GEORGIA DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Updated Human Health Criteria

Supporting Documentation for Human Health Ambient Water Quality Criteria Derived Using Probabilistic Risk Assessment for the 2022 Triennial Review of Water Quality Standards

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1.0 Introduction

Human health criteria (HHC) are the highest concentration of pollutants in surface water that are not expected to pose a significant risk to human health over a lifetime. These criteria are set to protect against harmful concentrations of pollutants in ambient surface waters that could impact human health through treated drinking water or consumption of contaminated fish and shellfish.

The methodology for deriving human health criteria was published by the U.S. Environmental Protection Agency (EPA) in 2000. In 2002, EPA published an updated compilation of its national recommended water quality criteria for 158 pollutants (US EPA, 2002). Most of Georgia's current human health criteria were adopted in the early 2000s based on the 2002 EPA recommendation.

For non-carcinogenic compounds, criteria for consumption of water and organisms are derived by multiplying the body weight value by the parameter-specific reference dose value times the relative source contribution and dividing by the sum of the drinking water intake value plus the product of the parameter specific fish consumption rates and bioaccumulation factors for fish trophic levels 2 through 4. Criteria for consumption of organisms only are derived using the same equation, excluding the drinking water intake value.

For consumption of water and organisms (non-carcinogens):

$$\text{AWQC}(\mu g/L) = \frac{\left[RfD\left({}^{mg}/_{kg \cdot d}\right) \times RSC\right] \times BW\ (kg)\ \times 1{,}000\ (\mu g/mg)}{DI\ (L/d) + \sum_{i=2}^{4}[FCR_i(kg/d) \times\ BAF_i\ (L/kg)]}$$

For consumption of organisms only (non-carcinogens):

$$\text{AWQC}(\mu g/L) = \frac{\left[RfD\left({}^{mg}/_{kg \cdot d}\right) \times RSC\right] \times BW\ (kg)\ \times 1{,}000\ (\mu g/mg)}{\sum_{i=2}^{4}[FCR_i(kg/d) \times\ BAF_i\ (L/kg)]}$$

For carcinogenic compounds, criteria for consumption of water plus organisms are derived by multiplying the quotient of the target incremental lifetime increased cancer risk divided by the parameter specific cancer slope factor times the body weight value and dividing by the sum of the drinking water intake value plus the product of the parameter specific fish consumption rates and bioaccumulation factors for fish trophic levels 2 through 4. Criteria for consumption of organisms only are derived using the same equation, excluding the drinking water intake value.

For consumption of water and organisms (carcinogens):

$$\text{AWQC}(\mu g/L) = \frac{\left[Risk/CSF\left({}^{mg}/_{kg \cdot d}\right)\right] \times BW\ (kg)\ \times 1{,}000\ (\mu g/mg)}{DI\ (L/d) + \sum_{i=2}^{4}[FCR_i(kg/d) \times\ BAF_i\ (L/kg)]}$$

For consumption of organisms only (carcinogens):

$$\text{AWQC}(\mu g/L) = \frac{\left[Risk/CSF\left({}^{mg}/_{kg \cdot d}\right)\right] \times BW\ (kg)\ \times 1{,}000\ (\mu g/mg)}{\sum_{i=2}^{4}[FCR_i(kg/d) \times\ BAF_i\ (L/kg)]}$$

Where:

AWQC = ambient water quality criterion (µg/L)
RfD = parameter-specific reference dose (mg/kg-day)
RSC = relative source contribution (percentage); accounts for non-water sources of exposure
BW = body weight (kg)
DI = drinking water intake (L/day)
CSF = cancer slope factor (mg/kg-day)
Risk = incremental lifetime increased cancer risk (10^{-6} to 10^{-4})
FCR_i = fish consumption rate at trophic level *i* (*i* = 2, 3, and 4)
BAF_i = bioaccumulation factor for trophic level *i* (*i* = 2, 3, and 4)

As updated National Health and Nutrition Examination Survey (NHANES) data became available and as more information was published on the health effects, occurrence, and bioaccumulation of some contaminants, EPA decided that the input values used to calculate the criteria in 2002 were no longer relevant. Therefore, the recommended criteria needed to be updated. In 2015, EPA updated its national recommended water quality criteria for human health for 94 chemical pollutants using the 2000 methodology. The updated criteria reflected the latest scientific information and EPA policies, including updated fish consumption rates, body weight, and drinking water intake (US EPA, 2015).

The updated body weight value of 80 kg is based on the mean body weight for adults ages 21 and older from 1999 to 2006. The updated drinking water value of 2.4 liters per day is based on the per capita estimate of community water ingestion at the 90th percentile for adults ages 21 and older from 2003 to 2006. The updated fish consumption rate of 22 grams per day represents the 90th percentile consumption rate of fish and shellfish from inland and nearshore waters for adults ages 21 and older from 2003 to 2010.

EPA also used updated values for parameter specific reference dose, relative source contribution, cancer slope factors, and bioaccumulation factors (replacing the bioconcentration factors used in the previous criteria derivation) whenever available. The reference dose (RfD, and cancer slope factor (CSF) values result from studies conducted to determine how dangerous a substance is and the type of toxicity caused by exposure to the contaminant. The relative source contribution (RSC) is the percentage of total exposure typically accounted for by the consumption of inland and nearshore fish and shellfish and drinking water."

Incremental life-time increased cancer risk is the toxicity endpoint for carcinogens. It is determined based on the parameter-specific cancer slope factor (CSF) and represents one's risk of developing cancer (in addition to background cancer risk) if exposed to the criterion level over a lifetime. The cancer risks discussed here refer to the increased risk of cancer for each individual pollutant and are in addition to the background cancer risk people are exposed to in everyday life. The target incremental lifetime increased cancer risk is determined by the agency responsible for

risk management decisions and is expressed as a fraction or ratio (ex: 10^{-6} = 1 in 1 million, 10^{-5} = 1 in 100,000, 10^{-4} = 1 in 10,000).

2.0 Deterministic Method Used to Derive Human Health Criteria

EPA's approach of assigning a single value (from a range of possible values) to each parameter is referred to as the deterministic method. The deterministic risk assessment method calculates the criteria based on the risk to individuals weighing 80 kg who consume 22 grams of fish per day and drink 2.4 liters of water per day. The resulting criteria protects individuals with these exact exposure variable values, as well as individuals with higher bodyweights and individuals who consume less water or fish, from an incremental life-time increased cancer risk at the target risk level of one in one million or from the noncancer health effect. Using this approach, it is impossible to determine what percentage of the population is protected by the criteria. The risk to individuals whose body weight, fish consumption rate, and water ingestion rate differ from those point estimates is unclear. It does not account for variability among the population and has raised concerns for compounded conservatism, which results from using upper bound percentiles for multiple inputs. This can result in criteria values that are unnecessarily overprotective leading to misallocation of limited resources.

EPA's human health criteria recommendations included "water + organism" criteria to protect human health from exposure via drinking water and fish consumption, as well as "organism only" criteria to protect human health from exposure via consumption of fish only. Georgia's current water quality standards list one criterion value for each pollutant based on EPA's 2002 organism only criteria recommendations. Table 1 compares Georgia's current criteria for 83 pollutants in 391-3-6-.03 (5)(e)(iv) with EPA's 2015 criteria recommendations.

Table 1. Difference Between the 2015 EPA Proposed Human Health Criteria and Georgia's Current Human Health Criteria

Chemical Name	Current Georgia WQS (µg/L)	EPA 2015 Organism Only AWQC (µg/L)	% difference current vs EPA 2015 Organism Only
1,1,2,2-Tetrachloroethane	4	3	-25%
1,1,2-Trichloroethane	16	8.9	-44%
1,1-Dichloroethylene	7100	20000	182%
1,2,4-Trichlorobenzene	70	0.076	-100%
1,2-Dichlorobenzene	1300	3000	131%
1,2-Dichloroethane	37	650	1657%
1,2-Dichloropropane	15	31	107%
1,2-Diphenylhydrazine	0.2	0.2	0%
1,3-Dichlorobenzene	960	10	-99%
1,3-Dichloropropene	21	12	-43%
1,4-Dichlorobenzene	190	900	374%
2,4,6-Trichlorophenol	2.4	2.8	17%
2,4-Dichlorophenol	290	60	-79%
2,4-Dimethylphenol	850	3000	253%

Chemical Name	Current Georgia WQS (µg/L)	EPA 2015 Organism Only AWQC (µg/L)	% difference current vs EPA 2015 Organism Only
2,4-Dinitrophenol	5300	300	-94%
2,4-Dinitrotoluene	3.4	1.7	-50%
2-Chloronaphthalene	1600	1000	-38%
2-Chlorophenol	150	800	433%
2-Methyl-4,6-Dinitrophenol	280	30	-89%
3,3'-Dichlorobenzidine	0.028	0.15	436%
Acenaphthene	990	90	-91%
Acrolein	9.3	400	4201%
Acrylonitrile	0.25	7	2700%
Aldrin	0.00005	0.00000077	-98%
alpha-Endosulfan	89	30	-66%
alpha-Hexachlorocyclohexane (HCH)	0.0049	0.00039	-92%
Anthracene	40000	400	-99%
Benzene	51	16	-69%
Benzidine	0.0002	0.011	5400%
Benzo(a)anthracene	0.018	0.0013	-93%
Benzo(a)pyrene	0.018	0.00013	-99%
Benzo(b)fluoranthene	0.018	0.0013	-93%
Benzo(k)fluoranthene	0.018	0.013	-28%
beta-Endosulfan	89	40	-55%
beta-Hexachlorocyclohexane (HCH)	0.17	0.014	-92%
Bis(2-Chloro-1-Methylethyl) Ether	65000	4000	-94%
Bis(2-Chloroethyl) Ether	0.53	2.2	315%
Bis(2-Ethylhexyl) Phthalate	2.2	0.37	-83%
Bromoform	140	120	-14%
Butylbenzyl Phthalate	1900	0.1	-100%
Carbon Tetrachloride	1.6	5	213%
Chlordane	0.00081	0.00032	-60%
Chlorobenzene	1600	800	-50%
Chlorodibromomethane	13	21	62%
Chloroform	470	2000	326%
Chrysene	0.018	0.13	622%
Dibenzo(a,h)anthracene	0.018	0.00013	-99%
Dichlorobromomethane	17	27	59%
Dieldrin	0.000054	0.0000012	-98%
Diethyl Phthalate	44000	600	-99%
Dimethyl Phthalate	1100000	2000	-100%
Di-n-Butyl Phthalate	4500	30	-99%

Chemical Name	Current Georgia WQS (µg/L)	EPA 2015 Organism Only AWQC (µg/L)	% difference current vs EPA 2015 Organism Only
Endosulfan Sulfate	89	40	-55%
Endrin	0.06	0.03	-50%
Endrin Aldehyde	0.3	1	233%
Ethylbenzene	2100	130	-94%
Fluoranthene	140	20	-86%
Fluorene	5300	70	-99%
gamma-Hexachlorocyclohexane (HCH)	1.8	4.4	144%
Heptachlor	0.000079	0.0000059	-93%
Heptachlor Epoxide	0.000039	0.000032	-18%
Hexachlorobenzene	0.00029	0.000079	-73%
Hexachlorobutadiene	18	0.01	-100%
Hexachlorocyclopentadiene	1100	4	-100%
Hexachloroethane	3.3	0.1	-97%
Indeno(1,2,3-cd)pyrene	0.018	0.0013	-93%
Isophorone	960	1800	88%
Methoxychlor	0.03	0.02	-33%
Methyl Bromide	1500	10000	567%
Methylene Chloride	590	1000	69%
Nitrobenzene	690	600	-13%
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.00031	0.00012	-61%
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.00022	0.000018	-92%
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.00022	0.00003	-86%
Pentachlorophenol	3	0.04	-99%
Phenol	857000	300000	-65%
Pyrene	4000	30	-99%
Tetrachloroethylene (Perchloroethylene)	3.3	29	779%
Toluene	5980	520	-91%
Toxaphene	0.00028	0.00071	154%
trans-1,2-Dichloroethylene (DCE)	10000	4000	-60%
Trichloroethylene (TCE)	30	7	-77%
Vinyl Chloride	2.4	1.6	-33%

* - Existing Methoxychlor criteria is found in 391-03-06-.03(5)(e)(i)

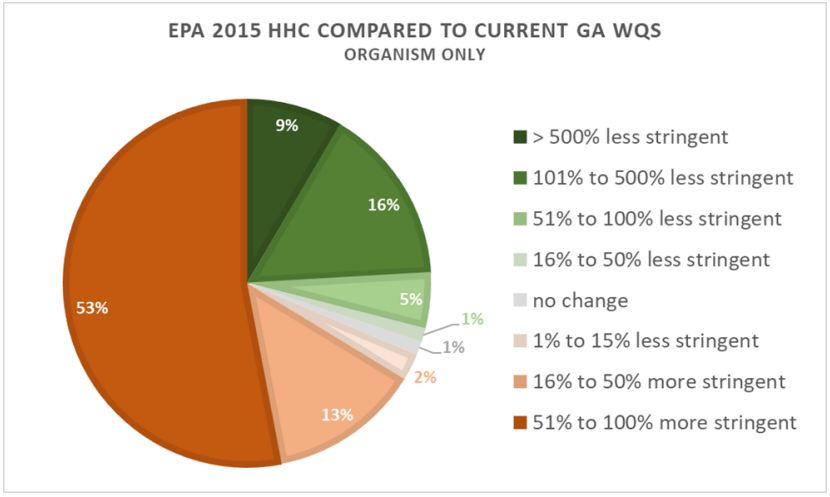
An example is Georgia's current criterion of 4 µg/L for 1,1,2,2 - Tetrachloroethane. This is the highest concentration of this pollutant in the water column that is assumed to be safe if fish from these waters are consumed over a person's lifetime. EPA's updated inputs yielded a criterion

value of 3 µg/L for organism only, meaning this concentration is assumed safe for lifetime consumption of fish sourced from that water body. EPA's organism only criterion is 25% more stringent than Georgia's current criteria.

The comparison from Table 1 is summarized in the following figure. Figure 1 displays EPA's 2015 organism only criteria compared to the 83 pollutants in Georgia's current water quality standards (WQS). The shades of green represent the percentage of pollutants for which EPA's updated criteria are less stringent (higher criteria value) than Georgia's current WQS. The shades of red/orange represent the percentage of pollutants for which EPA's updated criteria are more stringent (lower criteria value) than Georgia's current WQS.

Georgia's current WQS are based on organism only exposure pathway, so EPA's updated water + organism criteria for most parameters are much more stringent because they account for an additional exposure route.

The goal of EPA's 2015 criteria update was not specifically to derive more stringent (or less stringent) criteria, but to use the best available data to ensure the criteria are adequately protective of the target population(s).



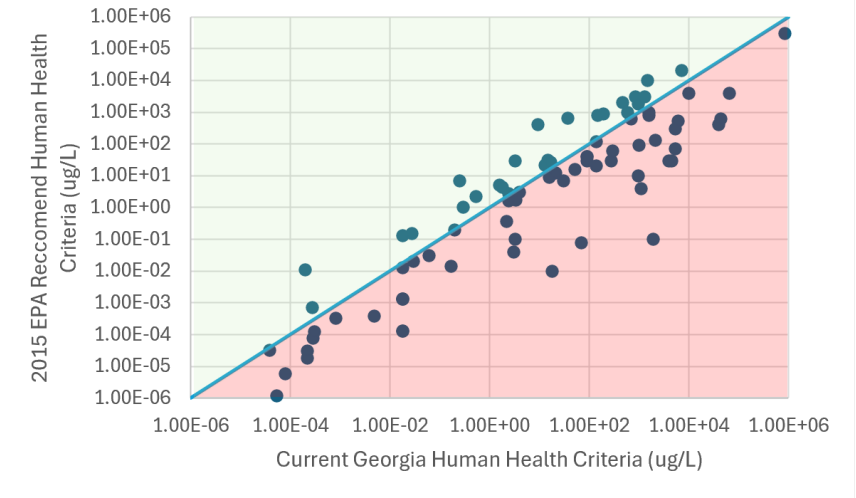


Figure 1. Comparison of EPA's Organism Only Criteria to EPD's Current Human Health Criteria for 83 Pollutants

3.0 Probabilistic Method Used to Derive Human Health Criteria

Concerns regarding compounded conservatism in EPA's recommended criteria led Georgia to evaluate alternate criteria derivation options. Compounded conservatism results from using upper bound percentiles for multiple inputs, as summarized in Section 2. This can result in criteria values that are unnecessarily overprotective. Additionally, using single point values for inputs does not adequately reflect the variability among the target population. It is also impossible to determine the percentage of the population to which the target risk applies.

Georgia EPD began researching the use of probabilistic risk assessment (PRA) for derivation of human health criteria during the 2019 Triennial Review. Probabilistic risk assessment evaluates risk based on a distribution of data, rather than a single point, for one or more inputs. This allows for transparent risk management decisions by identifying the target population and its level of protection.

3.1 Monte Carlo Analysis

Under the probabilistic approach, Monte Carlo analysis inserts one or more of the exposure variables into the equation as probability distributions. Exposure distributions are treated as random variables, allowing for an evaluation of risk to both the entire population and to higher risk sub-populations. Unlike the deterministic method, Monte Carlo analysis reflects the variability in the target population by calculating various possible outcomes using the whole range of possible input values from the distributions provided. Georgia ran 100,000 various combinations of possible inputs for each of three risk scenarios that will be discussed in Section 3.3.

EPD used a program called @RISK to perform the Monte Carlo analysis (Barnhart et al., 2022). The program allows input of percentile data for each variable. Distributions are then fit to the provided data. This process is explained in greater detail in the next section. The program randomly selects input values from each probability distribution and solves the equation to calculate risk. The outcome of PRA is a distribution rather than a single value and criteria values are selected from the distribution based on risk management decisions selected to protect the target population. For example: the 90th percentile of the population must have an excess lifetime cancer risk (ELCR) equal to or less than $1x10^{-5}$. Selecting the 90th percentile value from the distribution results in criteria protective of 90% of the population at the selected ECLR.

The equations used to derive the human health criteria require input values specific to each chemical. The @RISK program used the chemical-specific values provided by EPA in the 2015 recommendation. Table 2 displays the cancer slope factor and the reference dose input values used for each pollutant.

Table 2. Cancer Slope Factor and Reference Dose Values by Pollutant

Chemical Name	Chemical-specific Inputs for Human Health Ambient Water Quality Criteria					
	Cancer Slope Factor, CSF (per mg/kg-d)	Reference Dose, RfD (mg/kg-d)	Relative Source Contribution, RSC (-)	Bioaccumulation Factor		
				Trophic Level 2 (L/kg tissue)	Trophic Level 3 (L/kg tissue)	Trophic Level 4 (L/kg tissue)
1,1,1-Trichloroethane	ND	2	0.2	6.9	9	10
1,1,2,2-Tetrachloroethane	0.2	0.02	0.2	5.7	7.4	8.4
1,1,2-Trichloroethane	0.057	0.004	0.2	6	7.8	8.9
1,1-Dichloroethylene	ND	0.05	0.2	2	2.4	2.6
1,2,4-Trichlorobenzene	0.029	0.01	0.2	2800	1500	430
1,2-Dichlorobenzene	ND	0.3	0.2	52	71	82
1,2-Dichloroethane	0.0033	0.078	0.2	1.6	1.8	1.9
1,2-Dichloropropane	0.036	0.0893	0.2	2.9	3.5	3.9
1,2-Diphenylhydrazine	0.8	ND	ND	18	24	27
1,3-Dichlorobenzene	ND	0.002	0.2	31	120	190
1,3-Dichloropropene	0.122	0.025	0.2	2.3	2.7	3
1,4-Dichlorobenzene	ND	0.07	0.2	28	66	84
2,4,6-Trichlorophenol	0.011	0.001	0.2	94	130	150
2,4-Dichlorophenol	ND	0.003	0.2	31	42	48
2,4-Dimethylphenol	ND	0.02	0.2	4.8	6.2	7
2,4-Dinitrophenol	ND	0.002	0.2	4.4	4.4	4.4
2,4-Dinitrotoluene	0.667	0.002	0.2	2.8	3.5	3.9
2-Chloronaphthalene	ND	0.08	0.8	150	210	240
2-Chlorophenol	ND	0.005	0.2	3.8	4.8	5.4
2-Methyl-4,6-Dinitrophenol	ND	0.0003	0.2	6.8	8.9	10
3,3'-Dichlorobenzidine	0.45	ND	ND	44	60	69
3-Methyl-4-Chlorophenol	ND	0.1	0.2	25	34	39
Acenaphthene	ND	0.06	0.2	510	510	510
Acrolein	ND	0.0005	0.2	1	1	1
Acrylonitrile	0.54	ND	ND	1	1	1
Aldrin	17	0.00003	0.2	18000	310000	650000
alpha-Endosulfan	ND	0.006	0.2	130	180	200
alpha-Hexachlorocyclohexane (HCH)	6.3	0.008	0.2	1700	1400	1500
Anthracene	ND	0.3	0.2	610	610	610
Benzene High	0.015	0.0005	0.2	3.6	4.5	5
Benzene Low	0.055	0.0005	0.2	3.6	4.5	5
Benzidine	230	0.003	0.2	1.4	1.6	1.7
Benzo(a)anthracene	0.73	ND	ND	3900	3900	3900
Benzo(a)pyrene	7.3	ND	ND	3900	3900	3900
Benzo(b)fluoranthene	0.73	ND	ND	3900	3900	3900

Chemical Name	Chemical-specific Inputs for Human Health Ambient Water Quality Criteria					
	Cancer Slope Factor, CSF (per mg/kg-d)	Reference Dose, RfD (mg/kg-d)	Relative Source Contribution, RSC (-)	Bioaccumulation Factor		
				Trophic Level 2 (L/kg tissue)	Trophic Level 3 (L/kg tissue)	Trophic Level 4 (L/kg tissue)
Benzo(k)fluoranthene	0.073	ND	ND	3900	3900	3900
beta-Endosulfan	ND	0.006	0.2	80	110	130
beta-Hexachlorocyclohexane (HCH)	1.8	ND	ND	110	160	180
Bis(2-Chloro-1-Methylethyl) Ether	ND	0.04	0.2	6.7	8.8	10
Bis(2-Chloroethyl) Ether	1.1	ND	ND	1.4	1.6	1.7
Bis(2-Ethylhexyl) Phthalate	0.014	0.06	0.2	710	710	710
Bromoform	0.0045	0.03	0.2	5.8	7.5	8.5
Butylbenzyl Phthalate	0.0019	1.3	0.2	19000	19000	19000
Carbon Tetrachloride	0.07	0.004	0.2	9.3	12	14
Chlordane	0.35	0.0005	0.2	5300	44000	60000
Chlorobenzene	ND	0.02	0.2	14	19	22
Chlorodibromomethane	0.04	0.02	0.2	3.7	4.8	5.3
Chloroform	ND	0.01	0.2	2.8	3.4	3.8
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	ND	0.008	0.8	58	58	58
Chlorophenoxy Herbicide (2,4-D)	ND	0.21	0.2	13	13	13
Chrysene	0.0073	ND	ND	3900	3900	3900
Cyanide	ND	0.0006	0.2	1	1	1
Dibenzo(a,h)anthracene	7.3	ND	ND	3900	3900	3900
Dichlorobromomethane	0.034	0.003	0.2	3.4	4.3	4.8
Dieldrin	16	0.00005	0.2	14000	210000	410000
Diethyl Phthalate	ND	0.8	0.2	920	920	920
Dimethyl Phthalate	ND	10	0.2	4000	4000	4000
Di-n-Butyl Phthalate	ND	0.1	0.2	2900	2900	2900
Endosulfan Sulfate	ND	0.006	0.2	88	120	140
Endrin	ND	0.0003	0.8	4600	36000	46000
Endrin Aldehyde	ND	0.0003	0.8	440	920	850
Ethylbenzene	ND	0.022	0.2	100	140	160
Fluoranthene	ND	0.04	0.2	1500	1500	1500
Fluorene	ND	0.04	0.2	230	450	710
gamma-Hexachlorocyclohexane (HCH)	ND	0.0047	0.5	1200	2400	2500
Heptachlor	4.1	0.0001	0.2	12000	180000	330000
Heptachlor Epoxide	5.5	0.000013	0.2	4000	28000	35000
Hexachlorobenzene	1.02	0.0008	0.2	18000	46000	90000
Hexachlorobutadiene	0.04	0.0003	0.2	23000	2800	1100
Hexachlorocyclopentadiene	ND	0.006	0.2	620	1500	1300

Chemical Name	Chemical-specific Inputs for Human Health Ambient Water Quality Criteria					
	Cancer Slope Factor, CSF (per mg/kg-d)	Reference Dose, RfD (mg/kg-d)	Relative Source Contribution, RSC (-)	Bioaccumulation Factor		
				Trophic Level 2 (L/kg tissue)	Trophic Level 3 (L/kg tissue)	Trophic Level 4 (L/kg tissue)
Hexachloroethane	0.04	0.0007	0.2	1200	280	600
Indeno(1,2,3-cd)pyrene	0.73	ND	ND	3900	3900	3900
Isophorone	0.00095	0.2	0.2	1.9	2.2	2.4
Methoxychlor	ND	0.00002	0.8	1400	4800	4400
Methyl Bromide	ND	0.02	0.2	1.2	1.3	1.4
Methylene Chloride	0.002	0.006	0.2	1.4	1.5	1.6
Nitrobenzene	ND	0.002	0.2	2.3	2.8	3.1
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.24	0.0005	0.2	33000	140000	240000
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.167	0.0005	0.2	270000	1100000	3100000
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.34	0.0005	0.2	35000	240000	1100000
Pentachlorophenol	0.4	0.005	0.2	44	290	520
Phenol	ND	0.6	0.2	1.5	1.7	1.9
Pyrene	ND	0.03	0.2	860	860	860
Tetrachloroethylene (Perchloroethylene)	0.0021	0.006	0.2	49	66	76
Toluene	ND	0.0097	0.2	11	15	17
Toxaphene	1.1	0.00035	0.2	1700	6600	6300
trans-1,2-Dichloroethylene (DCE)	ND	0.02	0.2	3.3	4.2	4.7
Trichloroethylene (TCE)	0.05	0.0005	0.2	8.7	12	13
Vinyl Chloride	1.5	0.003	0.2	1.4	1.6	1.7

ND – No data
Source: https://www.epa.gov/sites/default/files/2016-03/documents/summary_of_inputs_final_revised_3.24.16.pdf

3.2 Probabilistic Distributions

3.2.1 Body Weight

For the body weight variable, Georgia used the same survey data from which EPA selected the mean body weight of 80 kg for adults 21 and over. In Table 8-3 of EPA's Exposure Factors Handbook, Chapter 8 – Body Weight Studies, mean and percentile body weights for males and females combined derived from NHANES (1999 – 2006) are provided for multiple age groups. A copy of this table is provided in Table A-1 in Appendix A (US EPA, 2011). While the table provides percentile body weight data for adults 21 to <30 years, 30 to <40 years, 40 to <50 years, 50 to <60 years, 60 to <70 years, 70 to <80 years, and over 80 years, EPA did not provide the mean and percentile body weight data for all adults 21 and over. EPD used the data provided to calculate weighted mean and percentile body weights for all adults 21 and over, weighted by the number of individuals in each age group. Table 3 lists the resulting percentile body weight data determined for adults 21 and over. The calculations for the mean and percentile body weights can be found in Tables A-2 and A-3 of Appendix A.

Table 3. Body Weight Percentiles for Adults 21 and Over

Body Weight (kg) Adults 21+	Percentile
52.9	0.05
57.2	0.1
60.4	0.15
66.0	0.25
77.6	0.5
91.0	0.75
99.5	0.85
105.6	0.9
115.4	0.95

The percentile values were input into the @RISK tool and the distribution fitting feature was used to fit possible distributions to the provided data. @RISK provides multiple distribution options and ranks them in order of root mean square error (RMS error), which is a performance indicator used to measure the average magnitude of error of a model. For the body weight data, an Inverse Gauss distribution was the best fit with an RMS error of 0.0020, followed by a lognormal distribution with an RMS error of 0.0021. In most cases, the distribution with the lowest RMS error was selected for the analysis, but in this case, EPD chose to use the lognormal distribution. The definition of the log-normal distribution holds that its skewness is essentially zero, whereas the inverse Gaussian distribution is slightly right (positively) skewed. These differences are so small, and their RMS errors are so similar, that EPD concluded there is no appreciable benefit for using the more complex inverse Gaussian compared with the more common and widely used log-normal distribution. EPD's intention was to select a distribution that more people would be familiar with in hopes of not increasing confusion in an already complex topic. Figure 2 displays the probability density curve for the fitted body weight distribution. Figure 3 compares fit results of both distributions to the body weight data provided. The table appearing in the pane on the left of

this figure displays distribution types ranked in order of RMS error. Figure 3 is comparing the input data (blue) with the resulting probability curve for both an Inverse Gaussian distribution (red) and a Lognormal distribution (green). The red curve of the Inverse Gaussian distribution is barely visible because it is nearly identical to the green curve of the Lognormal distribution. The statistics table on the right provides statistics for the input data and the fit distributions. The fitted parameters for the lognormal distribution are displayed in Table 4. A table comparing fit results for 16 different distribution types can be found in Table B-1 of Appendix B.

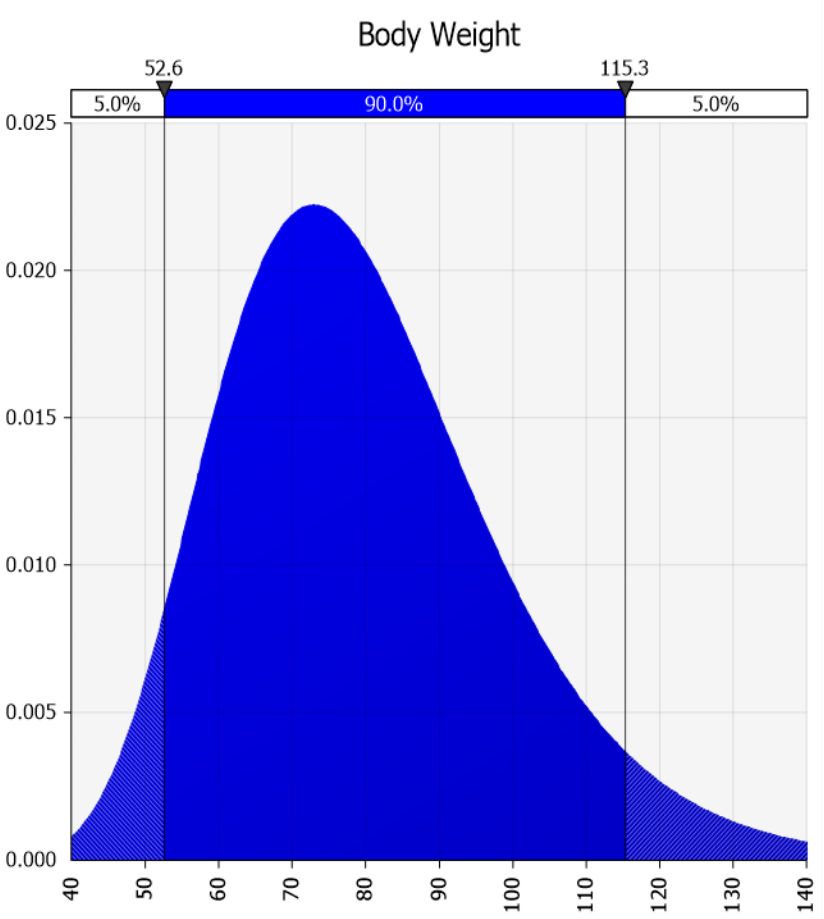


Figure 2 . Probability Density Graph for Fitted Body Weight Distribution

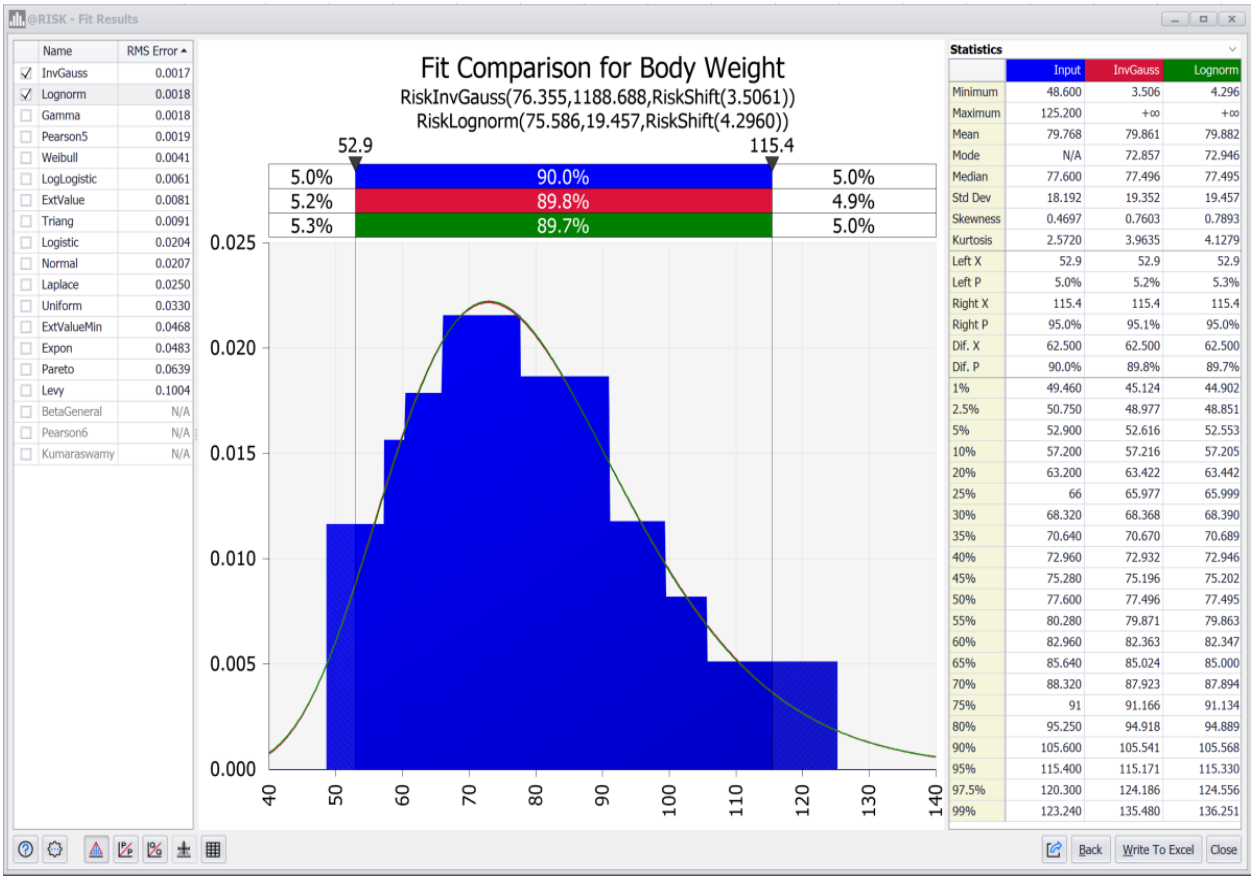


Figure 3. Fit Comparison of Body Weight Inputs to Resulting Inverse Gaussian and Lognormal Distributions

Table 4. Fitted Parameters for Lognormal Body Weight Distribution

Distribution	
Function	Lognorm
Parameters	Standard
μ	75.586
σ	19.457
Shift	4.296

3.2.2 Drinking Water Ingestion Rate

The drinking water consumption rate data distribution used in EPD's analysis is from Table 3-23 from Chapter 3 of EPA's Exposure Factors Handbook (US EPA, 2011), which lists per capita estimates of combined direct and indirect community water ingestion rates for the 25th, 50th, 75th, 90th, 95th, and 99th percentiles for adults 21 and older based on 2003 to 2006 NHANES data. The data includes all participants whether or not they ingested water from the source during the survey period. A copy of this table is included as Appendix C. This is the same dataset from which EPA selected the 90th percentile value of 2.4 liters per day used in the 2015 criteria recommendation. The drinking water ingestion rate data was used in the calculation of the "water + organism" criteria only. Table 5 displays the inputs used to generate the drinking water distribution used in our analysis. The upper bound was set at 7.4 to provide the closes fit to the 99th percentile. Figure 4 displays the resulting probability distribution. Figure 5 displays a comparison of distribution fitting tool inputs to the resulting distribution. Figure 5 also includes a comparison of RMS errors for various distribution types. The BetaGeneral distribution was selected for the drinking water ingestion rate because it had the lowest RMS error. The fitted parameters for the BetaGeneral distribution are given in Table 6. A table comparing fit results for 13 different distribution types can be found in Table B-2 of Appendix B.

Table 5. Water Ingestion Percentiles for Adults 21+

Water Ingestion for Adults 21+ (L/day)	Percentile
0	0.01
0.00000001	0.025
0.0000001	0.05
0.000001	0.1
0.227	0.25
0.787	0.5
1.577	0.75
2.414	0.9
2.958	0.95
4.405	0.99

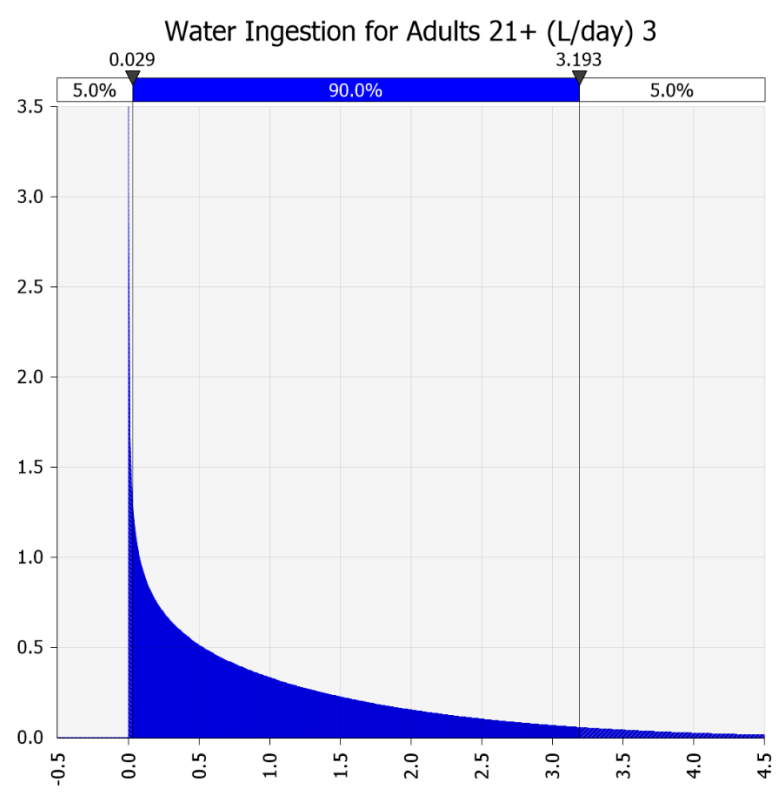


Figure 4. Probability Density Graph of for Fitted Drinking Water Ingestion Rates Distribution for Adults 21+

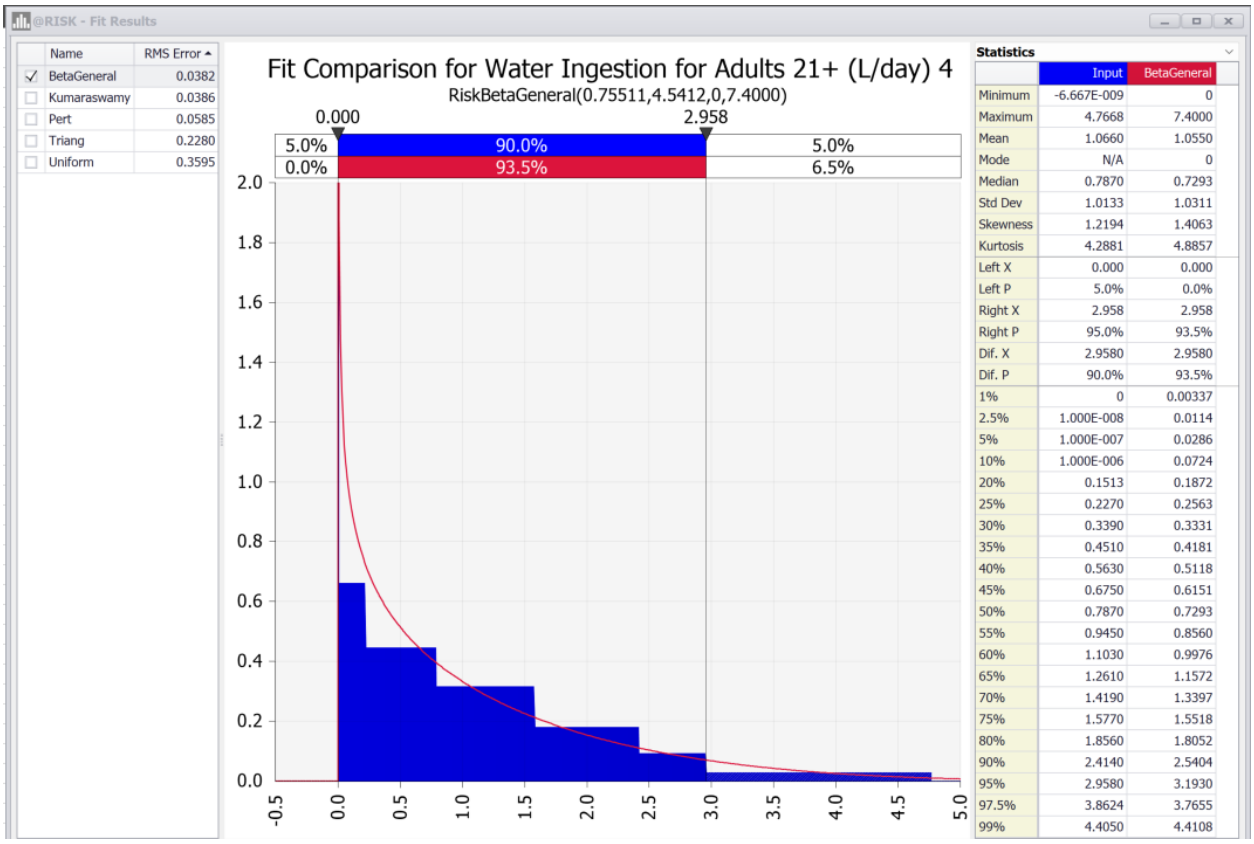


Figure 5. Fit Comparison of Drinking Water Ingestion Inputs to Resulting BetaGeneral Distribution

Table 6. Fitted Parameters for BetaGeneral Drinking Water Ingestion Distribution

Distribution	
Function	BetaGeneral
Parameters	Standard
α1	0.75511
α2	4.5412
Min	0
Max	7.4

3.2.3 Fish Consumption Rate Distribution

Fish consumption rate (FCR) data from EPA's *Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations* (US EPA, 2014) were used as input data in the @RISK tool to generate the fish consumption probability distributions. This report used NHANES data from 2003 to 2010 and is the same report used by EPA to select the 22 g/day 90th percentile national fish consumption rate. This report provided regional fish consumption rate data for specific subpopulations and two of the geographical subpopulations are applicable to Georgia. EPD used Inland South and Atlantic Coast total fish consumption rates as well as the fish

consumption rates by trophic levels 2, 3, and 4 for these geographical subpopulations. Fish consumption rates for the 25th, 50th, 75th, 90th, 95th, 97th, and 99th percentiles were used.

Table 7 displays the total and trophic-level-specific fish consumption rate estimates by geographic region given in Appendix E of EPA's report Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (US EPA, 2014). The data used in our analysis are from Tables E-7, E-13, E-14, and E-15. A copy of these tables is included as Appendix D of this document. The fish consumption rates summarized in Table 7 are for populations 21 and over. These percentiles were used in the distribution fitting tool in @RISK to generate data distributions for the total fish consumption rates of the Inland South and Atlantic Coast regions, as well as for consumption rates at each trophic level of both regions. A lower bound of zero was selected for all fish consumption rate distributions to exclude any negative consumption values.

Table 7. Total and Trophic-Level-Specific Fish Consumption Rates (FCRs)

Total (Group)

Inland South		
g/day	**kg/day**	**Percentile**
1.9	0.0019	0.25
5.3	0.0053	0.5
12.0	0.0120	0.75
22.8	0.0228	0.9
32.7	0.0327	0.95
40.9	0.0409	0.97
61.0	0.0610	0.99
Weight	0.95	

Atlantic Coast		
g/day	**kg/day**	**Percentile**
3.5	0.0035	0.25
8.3	0.0083	0.5
17.0	0.0170	0.75
30.8	0.0308	0.9
42.8	0.0428	0.95
52.3	0.0523	0.97
75.8	0.0758	0.99
Weight	0.05	

Trophic Level 2

Inland South		
g/day	**kg/day**	**Percentile**
0.6	0.0006	0.25
1.6	0.0016	0.5
3.7	0.0037	0.75
7.6	0.0076	0.9
11.3	0.0113	0.95
14.6	0.0146	0.97
23.1	0.0231	0.99
Weight	0.95	

Atlantic Coast		
g/day	**kg/day**	**Percentile**
1.1	0.0011	0.25
2.8	0.0028	0.5
6.2	0.0062	0.75
11.6	0.0116	0.9
16.4	0.0164	0.95
20.4	0.0204	0.97
29.6	0.0296	0.99
Weight	0.05	

Trophic Level 3

Inland South		
g/day	**kg/day**	**Percentile**
0.9	0.0009	0.25
2.2	0.0022	0.5
4.7	0.0047	0.75
8.6	0.0086	0.9
11.9	0.0119	0.95

Atlantic Coast		
g/day	**kg/day**	**Percentile**
1.6	0.0016	0.25
3.6	0.0036	0.5
7.1	0.0071	0.75
12.3	0.0123	0.9
16.6	0.0166	0.95

14.7	0.0147	0.97
21.4	0.0214	0.99
Weight	0.95	

20.1	0.0201	0.97
28.5	0.0285	0.99
Weight	0.05	

Trophic Level 4

Inland South		
g/day	**kg/day**	**Percentile**
0.2	0.0002	0.25
0.7	0.0007	0.5
2.3	0.0023	0.75
6.1	0.0061	0.9
10.9	0.0109	0.95
15.8	0.0158	0.97
32.5	0.0325	0.99
Weight	0.95	

Atlantic Coast		
g/day	**kg/day**	**Percentile**
0.2	0.0002	0.25
0.8	0.0008	0.5
2.2	0.0022	0.75
5.8	0.0058	0.9
10.2	0.0102	0.95
14.7	0.0147	0.97
28.8	0.0288	0.99
Weight	0.05	

The resulting distributions are shown in Figures 6a – 13a. Figures 6b – 13b display a comparison of distribution fitting tool inputs to the resulting distributions. These figures include a comparison of RMS errors for various distribution types. The distribution type with the lowest RMS error was selected for each data set. Tables comparing fit results for different distribution types for each data set can be found in Appendix B. Tables 8–15 provide the Fitted Parameters for each fish consumption rate distribution.

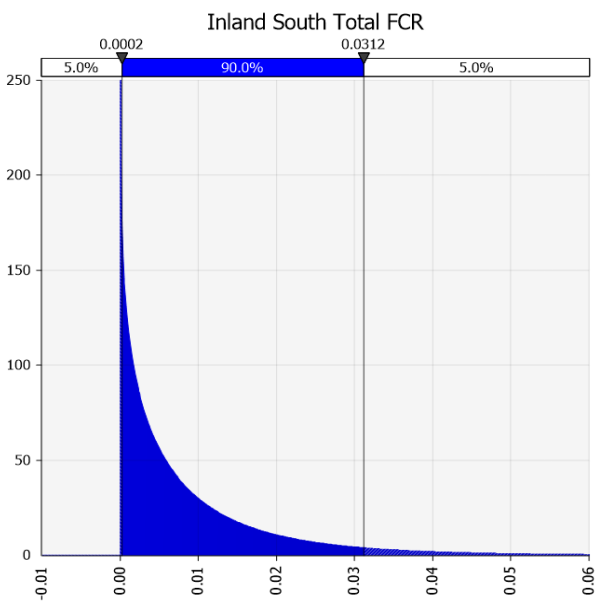


Figure 6a. Probability Density Graph of Total Fish Consumption Rates for the Inland South Region

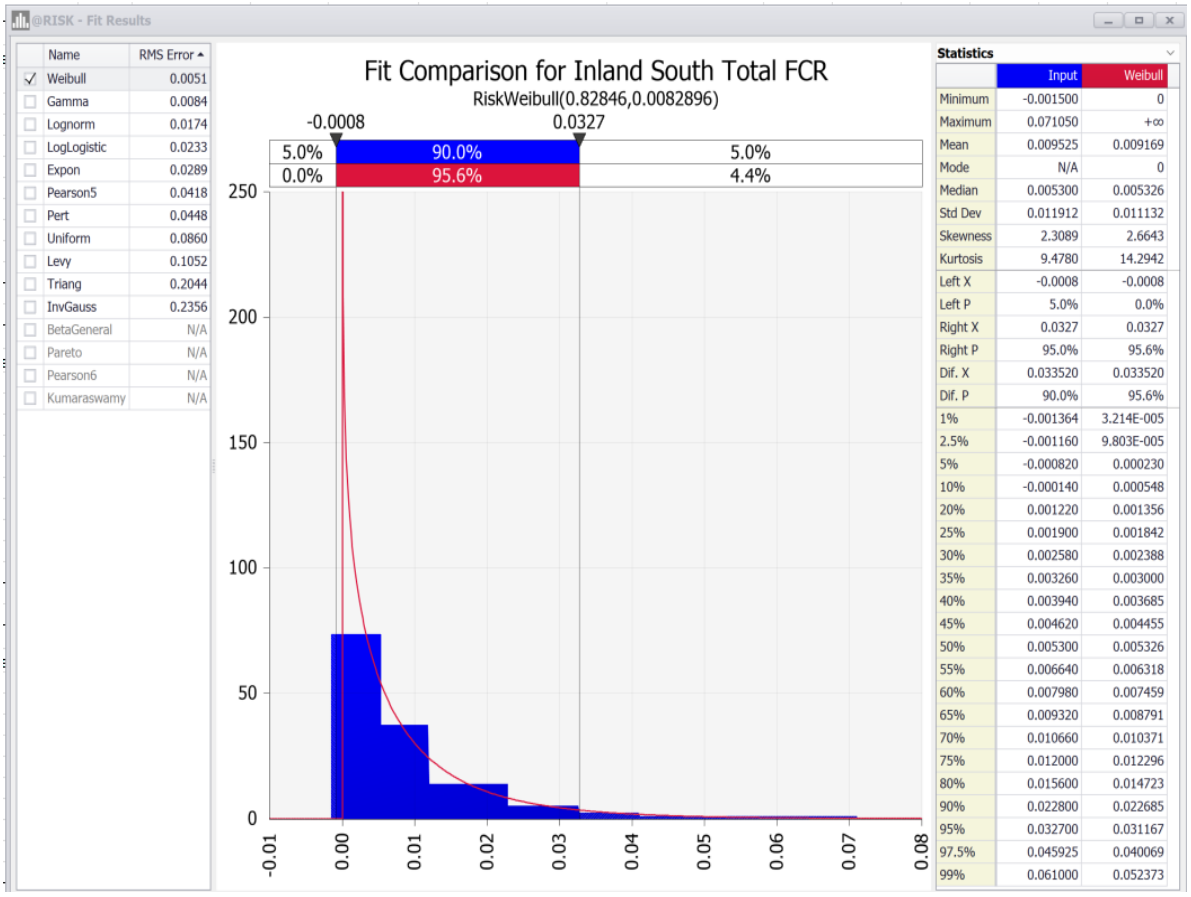


Figure 7b. Fit Comparison for Inland South Total Fish Consumption Rate Weibull Distribution

Table 8. Fitted Parameters for Inland South Total Fish Consumption Rate Weibull Distribution

Distribution	
Function	Weibull
Parameters	Standard
α	0.82846
β	0.0082896

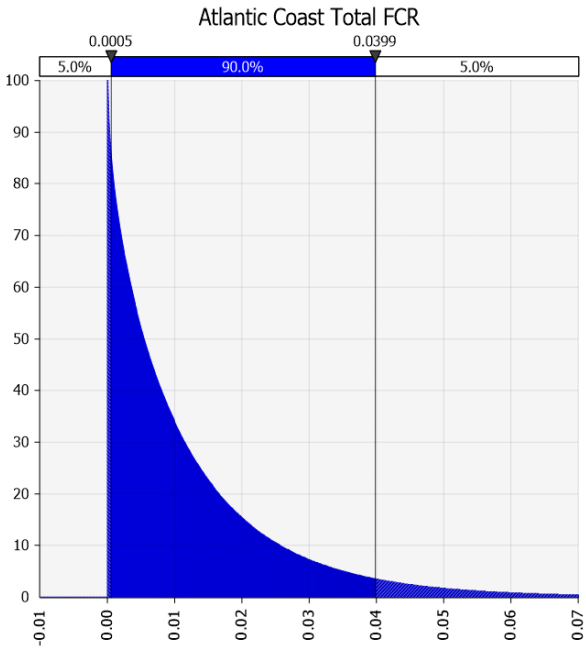
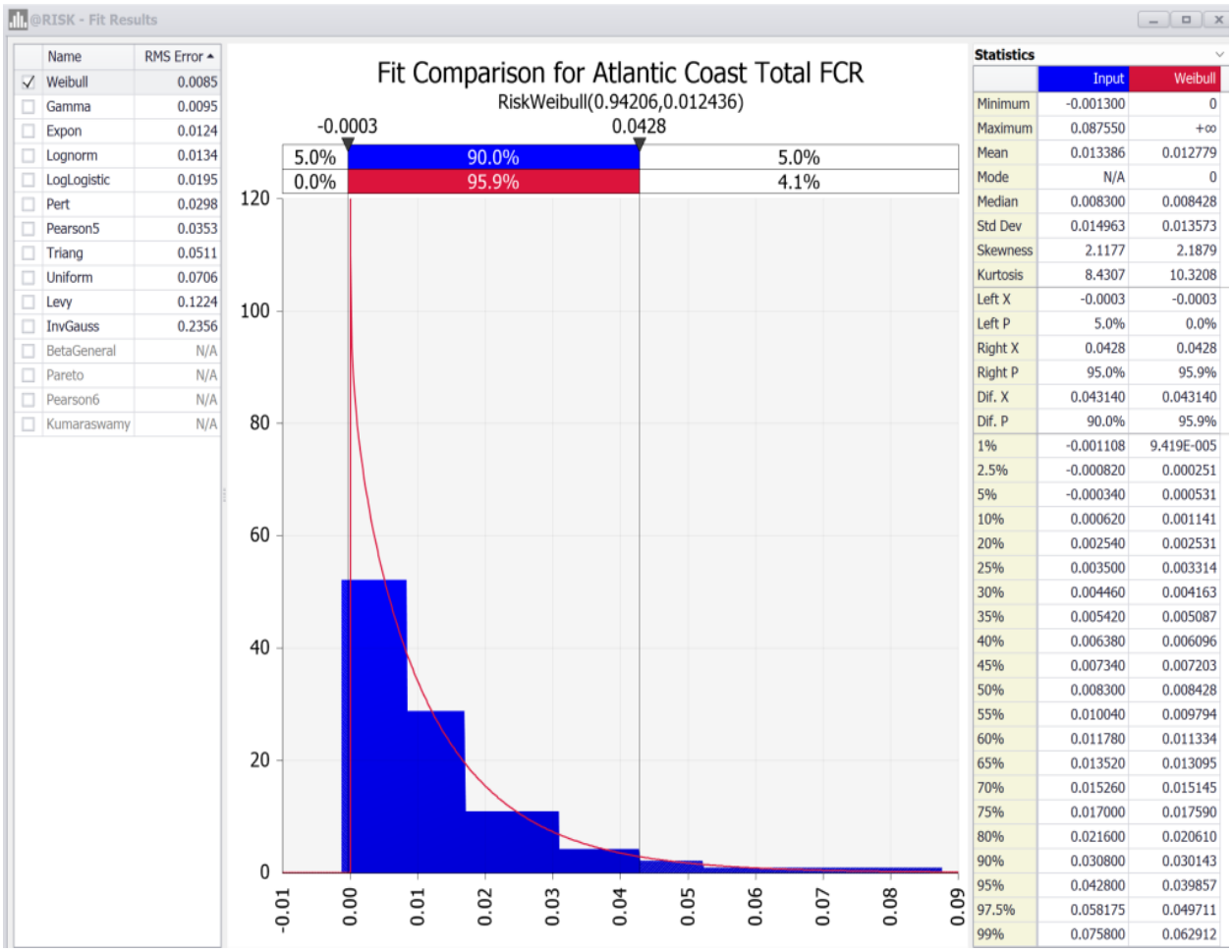


Figure 8a. Probability Density Graph of Total Fish Consumption Rates for the Atlantic Coastal Region



Name	RMS Error
✓ Weibull	0.0085
Gamma	0.0095
Expon	0.0124
Lognorm	0.0134
LogLogistic	0.0195
Pert	0.0298
Pearson5	0.0353
Triang	0.0511
Uniform	0.0706
Levy	0.1224
InvGauss	0.2356
BetaGeneral	N/A
Pareto	N/A
Pearson6	N/A
Kumaraswamy	N/A

	Input	Weibull
Minimum	-0.001300	0
Maximum	0.087550	+∞
Mean	0.013386	0.012779
Mode	N/A	0
Median	0.008300	0.008428
Std Dev	0.014963	0.013573
Skewness	2.1177	2.1879
Kurtosis	8.4307	10.3208
Left X	-0.0003	-0.0003
Left P	5.0%	0.0%
Right X	0.0428	0.0428
Right P	95.0%	95.9%
Dif. X	0.043140	0.043140
Dif. P	90.0%	95.9%
1%	-0.001108	9.419E-005
2.5%	-0.000820	0.000251
5%	-0.000340	0.000531
10%	0.000620	0.001141
20%	0.002540	0.002531
25%	0.003500	0.003314
30%	0.004460	0.004163
35%	0.005420	0.005087
40%	0.006380	0.006096
45%	0.007340	0.007203
50%	0.008300	0.008428
55%	0.010040	0.009794
60%	0.011780	0.011334
65%	0.013520	0.013095
70%	0.015260	0.015145
75%	0.017000	0.017590
80%	0.021600	0.020610
90%	0.030800	0.030143
95%	0.042800	0.039857
97.5%	0.058175	0.049711
99%	0.075800	0.062912

Figure 9b. Fit Comparison of Atlantic Coast Total Fish Consumption Rate Inputs to Resulting Weibull Distribution

Table 9. Fitted Parameters for Atlantic Coast Total Fish Consumption Rate Weibull Distribution

Distribution	
Function	Weibull
Parameters	Standard
α	0.94206
β	0.012436

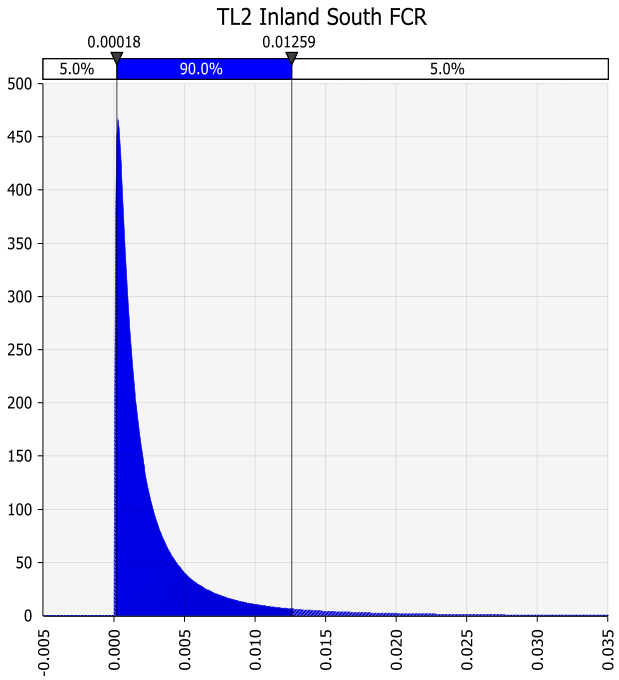


Figure 10a. Probability Density Graph of Trophic Level 2 Fish Consumption Rates for the Inland South Region

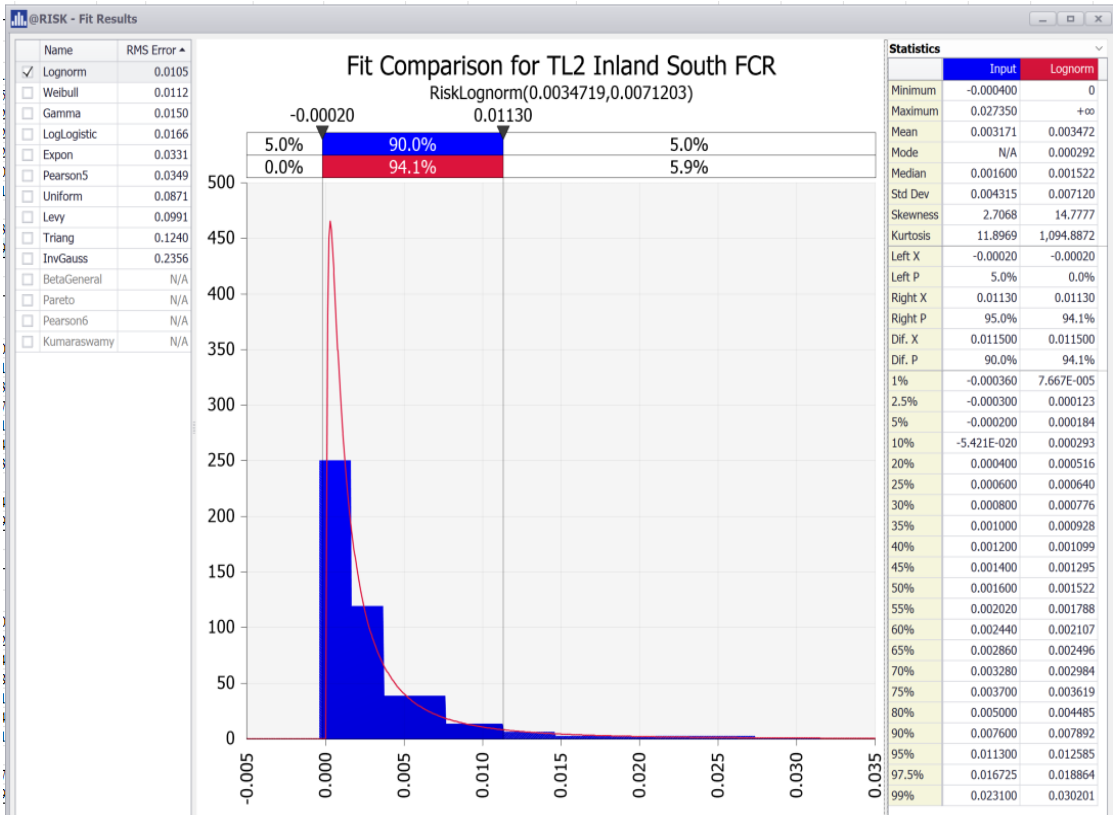


Figure 11b. Fit Comparison of Inland South Trophic Level 2 Fish Consumption Rate Inputs to Resulting Lognormal Distribution

Table 10. Fitted Parameters for Inland South Trophic Level 2 Fish Consumption Rate Lognormal Distribution

Distribution	
Function	Lognorm ···
Parameters	Standard ···
μ	0.0034719
σ	0.0071203

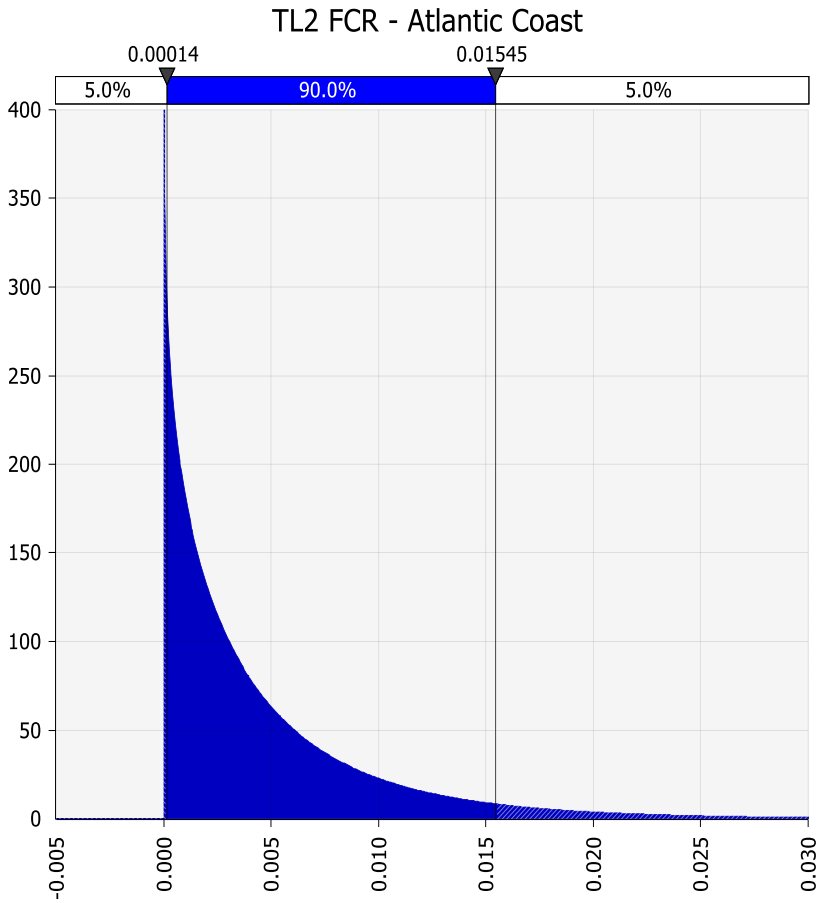


Figure 12a. Probability Density Graph of Trophic Level 2 Fish Consumption Rates for the Atlantic Coastal Region

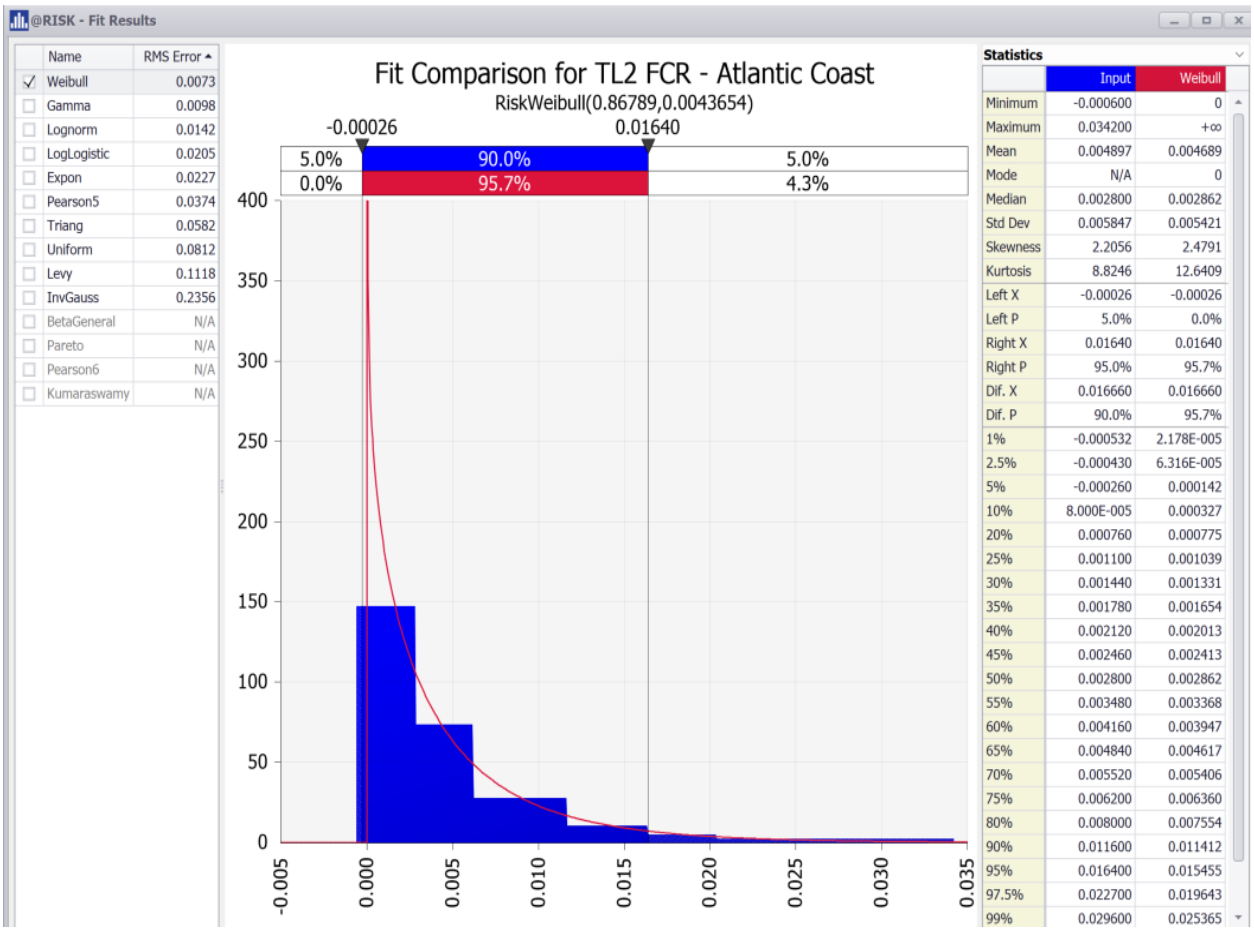


Figure 13b. Fit Comparison of Atlantic Coast Trophic Level 2 Fish Consumption Rate Inputs to Resulting Weibull Distribution

Table 11. Fitted Parameters for Atlantic Coast Trophic Level 2 Fish Consumption Rate Weibull Distribution

Distribution	
Function	Weibull
Parameters	Standard
α	0.86789
β	0.0043654

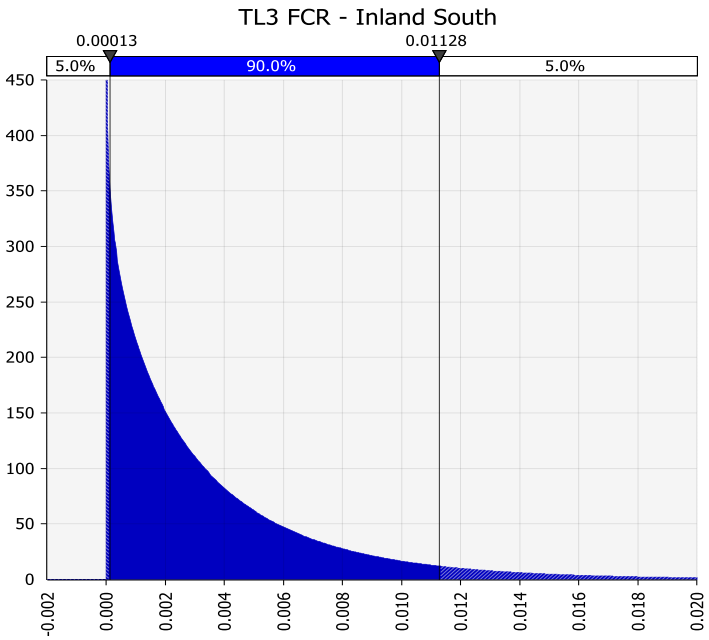


Figure 14a. Probability Density Graph of Trophic Level 3 Fish Consumption Rates for the Inland South Region

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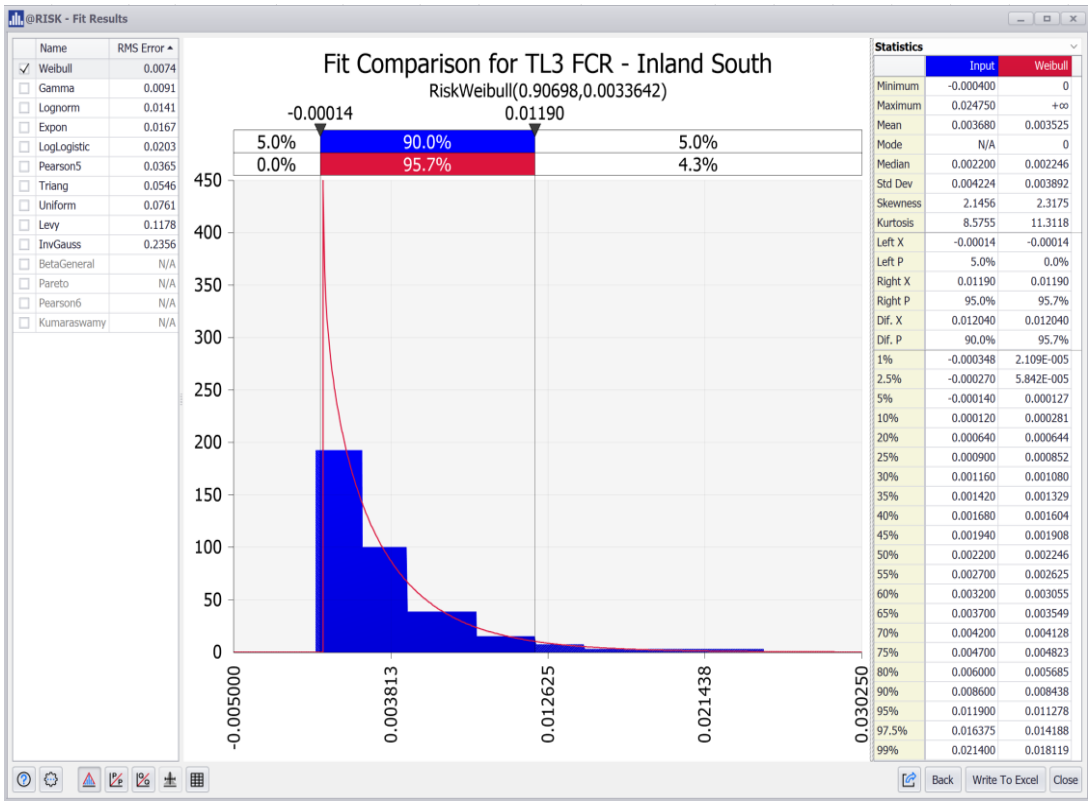


Figure 15b. Fit Comparison of Inland South Trophic Level 3 Fish Consumption Rate Inputs to Resulting Weibull Distribution

Table 12. Fitted Parameters for Inland South Trophic Level 3 Fish Consumption Rate Weibull Distribution

Distribution	
Function	Weibull
Parameters	Standard
α	0.90698
β	0.0033642

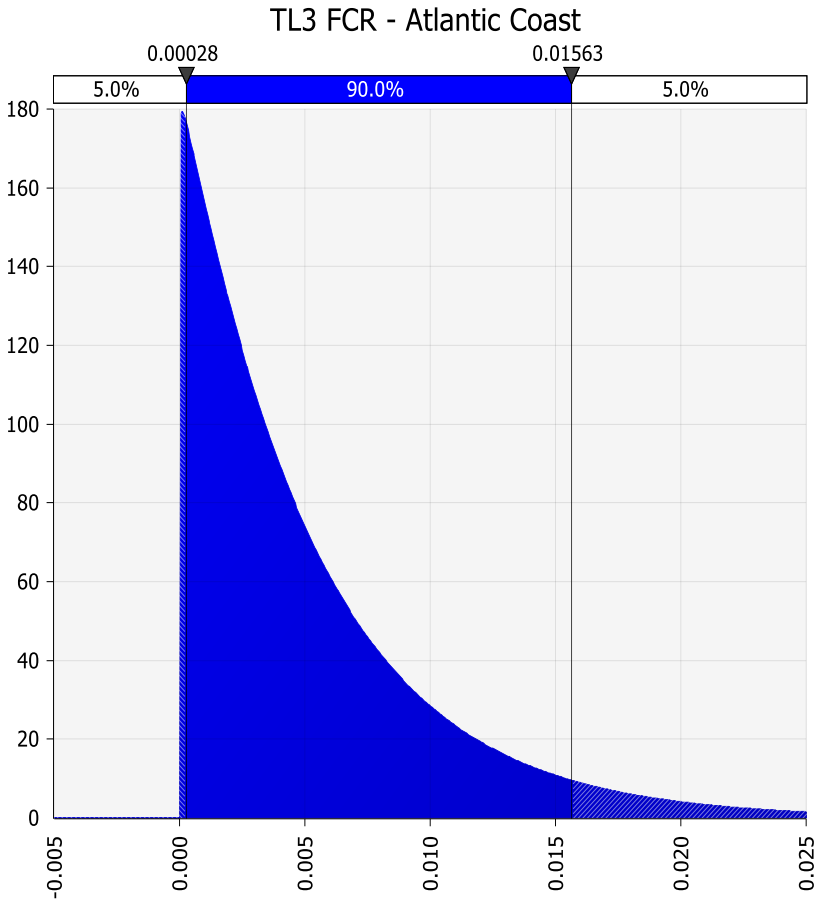


Figure 16a. Probability Density Graph of Trophic Level 3 Fish Consumption Rates for the Atlantic Coastal Region

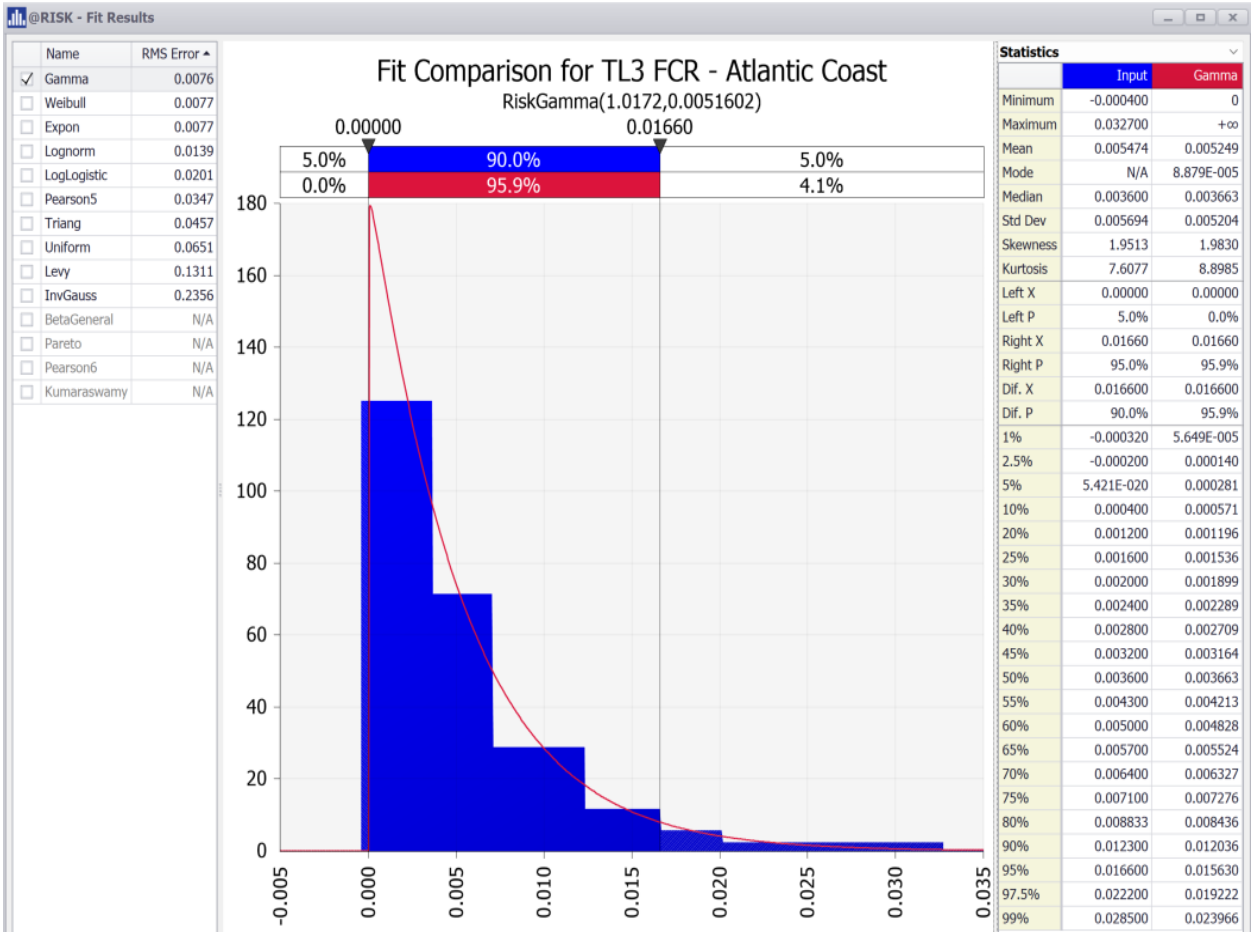


Figure 17b. Fit Comparison of Atlantic Coast Trophic Level 3 Fish Consumption Rate Inputs to Resulting Gamma Distribution

Table 13. Fitted Parameters for Atlantic Coast Trophic Level 3 Fish Consumption Rate Gamma Distribution

Distribution	
Function	Gamma
Parameters	Standard
α	1.0172
β	0.0051602

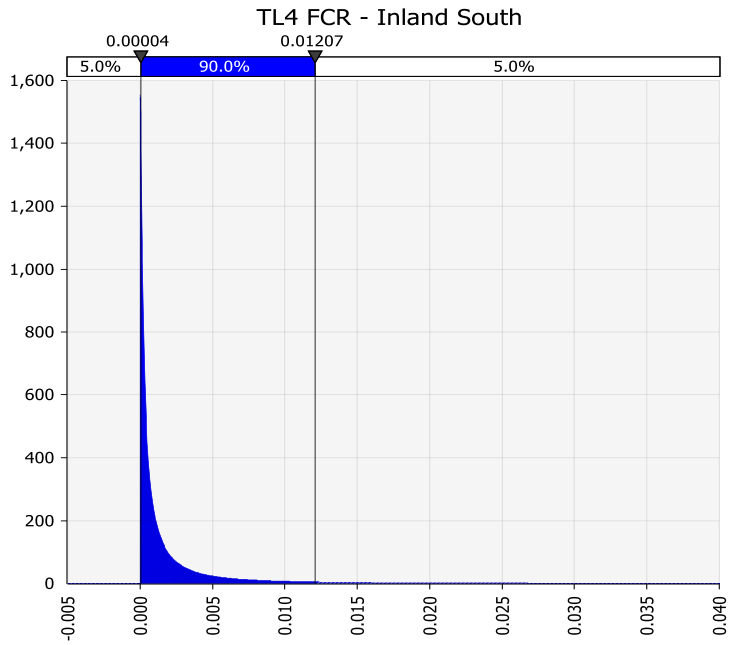


Figure 18a. Probability Density Graph of Trophic Level 4 Fish Consumption Rates for the Inland South Region

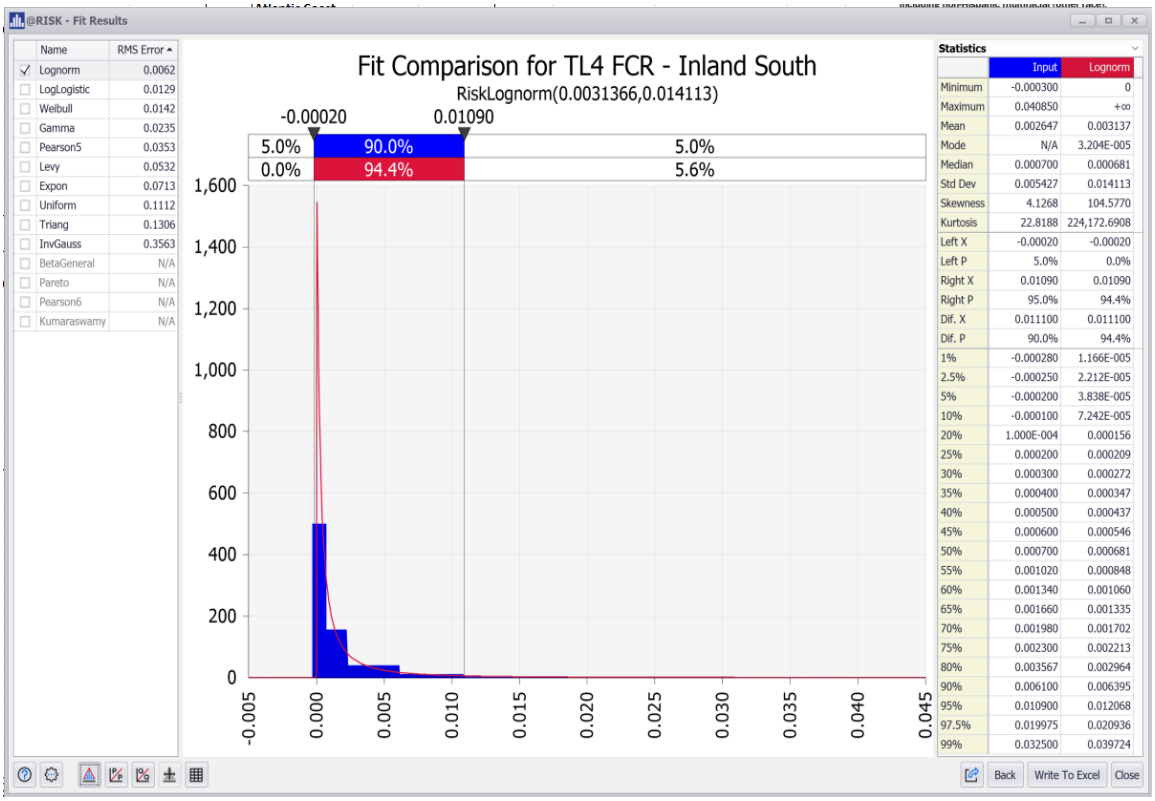


Figure 19b. Fit Comparison of Inland South Trophic Level 4 Fish Consumption Rate Inputs to Resulting Lognormal Distribution

Table 14. Fitted Parameters for Inland South Trophic Level 4 Fish Consumption Rate Lognormal Distribution

Distribution	
Function	Lognorm
Parameters	Standard
μ	0.0031366
σ	0.014113

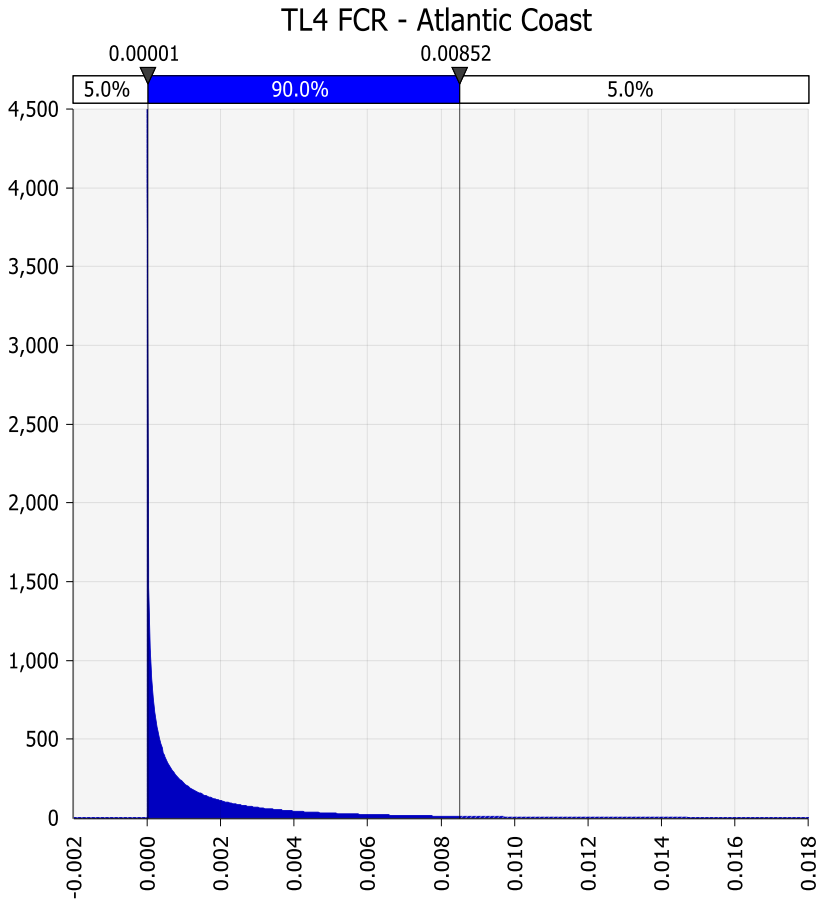
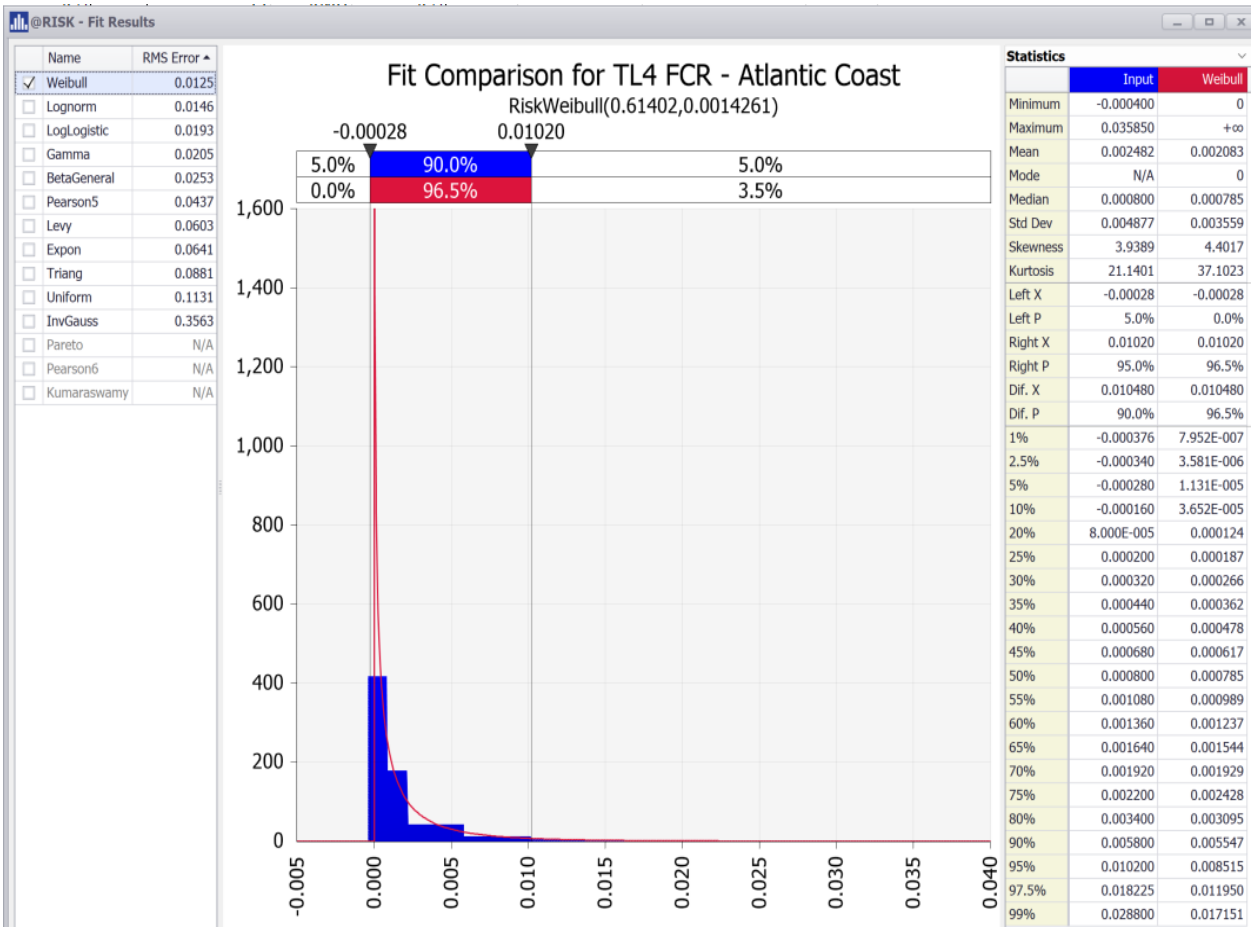


Figure 20a. Probability Density Graph of Trophic Level 4 Fish Consumption Rates for the Atlantic Coastal Region



Name	RMS Error
Weibull	0.0125
Lognorm	0.0146
LogLogistic	0.0193
Gamma	0.0205
BetaGeneral	0.0253
Pearson5	0.0437
Levy	0.0603
Expon	0.0641
Triang	0.0881
Uniform	0.1131
InvGauss	0.3563
Pareto	N/A
Pearson6	N/A
Kumaraswamy	N/A

	Input	Weibull
Minimum	-0.000400	0
Maximum	0.035850	+∞
Mean	0.002482	0.002083
Mode	N/A	0
Median	0.000800	0.000785
Std Dev	0.004877	0.003559
Skewness	3.9389	4.4017
Kurtosis	21.1401	37.1023
Left X	-0.00028	-0.00028
Left P	5.0%	0.0%
Right X	0.01020	0.01020
Right P	95.0%	96.5%
Dif. X	0.010480	0.010480
Dif. P	90.0%	96.5%
1%	-0.000376	7.952E-007
2.5%	-0.000340	3.581E-006
5%	-0.000280	1.131E-005
10%	-0.000160	3.652E-005
20%	8.000E-005	0.000124
25%	0.000200	0.000187
30%	0.000320	0.000266
35%	0.000440	0.000362
40%	0.000560	0.000478
45%	0.000680	0.000617
50%	0.000800	0.000785
55%	0.001080	0.000989
60%	0.001360	0.001237
65%	0.001640	0.001544
70%	0.001920	0.001929
75%	0.002200	0.002428
80%	0.003400	0.003095
90%	0.005800	0.005547
95%	0.010200	0.008515
97.5%	0.018225	0.011950
99%	0.028800	0.017151

Figure 21b. Fit Comparison of Atlantic Coast Trophic Level 4 Fish Consumption Rate Inputs to Resulting Weibull Distribution

Table 15. Fitted Parameters for Atlantic Coast Trophic Level 4 Fish Consumption Rate Weibull Distribution

Distribution	
Function	Weibull
Parameters	Standard
α	0.61402
β	0.0014261

The Atlantic Coast region applies to Georgia's coastal counties and the Inland South region applies to the remaining non-coastal counties in Georgia. Coastal regions were defined as including counties bordering the 3 coasts (Pacific, Atlantic, and Gulf of Mexico) and the Great Lakes and estuaries and bays. Additionally, any county that did not directly border a coast, but the central point was within 25 miles of a coast was defined as coastal. The inland regions are the remaining counties in each of the 4 Census Regions.

The portion of Georgia's population residing in each of these two regions was calculated using 2020 census data. Camden, Glynn, McIntosh, Liberty, and Chatham counties are considered coastal counties because they border the coast. Bryan county does not directly border the coast but has a center point within 25 miles of the coast. Figure 14 shows the coastal counties highlighted in blue, as well as the second line counties and their center points (red diamonds).

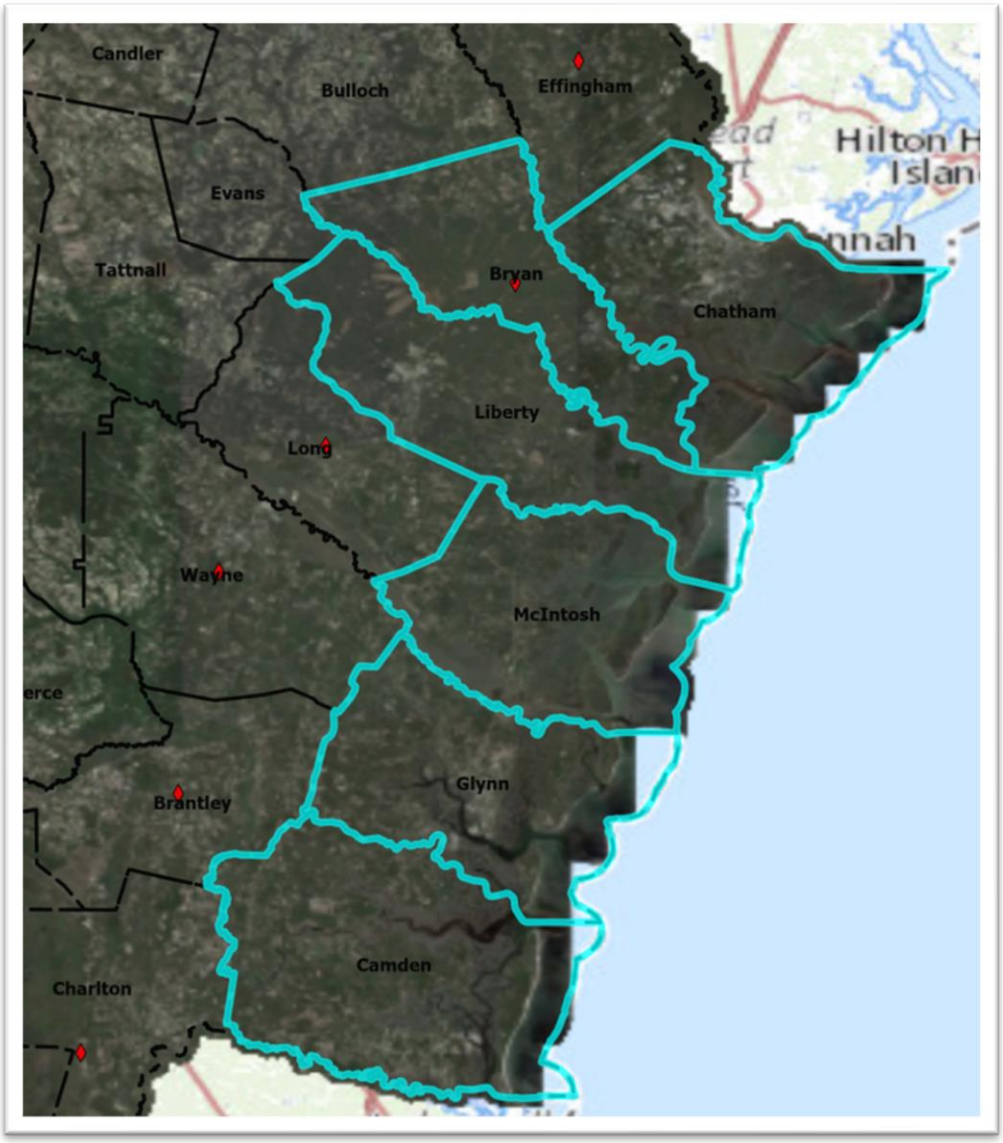


Figure 22. Coastal Counties

Table 16 provides the 2020 census data used to assign the population percentages to either the Atlantic Coast region or the Inland South Region. US. Census data provides population by the age group of 18 and over, rather than the 21 and over age group used for the fish consumption distributions. However, this information was only used to determine the population ratio of Inland to Coastal counties. Table 17 provides the percentages of Georgia's population living in each region.

Table 16. 2020 Georgia County Population

County	Total Population	Total population 18 years and over	Total population under 18 years	Inland vs Coastal
Georgia	10,711,908	8,220,274	2,491,634	
Appling County, Georgia	18,444	13,958	4,486	Inland
Atkinson County, Georgia	8,286	6,129	2,157	Inland
Bacon County, Georgia	11,140	8,310	2,830	Inland
Baker County, Georgia	2,876	2,275	601	Inland
Baldwin County, Georgia	43,799	35,732	8,067	Inland
Banks County, Georgia	18,035	13,900	4,135	Inland
Barrow County, Georgia	83,505	62,195	21,310	Inland
Bartow County, Georgia	108,901	83,570	25,331	Inland
Ben Hill County, Georgia	17,194	13,165	4,029	Inland
Berrien County, Georgia	18,160	13,690	4,470	Inland
Bibb County, Georgia	157,346	120,902	36,444	Inland
Bleckley County, Georgia	12,583	9,613	2,970	Inland
Brantley County, Georgia	18,021	13,692	4,329	Inland
Brooks County, Georgia	16,301	12,747	3,554	Inland
Bryan County, Georgia	44,738	31,828	12,910	Coastal
Bulloch County, Georgia	81,099	64,494	16,605	Inland
Burke County, Georgia	24,596	18,778	5,818	Inland
Butts County, Georgia	25,434	20,360	5,074	Inland
Calhoun County, Georgia	5,573	4,687	886	Inland
Camden County, Georgia	54,768	41,808	12,960	Coastal
Candler County, Georgia	10,981	8,241	2,740	Inland
Carroll County, Georgia	119,148	90,996	28,152	Inland
Catoosa County, Georgia	67,872	52,448	15,424	Inland
Charlton County, Georgia	12,518	10,135	2,383	Inland
Chatham County, Georgia	295,291	234,715	60,576	Coastal
Chattahoochee County, Georgia	9,565	7,199	2,366	Inland
Chattooga County, Georgia	24,965	19,416	5,549	Inland
Cherokee County, Georgia	266,620	202,928	63,692	Inland
Clarke County, Georgia	128,671	106,830	21,841	Inland
Clay County, Georgia	2,848	2,246	602	Inland
Clayton County, Georgia	297,595	220,578	77,017	Inland
Clinch County, Georgia	6,749	5,034	1,715	Inland
Cobb County, Georgia	766,149	591,848	174,301	Inland
Coffee County, Georgia	43,092	32,419	10,673	Inland
Colquitt County, Georgia	45,898	34,193	11,705	Inland

County	Total Population	Total population 18 years and over	Total population under 18 years	Inland vs Coastal
Columbia County, Georgia	156,010	114,823	41,187	Inland
Cook County, Georgia	17,229	12,938	4,291	Inland
Coweta County, Georgia	146,158	111,155	35,003	Inland
Crawford County, Georgia	12,130	9,606	2,524	Inland
Crisp County, Georgia	20,128	15,570	4,558	Inland
Dade County, Georgia	16,251	12,987	3,264	Inland
Dawson County, Georgia	26,798	21,441	5,357	Inland
Decatur County, Georgia	29,367	22,443	6,924	Inland
DeKalb County, Georgia	764,382	595,276	169,106	Inland
Dodge County, Georgia	19,925	15,709	4,216	Inland
Dooly County, Georgia	11,208	9,187	2,021	Inland
Dougherty County, Georgia	85,790	66,266	19,524	Inland
Douglas County, Georgia	144,237	108,428	35,809	Inland
Early County, Georgia	10,854	8,315	2,539	Inland
Echols County, Georgia	3,697	2,709	988	Inland
Effingham County, Georgia	64,769	47,295	17,474	Inland
Elbert County, Georgia	19,637	15,493	4,144	Inland
Emanuel County, Georgia	22,768	17,320	5,448	Inland
Evans County, Georgia	10,774	8,127	2,647	Inland
Fannin County, Georgia	25,319	21,188	4,131	Inland
Fayette County, Georgia	119,194	91,798	27,396	Inland
Floyd County, Georgia	98,584	76,295	22,289	Inland
Forsyth County, Georgia	251,283	181,193	70,090	Inland
Franklin County, Georgia	23,424	18,307	5,117	Inland
Fulton County, Georgia	1,066,710	847,182	219,528	Inland
Gilmer County, Georgia	31,353	25,417	5,936	Inland
Glascock County, Georgia	2,884	2,236	648	Inland
Glynn County, Georgia	84,499	66,468	18,031	Coastal
Gordon County, Georgia	57,544	43,500	14,044	Inland
Grady County, Georgia	26,236	19,962	6,274	Inland
Greene County, Georgia	18,915	15,358	3,557	Inland
Gwinnett County, Georgia	957,062	709,484	247,578	Inland
Habersham County, Georgia	46,031	35,878	10,153	Inland
Hall County, Georgia	203,136	153,844	49,292	Inland
Hancock County, Georgia	8,735	7,487	1,248	Inland
Haralson County, Georgia	29,919	22,854	7,065	Inland
Harris County, Georgia	34,668	26,799	7,869	Inland
Hart County, Georgia	25,828	20,436	5,392	Inland

County	Total Population	Total population 18 years and over	Total population under 18 years	Inland vs Coastal
Heard County, Georgia	11,412	8,698	2,714	Inland
Henry County, Georgia	240,712	179,973	60,739	Inland
Houston County, Georgia	163,633	122,118	41,515	Inland
Irwin County, Georgia	9,666	7,547	2,119	Inland
Jackson County, Georgia	75,907	56,451	19,456	Inland
Jasper County, Georgia	14,588	11,118	3,470	Inland
Jeff Davis County, Georgia	14,779	10,856	3,923	Inland
Jefferson County, Georgia	15,709	12,301	3,408	Inland
Jenkins County, Georgia	8,674	7,005	1,669	Inland
Johnson County, Georgia	9,189	7,474	1,715	Inland
Jones County, Georgia	28,347	21,575	6,772	Inland
Lamar County, Georgia	18,500	14,541	3,959	Inland
Lanier County, Georgia	9,877	7,326	2,551	Inland
Laurens County, Georgia	49,570	37,734	11,836	Inland
Lee County, Georgia	33,163	24,676	8,487	Inland
Liberty County, Georgia	65,256	48,014	17,242	Coastal
Lincoln County, Georgia	7,690	6,270	1,420	Inland
Long County, Georgia	16,168	11,234	4,934	Inland
Lowndes County, Georgia	118,251	89,031	29,220	Inland
Lumpkin County, Georgia	33,488	27,689	5,799	Inland
McDuffie County, Georgia	21,632	16,615	5,017	Inland
McIntosh County, Georgia	10,975	9,040	1,935	Coastal
Macon County, Georgia	12,082	9,938	2,144	Inland
Madison County, Georgia	30,120	23,112	7,008	Inland
Marion County, Georgia	7,498	5,854	1,644	Inland
Meriwether County, Georgia	20,613	16,526	4,087	Inland
Miller County, Georgia	6,000	4,749	1,251	Inland
Mitchell County, Georgia	21,755	17,065	4,690	Inland
Monroe County, Georgia	27,957	21,913	6,044	Inland
Montgomery County, Georgia	8,610	6,792	1,818	Inland
Morgan County, Georgia	20,097	15,574	4,523	Inland
Murray County, Georgia	39,973	30,210	9,763	Inland
Muscogee County, Georgia	206,922	157,052	49,870	Inland
Newton County, Georgia	112,483	84,748	27,735	Inland
Oconee County, Georgia	41,799	30,221	11,578	Inland
Oglethorpe County, Georgia	14,825	11,639	3,186	Inland
Paulding County, Georgia	168,661	123,998	44,663	Inland
Peach County, Georgia	27,981	22,111	5,870	Inland

County	Total Population	Total population 18 years and over	Total population under 18 years	Inland vs Coastal
Pickens County, Georgia	33,216	26,799	6,417	Inland
Pierce County, Georgia	19,716	14,899	4,817	Inland
Pike County, Georgia	18,889	14,337	4,552	Inland
Polk County, Georgia	42,853	32,238	10,615	Inland
Pulaski County, Georgia	9,855	8,012	1,843	Inland
Putnam County, Georgia	22,047	17,847	4,200	Inland
Quitman County, Georgia	2,235	1,870	365	Inland
Rabun County, Georgia	16,883	13,767	3,116	Inland
Randolph County, Georgia	6,425	4,977	1,448	Inland
Richmond County, Georgia	206,607	160,899	45,708	Inland
Rockdale County, Georgia	93,570	71,503	22,067	Inland
Schley County, Georgia	4,547	3,328	1,219	Inland
Screven County, Georgia	14,067	10,893	3,174	Inland
Seminole County, Georgia	9,147	7,277	1,870	Inland
Spalding County, Georgia	67,306	52,123	15,183	Inland
Stephens County, Georgia	26,784	21,163	5,621	Inland
Stewart County, Georgia	5,314	4,617	697	Inland
Sumter County, Georgia	29,616	23,036	6,580	Inland
Talbot County, Georgia	5,733	4,783	950	Inland
Taliaferro County, Georgia	1,559	1,289	270	Inland
Tattnall County, Georgia	22,842	17,654	5,188	Inland
Taylor County, Georgia	7,816	6,120	1,696	Inland
Telfair County, Georgia	12,477	10,190	2,287	Inland
Terrell County, Georgia	9,185	7,204	1,981	Inland
Thomas County, Georgia	45,798	35,037	10,761	Inland
Tift County, Georgia	41,344	31,224	10,120	Inland
Toombs County, Georgia	27,030	20,261	6,769	Inland
Towns County, Georgia	12,493	10,923	1,570	Inland
Treutlen County, Georgia	6,406	4,934	1,472	Inland
Troup County, Georgia	69,426	52,581	16,845	Inland
Turner County, Georgia	9,006	6,960	2,046	Inland
Twiggs County, Georgia	8,022	6,589	1,433	Inland
Union County, Georgia	24,632	20,808	3,824	Inland
Upson County, Georgia	27,700	21,711	5,989	Inland
Walker County, Georgia	67,654	52,794	14,860	Inland
Walton County, Georgia	96,673	73,098	23,575	Inland
Ware County, Georgia	36,251	27,788	8,463	Inland
Warren County, Georgia	5,215	4,159	1,056	Inland

County	Total Population	Total population 18 years and over	Total population under 18 years	Inland vs Coastal
Washington County, Georgia	19,988	15,709	4,279	Inland
Wayne County, Georgia	30,144	23,105	7,039	Inland
Webster County, Georgia	2,348	1,847	501	Inland
Wheeler County, Georgia	7,471	6,217	1,254	Inland
White County, Georgia	28,003	22,482	5,521	Inland
Whitfield County, Georgia	102,864	76,262	26,602	Inland
Wilcox County, Georgia	8,766	7,218	1,548	Inland
Wilkes County, Georgia	9,565	7,651	1,914	Inland
Wilkinson County, Georgia	8,877	7,026	1,851	Inland
Worth County, Georgia	20,784	16,444	4,340	Inland

Table 17. Georgia Population Located in Inland and Coastal Counties

Inland Total Population	Inland Total Population 18 & Over	Inland Total Population under 18	Coastal Total Population	Coastal Total Population 18 & Over	Coastal Total Population under 18
10,156,381	7,788,401	2,367,980	555,527	431,873	123,654
95%	95%	95%	5%	5%	5%

A random number generator was used to select which probability distributions. would be used for each iteration. A number between 0 and 1 was generated for each iteration. If the number generated was 0.95 or below, the simulation would select values from the Inland South probability distributions for the fish consumption rate variables for that iteration. If the number generated was greater than 0.95, fish consumption values from the Atlantic Coast distributions were used. The simulation also differentiates between pollutants for which bioaccumulation factors (BAFs) are constant across all trophic and those for which different BAFs apply to each trophic level. Distributions for the Total Inland South and Total Atlantic Coast fish consumption rates were used to derive criteria for constant trophic level pollutants. Individual trophic level specific FCR distributions were used for non-constant trophic level pollutants.

3.3 @RISK

Once the relevant data distributions were identified and input into @RISK, the tool was used to run a naïve Monte Carlo simulation in which the program randomly selected input values from each probability distribution. Each group of selections was an iteration. For Georgia's probabilistic risk assessment of the human health criteria, 100,000 Monte Carlo draws were used; that is, 100,000 different combinations of input values were used for each simulation. This resulted in a distribution of output values for each chemical, rather than a single value. The final criteria value for each chemical from a given simulation was selected based on pre-determined risk target inputs to protect the target population.

3.3.1 Risk Levels

The probabilistic method allowed EPD to model the range of possible input variables that represent the population as a whole. This covers the range of risk that would be associated with varying fish consumption, varying water consumption, and varying body weight. It also allowed EPD to ensure the appropriate level of protection for select subgroups of the population and to evaluate criteria based on a range of risk-taking by the public. While Georgia does not have federally recognized tribes, EPA guidance states that subsistence fishers that consume more fish than the majority of the population must be protected at a risk level of 10^{-4} (1 in 10,000) (EPA 2000).

In addition, Georgia's fish consumption guidelines, which are protective of the portion of the population that regularly consumes fish caught in Georgia waters, are based on a risk level of 10^{-4}. EPD's goal in using probabilistic risk assessment is to evaluate the risk to various portions of the population and select the criteria that applies the appropriate level of protection to both the entire population and to higher risk sub-populations.

For this probabilistic risk assessment criteria derivation process, EPD evaluated three risk scenarios for carcinogens:

Scenario 1 was set to protect the 50th percentile of the population (median population) at a target risk of one in one million (10^{-6}). In other words, consuming fish from Georgia waters over the course of a lifetime (defined here as 70 years) could increase a person's incremental lifetime cancer risk by 0.000001 and this level of risk applies to 50% of the population.

Scenario 2 was set to protect the 90th percentile of the population at a target risk of one in one hundred thousand (10^{-5}). Consuming fish from Georgia waters over the course of a lifetime (defined here as 70 years) could increase a person's incremental lifetime cancer risk by 0.00001 and this level of risk applies to 10% of the population. The 90th percentile references the portion of the population that are protected from this level of risk, so this increased risk level only applies to the most at-risk 10% of the population.

Scenario 3 was set to protect the 99th percentile of the population at a target risk of one in ten thousand (10^{-4}). Consuming fish from Georgia waters over the course of a lifetime could increase a person's incremental lifetime cancer risk by 0.0001 and this level of risk applies to 1% of the population. The 99th percentile references the portion of the population that are protected from this level of risk, so this increased risk level only applies to the most at-risk 1% of the population and is intended to specifically protect subsistence fishers that consume fish at a much higher rate than the general population.

Noncancerous pollutants were evaluated at the 50th and 90th percentiles. The 90th percentile is considered protective of subsistence fisherman. The @RISK tool required Hazard Quotient (HQ) values. The HQ a ratio that compares the exposure of a non-carcinogenic contaminant to the health-based criterion for that contaminant. A HQ less than one means the exposure has not exceeded the HHC and the associated adverse effects are less likely to occur. A HQ greater than

one means exposure may result in increased risk to the population. Criteria were derived by setting the HQ equal to one.

3.3.2 Criteria Selection

@RISK was used to run Monte Carlo simulations for each risk scenario described above. Each simulation consisted of 100,000 draws of inputs. For each scenario, the results included values for both “water + organism” and “organism only” criteria. Depending on the toxicity endpoints of the pollutant, criteria results were calculated based on either cancer risk, non-cancer hazard quotient, or both. Three Monte Carlo simulations were run for each of the three risk scenarios and the results of each risk scenario were averaged. Appendix E has the results from all risk scenarios with the resulting averages for the three simulations.

Then the most stringent water + organism result of the three scenarios was selected as the final value for the water + organism three criteria for each pollutant, and the most stringent organism only result of the scenarios was selected as the final value for the organism only criteria for each pollutant. Table 18 lists both the carcinogenic and noncarcinogenic results for all the pollutants and highlights the most stringent value that was selected as the final criteria. Table 19 lists the scenario used and limiting effect for each pollutant. Inputs and results for each simulation are archived in EPD’s electronic files and are available upon request.

Scenario 1 yielded the most stringent (lowest) criteria result for pollutants where cancer was the limiting effect. Scenario 1 protects the 50^{th} percentile of the population at a target risk of one in one million. However, because this was the lowest criteria value of all three scenarios, this value is also protective of the 90^{th} percentile at a target risk of one in one hundred thousand and of the 99^{th} percentile at a target risk of one in ten thousand.

For pollutants where the non-cancerous endpoint was the limiting effect, all had Scenario 2 for the most stringent (lowest) criteria result. Toxicity endpoints for noncarcinogenic pollutants were derived using a non-linear hazard quotient instead of a target risk, and therefore it is not possible to express the risk in the same way as it is for cancerous pollutants. Because criteria for noncarcinogenic compounds are derived by setting the hazard quotient equal to one, the only difference between Scenarios 1 and 2 is the percentile of the population the criteria are set to protect. Naturally, the criteria set to protect the 90^{th} percentile of the population in Scenario 2 are more stringent than the criteria set to protect the 50^{th} percentile of the population in Scenario 1. The important thing to consider in comparing all effects of all scenarios is that for pollutants that display both cancerous and noncancerous effects, the resulting criteria is protective of all effects across all scenarios. Therefore, the risk management policy for the non-cancerous effect is to select the 90^{th} percentile of the population.

Table 18. Comparison of the Criteria for the Various Risk Scenarios

Summary of Final Probabilistic AWQC	Average of Simulations for 50th Percentile				Average of Simulations for 90th Percentile				Average of Simulations for 99th Percentile	
Chemical Name	Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)	
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism	Organism Only
	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Cancer Risk
1,1,1-Trichloroethane	NA	3.82E+04	NA	5.26E+05	NA	1.14E+04	NA	1.75E+05	NA	NA
1,1,2,2-Tetrachloroethane	4.87 E-01	3.90E+02	7.95E+00	6.36E+03	1.43E+00	1.15E+02	2.63E+01	2.11E+03	7.56E+00	8.69E+01
1,1,2-Trichloroethane	1.70E+00	7.76E+01	2.65E+01	1.21E+03	5.02E+00	2.29E+01	8.76E+01	4.00E+02	2.65E+01	2.88E+02
1,1-Dichloroethylene	NA	1.04E+03	NA	4.84E+04	NA	2.93E+02	NA	1.61E+04	NA	NA
1,2,4-Trichlorobenzene	2.16E-01	1.25E+01	2.38E-01	1.38E+01	7.42E-01	4.31E+00	7.67E-01	4.45E+00	2.66E+00	2.68E+00
1,2-Dichlorobenzene	NA	3.35E+03	NA	1.01E+04	NA	1.29E+03	NA	3.32E+03	NA	NA
1,2-Dichloroethane	3.18E+01	1.64E+03	1.93E+03	9.92E+04	8.91E+01	4.59E+02	6.42E+03	3.31E+04	4.66E+02	2.18E+04
1,2-Dichloropropane	2.85E+00	1.83E+03	9.17E+01	5.90E+04	8.11E+00	5.21E+02	3.05E+02	1.96E+04	4.25E+01	1.01E+03
1,2-Diphenylhydrazine	1.01E-01	NA	6.19E-01	NA	3.32 E-01	NA	2.05E+00	NA	1.77E+00	6.77E+00
1,3-Dichlorobenzene	NA	1.84E+01	NA	4.58E+01	NA	7.24E+00	NA	1.39E+01	NA	NA
1,3-Dichloropropene	8.49E-01	5.18E+02	3.48E+01	2.12E+04	2.40E+00	1.46E+02	1.16E+02	7.06E+03	1.52E+01	3.84E+02
1,4-Dichlorobenzene	NA	8.40E+02	NA	2.83E+03	NA	3.15 E+02	NA	9.09E+02	NA	NA
2,4,6-Trichlorophenol	3.78E+00	8.33E+00	8.36E+00	1.84E+01	1.56E+01	3.43E+00	2.76E+01	6.07E+00	7.36E+01	9.03E+01
2,4-Dichlorophenol	NA	4.12E+01	NA	1.70E+02	NA	1.47E+01	NA	5.62E+01	NA	NA
2,4-Dimethylphenol	NA	3.96E+02	NA	7.59E+03	NA	1.15E+02	NA	2.52E+03	NA	NA
2,4-Dinitrophenol	NA	4.06E+01	NA	1.30E+03	NA	1.16E+01	NA	2.96E+02	NA	NA
2,4-Dinitrotoluene	15.4E-01	4.10E+01	5.00E+00	1.34E+03	4.38E-01	1.17E+01	1.66E+01	4.44E+02	2.29E+00	5.52E+01
2-Chloronaphthalene	NA	2.03E+03	NA	3.66E+03	NA	8.49E+02	NA	1.21E+03	NA	NA
2-Chlorophenol	NA	1.01E+02	NA	2.44E+03	NA	3.90E+01	NA	8.08E+02	NA	NA
2-Methyl-4,6-Dinitrophenol	NA	5.74E+00	NA	7.97E+01	NA	1.71E+00	NA	2.64E+01	NA	NA
3,3'-Dichlorobenzidine	1.33E-01	NA	4.41E-01	NA	5.02E-01	NA	1.46E+00	NA	2.64E+00	4.77E+00
3-Methyl-4-Chlorophenol	NA	1.47E+03	NA	7.01E+03	NA	5.07E+02	NA	2.32E+03	NA	NA

Summary of Final Probabilistic AWQC	Average of Simulations for 50th Percentile				Average of Simulations for 90th Percentile				Average of Simulations for 99th Percentile	
Chemical Name	Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)	
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism	Organism Only
	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Cancer Risk
Acenaphthene	NA	2.34E+02	NA	3.37E+02	NA	6.96E+01	NA	7.66E+01	NA	NA
Acrolein	NA	1.06E+01	NA	1.43E+03	NA	2.95E+00	NA	3.26E+02	NA	NA
Acrylonitrile	1.96E-01	NA	2.66E+01	NA	5.47E-01	NA	6.03E+01	NA	2.86E+00	2.50E+02
Aldrin	2.69E-06	2.75E-04	2.70E-06	2.75E-04	7.28E-06	7.42E-05	7.28E-06	7.43E-05	1.68E-05	1.66E-05
alpha-Endosulfan	NA	4.19E+01	NA	8.04E+01	NA	1.75E+01	NA	2.66E+01	NA	NA
alpha-Hexachlorocyclohexane (HCH)	1.05E-03	1.06E+01	1.16E-03	1.17E+01	3.70E-03	3.73E+00	3.84E-03	3.87E+00	1.27E-02	1.29E-02
Anthracene	NA	1.03E+03	NA	1.41E+03	NA	2.96E+02	NA	3.20E+02	NA	NA
Benzene Low	1.84E+00	1.01E+01	4.72E+01	2.60E+02	5.28E+00	2.91E+00	1.57E+02	8.63E+01	2.77E+01	5.21E+02
Benzidine	4.57E-04	6.31E+01	3.12E-02	4.31E+03	1.28E-03	1.77E+01	1.04E-01	1.43E+03	6.69E-03	3.52E-01
Benzo(a)anthracene	4.79E-03	NA	5.04E-03	NA	1.13E-02	NA	1.14E-02	NA	4.73E-02	4.74E-02
Benzo(a)pyrene	4.79E-04	NA	5.04E-04	NA	1.13E-03	NA	1.14E-03	NA	4.73E-03	4.74E-03
Benzo(b)fluoranthene	4.79E-03	NA	5.04E-03	NA	1.13E-02	NA	1.14E-02	NA	4.73E-02	4.74E-02
Benzo(k)fluoranthene	4.79E-02	NA	5.04E-02	NA	1.13E-01	NA	1.14E-01	NA	4.73E-01	4.74E-01
beta-Endosulfan	NA	5.43E+01	NA	1.29E+02	NA	2.20E+01	NA	4.27E+01	NA	NA
beta-Hexachlorocyclohexane (HCH)	2.09E-02	NA	4.23E-02	NA	8.69E-02	NA	1.40E-01	NA	3.92E-01	4.60E-01
Bis(2-Chloro-1-Methylethyl) Ether	NA	7.66E+02	NA	1.07E+04	NA	2.28E+02	NA	3.56E+03	NA	NA
Bis(2-Chloroethyl) Ether	9.56E-02	NA	6.52E+00	NA	2.68E-01	NA	2.17E+01	NA	1.40E+00	7.36E+01
Bis(2-Ethylhexyl) Phthalate	1.10E+00	1.85E+02	1.44E+00	2.42E+02	3.06E+00	5.14E+01	3.28E+00	5.51E+01	1.32E+01	1.36E+01
Bromoform	2.16E+01	5.84E+02	3.48E+02	9.41E+03	6.37E+01	1.72E+02	1.15E+03	3.12E+03	4.04E+02	3.81E+03
Butylbenzyl Phthalate	3.94E-01	1.94E+02	3.97E-01	1.96E+02	9.01E-01	4.45E+01	9.02E-01	4.46E+01	3.75E+00	3.74E+00
Carbon Tetrachloride	1.31E+00	7.35E+01	1.39E+01	7.79E+02	4.01E+00	2.24E+01	4.59E+01	2.57E+02	2.12E+01	1.50E+02
Chlordane	1.02E-03	3.56E-02	1.02E-03	3.58E-02	3.03E-03	1.06E-02	3.03E-03	1.06E-02	8.51E-03	8.38E-03
Chlorobenzene	NA	3.40E+02	NA	2.50E+03	NA	1.09E+02	NA	8.26E+02	NA	NA

Summary of Final Probabilistic AWQC	Average of Simulations for 50th Percentile				Average of Simulations for 90th Percentile				Average of Simulations for 99th Percentile	
Chemical Name	Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)	
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism	Organism Only
	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Cancer Risk
Chlorodibromomethane	2.52E+00	4.03E+02	6.17E+01	9.87E+03	7.26E+00	1.16E+02	2.05E+02	3.28E+03	3.81E+01	6.82E+02
Chloroform	NA	2.05E+02	NA	6.81E+03	NA	5.84E+01	NA	2.26E+03	NA	NA
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	NA	3.87E+02	NA	1.58E+03	NA	1.44E+02	NA	3.59E+02	NA	NA
Chlorophenoxy Herbicide (2,4-D)	NA	3.81E+03	NA	4.63E+04	NA	1.18E+03	NA	1.05E+04	NA	NA
Chrysene	4.79E-01	NA	5.04E-01	NA	1.13E+00	NA	1.14E+00	NA	4.73E+00	4.74E+00
Cyanide	NA	1.27E+01	NA	1.72E+03	NA	3.54E+00	NA	3.91E+02	NA	NA
Dibenzo(a,h)anthracene	4.79E-04	NA	5.04E-04	NA	1.13E-03	NA	1.14E-03	NA	4.73E-03	4.74E-03
Dichlorobromomethane	2.98E+00	6.09E+01	8.02E+01	1.64E+03	8.55E+00	1.74E+01	2.66E+02	5.43E+02	5.42E+01	8.83E+02
Dieldrin	4.31E-06	6.90E-04	4.32E-06	6.91E-04	1.18E-05	1.89E-04	1.19E-05	1.90E-04	2.78E-05	2.78E-05
Diethyl Phthalate	NA	2.02E+03	NA	2.49E+03	NA	5.38E+02	NA	5.66E+02	NA	NA
Dimethyl Phthalate	NA	6.83E+03	NA	7.17E+03	NA	1.61E+03	NA	1.63E+03	NA	NA
Di-n-Butyl Phthalate	NA	9.25E+01	NA	9.89E+01	NA	2.21E+01	NA	2.25E+01	NA	NA
Endosulfan Sulfate	NA	5.19E+01	NA	1.19E+02	NA	2.13E+01	NA	3.92E+01	NA	NA
Endrin	NA	1.06E-01	NA	1.07E-01	NA	3.18E-02	NA	3.18E-02	NA	NA
Endrin Aldehyde	NA	2.98E+00	NA	3.66E+00	NA	1.12E+00	NA	1.21E+00	NA	NA
Ethylbenzene	NA	1.77E+02	NA	3.78E+02	NA	7.30E+01	NA	1.25E+02	NA	NA
Fluoranthene	NA	6.71E+01	NA	7.65E+01	NA	1.68E+01	NA	1.74E+01	NA	NA
Fluorene	NA	1.53E+02	NA	2.14E+02	NA	5.87E+01	NA	6.79E+01	NA	NA
gamma-Hexachlorocyclohexane (HCH)	NA	1.22E+01	NA	1.32E+01	NA	4.23E+00	NA	4.35E+00	NA	NA
Heptachlor	2.01E-05	1.65E-03	2.01E-05	1.65E-03	5.58E-05	4.57E-04	5.58E-05	4.58E-04	1.36E-04	1.34E-04
Heptachlor Epoxide	1.02E-04	1.46E-03	1.03E-04	1.48E-03	3.11E-04	4.45E-04	3.11E-04	4.45E-04	9.18E-04	9.03E-04
Hexachlorobenzene	2.54E-04	4.15E-02	2.55E-04	4.16E-02	7.70E-04	1.26E-02	7.71E-04	1.26E-02	1.97E-03	1.94E-03
Hexachlorobutadiene	3.72E-02	8.93E-02	3.79E-02	9.10E-02	9.18E-02	2.20E-02	9.24E-02	2.22E-02	2.62E-01	2.63E-01
Hexachlorocyclopentadiene	NA	1.03E+01	NA	1.18E+01	NA	3.70E+00	NA	3.90E+00	NA	NA

Summary of Final Probabilistic AWQC	Average of Simulations for 50th Percentile				Average of Simulations for 90th Percentile				Average of Simulations for 99th Percentile	
Chemical Name	Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)				Probabilistic AWQC (ug/L)	
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism	Organism Only
	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Non-cancer HQ	Cancer Risk	Cancer Risk
Hexachloroethane	3.57E-01	2.00E+00	4.55E-01	2.55E+00	1.18E+00	6.63E-01	1.29E+00	7.21E-01	3.75E+00	3.85E+00
Indeno(1,2,3-cd)pyrene	4.79E-03	NA	5.04E-03	NA	1.13E-02	NA	1.14E-02	NA	4.73E-02	4.74E-02
Isophorone	1.10E+02	4.17E+03	5.48E+03	2.08E+05	3.09E+02	1.17E+03	1.82E+04	6.93E+04	1.62E+03	6.12E+04
Methoxychlor	NA	4.97E-02	NA	5.21E-02	NA	1.66E-02	NA	1.68E-02	NA	NA
Methyl Bromide	NA	4.22E+02	NA	3.46E+04	NA	1.18E+02	NA	1.15E+04	NA	NA
Methylene Chloride	5.26E+01	1.26E+02	3.74E+03	8.99E+03	1.47E+02	3.53E+01	1.25E+04	2.99E+03	7.69E+02	4.21E+04
Nitrobenzene	NA	4.14E+01	NA	1.66E+03	NA	1.17E+01	NA	5.51E+02	NA	NA
p,p'-Dichlorodiphenyldichloroethane (DDD)	4.03E-04	9.67E-03	4.04E-04	9.69E-03	1.21E-03	2.89E-03	1.21E-03	2.90E-03	3.14E-03	3.09E-03
p,p'-Dichlorodiphenyldichloroethylene (DDE)	6.18E-05	1.03E-03	6.19E-05	1.03E-03	1.67E-04	2.80E-04	1.67E-04	2.80E-04	3.60E-04	3.57E-04
p,p'-Dichlorodiphenyltrichloroethane (DDT)	1.19E-04	4.06E-03	1.20E-04	4.07E-03	2.71E-04	9.21E-04	2.71E-04	9.20E-04	5.09E-04	5.06E-04
Pentachlorophenol	7.08E-02	2.83E+01	1.21E-01	4.86E+01	2.72E-01	1.09E+01	3.51E-01	1.41E+01	8.30E-01	8.68E-01
Phenol	NA	1.26E+04	NA	7.99E+05	NA	3.53E+03	NA	2.65E+05	NA	NA
Pyrene	NA	7.99E+01	NA	1.00E+02	NA	2.15E+01	NA	2.27E+01	NA	NA
Tetrachloroethylene (Perchloroethylene)	2.74E+01	6.90E+01	8.56E+01	2.16E+02	1.05E+02	2.64E+01	2.83E+02	7.13E+01	5.47E+02	9.26E+02
Toluene	NA	1.73E+02	NA	1.55E+03	NA	5.38E+01	NA	5.11E+02	NA	NA
Toxaphene	2.11E-03	1.62E-01	2.18E-03	1.68E-01	6.89E-03	5.30E-02	6.96E-03	5.36E-02	2.37E-02	2.33E-02
trans-1,2-Dichloroethylene (DCE)	NA	4.06E+02	NA	1.12E+04	NA	1.16E+02	NA	3.71E+03	NA	NA
Trichloroethylene (TCE)	1.85E+00	9.25E+00	2.02E+01	1.01E+02	5.63E+00	2.81E+00	6.70E+01	3.35E+01	3.97E+01	2.24E+02
Vinyl Chloride	7.01E-02	6.31E+01	4.78E+00	4.31E+03	1.96E-01	1.77E+01	1.59E+01	1.43E+03	1.03E+00	5.40E+01

final water + organism and organism only criterion value for each pollutant highlighted in yellow

Table 19. Scenario Results Table

Chemical Name	Water + Organism Outcomes		Organism Only Outcomes	
	Minimum Scenario	Limiting Effect	Minimum Scenario	Limiting Effect
1,1,1-Trichloroethane	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
1,1,2,2-Tetrachloroethane	Scenario 1	Cancer	Scenario 1	Cancer
1,1,2-Trichloroethane	Scenario 1	Cancer	Scenario 1	Cancer
1,1-Dichloroethylene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
1,2,4-Trichlorobenzene	Scenario 1	Cancer	Scenario 1	Cancer
1,2-Dichlorobenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
1,2-Dichloroethane	Scenario 1	Cancer	Scenario 1	Cancer
1,2-Dichloropropane	Scenario 1	Cancer	Scenario 1	Cancer
1,2-Diphenylhydrazine	Scenario 1	Cancer	Scenario 1	Cancer
1,3-Dichlorobenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
1,3-Dichloropropene	Scenario 1	Cancer	Scenario 1	Cancer
1,4-Dichlorobenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2,4,6-Trichlorophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2,4-Dichlorophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2,4-Dimethylphenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2,4-Dinitrophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2,4-Dinitrotoluene	Scenario 1	Cancer	Scenario 1	Cancer
2-Chloronaphthalene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2-Chlorophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
2-Methyl-4,6-Dinitrophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
3,3'-Dichlorobenzidine	Scenario 1	Cancer	Scenario 1	Cancer
3-Methyl-4-Chlorophenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Acenaphthene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Acrolein	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Acrylonitrile	Scenario 1	Cancer	Scenario 1	Cancer
Aldrin	Scenario 1	Cancer	Scenario 1	Cancer
alpha-Endosulfan	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
alpha-Hexachlorocyclohexane (HCH)	Scenario 1	Cancer	Scenario 1	Cancer
Anthracene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Benzene High	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Benzene Low	Scenario 1	Cancer	Scenario 1	Cancer
Benzidine	Scenario 1	Cancer	Scenario 1	Cancer
Benzo(a)anthracene	Scenario 1	Cancer	Scenario 1	Cancer
Benzo(a)pyrene	Scenario 1	Cancer	Scenario 1	Cancer
Benzo(b)fluoranthene	Scenario 1	Cancer	Scenario 1	Cancer

Chemical Name	Water + Organism Outcomes		Organism Only Outcomes	
	Minimum Scenario	Limiting Effect	Minimum Scenario	Limiting Effect
Benzo(k)fluoranthene	Scenario 1	Cancer	Scenario 1	Cancer
beta-Endosulfan	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
beta-Hexachlorocyclohexane (HCH)	Scenario 1	Cancer	Scenario 1	Cancer
Bis(2-Chloro-1-Methylethyl) Ether	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Bis(2-Chloroethyl) Ether	Scenario 1	Cancer	Scenario 1	Cancer
Bis(2-Ethylhexyl) Phthalate	Scenario 1	Cancer	Scenario 1	Cancer
Bromoform	Scenario 1	Cancer	Scenario 1	Cancer
Butylbenzyl Phthalate	Scenario 1	Cancer	Scenario 1	Cancer
Carbon Tetrachloride	Scenario 1	Cancer	Scenario 1	Cancer
Chlordane	Scenario 1	Cancer	Scenario 1	Cancer
Chlorobenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Chlorodibromomethane	Scenario 1	Cancer	Scenario 1	Cancer
Chloroform	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Chlorophenoxy Herbicide (2,4-D)	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Chrysene	Scenario 1	Cancer	Scenario 1	Cancer
Cyanide	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Dibenzo(a,h)anthracene	Scenario 1	Cancer	Scenario 1	Cancer
Dichlorobromomethane	Scenario 1	Cancer	Scenario 1	Cancer
Dieldrin	Scenario 1	Cancer	Scenario 1	Cancer
Diethyl Phthalate	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Dimethyl Phthalate	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Di-n-Butyl Phthalate	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Endosulfan Sulfate	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Endrin	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Endrin Aldehyde	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Ethylbenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Fluoranthene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Fluorene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
gamma-Hexachlorocyclohexane (HCH)	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Heptachlor	Scenario 1	Cancer	Scenario 1	Cancer
Heptachlor Epoxide	Scenario 1	Cancer	Scenario 1	Cancer
Hexachlorobenzene	Scenario 1	Cancer	Scenario 1	Cancer
Hexachlorobutadiene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer

Chemical Name	Water + Organism Outcomes		Organism Only Outcomes	
	Minimum Scenario	Limiting Effect	Minimum Scenario	Limiting Effect
Hexachlorocyclopentadiene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Hexachloroethane	Scenario 1	Cancer	Scenario 1	Cancer
Indeno(1,2,3-cd)pyrene	Scenario 1	Cancer	Scenario 1	Cancer
Isophorone	Scenario 1	Cancer	Scenario 1	Cancer
Methoxychlor	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Methyl Bromide	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Methylene Chloride	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Nitrobenzene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
p,p'-Dichlorodiphenyldichloroethane (DDD)	Scenario 1	Cancer	Scenario 1	Cancer
p,p'-Dichlorodiphenyldichloroethylene (DDE)	Scenario 1	Cancer	Scenario 1	Cancer
p,p'-Dichlorodiphenyltrichloroethane (DDT)	Scenario 1	Cancer	Scenario 1	Cancer
Pentachlorophenol	Scenario 1	Cancer	Scenario 1	Cancer
Phenol	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Pyrene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Tetrachloroethylene (Perchloroethylene)	Scenario 1	Cancer	Scenario 2	Non-Cancer
Toluene	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Toxaphene	Scenario 1	Cancer	Scenario 1	Cancer
trans-1,2-Dichloroethylene (DCE)	Scenario 2	Non-Cancer	Scenario 2	Non-Cancer
Trichloroethylene (TCE)	Scenario 1	Cancer	Scenario 1	Cancer
Vinyl Chloride	Scenario 1	Cancer	Scenario 1	Cancer

3.3.3 Proposed Criteria

Georgia's Water Quality Standards currently have human health criteria for 83 of the pollutants listed in EPA's 2015 update. These 83 pollutants are listed in paragraph (5)(e)(iv) in Georgia's water quality standards, each with a single criterion value, most of which are based on the "organism only" criteria from EPA's 2002 recommendation. These criteria values will be updated based on EPD's PRA results, which derived two criteria values for each pollutant; one to protect human health from exposure through fish consumption ("organism only") and one to protect human health from exposure through fish consumption and water ingestion ("water + organism"). For assessment and implementation purposes, EPD is planning to utilizing the "organism only" criteria values for all waterbodies except those with a designated use of Drinking Water. For assessment and implementation purposes, the "water + organism" criteria values will be utilized for waterbodies with a designated use of Drinking Water. There are 11 pollutants in EPA's 2015 update for which Georgia has no current human health criteria. EPD is only moving forward with adopting criteria for the five of these pollutants with approved methods listed in 40 CFR part 136.

Table 20 displays the results of EPD's probabilistic risk assessment as final criteria values for 88 pollutants in micrograms per liter (µg/L) and rounded to two significant figures. Table 21 provides comparisons of the updated criteria to the human health criteria currently in Georgia's Water Quality Standards. Table 21 compares proposed criteria for all waterbodies that are not designated as a Drinking Water source (organism only) to Georgia's current criteria. A negative percentage value in the comparison column indicates that the updated criteria value is lower (more stringent) than the current criteria. A positive percentage value indicates that the updated criteria value is higher (less stringent) than the current criteria. Figure 15 displays the percent difference between the updated human health criteria values and Georgia's current criteria values for 82 pollutants. The shades of green represent an increase in criteria values (new criteria are less stringent than current criteria) and the shades of orange represent a decrease in criteria values (new criteria are more stringent than current criteria).

Table 20. Proposed Human Health Criteria Values

Chemical Name	Final Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only
1,1,1-Trichloroethane	11000	170000
1,1,2,2-Tetrachloroethane	0.49	8.0
1,1,2-Trichloroethane	1.7	26
1,1-Dichloroethylene	290	16000
1,2,4-Trichlorobenzene	0.22	0.24
1,2-Dichlorobenzene	1300	3300
1,2-Dichloroethane	32	1900
1,2-Dichloropropane	2.8	92
1,2-Diphenylhydrazine	0.10	0.62
1,3-Dichlorobenzene	7.2	14
1,3-Dichloropropene	0.85	35

Chemical Name	Final Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only
1,4-Dichlorobenzene	310	910
2,4,6-Trichlorophenol	3.4	6.1
2,4-Dichlorophenol	15	56
2,4-Dimethylphenol	120	2500
2,4-Dinitrophenol	12	300
2,4-Dinitrotoluene	0.15	5.0
2-Chloronaphthalene	850	1200
2-Chlorophenol	29	810
2-Methyl-4,6-Dinitrophenol	1.7	26
3,3'-Dichlorobenzidine	0.13	0.44
3-Methyl-4-Chlorophenol	510	2300
Acenaphthene	70	77
Acrolein	3.0	330
Acrylonitrile	0.20	27
Aldrin	0.0000027	0.0000027
alpha-Endosulfan	18	27
alpha-Hexachlorocyclohexane (HCH)	0.0011	0.0012
Anthracene	300	320
Benzene	1.8	47
Benzidine	0.00046	0.031
Benzo(a)anthracene	0.0048	0.0050
Benzo(a)pyrene	0.00048	0.00050
Benzo(b)fluoranthene	0.0048	0.0050
Benzo(k)fluoranthene	0.048	0.050
beta-Endosulfan	22	43
beta-Hexachlorocyclohexane (HCH)	0.021	0.042
Bis(2-Chloro-1-Methylethyl) Ether	230	3600
Bis(2-Chloroethyl) Ether	0.096	6.5
Bis(2-Ethylhexyl) Phthalate	1.1	1.4
Bromoform	22	350
Butylbenzyl Phthalate	0.39	0.40
Carbon Tetrachloride	1.3	14
Chlordane	0.0010	0.0010
Chlorobenzene	110	830
Chlorodibromomethane	2.5	62
Chloroform	58	2300
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	140	360

Chemical Name	Final Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only
Chlorophenoxy Herbicide (2,4-D)	1200	11000
Chrysene	0.48	0.50
Cyanide	3.5	390
Dibenzo(a,h)anthracene	0.00048	0.00050
Dichlorobromomethane	3.0	80
Dieldrin	0.0000043	0.0000043
Diethyl Phthalate	540	570
Dimethyl Phthalate	1600	1600
Di-n-Butyl Phthalate	22	22
Endosulfan Sulfate	21	39
Endrin	0.032	0.032
Endrin Aldehyde	1.1	1.2
Ethylbenzene	73	120
Fluoranthene	17	17
Fluorene	59	68
gamma-Hexachlorocyclohexane (HCH)	4.2	4.4
Heptachlor	0.000020	0.000020
Heptachlor Epoxide	0.00010	0.00010
Hexachlorobenzene	0.00025	0.00026
Hexachlorobutadiene	0.022	0.022
Hexachlorocyclopentadiene	3.7	3.9
Hexachloroethane	0.36	0.45
Indeno(1,2,3-cd)pyrene	0.0048	0.0050
Isophorone	110	5500
Methoxychlor	0.017	0.017
Methyl Bromide	120	12000
Methylene Chloride	35	3000
Nitrobenzene	12	550
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.00040	0.00040
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.000062	0.000062
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.00012	0.00012
Pentachlorophenol	0.071	0.12
Phenol	3700	270000
Pyrene	21	23
Tetrachloroethylene (Perchloroethylene)	26	71
Toluene	54	510
Toxaphene	0.0021	0.0022

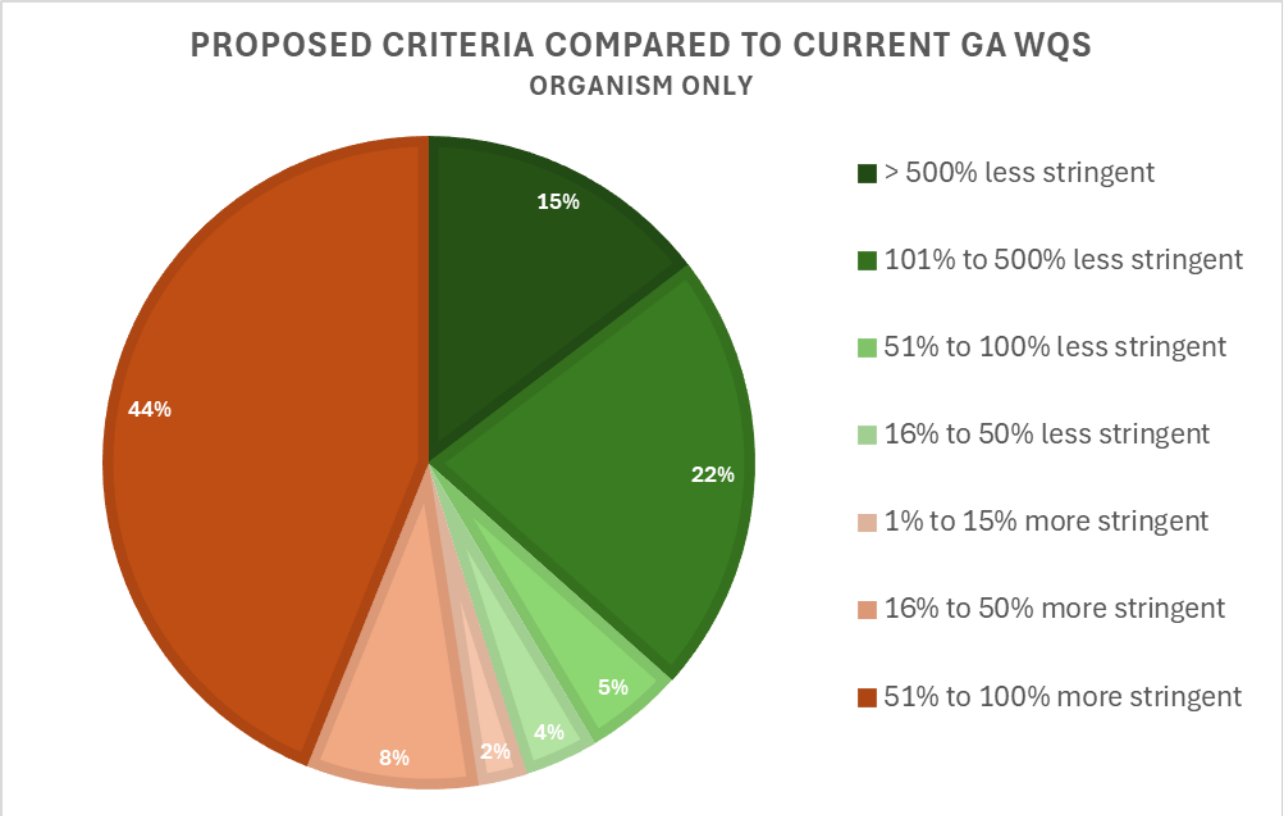
Chemical Name	Final Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only
trans-1,2-Dichloroethylene (DCE)	120	3700
Trichloroethylene (TCE)	1.8	20
Vinyl Chloride	0.070	4.8

Table 21. Comparison of Proposed Organism Only Criteria to Georgia's Current Human Health Criteria

Name	Organism Only Final Probabilistic AWQC (µg/L)	Current Georgia WQS (µg/L)	Organism Only PRA Comparison to Current Criteria
1,1,2,2-Tetrachloroethane	8.0	4	100%
1,1,2-Trichloroethane	26	16	65%
1,1-Dichloroethylene	16000	7100	125%
1,2,4-Trichlorobenzene	0.24	70	-100%
1,2-Dichlorobenzene	3300	1300	154%
1,2-Dichloroethane	1944	37	5035%
1,2-Dichloropropane	92	15	511%
1,2-Diphenylhydrazine	0.62	0.2	210%
1,3-Dichlorobenzene	14	960	-99%
1,3-Dichloropropene	35	21	66%
1,4-Dichlorobenzene	910	190	379%
2,4,6-Trichlorophenol	6.1	2.4	154%
2,4-Dichlorophenol	56	290	-81%
2,4-Dimethylphenol	2500	850	194%
2,4-Dinitrophenol	300	5300	-94%
2,4-Dinitrotoluene	5.0	3.4	47%
2-Chloronaphthalene	1200	1600	-25%
2-Chlorophenol	810	150	440%
2-Methyl-4,6-Dinitrophenol	26	280	-91%
3,3'-Dichlorobenzidine	0.33	0.028	1079%
Acenaphthene	77	990	--92%
Acrolein	330	9.3	3448%
Acrylonitrile	27	0.25	10524%
Aldrin	0.0000027	0.00005	--95%
alpha-Endosulfan	27	89	-70%
alpha-Hexachlorocyclohexane (HCH)	0.0012	0.0049	-76%
Anthracene	320	40000	-99%
Benzene	47	51	-7%
Benzidine	0.031	0.0002	15400%
Benzo(a)anthracene	0.0050	0.018	-72%
Benzo(a)pyrene	0.00050	0.018	-97%
Benzo(b)fluoranthene	0.0050	0.018	-72%

Name	Organism Only Final Probabilistic AWQC (µg/L)	Current Georgia WQS (µg/L)	Organism Only PRA Comparison to Current Criteria
Benzo(k)fluoranthene	0.050	0.018	178%
beta-Endosulfan	43	89	-52%
beta-Hexachlorocyclohexane (HCH)	0.042	0.17	147%
Bis(2-Chloro-1-Methylethyl) Ether	3600	65000	-94%
Bis(2-Chloroethyl) Ether	6.5	0.53	1126%
Bis(2-Ethylhexyl) Phthalate	1.4	2.2	-36%
Bromoform	350	140	150%
Butylbenzyl Phthalate	0.40	1900	-100%
Carbon Tetrachloride	14	1.6	769%
Chlordane	0.0010	0.00081	23%
Chlorobenzene	830	1600	-48%
Chlorodibromomethane	62	13	374%
Chloroform	2300	470	389%
Chrysene	0.50	0.018	2678%
Dibenzo(a,h)anthracene	0.00050	0.018	-97%
Dichlorobromomethane	80	17	372%
Dieldrin	0.0000043	0.000054	-92%
Diethyl Phthalate	570	44000	-99%
Dimethyl Phthalate	1600	1100000	-100%
Di-n-Butyl Phthalate	22	4500	-100%
Endosulfan Sulfate	39	89	-56%
Endrin	0.032	0.06	-47%
Endrin Aldehyde	1.2	0.3	300%
Ethylbenzene	120	2100	-94%
Fluoranthene	17	140	-88%
Fluorene	68	5300	-99%
gamma-Hexachlorocyclohexane (HCH)	4.4	1.8	144%
Heptachlor	0.000020	0.000079	-75%
Heptachlor Epoxide	0.00010	0.000039	156%
Hexachlorobenzene	0.00025	0.00029	-14%
Hexachlorobutadiene	0.022	18	-100%
Hexachlorocyclopentadiene	3.9	1100	-100%
Hexachloroethane	0.45	3.3	-86%
Indeno(1,2,3-cd)pyrene	0.0050	0.018	-72%
Isophorone	5500	960	473%
Methyl Bromide	12000	1500	7000%
Methylene Chloride	3000	590	408%
Nitrobenzene	550	690	-20%
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.00040	0.00031	29%
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.000062	0.00022	-72%
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.00012	0.00022	-45%

Name	Organism Only Final Probabilistic AWQC (µg/L)	Current Georgia WQS (µg/L)	Organism Only PRA Comparison to Current Criteria
Pentachlorophenol	0.12	3	-96%
Phenol	270000	857000	-68%
Pyrene	23	4000	-99%
Tetrachloroethylene (Perchloroethylene)	71	3.3	2060%
Toluene	510	5980	-91%
Toxaphene	0.0022	0.00028	686%
trans-1,2-Dichloroethylene (DCE)	3700	10000	-63%
Trichloroethylene (TCE)	20	30	-33%
Vinyl Chloride	4.8	2.4	100%



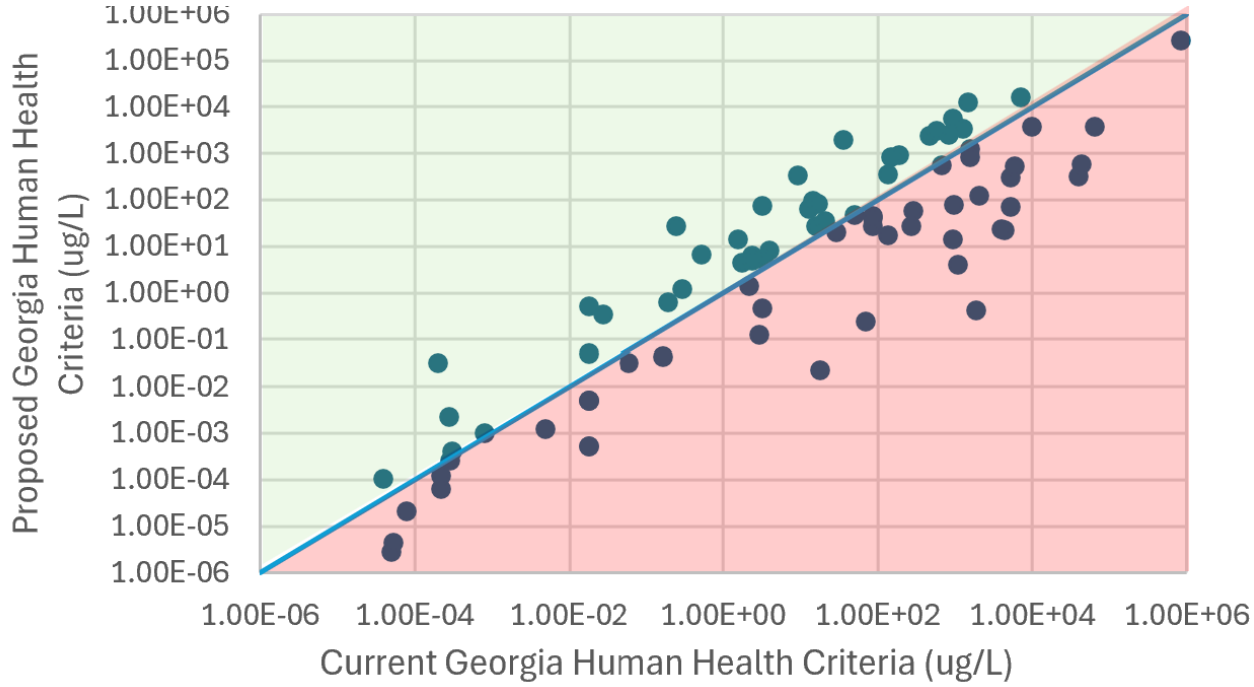


Figure 23. Proposed Organism Only Criteria Compared to Georgia's Current Human Health Criteria for 82 Pollutants

EPD used probabilistic risk assessment to derive human health criteria because of concerns for compounded conservatism resulting from the deterministic method used by EPA. Comparison of EPD's PRA results to EPA's criteria recommendation reveals that PRA criteria values were less stringent for the majority of the pollutants. Table 22 compares EPD's proposed human health criteria to EPA's recommended human health criteria for 88 pollutants. A negative percentage value in the comparison column indicates that EPD's criteria value is lower (more stringent) than EPA's criteria. A positive percentage value indicates that EPD's critertia value is higher (less stringent) than EPA's. Figures 16 and 17 display the percent difference between EPD's proposed criteria and EPA's recommended criteria for 88 pollutants. The shades of green represent criteria for which EPD's values are greater (less stringent) than EPA's and the shades of orange represent criteria for which EPD's values are lower (more stringent) than EPA's.

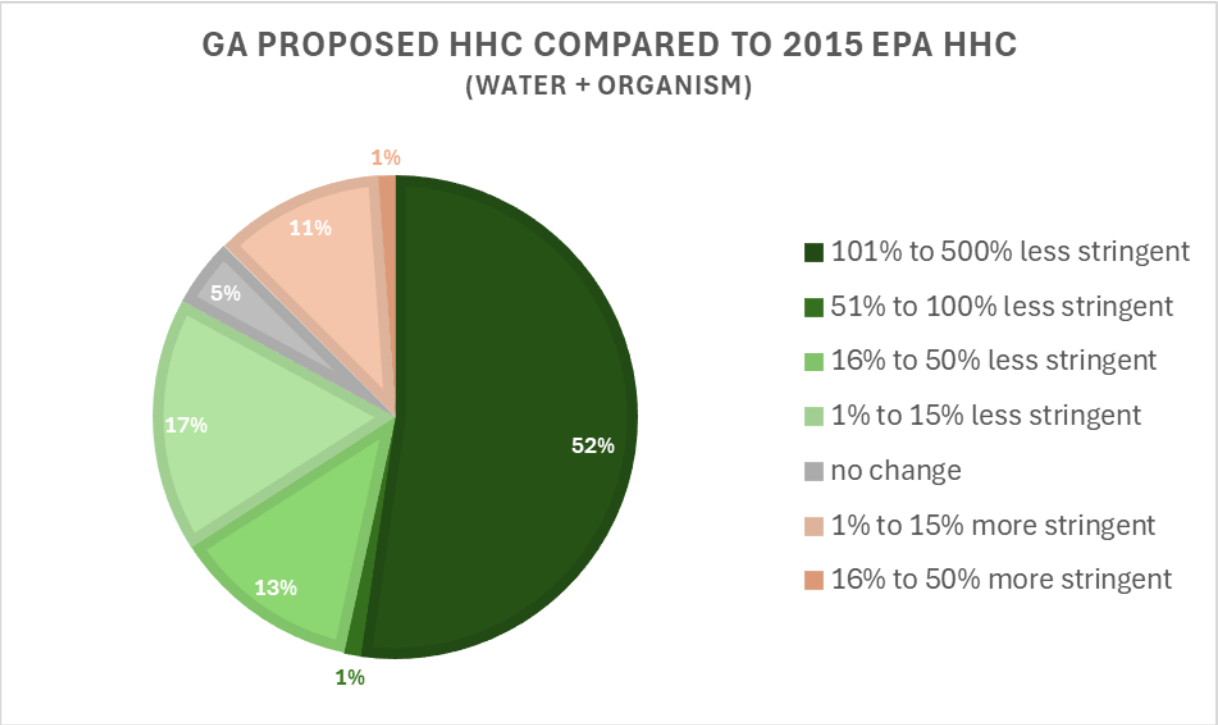
Table 22. Comparison of Georgia's Proposed Human Health Criteria to EPA's Recommended Human Health Criteria by Pollutant

Chemical Name	Final Probabilistic AWQC (ug/L)		EPA 2015 AWQC (ug/L)		% difference final HHC vs 2015	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
1,1,1-Trichloroethane	1.1E+04	1.70E+05	1.00E+04	2.00E+05	10%	-15%
1,1,2,2-Tetrachloroethane	4.9E-01	8.00E+00	2.00E-01	3.00E+00	145%	167%
1,1,2-Trichloroethane	1.70E+00	2.60E+01	5.50E-01	8.90E+00	209%	192%
1,1-Dichloroethylene	2.90E+02	1.60E+04	3.00E+02	2.00E+04	-3%	-20%
1,2,4-Trichlorobenzene	2.20E-01	2.4E-01	7.10E-02	7.60E-02	210%	216%

Chemical Name	Final Probabilistic AWQC (ug/L)		EPA 2015 AWQC (ug/L)		% difference final HHC vs 2015	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
1,2-Dichlorobenzene	1.30E+03	3.30E+03	1.00E+03	3.00E+03	30%	10%
1,2-Dichloroethane	3.2E+01	1.90E+03	9.90E+00	6.50E+02	223%	192%
1,2-Dichloropropane	2.80E+00	9.20E+01	9.00E-01	3.10E+01	211%	197%
1,2-Diphenylhydrazine	1.00E-01	6.20E-01	3.00E-02	2.00E-01	233%	210%
1,3-Dichlorobenzene	7.20 E+00	1.40E+01	7.00E+00	1.00E+01	3%	40%
1,3-Dichloropropene	8.50E-01	3.50E+01	2.70E-01	1.20E+01	215%	192%
1,4-Dichlorobenzene	3.10 E+02	9.10E+02	3.00E+02	9.00E+02	3%	1%
2,4,6-Trichlorophenol	3.40 E+00	6.10E+00	1.50E+00	2.80E+00	127%	118%
2,4-Dichlorophenol	1.50E+01	5.60E+01	1.00E+01	6.00E+01	50%	-7%
2,4-Dimethylphenol	1.20E+02	2.50E+03	1.00E+02	3.00E+03	20%	-17%
2,4-Dinitrophenol	1.20E+01	3.00E+02	1.00E+01	3.00E+02	20%	0%
2,4-Dinitrotoluene	1.50E-01	5.00E+00	4.90E-02	1.70E+00	206%	194%
2-Chloronaphthalene	8.50E+02	1.20E+03	8.00E+02	1.00E+03	6%	20%
2-Chlorophenol	2.90E+01	8.10E+02	3.00E+01	8.00E+02	-3%	1%
2-Methyl-4,6-Dinitrophenol	1. 70E+00	2.60E+01	2.00E+00	3.00E+01	-15%	-13%
3,3'-Dichlorobenzidine	1.30E-01	3.30E-01	4.90E-02	1.50E-01	165%	120%
3-Methyl-4-Chlorophenol	5.10 E+02	2.30E+03	5.00E+02	2.00E+03	2%	15%
Acenaphthene	7.00E+01	7.70E+01	7.00E+01	9.00E+01	0%	-14%
Acrolein	3.00E+00	3.30E+02	3.00E+00	4.00E+02	0%	-18%
Acrylonitrile	2.00E-01	2.70E+01	6.10E-02	7.00E+00	228%	286%
Aldrin	2.70E-06	2.70E-06	7.70E-07	7.70E-07	251%	251%
alpha-Endosulfan	1.80E+01	2.70E+01	2.00E+01	3.00E+01	-10%	-10%
alpha-Hexachlorocyclohexane (HCH)	1.10E-03	1.20E-03	3.60E-04	3.90E-04	206%	208%
Anthracene	3.00+02	3.20E+02	3.00E+02	4.00E+02	0%	-20%
Benzene Low	1.80E+00	4.70E+01	5.80E-01	1.60E+01	210%	194%
Benzidine	4.60E-04	3.10E-02	1.40E-04	1.10E-02	229%	182%
Benzo(a)anthracene	4.80E-03	5.00E-03	1.20E-03	1.30E-03	300%	285%
Benzo(a)pyrene	4.80E-04	5.00E-04	1.20E-04	1.30E-04	300%	285%
Benzo(b)fluoranthene	4.80E-03	5.00E-03	1.20E-03	1.30E-03	300%	285%
Benzo(k)fluoranthene	4.80E-02	5.00E-02	1.20E-02	1.30E-02	300%	285%
beta-Endosulfan	2.20E+01	4.30E+01	2.00E+01	4.00E+01	10%	8%
beta-Hexachlorocyclohexane (HCH)	2.10E-02	4.20E-02	8.00E-03	1.40E-02	163%	200%
Bis(2-Chloro-1-Methylethyl) Ether	2.30E+02	3.60E+03	2.00E+02	4.00E+03	15%	-10%
Bis(2-Chloroethyl) Ether	9.60E-02	6.50E+00	3.00E-02	2.20E+00	220%	195%
Bis(2-Ethylhexyl) Phthalate	1.10E+00	1.40E+00	3.20E-01	3.70E-01	244%	278%
Bromoform	2.20E+01	3.50E+02	7.00E+00	1.20E+02	214%	192%
Butylbenzyl Phthalate	3.90E-01	4.00E-01	1.00E-01	1.00E-01	290%	300%
Carbon Tetrachloride	1.30E+00	1.40E+01	4.00E-01	5.00E+00	225%	180%
Chlordane	1.00E-03	1.00E-03	3.10E-04	3.20E-04	223%	213%

Chemical Name	Final Probabilistic AWQC (ug/L)		EPA 2015 AWQC (ug/L)		% difference final HHC vs 2015	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
Chlorobenzene	1.10E+02	8.30E+02	1.00E+02	8.00E+02	10%	4%
Chlorodibromomethane	2.50E+00	6.20E+01	8.00E-01	2.10E+01	213%	195%
Chloroform	5.80E+01	2.30E+03	6.00E+01	2.00E+03	-3%	15%
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	1.40E+02	3.60E+02	1.00E+02	4.00E+02	40%	-10%
Chlorophenoxy Herbicide (2,4-D)	1.20E+03	1.10E+04	1.30E+03	1.20E+04	-8%	-8%
Chrysene	4.80E-01	5.00E-01	1.20E-01	1.30E-01	300%	285%
Cyanide	3.50E+00	3.90E+02	4.00E+00	4.00E+02	-13%	-3%
Dibenzo(a,h)anthracene	4.80E-04	5.00E-04	1.20E-04	1.30E-04	300%	285%
Dichlorobromomethane	3.00E+00	8.00E+01	9.50E-01	2.70E+01	216%	196%
Dieldrin	4.30E-06	4.30E-06	1.20E-06	1.20E-06	258%	258%
Diethyl Phthalate	5.40E+02	5.70E+02	6.00E+02	6.00E+02	-10%	-5%
Dimethyl Phthalate	1.60E+03	1.60E+03	2.00E+03	2.00E+03	-20%	-20%
Di-n-Butyl Phthalate	2.20E+01	2.20E+01	2.00E+01	3.00E+01	10%	-27%
Endosulfan Sulfate	2.10E+01	3.90E+01	2.00E+01	4.00E+01	5%	-3%
Endrin	3.20E-02	3.20E-02	3.00E-02	3.00E-02	7%	7%
Endrin Aldehyde	1.10E+00	1.20E+00	1.00E+00	1.00E+00	10%	20%
Ethylbenzene	7.30E+01	1.20E+02	6.80E+01	1.30E+02	7%	-8%
Fluoranthene	1.70E+01	1.70E+01	2.00E+01	2.00E+01	-15%	-15%
Fluorene	5.90E+01	6.80E+01	5.00E+01	7.00E+01	18%	-3%
gamma-Hexachlorocyclohexane (HCH)	4.20E+00	4.40E+00	4.20E+00	4.40E+00	0%	0%
Heptachlor	2.00E-05	2.00E-05	5.90E-06	5.90E-06	239%	239%
Heptachlor Epoxide	1.00E-04	1.00E-04	3.20E-05	3.20E-05	213%	213%
Hexachlorobenzene	2.50E-04	2.50E-04	7.90E-05	7.90E-05	216%	216%
Hexachlorobutadiene	2.20E-02	2.20E-02	1.00E-02	1.00E-02	120%	120%
Hexachlorocyclopentadiene	3.70E+00	3.90E+00	4.00E+00	4.00E+00	-8%	-3%
Hexachloroethane	3.60E-01	4.50E-01	1.00E-01	1.00E-01	260%	350%
Indeno(1,2,3-cd)pyrene	4.80E-03	5.00E-03	1.20E-03	1.30E-03	300%	285%
Isophorone	1.10E+02	5.50E+03	3.40E+01	1.80E+03	224%	206%
Methoxychlor	1.70E-02	1.70E-02	2.00E-02	2.00E-02	-15%	-15%
Methyl Bromide	1.20E+02	1.20E+04	1.00E+02	1.00E+04	20%	20%
Methylene Chloride	3.50E+01	3.00E+03	2.00E+01	1.00E+03	75%	200%
Nitrobenzene	1.20E+01	5.55E+02	1.00E+01	6.00E+02	20%	-8%
p,p'-Dichlorodiphenyldichloroethane (DDD)	4.00E-04	4.00E-04	1.20E-04	1.20E-04	233%	233%
p,p'-Dichlorodiphenyldichloroethylene (DDE)	6.20E-05	6.20E-05	1.80E-05	1.80E-05	244%	244%
p,p'-Dichlorodiphenyltrichloroethane (DDT)	1.20E-04	1.20E-04	3.00E-05	3.00E-05	300%	300%
Pentachlorophenol	7.10E-02	1.20E-01	3.00E-02	4.00E-02	137%	200%
Phenol	3.50E+03	2.70E+05	4.00E+03	3.00E+05	-13%	-10%

Chemical Name	Final Probabilistic AWQC (ug/L)		EPA 2015 AWQC (ug/L)		% difference final HHC vs 2015	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
Pyrene	2.10E+01	2.30E+01	2.00E+01	3.00E+01	5%	-23%
Tetrachloroethylene (Perchloroethylene)	2.60E+01	7.10E+01	1.00E+01	2.90E+01	160%	145%
Toluene	5.40E+01	5.10E+02	5.70E+01	5.20E+02	-5%	-2%
Toxaphene	2.10E-03	2.20E-03	7.00E-04	7.10E-04	200%	210%
trans-1,2-Dichloroethylene (DCE)	1.20E+02	3.70E+03	1.00E+02	4.00E+03	20%	-8%
Trichloroethylene (TCE)	1.80E+00	2.05E+01	6.00E-01	7.00E+00	200%	186%
Vinyl Chloride	7.00E-02	4.80E+00	2.20E-02	1.60E+00	218%	200%



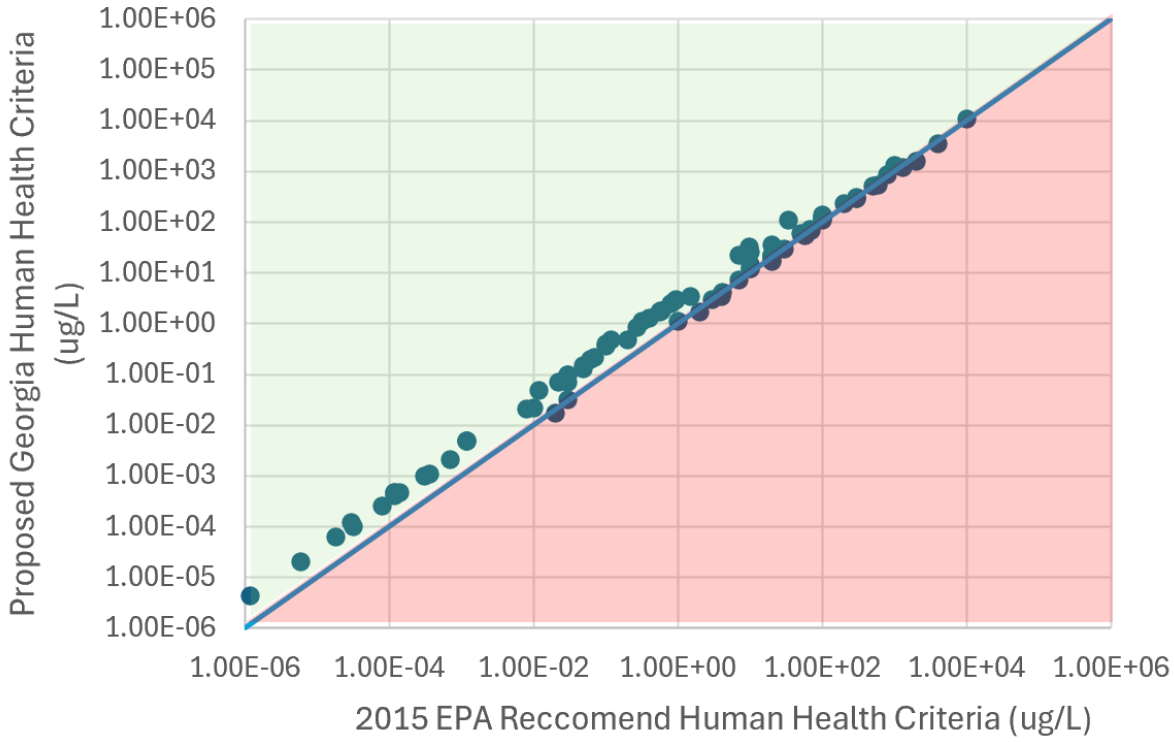
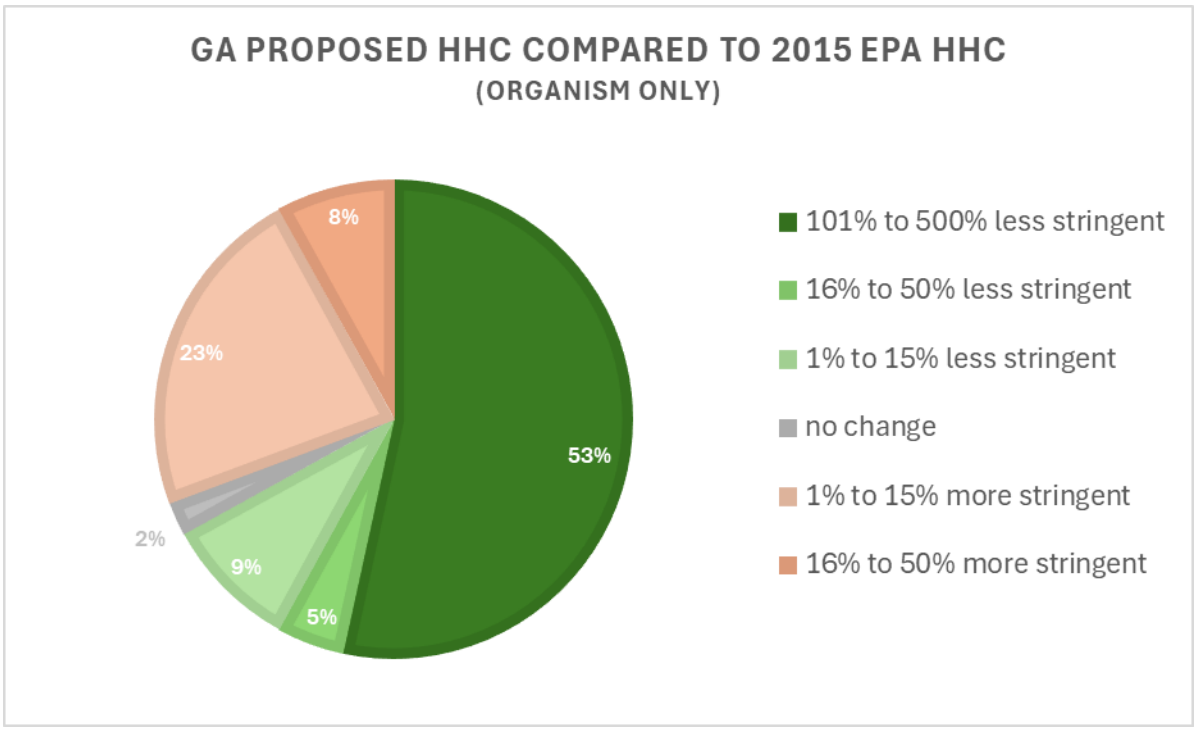


Figure 24. Comparison of Georgia's Proposed Water + Organism Human Health Criteria for 88 Pollutants to EPA's Criteria Recommendation



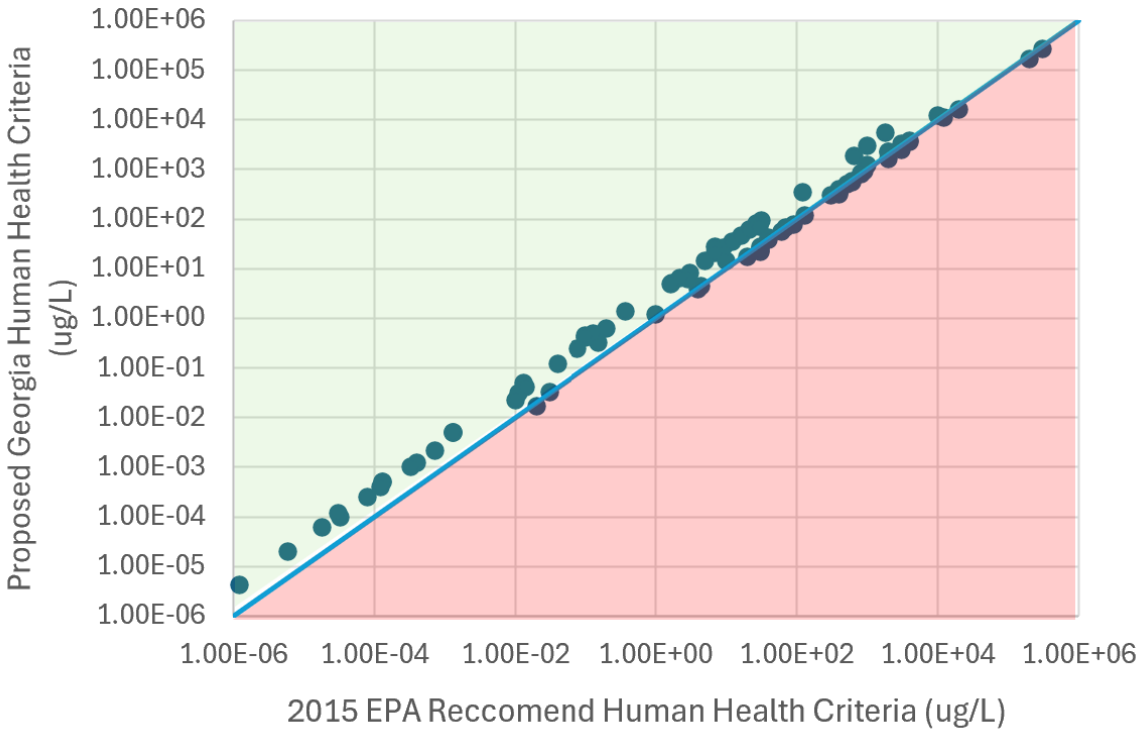


Figure 25. Comparison of Georgia's Proposed Organism Only Human Health Criteria for 88 Pollutants to EPA's Criteria Recommendation

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Human Health Criteria Derivation and Review

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Appendices

Appendix A: Calculation of Mean and Percentile Body Weights (kg) for Adults 21 and Over

Table A-1. Mean and Percentile Body Weights Listed in EPA's Exposure Factors Handbook

Exposure Factors Handbook

Chapter 8—Body Weight Studies

Table 8-3. Mean and Percentile Body Weights (kg) Derived From NHANES (1999–2006) Males and Females Combined

Age Group	*N*	Mean	Percentiles								
			5th	10th	15th	25th	50th	75th	85th	90th	95th
Birth to <1 month	158	4.8	3.6	3.9	4.1	4.2	4.8	5.1	5.5	5.8	6.2
1 to <3 months	284	5.9	4.5	4.7	4.9	5.2	5.9	6.6	6.9	7.1	7.3
3 to <6 months	489	7.4	5.7	6.1	6.3	6.7	7.3	8.0	8.4	8.7	9.1
6 to <12 months	927	9.2	7.1	7.5	7.9	8.3	9.1	10.1	10.5	10.8	11.3
1 to <2 years	1,176	11.4	8.9	9.3	9.7	10.3	11.3	12.4	13.0	13.4	14.0
2 to <3 years	1,144	13.8	10.9	11.5	11.9	12.4	13.6	14.9	15.8	16.3	17.1
3 to <6 years	2,318	18.6	13.5	14.4	14.9	15.8	17.8	20.3	22.0	23.6	26.2
6 to <11 years	3,593	31.8	19.7	21.3	22.3	24.4	29.3	36.8	42.1	45.6	52.5
11 to <16 years	5,297	56.8	34.0	37.2	40.6	45.0	54.2	65.0	73.0	79.3	88.8
16 to <21 years	4,851	71.6	48.2	52.0	54.5	58.4	67.6	80.6	90.8	97.7	108.0
21 to <30 years	3,232	78.4	50.8	54.7	57.9	63.3	75.2	88.2	98.5	106.0	118.0
30 to <40 years	3,176	80.8	53.5	57.4	60.1	66.1	77.9	92.4	101.0	107.0	118.0
40 to <50 years	3,121	83.6	54.3	58.8	62.1	68.3	81.4	95.0	104.0	111.0	122.0
50 to <60 years	2,387	83.4	54.7	59.0	62.8	69.1	80.8	95.5	104.0	110.0	120.0
60 to <70 years	2,782	82.6	55.2	59.8	63.3	69.0	80.5	94.2	103.0	109.0	116.0
70 to <80 years	2,033	76.4	52.0	56.5	59.7	64.4	74.9	86.8	93.8	98.0	106.0
Over 80 years	1,430	68.5	46.9	51.4	53.8	58.2	67.4	77.4	82.6	87.2	93.6

Source: U.S. EPA Analysis of NHANES 1999–2006 data.

Source: US EPA Exposure Factors Handbook: 2011 Edition, EPA/600/R-09/052F

Table 8-3 from EPA's Exposure Factors Handbook was used to calculate mean and percentile body weights for adults aged 21 and over by assigning a weight to each age group (highlighted in blue). The percentage was determined by dividing the number of individuals (N) by the total number of adults 21 and over (18,161) as shown in Table A-2.

Table A-2. Percent of Each Age Group for Adults 21 and Older

Age group	N	Percent
21 to <30 years	3,232	17.8
30 to <40 years	3,176	17.49
40 to <50 years	3,121	17.19
50 to <60 years	2,387	13.14
60 to <70 years	2,782	15.32
70 to <80 years	2,033	11.19
Over 80 years	1,430	7.87
total	18,161	

The percentage of each age group was multiplied by the mean or percentile weight for that group yielding the sum product. The final weight for adults 21 and older is the total of the sum products for each percentile. The final weights are displayed in bold in Table A-3. Note that the mean sum product weight is 80.01, which is consistent with the mean body weight of 80 kg used by EPA.

Table A-3. Calculation of Percentile Values for Body Weight Data Distribution

Age	Mean	Mean	5th%	5th Sum Product	10th%	10th Sum Product	15th%	15th Sum Product	25th%	25th Sum Product	50th%	50th Sum Product	75th%	75th Sum Product	85th%	85th Sum Product	90th%	90th Sum Product	95th%	95th Sum Product
21-30	78.4	13.95236	50.8	9.040559	54.7	9.734618	57.9	10.3041	63.3	11.26511	75.2	13.38288	88.2	15.6964	98.5	17.52943	106	18.86416	118	20.99972
30-40	80.8	14.13032	53.5	9.356093	57.4	10.03813	60.1	10.5103	66.1	11.55958	77.9	13.62317	92.4	16.15893	101	17.6629	107	18.71219	118	20.63587
40-50	83.6	14.36681	54.3	9.331551	58.8	10.10488	62.1	10.67199	68.3	11.73748	81.4	13.98873	95	16.32592	104	17.87258	111	19.07555	122	20.96592
50-60	83.4	10.96172	54.7	7.189522	59	7.754694	62.8	8.254149	69.1	9.082193	80.8	10.61999	95.5	12.55209	104	13.66929	110	14.4579	120	15.77226
60-70	82.6	12.65311	55.2	8.455834	59.8	9.160487	63.3	9.696636	69	10.56979	80.5	12.33142	94.2	14.43006	103	15.7781	109	16.69721	116	17.76951
70-80	76.4	8.552459	52	5.821045	56.5	6.324789	59.7	6.683008	64.4	7.20914	74.9	8.384544	86.8	9.716668	93.8	10.50027	98	10.97043	106	11.86598
80+	68.5	5.393701	46.9	3.692913	51.4	4.047244	53.8	4.23622	58.2	4.582677	67.4	5.307087	77.4	6.094488	82.6	6.503937	87.2	6.866142	93.6	7.370079
21+		**80.01048**		**52.88752**		**57.16484**		**60.35641**		**66.00597**		**77.63782**		**90.97457**		**99.51651**		**105.6436**		**115.3793**

Appendix B:

Table B-1. Fit Results For Body Weight Distributions

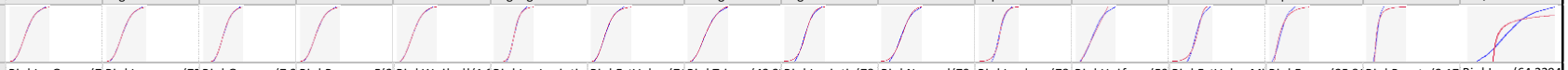
Name	InvGauss	Lognorm	Gamma	Pearson5	Weibull	LogLogistic	ExtValue	Triang	Logistic	Normal	Laplace	Uniform	ExtValueMin	Expon	Pareto	Levy
Graph																
Function	RiskInvGauss(7	RiskLognorm(75	RiskGamma(7.3	RiskPearson5(2	RiskWeibull(1.9	RiskLogLogistic	RiskExtValue(7	RiskTriang(42.2	RiskLogistic(78.	RiskNormal(79.	RiskLaplace(78.	RiskUniform(50	RiskExtValueMi	RiskExpon(25.8	RiskPareto(3.17	RiskLevy(64.2294
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (16 Valid Fits)																
Parameters - [* Values unavailable without running a bootstrap.]																
Num. Est.	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2
Fitted Parameter #1	mu	mu	alpha	alpha	alpha	gamma	a	Min	alpha	mu	mu	Min	a	beta	theta	a
Fitted Value	76.35462	75.58592	7.376864	28.054	1.99193	5.31562	71.04246	42.27668	78.90844	79.03873	78.509583	50.56683	86.922561	25.81229	3.17797	64.229419
Fitted Parameter #2	lambda	sigma	beta	beta	beta	beta	b	M. likely	beta	sigma	sigma	Max	b	Shift Factor	a	c
Fitted Value	1,188.68801	19.45749	7.074771	2,700.635	40.04764	72.16777	16.00573	68.33252	10.98840	18.53682	22.275467	108.50186	16.052714	56.11266	58.67552	2.454060
Fitted Parameter #3	Shift Factor	Shift Factor	Shift Factor	Shift Factor	Shift Factor	alpha		Max								
Fitted Value	3.50609	4.29598	27.656770	-19.925	44.29618	6.57002		127.60860								
Distribution Statistics																
Minimum	3.50609	4.29598	27.656770	-19.925	44.29618	5.31562	−∞	42.27668	−∞	−∞	−∞	50.56683	−∞	56.11266	58.67552	64.229419
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	+∞	127.60860	+∞	+∞	+∞	108.50186	+∞	+∞	+∞	+∞
Mean	79.86071	79.88191	79.846396	79.899	79.79017	80.30872	80.28122	79.40593	78.90844	79.03873	78.509583	79.53435	77.656683	81.92495	85.61597	N/A
Mode	72.85743	72.94629	72.771625	73.027	72.51684	74.19088	71.04246	68.33252	78.90844	79.03873	78.509583	50.56683	86.922561	56.11266	58.67552	65.047439
Median	77.49619	77.49548	77.508029	77.496	77.61329	77.48339	76.90877	77.31873	78.90844	79.03873	78.509583	79.53435	81.039034	74.00437	72.97614	69.623712
Std. Deviation	19.35170	19.45749	19.215350	19.557	18.62117	21.72178	20.52815	17.85287	19.93076	18.53682	22.275467	16.72440	20.588406	25.81229	44.24992	N/A
Skewness	0.7603	0.7893	0.7364	0.8149	0.6365	1.5918	1.1395	0.3483	0	0	0	0	-1.1395	2	28.5850	N/A
Kurtosis	3.9635	4.1279	3.8134	4.2870	3.2553	11.7893	5.4000	2.4000	4.2000	3	6	1.8000	5.4000	9	N/A	N/A
Percentiles																
1%	45.12389	44.90195	45.654607	44.649	48.27378	41.17434	46.59883	46.99197	28.41541	35.91563	16.890784	51.14618	13.077681	56.37208	58.86137	64.599290
2.5%	48.97748	48.85086	49.252420	48.710	50.62112	46.63683	50.14982	49.73221	38.65174	42.70723	31.323402	52.01520	27.908815	56.76617	59.14483	64.717897
5%	52.61553	52.55296	52.736600	52.485	53.31178	51.41645	53.48115	52.82039	46.55375	48.54837	42.241256	53.46358	39.242866	57.43665	59.63024	64.868254
10%	57.21552	57.20461	57.227453	57.192	57.23624	56.96932	57.69316	57.18773	54.76445	55.28284	53.159110	56.36033	50.798058	58.83225	60.65341	65.136467
20%	63.42195	63.44160	63.383112	63.461	63.15653	63.75504	63.42558	63.36409	63.67528	63.43775	64.076965	62.15384	62.844454	61.87250	62.94355	65.723633
25%	65.97663	65.99929	65.936757	66.022	65.72200	66.37078	65.81444	65.85313	66.83644	66.53584	67.591729	65.05059	66.922496	63.53839	64.23488	66.083914
30%	68.36850	68.39031	68.334094	68.412	68.16365	68.75148	68.07137	68.10338	69.59799	69.31801	70.463500	67.94734	70.373330	65.31925	65.64465	66.513978
35%	70.67020	70.68857	70.645049	70.707	70.53628	70.99413	70.26425	70.26933	72.10619	71.89612	72.891548	70.84409	73.403752	67.23215	67.19342	67.039013
40%	72.93242	72.94554	72.918724	72.959	72.88014	73.16425	72.44171	72.51881	74.45302	74.34248	74.994819	73.74084	76.139520	69.29824	68.90730	67.694009
45%	75.19557	75.20220	75.194478	75.209	75.22874	75.31247	74.64392	74.86414	76.70339	76.70937	76.850035	76.63759	78.664449	71.54420	70.82001	68.529870
50%	77.49619	77.49548	77.508029	77.496	77.61329	77.48339	76.90877	77.31873	78.90844	79.03873	78.509583	79.53435	81.039034	74.00437	72.97614	69.623712
55%	79.87142	79.86294	79.895774	79.856	80.06615	79.72165	79.27641	79.89944	81.11349	81.36810	80.169130	82.43110	83.310529	76.72397	75.43610	71.097436
60%	82.36322	82.34698	82.398888	82.332	82.62423	82.07749	81.79395	82.62798	83.36385	83.73498	82.024347	85.32785	85.519208	79.76422	78.28439	73.153408
65%	85.02370	85.00028	85.068469	84.979	85.33337	84.61381	84.52171	85.53308	85.71069	86.18135	84.127618	88.22460	87.703056	83.21097	81.64381	76.148112
70%	87.92327	87.89413	87.973524	87.868	88.25526	87.41724	87.54326	88.65424	88.21889	88.75945	86.555666	91.12135	89.902375	87.18995	85.70165	80.758210
75%	91.16550	91.13357	91.215374	91.104	91.47989	90.61861	90.98400	92.04829	90.98044	91.54163	89.427437	94.01810	92.165928	91.89609	90.76216	88.399961
80%	94.91782	94.88878	94.957438	94.862	95.15107	94.43676	95.05010	95.80250	94.14160	94.63972	92.942201	96.91485	94.561807	97.65594	97.36416	102.463738
90%	105.54064	105.56807	105.485692	105.592	105.16831	106.14455	107.06124	105.11829	103.05243	102.79463	103.860055	102.70836	100.311046	115.54765	121.09413	219.640447
95%	115.17059	115.33001	114.938049	115.470	113.76560	118.28945	118.58262	111.70555	111.26312	109.52909	114.777909	105.60511	104.535418	133.43937	150.60766	688.332438
97.5%	124.18629	124.55591	123.705090	124.882	121.41715	131.35713	129.88350	116.36344	119.16514	115.37024	125.695764	107.05349	107.876534	151.33109	187.31433	2,563.096764
99%	135.48034	136.25112	134.576093	136.934	130.50332	150.55750	144.67122	120.49654	129.40147	122.16183	140.128382	107.92251	111.437939	174.98265	249.91325	15,686.445423

Table B-2. Fit Results for Drinking Water Distributions

Name	BetaGeneral	Kumaraswamy	Pert	Triang	Uniform
Graph					
Function	RiskBetaGeneral(0.	RiskKumaraswamy(	RiskPert(0,1.70425e	RiskTriang(0,1.6179	RiskUniform(0,7.40(
Method	Least Squares	Least Squares	Least Squares	Least Squares	Predefined
Ranking by Fit Statistic (5 Valid Fits)					
Parameters - [* Values unavailable without running a bootstrap.]					
Num. Est. Parameters	4	4	3	3	2
Fitted Parameter #1	alpha1	alpha1	Min	Min	Min
Fitted Value	0.755110	0.812919	0	0	0
Fitted Parameter #2	alpha2	alpha2	M. likely	M. likely	Max
Fitted Value	4.541238	4.220333	1.704E-007	1.618E-006	7.400000
Fitted Parameter #3	Min	Min	Max	Max	
Fitted Value	0	0	7.400000	7.400000	
Fitted Parameter #4	Max	Max			
Fitted Value	7.400000	7.400000			
Distribution Statistics					
Minimum	0	0	0	0	0
Maximum	7.400000	7.400000	7.400000	7.400000	7.400000
Mean	1.055032	1.057934	1.233333	2.466667	3.700000
Mode	0	0	1.704E-007	1.618E-006	0
Median	0.729256	0.725928	0.957926	2.167410	3.700000
Std. Deviation	1.031106	1.038375	1.042357	1.744197	2.136196
Skewness	1.4063	1.4442	1.1832	0.5657	0
Kurtosis	4.8857	5.0358	4.2000	2.4000	1.8000
Percentiles					
1%	0.003369	0.004383	0.014860	0.037094	0.074000
2.5%	0.011362	0.013626	0.037376	0.093086	0.185000
5%	0.028585	0.032354	0.075526	0.187373	0.370000
10%	0.072441	0.077818	0.154302	0.379744	0.740000
20%	0.187156	0.192567	0.322992	0.781240	1.480000
25%	0.256271	0.260769	0.413752	0.991413	1.850000
30%	0.333135	0.336349	0.509491	1.208716	2.220000
35%	0.418098	0.419784	0.610866	1.433930	2.590000
40%	0.511780	0.511801	0.718685	1.667985	2.960000
45%	0.615085	0.613402	0.833949	1.912014	3.330000
50%	0.729256	0.725928	0.957926	2.167410	3.700000
55%	0.855984	0.851172	1.092254	2.435930	4.070000
60%	0.997575	0.991564	1.239106	2.719830	4.440000
65%	1.157249	1.150472	1.401463	3.022101	4.810000
70%	1.339650	1.332745	1.583577	3.346854	5.180000
75%	1.551813	1.545712	1.791849	3.700000	5.550000
80%	1.805152	1.801252	2.036631	4.090620	5.920000
90%	2.540446	2.549271	2.730916	5.059915	6.660000
95%	3.193023	3.218788	3.335326	5.745310	7.030000
97.5%	3.765511	3.808419	3.861496	6.229957	7.215000
99%	4.410806	4.473229	4.454007	6.660000	7.326000

Table B-3. Fit Results for Inland South Total Fish Consumption Distributions

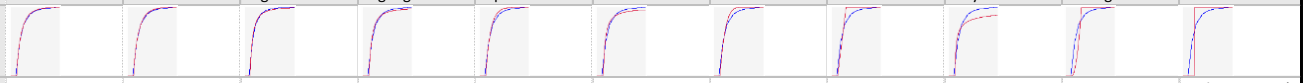
Name	Weibull	Gamma	Lognorm	LogLogistic	Expon	Pearson5	Pert	Uniform	Levy	Triang	InvGauss
Graph											
Function	RiskWeibull(0.	RiskGamma(0.7	RiskLognorm(0.	RiskLogLogistic	RiskExpon(0.00	RiskPearson5(1	RiskPert(0,5.175	RiskUniform(0,	RiskLevy(0,0.00	RiskTriang(0,0.(	RiskInvGauss(0
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (11 Valid Fits)											
Parameters - [* Values unavailable without running a bootstrap.]											
Num. Est.	3	3	3	3	2	3	3	2	2	3	3
Fitted Parameter #1	alpha	alpha	mu	gamma	beta	alpha	Min	Min	a	Min	mu
Fitted Value	0.828457503	0.73796891	0.01076716	0	0.008199131	1.035282772	0	0	0	0	0.009525250
Fitted Parameter #2	beta	beta	sigma	beta	Shift Factor	beta	M. likely	Max	c	M. likely	lambda
Fitted Value	0.008289555	0.01220191	0.02103404	0.004903972	0	0.003201316	5.175E-009	0.01448979	0.001577	0.01692502	67.131920881
Fitted Parameter #3	Shift Factor	Shift Factor	Shift Factor	alpha		Shift Factor	Max			Max	Shift Factor
Fitted Value	0	0	0	1.349443265		0	0.04567983			0.01692502	0
Distribution Statistics											
Minimum	0	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	0.04567983	0.01448979	+∞	0.01692502	+∞
Mean	0.009168760	0.00900463	0.01076716	0.015710116	0.008199131	0.090733105	0.00761331	0.00724489	N/A	0.01128335	0.009525250
Mode	0	0	0.00101866	0.001194721	0	0.001572909	5.175E-009	0	0.000526	0.01692502	0.009523223
Median	0.005325956	0.00540393	0.00490619	0.004903972	0.005683205	0.004401369	0.00591323	0.00724489	0.003465	0.01196780	0.009525250
Std. Deviation	0.011131849	0.01048207	0.02103404	N/A	0.008199131	N/A	0.00643442	0.00418284	N/A	0.00398927	0.000113462
Skewness	2.6643	2.3282	13.3159	N/A	2	N/A	1.1832	0	N/A	-0.5657	0.0357
Kurtosis	14.2942	11.1304	828.1291	N/A	9	N/A	4.2000	1.8000	N/A	2.4000	3.0021
Percentiles											
1%	3.214E-005	2.115E-005	0.00026547	0.000162813	8.240E-005	0.000683254	9.173E-005	0.00014490	0.000238	0.00169250	0.009264930
2.5%	9.803E-005	7.339E-005	0.00042025	0.000324710	0.000207584	0.000850807	0.00023072	0.00036224	0.000314	0.00267608	0.009305450
5%	0.000229876	0.00018876	0.00062387	0.000553264	0.000420560	0.001044914	0.00046622	0.00072449	0.000410	0.00378455	0.009340441
10%	0.000548078	0.00048973	0.00098382	0.000962521	0.000863865	0.001354464	0.00095250	0.00144898	0.000583	0.00535216	0.009380948
20%	0.001355913	0.00130085	0.00170792	0.001755471	0.001829583	0.001926832	0.00199381	0.00289796	0.000960	0.00756910	0.009430236
25%	0.001842490	0.00180102	0.00210607	0.002172596	0.002358743	0.002231190	0.00255408	0.00362245	0.001191	0.00846251	0.009449028
30%	0.002388340	0.00236574	0.00254214	0.002617340	0.002924425	0.002562466	0.00314506	0.00434694	0.001468	0.00927022	0.009465936
35%	0.002999565	0.00299967	0.00302643	0.003099710	0.003532046	0.002931058	0.00377085	0.00507143	0.001805	0.01001298	0.009481631
40%	0.003684666	0.00371000	0.00357102	0.003631250	0.004188326	0.003349136	0.00443641	0.00579592	0.002226	0.01070432	0.009496548
45%	0.004455051	0.00450683	0.00419101	0.004226352	0.004901744	0.003832237	0.00514793	0.00652040	0.002763	0.01135365	0.009511003
50%	0.005325956	0.00540393	0.00490619	0.004903972	0.005683205	0.004401369	0.00591323	0.00724489	0.003465	0.01196780	0.009525250
55%	0.006317947	0.00642009	0.00574340	0.005690236	0.006547069	0.005086289	0.00674243	0.00796938	0.004412	0.01255193	0.009539518
60%	0.007459385	0.00758128	0.00674056	0.006622771	0.007512788	0.005931104	0.00764894	0.00869387	0.005733	0.01311007	0.009554039
65%	0.008790614	0.00892443	0.00795349	0.007758447	0.008607629	0.007004550	0.00865117	0.00941836	0.007657	0.01364539	0.009569070
70%	0.010371476	0.01050416	0.00946867	0.009188313	0.009871531	0.008420419	0.00977535	0.01014285	0.010619	0.01416049	0.009584936
75%	0.012295880	0.01240570	0.01142918	0.011069217	0.011366409	0.010382263	0.01106100	0.01086734	0.015528	0.01465750	0.009602087
80%	0.014723122	0.01477257	0.01409358	0.013699424	0.013195993	0.013294488	0.01257202	0.01159183	0.024563	0.01513820	0.009621222
90%	0.022685491	0.02232279	0.02446645	0.024985375	0.018879197	0.027559403	0.01685781	0.01304081	0.099841	0.01605649	0.009671771
95%	0.031167366	0.03007124	0.03858292	0.043467397	0.024562402	0.055375287	0.02058881	0.01376530	0.400943	0.01649647	0.009713715
97.5%	0.040068977	0.03794635	0.05727672	0.074062874	0.030245607	0.109686172	0.02383682	0.01412754	1.605349	0.01671212	0.009750242
99%	0.052373332	0.04848791	0.09067352	0.147708714	0.037758395	0.268038389	0.02749437	0.01434489	10.036189	0.01684018	0.009792884

Table B-4. Fit Results for Atlantic Total Fish Consumption Distribution

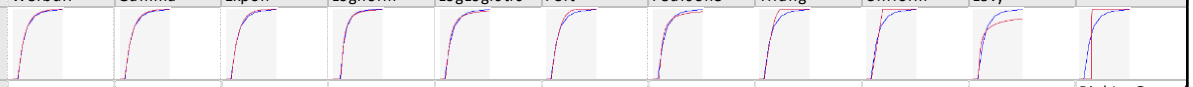
Name	Weibull	Gamma	Expon	Lognorm	LogLogistic	Pert	Pearson5	Triang	Uniform	Levy	InvGauss
Graph											
Function	RiskWeibull(	RiskGamma(	RiskExpon(0.(	RiskLognorm(	RiskLogLogist	RiskPert(0,5.8	RiskPearson5	RiskTriang(0,	RiskUniform(	RiskLevy(0,0.(	RiskInvGauss(
Method	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:	Least Square:
Ranking by Fit Statistic (11 Valid Fits)											
Parameters - [* Values unavailable without running a bootstrap.]											
Num. Est.	3	3	2	3	3	3	3	3	2	2	3
Fitted Parameter #1	alpha	alpha	beta	mu	gamma	Min	alpha	Min	Min	a	mu
Fitted Value	0.94206285	0.91430516	0.01240722	0.01438556	0	0	1.270478919	0	0	0	0.01338625
Fitted Parameter #2	beta	beta	Shift Factor	sigma	beta	M. likely	beta	M. likely	Max	c	lambda
Fitted Value	0.01243641	0.01388135	0	0.02200326	0.007858720	5.883E-010	0.006954142	1.035E-008	0.02082212	0.002422	59.79040708
Fitted Parameter #3	Shift Factor	Shift Factor		Shift Factor	alpha	Max	Shift Factor	Max			Shift Factor
Fitted Value	0	0		0	1.541299318	0.06942534	0	0.03134555			0
Distribution Statistics											
Minimum	0	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	0.06942534	+∞	0.03134555	0.02082212	+∞	+∞
Mean	0.01277939	0.01269179	0.01240722	0.01438556	0.017943439	0.01157089	0.025710478	0.01044852	0.01041106	N/A	0.01338625
Mode	0	0	0	0.00235726	0.002881401	5.883E-010	0.003062853	1.035E-008	0	0.000807	0.01338176
Median	0.00842813	0.00847429	0.00860003	0.00787203	0.007858720	0.00898707	0.007266500	0.00918090	0.01041106	0.005324	0.01338625
Std. Deviation	0.01357262	0.01327325	0.01240722	0.02200326	N/A	0.00977919	N/A	0.00738821	0.00601083	N/A	0.00020030
Skewness	2.1879	2.0916	2	8.1670	N/A	1.1832	N/A	0.5657	0	N/A	0.0449
Kurtosis	10.3208	9.5624	9	229.3127	N/A	4.2000	N/A	2.4000	1.8000	N/A	3.0034
Percentiles											
1%	9.419E-005	8.716E-005	0.00012470	0.00061187	0.000398637	0.00013941	0.001337576	0.00015713	0.00020822	0.000365	0.01292833
2.5%	0.00025115	0.00023881	0.00031412	0.00091492	0.000729565	0.00035065	0.001641572	0.00039430	0.00052055	0.000482	0.01299939
5%	0.00053140	0.00051497	0.00063641	0.00129318	0.001163302	0.00070857	0.001986231	0.00079369	0.00104111	0.000631	0.01306082
10%	0.00114095	0.00112430	0.00130723	0.00192716	0.001889018	0.00144763	0.002521905	0.00160855	0.00208221	0.000895	0.01313201
20%	0.00253056	0.00252641	0.00276859	0.00312406	0.003196931	0.00303024	0.003476409	0.00330924	0.00416442	0.001475	0.01321873
25%	0.00331383	0.00331861	0.00356934	0.00375340	0.003852955	0.00388174	0.003968595	0.00419951	0.00520553	0.001830	0.01325183
30%	0.00416325	0.00417754	0.00442535	0.00442590	0.004535313	0.00477994	0.004494207	0.00511998	0.00624664	0.002255	0.01328163
35%	0.00508698	0.00511075	0.00534482	0.00515618	0.005259253	0.00573102	0.005068140	0.00607396	0.00728774	0.002773	0.01330929
40%	0.00609574	0.00612838	0.00633793	0.00596027	0.006040922	0.00674256	0.005706911	0.00706539	0.00832885	0.003420	0.01333560
45%	0.00720340	0.00724373	0.00741750	0.00685740	0.006899355	0.00782394	0.006430812	0.00809907	0.00936995	0.004245	0.01336110
50%	0.00842813	0.00847429	0.00860003	0.00787203	0.007858720	0.00898707	0.007266500	0.00918090	0.01041106	0.005324	0.01338625
55%	0.00979409	0.00984338	0.00990726	0.00903679	0.008951485	0.01024731	0.008250825	0.01031832	0.01145216	0.006779	0.01341144
60%	0.01133426	0.01138284	0.01136862	0.01039698	0.010223518	0.01162505	0.009437186	0.01152089	0.01249327	0.008808	0.01343709
65%	0.01309511	0.01313751	0.01302538	0.01201836	0.011743012	0.01314825	0.010906913	0.01280127	0.01353438	0.011764	0.01346365
70%	0.01514501	0.01517328	0.01493796	0.01400142	0.013617467	0.01485681	0.012791386	0.01417689	0.01457548	0.016315	0.01349170
75%	0.01759035	0.01759254	0.01720007	0.01651008	0.016029117	0.01681077	0.015319207	0.01567278	0.01561659	0.023858	0.01352203
80%	0.02061008	0.02056708	0.01996866	0.01983599	0.019318361	0.01910727	0.018930114	0.01732739	0.01665769	0.037739	0.01355589
90%	0.03014304	0.02987458	0.02856869	0.03215552	0.032693952	0.02562091	0.035092778	0.02143322	0.01873991	0.153398	0.01364541
95%	0.03985686	0.03924965	0.03716872	0.04791963	0.053089823	0.03129137	0.062887315	0.02433647	0.01978101	0.616020	0.01371979
97.5%	0.04971113	0.04866789	0.04576876	0.06773120	0.084652477	0.03622779	0.110801309	0.02638938	0.02030156	2.466504	0.01378462
99%	0.06291156	0.06116297	0.05713738	0.10127829	0.154926740	0.04178662	0.231194670	0.02821099	0.02061390	15.419890	0.01386039

Table B-5. Fit Results for Inland South Trophic Level 2 Fish Consumption Distributions

Name	Lognorm	Weibull	Gamma	LogLogistic	Expon	Pearson5	Uniform	Levy	Triang	InvGauss
Graph										
Function	RiskLognorm(	RiskWeibull(	RiskGamma(	RiskLogLogist	RiskExpon(0.(	RiskPearson5	RiskUniform(	RiskLevy(0,0.(	RiskTriang(0,	RiskInvGauss
Method	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Squares
Ranking by Fit Statistic (10 Valid Fits)										
Parameters - [* Values unavailable without running a bootstrap.]										
Num. Est.	3	3	3	3	2	3	2	2	3	3
Fitted Parameter #1	mu	alpha	alpha	gamma	beta	alpha	Min	a	Min	mu
Fitted Value	0.003471944	0.804167175	0.710316460	0	0.002514246	1.0096864319	0	0	0	0.003602239
Fitted Parameter #2	sigma	beta	beta	beta	Shift Factor	beta	Max	c	M. likely	lambda
Fitted Value	0.007120279	0.002591641	0.004009461	0.001517348	0	0.0009634972	0.004459657	0.000506	0.001955144	############
Fitted Parameter #3	Shift Factor	Shift Factor	Shift Factor	alpha		Shift Factor			Max	Shift Factor
Fitted Value	0	0	0	1.317883093		0			0.002495466	0
Distribution Statistics										
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	0.004459657	+∞	0.002495466	+∞
Mean	0.003471944	0.002925501	0.002847986	0.005262686	0.002514246	0.0994687460	0.002229828	N/A	0.001483537	0.003602239
Mode	0.000292309	0	0	0.000336032	0	0.0004794266	0	0.000169	0.001955144	0.003602125
Median	0.001521700	0.001643000	0.001672055	0.001517348	0.001742742	0.0013714728	0.002229828	0.001112	0.001561889	0.003602239
Std. Deviation	0.007120279	0.003667007	0.003379184	N/A	0.002514246	N/A	0.001287392	N/A	0.000535980	1.657E-005
Skewness	14.7777	2.7917	2.3730	N/A	2	N/A	0	N/A	-0.4598	0.0138
Kurtosis	1,094.8872	15.5134	11.4469	N/A	9	N/A	1.8000	N/A	2.4000	3.0003
Percentiles										
1%	7.667E-005	8.497E-006	5.377E-006	4.643E-005	2.527E-005	0.0002082206	4.460E-005	7.622E-005	0.000220884	0.003563904
2.5%	0.000122748	2.680E-005	1.957E-005	9.414E-005	6.366E-005	0.0002597572	0.000111491	0.000101	0.000349249	0.003569914
5%	0.000183989	6.449E-005	5.218E-005	0.000162471	0.000128964	0.0003196245	0.000222983	0.000132	0.000493913	0.003575092
10%	0.000293393	0.000157853	0.000140241	0.000286426	0.000264902	0.0004154131	0.000445966	0.000187	0.000698498	0.003581070
20%	0.000516242	0.000401351	0.000385463	0.000529964	0.000561038	0.0005933784	0.000891931	0.000308	0.000987825	0.003588323
25%	0.000639857	0.000550454	0.000539416	0.000659249	0.000723303	0.0006883907	0.001114914	0.000382	0.001104422	0.003591082
30%	0.000775901	0.000719144	0.000714705	0.000797751	0.000896768	0.0007920646	0.001337897	0.000471	0.001209834	0.003593562
35%	0.000927659	0.000909425	0.000912806	0.000948610	0.001083094	0.0009077020	0.001560880	0.000579	0.001306770	0.003595861
40%	0.001099022	0.001124101	0.001136026	0.001115497	0.001284341	0.0010391931	0.001783863	0.000714	0.001396996	0.003598045
45%	0.001294888	0.001366943	0.001387624	0.001303036	0.001503109	0.0011915268	0.002006845	0.000886	0.001481738	0.003600158
50%	0.001521700	0.001643000	0.001672055	0.001517348	0.001742742	0.0013714728	0.002229828	0.001112	0.001561889	0.003602239
55%	0.001788240	0.001959100	0.001995407	0.001766909	0.002007645	0.0015886499	0.002452811	0.001415	0.001638123	0.003604322
60%	0.002106939	0.002324675	0.002366115	0.002063964	0.002303780	0.0018573570	0.002675794	0.001839	0.001710964	0.003606439
65%	0.002496144	0.002753168	0.002796185	0.002427075	0.002639511	0.0021999455	0.002898777	0.002456	0.001780828	0.003608629
70%	0.002984364	0.003264551	0.003303381	0.002886047	0.003027084	0.0026535421	0.003121760	0.003406	0.001848052	0.003610938
75%	0.003618887	0.003890230	0.003915446	0.003492380	0.003485485	0.0032848069	0.003344742	0.004981	0.001912916	0.003613431
80%	0.004485437	0.004683590	0.004679134	0.004344342	0.004046522	0.0042267637	0.003567725	0.007879	0.001976167	0.003616210
90%	0.007892380	0.007311360	0.007124388	0.008038176	0.005789265	0.0088979921	0.004013691	0.032025	0.002128267	0.003623534
95%	0.012585378	0.010141846	0.009642792	0.014170793	0.007532007	0.0181640176	0.004236674	0.128605	0.002235817	0.003629593
97.5%	0.018864360	0.013137745	0.012207934	0.024455326	0.009274749	0.0365666321	0.004348165	0.514925	0.002311866	0.003634857
99%	0.030200869	0.017311541	0.015647262	0.049585951	0.011578530	0.0913295206	0.004415060	3.219165	0.002379348	0.003640987

Table B-6. Fit Results for Atlantic Trophic Level 2 Fish Consumption Distribution

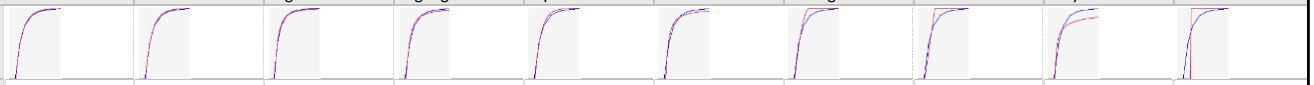
Name	Weibull	Gamma	Lognorm	LogLogistic	Expon	Pearson5	Triang	Uniform	Levy	InvGauss
Graph										
Function	RiskWeibull(0.8	RiskGamma(0.79	RiskLognorm(0.0	RiskLogLogistic(	RiskExpon(0.004	RiskPearson5(1.	RiskTriang(0,3.1	RiskUniform(0,0	RiskLevy(0,0.000	RiskInvGauss(0.0
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (10 Valid Fits)										
Parameters - [* Values unavailable without running a bootstrap.]										
Num. Est.	3	3	3	3	2	3	3	2	2	3
Fitted Parameter #1	alpha	alpha	mu	gamma	beta	alpha	Min	Min	a	mu
Fitted Value	0.867887727	0.797414247	0.005389778	0	0.004326603	1.126256038	0	0	0	0.004897000
Fitted Parameter #2	beta	beta	sigma	beta	Shift Factor	beta	M. likely	Max	c	lambda
Fitted Value	0.004365399	0.005800211	0.009532530	0.002646736	0	0.001968854	3.138E-010	0.007507817	0.000842	143.254496999
Fitted Parameter #3	Shift Factor	Shift Factor	Shift Factor	alpha		Shift Factor	Max			Shift Factor
Fitted Value	0	0	0	1.421086695		0	0.01092500			0
Distribution Statistics										
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	0.01092500	0.007507817	+∞	+∞
Mean	0.004689434	0.004625171	0.005389778	0.007294267	0.004326603	0.015594136	0.00364167	0.003753908	N/A	0.004897000
Mode	0	0	0.000642617	0.000772970	0	0.000925972	3.138E-010	0	0.000281	0.004896749
Median	0.002861669	0.002893735	0.002652760	0.002646736	0.002998973	0.002413190	0.00319986	0.003753908	0.001852	0.004897000
Std. Deviation	0.005420577	0.005179475	0.009532530	N/A	0.004326603	N/A	0.00257505	0.002167320	N/A	2.863E-005
Skewness	2.4791	2.2397	10.8383	N/A	2	N/A	0.5657	0	N/A	0.0175
Kurtosis	12.6409	10.5243	479.2044	N/A	9	N/A	2.4000	1.8000	N/A	3.0005
Percentiles										
1%	2.178E-005	1.648E-005	0.000166224	0.000104330	4.348E-005	0.000402781	5.476E-005	7.508E-005	0.000127	0.004830845
2.5%	6.316E-005	5.217E-005	0.000257133	0.000200955	0.000109540	0.000498520	0.00013743	0.000187695	0.000168	0.004841204
5%	0.000142471	0.000125308	0.000374204	0.000333325	0.000221926	0.000608432	0.00027663	0.000375391	0.000219	0.004850132
10%	0.000326536	0.000304000	0.000576740	0.000563927	0.000455853	0.000781824	0.00056063	0.000750782	0.000311	0.004860445
20%	0.000775261	0.000756652	0.000973817	0.000997812	0.000965454	0.001097446	0.00115338	0.001501563	0.000513	0.004872963
25%	0.001038893	0.001026413	0.001188241	0.001221706	0.001244686	0.001263101	0.00146367	0.001876954	0.000637	0.004877727
30%	0.001330890	0.001326196	0.001420755	0.001458042	0.001543191	0.001441950	0.00178449	0.002252345	0.000784	0.004882009
35%	0.001654277	0.001658446	0.001676642	0.001712094	0.001863827	0.001639353	0.00211698	0.002627736	0.000964	0.004885980
40%	0.002013210	0.002026808	0.001961945	0.001989745	0.002210140	0.001861451	0.00246253	0.003003127	0.001189	0.004889752
45%	0.002413223	0.002436309	0.002284104	0.002298180	0.002586603	0.002115960	0.00282280	0.003378518	0.001476	0.004893403
50%	0.002861669	0.002893735	0.002652760	0.002646736	0.002998973	0.002413190	0.00319986	0.003753908	0.001852	0.004897000
55%	0.003368431	0.003408278	0.003080919	0.003048154	0.003454826	0.002767600	0.00359629	0.004129299	0.002357	0.004900599
60%	0.003947097	0.003992610	0.003586818	0.003520656	0.003964426	0.003200412	0.00401542	0.004504690	0.003063	0.004904259
65%	0.004616937	0.004664691	0.004197161	0.004091603	0.004542163	0.003744378	0.00446168	0.004880081	0.004091	0.004908045
70%	0.005406451	0.005451024	0.004953099	0.004804531	0.005209112	0.004453143	0.00494113	0.005255472	0.005673	0.004912037
75%	0.006360233	0.006392914	0.005922313	0.005733958	0.005997945	0.005421525	0.00546250	0.005630863	0.008296	0.004916350
80%	0.007553681	0.007559835	0.007226345	0.007020568	0.006963399	0.006835270	0.00603919	0.006006253	0.013124	0.004921156
90%	0.011412402	0.011255222	0.012201586	0.012422198	0.009962371	0.013493361	0.00747021	0.006757035	0.053344	0.004933830
95%	0.015454733	0.015021191	0.018805621	0.021016124	0.012961344	0.025785371	0.00848209	0.007132426	0.214221	0.004944321
97.5%	0.019643217	0.018832258	0.027367688	0.034859549	0.015960316	0.048517686	0.00919760	0.007320121	0.857726	0.004953439
99%	0.025364756	0.023916979	0.042335354	0.067144858	0.019924743	0.110627500	0.00983250	0.007432739	5.362264	0.004964061

Table B-7. Fit Results for Inland South Trophic Level 3 Fish Consumption Distributions

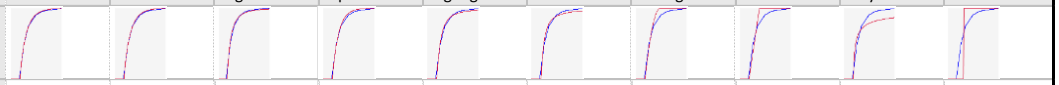
Name	Weibull	Gamma	Lognorm	Expon	LogLogistic	Pearson5	Triang	Uniform	Levy	InvGauss
Graph										
Function	RiskWeibull(	RiskGamma(	RiskLognorm	RiskExpon(0.(	RiskLogLogis	RiskPearson5	RiskTriang(0,	RiskUniform(	RiskLevy(0,0.(	RiskInvGauss
Method	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Square	Least Squares
Ranking by Fit Statistic (10 Valid Fits)										
Parameters - [* Values unavailable without running a bootstrap.]										
Num. Est.	3	3	3	2	3	3	3	2	2	3
Fitted Parameter #1	alpha	alpha	mu	beta	gamma	alpha	Min	Min	a	mu
Fitted Value	0.906979736	0.857125635	0.003998992	0.003349390	0	1.202466460	0	0	0	0.003680250
Fitted Parameter #2	beta	beta	sigma	Shift Factor	beta	beta	M. likely	Max	c	lambda
Fitted Value	0.003364168	0.004073448	0.006527632	0	0.002084474	0.001705142	7.387E-010	0.005720992	0.000652	###########
Fitted Parameter #3	Shift Factor	Shift Factor	Shift Factor		alpha	Shift Factor	Max			Shift Factor
Fitted Value	0	0	0		1.484694905	0	0.008427286			0
Distribution Statistics										
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	0.008427286	0.005720992	+∞	+∞
Mean	0.003524939	0.003491457	0.003998992	0.003349390	0.005158556	0.008421848	0.002809095	0.002860496	N/A	0.003680250
Mode	0	0	0.000570078	0	0.000693291	0.000774197	7.387E-010	0	0.000217	0.003680151
Median	0.002245837	0.002263611	0.002089032	0.002321621	0.002084474	0.001915135	0.002468295	0.002860496	0.001434	0.003680250
Std. Deviation	0.003892192	0.003771243	0.006527632	0.003349390	N/A	N/A	0.001986330	0.001651508	N/A	1.555E-005
Skewness	2.3175	2.1603	9.2462	2	N/A	N/A	0.5657	0	N/A	0.0127
Kurtosis	11.3118	10.0001	316.0198	9	N/A	N/A	2.4000	1.8000	N/A	3.0003
Percentiles										
1%	2.109E-005	1.780E-005	0.000147430	3.366E-005	9.438E-005	0.000337390	4.224E-005	5.721E-005	9.830E-005	0.003644260
2.5%	5.842E-005	5.208E-005	0.000223830	8.480E-005	0.000176747	0.000415658	0.000106008	0.000143025	0.000130	0.003649904
5%	0.000127245	0.000117937	0.000320533	0.000171801	0.000286884	0.000504899	0.000213384	0.000286050	0.000170	0.003654766
10%	0.000281398	0.000270093	0.000484929	0.000352894	0.000474544	0.000644533	0.000432461	0.000572099	0.000241	0.003660380
20%	0.000643654	0.000635734	0.000800588	0.000747395	0.000819380	0.000895739	0.000889693	0.001144198	0.000397	0.003667189
25%	0.000851719	0.000847372	0.000968559	0.000963560	0.000994573	0.001026305	0.001129043	0.001430248	0.000493	0.003669779
30%	0.001079521	0.001079405	0.001149234	0.001194644	0.001178012	0.001166422	0.001376513	0.001716298	0.000607	0.003672106
35%	0.001329308	0.001333783	0.001346610	0.001442860	0.001373785	0.001320159	0.001632991	0.002002347	0.000747	0.003674264
40%	0.001604097	0.001613262	0.001565159	0.001710954	0.001586325	0.001492093	0.001899539	0.002288397	0.000921	0.003676313
45%	0.001907861	0.001921555	0.001810309	0.002002390	0.001820947	0.001687911	0.002177444	0.002574446	0.001143	0.003678297
50%	0.002245837	0.002263611	0.002089032	0.002321621	0.002084474	0.001915135	0.002468295	0.002860496	0.001434	0.003680250
55%	0.002625031	0.002646080	0.002410669	0.002674514	0.002386138	0.002184239	0.002774091	0.003146546	0.001825	0.003682204
60%	0.003055041	0.003078089	0.002788252	0.003069015	0.002739055	0.002510482	0.003097402	0.003432595	0.002372	0.003684191
65%	0.003549434	0.003572532	0.003240771	0.003516264	0.003162818	0.002917246	0.003441636	0.003718645	0.003167	0.003686245
70%	0.004128216	0.004148397	0.003797362	0.004032575	0.003688444	0.003442530	0.003811471	0.004004694	0.004393	0.003688412
75%	0.004822607	0.004835228	0.004505721	0.004643241	0.004368740	0.004152921	0.004213643	0.004290744	0.006424	0.003690751
80%	0.005685236	0.005682663	0.005451062	0.005390636	0.005302826	0.005177533	0.004658489	0.004576794	0.010161	0.003693358
90%	0.008438056	0.008349020	0.008999366	0.007712257	0.009156216	0.009868026	0.005762344	0.005148893	0.041302	0.003700228
95%	0.011278493	0.011049321	0.013615002	0.010033877	0.015145616	0.018191501	0.006542887	0.005434942	0.165861	0.003705912
97.5%	0.014187737	0.013771310	0.019497208	0.012355498	0.024583323	0.032992746	0.007094815	0.005577967	0.664095	0.003710848
99%	0.018119498	0.017392091	0.029600803	0.015424513	0.046039933	0.071584594	0.007584557	0.005663782	4.151736	0.003716596

Table B-8. Fit Results for Atlantic Trophic Level 3 Fish Consumption Distribution

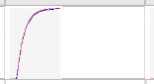
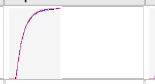
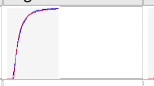
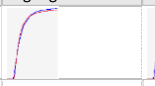
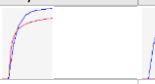
Name	Gamma	Weibull	Expon	Lognorm	LogLogistic	Pearson5	Triang	Uniform	Levy	InvGauss
Graph										
Function	RiskGamma(1.017	RiskWeibull(1.00	RiskExpon(0.0052	RiskLognorm(0.00	RiskLogLogistic(0,	RiskPearson5(1.4	RiskTriang(0,2.665	RiskUniform(0,0.0	RiskLevy(0,0.0010	RiskInvGauss(0.00
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (10 Valid Fits)										
Parameters - [* Values unavailable without running a bootstrap.]										
Num. Est.	3	3	2	3	3	3	3	2	2	3
Fitted Parameter #1	alpha	alpha	beta	mu	gamma	alpha	Min	Min	a	mu
Fitted Value	1.017206397	1.004296487	0.005268536	0.005826595	0	1.401296719	0	0	0	0.005474000
Fitted Parameter #2	beta	beta	Shift Factor	sigma	beta	beta	M. likely	Max	c	lambda
Fitted Value	0.005160216	0.005268219	0	0.008009788	0.003422049	0.003465389	2.665E-010	0.008762096	0.001021	168.836246416
Fitted Parameter #3	Shift Factor	Shift Factor		Shift Factor	alpha	Shift Factor	Max			Shift Factor
Fitted Value	0	0		0	1.642629699	0	0.01379594			0
Distribution Statistics										
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	0.01379594	0.008762096	+∞	+∞
Mean	0.005249005	0.005258730	0.005268536	0.005826595	0.006946501	0.008635478	0.00459865	0.004381048	N/A	0.005474000
Mode	8.879E-005	2.307E-005	0	0.001186087	0.001446936	0.001443132	2.665E-010	0	0.000340	0.005473734
Median	0.003662795	0.003657381	0.003651871	0.003427536	0.003422049	0.003191998	0.00404074	0.004381048	0.002245	0.005474000
Std. Deviation	0.005204421	0.005236246	0.005268536	0.008009788	N/A	N/A	0.00325174	0.002529399	N/A	3.117E-005
Skewness	1.9830	1.9872	2	6.7220	N/A	N/A	0.5657	0	N/A	0.0171
Kurtosis	8.8985	8.9149	9	140.0537	N/A	N/A	2.4000	1.8000	N/A	3.0005
Percentiles										
1%	5.649E-005	5.400E-005	5.295E-005	0.000312043	0.000208633	0.000633327	6.915E-005	8.762E-005	0.000154	0.005401968
2.5%	0.000140181	0.000135494	0.000133388	0.000455122	0.000367856	0.000772086	0.00017354	0.000219052	0.000203	0.005413250
5%	0.000280838	0.000273680	0.000270241	0.000629655	0.000569911	0.000927864	0.00034932	0.000438105	0.000266	0.005422971
10%	0.000570584	0.000560432	0.000555096	0.000915457	0.000898178	0.001167184	0.00070796	0.000876210	0.000378	0.005434201
20%	0.001195648	0.001183137	0.001175640	0.001440307	0.001471513	0.001586658	0.00145648	0.001752419	0.000622	0.005447830
25%	0.001536271	0.001523672	0.001515663	0.001710909	0.001753171	0.001800035	0.00184831	0.002190524	0.000772	0.005453017
30%	0.001899484	0.001887347	0.001879155	0.001996983	0.002043005	0.002026012	0.00225343	0.002628629	0.000951	0.005457679
35%	0.002288828	0.002277650	0.002269595	0.002304604	0.002347570	0.002270755	0.00267330	0.003066734	0.001169	0.005462003
40%	0.002708630	0.002698886	0.002691303	0.002640213	0.002673532	0.002540922	0.00310965	0.003504838	0.001442	0.005466109
45%	0.003164306	0.003156475	0.003149726	0.003011365	0.003028523	0.002844537	0.00356460	0.003942943	0.001790	0.005470085
50%	0.003662795	0.003657381	0.003651871	0.003427536	0.003422049	0.003191998	0.00404074	0.004381048	0.002245	0.005474000
55%	0.004213208	0.004210765	0.004206967	0.003901223	0.003866709	0.003597517	0.00454134	0.004819153	0.002859	0.005477918
60%	0.004827869	0.004829026	0.004827511	0.004449643	0.004380130	0.004081482	0.00507062	0.005257258	0.003714	0.005481902
65%	0.005524035	0.005529542	0.005531026	0.005097624	0.004988315	0.004674641	0.00563415	0.005695362	0.004961	0.005486023
70%	0.006326968	0.006337757	0.006343175	0.005882878	0.005731959	0.005426149	0.00623959	0.006133467	0.006880	0.005490370
75%	0.007275813	0.007293103	0.007303742	0.006866528	0.006679563	0.006420560	0.00689797	0.006571572	0.010060	0.005495064
80%	0.008436130	0.008461626	0.008479382	0.008156595	0.007958079	0.007818361	0.00762621	0.007009677	0.015914	0.005500296
90%	0.012035556	0.012087316	0.012131254	0.012832940	0.013037968	0.013846440	0.00943328	0.007885886	0.064685	0.005514091
95%	0.015630153	0.015708266	0.015783125	0.018657835	0.020547820	0.023686723	0.01071108	0.008323991	0.259762	0.005525509
97.5%	0.019221664	0.019325601	0.019434996	0.025812864	0.031834235	0.039800288	0.01161461	0.008543043	1.040070	0.005535432
99%	0.023966176	0.024103052	0.024262507	0.037648705	0.056129203	0.077894179	0.01241635	0.008674475	6.502227	0.005546992

Table B-9. Fit Results for Inland South Trophic Level 4 Fish Consumption Distributions

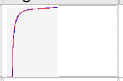
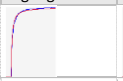
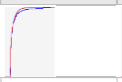
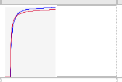
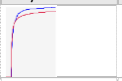
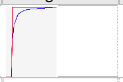
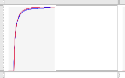
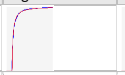
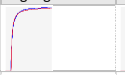
Name	Lognorm	LogLogistic	Weibull	Gamma	Pearson5	Levy	Expon	Uniform	Triang	InvGauss
Graph										
Function	RiskLognorm(0	RiskLogLogistic	RiskWeibull(0.	RiskGamma(0.	RiskPearson5((	RiskLevy(0,0.00	RiskExpon(0.00	RiskUniform(0,	RiskTriang(0,0.	RiskInvGauss(0
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (10 Valid Fits)										
Parameters - [* Values unavailable without running a bootstrap.]										
Num. Est.	3	3	3	3	3	2	2	2	3	3
Fitted Parameter #1	mu	gamma	alpha	alpha	alpha	a	beta	Min	Min	mu
Fitted Value	0.003136650	0	0.589263355	0.448071393	0.6627520260	0	0.001196261	0	0	0.002646750
Fitted Parameter #2	sigma	beta	beta	beta	beta	c	Shift Factor	Max	M. likely	lambda
Fitted Value	0.014112563	0.0006757927	0.001402981	0.004321255	0.0002130730	0.000245	0	0.001324959	0.000924851	89.874410279
Fitted Parameter #3	Shift Factor	alpha	Shift Factor	Shift Factor	Shift Factor				Max	Shift Factor
Fitted Value	0	0.9676677799	0	0	0				0.001025304	0
Distribution Statistics										
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	+∞	+∞	+∞	0.001324959	0.001025304	+∞
Mean	0.003136650	N/A	0.002162054	0.001936231	N/A	N/A	0.001196261	0.000662479	0.000650052	0.002646750
Mode	3.204E-005	0	0	0	0.0001281448	8.181E-005	0	0	0.000924851	0.002646633
Median	0.000680543	0.0006757927	0.000753229	0.000793976	0.0005713204	0.000539	0.000829185	0.000662479	0.000688569	0.002646750
Std. Deviation	0.014112563	N/A	0.003887973	0.002892568	N/A	N/A	0.001196261	0.000382483	0.000230741	1.436E-005
Skewness	104.5770	N/A	4.7514	2.9878	N/A	N/A	2	0	-0.5456	0.0163
Kurtosis	224,172.6908	N/A	43.4035	16.3907	N/A	N/A	9	1.8000	2.4000	3.0004
Percentiles										
1%	1.166E-005	5.855E-006	5.711E-007	1.133E-007	5.641E-005	3.699E-005	1.202E-005	1.325E-005	9.738E-005	0.002613546
2.5%	2.212E-005	1.533E-005	2.739E-006	8.761E-007	7.271E-005	4.885E-005	3.029E-005	3.312E-005	0.000153969	0.002618748
5%	3.838E-005	3.224E-005	9.078E-006	4.117E-006	9.261E-005	6.389E-005	6.136E-005	6.625E-005	0.000217745	0.002623230
10%	7.242E-005	6.977E-005	3.080E-005	1.939E-005	0.0001264529	9.071E-005	0.000126039	0.000132496	0.000307937	0.002628407
20%	0.000156274	0.0001613010	0.000110047	9.212E-005	0.0001952890	0.000149	0.000266938	0.000264992	0.000435489	0.002634689
25%	0.000209302	0.0002171453	0.000169359	0.000153054	0.0002349531	0.000185	0.000344143	0.000331240	0.000486892	0.002637080
30%	0.000272097	0.0002815410	0.000243918	0.000232824	0.0002803865	0.000228	0.000426676	0.000397488	0.000533363	0.002639229
35%	0.000346989	0.0003564391	0.000336028	0.000333664	0.0003335824	0.000281	0.000515329	0.000463736	0.000576098	0.002641221
40%	0.000437030	0.0004444660	0.000448725	0.000458316	0.0003971416	0.000346	0.000611081	0.000529983	0.000615875	0.002643114
45%	0.000546326	0.0005492264	0.000586010	0.000610251	0.0004746580	0.000430	0.000715169	0.000596231	0.000653234	0.002644946
50%	0.000680543	0.0006757927	0.000753229	0.000793976	0.0005713204	0.000539	0.000829185	0.000662479	0.000688569	0.002646750
55%	0.000847734	0.0008315255	0.000957671	0.001015487	0.0006949395	0.000687	0.000955223	0.000728727	0.000722177	0.002648556
60%	0.001059742	0.0010275156	0.001209542	0.001282997	0.0008578236	0.000892	0.001096122	0.000794975	0.000754289	0.002650391
65%	0.001334738	0.0012812728	0.001523653	0.001608147	0.0010804472	0.001192	0.001255861	0.000861223	0.000785089	0.002652290
70%	0.001702110	0.0016221287	0.001922477	0.002008156	0.0013992459	0.001653	0.001440265	0.000927471	0.000814725	0.002654293
75%	0.002212775	0.0021031807	0.002442224	0.002509984	0.0018850033	0.002417	0.001658369	0.000993719	0.000843321	0.002656456
80%	0.002963642	0.0028313257	0.003146191	0.003159233	0.0026927819	0.003824	0.001925307	0.001059967	0.000870978	0.002658866
90%	0.006394794	0.0065454523	0.005777558	0.005355123	0.0079045528	0.015542	0.002754492	0.001192463	0.000923812	0.002665221
95%	0.012068415	0.0141675086	0.009030125	0.007732526	0.0227333327	0.062414	0.003583676	0.001258711	0.000953542	0.002670481
97.5%	0.020935635	0.0297878796	0.012855564	0.010226048	0.0649327693	0.249901	0.004412861	0.001291835	0.000974561	0.002675051
99%	0.039723690	0.0780059806	0.018732789	0.013641759	0.2591443241	1.562311	0.005508983	0.001311709	0.000993212	0.002680375

Table B-10. Fit Results for Atlantic Trophic Level 4 Fish Consumption Distribution

Name	Weibull	Lognorm	LogLogistic	Gamma	BetaGeneral	Pearson5	Levy	Expon	Triang	Uniform	InvGauss
Graph											
Function	RiskWeibull(0.6	RiskLognorm(0.(	RiskLogLogistic(	RiskGamma(0.4	RiskBetaGenera	RiskPearson5(0.	RiskLevy(0,0.000	RiskExpon(0.001	RiskTriang(0,8.4	RiskUniform(0,(	RiskInvGauss(0.(
Method	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares	Least Squares
Ranking by Fit Statistic (11 Valid Fits)											
Parameters - [* Values unavailable without running a bootstrap.]											
Num. Est.	3	3	3	3	4	3	2	2	3	2	3
Fitted Parameter #1	alpha	mu	gamma	alpha	alpha1	alpha	a	beta	Min	Min	mu
Fitted Value	0.614024837	0.003019926	0	0.477448869	0.45279140	0.6690640662	0	0.001283100	0	0	0.002482250
Fitted Parameter #2	beta	sigma	beta	beta	alpha2	beta	c	Shift Factor	M. likely	Max	lambda
Fitted Value	0.001426060	0.012474053	0.0007112239	0.003943307	5.52116359	0.0002246010	0.000250	0	8.488E-012	0.002628250	104.378673998
Fitted Parameter #3	Shift Factor	Shift Factor	alpha	Shift Factor	Min	Shift Factor			Max		Shift Factor
Fitted Value	0	0	0.9952625267	0	0	0			0.003546854		0
Fitted Parameter #4					Max						
Fitted Value					0.02366780						
Distribution Statistics											
Minimum	0	0	0	0	0	0	0	0	0	0	0
Maximum	+∞	+∞	+∞	+∞	0.02366780	+∞	+∞	+∞	0.003546854	0.002628250	+∞
Mean	0.002083390	0.003019926	N/A	0.001882727	0.00179388	N/A	N/A	0.001283100	0.001182285	0.001314125	0.002482250
Mode	0	3.934E-005	0	0	0	0.0001345671	8.332E-005	0	8.488E-012	0	0.002482161
Median	0.000785066	0.000710586	0.0007112239	0.000821238	0.00083023	0.0005929790	0.000549	0.000889377	0.001038850	0.001314125	0.002482250
Std. Deviation	0.003559486	0.012474053	N/A	0.002724733	0.00237203	N/A	N/A	0.001283100	0.000836002	0.000758710	1.210E-005
Skewness	4.4017	82.8666	N/A	2.8945	2.1232	N/A	N/A	2	0.5657	0	0.0146
Kurtosis	37.1023	119,183.1916	N/A	15.5668	8.3401	N/A	N/A	9	2.4000	1.8000	3.0004
Percentiles											
1%	7.952E-007	1.358E-005	7.029E-006	1.979E-007	1.319E-007	5.919E-005	3.768E-005	1.290E-005	1.778E-005	2.628E-005	0.002454249
2.5%	3.581E-006	2.533E-005	1.792E-005	1.349E-006	9.979E-007	7.624E-005	4.976E-005	3.249E-005	4.462E-005	6.571E-005	0.002458638
5%	1.131E-005	4.329E-005	3.691E-005	5.767E-006	4.614E-006	9.703E-005	6.507E-005	6.581E-005	8.981E-005	0.000131412	0.002462419
10%	3.652E-005	8.032E-005	7.820E-005	2.471E-005	2.137E-005	0.0001323277	9.239E-005	0.000135188	0.000182013	0.000262825	0.002466785
20%	0.000123949	0.000169762	0.0001766365	0.000107015	9.981E-005	0.0002039581	0.000152	0.000286315	0.000374451	0.000525650	0.002472083
25%	0.000187467	0.000225587	0.0002358381	0.000172690	0.00016479	0.0002451527	0.000189	0.000369125	0.000475188	0.000657062	0.002474099
30%	0.000266054	0.000291204	0.0003035834	0.000256609	0.00024922	0.0002922802	0.000233	0.000457649	0.000579343	0.000788475	0.002475910
35%	0.000361819	0.000368933	0.0003818399	0.000360646	0.00035517	0.0003473904	0.000286	0.000552737	0.000687289	0.000919887	0.002477590
40%	0.000477563	0.000461793	0.0004732350	0.000487195	0.00048511	0.0004131517	0.000353	0.000655440	0.000799473	0.001051300	0.002479185
45%	0.000616994	0.000573826	0.0005813549	0.000639362	0.00064215	0.0004932455	0.000438	0.000767084	0.000916437	0.001182712	0.002480729
50%	0.000785066	0.000710586	0.0007112239	0.000821238	0.00083023	0.0005929790	0.000549	0.000889377	0.001038850	0.001314125	0.002482250
55%	0.000988529	0.000879941	0.0008701044	0.001038317	0.00105456	0.0007203296	0.000700	0.001024565	0.001167552	0.001445537	0.002483772
60%	0.001236816	0.001093417	0.0010688969	0.001298158	0.00132210	0.0008878484	0.000909	0.001175692	0.001303627	0.001576950	0.002485319
65%	0.001543571	0.001368629	0.0013247422	0.001611503	0.00164258	0.0011163796	0.001214	0.001347026	0.001448507	0.001708362	0.002486919
70%	0.001929434	0.001733948	0.0016662291	0.001994267	0.00203002	0.0014429466	0.001684	0.001544817	0.001604162	0.001839775	0.002488606
75%	0.002427523	0.002238308	0.0021448589	0.002471375	0.00250586	0.0019393207	0.002462	0.001778754	0.001773427	0.001971187	0.002490428
80%	0.003095473	0.002974363	0.0028637307	0.003084987	0.00310527	0.0027623243	0.003895	0.002065069	0.001960653	0.002102600	0.002492459
90%	0.005546789	0.006286487	0.0064683139	0.005142128	0.00500590	0.0080336723	0.015830	0.002954446	0.002425240	0.002365425	0.002497812
95%	0.008514709	0.011662997	0.0137039844	0.007352044	0.00686226	0.0228845281	0.063571	0.003843823	0.002753753	0.002496837	0.002502241
97.5%	0.011950367	0.019934669	0.0282256837	0.009659659	0.00860848	0.0647317650	0.254536	0.004733200	0.002986047	0.002562543	0.002506089
99%	0.017151365	0.037178170	0.0719682304	0.012810763	0.01070667	0.2550127732	1.591285	0.005908892	0.003192169	0.002601967	0.002510570

Appendix C: Drinking Water Ingestion Distribution Data from EPA's Exposure Factors Handbook

Table 3-23. Per Capita[a] Estimates of Combined Direct and Indirect[b] Water Ingestion Based on NHANES 2003–2006: Community Water (mL/day)

Age	Sample Size	Mean	Percentile						
			10	25	50	75	90	95	99
Birth to <1 month	88	239*	-	-	78*	473*	693*	851*	956*
1 to <3 months	143	282*	-	-	41*	524*	784*	962*	1,102*
3 to <6 months	244	373*	-	-	378*	630*	794*	925*	1,192*
6 to <12 months	466	303	-	46	199	520	757*	866*	1,150*
1 to <2 years	611	223	-	27	134	310	577*	760*	1,206*
2 to <3 years	571	265	-	39	160	387	657*	861*	1,354*
3 to <6 years	1,091	327	-	67	245	465	746	959	1,570*
6 to <11 years	1,601	414	-	64	297	598	1,000	1,316	2,056*
11 to <16 years	2,396	520	-	60	329	688	1,338	1,821	2,953
16 to <18 years	1,087	573	-	59	375	865	1,378	1,783	3,053
18 to <21 years	1,245	681	-	88	355	872	1,808	2,368	3,911
≥21 years	8,673	1,043	-	227	787	1,577	2,414	2,958	4,405
≥65 years	2,287	1,046	-	279	886	1,587	2,272	2,730	4,123
All ages	18,216	869	-	134	560	1,299	2,170	2,717	4,123

[a] Includes all participants whether or not they ingested any water from the source during survey period.
[b] Direct water is defined as water ingested directly as a beverage; indirect water is defined as water added in the preparation of food or beverages.
\- = Zero.
* Estimates are less statistically reliable based on guidance published in the *Joint Policy on Variance Estimation and Statistical Reporting Standards on NHANES III and CSFII Reports: NHIS/NCHS Analytical Working Group Recommendations* (NCHS, 1993).

Source: U.S. EPA analysis of NHANES 2003–2006 data.

Appendix D: Fish Consumption Rate Distribution Data from EPA's 2014 Estimated Fish Consumption Rates Report

Table E-7. Total freshwater and estuarine finfish and shellfish usual fish consumption rate estimates (g/day), raw weight, edible portion (continued)

Freshwater + Estuarine Finfish and Shellfish	Mean (95% CI)	Percentile (95% CI)						
		25th	50th	75th	90th	95th	97th	99th
Youth, Atlantic	4.7 (3.3,6.5)	0.6 (0.4,1.0)	1.9 (1.3,2.9)	5.4 (3.8,7.7)	12.0 (8.6,16.7)	18.4 (13.2,25.4)	23.8 (17.1,33.1)	37.2 (25.9,53.3)
Youth, Gulf of Mexico	5.5 (3.1,9.9)	0.7 (0.3,1.5)	2.3 (1.1,4.9)	6.3 (3.3,11.8)	13.8 (7.8,24.4)	21.3 (11.9,38.0)	27.9 (15.3,50.9)	46.4 (25.4,84.7)
Youth, Great Lakes	3.3 (2.1,5.3)	0.3 (0.2,0.5)	1.0 (0.6,1.7)	3.3 (2.1,5.3)	8.6 (5.3,14.0)	14.3 (8.5,24.0)	19.4 (11.3,33.3)	32.9 (18.7,58.1)
Youth, Inland Northeast	1.9 (1.2,3.2)	0.2 (0.1,0.4)	0.7 (0.4,1.2)	2.2 (1.3,3.6)	5.1 (3.0,8.5)	7.8 (4.5,13.6)	10.1 (5.7,17.9)	16.2 (8.8,29.8)
Youth, Inland Midwest	2.0 (1.4,2.7)	0.2 (0.1,0.3)	0.6 (0.4,0.9)	1.9 (1.3,2.7)	4.7 (3.4,6.5)	8.0 (5.7,11.1)	11.2 (7.8,15.9)	19.9 (13.1,30.3)
Youth, Inland South	3.2 (2.4,4.3)	0.4 (0.2,0.7)	1.2 (0.8,1.9)	3.6 (2.6,5.2)	8.2 (6.2,11.0)	12.8 (9.7,16.9)	16.8 (12.7,22.2)	27.5 (20.6,36.8)
Youth, Inland West	2.7 (1.8,3.8)	0.3 (0.2,0.5)	1.0 (0.7,1.5)	2.9 (2.0,4.2)	6.7 (4.8,9.6)	10.6 (7.4,15.2)	14.1 (9.7,20.6)	23.0 (15.1,35.2)
Adults, Pacific	11.6 (8.2,16.4)	2.4 (1.6,3.7)	6.3 (4.4,9.0)	14.0 (10.1,19.5)	27.3 (19.3,38.6)	39.7 (27.4,57.7)	51.2 (34.3,76.3)	81.2 (51.6,127.8)
Adults, Atlantic	13.3 (11.0,16.0)	3.5 (2.5,4.8)	8.3 (6.4,10.7)	17.0 (13.9,20.8)	30.8 (25.3,37.5)	42.8 (34.5,53.0)	52.3 (41.8,65.5)	75.8 (58.8,97.7)
Adults, Gulf of Mexico	12.2 (9.3,15.9)	2.8 (1.6,5.1)	7.3 (4.8,11.1)	15.7 (11.7,21.1)	28.6 (22.5,36.4)	40.1 (31.8,50.6)	50.3 (39.3,64.4)	73.8 (55.6,97.8)
Adults, Great Lakes	6.9 (5.8,8.4)	1.5 (1.1,2.2)	4.0 (3.1,5.1)	8.7 (7.1,10.7)	16.5 (13.5,20.2)	23.6 (19.1,29.1)	29.4 (23.5,36.8)	44.5 (34.1,57.9)
Adults, Inland Northeast	8.7 (6.2,12.2)	1.7 (1.1,2.6)	5.0 (3.5,7.3)	11.3 (8.0,16.0)	21.0 (14.8,29.7)	29.5 (20.6,42.2)	36.5 (25.3,52.8)	54.4 (36.7,80.6)
Adults, Inland Midwest	5.7 (4.6,7.0)	1.1 (0.8,1.6)	3.0 (2.3,4.0)	6.9 (5.5,8.7)	13.5 (10.8,17.0)	19.8 (15.5,25.2)	25.1 (19.4,32.6)	39.5 (29.1,53.5)
Adults, Inland South	9.5 (7.8,11.7)	1.9 (1.3,2.8)	5.3 (4.0,7.1)	12.0 (9.7,14.9)	22.8 (18.6,27.9)	32.7 (26.2,40.7)	40.9 (32.3,51.7)	61.0 (46.7,79.7)
Adults, Inland West	7.7 (5.9,10.1)	1.7 (1.2,2.2)	4.3 (3.3,5.4)	9.4 (7.4,12.1)	18.2 (13.7,24.3)	26.3 (19.1,36.1)	33.3 (23.8,46.7)	51.6 (35.5,74.9)

[1]Race/Ethnicity is as defined by NHANES. Respondents who self-identified as "Mexican American" were coded as such regardless of their other race-ethnicity identities. Otherwise, self-identified "Hispanic" ethnicity was coded as "Other Hispanic." All other non-Hispanic participants were then categorized based on their self-reported races: non-Hispanic white, non-Hispanic black, and other non-Hispanic race including non-Hispanic multiracial (other race).

[2]US Regions are the U.S. Census Bureau regions. Midwest = OH, MI, IN, WI, IL, MO, IA, MN, SD, ND, NE, KS. Northeast = PA, NY, NJ, CT, RI, MA, NH, VT, ME. South = DE, MD, DC, VA, WV, KY, TN, NC, SC, GA, AL, MS, FL, LA, AR, OK, TX. West = NM, CO, WY, MT, ID, UT, AZ, NV, CA, OR, WA, AK, HI.

[3]Coastal regions include counties bordering the 3 coasts (Pacific, Atlantic, and Gulf of Mexico) and the Great Lakes and estuaries and bays. Additionally, any county that did not directly border a coast, but the central point was within 25 miles of a coast was defined as coastal. The inland regions are the remaining counties in each of the 4 Census Regions.

Table E-13. Total freshwater and estuarine trophic level 2 finfish and shellfish usual fish consumption rate estimates (g/day), raw weight, edi

Freshwater + Estuarine Trophic Level 2 Finfish and Shellfish	Mean (95% CI)	Percentile (95% CI)						
		25th	50th	75th	90th	95th	97th	99th
Youth, Atlantic	1.3 (1.0,1.8)	0.1 (0.1,0.2)	0.4 (0.3,0.7)	1.4 (1.0,2.0)	3.5 (2.5,4.8)	5.5 (4.0,7.7)	7.3 (5.1,10.3)	11.7 (7.7,17.8)
Youth, Gulf of Mexico	1.6 (1.0,2.7)	0.2 (0.1,0.3)	0.5 (0.3,1.0)	1.7 (0.9,3.0)	4.3 (2.4,7.6)	7.1 (4.1,12.3)	9.6 (5.7,16.2)	15.2 (9.9,23.3)
Youth, Great Lakes	0.8 (0.5,1.3)	0.1 (0.0,0.1)	0.2 (0.1,0.4)	0.7 (0.5,1.2)	2.1 (1.3,3.4)	3.6 (2.2,6.2)	5.1 (3.0,8.8)	9.0 (5.1,15.8)
Youth, Inland Northeast	0.7 (0.4,1.3)	0.1 (0.0,0.1)	0.2 (0.1,0.4)	0.7 (0.4,1.3)	1.7 (0.9,3.2)	2.7 (1.4,5.3)	3.7 (1.9,7.2)	6.5 (3.3,12.9)
Youth, Inland Midwest	0.5 (0.3,0.8)	0.0 (0.0,0.1)	0.1 (0.1,0.2)	0.4 (0.3,0.7)	1.2 (0.7,1.9)	2.1 (1.3,3.7)	3.1 (1.8,5.4)	5.9 (3.2,10.7)
Youth, Inland South	0.9 (0.6,1.2)	0.1 (0.0,0.2)	0.3 (0.2,0.5)	0.9 (0.6,1.4)	2.2 (1.5,3.1)	3.6 (2.5,5.1)	4.9 (3.5,6.9)	8.6 (6.0,12.1)
Youth, Inland West	0.9 (0.5,1.5)	0.1 (0.0,0.2)	0.3 (0.2,0.5)	0.9 (0.5,1.5)	2.3 (1.4,3.8)	3.9 (2.3,6.6)	5.4 (3.2,9.1)	9.2 (5.2,16.3)
Adults, Pacific	3.7 (2.6,5.3)	0.7 (0.4,1.2)	1.9 (1.2,3.1)	4.6 (3.1,6.8)	9.2 (6.5,13.2)	13.5 (9.5,19.0)	16.9 (12.0,23.9)	25.9 (18.1,37.2)
Adults, Atlantic	4.9 (3.8,6.1)	1.1 (0.7,1.7)	2.8 (2.0,3.9)	6.2 (4.8,8.0)	11.6 (9.1,14.8)	16.4 (12.7,21.2)	20.4 (15.4,27.1)	29.6 (20.9,42.1)
Adults, Gulf of Mexico	4.2 (3.2,5.6)	0.9 (0.4,1.7)	2.3 (1.4,3.7)	5.3 (3.8,7.3)	10.4 (8.0,13.5)	14.6 (11.5,18.6)	18.4 (14.2,23.8)	27.1 (20.3,36.2)
Adults, Great Lakes	2.2 (1.5,3.2)	0.4 (0.2,0.6)	1.1 (0.7,1.7)	2.7 (1.8,3.9)	5.4 (3.7,8.0)	7.9 (5.3,12.0)	10.1 (6.6,15.5)	15.6 (9.7,25.1)
Adults, Inland Northeast	3.4 (2.0,5.6)	0.6 (0.4,1.0)	1.7 (1.1,2.7)	4.1 (2.6,6.6)	8.2 (4.8,14.1)	12.1 (6.7,21.9)	15.5 (8.3,28.8)	24.3 (12.4,47.5)
Adults, Inland Midwest	1.5 (1.0,2.2)	0.2 (0.2,0.3)	0.7 (0.5,1.0)	1.7 (1.1,2.5)	3.6 (2.3,5.6)	5.5 (3.5,8.9)	7.2 (4.4,11.9)	11.6 (6.7,20.0)
Adults, Inland South	3.1 (2.4,4.1)	0.6 (0.3,0.9)	1.6 (1.1,2.2)	3.7 (2.8,4.9)	7.6 (5.8,9.8)	11.3 (8.6,15.0)	14.6 (10.8,19.6)	23.1 (16.3,32.9)
Adults, Inland West	2.6 (1.9,3.5)	0.5 (0.3,0.8)	1.3 (0.9,1.8)	2.9 (2.2,4.0)	6.2 (4.6,8.3)	9.3 (6.8,12.9)	12.3 (8.7,17.3)	20.0 (13.6,29.4)

[1]Race/Ethnicity is as defined by NHANES. Respondents who self-identified as "Mexican American" were coded as such regardless of their other race-ethnicity identities. Otherwise, self-identified "Hispanic" ethnicity was coded as "Other Hispanic." All other non-Hispanic participants were then categorized based on their self-reported races: non-Hispanic white, non-Hispanic black, and other non-Hispanic race including non-Hispanic multiracial (other race).

[2]US Regions are the U.S. Census Bureau regions. Midwest = OH, MI, IN, WI, IL, MO, IA, MN, SD, ND, NE, KS. Northeast = PA, NY, NJ, CT, RI, MA, NH, VT, ME. South = DE, MD, DC, VA, WV, KY, TN, NC, SC, GA, AL, MS, FL, LA, AR, OK, TX. West = NM, CO, WY, MT, ID, UT, AZ, NV, CA, OR, WA, AK, HI.

[3]Coastal regions include counties bordering the 3 coasts (Pacific, Atlantic, and Gulf of Mexico) and the Great Lakes and estuaries and bays. Additionally, any county that did not directly border a coast, but the central point was within 25 miles of a coast was defined as coastal. The inland regions are the remaining counties in each of the 4 Census Regions.

Table E-14. Total freshwater and estuarine trophic level 3 finfish and shellfish usual fish consumption rate estimates (g/day), raw weight, edible portion (continued)

Freshwater + Estuarine Trophic Level 3 Finfish and Shellfish	Mean (95% CI)	Percentile (95% CI)						
		25th	50th	75th	90th	95th	97th	99th
Youth, Atlantic	1.8 (1.2,2.6)	0.2 (0.1,0.4)	0.8 (0.5,1.2)	2.1 (1.3,3.2)	4.5 (3.1,6.7)	6.9 (4.7,10.1)	8.9 (6.0,13.1)	13.9 (9.2,20.9)
Youth, Gulf of Mexico	2.1 (1.0,4.5)	0.2 (0.1,0.6)	0.8 (0.3,1.9)	2.1 (1.0,4.5)	5.1 (2.6,10.2)	8.6 (3.9,18.9)	12.1 (5.0,29.4)	21.2 (9.0,50.2)
Youth, Great Lakes	1.2 (0.7,2.1)	0.1 (0.1,0.2)	0.4 (0.2,0.6)	1.1 (0.6,2.0)	3.0 (1.6,5.5)	5.1 (2.5,10.3)	7.2 (3.4,15.0)	12.6 (5.9,26.7)
Youth, Inland Northeast	0.8 (0.4,1.3)	0.1 (0.1,0.2)	0.3 (0.2,0.6)	0.9 (0.5,1.6)	2.0 (1.1,3.4)	2.9 (1.6,5.2)	3.8 (2.1,6.8)	5.9 (3.1,11.4)
Youth, Inland Midwest	0.7 (0.4,1.2)	0.1 (0.0,0.1)	0.2 (0.1,0.4)	0.7 (0.4,1.2)	1.6 (0.9,3.0)	2.6 (1.4,4.8)	3.7 (2.0,6.7)	6.7 (3.8,11.8)
Youth, Inland South	1.4 (1.0,1.9)	0.2 (0.1,0.3)	0.6 (0.4,0.8)	1.6 (1.1,2.2)	3.5 (2.6,4.8)	5.5 (4.1,7.5)	7.2 (5.2,10.0)	11.5 (7.9,16.6)
Youth, Inland West	1.1 (0.7,1.5)	0.1 (0.1,0.2)	0.4 (0.3,0.7)	1.2 (0.8,1.8)	2.7 (1.8,3.8)	4.2 (2.9,6.0)	5.5 (3.8,8.0)	9.0 (5.9,13.8)
Adults, Pacific	4.8 (3.3,7.2)	1.1 (0.7,1.7)	2.8 (1.9,4.1)	6.0 (4.2,8.7)	11.4 (7.7,16.9)	16.3 (10.5,25.5)	20.5 (12.5,33.7)	31.0 (16.6,57.7)
Adults, Atlantic	5.4 (4.4,6.6)	1.6 (1.1,2.3)	3.6 (2.7,4.7)	7.1 (5.8,8.8)	12.3 (10.0,15.2)	16.6 (13.1,21.0)	20.1 (15.4,26.2)	28.5 (20.4,39.7)
Adults, Gulf of Mexico	5.1 (3.8,6.8)	1.3 (0.7,2.5)	3.2 (2.0,5.0)	6.6 (4.8,9.2)	11.9 (8.9,15.7)	16.4 (12.5,21.7)	20.2 (15.1,27.0)	28.9 (20.9,40.0)
Adults, Great Lakes	2.3 (1.9,2.9)	0.6 (0.4,0.9)	1.4 (1.0,2.0)	3.0 (2.3,3.8)	5.4 (4.3,6.9)	7.6 (5.9,9.7)	9.3 (7.1,12.1)	13.7 (10.1,18.7)
Adults, Inland Northeast	3.7 (2.8,4.8)	0.8 (0.5,1.3)	2.3 (1.6,3.3)	4.9 (3.7,6.6)	8.8 (6.5,11.8)	11.9 (8.7,16.4)	14.3 (10.2,20.1)	20.3 (13.7,30.2)
Adults, Inland Midwest	1.7 (1.3,2.1)	0.4 (0.2,0.6)	0.9 (0.7,1.3)	2.1 (1.6,2.7)	3.9 (3.0,5.2)	5.7 (4.2,7.7)	7.2 (5.2,10.0)	11.2 (7.7,16.3)
Adults, Inland South	3.7 (2.9,4.5)	0.9 (0.6,1.3)	2.2 (1.7,3.0)	4.7 (3.8,5.9)	8.6 (6.7,10.9)	11.9 (9.1,15.5)	14.7 (11.0,19.6)	21.4 (15.2,30.0)
Adults, Inland West	3.1 (2.4,4.1)	0.8 (0.5,1.1)	1.9 (1.4,2.5)	3.9 (3.1,5.0)	7.3 (5.4,9.9)	10.3 (7.2,14.6)	12.9 (8.8,18.9)	19.0 (12.2,29.4)

[1]Race/Ethnicity is as defined by NHANES. Respondents who self-identified as "Mexican American" were coded as such regardless of their other race-ethnicity identities. Otherwise, self-identified "Hispanic" ethnicity was coded as "Other Hispanic." All other non-Hispanic participants were then categorized based on their self-reported races: non-Hispanic white, non-Hispanic black, and other non-Hispanic race including non-Hispanic multiracial (other race).

[2]US Regions are the U.S. Census Bureau regions. Midwest = OH, MI, IN, WI, IL, MO, IA, MN, SD, ND, NE, KS. Northeast = PA, NY, NJ, CT, RI, MA, NH, VT, ME. South = DE, MD, DC, VA, WV, KY, TN, NC, SC, GA, AL, MS, FL, LA, AR, OK, TX. West = NM, CO, WY, MT, ID, UT, AZ, NV, CA, OR, WA, AK, HI.

[3]Coastal regions include counties bordering the 3 coasts (Pacific, Atlantic, and Gulf of Mexico) and the Great Lakes and estuaries and bays. Additionally, any county that did not directly border a coast, but the central point was within 25 miles of a coast was defined as coastal. The inland regions are the remaining counties in each of the 4 Census Regions.

Table E-15. Total freshwater and estuarine trophic level 4 finfish and shellfish usual fish consumption rate estimates (g/day), raw weight, edible portion (continued)

Freshwater + Estuarine Trophic Level 4 Finfish and Shellfish	Mean (95% CI)	Percentile (95% CI)						
		25th	50th	75th	90th	95th	97th	99th
Youth, Atlantic	1.1 (0.5,2.7)	0.0 (0.0,0.1)	0.2 (0.1,0.4)	0.8 (0.4,1.4)	2.4 (1.3,4.3)	4.6 (2.5,8.5)	7.0 (3.7,13.5)	15.3 (6.5,35.8)
Youth, Gulf of Mexico	1.3 (0.7,2.5)	0.1 (0.0,0.2)	0.3 (0.1,0.5)	0.9 (0.5,1.8)	2.8 (1.5,5.2)	5.4 (3.0,9.8)	8.1 (4.5,14.5)	15.7 (7.7,32.0)
Youth, Great Lakes	1.6 (0.5,5.3)	0.0 (0.0,0.1)	0.2 (0.1,0.5)	0.8 (0.3,2.2)	2.8 (1.0,7.8)	5.7 (2.0,16.7)	9.1 (3.0,27.9)	22.6 (6.5,78.6)
Youth, Inland Northeast	0.4 (0.1,1.5)	0.0 (0.0,0.0)	0.1 (0.0,0.2)	0.2 (0.1,0.6)	0.8 (0.3,2.1)	1.7 (0.6,4.9)	2.7 (0.8,8.8)	6.0 (1.3,28.0)
Youth, Inland Midwest	1.2 (0.5,3.0)	0.0 (0.0,0.1)	0.2 (0.0,0.6)	0.7 (0.2,2.4)	2.3 (0.7,6.9)	4.5 (1.6,12.5)	6.8 (2.6,17.9)	15.7 (6.5,37.9)
Youth, Inland South	1.0 (0.6,1.6)	0.0 (0.0,0.1)	0.2 (0.1,0.3)	0.7 (0.4,1.1)	2.1 (1.3,3.3)	3.9 (2.4,6.4)	5.9 (3.5,9.9)	12.7 (7.2,22.4)
Youth, Inland West	0.7 (0.4,1.3)	0.0 (0.0,0.1)	0.2 (0.1,0.3)	0.5 (0.3,0.9)	1.6 (0.9,2.7)	3.0 (1.7,5.2)	4.4 (2.5,7.8)	9.1 (4.6,18.0)
Adults, Pacific	2.8 (1.7,4.5)	0.2 (0.1,0.4)	0.7 (0.5,1.1)	2.2 (1.5,3.1)	5.9 (3.9,8.7)	10.5 (6.6,16.7)	15.6 (9.1,26.5)	33.8 (17.1,66.9)
Adults, Atlantic	2.6 (1.9,3.6)	0.2 (0.1,0.4)	0.8 (0.5,1.1)	2.2 (1.7,3.0)	5.8 (4.3,7.8)	10.2 (7.4,13.9)	14.7 (10.5,20.7)	28.8 (19.6,42.5)
Adults, Gulf of Mexico	2.5 (1.7,3.6)	0.2 (0.1,0.4)	0.7 (0.5,1.2)	2.1 (1.5,3.0)	5.4 (3.8,7.7)	9.7 (6.7,14.2)	13.8 (9.1,20.9)	28.1 (17.1,46.1)
Adults, Great Lakes	1.9 (1.1,3.2)	0.1 (0.1,0.3)	0.5 (0.2,0.9)	1.5 (0.9,2.5)	4.0 (2.5,6.5)	7.3 (4.5,11.9)	10.9 (6.6,18.3)	22.9 (12.8,41.0)
Adults, Inland Northeast	1.3 (1.0,1.9)	0.1 (0.1,0.2)	0.4 (0.3,0.6)	1.2 (0.8,1.7)	3.1 (2.2,4.4)	5.3 (3.7,7.6)	7.5 (5.1,10.9)	14.6 (9.7,22.1)
Adults, Inland Midwest	2.3 (1.4,3.9)	0.2 (0.1,0.4)	0.6 (0.3,1.2)	1.8 (1.0,3.4)	5.1 (3.0,8.8)	9.3 (5.5,15.7)	13.5 (8.1,22.5)	27.8 (16.4,46.9)
Adults, Inland South	2.8 (2.0,3.8)	0.2 (0.1,0.4)	0.7 (0.5,1.1)	2.3 (1.7,3.1)	6.1 (4.6,8.1)	10.9 (8.1,14.8)	15.8 (11.5,21.9)	32.5 (22.0,48.0)
Adults, Inland West	2.0 (1.2,3.1)	0.2 (0.1,0.3)	0.6 (0.5,0.9)	1.7 (1.3,2.4)	4.3 (3.0,6.3)	7.4 (4.7,11.7)	10.7 (6.4,17.8)	20.9 (10.9,40.3)

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[2]US Regions are the U.S. Census Bureau regions. Midwest = OH, MI, IN, WI, IL, MO, IA, MN, SD, ND, NE, KS. Northeast = PA, NY, NJ, CT, RI, MA, NH, VT, ME. South = DE, MD, DC, VA, WV, KY, TN, NC, SC, GA, AL, MS, FL, LA, AR, OK, TX. West = NM, CO, WY, MT, ID, UT, AZ, NV, CA, OR, WA, AK, HI.

[3]Coastal regions include counties bordering the 3 coasts (Pacific, Atlantic, and Gulf of Mexico) and the Great Lakes and estuaries and bays. Additionally, any county that did not directly border a coast, but the central point was within 25 miles of a coast was defined as coastal. The inland regions are the remaining counties in each of the 4 Census Regions.

Appendix E: Comparison of Criteria at Various Risk Scenarios

Table E-1. Comparison and Average of 50% Percentile Results from 3 Simulations

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 50th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ
1,1,1-Trichloroethane	NA	3.82E+01	NA	5.26E+02	NA	3.83E+01	NA	5.26E+02	NA	3.82E+01	NA	5.27E+02	NA!	38237.18	NA	5.26E+05
1,1,2,2-Tetrachloroethane	4.88E-04	3.90E-01	7.94E-03	6.35E+00	4.87E-04	3.90E-01	7.95E-03	6.36E+00	4.87E-04	3.90E-01	7.97E-03	6.37E+00	0.49	389.89	7.95E+00	6.36E+03
1,1,2-Trichloroethane	1.70E-03	7.76E-02	2.64E-02	1.21E+00	1.70E-03	7.76E-02	2.64E-02	1.21E+00	1.70E-03	7.75E-02	2.65E-02	1.21E+00	1.70	77.57	2.65E+01	1.21E+03
1,1-Dichloroethylene	NA	1.04E+00	NA	4.83E+01	NA	1.04E+00	NA	4.84E+01	NA	1.04E+00	NA	4.84E+01	NA	1040.05	NA	4.84E+04
1,2,4-Trichlorobenzene	2.16E-04	1.25E-02	2.37E-04	1.37E-02	2.16E-04	1.25E-02	2.38E-04	1.38E-02	2.16E-04	1.25E-02	2.38E-04	1.38E-02	0.22	12.53	2.38E-01	1.38E+01
1,2-Dichlorobenzene	NA	3.35E+00	NA	1.00E+01	NA	3.35E+00	NA	1.01E+01	NA	3.34E+00	NA	1.01E+01	NA	3346.71	NA	1.01E+04
1,2-Dichloroethane	3.17E-02	1.63E+00	1.92E+00	9.90E+01	3.18E-02	1.64E+00	1.93E+00	9.92E+01	3.18E-02	1.63E+00	1.93E+00	9.93E+01	31.77	1635.39	1.93E+03	9.92E+04
1,2-Dichloropropane	2.84E-03	1.83E+00	9.16E-02	5.89E+01	2.85E-03	1.83E+00	9.17E-02	5.89E+01	2.85E-03	1.83E+00	9.18E-02	5.90E+01	2.85	1830.22	9.17E+01	5.90E+04
1,2-Diphenylhydrazine	1.01E-04	NA	6.18E-04	NA	1.01E-04	NA	6.19E-04	NA	1.01E-04	NA	6.21E-04	NA	0.10	NA	6.19E-01	NA
1,3-Dichlorobenzene	NA	1.84E-02	NA	4.58E-02	NA	1.84E-02	NA	4.58E-02	NA	1.84E-02	NA	4.58E-02	NA	18.38	NA	4.58E+01
1,3-Dichloropropene	8.48E-04	5.17E-01	3.48E-02	2.12E+01	8.50E-04	5.18E-01	3.48E-02	2.12E+01	8.48E-04	5.17E-01	3.49E-02	2.13E+01	0.85	517.64	3.48E+01	2.12E+04
1,4-Dichlorobenzene	NA	8.41E-01	NA	2.83E+00	NA	8.43E-01	NA	2.83E+00	NA	8.37E-01	NA	2.83E+00	NA	840.49	NA	2.83E+03
2,4,6-Trichlorophenol	3.78E-03	8.32E-03	8.34E-03	1.84E-02	3.79E-03	8.33E-03	8.35E-03	1.84E-02	3.78E-03	8.32E-03	8.37E-03	1.84E-02	3.78	8.33	8.36E+00	1.84E+01
2,4-Dichlorophenol	NA	4.12E-02	NA	1.70E-01	NA	4.13E-02	NA	1.70E-01	NA	4.10E-02	NA	1.70E-01	NA	41.16	NA	1.70E+02
2,4-Dimethylphenol	NA	3.96E-01	NA	7.58E+00	NA	3.96E-01	NA	7.59E+00	NA	3.96E-01	NA	7.60E+00	NA	395.96	NA	7.59E+03
2,4-Dinitrophenol	NA	4.05E-02	NA	1.31E+00	NA	4.06E-02	NA	1.30E+00	NA	4.06E-02	NA	1.30E+00	NA	40.58	NA	1.30E+03
2,4-Dinitrotoluene	1.54E-04	4.10E-02	5.00E-03	1.33E+00	1.54E-04	4.11E-02	5.00E-03	1.33E+00	1.54E-04	4.10E-02	5.01E-03	1.34E+00	0.15	41.01	5.00E+00	1.34E+03
2-Chloronaphthalene	NA	2.03E+00	NA	3.66E+00	NA	2.04E+00	NA	3.66E+00	NA	2.03E+00	NA	3.67E+00	NA	2032.90	NA	3.66E+03
2-Chlorophenol	NA	1.01E-01	NA	2.43E+00	NA	1.01E-01	NA	2.44E+00	NA	1.01E-01	NA	2.44E+00	NA	100.76	NA	2.44E+03
2-Methyl-4,6-Dinitrophenol	NA	5.74E-03	NA	7.96E-02	NA	5.74E-03	NA	7.97E-02	NA	5.74E-03	NA	7.99E-02	NA	5.74	NA	7.97E+01
3,3'-Dichlorobenzidine	1.33E-04	NA	4.40E-04	NA	1.34E-04	NA	4.41E-04	NA	1.33E-04	NA	4.42E-04	NA	0.13	NA	4.41E-01	NA
3-Methyl-4-Chlorophenol	NA	1.47E+00	NA	6.99E+00	NA	1.47E+00	NA	7.00E+00	NA	1.47E+00	NA	7.02E+00	NA	1470.17	NA	7.01E+03

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 50th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ
Acenaphthene	NA	2.34E-01	NA	3.39E-01	NA	2.34E-01	NA	3.36E-01	NA	2.34E-01	NA	3.38E-01	NA	234.19	NA	3.37E+02
Acrolein	NA	1.06E-02	NA	1.44E+00	NA	1.06E-02	NA	1.43E+00	NA	1.06E-02	NA	1.44E+00	NA	10.61	NA	1.43E+03
Acrylonitrile	1.96E-04	NA	2.66E-02	NA	1.97E-04	NA	2.65E-02	NA	1.97E-04	NA	2.66E-02	NA	0.20	NA	2.66E+01	NA
Aldrin	2.69E-09	2.74E-07	2.70E-09	2.76E-07	2.69E-09	2.74E-07	2.70E-09	2.75E-07	2.71E-09	2.76E-07	2.69E-09	2.75E-07	0.00	0.00	2.70E-06	2.75E-04
alpha-Endosulfan	NA	4.18E-02	NA	8.03E-02	NA	4.19E-02	NA	8.04E-02	NA	4.19E-02	NA	8.06E-02	NA	41.87	NA	8.04E+01
alpha-Hexachlorocyclohexane (HCH)	1.05E-06	1.06E-02	1.16E-06	1.17E-02	1.05E-06	1.06E-02	1.16E-06	1.17E-02	1.05E-06	1.06E-02	1.17E-06	1.17E-02	0.00	10.59	1.16E-03	1.17E+01
Anthracene	NA	1.03E+00	NA	1.42E+00	NA	1.03E+00	NA	1.41E+00	NA	1.03E+00	NA	1.41E+00	NA	1033.42	NA	1.41E+03
Benzene Low	1.84E-03	1.01E-02	4.72E-02	2.59E-01	1.84E-03	1.01E-02	4.72E-02	2.60E-01	1.84E-03	1.01E-02	4.73E-02	2.60E-01	1.84	10.12	4.72E+01	2.60E+02
Benzidine	4.57E-07	6.31E-02	3.11E-05	4.30E+00	4.58E-07	6.31E-02	3.12E-05	4.31E+00	4.57E-07	6.31E-02	3.12E-05	4.31E+00	0.00	63.10	3.12E-02	4.31E+03
Benzo(a)anthracene	4.78E-06	NA	5.05E-06	NA	4.80E-06	NA	5.02E-06	NA	4.79E-06	NA	5.04E-06	NA	0.00	NA	5.04E-03	NA
Benzo(a)pyrene	4.78E-07	NA	5.05E-07	NA	4.80E-07	NA	5.02E-07	NA	4.79E-07	NA	5.04E-07	NA	0.00	NA	5.04E-04	NA
Benzo(b)fluoranthene	4.78E-06	NA	5.05E-06	NA	4.80E-06	NA	5.02E-06	NA	4.79E-06	NA	5.04E-06	NA	0.00	NA	5.04E-03	NA
Benzo(k)fluoranthene	4.78E-05	NA	5.05E-05	NA	4.80E-05	NA	5.02E-05	NA	4.79E-05	NA	5.04E-05	NA	0.05	NA	5.04E-02	NA
beta-Endosulfan	NA	5.42E-02	NA	1.29E-01	NA	5.44E-02	NA	1.29E-01	NA	5.42E-02	NA	1.30E-01	NA	54.26	NA	1.29E+02
beta-Hexachlorocyclohexane (HCH)	2.08E-05	NA	4.23E-05	NA	2.09E-05	NA	4.23E-05	NA	2.09E-05	NA	4.24E-05	NA	0.02	NA	4.23E-02	NA
Bis(2-Chloro-1-Methylethyl) Ether	NA	7.66E-01	NA	1.07E+01	NA	7.66E-01	NA	1.07E+01	NA	7.66E-01	NA	1.08E+01	NA	766.13	NA	1.07E+04
Bis(2-Chloroethyl) Ether	9.55E-05	NA	6.51E-03	NA	9.57E-05	NA	6.53E-03	NA	9.56E-05	NA	6.53E-03	NA	0.10	NA	6.52E+00	NA
Bis(2-Ethylhexyl) Phthalate	1.10E-03	1.85E-01	1.45E-03	2.43E-01	1.10E-03	1.85E-01	1.44E-03	2.42E-01	1.10E-03	1.85E-01	1.44E-03	2.43E-01	1.10	184.88	1.44E+00	2.42E+02
Bromoform	2.16E-02	5.84E-01	3.48E-01	9.40E+00	2.16E-02	5.84E-01	3.48E-01	9.41E+00	2.16E-02	5.84E-01	3.49E-01	9.43E+00	21.63	584.02	3.48E+02	9.41E+03
Butylbenzyl Phthalate	3.93E-04	1.94E-01	3.99E-04	1.97E-01	3.94E-04	1.95E-01	3.96E-04	1.96E-01	3.94E-04	1.94E-01	3.98E-04	1.96E-01	0.39	194.46	3.97E-01	1.96E+02
Carbon Tetrachloride	1.31E-03	7.35E-02	1.39E-02	7.78E-01	1.31E-03	7.35E-02	1.39E-02	7.78E-01	1.31E-03	7.35E-02	1.39E-02	7.80E-01	1.31	73.49	1.39E+01	7.79E+02
Chlordane	1.01E-06	3.55E-05	1.02E-06	3.57E-05	1.01E-06	3.55E-05	1.02E-06	3.58E-05	1.02E-06	3.58E-05	1.02E-06	3.58E-05	0.00	0.04	1.02E-03	3.58E-02
Chlorobenzene	NA	3.40E-01	NA	2.50E+00	NA	3.40E-01	NA	2.50E+00	NA	3.40E-01	NA	2.51E+00	NA	340.27	NA	2.50E+03

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 50th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ
Chlorodibromomethane	2.52E-03	4.03E-01	6.16E-02	9.85E+00	2.52E-03	4.04E-01	6.16E-02	9.86E+00	2.52E-03	4.03E-01	6.18E-02	9.88E+00	2.52	403.40	6.17E+01	9.87E+03
Chloroform	NA	2.05E-01	NA	6.80E+00	NA	2.05E-01	NA	6.80E+00	NA	2.05E-01	NA	6.81E+00	NA	205.18	NA	6.81E+03
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	NA	3.86E-01	NA	1.59E+00	NA	3.87E-01	NA	1.58E+00	NA	3.87E-01	NA	1.58E+00	NA	386.53	NA	1.58E+03
Chlorophenoxy Herbicide (2,4-D)	NA	3.80E+00	NA	4.65E+01	NA	3.81E+00	NA	4.62E+01	NA	3.82E+00	NA	4.64E+01	NA	3810.99	NA	4.63E+04
Chrysene	4.78E-04	NA	5.05E-04	NA	4.80E-04	NA	5.02E-04	NA	4.79E-04	NA	5.04E-04	NA	0.48	NA	5.04E-01	NA
Cyanide	NA	1.27E-02	NA	1.73E+00	NA	1.27E-02	NA	1.71E+00	NA	1.27E-02	NA	1.72E+00	NA!	12.73	NA	1.72E+03
Dibenzo(a,h)anthracene	4.78E-07	NA	5.05E-07	NA	4.80E-07	NA	5.02E-07	NA	4.79E-07	NA	5.04E-07	NA	0.00	NA	5.04E-04	NA
Dichlorobromomethane	2.98E-03	6.09E-02	8.00E-02	1.63E+00	2.99E-03	6.09E-02	8.01E-02	1.63E+00	2.98E-03	6.08E-02	8.03E-02	1.64E+00	2.98	60.87	8.02E+01	1.64E+03
Dieldrin	4.30E-09	6.88E-07	4.32E-09	6.91E-07	4.30E-09	6.88E-07	4.32E-09	6.91E-07	4.33E-09	6.93E-07	4.32E-09	6.90E-07	0.00	0.00	4.32E-06	6.91E-04
Diethyl Phthalate	NA	2.02E+00	NA	2.50E+00	NA	2.02E+00	NA	2.49E+00	NA	2.02E+00	NA	2.50E+00	NA	2019.51	NA	2.49E+03
Dimethyl Phthalate	NA	6.82E+00	NA	7.19E+00	NA	6.85E+00	NA	7.15E+00	NA	6.83E+00	NA	7.18E+00	NA	6831.13	NA	7.17E+03
Di-n-Butyl Phthalate	NA	9.23E-02	NA	9.92E-02	NA	9.27E-02	NA	9.86E-02	NA	9.24E-02	NA	9.90E-02	NA	92.47	NA	9.89E+01
Endosulfan Sulfate	NA	5.19E-02	NA	1.19E-01	NA	5.20E-02	NA	1.19E-01	NA	5.19E-02	NA	1.19E-01	NA	51.91	NA	1.19E+02
Endrin	NA	1.06E-04	NA	1.06E-04	NA	1.06E-04	NA	1.06E-04	NA	1.06E-04	NA	1.07E-04	NA	0.11	NA	1.07E-01
Endrin Aldehyde	NA	2.97E-03	NA	3.66E-03	NA	2.98E-03	NA	3.66E-03	NA	2.99E-03	NA	3.66E-03	NA	2.98	NA	3.66E+00
Ethylbenzene	NA	1.76E-01	NA	3.77E-01	NA	1.77E-01	NA	3.77E-01	NA	1.77E-01	NA	3.79E-01	NA	176.53	NA	3.78E+02
Fluoranthene	NA	6.70E-02	NA	7.67E-02	NA	6.73E-02	NA	7.62E-02	NA	6.70E-02	NA	7.65E-02	NA	67.07	NA	7.65E+01
Fluorene	NA	1.53E-01	NA	2.14E-01	NA	1.53E-01	NA	2.14E-01	NA	1.53E-01	NA	2.15E-01	NA	152.87	NA	2.14E+02
gamma-Hexachlorocyclohexane (HCH)	NA	1.22E-02	NA	1.32E-02	NA	1.22E-02	NA	1.32E-02	NA	1.22E-02	NA	1.32E-02	NA	12.22	NA	1.32E+01
Heptachlor	2.00E-08	1.64E-06	2.01E-08	1.65E-06	2.00E-08	1.64E-06	2.01E-08	1.65E-06	2.02E-08	1.65E-06	2.01E-08	1.65E-06	0.00	0.00	2.01E-05	1.65E-03
Heptachlor Epoxide	1.02E-07	1.46E-06	1.03E-07	1.47E-06	1.02E-07	1.46E-06	1.03E-07	1.48E-06	1.03E-07	1.47E-06	1.03E-07	1.48E-06	0.00	0.00	1.03E-04	1.48E-03
Hexachlorobenzene	2.53E-07	4.13E-05	2.55E-07	4.16E-05	2.54E-07	4.14E-05	2.55E-07	4.16E-05	2.55E-07	4.17E-05	2.55E-07	4.17E-05	0.00	0.04	2.55E-04	4.16E-02
Hexachlorobutadiene	3.73E-05	8.95E-05	3.79E-05	9.10E-05	3.72E-05	8.94E-05	3.78E-05	9.07E-05	3.71E-05	8.90E-05	3.80E-05	9.12E-05	0.04	0.09	3.79E-02	9.10E-02

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 50th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ	Cancer Risk 10-6	Non-cancer HQ
Hexachlorocyclopentadiene	NA	1.03E-02	NA	1.18E-02	NA	1.03E-02	NA	1.18E-02	NA	1.03E-02	NA	1.18E-02	NA!	10.29	NA	1.18E+01
Hexachloroethane	3.56E-04	2.00E-03	4.54E-04	2.54E-03	3.57E-04	2.00E-03	4.54E-04	2.54E-03	3.56E-04	2.00E-03	4.56E-04	2.55E-03	0.36	2.00	4.55E-01	2.55E+00
Indeno(1,2,3-cd)pyrene	4.78E-06	NA	5.05E-06	NA	4.80E-06	NA	5.02E-06	NA	4.79E-06	NA	5.04E-06	NA	0.00	NA	5.04E-03	NA
Isophorone	1.10E-01	4.17E+00	5.48E+00	2.08E+02	1.10E-01	4.17E+00	5.49E+00	2.08E+02	1.10E-01	4.17E+00	5.49E+00	2.09E+02	109.72	4169.25	5.48E+03	2.08E+05
Methoxychlor	NA	4.96E-05	NA	5.20E-05	NA	4.97E-05	NA	5.20E-05	NA	4.99E-05	NA	5.22E-05	NA	0.05	NA	5.21E-02
Methyl Bromide	NA	4.22E-01	NA	3.46E+01	NA	4.23E-01	NA	3.46E+01	NA	4.22E-01	NA	3.47E+01	NA	422.20	NA	3.46E+04
Methylene Chloride	5.26E-02	1.26E-01	3.74E+00	8.97E+00	5.27E-02	1.26E-01	3.75E+00	8.99E+00	5.26E-02	1.26E-01	3.75E+00	9.00E+00	52.63	126.31	3.74E+03	8.99E+03
Nitrobenzene	NA	4.14E-02	NA	1.66E+00	NA	4.14E-02	NA	1.66E+00	NA	4.13E-02	NA	1.66E+00	NA	41.38	NA	1.66E+03
p,p'-Dichlorodiphenyldichloroethane (DDD)	4.02E-07	9.65E-06	4.04E-07	9.69E-06	4.03E-07	9.66E-06	4.04E-07	9.69E-06	4.05E-07	9.71E-06	4.04E-07	9.70E-06	0.00	0.01	4.04E-04	9.69E-03
p,p'-Dichlorodiphenyldichloroethylene (DDE)	6.17E-08	1.03E-06	6.19E-08	1.03E-06	6.16E-08	1.03E-06	6.19E-08	1.03E-06	6.20E-08	1.04E-06	6.19E-08	1.03E-06	0.00	0.00	6.19E-05	1.03E-03
p,p'-Dichlorodiphenyltrichloroethane (DDT)	1.19E-07	4.06E-06	1.20E-07	4.07E-06	1.19E-07	4.05E-06	1.20E-07	4.07E-06	1.20E-07	4.08E-06	1.20E-07	4.07E-06	0.00	0.00	1.20E-04	4.07E-03
Pentachlorophenol	7.08E-05	2.83E-02	1.21E-04	4.86E-02	7.06E-05	2.83E-02	1.21E-04	4.86E-02	7.09E-05	2.84E-02	1.21E-04	4.86E-02	0.07	28.31	1.21E-01	4.86E+01
Phenol	NA	1.26E+01	NA	7.98E+02	NA	1.26E+01	NA	8.00E+02	NA	1.26E+01	NA	8.00E+02	NA	12593.19	NA	7.99E+05
Pyrene	NA	7.99E-02	NA	1.00E-01	NA	7.99E-02	NA	9.97E-02	NA	7.99E-02	NA	1.00E-01	NA	79.88	NA	1.00E+02
Tetrachloroethylene (Perchloroethylene)	2.74E-02	6.91E-02	8.55E-02	2.15E-01	2.75E-02	6.92E-02	8.55E-02	2.16E-01	2.73E-02	6.88E-02	8.58E-02	2.16E-01	27.39	69.03	8.56E+01	2.16E+02
Toluene	NA	1.73E-01	NA	1.54E+00	NA	1.73E-01	NA	1.54E+00	NA	1.73E-01	NA	1.55E+00	NA	172.76	NA	1.55E+03
Toxaphene	2.10E-06	1.62E-04	2.17E-06	1.67E-04	2.10E-06	1.62E-04	2.18E-06	1.68E-04	2.11E-06	1.63E-04	2.18E-06	1.68E-04	0.00	0.16	2.18E-03	1.68E-01
trans-1,2-Dichloroethylene (DCE)	NA	4.06E-01	NA	1.12E+01	NA	4.07E-01	NA	1.12E+01	NA	4.06E-01	NA	1.12E+01	NA	406.34	NA	1.12E+04
Trichloroethylene (TCE)	1.85E-03	9.25E-03	2.02E-02	1.01E-01	1.85E-03	9.25E-03	2.02E-02	1.01E-01	1.85E-03	9.25E-03	2.02E-02	1.01E-01	1.85	9.25	2.02E+01	1.01E+02
Vinyl Chloride	7.01E-05	6.31E-02	4.77E-03	4.30E+00	7.02E-05	6.31E-02	4.79E-03	4.31E+00	7.01E-05	6.31E-02	4.79E-03	4.31E+00	0.07	63.10	4.78E+00	4.31E+03

Table E-2: Comparison and Average of 90% Percentile Results from 3 Simulations

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 90th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ
1,1,1-Trichloroethane	NA	1.14E+01	NA	1.75E+02	NA	1.14E+01	NA	1.74E+02	NA	1.14E+01	NA	1.75E+02	NA	11395.64	NA	1.75E+05
1,1,2,2-Tetrachloroethane	1.43E-03	1.15E-01	2.64E-02	2.11E+00	1.44E-03	1.15E-01	2.63E-02	2.10E+00	1.43E-03	1.15E-01	2.64E-02	2.11E+00	1.43	114.74	2.63E+01	2.11E+03
1,1,2-Trichloroethane	5.02E-03	2.29E-02	8.77E-02	4.00E-01	5.03E-03	2.29E-02	8.74E-02	3.98E-01	5.02E-03	2.29E-02	8.78E-02	4.00E-01	5.02	22.90	8.76E+01	4.00E+02
1,1-Dichloroethylene	NA	2.93E-01	NA	1.61E+01	NA	2.94E-01	NA	1.61E+01	NA	2.94E-01	NA	1.61E+01	NA	293.39	NA	1.61E+04
1,2,4-Trichlorobenzene	7.44E-04	4.32E-03	7.69E-04	4.46E-03	7.40E-04	4.29E-03	7.68E-04	4.45E-03	7.43E-04	4.31E-03	7.66E-04	4.44E-03	0.74	4.31	7.67E-01	4.45E+00
1,2-Dichlorobenzene	NA	1.30E+00	NA	3.33E+00	NA	1.29E+00	NA	3.31E+00	NA	1.29E+00	NA	3.33E+00	NA	1292.30	NA	3.32E+03
1,2-Dichloroethane	8.90E-02	4.58E-01	6.42E+00	3.30E+01	8.92E-02	4.59E-01	6.41E+00	3.30E+01	8.92E-02	4.59E-01	6.44E+00	3.31E+01	89.13	458.85	6.42E+03	3.31E+04
1,2-Dichloropropane	8.10E-03	5.20E-01	3.05E-01	1.96E+01	8.12E-03	5.22E-01	3.04E-01	1.96E+01	8.11E-03	5.21E-01	3.06E-01	1.96E+01	8.11	521.21	3.05E+02	1.96E+04
1,2-Diphenylhydrazine	3.32E-04	NA	2.05E-03	NA	3.33E-04	NA	2.05E-03	NA	3.32E-04	NA	2.06E-03	NA	0.33	NA	2.05E+00	NA
1,3-Dichlorobenzene	NA	7.27E-03	NA	1.39E-02	NA	7.25E-03	NA	1.39E-02	NA	7.20E-03	NA	1.39E-02	NA	7.24	NA	1.39E+01
1,3-Dichloropropene	2.40E-03	1.46E-01	1.16E-01	7.05E+00	2.40E-03	1.47E-01	1.15E-01	7.05E+00	2.40E-03	1.47E-01	1.16E-01	7.07E+00	2.40	146.46	1.16E+02	7.06E+03
1,4-Dichlorobenzene	NA	3.15E-01	NA	9.08E-01	NA	3.15E-01	NA	9.10E-01	NA	3.14E-01	NA	9.10E-01	NA!	314.53	NA	9.09E+02
2,4,6-Trichlorophenol	1.56E-02	3.43E-03	2.76E-02	6.07E-03	1.56E-02	3.43E-03	2.75E-02	6.06E-03	1.55E-02	3.42E-03	2.76E-02	6.08E-03	15.58	3.43	2.76E+01	6.07E+00
2,4-Dichlorophenol	NA	1.47E-02	NA	5.63E-02	NA	1.47E-02	NA	5.61E-02	NA	1.46E-02	NA	5.63E-02	NA	14.67	NA	5.62E+01
2,4-Dimethylphenol	NA	1.15E-01	NA	2.52E+00	NA	1.15E-01	NA	2.51E+00	NA	1.15E-01	NA	2.52E+00	NA	115.32	NA	2.52E+03
2,4-Dinitrophenol	NA	1.16E-02	NA	2.98E-01	NA	1.17E-02	NA	2.97E-01	NA	1.17E-02	NA	2.94E-01	NA	11.65	NA	2.96E+02
2,4-Dinitrotoluene	4.37E-04	1.17E-02	1.66E-02	4.44E-01	4.38E-04	1.17E-02	1.66E-02	4.43E-01	4.38E-04	1.17E-02	1.67E-02	4.45E-01	0.44	11.67	1.66E+01	4.44E+02
2-Chloronaphthalene	NA	8.52E-01	NA	1.21E+00	NA	8.49E-01	NA	1.21E+00	NA	8.46E-01	NA	1.21E+00	NA	849.23	NA	1.21E+03
2-Chlorophenol	NA	2.90E-02	NA	8.09E-01	NA	2.90E-02	NA	8.06E-01	NA	2.90E-02	NA	8.10E-01	NA	29.01	NA	8.08E+02
2-Methyl-4,6-Dinitrophenol	NA	1.71E-03	NA	2.64E-02	NA	1.71E-03	NA	2.63E-02	NA	1.71E-03	NA	2.65E-02	NA	1.71	NA	2.64E+01
3,3'-Dichlorobenzidine	5.03E-04	NA	1.46E-03	NA	5.03E-04	NA	1.45E-03	NA	5.00E-04	NA	1.46E-03	NA	0.50	NA	1.46E+00	NA
3-Methyl-4-Chlorophenol	NA	5.07E-01	NA	2.32E+00	NA	5.09E-01	NA	2.31E+00	NA	5.06E-01	NA	2.32E+00	NA	507.28	NA	2.32E+03

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 90th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ
Acenaphthene	NA	6.93E-02	NA	7.70E-02	NA	6.96E-02	NA	7.68E-02	NA	6.97E-02	NA	7.62E-02	NA	69.55	NA	7.66E+01
Acrolein	NA	2.95E-03	NA	3.27E-01	NA	2.95E-03	NA	3.26E-01	NA	2.95E-03	NA	3.24E-01	NA	2.95	NA	3.26E+02
Acrylonitrile	5.46E-04	NA	6.06E-02	NA	5.47E-04	NA	6.04E-02	NA	5.47E-04	NA	5.99E-02	NA	0.55	NA!	6.03E+01	NA
Aldrin	7.30E-09	7.44E-08	7.29E-09	7.44E-08	7.24E-09	7.39E-08	7.30E-09	7.45E-08	7.29E-09	7.43E-08	7.25E-09	7.40E-08	0.00	0.00	7.28E-06	7.43E-05
alpha-Endosulfan	NA	1.75E-02	NA	2.67E-02	NA	1.76E-02	NA	2.66E-02	NA	1.74E-02	NA	2.67E-02	NA	17.51	NA	2.66E+01
alpha-Hexachlorocyclohexane (HCH)	3.71E-06	3.74E-03	3.85E-06	3.88E-03	3.68E-06	3.71E-03	3.83E-06	3.86E-03	3.70E-06	3.73E-03	3.84E-06	3.87E-03	0.00	3.73	3.84E-03	3.87E+00
Anthracene	NA	2.95E-01	NA	3.22E-01	NA	2.96E-01	NA	3.21E-01	NA	2.97E-01	NA	3.18E-01	NA	295.84	NA	3.20E+02
Benzene Low	5.28E-03	2.90E-03	1.57E-01	8.63E-02	5.29E-03	2.91E-03	1.57E-01	8.61E-02	5.28E-03	2.91E-03	1.57E-01	8.65E-02	5.28	2.91	1.57E+02	8.63E+01
Benzidine	1.28E-06	1.76E-02	1.04E-04	1.43E+00	1.28E-06	1.77E-02	1.04E-04	1.43E+00	1.28E-06	1.77E-02	1.04E-04	1.44E+00	0.00	17.66	1.04E-01	1.43E+03
Benzo(a)anthracene	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.14E-05	NA	0.01	NA	1.14E-02	NA
Benzo(a)pyrene	1.13E-06	NA	1.15E-06	NA	1.13E-06	NA	1.15E-06	NA	1.13E-06	NA	1.14E-06	NA	0.00	NA	1.14E-03	NA
Benzo(b)fluoranthene	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.14E-05	NA	0.01	NA	1.14E-02	NA
Benzo(k)fluoranthene	1.13E-04	NA	1.15E-04	NA	1.13E-04	NA	1.15E-04	NA	1.13E-04	NA	1.14E-04	NA	0.11	NA	1.14E-01	NA
beta-Endosulfan	NA	2.21E-02	NA	4.27E-02	NA	2.21E-02	NA	4.26E-02	NA	2.20E-02	NA	4.27E-02	NA	22.05	NA	4.27E+01
beta-Hexachlorocyclohexane (HCH)	8.70E-05	NA	1.40E-04	NA	8.72E-05	NA	1.40E-04	NA	8.65E-05	NA	1.40E-04	NA	0.09	NA	1.40E-01	NA
Bis(2-Chloro-1-Methylethyl) Ether	NA	2.28E-01	NA	3.56E+00	NA	2.28E-01	NA	3.55E+00	NA	2.28E-01	NA	3.56E+00	NA	228.07	NA	3.56E+03
Bis(2-Chloroethyl) Ether	2.67E-04	NA	2.17E-02	NA	2.68E-04	NA	2.17E-02	NA	2.68E-04	NA	2.18E-02	NA	0.27	NA	2.17E+01	NA
Bis(2-Ethylhexyl) Phthalate	3.05E-03	5.13E-02	3.29E-03	5.53E-02	3.06E-03	5.14E-02	3.28E-03	5.51E-02	3.07E-03	5.16E-02	3.26E-03	5.47E-02	3.06	51.43	3.28E+00	5.51E+01
Bromoform	6.37E-02	1.72E-01	1.15E+00	3.12E+00	6.38E-02	1.72E-01	1.15E+00	3.11E+00	6.37E-02	1.72E-01	1.16E+00	3.12E+00	63.71	172.03	1.15E+03	3.12E+03
Butylbenzyl Phthalate	8.99E-04	4.44E-02	9.07E-04	4.48E-02	9.01E-04	4.45E-02	9.04E-04	4.46E-02	9.03E-04	4.46E-02	8.97E-04	4.43E-02	0.90	44.52	9.02E-01	4.46E+01
Carbon Tetrachloride	4.01E-03	2.25E-02	4.60E-02	2.57E-01	4.01E-03	2.25E-02	4.58E-02	2.57E-01	4.00E-03	2.24E-02	4.61E-02	2.58E-01	4.01	22.44	4.59E+01	2.57E+02
Chlordane	3.04E-06	1.06E-05	3.03E-06	1.06E-05	3.02E-06	1.06E-05	3.03E-06	1.06E-05	3.02E-06	1.06E-05	3.02E-06	1.06E-05	0.00	0.01	3.03E-03	1.06E-02
Chlorobenzene	NA	1.09E-01	NA	8.26E-01	NA	1.09E-01	NA	8.23E-01	NA	1.09E-01	NA	8.27E-01	NA!	108.71	NA	8.26E+02

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 90th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ
Chlorodibromomethane	7.25E-03	1.16E-01	2.05E-01	3.28E+00	7.26E-03	1.16E-01	2.04E-01	3.27E+00	7.25E-03	1.16E-01	2.05E-01	3.28E+00	7.26	116.08	2.05E+02	3.28E+03
Chloroform	NA	5.83E-02	NA	2.26E+00	NA	5.85E-02	NA	2.26E+00	NA	5.84E-02	NA	2.27E+00	NA	58.39	NA	2.26E+03
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	NA	1.44E-01	NA	3.61E-01	NA	1.44E-01	NA	3.60E-01	NA	1.43E-01	NA	3.57E-01	NA	143.57	NA	3.59E+02
Chlorophenoxy Herbicide (2,4-D)	NA	1.18E+00	NA	1.06E+01	NA	1.18E+00	NA	1.05E+01	NA	1.18E+00	NA	1.05E+01	NA	1179.31	NA	1.05E+04
Chrysene	1.13E-03	NA	1.15E-03	NA	1.13E-03	NA	1.15E-03	NA	1.13E-03	NA	1.14E-03	NA	1.13	NA	1.14E+00	NA
Cyanide	NA	3.54E-03	NA	3.93E-01	NA	3.55E-03	NA	3.91E-01	NA	3.54E-03	NA	3.88E-01	NA!	3.54	NA	3.91E+02
Dibenzo(a,h)anthracene	1.13E-06	NA	1.15E-06	NA	1.13E-06	NA	1.15E-06	NA	1.13E-06	NA	1.14E-06	NA	0.00	NA	1.14E-03	NA
Dichlorobromomethane	8.55E-03	1.74E-02	2.66E-01	5.43E-01	8.56E-03	1.75E-02	2.65E-01	5.42E-01	8.55E-03	1.75E-02	2.67E-01	5.44E-01	8.55	17.45	2.66E+02	5.43E+02
Dieldrin	1.19E-08	1.90E-07	1.19E-08	1.90E-07	1.18E-08	1.89E-07	1.19E-08	1.90E-07	1.19E-08	1.90E-07	1.18E-08	1.89E-07	0.00	0.00	1.19E-05	1.90E-04
Diethyl Phthalate	NA	5.36E-01	NA	5.69E-01	NA	5.37E-01	NA	5.67E-01	NA	5.40E-01	NA	5.63E-01	NA	537.84	NA	5.66E+02
Dimethyl Phthalate	NA	1.61E+00	NA	1.64E+00	NA	1.61E+00	NA	1.63E+00	NA	1.62E+00	NA	1.62E+00	NA	1610.98	NA	1.63E+03
Di-n-Butyl Phthalate	NA	2.21E-02	NA	2.26E-02	NA	2.21E-02	NA	2.25E-02	NA	2.22E-02	NA	2.23E-02	NA	22.12	NA	2.25E+01
Endosulfan Sulfate	NA	2.13E-02	NA	3.92E-02	NA	2.13E-02	NA	3.91E-02	NA	2.12E-02	NA	3.92E-02	NA	21.26	NA	3.92E+01
Endrin	NA	3.19E-05	NA	3.19E-05	NA	3.18E-05	NA	3.19E-05	NA	3.18E-05	NA	3.18E-05	NA	0.03	NA	3.18E-02
Endrin Aldehyde	NA	1.12E-03	NA	1.21E-03	NA	1.12E-03	NA	1.21E-03	NA	1.12E-03	NA	1.21E-03	NA	1.12	NA	1.21E+00
Ethylbenzene	NA	7.31E-02	NA	1.25E-01	NA	7.31E-02	NA	1.25E-01	NA	7.28E-02	NA	1.25E-01	NA	73.01	NA	1.25E+02
Fluoranthene	NA	1.68E-02	NA	1.75E-02	NA	1.68E-02	NA	1.74E-02	NA	1.69E-02	NA	1.73E-02	NA	16.83	NA	1.74E+01
Fluorene	NA	5.89E-02	NA	6.78E-02	NA	5.85E-02	NA	6.79E-02	NA	5.88E-02	NA	6.79E-02	NA	58.73	NA	6.79E+01
gamma-Hexachlorocyclohexane (HCH)	NA	4.24E-03	NA	4.35E-03	NA	4.22E-03	NA	4.35E-03	NA	4.23E-03	NA	4.36E-03	NA	4.23	NA	4.35E+00
Heptachlor	5.60E-08	4.59E-07	5.59E-08	4.59E-07	5.55E-08	4.55E-07	5.59E-08	4.58E-07	5.59E-08	4.58E-07	5.57E-08	4.57E-07	0.00	0.00	5.58E-05	4.58E-04
Heptachlor Epoxide	3.12E-07	4.46E-07	3.11E-07	4.45E-07	3.11E-07	4.44E-07	3.12E-07	4.46E-07	3.11E-07	4.45E-07	3.11E-07	4.45E-07	0.00	0.00	3.11E-04	4.45E-04
Hexachlorobenzene	7.70E-07	1.26E-05	7.71E-07	1.26E-05	7.68E-07	1.25E-05	7.71E-07	1.26E-05	7.72E-07	1.26E-05	7.70E-07	1.26E-05	0.00	0.01	7.71E-04	1.26E-02
Hexachlorobutadiene	9.19E-05	2.21E-05	9.26E-05	2.22E-05	9.15E-05	2.20E-05	9.22E-05	2.21E-05	9.21E-05	2.21E-05	9.24E-05	2.22E-05	0.09	0.02	9.24E-02	2.22E-02

Summary of Final Probabilistic AWQC	Simulation 1				Simulation 2				Simulation 3				Average of 90th Percentile Simulations			
Chemical Name	Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (mg/L)				Probabilistic AWQC (µg/L)			
	Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only		Water + Organism		Organism Only	
	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ	Cancer Risk 10-5	Non-cancer HQ
Hexachlorocyclopentadiene	NA	3.71E-03	NA	3.89E-03	NA	3.69E-03	NA	3.90E-03	NA	3.70E-03	NA	3.90E-03	NA	3.70	NA	3.90E+00
Hexachloroethane	1.19E-03	6.64E-04	1.29E-03	7.22E-04	1.18E-03	6.61E-04	1.28E-03	7.19E-04	1.19E-03	6.65E-04	1.29E-03	7.21E-04	1.18	0.66	1.29E+00	7.21E-01
Indeno(1,2,3-cd)pyrene	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.15E-05	NA	1.13E-05	NA	1.14E-05	NA	0.01	NA	1.14E-02	NA
Isophorone	3.09E-01	1.17E+00	1.82E+01	6.92E+01	3.09E-01	1.18E+00	1.82E+01	6.92E+01	3.09E-01	1.17E+00	1.83E+01	6.95E+01	309.04	1174.34	1.82E+04	6.93E+04
Methoxychlor	NA	1.66E-05	NA	1.68E-05	NA	1.65E-05	NA	1.68E-05	NA	1.66E-05	NA	1.69E-05	NA	0.02	NA	1.68E-02
Methyl Bromide	NA	1.18E-01	NA	1.15E+01	NA	1.18E-01	NA	1.15E+01	NA	1.18E-01	NA	1.16E+01	NA	117.89	NA	1.15E+04
Methylene Chloride	1.47E-01	3.53E-02	1.25E+01	2.99E+00	1.47E-01	3.54E-02	1.24E+01	2.99E+00	1.47E-01	3.54E-02	1.25E+01	3.00E+00	147.23	35.34	1.25E+04	2.99E+03
Nitrobenzene	NA	1.17E-02	NA	5.51E-01	NA	1.17E-02	NA	5.50E-01	NA	1.17E-02	NA	5.52E-01	NA	11.71	NA	5.51E+02
p,p'-Dichlorodiphenyldichloroethane (DDD)	1.21E-06	2.90E-06	1.21E-06	2.90E-06	1.20E-06	2.88E-06	1.21E-06	2.90E-06	1.21E-06	2.90E-06	1.21E-06	2.90E-06	0.00	0.00	1.21E-03	2.90E-03
p,p'-Dichlorodiphenyldichloroethylene (DDE)	1.68E-07	2.81E-07	1.67E-07	2.80E-07	1.67E-07	2.78E-07	1.67E-07	2.80E-07	1.67E-07	2.79E-07	1.68E-07	2.80E-07	0.00	0.00	1.67E-04	2.80E-04
p,p'-Dichlorodiphenyltrichloroethane (DDT)	2.71E-07	9.22E-07	2.70E-07	9.18E-07	2.71E-07	9.20E-07	2.71E-07	9.20E-07	2.71E-07	9.20E-07	2.71E-07	9.21E-07	0.00	0.00	2.71E-04	9.20E-04
Pentachlorophenol	2.73E-04	1.09E-02	3.52E-04	1.41E-02	2.71E-04	1.09E-02	3.52E-04	1.41E-02	2.71E-04	1.08E-02	3.50E-04	1.40E-02	0.27	10.86	3.51E-01	1.41E+01
Phenol	NA	3.53E+00	NA	2.65E+02	NA	3.53E+00	NA	2.65E+02	NA	3.53E+00	NA	2.66E+02	NA	3530.78	NA	2.65E+05
Pyrene	NA	2.14E-02	NA	2.28E-02	NA	2.15E-02	NA	2.28E-02	NA	2.16E-02	NA	2.26E-02	NA	21.50	NA	2.27E+01
Tetrachloroethylene (Perchloroethylene)	1.05E-01	2.64E-02	2.83E-01	7.13E-02	1.05E-01	2.64E-02	2.82E-01	7.11E-02	1.04E-01	2.63E-02	2.83E-01	7.14E-02	104.67	26.38	2.83E+02	7.13E+01
Toluene	NA	5.38E-02	NA	5.12E-01	NA	5.38E-02	NA	5.10E-01	NA	5.37E-02	NA	5.12E-01	NA	53.76	NA	5.11E+02
Toxaphene	6.90E-06	5.31E-05	6.94E-06	5.35E-05	6.88E-06	5.30E-05	6.96E-06	5.36E-05	6.89E-06	5.31E-05	6.98E-06	5.38E-05	0.01	0.05	6.96E-03	5.36E-02
trans-1,2-Dichloroethylene (DCE)	NA	1.16E-01	NA	3.71E+00	NA	1.17E-01	NA	3.70E+00	NA	1.16E-01	NA	3.72E+00	NA	116.40	NA	3.71E+03
Trichloroethylene (TCE)	5.63E-03	2.81E-03	6.71E-02	3.36E-02	5.63E-03	2.82E-03	6.68E-02	3.34E-02	5.62E-03	2.81E-03	6.71E-02	3.36E-02	5.63	2.81	6.70E+01	3.35E+01
Vinyl Chloride	1.96E-04	1.76E-02	1.59E-02	1.43E+00	1.96E-04	1.77E-02	1.59E-02	1.43E+00	1.96E-04	1.77E-02	1.60E-02	1.44E+00	0.20	17.66	1.59E+01	1.43E+03

Table E-3: Comparison and Average of 99% Percentile Results from 3 Simulations

Summary of Final Probabilistic AWQC	Simulation 1		Simulation 2		Simulation 3		Average of 99th Percentile Simulations	
Chemical Name	Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	7.55E-03	8.63E-02	7.55E-03	8.66E-02	7.58E-03	8.79E-02	7.56	8.69E+01
1,1,2-Trichloroethane	2.65E-02	2.86E-01	2.65E-02	2.87E-01	2.65E-02	2.91E-01	26.48	2.88E+02
1,1-Dichloroethylene	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	2.66E-03	2.67E-03	2.66E-03	2.68E-03	2.64E-03	2.70E-03	2.66	2.68E+00
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	4.66E-01	2.16E+01	4.66E-01	2.18E+01	4.66E-01	2.20E+01	465.91	2.18E+04
1,2-Dichloropropane	4.25E-02	1.01E+00	4.25E-02	1.01E+00	4.25E-02	1.02E+00	42.47	1.01E+03
1,2-Diphenylhydrazine	1.77E-03	6.72E-03	1.77E-03	6.75E-03	1.77E-03	6.85E-03	1.77	6.77E+00
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichloropropene	1.26E-02	3.82E-01	1.26E-02	3.83E-01	1.26E-02	3.88E-01	12.57	3.84E+02
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	7.37E-02	8.99E-02	7.37E-02	9.01E-02	7.34E-02	9.09E-02	73.59	9.03E+01
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	2.29E-03	5.48E-02	2.29E-03	5.50E-02	2.29E-03	5.57E-02	2.29	5.52E+01
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	2.63E-03	4.75E-03	2.63E-03	4.76E-03	2.65E-03	4.80E-03	2.64	4.77E+00
3-Methyl-4-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.86E-03	2.48E-01	2.86E-03	2.52E-01	2.85E-03	2.50E-01	2.86	2.50E+02
Aldrin	1.68E-08	1.66E-08	1.68E-08	1.65E-08	1.68E-08	1.66E-08	0.00	1.66E-05
alpha-Endosulfan	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Hexachlorocyclohexane (HCH)	1.28E-05	1.29E-05	1.28E-05	1.28E-05	1.27E-05	1.29E-05	0.01	1.29E-02
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzene Low	2.77E-02	5.18E-01	2.77E-02	5.19E-01	2.77E-02	5.26E-01	27.74	5.21E+02

Summary of Final Probabilistic AWQC	Simulation 1		Simulation 2		Simulation 3		Average of 99th Percentile Simulations	
Chemical Name	Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4
Benzidine	6.69E-06	3.49E-04	6.69E-06	3.52E-04	6.69E-06	3.55E-04	0.01	3.52E-01
Benzo(a)anthracene	4.75E-05	4.70E-05	4.75E-05	4.79E-05	4.70E-05	4.73E-05	0.05	4.74E-02
Benzo(a)pyrene	4.75E-06	4.70E-06	4.75E-06	4.79E-06	4.70E-06	4.73E-06	0.00	4.74E-03
Benzo(b)fluoranthene	4.75E-05	4.70E-05	4.75E-05	4.79E-05	4.70E-05	4.73E-05	0.05	4.74E-02
Benzo(k)fluoranthene	4.75E-04	4.70E-04	4.75E-04	4.79E-04	4.70E-04	4.73E-04	0.47	4.74E-01
beta-Endosulfan	NA	NA	NA	NA	NA	NA	NA	NA
beta-Hexachlorocyclohexane (HCH)	3.92E-04	4.60E-04	3.92E-04	4.58E-04	3.92E-04	4.63E-04	0.39	4.60E-01
Bis(2-Chloro-1-Methylethyl) Ether	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Chloroethyl) Ether	1.40E-03	7.30E-02	1.40E-03	7.36E-02	1.40E-03	7.43E-02	1.40	7.36E+01
Bis(2-Ethylhexyl) Phthalate	1.32E-02	1.34E-02	1.32E-02	1.37E-02	1.31E-02	1.36E-02	13.17	1.36E+01
Bromoform	3.36E-01	3.78E+00	3.36E-01	3.80E+00	3.37E-01	3.85E+00	335.94	3.81E+03
Butylbenzyl Phthalate	3.76E-03	3.70E-03	3.76E-03	3.78E-03	3.72E-03	3.73E-03	3.75	3.74E+00
Carbon Tetrachloride	2.12E-02	1.49E-01	2.12E-02	1.49E-01	2.12E-02	1.52E-01	21.18	1.50E+02
Chlordane	8.50E-06	8.37E-06	8.50E-06	8.35E-06	8.54E-06	8.42E-06	0.01	8.38E-03
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	3.81E-02	6.77E-01	3.81E-02	6.79E-01	3.81E-02	6.88E-01	38.12	6.82E+02
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	NA	NA	NA	NA	NA	NA	NA	NA
Chlorophenoxy Herbicide (2,4-D)	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	4.75E-03	4.70E-03	4.75E-03	4.79E-03	4.70E-03	4.73E-03	4.73	4.74E+00
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	4.75E-06	4.70E-06	4.75E-06	4.79E-06	4.70E-06	4.73E-06	0.00	4.74E-03
Dichlorobromomethane	4.49E-02	8.78E-01	4.49E-02	8.80E-01	4.49E-02	8.91E-01	44.90	8.83E+02
Dieldrin	2.81E-08	2.79E-08	2.81E-08	2.77E-08	2.83E-08	2.78E-08	0.00	2.78E-05
Diethyl Phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl Phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butyl Phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA

Summary of Final Probabilistic AWQC	Simulation 1		Simulation 2		Simulation 3		Average of 99th Percentile Simulations	
Chemical Name	Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (mg/L)		Probabilistic AWQC (µg/L)	
	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only	Water + Organism	Organism Only
	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4	Cancer Risk 10-4
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Hexachlorocyclohexane (HCH)	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	1.36E-07	1.35E-07	1.36E-07	1.34E-07	1.37E-07	1.35E-07	0.00	1.34E-04
Heptachlor Epoxide	9.18E-07	9.00E-07	9.18E-07	9.01E-07	9.18E-07	9.08E-07	0.00	9.03E-04
Hexachlorobenzene	1.96E-06	1.94E-06	1.96E-06	1.93E-06	1.97E-06	1.94E-06	0.00	1.94E-03
Hexachlorobutadiene	2.62E-04	2.62E-04	2.62E-04	2.63E-04	2.63E-04	2.64E-04	0.26	2.63E-01
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	3.76E-03	3.88E-03	3.76E-03	3.82E-03	3.73E-03	3.86E-03	3.75	3.85E+00
Indeno(1,2,3-cd)pyrene	4.75E-05	4.70E-05	4.75E-05	4.79E-05	4.70E-05	4.73E-05	0.05	4.74E-02
Isophorone	1.62E+00	6.07E+01	1.62E+00	6.11E+01	1.62E+00	6.18E+01	1616.14	6.12E+04
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Bromide	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	7.69E-01	4.18E+01	7.69E-01	4.22E+01	7.69E-01	4.23E+01	769.17	4.21E+04
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-Dichlorodiphenyldichloroethane (DDD)	3.13E-06	3.10E-06	3.13E-06	3.09E-06	3.16E-06	3.10E-06	0.00	3.09E-03
p,p'-Dichlorodiphenyldichloroethylene (DDE)	3.60E-07	3.59E-07	3.60E-07	3.55E-07	3.61E-07	3.57E-07	0.00	3.57E-04
p,p'-Dichlorodiphenyltrichloroethane (DDT)	5.08E-07	5.09E-07	5.08E-07	5.04E-07	5.09E-07	5.04E-07	0.00	5.06E-04
Pentachlorophenol	8.29E-04	8.72E-04	8.29E-04	8.62E-04	8.31E-04	8.69E-04	0.83	8.68E-01
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethylene (Perchloroethylene)	5.47E-01	9.23E-01	5.47E-01	9.22E-01	5.48E-01	9.33E-01	547.15	9.26E+02
Toluene	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	2.36E-05	2.33E-05	2.36E-05	2.32E-05	2.38E-05	2.35E-05	0.02	2.33E-02
trans-1,2-Dichloroethylene (DCE)	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethylene (TCE)	2.97E-02	2.23E-01	2.97E-02	2.23E-01	2.98E-02	2.26E-01	29.73	2.24E+02
Vinyl Chloride	1.03E-03	5.35E-02	1.03E-03	5.40E-02	1.03E-03	5.45E-02	1.03	5.40E+01