

**Biomass modelling across LBA sites:
investigating the role of environmental
variables and land use with the
HYLAND model**

David Galbraith, University of Edinburgh/CEH Edinburgh

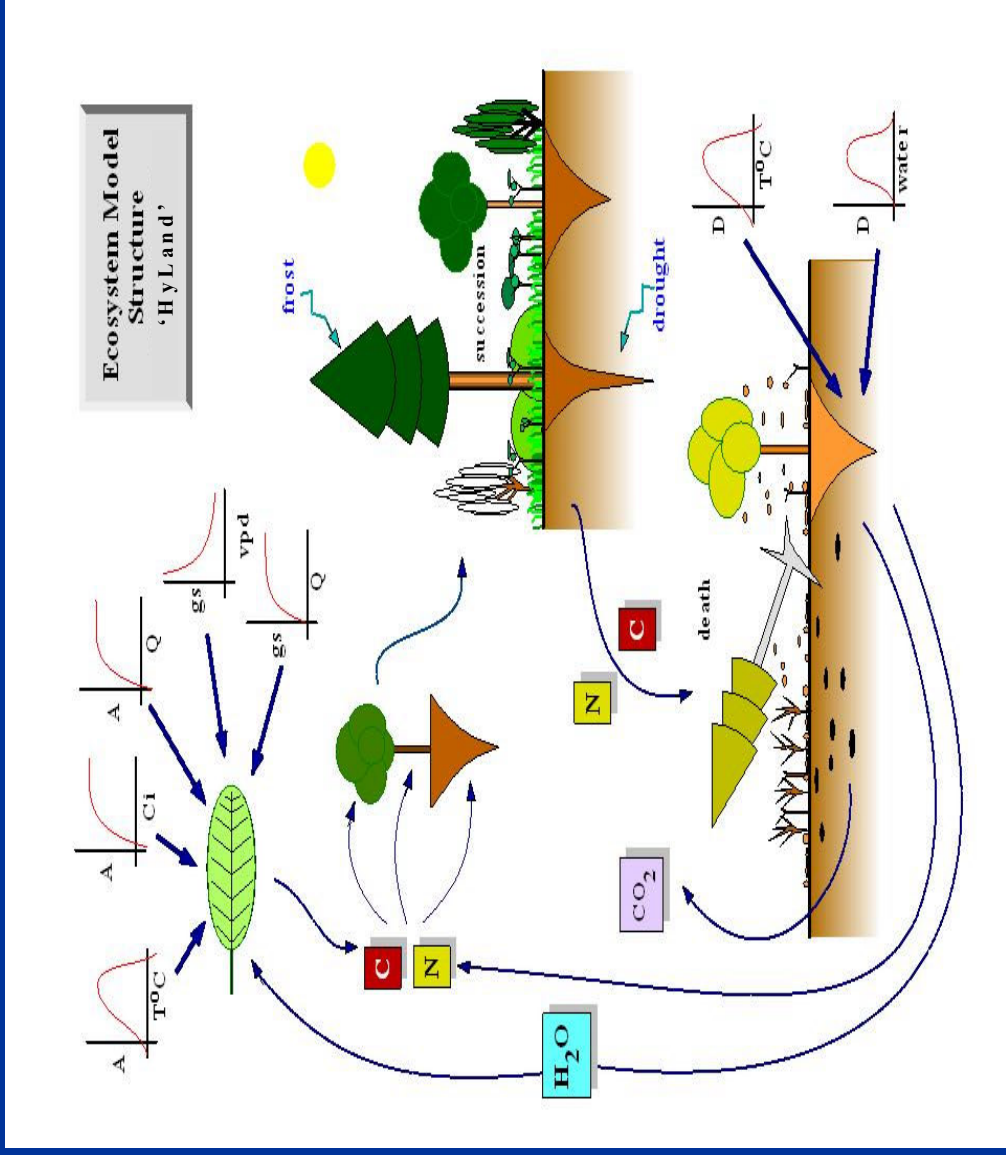
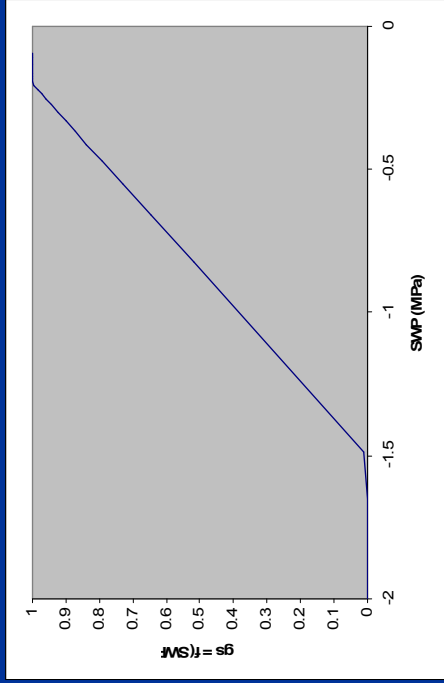
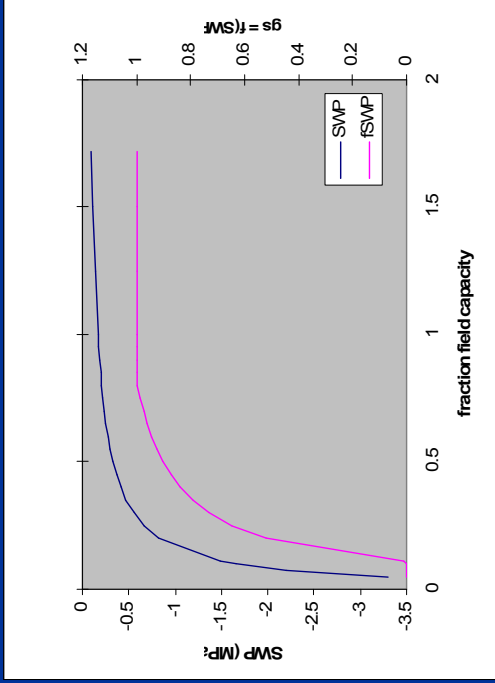
Peter Levy, CEH Edinburgh

Patrick Meir, University of Edinburgh

Talk Structure

- 1: HYLAND overview
- 2: Aboveground Biomass Results
- 3: Role of environmental drivers
- 4: Equilibrium vs. Non-equilibrium dynamics

HYLAND - OVERVIEW



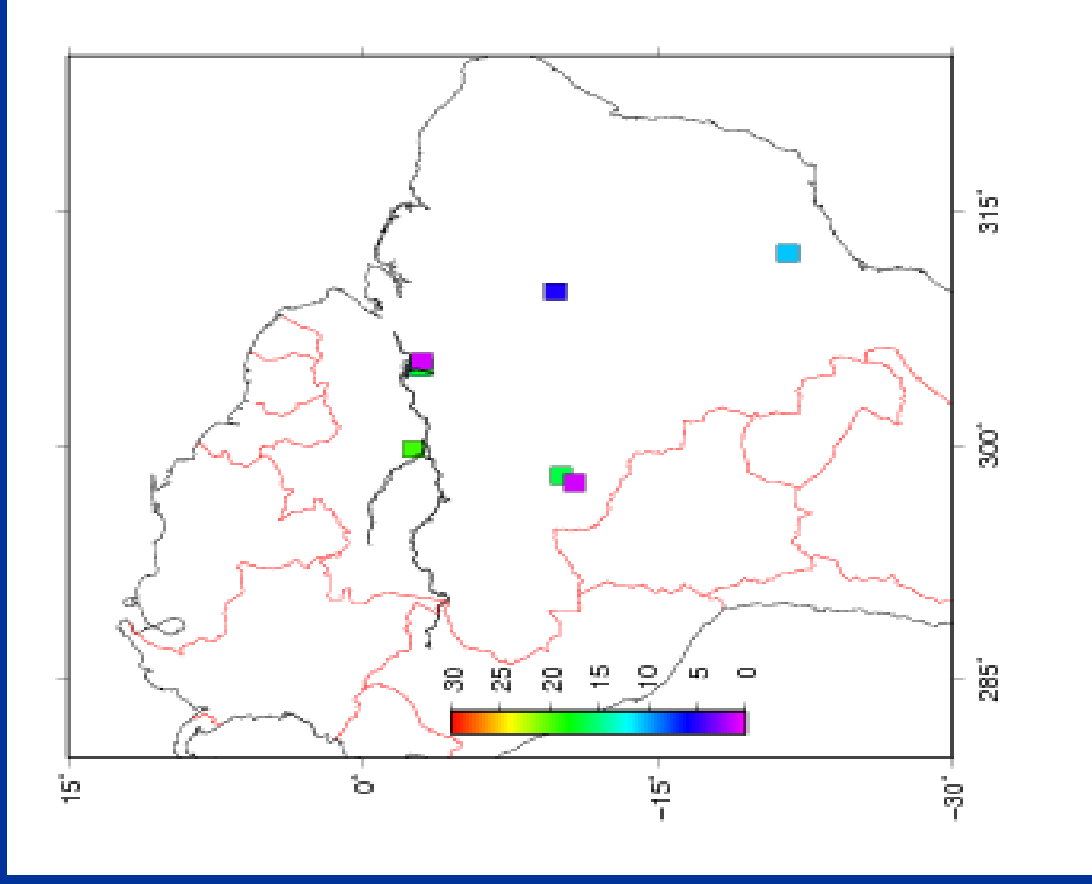
LAND USE CHANGE IN HYLAND

- 10 land use types
- Each LUC point modelled independently
- 4 LUC points used in LBA-MIP simulations
(undisturbed, scattered lumbering, pasture, cropland)

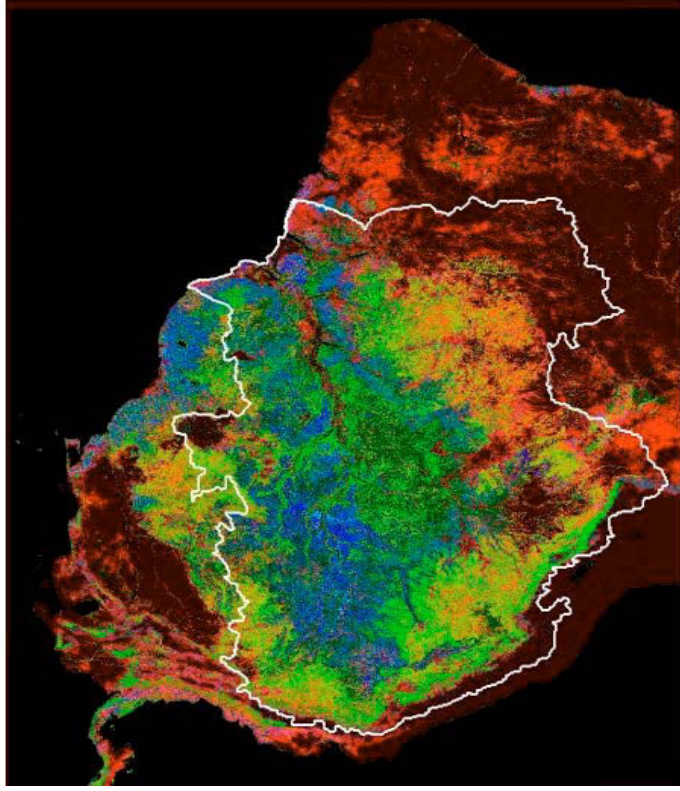
Scattered Lumbering	Pasture	Cropland
- 1% of harvestable trees cut each year	- All trees removed - 50% of NPP grazed each year	- All trees removed - 50% of crop ABG removed in harvest - tillage effect (30% of SOC moved from slow to fast pool)

Site Differences in Aboveground Biomass (1)

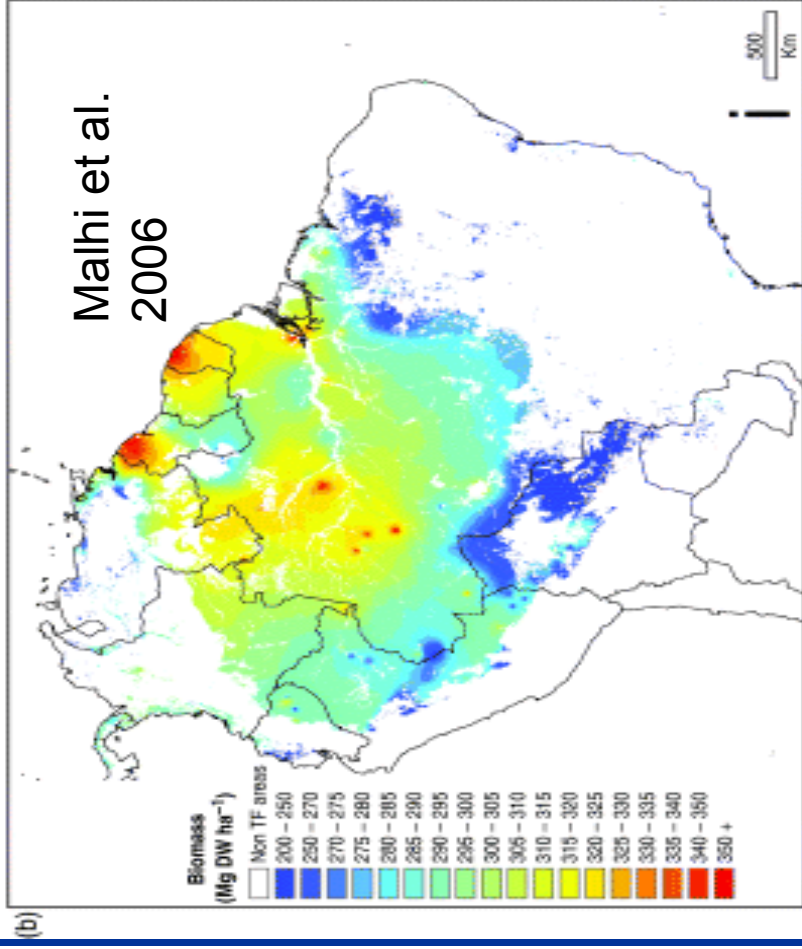
Site	ABG (kg/m ²)
BAN	5.30
FNS	1.03
KM 34	19.45
KM67	18.30
KM77	1.00
KM83	17.07
RJA	16.41
PDG	10.62



Comparison with published data

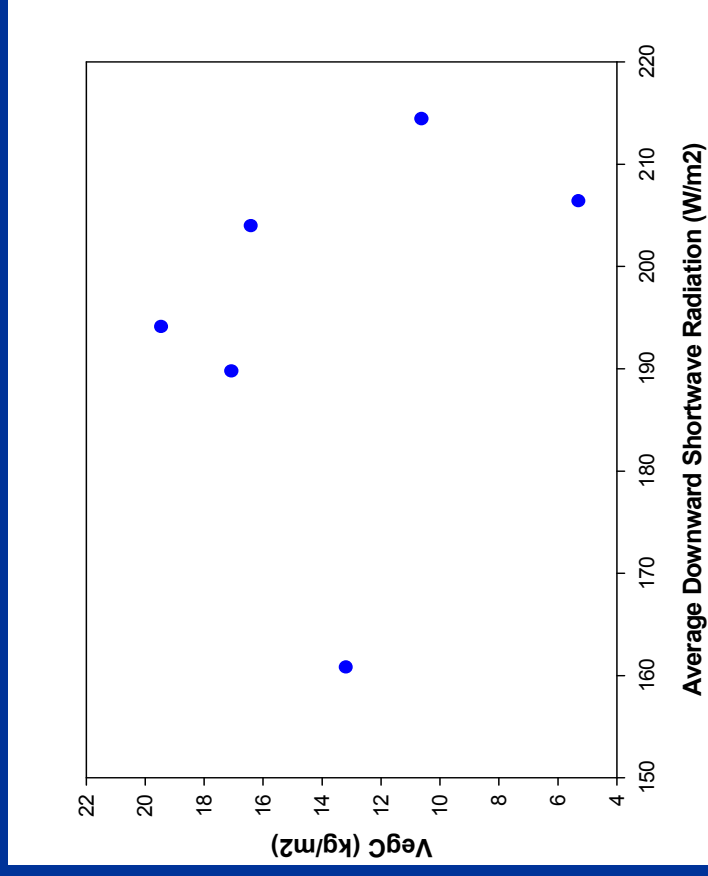


Saatchi 2007

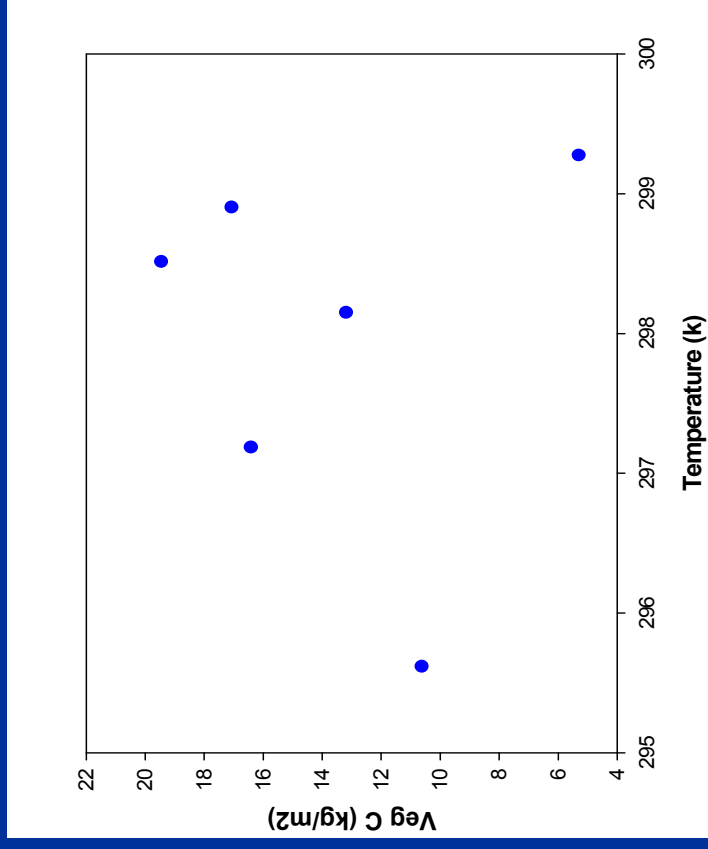


Underestimation Trend – too few points to comment on accuracy of spatial pattern

Response to Environmental Drivers: Temperature and Radiation

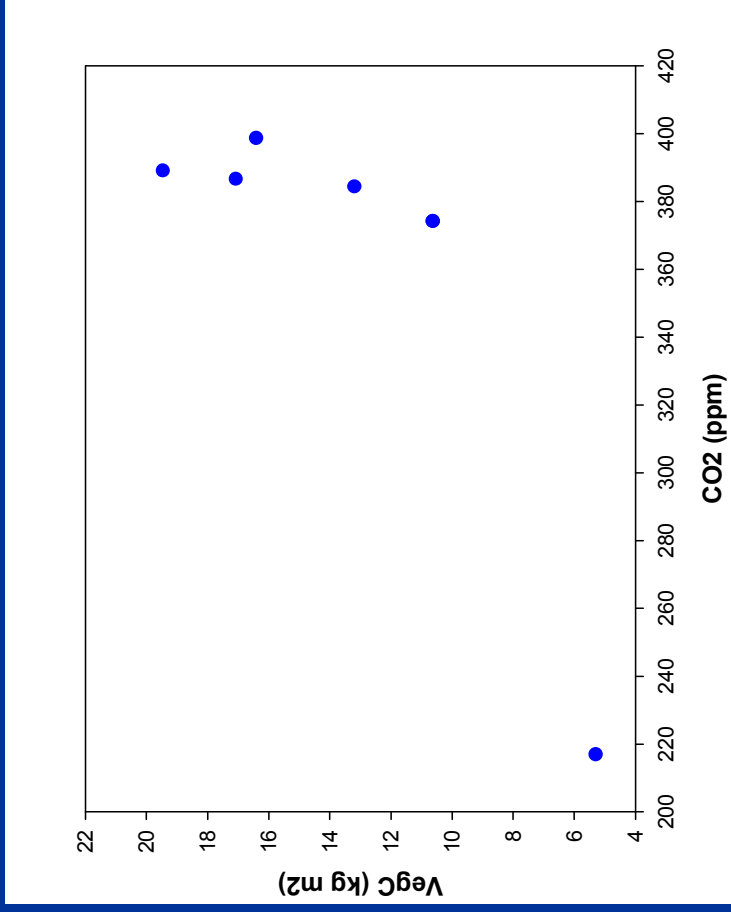


Bananal included, pasture/agriculture sites not included

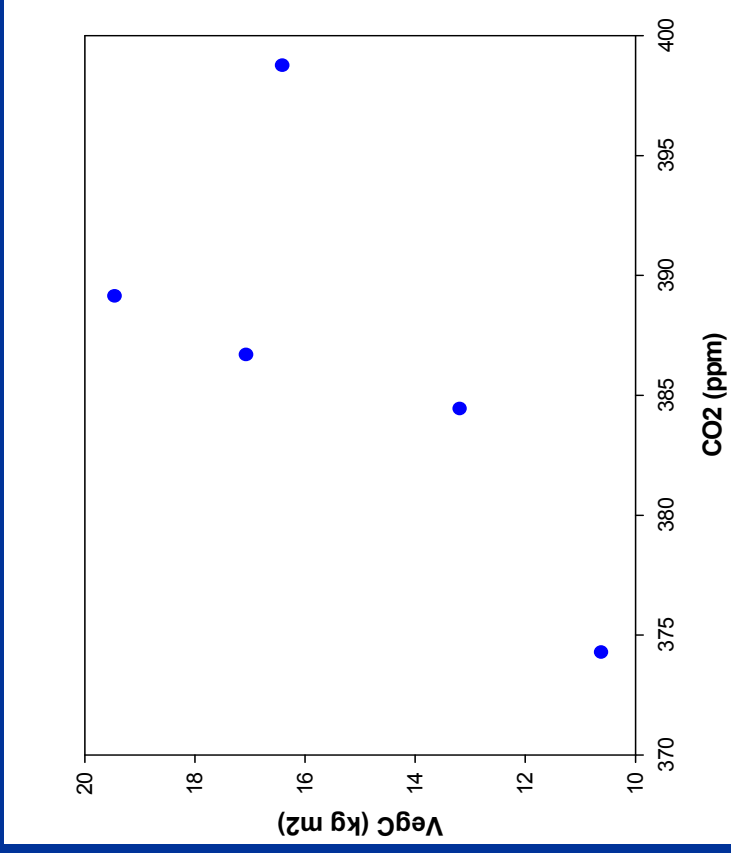


Bananal included, pasture/agriculture sites not included

Response to Environmental Drivers: CO2

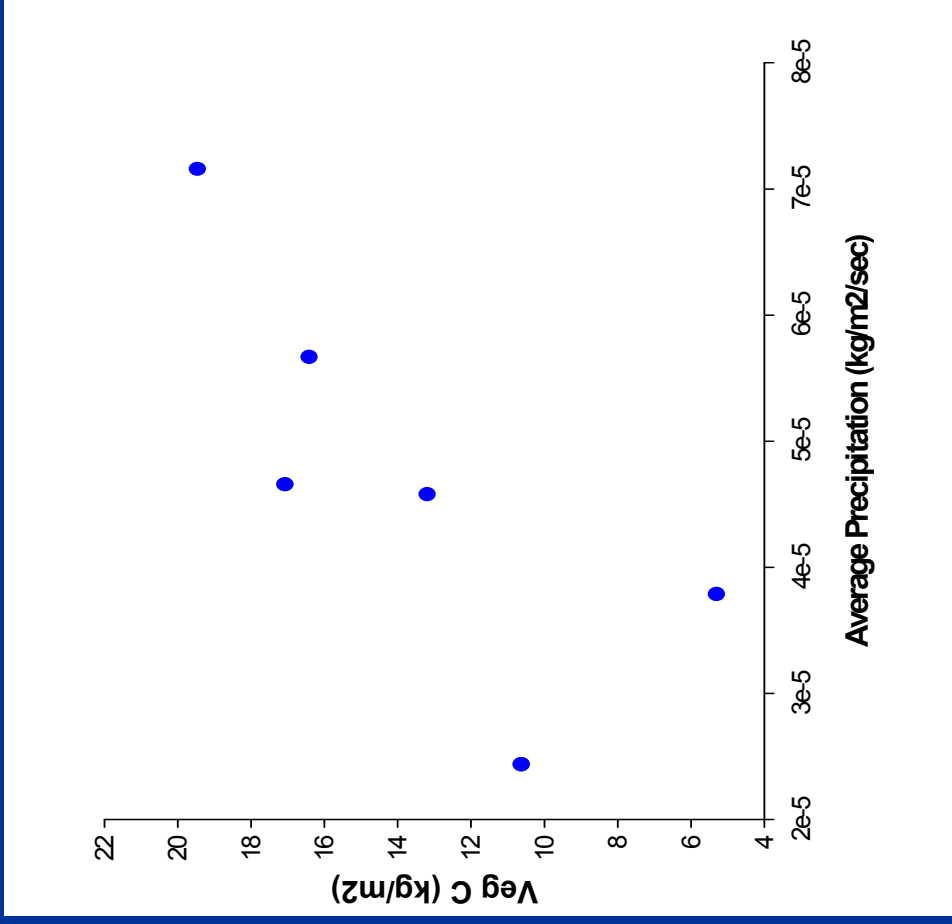


Includes Bananal Site



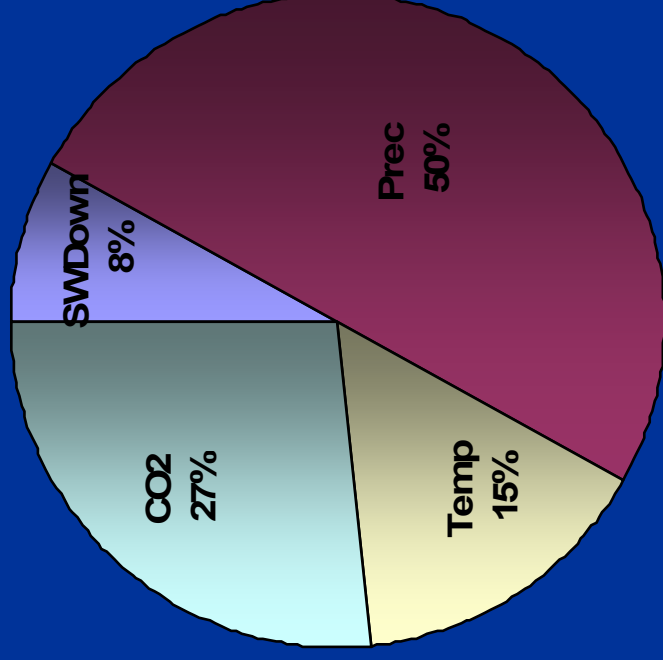
Excludes Bananal Site

Response to Environmental Drivers: Precipitation



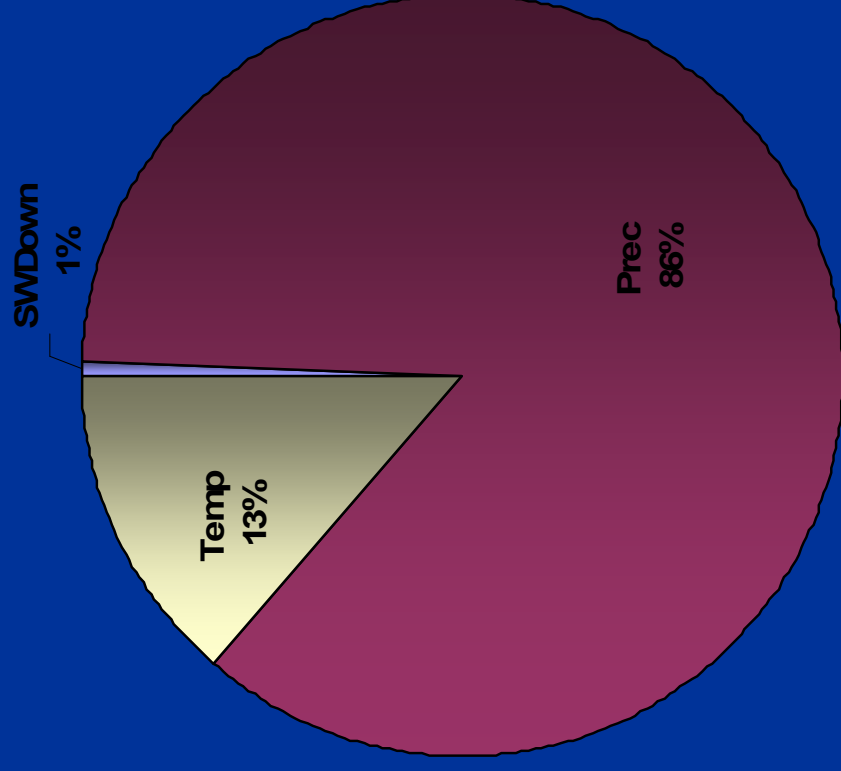
Bananal included, Without pasture/agriculture sites

Biomass response to Environmental Drivers : Variance partitioning



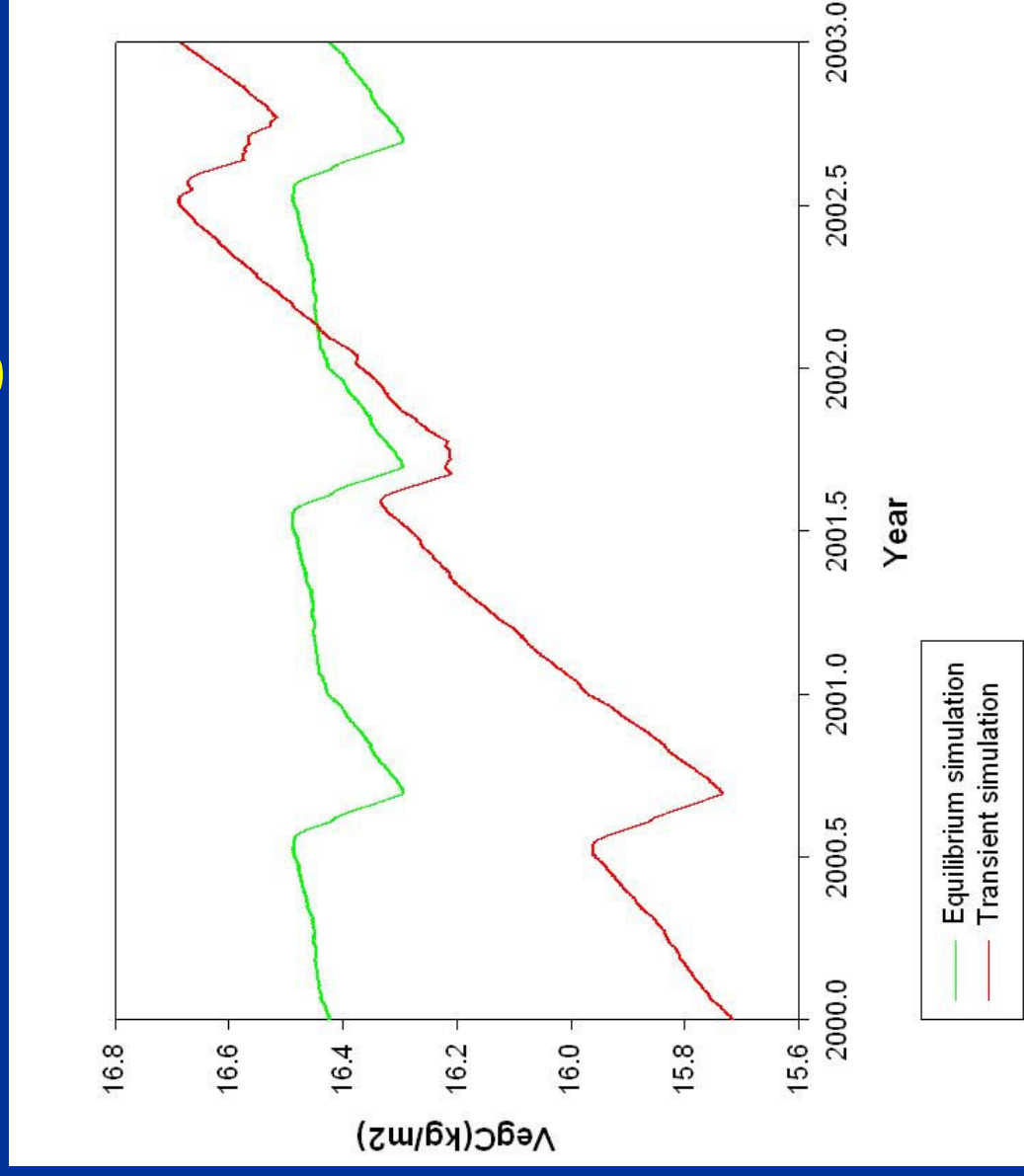
* Does not include converted sites but includes low Bananal site

Without Bananal low CO2 site...
precipitation is key driver of site biomass
differences (natural vegetation sites only)



* Does not include Bananal site or pasture/agriculture sites

Equilibrium system vs. transient system – effects on biomass modelling



CONCLUSIONS

- Data Drivers can seriously affect the reliability of the results
- LUC issues – LUC category can be important determinant of results
- Precipitation main environmental driver of biomass trends in HYLAND
- Equilibrium vs. non-equilibrium system – importance of trend identification