OCO-2 and OCO-3 Validation Strategy and Needs

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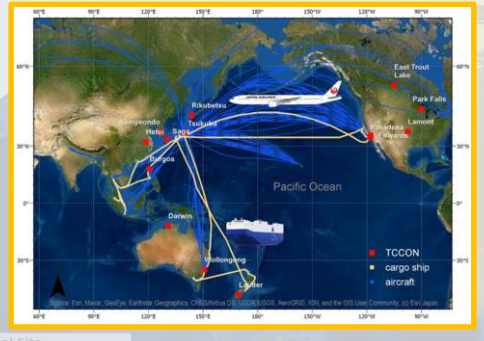
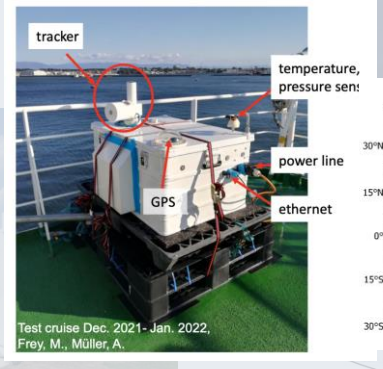
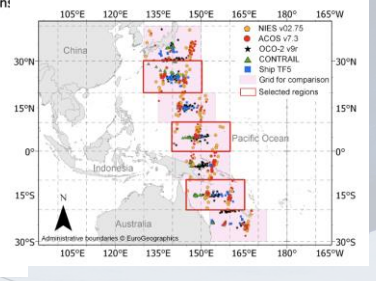
OCO Validation Strategy



Ocean/Coast

Müller et al.



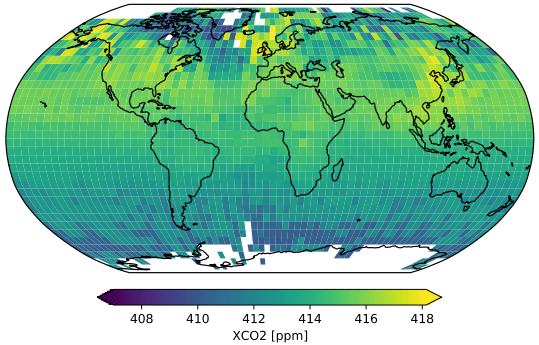


(Sub)Tropics

McKain et al.

TCCON as a Transfer Standard

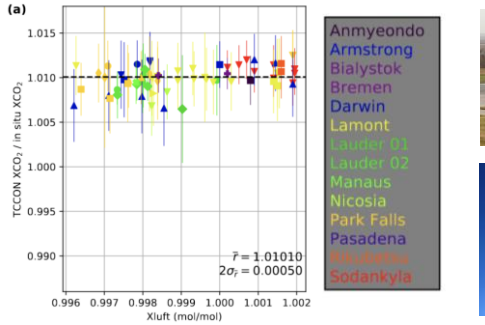
1



2

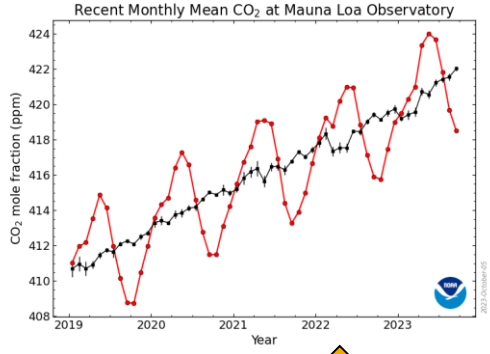
TCCON
total carbon column observing network

3



WMO

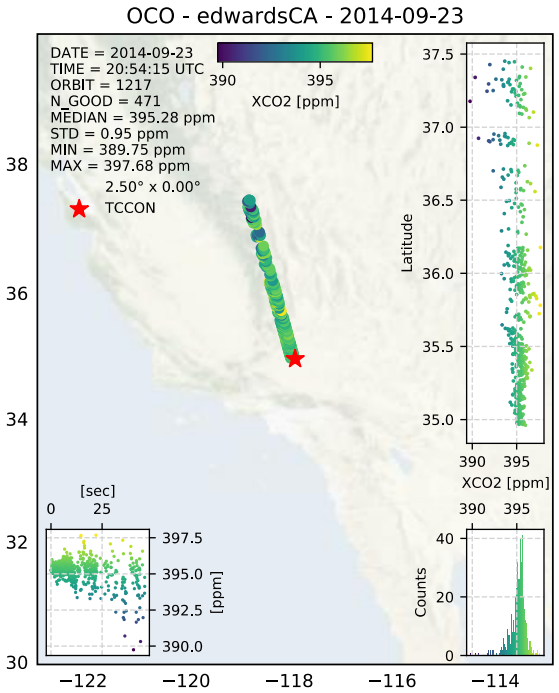
4



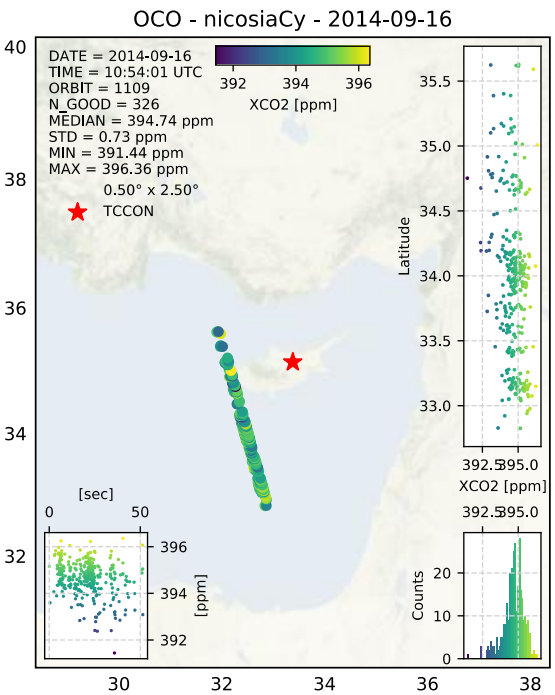
WMO

Sampling Collocated TCCON Data

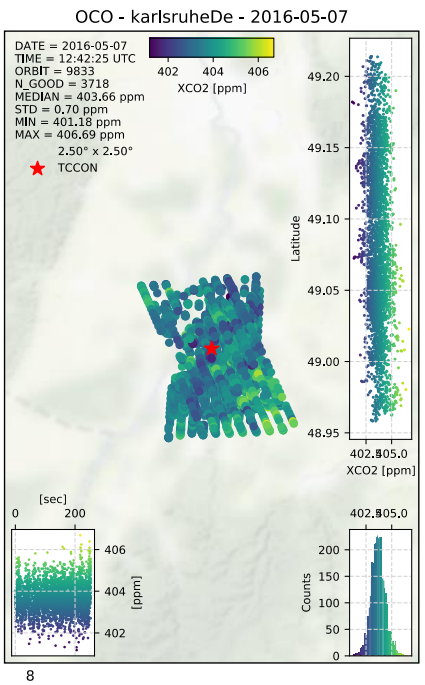
Land



Ocean

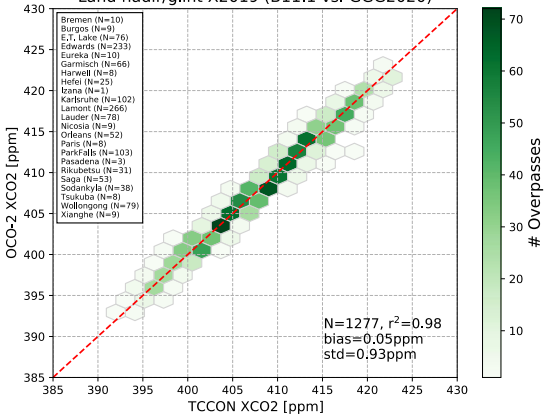


Target

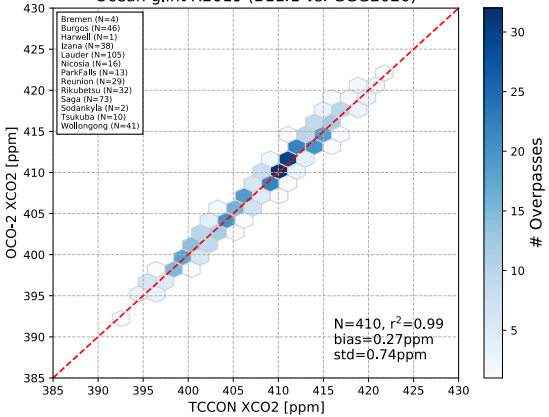


OCO-2 Validation against TCCON GGG2020

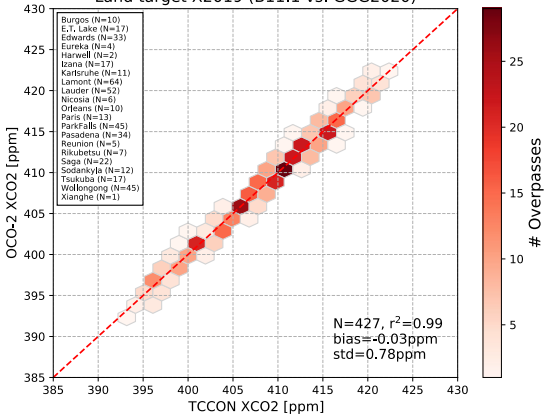
Land Nadir/Glint



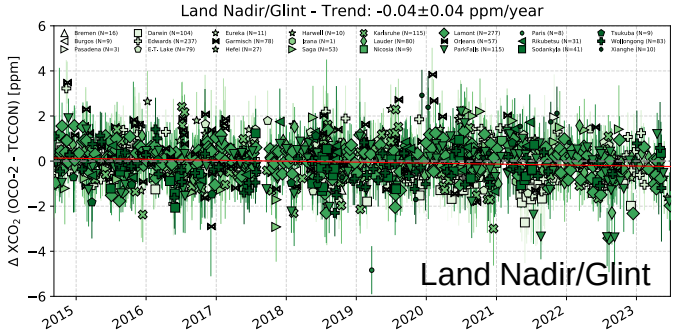
Ocean Glint



Land Target

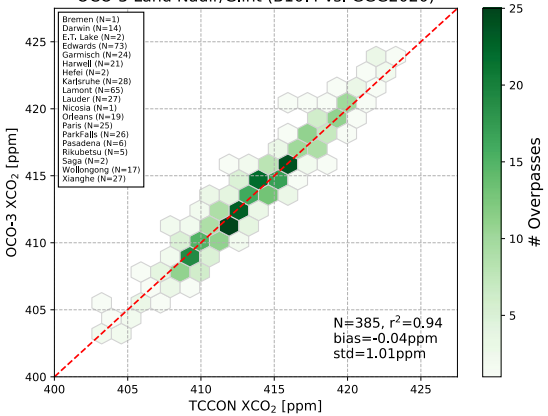


Time Dependence

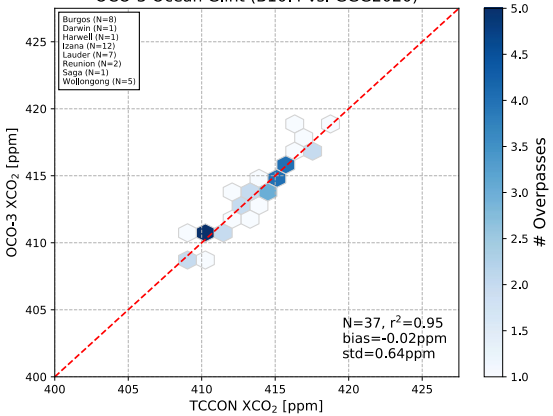


OCO-3 Validation against TCCON GGG2020

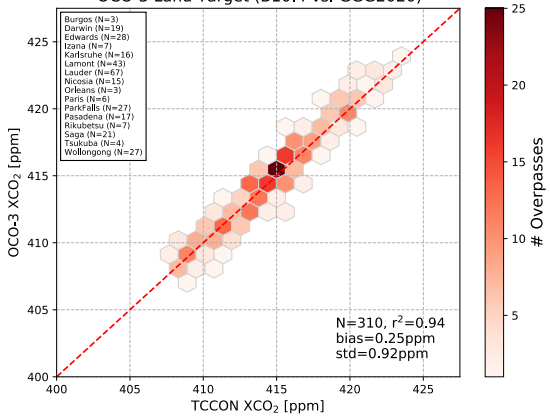
Land Nadir/Glint



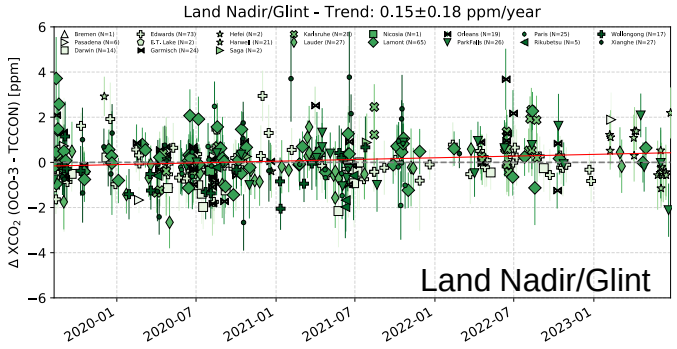
Ocean Glint

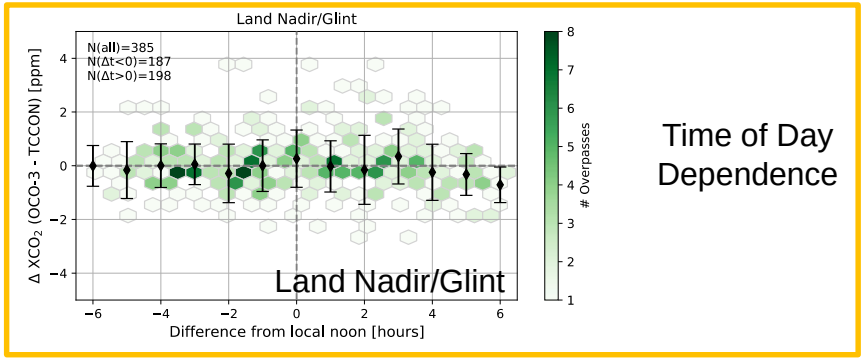


Land Target



Time Dependence





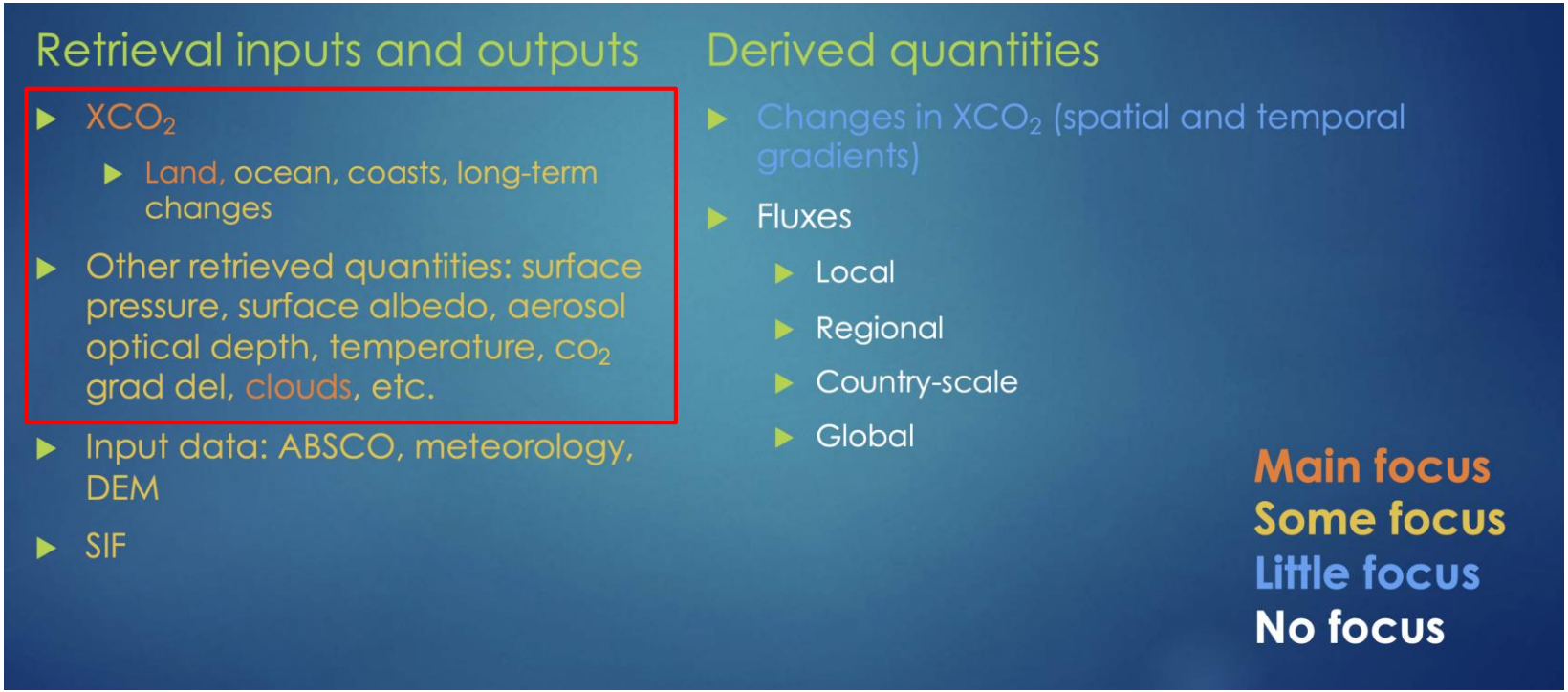
Time of Day Dependence

Lessons Learned / Validation Needs

- Preferred stations/locations: coastal sites, high albedo sites, remote vs. urban, under-represented areas over land (tropics, high-northern latitudes), ocean/island sites (ocean glint retrievals have more stringent accuracy requirements than land retrievals)
- Towards “Super Sites”? Collocation of tiered observing strategy for GHG (in situ, AirCores, total column), aerosol, cloud, P, T, H2O measurements?
- Expansion of COCCON? Need to better define combining different ground-based FTS-based validation sources (e.g., TCCON + COCCON).
- How to sustain continued support to networks? Personnel? New sites? Spare parts (LASER)? Travel standard? AirCore network?
- Uncertainty budget needed for ground-based networks.

We cannot always get the overpass / obs. mode / revisit frequency we want!

Lessons Learned / Validation Needs



Summary from the "*Validation Needs*" Session at the OCO Science Team meeting in March 2023
Credit: D. Wunch (U. Toronto), M. Kiel (JPL)

QUESTIONS?

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