URSI - RCRS 2022, IIT (Indore), India, 1 - 4 December, 2022

Alteration in atmospheric composition due to an oil well blowout at Baghjan, Assam

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Oil and gas exploration along with its production has the potential to cause severe environmental degradation. One uncontrolled Gas and Oil leak occured at Baghjan well No 5 on 27th May 2020. The oil spill due to blow out caught fire on 9th June 2020. High resolution MODIS, Sentinel-2 MSI, TROPOMI data are used to examined Fire Radiative Power (FRP), surface reflectance, Normalized Difference Vegetation Index (NDVI), dry air mixing ratio of CH_4, column number density of SO_2, Tropospheric NO_2 and O_3 surrounding the well blow site from May-Nov, 2020. The highest FRP is observed on 9th June 2020 when the leak caught fire. This has led to decrease in NDVI values which were regained in November after the leakage was over. Methane concentration increased by ~5% on the 3rd and 5th day of the blowout compared to that of the pre-blowout days. While on the fire blowout day its concentration increased by ~15.84% than the pre-blowout values. SO_2 column number density peaked after 2 days which then decreases after the leak was fully sealed. Highest total NO_2 column number density was observed on 27th May 2020, on the leakage day. O_3 column number density decreases through the entire blow out period. However, the prevailing monsoon heavy rainfall during the study period minimized the impact of the blowout event both in the atmosphere as well as on soil.