South Asia Heat Trends and the State of Science in Forecasting/Applications

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Summer Temperatures in the Region

Starts building up from Sri Lanka and the south & central parts of India in March AND Peaks towards end of May/early June

March 16
April 16
May 16
June 16
July 16
July 16 Minimum

• Some parts, particularly northwest India and south Pakistan, could remain quite warm into entire June/early July in case of late onset OR weak monsoon
• Warm Nights and High Humidity are added issue in July in NWI & S Pak
Observed Trends

- **Annual Tmean Trends (C/100 yrs)** Most Areas Warming
- A few cooling pockets
  - For how long?

**INDIA Summer Tmean Trend 0.63C/100 yrs**
- All of last 20 yrs warmer

**Mean Monthly Tmax Anomalies. Most warmer than avg. Jan-Feb more marked.**

Warmer Post Monsoon & Winters = Prolonged & Early Heat Load AND Stress on Agriculture and on Water resources which have implications for Heat Management issues

**HW days India hot weather season (April-June).**
- 14 El Nino- 9 warmer
- 12 La Nina- 3 warmer

**Trends in heat wave affected area in Pakistan**

**Mean Annual Temp Nepal**

**Annual T max/min Dhaka More Warming in Southern Parts**
HEAT WAVE OVER INDIA

- In spells of 5 to 6 days (recorded up to 15 days in some cases). Severe HW 2-3 days (upto 7 days).
- Originate in April over Central India due to high insolation and stable atmosphere in absence of thunderstorm activity.
- Maximum frequency in May. HWs developing over NW India/Pak and are advected east & south by prevailing NW’ly winds. Sustained N’wlies result in HW upto Bangladesh.

Typical Low Level flow Associated with HW up to east coast

A prolonged Spell from 20-30 May, 2015
### Heat Wave 2015

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**Prolonged Heat Stress during the day**

**Sudden Increase in Temperature due to onset of w'lies over east coast**

Coincidences with droughts are conflicting
RCC, Pune: Seasonal Climate Outlook for South Asia every month for next 4 months (Current and FC ENSO, precipitation & temp anomalies FC Afg, B. Desh, Bhutan, India, Myn, Nepal, Pak & S. Lanka. The spatial pattern of Anomalies are reasonably well captured.

The outlooks in India are found to be useful in Heat Wave Mgt. India.

D-5 warning accuracy in 2018 is higher than D-3 accuracy of 2017. The improvement in D-3 of 2018 warning is more than 100% compare to D-3 of 2017.
REFERENCES/ACKNOWLEDGEMENT


