Technical Document

An Example of Reusing HealthWebMapper: Southern California Cancer Geospatial Modelling Viewer

Project conducted by:
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Abstract

This report introduces how to reuse the source code of "HealthWebMapper" a web-based health data mapping tool developed by Dr. Su to visualize cancer GWR modelling results. The procedure mentioned in this report is similar to the tutorial in Dr. Su's technical report (Web-based Health Data Mapping Tools for San Diego County) about how to reuse the source code for new dataset (p.12-18) but contains differences in details. Thus, this report serves as a unique reuse case for visualizing cancer GWR modelling results.

Part 1 Raw data Description

1. Sounthern_CA_WGS84 shapefiles(including dbf,prj,sbn,sbx,shp,shp.xml,shx)(Fig.1)

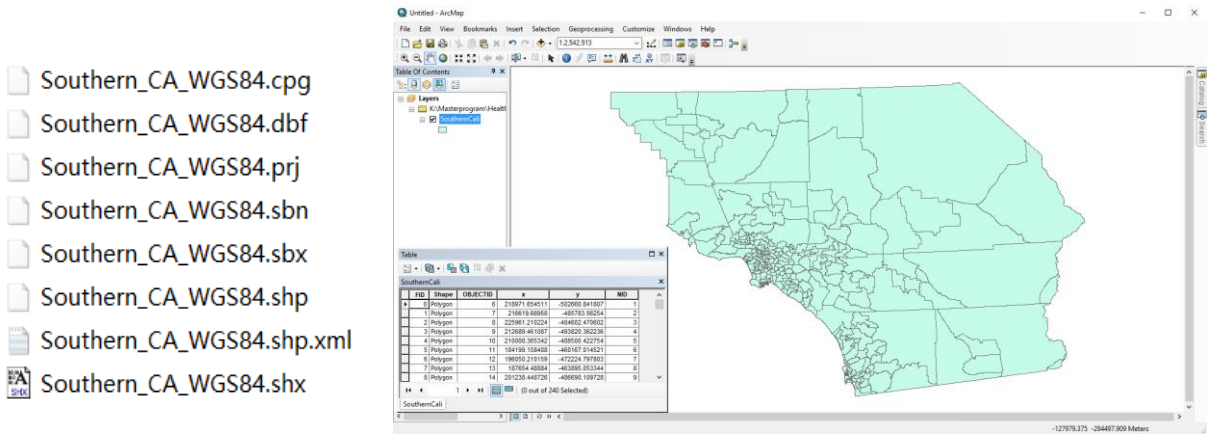


Fig. 1 SounthernCalifornia shapefiles and open it in ArcMap

If your original shpfiles projection is not WGS 1984, you need to transform your data following ArcMap→ArcToolBox→Data→Management Tools→Projections and Transformations→Project (see Fig. 4)

2. Raw data for the left map: Brst_ISMR_GWR_cancer_results.csv and Crcm_ISMR_GWR_results.csv (Fig.2)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	OBJECTID	MSSA_ID	Observed	Cond	LocalR2	Predicted	Intercept	C1_BR	C2_HR	C3_AFFL	C4_SInS	C5_SPoD	Residual	StdError	StdErr_Int	StdErrC1_I	StdErrC2_I	StdErrC3_/	StdErrC4_S	StdErrC5_S	StdResid	tValC1	tValC2
2	6	115.1	0.643545	12.35146	0.131369	0.840833	0.963505	-2.09292	-0.08831	-0.06235	0.045653	-0.07666	-0.19729	0.182346	0.245974	4.065676	0.475805	0.068987	0.100239	0.088172	-1.08195	-0.51478	-0.1856
3	7	115.2a	0.819988	14.75317	0.176117	0.817084	0.979131	-3.28764	0.025574	-0.08073	0.076718	-0.09276	0.002905	0.211737	0.246216	3.52892	0.509573	0.069762	0.114767	0.086829	0.013718	-0.93163	0.050187
4	8	115.2b	0.99517	13.2473	0.154422	0.830272	0.99663	-2.59478	-0.05538	-0.07673	0.041678	-0.09749	0.164898	0.188789	0.22782	2.421524	0.476883	0.063584	0.095484	0.077599	0.873451	-1.07155	-0.11612
5	9	115.2c	0.695791	13.5029	0.16247	0.750885	0.932172	-1.43077	0.008304	-0.07416	0.086173	-0.06956	-0.05509	0.187647	0.238034	3.218786	0.477154	0.071255	0.107224	0.079789	-0.29361	-0.44451	0.017403
6	10	115.2d	1.055926	15.54385	0.188064	0.912768	0.885723	-0.88428	0.109722	-0.08106	0.127353	-0.05798	0.143158	0.191393	0.243951	2.366702	0.519624	0.069927	0.128204	0.074197	0.747983	-0.37363	0.211156
7	11	116a	0.632243	16.43286	0.3288	0.845954	0.67822	1.617606	0.131192	0.030362	0.096877	0.046275	-0.21371	0.217863	0.243059	0.886752	0.361073	0.072835	0.126243	0.090495	-0.98094	1.824193	0.363339
8	12	116b	0.53453	16.83481	0.233897	0.565459	0.909288	1.105666	-0.01029	-0.06567	0.07511	-0.07503	-0.03093	0.120656	0.278083	1.235575	0.464633	0.069267	0.146179	0.111356	-0.25634	0.89486	-0.02214
9	13	116c	0.884676	16.40485	0.282069	0.796114	0.772185	1.57858	0.061589	0.007299	0.069113	-0.00927	0.088562	0.216007	0.270003	1.039183	0.392966	0.077563	0.130147	0.105515	0.409996	1.519059	0.15673
10	14	116d	0.784396	18.11728	0.243616	0.717775	0.856747	0.487475	0.157373	-0.0779	0.133097	-0.06901	0.066621	0.166504	0.300963	1.468865	0.600539	0.06823	0.183464	0.107295	0.400117	0.331872	0.262053
11	15	116e	0.818367	15.93673	0.359102	0.897997	0.678545	1.578915	0.172854	0.040321	0.086497	0.026081	-0.07963	0.207704	0.238071	0.761873	0.373151	0.063585	0.123292	0.083461	-0.38338	2.072412	0.463229
12	16	116f	0.829719	16.57971	0.250998	0.772213	0.778681	1.509851	-0.00371	-0.03809	0.132128	0.042224	0.057506	0.194578	0.268968	1.271063	0.388344	0.085142	0.143818	0.115209	0.295542	1.187865	-0.00955
13	17	116g	0.578078	17.31772	0.245621	0.737966	0.920054	1.024858	0.006956	-0.07056	0.076372	-0.08735	-0.15989	0.186558	0.287834	1.302348	0.50794	0.068551	0.158565	0.113775	-0.85704	0.786931	0.013695
14	18	116h	1.148413	17.5096	0.229469	0.824	0.918909	0.735021	0.008273	-0.08509	0.103679	-0.06915	0.324414	0.215852	0.283099	1.446593	0.505695	0.070162	0.154725	0.108957	1.502942	0.508105	0.016361
15	19	116i	0.700043	16.23548	0.238034	0.746118	0.846565	1.212662	0.021277	-0.03087	0.068075	-0.0479	-0.04607	0.202282	0.262384	1.011805	0.417919	0.06488	0.134658	0.10051	-0.22777	1.198514	0.050913
16	20	116j	0.921065	16.73001	0.253284	0.859088	0.84177	1.16016	0.05028	-0.02459	0.06426	-0.05696	0.061977	0.204775	0.273511	1.002785	0.471825	0.060952	0.150113	0.100098	0.302657	1.156938	0.106565
17	21	116k	0.933522	17.43585	0.302905	0.772983	0.762405	1.556772	-0.01601	-0.05443	0.175107	0.079232	0.16054	0.214865	0.252044	1.418991	0.363794	0.089677	0.158928	0.11413	0.747164	1.097097	-0.04401
18	22	116l	0.824095	16.40362	0.234853	0.760383	0.818152	1.436252	0.000662	-0.03089	0.086887	-0.01201	0.063712	0.210964	0.271773	1.127807	0.3946	0.078696	0.129135	0.107985	0.302003	1.273491	0.001677
19	23	116m	0.738618	18.52799	0.287689	0.738398	0.929418	0.548982	-0.09806	-0.13641	0.212146	0.028135	0.00022	0.17078	0.296727	2.508006	0.442574	0.08378	0.147443	0.107477	0.001286	0.218892	-0.22156
20	24	116n	0.783283	18.90268	0.258173	0.761621	0.928042	-1.24534	0.060758	-0.12758	0.194398	-0.0203	0.021662	0.188313	0.277209	2.683035	0.499246	0.066238	0.149589	0.099217	0.11503	-0.46415	0.1217
21	25	116o	0.811905	18.79241	0.247067	0.804921	0.889418	-0.15874	0.130385	-0.09572	0.150104	-0.06197	0.006984	0.197008	0.299344	1.995078	0.604949	0.070486	0.181188	0.104875	0.035452	-0.07957	0.215531
22	26	116p	0.851689	17.38237	0.243843	0.796457	0.891151	0.928531	0.041864	-0.05661	0.075979	-0.08135	0.055232	0.180237	0.28854	1.1748	0.529762	0.063865	0.165356	0.107404	0.306443	0.790374	0.079024
23	27	116q	0.95048	16.5544	0.20427	0.812683	0.872947	1.256801	-0.03801	-0.07208	0.108134	-0.02323	0.137797	0.211596	0.274097	1.376451	0.418088	0.078176	0.13166	0.107952	0.651226	0.913073	-0.09091
24	28	116r	0.948507	16.22617	0.245121	0.760269	0.829239	1.343584	0.023984	-0.02313	0.068302	-0.03715	0.188238	0.214237	0.265303	1.029819	0.404169	0.069064	0.130595	0.102731	0.878641	1.30468	0.05934
25	29	116s	0.684242	16.22342	0.287696	0.765037	0.779775	1.359121	0.093962	0.003886	0.068212	-0.02789	-0.08079	0.186825	0.260066	0.906037	0.423676	0.061416	0.136052	0.093957	-0.43246	1.500073	0.221777
26	30	116t	0.79974	17.19171	0.254762	0.842998	0.83092	1.098125	0.060509	-0.02046	0.066367	-0.05284	-0.04326	0.193353	0.283093	0.962731	0.514485	0.058577	0.160438	0.097315	-0.22373	1.140635	0.11761
27	31	116u	0.843056	16.40206	0.356431	0.870311	0.710678	1.468004	0.164733	0.032077	0.077529	-0.00019	-0.02726	0.194544	0.256516	0.781203	0.427912	0.059913	0.136701	0.088635	-0.1401	1.879158	0.38497
28	32	116v	0.547243	18.07529	0.228565	0.796805	0.956623	-2.36753	0.08067	-0.10354	0.135133	-0.07203	-0.24956	0.208226	0.27005	3.015101	0.574082	0.066942	0.149642	0.086509	-1.19852	-0.78523	0.14052
29	33	128	0.90799	15.66248	0.47027	0.889166	0.768946	1.507015	-0.12306	-0.16226	0.159136	-0.18621	0.018824	0.124787	0.182549	1.842531	0.250235	0.059464	0.049551	0.239627	0.150849	0.817905	-0.49178
30	34	129.1	0.763374	16.20083	0.298812	0.934713	0.885122	0.283896	-0.24244	-0.14621	0.135893	-0.21495	-0.17134	0.182325	0.240328	1.574596	0.371979	0.057923	0.043964	0.257386	-0.93974	0.180298	-0.65176
31	35	129.2	0.745056	15.84267	0.525798	0.880541	0.813967	0.908463	-0.27097	-0.17111	0.171286	-0.33063	-0.13549	0.185578	0.233408	1.498424	0.333969	0.057327	0.042813	0.249707	-0.73007	0.606279	-0.81136

Fig.2 GWR_cancer_ism.csv showed in EXCEL, containing MSSA_ID, cotaining Breast Cancer data and highlight desired columns

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
OBJECTID	MSSA_ID	Observed	Cond	LocalR2	Predicted	Intercept	C1_BR	C2_HR	C3_AFFL	C4_SInS	C5_SPoD	Residual	StdError	StdErr_Int	StdErrC1_I	StdErrC2_I	StdErrC3_I	StdErrC4_S	StdErrC5_S	StdResid	tValC1	tValC2
6	115.1	0.76957	12.35146	0.361578	1.036797	1.026964	-0.71453	0.679736	-0.07707	-0.01159	-0.14786	-0.26723	0.357047	0.481636	7.960903	0.931663	0.135081	0.196276	0.172648	-0.74843	-0.08975	0.729594
7	115.2a	0.991213	14.75317	0.364581	0.918048	1.392961	-2.07506	-0.09902	-0.08745	-0.18363	-0.18367	0.073164	0.414597	0.48211	6.909892	0.997782	0.136599	0.224722	0.170018	0.176471	-0.3003	-0.09924
8	115.2b	1.177687	13.2473	0.397598	0.948955	1.106912	-1.94375	0.477268	-0.05238	-0.09307	-0.18447	0.228732	0.369662	0.446088	4.741529	0.933773	0.124502	0.186965	0.151945	0.618759	-0.40994	0.511119
9	115.2c	0.59813	13.5029	0.346007	0.830537	1.247541	-0.45922	0.188214	-0.09706	-0.09625	-0.15308	-0.23241	0.367427	0.466089	6.302627	0.934305	0.139523	0.209954	0.156233	-0.63252	-0.07286	0.201448
10	115.2d	0.908813	15.54385	0.351068	1.086877	1.480535	0.820935	-0.42003	-0.09079	-0.25152	-0.17204	-0.17806	0.374761	0.477674	4.634182	1.017464	0.136923	0.251033	0.145284	-0.47514	0.177148	-0.41282
11	116a	1.615536	16.43286	0.069618	1.350539	1.466408	1.480173	-0.09694	-0.01118	-0.18613	-0.1795	0.264998	0.426592	0.475929	1.736327	0.707008	0.142616	0.247193	0.177196	0.621196	0.852474	-0.13711
12	116b	1.169095	16.83481	0.363486	1.199283	2.015611	2.61101	-1.1554	-0.13145	-0.52249	-0.38429	-0.03019	0.236253	0.544508	2.419349	0.909786	0.135629	0.286229	0.218043	-0.12778	1.07922	-1.26997
13	116c	1.357452	16.40485	0.139715	1.298542	1.741024	1.762623	-0.53569	-0.07417	-0.32925	-0.29654	0.05891	0.422959	0.528686	2.034798	0.769458	0.151875	0.254838	0.206606	0.139281	0.86624	-0.69619
14	116d	0.824714	18.11728	0.418348	0.832619	1.923455	2.971886	-1.21444	-0.09969	-0.55429	-0.34035	-0.00791	0.326027	0.589309	2.876149	1.175902	0.1336	0.359236	0.210093	-0.02425	1.033287	-1.03277
15	116e	1.527404	15.93673	0.187096	1.195665	1.607605	1.575576	-0.21062	-0.00753	-0.31312	-0.28586	0.33174	0.406701	0.466161	1.491805	0.730658	0.124504	0.241414	0.163423	0.815684	1.056154	-0.28826
16	116f	1.349935	16.57971	0.099474	1.316157	1.674921	1.405703	-0.50669	-0.15784	-0.10984	-0.16003	0.033778	0.380998	0.526659	2.488837	0.760406	0.166715	0.281607	0.225588	0.088656	0.564803	-0.66635
17	116g	1.266494	17.31772	0.409506	1.35569	2.073785	2.889713	-1.31751	-0.12568	-0.5823	-0.4002	-0.0892	0.365294	0.5636	2.550097	0.994584	0.134229	0.310482	0.222781	-0.24418	1.133178	-1.32468
18	116h	1.305977	17.5096	0.391564	1.253252	2.019484	2.867826	-1.31092	-0.12803	-0.53621	-0.34494	0.052725	0.422655	0.554329	2.832538	0.990189	0.137382	0.302964	0.213345	0.124746	1.012458	-1.32391
19	116i	1.785398	16.23548	0.29922	1.330596	1.917703	1.981558	-0.87225	-0.11062	-0.46298	-0.37725	0.454802	0.396083	0.513768	1.98119	0.818317	0.12704	0.26367	0.196806	1.14825	1.000186	-1.06591
20	116j	0.888545	16.73001	0.381891	0.958324	2.014295	2.243256	-1.08288	-0.09979	-0.55918	-0.41677	-0.06978	0.400965	0.535555	1.963529	0.923869	0.119348	0.293933	0.195999	-0.17403	1.142461	-1.17212
21	116k	1.137097	17.43585	0.080798	1.276273	1.625568	1.304387	-0.38251	-0.1785	0.00411	-0.12893	-0.13918	0.420722	0.493522	2.778493	0.712336	0.175593	0.311193	0.223476	-0.3308	0.469459	-0.53697
22	116l	0.865114	16.40362	0.161024	1.335814	1.789248	1.685276	-0.65453	-0.13117	-0.2955	-0.28058	-0.4707	0.413083	0.532152	2.208331	0.772658	0.154093	0.252855	0.211444	-1.13948	0.763144	-0.84712
23	116m	1.156147	18.52799	0.291987	0.923092	1.992789	-0.23498	-0.97153	-0.26929	-0.09972	-0.19584	0.233055	0.334401	0.581013	4.910866	0.866594	0.164048	0.288704	0.210448	0.696932	-0.04785	-1.12109
24	116n	0.769007	18.90268	0.290802	1.003607	1.860148	-0.48185	-1.09722	-0.12581	-0.35071	-0.19034	-0.2346	0.36873	0.542796	5.253587	0.977562	0.129699	0.292908	0.194274	-0.63624	-0.09172	-1.1224
25	116o	0.457851	18.79241	0.396217	0.885946	1.948619	2.61787	-1.37061	-0.10017	-0.54421	-0.28888	-0.42809	0.385757	0.586139	3.906514	1.184537	0.138018	0.35478	0.205354	-1.10975	0.670129	-1.15709
26	116p	1.519527	17.38237	0.435491	1.488908	2.062215	2.686217	-1.29481	-0.11141	-0.6064	-0.41249	0.030619	0.352918	0.564983	2.300347	1.037313	0.125053	0.32378	0.210305	0.086761	1.167744	-1.24823
27	116q	1.131216	16.5544	0.253632	1.235831	1.879311	2.265801	-0.89829	-0.16646	-0.33071	-0.28387	-0.10461	0.414321	0.536703	2.695196	0.818648	0.153074	0.257801	0.211379	-0.2525	0.840681	-1.09729
28	116r	1.493789	16.22617	0.240529	1.325063	1.875155	1.85806	-0.77252	-0.11154	-0.41146	-0.35476	0.168726	0.419493	0.519483	2.016465	0.791394	0.135232	0.255716	0.201155	0.402215	0.921445	-0.97614
29	116s	1.276381	16.22342	0.302946	1.323417	1.898833	1.898279	-0.79121	-0.07943	-0.47366	-0.38725	-0.04704	0.365817	0.50923	1.774089	0.82959	0.120257	0.2664	0.183975	-0.12858	1.070002	-0.95373
30	116t	0.776807	17.19171	0.43247	0.7918	2.058751	2.289487	-1.19991	-0.09359	-0.60579	-0.42865	-0.01499	0.378599	0.554317	1.8851	1.007401	0.114698	0.314149	0.19055	-0.0396	1.214518	-1.19109
31	116u	0.877349	16.40206	0.328229	1.188658	1.836102	1.746507	-0.60941	-0.04091	-0.45772	-0.38092	-0.31131	0.380931	0.502278	1.529655	0.837884	0.117314	0.267671	0.173553	-0.81723	1.141765	-0.72732
32	116v	1.247408	18.07529	0.358284	0.955394	1.801525	-0.79867	-1.0923	-0.08331	-0.42671	-0.20802	0.292014	0.407723	0.528779	5.903796	1.124096	0.131078	0.293011	0.169391	0.716207	-0.13528	-0.97171
33	128	0.807472	15.66248	0.065199	1.311572	1.132326	1.430385	-0.22028	0.036889	-0.03897	-0.59632	-0.5041	0.244342	0.357445	3.607815	0.489979	0.116435	0.097025	0.469209	-2.06309	0.396469	-0.44956
34	129.1	1.274335	16.20083	0.086452	1.431909	1.804517	-0.80521	-1.02977	-0.07491	-0.0339	0.027789	-0.15757	0.357007	0.47058	3.083179	0.728363	0.113418	0.086084	0.503981	-0.44137	-0.26116	-1.41381
35	129.2	1.707426	15.84267	0.080309	1.258117	1.315422	2.814507	-0.71161	-0.07806	0.070024	-0.49624	0.449309	0.363375	0.457031	2.934028	0.653936	0.112251	0.083831	0.488945	1.23649	0.959264	-1.0882

Fig.3 Crcm_ISMR_GWR_results.csv showed in EXCEL, containing Colorectal Male data and highlight desired columns

Since I only need to column MSSA_ID and Observed in both csv files,remove other collomns and add column “CANCER_TYPE”. Then, organize desired data into one file called “GWR_cancer_ism.csv” with 3 columns and the following 3 headers :

1) “MSSA_ID”: unique ID for each polygon
2) “CANCER_TYPE”: in this cace value is either “Breast Cancer” or “Colorectal Male”
3) “Indirect standardized mortality”: columns named “Observed” in both files

3. Raw data for the right map: socioeconomic.csv

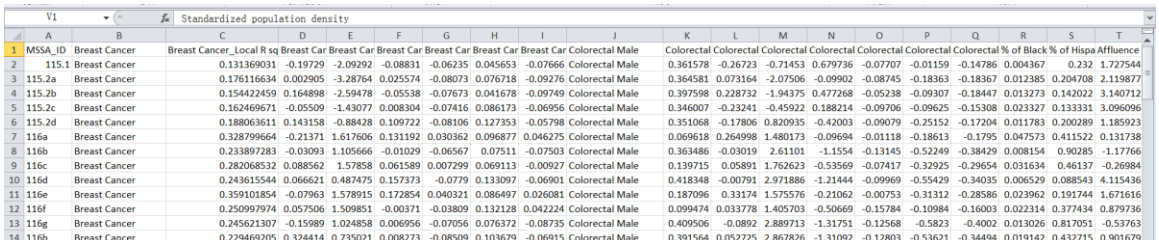


Fig.4 socioeconomic.csv showed in EXCEL

It contains 22 columns, headers are:
"MSSA_ID",
"Breast Cancer",
"Breast Cancer_Local R square",
"Breast Cancer_Residual",

"Breast Cancer_% of Black population",
"Breast Cancer_% of Hispanic population",
"Breast Cancer_Affluence score",
"Breast Cancer_Standardized % of health-insured population",
"Breast Cancer_Standardized population density",
"Colorectal Male",
"Colorectal Male_Local R square",
"Colorectal Male_Residual",
"Colorectal Male_% of Black population",
"Colorectal Male_% of Hispanic population",
"Colorectal Male_Affluence score",
"Colorectal Male_Standardized % of health-insured population",
"Colorectal Male_Standardized population density",
"% of Black population",
"% of Hispanic population",
"Affluence score",
"Standardized % of health-insured population",
"Standardized population density"

Tips: Before you start customzing HealthWebMapper source code for your own dataset, you may have a huge csv file containing all the data. However, you need to first decide which data you want to show in the left or right map, what does the drop-down menu look like. Then, according to your design and original menu sturcture, separate the data into two different csv files for each map and orgnized it. Every csv files should have a header for each column.

Part 2 Conversion of raw data to js. files

In Dr. Su's technical report, the method she adoped to reuse the tool is to "force overwrite of existing identically named objects". Thus, you need to first convert raw data to the formats that match the original data. Coversion procedure showed in Table 1.

Raw data to js files	Original data in HealthWebMapper to be replaced	method
Southern_CA_WGS84.shp to Southern_CA_WGS84.js	Polygon.js or MSSA_SD_Imperial.js	shp to js 1) ArcMap→ArcToolBox→Data Management Tools→Projections and Transformations→Project(see Fig. 4) 2) Convert .shp with WGS 1984 projection to geojson through Mapshaper(http://mapshaper.org/) 3) Edit geojs file by adding "var stateData="and save as .jsfile

GWR_cancer_ism.csv to GWR_cancer_ism.js	Cancer.js or late_stage_dx_SD_Imperial_fake.js	csv to js 1) Convert .cvs to geojson via http://www.convertcsv.com/csv-to-geojson.htm 2) Edit geojson file by adding "var CANCER_SD_Imperical="and save as .js file
socioeconomic.csv to socioeconomic.js	CENSUS2010_v2.js or MSSA_ACS_SD_Imperial_simple.js	csv to js 1) Convert .cvs to geojson via http://www.convertcsv.com/csv-to-geojson.htm 2) Edit geojson file by adding "var census="and save as .js file

Table 1 converstion of raw data to desired js. format

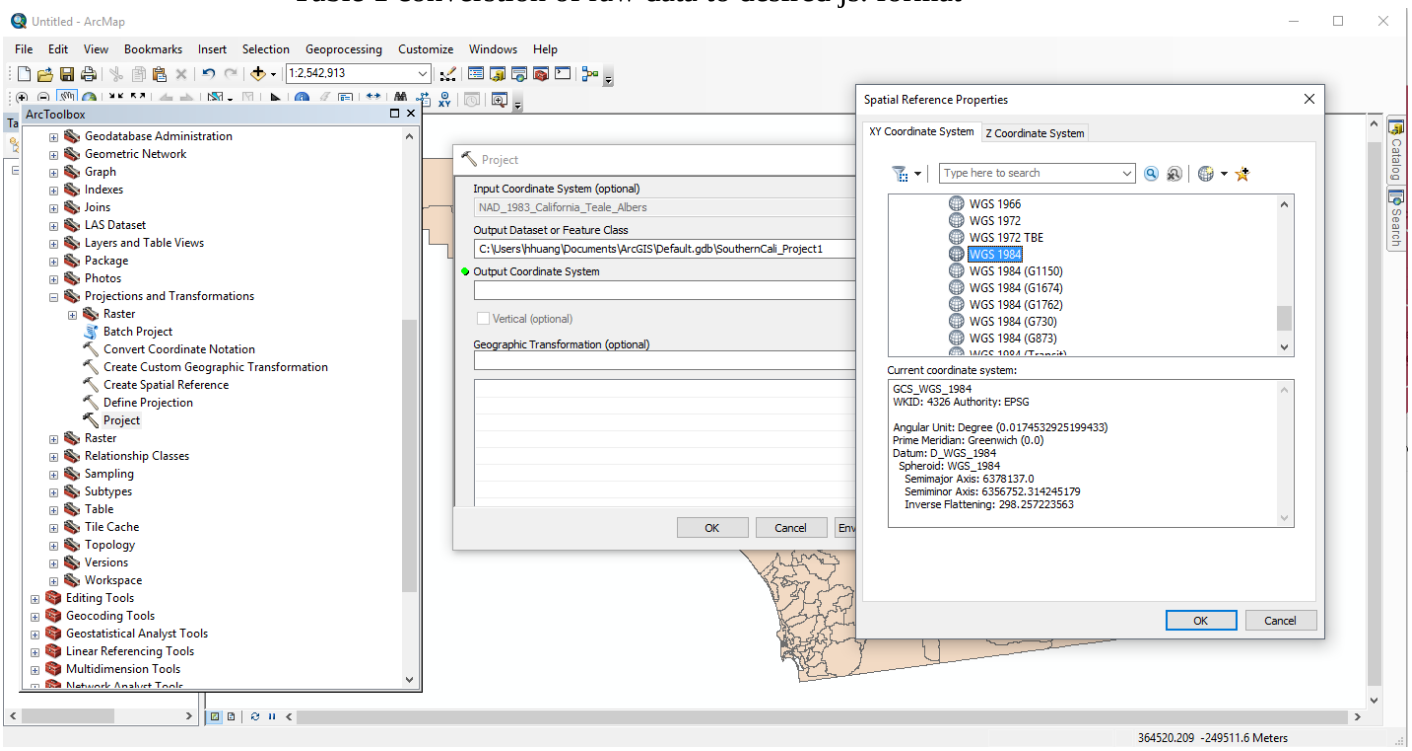


Fig.5 project shapefiles to WGS84 in ArcMap (if you original data projection is not WGS 1984)

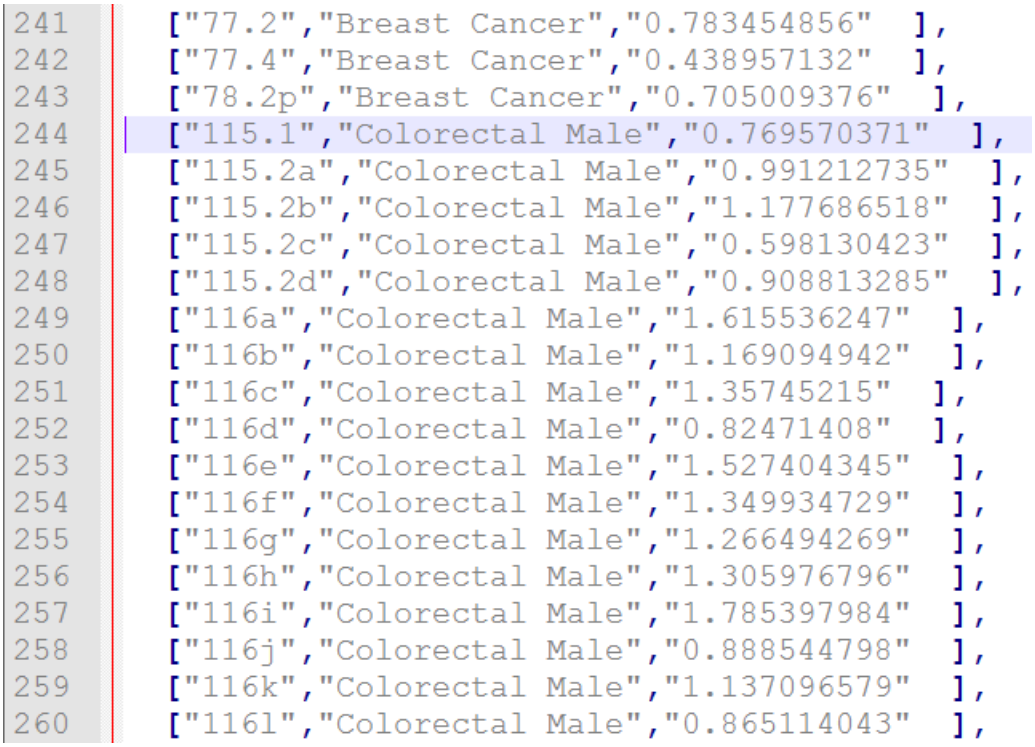
After conversion, the three .js files should look like below:

1) Southern_CA_WGS84.js

Fig.6 Southern_CA_WGS84.js

2) GWR_cancer_ism.js

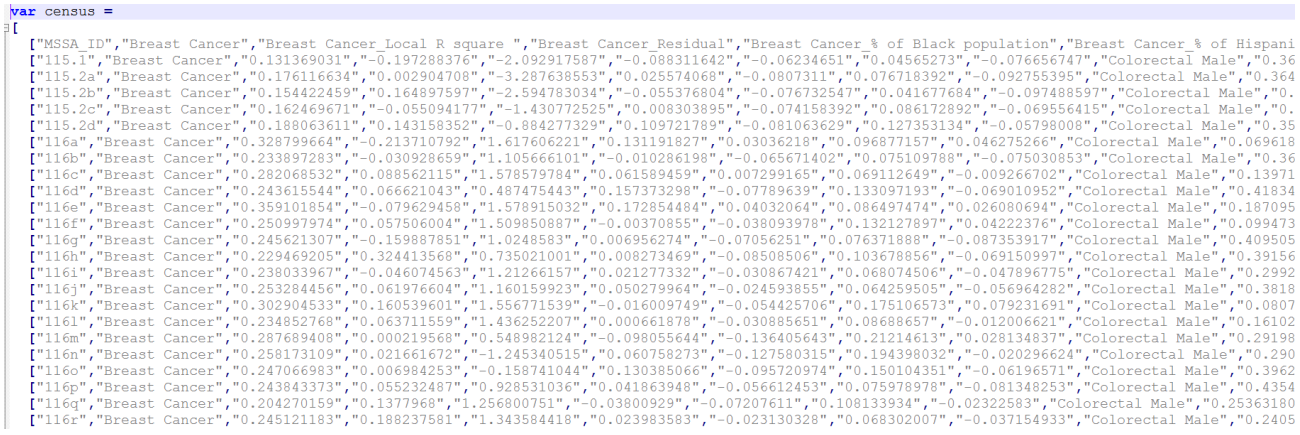
```
var CANCER_SD_Imperical =
[
  ["MSSA_ID","CANCER_TYPE","Indirect standardized mortality"  ]
  ["115.1","Breast Cancer","0.643544863"  ],
  ["115.2a","Breast Cancer","0.819988419"  ],
  ["115.2b","Breast Cancer","0.995169547"  ],
  ["115.2c","Breast Cancer","0.695791179"  ],
  ["115.2d","Breast Cancer","1.055926463"  ],
  ["116a","Breast Cancer","0.63224307"  ],
  ["116b","Breast Cancer","0.534530189"  ],
  ["116c","Breast Cancer","0.884676042"  ],
  ["116d","Breast Cancer","0.784395703"  ],
  ["116e","Breast Cancer","0.818367116"  ],
  ["116f","Breast Cancer","0.82971925"  ],
  ["116g","Breast Cancer","0.578078139"  ],
  ["116h","Breast Cancer","1.148413347"  ],
  ["116i","Breast Cancer","0.700043458"  ],
  ["116j","Breast Cancer","0.92106507"  ],
  ["116k","Breast Cancer","0.933522366"  ],
  ["116l","Breast Cancer","0.824094691"  ],
  ["116m","Breast Cancer","0.738617574"  ],
  ["116n","Breast Cancer","0.783282542"  ],
  ["116o","Breast Cancer","0.811905016"  ],
  ["116p","Breast Cancer","0.851689328"  ],
  ["116q","Breast Cancer","0.950479753"  ],
```



```
241    ["77.2","Breast Cancer","0.783454856"  ],
242    ["77.4","Breast Cancer","0.438957132"  ],
243    ["78.2p","Breast Cancer","0.705009376"  ],
244    ["115.1","Colorectal Male","0.769570371"  ],
245    ["115.2a","Colorectal Male","0.991212735"  ],
246    ["115.2b","Colorectal Male","1.177686518"  ],
247    ["115.2c","Colorectal Male","0.598130423"  ],
248    ["115.2d","Colorectal Male","0.908813285"  ],
249    ["116a","Colorectal Male","1.615536247"  ],
250    ["116b","Colorectal Male","1.169094942"  ],
251    ["116c","Colorectal Male","1.35745215"  ],
252    ["116d","Colorectal Male","0.82471408"  ],
253    ["116e","Colorectal Male","1.527404345"  ],
254    ["116f","Colorectal Male","1.349934729"  ],
255    ["116g","Colorectal Male","1.266494269"  ],
256    ["116h","Colorectal Male","1.305976796"  ],
257    ["116i","Colorectal Male","1.785397984"  ],
258    ["116j","Colorectal Male","0.888544798"  ],
259    ["116k","Colorectal Male","1.137096579"  ],
260    ["116l","Colorectal Male","0.865114043"  ],
```

Fig.7 GWR_cancer_ism.js

3) Socioeconomic.j



```
var census =
[
  ["MSSA_ID","Breast Cancer","Breast Cancer_Local R square ","Breast Cancer_Residual","Breast Cancer_% of Black population","Breast Cancer_% of Hispani
  ["115.1","Breast Cancer","0.131369031","-0.197288376","-2.092917587","-0.088311642","-0.06234651","0.04565273","-0.076656747","Colorectal Male","0.36
  ["115.2a","Breast Cancer","0.176116634","0.002904708","-3.287638553","0.025574068","-0.0807311","0.076718392","-0.092755395","Colorectal Male","0.364
  ["115.2b","Breast Cancer","0.154422459","0.164897597","-2.594783034","-0.055376804","-0.076732547","0.041677684","-0.097488597","Colorectal Male","0.
  ["115.2c","Breast Cancer","0.162469671","-0.055094177","-1.430772525","0.008303895","-0.074158392","0.086172892","-0.069556415","Colorectal Male","0.
  ["115.2d","Breast Cancer","0.188063611","0.143158352","-0.884277329","0.109721789","-0.081063629","0.127353134","-0.05798008","Colorectal Male","0.35
  ["116a","Breast Cancer","0.328799664","-0.213710792","1.617606221","0.131191827","0.03036218","0.096877157","0.046275266","Colorectal Male","0.069618
  ["116b","Breast Cancer","0.233897283","-0.030928659","1.105666101","-0.010286198","-0.065671402","0.075109788","-0.075030853","Colorectal Male","0.36
  ["116c","Breast Cancer","0.282068532","0.088562115","1.578579784","0.061589459","0.007299165","0.069112649","-0.009266702","Colorectal Male","0.13971
  ["116d","Breast Cancer","0.243615544","0.066621043","0.487475443","0.157373298","-0.07789639","0.133097193","-0.069010952","Colorectal Male","0.41834
  ["116e","Breast Cancer","0.359101854","-0.079629458","1.578915032","0.172854484","0.04032064","0.086497474","0.026080694","Colorectal Male","0.187095
  ["116f","Breast Cancer","0.250997974","0.057506004","1.509850887","-0.00370855","-0.038093978","0.132127897","0.04222376","Colorectal Male","0.099473
  ["116g","Breast Cancer","0.245621307","-0.159887851","1.0248583","0.006956274","-0.07056251","0.076371888","-0.087353917","Colorectal Male","0.409505
  ["116h","Breast Cancer","0.229469205","0.324413568","0.735021001","0.008273469","-0.08508506","0.103678856","-0.069150997","Colorectal Male","0.39156
  ["116i","Breast Cancer","0.238033967","-0.046074563","1.21266157","0.021277332","-0.030867421","0.068074506","-0.047896775","Colorectal Male","0.2992
  ["116j","Breast Cancer","0.253284456","0.061976604","1.160159923","0.050279964","-0.024593855","0.064259505","-0.056964282","Colorectal Male","0.3818
  ["116k","Breast Cancer","0.302904533","0.160539601","1.556771539","-0.016009749","-0.054425706","0.175106573","0.079231691","Colorectal Male","0.0807
  ["116l","Breast Cancer","0.234852768","0.063711559","1.436252207","0.000661878","-0.030885651","0.08688657","-0.012006621","Colorectal Male","0.16102
  ["116m","Breast Cancer","0.287689408","0.000219568","0.548982124","-0.098055644","-0.136405643","0.21214613","0.028134837","Colorectal Male","0.29198
  ["116n","Breast Cancer","0.258173109","0.021661672","-1.245340515","0.060758273","-0.127580315","0.194398032","-0.020296624","Colorectal Male","0.290
  ["116o","Breast Cancer","0.247066983","0.006984253","-0.158741044","0.130385066","-0.095720974","0.150104351","-0.06196571","Colorectal Male","0.3962
  ["116p","Breast Cancer","0.243843373","0.055232487","0.928531036","0.041863948","-0.056612453","0.075978978","-0.081348253","Colorectal Male","0.4354
  ["116q","Breast Cancer","0.204270159","0.1377968","1.256800751","-0.03800929","-0.07207611","0.108133934","-0.02322583","Colorectal Male","0.25363180
  ["116r","Breast Cancer","0.245121183","0.188237581","1.343584418","0.023983583","-0.023130328","0.068302007","-0.037154933","Colorectal Male","0.2405
```

Fig.8 Socioeconomic.js

Tips: There is no much difference between csv and js, only js files has [] in each line and all the data is assigned to a variable named after you (e.g. var census = []). Be carful to keep the original variable names because these names are still used in the source code.

Once get these 3 js files, put them into your source code folder, in this case js folder. You can place it wherever you want, but remember to provide the correct directory in you source code.

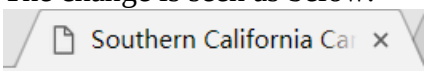
Part 3 Customize source code of HealthWebMapper

Then, you can follow Dr.Su's technical report, she provide step by step procedure about how to reuse the tool illustrated in the example of "San Diego_Imperial_final". The procedure can be summarized as:

1. Change webpage title

```
8       <title>Southern California Cancer Geospatial Modelling Viewer</title>
9
```

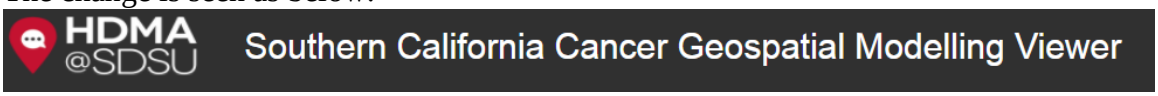
The change is seen as below:



2. Change header title

```
341     <!--HHH CHANGE: title-->
342         <font size="5" color="white">     Southern California Cancer Geospatial Modelling Viewer</font>
343     </div>
```

The change is seen as below:



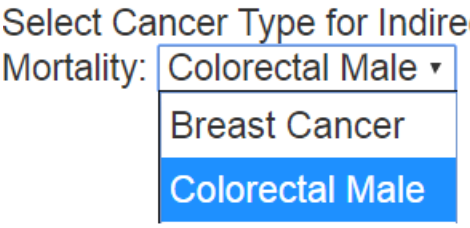
3. Replace js files

```
524     <script type="text/javascript" src="Southern_CA_WGS84.js"></script>
525     <!--script type="text/javascript" src="cancer.js"></script-->
526     <!--script type="text/javascript" src="late_stage_dx_SD_Imperial_fake.js"></script
527     <script type="text/javascript" src="GWR_cancer_ism.js"></script>
528     <script type="text/javascript" src="socioeconomic.js"></script>
529     <script type="text/javascript" src="header_descriptions.js"></script>
530     <script type="text/javascript" src="category_descriptions_master.js"></script>
531     <!--script type="text/javascript" src="MSSA_ACS_SD_Imperial_simple.js"></script-->
532     <!--script type="text/javascript" src="CENSUS2010_v2.js"></script-->
533     <!--script type="text/javascript" src="CENSUS2011_v2.js"></script-->
534     <!--script type="text/javascript" src="CENSUS2012_v2.js"></script-->
535     <!--script type="text/javascript" src="CENSUS2013_v2.js"></script-->
536     <script type="text/javascript" src="NoShown.js"></script>
537     <!--script src="test.js" type="text/javascript"></script-->
```

Southern_CA_WGS84.js replaces *polygon.js*,
GWR_cancer_ism.js replaces *cancer.js*,
socioeconomic.js replaces *CENSUS2011_v2.js* , *CENSUS2011_v2.js and CENSUS2011_v2.js*
Keep other .js files.

4. Change left menu

In the left menu, I want to visualize "Indirect standardized mortality" for both cancer types. The menu should look like below:



1) In the source code, first comment unnecessary “menu_L2” and “menu_L4”

```
<!--        <div id="menu_L2" style="background-color:#ffffff;width:245px;float:left;margin-bottom:0.1cm;">
            <form name="OutcomeSelect" action="">
                <span id="outcome_change">Outcome: </span>
                <select name="outcome" onChange="layerChange1()">
                    <option value="Death">Death</option>
                    <option value="Hospitalization">Hospitalization</option>
                    <option value="ED Discharge">ED Discharge</option>
                </select>
            </form>
        </div> -->

        <div id="menu_L3" style="background-color:#ffffff;width:345px;float:left;margin-bottom:0.1cm;">
            <form name="CaseSelect" action="">
                <span id="case_change">Case: </span>
                <select name="case" id="cancer_case" onChange="layerChange1()">
                </select>
            </form>
        </div>

<!--        <div id="menu_L4" style="background-color:#ffffff;width:250px;float:left;margin-bottom:0.1cm;">
            <form name="YearSelect1" action="">
                <span id="year_change">Year: </span>
                <select name="year1" onChange="layerChange1()">
                    <option value="2010" >2010</option>
                    <option value="2011">2011</option>
                    <option value="2012">2012</option>
                    <option value="2013" selected>2013</option>
                    <option value="Most Up-to-Date" >Most up-to-date</option>
                </select>
            </form>
        </div> -->
```

2) Second, put “display:none;” after menu_L3 and menu 7

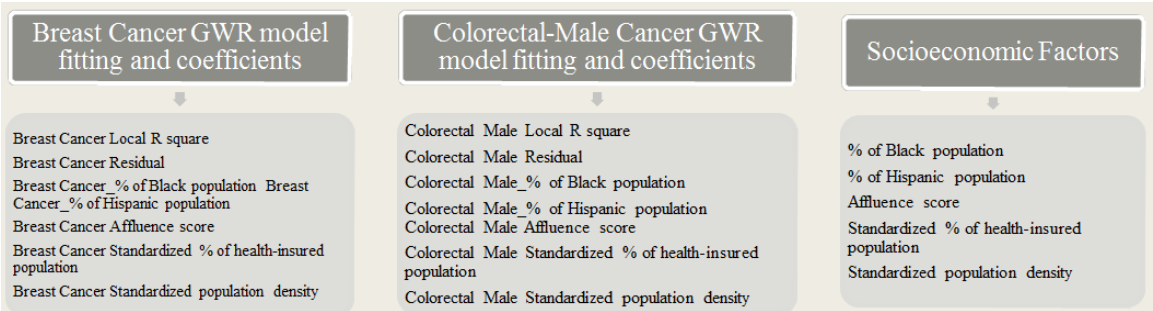
```
        <div id="menu_L3" style="background-color:#ffffff;width:345px;float:left;margin-bottom:0.1cm;display:none;">
            <form name="CaseSelect" action="">
                <span id="case_change">Rate: </span>
                <select name="case" id="cancer_case" onChange="layerChange1()">
                </select>
            </form>
        </div>

<div id="menu_L7" style="background-color:#ffffff;width:180px;float:right; margin-top:0cm;  margin-right:0.9cm; margin-bottom:0.1cm;display:none;" >
    <button type="button" style="font-size:17px;width:200px;" onclick="corrleationAnalysis(dispValue1, dispValue2, allValue1, allValue2, true)">Correl

</div>
```

3) Last, change menu_L1 name to “Select Cancer Type for Indirect Sandardized Mortality”

```
<!-- HHH CHANGE-->
        <div id="menu_L1" style="background-color:#ffffff;width:365px;float:left;margin-bottom:0.1cm;">
            <form name="ConditionSelect" action="">
                <span id="condition_change">Select Cancer Type for Indirect Standardized Mortality: </span>
                <select name="condition" id="cancer_type" onChange="layerChange1()">
                </select>
            </form>
        </div>
```

5. Change right menu

In the right map menu, I group the 21 columns into 3 categories. Then based on your selection in first drop-down menu, the contents in second drop-down menu will change. The selection structure showed as below:



1) First, comment “menu_R2”, then put “display:none;” behind “menu_R3”

```
        <div id="menu_R3" style="background-color:#ffffff;width:300px;float:left;margin-bottom:0.1cm;display:none;">
            <form name="NormalizationSelect" action="">
                <span id="normalization_change">Normalization: </span>
                <select name="normalization" id="normalization_options" onChange="layerChange2()">
                    <option value="none">none</option>
                    <option value="Total Population" selected>Total Population</option>
                    <option value="area">Area</option>
                </select>
            </form>
        </div>

        <!--div id="menu_R2" style="background-color:#ffffff;width:140px;float:left;margin-bottom:0.1cm;">
            <form name="YearSelect2" action="">
                <span id="year_change">Year: </span>
                <select name="year2" onChange="yearChange2()">
                    <option value="2010">2010</option>
                    <option value="2011">2011</option>
                    <option value="2012">2012</option>
                    <option value="2013" selected>2013</option>
                    <option value="Average">Average</option>
                </select>
            </form>
        </div-->
```

2) Then, change names of menu_R0 and menu_R1 to “Select” and “Select Factors” separately.

```
    <div id="input_area_right">
        <div id="menu_R0" style="background-color:#ffffff;margin-bottom:0.1cm;">
            <form name="layerSelect0" action="">
                <span id="layer_change0">Select:</span>
                <select name="ACSdata0" id="ACSdata_SDFgroup" onChange="yearChange2()">
                </select>
            </form>
        </div>

        <div id="menu_R1" style="background-color:#ffffff;margin-bottom:0.1cm;">

            <form name="layerSelect" action="">
                <span id="layer_change">Select Factors: </span>
                <select name="ACSdata" id="ACSdata_options" onChange="layerChange2()">
                </select>
            </form>
        </div>
```

The customized menus looks like below:

Select Cancer Type for Indirect Standardized Mortality: Breast Cancer

Left map menu

Select: Breast Cancer GWR model fitting and coefficients

Select Factors: Breast Cancer_Local R square

Right map menu

6. Force overwrite of existing named objects

1) For Southern_CA_WGS84 data:

First, add the following lines(544-549) after <script…> to the code.

```
        // Force overwrite of existing identically named objects.
        // Polygon data: MSSA_SD_Imperical.js
        var CA = statesData;        // from MSSA_SD_Imperical.js
        for (var j=0; j<CA.features.length; j++) {
            CA.features[j].properties["SRA"] = CA.features[j].properties["MSSA_ID"];
            CA.features[j].properties["SRA_Name"] = CA.features[j].properties["MSSA_ID"]
            //console.log(CA.features[j].properties.SRA + ":  " + CA.features[j].properties.SRA_Name);
        }
```

2) For Cancer data: add the following lines to the code

```
        // Force overwrite of existing identically named objects.
        // Cancer data: late_stage_dx_SD_Imperical.js
        var CANCER = [];        // from late_stage_dx_SD_Imperical.js
       //CANCER.push(["CONDITION","OUTCOME","YEAR","","SRANum","","","","","","","","","case","proportion"]);
        CANCER.push(["CONDITION","OUTCOME","YEAR","","SRANum","","","","","","","","","Indirect standardized mortality"]);
        for (var j=1; j<CANCER_SD_Imperical.length; j++) {
            var col = CANCER_SD_Imperical[j];
            //CANCER.push([col[2],col[1],col[4],"",col[0],"","","","","","","","",col[6],col[7]]);
            //HHH CHANGE
              CANCER.push([col[1],"","","",col[0],"","","","","","","","",col[2]]);
        }
```

3) In "Header_descriptions": add the following code to replace the old header descriptions

```
HEADER_DESCRIPTIONS =
{
    //"2010":["AREA_SQMI","POP","DENTIST","HISPANIC","WHITE","BLACK","NHS_BLACK","ASIAN","AGE_65OVER","AGE_18_64","AGE_UNDER18","AGE_UNDER5"],
    "2010":["MSSA_ID", "Breast Cancer", "Breast Cancer_Local R square", "Breast Cancer_Residual", "Breast Cancer_% of Black population", "Brea
    "2011":[],
    "2012":[],
    "2013":[],
    "Definition":["MSSA_ID",
                  "Breast Cancer",
                  "Breast Cancer_Local R square",
                  "Breast Cancer_Residual",
                  "Breast Cancer_% of Black population",
                  "Breast Cancer_% of Hispanic population",
                  "Breast Cancer_Affluence score",
                  "Breast Cancer_Standardized % of health-insured population",
                  "Breast Cancer_Standardized population density",
                  "Colorectal Male",
                  "Colorectal Male_Local R square",
                  "Colorectal Male_Residual", "Colorectal Male_% of Black population",
                  "Colorectal Male_% of Hispanic population",
                  "Colorectal Male_Affluence score",
                  "Colorectal Male_Standardized % of health-insured population",
                  "Colorectal Male_Standardized population density",
                  "% of Black population",
                  "% of Hispanic population",
                  "Affluence score",
                  "Standardized % of health-insured population",
                  "Standardized population density"
                  ]
}
```

4) For socioeconomic.js for the right map :

```
// Force overwrite of existing identically named objects.
// Census data: CENSUS2010_v2.js
var CENSUS2010 = [];        // from CENSUS2010_v2.js
var CENSUS2011 = [];        // from CENSUS2011_v2.js
var CENSUS2012 = [];        // from CENSUS2012_v2.js
var CENSUS2013 = [];        // from CENSUS2013_v2.js
var CENSUSaverage = [];
//CENSUS2010.push(["Year","SRA Name","SRA Num","Region Num","Region Name","AREA_SQMI","POP","DENTIST","HISPANIC","WHITE","BLACK","NHS_BLACK","ASIAN","A
CENSUS2010.push(["Year","SRA Name","SRA Num","Region Num","Region Name","MSSA_ID", "Breast Cancer", "Breast Cancer_Local R square", "Breast Cancer_Resi
CENSUS2011.push([]);        // no header
CENSUS2012.push([]);        // no header
CENSUS2013.push([]);        // no header
CENSUSaverage.push([]);     // no header
for (var j=1; j<census.length; j++) {
    var col = census[j];
    //CENSUS2010.push(["2010",col[4],col[0],"","",col[6],col[7],col[8],col[9],col[10],col[11],col[12],col[13],col[14],col[15],col[16],col[17]]);
    CENSUS2010.push(["2010",col[0],col[0],"","",col[0],col[1],col[2],col[3],col[4],col[5],col[6],col[7],col[8],col[9],col[10],col[11],col[12],col[13],c
}
```

5) This program does not need to use the function "no show". So two variables below need to be initialized.

```
MUST_REMOVE_SDFs = [];
NO_SHOWNS = [];
```

7. Comment all "selectedOutcom" and "YearSelect1" showed in the following lines. Your can use Ctrl+F to search for "selectedOutcom" and and "YearSelect1" quickly. This step is the result of debugging which is not listed in Dr.Su's technical report,

```
2177 function layerChange1(direction) {
2178
2179     var selectedCondition  = document.ConditionSelect.condition.value;
2180     //var selectedOutcom     = document.OutcomeSelect.outcome.value;
2181     var selectedCase       = document.CaseSelect.case.value;
2182     //var selectedYear       = document.YearSelect1.year1.value;
2183     var classification     = document.classSelect1.classified.value;
2184     var selectedColorNum   = document.colorNumSelect1.colorNum.value;
2185     var selectedClassNum   = document.classNumSelect1.classNum.value;
2186     var classCount         = selectedClassNum * 1;
2187     var colorList          = COLOR_CLASS[selectedColorNum+selectedClassNum];
2188     //alert("selectedCondition: " + selectedCondition);
2189     //alert("selectedOutcom: " + selectedOutcom);
2190     //alert("selectedCase: " + selectedCase);
2191     //alert("selectedYear: " + selectedYear);
2192     //alert("classification: " + classification);
2193     //alert("Color+Class: " + selectedColorNum+selectedClassNum);
2194     //alert(dump(COLOR_CLASS[selectedColorNum+selectedClassNum]));
```

```
2277     // save all cancer type for the correlations
2278     for (var i=1; i<CANCER.length; i++) {
2279         var cols = CANCER[i];
2280         //if (cols[iCondition] != selectedCondition) continue;
2281 //      if (cols[iOutcom]    != selectedOutcom) continue;
2282 //      if (cols[iYEAR]      != selectedYear) continue;
2283 //      var condition   = cols[iCondition];
2284         var condition   = cols[iCondition];
2285         //var NAME        = cols[iGeography];
2286         var SRANum      = cols[iSRANum];
2287         var value       = cols[iCase];
2288         if (value == "") continue;    // ????
```

```
2239     // Build cancer data here.
2240     for (var i=1; i<CANCER.length; i++) {
2241         var cols = CANCER[i];
2242         //alert(dump(cols));
2243         //alert("CONDITION: "+cols[iCondition]);
2244         //alert("OUTCOME: "+cols[iOutcom]);
2245         //alert("YEAR: "+cols[iYEAR]);
2246         //alert("selectedYear: "+selectedYear);
2247         if (cols[iCondition] != selectedCondition) continue;
2248         //if (cols[iOutcom]    != selectedOutcom) continue;
2249         //if (cols[iYEAR]      != selectedYear) continue;
2250         //var NAME   = cols[iGeography];
2251         var SRANum = cols[iSRANum];
2252         var value  = cols[iCase];
2253         if (value == "") continue;
```

```
1226     //message += document.OutcomeSelect.outcome.value + " due to ";
1227     message += document.ConditionSelect.condition.value;
1228     //if ( document.YearSelect1.year1.value == "Most Up-to-Date") {
1229     //  message += ", Most Up-to-Date Available Data during 2010 to 2013";
1230     //}
1231     //else{
1232     //  message += " in " + document.YearSelect1.year1.value;
1233     //}
```

```
//chart_L_title += document.OutcomeSelect.outcome.value + " due to ";
chart_L_title += disease;

//if ( document.YearSelect1.year1.value == "Most Up-to-Date") {
//  chart_L_title += ", Most Up-to-Date Available Data during 2010 to 2013";
//}
//else{
//  chart_L_title += " in " + document.YearSelect1.year1.value;
//}
//chart_L_title +=  "</font>    &amp;     <font size='3' color='#008080'> "
//chart_L_title += document.YearSelect1.year1.value + "</font>    &amp;     <font size='3' color='#008080'> ";
```

```
    //chart_R_title += document.OutcomeSelect.outcome.value + " due to ";
    chart_R_title += document.ConditionSelect.condition.value ;
    //if ( document.YearSelect1.year1.value == "Most Up-to-Date") {
    //  chart_R_title += ", Most Up-to-Date Available Data during 2010 to 2013";
    //}
    //else{
    //  chart_R_title += " in " + document.YearSelect1.year1.value ;
    //}
```

8. Change map center and minZoom and maxZoom according to your need

```
    var center = [33.0, -116.9]; // put the coordiantes of the center of your map

    var stamenOptions = {

        minZoom: 7,
        maxZoom: 12
    };

    var layer_1 = L.tileLayer('http://{s}.tile.stamen.com/toner-lite/{z}/{x}/{y}.png', stamenOptions);

    var layer_2 = L.tileLayer('http://{s}.tile.stamen.com/toner-lite/{z}/{x}/{y}.png', stamenOptions);

    var map1 = L.map('map1', {
        layers: [layer_1],
        center: center,
        zoom: 10,
```