

## Database of Estimates by 6-Digit HUC of Animal Units and Recoverable and Non-Recoverable Manure Nutrients based on the Census of Agriculture

This database is a supplement to a USDA/NRCS report entitled “**Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture,**” authored by Robert L. Kellogg,

This database supplement provides estimates by 6-digit Hydrologic Unit Codes (HUCs) of manure, manure nutrients, and other selected variables derived from the 2007 and 2012 Census of Agriculture Databases. The full report cited above should be consulted for definitions and methods used to derive the estimates from variables available in the Census of Agriculture databases for 2007 and 2012.

Livestock populations reported in the Census of Agriculture were used in this report to estimate total manure and manure nutrients *as excreted*, which are then disaggregated into two parts—

- recoverable manure from animal feeding operations (AFOs), where manure from confined animals is assumed to be collectable and available for land application after recovery, and
- non-recoverable manure from all farms with livestock.

Non-recoverable manure includes manure deposited by pastured animals and manure that was assumed to not be recoverable from AFOs. Manure from confined livestock types on farms too small to qualify as AFOs (based on the size of the on-farm livestock population of confined livestock types) was included with pastured livestock, representing nutrient loadings on farmland in the vicinity of small farms.

Specifically, data from the Census of Agriculture databases were used to estimate

1. average annual on-farm livestock population,
2. quantity of manure and manure nutrients *as excreted* for all farms with livestock,
3. quantity of recoverable manure and manure nutrients for AFOs,
4. quantity of non-recoverable manure nutrients for all farms with livestock,
5. capacity of farmland to receive land-applied manure nutrients, and
6. potential application rates of recoverable manure on crops and pastureland.

This information was then used to identify areas where the amount of recoverable manure nutrients exceeds the assumed availability of farmland for land application. Results from this estimation process identify areas potentially needing more land for manure application or alternative manure utilization

This database consists of the following seven tables.

1. **Table S1.** Farm counts by 6-digit HUC, Derived from the Census of Agriculture Database
2. **Table S2.** Animal Units (AU) by 6-digit HUC, Derived from the Census of Agriculture Database
3. **Table S3.** Quantity of Manure and Manure Nutrients Produced *as excreted* for Confined Livestock Types by 6-digit HUC, Derived from the Census of Agriculture Database
4. **Table S4.** Quantity of Manure and Manure Nutrients Produced *as excreted* for Pastured Livestock Types by 6-digit HUC, Derived from the Census of Agriculture Database
5. **Table S5.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC, Derived from the Census of Agriculture Database

6. **Table S6.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC, Derived from the Census of

7. **Table S7.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC, Derived from the Census of

In some cases the estimates could not be reported because disclosure criteria to protect confidentiality were not met, indicated by a “DD” in place of the value in these tables.

The Census of Agriculture is conducted by the National Agricultural Statistics Service (NASS), Department of Agriculture. Electronic databases of farm-level responses maintained by NASS were used to make the calculations at the farm level. Farm-level estimates were then aggregated for reporting. Access to the farm-level data base is restricted to protect the confidentiality of respondents. All estimates published in this supplement database meet the disclosure criteria used by NASS to assure confidentiality.

Beginning in 2007, the National Agricultural Statistics Service (NASS) assigned Hydrologic Unit Codes (HUCs) to all farms. Initial watershed assignments were made based on the principal state, principal county, and zip code for each operation. If the principal county was contained completely within a watershed and the zip code was valid for the principal county, the operation was deterministically assigned to that watershed. Operations that could not be deterministically assigned were probabilistically assigned. Probabilistic assignments were made based on the proportion of agricultural land each watershed had within the principal county. For example, if a watershed represents 60 percent of the agricultural land in a county, a record would have had a 6 out of 10 chance of being assigned to that

(This information was excerpted from a NASS summary of the methodology at [http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/Watersheds/wtrsheds.txt](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Watersheds/wtrsheds.txt))

**Table S1-2007.** Farm counts by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
10100	1,143	0	44	0
10200	1,018	10	70	9
10300	1,517	19	131	16
10400	946	7	85	23
10500	1,636	4	29	<4
10600	2,407	4	92	26
10700	3,034	5	145	62
10801	2,901	40	351	46
10802	4,406	11	222	55
10900	4,049	<4	213	127
11000	3,917	36	238	62
11100	385	18	90	19
20100	3,944	143	776	83
20200	7,008	100	999	108
20301	2,923	<4	63	32
20302	625	<4	21	21
20401	5,659	18	446	60
20402	8,024	201	829	227
20403	1,656	<4	16	7
20501	10,551	139	1,855	210
20502	4,604	70	748	163
20503	15,516	873	4,824	1,029
20600	6,881	985	668	1,158
20700	18,795	833	2,044	1,195
20801	5,740	64	249	107
20802	7,898	124	314	205
30101	11,267	85	510	247
30102	4,236	161	191	213
30201	3,083	127	97	170
30202	4,673	505	199	513
30203	0	0	0	0
30300	8,267	1,406	647	1,665
30401	10,339	588	751	972
30402	8,501	472	327	554
30501	15,142	311	596	596
30502	4,747	144	169	191
30601	10,012	592	585	994
30602	3,038	68	129	94
30701	11,237	363	502	606
30702	3,396	134	113	165
30801	9,529	8	190	149
30802	986	<4	15	15
30901	2,502	21	43	52
30902	6,855	<4	157	147
31001	3,972	9	74	69
31002	8,110	22	128	110
31101	2,101	25	49	48
31102	8,236	204	277	285
31200	2,128	38	66	49
31300	13,063	396	558	693
31401	3,344	30	112	73
31402	5,155	254	208	377
31403	2,779	152	105	200
31501	13,406	787	640	1,218
31502	4,157	37	126	91
31601	14,040	582	859	1,158
31602	2,717	19	104	78
31700	8,506	612	365	784
31800	8,275	695	503	900

**Table S1-2012.** Farm counts by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
10100	839	<4	25	<4
10200	974	12	62	9
10300	1,641	21	130	22
10400	1,063	4	64	16
10500	1,645	<4	53	25
10600	2,673	4	85	22
10700	3,342	6	138	67
10801	3,080	34	283	49
10802	4,791	9	190	52
10900	3,956	4	194	125
11000	4,640	37	219	94
11100	0	0	0	0
20100	0	0	0	0
20200	7,078	89	961	154
20301	2,625	<4	63	45
20302	635	5	29	30
20401	5,200	22	431	84
20402	7,600	179	883	279
20403	1,659	99	72	135
20501	10,466	105	1,685	194
20502	4,265	76	856	242
20503	14,479	872	5,018	1,080
20600	4,973	219	268	216
20700	18,364	748	1,909	1,102
20801	6,991	698	452	786
20802	7,859	114	329	196
30101	11,026	79	364	136
30102	3,973	149	142	173
30201	2,735	104	86	126
30202	4,319	363	161	362
30203	403	60	10	53
30300	8,026	991	478	1,113
30401	10,155	525	617	772
30402	7,786	432	229	446
30501	15,112	384	428	568
30502	4,846	163	125	187
30601	8,952	799	532	1,170
30602	2,657	61	108	91
30701	9,950	426	373	608
30702	3,129	169	100	198
30801	9,493	8	243	197
30802	1,068	<4	9	8
30901	2,491	13	64	62
30902	7,401	<4	251	243
31001	3,521	11	58	54
31002	8,471	16	206	182
31101	2,006	17	57	52
31102	8,024	179	213	246
31200	2,050	31	51	47
31300	11,591	400	437	635
31401	3,171	25	91	79
31402	4,597	279	223	416
31403	2,507	135	87	173
31501	11,587	856	465	1,145
31502	3,786	40	105	77
31601	12,338	564	662	940
31602	2,316	14	73	50
31700	7,419	589	385	810
31800	7,410	651	437	853

**Table S1-2007.** Farm counts by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
40101	48	0	0	0
40102	675	<4	34	4
40103	808	<4	84	9
40201	392	0	21	<4
40202	263	<4	17	0
40203	8	0	0	0
40301	6,840	238	2,045	224
40302	6,896	178	2,139	182
40400	2,154	36	373	32
40500	23,047	533	2,499	590
40601	7,145	77	620	60
40602	72	<4	6	<4
40700	2,236	15	163	13
40801	3,252	80	409	66
40802	8,850	78	797	88
40803	86	0	<4	0
40900	3,923	14	302	37
41000	23,624	413	1,820	451
41100	4,059	15	318	30
41201	3,044	73	382	36
41202	24	0	<4	0
41300	3,434	94	394	53
41401	1,078	19	131	15
41402	4,817	133	1,029	117
41501	587	22	238	19
41502	25	<4	4	0
41503	1,877	59	539	40
41504	0	0	0	0
41505	0	0	0	0
50100	11,058	68	1,339	122
50200	9,755	18	543	72
50301	9,752	45	880	71
50302	8,831	15	251	28
50400	14,273	197	2,284	396
50500	12,252	18	398	102
50600	9,209	84	595	99
50701	636	0	<4	0
50702	1,322	0	18	8
50800	10,673	216	1,064	202
50901	5,343	<4	131	38
50902	10,380	32	409	57
51001	9,989	7	361	78
51002	12,737	5	467	104
51100	22,949	260	1,265	486
51201	28,584	855	2,429	702
51202	17,550	367	1,347	392
51301	17,303	97	787	327
51302	15,177	33	597	180
51401	14,516	66	774	183
51402	8,468	99	409	153
60101	20,247	69	706	288
60102	11,936	25	348	127
60200	6,332	157	375	315
60300	19,671	657	1,192	1,268
60400	12,646	137	449	280
70101	6,636	80	795	130
70102	11,333	356	2,631	471
70200	19,166	1,381	2,973	797
70300	6,806	56	788	73

**Table S1-2012.** Farm counts by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
40101	91	0	<4	<4
40102	599	<4	47	5
40103	857	4	75	9
40201	410	0	18	<4
40202	245	0	17	<4
40203	10	0	0	0
40301	6,019	272	1,594	172
40302	6,541	210	1,739	216
40400	1,918	38	345	36
40500	22,063	513	2,524	692
40601	7,050	85	524	52
40602	59	0	<4	0
40700	2,159	14	149	24
40801	2,952	90	351	72
40802	8,101	83	612	77
40803	62	0	0	0
40900	3,755	17	283	46
41000	22,703	388	1,679	409
41100	3,973	18	356	59
41201	2,912	61	354	61
41202	26	0	0	0
41300	3,124	87	338	65
41401	1,133	19	120	19
41402	4,863	114	1,126	154
41501	606	22	283	32
41502	22	<4	<4	0
41503	1,901	43	544	49
41504	4,316	151	647	92
41505	364	19	84	15
50100	9,481	60	1,154	99
50200	8,957	14	427	47
50301	9,214	49	720	89
50302	8,732	14	235	44
50400	15,109	200	2,500	470
50500	11,888	17	367	95
50600	9,032	87	501	104
50701	509	0	<4	<4
50702	1,204	0	15	7
50800	10,224	217	873	213
50901	4,798	<4	129	37
50902	10,069	28	399	62
51001	9,117	7	295	72
51002	11,504	<4	396	139
51100	21,166	246	1,137	451
51201	28,422	788	1,897	669
51202	16,837	318	1,047	378
51301	15,475	67	613	244
51302	12,756	29	477	145
51401	13,296	46	633	159
51402	7,983	77	331	146
60101	17,779	52	482	171
60102	10,949	17	250	88
60200	5,467	143	275	244
60300	17,349	648	929	1,142
60400	11,754	85	347	178
70101	6,098	71	891	151
70102	11,228	322	2,736	387
70200	17,978	1,137	2,676	733
70300	5,821	61	617	67

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6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
70400	15,824	599	4,086	548
70500	7,534	132	2,386	204
70600	12,601	693	4,007	660
70700	13,274	216	3,535	278
70801	14,322	735	2,329	572
70802	18,784	1,137	3,142	741
70900	17,584	524	3,629	446
71000	18,827	1,094	2,191	737
71100	14,248	189	985	189
71200	12,429	181	1,012	258
71300	20,910	378	1,574	266
71401	14,146	38	903	154
71402	8,500	130	878	142
80101	705	7	14	8
80102	13,581	180	511	303
80201	170	0	<4	0
80202	6,485	36	169	62
80203	4,436	10	136	31
80204	1,124	4	22	13
80301	269	0	<4	0
80302	10,332	10	206	75
80401	2,954	163	286	299
80402	4,459	360	212	447
80403	1,737	35	48	50
80500	4,907	0	90	24
80601	261	0	12	5
80602	4,791	44	112	88
80701	210	0	18	6
80702	4,016	50	251	134
80703	448	0	22	10
80801	4,399	0	129	31
80802	6,051	<4	156	76
80901	56	0	<4	0
80902	713	<4	26	5
80903	902	0	28	6
90100	4,320	10	150	34
90201	8,610	105	649	122
90202	5,517	18	197	33
90203	9,526	29	276	62
90300	901	0	22	<4
90400	0	0	0	0
100100	108	0	5	5
100200	2,341	11	103	38
100301	2,572	12	84	29
100302	2,269	18	98	55
100401	1,620	<4	48	18
100402	1,168	<4	32	15
100500	2,730	4	97	34
100600	2,614	<4	67	15
100700	3,740	19	135	45
100800	3,100	8	172	40
100901	787	0	19	6
100902	1,343	0	27	6
101000	2,125	5	111	42
101101	2,500	<4	87	18
101102	1,448	<4	49	5
101201	2,864	4	83	40
101202	1,533	<4	59	14
101301	5,636	18	342	63

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6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
70400	14,538	608	3,431	535
70500	7,047	143	2,004	147
70600	12,307	687	3,474	446
70700	11,651	223	2,929	291
70801	14,188	673	1,557	343
70802	18,078	1,121	2,433	662
70900	16,616	470	2,962	417
71000	18,867	983	1,722	583
71100	14,072	147	785	184
71200	11,265	151	786	180
71300	21,148	305	1,102	268
71401	13,457	35	615	129
71402	8,475	111	730	131
80101	511	6	13	10
80102	11,206	181	334	274
80201	162	0	0	0
80202	6,040	40	97	59
80203	3,729	<4	75	26
80204	991	7	21	22
80301	200	0	<4	<4
80302	9,798	6	195	109
80401	2,761	148	205	267
80402	4,034	269	184	366
80403	1,894	26	56	48
80500	4,048	<4	52	25
80601	254	0	<4	0
80602	4,138	40	125	106
80701	128	0	6	<4
80702	3,727	51	197	146
80703	439	0	10	5
80801	4,070	0	148	70
80802	5,708	<4	142	75
80901	40	0	<4	<4
80902	765	<4	21	17
80903	859	0	30	11
90100	4,134	5	174	46
90201	8,006	73	625	156
90202	5,403	13	198	44
90203	8,379	26	280	72
90300	769	0	40	6
90400	135	0	6	5
100100	0	0	0	0
100200	2,350	7	126	79
100301	2,604	10	123	49
100302	2,129	18	97	40
100401	1,515	4	126	54
100402	1,045	4	40	19
100500	2,364	<4	132	66
100600	2,286	<4	83	19
100700	3,526	8	186	91
100800	3,078	5	245	103
100901	824	0	43	27
100902	1,261	0	74	60
101000	2,049	<4	143	80
101101	2,368	<4	94	23
101102	1,476	0	96	43
101201	2,747	<4	156	109
101202	1,712	<4	85	52
101301	5,242	23	350	104

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6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
101302	3,862	12	253	36
101303	1,666	6	74	11
101401	2,660	64	314	61
101402	1,915	16	101	25
101500	3,259	59	323	89
101600	10,293	230	1,082	154
101701	4,460	212	919	90
101702	7,926	917	1,809	635
101800	4,925	93	289	114
101900	14,560	180	724	357
102001	3,248	135	339	99
102002	4,173	130	386	69
102100	5,030	173	659	165
102200	5,534	409	1,020	228
102300	9,555	1,084	1,932	650
102400	17,327	332	1,564	252
102500	10,497	209	627	220
102600	10,304	82	657	149
102701	7,999	45	477	111
102702	8,853	273	803	226
102801	12,222	91	689	165
102802	4,752	20	215	54
102901	24,548	202	1,376	397
102902	4,755	32	393	114
103001	15,696	237	904	314
103002	2,288	22	103	14
110100	25,088	740	1,406	1,244
110200	7,468	36	305	145
110300	14,272	216	893	261
110400	4,089	65	177	91
110500	7,824	21	345	122
110600	7,495	16	290	90
110701	9,091	19	373	100
110702	18,732	500	1,374	837
110800	1,876	<4	41	14
110901	1,916	26	94	55
110902	8,617	20	305	111
111001	2,607	38	142	72
111002	1,832	18	64	35
111003	9,897	21	266	112
111101	12,631	487	762	786
111102	8,614	584	714	854
111201	3,706	60	179	117
111202	1,203	<4	32	16
111203	3,477	9	96	44
111301	2,488	<4	71	32
111302	9,490	17	304	116
111303	9,646	24	376	118
111401	15,354	416	850	723
111402	3,910	183	204	261
111403	10,890	255	432	354
120100	13,721	313	468	460
120200	12,018	247	359	385
120301	26,526	21	784	304
120302	9,062	14	265	109
120401	6,377	4	190	113
120402	3,847	0	91	48
120500	8,715	117	345	195
120601	5,577	9	140	48

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6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
101302	3,672	12	276	73
101303	1,508	5	137	65
101401	2,792	53	363	113
101402	1,805	12	150	67
101500	3,258	55	414	198
101600	10,564	178	977	215
101701	4,956	158	818	155
101702	8,168	870	1,593	695
101800	5,188	67	364	208
101900	14,176	146	729	445
102001	3,347	111	414	191
102002	4,548	107	335	108
102100	5,428	116	659	256
102200	5,967	322	1,084	353
102300	9,381	1,006	1,519	557
102400	16,371	282	1,153	253
102500	10,102	169	598	291
102600	9,961	78	518	193
102701	7,292	26	341	90
102702	8,816	207	798	299
102801	11,456	99	490	164
102802	4,280	13	143	49
102901	22,821	178	1,097	430
102902	4,723	18	342	130
103001	14,485	192	686	311
103002	2,030	16	92	20
110100	23,718	633	1,073	1,155
110200	6,748	21	280	182
110300	13,859	143	884	297
110400	3,917	47	164	96
110500	7,479	15	342	140
110600	6,984	6	234	76
110701	8,426	24	316	124
110702	17,839	467	1,041	833
110800	1,859	<4	42	31
110901	1,820	24	67	68
110902	8,199	17	244	130
111001	2,564	33	105	64
111002	1,723	16	40	27
111003	9,352	17	261	158
111101	11,959	414	611	746
111102	7,985	504	540	782
111201	3,632	52	156	137
111202	1,140	<4	31	16
111203	3,409	8	89	47
111301	2,477	<4	67	23
111302	8,929	13	314	157
111303	8,546	14	300	148
111401	14,329	320	673	674
111402	3,824	135	213	255
111403	11,606	228	458	396
120100	14,554	284	514	524
120200	11,898	199	351	363
120301	28,249	19	854	469
120302	8,889	31	249	155
120401	6,030	<4	199	113
120402	4,217	<4	136	91
120500	8,153	106	278	244
120601	5,187	<4	124	58

**Table S1-2007.** Farm counts by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
120602	13,592	75	383	153
120701	17,326	54	553	245
120702	12,808	68	294	167
120800	6,605	10	184	71
120901	8,964	16	154	76
120902	7,646	<4	129	74
120903	6,417	9	169	72
120904	2,622	4	71	37
121001	4,478	17	142	69
121002	10,911	92	227	200
121003	8,110	4	231	117
121004	4,000	<4	73	25
121101	9,350	14	180	111
121102	7,636	6	196	120
130100	1,632	0	122	16
130201	1,688	0	99	41
130202	3,649	20	451	379
130301	1,646	11	38	29
130302	578	9	26	27
130401	442	<4	24	18
130402	435	0	8	6
130403	608	0	8	7
130500	1,381	4	36	25
130600	2,406	42	78	94
130700	1,395	6	35	24
130800	1,318	<4	32	23
130900	969	<4	20	17
140100	2,490	<4	118	39
140200	2,218	7	144	43
140300	1,237	<4	111	48
140401	1,042	<4	58	30
140402	98	0	5	0
140500	1,565	<4	66	20
140600	2,569	11	194	71
140700	750	5	115	68
140801	4,326	<4	693	580
140802	2,342	0	548	516
150100	1,199	<4	255	223
150200	5,176	<4	1,611	1,597
150301	521	<4	32	26
150302	222	0	18	17
150400	997	<4	64	48
150501	712	29	79	93
150502	772	<4	36	30
150503	907	14	103	103
150601	916	<4	180	181
150602	608	0	103	100
150701	823	31	100	113
150702	318	4	20	22
150801	76	0	<4	<4
150802	6	0	0	0
150803	274	0	8	8
160101	361	0	42	17
160102	2,640	55	326	93
160201	1,793	8	115	44
160202	2,973	20	206	71
160203	1,883	15	140	44
160300	2,507	85	228	118
160401	402	<4	41	17

**Table S1-2012.** Farm counts by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
120602	14,149	48	391	266
120701	17,888	61	547	351
120702	12,547	50	326	212
120800	6,158	13	174	107
120901	8,838	12	264	204
120902	7,239	<4	117	85
120903	6,143	6	160	86
120904	2,584	<4	77	44
121001	4,338	11	123	71
121002	11,052	106	269	287
121003	8,232	4	246	157
121004	3,904	<4	111	71
121101	9,037	9	255	173
121102	7,517	6	248	168
130100	1,743	4	99	26
130201	2,641	0	115	65
130202	5,324	12	419	300
130301	2,188	7	80	47
130302	569	6	27	30
130401	491	<4	31	21
130402	448	0	9	9
130403	525	0	7	7
130500	1,405	4	59	41
130600	2,533	36	128	125
130700	1,257	7	39	36
130800	1,456	<4	59	52
130900	1,003	<4	36	32
140100	2,995	<4	152	54
140200	2,398	9	157	47
140300	1,124	<4	69	33
140401	1,084	0	54	21
140402	71	0	16	9
140500	1,676	<4	95	37
140600	2,998	10	193	54
140700	795	<4	104	58
140801	5,285	0	390	281
140802	3,833	0	446	430
150100	1,472	<4	222	187
150200	7,176	<4	1,252	1,239
150301	595	<4	50	24
150302	204	0	20	14
150400	1,178	<4	62	47
150501	907	25	101	117
150502	762	<4	63	62
150503	1,168	15	174	182
150601	956	<4	222	221
150602	769	0	111	109
150701	1,159	29	165	186
150702	348	6	20	20
150801	70	0	14	13
150802	5	0	0	0
150803	233	0	16	16
160101	363	0	39	16
160102	3,053	67	367	123
160201	2,061	9	119	45
160202	3,363	16	256	93
160203	1,718	10	174	65
160300	2,648	71	247	118
160401	601	<4	58	34

**Table S1-2007.** Farm counts by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
160402	264	0	28	11
160501	350	<4	44	19
160502	388	16	42	28
160503	287	<4	20	12
160600	779	<4	112	60
170101	672	0	21	<4
170102	6,809	7	160	64
170103	3,707	<4	112	32
170200	8,842	52	239	117
170300	4,786	57	138	117
170401	841	0	87	18
170402	9,396	284	764	372
170501	7,763	112	540	236
170502	911	<4	55	20
170601	4,223	6	130	54
170602	841	0	42	<4
170603	1,908	<4	66	6
170701	5,192	18	146	77
170702	958	<4	45	21
170703	3,037	4	133	44
170800	4,641	46	149	96
170900	17,236	89	384	245
171001	2,227	16	109	54
171002	1,656	51	115	109
171003	5,555	8	168	67
171100	10,255	161	360	220
171200	817	0	57	17
180101	4,727	95	155	170
180102	2,205	10	73	29
180200	802	0	29	10
180201	15,349	75	376	296
180300	12,867	595	284	589
180400	14,711	772	438	768
180500	4,126	34	133	137
180600	6,915	17	196	178
180701	3,458	5	189	189
180702	2,130	114	190	298
180703	7,244	24	249	261
180800	400	0	26	16
180901	87	0	<4	0
180902	1,007	19	112	117
181001	225	<4	22	25
181002	1,362	30	62	69
190101	13	0	0	0
190102	12	0	0	0
190103	11	0	0	0
190104	<4	<4	<4	<4
190201	20	0	<4	0
190202	7	0	0	0
190203	111	0	<4	<4
190204	58	0	<4	0
190205	184	0	10	4
190206	7	0	0	0
190207	14	0	<4	<4
190301	13	0	0	0
190302	0	0	0	0
190303	<4	<4	<4	<4
190304	0	0	0	0
190305	<4	<4	<4	<4

**Table S1-2012.** Farm counts by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
160402	337	<4	28	23
160501	430	<4	51	28
160502	644	17	80	58
160503	340	<4	34	20
160600	879	4	161	89
170101	644	0	22	5
170102	6,336	5	191	70
170103	3,659	<4	105	46
170200	8,039	49	215	118
170300	4,574	49	108	107
170401	792	0	69	25
170402	9,151	239	807	335
170501	7,419	94	487	175
170502	855	<4	53	27
170601	4,036	5	150	70
170602	797	<4	52	12
170603	1,773	0	75	25
170701	5,082	16	113	61
170702	882	0	37	5
170703	2,710	<4	107	48
170800	4,380	44	118	94
170900	15,968	76	328	201
171001	2,127	17	84	36
171002	1,421	48	60	70
171003	4,957	9	149	85
171100	10,203	133	352	207
171200	715	<4	46	20
180101	4,859	101	177	204
180102	2,068	12	85	44
180200	749	<4	22	14
180201	15,614	53	354	291
180300	12,089	508	314	545
180400	14,490	581	469	648
180500	4,176	46	144	168
180600	6,805	7	254	219
180701	2,972	0	117	112
180702	1,843	77	202	275
180703	6,207	20	182	200
180800	430	0	37	21
180901	96	0	9	8
180902	847	23	89	104
181001	242	<4	14	15
181002	1,174	21	55	55
190101	16	0	0	0
190102	17	0	0	0
190103	18	0	0	0
190104	1	0	0	0
190201	24	0	<4	0
190202	13	0	0	0
190203	152	0	<4	<4
190204	96	0	<4	<4
190205	150	0	6	<4
190206	8	0	0	0
190207	15	0	0	0
190301	8	0	0	0
190302	2	0	0	0
190303	3	0	0	0
190304	3	0	0	0
190305	2	0	0	0



**Table S1-2007.** Farm counts by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
190401	25	0	<4	0
190402	0	0	0	0
190403	<4	<4	<4	<4
190404	15	0	<4	<4
190405	152	0	12	4
190406	<4	<4	<4	<4
190407	0	0	0	0
190408	<4	<4	<4	<4
190501	4	0	0	0
190502	0	0	0	0
200100	4,620	<4	27	28
200200	875	<4	4	5
200400	57	0	0	0
200500	212	0	7	7
200600	919	7	41	47
200700	727	<4	4	4
200800	14	0	<4	<4

Sum of column	1,939,159	36,774	133,248	60,556
National total	1,939,159	36,873	133,271	60,584
Percent of national total	100.00%	99.73%	99.98%	99.95%

**Table S1-2012.** Farm counts by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Number of Non-AFOs	Number of Large and Medium AFO-CAFOs	Number of Small and Very Small AFOs	Number of AFOs with Farm-Level Excess Manure
	non-AFO	CAFO_LM_count	AFO_SVs_count	f_fexn
190401	17	0	0	0
190402	3	0	0	0
190403	0	0	0	0
190404	8	0	<4	0
190405	170	0	7	<4
190406	5	0	0	0
190407	2	0	0	0
190408	4	0	0	0
190501	5	0	0	0
190502	1	0	0	0
200100	4,261	<4	19	18
200200	887	0	7	6
200400	32	0	0	0
200500	200	0	<4	<4
200600	968	<4	29	31
200700	581	<4	<4	<4
200800	7	0	0	0

Notes: The total number of AFOs is the sum of the number of large and medium AFO-CAFOs and the number of small and very small AFOs. The total number of farms is the sum of AFOs and Non-AFOs.

For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
10100	2,992	3,172	156	2,363	2,560	802
10200	4,894	13,859	290	12,056	4,252	1,803
10300	7,827	25,227	722	21,787	6,857	3,438
10400	4,997	23,432	505	21,847	4,321	1,585
10500	5,005	3,997	406	3,498	3,974	498
10600	11,673	8,411	1,176	6,646	10,240	1,763
10700	15,840	10,450	1,291	8,924	13,910	1,523
10801	15,105	55,811	1,110	48,156	13,678	7,651
10802	20,851	21,661	1,665	18,916	18,681	2,673
10900	18,091	11,595	1,865	9,807	16,013	1,778
11000	20,660	51,331	1,701	44,678	18,529	6,554
11100	2,024	28,965	83	24,558	1,885	3,983
20100	25,835	201,916	1,265	176,841	23,880	25,072
20200	59,026	172,610	3,059	146,804	54,906	25,517
20301	16,531	4,324	766	3,328	15,304	956
20302	2,117	2,297	240	2,132	1,502	DD
20401	32,512	57,568	2,102	49,954	29,265	7,611
20402	42,385	151,792	2,493	136,783	38,702	14,956
20403	7,855	1,556	564	1,458	7,182	DD
20501	80,036	270,232	4,144	229,131	73,513	40,997
20502	27,372	95,615	2,104	81,612	24,311	13,961
20503	107,646	855,638	8,443	771,215	95,154	84,040
20600	41,007	290,509	1,626	282,581	38,244	7,878
20700	328,301	665,560	6,184	559,618	320,464	105,863
20801	109,156	55,055	1,800	41,208	106,864	13,844
20802	181,078	81,947	2,046	63,716	178,184	18,223
30101	218,063	102,885	2,639	82,475	214,663	20,406
30102	42,871	110,660	1,001	105,561	41,607	5,094
30201	29,941	122,447	382	118,981	29,538	3,466
30202	36,190	426,032	960	416,684	35,114	9,346
30203	0	0	0	0	0	0
30300	98,848	1,199,916	1,835	1,157,860	96,742	42,029
30401	159,070	287,899	2,221	252,280	156,291	35,612
30402	68,381	364,925	1,844	353,750	66,254	11,051
30501	213,094	204,202	3,483	178,069	209,041	26,112
30502	45,321	58,040	1,360	51,678	43,886	6,362
30601	190,263	270,227	1,891	230,282	187,853	39,945
30602	46,077	38,545	562	32,853	45,471	5,691
30701	173,301	186,849	2,512	161,207	170,229	25,506
30702	41,948	64,539	1,157	56,136	40,664	8,395
30801	248,297	17,129	2,892	13,940	244,842	3,186
30802	24,277	DD	299	DD	23,957	DD
30901	221,829	77,425	333	64,824	221,333	12,600
30902	159,784	17,515	1,986	15,266	157,167	2,242
31001	181,281	32,201	550	27,092	180,661	5,105
31002	196,327	40,811	1,907	34,447	193,424	6,299
31101	68,787	19,193	489	17,298	68,078	1,895
31102	174,005	185,433	2,104	159,942	171,353	25,487
31200	32,309	29,297	513	27,416	31,746	1,881
31300	261,980	207,476	2,774	183,180	258,803	24,272
31401	49,458	19,927	740	14,426	48,451	DD
31402	111,186	105,251	926	88,538	110,099	16,712
31403	54,142	55,593	505	44,703	53,443	10,889
31501	258,099	305,905	2,710	272,483	254,821	33,372
31502	128,578	28,368	825	20,838	127,661	7,527
31601	281,135	273,123	2,294	233,374	278,323	39,744
31602	53,799	14,267	552	11,571	53,148	2,695
31700	169,378	206,126	1,692	179,385	167,312	26,714
31800	172,972	274,283	1,284	242,941	171,313	31,340
40101	219	0	DD	0	194	0
40102	8,367	3,607	284	2,716	7,909	890
40103	11,208	10,079	321	6,724	10,606	3,315
40201	2,801	1,870	144	1,189	2,535	DD
40202	2,143	2,146	159	1,699	1,924	447
40203	DD	0	DD	0	DD	0
40301	44,475	397,546	3,851	363,009	37,972	34,119
40302	37,709	351,658	4,033	317,279	30,884	34,260
40400	8,739	56,096	966	50,216	7,396	5,735
40500	118,862	639,776	11,932	590,695	103,487	48,866
40601	44,853	133,143	3,360	121,060	38,486	11,888
40602	226	DD	46	DD	164	146

**Table S2-2012.** Animal Units (AU) by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
10100	3,311	DD	206	DD	2,623	DD
10200	3,689	14,140	416	12,478	2,900	1,661
10300	8,718	32,089	977	29,207	7,482	2,882
10400	4,254	DD	457	DD	3,667	948
10500	4,231	3,150	474	2,625	3,663	525
10600	12,563	6,679	1,395	5,769	10,929	874
10700	15,046	9,873	1,607	8,703	13,098	1,170
10801	14,494	50,777	1,171	44,699	12,995	6,077
10802	20,756	17,272	1,827	14,813	18,677	2,456
10900	15,883	10,544	1,845	8,801	13,899	1,735
11000	25,803	44,794	2,089	39,169	23,223	5,622
11100	0	0	0	0	0	0
20100	0	0	0	0	0	0
20200	62,405	168,496	2,921	144,737	58,402	23,746
20301	16,228	3,559	783	2,907	15,054	645
20302	2,821	DD	209	2,022	2,297	DD
20401	31,401	62,069	1,906	55,314	28,789	6,752
20402	44,485	151,418	2,646	137,768	41,374	13,630
20403	6,395	DD	589	32,470	5,746	DD
20501	78,758	238,507	3,614	204,300	74,291	34,155
20502	26,593	101,252	1,471	85,301	24,462	15,906
20503	102,960	866,191	7,482	780,840	93,090	85,210
20600	32,194	79,514	1,463	74,910	30,249	4,602
20700	313,160	589,809	6,405	487,515	305,827	102,287
20801	116,423	200,297	2,075	190,555	113,737	9,735
20802	187,950	82,125	2,094	57,784	184,950	24,340
30101	208,596	94,558	2,536	73,497	205,524	21,055
30102	34,592	74,790	782	70,632	33,750	4,158
30201	31,801	82,924	295	80,510	31,490	2,414
30202	31,234	366,587	774	357,613	30,403	8,971
30203	1,818	42,594	119	41,723	1,694	871
30300	102,936	983,727	1,837	944,626	100,841	39,097
30401	155,915	246,034	2,529	216,301	153,135	29,720
30402	58,317	330,160	1,949	320,149	56,155	10,010
30501	185,392	192,821	3,350	171,693	181,755	21,059
30502	37,555	56,859	1,533	51,944	35,975	4,914
30601	160,453	298,410	2,194	253,414	158,018	44,980
30602	37,859	38,048	529	33,128	37,196	4,920
30701	152,087	170,356	2,013	148,901	149,756	21,431
30702	38,436	66,316	931	58,018	37,441	8,298
30801	250,606	21,328	2,816	16,722	247,507	4,606
30802	24,833	DD	190	DD	24,639	DD
30901	260,440	84,404	440	72,288	259,112	11,984
30902	191,591	29,943	2,458	27,547	188,928	2,362
31001	165,651	30,163	686	26,254	164,933	3,904
31002	190,599	34,344	2,449	30,763	187,715	3,574
31101	54,636	24,488	610	22,780	53,916	1,708
31102	163,661	144,041	2,045	130,681	161,076	13,360
31200	25,978	18,029	422	17,203	25,490	826
31300	238,843	183,524	2,169	163,078	236,397	20,251
31401	43,008	14,874	734	13,198	42,199	1,676
31402	96,818	103,563	789	91,391	95,710	12,171
31403	60,536	52,095	390	41,873	59,844	10,222
31501	249,384	311,437	2,545	278,820	246,475	32,566
31502	145,048	29,261	737	22,558	144,111	6,702
31601	275,591	222,548	1,936	194,743	273,383	27,803
31602	53,875	9,853	481	7,792	53,345	2,059
31700	172,632	185,367	1,537	162,042	170,770	23,325
31800	167,393	252,266	1,658	221,683	165,574	30,583
40101	552	DD	23	DD	528	0
40102	7,431	3,821	154	3,228	7,180	593
40103	11,235	8,651	224	6,795	10,980	1,810
40201	3,105	1,187	95	977	2,905	209
40202	2,588	DD	119	647	2,463	DD
40203	DD	0	DD	0	DD	0
40301	37,500	457,449	2,914	430,329	33,091	26,802
40302	34,991	364,129	3,217	338,585	30,106	25,432
40400	8,265	61,216	916	56,954	7,045	4,263
40500	125,599	725,946	9,443	680,413	113,678	45,514
40601	40,592	129,093	2,882	118,861	35,365	10,099
40602	DD	DD	0	DD	DD	DD

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
40700	20,681	23,106	1,249	18,699	17,743	4,196
40801	10,942	116,268	1,213	111,485	9,215	4,762
40802	45,411	123,333	4,624	113,475	38,526	9,755
40803	670	DD	38	DD	631	DD
40900	21,055	28,941	1,744	26,223	18,561	2,613
41000	59,236	378,637	10,838	362,394	47,300	16,184
41100	22,060	33,258	2,184	28,991	19,302	4,266
41201	16,624	97,646	1,277	84,848	15,018	12,785
41202	DD	DD	DD	DD	DD	DD
41300	26,047	163,739	1,561	146,294	24,220	17,443
41401	7,637	24,912	421	21,917	7,035	2,995
41402	34,027	238,247	2,058	211,349	30,935	26,869
41501	4,842	51,596	291	46,054	4,500	5,542
41502	DD	DD	DD	DD	DD	DD
41503	17,539	110,813	890	93,687	16,314	17,069
41504	0	0	0	0	0	0
41505	0	0	0	0	0	0
50100	78,558	159,755	5,042	131,829	71,569	27,897
50200	117,318	48,586	2,757	39,425	113,799	9,126
50301	95,660	93,084	4,397	77,691	90,054	15,382
50302	102,800	27,958	2,183	21,089	100,411	6,868
50400	163,424	314,905	7,303	261,258	153,304	53,553
50500	288,195	52,206	2,640	34,063	285,134	18,126
50600	58,193	102,462	3,826	91,742	53,892	10,717
50701	5,366	DD	127	DD	5,118	0
50702	16,323	DD	354	456	15,949	DD
50800	56,779	217,069	5,092	203,221	51,194	13,841
50901	67,632	7,372	1,523	4,774	65,868	2,598
50902	111,462	53,801	3,424	44,094	107,576	9,706
51001	267,242	30,000	2,537	20,108	264,412	9,886
51002	325,685	31,591	2,846	22,199	322,387	9,380
51100	568,975	209,565	5,743	168,170	562,815	41,388
51201	125,939	794,620	10,995	758,899	113,542	35,532
51202	134,316	394,659	8,037	370,927	124,534	23,657
51301	450,899	89,213	3,981	67,511	446,050	21,697
51302	338,777	65,470	3,119	55,095	335,037	10,303
51401	293,362	88,698	3,903	64,023	288,001	24,628
51402	108,918	87,509	2,202	74,566	106,201	12,941
60101	406,266	81,946	3,955	62,242	401,377	19,678
60102	265,459	32,037	2,176	25,775	262,795	6,261
60200	143,258	75,386	1,497	63,945	141,461	11,437
60300	421,270	254,322	4,203	207,662	416,399	46,597
60400	273,444	72,146	2,214	60,673	270,595	11,432
70101	97,598	132,019	2,486	107,884	92,910	23,940
70102	82,768	555,091	6,104	512,755	74,242	42,261
70200	131,068	1,270,807	7,257	1,223,603	121,011	47,108
70300	68,861	115,448	2,996	94,958	63,715	20,460
70400	136,151	744,036	7,645	644,528	123,845	99,301
70500	70,958	342,580	3,481	294,623	64,309	47,865
70600	157,761	892,377	6,001	754,821	150,394	137,187
70700	116,067	465,225	6,036	389,029	106,989	76,027
70801	130,292	662,671	6,433	606,014	122,098	56,515
70802	126,611	1,115,399	8,686	1,042,184	116,056	73,072
70900	112,240	733,243	9,080	657,974	100,551	74,647
71000	199,111	1,224,514	6,345	1,168,147	191,169	56,009
71100	271,249	218,292	3,630	168,988	267,137	49,271
71200	50,669	272,927	5,251	255,737	44,682	17,165
71300	143,104	398,046	7,147	357,880	135,010	39,901
71401	260,851	96,437	4,480	64,128	253,840	32,306
71402	46,236	156,337	3,336	143,293	42,631	13,017
80101	5,745	3,235	131	2,847	5,607	388
80102	184,191	95,913	2,364	88,572	181,472	7,314
80201	DD	DD	11	DD	DD	0
80202	53,257	33,400	1,440	29,820	51,677	3,574
80203	48,876	14,862	1,060	12,641	47,774	2,220
80204	12,194	DD	277	DD	11,902	DD
80301	DD	DD	DD	DD	DD	0
80302	145,677	16,060	1,282	14,690	144,246	1,369
80401	99,598	72,679	621	52,529	98,941	20,147
80402	86,501	143,087	1,031	127,145	85,354	15,938
80403	41,798	15,627	268	14,205	41,503	1,421

**Table S2-2012.** Animal Units (AU) by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
40700	18,122	17,426	803	15,181	16,436	2,245
40801	9,559	146,608	798	142,273	8,500	4,335
40802	37,437	119,567	3,527	110,776	33,000	8,714
40803	DD	0	DD	0	571	0
40900	19,509	33,075	1,764	30,497	17,152	2,573
41000	58,946	388,790	8,963	373,067	49,023	15,687
41100	21,537	33,187	1,642	28,075	19,669	5,111
41201	16,493	95,054	979	84,517	15,335	10,515
41202	DD	0	DD	0	DD	0
41300	25,410	163,967	1,227	150,419	24,119	13,532
41401	6,953	33,592	283	30,941	6,494	2,650
41402	33,507	237,449	1,642	212,603	31,448	24,842
41501	4,862	55,796	282	49,892	4,509	5,905
41502	120	DD	DD	DD	DD	DD
41503	16,219	105,955	716	93,063	15,406	12,889
41504	27,782	201,671	1,673	178,215	25,854	23,455
41505	2,024	29,293	93	25,269	1,923	3,686
50100	72,526	143,731	3,571	120,388	67,571	23,314
50200	113,482	38,385	2,002	30,555	111,168	7,816
50301	92,065	79,151	3,244	66,438	88,069	12,688
50302	98,880	22,321	2,044	16,597	96,714	5,708
50400	160,284	324,852	6,165	272,827	152,549	51,951
50500	301,114	49,691	2,753	33,350	298,181	16,333
50600	53,447	110,059	2,967	100,754	50,178	9,299
50701	3,810	DD	59	DD	3,749	0
50702	13,940	DD	313	315	13,611	DD
50800	49,563	206,033	4,215	195,617	45,082	10,413
50901	58,708	10,054	1,288	6,049	57,333	4,004
50902	98,061	45,949	2,839	38,583	94,930	7,366
51001	243,642	23,123	2,054	15,085	241,510	8,037
51002	311,108	31,371	2,670	20,697	308,248	10,674
51100	456,379	183,470	5,303	151,232	450,899	32,231
51201	112,823	821,121	10,143	792,925	101,791	28,151
51202	119,353	351,812	6,992	332,363	111,521	19,439
51301	383,979	68,915	3,360	49,750	379,753	19,133
51302	265,894	52,680	2,839	44,098	262,701	8,576
51401	264,724	70,213	3,353	54,328	260,047	15,869
51402	92,061	88,601	1,717	80,353	90,234	8,247
60101	343,471	61,416	3,149	48,250	339,908	13,166
60102	240,314	24,253	2,088	18,182	238,096	6,071
60200	114,511	68,834	1,239	58,631	113,032	10,201
60300	414,637	212,077	3,368	177,014	410,913	35,043
60400	246,948	61,270	2,107	53,130	244,284	8,096
70101	79,703	153,131	1,488	132,093	76,861	21,036
70102	83,334	533,652	4,583	500,249	77,042	33,285
70200	112,098	1,233,159	5,482	1,190,498	105,002	42,486
70300	56,305	105,223	1,754	88,601	53,625	16,586
70400	125,273	753,704	5,757	672,043	116,752	81,170
70500	62,085	338,683	2,646	297,750	56,815	40,921
70600	159,124	885,699	4,608	754,756	153,951	130,801
70700	107,505	452,281	4,456	384,052	101,649	67,924
70801	131,061	646,031	4,340	594,797	125,719	51,219
70802	131,145	1,147,171	6,458	1,084,937	123,738	62,181
70900	101,865	689,991	6,973	625,764	93,219	63,660
71000	194,725	1,096,990	5,080	1,048,721	189,038	48,256
71100	246,359	218,367	3,283	177,683	242,865	40,675
71200	43,033	256,388	3,921	243,853	38,380	12,517
71300	122,498	377,812	5,094	339,452	117,031	38,271
71401	224,772	73,667	3,276	56,234	219,691	17,433
71402	40,846	144,722	2,465	135,234	38,158	9,486
80101	4,470	DD	116	2,919	4,343	DD
80102	140,077	98,152	2,044	90,900	137,930	7,250
80201	DD	0	DD	0	471	0
80202	51,139	29,440	1,106	26,861	49,909	2,579
80203	39,054	DD	612	6,664	38,416	DD
80204	6,621	DD	108	3,067	6,510	DD
80301	DD	DD	DD	DD	DD	0
80302	131,622	13,021	1,098	12,259	130,480	761
80401	90,087	54,620	633	42,974	89,434	11,645
80402	80,566	93,547	880	79,581	79,647	13,960
80403	39,578	11,317	374	10,137	39,182	1,180

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
80500	77,087	10,547	614	7,919	76,444	DD
80601	1,526	DD	26	DD	1,495	DD
80602	99,698	31,949	699	29,721	98,779	2,227
80701	5,063	2,649	35	2,383	5,025	DD
80702	108,241	50,972	773	44,297	107,169	6,673
80703	16,048	1,131	150	1,131	15,879	0
80801	91,915	7,439	1,025	6,447	90,809	DD
80802	161,293	9,346	1,310	8,033	159,672	DD
80901	DD	DD	0	DD	DD	DD
80902	13,108	2,986	208	2,741	12,879	246
80903	27,491	1,881	201	DD	27,218	DD
90100	151,105	23,599	675	16,600	144,821	6,999
90201	96,455	184,226	1,922	163,974	92,232	20,247
90202	122,878	41,828	885	30,633	119,990	11,103
90203	99,082	52,865	1,190	43,808	95,551	8,562
90300	10,972	1,959	287	1,150	10,342	809
90400	0	0	0	0	0	0
100100	5,168	DD	DD	DD	5,128	0
100200	239,130	32,074	800	20,014	229,052	12,057
100301	185,264	28,280	840	21,478	183,627	6,772
100302	132,478	36,250	359	29,421	131,810	6,826
100401	194,356	15,173	318	8,160	193,597	7,009
100402	163,784	9,441	217	4,934	162,880	4,505
100500	234,391	17,410	614	12,045	232,742	5,358
100600	133,226	11,162	292	6,571	132,467	DD
100700	211,774	63,109	1,186	43,427	209,467	19,657
100800	297,684	31,973	1,049	21,053	292,245	10,918
100901	87,326	4,050	182	DD	86,857	1,445
100902	213,900	7,526	367	2,020	213,013	5,506
101000	265,934	44,768	338	26,889	264,928	17,878
101101	98,903	10,806	397	4,846	97,343	5,950
101102	185,511	16,359	338	6,921	181,583	9,438
101201	324,011	DD	767	DD	317,538	18,477
101202	160,517	17,091	313	10,675	156,155	6,417
101301	445,493	95,422	964	54,468	437,716	40,229
101302	308,283	50,953	784	26,958	303,123	23,843
101303	280,162	45,008	327	23,844	268,215	21,163
101401	292,449	160,443	804	96,263	279,035	63,847
101402	294,253	63,936	316	36,854	288,935	27,081
101500	505,616	218,689	564	161,142	494,327	57,546
101600	622,612	505,991	2,070	358,175	612,955	147,519
101701	162,237	342,139	1,715	262,083	159,763	79,937
101702	170,823	975,330	3,544	881,966	166,187	93,322
101800	506,200	356,323	1,091	298,175	498,106	57,309
101900	350,110	930,624	6,032	867,148	325,459	63,276
102001	187,591	461,674	1,160	425,173	185,937	33,241
102002	50,792	219,195	1,297	203,882	49,287	15,313
102100	611,176	623,580	1,535	502,551	606,663	120,983
102200	205,539	841,580	1,903	756,396	203,463	85,175
102300	100,922	1,077,439	3,864	1,025,747	96,651	51,682
102400	329,229	468,364	4,952	400,332	323,565	68,024
102500	550,556	950,902	1,750	851,888	547,325	98,993
102600	468,371	522,962	2,120	448,442	464,797	74,506
102701	221,108	99,348	2,639	71,917	216,743	27,425
102702	221,565	500,853	2,508	446,276	218,118	54,528
102801	373,482	335,848	2,501	291,549	370,451	44,267
102802	147,411	42,149	1,034	28,287	145,320	13,860
102901	879,376	312,331	6,683	228,613	870,563	83,600
102902	175,522	63,566	1,428	44,454	173,538	19,034
103001	410,837	249,871	4,250	190,103	405,757	59,736
103002	38,698	25,032	756	17,617	37,673	7,415
110100	865,457	460,456	5,620	367,810	858,083	92,612
110200	299,547	218,123	2,799	192,907	293,916	23,966
110300	470,184	1,527,510	3,356	1,445,936	463,641	79,668
110400	147,497	818,658	457	795,115	146,619	23,389
110500	373,280	189,498	1,598	170,892	371,214	18,601
110600	387,755	53,304	1,402	37,229	373,745	16,066
110701	431,102	68,894	2,697	37,788	427,128	31,078
110702	783,237	430,865	5,355	336,279	776,049	94,537
110800	127,150	4,220	375	2,086	123,239	DD
110901	181,048	383,508	296	357,548	180,665	25,958

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6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
80500	52,845	DD	502	3,352	52,141	DD
80601	DD	DD	DD	DD	2,690	0
80602	94,797	35,692	848	33,722	93,885	1,970
80701	2,842	DD	36	DD	2,806	DD
80702	105,915	35,045	1,006	30,797	104,628	4,248
80703	15,604	DD	97	223	15,505	DD
80801	81,799	DD	1,146	4,284	80,614	DD
80802	148,132	DD	1,527	6,013	146,388	DD
80901	DD	DD	DD	DD	DD	0
80902	13,320	DD	229	1,615	13,088	DD
80903	26,482	DD	213	1,045	26,216	DD
90100	135,056	24,292	670	15,145	132,561	9,146
90201	94,231	169,618	1,467	155,653	91,429	13,964
90202	121,525	53,129	560	39,448	115,694	13,568
90203	76,206	53,278	912	41,649	73,883	11,629
90300	9,385	DD	143	1,789	9,025	DD
90400	DD	320	DD	320	5,184	0
100100	0	0	0	0	0	0
100200	250,314	25,147	689	17,451	241,440	7,679
100301	156,380	30,652	1,235	21,232	154,751	9,420
100302	111,789	42,001	663	34,884	107,418	7,117
100401	196,126	DD	328	21,691	195,759	DD
100402	155,717	10,954	292	5,863	155,308	5,091
100500	202,326	23,477	473	15,788	201,076	7,689
100600	107,691	10,898	268	8,887	105,783	2,011
100700	214,154	67,576	1,536	40,194	212,047	27,382
100800	225,776	37,046	1,118	24,216	221,874	12,827
100901	90,898	DD	270	2,380	89,965	DD
100902	201,996	9,496	323	5,802	200,568	3,694
101000	279,227	29,426	515	19,484	278,374	9,942
101101	88,051	9,786	300	7,402	86,640	2,377
101102	206,020	13,815	197	6,596	204,503	7,216
101201	315,867	DD	820	DD	310,007	16,670
101202	165,123	17,991	487	8,110	161,557	9,880
101301	439,516	106,254	1,007	60,919	433,389	45,335
101302	301,991	49,067	990	24,734	300,465	24,183
101303	281,371	45,367	433	23,779	271,516	21,095
101401	300,495	148,821	713	88,806	288,048	59,686
101402	285,071	71,546	392	41,779	280,349	29,767
101500	464,338	245,065	906	183,771	448,385	61,292
101600	594,664	439,030	2,207	322,725	587,086	116,210
101701	165,079	301,825	1,710	244,745	162,835	56,933
101702	186,251	1,033,131	3,187	958,091	182,082	74,983
101800	464,394	365,630	1,634	303,309	457,673	62,310
101900	340,232	819,022	6,093	761,698	321,516	57,161
102001	154,162	501,707	1,081	463,973	152,716	34,040
102002	52,579	173,397	1,872	161,194	50,669	12,203
102100	572,146	603,765	1,784	513,134	566,662	90,624
102200	205,100	784,420	2,123	721,443	202,689	62,969
102300	109,492	982,422	3,326	933,707	105,761	48,358
102400	296,058	408,249	3,749	355,419	291,260	52,823
102500	519,014	994,361	2,241	905,587	515,567	88,768
102600	408,917	485,968	1,606	435,120	405,747	50,780
102701	172,163	77,679	2,135	54,661	168,232	22,943
102702	197,465	433,799	2,364	386,889	192,873	46,908
102801	301,641	340,494	2,529	308,215	298,807	32,278
102802	119,943	DD	833	DD	118,556	10,017
102901	792,401	258,640	6,109	191,478	785,265	67,096
102902	164,835	47,261	1,315	32,692	163,306	14,530
103001	337,889	196,988	3,561	166,293	333,870	30,684
103002	31,198	21,781	468	14,185	30,662	7,956
110100	759,279	402,266	4,760	316,056	753,190	86,157
110200	266,431	203,137	3,002	190,066	261,880	13,069
110300	377,147	1,323,513	3,149	1,251,456	373,278	71,974
110400	129,725	860,126	464	850,029	128,478	10,096
110500	299,823	134,367	1,793	119,893	297,704	14,447
110600	316,942	37,543	1,297	29,569	303,098	7,971
110701	381,805	50,571	2,451	30,770	378,173	19,776
110702	691,778	382,892	4,360	305,267	686,277	77,596
110800	97,887	8,885	549	DD	94,433	DD
110901	148,737	343,416	477	332,289	148,096	11,127

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
110902	300,529	58,877	2,610	43,314	297,027	15,554
111001	170,956	924,481	316	914,572	170,469	9,909
111002	116,577	284,658	208	269,321	116,292	DD
111003	335,784	46,341	2,949	38,233	331,746	8,105
111101	399,980	247,900	3,651	200,885	395,551	46,991
111102	252,415	285,969	1,991	236,745	249,851	49,048
111201	213,282	947,299	518	921,615	212,288	25,681
111202	58,915	DD	108	DD	58,793	846
111203	164,977	125,990	554	121,038	164,224	4,907
111301	136,662	10,059	350	8,336	136,119	1,719
111302	529,516	50,338	1,910	34,679	526,301	15,657
111303	494,088	98,165	2,240	80,603	490,843	17,560
111401	595,237	133,559	3,593	159,923	590,784	55,800
111402	154,213	78,535	782	60,389	153,241	18,143
111403	335,251	181,623	2,892	147,783	331,428	33,735
120100	308,445	165,458	4,332	136,793	302,671	28,658
120200	294,108	133,559	3,641	103,179	288,885	30,354
120301	589,171	84,319	9,571	61,783	576,399	22,516
120302	341,954	38,817	2,256	22,095	338,604	16,692
120401	131,995	15,617	2,096	9,106	128,889	6,510
120402	110,171	7,263	1,318	4,595	108,127	DD
120500	219,856	1,048,311	1,516	1,010,009	218,176	38,264
120601	223,340	43,661	853	27,759	221,995	15,892
120602	364,346	136,440	3,682	113,887	358,097	22,540
120701	705,109	80,477	3,452	54,922	699,903	25,536
120702	437,116	114,102	2,698	92,216	432,547	21,856
120800	165,862	63,185	1,494	54,127	164,093	9,058
120901	378,360	58,153	1,413	50,304	374,466	7,813
120902	253,222	13,138	1,378	8,699	246,634	4,313
120903	225,755	17,749	1,403	8,856	223,154	8,893
120904	104,334	DD	655	DD	103,537	5,763
121001	176,736	20,007	789	15,071	175,504	4,925
121002	347,188	99,029	1,930	77,087	341,523	21,775
121003	198,781	19,611	2,042	16,549	195,292	DD
121004	207,222	18,585	660	12,646	206,083	5,939
121101	359,824	68,744	1,782	53,448	352,880	15,076
121102	235,053	41,162	1,818	37,067	232,265	4,028
130100	73,735	11,308	650	9,960	72,713	1,348
130201	26,850	3,438	878	3,015	24,736	DD
130202	100,587	52,160	4,488	44,749	95,660	7,407
130301	23,471	63,611	798	DD	21,144	DD
130302	33,366	39,151	157	34,583	33,019	4,568
130401	7,089	4,843	453	DD	6,636	DD
130402	44,779	988	144	618	44,360	DD
130403	53,751	290	84	190	53,209	DD
130500	64,814	15,382	558	13,414	63,950	1,967
130600	175,403	155,215	743	145,031	174,520	10,180
130700	139,155	18,623	327	12,198	138,383	6,425
130800	65,816	DD	304	DD	64,721	2,520
130900	25,658	DD	181	DD	25,391	DD
140100	70,134	12,648	1,532	11,165	67,605	1,474
140200	70,088	19,010	1,245	14,395	67,107	4,615
140300	31,551	12,842	866	8,649	30,561	4,193
140401	122,440	9,621	338	2,864	120,179	6,751
140402	7,997	DD	74	230	6,693	DD
140500	110,497	8,453	518	4,925	109,045	3,527
140600	104,631	27,615	1,635	15,869	102,483	11,744
140700	39,138	13,887	744	10,340	38,250	3,547
140801	62,714	27,751	6,383	22,046	55,832	DD
140802	28,894	12,359	7,344	11,655	21,293	690
150100	29,858	16,960	1,940	14,096	27,810	2,860
150200	77,718	76,749	19,709	64,510	57,900	DD
150301	4,969	5,458	431	5,415	4,521	DD
150302	11,647	3,851	190	2,897	11,451	DD
150400	49,835	10,675	789	8,859	49,024	1,807
150501	13,540	87,436	799	85,252	12,620	DD
150502	24,968	DD	573	DD	24,367	DD
150503	33,164	DD	848	DD	32,198	3,701
150601	19,286	16,816	2,222	15,966	16,959	DD
150602	24,922	5,924	1,013	4,847	23,868	1,078
150701	11,129	125,712	1,005	122,148	9,963	3,337

**Table S2-2012.** Animal Units (AU) by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
huc6	nonAFO_all_au	AFO_all_au	nonAFO_conf_a	AFO_conf_a	nonAFO_pastL	AFO_pastL
110902	250,310	63,439	2,445	57,610	247,227	5,824
111001	114,829	955,234	391	944,076	114,367	11,153
111002	87,743	DD	174	250,525	87,445	DD
111003	270,837	65,942	2,698	54,224	267,017	11,710
111101	361,113	193,266	3,482	162,723	357,038	30,535
111102	231,765	246,384	1,535	211,717	230,044	34,667
111201	128,674	811,716	803	792,598	127,442	19,116
111202	43,845	DD	254	DD	43,531	DD
111203	126,775	92,782	455	88,298	126,150	4,483
111301	95,786	DD	377	4,433	95,259	DD
111302	431,552	41,834	2,293	34,609	428,144	7,193
111303	376,365	75,658	1,938	62,456	373,529	13,185
111401	493,829	166,888	3,838	126,681	489,501	40,189
111402	152,483	56,394	961	46,105	151,408	10,288
111403	306,835	142,918	3,245	114,281	302,815	28,635
120100	275,347	153,309	5,070	130,688	269,252	22,607
120200	243,923	121,902	3,590	100,819	239,205	21,084
120301	529,633	73,450	11,095	59,504	516,477	13,791
120302	291,624	38,175	2,400	31,920	288,385	6,164
120401	120,078	DD	2,521	7,524	116,754	DD
120402	105,080	10,784	1,704	6,674	103,028	4,109
120500	159,340	1,146,655	1,880	1,097,935	157,270	48,698
120601	175,867	13,177	1,159	8,081	174,329	5,097
120602	330,285	101,784	4,027	88,780	323,952	12,969
120701	564,503	67,074	4,597	54,847	557,883	12,215
120702	318,922	91,992	3,327	75,242	313,788	16,672
120800	117,005	84,495	2,075	75,661	114,646	8,834
120901	276,851	52,172	1,999	41,011	273,129	11,160
120902	183,667	8,286	1,847	6,126	179,280	2,152
120903	173,601	7,620	1,276	6,651	171,660	969
120904	86,643	DD	627	DD	85,938	DD
121001	138,833	10,689	804	8,768	137,657	1,922
121002	278,221	111,044	2,701	89,755	272,104	21,215
121003	164,841	DD	2,733	DD	158,745	DD
121004	145,296	9,230	1,027	7,289	143,876	1,921
121101	306,553	48,798	2,493	43,725	299,010	4,994
121102	193,536	47,641	2,771	43,089	189,452	4,552
130100	69,834	DD	723	7,020	66,595	DD
130201	28,080	4,205	1,570	3,690	24,895	515
130202	95,479	52,182	4,615	45,998	90,742	6,164
130301	23,421	DD	1,055	DD	19,450	DD
130302	34,465	DD	314	23,765	34,069	DD
130401	6,070	DD	471	DD	5,591	0
130402	36,086	1,196	132	1,196	35,668	0
130403	32,148	DD	87	DD	31,693	0
130500	61,956	DD	721	10,278	61,002	DD
130600	144,311	149,963	1,095	137,690	143,044	12,272
130700	109,456	DD	550	11,750	108,835	DD
130800	61,403	DD	652	DD	59,249	1,892
130900	24,633	DD	389	DD	24,112	DD
140100	78,943	12,834	1,988	10,106	76,221	2,727
140200	67,110	24,032	1,487	19,961	64,776	4,069
140300	36,030	7,861	622	3,645	35,327	4,214
140401	121,334	3,391	399	2,644	120,539	747
140402	DD	DD	DD	DD	8,136	0
140500	108,636	DD	679	5,737	107,480	DD
140600	105,280	24,377	1,662	17,364	103,187	7,009
140700	38,624	DD	424	5,904	38,168	DD
140801	79,955	14,206	3,884	11,328	75,873	2,876
140802	36,365	DD	7,904	11,069	28,080	DD
150100	46,151	11,648	2,058	9,984	44,047	1,662
150200	97,057	75,670	16,169	72,080	80,797	3,570
150301	8,160	DD	423	DD	7,735	DD
150302	14,602	2,088	148	1,179	14,442	DD
150400	56,935	DD	748	6,496	56,149	DD
150501	12,820	DD	1,133	78,448	11,294	DD
150502	24,811	DD	717	DD	24,063	DD
150503	34,676	DD	1,333	DD	33,239	DD
150601	13,728	DD	1,909	16,227	11,803	DD
150602	26,854	DD	1,190	7,448	25,638	DD
150701	15,129	134,512	2,111	133,837	12,971	673

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
150702	1,079	DD	134	DD	942	DD
150801	DD	DD	40	DD	DD	0
150802	393	0	0	0	393	0
150803	8,672	DD	224	455	8,446	DD
160101	44,315	10,401	156	3,999	44,141	6,400
160102	71,056	82,508	1,679	68,176	68,580	14,283
160201	37,995	21,136	1,221	13,963	35,423	7,173
160202	44,272	46,669	2,448	36,498	41,282	10,164
160203	113,771	47,358	1,346	38,488	112,104	8,854
160300	130,491	244,345	1,587	221,510	128,084	22,795
160401	97,842	14,443	263	10,522	97,515	3,919
160402	46,828	DD	219	DD	46,535	DD
160501	6,559	5,217	355	3,673	6,150	1,544
160502	19,339	25,967	378	21,635	18,867	DD
160503	20,161	9,012	285	DD	19,802	DD
160600	70,421	21,370	837	17,695	69,532	DD
170101	7,763	957	227	809	7,459	DD
170102	193,192	23,169	2,570	13,177	187,198	9,984
170103	32,598	7,479	1,442	5,724	29,862	1,749
170200	146,818	212,919	2,344	190,303	143,822	22,569
170300	67,042	162,996	1,616	152,936	65,182	9,976
170401	28,683	8,145	341	4,837	28,275	3,308
170402	321,795	933,235	4,075	828,417	314,981	104,436
170501	313,789	441,156	4,428	388,292	308,426	52,843
170502	75,969	10,949	373	4,526	75,511	6,422
170601	100,941	24,217	1,114	15,053	99,198	9,164
170602	61,188	6,175	351	3,247	60,710	2,928
170603	33,772	5,226	432	2,597	32,873	2,625
170701	96,411	175,207	1,738	164,777	93,839	10,366
170702	62,411	8,686	264	4,630	61,821	4,055
170703	89,220	20,226	1,466	10,465	86,975	9,760
170800	34,116	36,207	1,262	31,940	32,206	4,261
170900	110,304	102,484	5,743	92,167	102,166	10,292
171001	23,019	22,121	713	20,536	22,004	1,550
171002	19,408	47,106	558	41,212	18,477	5,893
171003	105,316	21,459	2,357	12,151	102,118	9,295
171100	90,784	162,075	3,750	146,002	85,249	16,049
171200	150,389	12,974	363	7,293	149,839	5,681
180101	70,060	96,928	1,430	81,661	68,349	15,238
180102	113,247	30,915	948	20,024	112,119	10,890
180200	61,197	8,878	401	DD	60,664	6,117
180201	221,633	109,495	5,275	94,260	213,592	15,176
180300	159,606	1,829,890	2,761	1,767,424	156,535	62,457
180400	277,252	1,322,679	4,090	1,248,147	272,438	74,496
180500	69,959	32,164	1,145	24,229	68,442	7,934
180600	149,622	33,245	1,965	24,079	147,099	9,133
180701	14,534	10,042	2,403	9,172	11,982	860
180702	12,691	243,655	2,751	235,875	9,758	7,719
180703	20,756	39,832	2,929	37,886	17,027	1,944
180800	29,280	991	376	906	28,765	DD
180901	7,283	DD	45	DD	7,228	0
180902	18,238	60,683	1,254	59,500	16,719	1,171
181001	2,100	DD	324	DD	1,751	0
181002	7,787	294,034	531	292,283	7,166	1,752
190101	0	0	0	0	0	0
190102	DD	0	DD	0	0	0
190103	DD	0	DD	0	DD	0
190104	0	0	0	0	0	0
190201	DD	DD	DD	DD	DD	DD
190202	DD	0	DD	0	DD	0
190203	711	DD	74	80	597	DD
190204	240	DD	32	DD	127	0
190205	976	792	77	663	689	DD
190206	DD	0	DD	0	DD	0
190207	2,181	DD	DD	DD	DD	DD
190301	DD	0	0	0	DD	0
190302	0	0	0	0	0	0
190303	0	0	0	0	0	0
190304	0	0	0	0	0	0
190305	0	0	0	0	0	0
190401	DD	DD	DD	DD	119	DD

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6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
150702	918	DD	395	DD	523	DD
150801	1,002	DD	109	761	796	DD
150802	488	0	0	0	488	0
150803	10,205	DD	96	DD	10,105	0
160101	47,618	DD	125	2,462	47,479	DD
160102	85,190	84,879	1,574	71,386	83,134	13,486
160201	37,470	14,331	1,428	13,157	34,866	1,173
160202	46,373	44,378	3,230	38,960	42,839	5,333
160203	91,102	45,214	1,070	37,331	89,920	7,879
160300	115,227	DD	1,752	DD	113,163	27,620
160401	97,971	9,012	323	DD	97,628	DD
160402	31,801	DD	358	3,303	31,409	DD
160501	9,395	DD	457	3,487	8,680	DD
160502	25,198	25,686	790	20,381	24,267	5,304
160503	23,681	DD	297	DD	23,280	DD
160600	64,344	20,116	925	18,728	63,358	1,382
170101	7,496	DD	349	855	7,061	DD
170102	163,692	22,650	2,934	14,081	158,696	8,569
170103	28,343	5,389	1,495	4,283	26,245	1,030
170200	108,941	242,112	1,815	224,883	106,681	17,229
170300	53,489	242,476	1,849	235,352	51,464	7,124
170401	35,468	6,100	414	4,781	35,017	1,319
170402	310,427	991,629	4,207	920,288	304,036	69,296
170501	307,531	436,532	3,716	399,022	303,112	37,499
170502	66,733	DD	366	5,370	66,267	DD
170601	85,331	24,621	1,226	16,307	83,667	8,315
170602	58,657	8,893	258	4,334	57,731	4,559
170603	33,135	7,631	440	4,991	32,300	2,639
170701	77,519	167,254	1,403	157,333	75,826	9,853
170702	60,709	10,577	216	3,512	60,460	7,065
170703	86,920	16,993	1,351	9,572	85,142	7,421
170800	28,008	34,653	1,766	30,737	26,004	3,914
170900	92,306	98,854	5,153	90,074	85,872	8,754
171001	17,254	20,933	743	19,272	16,277	1,658
171002	17,905	43,299	569	37,280	17,220	6,019
171003	92,418	16,075	2,077	11,705	89,645	4,370
171100	66,615	151,602	3,528	139,336	62,286	12,255
171200	140,159	DD	339	4,175	139,722	DD
180101	61,080	107,176	1,414	89,580	59,465	17,593
180102	84,856	29,787	957	18,811	83,779	10,974
180200	58,626	DD	344	1,710	58,218	DD
180201	220,261	109,932	5,676	88,714	213,285	21,013
180300	152,332	1,894,423	2,861	1,833,923	149,354	60,455
180400	223,216	1,295,588	4,788	1,245,808	217,919	49,761
180500	69,270	38,727	1,371	31,516	67,708	7,208
180600	144,845	25,467	2,035	19,423	142,262	6,003
180701	9,453	DD	1,640	4,452	7,735	DD
180702	9,506	172,525	1,944	166,779	7,484	5,709
180703	10,298	40,037	2,288	38,416	7,759	1,617
180800	28,755	DD	360	1,473	28,243	DD
180901	6,660	DD	76	DD	6,553	0
180902	16,309	70,326	1,412	68,666	14,834	1,659
181001	DD	DD	211	DD	DD	DD
181002	3,548	DD	600	248,519	2,915	DD
190101	0	0	0	0	0	0
190102	DD	0	DD	0	DD	0
190103	DD	0	14	0	DD	0
190104	0	0	0	0	0	0
190201	DD	DD	8	DD	DD	DD
190202	DD	0	DD	0	0	0
190203	708	DD	74	DD	621	DD
190204	DD	DD	64	DD	DD	DD
190205	1,043	DD	76	492	705	DD
190206	DD	0	DD	0	DD	0
190207	2,182	0	DD	0	DD	0
190301	DD	0	0	0	DD	0
190302	DD	0	DD	0	0	0
190303	0	0	0	0	0	0
190304	DD	0	DD	0	0	0
190305	DD	0	DD	0	0	0
190401	DD	0	DD	0	171	0

**Table S2-2007.** Animal Units (AU) by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
190402	0	0	0	0	0	0
190403	DD	0	DD	0	DD	0
190404	46	DD	DD	DD	DD	DD
190405	602	585	92	292	328	239
190406	DD	0	0	0	DD	0
190407	0	0	0	0	0	0
190408	DD	0	0	0	DD	0
190501	0	0	0	0	0	0
190502	0	0	0	0	0	0
200100	89,754	DD	667	3,140	88,972	DD
200200	16,451	DD	188	DD	16,179	DD
200400	DD	0	DD	0	DD	0
200500	3,207	DD	65	DD	3,141	0
200600	5,018	4,801	230	4,197	4,787	DD
200700	9,612	DD	161	DD	9,328	DD
200800	DD	DD	0	DD	DD	0

**Table S2-2012.** Animal Units (AU) by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	All livestock types		Confined livestock types		Pastured livestock types	
	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs	AU on Non-AFOs	AU on AFOs
190402	DD	0	DD	0	DD	0
190403	0	0	0	0	0	0
190404	DD	DD	DD	DD	DD	DD
190405	771	DD	143	313	410	DD
190406	0	0	0	0	0	0
190407	DD	0	DD	0	0	0
190408	DD	0	0	0	DD	0
190501	0	0	0	0	0	0
190502	0	0	0	0	0	0
200100	77,742	DD	482	DD	77,149	DD
200200	11,291	DD	221	180	11,040	DD
200400	DD	0	DD	0	DD	0
200500	DD	DD	DD	DD	1,877	DD
200600	4,751	DD	228	1,968	4,517	DD
200700	11,330	DD	50	DD	11,157	0
200800	DD	0	DD	0	DD	0

Sum of column National total of national	43,031,995	50,084,152	619,439	45,983,714	42,139,266	4,941,358
	43,067,417	51,938,722	619,685	46,851,262	42,154,317	5,073,062
	99.92%	96.43%	99.96%	98.15%	99.96%	97.40%

Notes: All AU includes specialty livestock in addition to confined and pastured livestock types.

For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

**Table S4-2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
10100	27,498	9,351	5,209	1,451	337,116	112,253	120,919	46,555
10200	43,826	20,940	9,109	3,289	542,948	251,521	179,050	103,547
10300	71,517	39,905	14,463	6,257	884,219	480,206	298,985	197,535
10400	46,428	18,393	8,696	2,881	574,286	221,648	205,905	91,110
10500	39,931	5,571	8,397	913	518,886	70,333	161,793	26,945
10600	100,187	19,402	23,281	3,532	1,257,046	233,141	367,656	87,696
10700	135,634	17,146	31,945	2,851	1,691,458	210,825	490,317	82,163
10801	138,596	88,428	29,410	14,009	1,751,706	1,065,971	556,391	435,321
10802	184,914	30,658	41,738	4,898	2,324,414	373,386	699,610	150,271
10900	156,692	19,674	36,714	3,500	1,947,969	238,169	569,621	90,340
11000	185,637	74,965	41,480	12,193	2,290,112	905,982	708,952	363,661
11100	19,739	46,288	3,825	7,261	251,157	555,537	85,463	229,057
20100	247,316	290,469	50,799	45,860	3,063,688	3,492,587	1,020,675	1,432,461
20200	562,016	294,666	118,188	46,732	6,997,076	3,555,874	2,273,077	1,449,768
20301	146,497	10,127	35,917	1,945	1,830,277	126,551	505,561	44,120
20302	13,461	DD	3,868	DD	164,539	DD	36,740	DD
20401	296,976	87,787	63,548	13,961	3,710,425	1,059,833	1,182,629	431,258
20402	378,278	170,173	89,005	28,226	4,694,828	2,048,830	1,368,717	816,119
20403	65,897	DD	17,864	DD	815,386	DD	198,227	DD
20501	792,292	474,573	147,649	75,030	9,777,805	5,710,255	3,526,308	2,338,687
20502	260,035	157,980	49,260	26,599	3,218,508	1,902,526	1,143,832	750,918
20503	998,433	943,341	197,508	161,815	12,423,712	11,392,996	4,250,223	4,433,481
20600	388,394	89,206	83,531	14,881	4,819,990	1,080,467	1,539,073	426,462
20700	3,579,838	1,226,597	616,750	192,550	43,543,939	14,807,439	16,782,678	6,068,700
20801	1,201,879	161,120	204,848	25,080	14,527,843	1,938,690	5,671,100	800,690
20802	2,024,959	212,073	334,965	32,969	24,497,075	2,554,397	9,728,280	1,054,655
30101	2,458,793	237,535	398,387	37,043	29,686,245	2,853,080	11,946,141	1,179,213
30102	465,039	58,694	79,987	9,315	5,657,244	711,381	2,182,417	288,715
30201	329,819	39,771	56,347	6,441	4,042,625	479,051	1,554,734	193,384
30202	381,102	107,369	70,303	17,127	4,670,196	1,304,430	1,707,993	526,694
30203	0	0	0	0	0	0	0	0
30300	1,078,902	487,954	186,119	76,418	13,157,303	5,875,602	5,054,347	2,417,068
30401	1,763,278	413,758	296,410	64,796	21,401,517	4,974,743	8,391,444	2,049,487
30402	740,386	127,339	127,419	20,257	9,006,148	1,540,366	3,473,360	625,498
30501	2,341,749	303,466	401,925	47,507	28,394,417	3,647,188	11,003,126	1,503,445
30502	480,484	73,571	87,237	11,686	5,852,658	884,086	2,176,753	361,621
30601	2,133,336	464,782	353,591	72,501	25,808,124	5,586,471	10,237,047	2,307,066
30602	519,895	66,381	84,428	10,284	6,295,918	797,751	2,524,545	330,700
30701	1,919,160	296,878	323,887	46,265	23,257,513	3,568,244	9,111,134	1,474,392
30702	461,402	97,473	76,267	15,294	5,604,083	1,171,841	2,217,923	482,317
30801	2,735,152	33,939	476,459	6,719	32,970,712	407,375	12,729,628	144,183
30802	274,646	DD	44,578	DD	3,308,324	DD	1,333,800	DD
30901	2,575,325	147,124	402,159	22,766	30,930,545	1,765,487	12,775,545	733,377
30902	1,796,052	24,657	294,567	4,436	21,610,348	299,633	8,670,177	112,388
31001	2,098,717	59,598	329,333	9,226	25,201,983	715,171	10,383,892	297,022
31002	2,200,233	72,365	365,282	11,572	26,487,577	877,473	10,546,098	354,466
31101	779,073	22,039	127,155	3,451	9,380,175	264,475	3,771,491	109,165
31102	1,956,380	296,664	320,085	46,213	23,630,104	3,566,732	9,458,551	1,473,623
31200	357,955	21,899	60,211	3,415	4,347,821	262,884	1,702,901	108,723
31300	2,947,601	281,370	486,372	44,265	35,558,042	3,387,705	14,180,191	1,390,358
31401	542,423	DD	93,552	DD	6,560,372	DD	2,540,726	DD
31402	1,265,825	194,382	203,556	30,382	15,260,063	2,334,965	6,179,935	963,813
31403	612,484	125,989	99,301	20,017	7,388,833	1,512,093	2,976,540	619,155
31501	2,880,588	386,672	484,188	61,053	34,814,276	4,647,774	13,707,540	1,906,807
31502	1,464,624	87,948	237,009	13,582	17,653,454	1,055,439	7,125,174	438,864
31601	3,170,877	458,122	523,068	73,451	38,234,680	5,504,845	15,256,581	2,240,119
31602	605,774	31,375	99,667	4,898	7,312,162	376,521	2,919,227	155,665
31700	1,905,284	309,543	314,494	48,956	22,985,523	3,715,704	9,163,995	1,525,005
31800	1,952,327	362,485	322,541	57,502	23,498,117	4,358,316	9,384,743	1,782,985
40101	2,139	0	388	0	25,719	0	9,688	0
40102	85,937	10,255	16,057	1,640	1,038,861	123,530	381,477	50,217
40103	117,780	38,572	20,678	6,011	1,429,478	463,970	545,550	191,563
40201	27,422	DD	5,139	DD	334,100	DD	121,507	DD
40202	20,251	5,209	3,846	812	259,380	62,512	89,026	25,863
40203	DD	0	DD	0	DD	0	DD	0
40301	408,663	397,248	77,535	61,869	4,981,490	4,773,879	1,794,591	1,973,491
40302	329,708	394,237	63,486	63,282	4,040,187	4,750,206	1,432,279	1,926,650
40400	73,439	66,796	16,759	10,393	905,996	802,606	274,516	331,998
40500	1,058,182	548,005	224,471	93,952	13,096,433	6,634,744	4,245,732	2,576,543
40601	404,486	135,066	80,832	22,460	4,967,942	1,628,058	1,707,081	646,795
40602	1,650	1,707	350	263	21,144	20,483	6,633	8,534
40700	192,520	48,257	36,021	7,770	2,332,063	580,743	853,850	235,422
40801	97,684	54,658	19,010	8,788	1,204,910	661,325	421,035	266,902
40802	400,720	111,759	82,239	18,235	4,918,174	1,342,698	1,654,365	541,077
40803	6,893	DD	1,247	DD	84,669	DD	31,309	DD
40900	482,175	29,714	42,906	4,810	2,235,501	365,084	658,115	144,615
41000	882,158	182,023	101,504	30,781	6,054,958	2,213,838	1,948,912	863,195
41100	190,798	47,396	44,199	8,388	2,341,927	570,799	701,840	218,335
41201	156,090	148,490	31,895	23,293	1,927,032	1,784,247	646,931	734,842

**Table S4-2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
10100	28,459	DD	5,247	DD	349,192	DD	127,604	DD
10200	29,694	19,125	6,246	3,019	369,239	233,138	120,060	94,363
10300	78,138	33,569	15,748	5,224	966,266	403,305	327,581	166,842
10400	37,878	11,054	7,801	1,715	470,984	132,958	155,985	55,035
10500	36,672	5,773	7,782	973	476,520	73,955	147,395	27,483
10600	106,097	9,869	24,930	1,655	1,340,867	119,844	384,781	47,033
10700	125,907	12,580	30,537	2,342	1,575,587	156,133	440,199	56,049
10801	133,218	69,850	27,101	11,068	1,704,520	851,735	554,967	343,947
10802	183,513	27,669	42,166	4,477	2,305,625	346,637	681,624	134,774
10900	133,994	18,062	32,571	3,669	1,660,456	223,247	467,011	75,238
11000	230,961	64,621	52,600	10,395	2,843,920	779,253	865,070	315,439
11100	0	0	0	0	0	0	0	0
20100	0	0	0	0	0	0	0	0
20200	591,852	272,231	127,543	44,240	7,367,292	3,275,814	2,341,262	1,321,117
20301	144,899	7,076	35,160	1,254	1,806,444	87,670	506,217	32,599
20302	20,728	DD	5,895	DD	252,146	DD	57,598	DD
20401	290,955	77,318	62,865	12,534	3,636,030	934,516	1,148,360	375,796
20402	406,534	154,794	95,111	25,679	5,011,091	1,871,125	1,479,734	742,387
20403	53,084	DD	14,009	DD	666,863	DD	166,302	DD
20501	798,651	395,210	149,541	62,616	9,872,211	4,751,955	3,542,774	1,945,279
20502	262,225	179,667	49,787	30,357	3,223,231	2,166,311	1,151,267	852,215
20503	982,521	960,085	192,160	163,221	12,187,009	11,582,401	4,219,464	4,536,975
20600	304,180	52,264	67,665	8,628	3,736,359	634,184	1,166,606	251,402
20700	3,423,682	1,188,202	585,651	185,447	41,685,962	14,326,670	16,122,618	5,896,821
20801	1,273,491	112,003	219,701	17,916	15,394,379	1,353,584	5,963,936	548,487
20802	2,105,008	284,158	346,916	43,935	25,455,678	3,413,407	10,134,712	1,417,122
30101	2,355,908	245,140	381,313	38,127	24,444,863	2,948,975	11,460,517	1,218,757
30102	373,774	48,412	66,061	7,527	4,588,743	582,565	1,723,838	240,738
30201	356,498	27,498	59,214	4,542	4,335,039	331,351	1,708,840	132,212
30202</								



**Table S4-2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
41202	DD	DD	DD	DD	DD	DD	DD	DD
41300	258,422	202,226	49,715	31,874	3,173,426	2,431,007	1,123,458	998,214
41401	75,713	34,558	14,395	5,470	921,043	418,289	331,940	170,231
41402	323,001	308,552	64,962	49,595	4,004,206	3,730,622	1,356,632	1,506,921
41501	48,903	64,381	9,089	10,104	593,819	773,042	217,951	318,513
41502	DD	DD	DD	DD	DD	DD	DD	DD
41503	178,365	197,476	32,320	31,316	2,182,952	2,373,529	809,288	971,505
41504	0	0	0	0	0	0	0	0
41505	0	0	0	0	0	0	0	0
50100	762,185	319,459	147,598	52,063	9,344,628	3,845,298	3,296,818	1,547,795
50200	1,272,136	103,890	218,148	17,108	15,507,420	1,256,521	5,981,747	500,427
50301	982,052	176,299	179,213	28,582	12,016,658	2,126,474	4,434,237	856,784
50302	1,123,698	79,739	193,038	12,503	13,645,813	959,250	5,277,235	394,721
50400	1,674,545	600,539	302,214	102,570	20,606,244	7,293,643	7,619,955	2,830,459
50500	3,258,733	210,495	530,177	32,938	39,443,837	2,534,892	15,807,034	1,043,157
50600	583,131	122,785	107,513	19,699	7,198,204	1,494,140	2,615,114	600,425
50701	56,450	0	10,045	0	687,677	0	259,217	0
50702	176,312	DD	30,790	DD	2,170,499	DD	819,860	DD
50800	549,936	158,605	103,512	25,385	6,778,636	1,932,518	2,430,033	776,655
50901	736,005	30,088	127,153	4,762	8,927,133	361,506	3,444,164	148,177
50902	1,199,491	112,762	208,706	17,625	14,533,130	1,357,643	5,587,632	559,144
51001	3,004,181	114,734	500,153	18,006	36,179,968	1,380,532	14,375,988	567,672
51002	3,613,330	106,356	623,828	17,677	43,556,081	1,288,090	16,912,235	509,543
51100	6,465,741	480,366	1,042,828	75,424	77,903,911	5,776,907	31,513,637	2,376,085
51201	1,245,543	409,765	223,912	65,265	15,231,421	4,943,193	5,681,498	2,011,283
51202	1,377,757	272,583	243,174	43,691	16,787,163	3,278,862	6,360,539	1,333,134
51301	5,117,708	251,561	826,627	39,554	61,764,706	3,028,826	24,924,034	1,243,413
51302	3,810,580	117,759	629,713	19,334	46,053,090	1,415,209	18,316,805	568,092
51401	3,273,922	286,185	543,392	44,686	39,477,656	3,446,989	15,695,757	1,419,899
51402	1,209,362	150,405	199,459	23,469	14,599,422	1,811,686	5,819,683	746,492
60101	4,574,719	226,976	750,178	36,136	55,365,440	2,737,962	22,089,897	1,114,341
60102	3,003,357	72,150	490,318	11,559	36,258,625	868,018	14,538,284	352,968
60200	1,611,731	131,838	266,191	21,507	19,413,877	1,591,726	7,749,088	647,072
60300	4,737,382	538,800	781,897	85,052	57,271,957	6,477,586	22,788,608	2,648,774
60400	3,078,680	132,612	508,509	20,879	37,195,073	1,593,445	14,802,858	654,970
70101	1,047,157	277,790	177,512	43,554	12,653,615	3,345,958	4,957,424	1,375,194
70102	806,376	490,416	149,091	76,985	9,845,908	5,900,893	3,607,741	2,426,123
70200	1,361,623	544,136	227,624	85,617	16,694,131	6,601,105	6,503,745	2,689,192
70300	697,099	237,573	126,680	37,262	8,497,661	2,856,718	3,156,248	1,175,817
70400	1,362,877	1,149,383	243,119	181,503	16,655,932	13,845,135	6,248,696	5,667,985
70500	708,558	553,529	126,886	87,842	8,608,342	6,655,994	3,239,692	2,722,125
70600	1,175,560	1,592,160	280,668	249,092	20,776,515	19,200,896	8,272,869	7,891,466
70700	1,712,590	876,656	211,215	140,202	14,330,381	10,545,859	5,363,881	4,292,812
70801	1,383,043	652,767	228,820	102,826	16,848,500	7,913,110	6,645,246	3,223,990
70802	1,306,497	837,937	219,186	134,318	15,957,693	10,182,696	6,226,402	4,099,296
70900	1,084,613	866,832	203,087	135,572	13,305,304	10,443,231	4,809,928	4,296,998
71000	2,180,989	650,383	355,699	101,752	26,450,064	7,834,201	10,565,189	3,223,466
71100	3,072,263	568,361	492,625	90,181	37,093,715	6,871,780	15,024,176	2,795,790
71200	461,438	196,366	96,673	32,165	5,646,616	2,359,527	1,871,207	948,569
71300	1,529,201	463,644	255,248	72,553	18,503,844	5,575,922	7,307,621	2,297,548
71401	2,908,388	375,749	472,569	58,619	35,046,889	4,520,059	14,115,937	1,865,073
71402	473,698	150,540	82,937	23,886	5,754,347	1,810,326	2,198,067	740,380
80101	61,995	4,539	11,026	701	751,723	54,470	284,735	22,650
80102	2,056,652	84,604	343,825	13,423	24,824,308	1,017,080	9,818,192	416,114
80201	DD	DD	DD	DD	DD	DD	DD	DD
80202	585,403	41,613	97,921	6,459	7,069,732	501,397	2,793,753	207,129
80203	542,073	25,572	90,375	4,111	6,539,965	307,102	2,591,957	124,860
80204	135,715	DD	22,362	DD	1,634,936	DD	653,409	DD
80301	DD	DD	DD	DD	DD	DD	DD	DD
80302	1,651,103	15,897	269,584	2,496	19,864,116	190,979	7,991,030	78,625
80401	1,139,189	234,345	183,017	36,667	13,700,699	2,812,433	5,564,233	1,161,280
80402	968,941	184,000	161,561	29,383	11,677,080	2,210,318	4,632,578	901,723
80403	476,062	16,454	77,221	2,611	5,730,073	197,450	2,312,745	80,913
80500	885,089	DD	140,110	DD	10,635,022	DD	4,358,483	DD
80601	16,465	DD	2,961	DD	199,379	DD	75,066	DD
80602	1,130,671	25,891	184,838	4,057	13,589,896	310,810	5,468,196	128,210
80701	57,652	DD	9,359	DD	693,057	DD	279,943	DD
80702	1,224,470	77,385	200,849	12,154	14,737,254	932,238	5,910,550	382,738
80703	183,675	0	29,146	0	2,207,527	0	903,289	0
80801	1,035,617	DD	170,723	DD	12,466,447	DD	4,984,485	DD
80802	1,823,458	DD	299,506	DD	21,946,799	DD	8,794,991	DD
80901	DD	DD	DD	DD	DD	DD	DD	DD
80902	141,323	2,874	25,848	442	1,701,904	34,493	636,835	14,372
80903	313,331	DD	50,377	DD	3,767,596	DD	1,529,688	DD
90100	1,672,777	81,182	265,971	12,781	20,136,465	975,599	8,217,892	400,969
90201	1,054,831	234,912	171,483	36,812	12,756,120	2,831,427	5,118,724	1,163,287
90202	1,384,060	129,217	220,521	20,157	16,684,492	1,552,459	6,792,043	641,383
90203	1,094,185	99,746	177,810	15,529	13,199,554	1,197,572	5,310,477	495,615
90300	114,951	9,371	20,234	1,482	1,389,461	112,457	531,478	46,167

**Table S4-2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
41202	DD	0	DD	0	DD	0	DD	0
41300	254,979	157,174	49,740	24,612	3,158,113	1,890,885	1,097,134	778,578
41401	69,487	29,472	13,355	4,912	848,497	371,438	302,240	141,160
41402	324,206	285,202	65,713	46,093	4,108,843	3,435,916	1,354,191	1,388,451
41501	48,392	68,351	9,274	10,826	588,459	821,293	210,912	336,480
41502	DD	DD	DD	DD	DD	DD	DD	DD
41503	166,911	147,845	30,750	24,033	2,055,834	1,776,614	748,873	717,318
41504	268,228	272,855	54,520	42,494	3,341,875	3,284,928	1,117,011	1,355,613
41505	20,160	42,746	3,856	6,668	258,993	517,352	88,177	212,231
50100	721,915	267,483	138,391	43,471	8,866,251	3,213,245	3,146,822	1,297,960
50200	1,246,981	89,166	212,156	14,682	15,182,240	1,073,434	5,891,808	429,456
50301	963,054	146,084	174,965	23,368	11,756,115	1,762,671	4,361,389	715,340
50302	1,090,543	66,334	183,692	10,396	13,230,852	796,681	5,183,530	328,423
50400	1,671,762	575,981	299,861	101,647	20,527,464	6,985,619	7,638,237	2,658,881
50500	3,421,607	188,420	551,182	29,624	41,367,222	2,293,181	16,690,018	931,691
50600	542,683	106,553	100,680	17,187	6,670,624	1,290,896	2,422,722	519,400
50701	42,007	0	7,211	0	508,994	0	197,350	0
50702	150,787	DD	26,395	DD	1,844,101	DD	699,938	DD
50800	485,936	119,416	90,986	19,368	5,970,846	1,438,066	2,155,141	580,174
50901	642,514	46,255	361,506	7,315	7,804,331	558,999	3,025,245	227,930
50902	1,055,788	85,495	184,875	13,412	12,797,661	1,028,672	4,898,316	423,094
51001	2,756,290	93,532	453,137	14,599	33,196,700	1,123,382	13,287,500	464,099
51002	3,480,937	119,490	589,469	19,913	41,917,509	1,484,727	16,487,907	572,068
51100	5,179,399	374,745	834,805	58,582	62,452,933	4,504,395	25,254,169	1,858,005
51201	1,111,052	321,859	202,273	52,494	13,594,970	3,885,192	5,024,892	1,558,882
51202	1,221,183	223,155	221,260	36,155	14,895,261	2,683,862	5,540,461	1,084,793
51301	4,368,398	222,012	700,934	34,836	52,690,594	2,672,520	21,353,781	1,098,586
51302	2,997,952	98,383	491,183	15,914	36,207,396	1,186,424	14,482,544	479,183
51401	2,964,558	183,604	487,931</					

**Table S4-2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
90400	0	0	0	0	0	0	0	0
100100	56,353	0	10,278	0	678,049	0	254,399	0
100200	2,633,663	140,174	422,096	21,868	31,824,986	1,687,622	12,883,094	695,783
100301	2,112,481	78,646	337,744	12,238	25,544,828	950,707	10,347,864	390,959
100302	1,517,359	77,033	243,038	12,648	18,297,525	951,611	7,424,493	371,955
100401	2,236,019	80,467	351,954	12,750	27,123,211	983,844	11,048,494	396,269
100402	1,871,630	50,773	296,726	8,201	22,831,034	636,620	9,213,424	247,576
100500	2,697,545	59,947	424,364	9,730	32,491,639	760,563	13,329,946	291,640
100600	1,528,164	DD	241,718	DD	18,516,720	DD	7,530,490	DD
100700	2,385,998	228,883	392,137	35,557	28,864,008	2,755,296	11,506,211	1,138,669
100800	3,306,080	123,617	548,579	19,920	40,296,670	1,537,556	15,858,134	603,431
100901	996,762	16,847	160,705	2,617	12,040,931	202,268	4,859,548	83,803
100902	2,419,075	63,711	391,883	10,087	29,778,633	766,381	11,769,386	313,710
101000	3,070,233	208,627	482,966	32,271	36,991,613	2,507,396	15,172,201	1,040,206
101101	1,125,553	69,413	178,770	10,763	13,529,584	833,412	5,532,552	345,644
101102	2,083,228	109,625	330,775	17,046	25,469,577	1,325,634	10,247,252	545,179
101201	3,636,713	209,962	585,058	33,625	44,194,110	2,603,220	17,755,424	1,028,367
101202	1,768,129	74,398	288,467	11,662	21,787,983	897,817	8,567,996	368,386
101301	5,072,630	477,757	799,385	73,946	61,036,977	5,736,242	25,042,047	2,381,250
101302	3,512,825	278,241	552,250	43,087	42,344,324	3,341,510	17,365,378	1,386,455
101303	3,074,280	245,371	489,500	38,247	37,583,056	2,973,406	15,098,864	1,218,762
101401	3,232,467	744,824	507,964	115,260	39,008,002	8,955,679	15,983,624	3,712,905
101402	3,349,520	314,661	528,746	49,295	40,224,165	3,781,588	16,519,159	1,558,303
101500	5,751,110	669,218	897,090	104,148	69,145,732	8,066,938	28,547,729	3,326,271
101600	7,095,208	1,719,596	1,113,899	266,159	85,825,554	20,706,843	35,104,701	8,571,567
101701	1,844,475	929,399	291,484	144,285	22,327,885	11,228,710	9,093,464	4,625,842
101702	1,898,287	1,083,771	306,864	168,689	23,115,923	13,100,998	9,243,439	5,386,816
101800	5,733,919	667,108	914,393	103,845	69,375,534	8,023,557	28,127,573	3,315,120
101900	3,663,899	721,966	621,873	114,874	44,341,823	8,916,544	17,333,242	3,548,384
102001	2,153,767	387,239	339,151	60,173	25,956,692	4,655,783	10,637,415	1,926,126
102002	563,272	178,508	91,906	27,712	6,803,373	2,144,678	2,727,538	888,331
102100	7,057,671	1,410,725	1,101,947	218,964	84,804,528	16,941,220	35,014,744	7,020,934
102200	2,360,131	993,913	370,799	153,864	28,405,104	11,940,079	11,670,562	4,953,482
102300	1,101,429	596,827	179,952	93,862	13,371,679	7,246,417	5,330,317	2,950,453
102400	3,732,012	791,990	594,088	123,223	45,024,443	9,524,908	18,323,735	3,936,745
102500	6,362,075	1,152,338	994,084	178,953	76,539,819	13,883,492	31,552,290	5,733,981
102600	5,397,442	869,005	845,542	134,568	64,947,743	10,447,638	26,731,237	4,330,386
102701	2,494,175	320,189	401,054	49,505	30,012,058	3,845,732	12,176,708	1,596,819
102702	2,527,055	632,648	397,999	98,624	30,438,051	7,654,339	12,479,718	3,142,026
102801	4,292,892	514,716	676,203	80,422	51,677,438	6,188,401	21,198,212	2,552,696
102802	1,681,269	161,501	266,115	25,089	20,236,532	1,941,248	8,280,124	803,417
102901	10,048,548	970,584	1,601,262	152,077	120,943,042	11,683,118	49,305,087	4,806,445
102902	2,001,961	221,262	319,246	34,592	24,111,171	2,660,620	9,819,308	1,096,984
103001	4,672,704	694,508	749,380	108,621	56,248,464	8,345,914	22,846,323	3,442,483
103002	430,728	86,708	70,418	13,360	5,189,720	1,040,550	2,083,201	433,186
110100	9,880,827	1,074,648	1,583,179	168,774	119,046,416	12,928,128	48,336,502	5,315,024
110200	3,361,269	278,743	548,610	43,454	40,528,850	3,354,965	16,272,530	1,384,138
110300	5,360,682	927,650	848,589	144,369	64,606,190	11,152,065	26,400,537	4,610,345
110400	1,704,630	272,618	266,731	42,405	20,477,481	3,271,443	8,447,123	1,355,184
110500	4,294,860	162,726	678,995	33,698	51,737,921	2,603,706	21,165,725	1,077,660
110600	4,333,055	187,107	681,387	29,115	52,174,286	2,248,689	21,416,157	2,997,972
110701	4,906,492	362,680	792,290	56,202	59,075,081	4,353,136	23,897,299	1,806,516
110702	8,967,541	1,100,727	1,423,685	171,452	107,976,637	13,225,910	44,092,228	5,467,932
110800	1,424,160	DD	226,626	DD	17,115,974	DD	6,992,994	DD
110901	2,093,231	302,671	330,959	47,029	25,137,194	3,632,266	10,314,419	1,505,457
110902	3,416,937	180,929	549,144	28,293	41,160,311	2,172,206	16,687,151	896,862
111001	1,977,582	114,977	311,479	18,104	23,752,345	1,380,714	9,764,954	567,822
111002	1,352,817	DD	211,439	DD	16,244,873	DD	6,707,793	DD
111003	3,808,651	93,881	615,563	14,784	45,882,174	1,131,571	18,541,175	463,677
111101	4,540,546	545,253	733,899	85,588	54,712,656	6,562,328	22,103,562	2,697,516
111102	2,872,397	570,014	463,025	89,363	34,569,417	6,843,867	14,003,627	2,821,698
111201	2,462,542	299,385	387,406	46,466	29,607,392	3,597,241	12,167,782	1,490,061
111202	682,864	9,437	107,174	1,557	8,202,330	118,994	3,378,353	45,469
111203	1,907,450	56,992	299,051	8,895	22,928,602	687,413	9,442,438	282,851
111301	1,580,532	20,072	247,749	3,108	19,013,816	240,864	7,825,103	100,015
111302	6,084,374	181,799	965,739	28,590	73,201,605	2,181,718	29,918,830	898,415
111303	5,679,826	204,688	897,696	31,808	68,413,009	2,457,812	27,995,818	1,018,051
111401	6,803,960	648,429	1,090,499	101,616	81,929,671	7,788,780	33,278,598	3,210,598
111402	1,758,310	210,201	285,337	33,139	21,142,302	2,527,955	8,539,570	1,040,427
111403	3,800,932	392,391	616,450	61,309	45,773,958	4,714,256	18,467,037	1,946,000
120100	3,450,725	332,620	568,582	52,350	41,581,621	3,992,918	16,613,790	1,643,065
120200	3,302,941	353,625	540,484	55,079	39,767,282	4,243,981	15,965,643	1,756,639
120301	6,518,977	258,992	1,094,882	41,771	78,798,777	3,112,226	31,049,732	1,262,222
120302	3,902,699	193,826	624,237	30,481	46,986,576	2,325,991	19,109,769	957,853
120401	1,453,100	73,414	246,864	12,338	17,516,834	892,199	6,869,542	349,452
120402	1,236,527	DD	202,096	DD	14,894,956	DD	5,981,357	DD
120500	2,521,067	446,049	399,261	69,290	30,412,379	5,356,777	12,413,179	2,218,946
120601	2,560,224	185,483	407,058	28,714	30,922,959	2,227,352	12,579,309	924,407
120602	4,073,886	261,812	669,626	41,088	49,412,452	3,144,623	19,646,106	1,295,322

**Table S4-2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
90400	57,034	0	10,256	0	692,881	0	260,053	0
100100	0	0	0	0	0	0	0	0
100200	2,778,907	88,896	444,342	14,056	33,566,005	1,069,591	13,610,970	438,059
100301	1,777,610	108,482	285,477	17,095	21,492,556	1,322,886	8,685,805	535,783
100302	1,231,866	81,120	198,641	12,856	14,901,287	1,006,977	6,005,511	399,636
100401	2,265,087	DD	355,874	DD	27,407,138	DD	11,202,386	DD
100402	1,790,311	56,677	282,255	9,180	21,780,704	727,645	8,839,240	276,157
100500	2,328,876	89,639	366,807	13,925	28,068,814	1,076,136	11,500,896	445,912
100600	1,221,078	23,340	193,244	3,655	14,770,668	281,125	6,015,205	115,628
100700	2,414,832	320,003	395,303	49,389	29,316,754	3,840,487	11,673,418	1,597,324
100800	2,499,920	141,681	418,441	23,370	30,530,783	1,825,118	11,930,252	683,249
100901	1,036,879	DD	165,222	DD	12,520,109	DD	5,088,293	DD
100902	2,292,503	43,065	368,017	6,687	28,023,094	517,203	11,208,256	214,286
101000	3,229,685	115,976	507,888	17,992	38,828,355	1,391,972	15,961,796	577,333
101101	1,000,539	27,528	159,630	4,361	12,018,945	330,337	4,905,753	135,501
101102	2,357,534	83,776	372,038	13,069	28,657,914	1,011,716	11,633,412	415,885
101201	3,487,131	281,495	569,488	30,182	43,213,733	2,333,385	17,408,273	967,707
101202	1,836,962	115,202	297,228	17,856	22,574,006	1,385,111	8,942,794	573,794
101301	5,015,914	529,754	794,312	81,798	60,304,654	6,357,235	24,695,585	2,643,705
101302	3,487,131	281,495	569,488	30,182	43,213,733	2,333,385	17,408,273	967,707
101303	3,123,250	245,543	494,907	38,153	38,027,134</			

**Table S4--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
120701	8,085,578	296,726	1,286,198	46,450	97,266,716	3,567,628	39,711,224	1,470,092
120702	4,921,169	251,052	796,593	39,562	60,378,629	3,078,542	23,950,632	1,240,148
120800	1,863,631	105,540	302,126	16,423	22,925,488	1,267,231	9,063,003	524,536
120901	4,073,904	90,735	685,076	14,168	53,424,373	1,094,315	19,435,692	450,199
120902	2,714,836	46,490	453,624	7,813	34,898,298	621,820	12,992,202	222,035
120903	2,581,445	103,325	408,988	16,188	31,057,543	1,241,833	12,706,574	511,680
120904	1,196,800	66,855	189,827	10,539	14,410,528	802,549	5,887,497	329,970
121001	2,040,472	57,538	319,109	8,881	24,521,206	690,883	10,114,433	287,204
121002	3,911,492	254,035	627,976	39,355	47,604,096	3,051,788	19,119,827	1,265,572
121003	2,233,692	DD	360,802	DD	27,138,939	DD	10,880,634	DD
121004	2,391,328	69,369	375,734	10,726	28,758,061	832,426	11,823,968	345,924
121101	4,028,681	174,944	645,876	27,426	49,418,065	2,107,203	19,713,312	866,110
121102	2,682,773	46,684	426,250	7,345	32,313,350	562,382	13,185,252	230,672
130100	820,834	15,287	135,598	2,544	10,085,175	184,777	3,948,587	73,180
130201	276,933	DD	47,865	DD	3,343,488	DD	1,295,344	DD
130202	1,089,170	85,537	178,962	13,622	13,190,707	1,029,060	5,253,314	419,840
130301	241,488	DD	39,660	DD	2,906,059	DD	1,164,827	DD
130302	382,479	53,384	60,545	8,240	4,591,295	640,612	1,883,429	266,462
130401	73,284	DD	12,572	DD	917,084	DD	344,820	DD
130402	476,980	DD	81,541	DD	6,334,035	DD	2,253,940	DD
130403	508,923	DD	97,373	DD	7,925,228	DD	2,243,531	DD
130500	731,095	22,714	118,003	3,616	8,896,827	273,420	3,562,964	111,504
130600	1,997,599	118,828	319,825	18,397	24,392,527	1,426,517	9,780,587	592,165
130700	1,503,593	74,831	253,547	11,665	19,730,556	898,070	7,161,551	371,555
130800	724,658	28,193	118,792	4,541	9,113,042	359,677	3,504,321	137,778
130900	292,778	DD	46,685	DD	3,529,938	DD	1,436,294	DD
140100	749,544	16,684	130,758	2,820	9,176,570	200,255	3,487,084	79,109
140200	749,183	52,117	127,252	8,396	9,228,179	651,826	3,544,778	254,504
140300	342,532	48,332	57,681	7,760	4,211,354	580,092	1,629,106	236,127
140401	1,336,949	68,425	223,302	12,393	16,809,277	984,780	6,394,731	312,493
140402	77,091	DD	12,389	DD	926,166	DD	376,472	DD
140500	1,198,355	37,113	203,325	6,460	15,282,245	508,923	5,680,632	173,624
140600	1,151,315	134,583	192,911	21,520	14,139,099	1,640,814	5,491,954	659,377
140700	436,210	41,333	71,119	6,435	5,295,975	495,998	2,113,561	205,368
140801	608,159	DD	109,573	DD	7,540,579	DD	2,771,291	DD
140802	236,908	7,778	41,473	1,294	2,869,781	95,214	1,099,298	37,252
150100	313,860	33,192	53,186	5,225	3,782,444	398,589	1,486,051	163,948
150200	637,065	DD	112,955	DD	7,827,720	DD	2,933,182	DD
150301	50,817	DD	8,562	DD	620,580	DD	241,563	DD
150302	130,698	DD	21,547	DD	1,570,453	DD	628,993	DD
150400	563,465	21,006	90,957	3,291	6,777,752	252,071	2,744,809	104,015
150501	135,225	DD	24,639	DD	1,722,323	DD	612,103	DD
150502	277,034	DD	45,950	DD	3,341,347	DD	1,328,696	DD
150503	351,491	42,770	63,567	6,767	4,323,577	516,286	1,597,187	210,697
150601	183,169	DD	34,950	1,616	2,203,258	DD	800,596	DD
150602	264,541	12,187	45,223	2,065	3,293,471	146,240	1,247,201	57,702
150701	107,292	38,433	20,456	6,177	1,300,317	461,719	469,357	187,673
150702	9,180	DD	2,218	DD	111,367	DD	32,189	DD
150801	DD	0	2,095	0	DD	0	DD	0
150802	4,492	0	741	0	53,907	0	21,610	0
150803	95,694	DD	16,052	DD	1,152,565	DD	455,880	DD
160101	506,997	71,988	81,305	11,669	6,137,781	903,925	2,479,395	350,353
160102	764,390	164,625	128,800	26,232	9,507,294	1,987,569	6,365,565	807,880
160201	376,354	77,690	69,129	13,069	4,851,970	1,027,947	1,694,935	370,686
160202	442,405	117,099	82,196	18,798	5,543,592	1,407,388	1,974,380	572,190
160203	1,276,710	102,358	207,207	16,296	15,599,613	1,228,743	6,203,437	502,463
160300	1,433,693	263,832	236,915	41,555	17,933,659	3,184,589	6,899,605	1,302,955
160401	1,126,515	45,530	178,129	7,141	13,612,721	546,926	5,551,749	225,332
160402	534,951	DD	85,368	DD	6,488,289	DD	2,623,409	DD
160501	68,558	17,384	12,019	2,821	825,894	217,683	317,764	84,543
160502	215,722	DD	35,270	DD	2,598,862	DD	1,043,281	DD
160503	215,359	DD	36,629	DD	2,802,563	DD	1,020,104	DD
160600	796,463	DD	127,740	DD	9,697,815	DD	3,895,463	177,552
170101	81,405	DD	14,901	DD	991,720	DD	366,725	DD
170102	2,114,216	115,390	357,389	18,254	25,488,860	1,392,472	10,025,495	568,500
170103	322,525	20,206	60,931	3,226	3,914,642	242,470	1,420,554	99,034
170200	1,627,042	262,455	273,169	41,079	19,649,748	3,150,593	7,747,594	1,300,342
170300	725,160	116,403	125,891	18,400	8,845,840	1,397,537	3,383,664	579,783
170401	314,314	36,678	55,496	6,034	3,788,005	469,552	1,450,172	177,104
170402	3,534,069	1,212,085	590,198	189,116	43,631,834	14,645,630	16,894,483	6,016,748
170501	3,525,939	612,953	575,060	96,059	42,571,696	7,391,172	17,077,742	3,035,279
170502	866,051	74,616	138,458	11,715	10,541,605	895,388	4,243,320	369,070
170601	1,132,291	106,355	185,341	16,720	13,678,800	1,278,010	5,472,879	525,701
170602	698,027	33,995	112,507	5,340	8,399,439	408,500	3,403,272	168,109
170603	371,604	30,367	62,515	4,828	4,488,198	364,401	1,767,362	149,166
170701	1,057,548	118,681	177,202	18,832	12,898,510	1,458,006	5,043,469	584,074
170702	712,838	47,165	113,696	7,383	8,592,693	566,016	3,496,083	233,668
170703	974,088	113,347	167,734	17,771	11,786,473	1,362,862	4,567,292	561,100
170800	344,027	49,572	66,127	7,726	4,216,622	596,392	1,496,472	246,191

**Table S4--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
120701	6,424,719	141,822	1,030,979	22,234	77,299,847	1,706,110	31,401,384	702,097
120702	3,557,988	191,676	578,426	30,321	43,828,250	2,339,335	17,276,071	944,721
120800	1,302,526	103,154	211,759	15,956	15,976,747	1,238,203	6,323,517	514,319
120901	2,997,323	129,849	501,053	20,151	38,765,030	1,566,697	14,343,270	646,399
120902	1,972,437	24,211	330,547	3,887	25,326,776	305,912	9,422,440	118,487
120903	1,980,808	11,136	315,559	1,751	23,861,059	136,547	9,720,967	55,082
120904	994,564	DD	157,506	DD	11,958,342	DD	4,896,556	DD
121001	1,599,879	22,416	250,427	3,467	19,228,442	269,775	7,926,685	111,783
121002	3,106,689	247,357	501,242	38,398	37,923,228	2,970,738	15,145,204	1,230,978
121003	1,812,674	DD	294,470	DD	22,007,234	DD	8,801,070	DD
121004	1,666,434	22,397	263,120	3,481	20,046,365	268,759	8,217,918	111,373
121101	3,417,514	56,993	548,516	9,096	41,785,470	701,942	16,710,362	279,612
121102	2,682,773	52,985	347,475	8,255	26,373,275	636,870	10,751,340	263,183
130100	760,150	DD	123,427	DD	9,239,554	DD	3,691,913	DD
130201	279,743	6,002	47,836	932	3,379,089	72,028	1,317,285	29,862
130202	1,026,913	70,705	171,451	11,493	12,447,041	849,775	4,906,876	343,053
130301	217,968	DD	37,652	DD	2,662,892	DD	1,019,834	DD
130302	393,834	DD	62,600	DD	4,733,724	DD	1,935,033	DD
130401	62,241	0	10,710	0	763,415	0	292,090	0
130402	394,208	0	65,671	0	5,035,515	0	1,889,478	0
130403	307,563	0	58,033	0	4,697,419	0	1,368,517	0
130500	701,608	DD	112,184	DD	8,487,909	DD	3,436,658	DD
130600	1,642,713	143,503	261,731	22,115	19,990,608	1,722,036	8,063,824	716,871
130700	1,198,849	DD	199,511	DD	15,433,431	DD	5,751,262	DD
130800	663,374	22,092	108,851	3,418	8,336,936	265,106	3,206,101	110,138
130900	278,008	DD	44,153	DD	3,362,428	DD	1,366,838	DD
140100	847,689	28,696	145,777	5,175	10,426,705	383,308	3,980,115	131,042
140200	722,125	46,735	122,665	7,492	8,921,949	563,049	3,416,944	228,601
140300	403,898	48,437	65,980	7,630	4,869,508	595,395	1,954,356	239,308
140401	1,343,483	8,649	222,771	1,373	16,915,525	103,788	6,453,399	42,521
140402	9							

**Table S4--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
170900	1,060,594	117,940	206,766	18,931	13,694,209	1,434,029	4,573,104	576,552
171001	243,052	18,121	43,288	2,796	2,949,729	217,470	1,115,278	90,458
171002	205,192	68,558	35,533	10,696	2,517,957	824,175	959,168	340,278
171003	1,125,284	108,335	193,420	16,834	14,126,232	1,301,193	5,288,852	538,849
171100	901,026	186,212	178,100	29,328	11,033,745	2,235,761	3,835,610	919,488
171200	1,738,300	66,210	273,568	10,300	20,889,694	794,518	8,587,360	329,112
180101	756,518	176,991	129,980	27,677	9,409,353	2,131,654	3,555,431	877,437
180102	1,286,278	127,027	207,527	19,717	15,540,149	1,524,385	6,268,616	632,172
180200	696,212	71,482	111,291	11,037	8,463,333	857,789	3,411,266	356,739
180201	2,354,994	173,163	408,887	27,614	29,294,825	2,134,837	10,995,195	849,983
180300	1,688,911	728,068	291,830	112,804	22,090,844	8,760,109	7,923,498	3,627,125
180400	3,076,980	866,651	511,746	135,231	37,570,000	10,418,405	14,739,967	4,301,134
180500	763,299	87,838	130,684	14,580	9,364,529	1,120,907	3,593,445	421,914
180600	1,661,753	99,193	279,615	16,657	20,096,011	1,306,788	7,902,705	473,707
180701	122,132	8,021	26,504	2,154	1,489,017	96,246	479,576	24,428
180702	89,107	89,274	21,985	14,183	1,239,768	1,072,329	306,807	438,739
180703	167,535	21,599	39,464	3,833	2,042,886	259,655	604,958	99,317
180800	331,051	DD	53,184	DD	3,985,335	DD	1,617,050	DD
180901	83,267	0	13,387	0	999,613	0	406,512	0
180902	185,996	13,464	32,741	2,171	2,243,463	162,032	859,855	65,639
181001	18,955	0	3,558	0	230,162	0	DD	0
181002	66,378	16,000	14,389	3,210	1,005,442	264,274	263,485	68,190
190101	0	0	0	0	0	0	0	0
190102	0	0	0	0	0	0	0	0
190103	DD	0	DD	0	DD	0	DD	0
190104	0	0	0	0	0	0	0	0
190201	DD	DD	124	DD	DD	DD	DD	DD
190202	DD	0	DD	0	DD	0	DD	0
190203	5,987	DD	1,358	DD	72,624	DD	22,506	DD
190204	1,151	0	324	0	14,025	0	3,255	0
190205	7,075	DD	1,460	DD	88,994	DD	29,110	DD
190206	DD	0	DD	0	DD	0	DD	0
190207	DD	DD	DD	DD	DD	DD	DD	DD
190301	DD	0	DD	0	DD	0	DD	0
190302	0	0	0	0	0	0	0	0
190303	0	0	0	0	0	0	0	0
190304	0	0	0	0	0	0	0	0
190305	0	0	0	0	0	0	0	0
190401	1,189	DD	273	DD	14,449	DD	4,413	DD
190402	0	0	0	0	0	0	0	0
190403	DD	0	DD	0	DD	0	DD	0
190404	DD	DD	DD	DD	DD	DD	1,151	DD
190405	3,232	DD	756	DD	39,451	DD	11,755	DD
190406	DD	0	DD	0	DD	0	DD	0
190407	0	0	0	0	0	0	0	0
190408	DD	0	DD	0	DD	0	DD	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	1,027,047	DD	162,944	DD	12,400,084	DD	5,052,146	DD
200200	185,194	DD	29,896	DD	2,247,479	DD	902,378	DD
200400	DD	0	DD	0	DD	0	DD	0
200500	35,596	0	5,951	0	429,673	0	169,925	0
200600	53,157	DD	9,284	DD	648,016	DD	247,077	DD
200700	105,923	DD	17,335	DD	1,294,081	DD	512,218	DD
200800	DD	0	DD	0	DD	0	DD	0

**Table S4--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Pastured Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
170900	897,141	100,140	170,375	15,990	11,676,584	1,226,897	3,946,621	491,094
171001	179,433	19,370	31,919	2,995	2,189,528	232,441	824,160	96,598
171002	193,479	70,144	32,553	10,886	2,367,864	843,349	920,537	349,132
171003	997,712	50,894	167,665	7,902	12,474,155	612,601	4,753,782	253,272
171100	660,399	142,491	129,323	22,301	8,097,217	1,711,072	2,832,086	706,003
171200	1,620,579	DD	255,029	DD	19,484,986	DD	8,006,161	DD
180101	657,483	203,976	112,432	31,894	8,226,649	2,466,159	3,099,694	1,011,386
180102	964,007	127,419	154,270	19,845	11,643,752	1,540,326	4,719,507	633,126
180200	666,711	DD	106,238	DD	8,161,196	DD	3,273,197	DD
180201	2,359,279	240,184	404,024	38,103	29,458,514	2,961,555	11,112,145	1,182,339
180300	1,605,122	697,685	276,640	109,229	21,210,153	8,511,030	7,545,353	3,458,006
180400	2,449,144	577,711	408,244	90,841	30,171,535	6,935,847	11,720,279	2,855,172
180500	749,909	82,527	127,598	13,302	9,384,718	1,002,029	3,546,352	402,474
180600	1,613,531	67,450	267,135	11,478	19,590,747	817,993	7,748,765	318,606
180701	81,111	DD	16,462	DD	987,115	DD	337,887	DD
180702	65,492	64,261	16,034	10,535	1,011,258	799,084	228,945	310,624
180703	78,321	17,313	16,997	3,386	977,338	207,901	307,829	74,254
180800	323,508	DD	51,719	DD	3,948,701	DD	1,585,220	DD
180901	75,804	0	12,034	0	910,724	0	372,700	0
180902	168,450	19,384	28,048	2,989	2,030,957	232,887	806,058	96,814
181001	DD	DD	DD	DD	DD	DD	DD	DD
181002	30,006	DD	5,996	DD	386,581	DD	126,877	DD
190101	0	0	0	0	0	0	0	0
190102	DD	0	DD	0	DD	0	DD	0
190103	DD	0	DD	0	DD	0	DD	0
190104	0	0	0	0	0	0	0	0
190201	DD	DD	DD	DD	DD	DD	DD	DD
190202	0	0	0	0	0	0	0	0
190203	6,536	DD	1,318	DD	79,482	DD	27,378	DD
190204	1,547	DD	366	DD	19,202	DD	5,571	DD
190205	7,380	DD	1,454	DD	92,701	DD	31,536	DD
190206	DD	0	DD	0	DD	0	DD	0
190207	DD	0	DD	0	DD	0	DD	0
190301	DD	0	DD	0	DD	0	DD	0
190302	0	0	0	0	0	0	0	0
190303	0	0	0	0	0	0	0	0
190304	0	0	0	0	0	0	0	0
190305	0	0	0	0	0	0	0	0
190401	1,851	0	346	0	22,581	0	8,213	0
190402	DD	0	DD	0	DD	0	DD	0
190403	0	0	0	0	0	0	0	0
190404	DD	DD	DD	DD	DD	DD	DD	DD
190405	4,292	DD	849	DD	53,765	DD	18,286	DD
190406	0	0	0	0	0	0	0	0
190407	0	0	0	0	0	0	0	0
190408	DD	0	DD	0	DD	0	DD	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	889,992	DD	141,274	DD	10,756,018	DD	4,376,842	DD
200200	124,408	DD	20,238	DD	1,552,050	DD	604,111	DD
200400	DD	0	DD	0	DD	0	DD	0
200500	20,771	DD	3,643	DD	254,324	DD	96,298	DD
200600	50,302	DD	8,737	DD	612,049	DD	234,623	DD
200700	127,655	0	20,584	0	1,551,781	0	622,445	0
200800	DD	0	DD	0	DD	0	DD	0

Sum of column	480,212,189	57,148,918	78,603,207	9,023,081	5,821,854,645	689,664,736	2,321,374,046	281,862,140
National total	480,372,790	58,667,953	78,631,357	9,263,886	5,823,934,916	708,049,163	2,322,120,433	289,338,303
Percent of national total	99.97%	97.41%	99.96%	97.40%	99.96%	97.40%	99.97%	97.42%

For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg.

**Table S3--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	10100	1,802	41,760	234	5,118	22,829	480,357	4,915
10200	3,348	240,592	451	31,270	45,735	3,064,828	9,538	542,230
10300	8,614	430,213	1,132	56,262	102,373	5,483,052	19,918	976,715
10400	6,393	305,600	780	58,908	75,625	7,591,560	14,187	2,169,215
10500	4,778	61,138	686	8,795	67,363	877,987	14,608	193,409
10600	13,737	122,423	1,954	16,003	171,813	1,528,798	35,395	275,569
10700	13,848	151,192	2,087	20,564	172,665	1,979,138	36,130	375,656
10800	14,609	959,476	1,970	125,589	178,317	12,365,853	36,286	2,228,653
10802	20,778	360,457	2,880	47,284	265,184	4,583,173	56,815	838,250
10900	19,414	160,290	2,793	21,236	236,546	1,995,346	50,018	376,909
11000	20,284	781,694	2,828	116,346	262,610	12,782,665	54,956	2,894,234
11100	1,008	496,076	137	64,485	12,440	6,360,860	2,401	1,129,054
20100	15,380	3,495,672	2,127	460,358	203,287	45,730,821	41,660	8,372,358
20200	35,752	2,890,652	4,848	376,386	455,802	37,137,911	89,584	6,675,471
20301	8,391	50,603	1,214	6,810	105,891	654,174	21,918	122,875
20302	2,387	30,182	397	6,867	31,548	511,147	7,209	162,849
20401	25,429	848,012	3,305	124,742	320,194	13,144,039	63,370	2,851,385
20402	29,676	2,279,270	3,852	353,694	364,967	35,765,363	70,354	7,969,561
20403	5,242	21,047	804	3,404	65,721	DD	14,111	DD
20501	51,882	4,371,473	6,443	561,505	611,030	55,464,772	114,423	9,919,265
20502	25,027	1,438,382	2,881	194,931	285,846	19,552,762	52,053	3,767,274
20503	107,244	12,248,135	13,129	1,796,045	1,221,176	189,334,066	228,332	40,645,634
20600	18,915	4,574,006	2,421	1,092,180	229,419	93,529,545	44,310	26,050,969
20700	76,541	7,770,661	9,560	1,421,739	866,011	146,158,686	165,588	36,487,924
20801	21,198	661,756	2,735	114,669	247,746	10,382,500	48,967	2,490,959
20802	25,178	954,895	3,145	172,623	283,847	16,132,673	54,954	4,038,250
30101	34,094	1,281,726	4,220	176,381	343,594	17,684,818	66,061	3,633,281
30102	11,409	1,266,182	1,476	208,699	141,797	22,101,024	27,475	5,082,450
30201	4,636	1,185,064	665	173,900	54,325	21,480,420	11,844	5,063,732
30202	9,730	4,171,769	1,464	633,271	129,835	80,612,751	28,175	17,745,740
30203	0	0	0	0	0	0	0	0
30300	20,385	12,137,303	2,883	1,934,759	254,132	232,634,015	54,590	52,685,079
30401	26,616	3,481,427	3,758	774,791	288,180	74,157,273	60,548	20,507,626
30402	20,568	3,763,946	2,848	716,839	236,561	76,671,305	48,087	19,767,874
30501	39,169	2,122,026	5,390	454,947	431,220	46,500,417	86,234	12,808,546
30502	13,497	805,887	1,876	172,429	166,736	15,598,037	33,185	4,195,232
30601	22,920	3,519,396	2,961	845,752	252,804	75,773,965	50,455	21,654,275
30602	6,746	531,289	901	92,593	77,241	8,440,874	14,767	2,031,324
30701	28,606	2,549,001	3,920	563,091	333,081	52,276,349	66,815	14,526,445
30702	13,933	892,580	1,812	185,711	151,973	17,225,189	30,256	4,713,507
30801	33,041	248,556	4,295	32,216	348,030	2,846,161	71,907	524,511
30802	3,654	DD	493	DD	34,780	DD	7,213	DD
30901	4,246	1,179,918	532	165,411	44,826	16,997,284	9,065	3,739,882
30902	22,237	269,546	3,192	35,102	249,878	3,030,129	52,332	571,929
31001	7,447	536,047	924	68,424	79,695	6,226,057	15,769	1,139,516
31002	24,877	583,359	3,259	89,076	257,828	9,726,625	52,116	2,341,405
31101	5,115	317,923	695	52,457	60,866	4,698,144	12,188	1,070,861
31102	24,946	2,706,701	3,348	490,207	275,502	46,698,663	55,228	11,777,514
31200	5,607	470,906	752	94,384	63,075	8,114,050	12,514	2,100,058
31300	31,164	2,947,741	4,270	625,121	345,161	55,348,960	68,931	14,886,502
31401	8,810	217,807	1,219	44,262	98,350	4,147,352	20,224	1,154,304
31402	11,235	1,417,674	1,490	334,659	113,177	28,480,556	23,978	8,091,664
31403	5,594	702,353	821	171,813	62,176	14,776,925	13,188	4,262,495
31501	33,344	4,223,976	4,557	1,053,912	352,895	91,024,283	73,928	26,263,851
31502	9,922	326,619	1,372	66,619	99,395	5,576,249	17,483	1,488,274
31601	27,963	3,442,593	3,903	732,467	281,019	66,156,194	60,106	17,864,152
31602	6,955	188,027	935	32,960	67,429	2,941,991	14,844	765,632
31700	18,770	2,846,775	2,719	699,026	214,315	59,831,604	46,452	17,191,497
31800	14,898	3,912,361	2,082	916,594	148,907	79,245,529	31,841	22,142,513
40101	248	0	DD	0	2,416	0	545	0
40102	3,436	52,656	395	6,782	42,168	658,188	7,273	118,777
40103	3,747	132,735	491	17,028	40,467	1,654,703	8,100	294,520
40201	1,642	21,618	200	2,748	19,086	266,194	3,696	47,153
40202	2,089	33,554	244	4,332	23,180	414,887	4,474	74,208
40203	DD	0	DD	0	DD	0	DD	0
40301	47,046	7,014,985	5,509	901,279	485,143	85,420,568	88,213	15,024,674
40302	49,174	6,099,329	5,761	780,606	520,747	74,794,926	93,763	13,124,375
40400	11,829	960,594	1,398	122,982	123,174	11,827,660	22,467	2,072,776
40500	144,994	9,173,088	17,247	1,238,977	1,568,784	133,114,319	281,680	26,305,695
40601	40,442	1,958,867	4,889	255,433	459,309	26,670,883	87,254	4,880,075
40602	DD	DD	72	DD	4,514	DD	929	DD
40700	15,010	358,999	1,770	45,939	168,331	4,409,656	30,242	776,861
40801	15,115	1,861,070	1,734	224,724	153,580	22,647,272	26,720	3,872,483
40802	55,142	2,011,746	6,547	251,232	597,119	24,478,177	107,393	4,265,856
40803	427	DD	55	DD	4,487	DD	777	DD
40900	20,330	447,897	2,602	55,317	235,317	5,279,309	44,010	897,296
41000	134,826	5,249,678	16,185	681,322	1,452,522	76,381,461	254,990	15,020,534
41100	25,190	529,567	3,228	67,137	296,066	6,523,134	54,355	1,138,768

**Table S3--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	huc6	AFO_conf_wet_weight	FO_conf_wet_weight	AFO_conf_dry_weight	FO_conf_dry_weight	AFO_conf_nitrogen	AFO_conf_phosphorus	nonAFO_conf_nitrogen
10100	3,073	DD	417	DD	41,319	DD	8,250	DD
10200	5,374	245,453	783	32,093	71,613	3,078,159	15,427	541,277
10300	11,567	540,785	1,577	76,744	143,424	8,045,735	30,265	1,692,440
10400	6,976	DD	928	DD	85,561	DD	17,467	DD
10500	5,827	51,000	876	6,840	89,355	677,618	20,831	130,102
10600	17,880	107,975	2,537	14,037	239,711	1,337,557	49,178	238,046
10700	18,652	151,347	2,758	20,369	248,002	1,905,823	54,320	344,779
10801	17,068	879,811	2,369	115,538	227,441	11,262,349	48,251	2,035,248
10802	21,776	276,290	3,162	36,588	295,604	3,567,503	64,130	658,230
10900	19,621	138,163	3,026	18,532	283,338	1,762,393	62,030	334,350
11000	24,858	684,008	3,569	100,755	322,517	10,899,741	68,434	2,428,674
11100	0	0	0	0	0	0	0	0
20100	0	0	0	0	0	0	0	0
20200	32,723	2,809,164	4,702	366,977	436,708	35,787,339	93,738	6,452,990
20301	8,371	40,530	1,298	5,458	116,300	447,197	26,261	84,352
20302	2,001	30,083	330	7,128	27,544	559,730	6,632	176,976
20401	22,141	791,341	3,060	127,329	275,932	14,108,376	58,457	3,314,430
20402	31,510	2,275,764	4,413	355,380	377,283	35,824,588	79,279	8,116,188
20403	5,718	510,884	916	130,470	75,216	11,169,237	16,620	3,207,471
20501	46,615	3,903,707	6,214	505,516	562,314	49,602,828	117,321	8,928,416
20502	19,376	1,482,215	2,498	200,986	210,708	19,948,188	42,984	3,937,097
20503	98,462	12,596,830	13,165	1,859,813	1,157,835	195,007,713	237,725	42,358,716
20600	17,531	1,256,150	2,431	255,743	197,855	22,252,257	41,614	5,737,270
20700	80,017	7,108,952	10,538	1,287,635	925,475	127,897,704	190,066	31,463,125
20801	23,987	3,055,450	3,281	737,187	297,851	62,799,058	63,971	17,623,466
20802	25,467	843,346	3,495	153,567	319,564	14,701,952	67,497	3,684,233
30101	31,112	1,109,410	4,083	155,568	365,658	15,997,196	74,042	3,336,193
30102	9,137	911,500	1,324	175,328	116,741	16,902,233	24,569	4,284,714
30201	3,602	842,462	526					

**Table S3--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	41201	14,531	1,638,525	1,836	216,934	167,735	21,465,403	30,899
41202	DD	DD	DD	DD	DD	DD	DD	DD
41300	18,342	2,842,155	2,196	370,224	210,539	35,590,340	37,464	6,392,731
41401	5,185	422,230	662	55,357	63,814	5,410,544	12,441	979,053
41402	24,356	4,002,780	3,115	518,551	292,667	50,398,175	56,280	9,065,127
41501	3,399	919,048	428	119,629	39,242	11,570,689	7,395	2,042,569
41502	DD	DD	DD	DD	DD	DD	DD	DD
41503	11,785	1,881,638	1,468	244,342	144,981	23,900,040	27,094	4,244,266
41504	0	0	0	0	0	0	0	0
41505	0	0	0	0	0	0	0	0
50100	61,184	2,537,892	7,049	327,626	719,006	32,463,673	129,375	5,890,269
50200	34,242	759,384	4,010	96,970	396,086	9,437,704	74,063	1,679,828
50301	53,829	1,463,214	6,021	187,718	613,952	18,518,573	106,976	3,319,130
50302	27,109	364,240	3,213	45,009	304,733	4,603,154	56,685	800,477
50400	87,512	4,448,331	10,174	618,765	1,011,811	63,285,835	176,085	12,795,808
50500	33,417	584,201	4,181	76,128	383,285	7,332,012	73,347	1,419,027
50600	44,469	1,299,456	5,315	157,413	502,898	17,028,756	88,451	3,080,237
50701	1,458	DD	199	DD	16,007	DD	3,407	DD
50702	4,407	6,341	584	764	49,624	51,446	10,026	9,849
50800	61,089	2,722,317	7,177	389,459	666,551	46,236,150	116,967	10,517,217
50901	18,635	83,743	2,342	10,423	205,670	902,757	39,028	167,938
50902	41,747	657,896	4,979	79,334	464,616	8,639,391	83,399	1,560,673
51001	33,165	356,296	4,021	44,259	344,931	3,767,322	63,421	696,710
51002	34,348	386,734	4,287	47,391	367,591	3,851,701	67,475	730,711
51100	75,875	2,793,030	9,252	467,772	818,028	43,179,062	149,656	10,089,835
51201	130,174	9,210,748	15,801	1,250,394	1,436,352	55,910,503	257,832	33,009,782
51202	96,905	4,125,686	11,335	628,709	1,053,123	77,919,430	184,143	18,134,017
51301	51,312	1,186,712	6,672	201,243	533,099	17,246,676	105,774	4,150,503
51302	37,496	871,220	5,193	126,793	406,465	12,747,737	82,162	3,006,283
51401	48,520	1,073,913	5,901	155,931	521,112	14,037,455	94,549	2,990,676
51402	27,446	1,009,673	3,305	168,774	295,157	16,754,457	52,470	3,946,498
60101	52,793	1,126,859	7,038	174,559	517,715	15,312,870	107,506	3,457,706
60102	29,441	486,774	3,844	65,252	310,751	5,549,281	63,067	1,101,596
60200	19,123	1,059,414	2,509	218,722	195,165	19,627,119	39,544	5,280,906
60300	53,143	3,237,252	7,396	743,860	552,593	64,963,612	115,584	18,300,185
60400	28,061	1,000,937	3,828	187,949	305,940	16,087,861	63,210	4,110,460
70101	29,734	1,637,964	3,285	234,078	331,533	24,314,177	56,571	5,089,280
70102	74,463	7,145,612	8,268	1,086,183	802,444	116,336,495	135,535	25,784,111
70200	88,399	15,026,628	10,570	1,843,484	953,702	226,252,255	164,986	41,858,788
70300	34,753	1,681,852	3,943	226,256	402,960	22,996,188	70,633	4,404,116
70400	94,439	10,454,711	10,658	1,380,840	1,039,064	143,384,631	176,716	26,820,509
70500	41,996	5,116,896	4,727	703,629	470,202	71,504,729	81,881	13,902,838
70600	73,967	10,953,459	8,444	1,263,752	820,537	141,818,766	138,257	24,004,848
70700	75,856	7,365,720	8,696	942,104	825,293	93,082,427	147,755	16,494,490
70801	80,208	7,280,593	9,392	849,730	849,140	105,374,429	143,068	18,634,611
70802	107,051	12,863,309	12,715	1,515,814	1,185,899	190,613,227	202,492	34,029,617
70900	106,689	10,542,724	12,745	1,293,103	1,183,740	136,669,706	205,441	24,339,520
71000	78,638	13,699,315	9,713	1,731,896	819,583	223,251,345	146,950	45,313,811
71100	44,012	2,170,114	5,391	257,658	497,944	29,883,542	90,715	5,497,499
71200	57,933	3,905,049	7,473	510,725	644,806	56,703,331	116,717	11,208,826
71300	83,748	4,200,611	10,032	482,921	898,053	56,698,994	157,483	10,347,668
71401	55,768	954,281	6,497	114,210	590,510	11,027,683	105,710	2,056,956
71402	39,104	2,099,998	4,704	259,664	415,492	27,827,063	72,967	5,182,425
80101	1,388	47,308	196	9,791	15,022	830,724	2,724	223,345
80102	27,179	1,370,962	3,735	274,498	288,495	23,980,963	58,161	6,318,693
80201	106	DD	16	DD	1,072	DD	220	DD
80202	16,747	457,902	2,232	90,620	174,380	7,640,807	34,567	2,032,273
80203	11,258	224,309	1,592	33,560	117,154	2,476,122	23,450	608,754
80204	3,301	DD	447	DD	30,304	DD	6,347	DD
80301	DD	DD	DD	DD	DD	DD	1,052	DD
80302	14,360	252,888	2,005	33,250	148,590	2,532,826	31,050	553,267
80401	7,735	717,944	1,050	158,378	76,380	14,817,796	17,310	4,336,466
80402	11,539	1,994,778	1,580	501,700	125,487	43,152,800	25,877	12,476,270
80403	3,459	229,296	455	51,650	36,532	4,291,858	7,813	1,223,081
80500	7,506	143,652	1,022	17,440	68,131	957,321	14,298	216,920
80601	250	DD	34	DD	3,330	DD	639	DD
80602	7,810	448,129	1,103	85,945	82,391	8,559,396	17,231	2,275,932
80701	420	43,110	59	5,232	4,038	293,336	796	64,433
80702	9,854	806,721	1,329	130,086	100,825	12,216,564	21,694	2,792,583
80703	1,495	18,892	218	2,333	15,072	137,227	3,101	30,251
80801	12,460	114,748	1,681	13,970	121,958	827,423	26,093	180,913
80802	15,244	144,329	2,105	18,259	157,946	1,141,291	33,748	256,160
80901	0	DD	0	DD	0	DD	0	DD
80902	2,247	53,706	318	6,885	25,472	622,920	5,261	114,561
80903	2,812	DD	375	DD	26,470	DD	5,560	DD
90100	8,056	239,454	943	27,663	81,465	2,363,105	14,455	462,983
90201	23,458	2,085,461	2,747	308,974	245,176	34,029,622	42,003	7,542,316
90202	9,860	387,920	1,228	48,714	107,545	4,836,435	19,165	1,012,735

**Table S3--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	huc6	AFO_conf	FO_conf_wet	AFO_conf	FO_conf_dry	AFO_conf	FO_conf_n	AFO_conf
41201	11,793	1,632,692	1,593	212,875	142,936	20,674,759	29,012	3,740,126
41202	DD	0	DD	0	DD	0	DD	0
41300	14,705	2,912,198	2,014	380,222	167,775	36,236,536	34,692	6,471,624
41401	3,661	559,936	494	76,536	45,700	7,920,290	8,982	1,572,100
41402	19,459	4,059,904	2,669	529,190	254,370	50,819,308	53,052	9,116,503
41501	3,464	993,366	452	129,210	40,606	12,433,203	8,061	2,193,250
41502	DD	DD	DD	DD	DD	DD	DD	DD
41503	9,815	1,854,529	1,272	241,332	117,909	23,350,990	24,577	4,113,394
41504	22,613	3,488,762	3,100	461,509	288,256	45,643,238	60,417	8,444,977
41505	1,095	510,250	159	66,328	13,633	6,559,733	2,818	1,166,112
50100	43,385	2,339,990	5,586	305,029	505,971	29,741,515	101,438	5,480,297
50200	25,563	590,520	3,350	75,313	302,868	7,283,974	61,012	1,298,364
50301	39,968	1,261,728	4,962	166,834	471,436	16,094,611	91,047	2,949,401
50302	26,588	278,559	3,440	33,684	306,578	3,346,267	62,644	582,232
50400	78,677	4,597,843	10,243	651,181	913,708	65,990,224	181,546	13,575,988
50500	34,791	541,116	4,402	75,714	415,283	7,540,311	82,086	1,555,520
50600	34,509	1,489,844	4,486	185,560	379,913	19,495,960	75,994	3,600,808
50701	653	DD	91	DD	8,680	DD	1,839	DD
50702	3,838	5,355	529	659	46,886	41,382	10,375	8,488
50800	51,822	2,626,792	6,692	367,889	537,928	43,984,237	106,333	9,762,622
50901	16,108	94,264	2,107	13,358	179,566	1,350,772	37,263	313,966
50902	34,272	592,041	4,464	72,184	370,269	7,213,328	76,177	1,289,023
51001	26,199	261,549	3,437	31,249	286,198	2,623,905	57,517	481,701
51002	33,952	351,381	4,496	43,112	371,148	3,207,202	74,814	621,310
51100	69,142	2,544,830	8,732	441,206	708,094	39,372,892	139,690	9,505,769
51201	123,736	9,573,527	16,103	1,306,753	1,312,637	164,910,990	260,669	35,195,763
51202	85,269	3,673,599	10,965	562,334	887,722	70,425,511	173,851	16,251,311
51301	44,751	869,995	5,861	143,594	463,343	12,501,022	95,691	2,979,212
51302	34,490	745,668	4,794	109,537	388,118	10,784,681	82,329	2,521,365
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**Table S3--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	90203	14,229	588,926	1,713	79,592	152,389	7,950,571	27,845
90300	3,066	20,922	407	2,571	39,069	226,126	7,482	41,516
90400	0	0	0	0	0	0	0	0
100100	DD	DD	DD	DD	DD	DD	DD	DD
100200	9,195	370,759	1,230	45,992	99,483	3,472,985	18,512	670,284
100301	9,280	314,795	1,227	36,856	95,740	3,632,144	17,771	669,463
100302	4,001	417,327	511	52,289	42,598	5,520,275	7,778	1,032,863
100401	4,102	139,068	495	16,170	49,192	1,124,511	8,894	221,186
100402	2,850	75,590	377	9,503	31,322	898,413	6,115	177,169
100500	7,323	193,744	946	23,967	80,911	1,838,030	14,948	370,090
100600	3,220	105,090	412	12,489	35,996	708,258	6,598	160,066
100700	12,985	635,774	1,722	66,386	140,043	5,572,235	26,773	925,938
100800	11,821	332,224	1,597	39,758	130,869	2,764,756	25,802	535,613
100901	2,342	DD	287	DD	23,734	286,984	4,561	63,621
100902	4,388	32,196	596	3,632	53,160	248,156	9,865	47,792
101000	4,252	472,344	510	55,513	48,375	3,425,768	8,768	715,583
101101	4,067	78,352	526	8,956	48,532	719,583	8,657	132,097
101102	4,109	95,400	465	9,360	46,687	963,771	7,730	146,532
101201	8,625	DD	1,121	DD	92,646	DD	17,806	DD
101202	3,728	192,421	458	23,065	43,295	1,531,665	7,812	310,038
101301	11,356	854,157	1,365	94,713	129,919	8,529,634	22,659	1,472,732
101302	9,701	470,993	1,106	56,516	107,788	5,110,579	18,449	911,985
101303	3,969	317,875	436	32,321	49,519	2,995,781	8,023	505,377
101401	9,420	1,148,914	1,091	124,421	106,772	14,530,119	17,938	2,537,510
101402	3,627	450,993	431	44,377	41,951	5,658,819	7,382	830,793
101500	7,144	2,077,664	843	196,267	80,136	22,159,668	14,712	3,245,471
101600	24,859	4,483,859	2,996	509,464	273,267	59,051,729	47,835	10,640,207
101701	20,523	3,330,498	2,439	368,012	243,986	43,541,742	41,397	7,890,860
101702	42,660	11,366,700	5,220	1,266,566	491,739	151,002,730	83,511	25,780,559
101800	13,670	3,703,530	1,835	331,698	148,154	39,195,964	29,305	5,408,634
101900	68,127	11,578,975	8,995	1,237,179	734,060	139,405,014	139,463	22,433,739
102001	13,729	5,212,077	1,689	459,564	150,933	57,144,860	26,974	7,720,875
102002	15,072	2,327,112	1,919	236,286	162,573	29,561,282	30,174	4,907,329
102100	19,316	6,042,707	2,231	568,825	212,790	71,565,955	37,322	10,551,458
102200	23,061	9,236,007	2,754	879,507	278,108	108,956,591	47,958	16,673,693
102300	47,595	12,965,935	6,061	1,461,858	504,038	175,426,284	89,075	30,490,362
102400	59,494	4,924,434	7,152	562,332	641,377	65,399,402	113,905	12,069,523
102500	21,175	10,188,995	2,628	935,109	235,342	118,611,356	43,873	17,082,663
102600	24,502	5,649,623	3,248	510,149	274,011	61,058,558	51,270	8,395,506
102701	31,230	980,296	3,865	105,973	343,242	11,362,786	63,607	1,895,629
102702	29,012	5,510,315	3,671	566,791	337,162	68,497,024	60,511	11,126,732
102801	30,492	3,391,738	3,701	396,087	337,714	51,836,794	61,272	9,254,843
102802	13,276	369,710	1,628	42,077	140,874	4,151,678	16,011	767,513
102901	84,750	2,704,595	10,644	385,410	195,020	41,348,485	275,994	9,353,664
102902	18,462	723,612	2,236	97,805	213,787	9,979,099	39,316	1,972,851
103001	52,884	2,345,115	6,503	368,251	588,019	38,321,767	108,981	9,165,883
103002	9,375	223,906	1,086	26,595	107,874	3,172,286	18,728	569,633
101010	72,540	4,674,661	9,346	1,037,479	750,204	99,960,810	148,219	27,910,220
101020	32,906	2,336,865	4,427	216,200	345,685	24,781,680	67,808	3,708,810
101030	39,205	18,096,623	5,133	1,637,448	406,932	200,360,790	77,663	27,628,657
101040	5,936	9,806,102	806	907,231	63,171	113,342,152	12,511	16,071,432
101050	19,542	2,024,935	2,484	212,856	215,986	25,950,846	42,365	4,344,185
101060	16,128	569,686	2,051	62,468	179,966	5,028,409	34,895	913,129
101070	32,319	572,952	4,180	67,872	340,088	5,912,803	66,545	1,128,306
101072	67,991	4,617,802	8,497	873,217	727,233	84,122,784	138,872	21,774,539
101080	4,968	34,659	679	4,027	51,729	255,721	10,189	51,540
1010901	3,279	4,621,479	435	423,097	34,641	51,652,822	7,075	7,034,779
1010902	30,344	DD	3,955	DD	331,981	DD	65,038	1,515,024
111001	4,180	10,795,132	550	993,349	42,923	134,236,128	8,589	19,116,770
111002	2,650	2,974,442	316	301,940	27,407	42,013,829	5,609	6,814,744
111003	34,472	479,722	4,425	55,669	373,599	5,844,053	74,692	1,110,055
111101	45,273	2,799,977	5,891	638,604	459,406	58,503,570	93,262	16,575,492
111102	26,592	3,151,458	3,523	729,336	251,815	66,662,855	52,983	18,858,684
111201	6,253	11,683,748	816	1,048,891	65,348	129,512,574	12,796	17,346,361
111202	1,336	DD	185	38,460	14,209	DD	2,779	637,829
111203	6,287	1,481,372	785	126,738	67,073	16,279,112	12,872	2,107,604
111301	4,045	153,806	508	18,869	45,192	1,388,909	8,612	276,240
111302	24,398	635,655	3,038	79,225	250,963	7,236,112	49,137	1,297,697
111303	25,448	1,065,135	3,277	111,625	288,032	12,082,726	55,920	1,993,873
111401	44,725	2,416,219	5,871	509,931	461,076	43,882,186	92,551	12,088,087
111402	9,763	955,702	1,309	224,343	97,037	19,082,590	20,539	5,476,873
111403	35,712	2,542,209	4,719	485,140	346,910	43,322,133	69,425	10,951,631
120100	52,912	2,287,920	6,975	482,711	533,419	42,146,365	106,225	11,267,845
120200	44,027	1,668,442	5,716	374,055	449,006	32,322,342	88,313	8,958,828
120301	118,303	950,490	15,853	133,034	1,141,572	12,119,740	230,202	2,788,442
120302	28,458	340,279	3,634	54,754	285,970	4,628,130	56,673	1,122,979
120401	24,801	145,783	3,352	20,693	248,112	1,576,016	49,928	373,821
120402	16,034	76,316	2,136	9,265	163,283	535,547	33,814	114,610

**Table S3--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	huc6	AFO_conf	_FO_conf_wet	AFO_conf	_FO_conf_dry	AFO_conf	_FO_conf_n	AFO_conf
90203	11,436	561,223	1,464	74,063	123,071	7,197,754	24,068	1,554,582
90300	1,864	27,999	239	3,485	22,359	301,276	4,678	54,804
90400	DD	5,548	DD	632	DD	38,405	DD	8,590
100100	DD	DD	DD	DD	DD	DD	DD	DD
100200	7,860	321,278	1,091	39,855	86,688	2,867,043	17,178	561,487
100301	13,763	324,338	1,973	39,672	137,958	3,719,979	27,047	719,801
100302	7,869	491,056	1,029	58,828	75,069	6,050,394	14,136	1,120,523
100401	4,245	323,640	557	34,285	44,135	2,899,446	8,790	494,583
100402	4,044	84,133	518	10,098	43,935	1,062,833	8,363	199,002
100500	5,727	255,988	773	30,895	60,303	2,150,043	11,548	455,399
100600	2,963	145,904	333	17,291	33,205	1,063,668	5,789	239,165
100700	17,534	645,607	2,379	72,081	183,335	4,764,974	34,831	885,021
100800	13,911	407,771	1,881	49,068	138,938	2,835,493	27,827	581,460
100901	3,640	41,428	497	4,973	38,066	298,925	7,605	64,621
100902	4,070	96,042	572	11,385	44,098	717,011	8,741	147,825
101000	6,435	331,215	813	38,173	65,204	2,375,407	12,054	486,041
101101	4,035	126,892	478	14,985	39,094	958,017	7,413	200,715
101102	2,919	103,066	362	11,392	29,412	836,751	5,886	152,653
101201	11,117	DD	1,497	DD	127,137	DD	24,314	DD
101202	6,815	127,094	897	14,226	79,148	1,031,462	15,877	192,806
101301	12,772	909,630	1,532	101,582	134,409	8,582,020	24,511	1,577,093
101302	12,147	424,159	1,503	49,919	122,207	4,194,681	22,415	762,047
101303	6,296	334,647	781	35,390	71,810	3,010,821	13,286	531,793
101401	9,349	1,126,468	1,169	124,110	115,668	13,076,666	20,468	2,386,226
101402	5,149	595,410	647	61,626	58,475	5,265,478	11,182	889,262
101500	12,095	2,308,655	1,454	217,580	125,961	24,219,796	24,066	3,619,765
101600	27,768	4,077,152	3,533	477,544	286,659	52,322,655	53,126	9,937,380
101701	21,747	3,128,404	2,754	345,538	238,491	39,463,739	44,31	

**Table S3--2007.** Quantity of Manure and Manure Nutrients Produced as *excreted* for Confined Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	120500	17,266	14,819,490	2,421	1,551,266	182,849	170,282,699	35,840
120601	10,032	428,912	1,327	46,194	106,857	3,528,376	20,605	623,938
120602	45,785	2,004,624	6,027	272,899	470,383	26,622,048	91,274	5,258,311
120701	43,082	877,881	5,562	150,963	422,823	12,624,414	84,101	3,298,493
120702	32,161	1,475,903	4,313	216,046	345,940	21,697,158	66,813	4,585,777
120800	16,435	939,854	2,368	112,849	179,993	10,528,519	35,083	1,828,232
120901	14,973	827,225	2,211	95,158	188,900	9,710,817	34,932	1,611,595
120902	15,197	109,442	2,176	14,666	198,067	1,227,469	36,006	211,231
120903	18,696	142,813	2,399	17,804	186,170	1,491,775	37,573	321,006
120904	7,994	DD	1,071	DD	76,617	DD	15,659	DD
121001	10,742	226,857	1,304	39,911	105,754	4,044,979	19,868	1,158,089
121002	23,777	1,078,542	3,201	225,193	258,872	22,692,110	52,609	6,364,143
121003	25,701	246,221	3,348	27,499	257,704	2,389,329	51,890	429,224
121004	9,010	186,657	1,161	19,252	89,477	1,603,082	18,042	269,026
121101	21,964	717,809	2,975	68,575	226,621	7,370,242	44,463	1,081,057
121102	22,153	466,806	2,967	41,796	217,136	4,787,216	43,506	656,904
130100	7,896	176,842	1,058	21,802	81,770	1,392,523	15,803	294,983
130201	10,825	50,933	1,493	6,250	96,837	370,955	19,988	81,602
130202	50,699	814,516	7,579	104,208	520,337	9,418,518	99,941	1,692,900
130301	8,111	DD	1,217	DD	83,267	14,449,749	16,370	DD
130302	1,739	668,794	241	85,782	17,682	8,009,955	3,518	1,406,492
130401	4,536	DD	694	DD	48,601	DD	9,300	DD
130402	1,776	DD	242	1,321	18,955	DD	3,176	DD
130403	832	2,303	134	349	12,289	25,454	2,176	4,747
130500	5,804	244,147	878	34,456	65,673	3,578,352	12,648	759,985
130600	8,466	2,878,826	1,188	375,054	85,183	36,235,169	17,199	6,375,888
130700	3,358	239,637	502	30,731	37,140	2,851,683	7,266	515,510
130800	3,706	DD	487	DD	39,596	DD	7,411	DD
130900	2,723	DD	336	DD	23,076	DD	4,914	DD
140100	18,233	182,250	2,437	24,766	173,877	1,967,527	33,992	DD
140200	15,051	235,265	1,986	30,957	147,864	2,488,915	29,218	566,149
140300	9,583	146,271	1,345	17,452	106,372	1,117,484	19,619	221,508
140401	4,139	35,308	523	4,103	43,081	323,131	8,077	55,504
140402	758	3,245	104	325	7,915	29,543	1,444	4,747
140500	5,548	72,711	761	9,446	62,592	626,745	12,110	124,134
140600	18,326	245,195	2,340	32,764	187,940	2,858,492	34,327	585,310
140700	9,085	141,621	1,283	21,284	92,036	1,826,727	17,768	DD
140801	72,354	338,298	11,082	41,316	781,343	2,746,034	146,406	541,042
140802	76,016	170,303	12,433	22,788	889,720	1,453,886	161,685	296,521
150100	22,577	227,941	3,297	27,781	226,344	1,783,675	43,369	371,606
150200	213,189	827,215	33,768	110,414	2,372,710	DD	440,271	DD
150301	4,922	71,847	696	10,895	49,441	DD	9,769	145,488
150302	2,579	50,716	325	6,156	22,278	329,991	4,546	73,076
150400	9,376	159,713	1,344	19,446	90,425	1,192,577	18,014	255,763
150501	8,835	1,648,237	1,255	212,687	87,096	19,291,770	17,112	3,407,761
150502	6,678	DD	937	DD	68,201	DD	13,621	DD
150503	9,106	3,220,581	1,330	331,064	94,967	36,836,371	18,509	5,436,790
150601	24,976	286,360	3,788	37,508	259,688	3,231,270	49,419	588,375
150602	11,284	76,377	1,656	9,621	111,631	540,499	21,786	115,198
150701	10,393	2,306,082	1,520	308,158	97,067	29,857,826	19,081	5,623,945
150702	1,446	DD	207	DD	14,146	DD	2,970	DD
150801	347	DD	61	DD	4,457	DD	804	DD
150802	0	0	0	0	0	0	0	0
150803	2,257	6,369	310	778	23,791	50,248	5,074	9,618
160101	1,983	69,630	227	8,305	19,156	516,698	3,349	102,132
160102	19,894	1,261,354	2,460	166,681	190,859	15,947,332	34,280	3,084,470
160201	13,830	250,327	1,836	31,397	130,051	2,875,877	24,284	505,065
160202	27,020	598,370	3,642	80,906	271,344	8,201,775	50,900	1,656,047
160203	14,364	628,029	1,900	78,656	150,815	8,102,674	28,062	1,545,593
160300	17,908	2,684,040	2,417	356,782	177,131	43,496,246	33,809	8,694,444
160401	3,017	162,919	433	17,787	32,226	1,294,785	6,191	236,222
160402	2,376	DD	335	DD	25,895	DD	4,955	DD
160501	3,426	61,432	507	7,469	34,051	544,331	6,562	101,427
160502	4,162	410,654	590	53,231	38,660	4,718,431	7,670	834,189
160503	3,043	DD	442	DD	31,006	1,068,248	5,938	DD
160600	8,502	318,816	1,244	40,059	86,019	2,859,763	16,302	560,962
170101	2,933	13,850	381	1,748	34,094	127,572	6,490	24,588
170102	29,411	234,166	3,900	29,055	306,964	2,246,248	58,571	426,101
170103	15,516	91,240	2,075	11,474	175,913	948,424	33,358	173,755
170200	27,096	2,903,522	3,538	335,693	293,085	35,021,281	55,717	6,184,105
170300	19,459	2,899,704	2,660	370,011	203,671	35,080,956	40,251	6,093,126
170401	3,856	81,789	524	9,976	36,623	858,546	7,072	156,017
170402	48,352	15,181,353	6,156	1,887,438	473,792	179,351,572	88,061	31,041,742
170501	52,599	6,402,853	6,860	744,587	527,651	71,306,482	98,891	11,826,754
170502	5,083	69,971	619	7,784	48,014	637,189	9,020	112,836
170601	13,134	242,915	1,686	28,295	133,889	2,359,279	25,706	427,638
170602	3,813	56,031	506	6,754	37,773	465,131	7,111	91,448
170603	5,486	39,530	703	4,455	54,485	320,003	10,199	59,627

**Table S3--2012.** Quantity of Manure and Manure Nutrients Produced as *excreted* for Confined Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	huc6	AFO_conf	FO_conf_wet	AFO_conf	FO_conf_dry	AFO_conf	FO_conf_n	AFO_conf
120500	22,153	16,412,202	3,032	1,761,599	222,275	192,393,314	44,286	29,959,898
120601	14,652	120,287	2,006	12,697	146,060	1,026,729	30,039	177,589
120602	50,052	1,555,428	6,933	216,029	498,654	20,482,512	101,870	4,147,398
120701	58,604	859,756	7,701	154,673	553,044	12,891,386	116,288	3,450,498
120702	39,528	1,177,424	5,687	176,893	424,893	18,036,013	88,715	3,926,554
120800	23,052	1,381,685	3,322	172,913	229,956	16,351,593	46,060	2,828,606
120901	21,203	700,198	3,217	84,144	265,109	8,145,308	50,171	1,402,978
120902	22,234	88,712	3,159	9,863	250,220	842,753	50,584	145,126
120903	17,601	104,390	2,308	15,418	173,127	1,441,912	37,388	379,888
120904	8,137	DD	1,087	DD	80,056	DD	17,082	DD
121001	11,998	146,374	1,473	21,502	107,311	1,852,693	22,119	484,885
121002	35,600	1,251,731	4,759	269,846	357,307	27,345,226	75,424	7,829,692
121003	35,308	DD	4,857	DD	351,265	DD	73,464	DD
121004	13,339	109,225	1,701	11,585	127,068	1,002,801	25,135	170,487
121101	31,892	573,939	4,405	54,058	330,655	5,821,546	66,446	838,821
121102	35,613	550,170	4,825	50,130	340,272	5,463,174	69,582	758,656
130100	7,977	117,584	1,129	13,740	85,716	860,794	16,619	167,008
130201	22,416	65,016	3,007	7,893	209,569	466,115	43,192	101,698
130202	59,929	863,452	8,257	110,710	518,830	9,956,533	105,459	1,791,575
130301	12,276	DD	1,736	DD	112,746	DD	22,665	DD
130302	3,888	464,274	531	59,406	34,761	5,675,161	7,099	1,008,277
130401	4,325	DD	740	DD	54,107	DD	9,863	DD
130402	1,612	21,818	233	2,627	18,040	153,535	3,470	34,446
130403	1,124	DD	162	DD	12,782	DD	2,469	DD
130500	8,228	193,534	1,200	24,803	84,789	2,279,723	16,518	406,748
130600	14,411	2,728,185	1,917	354,799	138,657	33,569,985	27,135	5,930,767
130700	6,171	211,136	866	26,061	57,558	2,423,010	11,166	423,929
130800	8,202	DD	1,156	DD	84,957	DD	16,492	DD
130900	5,771	DD	750	DD	50,606	DD	10,972	DD
140100	22,501	146,400	3,158	21,774	219,420	1,843,632	44,289	447,649
140200	17,762	341,998	2,409	43,474	179,930	3,553,852	35,348	738,214
140300	7,279	59,303	1,027	7,546	80,341	495,391	15,579	92,995



**Table S3--2007.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	170701	20,090	2,481,332	2,642	269,854	209,739	27,754,236	40,806
170702	3,323	69,022	409	7,374	37,565	581,089	6,672	101,757
170703	16,993	168,184	2,191	19,212	164,638	1,422,622	31,157	270,342
170800	15,505	576,380	1,995	99,321	173,223	8,905,205	34,928	2,050,781
170900	68,647	1,641,737	9,019	248,280	739,498	24,275,845	144,757	5,260,313
171001	8,526	352,678	1,129	54,635	99,816	5,835,378	21,000	1,379,185
171002	6,867	824,789	927	106,965	84,037	10,446,742	17,120	1,861,659
171003	27,181	216,151	3,688	28,104	291,093	2,534,703	56,867	502,975
171100	44,763	2,829,673	5,944	377,482	523,251	36,719,557	105,653	6,849,859
171200	4,438	125,558	565	15,064	42,424	879,975	7,754	189,987
180101	16,533	1,562,004	2,377	222,835	185,618	22,063,550	37,827	4,454,380
180102	11,068	352,055	1,463	42,094	114,961	3,633,142	21,882	661,130
180200	4,563	DD	590	DD	49,880	255,601	9,415	53,853
180201	56,137	1,783,809	8,115	230,593	639,850	21,197,165	125,609	3,784,503
180300	30,248	32,271,556	4,319	4,244,762	302,396	403,539,455	60,295	72,922,294
180400	44,972	22,907,159	6,496	3,244,388	481,025	312,581,903	93,224	61,344,387
180500	11,663	451,837	1,768	60,825	137,274	5,762,445	27,900	1,085,069
180600	21,935	384,845	3,166	51,596	232,099	4,713,107	46,829	947,140
180701	22,705	106,821	3,417	15,639	229,289	1,162,922	44,494	224,276
180702	26,682	4,349,887	4,030	594,710	271,010	58,586,936	52,606	11,496,707
180703	28,229	592,008	4,281	90,826	293,465	9,514,115	58,699	2,231,131
180800	4,413	DD	607	DD	43,602	116,143	8,414	23,670
180901	670	DD	87	DD	5,627	DD	1,178	DD
180902	12,061	1,116,492	1,850	150,349	128,785	14,494,598	25,608	2,657,068
181001	3,130	DD	468	DD	32,720	DD	6,257	DD
181002	5,223	3,650,903	802	335,275	61,510	40,580,996	12,663	5,491,266
190101	0	0	0	0	0	0	0	0
190102	DD	0	DD	0	DD	0	DD	0
190103	DD	0	DD	0	DD	0	DD	0
190104	0	0	0	0	0	0	0	0
190201	DD	DD	DD	DD	DD	DD	DD	DD
190202	DD	0	DD	0	DD	0	DD	0
190203	883	944	110	108	11,193	10,335	2,035	1,622
190204	296	DD	43	DD	3,357	DD	692	DD
190205	920	11,651	129	1,591	10,707	151,830	2,363	28,999
190206	DD	0	DD	0	DD	0	DD	0
190207	DD	DD	DD	DD	DD	DD	DD	DD
190301	0	0	0	0	0	0	0	0
190302	0	0	0	0	0	0	0	0
190303	0	0	0	0	0	0	0	0
190304	0	0	0	0	0	0	0	0
190305	0	0	0	0	0	0	0	0
190401	DD	DD	DD	DD	237	DD	DD	DD
190402	0	0	0	0	0	0	0	0
190403	DD	0	DD	0	DD	0	DD	0
190404	166	DD	DD	DD	2,095	DD	402	DD
190405	986	4,896	132	612	12,031	55,564	2,381	10,135
190406	0	0	0	0	0	0	0	0
190407	0	0	0	0	0	0	0	0
190408	0	0	0	0	0	0	0	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	6,728	60,564	916	7,888	84,188	735,771	17,181	140,542
200200	1,787	DD	246	DD	25,067	DD	4,956	DD
200400	DD	0	DD	0	DD	0	DD	0
200500	701	DD	87	DD	9,189	DD	1,714	DD
200600	2,089	49,716	293	7,915	28,088	1,010,457	5,514	DD
200700	1,777	DD	218	DD	18,272	DD	3,490	DD
200800	0	DD	0	DD	0	DD	0	DD

**Table S3--2012.** Quantity of Manure and Manure Nutrients Produced as excreted for Confined Livestock Types by 6-digit HUC,

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of manure, wet weight (tons)		Quantity of manure, dry weight (tons)		Quantity of manure nitrogen, pounds		Quantity of manure phosphorus, pounds	
	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs	Non-AFOs	AFOs
	huc6	AFO_conf_wet_weight	AFO_conf_dry_weight	AFO_conf_nitrogen	AFO_conf_phosphorus	Non-AFOs	AFOs	Non-AFOs
170701	16,907	2,533,746	2,324	291,080	173,752	28,458,351	35,255	4,635,591
170702	3,008	53,278	403	5,659	32,739	416,852	6,840	71,838
170703	15,526	158,106	2,152	19,157	158,095	1,253,583	32,109	251,565
170800	23,247	554,039	3,178	97,375	250,212	8,643,109	53,675	2,026,929
170900	64,558	1,626,830	9,010	243,511	728,246	23,547,640	156,140	5,021,303
171001	9,906	334,898	1,375	51,810	109,022	5,603,502	23,114	1,309,425
171002	7,239	746,784	987	96,929	84,462	9,357,888	17,793	1,661,553
171003	26,219	209,590	3,652	27,631	277,037	2,574,985	57,999	501,833
171100	42,591	2,691,729	5,997	359,041	489,314	34,859,159	105,728	6,533,252
171200	4,430	66,823	587	7,596	43,943	504,993	8,406	97,577
180101	15,020	1,712,888	2,232	245,875	182,675	24,243,350	38,890	4,892,618
180102	11,837	323,921	1,600	38,307	120,146	3,503,912	24,435	616,454
180200	4,415	23,936	615	2,757	48,617	235,873	9,618	40,516
180201	64,061	1,659,308	9,451	214,904	725,989	19,915,970	149,040	3,539,085
180300	32,490	33,744,851	4,686	4,445,644	335,054	415,284,904	68,230	74,196,162
180400	58,096	23,025,935	8,303	3,226,951	594,300	306,832,606	119,865	59,205,924
180500	14,748	590,320	2,215	78,132	169,443	7,360,814	35,865	1,367,227
180600	22,971	285,786	3,322	39,782	246,482	3,501,808	51,008	722,583
180701	15,618	43,743	2,395	6,431	164,055	396,844	32,397	77,157
180702	19,493	3,021,662	2,997	418,383	208,542	41,298,188	41,825	8,249,486
180703	22,597	604,685	3,439	92,505	238,628	9,696,357	47,344	2,246,269
180800	3,789	21,807	571	2,692	39,028	188,197	7,793	36,531
180901	951	DD	130	DD	8,605	DD	1,783	DD
180902	15,039	1,281,493	2,228	174,396	153,368	17,014,390	30,864	3,201,981
181001	1,927	DD	298	DD	20,263	DD	4,056	DD
181002	6,206	3,050,121	953	276,287	66,854	33,687,382	13,111	4,511,817
190101	0	0	0	0	0	0	0	0
190102	DD	0	DD	0	DD	0	DD	0
190103	144	0	23	0	1,878	0	401	0
190104	0	0	0	0	0	0	0	0
190201	79	DD	13	DD	1,510	DD	370	DD
190202	DD	0	DD	0	DD	0	DD	0
190203	876	DD	127	DD	10,070	DD	2,067	DD
190204	743	DD	104	DD	8,597	DD	1,778	DD
190205	879	9,437	123	1,245	11,122	122,764	2,391	22,503
190206	DD	0	DD	0	DD	0	DD	0
190207	DD	0	DD	0	DD	0	DD	0
190301	0	0	0	0	0	0	0	0
190302	DD	0	DD	0	DD	0	DD	0
190303	0	0	0	0	0	0	0	0
190304	DD	0	DD	0	DD	0	DD	0
190305	DD	0	DD	0	DD	0	DD	0
190401	DD	0	DD	0	DD	0	DD	0
190402	DD	0	DD	0	DD	0	DD	0
190403	0	0	0	0	0	0	0	0
190404	DD	DD	DD	DD	DD	DD	DD	DD
190405	1,715	4,474	242	536	20,210	49,833	4,210	8,764
190406	0	0	0	0	0	0	0	0
190407	DD	0	DD	0	DD	0	DD	0
190408	0	0	0	0	0	0	0	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	5,279	DD	794	DD	65,805	DD	14,547	DD
200200	2,025	1,842	275	224	29,226	29,071	6,715	5,238
200400	DD	0	DD	0	DD	0	DD	0
200500	DD	DD	DD	DD	DD	DD	DD	DD
200600	2,238	19,889	309	3,815	28,951	540,085	6,168	155,446
200700	395	DD	64	DD	7,058	DD	1,734	DD
200800	DD	0	DD	0	DD	0	DD	0
Sum of column	7,555,569	671,163,890	1,025,971	90,295,894	80,977,698	9,392,534,527	16,351,582	#####
National total	7,558,327	683,464,814	1,026,336	91,774,282	81,010,866	9,554,739,521	16,358,651	#####
Percent of national	99.96%	98.20%	99.96%	98.39%	99.96%	98.30%	99.96%	98.44%

For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

**Table SS-2007.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
10100	27,445	3,357	592,610	116,527	476,083	131,717	51,819	79,898
10200	152,670	19,852	3,316,349	770,341	2,546,008	645,777	325,330	320,447
10300	273,226	35,811	5,963,258	1,384,981	4,578,276	1,174,250	588,404	585,846
10400	235,754	47,930	7,813,209	3,979,369	3,833,840	2,260,325	1,615,376	644,949
10500	40,102	5,975	948,320	257,223	691,097	220,354	132,347	88,007
10600	78,454	10,280	1,761,938	383,928	1,378,011	363,265	166,435	196,829
10700	98,388	13,522	2,189,963	520,411	1,669,553	457,818	234,331	223,487
10801	607,617	79,795	13,431,823	3,133,309	10,248,514	2,663,974	1,344,301	1,319,673
10802	230,300	30,349	4,956,559	1,188,573	3,767,986	988,521	509,359	479,162
10900	104,994	14,001	2,233,515	515,772	1,717,743	467,248	232,220	235,029
11000	530,028	82,195	13,688,648	4,806,064	8,882,583	3,257,895	1,978,629	1,279,266
11100	315,258	40,991	6,916,397	1,609,793	5,306,604	1,358,111	680,121	677,990
20100	2,237,809	296,499	49,223,408	12,241,326	36,982,082	9,804,818	5,141,640	4,663,179
20200	1,835,607	239,589	40,693,786	9,543,924	31,149,861	8,125,239	4,029,968	4,095,271
20301	33,990	4,596	780,725	166,839	613,886	166,995	77,144	89,851
20302	23,254	5,333	DD	186,443	DD	DD	119,872	DD
20401	564,223	86,142	14,203,872	4,439,350	9,764,522	3,282,642	1,926,129	1,356,513
20402	1,609,206	260,382	37,814,193	12,675,747	25,138,446	8,785,680	5,667,035	3,118,644
20403	15,302	DD	DD	DD	DD	DD	DD	DD
20501	2,799,007	359,250	61,175,027	14,021,672	47,153,354	12,257,952	6,016,601	6,241,351
20502	965,144	132,934	21,455,288	5,526,462	15,928,826	4,518,192	2,467,355	2,050,837
20503	8,526,889	1,294,040	200,727,062	63,248,032	137,479,030	45,079,115	28,359,474	16,719,642
20600	3,827,670	931,008	94,610,011	46,442,816	48,167,629	26,477,431	21,192,801	5,284,630
20700	5,737,366	1,102,570	160,966,125	58,927,685	102,038,441	42,556,623	27,429,126	15,127,497
20801	480,808	87,504	12,321,190	3,987,308	8,333,882	3,291,648	1,850,101	1,441,547
20802	733,766	137,825	18,687,070	6,565,293	12,121,777	5,092,905	3,093,338	1,999,567
30101	922,629	129,253	20,537,898	5,197,106	15,340,792	4,812,494	2,554,866	2,257,628
30102	1,114,558	185,211	22,812,404	8,038,176	14,774,229	5,371,164	4,212,153	1,159,011
30201	1,057,977	154,886	21,959,471	7,349,624	14,609,847	5,257,116	4,065,083	1,192,033
30202	3,712,989	558,608	81,917,181	25,520,065	56,397,116	18,272,435	14,377,309	3,895,126
30203	0	0	0	0	0	0	0	0
30300	10,782,737	1,710,653	238,509,618	78,472,422	160,037,196	55,102,147	42,973,898	12,128,249
30401	2,907,509	666,975	79,131,746	35,882,253	43,249,493	22,557,113	16,682,882	5,874,231
30402	3,332,881	634,851	78,211,671	31,553,833	46,657,838	20,393,371	16,291,066	4,102,306
30501	1,706,360	379,412	50,147,605	21,123,764	29,023,841	14,311,991	10,174,606	4,137,385
30502	676,848	149,459	16,482,123	7,484,706	8,997,417	4,556,852	3,450,835	1,106,017
30601	3,089,799	753,694	81,360,438	39,862,600	41,497,836	23,961,341	18,122,348	5,838,992
30602	409,469	74,730	9,238,625	3,357,357	5,881,268	2,362,024	1,579,725	782,299
30701	2,116,218	484,613	58,844,593	26,276,469	29,568,124	16,000,837	11,745,536	4,255,301
30702	721,558	156,803	18,397,029	8,256,511	10,140,518	5,195,824	3,764,482	1,431,342
30801	159,893	20,724	3,253,537	679,246	2,574,291	668,695	312,462	356,232
30802	DD	DD	DD	DD	DD	DD	DD	DD
30901	777,691	111,732	18,762,771	DD	DD	4,473,259	DD	DD
30902	176,426	23,023	3,329,761	735,092	2,594,670	684,317	347,891	336,426
31001	339,863	43,252	6,941,228	1,503,025	5,438,203	1,436,537	672,170	764,367
31002	395,662	62,919	10,604,098	3,813,137	6,790,961	2,695,871	1,573,630	1,122,240
31101	225,140	39,451	4,962,619	1,733,496	3,229,122	1,180,027	785,469	394,558
31102	2,023,566	388,006	50,265,396	20,076,755	30,188,640	13,251,166	8,904,006	4,347,160
31200	371,798	78,589	8,376,935	3,687,448	4,689,487	2,208,781	1,693,324	515,457
31300	2,433,632	536,358	58,736,665	26,515,362	32,221,401	16,076,860	12,191,522	4,085,338
31401	178,911	37,839	DD	2,082,921	DD	DD	918,047	DD
31402	1,235,136	297,386	30,815,522	14,860,026	15,955,496	9,055,476	6,831,810	2,223,667
31403	622,410	154,087	16,289,018	7,894,279	8,394,739	4,881,649	3,610,607	1,271,042
31501	3,777,334	949,721	95,672,057	48,799,682	46,872,375	28,170,658	22,359,109	5,811,549
31502	275,550	54,726	6,631,688	2,653,449	3,978,239	1,927,138	1,242,908	684,231
31601	3,002,107	649,510	71,661,031	31,753,323	39,907,716	20,104,271	14,947,684	5,156,587
31602	145,712	26,702	3,318,512	1,262,185	2,056,327	921,297	588,133	333,164
31700	2,521,642	626,843	63,547,308	31,962,639	31,584,669	18,716,502	14,591,541	4,124,961
31800	3,371,537	809,262	83,603,845	40,606,758	42,997,087	23,925,498	18,617,021	5,308,477
40101	0	0	0	0	0	0	0	0
40102	33,359	4,296	781,718	163,139	618,579	168,994	70,837	98,157
40103	83,352	10,681	2,118,672	408,157	1,710,516	486,083	174,113	311,971
40201	13,568	1,725	DD	66,571	DD	DD	27,726	DD
40202	21,495	2,773	477,399	103,014	374,385	100,071	44,693	55,378
40203	0	0	0	0	0	0	0	0
40301	4,531,450	581,634	90,194,447	21,447,293	68,747,154	16,998,165	9,091,723	7,906,442
40302	3,922,096	501,020	79,545,132	18,720,898	60,824,234	15,051,025	7,911,604	7,139,421
40400	618,613	79,141	12,630,266	2,959,679	9,670,586	2,404,774	1,251,850	1,152,925
40500	6,496,768	888,867	139,749,063	39,325,437	100,423,627	28,882,238	18,078,694	10,803,544
40601	1,348,743	176,500	28,298,941	6,927,485	21,371,456	5,526,869	3,233,448	2,293,421
40602	DD	DD	DD	DD	DD	DD	DD	DD
40700	230,609	29,409	4,990,399	1,099,415	3,890,984	1,012,283	466,998	545,285
40801	1,253,730	151,022	23,308,597	6,001,295	17,307,302	4,139,385	2,436,641	1,702,923
40802	1,331,508	166,020	25,820,875	6,217,552	19,603,323	4,806,934	2,639,398	2,167,536
40803	DD	DD	DD	DD	DD	DD	DD	DD
40900	293,615	36,155	5,644,393	1,309,436	4,334,957	1,041,910	542,891	499,020
41000	3,795,527	498,247	78,595,299	22,569,025	56,026,274	15,883,728	10,406,045	5,477,684
41100	337,847	42,746	7,093,933	1,608,230	5,485,704	1,357,103	680,168	676,935
41201	1,063,885	142,800	23,249,650	5,968,244	17,281,406	4,758,425	2,514,606	2,243,818
41202	DD	DD	DD	DD	DD	DD	DD	DD
41300	1,846,959	241,138	38,021,347	9,253,291	28,768,056	7,390,945	3,931,226	3,459,719
41401	272,623	35,908	5,828,833	1,413,725	4,415,109	1,149,285	601,868	547,417
41402	2,594,127	336,681	54,128,796	12,929,365	41,199,431	10,572,049	5,576,706	4,995,343
41501	585,365	76,239	12,343,731	2,905,862	9,437,869	2,361,082	1,226,914	1,134,167
41502	DD	DD	DD	DD	DD	DD	DD	DD
41503	1,192,870	154,938	26,273,569	6,005,436	20,268,133	5,215,771	2,544,513	2,671,258

**Table SS-2012.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
huc6	brd_r_wete	brd_r_drye	brd_ne	brd_r_n	difference	brd_pe	brd_r_p	difference
10100	DD	DD	DD	DD	DD	DD	DD	DD
10200	169,290	22,156	3,311,296	832,539	2,478,757	635,641	351,712	283,928
10300	383,068	55,710	8,449,040	2,876,514	5,572,526	1,859,283	1,176,548	682,735
10400	DD	DD	DD	DD	DD	DD	DD	DD
10500	33,344	4,530	751,573	187,230	564,343	157,585	83,416	74,170
10600	73,134	9,519	1,457,401	348,986	1,108,415	285,079	151,037	134,042
10700	104,347	14,127	2,061,956	510,010	1,551,947	400,828	224,203	176,625
10801	603,596	79,552	12,114,084	3,134,389	8,979,695	2,379,195	1,327,205	1,051,989
10802	187,190	24,931	3,914,140	986,867	2,927,273	793,004	425,192	367,812
10900	96,357	13,051	1,985,641	485,898	1,499,743	409,588	219,826	189,761
11000	495,402	75,291	11,678,994	4,216,116	7,462,879	2,744,113	1,734,117	1,009,996
11100	0	0	0	0	0	0	0	0
20100	0	0	0	0	0	0	0	0
20200	1,920,678	251,726	39,063,152	9,928,465	29,134,687	7,774,107	4,186,277	3,587,830
20301	29,786	4,027	534,867	119,953	414,914	116,951	56,882	60,609
20302	DD	DD	DD	DD	DD	DD	DD	DD
20401	574,217	96,803	15,042,892	5,449,623	9,593,269	3,690,226	2,468,691	1,221,335
20402	1,708,185	278,154	37,695,7					

**Table S5--2007.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
41504	0	0	0	0	0	0	0	0
41505	0	0	0	0	0	0	0	0
50100	1,611,050	208,625	36,308,971	8,443,202	27,865,768	7,438,064	3,562,274	3,875,790
50200	479,185	61,102	10,694,224	2,312,197	8,382,027	2,180,255	995,440	1,184,815
50301	933,861	120,087	20,645,047	4,722,668	15,922,379	4,175,914	2,012,672	2,163,242
50302	241,817	29,765	5,562,404	1,117,147	4,445,257	1,195,198	496,831	698,367
50400	3,025,962	432,503	70,579,479	19,680,019	50,899,460	15,626,267	8,625,361	7,000,905
50500	738,338	49,804	9,866,904	1,949,967	7,916,937	2,462,184	893,246	1,568,939
50600	947,154	114,622	18,522,896	4,073,545	14,449,351	3,680,662	2,117,625	1,563,037
50701	DD	DD	DD	DD	DD	DD	DD	DD
50702	4,584	554	DD	11,952	DD	DD	6,416	DD
50800	2,051,008	301,471	48,168,668	16,631,699	31,536,969	11,293,872	7,655,479	3,638,392
50901	54,673	6,790	1,264,263	213,446	1,050,817	316,114	100,503	215,611
50902	461,891	55,783	9,997,034	2,286,300	7,710,734	2,119,818	1,034,069	1,085,749
51001	233,012	28,839	5,147,854	876,028	4,271,825	1,264,382	415,405	748,976
51002	260,172	31,788	5,139,791	890,638	4,249,153	1,240,255	446,273	993,982
51100	2,103,124	369,893	48,955,969	16,502,136	32,453,833	12,465,920	7,704,917	4,761,003
51201	7,352,304	1,009,135	160,853,697	48,812,803	112,040,893	35,021,065	24,712,232	10,308,833
51202	3,313,673	513,203	81,198,292	27,498,109	53,700,183	19,467,151	13,815,812	5,651,339
51301	871,875	156,680	20,275,502	6,789,917	13,485,585	5,393,917	3,137,186	2,256,731
51302	617,659	92,934	14,162,946	4,609,880	9,553,066	3,574,375	2,111,839	1,462,536
51401	762,182	114,315	17,484,444	4,423,070	13,061,374	4,410,575	2,107,753	2,302,822
51402	810,298	139,983	18,566,144	6,273,634	12,292,510	4,692,989	3,113,956	1,579,033
60101	790,051	128,755	18,050,834	5,431,984	12,618,850	4,572,047	2,468,379	2,103,668
60102	322,910	44,078	6,417,299	1,493,813	4,923,486	1,454,565	702,427	752,668
60200	849,045	183,890	21,218,845	9,360,593	11,858,252	5,927,977	4,229,845	1,698,133
60300	2,798,817	657,480	71,441,197	33,263,964	38,177,233	20,948,959	15,305,416	5,643,543
60400	800,195	157,027	17,681,306	7,002,480	10,678,826	4,765,430	3,305,975	1,459,455
70101	1,107,955	162,931	27,660,134	7,485,793	20,174,341	6,464,474	3,480,854	2,983,620
70102	5,019,135	791,371	122,237,388	39,267,468	82,969,920	28,210,235	18,428,903	9,781,331
70200	11,709,722	1,445,363	232,853,359	59,383,430	173,469,929	44,547,979	30,678,857	13,869,122
70300	1,092,087	149,168	25,852,903	6,478,090	19,374,815	5,579,934	2,812,467	2,767,467
70400	7,135,995	953,584	157,229,766	39,145,076	118,084,690	32,488,494	17,794,608	14,693,886
70500	3,305,159	463,270	78,160,723	20,071,496	58,089,226	16,624,963	8,954,390	7,670,033
70600	7,756,952	892,862	161,019,662	35,372,248	125,647,414	31,896,315	15,891,952	16,004,362
70700	4,707,114	601,791	103,628,286	23,406,476	80,221,810	20,787,302	9,956,988	10,830,314
70801	5,766,827	676,926	113,287,539	25,204,492	88,083,047	21,858,601	13,728,192	8,130,409
70802	10,334,583	1,228,195	200,795,923	48,597,438	152,198,485	38,128,913	25,285,958	12,842,955
70900	7,207,363	884,957	147,112,937	36,475,274	110,637,663	28,636,518	15,766,027	12,870,941
71000	11,234,088	1,443,211	231,085,546	70,497,579	160,587,967	48,537,277	34,333,462	14,203,815
71100	1,664,817	197,997	36,755,322	7,331,952	29,423,370	8,293,289	3,926,328	4,366,961
71200	2,805,964	371,338	59,062,859	17,089,788	41,973,071	12,157,395	7,743,300	4,414,095
71300	3,340,444	384,410	62,274,917	12,274,291	50,000,626	12,645,216	7,627,854	5,107,362
71401	682,541	81,805	15,547,742	2,701,421	12,846,321	3,922,029	1,372,862	2,549,168
71402	1,521,053	188,270	29,637,389	7,204,299	22,433,090	5,922,805	3,540,291	2,382,514
80101	39,080	8,411	885,194	398,043	487,151	245,994	183,900	62,095
80102	1,155,198	238,260	24,998,043	11,068,312	13,929,731	6,734,807	5,228,673	1,506,135
80201	DD	DD	DD	DD	DD	DD	DD	DD
80202	374,270	76,056	8,142,204	3,430,523	4,711,681	2,239,402	1,628,673	610,729
80203	167,638	26,024	2,783,223	892,264	1,890,959	733,614	451,177	282,346
80204	DD	DD	DD	DD	DD	DD	DD	DD
80301	DD	DD	DD	DD	DD	DD	DD	DD
80302	185,339	24,708	2,723,804	718,807	2,004,997	631,892	385,988	245,903
80401	616,510	138,798	17,630,229	7,605,953	10,024,276	5,497,745	3,523,413	1,974,332
80402	1,786,238	452,373	45,363,118	23,239,191	22,123,927	13,377,993	10,629,540	2,748,453
80403	198,151	45,692	4,489,308	2,227,101	2,262,207	1,303,994	1,027,790	276,205
80500	104,792	12,734	DD	221,509	DD	DD	142,890	DD
80601	DD	DD	DD	DD	DD	DD	DD	DD
80602	363,279	72,092	8,870,207	3,925,205	4,945,001	2,404,142	1,777,168	626,974
80701	31,166	3,780	DD	64,718	DD	DD	41,850	DD
80702	561,092	95,904	13,148,801	4,536,954	8,611,847	3,175,321	1,994,891	1,180,430
80703	13,791	1,703	137,227	30,108	107,119	30,251	19,878	10,373
80801	82,697	10,661	DD	182,052	DD	DD	117,003	DD
80802	104,959	13,399	DD	289,730	DD	DD	172,985	DD
80901	DD	DD	DD	DD	DD	DD	DD	DD
80902	34,138	4,368	657,413	149,214	508,198	128,933	67,663	61,270
80903	DD	DD	DD	DD	DD	DD	DD	DD
90100	171,859	19,827	3,338,704	597,825	2,740,879	863,951	309,838	554,113
90201	1,503,165	229,421	36,861,050	11,408,575	25,452,474	8,705,603	5,467,535	3,238,068
90202	290,213	36,690	6,388,894	1,320,020	5,068,873	1,654,117	726,553	927,564
90203	424,758	58,199	9,148,143	2,369,320	6,778,823	2,226,775	1,224,410	1,002,365
90300	13,834	1,695	338,582	54,616	283,966	87,683	25,219	62,464
90400	0	0	0	0	0	0	0	0
100100	DD	DD	DD	DD	DD	DD	DD	DD
100200	260,884	32,315	5,160,607	858,590	4,302,016	1,366,067	432,764	933,303
100301	238,780	28,003	4,582,851	926,428	3,656,423	1,060,422	470,319	590,104
100302	326,006	40,744	6,471,886	1,349,916	5,121,969	1,404,818	746,488	658,330
100401	100,079	11,628	2,108,355	270,962	1,837,393	617,454	143,685	473,769
100402	56,012	7,040	1,535,033	230,887	1,304,147	424,745	121,830	302,915
100500	144,868	17,907	2,598,593	423,649	2,174,944	661,730	253,810	407,920
100600	77,800	9,234	DD	156,577	DD	DD	108,936	DD
100700	460,992	48,129	8,327,531	1,449,945	6,877,586	2,064,606	606,231	1,458,376
100800	240,549	28,816	4,302,312	651,962	3,650,350	1,139,044	350,338	789,005
100901	DD	DD	489,249	63,034	426,214	147,425	41,728	105,697
100902	23,157	2,622	1,014,537	58,021	956,516	361,504	30,872	330,631
101000	343,071	40,334	5,933,164	786,947	5,146,216	1,755,789	468,635	1,287,154

**Table S5--2012.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
huc6	brd_r_wete	brd_r_drye	brd_ne	brd_r_n	difference	brd_pe	brd_r_p	difference
41504	2,422,906	322,504	48,928,190	13,337,999	35,590,191	9,800,590	5,614,195	4,186,395
41505	350,929	45,629	7,077,085	1,798,008	5,279,077	1,378,342	760,814	617,528
50100	1,589,021	207,944	32,954,760	8,336,382	24,618,377	6,641,114	3,541,701	3,236,556
50200	395,249	50,290	8,357,407	1,896,293	6,461,114	1,727,820	815,426	912,394
50301	865,180	115,684	17,857,282	4,542,554	13,314,728	3,664,741	1,944,127	1,720,614
50302	198,136	23,840	4,142,948	847,645	3,295,303	910,656	382,887	527,769
50400	3,331,992	486,092	72,975,844	21,954,529	51,021,315	16,243,869	9,759,255	6,475,614
50500	372,574	53,502	9,833,492	2,316,576	7,516,916	2,627,211	1,081,387	1,545,824
50600	1,131,926	140,681	20,786,856	5,087,583	15,699,273	4,120,208	2,581,903	1,538,305
50701	DD	DD	DD	DD	DD	DD	DD	DD
50702	DD	DD	DD	DD	DD	DD	DD	DD
50800	2,110,018	301,173	45,422,303	16,135,509	29,286,794	10,342,847	7,425,109	2,917,738
50901	67,593	9,909	1,909,771	215,611	1,401,073	541,905	222,449	319,456
50902	449,751	54,650	8,242,000	1,789,229	6,452,771	1,712,116	907,492	804,624
51001	184,076	21,888	3,747,287	655,553	3,091,733	945,800	307,312	638,488
51002	254,961	31,226	4,691,929	781,541	3,910,388	1,193,378	460,607	786,771
51100	2,015,643	367,989	43,877,287	16,585,109	27,292,178	11,363,774	7,654,688	3,709,806
51201	8,097,894	1,114,909	168,796,182	55,076,6				

**Table S5--2007.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOS, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
101101	54,817	6,264	1,552,995	172,090	1,380,905	477,741	83,378	394,363
101102	67,753	6,633	2,289,405	254,778	2,034,627	691,711	93,809	597,903
101201	DD	DD	DD	DD	DD	DD	DD	DD
101202	136,903	16,393	2,429,482	357,742	2,071,739	678,424	199,103	479,321
101301	596,626	65,929	14,265,876	2,116,253	12,149,623	3,853,982	933,555	2,920,427
101302	316,395	37,772	8,452,089	1,267,011	7,185,078	2,298,440	561,487	1,736,952
101303	233,106	23,718	5,969,187	772,944	5,196,243	1,724,140	388,227	1,385,913
101401	869,351	95,470	23,485,798	3,830,588	19,655,210	6,250,416	1,823,463	4,426,953
101402	344,951	34,570	9,440,407	1,406,613	8,033,795	2,389,096	DD	DD
101500	1,485,176	140,953	30,226,607	5,805,422	24,421,185	6,571,742	2,121,785	4,449,957
101600	3,365,528	387,501	79,758,574	16,181,534	63,577,038	19,211,774	7,616,953	11,594,821
101701	2,431,223	273,856	54,770,452	13,227,102	41,543,350	12,516,702	5,482,850	7,033,852
101702	8,588,237	964,687	164,103,727	40,003,099	124,100,628	31,167,374	18,227,979	12,939,395
101800	2,655,500	239,057	47,219,521	10,613,719	36,605,803	8,723,754	3,533,440	5,190,314
101900	8,135,049	870,722	148,321,558	39,609,731	108,711,827	25,982,122	14,573,611	11,408,511
102001	3,697,427	327,639	61,800,644	15,507,718	46,292,926	9,647,001	4,999,427	4,647,574
102002	1,764,005	182,102	31,705,960	7,735,634	23,970,326	5,795,660	3,521,698	2,273,962
102100	4,474,289	427,290	88,507,175	18,604,015	69,903,160	17,572,392	7,313,677	10,258,715
102200	6,672,364	644,260	120,896,670	30,750,462	90,146,207	21,627,175	11,259,416	10,367,759
102300	10,114,992	1,154,208	182,672,702	46,025,773	136,646,928	33,440,815	22,221,879	11,218,936
102400	3,782,615	436,790	74,924,310	17,897,928	57,026,382	16,006,268	8,701,028	7,305,239
102500	7,445,477	691,053	132,944,848	31,297,654	101,197,194	22,816,644	11,644,025	11,712,619
102600	3,993,762	361,539	71,506,197	16,423,908	55,082,289	12,725,892	5,396,134	7,329,758
102701	713,342	77,329	15,208,518	2,807,928	12,400,590	3,492,448	1,279,190	2,213,258
102702	4,060,493	423,500	76,151,363	18,579,685	57,571,679	14,268,759	7,729,770	6,538,989
102801	2,860,793	335,075	58,025,195	12,137,228	45,887,967	11,807,539	7,163,792	4,643,746
102802	282,394	32,145	6,092,926	945,669	5,147,256	1,570,930	543,998	1,026,931
102901	2,025,458	296,382	53,031,603	13,218,110	39,813,492	14,160,109	7,026,578	7,133,530
102902	1,855,726	187,962	36,796,192	7,265,944	9,783,776	3,069,835	1,316,394	1,753,440
103001	4,852,726	299,642	46,667,681	14,096,269	32,571,412	12,608,366	7,120,356	5,488,009
103002	171,301	20,262	4,212,835	708,843	3,503,992	1,002,818	404,530	598,288
101100	3,910,642	895,167	112,888,938	48,265,338	64,623,580	33,225,244	22,965,034	10,260,210
101200	1,675,116	155,624	28,136,644	6,636,653	21,522,700	5,092,948	2,456,371	2,636,577
101300	12,840,214	1,167,424	211,512,856	54,652,232	156,860,624	32,329,002	17,944,895	14,294,107
101400	7,016,704	651,823	116,613,594	30,179,902	86,433,693	17,426,616	10,645,229	6,781,387
101500	1,588,066	168,705	28,554,552	6,340,378	22,214,174	5,421,791	3,202,722	2,219,069
101600	409,359	44,963	7,277,098	1,216,740	6,060,359	1,843,101	595,119	1,247,982
101701	420,922	50,336	10,265,939	1,515,526	8,750,413	2,934,822	778,659	2,156,163
101702	3,666,791	726,524	97,348,694	37,713,797	59,634,897	27,242,471	17,348,900	9,894,381
101800	25,106	2,922	DD	59,998	DD	DD	33,597	DD
101901	3,225,972	294,944	55,285,088	14,270,570	41,014,518	8,540,236	4,471,834	4,068,402
101902	456,639	57,112	DD	DD	DD	2,411,886	1,040,869	1,371,018
111001	8,125,583	762,141	135,616,842	34,768,031	100,848,812	19,684,592	13,537,705	6,146,887
111002	2,393,020	247,383	DD	DD	DD	5,160,565	DD	DD
111003	371,632	43,097	6,975,624	1,389,485	5,586,139	1,573,732	802,648	771,085
111101	2,408,278	562,056	65,065,898	29,563,640	35,502,258	19,273,008	13,777,714	5,495,293
111102	2,742,724	646,466	73,506,721	33,430,680	40,076,041	21,680,381	15,879,218	5,801,163
111201	8,167,569	732,696	133,109,815	35,806,233	97,303,582	18,836,422	11,013,601	7,822,820
111202	DD	26,841	DD	DD	DD	683,298	405,412	277,886
111203	1,037,333	88,755	16,966,525	4,511,696	12,454,829	2,390,455	1,334,348	1,056,107
111301	109,141	13,376	1,629,773	388,721	1,291,052	376,255	178,859	197,396
111302	432,419	53,817	9,417,830	1,866,135	7,551,695	2,196,112	820,979	1,375,133
111303	778,673	81,863	14,540,539	3,053,859	11,486,680	3,011,924	1,360,375	1,651,549
111401	2,044,972	444,676	51,670,966	21,354,331	30,316,634	15,298,685	10,039,687	5,258,997
111402	834,546	199,546	21,610,545	10,018,783	11,591,763	6,517,300	4,610,125	1,907,174
111403	2,013,364	402,865	48,036,389	19,416,737	28,619,652	12,897,631	8,739,554	4,158,077
121000	1,883,706	413,522	46,139,282	20,275,500	25,863,782	12,910,910	9,241,112	3,669,798
120200	1,425,605	328,381	36,566,322	16,327,817	20,238,505	10,715,467	7,481,142	3,234,326
120301	689,598	98,904	15,231,966	4,251,071	10,980,894	4,050,664	1,973,365	2,077,299
120302	273,258	45,620	6,954,121	1,833,523	5,120,598	2,080,832	892,228	1,188,604
120401	109,372	15,942	2,468,215	531,603	1,936,612	723,273	270,835	452,438
120402	55,629	6,758	DD	DD	DD	DD	75,204	DD
120500	10,292,183	1,075,339	175,639,476	46,626,092	129,013,384	28,042,164	16,549,471	11,492,693
120601	307,906	33,254	5,755,727	879,892	4,875,836	1,548,346	404,191	1,144,154
120602	1,404,326	194,316	29,766,671	8,050,097	21,716,574	6,553,633	3,629,989	2,923,644
120701	692,039	124,561	16,192,042	5,593,970	10,598,072	4,768,585	2,589,777	2,178,808
120702	1,055,520	159,146	24,775,701	7,121,722	17,653,978	5,825,924	3,325,522	2,500,402
120800	653,989	78,452	11,795,570	2,787,128	9,008,622	2,352,768	1,181,291	1,171,477
120901	572,063	65,684	10,805,132	2,618,177	8,186,955	2,061,794	1,037,128	1,024,667
120902	78,465	10,568	1,849,289	289,388	1,559,902	433,266	137,035	296,231
120903	102,835	12,959	2,733,608	457,638	2,275,970	832,686	214,532	618,153
120904	DD	DD	DD	DD	DD	DD	DD	DD
121001	177,779	32,525	4,735,862	1,964,589	2,771,273	1,445,293	865,749	579,544
121002	907,959	196,453	25,743,899	11,867,072	13,876,827	7,629,715	5,100,247	2,529,468
121003	175,612	19,704	DD	DD	DD	DD	279,998	DD
121004	133,802	13,857	2,435,508	404,658	2,030,850	614,950	173,764	441,186
121101	505,917	48,415	9,477,445	1,974,778	7,502,467	1,947,168	690,161	1,257,007
121102	329,395	29,579	5,349,598	1,291,835	4,057,763	887,576	417,588	469,988
130100	126,883	15,631	1,577,350	312,495	1,264,855	368,163	190,622	177,540
130201	37,122	4,553	DD	DD	DD	DD	53,381	DD
130202	565,167	72,267	10,447,577	2,478,428	7,969,150	2,112,741	1,096,705	1,016,036
130301	DD	DD	DD	DD	DD	DD	DD	DD
130302	459,924	58,977	8,650,567	2,146,846	6,503,721	1,672,953	909,327	763,626
130401	DD	DD	DD	DD	DD	DD	DD	DD
130402	DD	DD	DD	DD	DD	DD	DD	DD
130403	1,640	250	DD	5,516	DD	DD	3,042	DD

**Table S5--2012.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOS, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
huc6	brd_r_wete	brd_r_drye	brd_ne	brd_r_n	difference	brd_pe	brd_r_p	difference
101101	97,845	11,563	1,288,356	231,260	1,057,096	336,217	139,111	197,105
101102	78,655	8,708	1,848,467	215,776	1,632,691	568,538	104,709	463,829
101201	DD	DD	DD	DD	DD	DD	DD	DD
101202	97,600	10,947	2,416,573	264,801	2,151,772	766,599	133,363	633,236
101301	703,538	78,547	14,939,255	2,203,087	12,736,168	4,220,799	1,118,943	3,101,855
101302	311,318	36,505	7,590,731	1,104,405	6,486,327	2,164,103	580,749	1,655,354
101303	258,440	27,387	5,968,328	799,045	5,169,284	1,753,224	373,202	1,380,022
101401	887,997	99,108	21,447,250	3,876,458	17,570,792	5,862,101	1,778,740	4,083,361
101402	459,693	47,770	9,432,272	1,406,237	8,026,035	2,613,266	624,175	1,989,092
101500	1,774,575	168,081	32,815,578	6,781,915	26,033,663	7,190,187	2,554,959	4,635,228
101600	3,269,172	387,675	68,233,343	15,410,630	53,222,713	16,690,041	5,885,766	9,104,275
101701	2,443,276	274,246	47,456,457	12,654,786	34,801,671	10,496,616	5,304,009	5,192,606
101702	10,036,844	1,129,781	173,879,380	45,170,785	128,708,595	27,328,379	20,830,982</	

**Table S5--2007.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
130500	171,154	24,592	3,851,772	1,239,022	2,612,749	871,489	512,871	358,618
130600	1,967,312	256,392	37,661,686	9,772,808	27,888,878	6,968,053	4,120,194	2,847,859
130700	164,828	21,126	3,749,753	760,859	2,988,894	887,065	333,284	553,781
130800	DD	DD	DD	DD	DD	DD	DD	DD
130900	DD	DD	DD	DD	DD	DD	DD	DD
140100	134,361	18,552	2,167,782	DD	DD	DD	DD	DD
140200	170,609	22,748	3,140,740	DD	DD	820,653	383,896	436,757
140300	105,024	12,539	1,697,576	263,322	1,434,254	457,634	143,598	314,037
140401	25,262	2,945	1,307,910	78,571	1,229,339	367,996	35,751	332,246
140402	2,309	233	DD	7,544	DD	DD	3,047	DD
140500	52,728	6,856	1,135,668	140,351	995,317	297,758	81,102	216,656
140600	170,279	22,698	4,499,306	774,599	3,724,707	1,244,687	373,498	871,189
140700	99,617	14,862	2,322,725	DD	DD	DD	DD	DD
140801	244,817	29,946	DD	629,119	DD	DD	352,382	DD
140802	123,693	16,556	1,549,100	318,929	1,230,171	333,773	193,692	140,080
150100	166,055	20,251	2,182,264	400,847	1,781,417	535,554	244,362	291,192
150200	684,765	86,255	DD	DD	DD	DD	DD	DD
150301	52,454	7,954	DD	DD	DD	DD	95,573	DD
150302	37,000	4,492	DD	72,401	DD	DD	47,982	DD
150400	115,701	14,081	1,444,649	273,612	1,171,036	359,777	167,659	192,118
150501	1,139,544	146,932	DD	5,114,673	DD	DD	2,207,298	DD
150502	DD	DD	DD	DD	DD	DD	DD	DD
150503	2,238,961	229,699	37,352,656	10,076,488	27,276,169	5,647,487	3,478,156	2,169,331
150601	199,339	26,114	DD	841,758	DD	DD	381,712	DD
150602	55,676	7,015	686,737	118,784	567,953	172,900	75,560	97,340
150701	1,598,506	215,033	30,319,544	8,842,969	21,476,575	5,811,618	3,711,812	2,099,806
150702	DD	DD	DD	DD	DD	DD	DD	DD
150801	DD	DD	DD	DD	DD	DD	DD	DD
150802	0	0	0	0	0	0	0	0
150803	4,619	565	DD	11,699	DD	DD	6,282	DD
160101	49,278	5,872	1,420,623	120,307	1,300,316	452,485	64,829	387,656
160102	861,471	114,693	17,934,900	4,664,603	13,270,297	3,892,350	2,001,079	1,891,271
160201	170,368	21,347	3,903,823	746,168	3,157,656	875,751	319,579	556,172
160202	416,021	56,757	9,609,163	2,578,897	7,030,267	2,228,237	1,091,669	1,136,568
160203	437,865	55,455	9,331,417	2,549,242	6,782,175	2,048,055	1,023,179	1,024,876
160300	2,143,884	280,586	46,680,835	11,731,709	34,949,126	9,997,399	6,310,935	3,686,465
160401	117,508	12,869	1,841,711	315,719	1,525,992	461,554	153,475	308,079
160402	DD	DD	DD	DD	DD	DD	DD	DD
160501	43,487	5,286	762,015	133,576	628,438	185,970	65,239	120,731
160502	283,553	36,763	DD	1,252,252	DD	DD	539,287	DD
160503	DD	DD	DD	257,670	DD	DD	DD	DD
160600	227,597	28,584	DD	697,168	DD	738,513	365,799	372,714
170101	9,615	1,212	DD	29,858	DD	DD	15,468	DD
170102	163,872	20,314	3,638,720	558,313	3,080,408	994,601	273,518	721,083
170103	62,831	7,896	1,190,894	229,078	961,816	272,788	109,540	163,248
170200	2,038,177	237,586	38,171,874	10,554,679	27,617,195	7,484,447	4,081,316	3,403,131
170300	1,993,842	254,236	36,478,494	9,400,696	27,077,797	6,672,908	3,937,014	2,735,894
170401	55,141	6,708	1,328,098	206,925	1,121,172	333,121	96,078	237,042
170402	10,469,016	1,299,464	193,997,201	47,998,081	145,999,120	37,058,490	20,046,465	17,012,025
170501	4,452,118	516,781	78,697,654	18,971,325	59,726,330	14,862,033	7,611,188	7,250,845
170502	49,676	5,533	1,532,576	159,084	1,373,492	481,906	72,584	409,322
170601	174,775	20,367	3,637,289	575,478	3,061,811	953,339	281,932	671,407
170602	39,586	4,770	873,631	109,456	764,175	259,557	58,339	201,218
170603	28,344	3,200	684,404	76,792	607,612	208,792	38,484	170,309
170701	1,732,590	188,399	29,212,242	7,592,020	21,620,222	4,939,649	2,807,162	2,132,487
170702	49,630	5,322	1,147,106	143,988	1,003,117	335,426	65,935	269,490
170703	120,692	13,804	2,785,484	338,762	2,446,722	831,442	175,617	655,825
170800	425,999	76,691	9,501,598	3,428,579	6,073,019	2,296,972	1,533,307	763,665
170900	1,173,771	182,759	25,709,875	8,567,546	17,142,329	5,836,865	3,692,973	2,143,892
171001	250,085	40,041	6,052,848	2,301,510	3,751,338	1,469,643	951,187	518,457
171002	552,904	71,700	11,270,916	2,774,393	8,496,523	2,201,938	1,181,446	1,020,492
171003	149,394	19,556	3,835,896	726,940	3,108,957	1,041,824	327,751	714,072
171100	1,933,871	259,692	38,955,318	10,583,935	28,371,383	7,769,347	4,471,074	3,298,273
171200	91,287	10,960	1,674,494	195,573	1,478,920	519,098	124,219	394,879
180101	1,084,825	158,159	24,195,204	7,079,471	17,115,733	5,331,818	3,029,600	2,302,217
180102	246,500	29,384	5,157,527	933,726	4,223,801	1,293,302	425,634	867,668
180200	DD	DD	1,113,389	57,287	1,056,103	410,592	35,130	375,462
180201	1,226,281	158,682	23,332,002	5,639,288	17,692,715	4,634,486	2,443,380	2,191,106
180300	22,485,389	2,975,174	412,299,563	114,629,062	297,670,501	76,549,419	48,522,789	28,026,630
180400	16,038,997	2,309,570	323,000,308	96,620,916	226,379,393	65,645,521	41,874,379	23,771,142
180500	311,366	42,189	6,883,352	1,612,210	5,271,142	1,506,982	714,262	792,720
180600	270,435	36,580	6,019,895	1,366,792	4,653,103	1,420,847	636,766	784,082
180701	77,212	11,415	1,259,168	309,122	950,047	248,704	151,831	96,873
180702	3,041,435	419,841	59,659,266	18,462,007	41,197,259	11,935,446	7,681,687	4,253,759
180703	426,590	67,165	9,773,770	3,671,657	6,102,114	2,330,449	1,550,355	780,094
180800	DD	DD	DD	25,406	DD	DD	DD	DD
180901	DD	DD	DD	DD	DD	DD	DD	DD
180902	766,924	103,773	14,656,630	4,023,807	10,632,823	2,722,706	1,745,509	977,197
181001	DD	DD	DD	DD	DD	DD	DD	DD
181002	2,560,384	235,544	40,845,270	11,170,936	29,674,334	5,559,456	3,498,301	2,061,155
190101	0	0	0	0	0	0	0	0
190102	0	0	0	0	0	0	0	0
190103	0	0	0	0	0	0	0	0
190104	0	0	0	0	0	0	0	0
190201	DD	DD	DD	DD	DD	DD	DD	DD
190202	0	0	0	0	0	0	0	0

**Table S5--2012.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
huc6	brd_r_wete	brd_r_drye	brd_ne	brd_r_n	difference	brd_pe	brd_r_p	difference
130500	DD	DD	DD	DD	DD	DD	DD	DD
130600	1,954,655	254,216	35,292,020	9,425,013	25,867,007	6,647,638	4,006,566	2,641,072
130700	DD	DD	DD	DD	DD	DD	DD	DD
130800	DD	DD	DD	DD	DD	DD	DD	DD
130900	DD	DD	DD	DD	DD	DD	DD	DD
140100	113,626	17,187	2,226,941	708,264	1,518,676	578,691	324,081	254,611
140200	257,651	32,985	4,119,901	1,100,681	3,019,220	966,815	517,877	448,938
140300	44,751	5,696	1,088,786	312,033	776,863	323,304	63,714	268,589
140401	33,291	4,051	423,943	75,408	348,535	110,572	47,035	63,537
140402	DD	DD	DD	DD	DD	DD	DD	DD
140500	DD	DD	DD	DD	DD	DD	DD	DD
140600	198,411	26,328	4,044,799	877,166	3,167,633	1,019,261	418,637	600,624
140700	DD	DD	DD	DD	DD	DD	DD	DD
140801	137,759	16,643	1,711,443	315,512	1,395,931	429,212	181,504	247,708
140802	DD	DD	DD	DD	DD	DD	DD	DD
150100	120,244	15,217	1,442,297	286,773	1,155,524	336,485	173,732	162,753
150200	775,336	98,290	10,880,675	2,409,581	8,471,094	2,151,975	1,494,423	657,552
150301	DD	DD	DD	DD	DD	DD	DD	DD
150302	15,516	1,756	255,468	31,373	224,095	79,837	19,410	60,427
150400	DD	DD	DD	DD	DD	DD	DD	DD
150501	DD	DD	DD	DD	DD	DD	DD	DD
150502	DD	DD	DD	DD	DD	DD	DD	DD
150503	DD	DD	DD	DD	DD	DD	DD	DD
150601	DD	DD	DD	DD	DD	DD	DD	DD
150602	DD	DD	DD	DD	DD	DD	DD	DD
150701	1,804,567	248,883	33,247,666	10,762,503	22,485,164	6,416,890	4,450,115	1,966,775
150702	DD	DD	DD	DD	DD	DD	DD	DD
150801	DD	DD	DD	DD	DD	DD	DD	DD
150802	0	0	0	0	0	0	0	0
150803	DD	DD	DD	DD	DD	DD	DD	DD
160101	DD	DD	DD	DD	DD	DD	DD	DD
160102	943,093	126,485	18,476,858	5,185,184	13,291,674	4,011,190	2,241,788	1,769,402
160201	171,960	22,446	2,871,980	735,290	2,136,690	550,931	326,715	

**Table S5--2007.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
190203	DD	DD	DD	DD	DD	DD	948	DD
190204	DD	DD	DD	DD	DD	DD	DD	DD
190205	7,610	1,050	DD	40,072	DD	DD	18,265	DD
190206	0	0	0	0	0	0	0	0
190207	DD	DD	DD	DD	DD	DD	DD	DD
190301	0	0	0	0	0	0	0	0
190302	0	0	0	0	0	0	0	0
190303	0	0	0	0	0	0	0	0
190304	0	0	0	0	0	0	0	0
190305	0	0	0	0	0	0	0	0
190401	DD	DD	DD	DD	DD	DD	DD	DD
190402	0	0	0	0	0	0	0	0
190403	0	0	0	0	0	0	0	0
190404	DD	DD	DD	DD	DD	DD	DD	DD
190405	3,112	388	DD	12,494	DD	DD	5,899	DD
190406	0	0	0	0	0	0	0	0
190407	0	0	0	0	0	0	0	0
190408	0	0	0	0	0	0	0	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	42,030	5,495	DD	207,774	DD	DD	92,194	DD
200200	DD	DD	DD	DD	DD	DD	DD	DD
200400	0	0	0	0	0	0	0	0
200500	DD	DD	DD	DD	DD	DD	DD	DD
200600	38,438	6,254	DD	DD	DD	DD	DD	DD
200700	DD	DD	DD	DD	DD	DD	DD	DD
200800	DD	DD	DD	DD	DD	DD	DD	DD

**Table S5--2012.** Quantity of Recoverable and Non-Recoverable Manure and Manure Nutrients Produced on AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Quantity of recoverable manure, wet weight (tons)	Quantity of recoverable manure, dry weight (tons)	Manure nitrogen as excreted (pounds)	Recoverable manure nitrogen (pounds)	Non-recoverable manure nitrogen (pounds)	Manure phosphorus as excreted (pounds)	Recoverable manure phosphorus (pounds)	Non-recoverable manure phosphorus (pounds)
huc6	brd_r_wete	brd_r_drye	brd_ne	brd_r_n	difference	brd_pe	brd_r_p	difference
190203	DD	DD	DD	DD	DD	DD	DD	DD
190204	DD	DD	DD	DD	DD	DD	DD	DD
190205	DD	DD	DD	DD	DD	DD	DD	DD
190206	0	0	0	0	0	0	0	0
190207	0	0	0	0	0	0	0	0
190301	0	0	0	0	0	0	0	0
190302	0	0	0	0	0	0	0	0
190303	0	0	0	0	0	0	0	0
190304	0	0	0	0	0	0	0	0
190305	0	0	0	0	0	0	0	0
190401	0	0	0	0	0	0	0	0
190402	0	0	0	0	0	0	0	0
190403	0	0	0	0	0	0	0	0
190404	DD	DD	DD	DD	DD	DD	DD	DD
190405	DD	DD	DD	DD	DD	DD	DD	DD
190406	0	0	0	0	0	0	0	0
190407	0	0	0	0	0	0	0	0
190408	0	0	0	0	0	0	0	0
190501	0	0	0	0	0	0	0	0
190502	0	0	0	0	0	0	0	0
200100	DD	DD	DD	DD	DD	DD	DD	DD
200200	DD	DD	DD	DD	DD	DD	DD	DD
200400	0	0	0	0	0	0	0	0
200500	DD	DD	DD	DD	DD	DD	DD	DD
200600	DD	DD	DD	DD	DD	DD	DD	DD
200700	DD	DD	DD	DD	DD	DD	DD	DD
200800	0	0	0	0	0	0	0	0

Sum of column	514,031,823	71,067,816	9,939,983,337	3,130,632,937	6,809,350,400	2,125,048,925	1,404,887,472	720,161,453
National total	532,088,930	73,237,187	10,262,788,683	3,220,197,752	7,042,590,931	2,188,915,535	1,443,883,156	745,032,379
national total	96.61%	97.04%	96.85%	97.22%	96.69%	97.08%	97.30%	96.66%

Notes: Non-recoverable manure nitrogen includes nitrogen volatilized and nitrogen lost during on-farm collection, handling, and treatment. Non-recoverable manure phosphorus includes phosphorus lost during on-farm collection, handling, and treatment.

For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

**Table S6-2007.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure	
				nitrogen (pounds)	phosphorus (pounds)
10100	846	116,527	51,819	0	0
10200	4,267	709,762	299,591	DD	DD
10300	7,736	1,343,986	566,204	40,995	DD
10400	2,925	411,151	186,679	3,568,217	1,428,697
10500	1,414	180,939	76,484	DD	DD
10600	2,296	334,104	143,437	49,824	22,998
10700	2,054	404,207	174,812	116,204	59,519
10801	17,178	2,958,511	1,251,973	DD	DD
10802	5,270	1,001,434	429,385	187,140	79,974
10900	2,212	399,779	174,311	115,994	57,909
11000	8,829	2,048,557	867,980	DD	DD
11100	8,922	1,551,795	655,600	57,998	24,521
20100	60,105	11,313,585	4,764,757	927,741	376,883
20200	51,628	9,036,153	3,814,894	507,772	215,074
20301	902	144,053	64,945	22,786	12,199
20302	49	3,940	2,312	182,503	117,560
20401	20,075	2,779,944	1,236,335	DD	DD
20402	40,221	7,251,959	3,256,262	5,423,789	2,410,773
20403	405	42,653	20,126	DD	DD
20501	86,151	13,067,436	5,550,050	954,236	466,551
20502	30,153	4,233,637	1,851,116	1,292,825	616,239
20503	194,286	37,593,330	16,605,698	25,654,702	11,753,776
20600	97,523	11,943,002	5,438,581	34,499,381	15,754,220
20700	170,610	22,061,173	9,984,351	36,866,512	17,444,775
20801	14,990	1,827,699	838,384	2,159,610	1,011,718
20802	21,885	2,380,180	1,152,533	4,185,113	1,940,805
30101	27,016	2,769,672	1,288,748	2,427,434	1,266,119
30102	26,593	2,214,152	1,137,979	5,824,024	3,074,174
30201	14,547	1,406,845	830,020	5,942,779	3,235,063
30202	73,083	7,073,507	4,078,217	18,446,559	10,299,091
30203	0	0	0	0	0
30300	168,197	16,871,316	9,625,015	61,601,106	33,348,882
30401	82,620	8,082,985	3,769,689	27,799,268	12,913,193
30402	81,735	7,029,817	3,724,341	24,524,016	12,566,725
30501	47,518	3,902,161	1,835,807	17,221,602	8,338,799
30502	17,495	2,125,794	997,055	5,358,912	2,453,780
30601	56,054	4,707,908	2,157,125	35,154,692	15,965,223
30602	11,687	1,319,810	631,055	2,037,547	948,670
30701	44,407	3,863,629	1,764,520	22,412,840	9,981,016
30702	18,093	2,093,516	996,235	6,162,995	2,768,247
30801	3,336	DD	DD	237,536	116,205
30802	DD	DD	DD	DD	7,074
30901	10,170	2,242,329	947,779	DD	DD
30902	DD	316,121	142,413	418,971	205,478
31001	4,524	618,858	270,557	DD	401,613
31002	5,499	739,219	326,980	DD	DD
31101	3,351	616,062	272,605	1,117,435	512,864
31102	32,677	4,746,495	2,181,097	15,330,261	6,722,909
31200	9,082	703,478	334,888	2,983,970	1,358,436
31300	47,821	5,558,108	2,638,700	20,957,156	9,552,822
31401	4,202	334,205	159,108	1,748,717	758,939
31402	35,460	3,165,049	1,496,279	11,694,977	5,335,530
31403	15,660	1,500,999	696,569	6,393,279	2,914,038
31501	50,425	3,980,412	1,885,589	44,819,270	20,473,521
31502	8,799	502,435	244,111	2,151,014	998,797
31601	61,263	5,171,710	2,454,109	26,581,613	12,493,575
31602	4,807	459,002	224,401	803,183	363,732
31700	39,181	4,417,908	2,074,345	27,544,731	12,517,196
31800	55,043	6,579,794	3,044,026	34,026,963	15,572,995
40101	0	0	0	0	0
40102	2,295	161,878	69,982	DD	DD
40103	4,409	380,763	161,880	DD	DD
40201	DD	66,451	27,656	DD	DD
40202	1,107	103,014	44,693	0	0
40203	0	0	0	0	0
40301	114,014	19,270,757	8,141,325	2,176,536	950,398
40302	97,529	17,097,499	7,201,879	1,623,399	709,725
40400	14,413	2,868,379	1,208,565	91,300	43,285
40500	134,551	23,704,507	10,873,240	15,620,930	7,205,454
40601	36,170	5,273,530	2,335,949	1,653,955	897,500
40602	361	33,193	13,842	DD	DD
40700	8,898	1,044,033	443,621	DD	DD
40801	19,081	3,691,909	1,466,571	2,309,386	969,891
40802	28,161	4,917,532	2,092,892	1,300,020	546,506
40803	DD	DD	DD	0	0
40900	7,451	1,257,435	518,806	52,001	24,085
41000	64,811	12,426,315	5,924,631	10,142,710	4,481,414
41100	9,211	1,494,541	626,678	DD	DD

**Table S6-2012.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
10100	DD	DD	DD	DD	DD
10200	4,729	726,344	306,587	106,196	45,126
10300	10,457	1,593,205	673,425	1,283,309	503,123
10400	DD	DD	DD	DD	DD
10500	1,703	146,765	62,590	40,465	20,826
10600	2,193	327,565	140,630	21,421	10,407
10700	2,280	445,066	189,065	64,943	35,138
10801	16,759	2,870,597	1,216,704	263,791	110,501
10802	4,977	843,196	362,602	143,670	62,590
10900	1,989	329,566	145,373	156,332	74,454
11000	8,365	1,934,844	816,803	2,281,272	917,315
11100	0	0	0	0	0
20100	0	0	0	0	0
20200	53,380	9,207,468	3,877,417	720,997	308,861
20301	568	77,351	33,198	42,602	23,684
20302	DD	DD	DD	DD	DD
20401	23,587	3,501,643	1,632,162	1,947,980	865,529
20402	37,774	7,268,612	3,235,443	6,478,880	2,862,430
20403	DD	DD	DD	DD	DD
20501	81,823	12,419,985	5,283,198	932,004	497,664
20502	25,553	4,494,200	1,990,400	1,656,666	765,632
20503	200,923	41,418,950	18,219,275	28,981,228	12,879,172
20600	33,209	4,503,364	2,040,891	6,055,660	2,772,786
20700	141,658	22,895,810	10,319,151	30,844,133	14,690,560
20801	58,002	8,471,681	3,876,475	24,977,867	11,451,405
20802	19,201	2,163,667	1,020,498	4,193,391	1,951,570
30101	22,007	2,812,235	1,240,884	2,240,868	1,221,557
30102	18,504	2,043,991	1,034,788	5,527,749	2,711,008
30201	13,489	1,280,768	724,929	6,003,027	2,954,136
30202	66,076	8,056,163	4,646,899	13,120,116	7,522,800
30203	7,868	926,552	510,089	2,161,427	1,171,176
30300	129,507	16,905,333	9,324,030	50,647,940	27,489,153
30401	77,464	10,445,121	4,872,499	21,794,462	10,031,834
30402	56,443	7,337,492	3,751,651	23,958,625	12,189,304
30501	37,736	4,534,842	2,131,872	19,929,889	9,393,503
30502	16,421	2,171,532	1,004,617	5,507,486	2,544,227
30601	63,280	6,511,616	2,990,347	38,220,046	17,390,131
30602	9,455	1,379,680	635,420	1,880,547	889,885
30701	42,358	4,607,139	2,118,787	20,939,069	9,293,180
30702	19,680	2,859,578	1,333,154	6,387,726	2,874,161
30801	2,928	613,311	266,902	239,735	127,259
30802	DD	DD	DD	DD	DD
30901	10,048	2,425,479	1,028,404	2,820,280	1,273,537
30902	2,337	340,375	151,264	745,675	429,475
31001	4,245	862,962	370,756	793,920	345,888
31002	5,703	845,365	365,996	3,101,559	1,256,883
31101	5,630	880,573	381,762	795,150	358,549
31102	32,380	4,991,218	2,213,271	11,615,468	5,064,586
31200	6,304	871,699	414,372	1,890,405	868,036
31300	34,605	5,143,253	2,356,388	19,913,224	9,075,135
31401	2,389	246,393	131,709	1,668,806	740,588
31402	27,154	2,880,277	1,343,838	13,676,259	6,245,332
31403	13,275	1,697,857	787,321	6,335,626	2,733,183
31501	52,983	4,954,321	2,316,453	48,525,835	22,146,597
31502	5,563	554,964	280,781	2,584,160	1,192,697
31601	44,951	5,314,620	2,505,706	24,217,924	11,304,607
31602	2,393	354,778	178,421	474,110	211,908
31700	35,799	3,682,859	1,717,560	26,324,061	12,037,068
31800	47,859	6,035,424	2,816,804	33,258,614	15,205,676
40101	DD	DD	DD	DD	DD
40102	1,836	187,979	81,455	2,861	1,953
40103	3,554	412,741	175,773	8,339	5,181
40201	653	52,041	23,596	517	297
40202	DD	DD	DD	DD	DD
40203	0	0	0	0	0
40301	115,092	23,900,518	10,076,429	3,268,388	1,410,781
40302	107,032	18,746,306	7,905,405	2,066,139	899,195
40400	19,358	3,172,149	1,362,517	271,778	115,516
40500	157,773	27,558,272	12,541,395	23,193,097	10,832,513
40601	35,129	6,118,210	2,737,191	651,787	393,825
40602	DD	DD	DD	DD	DD
40700	7,058	887,877	382,843	69,769	30,403
40801	24,125	4,642,874	1,833,160	3,582,986	1,499,388
40802	25,805	4,732,338	2,029,465	1,874,350	795,796
40803	0	0	0	0	0
40900	8,317	1,502,575	608,951	111,660	52,781
41000	78,679	12,176,578	5,803,610	13,401,463	5,873,497
41100	8,795	1,446,321	635,800	149,958	66,773

**Table S6-2007.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
41201	26,718	4,946,852	2,104,017	DD	DD
41202	DD	DD	DD	0	0
41300	40,255	8,307,281	3,522,981	946,010	408,245
41401	6,717	1,301,216	551,945	DD	49,922
41402	58,188	11,597,274	4,933,192	1,332,090	643,514
41501	15,411	2,789,986	1,178,693	DD	DD
41502	DD	DD	DD	0	0
41503	34,596	5,932,528	2,513,110	72,908	31,402
41504	0	0	0	0	0
41505	0	0	0	0	0
50100	42,690	7,456,382	3,148,154	DD	DD
50200	13,385	2,235,567	954,882	76,631	40,558
50301	24,163	4,327,552	1,836,392	DD	DD
50302	8,242	1,023,200	457,506	DD	DD
50400	65,362	12,097,479	5,276,196	7,582,540	3,349,166
50500	15,193	1,418,799	624,866	DD	DD
50600	16,336	2,961,228	1,457,408	1,112,317	660,217
50701	DD	DD	DD	0	0
50702	108	7,861	3,922	4,091	2,494
50800	36,795	6,754,242	3,325,653	9,877,457	4,329,826
50901	1,742	187,148	86,041	26,298	14,462
50902	10,541	1,391,617	692,281	894,683	341,787
51001	9,825	723,057	343,177	152,971	72,228
51002	10,334	782,167	382,350	108,471	63,923
51100	59,728	7,196,705	3,418,607	9,305,431	4,286,310
51201	126,909	25,647,001	13,202,923	23,165,802	11,509,308
51202	63,977	11,542,602	6,217,294	15,955,507	7,598,519
51301	27,175	2,569,869	1,193,018	4,220,048	1,944,168
51302	17,594	1,914,794	939,603	DD	DD
51401	24,985	2,736,884	1,303,334	1,686,186	804,420
51402	13,648	2,150,726	1,137,830	4,122,908	1,976,126
60101	24,602	2,667,442	1,219,822	2,764,542	1,248,557
60102	11,606	1,044,197	486,205	449,616	216,222
60200	18,263	1,764,682	809,545	7,595,912	3,420,299
60300	75,600	6,739,648	3,217,857	26,524,315	12,087,559
60400	22,389	2,084,395	1,024,996	4,918,084	2,280,979
70101	42,090	4,079,340	1,770,476	3,406,453	1,710,378
70102	158,146	18,474,325	8,091,025	20,793,144	10,337,878
70200	166,620	31,818,963	15,819,558	27,564,467	14,859,299
70300	40,212	4,860,231	2,058,450	1,617,860	754,017
70400	151,107	29,605,410	12,932,250	9,539,666	4,862,358
70500	103,285	14,639,428	6,169,307	DD	DD
70600	135,275	30,331,515	13,334,630	5,040,733	2,557,323
70700	128,801	21,146,191	8,901,979	2,260,285	1,055,010
70801	80,257	18,007,145	9,500,476	7,197,347	4,227,716
70802	123,422	27,828,490	14,315,373	20,768,948	10,970,584
70900	136,201	29,639,309	12,605,984	6,835,965	3,160,044
71000	113,417	24,803,290	12,396,899	45,694,289	21,936,563
71100	31,237	4,958,817	2,578,614	2,373,135	1,347,714
71200	35,658	8,160,881	3,689,410	8,928,906	4,053,891
71300	40,046	8,747,259	4,878,806	4,027,032	2,749,048
71401	18,580	2,252,550	1,122,346	448,870	250,516
71402	30,807	5,411,958	2,707,542	1,792,341	832,750
80101	685	90,523	43,248	307,519	140,652
80102	21,398	2,797,480	1,393,440	8,270,832	3,835,232
80201	DD	DD	DD	0	0
80202	4,397	442,826	236,568	2,987,697	1,392,104
80203	4,176	543,896	292,456	348,369	158,722
80204	510	34,562	17,652	DD	DD
80301	DD	DD	DD	0	0
80302	4,346	438,744	245,035	280,064	140,954
80401	24,046	2,483,515	1,199,544	5,122,438	2,323,870
80402	26,077	3,002,580	1,391,968	20,236,611	9,237,572
80403	2,580	318,527	158,963	1,908,574	868,826
80500	1,199	195,695	DD	25,814	14,773
80601	48	7,269	4,864	DD	DD
80602	4,705	618,715	294,781	3,306,491	1,482,387
80701	DD	DD	DD	11,035	7,062
80702	14,107	1,589,939	704,741	2,947,015	1,290,149
80703	198	22,994	15,308	7,114	4,571
80801	1,759	156,029	100,378	26,023	16,626
80802	1,660	183,537	111,041	106,193	61,943
80901	DD	DD	DD	0	0
80902	918	135,580	61,521	DD	DD
80903	DD	DD	DD	4,382	DD
90100	5,592	467,553	215,448	130,272	DD
90201	32,595	4,306,214	2,012,485	7,102,361	3,455,050
90202	6,649	866,528	444,239	453,492	282,315

**Table S6-2012.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
41201	28,955	5,197,207	2,201,825	682,797	273,492
41202	0	0	0	0	0
41300	42,548	9,021,677	3,819,130	1,142,624	498,693
41401	9,311	1,665,510	700,178	974,468	383,477
41402	67,235	12,780,809	5,457,977	1,274,859	539,613
41501	18,835	3,205,798	1,355,744	128,410	54,325
41502	DD	DD	DD	DD	DD
41503	39,545	6,157,416	2,596,002	118,098	51,104
41504	64,846	12,651,666	5,322,870	686,332	291,325
41505	8,601	1,738,754	735,577	59,254	25,237
50100	37,785	7,300,062	3,107,244	1,036,320	434,457
50200	10,953	1,831,185	781,332	65,108	34,094
50301	22,751	4,036,306	1,710,966	506,248	233,160
50302	6,099	770,961	351,428	76,684	31,459
50400	82,107	13,011,703	5,680,862	8,942,826	4,078,393
50500	10,526	1,424,179	630,931	892,397	450,456
50600	18,803	3,060,724	1,509,059	2,026,859	1,072,844
50701	DD	DD	DD	DD	DD
50702	DD	DD	DD	DD	DD
50800	49,007	6,588,350	3,237,025	9,547,159	4,188,084
50901	2,084	208,680	97,869	300,018	124,580
50902	8,481	1,278,085	653,358	511,144	254,134
51001	7,938	600,678	278,702	54,876	28,611
51002	7,811	634,127	311,548	147,413	95,059
51100	65,024	7,043,041	3,320,559	9,542,068	4,334,128
51201	201,832	24,074,744	12,487,359	31,001,908	15,130,788
51202	88,720	9,415,399	5,053,887	16,356,276	7,990,767
51301	21,519	2,489,157	1,150,915	2,525,435	1,177,785
51302	12,553	1,670,452	780,442	2,425,890	1,038,400
51401	22,880	2,273,528	1,096,373	1,745,467	823,511
51402	18,095	1,775,791	916,433	4,475,277	2,292,062
60101	15,231	2,329,137	1,047,735	2,611,608	1,177,538
60102	7,050	838,968	375,320	424,536	199,767
60200	15,570	2,087,940	952,648	7,525,521	3,364,612
60300	56,539	6,022,221	2,861,558	24,891,579	11,333,521
60400	18,646	1,815,541	860,147	4,675,382	2,186,153
70101	32,663	4,582,361	1,995,657	5,576,003	2,902,758
70102	113,438	21,365,814	9,356,567	17,558,025	8,616,920
70200	157,914	32,928,952	16,818,765	28,891,795	15,433,677
70300	27,202	4,955,866	2,110,736	1,661,761	767,239
70400	157,410	31,980,881	14,109,287	10,652,200	5,590,045
70500	91,502	15,349,518	6,478,745	5,793,814	2,941,756
70600	202,616	31,152,194	13,772,694	6,324,697	3,295,654
70700	154,158	22,481,129	9,487,449	1,767,999	790,485
70801	105,675	17,706,210	9,348,435	8,452,260	5,053,162
70802	158,187	27,794,307	14,639,015	25,457,979	13,582,702
70900	206,574	29,466,476	12,471,729	7,896,621	3,685,949
71000	147,660	24,232,178	12,321,420	42,165,362	20,394,246
71100	59,731	4,553,833	2,211,295	3,514,287	2,118,763
71200	46,409	7,198,538	3,135,658	7,895,187	3,687,831
71300	61,961	7,658,170	4,046,840	5,691,009	3,691,748
71401	23,926	1,709,915	803,849	988,287	576,332
71402	60,732	4,616,930	2,239,250	2,831,784	1,368,857
80101	DD	DD	DD	DD	DD
80102	29,796	3,030,763	1,526,906	9,119,882	4,228,210
80201	0	0	0	0	0
80202	6,964	661,072	301,603	3,222,121	1,492,321
80203	DD	DD	DD	DD	DD
80204	DD	DD	DD	DD	DD
80301	DD	DD	DD	DD	DD
80302	2,847	309,531	166,622	224,611	117,605
80401	19,602	1,373,086	666,585	6,016,485	2,720,538
80402	19,023	1,633,142	771,915	13,410,853	6,120,209
80403	2,536	217,550	104,666	1,530,603	684,296
80500	DD	DD	DD	DD	DD
80601	DD	DD	DD	DD	DD
80602	4,620	531,565	265,270	3,366,884	1,599,698
80701	DD	DD	DD	DD	DD
80702	8,378	961,641	415,777	2,708,608	1,200,558
80703	DD	DD	DD	DD	DD
80801	DD	DD	DD	DD	DD
80802	DD	DD	DD	DD	DD
80901	DD	DD	DD	DD	DD
80902	DD	DD	DD	DD	DD
80903	DD	DD	DD	DD	DD
90100	3,101	343,290	174,582	190,369	136,661
90201	30,130	4,937,209	2,312,887	6,899,280	3,392,143
90202	8,557	1,076,421	573,017	531,352	341,847



**Table S6-2007.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
90203	9,488	1,173,380	578,990	1,195,940	645,420
90300	790	49,899	22,041	DD	DD
90400	0	0	0	0	0
100100	DD	DD	DD	DD	DD
100200	4,268	699,402	334,582	159,189	98,182
100301	7,785	721,372	369,613	DD	DD
100302	20,438	1,204,347	653,056	145,569	93,431
100401	2,924	162,567	91,501	DD	DD
100402	1,941	207,698	106,642	23,189	15,188
100500	5,199	373,008	220,606	50,641	33,204
100600	2,710	140,552	98,175	16,025	10,761
100700	5,313	1,082,132	455,251	367,814	DD
100800	3,454	597,910	314,547	DD	DD
100901	463	DD	DD	DD	DD
100902	604	36,797	16,601	21,225	14,271
101000	4,338	628,752	372,066	158,195	96,569
101101	1,930	132,811	64,024	DD	DD
101102	3,477	344,863	87,279	DD	DD
101201	5,529	502,110	207,531	DD	DD
101202	2,591	308,025	173,381	49,718	25,722
101301	15,827	1,567,598	721,627	548,655	211,928
101302	11,278	1,002,740	433,680	264,271	DD
101303	5,899	361,502	212,262	DD	125,965
101401	27,355	3,195,136	1,416,668	635,451	406,795
101402	6,360	410,808	150,216	DD	DD
101500	20,921	3,517,356	1,265,644	DD	856,142
101600	88,156	12,829,446	5,994,770	3,352,087	1,622,183
101701	49,850	7,740,847	3,177,788	DD	DD
101702	122,095	24,860,316	11,185,538	15,142,783	7,042,442
101800	30,424	5,267,343	1,699,082	5,346,376	1,834,358
101900	53,124	9,412,028	3,814,083	30,197,703	10,759,528
102001	28,742	6,757,722	2,253,318	8,749,996	2,746,109
102002	21,538	4,222,273	1,715,864	3,513,361	1,805,834
102100	40,893	8,671,411	2,989,707	9,932,604	4,323,970
102200	88,346	18,002,285	6,469,521	12,748,177	4,789,895
102300	130,752	28,008,147	13,191,681	18,017,627	9,030,199
102400	53,963	9,765,275	4,551,447	8,132,653	4,149,581
102500	49,713	8,850,389	3,100,974	22,447,265	8,543,051
102600	31,007	3,666,353	1,590,968	12,757,555	3,805,166
102701	14,626	1,957,417	855,135	850,512	DD
102702	47,904	9,531,032	4,023,268	9,048,653	3,706,502
102801	24,373	3,024,097	1,504,830	9,113,130	5,658,962
102802	6,075	710,648	369,692	235,021	174,306
102901	64,152	6,544,851	3,514,428	6,673,259	3,512,150
102902	23,999	1,861,118	864,721	904,826	451,673
103001	38,735	4,912,870	2,611,707	9,183,398	4,508,649
103002	4,975	644,777	359,311	64,067	DD
110100	118,938	9,938,660	4,742,463	38,326,698	18,222,571
110200	10,960	1,248,114	585,259	5,365,821	1,871,112
110300	71,332	11,582,025	4,370,197	43,070,207	13,574,699
110400	18,678	3,370,197	1,250,256	26,809,705	9,394,973
110500	18,780	1,231,952	575,807	5,108,226	2,626,915
110600	12,066	884,210	444,201	DD	150,918
110701	13,217	1,109,690	562,741	405,836	215,918
110702	85,876	9,266,771	4,301,315	28,447,027	13,046,775
110800	DD	42,023	22,357	17,075	11,241
110901	15,559	2,790,285	951,253	11,480,285	3,520,581
110902	16,848	DD	DD	408,224	291,226
111001	28,133	3,846,768	1,542,143	30,921,262	11,995,562
111002	6,257	653,063	311,396	9,616,668	DD
111003	8,017	756,017	417,760	633,468	384,888
111101	60,865	5,982,254	2,841,304	23,581,386	10,936,411
111102	76,243	8,352,050	4,021,701	25,078,630	11,857,517
111201	25,469	4,473,090	1,793,540	31,333,143	9,220,062
111202	1,237	136,345	58,718	DD	DD
111203	9,012	1,051,255	372,181	3,460,441	962,167
111301	2,760	228,355	115,952	110,366	DD
111302	16,245	1,341,758	585,952	524,377	235,028
111303	16,914	1,129,791	527,319	DD	833,057
111401	57,858	6,132,103	2,978,512	15,222,228	7,061,175
111402	20,801	2,238,077	1,073,391	7,780,706	3,536,734
111403	44,869	5,920,319	2,656,926	13,496,418	6,082,629
120100	38,739	4,587,339	2,105,101	15,688,162	7,136,012
120200	32,694	3,390,483	1,559,801	12,937,334	5,921,340
120301	DD	DD	1,162,546	1,634,747	810,819
120302	5,628	632,020	331,364	1,201,502	560,864
120401	2,265	222,510	110,796	DD	DD
120402	841	89,583	56,205	29,412	18,999

**Table S6-2012.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
90203	10,582	1,160,103	611,435	1,047,458	556,600
90300	DD	DD	DD	DD	DD
90400	16	841	577	8,351	5,462
100100	0	0	0	0	0
100200	2,945	533,461	250,890	206,124	130,354
100301	10,279	793,185	403,377	187,381	124,045
100302	17,132	1,306,418	678,055	325,048	151,699
100401	DD	DD	DD	DD	DD
100402	4,363	255,219	125,607	32,320	21,728
100500	5,092	375,407	230,754	140,938	93,693
100600	3,297	210,618	143,294	38,451	25,919
100700	6,606	967,523	463,179	276,950	149,066
100800	3,376	470,200	267,046	219,922	134,335
100901	DD	DD	DD	DD	DD
100902	646	23,504	10,533	148,834	91,414
101000	3,000	402,805	217,321	179,460	118,800
101101	3,272	199,807	119,096	31,454	20,015
101102	3,011	139,432	54,427	76,344	50,282
101201	DD	DD	DD	DD	DD
101202	3,063	200,406	90,721	64,395	42,643
101301	14,890	1,513,118	711,358	689,969	407,585
101302	11,970	945,521	424,650	158,883	84,099
101303	5,600	389,214	188,353	409,831	184,849
101401	38,789	2,896,063	1,282,757	980,395	495,983
101402	10,439	621,785	263,209	784,452	360,966
101500	27,029	3,619,705	1,270,850	3,162,209	1,284,109
101600	115,181	12,198,545	5,981,140	3,212,085	1,604,626
101701	85,928	6,874,860	2,880,129	5,779,926	2,422,880
101702	148,239	25,933,998	11,948,526	19,236,787	8,882,456
101800	38,999	5,207,357	1,643,301	6,156,162	2,079,514
101900	50,635	8,783,165	3,666,986	28,038,303	9,705,997
102001	26,285	5,815,689	1,960,698	11,966,015	3,848,817
102002	25,731	3,662,331	1,673,562	2,278,795	893,077
102100	56,301	9,573,134	3,205,875	10,608,985	5,209,798
102200	118,883	15,131,283	5,508,357	16,318,798	5,995,856
102300	146,792	26,065,754	12,854,550	21,827,055	10,379,045
102400	71,302	9,064,645	4,408,326	9,166,025	4,423,469
102500	60,173	6,893,294	2,564,139	28,549,648	10,863,112
102600	41,818	2,947,637	1,231,534	14,178,152	4,343,188
102701	15,121	1,308,459	587,464	1,105,191	675,583
102702	48,317	8,003,459	3,334,073	8,565,742	3,592,382
102801	29,388	2,207,195	1,121,234	10,548,229	6,591,062
102802	DD	DD	DD	DD	DD
102901	68,497	5,469,903	2,939,794	6,541,399	3,436,648
102902	23,239	1,314,155	606,124	803,358	407,961
103001	50,265	3,972,343	2,103,951	9,627,364	4,732,380
103002	6,504	521,187	267,975	94,021	61,249
110100	111,881	6,377,343	3,027,679	37,836,876	18,007,375
110200	6,972	589,843	267,585	6,417,597	2,213,624
110300	97,301	11,583,351	4,575,591	39,833,494	12,696,971
110400	15,139	1,597,291	670,808	33,867,817	12,569,849
110500	15,837	861,007	418,271	3,381,344	1,911,013
110600	12,690	573,673	305,059	476,826	155,798
110701	18,418	956,375	472,331	740,862	345,286
110702	90,195	6,678,511	3,070,013	32,074,264	14,662,081
110800	493	63,232	20,776	181,255	64,655
110901	13,381	2,467,460	970,058	12,627,072	4,151,368
110902	11,520	1,568,176	714,457	994,275	709,747
111001	14,455	1,948,091	788,855	36,561,785	13,884,993
111002	DD	DD	DD	DD	DD
111003	6,870	433,650	230,233	1,481,220	775,142
111101	51,274	3,280,331	1,561,421	23,826,161	10,998,282
111102	73,235	5,054,346	2,434,716	26,896,604	12,728,657
111201	28,659	4,362,190	1,782,390	28,170,128	8,052,906
111202	DD	DD	DD	DD	DD
111203	7,998	852,557	306,004	2,714,724	768,195
111301	DD	DD	DD	DD	DD
111302	15,165	1,196,161	532,565	781,985	366,843
111303	9,168	568,823	276,915	2,405,478	1,034,970
111401	50,338	3,508,420	1,717,985	13,696,936	6,401,202
111402	16,809	1,376,889	653,966	6,703,887	3,053,141
111403	43,413	4,112,017	1,857,641	11,208,644	5,066,864
120100	38,590	3,476,280	1,583,415	17,569,059	8,037,625
120200	33,389	2,746,457	1,306,337	12,777,536	5,902,439
120301	26,707	1,839,663	834,404	3,305,749	1,473,762
120302	7,728	838,954	486,961	2,413,983	1,110,766
120401	DD	DD	DD	DD	DD
120402	1,921	199,331	97,361	111,570	74,132

**Table S6-2007.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
120500	70,876	14,533,183	5,966,756	32,092,909	10,582,715
120601	5,944	400,579	210,862	DD	193,330
120602	25,853	3,828,805	1,663,788	4,221,292	1,966,201
120701	12,343	1,412,981	672,678	4,180,989	1,917,099
120702	18,521	2,997,271	1,330,537	4,124,451	1,994,985
120800	12,705	897,645	429,636	1,889,483	751,656
120901	6,643	673,774	291,300	1,944,403	745,828
120902	1,280	99,436	51,571	DD	DD
120903	2,767	260,473	119,388	197,166	95,145
120904	2,881	255,378	119,546	DD	DD
121001	4,430	528,351	253,721	1,436,238	612,028
121002	13,399	1,814,333	836,470	10,052,739	4,263,777
121003	2,571	225,752	121,654	DD	158,344
121004	1,715	170,319	88,354	DD	DD
121101	6,199	583,557	211,491	1,391,421	478,670
121102	2,572	162,502	84,290	1,129,334	333,298
130100	4,819	275,090	167,800	37,404	22,822
130201	780	47,738	31,006	33,973	22,374
130202	2,842	698,984	299,454	1,779,443	797,252
130301	DD	DD	DD	2,447,432	1,046,797
130302	684	105,733	45,252	2,041,113	864,075
130401	80	5,781	3,001	DD	DD
130402	DD	DD	DD	6,902	4,256
130403	DD	DD	DD	DD	DD
130500	DD	DD	DD	DD	DD
130600	6,867	1,858,886	788,268	7,913,922	3,331,926
130700	648	73,165	36,475	687,694	296,809
130800	DD	DD	DD	DD	119,321
130900	DD	DD	DD	DD	DD
140100	1,761	226,204	137,029	DD	DD
140200	2,315	369,699	196,919	DD	DD
140300	1,168	230,909	124,180	32,414	19,418
140401	901	61,619	25,922	16,952	9,828
140402	DD	7,544	3,047	0	0
140500	1,772	115,350	66,709	25,002	14,393
140600	3,003	522,549	243,761	252,050	129,737
140700	993	233,191	119,658	DD	DD
140801	1,315	DD	89,456	414,796	262,926
140802	497	41,963	25,441	276,966	168,251
150100	797	135,418	75,113	265,429	169,249
150200	311	41,527	20,640	DD	DD
150301	DD	46,401	31,750	DD	DD
150302	DD	DD	DD	66,924	44,516
150400	622	145,273	DD	128,339	86,163
150501	DD	DD	DD	4,436,969	1,928,449
150502	DD	DD	DD	DD	DD
150503	DD	DD	DD	8,854,086	2,953,169
150601	DD	DD	DD	833,312	377,881
150602	38	DD	1,334	115,739	74,226
150701	DD	DD	DD	8,076,444	3,384,170
150702	DD	DD	DD	DD	DD
150801	0	0	0	DD	DD
150802	0	0	0	0	0
150803	DD	DD	DD	11,628	6,262
160101	1,522	106,163	55,770	DD	DD
160102	16,120	2,700,402	1,171,679	1,964,202	829,400
160201	3,060	663,905	274,583	82,263	44,996
160202	4,613	1,035,899	456,322	1,542,997	635,348
160203	4,486	1,200,440	470,845	DD	DD
160300	14,389	3,063,260	1,440,986	8,668,448	DD
160401	1,506	204,023	106,165	DD	47,310
160402	DD	DD	DD	5,381	3,190
160501	410	82,685	42,243	DD	DD
160502	2,878	699,877	304,089	552,375	235,198
160503	DD	33,491	20,069	DD	DD
160600	1,665	289,590	161,625	DD	204,174
170101	182	19,340	10,893	DD	DD
170102	2,613	413,592	188,325	144,721	85,193
170103	1,965	189,990	89,432	39,088	20,108
170200	12,876	3,626,523	1,578,879	6,928,156	2,502,437
170300	15,215	4,615,850	1,945,908	4,784,846	1,991,106
170401	2,058	198,133	90,666	8,793	5,413
170402	89,192	27,375,045	11,560,933	20,623,036	8,485,531
170501	28,176	7,670,569	3,303,218	11,300,756	4,307,970
170502	1,138	134,723	57,938	24,361	14,646
170601	3,824	445,306	227,290	130,172	54,642
170602	949	108,229	57,581	DD	DD
170603	792	66,574	32,247	10,218	DD

**Table S6-2012.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC,  
Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
120500	72,233	13,477,951	5,455,249	42,779,837	14,943,183
120601	3,965	88,928	48,856	182,503	72,342
120602	19,839	2,541,083	1,104,501	4,072,844	1,918,474
120701	11,535	790,124	392,707	5,256,190	2,474,220
120702	14,660	1,792,460	789,462	4,693,381	2,212,913
120800	11,576	1,867,474	798,320	2,701,078	1,113,821
120901	8,335	855,871	362,371	1,420,051	586,821
120902	1,256	63,545	31,210	164,285	68,460
120903	1,896	140,487	74,939	488,675	204,411
120904	DD	DD	DD	DD	DD
121001	2,550	271,244	135,030	518,713	227,710
121002	15,782	1,134,415	511,395	14,089,609	6,029,283
121003	DD	DD	DD	DD	DD
121004	1,518	112,899	54,145	154,932	60,675
121101	3,838	503,335	176,576	1,153,273	391,387
121102	3,035	345,623	129,953	1,227,629	385,409
130100	DD	DD	DD	DD	DD
130201	627	47,243	30,374	60,124	38,683
130202	4,192	1,074,537	459,053	1,665,078	750,779
130301	DD	DD	DD	DD	DD
130302	DD	DD	DD	DD	DD
130401	DD	DD	DD	DD	DD
130402	0	0	0	35,466	23,871
130403	DD	DD	DD	DD	DD
130500	DD	DD	DD	DD	DD
130600	6,586	1,962,794	833,691	7,462,219	3,172,875
130700	DD	DD	DD	DD	DD
130800	DD	DD	DD	DD	DD
130900	DD	DD	DD	DD	DD
140100	1,134	167,289	93,221	540,976	230,860
140200	3,726	740,424	358,491	360,257	159,386
140300	655	102,698	48,675	23,225	15,039
140401	1,103	52,577	32,387	22,831	14,648
140402	DD	DD	DD	DD	DD
140500	DD	DD	DD	DD	DD
140600	3,209	605,781	273,961	271,385	144,675
140700	DD	DD	DD	DD	DD
140801	1,040	135,235	66,780	180,278	114,724
140802	DD	DD	DD	DD	DD
150100	335	72,876	46,190	213,897	127,542
150200	96	11,955	6,346	2,397,626	1,488,078
150301	DD	DD	DD	DD	DD
150302	55	11,366	7,224	20,007	12,186
150400	DD	DD	DD	DD	DD
150501	DD	DD	DD	DD	DD
150502	DD	DD	DD	DD	DD
150503	DD	DD	DD	DD	DD
150601	DD	DD	DD	DD	DD
150602	DD	DD	DD	DD	DD
150701	2,040	744,223	314,050	10,018,280	4,136,066
150702	DD	DD	DD	DD	DD
150801	DD	DD	DD	DD	DD
150802	0	0	0	0	0
150803	DD	DD	DD	DD	DD
160101	DD	DD	DD	DD	DD
160102	16,709	3,080,031	1,341,626	2,105,153	900,162
160201	2,445	570,268	252,739	165,022	73,976
160202	4,545	1,203,271	527,769	1,740,381	739,632
160203	4,346	1,185,817	490,705	1,470,174	610,247
160300	DD	DD	DD	DD	DD
160401	778	143,703	51,474	93,449	54,825
160402	DD	DD	DD	DD	DD
160501	DD	DD	DD	DD	DD
160502	2,919	721,388	317,509	467,727	193,084
160503	DD	DD	DD	DD	DD
160600	2,436	612,641	307,389	151,428	87,474
170101	DD	DD	DD	DD	DD
170102	2,643	276,859	137,668	244,625	144,871
170103	1,265	118,239	59,510	51,220	28,867
170200	18,832	5,445,835	2,357,075	8,993,176	3,307,630
170300	15,931	5,108,827	2,145,329	8,684,899	3,242,578
170401	2,122	185,645	94,991	14,326	8,022
170402	112,057	37,325,373	15,800,210	18,024,571	7,429,950
170501	32,875	10,449,870	4,411,726	9,991,275	3,909,347
170502	DD	DD	DD	DD	DD
170601	3,328	289,284	159,153	266,519	112,296
170602	1,555	142,266	68,170	27,493	18,280
170603	1,304	98,220	61,046	42,637	26,950

**Table S6-2007.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC, Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
170701	7,786	DD	518,099	6,250,959	2,289,063
170702	1,695	101,904	41,443	42,084	24,493
170703	1,945	197,912	101,023	140,850	74,594
170800	6,951	1,105,900	477,170	2,322,678	1,056,138
170900	14,230	2,751,026	1,183,092	5,816,520	2,509,881
171001	5,955	697,370	301,842	1,604,140	649,344
171002	11,381	1,325,893	568,332	1,448,500	613,115
171003	4,183	405,508	182,939	DD	144,813
171100	31,273	7,744,729	3,274,870	2,839,206	1,196,204
171200	DD	165,284	104,818	30,289	19,401
180101	17,566	2,608,819	1,108,616	4,470,653	1,920,985
180102	4,368	612,363	293,312	321,363	132,322
180200	280	47,952	DD	9,335	5,771
180201	14,540	3,627,482	1,552,669	2,011,806	890,711
180300	172,425	56,846,112	23,904,546	57,782,950	24,618,243
180400	158,437	49,310,825	20,751,142	47,310,091	21,123,237
180500	6,284	726,757	310,905	885,453	403,357
180600	3,034	464,663	196,340	902,130	440,426
180701	125	15,618	7,929	293,504	143,902
180702	3,890	1,295,685	532,737	17,166,322	7,148,951
180703	641	41,998	20,306	3,629,658	1,530,049
180800	83	8,572	4,601	DD	DD
180901	DD	DD	DD	DD	DD
180902	DD	1,500,224	632,751	2,523,583	1,112,758
181001	DD	DD	DD	DD	DD
181002	3,740	1,001,973	413,833	10,168,963	3,084,468
190101	0	0	0	0	0
190102	0	0	0	0	0
190103	0	0	0	0	0
190104	0	0	0	0	0
190201	DD	DD	DD	0	0
190202	0	0	0	0	0
190203	DD	DD	DD	DD	DD
190204	DD	DD	DD	0	0
190205	655	34,077	14,566	DD	DD
190206	0	0	0	0	0
190207	0	0	0	DD	DD
190301	0	0	0	0	0
190302	0	0	0	0	0
190303	0	0	0	0	0
190304	0	0	0	0	0
190305	0	0	0	0	0
190401	DD	DD	DD	0	0
190402	0	0	0	0	0
190403	0	0	0	0	0
190404	DD	DD	DD	DD	DD
190405	199	DD	5,306	1,021	592
190406	0	0	0	0	0
190407	0	0	0	0	0
190408	0	0	0	0	0
190501	0	0	0	0	0
190502	0	0	0	0	0
200100	DD	DD	DD	206,168	91,115
200200	DD	DD	DD	DD	DD
200400	0	0	0	0	0
200500	0	0	0	DD	DD
200600	DD	DD	DD	DD	DD
200700	DD	DD	DD	DD	DD
200800	0	0	0	DD	DD

**Table S6-2012.** Farm-level Excess Manure Nutrients and Related Results from the Land Application Simulation Model on AFOs, by 6-digit HUC, Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving on-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	Farm-level excess manure nitrogen (pounds)	Farm-level excess manure phosphorus (pounds)
huc6	all_aa	all_na	all_pa	fex_n	fex_p
170701	5,665	1,032,150	484,700	7,074,574	2,661,057
170702	1,725	103,649	45,861	7,083	3,413
170703	1,708	180,996	99,451	125,199	71,638
170800	6,535	1,094,042	473,530	2,527,679	1,153,616
170900	16,408	3,344,638	1,435,667	5,256,614	2,259,992
171001	5,038	730,367	310,776	1,588,936	643,559
171002	9,336	1,461,065	616,480	1,166,758	497,461
171003	3,866	513,583	222,792	259,318	120,573
171100	31,815	7,608,215	3,222,926	3,029,655	1,255,161
171200	DD	DD	DD	DD	DD
180101	19,178	2,834,446	1,199,505	5,363,032	2,326,777
180102	8,463	543,210	224,718	424,149	193,109
180200	DD	DD	DD	DD	DD
180201	17,016	3,832,300	1,633,388	1,731,057	766,921
180300	202,019	61,866,554	25,850,097	60,783,327	25,775,342
180400	165,885	52,286,390	21,819,125	45,960,343	20,408,255
180500	7,956	807,933	343,032	1,303,211	590,242
180600	2,131	212,520	88,315	881,175	424,878
180701	DD	DD	DD	DD	DD
180702	3,665	942,393	388,707	12,951,844	5,410,155
180703	2,162	345,595	145,667	3,564,597	1,487,660
180800	DD	DD	DD	DD	DD
180901	DD	DD	DD	DD	DD
180902	2,892	1,136,699	478,964	4,052,043	1,737,607
181001	DD	DD	DD	DD	DD
181002	DD	DD	DD	DD	DD
190101	0	0	0	0	0
190102	0	0	0	0	0
190103	0	0	0	0	0
190104	0	0	0	0	0
190201	DD	DD	DD	DD	DD
190202	0	0	0	0	0
190203	DD	DD	DD	DD	DD
190204	DD	DD	DD	DD	DD
190205	DD	DD	DD	DD	DD
190206	0	0	0	0	0
190207	0	0	0	0	0
190301	0	0	0	0	0
190302	0	0	0	0	0
190303	0	0	0	0	0
190304	0	0	0	0	0
190305	0	0	0	0	0
190401	0	0	0	0	0
190402	0	0	0	0	0
190403	0	0	0	0	0
190404	DD	DD	DD	DD	DD
190405	DD	DD	DD	DD	DD
190406	0	0	0	0	0
190407	0	0	0	0	0
190408	0	0	0	0	0
190501	0	0	0	0	0
190502	0	0	0	0	0
200100	DD	DD	DD	DD	DD
200200	DD	DD	DD	DD	DD
200400	0	0	0	0	0
200500	DD	DD	DD	DD	DD
200600	DD	DD	DD	DD	DD
200700	DD	DD	DD	DD	DD
200800	0	0	0	0	0
Sum of column	8,439,264	1,290,184,631	581,219,345	1,840,448,307	823,668,127
National total	8,547,164	1,307,565,904	589,004,593	1,912,631,848	854,878,563
national total	98.74%	98.67%	98.68%	96.23%	96.35%

Notes: For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

**Table S7--2007.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
10100	0	0	0	0	0
10200	310	60,579	25,739	0	0
10300	202	40,995	22,200	0	0
10400	12,552	1,116,248	446,940	2,451,970	981,757
10500	874	76,283	55,862	0	0
10600	302	49,824	22,998	0	0
10700	569	116,204	59,519	0	0
10801	1,036	224,798	92,328	0	0
10802	832	187,140	79,974	0	0
10900	536	115,994	57,909	0	0
11000	24,540	2,757,507	1,110,649	0	0
11100	609	57,998	24,521	0	0
20100	5,451	927,741	376,883	0	0
20200	3,132	507,772	215,074	0	0
20301	124	22,786	12,199	0	0
20302	1,317	182,503	117,560	0	0
20401	10,258	1,659,406	689,794	0	0
20402	38,808	5,423,789	2,410,773	0	0
20403	948	126,143	49,996	0	0
20501	5,432	954,236	466,551	0	0
20502	9,384	1,292,825	616,239	0	0
20503	175,838	25,654,702	11,753,776	0	0
20600	282,153	34,499,381	15,754,220	0	0
20700	384,279	36,866,512	17,444,775	0	0
20801	20,224	2,159,610	1,011,718	0	0
20802	37,261	4,185,113	1,940,805	0	0
30101	22,481	2,427,434	1,266,119	0	0
30102	44,488	5,824,024	3,074,174	0	0
30201	42,582	5,942,779	3,235,063	0	0
30202	150,682	18,446,559	10,299,091	0	0
30203	0	0	0	0	0
30300	278,835	22,391,473	12,122,032	39,209,634	21,226,850
30401	280,660	24,524,122	11,391,836	3,275,146	1,521,356
30402	233,080	24,524,016	12,566,725	0	0
30501	238,406	17,221,602	8,338,799	0	0
30502	48,265	5,358,912	2,453,780	0	0
30601	288,167	24,236,443	11,006,787	10,918,249	4,958,436
30602	15,261	2,037,547	948,670	0	0
30701	216,145	22,412,840	9,981,016	0	0
30702	47,337	6,162,995	2,768,247	0	0
30801	1,137	237,536	116,205	0	0
30802	82	12,884	7,074	0	0
30901	30,212	3,558,242	1,474,966	0	0
30902	1,594	418,971	205,478	0	0
31001	4,536	884,167	401,613	0	0
31002	19,461	3,073,917	1,246,651	0	0
31101	10,985	1,117,435	512,864	0	0
31102	107,468	15,330,261	6,722,909	0	0
31200	37,907	2,983,970	1,358,436	0	0
31300	121,131	20,957,156	9,552,822	0	0
31401	17,577	1,748,717	758,939	0	0
31402	116,763	11,694,977	5,335,530	0	0
31403	67,955	6,393,279	2,914,038	0	0
31501	360,114	28,716,936	13,117,947	16,102,333	7,355,574
31502	31,468	2,151,014	998,797	0	0
31601	261,599	26,581,613	12,493,575	0	0
31602	8,851	803,183	363,732	0	0
31700	195,227	20,984,921	9,536,211	6,559,810	2,980,985
31800	211,628	24,407,726	11,170,594	9,619,237	4,402,401
40101	0	0	0	0	0
40102	11	1,261	855	0	0
40103	351	27,393	12,232	0	0
40201	3	120	69	0	0
40202	0	0	0	0	0
40203	0	0	0	0	0
40301	12,979	2,176,536	950,398	0	0
40302	8,781	1,623,399	709,725	0	0
40400	536	91,300	43,285	0	0
40500	105,002	15,620,930	7,205,454	0	0
40601	12,474	1,653,955	897,500	0	0
40602	463	21,819	9,225	0	0
40700	508	55,382	23,377	0	0
40801	13,065	2,309,386	969,891	0	0
40802	8,057	1,300,020	546,506	0	0
40803	0	0	0	0	0
40900	363	52,001	24,085	0	0
41000	58,343	10,142,710	4,481,414	0	0
41100	512	113,689	53,490	0	0
41201	5,780	1,021,393	410,590	0	0
41202	0	0	0	0	0
41300	4,616	946,010	408,245	0	0
41401	864	112,509	49,922	0	0
41402	6,991	1,332,090	643,514	0	0
41501	633	115,876	48,221	0	0
41502	0	0	0	0	0
41503	375	72,908	31,402	0	0
41504	0	0	0	0	0

**Table S7--2012.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
10100	DD	DD	DD	DD	DD
10200	536	106,196	45,126	0	0
10300	11,798	1,283,309	503,123	0	0
10400	DD	DD	DD	DD	DD
10500	369	40,465	20,826	0	0
10600	93	21,421	10,407	0	0
10700	340	64,943	35,138	0	0
10801	1,150	263,791	110,501	0	0
10802	755	143,670	62,590	0	0
10900	797	156,332	74,454	0	0
11000	19,893	2,281,272	917,315	0	0
11100	0	0	0	0	0
20100	0	0	0	0	0
20200	4,013	720,997	308,861	0	0
20301	244	42,602	23,684	0	0
20302	DD	DD	DD	DD	DD
20401	13,231	1,947,980	836,529	0	0
20402	41,457	6,478,880	2,862,430	0	0
20403	DD	DD	DD	DD	DD
20501	5,493	932,004	497,664	0	0
20502	10,484	1,656,666	765,632	0	0
20503	191,392	28,981,228	12,897,172	0	0
20600	45,213	6,055,660	2,772,786	0	0
20700	244,199	30,844,133	14,690,560	0	0
20801	205,621	24,977,867	11,451,405	0	0
20802	32,098	4,193,391	1,951,570	0	0
30101	19,396	2,240,868	1,221,557	0	0
30102	36,968	5,527,749	2,711,008	0	0
30201	38,668	6,003,027	2,954,136	0	0
30202	110,043	13,120,116	7,522,800	0	0
30203	14,582	2,161,427	1,171,176	0	0
30300	286,428	23,907,276	12,975,666	26,740,663	14,513,486
30401	187,743	21,794,462	10,031,834	0	0
30402	181,133	23,958,625	12,189,304	0	0
30501	181,484	19,929,889	9,393,503	0	0
30502	40,551	5,507,486	2,544,227	0	0
30601	246,887	22,487,033	10,231,606	15,733,012	7,158,525
30602	9,407	1,880,547	889,885	0	0
30701	151,329	20,939,069	9,293,180	0	0
30702	42,162	6,387,726	2,874,161	0	0
30801	1,089	239,735	127,259	0	0
30802	DD	DD	DD	DD	DD
30901	18,741	2,820,280	1,273,537	0	0
30902	3,081	745,675	429,475	0	0
31001	6,823	793,920	345,888	0	0
31002	23,149	3,101,559	1,256,883	0	0
31101	6,009	795,150	358,549	0	0
31102	64,562	11,615,468	5,064,586	0	0
31200	13,124	1,890,405	868,036	0	0
31300	94,476	19,913,224	9,075,135	0	0
31401	13,512	1,668,806	740,588	0	0
31402	171,442	12,628,317	5,766,785	1,047,942	478,548
31403	43,415	6,335,626	2,873,183	0	0
31501	332,809	30,936,061	14,118,839	17,589,774	8,027,757
31502	24,250	2,584,160	1,192,697	0	0
31601	184,560	24,217,924	11,304,607	0	0
31602	3,265	474,110	211,908	0	0
31700	174,058	17,567,457	8,032,981	8,756,603	4,004,087
31800	171,595	18,673,072	8,537,237	14,585,542	6,668,439
40101	DD	DD	DD	DD	DD
40102	23	2,861	1,953	0	0
40103	68	8,339	5,181	0	0
40201	2	517	297	0	0
40202	DD	DD	DD	DD	DD
40203	0	0	0	0	0
40301	18,316	3,268,388	1,410,781	0	0
40302	11,876	2,066,139	899,195	0	0
40400	1,558	271,778	115,516	0	0
40500	153,851	23,193,097	10,832,513	0	0
40601	4,047	651,787	393,825	0	0
40602	DD	DD	DD	DD	DD
40700	506	69,769	30,403	0	0
40801	18,832	3,582,986	1,499,388	0	0
40802	9,792	1,874,350	795,796	0	0
40803	0	0	0	0	0
40900	702	111,660	52,781	0	0
41000	97,578	13,401,463	5,873,497	0	0
41100	921	149,958	66,773	0	0
41201	3,651	682,797	273,492	0	0
41202	0	0	0	0	0
41300	5,575	1,142,624	498,693	0	0
41401	6,540	974,468	383,477	0	0
41402	7,284	1,274,859	539,613	0	0
41501	642	128,410	54,325	0	0
41502	DD	DD	DD	DD	DD
41503	710	118,098	51,104	0	0
41504	3,336	686,332	291,325	0	0

**Table S7--2007.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
41505	0	0	0	0	0
50100	5,809	986,820	414,120	0	0
50200	484	76,631	40,558	0	0
50301	2,493	395,115	176,280	0	0
50302	552	93,947	39,325	0	0
50400	42,733	7,582,540	3,349,166	0	0
50500	3,244	531,168	268,379	0	0
50600	5,621	1,112,317	660,217	0	0
50701	0	0	0	0	0
50702	18	4,091	2,494	0	0
50800	58,431	9,877,457	4,329,826	0	0
50901	188	26,298	14,462	0	0
50902	5,810	894,683	341,787	0	0
51001	964	152,971	72,228	0	0
51002	753	108,471	63,923	0	0
51100	58,928	9,305,431	4,286,310	0	0
51201	124,119	23,165,802	11,509,308	0	0
51202	93,296	15,955,507	7,598,519	0	0
51301	33,924	4,220,048	1,944,168	0	0
51302	22,858	2,695,086	1,172,236	0	0
51401	11,497	1,686,186	804,420	0	0
51402	24,840	4,122,908	1,976,126	0	0
60101	21,855	2,764,542	1,248,557	0	0
60102	3,535	449,616	216,222	0	0
60200	89,055	7,595,912	3,420,299	0	0
60300	283,009	26,524,315	12,087,559	0	0
60400	44,091	4,918,084	2,280,979	0	0
70101	33,753	3,406,453	1,710,378	0	0
70102	158,140	20,793,144	10,337,878	0	0
70200	155,207	27,564,467	14,859,299	0	0
70300	10,986	1,617,860	754,017	0	0
70400	51,440	9,539,666	4,862,358	0	0
70500	41,526	5,432,068	2,785,623	0	0
70600	24,178	5,040,733	2,557,323	0	0
70700	12,718	2,260,285	1,055,010	0	0
70801	34,426	7,197,347	4,227,716	0	0
70802	101,276	20,768,948	10,970,584	0	0
70900	32,244	6,835,965	3,160,044	0	0
71000	235,112	45,694,289	21,936,563	0	0
71100	14,010	2,373,135	1,347,714	0	0
71200	41,657	8,928,906	4,053,891	0	0
71300	18,734	4,027,032	2,749,048	0	0
71401	3,380	448,870	250,516	0	0
71402	9,830	1,792,341	832,750	0	0
80101	1,748	307,519	140,652	0	0
80102	59,057	8,270,832	3,835,232	0	0
80201	0	0	0	0	0
80202	15,210	2,987,697	1,392,104	0	0
80203	1,751	348,369	158,722	0	0
80204	1,661	339,082	153,024	0	0
80301	0	0	0	0	0
80302	1,880	280,064	140,954	0	0
80401	40,346	5,122,438	2,323,870	0	0
80402	120,799	20,236,611	9,237,572	0	0
80403	9,861	1,908,574	868,826	0	0
80500	127	25,814	14,773	0	0
80601	59	10,813	7,302	0	0
80602	21,902	3,306,491	1,482,387	0	0
80701	52	11,035	7,062	0	0
80702	22,929	2,947,015	1,290,149	0	0
80703	33	7,114	4,571	0	0
80801	137	26,023	16,626	0	0
80802	941	106,193	61,943	0	0
80901	0	0	0	0	0
80902	98	13,634	6,143	0	0
80903	61	4,382	2,886	0	0
90100	1,004	130,272	94,390	0	0
90201	46,810	7,102,361	3,455,050	0	0
90202	2,990	453,492	282,315	0	0
90203	8,269	1,195,940	645,420	0	0
90300	42	4,717	3,178	0	0
90400	0	0	0	0	0
100100	156	4,309	2,829	0	0
100200	638	159,189	98,182	0	0
100301	3,292	205,057	100,705	0	0
100302	2,589	145,569	93,431	0	0
100401	1,087	108,395	52,184	0	0
100402	93	23,189	15,188	0	0
100500	358	50,641	33,204	0	0
100600	79	16,025	10,761	0	0
100700	1,292	367,814	150,980	0	0
100800	224	54,052	35,492	0	0
100901	21	5,796	3,844	0	0
100902	83	21,225	14,271	0	0
101000	675	158,195	96,569	0	0
101101	312	39,279	19,354	0	0
101102	111	9,914	6,530	0	0

**Table S7--2012.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
huc6	mrf_all_aa	MRF_all_na	MRF_all_pa	cex_n	cex_p
41505		437	59,254	25,237	0
50100		5,378	1,036,320	434,457	0
50200		354	65,108	34,094	0
50301		2,805	506,248	233,160	0
50302		332	76,684	31,459	0
50400		57,910	8,942,826	4,078,393	0
50500		4,136	892,397	450,456	0
50600		12,537	2,026,859	1,072,844	0
50701		DD	DD	DD	DD
50702		DD	DD	DD	DD
50800		75,659	9,547,159	4,188,084	0
50901		2,438	300,018	124,580	0
50902		3,658	511,144	254,134	0
51001		403	54,876	28,611	0
51002		1,057	147,413	95,059	0
51100		96,304	9,542,068	4,334,128	0
51201		286,358	31,001,908	15,130,788	0
51202		171,333	16,356,276	7,990,767	0
51301		22,290	2,525,435	1,177,785	0
51302		29,804	2,425,890	1,038,400	0
51401		12,334	1,745,467	823,511	0
51402		57,194	4,475,277	2,292,062	0
60101		16,453	2,611,608	1,177,538	0
60102		2,292	424,536	199,767	0
60200		66,496	7,525,521	3,364,612	0
60300		256,076	24,891,579	11,333,521	0
60400		66,968	4,675,382	2,186,153	0
70101		41,042	5,576,003	2,902,758	0
70102		99,244	17,558,025	8,616,920	0
70200		151,935	28,891,795	15,433,677	0
70300		8,863	1,661,761	767,239	0
70400		54,769	10,652,200	5,590,045	0
70500		35,555	5,793,814	2,941,756	0
70600		41,973	6,324,697	3,295,654	0
70700		12,584	1,767,999	790,485	0
70801		52,387	8,452,260	5,053,162	0
70802		153,686	25,457,979	13,582,702	0
70900		58,329	7,896,621	3,685,949	0
71000		260,765	42,165,362	20,394,246	0
71100		39,968	3,514,287	2,118,763	0
71200		52,161	7,895,187	3,687,831	0
71300		43,460	5,691,009	3,691,748	0
71401		13,175	988,287	576,332	0
71402		31,340	2,831,784	1,368,857	0
80101		DD	DD	DD	DD
80102		88,147	9,119,882	4,228,210	0
80201		0	0	0	0
80202		20,096	3,222,121	1,492,321	0
80203		DD	DD	DD	DD
80204		DD	DD	DD	DD
80301		DD	DD	DD	DD
80302		1,392	224,611	117,605	0
80401		88,399	6,016,485	2,720,538	0
80402		61,276	13,410,853	6,120,209	0
80403		7,518	1,530,603	684,296	0
80500		DD	DD	DD	DD
80601		DD	DD	DD	DD
80602		19,424	3,366,884	1,599,698	0
80701		DD	DD	DD	DD
80702		23,148	2,708,608	1,200,558	0
80703		DD	DD	DD	DD
80801		DD	DD	DD	DD
80802		DD	DD	DD	DD
80901		DD	DD	DD	DD
80902		DD	DD	DD	DD
80903		DD	DD	DD	DD
90100		1,270	190,369	136,661	0
90201		40,326	6,899,280	3,392,143	0
90202		3,704	531,352	341,847	0
90203		6,713	1,047,458	556,600	0
90300		DD	DD	DD	DD
90400		251	8,351	5,462	0
100100		0	0	0	0
100200		888	206,124	130,354	0
100301		1,766	187,381	124,045	0
100302		5,013	325,048	151,699	0
100401		DD	DD	DD	DD
100402		133	32,320	21,728	0
100500		565	140,938	93,693	0
100600		191	38,451	25,919	0
100700		985	276,950	149,066	0
100800		909	219,922	134,335	0
100901		DD	DD	DD	DD
100902		541	148,834	91,414	0
101000		818	179,460	118,800	0
101101		219	31,454	20,015	0
101102		823	76,344	50,282	0

**Table S7--2007.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
101201	19,460	1,047,859	401,223	0	0
101202	302	49,718	25,722	0	0
101301	4,441	548,655	211,928	0	0
101302	2,357	264,271	127,807	0	0
101303	5,644	411,442	125,965	0	0
101401	6,650	635,451	406,795	0	0
101402	11,842	995,804	441,977	0	0
101500	15,489	2,288,066	856,142	0	0
101600	25,498	3,352,087	1,622,183	0	0
101701	40,441	5,486,255	2,305,062	0	0
101702	88,563	15,142,783	7,042,442	0	0
101800	28,785	5,346,376	1,834,358	0	0
101900	161,281	30,197,703	10,759,528	0	0
102001	42,673	8,749,996	2,746,109	0	0
102002	21,117	3,513,361	1,805,834	0	0
102100	52,255	9,932,604	4,323,970	0	0
102200	71,079	12,748,177	4,789,895	0	0
102300	99,147	18,017,627	9,030,199	0	0
102400	49,153	8,132,653	4,149,581	0	0
102500	124,767	22,447,265	8,543,051	0	0
102600	84,206	12,757,555	3,805,166	0	0
102701	4,754	850,512	424,055	0	0
102702	48,849	9,048,653	3,706,502	0	0
102801	60,114	9,113,130	5,658,962	0	0
102802	1,272	235,021	174,306	0	0
102901	47,223	6,673,259	3,512,150	0	0
102902	6,427	904,826	451,673	0	0
103001	56,382	9,183,398	4,508,649	0	0
103002	403	64,067	45,220	0	0
10100	337,210	38,326,698	18,222,571	0	0
10200	44,892	5,365,821	1,871,112	0	0
10300	228,563	43,070,207	13,574,699	0	0
10400	126,251	26,809,705	9,394,973	0	0
10500	53,421	5,108,426	2,626,915	0	0
10600	2,235	332,529	150,918	0	0
10701	3,027	405,836	215,918	0	0
10702	216,847	28,447,027	13,046,775	0	0
10800	660	17,075	11,241	0	0
10901	45,861	11,480,285	3,520,581	0	0
10902	3,304	408,224	291,226	0	0
111001	122,100	30,921,262	11,995,562	0	0
111002	60,142	9,616,668	4,849,169	0	0
111003	5,646	633,468	384,888	0	0
111101	201,476	23,581,386	10,936,411	0	0
111102	205,701	25,078,630	11,857,517	0	0
111201	160,295	31,333,143	9,220,062	0	0
111202	7,516	1,137,712	346,695	0	0
111203	16,854	3,460,441	962,167	0	0
111301	551	110,366	62,907	0	0
111302	3,904	524,377	235,028	0	0
111303	16,328	1,924,068	833,057	0	0
111401	131,874	15,222,228	7,061,175	0	0
111402	39,777	7,780,706	3,536,734	0	0
111403	100,646	13,496,418	6,082,629	0	0
120100	120,016	15,688,162	7,136,012	0	0
120200	83,757	12,937,334	5,921,340	0	0
120301	13,327	1,634,747	810,819	0	0
120302	14,257	1,201,502	560,864	0	0
120401	2,131	309,093	160,039	0	0
120402	366	29,412	18,999	0	0
120500	125,214	32,092,909	10,582,715	0	0
120601	3,243	479,313	193,330	0	0
120602	35,474	4,221,292	1,966,201	0	0
120701	33,187	4,180,989	1,917,099	0	0
120702	33,427	4,124,451	1,994,985	0	0
120800	13,153	1,889,483	751,656	0	0
120901	20,872	1,944,403	745,828	0	0
120902	1,305	189,952	85,464	0	0
120903	1,082	197,166	95,145	0	0
120904	22,574	3,261,808	1,296,453	0	0
121001	11,599	1,436,238	612,028	0	0
121002	97,839	10,052,739	4,263,777	0	0
121003	4,367	411,912	158,344	0	0
121004	1,213	234,339	85,410	0	0
121101	10,521	1,391,421	478,670	0	0
121102	10,551	1,129,334	333,298	0	0
130100	156	37,404	22,822	0	0
130201	189	33,973	22,374	0	0
130202	17,026	1,779,443	797,252	0	0
130301	12,916	2,447,432	1,046,797	0	0
130302	12,455	2,041,113	864,075	0	0
130401	509	129,562	58,695	0	0
130402	42	6,902	4,256	0	0
130403	75	4,671	2,481	0	0
130500	3,022	914,901	374,013	0	0
130600	37,267	7,913,922	3,331,926	0	0
130700	6,015	687,694	296,809	0	0

**Table S7--2012.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
huc6	mrf_all_aa	MRF_all_na	MRF_all_pa	cex_n	cex_p
101201	DD	DD	DD	DD	DD
101202	546	64,395	42,643	0	0
101301	6,155	689,969	407,585	0	0
101302	1,241	158,883	84,099	0	0
101303	3,954	409,831	184,849	0	0
101401	12,486	980,395	495,983	0	0
101402	10,291	784,452	360,966	0	0
101500	32,605	3,162,209	1,284,109	0	0
101600	29,139	3,212,085	1,604,626	0	0
101701	71,628	5,779,926	2,423,880	0	0
101702	137,646	19,236,787	8,882,456	0	0
101800	32,490	6,156,162	2,079,514	0	0
101900	160,215	28,038,303	9,705,997	0	0
102001	65,183	11,966,015	3,848,817	0	0
102002	18,595	2,278,795	893,077	0	0
102100	79,851	10,608,985	5,209,798	0	0
102200	130,966	16,318,798	5,995,856	0	0
102300	136,853	21,827,055	10,379,045	0	0
102400	73,037	9,166,025	4,423,469	0	0
102500	235,140	28,549,648	10,863,112	0	0
102600	153,261	14,178,152	4,343,188	0	0
102701	12,035	1,105,191	675,583	0	0
102702	53,381	8,565,742	3,592,382	0	0
102801	140,467	10,548,229	6,591,062	0	0
102802	DD	DD	DD	DD	DD
102901	101,290	6,541,399	3,436,648	0	0
102902	11,192	803,358	407,961	0	0
103001	119,819	9,627,364	4,732,380	0	0
103002	824	94,021	61,249	0	0
10100	473,216	37,836,876	18,007,375	0	0
10200	67,170	6,417,972	2,213,624	0	0
10300	282,935	39,833,494	12,696,971	0	0
10400	199,571	33,867,817	12,569,849	0	0
10500	47,366	3,381,344	1,911,013	0	0
10600	5,532	476,826	155,798	0	0
10701	9,256	740,862	345,286	0	0
10702	540,132	32,074,264	14,662,081	0	0
10800	1,311	181,255	64,655	0	0
10901	54,530	12,627,072	4,151,368	0	0
10902	16,390	994,275	709,747	0	0
111001	173,646	36,561,785	13,884,993	0	0
111002	DD	DD	DD	DD	DD
111003	18,635	1,481,220	775,142	0	0
111101	356,404	23,826,161	10,998,282	0	0
111102	371,706	23,562,938	11,151,020	3,333,666	1,577,638
111201	186,642	28,170,128	8,052,906	0	0
111202	DD	DD	DD	DD	DD
111203	12,664	2,714,724	768,195	0	0
111301	DD	DD	DD	DD	DD
111302	7,073	781,985	366,843	0	0
111303	34,229	2,405,478	1,034,970	0	0
111401	157,990	13,696,936	6,401,202	0	0
111402	40,330	6,703,887	3,053,141	0	0
111403	110,755	11,208,644	5,066,864	0	0
120100	175,050	17,569,059	8,037,625	0	0
120200	114,897	12,777,536	5,902,439	0	0
120301	26,802	3,305,749	1,473,762	0	0
120302	28,034	2,413,983	1,110,766	0	0
120401	DD	DD	DD	DD	DD
120402	853	111,570	74,132	0	0
120500	275,151	42,779,837	14,943,183	0	0
120601	2,136	182,503	72,342	0	0
120602	34,374	4,072,844	1,918,474	0	0
120701	47,722	5,256,190	2,474,220	0	0
120702	45,377	4,693,381	2,212,913	0	0
120800	29,758	2,701,078	1,113,821	0	0
120901	18,583	1,420,051	586,821	0	0
120902	1,640	164,285	68,460	0	0
120903	4,266	488,675	204,411	0	0
120904	DD	DD	DD	DD	DD
121001	5,018	518,713	227,710	0	0
121002	151,958	14,089,609	6,029,283	0	0
121003	DD	DD	DD	DD	DD
121004	1,573	154,932	60,675	0	0
121101	8,820	1,153,273	391,387	0	0
121102	9,900	1,227,629	385,409	0	0
130100	DD	DD	DD	DD	DD
130201	928	60,124	38,683	0	0
130202	13,356	1,665,078	750,779	0	0
130301	DD	DD	DD	DD	DD
130302	DD	DD	DD	DD	DD
130401	DD	DD	DD	DD	DD
130402	197	35,466	23,871	0	0
130403	DD	DD	DD	DD	DD
130500	DD	DD	DD	DD	DD
130600	43,528	7,462,219	3,172,875	0	0
130700	DD	DD	DD	DD	DD

**Table S7--2007.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
130800	3,926	400,212	119,321	0	0
130900	2,305	271,203	78,135	0	0
140100	3,672	488,540	202,078	0	0
140200	1,695	452,799	186,977	0	0
140300	170	32,414	19,418	0	0
140401	166	16,952	9,828	0	0
140402	0	0	0	0	0
140500	323	25,002	14,393	0	0
140600	1,290	252,050	129,737	0	0
140700	1,937	302,577	155,212	0	0
140801	3,964	414,796	262,926	0	0
140802	3,353	276,966	168,251	0	0
150100	2,172	265,429	169,249	0	0
150200	27,522	2,090,981	1,286,416	38,643	23,774
150301	352	121,025	63,824	0	0
150302	404	66,924	44,516	0	0
150400	553	128,339	86,163	0	0
150501	15,084	4,436,969	1,928,449	0	0
150502	1,400	389,632	186,673	0	0
150503	47,895	8,854,086	2,953,169	0	0
150601	4,525	833,312	377,881	0	0
150602	786	115,739	74,226	0	0
150701	57,074	8,076,444	3,384,170	0	0
150702	13,123	3,297,357	1,105,491	0	0
150801	1	357	242	0	0
150802	0	0	0	0	0
150803	151	11,628	6,262	0	0
160101	64	14,144	9,059	0	0
160102	10,536	1,964,202	829,400	0	0
160201	379	82,263	44,996	0	0
160202	7,241	1,542,997	635,348	0	0
160203	5,469	1,348,801	552,334	0	0
160300	74,775	8,668,448	4,869,949	0	0
160401	795	111,696	47,310	0	0
160402	89	5,381	3,190	0	0
160501	157	50,891	22,995	0	0
160502	1,826	552,375	235,198	0	0
160503	1,823	224,179	121,360	0	0
160600	2,910	407,579	204,174	0	0
170101	185	10,517	4,575	0	0
170102	640	144,721	85,193	0	0
170103	624	39,088	20,108	0	0
170200	26,580	6,928,156	2,502,437	0	0
170300	16,124	4,784,846	1,991,106	0	0
170401	47	8,793	5,413	0	0
170402	65,971	20,623,036	8,485,531	0	0
170501	37,681	11,300,756	4,307,970	0	0
170502	106	24,361	14,646	0	0
170601	381	130,172	54,642	0	0
170602	13	1,227	757	0	0
170603	184	10,218	6,237	0	0
170701	21,721	6,250,959	2,289,063	0	0
170702	128	42,084	24,493	0	0
170703	1,506	140,850	74,594	0	0
170800	26,139	2,322,678	1,056,138	0	0
170900	46,735	5,816,520	2,509,881	0	0
171001	16,187	1,604,140	649,344	0	0
171002	13,845	1,448,500	613,115	0	0
171003	3,330	321,432	144,813	0	0
171100	15,293	2,839,206	1,196,204	0	0
171200	327	30,289	19,401	0	0
180101	51,738	4,470,653	1,920,985	0	0
180102	2,883	321,363	132,322	0	0
180200	104	9,335	5,771	0	0
180201	6,732	2,011,806	890,711	0	0
180300	238,129	57,782,950	24,618,243	0	0
180400	222,870	47,310,091	21,123,237	0	0
180500	4,520	885,453	403,357	0	0
180600	12,361	902,130	440,426	0	0
180701	3,411	293,504	143,902	0	0
180702	11,417	1,895,570	789,414	15,270,752	6,359,537
180703	10,753	827,048	348,634	2,802,610	1,181,414
180800	183	16,834	10,313	0	0
180901	11	809	465	0	0
180902	10,976	1,224,421	539,901	1,299,162	572,857
181001	3,287	130,703	54,872	840,151	352,712
181002	38,333	10,168,963	3,084,468	0	0
190101	0	0	0	0	0
190102	0	0	0	0	0
190103	0	0	0	0	0
190104	0	0	0	0	0
190201	0	0	0	0	0
190202	0	0	0	0	0
190203	10	631	363	0	0
190204	0	0	0	0	0
190205	117	5,995	3,699	0	0
190206	0	0	0	0	0

**Table S7--2012.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
huc6	mrf_all_aa	MRF_all_na	MRF_all_pa	cex_n	cex_p
130800	DD	DD	DD	DD	DD
130900	DD	DD	DD	DD	DD
140100	3,059	540,976	230,860	0	0
140200	1,425	360,257	159,386	0	0
140300	110	23,225	15,039	0	0
140401	279	22,831	14,648	0	0
140402	DD	DD	DD	DD	DD
140500	DD	DD	DD	DD	DD
140600	1,109	271,385	144,675	0	0
140700	DD	DD	DD	DD	DD
140801	813	180,278	114,724	0	0
140802	DD	DD	DD	DD	DD
150100	1,862	213,897	127,542	0	0
150200	22,071	1,794,732	1,113,894	602,893	374,183
150301	DD	DD	DD	DD	DD
150302	61	20,007	12,186	0	0
150400	DD	DD	DD	DD	DD
150501	DD	DD	DD	DD	DD
150502	DD	DD	DD	DD	DD
150503	DD	DD	DD	DD	DD
150601	DD	DD	DD	DD	DD
150602	DD	DD	DD	DD	DD
150701	44,204	10,018,280	4,136,066	0	0
150702	DD	DD	DD	DD	DD
150801	DD	DD	DD	DD	DD
150802	0	0	0	0	0
150803	DD	DD	DD	DD	DD
160101	DD	DD	DD	DD	DD
160102	10,565	2,105,153	900,162	0	0
160201	566	165,022	73,976	0	0
160202	7,809	1,740,381	739,632	0	0
160203	6,917	1,470,174	610,247	0	0
160300	DD	DD	DD	DD	DD
160401	267	93,449	54,825	0	0
160402	DD	DD	DD	DD	DD
160501	DD	DD	DD	DD	DD
160502	2,406	467,727	193,084	0	0
160503	DD	DD	DD	DD	DD
160600	425	151,428	87,474	0	0
170101	DD	DD	DD	DD	DD
170102	1,452	244,625	144,871	0	0
170103	406	51,220	28,867	0	0
170200	34,504	8,993,176	3,307,630	0	0
170300	29,259	8,684,899	3,242,578	0	0
170401	73	14,326	8,022	0	0
170402	57,021	18,024,571	7,429,950	0	0
170501	29,073	9,991,275	3,909,347	0	0
170502	DD	DD	DD	DD	DD
170601	1,383	266,519	112,296	0	0
170602	158	27,493	18,280	0	0
170603	755	42,637	26,950	0	0
170701	23,740	7,074,574	2,661,057	0	0
170702	53	7,083	3,413	0	0
170703	1,535	125,199	71,638	0	0
170800	29,121	2,527,679	1,153,616	0	0
170900	38,464	5,256,614	2,259,992	0	0
171001	15,142	1,588,936	643,559	0	0
171002	10,349	1,166,758	497,461	0	0
171003	2,292	259,318	120,573	0	0
171100	18,189	3,029,655	1,255,161	0	0
171200	DD	DD	DD	DD	DD
180101	60,164	4,727,416	2,051,012	635,616	275,765
180102	4,819	424,149	193,109	0	0
180200	DD	DD	DD	DD	DD
180201	5,336	1,731,057	766,921	0	0
180300	365,994	60,783,327	25,775,342	0	0
180400	213,304	45,960,343	20,408,255	0	0
180500	6,953	1,303,211	590,242	0	0
180600	9,889	881,175	424,878	0	0
180701	DD	DD	DD	DD	DD
180702	23,869	4,806,695	2,007,819	8,145,149	3,402,335
180703	5,953	858,981	358,490	2,705,617	1,129,170
180800	DD	DD	DD	DD	DD
180901	DD	DD	DD	DD	DD
180902	12,592	1,214,326	520,730	2,837,717	1,216,877
181001	DD	DD	DD	DD	DD
181002	DD	DD	DD	DD	DD
190101	0	0	0	0	0
190102	0	0	0	0	0
190103	0	0	0	0	0
190104	0	0	0	0	0
190201	DD	DD	DD	DD	DD
190202	0	0	0	0	0
190203	DD	DD	DD	DD	DD
190204	DD	DD	DD	DD	DD
190205	DD	DD	DD	DD	DD
190206	0	0	0	0	0

**Table S7--2007.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2007 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
190207	12	221	149	0	0
190301	0	0	0	0	0
190302	0	0	0	0	0
190303	0	0	0	0	0
190304	0	0	0	0	0
190305	0	0	0	0	0
190401	0	0	0	0	0
190402	0	0	0	0	0
190403	0	0	0	0	0
190404	5	311	209	0	0
190405	29	1,021	592	0	0
190406	0	0	0	0	0
190407	0	0	0	0	0
190408	0	0	0	0	0
190501	0	0	0	0	0
190502	0	0	0	0	0
200100	2,735	206,168	91,115	0	0
200200	192	13,814	8,716	0	0
200400	0	0	0	0	0
200500	30	1,825	1,333	0	0
200600	1,581	121,096	53,970	289,029	128,814
200700	380	14,524	8,543	0	0
200800	0	0	0	0	0

**Table S7--2012.** Off-Farm Excess Manure Nutrients and Related Results from the Land Application Simulation Model on Non-AFOs, by 6-digit HUC.

Derived from the 2012 Census of Agriculture Database

6-digit HUC	Cropland and pastureland acres receiving off-farm manure applications in the model simulation	Manure nitrogen applied (pounds) in the model simulation	Manure phosphorus applied (pounds) in the model simulation	HUC 6-level excess manure nitrogen (pounds)	HUC 6-level excess manure phosphorus (pounds)
huc6	mrf_all_aa	MRF_all_na	MRF_all_pa	cex_n	cex_p
190207	0	0	0	0	0
190301	0	0	0	0	0
190302	0	0	0	0	0
190303	0	0	0	0	0
190304	0	0	0	0	0
190305	0	0	0	0	0
190401	0	0	0	0	0
190402	0	0	0	0	0
190403	0	0	0	0	0
190404	DD	DD	DD	DD	DD
190405	DD	DD	DD	DD	DD
190406	0	0	0	0	0
190407	0	0	0	0	0
190408	0	0	0	0	0
190501	0	0	0	0	0
190502	0	0	0	0	0
200100	DD	DD	DD	DD	DD
200200	DD	DD	DD	DD	DD
200400	0	0	0	0	0
200500	DD	DD	DD	DD	DD
200600	DD	DD	DD	DD	DD
200700	DD	DD	DD	DD	DD
200800	0	0	0	0	0
Sum of column	13,991,966	1,737,734,112	774,841,316	102,714,195	48,826,811
National total	14,489,417	1,809,061,062	805,712,732	103,570,786	49,165,831
Percent of national total	96.57%	96.06%	96.17%	99.17%	99.31%

Notes: For complete definitions of variables, see the USDA/NRCS report entitled "Estimates of Recoverable and Non-Recoverable Manure Nutrients Based on the Census of Agriculture," authored by Robert L. Kellogg, David C. Moffitt, and Noel Gollehon.

For these results, the off-farm land application simulation was conducted at the 6-digit HUC level.

National results reported in the report, however, are for the off-farm land application simulation conducted at the county level. Consequently, the national totals for the results shown in this table differ from those in the full report.