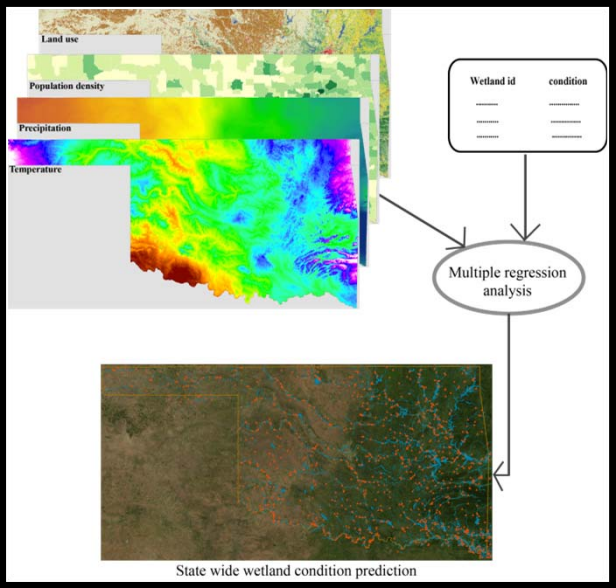
# Development of Landscape GIS Models for the Prediction of Wetland Condition

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# Monitoring and Assessment

- Level 1 - Landscape assessments using GIS data
- Level 2 - Rapid assessments using relatively simple metrics
- Level 3 - Intensive site assessments of biological taxa and/or hydrogeomorphic functions

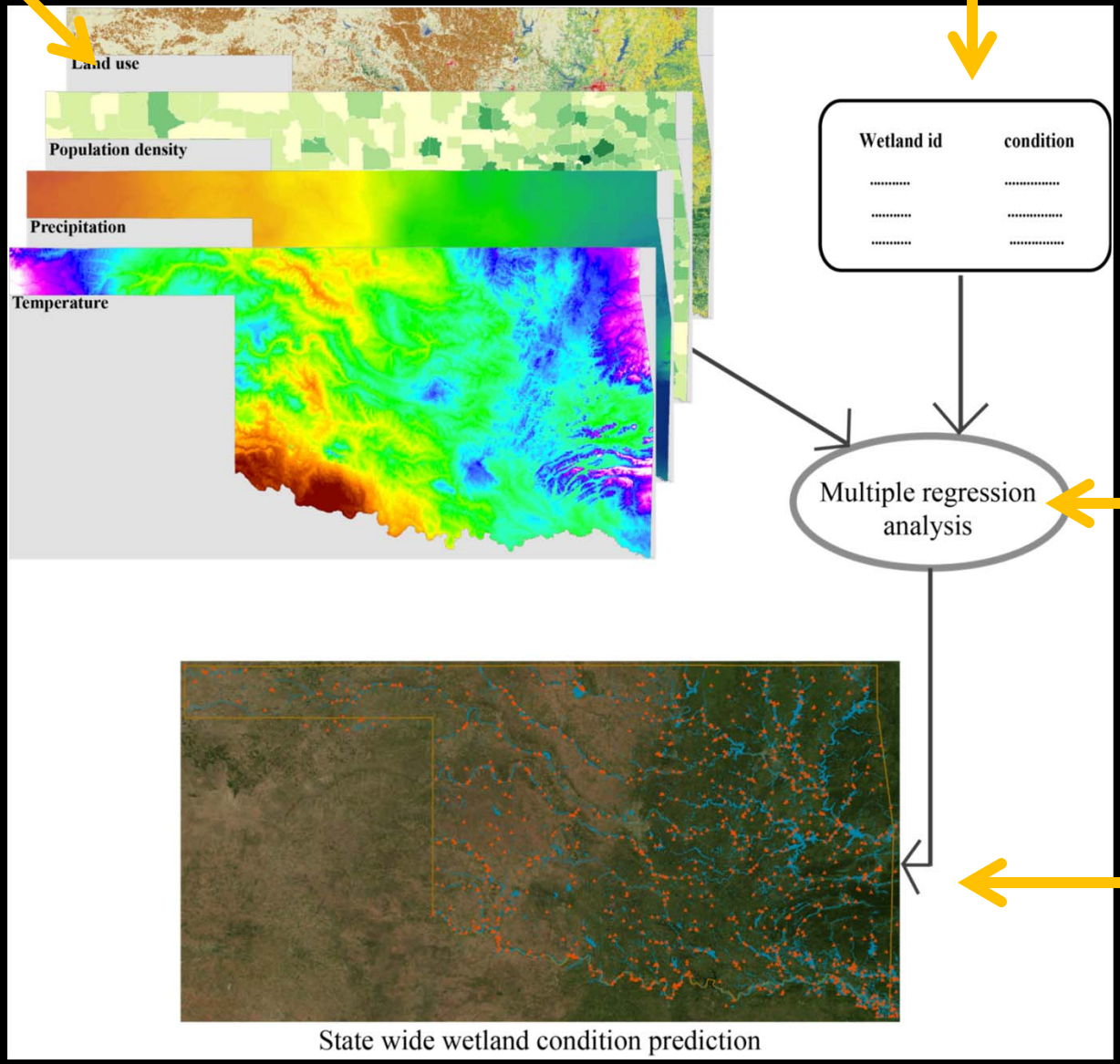
http://water.epa.gov/grants_funding/wetlands/monitoring.cfm

# Project Objective

- Identify the relationships between landscape characteristics and wetland condition
- Develop a series of models that relate wetland condition (Level 2 or 3) to landscape characteristics (Level 1)
- Develop a web-based tool set that can be used to predict wetland condition of individual sites

1b. Extract associated landscape data

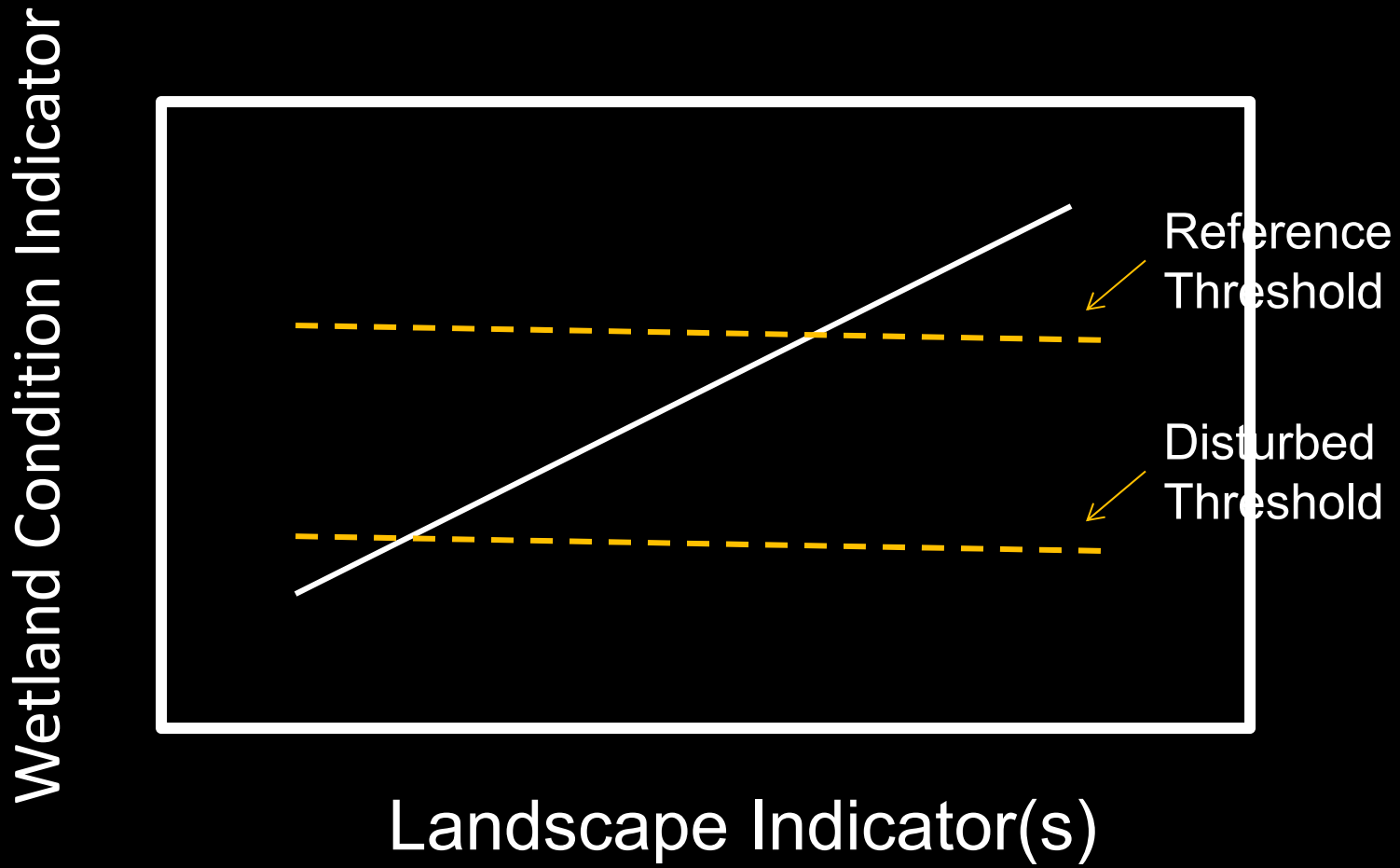
1a. Sample wetlands of varying condition




2. Statistical analyses

3. Make it usable with online tools

# Develop Models



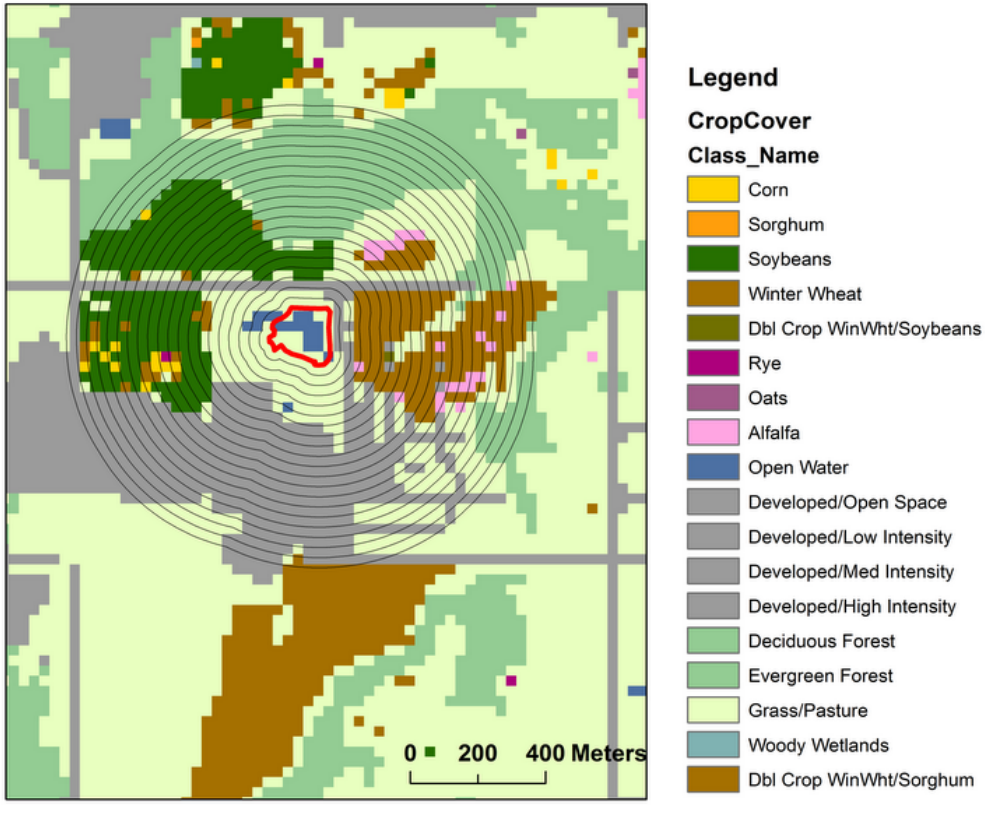
# Specific Questions

- Can we develop models with enough predictive power?
- “Universal” models
- What size buffer works best?
- What landscape data?
- What type of condition variables (Level 2 versus Level 3)?

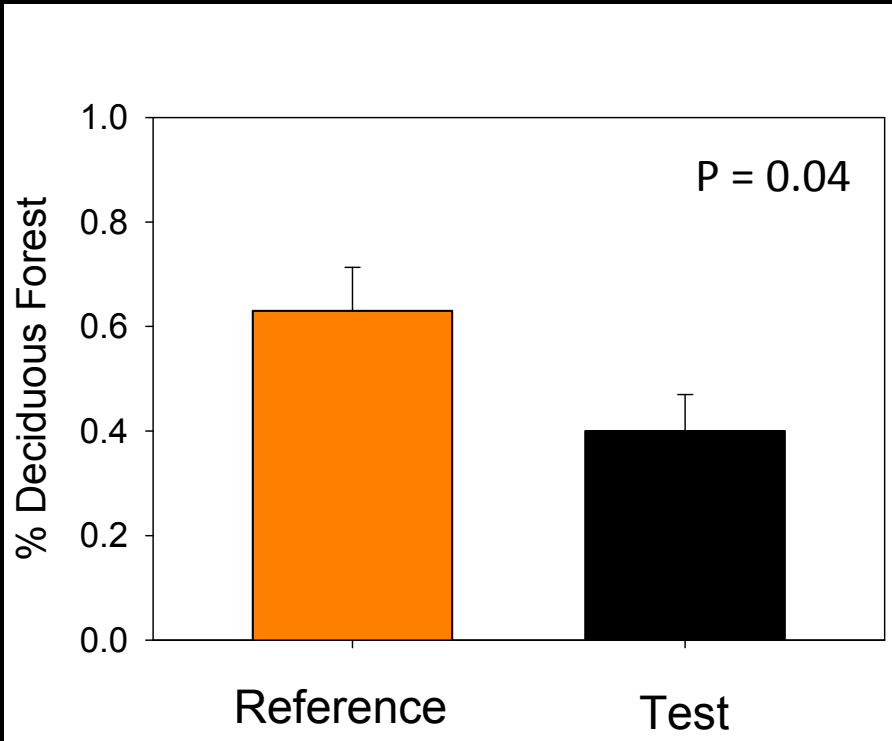
# Progress to Date

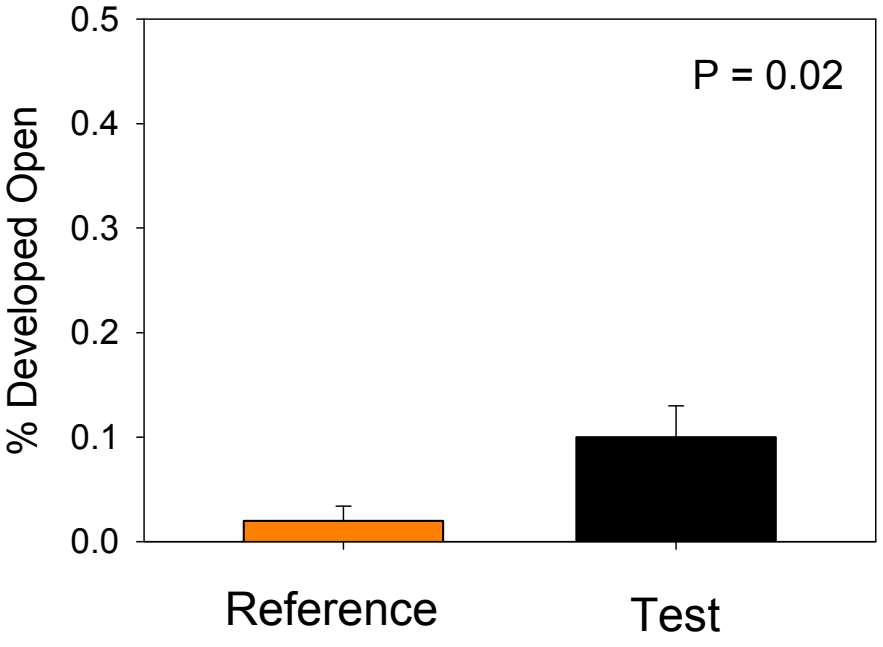
- Sampled wetlands
  - Level 2 and 3 Condition data from ~70 wetlands
- Extracted landscape data
  - Land use types from 30-600m buffers
  - Land Use Scores (Dvorett et al., 2013)
- Developed preliminary models
  - Linear regression
- Develop web-based tools


0 200 400 Meters

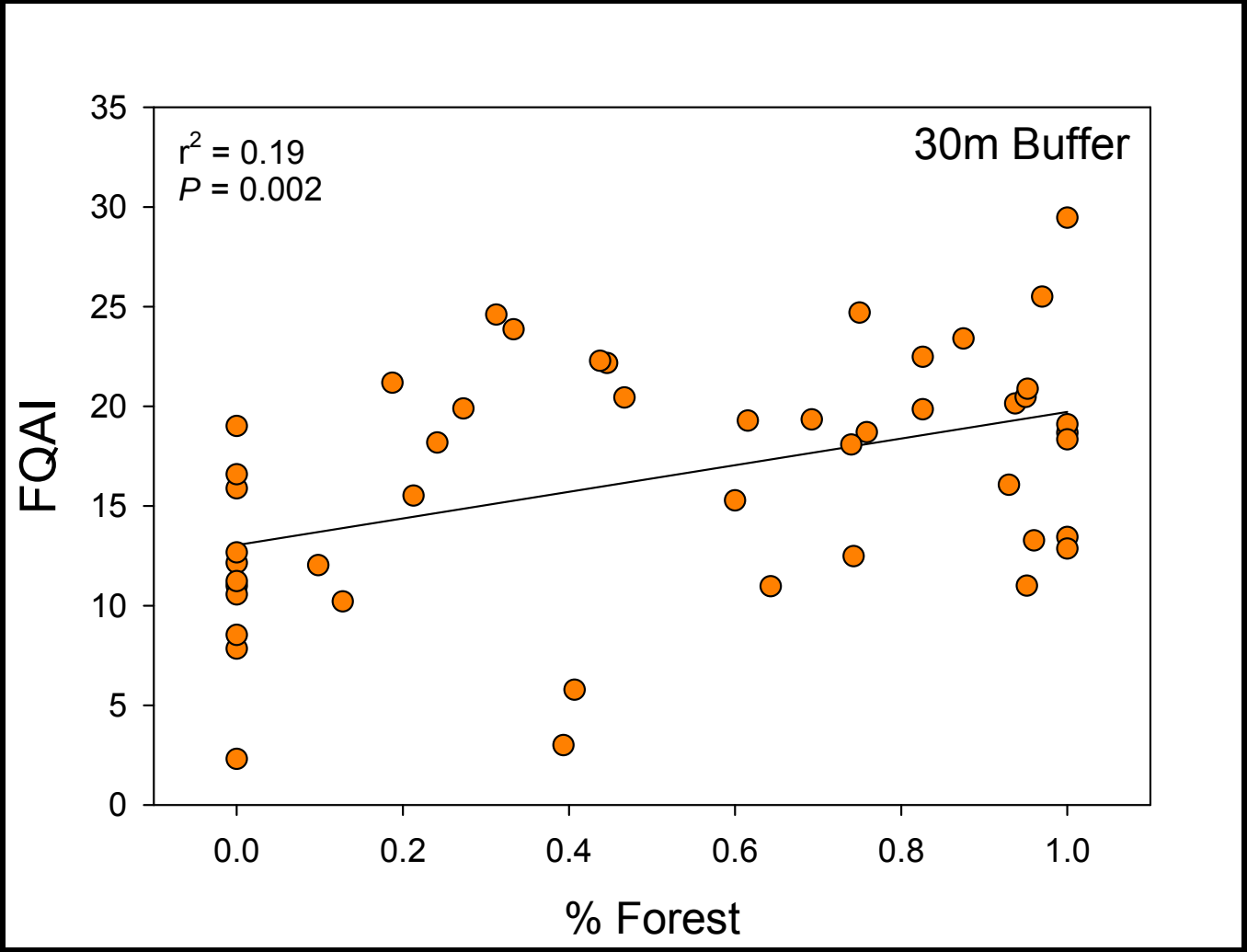

0 200 400 Meters
Legend
CropCover
Class_Name
Corn
Sorghum
Soybeans
Winter Wheat
Dbl Crop WinWht/Soybeans
Rye
Oats
Alfalfa
Open Water
Developed/Open Space
Developed/Low Intensity
Developed/Med Intensity
Developed/High Intensity
Deciduous Forest
Evergreen Forest
Grass/Pasture
Woody Wetlands
Dbl Crop WinWht/Sorghum

# Preliminary Analyses – Reference Sites

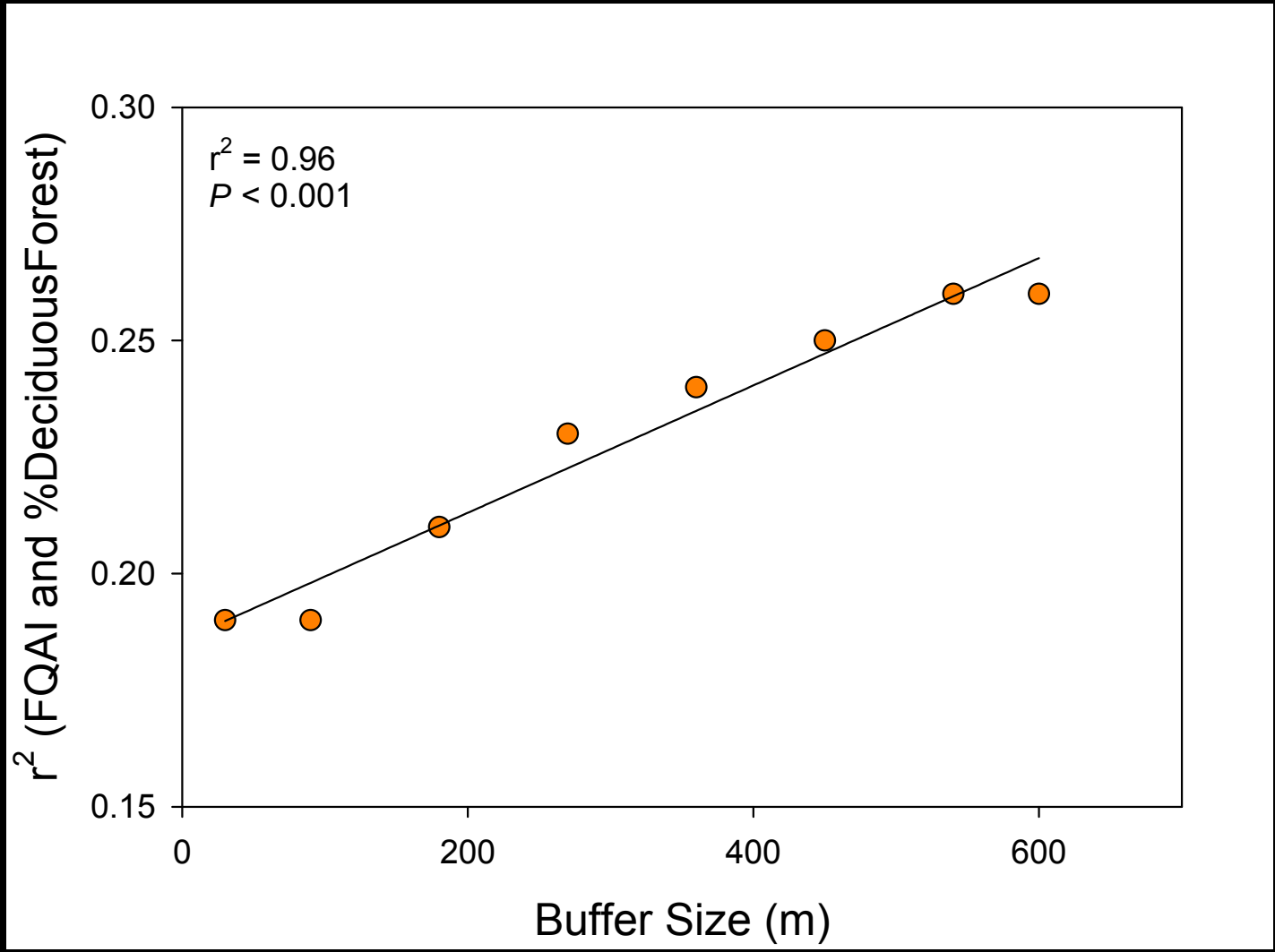


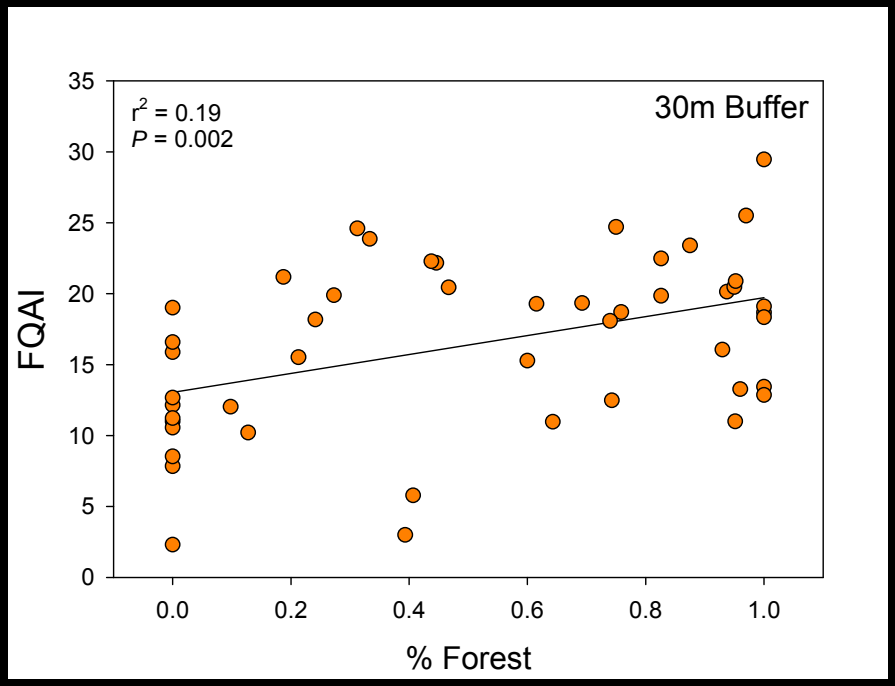
# Preliminary Analyses – Level 3 Indicators

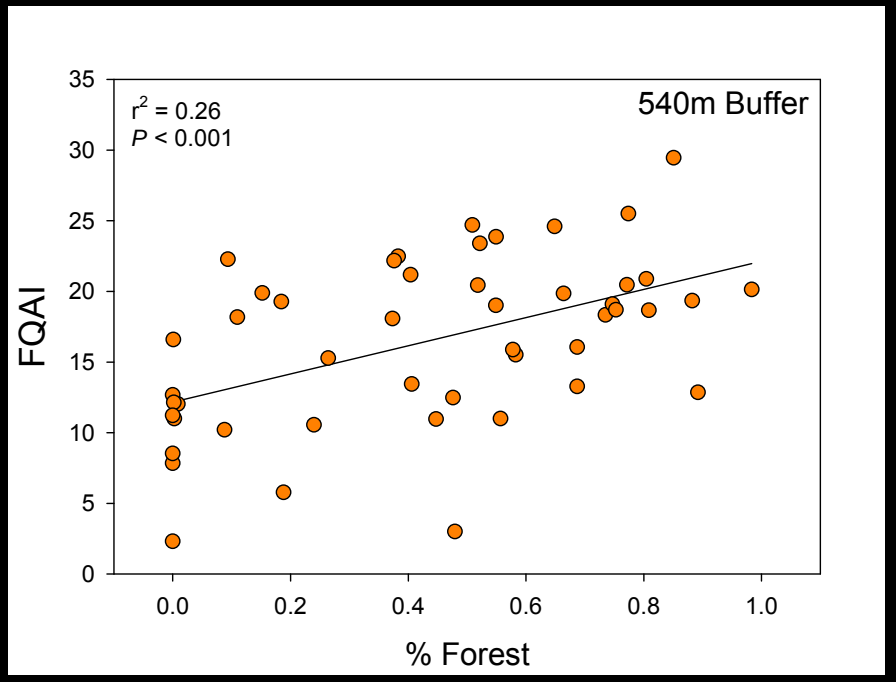


# Preliminary Analyses – Buffer Size

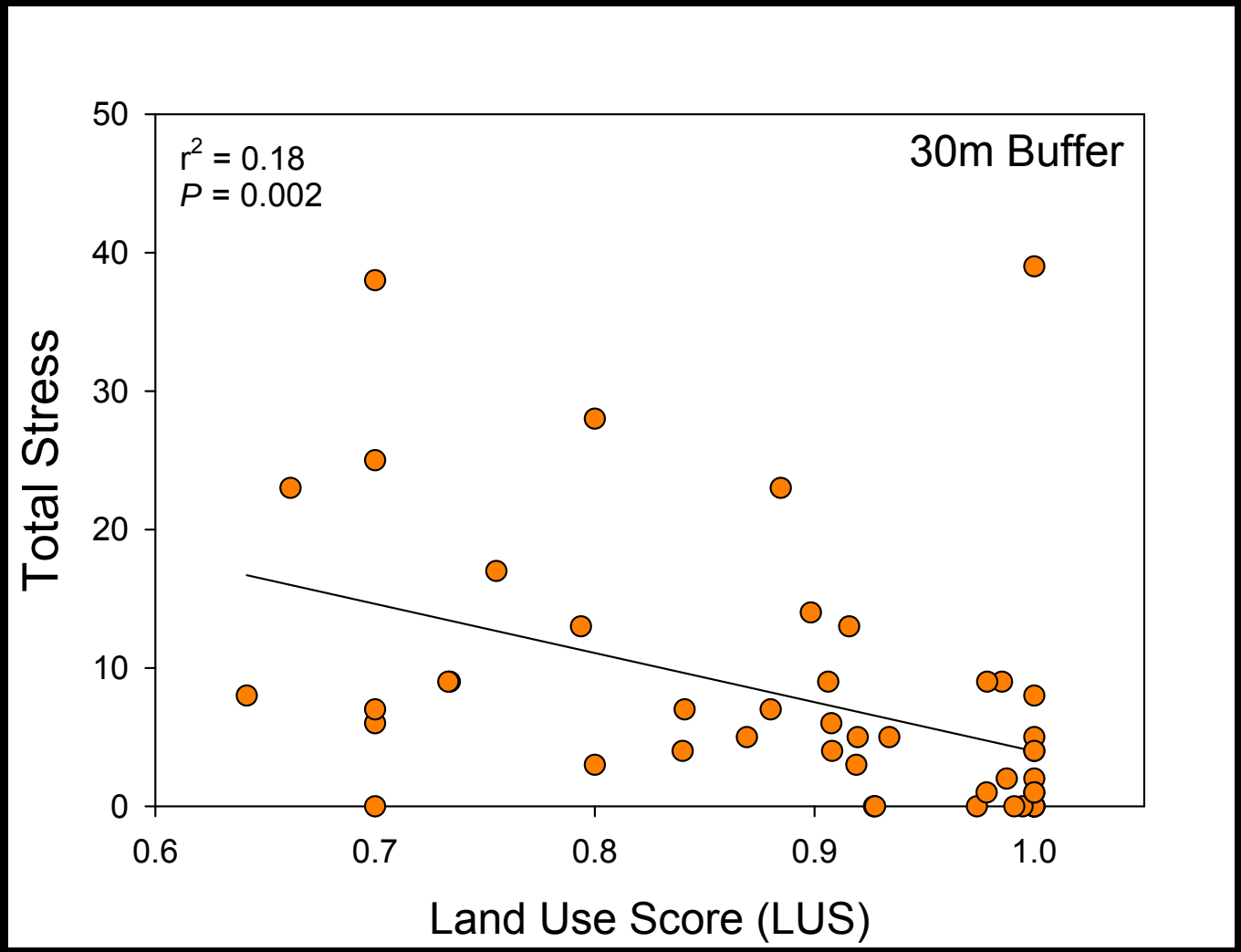


# Preliminary Analyses – Buffer Size



# Preliminary Analyses – Level 2 Indicators



# Continuing Research

- Sample more wetlands
  - Summer 2014 and 2015
- Extract additional landscape variables
  - Precipitation, human population density, slope
- Improve models
  - Additional variables, more complex analyses, wetland types

# Continuing Research

- Web-based tool set
  - Site specific landscape data
  - Provide initial condition assessments of wetlands throughout the state

➢ Compliment field-based monitoring programs
  - Help direct resources for Level 2 and/or 3 assessments

# Acknowledgements


- U.S. EPA 104(b) 3 Wetland Program Development Grant

- Dan Dvorett, Brooks Tramell

- Josh Crane, Xiao Feng