Preliminary N-Methyl Carbamate Pesticides Cumulative Risk Assessment

II.D Appendices: Drinking Water Exposure

1. Summary of USGS NAWQA Monitoring for N-Methyl Carbamates

The U.S. Geological Survey (USGS) National Water Quality Assessment (NAWQA) program has been collecting pesticide monitoring data from sites across the country since 1991. N-methyl carbamate (NMC) pesticides included in the USGS analytical methods include aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, Methiocarb, methomyl, oxamyl, and propoxur. With the assistance or Rick Bell of the USGS NAWQA program, the Agency obtained all the USGS monitoring for these NMC pesticides in both ground water and surface water through November 15, 2004. The following tables provide summaries of reported NMC detections for each NAWQA study unit by land use type.

The NAWQA study did not focus on drinking water and the monitoring reflect a range of ambient waters. OPP tried to focus on those sampling sites that fed into drinking water sources or were reflective of drinking water sources in the region. Nor were the study sites targeted to high pesticide or NMC use areas. The monitoring results are most valuable in identifying areas and conditions under which NMC pesticides may be found in ambient waters. Such information is useful in identifying potential vulnerable areas and in evaluating the model estimates where monitoring sites occur in the same area as the exposure scenarios.

a. Surface Water Monitoring Summary

Figures II.D.1.1 through !!.D.1.4 show the NAWQA Study Units in relation to cumulative carbamate use areas. The monitoring data are listed by the 4-letter study unit identification (SUID) codes displayed on the maps.

This is only a preliminary summary of N-methyl carbamate detections, grouped by study unit and land use. For the revised NMC CRA, the Agency will revise this appendix, ass necessary, to better characterize NAWQA monitoring results and drinking water exposure estimates from the NMC CRA.

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FIgure II.D.1. 1 - NAWQA Study Units in the Northwestern US in Relation to Cumulative Carbamate Use

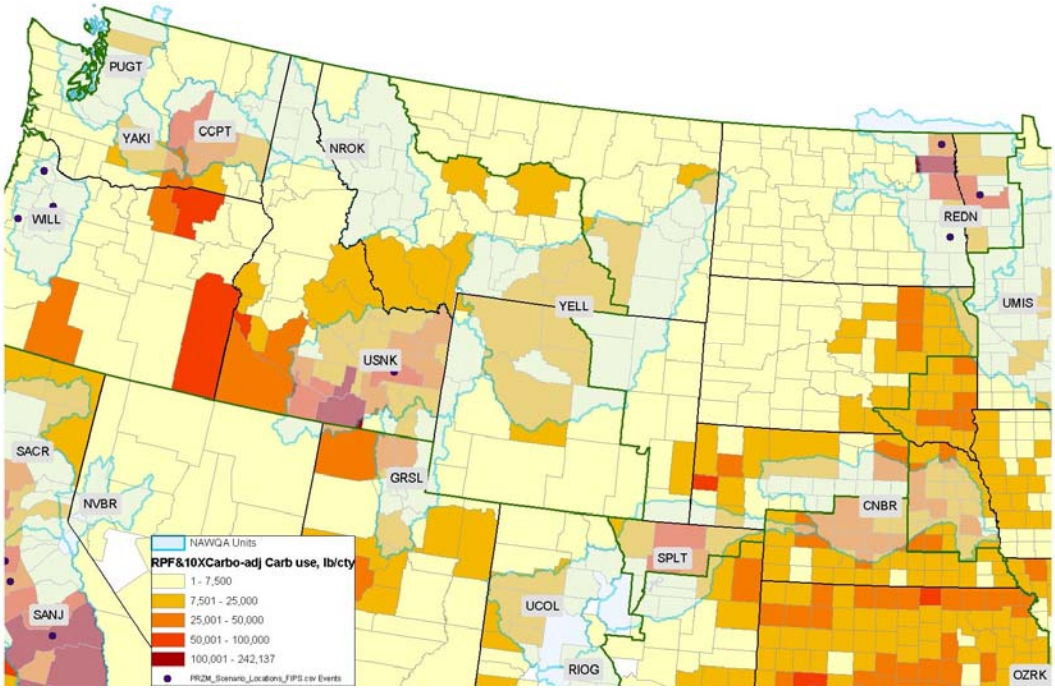

FIgure II.D.1. 2 - NAWQA Study Units in the Southwestern US in Relation to Cumulative Carbamate Use

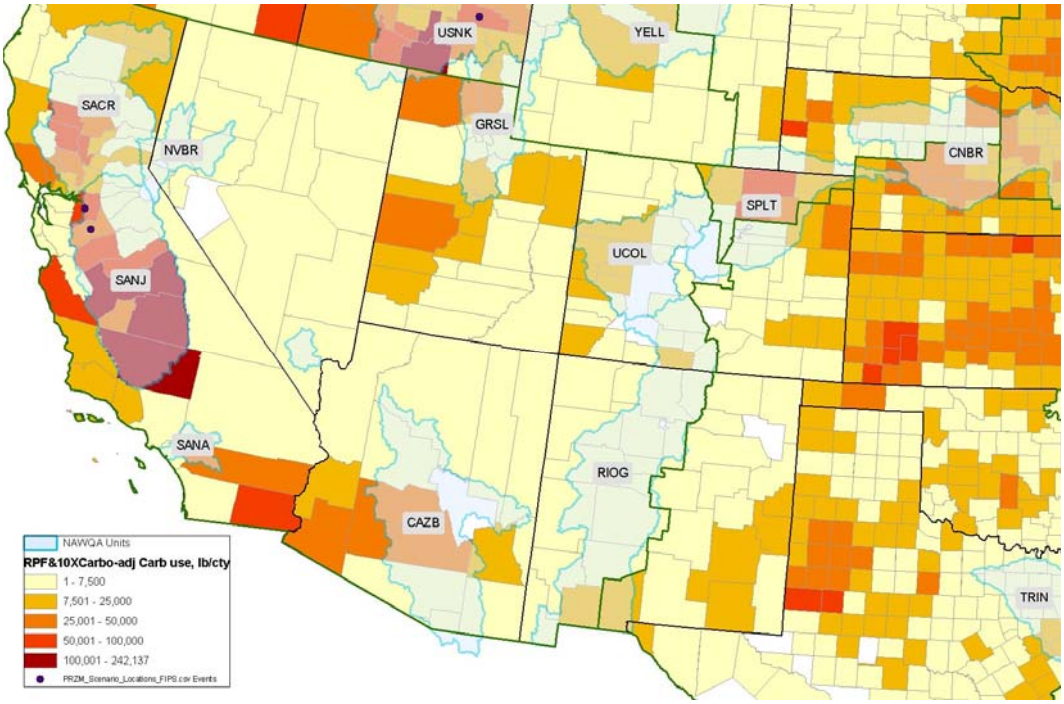

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FIgure II.D.1. 3 - NAWQA Study Units in the Northeastern US in Relation to Cumulative Carbamate Use

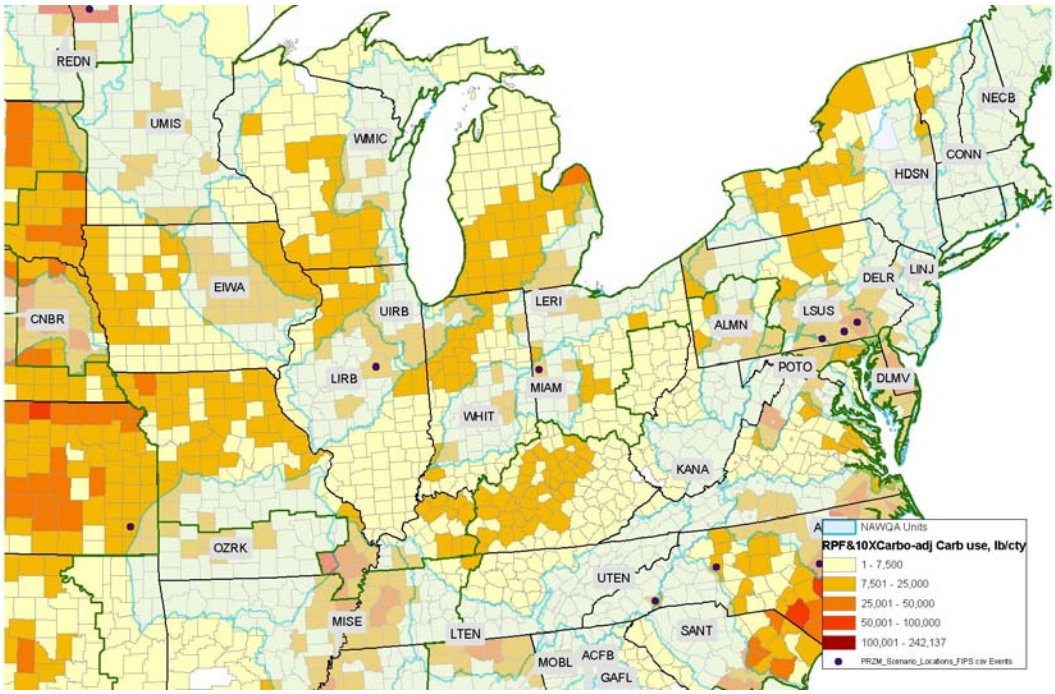
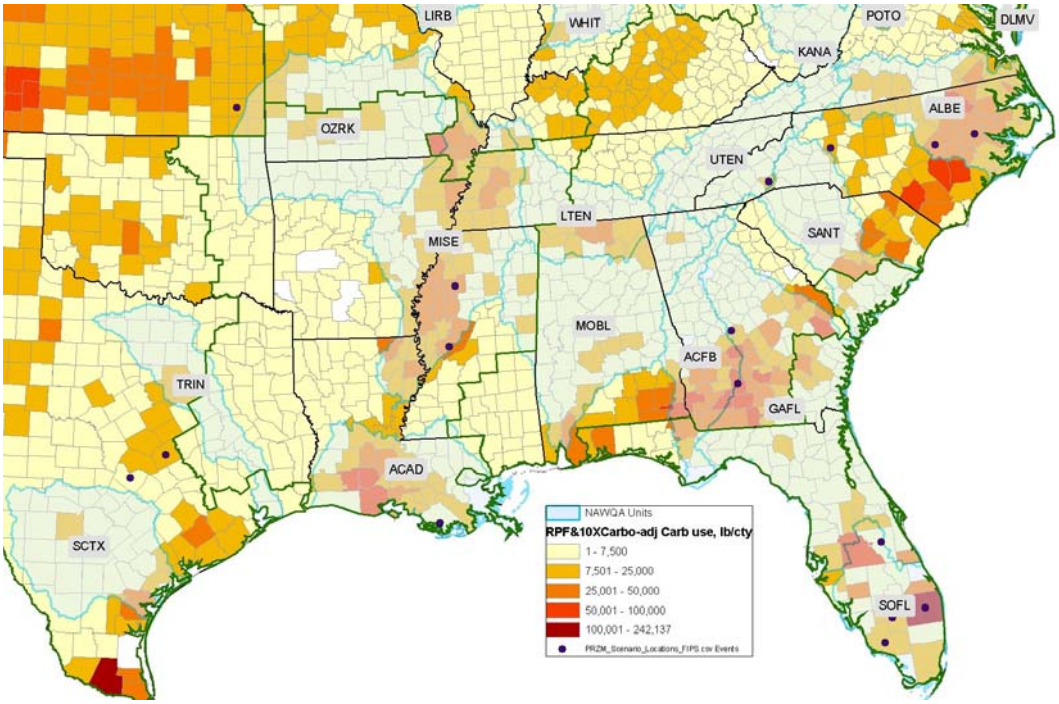


FIgure II.D.1. 4 - NAWQA Study Units in the Southeastern US in Relation to Cumulative Carbamate Use



Preliminary N-Methyl Carbamate Pesticides Cumulative Risk Assessment

Table II.D.1.1 – Detections of aldicarb, aldicarb sulfone, and aldicarb sulfoxide in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
Aldicarb							
ACFB	Cropland	0.040	0.040	0.040	0.040	0.0%	0
ALBE	Agriculture	0.340	0.078	0.016	0.016	1.2%	1
GAFL	Agriculture	0.040	0.040	0.040	0.023	0.0%	0
MISE	Cropland	0.550	0.550	0.550	0.016	0.0%	0
NVBR	Mixed	0.050	0.034	0.016	0.016	0.0%	0
REDN	Cropland	0.510	0.140	0.016	0.016	1.3%	1
SANJ	Mixed	0.460	0.072	0.040	0.040	0.7%	1
SANT	Cropland	0.480	0.350	0.016	0.016	3.4%	1
SPLT	Agriculture	0.016	0.016	0.016	0.016	0.0%	0
SPLT	Mixed	0.080	0.061	0.016	0.016	3.3%	1
SPLT	Urban	0.040	0.040	0.040	0.040	0.0%	0
TENN	Cropland	0.040	0.040	0.040	0.040	0.0%	0
TENN	Mixed	0.040	0.040	0.022	0.016	0.0%	0
WILL	Agriculture	0.040	0.040	0.040	0.040	0.0%	0
YELL	Mixed	1.200	1.031	0.550	0.550	3.7%	1
Aldicarb Sulfone							
ACFB	Cropland	0.020	0.020	0.020	0.020	0.0%	0
ALBE	Agriculture	0.016	0.016	0.016	0.016	0.0%	0
GAFL	Agriculture	0.020	0.020	0.020	0.017	0.0%	0
MISE	Cropland	0.100	0.100	0.100	0.016	0.0%	0
NVBR	Mixed	0.070	0.061	0.016	0.016	2.1%	1
REDN	Cropland	0.016	0.016	0.016	0.016	0.0%	0
SANJ	Mixed	0.090	0.020	0.020	0.020	0.0%	0
SANT	Cropland	0.016	0.016	0.016	0.016	0.0%	0
SPLT	Agriculture	0.016	0.016	0.016	0.016	0.0%	0
SPLT	Mixed	0.016	0.016	0.016	0.016	0.0%	0
SPLT	Urban	0.157	0.050	0.020	0.020	1.3%	1
TENN	Cropland	0.042	0.042	0.039	0.036	25.0%	1
TENN	Mixed	0.022	0.021	0.020	0.016	1.0%	1
WILL	Agriculture	0.020	0.020	0.020	0.020	0.0%	0
YELL	Mixed	0.260	0.218	0.100	0.100	0.0%	0
Aldicarb Sulfoxide							
ACFB	Cropland	0.920	0.021	0.021	0.021	0.6%	1
ALBE	Agriculture	0.021	0.021	0.021	0.021	0.0%	0
GAFL	Agriculture	0.290	0.021	0.021	0.021	0.8%	1
MISE	Cropland	1.910	0.222	0.021	0.021	1.2%	2
NVBR	Mixed	0.050	0.037	0.021	0.021	0.0%	0
REDN	Cropland	0.021	0.021	0.021	0.021	0.0%	0
SANJ	Mixed	0.090	0.021	0.021	0.021	0.7%	1
SANT	Cropland	1.200	0.870	0.021	0.021	3.4%	1
SPLT	Agriculture	0.980	0.472	0.021	0.021	1.9%	1
SPLT	Mixed	0.021	0.021	0.021	0.021	0.0%	0

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Table II.D.1.1 – Detections of aldicarb, aldicarb sulfone, and aldicarb sulfoxide in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
SPLT	Urban	0.021	0.021	0.021	0.021	0.0%	0
TENN	Cropland	0.043	0.042	0.038	0.033	25.0%	1
TENN	Mixed	0.065	0.045	0.027	0.021	2.9%	3
WILL	Agriculture	0.021	0.021	0.021	0.021	2.6%	3
YELL	Mixed	0.140	0.130	0.076	0.021	0.0%	0

Table II.D.1.2 – Detections of carbaryl by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
Carbaryl (Anal. Meth 49310)							
ACAD	Cropland	0.01	0.00936	0.008	0.008	0.0%	0
ACAD	Forest	0.008	0.008	0.008	0.008	0.0%	0
ACAD	Mixed	0.0284	0.0284	0.0284	0.0182	0.0%	0
ACAD	Urban	0.008	0.008	0.008	0.008	0.0%	0
ACFB	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
ACFB	Cropland	0.0284	0.0284	0.0284	0.0284	0.6%	1
ACFB	Mixed	0.07	0.06371	0.01	0.008	4.2%	5
ACFB	Not Applicable	0.0548	0.054007	0.050835	0.0448	42.9%	6
ACFB	Reference	0.07	0.07	0.0142	0.008	0.0%	0
ACFB	Residential	0.12	0.097	0.04	0.0284	14.5%	24
ACFB	Urban	0.97	0.511	0.066	0.0332	12.7%	7
ALBE	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
ALBE	Forest	-	-	-	-	-	0
ALBE	Mixed	0.0284	0.0284	0.0284	0.0284	10.5%	6
ALBE	Not Applicable	0.0284	0.0284	0.0284	0.0284	30.8%	4
ALBE	Urban	0.1089	0.080592	0.0284	0.0284	58.1%	25
ALMN	Mixed	-	-	-	-	-	0
ALMN	Urban	0.09	0.0695	0.008	0.008	3.8%	1
CAZB	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
CAZB	Mixed	0.5	0.35732	0.008	0.008	0.0%	0
CCYK	Agriculture	0.8732	0.053016	0.0284	0.0284	7.5%	13
CCYK	Mixed	0.0284	0.0284	0.0284	0.0284	5.4%	6
CCYK	Not Applicable	-	-	-	-	-	0
CCYK	Other/Mixed	-	-	-	-	-	0
CCYK	Reference	0.008	0.008	0.008	0.008	0.0%	0
CNBR	Agriculture	0.05	0.039416	0.0284	0.0284	2.0%	1
CNBR	Cropland	0.008	0.008	0.008	0.008	0.0%	0
CNBR	Mixed	0.0284	0.0284	0.0284	0.0284	0.0%	0
CONN	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
CONN	Mixed	0.02	0.01568	0.008	0.008	2.7%	1
CONN	Reference	0.02	0.01904	0.0152	0.0104	11.1%	1
CONN	Urban	2.9	0.6264	0.061	0.0284	14.1%	14
COOK	Residential	0.11	0.1094	0.107	0.104	28.6%	2

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Table II.D.1.2 – Detections of carbaryl by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
DELR	Agriculture	-	-	-	-	-	0
DELR	Cropland	-	-	-	-	-	0
DELR	Forest	-	-	-	-	-	0
DELR	Mixed	-	-	-	-	-	0
DELR	Reference	-	-	-	-	-	0
DELR	Residential	-	-	-	-	-	0
DELR	Urban	-	-	-	-	-	0
GAFL	Agriculture	0.03	0.0284	0.0284	0.0284	0.0%	0
GAFL	Mixed	0.0284	0.0284	0.0284	0.0284	2.5%	2
GAFL	Not Applicable	0.0284	0.0284	0.0284	0.0284	5.4%	2
GAFL	Urban	0.07	0.0583	0.0305	0.008	2.5%	1
GRSL	Agriculture	0.0284	0.0284	0.0284	0.0284	0.0%	0
GRSL	Commercial/Industrial	-	-	-	-	-	0
GRSL	Mixed	0.0284	0.0284	0.0284	0.0284	0.0%	0
GRSL	Rangeland	0.0284	0.0284	0.0284	0.0284	0.0%	0
GRSL	Residential	-	-	-	-	-	0
GRSL	Urban	-	-	-	-	-	0
HDSN	Agriculture	0.0284	0.02024	0.008	0.008	0.0%	0
HDSN	Mixed	0.008	0.008	0.008	0.008	0.0%	0
HDSN	Residential	0.07	0.058768	0.0284	0.01412	3.6%	1
HDSN	Urban	0.22	0.22	0.22	0.22	100.0%	1
KANA	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
KANA	Mixed	0.07	0.05388	0.008	0.008	3.7%	1
LERI	Cropland	0.0284	0.0284	0.0284	0.0284	0.0%	0
LERI	Mixed	0.0284	0.0284	0.0284	0.0284	0.0%	0
LERI	Pasture	0.008	0.008	0.008	0.008	0.0%	0
LERI	Urban	0.0284	0.0284	0.0284	0.01122	5.9%	2
LINJ	Agriculture	0.05	0.0479	0.0395	0.029	16.7%	1
LINJ	Commercial/Industrial	-	-	-	-	-	0
LINJ	Forest	0.008	0.008	0.008	0.008	0.0%	0
LINJ	Mixed	0.23	0.1988	0.09	0.046	28.0%	7
LINJ	Residential	0.04	0.0392	0.036	0.032	33.3%	3
LINJ	Urban	0.008	0.008	0.008	0.008	2.5%	1
LIRB	Cropland	0.008	0.008	0.008	0.008	0.0%	0
LIRB	Mixed	0.07	0.07	0.07	0.07	0.0%	0
LSUS	Agriculture	0.34	0.085	0.008	0.008	2.3%	2
LSUS	Mixed	0.008	0.008	0.008	0.008	0.0%	0
LSUS	Reference	-	-	-	-	-	0
LSUS	Urban	0.008	0.008	0.008	0.008	0.0%	0
MISE	Cropland	0.02	0.0104	0.008	0.008	0.6%	1
MISE	Forest	-	-	-	-	-	0
MISE	Mixed	0.008	0.008	0.008	0.008	0.0%	0
MISE	Urban	0.26	0.2432	0.178	0.09	20.0%	5

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Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
MOBL	Cropland	0.0284	0.0284	0.0284	0.0284	0.0%	0
MOBL	Mixed	0.0284	0.027584	0.02432	0.02024	0.0%	0
MOBL	Pasture	-	-	-	-	-	0
MOBL	Urban	0.0284	0.0284	0.0284	0.0284	0.0%	0
NECB	Mixed	-	-	-	-	-	0
NECB	Urban	-	-	-	-	-	0
NROK	Cropland	-	-	-	-	-	0
NROK	Mixed	-	-	-	-	-	0
NROK	Urban	-	-	-	-	-	0
NVBR	Mixed	0.05	0.03068	0.008	0.008	0.0%	0
NVBR	Urban	0.0284	0.0284	0.0284	0.0284	2.3%	2
OAHU	Mixed	-	-	-	-	-	0
OAHU	Urban	-	-	-	-	-	0
OZRK	Pasture	0.008	0.008	0.008	0.008	0.0%	0
PODL	Agriculture	0.0284	0.0284	0.0284	0.0284	0.0%	0
PODL	Mixed	0.008	0.008	0.008	0.008	0.0%	0
PODL	Not Applicable	0.1196	0.098272	0.07	0.05959	4.5%	2
PODL	Urban	0.12	0.1136	0.08876	0.05964	41.5%	27
PUGT	Agriculture	0.02	0.01628	0.008	0.008	0.0%	0
PUGT	Mixed	0.01	0.0091	0.008	0.008	0.0%	0
PUGT	Residential	-	-	-	-	-	0
PUGT	Urban	0.01	0.00908	0.008	0.008	0.0%	0
REDN	Cropland	0.008	0.008	0.008	0.008	0.0%	0
RIOG	Mixed	0.008	0.008	0.008	0.008	0.0%	0
RIOG	Not Applicable	0.008	0.008	0.008	0.008	0.0%	0
RIOG	Urban	-	-	-	-	-	0
SACR	Cropland	0.04	0.03264	0.008	0.008	12.5%	3
SACR	Mixed	0.008	0.008	0.008	0.008	0.0%	0
SACR	Urban	0.55	0.5365	0.4405	0.316	39.3%	11
SANA	Mixed	0.008	0.008	0.008	0.008	0.0%	0
SANA	Not Applicable	-	-	-	-	-	0
SANA	Residential	-	-	-	-	-	0
SANA	Urban	0.008	0.008	0.008	0.008	0.0%	0
SANJ	Agriculture	0.18	0.0735	0.0284	0.0284	13.9%	10
SANJ	Mixed	0.09	0.029408	0.0284	0.0284	1.4%	2
SANJ	Not Applicable	0.0284	0.0284	0.0284	0.0284	0.0%	0
SANJ	Urban	-	-	-	-	-	0
SANT	Cropland	0.008	0.008	0.008	0.008	0.0%	0
SANT	Forest	0.008	0.008	0.008	0.008	0.0%	0
SANT	Mixed	0.008	0.008	0.008	0.008	0.0%	0
SANT	Urban	0.05	0.03656	0.008	0.008	3.0%	1
SCTX	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
SCTX	Mixed	0.14	0.08588	0.008	0.008	2.4%	1
SCTX	Urban	0.2	0.1825	0.12	0.08	16.7%	6
SOFL	Agriculture	0.008	0.008	0.008	0.008	0.0%	0

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Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
SOFL	Cropland	0.02	0.02	0.008	0.008	2.3%	2
SOFL	Mixed	0.008	0.008	0.008	0.008	0.0%	0
SPLT	Agriculture	2	1.576	0.1425	0.008	7.4%	4
SPLT	Mixed	0.008	0.008	0.008	0.008	0.0%	0
SPLT	Not Applicable	0.0284	0.0284	0.0284	0.0284	0.0%	0
SPLT	Urban	4.4	3.386	1.75	0.72	51.9%	41
TENN	Agriculture	0.011	0.00857	0.008	0.008	0.0%	0
TENN	Cropland	0.0284	0.0284	0.0284	0.0284	25.0%	1
TENN	Forest	0.011	0.01073	0.01	0.0086	0.0%	0
TENN	Mining	0.24	0.19592	0.0196	0.008	5.0%	1
TENN	Mixed	0.11	0.0284	0.0109	0.008	4.9%	5
TENN	Urban	0.008	0.008	0.008	0.008	0.0%	0
TRIN	Agriculture	0.05	0.0323	0.008	0.008	0.6%	1
TRIN	Forest	0.008	0.008	0.008	0.008	0.0%	0
TRIN	Mixed	0.008	0.008	0.008	0.008	0.0%	0
TRIN	Not Applicable	0.0328	0.031304	0.0284	0.0284	11.4%	4
TRIN	Rangeland	0.008	0.008	0.008	0.008	0.0%	0
TRIN	Reference	0.008	0.008	0.008	0.008	0.0%	0
TRIN	Urban	0.47	0.368	0.105	0.05	22.6%	7
UCOL	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
UCOL	Mixed	0.07	0.07	0.07	0.07	0.0%	0
UCOL	Other/Mixed	0.008	0.008	0.008	0.008	0.0%	0
UIRB	Cropland	-	-	-	-	-	0
UIRB	Mixed	0.008	0.008	0.008	0.008	0.0%	0
UIRB	Urban	-	-	-	-	-	0
UMIS	Agriculture	0.07	0.07	0.07	0.0266	0.0%	0
UMIS	Mixed	0.07	0.07	0.008	0.008	0.0%	0
UMIS	Urban	0.07	0.07	0.07	0.008	0.0%	0
USNK	Agriculture	0.008	0.008	0.008	0.008	0.0%	0
WHMI	Agriculture	-	-	-	-	-	0
WHMI	Cropland	0.05	0.0284	0.0284	0.0284	1.9%	4
WHMI	Mixed	0.0284	0.0284	0.0284	0.0284	2.2%	3
WHMI	Not Applicable	0.0653	0.059396	0.03578	0.0284	5.9%	1
WHMI	Urban	0.0415	0.038356	0.0284	0.0284	32.0%	8
WILL	Agriculture	0.0809	0.062523	0.0284	0.0284	7.0%	8
WILL	Mixed	0.07	0.0642	0.05	0.03056	6.7%	2
WILL	Urban	0.25	0.199096	0.05766	0.0284	38.6%	22
WMIC	Cropland	0.0284	0.009632	0.008	0.008	0.0%	0
WMIC	Mixed	0.0284	0.0284	0.0284	0.0284	0.0%	0
YELL	Mixed	0.008	0.008	0.008	0.008	0.0%	0
Carbaryl (Anal. Meth 82680)							
ACAD	Cropland	0.206	0.055964	0.041	0.041	20.2%	57
ACAD	Forest	0.236	0.2096	0.041	0.041	13.6%	11
ACAD	Mixed	0.161	0.13403	0.041	0.041	27.7%	26
ACAD	Urban	0.482	0.38813	0.2405	0.1767	64.1%	41

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Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
ACFB	Agriculture	0.01	0.00923	0.00615	0.003	8.3%	1
ACFB	Cropland	0.041	0.041	0.041	0.041	3.8%	7
ACFB	Mixed	0.174	0.098176	0.06266	0.041	48.6%	86
ACFB	Not Applicable	0.0924	0.074481	0.041	0.041	34.0%	34
ACFB	Reference	0.05	0.0446	0.041	0.041	9.8%	6
ACFB	Residential	0.24	0.20448	0.07786	0.0451	54.2%	123
ACFB	Urban	1.9	0.8793	0.121	0.1	73.3%	44
ALBE	Agriculture	0.15	0.1102	0.0502	0.017	28.1%	56
ALBE	Forest	0.01	0.00979	0.00895	0.0079	25.0%	1
ALBE	Mixed	0.469	0.25472	0.0588	0.041	47.7%	113
ALBE	Not Applicable	0.36	0.2589	0.041	0.041	50.9%	54
ALBE	Urban	0.197	0.139682	0.04347	0.041	85.7%	36
ALMN	Mixed	0.006	0.00513	0.003	0.003	3.3%	1
ALMN	Urban	0.613	0.61207	0.59405	0.38289	34.4%	11
CAZB	Agriculture	0.336	0.3316	0.314	0.09	14.6%	6
CAZB	Mixed	0.09	0.0784	0.0365	0.0173	13.3%	4
CCYK	Agriculture	33.5	0.34724	0.08617	0.041	36.4%	183
CCYK	Mixed	0.175	0.05794	0.041	0.041	17.9%	50
CCYK	Not Applicable	0.041	0.041	0.041	0.041	66.7%	4
CCYK	Other/Mixed	0.16	0.155198	0.13599	0.11198	75.0%	6
CCYK	Reference	0.0411	0.041074	0.041	0.03428	33.3%	9
CNBR	Agriculture	0.101	0.041	0.041	0.041	3.8%	8
CNBR	Cropland	0.138	0.11848	0.0404	0.0082	11.8%	2
CNBR	Mixed	0.49	0.08461	0.041	0.041	11.8%	25
CONN	Agriculture	0.012	0.01182	0.0111	0.0102	15.8%	3
CONN	Mixed	0.0971	0.082944	0.041	0.041	20.8%	26
CONN	Reference	0.041	0.041	0.041	0.041	8.0%	2
CONN	Urban	3.2	1.2033	0.1626	0.041	36.5%	70
COOK	Residential	0.332	0.31751	0.2657	0.2296	75.0%	18
DELR	Agriculture	0.452	0.28169	0.03843	0.01128	14.0%	6
DELR	Cropland	0.573	0.18152	0.041	0.041	20.6%	34
DELR	Forest	0.041	0.041	0.041	0.041	2.1%	1
DELR	Mixed	0.617	0.061848	0.041	0.041	36.1%	66
DELR	Reference	0.041	0.041	0.041	0.041	22.2%	4
DELR	Residential	2.41	0.528	0.148	0.12	66.3%	67
DELR	Urban	0.154	0.119776	0.04021	0.02784	34.9%	22
GAFL	Agriculture	0.083	0.041	0.041	0.041	4.6%	11
GAFL	Mixed	0.154	0.06258	0.041	0.041	26.2%	49
GAFL	Not Applicable	0.0842	0.066056	0.041	0.041	18.6%	8
GAFL	Urban	0.441	0.32922	0.1067	0.04018	52.9%	37
GRSL	Agriculture	0.174	0.13011	0.041	0.041	29.4%	10
GRSL	Commercial/Industrial	0.128	0.128	0.128	0.128	100.0%	1
GRSL	Mixed	0.0928	0.086912	0.06608	0.041	50.8%	33
GRSL	Rangeland	0.041	0.041	0.041	0.041	5.6%	1

Preliminary N-Methyl Carbamate Pesticides Cumulative Risk Assessment

Table II.D.1.2 – Detections of carbaryl by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
GRSL	Residential	0.411	0.31552	0.1308	0.07672	56.8%	71
GRSL	Urban	0.0315	0.031284	0.03042	0.02934	75.0%	3
HDSN	Agriculture	0.041	0.041	0.041	0.041	2.5%	5
HDSN	Mixed	0.0641	0.041	0.041	0.041	11.1%	17
HDSN	Residential	0.86	0.4424	0.194	0.118	49.3%	36
HDSN	Urban	1.6	1.6	1.6	1.6	100.0%	1
KANA	Agriculture	0.0061	0.005108	0.003	0.003	3.0%	1
KANA	Mixed	0.092	0.072008	0.01748	0.01056	31.0%	9
LERI	Cropland	0.432	0.114254	0.041	0.041	8.6%	21
LERI	Mixed	0.143	0.11234	0.05306	0.041	24.4%	30
LERI	Pasture	0.0311	0.021665	0.01135	0.00633	11.5%	6
LERI	Urban	0.222	0.17386	0.08472	0.041	44.1%	26
LINJ	Agriculture	0.3	0.274872	0.17436	0.08192	53.8%	7
LINJ	Commercial/Industrial	0.189	0.185253	0.170265	0.15153	75.0%	3
LINJ	Forest	0.0441	0.038146	0.02114	0.01746	33.3%	9
LINJ	Mixed	0.353	0.2498	0.1544	0.1104	58.6%	51
LINJ	Residential	0.13	0.13	0.1155	0.0973	41.9%	13
LINJ	Urban	0.043	0.04012	0.03294	0.01414	28.6%	14
LIRB	Cropland	0.124	0.042102	0.041	0.041	6.6%	12
LIRB	Mixed	0.041	0.041	0.041	0.041	5.3%	5
LSUS	Agriculture	0.647	0.15816	0.01792	0.00888	18.1%	44
LSUS	Mixed	0.057	0.04728	0.0277	0.0057	12.2%	10
LSUS	Reference	0.003	0.003	0.003	0.003	3.8%	1
LSUS	Urban	0.15	0.124	0.0572	0.031	29.4%	32
MISE	Cropland	0.0944	0.041	0.041	0.041	4.4%	10
MISE	Forest	0.041	0.041	0.041	0.041	16.7%	1
MISE	Mixed	0.041	0.041	0.041	0.041	7.1%	8
MISE	Urban	0.359	0.33409	0.23325	0.1695	77.1%	37
MOBL	Cropland	0.041	0.041	0.041	0.041	10.6%	7
MOBL	Mixed	0.041	0.041	0.041	0.041	16.1%	19
MOBL	Pasture	0.0041	0.004078	0.00399	0.00388	33.3%	1
MOBL	Urban	0.422	0.30602	0.073755	0.041	28.6%	48
NECB	Mixed	0.131	0.114017	0.050585	0.041	48.1%	25
NECB	Urban	1.1	0.48234	0.1687	0.0641	43.3%	55
NROK	Cropland	0.0065	0.00629	0.00545	0.0044	14.3%	1
NROK	Mixed	0.006	0.005675	0.004375	0.00335	7.1%	1
NROK	Urban	0.006	0.00576	0.0048	0.0036	9.1%	1
NVBR	Mixed	0.173	0.102895	0.041	0.041	27.9%	38
NVBR	Urban	0.215	0.11368	0.06544	0.0452	30.3%	47
OAHU	Mixed	0.294	0.2697	0.1788	0.0683	25.0%	7
OAHU	Urban	0.37	0.33463	0.23865	0.11277	32.1%	9
OZRK	Pasture	0.079	0.04241	0.041	0.041	2.6%	4
PODL	Agriculture	0.186	0.08662	0.041	0.041	13.3%	42
PODL	Mixed	0.061	0.041	0.041	0.041	21.1%	47

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Table II.D.1.2 – Detections of carbaryl by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
PODL	Not Applicable	0.218	0.072272	0.041	0.041	9.7%	9
PODL	Urban	2	1.3516	0.38235	0.234	80.4%	135
PUGT	Agriculture	0.133	0.114648	0.04696	0.0093	9.4%	3
PUGT	Mixed	0.23	0.046256	0.041	0.041	7.0%	7
PUGT	Residential	0.0218	0.021189	0.018745	0.01413	21.4%	3
PUGT	Urban	0.483	0.23484	0.0571	0.041	26.3%	25
REDN	Cropland	0.008	0.004846	0.003	0.003	1.7%	2
RIOG	Mixed	0.082	0.0448	0.041	0.041	5.6%	11
RIOG	Not Applicable	0.044	0.04313	0.03965	0.0353	75.0%	3
RIOG	Urban	0.036	0.0357	0.0345	0.033	50.0%	2
SACR	Cropland	0.657	0.39204	0.0989	0.0809	38.8%	19
SACR	Mixed	0.0725	0.061622	0.041	0.041	24.2%	24
SACR	Urban	1.55	1.2024	0.41225	0.2915	96.4%	54
SANA	Mixed	0.145	0.095185	0.063925	0.04352	53.7%	44
SANA	Not Applicable	0.0261	0.025638	0.02379	0.02148	33.3%	1
SANA	Residential	0.008	0.008	0.008	0.008	100.0%	1
SANA	Urban	0.307	0.150616	0.041	0.041	16.4%	12
SANJ	Agriculture	0.7	0.33832	0.0884	0.041	45.3%	216
SANJ	Mixed	5.2	0.18284	0.0475	0.041	37.3%	326
SANJ	Not Applicable	0.041	0.041	0.041	0.041	21.9%	7
SANJ	Urban	0.411	0.38097	0.30505	0.2084	97.1%	33
SANT	Cropland	0.041	0.041	0.041	0.041	9.0%	10
SANT	Forest	0.0064	0.005108	0.003	0.003	2.6%	1
SANT	Mixed	0.0593	0.043928	0.041	0.041	7.1%	6
SANT	Urban	0.16	0.14173	0.04217	0.041	50.0%	44
SCTX	Agriculture	0.0903	0.064395	0.008875	0.00398	11.8%	4
SCTX	Mixed	0.172	0.073811	0.041	0.041	31.5%	29
SCTX	Urban	0.168	0.1599	0.1088	0.06848	47.3%	26
SOFL	Agriculture	0.0071	0.006854	0.00587	0.00464	14.3%	1
SOFL	Cropland	0.414	0.04102	0.041	0.041	7.0%	14
SOFL	Mixed	0.273	0.21036	0.041	0.041	46.4%	13
SPLT	Agriculture	1.5	0.377	0.07125	0.041	16.5%	17
SPLT	Mixed	0.143	0.13802	0.092915	0.06116	56.7%	76
SPLT	Not Applicable	16.5	0.9832	0.09117	0.05094	32.1%	36
SPLT	Urban	5.5	4.976	1.72	0.69	89.2%	140
TENN	Agriculture	0.0456	0.041	0.041	0.041	4.2%	7
TENN	Cropland	0.101	0.059892	0.041	0.041	9.2%	8
TENN	Forest	0.041	0.041	0.041	0.0276	4.9%	4
TENN	Mining	0.72	0.53208	0.06312	0.01064	21.6%	8
TENN	Mixed	0.921	0.084364	0.041	0.041	15.7%	48
TENN	Urban	0.007	0.00676	0.0058	0.0046	14.3%	1
TRIN	Agriculture	0.205	0.06115	0.041	0.041	7.5%	15
TRIN	Forest	0.009	0.00894	0.0087	0.0084	50.0%	1
TRIN	Mixed	0.183	0.13196	0.098	0.06288	57.3%	51
TRIN	Not Applicable	0.167	0.16294	0.142	0.094	57.6%	34

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Table II.D.1.2 – Detections of carbaryl by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
TRIN	Rangeland	0.009	0.00834	0.0057	0.003	8.3%	1
TRIN	Reference	5.18	2.8864	0.041	0.041	8.3%	4
TRIN	Urban	0.4	0.358	0.23	0.19	41.9%	13
UCOL	Agriculture	0.0227	0.015484	0.00552	0.00324	11.1%	5
UCOL	Mixed	0.041	0.041	0.041	0.041	11.8%	6
UCOL	Other/Mixed	0.041	0.041	0.041	0.041	7.7%	1
UIRB	Cropland	0.0708	0.054112	0.041	0.041	14.0%	8
UIRB	Mixed	0.0992	0.065536	0.041975	0.041	36.6%	49
UIRB	Urban	0.14	0.1342	0.0963	0.07612	64.4%	38
UMIS	Agriculture	0.041	0.041	0.041	0.041	1.2%	1
UMIS	Mixed	0.0827	0.041	0.041	0.041	4.7%	7
UMIS	Urban	0.175	0.108374	0.041	0.041	23.6%	30
USNK	Agriculture	0.19	0.041109	0.041	0.041	4.0%	8
WHMI	Agriculture	0.19	0.148967	0.03184	0.01858	44.7%	17
WHMI	Cropland	0.46	0.0814	0.041	0.041	13.6%	68
WHMI	Mixed	0.065	0.041	0.041	0.041	12.8%	49
WHMI	Not Applicable	0.041	0.041	0.041	0.041	21.4%	12
WHMI	Urban	0.672	0.16322	0.074925	0.04939	46.9%	60
WILL	Agriculture	2	0.48862	0.05632	0.041	39.6%	72
WILL	Mixed	0.132	0.041	0.041	0.041	24.6%	32
WILL	Urban	0.842	0.44676	0.238	0.1082	66.3%	55
WMIC	Cropland	0.045	0.041	0.041	0.041	1.4%	2
WMIC	Mixed	0.045	0.041	0.041	0.041	18.2%	22
YELL	Mixed	0.041	0.041	0.041	0.041	1.9%	3

Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
Carbofuran (Anal. Meth. 49309)							
ACAD	Cropland	1.35	0.9564	0.12	0.12	3.0%	1
ACAD	Mixed	0.12	0.12	0.12	0.12	6.3%	1
ACFB	Residential	0.29	0.1795	0.12	0.028	0.0%	0
ACFB	Urban	0.028	0.028	0.028	0.028	0.0%	0
ALBE	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
ALBE	Mixed	0.028	0.028	0.028	0.028	0.0%	0
ALBE	Not Applicable	0.0065	0.006476	0.00638	0.00616	15.4%	2
CAZB	Agriculture	0.12	0.12	0.12	0.12	0.0%	0
CAZB	Mixed	0.5	0.3898	0.12	0.12	0.0%	0
CCYK	Agriculture	0.13	0.12	0.12	0.12	1.2%	2
CCYK	Mixed	0.12	0.12	0.12	0.12	0.0%	0
CNBR	Agriculture	0.05	0.03922	0.028	0.028	2.0%	1
CNBR	Cropland	0.49	0.43456	0.2128	0.028	7.7%	1
CNBR	Mixed	0.3066	0.22302	0.028	0.028	3.2%	1
CONN	Agriculture	0.08	0.07064	0.0332	0.028	5.3%	1

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Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
CONN	Mixed	0.028	0.028	0.028	0.028	0.0%	0
DELR	Agriculture	-	-	-	-	-	0
DELR	Cropland	-	-	-	-	-	0
DELR	Forest	-	-	-	-	-	0
DELR	Mixed	-	-	-	-	-	0
DELR	Residential	-	-	-	-	-	0
EIWA	Cropland	0.12	0.12	0.12	0.12	0.0%	0
EIWA	Mixed	-	-	-	-	-	0
EIWA	Not Applicable	0.028	0.028	0.028	0.028	0.0%	0
GAFL	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
GAFL	Mixed	0.028	0.028	0.028	0.028	2.5%	2
GRSL	Mixed	0.0056	0.0056	0.0056	0.0056	0.0%	0
GRSL	Residential	-	-	-	-	-	0
HDSN	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
HDSN	Commercial/Industrial	0.028	0.028	0.028	0.028	0.0%	0
HDSN	Mixed	0.028	0.028	0.028	0.028	0.0%	0
LERI	Cropland	0.12	0.12	0.12	0.12	1.4%	1
LERI	Mixed	0.12	0.12	0.12	0.028	0.0%	0
LINJ	Agriculture	0.12	0.1154	0.097	0.074	0.0%	0
LINJ	Forest	0.12	0.11908	0.1154	0.1108	0.0%	0
LINJ	Mixed	0.12	0.12	0.1016	0.028	0.0%	0
LINJ	Urban	0.12	0.08412	0.028	0.028	2.5%	1
LIRB	Cropland	2.02	0.634	0.12	0.12	2.8%	4
LIRB	Mixed	1.32	1.0578	0.7845	0.458	1.4%	1
LSUS	Agriculture	0.27	0.0643	0.028	0.028	1.2%	1
LSUS	Mixed	0.028	0.028	0.028	0.028	0.0%	0
LSUS	Urban	0.028	0.028	0.028	0.028	0.0%	0
MISE	Cropland	2.82	0.7882	0.3455	0.12	8.1%	13
MISE	Mixed	0.33	0.2313	0.12	0.12	2.1%	1
MISE	Urban	0.028	0.028	0.028	0.028	0.0%	0
MOBL	Urban	0.84	0.7536	0.408	0.12	0.0%	0
NVBR	Mixed	0.05	0.03988	0.028	0.028	0.0%	0
NVBR	Urban	0.028	0.028	0.028	0.028	0.0%	0
OZRK	Pasture	0.028	0.028	0.028	0.028	0.0%	0
PODL	Agriculture	0.056	0.0322	0.028	0.028	11.6%	10
PODL	Mixed	0.028	0.028	0.028	0.028	0.0%	0
PODL	Not Applicable	0.29	0.29	0.29	0.20933	25.0%	11
PODL	Urban	0.1	0.05392	0.028	0.028	1.5%	1
PUGT	Agriculture	0.11	0.11	0.11	0.11	0.0%	0
REDN	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
REDN	Cropland	0.4	0.3475	0.028	0.028	2.6%	2
REDN	Mixed	0.059	0.05726	0.028	0.028	0.0%	0
REDN	Not Applicable	0.028	0.028	0.028	0.028	0.0%	0
RIOG	Agriculture	0.028	0.028	0.028	0.028	0.0%	0

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Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
RIOG	Mixed	0.28	0.115	0.028	0.028	3.0%	2
SACR	Cropland	0.2	0.2	0.1925	0.141	20.8%	5
SACR	Mixed	0.12	0.12	0.12	0.12	0.0%	0
SACR	Urban	0.12	0.12	0.12	0.12	0.0%	0
SANA	Mixed	0.34	0.334	0.31	0.28	0.0%	0
SANJ	Agriculture	0.79	0.24898	0.028	0.028	6.9%	5
SANJ	Mixed	0.09	0.028504	0.028	0.028	4.3%	6
SANJ	Urban	-	-	-	-	-	0
SANT	Cropland	0.12	0.09424	0.028	0.028	3.4%	1
SANT	Mixed	0.028	0.028	0.028	0.028	0.0%	0
SCTX	Mixed	0.12	0.12	0.12	0.12	0.0%	0
SOFL	Cropland	0.12	0.12	0.12	0.12	0.0%	0
SPLT	Agriculture	1.8	1.2859	0.4825	0.1624	11.1%	6
SPLT	Mixed	0.028	0.028	0.028	0.028	0.0%	0
SPLT	Urban	0.028	0.028	0.028	0.028	0.0%	0
TENN	Agriculture	0.038	0.03557	0.028	0.028	0.0%	0
TENN	Cropland	0.0056	0.0056	0.0056	0.0056	0.0%	0
TENN	Mining	0.028	0.028	0.028	0.028	0.0%	0
TENN	Mixed	0.06	0.03796	0.0343	0.028	1.0%	1
TENN	Urban	0.028	0.028	0.028	0.028	0.0%	0
TRIN	Agriculture	1.8	0.964	0.0291	0.028	3.8%	6
TRIN	Not Applicable	0.056	0.056	0.056	0.0448	0.0%	0
TRIN	Rangeland	0.028	0.028	0.028	0.028	0.0%	0
TRIN	Reference	0.028	0.028	0.028	0.028	0.0%	0
TRIN	Urban	0.056	0.056	0.056	0.056	0.0%	0
UCOL	Agriculture	1.81	1.724	0.6125	0.54	31.8%	14
UCOL	Mixed	0.29	0.29	0.29	0.29	0.0%	0
UIRB	Cropland	-	-	-	-	-	0
UIRB	Mixed	0.12	0.12	0.12	0.12	0.0%	0
UMIS	Agriculture	3.4	3.1151	1.9755	0.55	0.0%	0
UMIS	Mixed	0.29	0.29	0.1225	0.12	0.0%	0
UMIS	Urban	0.29	0.29	0.29	0.12	0.0%	0
USNK	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
WHMI	Agriculture	-	-	-	-	-	0
WHMI	Cropland	0.52	0.0551	0.028	0.028	2.3%	5
WHMI	Forest	-	-	-	-	-	0
WHMI	Mixed	0.056	0.04592	0.028	0.028	0.7%	1
WHMI	Not Applicable	0.0116	0.01064	0.0068	0.0056	5.9%	1
WILL	Agriculture	13.2711	9.043899	1.64	0.531	36.0%	41
WILL	Mixed	0.05	0.05	0.05	0.0302	10.0%	3
WILL	Urban	0.028	0.028	0.028	0.028	0.0%	0
WMIC	Agriculture	0.028	0.028	0.028	0.028	0.0%	0
WMIC	Cropland	0.028	0.028	0.028	0.028	0.0%	0
WMIC	Mixed	0.028	0.028	0.028	0.028	0.0%	0
YELL	Mixed	0.12	0.12	0.12	0.12	0.0%	0

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Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
Carbofuran (Anal. Meth. 82674)							
ACAD	Cropland	1.84	0.69522	0.1083	0.04008	20.1%	57
ACAD	Mixed	0.744	0.70773	0.0757	0.03894	23.4%	22
ACFB	Residential	0.02	0.02	0.02	0.02	0.5%	1
ACFB	Urban	0.008	0.00525	0.003	0.003	1.8%	1
ALBE	Agriculture	0.14	0.04842	0.018	0.003	8.5%	17
ALBE	Mixed	0.48	0.086472	0.02	0.02	4.2%	10
ALBE	Not Applicable	-	-	-	-	-	0
CAZB	Agriculture	0.57	0.358	0.036	0.03	2.4%	1
CAZB	Mixed	0.087	0.07917	0.051	0.0355	3.3%	1
CCYK	Agriculture	0.14	0.05315	0.02	0.02	4.8%	22
CCYK	Mixed	0.123	0.04147	0.02	0.02	2.5%	7
CNBR	Agriculture	0.59	0.4034	0.03631	0.02	15.1%	30
CNBR	Cropland	0.326	0.30984	0.2452	0.2178	35.3%	6
CNBR	Mixed	0.35	0.25174	0.05784	0.02672	20.3%	43
CONN	Agriculture	0.05	0.04154	0.0077	0.003	5.3%	1
CONN	Mixed	0.03	0.02	0.02	0.02	0.8%	1
DELR	Agriculture	0.05	0.0374	0.01988	0.01028	4.7%	2
DELR	Cropland	0.1	0.0418	0.02008	0.02	2.4%	4
DELR	Forest	0.0452	0.035908	0.02	0.02	2.1%	1
DELR	Mixed	0.1	0.0418	0.0245	0.02	0.5%	1
DELR	Residential	0.109	0.02	0.02	0.02	1.0%	1
EIWA	Cropland	1.5	0.49112	0.08788	0.02	11.8%	27
EIWA	Mixed	0.2	0.10953	0.06395	0.02	10.7%	9
EIWA	Not Applicable	0.02	0.01779	0.00895	0.003	7.1%	1
GAFL	Agriculture	0.03	0.02	0.02	0.02	2.1%	5
GAFL	Mixed	0.287	0.025754	0.02	0.02	2.7%	5
GRSL	Mixed	0.05	0.041552	0.02	0.02	1.5%	1
GRSL	Residential	0.04	0.03	0.02	0.02	1.6%	2
HDSN	Agriculture	0.1	0.0203	0.02	0.02	0.5%	1
HDSN	Commercial/Industrial	0.021	0.021	0.021	0.021	100.0%	1
HDSN	Mixed	0.03	0.0248	0.02	0.02	0.7%	1
LERI	Cropland	0.188	0.03368	0.02	0.02	3.3%	8
LERI	Mixed	0.328	0.25324	0.03503	0.02	5.7%	7
LINJ	Agriculture	0.132	0.11754	0.0597	0.0107	30.8%	4
LINJ	Forest	0.0185	0.015432	0.00559	0.003	7.4%	2
LINJ	Mixed	0.0635	0.04329	0.02	0.02	10.3%	9
LINJ	Urban	0.0546	0.049848	0.02378	0.01644	24.5%	12
LIRB	Cropland	1.01	0.56058	0.040595	0.02	13.2%	24
LIRB	Mixed	0.0872	0.073758	0.02846	0.02	7.4%	7
LSUS	Agriculture	0.476	0.101004	0.0359	0.01032	13.2%	32
LSUS	Mixed	0.341	0.26729	0.019	0.0094	13.4%	11
LSUS	Urban	0.062	0.01772	0.003	0.003	0.9%	1
MISE	Cropland	2.63	1.114	0.3668	0.1278	14.7%	33

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Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
MISE	Mixed	0.549	0.24676	0.08614	0.0516	12.4%	14
MISE	Urban	0.02	0.02	0.02	0.02	2.1%	1
MOBL	Urban	0.05	0.0283	0.02	0.02	1.8%	3
NVBR	Mixed	0.051	0.03195	0.02	0.02	2.9%	4
NVBR	Urban	0.026	0.02	0.02	0.02	0.6%	1
OZRK	Pasture	0.25	0.02	0.02	0.02	2.6%	4
PODL	Agriculture	0.17	0.07118	0.02	0.02	9.8%	31
PODL	Mixed	0.16	0.1178	0.02	0.02	5.4%	12
PODL	Not Applicable	0.04	0.031638	0.02	0.02	18.7%	14
PODL	Urban	0.46	0.02732	0.02	0.02	1.8%	3
PUGT	Agriculture	0.005	0.00438	0.003	0.003	3.1%	1
REDN	Agriculture	0.11	0.06905	0.00825	0.003	6.5%	3
REDN	Cropland	0.43	0.3976	0.0867	0.0164	12.2%	14
REDN	Mixed	0.1	0.08344	0.0248	0.0148	11.8%	11
REDN	Not Applicable	0.15	0.138	0.092	0.04	19.4%	6
RIOG	Agriculture	0.15	0.11374	0.0486	0.04	21.1%	8
RIOG	Mixed	0.75	0.1359	0.02	0.02	9.2%	18
SACR	Cropland	0.412	0.30304	0.1302	0.10056	55.1%	27
SACR	Mixed	0.0744	0.066658	0.0286	0.02	12.1%	12
SACR	Urban	0.0565	0.053145	0.0225	0.02	3.6%	2
SANA	Mixed	0.02	0.02	0.02	0.02	2.4%	2
SANJ	Agriculture	0.982	0.21375	0.03795	0.02	14.7%	70
SANJ	Mixed	0.156	0.03552	0.02	0.02	5.3%	46
SANJ	Urban	0.06	0.06	0.054	0.0264	3.0%	1
SANT	Cropland	0.31	0.0335	0.02	0.02	4.5%	5
SANT	Mixed	0.035	0.0224	0.02	0.02	2.4%	2
SCTX	Mixed	0.085	0.046234	0.0228	0.02	5.4%	5
SOFL	Cropland	0.328	0.067086	0.02	0.02	4.5%	9
SPLT	Agriculture	1.2	0.9604	0.347	0.228	25.2%	26
SPLT	Mixed	0.14	0.1068	0.05376	0.0344	17.3%	23
SPLT	Urban	0.059	0.02484	0.02	0.02	1.9%	3
TENN	Agriculture	0.0895	0.02	0.02	0.02	2.4%	4
TENN	Cropland	0.02	0.02	0.02	0.02	3.4%	3
TENN	Mining	0.011	0.010496	0.00432	0.003	2.7%	1
TENN	Mixed	0.22	0.05056	0.02	0.02	5.9%	18
TENN	Urban	0.0054	0.005256	0.00468	0.00396	14.3%	1
TRIN	Agriculture	7	2.638	0.1919	0.0206	14.5%	29
TRIN	Not Applicable	0.02	0.02	0.02	0.02	2.3%	1
TRIN	Rangeland	0.031	0.02792	0.0156	0.003	8.3%	1
TRIN	Reference	5.82	3.094	0.02	0.02	2.1%	1
TRIN	Urban	0.24	0.1689	0.003	0.003	6.5%	2
UCOL	Agriculture	1.69	1.37848	0.9192	0.5352	44.4%	20
UCOL	Mixed	0.163	0.1091	0.03065	0.0254	27.5%	14
UIRB	Cropland	0.332	0.30288	0.09092	0.02	10.5%	6
UIRB	Mixed	0.2	0.139867	0.02	0.02	6.0%	8

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Table II.D.1.3 – Detections of carbofuran by two analytical methods in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
UMIS	Agriculture	0.939	0.18384	0.02	0.02	3.5%	3
UMIS	Mixed	0.2	0.1816	0.02	0.02	2.7%	4
UMIS	Urban	0.05	0.0275	0.02	0.02	1.6%	2
USNK	Agriculture	0.0703	0.05015	0.02	0.02	1.0%	2
WHMI	Agriculture	0.0829	0.054817	0.0036	0.003	2.6%	1
WHMI	Cropland	0.95	0.12815	0.02	0.02	6.3%	30
WHMI	Forest	0.019	0.019	0.019	0.019	100.0%	1
WHMI	Mixed	0.157	0.06	0.02	0.02	7.1%	27
WHMI	Not Applicable	0.0464	0.044024	0.03452	0.02264	10.0%	1
WILL	Agriculture	32.2	11.783	3.4125	0.7767	68.1%	124
WILL	Mixed	0.181	0.074189	0.02	0.02	13.8%	18
WILL	Urban	0.038	0.031112	0.02	0.02	6.0%	5
WMIC	Agriculture	0.045	0.04164	0.0282	0.0114	11.1%	1
WMIC	Cropland	0.097	0.073224	0.02	0.02	4.1%	6
WMIC	Mixed	0.119	0.02	0.02	0.02	3.3%	4
YELL	Mixed	0.0335	0.02735	0.02	0.02	1.9%	3

Table II.D.1.4 – Detections of Methiocarb in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
TRIN	Mixed	0.23	0.179	0.026	0.026	3.8%	1
WILL	Agriculture	0.1	0.02948	0.026	0.026	2.6%	3

Table II.D.1.5 – Detections of Methomyl in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
ALBE	Mixed	0.021	0.019	0.017	0.017	5.3%	3
CAZB	Agriculture	0.270	0.169	0.017	0.017	2.4%	1
GAFL	Mixed	0.017	0.017	0.017	0.017	1.3%	1
LSUS	Agriculture	0.190	0.043	0.017	0.017	1.2%	1
MISE	Cropland	0.650	0.278	0.017	0.017	3.7%	6
MISE	Mixed	0.090	0.057	0.017	0.017	2.2%	1
MOBL	Cropland	0.017	0.017	0.017	0.017	11.1%	1
NVBR	Urban	0.140	0.034	0.017	0.017	1.1%	1
SANJ	Agriculture	0.670	0.429	0.214	0.043	19.4%	14
SANJ	Mixed	0.090	0.052	0.017	0.017	2.9%	4
SOFL	Cropland	0.470	0.436	0.168	0.017	8.0%	7
SPLT	Urban	0.017	0.017	0.017	0.017	1.3%	1
TRIN	Agriculture	1.000	0.227	0.017	0.017	1.9%	3
WILL	Agriculture	0.020	0.017	0.017	0.017	1.8%	2

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Table II.D.1.6 – Detections of Oxamyll in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
PUGT	Agriculture	0.16	0.1569	0.1445	0.129	34.4%	11
SANJ	Agriculture	0.0254	0.020146	0.018	0.018	1.4%	1
WILL	Agriculture	0.07	0.01974	0.018	0.018	0.9%	1

Table II.D.1.7 – Detections of Propoxur in USGS NAWQA surface water monitoring sites summarized by study unit (Suid) and land use.

Suid	Land Use	Max Detect	99th	95th	90th	Pct Detect	No. Detect
ACFB	Residential	0.290	0.143	0.035	0.035	0.6%	1
ALBE	Mixed	0.035	0.035	0.035	0.035	14.0%	8
CAZB	Agriculture	0.190	0.128	0.035	0.035	2.4%	1
CCYK	Mixed	0.035	0.035	0.035	0.035	0.9%	1
GAFL	Mixed	0.035	0.035	0.035	0.035	18.8%	12
GAFL	Not Applicable	0.035	0.025	0.008	0.008	5.4%	2
LERI	Urban	0.035	0.035	0.035	0.035	2.9%	1
NVBR	Urban	0.035	0.035	0.035	0.035	4.7%	4
PODL	Urban	0.035	0.035	0.035	0.035	10.0%	6
REDN	Agriculture	0.035	0.035	0.035	0.035	4.3%	2
SANJ	Agriculture	0.070	0.047	0.035	0.035	13.9%	10
SANJ	Mixed	0.090	0.046	0.035	0.035	16.7%	23
SPLT	Agriculture	0.110	0.071	0.035	0.035	1.9%	1
SPLT	Urban	0.035	0.035	0.035	0.035	2.5%	2
TRIN	Not Applicable	0.035	0.035	0.035	0.035	8.6%	3

b. Ground Water Monitoring Summary

The USGS National Water-Quality Assessment (NAWQA) program began in 1990 as an effort to catalog the quality of water resources in the United States by collecting surface and groundwater data in selected watersheds. Chemical, biological, and physical parameters are measured at 59 study units across the United States. In the period between May, 1993 and September, 2003, approximately 6700 groundwater samples were tested for an assortment of carbamate pesticides and metabolites. Most sites were sampled only once, although repeat samples were taken at some locations. Carbofuran and carbaryl were tested for in 6500 of these samples while 9 other compounds including aldicarb and methomyl were tested for in approximately 4200 samples each.

This represents a preliminary summary of the USGS ground water monitoring data from NAWQA.

Aldicarb

Aldicarb and its metabolites aldicarb sulfoxide and aldicarb sulfone were tested for in 4223 groundwater samples, resulting in 1 detection of aldicarb (0.01 ppb), 22

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detections of aldicarb sulfoxide (0.004 – 1.8 ppb), and 15 detections of aldicarb sulfone (0.009 – 0.141 ppb). Several additional samples were tested for individual compounds with no detections. The large majority of the detections (87%) were found in the Southeast, primarily in Georgia and Alabama, although only 27% of the total sampling was carried out in this region. The two highest aldicarb sulfoxide concentrations, 1.8 and 0.26 ppb, were measured outside of the Southeast, in Connecticut and Idaho, respectively. The only detection of aldicarb was found in Indiana. 29 detections (76%) occurred in the years 2000 to 2003, despite the fact that only 18% of the sampling was conducted in these years. In part, this can be attributed to improved detection limits for aldicarb sulfoxide in that time period, but this only applies to about a third of these more recent detections. See the tables below for further details on these results.

Table II.D.1.8. Summary of sampling and detections for aldicarb and its metabolites from USGS NAWQA ground water monitoring sites

	Aldicarb	Aldicarb Sulfoxide	Aldicarb Sulfone
Total Detections:	1	22	15
Total Samples:	4263	4226	4223
Range (ppb):	0.01 (E)	0.004 (E) - 1.8	0.009 (E) - 0.141
Detection Limit (ppb):	0.04 - 0.21	0.016 - 0.2	0.0082 - 0.05

Table II.D.1.9. Detections for aldicarb and its metabolites by region and time from USGS NAWQA ground water monitoring sites

	1993-1996		1997-1999		2000-2003		*Grand Total*	
Region	Det.	Ttl No.	Det.	Ttl No.	Det.	Ttl No.	Det.	Ttl No.
Middle Atlantic	--	358	1	62	--	70	1	490
Midwest	1	409	--	253	--	168	1	830
New England	2	130	--	--	--	31	2	161
Pacific		376		85		142		603
Rocky Mountain	1	403	--	97	--	83	1	583
Southeast	4	562	--	354	29	241	33	1157
Southwest		253		98		48		399
Grand Total	8	2491	1	949	29	783	38	4223

Carbofuran

6558 groundwater samples were tested for carbofuran, with 58 positive detections ranging from 0.0018 to 1.3 ppb, with an average of 0.01 ppb and a 99th percentile value of 0.95 ppb. The highest concentrations of carbofuran were found in agricultural areas in Connecticut in 1993 (1.3 ppb) and in California in 1997 (0.686 ppb). The largest number of detections were found in the middle Atlantic region, which had 31% of the total detections, although only 11% of the samples were collected in that region.

4259 samples, all but 113 from the same set as carbofuran, were tested for the

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metabolite 2-hydroxycarbofuran. Detectable 2-hydroxycarbofuran was found in only one sample, from a mixed use area in Iowa in 1998, which measured 0.07 ppb. Sampling for the metabolite 3-ketocarbofuran did not begin until the year 2000, and so only 763 samples were tested for this compound. There were no detections. For each of the compounds, approximately half of the samples were collected in the Southeast and the Midwest. See the tables below for further details on these results.

Table II.D.1.10. Summary of sampling and detections for carbofuran and its metabolites from USGS NAWQA ground water monitoring sites

	Carbofuran	2-hydroxy carbo	3-keto carbo
Total Detections:	58	1	0
Total Samples:	6558	4259	763
Range (ppb):	0.0018 (E) - 1.3 (E)	0.07	-
Detection Limit (ppb):	0.003 (75%) 0.02 (25%)	0.014 (75%) 0.0058 (23%)	1.5

Table II.D.1.11. Detections for carbofuran and its metabolites by region and time from USGS NAWQA ground water monitoring sites

	1993-1996		1997-1999		2000-2003		*Grand Total*	
Region	Det.	Ttl No.	Det.	Ttl No.	Det.	Ttl No.	Det.	Ttl No.
Middle Atlantic	10	419	6	137	2	151	18	707
Midwest	4	577	2	439	3	511	9	1527
New England	1	131	--	39	1	116	2	286
Pacific	--	437	8	169	1	286	9	892
Rocky Mountain	2	434	--	202	4	290	6	926
Southeast	3	616	4	482	4	567	11	1665
Southwest	1	273	--	141	2	141	3	555
Grand Total	21	2887	20	1609	17	2062	58	6558

NAWQA monitored for five other carbamates in groundwater, as listed below.

Methiocarb: 0 detections out of 4274 samples

Propoxur: 8 detections out of 4248 samples
Range: 0.0057 to 0.3 ppb
Average: 0.064 ppb
Locations: Delaware, Florida, Georgia, Maryland, Virginia

Oxamyl: 12 detections out of 4222 samples
Range: 0.02 to 2.56 ppb
Average: 1.01 ppb
Locations: British Columbia, Illinois, Minnesota, Washington

Methomyl: 3 detections out of 4224 samples

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Range: 0.04 to 0.38 ppb
Average: 0.28 ppb
Locations: Minnesota, New Jersey, Virginia

Carbaryl: 58 detections out of 6575 samples
Range: 0.002 to 0.539 ppb
Average: 0.027 ppb
95th percentile: 0.0525 ppb
Locations: Middle Atlantic (41%), Midwest (7%), New England (10%), Pacific (3%), Rocky Mountain (5%), Southeast (21%), Southwest (12%)