Supplemental Table 1. Rural-urban category criteria, derived from the USEPA EQI Rural Urban Continuum Category (RUCC) category definitions

and Derived Summary Staging as Defined by NC CCR, adapted from SEER

Rural-Urban Stratification

Rural-Urban Category	Criteria
Metropolitan urbanized	EQI RUCC1 "metropolitan urbanized"
Non-metro urbanized	EQI RUCC2 "non-metro urbanized"
Less populated	EQI RUCC3 "less urbanized" + RUCC4 "thinly populated"

Summary Stage Inclusion Criteria

Carcinoma In Situ

Noninvasive; intraepithelial, Intraductal WITHOUT infiltration, Lobular neoplasia, Noninfiltrating, In situ Paget disease

Distant Metastatic Breast Cancer

Distant lymph node(s): Cervical, NOS, Contralateral/bilateral axillary, Contralateral/bilateral internal mammary (parasternal), Supraclavicular (transverse cervical), Other distant lymph node(s), Further contiguous extension: Skin over: Axilla, Contralateral (opposite) breast, Sternum, Upper abdomen, Metastasis: Adrenal (suprarenal) gland, Bone other than adjacent rib, Contralateral (opposite) breast - if stated as metastatic, Lung, Ovary, Satellite nodule(s) in skin other than primary breast

Supplemental Table 2. Individual-level characteristics of women in the analyses [n(%)]

	Carcinoma In Situ				Localized Breast Cancer				Regional Breast Cancer				Distant Metastatic Breast Cancer			
	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less populated
n	7975	5687	1314	974	25827	18091	4561	3175	12371	8513	2310	1548	2073	1428	359	286
EQI																
Quartile 1	4784 (60%)	4251 (75%)	444 (34%)	89 (9%)	15150 (59%)	13345 (74%)	1527 (33%)	278 (9%)	7026 (57%)	6150 (72%)	736 (32%)	140 (9%)	1157 (56%)	1020 (71%)	118 (33%)	19 (7%)
Quartile 2	1791 (22%)	968 (17%)	543 (41%)	280 (29%)	5863 (23%)	3079 (17%)	1870 (41%)	914 (29%)	2850 (23%)	1526 (18%)	937 (41%)	387 (25%)	482 (23%)	270 (19%)	132 (37%)	80 (28%)
Quartile 3	849 (11%)	370 (7%)	212 (16%)	267 (27%)	3082 (12%)	1350 (7%)	792 (17%)	940 (30%)	1588 (13%)	669 (8%)	403 (17%)	516 (33%)	283 (14%)	121 (8%)	72 (20%)	90 (31%)
Quartile 4	551 (7%)	98 (2%)	115 (9%)	338 (35%)	1732 (7%)	317 (2%)	372 (8%)	1043 (33%)	907 (7%)	168 (2%)	234 (10%)	505 (33%)	151 (7%)	17 (1%)	37 (10%)	97 (34%)
Air EQI																
Quartile 1	5060 (63%)	4387 (77%)	619 (47%)	54 (6%)	16217 (63%)	13873 (77%)	2188 (48%)	156 (5%)	7658 (62%)	6431 (76%)	1138 (49%)	89 (6%)	1248 (60%)	1081 (76%)	155 (43%)	12 (4%)
Quartile 2	1464 (18%)	836 (15%)	383 (29%)	245 (25%)	4802 (19%)	2591 (14%)	1452 (32%)	759 (24%)	2371 (19%)	1312 (15%)	732 (32%)	327 (21%)	405 (20%)	215 (15%)	122 (34%)	68 (24%)
Quartile 3	1006 (13%)	398 (7%)	270 (21%)	338 (35%)	3303 (13%)	1445 (8%)	814 (18%)	1044 (33%)	1614 (13%)	658 (8%)	394 (17%)	562 (36%)	292 (14%)	118 (8%)	75 (21%)	99 (35%)
Quartile 4	445 (6%)	66 (1%)	42 (3%)	337 (35%)	1505 (6%)	182 (1%)	107 (2%)	1216 (38%)	728 (6%)	112 (1%)	46 (2%)	570 (37%)	128 (6%)	14 (1%)	7 (2%)	107 (37%)
Water EQI																
Quartile 1	3285 (41%)	2577 (45%)	433 (33%)	275 (28%)	10600 (41%)	8234 (46%)	1486 (33%)	880 (28%)	5121 (41%)	3954 (46%)	707 (31%)	460 (30%)	858 (41%)	652 (46%)	118 (33%)	88 (31%)
Quartile 2	2139 (27%)	1705 (30%)	190 (14%)	244 (25%)	7213 (28%)	5741 (32%)	661 (14%)	811 (26%)	3384 (27%)	2682 (32%)	316 (14%)	386 (25%)	601 (29%)	468 (33%)	54 (15%)	79 (28%)
Quartile 3	1828 (23%)	1193 (21%)	492 (37%)	143 (15%)	5714 (22%)	3649 (20%)	1583 (35%)	482 (15%)	2752 (22%)	1667 (20%)	843 (36%)	242 (16%)	431 (21%)	274 (19%)	117 (33%)	40 (14%)
Quartile 4	723 (9%)	212 (4%)	199 (15%)	312 (32%)	2300 (9%)	467 (3%)	831 (18%)	1002 (32%)	1114 (9%)	210 (2%)	444 (19%)	460 (30%)	183 (9%)	34 (2%)	70 (19%)	79 (28%)
Land EQI																
Quartile 1	2916 (37%)	2242 (39%)	394 (30%)	280 (29%)	9024 (35%)	6991 (39%)	1257 (28%)	776 (24%)	4163 (34%)	3112 (37%)	652 (28%)	399 (26%)	687 (33%)	529 (37%)	91 (25%)	67 (23%)
Quartile 2	2573 (32%)	2125 (37%)	285 (22%)	163 (17%)	7846 (30%)	6327 (35%)	964 (21%)	555 (17%)	3697 (30%)	2968 (35%)	482 (21%)	247 (16%)	621 (30%)	503 (35%)	80 (22%)	38 (13%)
Quartile 3	1155 (14%)	635 (11%)	227 (17%)	293 (30%)	4175 (16%)	2209 (12%)	905 (20%)	1061 (33%)	1985 (16%)	1092 (13%)	415 (18%)	478 (31%)	332 (16%)	168 (12%)	80 (22%)	84 (29%)
Quartile 4	1331 (17%)	685 (12%)	408 (31%)	238 (24%)	4782 (19%)	2564 (14%)	1435 (31%)	783 (25%)	2526 (20%)	1341 (16%)	761 (33%)	424 (27%)	433 (21%)	228 (16%)	108 (30%)	97 (34%)
Sociodemographic EQI																
Quartile 1	4081 (51%)	3606 (63%)	396 (30%)	79 (8%)	12923 (50%)	11342 (63%)	1354 (30%)	227 (7%)	6065 (49%)	5309 (62%)	638 (28%)	118 (8%)	1007 (49%)	880 (62%)	105 (29%)	22 (8%)
Quartile 2	2450 (31%)	1798 (32%)	468 (36%)	184 (19%)	7688 (30%)	5660 (31%)	1456 (32%)	572 (18%)	3613 (29%)	2642 (31%)	698 (30%)	273 (18%)	599 (29%)	451 (32%)	104 (29%)	44 (15%)
Quartile 3	847 (11%)	210 (4%)	264 (20%)	373 (38%)	3101 (12%)	832 (5%)	1063 (23%)	1206 (38%)	1580 (13%)	418 (5%)	584 (25%)	578 (37%)	259 (12%)	70 (5%)	81 (23%)	108 (38%)
Quartile 4	597 (7%)	73 (1%)	186 (14%)	338 (35%)	2115 (8%)	257 (1%)	688 (15%)	1170 (37%)	1113 (9%)	144 (2%)	390 (17%)	579 (37%)	208 (10%)	27 (2%)	69 (19%)	112 (39%)
Built EQI																
Quartile 1	4045 (51%)	3515 (62%)	297 (23%)	233 (24%)	12942 (50%)	10959 (61%)	1142 (25%)	841 (26%)	6018 (49%)	5078 (60%)	568 (25%)	372 (24%)	995 (48%)	835 (58%)	94 (26%)	66 (23%)
Quartile 2	1784 (22%)	1002 (18%)	545 (41%)	237 (24%)	5640 (22%)	3213 (18%)	1688 (37%)	739 (23%)	2731 (22%)	1553 (18%)	831 (36%)	347 (22%)	434 (21%)	245 (17%)	128 (36%)	61 (21%)
Quartile 3	1344 (17%)	837 (15%)	245 (19%)	262 (27%)	4744 (18%)	2835 (16%)	1033 (23%)	876 (28%)	2337 (19%)	1321 (16%)	551 (24%)	465 (30%)	437 (21%)	255 (18%)	90 (25%)	92 (32%)
Quartile 4	802 (10%)	333 (6%)	227 (17%)	242 (25%)	2501 (10%)	1084 (6%)	698 (15%)	719 (23%)	1285 (10%)	561 (7%)	360 (16%)	364 (24%)	207 (10%)	93 (7%)	47 (13%)	67 (23%)
BMI																
Underweight	37 (0%)	25 (0%)	10 (1%)	2 (<1%)	201 (1%)	139 (1%)	35 (1%)	27 (1%)	107 (1%)	68 (1%)	22 (1%)	17 (1%)	22 (1%)	17 (1%)	2 (1%)	3 (1%)
Normal weight	753 (9%)	582 (10%)	101 (8%)	70 (7%)	3019 (12%)	2215 (12%)	484 (11%)	320 (10%)	1423 (12%)	1020 (12%)	237 (10%)	166 (11%)	207 (10%)	150 (11%)	33 (9%)	24 (8%)
Overweight	950 (12%)	710 (12%)	133 (10%)	107 (11%)	3447 (13%)	2459 (14%)	545 (12%)	443 (14%)	1599 (13%)	1134 (13%)	281 (12%)	184 (12%)	291 (14%)	210 (15%)	37 (10%)	44 (15%)
Obese	1408 (18%)	953 (17%)	263 (20%)	192 (20%)	4563 (18%)	3211 (18%)	811 (18%)	541 (17%)	2415 (20%)	1689 (20%)	412 (18%)	314 (20%)	415 (20%)	294 (21%)	65 (18%)	56 (20%)
Unknown	4827 (61%)	3417 (60%)	807 (61%)	603 (62%)	14597 (57%)	10067 (56%)	2686 (59%)	1844 (58%)	6827 (55%)	4602 (54%)	1358 (59%)	867 (56%)	1138 (55%)	757 (53%)	222 (62%)	159 (56%)

Age																
Average Age	60.3	60.0	61.1	61.4	62.2	61.8	63.1	63.5	59.1	58.6	60.2	60.5	60.9	60.1	62.3	62.8
Race																
White	6174 (77%)	4393 (77%)	1048 (80%)	733 (75%)	20570 (80%)	14284 (79%)	3733 (82%)	2553 (80%)	9070 (73%)	6143 (72%)	1758 (76%)	1169 (76%)	1397 (67%)	955 (67%)	253 (70%)	189 (66%)
Black	1577 (20%)	1138 (20%)	216 (16%)	223 (23%)	4542 (18%)	3290 (18%)	700 (15%)	552 (17%)	2945 (24%)	2120 (25%)	483 (21%)	342 (22%)	607 (29%)	431 (30%)	87 (24%)	89 (31%)
Other	224 (3%	156 (3%)	50 (4%)	18 (2%)	715 (2%)	517 (3%)	128 (3%)	70 (3%)	356 (3%)	250 (3%)	69 (3%)	37 (2%)	69 (4%)	42 (3%)	19 (6%)	8 (3%)
Smoking																
Current smoker	364 (5%)	253 (4%)	64 (5%)	47 (5%)	1550 (6%)	1011 (6%)	337 (7%)	202 (6%)	949 (8%)	630 (7%)	190 (8%)	129 (8%)	205 (10%)	145 (10%)	40 (11%)	20 (7%)
Former smoker	795 (10%)	571 (10%)	136 (10%)	88 (9%)	3076 (12%)	2236 (12%)	495 (11%)	345 (11%)	1471 (12%)	1041 (12%)	244 (11%)	186 (12%)	219 (11%)	148 (10%)	43 (12%)	28 (10%)
Never smoked	2351 (29%)	1680 (30%)	391 (30%)	280 (29%)	7696 (30%)	5423 (30%)	1324 (29%)	949 (30%)	6272 (51%)	2566 (30%)	664 (29%)	449 (29%)	653 (32%)	466 (33%)	92 (26%)	95 (33%)
Unknown	4465 (56%)	3183 (56%)	723 (55%)	559 (57%)	13505 (52%)	9421 (52%)	2405 (53%)	1679 (53%)	3679 (30%)	4276 (50%)	1212 (52%)	784 (51%)	996 (48%)	669 (47%)	184 (51%)	143 (50%)

*Other Race = American Indian, Asian, Native Hawaiian or Pacific Islander, Other, Unknown

Supplemental Table 3. Odds ratios (95% CI) for localized, regional, or distant metastatic breast cancer versus carcinoma in situ based on individual environmental quality index domain indices (Air, Water, Land, Sociodemographic, and Built domains) by urban/rural continuum codes (metropolitan urbanized, non-metro urbanized, less populated) using quartile 1 (worst environmental domain quality) as reference. Models were adjusted for individual age at diagnosis, BMI, smoking status, race, and all other domains.

	Localized Breast Cancer				Regional Breast Cancer				Distant Metastatic Breast Cancer			
	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less Populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less Populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less Populated
air EQI												
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.98 (0.96-1.01)	0.98 (0.96-1.01)	1.00 (0.96-1.04)	**0.93 (0.88-0.99)**	0.98 (0.95-1.01)	1.00 (0.96-1.04)	0.99 (0.95-1.04)	**0.78 (0.73-0.84)**	1.00 (0.97-1.04)	0.98 (0.93-1.03)	1.05 (0.98-1.12)	0.90 (0.81-1.01)
Third Quartile	0.98 (0.95-1.00)	1.00 (0.98-1.03)	**0.89 (0.83-0.95)**	**0.94 (0.89-0.99)**	0.97 (0.93-1.01)	0.99 (0.96-1.03)	**0.89 (0.81-0.97)**	**0.84 (0.79-0.9)**	1.00 (0.96-1.04)	0.99 (0.93-1.05)	0.88 (0.78-1.00)	0.91 (0.83-1.01)
Fourth Quartile	0.97 (0.95-1.00)	0.95 (0.91-1.00)	**0.91 (0.85-0.96)**	0.93 (0.86-1.01)	0.96 (0.92-1.00)	1.00 (0.94-1.05)	**0.87 (0.81-0.93)**	**0.8 (0.72-0.88)**	0.99 (0.95-1.03)	0.94 (0.86-1.03)	0.95 (0.85-1.07)	0.89 (0.77-1.03)
p-trend	0.144	0.649	0.051	0.201	0.102	0.968	**0.006**	0.451	0.937	0.499	0.883	0.846
water EQI												
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	1.01 (0.98-1.03)	1.00 (0.98-1.03)	0.99 (0.96-1.03)	1.02 (0.99-1.06)	1.00 (0.96-1.03)	1.01 (0.97-1.05)	0.97 (0.93-1.01)	1.02 (0.96-1.08)	1.00 (0.97-1.03)	1.01 (0.97-1.05)	0.95 (0.91-1.00)	1.02 (0.94-1.11)
Third Quartile	0.99 (0.97-1.01)	0.98 (0.96-1.00)	0.98 (0.94-1.01)	1.02 (0.98-1.06)	0.98 (0.95-1.02)	0.97 (0.94-1.01)	1.02 (0.98-1.05)	1.02 (0.95-1.08)	0.98 (0.95-1.01)	0.99 (0.96-1.03)	0.97 (0.90-1.03)	0.93 (0.86-1.01)
Fourth Quartile	0.98 (0.94-1.01)	**0.94 (0.89-0.98)**	1.02 (0.95-1.09)	1.00 (0.97-1.04)	0.96 (0.91-1.00)	**0.91 (0.85-0.97)**	1.05 (0.97-1.14)	0.98 (0.93-1.04)	0.95 (0.92-1.00)	0.95 (0.90-1.02)	1.03 (0.89-1.19)	0.95 (0.88-1.02)
p-trend	0.646	0.351	0.255	0.454	0.587	0.414	**0.046**	0.538	0.199	0.547	0.491	0.198
land EQI												
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	1.00 (0.97-1.03)	0.99 (0.96-1.02)	1.01 (0.96-1.06)	**1.05 (1.01-1.10)**	1.00 (0.94-1.06)	1.00 (0.95-1.06)	0.98 (0.92-1.04)	**1.05 (1.00-1.11)**	1.00 (0.97-1.04)	1.01 (0.97-1.05)	0.99 (0.91-1.07)	1.00 (0.93-1.08)
Third Quartile	**1.02 (1.00-1.05)**	1.01 (0.98-1.04)	**1.06 (1.01-1.11)**	**1.07 (1.02-1.11)**	**1.05 (1.01-1.09)**	**1.05 (1.00-1.10)**	1.00 (0.95-1.06)	**1.09 (1.03-1.16)**	1.02 (0.99-1.06)	1.01 (0.97-1.06)	1.07 (0.98-1.16)	1.06 (0.98-1.15)
Fourth Quartile	**1.03 (1.00-1.05)**	**1.03 (1.01-1.06)**	1.01 (0.96-1.06)	**1.05 (1.01-1.09)**	**1.05 (1.01-1.09)**	**1.08 (1.03-1.12)**	0.96 (0.91-1.02)	**1.06 (1.01-1.12)**	1.02 (0.98-1.06)	**1.05 (1.00-1.10)**	**0.92 (0.85-0.99)**	**1.08 (1.01-1.16)**
p-trend	**0.006**	0.053	0.161	**0.014**	**0.001**	**0.001**	0.503	0.124	0.109	0.102	0.66	**0.013**
sociodemographic EQI												
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.99 (0.97-1.01)	0.98 (0.96-1.01)	0.94 (0.89-1.00)	0.97 (0.92-1.03)	0.98 (0.95-1.01)	0.97 (0.94-1.01)	0.95 (0.88-1.02)	**0.88 (0.82-0.95)**	0.99 (0.96-1.01)	0.99 (0.96-1.02)	**0.91 (0.83-0.99)**	**0.85 (0.77-0.94)**
Third Quartile	**1.02 (1.00-1.05)**	1.01 (0.98-1.04)	0.95 (0.89-1.01)	1.01 (0.95-1.08)	**1.04 (1.00-1.08)**	0.97 (0.92-1.02)	1.01 (0.93-1.09)	0.99 (0.94-1.04)	1.02 (0.98-1.06)	0.99 (0.92-1.07)	0.93 (0.83-1.05)	0.93 (0.85-1.01)
Fourth Quartile	1.01 (0.98-1.04)	1.01 (0.95-1.08)	1.00 (0.95-1.06)	1.02 (0.96-1.09)	1.03 (0.99-1.07)	1.00 (0.93-1.08)	**1.08 (1.01-1.16)**	0.99 (0.93-1.05)	1.02 (0.98-1.05)	1.01 (0.94-1.08)	1.07 (0.98-1.16)	0.93 (0.86-1.01)
p-trend	0.295	0.711	0.657	0.759	0.152	0.496	**0.026**	0.856	0.39	0.614	0.191	0.971
built EQI												
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.99 (0.97-1.01)	0.99 (0.97-1.02)	1.00 (0.94-1.07)	0.96 (0.92-1.00)	1.00 (0.97-1.04)	1.01 (0.97-1.06)	0.97 (0.9-1.06)	**0.92 (0.86-0.98)**	0.99 (0.96-1.02)	1.00 (0.97-1.03)	1.05 (0.94-1.16)	0.93 (0.85-1.02)

Third Quartile	1.01 (0.98-1.03)	1.00 (0.98-1.02)	1.01 (0.96-1.06)	0.97 (0.94-1.01)	1.03 (0.99-1.07)	1.01 (0.97-1.04)	0.97 (0.9-1.03)	1.01 (0.97-1.05)	**1.04 (1.00-1.07)**	1.03 (0.99-1.07)	1.01 (0.90-1.14)	1.00 (0.94-1.08)
Fourth Quartile	0.99 (0.97-1.01)	1.01 (0.97-1.04)	1.00 (0.95-1.05)	0.96 (0.93-1.00)	1.02 (0.99-1.05)	1.03 (0.97-1.09)	**0.93 (0.87-0.99)**	0.95 (0.9-1.01)	1.00 (0.97-1.04)	1.03 (0.98-1.09)	1.01 (0.92-1.12)	0.96 (0.90-1.03)
p-trend	*0.957*	*0.413*	*0.07*	*0.067*	*0.255*	*0.199*	***0.01***	*0.884*	*0.207*	***0.028***	*0.145*	*0.961*

*Bolded values are p<0.05

Supplemental Table 4. Unadjusted and adjusted odds ratios (95% CI) for localized, regional, or distant metastatic breast cancer versus carcinoma in situ based on sociodemographic environmental quality index by urban/rural continuum codes (metropolitan urbanized, non-metro urbanized, less populated) using quartile 1 (worst environmental domain quality) as reference. Adjusted models were adjusted for individual age at diagnosis, BMI, smoking status, and race.

	Not Adjusted (OR, 95% CI)				Adjusted for Individual Age, BMI, Smoking Status, and Race (aOR, 95% CI)			
	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less Populated	Non-stratified	Metropolitan urbanized	Non-metro urbanized	Less Populated
Localized Breast Cancer - Sociodemographic EQI								
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.99 (0.98-1.01)	0.99 (0.97-1.01)	0.95 (0.90-1.01)	0.97 (0.92-1.03)	0.99 (0.97-1.01)	0.98 (0.96-1.01)	0.94 (0.89-1.00)	0.97 (0.92-1.03)
Third Quartile	**1.03 (1.00-1.05)**	1.01 (0.99-1.04)	0.94 (0.88-1.01)	1.01 (0.96-1.06)	**1.02 (1.00-1.05)**	1.01 (0.98-1.04)	0.95 (0.89-1.01)	1.01 (0.95-1.08)
Fourth Quartile	1.01 (0.98-1.04)	1.01 (0.95-1.08)	1.00 (0.94-1.06)	1.01 (0.97-1.07)	1.01 (0.98-1.04)	1.01 (0.95-1.08)	1.00 (0.95-1.06)	1.02 (0.96-1.09)
Regional Breast Cancer - Sociodemographic EQI								
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.98 (0.95-1.01)	0.97 (0.93-1.01)	0.96 (0.90-1.04)	**0.88 (0.82-0.95)**	0.98 (0.95-1.01)	0.97 (0.94-1.01)	0.95 (0.88-1.02)	**0.88 (0.82-0.95)**
Third Quartile	**1.04 (1.00-1.08)**	0.97 (0.92-1.03)	1.03 (0.94-1.12)	0.98 (0.93-1.04)	**1.04 (1.00-1.08)**	0.97 (0.92-1.02)	1.01 (0.93-1.09)	0.99 (0.94-1.04)
Fourth Quartile	1.04 (0.99-1.08)	1.02 (0.94-1.11)	**1.09 (1.01-1.17)**	0.99 (0.93-1.05)	1.03 (0.99-1.07)	1.00 (0.93-1.08)	**1.08 (1.01-1.16)**	0.99 (0.93-1.05)
Distant Metastatic Breast Cancer - Sociodemographic EQI								
First Quartile	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Second Quartile	0.98 (0.95-1.01)	0.98 (0.95-1.02)	0.94 (0.85-1.03)	**0.85 (0.76-0.94)**	0.99 (0.96-1.01)	0.99 (0.96-1.02)	**0.91 (0.83-0.99)**	**0.85 (0.77-0.94)**
Third Quartile	1.03 (0.99-1.07)	1.01 (0.93-1.09)	0.98 (0.86-1.11)	0.94 (0.86-1.03)	1.02 (0.98-1.06)	0.99 (0.92-1.07)	0.93 (0.83-1.05)	0.93 (0.85-1.01)
Fourth Quartile	**1.04 (1.00-1.08)**	1.05 (0.97-1.13)	**1.10 (1.00-1.20)**	0.94 (0.87-1.02)	1.02 (0.98-1.05)	1.01 (0.94-1.08)	1.07 (0.98-1.16)	0.93 (0.86-1.01)

*Bolded values are p<0.05

Supplemental Table 5. Total and domain-specific EQI value range across the United States compared to North Carolina

Minimum and maximum EQI values are reported for total and domain-specific EQI across the U.S. and North Carolina. The percent EQI range of

North Carolina compared to the U.S. is also reported.

	United States		North Carolina		
	Min	Max	Min	Max	% of US Range
EQI	-5.88	2.85	-1.17	1.71	33.0%
Air EQI	-3.26	2.79	-1.44	1.80	53.5%
Water EQI	-1.64	1.48	0.10	1.14	33.2%
Land EQI	-5.21	2.09	-1.38	0.56	26.6%
Sociodemographic EQI	-4.81	3.98	-1.32	1.57	33.0%
Built EQI	-6.09	3.88	-3.00	1.41	44.2%

Supplemental Figure 1. Environmental quality index data sources and factors

Summary of data sources and individual factors comprising the five environmental quality domains [1].

Total Environmental Quality Index (EQI)				
Air Index	**Water Index**	**Land Index**	**Sociodemographic Index**	**Built Index**

Sources of Data

Air	Water	Land	Sociodemographic	Built
• Air Quality System • National-Scale Air Toxics Assessment	• Watershed Assessment, Tracking and Environmental Results Program Database/Reach Address Database • National Contaminant Occurrence Database • Estimates of Water Use in the United States • Drought Monitor Data • National Atmospheric Deposition Program	• National Pesticide Use Database • Census of Agriculture Full Report • EPA Geospatial Data Download Service • National Geochemical Survey • Map of Radon Zones	• U.S. Census • Uniform Crime Reports	• Dun and Bradstreet North American Industry Classification System codes • Topologically Integrated Geographic Encoding and Referencing • Fatality Annual Reporting System • Housing and Urban Development Data

Individual Factors

AIR DOMAIN
- Particulate matter under 10 μm in aerodynamic diameter
- Particulate matter under 2.5 μm in aerodynamic diameter
- Nitrogen dioxide
- Sulfur dioxide
- Ozone
- Carbon monoxide
- 1,1,2,2-tetrachloroethane
- 1,1,2-trichloroethane
- 1,2-dibromo-3-chloropropane
- 2,4-toluene diisocyanate
- 2-chloroacetophenone
- 2-nitropropane
- 4-nitrophenol
- Acetonitrile
- Acetophenone
- Acrolein
- Acrylic acid
- Acrylonitrile
- Antimony compounds
- Benzidine
- Benzyl chloride
- Beryllium compounds
- Biphenyl
- bis-2-ethylhexyl phthalate
- Bromoform
- Cadmium compounds
- Carbon disulfide
- Carbon tetrachloride
- Carbon sulfide
- Chlorine
- Chlorobenzene
- Chloroform
- Chloroprene
- Chromium compounds
- Cresol/cresylic acid
- Cumene
- Cyanide compounds
- Dibutylphthalate
- Diesel engine emissions
- Dimethyl formamide
- Dimethyl phthalates
- Dimethyl sulfate
- Epichlorohydrin
- Ethyl acrylate
- Ethyl chloride
- Ethylene dibromide
- Ethylene dichloride
- Ethylene glycol
- Ethylene oxide
- Ethylidene dichloride
- Glycol ethers
- Hexachlorobenzene
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- Hexane
- Hydrazine
- Hydrochloric acid
- Isophorone
- Lead compounds
- Manganese compounds
- Mercury compounds
- Methanol
- Methyl isobutyl ketone
- Methyl methacrylate
- Methyl chloride
- Methylhydrazine
- Methyl tert-butyl ether
- Nitrobenzene
- N,N-dimethylaniline
- o-toluidine
- Polycyclic organic matter/polycyclic aromatic hydrocarbons
- Pentachlorophenol
- Phosphine
- Phosphorus
- Polychlorinated biphenyls
- Propylene dichloride
- Propylene oxide
- Quinoline
- Selenium compounds
- Styrene
- Tetrachloroethylene
- Toluene
- Trichloroethylene
- Triethylamine
- Vinyl acetate
- Vinyl chloride
- Vinylidene chloride

WATER DOMAIN
- Percent of stream length impaired in county
- Sewage permits per 1000 km of stream in county
- Industrial permits per 1000 km of stream in county
- Stormwater permits per 1000 km of stream in county
- Number of days closed per event in county, 2000-2005
- Number of days per contamination advisory event in county, 2000-2005
- Number of days per rain advisory event in county, 2000-2005
- Percent of population on self supply, average 2000 and 2005
- Percent of public supply population that is on surface water, average 2000 and 2005
- Calcium precipitation weighted mean
- Magnesium precipitation weighted mean
- Potassium precipitation weighted mean
- Sodium precipitation weighted mean
- Ammonium precipitation weighted mean
- Nitrate precipitation weighted mean
- Chloride precipitation weighted mean
- Sulfate precipitation weighted mean
- Total mercury deposition
- Percent of county in extreme or exceptional drought (intensity levels D3 and D4, respectively)
- Arsenic
- Barium
- Cadmium
- Chromium
- Cyanide
- Fluoride
- Mercury (inorganic)
- Nitrate
- Nitrite
- Selenium
- Antimony
- Beryllium
- Thallium
- Endrin
- Lindane
- Methoxychlor
- Toxaphene
- Dalapon
- di(2-ethylhexyl) adipate
- Oxamyl (Vydate)
- Simazine
- di(2-ethylhexyl) phthalate
- Picloram
- Dinoseb
- Hexachlorocyclopentadiene
- Carbofuran
- Atrazine
- Alachlor
- Heptachlor
- Heptachlor epoxide
- 2,4-Dichlorophenoxyacetic acid
- Hexachlorobenzene
- Benzo[a]pyrene
- Pentachlorophenol
- 1,2,4-Trichlorobenzene
- Polychlorinated biphenyls
- 1,2-Dibromo-3-chloropropane
- Ethylene dibromide
- Xylenes
- Chlordane
- Dichloromethane (Methylene chloride)
- 1,2-Dichlorobenzene (o-Dichlorobenzene)
- 1,4-Dichlorobenzene (p-Dichlorobenzene)
- Vinyl chloride
- 1,1-Dichloroethylene
- trans-1,2-Dichloroethylene
- 1,2-Dichloroethane (Ethylene dichloride)
- 1,1,1-Trichloroethane
- Carbon tetrachloride
- 1,2-Dichloropropane
- Trichloroethylene
- 1,1,2-Trichloroethane
- Tetrachloroethylene
- Benzene
- Monochlorobenzene (Chlorobenzene)
- Toluene
- Ethylbenzene
- Styrene
- Alpha particles
- cis-1,2-Dichloroethylene
- Silvex

LAND DOMAIN
- Harvested acreage
- Irrigated acreage
- Farms per acre
- Manure applied
- Chemicals used to control nematodes
- Chemicals used to control disease
- Chemicals used to defoliate/control growth/thin fruit
- Animal units
- Herbicides
- Fungicides
- Insecticides
- Arsenic
- Selenium
- Mercury
- Lead
- Zinc
- Copper
- Sodium
- Magnesium
- Titanium
- Calcium
- Iron
- Aluminum
- Phosphorus
- Facilities per county population
- Radon zone

SOCIODEMOGRAPHIC DOMAIN
- Percent renter occupied
- Percent vacant units
- Median household value
- Median household income
- Percent persons with income below the poverty level
- Percent who do not report speaking English
- Percent earning greater than high school education
- Percent unemployed
- Percent work outside county
- Median number rooms per house
- Percent of housing with more than 10 units
- Mean number of violent crimes per capita

BUILT DOMAIN
- Proportion of roads that are highways
- Proportion of roads that are primary streets
- Traffic fatality rate
- Percent of population using public transport
- Vice-related businesses
- Entertainment-related businesses
- Education-related businesses
- Negative-food-related businesses
- Positive-food-related businesses
- Health-care-related businesses
- Recreation-related businesses
- Transportation-related businesses
- Civic-related businesses
- Total subsidized housing units