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Enterprise GeoDesign: University-Community Sustainability Partnerships

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Overview

Enterprise GeoDesign

University-Community Partnership

between university units and environmental organizations,

each with mandates for sustainability: economic, social, ecological, and institutional.

Address:

- pathways to a sustainable system approach,
- the alignment of curriculum with partner projects,
- the technological capacity for success
- Challenges and Outcomes

UW Colleagues

Timothy Nyerges

Professor, Geography

Director, Professional Master Program for GIS for Sustainability Management

Nancy Rottle

Associate Professor,

Landscape Architecture, Director,

Green Futures Research Lab

Kathleen Wolf

Research Professor, School of Environmental and Forest Sciences
Chair, Social Sciences Advisory Committee, Puget Sound Partnership

Robert Aguirre

Lecturer, Professional Master Program for GIS for Sustainability Management

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MASTER OF GEOGRAPHIC INFORMATION SYSTEMS

UNIVERSITY of WASHINGTON

Offered by the UW Department of Geography

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Online Master of GIS With a Focus in Sustainability Management

The Master of Geographic Information Systems: Sustainability Management online program at the University of Washington teaches you how to design a more sustainable world using GIS. This part-time, two-year professional program focuses on leveraging powerful GIS technologies to develop

IMPORTANT DATES

July 15
Extended Application Deadline

Mid-August

Program Curriculum Overview: Sustainable Systems Perspective

Sustainable Systems Perspective

Build a bridge between sustainability science and sustainability management in the form of sustainability information science (SIS)

SIS: four-tiers of ontology abstraction

- Foundations of spatial-temporal systems
- Substance of sustainable systems domains (e.g., watersheds and supercomputing)
- Fundamental methods of workflow design
- Sustainable systems applications

Sustainability Science

Sustainability science defined by PNAS website…

"…an emerging field of research dealing with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability: meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support systems.."

(Kates 2011 citing Proceedings of National Academy of Sciences, p.19449)

Complex sustainable systems aka social-ecological systems, coupled natural-human systems, hazard-receptor systems, and human-technology systems.

Domains of Sustainability

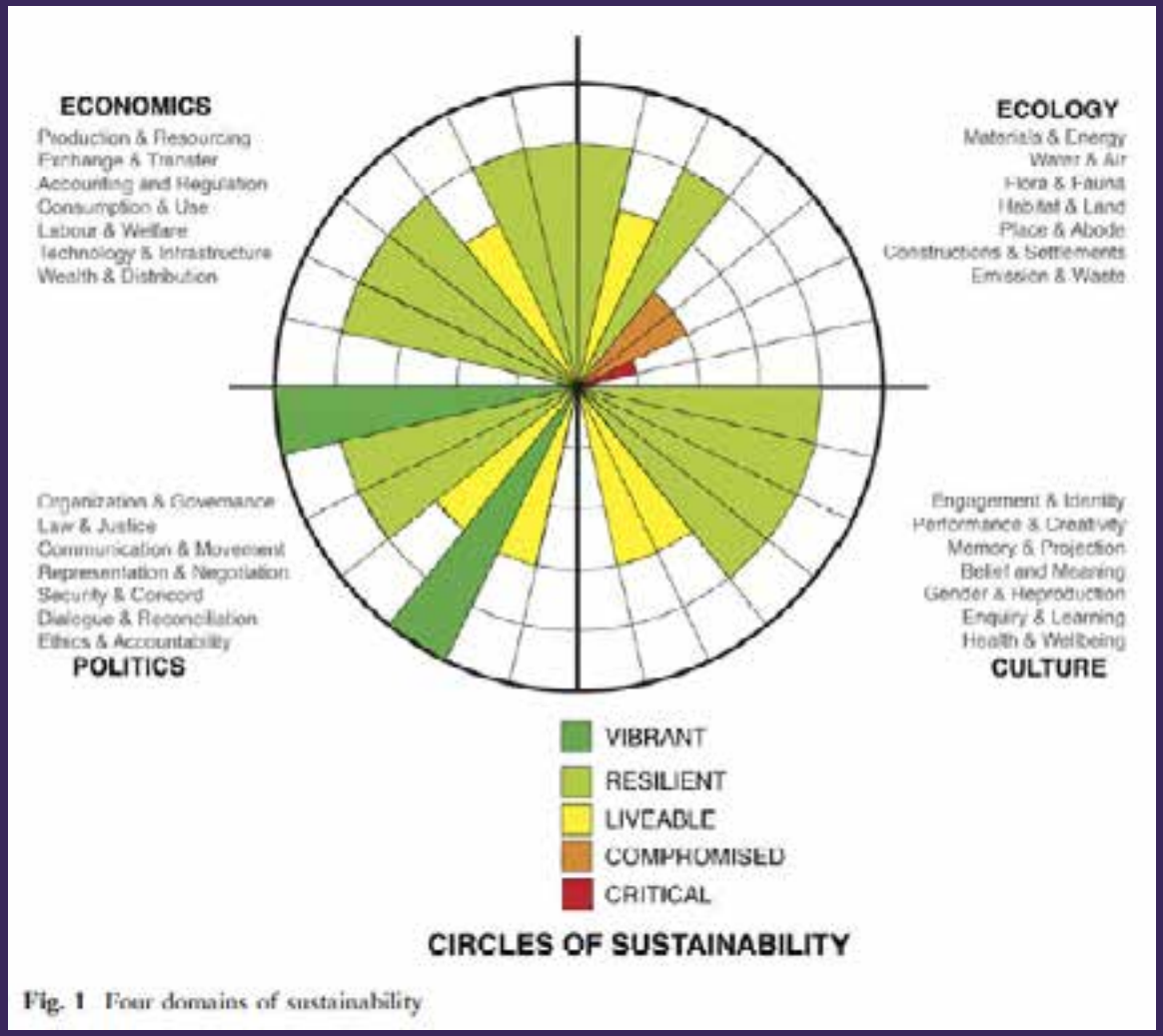


Fig. 1 Four domains of sustainability

Magee et al. (2013)

Reframing social sustainability reporting: towards an engaged approach.

Environment, Development and Sustainability 15:225–243

Ostrom's Framework for Analyzing Sustainability of Social-Ecological Systems

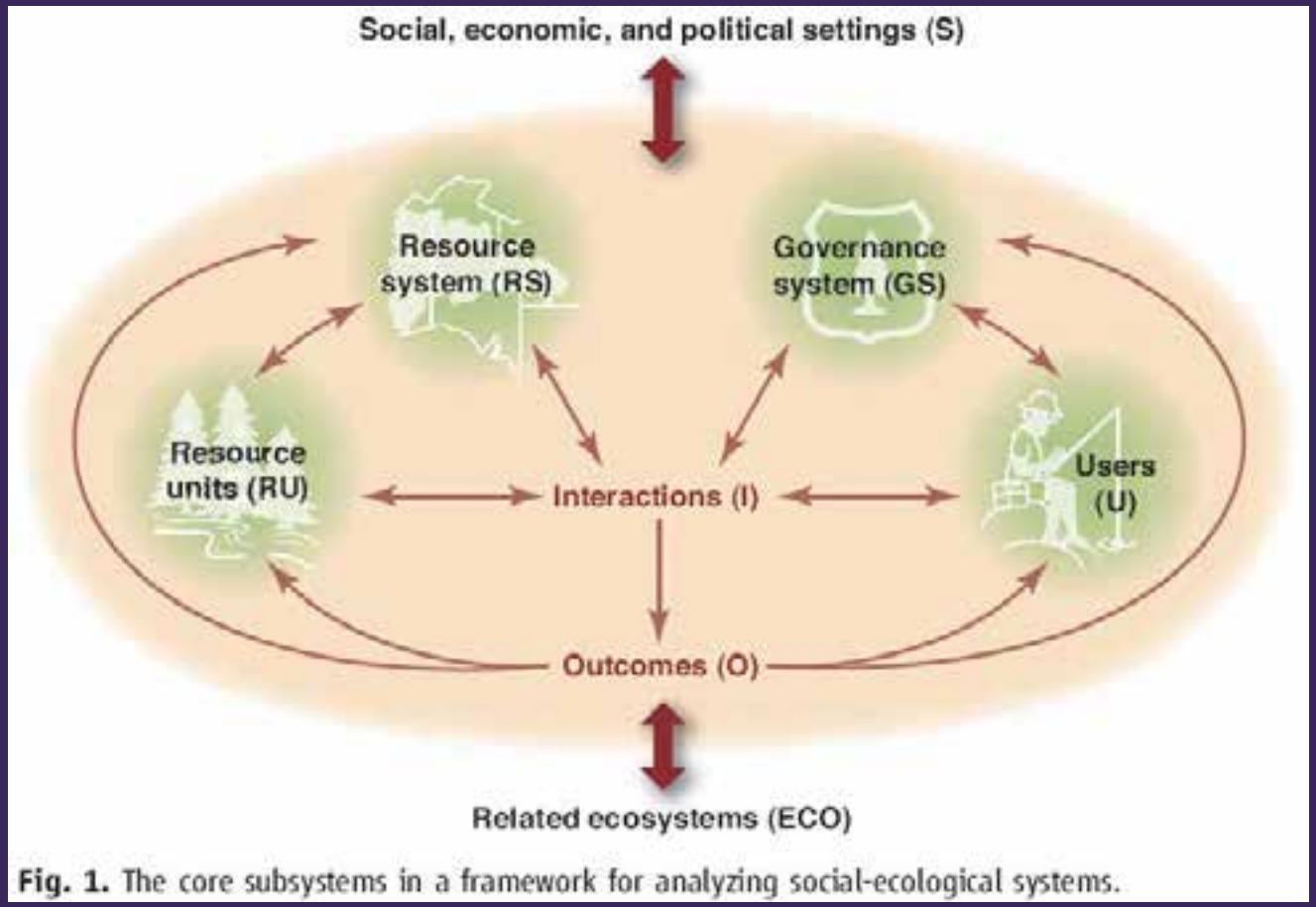


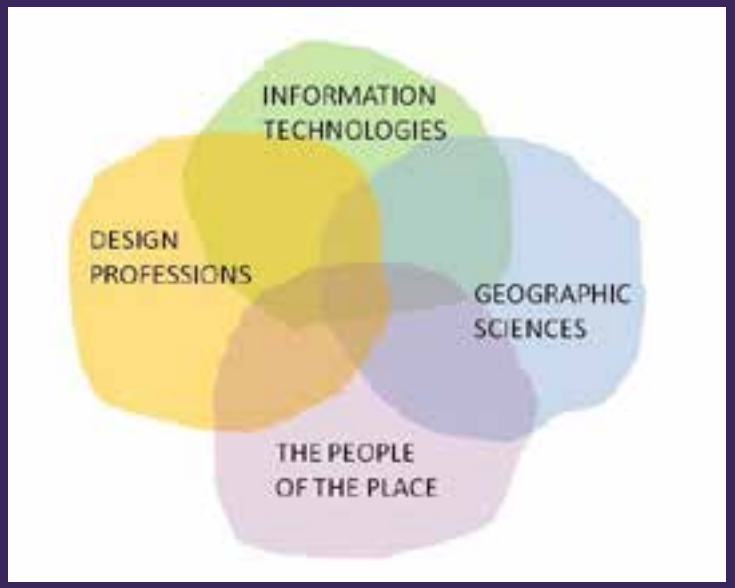
Fig. 1. The core subsystems in a framework for analyzing social-ecological systems.

Elinor Ostrom, *et al.* A General Framework for Analyzing Sustainability of Social-Ecological Systems; *Science* 325, 419 (2009)

GeoDesign

"Geodesign changes geography by design."

C. Steinitz, 2012, A Framework for Geodesign, Esri Press.

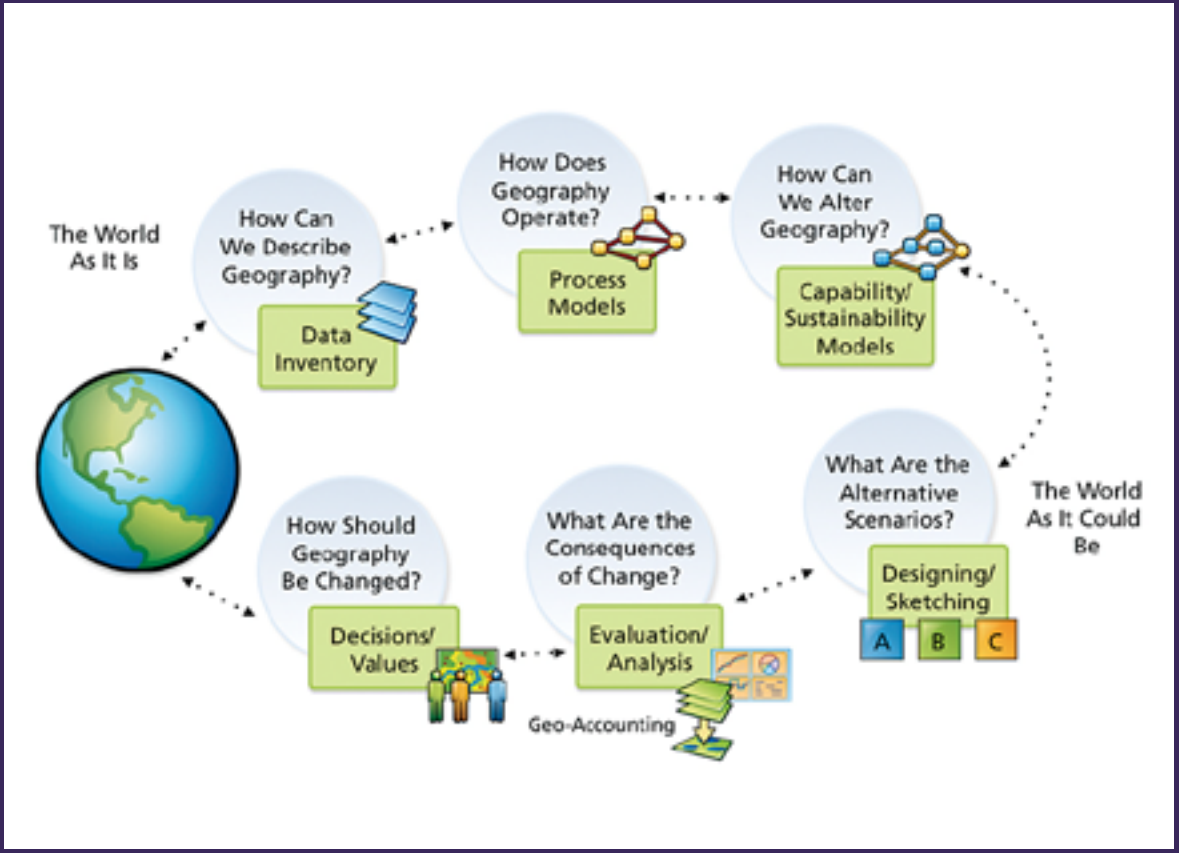


"Geodesign applies systems thinking to the creation of proposals for change and impact simulations in their geographic contexts, usually supported by digital technology."

T. Caufield and C. Steintiz after M. Flaxman and S. Ervin

GIS, Design, and Evolving Technology.

Jack Dangermond, *ArcNews Online*, Fall 2009.

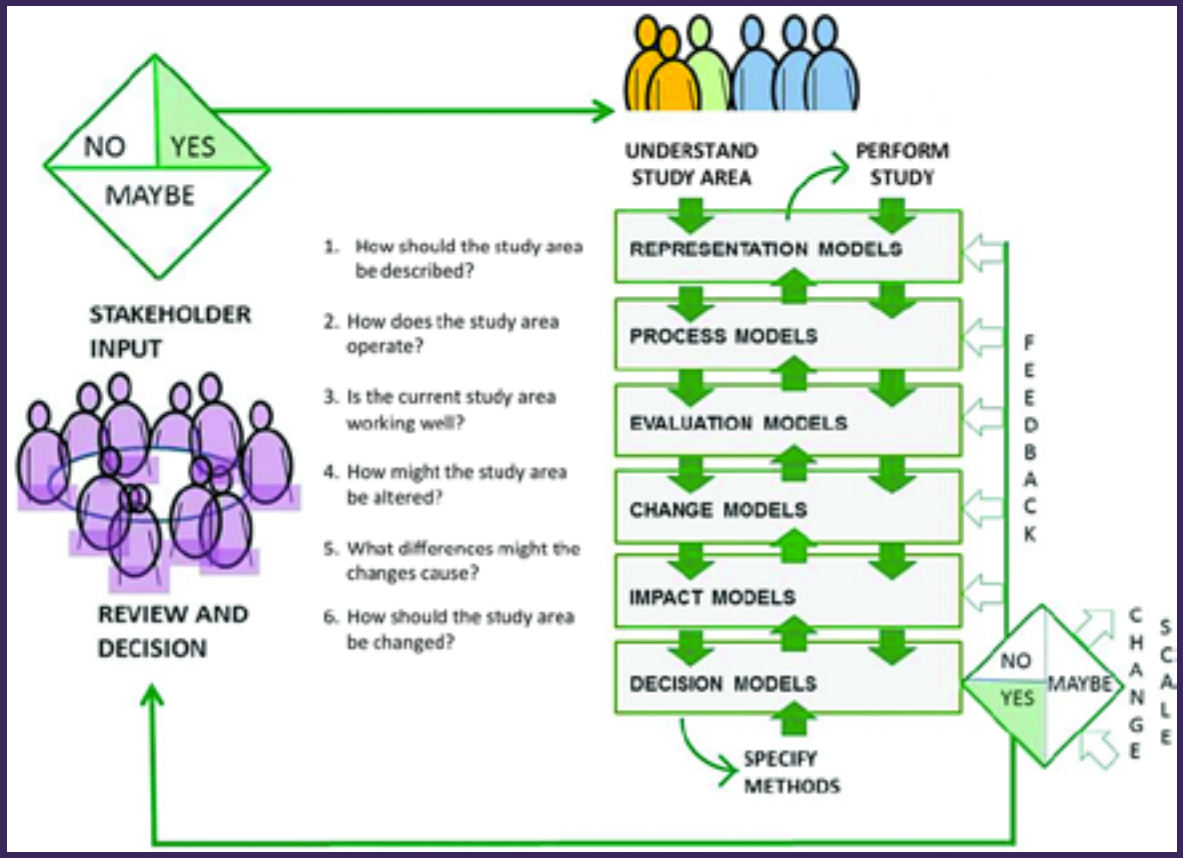


Adapted from the Steinitz model of landscape change, GeoDesign is a rapid and adaptive process for creating a sustainable future.

Source: http://www.esri.com/news/arcnews/fall09articles/fall09gifs/p14p4-lg.jpg

A Conversation with Carl Steinitz

ESRI, ArcWatch, April 2012



Source: http://www.esri.com/news/arcwatch/0412/a-conversation-with-carl-steinitz.html

GeoDesign and SDS Ontology

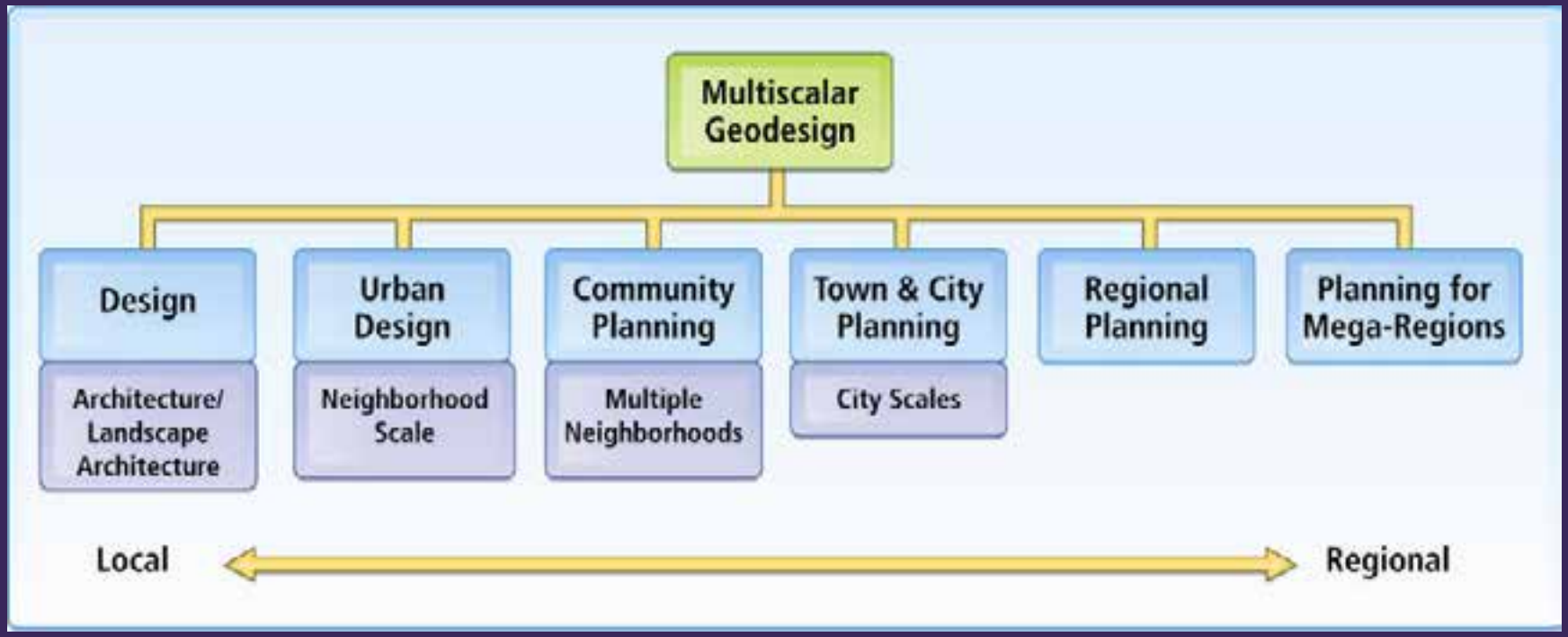
- GeoDesign Knowledge Portal
- http://www.spatial.redlands.edu/geodesign/

Built upon

- Spatial Decision Support Knowledge Portal
- http://www.spatial.redlands.edu/sds/ontology/?n=SDSKnowledgePortalOnto:SDSOnto

Making Smart Growth Smarter with GeoDesign

Abukhater & Walker, Directions Magazine, July 19th, 2010



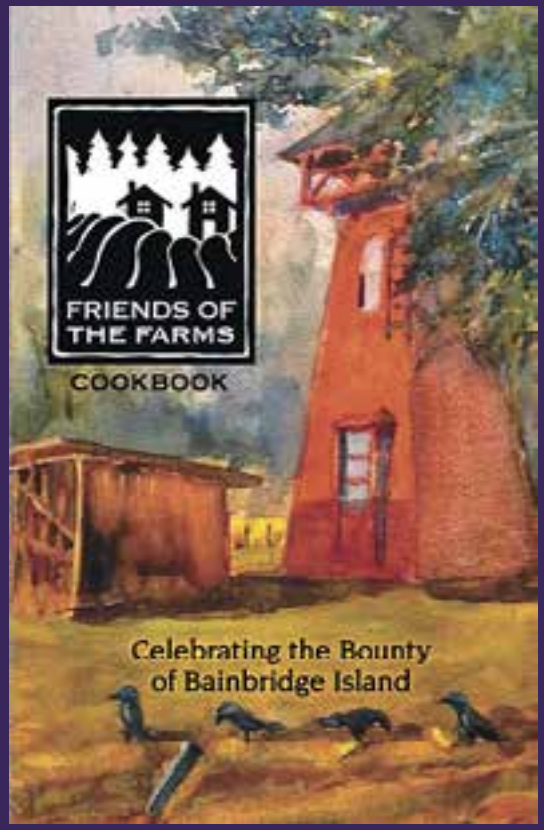
Source: http://www.directionsmag.com/articles/making-smart-growth-smarter-with-geodesign/122336

University-Community Partnership Workshop Elements

1. Problem statement: project goals, objectives, scope
2. Design considerations: focal, temporal, organizational scale, alternative methods, resilience thinking
3. Design: including activity workflow diagram
4. Testing / Results: prototype or proof-of-concept
5. Implementation Plan: people, time, hardware, software
6. Business case for sustainability management: financial and strategic
7. Recommendation
8. References: scientific and sponsor publications

Community Partners

Farmland Prioritization Plan for Bainbridge Island, WA
Friends of the Farm



Stew-MAP: Geo-Visualization of Seattle Environmental Stewardship Organizations, USDA Forest Service Green Cities Research Alliance

Community Partners

Puget Sound Regional Council Growth Management Department,
Transit-Oriented Development Map for
Low Income Housing Tax Credit Allocations

King County Noxious Weeds Distribution Analysis, King County Noxious Weed Control Program

Community Partners

Exploratory Ecosystem Services Analysis, San Juan County, WA

Updating the River Mile System for the Spokane Tribe, Spokane, WA

Community Partners

Hood River County Trail System GIS Improvement Project
Hood River County, OR

Green Stormwater Infrastructure, Urban Forests and Integrated Water Systems
Forterra, Seattle, WA

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University-Community Partnership Considerations

1. Motivation of establishing partnerships
2. Approaches to community engagement
3. Protocols for knowledge transfer
4. Challenges for U-C partnerships
5. Technological capacity for success
6. Epistemological Issues
7. Outcomes and best practices

Partnership projects from the Class of 2012 are available here:
https://digital.lib.washington.edu/researchworks/handle/1773/24058

Partnership projects from the Class of 2013 are available here:
https://digital.lib.washington.edu/researchworks/handle/1773/24953

Conclusion

The potential to realize sustainable systems through University-Community partnerships implementing Enterprise GeoDesign is promising.

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