CHALLENGES OF REFLECTING THE TRUE VALUE OF WATER

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Ecosystem Services and Why Ecosystem Service Valuation Is Important

- Ecosystems are biological communities that interact with the environment.
- Ecosystem services or environmental services are all the benefits derived from nature.
- Nature provides us with a variety of goods, services, and experiences

Southern Pines
Source: www.sfrc.edu

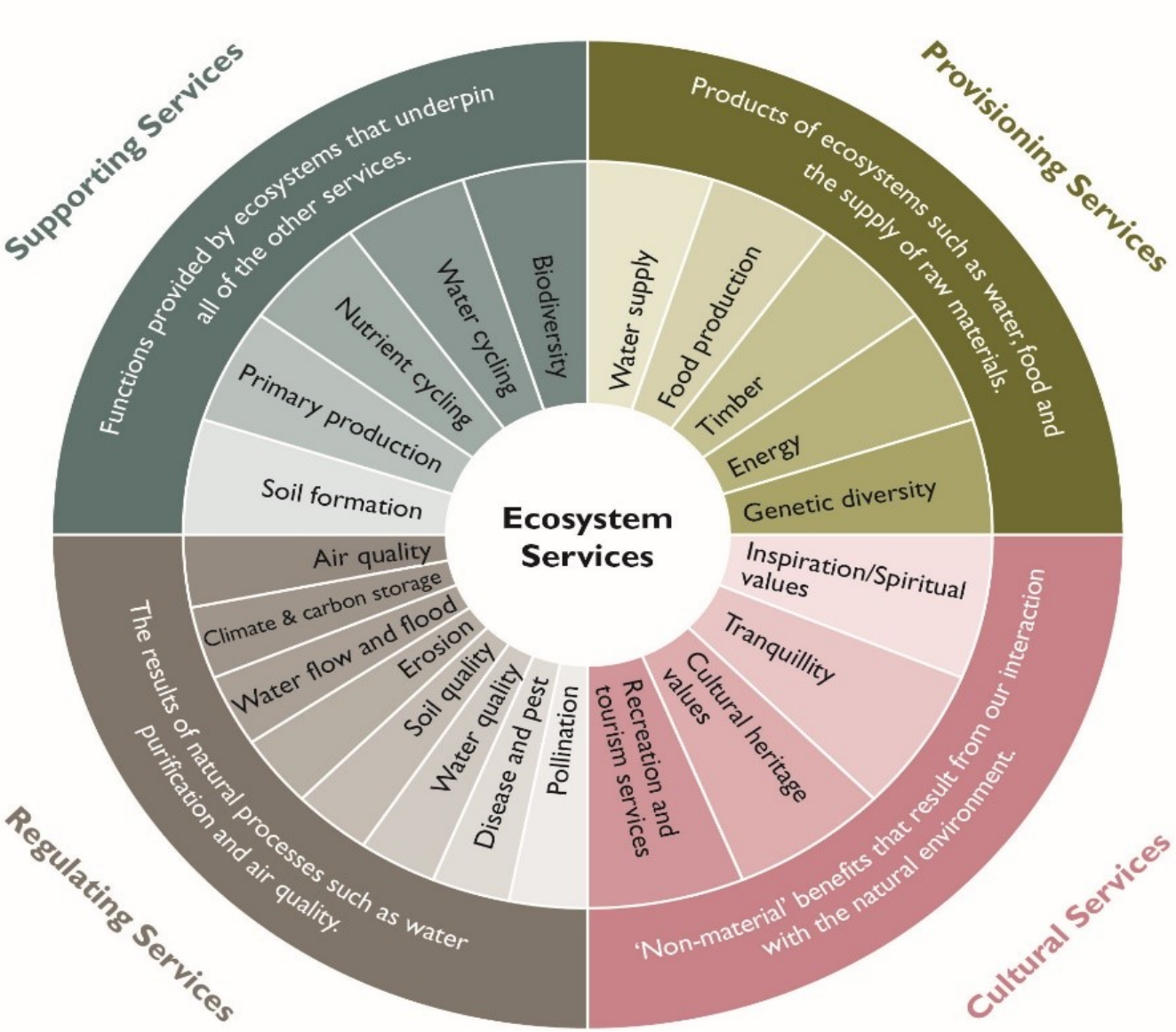
Ecosystem Services and Why Ecosystem Service Valuation Is Important

Benefits or values depend on who you ask

- ✓ Industry (e.g., agriculture, tourism, water treatment, timber)
- ✓ Landowners
- ✓ Policymakers

Source: www.bonitaspringsfishing.com

Categories of Ecosystem Services

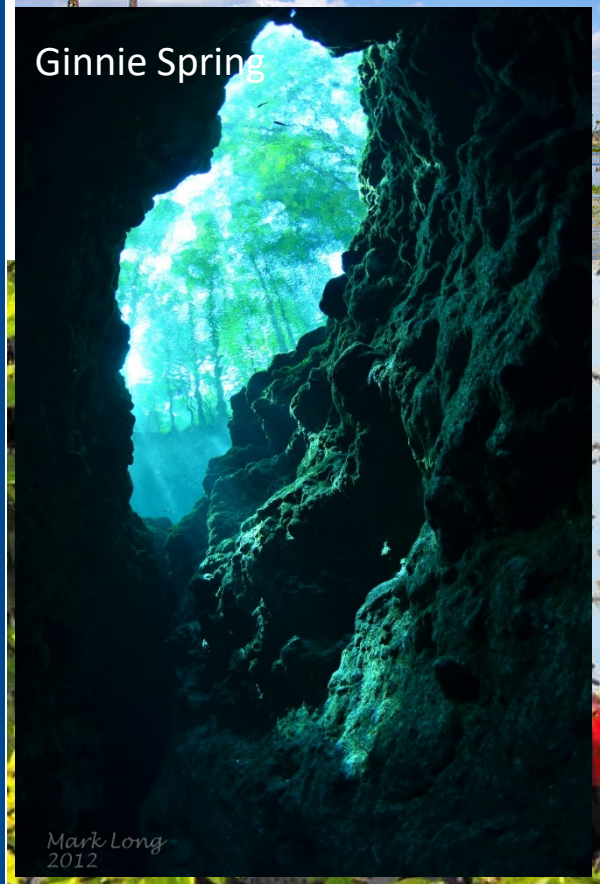


source: SDNPA (2013)

The Issue: How do you put a price on nature?

We underappreciate these resources because they are free.

Although people value nature it is difficult to quantify its value.



Total Economic Value

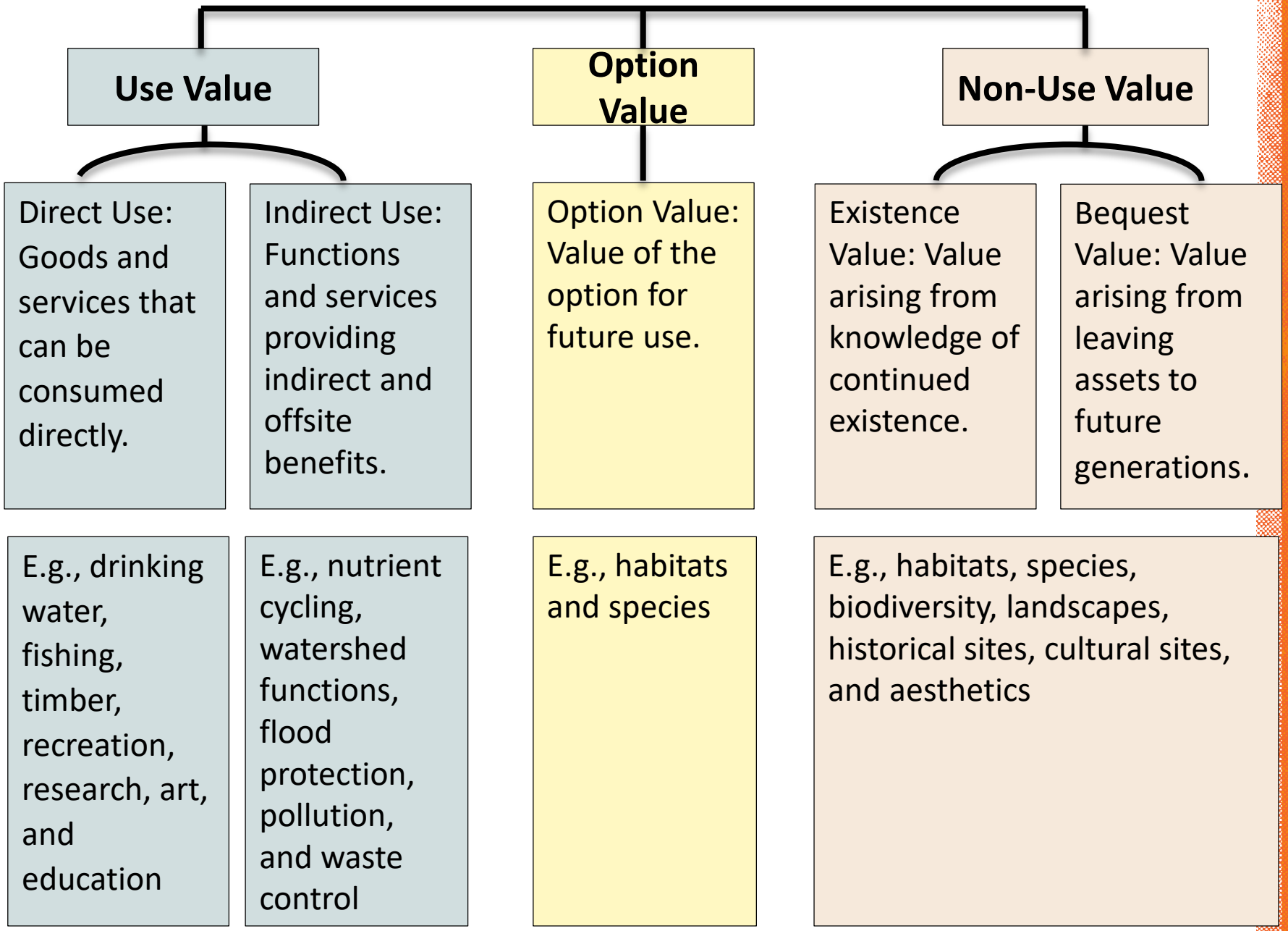
Total economic value (TEV):

TEV = USE VALUE + OPTION VALUE + NON-USE VALUE

The benefits from ecosystems can be much larger than the cost of restoring or preserving them (Tientenberg 2006).

Ginnie Springs
Source: www.visitflorida.com

TOTAL ECONOMIC VALUE



Methods of Assessing Economic Value

Market Based Methods

- Total economic contributions (Use Value)
  - Examines the flow of goods and services associated with a site
- Travel cost method (Use Value)
  - Value of a site is assessed by how much people are willing to pay to visit
- Hedonic valuation (Use Value)
  - Making inferences from property values or valued amenities

Circumstantial Evidence Methods

- Benefits transfer (Use Value; Non-Use Value)
  - Adjusting information from other locations or contexts

Survey Methods

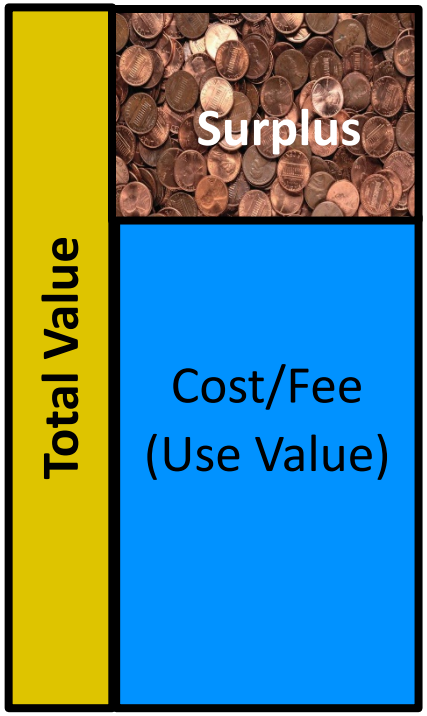
- Contingent valuation (Use Value; Non-Use Value)
  - Asks what respondents what they would do
  - Willingness to pay

Consumer Surplus

The additional value the consumer is willing to pay

Consumer Surplus = Total Value – Cost/Fee

We rarely know this value



Examples of Values for Springs

Borisova, Hodges, & Stevens (2014)

- Several natural and human actions affects springs:

  droughts, groundwater withdrawals (residential, agricultural, and industrial), and groundwater pollution (from urban and agricultural lands)

Suwannee and Santa Fe River Basins

- ***Public Sites***: Fanning Springs State Park, Hart Springs County Park, Ichetucknee Springs State Park, Lafayette Blue Springs State Park, Little River Springs County Park, Manatee Springs State Park, Poe Springs County Park, Rum Island Springs County Park, Troy Springs State Park, and Wes Skiles Peacock Springs State Park

- ***Private Sites***: Blue Grotto, Blue Springs, Devil's Den, Ginnie Springs, and Hornsby Springs

➢ **Evaluating Economic Contributions**: industry output, value added, employment, wages, property income, taxes

Value of Tourism

Borisova, Hodges, & Stevens (2014)

Category	Value from Tourism
Diving visitors	57,206
Total spending	$84.2 million
Local	$38.9 million
Nonlocal	$45.3 million
Employment	1,160
Industry output (sales, employee spending)	$91.0 million
Taxes	$12.8 million
State and local	$6.4 million
Federal	$6.4 million

Note: Annual averages for 2012-13

Consumer Surplus for Springs

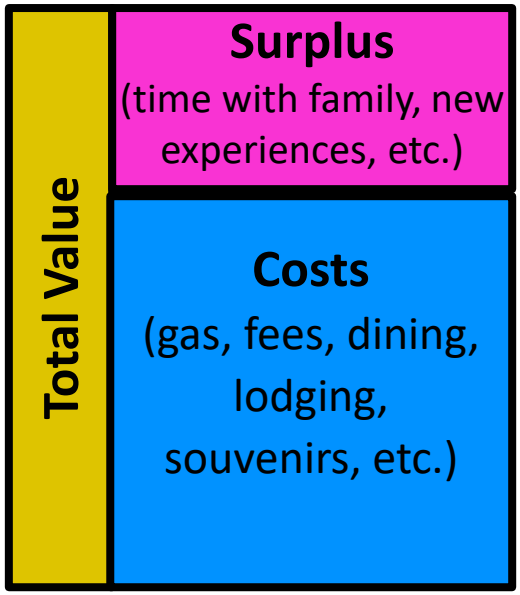
Borisova, Hodges, & Stevens (2014)

Consumer Surplus: total value of recreational experiences exceeds visitors' total expenditures for recreational trips

Total value (M$) = Industry Output (M$) + Consumer Surplus (M$)

$103.42 = $94.00 + $9.44

Source: Ichetucknee Springs State Park Website



Visitors' Value of Recreation

Study	Location	Question Examined	Selected Conclusions
Huth & Morgan (2011)	Wakulla Springs	Value of cave and cavern diving for registered divers	Willingness to pay is $52 - $83 per dive: about $0.5M per year
Morgan & Huth (2011)	Jackson Blue Spring	Value of recreational cave diving	Willingness to pay is $147 - $167 per dive; about $0.6M per year
Bi et al. (2017)	St. Johns River Basin	Value of inland water-based recreation	Willingness to pay is $172M per year
Shrestha et al. (2002)	Ocala National Forest	Value of water-based recreation for the visitors	Willingness to pay for basic, moderately improved, and improved facilities is $1M, $1.9M, and $2.5M per year

Amenity Value of Water Resources

Study	Location	Question Examined	Selected Conclusions
Walsh et al. (2010)	Urban Orange County	Residential property prices and urban lake water quality	Increase in lakefront property sale price by $6,900 for 1 foot increase in Secchi depth (i.e., water clarity)
Bin and Czajkowski (2013)	Martin County	Residential property prices in coastal areas	increasing average water clarity by 1% can result in $7,531 to $43,158 increase in average property values

Value of Clean Water

Study	Location	Question Examined	Selected Conclusions
Kreye et al. (2016)	Statewide	Public values for forest-water resource protection (clean water and other benefits)	Public annual willingness to pay is $154–230 million
Alvarez et al. (2016)	Statewide	Public value of improving surface water quality from “fishable” to “swimmable”	Public annual willingness to pay is $803 million per year

One Service vs Entire Systems

Valuing entire ecosystems pose additional challenges.

- Ecosystems are integrated and complicated.

- The value of entire ecosystems are extremely difficult to estimate.
  - Assess the values of individual components, then sum
  - Assess the value using language that captures the entire ecosystem

    E.g., *How much are you willing to pay for cleaner water?*

    How much are you willing to pay for a wider variety of species?

Policy Questions

Who should pay for the restoration or preservation of ecosystems?

- People who use it
- People who value its existence
- People who overuse it (excessive withdrawals)
- People/entities that pollute

How much should they pay?

How should they pay?

- Pricing municipal water use
- Labels
- Taxes and cost share programs
- Payment for ecosystem services / private-public partnerships

Silver Springs State Park

Questions?

Silver Springs

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