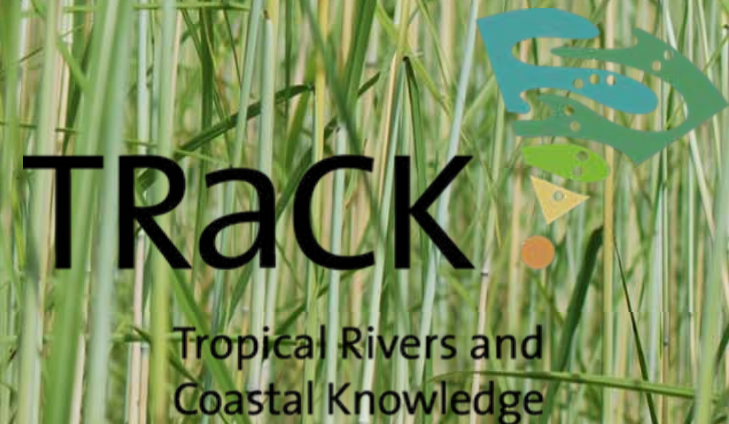


TRaCK - Tropical Rivers and Coastal Knowledge Research Hub

Project 4.1

Seasonal patterns of energy balance and land use change in the Daly River catchment

**Richard Weinmann, Lindsay Hutley – CDU TRaCK,
Peter Isaac, Carol Hensley and Jason Berringer -
MONASH**



Overview

- Introduction and Sites
- LE and H Fluxes
- Net Radiation and Albedo
- Wet/Dry season comparison of fluxes and Bowen ratios
- Soil Moisture and LE
- Conclusions

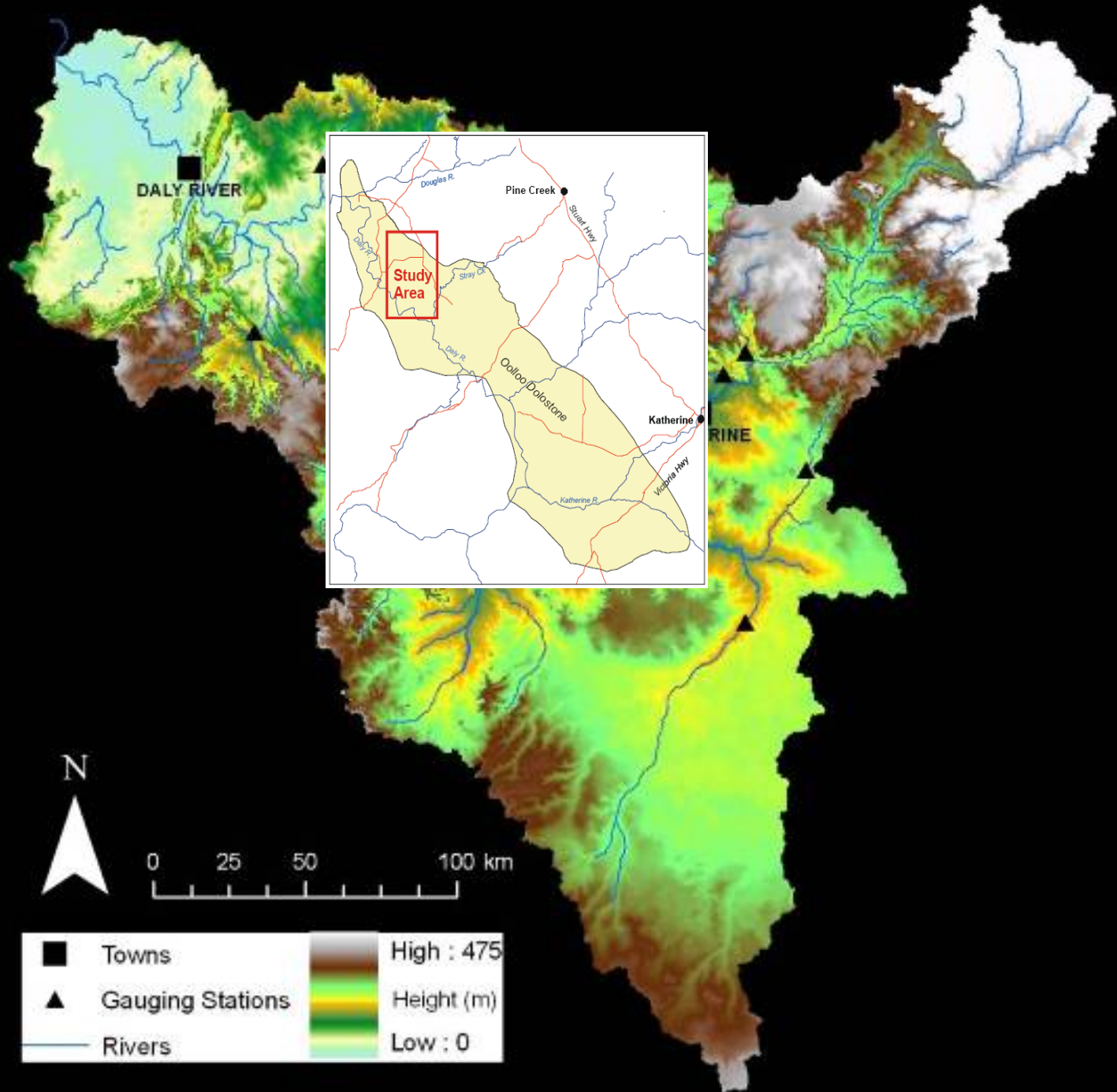
Objectives, outputs

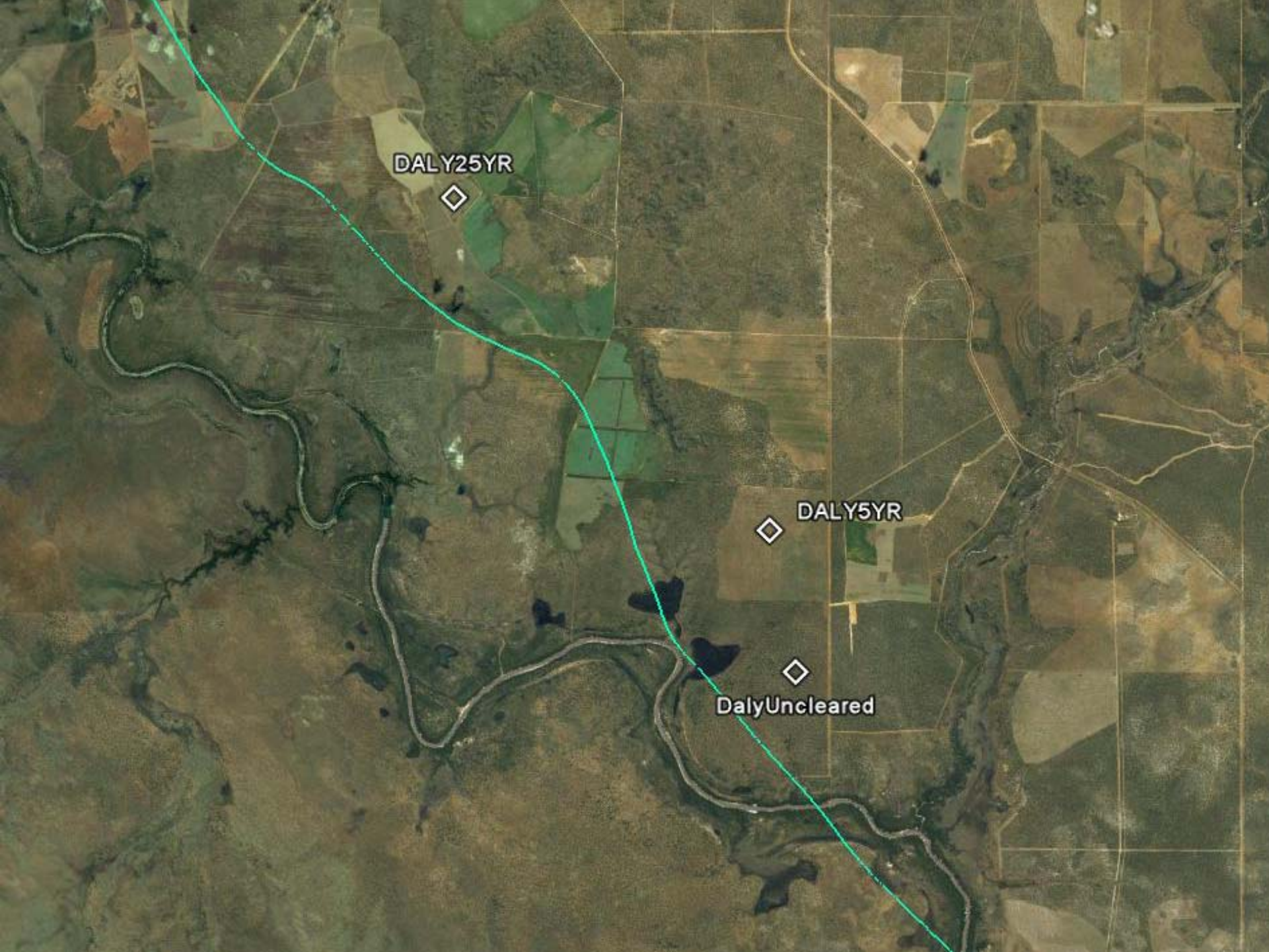
Objectives

1. Determine the fate of rainfall falling on catchments, and partition this into evapotranspiration, recharge and surface runoff.
2. Develop simple models that can be used to predict changes in surface water and groundwater availability that might result from changes in land use or climate change.

Outputs

1. Conceptual models of hydrological processes in tropical river catchments
2. Predictive numerical models for examining LULUC and surface water and groundwater availability.





DALY25YR



DALY5YR



DalyUncleared

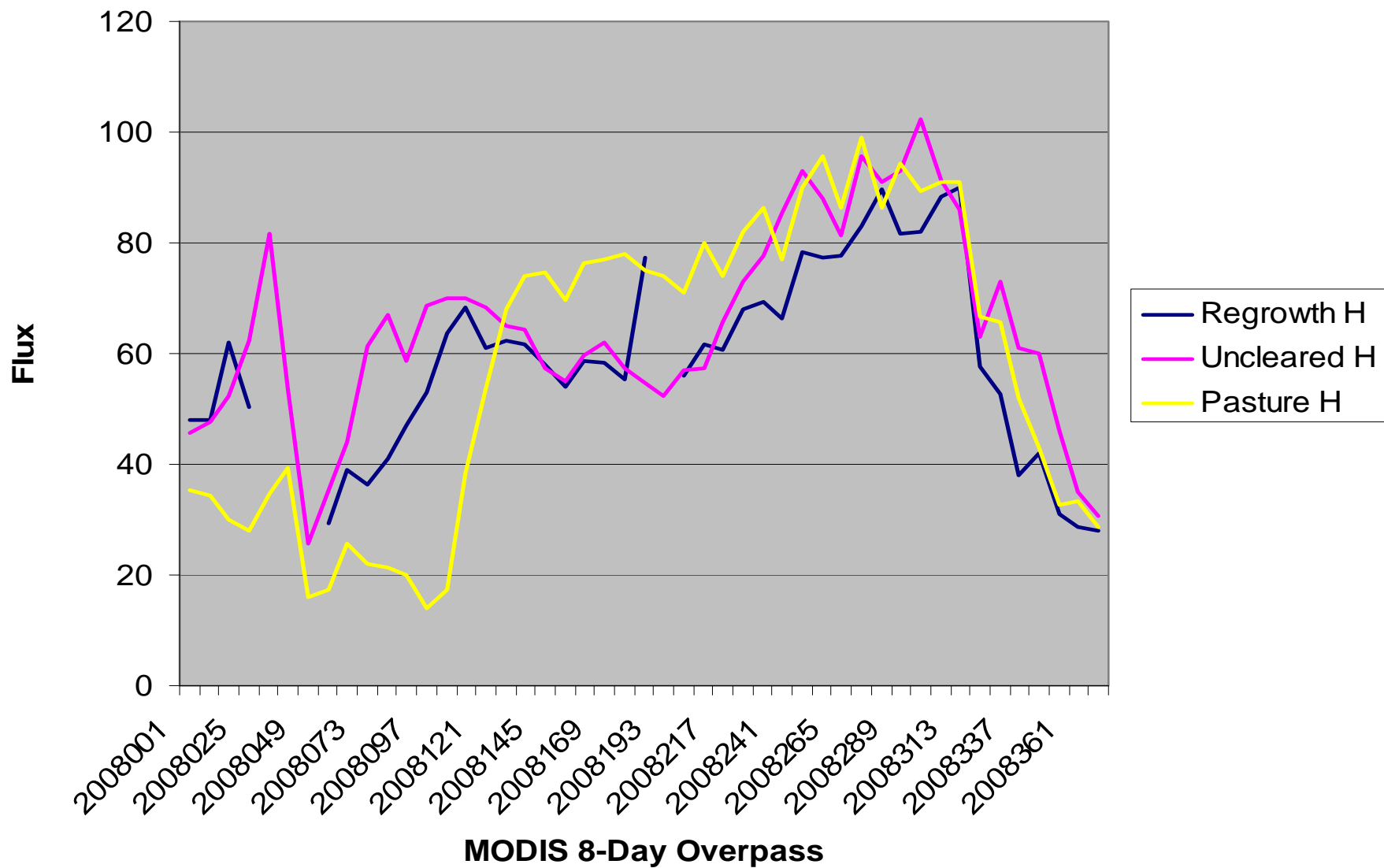




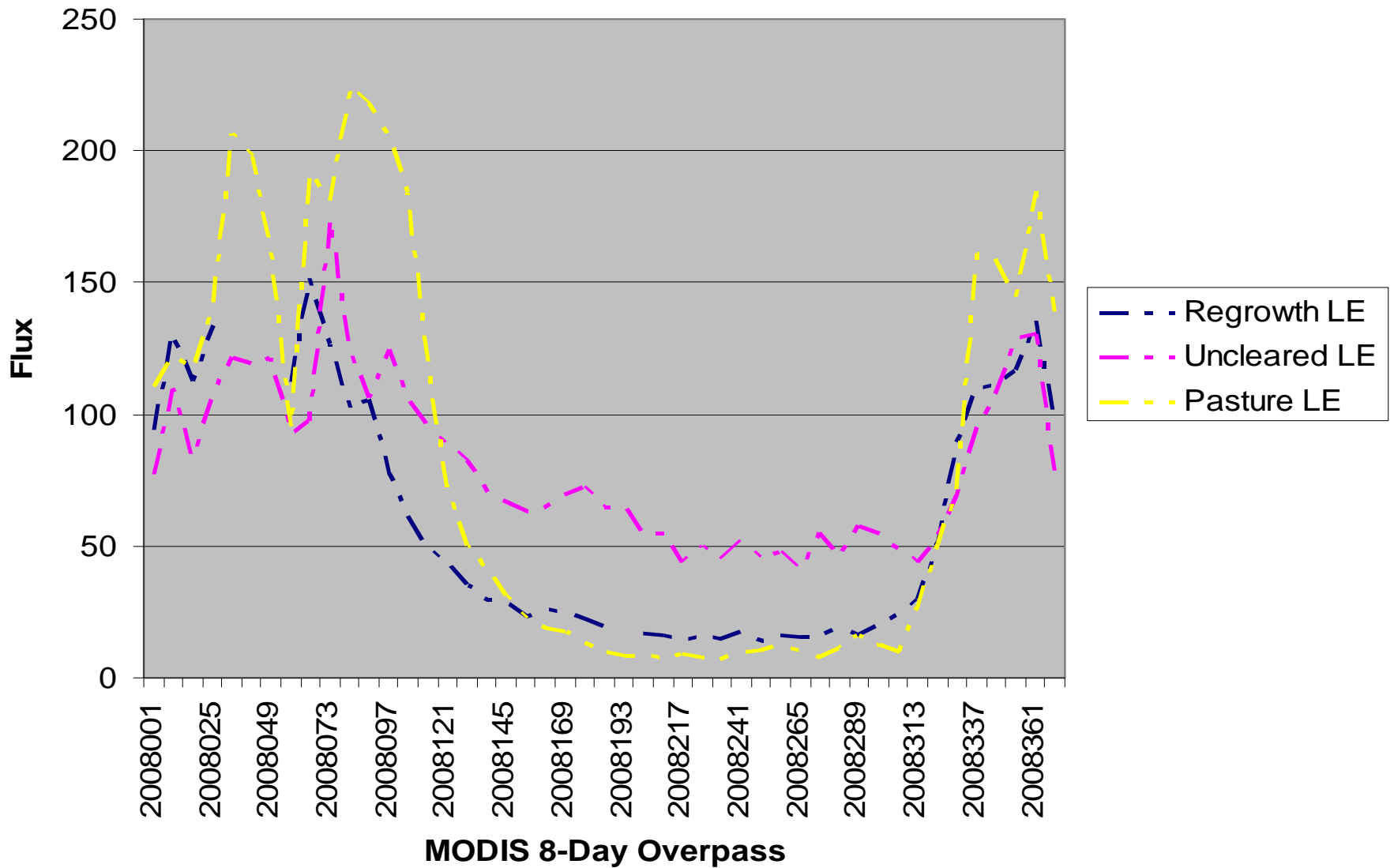




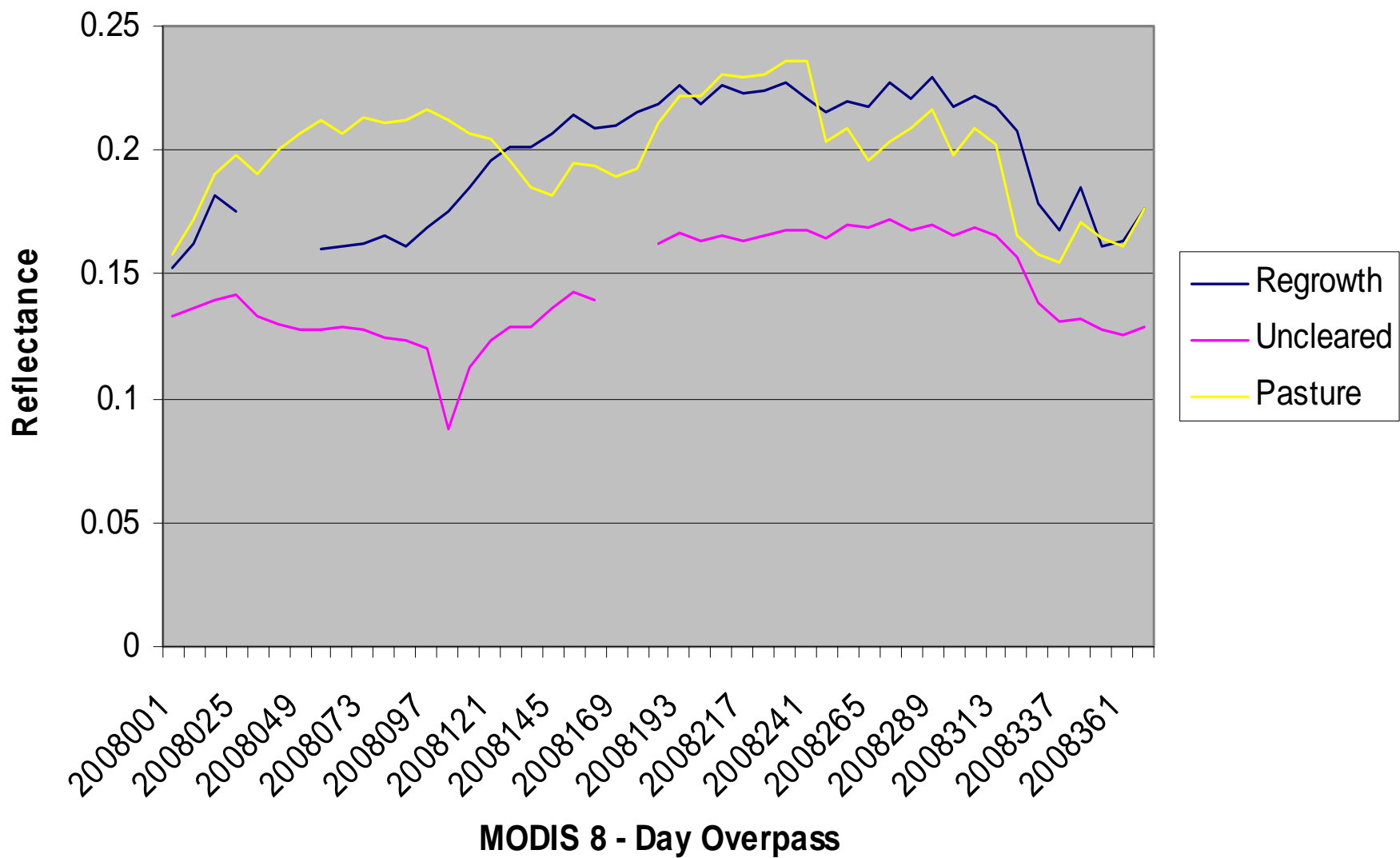
Average H



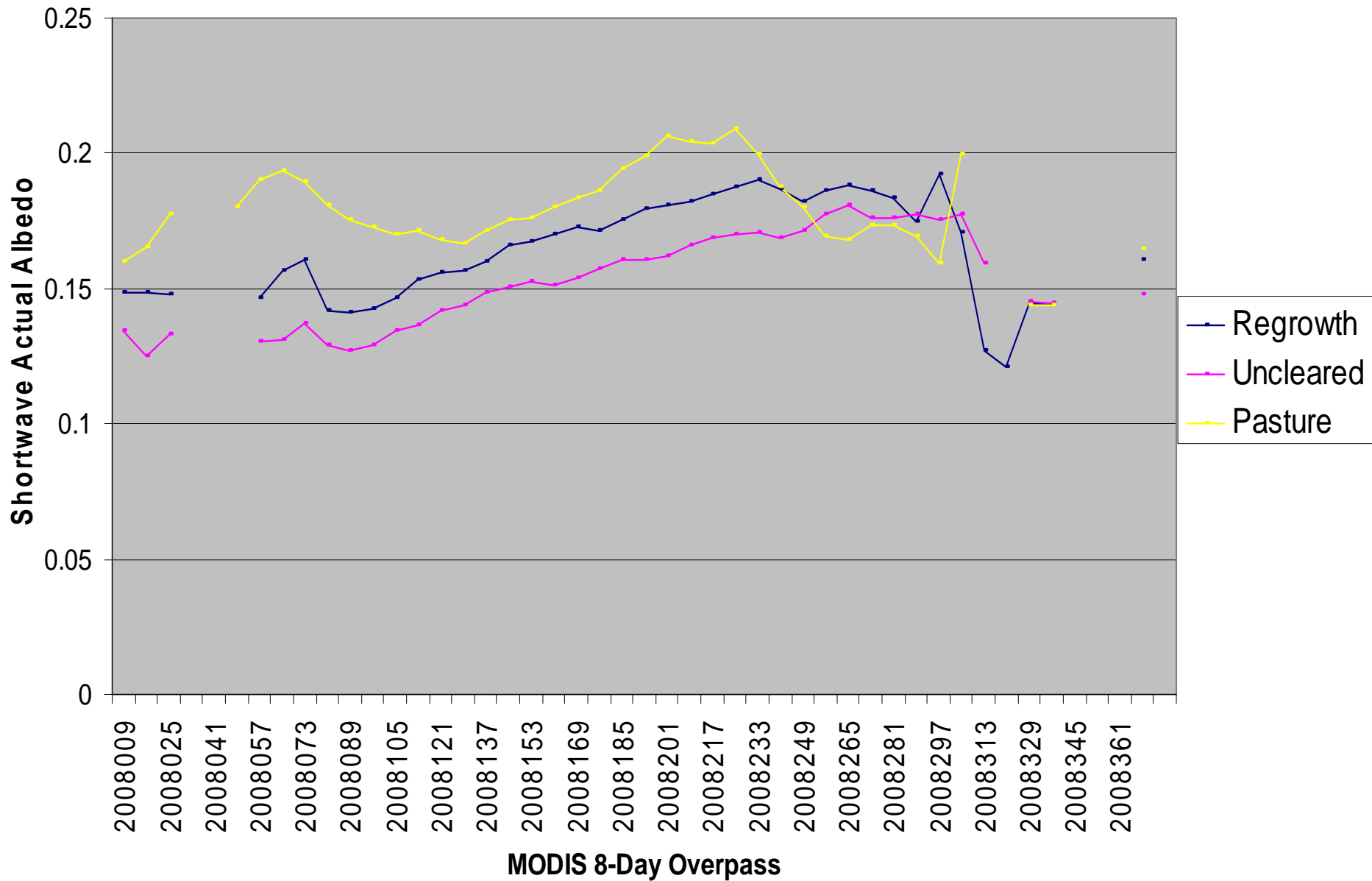
Average LE



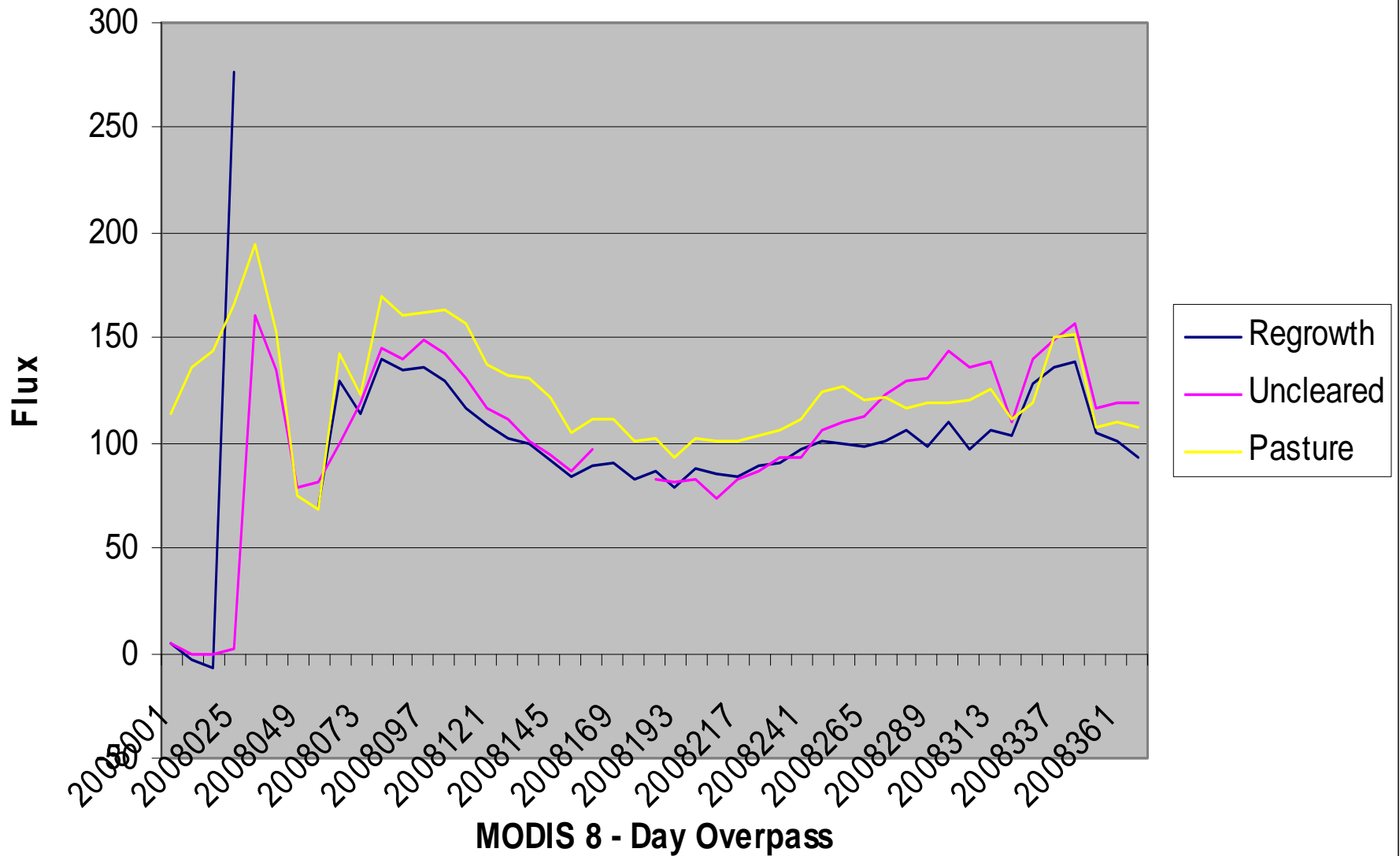
Albedo



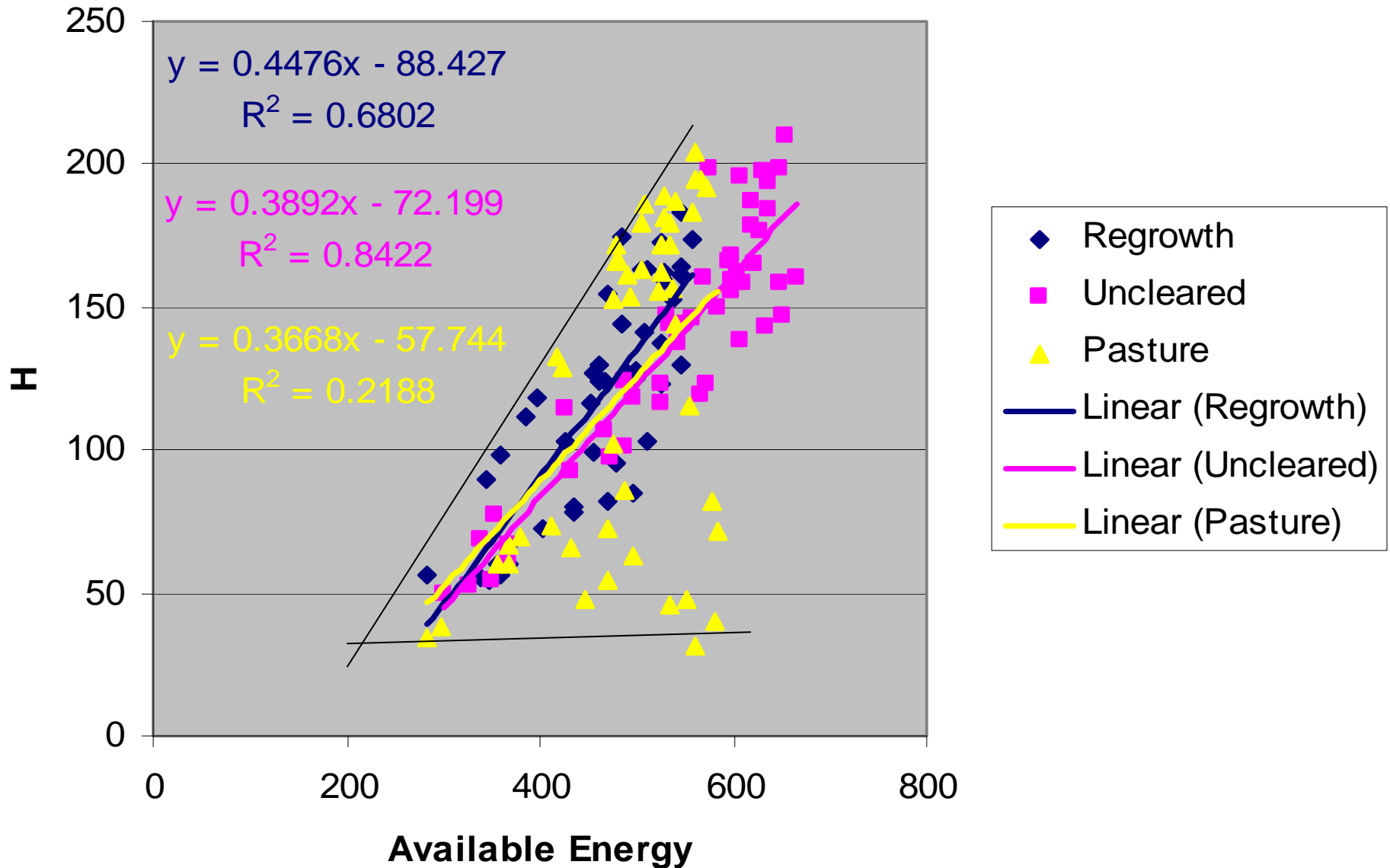
MODIS 1km Shortwave Actual Albedo



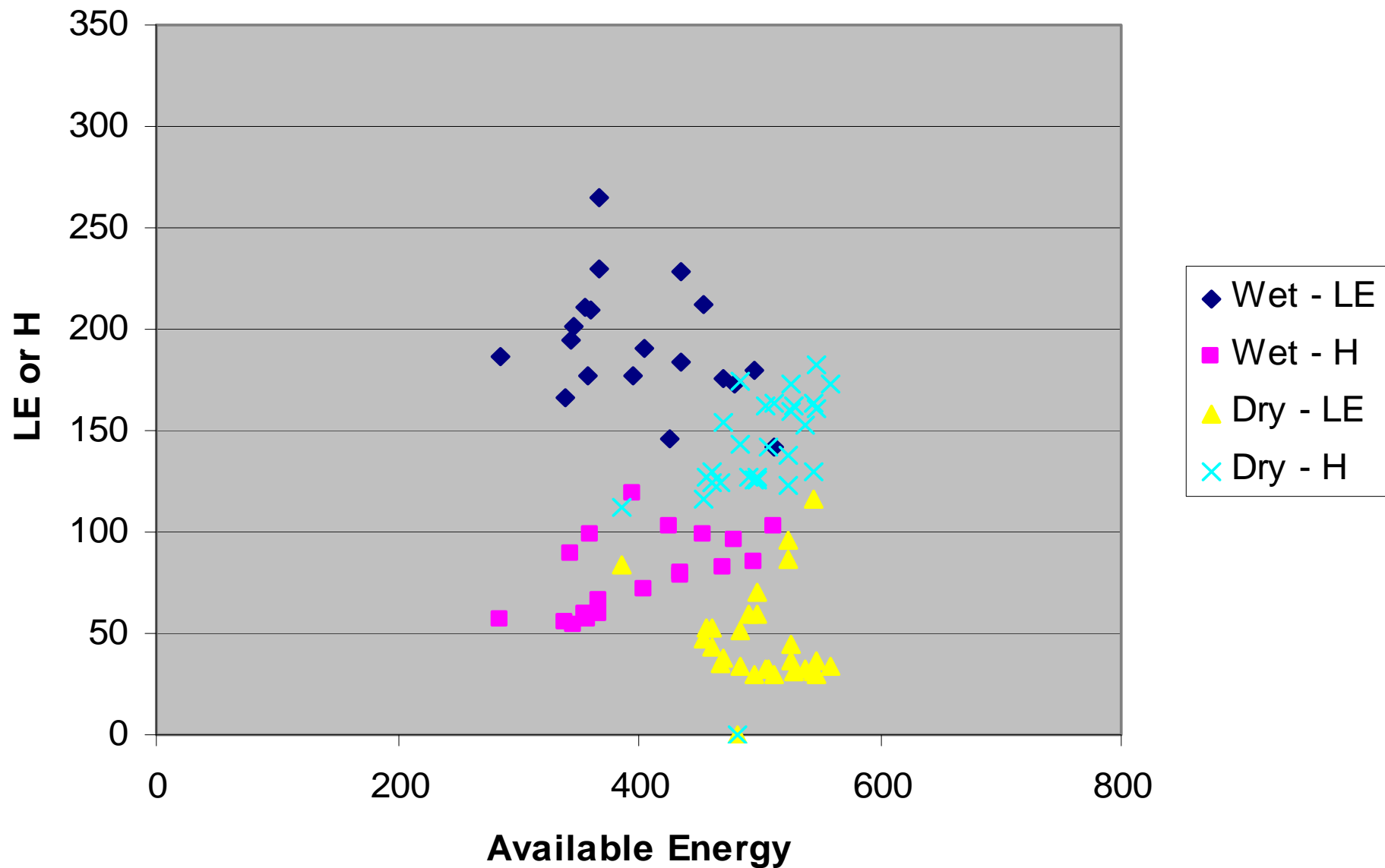
Available Energy



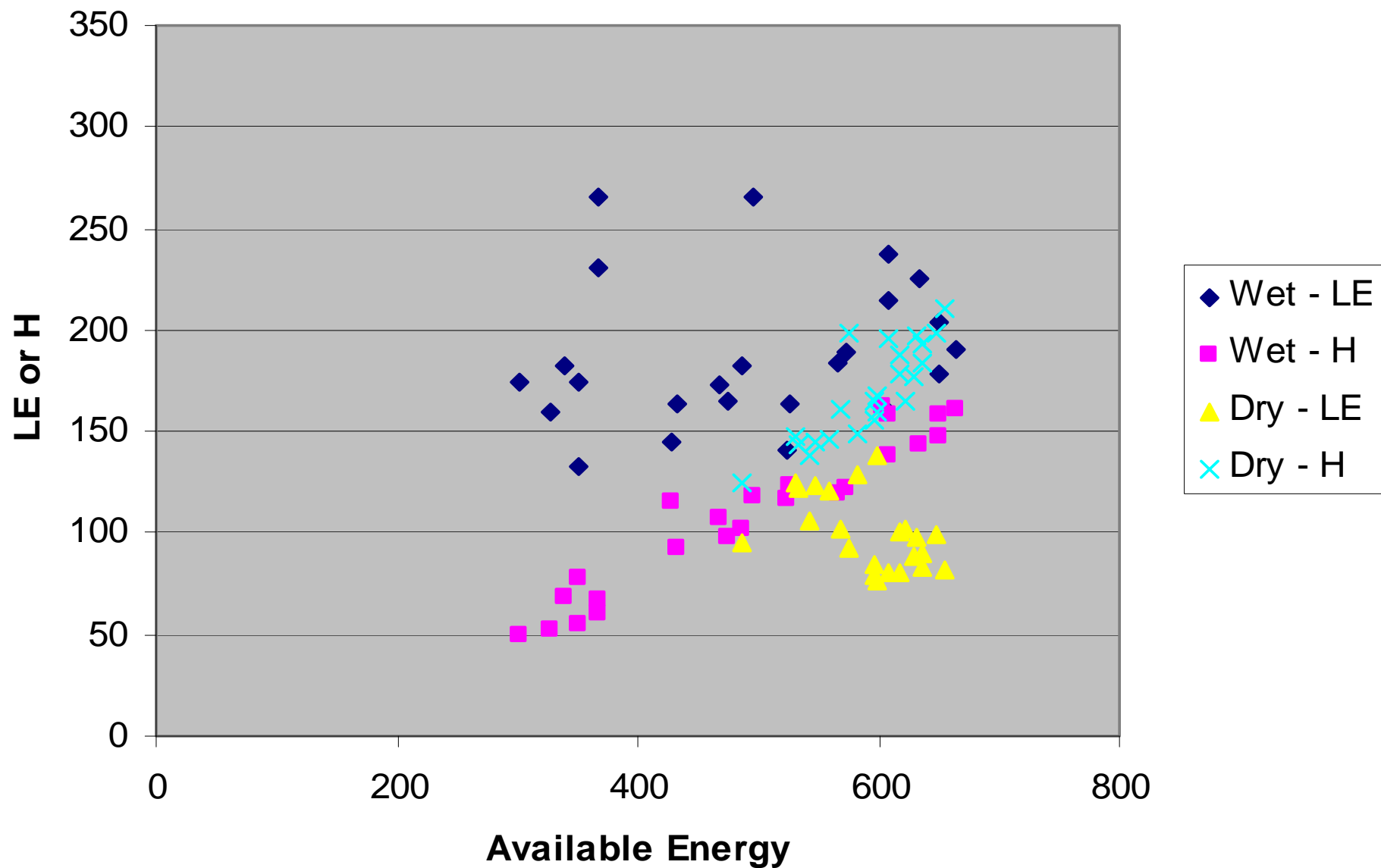
H vs Available Energy



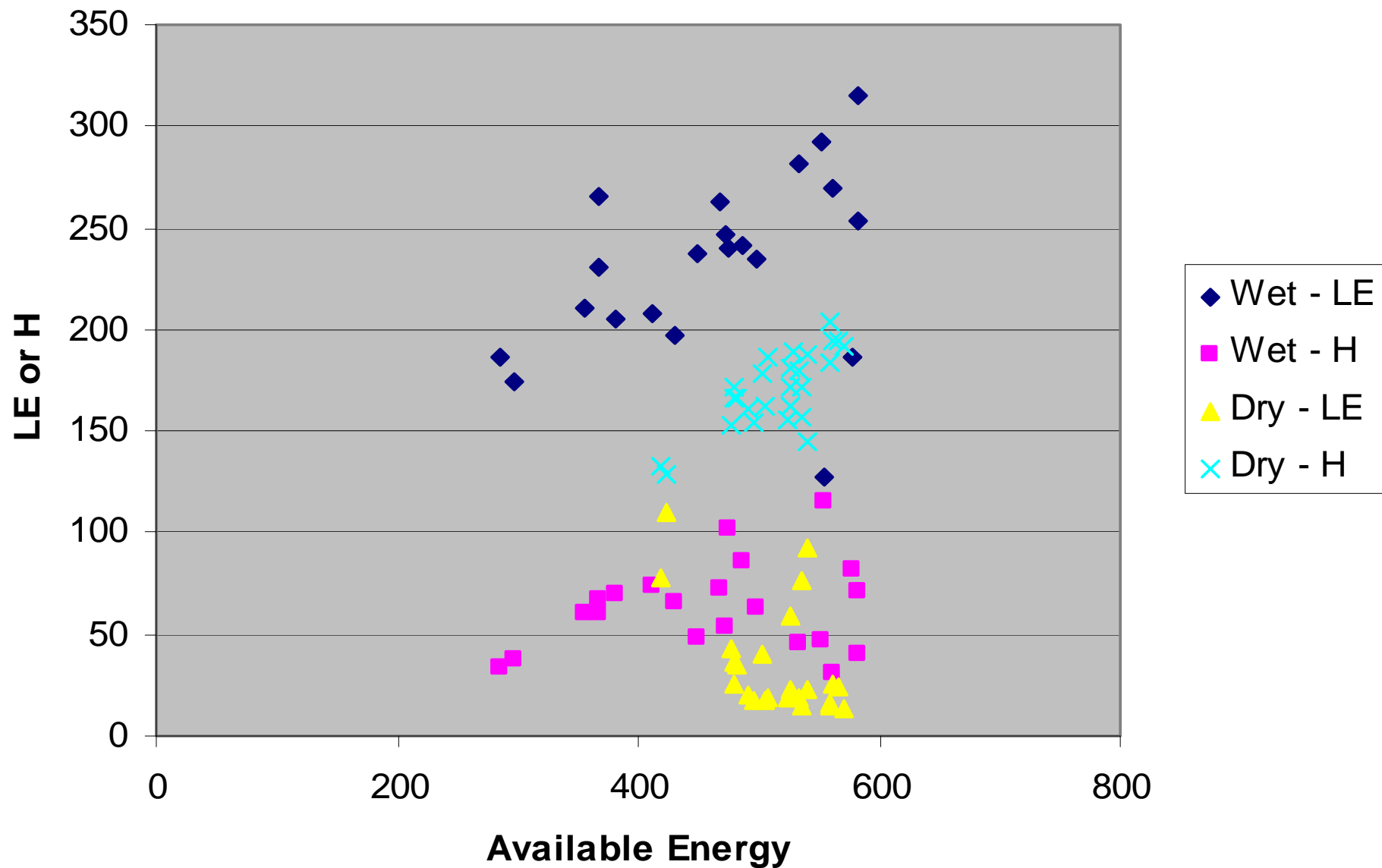
Regrowth Wet and Dry LE or H vs Available Energy



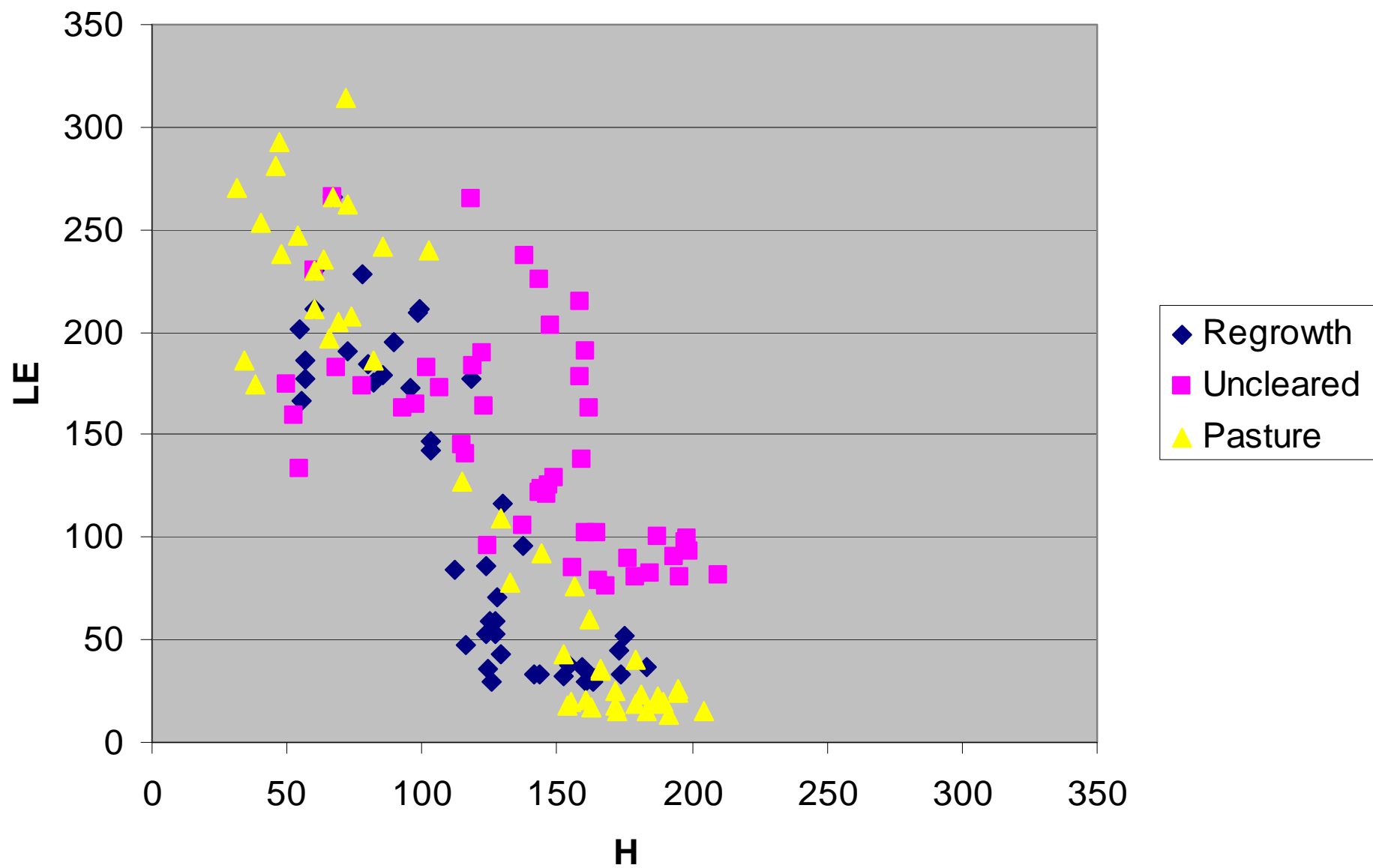
Uncleared Wet and Dry LE or H vs Available Energy



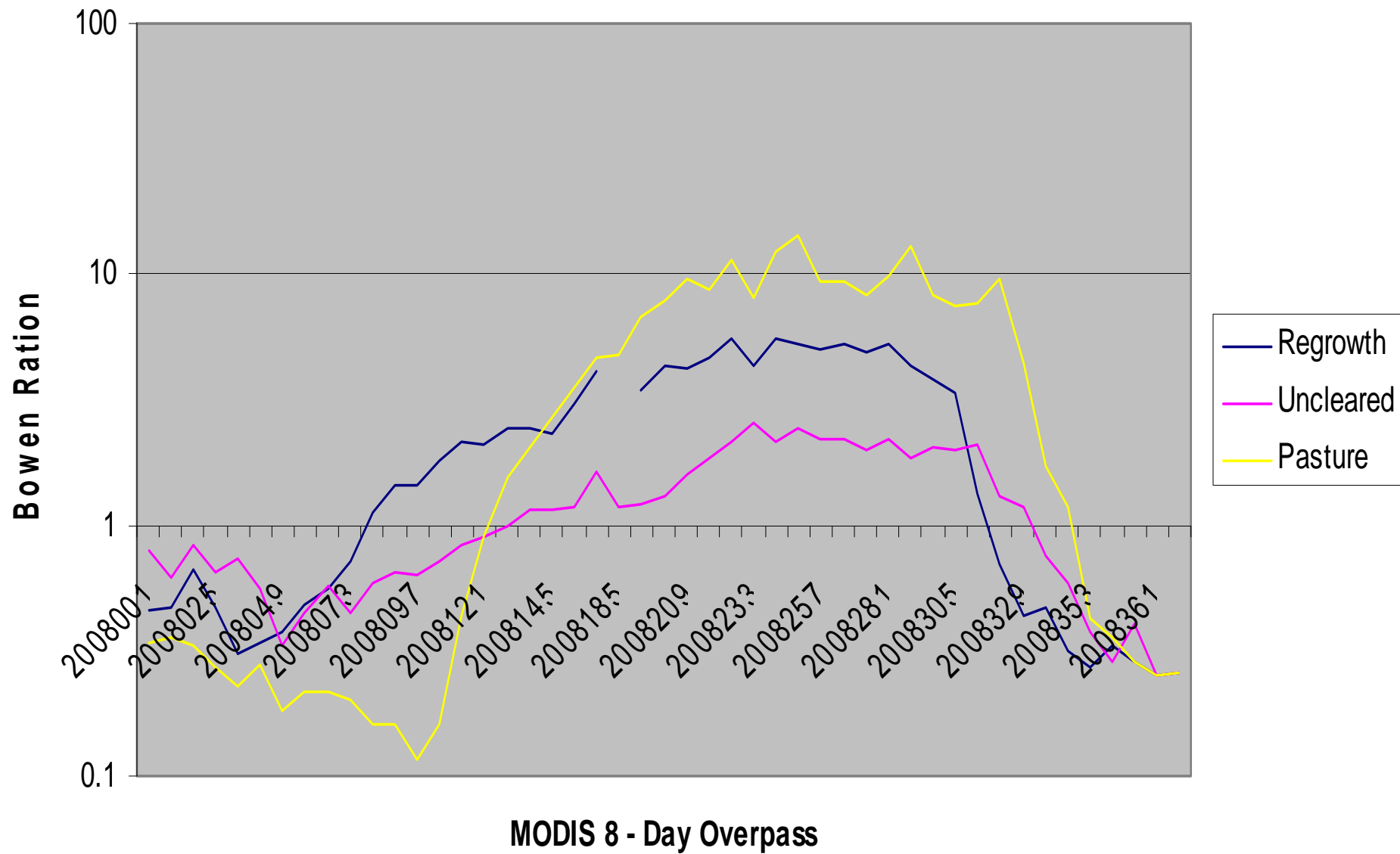
Pasture Wet and Dry LE or H vs Available Energy



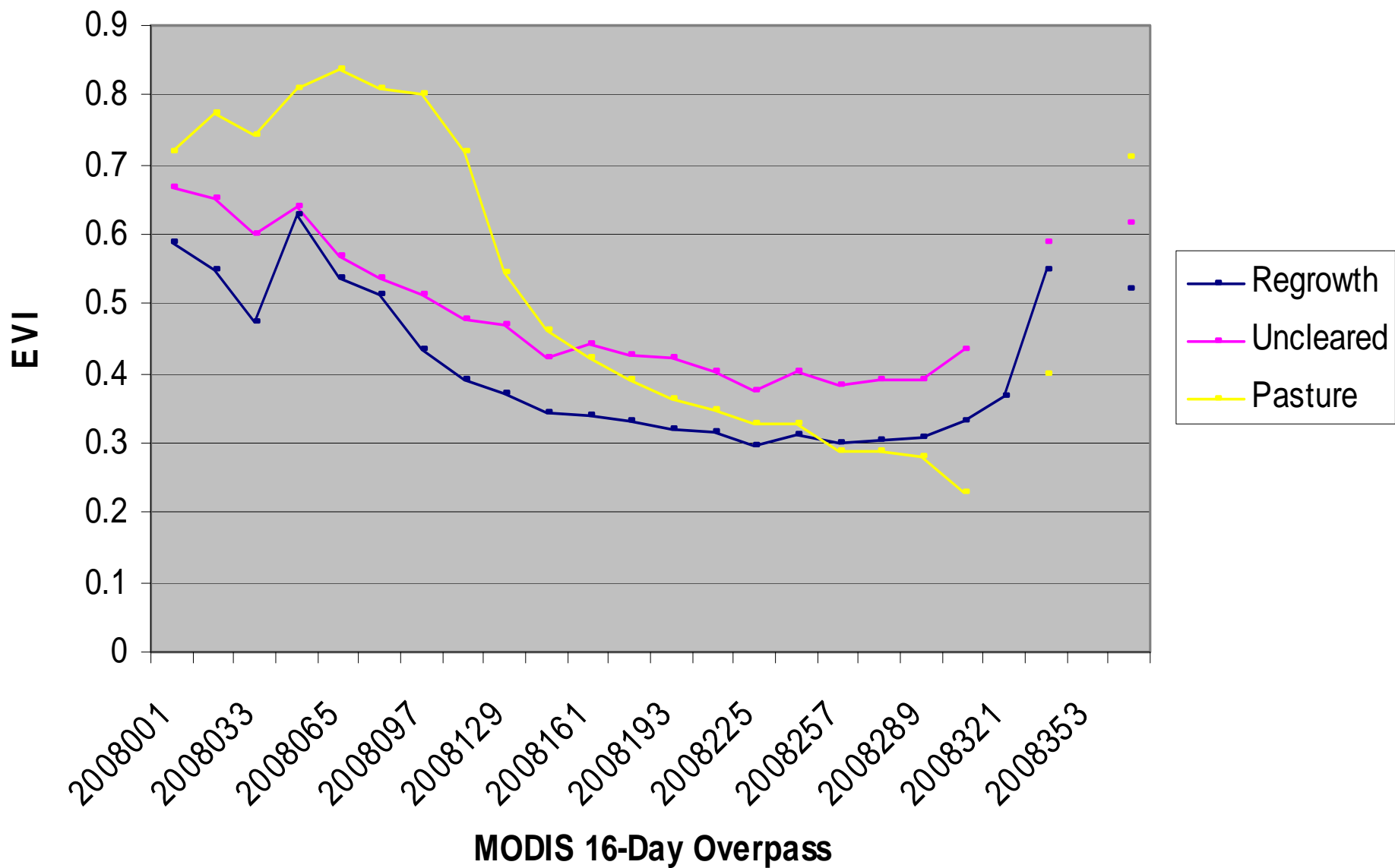
LE vs H



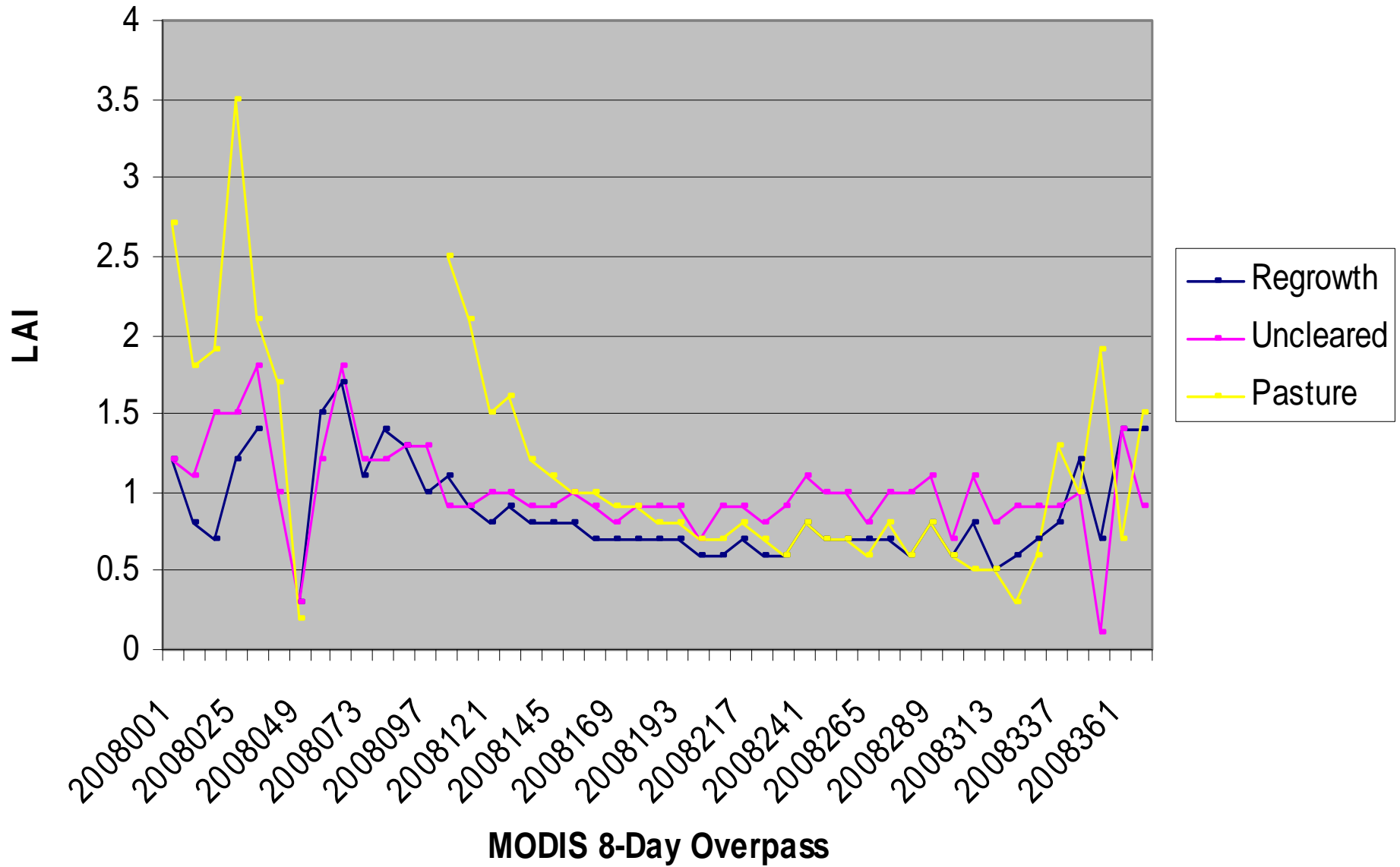
Bowen Ratios



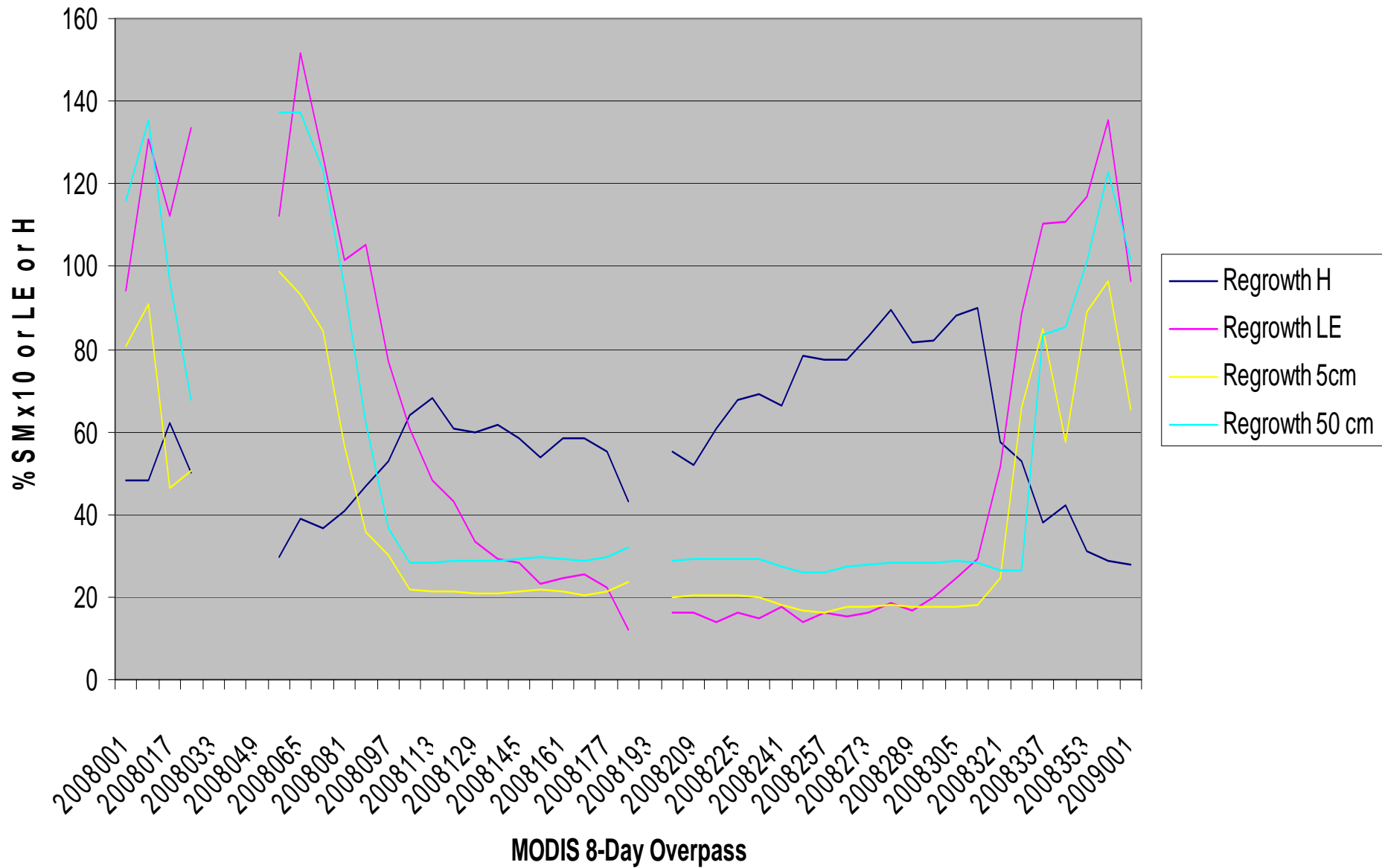
MODIS 16-Day EVI



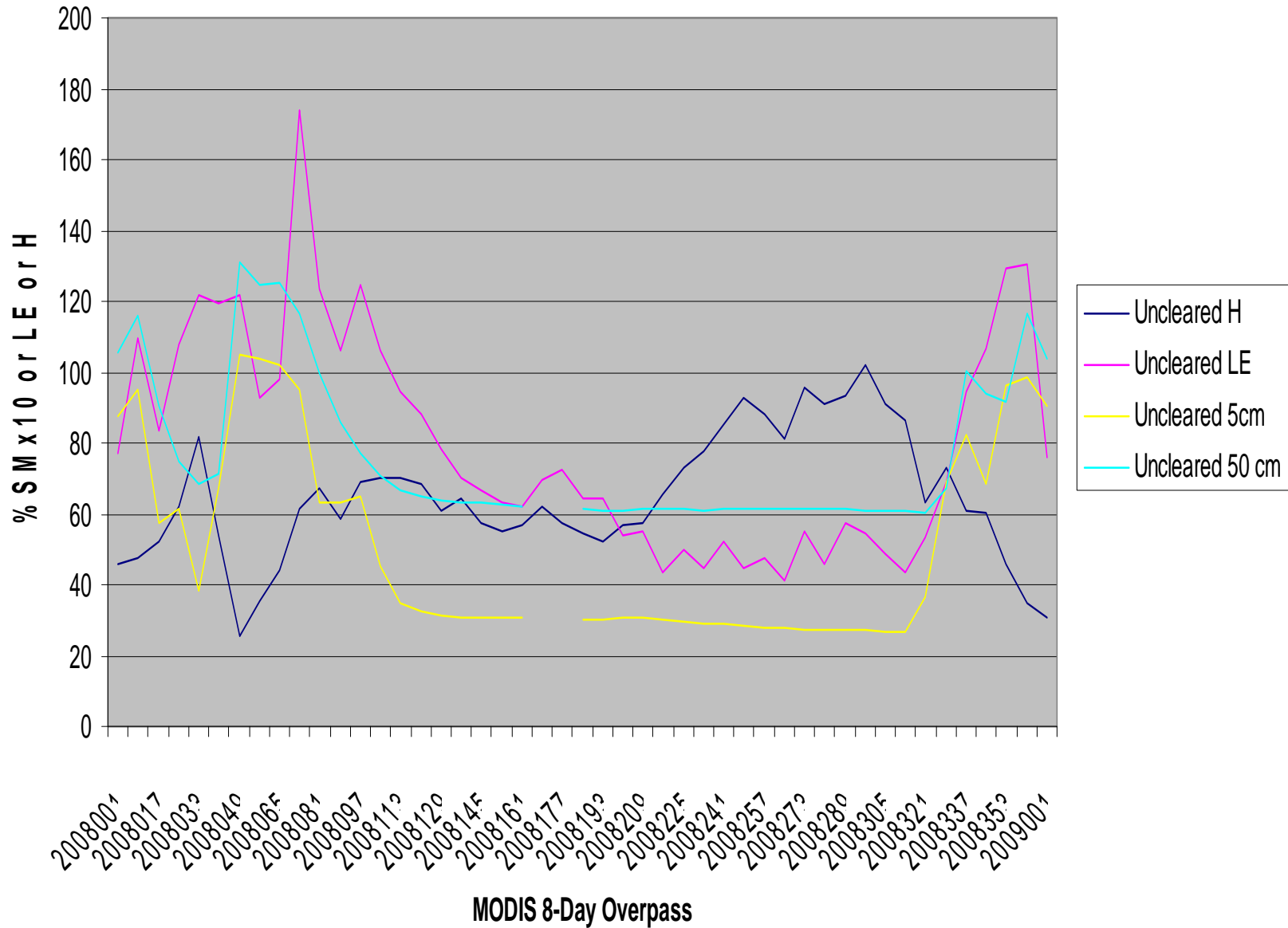
MODIS 1km LAI



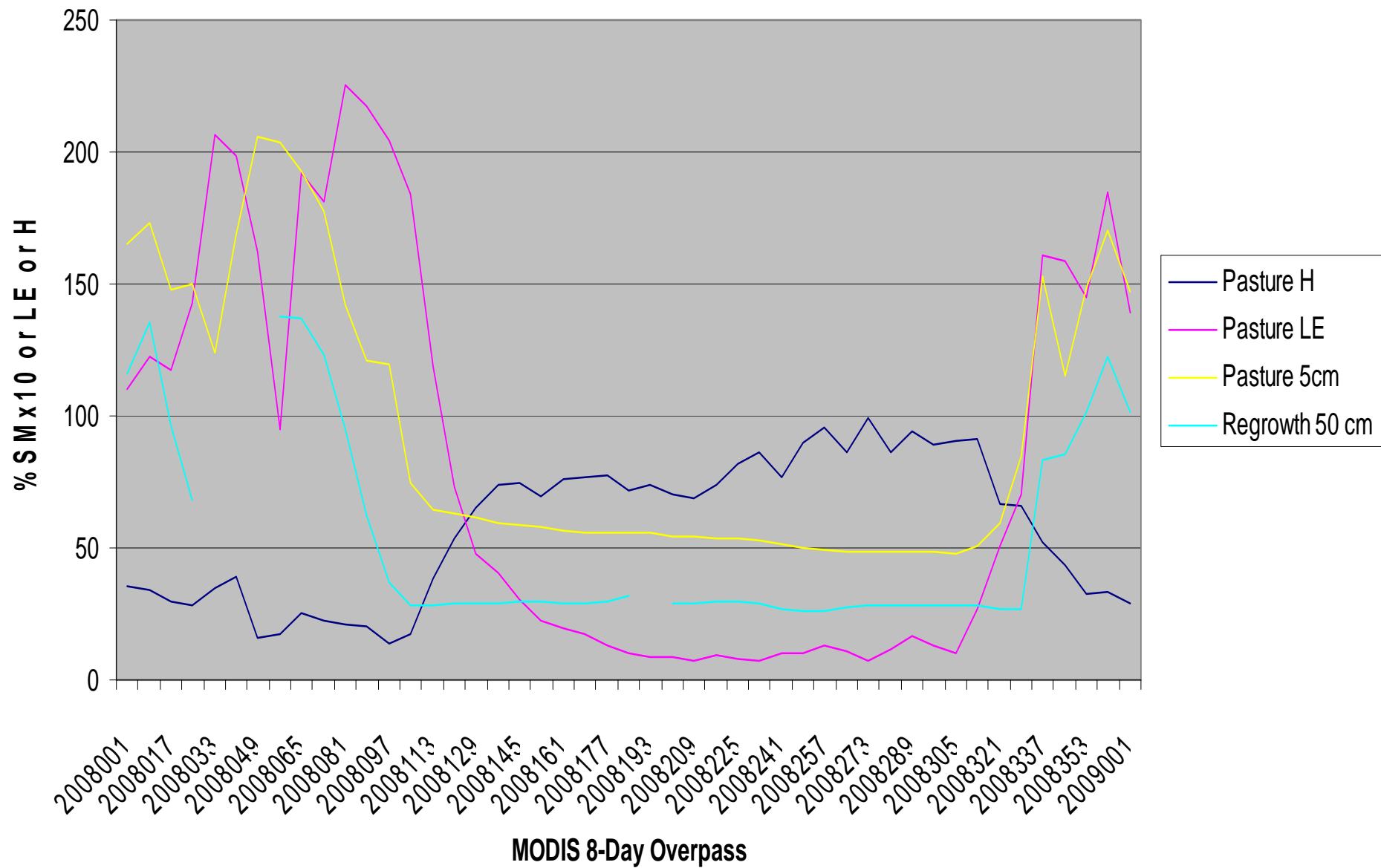
Regrowth Site - Soil Moisture vs LE and H



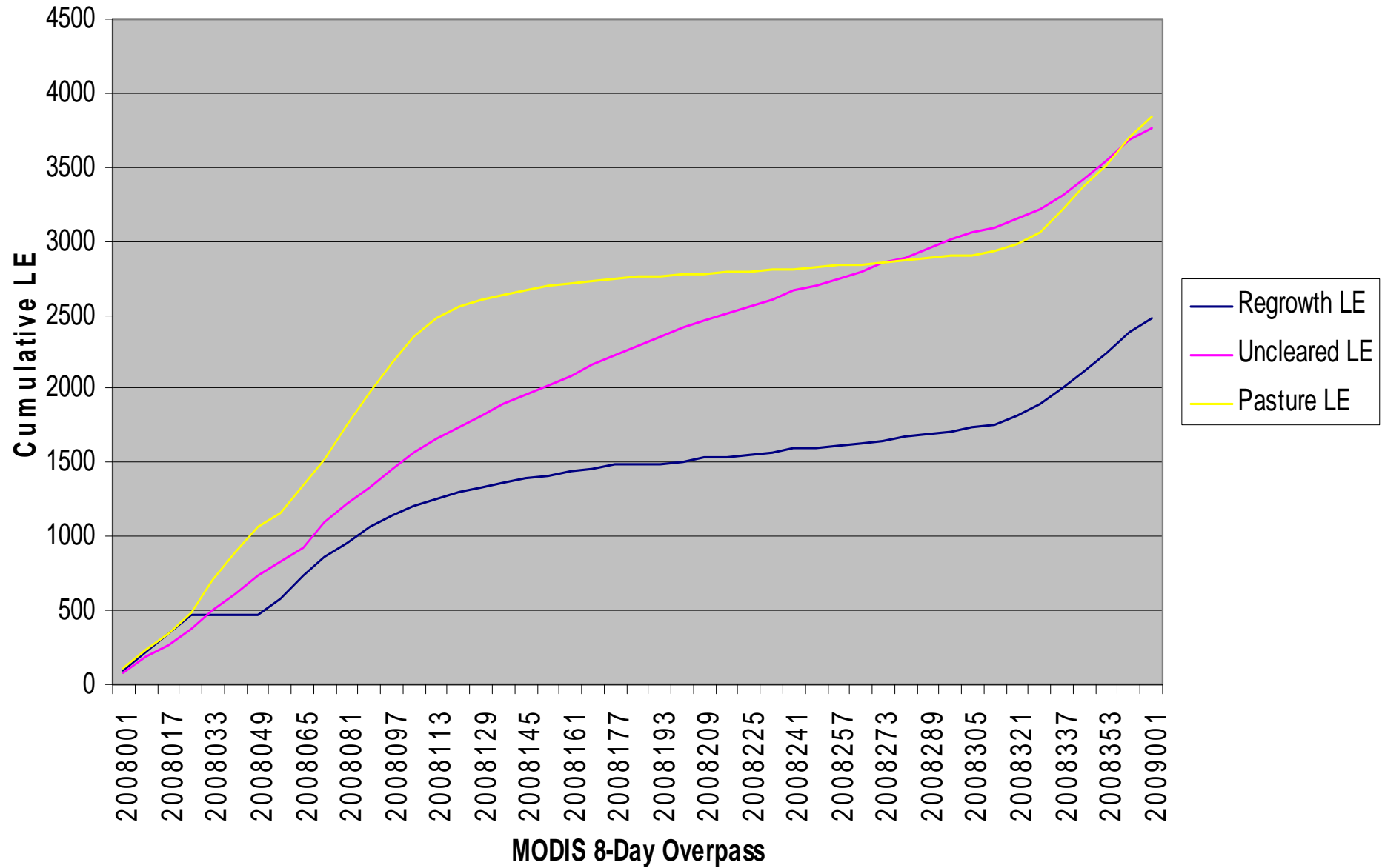
Uncleared Site - Soil Moisture vs LE and H



Pasture Site - Soil Moisture vs LE and H



Cumulative LE



Conclusions

- Land clearing significantly alters the water-energy balance in the Daly
- There is a strong seasonality of LE and H fluxes
- Cleared sites are more seasonal than native, uncleared sites
- Total ET at cleared sites and native sites are equal although rates of water use differs seasonally
- Deep Soil Moisture and changes in runoff-infiltration dynamics are likely to impact the water balance more than changes in total ET