

16 December 2010 -Global La Niña Update

Produced by the Red Cross/Red Crescent Climate Centre and the
International Research Institute for Climate and Society
16 December, 2010

About the Update

This document contains updated information on the regional impacts of the current La Niña, based on the December 16th update of IRI's seasonal forecast for January – March 2011. In most regions, unusual rainfall patterns related to this La Niña event are forecast to persist into the first three to four months of 2011. Thus it is recommended to continue monitoring seasonal forecasts on a monthly basis for updates. IRI's next forecast update is scheduled for 20 January, 2011 and can be found at:
<http://iri.columbia.edu/ifrc/forecast/3munusualprecip>

This update contains:

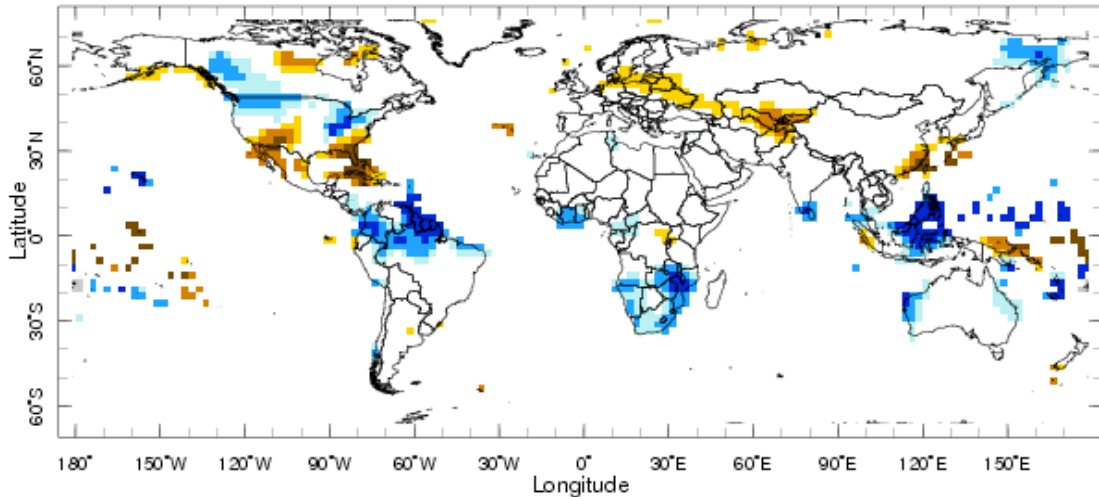
- IRI's global forecast map
- Regional updates (which can be read separately) with regional forecast maps.
- Background information on La Niña, as well as forecast monitoring guidance and resources.

Global Forecast Map

The map below shows the IRI forecast for the total amount of rainfall that is expected from January to March 2011. The map shows whether this three-month period as a whole is expected to be *unusually* wet or dry.

The forecasts are not a direct indication of flooding risks because floods can occur as a result of exceptionally heavy rainfall over only a few hours or a few days, and because "good" rains over a three-month prolonged period may not produce any flooding at all. However, the map does provide a reasonably good indication of areas that might be at increased risk.

Global Forecast Map: IRI Seasonal Forecast for Precipitation (rain and snow) over January – March 2011, issued on 16 December, 2010.



Forecast for Jan-Mar 2011, Forecast Issued Dec 2010

How confident can we be that the next 3 months will be unusually wet?



Low Confidence
(35% to 40% Chance)



Medium Confidence
(45% to 50% Chance)



High Confidence
(55% Chance or Greater)

How confident can we be that the next 3 months will be unusually dry?



Low Confidence
(35% to 40% Chance)



Medium Confidence
(45% to 50% Chance)



High Confidence
(55% Chance or Greater)

How to read this forecast map: Colours over the map correspond to how confident we can be in the forecast that the total amount of rainfall over the period January to March 2011 will be either above-normal (i.e., unusually wet, indicated by shades of blue) or below-normal (i.e., unusually dry, indicated by shades of yellow) for the given area and time of year. Above-normal and below-normal rainfall typically each occur about once every three years (i.e., with a probability of 33%), and so shaded areas indicate increased risks of an unusually wet or dry season. Areas with higher confidence levels have darker shades (see colour bar above). For more guidance on interpreting the forecast, see page 9.

Africa Regional La Niña update (16 December 2010)

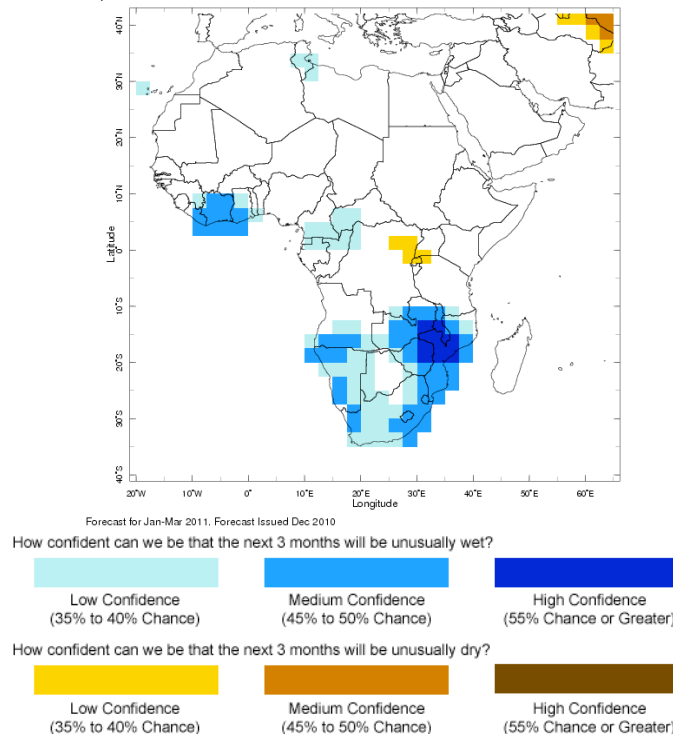
Increased risk of floods in Southern Africa

The La Niña event that emerged in mid-June 2010 has developed into a moderate to strong event, and is expected to last through the first three or four months of 2011. Frequently, La Niña events are associated with drought in East Africa and increased chances of heavy rainfall and floods in parts of the Sahel, and in Southern Africa. Heavy rainfall and floods that occurred in West Africa this year can in part be attributed to the current La Niña. While no two La Niña events are the same, they can have severe humanitarian implications. For instance, devastating floods in southern Africa left thousands homeless in the La Niña year of 2000.

For southern Africa, there is medium-high confidence that much of the region will experience above-normal rainfall over January - March (see regional forecast map below). Forecast confidence levels for above-normal rainfall, and therefore flood risk, are highest over parts of Angola, southern Democratic Republic of Congo, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. These forecasts for an unusually wet coming three-months in the region coincide with southern Africa's rainy season, meaning that flood risk is heightened there, particularly during the early part of 2011.

For west Africa, there is medium-confidence that rainfall will be above-normal over the coming months of January - March over parts of Liberia, Cote d'Ivoire, and Ghana (see regional forecast map below).

Africa Forecast Map: IRI Seasonal Forecast for Africa Precipitation (rain and snow) over January – March 2011, issued on 16 December, 2010.



Continued monitoring required

Given the forecast for increased chances of above-normal rainfall in **southern Africa**, we strongly recommend making contact with national/regional met services and monitoring weather forecasts on shorter timescales over the course of the season to anticipate the specifics in terms of where, when and how severe

rainfall events might be. You may also want to consider advanced planning for implications of above-normal rainfall on disaster management, health, WATSAN and livelihoods for instance (see background information below for further guidance).

In addition, IRI updates its seasonal forecasts on a monthly basis (next update: 20 January). We recommend monitoring the forecasts as they are updated on a monthly basis for any developments: <http://iri.columbia.edu/ifrc/forecast/3munusualprecip> and we strongly recommend contacting national meteorological services and regional climate centres for more detailed forecasts (see page 11 for some regional monitoring resources). For further information about La Niña, and guidance on monitoring and enhancing preparedness using forecasts across timescales, see the background section of this document. If you have questions related to this La Niña or to seasonal forecasts, you can e-mail the IFRC Helpdesk at IRI: ifrc@iri.columbia.edu.

Asia Regional La Niña update (16 December 2010)

Heightened flood risk in parts of SE and South Asia, tendency for dry conditions in parts of South and Central Asia

The La Niña event that emerged in mid-June 2010 has developed into a moderate to strong event, and is expected to last through the first three or four months of 2011. Frequently, La Niña events are associated with unusually wet conditions and heightened flood risk in parts of South and Southeast Asia. During the La Niña event of 2007, 69 floods occurred throughout South and Southeast Asia, more than double the annual average number of floods from 1980-2009. In Bangladesh, 4 out of the 6 most catastrophic flood years since 1954 have occurred during La Niña events. La Niña can also cause the paths of typhoons in the western Pacific to shift more towards the mainland, which increases the chances of typhoons causing severe flooding and wind damage, and increases the risks of landslides.

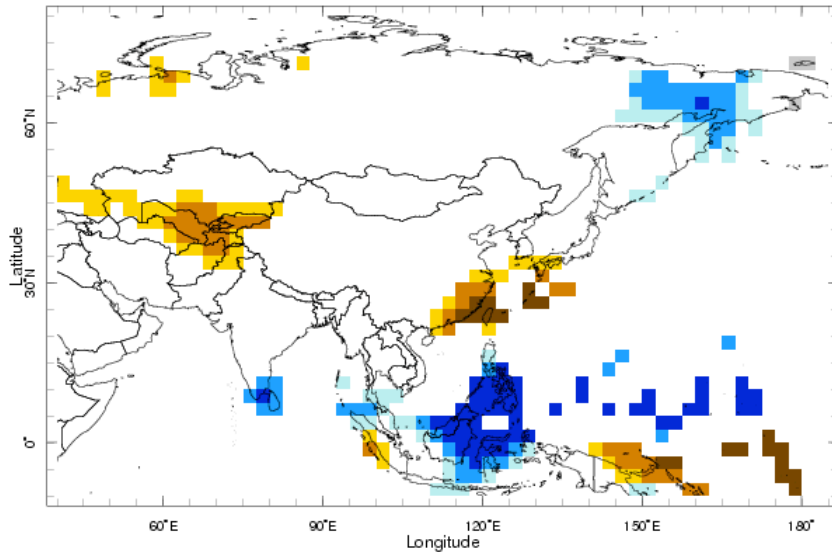
For Southeast Asia: There is medium-high confidence that parts of Brunei Darussalam, Indonesia, Malaysia, and the Philippines will experience above-normal rainfall this January - March (see regional forecast map below). The risks of flooding events are therefore increased.

There is also medium-high confidence that parts of Taiwan and the east coast of China and will experience drier than normal conditions this January - March, enhancing drought risk (see regional forecast map below)

For South Asia: There is medium-high confidence that parts of Sri Lanka and southern India will experience wetter than normal conditions this January - March, enhancing flood risk (see regional forecast map below).

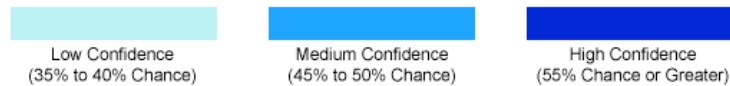
For Central Asia: There is also medium confidence that parts of Afghanistan Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan will experience drier than normal conditions this January - March. Reduced spring snowmelt could enhance drought risk later in the year (see regional forecast map below).

Asia Forecast Map: IRI Seasonal Forecast for Asia Precipitation (rain and snow) over January – March 2011, issued on 16 December, 2010.

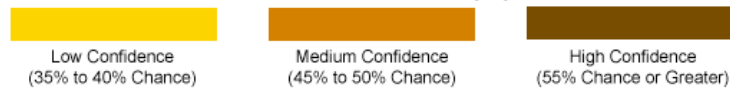


Forecast for Jan-Mar 2011, Forecast Issued Dec 2010

How confident can we be that the next 3 months will be unusually wet?



How confident can we be that the next 3 months will be unusually dry?



Continued monitoring required

Given increased flood risk in several countries in **Southeast and South Asia**, we strongly recommend making contact with national met service and monitoring weather forecasts on shorter timescales over the course of the season to anticipate the specifics in terms of where, when and how severe rainfall events might be. You may also want to consider advanced planning for implications of above-normal rainfall on disaster management, health, WATSAN and livelihoods for instance (see background information below for further guidance).

Given heightened flood risk in parts of **South Asia** (South India and Sri Lanka, which has already experienced above-normal rainfall in November and December), we recommend continued monitoring for further rainfall that might lead to floods or landslides. We also recommend monitoring **Central Asia** for emerging drought conditions later in the year. As Central Asia depends on spring snowmelt for much of their water, the impact of a dry winter would only emerge in the spring.

In addition, IRI updates its seasonal forecasts on a monthly basis (next update: 20 January). We recommend monitoring the forecasts as they are updated on a monthly basis for any developments: <http://iri.columbia.edu/ifrc/forecast/3munusblueprecip>, and we strongly recommend contacting national

meteorological services and regional climate centres for more detailed forecasts (see page 11 for some regional monitoring resources). For further information about La Niña, and guidance on monitoring and enhancing preparedness using forecasts across timescales, see the background section of this document. If you have questions related to this La Niña or to seasonal forecasts, you can e-mail the IFRC Helpdesk at IRI: ifrc@iri.columbia.edu.

Pacific Regional La Niña update (16 December 2010)

Increased risk of Pacific Island floods and droughts

The La Niña event that emerged in mid-June 2010 has developed into a moderate to strong event, and is expected to last through the first three or four months of 2011. Some islands in the Pacific tend to experience drought during La Niña events, while others experience above-normal rainfall. Droughts in Fiji, Solomon Islands, Micronesia and Kiribati all coincided with the La Niña that persisted from 1998-2001. Due to limited water resources, droughts affecting Pacific Islands can have implications on food security, water and sanitation, health and livelihoods.

For January - March 2011 IRI forecasts show substantially increased chances of **above-normal** rainfall for:

- Marshall Islands
- Micronesia
- New Caledonia
- Niue
- Tonga
- Vanuatu
- And increased chance of above-normal rainfall for the Cook Islands (south)

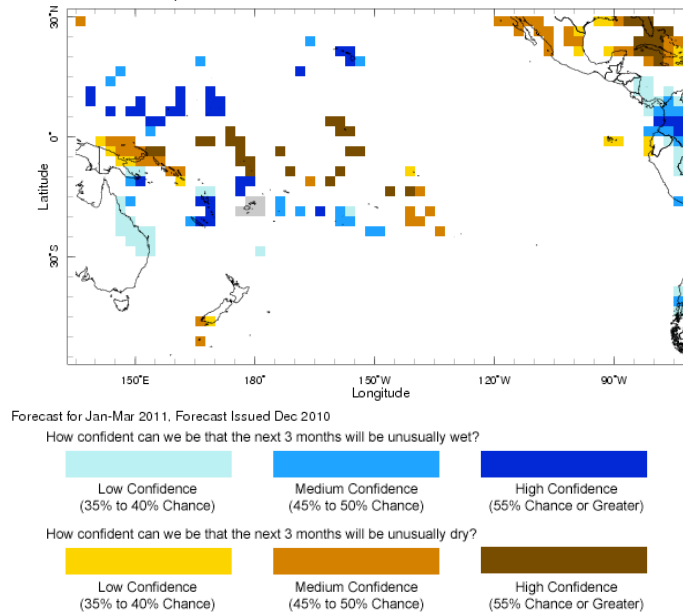
The risk of flooding for these island nations is therefore increased.

For January - March IRI forecasts show substantially increased chances of **below-normal** rainfall for:

- Kiribati (main and east)
- Nauru
- Tuvalu
- And increased chance of below-normal rainfall for the Galapagos and Solomon Islands

The risk of drought for these island nations is therefore increased.

Pacific Forecast Map: IRI Seasonal Forecast for Precipitation (rain and snow) in the Pacific over January - March 2011, issued on 16 December, 2010.



Continued monitoring required

Given the notably increased flood risk in the Marshall Islands, Micronesia, New Caledonia, Niue, Tonga, and Vanuatu, we strongly recommend making contact with national met service and monitoring weather forecasts on shorter timescales over the course of the season to anticipate the specifics in terms of where, when and how severe rainfall events might be. You may also want to consider advanced planning for implications of above-normal rainfall on disaster management, health, WATSAN and livelihoods for instance (see background information below for further guidance).

Given the notably increased risk of drought on Kiribati, Nauru and Tuvalu, we strongly recommend monitoring for any emerging drought conditions that would activate your regional drought contingency plans. You might also consider some pre-emptive actions such as hand washing campaigns, water conservation etc as appropriate in country.

In addition, IRI updates its seasonal forecasts on a monthly basis (next update: 16 December). We recommend monitoring the forecasts as they are updated on a monthly basis for any developments: <http://iri.columbia.edu/ifrc/forecast/3munusualprecip> and we strongly recommend contacting national meteorological services and regional climate centres for more detailed forecasts (see page 11 for some regional monitoring resources). For further information about La Niña, and guidance on monitoring and enhancing preparedness using forecasts across timescales, see the attached background document. If you have questions related to this La Niña or seasonal forecasts, you can e-mail the IFRC Helpdesk at IRI: ifrc@iri.columbia.edu.

Americas Regional La Niña update (16 December 2010)

Increased risk of floods and droughts

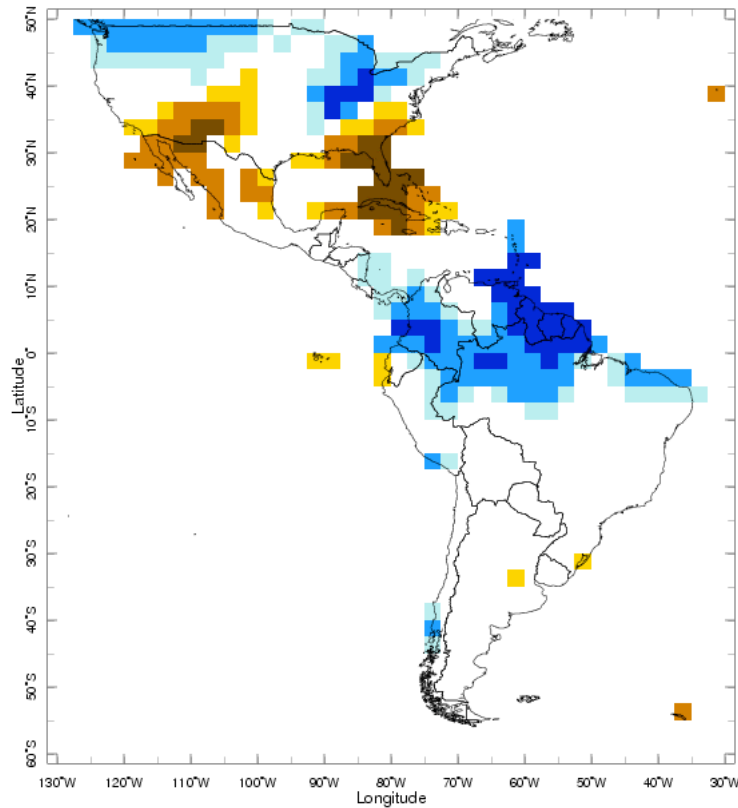
The La Niña event that emerged in mid-June 2010 has developed into a moderate to strong event, and is expected to last through the first three or four months of 2011. Frequently in the past, La Niña events have been associated with:

- Unusually wet conditions and heightened flood risk in northern parts of South America, (mostly in Colombia, Venezuela, Guyana, Suriname, French Guiana and northern Brazil).
- Abnormally dry conditions and heightened drought risk in central Chile, eastern portions of Argentina and Uruguay.
- Increased hurricane activity in the Atlantic – the season was very active, and the La Niña is one of the reasons that the forecasts indicated a very active hurricane season for this year.

There is medium-high confidence that northern parts of South America, including northern Brazil, Colombia, French Guiana, Guyana, Trinidad and Tobago, Suriname and Venezuela will experience above-normal rainfall this January - March, implying increased flood risk (see regional forecast map below).

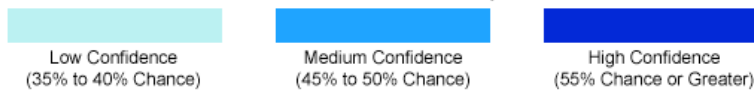
There is medium-high confidence that parts of the Bahamas, Cuba, Jamaica, and Mexico will experience conditions that are drier than normal this January - March implying increased drought risk (see regional forecast map below).

Americas Forecast Map: IRI Seasonal Forecast for Precipitation (rain and snow) in the Americas over January – March 2011, issued on 16 December, 2010.

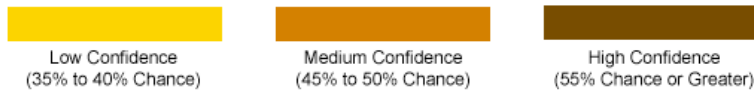


Forecast for Jan-Mar 2011, Forecast Issued Dec 2010

How confident can we be that the next 3 months will be unusually wet?



How confident can we be that the next 3 months will be unusually dry?



It is important to monitor weather forecasts on shorter timescales over the course of the season to anticipate the specifics in terms of where, when and how severe rainfall events might be, and to monitor any emerging drought conditions. You may want to consider advanced planning for implications of unusual rainfall on disaster management, health, WATSAN and livelihoods for instance (see attached background document for further guidance).

In addition, IRI updates its seasonal forecasts on a monthly basis (next update: 20 January). We recommend monitoring the forecasts as they are updated on a monthly basis for any developments: <http://iri.columbia.edu/ifrc/forecast/3munusualprecip> and we strongly recommend contacting national meteorological services and regional climate centres for more detailed forecasts (see page 11 for some regional monitoring resources). For further information about La Niña, and guidance on monitoring and enhancing preparedness using forecasts across timescales, see the attached background document. If you have questions related to this La Niña or seasonal forecasts, you can e-mail the IFRC Helpdesk at IRI: ifrc@iri.columbia.edu.

Background and Forecast Monitoring Information

What is La Niña and why does it matter?

La Niña is a natural part of climate variability, and refers to a colder than average period in the equatorial Pacific (the opposite of warm El Niño events). In the last 20 years, we have experienced 3 moderate to strong La Niña events (1995-96, 1998-2000, 2007-08). While La Niña can go unnoticed or even have beneficial impacts in many parts of the world, it can also be disruptive or cause extensive problems when some areas receive too much or too little rainfall.

For example, unusually heavy rainfall in Southern Africa that often accompanies La Niña events, caused devastating floods and mudslides during the 1998-2000 La Niña that resulted in deaths, injuries and left thousands homeless. In Bangladesh, 4 out of the 6 most catastrophic flood years since 1954 have occurred during La Niña events. On many Pacific Islands, La Niña is frequently accompanied by drought, putting major stress on the limited availability of fresh water resources. Recent flooding in Pakistan and West Africa can in part be attributed to La Niña conditions that began to develop this June. La Niña is also associated with increased hurricane activity in the Atlantic, and can cause the path of typhoons in the western Pacific to shift more towards mainland Asia.

Once developed, La Niña events typically persist for about a year (occasionally longer), peaking during the October - January period. However, the largest impacts for a location may not coincide with the peak of the La Niña itself. Peak impacts from La Niña are usually felt during a given location's rainy season, because that is when a disruption of the rains or too much rainfall can have the greatest impact on society (affecting agriculture, livelihoods, food security, health and safety, etc).

Summary of current La Niña conditions

16 December 2010 – The La Niña that emerged in June 2010 has been a moderate-to-strong level event since mid-August. There is a very high chance (98%) that the La Niña will continue through February 2011. It is also likely to persist through the first three to four months of 2011.

La Niña updates can be monitored for any developments in terms of the strength of the event. However, it is important to remember that the strength of a La Niña event only provides a rough indication of how widespread and severe associated impacts are likely to be on a *global scale*. The strength of a La Niña event does not provide certainty regarding the severity of impacts *in specific locations*. The best way to anticipate if this La Niña event is likely to bring too much or too little rainfall to your area is to monitor

seasonal forecasts, which take influential factors from this La Niña and other elements in the climate system into account.

Guidance on monitoring and connecting forecasts with actions to enhance preparedness and response

The benefit that seasonal forecasts offer, which weather forecasts do not, is long-lead time or early warning information. Having an early indication that a rainy season might be wetter or drier than normal for instance can be a helpful guide to anticipate any potential impacts. However, monitoring seasonal forecasts should be supplemented with monitoring forecasts on shorter-term timescales (like 10-day, weekly and daily weather forecasts), to obtain more certainty and detail regarding where and when extreme events might occur. Seasonal rainfall forecasts are similar to seasonal cyclone forecasts in the sense that knowing if the cyclone season is likely to be more active than normal might prompt you to be more prepared, but you would have to monitor shorter-term weather and cyclone forecasts to anticipate where and when individual cyclones make landfall.

Limitations

Important! Seasonal Forecasts Do Not Provide Any Detailed Spatial Information. Weather forecasts are like a high-definition picture, giving you detailed information on exactly where rainfall is likely to occur. Seasonal forecasts however, are more big-picture (coarse resolution). Thus, it is not possible to make inferences about precisely *where* there are risks of increased or decreased rainfall. A forecast for increased risk of above-normal rainfall over West Africa, for example, should be taken as just that, and not as a forecast for above-normal rainfall in specific countries or parts of countries in West Africa.

Important! Seasonal Forecasts Only Give a General Sense of the Character of the Season by Providing a Forecast of Seasonal Rainfall Totals. The seasonal forecasts are for whether cumulative rainfall totals over 3 months time are likely to be normal, above-normal or below-normal. This gives you a general overview of the season, but does not elaborate on possible day-to-day weather fluctuations. Although it does not happen very often, it is possible for an area to receive a month's worth of rainfall in 1 day and thus suffer from floods, but end up having a seasonal total of below-normal rainfall consistent with the seasonal forecast.

Important! Seasonal forecasts are probabilistic. If you had no forecast, you would have no idea of whether rainfall would be normal, above-normal, or below-normal, and so each of these three possible outcomes would have a probability of 33%. Seasonal forecasts can tell you if one of those three categories is more likely than the others. However, probabilities for the less likely events should not be ignored, to avoid being over-confident in the forecasts. For example, a 45% chance of above normal-rainfall means that there is an enhanced chance of getting rainfall totals that are above-normal for the season, but there is still a 55% chance of getting normal or below-normal rainfall. Seasonal forecasts therefore leave a large amount of uncertainty, but when combined with monitoring of weather forecasts on shorter timescales and a no-regrets early action strategy, can still be very beneficial by providing enhanced lead-time for preparedness.

One helpful guide may be to think of probabilities of 35 or 40% as being only slightly enhanced, 45 or 50% as enhanced, and greater than 50% as highly enhanced.

Recommendations for connecting forecasts to actions for enhanced preparedness and response:

If over the coming months seasonal precipitation (rainfall) forecasts for your region indicate a higher risk of abnormal rainfall, it is important to start considering the implications:

- What would too much or too little rainfall mean in terms of food security, health, disaster management, displacement and livelihoods?
- Who is vulnerable?
- What can be done to prepare? What kind of 'no-regrets' actions could be taken early on, that would help to manage these impacts?
- Are your contingency plans adequate and up to date?
- Are your relief stocks sufficient for probable demands?
- When was the last time that staff and volunteers received training on disaster management?
- Should you meet with staff to discuss the situation and collectively brainstorm possible courses of action?

Thinking through these questions with your colleagues is always a good idea. That way you can monitor conditions and forecasts for the months, weeks, days and hours ahead, to see if and when it becomes necessary to activate the plans and resources you've put in place. For more resources on developing an Early Warning, Early Action strategy, visit: <http://www.climatecentre.org/site/early-warning-early-action>

Monitoring Resources

For short-term weather forecasts, the best place to check is with your national meteorological services. Some national meteorological services also provide seasonal forecast information. To find your national meteorological service: http://www.wmo.int/pages/members/members_en.html

The resources provided below include global and regional sources for monitoring seasonal forecasts. In some cases, short-term weather forecasts are also provided by these institutions.

Global Source:

International Research Institute for Climate and Society (IRI)

- Seasonal forecasts: <http://iri.columbia.edu/ifrc/forecast/3munusualprecip>
- Updates on the current La Niña/El Niño status: <http://iri.columbia.edu/climate/ENSO/currentinfo/QuickLook.html>
- For global forecasts on the likelihood of above average rainfall in the coming 6 days: <http://ingrid.ldeo.columbia.edu/maproom/.IFRC/.Forecasts/>

Regional Sources:

Africa

African Centre for Meteorological Applications for Development (ACMAD)

- Seasonal forecasts: http://www.acmad.ne/en/climat/previ_saison.htm
- Monthly, 10-day, and 24-hour forecasts also available

East Africa

IGAD Climate Prediction and Applications Centre (ICPAC)

- Seasonal, monthly and 10-day forecasts: <http://www.icpac.net/>

Southern Africa

SADC Drought Monitoring Centre (DMC)

- Seasonal and 10-day forecasts: <http://www.sadc.int/dmc/>

South African Weather Service

- Weather forecasts 11-30 days in advance, 7-day forecasts: <http://www.weathersa.co.za/>

Asia

Regional Climate Centre for RA II (Asia)

- Seasonal forecasts and monitoring products: <http://www.rccra2.org/detail/index.htm>

ASEAN Specialised Meteorological Centre (ASMC)

- Seasonal forecast:
http://www.weather.gov.sg/wip/web/ASMC/Regional_Weather/Monthly_Weather_and_Haze_Outlook4
- La Niña/El Niño monitoring
http://www.weather.gov.sg/wip/web/ASMC/Regional_Weather/Status_of_El_Nino

Pacific Islands

Island Climate Update (ICU)

- Seasonal forecasts: <http://www.niwa.co.nz/news-and-publications/publications/all/icu>

Americas

Caribbean

Caribbean Institute for Meteorology and Hydrology (CIMH)

- Seasonal forecast and drought monitoring resources: <http://www.cimh.edu.bb/>

Central America

Climate Outlook Forum for Central America

- Seasonal forecast: <http://www.aguayclima.com/clima/inicio.htm>

South America

Centro Internacional para la Investigacion del Fenomeno de El Niño (CIIFEN)

- Seasonal forecast: <http://www.ciifen-int.org/>

Historical La Niña Impacts

While no two La Niña events are exactly alike, scientists have mapped out areas where La Niña has frequently been associated with increases or decreases in rainfall in the past, see:

http://portal.iri.columbia.edu/portal/server.pt/gateway/PTARGS_0_5665_7182_0_0_18/LaNinagraphic_aug2%207.pdf

The IFRC Helpdesk at IRI

If you have questions about La Niña or forecasts etc. the International Research Institute for Climate and Society (IRI) has a helpdesk to provide the RC/RC with assistance in interpreting climate information relevant to the RC/RC's work. To seek assistance from this source please e-mail your question to ifrc@iri.columbia.edu.