

**A hierarchical collection of political/economic
regions for analysis of climate extremes:
Supplementary material A (WRAF0.5-v4.1)**

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Abstract This document lists the WRAF0.5-v4.1 regions, of approximately 0.5Mm² size, developed in the manuscript titled “A hierarchical collection of political/economic regions for analysis of climate extremes”.

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Supplementary Table A 1 List of WRAF0.5-v4.1 regions defined within Canada (WRAF10-v4.1 region 1). Regions are defined according to boundaries of provinces, territories, counties, territorial regions, and Lancaster Sound and Prince Regent Inlet.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
1.1 Arctic Canada	1.1.1 NWT and Yukon	1.1.1.1	Yukon	0.481	Canada	Yukon	—
		1.1.1.2	Inuvik	0.572	Canada	Northwest Territories	Inuvik
		1.1.1.3	Fort Smith	0.767	Canada	Northwest Territories	Fort Smith
	1.1.2 Nunavut	1.1.2.1	Kitikmeot	0.521	Canada	Nunavut	Kitikmeot
		1.1.2.2	Kivalliq	0.542	Canada	Nunavut	Kivalliq
		1.1.2.3	north Qikiqtaaluk	0.404	Canada	Nunavut	Qikiqtaaluk (<i>Islands not in south Qikiqtaaluk</i>)
		1.1.2.4	south Qikiqtaaluk	0.632	Canada	Nunavut	Qikiqtaaluk (Baffin Island, Melville Peninsula)
	1.2 south Canada	1.2.1 west Canada	1.2.1.1	north British Columbia	0.457	Canada	British Columbia
1.2.1.2			south British Columbia	0.498	Canada	British Columbia	<i>Counties not in north British Columbia</i>
1.2.1.3			Alberta	0.661	Canada	Alberta	—
1.2.1.4			Saskatchewan	0.648	Canada	Saskatchewan	—
1.2.2 Manitoba and Ontario		1.2.2.1	Manitoba	0.649	Canada	Manitoba	—
		1.2.2.2	west Ontario	0.617	Canada	Ontario	Kenora, Lake Superior, Rainy River, Thunder Bay
		1.2.2.3	east Ontario	0.464	Canada	Ontario	<i>Counties not in north Ontario</i>
1.2.3 east Canada		1.2.3.1	Nord-du-Québec	0.873	Canada	Québec	Nord-du-Québec
		1.2.3.2	south Québec	0.659	Canada	Québec	<i>Counties except Nord-du-Québec</i>
		1.2.3.3	Atlantic Canada	0.539	Canada	Newfoundland and Labrador, New Brunswick, Nova Scotia, Prince Edward Island	—

NWT = Northwest Territories

Supplementary Table A 2 List of WRAF0.5-v4.1 regions defined within the United States of America (WRAF10-v4.1 region 2). Regions are defined according to boundaries of states and Alaskan boroughs.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
2.1 north USA	2.1.1 Alaska	2.1.1.1	north Alaska	0.764	USA	Alaska	Nome, North Slope, Northwest Arctic, Yukon-Koyukuk
		2.1.1.2	south Alaska	0.753	USA	Alaska	<i>Boroughs not in north Alaska</i>
	2.1.2 northwest USA	2.1.2.1	Pacific Northwest USA	0.643	USA	Idaho, Oregon, Washington	—
		2.1.2.2	Montana and the Dakotas	0.761	USA	Montana, North Dakota, South Dakota	—
		2.1.2.3	Colorado, Utah, Wyoming	0.743	USA	Colorado, Utah, Wyoming	—
	2.1.3 Midwest USA	2.1.3.1	west Great Lakes USA	0.644	USA	Michigan, Minnesota, and Wisconsin	—
		2.1.3.2	southwest Midwest USA	0.593	USA	Kansas, Missouri, and Nebraska	—
		2.1.3.3	Corn Belt USA	0.505	USA	Illinois, Indiana, Iowa, Ohio	—
	2.2 south USA	2.2.1 southwest USA	2.2.1.1	California and Nevada	0.698	USA	California, Nevada
2.2.1.2			Arizona and New Mexico	0.610	USA	Arizona, New Mexico	—
2.2.1.3			Texas	0.688	USA	Texas	—
2.2.1.4			west South Central USA	0.438	USA	Arkansas, Louisiana, Oklahoma	—
—		—	—	USA	Hawai'i	—	
2.2.2 east USA		2.2.2.1	Northeast USA	0.477	USA	Connecticut, Delaware, District of Columbia, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont	—
		2.2.2.2	central east USA	0.590	USA	Kentucky, North Carolina, South Carolina, Tennessee, Virginia, West Virginia	—
	2.2.2.3	southeast USA	0.560	USA	Alabama, Florida, Georgia, Mississippi	—	

USA = United States of America

Supplementary Table A 3 List of WRAF0.5-v4.1 regions defined within Mercosur (WRAF10-v4.1 region 3). Regions are defined according to boundaries of: countries; Brazilian states, Federal District, and municipalities; Argentinian provinces; and Venezuelan states, Capital District, and federal dependencies.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
3.1 northern Brazil	3.1.1 west North Brazil	3.1.1.1	Centro and Norte Amazonense	0.765	Brazil	Amazonas	Centro Amazonense, Norte Amazonense
		3.1.1.2	Sudoeste and Sul Amazonense	0.812	Brazil	Amazonas	Sudoeste Amazonense, Sul Amazonense
		—	—	—	Brazil	Acre, Rondônia	—
	3.1.2 central North Brazil	3.1.2.1	north Pará	0.539	Brazil	Pará	Baixo Amazonas, Marajó, Metropolitana de Belém, and Nordeste Paraense
		3.1.2.2	south Pará	0.718	Brazil	Pará	Sudeste Paraense, Sudoeste Paraense
		—	—	—	Brazil	Amapá, Roraima	—
		3.2.1.1	Maranhão and Tocantins	0.607	Brazil	Maranhão, Tocantins	—
3.2 east and south Brazil	3.2.1 northeast Brazil	3.2.1.2	northeast Northeast Brazil	0.663	Brazil	Alagoas, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe	—
		3.2.1.3	Bahia	0.565	Brazil	Bahia	—
		3.2.2.1	Norte Mato-Grossense	0.485	Brazil	Mato Grosso	Norte Mato-Grossense
	3.2.2 Central-West Brazil	3.2.2.2	east and south Mato Grosso	0.423	Brazil	Mato Grosso	Centro-Sul Mato-Grossense, Nordeste Mato-Grossense, Sudeste Mato-Grossense, Sudoeste Mato-Grossense
		3.2.2.3	central Brazil	0.704	Brazil	Distrito Federal, Goiás, Mato Grosso do Sul	—
		3.2.3.1	north Southeast Brazil	0.680	Brazil	Espírito Santo, Minas Gerais, Rio de Janeiro	—
	3.2.3 South and Southeast Brazil	3.2.3.2	southern Brazil	0.817	Brazil	Paraná, Rio Grande do Sul, Santa Catarina, São Paulo	—

Mercosur = Southern Common Market
Continued...

Supplementary Table A 3 ...continued.

WRAF5	WRAF2	ID	Label	Area (Mm ²)	WRAF0.5		
					Nation(s)	Province(s)	Subprovince(s)
3.3 south Mercosur	3.3.1 Argentina	3.3.1.1	northwest Argentina	0.512	Argentina	Catamarca, Jujuy, La Rioja, San Juan, Salta, Tucumán	—
		3.3.1.2	northeast Argentina	0.507	Argentina	Chaco, Corrientes, Entre Ríos, Formosa, Misiones, Santiago del Estero	—
		3.3.1.3	west central Argentina	0.669	Argentina	La Pampa, Mendoza, Neuquén, Río Negro, San Luis	—
		3.3.1.4	east central Argentina	0.608	Argentina	Buenos Aires, Ciudad de Buenos Aires, Córdoba, Santa Fe	—
		3.3.1.5	south Patagonia	0.490	Argentina	Chubut, Santa Cruz, Tierra del Fuego	—
	—	3.3.X.1	Paraguay	0.402	Paraguay	—	—
	—	—	—	—	Uruguay	—	—
—	—	3.X.X.1	north Venezuela	0.486	Venezuela	Anzoátegui, Apure, Aragua, Barinas, Carabobo, Caracas, Cojedes, Delta Amacuro, Falcón, Federal Dependencias, Guárico, Lara, Mérida, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Táchira, Trujillo, Vargas, Yaracuy, Zulia	—
—	—	3.X.X.2	Amazonas and Bolívar	0.434	Venezuela	Amazonas, Bolívar	—

Supplementary Table A 4 List of WRAF0.5-v4.1 regions defined within the Arab League (WRAF10-v4.1 region 4). Regions are defined according to boundaries of: countries; Mauritanian regions and capital district; Algerian provinces; Libyan districts; Sudanese states; Egyptian governorates; and Saudi Arabian regions.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Definition	Subprovince(s)
4.1 west Arab League	4.1.1 west AMU	4.1.1.1	Morocco	0.593	Morocco	—	—
		4.1.1.2	north Mauritania	0.482	Mauritania	Adrar and Tiris Zemmour	—
		4.1.1.3	south Mauritania	0.558	Mauritania	<i>Regions except</i> Adrar and Tiris Zemmour	—
	4.1.2 central AMU	4.1.2.1	coastal Algeria	0.418	Algeria	<i>Provinces except</i> Adrar, Béchar, Ghardaia, Illizi, Ouargla, Tamanrasset, Tindouf	—
		4.1.2.2	west Algeria	0.757	Algeria	Adrar, Béchar, Tindouf	—
		4.1.2.3	Tamanrasset	0.604	Algeria	Tamanrasset	—
		4.1.2.4	east Algeria	0.534	Algeria	Ghardaia, Illizi, Ouargla	—
		—	—	—	Tunisia	—	—
4.2 central Arab League	4.2.1 Libya	4.2.1.1	Cirenaica	0.758	Libya	Al Wahat, Benghazi, Butnan, Derna, Jabal al Akhdar, Kufra, Marj	—
		4.2.1.2	Fezzan and Tripolitania	0.868	Libya	Ghadamis, Ghat, Jafara, Jufra, Marqab, Misratah, Mizdah, Murzuq, Nuqat al Khams, Sabha, Sirte, Tajurawa, Wadi al Hayaa, Wadi al Shatii, Zawiya	—
	4.2.2 Sudan	4.2.2.1	Darfur	0.512	Sudan	North Darfur, South Darfur, West Darfur	—
		4.2.2.2	north Sudan	0.693	Sudan	Northern, Red Sea, River Nile	—
		4.2.2.3	southern Sudan	0.660	Sudan	Blue Nile, Gedarif, Gezira, Kassala, Khartoum, North Kordofan, Senнар, South Kordofan, White Nile	—

AMU = Arab Maghreb Union; Arab League = League of Arab States; GCC = Gulf Cooperation Council

Continued...

Supplementary Table A 4 ...continued.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
4.3 central and east Arab League	4.3.1 northeast Arab League	4.3.1.1	north and east Egypt	0.551	Egypt	<i>Governorates except New Valley</i>	—
		4.3.1.2	New Valley	0.453	Egypt	New Valley	—
		4.3.1.3	north Arab League	0.729	Iraq, Jordan, Lebanon, Palestine, Syria	—	—
	4.3.2 Saudi Arabia	4.3.2.1	north and west Saudi Arabia	0.749	Saudi Arabia	Ha'il, Jawf, Madinah, Makkah, Northern Borders, Tabuk	—
		4.3.2.2	central and south Saudi Arabia	0.625	Saudi Arabia	'Asir, Bahah, Jizan, Najran, Qassim, Riyadh	—
		4.3.2.3	east Saudi Arabia	0.556	Saudi Arabia	Eastern Province	—
	4.3.3 east Arab League	4.3.3.1	east GCC	0.414	Bahrain, Kuwait, Oman, Qatar, United Arab Emirates	—	—
		4.3.3.2	Yemen	0.456	Yemen	—	—
		4.3.3.3	Somalia	0.476	Somalia	—	—
		—	—	—	Comoros, Djibouti	—	—

Supplementary Table A 5 List of WRAF0.5-v4.1 regions defined within the Economic Community of West African States (ECOWAS) and Economic and Monetary Community of Central Africa (CEMAC) (WRAF10-v4.1 region 5). Regions are defined according to boundaries of: countries; Malian regions and District of Bamako; Nigerien regions; Nigerian states; and Chadian regions.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
5.1 ECOWAS	5.1.1 west ECOWAS	5.1.1.1	far west ECOWAS	0.560	The Gambia, Guinea, Guinea-Bissau, Senegal, Sierra Leone	—	—
		5.1.1.2	north Mali	0.827	Mali	Gao, Kidal, Timbuktu	—
		5.1.1.3	south Mali	0.432	Mali	Bamako, Kayes, Koulikoro, Mopti, Ségou, Sikasso	—
		5.1.1.4	southwest ECOWAS	0.419	Côte d'Ivoire, Liberia	—	—
		—	—	—	Cape Verde	—	—
	5.1.2 east ECOWAS	5.1.2.1	south ECOWAS	0.687	Benin, Burkina Faso, Ghana, Togo	—	—
		5.1.2.2	Agadez	0.624	Niger	Agadez	—
		5.1.2.3	south Niger	0.561	Niger	Diffa, Dosso, Maradi, Niamey, Tillabéri, Tahoua, Zinder	—
		5.1.2.4	north Nigeria	0.472	Nigeria	Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Katsina, Kebbi, Niger, Sokoto, Yobe, Zamfara	—
		5.1.2.5	south Nigeria	0.442	Nigeria	Abia, Adamawa, Akwa Ibom, Anambra, Bayelsa, Benue, Cross River, Delta, Ebonyi, Edo, Ekiti, Enugu, Federal Capital Territory, Imo, Kogi, Kwara, Lagos, Nasarawa, Ogun, Ondo, Osun, Oyo, Plateau, Rivers, Taraba	—

CEMAC = Economic and Monetary Community of Central Africa; ECOWAS = Economic Community of West African States

Continued...

Supplementary Table A 5 ...continued.

WRAF5	WRAF2	ID	Label	Area (Mm ²)	WRAF0.5		
					Nation(s)	Province(s)	Subprovince(s)
5.2 CEMAC	5.2.1 Chad	5.2.1.1	north Chad	0.563	Chad	Borkou, Ennedi, Tibesti	—
		5.2.1.2	south Chad	0.711	Chad	<i>Regions except</i> Borkou, Ennedi, Tibesti	—
	5.2.2 central and south CEMAC	5.2.2.1	Cameroon	0.466	Cameroon	—	—
		5.2.2.2	Central African Republic	0.619	Central African Republic	—	—
		5.2.2.3	south CEMAC	0.638	Equatorial Guinea, Gabon, Republic of the Congo, Sao Tome and Principe	—	—

CEMAC = Economic and Monetary Community of Central Africa

Supplementary Table A 6 List of WRAF0.5-v4.1 regions defined within the Southern African Development Community (SADC) (WRAF10-v4.1 region 6). The regions are defined according to the boundaries of: countries; Congolese, Angolan, and South African, provinces; and Tanzanian regions.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Definition Province(s)	Subprovince(s)
6.1 north SADC	6.1.1 DR Congo	6.1.1.1	northwest DR Congo	0.575	DR Congo	Équateur, Kasai-Oriental, Lomami, Mongala, Nord-Ubangi, Tshuapa, Sankuru, Sud-Ubangi	—
		6.1.1.2	northeast DR Congo	0.563	DR Congo	Bas-Uele, Haut-Uele, Ituri, Nord-Kivu, Tshopo	—
		6.1.1.3	west DR Congo	0.517	DR Congo	Kasai, Kasai-Central, Kinshasa, Kongo-Central, Kwango, Kwilu, Mai-Ndombe	—
		6.1.1.4	southeast DR Congo	0.680	DR Congo	Haut-Katanga, Haut-Lomami, Lualaba, Maniema, Sud-Kivu, Tanganyika	—
	6.1.2 northwest SADC	6.1.2.1	northeast Angola	0.636	Angola	Bengo, Cabinda, Cuanza Norte, Luanda, Lunda Norte, Lunda Sul, Malanje, Moxico, Uíge, Zaire	—
		6.1.2.2	southwest Angola	0.614	Angola	Benguela, Bié, Cuando Cubango, Cuanza Sul, Cunene, Huambo, Huila, Namibe	—
		6.1.2.3	north central SADC	0.877	Malawi, Zambia	—	—
—	—	—	—	Zimbabwe	—	—	

DR Congo = Democratic Republic of the Congo; SADC =Southern Africa Development Community

Continued...

Supplementary Table A 6 ...continued.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Definition Province(s)	Subprovince(s)
6.2 east and south SADC	6.2.1 east SADC	6.2.1.1	northeast Tanzania	0.477	Tanzania	Arusha, Dar es Salaam, Dodoma, Geita, Kagera, Kilimanjaro, Manjara, Mara, Morogoro, Mwanza, Pemba North, Pemba South, Pwani, Shinyanga, Simiyu, Singida, Tanga, Zanzibar North, Zanzibar South, Zanzibar Urban West	—
		6.2.1.2	southwest Tanzania	0.471	Tanzania	Iringa, Katavi, Kigoma, Lindi, Mbeya, Mtwara, Njombe, Rukwa, Ruvuma, Tabora	—
		6.2.1.3	Mozambique	0.791	Mozambique	—	—
		6.2.1.4	Madagascar	0.597	Madagascar	—	—
		—	—	—	Mauritius, Seychelles	—	—
	6.2.2 south SADC	6.2.2.1	Namibia	0.828	Namibia	—	—
		6.2.2.2	Botswana	0.580	Botswana	—	—
		6.2.2.3	west South Africa	0.664	South Africa	Eastern Cape, Northern Cape, Western Cape	—
		6.2.2.4	east South Africa	0.560	South Africa	Limpopo, Gauteng, Free State, KwaZulu-Natal, North West, Mpumalanga	—
		—	—	—	Lesotho, Swaziland	—	—

Supplementary Table A 7 List of WRAF0.5-v4.1 regions defined within west Russia (WRAF10-v4.1 region 7). Regions are defined according to boundaries of economic regions, republics, krais, oblasts, cities, and okrugs.

WRAF5	WRAF2	WRAF0.5						
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)	
7.1 European Russia	7.1.1 northwest Russia	7.1.1.1	west Northern Russia	0.865	Russia	Arkhangelsk, Karelia, Murmansk, Vologda	—	
		7.1.1.2	Komi and Nenets	0.592	Russia	Komi, Nenets	—	
		7.1.1.3	Central and North-western Russia	0.679	Russia	Central and Northwest-ern Economic Regions	—	
		—	—	—	Russia	Kaliningrad	—	
	7.1.2 southwest Russia	7.1.2.1	Central Black Earth and North Caucasus	0.524	Russia	Central Black Earth and North Caucasus Economic Regions	—	
		7.1.2.2	Volga and Volga-Vyatka	0.798	Russia	Volga and Volga-Vyatka Economic Regions	—	
		7.1.2.3	Urals	0.824	Russia	Urals Economic Region	—	
	7.2 west and north Siberia	7.2.1 West Siberia	7.2.1.1	Yamalo-Nenets	0.682	Russia	Yamalo-Nenets	—
			7.2.1.2	Khanty-Mansi	0.531	Russia	Khanty-Mansi	—
7.2.1.3			central West Siberia	0.613	Russia	Omsk, Tomsk, Tyumen	—	
7.2.1.4			south West Siberia	0.536	Russia	Altai Krai, Altai Rep., Kemerovo, Novosibirsk	—	
7.2.2 north East Siberia		7.2.2.1	Taymyr	0.841	Russia	Taymyr	—	
		7.2.2.2	Evenk	0.761	Russia	Evenk	—	
		7.2.2.3	Krasnoyarsk	0.712	Russia	Krasnoyarsk	—	

Supplementary Table A 8 List of WRAF0.5-v4.1 regions defined within east Russia (WRAF10-v4.1 region 8). Regions are defined according to boundaries of economic regions, republics, krais, oblasts, cities, okrugs, and Sakha districts.

WRAF5	WRAF2	WRAF0.5						
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)	
8.1 central east Russia	8.1.1 south East Siberia	8.1.1.1	Buryatia, Khakassia, and Tuva	0.581	Russia	Buryatia, Khakassia, Tuva	—	
		8.1.1.2	Irkutsk	0.764	Russia	Irkutsk	—	
		8.1.1.3	Zabaykalsky	0.431	Russia	Zabaykalsky	—	
	8.1.2 Sakha	8.1.2.1	northwest Sakha	0.549	Russia	Sakha	Anabarsky, Bulunsky, Olenyoksky	
		8.1.2.2	northeast Sakha	0.675	Russia	Sakha	Abyysky, Allaikhovsky, Momsky, Nizhnekolymsky, Srednekolymsky, Ust-Yansky, Verkhnekolymsky	
		8.1.2.3	southwest Sakha	0.617	Russia	Sakha	Lensky, Mirninsky, Nyurbinsky, Olyokminsky, Suntarsky, Verkhnevilyuyusky, Vilyuysky	
		8.1.2.4	central Sakha	0.660	Russia	Sakha	Eveno-Bytantaysky, Kobyaysky, Oymyakonsky, Tomponsky, Verkhoyansky, Zhigansky	
		8.1.2.5	southeast Sakha	0.523	Russia	Sakha	Aldansky, Amginsky, Churapchinsky, Gorny, Khangalassky, Megino-Kangalassky, Namsky, Neryungrinsky, Tattinsky, Ust-Aldansky, Ust-Maysky, Yakutsk	
	8.2 Pacific Russia	8.2.1 north Pacific Russia	8.2.1.1	Magadan	0.460	Russia	Magadan	—
			8.2.1.2	Chukotka	0.712	Russia	Chukotka	—
8.2.1.3			Kamchatka	0.464	Russia	Kamchatka	—	
8.2.2 south Pacific Russia		8.2.2.1	Amur, Primorsky, Yevrey	0.560	Russia	Amur, Primorsky, Yevrey	—	
		8.2.2.2	Khabarovsk	0.781	Russia	Khabarovsk	—	
		—	—	—	Russia	Sakhalin	—	

Supplementary Table A 9 List of WRAF0.5-v4.1 regions defined within the Economic Cooperation Organization (ECO) (WRAF10-v4.1 region 9). Regions are defined according to boundaries of countries, Iranian provinces, and Kazakhstan regions.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
9.1 west ECO	9.1.1 north-west ECO	9.1.1.1	Turkey	0.783	Turkey	—	—
		9.1.1.2	Turkmenistan	0.471	Turkmenistan	—	—
		9.1.1.3	Uzbekistan	0.450	Uzbekistan	—	—
		—	—	—	Azerbaijan	—	—
	9.1.2 Iran	9.1.2.1	northwest Iran	0.537	Iran	Alborz, Ardabil, East Azerbaijan, Gilan, Golestan, Hamadan, Ilam, Kermanshah, Khuzestan, Kordestan, Lorestan, Markazi, Mazandaran, Qazvin, Qom, Semnan, Tehran, West Azerbaijan, Zanjan	—
		9.1.2.2	southwest Iran	0.484	Iran	Bushehr, Chaharmahal and Bakhtiari, Fars, Hormozgan, Isfahan, Kohgiluyeh and Boyer-Ahmad, Yazd	—
		9.1.2.3	east Iran	0.604	Iran	Kerman, North Khorasan, Razavi Khorasan, Sistan and Baluchestan, South Khorasan	—
		9.2.1.1	western Kazakhstan	0.430	Kazakhstan	Atyrau, Mangystau, West Kazakhstan	—
		9.2.1.2	north Kazakhstan	0.568	Kazakhstan	Akmola, Astana, Kostanay, North Kazakhstan, Pavlodar	—
		9.2.1.3	southwest Kazakhstan	0.644	Kazakhstan	Aktobe, Baikonur, Kyzylorda, South Kazakhstan	—
9.2.2 south-east ECO	9.2.1.4	central Kazakhstan	0.570	Kazakhstan	Karagandy, Zhambyl	—	
	9.2.1.5	east Kazakhstan	0.499	Kazakhstan	Almaty, Almaty Region, East Kazakhstan	—	
	9.2.2.1	Afghanistan	0.641	Afghanistan	—	—	
	9.2.2.2	Pakistan	0.878	Pakistan	—	—	
	—	—	—	Kyrgyzstan, Tajikistan	—	—	
	—	—	—	—	—	—	

ECO = Economic Cooperation Organization

Supplementary Table A 10 List of WRAF0.5-v4.1 regions defined within China (WRAF10-v4.1 region 10). Regions are defined according to boundaries of provinces, autonomous regions, municipalities, and special administrative regions.

WRAF5	WRAF2	WRAF0.5					
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
10.1 north China	10.1.1 northwest China	10.1.1.1	north Xinjiang Uyghur	0.595	China	Xinjiang Uyghur	Altay, Börtala Mongol, Changji Hui, Hami, Ili Kazakh, Karamay, Shihezi, Tacheng, Turpan, Ürümqi
		10.1.1.2	west Xinjiang Uyghur	0.561	China	Xinjiang Uyghur	Aksu, Kashgar, Khotan, Kizilsu Kirghiz
		10.1.1.3	Bayingolin	0.474	China	Xinjiang Uyghur	Bayin'gholin Mongol
		10.1.1.4	Gansu and Ningxia	0.454	China	Gansu, Ningxia	—
		10.1.1.5	Qinghai	0.713	China	Qinghai	—
	10.1.2 northeast China	10.1.2.1	west Inner Mongolia	0.493	China	Inner Mongolia	Alxa, Baotou, Bayannur, Hohhot, Ordos, Ulaan Chab, Wuhai
		10.1.2.2	east Inner Mongolia	0.654	China	Inner Mongolia	Chifeng, Hulunbuir, Tongliao, Xilin Gol, Xing'an
		10.1.2.3	Heilongjiang and Jilin	0.638	China	Heilongjiang, Jilin	—
		10.1.2.4	northern east China	0.518	China	Beijing, Hebei, Liaoning, Shandong, Tianjin	—
	10.2 south China	10.2.1 southwest China	10.2.1.1	northeast Tibet-Xizang	0.581	China	Tibet-Xizang
10.2.1.2			southwest Tibet-Xizang	0.553	China	Tibet-Xizang	Lhasa, Ngari, Shannan, Shigatse
10.2.1.3			Chongqing and Sichuan	0.569	China	Chongqing, Sichuan	—
10.2.1.4			Guizhou and Yunnan	0.560	China	Guizhou, Yunnan	—
10.2.2 southeast China		10.2.2.1	Henan, Shaanxi, and Shanxi	0.528	China	Henan, Shaanxi, Shanxi	—
		10.2.2.2	central east China	0.536	China	Anhui, Hubei, Jiangsu, Shanghai, Zhejiang	—
		10.2.2.3	Fujian, Hunan, and Jiangxi	0.503	China	Fujian, Hunan, Jiangxi	—
		10.2.2.4	south coast China	0.450	China	Guangdong, Guangxi, Hainan, Hong Kong, Macau	—

Supplementary Table A 11 List of WRAF0.5-v4.1 regions defined within Australia (WRAF10-v4.1 region 11). Regions are defined according to boundaries of: states; territories; Western Australian Regional Development Commissions Act regions; South Australian local government areas; Northern Territory cities, municipalities, regions, shires, and unincorporated areas; and Queensland trade and investment regions.

WRAF5	WRAF2	WRAF0.5							
		ID	Label	Area (Mm ²)	Nation(s)	Province(s)		Subprovince(s)	
11.1 west and south Australia	11.1.1 Western Australia	11.1.1.1	Kimberley	0.432	Australia	Western Australia	Australia	Kimberly	
		11.1.1.2	Gascoyne and Pilbara	0.643	Australia	Western Australia	Australia	Gascoyne and Pilbara	
		11.1.1.3	southwest Western Australia	0.699	Australia	Western Australia	Australia	Great Southern, Mid West, Peel, Perth Metropolitan Area, South West, Wheatbelt	
		11.1.1.4	Goldfields-Esperance	0.776	Australia	Western Australia	Australia	Goldfields-Esperance	
	11.1.2 southeast Australia	11.1.2.1	Far North South Australia	0.468	Australia	South Australia	South Australia	Unincorporated Far North	
		11.1.2.2	south South Australia	0.519	Australia	South Australia	South Australia	<i>Areas not in</i> Far North South Australia	
		11.1.2.3	New South Wales	0.805	Australia	New South Wales	South Wales	—	
		—	—	—	Australia	Australian Capital Territory, Tasmania, Victoria	—	—	
	11.2 northeast Australia	11.2.1 Northern Territory	11.2.1.1	Darwin, East Arnhem, and Katherine	0.505	Australia	Northern Territory	Northern Territory	Darwin, East Arnhem, and Katherine
			11.2.1.2	Alice Springs and Barkly Tableland	0.853	Australia	Northern Territory	Northern Territory	Alice Springs and Barkly Tableland
11.2.2 Queensland		11.2.2.1	north Queensland	0.667	Australia	Queensland	Queensland	Far North and North Queensland	
		11.2.2.2	central Queensland	0.616	Australia	Queensland	Queensland	Central, Mackay, Isaac, Whitsunday	
		11.2.2.3	south Queensland	0.463	Australia	Queensland	Queensland	Darling Downs South West, South East, Wide Bay Burnett	

Supplementary Table A 12 List of WRAF0.5-v4.1 regions defined within Antarctica (WRAF10-v4.1 region 12). In contrast to other regions in this paper, the Antarctic regions are defined according to lines of longitude and latitude, as well as coastlines.

WRAF5	WRAF2	WRAF0.5			
		ID	Label	Area (Mm ²)	Definition Territory Geographic range
12.1 polar and West Antarctica	12.1.1 West Antarctica	12.1.1.1	Antarctic Peninsula	0.688	Antarctica 95W–50W, 79S–60S
		12.1.1.2	north Marie Byrd	0.698	Antarctica 180W–95W, 79S–70S
		12.1.1.3	Rockefeller Plateau	0.545	Antarctica 180W–110W, 86S–79S
		12.1.1.4	Whitmore Mountains	0.582	Antarctica 110W–45W, 86S–79S
	12.1.2 polar Antarctica	12.1.2.1	Dome Argus	0.562	Antarctica 65E–115E, 86S–79S
		12.1.2.2	Shackleton Coast	0.576	Antarctica 115E–180E, 86S–79S
		12.1.2.3	Shackleton Range	0.612	Antarctica 45W–15E, 86S–79S
		12.1.2.4	south of Dome Fuji	0.562	Antarctica 15E–65E, 86S–79S
		12.1.2.5	South Pole	0.609	Antarctica 180W–180E, 90S–86S
		12.2 East Antarctica	12.2.1 west East Antarctica	12.2.1.1	central Queen Maud
12.2.1.2	coastal Queen Maud			0.598	Antarctica 40W–45E, 73S–64S
12.2.1.3	Coats Land			0.548	Antarctica 50W–5E, 79S–73S
12.2.1.4	Dome Fuji			0.626	Antarctica 35E–70E, 79S–73S
12.2.2 central East Antarctica	12.2.2.1		Enderby and MacRobertson	0.597	Antarctica 45E–70E, 73S–64S
	12.2.2.2		Ingrid Christensen Coast	0.509	Antarctica 70E–95E, 73S–64S
	12.2.2.3		west of Vostok	0.627	Antarctica 70E–105E, 79S–73S
	12.2.2.4		western Wilkes	0.577	Antarctica 95E–115E, 73S–65S
12.2.3 east East Antarctica	12.2.3.1		Dome C	0.537	Antarctica 105E–135E, 79S–73S
	12.2.3.2		eastern Wilkes	0.536	Antarctica 115E–135E, 73S–65S
	12.2.3.3		Scott Coast	0.523	Antarctica 135E–180E, 79S–73S
	12.2.3.4		Talos Dome	0.628	Antarctica 135E–180E, 73S–65S

Supplementary Table A 13 List of WRAF0.5-v4.1 regions defined within the Andean Community (WRAF5-v4.1 region X.1). Regions are defined according to boundaries of: countries; Colombian districts and Capital District; and Bolivian departments.

WRAF2	WRAF0.5					
	ID	Label	Area (Mm ²)	Nation(s)	Definition	Subprovince(s)
X.1.1 north Andean Community	X.1.1.1	west Colombia	0.482	Colombia	Antioquia, Atlántico, Bogotá, Bolívar, Boyacá, Caldas, Cauca, Cesar, Chocó, Córdoba, Cundinamarca, Huila, La Guajira, Magdalena, Nariño, Norte de Santander, Quindío, Risaralda, Santander, Sucre, Tolima, Valle del Cauca	—
	X.1.1.2	east Colombia	0.656	Colombia	Amazonas, Arauca, Caquetá, Casanare, Guainía, Guaviare, Meta, Putumayo, Vaupés, Vichada	—
	—	—	—	Ecuador	—	—
X.1.2 south Andean Community	X.1.2.1	southwest Peru	0.735	Peru	<i>Regions except</i> Loreto, Madre de Dios, Ucayali	—
	X.1.2.2	northeast Peru	0.565	Peru	Loreto, Madre de Dios, Ucayali	—
	X.1.2.3	northeast Bolivia	0.638	Bolivia	Beni, Pando, Santa Cruz	—
	X.1.2.4	southwest Bolivia	0.452	Bolivia	Chuquisaca, Cochabamba, La Paz, Oruro, Potosí, Tarija	—

Supplementary Table A 14 List of WRAF0.5-v4.1 regions defined within the European Economic Area (EEA) (WRAF5-v4.1 region X.2). Regions are defined according to boundaries of countries.

WRAF2	ID	Label	Area (Mm ²)	WRAF0.5		
				Nation(s)	Province(s)	Subprovince(s)
X.2.1 north EEA	X.2.1.1	northwest EEA	0.742	Denmark, Ireland, Norway, United Kingdom	—	—
	X.2.1.2	Sweden	0.446	Sweden	—	—
	X.2.1.3	northeast EEA	0.506	Estonia, Finland, Latvia, Lithuania	—	—
	X.2.1.4	central EEA	0.428	Belgium, Germany, Luxembourg, Netherlands	—	—
	X.2.1.5	Visegrád EEA	0.532	Czech Republic, Hungary, Poland, Slovakia	—	—
	—	—	—	Iceland	—	—
X.2.2 south EEA	X.2.2.1	Iberian EEA	0.600	Portugal, Spain	—	—
	X.2.2.2	France	0.639	France	—	—
	X.2.2.3	Adriatic EEA	0.463	Austria, Croatia, Italy, Liechtenstein, Slovenia	—	—
	X.2.2.4	southeast EEA	0.482	Bulgaria, Greece, Romania	—	—
	—	—	—	Cyprus, Malta	—	—

EEA = European Economic Area

Supplementary Table A 15 List of WRAF0.5-v4.1 regions defined within India (WRAF5-v4.1 region X.3). Regions are defined according to the Zonal Councils.

WRAF2	WRAF0.5					
	ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
X.3.1 north India	X.3.1.1	Northern India	0.598	India	Northern Zonal Council	—
	X.3.1.2	North-Central India	0.702	India	North-Central Zonal Council	—
X.3.2 south and east India	X.3.2.1	Western India	0.498	India	Western Zonal Council	—
	X.3.2.2	Eastern and North-eastern India	0.717	India	Eastern and Northeastern Zonal Councils	—
	X.3.2.3	Southern India	0.640	India	Southern Zonal Council	—

Supplementary Table A 16 List of WRAF0.5-v4.1 regions defined within the Association of Southeast Asian Nations (ASEAN) (WRAF5-v4.1 region X.4). Regions are defined according to boundaries of countries and Indonesian provinces.

WRAF2	WRAF0.5					
	ID	Label	Area (Mm ²)	Nation(s)	Province(s)	Subprovince(s)
X.4.1 north ASEAN	X.4.1.1	Myanmar	0.667	Myanmar	—	—
	X.4.1.2	central north ASEAN	0.743	Cambodia, Laos, Vietnam	—	—
	X.4.1.3	Thailand	0.520	Thailand	—	—
	X.4.1.4	central ASEAN	0.637	Brunei, Malaysia, Philippines, Singapore	—	—
X.4.2 Indonesia	X.4.2.1	west Indonesia	0.680	Indonesia	Aceh, Bali, Bangka-Belitung Islands, Banten, Bengkulu, Central Java, East Java, East Nusa Tenggara, Jakarta, Jambi, Lampung, North Sumatra, Riau, South Sumatra, West Java, West Nusa Tenggara, West Sumatra, Yogyakarta	—
	X.4.2.2	Kalimantan	0.538	Indonesia	Central Kalimantan, East Kalimantan, North Kalimantan, South Kalimantan, West Kalimantan	—
	X.4.2.3	east Indonesia	0.678	Indonesia	Central Sulawesi, Gorontalo, Maluku, North Maluku, North Sulawesi, Papua, South Sulawesi, Southeast Sulawesi, West Papua, West Sulawesi	—
	—	—	—	Indonesia	Riau Islands	—

ASEAN = Association of Southeast Asian Nations

Supplementary Table A 17 List of 2Mm² and 0.5Mm² regions not contained within 10Mm² or 5Mm² regions. Regions are defined according to boundaries of: countries; Greenland municipalities and the Northeast Greenland National Park; Mexican states; Ethiopian regions and chartered cities; and Mongolian provinces.

	WRAF2	WRAF0.5				
		ID	Label	Area (Mm ²)	Nation(s)	Province(s) Subprovince(s)
X.X.1 Greenland		X.X.1.1	Qaasuitsup	0.576	Greenland	Qaasuitsup —
		X.X.1.2	Northeast Greenland National Park	0.871	Greenland	Northeast Greenland National Park —
		X.X.1.3	south Greenland	0.698	Greenland	Kujalleq, Qeqqata, Sermersooq —
X.X.2 Mexico		X.X.2.1	northwest Mexico	0.577	Mexico	Baja California, Baja California Sur, Chihuahua, Sonora —
		X.X.2.2	northeast Mexico	0.456	Mexico	Coahuila, Hidalgo, Nuevo León, San Luis Potosí, Tamaulipas, Zacatecas —
		X.X.2.3	southwest Mexico	0.534	Mexico	Aguascalientes, Colima, Distrito Federal, Durango, Guanajuato, Guerrero, Jalisco, México, Michoacán, Morelos, Nayarit, Puebla, Querétaro, Sinaloa, Tlaxcala —
		X.X.2.4	south Mexico	0.404	Mexico	Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz, Yucatán —
X.X.3 central IGAD		X.X.3.1	South Sudan	0.631	South Sudan	— —
		X.X.3.2	west Ethiopia	0.674	Ethiopia	Addis Ababa, Oromia, Amhara, Benishangul-Gumuz, Gambela, Harari, Southern Nations and Nationalities and Peoples Region —
		X.X.3.3	east Ethiopia	0.458	Ethiopia	Afar, Dire Dawa, Somali, Tigray —
		X.X.3.4	south IGAD	0.832	Kenya, Uganda	— —
		—	—	—	Djibouti, Eritrea	— —
X.X.4 Mongolia		X.X.4.1	west Mongolia	0.529	Mongolia	Uvs, Bayan-Ölgii, Bayankhongor, Govi-Altai, Khovd, Zavkhan —
		X.X.4.2	northeast Mongolia	0.611	Mongolia	Dornod, Sükhbaatar, Arkhangai, Bulgan, Darkhan-Uul, Govi-sumber, Khentii, Khövsgöl, Orkhon, Selenge, Töv, Ulaanbaatar —
		X.X.4.3	south Mongolia	0.416	Mongolia	Dornogovi, Dundgovi, Ömnögovi, Övörkhangaï —

IGAD = Intergovernmental Authority on Development; NE Greenland NP = Northeast Greenland National Park

Supplementary Table A 18 List of WRAF0.5-v4.1 regions not contained within 10Mm², 5Mm², or 2Mm² regions. Regions are defined according to boundaries of countries.

ID	Label	Area (Mm ²)	Definition		
			Nation(s)	Province(s)	Subprovince(s)
X.X.X.1	central SICA	0.524	Belize, Costa Rica, El Salvador, Guatemala, Hon- duras, Nicaragua, Panama	—	—
X.X.X.2	Chile	0.746	Chile	—	—
X.X.X.3	Ukraine	0.600	Ukraine	—	—
X.X.X.4	far east ACD	0.478	Japan, South Korea	—	—
X.X.X.5	Papua New Guinea	0.472	Papua New Guinea	—	—

ACD =Asia Cooperation Dialogue; SICA =Central American Integration System

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