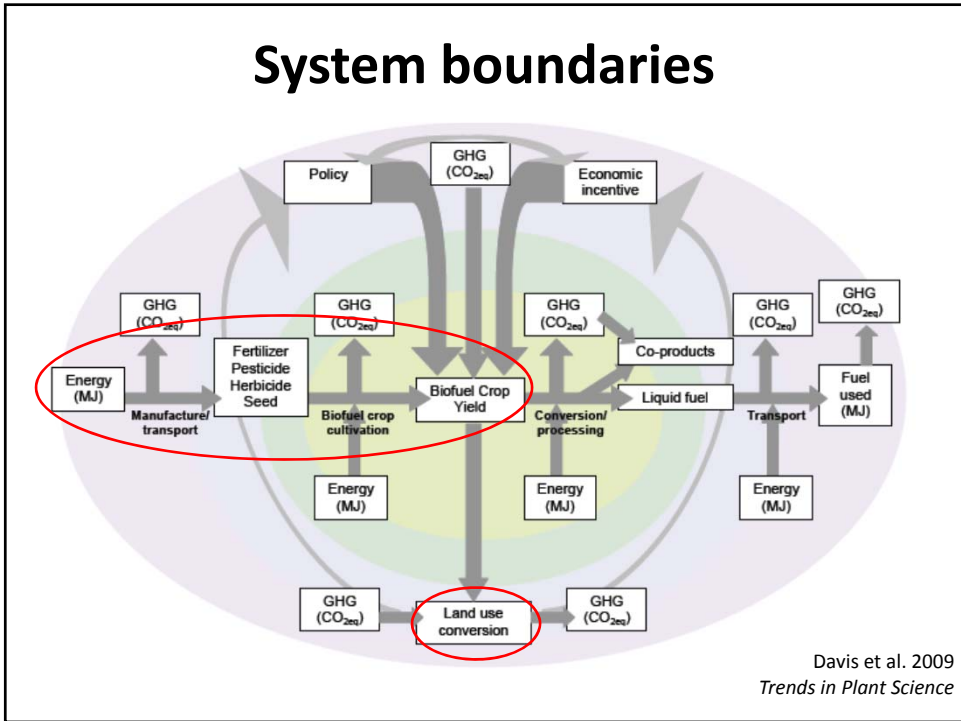


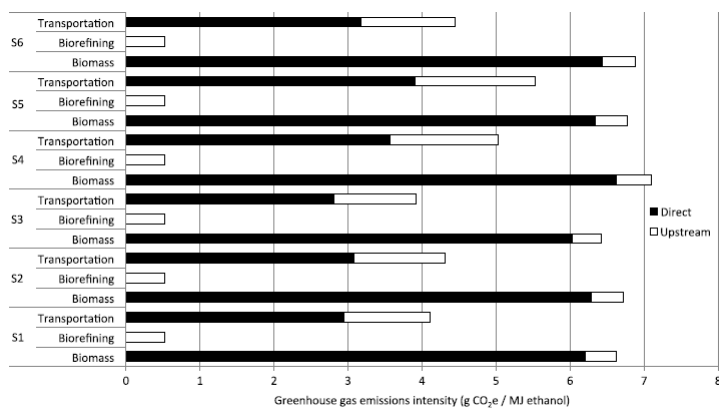
Timing of emissions: land use and management

Sarah C. Davis

IEA Bioenergy Task 38
Argonne National Laboratory
April 12, 2012



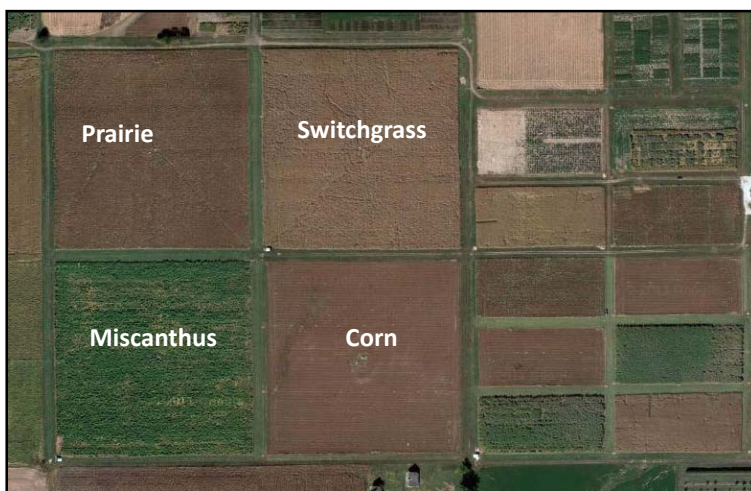
GHG emissions of biofuel production



66% of emissions occur in the biomass production phase of the biofuel production chain

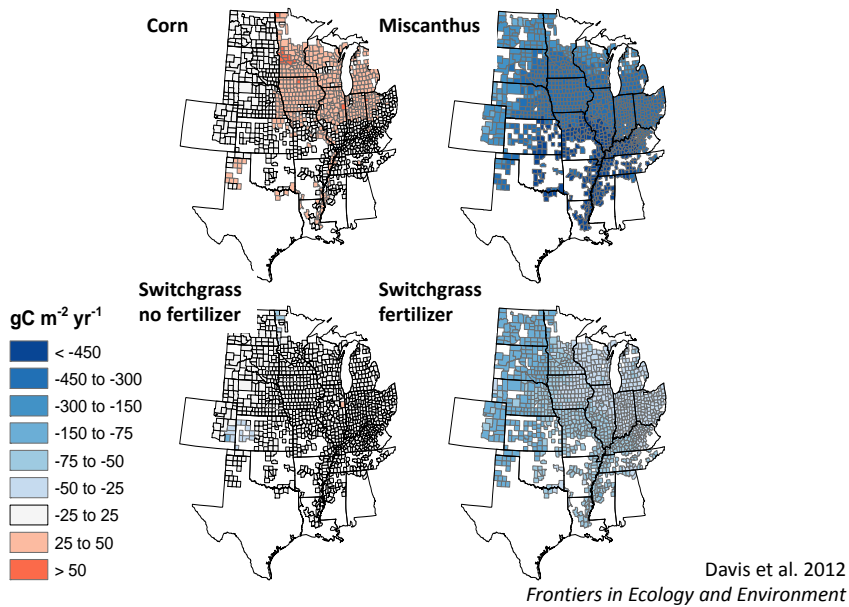
Scown *et al.* 2012
Environmental Research Letters

Land cover change

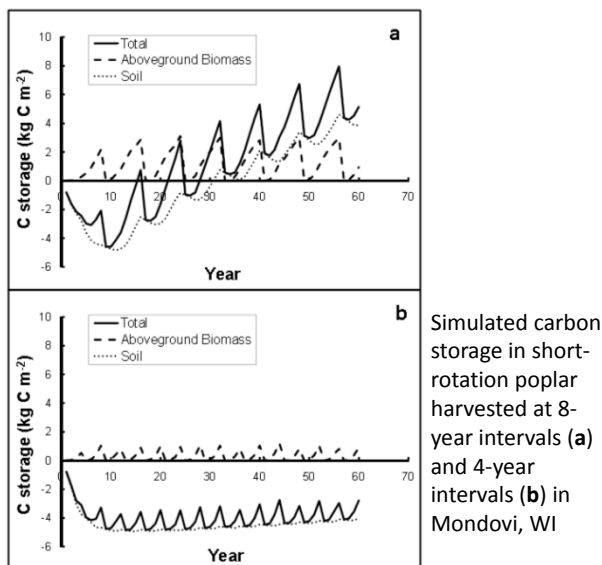


Google Earth Image

Net Greenhouse Gas Fluxes



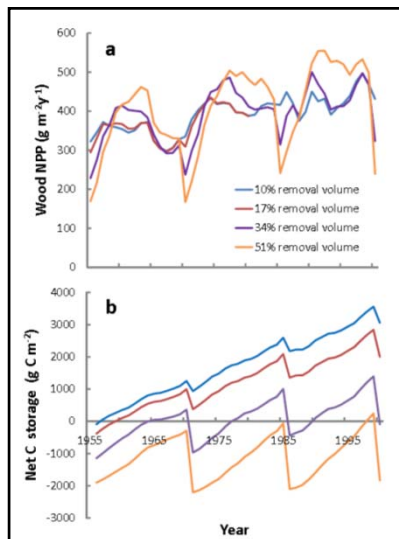
Harvest timing affects C storage -woody biomass example



Simulated carbon storage in short-rotation poplar harvested at 8-year intervals (a) and 4-year intervals (b) in Mondovi, WI

Davis et al.
in review

There is a tradeoff between the frequency and intensity of harvests



Davis et al.
in review

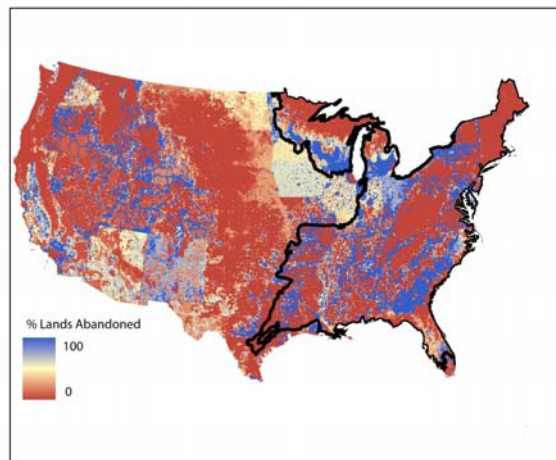
Impact of land use change depends on spatial scale of management



Management affects emissions



Timing of Land Abandonment -regenerating forest is a large C sink



Davis et al.
in review

Summary

Timing of emissions is less important when assessing carbon emissions associated with a bioenergy cropping system that replaces an existing bioenergy crop (cover change) than when assessing emissions from a bioenergy cropping system that replaces a vegetation used in a different capacity. A simple comparison of carbon balances can be sufficient.

Carbon emissions over time vary with harvesting intervals.

Timing of carbon emissions may depend on the spatial scale analyzed.

A reasonable point in history should be identified as the benchmark for land use change.

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