Appendix C1

PRECIPITATION DATA ANALYSIS FOR SINCLAIR/DYES INLET FOR WATERYEAR 2003

(WY2003 October 1, 2002 – September 30, 2003)

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INTRODUCTION

This document was prepared as supporting information for **An Analysis of Microbial Pollution in the Sinclair-Dyes Inlet Watershed** the fecal coliform Total Maxium Daily Load study conducted for Sinclair and Dyes Inlets by PSNS Project ENVVEST. Rain data for water year 2003 (WY2003), from the beginning of October 2002 to the end of September 2003, was analyzed (with the exception of Station 8 which started recording rain in Jan. 2003). The ENVVEST project utilizes 13 rain gages for modeling, correlations, and predictions. Eight rain gage stations are maintained by the City of Bremerton; four stations are maintained by Kitsap Public Utility District (KPUD); one station is maintained by Puget Sound Naval Shipyard (PSNS). The Figure 1 shows the locations of the rain gages, and the exact locations are listed in Table 1.

APPROACH

Rain events can be classified as to their reoccurrence interval. The National Oceanic and Atmospheric Administration (NOAA) bases the frequency on the probability that an event will occur within 2 years, 5 years, 10 years, 25 years, 50 years, or 100 years. The precipitation data is either summed in a 6 hour or 24 hour period. NOAA's Western US Precipitation Frequency maps (http://www.wrcc.dri.edu/pcpnfreq.html) shows isohedrals for the two periods for each frequency interval, for a total of 12 isohedral maps. These maps were then overlaid into ArcMap GIS with each of the 13 precipitation gages. These maps can be found in Attachment A. Table 2 below summarizes each event for the 6 hour period-all frequency events. Table 3 below summarizes each event for the 24 hour period-all frequency events.
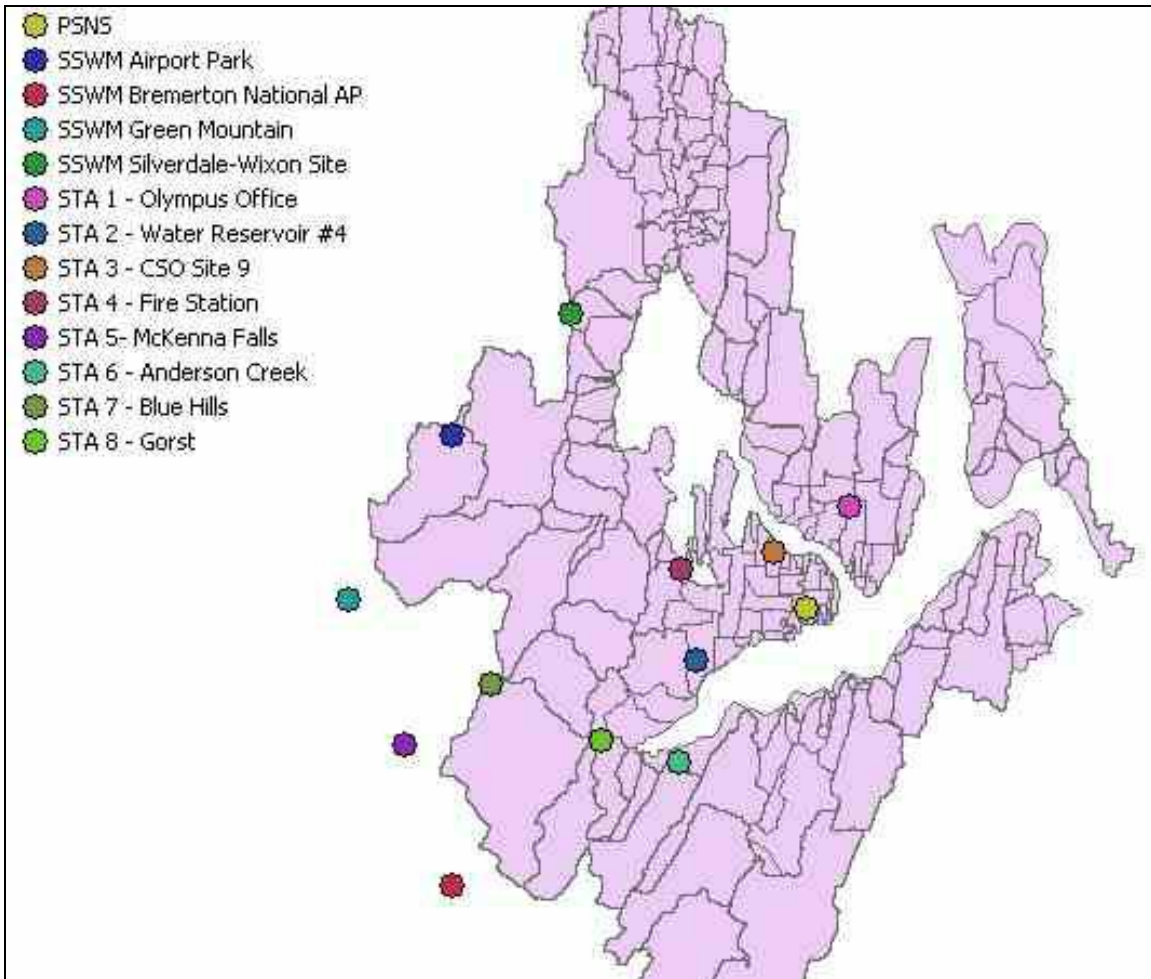
Ecology Publication No. 05-03-042 app C

Figure 1: Locations of Rain Gages Near the ENVVEST Study Region

Station	Latitude-y	Longitutde-x	Comments
STA 1 - Olympus Office	47.59000000000000	-122.61916666666700	Olympus Drive
STA 2 - Water Reservoir #4	47.55027777777780	-122.67527777777800	Roosevelt Blvd.
STA 3 - CSO Site 9	47.57805555555560	-122.64722222222200	19th Ave.
STA 4 - Fire Station	47.57333333333330	-122.68250000000000	Kitsap Way
STA 5- McKenna Falls	47.52722222222220	-122.78444444444400	Brem Watershed
STA 6 - Anderson Creek	47.52430555555560	-122.68125000000000	Anderson Hill Rd
STA 7 - Blue Hills	47.54280555555560	-122.75216666666700	Brem Watershed
STA 8 - Gorst	47.52944444444440	-122.71055555555600	Old Belfair Hwy
SSWM Green Mountain	47.56333333333320	-122.80638888888900	kpud sta.60
SSWM Bremerton National AP	47.49194444444440	-122.76527777777800	kpud sta.61
SSWM Silverdale-Wixon Site	47.63750000000000	-122.72583333333300	kpud sta.62
SSWM Airport Park	47.60583333333330	-122.76888888888800	kpud sta.63
PSNS	47.56398000000000	-122.63447000000000	psns

Table 1: Exact Location of Rain Gages Near the ENVVEST Study Region (decimal degrees)

The yearly summary is shown in Table 2 and Figure 2 for each gage along with the percentage of data that is missing. The yearly summary does not include those times that it rained when the rain gage was malfunctioning, etc.

	Yearly Precip (inches)	Percent of Data Missing
Sta 1	39.14	2.00
Sta 2	41.10	3.95
Sta 3	31.61	10.08
Sta 4	45.93	11.88
Sta 5	14.34	56.79
Sta 6	46.31	30.83
Sta 7	32.37	28.07
Sta 8	9.99	61.39
Green	46.96	9.45
Brem	40.92	0.00
Silver	49.46	0.00
Airport	55.37	0.00
PSNS	34.31	0.00

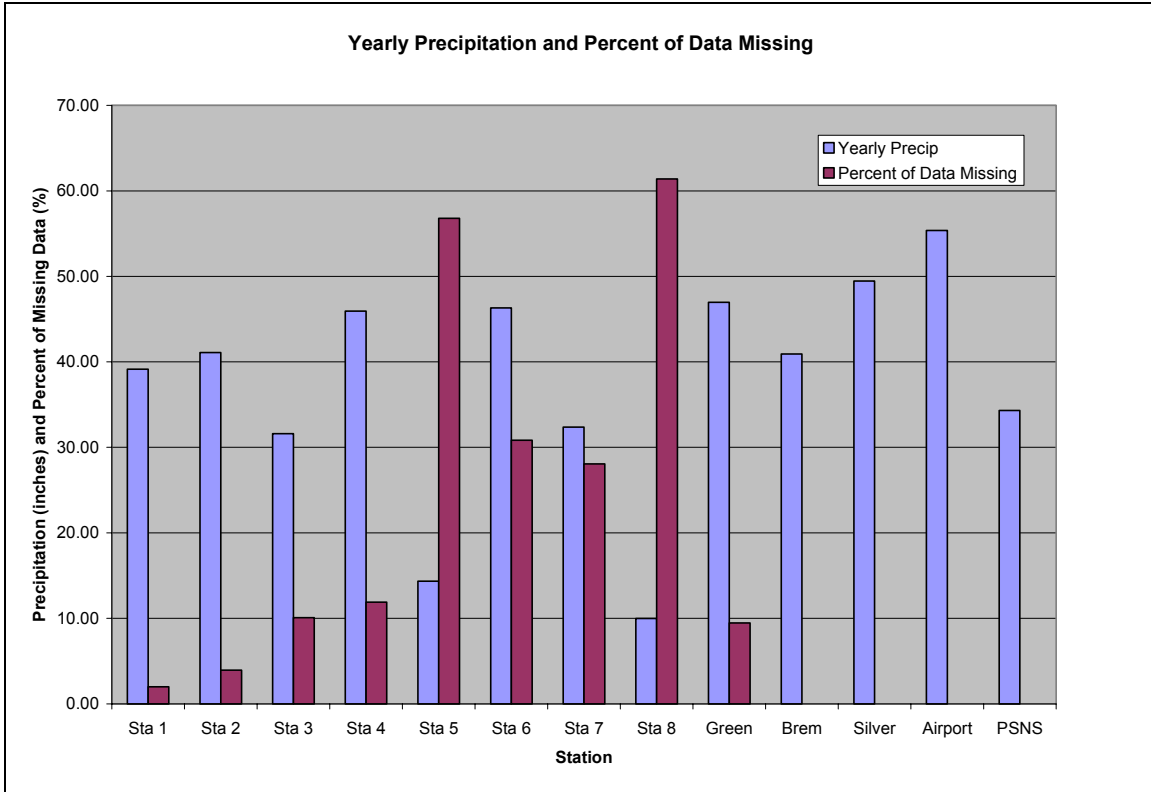Table 2: Yearly Precipitation and Percent of Data Missing for Each Station

Figure 2:Yearly Precipitation for Each Station

The monthly summary of precipitation is shown in Table 3 and Figure 3. This does not include all precipitation. Red text denotes that month which had missing data. Table 4 shows the percent of data that is missing for each station by month.

	October	November	December	January	February	March	April	May	June	July	August	Sept
Sta 1	0.36	3.8	8.51	11.34	1.21	9.09	3.17	0.96	0.39	0.08	0.23	0
Sta 2	0.43	3.78	8.64	11.8	1.25	9.2	3.79	1.03	0.42	0.1	0.18	0.48
Sta 3	0.4	3.47	7.55	5.59	1.17	8.25	3.26	1.03	0.56	0.07	0.26	0
Sta 4	0.6	4.38	9.29	12.24	1.63	9.95	4.6	0.69	0.82	0.26	0.94	0.53
Sta 5	0.41	3.49	0	8.21	1.34	0	0	0	0	0.06	0.35	0.48
Sta 6	0.57	14.78	9.53	12.2	1.7	6.73	0	0	0	0.01	0.22	0.57
Sta 7	0.7	5.63	9.55	13.19	1.3	0	0	0.23	0.48	0.2	0.34	0.75
Sta 8	0	0	0	8.46	1.43	0	0	0.1	0	0	0	0
Green	0.61	8.35	13.11	15.51	2.19	0.02	4.18	0.83	0.59	0.22	0.37	0.98
Brem	0.29	4.73	7.97	11.76	1.68	8.71	3.96	0.53	0.38	0.1	0.27	0.54
Silver	0.58	5.3	11.13	12.4	1.35	11.92	4.4	1.31	0.48	0.01	0.27	0.31
Airport	0.72	6.56	12.72	13.62	1.72	13.45	4.41	0.81	0.51	0.28	0.26	0.31
PSNS	0.34	1.32	7.71	10.56	1.26	8.49	2.99	0.71	0.3	0.06	0.21	0.36

Table 3: Monthy Precipitation Totals (Note: Does not include all precipitation. Red text denotes that month which had missing data)

	October	November	December	January	February	March	April	May	June	July	August	Sept
Sta 1	0	0	0	0	0	0	23	5	42	0	72	99
Sta 2	0	0	0	0	0	0	0	8	31	0	9	0
Sta 3	0	0	0	0	0	0	22	9	0	0	0	92
Sta 4	0	0	0	0	0	0	0	0	94	38	0	11
Sta 5	0	59	100	33	35	100	100	100	100	29	0	25
Sta 6	0	0	0	0	0	38	100	100	100	29	2	0.03
Sta 7	0	0	0	0	35	100	100	32	30	7	9	25
Sta 8	100	100	100	23	0	0	0	9	100	100	100	98.82
Green	0	0	0	0	0	92	20	0	0	0	0	0
Brem	0	0	0	0	0	0	0	0	0	0	0	0
Silver	0	0	0	0	0	0	0	0	0	0	0	0
Airport	0	0	0	0	0	0	0	0	0	0	0	0
PSNS	0	0	0	0	0	0	0	0	0	0	0	0

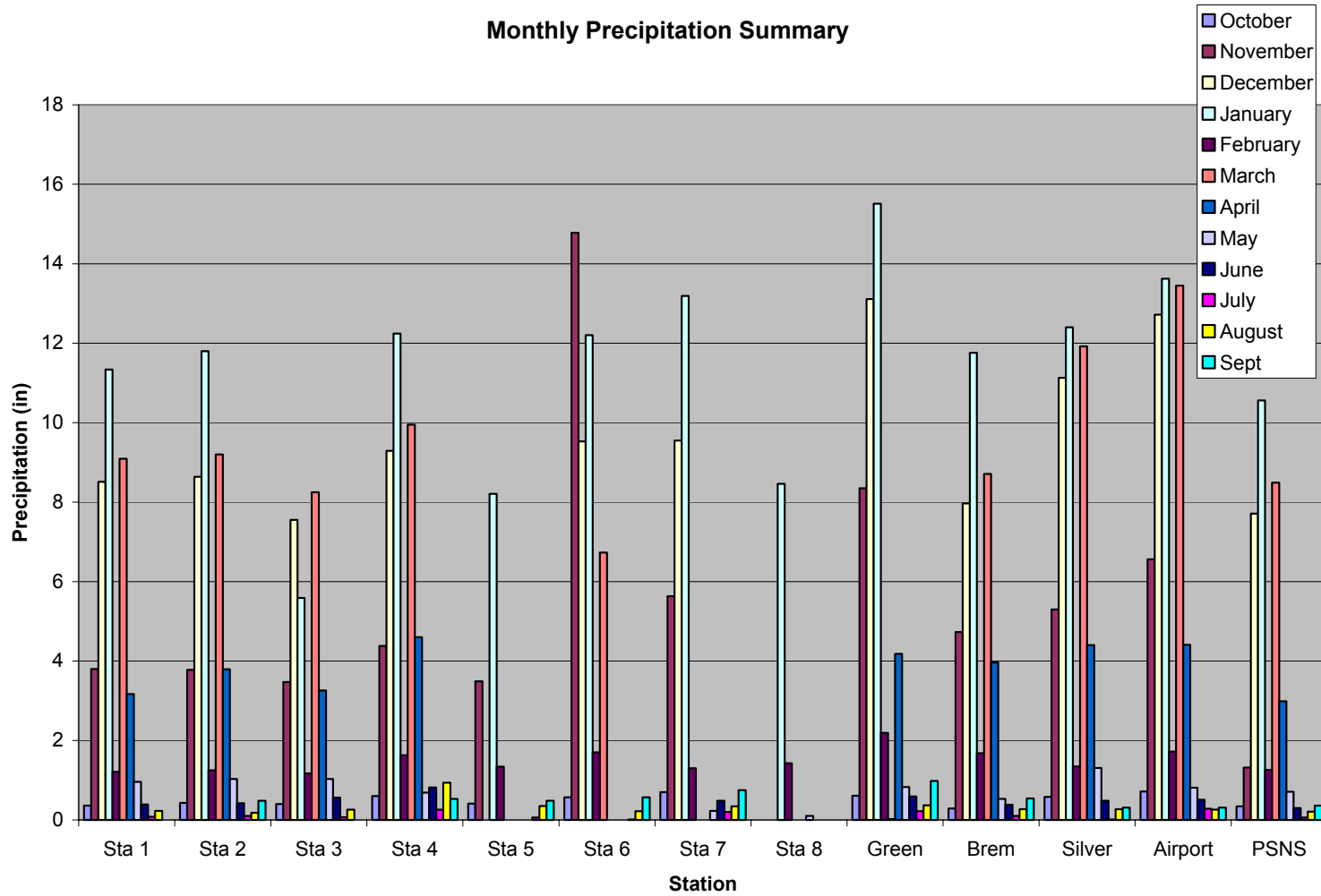Table 4: Percent Data Missing by Month for Each Station

Figure 3: Monthly Precipitation

Frequency Analysis

Rain events can be classified as to their reoccurrence interval. NOAA bases the frequency on the probability that an even will occur within 2 years, 5 years, 10 years, 25 years, 50 years, or 100 years. The precipitation data is either summed in a 6 hour or 24 hour period. NOAA's Western US Precipitation Frequency maps (http://www.wrcc.dri.edu/pcpnfreq.html) shows iso-hedrals for the two periods for each frequency interval, for a total of 12 iso-hedral maps. These maps were then overlayed into ArcMap GIS with each of the 13 precipitaiton gages. These maps can be found in Attachment A. Table 5 below summarizes each event for the 6 hour period-all frequency events. Table 6 below summarizes each event for the 24 hour period-all frequency events.

STATION	2 yr- 6 hr	5 yr- 6 hr	10 yr- 6 hr	25 yr- 6 hr	50 yr- 6 hr	100 yr- 6 hr
Sta.1	1.2	1.6	1.8	2	2.2	2.5
PSNS	1.3	1.6	1.8	2.1	2.3	2.6
Sta. 3	1.3	1.6	1.8	2.1	2.4	2.6
Sta. 4	1.4	1.8	1.9	2.3	2.5	2.7
Sta. 2	1.4	1.8	1.9	2.3	2.5	2.7
Sta. 6	1.4	1.8	2	2.3	2.5	2.7
Sta. 8	1.5	1.8	2	2.4	2.5	2.8
SWMM Silverdale	1.5	1.8	2	2.5	2.6	2.8
SWMM Airport Park	1.6	1.9	2.2	2.6	2.8	3
SWMM Green Mtn	1.7	2	2.3	2.7	2.9	3.2
Sta. 7	1.6	1.9	2	2.5	2.7	3
Sta. 5	1.6	2	2.2	2.6	2.8	3.1
SWMM Bremerton	1.8	1.9	2	2.5	2.8	3

Table 5: 6-hour events for the 13 ENVVEST precipitation gages (inches)

STATION	2 yr- 24 hr	5 yr- 24 hr	10 yr- 24 hr	25 yr- 24 hr	50 yr- 24 hr	100 yr- 24 hr
Sta.1	2.6	3.2	3.5	4.2	4.6	5.2
PSNS	2.7	3.4	3.6	4.4	4.9	5.4
Sta. 3	2.7	3.5	3.7	4.5	5	5.5
Sta. 4	2.8	3.6	4.1	4.8	5.4	5.9
Sta. 2	2.8	3.6	4.1	4.7	5.4	5.8
Sta. 6	2.8	3.6	4.1	4.8	5.5	5.9
Sta. 8	3.2	3.7	4.3	5.1	5.7	6.2
SWMM Silverdale	3.2	3.9	4.4	5.1	5.7	6.2
SWMM Airport Park	3.4	4.2	4.6	5.4	6	6.5
SWMM Green Mtn	3.6	4.4	4.9	5.6	6.4	6.9
Sta. 7	3.3	4.1	4.6	5.4	5.9	6.4
Sta. 5	3.4	4.3	4.8	5.5	6.1	6.6
SWMM Bremerton	3.3	4.2	4.6	5.4	6	6.5

Table 6: 24-hour events for the 13 ENVVEST precipitation gages (inches)

For each event and specific frequency, the range was allowed to vary as much as 0.1" above and 0.1" below the reported numbers in Table 5 and Table 6. For example, for the 10 year-24 hour even for Station 8, the qualifying event would be 4.3" However, for computational purposes, an event from 4.2" to 4.4" would qualify as a 10 year-24 hour event.

The 8 stations maintained by the city were summed on a 6 hour interval basis for the guidelines in Table 5. No event for any of the 8 stations qualified for any event. Therefore, the other 5 gages were not analyzed, nor were the 24 hour interval events. This lead to the event analysis (see below).

EVENT ANALYSIS

   The second analysis performed on the WY2003 precipitation data was to group each event. The events were defined as from when they began to when the rain stopped. The rain data was gathered for every 15 minutes, so if there was a 15 minute interval that had a rainfall of "0," that value ended the event. The events were tabulated showing the start date and time of the event, the total rainfall for the event, and the number of 15 minute intervals for that event. These are included in a zip file attached with this report. The events are summarized for the 8 rain gages maintained by the city below.

Rain event range	0.01 to 1.64	inches	
Time event range	.25 to 16.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	601	11.36	0.02
0.11- 0.5	71	15.39	0.22
0.51-1.0	9	5.69	0.63
1.1-2.0	5	6.70	1.34
TOTAL	686	39.14	0.06

Table 7: Statistics for Station 1

Rain event range	0.01 to 1.45	inches	
Time event range	.25 to 14.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	627	12.44	0.02
0.11- 0.5	68	15.67	0.23
0.51-1.0	11	6.60	0.60
1.1-2.0	5	6.39	1.28
TOTAL	711	41.10	0.06

Table 8: Statistics for Station 2

Rain event range	0.01 to 1.3	inches	
Time event range	.25 to 14	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	600	11.15	0.02
0.11- 0.5	70	15.25	0.22
0.51-1.0	4	2.81	0.70
1.1-2.0	2	2.40	1.20
TOTAL	676	31.61	0.05

Table 9: Statistics for Station 3

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Rain event range	0.01 to 2.26	inches	
Time event range	.25 to 16.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	686	13.89	0.02
0.11- 0.5	76	17.28	0.23
0.51-1.0	12	7.45	0.62
1.1-2.0	4	5.05	1.26
2.1-3.0	1	2.26	2.26
TOTAL	779	45.93	0.06

Table 10: Statistics for Station 4

Rain event range	0.01 to 1.52	inches	
Time event range	.25 to 12.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	233	4.61	0.02
0.11- 0.5	23	5.58	0.24
0.51-1.0	2	1.40	0.70
1.1-2.0	2	2.75	1.38
TOTAL	260	14.34	0.06

Table 11: Statistics for Station 5

Rain event range	0.01 to 2.19	inches	
Time event range	.25 to 16.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	536	10.75	0.02
0.11- 0.5	61	14.66	0.24
0.51-1.0	8	4.73	0.59
1.1-2.0	3	3.68	1.23
2.0 up	1	2.19	2.19
TOTAL	609	36.01	0.06

Table 9: Statistics for Station 6

Rain event range	0.01 to 2.24	inches	
Time event range	.25 to 15	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	519	9.87	0.02
0.11- 0.5	41	9.57	0.23
0.51-1.0	10	6.19	0.62
1.1-2.0	4	4.50	1.13

2.0 up	1	2.24	2.24
TOTAL	575	32.37	0.06

Table 10: Statistics for Station 7

Rain event range	0.01 to 1.47	inches	
Time event range	.25 to 9.25	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	110	2.05	0.02
0.11- 0.5	16	4.12	0.26
0.51-1.0	2	1.26	0.63
1.1-2.0	2	2.56	1.28
TOTAL	130	9.99	0.08

Table 11: Statistics for Station 8

Rain event range	0.01 to 1.73	inches	
Time event range	0.25 to 17.25	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	672	13.04	0.019
0.11- 0.5	53	11.5	0.217
0.51-1.0	15	11.07	0.738
1.1-2.0	8	11.35	1.42
TOTAL	748	46.96	

Table 12: Statistics for Station Green Mountain

Rain event range	0.01 to 1.2	inches	
Time event range	0.25 to 10.25	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	659	14.49	0.022
0.11- 0.5	76	17.23	0.227
0.51-1.0	8	4.8	0.6
1.1-2.0	4	4.4	1.1
TOTAL	747	40.92	

Table 13: Statistics for Station Bremerton

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Rain event range	0.01 to 3.46	inches	
Time event range	0.25 to 20	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	623	12.98	0.0208
0.11- 0.5	65	14.74	0.2267
0.51-1.0	15	10.65	0.71
1.1-3.5	7	11.09	1.584
TOTAL	710	49.46	

Table 14: Statistics for Station Silverdale/Wixton

Rain event range	0.01 to 3.34	inches	
Time event range	0.25 to 19.5	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	622	13.54	0.0218
0.11- 0.5	66	15.03	0.2277
0.51-1.0	14	9.44	0.6742
1.1-3.5	12	17.36	1.4466
TOTAL	714	55.37	

Table 15: Statistics for Station Airport Park

Rain event range	0.01 to 1.37	inches	
Time event range	0.25 to 10.25	hours	
Precip (inches)	No. of events	Precip (inches)	Average precip per event (inches)
0.01-.1	475	9.85	0.0207
0.11- 0.5	63	14.57	0.2313
0.51-1.0	11	7.19	0.6536
1.1-2.0	2	2.7	1.35
TOTAL	551	34.31	

Table 16: Statistics for Station PSNS

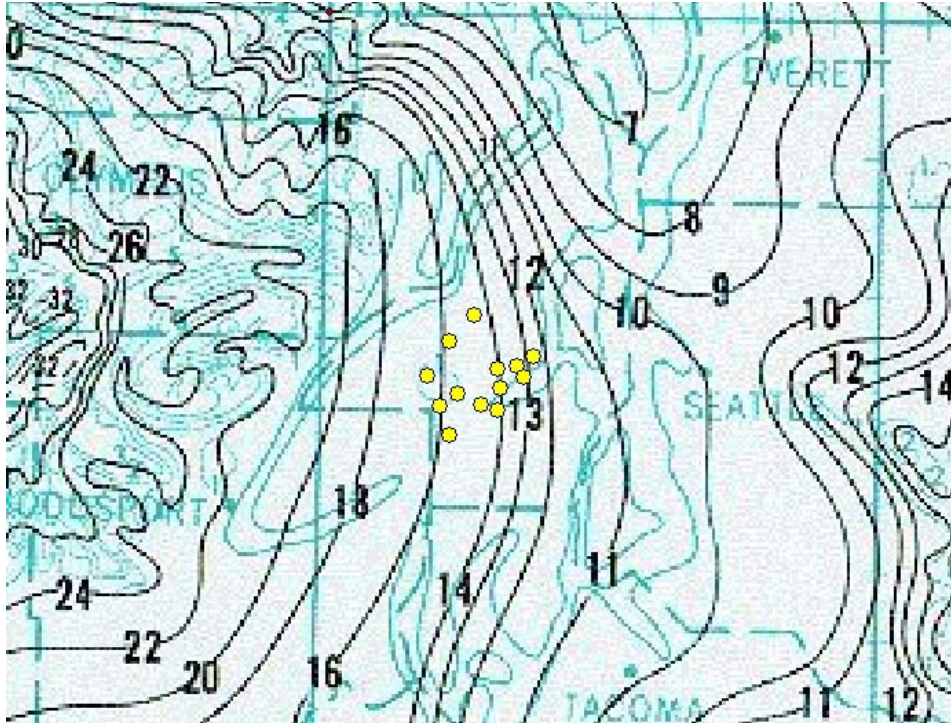**Attachment A: Iso-Hyetographs with 13 Rain Gage Stations View**

Figure Above: 2 Year 6 Hour
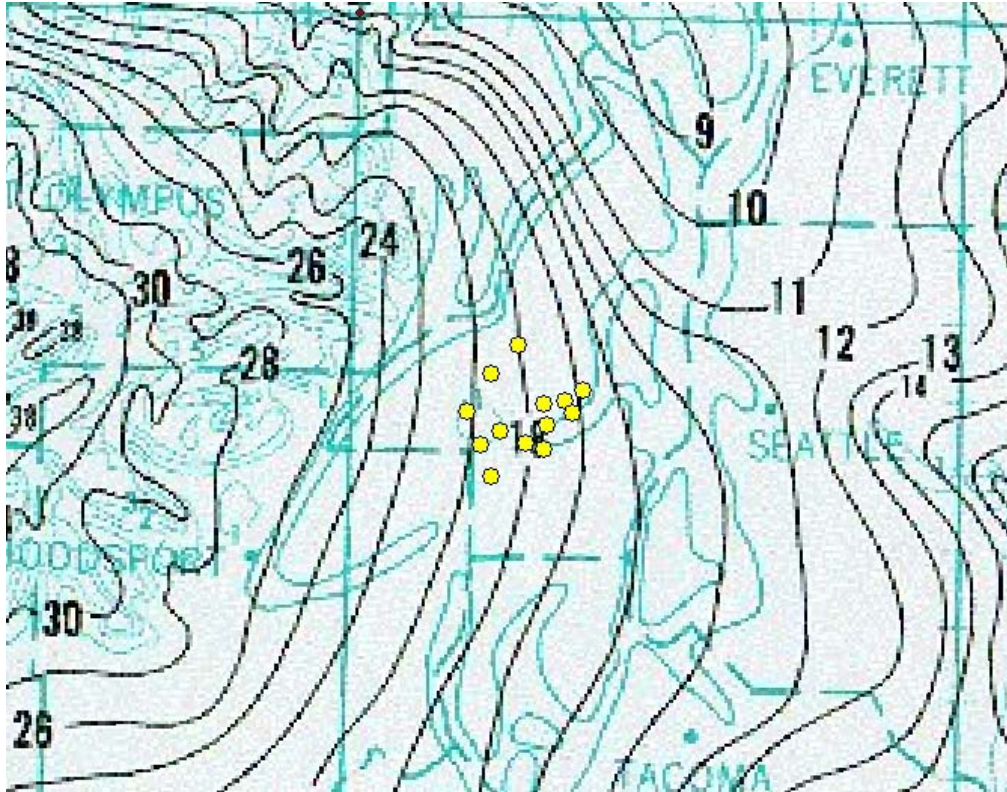

Figure Above: 5 Year 6 Hour
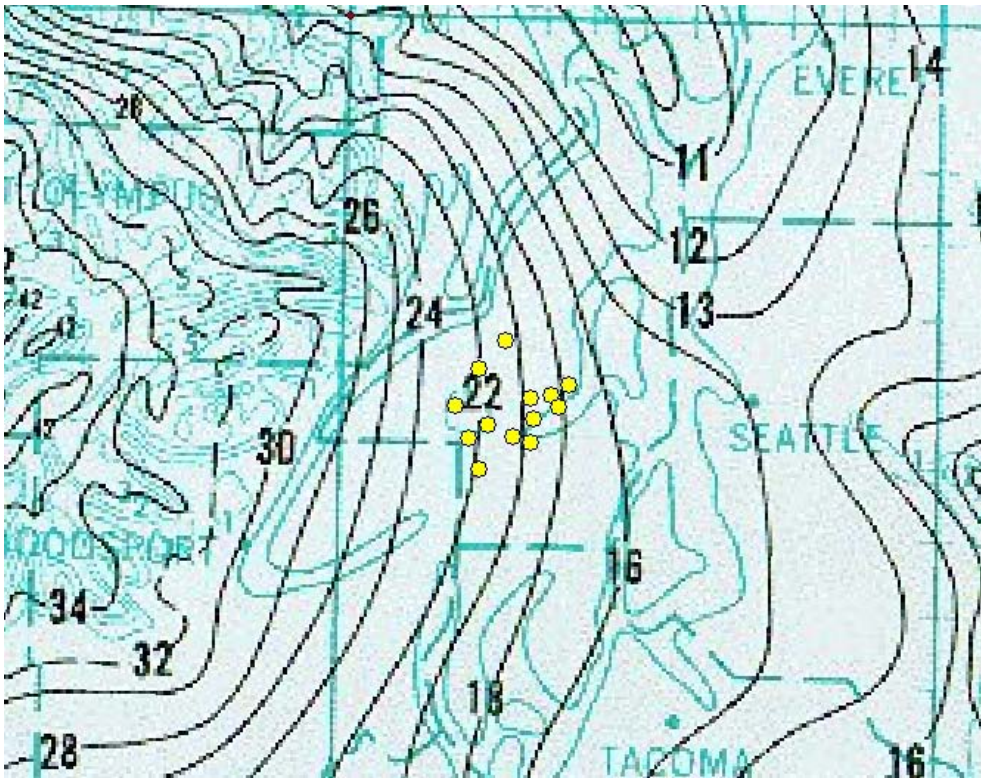
Figure Above: 10 Year 6 Hour
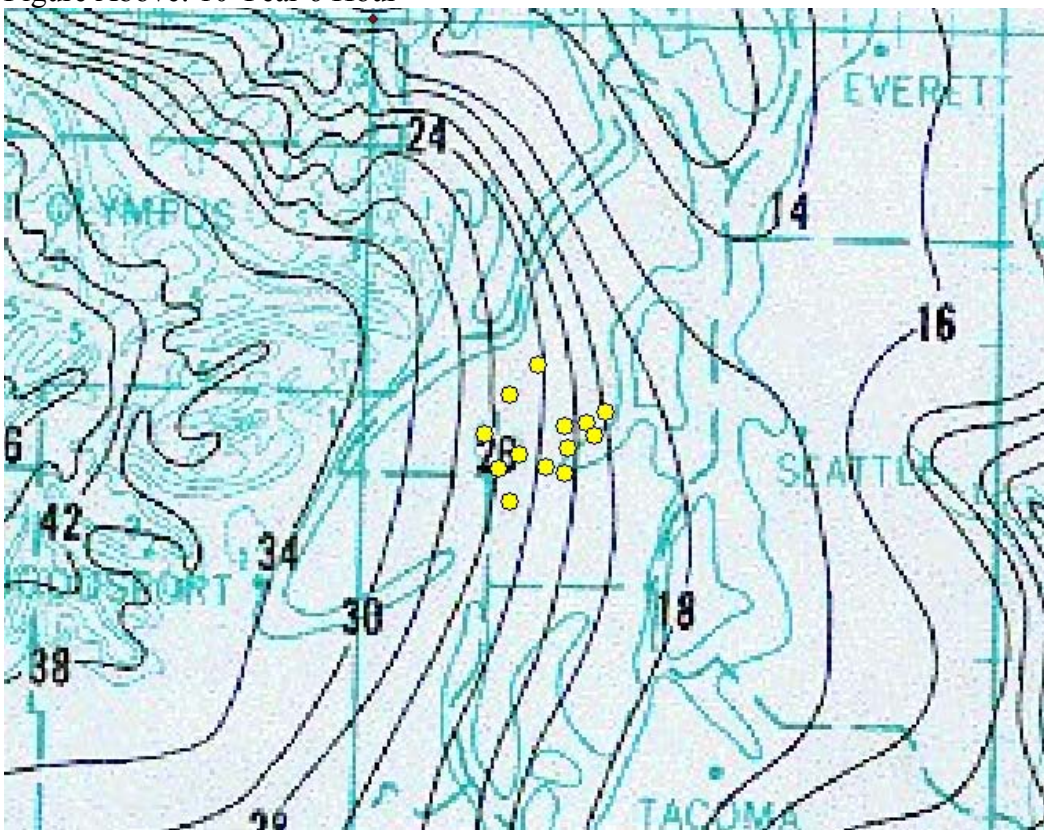

Figure Above: 25 Year 6 Hour
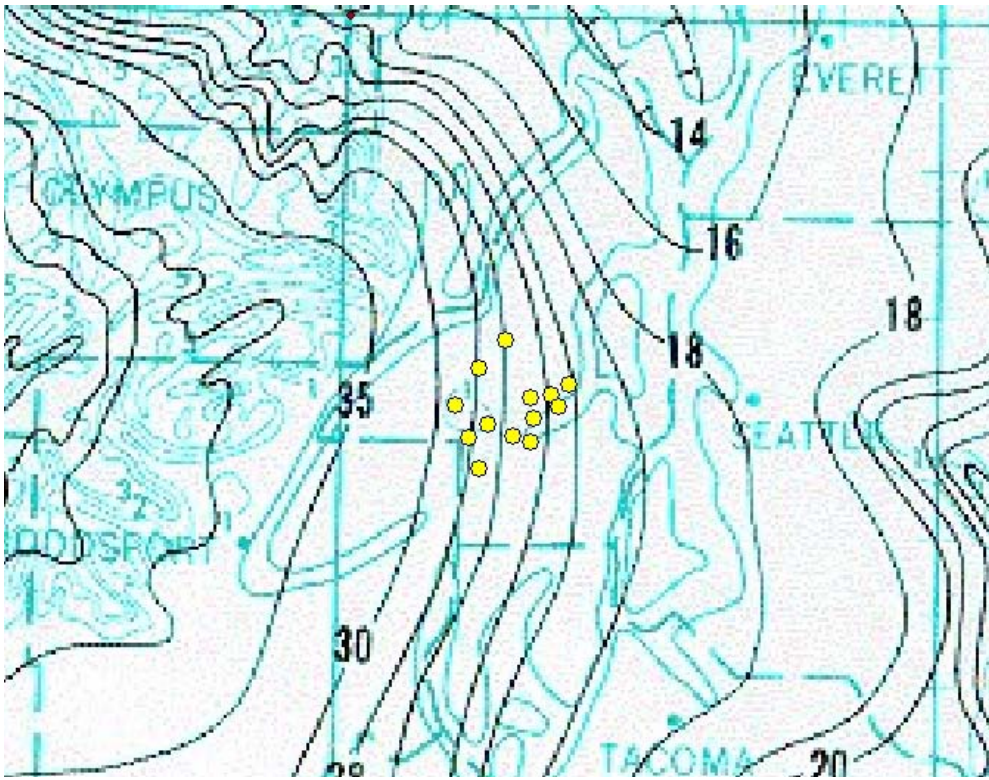
Figure Above: 50 Year 6 Hour

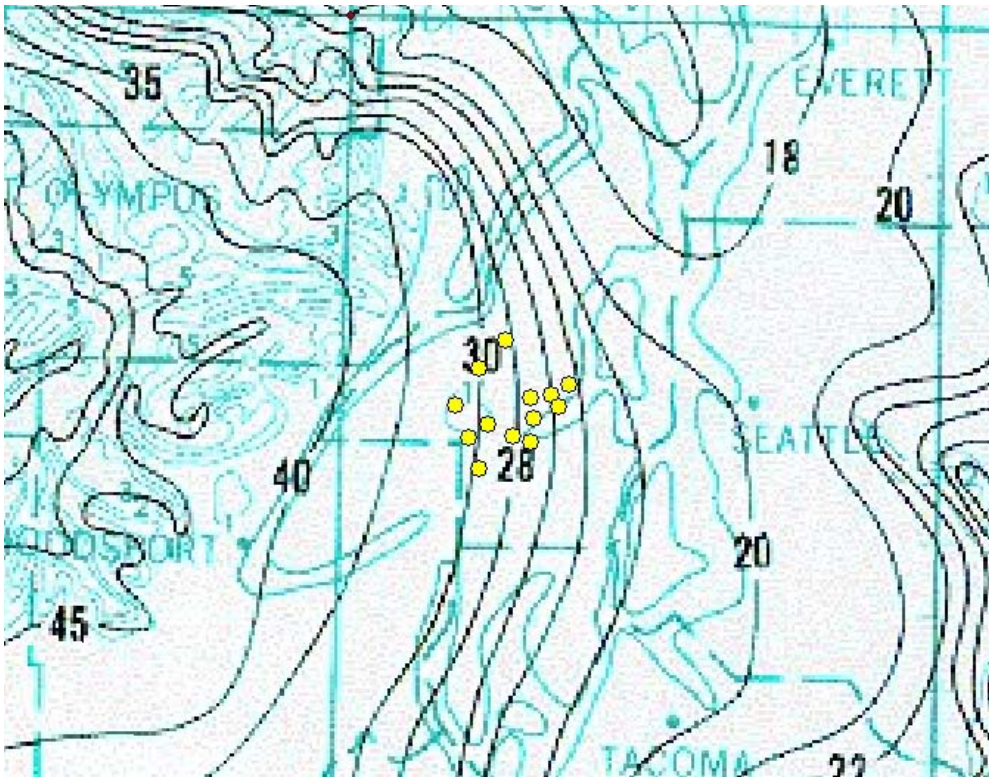Figure Above: 100 Year 6 Hour
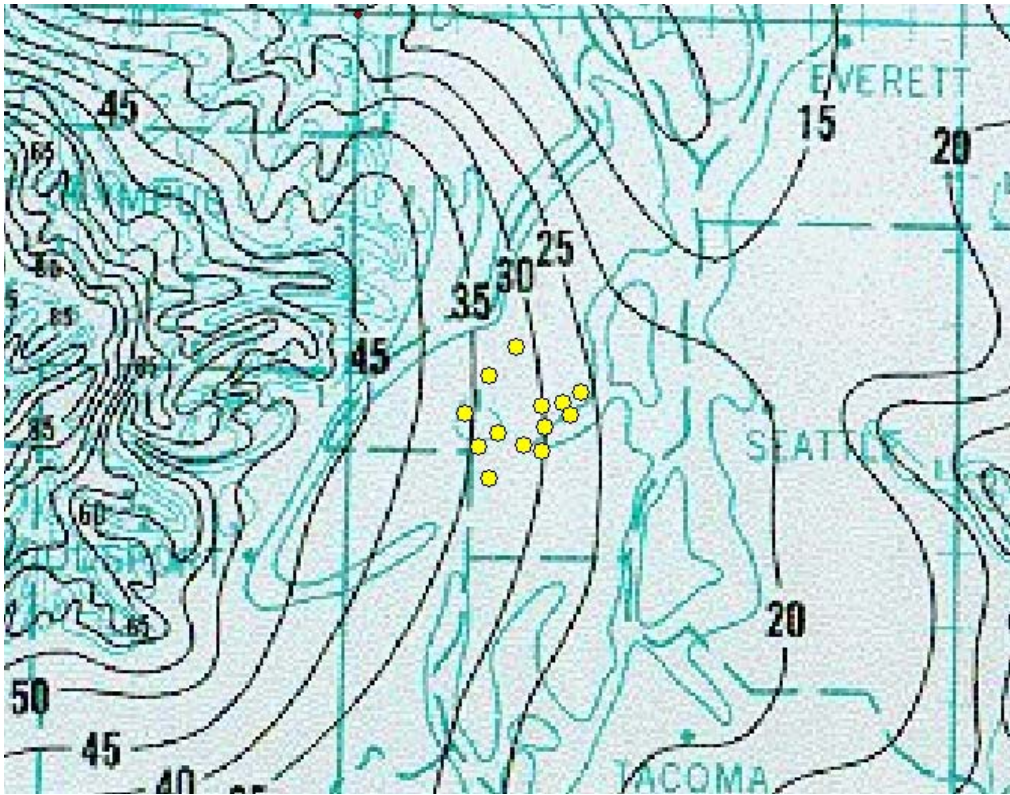
Figure Above: 2 Year 24 Hour
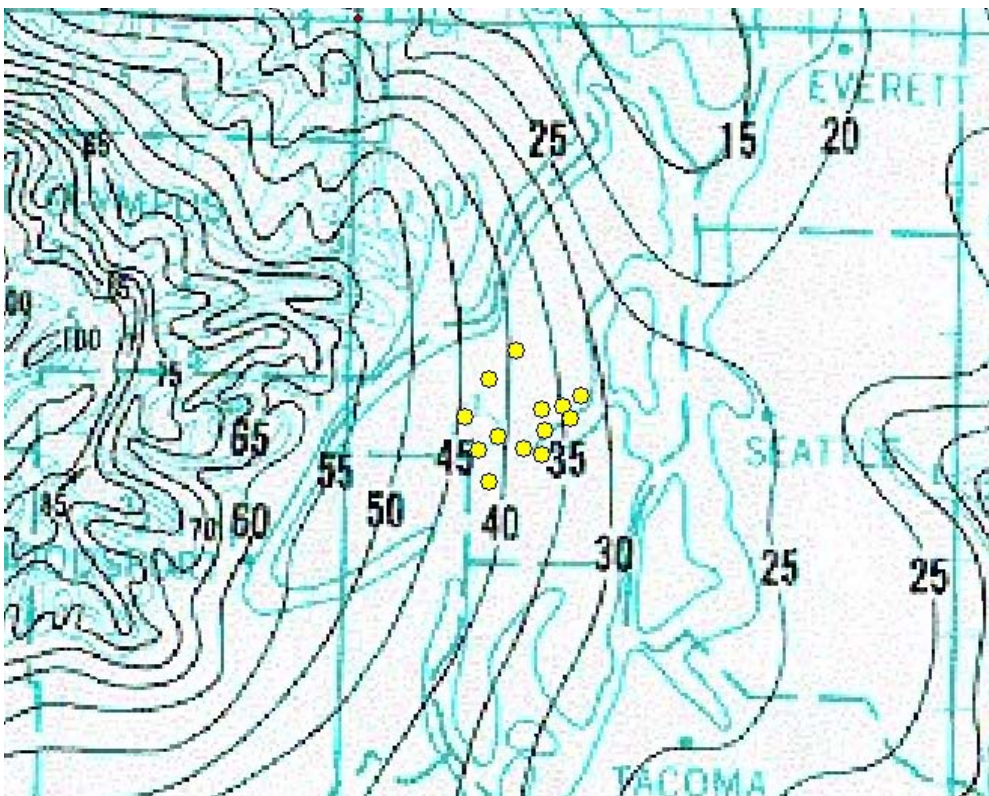

Figure Above: 5 year 24 Hour
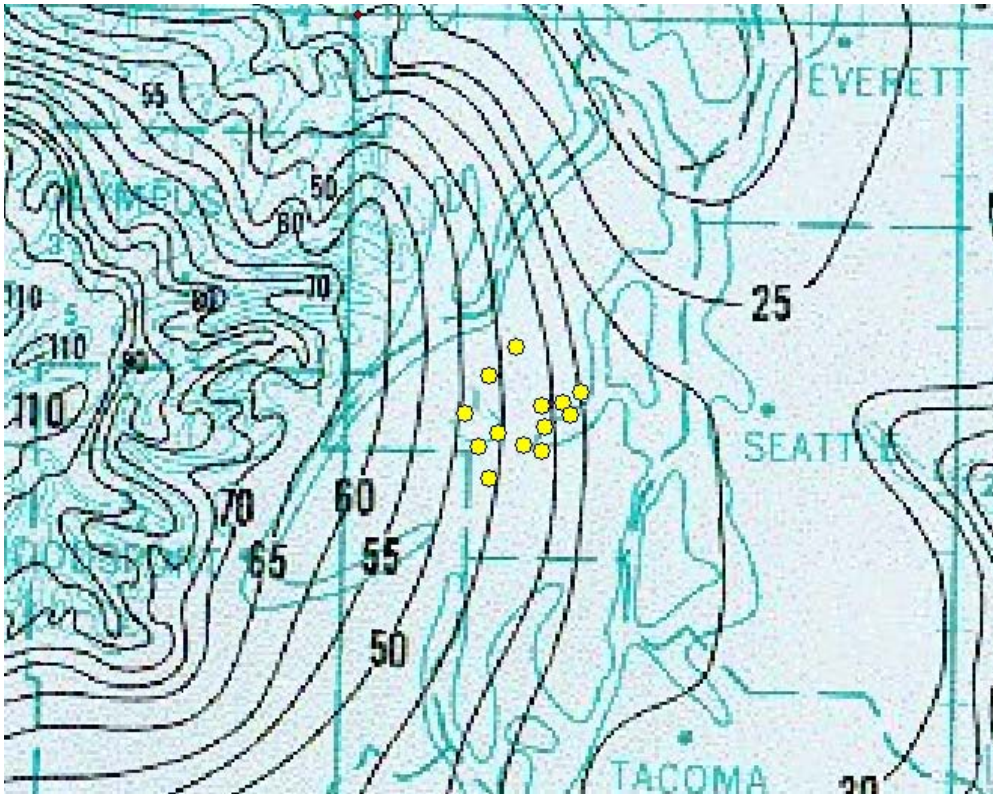
Figure Above: 10 Year 24 Hour
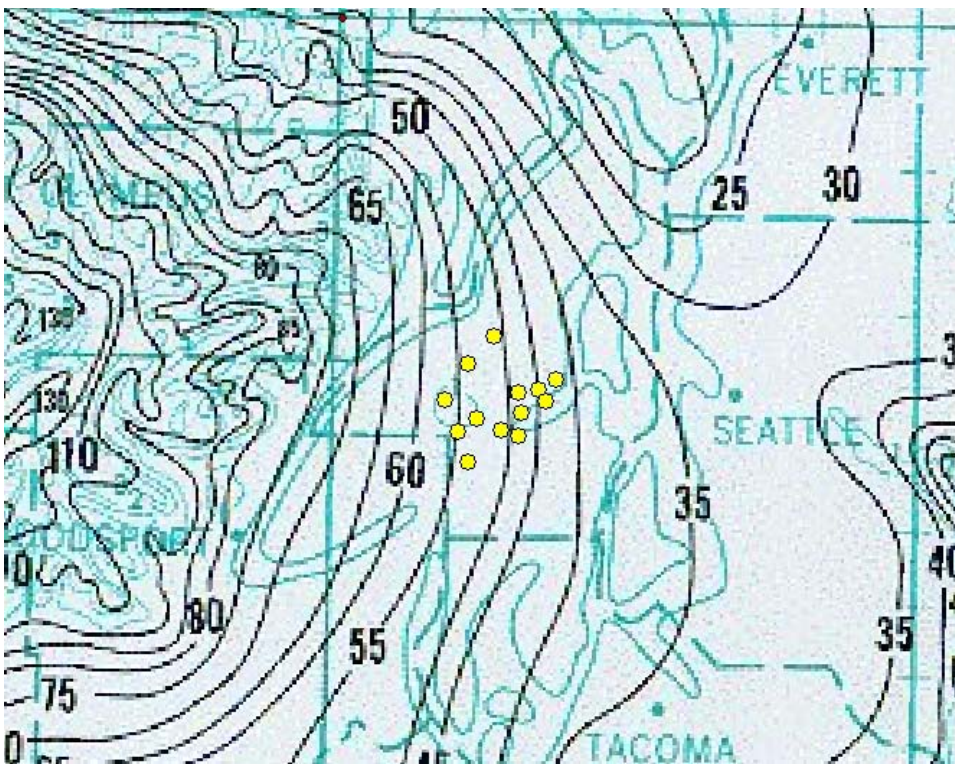
Figure Above: 25 Year 24 Hour
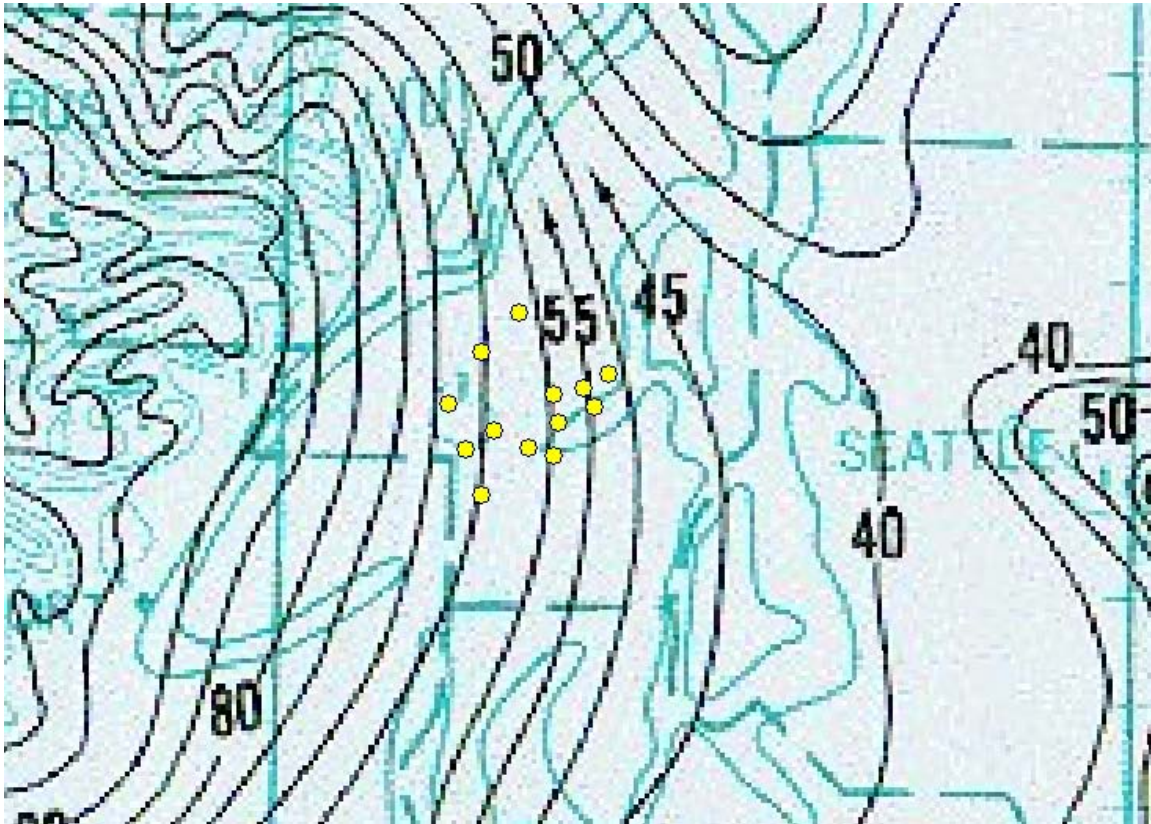
Figure Above: 100 Year 24 Hour

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
1	2	auto_hiway	282,547.8	56.72%	160,261.11
1	5	commercial_retail	3,940,646.3	61.18%	2,410,887.40
1	6	commercial_service	772,510.4	46.90%	362,307.38
1	15	industrial_light	400,513.4	28.59%	114,506.78
1	18	open_land	5,374,138.9	3.62%	194,543.83
1	19	parking	45,970.9	44.94%	20,659.32
1	20	parks	13,854.0	7.73%	1,070.91
1	24	power	149,001.2	8.07%	12,024.40
1	26	rural	466,380.8	8.04%	37,497.02
1	28	streets_hiways	20,229.1	27.28%	5,518.50
1	29	suburban	329,382.8	13.04%	42,951.52
1	31	urban_high	326,492.9	58.79%	191,945.18
1	32	urban_low	2,365,787.2	21.79%	515,505.03
1	33	urban_medium	64,936.8	45.09%	29,280.00
1	34	urban_standard	3,532,891.3	38.47%	1,359,103.30
1	36	vacant	2,950,127.2	6.20%	182,907.89
1	39	no_label	722,403.9	10.92%	78,886.51
1	40	rightofway	1,748,706.5	41.55%	726,587.55
1	41	unknown	2,589.8	10.92%	282.81
2	4	church	41,424.0	40.33%	16,706.30
2	5	commercial_retail	129,808.4	61.18%	79,416.78
2	8	estate	251,072.5	9.84%	24,705.53
2	9	facilities	33,003.2	18.00%	5,940.58
2	19	parking	61,049.4	44.94%	27,435.60
2	28	streets_hiways	40,801.2	27.28%	11,130.57
2	29	suburban	347,638.2	13.04%	45,332.02
2	31	urban_high	171,461.1	58.79%	100,801.98
2	32	urban_low	903,050.1	21.79%	196,774.62
2	33	urban_medium	78,804.5	45.09%	35,532.95
2	34	urban_standard	2,992,023.9	38.47%	1,151,031.60
2	36	vacant	1,371,065.2	6.20%	85,006.04
2	40	rightofway	1,481,466.3	41.55%	615,549.25
3	2	auto_hiway	56,099.6	56.72%	31,819.69
3	5	commercial_retail	419,537.3	61.18%	256,672.92
3	6	commercial_service	95,348.8	46.90%	44,718.59
3	9	facilities	350,305.5	18.00%	63,054.99
3	10	gas	96,537.8	26.95%	26,016.94
3	15	industrial_light	15,993.9	28.59%	4,572.66
3	24	power	292,714.5	8.07%	23,622.06
3	26	rural	895,075.0	8.04%	71,964.03
3	27	schools	1,102,276.8	29.63%	326,604.62
3	31	urban_high	94,970.1	58.79%	55,832.92
3	32	urban_low	417,620.3	21.79%	90,999.46
3	33	urban_medium	173,273.4	45.09%	78,128.98
3	34	urban_standard	2,443,006.1	38.47%	939,824.45
3	36	vacant	452,869.2	6.20%	28,077.89
3	39	no_label	1,079,765.4	10.92%	117,910.38
3	40	rightofway	672,736.8	41.55%	279,522.14
3	41	unknown	3,782.4	10.92%	413.04

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
4	5	commercial_retail	35,355.4	61.18%	21,630.43
4	29	suburban	23,556.7	13.04%	3,071.79
4	31	urban_high	186,212.3	58.79%	109,474.21
4	32	urban_low	218,783.3	21.79%	47,672.88
4	33	urban_medium	133,880.6	45.09%	60,366.76
4	34	urban_standard	952,688.7	38.47%	366,499.34
4	36	vacant	251,716.8	6.20%	15,606.44
4	40	rightofway	514,343.1	41.55%	213,709.56
4	41	unknown	5,047.2	10.92%	551.15
5	4	church	71,348.0	40.33%	28,774.65
5	6	commercial_service	7,335.3	46.90%	3,440.26
5	19	parking	3,500.0	44.94%	1,572.90
5	24	power	2,307.7	8.07%	186.23
5	29	suburban	53,876.7	13.04%	7,025.52
5	31	urban_high	21,907.5	58.79%	12,879.42
5	32	urban_low	248,647.3	21.79%	54,180.25
5	33	urban_medium	96,914.3	45.09%	43,698.66
5	34	urban_standard	1,233,419.9	38.47%	474,496.64
5	36	vacant	14,007.2	6.20%	868.45
5	40	rightofway	626,542.6	41.55%	260,328.45
6	8	estate	1,072,649.0	9.84%	105,548.66
6	18	open_land	25,981,812.0	3.62%	940,541.59
6	26	rural	159,087.0	8.04%	12,790.60
6	29	suburban	803,221.2	13.04%	104,740.04
6	32	urban_low	23,907.6	21.79%	5,209.47
6	36	vacant	1,752,237.0	6.20%	108,638.69
6	38	wooded	53,512,507.0	2.58%	1,380,622.70
6	41	unknown	27.0	10.92%	2.95
7	5	commercial_retail	34,442.9	61.18%	21,072.17
7	6	commercial_service	1,353,097.0	46.90%	634,602.49
7	8	estate	4,299,129.7	9.84%	423,034.36
7	9	facilities	24,924.6	18.00%	4,486.43
7	18	open_land	6,492,887.4	3.62%	235,042.52
7	20	parks	404,169.0	7.73%	31,242.26
7	24	power	1,591.6	8.07%	128.44
7	26	rural	325,478.4	8.04%	26,168.46
7	28	streets_hiways	297,261.5	27.28%	81,092.94
7	29	suburban	7,122,327.3	13.04%	928,751.48
7	32	urban_low	2,442,304.9	21.79%	532,178.24
7	34	urban_standard	72,951.0	38.47%	28,064.25
7	36	vacant	11,934,565.0	6.20%	739,943.04
7	38	wooded	28,725,671.0	2.58%	741,122.32
7	40	rightofway	1,713,020.7	41.55%	711,760.10
7	41	unknown	99,459.8	10.92%	10,861.01
7	42	lake	5,002,610.0	6.60%	330,172.26
8	1	airports	245,827.0	15.20%	37,365.70
8	2	auto_hiway	737,550.0	56.72%	418,338.36
8	5	commercial_retail	204,853.0	61.18%	125,329.07
8	6	commercial_service	35,243.0	46.90%	16,528.97

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
8	8	estate	1,486,517.3	9.84%	146,273.30
8	10	gas	5,680.8	26.95%	1,530.98
8	14	industrial_heavy	2,143,763.7	46.53%	997,493.25
8	18	open_land	57,038,036.0	3.62%	2,064,776.90
8	19	parking	17,589.5	44.94%	7,904.72
8	20	parks	41,048,555.0	7.73%	3,173,053.30
8	24	power	78,601.7	8.07%	6,343.16
8	25	rail	1,036,196.0	15.97%	165,480.50
8	26	rural	431,105.0	8.04%	34,660.84
8	27	schools	86,101.4	29.63%	25,511.85
8	28	streets_hiways	31,534.5	27.28%	8,602.61
8	29	suburban	1,688,671.5	13.04%	220,202.76
8	30	transportation	1,215,711.6	33.42%	406,290.82
8	32	urban_low	2,457,966.5	21.79%	535,590.90
8	34	urban_standard	510,268.2	38.47%	196,300.18
8	36	vacant	6,290,142.0	6.20%	389,988.80
8	38	wooded	16,796,201.0	2.58%	433,341.99
8	39	no_label	148,757.0	10.92%	16,244.26
8	40	rightofway	5,524,790.9	41.55%	2,295,550.60
8	41	unknown	135.9	10.92%	14.84
9	18	open_land	3,497,757.0	3.62%	126,618.80
9	29	suburban	529,544.3	13.04%	69,052.58
9	32	urban_low	489,707.9	21.79%	106,707.35
9	33	urban_medium	358.1	45.09%	161.47
9	34	urban_standard	45,321.6	38.47%	17,435.22
9	36	vacant	303,148.9	6.20%	18,795.23
9	38	wooded	59,051,014.0	2.58%	1,523,516.20
9	40	rightofway	262,896.4	41.55%	109,233.45
9	41	unknown	21,870.5	10.92%	2,388.26
10	18	open_land	26,075,577.0	3.62%	943,935.87
10	24	power	376,621.0	8.07%	30,393.32
10	25	rail	1,554,047.0	15.97%	248,181.31
10	36	vacant	58,241.9	6.20%	3,611.00
10	38	wooded	15,726,680.0	2.58%	405,748.35
10	41	unknown	1,846.4	10.92%	201.63
11	2	auto_hiway	24,092.1	56.72%	13,665.04
11	4	church	36,296.0	40.33%	14,638.18
11	5	commercial_retail	79,840.9	61.18%	48,846.66
11	6	commercial_service	573,734.3	46.90%	269,081.39
11	8	estate	3,502,127.7	9.84%	344,609.37
11	9	facilities	14,756.8	18.00%	2,656.22
11	10	gas	2,551.7	26.95%	687.68
11	18	open_land	4,946,811.7	3.62%	179,074.58
11	24	power	534,432.0	8.07%	43,128.66
11	26	rural	2,084,512.0	8.04%	167,594.76
11	27	schools	557,664.0	29.63%	165,235.84
11	28	streets_hiways	66,772.0	27.28%	18,215.40
11	29	suburban	2,433,506.6	13.04%	317,329.26
11	32	urban_low	5,117,739.1	21.79%	1,115,155.30

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
11	33	urban_medium	15,346.6	45.09%	6,919.78
11	34	urban_standard	506,518.5	38.47%	194,857.67
11	36	vacant	10,412,244.0	6.20%	645,559.10
11	38	wooded	14,178,015.0	2.58%	365,792.80
11	40	rightofway	2,473,910.3	41.55%	1,027,909.70
11	41	unknown	11.7	10.92%	1.28
12	8	estate	440,523.3	9.84%	43,347.49
12	10	gas	2,500.0	26.95%	673.75
12	16	mines	6,114,437.7	25.67%	1,569,576.20
12	18	open_land	11,504,921.0	3.62%	416,478.12
12	19	parking	108,295.0	44.94%	48,667.77
12	25	rail	434,533.0	15.97%	69,394.92
12	28	streets_hiways	77,035.1	27.28%	21,015.18
12	29	suburban	71,170.5	13.04%	9,280.63
12	32	urban_low	354,881.9	21.79%	77,328.77
12	36	vacant	2,880,765.4	6.20%	178,607.45
12	38	wooded	11,344,388.0	2.58%	292,685.22
12	40	rightofway	546,233.4	41.55%	226,959.98
13	8	estate	13,976.5	9.84%	1,375.29
13	25	rail	102,687.0	15.97%	16,399.11
13	28	streets_hiways	10,951.9	27.28%	2,987.68
13	29	suburban	965,404.2	13.04%	125,888.71
13	32	urban_low	695,760.4	21.79%	151,606.19
13	33	urban_medium	2,677.7	45.09%	1,207.37
13	34	urban_standard	110,676.0	38.47%	42,577.06
13	36	vacant	585,745.0	6.20%	36,316.19
13	38	wooded	2,607,608.9	2.58%	67,276.31
13	40	rightofway	252,962.4	41.55%	105,105.88
13	41	unknown	3,906.7	10.92%	426.61
14	4	church	27,424.7	40.33%	11,060.38
14	5	commercial_retail	222,457.0	61.18%	136,099.19
14	6	commercial_service	290,305.8	46.90%	136,153.42
14	8	estate	774,243.8	9.84%	76,185.59
14	9	facilities	148,545.5	18.00%	26,738.19
14	10	gas	163,585.1	26.95%	44,086.18
14	15	industrial_light	206,800.2	28.59%	59,124.18
14	18	open_land	12,614,729.0	3.62%	456,653.18
14	24	power	2,974,699.4	8.07%	240,058.24
14	29	suburban	2,073,099.3	13.04%	270,332.15
14	31	urban_high	1,132.3	58.79%	665.68
14	32	urban_low	2,093,905.9	21.79%	456,262.10
14	33	urban_medium	57,825.9	45.09%	26,073.70
14	34	urban_standard	865,549.7	38.47%	332,976.97
14	35	utilities_general	26,029.2	32.09%	8,352.77
14	36	vacant	4,234,310.9	6.20%	262,527.28
14	38	wooded	7,848,337.9	2.58%	202,487.12
14	39	no_label	51,119.9	10.92%	5,582.29
14	40	rightofway	2,255,269.5	41.55%	937,064.48
14	41	unknown	787.8	10.92%	86.03

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
15	8	estate	463,719.2	9.84%	45,629.97
15	18	open_land	23,918,504.0	3.62%	865,849.85
15	20	parks	1,703,748.5	7.73%	131,699.76
15	24	power	60,220.4	8.07%	4,859.79
15	26	rural	536,473.0	8.04%	43,132.43
15	29	suburban	828,108.5	13.04%	107,985.35
15	32	urban_low	2,318,845.3	21.79%	505,276.39
15	34	urban_standard	9,854.8	38.47%	3,791.14
15	36	vacant	3,029,746.9	6.20%	187,844.31
15	38	wooded	19,030,345.0	2.58%	490,982.90
15	40	rightofway	1,260,562.5	41.55%	523,763.72
16	4	church	219,474.4	40.33%	88,514.03
16	5	commercial_retail	15,525.1	61.18%	9,498.26
16	6	commercial_service	618,377.6	46.90%	290,019.09
16	8	estate	5,208,176.1	9.84%	512,484.53
16	9	facilities	64,470.3	18.00%	11,604.65
16	10	gas	316,178.3	26.95%	85,210.05
16	17	mobile_park	463,393.0	40.49%	187,627.83
16	18	open_land	2,341,113.0	3.62%	84,748.29
16	19	parking	15,768.6	44.94%	7,086.41
16	20	parks	118,870.4	7.73%	9,188.68
16	23	phone_tv_radio	1,798.6	1.39%	25.00
16	24	power	1,721.4	8.07%	138.92
16	26	rural	2,370,944.8	8.04%	190,623.96
16	27	schools	511,976.0	29.63%	151,698.49
16	28	streets_hiways	96,282.1	27.28%	26,265.76
16	29	suburban	6,768,044.9	13.04%	882,553.05
16	31	urban_high	219,393.5	58.79%	128,981.44
16	32	urban_low	4,159,431.3	21.79%	906,340.08
16	33	urban_medium	225,483.7	45.09%	101,670.60
16	34	urban_standard	2,090,005.5	38.47%	804,025.12
16	36	vacant	7,470,572.6	6.20%	463,175.50
16	39	no_label	1,058,884.8	10.92%	115,630.22
16	40	rightofway	2,692,314.3	41.55%	1,118,656.60
16	41	unknown	7,973.7	10.92%	870.73
17	4	church	1,198.9	40.33%	483.52
17	5	commercial_retail	205,424.3	61.18%	125,678.59
17	6	commercial_service	59,267.0	46.90%	27,796.22
17	8	estate	3,368,163.2	9.84%	331,427.26
17	16	mines	435,600.0	25.67%	111,818.52
17	18	open_land	2,772,464.2	3.62%	100,363.20
17	19	parking	21,364.4	44.94%	9,601.16
17	20	parks	664.2	7.73%	51.34
17	21	parks_resort	3,974,907.0	7.24%	287,783.27
17	23	phone_tv_radio	147.3	1.39%	2.05
17	26	rural	2,345,091.0	8.04%	188,545.32
17	27	schools	397,666.4	29.63%	117,828.55
17	28	streets_hiways	6,540.4	27.28%	1,784.22
17	29	suburban	3,948,301.3	13.04%	514,858.49

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
17	31	urban_high	92,941.5	58.79%	54,640.31
17	32	urban_low	2,140,157.9	21.79%	466,340.41
17	33	urban_medium	242,056.2	45.09%	109,143.14
17	34	urban_standard	2,958,917.6	38.47%	1,138,295.60
17	36	vacant	9,460,246.2	6.20%	586,535.26
17	39	no_label	791,070.4	10.92%	86,384.89
17	40	rightofway	1,413,419.3	41.55%	587,275.72
17	41	unknown	2,038.3	10.92%	222.58
18	5	commercial_retail	62,598.3	61.18%	38,297.64
18	8	estate	1,057,879.1	9.84%	104,095.30
18	18	open_land	2,221,253.7	3.62%	80,409.38
18	19	parking	42,500.7	44.94%	19,099.82
18	20	parks	993,816.0	7.73%	76,821.98
18	21	parks_resort	1,542,973.3	7.24%	111,711.27
18	24	power	78,298.7	8.07%	6,318.71
18	26	rural	945.5	8.04%	76.02
18	29	suburban	2,047,553.8	13.04%	267,001.02
18	31	urban_high	276,790.7	58.79%	162,725.25
18	32	urban_low	886,861.0	21.79%	193,247.01
18	33	urban_medium	115,122.3	45.09%	51,908.65
18	34	urban_standard	2,959,499.6	38.47%	1,138,519.50
18	36	vacant	4,161,743.9	6.20%	258,028.12
18	39	no_label	133,935.0	10.92%	14,625.70
18	40	rightofway	2,078,031.0	41.55%	863,421.88
18	41	unknown	913.1	10.92%	99.71
18	42	lake	1,895,532.1	6.60%	125,105.12
19	8	estate	484,183.3	9.84%	47,643.64
19	18	open_land	182,141.0	3.62%	6,593.50
19	24	power	40,710.3	8.07%	3,285.32
19	26	rural	327,176.0	8.04%	26,304.95
19	27	schools	255,100.0	29.63%	75,586.13
19	29	suburban	81,796.9	13.04%	10,666.32
19	32	urban_low	1,213,121.2	21.79%	264,339.11
19	34	urban_standard	807,464.6	38.47%	310,631.63
19	36	vacant	791,952.7	6.20%	49,101.07
19	39	no_label	426,779.5	10.92%	46,604.32
20	2	auto_hiway	46,701.4	56.72%	26,489.03
20	3	cemetery	591,549.0	10.17%	60,160.53
20	4	church	331,583.0	40.33%	133,727.42
20	5	commercial_retail	1,578,525.0	61.18%	965,741.60
20	6	commercial_service	308,744.4	46.90%	144,801.12
20	8	estate	1,155,261.8	9.84%	113,677.76
20	9	facilities	395,924.0	18.00%	71,266.32
20	10	gas	1,458.9	26.95%	393.17
20	11	hospital	91,750.0	46.80%	42,939.00
20	15	industrial_light	198,405.0	28.59%	56,723.99
20	18	open_land	1,725,169.6	3.62%	62,451.14
20	19	parking	33,023.2	44.94%	14,840.63
20	20	parks	9,952,510.1	7.73%	769,329.03

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
20	24	power	605,355.5	8.07%	48,852.19
20	26	rural	291,633.0	8.04%	23,447.29
20	27	schools	2,289,700.0	29.63%	678,438.11
20	28	streets_hiways	11,964.1	27.28%	3,263.81
20	29	suburban	2,633,958.2	13.04%	343,468.15
20	31	urban_high	230,070.7	58.79%	135,258.56
20	32	urban_low	6,208,180.0	21.79%	1,352,762.40
20	33	urban_medium	1,814,790.5	45.09%	818,289.04
20	34	urban_standard	11,409,117.0	38.47%	4,389,087.20
20	35	utilities_general	99,269.0	32.09%	31,855.42
20	36	vacant	4,395,908.5	6.20%	272,546.33
20	39	no_label	3,824,825.3	10.92%	417,670.92
20	40	rightofway	3,141,546.4	41.55%	1,305,312.50
20	41	unknown	13,203.9	10.92%	1,441.87
21	5	commercial_retail	145.0	61.18%	88.71
21	8	estate	6,386,167.0	9.84%	628,398.83
21	18	open_land	16,029,047.0	3.62%	580,251.49
21	19	parking	203,408.5	44.94%	91,411.78
21	20	parks	2,507,278.4	7.73%	193,812.62
21	21	parks_resort	4,398,293.0	7.24%	318,436.41
21	24	power	2,887.2	8.07%	233.00
21	26	rural	3,651,938.8	8.04%	293,615.88
21	27	schools	104,055.0	29.63%	30,831.50
21	28	streets_hiways	39,053.7	27.28%	10,653.85
21	29	suburban	4,697,828.8	13.04%	612,596.88
21	32	urban_low	3,454,701.4	21.79%	752,779.44
21	33	urban_medium	21,299.9	45.09%	9,604.12
21	34	urban_standard	981,348.8	38.47%	377,524.88
21	36	vacant	13,061,106.0	6.20%	809,788.57
21	38	wooded	16,301,360.0	2.58%	420,575.09
21	39	no_label	22,150.4	10.92%	2,418.82
21	40	rightofway	2,683,003.9	41.55%	1,114,788.10
21	41	unknown	12,989.9	10.92%	1,418.50
22	5	commercial_retail	14,908.5	61.18%	9,121.02
22	8	estate	9,309,091.7	9.84%	916,014.62
22	18	open_land	14,659,357.0	3.62%	530,668.71
22	24	power	70,899.2	8.07%	5,721.57
22	26	rural	3,764,198.4	8.04%	302,641.55
22	29	suburban	7,960,636.1	13.04%	1,038,066.90
22	32	urban_low	5,768,827.1	21.79%	1,257,027.40
22	36	vacant	12,037,363.0	6.20%	746,316.49
22	38	wooded	16,597,277.0	2.58%	428,209.76
22	39	no_label	402,776.7	10.92%	43,983.22
22	40	rightofway	1,952,303.8	41.55%	811,182.23
22	41	unknown	7,286.3	10.92%	795.66
23	2	auto_hiway	37,380.3	56.72%	21,202.11
23	4	church	82,379.0	40.33%	33,223.45
23	8	estate	1,006,462.7	9.84%	99,035.93
23	18	open_land	425,164.7	3.62%	15,390.96

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
23	26	rural	146,368.0	8.04%	11,767.99
23	27	schools	23,023.9	29.63%	6,821.98
23	29	suburban	101,178.9	13.04%	13,193.73
23	32	urban_low	9,833.4	21.79%	2,142.70
23	36	vacant	1,148,117.1	6.20%	71,183.26
23	40	rightofway	1,079,099.6	41.55%	448,365.88
24	2	auto_hiway	47,168.2	56.72%	26,753.80
24	4	church	22,761.8	40.33%	9,179.83
24	5	commercial_retail	378,921.5	61.18%	231,824.17
24	6	commercial_service	244,057.0	46.90%	114,462.73
24	8	estate	2,644,026.3	9.84%	260,172.19
24	18	open_land	5,371,316.0	3.62%	194,441.64
24	19	parking	653.7	44.94%	293.77
24	20	parks	119,658.2	7.73%	9,249.58
24	26	rural	1,191,638.0	8.04%	95,807.70
24	29	suburban	3,089,454.8	13.04%	402,864.91
24	32	urban_low	4,970,380.6	21.79%	1,083,045.90
24	34	urban_standard	935,821.8	38.47%	360,010.65
24	36	vacant	7,352,468.9	6.20%	455,853.07
24	39	no_label	804,238.3	10.92%	87,822.82
24	40	rightofway	1,179,705.8	41.55%	490,167.76
24	41	unknown	15,062.9	10.92%	1,644.87
25	8	estate	6,519,516.2	9.84%	641,520.39
25	10	gas	504,155.0	26.95%	135,869.77
25	18	open_land	4,103,085.5	3.62%	148,531.70
25	19	parking	106,271.1	44.94%	47,758.23
25	24	power	155,131.2	8.07%	12,519.09
25	26	rural	5,904,756.3	8.04%	474,742.41
25	28	streets_hiways	5,687.9	27.28%	1,551.66
25	29	suburban	3,671,327.8	13.04%	478,741.15
25	32	urban_low	3,305,166.4	21.79%	720,195.76
25	34	urban_standard	1,474,397.2	38.47%	567,200.60
25	36	vacant	16,070,185.0	6.20%	996,351.48
25	38	wooded	546,496.0	2.58%	14,099.60
25	39	no_label	1,931,462.7	10.92%	210,915.73
25	40	rightofway	1,960,151.9	41.55%	814,443.11
25	41	unknown	21,932.9	10.92%	2,395.07
26	8	estate	4,392,024.3	9.84%	432,175.19
26	9	facilities	7,538,396.0	18.00%	1,356,911.30
26	18	open_land	37,488,108.0	3.62%	1,357,069.50
26	20	parks	331,067.9	7.73%	25,591.55
26	24	power	59,787.7	8.07%	4,824.87
26	26	rural	1,857,675.3	8.04%	149,357.09
26	29	suburban	5,902,631.6	13.04%	769,703.16
26	32	urban_low	1,807,763.5	21.79%	393,911.67
26	34	urban_standard	30,123.7	38.47%	11,588.59
26	36	vacant	12,516,139.0	6.20%	776,000.62
26	38	wooded	27,910,661.0	2.58%	720,095.05
26	40	rightofway	1,891,426.9	41.55%	785,887.88

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
26	41	unknown	2,838.2	10.92%	309.93
27	5	commercial_retail	381,032.9	61.18%	233,115.93
27	6	commercial_service	111,100.1	46.90%	52,105.95
27	8	estate	1,429,030.3	9.84%	140,616.58
27	9	facilities	904,529.0	18.00%	162,815.22
27	10	gas	749,333.7	26.95%	201,945.43
27	16	mines	1,491,829.4	25.67%	382,952.61
27	17	mobile_park	244,327.4	40.49%	98,928.16
27	18	open_land	2,949,589.3	3.62%	106,775.13
27	19	parking	10,082.6	44.94%	4,531.12
27	20	parks	587,577.1	7.73%	45,419.71
27	25	rail	929,578.3	15.97%	148,453.65
27	28	streets_hiways	33,654.8	27.28%	9,181.03
27	29	suburban	2,024,107.0	13.04%	263,943.55
27	32	urban_low	7,548,005.2	21.79%	1,644,710.30
27	33	urban_medium	45,375.4	45.09%	20,459.77
27	34	urban_standard	1,749,880.0	38.47%	673,178.84
27	35	utilities_general	29,098.1	32.09%	9,337.58
27	36	vacant	5,531,864.2	6.20%	342,975.58
27	37	water	1,035,048.4	6.60%	68,313.19
27	38	wooded	8,633,098.9	2.58%	222,733.95
27	40	rightofway	2,436,764.9	41.55%	1,012,475.80
27	41	unknown	599,797.3	10.92%	65,497.87
27	42	lake	7,040,538.3	6.60%	464,675.53
28	2	auto_hiway	387,599.1	56.72%	219,846.21
28	8	estate	63,417.4	9.84%	6,240.27
28	18	open_land	1,952,713.8	3.62%	70,688.24
28	26	rural	797,018.0	8.04%	64,080.25
28	29	suburban	261,776.9	13.04%	34,135.71
28	32	urban_low	450,298.1	21.79%	98,119.96
28	34	urban_standard	17,482.4	38.47%	6,725.48
28	36	vacant	1,417,543.2	6.20%	87,887.68
28	38	wooded	2,006,516.0	2.58%	51,768.11
28	40	rightofway	461,040.2	41.55%	191,562.20
29	2	auto_hiway	917,247.1	56.72%	520,262.56
29	5	commercial_retail	197,140.7	61.18%	120,610.68
29	6	commercial_service	289,034.5	46.90%	135,557.18
29	8	estate	1,284,228.1	9.84%	126,368.05
29	10	gas	76,831.4	26.95%	20,706.06
29	18	open_land	3,200,736.2	3.62%	115,866.65
29	24	power	56,477.0	8.07%	4,557.69
29	25	rail	135,334.9	15.97%	21,612.98
29	26	rural	651,914.8	8.04%	52,413.95
29	28	streets_hiways	13,027.6	27.28%	3,553.93
29	29	suburban	3,270,505.7	13.04%	426,473.94
29	32	urban_low	2,425,279.9	21.79%	528,468.49
29	33	urban_medium	447,876.4	45.09%	201,947.47
29	34	urban_standard	393,949.3	38.47%	151,552.30
29	36	vacant	5,717,960.3	6.20%	354,513.54

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
29	38	wooded	3,124,260.7	2.58%	80,605.93
29	40	rightofway	1,694,906.9	41.55%	704,233.82
29	41	unknown	17,474.1	10.92%	1,908.17
30	2	auto_hiway	152,268.6	56.72%	86,366.75
30	4	church	529,225.4	40.33%	213,436.60
30	5	commercial_retail	485,524.5	61.18%	297,043.89
30	6	commercial_service	969,674.5	46.90%	454,777.34
30	8	estate	13,545,549.0	9.84%	1,332,882.00
30	9	facilities	708,810.6	18.00%	127,585.91
30	10	gas	86,190.7	26.95%	23,228.39
30	15	industrial_light	380,816.0	28.59%	108,875.29
30	17	mobile_park	38,609.1	40.49%	15,632.83
30	18	open_land	28,707,919.0	3.62%	1,039,226.70
30	19	parking	115,569.6	44.94%	51,936.98
30	20	parks	143,638.0	7.73%	11,103.22
30	24	power	628,595.5	8.07%	50,727.66
30	26	rural	15,468,482.0	8.04%	1,243,665.90
30	27	schools	733,876.2	29.63%	217,447.52
30	28	streets_hiways	195,232.3	27.28%	53,259.37
30	29	suburban	21,092,360.0	13.04%	2,750,443.70
30	30	transportation	49,562.7	33.42%	16,563.85
30	32	urban_low	16,165,773.0	21.79%	3,522,521.80
30	33	urban_medium	78,417.5	45.09%	35,358.45
30	34	urban_standard	3,930,533.4	38.47%	1,512,076.20
30	35	utilities_general	57,744.9	32.09%	18,530.34
30	36	vacant	30,465,596.0	6.20%	1,888,867.00
30	38	wooded	7,571,506.7	2.58%	195,344.87
30	39	no_label	1,976,835.4	10.92%	215,870.43
30	40	rightofway	9,146,489.7	41.55%	3,800,366.50
30	41	unknown	149,237.3	10.92%	16,296.71
31	9	facilities	13,197,169.0	18.00%	2,375,490.50
32	9	facilities	20,231,110.0	18.00%	3,641,599.80
33	8	estate	574,505.1	9.84%	56,531.30
33	9	facilities	17,662,213.0	18.00%	3,179,198.30
33	18	open_land	773,980.8	3.62%	28,018.11
33	26	rural	822,762.0	8.04%	66,150.07
33	29	suburban	596,599.7	13.04%	77,796.60
33	32	urban_low	294,703.7	21.79%	64,215.94
33	36	vacant	880,619.6	6.20%	54,598.42
33	40	rightofway	250,984.0	41.55%	104,283.85
34	9	facilities	9,319,601.0	18.00%	1,677,528.20
35	8	estate	278,572.0	9.84%	27,411.49
35	17	mobile_park	1,005,260.0	40.49%	407,029.77
35	18	open_land	241,472.0	3.62%	8,741.29
35	26	rural	27,135.5	8.04%	2,181.69
35	29	suburban	277,292.5	13.04%	36,158.94
35	32	urban_low	668,577.3	21.79%	145,682.99
35	36	vacant	937,541.1	6.20%	58,127.55
35	40	rightofway	2,759,447.4	41.55%	1,146,550.40

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
35	41	unknown	0.7	10.92%	0.08
36	8	estate	1,936,580.5	9.84%	190,559.52
36	18	open_land	979,586.9	3.62%	35,461.05
36	26	rural	1,599,662.7	8.04%	128,612.88
36	29	suburban	1,953,287.6	13.04%	254,708.70
36	32	urban_low	362,818.6	21.79%	79,058.17
36	36	vacant	6,556,081.5	6.20%	406,477.05
36	40	rightofway	1,128,356.8	41.55%	468,832.25
36	41	unknown	0.2	10.92%	0.02
37	8	estate	214,770.5	9.84%	21,133.42
37	18	open_land	9,219.5	3.62%	333.75
37	29	suburban	220,824.8	13.04%	28,795.55
37	32	urban_low	715,806.7	21.79%	155,974.28
37	34	urban_standard	16,756.2	38.47%	6,446.11
37	36	vacant	605,482.9	6.20%	37,539.94
37	40	rightofway	837,937.7	41.55%	348,163.11
38	3	cemetery	133,013.0	10.17%	13,527.42
38	8	estate	568,273.5	9.84%	55,918.11
38	18	open_land	4,221,303.3	3.62%	152,811.18
38	19	parking	22,024.1	44.94%	9,897.63
38	26	rural	13,756.0	8.04%	1,105.98
38	29	suburban	1,044,287.0	13.04%	136,175.02
38	32	urban_low	582,421.4	21.79%	126,909.62
38	34	urban_standard	11,550.1	38.47%	4,443.32
38	36	vacant	3,429,573.9	6.20%	212,633.58
38	40	rightofway	1,245,433.3	41.55%	517,477.54
39	8	estate	897,532.1	9.84%	88,317.16
39	9	facilities	9,710,196.5	18.00%	1,747,835.40
39	18	open_land	15,829.9	3.62%	573.04
39	24	power	9,323.6	8.07%	752.41
39	26	rural	371,115.2	8.04%	29,837.66
39	29	suburban	527,433.8	13.04%	68,777.37
39	32	urban_low	2,065,692.6	21.79%	450,114.42
39	36	vacant	1,371,153.1	6.20%	85,011.49
39	40	rightofway	371,466.3	41.55%	154,344.25
40	8	estate	1,443,745.1	9.84%	142,064.52
40	9	facilities	702,439.0	18.00%	126,439.02
40	24	power	97,182.1	8.07%	7,842.60
40	26	rural	326,003.0	8.04%	26,210.64
40	27	schools	523,272.0	29.63%	155,045.49
40	29	suburban	2,203,197.1	13.04%	287,296.90
40	32	urban_low	385,624.7	21.79%	84,027.62
40	34	urban_standard	248,826.7	38.47%	95,723.63
40	36	vacant	920,648.7	6.20%	57,080.22
40	40	rightofway	383,131.7	41.55%	159,191.22
41	3	cemetery	9,327.1	10.17%	948.57
41	8	estate	481,632.5	9.84%	47,392.64
41	18	open_land	747,087.7	3.62%	27,044.58
41	26	rural	62,077.6	8.04%	4,991.04

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
41	29	suburban	389,001.6	13.04%	50,725.81
41	32	urban_low	170,272.9	21.79%	37,102.47
41	36	vacant	670,188.8	6.20%	41,551.71
41	40	rightofway	308,841.1	41.55%	128,323.48
42	3	cemetery	82,578.5	10.17%	8,398.23
42	5	commercial_retail	38,951.5	61.18%	23,830.53
42	18	open_land	899,231.2	3.62%	32,552.17
42	24	power	14,844.4	8.07%	1,197.94
42	32	urban_low	1,766,836.7	21.79%	384,993.72
42	33	urban_medium	4,430.9	45.09%	1,997.89
42	34	urban_standard	924,838.9	38.47%	355,785.52
42	36	vacant	458,158.4	6.20%	28,405.82
42	40	rightofway	1,081,393.8	41.55%	449,319.12
43	8	estate	1,018,393.0	9.84%	100,209.87
43	18	open_land	2,754,283.6	3.62%	99,705.07
43	26	rural	95.3	8.04%	7.66
43	29	suburban	126,021.9	13.04%	16,433.26
43	32	urban_low	1,567,221.0	21.79%	341,497.46
43	34	urban_standard	3,691.4	38.47%	1,420.08
43	36	vacant	1,281,288.8	6.20%	79,439.91
43	40	rightofway	407,415.9	41.55%	169,281.31
44	5	commercial_retail	20,560.9	61.18%	12,579.16
44	8	estate	306,710.3	9.84%	30,180.29
44	18	open_land	3,136,598.6	3.62%	113,544.87
44	26	rural	410,430.2	8.04%	32,998.59
44	29	suburban	516,626.7	13.04%	67,368.12
44	32	urban_low	591,064.2	21.79%	128,792.89
44	34	urban_standard	88,487.9	38.47%	34,041.30
44	36	vacant	914,263.8	6.20%	56,684.36
44	40	rightofway	1,456,197.2	41.55%	605,049.94
44	41	unknown	0.4	10.92%	0.04
45	8	estate	693,745.8	9.84%	68,264.59
45	18	open_land	1,467,396.2	3.62%	53,119.74
45	24	power	14,591.1	8.07%	1,177.50
45	29	suburban	138,179.0	13.04%	18,018.54
45	32	urban_low	874,253.8	21.79%	190,499.90
45	34	urban_standard	108,153.5	38.47%	41,606.65
45	36	vacant	593,068.3	6.20%	36,770.24
45	40	rightofway	330,211.0	41.55%	137,202.67
45	41	unknown	9,902.5	10.92%	1,081.35
46	5	commercial_retail	12,047.6	61.18%	7,370.72
46	8	estate	369,392.1	9.84%	36,348.18
46	9	facilities	1,798,200.0	18.00%	323,676.00
46	18	open_land	247,806.6	3.62%	8,970.60
46	24	power	107,518.5	8.07%	8,676.74
46	26	rural	701,877.0	8.04%	56,430.91
46	29	suburban	585,326.0	13.04%	76,326.51
46	32	urban_low	648,200.9	21.79%	141,242.98
46	34	urban_standard	88,146.9	38.47%	33,910.11

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
46	36	vacant	830,848.1	6.20%	51,512.58
46	40	rightofway	1,001,355.0	41.55%	416,063.00
47	6	commercial_service	13,498.0	46.90%	6,330.56
47	8	estate	567,054.5	9.84%	55,798.16
47	9	facilities	4,120,907.9	18.00%	741,763.42
47	18	open_land	22,516.1	3.62%	815.08
47	29	suburban	436,339.3	13.04%	56,898.65
47	32	urban_low	123,336.3	21.79%	26,874.98
47	36	vacant	284,837.9	6.20%	17,659.95
47	40	rightofway	95,304.0	41.55%	39,598.81
48	6	commercial_service	112,383.0	46.90%	52,707.63
48	8	estate	521,223.5	9.84%	51,288.39
48	9	facilities	392,277.9	18.00%	70,610.02
48	17	mobile_park	2,623.1	40.49%	1,062.09
48	18	open_land	1,064,445.1	3.62%	38,532.91
48	26	rural	212,599.0	8.04%	17,092.96
48	29	suburban	615,191.5	13.04%	80,220.97
48	32	urban_low	974,380.7	21.79%	212,317.55
48	36	vacant	1,656,724.8	6.20%	102,716.94
48	40	rightofway	695,018.4	41.55%	288,780.15
49	8	estate	4,870.8	9.84%	479.29
49	18	open_land	36,201.5	3.62%	1,310.49
49	24	power	1,348.5	8.07%	108.82
49	28	streets_hiways	9,255.3	27.28%	2,524.85
49	29	suburban	138,384.7	13.04%	18,045.37
49	32	urban_low	939,842.8	21.79%	204,791.75
49	33	urban_medium	719.0	45.09%	324.20
49	34	urban_standard	952,635.2	38.47%	366,478.76
49	36	vacant	828,532.1	6.20%	51,368.99
49	40	rightofway	822,611.4	41.55%	341,795.04
50	4	church	351.3	40.33%	141.68
50	5	commercial_retail	100,322.4	61.18%	61,377.24
50	8	estate	76,995.2	9.84%	7,576.33
50	11	hospital	207,401.0	46.80%	97,063.67
50	26	rural	298,089.0	8.04%	23,966.36
50	29	suburban	139,052.8	13.04%	18,132.49
50	31	urban_high	1,003,460.0	58.79%	589,934.13
50	32	urban_low	481,350.8	21.79%	104,886.34
50	33	urban_medium	806,014.8	45.09%	363,432.07
50	34	urban_standard	1,188,917.6	38.47%	457,376.60
50	36	vacant	1,002,223.7	6.20%	62,137.87
50	40	rightofway	631,125.3	41.55%	262,232.56
51	4	church	163,514.0	40.33%	65,945.20
51	8	estate	307,121.2	9.84%	30,220.73
51	18	open_land	450,042.3	3.62%	16,291.53
51	20	parks	813.2	7.73%	62.86
51	29	suburban	214,748.0	13.04%	28,003.14
51	32	urban_low	108,812.1	21.79%	23,710.16
51	34	urban_standard	133,785.4	38.47%	51,467.24

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
	This data is obtained using all ~42 categories				
51	36	vacant	359,108.8	6.20%	22,264.75
51	38	wooded	3,345,908.0	2.58%	86,324.43
51	39	no_label	75,339.2	10.92%	8,227.04
51	40	rightofway	183,609.3	41.55%	76,289.66
52	8	estate	118,247.6	9.84%	11,635.56
52	18	open_land	4,996,794.5	3.62%	180,883.96
52	20	parks	75,888.9	7.73%	5,866.21
52	26	rural	319,995.2	8.04%	25,727.61
52	29	suburban	977,027.3	13.04%	127,404.36
52	32	urban_low	385,614.3	21.79%	84,025.36
52	34	urban_standard	26,904.4	38.47%	10,350.12
52	36	vacant	569,696.3	6.20%	35,321.17
52	39	no_label	3,644.2	10.92%	397.95
52	40	rightofway	346,570.8	41.55%	144,000.17
53	9	facilities	247.2	18.00%	44.50
53	18	open_land	62,676.5	3.62%	2,268.89
53	20	parks	263,687.0	7.73%	20,383.01
53	29	suburban	19,665.6	13.04%	2,564.39
53	32	urban_low	24,260.3	21.79%	5,286.32
53	34	urban_standard	7,916.1	38.47%	3,045.32
53	36	vacant	498,556.8	6.20%	30,910.52
53	39	no_label	283,908.8	10.92%	31,002.84
53	40	rightofway	199,177.0	41.55%	82,758.04
54	4	church	30,319.3	40.33%	12,227.77
54	6	commercial_service	42,515.5	46.90%	19,939.77
54	8	estate	634,141.6	9.84%	62,399.53
54	18	open_land	340,836.9	3.62%	12,338.30
54	26	rural	55,477.9	8.04%	4,460.42
54	29	suburban	154,990.4	13.04%	20,210.75
54	32	urban_low	260,707.9	21.79%	56,808.25
54	36	vacant	314,525.5	6.20%	19,500.58
54	40	rightofway	2,087,497.2	41.55%	867,355.09
54	41	unknown	0.1	10.92%	0.01
55	4	church	173,195.0	40.33%	69,849.54
55	8	estate	1,883,923.2	9.84%	185,378.04
55	18	open_land	1,682,930.0	3.62%	60,922.07
55	26	rural	1,300,724.0	8.04%	104,578.21
55	29	suburban	2,037,010.6	13.04%	265,626.18
55	32	urban_low	450,946.0	21.79%	98,261.13
55	34	urban_standard	9,950.1	38.47%	3,827.80
55	36	vacant	2,450,942.9	6.20%	151,958.46
55	40	rightofway	711,804.7	41.55%	295,754.85
56	8	estate	1,271,307.8	9.84%	125,096.69
56	18	open_land	669,447.0	3.62%	24,233.98
56	20	parks	239,427.0	7.73%	18,507.71
56	26	rural	1,469,413.3	8.04%	118,140.83
56	29	suburban	219,509.4	13.04%	28,624.03
56	32	urban_low	237,875.2	21.79%	51,833.01
56	36	vacant	1,831,304.2	6.20%	113,540.86

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
56	39	no_label	155,537.3	10.92%	16,984.67
56	40	rightofway	993,687.6	41.55%	412,877.20
57	5	commercial_retail	2,216.9	61.18%	1,356.30
57	18	open_land	754,529.6	3.62%	27,313.97
57	19	parking	34,262.0	44.94%	15,397.34
57	24	power	68,625.6	8.07%	5,538.09
57	31	urban_high	556,302.9	58.79%	327,050.47
57	32	urban_low	765,367.8	21.79%	166,773.64
57	33	urban_medium	14,775.4	45.09%	6,662.23
57	34	urban_standard	174,432.9	38.47%	67,104.34
57	36	vacant	738,843.0	6.20%	45,808.27
57	38	wooded	734,724.8	2.58%	18,955.90
57	39	no_label	4,149.8	10.92%	453.16
57	40	rightofway	139,238.8	41.55%	57,853.72
58	18	open_land	1,719,644.1	3.62%	62,251.12
58	24	power	26,599.5	8.07%	2,146.58
58	32	urban_low	19,004.8	21.79%	4,141.15
58	34	urban_standard	177,668.8	38.47%	68,349.19
58	36	vacant	139,689.6	6.20%	8,660.76
58	38	wooded	149,851.0	2.58%	3,866.16
58	39	no_label	238,339.9	10.92%	26,026.72
58	40	rightofway	165,793.7	41.55%	68,887.28
59	5	commercial_retail	530,638.5	61.18%	324,644.63
59	6	commercial_service	33,178.1	46.90%	15,560.53
59	9	facilities	177,249.9	18.00%	31,904.98
59	18	open_land	22,157.1	3.62%	802.09
59	19	parking	23,249.3	44.94%	10,448.24
59	26	rural	10,063.5	8.04%	809.11
59	29	suburban	55.4	13.04%	7.22
59	36	vacant	517,253.2	6.20%	32,069.70
59	39	no_label	716,094.6	10.92%	78,197.53
59	40	rightofway	1,201,296.9	41.55%	499,138.86
60	8	estate	117,138.0	9.84%	11,526.38
60	18	open_land	519,106.7	3.62%	18,791.66
60	20	parks	32,269.9	7.73%	2,494.46
60	36	vacant	595,271.9	6.20%	36,906.86
60	39	no_label	712,776.9	10.92%	77,835.24
61	2	auto_hiway	46,576.1	56.72%	26,417.96
61	5	commercial_retail	421,460.1	61.18%	257,849.29
61	6	commercial_service	191,830.1	46.90%	89,968.32
61	18	open_land	1,378.4	3.62%	49.90
61	19	parking	108,440.0	44.94%	48,732.94
61	20	parks	198,947.0	7.73%	15,378.60
61	36	vacant	93,103.4	6.20%	5,772.41
61	39	no_label	111,459.6	10.92%	12,171.39
61	40	rightofway	66,627.6	41.55%	27,683.77
62	18	open_land	4,609.9	3.62%	166.88
62	36	vacant	620,582.0	6.20%	38,476.08
62	39	no_label	91,142.5	10.92%	9,952.76

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
62	40	rightofway	15,089.6	41.55%	6,269.73
63	2	auto_hiway	28,178.7	56.72%	15,982.96
63	5	commercial_retail	1,019,144.9	61.18%	623,512.85
63	6	commercial_service	305,347.9	46.90%	143,208.17
63	15	industrial_light	362,278.1	28.59%	103,575.31
63	18	open_land	343,695.0	3.62%	12,441.76
63	19	parking	154,654.1	44.94%	69,501.55
63	28	streets_hiways	39,462.2	27.28%	10,765.29
63	29	suburban	81,177.1	13.04%	10,585.49
63	36	vacant	714,238.5	6.20%	44,282.79
63	39	no_label	58,355.0	10.92%	6,372.37
63	40	rightofway	131,387.8	41.55%	54,591.63
64	2	auto_hiway	1,243,899.1	56.72%	705,539.57
64	4	church	38,712.2	40.33%	15,612.63
64	5	commercial_retail	64,477.7	61.18%	39,447.46
64	6	commercial_service	199,063.7	46.90%	93,360.88
64	8	estate	522,065.0	9.84%	51,371.20
64	9	facilities	161,372.9	18.00%	29,047.12
64	10	gas	137,211.3	26.95%	36,978.45
64	15	industrial_light	1,028,830.7	28.59%	294,142.70
64	19	parking	42,122.6	44.94%	18,929.90
64	20	parks	4,278.5	7.73%	330.73
64	27	schools	49,061.6	29.63%	14,536.95
64	28	streets_hiways	8,596.6	27.28%	2,345.15
64	29	suburban	290,717.3	13.04%	37,909.54
64	30	transportation	72,029.0	33.42%	24,072.09
64	31	urban_high	119,625.3	58.79%	70,327.71
64	32	urban_low	731,414.2	21.79%	159,375.15
64	33	urban_medium	363,271.5	45.09%	163,799.12
64	34	urban_standard	308,916.1	38.47%	118,840.02
64	36	vacant	1,514,261.4	6.20%	93,884.21
64	39	no_label	146,937.0	10.92%	16,045.52
64	40	rightofway	1,376,294.3	41.55%	571,850.28
64	41	unknown	4,386.4	10.92%	478.99
65	2	auto_hiway	138,363.3	56.72%	78,479.66
65	4	church	17,211.8	40.33%	6,941.52
65	5	commercial_retail	526,135.4	61.18%	321,889.64
65	6	commercial_service	111,299.5	46.90%	52,199.47
65	15	industrial_light	67,988.0	28.59%	19,437.77
65	19	parking	103,318.7	44.94%	46,431.42
65	27	schools	286,017.9	29.63%	84,747.10
65	28	streets_hiways	2,585.4	27.28%	705.30
65	31	urban_high	301,811.5	58.79%	177,434.98
65	32	urban_low	223,027.7	21.79%	48,597.74
65	33	urban_medium	831,840.9	45.09%	375,077.06
65	34	urban_standard	1,512,565.5	38.47%	581,883.95
65	36	vacant	172,563.9	6.20%	10,698.96
65	40	rightofway	2,246,530.0	41.55%	933,433.21
66	2	auto_hiway	87,167.4	56.72%	49,441.35

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
66	5	commercial_retail	448,990.8	61.18%	274,692.57
66	6	commercial_service	118,493.1	46.90%	55,573.26
66	9	facilities	39,500.4	18.00%	7,110.07
66	10	gas	2,297.0	26.95%	619.04
66	15	industrial_light	33,152.2	28.59%	9,478.21
66	19	parking	42,598.2	44.94%	19,143.63
66	20	parks	765,077.2	7.73%	59,140.47
66	27	schools	38,838.3	29.63%	11,507.79
66	28	streets_hiways	9,954.8	27.28%	2,715.67
66	31	urban_high	561,244.2	58.79%	329,955.47
66	32	urban_low	71,274.2	21.79%	15,530.65
66	33	urban_medium	1,177,009.1	45.09%	530,713.40
66	34	urban_standard	959,695.2	38.47%	369,194.74
66	36	vacant	349,910.8	6.20%	21,694.47
66	40	rightofway	2,566,104.3	41.55%	1,066,216.30
67	2	auto_hiway	58,064.0	56.72%	32,933.90
67	4	church	32,810.4	40.33%	13,232.43
67	5	commercial_retail	195,277.1	61.18%	119,470.53
67	6	commercial_service	32,115.5	46.90%	15,062.17
67	9	facilities	65,947.5	18.00%	11,870.55
67	15	industrial_light	39,359.4	28.59%	11,252.85
67	19	parking	28,954.0	44.94%	13,011.93
67	30	transportation	126,797.0	33.42%	42,375.56
67	31	urban_high	270,648.1	58.79%	159,114.02
67	32	urban_low	122,619.5	21.79%	26,718.79
67	33	urban_medium	421,197.1	45.09%	189,917.77
67	34	urban_standard	1,144,919.8	38.47%	440,450.65
67	36	vacant	685,001.6	6.20%	42,470.10
67	39	no_label	948,674.3	10.92%	103,595.23
67	40	rightofway	586,264.7	41.55%	243,592.98
68	2	auto_hiway	20,433.4	56.72%	11,589.82
68	4	church	138,128.7	40.33%	55,707.31
68	5	commercial_retail	56,352.2	61.18%	34,476.28
68	6	commercial_service	14,125.2	46.90%	6,624.72
68	15	industrial_light	37,929.5	28.59%	10,844.04
68	19	parking	38,687.8	44.94%	17,386.30
68	27	schools	15,748.3	29.63%	4,666.22
68	28	streets_hiways	6,236.3	27.28%	1,701.26
68	31	urban_high	319,260.2	58.79%	187,693.07
68	32	urban_low	29,785.0	21.79%	6,490.15
68	33	urban_medium	969,182.2	45.09%	437,004.25
68	34	urban_standard	783,808.9	38.47%	301,531.28
68	36	vacant	165,510.8	6.20%	10,261.67
68	40	rightofway	1,382,309.9	41.55%	574,349.76
69	9	facilities	476,175.7	18.00%	85,711.63
69	40	rightofway	17,432.5	41.55%	7,243.20
69	41	unknown	51.9	10.92%	5.67
70	2	auto_hiway	85,309.4	56.72%	48,387.49
70	4	church	119,927.9	40.33%	48,366.92

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
70	5	commercial_retail	462,263.0	61.18%	282,812.50
70	6	commercial_service	370,754.3	46.90%	173,883.77
70	9	facilities	149,202.0	18.00%	26,856.36
70	10	gas	18,461.7	26.95%	4,975.43
70	14	industrial_heavy	3,261.1	46.53%	1,517.39
70	15	industrial_light	17,193.2	28.59%	4,915.54
70	19	parking	530,660.3	44.94%	238,478.74
70	20	parks	70,221.5	7.73%	5,428.12
70	27	schools	11,448.4	29.63%	3,392.16
70	31	urban_high	530,521.0	58.79%	311,893.30
70	32	urban_low	14,309.4	21.79%	3,118.02
70	33	urban_medium	502,041.5	45.09%	226,370.51
70	34	urban_standard	280,041.5	38.47%	107,731.97
70	36	vacant	134,803.3	6.20%	8,357.80
70	40	rightofway	1,924,452.5	41.55%	799,610.01
70	41	unknown	1,215.0	10.92%	132.68
10000	4	church	127,065.0	40.33%	51,245.32
10000	8	estate	46,293.5	9.84%	4,555.28
10000	9	facilities	3,274,331.0	18.00%	589,379.58
10000	10	gas	64,164.6	26.95%	17,292.36
10000	15	industrial_light	64,266.7	28.59%	18,373.85
10000	16	mines	18,127.8	25.67%	4,653.41
10000	18	open_land	15,765,067.0	3.62%	570,695.44
10000	20	parks	2,190,790.0	7.73%	169,348.07
10000	28	streets_hiways	5,657.1	27.28%	1,543.26
10000	29	suburban	278,661.0	13.04%	36,337.39
10000	30	transportation	983.4	33.42%	328.65
10000	32	urban_low	836,728.5	21.79%	182,323.14
10000	33	urban_medium	72,455.2	45.09%	32,670.05
10000	34	urban_standard	356,661.8	38.47%	137,207.79
10000	36	vacant	7,389,798.5	6.20%	458,167.51
10000	39	no_label	889,233.5	10.92%	97,104.30
10000	40	rightofway	404,354.3	41.55%	168,009.21
10000	41	unknown	10,026.1	10.92%	1,094.85
20000	2	auto_hiway	634,011.2	56.72%	359,611.15
20000	4	church	45,193.3	40.33%	18,226.46
20000	5	commercial_retail	381,387.9	61.18%	233,333.12
20000	6	commercial_service	61,905.2	46.90%	29,033.54
20000	8	estate	108,250.7	9.84%	10,651.87
20000	9	facilities	787,028.4	18.00%	141,665.11
20000	10	gas	1,499.9	26.95%	404.22
20000	15	industrial_light	320,084.3	28.59%	91,512.10
20000	19	parking	15,322.5	44.94%	6,885.93
20000	24	power	360,028.9	8.07%	29,054.33
20000	28	streets_hiways	40,567.3	27.28%	11,066.76
20000	29	suburban	172,881.2	13.04%	22,543.71
20000	30	transportation	175,199.2	33.42%	58,551.57
20000	31	urban_high	108,169.4	58.79%	63,592.79
20000	32	urban_low	861,877.9	21.79%	187,803.19

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
20000	33	urban_medium	692,663.7	45.09%	312,322.06
20000	34	urban_standard	1,793,814.7	38.47%	690,080.52
20000	35	utilities_general	511,658.3	32.09%	164,191.15
20000	36	vacant	2,995,082.2	6.20%	185,695.10
20000	37	water	1,799.8	6.60%	118.79
20000	39	no_label	4,046,915.5	10.92%	441,923.17
20000	40	rightofway	845,565.0	41.55%	351,332.26
20000	41	unknown	1,885.6	10.92%	205.91
30000	2	auto_hiway	82,045.1	56.72%	46,535.98
30000	4	church	26,733.9	40.33%	10,781.78
30000	5	commercial_retail	148,764.7	61.18%	91,014.24
30000	6	commercial_service	102,198.2	46.90%	47,930.96
30000	9	facilities	190,743.1	18.00%	34,333.76
30000	15	industrial_light	95,311.2	28.59%	27,249.47
30000	19	parking	5,606.8	44.94%	2,519.70
30000	30	transportation	85,821.2	33.42%	28,681.45
30000	31	urban_high	162,410.5	58.79%	95,481.13
30000	32	urban_low	222,062.4	21.79%	48,387.40
30000	33	urban_medium	309,715.4	45.09%	139,650.67
30000	34	urban_standard	1,855,122.4	38.47%	713,665.59
30000	35	utilities_general	5,408.9	32.09%	1,735.72
30000	36	vacant	405,444.6	6.20%	25,137.57
30000	37	water	21,046.7	6.60%	1,389.08
30000	39	no_label	1,522,083.9	10.92%	166,211.56
30000	40	rightofway	84,968.8	41.55%	35,304.54
30000	41	unknown	239.2	10.92%	26.12
40000	2	auto_hiway	14,942.4	56.72%	8,475.33
40000	5	commercial_retail	49,860.4	61.18%	30,504.59
40000	6	commercial_service	9,202.2	46.90%	4,315.83
40000	9	facilities	33,103.9	18.00%	5,958.70
40000	15	industrial_light	11,198.2	28.59%	3,201.57
40000	19	parking	4,995.8	44.94%	2,245.11
40000	31	urban_high	40,976.5	58.79%	24,090.08
40000	32	urban_low	129,586.5	21.79%	28,236.90
40000	33	urban_medium	82,849.9	45.09%	37,357.02
40000	34	urban_standard	334,264.0	38.47%	128,591.36
40000	36	vacant	97,004.4	6.20%	6,014.27
40000	39	no_label	442,537.4	10.92%	48,325.08
40000	40	rightofway	422.3	41.55%	175.47
40000	41	unknown	831.9	10.92%	90.84
40500	5	commercial_retail	1,349.3	61.18%	825.50
40500	9	facilities	14,639,464.0	18.00%	2,635,103.50
40500	36	vacant	406.3	6.20%	25.19
40500	39	no_label	4.4	10.92%	0.48
40500	40	rightofway	834.9	41.55%	346.90
40500	41	unknown	262.1	10.92%	28.62
50000	9	facilities	165,004.0	18.00%	29,700.72
50000	40	rightofway	1,270.7	41.55%	527.98
60000	2	auto_hiway	40,283.6	56.72%	22,848.86

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
60000	5	commercial_retail	99,424.6	61.18%	60,827.97
60000	6	commercial_service	108,957.0	46.90%	51,100.83
60000	7	docks	55,473.2	40.11%	22,250.30
60000	9	facilities	122,678.9	18.00%	22,082.20
60000	19	parking	41,371.0	44.94%	18,592.13
60000	20	parks	7,150.3	7.73%	552.72
60000	28	streets_hiways	1,698.9	27.28%	463.46
60000	30	transportation	20,565.2	33.42%	6,872.89
60000	31	urban_high	55,640.4	58.79%	32,710.99
60000	33	urban_medium	32,799.6	45.09%	14,789.34
60000	34	urban_standard	244.2	38.47%	93.94
60000	36	vacant	20,147.9	6.20%	1,249.17
60000	40	rightofway	332,650.1	41.55%	138,216.12
70000	2	auto_hiway	22,704.5	56.72%	12,877.99
70000	5	commercial_retail	220,718.7	61.18%	135,035.70
70000	6	commercial_service	121,623.3	46.90%	57,041.33
70000	9	facilities	35,572.2	18.00%	6,403.00
70000	10	gas	635.2	26.95%	171.19
70000	15	industrial_light	16,881.4	28.59%	4,826.39
70000	19	parking	235,661.7	44.94%	105,906.37
70000	20	parks	1,706.6	7.73%	131.92
70000	31	urban_high	132,951.3	58.79%	78,162.07
70000	32	urban_low	49,228.6	21.79%	10,726.91
70000	33	urban_medium	145,240.3	45.09%	65,488.85
70000	34	urban_standard	185,034.9	38.47%	71,182.93
70000	35	utilities_general	10,741.8	32.09%	3,447.04
70000	36	vacant	99,902.6	6.20%	6,193.96
70000	39	no_label	37,066.4	10.92%	4,047.65
70000	40	rightofway	604,897.8	41.55%	251,335.04
80000	2	auto_hiway	49,817.2	56.72%	28,256.32
80000	4	church	3,262.4	40.33%	1,315.73
80000	5	commercial_retail	129,193.6	61.18%	79,040.64
80000	6	commercial_service	51,351.8	46.90%	24,083.99
80000	9	facilities	23,320.8	18.00%	4,197.74
80000	10	gas	7,993.8	26.95%	2,154.33
80000	15	industrial_light	14,472.8	28.59%	4,137.77
80000	19	parking	48,936.4	44.94%	21,992.02
80000	20	parks	144,432.0	7.73%	11,164.59
80000	27	schools	2,110.0	29.63%	625.19
80000	31	urban_high	146,715.9	58.79%	86,254.28
80000	33	urban_medium	344,215.3	45.09%	155,206.68
80000	34	urban_standard	67,983.8	38.47%	26,153.37
80000	35	utilities_general	90,164.4	32.09%	28,933.76
80000	36	vacant	78,587.6	6.20%	4,872.43
80000	39	no_label	48,262.3	10.92%	5,270.24
80000	40	rightofway	650,449.1	41.55%	270,261.60
80000	41	unknown	110.6	10.92%	12.08
90000	4	church	23,503.6	40.33%	9,479.00
90000	5	commercial_retail	88,564.3	61.18%	54,183.64

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
90000	6	commercial_service	13,194.9	46.90%	6,188.41
90000	9	facilities	111,737.1	18.00%	20,112.68
90000	10	gas	117,056.6	26.95%	31,546.75
90000	15	industrial_light	41,793.8	28.59%	11,948.85
90000	20	parks	398,722.4	7.73%	30,821.24
90000	27	schools	351,228.8	29.63%	104,069.09
90000	28	streets_hiways	1,534.4	27.28%	418.58
90000	31	urban_high	322,088.7	58.79%	189,355.95
90000	32	urban_low	44,776.1	21.79%	9,756.71
90000	33	urban_medium	642,911.6	45.09%	289,888.84
90000	34	urban_standard	685,140.3	38.47%	263,573.47
90000	36	vacant	118,658.6	6.20%	7,356.83
90000	39	no_label	12,659.1	10.92%	1,382.37
90000	40	rightofway	1,379,448.0	41.55%	573,160.64
100000	9	facilities	14,287.0	18.00%	2,571.66
100000	20	parks	4,883.8	7.73%	377.52
100000	31	urban_high	6,595.1	58.79%	3,877.26
100000	32	urban_low	5,384.8	21.79%	1,173.35
100000	33	urban_medium	86,195.1	45.09%	38,865.37
100000	34	urban_standard	93,446.7	38.47%	35,948.95
100000	36	vacant	118,917.4	6.20%	7,372.88
100000	39	no_label	17,818.3	10.92%	1,945.76
100000	40	rightofway	126,176.7	41.55%	52,426.42
110000	9	facilities	29,570.8	18.00%	5,322.74
110000	19	parking	826.6	44.94%	371.47
110000	20	parks	116,307.0	7.73%	8,990.53
110000	27	schools	499,302.8	29.63%	147,943.42
110000	29	suburban	86,115.7	13.04%	11,229.49
110000	32	urban_low	20,391.4	21.79%	4,443.29
110000	33	urban_medium	25,209.4	45.09%	11,366.92
110000	34	urban_standard	48,015.7	38.47%	18,471.64
110000	36	vacant	24,076.9	6.20%	1,492.77
110000	40	rightofway	144,302.8	41.55%	59,957.81
120000	4	church	29,803.1	40.33%	12,019.59
120000	19	parking	23,911.0	44.94%	10,745.60
120000	27	schools	367,431.2	29.63%	108,869.86
120000	31	urban_high	8,460.9	58.79%	4,974.16
120000	32	urban_low	69,934.7	21.79%	15,238.77
120000	33	urban_medium	83,071.1	45.09%	37,456.76
120000	34	urban_standard	160,993.7	38.47%	61,934.28
120000	36	vacant	22,146.0	6.20%	1,373.05
120000	40	rightofway	180,485.0	41.55%	74,991.52
130000	4	church	30,500.6	40.33%	12,300.89
130000	5	commercial_retail	93,235.9	61.18%	57,041.72
130000	27	schools	528,274.0	29.63%	156,527.59
130000	31	urban_high	5,686.8	58.79%	3,343.27
130000	32	urban_low	85,058.0	21.79%	18,534.14
130000	33	urban_medium	88,319.9	45.09%	39,823.44
130000	34	urban_standard	517,956.7	38.47%	199,257.94

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
130000	36	vacant	30,968.0	6.20%	1,920.02
130000	40	rightofway	244,376.6	41.55%	101,538.48
140000	5	commercial_retail	36,647.5	61.18%	22,420.94
140000	14	industrial_heavy	105,854.0	46.53%	49,253.87
140000	15	industrial_light	140,510.2	28.59%	40,171.87
140000	19	parking	93,974.7	44.94%	42,232.23
140000	28	streets_hiways	2,217.6	27.28%	604.96
140000	31	urban_high	66,069.4	58.79%	38,842.20
140000	32	urban_low	131,856.6	21.79%	28,731.55
140000	33	urban_medium	42,069.3	45.09%	18,969.05
140000	34	urban_standard	439,582.8	38.47%	169,107.50
140000	36	vacant	125,183.5	6.20%	7,761.38
140000	39	no_label	187.5	10.92%	20.48
140000	40	rightofway	238,848.2	41.55%	99,241.43
150000	3	cemetery	516,479.6	10.17%	52,525.98
150000	5	commercial_retail	14,527.5	61.18%	8,887.92
150000	29	suburban	15,194.1	13.04%	1,981.31
150000	31	urban_high	242,459.6	58.79%	142,542.00
150000	32	urban_low	580,533.8	21.79%	126,498.32
150000	33	urban_medium	581,754.8	45.09%	262,313.24
150000	34	urban_standard	882,107.6	38.47%	339,346.79
150000	35	utilities_general	4,473.2	32.09%	1,435.45
150000	36	vacant	199,244.4	6.20%	12,353.15
150000	39	no_label	23,812.1	10.92%	2,600.28
150000	40	rightofway	772,008.0	41.55%	320,769.32
160000	5	commercial_retail	85,205.1	61.18%	52,128.48
160000	29	suburban	222,931.3	13.04%	29,070.24
160000	31	urban_high	22,479.4	58.79%	13,215.64
160000	32	urban_low	773,529.2	21.79%	168,552.01
160000	33	urban_medium	320,476.0	45.09%	144,502.63
160000	34	urban_standard	1,449,115.9	38.47%	557,474.89
160000	36	vacant	217,532.7	6.20%	13,487.03
160000	39	no_label	23,265.5	10.92%	2,540.59
160000	40	rightofway	382,490.7	41.55%	158,924.89
160000	41	unknown	27,130.8	10.92%	2,962.68
170000	29	suburban	17,887.4	13.04%	2,332.52
170000	31	urban_high	10,206.7	58.79%	6,000.52
170000	32	urban_low	289,989.2	21.79%	63,188.65
170000	33	urban_medium	191,410.7	45.09%	86,307.09
170000	34	urban_standard	544,615.3	38.47%	209,513.51
170000	36	vacant	129,378.2	6.20%	8,021.45
170000	39	no_label	39,939.8	10.92%	4,361.43
170000	40	rightofway	470,672.0	41.55%	195,564.22
180000	5	commercial_retail	19,844.2	61.18%	12,140.68
180000	29	suburban	111,897.5	13.04%	14,591.43
180000	31	urban_high	19,813.2	58.79%	11,648.18
180000	32	urban_low	1,071,573.5	21.79%	233,495.87
180000	33	urban_medium	56,546.3	45.09%	25,496.73
180000	34	urban_standard	662,307.5	38.47%	254,789.70

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
180000	36	vacant	170,154.5	6.20%	10,549.58
180000	39	no_label	776.9	10.92%	84.84
180000	40	rightofway	600,648.5	41.55%	249,569.45
190000	2	auto_hiway	154,350.2	56.72%	87,547.43
190000	4	church	33,418.0	40.33%	13,477.48
190000	5	commercial_retail	433,226.5	61.18%	265,047.97
190000	6	commercial_service	196,865.7	46.90%	92,330.01
190000	8	estate	127,636.0	9.84%	12,559.38
190000	9	facilities	200,737.4	18.00%	36,132.73
190000	10	gas	107,800.0	26.95%	29,052.10
190000	11	hospital	148,229.6	46.80%	69,371.45
190000	12	hotel_motel	32,664.8	59.51%	19,438.82
190000	15	industrial_light	214,155.1	28.59%	61,226.94
190000	19	parking	102,843.6	44.94%	46,217.91
190000	20	parks	423,561.7	7.73%	32,741.32
190000	27	schools	1,181,394.5	29.63%	350,047.19
190000	29	suburban	878,191.2	13.04%	114,516.13
190000	31	urban_high	255,991.8	58.79%	150,497.58
190000	32	urban_low	2,596,921.0	21.79%	565,869.09
190000	33	urban_medium	682,063.2	45.09%	307,542.30
190000	34	urban_standard	2,061,695.0	38.47%	793,134.07
190000	36	vacant	2,298,245.1	6.20%	142,491.20
190000	39	no_label	620,935.8	10.92%	67,806.19
190000	40	rightofway	1,761,490.7	41.55%	731,899.39
190000	41	unknown	6,597.9	10.92%	720.49
190500	3	cemetery	30,698.1	10.17%	3,122.00
190500	8	estate	489,858.0	9.84%	48,202.03
190500	22	parks_special	18,929.6	38.78%	7,340.90
190500	26	rural	218,136.1	8.04%	17,538.14
190500	28	streets_hiways	32,809.3	27.28%	8,950.38
190500	29	suburban	1,924,027.3	13.04%	250,893.16
190500	31	urban_high	30,067.1	58.79%	17,676.45
190500	32	urban_low	10,406,881.0	21.79%	2,267,659.30
190500	33	urban_medium	136,539.3	45.09%	61,565.57
190500	34	urban_standard	2,476,137.0	38.47%	952,569.90
190500	36	vacant	3,545,381.6	6.20%	219,813.66
190500	39	no_label	1,005,856.0	10.92%	109,839.48
190500	40	rightofway	1,939,006.1	41.55%	805,657.03
200000	2	auto_hiway	3,600.4	56.72%	2,042.15
200000	5	commercial_retail	62,239.8	61.18%	38,078.31
200000	6	commercial_service	105,369.7	46.90%	49,418.39
200000	9	facilities	32,072.8	18.00%	5,773.10
200000	15	industrial_light	78,091.3	28.59%	22,326.30
200000	19	parking	152,250.3	44.94%	68,421.29
200000	26	rural	251,075.3	8.04%	20,186.45
200000	27	schools	463,207.0	29.63%	137,248.23
200000	28	streets_hiways	20,159.4	27.28%	5,499.48
200000	29	suburban	210,011.5	13.04%	27,385.50
200000	31	urban_high	12,182.3	58.79%	7,161.97

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
200000	32	urban_low	1,264,063.3	21.79%	275,439.39
200000	33	urban_medium	42,024.9	45.09%	18,949.03
200000	34	urban_standard	703,801.8	38.47%	270,752.55
200000	36	vacant	727,806.7	6.20%	45,124.02
200000	39	no_label	37,004.8	10.92%	4,040.92
200000	40	rightofway	765,526.6	41.55%	318,076.30
200000	41	unknown	2,504.9	10.92%	273.54
210000	2	auto_hiway	60,864.4	56.72%	34,522.29
210000	5	commercial_retail	490,356.4	61.18%	300,000.05
210000	6	commercial_service	241,844.6	46.90%	113,425.12
210000	9	facilities	21,571.1	18.00%	3,882.80
210000	12	hotel_motel	309,793.9	59.51%	184,358.35
210000	15	industrial_light	42,253.5	28.59%	12,080.28
210000	19	parking	15,126.7	44.94%	6,797.94
210000	27	schools	258,924.3	29.63%	76,719.27
210000	29	suburban	181,893.3	13.04%	23,718.89
210000	31	urban_high	10,675.3	58.79%	6,276.01
210000	32	urban_low	631,757.3	21.79%	137,659.92
210000	33	urban_medium	2,681,197.2	45.09%	1,208,951.80
210000	34	urban_standard	599,638.2	38.47%	230,680.82
210000	36	vacant	1,377,356.9	6.20%	85,396.13
210000	39	no_label	99,723.7	10.92%	10,889.83
210000	40	rightofway	2,097,583.5	41.55%	871,545.94
210500	5	commercial_retail	88,732.4	61.18%	54,286.48
210500	6	commercial_service	39,013.9	46.90%	18,297.52
210500	9	facilities	927.8	18.00%	167.00
210500	12	hotel_motel	65.5	59.51%	38.98
210500	28	streets_hiways	2,941.3	27.28%	802.39
210500	29	suburban	10,849.0	13.04%	1,414.71
210500	31	urban_high	146,627.6	58.79%	86,202.37
210500	32	urban_low	685,009.1	21.79%	149,263.48
210500	33	urban_medium	141,797.0	45.09%	63,936.27
210500	34	urban_standard	721,428.3	38.47%	277,533.47
210500	35	utilities_general	400.0	32.09%	128.36
210500	36	vacant	65,739.4	6.20%	4,075.84
210500	39	no_label	129,988.2	10.92%	14,194.71
210500	40	rightofway	245,548.8	41.55%	102,025.53
220000	2	auto_hiway	25,746.8	56.72%	14,603.59
220000	3	cemetery	1,574,545.0	10.17%	160,131.23
220000	4	church	181,148.1	40.33%	73,057.03
220000	5	commercial_retail	75,506.5	61.18%	46,194.88
220000	6	commercial_service	687,096.9	46.90%	322,248.45
220000	8	estate	336,676.0	9.84%	33,128.92
220000	9	facilities	30,431.8	18.00%	5,477.72
220000	10	gas	28,106.2	26.95%	7,574.62
220000	12	hotel_motel	108,223.9	59.51%	64,404.04
220000	13	industrial_general	164,990.9	53.48%	88,237.13
220000	15	industrial_light	249,957.9	28.59%	71,462.96
220000	16	mines	459,474.4	25.67%	117,947.08

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
220000	18	open_land	312,893.4	3.62%	11,326.74
220000	20	parks	306,339.5	7.73%	23,680.04
220000	24	power	43,546.6	8.07%	3,514.21
220000	27	schools	43,559.0	29.63%	12,906.53
220000	28	streets_hiways	21,654.8	27.28%	5,907.43
220000	29	suburban	1,022,601.0	13.04%	133,347.17
220000	31	urban_high	34,903.7	58.79%	20,519.89
220000	32	urban_low	2,424,801.1	21.79%	528,364.16
220000	33	urban_medium	167,932.2	45.09%	75,720.63
220000	34	urban_standard	1,768,620.8	38.47%	680,388.42
220000	35	utilities_general	4,400.2	32.09%	1,412.02
220000	36	vacant	3,805,489.7	6.20%	235,940.36
220000	39	no_label	13.6	10.92%	1.49
220000	40	rightofway	3,596,136.9	41.55%	1,494,194.90
220000	41	unknown	2,721.9	10.92%	297.23
220500	5	commercial_retail	132,475.0	61.18%	81,048.21
220500	6	commercial_service	94,122.3	46.90%	44,143.36
220500	12	hotel_motel	21,320.9	59.51%	12,688.07
220500	13	industrial_general	10,418.7	53.48%	5,571.92
220500	18	open_land	134,037.0	3.62%	4,852.14
220500	20	parks	876,621.8	7.73%	67,762.87
220500	28	streets_hiways	26,089.7	27.28%	7,117.27
220500	29	suburban	226,966.3	13.04%	29,596.41
220500	32	urban_low	301,500.9	21.79%	65,697.05
220500	33	urban_medium	36,404.1	45.09%	16,414.61
220500	34	urban_standard	292,212.6	38.47%	112,414.19
220500	36	vacant	289,522.6	6.20%	17,950.40
220500	39	no_label	27,798.2	10.92%	3,035.56
220500	40	rightofway	921,092.7	41.55%	382,714.02
230000	6	commercial_service	505.6	46.90%	237.13
230000	17	mobile_park	1,567.3	40.49%	634.60
230000	18	open_land	91,616.1	3.62%	3,316.50
230000	19	parking	2,347.8	44.94%	1,055.10
230000	20	parks	1,150,622.6	7.73%	88,943.13
230000	29	suburban	65,120.9	13.04%	8,491.77
230000	32	urban_low	690,867.4	21.79%	150,540.01
230000	34	urban_standard	125,120.3	38.47%	48,133.78
230000	36	vacant	103,298.0	6.20%	6,404.48
230000	40	rightofway	716,046.5	41.55%	297,517.32
230500	5	commercial_retail	18,661.7	61.18%	11,417.23
230500	6	commercial_service	125,745.9	46.90%	58,974.83
230500	8	estate	742,257.1	9.84%	73,038.10
230500	18	open_land	13,023,691.0	3.62%	471,457.60
230500	19	parking	230.5	44.94%	103.59
230500	20	parks	1,402,592.5	7.73%	108,420.40
230500	27	schools	430,382.3	29.63%	127,522.28
230500	28	streets_hiways	17,749.4	27.28%	4,842.04
230500	29	suburban	2,096,444.2	13.04%	273,376.32
230500	31	urban_high	4,939.5	58.79%	2,903.93

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
230500	32	urban_low	6,660,796.2	21.79%	1,451,387.50
230500	33	urban_medium	63,911.2	45.09%	28,817.56
230500	34	urban_standard	1,808,555.2	38.47%	695,751.19
230500	36	vacant	2,786,158.6	6.20%	172,741.83
230500	37	water	145,289.8	6.60%	9,589.13
230500	39	no_label	359,661.7	10.92%	39,275.06
230500	40	rightofway	5,054,004.9	41.55%	2,099,939.00
230500	41	unknown	23,898.8	10.92%	2,609.75
240000	2	auto_hiway	12,491.7	56.72%	7,085.29
240000	5	commercial_retail	299,574.7	61.18%	183,279.80
240000	6	commercial_service	267,678.4	46.90%	125,541.17
240000	8	estate	1,426,286.0	9.84%	140,346.54
240000	9	facilities	89,149.8	18.00%	16,046.96
240000	18	open_land	2,683,512.6	3.62%	97,143.16
240000	20	parks	53,428.4	7.73%	4,130.02
240000	24	power	64,054.1	8.07%	5,169.17
240000	25	rail	736,687.0	15.97%	117,648.91
240000	26	rural	658,831.0	8.04%	52,970.01
240000	27	schools	266,194.0	29.63%	78,873.28
240000	29	suburban	1,714,081.7	13.04%	223,516.25
240000	31	urban_high	178,618.3	58.79%	105,009.70
240000	32	urban_low	1,014,734.4	21.79%	221,110.63
240000	33	urban_medium	9,824.9	45.09%	4,430.05
240000	34	urban_standard	123,908.6	38.47%	47,667.64
240000	36	vacant	3,270,533.6	6.20%	202,773.08
240000	37	water	7,703.7	6.60%	508.44
240000	38	wooded	4,807,332.3	2.58%	124,029.17
240000	40	rightofway	1,639,289.9	41.55%	681,124.95
240000	41	unknown	5,770.3	10.92%	630.12
240500	18	open_land	14,150.6	3.62%	512.25
240500	25	rail	173,021.0	15.97%	27,631.45
240500	29	suburban	271,147.5	13.04%	35,357.63
240500	32	urban_low	639,788.8	21.79%	139,409.98
240500	34	urban_standard	43,456.0	38.47%	16,717.52
240500	36	vacant	645,086.3	6.20%	39,995.35
240500	37	water	4,275.4	6.60%	282.18
240500	38	wooded	198,738.1	2.58%	5,127.44
240500	39	no_label	88,146.3	10.92%	9,625.58
240500	40	rightofway	1,301,104.4	41.55%	540,608.88
240500	41	unknown	742.9	10.92%	81.12
250000	18	open_land	3,152,935.7	3.62%	114,136.27
250000	29	suburban	103,242.8	13.04%	13,462.86
250000	32	urban_low	70,515.9	21.79%	15,365.42
250000	34	urban_standard	36,042.4	38.47%	13,865.51
250000	36	vacant	1,368,022.9	6.20%	84,817.42
250000	38	wooded	1,641,190.8	2.58%	42,342.72
250000	39	no_label	173,130.6	10.92%	18,905.86
250000	40	rightofway	775,588.9	41.55%	322,257.19
250500	5	commercial_retail	31,606.9	61.18%	19,337.10

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
250500	18	open_land	2,123,589.5	3.62%	76,873.94
250500	24	power	326,124.1	8.07%	26,318.22
250500	28	streets_hiways	6,363.9	27.28%	1,736.07
250500	29	suburban	141,911.3	13.04%	18,505.23
250500	32	urban_low	2,828,839.6	21.79%	616,404.15
250500	33	urban_medium	6,117.9	45.09%	2,758.56
250500	34	urban_standard	432,957.4	38.47%	166,558.71
250500	36	vacant	1,941,716.2	6.20%	120,386.40
250500	39	no_label	383,209.9	10.92%	41,846.52
250500	40	rightofway	2,251,329.1	41.55%	935,427.24
260000	18	open_land	1,205,012.4	3.62%	43,621.45
260000	19	parking	79.2	44.94%	35.59
260000	24	power	1,284,948.1	8.07%	103,695.31
260000	32	urban_low	552,262.6	21.79%	120,338.02
260000	34	urban_standard	59,796.8	38.47%	23,003.83
260000	36	vacant	127,705.8	6.20%	7,917.76
260000	39	no_label	71,828.8	10.92%	7,843.71
260000	40	rightofway	490,474.6	41.55%	203,792.20
260500	19	parking	8,908.2	44.94%	4,003.35
260500	24	power	95,171.5	8.07%	7,680.34
260500	29	suburban	76,841.5	13.04%	10,020.13
260500	32	urban_low	227,520.6	21.79%	49,576.74
260500	34	urban_standard	28,483.9	38.47%	10,957.76
260500	36	vacant	63,162.1	6.20%	3,916.05
260500	39	no_label	37,642.8	10.92%	4,110.59
260500	40	rightofway	199,499.0	41.55%	82,891.83
270000	18	open_land	6,146,330.9	3.62%	222,497.18
270000	19	parking	5,762.5	44.94%	2,589.67
270000	24	power	26,007.3	8.07%	2,098.79
270000	29	suburban	186,175.1	13.04%	24,277.23
270000	32	urban_low	1,949,604.4	21.79%	424,818.80
270000	34	urban_standard	38,460.9	38.47%	14,795.91
270000	36	vacant	1,816,198.3	6.20%	112,604.29
270000	39	no_label	89,094.0	10.92%	9,729.06
270000	40	rightofway	933,719.1	41.55%	387,960.29
270500	4	church	165,610.5	40.33%	66,790.72
270500	8	estate	385,593.0	9.84%	37,942.35
270500	15	industrial_light	49,319.2	28.59%	14,100.36
270500	18	open_land	3,124,137.7	3.62%	113,093.78
270500	24	power	30,676.1	8.07%	2,475.56
270500	26	rural	204,882.0	8.04%	16,472.51
270500	28	streets_hiways	20,314.9	27.28%	5,541.90
270500	29	suburban	872,832.6	13.04%	113,817.37
270500	32	urban_low	4,833,882.9	21.79%	1,053,303.10
270500	34	urban_standard	1,784,499.5	38.47%	686,496.96
270500	36	vacant	1,644,631.8	6.20%	101,967.17
270500	39	no_label	640,809.9	10.92%	69,976.44
270500	40	rightofway	3,955,807.0	41.55%	1,643,637.80
280000	4	church	12,423.6	40.33%	5,010.44

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
280000	6	commercial_service	283,412.1	46.90%	132,920.27
280000	8	estate	384,473.5	9.84%	37,832.19
280000	15	industrial_light	188,182.2	28.59%	53,801.29
280000	16	mines	322,646.0	25.67%	82,823.23
280000	18	open_land	133,648.3	3.62%	4,838.07
280000	20	parks	46,534.2	7.73%	3,597.09
280000	24	power	1,885.5	8.07%	152.16
280000	27	schools	360,310.6	29.63%	106,760.03
280000	29	suburban	593,106.2	13.04%	77,341.05
280000	32	urban_low	2,598,515.3	21.79%	566,216.48
280000	34	urban_standard	800,927.5	38.47%	308,116.81
280000	36	vacant	3,550,511.9	6.20%	220,131.74
280000	39	no_label	95,052.3	10.92%	10,379.71
280000	40	rightofway	1,657,963.2	41.55%	688,883.71
280000	41	unknown	8,119.0	10.92%	886.59
280500	2	auto_hiway	54,129.8	56.72%	30,702.42
280500	4	church	17,854.6	40.33%	7,200.76
280500	5	commercial_retail	210,262.8	61.18%	128,638.78
280500	6	commercial_service	482,421.1	46.90%	226,255.50
280500	8	estate	517,336.1	9.84%	50,905.87
280500	9	facilities	3,816.0	18.00%	686.88
280500	14	industrial_heavy	4,254.0	46.53%	1,979.39
280500	15	industrial_light	37,325.0	28.59%	10,671.22
280500	19	parking	25,715.5	44.94%	11,556.55
280500	20	parks	65,076.6	7.73%	5,030.42
280500	24	power	38,641.3	8.07%	3,118.35
280500	27	schools	1,301,114.0	29.63%	385,520.08
280500	28	streets_hiways	1,774.5	27.28%	484.08
280500	29	suburban	990,232.8	13.04%	129,126.36
280500	31	urban_high	2,113.4	58.79%	1,242.47
280500	32	urban_low	3,432,298.6	21.79%	747,897.86
280500	33	urban_medium	155,506.3	45.09%	70,117.79
280500	34	urban_standard	737,284.3	38.47%	283,633.27
280500	36	vacant	2,151,268.9	6.20%	133,378.67
280500	37	water	4,723.7	6.60%	311.76
280500	39	no_label	718,671.0	10.92%	78,478.87
280500	40	rightofway	3,568,839.8	41.55%	1,482,852.90
290000	1	airports	653,904.0	15.20%	99,393.41
290000	2	auto_hiway	37,462.4	56.72%	21,248.67
290000	3	cemetery	213,405.0	10.17%	21,703.29
290000	4	church	448,694.3	40.33%	180,958.41
290000	5	commercial_retail	197,206.0	61.18%	120,650.63
290000	6	commercial_service	1,533,918.6	46.90%	719,407.82
290000	8	estate	5,890,101.8	9.84%	579,586.02
290000	9	facilities	3,196,518.3	18.00%	575,373.29
290000	10	gas	166,548.3	26.95%	44,884.77
290000	14	industrial_heavy	2,893.7	46.53%	1,346.44
290000	15	industrial_light	136,658.8	28.59%	39,070.75
290000	16	mines	359,400.0	25.67%	92,257.98

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
290000	18	open_land	13,524,741.0	3.62%	489,595.63
290000	19	parking	104,885.2	44.94%	47,135.41
290000	20	parks	1,072,947.9	7.73%	82,938.87
290000	24	power	66,703.4	8.07%	5,382.96
290000	25	rail	946,934.0	15.97%	151,225.36
290000	26	rural	5,533,961.5	8.04%	444,930.50
290000	27	schools	1,847,045.6	29.63%	547,279.61
290000	28	streets_hiways	37,329.6	27.28%	10,183.52
290000	29	suburban	9,445,424.3	13.04%	1,231,683.30
290000	32	urban_low	12,665,128.0	21.79%	2,759,731.40
290000	33	urban_medium	23,540.5	45.09%	10,614.41
290000	34	urban_standard	2,149,678.3	38.47%	826,981.24
290000	35	utilities_general	31,241.7	32.09%	10,025.46
290000	36	vacant	14,959,914.0	6.20%	927,514.68
290000	37	water	42,447.0	6.60%	2,801.50
290000	39	no_label	2,667,759.8	10.92%	291,319.37
290000	40	rightofway	5,426,608.6	41.55%	2,254,755.90
290000	41	unknown	11.7	10.92%	1.28
290500	2	auto_hiway	62,338.1	56.72%	35,358.17
290500	5	commercial_retail	452,991.3	61.18%	277,140.08
290500	6	commercial_service	155,589.0	46.90%	72,971.24
290500	19	parking	76,277.6	44.94%	34,279.15
290500	27	schools	40,328.9	29.63%	11,949.45
290500	32	urban_low	73,299.8	21.79%	15,972.03
290500	34	urban_standard	84,470.0	38.47%	32,495.61
290500	35	utilities_general	1,460.3	32.09%	468.61
290500	36	vacant	142,051.5	6.20%	8,807.19
290500	37	water	1,892.4	6.60%	124.90
290500	39	no_label	93,937.6	10.92%	10,257.99
290500	40	rightofway	243,050.4	41.55%	100,987.44
300000	2	auto_hiway	128,781.4	56.72%	73,044.81
300000	4	church	112,447.8	40.33%	45,350.20
300000	5	commercial_retail	4,039,438.3	61.18%	2,471,328.40
300000	6	commercial_service	560,211.7	46.90%	262,739.29
300000	8	estate	417,332.9	9.84%	41,065.56
300000	9	facilities	519.0	18.00%	93.42
300000	10	gas	68,852.8	26.95%	18,555.83
300000	12	hotel_motel	319,669.3	59.51%	190,235.20
300000	15	industrial_light	7,785.4	28.59%	2,225.85
300000	18	open_land	448,279.0	3.62%	16,227.70
300000	19	parking	388,810.5	44.94%	174,731.44
300000	20	parks	235,664.0	7.73%	18,216.83
300000	27	schools	724,394.0	29.63%	214,637.94
300000	29	suburban	326,729.8	13.04%	42,605.57
300000	31	urban_high	493,739.0	58.79%	290,269.16
300000	32	urban_low	142,114.0	21.79%	30,966.64
300000	34	urban_standard	46,363.8	38.47%	17,836.15
300000	36	vacant	568,981.5	6.20%	35,276.85
300000	39	no_label	556,888.5	10.92%	60,812.22

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
300000	40	rightofway	769,341.5	41.55%	319,661.39
300000	41	unknown	7,386.5	10.92%	806.61
310000	4	church	170,033.0	40.33%	68,574.31
310000	5	commercial_retail	771,245.0	61.18%	471,847.69
310000	6	commercial_service	106,662.5	46.90%	50,024.71
310000	8	estate	172,368.1	9.84%	16,961.02
310000	19	parking	25,777.4	44.94%	11,584.36
310000	26	rural	224,258.5	8.04%	18,030.38
310000	36	vacant	372,244.3	6.20%	23,079.15
310000	40	rightofway	181,501.0	41.55%	75,413.67
310000	41	unknown	3,851.4	10.92%	420.57
310500	2	auto_hiway	43,637.7	56.72%	24,751.30
310500	5	commercial_retail	1,367,981.2	61.18%	836,930.90
310500	6	commercial_service	687,991.4	46.90%	322,667.97
310500	8	estate	1,466,782.0	9.84%	144,331.35
310500	10	gas	62,921.9	26.95%	16,957.45
310500	15	industrial_light	173,837.5	28.59%	49,700.14
310500	18	open_land	1,928,802.6	3.62%	69,822.65
310500	19	parking	42,854.6	44.94%	19,258.86
310500	20	parks	46,641.4	7.73%	3,605.38
310500	23	phone_tv_radio	11,548.9	1.39%	160.53
310500	24	power	58,221.2	8.07%	4,698.45
310500	26	rural	233,380.0	8.04%	18,763.75
310500	27	schools	695,284.4	29.63%	206,012.77
310500	28	streets_hiways	107,012.1	27.28%	29,192.90
310500	29	suburban	2,169,360.2	13.04%	282,884.57
310500	31	urban_high	912,361.1	58.79%	536,377.09
310500	32	urban_low	5,448,728.3	21.79%	1,187,277.90
310500	34	urban_standard	1,930,077.0	38.47%	742,500.62
310500	35	utilities_general	21,810.7	32.09%	6,999.05
310500	36	vacant	2,890,240.1	6.20%	179,194.89
310500	37	water	31,462.4	6.60%	2,076.52
310500	39	no_label	371,330.7	10.92%	40,549.31
310500	40	rightofway	2,495,002.7	41.55%	1,036,673.60
310500	41	unknown	10,896.5	10.92%	1,189.90
320000	6	commercial_service	136,909.3	46.90%	64,210.46
320000	8	estate	1,628,387.3	9.84%	160,233.31
320000	18	open_land	2,586,425.1	3.62%	93,628.59
320000	20	parks	3,135,051.9	7.73%	242,339.51
320000	24	power	37,272.8	8.07%	3,007.92
320000	26	rural	688,671.1	8.04%	55,369.16
320000	28	streets_hiways	3,209.4	27.28%	875.52
320000	29	suburban	417,191.9	13.04%	54,401.82
320000	31	urban_high	50,541.2	58.79%	29,713.17
320000	32	urban_low	1,509,568.0	21.79%	328,934.87
320000	34	urban_standard	1,635,157.8	38.47%	629,045.21
320000	36	vacant	3,131,276.3	6.20%	194,139.13
320000	39	no_label	398,964.9	10.92%	43,566.97
320000	40	rightofway	929,984.8	41.55%	386,408.68

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
320500	5	commercial_retail	126,754.0	61.18%	77,548.10
320500	8	estate	1,029,330.6	9.84%	101,286.13
320500	18	open_land	485,403.0	3.62%	17,571.59
320500	20	parks	842,972.9	7.73%	65,161.81
320500	26	rural	902,781.0	8.04%	72,583.59
320500	29	suburban	1,874,844.4	13.04%	244,479.71
320500	31	urban_high	12,547.5	58.79%	7,376.68
320500	32	urban_low	3,211,415.3	21.79%	699,767.39
320500	34	urban_standard	313,276.4	38.47%	120,517.43
320500	36	vacant	1,860,590.9	6.20%	115,356.64
320500	39	no_label	23,002.4	10.92%	2,511.86
320500	40	rightofway	720,586.8	41.55%	299,403.82
320500	41	unknown	57,478.0	10.92%	6,276.60
330000	3	cemetery	32,788.8	10.17%	3,334.62
330000	4	church	48,604.7	40.33%	19,602.28
330000	8	estate	496,745.3	9.84%	48,879.74
330000	18	open_land	158,852.4	3.62%	5,750.46
330000	20	parks	1,252,360.0	7.73%	96,807.43
330000	26	rural	199,605.0	8.04%	16,048.24
330000	27	schools	1,593,880.0	29.63%	472,266.64
330000	29	suburban	1,097,563.2	13.04%	143,122.24
330000	32	urban_low	1,479,055.8	21.79%	322,286.26
330000	34	urban_standard	1,363,071.0	38.47%	524,373.41
330000	36	vacant	847,338.2	6.20%	52,534.97
330000	39	no_label	58,153.5	10.92%	6,350.36
330000	40	rightofway	763,198.0	41.55%	317,108.77
330500	3	cemetery	53,594.1	10.17%	5,450.52
330500	26	rural	81,773.3	8.04%	6,574.57
330500	29	suburban	318,996.9	13.04%	41,597.20
330500	32	urban_low	276,219.0	21.79%	60,188.12
330500	36	vacant	1,368.4	6.20%	84.84
330500	39	no_label	7,501.3	10.92%	819.14
330500	40	rightofway	87,810.0	41.55%	36,485.06
340000	6	commercial_service	25,492.5	46.90%	11,955.98
340000	8	estate	1,010,742.4	9.84%	99,457.05
340000	18	open_land	1,472,743.0	3.62%	53,313.30
340000	19	parking	4,888.3	44.94%	2,196.80
340000	26	rural	1,378,701.7	8.04%	110,847.62
340000	27	schools	513,336.0	29.63%	152,101.46
340000	29	suburban	984,026.4	13.04%	128,317.04
340000	31	urban_high	130,288.4	58.79%	76,596.55
340000	32	urban_low	2,130,374.5	21.79%	464,208.60
340000	34	urban_standard	2,654,352.2	38.47%	1,021,129.30
340000	36	vacant	1,369,051.3	6.20%	84,881.18
340000	39	no_label	622,453.1	10.92%	67,971.88
340000	40	rightofway	919,740.5	41.55%	382,152.18
340500	19	parking	15,105.4	44.94%	6,788.37
340500	29	suburban	277,018.8	13.04%	36,123.25
340500	32	urban_low	248,434.1	21.79%	54,133.79

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
340500	34	urban_standard	21,946.1	38.47%	8,442.66
340500	36	vacant	2,548.0	6.20%	157.98
340500	38	wooded	221,112.0	2.58%	5,704.69
340500	39	no_label	23,099.3	10.92%	2,522.44
340500	40	rightofway	15,618.9	41.55%	6,489.65
350000	4	church	101,677.0	40.33%	41,006.33
350000	5	commercial_retail	143,840.3	61.18%	88,001.50
350000	6	commercial_service	745,633.9	46.90%	349,702.30
350000	8	estate	2,823,794.3	9.84%	277,861.36
350000	10	gas	59,814.9	26.95%	16,120.12
350000	17	mobile_park	2,246,488.0	40.49%	909,602.99
350000	18	open_land	4,924,929.7	3.62%	178,282.46
350000	19	parking	13,721.2	44.94%	6,166.31
350000	20	parks	10,648.5	7.73%	823.13
350000	24	power	146,314.5	8.07%	11,807.58
350000	26	rural	564,055.6	8.04%	45,350.07
350000	27	schools	1,458,156.5	29.63%	432,051.77
350000	28	streets_hiways	3,015.0	27.28%	822.49
350000	29	suburban	2,912,932.6	13.04%	379,846.41
350000	31	urban_high	572,036.0	58.79%	336,299.96
350000	32	urban_low	10,295,290.0	21.79%	2,243,343.70
350000	33	urban_medium	1,154,552.8	45.09%	520,587.86
350000	34	urban_standard	7,006,385.8	38.47%	2,695,356.60
350000	35	utilities_general	30,629.7	32.09%	9,829.07
350000	36	vacant	7,331,656.2	6.20%	454,562.68
350000	38	wooded	325,756.0	2.58%	8,404.50
350000	39	no_label	1,705,346.2	10.92%	186,223.81
350000	40	rightofway	3,193,527.7	41.55%	1,326,910.80
350000	41	unknown	1,785.4	10.92%	194.97
350500	2	auto_hiway	14,361.9	56.72%	8,146.07
350500	4	church	180,038.8	40.33%	72,609.65
350500	5	commercial_retail	41,926.8	61.18%	25,650.82
350500	6	commercial_service	59,820.4	46.90%	28,055.77
350500	8	estate	1,355,270.3	9.84%	133,358.60
350500	9	facilities	440,804.0	18.00%	79,344.72
350500	18	open_land	1,604,629.0	3.62%	58,087.57
350500	19	parking	27,095.7	44.94%	12,176.81
350500	20	parks	64,497.2	7.73%	4,985.63
350500	24	power	1,759,354.8	8.07%	141,979.93
350500	26	rural	449,482.2	8.04%	36,138.37
350500	28	streets_hiways	59,545.2	27.28%	16,243.93
350500	29	suburban	2,712,218.1	13.04%	353,673.24
350500	30	transportation	14,686.3	33.42%	4,908.16
350500	31	urban_high	22,428.1	58.79%	13,185.48
350500	32	urban_low	3,991,362.5	21.79%	869,717.89
350500	33	urban_medium	234,953.2	45.09%	105,940.40
350500	34	urban_standard	2,647,058.6	38.47%	1,018,323.40
350500	36	vacant	7,850,082.6	6.20%	486,705.12
350500	37	water	10,807.2	6.60%	713.28

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
350500	39	no_label	349,205.7	10.92%	38,133.26
350500	40	rightofway	2,889,829.7	41.55%	1,200,724.20
350500	41	unknown	103,451.0	10.92%	11,296.85
360000	5	commercial_retail	417,568.7	61.18%	255,468.53
360000	8	estate	227,712.1	9.84%	22,406.87
360000	19	parking	3,514.3	44.94%	1,579.33
360000	20	parks	2,392.7	7.73%	184.96
360000	28	streets_hiways	5,688.9	27.28%	1,551.93
360000	29	suburban	222,315.3	13.04%	28,989.92
360000	31	urban_high	310,018.4	58.79%	182,259.82
360000	32	urban_low	1,173,263.0	21.79%	255,654.01
360000	33	urban_medium	348,672.0	45.09%	157,216.20
360000	34	urban_standard	987,554.8	38.47%	379,912.33
360000	36	vacant	1,819,816.8	6.20%	112,828.64
360000	40	rightofway	669,070.3	41.55%	277,998.71
360000	41	unknown	55,095.3	10.92%	6,016.41
370000	4	church	51,518.3	40.33%	20,777.33
370000	5	commercial_retail	113,834.9	61.18%	69,644.19
370000	6	commercial_service	5,807.5	46.90%	2,723.72
370000	20	parks	24,653.2	7.73%	1,905.69
370000	27	schools	470,243.0	29.63%	139,333.00
370000	28	streets_hiways	93.7	27.28%	25.56
370000	29	suburban	398,556.0	13.04%	51,971.70
370000	31	urban_high	327,187.0	58.79%	192,353.24
370000	32	urban_low	778,384.5	21.79%	169,609.98
370000	33	urban_medium	507,342.4	45.09%	228,760.69
370000	34	urban_standard	656,023.5	38.47%	252,372.24
370000	36	vacant	604,942.0	6.20%	37,506.40
370000	40	rightofway	671,448.7	41.55%	278,986.93
370000	41	unknown	13,269.9	10.92%	1,449.07
380000	2	auto_hiway	13,464.0	56.72%	7,636.78
380000	5	commercial_retail	135,340.5	61.18%	82,801.32
380000	6	commercial_service	233,240.0	46.90%	109,389.56
380000	12	hotel_motel	26,657.1	59.51%	15,863.64
380000	20	parks	1,279,179.6	7.73%	98,880.58
380000	27	schools	60,644.9	29.63%	17,969.08
380000	31	urban_high	25,975.5	58.79%	15,271.00
380000	32	urban_low	51,291.8	21.79%	11,176.48
380000	33	urban_medium	170,624.9	45.09%	76,934.77
380000	34	urban_standard	952,822.7	38.47%	366,550.89
380000	36	vacant	108,386.1	6.20%	6,719.94
380000	40	rightofway	626,313.6	41.55%	260,233.30
380000	41	unknown	928.1	10.92%	101.35
390000	5	commercial_retail	184,047.4	61.18%	112,600.20
390000	9	facilities	55,002.5	18.00%	9,900.45
390000	11	hospital	198,805.0	46.80%	93,040.74
390000	20	parks	9,474.3	7.73%	732.36
390000	31	urban_high	3,662.7	58.79%	2,153.30
390000	32	urban_low	99,786.5	21.79%	21,743.48

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
390000	33	urban_medium	22,931.2	45.09%	10,339.68
390000	34	urban_standard	79,453.9	38.47%	30,565.92
390000	36	vacant	141,679.4	6.20%	8,784.12
390000	39	no_label	42,670.9	10.92%	4,659.66
390000	40	rightofway	101,134.7	41.55%	42,021.47
400000	4	church	214,724.4	40.33%	86,598.35
400000	5	commercial_retail	403,144.1	61.18%	246,643.56
400000	6	commercial_service	670,152.2	46.90%	314,301.38
400000	9	facilities	84,068.3	18.00%	15,132.29
400000	11	hospital	462,393.2	46.80%	216,400.02
400000	19	parking	81,772.1	44.94%	36,748.38
400000	20	parks	693,719.5	7.73%	53,624.52
400000	24	power	320,274.6	8.07%	25,846.16
400000	27	schools	1,180,026.7	29.63%	349,641.91
400000	31	urban_high	106,195.3	58.79%	62,432.22
400000	32	urban_low	678,027.6	21.79%	147,742.21
400000	33	urban_medium	195,708.6	45.09%	88,245.01
400000	34	urban_standard	1,577,648.6	38.47%	606,921.42
400000	36	vacant	640,782.4	6.20%	39,728.51
400000	39	no_label	105,945.2	10.92%	11,569.22
400000	40	rightofway	2,231,503.2	41.55%	927,189.58
410000	2	auto_hiway	65,745.5	56.72%	37,290.85
410000	5	commercial_retail	107,226.8	61.18%	65,601.36
410000	6	commercial_service	113,042.0	46.90%	53,016.70
410000	19	parking	122,993.8	44.94%	55,273.41
410000	20	parks	327,744.4	7.73%	25,334.64
410000	32	urban_low	53,195.8	21.79%	11,591.37
410000	33	urban_medium	19,461.6	45.09%	8,775.24
410000	34	urban_standard	49,867.9	38.47%	19,184.18
410000	36	vacant	30,296.1	6.20%	1,878.36
410000	39	no_label	43,857.0	10.92%	4,789.18
410000	40	rightofway	88,618.1	41.55%	36,820.82
420000	2	auto_hiway	9,151.7	56.72%	5,190.84
420000	4	church	53,099.1	40.33%	21,414.87
420000	5	commercial_retail	738,188.4	61.18%	451,623.66
420000	6	commercial_service	63,987.4	46.90%	30,010.09
420000	10	gas	1,078.8	26.95%	290.74
420000	19	parking	16,637.2	44.94%	7,476.76
420000	20	parks	676,156.3	7.73%	52,266.88
420000	24	power	7,671.8	8.07%	619.11
420000	29	suburban	46,628.9	13.04%	6,080.41
420000	31	urban_high	313,472.5	58.79%	184,290.48
420000	32	urban_low	651,309.9	21.79%	141,920.43
420000	33	urban_medium	809,138.0	45.09%	364,840.32
420000	34	urban_standard	3,666,835.6	38.47%	1,410,631.70
420000	36	vacant	740,291.6	6.20%	45,898.08
420000	39	no_label	808.6	10.92%	88.30
420000	40	rightofway	1,275,995.8	41.55%	530,176.25
430000	5	commercial_retail	28,452.2	61.18%	17,407.06

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories				
430000	31	urban_high	9,864.8	58.79%	5,799.52
430000	32	urban_low	13,501.6	21.79%	2,942.00
430000	33	urban_medium	161,877.7	45.09%	72,990.66
430000	34	urban_standard	20,124.7	38.47%	7,741.97
430000	36	vacant	97,503.2	6.20%	6,045.20
430000	39	no_label	88.6	10.92%	9.68
430000	40	rightofway	45,928.8	41.55%	19,083.42
440000	5	commercial_retail	42,839.4	61.18%	26,209.15
440000	6	commercial_service	8,706.4	46.90%	4,083.30
440000	20	parks	1,195.0	7.73%	92.37
440000	31	urban_high	33,346.8	58.79%	19,604.58
440000	32	urban_low	69,452.6	21.79%	15,133.72
440000	33	urban_medium	18,410.5	45.09%	8,301.29
440000	34	urban_standard	124,239.9	38.47%	47,795.09
440000	36	vacant	47,782.5	6.20%	2,962.52
440000	40	rightofway	203,239.7	41.55%	84,446.10
450000	2	auto_hiway	7,506.5	56.72%	4,257.69
450000	4	church	7,463.3	40.33%	3,009.95
450000	5	commercial_retail	117,538.9	61.18%	71,910.30
450000	6	commercial_service	37,687.0	46.90%	17,675.20
450000	15	industrial_light	307.9	28.59%	88.03
450000	19	parking	36,177.6	44.94%	16,258.21
450000	22	parks_special	677.9	38.78%	262.89
450000	31	urban_high	24,902.2	58.79%	14,640.00
450000	32	urban_low	35,677.7	21.79%	7,774.17
450000	33	urban_medium	113,513.4	45.09%	51,183.19
450000	34	urban_standard	267,251.6	38.47%	102,811.69
450000	36	vacant	25,663.0	6.20%	1,591.11
450000	40	rightofway	304,517.0	41.55%	126,526.81
460000	4	church	22,888.5	40.33%	9,230.93
460000	5	commercial_retail	24,612.6	61.18%	15,057.99
460000	6	commercial_service	44,620.9	46.90%	20,927.20
460000	27	schools	51,518.0	29.63%	15,264.78
460000	31	urban_high	35,451.5	58.79%	20,841.94
460000	32	urban_low	31,814.3	21.79%	6,932.34
460000	33	urban_medium	257,548.0	45.09%	116,128.39
460000	34	urban_standard	580,743.6	38.47%	223,412.06
460000	36	vacant	23,470.4	6.20%	1,455.16
460000	40	rightofway	616,041.0	41.55%	255,965.04
470000	4	church	46,488.6	40.33%	18,748.85
470000	5	commercial_retail	159,605.1	61.18%	97,646.40
470000	6	commercial_service	147,377.4	46.90%	69,120.00
470000	8	estate	107,751.8	9.84%	10,602.78
470000	19	parking	6,670.4	44.94%	2,997.68
470000	20	parks	7,161.5	7.73%	553.58
470000	24	power	24,644.3	8.07%	1,988.80
470000	27	schools	16,749.3	29.63%	4,962.82
470000	29	suburban	373,231.7	13.04%	48,669.41
470000	31	urban_high	43,911.4	58.79%	25,815.51

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
470000	32	urban_low	1,237,732.8	21.79%	269,701.98
470000	33	urban_medium	273,226.6	45.09%	123,197.87
470000	34	urban_standard	2,423,433.2	38.47%	932,294.75
470000	36	vacant	617,219.2	6.20%	38,267.59
470000	40	rightofway	1,296,755.3	41.55%	538,801.83
480000	2	auto_hiway	19,290.9	56.72%	10,941.80
480000	4	church	22,746.4	40.33%	9,173.62
480000	5	commercial_retail	103,937.4	61.18%	63,588.90
480000	6	commercial_service	198,066.9	46.90%	92,893.38
480000	8	estate	775,307.3	9.84%	76,290.24
480000	9	facilities	82,006.0	18.00%	14,761.08
480000	10	gas	5,382.3	26.95%	1,450.53
480000	18	open_land	282,967.0	3.62%	10,243.41
480000	19	parking	1,407.2	44.94%	632.40
480000	24	power	84,794.4	8.07%	6,842.91
480000	26	rural	125,373.3	8.04%	10,080.01
480000	27	schools	1,000,436.2	29.63%	296,429.25
480000	29	suburban	995,342.7	13.04%	129,792.69
480000	31	urban_high	18,816.4	58.79%	11,062.16
480000	32	urban_low	3,307,341.3	21.79%	720,669.67
480000	33	urban_medium	110,279.0	45.09%	49,724.80
480000	34	urban_standard	3,812,314.0	38.47%	1,466,597.20
480000	36	vacant	3,955,739.0	6.20%	245,255.82
480000	39	no_label	661,577.7	10.92%	72,244.29
480000	40	rightofway	1,720,971.7	41.55%	715,063.74
480000	41	unknown	8,865.6	10.92%	968.12
480500	8	estate	398,272.7	9.84%	39,190.03
480500	18	open_land	1,632,495.0	3.62%	59,096.32
480500	20	parks	1,729,296.5	7.73%	133,674.62
480500	26	rural	236,500.3	8.04%	19,014.62
480500	29	suburban	493,108.9	13.04%	64,301.40
480500	32	urban_low	2,105,384.2	21.79%	458,763.22
480500	34	urban_standard	417,681.4	38.47%	160,682.03
480500	36	vacant	2,271,138.9	6.20%	140,810.61
480500	39	no_label	308,691.4	10.92%	33,709.10
480500	40	rightofway	579,951.5	41.55%	240,969.85
480500	41	unknown	16,315.7	10.92%	1,781.67
490000	8	estate	439,541.0	9.84%	43,250.83
490000	20	parks	1,492,476.5	7.73%	115,368.43
490000	26	rural	340,589.0	8.04%	27,383.36
490000	29	suburban	347,695.0	13.04%	45,339.43
490000	32	urban_low	1,667,393.7	21.79%	363,325.09
490000	34	urban_standard	519,626.3	38.47%	199,900.24
490000	36	vacant	992,439.0	6.20%	61,531.22
490000	39	no_label	19,512.1	10.92%	2,130.72
490000	40	rightofway	632,227.6	41.55%	262,690.57
490500	8	estate	576,078.5	9.84%	56,686.12
490500	18	open_land	61,028.2	3.62%	2,209.22
490500	29	suburban	939,097.2	13.04%	122,458.27

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
490500	32	urban_low	1,719,851.6	21.79%	374,755.66
490500	34	urban_standard	511,973.7	38.47%	196,956.28
490500	36	vacant	1,276,451.3	6.20%	79,139.98
490500	39	no_label	132,818.9	10.92%	14,503.82
490500	40	rightofway	608,722.8	41.55%	252,924.32
500000	4	church	100,395.0	40.33%	40,489.30
500000	5	commercial_retail	125,862.9	61.18%	77,002.92
500000	6	commercial_service	93,466.2	46.90%	43,835.65
500000	8	estate	765,485.0	9.84%	75,323.72
500000	9	facilities	21,532.5	18.00%	3,875.85
500000	18	open_land	16,126,112.0	3.62%	583,765.24
500000	24	power	2,009,805.3	8.07%	162,191.29
500000	28	streets_hiways	7,283.6	27.28%	1,986.97
500000	29	suburban	987,822.1	13.04%	128,812.00
500000	32	urban_low	3,645,751.4	21.79%	794,409.23
500000	33	urban_medium	583,978.0	45.09%	263,315.68
500000	34	urban_standard	3,236,535.0	38.47%	1,245,095.00
500000	36	vacant	4,080,383.9	6.20%	252,983.80
500000	39	no_label	643,080.4	10.92%	70,224.38
500000	40	rightofway	2,468,522.8	41.55%	1,025,671.20
500000	41	unknown	6,662.9	10.92%	727.59
500400	5	commercial_retail	6,113.5	61.18%	3,740.24
500400	8	estate	484,804.0	9.84%	47,704.71
500400	18	open_land	122,806.0	3.62%	4,445.58
500400	19	parking	130,290.5	44.94%	58,552.55
500400	24	power	116,788.3	8.07%	9,424.82
500400	26	rural	408,485.0	8.04%	32,842.19
500400	29	suburban	1,254,122.4	13.04%	163,537.56
500400	32	urban_low	6,097,138.3	21.79%	1,328,566.40
500400	33	urban_medium	43,597.6	45.09%	19,658.16
500400	34	urban_standard	4,422,578.1	38.47%	1,701,365.80
500400	36	vacant	4,720,132.9	6.20%	292,648.24
500400	37	water	7,698.3	6.60%	508.09
500400	39	no_label	999,584.8	10.92%	109,154.66
500400	40	rightofway	2,286,704.4	41.55%	950,125.68
500400	41	unknown	21,170.1	10.92%	2,311.77
500600	8	estate	377,951.2	9.84%	37,190.40
500600	18	open_land	2,844,614.3	3.62%	102,975.04
500600	26	rural	454,459.5	8.04%	36,538.54
500600	29	suburban	1,043,796.7	13.04%	136,111.09
500600	32	urban_low	396,681.9	21.79%	86,436.99
500600	36	vacant	2,042,908.0	6.20%	126,660.30
500600	37	water	168.8	6.60%	11.14
500600	38	wooded	589,978.8	2.58%	15,221.45
500600	40	rightofway	103,946.8	41.55%	43,189.90
500600	41	unknown	56.1	10.92%	6.13
510000	8	estate	366,381.3	9.84%	36,051.92
510000	18	open_land	4,099,549.3	3.62%	148,403.68
510000	26	rural	150,114.7	8.04%	12,069.22

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
510000	29	suburban	146,810.9	13.04%	19,144.14
510000	36	vacant	862,560.8	6.20%	53,478.77
510000	40	rightofway	64,984.9	41.55%	27,001.23
510000	41	unknown	6,938.0	10.92%	757.63
510100	8	estate	209,362.0	9.84%	20,601.22
510100	18	open_land	7,187,726.4	3.62%	260,195.70
510100	24	power	10,200.0	8.07%	823.14
510100	29	suburban	1,803,460.2	13.04%	235,171.21
510100	32	urban_low	2,163,089.2	21.79%	471,337.14
510100	34	urban_standard	79,804.0	38.47%	30,700.60
510100	36	vacant	3,306,672.8	6.20%	205,013.71
510100	40	rightofway	686,389.9	41.55%	285,195.00
510100	41	unknown	11,212.8	10.92%	1,224.44
510300	8	estate	87,278.2	9.84%	8,588.17
510300	29	suburban	1,068,316.2	13.04%	139,308.43
510300	32	urban_low	542,475.4	21.79%	118,205.39
510300	34	urban_standard	773.1	38.47%	297.41
510300	36	vacant	619,058.0	6.20%	38,381.60
510300	40	rightofway	276,010.1	41.55%	114,682.20
510300	41	unknown	3,052.6	10.92%	333.34
510500	8	estate	449,202.0	9.84%	44,201.48
510500	19	parking	11,135.9	44.94%	5,004.47
510500	26	rural	346,186.3	8.04%	27,833.38
510500	28	streets_hiways	5,980.3	27.28%	1,631.43
510500	29	suburban	3,821,504.5	13.04%	498,324.19
510500	32	urban_low	3,483,216.5	21.79%	758,992.88
510500	33	urban_medium	17,252.7	45.09%	7,779.24
510500	34	urban_standard	370,959.1	38.47%	142,707.97
510500	36	vacant	5,113,783.1	6.20%	317,054.55
510500	39	no_label	4,633.6	10.92%	505.99
510500	40	rightofway	666,435.2	41.55%	276,903.83
510500	41	unknown	13,329.7	10.92%	1,455.60
510700	8	estate	261,829.0	9.84%	25,763.97
510700	18	open_land	534,728.0	3.62%	19,357.15
510700	29	suburban	662,941.7	13.04%	86,447.60
510700	32	urban_low	78,872.2	21.79%	17,186.25
510700	36	vacant	325,505.9	6.20%	20,181.37
510700	40	rightofway	172,834.4	41.55%	71,812.69
510900	2	auto_hiway	4,143.3	56.72%	2,350.08
510900	5	commercial_retail	4,378.5	61.18%	2,678.77
510900	8	estate	1,020,306.7	9.84%	100,398.18
510900	14	industrial_heavy	7,707.2	46.53%	3,586.16
510900	18	open_land	164,883.6	3.62%	5,968.79
510900	24	power	138,379.0	8.07%	11,167.19
510900	29	suburban	1,503,873.2	13.04%	196,105.07
510900	32	urban_low	419,956.1	21.79%	91,508.43
510900	34	urban_standard	23,199.8	38.47%	8,924.96
510900	36	vacant	2,308,887.0	6.20%	143,150.99
510900	37	water	26,308.7	6.60%	1,736.37

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
510900	38	wooded	2,085,010.0	2.58%	53,793.26
510900	40	rightofway	455,259.4	41.55%	189,160.28
520000	2	auto_hiway	21,263.2	56.72%	12,060.49
520000	5	commercial_retail	10,533.7	61.18%	6,444.52
520000	6	commercial_service	57,384.0	46.90%	26,913.10
520000	8	estate	3,144,044.6	9.84%	309,373.99
520000	9	facilities	1,810,732.5	18.00%	325,931.85
520000	10	gas	4,866.0	26.95%	1,311.39
520000	15	industrial_light	570.3	28.59%	163.05
520000	18	open_land	2,845,864.0	3.62%	103,020.28
520000	24	power	218,467.8	8.07%	17,630.35
520000	26	rural	244,155.0	8.04%	19,630.06
520000	27	schools	239,398.0	29.63%	70,933.63
520000	28	streets_hiways	28,832.3	27.28%	7,865.45
520000	29	suburban	3,265,191.3	13.04%	425,780.95
520000	32	urban_low	2,420,785.6	21.79%	527,489.18
520000	34	urban_standard	143,215.7	38.47%	55,095.08
520000	36	vacant	7,379,670.0	6.20%	457,539.54
520000	38	wooded	3,497,548.0	2.58%	90,236.74
520000	40	rightofway	1,195,504.0	41.55%	496,731.91
520000	41	unknown	7,758.0	10.92%	847.17
520500	2	auto_hiway	6,210.2	56.72%	3,522.43
520500	5	commercial_retail	118,784.3	61.18%	72,672.24
520500	15	industrial_light	14,649.2	28.59%	4,188.21
520500	18	open_land	288,771.0	3.62%	10,453.51
520500	29	suburban	582,638.6	13.04%	75,976.07
520500	32	urban_low	1,945,823.6	21.79%	423,994.96
520500	34	urban_standard	86,782.7	38.47%	33,385.31
520500	36	vacant	504,408.5	6.20%	31,273.33
520500	40	rightofway	433,575.3	41.55%	180,150.54
530000	18	open_land	129,780.8	3.62%	4,698.07
530000	27	schools	314,289.0	29.63%	93,123.83
530000	29	suburban	491,230.8	13.04%	64,056.50
530000	32	urban_low	2,458,273.4	21.79%	535,657.77
530000	34	urban_standard	82,688.0	38.47%	31,810.07
530000	36	vacant	627,206.2	6.20%	38,886.78
530000	40	rightofway	447,654.1	41.55%	186,000.28
530000	41	unknown	3,662.2	10.92%	399.91
530400	5	commercial_retail	123,054.7	61.18%	75,284.87
530400	8	estate	145,335.7	9.84%	14,301.03
530400	9	facilities	5,385,260.0	18.00%	969,346.80
530400	13	industrial_general	26,356.5	53.48%	14,095.46
530400	15	industrial_light	7,479.8	28.59%	2,138.47
530400	18	open_land	2,016,732.2	3.62%	73,005.71
530400	26	rural	343,746.8	8.04%	27,637.24
530400	29	suburban	2,132,548.4	13.04%	278,084.31
530400	31	urban_high	5,309.4	58.79%	3,121.40
530400	32	urban_low	2,522,859.1	21.79%	549,731.00
530400	33	urban_medium	21,296.7	45.09%	9,602.68

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
530400	34	urban_standard	476,710.4	38.47%	183,390.49
530400	36	vacant	5,675,801.3	6.20%	351,899.68
530400	40	rightofway	1,571,322.6	41.55%	652,884.54
530400	41	unknown	7,310.2	10.92%	798.27
530600	4	church	126,576.0	40.33%	51,048.10
530600	5	commercial_retail	45,421.4	61.18%	27,788.81
530600	6	commercial_service	33,827.5	46.90%	15,865.10
530600	8	estate	525,485.5	9.84%	51,707.77
530600	9	facilities	9,976,556.0	18.00%	1,795,780.10
530600	19	parking	8,646.5	44.94%	3,885.74
530600	22	parks_special	1,366.5	38.78%	529.93
530600	24	power	122,529.9	8.07%	9,888.16
530600	26	rural	1,030,551.0	8.04%	82,856.30
530600	27	schools	580,274.0	29.63%	171,935.19
530600	28	streets_hiways	76,815.3	27.28%	20,955.21
530600	29	suburban	2,482,685.6	13.04%	323,742.20
530600	31	urban_high	24,373.2	58.79%	14,329.00
530600	32	urban_low	8,036,314.6	21.79%	1,751,113.00
530600	33	urban_medium	112,943.1	45.09%	50,926.04
530600	34	urban_standard	6,661,444.9	38.47%	2,562,657.90
530600	35	utilities_general	66,997.0	32.09%	21,499.34
530600	36	vacant	9,717,794.5	6.20%	602,503.26
530600	37	water	19,692.5	6.60%	1,299.71
530600	39	no_label	3,925,595.7	10.92%	428,675.05
530600	40	rightofway	1,883,814.8	41.55%	782,725.05
530600	41	unknown	7,564.8	10.92%	826.08
540000	8	estate	659,793.9	9.84%	64,923.72
540000	9	facilities	1,760,340.0	18.00%	316,861.20
540000	18	open_land	1,368,638.0	3.62%	49,544.70
540000	20	parks	1,141,330.0	7.73%	88,224.81
540000	24	power	25,434.7	8.07%	2,052.58
540000	29	suburban	173,476.1	13.04%	22,621.28
540000	32	urban_low	62,439.5	21.79%	13,605.57
540000	34	urban_standard	15,750.6	38.47%	6,059.26
540000	36	vacant	1,979,432.8	6.20%	122,724.83
540000	40	rightofway	328,047.1	41.55%	136,303.57
540000	41	unknown	1,766.7	10.92%	192.92
540500	8	estate	1,369,554.3	9.84%	134,764.14
540500	9	facilities	284,404.0	18.00%	51,192.72
540500	18	open_land	4,139,187.1	3.62%	149,838.57
540500	20	parks	4,321,139.4	7.73%	334,024.08
540500	29	suburban	2,211,160.0	13.04%	288,335.26
540500	32	urban_low	1,602,545.4	21.79%	349,194.64
540500	33	urban_medium	8,462.2	45.09%	3,815.61
540500	34	urban_standard	485,552.9	38.47%	186,792.20
540500	36	vacant	3,039,300.8	6.20%	188,436.65
540500	39	no_label	57,059.4	10.92%	6,230.89
540500	40	rightofway	1,131,169.3	41.55%	470,000.84
540500	41	unknown	11,919.4	10.92%	1,301.60

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
550000	4	church	133,083.0	40.33%	53,672.37
550000	8	estate	2,536,778.0	9.84%	249,618.96
550000	18	open_land	1,659,802.0	3.62%	60,084.83
550000	20	parks	8,299.5	7.73%	641.55
550000	26	rural	2,864,057.6	8.04%	230,270.23
550000	28	streets_hiways	7,612.0	27.28%	2,076.55
550000	29	suburban	763,571.4	13.04%	99,569.71
550000	32	urban_low	762,109.7	21.79%	166,063.70
550000	34	urban_standard	61,441.8	38.47%	23,636.66
550000	36	vacant	4,881,141.4	6.20%	302,630.77
550000	38	wooded	278,049.0	2.58%	7,173.66
550000	39	no_label	21,943.5	10.92%	2,396.23
550000	40	rightofway	662,088.9	41.55%	275,097.94
550500	8	estate	17,242.3	9.84%	1,696.64
550500	26	rural	334,099.7	8.04%	26,861.62
550500	28	streets_hiways	9,146.7	27.28%	2,495.22
550500	29	suburban	504,946.1	13.04%	65,844.97
550500	32	urban_low	787,879.5	21.79%	171,678.94
550500	34	urban_standard	148,518.4	38.47%	57,135.03
550500	36	vacant	606,237.8	6.20%	37,586.74
550500	37	water	14,614.6	6.60%	964.56
550500	40	rightofway	360,266.6	41.55%	149,690.77
550500	41	unknown	1,063.4	10.92%	116.12
560000	4	church	32,571.5	40.33%	13,136.09
560000	8	estate	1,450,430.2	9.84%	142,722.33
560000	18	open_land	1,603,396.6	3.62%	58,042.96
560000	20	parks	74,003.7	7.73%	5,720.49
560000	26	rural	1,048,519.8	8.04%	84,300.99
560000	29	suburban	861,044.1	13.04%	112,280.15
560000	32	urban_low	726,208.4	21.79%	158,240.81
560000	34	urban_standard	109,035.5	38.47%	41,945.96
560000	36	vacant	2,051,864.3	6.20%	127,215.59
560000	39	no_label	84.0	10.92%	9.17
560000	40	rightofway	202,481.6	41.55%	84,131.11
560500	8	estate	1,416,381.6	9.84%	139,371.95
560500	18	open_land	1,836,141.6	3.62%	66,468.33
560500	22	parks_special	8,047.7	38.78%	3,120.90
560500	28	streets_hiways	5,530.6	27.28%	1,508.75
560500	29	suburban	975,374.1	13.04%	127,188.78
560500	31	urban_high	5,823.5	58.79%	3,423.64
560500	32	urban_low	1,569,986.5	21.79%	342,100.06
560500	33	urban_medium	56,428.3	45.09%	25,443.52
560500	34	urban_standard	486,956.7	38.47%	187,332.24
560500	36	vacant	2,044,550.6	6.20%	126,762.14
560500	37	water	32,553.6	6.60%	2,148.54
560500	40	rightofway	582,756.7	41.55%	242,135.41
560500	41	unknown	5,618.5	10.92%	613.54
570000	8	estate	690,638.7	9.84%	67,958.85
570000	18	open_land	2,188,452.8	3.62%	79,221.99

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
570000	28	streets_hiways	13,851.7	27.28%	3,778.74
570000	29	suburban	787,029.9	13.04%	102,628.70
570000	32	urban_low	258,235.0	21.79%	56,269.41
570000	36	vacant	2,245,667.2	6.20%	139,231.37
570000	40	rightofway	164,636.4	41.55%	68,406.42
570000	41	unknown	6,725.7	10.92%	734.45
570400	8	estate	303,238.8	9.84%	29,838.70
570400	29	suburban	167,664.6	13.04%	21,863.46
570400	32	urban_low	594,288.9	21.79%	129,495.55
570400	34	urban_standard	28,486.5	38.47%	10,958.76
570400	36	vacant	729,619.3	6.20%	45,236.40
570400	37	water	11,979.3	6.60%	790.63
570400	40	rightofway	187,912.7	41.55%	78,077.73
570600	29	suburban	515,812.2	13.04%	67,261.91
570600	31	urban_high	6,501.8	58.79%	3,822.41
570600	32	urban_low	1,173,600.7	21.79%	255,727.59
570600	33	urban_medium	22,593.9	45.09%	10,187.59
570600	34	urban_standard	190,891.5	38.47%	73,435.96
570600	36	vacant	808,400.4	6.20%	50,120.83
570600	37	water	58,690.5	6.60%	3,873.57
570600	39	no_label	568.7	10.92%	62.10
570600	40	rightofway	490,889.0	41.55%	203,964.38
570600	41	unknown	23,376.6	10.92%	2,552.72
580000	3	cemetery	212,031.0	10.17%	21,563.55
580000	5	commercial_retail	168,630.5	61.18%	103,168.14
580000	8	estate	1,018,133.0	9.84%	100,184.29
580000	18	open_land	874,962.0	3.62%	31,673.62
580000	28	streets_hiways	34,695.3	27.28%	9,464.88
580000	29	suburban	887,719.3	13.04%	115,758.60
580000	32	urban_low	1,227,345.4	21.79%	267,438.56
580000	33	urban_medium	168,854.0	45.09%	76,136.27
580000	34	urban_standard	409,325.6	38.47%	157,467.56
580000	36	vacant	2,691,230.4	6.20%	166,856.28
580000	39	no_label	448,331.5	10.92%	48,957.80
580000	40	rightofway	429,289.7	41.55%	178,369.87
580000	41	unknown	3,322.3	10.92%	362.80
580500	8	estate	8,462.2	9.84%	832.68
580500	19	parking	4,711.4	44.94%	2,117.30
580500	31	urban_high	10,209.1	58.79%	6,001.93
580500	32	urban_low	176,718.4	21.79%	38,506.94
580500	34	urban_standard	87,711.6	38.47%	33,742.65
580500	36	vacant	7,056.0	6.20%	437.47
580500	39	no_label	72,112.3	10.92%	7,874.66
580500	40	rightofway	1,554.1	41.55%	645.73
590000	8	estate	40,556.7	9.84%	3,990.78
590000	11	hospital	489,360.0	46.80%	229,020.48
590000	19	parking	8,195.7	44.94%	3,683.15
590000	32	urban_low	136,761.9	21.79%	29,800.42
590000	34	urban_standard	15.2	38.47%	5.85

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
590000	36	vacant	125,214.3	6.20%	7,763.29
590000	39	no_label	71,207.2	10.92%	7,775.83
590500	5	commercial_retail	22,941.9	61.18%	14,035.85
590500	11	hospital	292,864.0	46.80%	137,060.35
590500	19	parking	97,173.2	44.94%	43,669.64
590500	34	urban_standard	616.8	38.47%	237.28
590500	36	vacant	65,590.8	6.20%	4,066.63
590500	37	water	689.4	6.60%	45.50
590500	39	no_label	91,360.9	10.92%	9,976.61
590500	41	unknown	14.1	10.92%	1.54
600000	2	auto_hiway	4,960.3	56.72%	2,813.48
600000	5	commercial_retail	696,070.0	61.18%	425,855.63
600000	6	commercial_service	360,309.8	46.90%	168,985.30
600000	8	estate	140,851.1	9.84%	13,859.75
600000	9	facilities	287,005.0	18.00%	51,660.90
600000	10	gas	220,969.0	26.95%	59,551.15
600000	11	hospital	317,864.0	46.80%	148,760.35
600000	15	industrial_light	134,199.3	28.59%	38,367.58
600000	18	open_land	785,789.0	3.62%	28,445.56
600000	19	parking	5,449.0	44.94%	2,448.78
600000	20	parks	799,779.0	7.73%	61,822.92
600000	24	power	206,181.7	8.07%	16,638.86
600000	26	rural	423,900.0	8.04%	34,081.56
600000	27	schools	1,488,784.0	29.63%	441,126.70
600000	29	suburban	338,315.4	13.04%	44,116.33
600000	31	urban_high	205,128.1	58.79%	120,594.81
600000	32	urban_low	1,268,731.3	21.79%	276,456.55
600000	33	urban_medium	239,935.2	45.09%	108,186.78
600000	34	urban_standard	1,681,752.9	38.47%	646,970.34
600000	36	vacant	2,339,983.5	6.20%	145,078.98
600000	39	no_label	1,023,569.2	10.92%	111,773.76
600000	40	rightofway	635,689.3	41.55%	264,128.90
600000	41	unknown	15,860.4	10.92%	1,731.96
600500	2	auto_hiway	212,248.1	56.72%	120,387.12
600500	3	cemetery	318,053.8	10.17%	32,346.07
600500	5	commercial_retail	424,258.7	61.18%	259,561.47
600500	6	commercial_service	232,058.4	46.90%	108,835.39
600500	9	facilities	90,966.6	18.00%	16,373.99
600500	12	hotel_motel	4,202.5	59.51%	2,500.91
600500	15	industrial_light	11,112.7	28.59%	3,177.12
600500	19	parking	24,599.0	44.94%	11,054.79
600500	20	parks	59,049.2	7.73%	4,564.50
600500	23	phone_tv_radio	79,510.4	1.39%	1,105.19
600500	24	power	1,699.4	8.07%	137.14
600500	27	schools	539,826.8	29.63%	159,950.68
600500	28	streets_hiways	7,322.5	27.28%	1,997.58
600500	29	suburban	91,584.2	13.04%	11,942.58
600500	31	urban_high	146,848.2	58.79%	86,332.06
600500	32	urban_low	564,780.7	21.79%	123,065.71

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
This data is obtained using all ~42 categories					
600500	33	urban_medium	207,244.9	45.09%	93,446.73
600500	34	urban_standard	820,982.5	38.47%	315,831.97
600500	36	vacant	658,754.3	6.20%	40,842.77
600500	37	water	4,162.7	6.60%	274.74
600500	39	no_label	1,165,429.5	10.92%	127,264.90
600500	40	rightofway	675,164.0	41.55%	280,530.64
600500	41	unknown	1,903.8	10.92%	207.89
610000	2	auto_hiway	193,314.8	56.72%	109,648.15
610000	3	cemetery	549,443.7	10.17%	55,878.42
610000	4	church	595,752.0	40.33%	240,266.78
610000	5	commercial_retail	1,727,106.4	61.18%	1,056,643.70
610000	6	commercial_service	1,159,488.9	46.90%	543,800.29
610000	8	estate	4,503,674.1	9.84%	443,161.53
610000	9	facilities	333,059.6	18.00%	59,950.73
610000	10	gas	69,492.4	26.95%	18,728.20
610000	12	hotel_motel	44,222.7	59.51%	26,316.93
610000	14	industrial_heavy	98,880.0	46.53%	46,008.86
610000	15	industrial_light	71,414.8	28.59%	20,417.49
610000	17	mobile_park	293,972.5	40.49%	119,029.47
610000	18	open_land	8,988,135.1	3.62%	325,370.49
610000	19	parking	146,146.9	44.94%	65,678.42
610000	20	parks	89,609.9	7.73%	6,926.85
610000	24	power	49,945.5	8.07%	4,030.60
610000	26	rural	835,824.9	8.04%	67,200.32
610000	27	schools	477,589.0	29.63%	141,509.62
610000	29	suburban	4,974,744.4	13.04%	648,706.67
610000	31	urban_high	60,687.1	58.79%	35,677.95
610000	32	urban_low	7,338,990.4	21.79%	1,599,166.00
610000	33	urban_medium	160,334.2	45.09%	72,294.69
610000	34	urban_standard	2,700,579.4	38.47%	1,038,912.90
610000	36	vacant	16,365,060.0	6.20%	1,014,633.70
610000	39	no_label	1,968,795.7	10.92%	214,992.49
610000	40	rightofway	4,352,508.4	41.55%	1,808,467.20
610000	41	unknown	108,657.3	10.92%	11,865.38
610500	2	auto_hiway	286,677.0	56.72%	162,603.19
610500	4	church	5,062.5	40.33%	2,041.71
610500	5	commercial_retail	370,976.8	61.18%	226,963.61
610500	6	commercial_service	205,263.7	46.90%	96,268.68
610500	7	docks	2,047.8	40.11%	821.37
610500	9	facilities	203,645.8	18.00%	36,656.24
610500	14	industrial_heavy	26,429.3	46.53%	12,297.55
610500	15	industrial_light	13,493.3	28.59%	3,857.73
610500	19	parking	186,096.1	44.94%	83,631.59
610500	20	parks	17,438.0	7.73%	1,347.96
610500	22	parks_special	15,670.9	38.78%	6,077.18
610500	31	urban_high	40,777.7	58.79%	23,973.21
610500	32	urban_low	381,736.2	21.79%	83,180.32
610500	33	urban_medium	169,166.5	45.09%	76,277.18
610500	34	urban_standard	656,487.5	38.47%	252,550.74

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
610500	36	vacant	359,688.8	6.20%	22,300.71
610500	37	water	0.1	6.60%	0.01
610500	39	no_label	1,387,638.4	10.92%	151,530.11
610500	40	rightofway	22,441.9	41.55%	9,324.61
610500	41	unknown	512.9	10.92%	56.01
620000	2	auto_hiway	15,940.3	56.72%	9,041.34
620000	3	cemetery	8,567.3	10.17%	871.29
620000	5	commercial_retail	137,523.6	61.18%	84,136.94
620000	6	commercial_service	436,680.5	46.90%	204,803.15
620000	8	estate	601,040.7	9.84%	59,142.41
620000	9	facilities	217,014.9	18.00%	39,062.68
620000	15	industrial_light	12,910.6	28.59%	3,691.14
620000	18	open_land	5,815.1	3.62%	210.51
620000	20	parks	41,846.9	7.73%	3,234.77
620000	22	parks_special	15,078.4	38.78%	5,847.40
620000	24	power	378,102.3	8.07%	30,512.86
620000	27	schools	130,209.9	29.63%	38,581.19
620000	29	suburban	741,980.6	13.04%	96,754.27
620000	31	urban_high	164,146.3	58.79%	96,501.61
620000	32	urban_low	3,204,410.9	21.79%	698,241.14
620000	33	urban_medium	589,818.1	45.09%	265,948.98
620000	34	urban_standard	3,291,090.7	38.47%	1,266,082.60
620000	36	vacant	2,580,672.5	6.20%	160,001.70
620000	39	no_label	2,745,348.4	10.92%	299,792.05
620000	40	rightofway	1,225,348.8	41.55%	509,132.43
620000	41	unknown	7,193.5	10.92%	785.53
620500	5	commercial_retail	59,942.8	61.18%	36,673.01
620500	6	commercial_service	48,996.5	46.90%	22,979.36
620500	8	estate	909,867.5	9.84%	89,530.96
620500	15	industrial_light	65,601.1	28.59%	18,755.35
620500	19	parking	16.5	44.94%	7.42
620500	22	parks_special	61,144.8	38.78%	23,711.95
620500	24	power	25.0	8.07%	2.02
620500	26	rural	640,027.1	8.04%	51,458.18
620500	29	suburban	202,696.7	13.04%	26,431.65
620500	32	urban_low	636,919.0	21.79%	138,784.65
620500	33	urban_medium	16,119.5	45.09%	7,268.28
620500	34	urban_standard	307,000.8	38.47%	118,103.21
620500	36	vacant	2,427,603.8	6.20%	150,511.44
620500	37	water	18,372.7	6.60%	1,212.60
620500	39	no_label	564,021.6	10.92%	61,591.16
620500	40	rightofway	261,909.2	41.55%	108,823.27
620500	41	unknown	5,487.0	10.92%	599.18
630000	5	commercial_retail	439,260.9	61.18%	268,739.82
630000	6	commercial_service	698,843.8	46.90%	327,757.74
630000	8	estate	2,906,088.6	9.84%	285,959.12
630000	9	facilities	367,035.0	18.00%	66,066.30
630000	10	gas	82,170.7	26.95%	22,145.00
630000	11	hospital	686,017.2	46.80%	321,056.05

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
630000	15	industrial_light	335,623.0	28.59%	95,954.62
630000	18	open_land	8,608,550.9	3.62%	311,629.54
630000	19	parking	4,204.7	44.94%	1,889.59
630000	20	parks	2,854,781.6	7.73%	220,674.62
630000	24	power	1,143,809.0	8.07%	92,305.39
630000	26	rural	3,006,146.1	8.04%	241,694.15
630000	27	schools	1,302,430.0	29.63%	385,910.01
630000	29	suburban	2,643,263.0	13.04%	344,681.50
630000	31	urban_high	566,175.1	58.79%	332,854.34
630000	32	urban_low	3,189,328.5	21.79%	694,954.68
630000	33	urban_medium	280,944.8	45.09%	126,678.01
630000	34	urban_standard	1,930,373.8	38.47%	742,614.80
630000	36	vacant	11,751,768.0	6.20%	728,609.61
630000	37	water	45,302.7	6.60%	2,989.98
630000	38	wooded	5,950,696.8	2.58%	153,527.98
630000	39	no_label	168,985.6	10.92%	18,453.23
630000	40	rightofway	6,466,915.4	41.55%	2,687,003.30
630000	41	unknown	43,883.4	10.92%	4,792.07
630500	6	commercial_service	103,516.4	46.90%	48,549.19
630500	8	estate	671,974.6	9.84%	66,122.30
630500	15	industrial_light	250,591.4	28.59%	71,644.08
630500	18	open_land	2,607,749.3	3.62%	94,400.53
630500	22	parks_special	96,099.5	38.78%	37,267.39
630500	24	power	258,137.0	8.07%	20,831.66
630500	26	rural	324,594.0	8.04%	26,097.36
630500	29	suburban	790,696.7	13.04%	103,106.85
630500	32	urban_low	1,050,987.9	21.79%	229,010.26
630500	33	urban_medium	6,249.4	45.09%	2,817.85
630500	34	urban_standard	111,066.7	38.47%	42,727.36
630500	36	vacant	3,579,335.9	6.20%	221,918.83
630500	37	water	30,322.7	6.60%	2,001.30
630500	39	no_label	187,309.0	10.92%	20,454.14
630500	40	rightofway	2,870,794.3	41.55%	1,192,815.00
640000	2	auto_hiway	299,517.0	56.72%	169,886.04
640000	8	estate	136,779.2	9.84%	13,459.07
640000	18	open_land	1,164,500.0	3.62%	42,154.90
640000	32	urban_low	135,254.0	21.79%	29,471.85
640000	34	urban_standard	16,583.9	38.47%	6,379.83
640000	36	vacant	82,922.4	6.20%	5,141.19
640000	39	no_label	33.6	10.92%	3.67
640000	40	rightofway	147,636.7	41.55%	61,343.05
640500	2	auto_hiway	45,488.4	56.72%	25,801.02
640500	5	commercial_retail	40,586.8	61.18%	24,831.00
640500	6	commercial_service	78,605.5	46.90%	36,865.98
640500	8	estate	190,581.3	9.84%	18,753.20
640500	18	open_land	1,319,758.0	3.62%	47,775.24
640500	36	vacant	1,114,754.4	6.20%	69,114.77
640500	39	no_label	166,854.5	10.92%	18,220.51
640500	40	rightofway	705,980.0	41.55%	293,334.69

Impervious Surface Summary

CH3D	LU Code	Landuse	Total Area (sq. ft)	% Impervious	Impervious Area (sq. ft)
		This data is obtained using all ~42 categories			
650000	5	commercial_retail	268,470.8	61.18%	164,250.44
650000	8	estate	310,228.7	9.84%	30,526.50
650000	14	industrial_heavy	57,587.4	46.53%	26,795.42
650000	18	open_land	4,143,595.9	3.62%	149,998.17
650000	29	suburban	587,730.4	13.04%	76,640.04
650000	32	urban_low	180,757.0	21.79%	39,386.95
650000	34	urban_standard	9,459.2	38.47%	3,638.95
650000	36	vacant	242,024.6	6.20%	15,005.53
650000	38	wooded	4,876,095.8	2.58%	125,803.27
650000	40	rightofway	195,289.8	41.55%	81,142.91
650300	2	auto_hiway	245,741.1	56.72%	139,384.35
650300	4	church	14,165.4	40.33%	5,712.91
650300	5	commercial_retail	491,630.6	61.18%	300,779.60
650300	6	commercial_service	1,702.6	46.90%	798.52
650300	14	industrial_heavy	276,181.6	46.53%	128,507.30
650300	15	industrial_light	204,589.5	28.59%	58,492.14
650300	18	open_land	893,795.8	3.62%	32,355.41
650300	19	parking	46,958.1	44.94%	21,102.97
650300	26	rural	457,977.0	8.04%	36,821.35
650300	27	schools	240,133.0	29.63%	71,151.41
650300	29	suburban	1,184,760.9	13.04%	154,492.82
650300	32	urban_low	515,422.2	21.79%	112,310.50
650300	34	urban_standard	66,624.2	38.47%	25,630.33
650300	36	vacant	1,708,982.3	6.20%	105,956.90
650300	37	water	1,544.1	6.60%	101.91
650300	38	wooded	336,095.6	2.58%	8,671.27
650300	39	no_label	61,010.7	10.92%	6,662.37
650300	40	rightofway	813,675.0	41.55%	338,081.96
650600	2	auto_hiway	82,833.6	56.72%	46,983.22
650600	5	commercial_retail	301,080.1	61.18%	184,200.81
650600	6	commercial_service	55,330.7	46.90%	25,950.10
650600	8	estate	956,152.1	9.84%	94,085.37
650600	10	gas	1,037,338.0	26.95%	279,562.59
650600	14	industrial_heavy	27,320.6	46.53%	12,712.28
650600	15	industrial_light	23,398.0	28.59%	6,689.49
650600	16	mines	3,080,562.8	25.67%	790,780.47
650600	18	open_land	3,403,429.2	3.62%	123,204.14
650600	19	parking	575.0	44.94%	258.41
650600	24	power	144,797.8	8.07%	11,685.18
650600	26	rural	718,832.0	8.04%	57,794.09
650600	29	suburban	836,688.4	13.04%	109,104.17
650600	30	transportation	98,351.9	33.42%	32,869.21
650600	31	urban_high	8,016.4	58.79%	4,712.84
650600	32	urban_low	1,179,849.0	21.79%	257,089.10
650600	33	urban_medium	11,380.6	45.09%	5,131.51
650600	34	urban_standard	202,785.2	38.47%	78,011.47
650600	35	utilities_general	676,282.0	32.09%	217,018.89
650600	36	vacant	6,821,252.6	6.20%	422,917.66
650600	37	water	15,912.1	6.60%	1,050.20

Impervious Surface Summary

This data is obtained using all ~42 categories					
CH3D	**LU Code**	**Landuse**	**Total Area (sq. ft)**	**% Impervious**	**Impervious Area (sq. ft)**
650600	38	wooded	3,466,520.0	2.58%	89,436.22
650600	39	no_label	2,858,733.9	10.92%	312,173.74
650600	40	rightofway	1,279,170.9	41.55%	531,495.51
650600	41	unknown	3,750.8	10.92%	409.59

Land Use/Land Cover Analysis:
Comparison with Parcel Data for Project ENVVEST Study Area

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Introduction

The is analysis was prepared in support of PSNS Project ENVVEST to compare the land and cover data derived from satellite imagery with land use and land cover derived from parcel data for the ENVVEST study area. Land use and land cover data is used for a wide variety of purposes, including municipal and regional planning, land management, and habitat research to name a few.   Digital databases of land use, land cover, and associated datasets are widely available in GIS formats from the Internet. *Land use* is commonly defined as human operations on land that intend to obtain products and/or benefits from the land; whereas *land cover* is defined as vegetation or anthropogenic constructions on the earth's surface. Consequently, these maps and databases involve some interpretation and may take into account either or both land use and land cover. Land use and land cover databases are derived from numerous forms of remote sensing and aerial photography, and are available in varying spatial scales ranging from small parcels to state-wide coverages to world-wide images.

USGS Land Use and Land Cover Data

Land Use and Land Cover (LULC) is a set of data available in GIS format for most of the contiguous United States and for Hawaii. LULC data is available from the USGS based upon 1:100,000- and 1:250,000-scale USGS topographic quadrangles. It is obtained from interpretation of aerial photography from the 1970's and 1980's, as well as using secondary sources such as land use maps and surveys. The data is in Universal Transverse Mercator (UTM) projection, referenced to the North American Datum of 1983 (NAD83), and are available in GIRAS (Geographic Information Retrieval and Analysis System) and CTG (Composite Theme Grid) formats. Additionally, LULC data uses the Anderson 2 classification scheme for delineation of the different land uses and covers. All LULC data is free of charge and can be downloaded via FTP at http://edc.usgs.gov/geodata/. Layers including political units, hydrologic units, census county subdivisions, and Federal and State land ownership are also available.

Additionally, shapefiles that are compatible with ArcView can be downloaded free of charge at http://www.webgis.com/lulcdata.html.

The Anderson classification scheme for land use and land cover data was developed and introduced in 1976 via a US Geological Survey Professional Paper (Anderson, et. al, 1976). The classification scheme originally had 2 levels. Anderson 1 includes nine general levels of classification, while Anderson 2 contains 21 more specific classifications that further define and delineate the level 1 classifications. Higher levels of classification have also been developed up to level 5, although few go beyond a third level. Because the original focus for the Anderson classification system was habitat-resource based, as opposed to the current more standard usage of LULC data for management of anthropogenic land usage, the standard system is commonly altered to meet the needs of an individual project. In Table 1, the standard Anderson 2 classification scheme is shown, where the more general classes of level 1 are shown in bold. Additionally, an example of a level 3 classification scheme, developed by the Delaware Office of State Planning Coordination, can be found at http://www.pamagic.org/DataStds/Current/DataStandards_LandUse_05-22-02.pdf.

Table 1. Level 2 Anderson classification scheme for Land Use and Land Cover (LULC) data. The 9 classifications for level 1 are shown in bold. Taken from http://geo-nsdi.er.usgs.gov/metadata/other/epa/giras-lulc/sdd/metadata.faq.html.

Value	Definition
1	**Urban or built-up land**
11	Residential
12	Commercial and services
13	Industrial
14	Transportation, communication, utilities
15	Industrial and commercial complexes
16	Mixed urban or built-up land
17	Other urban or built-up land
2	**Agricultural land**
21	Cropland and pasture
22	Orchards, groves, vineyards, nurseries, and ornamental horticultural
23	Confined feeeding operations
24	Other agricultural land
3	**Rangeland**

31	Herbaceous rangeland
32	Shrub and brush rangeland
33	Mixed rangeland
4	**Forest land**
41	Deciduous forest land
42	Evergreen forest land
43	Mixed forest land
5	**Water**
51	Streams and canals
52	Lakes
53	Reservoirs
54	Bays and estuaries
6	**Wetland**
61	Forested wetland
62	Non-forested wetland
7	**Barren land**
71	Dry salt flats
72	Beaches
73	Sandy areas not beaches
74	Bare exposed rock
75	Strip mines, quarries, gravel pits
76	Transitional areas
8	**Tundra**
81	Shrub and brush tundra
82	Herbaceous tundra
83	Bare ground
84	Wet tundra
85	Mixed tundra

9	**Perennial snow or ice**
91	Perennial snowfields
92	Glaciers

National Land Cover Data

The National Land Cover Data (NLCD) is a set of GIS-accessible, single band raster images with a 21-class land cover classification scheme for the United States. The data has a 30-meter spatial resolution and is derived Landsat Thematic Mapper (TM) satellite data from the early to mid 1990's (circa 1992). Analysis of the TM data was conducted using large-scale mosaics with aerial photography as a secondary "ground-truthing" source. NLCD is set to the Alberson conic Equal Area projection and is referenced to NAD83. Files for all states are available free of charge as downloadable (FTP) 8-bit binary files and as Geo-TIFF files for most states at http://edcwww.cr.usgs.gov/pub/data/landcover/states/ with information on the data at http://landcover.usgs.gov/natllandcover.html. A new enhanced version is slated for 2005 using Landsat data from 2000. In addition, NLCD can be downloaded from the USGS seamless server at http://seamless.usgs.gov.

The classification scheme for NLCD differs from the Anderson 2 classification scheme and is sometimes called a "modified Anderson 2 classification scheme." Some classifications have been combined, whereas others are indistinguishable using TM imagery and have been eliminated from the classification scheme. A list of the classifications is given in Table 2, and a more comprehensive explanation can be found at http://landcover.usgs.gov/classes.html.

Table 2. The 21-class classification scheme for the National Land Cover Data (NLCD).

	Water
11	Open Water
12	Perennial Ice/Snow
	Developed
21	Low Intensity Residential
22	High Intensity Residential
23	Commercial/Industrial/Transportation
	Barren
31	Bare Rock/Sand/Clay
32	Quarries/Strip Mines/Gravel Pits
33	Transitional
	Vegetated; Natural Forested Upland
41	Deciduous Forest
42	Evergreen Forest
43	Mixed Forest
	Shrubland
51	Shrubland
	Non-natural Woody

61	Orchards/Vineyards/Other
	Herbaceous Upland
71	Grasslands/Herbaceous
	Herbaceous Planted Cultivated
81	Pasture/Hay
82	Row Crops
83	Small Grains
84	Fallow
85	Urban/Recreational Grasses
	Wetlands
91	Woody Wetlands
92	Emergent Herbaceous Wetlands

A plethora of other sources of land use and/or land cover data is also available from the Internet with various resolutions and spatial scales. The Multi-Resolution Land Characteristic Consortium has links to various website and can be found at http://www.epa.gov/mrlc/data.html. It has links to the National Land Cover Data (NLCD), the GAP analysis project, the North American Landscape Characterization (NALC), the Global Land Cover Characterization (GLCC), and many others. Links and information about land cover reference data sets is also given by the EPA at http://www.epa.gov/owowwtr1/watershed/landcover/lulcusa.html. Additionally, a website by NASA lists many different types of research activities and remote sensing techniques used for analysis of land use and land cover. This website can be found at http://www.earth.nasa.gov/research/land/index.html.

Explanation of Analysis of Land Use and Land Cover for the ENVVEST Study Area Based on Parcel Data

GIS Analysis
   1) The attribute table from the POLY.shp file obtained from Vickie Whitney was joined with the LANDCODE.dbf file based on the common field, SAPN/APN. This allowed the shapefile attribute table to list the parcel number and the land use for every parcel.
   2) The watersheds.shp file was obtained from Heather Halkola. Within the geoprocessing wizard, the "clip" feature was used to clip the watershed area from the POLY.shp file. (Sort of a cookie-cutter clip of just the study area)
   3) The "union" feature within the geoprocessing wizard was used to union the Watershed.shp and the clipped POLY file. This allowed the attribute table for the new layer to contain the parcel number (APN), land use, and the sub-watershed in which it is contained for all parcels. The final shapefile is called **Parcels_landuse.shp**.
   4) Within the attribute table of the new shapefile, an additional column was created called Area_ to calculate the new areas of each parcel. This step was necessary because some of the parcels were split during the clip, but the areas were not updated to reflect this change. The areas were calculated using the advanced field calculator. The VB code used was to type dblArea in the bottom box, while typing in the top box:

> Dim dblArea as double
> Dim pArea as IArea
> Set pArea = [shape]
> Dbl Area = pArea.area

Excel Analysis
   1) The database file was then imported into Excel. All unnecessary columns were removed, and the new file contained only the APN number, CH3D number, land use, landcode, and the newly calculated area. (The original land use data contained two columns of land uses, one which contained most of the data and one that contained only "Right of Way," "Lake," and "Unknown" categories. Because these parcels were not labeled in the primary land use column, these categories were moved over to fill the gaps. Any remaining cells without land use data were given the title of No Label.)
   2) This file was saved as a comma-separated file (.csv) for import into Matlab.

Appendix C2

Matlab Analysis
1) The comma-separated file was imported into Matlab, and the data was summarized based on the CH3D number and the land use (i.e. the areas for all parcels in a given watershed with a certain land use were summed).
2) Percent impervious values for each type of land use were originally obtained from the file "full county landcodes vs. imperviousness1.xls" from David Nash (Kitsap County). The file was rearranged slightly by Chris May, and this was the final configuration used in the analysis.
3) Percent impervious values for each watershed were calculated based on using all 42 specific categories and also using the 8 general categories outlined in the "May_Parcel_LULC_CodeKey.xls" file (which aggregate the 42 specific land use categories into 8 more general classifications). This is also shown in Table 1 (below).
4) The final summary of all data is contained in "ImperviousSummary.xls," and I have all the Matlab code if anyone would every want to use it. The Excel file is split into several worksheets. The worksheets that begin with "Gen_" are summaries of the data collected using the 8 general categories, whereas those beginning with "All_" use the 42 categories. The worksheets ending with "_LongVersion" show every individual land use for each watershed, whereas those ending in "_CondensedVersion" show the total % of impervious area for the entire watershed. A comparison between both of these classifications is also shown in the "Comparison" worksheet.

	% Impervious
Undeveloped	**3.96%**
vacant	6.20%
open_land	3.62%
wooded	2.58%
TaxTitle	7.20%
Low Density Residential	**13.46%**
rural	8.04%
estate	9.84%
suburban	13.04%
urban_low	21.79%
Medium Density Residential	**39.24%**
urban_medium	45.09%
urban_standard	38.47%
mobile_park	40.49%
High Density Residential	**58.79%**
urban_high	58.79%
Commercial/Industrial	**46.97%**
commercial_retail	61.18%
commercial_service	46.90%
industrial_light	28.59%
industrial_heavy	46.53%

parking	44.94%
streets_hiways	27.28%
industrial_general	53.48%
hotel_motel	59.51%
hospital	46.80%
docks	40.11%
church	40.33%
transportation	33.42%
Transportation	**41.23%**
auto_hiway	56.72%
RightofWay	41.55%
rail	15.97%
Parks, Etc.	**8.17%**
parks	7.73%
parks_special	38.78%
parks_resort	7.24%
Public Facilities, Utilities	**17.60%**
utilities_general	32.09%
facilities	18.00%
airports	15.20%
cemetery	10.17%
schools	29.63%
Unknowns (+ NoLabel)	10.92%
water	6.60%
gas	26.95%
mines	25.67%
Electric Power	8.07%
phone_tv_radio	1.39%

Table 1. The 8 general categories are shown in red, and the 42 more specific categories are shown in black.

Attachment 1: Spreadsheet file with calculations of Total Impervious Area (TIA) by watershed using both classification schemes:

ImperviousSummary2.xls