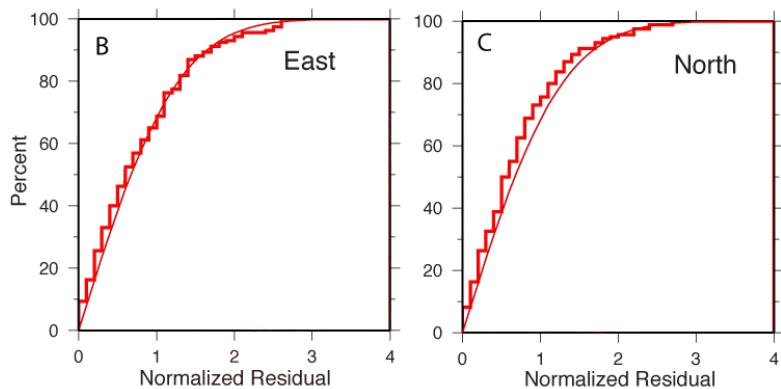
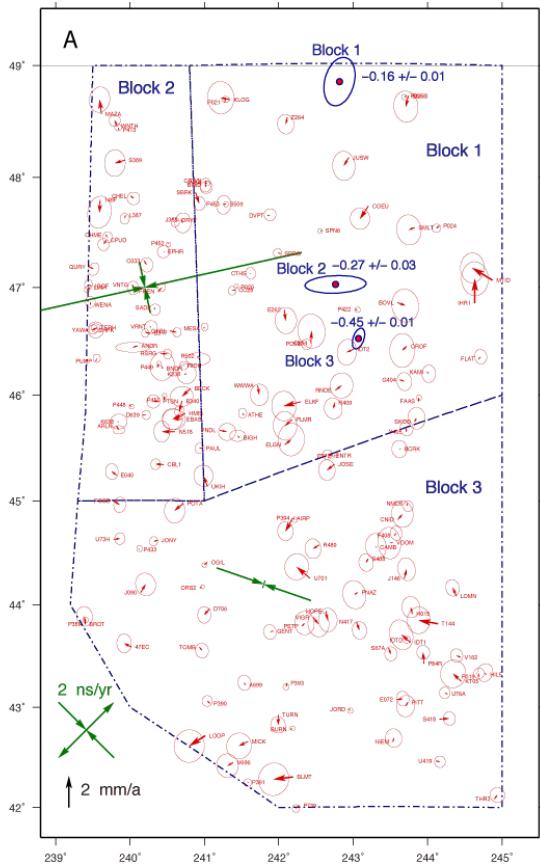


Figure S2. (A) Map of eastern Oregon, eastern Washington and western Idaho showing residuals after removing rotation and uniform strain from Blocks 2 and 3 and rotation only from Block 1. We estimated 3 rotation poles and 2 uniform horizontal strain rate tensors (15 total parameters) using the 160 sites (320 observations) that have velocity uncertainties less than 0.8 mm/yr. A minimum uncertainty of 0.2 mm/yr is applied to any less than this. Green arrows show principal strain rates and rotation poles are blue ellipses with rates given in deg/Ma. Error ellipses on velocities are 70%. (B and C) Distribution of normalized residuals (histogram) for east and north components of velocities compared to theoretical curve for Gaussian distribution (smooth curve).

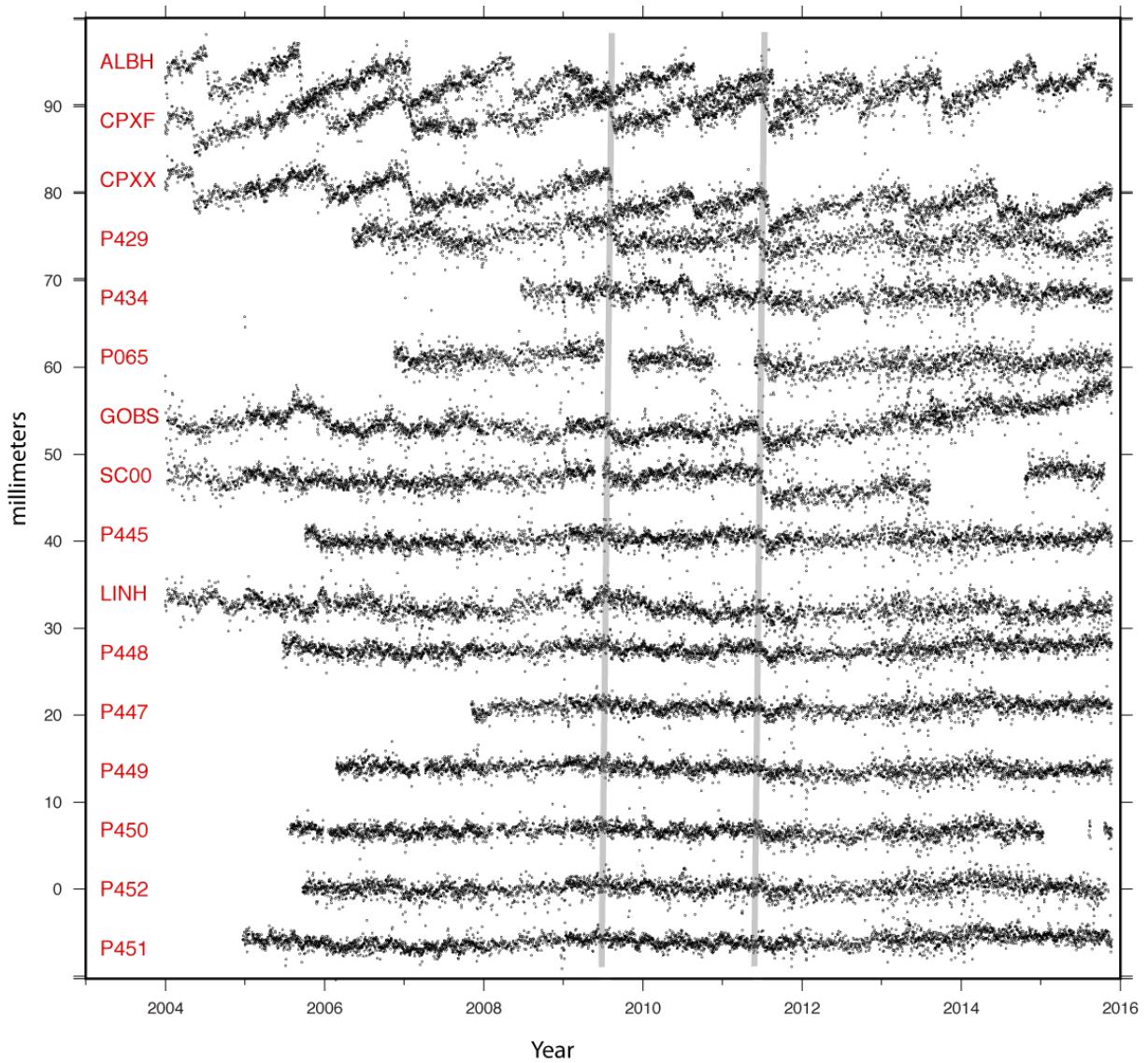


Figure S3. East components of selected continuous GPS time series showing SSE and their possible extension into the Yakima region. Sites are arranged from west at top to east at bottom. The YFTB extends from about P065 (239.0E) to P451 (241.0E). The 2011 SSE, a westward deflection, is evident as far east as P452 (240.5E).

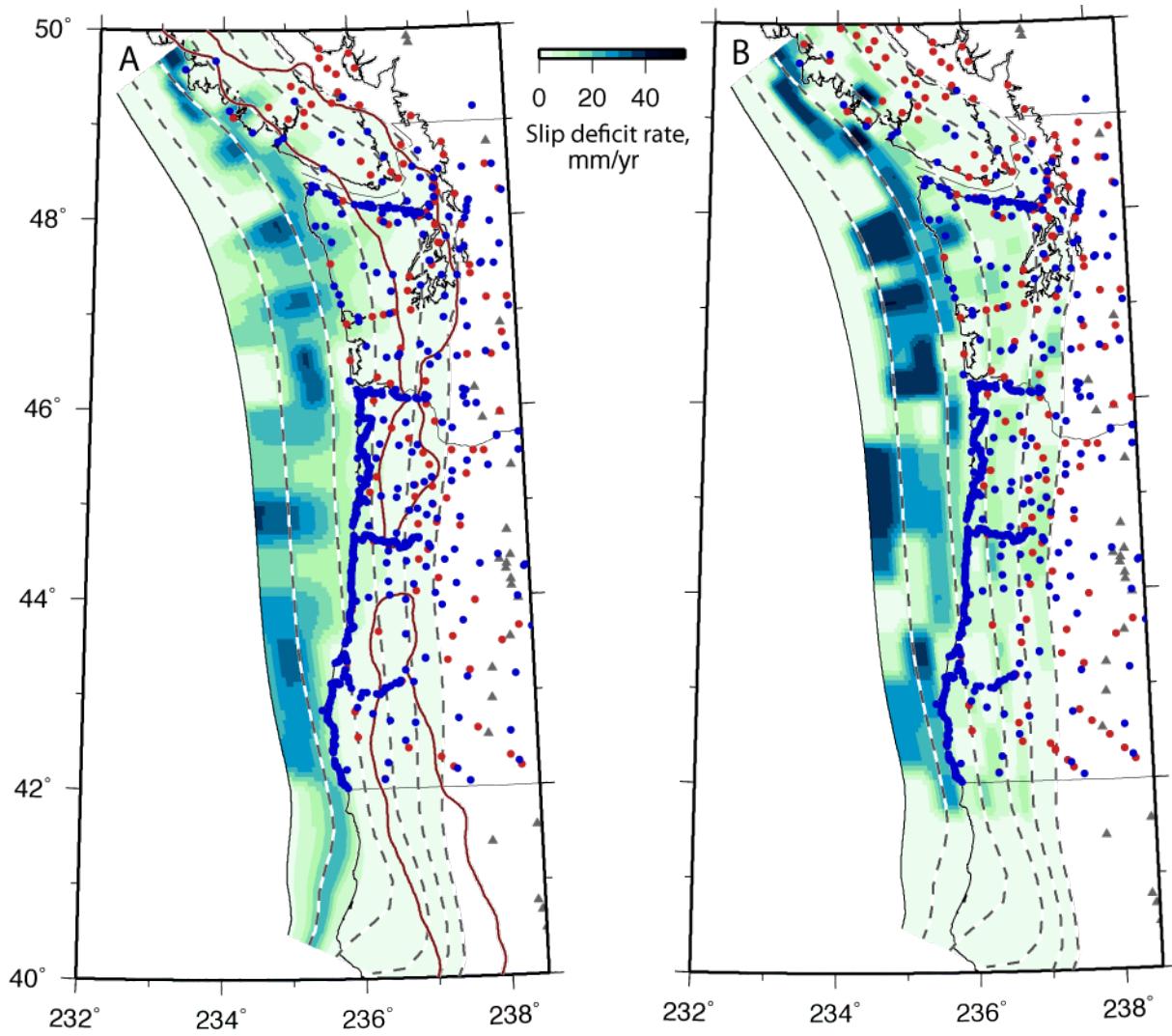


Figure S4. Locking distributions used to estimate elastic strain rates across the YFTB. (A) Locking is constrained to be a Gaussian function of depth. (B) Locking is estimated at rectangular patches along the plate interface. Red dots show GPS locations where only horizontal velocities are used; blue dots show where vertical rates were used either from GPS or leveling. Triangles are locations of volcanoes. See McCaffrey et al. (2013) for details.

Grid fit to velocities

In addition to looking at profiles of the north component of the velocities we performed a least-squares fit of the velocities to a grid of points throughout Oregon and Washington. The grid points are about 60 km apart (Fig. S5) and the velocity at each was estimated by inversion of the GPS velocities. We assumed a bilinear distribution between grid points and damped the first (strain rate) and second (curvature) derivatives of the gridded velocity field. Using a series of grid sizes and damping factors, we settled on the solution in Figs. S5 and S6 that provided a normalized rms (Nrms) of the north velocity misfit of 0.96 (Nrms for East was 1.21). From the velocity field we calculated the N-S and E-W normal strain rates (Fig. S5). Because the E-W strain rates dominate the strain rate field we do not show maps that combine these components. The map of N-S strain rates highlights the large strain rate west of the arc and north of about 46.5N. Small areas of N-S extension appear in the map but whether or not these are real would require some conjecture. Fig. S6 shows the 12 N-S profiles of the north GPS component and curves predicted by the strain rate calculations. Contraction is indicated by negative slopes and extension by positive slopes. Note in the profiles that in some areas there are indications of positive slopes but these are, in our opinion, equivocal. We infer that the N-S strain rates are everywhere negative, or contraction.

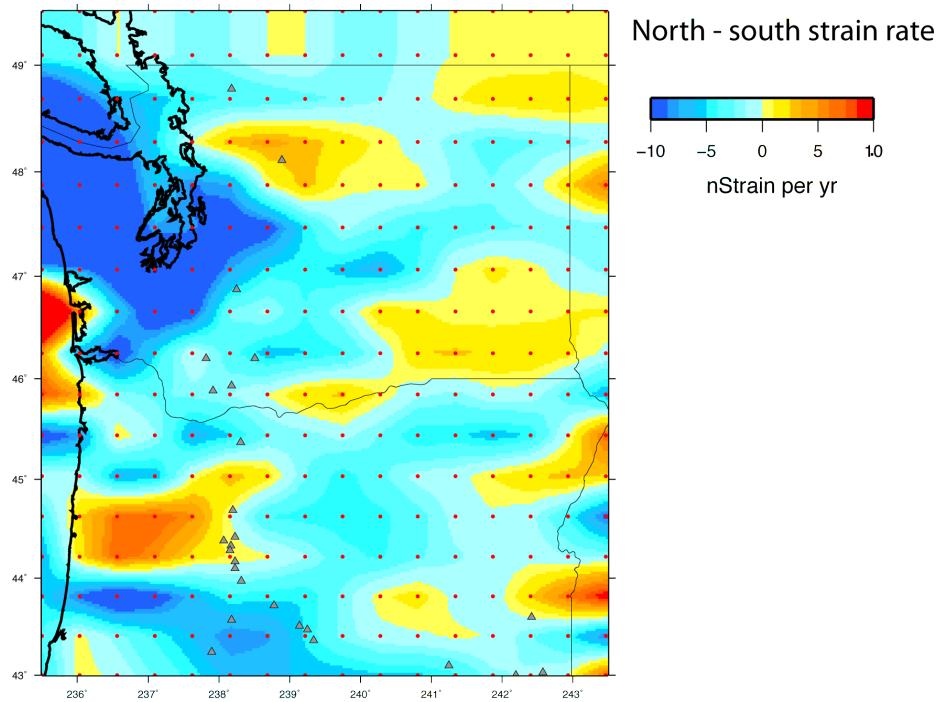
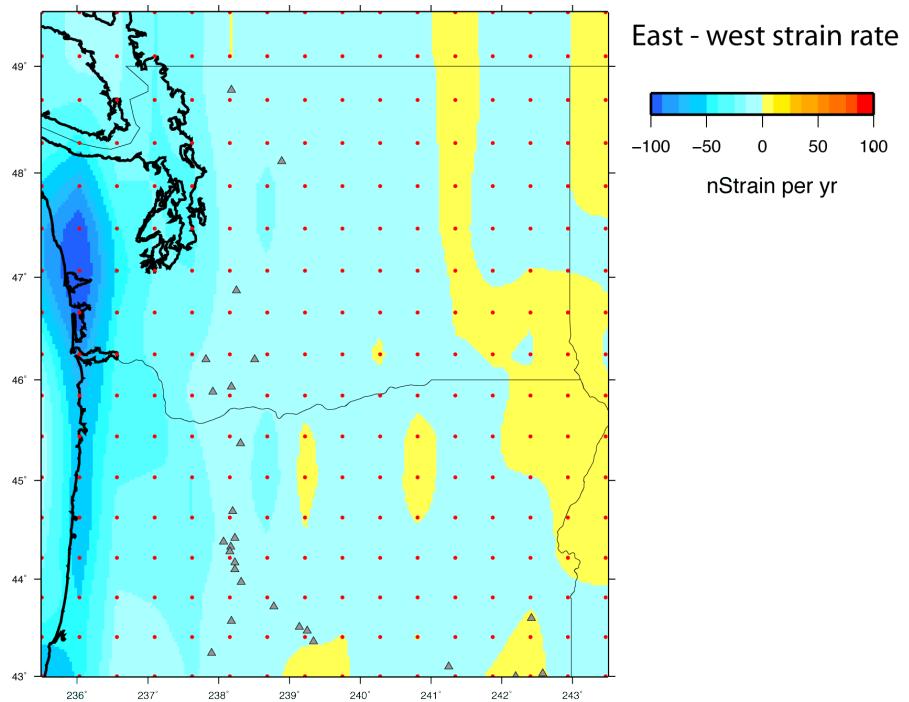
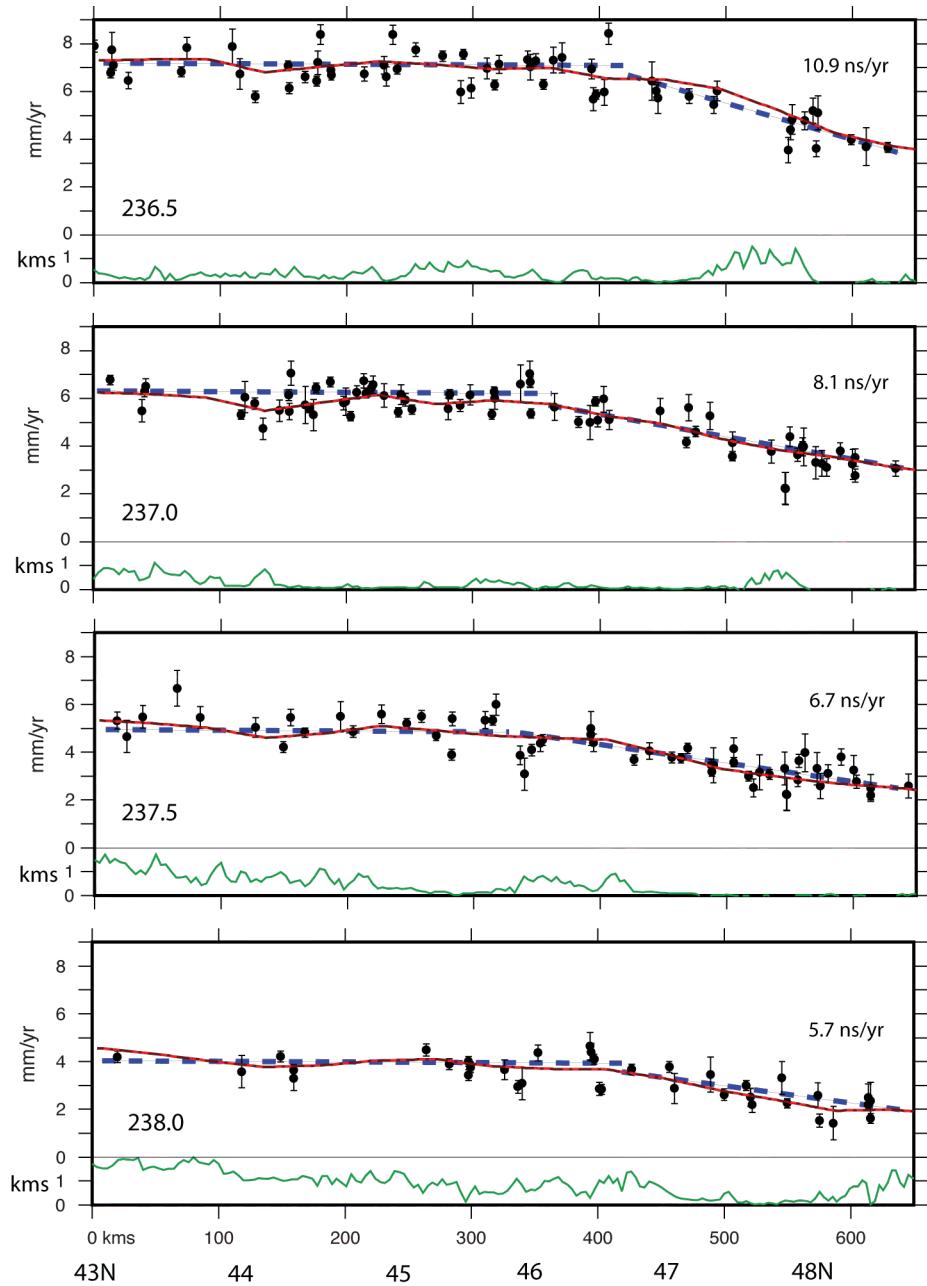
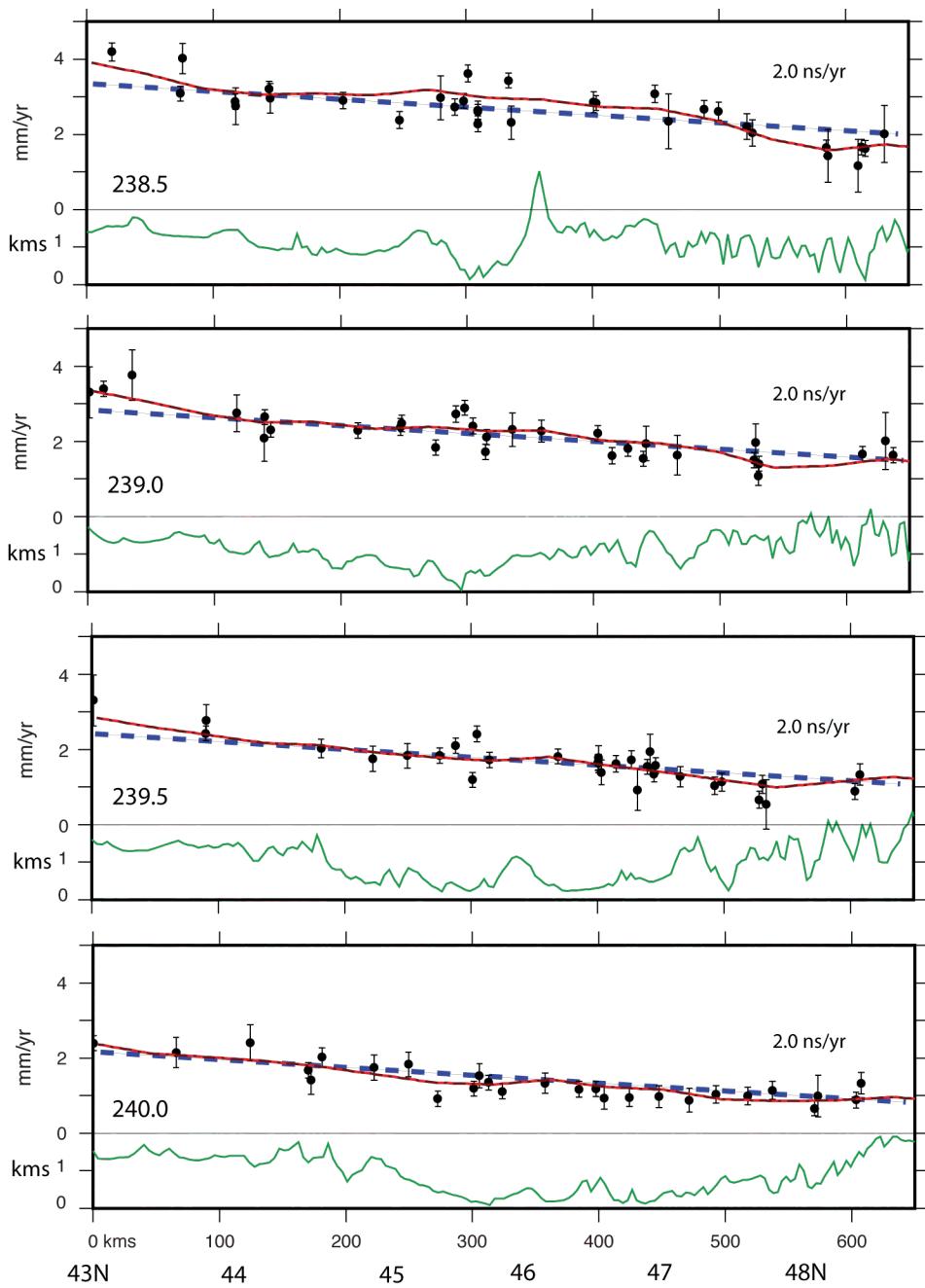


Figure S5. Surface strain rates estimated from GPS velocity field. Top shows east-west strain rate and bottom is north-south strain rate ($n\text{Strain} = 10^{-9}$). Red dots show grid points. Blue colors indicate contraction and yellow-red indicate extension. Note that the strain rate scale is a factor of 10 larger for E-W than it is for N-S.





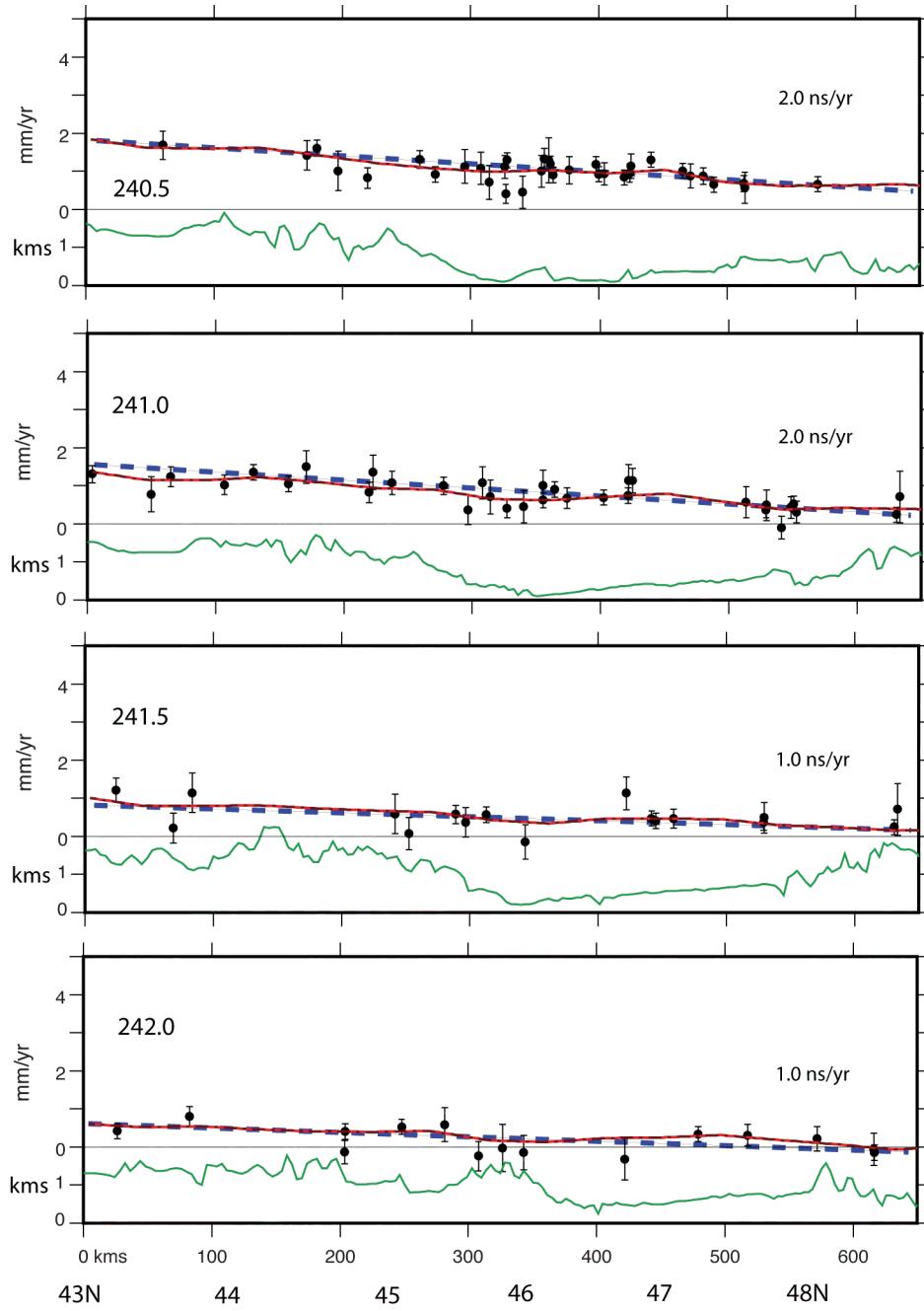


Figure S6. South to north profiles of the north component (black dot) of the GPS velocities at each 0.5 degree of longitude from 236.5E to 242.0E (longitude given in plot). Error bars are 1-sigma. Green curve is the topography using scale at left. Red curve is predicted north velocity from fitting of strain rate map in Fig. S5. In panels 236.5 to 238.0 blue dashed lines are at slopes of 0 ns/yr ($= 10^{-9}$ per year) on left (south) side and sloping in the north as labeled. For remaining panels slope is constant for entire profile, as labeled. At bottom is the latitude along the profiles. Note the change in the mm/yr scale between the first 4 profiles (west of arc) and the last 8 (east of arc).

Table S1. GPS Velocities relative to North America with 1-sigma uncertainties.

Site	Longitude	Latitude	Elev. m	East mm/yr	North mm/yr	Up mm/yr	E_sig	N_sig	U_sig	NE_corr.
							mm/yr	mm/yr	mm/yr	mm/yr
0112	239.3340	46.9705	584	0.35	1.94	-0.78	0.40	0.46	1.86	-0.002
149F	239.5993	47.7973	464	0.56	0.54	-1.95	0.49	0.66	2.84	0.110
187R	243.8974	44.8961	1514	-1.49	-0.06	-0.67	0.23	0.57	0.99	0.009
1882	239.3350	47.7680	548	0.38	1.07	-3.02	0.20	0.24	7.55	-0.035
1915	237.7817	46.7739	351	2.59	5.85	-0.98	0.73	0.94	3.56	0.083
217U	238.0945	46.5417	260	1.17	4.64	-3.09	0.44	0.57	2.42	0.019
2755	242.0198	45.4060	822	-0.00	-0.32	-3.92	0.61	0.83	2.62	0.024
9801	237.3329	45.0434	106	2.15	5.58	-3.01	0.34	0.39	10.25	-0.061
9802	237.0046	45.2215	28	2.30	5.93	-0.60	0.22	0.26	0.91	-0.040
9803	237.1234	44.9806	42	2.35	6.43	-4.78	0.24	0.28	20.10	-0.068
A46X	242.9528	46.2923	648	-1.28	-0.75	-1.33	0.43	0.58	1.91	0.010
A515	239.5748	48.5938	634	-0.11	0.95	-2.08	0.75	1.02	3.49	0.001
A545	239.2565	45.4745	556	-1.42	1.84	-0.78	0.15	0.17	2.75	-0.007
ACME	237.7964	48.7107	74	3.20	2.95	5.99	1.00	1.28	4.73	-0.025
ADHD	237.3183	48.1605	9	1.10	2.94	20.12	0.66	0.70	37.87	-0.012
AIRP	242.1848	44.8327	1010	-1.73	-0.13	-1.58	0.25	0.30	1.02	-0.035
ANAT	242.8772	46.1479	1048	-1.00	-0.10	-1.84	0.34	0.46	1.52	0.033
ANDR	240.1018	46.4582	982	-0.47	1.17	-0.99	0.70	0.21	0.94	0.007
ANTS	241.4457	45.1762	1398	-1.10	0.59	1.04	0.42	0.52	2.01	0.000
APSA	237.0147	46.6707	31	2.59	5.09	-0.68	0.38	0.41	2.35	0.006
ARLC	237.8423	48.1616	17	2.19	2.58	-1.03	0.49	0.53	1.78	-0.009
ARLI	237.8581	48.1741	23	1.94	1.53	-1.90	0.27	0.27	1.90	0.001
ARLN	239.8167	45.7082	120	-0.10	1.19	-2.26	0.30	0.20	0.63	0.002
ARLO	237.8456	48.1703	20	2.06	3.83	0.70	0.79	0.98	3.53	-0.046
ATHE	241.5291	45.8126	549	-1.06	0.57	-2.71	0.18	0.21	2.56	0.014
AULT	237.3141	48.3415	0	2.13	1.49	-0.82	0.52	0.60	5.29	0.024
AVI2	237.7509	47.6857	0	2.66	2.50	-0.21	0.32	0.37	1.36	-0.047
B059	238.5744	47.7354	239	1.59	2.03	-0.02	0.31	0.35	1.44	0.034
B197	237.2451	47.5007	113	3.46	5.27	1.89	0.84	0.61	2.30	0.007
B317	240.2725	46.5775	221	-0.57	1.18	-3.93	0.16	0.19	0.65	-0.005
B340	240.6996	45.9445	88	-0.89	0.41	-2.96	0.21	0.25	1.71	0.027
B407	242.9944	44.0196	649	-2.27	-0.53	-0.73	0.39	0.51	2.62	0.037
BATT	237.4528	45.7810	64	1.42	5.34	4.30	0.29	0.35	1.91	-0.079
BAYV	237.5693	48.4719	17	0.87	3.57	24.92	1.68	1.81	72.00	-0.004
BCRK	243.6355	45.4931	1409	-1.10	-0.31	-1.60	0.25	0.29	1.06	-0.002
BECK	240.8127	46.0614	417	-1.36	0.45	-1.76	0.48	0.42	1.48	0.032
BEEC	240.9640	44.5350	1137	-1.36	1.50	-0.10	0.35	0.43	1.51	-0.082
BEND	238.6848	44.0572	1095	-1.23	2.87	-1.76	0.17	0.17	0.56	0.001
BIGD	241.0112	47.9333	493	-0.21	0.43	0.05	0.27	0.28	1.03	0.003
BIGH	241.4698	45.5995	1149	-1.18	0.58	-3.18	0.33	0.24	1.16	-0.001
BIRD	238.1408	48.5387	42	2.01	2.34	23.03	0.58	0.79	56.51	-0.058
BLAP	237.4654	48.7912	25	2.49	2.58	0.90	0.49	0.50	2.08	0.025
BM31	238.3405	48.2732	142	1.79	1.42	-5.49	0.57	0.70	2.34	-0.045
BNDR	240.4358	46.2475	602	-0.44	1.29	-3.99	0.51	0.59	5.76	0.047
BNRS	243.7417	48.7313	693	-0.07	-0.75	-4.60	0.51	0.65	2.24	-0.060
BOAT	237.4207	48.5483	0	2.92	3.07	19.35	0.65	1.47	62.80	0.004
BOUN	237.0042	49.0776	0	3.02	3.40	-13.86	0.82	0.85	80.60	-0.032
BOVL	243.5980	46.8568	855	-0.11	-0.20	-5.54	0.56	0.69	2.39	-0.065
BPKT	239.6729	46.8832	564	0.27	0.92	-0.81	0.52	0.55	2.21	0.020
BREW	240.3174	48.1315	238	-0.04	0.66	-1.36	0.13	0.13	0.59	0.001
C033	240.1894	47.2416	370	0.21	0.88	-2.13	0.25	0.31	1.12	-0.010
C10X	243.6398	45.3118	702	0.23	-0.81	1.35	0.52	0.63	2.54	-0.023
C334	242.4308	46.4857	693	-0.66	1.03	-4.27	0.57	0.71	2.38	-0.059
CAMB	243.3066	44.5553	796	-2.31	0.12	-0.54	0.31	0.38	1.35	-0.010
CAPS	237.4010	48.5133	38	3.63	2.99	4.35	0.68	0.84	3.34	-0.018
CBL1	240.4510	45.3441	644	-1.34	1.31	-1.43	0.21	0.23	0.87	0.017
CC25	241.4110	46.9729	428	-0.78	0.47	-0.80	0.18	0.20	0.70	-0.009
CHAS	237.0090	45.5244	35	1.85	5.56	1.27	0.37	0.46	2.83	-0.113
CHCM	237.2241	48.0106	20	3.20	3.63	-1.06	0.31	0.27	0.80	0.000
CHEL	240.0101	47.8316	345	0.47	1.14	-3.40	0.24	0.24	0.86	0.006
CHWK	237.9916	49.1566	174	1.24	1.69	0.41	0.17	0.16	0.49	-0.003

CLCC	237.4246	45.3260	107	1.14	5.49	-0.75	0.22	0.25	0.90	-0.012
CLF2	237.7560	45.5402	187	0.43	3.89	-4.34	0.20	0.23	11.80	0.040
CLFH	237.6390	45.2961	74	1.18	4.78	-3.68	0.86	0.28	13.70	0.005
CNCR	238.2507	48.5387	55	1.50	1.62	-1.84	0.22	0.21	0.58	0.004
CNID	243.6012	44.8243	1110	-1.48	0.18	-2.94	0.45	0.56	1.92	-0.047
COEU	243.2036	47.7432	675	-0.81	-0.74	-2.85	0.41	0.46	1.78	-0.013
COLR	237.1697	44.2076	156	-0.03	4.73	-3.79	0.41	0.44	16.83	-0.000
COLV	242.0967	48.5448	486	-0.04	-0.15	1.59	0.18	0.18	0.58	0.003
COUG	237.7392	46.0592	151	0.79	3.08	1.90	0.59	0.68	1.36	-0.011
COUP	237.3144	48.2173	20	3.20	3.11	-0.73	0.43	0.37	1.42	0.000
COVE	242.1799	45.2968	845	-1.03	-0.22	-4.41	0.67	0.87	2.91	-0.074
CPUD	239.6858	47.4302	186	0.17	1.03	-2.67	0.23	0.23	1.07	0.001
CPXX	237.7435	46.8401	533	2.04	3.67	-1.51	0.23	0.22	0.83	0.000
CRWN	241.0145	47.9714	463	-0.28	0.31	-1.41	0.24	0.29	0.99	0.017
CSHR	238.2676	46.8707	2881	0.90	3.19	-0.20	0.50	0.31	0.57	0.005
CSTL	237.0811	46.2833	0	2.11	5.63	-1.22	0.46	0.56	2.98	-0.054
CTHS	241.6178	47.1272	532	-0.53	0.47	-2.08	0.21	0.25	0.90	-0.066
CUGR	237.7646	44.1188	499	-0.01	5.67	-7.88	1.06	1.26	5.02	0.049
Cupo	237.9762	44.1907	968	-2.88	5.64	-3.47	0.40	0.43	4.41	-0.033
CW05	238.4495	45.7105	86	0.35	3.62	-2.38	0.19	0.22	0.84	0.001
D405	243.7856	45.8816	1037	-1.51	-0.12	-1.67	0.99	1.15	2.79	0.032
D639	240.1774	45.8133	95	-0.31	1.35	-2.49	0.18	0.20	0.73	0.013
DALL	238.8248	45.6178	46	0.05	2.72	-2.29	0.26	0.22	0.94	0.005
DARK	241.6380	45.2735	1114	-1.84	0.07	-0.19	0.56	0.42	1.12	-0.020
DBL1	237.4537	47.9675	0	6.92	4.83	2.11	2.43	3.19	11.53	0.087
DBLF	237.4537	47.9674	0	6.92	4.83	2.11	2.43	3.19	11.53	0.087
DRAO	240.3750	49.3226	541	-0.08	0.53	-0.03	0.10	0.08	0.57	0.002
DRYF	240.6398	47.6124	493	-0.23	0.68	-2.42	0.19	0.21	5.32	-0.010
DVPT	241.8522	47.6561	727	-0.15	0.31	-1.69	0.25	0.28	0.90	0.011
DWH1	237.9198	47.7741	109	1.62	2.96	-0.15	1.18	1.19	1.48	-0.002
E040	239.8203	45.2433	862	-0.80	1.83	-2.93	0.27	0.33	1.09	-0.026
E262	242.0759	46.7946	424	-0.57	-0.32	-1.93	0.45	0.54	1.75	-0.018
E518	239.4079	47.5589	311	0.59	1.91	0.41	0.77	1.02	3.30	-0.075
EBAS	240.7023	45.7715	209	-1.35	1.08	-0.40	0.47	0.42	1.08	0.002
EDEN	242.4865	45.9086	996	2.70	-3.25	-2.96	0.41	0.93	1.84	-0.014
ELGN	242.0826	45.5333	799	-1.30	0.59	-2.21	0.37	0.45	1.65	0.019
ELKF	242.2978	45.9370	1473	-2.04	-0.02	0.68	0.51	0.62	2.14	-0.023
ELKR	237.6548	46.3009	1319	-1.00	7.61	2.83	1.42	1.77	4.96	-0.108
ENTR	242.7119	45.4313	1125	-1.30	0.14	-0.60	0.23	0.23	0.83	0.004
EPHR	240.4553	47.3293	375	-0.02	0.87	-2.32	0.20	0.22	0.79	0.006
F408	243.5511	44.6692	910	-1.78	0.06	-2.68	0.26	0.30	1.05	-0.061
FAAS	243.8807	45.9421	991	-0.89	0.08	-1.76	0.13	0.14	1.18	-0.013
FALL	238.8667	46.6288	879	1.14	2.21	-2.12	0.30	0.18	0.66	0.012
FLOR	242.6454	45.9271	1253	-1.63	0.21	-2.77	1.11	1.12	3.66	0.062
FOSS	239.7796	44.9998	784	-0.61	1.75	-3.52	0.26	0.33	1.21	0.068
FREN	240.3795	46.9630	516	0.09	1.30	-2.66	0.17	0.18	4.17	0.009
FRND	237.3968	48.8920	1	2.50	2.59	-1.22	1.30	1.68	6.02	-0.033
FRRY	241.8454	48.2775	381	-0.52	0.67	-6.14	1.56	2.07	7.20	-0.113
G370	238.7312	48.6737	131	1.49	2.01	-0.28	0.56	0.76	2.83	-0.132
G375	238.3255	48.8653	1234	0.17	0.87	1.70	0.85	1.06	4.12	-0.104
G404	243.6269	46.1419	1092	-0.54	-0.08	-3.36	0.31	0.38	1.30	-0.038
G407	242.7476	45.3491	1247	-1.55	-0.12	-1.57	0.27	0.39	1.15	-0.027
G753	239.4906	44.3531	1073	-2.22	2.11	2.00	0.93	1.16	3.98	0.013
GABL	240.5392	46.5981	309	0.08	0.92	-3.36	0.18	0.20	0.71	0.029
GLDH	237.2133	47.5486	515	3.50	4.13	-3.51	0.43	0.46	1.84	-0.048
GLNW	238.7113	46.0199	567	0.70	2.31	-2.26	0.43	0.44	1.92	0.001
GOBS	239.1853	45.8388	621	-0.08	2.11	-2.26	0.12	0.12	0.57	0.001
GOLY	239.1975	45.8287	500	0.23	1.72	-2.47	0.19	0.20	0.59	0.002
GP17	238.3747	47.1375	536	1.12	2.35	0.90	0.61	0.73	3.15	0.114
GP29	238.4064	48.4861	59	0.08	1.16	4.98	0.63	0.70	3.24	-0.034
GP31	238.3997	48.2552	150	1.38	3.88	-0.40	1.66	2.22	7.77	-0.081
GP37	237.8568	48.9166	114	2.35	1.84	-0.38	0.89	1.12	3.92	-0.100
GRCK	242.3354	48.1436	669	-0.23	0.22	-1.11	0.32	0.32	1.26	0.008
GRN2	237.0798	47.3893	0	2.71	1.04	-9.40	1.06	1.17	4.81	0.042
GRSM	238.2228	48.5385	38	2.45	3.47	-2.30	1.03	1.32	4.67	-0.037
GWEN	238.6724	45.7826	732	0.76	2.64	-2.48	0.24	0.25	0.80	-0.001
GWN5	238.6724	45.7826	732	0.87	2.60	-1.79	0.19	0.19	0.62	0.001

GWN6	238.6727	45.7826	733	0.19	2.28	-2.54	0.21	0.21	0.74	0.003
HACK	237.4718	48.0995	0	1.14	2.62	20.40	0.98	1.01	79.22	0.007
HAFF	237.8238	47.4848	80	1.43	3.46	-1.16	0.69	0.83	9.63	-0.024
HELE	237.1988	45.8569	1	1.80	5.99	3.47	0.37	0.45	3.52	-0.053
HIDA	241.2861	45.1704	1218	-1.44	0.15	-2.45	0.93	0.62	1.70	0.001
HILG	241.7642	45.3311	908	-1.81	1.17	-2.59	0.52	0.61	2.42	0.019
HMIS	240.7410	45.8274	172	-1.61	0.71	-1.87	0.43	0.44	1.32	-0.005
HOWL	237.1203	44.9900	38	1.67	6.57	-0.33	0.32	0.37	2.05	-0.100
HSTN	239.0702	44.2564	972	-1.89	2.09	-5.91	0.52	0.62	8.86	0.027
HTCH	239.0341	47.1917	569	1.83	1.63	5.00	0.47	0.52	2.01	0.022
HVX4	243.7013	45.1230	1144	-0.97	3.02	-3.80	0.86	1.85	3.56	-0.030
HYAK	238.6077	47.3885	758	0.76	2.66	-1.43	0.23	0.24	1.04	-0.004
ICBJ	237.1080	48.4215	8	3.71	3.51	-0.45	0.34	0.37	2.55	-0.019
ICEB	237.1153	48.4199	22	3.71	3.51	-0.45	0.34	0.37	2.55	-0.019
IDNP	243.8787	45.9397	996	-0.89	0.08	-1.03	0.13	0.14	0.59	-0.013
IDT2	243.0043	46.4282	212	-1.16	-0.04	-2.47	0.41	0.54	1.73	0.064
IMPO	237.1739	44.7951	106	1.12	5.86	1.05	0.50	0.57	2.13	-0.093
IOOF	239.4788	47.0121	492	0.18	1.57	0.95	0.18	0.21	1.73	0.020
J090	240.1434	44.1185	1191	-1.64	2.41	-2.35	0.42	0.48	1.77	-0.080
J146	243.6869	44.2539	971	-2.19	0.44	-4.71	0.37	0.47	15.91	-0.116
J388	240.6916	47.6196	462	0.00	0.57	-1.16	0.34	0.41	1.55	0.032
JAIL	237.0290	44.8765	73	1.89	6.25	-0.75	0.23	0.27	1.40	-0.040
JCIA	237.1906	48.0546	10	3.92	3.97	13.29	0.70	0.79	10.44	-0.026
JMS0	237.0135	45.2983	23	1.94	4.89	3.26	1.29	1.70	5.69	-0.233
JMSO	237.0135	45.2983	22	1.94	4.89	3.26	1.29	1.70	5.69	-0.233
JONY	240.3719	44.6226	697	-1.69	1.61	-2.59	0.19	0.21	18.31	0.044
JOSE	242.7477	45.3491	1246	-1.55	-0.12	-1.57	0.27	0.39	1.15	-0.027
JUSW	242.9413	48.1792	647	-0.41	-0.35	-0.35	0.47	0.61	2.04	-0.031
K024	242.2684	48.2076	488	-0.94	1.07	1.53	0.82	1.01	3.78	-0.032
K061	237.9406	48.5266	6	1.04	2.01	0.57	1.59	1.93	7.15	-0.108
K238	240.7324	46.1952	143	-0.52	1.00	-1.95	0.39	0.42	3.21	-0.007
K638	239.8353	45.7498	125	-0.28	1.53	-2.55	0.35	0.32	0.83	0.018
KAMI	243.9947	46.2126	354	-0.70	-0.16	-2.11	0.29	0.36	1.28	0.014
KELS	237.1039	46.1182	0	2.90	5.36	-1.94	0.20	0.15	0.50	0.000
KENI	240.8414	46.1979	146	0.10	0.62	-2.11	0.19	0.20	0.73	0.002
KINW	237.3519	47.7347	0	4.13	3.95	1.58	0.77	0.97	3.24	-0.059
KLOG	241.3408	48.6975	739	-0.48	0.71	-3.00	0.55	0.68	2.28	-0.030
KTBW	237.2046	47.5473	491	3.28	3.57	-1.25	0.20	0.16	0.42	0.001
L387	239.9370	47.6564	787	0.31	0.99	-3.10	0.20	0.23	0.83	0.001
LANG	237.0444	44.5660	70	1.86	5.30	-2.13	0.51	0.66	2.61	-0.066
LARC	237.9124	45.5327	1211	0.64	6.49	-0.49	1.18	0.79	172.25	-0.002
LATH	242.8681	47.2744	772	-0.03	0.58	-0.51	0.65	0.84	2.80	-0.051
LEWG	237.3793	47.0942	57	2.05	5.59	-3.34	0.75	0.94	4.98	-0.017
LINH	239.4615	47.0003	472	0.19	1.34	-2.26	0.14	0.14	0.49	0.001
LION	237.6610	48.4250	0	-4.09	2.51	-15.33	0.88	1.09	59.19	-0.069
LKCP	238.1691	47.9444	178	1.66	2.25	-2.17	0.14	0.13	0.39	0.007
LNGB	237.2417	47.2188	2	3.27	4.15	-0.76	0.21	0.22	0.78	0.001
LSIG	238.3104	47.6952	527	1.89	2.20	-3.14	0.37	0.34	1.27	-0.006
M415	240.3643	44.7715	551	-1.58	1.01	-1.02	0.44	0.52	1.97	-0.095
M516	238.1230	45.6763	24	-0.04	3.43	-5.29	0.20	0.23	5.60	0.012
M753	239.5841	44.3971	1216	-1.62	2.63	-2.85	0.88	1.27	4.77	0.087
MARY	239.2695	45.7403	933	-0.31	2.41	-1.81	0.19	0.21	5.46	0.018
MAYL	237.3692	48.2680	0	2.36	1.60	1.34	0.54	0.62	5.51	0.016
MAZA	239.6176	48.5705	615	0.79	2.23	8.91	0.43	0.87	5.60	0.046
MESA	240.9935	46.6212	276	-0.68	0.69	-2.15	0.16	0.17	0.59	0.011
MHTL	238.2888	45.3287	1750	1.03	2.99	-1.56	0.25	0.28	0.66	-0.029
MLCY	237.5200	44.7518	230	1.37	5.49	1.33	0.50	0.63	3.59	-0.082
MORT	237.7296	46.5506	265	2.35	4.39	-1.09	0.30	0.36	4.92	-0.005
MOSQ	237.9764	44.0646	1013	-2.29	3.58	-1.17	0.53	0.67	2.80	-0.078
MOWI	238.1350	46.9335	1497	0.80	3.70	3.09	1.34	1.47	7.46	0.007
MTAD	238.4581	46.0001	576	0.52	3.43	-2.26	0.15	0.17	3.40	-0.003
MUDM	238.0664	47.1419	383	0.57	2.87	-2.09	0.60	0.62	5.72	-0.007
N518	240.6034	45.6575	256	-1.64	1.13	-1.63	0.34	0.44	1.57	0.000
NACH	239.3017	46.7281	424	0.72	1.61	-2.99	0.19	0.22	0.76	-0.006
NINT	238.2029	47.4951	127	1.28	2.61	-2.53	0.26	0.24	0.52	0.005
NMDS	243.7200	44.9742	1165	-1.67	-0.57	-2.70	0.20	0.21	0.76	0.003
NOFO	237.5762	48.3663	19	2.45	3.45	19.52	1.39	0.74	34.06	-0.008

OGIL	241.0387	44.4099	1100	-1.94	1.05	-0.62	0.14	0.14	0.47	-0.002
OHME	239.6744	47.4800	297	0.52	1.13	-2.13	0.21	0.24	9.68	-0.007
OLYM	237.0924	46.9669	41	2.73	4.49	-0.51	1.25	0.63	2.24	-0.006
OROF	243.7185	46.4548	907	-1.01	-0.33	-1.10	0.52	0.71	2.31	0.011
ORS1	240.9413	44.1642	1437	-1.75	1.36	-2.13	0.13	0.11	0.48	0.000
ORS2	240.9415	44.1641	1438	-1.75	1.36	-2.13	0.13	0.11	0.48	0.000
OTHL	240.8321	46.8226	313	0.22	1.14	-4.26	0.25	0.32	6.49	0.009
P020	241.4342	47.0022	480	-0.70	0.41	-1.43	0.14	0.14	0.45	0.001
P021	241.2697	48.6747	1163	-0.14	0.24	-0.49	0.19	0.20	0.66	0.004
P022	241.9862	45.2318	888	-1.43	0.53	-0.84	0.15	0.15	0.62	0.001
P023	243.8970	44.8984	1521	-1.32	0.06	-0.56	0.17	0.17	0.53	0.000
P025	243.7125	48.7310	695	-0.22	-0.25	-0.04	0.17	0.17	0.66	0.001
P063	239.0538	44.9227	965	-0.70	2.29	-2.15	0.17	0.15	0.52	-0.004
P065	239.0669	46.8440	1017	0.75	1.80	-1.59	0.17	0.17	0.52	0.001
P372	242.7483	45.4281	1208	-1.06	0.24	-0.60	0.18	0.17	0.53	0.001
P377	237.1129	44.0521	142	0.49	5.32	-1.37	0.18	0.16	0.54	0.000
P378	237.0691	44.5350	83	1.60	5.59	-0.70	0.18	0.17	0.52	0.000
P379	237.4230	44.4965	1221	1.03	4.82	-1.24	0.20	0.19	0.46	0.000
P383	237.7828	44.3422	1295	0.20	4.21	-2.08	0.22	0.22	0.81	0.000
P384	237.5172	44.8411	1182	1.53	4.85	-0.75	0.24	0.24	0.87	0.000
P385	238.0542	44.4348	1120	-0.16	3.64	-1.74	0.22	0.23	0.77	0.002
P386	241.0322	44.4028	1103	-1.94	1.05	-0.62	0.14	0.14	0.47	-0.002
P387	238.4255	44.2968	962	-0.11	3.21	-2.02	0.18	0.18	0.53	0.001
P394	242.2004	44.8349	1010	-1.51	0.41	-0.66	0.18	0.17	0.56	0.000
P412	237.4109	45.2211	53	1.99	5.19	-1.76	0.19	0.18	0.54	0.001
P413	239.8504	48.4265	501	0.49	0.88	-1.47	0.21	0.21	0.80	0.000
P414	237.3072	45.8349	63	2.95	5.33	-2.32	0.31	0.21	0.82	0.001
P416	238.4031	47.0399	1576	1.33	3.07	-1.87	0.20	0.23	0.77	0.002
P420	237.1337	46.5886	74	2.96	5.08	-2.10	0.31	0.28	0.73	-0.000
P421	237.5708	46.5319	220	2.19	4.73	-1.86	0.23	0.22	0.58	0.000
P422	243.0203	46.7979	843	-0.54	-0.09	-0.83	0.18	0.17	0.53	0.000
P423	237.0588	47.2879	39	3.52	4.60	-1.35	0.28	0.22	0.64	0.001
P424	237.1253	47.8232	0	4.58	3.77	0.06	0.45	0.48	1.09	0.008
P425	237.1546	46.4527	64	2.71	5.01	-2.35	0.29	0.23	0.72	-0.000
P426	237.4854	47.8027	3	3.43	3.06	-3.46	0.26	0.21	0.78	0.003
P427	237.6594	45.4302	149	1.67	4.69	-2.74	0.19	0.16	0.51	0.000
P429	238.1226	45.6761	25	1.08	4.00	-2.52	0.20	0.16	0.52	-0.001
P431	238.0116	46.5721	1422	1.72	4.09	-2.23	0.21	0.21	0.76	0.000
P432	238.3168	46.6229	318	1.09	2.83	-2.09	0.24	0.15	0.46	0.001
P433	240.1280	44.5325	1158	-1.53	1.68	-1.06	0.20	0.19	0.58	0.002
P434	238.9244	47.7402	1698	1.08	1.50	-1.19	0.19	0.20	0.75	0.000
P437	237.5408	48.0018	12	3.09	2.84	-1.38	0.26	0.28	0.83	0.001
P438	237.3297	48.4192	0	2.94	2.76	-1.21	0.25	0.27	0.76	0.000
P439	237.0907	48.7082	0	3.14	3.07	-0.51	0.43	0.32	0.70	0.000
P442	238.3844	48.2605	146	1.35	1.64	-1.87	0.26	0.21	0.85	0.006
P443	238.7144	48.5097	1062	1.25	1.66	-0.43	0.20	0.20	0.72	0.002
P444	238.9324	48.7302	493	1.06	1.63	-1.33	0.30	0.17	0.63	-0.008
P445	239.3277	45.5901	436	-0.37	2.10	-2.28	0.25	0.17	0.54	0.000
P446	237.1072	46.1157	0	2.90	5.36	-1.94	0.20	0.15	0.50	0.000
P447	240.3099	45.4528	471	-0.99	0.92	-1.90	0.21	0.18	0.57	0.001
P448	239.9948	45.9106	261	-0.27	1.11	-3.07	0.15	0.15	0.46	0.000
P449	240.3690	46.2598	208	-0.38	1.20	-2.30	0.16	0.16	0.47	0.001
P450	240.4558	45.9533	163	-0.60	1.29	-2.25	0.18	0.15	0.43	0.001
P451	240.9586	46.7928	351	-0.34	0.74	-1.77	0.15	0.15	0.45	0.000
P452	240.5127	47.4035	323	-0.17	0.65	-1.80	0.15	0.15	0.46	0.004
P453	241.2545	47.7591	644	-0.27	0.36	-1.30	0.15	0.16	0.46	0.002
P454	241.0074	47.9538	478	-0.12	0.52	-1.23	0.16	0.16	0.56	0.001
P687	237.6454	46.1096	391	2.13	4.09	-2.95	0.30	0.24	0.72	-0.011
P688	237.8358	46.0301	1165	1.84	2.94	-1.76	0.25	0.27	0.75	0.001
P689	237.6394	46.1895	1359	1.24	4.51	-1.70	0.23	0.23	0.74	-0.000
P691	237.7730	46.2315	1182	1.13	5.40	0.27	0.21	0.22	0.67	0.001
P700	237.7826	46.1781	1521	1.54	3.67	-0.77	0.23	0.21	0.61	0.002
P701	237.8667	46.1946	1247	3.01	4.08	-0.76	0.27	0.23	0.61	0.000
P705	237.6894	46.1730	1150	1.01	4.36	-1.46	0.34	0.34	0.84	-0.001
P814	241.2546	47.7592	644	-0.27	0.36	-1.30	0.15	0.16	0.46	0.002
PACK	238.3248	46.6068	301	1.26	2.85	-3.49	0.27	0.28	1.04	0.003
PAN1	238.2315	46.3078	1732	-0.48	1.50	-0.79	0.67	0.68	8.06	0.001

PAUL	240.9685	45.4989	750	-1.22	1.00	-0.95	0.20	0.22	1.85	0.028
PCOL	237.4292	47.1721	79	2.66	3.74	-1.36	0.19	0.20	0.49	0.001
PETE	237.0309	44.5102	413	1.88	5.71	6.44	0.64	0.78	5.55	-0.176
PIBU	238.7168	44.0606	1241	-1.45	2.75	-0.97	0.42	0.49	2.06	-0.085
PKDL	238.4363	45.5183	511	1.07	2.97	-1.20	0.57	0.58	1.35	0.003
PKWD	238.3230	46.5998	306	1.26	2.85	-3.49	0.27	0.28	1.04	0.003
PLDX	237.3191	47.9264	0	3.08	2.22	1.56	0.46	0.67	34.43	-0.020
PLMR	242.1786	45.7691	1230	-1.16	-0.24	-0.38	0.31	0.39	1.38	-0.014
PLNW	239.3590	47.7481	693	-0.10	0.66	-1.21	0.21	0.23	3.25	0.031
PLSB	237.3703	47.7297	92	3.52	3.15	-2.53	0.61	0.74	2.51	-0.124
PLUD	237.3175	47.9216	0	3.08	2.23	1.55	0.46	0.67	34.43	-0.020
PNAZ	243.0559	44.1193	635	-2.66	0.46	0.82	0.39	0.48	1.76	-0.063
PNDL	241.2085	45.6696	315	-0.61	0.37	-4.80	0.37	0.38	5.29	0.006
PNFD	237.7278	47.9078	156	2.48	3.31	-1.88	0.56	0.68	2.33	-0.004
POME	242.3683	46.4799	551	-0.66	0.13	-1.38	0.28	0.25	0.89	0.005
POND	238.4500	45.7109	80	0.35	3.62	-2.38	0.19	0.22	0.84	0.001
POTA	240.7178	44.9746	745	-1.50	0.83	0.60	0.24	0.27	0.99	0.007
PRDY	237.3905	47.3914	82	2.80	3.18	-1.65	0.26	0.17	0.76	0.000
PRIN	239.1350	44.3013	951	-1.10	2.31	-2.91	0.18	0.20	0.70	-0.016
PRSC	237.0755	46.0401	340	2.05	6.60	-4.87	0.79	0.79	2.89	-0.091
PRSR	240.2092	46.2157	197	-0.43	1.33	-5.85	0.32	0.27	8.01	0.007
PTS5	237.2799	46.5327	134	3.03	4.99	0.25	0.60	0.71	2.66	-0.118
PTSN	240.3902	45.9392	118	-0.84	1.12	-1.37	0.30	0.30	1.18	0.007
PUMP	239.5406	46.3157	218	0.14	1.81	-3.41	0.17	0.19	14.05	0.030
QG15	237.1123	47.8368	11	3.58	4.59	-2.15	1.23	1.18	16.23	0.085
QMAR	239.0344	47.7751	812	1.21	1.40	-0.54	0.18	0.19	0.92	-0.004
QURY	239.4549	47.1868	1474	0.72	1.28	3.47	0.24	0.27	19.72	0.220
R378	239.7444	48.5082	566	-1.98	2.66	0.91	0.95	0.52	1.83	-0.012
R409	242.7510	45.9288	1270	-1.00	-0.19	0.25	0.38	0.44	1.59	-0.059
R489	242.5427	44.5776	782	-2.21	0.25	-1.34	0.33	0.41	1.42	-0.030
R502	240.9146	46.3644	141	-0.70	0.67	-2.00	0.49	0.27	0.92	0.001
RDP2	238.1790	45.9349	1493	1.19	3.66	-2.05	0.41	0.42	3.68	-0.000
REDM	238.8521	44.2598	919	-1.29	2.65	-2.12	0.09	0.08	0.38	0.001
REFL	238.2720	46.7683	1464	1.50	4.16	1.05	0.54	0.74	2.88	-0.025
RICH	240.7223	46.2774	99	-0.56	0.90	-1.81	0.20	0.20	0.68	0.003
RKBU	237.4340	45.5467	163	0.88	5.39	0.56	0.24	0.28	4.56	-0.080
RMDB	238.8521	44.2598	919	-1.29	2.65	-2.12	0.09	0.08	0.38	0.001
RNDE	242.7605	46.0455	581	-0.96	-0.68	-1.70	0.30	0.73	1.29	0.030
ROWE	238.6955	45.6801	211	0.38	2.89	1.16	0.15	0.16	3.82	0.003
RPT1	237.6252	47.3875	0	2.56	3.44	-0.95	0.23	0.27	0.66	-0.002
RSLK	238.9303	48.7333	476	5.93	0.73	19.96	1.78	1.88	78.12	-0.310
RSRG	240.4104	46.3914	1053	0.07	1.03	-3.30	0.34	0.36	19.25	0.002
S262	242.9505	46.4259	217	-0.29	-0.81	1.76	0.60	0.74	2.62	-0.081
S389	239.9302	48.1574	363	0.03	0.99	-2.05	0.44	0.56	1.98	0.020
S408	243.2019	44.4449	938	-2.22	-0.12	-0.87	0.31	0.37	1.31	-0.067
S509	241.2872	47.7607	638	-0.48	0.49	-2.38	0.29	0.40	1.25	0.052
SAD2	240.3288	46.8136	779	-0.13	0.95	-2.69	0.23	0.24	16.41	0.009
SANM	238.0511	44.4341	1116	-0.25	3.29	-0.06	0.42	0.50	2.23	-0.058
SAT3	240.6622	47.1852	347	-0.83	1.01	-3.13	0.16	0.18	16.54	-0.012
SBRK	240.8830	47.8670	499	-0.09	-0.10	-1.98	0.25	0.30	11.72	-0.014
SC00	239.2754	46.9509	1178	0.18	1.54	-1.99	0.21	0.17	0.61	0.001
SCHO	237.1245	47.8242	0	4.58	3.77	0.06	0.45	0.48	1.09	0.008
SCOL	243.4537	46.5149	381	-1.02	0.25	-2.59	1.08	1.62	4.99	0.054
SDRO	237.7720	48.5076	0	1.97	3.03	3.28	0.81	1.04	3.62	-0.098
SEAT	237.6905	47.6540	44	2.60	2.99	-1.94	0.16	0.15	0.45	0.001
SEDR	237.7762	48.5216	29	1.95	2.20	-1.81	0.15	0.14	0.48	0.002
SEDR	237.7762	48.5216	29	2.92	2.49	-1.49	0.55	0.56	1.56	0.008
SHKO	239.0535	44.9204	961	-0.70	2.29	-2.15	0.17	0.15	0.52	-0.004
SHPK	239.5228	46.6024	292	0.12	1.65	-3.42	0.18	0.21	0.72	0.040
SINK	238.2243	44.0232	1647	-0.91	-0.43	6.57	3.09	2.09	7.96	-0.015
SIST	238.4441	44.3057	946	-0.78	2.96	-2.59	0.33	0.40	1.96	-0.092
SKMA	238.1160	45.6942	43	1.95	3.47	-3.84	0.32	0.45	1.16	0.003
SKOO	243.8266	45.7488	1403	-0.84	0.17	-3.45	0.37	0.46	1.59	-0.014
SKYO	238.8721	44.6339	662	-0.92	2.03	-3.13	0.71	0.98	5.09	-0.092
SMLT	243.8245	47.5459	667	-0.70	-0.23	-6.39	0.51	0.63	2.21	-0.058
SNOQ	238.6117	47.3913	770	0.76	2.66	-1.43	0.23	0.24	1.04	-0.004
SPIL	238.6998	46.8729	1029	1.02	2.49	2.13	0.75	0.85	3.39	-0.173

SPN1	242.5763	47.5184	719	-0.48	0.13	-1.28	0.12	0.13	0.47	0.003
SPN5	242.5763	47.5184	720	-0.48	0.13	-1.28	0.12	0.13	0.47	0.003
SPN6	242.5766	47.5184	720	-0.48	0.13	-1.28	0.12	0.13	0.47	0.003
SPOO	237.8360	47.4008	140	2.27	3.45	-2.38	0.57	0.74	10.07	-0.122
SPR4	238.8629	46.2269	1535	0.65	2.27	-2.05	0.26	0.29	1.12	-0.011
SPRG	242.0247	47.3099	600	-0.62	0.34	-1.71	0.19	0.20	0.66	0.004
SPRO	237.1259	45.2694	129	2.06	5.53	-0.82	0.18	0.19	0.66	-0.003
STAR	240.0575	48.5281	2047	-0.08	-0.77	19.44	0.38	0.46	58.11	0.038
STAY	237.1791	44.8307	110	1.83	5.25	-0.05	0.20	0.18	0.99	0.001
STEV	238.1172	45.6922	10	0.55	3.76	-3.20	0.19	0.22	1.83	-0.053
STHM	237.2658	44.3962	144	1.27	5.44	-1.91	0.29	0.34	0.78	0.000
STOL	238.3303	45.3045	1269	0.40	3.39	1.47	0.54	0.73	2.48	0.026
STON	240.9374	45.0036	783	-1.55	1.36	-3.50	0.38	0.45	1.70	-0.118
STVP	238.9080	47.7511	1369	0.76	1.96	0.70	0.36	0.50	1.63	-0.093
STWD	237.6520	48.2393	0	2.26	3.85	-11.09	0.75	0.92	3.93	-0.057
SUCI	237.1155	48.7482	0	2.36	4.52	-1.74	1.07	1.11	4.71	0.002
SUNR	238.3579	46.9135	1925	-1.64	2.29	5.65	3.33	2.46	10.61	-0.163
T408	243.1879	44.4398	996	-2.96	0.55	-0.76	0.85	0.90	1.48	-0.008
TAUN	240.6793	46.7747	559	0.19	0.84	-2.14	0.17	0.18	0.68	0.017
TDLS	238.8705	45.6077	25	1.07	2.81	-2.81	0.25	0.29	0.64	0.001
TERH	239.5495	46.6264	540	0.12	1.39	-3.30	0.33	0.33	4.79	0.001
THNR	237.7102	47.1025	140	2.25	3.77	-1.92	0.22	0.22	0.65	0.004
THUN	237.7115	47.1058	142	2.25	3.77	-1.92	0.22	0.22	0.65	0.004
TIGR	238.0149	47.5086	816	1.80	2.86	-0.16	0.71	0.85	2.97	-0.031
TIMB	238.2881	45.3340	1848	1.03	2.99	-1.56	0.25	0.28	0.66	-0.029
TNSK	240.5484	48.6943	261	0.42	0.34	-0.75	0.77	1.03	3.34	-0.040
TOP5	239.3894	46.2841	853	-1.46	1.30	16.16	2.11	2.02	107.40	-0.050
U701	242.4175	44.2586	897	-2.77	1.17	-0.94	0.95	0.70	1.23	0.052
U73H	239.7824	44.6306	635	-0.98	2.03	-3.93	0.22	0.25	0.89	0.049
UKIH	241.0422	45.1377	992	-1.23	1.08	-0.47	0.26	0.30	1.01	-0.012
V362	243.2272	46.4689	232	-0.81	0.57	-0.59	0.66	0.92	2.97	-0.023
VERT	243.6968	45.5657	476	-1.54	-0.00	-1.91	0.44	0.53	1.97	0.156
VIDA	237.4294	44.1456	220	0.52	5.03	-1.94	0.35	0.41	1.74	-0.045
VNTG	240.0328	47.0244	352	0.10	0.98	-2.79	0.24	0.29	12.77	-0.003
VOOM	243.5281	44.5985	858	-2.16	-0.53	-0.98	0.35	0.47	1.55	0.003
VRNT	240.2680	46.6369	115	-0.11	0.93	-3.14	0.25	0.29	1.19	0.006
WAMC	238.7264	45.2238	527	0.48	2.38	-0.56	0.23	0.23	0.84	0.005
WDBN	237.1299	45.1709	39	2.76	5.41	-5.96	0.20	0.19	0.88	0.001
WENA	239.4711	46.8397	1080	0.29	1.72	-2.38	0.21	0.24	0.82	0.000
WEPT	237.3359	48.4019	0	3.90	3.23	15.58	0.54	0.63	79.22	-0.027
WHC2	240.1912	44.5515	1016	-1.16	1.42	-0.08	0.32	0.39	1.34	-0.002
WHD1	237.3039	48.3127	13	3.58	3.79	-2.63	0.26	0.34	0.57	0.001
WHEY	237.9651	45.3762	301	0.24	4.49	-2.35	0.20	0.25	1.08	0.003
WHSW	239.4142	46.3608	233	2.48	1.90	-12.58	0.87	1.14	4.46	0.034
WILL	237.8322	52.2369	1095	-1.43	0.19	1.17	0.13	0.11	0.59	0.004
WNTH	239.8270	48.4632	523	0.60	1.33	-2.42	0.39	0.28	0.95	0.010
WOPL	237.2323	48.1401	58	3.30	3.30	-0.40	0.71	0.67	1.43	-0.013
WORD	237.2319	48.1408	60	3.30	3.30	-0.40	0.71	0.67	1.43	-0.013
WORD	237.2319	48.1408	60	3.32	3.37	0.92	1.13	1.09	2.17	-0.008
WSKY	237.4966	48.6558	0	2.22	1.40	20.73	0.81	0.51	56.49	0.027
WWWA	241.7175	46.0883	339	-0.77	-0.15	-2.21	0.38	0.45	1.79	-0.013
Y100	241.2585	46.7961	358	-0.37	1.13	-1.75	0.39	0.43	5.53	-0.005
Y109	238.8652	45.2333	356	-0.26	2.48	-2.54	0.20	0.22	0.79	0.004
Y27X	243.5578	44.7521	887	-0.91	-0.03	-3.11	0.59	0.76	2.53	0.000
Y405	243.7087	45.6564	472	-0.93	0.04	-2.92	0.27	0.33	1.13	-0.053
Y502	238.6336	44.8226	774	-0.33	2.90	-2.58	0.19	0.22	0.77	-0.021
YAKI	239.4949	46.6050	323	0.79	1.77	-2.81	0.31	0.32	0.87	0.004
YALE	237.6819	46.0262	129	0.52	3.87	2.03	0.34	0.39	2.12	-0.074
YAWA	239.4949	46.6050	323	-0.05	1.63	-1.70	0.23	0.24	0.89	-0.002
YELM	237.3943	46.9487	81	2.63	4.05	-1.42	0.28	0.34	197.40	-0.023
YIN2	239.3910	46.3035	338	-1.60	1.83	-7.49	2.67	2.93	23.96	-0.003
Z231	242.6671	47.9693	524	-0.03	-0.07	-0.95	1.35	1.68	6.59	-0.088
Z264	242.1125	48.5415	550	-0.05	-0.06	-3.16	0.36	0.42	1.52	-0.041
Z28X	243.1104	44.3427	784	-4.10	2.34	0.53	1.47	0.84	1.44	-0.002