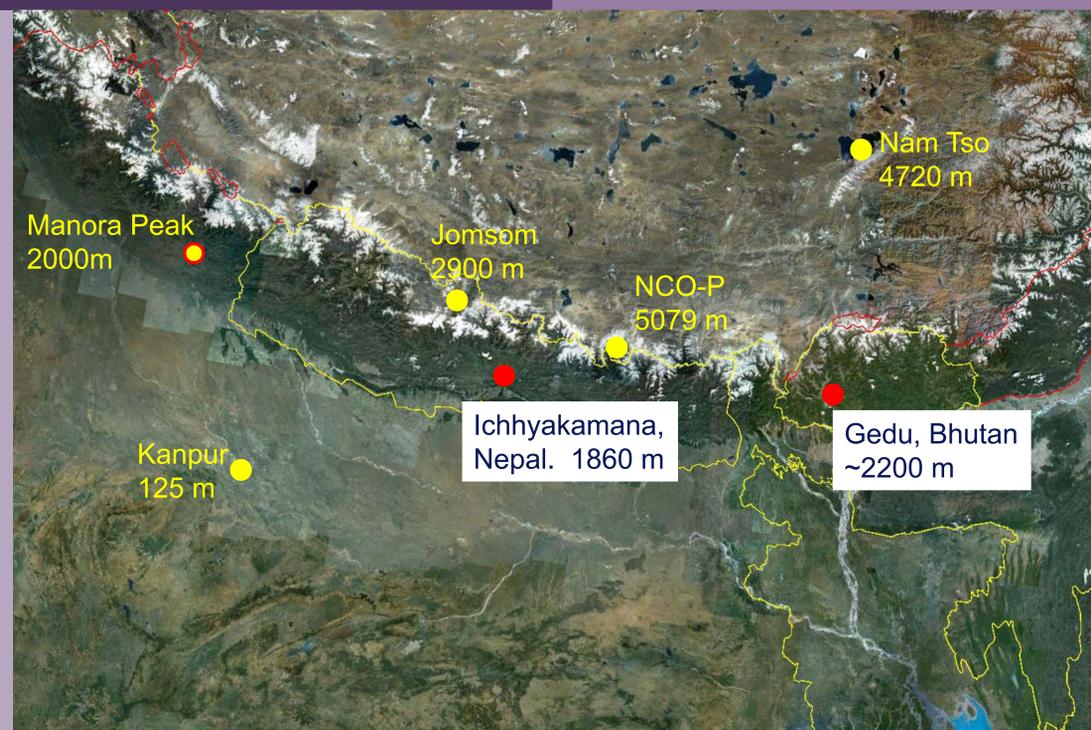
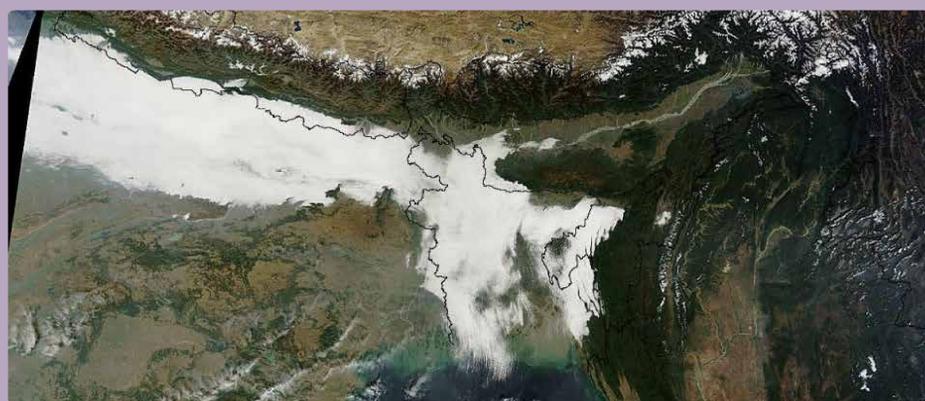


Atmospheric Modelling for Winter Fog in Northern Indo-Gangetic Plains

Vanisa Surapipith, Arnico Panday, Bhupesh Adhikary, Prakash Bhawe, Siva Praveen Puppala and Aditi Mukherji
International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal

An Atmospheric Modelling System has been set up at the International Centre for Integrated Mountain Development (ICIMOD) for the assessment of Air Quality across the Himalayan mountain ranges. Persistent fog in the Northern Indo-Gangetic plains, known as the Tarai, is also increasingly an issue every winter (see below satellite photo on 29 December 2012).

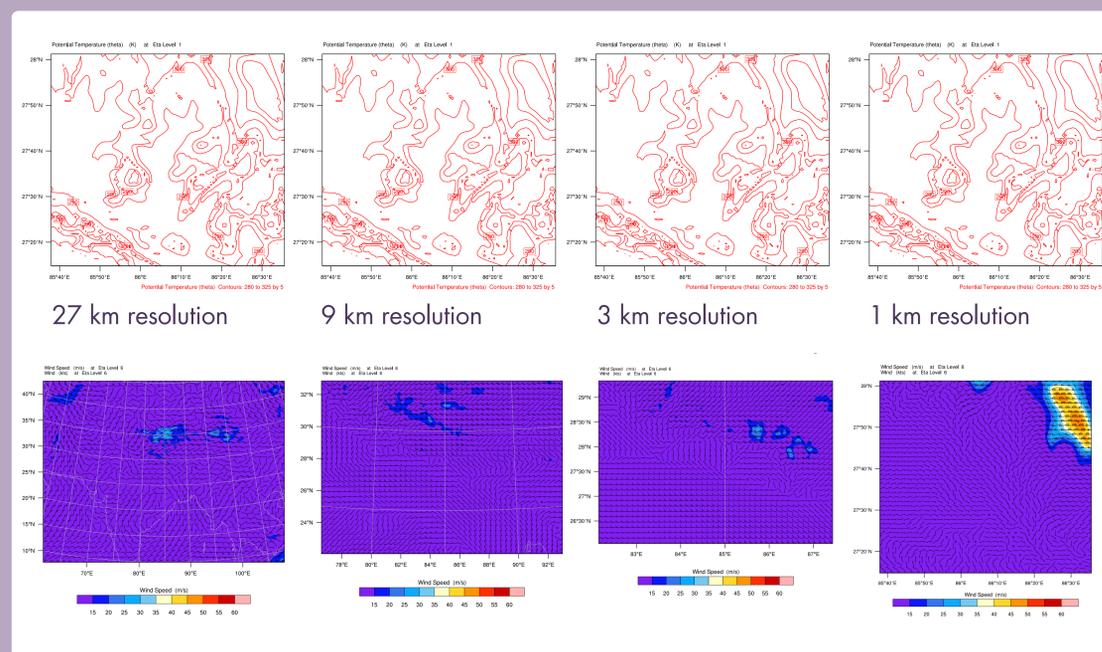


The Weather Research and Forecasting (WRF) model version 3.5 (Grell et al., 2005) has been implemented over the regional domain, stretching across 4995 x 4455 km² centred at Ichhyakamana, ICIMOD's newly set up mountain-peak station (1860 m) in central Nepal.

Simulation is carried out for the winter, i.e., December 2012 to February 2013, when there was an intensive field campaign, SusKat, where at least 7 super stations were collecting meteorology and chemical parameters on various sites, including Lumbini. The complex terrain requires a high horizontal resolution (1 x 1 km²), which is achieved by nesting the domain of interest, e.g., the Tarai, into 3 coarser ones (27, 9, 3 km resolution).



The effort aims at building a better understanding of atmospheric processes that have impacts on winter fog formation over Northern Indo-Gangetic Plains. The modeling exercise will help to develop testable hypotheses for an upcoming field campaign in the Tarai region.



The study is expected to lead to proper mitigation and adaptation strategies for solving the problem of persistent fog and thus improving the quality of people's lives across the Tarai in the changing environment.

References

Grell GA, SE Peckham, R Schmitz, and SA McKeen, G Frost, WC Skamarock, and B Eder. 2005. Fully coupled 'online' chemistry in the WRF model. Atmos. Environ., 39:6957-6976.