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Non-monetary benefits without apology

The economic theory and practice of ecosystem service benefit indicators

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Environmental decisions require tradeoffs

http://backpacker.web1.ec2.aimstaging.com/media/originals/NewYorkCityLibertyStateParkLoop110448.jpeg

http://ecosystems.mbl.edu/sippewissett/images/sippewissett2.jpg

Which of these sites should we spend money on?

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Ecological information alone is not enough to evaluate tradeoffs

Benefits to people matter!

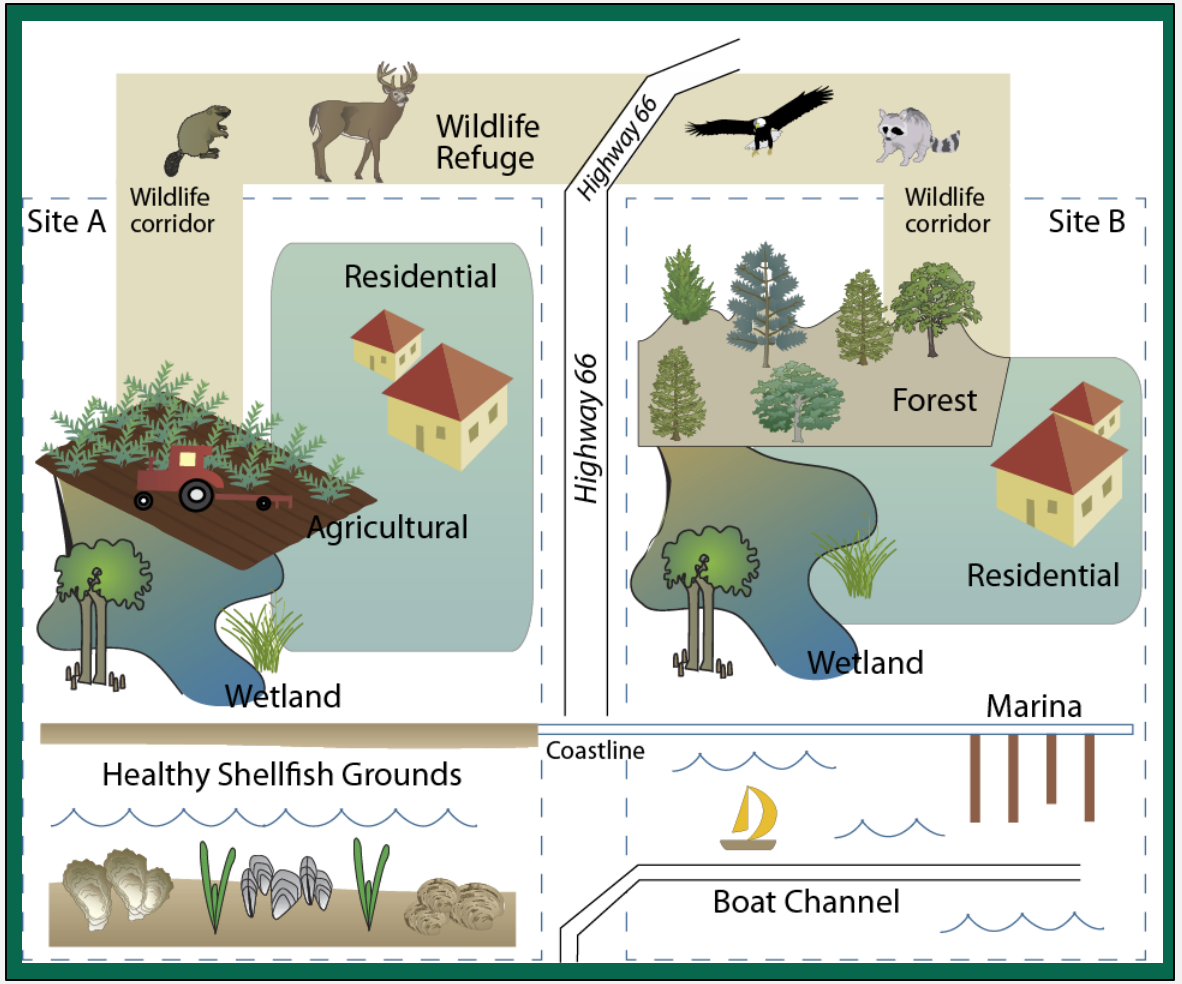

Illustration adapted from Dennis King, 1997

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Why not evaluate all benefits using monetary measures?

Photo: unep.org

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Dollar values may add controversy rather than clarity

Journal of Economic Perspectives—Volume 26, Number 4—Fall 2012-

From Exxon to BP: Has Some Number Become Better than No Number?

Catherine L. Kling, Daniel J. Phaneuf, and Jinhua Zhao

Contingent Valuation: From Dubious to Hopeless

Jerry Hausman

Contingent Valuation: A Practical Alternative when Prices Aren't Available

Richard T. Carson

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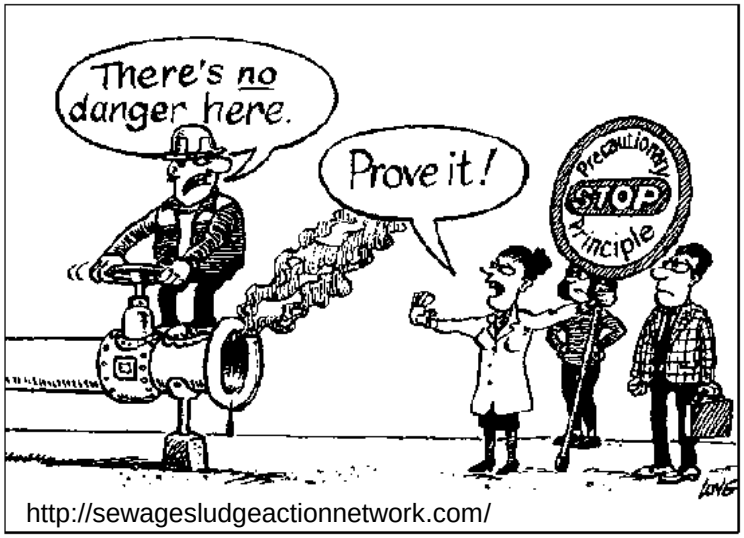
Dollar values are only one part of the story

- distribution of benefits
- environmental justice
- precautionary or safe minimum standards



http://sewagesludgeactionnetwork.com/

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Is some number better than no number?

http://www.lucrorfx.com/forex-market-2/best-forex-indicators.html

How should we interpret “the value of everything?”

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Values can be assessed using indicators

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What are indicators?

- Indicators simplify complexity to inform decisions and actions.
- They selectively represent a real system.
- They bridge science and policy.

What are value indicators?

- Value indicators are developed based on economic models and empirical evidence of factors that affect value.

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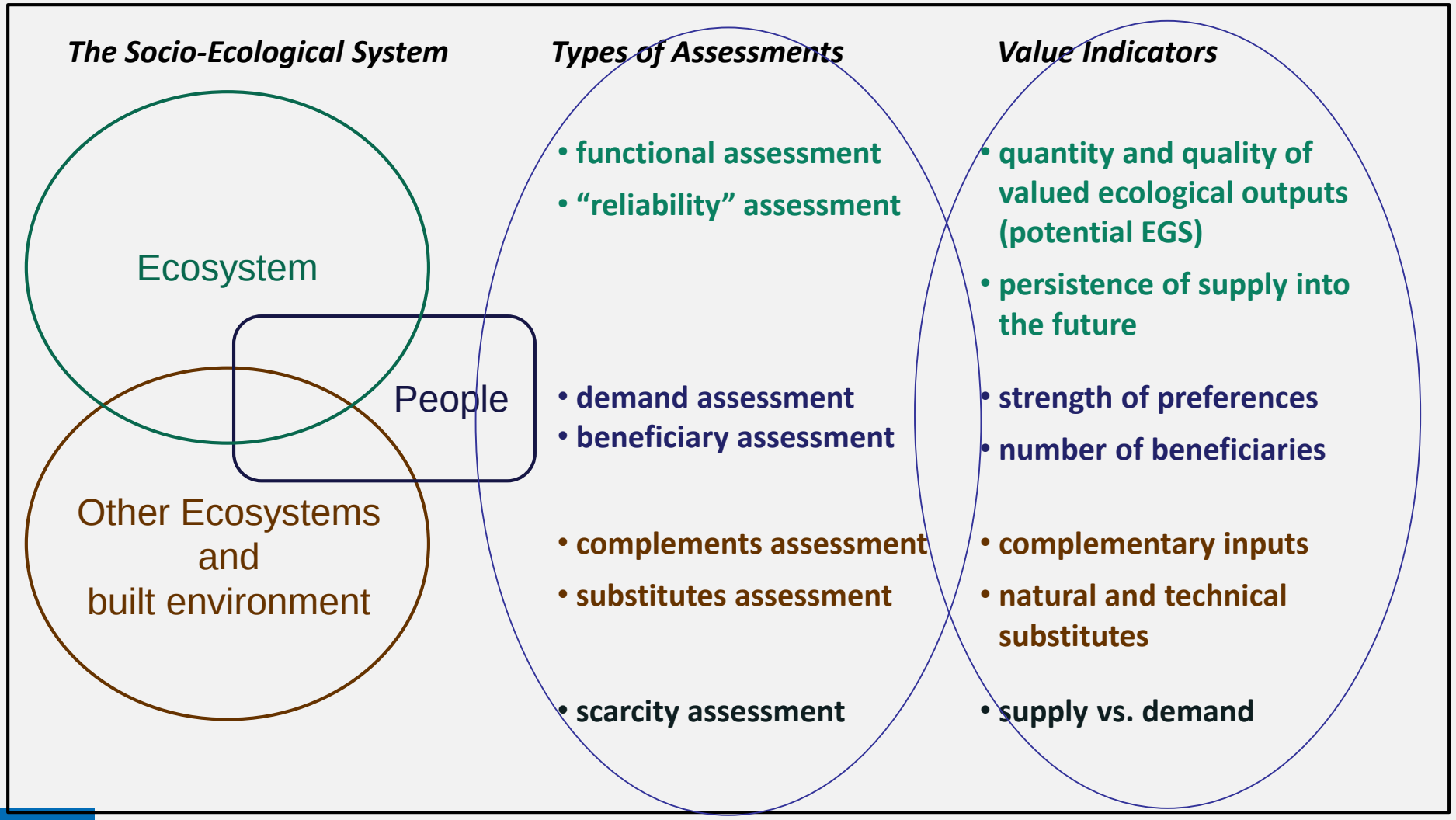
Value indicator framework



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What determines a good set of indicators?

- understandable
- provide essential information about the system
- policy relevant
- feasible to measure
- simple but not too simple
- scale-appropriate
- **based on valid models and assumptions**

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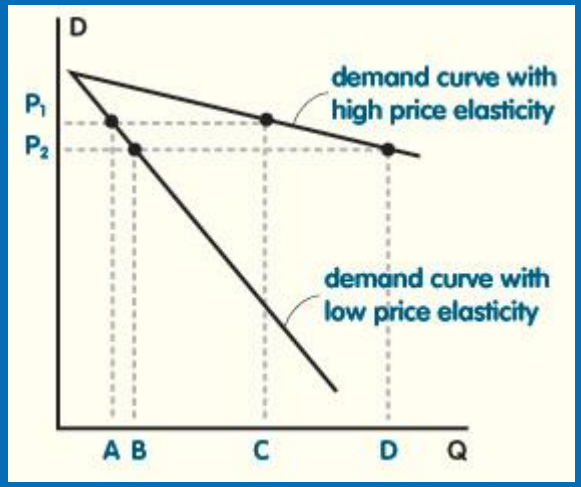
What does economic theory say that is relevant to value indicators?



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Value indicator theory

The Socio-Ecological System

Ecosystem
E = stock of natural capital
A = ecosystem attributes

People
G = human interventions and impacts
k = beneficiarie

Other Ecosystems and built environment
X = complementary inputs
S = substitutes

Types of Assessments

FUNCTIONAL ASSESSMENT:

supply of ecological outputs

ecological production function:

$q = q[\mathbf{E}, \mathbf{A}(\mathbf{G})]$

Value Indicators

sufficient quantity

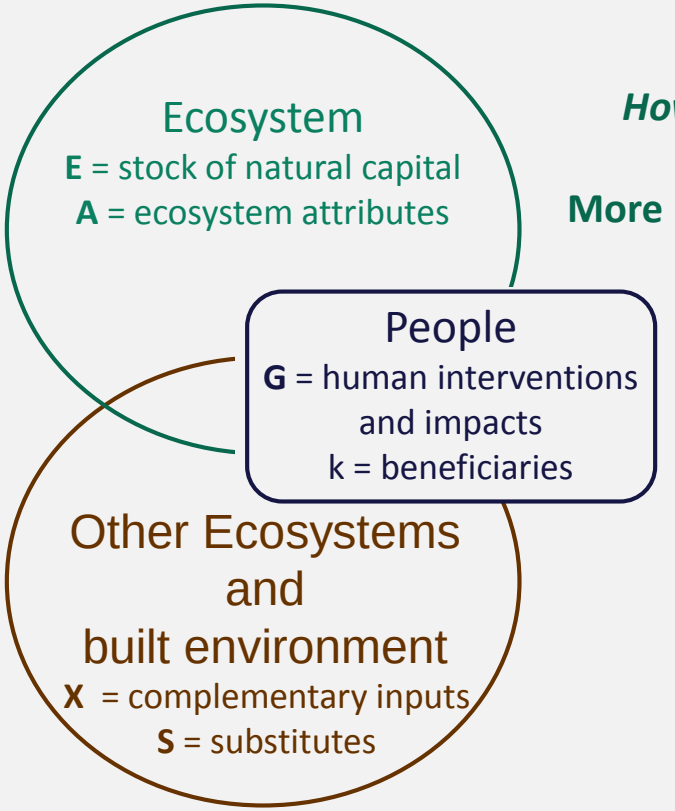
$q \geq q^*$

sufficient quality

$b \geq b^*$

Value indicator theory

The Socio-Ecological System



Types of Assessments

RELIABILITY ASSESSMENT:

How sure are we that benefits will continue?

More reliable --> Greater expected value

Value Indicators

Probability that ecological outputs will persist

$P_t(q_t)=f(\cdot)$

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Value indicator theory

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Types of Assessments

DEMAND ASSESSMENT:

demand for ecological outputs as inputs to valued experiences

household production function:

$z = z(c\mathbf{X}, b\mathbf{Q})$

Value Indicators

demand exists

D(Q) > 0


Photo: newstimes.com


Photo: nhdfl.org

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Types of Assessments

PREFERENCE ASSESSMENT:

utility function and elasticity of demand

utility from EGS

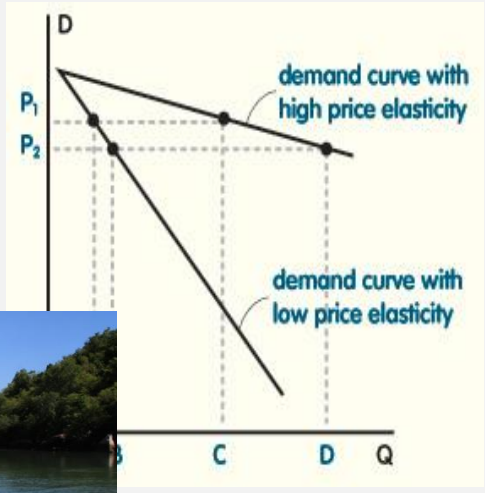
u = u(bQ, z(cX, bQ))

Higher utility --> Greater value

Less elastic --> Greater change in value for a given change in Q

Value Indicators

strength of preference and elasticity of demand



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Types of Assessments

BENEFICIARIES ASSESSMENT:

"extent of the market"

How many people value the EGS?

More beneficiaries --> Greater total value

Value Indicators

Sum of demand over number of beneficiaries

$\sum_k D(Q)$

will determine total demand


Photo: newstimes.com


Photo: nhdfl.org

Value indicator theory

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Types of Assessments

COMPLEMENTS ASSESSMENT:

complementary inputs – capital and labor

$z = z(c\mathbf{X}, b\mathbf{Q})$

Value is not received without all necessary inputs

Value Indicators

sufficient quantity

$x \geq x^*$

sufficient quality

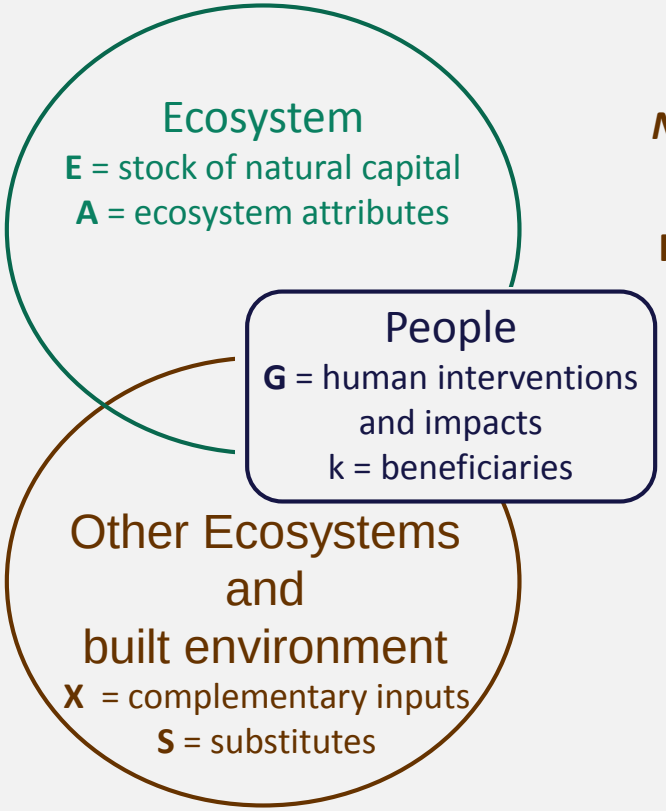
$c \geq c^*$


Photo: kayakspots.com


Photo: outboardmotoroilblog.com

Value indicator theory

The Socio-Ecological System



Types of Assessments

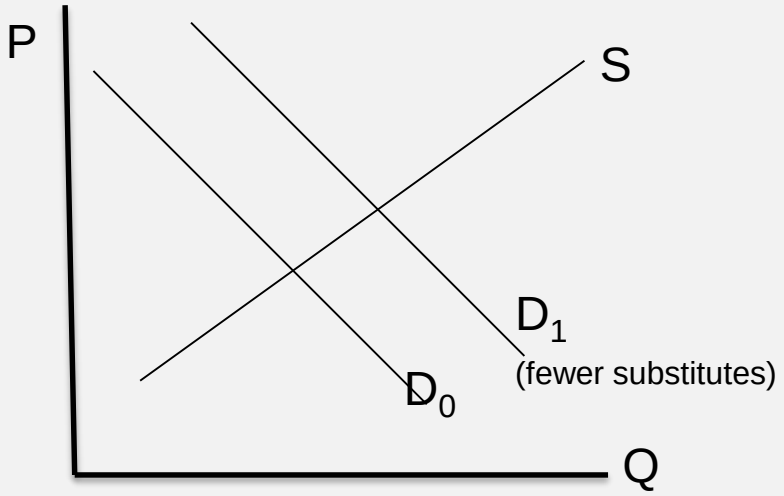
SUBSTITUTES ASSESSMENT:

Number and quality of natural and technological substitutes

Fewer substitutes or lower quality substitutes --> Greater value

Value Indicators

number and quality of natural and technological substitutes



Value indicator theory

SCARCITY ASSESSMENT:
(supply relative to demand)

Does demand exceed supply?
By how much?

Ecosystem
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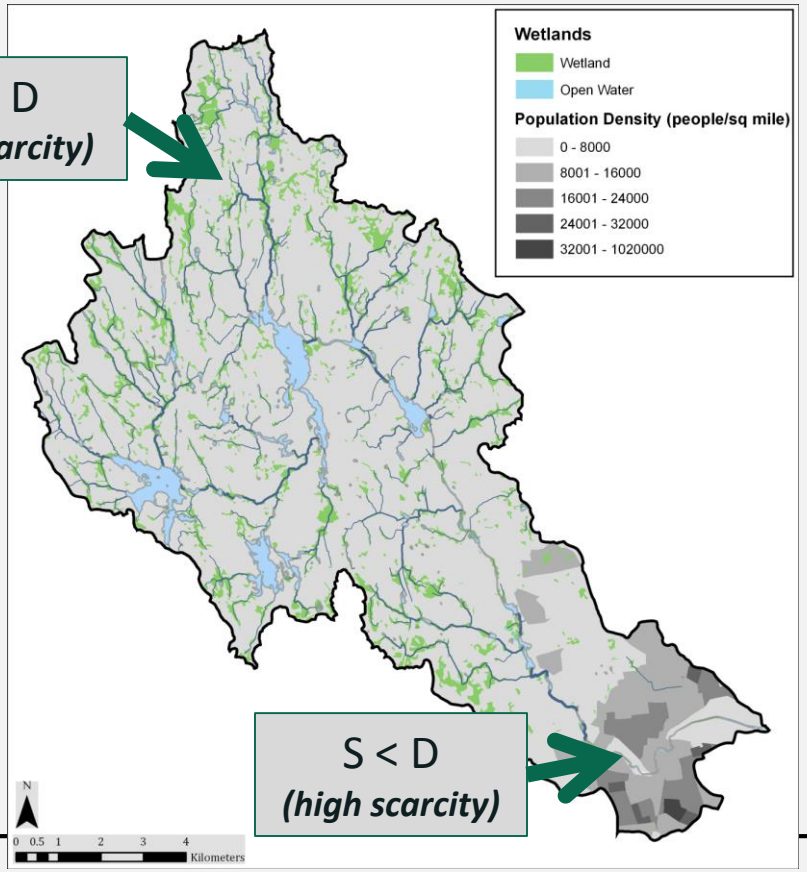
S ≈ D
(low scarcity)



S < D
(high scarcity)

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Summary

- Dollar values not always best
- A place for robust value indicators
- Consider how to develop indicators

Thank You!

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