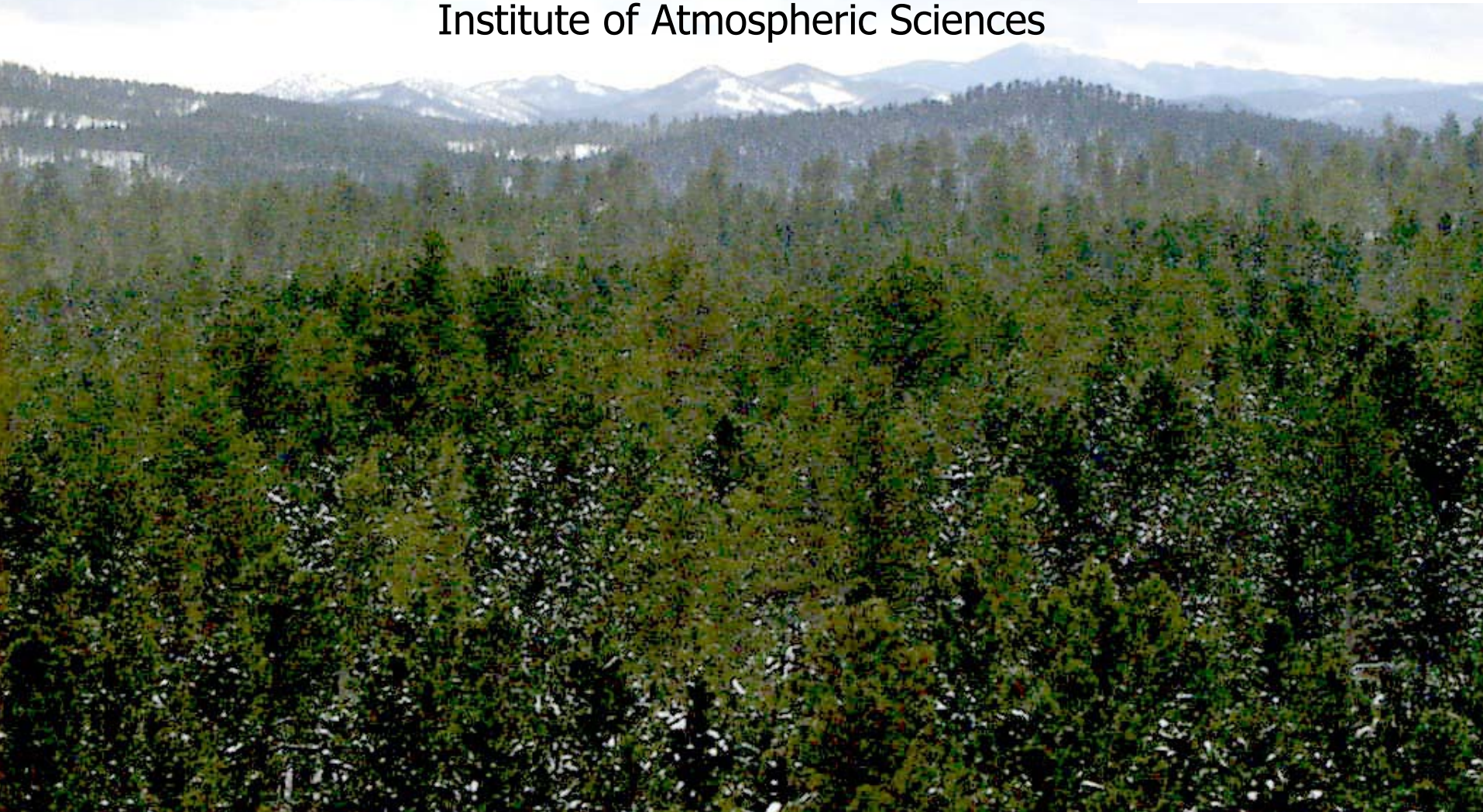
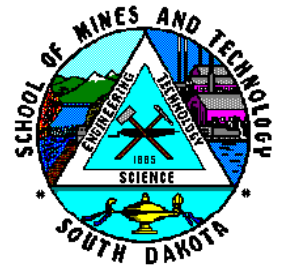




Determining the Global Importance of Biogenic 2-methyl-3-buten-2-ol

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The Project Goals:

Improve our understanding of biogenic emissions of 2-methyl-3-buten-2-ol (MBO) through:

- more flux measurements
- improved modeling capabilities.

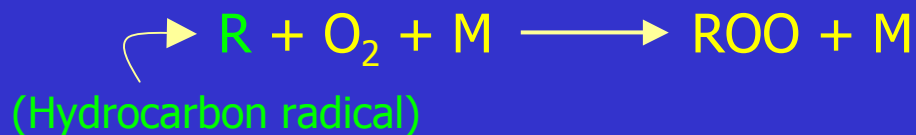
Improve our ability to model trace gas fluxes from coniferous forests globally through:

- more flux measurements
- use of remote sensing data for model parameters.

Important Classes of Compounds for Biogenic Volatile Organic Compound (VOC) Emissions:

Compound Class	Example	Controls
Terpenoids	Isoprene, 2-3-2 Methylbutenol, Monoterpenes	Light, Temperature
C ₆ Aldehydes and Alcohols	Hexenol, Hexenal	Wound Compounds
C ₁ to C ₃ Oxygenates	Methanol, Acetone	Light, Temperature, ???

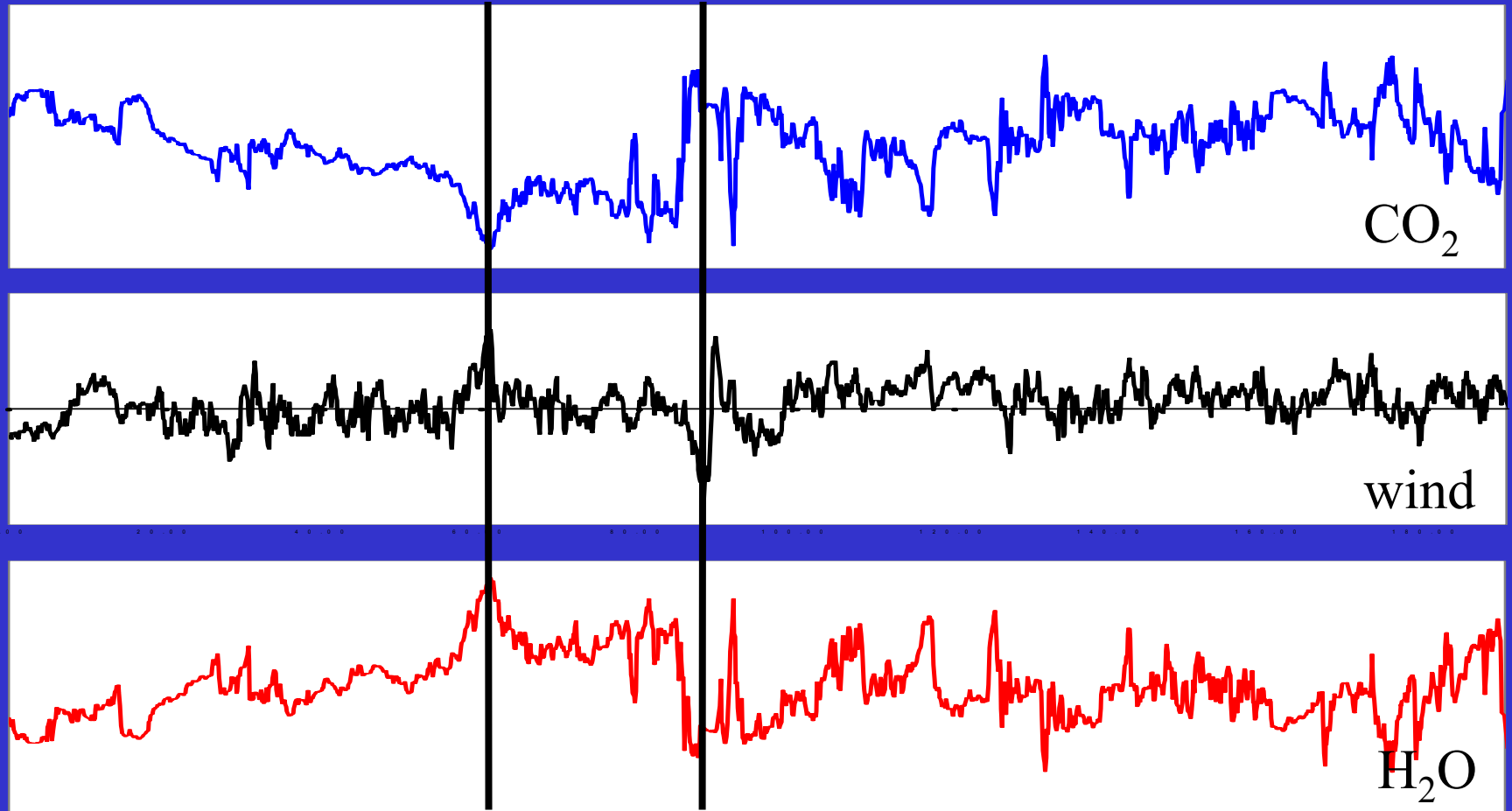
Primary role of hydrocarbons in tropospheric ozone production



Measuring ecosystem fluxes

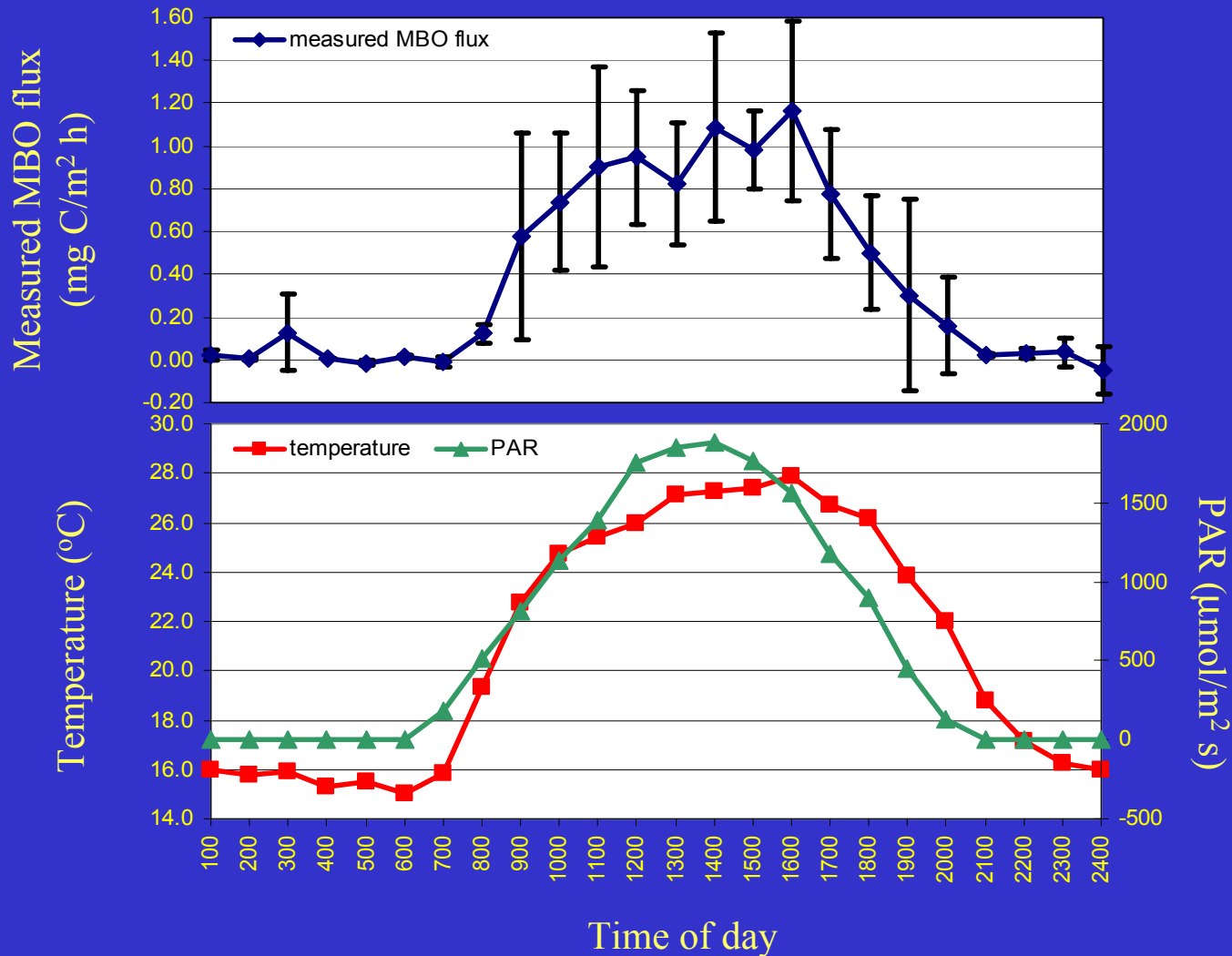


Flux Data at 10 Hz

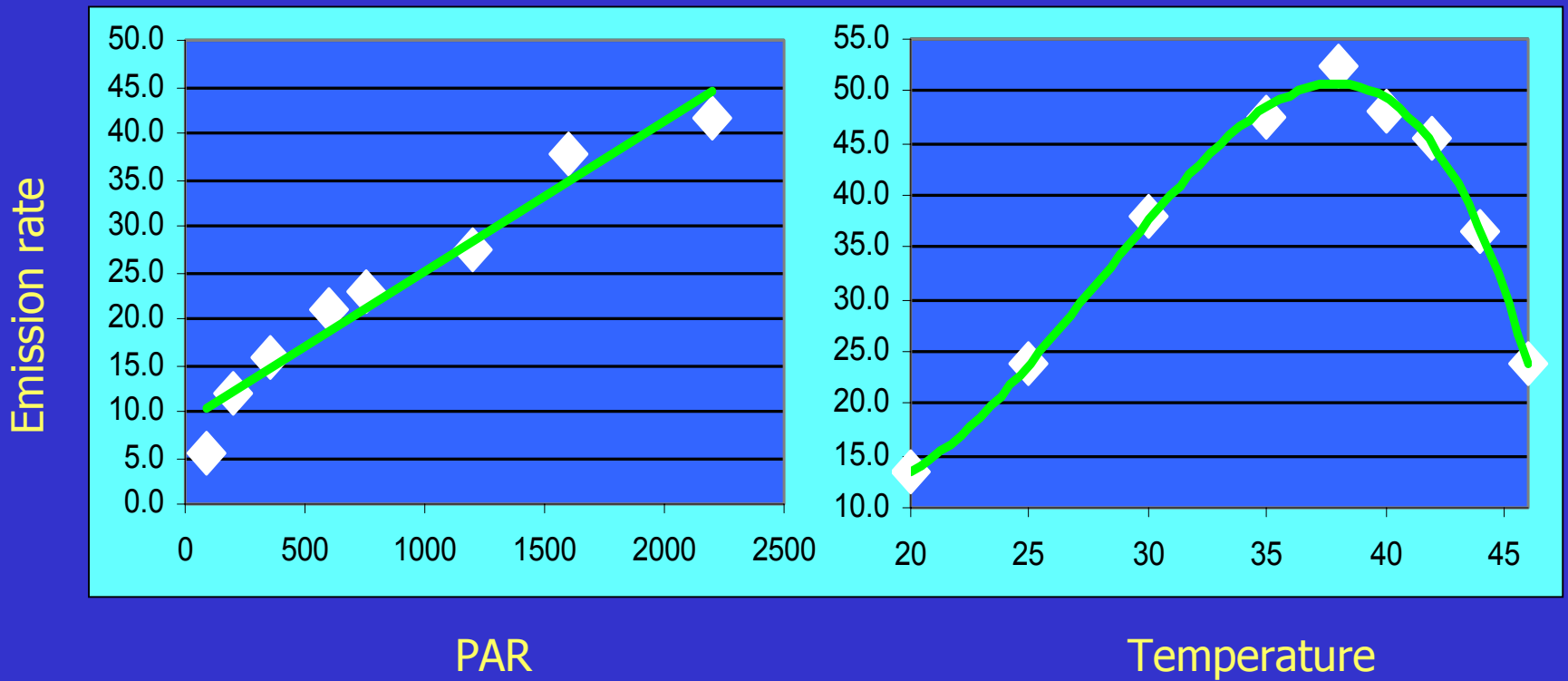


3 minutes

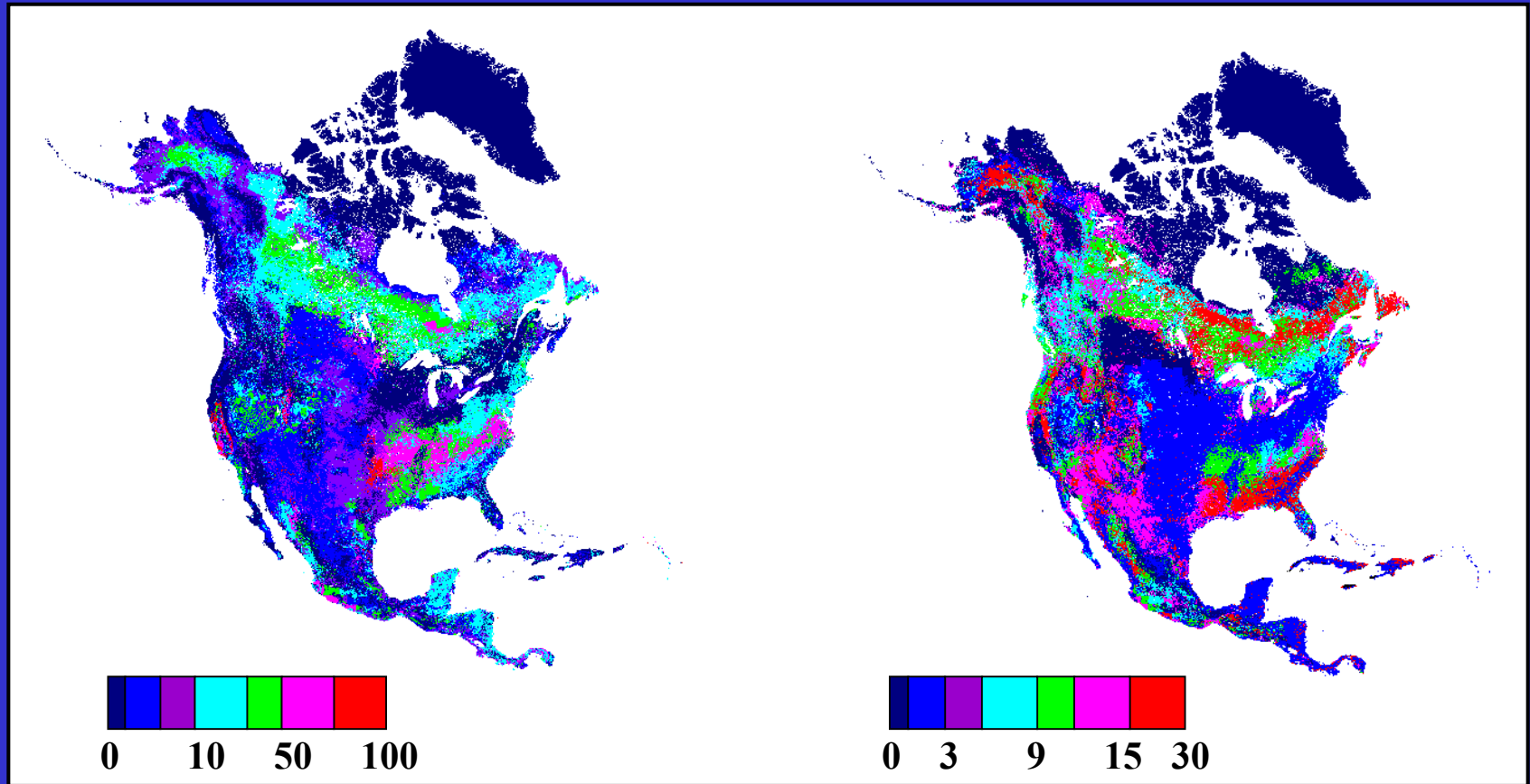
Average MBO flux results with measured light and temperature



Leaf level emissions of MBO from Ponderosa pine



Spatial distribution of North American July average isoprene and monoterpene emissions

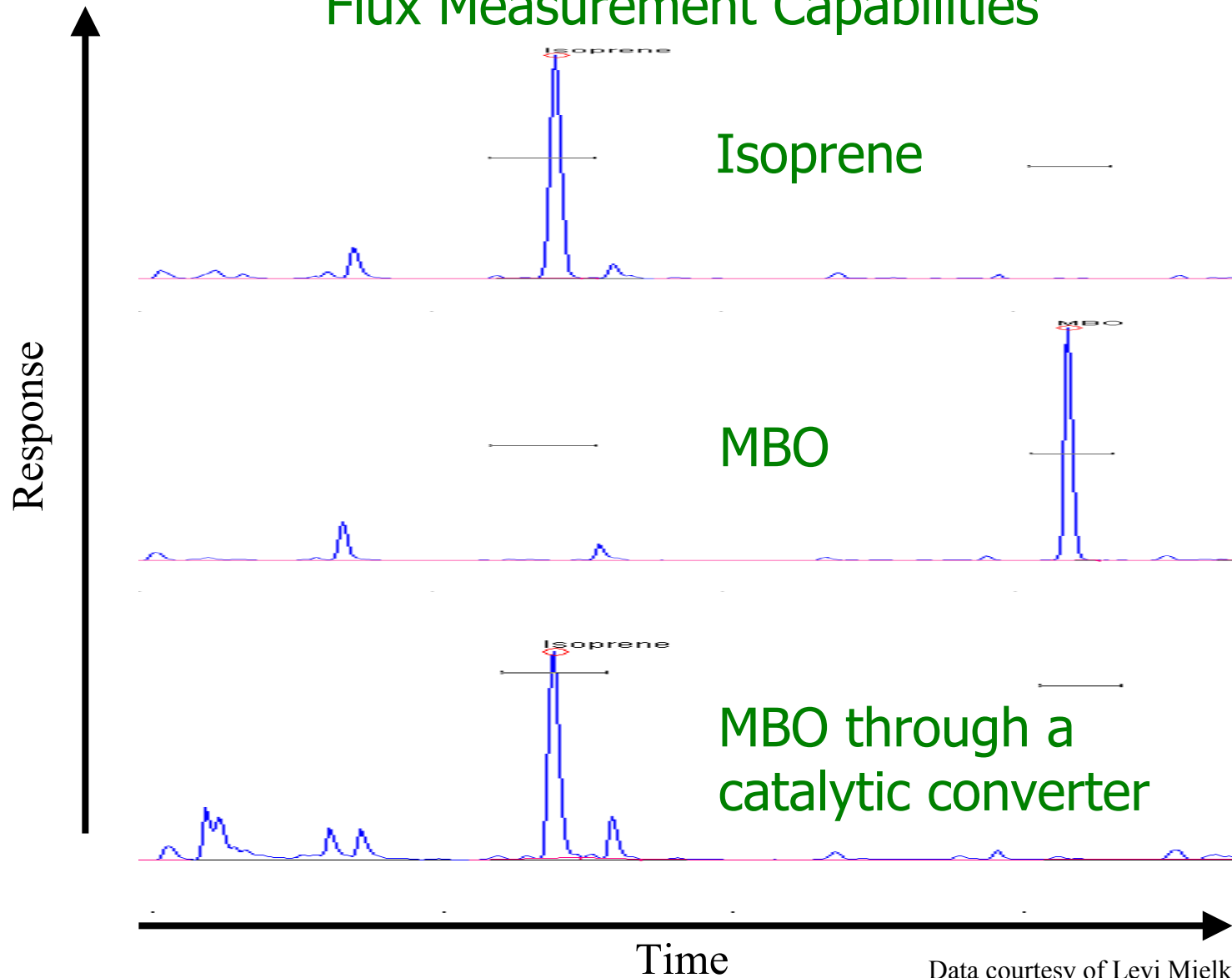


isoprene emission
(mg C m⁻² d⁻¹)

monoterpene emission
(mg C m⁻² d⁻¹)

Adapted from Guenther, *Ecol. App.*, 7(1), 1997

Conversion of MBO to Isoprene to Improve our Flux Measurement Capabilities



Data courtesy of Levi Mielke

Tower Measurements

Top of Tower

downward and upward total radiation
downward and upward PAR
downward and upward UV
upward IR
temperature
relative humidity
precipitation
wind speed and direction

Ground

upward IR
upward and downward total
radiation
soil heat flux
soil moisture
snow depth
bole temperature

Above Canopy Fluxes

CO₂
H₂O
sensible heat
momentum
MBO
Other VOCs



Use MODIS data to parameterize the emissions model

MOD13Q1 – Enhanced Vegetation Index

MOD15A2 – Leaf Area Index, Fraction of Absorbed PAR

MOD11 – Surface Temperature

Obtain NASA funding to extend this project

Submission of a proposal to the NASA new investigator Program.

Thank You