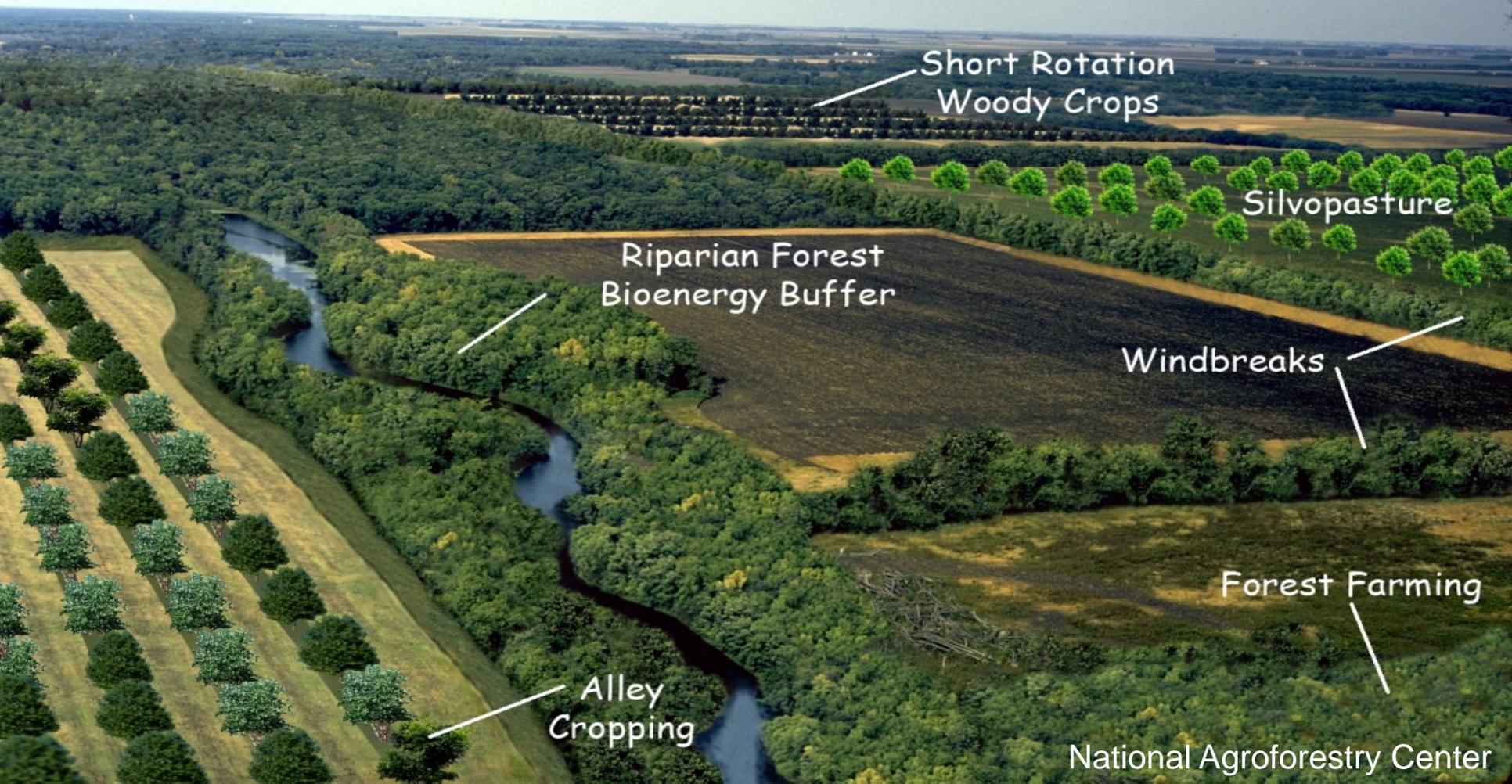


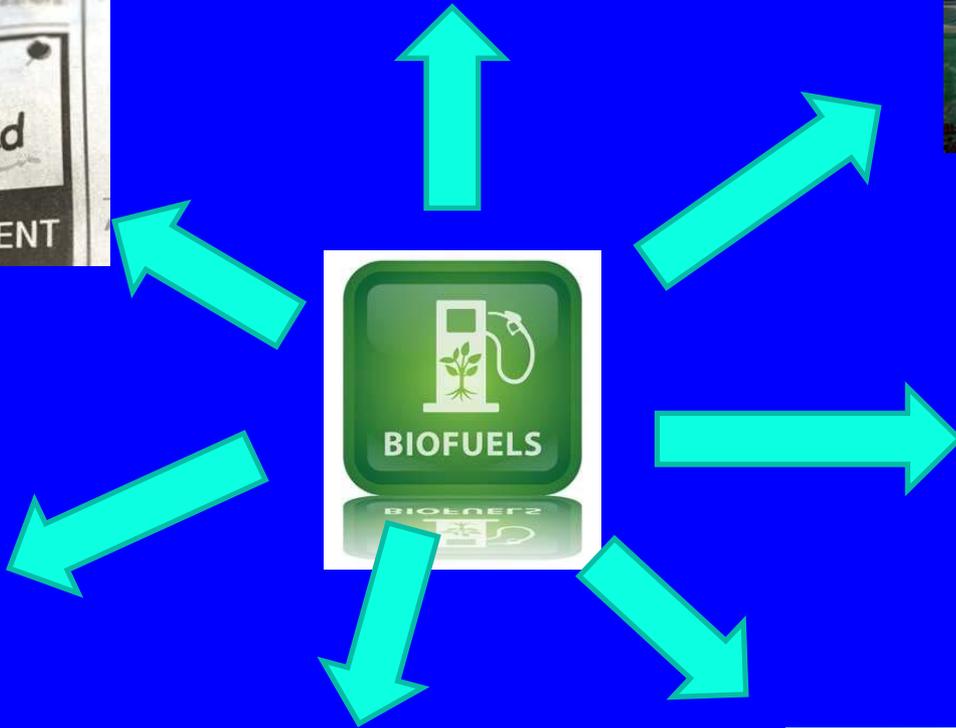
# Conservation, Energy Security and Jobs With Biomass Crops – How Do We Get There From Here?

Nick Jordan, Agronomy & Plant Genetics, University of Minnesota



# Multifunctional bioenergy crops can create private wealth & public value





# Cedar Rapids Data

Number of Days With Total Precipitation Greater Than  
or Equal to

inches

13

$R^2 = 0.0816$

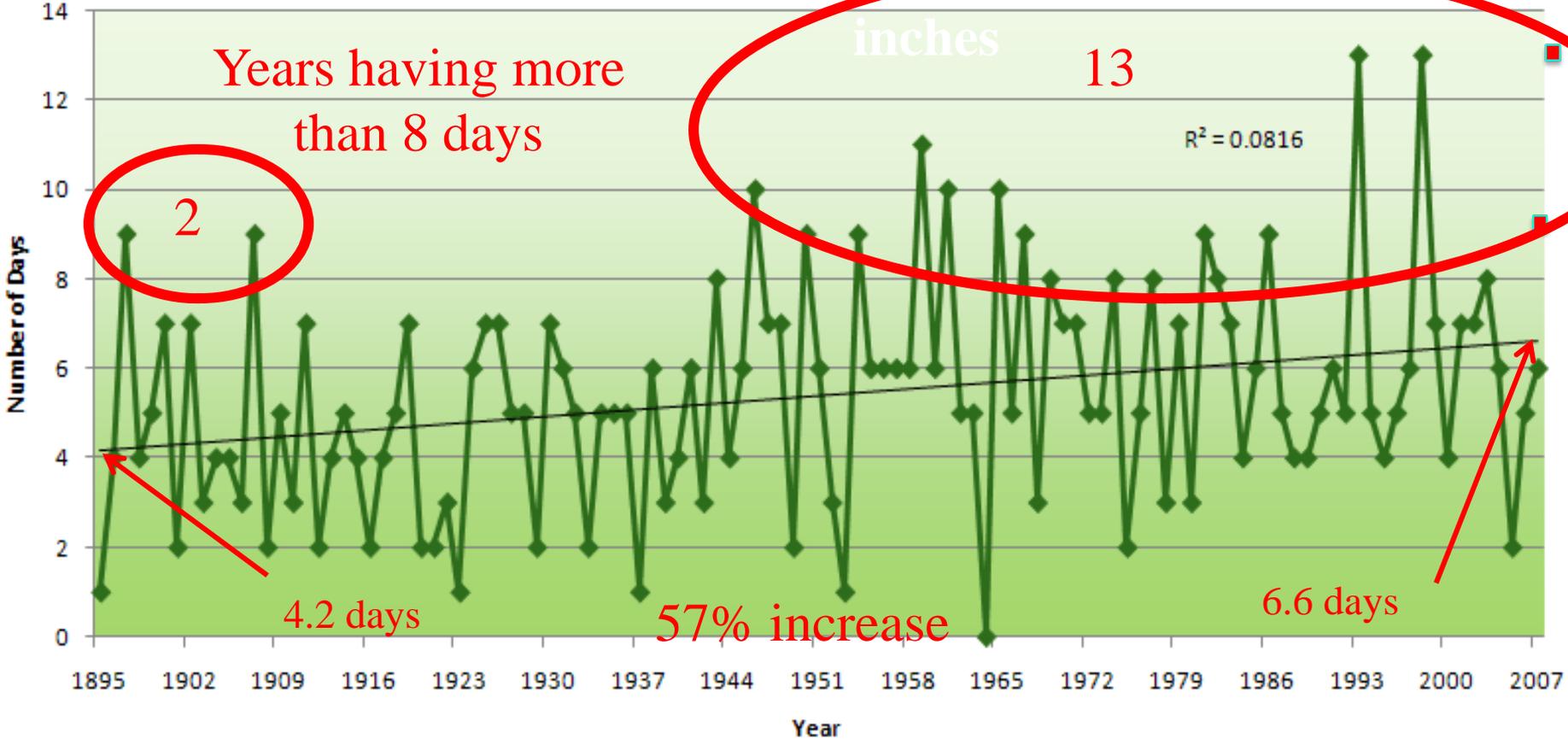
Years having more  
than 8 days

2

4.2 days

57% increase

6.6 days



# What should we do?

Reganold et al. 2011 *Transforming U.S. Agriculture*

“Transformative change looks to whole-system redesign rather than single technological improvements.”

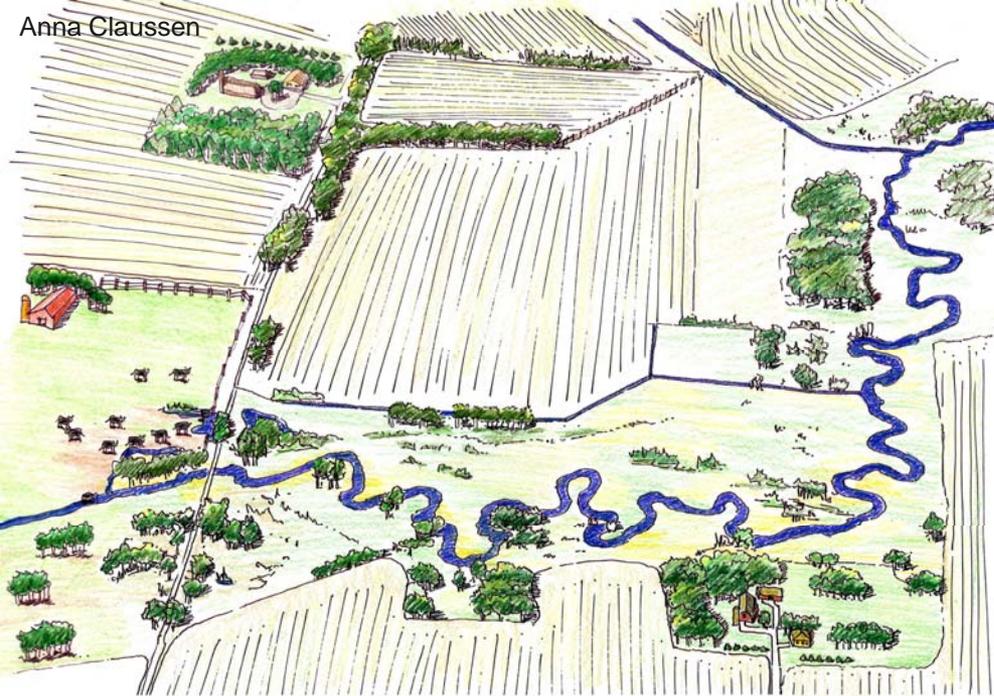
“...change is hindered by market structures, policy incentives, & uneven development & availability of scientific information...”

“...implementation will require organizations spanning political & institutional boundaries & integrating...from research to on-farm implementation, to markets, and to the dinner table.”

# New cross-sector institutions for transformation

## What are these all about?

- **‘Innovation System’ Approach *to link technological, economic, social, & policy innovation together for transformation***
- **Emphasis on pilot scale-up projects that link & leverage resources of private enterprise, research, NGOs and government at new biophysical, social & economic scales**
- **Now being explored by several regional groups**



What should the landscape look like?

How should it work?

Significant risks of NIMBY & LULU!!



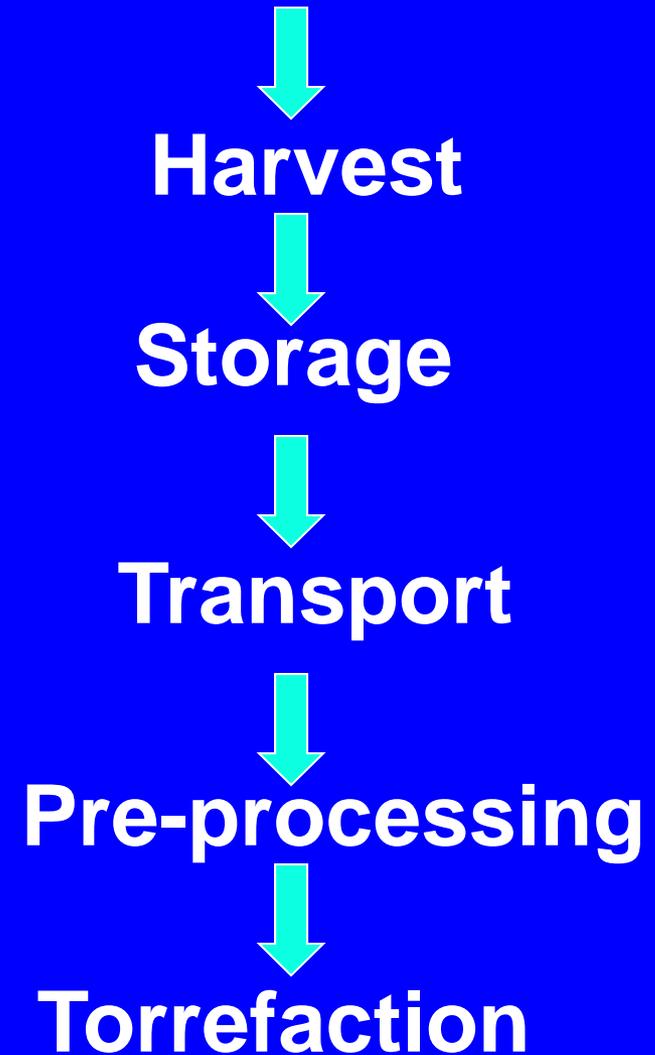
Innovation must address landscapes & land-  
**USE**...not just 'technology'



Innovation must connect  
**new technologies  
& enterprises into  
supply-value chains**  
that are viable economically,  
socially & environmentally

**Risk of NIMBY & LULU...**

## **Biomass Production**



*Bioenergy supply-value chain  
Rural Advantage, Fairmont MN*

# **Innovation** must address **policy & regulation**

- **EQIP** - Environmental Quality Incentives Program
- **WHIP** - Wildlife Habitat Incentives Program
- **CSP** - Conservation Stewardship Program
- **CRP** - Conservation Reserve Program
- **WRP** - Wetland Reserve Program
- **BCAP** - Biomass Crop Assistance Program

**MANY relevant policies...(see above!)**

**How can policies interact to drive innovation?**

**Needed: More synergy, less conflict, confusion...**

# A 'Landlab' Innovation System for Regional Bioenergy Systems Development

Landlabs couple biophysical, economic & policy innovation

## LandLabs: Landscape - Scale Learning Laboratories

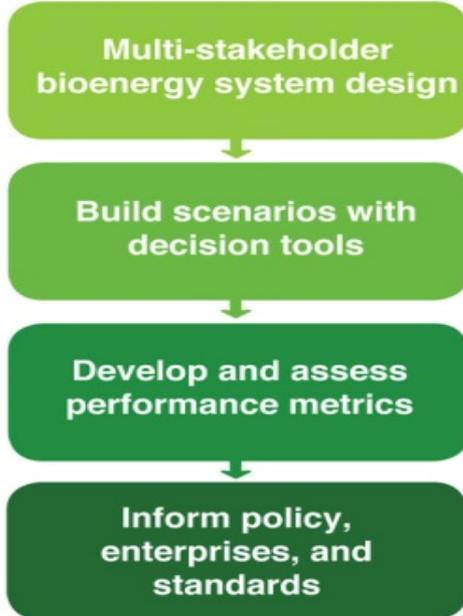
*Incorporate new knowledge*

*Test and validate*

Proposed Process

### Participatory bioenergy system design

Extension and Outreach



### Knowledge system development

K-12 and Higher Education



Inform new study

Community and Industry Partners

Desired Outcomes

