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Engaging Stakeholders in Ecosystem Service Assessment Under Climate Change and Urban Development Scenarios

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Engaging Stakeholders in Ecosystem Service Assessment under Climate Change and Urban Development Scenarios

Ecosystem Services Research to Action Program
October 25, 2013

Heejun Chang, Dave Ervin, Wes Hoyer, Mike Psaris, Ken Lyons, Emily Detritch, Samantha Hamlin, John Lambrinos, Tammy Winfield, Bobby Cochran
How can scientists engage in diverse stakeholder community?

- Dissemination of information (community education)
- Development of practical steps towards implementation of integrated resource management (decision tool)

Booth and Burgin (1997) *Frontiers in Ecology*
Current (2000) $t_1$  
Future (2050) $t_2$  

Scenarios

Modeling

Water Related ES
- Water Yield
- Water Temperature
- Sedimentation
- Nutrients (N & P)

Terrestrial ES
- Carbon sequestration
- Timber harvesting
- Agricultural production

INtegrated Valuation of Environmental Services and Tradeoffs
Nutrient Tracking Tool

Economic analysis: Target conservation area
FRAGSTATS: Landscape Configuration
Map correlation: Bundling and Tradeoff
Multilevel model: Scale Influence
How to construct scenarios?

Climate Change

Riparian planting

Low Δ

Land development

High Δ

Management

1. Climate Change
2. Riparian planting
3. Land development
4. Low Δ
5. Management
6. High Δ
7. Low Δ
8. Climate Change
9. Riparian planting
10. Land development
11. High Δ
12. Management

Change Annual Temperature (°C)

% Change Annual Precipitation
Summary of the stakeholders’ perception of the relative importance of individual ecosystem services

Water-related ES
- Water yield: 11.7
- Agriculture: 11.7
- Timber: 8.3
- Biodiversity: 11.7
- Carbon: 11.7
- Temperature: 13.3
- Sediment: 7.5
- Nutrient: 20.0

Terrestrial ES

Water-related ES
Bundling of ecosystem services

Example: Water yield 40%, water temperature 30%, nitrogen retention 15%, phosphorus retention 15%
Lessons learned

• **Early** communication helps identify the problems with appropriate scale and the needs of stakeholders in ES assessment.

• **Continuous** communication helps clarify and develop the common issues of interest (e.g., scenario development).

• More importantly, researchers can obtain original rich data from community partners (both quantitative and qualitative)

• **Visuals and maps** are useful tools for communication in the spatial patterns of ES.

• The **process** of developing a community of science and policy might be time-consuming but rewarding.
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http://www.pdx.edu/ecosystem-services/

Questions or comments: Contact Heejun Chang at changh@pdx.edu

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