

Economic Benefits of Springs and Associated Ecosystem Services

Laila Racevskis

Assistant Professor

Food & Resource Economics Department

University of Florida/IFAS

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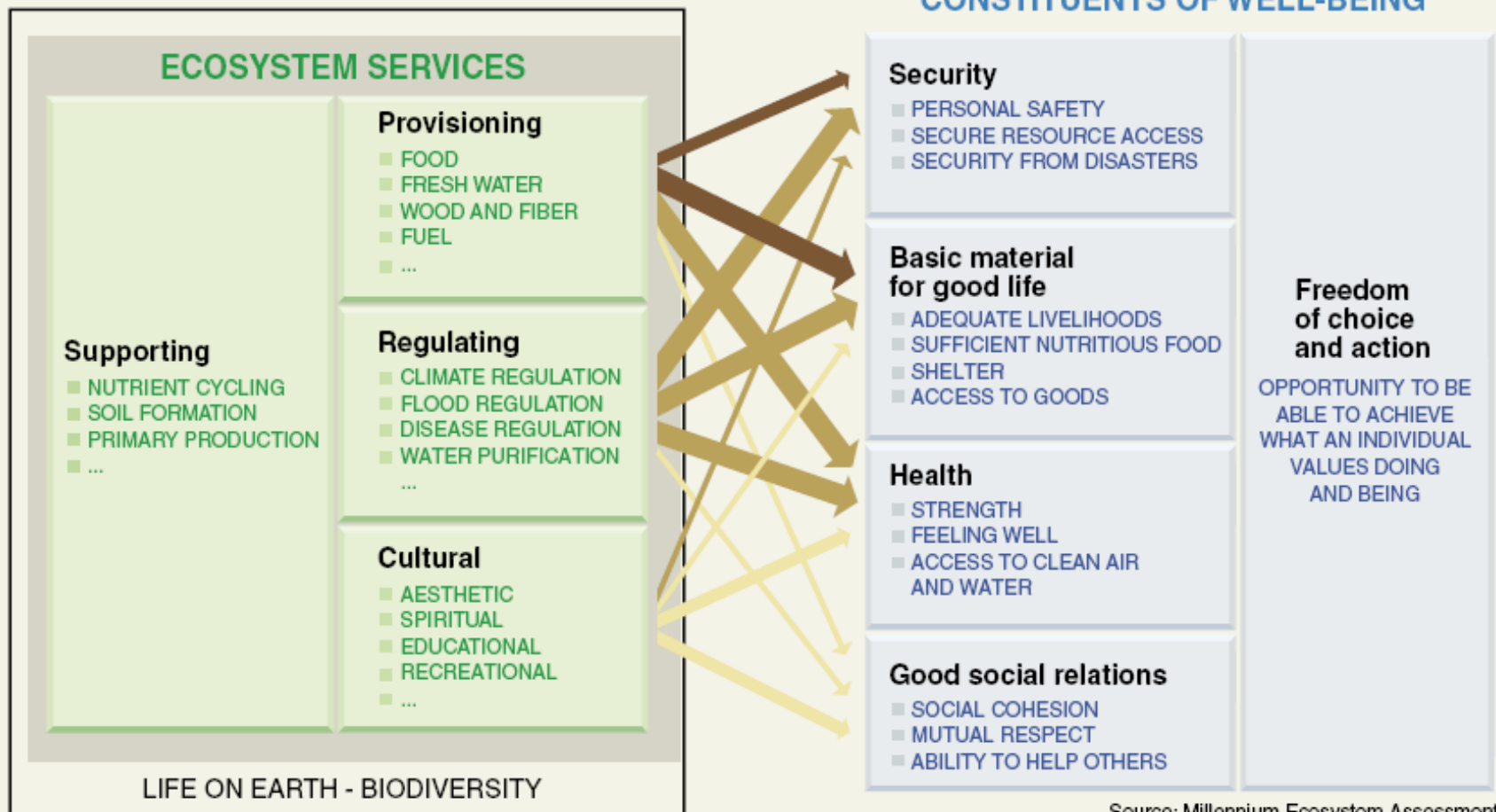


Human Well-being Depends on Natural Resources

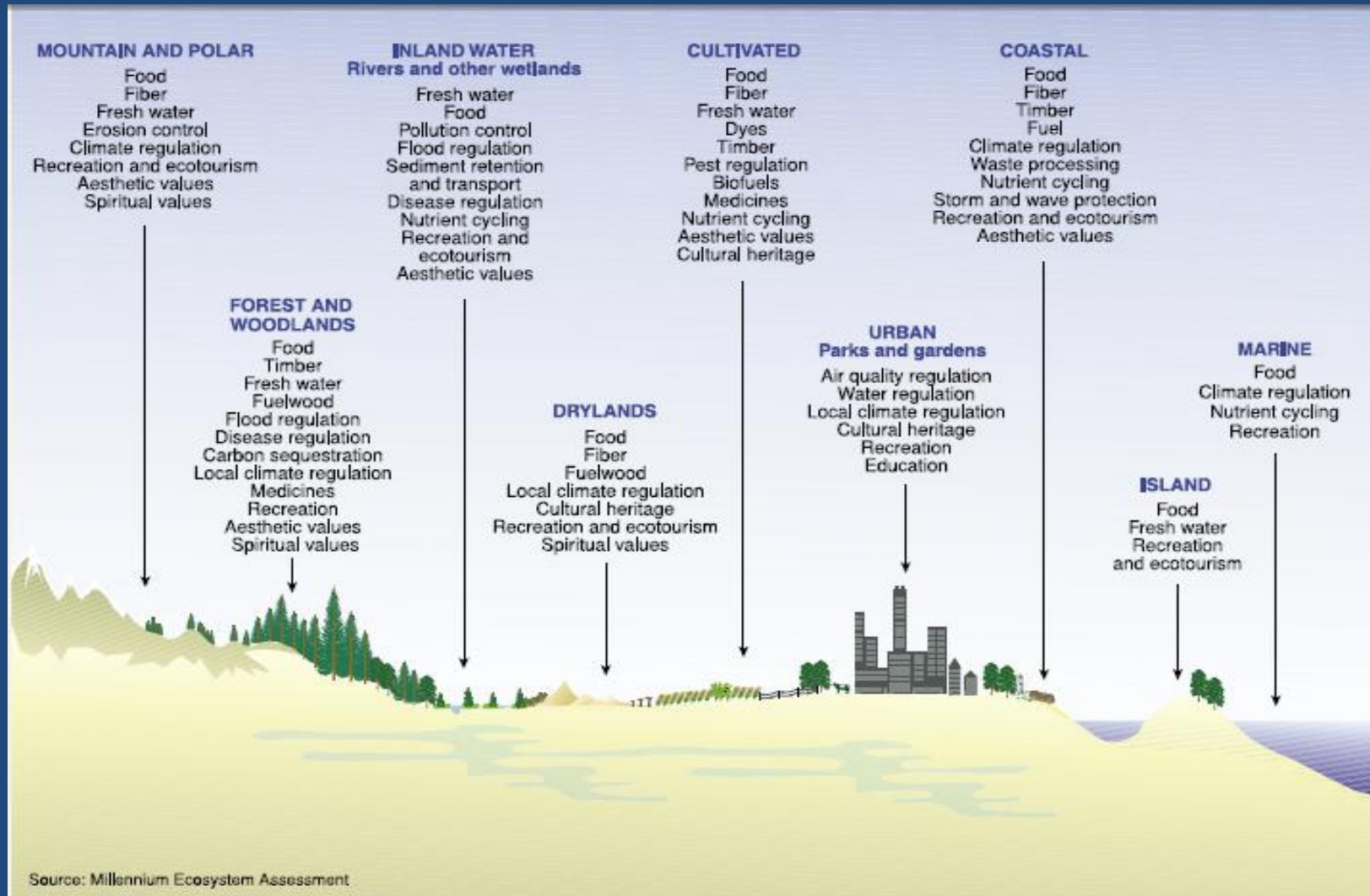
- We benefit every day from the natural resources on this planet
- These benefits are often referred to as *ecosystem services*, or “*The benefits people obtain from ecosystems*” (Millennium Ecosystem Assessment 2005)



We Benefit from Countless Ecosystem Services Every Day...



...And We Impact Countless Ecosystem Services Every Day

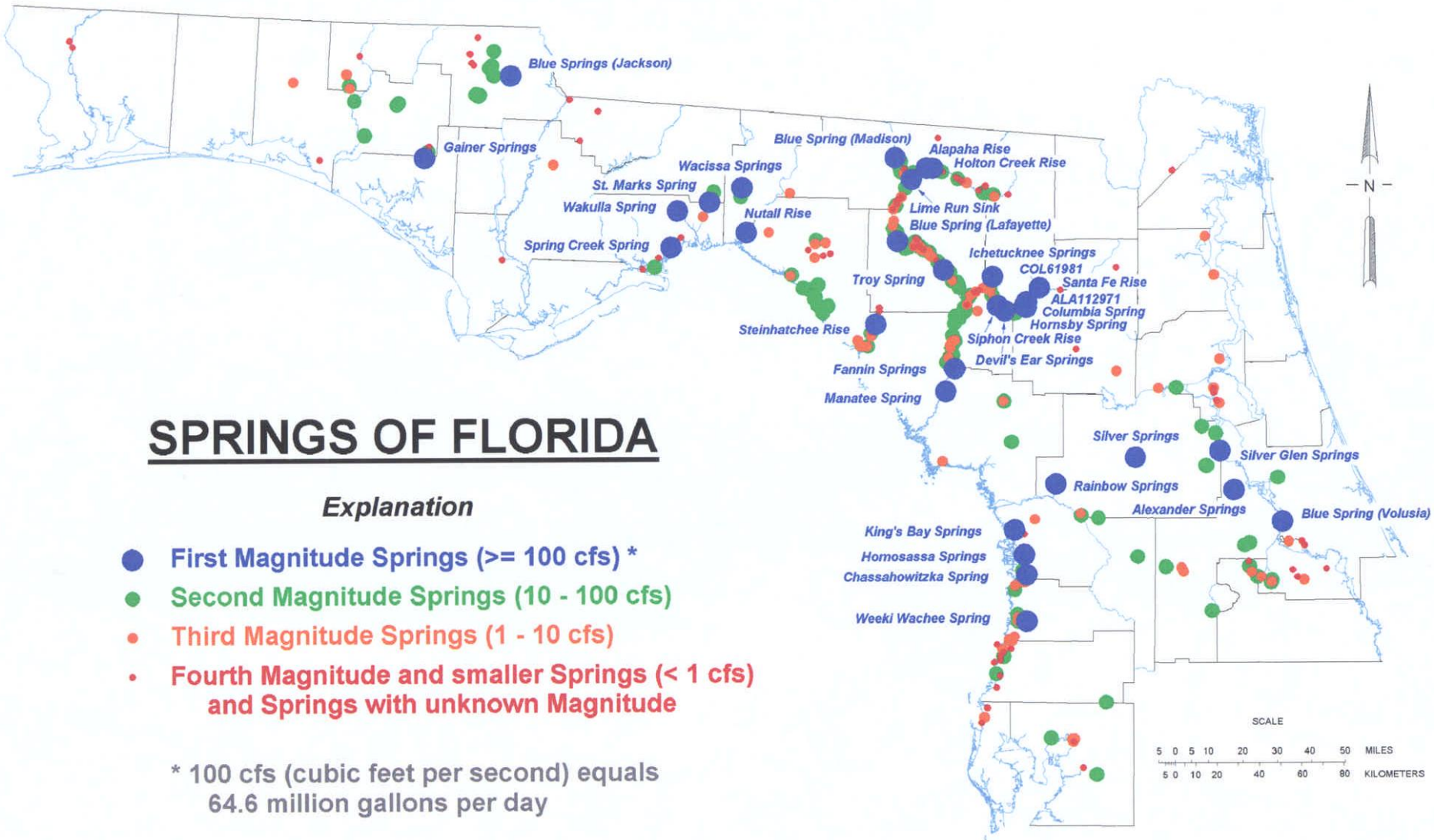


SPRINGS OF FLORIDA

Explanation

- First Magnitude Springs (≥ 100 cfs) *
- Second Magnitude Springs (10 - 100 cfs)
- Third Magnitude Springs (1 - 10 cfs)
- Fourth Magnitude and smaller Springs (< 1 cfs) and Springs with unknown Magnitude

* 100 cfs (cubic feet per second) equals 64.6 million gallons per day



Differences Between Ecosystem Functions, Services, and Values

- Ecosystem Functions – The biophysical processes in ecosystems, e.g. nutrient cycling
- Ecosystem Services – The outputs of ecosystem functions that directly or indirectly benefit humans, e.g. water quality
- Ecosystem Values – The utility to humans of Ecosystem Services, e.g. the benefits of water quality

From Casey and Kroeger 2007

Ecosystem Values/Benefits: Why Should We Care?

- How we value ecosystem services influences how we behave with respect to those ecosystem services
- Values are complex: they vary from person to person and are influenced by many other factors (e.g. knowledge, resource use, attitudes, demographic characteristics, etc.), and they can change
- Knowing something about these values/benefits (*and what influences them and how*) is important to decision-making to conserve & protect our natural resources

ES values, when carefully estimated and interpreted, can serve as:

- Indicators of public support for protection of the resource
- Indicators of contribution of the resource to the economic base
- Evidence of the significance of the resource to society and motivation for its protection
- Information that helps decision makers make informed decisions through weighing the full benefits and costs of different policy options
- Educational tools for decision makers, the general public, and other interested stakeholder groups

How Can We Estimate Values and Benefits of Ecosystem Services?

- Many different methods/approaches exist
- Each method/approach can help us answer different questions
- A suite of valuation approaches can be used to get as close as possible to an estimate of the “Total Economic Value” of the resource

Ecosystem Service Valuation Methods

■ Recreational Use Expenditures and Travel Cost Method:

- ◆ *How much are people spending on travel to get to the resource? How much are they spending in the local economy to use the resource?*

■ Avoided Cost Method:

- ◆ *How much money do we not have to spend on storm damage recovery because we have intact coastal wetlands?*

■ Non-market Valuation Methods:

- *What kinds of trade-offs, monetary and non-monetary, are people willing to make to protect the resource? What are they willing to pay and/or do?*
 - Contingent Valuation Method (CVM)
 - Attribute-Based Method (ABM)
 - Deliberative Valuation Method (DVM)

Ecosystem Service Valuation Methods

■ Meta-analysis / Benefits Transfer Method:

- ◆ *How much are the ecosystem services from multiple non-market valuation studies worth if we aggregate the values?*

■ Hedonic Valuation Method:

- ◆ *How much more is my property worth than other properties in the community because of how close I am to a lake?*

■ Economic Impact Analysis:

- ◆ *How much income and job creation can be attributed to the resource in a particular community, state, or region?*

Ecosystem Services from Springs

- Biodiversity
- Habitat for fish, reptiles & amphibians, birds & mammals, insects and invertebrates, plants
- Maintaining in-stream flows (minimum flows and levels)
- Water for consumptive use
- Recreational use
- Aesthetics
- Spiritual/cultural



Human Impacts on Springs

- Landscaping and lawn care
- Row crop agriculture
- Livestock
- Sprawl and development
- Runoff and stormwater
- Golf courses and athletic fields
- Human consumption and overuse of water
- Illegal dumping
- Recreational impact

Very Few Studies on Benefits of Florida Springs

- Foster, C. 2008. *Valuing Preferences for Water Quality Improvement in the Ichetucknee Springs System: A Case Study from Columbia County, Florida*. MS Thesis, Univ. of FL.
- Bonn, M.A. and F.W. Bell. 2003. *Economic Impact of Selected Florida Springs on Surrounding Local Areas*. Prepared for Florida DEP Division of State Lands, Florida Springs Task Force.

Springs Protection Policy in Florida – Some Examples

- Florida Springs Initiative
 - ◆ DEP driven effort initiated in 2001
 - ◆ \$24.5 million allocated from 2001~2010
 - ◆ Research, education, landowner assistance
- Florida Springs Task Force
- Florida Friendly Landscaping
- Local comprehensive plan provisions
- Land Development Regulations
- Springs Protection Ordinances (county level)

Local Land Use Planning and Springs Protection: Hypothetical Example

Economic Element

Goal: Protect springshed water quality and quantity to maintain and protect the environmental, aesthetic and economic values of spring resources.

Objective: Recognize the economic value of the springs and protection zones.

Policy: Create a greenway system leading through the most sensitive areas of the springshed in order to draw visitors to spring resources without jeopardizing the environmental integrity of these valuable resources.

Policy: Market and educate visitors about the springshed and greenway for use and enjoyment as a natural recreational and educational center.

Economic Benefits of Springs: What Would be Helpful to Know?

- *What are people willing to pay to protect the resource? Would they support a greenway to protect springs?*
 - Non-market valuation
- *Is there a positive effect on property values from proximity to springs?*
 - Hedonic valuation
- *How many jobs exist due to the resource? How much local revenue is generated due to the springs?*
 - Economic Impact Analysis

Concluding Thoughts

- Springs are a very valuable and unique natural resource in Florida but there is little evidence of their economic value to the state
- Public policy for springs protection has decreased significantly in recent years
- Information on how the public perceives and values springs protection would be a valuable input to future public policy for springs protection



Thank You!

Laila Racevskis

racevskis@ufl.edu

352~392~1826 Ext. 324