



EarthCARE 2026 Science and Validation workshop

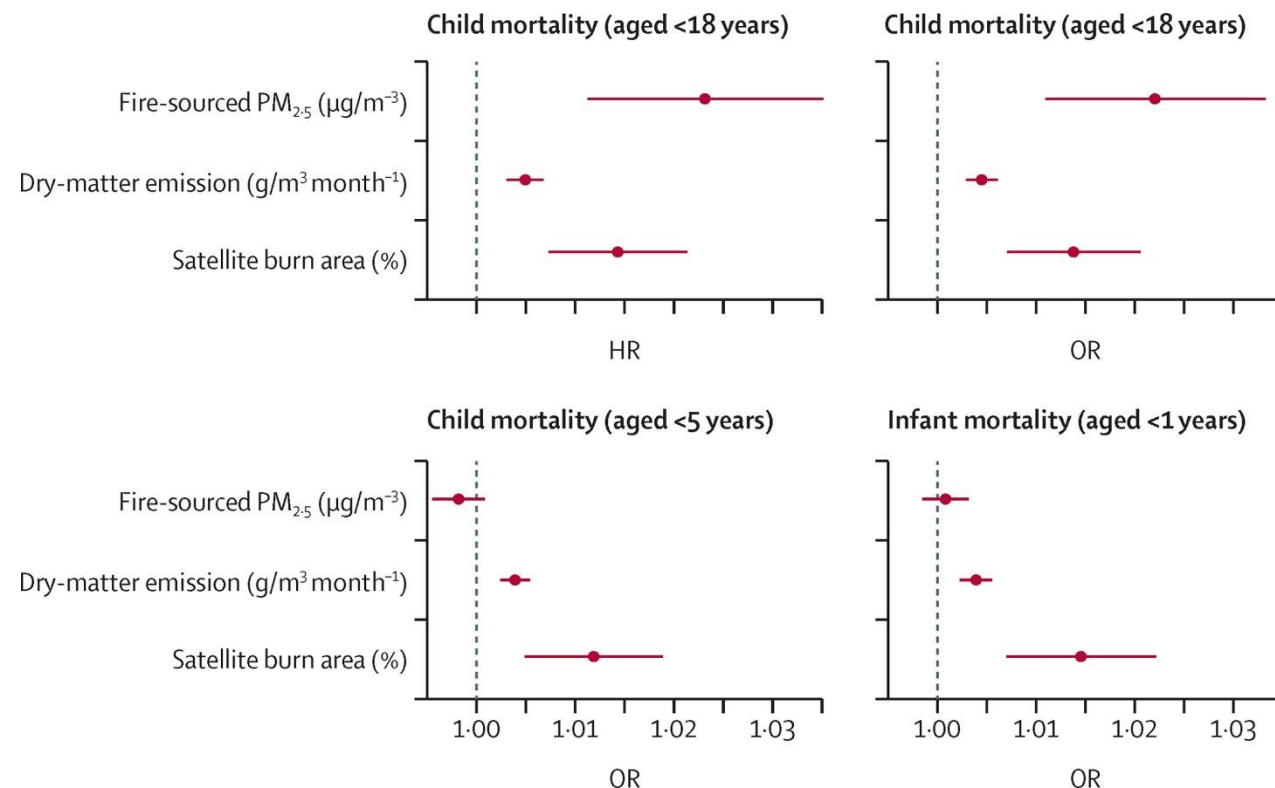
8–12 June 2026 | Rhodes House | Oxford, UK

Detectability of Wildfire Smoke Over the 2025 Canadian Wildfires

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Wildfires are a major hazard to people and property



Images: <https://yavapailandscaping.com/firewise-prescott-protecting-our-community-from-wildfires/>; Fig. 2 Xue et al. (2021), [https://doi.org/10.1016/S2542-5196\(21\)00153-4](https://doi.org/10.1016/S2542-5196(21)00153-4)

Wildfire risk factors are increasing in the Arctic

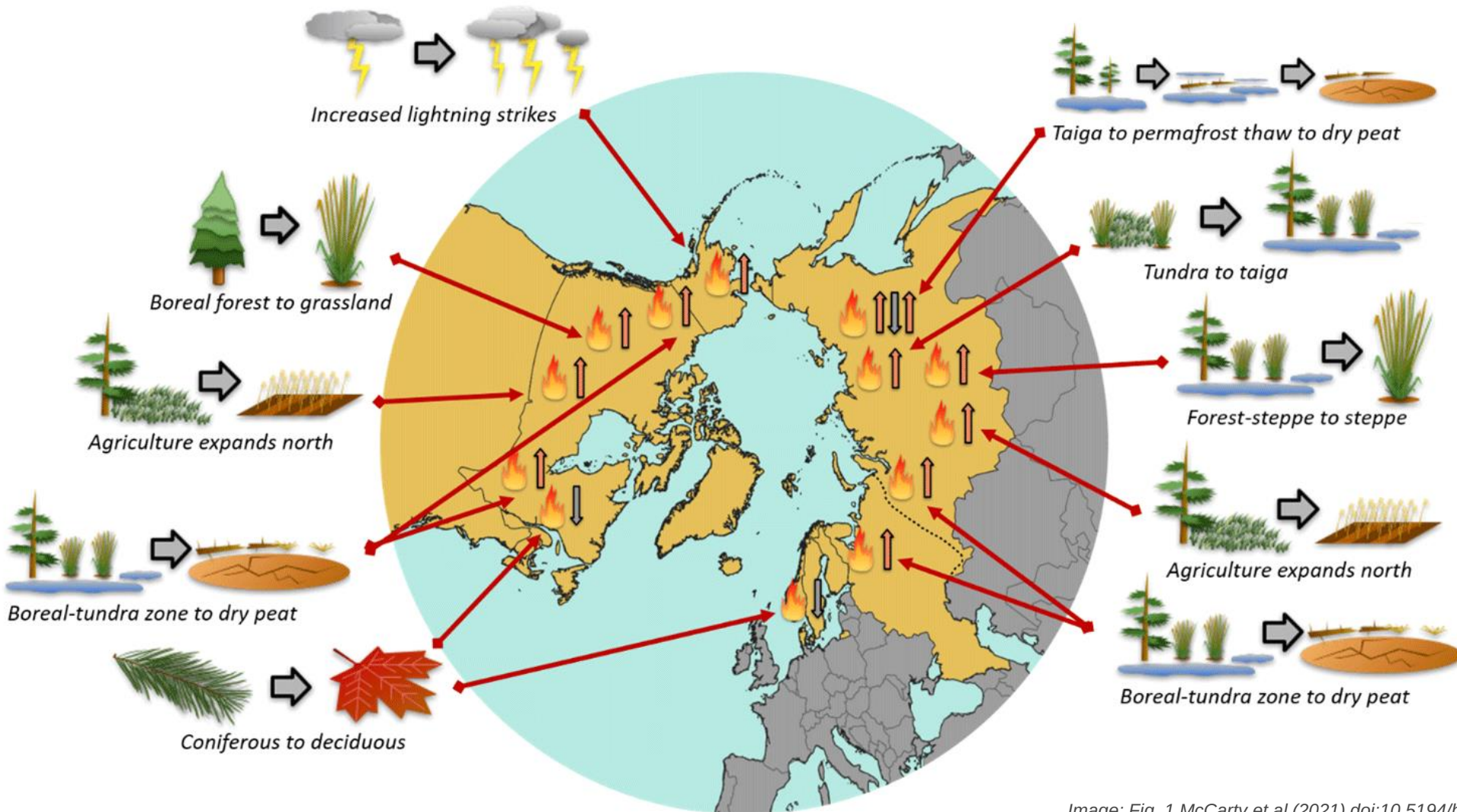


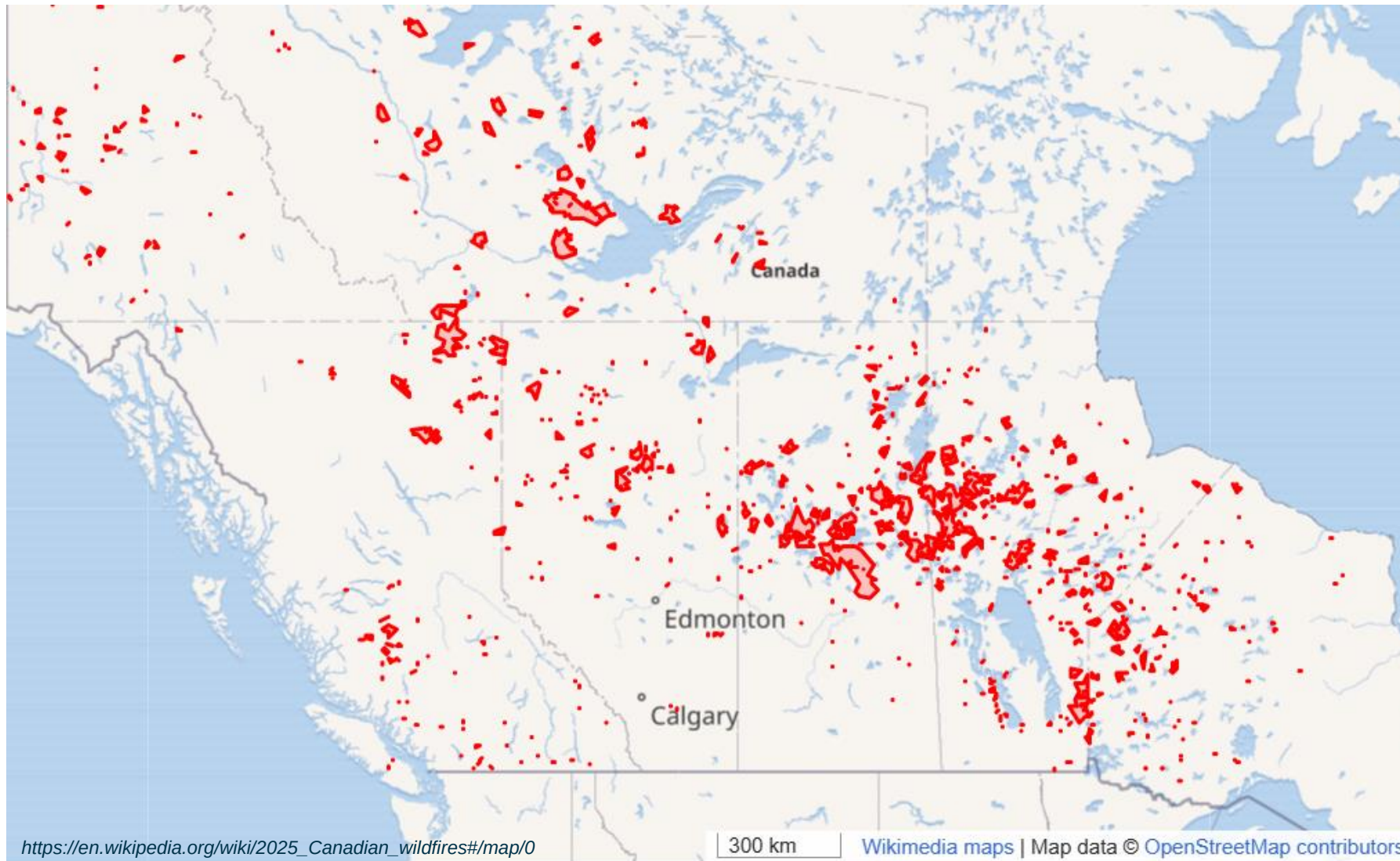
Image: Fig. 1 McCarty et al (2021) doi:10.5194/bg-18-5053-2021

2025 was the second-worse fire season on record for Canada

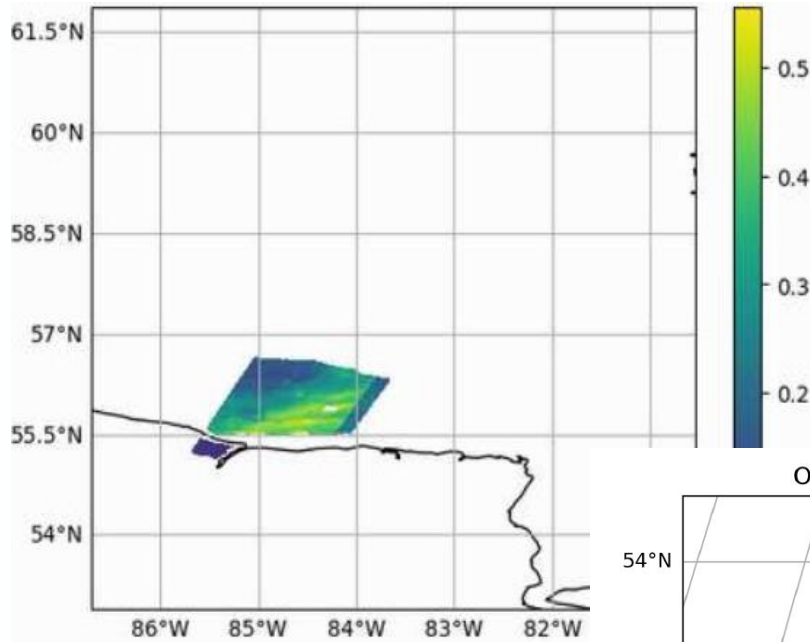


Images: Michala Garrison @ <https://earthobservatory.nasa.gov/images/154531/manitoba-burning>;
Joe Carr @ <https://www.flickr.com/photos/joetourist/54747543455/>;
National Interagency Fire Center-@ <https://www.flickr.com/photos/nifc/54631089404/>

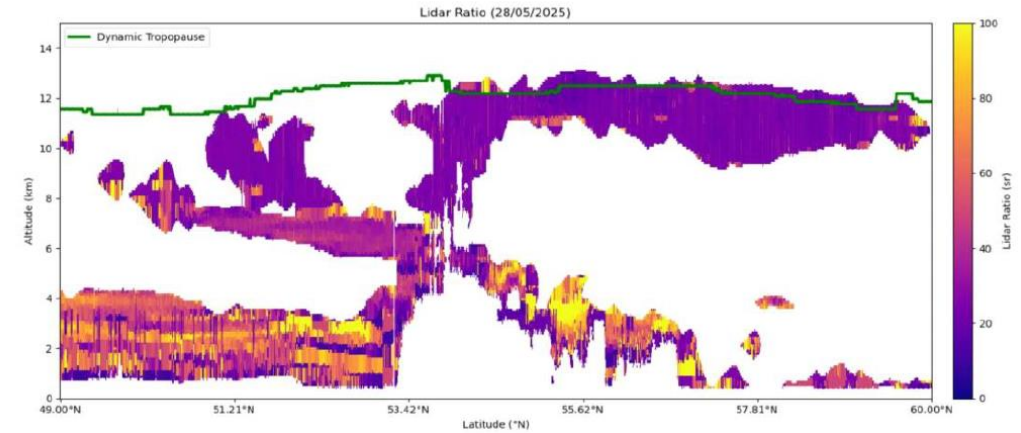
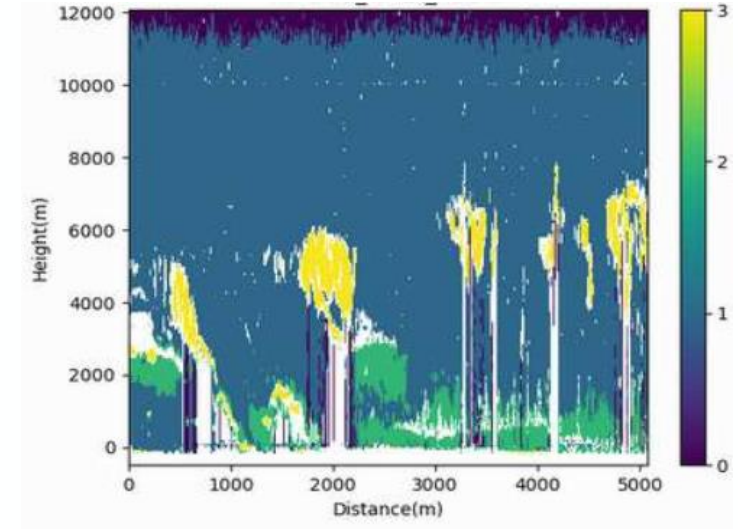
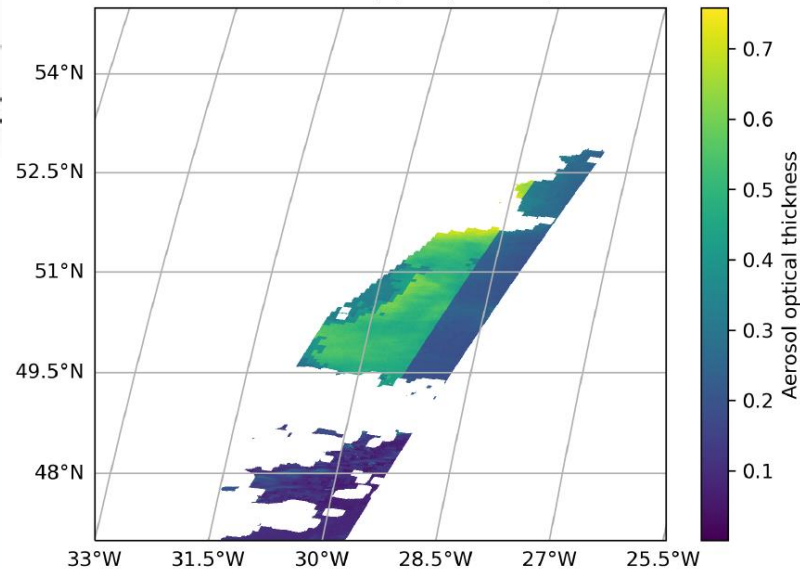
8.78 million hectares were burnt over 5,349 detected fires



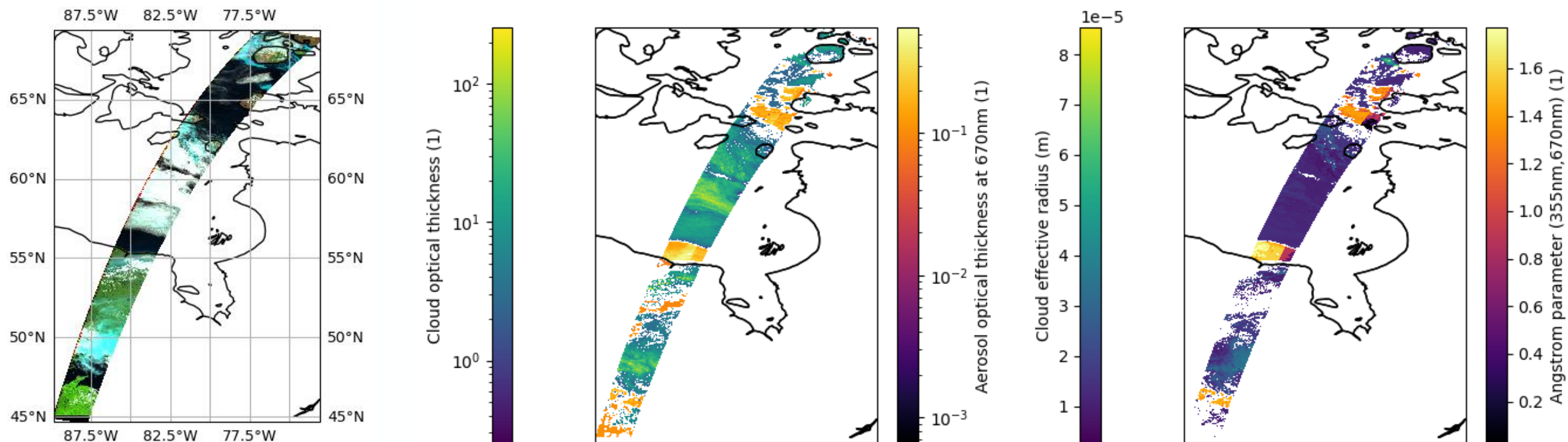
Using MSI, my students only found a couple of smoke plumes



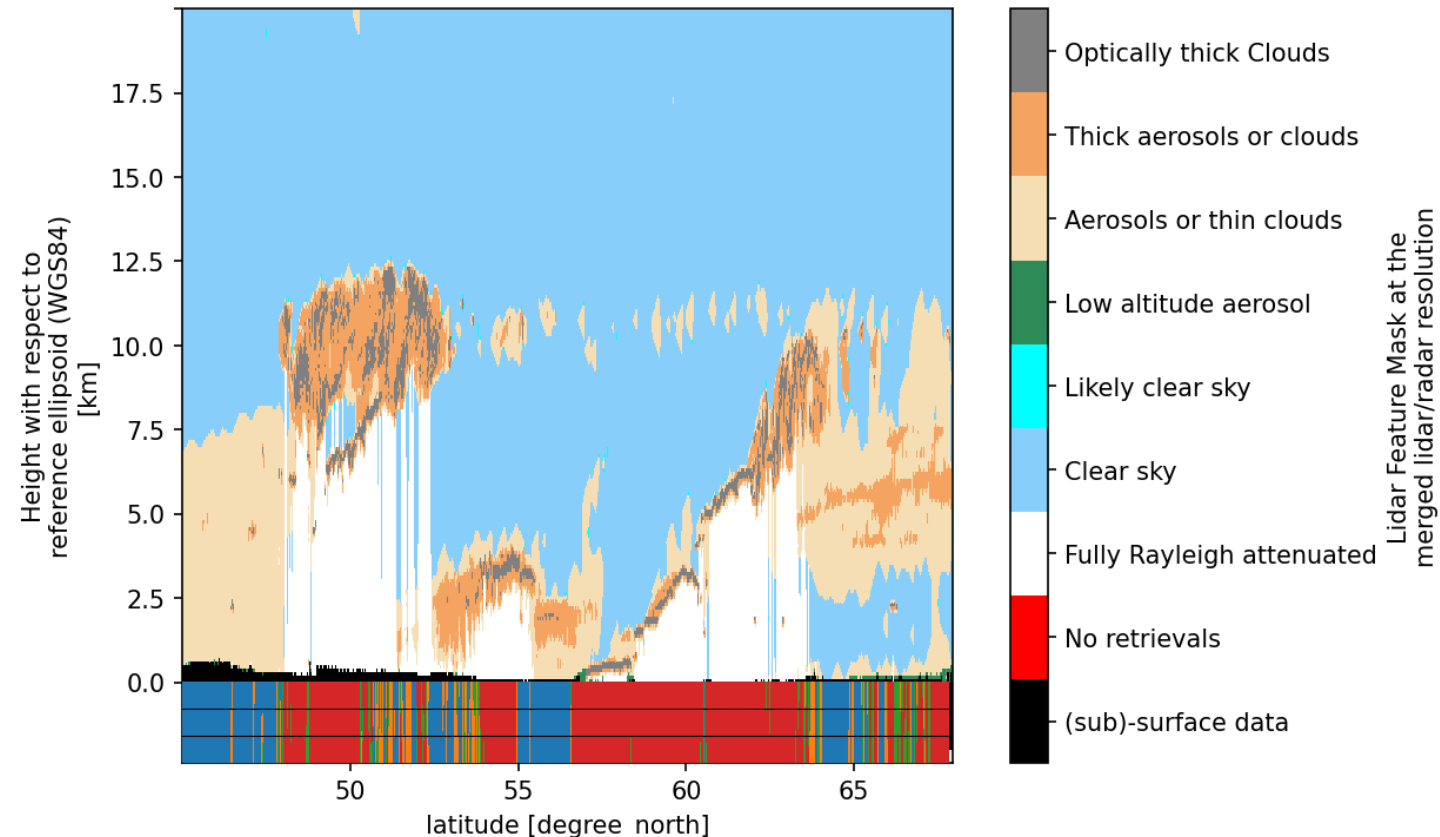
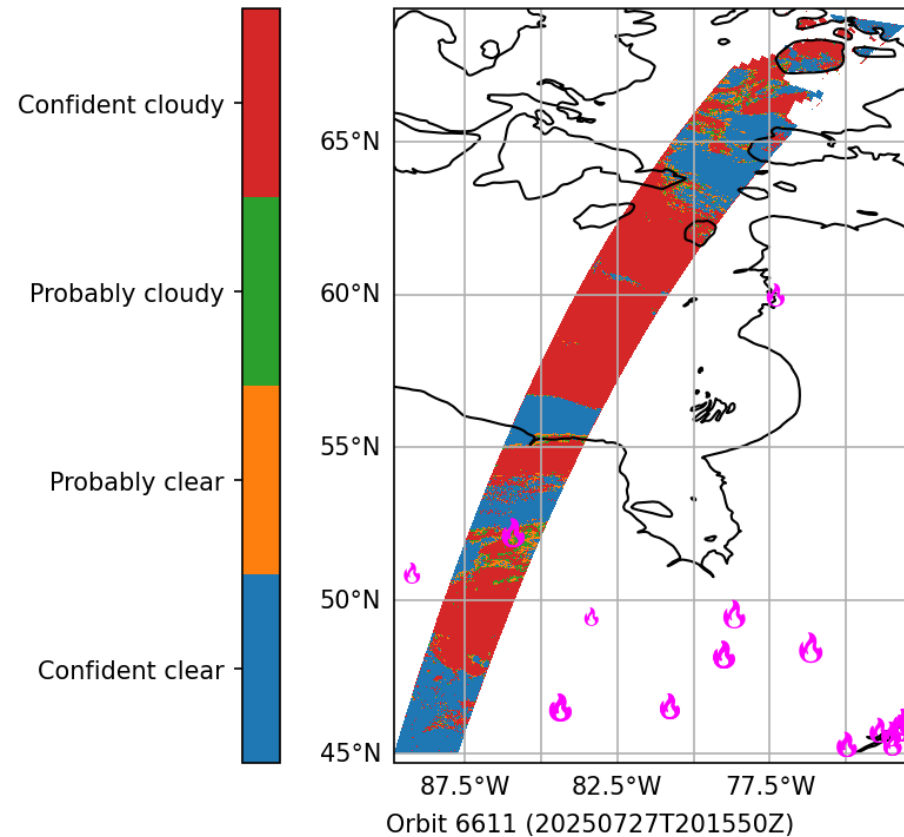
Orbit: 06733D, (ESA, Ex14.2)



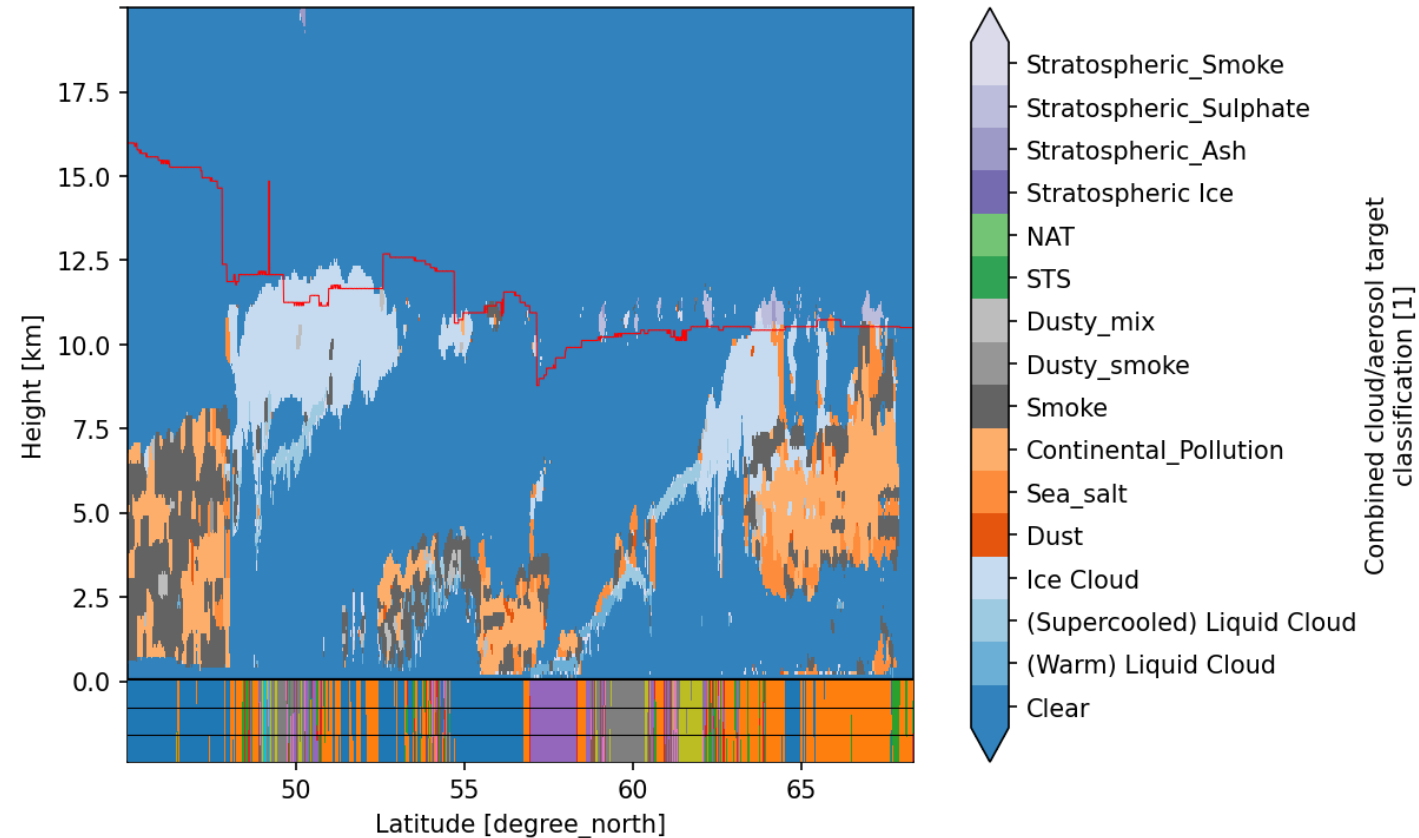
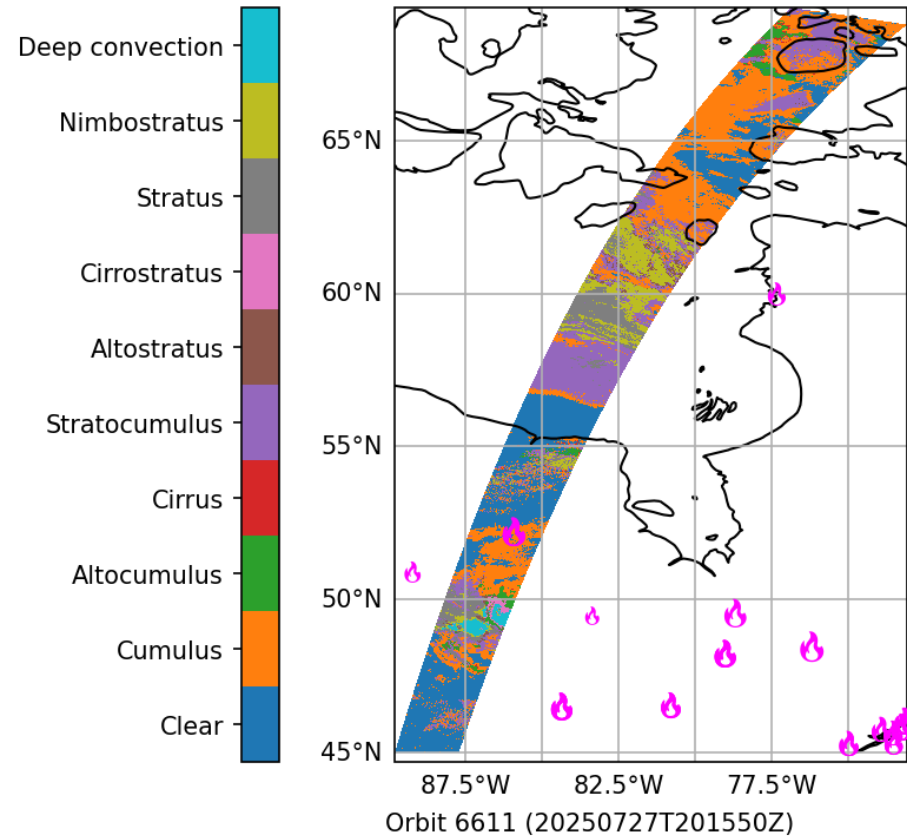
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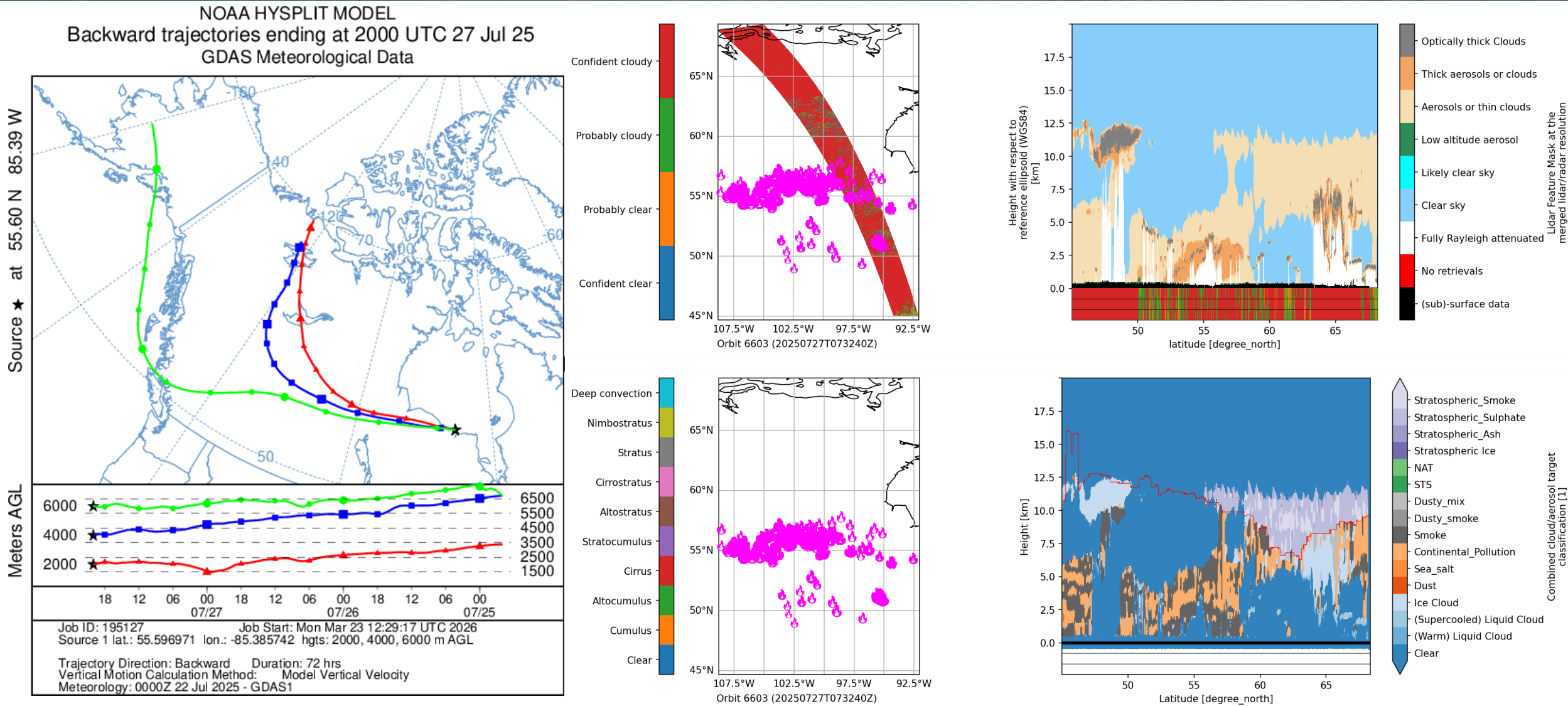
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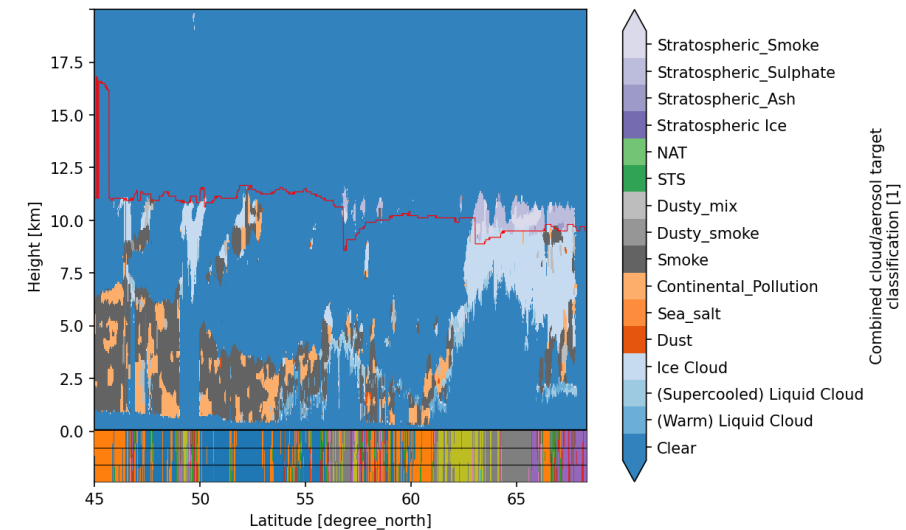
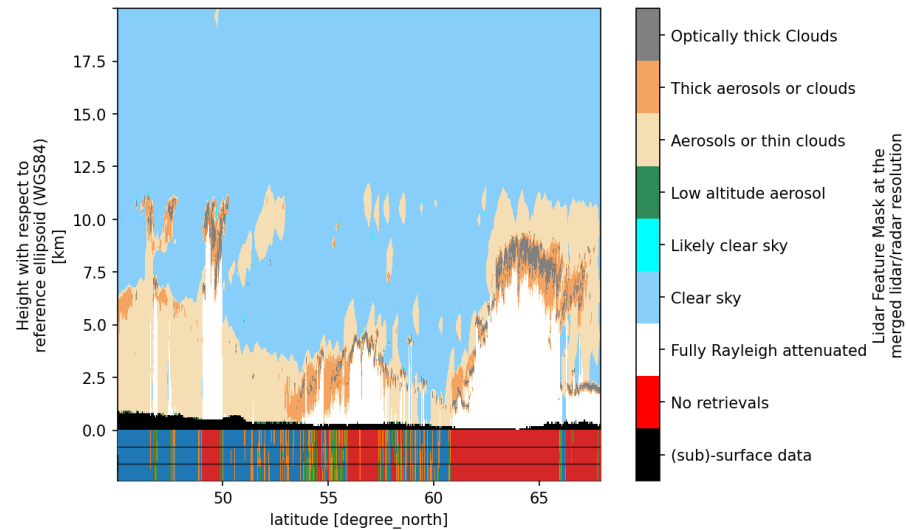
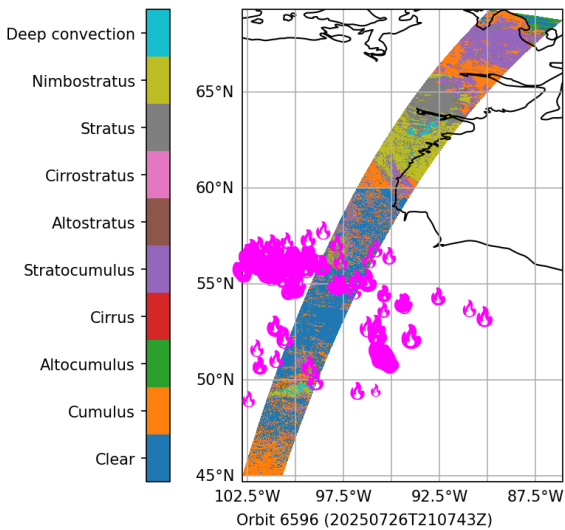
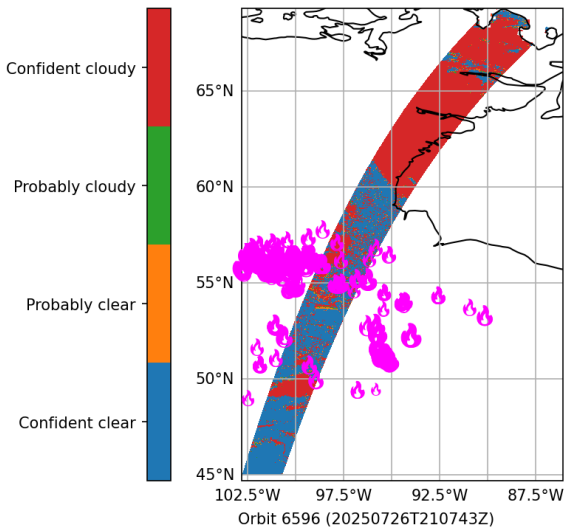
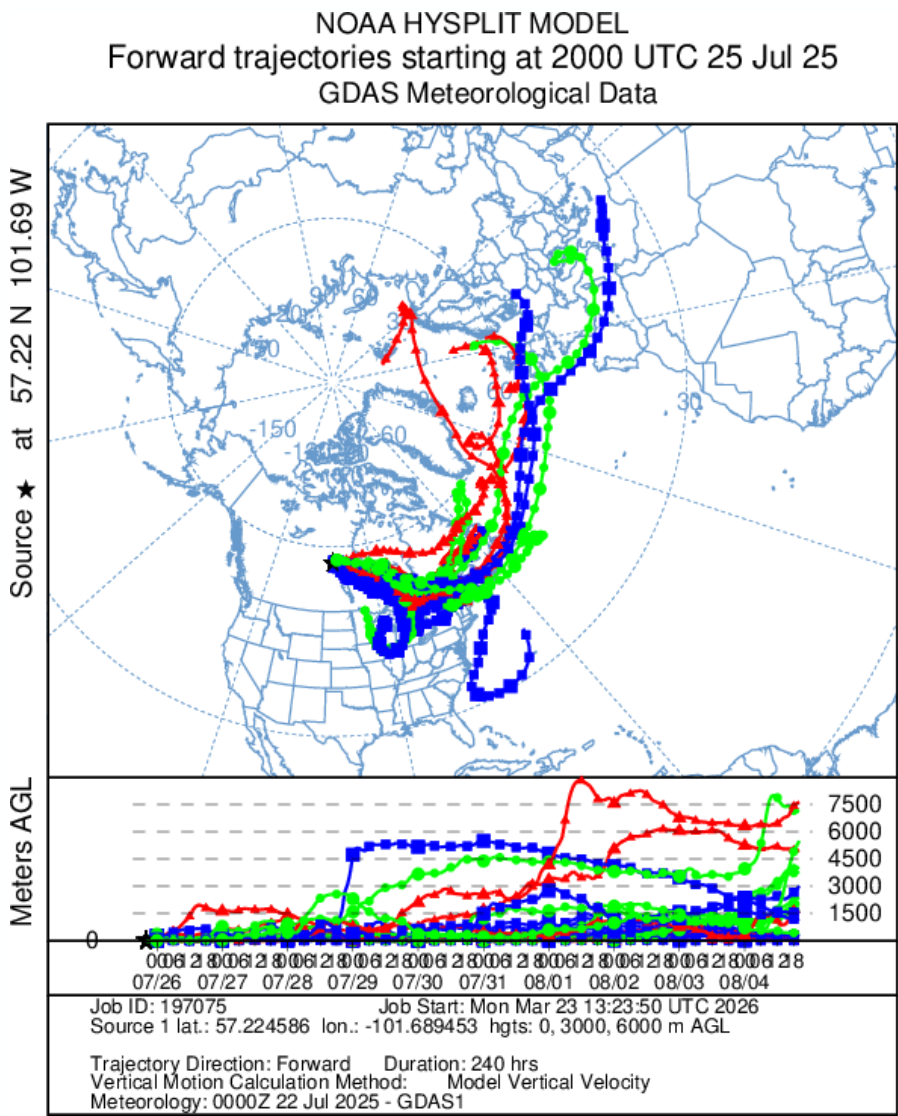
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At night, MSI cloud mask is very confident that smoke is cloud



Smoke was transported to Europe



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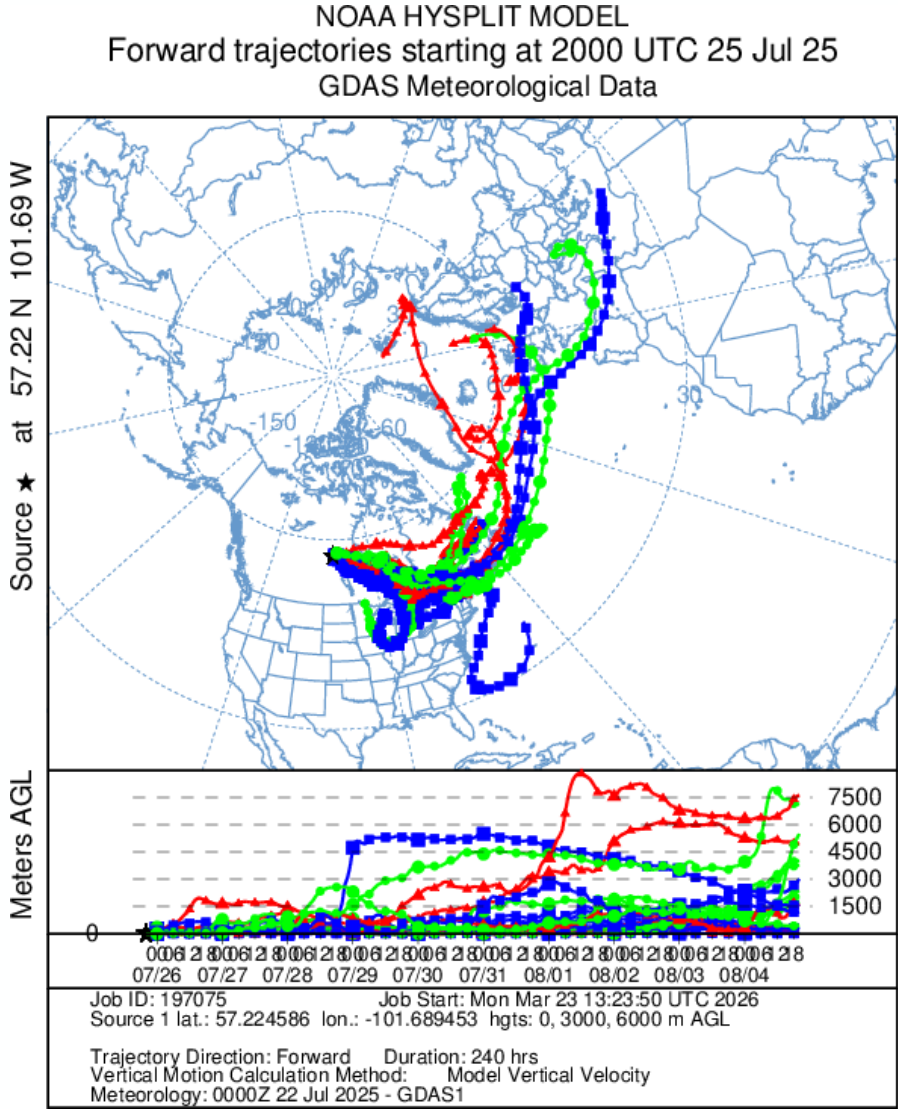
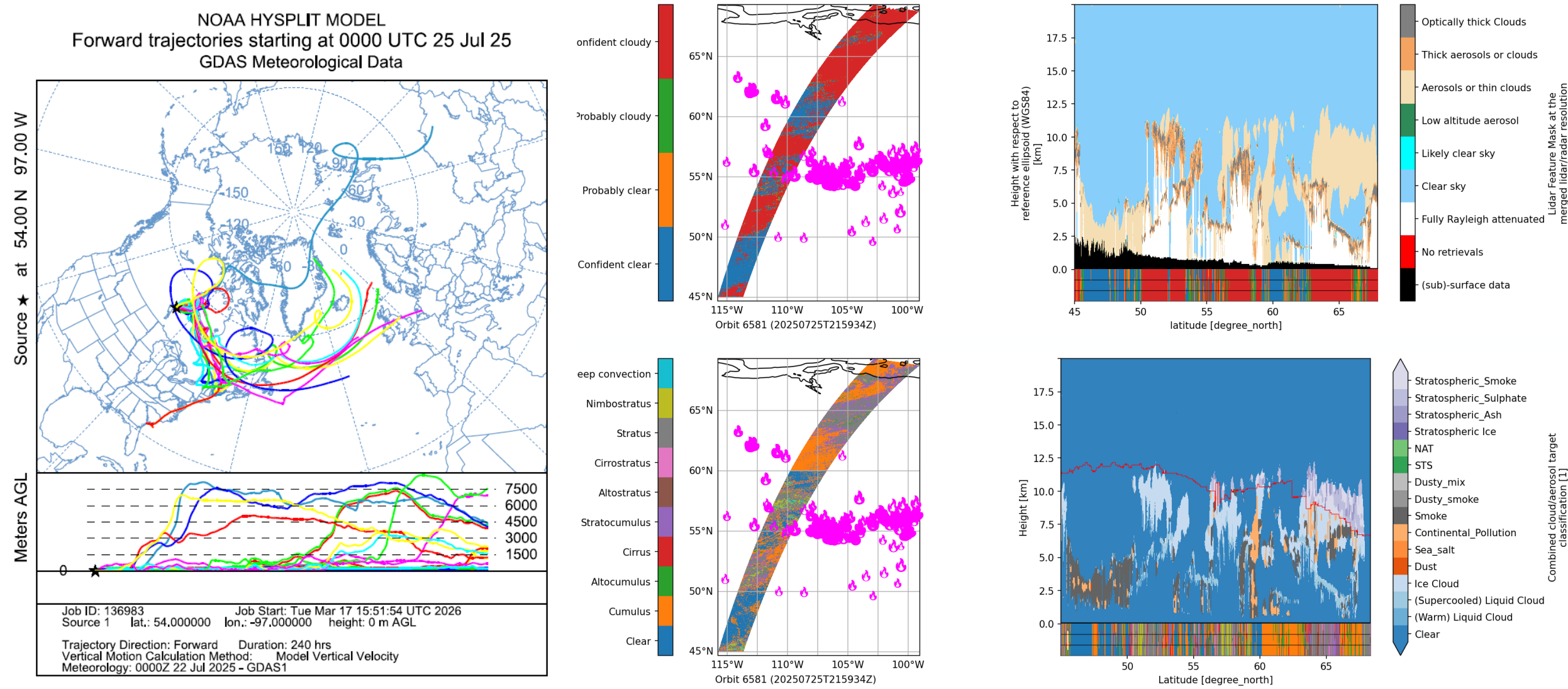
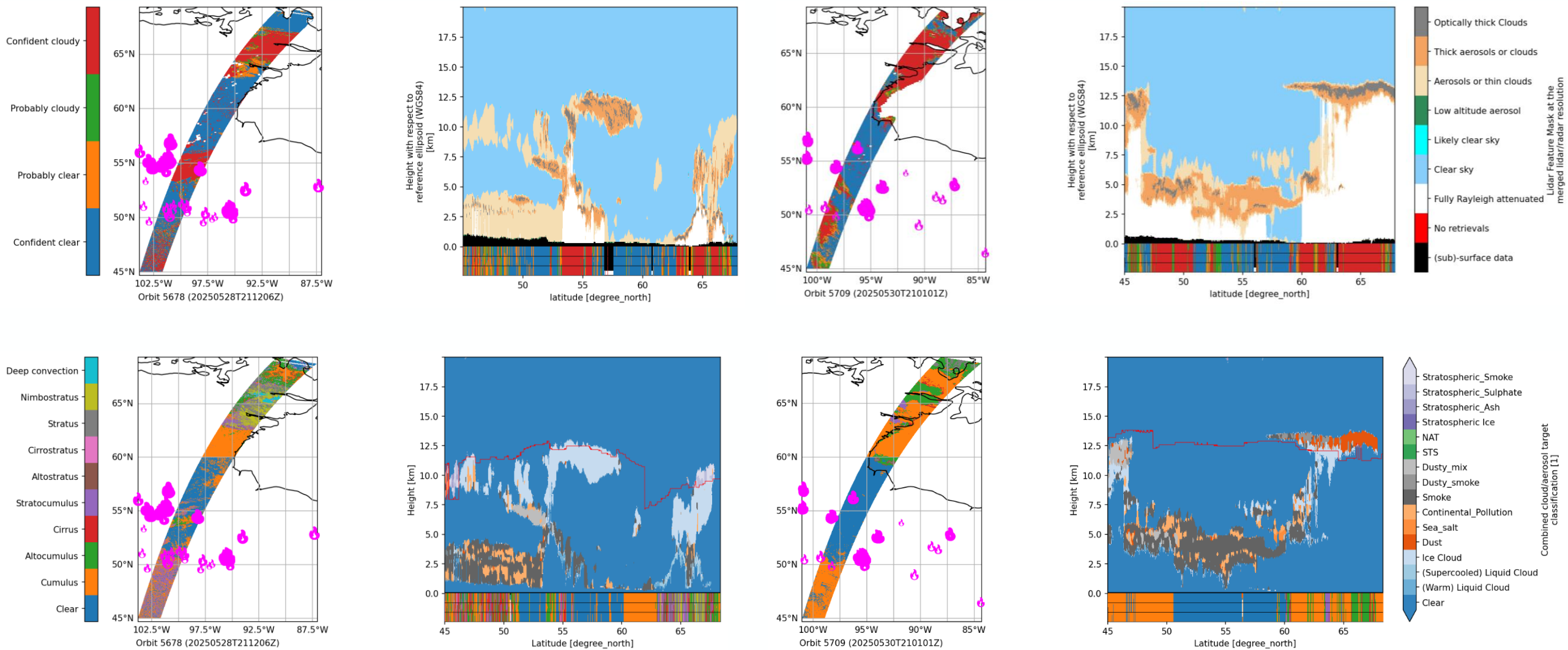


Image: Christian David @ <https://commons.wikimedia.org/w/index.php?curid=167423942>

Odd feature whereby clear sky becomes cumulus at 60°N



It works quite well sometimes



Summary



- The 2025 Canadian Wildfire season, though not the largest on record, appears to have had global impacts.
 - Smoke reached Europe
 - Substantial, numerous aerosol injections into the stratosphere
- Smoke appears to be frequently misidentified as cloud in the MSI masks, particularly at night.
 - Odd change in identification of cumulus cloud at 60° N
- ESA and JAXA products have no obvious differences.
 - Undergraduates found ESA MAAP and the JAXA hub relatively straightforward to use and could start work quickly.
 - Slight preference for JAXA's site as the quick-look plots were more intuitive and download was easier.
- While I don't currently have the time to do this properly, hopefully next year's students will!



Image: Wanmei Liang @ <https://earthobservatory.nasa.gov/images/154287/a-smoky-start-to-saskatchewan-fire-season>