



Supplement of

HydroFATE (v1): a high-resolution contaminant fate model for the global river system

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S.1 Literature sources for Measured Environmental Concentrations of sulfamethoxazole

Table S-1. Literature sources and numbers of Measured Environmental Concentrations (MECs) of sulfamethoxazole, total and above the Limit of Detection (LOD). Full citations are provided in section S.4 below.

Reference	Country	Number of MECs	Number of MECs above LOD
Arsand et al., 2020	Brazil	2	2
Aydin & Talinli, 2013	Turkey	4	4
Bagnis et al., 2020	Kenya	10	10
Barber et al., 2011	United States	4	0
Batt et al., 2006	United States	4	2
Bendz et al., 2005	Sweden	2	2
Böger et al., 2021	Brazil	2	2
Camacho-Muñoz et al., 2010	Spain	4	0
Carlson et al., 2013	Canada	5	4
Chang et al., 2010	China	4	3
Chau et al., 2018	Vietnam	29	4
Chaves et al., 2020	Brazil	3	2
Chitescu et al., 2015	Romania	13	13
Choi et al., 2008	South Korea	4	4
Dinh et al., 2018	France	4	3
Eckberg & Pletsch, 2011	United States	17	17
Feitosa-Felizzola & Chiron, 2009	France	1	0
Fick et al., 2011	Sweden	5	4
Finnegan et al., 2010	United States	4	4
Fonseca et al., 2020	Spain	10	2
Hanna et al., 2020	India	6	6
Joshua et al., 2020	India	11	11
K'Oreje et al., 2012	Kenya	7	5
Kairigo et al., 2020	Kenya	1	0
Kandie et al., 2020	Kenya	32	16
Kasprzyk-Hordern et al., 2007	United Kingdom, Poland	6	2
Kasprzyk-Hordern et al., 2008	United Kingdom	8	7
Khan, et al., 2013	Pakistan	11	11
Khan, et al., 2012	Sweden	1	0
Kim & Carlson, 2007	United States	4	3
Kunkel & Radke, 2016	Germany	1	1
Li & Radke, 2016	Sweden, Germany	6	6
Locatelli et al., 2011	Brazil	5	4
Loper et al., 2007	United States	8	5
López-Serna et al., 2011	Spain	21	4
Low et al., 2021	Malaysia	2	0
Luo et al., 2011	China	6	6
Managaki et al., 2007	Vietnam, Japan	5	5
Osorio et al., 2012	Spain	3	3

Paíga et al., 2016	Portugal	5	1
Rivera-Jaimes et al., 2018	Mexico	2	2
Sharma et al., 2019	India	13	10
Shimizu et al., 2013	Vietnam, Philippines	5	5
Sim et al., 2010	South Korea	2	0
Söregård et al., 2019	Sweden	3	0
Spongberg et al., 2011	Costa Rica	25	2
Stipaničev et al., 2017	Macedonia	5	5
Tamtam et al., 2008	France	4	4
ter Laak et al., 2010	Netherlands	3	3
Vilimanovic et al, 2020	United States	9	8
Wille et al., 2010	Belgium	3	3
Zhang et al., 2020	China	7	7
Total	World	361	227

S.2 Sensitivity to parameter and configuration settings

In addition to the main scenarios presented in Table 1 of the main manuscript, model simulations were conducted to analyze the sensitivity of results with regards to uncertainties inherited by each investigated parameter and configuration setting. Table S-2 shows the additional scenario settings for Scenarios 5 and 6 (i.e., representing a total of 14 sub-scenarios), and Scenario 7, which were implemented to create error bars around the results of baseline Scenario 1.

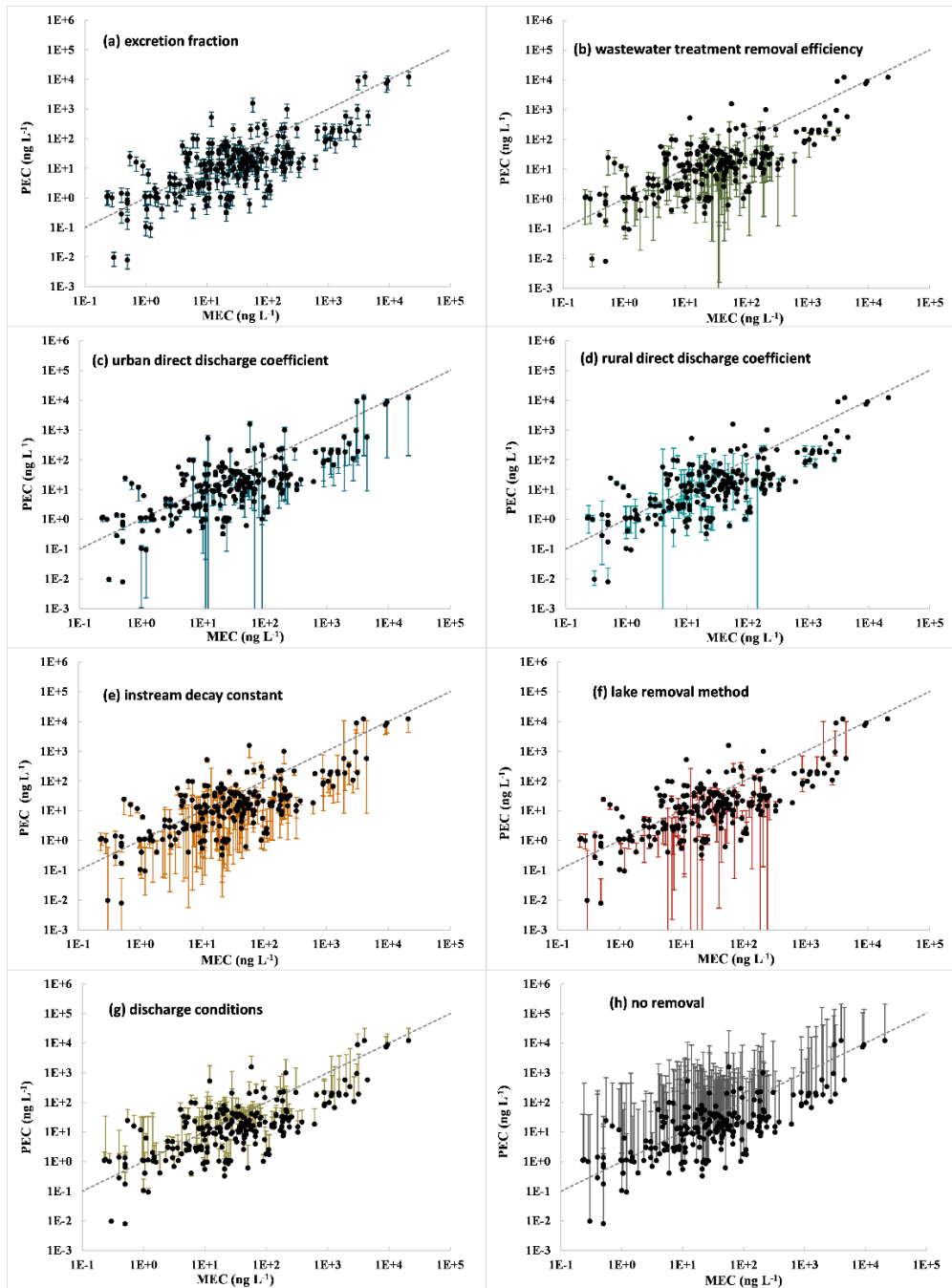
Table S-2. Additional scenarios and their settings designed to assist in the analysis of uncertainties introduced by selected model parameters and configurations. Scenarios 5 and 6 represent two groups of sub-scenarios (a total of 14 sub-scenarios), where in each iteration the baseline configuration (Scenario 1) is maintained but one target parameter or configuration setting is changed towards their limit that induces lower or higher contamination, respectively.

Scenario	Parameter or configuration modified from baseline (only for sub-scenarios)	Excretion fraction	Wastewater treatment removal efficiency (%)	Direct discharge coefficient		Instream decay constant k (day^{-1})	Configuration settings	
				Urban ddc_{urb}	Rural ddc_{urb}		Lake removal	Discharge condition
1	Baseline	0.2	49	0.8	0.5	0.13	CSTR removal	Average-flow
5	Lower contamination limits							
5a	excretion fraction	0.1	49	0.8	0.5	0.13	CSTR removal	Average-flow
5b	wastewater treatment removal efficiency	0.2	100	0.8	0.5	0.13	CSTR removal	Average-flow
5c	urban direct discharge coefficient	0.2	49	0	0.5	0.13	CSTR removal	Average-flow
5d	rural urban direct discharge coefficient	0.2	49	0.8	0	0.13	CSTR removal	Average-flow
5e	instream decay constant	0.2	49	0.8	0.5	2.88	CSTR removal	Average-flow
5f	lake removal	0.2	49	0.8	0.5	0.13	Full removal	Average-flow
5g	discharge condition			this scenario is the same as Scenario 1				
6	Upper contamination limits							
6a	excretion fraction	0.3	49	0.8	0.5	0.13	CSTR removal	Average-flow
6b	wastewater treatment removal efficiency	0.2	0	0.8	0.5	0.13	CSTR removal	Average-flow
6c	urban direct discharge coefficient	0.2	49	1	0.5	0.13	CSTR removal	Average-flow
6d	rural direct discharge coefficient	0.2	49	0.8	1	0.13	CSTR removal	Average-flow
6e	instream decay constant	0.2	49	0.8	0.5	0	CSTR removal	Average-flow
6f	lake removal	0.2	49	0.8	0.5	0.13	No removal	Average-flow
6g	discharge condition	0.2	49	0.8	0.5	0.13	CSTR removal	Low-flow
7	No removal	1	0	1	1	0	No removal	Low-flow

Figure S-1 presents the findings of the sensitivity assessment with regards to parameter settings (panels a to e), configuration settings (panel f and g), and the no-removal scenario (panel h). Panel a displays sensitivity related to variations in the excretion fractions. In HydroFATE, calculated PECs are directly proportional to the excretion fraction, and since the range reported by the literature is small, the error bars of PECs are also small. Panels b, c, and d show the influence of varying removal levels (i.e., wastewater treatment removal efficiencies or direct discharge values) associated with different types of contaminant pathways (i.e., treated versus untreated urban or rural). Panel e illustrates the sensitivity related to variations in the instream decay constants. The large ranges are due to the large uncertainties reported in literature, involving the different processes of instream decay which are highly variable and depend on various physical, chemical, and biological parameters of the local environment.

Regarding configurations, panel f of Fig. S-1 shows the model's sensitivity towards variations in lake removal methods. The CSTR method delivers average results, a compromise between likely overestimation of concentrations (no contaminant removal in lakes) and underestimation of concentrations (full removal in lakes). Panel g shows the sensitivity of results caused by presumed river discharge conditions. For some locations, the difference between MECs and PECs would be substantially decreased if using low flow discharge conditions (instead of average flow conditions) in the model simulations. This analysis demonstrates that cases in which PECs were too low could, in part, be explained by uncertainties within the measurements (i.e., measurements potentially taken at low flow conditions rather than errors in the model predictions.

Finally, panel d of Fig. S-1 illustrates the worst-case Scenario 7 which results in the maximum values of PECs based on parameter and configuration settings that corresponding to the elimination of all contaminant removal processes. Most upper limits of the error bars are above the 1:1 line, indicating the critical importance of the removal simulations in the model.



40 **Figure S-1. Sensitivity of estimated antibiotic concentrations to changes in HydroFATE parameter and**
configuration settings. Black points represent comparisons between the Measured (MEC) and the Predicted (PEC)
Environmental Concentrations for Scenario 1 (baseline). The black line in each panel represents the 1:1
correspondence line between predicted and measured concentrations. The error bars represent the range of the
45 **resulting PECs using the range of each input parameter and configuration setting as listed for the different**
scenarios in Table S-2: (a) excretion fraction for Scenarios 5a and 6a; (b) wastewater treatment removal efficiency
for Scenarios 5b and 6b; (c) urban direct discharge coefficient for Scenarios 5c and 6c; (d) rural direct discharge
coefficient for Scenarios 5d and 6d; and (e) instream decay constant for Scenarios 5e and 6e; (f) lake removal
method for Scenario 5f and 6f; and (g) discharge conditions for Scenario 6g. Panel (h) represents a worst-case
50 **scenario using parameter and configuration settings as listed for Scenario 7 assuming no removal processes. In**
all panels, error bars that extend below 10^{-3} ng L⁻¹ may include predicted zero concentrations.

S.3 Country statistics as results of the case study

Table S-3 is a complete version of Table 2 in the main manuscript. It shows country statistics on consumption and emission of SMX to rivers and lakes for different sources and contaminant pathways. Table S-4 is a complete version of Table 3 in the main manuscript. It shows the total length of rivers with a predicted risk quotient ≥ 1 for SMX for different scenarios.

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Table S-3. National consumption as well as population sources and emission rates of SMX per country by pathway.

Country	Population source (%)			Consumption		Total emission to rivers and lakes (kg y ⁻¹)	Emission to Consumption ratio (%)	Contaminant pathway into rivers or lakes (%)		
	Treated (WWTPs and DWTS)	Urban untreated	Rural untreated	Total (kg y ⁻¹)	per capita (µg day ⁻¹)			Treated (WWTPs and DWTS)	Urban untreated	Rural untreated
Afghanistan	3.3	20.4	76.3	11,500	1,156	881	7.7	4.4	42.5	53.0
Åland	0.0	0.2	99.8	0.3	143	0.0	4.3	0.0	0.9	99.1
Albania	86.1	0.0	13.9	1,190	1,285	113	9.5	92.1	0.1	7.9
Algeria	81.6	0.1	18.3	18,800	1,732	1,730	9.2	90.1	0.2	9.8
Andorra	79.3	4.7	16.0	25	725	2	9.7	82.9	7.8	9.3
Angola	4.1	21.4	74.5	4,970	647	372	7.5	5.5	45.8	48.7
Anguilla	3.3	45.1	51.6	1	486	0.1	9.9	3.4	73.3	23.4
Antigua and Barbuda	0.0	61.6	38.4	9	731	1	11.6	0.0	84.6	15.4
Argentina	53.8	17.9	28.4	9,370	729	919	9.8	55.9	29.2	14.9
Armenia	69.7	5.7	24.6	1,340	1,311	126	9.5	75.1	9.7	15.2
Aruba	0.0	79.0	21.0	3	748	0.4	13.5	0.0	94.0	6.0
Australia	97.4	0.0	2.6	3,140	720	316	10.1	98.7	0.0	1.3
Austria	93.0	0.0	7.0	264	84	26	9.8	96.4	0.0	3.6
Azerbaijan	24.6	13.7	61.7	3,420	1,255	275	8.0	31.2	27.3	41.5
Bahamas	0.0	53.4	46.6	27	769	3	10.7	0.0	79.8	20.2
Bahrain	0.0	71.6	28.4	46	748	6	12.6	0.0	90.9	9.1
Bangladesh	5.0	42.4	52.6	39,100	714	4,100	10.5	4.9	64.7	30.4
Barbados	0.0	69.5	30.5	41	750	5	12.7	0.0	87.5	12.5
Belarus	91.4	0.0	8.6	4,160	1,247	405	9.7	95.7	0.0	4.3
Belgium	94.9	0.0	5.0	1,640	445	163	9.9	97.4	0.1	2.5
Belize	2.1	8.3	89.6	141	1,202	9	6.5	3.3	20.2	76.5
Benin	0.8	36.6	62.6	6,220	1,634	555	8.9	0.9	65.7	33.4
Bhutan	3.8	4.9	91.2	383	1,334	24	6.3	6.1	12.5	81.4
Bolivia	48.3	3.2	48.4	4,650	1,233	370	8.0	61.9	6.5	31.6
Bonaire, Saint Eustatius and Saba	0.0	18.3	81.7	1	486	0.1	5.9	0.0	49.5	50.5
Bosnia and Herzegovina	55.4	0.9	43.7	4,720	3,803	385	8.2	69.2	1.7	29.2
Botswana	1.6	25.3	73.1	887	1,292	70	7.9	2.0	51.3	46.7
Brazil	61.8	17.0	21.2	77,400	1,189	7,910	10.2	61.7	26.7	11.6
Brunei	89.9	0.4	9.7	65	756	6	9.8	93.2	0.6	6.2
Bulgaria	73.6	0.7	25.7	3,560	1,422	317	8.9	84.4	1.3	14.2
Burkina Faso	0.9	19.7	79.3	11,300	1,634	795	7.0	1.4	45.1	53.5
Burundi	1.0	29.1	69.9	4,760	1,339	391	8.2	1.2	56.8	42.0
Cambodia	13.3	18.6	68.1	7,300	1,252	594	8.1	16.7	36.6	46.8
Cameroon	1.1	31.5	67.3	14,000	1,634	1,250	8.9	1.3	56.8	41.9
Canada	83.6	1.2	15.2	12,600	1,187	1,200	9.6	89.0	2.0	9.0
Cayman Islands	0.0	71.5	28.5	1	720	0.1	12.8	0.0	89.3	10.7
Central African Republic	0.0	25.7	74.3	2,340	1,354	181	7.7	0.0	53.1	46.9
Chad	0.7	6.7	92.6	8,020	1,634	451	5.6	1.3	19.1	79.6
Chile	82.6	0.2	17.2	2,470	418	234	9.5	89.0	0.4	10.6
China	57.3	8.0	34.7	31,800	67	2,860	9.0	65.0	14.2	20.8
Colombia	66.2	0.6	33.2	20,900	1,093	1,830	8.8	76.8	1.1	22.1
Comoros	2.0	19.7	78.4	193	1,251	15	8.0	2.5	39.5	58.0
Costa Rica	25.3	40.2	34.5	773	486	87	11.3	22.9	57.2	19.9
Côte d'Ivoire	2.7	33.7	63.6	13,200	1,634	1,170	8.8	3.1	61.1	35.7
Croatia	55.5	1.2	43.3	1,440	1,067	118	8.2	69.2	2.3	28.5

Cuba	37.9	4.2	57.9	3,830	1,253	288	7.5	51.4	8.8	39.8
Curaçao	0.0	86.3	13.7	21	742	3	14.3	0.0	96.9	3.1
Cyprus	38.9	20.4	40.7	183	748	17	9.4	42.4	34.7	22.9
Czech Republic	88.2	0.1	11.7	5,110	1,330	490	9.6	93.8	0.2	6.0
Democratic Republic of the Congo	0.3	28.4	71.4	39,900	1,236	3,220	8.1	0.3	56.2	43.4
Denmark	68.5	0.0	31.5	374	750	32	8.7	80.7	0.0	19.2
Djibouti	0.0	27.3	72.7	293	1,217	24	8.1	0.0	54.0	46.0
Dominica	10.2	9.7	80.1	18	1,265	1	7.5	13.8	20.6	65.6
Dominican Republic	7.0	54.1	38.9	858	308	99	11.5	6.2	75.4	18.4
East Timor	7.0	19.6	73.3	464	1,278	35	7.5	9.6	41.8	48.7
Ecuador	60.4	1.7	37.8	22,800	4,126	1,970	8.7	71.1	3.2	25.7
Egypt	65.8	25.2	8.9	55,500	1,920	6,220	11.2	60.0	36.1	4.0
El Salvador	40.1	19.9	39.9	1,070	486	103	9.6	42.8	33.4	23.8
Equatorial Guinea	0.1	1.1	98.9	197	524	12	6.2	0.1	2.7	97.2
Eritrea	3.8	15.5	80.7	2,330	1,661	156	6.7	5.7	37.0	57.3
Estonia	77.6	0.1	22.3	176	877	16	9.1	87.1	0.2	12.8
Ethiopia	1.2	20.9	77.9	40,400	1,214	2,940	7.3	1.7	45.9	52.5
Falkland Islands	100.0	0.0	0.0	0.0	239	0.0	10.2	100.0	0.0	0.0
Faroe Islands	0.0	38.8	61.2	8	760	1	9.9	0.0	62.7	37.3
Fiji	0.0	28.0	72.0	203	1,269	19	9.2	0.0	48.8	51.2
Finland	79.2	0.0	20.8	151	143	14	9.0	89.3	0.0	10.7
France	81.5	0.5	18.0	12,300	612	1,160	9.4	88.8	0.9	10.3
French Guiana	16.2	6.8	77.0	72	1,271	5	7.5	22.0	14.5	63.5
Gabon	24.7	2.0	73.3	863	1,069	61	7.1	35.7	4.4	59.9
Gambia	0.0	41.6	58.4	687	1,163	65	9.5	0.0	70.4	29.6
Georgia	49.7	5.9	44.4	1,730	1,289	150	8.6	58.7	10.9	30.4
Germany	99.1	0.0	0.9	22,300	816	2,270	10.1	99.6	0.0	0.4
Ghana	1.5	39.5	59.0	11,900	1,215	1,110	9.4	1.7	67.6	30.8
Greece	55.4	0.1	44.5	661	507	53	8.0	71.0	0.2	28.8
Greenland	97.0	0.0	3.0	2	761	0.2	10.0	98.8	0.0	1.2
Grenada	7.3	39.5	53.2	17	1,208	2	9.8	7.6	64.8	27.6
Guadeloupe	3.8	24.7	71.5	30	486	3	8.4	4.6	47.4	48.0
Guam	0.0	2.8	97.2	1	777	0.0	6.2	0.0	7.2	92.8
Guatemala	41.4	6.9	51.8	2,860	486	239	8.3	50.6	13.1	36.3
Guernsey	0.0	86.1	13.9	3	1,911	0.5	14.2	0.0	96.8	3.2
Guinea	0.1	27.0	73.0	6,150	1,634	513	8.3	0.1	51.7	48.2
Guinea-Bissau	3.6	23.8	72.6	726	1,309	58	8.0	4.5	47.4	48.0
Guyana	2.6	39.3	58.2	243	1,271	24	9.9	2.7	63.5	33.8
Haiti	0.0	47.9	52.1	4,360	1,255	450	10.3	0.0	74.2	25.8
Honduras	39.3	3.6	57.1	1,490	486	114	7.7	52.2	7.5	40.4
Hong Kong	31.0	56.6	12.4	60	360	8	12.8	24.8	70.8	4.4
Hungary	80.2	1.1	18.7	3,140	888	293	9.3	87.8	1.8	10.4
Iceland	100.0	0.0	0.0	13	745	1	10.2	100.0	0.0	0.0
India	8.0	29.2	62.7	366,000	801	32,300	8.8	9.3	53.0	37.7
Indonesia	5.0	52.5	42.5	74,800	904	8,610	11.5	4.4	73.1	22.5
Iran	27.2	18.4	54.5	34,700	1,265	3,010	8.7	31.9	33.9	34.2
Iraq	24.7	19.0	56.3	17,400	1,246	1,460	8.4	30.1	36.1	33.8
Ireland	51.6	0.8	47.5	251	307	21	8.2	64.1	1.6	34.2
Isle of Man	0.0	65.2	34.8	15	789	2	12.7	0.0	81.9	18.1
Israel	92.7	4.2	3.1	1,230	735	126	10.3	91.9	6.6	1.5
Italy	89.4	3.2	7.5	12,200	792	1,220	10.0	90.8	5.0	4.1
Jamaica	0.0	46.2	53.8	710	1,173	73	10.3	0.0	71.8	28.2
Japan	57.7	19.3	23.0	10,600	412	1,100	10.4	56.5	29.8	13.7
Jersey	0.0	91.4	8.6	3	239	0.5	15.0	0.0	97.6	2.4
Jordan	90.9	0.2	8.8	948	411	93	9.8	95.1	0.4	4.6
Kazakhstan	43.6	1.4	55.0	7,280	1,305	546	7.5	59.2	2.9	37.9
Kenya	5.4	40.2	54.4	19,600	1,182	1,920	9.8	5.7	65.9	28.4
Kosovo	19.5	11.6	68.8	839	1,201	63	7.5	26.7	25.0	48.3
Kuwait	98.8	0.2	1.0	15	40	2	10.2	99.1	0.4	0.5
Kyrgyzstan	15.1	24.7	60.1	2,600	1,240	232	8.9	17.4	44.5	38.1
Laos	1.1	19.7	79.2	3,170	1,258	264	8.3	1.3	37.9	60.8
Latvia	66.4	0.0	33.6	1,100	2,010	93	8.4	80.6	0.0	19.4
Lebanon	43.2	37.4	19.5	235	132	27	11.4	38.5	52.3	9.2
Lesotho	3.2	22.8	74.0	870	1,301	66	7.6	4.3	47.7	48.0
Liberia	0.0	30.6	69.4	1,660	1,242	153	9.2	0.0	53.3	46.7
Libya	61.9	0.4	37.7	1,950	1,219	162	8.3	75.8	0.9	23.3

Liechtenstein	99.2	0.0	0.8	17	750	2	10.2	99.5	0.0	0.5
Lithuania	90.3	0.0	9.7	621	636	60	9.6	95.8	0.0	4.2
Luxembourg	99.2	0.1	0.7	111	622	11	10.2	99.5	0.1	0.4
Macedonia	73.2	0.2	26.7	964	1,276	85	8.8	84.9	0.3	14.9
Madagascar	1.0	18.8	80.3	10,200	1,226	789	7.8	1.3	38.7	60.0
Malawi	2.2	42.2	55.6	7,250	1,255	711	9.8	2.3	68.8	28.8
Malaysia	67.5	3.7	28.8	1,560	198	144	9.3	74.4	6.4	19.2
Mali	1.3	27.2	71.5	10,900	1,634	878	8.0	1.7	54.2	44.1
Malta	0.0	0.0	100.0	0.0	723	0.0	2.1	0.0	0.0	100.0
Martinique	0.0	1.3	98.7	15	486	1	5.5	0.0	3.8	96.2
Mauritania	3.0	23.9	73.1	1,490	1,239	116	7.8	3.9	49.1	47.0
Mayotte	0.0	0.0	100.0	7	1,226	0.4	5.1	0.0	0.0	100.0
Mexico	78.4	4.3	17.4	63,000	1,504	6,090	9.7	82.8	7.0	10.2
Micronesia	0.0	2.3	97.7	8	1,221	1	6.8	0.0	5.4	94.6
Moldova	35.6	5.8	58.6	2,180	1,605	168	7.7	47.0	12.1	40.8
Mongolia	26.3	10.5	63.2	1,090	1,229	86	7.9	34.1	21.4	44.5
Montenegro	42.2	1.9	55.9	241	1,247	20	8.1	53.3	3.7	43.0
Montserrat	0.0	0.0	100.0	0.0	486	0.0	8.0	0.0	0.0	100.0
Morocco	49.4	9.1	41.6	9,970	982	868	8.7	57.8	16.7	25.6
Mozambique	0.2	19.9	79.9	11,100	1,269	793	7.1	0.2	44.7	55.0
Myanmar	1.2	30.6	68.2	22,700	1,292	2,070	9.1	1.3	53.7	45.0
Namibia	37.5	6.4	56.1	955	1,311	75	7.8	48.9	13.1	38.0
Nauru	13.1	12.6	74.3	0.4	616	0.0	8.5	15.8	23.8	60.4
Nepal	4.7	40.4	54.9	14,800	1,325	1,510	10.2	4.7	63.2	32.1
Netherlands	98.2	0.0	1.8	2,370	512	240	10.1	99.1	0.0	0.9
New Caledonia	0.0	19.4	80.6	32	738	3	8.0	0.0	38.6	61.4
New Zealand	74.8	0.5	24.7	575	1,126	54	9.3	82.0	0.9	17.1
Nicaragua	24.2	12.4	63.4	1,080	486	85	7.8	31.5	25.3	43.3
Niger	1.0	11.4	87.5	11,400	1,634	718	6.3	1.7	29.1	69.2
Nigeria	8.3	37.3	54.3	82,300	1,236	7,960	9.7	8.8	61.8	29.5
North Korea	50.2	7.6	42.2	9,770	1,267	847	8.7	59.1	14.1	26.8
Northern Mariana Islands	0.0	0.0	100.0	3	1,242	0.2	5.4	0.0	0.0	100.0
Norway	69.7	0.0	30.3	394	631	35	9.0	79.4	0.0	20.6
Oman	5.2	11.8	83.0	634	716	45	7.1	7.4	26.8	65.8
Pakistan	18.5	23.1	58.3	223,000	3,155	19,100	8.6	22.1	43.3	34.6
Palau	5.3	0.0	94.7	2	1,484	0.1	5.8	9.4	0.0	90.6
Palestina	38.5	49.9	11.6	1,680	1,267	210	12.5	31.5	64.0	4.5
Panama	7.0	32.9	60.1	412	486	39	9.5	7.5	55.2	37.3
Papua New Guinea	4.0	3.9	92.1	3,120	1,164	209	6.7	6.1	9.3	84.6
Paraguay	3.0	45.4	51.7	2,810	1,244	282	10.0	3.0	72.3	24.7
Peru	48.7	1.5	49.8	8,800	1,256	704	8.0	62.1	2.9	35.0
Philippines	1.6	66.7	31.7	13,300	453	1,710	12.8	1.3	83.1	15.6
Poland	72.9	2.5	24.6	12,400	912	1,120	9.1	81.9	4.4	13.6
Portugal	77.0	3.3	19.6	1,590	971	150	9.4	83.2	5.7	11.2
Puerto Rico	87.0	1.7	11.3	1,410	2,287	137	9.7	91.1	2.8	6.1
Qatar	64.1	10.7	25.2	634	628	60	9.5	69.0	18.0	13.0
Republic of Congo	14.2	35.2	50.6	2,400	1,634	228	9.5	15.2	59.1	25.7
Romania	48.5	12.6	38.9	10,600	1,408	965	9.1	54.1	22.0	23.9
Russia	79.9	0.2	19.9	32,700	696	3,020	9.2	88.3	0.3	11.4
Rwanda	1.1	43.0	56.0	5,300	1,260	514	9.7	1.1	70.9	28.0
Saint Kitts and Nevis	0.0	0.0	100.0	0.0	1,330	0.0	1.7	0.0	0.0	100.0
Saint Lucia	0.0	40.9	59.1	48	1,274	5	10.2	0.0	63.8	36.2
Saint Pierre and Miquelon	0.0	0.0	100.0	0.0	1,187	0.0	10.0	0.0	0.0	100.0
Saint Vincent and the Grenadines	4.9	49.7	45.3	19	1,250	2	11.0	4.6	72.0	23.4
Saint-Martin	0.0	42.2	57.8	1	960	0.1	8.9	0.0	76.1	23.9
San Marino	73.6	6.5	19.9	4	716	0.4	9.6	78.2	10.9	10.9
Sao Tome and Principe	6.6	14.5	78.9	49	1,182	4	7.5	9.0	31.1	59.9
Saudi Arabia	50.9	1.3	47.8	2,670	261	210	7.9	65.9	2.7	31.4
Senegal	0.8	13.7	85.5	6,540	1,634	418	6.4	1.3	34.3	64.4
Serbia	68.8	1.6	29.7	1,370	531	122	8.9	79.2	2.8	18.0
Seychelles	100.0	0.0	0.0	0.0	1,210	0.0	10.2	100.0	0.0	0.0
Sierra Leone	0.0	34.9	65.1	2,240	1,113	217	9.7	0.0	57.5	42.5

Singapore	100.0	0.0	0.0	85	349	9	10.2	100.0	0.0	0.0
Sint Maarten	0.0	100.0	0.0	0.1	960	0.0	16.0	0.0	100.0	0.0
Slovakia	69.5	0.8	29.6	1,190	611	105	8.8	80.3	1.5	18.2
Slovenia	70.8	2.9	26.3	1,380	1,910	128	9.3	78.0	5.0	17.0
Solomon Islands	6.5	9.1	84.4	107	1,200	9	8.1	8.2	18.1	73.8
Somalia	9.8	3.4	86.8	3,150	963	184	5.8	17.1	9.3	73.6
South Africa	47.7	28.2	24.1	102,000	6,216	10,700	10.6	46.2	42.8	11.1
South Korea	97.3	0.0	2.7	4,590	390	462	10.1	98.6	0.0	1.4
South Sudan	0.9	0.7	98.4	5,990	1,391	299	5.0	1.7	2.3	95.9
Spain	88.4	0.1	11.5	7,990	768	769	9.6	93.7	0.1	6.2
Sri Lanka	1.2	66.2	32.5	3,020	462	378	12.5	1.0	84.5	14.4
Sudan	1.1	15.7	83.2	17,200	1,280	1,170	6.8	1.6	37.0	61.4
Suriname	1.2	53.6	45.2	227	1,195	26	11.4	1.1	75.4	23.5
Swaziland	12.3	9.7	78.0	569	1,458	37	6.6	19.1	23.6	57.3
Sweden	75.8	0.1	24.1	883	550	79	9.0	86.0	0.1	13.9
Switzerland	97.8	0.1	2.1	2,570	852	260	10.1	98.7	0.2	1.1
Syria	55.9	8.7	35.4	11,400	1,362	1,000	9.0	63.5	15.5	21.0
Taiwan	41.8	46.6	11.6	3,790	666	470	12.4	34.3	60.0	5.7
Tajikistan	15.3	22.4	62.3	3,760	1,240	320	8.6	18.1	41.7	40.2
Tanzania	0.2	28.5	71.3	21,600	1,267	1,700	8.0	0.2	57.0	42.8
Thailand	6.0	40.8	53.2	16,400	674	1,700	10.1	6.1	64.9	29.1
Togo	0.1	36.9	63.0	4,180	1,634	380	9.0	0.1	65.5	34.4
Trinidad and Tobago	0.0	56.4	43.6	253	746	29	11.5	0.0	78.8	21.2
Tunisia	34.5	5.4	60.1	2,010	797	150	7.4	47.6	11.7	40.7
Turkey	78.5	0.3	21.2	11,700	577	1,100	9.2	87.4	0.6	12.0
Turkmenistan	18.5	6.8	74.7	3,720	1,211	250	6.8	27.8	16.0	56.2
Turks and Caicos Islands	0.0	0.0	100.0	0.4	702	0.0	3.4	0.0	0.0	100.0
Uganda	1.1	25.9	73.0	16,000	1,243	1,300	7.7	1.5	53.7	44.9
Ukraine	48.1	11.4	40.5	9,300	605	830	9.0	54.8	20.4	24.8
United Arab Emirates	99.9	0.0	0.1	420	253	43	10.2	99.9	0.0	0.1
United Kingdom	96.4	0.1	3.4	3,800	239	390	10.0	97.9	0.2	1.9
United States	77.1	2.5	20.5	290,000	3,070	27,000	9.3	84.4	4.2	11.4
Uruguay	40.7	39.5	19.8	670	999	76	11.4	36.4	55.4	8.1
Uzbekistan	22.7	20.8	56.5	14,000	1,246	1,200	8.7	26.6	38.2	35.2
Vanuatu	7.4	13.4	79.2	43	1,207	3	7.9	9.5	27.0	63.5
Venezuela	91.9	0.0	8.1	17,000	1,796	1,600	9.8	95.9	0.0	4.1
Vietnam	1.0	54.6	44.3	33,000	1,031	3,800	11.4	0.9	76.4	22.7
Virgin Islands, U.S.	24.6	20.6	54.7	6	734	0.5	8.8	28.7	37.7	33.6
Western Sahara	0.0	87.4	12.6	180	1,634	26	14.6	0.0	95.6	4.4
Yemen	27.3	15.1	57.6	11,000	1,247	930	8.1	34.2	29.7	36.1
Zambia	10.0	21.1	68.9	7,100	1,246	540	7.6	13.3	44.2	42.5
Zimbabwe	30.4	5.2	64.3	6,900	1,395	480	7.0	44.1	11.9	44.0
Global	36.1	19.9	44.0	2,400,000	1,331	220,000	9.2	38.2	36.0	25.7

65 **Table S-4. Total length of rivers per country with a predicted risk quotient (RQ) ≥ 1 for SMX for Scenarios 2**
(low-flow conditions) and 1 (average-flow conditions). See Table 1 (main manuscript) for scenario settings. The
total length of rivers is extracted for each country from the RiverATLAS database (Linke et al., 2019)
accounting for all rivers in the world with long-term annual average discharge above $0.1 \text{ m}^3 \text{ s}^{-1}$ (i.e., a global
70 **total of 23.9 million km). The increase in length of rivers presenting risk of exposure based on specific conditions**
was calculated by running the model for the pertinent scenario but changing the parameters and configurations
accordingly.

Country/ Territory	Total length of analyzed rivers (km)	RQ ≥ 1 at low-flow conditions				RQ ≥ 1 at average-flow conditions			
		Length of rivers (km)	% of total length	% increase in length without instream decay	% increase in length without lake removal	Length of rivers (km)	% of total length	% increase in length without instream decay	% increase in length without lake removal
Afghanistan	79,700	4,640	5.8	9.9	2.2	56	0.1	0.0	16.1
Åland	44	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Albania	8,080	14	0.2	0.0	42.9	0	0.0	0.0	0.0
Algeria	94,200	8,760	9.3	5.8	9.9	806	0.9	16.4	15.0
Andorra	83	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Angola	227,000	575	0.3	3.0	9.9	137	0.1	0.0	0.0
Anguilla	2	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Antigua and Barbuda	36	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Argentina	330,000	3,610	1.1	9.5	52.7	188	0.1	0.0	0.0
Armenia	4,020	240	6.0	0.0	2.1	48	1.2	0.0	0.0
Aruba	0	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Australia	680,000	2,640	0.4	31.5	26.4	0	0.0	0.0	0.0
Austria	22,900	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Azerbaijan	13,400	372	2.8	4.6	9.9	34	0.3	0.0	8.8
Bahamas	1,450	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bahrain	0	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bangladesh	56,600	1,770	3.1	1.5	3.9	44	0.1	0.0	2.3
Barbados	80	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Belarus	43,000	15	0.0	0.0	186.7	15	0.0	0.0	0.0
Belgium	7,870	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Belize	6,750	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Benin	21,600	263	1.2	0.0	25.9	20	0.1	0.0	0.0
Bhutan	10,400	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bolivia	212,000	619	0.3	3.1	27.3	61	0.0	0.0	4.9
Bonaire, Saint Eustatius and Saba	4	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bosnia and Herzegovina	13,300	7	0.1	0.0	0.0	0	0.0	0.0	0.0
Botswana	27,000	2,150	8.0	20.2	46.6	9	0.0	277.8	4522.2
Brazil	2,410,000	3,650	0.2	3.9	20.6	117	0.0	0.0	2.6
Brunei	2,450	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bulgaria	22,900	42	0.2	0.0	0.0	0	0.0	0.0	0.0
Burkina Faso	26,200	2,330	8.9	18.0	75.7	101	0.4	32.7	155.4
Burundi	5,630	121	2.1	2.5	0.0	27	0.5	0.0	0.0
Cambodia	58,800	64	0.1	0.0	4.7	0	0.0	0.0	0.0
Cameroon	126,000	1,190	0.9	12.0	3.1	70	0.1	10.0	0.0
Canada	2,060,000	86	0.0	26.7	115.1	10	0.0	410.0	0.0
Cayman Islands	12	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Central African Republic	126,000	31	0.0	0.0	0.0	14	0.0	0.0	0.0
Chad	85,100	5,870	6.9	12.5	2.4	68	0.1	0.0	79.4
Chile	140,000	1,130	0.8	0.9	1.0	0	0.0	0.0	0.0
China	1,440,000	5,900	0.4	15.8	20.7	39	0.0	38.5	176.9
Colombia	469,000	195	0.0	0.0	4.6	3	0.0	0.0	0.0
Comoros	498	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Costa Rica	22,200	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Côte d'Ivoire	70,200	427	0.6	1.4	38.2	120	0.2	7.5	52.5
Croatia	13,400	21	0.2	0.0	0.0	0	0.0	0.0	0.0
Cuba	25,100	32	0.1	28.1	131.3	0	0.0	0.0	0.0
Curaçao	0	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Cyprus	1,520	126	8.3	0.0	29.4	0	0.0	0.0	0.0
Czech Republic	17,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Democratic Republic of the Congo	553,000	879	0.2	7.8	6.4	279	0.1	2.5	5.0
Denmark	9,720	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Djibouti	1,290	290	22.5	3.1	0.0	10	0.8	0.0	0.0
Dominica	179	0	0.0	0.0	0.0	0	0.0	0.0	0.0

Dominican Republic	11,300	9	0.1	0.0	55.6	0	0.0	0.0	0.0
East Timor	3,020	25	0.8	0.0	0.0	0	0.0	0.0	0.0
Ecuador	94,600	474	0.5	0.0	17.1	100	0.1	0.0	0.0
Egypt	6,000	849	14.2	43.6	14.1	248	4.1	1.2	2.8
El Salvador	6,740	8	0.1	0.0	0.0	0	0.0	0.0	0.0
Equatorial Guinea	10,700	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Eritrea	14,600	2,870	19.7	9.5	0.5	77	0.5	16.9	77.9
Estonia	10,100	15	0.1	0.0	0.0	0	0.0	0.0	0.0
Ethiopia	186,000	14,400	7.7	10.7	2.6	382	0.2	8.9	21.7
Falkland Islands	1,780	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Faroe Islands	243	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Fiji	5,860	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Finland	75,800	0	0.0	0.0	0.0	0	0.0	0.0	0.0
France	140,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
French Guiana	32,500	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Gabon	84,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Gambia	1,380	102	7.4	12.7	0.0	24	1.7	0.0	0.0
Georgia	19,500	17	0.1	0.0	135.3	0	0.0	0.0	0.0
Germany	84,200	33	0.0	0.0	0.0	19	0.0	0.0	0.0
Ghana	48,300	834	1.7	21.6	20.3	213	0.4	3.3	15.0
Greece	23,600	40	0.2	0.0	0.0	0	0.0	0.0	0.0
Greenland	287,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Grenada	31	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Guadeloupe	317	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Guam	158	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Guatemala	37,600	29	0.1	0.0	0.0	0	0.0	0.0	0.0
Guernsey	1	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Guinea	68,700	296	0.4	4.1	0.0	1	0.0	0.0	0.0
Guinea-Bissau	8,580	80	0.9	0.0	0.0	6	0.1	0.0	0.0
Guyana	71,600	20	0.0	0.0	0.0	0	0.0	0.0	0.0
Haiti	6,020	101	1.7	0.0	0.0	37	0.6	0.0	0.0
Honduras	33,300	14	0.0	0.0	0.0	0	0.0	0.0	0.0
Hong Kong	168	1	0.6	0.0	0.0	0	0.0	0.0	0.0
Hungary	16,700	16	0.1	37.5	125.0	7	0.0	0.0	0.0
Iceland	42,700	0	0.0	0.0	0.0	0	0.0	0.0	0.0
India	776,000	123,000	15.9	6.9	17.9	3,370	0.4	17.4	37.1
Indonesia	705,000	1,070	0.2	2.1	3.8	13	0.0	0.0	0.0
Iran	202,000	14,500	7.2	6.3	2.3	800	0.4	3.9	1.4
Iraq	36,400	6,100	16.8	3.9	7.4	171	0.5	19.9	1.8
Ireland	21,200	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Isle of Man	126	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Israel	3,110	818	26.3	4.2	17.1	26	0.8	0.0	0.0
Italy	75,400	236	0.3	0.0	11.0	24	0.0	0.0	0.0
Jamaica	2,650	42	1.6	0.0	0.0	0	0.0	0.0	0.0
Japan	126,000	4	0.0	0.0	0.0	0	0.0	0.0	0.0
Jersey	6	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Jordan	2,650	636	24.0	4.7	22.3	52	2.0	15.4	0.0
Kazakhstan	152,000	2,980	2.0	20.7	56.3	127	0.1	4.7	35.4
Kenya	88,400	2,320	2.6	6.0	21.4	316	0.4	10.8	18.4
Kiribati	1	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Kosovo	2,850	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Kuwait	196	18	9.2	0.0	0.0	0	0.0	0.0	0.0
Kyrgyzstan	34,800	933	2.7	4.4	13.3	0	0.0	0.0	0.0
Laos	72,300	53	0.1	0.0	0.0	0	0.0	0.0	0.0
Latvia	15,900	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Lebanon	2,650	15	0.6	93.3	0.0	0	0.0	0.0	0.0
Lesotho	4,980	36	0.7	97.2	80.6	0	0.0	0.0	0.0
Liberia	38,800	60	0.2	0.0	0.0	0	0.0	0.0	0.0
Libya	42,600	3,610	8.5	39.1	3.5	30	0.1	0.0	0.0
Liechtenstein	60	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Lithuania	15,500	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Luxembourg	674	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Macedonia	5,290	12	0.2	0.0	0.0	0	0.0	0.0	0.0
Madagascar	172,000	259	0.2	0.0	3.9	16	0.0	0.0	0.0
Malawi	20,500	1,940	9.5	4.4	3.6	38	0.2	7.9	0.0
Malaysia	128,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mali	84,600	2,880	3.4	5.6	6.4	129	0.2	14.7	8.5
Malta	17	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Martinique	270	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mauritania	33,100	2,720	8.2	2.2	1.9	0	0.0	0.0	0.0

Mayotte	56	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mexico	270,000	9,180	3.4	9.8	30.0	1,180	0.4	7.7	19.3
Micronesia	136	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Moldova	6,160	33	0.5	0.0	103.0	0	0.0	0.0	0.0
Mongolia	70,500	1,520	2.2	14.5	13.7	6	0.0	0.0	0.0
Montenegro	4,240	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Montserrat	3	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Morocco	52,800	3,650	6.9	4.5	5.8	164	0.3	4.3	0.0
Mozambique	162,000	1,170	0.7	18.1	66.5	59	0.0	252.5	0.0
Myanmar	249,000	704	0.3	1.1	7.4	9	0.0	0.0	33.3
Namibia	35,800	1,800	5.0	33.8	20.1	20	0.1	65.0	230.0
Nauru	4	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Nepal	49,200	1,240	2.5	4.1	0.0	14	0.0	0.0	0.0
Netherlands	8,310	27	0.3	0.0	37.0	0	0.0	0.0	0.0
New Caledonia	4,300	0	0.0	0.0	0.0	0	0.0	0.0	0.0
New Zealand	91,100	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Nicaragua	42,100	44	0.1	6.8	0.0	0	0.0	0.0	0.0
Niger	49,500	7,990	16.1	8.7	7.9	444	0.9	25.2	73.2
Nigeria	201,000	12,600	6.3	7.2	11.3	673	0.3	48.6	85.9
North Korea	29,700	475	1.6	0.2	24.6	6	0.0	0.0	0.0
Northern Mariana Islands	44	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Norway	93,000	14	0.0	0.0	35.7	0	0.0	0.0	0.0
Oman	14,000	4,620	33.0	3.2	0.1	0	0.0	0.0	0.0
Pakistan	102,000	34,200	33.5	6.9	4.0	8,750	8.6	2.9	4.1
Palau	68	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Palestina	1,240	856	69.0	2.6	0.1	134	10.8	15.7	0.0
Panama	26,900	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Papua New Guinea	190,000	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Paraguay	63,700	162	0.3	117.9	0.0	59	0.1	0.0	0.0
Peru	425,000	795	0.2	4.0	7.3	26	0.0	0.0	57.7
Philippines	107,000	368	0.3	0.5	3.0	10	0.0	0.0	0.0
Poland	64,700	9	0.0	44.4	0.0	0	0.0	0.0	0.0
Portugal	21,300	56	0.3	0.0	0.0	0	0.0	0.0	0.0
Puerto Rico	2,270	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Qatar	0	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Republic of Congo	88,200	61	0.1	0.0	0.0	17	0.0	0.0	0.0
Romania	51,900	108	0.2	0.0	8.3	25	0.0	0.0	0.0
Russia	3,430,000	1,870	0.1	4.5	50.9	56	0.0	0.0	1.8
Rwanda	4,980	64	1.3	14.1	4.7	22	0.4	0.0	0.0
Saint Kitts and Nevis	1	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Saint Lucia	156	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Saint Pierre and Miquelon	27	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Saint Vincent and the Grenadines	61	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Saint-Martin	1	0	0.0	0.0	0.0	0	0.0	0.0	0.0
San Marino	12	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Sao Tome and Principe	259	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Saudi Arabia	71,400	11,800	16.5	12.0	0.3	67	0.1	35.8	0.0
Senegal	18,500	1,190	6.4	10.8	7.0	97	0.5	0.0	0.0
Serbia	15,500	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Seychelles	11	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Sierra Leone	31,400	101	0.3	0.0	0.0	0	0.0	0.0	0.0
Singapore	160	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Sint Maarten	2	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Slovakia	11,000	21	0.2	0.0	0.0	0	0.0	0.0	0.0
Slovenia	5,670	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Solomon Islands	9,180	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Somalia	42,200	7,440	17.6	8.3	0.0	32	0.1	34.4	0.0
South Africa	107,000	13,900	13.0	10.8	43.0	3,770	3.5	27.6	68.2
South Korea	25,700	61	0.2	0.0	3.3	0	0.0	0.0	0.0
South Sudan	74,200	856	1.2	3.9	15.4	68	0.1	19.1	0.0
Spain	90,600	436	0.5	1.4	8.0	0	0.0	0.0	0.0
Sri Lanka	18,800	30	0.2	0.0	10.0	0	0.0	0.0	0.0
Sudan	100,000	15,100	15.1	7.7	1.4	290	0.3	34.5	18.6
Suriname	45,800	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Svalbard and Jan Mayen	13,300	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Swaziland	3,480	47	1.4	0.0	0.0	0	0.0	0.0	0.0
Sweden	103,000	9	0.0	0.0	844.4	0	0.0	0.0	0.0
Switzerland	12,700	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Syria	11,900	2,180	18.3	6.1	8.2	147	1.2	4.1	0.0

Taiwan	13,100	15	0.1	0.0	20.0	3	0.0	0.0	0.0
Tajikistan	28,100	629	2.2	0.8	6.0	11	0.0	0.0	0.0
Tanzania	161,000	3,000	1.9	6.7	12.9	324	0.2	0.0	9.0
Thailand	135,000	626	0.5	3.2	24.3	53	0.0	15.1	0.0
Togo	12,600	115	0.9	0.0	28.7	54	0.4	0.0	0.0
Trinidad and Tobago	1,240	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Tunisia	14,100	1,440	10.2	4.0	3.3	19	0.1	26.3	0.0
Turkey	151,000	1,390	0.9	8.0	10.1	0	0.0	0.0	0.0
Turkmenistan	14,900	3,920	26.3	4.0	11.9	402	2.7	8.2	2.2
Uganda	34,100	700	2.1	9.4	0.9	150	0.4	12.0	0.0
Ukraine	98,300	490	0.5	5.3	40.0	0	0.0	0.0	0.0
United Arab Emirates	973	665	68.3	1.8	4.2	0	0.0	0.0	0.0
United Kingdom	69,500	0	0.0	0.0	0.0	0	0.0	0.0	0.0
United States	1,780,000	10,700	0.6	13.5	30.9	1,240	0.1	17.7	69.1
Uruguay	48,800	56	0.1	0.0	0.0	0	0.0	0.0	0.0
Uzbekistan	18,500	3,440	18.6	4.5	18.8	312	1.7	10.9	41.3
Vanuatu	2,870	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Venezuela	285,000	1,090	0.4	7.2	7.0	190	0.1	9.5	8.4
Vietnam	110,000	1,350	1.2	5.1	4.6	121	0.1	0.0	3.3
Virgin Islands, U.S.	28	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Western Sahara	10,300	62	0.6	0.0	0.0	32	0.3	0.0	0.0
Yemen	23,100	8,540	37.0	2.0	0.1	1,210	5.3	5.7	1.3
Zambia	134,000	732	0.5	6.7	38.5	172	0.1	0.0	5.8
Zimbabwe	55,000	642	1.2	9.2	155.8	78	0.1	115.4	59.0
Global	23,900,000	409,000	1.7	8.4	14.4	29,000	0.1	12.8	26.8

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