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# Global Water Monitor & Forecast Watch List

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# Introduction

The ISciences Water Security Indicator Model (WSIM) monitors and forecasts water anomalies on a global basis. Each month we produce data and a report that document current conditions and provide forecasts with lead times from 1 to 9 months. WSIM has been run continuously since April 2011 and has been validated against subsequently observed data.

ISciences also provides assessments of the impacts of water anomalies on people, agriculture, and electricity generation. Detailed data and reports are available for purchase. Additional information and pricing are available upon request.

We have recently completed the latest Water Security Indicator Model (WSIM) analysis of global water anomalies using observed temperature and precipitation through July 2021 and an ensemble of forecasts issued the last week of July 2021. This edition of *Global Water Monitor & Forecast Watch List* presents a selection of regions likely to encounter significant water anomalies in the next few months. This report uses results from WSIM Version 2. Visit https://wsim.isciences.com for details.

All maps have half-degree resolution and depict our composite water anomaly index, which is based on WSIM estimates of soil moisture, evapotranspiration deficit, runoff, and total blue water anomalies. Shades of red indicate deficits and shades of blue indicate surpluses. Since different variables are used to estimate deficits and surpluses, it is possible for a single half-degree cell to register both a deficit and a surplus. These cases are depicted on the maps in shades of purple, with the more extreme value (deficit or surplus) used to determine the shade.

Deficits and surpluses are stated in terms of return period – a measure that characterizes the rarity of an event. For example, a return period of 10 years indicates an event that would occur, on average, once every ten years. Higher return periods indicate more extreme and, therefore, more disruptive anomalies. Return period is computed by comparison to cell-specific distributions of data from 1950 through 2009. Anomaly levels correspond to return periods: abnormal=3-5 years, moderate=5-10 years, severe=10-20 years, extreme=20-40 years, and exceptional=greater than 40 years.

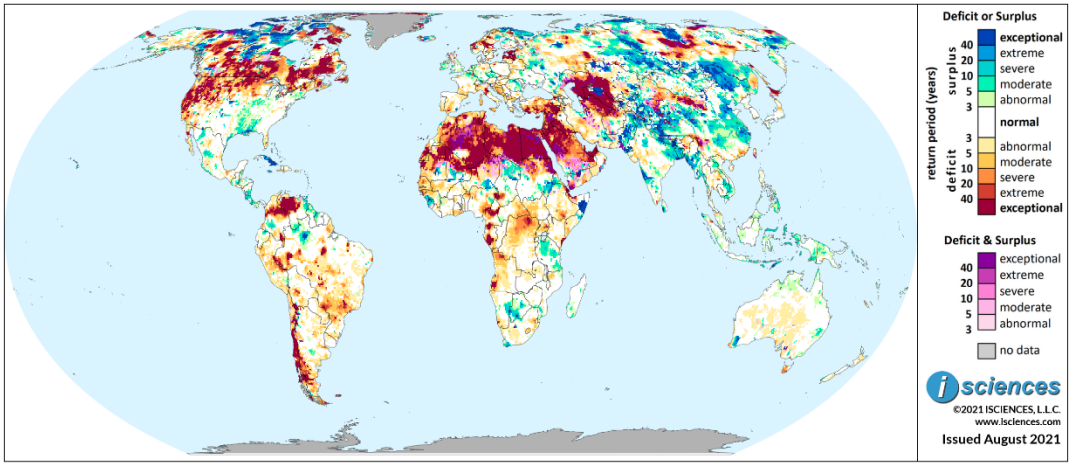
Please note that the WSIM model makes use of seasonal temperature and precipitation forecasts produced by the U.S. National Oceanic and Atmospheric Administration (NOAA) Climate Forecast System Version 2 (CFSv2). These forecasts predict broad temperature and precipitation patterns, but do not effectively predict singular events such as tropical storms. Detailed outlooks and analyses of tropical storms are available from the NOAA National Hurricane Center.

There are numerous regions around the world where country borders are contested. ISciences depicts country boundaries on these maps solely to provide some geographic context. The boundaries are nominal, not legal, descriptions of each entity. The use of these boundaries does not imply any judgement on the legal status of any territory, or any endorsement or acceptance of disputed boundaries on the part of ISciences or our data providers.

## Worldwide Water Watch List

This map presents a selection of regions likely to encounter significant water anomalies during the one-year period beginning in May 2021 and running through April 2022 using 3 months of observed temperature and precipitation data and 9 months of forecast data.

ISciences Water Anomalies Forecast: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

## Watch List: Regional Synopsis

This synopsis provides highlights of regional water forecasts. More detailed analysis is available in "Watch List: Regional Details" immediately following the synopsis.

**United States:** The forecast through October indicates that water deficits will shrink but remain widespread in Northern California, the Pacific Northwest, Rockies, and Northern Plains. Surpluses will persist in Gulf Coast States and emerge in the Northeast and pockets from Virginia through Florida.

**Canada:** The forecast through October indicates widespread water deficits throughout the provinces though deficits will shrink in the southern regions of the Prairie Provinces. Deficits will be extreme near Edmonton and severe in Winnipeg, Montreal, and Québec City.

**Mexico, Central America, and the Caribbean:** The forecast through October indicates that water surpluses will increase in the Yaqui River Watershed of Sonora, Mexico and in Durango and Zacatecas, but shrink in Central America. Deficits in southern Veracruz will intensify.

**South America:** The forecast through October indicates widespread water deficits in Brazil south of the Amazon and in Chile. Deficits are forecast for many other regions, including exceptional deficits on the Paraguay River. Surpluses will increase in the northern Amazon Basin.

**Europe:** The forecast through October indicates areas of intense water deficit in Norway and Sweden and deficits in the Baltics, southern France, northern Italy, and the western Balkans. Areas of surplus include Belgium, western Czech Republic, and the eastern region of the Balkans.

**Africa:** The forecast through October indicates water deficits across northern Africa. Exceptional deficits will persist in central Cameroon and western Angola and will emerge in central Zambia and near Lake Kariba. Surpluses will shrink in the Sahel and in the Kalahari Basin, but remain widespread in Tanzania.

**Middle East:** The forecast through October indicates that water deficits will downgrade but remain widespread in Turkey, the Levant, Iraq, and northern Saudi Arabia. Exceptional deficits are expected in Kuwait, southernmost Iraq, and Riyadh Province, Saudi Arabia.

**Central Asia and Russia:** The forecast through October indicates that exceptional water deficits in Turkmenistan, Uzbekistan, and southwestern Kazakhstan will retreat. Deficits will shrink in the Volga River Basin but increase in central Siberia. Widespread surpluses are forecast for the Yenisei Watershed.

**South Asia:** The forecast through October indicates that water surpluses will shrink and downgrade. Areas of surplus include India's Krishna River Basin, West Bengal, Bangladesh, Nepal, and northern Pakistan. Intense deficits are forecast in Baluchistan Province, Pakistan.

**Southeast Asia and the Pacific:** The forecast through October indicates that water surpluses will shrink considerably in Southeast Asia and the Philippines, and downgrade but remain widespread elsewhere. Deficits are forecast in eastern Thailand between the Mun and Chi Rivers.

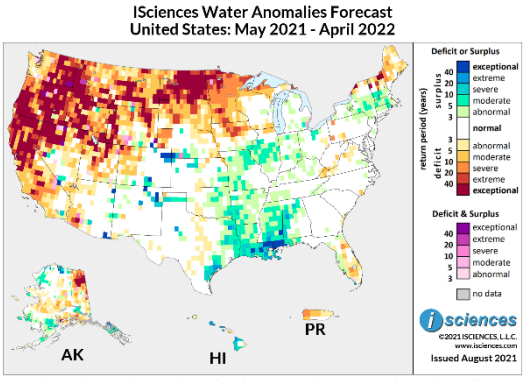
**East Asia:** The forecast through October indicates that water surpluses will shrink considerably overall, but persist in Northeast China, the North China Plain, and the lower Yellow and Yangtze Basins. Deficits in Southeast China will nearly disappear. Intense deficits will persist in Hokkaido.

**Australia & New Zealand:** The forecast through October indicates water surpluses in the Macintyre River region of northeastern New South Wales and the Avon River catchment southeast of Perth. Deficits will shrink in New Zealand and intensify in western Tasmania.

# Watch List: Regional Details

## United States

The 12-month forecast ending April 2022 indicates widespread water deficits of varying intensity in the U.S. West, Pacific Northwest, Rocky Mountains, and Northern Plains. Deficits will be exceptional in many areas but particularly dominant in Northern California, Oregon, and North Dakota. Deficits on the Colorado River will be moderate.



Based on observed data through July 2021 and forecasts through April 2022

In Minnesota's northern half, anomalies will be severe overall, becoming more intense in the Red River Basin in the northwest and somewhat less intense in the state's southern half and into northern Iowa. Deficits are also forecast for Wisconsin's northern and southern extremes and Michigan's Upper Peninsula.

In the U.S. Northeast, the northern reaches of New York, Vermont, and New Hampshire can expect deficits of varying intensity while some moderate surpluses are forecast in their southern regions and into Massachusetts and Connecticut. Much of Maine will experience moderate to extreme deficits. In Peninsular Florida, moderate to severe deficits are forecast around Lake George in the north and around Lake Okeechobee in the south.

Surpluses will be widespread in the Gulf States of Louisiana and Mississippi reaching into neighboring Alabama and Texas and north through parts of Arkansas, Oklahoma, Missouri, Kansas, and Illinois. Anomalies will be moderate overall but severe to exceptional in southern Louisiana and exceptional in coastal Mississippi. Texas can also expect surpluses along a stretch of its coast from the Brazos River to Corpus Christi and following the Canadian River in the Panhandle.

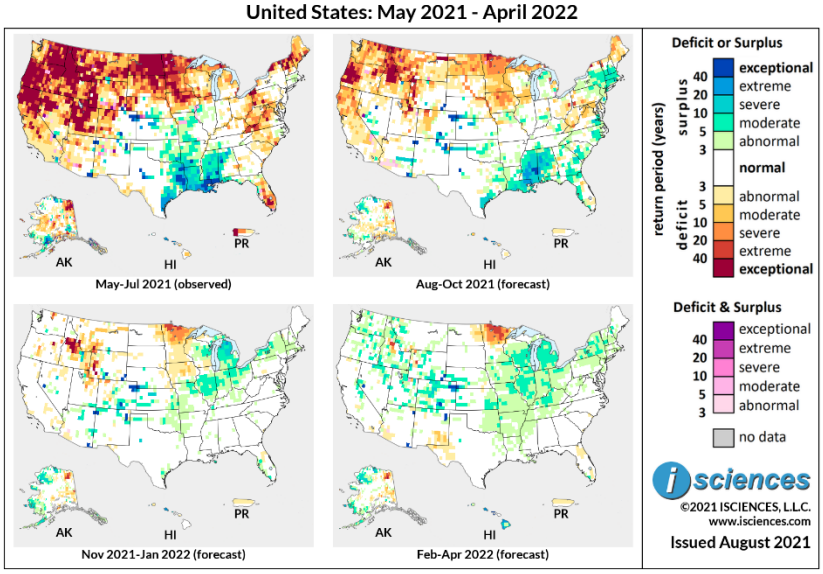
Nearby, surpluses will follow the Upper Canadian River region in New Mexico and reach into a pocket of south-central Colorado. Surpluses are also forecast along the South Fork Republican River near Nebraska's southwestern border leading into Colorado and in a pocket of north-central Kansas.

Outside the contiguous U.S., Alaska can expect widespread exceptional deficits in the northeast, deficits near Anchorage and Valdez in the south, and deficits in the center of the state between the Yukon and Kuskokwim Rivers. Areas with a forecast of surplus include Juneau, around Iliamna Lake, and the central Arctic Coast.

Most of the Hawaiian Islands will experience surpluses but moderate deficits are expected in Maui. Moderate to severe deficits are forecast for Puerto Rico.

The 3-month maps (below) show the evolving conditions in more detail.

ISciences Water Anomalies Forecast
United States: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that deficits will shrink and downgrade, but anomalies will remain widespread in Northern California, the Pacific Northwest, the Rockies, and Northern Plains. Widespread exceptional deficits will persist in western Oregon and the Salmon River Basin in Idaho but exceptional deficits in North Dakota will downgrade. Severe deficits will trace the Missouri River through the Dakotas to Omaha. Normal conditions will return to many areas of Nevada, Utah, Wyoming, South Dakota, and Arizona, and some surpluses will emerge in southern Nevada and from Phoenix to Arizona's eastern border. In the U.S. East, deficits will downgrade in Maine and from eastern Ohio through the Appalachians into Maryland. Moderate surpluses will emerge in New York and southern New England, and in pockets from coastal Virginia through the southeastern states and Florida's Gulf Coast. Surpluses will remain widespread in Mississippi, Alabama, and southern Louisiana and will be intense in Mississippi. Some surpluses will linger in Oklahoma, eastern Texas, and from the Brazos River to Corpus Christie, and will intensify on the Canadian River through the Panhandle, becoming severe. Other areas of surplus include the Canadian River through New Mexico and the nearby region in Colorado, the Republican River, and the northern reaches of Michigan's Lower Peninsula.

From November 2021 through January 2022, deficits are expected in the northern Rockies, along the Missouri River in Montana, the northern half of Minnesota, and pockets in Iowa. Anomalies will be exceptional in Idaho and severe to extreme in Minnesota. Surpluses will emerge in Michigan, Wisconsin, and from northeastern Missouri though Illinois, Indiana, Ohio, and parts of Upstate New York. Surpluses are also forecast in pockets of the Central Plains and Southwest.

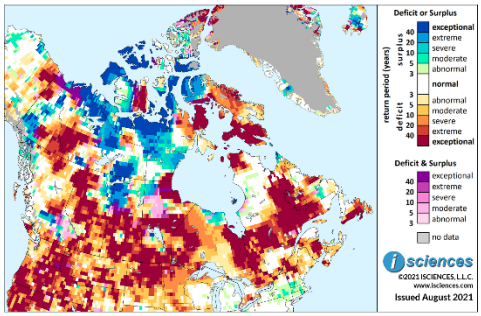
The forecast for the final months – February through April 2022 – indicates persistent deficits in Minnesota and emerging deficits in southeastern New Mexico. Surpluses are forecast in the Great Lakes region and beyond, and in pockets from the Pacific Northwest through the Rockies and Central Plains.

Please note that WSIM forecast skill declines with longer lead times.

## Canada

The 12-month outlook for Canada through April 2022 indicates widespread water deficits including vast areas of exceptional deficit throughout the provinces.

ISciences Water Anomalies Forecast
Canada: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

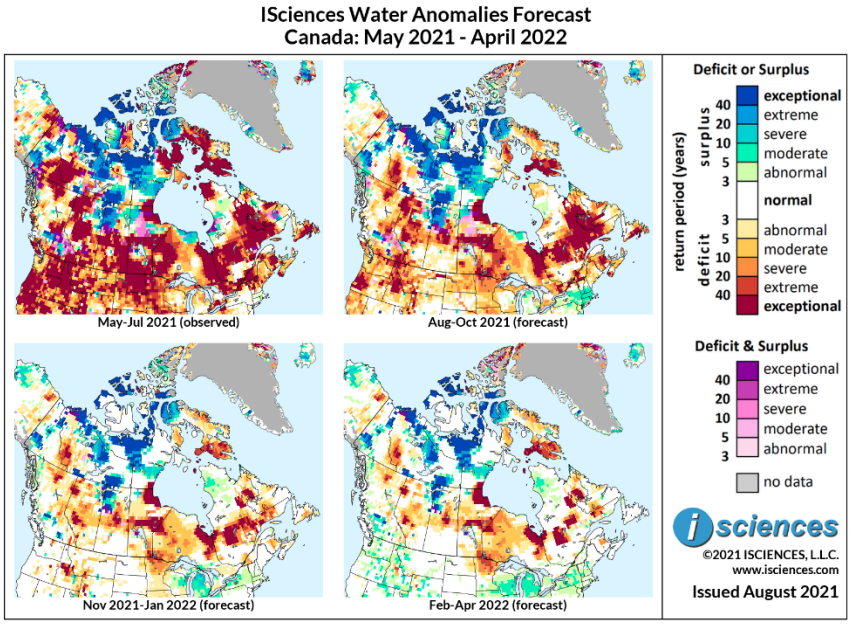
In the eastern half of the nation, deficits will be exceptional in southern Newfoundland, New Brunswick, northeastern Quebec including the Manicouagan Reservoir region and reaching into western Labrador, near Lake Mistassini in Quebec, and spanning the northern Quebec/Ontario border. Deficits of varying intensity are expected in Southern Ontario, and deficits will be widespread in Northern Ontario's Kenora District though surpluses are forecast on Hudson Bay. In the major metropolitan regions of the east, deficits will be severe in Ottawa and Montreal, moderate in Québec City, and mild in Toronto.

Exceptional deficits are expected across the breadth of southern Manitoba through Winnipeg; in a belt across the center of the province north of Lake Winnipeg; and on Hudson Bay. Extreme surpluses are forecast in the northwest, moderating as they reach into Saskatchewan.

While Saskatchewan's northwest will be dominated by intense surpluses leading well past Lake Athabasca into the Northwest Territories, much of the remainder of the province will experience exceptional deficits including Regina. Deficit anomalies of varying intensity are forecast in southern Alberta, and exceptional deficits between Edmonton and the city of Peace River and in the province's northwest corner leading into British Columbia.

British Columbia's Vancouver Island will see deficits as will mainland areas near the U.S. border. Surpluses of varying intensity are expected in the province's southern Cariboo region, but intense deficits are forecast farther north in the Fraser River Watershed near Prince George. Deficits will also be intense near British Columbia's northern border, expanding as they reach well into the Yukon and the Northwest Territories.

The 3-month maps (below) show the evolving conditions in more detail.




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates widespread deficits throughout the provinces but the extent of exceptional deficit will shrink, particularly in the southern regions of the Prairie Provinces. In the east, exceptional deficits will persist primarily in southern Newfoundland, eastern Quebec into Labrador, around Lake Mistassini, and in a column along Ontario's eastern border. Deficits of varying intensity are forecast from Toronto through Ottawa, Montreal, and Québec City. Widespread deficits will persist in Kenora District, Ontario though exceptional deficits will shrink, as will surpluses near Hudson Bay. The forecast for the Prairie Provinces' northern halves will be much like observed conditions in the prior three months though intense deficits will shrink. Near-normal conditions will return to southern Saskatchewan while deficits in southern Manitoba and Alberta shrink and downgrade. Deficits will persist in British Columbia's southern extreme, the far north, and the Fraser River Watershed near Prince George, though exceptional deficits will shrink. Surpluses will persist in the Chilcotin River region of west Cariboo.

From November 2021 through January 2022, deficits will shrink and downgrade. Moderate deficits are forecast for New Brunswick and southern Newfoundland, but large areas of intense deficit will persist around the Manicouagan Reservoir, from Lake Mistassini to the Gouin Reservoir, and the southern shore of James Bay. Deficits will moderate in Kenora, Ontario. The Prairie Provinces can expect near-normal conditions in the south. In British Columbia, deficits in the south will retreat, persisting in the East Kootenay region. Surpluses are forecast in western Cariboo and near Kelowna.

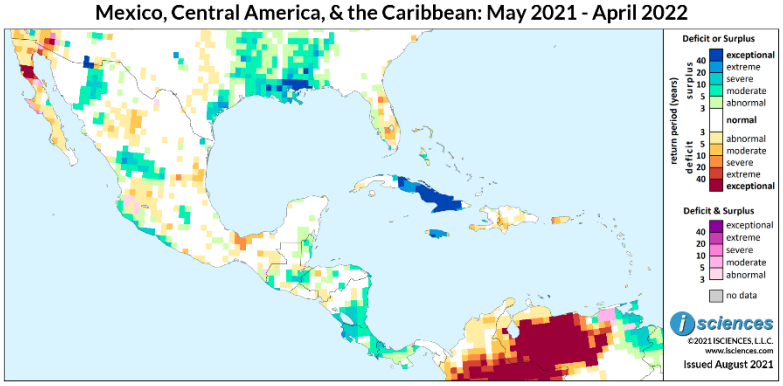
The forecast for the final months – February through April 2022 – indicates a forecast much like that of the prior period though surpluses will increase in southern British Columbia and deficits will in the eastern provinces will shrink somewhat.

Please note that WSIM forecast skill declines with longer lead times.

## Mexico, Central America, and the Caribbean

The 12-month forecast ending April 2022 indicates normal water conditions in many parts of Mexico. However, moderate to severe surpluses are forecast in the Yaqui River Watershed of Sonora, the San Pedro-Mezquital Watershed in Durango and Zacatecas, and along the Pacific Coast from Jalisco into Guerrero. Smaller pockets of moderate surplus are expected around Mexico City and the Urique River Watershed in the Copper Canyon region of southwestern Chihuahua.

ISciences Water Anomalies Forecast
Mexico, Central America, & the Caribbean: May 2021 - April 2022



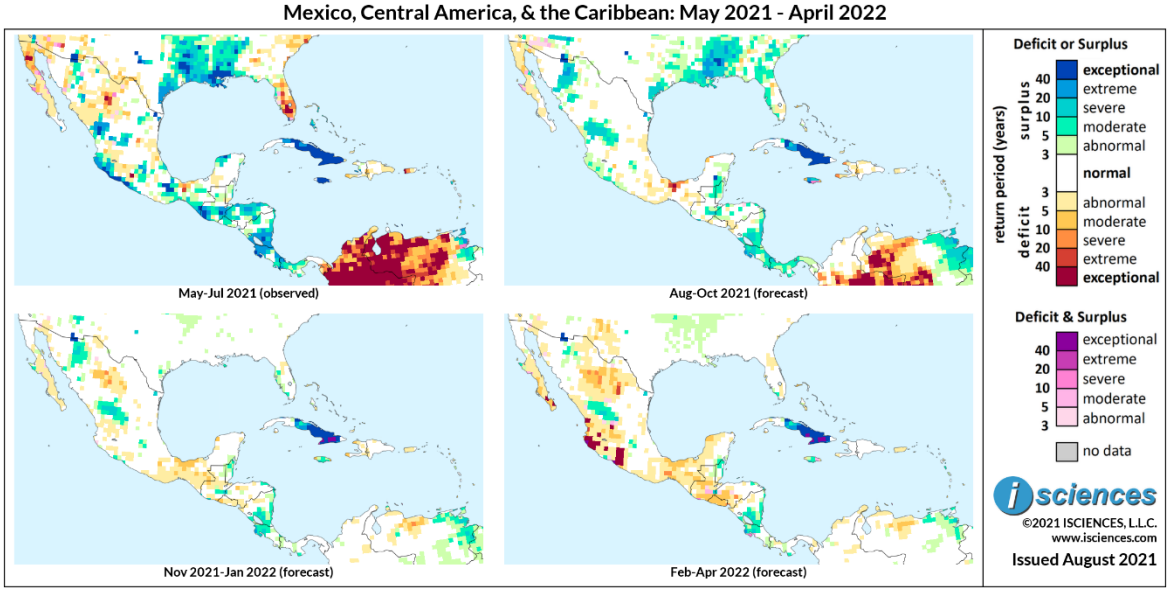

Based on observed data through July 2021 and forecasts through April 2022

Deficits are expected in the northern Baja Peninsula and will include exceptional anomalies. Severe deficits are expected in southern Veracruz and pockets of moderate deficit in southeastern Chihuahua and southern Tamaulipas.

In Central America and the Caribbean, moderate to severe surpluses are forecast from southern Nicaragua through western Panama. In the northern nations of Central America, no widespread anomalies are expected but the forecast indicates some pockets of moderate surplus. Intense surpluses are forecast in Cuba and Jamaica, and small pockets of deficit in Hispaniola.

The 3-month maps (below) show the evolving conditions in more detail.

ISciences Water Anomalies Forecast
Mexico, Central America, & the Caribbean: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that surpluses in the Yaqui River Watershed of Sonora will increase and intensify, becoming severe to extreme overall with exceptional anomalies near the border with Arizona. Surpluses will also increase in the San Pedro-Mezquital Watershed in Durango and Zacatecas, but surpluses along the central Pacific Coast will shrink. Other areas of surplus include the Urique River Watershed in the Copper Canyon region of southwestern Chihuahua and a pocket in the Yucatan Peninsula near Belize. Deficits from southern Veracruz into Tabasco will increase somewhat and intensify, becoming severe to exceptional. Deficits in Baja will be mild.

In Central America, surpluses will shrink considerably and downgrade though anomalies will persist from southern Nicaragua through Panama, and in some pockets of Belize, Guatemala, and Honduras. Surpluses are forecast in Cuba, surpluses and transitional conditions in Jamaica, and deficits on Dominican Republic's western points.

From November 2021 through January 2022, surpluses will moderate overall in the Yaqui and San Pedro-Mezquital Watersheds of Mexico, retreating elsewhere in the nation. Deficits will moderate in southern Veracruz and emerge in southeastern Chihuahua. Surpluses in Central America will continue to shrink, persisting primarily in southern Nicaragua and northern Costa Rica, and small pockets of mild deficit will begin to emerge in northern nations. Moderate surpluses are forecast in Jamaica and intense surpluses in much of Cuba. Deficits in Dominican Republic's western points will moderate.

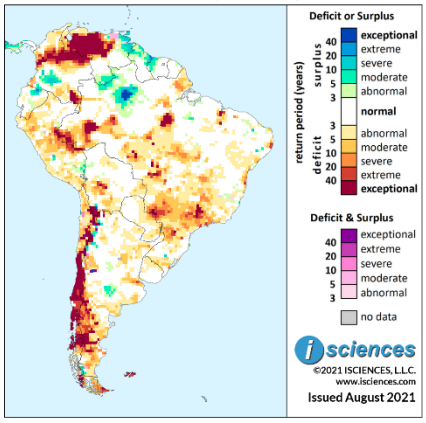
The forecast for the final three months – February through April 2022 – indicates that exceptional deficits will emerge in the central Pacific states and deficits will increase in Mexico's central north, in the south, and in southern Baja. Surpluses will shrink considerably in Sonora but persist from southern Durango into Zacatecas. Moderate deficits will increase in northern Central America, and surpluses will persist from southern Nicaragua into Costa Rica and in Jamaica and Cuba.

Please note that WSIM forecast skill declines with longer lead times.

## South America

The 12-month forecast through April 2022 indicates exceptional water deficits across northern Colombia and Venezuela and many regions of Chile, deficits of generally lesser intensity in central and southern Brazil and Peru, and large pockets of surplus in the continent's north.

ISciences Water Anomalies Forecast
South America: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

Deficits will be exceptional from Colombia's northern Pacific Coast through the northern Orinoco River Watershed in Venezuela. Moderate to exceptional deficits are forecast in southern Colombia.

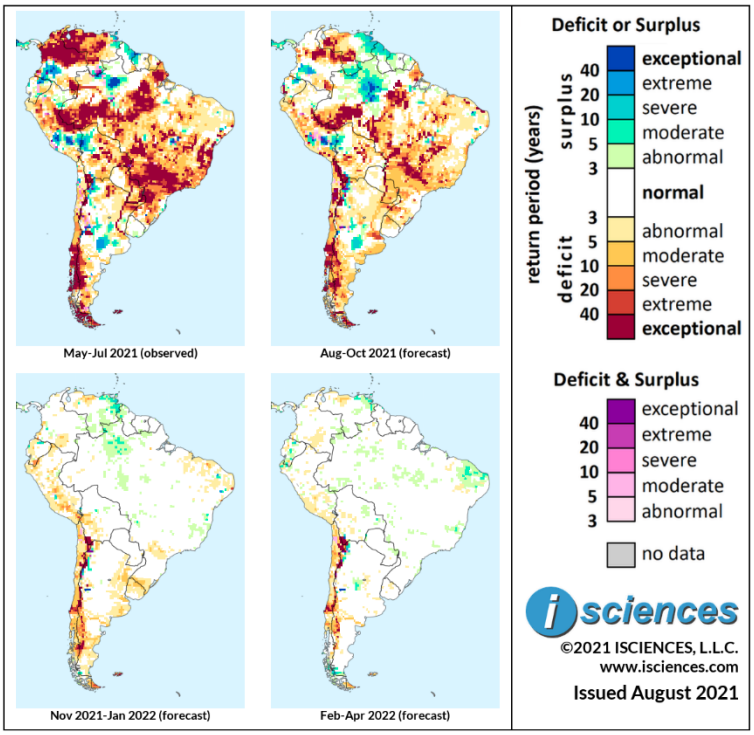
Surpluses are expected in northern Ecuador, east of Cali in Colombia, southern Venezuela, eastern Venezuela including the Orinoco Delta, northern Guyana and spanning its border with Suriname, and at the intersection of the Negro and Branco Rivers in the northern Amazon Basin of Brazil where anomalies will be exceptional.

While many other regions in Brazil north of the Amazon and in the nation's east can expect relatively normal water conditions, deficits of varying intensity are forecast in parts of the west and in the central and southeastern states. Exceptional anomalies will be especially prevalent in pockets of southern Amazonas and southern Pará. Severe to exceptional deficits will be widespread in Mato Grosso do Sul and São Paulo States.

Much of central Peru will experience moderate deficits, more intense near the Brazilian border. Central Bolivia can expect intense deficits between La Paz and Sucre. Nearly all of Chile will experience deficits, with exceptional deficits dominating the nation from La Serena through Valparaiso and Santiago to the Gulf of Corcovado. Deficits in southern Patagonia will extend across the border, eventually downgrading as they reach through Argentina. However, deficits will be intense in Tierra del Fuego and the Falklands. Elsewhere in Argentina, deficits are forecast north of the Salado River in Buenos Aires Province, severe to extreme in the metropolis of Buenos Aires; moderate deficits in the province's southeastern region and in northeastern Argentina; and moderate surpluses in La Pampa Province.

The 3-month maps (below) for the same 12-month period show the evolving conditions in greater detail.

ISciences Water Anomalies Forecast
South America: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates widespread deficits in Brazil south of the Amazon and surpluses north. Deficits will be exceptional in many areas including the Purus River Watershed in the west, and in large pockets of Pará, Mato Grosso, Mato Grosso do Sul, and São Paulo States. Surpluses north of the Amazon will increase and will be severe to exceptional in the central Amazon. Deficits from northern Colombia through northwestern Venezuela will shrink but remain widespread in the western Orinoco River Watershed and will include exceptional anomalies, notably around Merida, Venezuela and northeast of Bogotá, Colombia. Surpluses will increase from eastern Venezuela through northern Guyana and in Venezuela's southern tip, and will persist from Quito, Ecuador into southwestern Colombia and will include extreme anomalies.

Severe deficits are forecast for central Peru and deficits in the south near Arequipa will intensify, becoming exceptional. Surpluses will persist in the south around Huancayo and from Lake Titicaca through Cusco and across the border into Bolivia. Anomalies will be exceptional in Cusco. Deficits are expected in many other regions of Bolivia and eastern Paraguay with exceptional deficits on the Paraguay River through its namesake. In Uruguay, moderate to severe deficits will emerge in the north.

Deficits of varying intensity are expected throughout much of Chile, severe in Santiago and exceptional in Biobío Province. In Argentina, deficits will be moderate along the northern Paraná River, becoming severe on its approach to the Rio de la Plata. Between the Paraná and Salado Rivers in Buenos Aires Province deficits will be severe to extreme, while moderate deficits are expected in southeastern Buenos Aires Province. Deficits of varying intensity are forecast in Patagonia, and exceptional deficits

will persist in Tierra del Fuego and the Falklands. Widespread, severe surpluses will continue in La Pampa Province, and pockets of surplus will linger in San Luis Province.

From November 2021 through January 2022, moderate surpluses are forecast in northeastern Venezuela and deficits near Caracas in the north. A few pockets of moderate surplus are expected in the central Brazilian Amazon north of Manaus, and moderate deficits will span the nation's southern border into Uruguay. Severe deficits are forecast for Ecuador's southern corner, and pockets of moderate to severe deficit in central and southern Peru reaching past Lake Titicaca into Bolivia. Deficits are expected throughout most of Chile, moderate overall but more intense near Concepción in central Chile and along the Argentine border. Some moderate deficits are forecast in eastern Argentina and along rivers in the south, but deficits will be more intense in western Patagonia, Tierra del Fuego, and the Falklands.

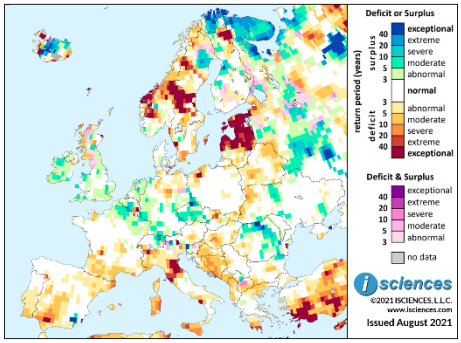
The final quarter – February through April 2022 – indicates surpluses in northeastern Venezuela, Brazil's northeastern tip, and pockets in Ecuador and in Córdoba Province, Argentina. Moderate deficits are forecast for north-central Venezuela, and mild to moderate deficits in much of Chile with exceptional pockets spanning the northern border and in Concepción. Deficits of varying intensity are expected for western Argentine Patagonia; deficits will downgrade in Tierra del Fuego; and surpluses will increase in the Patagonian Icefields.

Please note that WSIM forecast skill declines with longer lead times.

## Europe

The 12-month forecast through April 2022 indicates exceptional water deficits in Estonia, Latvia, and central Sweden's Dalälven River Watershed. Intense deficits are also forecast in Finnish Lapland, Västerbotten County in Sweden, and central Norway, while moderate deficits are expected in Lithuania, Belarus, and along Ukraine's western border.

ISciences Water Anomalies Forecast
Europe: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

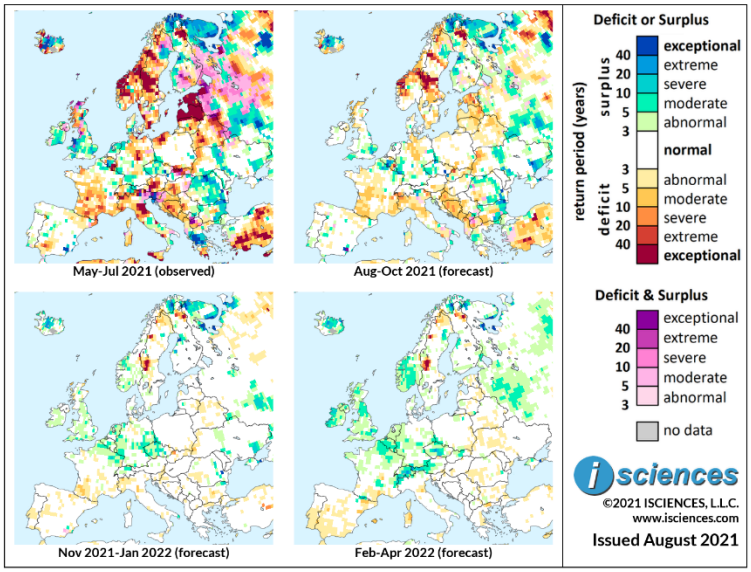
Intense surpluses are forecast from Murmansk, Russia into Arctic Norway and in pockets around the Gulf of Bothnia. In European Russia, surpluses are expected in the Vychegda Lowland in the north and the Don, Desna, and Volga River regions south of Moscow. Anomalies will be intense in the Vychedga Lowland and Don Basin. Deficits are expected in the Upper Mezen River area of northern Russia.

Surpluses will be widespread in Czech Republic and northern and eastern Romania and are also expected in pockets of Ukraine including Zhytomyr Oblast. Primarily moderate pockets are forecast in northern France, northern Belgium, eastern Switzerland into Austria, and southern Germany. Ireland, too, can expect moderate surpluses, and scattered, isolated pockets are forecast in England, Wales, and the Netherlands.

Extreme to exceptional deficits are forecast in Tuscany and Emilia-Romagna, Italy, and deficits of varying intensity in the Piedmont region, a pocket south of Naples, and Sicily and Sardinia. Several regions in the Balkans will experience deficits including Croatia, Bosnia and Herzegovina, Montenegro, Albania, North Macedonia, and Greece's Central Macedonia region and Peloponnese Peninsula. Anomalies will be severe in Bosnia and Herzegovina and extreme in Peloponnese. Deficits are forecast from southern France into Spain, and from Madrid past Seville and into Portugal's southern tip. Anomalies will be exceptional near Seville and severe north of Barcelona. Other areas with a forecast of deficit include southern Belgium, Hungary, and pockets in northern Germany and northwestern Poland.

The 3-month composites (below) for the same 12-month period show the evolving conditions.

ISciences Water Anomalies Forecast
Europe: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that deficits and surpluses will shrink and downgrade, but anomalies are expected in many regions. Intense deficits will persist in Finnish Lapland, the Dalälven River Watershed and Västerbotten County in Sweden, and central Norway and the southern fjords. Deficits of lesser intensity are expected in the Baltics, northern Belarus, and near Ukraine's western border. Surpluses will persist from Murmansk, Russia into Arctic Norway, and pockets around the Gulf of Bothnia. Deficits will remain intense in Russia's Mezen River Basin while intense surpluses persist in the Vychegda Lowland. Surpluses will also persist in the Don, Desna, and Volga River regions in the south.

Deficits, primarily moderate, are forecast for north-central Germany, France's southern half, Geneva, the Piedmont region in Italy, and south to Perugia. In the Balkans, moderate to severe deficits are forecast for Croatia, Bosnia and Herzegovina, Montenegro, and pockets elsewhere in the region. Surpluses are forecast for East Anglia and Devon in England; central Belgium into France; Luxembourg and the Mosul and Rhine Rivers in Germany; and western Czech Republic. Ukraine can expect surpluses from Zhytomyr Oblast trailing south and in the east near the Dnieper Reservoir. Surpluses are also forecast in Romania, eastern Bulgaria, and the Pindus Mountains in Greece.

From November 2021 through January 2022, small pockets of intense deficit will linger in Lapland and Sweden and surpluses in the far north. Moderate deficits will persist in southwestern France. Surpluses are forecast in pockets from northern France through Czech Republic, near the Dnieper Reservoir, and the Don River region.

The forecast for February through April 2022 includes surpluses in southern Norway, southwestern Russia, pockets of Ireland and the United Kingdom, northern France, Belgium, Switzerland, western Austria, and central Czech Republic. Deficits will persist in pockets of the Nordic nations.

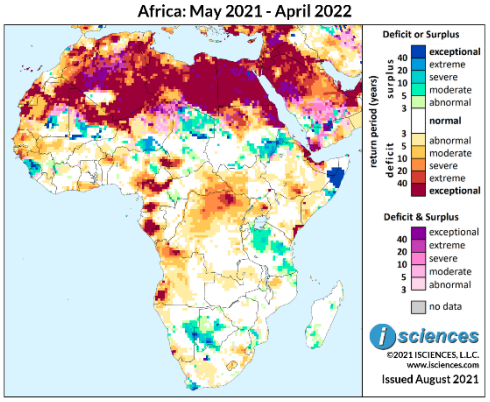
Please note that WSIM forecast skill declines with longer lead times.

## Africa

The 12-month forecast through April 2022 indicates exceptional water deficits in many regions across northern Africa, particularly Egypt, Libya, and Algeria along with some transitional areas (pink/purple).

Surpluses are forecast in large pockets of the Sahel and will be extreme in Zinder Region in southeastern Niger. Surpluses of varying intensity are expected in south-central Mauritania, central Mali including Timbuktu, central and northern Chad, Sudan between the White Nile and the Atbara Rivers, and western Eritrea.

ISciences Water Anomalies Forecast
Africa: May 2021 - April 2022



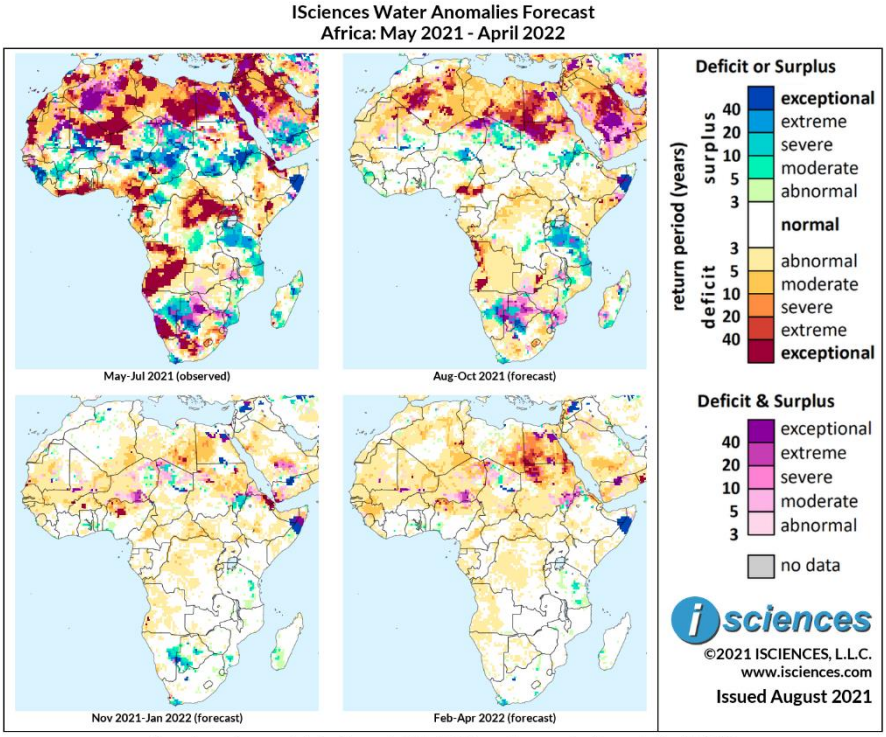

Based on observed data through July 2021 and forecasts through April 2022

West Africa can expect deficits of varying intensity in Senegal, Gambia, Guinea Bissau, northern Guinea, southern Ghana, northern Benin, and pockets of Nigeria. Anomalies will be intense in northeastern Nigeria through Cameroon into southern Chad, and from southeastern Nigeria reaching across central Cameroon. Along the mid-Atlantic, exceptional deficits are expected in Equatorial Guinea and southern Gabon. Moderate to exceptional deficits are forecast in northwestern Angola and exceptional deficits in the southwest surrounding Lubango.

In the heart of the continent, moderate to extreme deficits will prevail in eastern Central African Republic and through the northern half of the Democratic Republic of the Congo, becoming extreme to exceptional in the middle Kibali River region of the northeast. Moderate deficits are expected in South Sudan's western half, and deficits of varying intensity in Uganda. In the Horn of Africa, deficits are forecast for southern Eritrea, Djibouti, western Somaliland, the Genale (Jubba) River region in south-central Ethiopia, and Somalia's southern tip. Anomalies will be exceptional in Eritrea and coastal Somaliland. Exceptional surpluses are forecast for the Nugaal Valley and severe surpluses a bit farther south.

In East Africa, exceptional deficits are expected in coastal Kenya and moderate surpluses in many regions of Tanzania. Mozambique's northwestern corner will experience moderate deficits while moderate surpluses are expected in its southern extreme. In southern Africa, surpluses are forecast in the Kalahari Desert of eastern Namibia and Botswana and surrounding Lake Xau in central Botswana, but deficits are forecast in a pocket on Namibia's southern coast near Luderitz. Western Cape, South Africa, can expect surpluses while moderate to severe deficits are forecast east of Johannesburg and in Lesotho. A few pockets of moderate surplus are forecast in Madagascar, primarily in the south.

The 3-month maps (below) show the evolving conditions in greater detail.




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates moderate deficits across northern Africa along with some vast areas of intense deficit. Intense deficits will re-emerge in northwestern Algeria, persist in southeastern Libya and western Egypt, and emerge in northern Sudan. Conditions will normalize across much of the southern Sahara and the Sahel as surpluses shrink, but anomalies are forecast in central Mali, Niger's Zinder Region, northern Chad, and southeastern Sudan into Eritrea. Surpluses will be intense in Zinder Region and in the inland delta of the Niger River in Mali. Surpluses will persist in the Nugaal Valley in the Horn, throughout Tanzania, pockets of Mozambique, Western Cape, and the Kalahari Basin where transitional conditions are also forecast. Pockets of exceptional deficit will persist in central Cameroon and western Angola and will emerge in central Zambia and near Lake Kariba. Other regions with a forecast of deficit include southern Somalia, northern Democratic Republic of the Congo, and Lesotho.

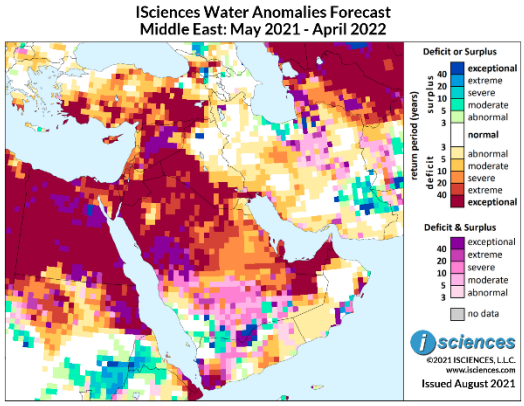
The forecast for November 2021 through January 2022 indicates exceptional deficits in southern Eritrea and northwestern Nigeria surrounding Kaduna. Deficits of lesser intensity are forecast for western Egypt and southeastern Libya, southeastern Algeria, northern Sudan, and central Cameroon. Exceptional surpluses will persist in Nugaal along with transitional conditions. Surpluses elsewhere include southeastern Sudan; pockets in eastern Tanzania and southern Mozambique; the southern Kalahari Desert and the region around Lake Xau, Botswana; and Western Cape.

The forecast for the final quarter – February through April 2022 – indicates severe to exceptional deficits in Egypt, southeastern Libya, northern Sudan, and Eritrea, and deficits of lesser intensity in northern Nigeria, Guinea, and Algeria. Surpluses are expected in Nugaal, pockets of Tanzania, and Western Cape.

Please note that WSIM forecast skill declines with longer lead times.

## Middle East

The forecast for the 12-month period ending April 2022 indicates water deficits in much of Turkey, throughout the Levant, and many regions in the Arabian Peninsula.



Based on observed data through July 2021 and forecasts through April 2022

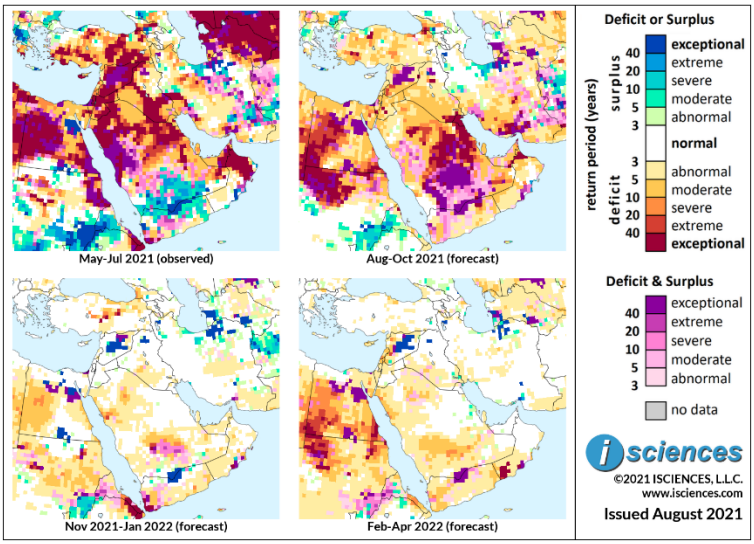
Deficits of varying intensity are expected in Turkey including exceptional anomalies in the southwest, around the city of Konya in Central Anatolia, and east of the Euphrates (Firat) River. Intense deficits are forecast in Cyprus and in Georgia north of the Mtkvari (Kura) River including exceptional anomalies in Batumi on the coast and severe anomalies in Tbilisi. A pocket of surplus is expected in the Lesser Caucasus Region south of the river.

Deficits will be exceptional in most of Jordan and many areas of Syria including Aleppo. Exceptional deficits are also forecast in Iraq west of the Euphrates River and in Saudi Arabia's northern half. Mixed conditions are expected in southern Saudi Arabia with severe to exceptional deficits in the southeastern provinces and transitional conditions and pockets of surplus elsewhere. Exceptional deficits will dominate United Arab Emirates and most of Qatar and Bahrain. Mixed conditions are forecast in Yemen including intense deficits near the Bab-el-Mandeb Strait.

In Iran, deficits are expected in much of Esfahan Province in the center of the country; along the northern Persian Gulf; and in the northeast near the Turkmen border. Surpluses are forecast in the southeast in Sistan and Baluchestan Province seeping west into Kerman, and along the central Black Sea Coast.

The 3-month maps (below) show the evolving conditions in greater detail.

ISciences Water Anomalies Forecast
Middle East: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that deficits will downgrade but remain widespread in Turkey, the Levant, Iraq, and northern Saudi Arabia. Deficits will increase in northwestern Turkey and in Georgia, and exceptional deficits are expected throughout Kuwait reaching into nearby areas in southern Iraq. Exceptional deficits will increase in northern Riyadh Province and along the Persian Gulf in Saudi Arabia while transitional conditions are expected farther south and into Yemen. Moderate deficits are forecast for pockets of Yemen and Oman, and in United Arab Emirates and Qatar.

In Iran, deficits are forecast in the southern provinces on the Persian Gulf and Gulf of Aden and will include exceptional anomalies near the Strait of Hormuz. Surpluses will persist on the central Black Sea Coast and inland to Tehran, and some scattered pockets of surplus are forecast near Lake Urmia in the northwest and in the Upper Karkheh River Basin.

From November 2021 through January 2022, deficits will shrink and downgrade considerably, persisting in pockets of central and northeastern Turkey, western Georgia, pockets of northwestern Saudi Arabia and northern Riyadh Province, and southwestern Yemen, where anomalies will be exceptional near the Bab-el-Mandeb Strait. Surpluses will re-emerge in central Syria and the central border spanning Saudi Arabia and Yemen, and will increase near Mosul, Iraq. In Iran, surpluses will retreat somewhat from the central Caspian Coast, but intense anomalies will re-emerge in Golestan Province and pockets nearby.

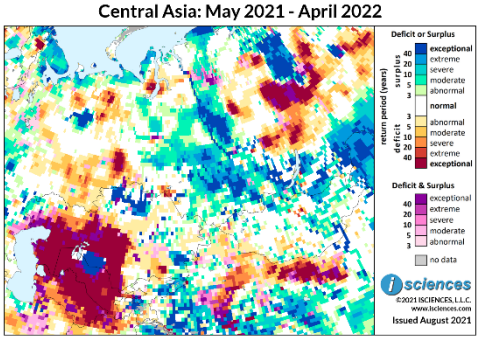
In the final quarter – February through April 2022 – the forecast indicates that pockets of deficit will emerge in the eastern Mediterranean region. Other areas of deficit include Saudi Arabia along the northern Red Sea and southern Riyadh Province, western Yemen, and southern Oman where anomalies will be exceptional. Surpluses are forecast in central Syria and Golestan, Iran, and small isolated pockets elsewhere.

Please note that WSIM forecast skill declines with longer lead times.

## Central Asia and Russia

The 12-month forecast through April 2022 indicates widespread exceptional water deficits throughout Uzbekistan, the Kazakh regions bordering Uzbekistan, and much of Turkmenistan.

ISciences Water Anomalies Forecast
Central Asia: May 2021 - April 2022



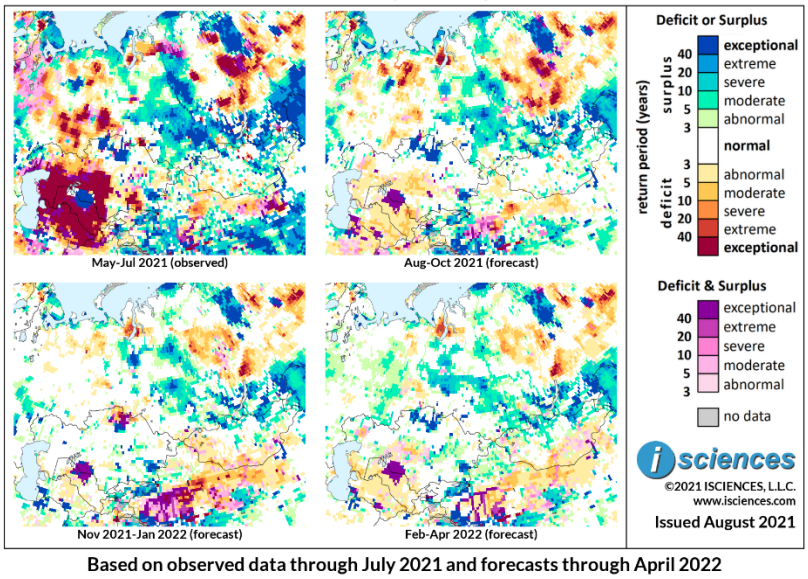

Based on observed data through July 2021 and forecasts through April 2022

Exceptional surpluses are forecast in the Ishim River Watershed of northern Kazakhstan. Surpluses will also be exceptional southeast of Lake Balkhash while deficits are expected between the lake's western end and Almaty. Central Tajikistan and much of Kyrgyzstan's eastern half can expect intense surpluses.

West of the Ural Mountains in Russia, surpluses are forecast in the coastal Arctic and the Vychegda Lowlands, but deficits are expected in the Pechora River Watershed, Trans-Volga, and the Ural River Watershed. East of the Urals, intense deficits are forecast in the Tura River region, particularly around Tyumen, and in the north on the central banks of the Gulf of Ob. Surpluses will be exceptional on the Yenisei River and widespread throughout much of the river's vast watershed and in the Upper Ob River region. In the Central Siberian Plateau, exceptional deficits are expected in the middle reaches of the Vilyuy River, a tributary of the Lena River, including the area surrounding the Vilyuy Reservoir. Exceptional surpluses are forecast in the plateau's northeast between the Olenyok and Markha Rivers.

The 3-month composites (below) for the same 12-month period show the evolving conditions in more detail.

ISciences Water Anomalies Forecast
Central Asia: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that widespread exceptional deficits in Turkmenistan, Uzbekistan, and southwestern Kazakhstan will retreat leaving mild to moderate deficits. Likewise, the region between the western end of Lake Balkhash and Almaty in Kazakhstan will return to normal from prior intense deficit. Intense surpluses are expected to persist southeast of the lake and in the Ishim River Watershed in the nation's north. Surpluses will persist in central Tajikistan and eastern Kyrgyzstan with moderate surpluses tracing a path along the Naryn River. In Russia, deficits in the Volga River Basin will shrink and downgrade, but intense deficits will persist in the Pechora River Watershed and deficits on the Mezen River will become extreme. In the Yenisei River Watershed, surpluses will downgrade overall but remain widespread. Deficits will increase in the Central Siberian Plateau though intense surpluses will persist in the northeast. Deficits will also increase in the northern Verhoyansk Range of Sakha Republic and will persist near the Sea of Okhotsk with intense surpluses between in the region of the Lower Alden River, a tributary of the Lena.

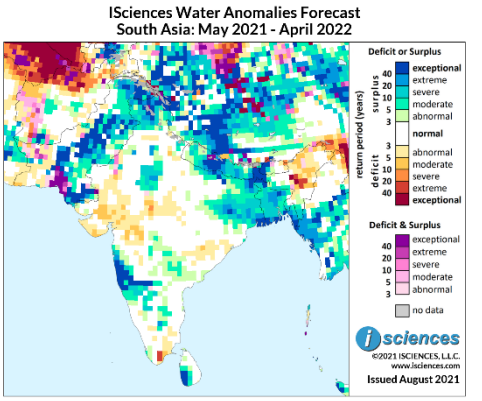
From November 2021 through January 2022, surpluses will increase somewhat in eastern Kyrgyzstan and will intensify on the Naryn River while moderating in central Tajikistan. Surpluses southeast of Lake Balkhash will increase, and while surpluses will persist in the Ishim Watershed of the north, deficits will also emerge. Intense surpluses will emerge in a pocket of western Turkmenistan on the Caspian Sea and in the Karakum Desert where the Harirud River disappears. In Russia, deficits in the Pechora and Volga Watersheds will shrink considerably, surpluses in the Upper Pur River region will become exceptional, and though shrinking, surpluses will remain widespread in the Yenisei Basin. Deficits in the Central Siberian Plateau will shrink and downgrade slightly and surpluses will persist in the northeast.

The forecast for the final months – February through April 2022 – indicates a distribution of anomalies much like the forecast through January. However, surpluses will increase in the Ob River Watershed and Kazakh Upland, and emerge in the Ural Watershed and Trans-Volga.

Please note that WSIM forecast skill declines with longer lead times.

## South Asia

The 12-month forecast through April 2022 indicates water surpluses in western India from Mumbai into Karnataka including exceptional anomalies in the Krisha River Basin. Surpluses are also expected in the east in Bihar, Jharkhand, and West Bengal, and will be exceptional in the Ganges Delta, the Upper Subarnarekha River in Jharkhand, and the Gandaki River in Bihar.



Based on observed data through July 2021 and forecasts through April 2022

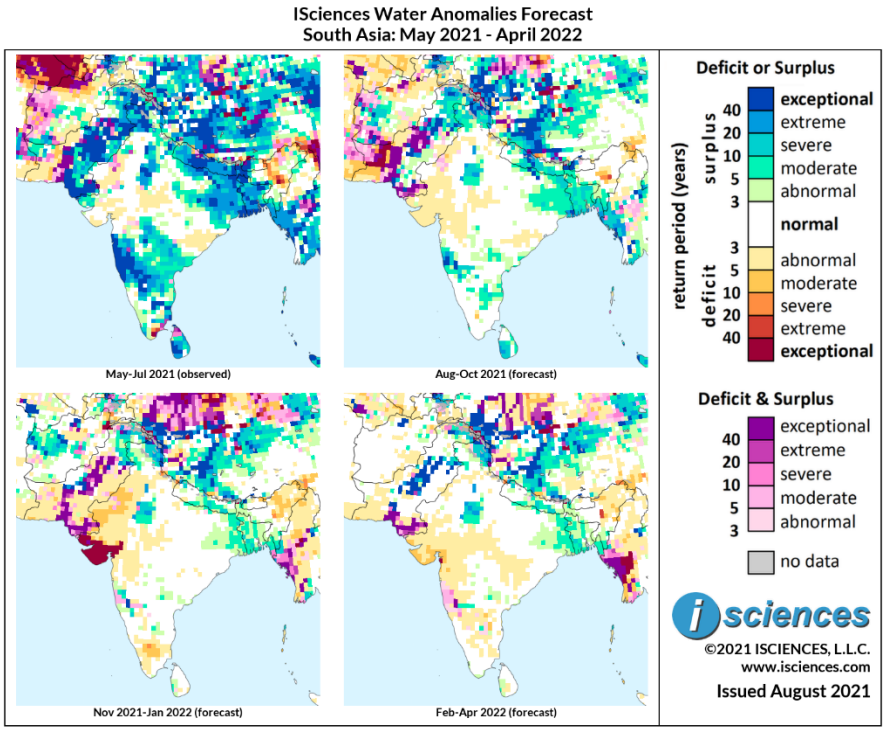
Surpluses of varying intensity are forecast in India's far north, severe surpluses in eastern Rajasthan, and pockets of moderate surplus in Telangana and central Maharashtra.

Deficits are expected in India's Far Northeast, exceptional in central Assam. Pockets of primarily moderate deficit are forecast for Gujarat, northern Maharashtra, and western Madhya Pradesh. At the tip of Tamil Nadu in the south, a pocket of extreme deficit is indicated.

Intense surpluses are forecast for southwestern Sri Lanka. Bangladesh can expect severe to extreme surpluses overall with exceptional anomalies on the coast. Nepal, too, can expect surplus conditions, as can western Bhutan. Anomalies will be exceptional on the Gandaki River through Nepal. Many regions of Pakistan will experience surpluses including exceptional anomalies west of the Jhelum and Indus Rivers and south of Hyderabad.

In Afghanistan, deficits will be severe to exceptional in the provinces surrounding Mazar-e Sharif in the north; some pockets of moderate surplus are expected in the Upper and Middle Helmand River regions; and mixed conditions are forecast in the nation's west and south.

The 3-month composites (below) show the evolving conditions in greater detail.




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that surpluses will shrink and downgrade considerably in the region. However, surpluses are expected in India's far north; the eastern states of West Bengal, Jharkhand, and Bihar; from Mumbai into Karnataka; around Hyderabad; and east of Bangalore. Deficits in the Far Northeast will shrink somewhat, persisting in central Assam. Moderate to severe surpluses will persist throughout Bangladesh. Surpluses will shrink in western Nepal, persisting elsewhere in the nation and into Bhutan. In Pakistan, surpluses are expected in the north, transitional conditions in the center of the country, and intense deficits in Baluchistan Province in the south. Afghanistan can expect surpluses and transitional conditions in the west.

From November 2021 through January 2022, exceptional deficits will emerge in Gujarat, India, and moderate deficits will increase in the Far Northeast and emerge in western Rajasthan and western Tamil Nadu. Moderate surpluses will linger in Bangladesh, nearby India states to the west, and Nepal. Surpluses will shrink in far north India but persist in eastern Rajasthan and a few pockets in the Krishna River Basin. Surpluses in Pakistan will shrink and moderate, persisting primarily in the north, and deficits will recede in the south. Surpluses are expected in Afghanistan from the Harirud River to the Helmand.

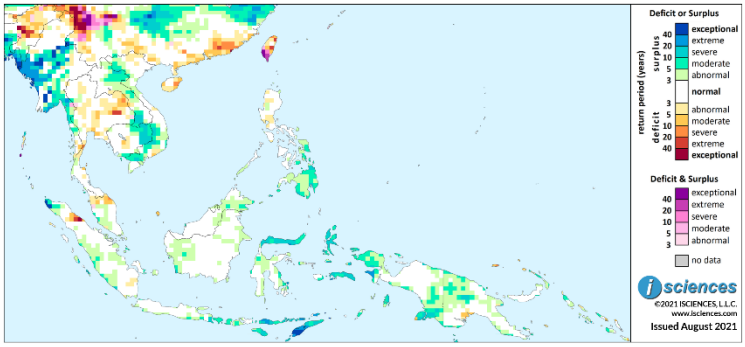
The forecast for the final months – February through April 2022 – indicates surpluses in Bangladesh, West Bengal, southern Nepal, eastern Maharashtra, and eastern Jammu and Kashmir. Moderate deficits are expected in Gujarat. Intense surpluses will re-emerge in central Pakistan.

Please note that WSIM forecast skill declines with longer lead times.

## Southeast Asia and the Pacific

The 12-month forecast through April 2022 indicates water surpluses in many regions of Myanmar. Anomalies will be extreme in the southwestern states. Severe surpluses are forecast in Cambodia east of the Mekong River reaching into southern Laos and Vietnam. In northeastern Laos and the Mekong Delta, primarily moderate surpluses are predicted.

ISciences Water Anomalies Forecast
Southeast Asia: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

Pockets of deficits are expected in eastern Thailand and Myanmar's far north.

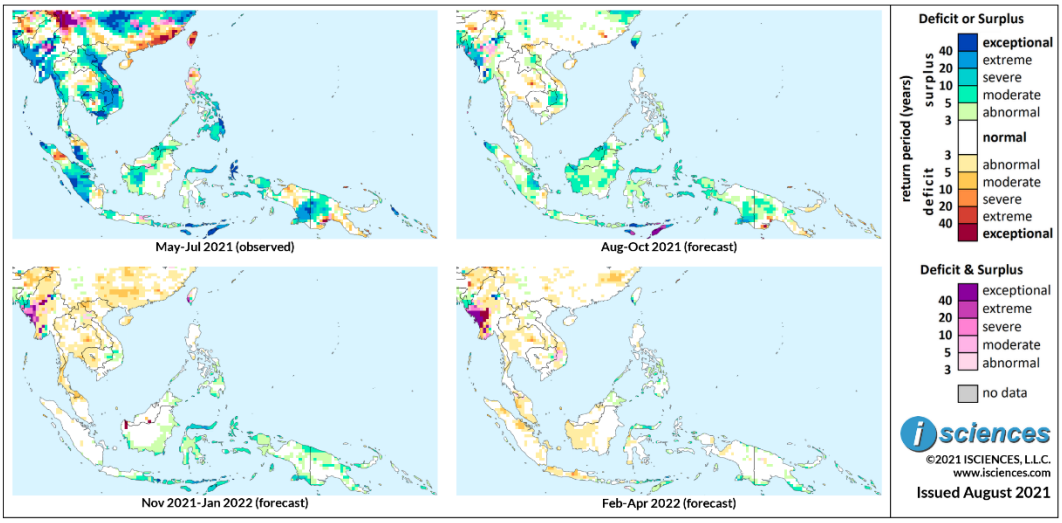
Water surpluses are forecast in the Lesser Sunda Islands and will be exceptional in western Timor (Indonesia). Severe surpluses are expected in Sulawesi's northern arm and in the Maluku Islands. Surpluses of generally lesser intensity are in the forecast for the Bird's Head Peninsula (Doberai) of New Guinea, pockets in the center of the island, and the southern region of Papua, Indonesia.

In Sumatra, deficits are forecast in a pocket around the metropolis of Medan, and surpluses in Banda Aceh at the northern tip of the island.

The central and southern Philippines can expect moderate surpluses.

The 3-month maps (below) show the evolving conditions in more detail.

ISciences Water Anomalies Forecast
Southeast Asia: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that surpluses will shrink considerably in Southeast Asia and the Philippines, and generally downgrade but remain widespread elsewhere. Surpluses will linger in Myanmar, particularly in the west, while transitional conditions are forecast for the center of the country. Deficits are forecast in eastern Thailand between the Mun and Chi Rivers, and a few small pockets elsewhere in Southeast Asia including Vietnam's northwest corner and west of Danang. Surpluses, primarily moderate, are expected in many large pockets throughout the Pacific region. Intense surpluses along with transitional conditions are forecast for the Lesser Sunda Islands. Areas of severe surplus include the Maluku Islands, Sulawesi's northern arm, and Banda Aceh in northern Sumatra. Moderate surpluses are expected in Borneo, and will linger in coastal Mindanao, Philippines. Deficits around the Gulf of Papua and near Medan, Sumatra will shrink.

From November 2021 through January 2022, surpluses will nearly disappear in Southeast Asia as mild deficits emerge. Severe deficits will persist in a pocket of Thailand between the Mon and Chi Rivers. Moderate to extreme surpluses are forecast for the Lesser Sundas and eastern Java, Sulawesi, the Malukus, and pockets of New Guinea.

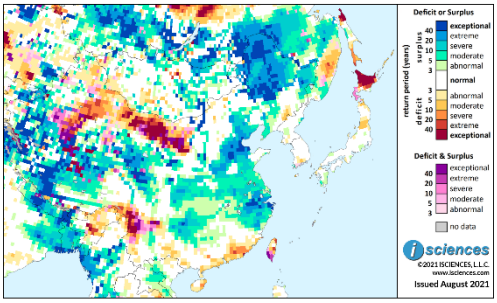
The forecast for the final months – February through April 2022 – indicates the emergence of exceptional deficits in the region of the Middle Irrawaddy River in Myanmar. Surpluses will shrink in the Pacific, lingering though downgrading in Sulawesi's northern arm, the Lesser Sundas, and along New Guinea's southern coast. Mild to moderate deficits are forecast for pockets of Malaysia, Sumatra, Java, and western Borneo.

Please note that WSIM forecast skill declines with longer lead times.

## East Asia

The 12-month forecast for East Asia through April 2022 indicates widespread extreme to exceptional water surpluses in Northeast China in much of the vast Songhua River Watershed, extending north across the Russian border. Surpluses of varying intensity are expected throughout the North China Plain, more intense north of the Yellow (Huang He) River. Surpluses will be intense in the river's upper basin in Qinghai and will follow the path of the Tongtian River.

ISciences Water Anomalies Forecast
East Asia: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

In the Yangtze Basin, severe to exceptional surpluses are forecast in the lower watershed and the nearby Fuchan River watershed. Surpluses will be moderate along the path of the Middle Yangtze, but anomalies will be more intense in the Wu River region, a southern tributary, and the Jialing River region in the Sichuan Basin.

In South and Southeast China, deficits are forecast in Guangdong and pockets of Taiwan and Hainan. Intense deficits along with some transitional conditions are expected from western Yunnan into Sichuan's southern tip and into southeastern Tibet (Xizang). A pocket of moderate surplus is forecast near Kunming, Yunnan.

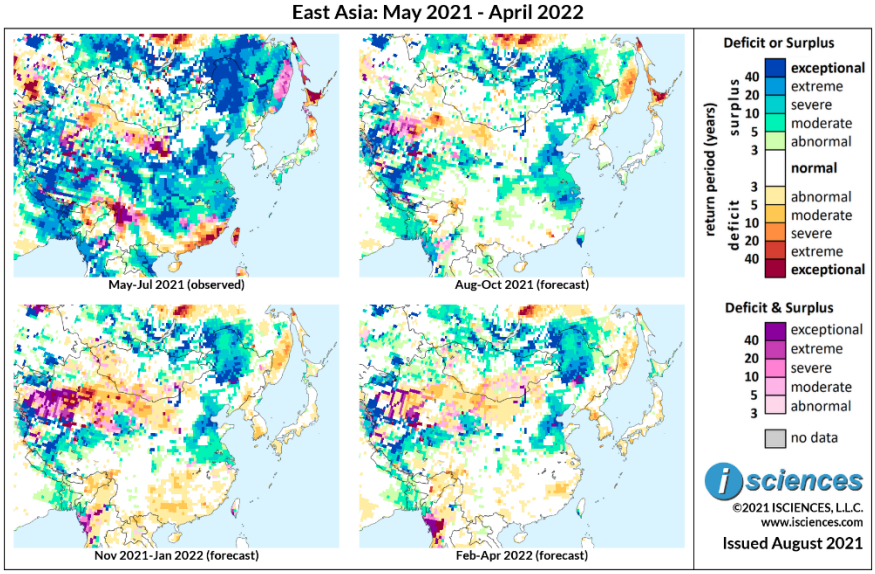
Mixed conditions are forecast for northern Tibet and exceptional surpluses in the west. Surpluses are also expected on the Yarlung (Brahmaputra) River. Xinjiang in northwestern China will experience intense surpluses in the west and intense deficits in the east leading to exceptional deficits in western Inner Mongolia.

In Mongolia, normal conditions are expected in Ulaanbaatar, and deficits west of the city and in the eastern extreme of the Altai Mountains. Surpluses are forecast in many areas of the nation's eastern half and in the north around Lake Khövsgöl.

Nearly normal conditions are forecast for the Korean Peninsula. Exceptional deficits are expected in Hokkaido, Japan, and moderate deficits in the Mogami River Watershed of Yamagata Prefecture in Honshu.

The 3-month time series maps below show the evolving conditions in more detail.

ISciences Water Anomalies Forecast
East Asia: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that surpluses will shrink considerably but many vast areas will persist. Widespread surpluses will continue in Northeast China and will remain intense though the extent of exceptional anomalies will shrink. Deficits will increase in Jilin near the North Korean border. Surpluses will persist in the North China Plain, severe to extreme overall, and in the lower regions of the Yellow and Yangtze Watersheds, where some exceptional anomalies are expected. Moderate surpluses are forecast for the Jialing River region in the Sichuan Basin. Deficits in South and Southeast China will nearly disappear with conditions in Taiwan flipping from deficit to normal in the north and surplus in the south. Elsewhere in China, surpluses are forecast in western Tibet, much of Qinghai, and western Xinjiang. Deficits are forecast in eastern Xinjiang, western Inner Mongolia, and in Tibet's southeastern corner. In Mongolia, pockets of surplus will persist in the north and east. Nearly normal conditions are expected in Korea and much of Japan, though intense deficits will persist in Hokkaido.

From November 2021 through January 2022, surpluses will remain widespread in Northeast China, moderating in the north but remaining exceptional in the Songhua Watershed. Surpluses will persist in the North China Plain and Lower Yellow River region but will shrink and moderate in the Lower Yangtze region and Jialing River region. Moderate deficits will emerge in pockets of Hunan, Guizhou, and Guangxi, and transitional conditions are expected in Taiwan. Deficits will increase from eastern Xinjiang into western Inner Mongolia, reaching into Mongolia. Moderate deficits will emerge in South Korea. Conditions in Hokkaido will return to near-normal.

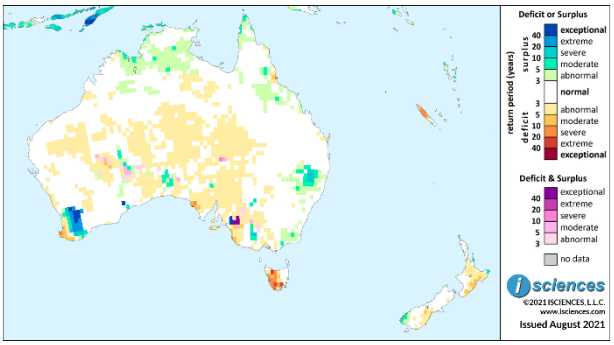
The forecast for the final three months – February through April 2022 – indicates deficits in North Korea, Fujian, and western Inner Mongolia and nearby regions. Areas of surplus include Northeast China, the North China Plain, and western Tibet.

Please note that WSIM forecast skill declines with longer lead times.

## Australia & New Zealand

The 12-month forecast through April 2022 indicates extreme to exceptional water surpluses in Western Australia in the Avon River catchment, while in the state's southern tip deficits are expected in Busselton and the lower Blackwood River region. In eastern Australia, moderate to severe surpluses are forecast for the Macintyre River region of northeastern New South Wales.

ISciences Water Anomalies Forecast
Australia & New Zealand: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

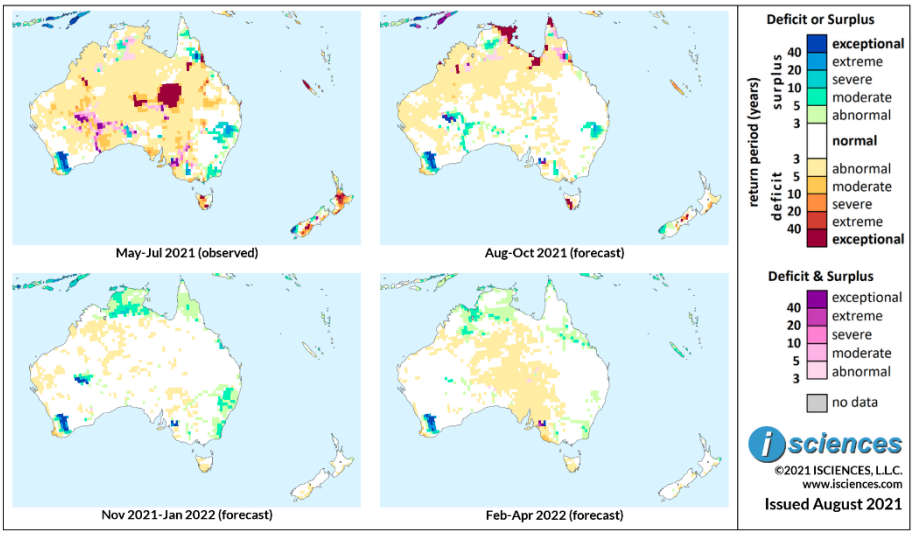
Surpluses, generally moderate, are forecast for some pockets in Victoria, South Australia, and scattered across Australia's northern regions. Near the Lower Murray River, intense surpluses and transitional conditions are expected.

Deficits are expected in a few pockets along the southern coast including the west coast of the Eyre Peninsula and Kangaroo Island. Deficits will be more intense in Tasmania, extreme near Hobart and around Lakes Gordon and Pedder and severe throughout much of western Tasmania.

In New Zealand, moderate deficits are expected around Hawke's Bay in the north and moderate surpluses in the Fiordland region of South Island. New Caledonia's northern half will experience severe deficits.

The 3-month maps (below) show the evolving conditions in greater detail.

ISciences Water Anomalies Forecast
Australia & New Zealand: May 2021 - April 2022




Based on observed data through July 2021 and forecasts through April 2022

The forecast through October indicates that surpluses in southeastern Australia will shrink, persisting in the Macintyre River region in northeastern New South Wales and north of Grampians National Park in

Victoria. Intense surpluses will persist in Western Australia in the Avon River catchment east of Perth and extending to the southern coast. Surpluses are expected to re-emerge in Western Australia from the Gibson Desert leading south, and around Katherine in Northern Territory. Also in the north, exceptional deficits will emerge in eastern Arnhem Land in Top End, Northern Territory, and in Queensland at the base of the Gulf of Carpentaria and tip of the Cape York Peninsula. Surpluses in the Peninsula will recede. In Tasmania, deficits will retreat from the Derwent Estuary but will intensify in the west, becoming exceptional. While shrinking overall in New Zealand, deficits are forecast around Hawke's Bay in the north and a few pockets in the south. Surpluses in Fiordland will moderate. In New Caledonia, deficits will increase but downgrade from exceptional to moderate or severe.

From November 2021 through January 2022, moderate surpluses will increase between the Macintyre and Macquarie Rivers in New South Wales and will emerge from Canberra to the coast. Intense surpluses are forecast in the Lower Murray River. In the west, surpluses will remain intense in the Avon River Watershed and southwest of the Gibson Desert. Across Australia's northern reaches, deficits will disappear and moderate surpluses will increase in Top End. Surpluses will emerge in a small pocket on the east coast north of Rockhampton and mild surpluses are expected in the Cape York Peninsula. Near-normal water conditions are forecast for Tasmania, New Zealand, and New Caledonia.

The forecast for the final months – February through April 2022 – indicates that surpluses will nearly disappear in the nation's southeast, remain intense in Western Australia's Avon River Watershed, shrink in Top End, and emerge in the Ord River region of Western Australia and Northern Territory. Some pockets of moderate surplus will emerge in northern Queensland and moderate surpluses are expected in New Caledonia.

Please note that WSIM forecast skill declines with longer lead times.