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### **Shrinking snow caps and rising tides and a sea of change**

**Abstract:** The recent trend of global warming has exerted a disproportionately strong influence on the Eurasian land surface causing a systematic decrease in snow persistence over the Indo-Tibetan Plateau region. Over the past decade, the western Arabian Sea has witnessed a nearly three-fold increase in summer-time phytoplankton biomass due to intensification of the southwest monsoon (SWM) winds and wind-driven coastal upwelling resulting from the decline in snow cover extent over southwest Asia and the Himalayan-Tibetan Plateau region. The impacts of the warming trend have not been confined to the SWM alone. During the northeast monsoon (NEM) also, chlorophyll *a* concentrations have been on the rise due to unprecedented green tides of a heterotrophic dinoflagellate, *Noctiluca*. Large blooms of *Noctiluca* have now become more pervasive and widespread over large parts of the Arabian Sea in association with nutrient-rich and oxygen-poor waters. The appearance of *N. miliaris* in bloom proportions year after year, despite signs of weakening convective mixing during the NEM, raises the intriguing possibility that the Arabian Sea ecosystem is becoming more eutrophic. Such concerns are consistent with the idea that the Arabian Sea's permanent oxygen minimum zone may be intensifying. This presentation will highlight results from a collaborative Indo-US-Oman effort to investigate the ecophysiological characteristics of *Noctiluca* and conditions that are promoting its appearance in bloom proportions year after year. The presentation will also touch upon some of the long-term socio economic consequences of these blooms for countries around the Arabian Sea and some ideas for future research.