

# New windows on Terrestrial Productivity

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# Solar-induced Fluorescence

- ▶ Fluorescence: Absorbing radiation and re-emitting at longer wavelength;
- ▶ Plant chlorophyll does this in processes related to photosynthesis;
- ▶ Can be measured by existing and future satellites (e.g. GOSAT)

# Carbonyl Sulphide (COS)

- ▶ Absorbed by plants along with  $\text{CO}_2$  during photosynthesis
- ▶ Not respired since it's converted
- ▶ Thus there is a response to GPP rather than NEP
- ▶ Not so simple, there are other sources and sinks.

# The Project

- ▶ Couple biosphere model to fluorescence model and atmospheric transport model;
- ▶ Insert into assimilation framework
- ▶ Theoretical calculations to see what we can expect
- ▶ Apply to existing measurements of fluorescence and COS

# Status

- ▶ Coupling done for fluorescence and BETHY;
- ▶ Other COS sources identified;
- ▶ Nutrients certainly important so BETHY warm-up exercise for CABLE;
- ▶ Will use familiar adjoint formalism for BETHY but probably an ensemble method for CABLE;
- ▶ Hopefully PhD student starting in February.