



## Questions & Answers Session 3

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amita Mehta ([amita.v.mehta@nasa.gov](mailto:amita.v.mehta@nasa.gov)) or Sean McCartney ([sean.mccartney@nasa.gov](mailto:sean.mccartney@nasa.gov)).

Question 1: What was the mortality data? Is it drought related, human, animal, or crop mortality?

Answer 1: It is human mortality. Please see <https://sedac.ciesin.columbia.edu/data/set/ndh-drought-mortality-risks-distribution>

Question 2: How do you actually do a risk assessment? I didn't catch that in the presentation.

Answer 2: 'Risk Assessment' is a general term--it could be in terms of mortality or lives lost, economic risk, or infrastructure damage risk etc. It is critical to have these data along with hazard data--based on past combination of data probabilistic risk factors are usually derived based on statistical/empirical techniques. Please see this ARSET webinar series for definitions and examples of risk assessment: <https://arset.gsfc.nasa.gov/disasters/webinars/19-DRA>

Question 3: Could I rely on the results of SPI for just 20 years of IMERG data?

Answer 3: It is not ideal but looking at multiple quantities like SPI, anomalies, percentile values and then comparing them with past in situ data of impacts might help verify and interpret SPI values. If you have long-term in situ data of precipitation you can compare with that also. The major advantage of the IMERG dataset is that it has global coverage--all derived with the same technique making it consistent and comparable from one region to another.

Question 4: How can we send our homework to you?

Answer 4: You can submit your HW via Google form on the ARSET website: <https://arset.gsfc.nasa.gov/water/webinars/IMERG-2020>



## Applications of GPM IMERG Reanalysis for Assessing Extreme Dry and Wet Periods

January 28 - February 4

Question 5: What are the limitations of procedures / applications using GPM IMERG for assessing Extreme Dry and Wet Periods?

Answer 5: This is relatively a short time series (20 years). As the data gets longer, mean may change and other statistics too. Still the same wet/dry events may be detected but intensity may change.

Question 6: Is there any high resolution climate data rather than IMERG? Please share the link if there is any.

Answer 6: CHIRPS data are at ~5 km resolution:

<https://www.chc.ucsb.edu/data/chirps>

Over the US there is combined model and radar-based data (NMQ:

<https://www.nssl.noaa.gov/projects/q2/>) available at 1 km resolution

Question 7: Can we say this is a drought month/year, just by observing only precipitation analysis? How about other parameters, like other climate data, atmosphere-biosphere interaction and dynamics?

It is not clear for me, starting from IMERG precipitation data, then SPI... then finally vulnerability of drought and flooding. Could you add some clarity on this issue, please?

Answer 7: With precipitation data alone, and a long-term climatology (ideally 30+ years) we can determine meteorological drought, but without more data it is difficult to ascertain other types of drought (e.g. agricultural, hydrological, etc). For other types of drought it is useful to have long-term data for soil moisture, temperature, and evapotranspiration. SPI is used to characterize meteorological drought and can be interpreted as the number of standard deviations by which the observed anomaly deviates from the long-term mean. It is an indication of wetness and dryness alone. To assess vulnerability of drought/flood, exposure and impact data are required along with precipitation and other quantities mentioned above (e.g. temperature, soil moisture etc), duration of dry/wet periods.

Question 8: Can SPI calculation apply as basic data to describe a climate future such as climate projection?

Answer 8: Concerns have been raised about the utility of the SPI as a measure of changes in drought associated with climate change, as it does not deal with changes in evapotranspiration.