

# On the Road with Geodesign

Len Kne



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# Transdisciplinary Partnership

Carissa Schively Slotterback, Humphrey School of Public Affairs

Nicholas Jordan, Agronomy and Plant Genetics

David G. Pitt, Landscape Architecture

David J. Mulla, Soil, Water, and Climate

Len Kne, U-Spatial

Michael Reichenbach, University of Minnesota Extension

Bryan Runck, Agronomy and Plant Genetics

Amanda Sames, Agronomy and Plant Genetics

Cindy Zerger, Humphrey School of Public Affairs

Joseph Nowak, Landscape Architecture



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# Funding

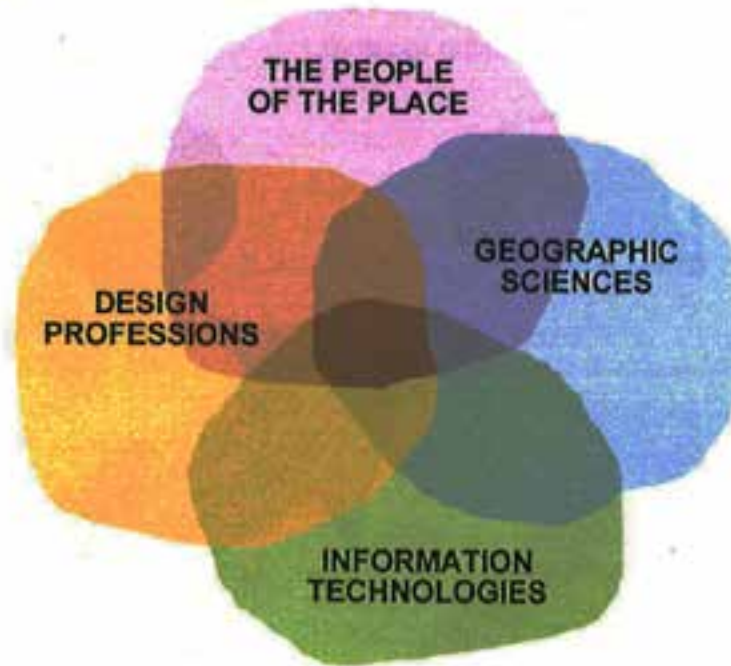
Funding provided by the USDA-NRCS  
Conservation Grant Innovation Program

Office of the Vice-President for Research,  
University of Minnesota



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# Definition of Geodesign



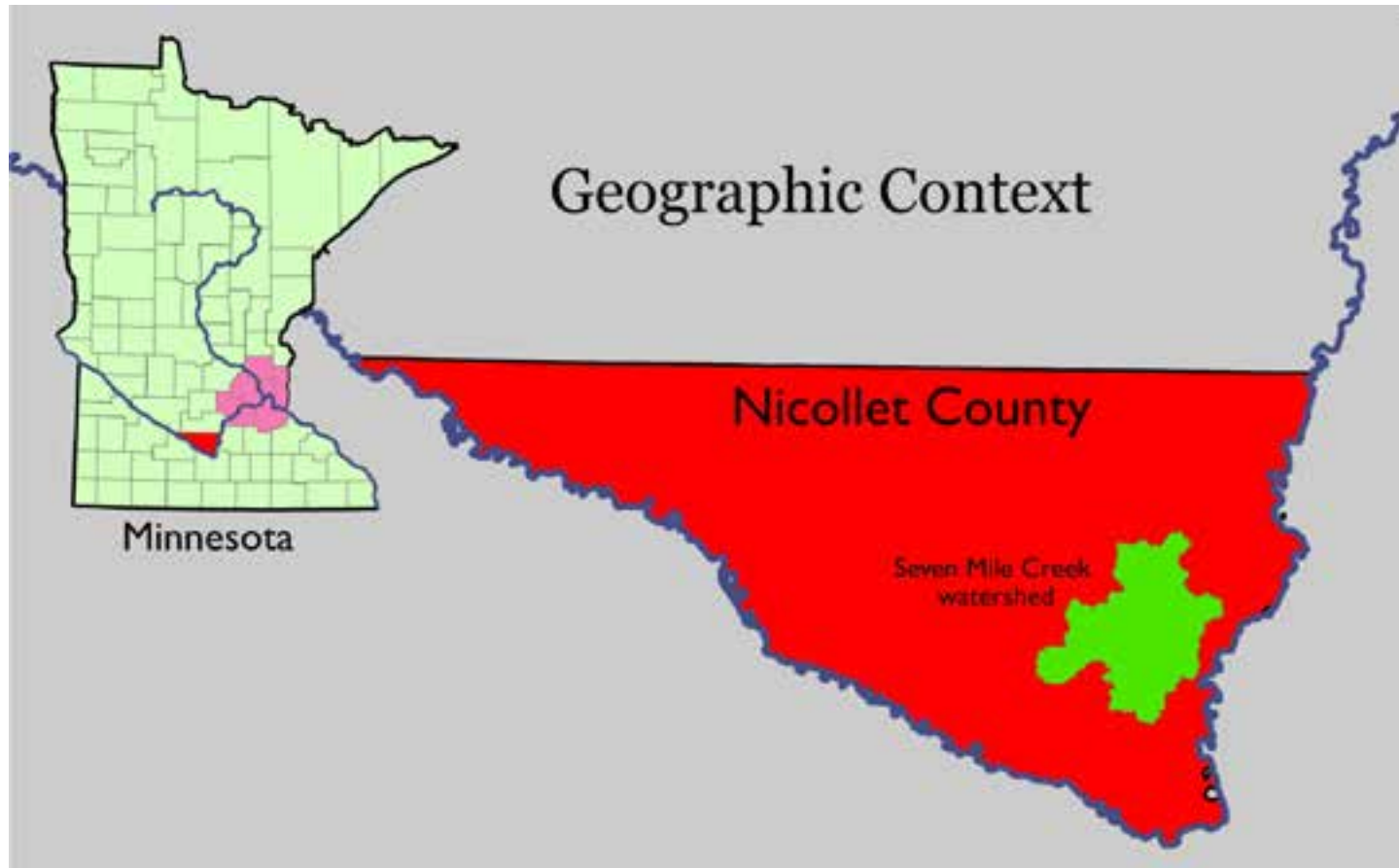
Geodesign requires collaboration among the design professionals, geographical sciences, information technologies, and the people of the place.

Carl Steinitz. 2012. A Framework for Geodesign: Changing Geography by Design. Redlands, CA: ESRI



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# Seven Mile Creek Watershed District



# Multifunctional Landscape Design for Biofuel Resource Production

## Overall goals of USDA-Conservation Innovation Grant

- Engage multiple stakeholder constituencies
  - Producers
  - Agency and institutional personnel
  - NGOs
- Design of working rural landscapes
  - Locating areas for production of food and biomass while also
  - Enhancing habitat and water quality



# Production of herbaceous cellulosic biomass

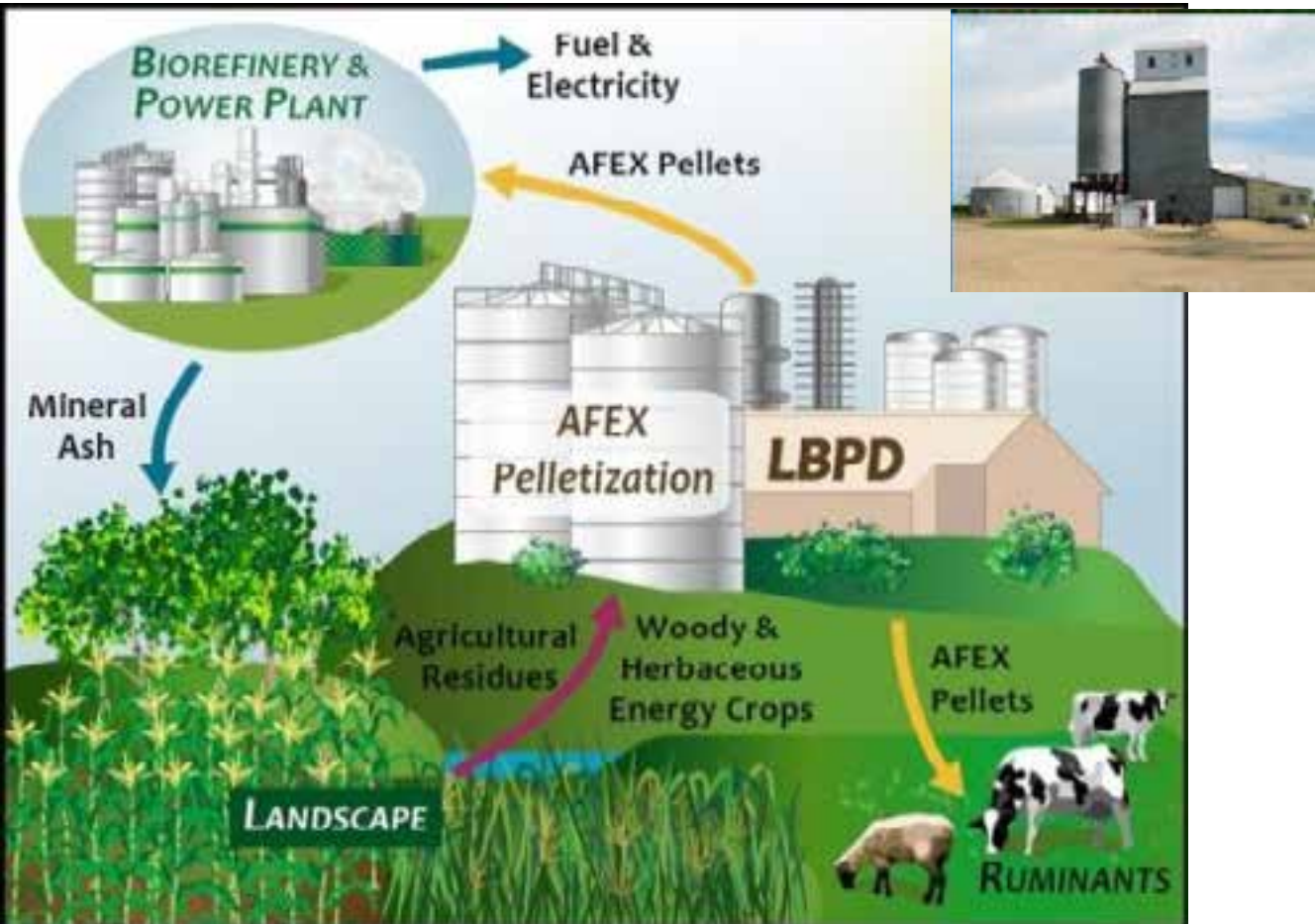


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Courtesy: Nick Jordan

# Supply Chain Scenario



AFEX treated biomass is dried and pelletized



Courtesy: Nick Jordan





# Criteria for evaluating design performance

- ↓ TSS based on SWAT modeling
- ↓ Total P based on SWAT modeling
- ↓ Runoff based on SWAT modeling
- ↑ Habitat value based on DNR modeling
- ↑ Market return based on UMN modeling
- ↑ Landscape appearance of practices included in design
- ↑ Carbon sequestration based on InVest modeling



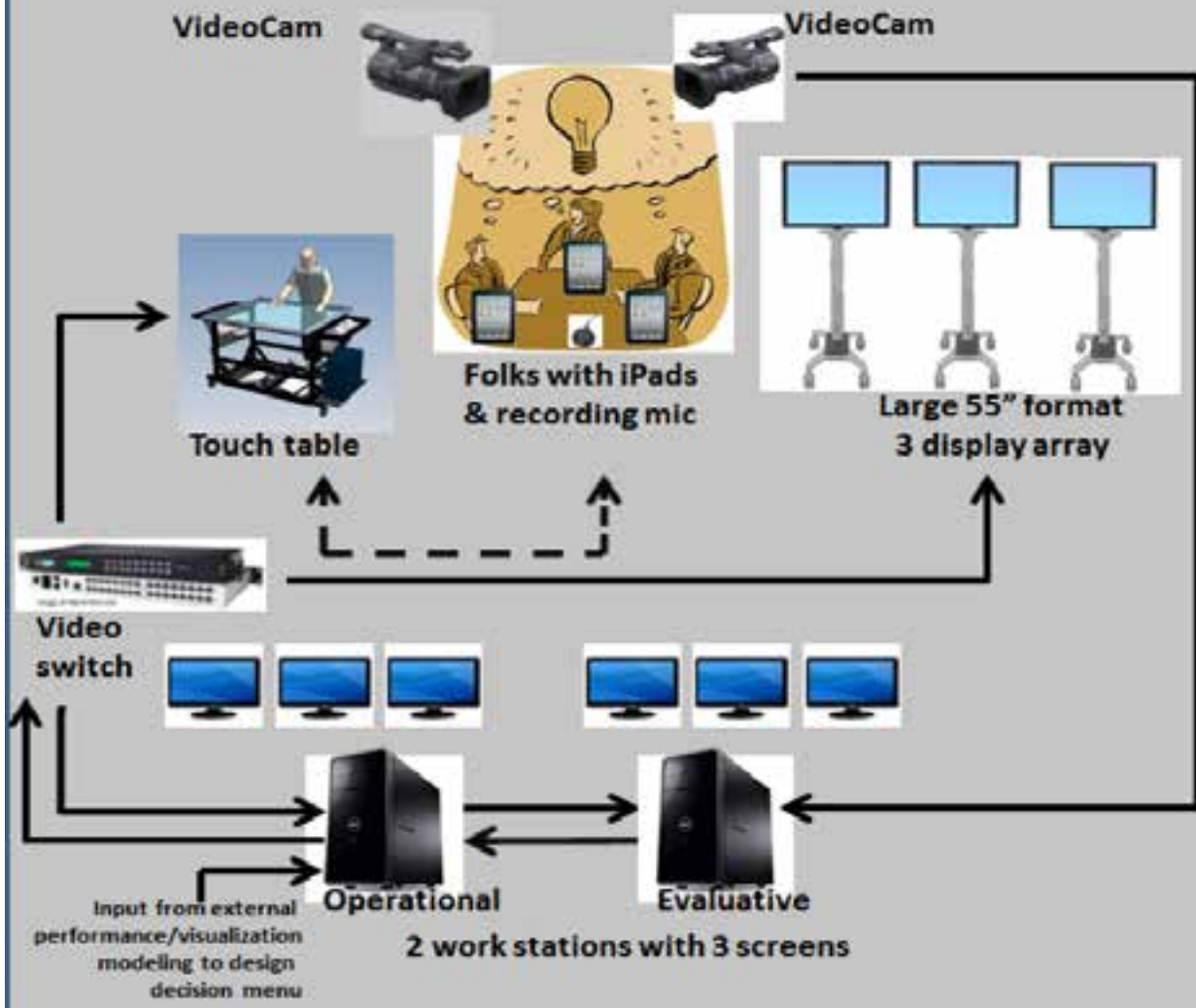
# The Decision Lab

Decision Lab Schematic



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# Decision Lab Module

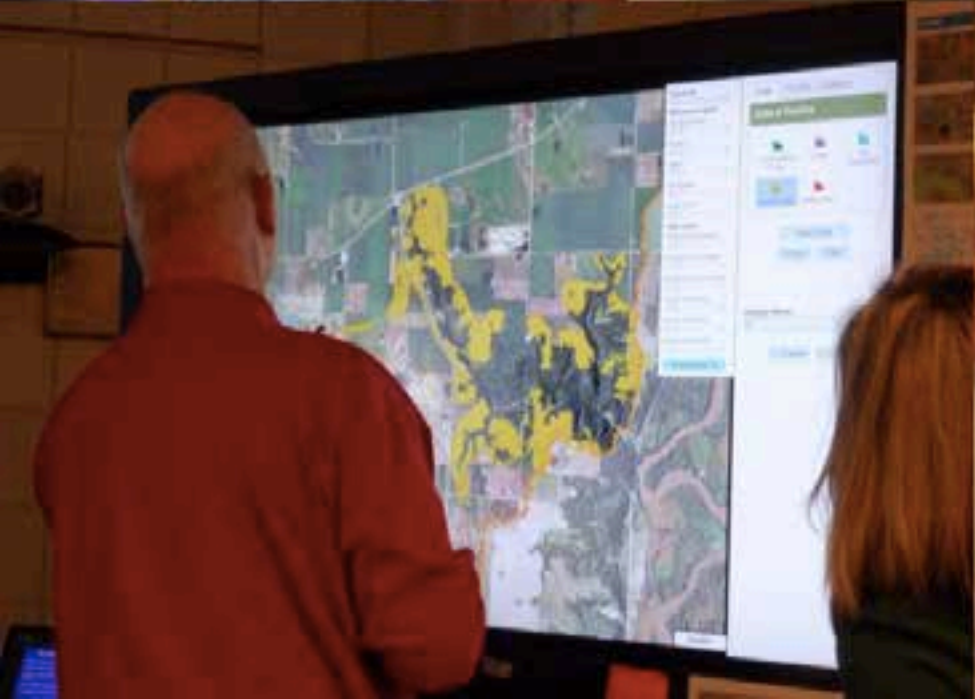


# Mobile Geodesign



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# Stakeholder Engagement with Geodesign Technology

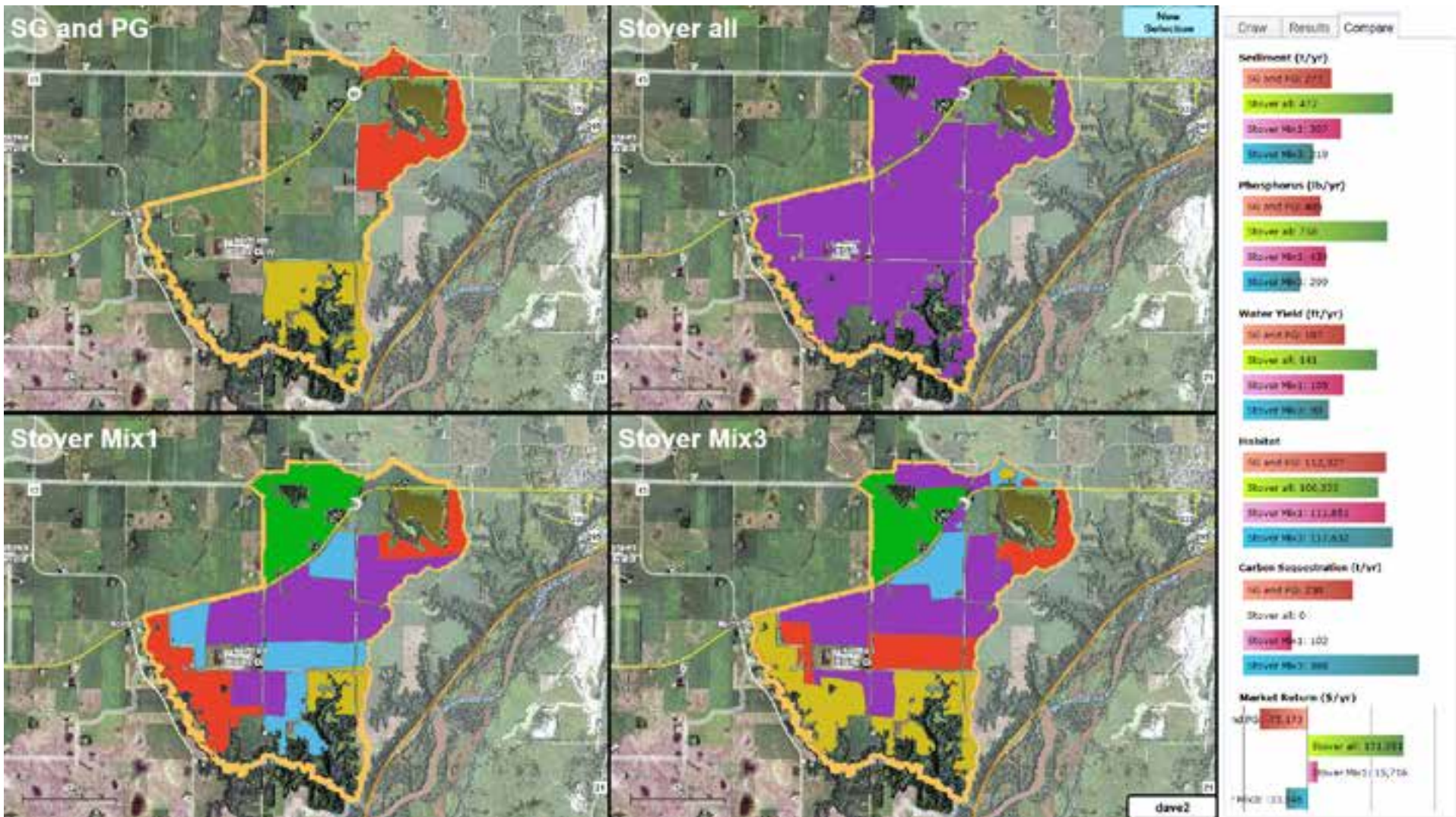


# Show video

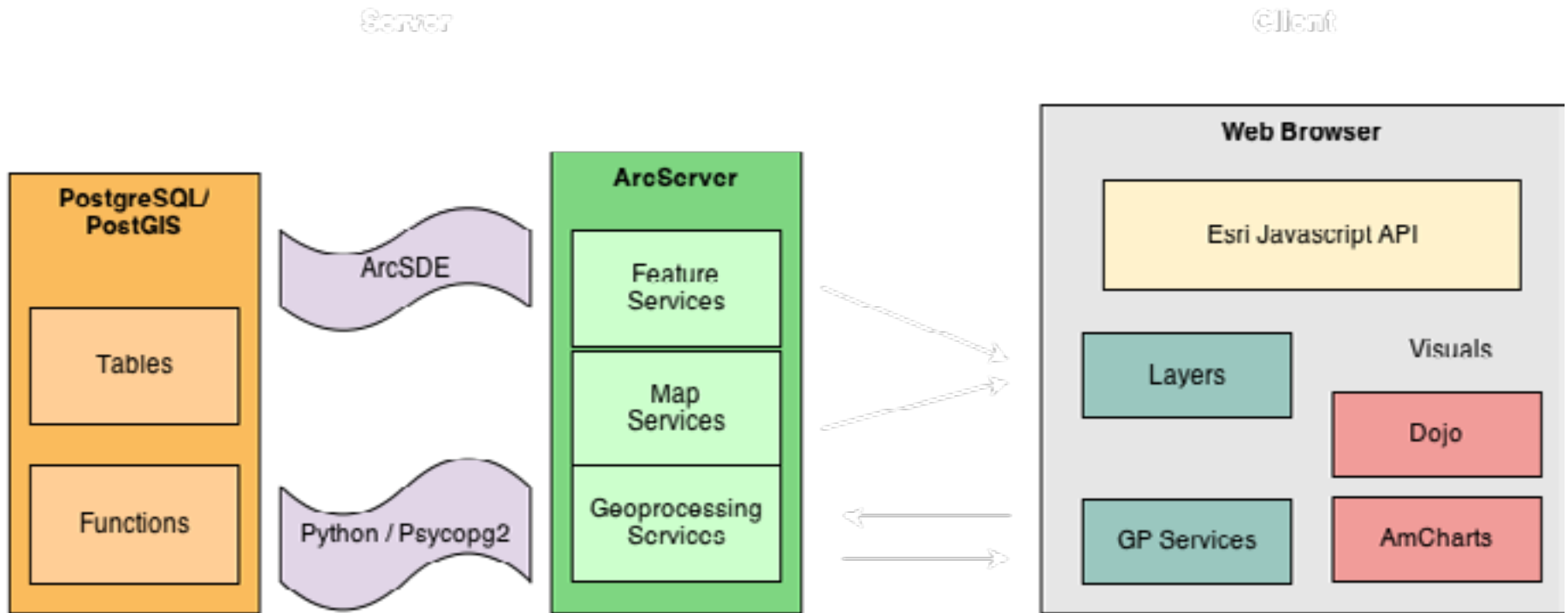
- <http://youtu.be/nXdW81Q7Kyl>



# Comparing Designs

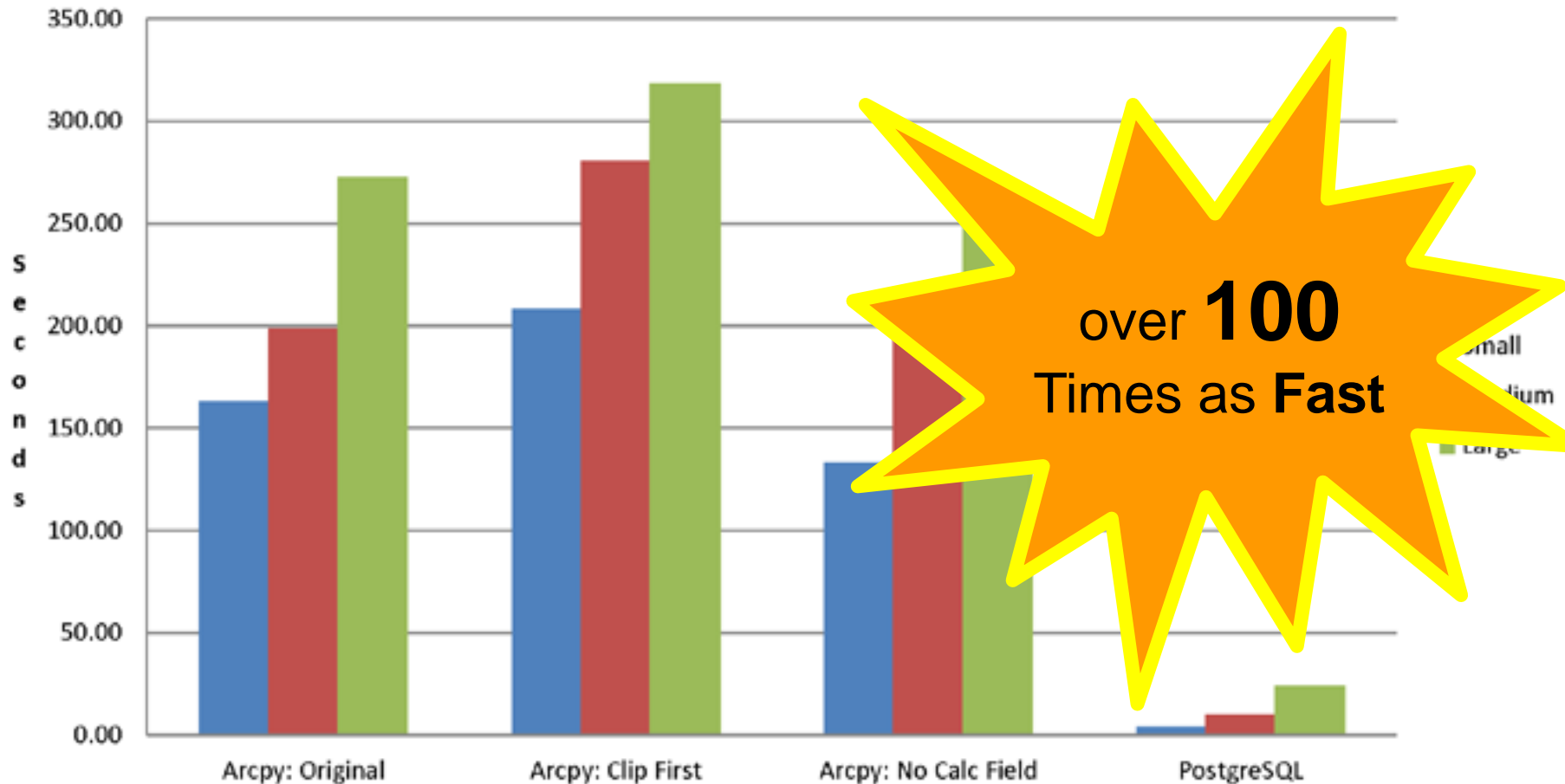


# System Architecture





## Geodesign Method Comparison Arcpy vs. PostgreSQL

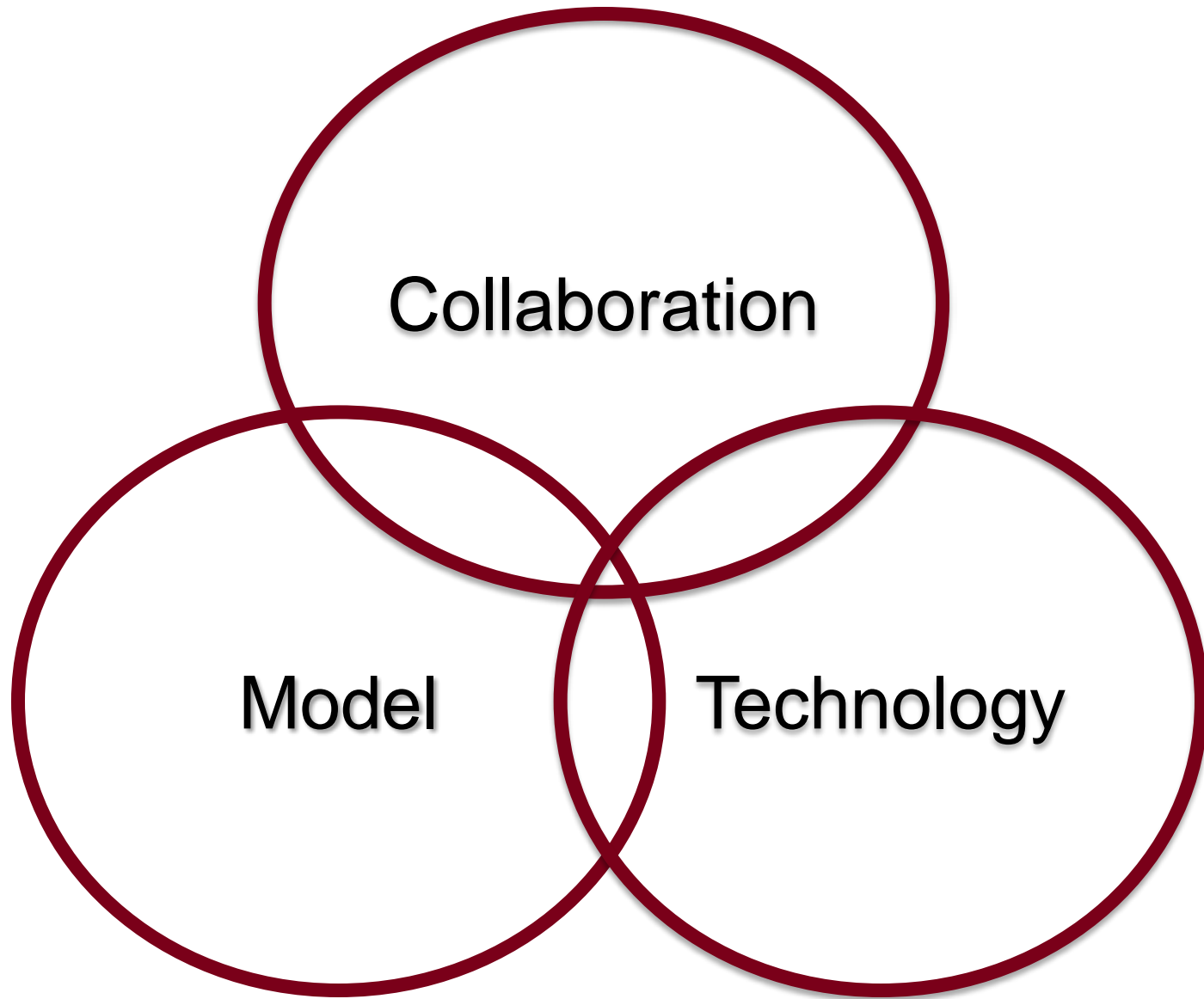


# Other Projects



- Research
  - Supply Chain
  - App Development
- Classroom
  - LA Studio
  - Public Policy
- Outreach
  - Education
  - Conservation Districts





Questions?

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