

International methane product standards

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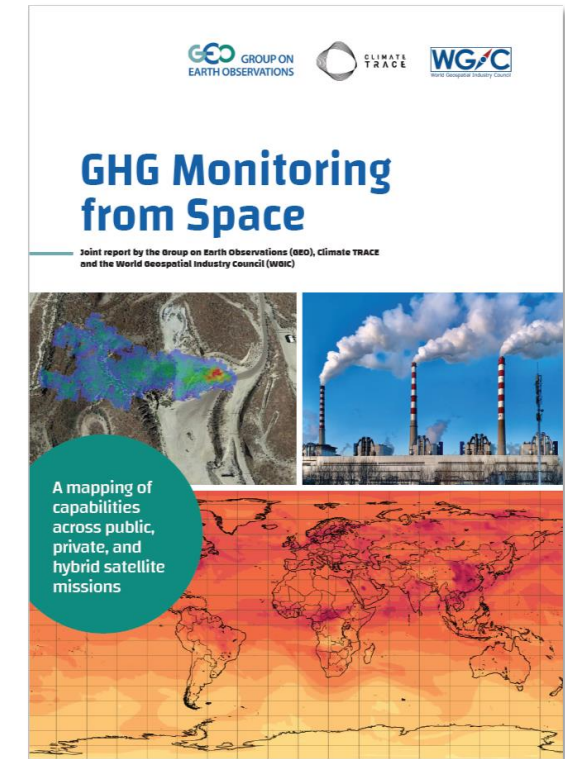
24/10/2023

CEOS AC-VC-19 Tu-34

Policy & commercial response to enable climate change action

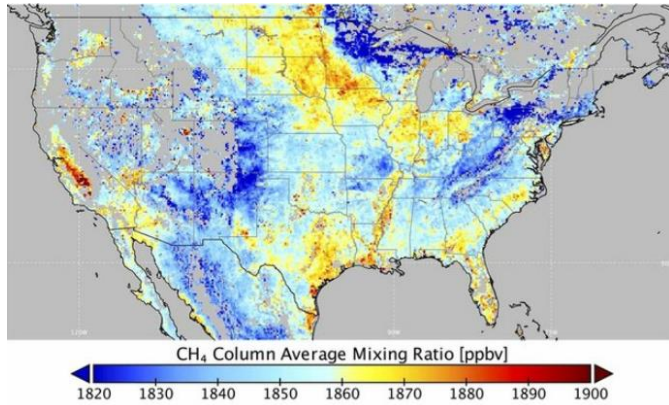


TCFD

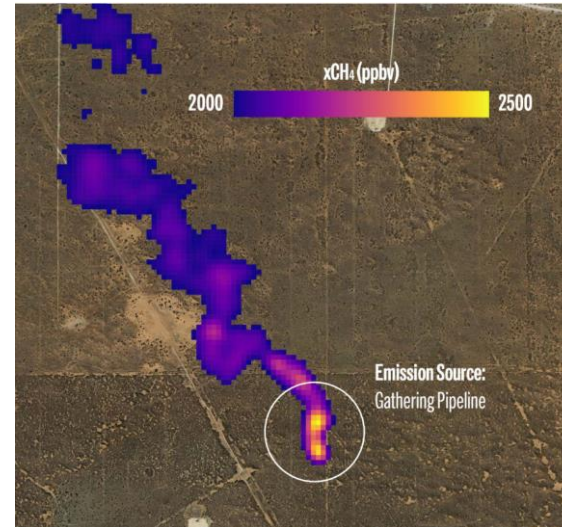


- New and refined regulatory drivers form the basis of a business model
- Rapidly growing private satellite/product sector provide urgency for independent quality assurance

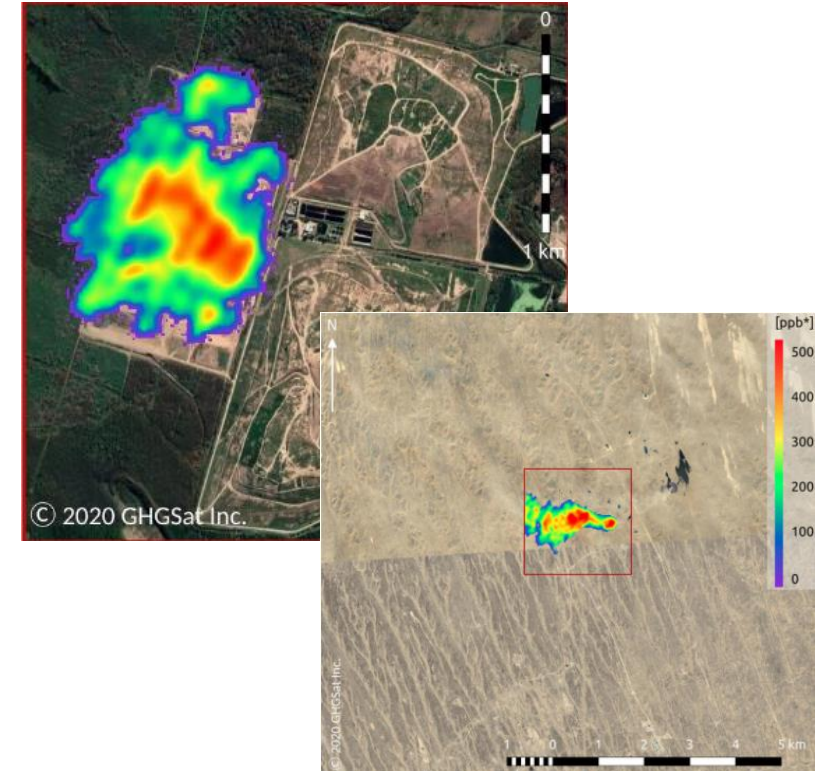
Methane standards suitable for all scales



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- Need to have standards across the spatial scales that allow synthesis and interoperability between sensors and applications

Transparency & traceability from sensor counts to reported emissions

Level 1 spectra / bands

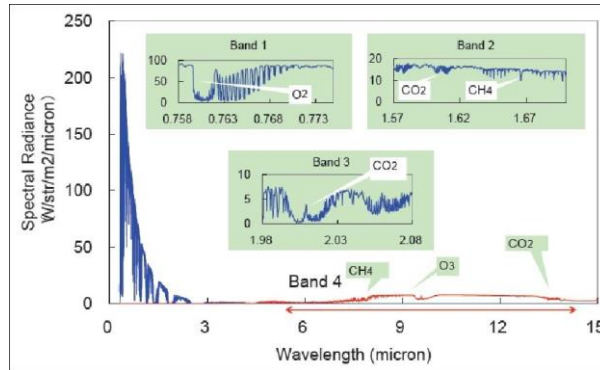


Image credit: JAXA

Level 2 concentrations

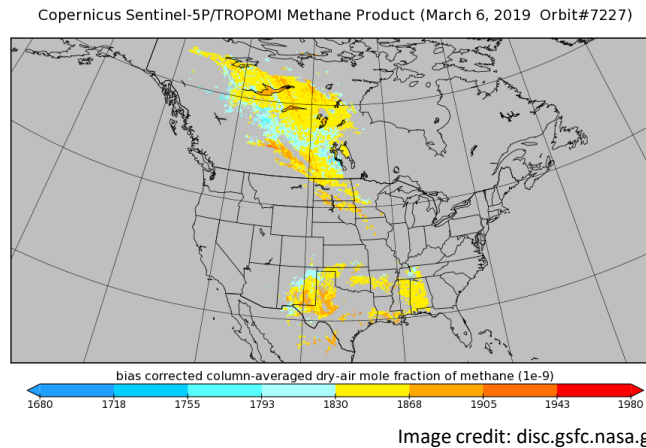


Image credit: disc.gsfc.nasa.gov

Level 4 flux & emission rates

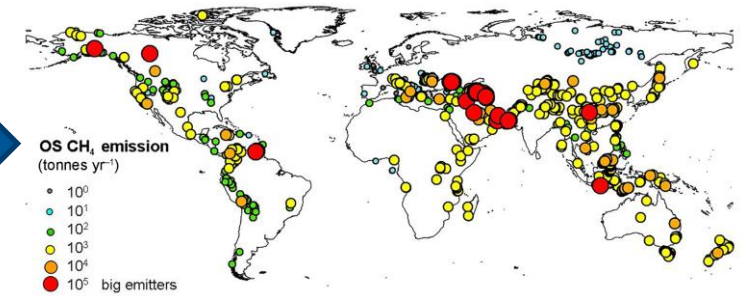
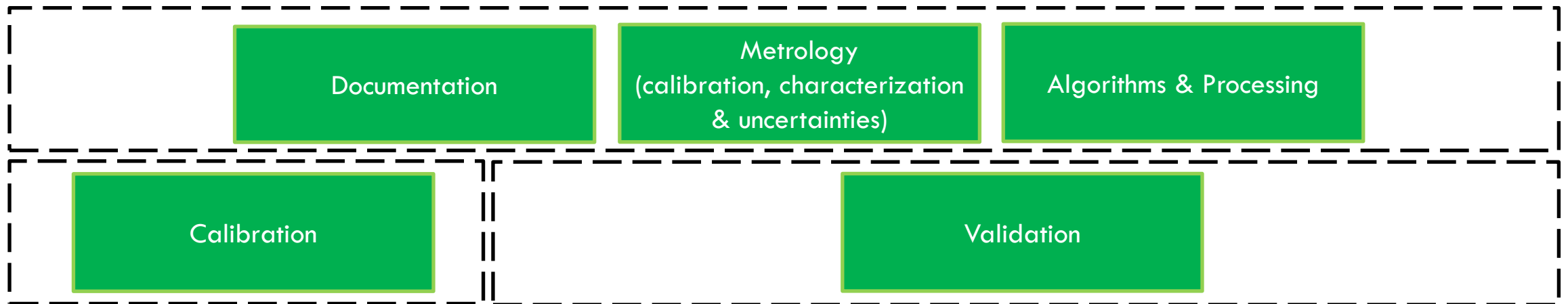


Image credit: 10.5194/essd-11-1-2019

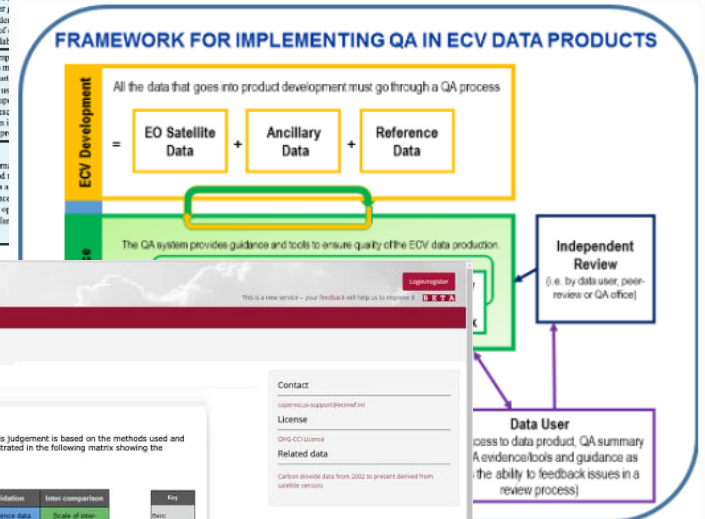


Adopting established quality assured principles & frameworks

QA4E Principle

“It is critical that data and derived products are easily accessible in an open manner and have associated with them an indicator of their quality, traceable to reference standards (preferably SI), to enable users to assess the suitability for their application (i.e. its fitness for purpose).”

Maturity	SOFTWARE READINESS	METADATA	USER DOCUMENTATION	UNCERTAINTY CHARACTERISATION	PUBLIC ACCESS, FEEDBACK, UPDATE	USAGE
1	Conceptual development	None	Limited scientific description of the methodology available from PI	None	Restricted availability from PI	None
2	Research grade code	Research grade	Comprehensive scientific description of the methodology, report on limited validation, and limited product user guide available from PI; paper on methodology is submitted for peer-review	Standard uncertainty nomenclature is identified or defined; limited validation done; limited information on uncertainty available	Data available from PI, feedback through scientific exchange, irregular updates by PI	Research: Benefits for applications identified; DSS: Potential benefits identified
3	Research code with partially applied standards; code contains header and comments, and a README file; PI affirms portability, numerical reproducibility and no security problems	Standards defined or identified; the data set and extract discovery metadata	Score 2 + paper on methodology published; comprehensive validation report available from PI and a paper on validation is submitted; comprehensive user guide is available from PI; limited description of operations concept available from PI	Score 2 + standard nomenclature applied; validation extended to full product data coverage; comprehensive information on uncertainty available; methods for automated monitoring defined	Data and documentation publicly available from PI, feedback through scientific exchange, irregular updates by PI	Research: Benefits for applications demonstrated; DSS: Use occurring and benefits emerging
4	Score 3 + draft software installation/user manual available; 3rd party affirms portability and numerical reproducibility; passes data providers security review	Score 3 + standards systematically applied; meets international standards for the data set; enhanced discovery metadata; limited location level metadata	Score 3 + comprehensive scientific description available from data provider; report on user comparison available from PI published; user data provide description of available	Score 3 + procedures to establish SI traceability are defined; (inter)comparison against corresponding CDBs (other	Daily record and documentation available	Score 3 + Research: Citations on
5	Score 4 + operational code following standards; actions to achieve full compliance are defined; software installation/user manual complete; 3rd party installs the code operationally	Score 4+ fully compliant with standards; complex discovery metadata; complete location level metadata	Score 4 + user description in provider; report results exist; as updated with user validation; description implemented in PE			
6	Score 5 + fully compliant with standards; Turnkey System	Score 5 + regularly updated	Score 5 + journal updates are and validated a quantitative since published, or regular			




Framework structure

- Partnership between scheme originator and professional body to enable an independent certified practitioner
- Produce assessed against a customer need/requirement – not a static standard
- Contract between product producer and customer/user
- Producer provides product, algorithm and metadata
- Customer provides requirements and need metrics
- Product rating made public

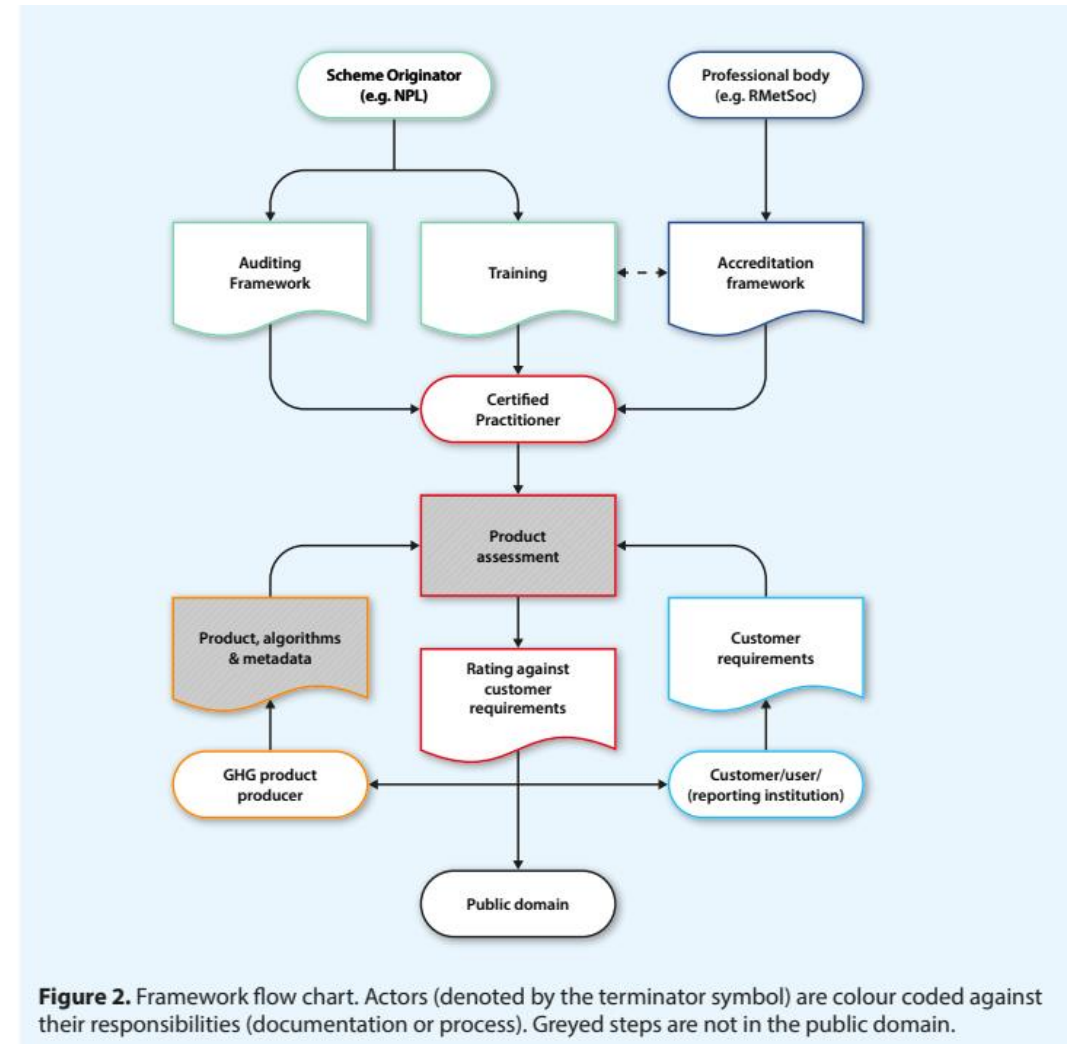


Figure 2. Framework flow chart. Actors (denoted by the terminator symbol) are colour coded against their responsibilities (documentation or process). Greyed steps are not in the public domain.

Summary

- The need for methane emission data is prescribed to response to government policy enacted to address the climate emergency
- Space Agency and Commercial satellite-derived products are part of the answer - but data confidence is key
- Confidence in trusted and reliable data is achieved through objective and independent assessment of products, from on-orbit measurement to fluxes/emissions to whether they are 'fit-for-purpose'
- Underpinned by
 - transparency
 - traceability
 - independence
 - Evidenced QA

COP26: Rishi Sunak unveils commitment from companies managing \$130 trillion to fight climate change

The Chancellor pledged to make the UK "the world's first net zero-aligned financial centre"



By Emily Ferguson

November 3, 2021 9:31 am (Updated 10:54 am)

Next steps

- Develop consensus on the need for international methane standards
- Engagement with the community (CEOS is a key partner)
- COP28 Space Summit Statement - Space Agencies Leaders Summit Pledge
- UK-hosted methane standards workshop in Q1 2024 with recommendations brought to April 2024 CEOS SIT meeting
- Implementation developed in 2024-25
- International agreement for CEOS Plenary / COP30 in Q3 2025.

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Auditing scheme for satellite-derived methane emissions products

A proposed satellite-derived 'kitemarking' scheme that describes a framework to allow the transparent, independent, and evidenced quality assurance assessment of satellite-derived methane emission data products.

It is targeted primarily at the corporate climate risk disclosure market but is applicable to a wider user base of satellite derived GHG data.



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