



## ECOLOGICAL RESEARCH PROGRAM

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

[www.epa.gov/ord](http://www.epa.gov/ord)

# *Overview of Ecological Research Program*

By

Rick Linthurst

National Program Director for Ecology

## ***BOSC Comment***

- *“The research, tools, and analytical technologies developed under the ERP represent the most comprehensive federal government research program examining the provision of ecosystem services and the communication of these to decision-makers. **LTG 3 is a highly relevant activity that is central to EPA’s mandate of improving environmental quality and protecting and restoring the health of the nation’s ecosystems.** ORD and particularly the ERP are uniquely suited and positioned to address these issues.” [emphasis added].*

# LIVING BEYOND OUR MEANS



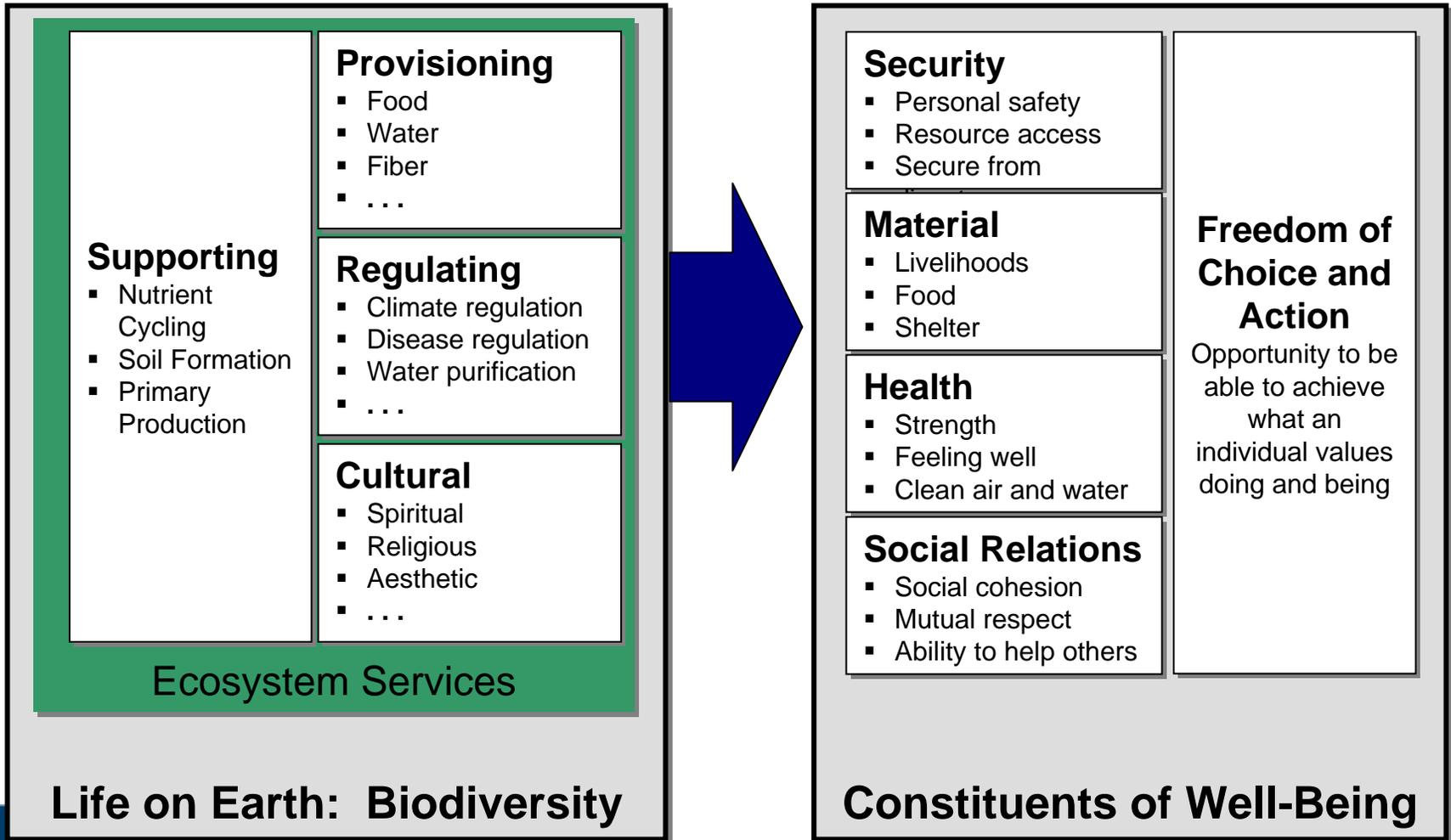
## NATURAL ASSETS AND HUMAN WELL-BEING

*Statement from the Board*

## ***Key Findings***

- Everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy, and secure life.
- Even today's technology and knowledge can reduce considerably the human impact on ecosystems. They are unlikely to be deployed fully, however, until ecosystem services cease to be perceived as free and limitless, and their full value is taken into account.

# Consequences for People

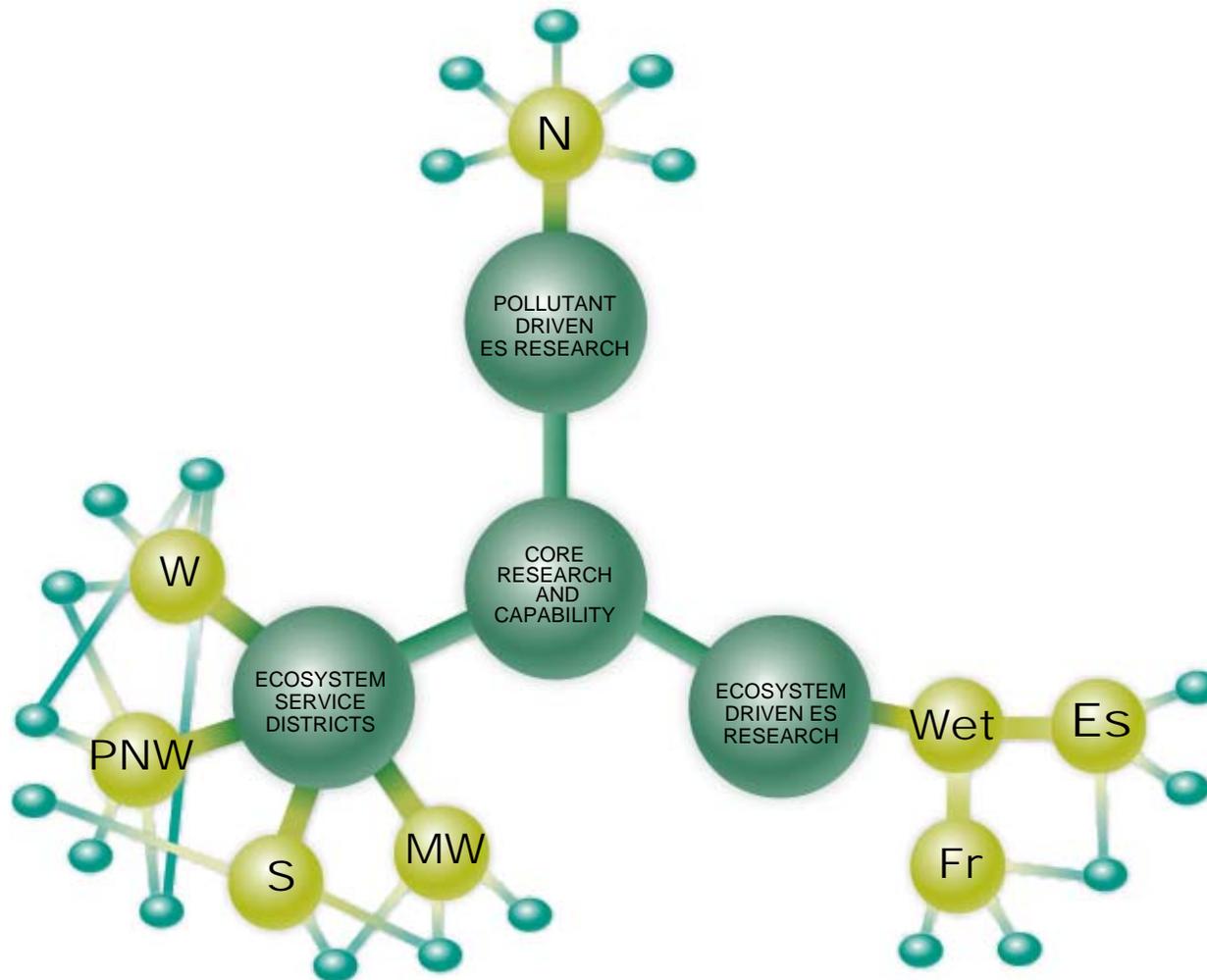


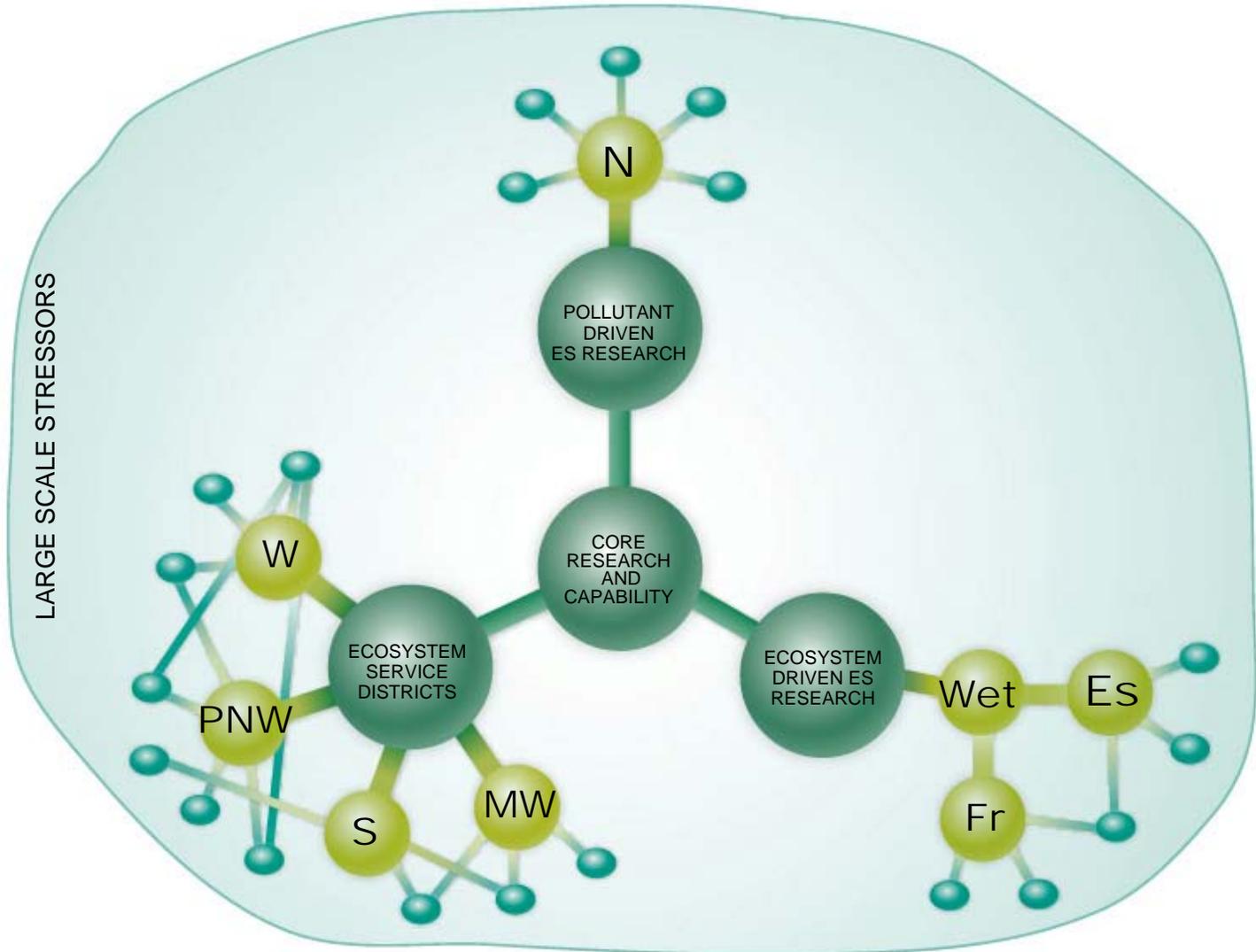
## *Vision*

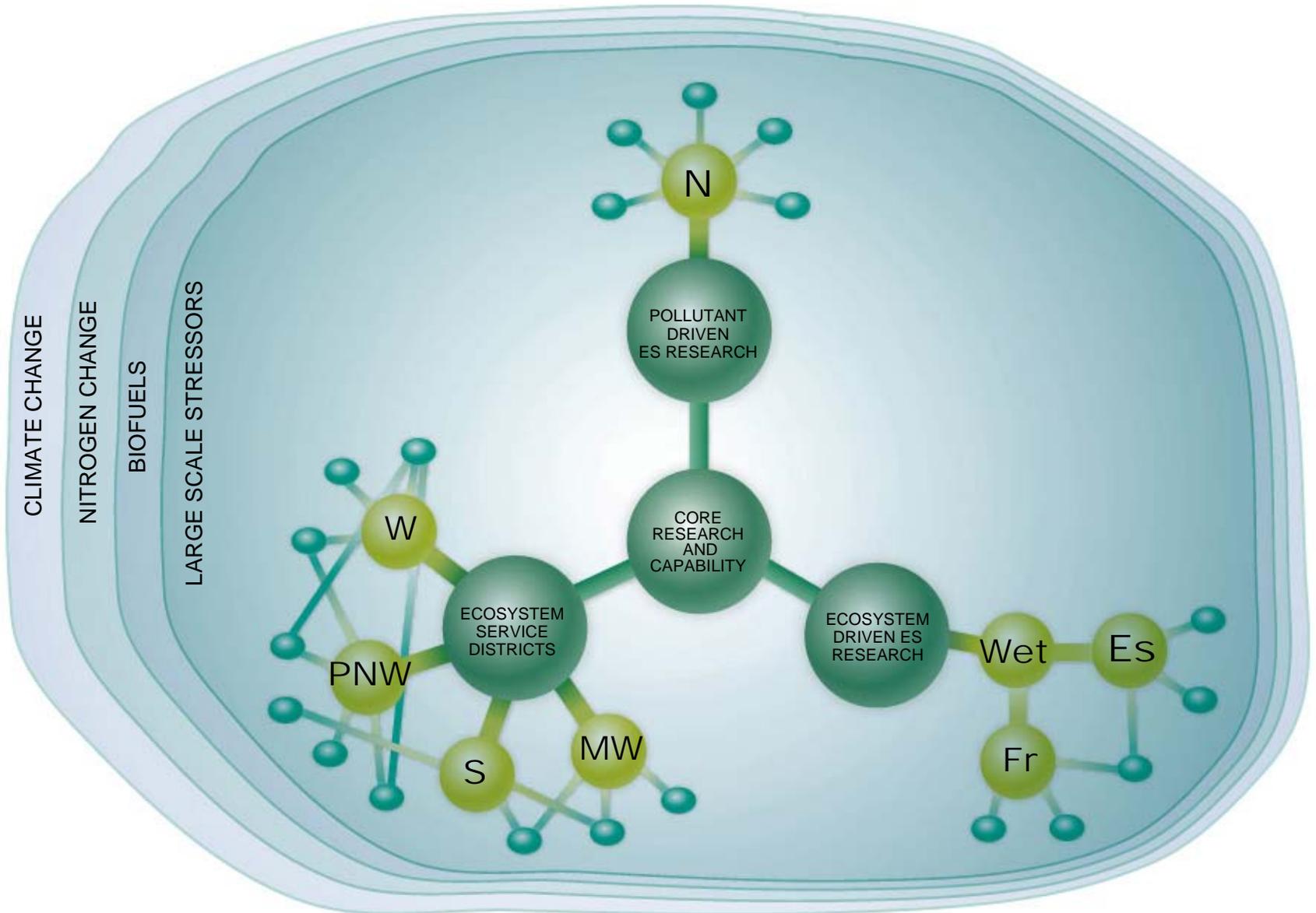
**To transform the way we understand and respond to environmental issues by making clear the ways in which our choices affect the type, quality and magnitude of the services we receive from ecosystems -- such as clean air, clean water, productive soils and generation of food and fiber.**

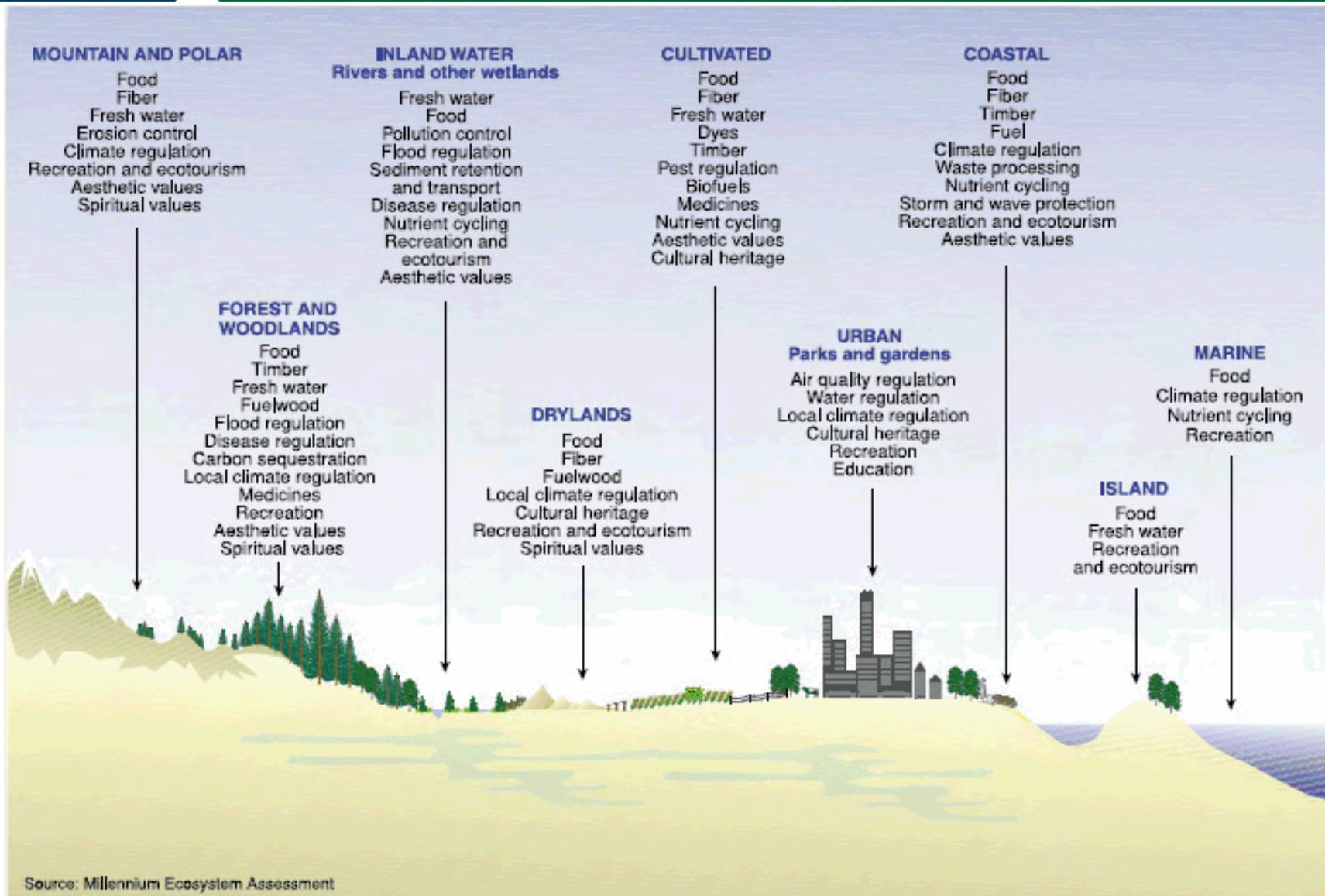
## ***Elements: a three prong approach***

- **Pollutant Driven Ecosystem Services Research**
  - How does a regulated pollutant affect, positively and/or negatively the collection/bundle of ecosystem services at multiple scales?
- **Ecosystem Driven Ecosystem Services Research**
  - How does the collection/bundle of ecosystem services provided by a single ecosystem type change under alternative management options at multiple scales?
- **Place Driven Ecosystem Services Research**
  - How do the collection/bundle of ecosystem services for all ecosystems within an ecosystem district change under alternative management options/drivers?

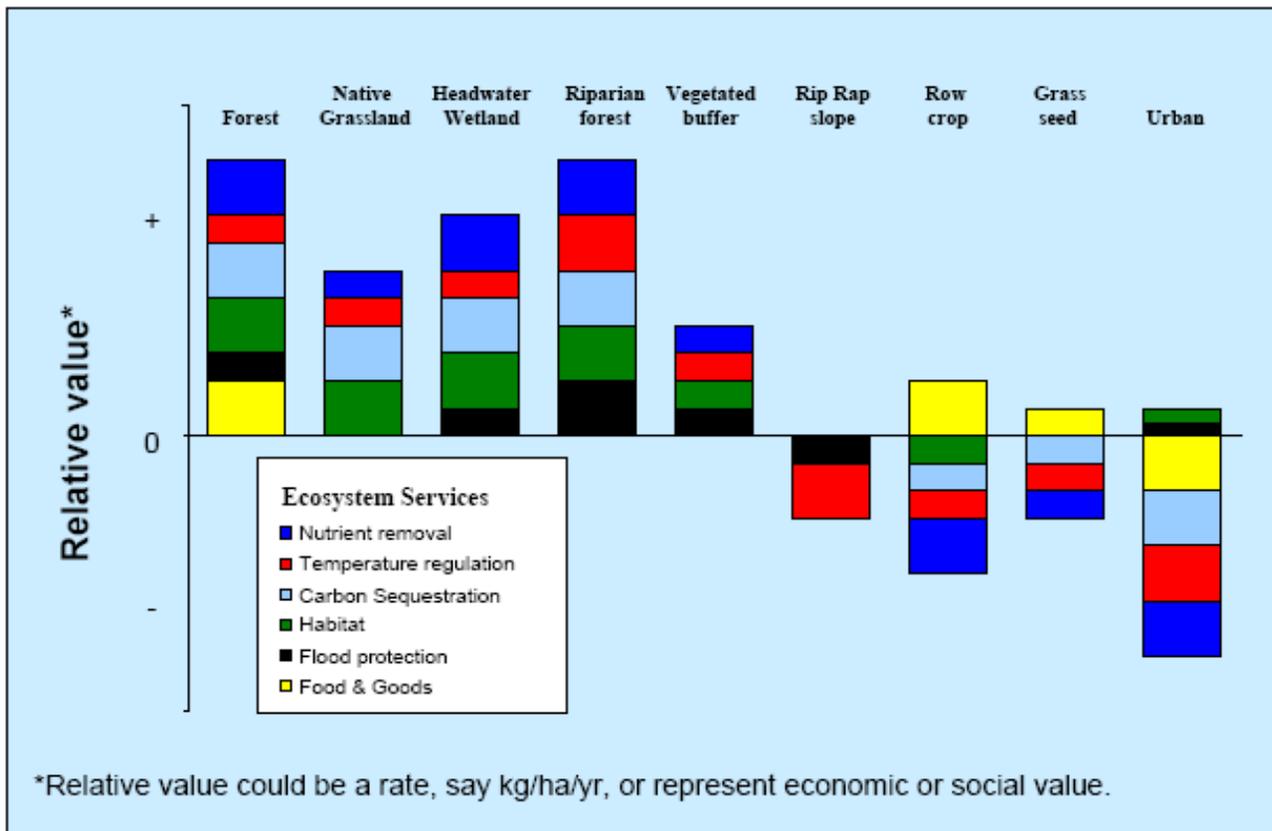






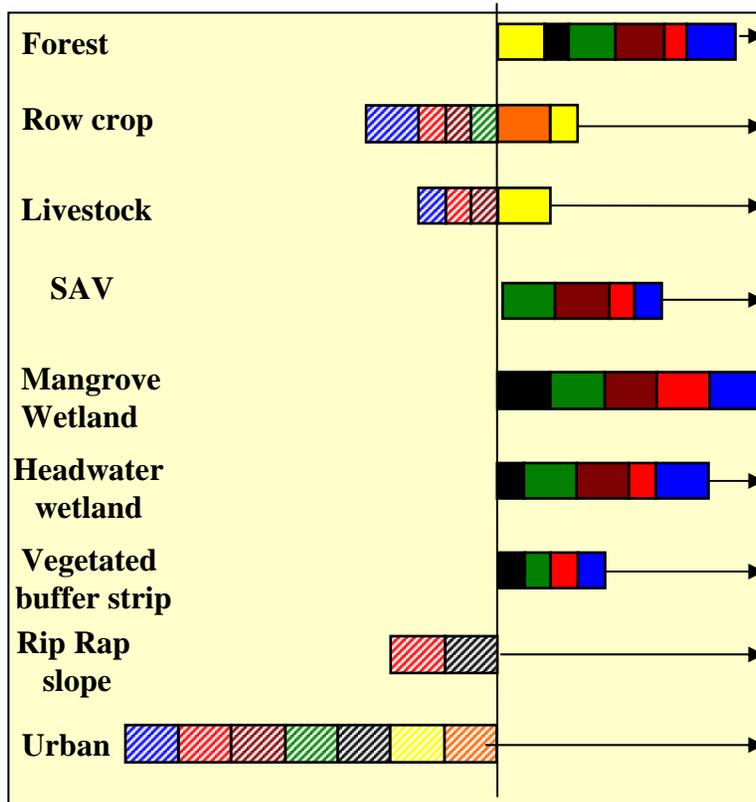


## Hypothetical ecosystem service values: *Bundled by land use in the Willamette ESD*

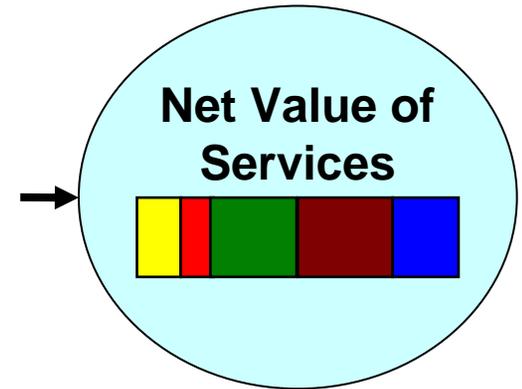
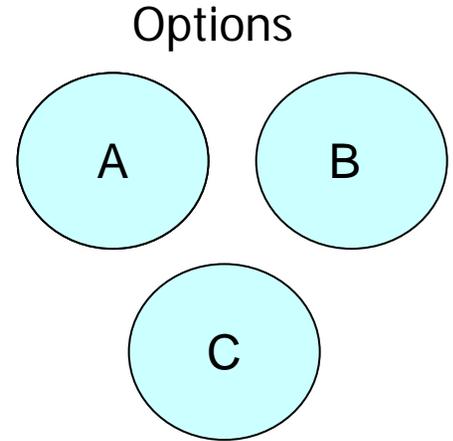


# End Product

## *Relative Ecosystem Services Within an Ecosystem District*



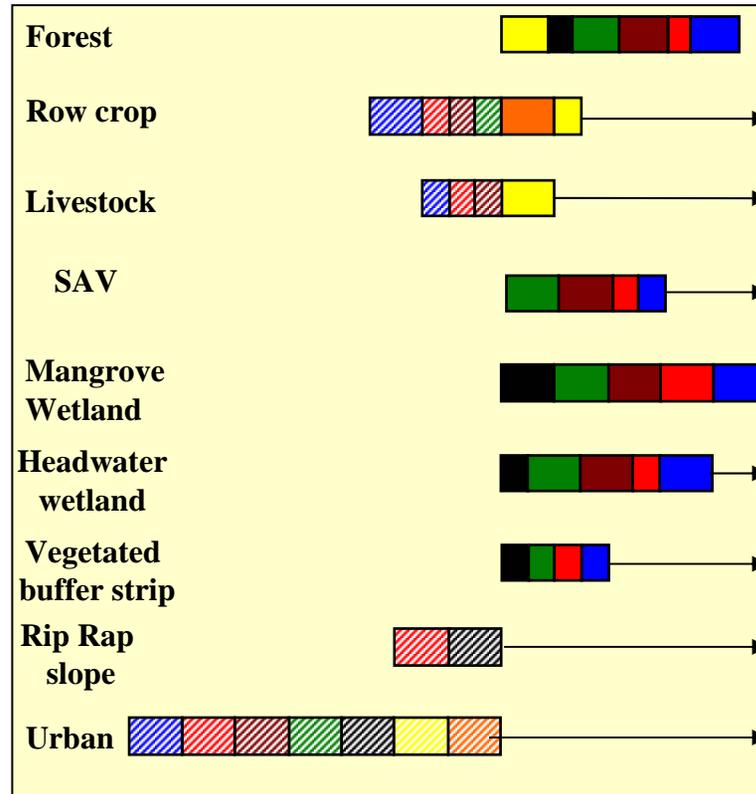
Scaling and Aggregation Under Alternative Management Scenarios



Management Option X

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How will changes in N affect the bundle of ecosystem services regionally and nationally?



N Species x Services?

N Species x Services x Ecosystem Type?

N Species x Services x Ecosystem Type x Region?

## ***Policy Challenge***

- Change N (by species?) to protect or enhance the largest number of the most valued (ecologically, socially, and economically) services at the lowest cost.
  - Protect ecosystems?
  - Protect services?
  - Optimize selected services?
  - ?????
- A summary of relative changes above could be invaluable for the decision maker
- Know the trade-offs



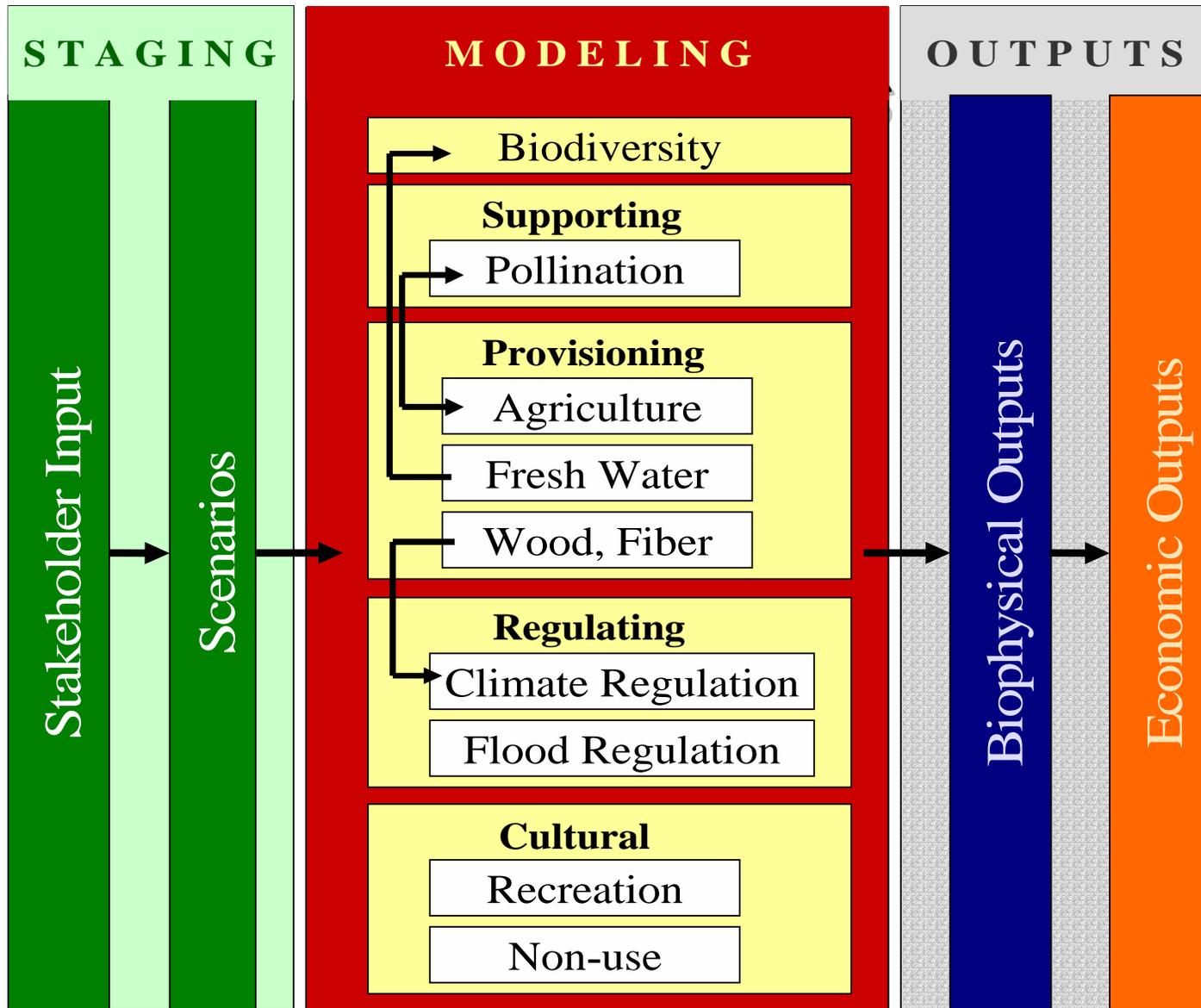
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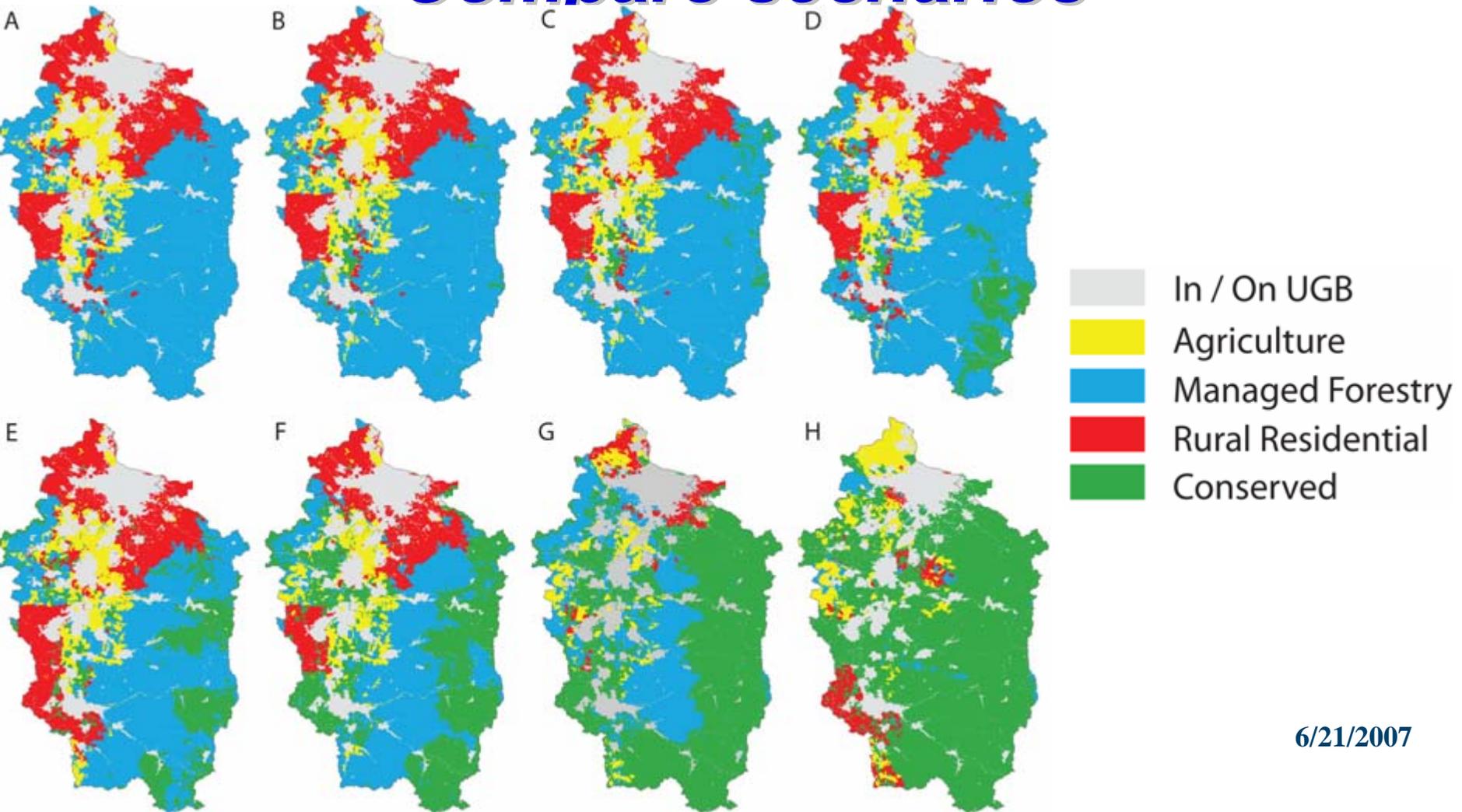
***Beyond ORD***

***Time Permitting?***



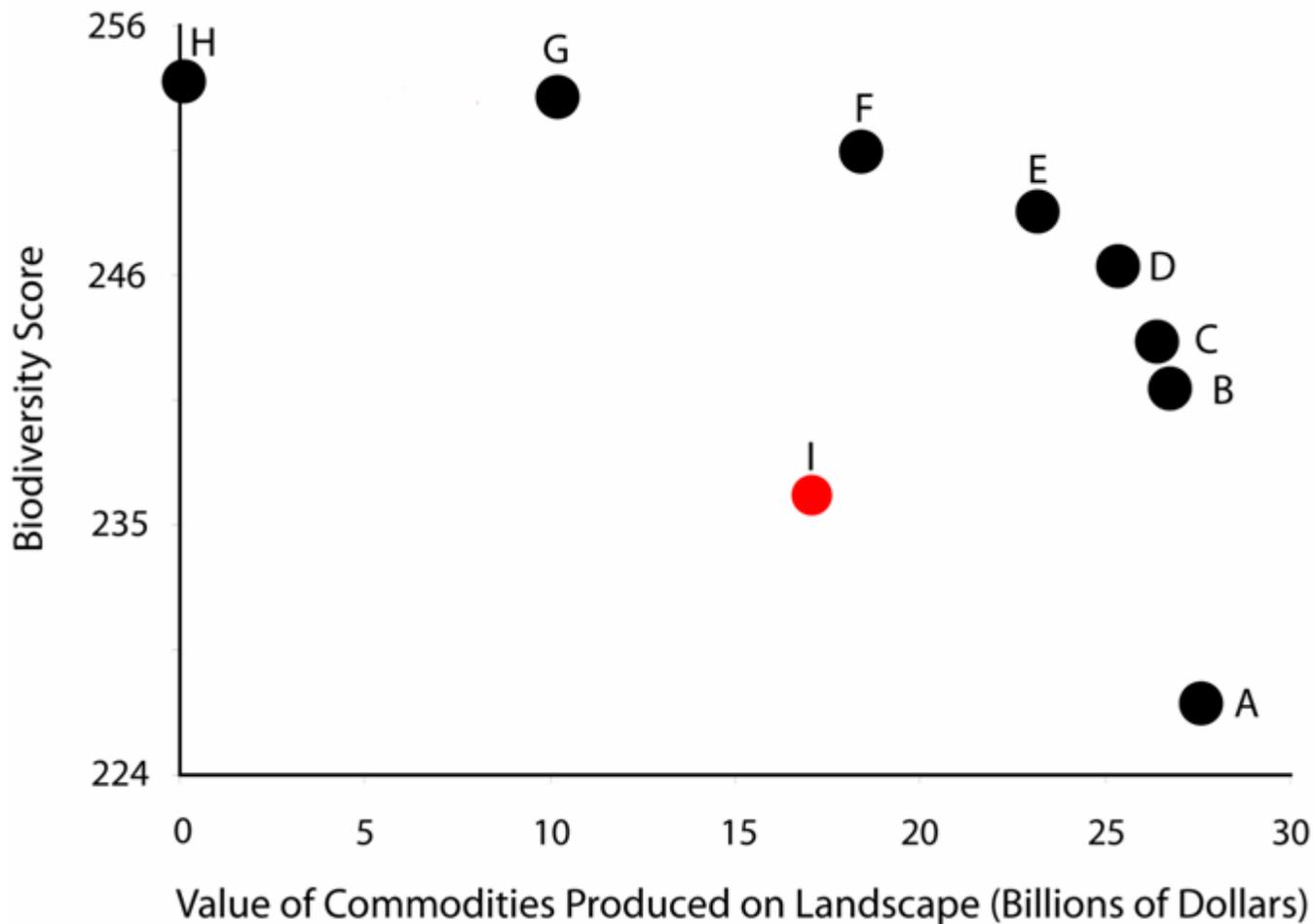
# Willamette Valley, Oregon

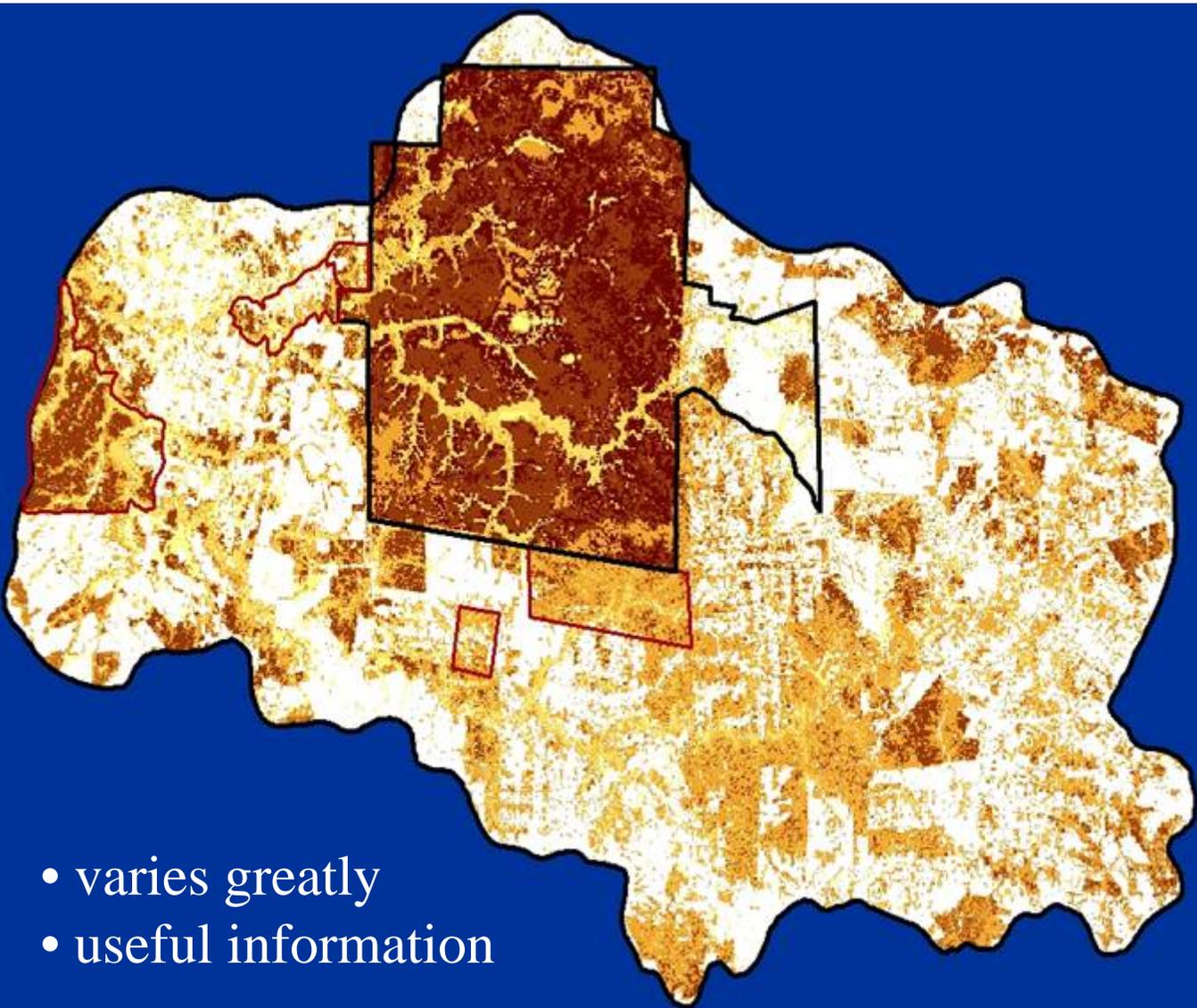
## *Compare scenarios*



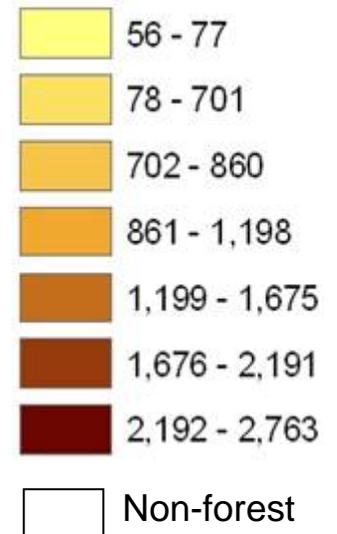
# Willamette Valley, Oregon

## *Compare scenarios*





### Net Present Value (\$ / ha)



Naidoo and Ricketts. 2006.  
*PLoS Biology*

6/21/2007

- varies greatly
- useful information



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