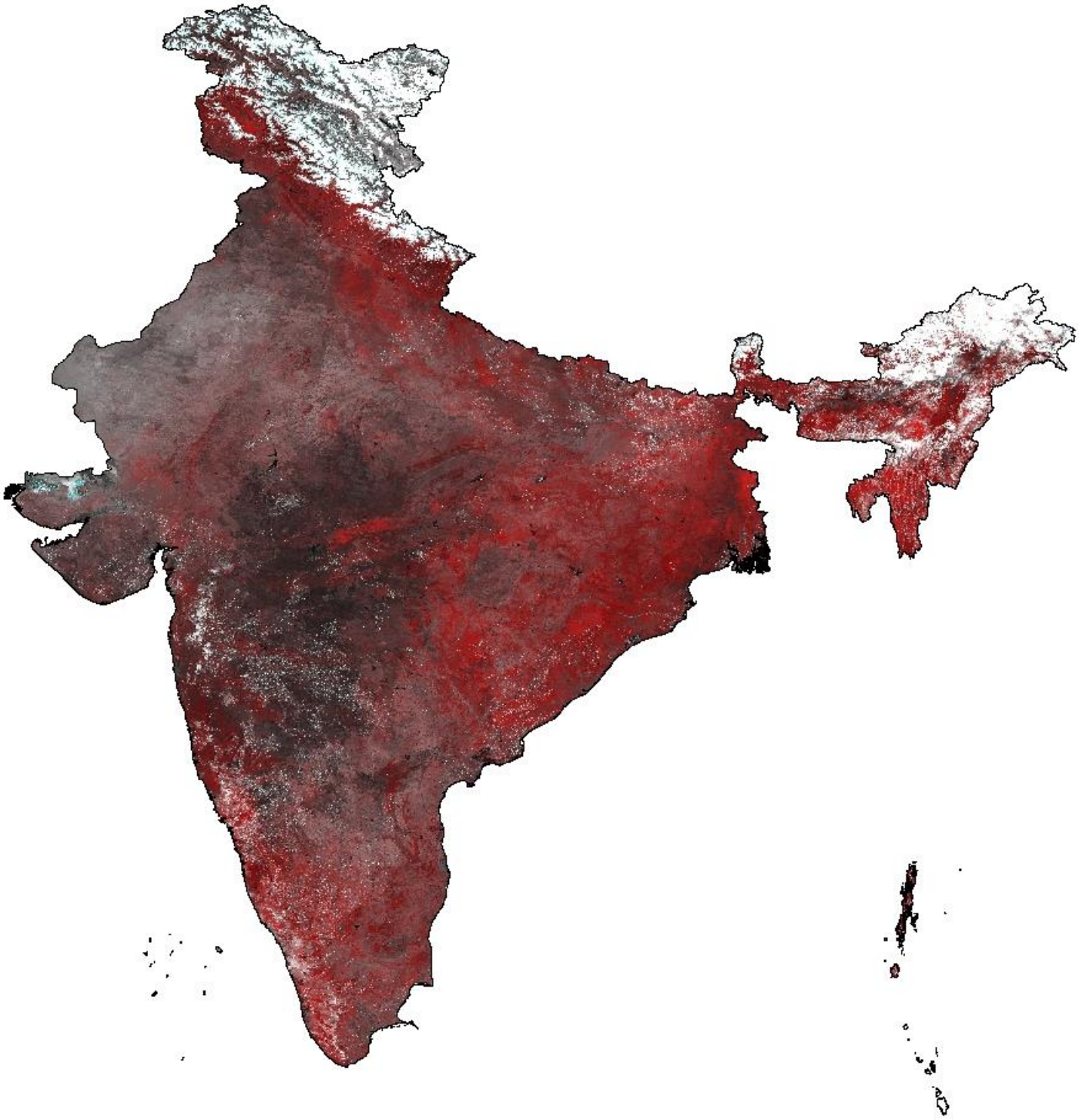
Locust Surveillance using Geospatial Technology

No. : 3 / 2020
Date : 12 June 2020

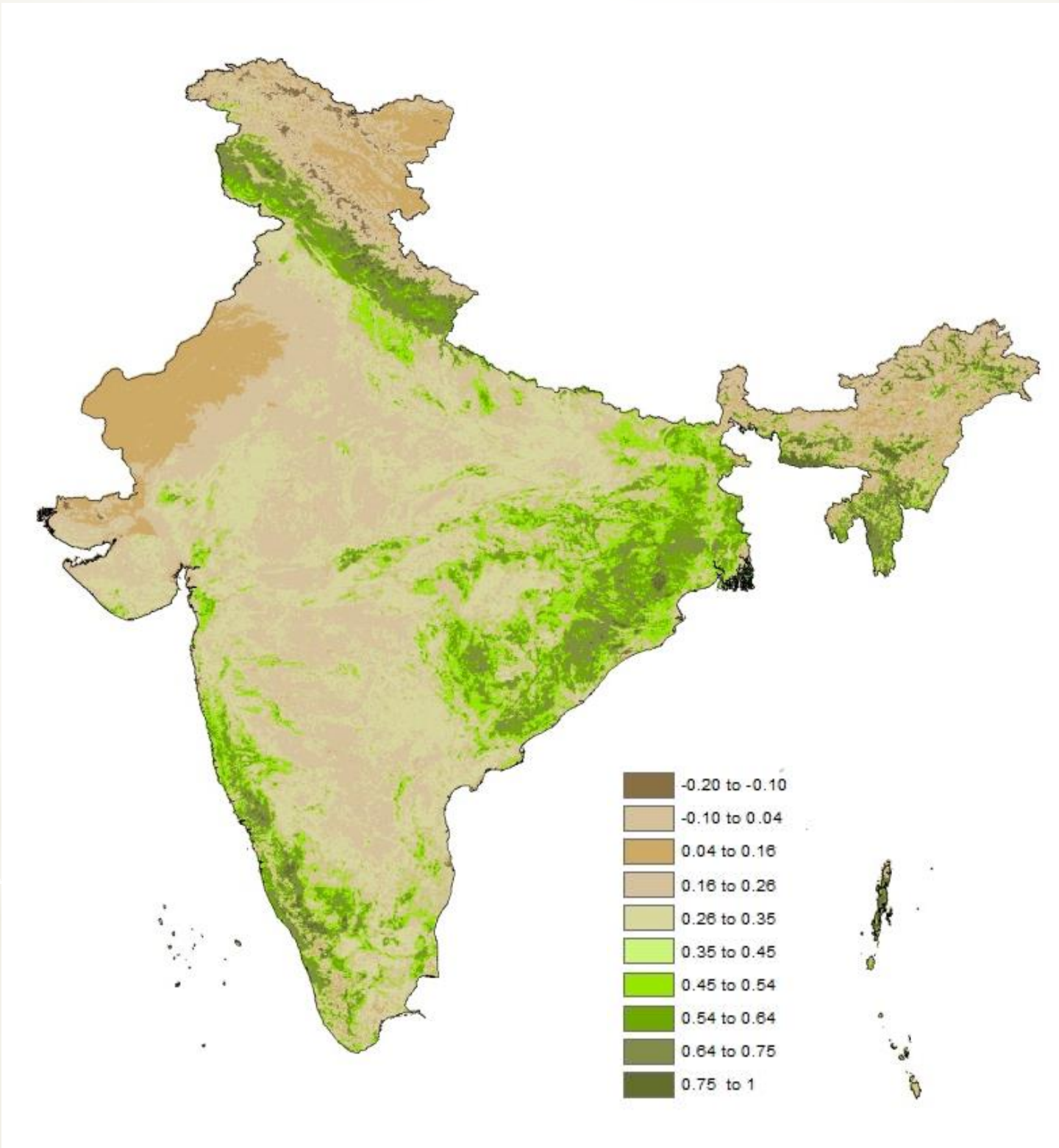
Regional Remote Sensing Centre - West
NRSC/ISRO, Jodhpur - 342 005

False Colour Composite



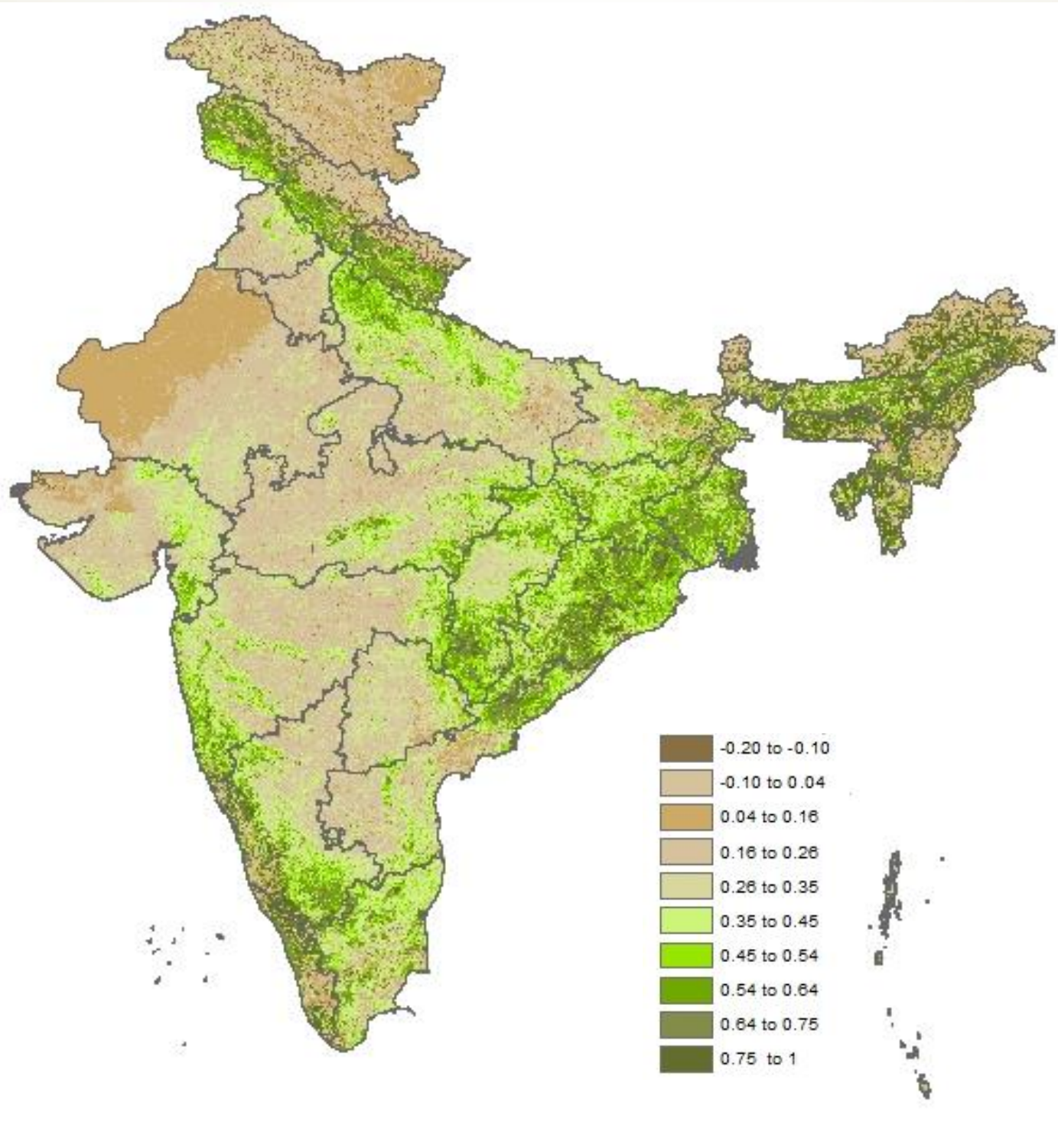
Source: MODIS 8day Composite
27 May-05 June, 2020

Normalized Difference Vegetation Index Map



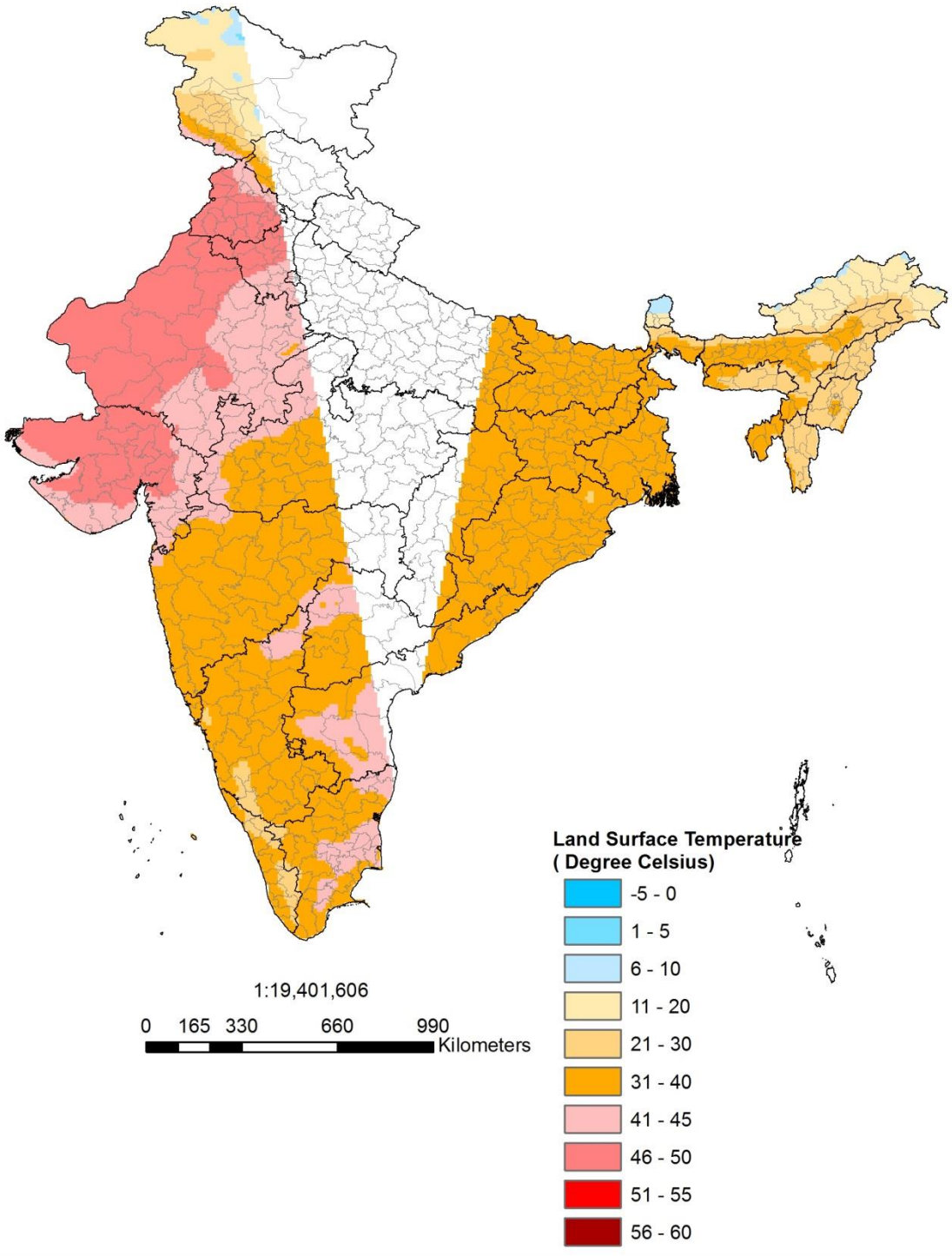
Source: MODIS 8day NDVI binned product
27 May - 03 June, 2020

Normalized Difference Vegetation Index Map

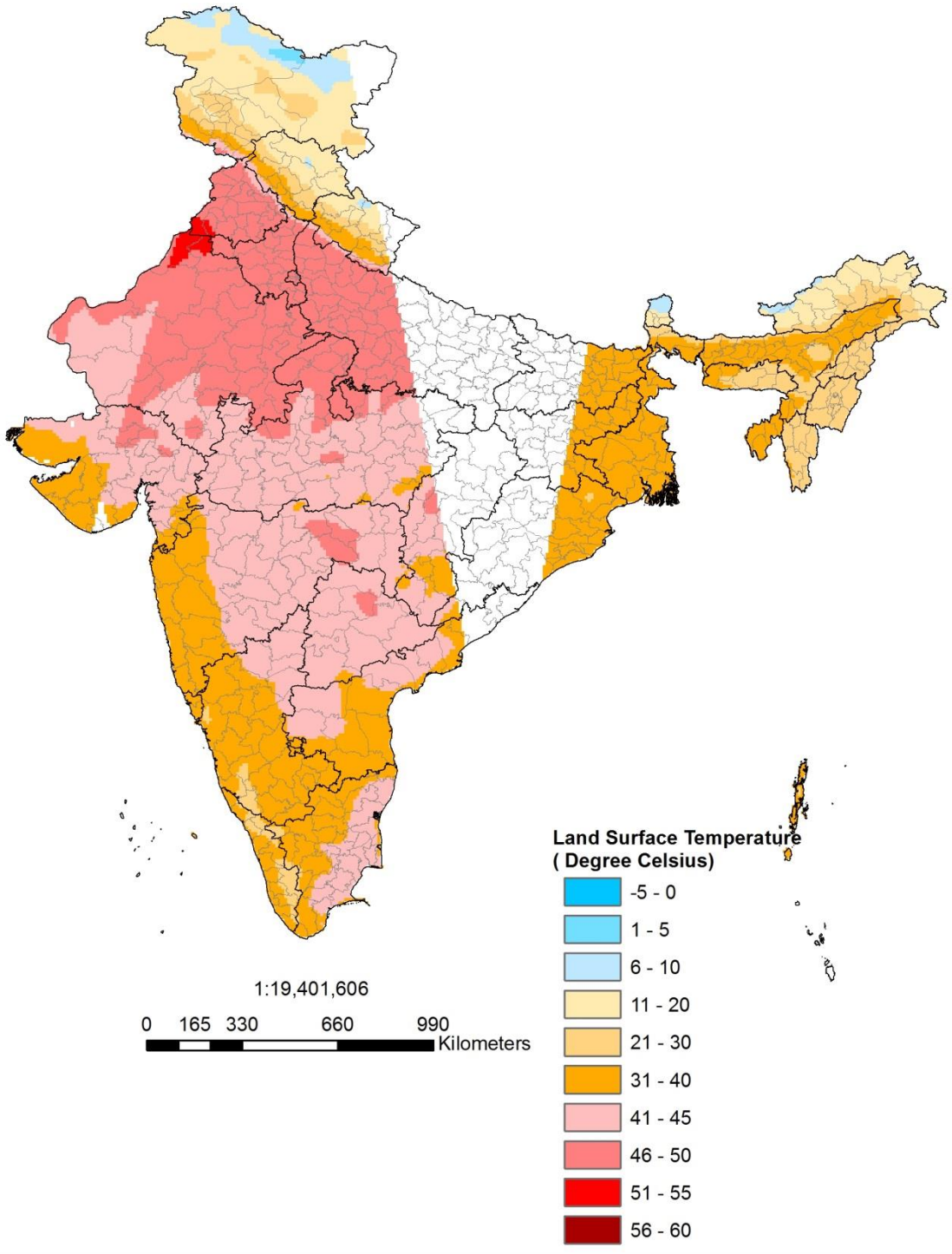


Source: MODIS 8day NDVI binned product
05 June: 12 June, 2020

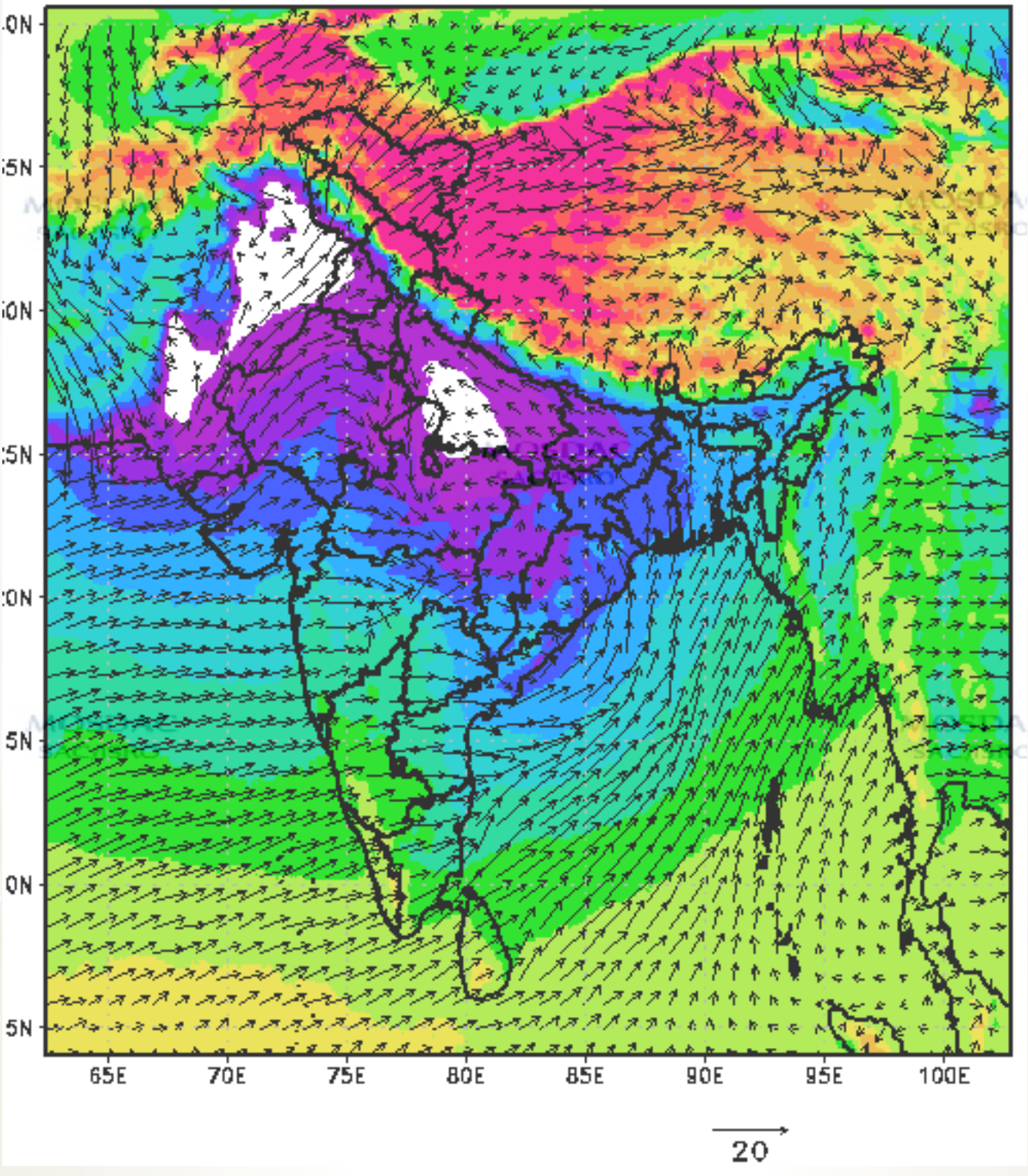
Land Surface Temperature Map of 04 June 2020 generated from SMAP Enhanced L3 Radiometer Global Daily 9 Km product

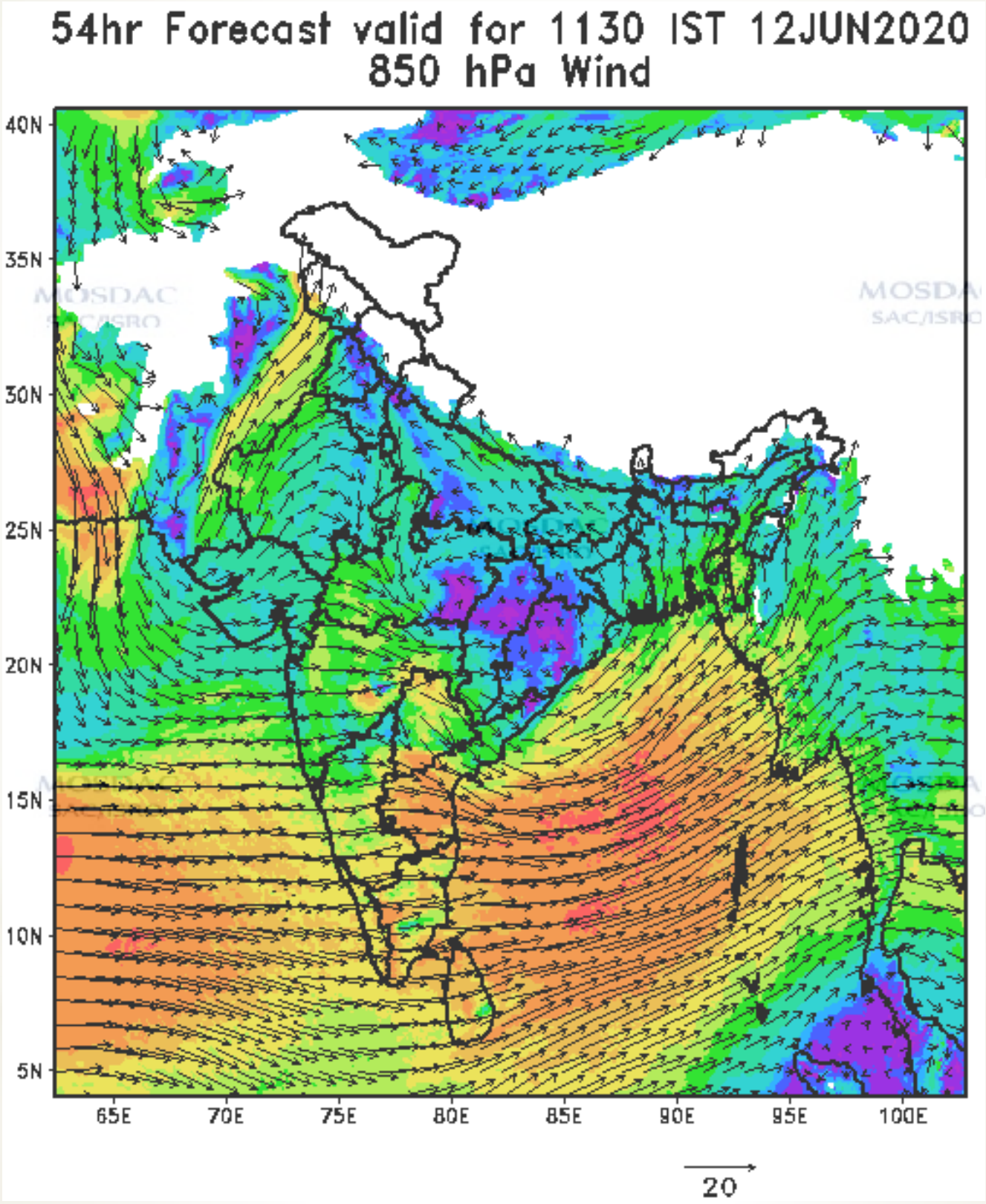


Land Surface Temperature Map of 09 June 2020 generated from SMAP Enhanced L3 Radiometer Global Daily 9 Km product



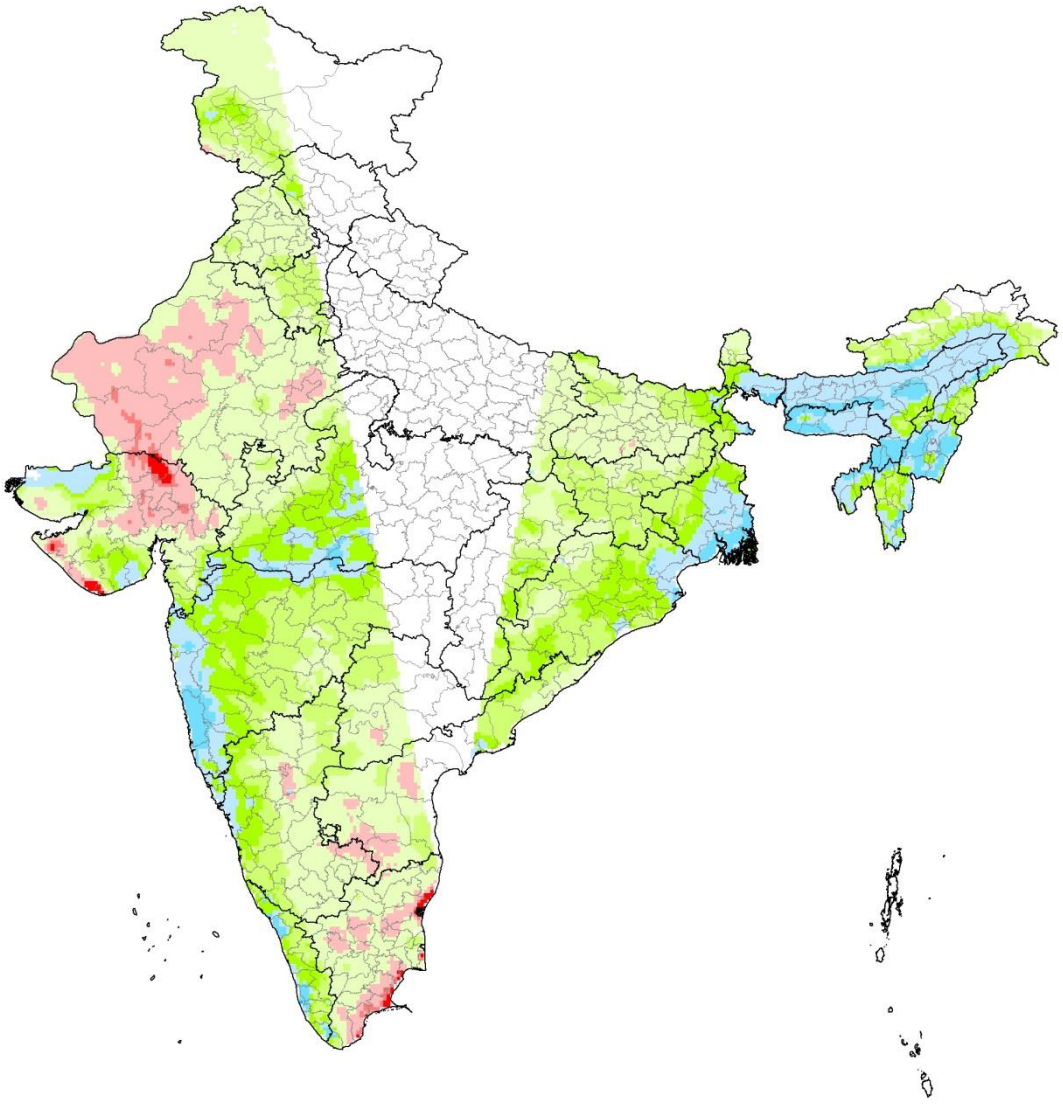
54hr Forecast valid for 1130 IST 12JUN2020
MSLP & 10m height Wind





Wind speed @ 1.46 km from msl.

Soil Moisture Map of 04 June 2020 generated from SMAP Enhanced L3 Radiometer Global Daily 9 Km product



N

1:20,000,000

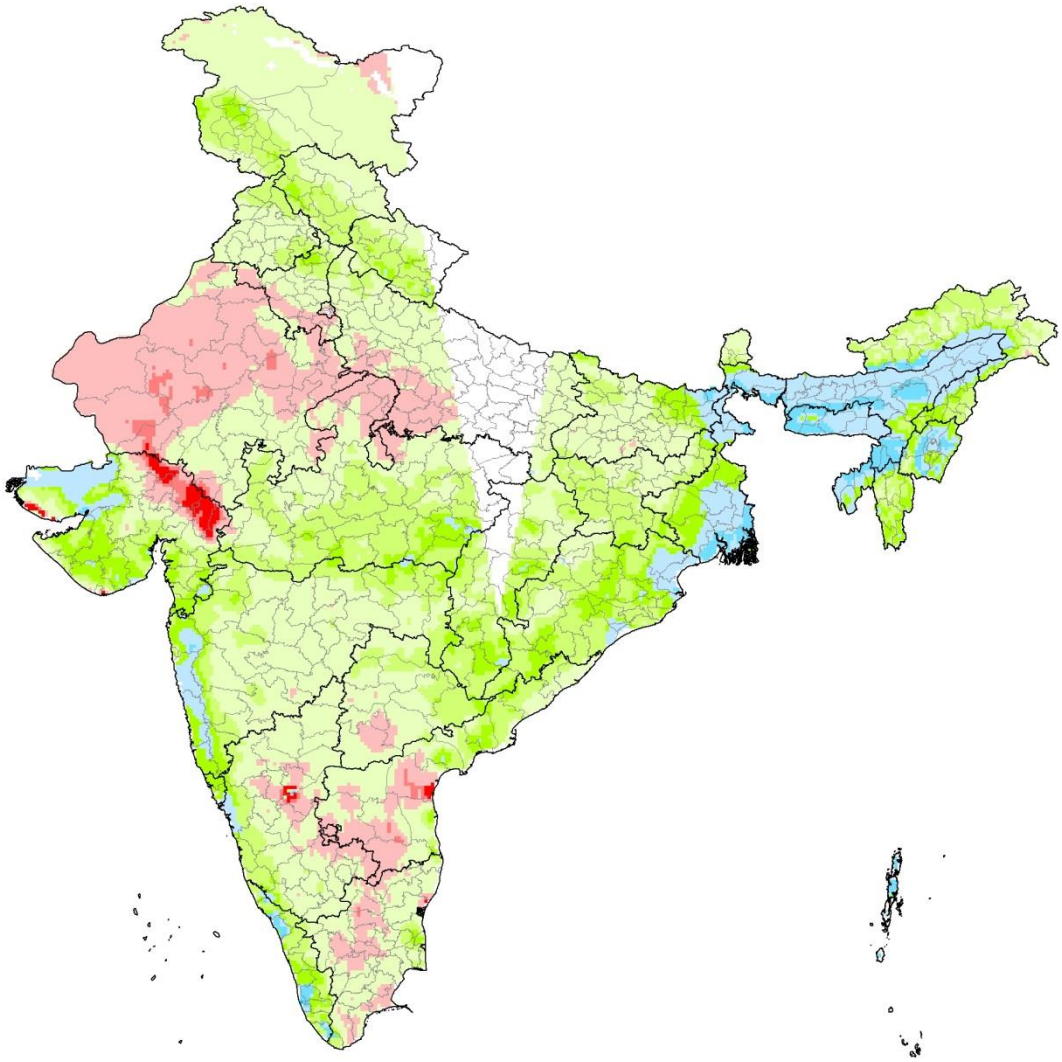
0 170 340 680 1,020

Kilometers

Soil Moisture (in %)

- 0 - 3
- 4 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70

Soil Moisture Map of 09 June 2020 generated from SMAP Enhanced L3 Radiometer Global Daily 9 Km product



N

1:20,000,000

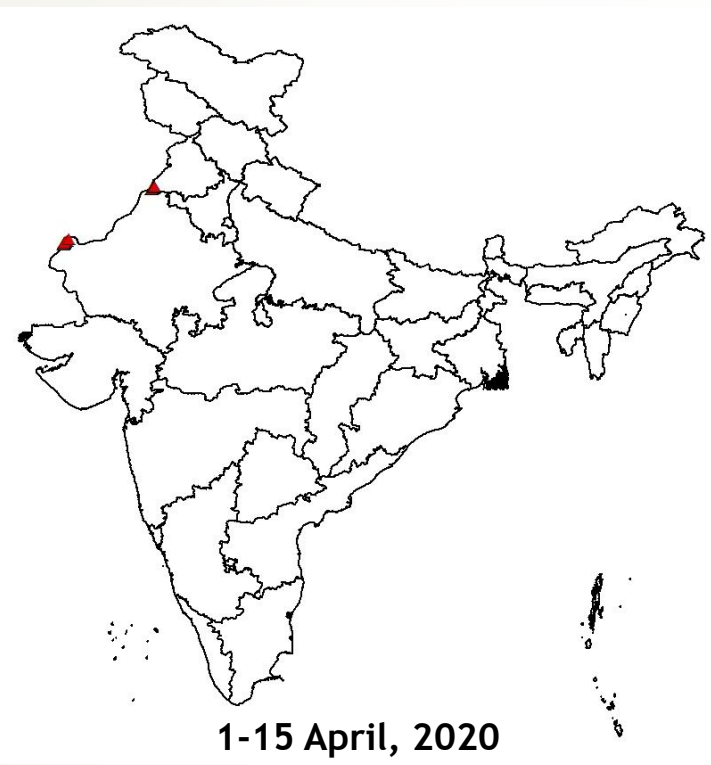
0 170 340 680 1,020

Kilometers

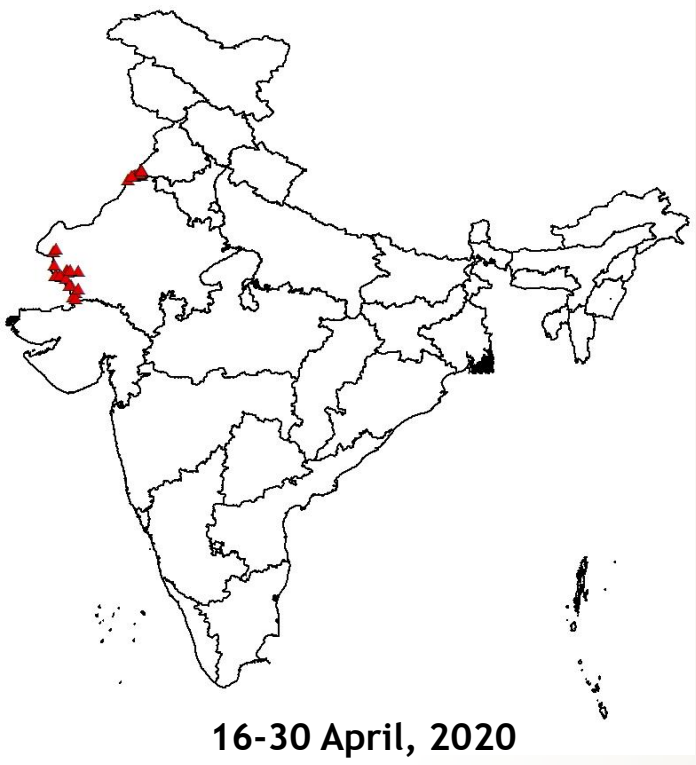
Soil Moisture (in %)

- 0 - 3
- 4 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70

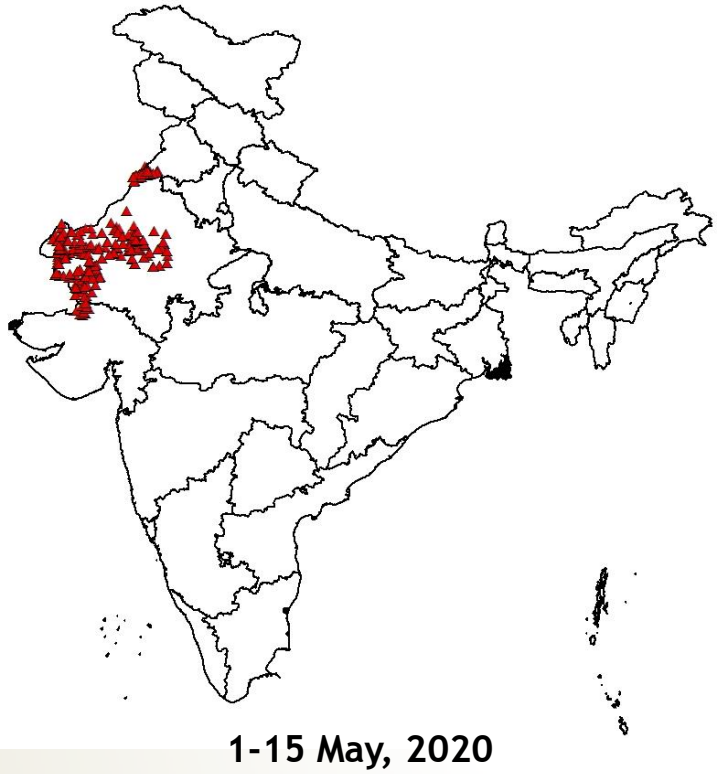
Fortnightly Progression of Locust in Rajasthan and adjoining States



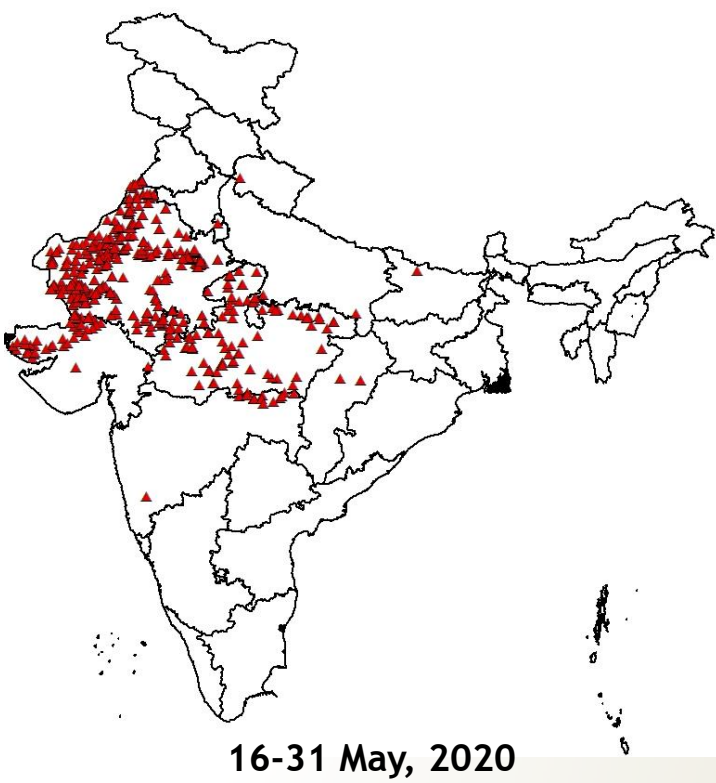
1-15 April, 2020



16-30 April, 2020



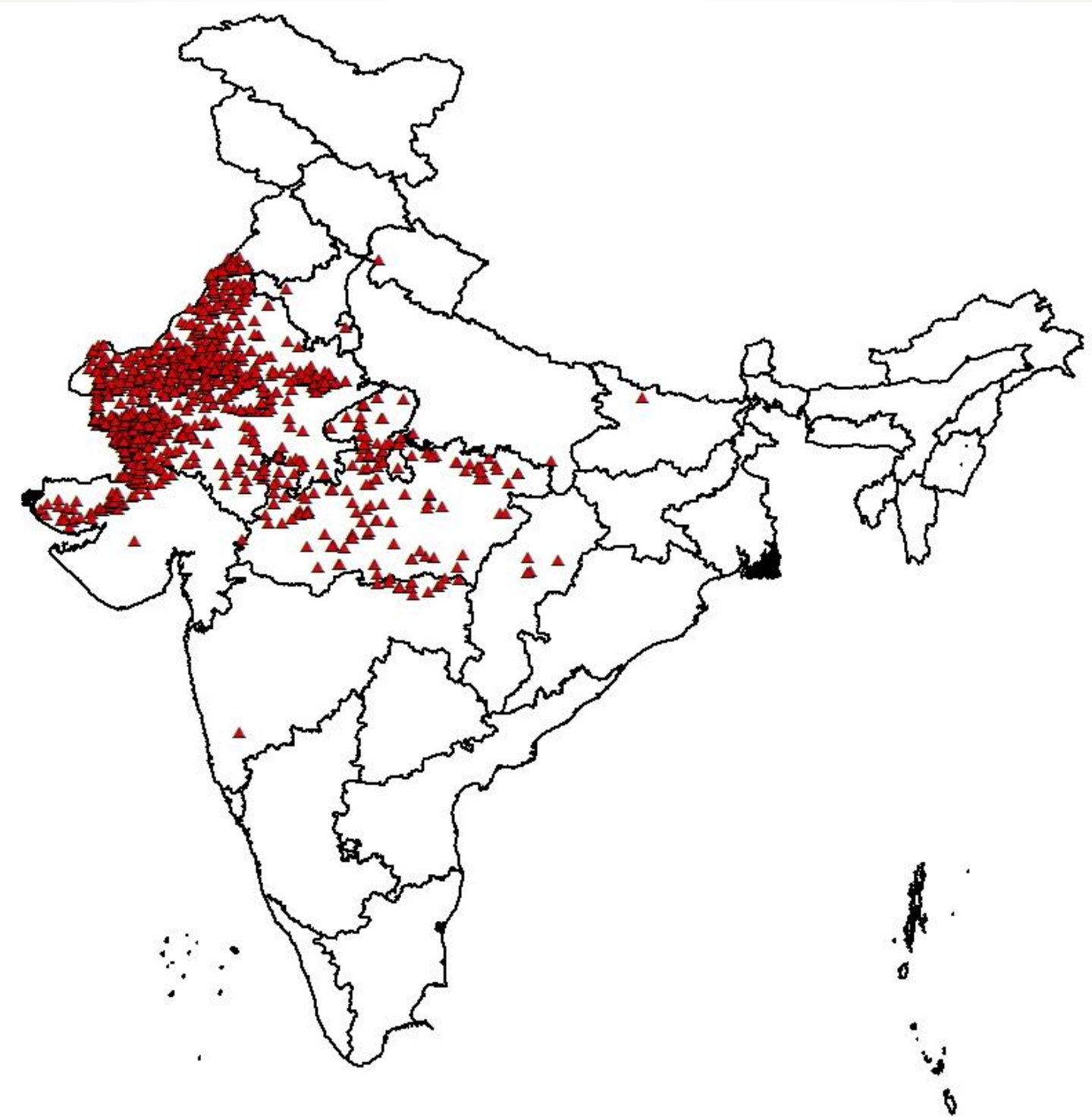
1-15 May, 2020



16-31 May, 2020

Locust locations provided by Locust Warning Organisaiton (LWO), Jodhpur

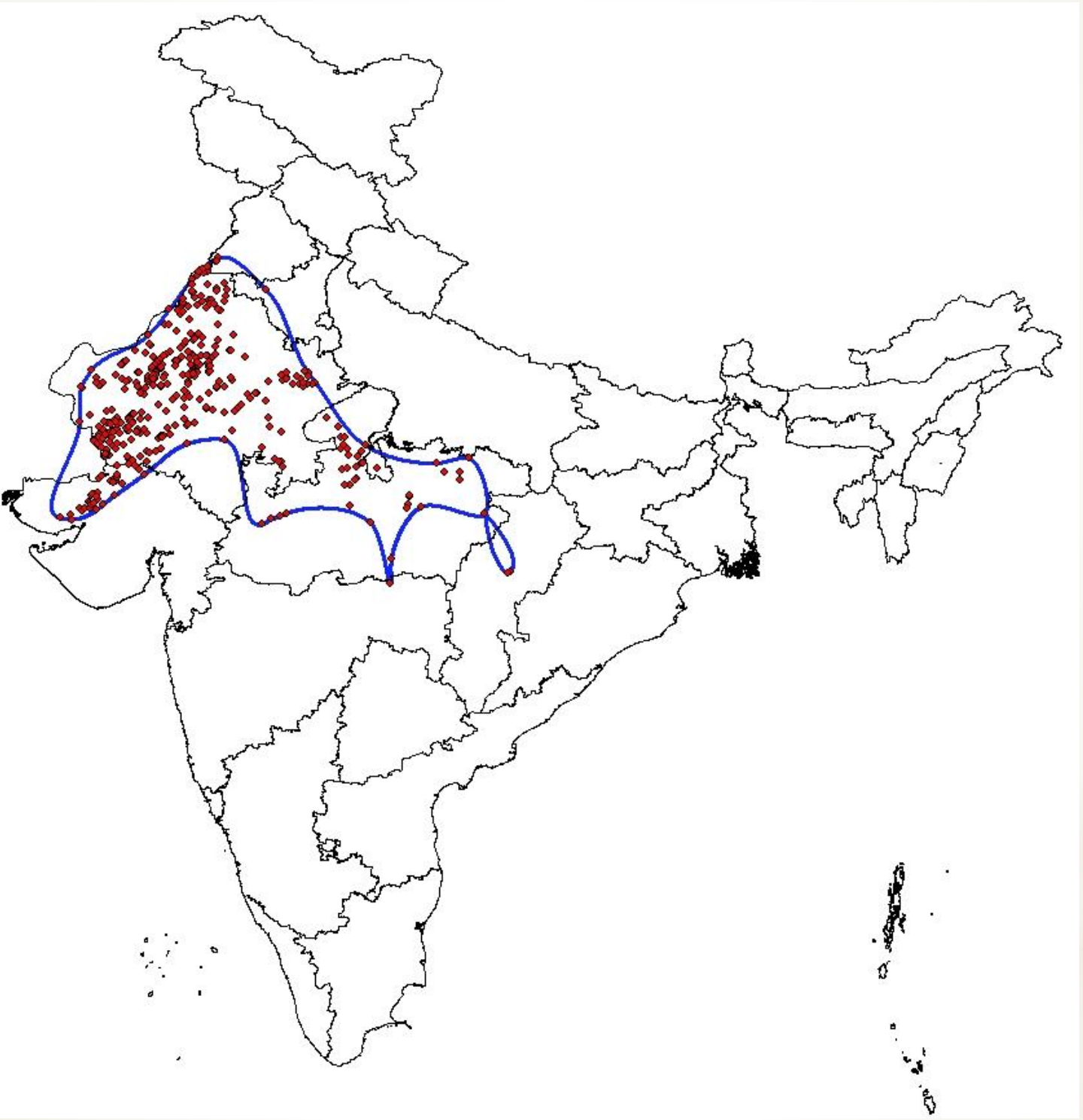
Cumulative Progression of Locust in Rajasthan and adjoining States



1 April -10 June, 2020

Locust locations provided by Locust Warning Organisaiton (LWO), Jodhpur

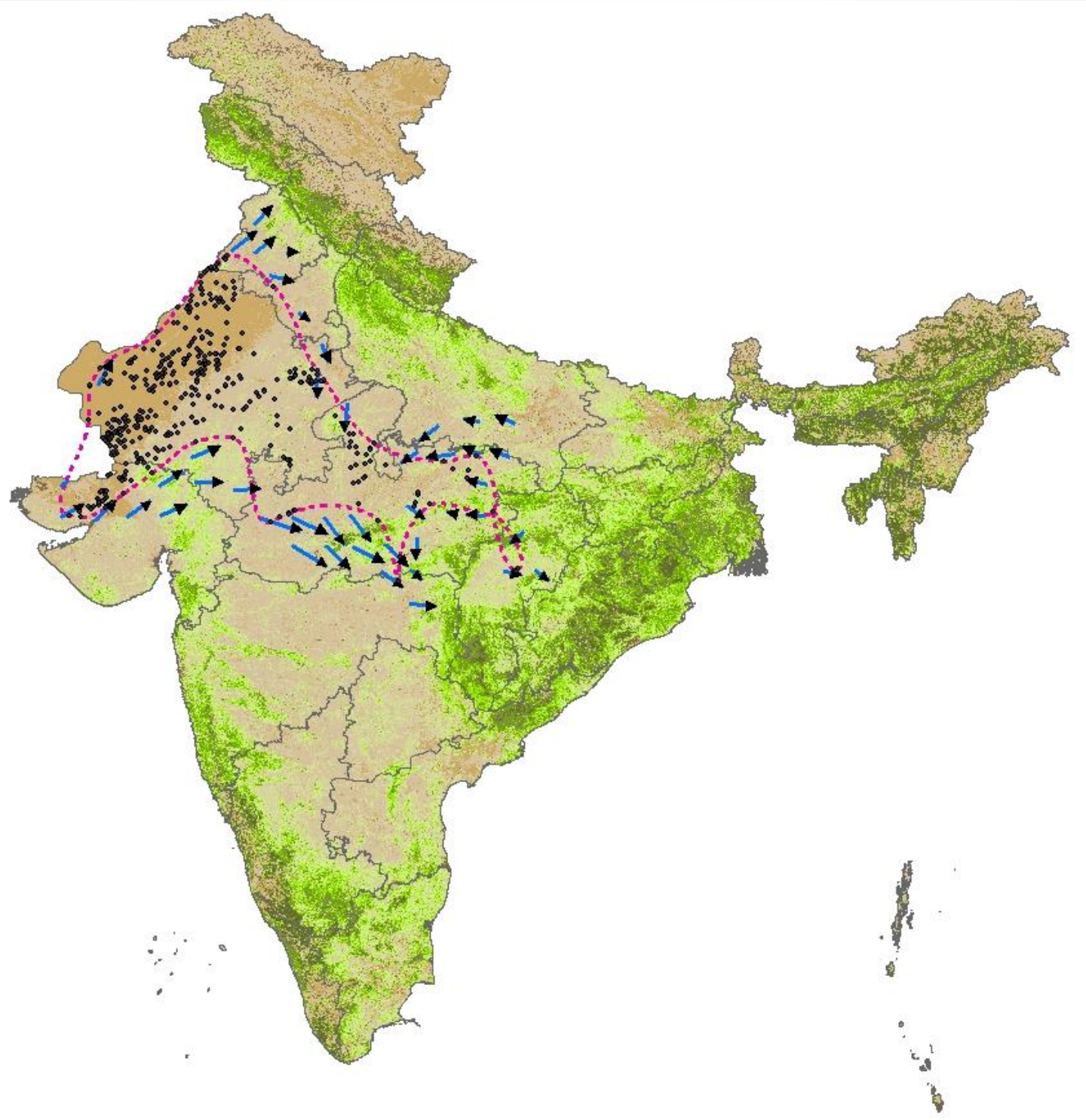
Progression of Locust in Rajasthan and adjoining States



1-10 June, 2020

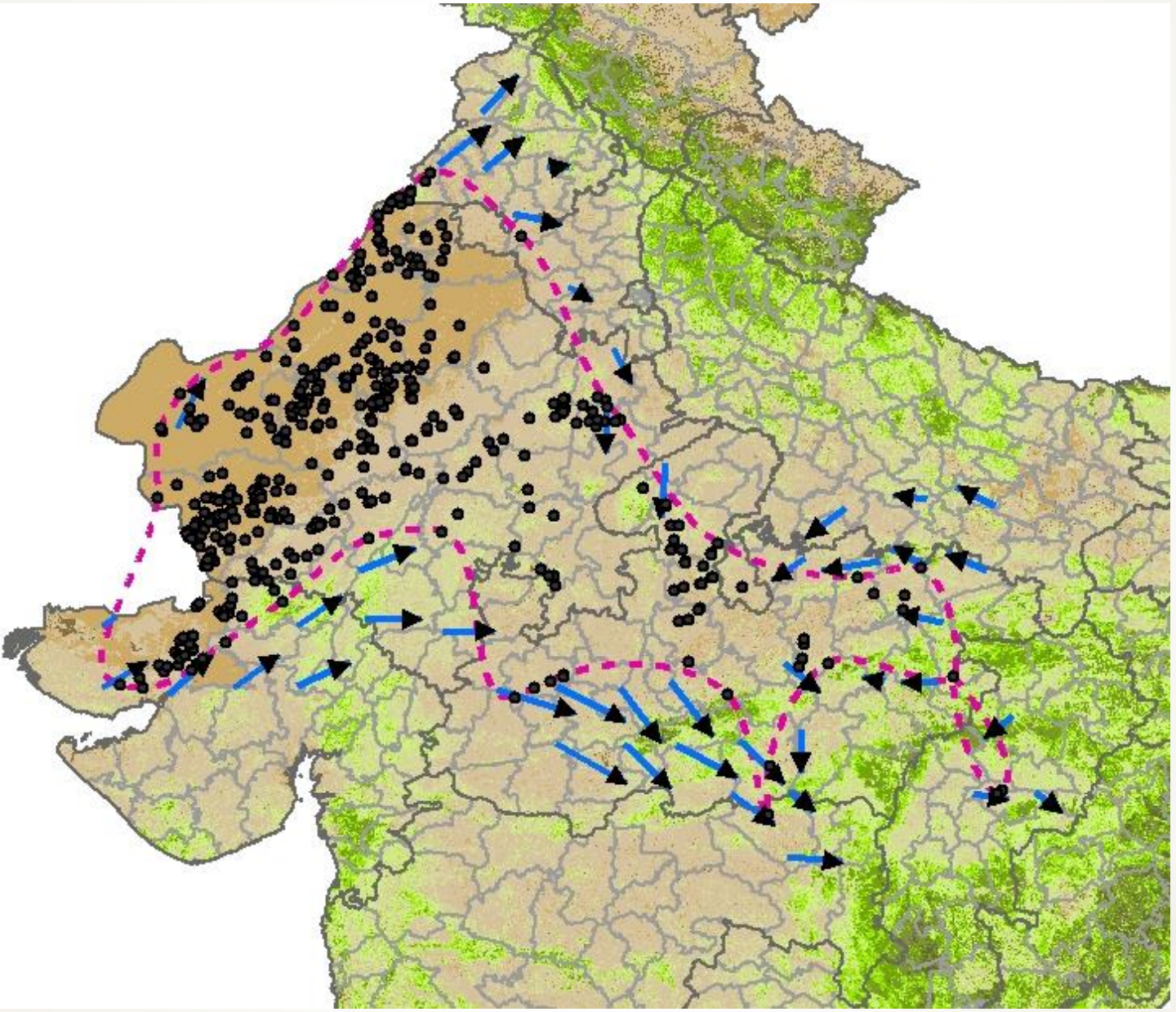
Locust locations provided by Locust Warning Organisaiton (LWO), Jodhpur

Probable Direction of Locust Migration Based on Vegetation Status & Wind Direction



12 June onwards, 2020

Probable Direction of Locust Migration Based on Vegetation Status & Wind Direction



12 June onwards, 2020

Data Used :

- Vegetation status maps (MODIS Level 1B product; 250 m spatial resolution)
- Soil moisture (SMAP; 10 km spatial resolution)
- Wind direction (MOSDAC; Experimental 24 hour, 48 hour and 72 hour forecast for India WRF model; measured at 1.46 km/850hPa, 5 km X 5 km grid)
- Locust incidences location in the field (LWO, Jodhpur)

Analysis Results :

- Vegetation cover status in terms of Normalized Difference Vegetation Index (NDVI) provides valuable information which could be the potential habitat of locust.
- Surface soil moisture variation is a very good indicator highlighting the potential breeding ground as locust females need moist area to lay their eggs.
- Wind directions show direct linkage to possible locust movement paths.
- The locust swarm was first visible in Barmer district of Rajasthan during the month of early May 2020. It has then moved towards Jaisalmer, Bikaner, Jodhpur, Pali, Nagaur, Churu, Sikar, Jaipur, Bhilwara, Kota and Sri Ganganagar districts of Rajasthan with time in search of green vegetation cover during 1 week of June 2020. In addition, swarms have been also observed in Kachchh district of Guajarat and Shivpuri, Ashok Nagar, Vidisha and Satna districts of Madhya Pradesh.
- Considering all the key factors, it has been suggested that desert locust swarms are likely to move in the following districts

  Rajasthan: Rajsamand, Sirohi , Alwar, Dausa& Udaipur
  Gujarat: Banaskantha, Patan, Sabarkanta, Mahesana
  Madhya Pradesh: Ujjain, Dewas, Sihore, Hosangabad, Indore, Harda, East Nimar, Chhatarpur, Jabalpur, Sheopur, Shivpuri, Gwalior, Vidhisha, Satna , Rewa & Seoni
  Maharashtra: Amravati, Nagpur, Wardha, Gondia & Bhandara
  Chattisgarh: Bemetra & Balodabazar
  Uttar Pradesh: Hamirpur, Fatehpur, Pratapgarh & Mahoba
  Haryana: Bhiwani, Jhajjar, Rewari & Sirsa
  Punjab: Muktsar, Fazilka, Firozpur, Moga, Mansa, Tam Taran, Gurdaspur, Jalandhar, Kapurtala & Fatehgarh

Forecast for India during by FAO (16 – 31 May 2020)

- According to FAO update dated 27 May 2020, there have been movements of adult groups and swarms in India, Oman, UAE and Uganda.
- As per global situation some adult groups and swarms are expected to arrive in India from spring breeding areas.
- Therefore, vigilance will remain continued towards expected invasion of locust in coming days.

Contact

Dr. S Srinivasa Rao
General Manager
Regional Remote Sensing Centre (RRSC-W)
NRSC, ISRO, Sector 9, K B Housing Board,
Bypass road, Jodhpur
Ph.: 0291-2796394
E-mail: ssrao@nrsc.gov.in