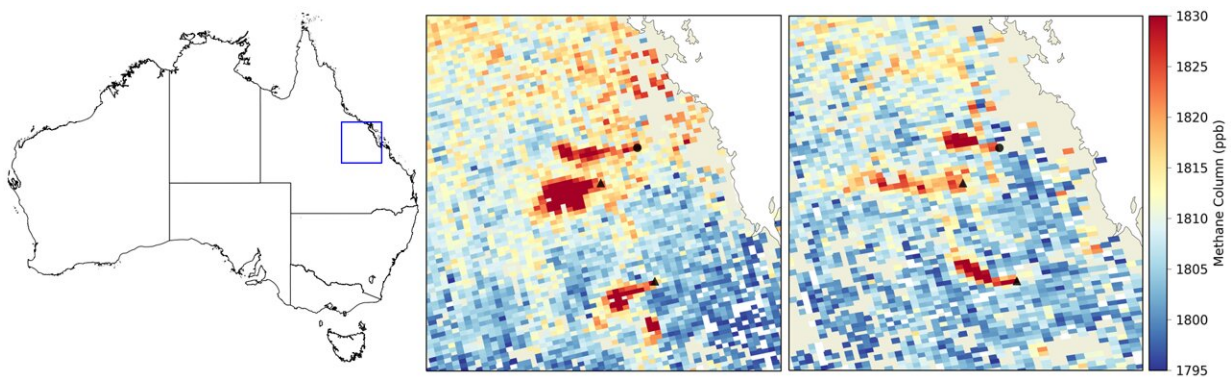


Satellite reveals Australian coal mines emit much more methane than expected based on national reporting

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TROPOMI methane observations on two different days showing large signals from three coal mine locations. The most Northern location is the surface mine, while the other locations are underground mines. Northern: Hail Creek. Middle: Broadmeadow, Moranbah North, Grosvenor. Southern: Grasree, Oaky North. Credit: SRON/VU/TNO

A group of Dutch scientists has used space instrument TROPOMI to calculate methane emissions from six Australian coal mines. Together, these account for 7 percent of the national coal production, but turn out to emit around 55 percent of what Australia reports for their total coal mining methane emissions.

Australia is in the top five [coal](#)-producing countries in the world. It

reports coal mining [methane](#) emissions of 1 million tons per year. "It is hard to believe that 7 percent of coal production is responsible for 55 percent of coal mining methane emissions," says Prof. Ilse Aben (SRON/VU), who led the team of researchers. "So in reality, Australia's coal mining methane emissions are likely much higher than reported. More importantly, knowing which mines have such large emissions is critical in focusing efforts for mitigation."

The research team observed five underground mines and one [surface](#) mine. The emissions from the surface mine, called Hail Creek, are particularly notable. It is one of 73 surface mines in Australia, but accounts for 88 percent of Australia's total reported surface coal mine emissions. First author Pankaj Sadavarte (SRON/TNO) said, "The most remarkable finding is that the emissions from the surface mine are so much higher than expected, and by far the largest we see in the TROPOMI data over the coal mine area in Queensland: On its own, it accounts for 40 percent of emissions for all six observed mines. Common understanding is that surface mines emit much less methane than underground mines. And to be quite honest, we still don't understand why this mine is emitting so much methane."

Methane has been recognized as crucial to mitigate climate change on the short term. At the COP26 in Glasgow, over 100 countries signed the global methane pledge initiative from the U.S. and the E.U. to reduce [methane emissions](#) with 30 percent—relative to 2020—by 2030. A few major methane emitting countries, including Australia, have not signed the pledge.

The TROPospheric Monitoring Instrument (TROPOMI) is the only instrument on board the European Copernicus Sentinel-5 Precursor satellite. TROPOMI is a Dutch collaboration between Airbus DSNL, KNMI, SRON and TNO, commissioned by NSO and ESA. Airbus DSNL was the main contractor for the design and construction of the

instrument. TNO has been responsible for the optical design and the manufacturing of key optical sub systems. The scientific management is in the hands of KNMI and SRON. TROPOMI is funded by the Dutch Ministry of Economic Affairs and Climate, the Ministry of Education, Culture and Science and the Ministry of Infrastructure and Water Management.

More information: Pankaj Sadavarte et al, Methane Emissions from Super-emitting Coal Mines in Australia quantified using TROPOMI Satellite Observations. arXiv:2106.10457v2 [physics.ao-ph], arxiv.org/abs/2106.10457

Provided by SRON Netherlands Institute for Space Research

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