

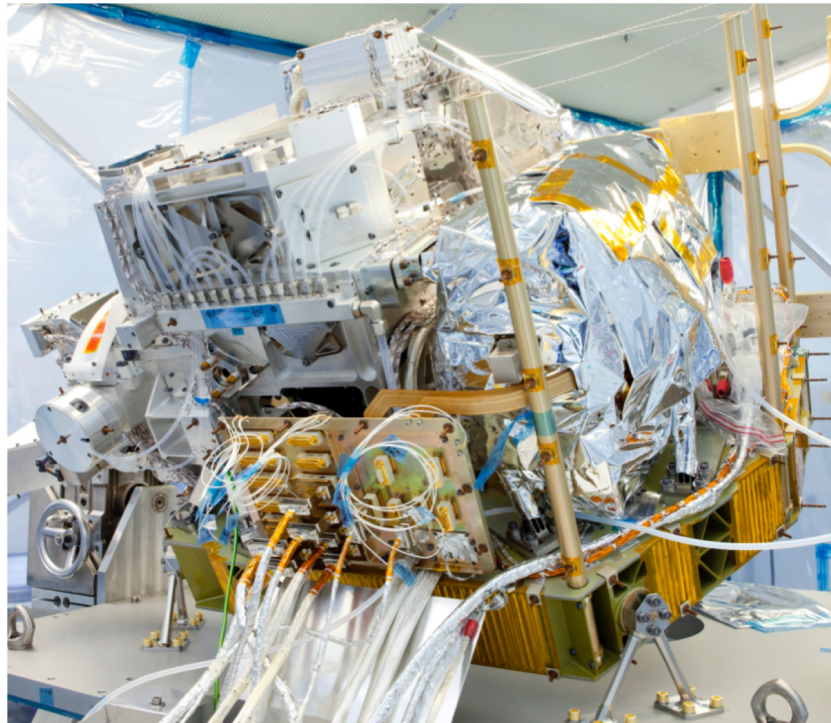
# S5P-TROPOMI Methane

Jochen Landgraf, Tobias Borsdorff, Alba Lorente, Andreas Schneider, Otto Hasekamp

# The Tropomi SWIR spectral band

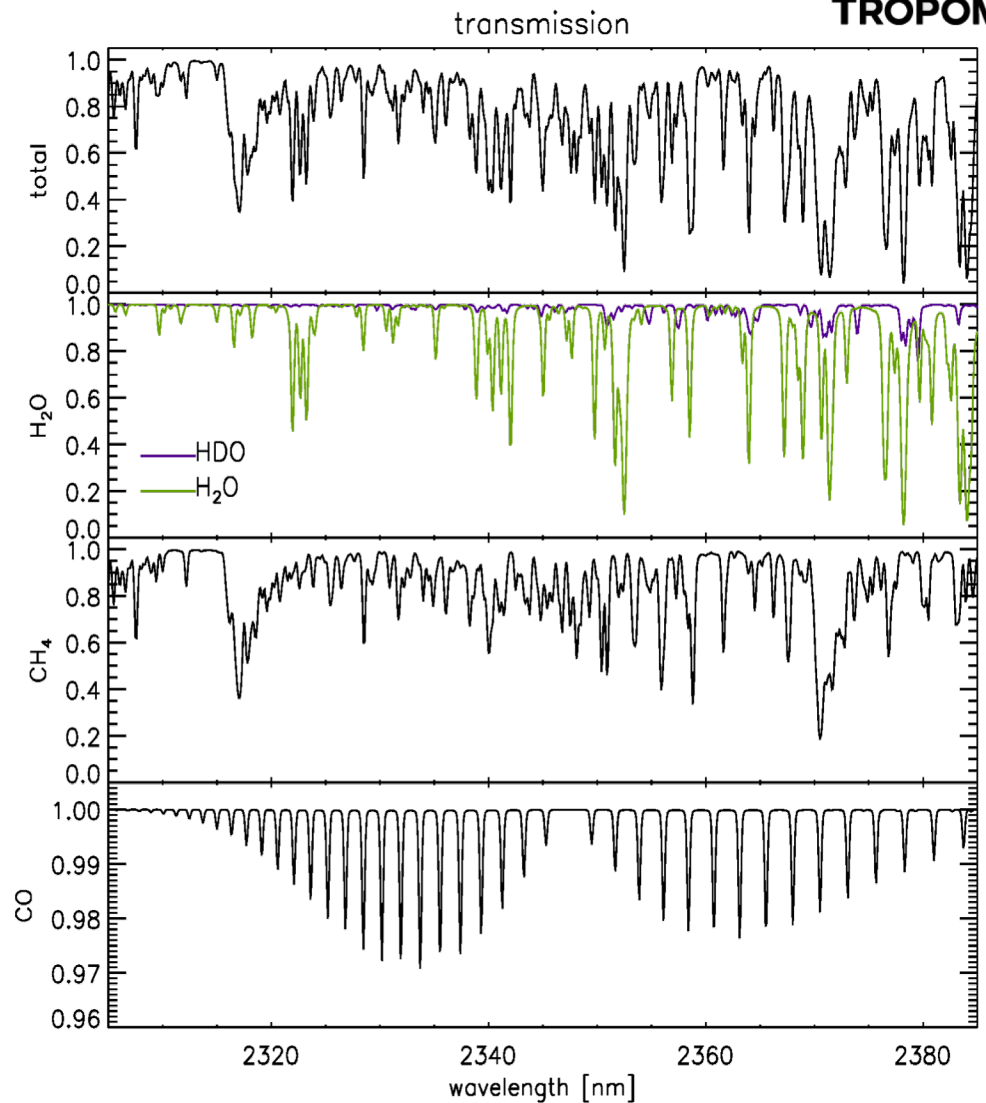


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## Quality requirement for operational data product:

	Precision [%]	Accuracy [%]
CO	10 %	15 %
CH <sub>4</sub>	1 %	1 % (bias)



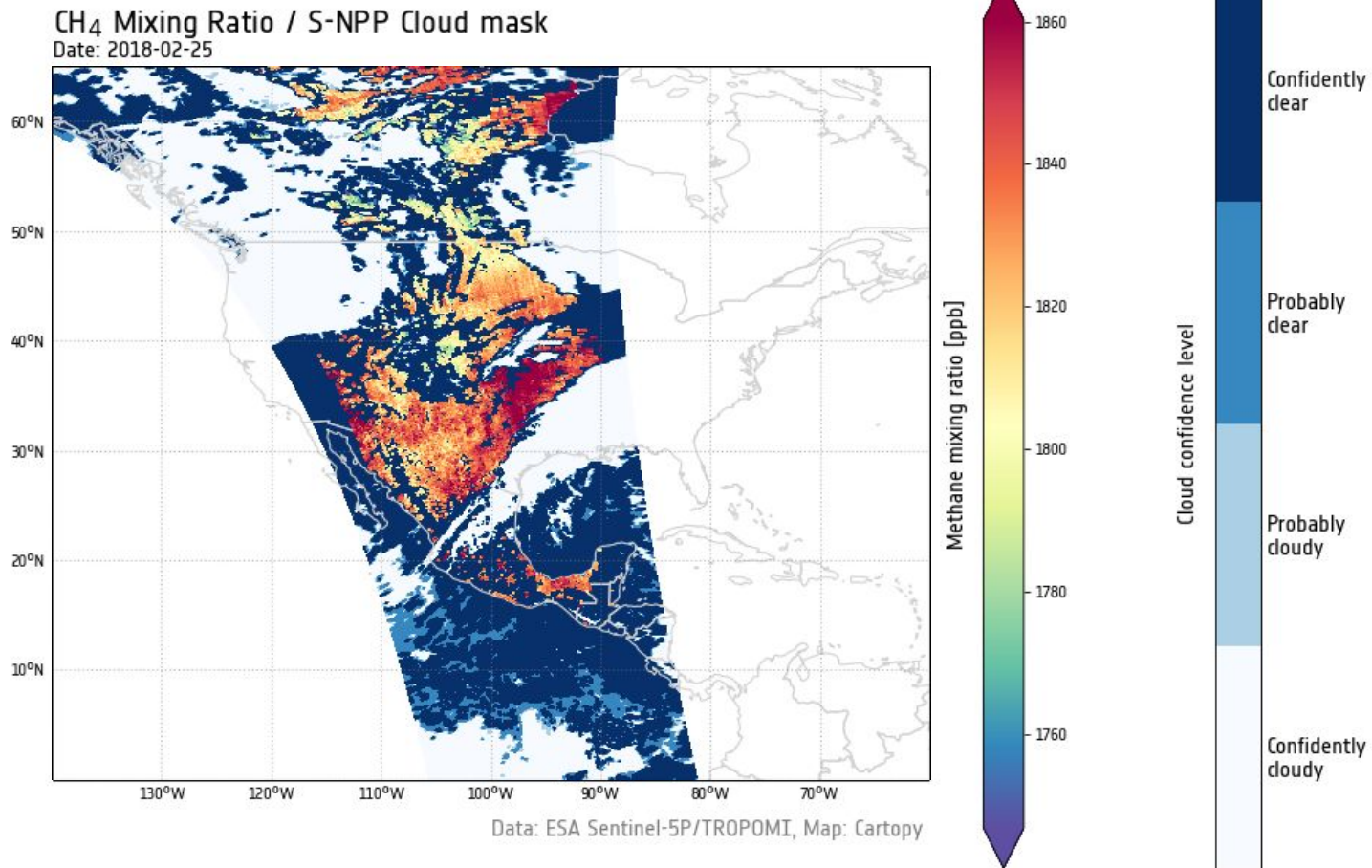


# S5P - Suomi NPP loose formation



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- Time difference within  $\leq 5$  min
- VIIRS data are used as cloud filter, TROPOMI requires 'confidently clear-sky' observations.

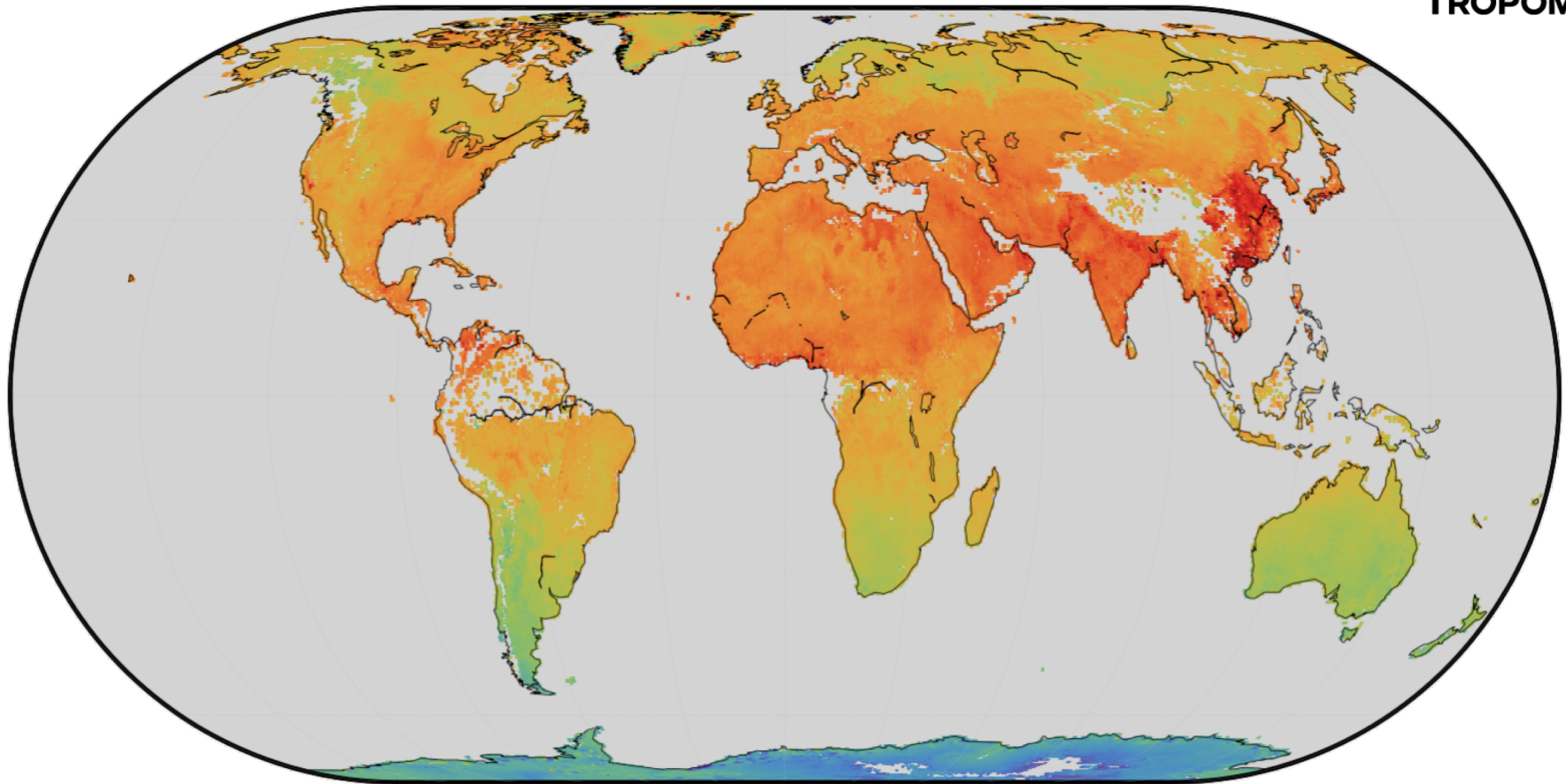


# The methane product

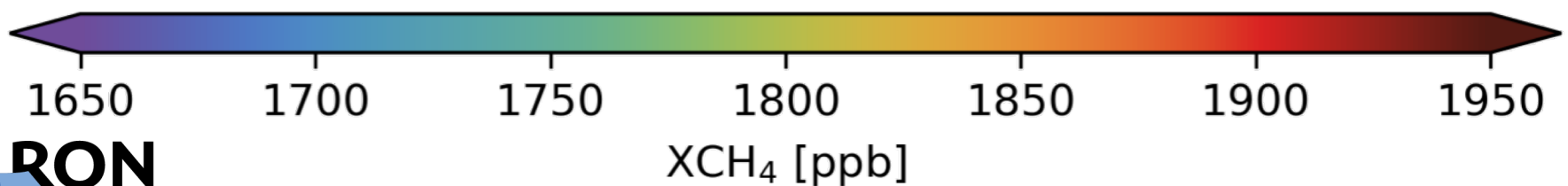


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Data release march 2019



Time range: 06.2018 - 01.2019, 0.5° x 0.5° grid

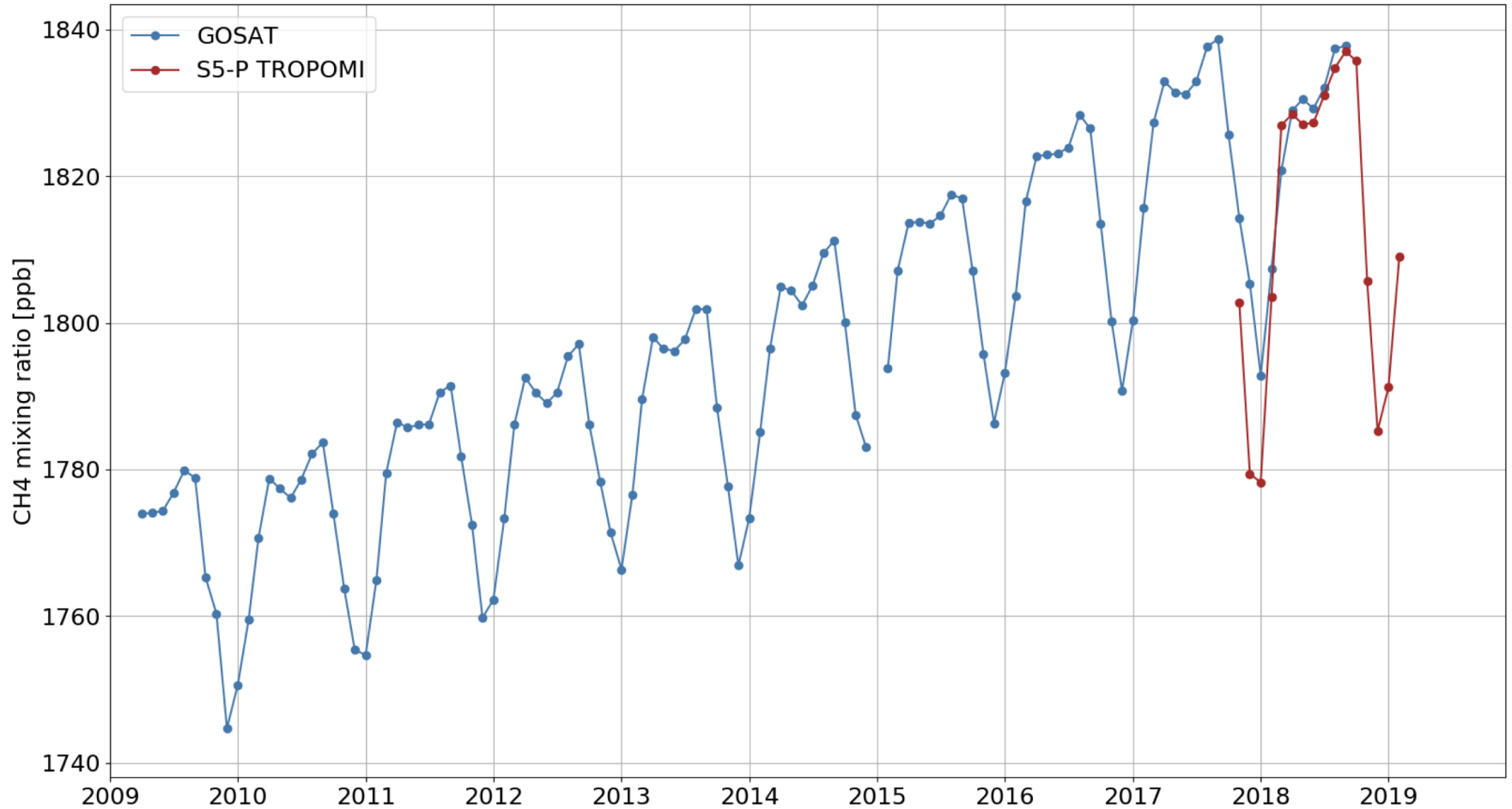


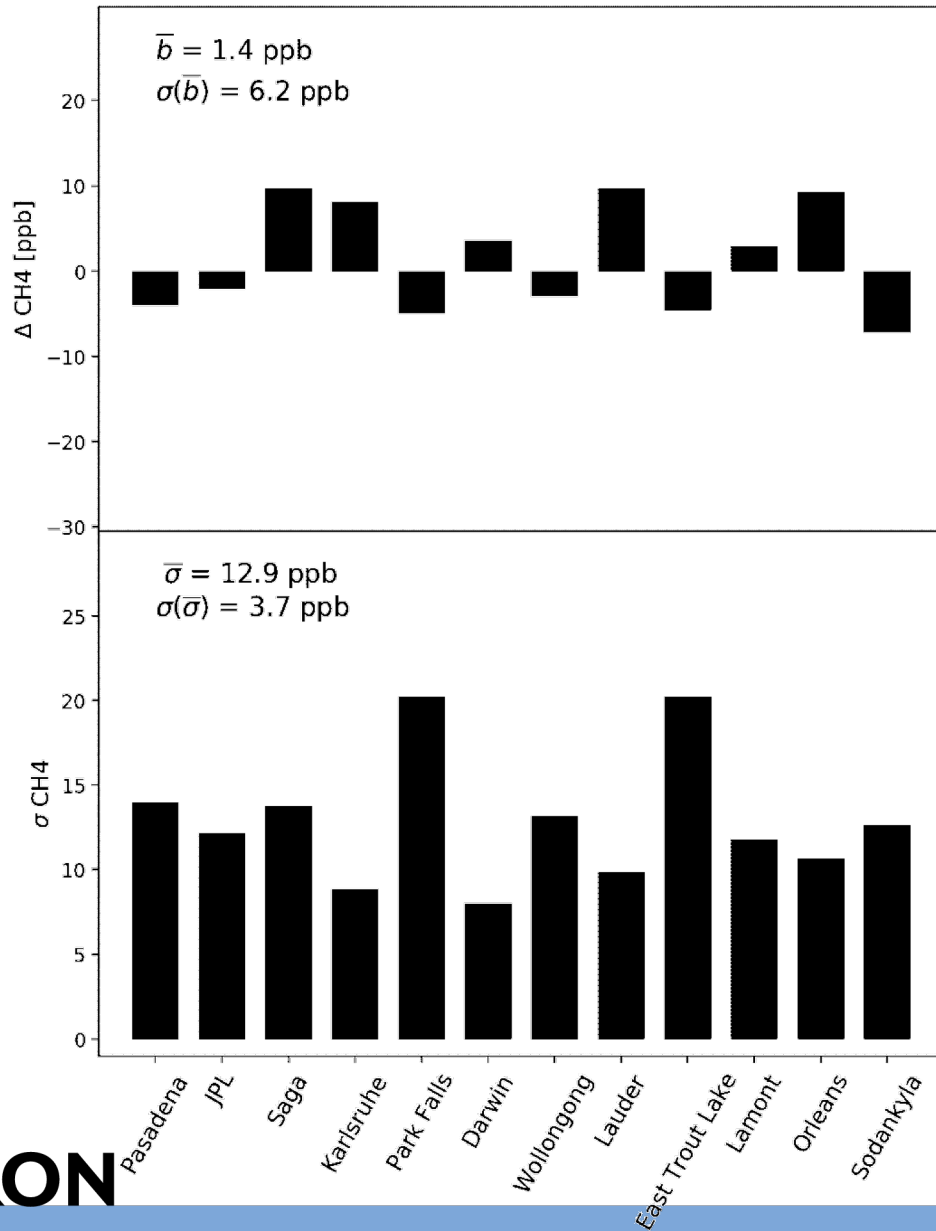
# The methane product



Data release march 2019

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Mean bias:  
 1.4 ppb (0.07 %)  
 Station-to-station bias  
 6.2 ppb (0.34 %)  
 Mean std. dev.  
 12.9 ppb (0.7 %)

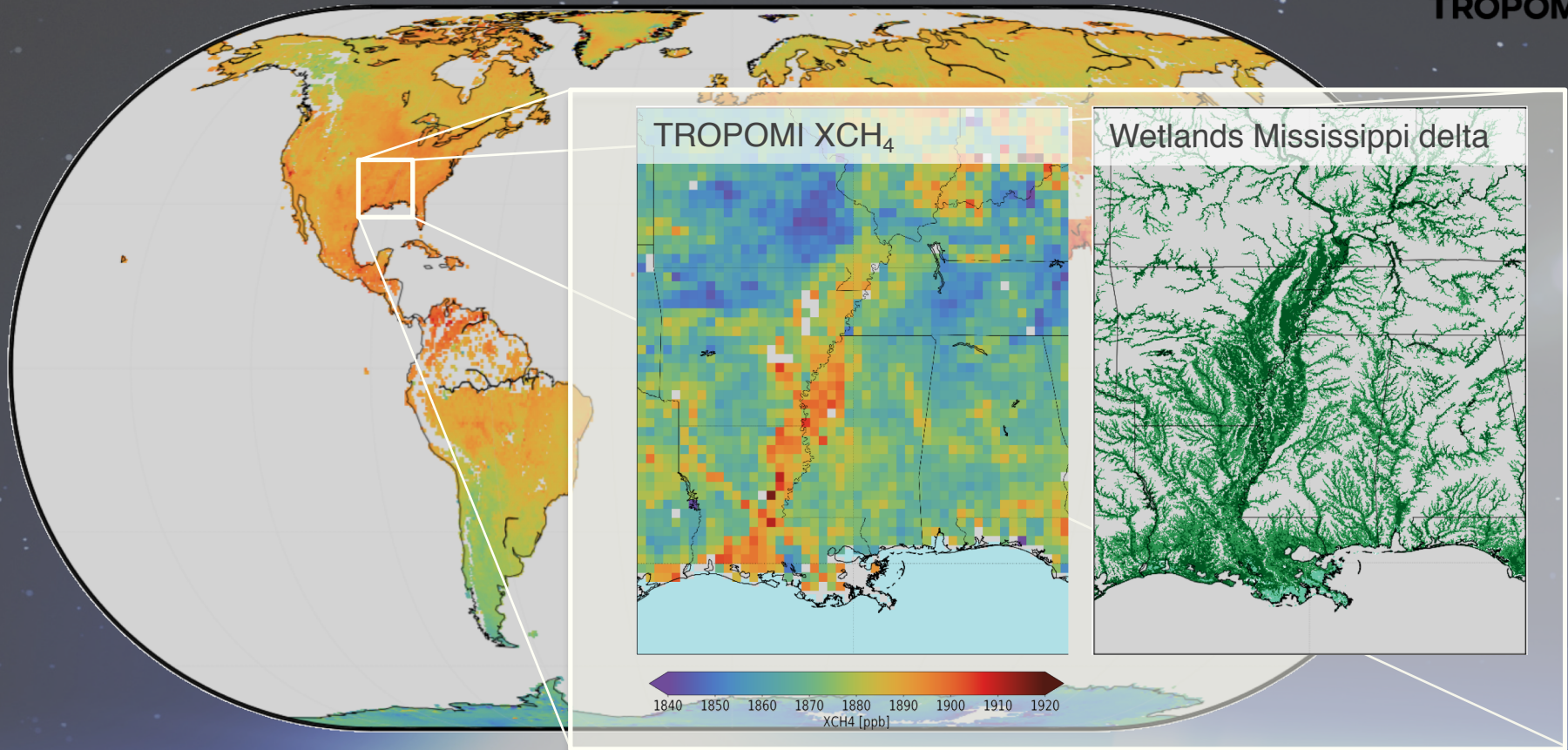
CH4 product well within the S5P requirement.



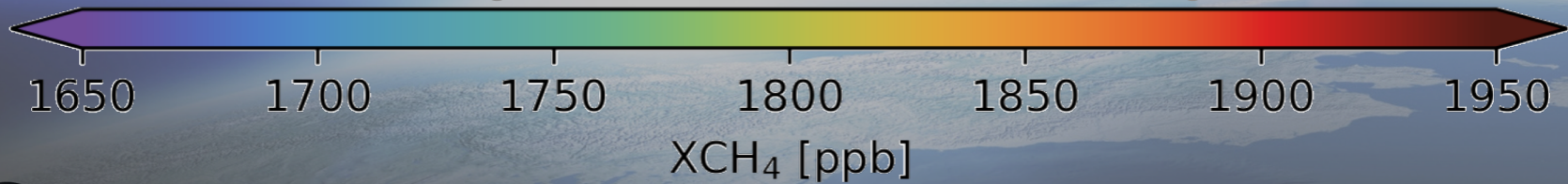
# Wetland emissions seen by TROPOMI



TROPOMI

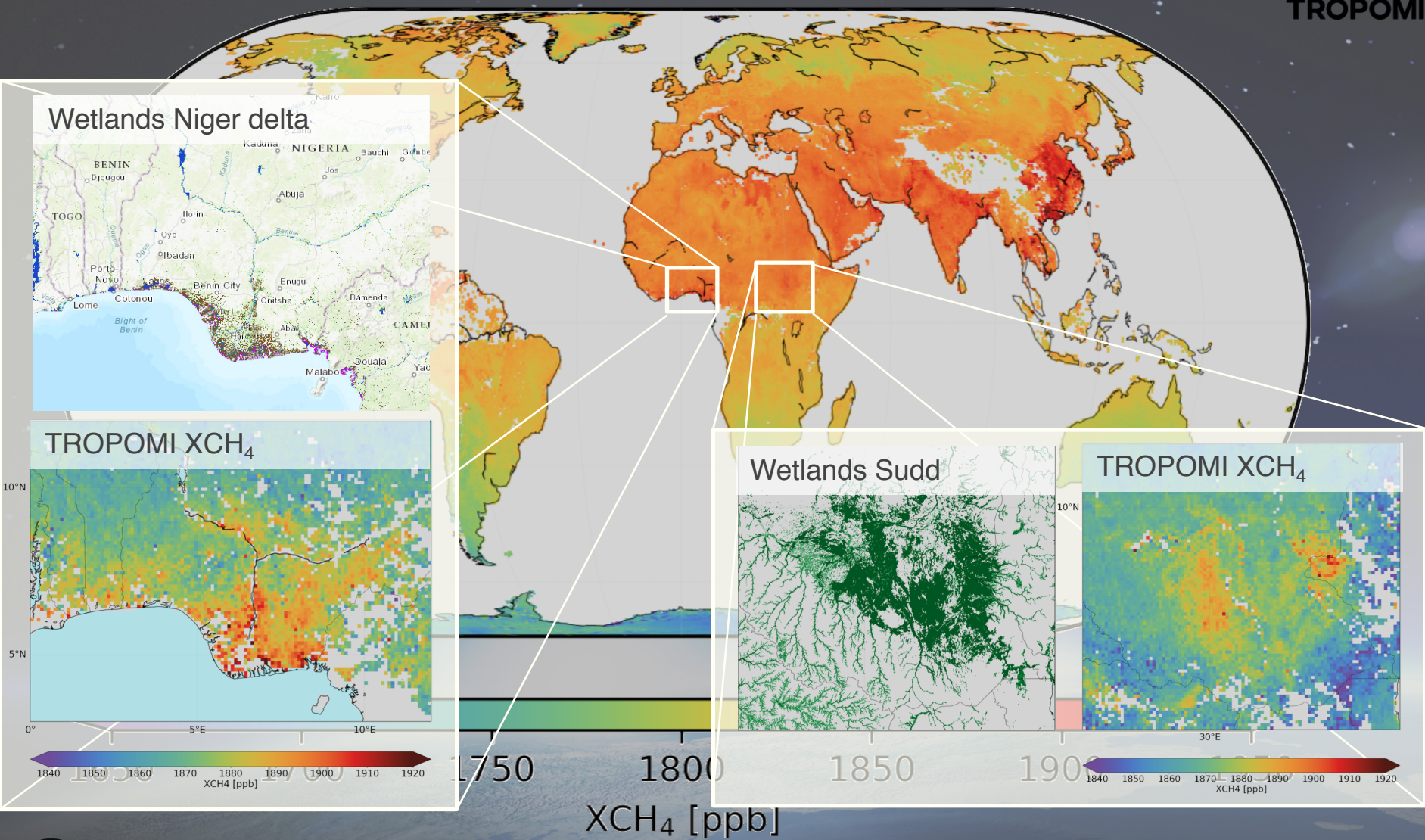


Time range: 06.2018 - 01.2019, 0.5° x 0.5° grid



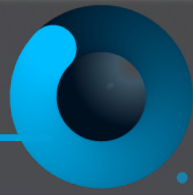


# Wetland emission seen by TROPOMI

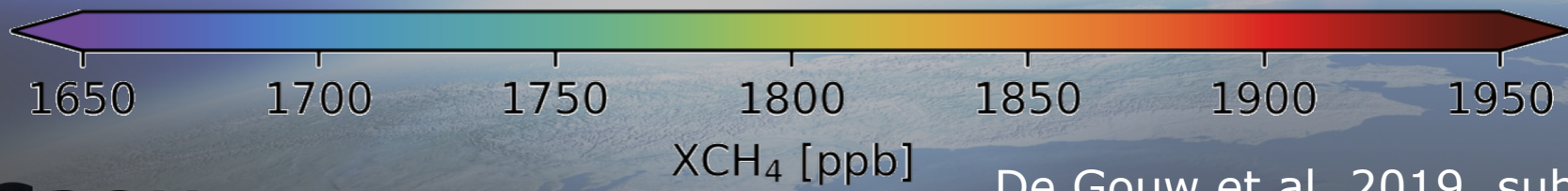
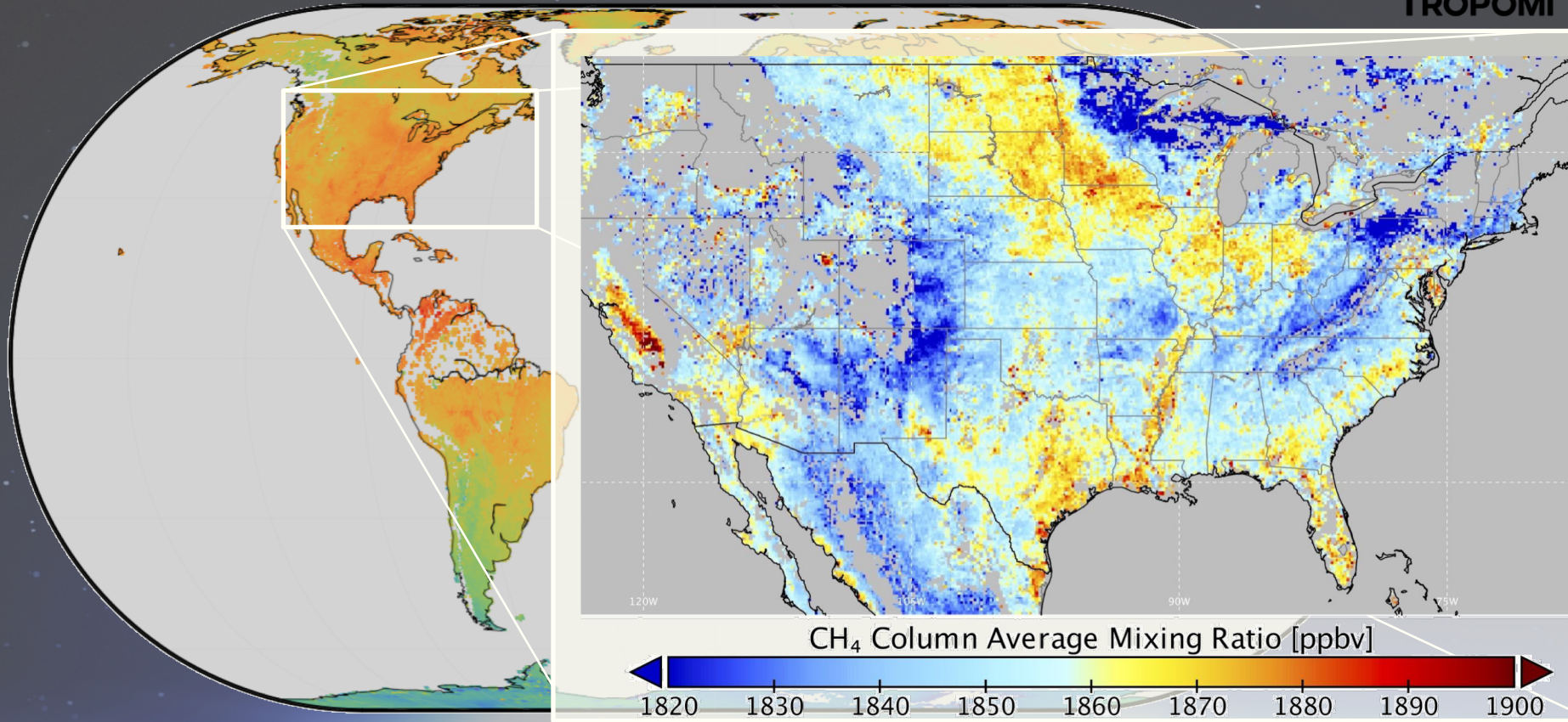




# Methane from Oil and Gas Production

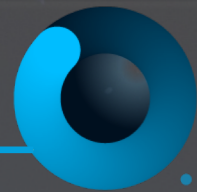


TROPOMI



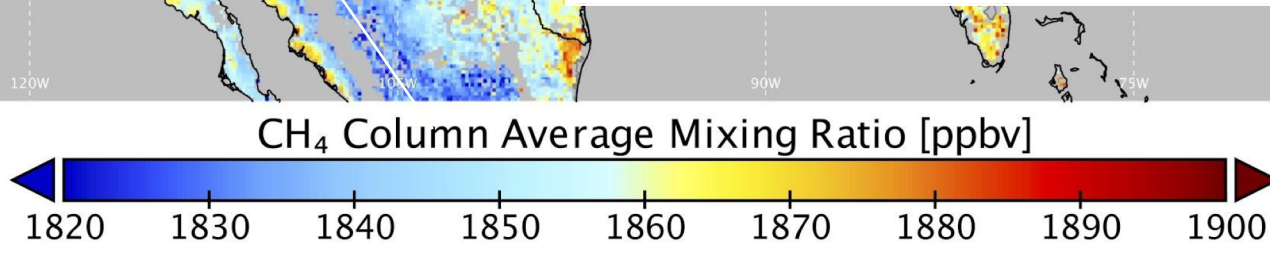
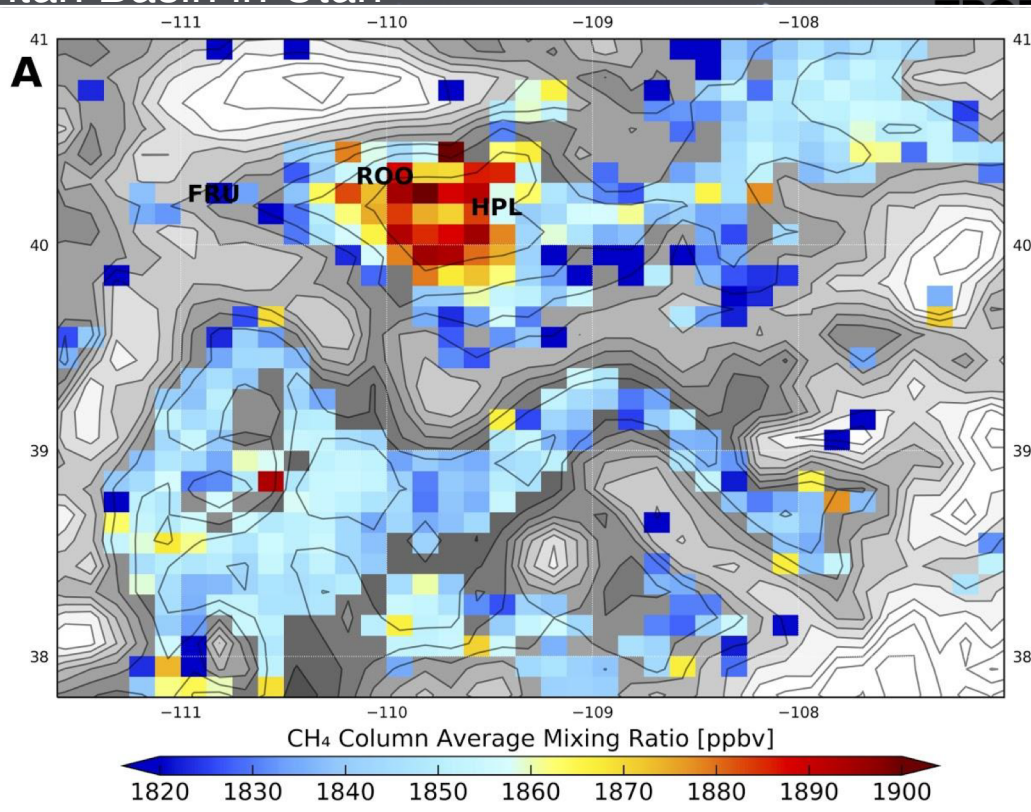
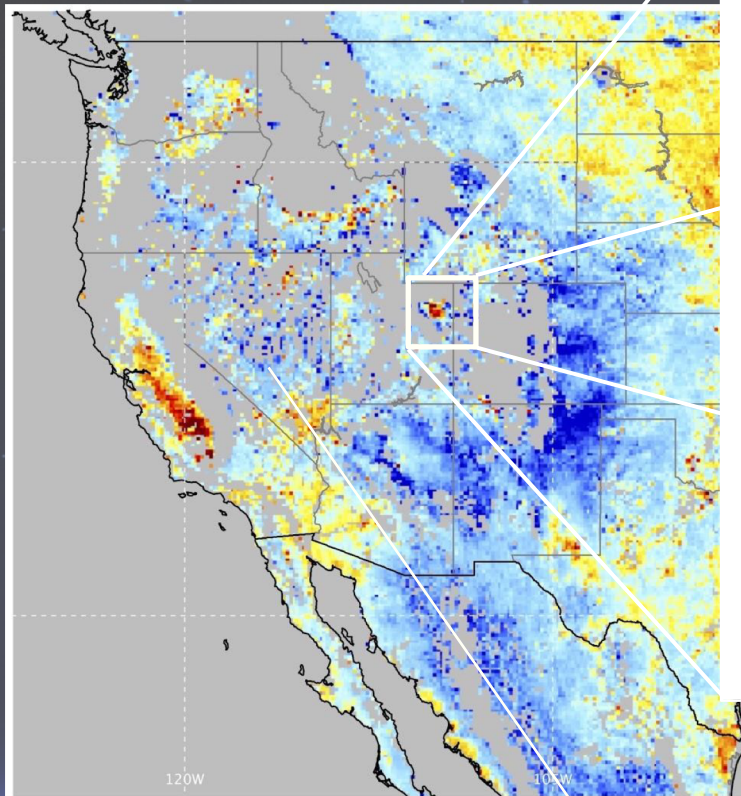


# Methane from Oil and Gas Production



## Uintah Basin in Utah

December 20

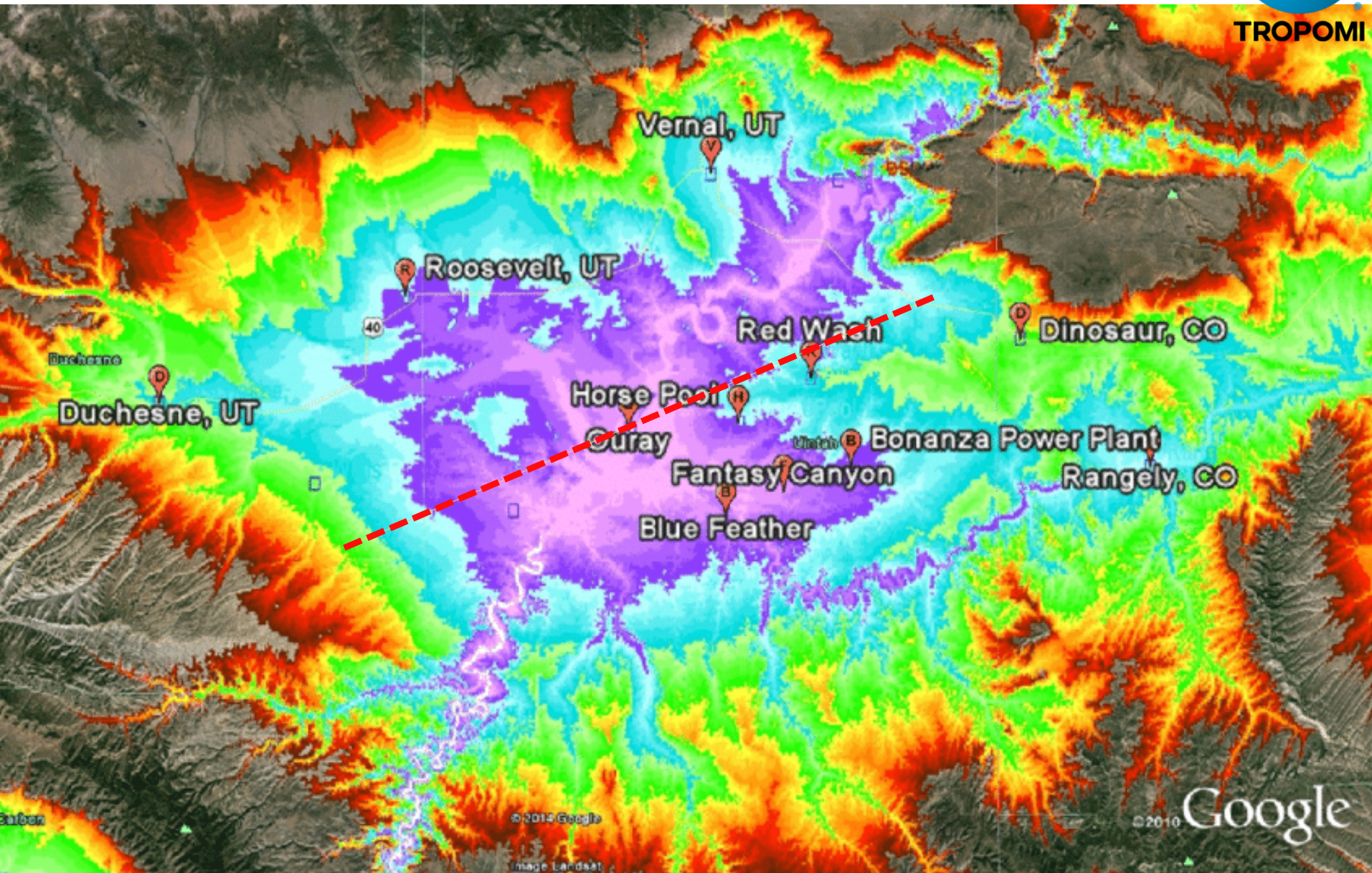




# Methane from Oil and Gas Production



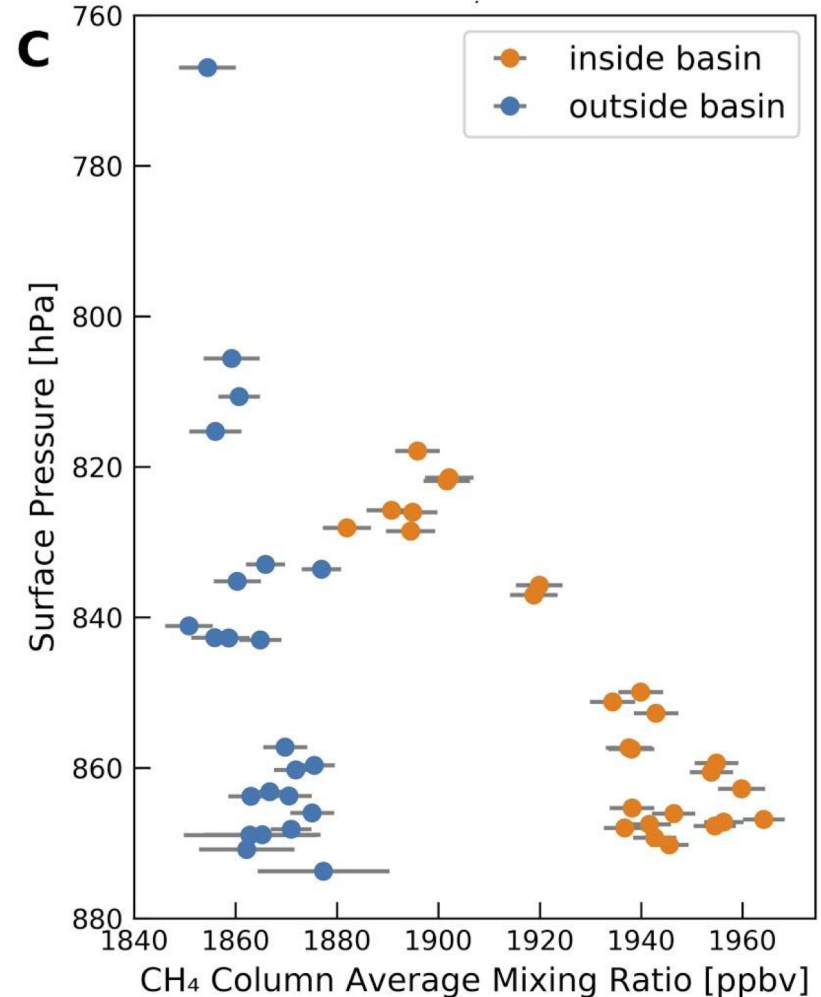
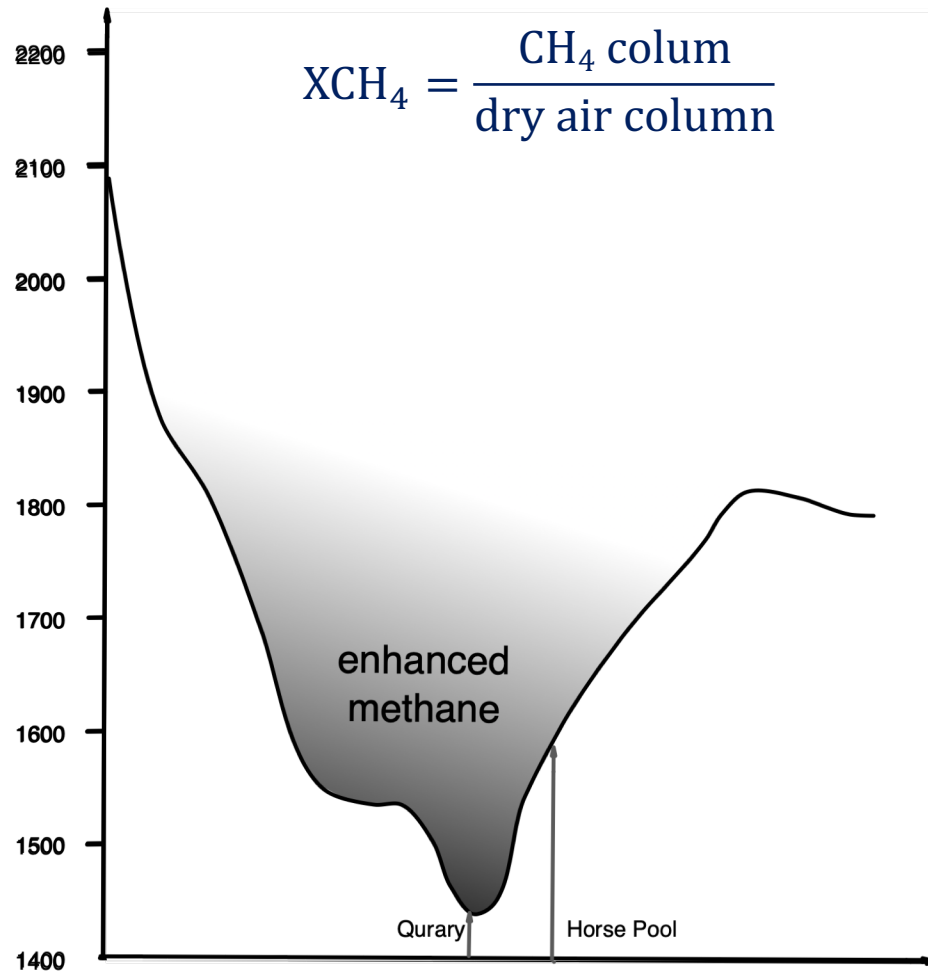
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# Methane from Oil and Gas Production



$$X_{CH_4} = \frac{CH_4 \text{ column}}{\text{dry air column}}$$



de Gouw et al., 2019, submitted

- The S5P methane product fulfils all mission requirement.
- Many new types of applications are possible due to the spatial and temporal coverage in combination with the high spatial resolution of TROPOMI.