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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?*

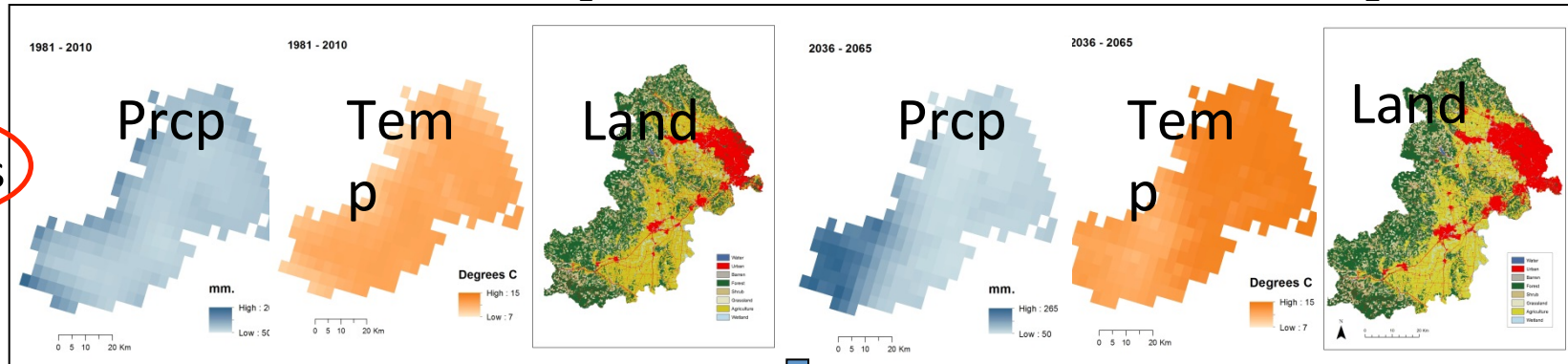
- Dissemination of information (community education)
- Development of practical steps towards implementation of integrated resource management (decision tool)



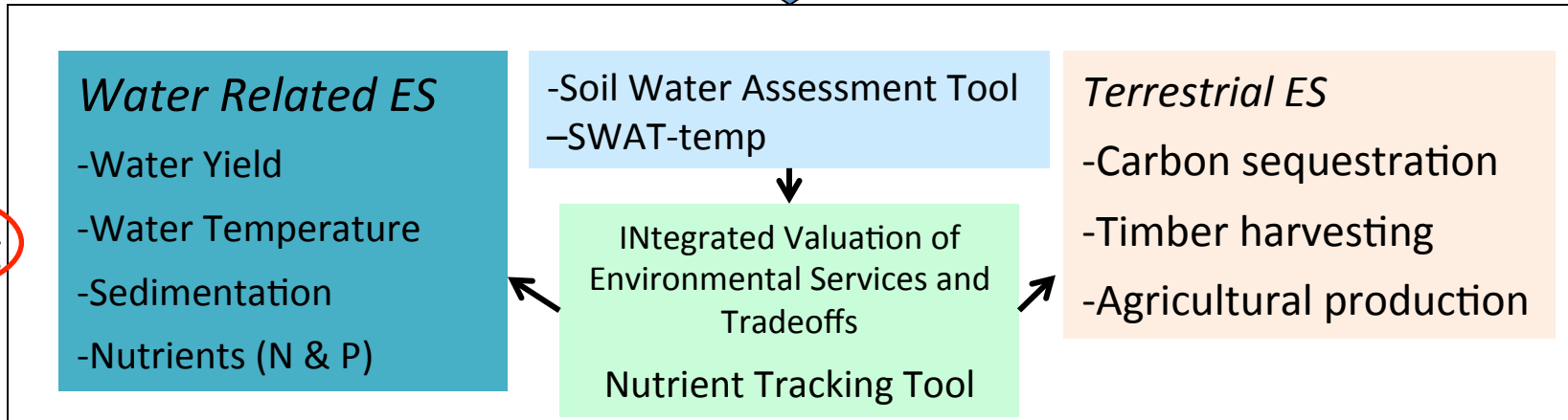


Current (2000)  $t_1$

Future (2050)  $t_2$



Scenarios



Modeling

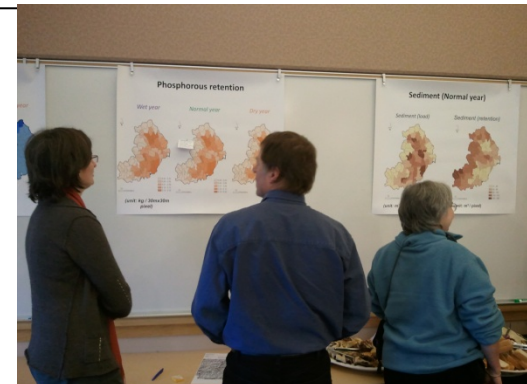
Spatial/  
Economic  
Analysis

Economic analysis: Target conservation area

FRAGSTATS: Landscape Configuration

Map correlation: Bundling and Tradeoff

Multilevel model: Scale Influence



# How to construct scenarios?

## Climate Change

High  $\Delta$

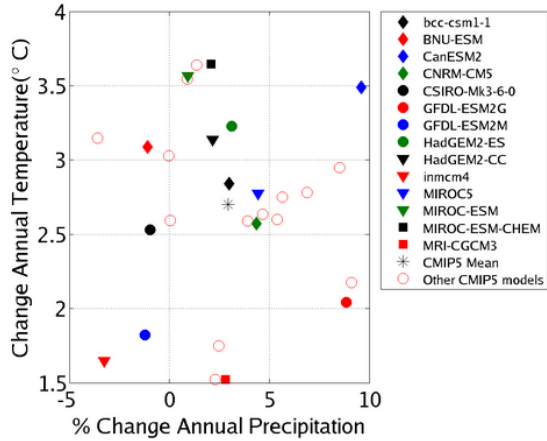
Phosphorous retention

Sediment (normal year)

Sediment (load)

Sediment (retention)

RCP8.5 2030-2060 vs. 1950-1999



## Riparian planting

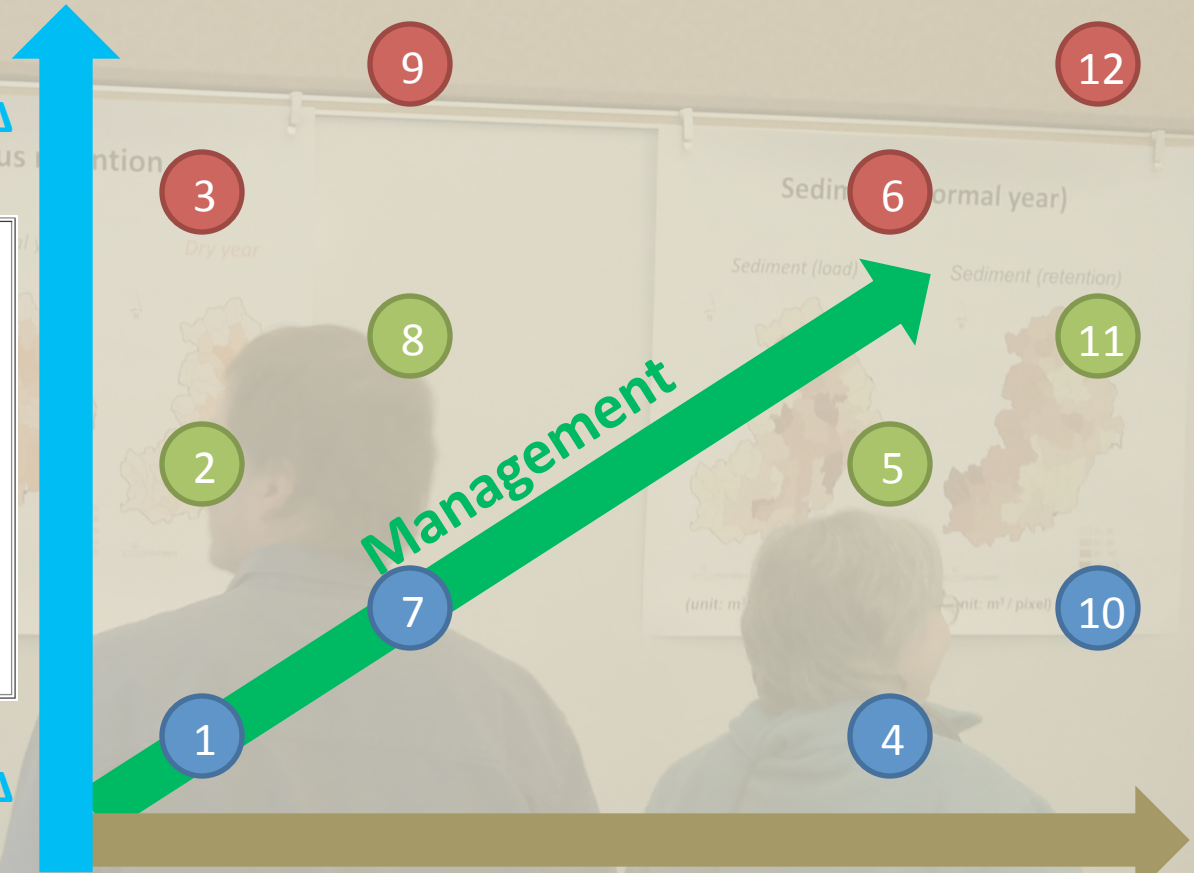
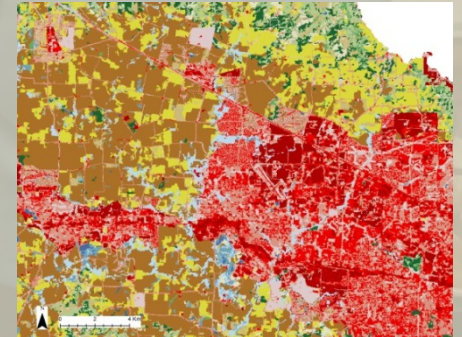
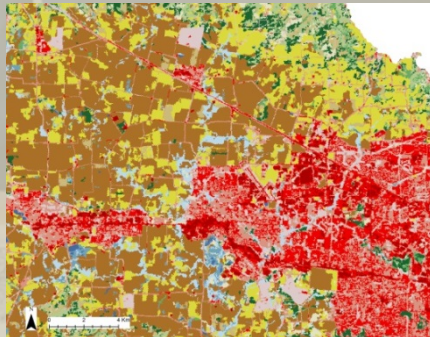
Low  $\Delta$



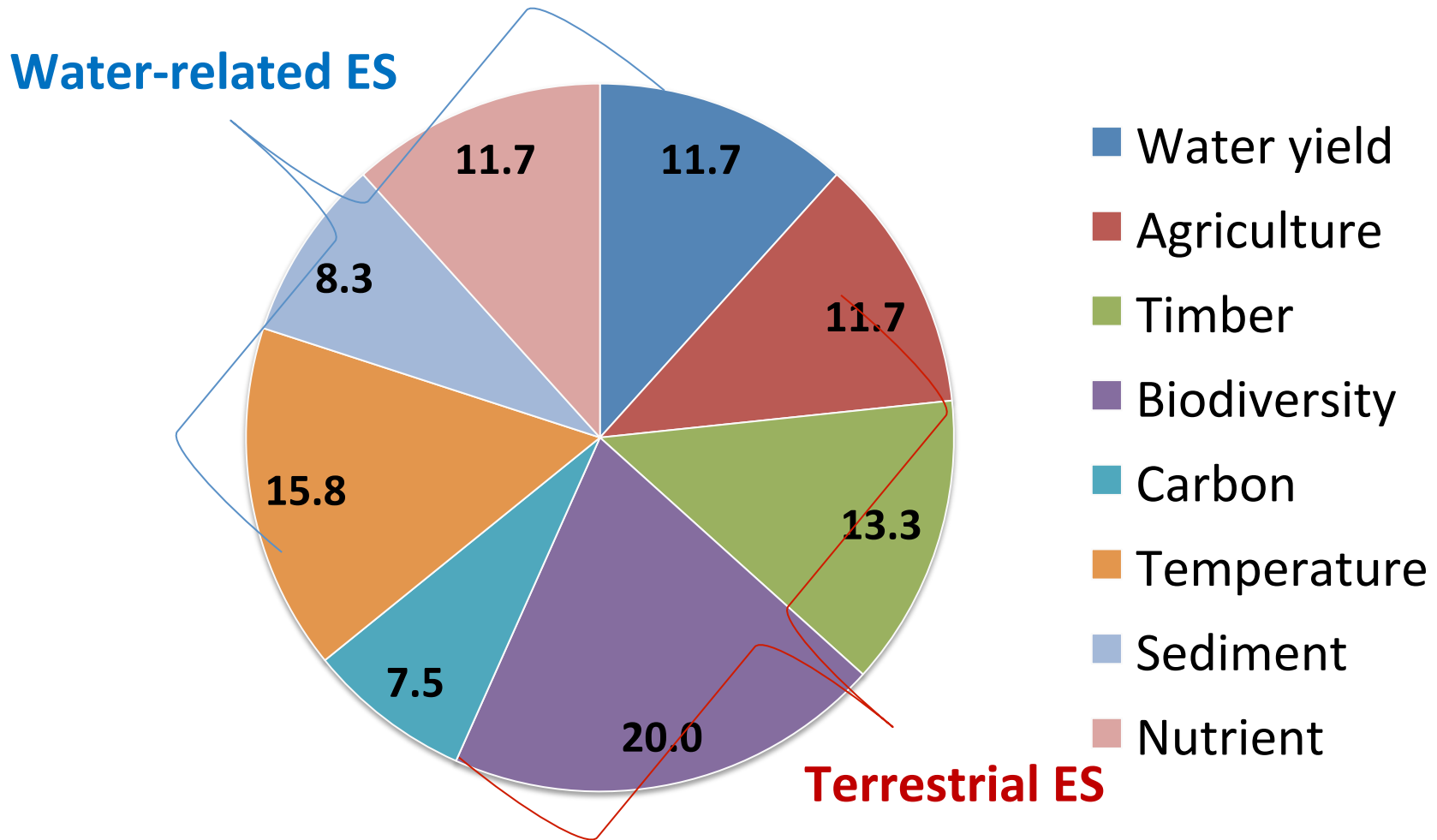
Low  $\Delta$

Land development

High  $\Delta$

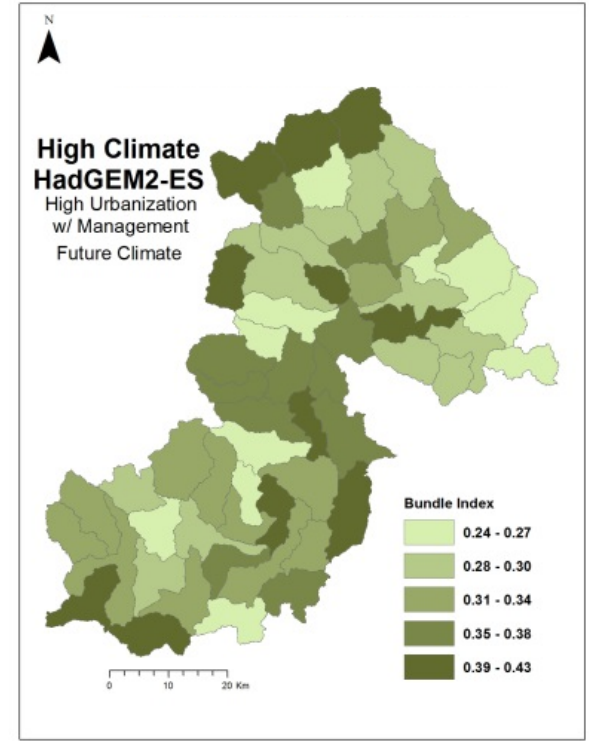
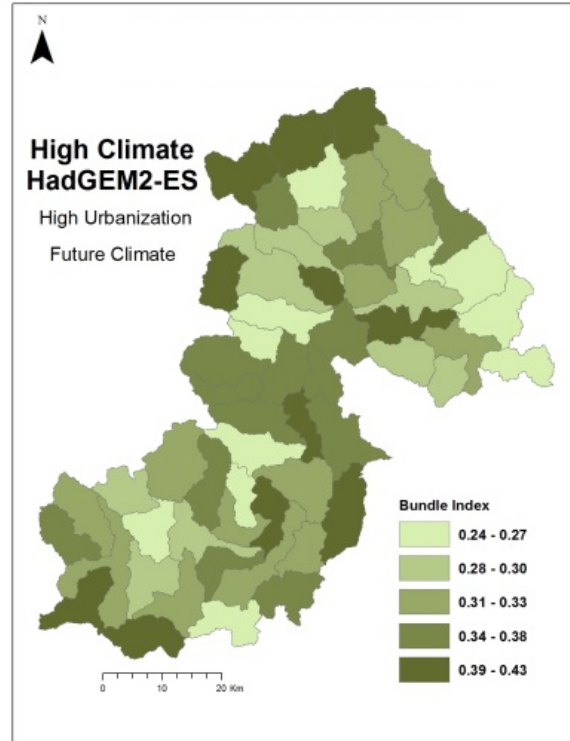
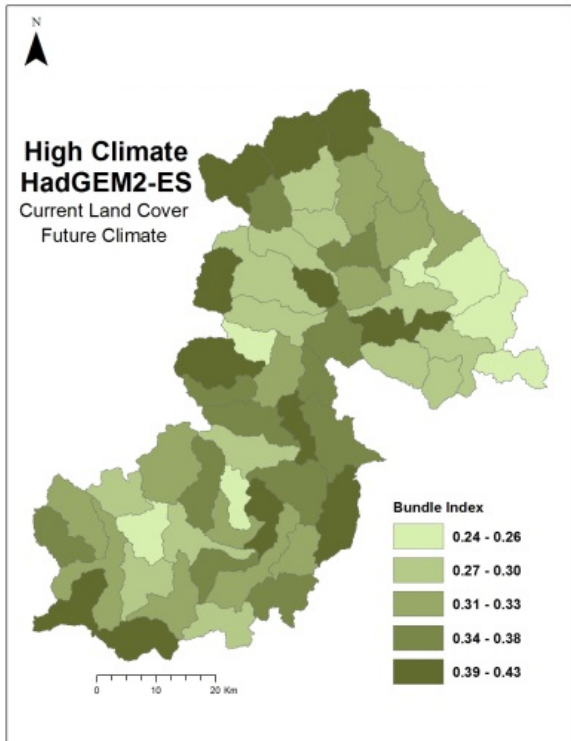


# Summary of the stakeholders' perception of the relative importance of individual ecosystem services



# 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.



# Acknowledgements

<http://www.pdx.edu/ecosystem-services/>

**Questions or comments:  
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