

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 August 2021 and an ensemble of forecasts issued the last week of August 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.

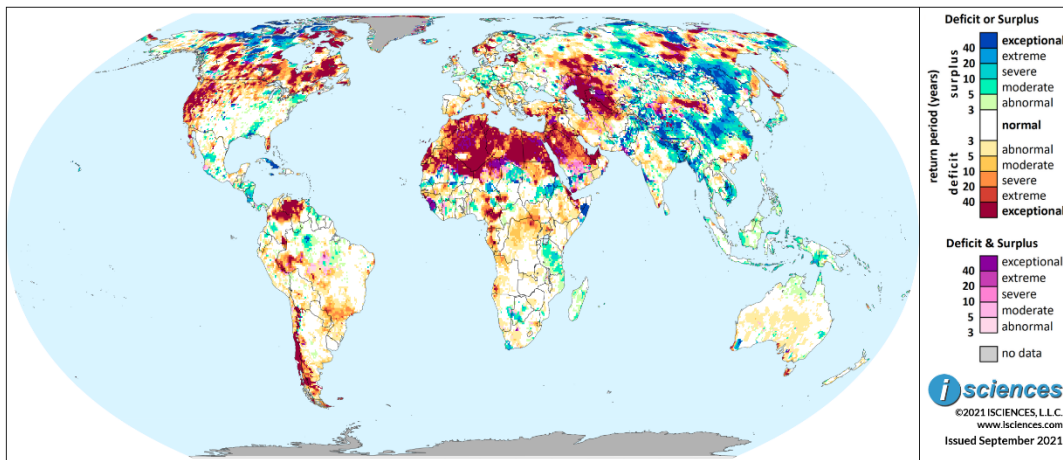
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Worldwide Water Watch List

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

ISciences Water Anomalies Forecast: June 2021 - May 2022



Based on observed data through August 2021 and forecasts through May 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 November indicates that water deficits will shrink and downgrade considerably in the West, Northern Plains, and Northeast but persist in Peninsular Florida. Surpluses are forecast in central Gulf States and northern neighbors and will increase from Wisconsin to the Atlantic.

Canada: The forecast through November indicates that water deficits will shrink, particularly in the southern region of the Prairie Provinces. However, widespread, exceptional anomalies will persist, especially in Quebec.

Mexico, Central America, and the Caribbean: The forecast through November indicates water surpluses in southern Durango and Zacatecas, surrounding Mexico City, on Mexico’s central Pacific Coast, Nicaragua, and northern Costa Rica. Areas of deficit include Baja, Tabasco, and western Haiti.

South America: The forecast through November indicates that widespread water deficits will shrink considerably, particularly in Brazil, but deficits are expected throughout Chile. Surpluses surrounding Manaus will downgrade but moderate surpluses will increase in the Amazon Basin.

Europe: The forecast through November indicates that water deficits will shrink considerably in Southern Europe but persist in the Nordic region, Baltics, and Scotland. Surpluses will increase in Germany and northeastern France.

Africa: The forecast through November indicates that water deficits will downgrade in North Africa but increase in northern Sudan. Deficits in central and southern Africa will downgrade considerably. Areas of surplus include southeastern Sudan, Tanzania, Botswana, and Western Cape, South Africa.

Middle East: The forecast through November indicates that water deficits will shrink and downgrade in Turkey and the Levant, but will intensify in Riyadh Province, Saudi Arabia. In Iraq, exceptional deficits will emerge at the confluence of the Tigris and Euphrates.

Central Asia and Russia: The forecast through November indicates that widespread, intense water deficits in Turkmenistan, Uzbekistan, and Kazakhstan will retreat. Deficits in the Volga River Basin will shrink and downgrade. Surpluses will remain widespread in the Yenisei River Watershed.

South Asia: The forecast through November indicates that water surpluses will shrink and downgrade considerably but will persist in the Chambal River Basin and far northern India, Nepal, Bangladesh, and Pakistan. Deficits are forecast in pockets of Assam and Tamil Nadu.

Southeast Asia and the Pacific: The forecast through November indicates that water surpluses will shrink and downgrade in Southeast Asia and the Philippines but will be widespread in many parts of Indonesia and New Guinea. Anomalies will be extreme to exceptional in the Lesser Sunda Islands.

East Asia: The forecast through November indicates that water surpluses will remain widespread in Northeast China and the Yellow and Yangtze Basins, downgrading in the rivers' upper regions. Deficits are forecast in South and Southeast China. Japan can expect surpluses in the south, deficits in Hokkaido.

Australia & New Zealand: The forecast through November indicates water surpluses in the Macintyre River region of New South Wales, the Atherton Tablelands in Queensland, and the Avon River catchment in Western Australia. Deficits are forecast south of Perth, near Melbourne, and in New Caledonia.

Watch List: Regional Details

United States

The 12-month forecast ending May 2022 indicates widespread water deficits in the U.S. West, Pacific Northwest, parts of the Rockies, and Northern Plains. Deficits will be exceptional in many areas including Oregon and Northern California, and extreme to exceptional in eastern North Dakota and northwestern Nebraska. On the Colorado River, deficits will be generally mild in the upper reaches and moderate to severe in the lower reaches.

In Minnesota’s northern half, anomalies will be severe overall, generally downgrading in the south and through northern Iowa. Deficits are also forecast for Wisconsin’s northern and southern extremes, but surpluses will be dominant in a wide belt across the middle and will reach across Lake Michigan well into northern regions of Michigan’s Lower Peninsula as well as a pocket in the state’s southeast. Most of Illinois can expect moderate surpluses and pockets are forecast nearby in northern Missouri and in Indiana.

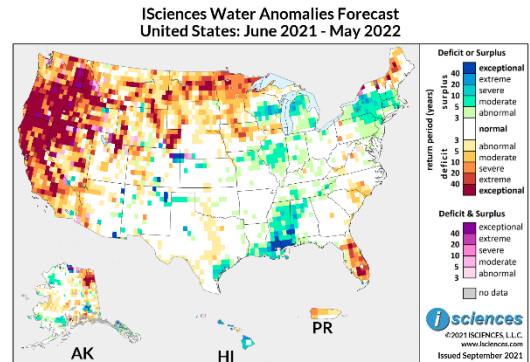
In the U.S. Northeast, deficits will skirt the northern reaches of New York, Vermont, and New Hampshire leading to more widespread anomalies in western Maine. However, surpluses will dominate the remainder of New York and reach through southern New England. Some moderate deficits are forecast spanning the shared border of the Carolinas. In Peninsular Florida, deficits will be widespread and will include extreme to exceptional deficits near Lake George in the north and Lake Okeechobee in the south.

In the Gulf States, surpluses will be widespread in Mississippi reaching into neighboring Alabama and southern Louisiana. Anomalies will be exceptional in coastal Mississippi and north of Lake Pontchartrain, Louisiana. Texas can expect surpluses along the coast from the Brazos River to Corpus Christi and following the Canadian River in the Panhandle. Surpluses will follow the Upper Canadian River region in New Mexico and reach into a pocket of south-central Colorado. Surpluses are also forecast in Colorado’s northeastern corner and in a pocket of north-central Kansas.

Outside the contiguous U.S., Alaska can expect intense deficits in the northeast and near Anchorage and Valdez in the south, and moderate deficits on the North Fork of the Kuskokwim River and near Norton Sound. Areas of surplus include Juneau, north of Iliamna Lake, west of Bethel, Noatak National Preserve, and the central Arctic Coast.

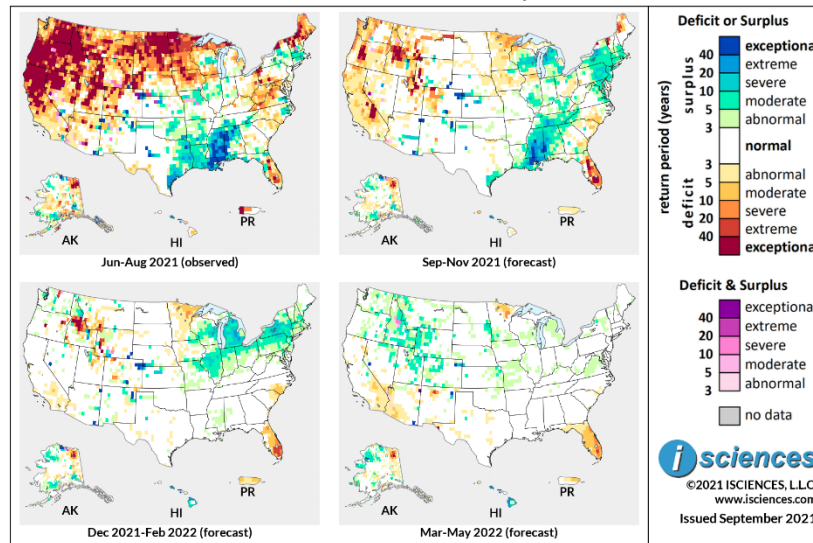
Most of the Hawaiian Islands will experience surpluses but moderate deficits are expected in Maui. Moderate to severe deficits are forecast for Puerto Rico.

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



Based on observed data through August 2021 and forecasts through May 2022

**ISciences Water Anomalies Forecast
United States: June 2021 - May 2022**



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that deficits will shrink and downgrade considerably. In California, deficits will be mild overall but exceptional in Death Valley and severe in the Klamath River. Much of eastern Washington State will return to near-normal conditions but deficits are expected elsewhere, including exceptional anomalies in Oregon east of the Willamette Valley. Deficits are forecast throughout the Rockies, exceptional in Idaho’s Salmon River Mountains and a few other regions, and severe in northwestern Colorado. Deficits will follow the Missouri River through Montana.

Much of the Great Plains region will see normal water conditions. Deficits will persist but downgrade in Minnesota and pockets in nearby states. Surpluses will increase in central Wisconsin, emerge in Lower Michigan, and become widespread from New York State to the Atlantic and through eastern Virginia. Though shrinking, intense deficits will persist in western Maine and pockets of northern Vermont. Some moderate deficits are expected in the Carolinas and intense deficits in Peninsular Florida. In the Gulf Region, surpluses will persist in Mississippi, southern Louisiana, and Alabama, and north through Tennessee and pockets in the Ohio River Watershed. In Texas, surpluses will persist from Corpus Christi to the Brazos River and on the Canadian River in the Panhandle. Surpluses elsewhere include a belt east of Phoenix, Arizona and the intersection of Colorado, Nebraska, and Kansas.

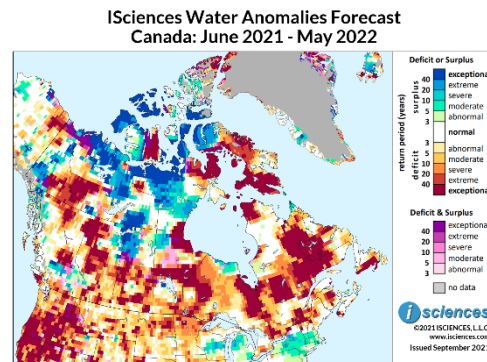
From December 2021 through February 2022, deficits will retreat from much of the western U.S. and the Northeast, persisting in Idaho and pockets of the Rockies, northeastern Minnesota, Florida, and southeastern North Carolina. Deficits will be intense in Idaho and southern Florida. Some pockets of surplus will emerge in the U.S. Northwest. Surpluses will nearly disappear in the South but widespread, moderate to severe anomalies are expected from the Great Lakes States into much of the Northeast.

The forecast for the final months – March through May 2022 – indicates a transition to moderate surplus in the Rockies. Deficits are forecast for Peninsular Florida and northeastern Minnesota. Please note that WSIM forecast skill declines with longer lead times.

Canada

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

In the eastern half of the nation, deficits will be exceptional in southern Newfoundland, eastern New Brunswick, northeastern Quebec including the Manicouagan Reservoir region and reaching into western Labrador, from Gouin Reservoir to Lake Mistassini in Quebec, and on Quebec’s northeastern border reaching along James Bay. 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 extreme to exceptional near Montreal and moderate near Toronto and Ottawa. Conditions will be nearly normal near Québec City.



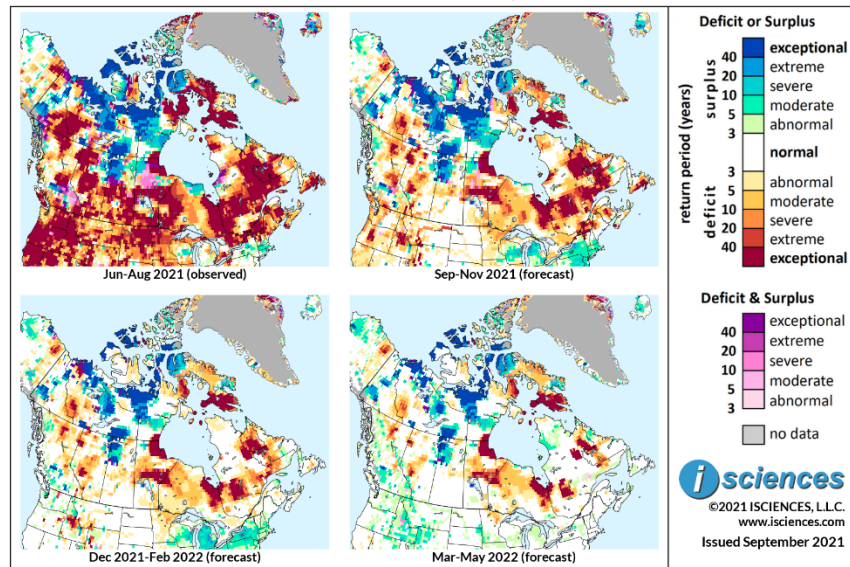
Based on observed data through August 2021 and forecasts through May 2022

In the Prairie Provinces, deficits of varying intensity are forecast across the southern halves, including exceptional deficits around Winnipeg (Manitoba) and Regina (Saskatchewan), and extreme deficits near Calgary and Edmonton (Alberta). In the provinces’ northern reaches, surpluses will dominate from Fort McMurray in Alberta through Saskatchewan’s northwest quadrant and in northwestern Manitoba. However, deficits will frame these surpluses with widespread, exceptional anomalies in Manitoba near Hudson Bay and in Alberta’s northwestern corner and the Middle Athabasca River region.

British Columbia’s Vancouver Island can expect exceptional deficits while deficits of varying intensity are forecast near the province’s southern border. Surpluses of varying intensity are expected in the 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.

Isciences Water Anomalies Forecast
Canada: June 2021 - May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that deficits will shrink in the western half of the nation, returning near-normalcy to the southern region of the Prairie Provinces. Though exceptional deficits will shrink in Canada’s eastern half, widespread intense anomalies will persist in Quebec and along Ontario’s northeastern border and James Bay. Anomalies in Northern Ontario will downgrade.

In Manitoba, moderate to extreme deficits will persist in the southeast. Exceptional deficits will persist in a belt across the middle of the province and in the northeast near Hudson Bay; moderate surpluses are forecast in the northwest. Conditions across southern Saskatchewan will be normal with moderate deficits on the South Saskatchewan River. Deficits of varying intensity are forecast in the province’s middle and intense surpluses in the northwest. While southeastern Saskatchewan will see relatively normal conditions, some deficits are expected. Farther north, intense deficits will persist in the Middle Athabasca River region and in the northwestern, and surpluses near Lake Athabasca. Deficits will persist in British Columbia’s southern extreme, the Fraser River Watershed near Prince George, and the far north, though exceptional deficits will shrink. Surpluses will persist in the Chilcotin River region of west Cariboo and near Kelowna in the province’s south and will increase in the far northwest.

From December 2021 through February 2022, deficits will shrink and downgrade though vast expanses of exceptional deficit will persist in Quebec, near James Bay in Ontario, and central and northeastern Manitoba. Relatively normal water conditions are forecast for the Prairie Province’s southern regions and deficits will recede from much of southern British Columbia, persisting in the East Kootenay region, as more pockets of surplus emerge.

The forecast for the final months – March through May 2022 – indicates that deficits will shrink, particularly in Quebec. Moderate surpluses will increase in British Columbia, especially in the Cariboo Region. Please note that WSIM forecast skill declines with longer lead times.

Mexico, Central America, and the Caribbean

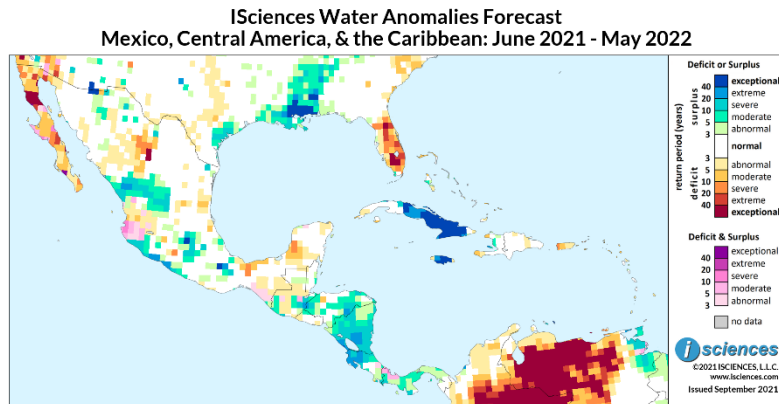
The 12-month forecast ending May 2022 indicates water deficits of varying intensity in Mexico's Baja Peninsula including exceptional anomalies, and severe deficits from southeastern Chihuahua into Durango.

Widespread surpluses are forecast from southern Durango into neighboring Sinaloa on the coast and land-locked Zacatecas. Farther south, surpluses are also forecast along the central Pacific Coast; in Mexico City and surrounding states; and northern Oaxaca.

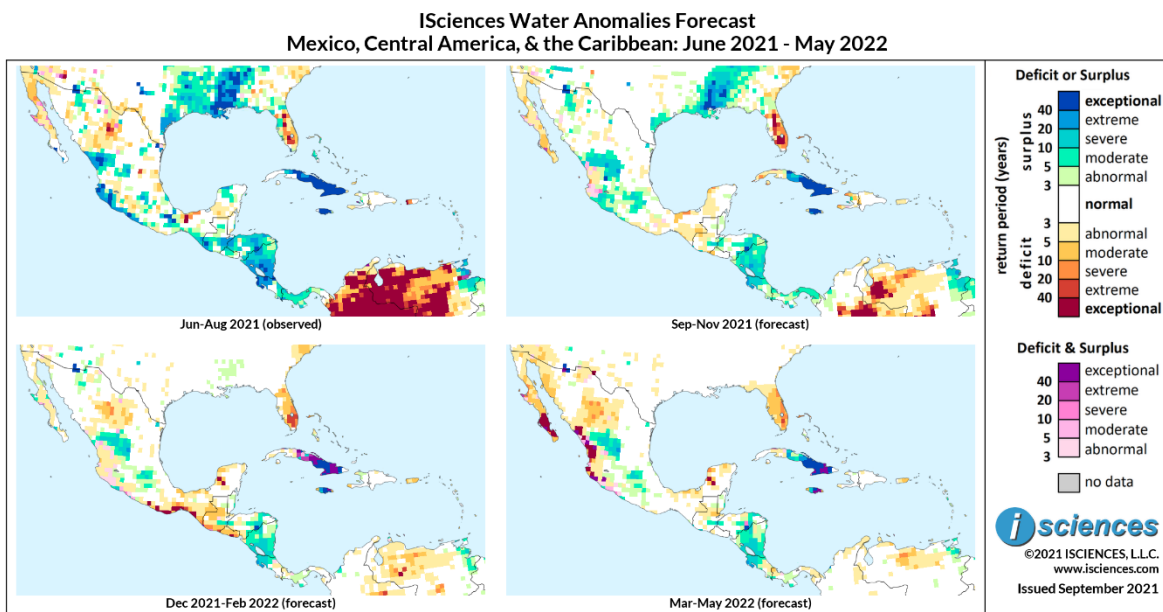
Pockets of moderate to severe deficit are expected along the southern coast of the Gulf of Mexico in Veracruz, Tabasco, and Campeche.

In Central America and the Caribbean, moderate to extreme surpluses are forecast from southern Nicaragua through northern Costa Rica. Surpluses of generally lesser intensity are forecast for many regions of Honduras, pockets of southern Guatemala, and Panama. Intense surpluses are expected in Cuba and Jamaica.

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



Based on observed data through August 2021 and forecasts through May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that surpluses will increase in southern Durango and Zacatecas, Mexico with severe anomalies overall. Surpluses will persist in Mexico City and increase in surrounding states, while surpluses on the central Pacific Coast shrink and downgrade. Surpluses will also persist in the Upper Yaqui River Watershed of Sonora in northern Mexico. Moderate deficits will emerge in southern Baja, downgrading to mild in the peninsula's north. In southern Mexico, severe deficits will persist in Tabasco on the Gulf, moderating as they reach into southern Veracruz State.

In Central America, surpluses will shrink and downgrade but remain widespread from eastern Honduras through Nicaragua and into northern Costa Rica. Moderate surpluses will emerge in eastern Panama. Intense surpluses are forecast in much of Cuba and Jamaica, but deficits will emerge in western Cuba and western Haiti.

From December 2021 through February 2022, deficits will retreat from Baja but moderate to severe deficits will emerge from southeastern Chihuahua into central Coahuila. Surpluses will nearly disappear along Mexico's central Pacific Coast, shrink slightly in the region around the nation's capital, but persist from southern Durango through Zacatecas into San Luis Potosi. In the south, exceptional deficits will emerge along the Pacific Coast from southern Guerrero through Oaxaca and Chiapas, and in pockets of Campeche in the Yucatán, while anomalies in Tabasco moderate. Deficits will emerge in Guatemala and El Salvador, and surpluses will downgrade somewhat but persist in Nicaragua, northern Costa Rica, and eastern Honduras, retreating from most of Panama. Surpluses and transitional conditions are expected in Cuba and Jamaica.

The forecast for the final three months – March through May 2022 – indicates deficits in Mexico's central north, Baja, coastal Sonora, the central Pacific Coast, and pockets of the Yucatan, and will include exceptional anomalies. Areas of surplus include Zacatecas, the area around Mexico City, Nicaragua, northern Costa Rica, Jamaica, and Cuba.

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

South America

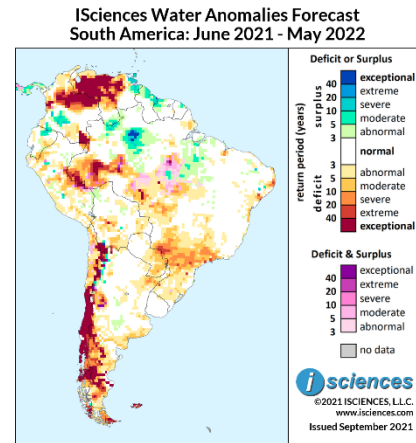
The 12-month forecast through May 2022 indicates exceptional water deficits across northern Colombia and Venezuela throughout the vast Orinoco River watershed. Deficits will also be intense in Colombia's southern corner.

Elsewhere across the northern arc of the continent, surpluses of varying intensity are expected spanning the central border of Ecuador and Colombia including Quito; in southwestern Colombia including Cali; in Venezuela's southern tip reaching across the border into Brazil; in northeastern Venezuela including the Orinoco Delta; and in northern regions of the Guianas, particularly Guyana.

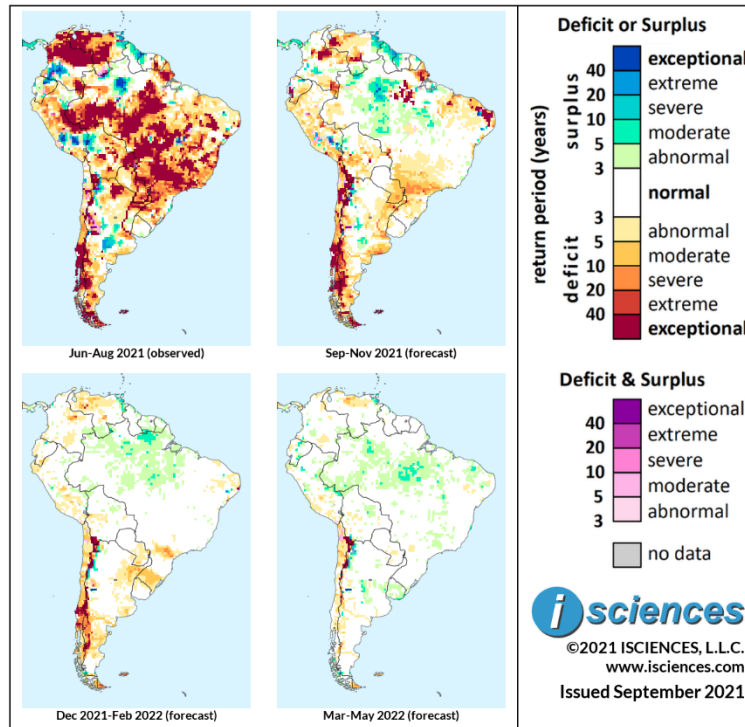
Brazil can expect intense deficits in the west; surpluses reaching exceptional intensity north of Manaus in the Amazon region; and moderate to extreme deficits in the central west and southeast. Deficits in the west will span the Peruvian border. In Bolivia, deficits are forecast in the center of the country from La Paz to Sucre and in the south where anomalies will be exceptional in the southwest corner of the nation. Neighboring Paraguay will also see deficits throughout much of its eastern half, moderate overall.

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. Deficits will be intense in Tierra del Fuego and the Falklands. Elsewhere in Argentina, deficits are forecast in San Juan Province in the west, Corrientes Province in the northeast, and Buenos Aires Province north of the Salado River and in pockets of the south. Anomalies will be extreme in pockets of San Juan and severe in Corrientes.

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



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



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that widespread deficits observed in the prior three months will shrink considerably. In Brazil, intense deficits will persist in northwestern Pará and Amapá, and will emerge in the nation's eastern tip with deficits of lesser intensity reaching through the northeastern states. Moderate to severe deficits are expected to persist in the southeast through Mato Grosso do Sul, São Paulo State, and Paraná. Moderate surpluses will increase in the northern Amazon Basin, exceptional surpluses surrounding Manaus will downgrade, and mild to moderate surpluses will emerge in pockets of the southern Amazon Basin.

In northern nations, deficits are forecast from Medellín, Colombia into western Venezuela and will be exceptional in several pockets including northeast of Bogotá, Colombia and surrounding Merida, Venezuela. Deficits will also be intense in the Japurá (Caquetá) River Watershed in southern Colombia. Surpluses are forecast from the Orinoco Delta in Venezuela through northern Guyana and western Suriname; near French Guiana's capital, Cayenne; and pockets in southern Venezuela and west-central Colombia. Surpluses are also forecast in Ecuador northeast of Quito while deficits are expected in several regions, exceptional near Guayaquil.

Pockets of mild to moderate deficit are expected throughout much of Peru but anomalies will be more intense in Ucayali Region in the east and Arequipa Region in the south. Surpluses are expected near Cusco and north of Lake Titicaca. Moderate to severe deficits are expected in central and southern Bolivia and eastern Paraguay. Deficits are expected throughout much of Chile with exceptional deficits in several regions including Biobío. Those deficits will reach across the border into Argentina, while

moderate to severe deficits increase in Buenos Aires Province. Deficits will be moderate along the northern Paraná River, becoming severe on its approach to the Rio de la Plata. Surpluses in central Argentina will shrink.

From December 2021 through February 2022, deficits are forecast in many regions of Chile, but the extent of intense deficit will shrink, persisting in Biobío Region and into southern Argentina. Moderate deficits are forecast along Argentina's southern rivers, in Corrientes Province in the northeast, and a lingering pocket in southern Buenos Aires Province. In Brazil, moderate deficits are expected in Rio Grande do Sul, moderate to severe deficits in Paraná, and moderate surpluses in northern Pará. Moderate surpluses will persist in northeastern Venezuela and some pockets of deficit in the northwest and in Casanare Department in Colombia.

The final quarter – March through May 2022 – indicates deficits in northern Venezuela's Guárico River Watershed, a tributary of the Orinoco, and in pockets of northern Chile and its border regions with Bolivia and Argentina. Surpluses, primarily moderate, are forecast in the Orinoco Delta, pockets in the central Amazon Basin, and Catamarca and Córdoba Provinces in Argentina.

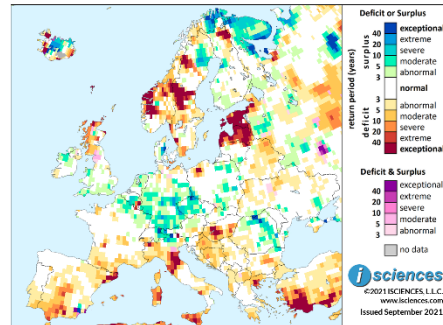
Please note that WSIM forecast skill declines with longer lead times.

Europe

The 12-month forecast through May 2022 indicates exceptional water deficits in Estonia, Latvia, and central Sweden’s Dalälven River Watershed. Intense deficits are also forecast in Västerbotten County in Sweden, Vestland in Norway, and Finnish Lapland. Severe deficits are expected in Sweden’s southern tip and moderate deficits in northeastern Belarus.

Surpluses are forecast from Murmansk, Russia into Arctic Norway and along the western shore of the White Sea. Northern Sweden’s Norrbotten region can also expect surpluses as can a pocket across the Gulf of Bothnia in Finland.

Isciences Water Anomalies Forecast
Europe: June 2021 - May 2022



Based on observed data through August 2021 and forecasts through May 2022

In European Russia, intense surpluses are expected in the Vychegda Lowland in the north and moderate pockets south of Lake Ilmen in the west and Tula Oblast. Deficits are forecast in the Middle Volga River region.

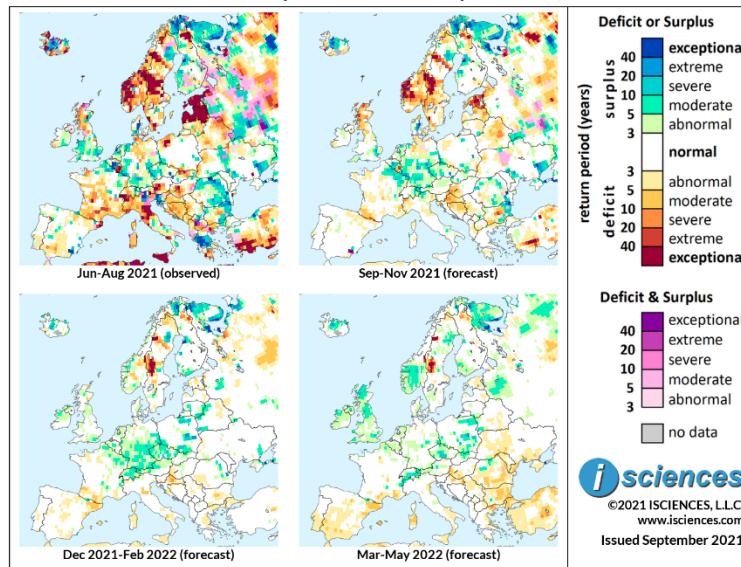
Surpluses of varying intensity are forecast throughout much of Germany south of Berlin, and in Czech Republic, pockets of eastern Poland, central Belgium and nearby regions of northern France, and eastern Switzerland into Austria and the Italian Alps. Surpluses are also expected in northern and eastern Romania and southeastern Ukraine.

Scotland can expect deficits of varying intensity while some small pockets of moderate surplus are forecast in other regions of the U.K. and in Ireland. Extreme to exceptional deficits are forecast for Tuscany and Emilia-Romagna, Italy, with deficits of varying intensity in northwestern Italy. Intense deficits are expected in Sicily, Sardinia, and a pocket south of Naples. Deficits will be widespread and intense in Hungary. Generally moderate deficits are expected in several regions in the Balkans including Croatia, Bosnia and Herzegovina, Albania, North Macedonia, and central Bulgaria. Deficits will be moderate to exceptional in Greece’s Central Macedonia region and moderate in the Peloponnese Peninsula.

Deficits are forecast in pockets of central France and in the south leading into Spain, and from Madrid past Seville and into Portugal’s southern tip. Anomalies will be exceptional north of Barcelona. Other areas with a forecast of deficit include southern Belgium and a pocket in northwestern Poland.

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

**ISciences Water Anomalies Forecast
Europe: June 2021 - May 2022**



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that deficits will shrink considerably in Southern Europe. In the Nordic region and the Baltics, however, deficits will shrink somewhat but remain widespread in Norway, Sweden, Estonia, and Latvia and intense anomalies will persist in many areas. Deficits are also forecast for north-central Belarus, the Mezen River region in Russia, and the Middle Volga River watershed. Surpluses will persist in Murmansk, Arctic Sweden, along the White Sea, pockets around the Gulf of Bothnia, Russia's Vychegda Lowlands, and in southeastern Ukraine and near Moldova. In the U.K., deficits are forecast for Scotland and some surpluses in East Anglia. Surpluses, primarily moderate, will increase in Central Europe in Germany south of Berlin, and the Netherlands, northern Belgium, western Hungary, northeastern France, and from eastern Switzerland into Austria and northern Italy. Surpluses are also expected in northern and southeastern Romania and eastern Bulgaria. Deficits are expected in western Hungary, eastern Croatia, Bosnia and Herzegovina, central and southwestern Bulgaria, and near France's border with Spain.

From December 2021 through February 2022, anomalies will shrink and downgrade. Intense deficits will persist in the western Dalälven River Watershed and Västerbotten, Sweden. Deficits of lesser intensity are forecast in Finnish Lapland and the Middle Volga River Watershed north of the river. Moderate deficits are expected in Catalonia, Spain and some small pockets in southern France, Emilia-Romagna, Italy, and central Bulgaria. Severe deficits will persist east of Zagreb, Croatia.

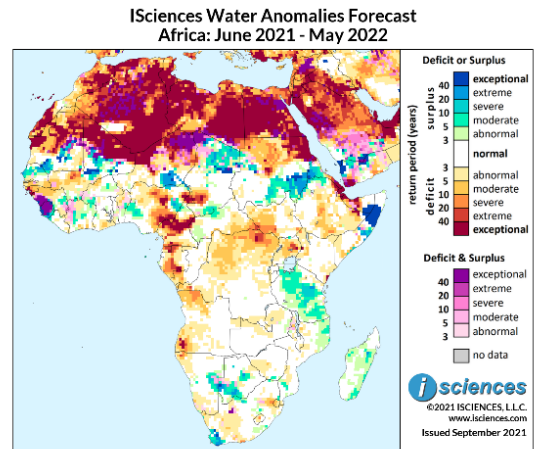
The forecast for March through May 2022 includes surpluses in southern Norway, Murmansk and southwestern Russia, Ireland and the U.K., Switzerland, Czech Republic, Poland, and Slovakia. Intense deficits will persist in pockets of the Nordic nations, moderate deficits in pockets of the western Mediterranean, and moderate deficits will increase in the eastern Balkans.

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

Africa

The 12-month forecast through May 2022 indicates exceptional water deficits in many regions across northern Africa particularly Egypt, Libya, Tunisia, and Algeria. Deficits of lesser intensity are also expected along with some transitional areas (pink/purple).

Surpluses are forecast in large pockets of the Sahel and will be extreme to exceptional around Lake Débo in the Inner Niger Delta of central Mali and between the White Nile and the Atbara Rivers in southeastern Sudan reaching into Eritrea. Surpluses will be extreme in southeastern Niger's Zinder region.



Based on observed data through August 2021 and forecasts through May 2022

A patchwork of water conditions is forecast in West Africa including deficits from southern Senegal through Guinea Bissau and into northern Guinea. In Nigeria, surpluses are expected in the southwest and in the northeast at the intersection of the Benue and Gongola Rivers. Intense deficits are forecast from northeastern Nigeria into Chad, and from Kano in northern Nigeria forming a column to the south and reaching across central Cameroon.

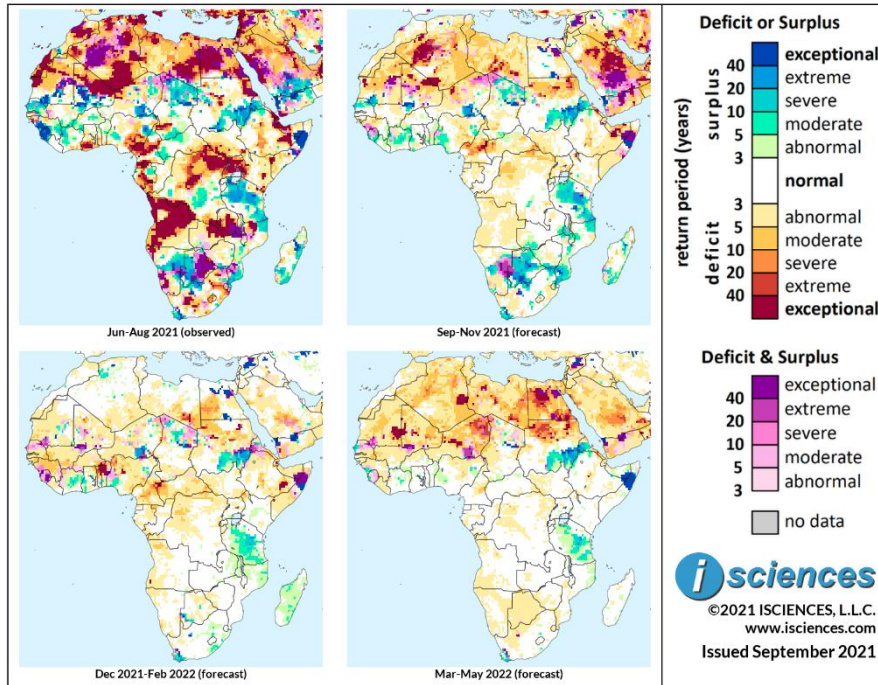
Deficits of varying intensity will extend from Equatorial Guinea through northwestern Angola and are also forecast in southwestern Angola near Lubango where anomalies will be exceptional.

In the heart of the continent, moderate to severe deficits are forecast from eastern Central African Republic into western South Sudan 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. Uganda can also expect deficits. In the Horn of Africa, deficits will be exceptional in southern Eritrea, Djibouti, and western Somaliland. Generally moderate deficits are forecast in Ethiopia from the Highlands through the the Genale (Jubba) River region in the south. Exceptional surpluses are forecast for the Nugaal Valley in Somalia and severe surpluses a bit farther south.

In East Africa, a small pocket off exceptional deficit is expected in coastal Kenya near Mombasa, and moderate to severe surpluses in many regions of Tanzania. Some small, isolated pockets of surplus are forecast in Mozambique and in eastern Madagascar. In southern Africa, surpluses are forecast in the Kalahari Desert of eastern Namibia and Botswana and surrounding Lake Xau in central Botswana. Western Cape, South Africa, can expect surpluses while moderate to severe deficits are forecast east of Johannesburg and into Swaziland. Central Lesotho will also see deficits.

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

ISciences Water Anomalies Forecast
Africa: June 2021 - May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates moderate deficits in northern Africa with intense pockets in western Algeria and southern Libya, while conditions in Egypt normalize overall. Deficits will increase across northern Sudan. Surpluses will persist in southeastern Sudan and northern Eritrea, shrink somewhat in the western Sahel, and persist in pockets around the northern Gulf of Guinea as deficits recede. Deficits will shrink and downgrade considerably in central African nations and along the Atlantic Coast, and downgrade in the Horn. Surpluses will persist in Tanzania and pockets of Mozambique, shrink in Madagascar, and re-emerge in southern Malawi, south-central Zambia, and throughout much of Botswana. Deficits in southern Africa will nearly disappear. Surpluses will persist west of Windhoek, Namibia and in Western Cape, South Africa and small pockets will emerge elsewhere in South Africa.

The forecast for December 2021 through February 2022 indicates normal water conditions in much of northern, central, and southern Africa. Deficits are forecast primarily in southeastern Libya, southwestern Egypt, northern Sudan, Guinea, northern Togo and Benin, Cameroon, and southwestern Ethiopia. Anomalies will be intense in Togo and Benin. Surpluses are expected in Zinder (Niger), northern Chad, southeastern Sudan, pockets around the northern Gulf of Guinea, Tanzania, Western Cape and the northern region of Eastern Cape in South Africa.

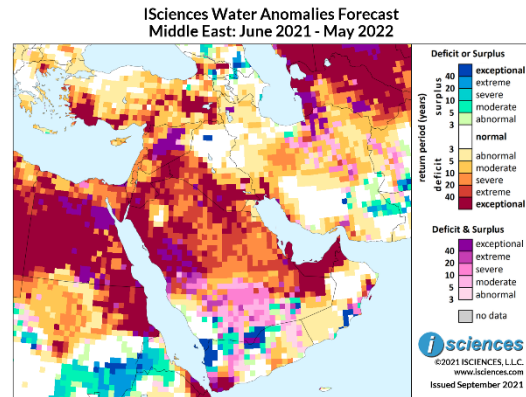
The forecast for the final quarter – March through May 2022 – indicates deficits in North Africa, moderate overall but more intense in some areas including Egypt and northern Sudan. Surpluses will persist in southwestern Sudan, re-emerge nearby in northern Eritrea and in Nugaal (Somalia), and shrink in 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 May 2022 indicates widespread water deficits of varying intensity in Turkey, the Levant, and many regions on the Arabian Peninsula.

Deficits in Turkey include exceptional anomalies south of the Byk Menderes River in the west, the central southern coast (Taurus Mountains), and the Murat River Watershed in the east reaching past Lake Van. Intense deficits are forecast 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.

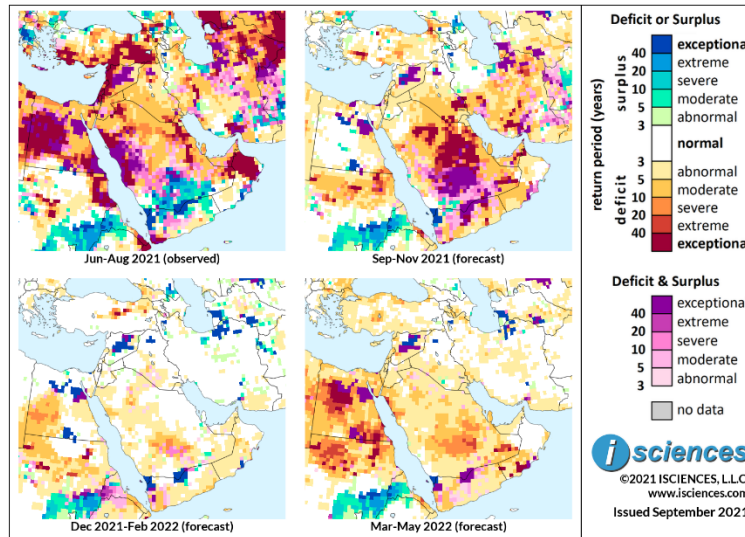


Deficits will be severe in the coastal Levant and will reach exceptional intensity in many other areas of the region including Jordan and Iraq west of the Euphrates River. Intense deficits are expected in the bulk of Saudi Arabia though transitional conditions (pink/purple) and some pockets of surplus are forecast in the southwest. Exceptional deficits will dominate United Arab Emirates, Qatar, and Bahrain. Mixed conditions are forecast in Yemen including intense deficits near the Bab-el-Mandeb Strait.

In Iran, severe deficits are expected in much of Esfahan Province in the center of the country, moderating as they reach the Afghan and Turkmen borders and mingling with transitional conditions. Deficits are forecast along the northern Persian Gulf and around the Strait of Hormuz. In the nation's southeast, surpluses are forecast in the northern half of Sistan and Baluchestan Province seeping west into Kerman.

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

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



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that deficits will shrink and downgrade in Turkey and the Levant but will remain intense in a path following the Byk Menderes River in western Turkey to Beysehir Lake. Moderate to severe deficits are forecast for much of Georgia. West of the Euphrates River in Iraq, deficits will be moderate, but exceptional anomalies will emerge at the confluence of the Tigris and Euphrates. In Saudi Arabia, deficits on the Red Sea will moderate but exceptional anomalies will emerge in the northern half of Riyadh Province reaching into neighboring provinces. Further south, transitional conditions are forecast leading into Yemen. Moderate deficits will emerge in Yemen and southern Oman, but intense surpluses will persist in Yemen northwest of Sanaa. In Iran, moderate deficits are expected throughout the bulk of the nation from the Persian Gulf to the Turkmen border with some pockets of greater intensity in the northeast and in southern Fars near the Persian Gulf. Small pockets of surplus will persist near Tehran and Lake Urmia.

From December 2021 through February 2022, deficits will shrink and downgrade considerably. Intense pockets are forecast in central Turkey and pockets of lesser intensity will linger in the northeast and in coastal Georgia. Moderate to severe deficits are forecast in southern Riyadh Province, Saudi Arabia, and a few pockets in the nation's north. Moderate deficits will linger in southwestern Yemen while exceptional surpluses persist in the northwest and re-emerge along its central Saudi border. Exceptional surpluses will also re-emerge in central Syria, near Mosul in Iraq, and in northeastern Iran. Surpluses will persist near Lake Urmia and Tehran.

In the final quarter – March through May 2022 – deficits will increase on the Arabian Peninsula, moderate to severe in Riyadh Province but more intense in southeastern Saudi Arabia and a pocket in southern Oman. Surpluses will shrink and mild deficits are forecast in the Levant and some pockets of moderate deficit in Turkey.

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

Central Asia and Russia

The 12-month forecast through May 2022 indicates widespread exceptional water deficits throughout Uzbekistan, western Kazakhstan, and much of Turkmenistan.

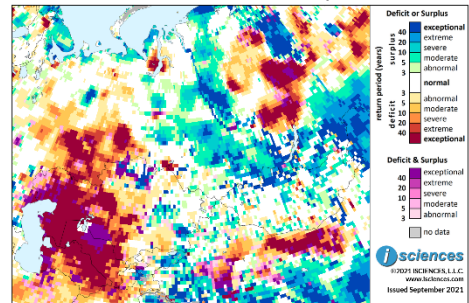
Exceptional surpluses are forecast in the Ishim River Watershed of northern Kazakhstan along with transitional conditions (pink/purple). Surpluses are forecast north of Lake Balkhash and southeast of the lake reaching exceptional intensity while moderate deficits are expected between the lake's western end and Almaty. Central Tajikistan can expect intense surpluses with some deficits elsewhere. Surpluses are also forecast for much of Kyrgyzstan's eastern half.

In Russia, intense deficits are expected in the southern Ural Mountains reaching east past Tyumen, south through the Ural River Watershed, and west well into TransVolga and the Middle Volga region. Exceptional surpluses are forecast along much of the Yenisei River with surpluses of varying intensity in the river's vast watershed reaching to Lake Baikal.

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, and spanning the southern edge of the plateau and the region north of Lake Baikal. Exceptional surpluses are forecast in the plateau's northeast between the Olenyok and Markha Rivers.

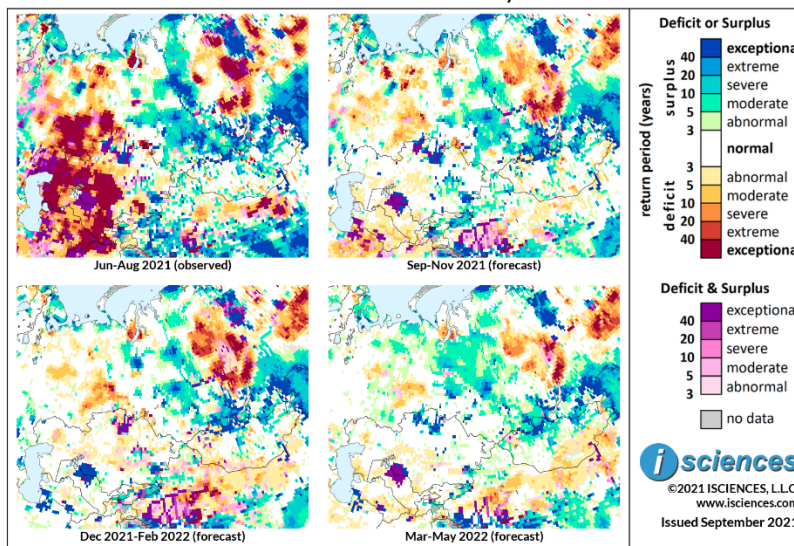
The 3-month composites (below) for the same 12-month period show the evolving conditions in more detail.

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



Based on observed data through August 2021 and forecasts through May 2022

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



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that widespread, intense deficits in Turkmenistan, Uzbekistan, and western Kazakhstan will retreat leaving some pockets of moderate deficit in eastern Turkmenistan and southern Uzbekistan. Surpluses and transitional conditions will persist in the Ishim River Watershed of northern Kazakhstan and surpluses will persist around Lake Balkhash. Surpluses are also forecast along the Naryn River in Kyrgyzstan and in the nation's east and south, leading into central Tajikistan.

In Russia, deficits in the Volga River Basin will shrink and moderate overall. Deficits will be intense in the Pechora and Mezen River watersheds in the north with intense surpluses between in the Vychedga Lowlands. Surpluses will downgrade somewhat in the Yenisei River Watershed but remain widespread. In the Central Siberian Plateau, deficits will increase though the extent of exceptional anomalies will shrink, particularly around the Vilyuy Reservoir. Exceptional surpluses will persist between the Olenyok and Markha Rivers. Deficits will shrink in the northern Verhojansk Range of Sakha Republic but intense surpluses will persist in the southern region of the range and spanning the Lower Alden River, a tributary of the Lena. Widespread surpluses will persist in Russian regions bordering Northeast China. Near the Sea of Okhotsk, intense deficits will persist.

From December 2021 through February 2022, some pockets of surplus will re-emerge in southern Turkmenistan and the Kyzylkum Desert region in Uzbekistan. Surpluses will persist on the Naryn River and in eastern Kyrgyzstan but transitions are forecast there and in Tajikistan as well. The Ishim River Watershed in Kazakhstan will also be in transition, and surpluses north of Lake Balkhash will shrink.

In Russia, deficits in the Mezen and Pechora Watersheds will nearly disappear as will surpluses in the Vychedga Lowlands. Deficits will persist in the southern Urals and to the east past Tyumen. Surpluses will persist in the Yenisei Watershed; deficits will remain widespread in much of the Central Siberian Plateau; and surpluses along with transitional conditions are forecast between the Olenek and Markha Rivers. Surpluses will persist in Russian regions bordering Northeast China. Intense deficits are expected to persist from the city of Yakutsk to the Sea of Okhotsk.

The forecast for the final months – March through May 2022 – indicates that moderate surpluses will increase from the Ob River to the Yenisei and will emerge in the Vychedga Lowlands, increasing in the tundra region along the coast to the north. Deficits will shrink from the southern Urals to Tyumen. Elsewhere, anomalies remain much the same as in the forecast for the prior three months.

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

South Asia

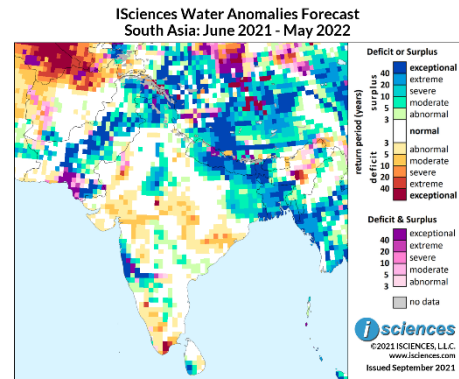
The 12-month forecast through May 2022 indicates water surpluses in western India from Mumbai into Karnataka including exceptional anomalies on the coast and transitional conditions (pink/purple) inland. Widespread surpluses are expected from West Bengal through Uttar Pradesh north of the Ghaghara River. Anomalies will be exceptional in the Ganges Delta and the Gandaki River.

Surpluses of varying intensity are forecast in India's far north and the Chambal River Watershed in Rajasthan, and moderate surpluses in pockets of central Maharashtra,

Telangana, and the southern reaches of the Deccan Plateau. Exceptional deficits are expected in central Assam in the Far Northeast and in the tip of Tamil Nadu. Moderate deficits are forecast along the western Narmada River and pockets of western Rajasthan, Gujarat, Madhya Pradesh, Odisha, and southern Karnataka into Tamil Nadu.

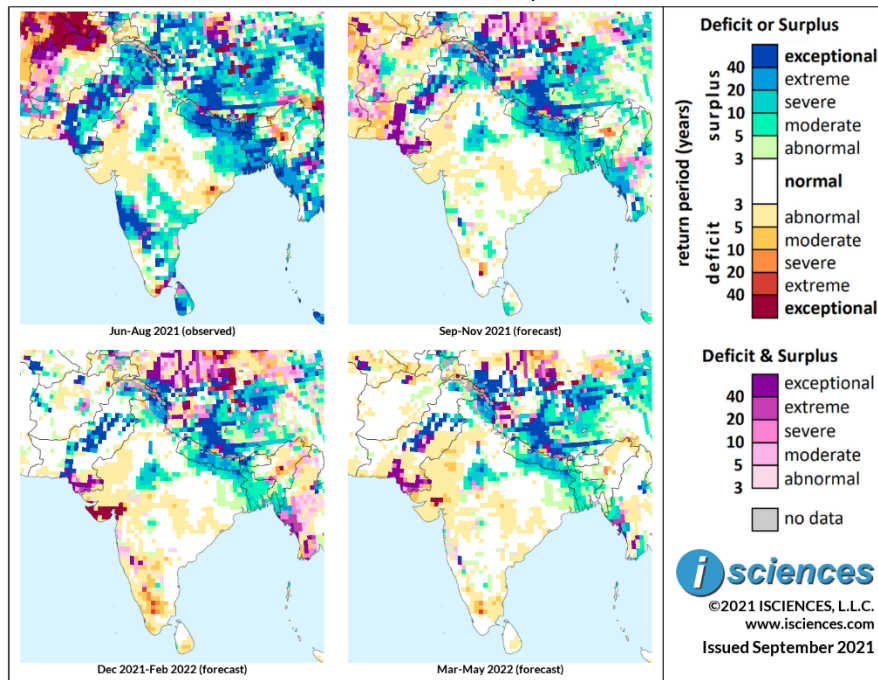
Extreme to exceptional surpluses will be widespread throughout Bangladesh and Nepal reaching into western Bhutan. Surpluses are also expected in Sri Lanka's southwest corner. Many regions of Pakistan will experience surpluses including exceptional anomalies west of the Jhelum and Indus Rivers and south of Hyderabad. In Afghanistan, deficits will be severe to exceptional in the provinces surrounding Mazar-e Sharif; moderate deficits and transitions are forecast in the west; and surpluses in the far south.

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



Based on observed data through August 2021 and forecasts through May 2022

ISciences Water Anomalies Forecast
South Asia: June 2021 - May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that surpluses will shrink and downgrade considerably in the region. Surpluses will nearly disappear in India's southern half, persisting primarily in pockets of Maharashtra, Karnataka, and southern Andhra Pradesh. Elsewhere in the nation, surplus anomalies will increase in the Chambal River Basin of eastern Rajasthan into northern Madhya Pradesh but shrink or downgrade in the far north and in Uttar Pradesh, Bihar, Jharkhand, and West Bengal. A column of extreme surplus will persist in central Haryana. Severe to exceptional deficits will persist in central Assam in the Far Northeast and emerge in western Tamil Nadu in southern India. Surpluses will continue to dominate Bangladesh and Nepal, but the extent of exceptional anomalies will shrink. Moderate to severe surpluses will persist in the southwest corner of Sri Lanka.

In Pakistan, surpluses are expected in the north and in the center of the nation, but transitions are also forecast in central Pakistan and in the south, while moderate deficits emerge in western Baluchistan Province. In Afghanistan, deficits in the north will downgrade to mild, surpluses will increase between the Harirud and Helmand Rivers, and transitions are expected in the west and south.

From December 2021 through February 2022, exceptional deficits will emerge in southern Gujarat, India, deficits will increase in Karnataka and Tamil Nadu, and shrink in Assam. Surpluses will persist in Haryana and the Chambal Basin, and shrink somewhat in the far north. Surpluses will persist in Indian regions bordering Nepal and Bangladesh; anomalies moderate in Bangladesh; and moderate to severe surpluses will persist in Nepal. In Pakistan, deficits will retreat and surpluses will re-emerge west of the Indus River and between its tributaries. Conditions will normalize in much of Afghanistan and surpluses will re-emerge near Mazar-e Sharif and in the west.

The forecast for the final months – March through May 2022 – indicates surpluses in India’s far north, the Chambal River Watershed, and regions bordering Nepal and Bangladesh where surpluses are also expected. Deficits will linger in Gujarat, southern India, and the Far Northeast. Surpluses and transitions are expected in Pakistan, and conditions in Afghanistan will be nearly normal.

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

Southeast Asia and the Pacific

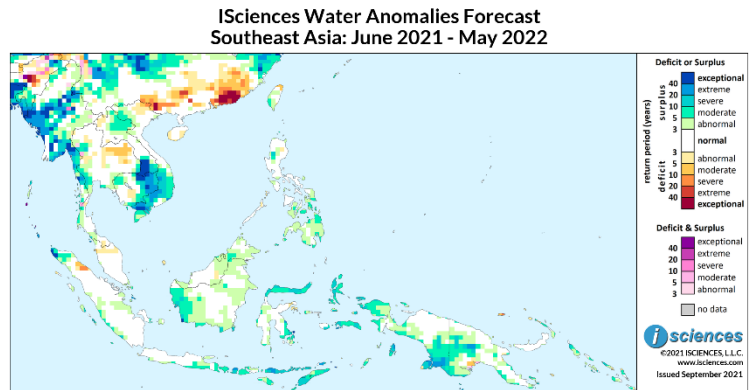
The 12-month forecast through May 2022 indicates water surpluses of varying intensity in many regions of Myanmar, extreme in the southwestern states. Surpluses in the nation's long southern extent will reach into pockets of Thailand while northeastern Thailand can expect moderate deficits.

Moderate surpluses are forecast in northeastern Laos, but anomalies in the south will be exceptional. Extreme surpluses are expected in Cambodia east of the Mekong River, downgrading as they reach through Vietnam's Central Highlands but intense approaching the Mekong Delta.

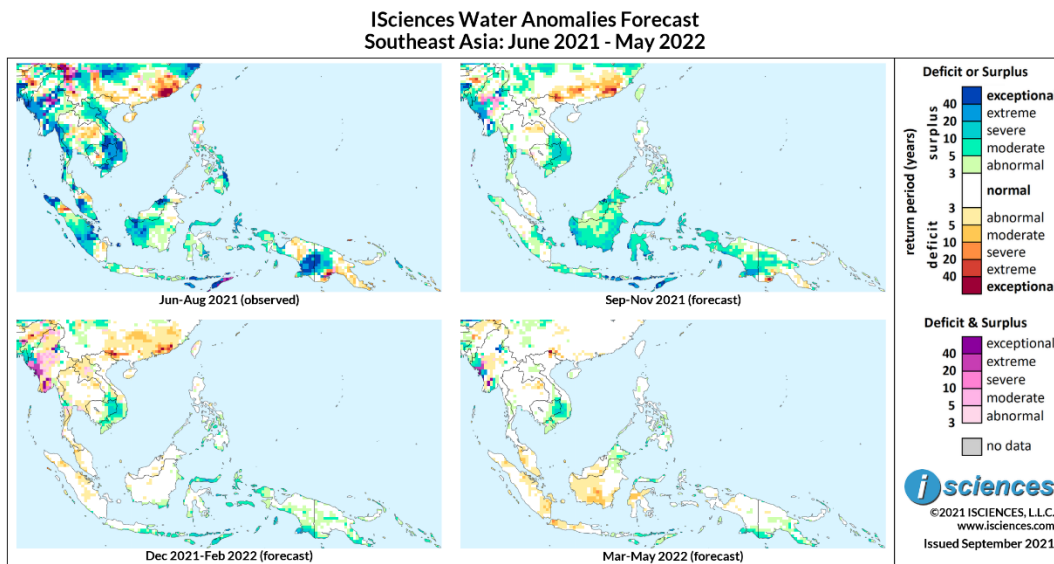
In Indonesia, surpluses in Banda Aceh at the northern tip of Sumatra will be intense, but deficits are forecast in a pocket around the metropolis of Medan. Western Indonesian Borneo will see moderate surpluses, and moderate to severe anomalies are forecast for Sulawesi's northern arm, the Maluku Islands, and the Bird's Head Peninsula (Doberai) of New Guinea. Surpluses will reach extreme intensity in the Lesser Sunda Islands. Widespread surpluses are forecast throughout southern Papua, Indonesia and the central New Guinea Highlands, extreme in south Papua and a pocket in the Highlands.

Some pockets of surplus, primarily moderate are expected in the Philippines.

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



Based on observed data through August 2021 and forecasts through May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that surpluses will shrink and downgrade in Southeast Asia and the Philippines. Surpluses will linger in Myanmar, particularly in the west where anomalies will be severe to extreme, while transitional conditions are forecast for the center of the country. Some moderate deficits will persist in northeastern Thailand. Moderate to severe surpluses will persist in southern Laos, eastern Cambodia, and central and southern Vietnam.

Surpluses, primarily moderate will be widespread in Borneo, Sulawesi, and the Maluku Islands, and moderate surpluses are expected in pockets of Sumatra and Java. Extreme to exceptional surpluses are forecast for the Lesser Sunda Islands. New Guinea can also expect surpluses, moderate overall but extreme in southern Papua, Indonesia. Intense deficits are forecast in a pocket of Papua New Guinea south of the Fly River.

From December 2021 through February 2022, surpluses will continue to shrink in Southeast Asia, persisting from eastern Cambodia into Vietnam and southern Laos, as some mild deficits emerge. Transitional conditions (pink/purple) are forecast in Myanmar. Surpluses will shrink considerably in Pacific regions. Anomalies, primarily moderate are forecast for Sulawesi's northern arm, the Maluku Islands, the Lesser Sunda Island, and pockets of New Guinea. Mild deficits will emerge in Sumatra. Deficits in Papua New Guinea near the Fly River will retreat.

The forecast for the final months – March through May 2022 – indicates that surpluses will persist from eastern Cambodia into Vietnam and will re-emerge in pockets of 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, central Sulawesi, and western Borneo.

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

East Asia

The 12-month forecast for East Asia through May 2022 indicates widespread extreme to exceptional water surpluses in Northeast China in the vast Songhua River Watershed and extending north to the Russian border. Surpluses of varying intensity are expected throughout the North China Plain, along the Lower and Middle Yellow (Huang He) River, and in the river's upper basin.

In the Yangtze Basin, surpluses will be widespread throughout the Basin with exceptional surpluses in the lower watershed and the nearby Fuchan River watershed. Surpluses will also be exceptional in a vast area from Chongqing north into Shaanxi, and along the Min, Dadu, and Tongtian Rivers.

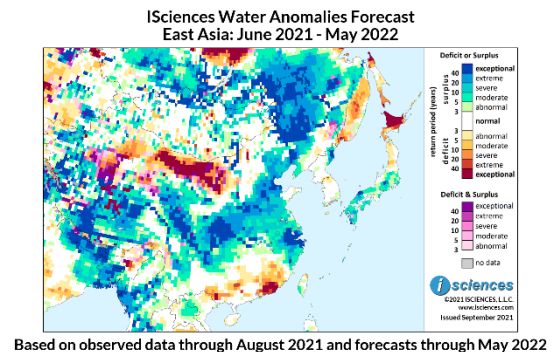
In South and Southeast China, deficits are forecast in eastern Guangdong, Guangxi, southern Fujian, and southern Jiangxi. Anomalies will be exceptional in Guangdong. Exceptional deficits are also forecast from western Inner Mongolia through northern Gansu. Deficits of varying intensity are expected in eastern Xinjiang, surpluses in the west, and transitional conditions in the Tarim Basin. Much of Tibet (Xizang) will see surpluses with severe to exceptional anomalies tracing the Yarlung (Brahmaputra) River.

Taiwan can expect moderate deficits in its northern tip and moderate surpluses along the southwestern coast.

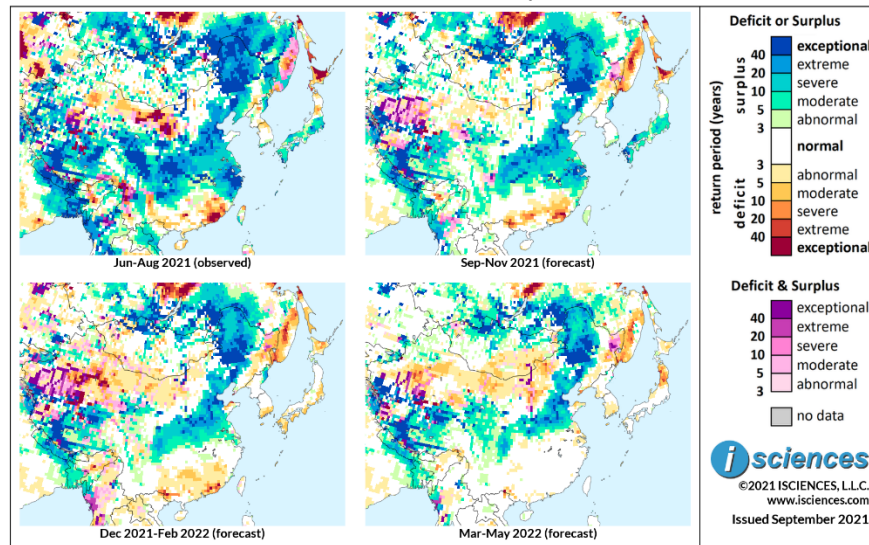
In Mongolia, normal conditions are expected in Ulaanbaatar and deficits west of the city. Surpluses are forecast in many pockets in the nation's eastern half and in the north where anomalies will be intense around Lake Khövsgöl.

Nearly normal conditions are forecast for the Korean Peninsula with some intense surpluses in the northeast. Exceptional deficits are expected in Hokkaido, Japan; mild to moderate deficits in northwestern Honshu; and surpluses of varying intensity in remaining regions of Japan.

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



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



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates that surpluses will remain widespread and intense in Northeast China though the extent of exceptional anomalies will shrink north of the Heilongjiang River and deficits will emerge in Jilin. Severe to exceptional surpluses will persist in the North China Plain and Lower and Middle Yellow River Watershed, while surpluses in the Upper Basin shrink and downgrade. Widespread surpluses will also persist in the Yangtze Basin with extreme to exceptional surpluses in the Lower Basin and along parts of the river’s path. Deficits in Southeast China will downgrade though anomalies in Guangdong will be severe to extreme. In the south, deficits will retreat from Hainan but increase and intensify in Guangxi. Moderate surpluses will emerge in western Yunnan as deficits retreat. Intense deficits from western Inner Mongolia into Xinjiang will downgrade, leaving some lingering mild to moderate anomalies. Transitions will increase in the Tarim Basin, and surpluses will continue in much of Tibet.

On the Korean Peninsula, deficits will retreat, and surpluses are forecast in the far northeast and the coastal south. Surpluses will remain widespread from central Honshu through southern Japan, intensifying along parts of the southwestern coast. Deficits will disappear from northern Honshu but will persist with intensity in Hokkaido, shrinking slightly in southern regions.

From December 2021 through February 2022, surpluses will remain widespread and intense in Northeast China though moderate deficits will increase in Jilin. Surpluses will persist in the North China Plain; Lower Yellow River Basin and eastern Qinghai in the Upper Basin; and Lower and Middle Yangtze Basin, downgrading as stretches of the Yangtze moderate. In South and Southeast China, severe to extreme deficits will persist in Guangdong and Guangxi, with mild to moderate deficits elsewhere. Surpluses will shrink in Yunnan. Deficits will increase and intensify in eastern Xinjiang. In North Korea, surpluses will continue in the northeast. Moderate deficits will emerge in South Korea’s southern

extreme. In Japan, deficits in Hokkaido will downgrade. Much of Honshu will return to normal but moderate deficits will emerge on its east coast and through the other islands.

The forecast for the final three months – March through May 2022 – indicates surpluses in Northeast China and the North China Plain. Surpluses will shrink south of the Yangtze but will persist in the Yellow River Watershed, increasing in the Upper Basin. Near-normal conditions will return to South and Southeast China, the Korean Peninsula, and southern Japan. Deficits are expected in northern Japan, Inner Mongolia and south-central Mongolia, and eastern and central Xinjiang.

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

Australia & New Zealand

The 12-month forecast through May 2022 indicates extreme to exceptional water surpluses in Western Australia in the Avon River catchment. Deficits are forecast along the southwestern coast, moderate near Geraldton but more intense from Perth through Busselton and past the lower Blackwood River region.

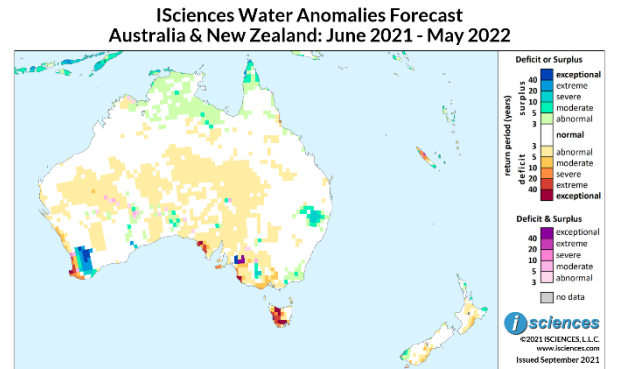
Deficits are expected in pockets of the coastal south on the west coast of the Eyre Peninsula, Kangaroo Island, and nearby on the mainland to Melbourne.

Near the Lower Murray River in South Australia, intense surpluses and transitional conditions are expected. Surpluses of lesser intensity are expected in the Grampians region of western Victoria. Deficits will be intense in western and southern Tasmania.

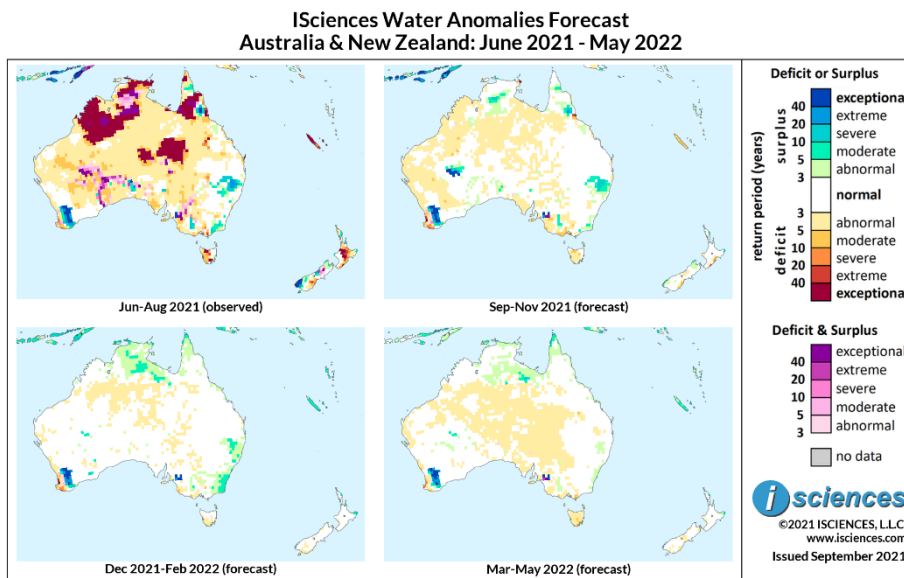
In eastern Australia, moderate to severe surpluses are forecast for the Macintyre River region of northeastern New South Wales. In Far North Queensland, surpluses are expected at the tip of the Cape York Peninsula.

Normal water conditions are expected overall in New Zealand with a small area of moderate deficit near Hawke’s Bay in the north and a few small pockets in the nation’s southeast. Surpluses are forecast in the Fjordland region in the south and coastal extremes in the northeast. New Caledonia’s northern half will experience severe deficits while its southern tip can expect moderate surpluses.

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



Based on observed data through August 2021 and forecasts through May 2022



Based on observed data through August 2021 and forecasts through May 2022

The forecast through November indicates moderate to severe surpluses in the Macintyre River region in northeastern New South Wales and moderate surpluses north of Grampians National Park in Victoria, while surpluses near the Australian Alps will shrink. Intense surpluses will persist in Western Australia in the Avon River catchment east of Perth and extending south, but deficits of varying intensity are forecast along the southwestern coast from Perth well past Busselton and the Blackwood River. Surpluses are expected to re-emerge in Western Australia in the Lake Carnegie region southwest of the Gibson Desert and also near Katherine in Northern Territory.

A few pockets of surplus will linger in Far North Queensland, particularly in the Atherton Tablelands. In the nation's coastal south from Cape Otway to Melbourne, moderate deficits are forecast that will reach across the Bass Strait into small pockets of Tasmania. Deficits will skirt New Zealand's eastern coastal areas and some limited areas of surplus are expected in NZ's extreme points. Moderate deficits are forecast throughout New Caledonia.

From December 2021 through February 2022, surpluses will shrink in the Macintyre River region, moderate surplus anomalies will increase from Sydney through Canberra to the Victoria border, and increase in Top End, Northern Territory. Intense surpluses are expected to persist in the Avon River catchment in the west and deficits will continue along the coast nearby. Nearly normal conditions are forecast for Tasmania and New Zealand. New Caledonia will transition from moderate deficit to moderate surplus.

The forecast for the final months – March through May 2022 – indicates persistent, intense surpluses in the Avon River Watershed while coastal deficits nearby diminish. Surpluses in southeastern Australia will nearly disappear but a few small pockets are expected in the nation's north. Moderate surpluses will shrink in New Caledonia.

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