Geodesign: Visualizing Green Infrastructure

Education Session - SAT A11
Saturday November 7th 11:00 AM - 12:30 AM

Geodesign applies systems thinking to the creation of proposals for change and impact simulations in geographic context usually supported by digital technology. This session will focus on Geodesign as a tool for collaborative planning and design, a method to find design solutions that improve our landscape infrastructure.
Steven Spears, PLA, AICP

Steven joined Design Workshop in 2004 after practicing throughout the United States and Australia. He became a partner in 2013. Spears holds a Bachelor of Landscape Architecture degree with honors from Ball State University and earned a Masters of Fine Arts in Design from the University of Texas at Austin. Spears is a member of the Urban Land Institute, American Society of Landscape Architects and American Planning Association and is a registered landscape architect in Texas, Indiana, and Colorado. After numerous years with the Aspen office, Spears co-opened the Austin office in 2008. A firm believer in the quadruple bottom line design process of integrating economic sustainability, environmental sensitivity, community benefit and profound art/aesthetics, Spears' design and planning work has been recognized at the state and national level. Spears has a rich portfolio of both private sector and public sector clients. He provides in depth knowledge on both sides of the table, and has built a reputation to creatively design, entitle and implement complex assignments.

Matthew Wilkins, ASLA

Matthew is a Senior Designer and Planner at KTU+A Planning and Landscape Architecture where he leads the 3D/GIS team and manages many of the visualization projects. He is currently the Vice President of PR and Visibility for the San Diego Chapter of ASLA and in 2013-2014 he was the co-chair for the Digital Technology PPN. Matthew is an ACE mentor and has presented at various events, universities and other functions and forums on digital technology. His active involvement in 3d modeling, animation, digital rendering and design provides him with a practical knowledge of the industries current tools and technologies.

Brooks Patrick, ASLA

Brooks is a Solutions Engineer for 3D Markets at Esri helping individuals, teams, and organizations take advantage of 3D GIS and the power of procedural modeling for Urban Planning, Architecture, Game Development, and Entertainment. Brooks is also a Landscape Architect and a frequent presenter at international conferences, workshops and trainings. As part of a team working with Esri CityEngine software, he designs solutions able to simulate the impact of planning and urban design alternatives in near real-time. He is responsible for further services and consulting in training, procedural city modeling, custom CGA rule development, and advanced visualization.

Learning Objectives:

- Help define Geodesign and its importance to the profession.
- Learn how GIS and 3D software help support the creation of healthier, safer and prosperous environments.
- Understand the evolution of GIS software towards supporting geo-based workflows in the design process.
- Learn how procedural 3D modeling is defining the future of real-time virtual design environments.
Course Outline:

I. Introduction
   A. Defining Geodesign and its use in Landscape Architecture
      1. Comprehensive projects require more robust technologies
      2. Practical tools for real world design
      3. A way to better interface and collaborate with other disciplines
      4. Challenges for design professionals
   B. Core values for sustainable growth
   C. Innovative Green Infrastructure
      1. Complete streets
      2. Better infrastructure equals better communities
      3. Geodesign as a means to further sustainability
      4. Agency monitoring and assessing using Geodesign platforms
   D. Supporting the Geodesign process
      1. Case Studies

II. Visualizing Green Infrastructure
   A. A platform for communication
      1. Community buy-off/outreach (Less time, More engaged, Happy public)
      2. Effective measures for visual simulations and assessments
      3. 3D tools for facilitated workshops
   B. Informative workflows for data use and visualization
      1. GIS for CAD, LandFX & Sketchup
      2. GIS & CityEngine
      3. SketchUp & LumenRT
   C. Case Study: From Beginning to End - Armorlite Drive, San Marcos California
      1. Geodesign strategies for proper master planning and inter-connectivity
      2. Visual tools for grant application and community support
      3. Technology throughout the construction documentation phase
      4. As-Built database for efficient future planning and growth
III. A Framework for Design and Planning
   A. Integrating GIS into the design process
      1. Integrating and synthesizing information from many different data sources
      2. Supporting informed decision making
      3. Engaging stakeholders and improving the methods of communication
   B. Procedural modeling – data centric and rule based
      1. Efficiency matters – enabling rapid 3D design iterations
      2. Shortening the cycle time of the design process and improving the quality of the results – giving time for designers to think and debate
   C. Introduction to case studies (case studies will be referred to throughout the presentation)
      1. Göteborg, Sweden – Stakeholder collaboration in the modeling of transportation and land use planning
      2. Austin, Texas - Urban rail studies move faster in 3D
      3. Hong Kong, China – Impact analysis (Solar radiation analysis and wind analysis)

IV. GeoDesign for Sustainable Landscape Systems - Integrating Connectivity and Suitability
   A. Performance Based Design
      1. Supporting rapid design with base conditions and benchmarks
      2. Design as an art as well as a problem-solving activity
      3. Metrics measured, alternatives compared, decisions supported
   B. Complete Streets Example – software as a template
      1. Helping to envision different relationships between the city and its streets.
      2. Rapid fire street treatments visualizations
      3. Transit oriented development and land use coordination
      4. Supporting Charettes - collaborative design
   C. Translating standards – Bicycle Infrastructure (state-of-the-practice solutions)
      1. Mineta Report on Low-Stress Bicycling and Network Connectivity
      2. Traffic stress criteria – quantifying the design
      3. 3D sketching with real-time reports
   D. Importance of data driven design and iterative design

V. Question and Answers
Links and Resources:

Geodesign

**Websites**


GeoDesign Concept and its Solution Platform for Urban Design and Landscape Architecture | Nadia Amoroso - WLA Article


**Books**

Design with Nature - Ian McHarg

A Framework for Geodesign: Changing Geography by Design - Carl Steinitz

Geodesign: Case Studies in Regional and Urban Planning - Shannon McElvaney

GIS for Landscape Architects - Karen Hanna

Green Infrastructure

**Websites**

http://www.asla.org/greeninfrastructure.aspx

http://www.asla.org/sustainabletransportation.aspx#GreenStreets

https://sandiego.surfrider.org/green-infrastructure-for-clean-water-act

**Books**

Green Infrastructure: Linking Landscapes and Communities - Mark A. Benedict

Green Infrastructure for Landscape Planning: Integrating Human and Natural Systems - Gary Austin

Green Infrastructure: A Landscape Approach - David C. Rouse

Sustainable Infrastructure: The Guide to Green Engineering and Design - S. Bry Sarte