

Regional Drought Monitoring and Outlook System

Seasonal outlook May–August 2020



Background

The Regional Drought Monitoring and Outlook System (RDMOS) is an operational service which produces reliable drought indicators for the Hindu Kush Himalayan (HKH) region with a specific focus on Afghanistan, Bangladesh, Nepal, and Pakistan. The system incorporates climatic models with suitable Earth observation data and land surface models to produce drought indices – precipitation, temperature, soil moisture, and evapotranspiration – and vegetation conditions at 10-day intervals for near real-time monitoring of droughts. The RDMOS also provides seasonal outlooks at four-month intervals to support drought management and preparedness processes.

The System leverages the capabilities of the South Asian Land Data Assimilation System (SALDAS) – a customized land data assimilation system that merges meteorological observations with numerical models to produce optimal estimates of land surface states and fluxes. To develop seasonal drought outlooks, the RDMOS applies meteorological fields extracted and downscaled from the North American Multi-Model Ensemble (NMME) seasonal forecast systems onto land surface models. A web-based graphical user interface provides a user-friendly means to analyse drought indices across river basins, national administrative boundaries, or a pre-defined area of interest and to aggregate results along cropping seasons.

The RDMOS generates monthly indices on current and future outlooks of drought conditions with lead times of 1–6 months at $0.05^\circ \times 0.05^\circ$ resolution. This capability has been in operation since April 2019 and has provided reliable outlooks of emerging seasonal water availability scenarios for the region.

The following brief presents seasonal anomaly maps¹ from May to August 2020 in major river basins of the HKH region based on data generated by the RDMOS. Long-term average conditions (climate normal) are also given for an overall understanding of precipitation and temperature patterns in the region. Read more about the RDMOS [here](#).



OFFICIAL LAUNCH OF THE RDMOS AT A REGIONAL TRAINING WORKSHOP IN ISLAMABAD, PAKISTAN (2019)

¹ Anomaly maps based on Z-score: The Z-score (anomaly) is a measure that reflects the departure from normal conditions in a particular month observed from 2001 to 2018.

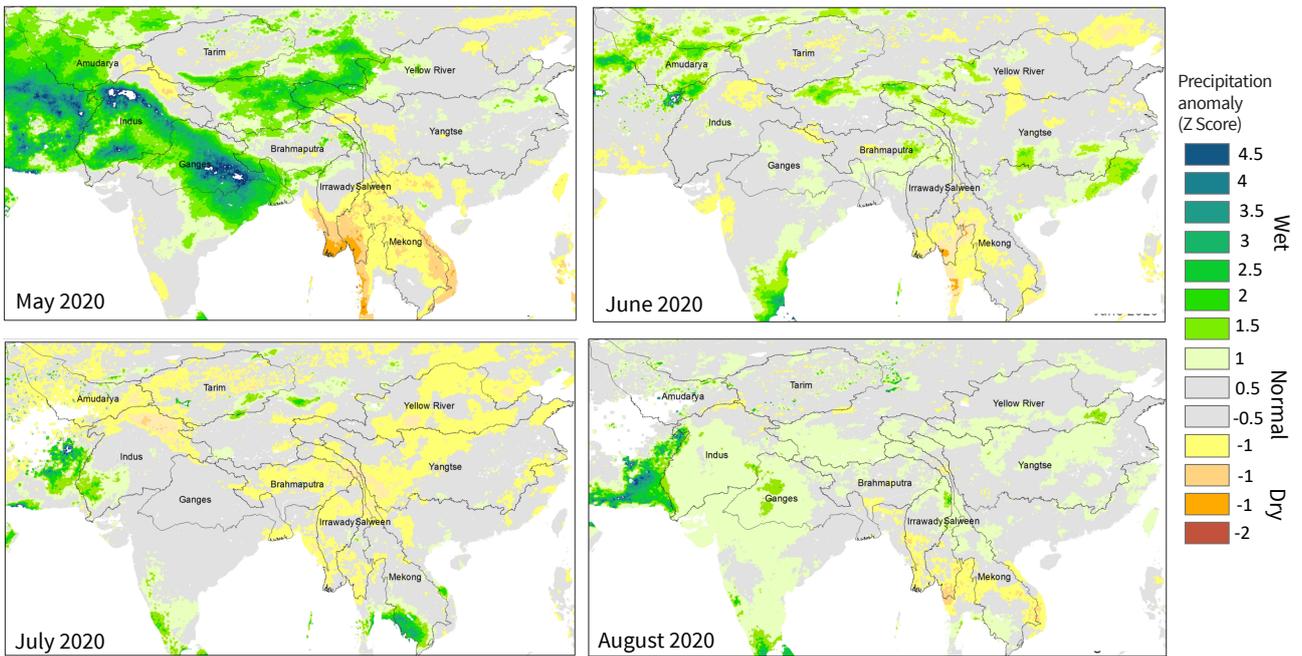
Precipitation outlook for May–August 2020

The four-month precipitation outlook from May to August indicates that moderate-to-high water surplus will dominate the lower Indus basin and the entire Ganges basin, while a moderate deficit is expected in the Salween and Mekong basins. All other basins are expected to have nearly normal conditions.

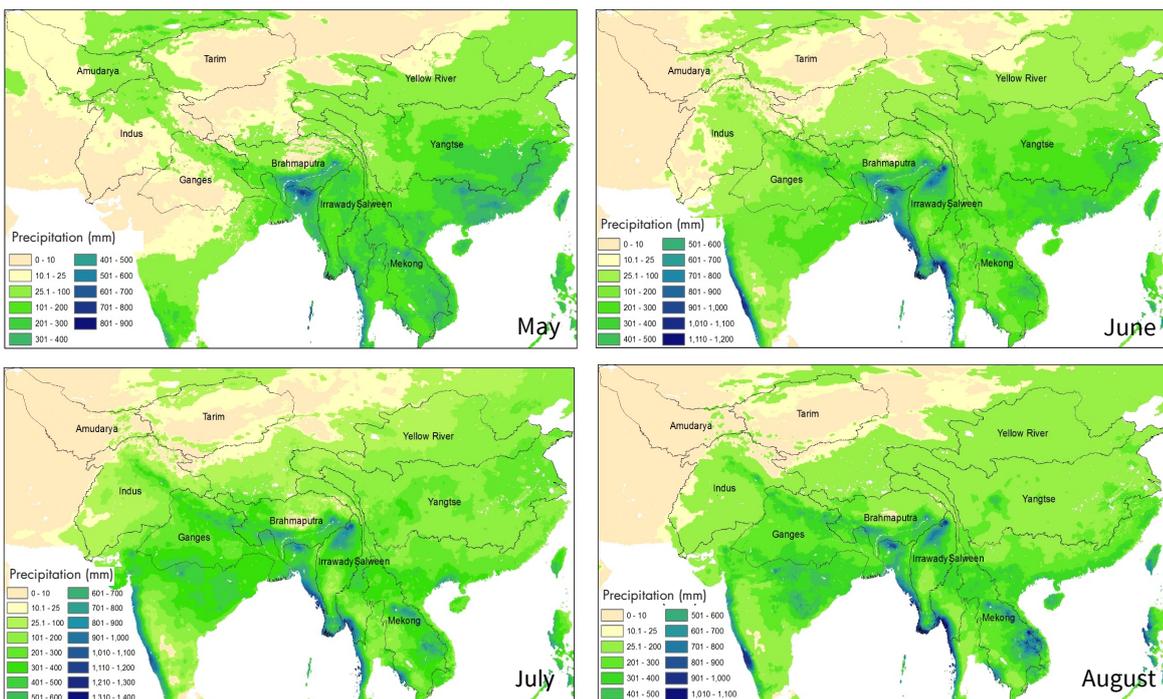
May exhibits the highest spatial variability, with intense surpluses expected in the Indus, Ganges, and Amu Darya

but a moderate deficit in the Mekong and Salween. June shows largely near-normal conditions except a small surplus in the Brahmaputra and deficits in the lower Salween region.

In July, most higher areas of the basins will transition towards small-to-moderate deficits except in the Ganges, which will remain near normal. In August, a small surplus is expected across all the basins except in the lower areas of the Salween and Mekong basins.



Extremely dry (<-3), Very dry (-2 to -3), (-1 to -2), Near normal (1 to -1), Wet (1 to 2), Very wet (2 to 3), Extremely wet (>3)
 PRECIPITATION OUTLOOK FOR MAY–AUGUST 2020

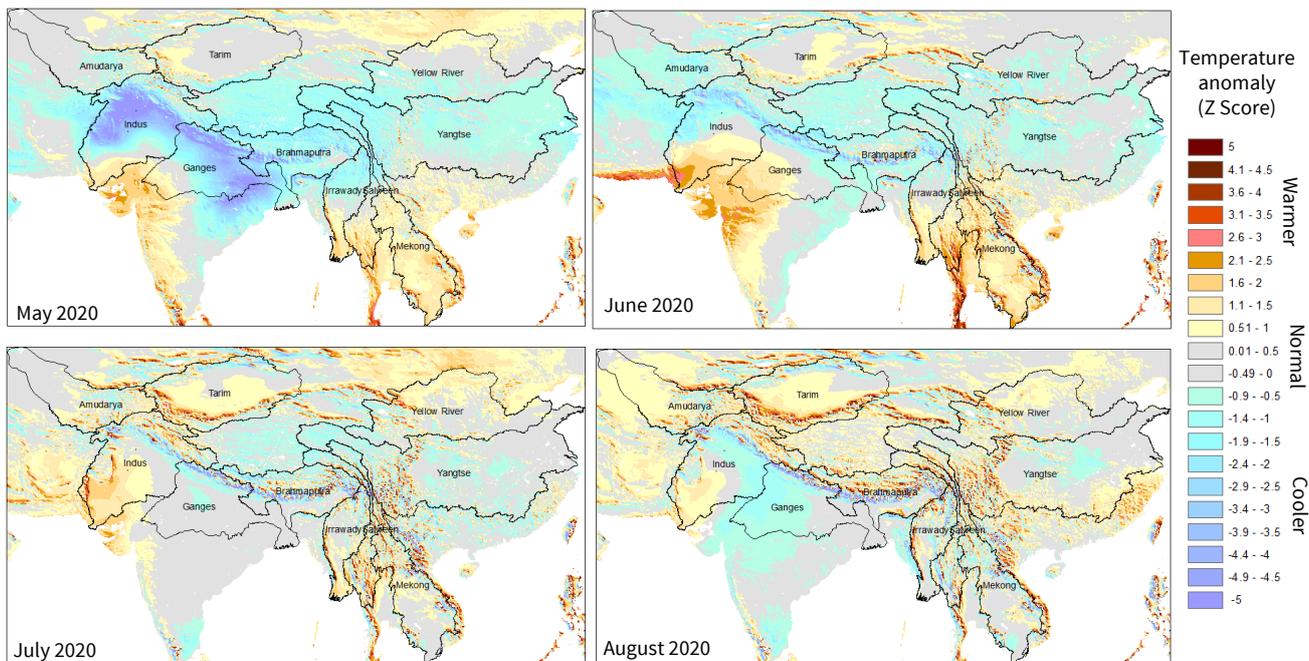


AVERAGE MONTHLY PRECIPITATION FROM MAY TO AUGUST BASED ON OBSERVATION DURING 2001–2018

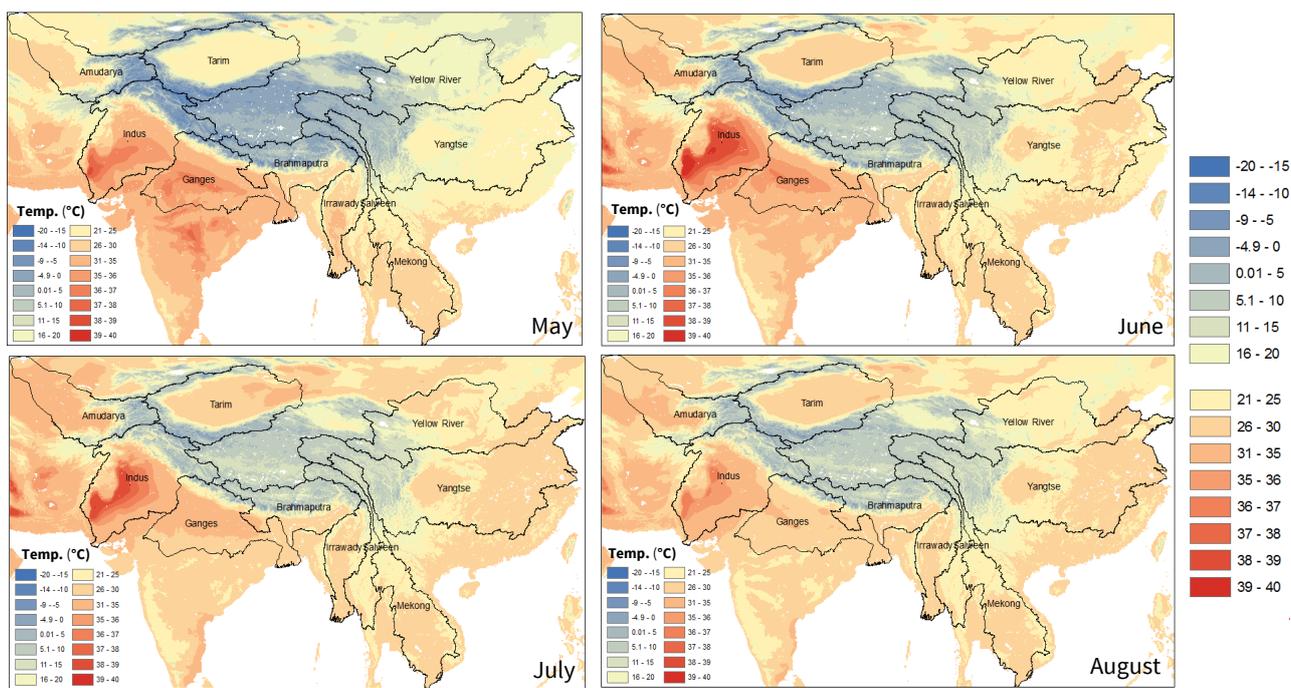
Temperature outlook for May–August 2020

As shown in the temperature anomaly map below, the lower Indus, lower Ganges, Salween, and Mekong basins can expect much warmer-than-normal temperatures; most of the central regions are expected to be normal or cooler than normal. May is particularly cooler than

normal for most of the Indus, Ganges, and Brahmaputra basins. Intense warm anomalies are expected in the lower Indus and lower Ganges in June. Relatively cooler conditions in the upper Indus and upper Ganges regions during May and June may slow down snowmelt. Later in July, high temperatures might accelerate snowmelt and further increase water availability in the major reservoirs and the Indo-Gangetic plains.



TEMPERATURE OUTLOOK FOR MAY–AUGUST 2020



AVERAGE MEAN MONTHLY TEMPERATURE FROM MAY TO AUGUST BASED ON OBSERVATION DURING 2001–2018

Impact on agriculture

Heavy rains anticipated during May could potentially damage wheat and other *rabi* (winter) crops in the hilly and mountainous regions where harvest is due in May and June. Wheat harvesting and threshing operations should be carried out in light of weather forecasts provided by national weather services to avoid pre- and post-harvest losses. However, these rains will be highly beneficial for *kharif* (summer) crops like rice, sugarcane, and cotton. Last winter's surplus water and continued water surplus during the summer in most areas will likely increase flood risks.

Visualization of drought outlook

Users can interact with the RDMOS to view and download different snapshots; the map control element in the web-based interface allows users to select different sub-basins, indices, periodicity, and filter forecast ensemble via drop-down menus. The map/visualization and corresponding graph are updated as per the selected variables. The system can be accessed from <http://tethys.icimod.org/apps/regionaldrought/>

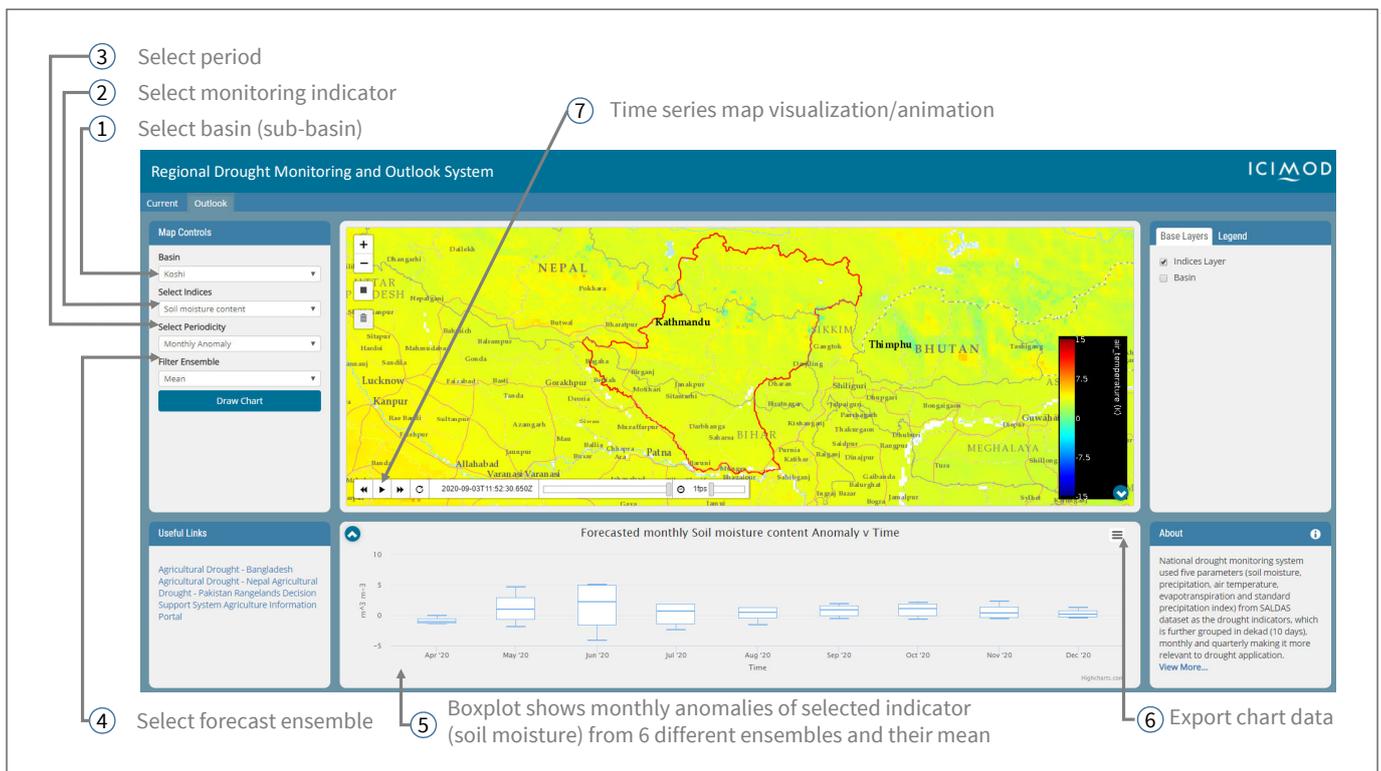
The system has been further customized to generate drought outlook at the provincial level for Afghanistan, Bangladesh, Nepal, and Pakistan and can be directly accessed from the following URLs:

National Agricultural Drought Watch – Afghanistan
<http://drought.spatialapps.net/apps/dmlocal/outlook/?c=Afghanistan>

National Agricultural Drought Watch – Bangladesh
<http://drought.spatialapps.net/apps/dmlocal/outlook/?c=Bangladesh>

National Agricultural Drought Watch – Nepal
<http://drought.spatialapps.net/apps/dmlocal/outlook/?c=Nepal>

National Agricultural Drought Watch – Pakistan
<http://drought.spatialapps.net/apps/dmlocal/outlook/?c=Pakistan>



VISUALIZATION OF DROUGHT OUTLOOK AT THE SUB-BASIN LEVEL FOR THE KOSHI SUB BASIN

<http://tethys.icimod.org/apps/regionaldrought/>



VISUALIZATION OF DROUGHT OUTLOOK AT THE DISTRICT LEVEL FOR PROVINCE 2 IN NEPAL

<http://drought.spatialapps.net/apps/dmlocal/outlook/?c=Nepal>

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About SERVIR

SERVIR connects space to village by helping developing countries use satellite data to address challenges in food security, water resources, weather and climate, land use, and natural disasters. A partnership of NASA, USAID, and leading technical organizations, SERVIR develops innovative solutions to improve livelihoods and foster self-reliance in Asia, Africa, and the Americas.

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