

Stormwater and Stream Research

Jason R. Vogel, Ph.D., P.E.

Associate Professor, Civil Engineering and Environmental Science

November 16, 2018



Low Impact Development

- The goal of *low impact development (LID)* is to reduce runoff and to **mimic a site's predevelopment hydrology** by infiltrating, filtering, storing, evaporating, and detaining stormwater runoff. (EPA, 2017)
- The term *low impact development (LID)* refers to systems and practices that use or mimic natural processes that result in infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. (EPA website, 4/1/2018)

**LID Design Goal:
Pre-development Runoff =
Post-development Runoff**



Continuum of LID Contributors

Geologist

Biologist/Horticulturalist

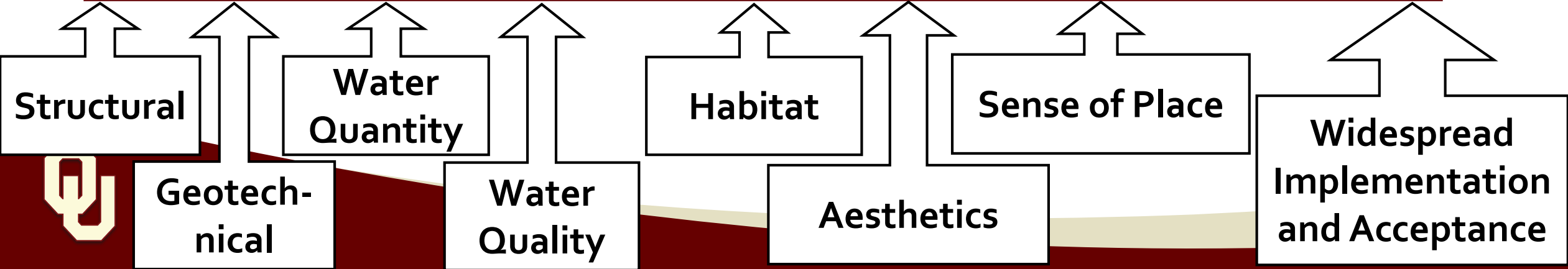
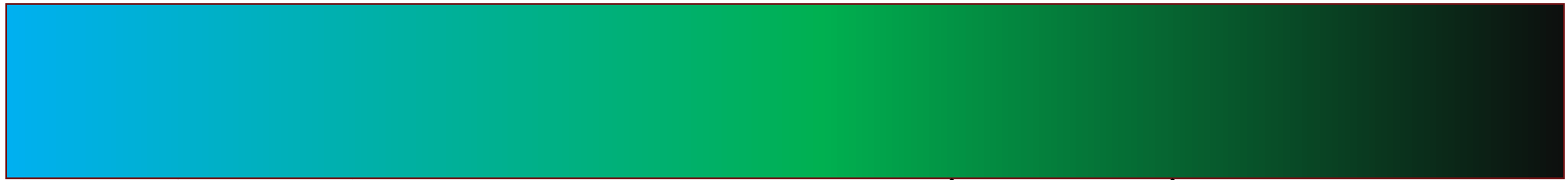
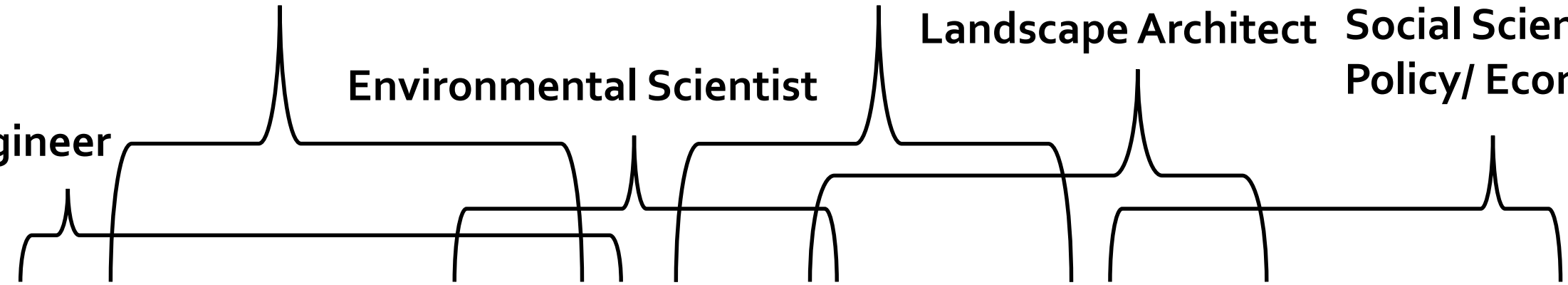
Urban Planner/
Social Scientist/
Policy/ Economics

Environmental Scientist

Landscape Architect

Social Scientist/
Policy/ Economics

Engineer



The OU LID Team

- **Architecture/Landscape Architecture**
 - Bret Betnar
 - Lee Fithian
 - Sarah Little
 - Thomas Woodfin
- **Civil Engineering and Environmental Science**
 - Elizabeth Butler
 - Bob Nairn
 - Chris Ramseyer
 - Keith Strevett
 - Jason Vogel
 - Tiantian Yang
- **Environmental Sustainability**
 - Tom Neeson
 - Jad Ziolkowska
- **Oklahoma Biological Survey**
 - Vonceil Harmon
 - Bruce Hoagland
 - Jeff Kelly
 - Randy Soto
- **Oklahoma Water Survey**
 - Jeri Fleming
 - Grant Graves
- **Urban Planning**
 - Bryce Lowery



Creating Learning Communities

www.greatplainslid.org

Save the Date!!

June 24-26, 2018

Great Plains LID Research and Innovation Symposium

Fort Collins, Colorado



Current, Probable and Potential Projects

- **Current and Upcoming**

- City of Tulsa LID Design Criteria and Operation and Maintenance Manual (with the City of Tulsa)
- Floating Wetlands for Shoreline Erosion Reduction (with COMCD & USBoR)
- Media Additives for Enhanced Pollutant Removal (with EPA, OCC, & others)
- Nutrient Leaching in Compost Filter Socks (with Minnick Materials & Fertile Ground)
- The Role of Underdrain Configurations on Removal of Pollutants, including PAH's, by Bioretention Cells (upcoming, with GRDA)



Current, Probable and Potential Projects

- **Probable**

- Investigation of the Viability of Enterococcus as a Pathogen Indicator in Oklahoma Streams (probable)
- LID for Enhanced Resiliency under Climate Change Scenarios at Trailwoods in Norman (probable)
- Optimization of In-stream Structure Design for Natural Stream Restoration (potential)



Current, Probable and Potential Projects

- **Potential**

- Using Big Data to Optimize Surface Water Management as Multiple Scales, including LID practices
- Pesticide Reduction in Nursery Runoff Using Bioretention Cells and Constructed Wetlands
- Curve Numbers of Structured Gravel Parking Lots
- Development of Resilient LID Design Criteria
- Detention Pond Retrofits for Water Quality Improvements
- ...and hundreds other potential projects!



jason.vogel@ou.edu

@jasonvogel1

GreatPlainsLID.org

OKH2O.org

(405) 325-2826

