



Assessing Restoration Using Ecosystem Service Benefit Indicators

An approach for decision makers

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Challenges

Environmental decisions require tradeoffs

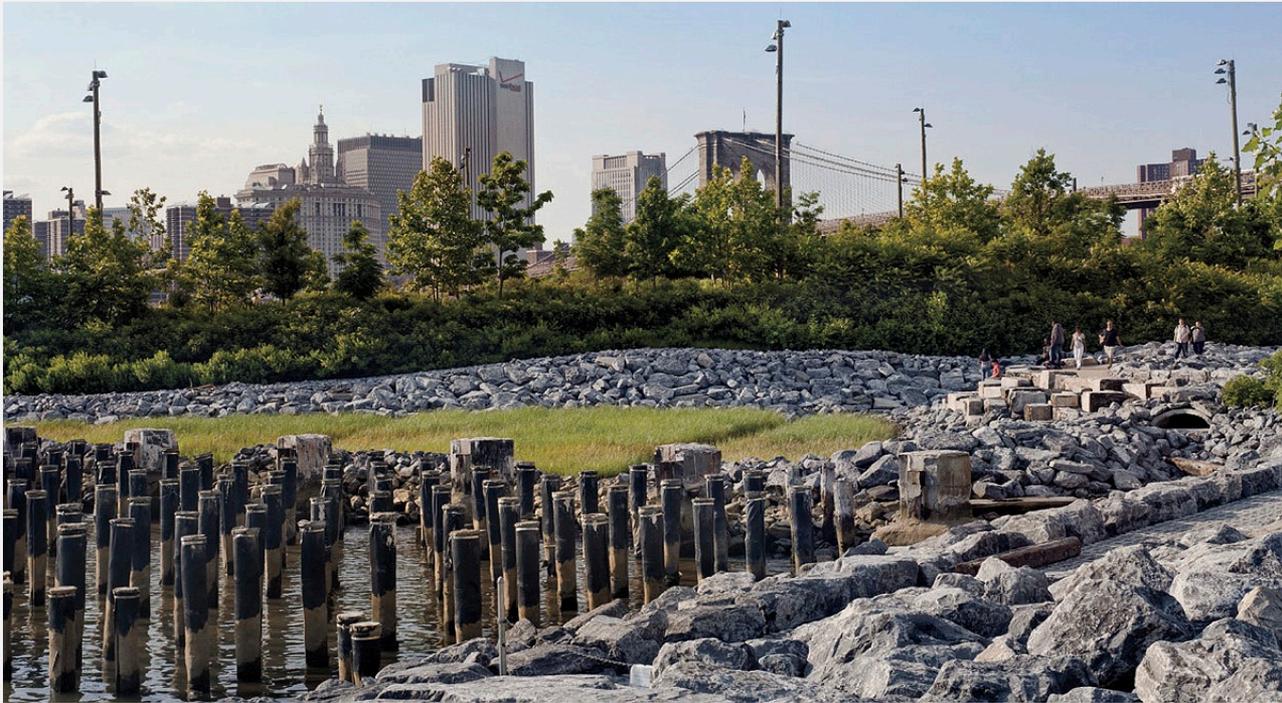


Which of these sites should we spend money on?

Both ecological and social criteria are important.

Challenges

- Scarce funding for smaller, more urban sites
- Lack of easily-applied methods to include benefits



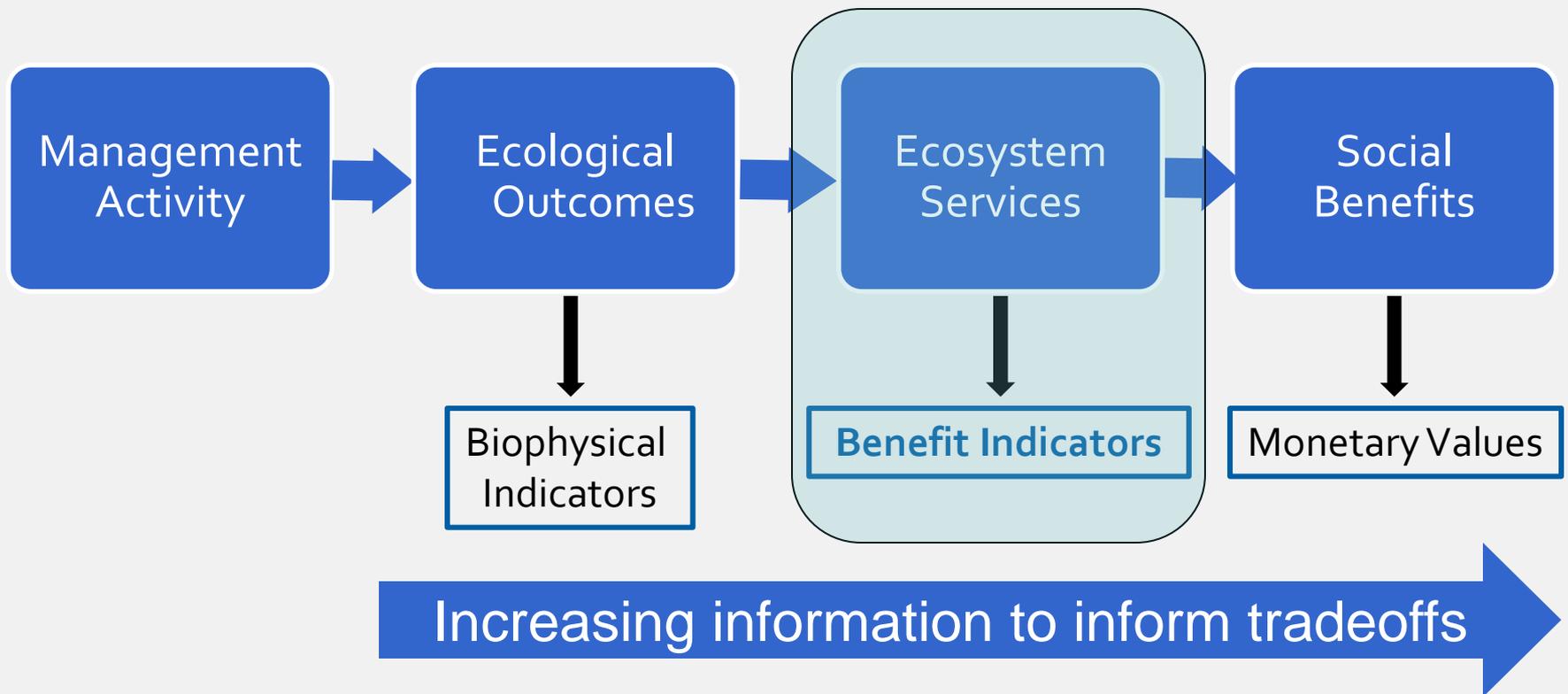
A rapid assessment approach using benefit indicators

Assessing The Benefits of Restoration:
A Step-By-Step Guide for Decision Makers



- Based on sound natural and social science
- User-friendly
- Explicitly includes benefits to people using indicators

Assessing Ecosystem Services



Indicator Example: Property Protection Service



Ecological Outcome
(Biophysical Indicator):
Change in wave height
at bridge

Simple benefit Indicator:
Reduced days of bridge
closure (20 days / yr)

Benefit Indicator:
Commuting time saved
(4,000 person-hours)

Monetary Value:
\$Value of time saved

What are Benefit Indicators ?

Benefit indicators simplify complexity to inform decisions and actions.

They are based on economic models and empirical evidence of factors that affect value, i.e. **scarcity metrics**.



Benefit Indicators answer these questions:



1. Can people benefit from an ecosystem service?
2. How many people benefit?
3. How much are people likely to benefit?
4. How reliably will services be provided over time?

1. Can people benefit from an ecosystem service?

Yes, if:

Demand exists



If required, complementary inputs are available



There is sufficient quantity and quality of the service



Example: Flood risk reduction from wetlands

Demand: Are there buildings in the downstream flood zone?



Sufficient Quality:

- ✓ Can wetlands retain or slow flood water?
- ✓ Is water available for retention?

Complementary Inputs are not needed

2. How many people benefit?

How many people are within the relevant benefits area?



Photo: https://parksandrecreation.idaho.gov/sites/default/files/uploads/EAG_aerial.jpg

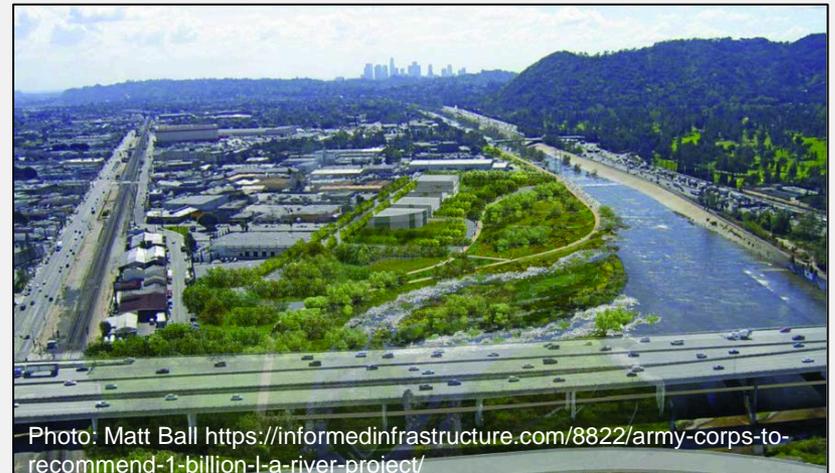
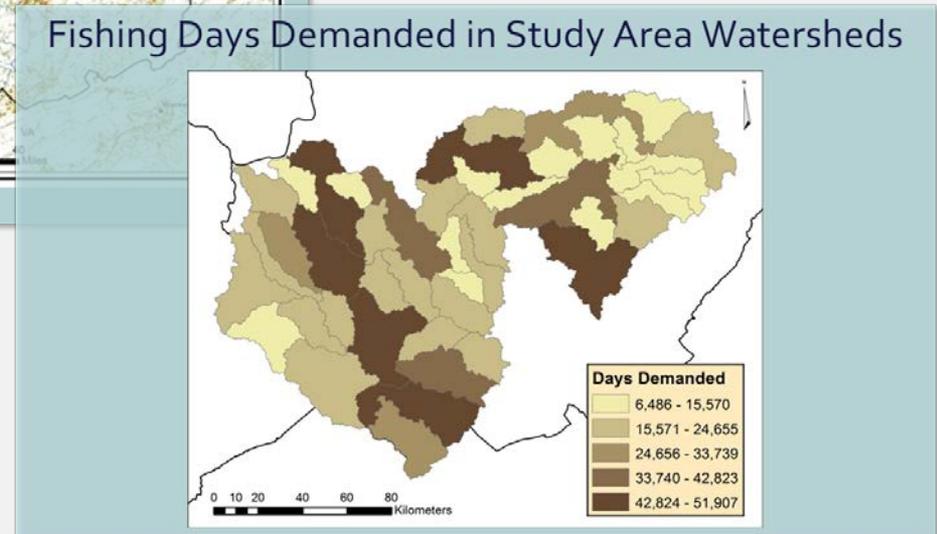
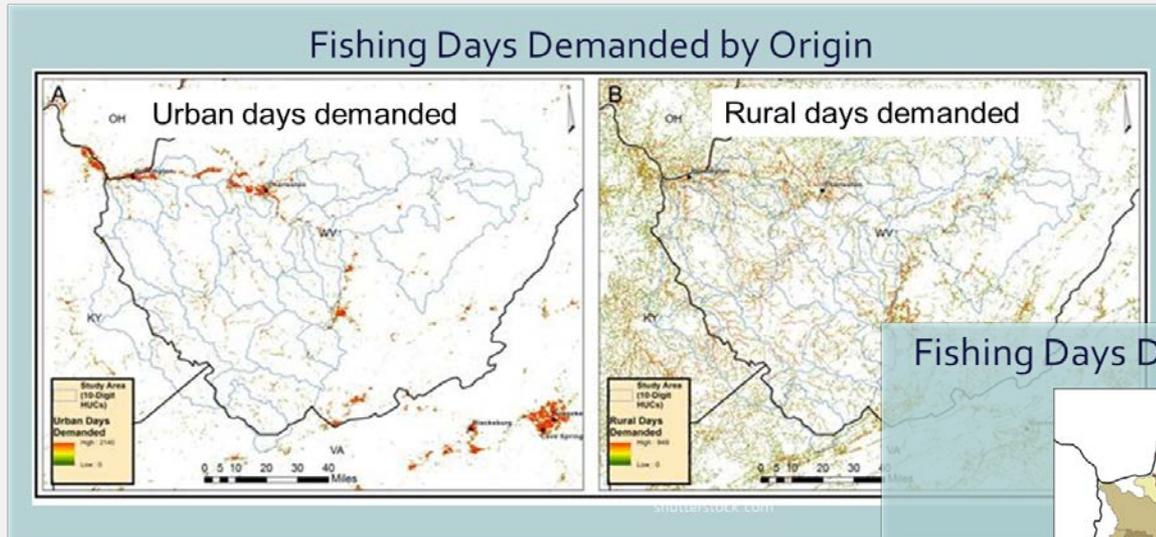


Photo: Matt Ball <https://informedinfrastructure.com/8822/army-corps-to-recommend-1-billion-l-a-river-project/>

Number of people who benefit is often a stronger determinant of aggregate social value than value per person (Bateman et al., 2008)

Example: Modeling recreational fishing demand to estimate number of beneficiaries



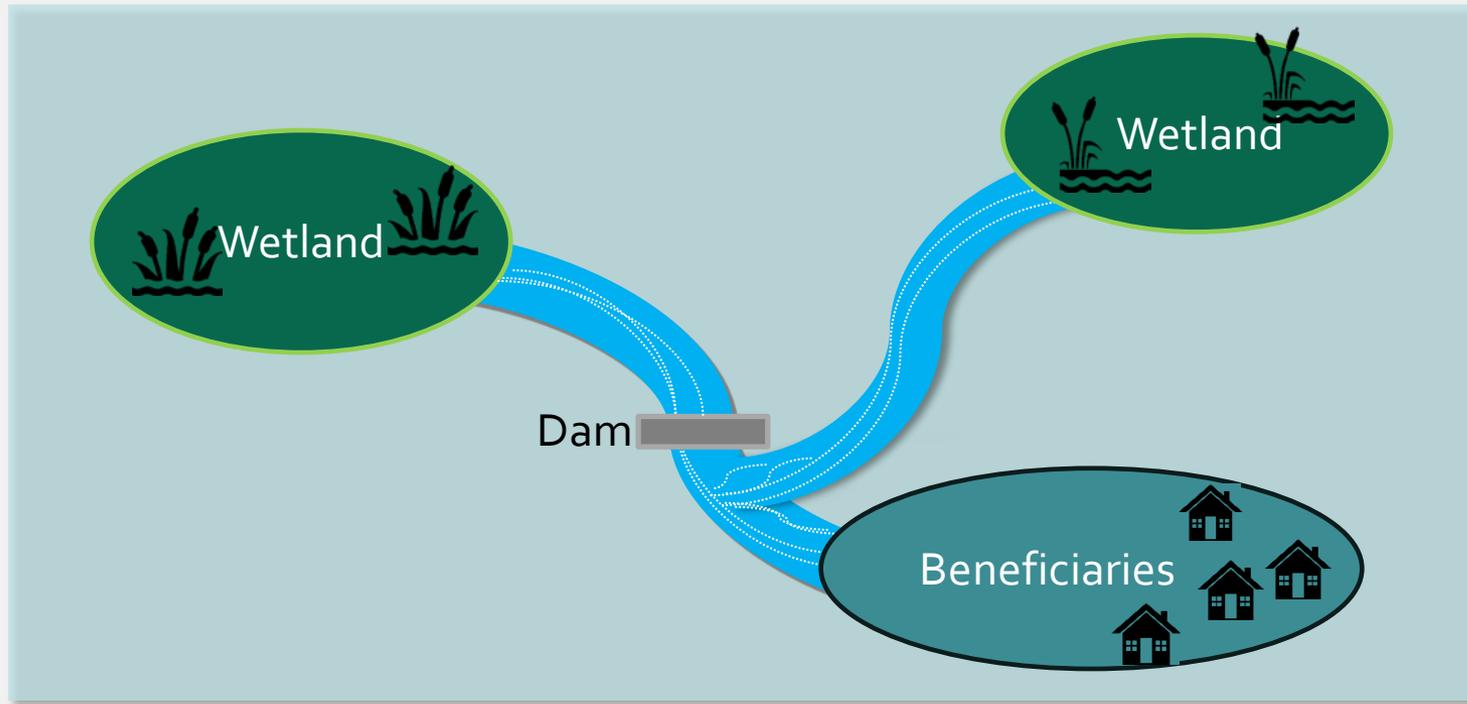
We used national survey data, combined with local information, to estimate participation by watershed.

3. By how much do people benefit?

Substitutes:

How many natural and technological substitutes are there?

Fewer substitutes or lower quality substitutes → Greater value

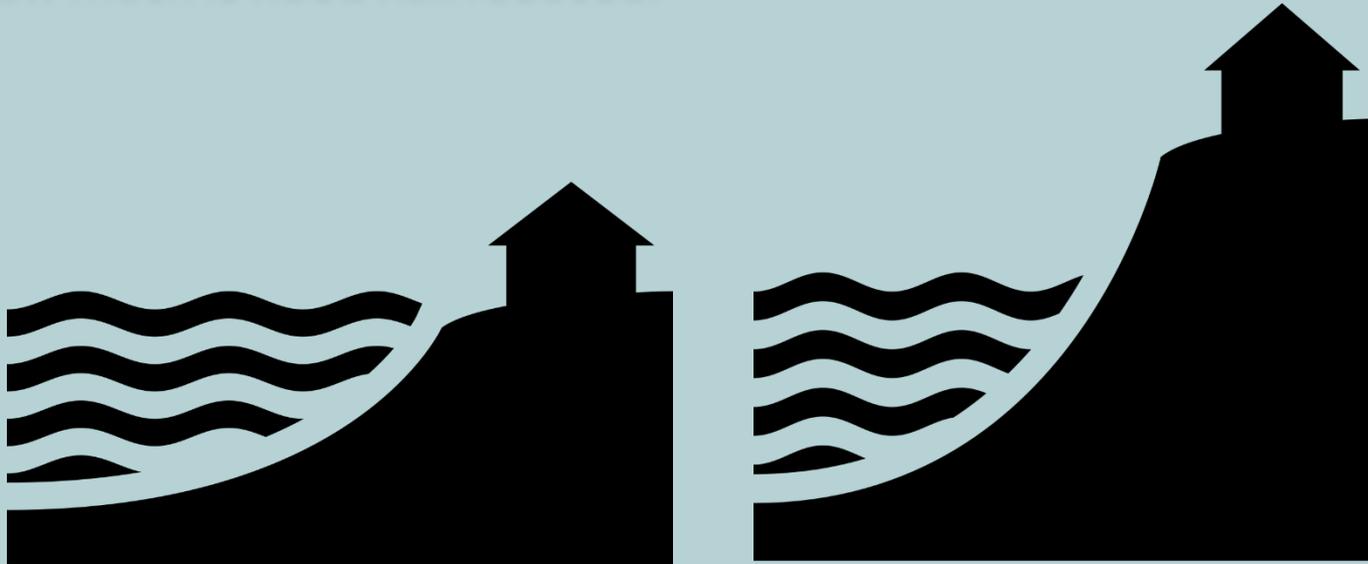


3. By how much do people benefit?

Quality:

Higher quality service → Greater value

How much is flood risk reduced?



3. By how much do people benefit?

Strength of Preferences:

Includes factors such as avidity, willingness/ability to adapt



not so avid angler



avid angler

4. Temporal reliability

Reliability:

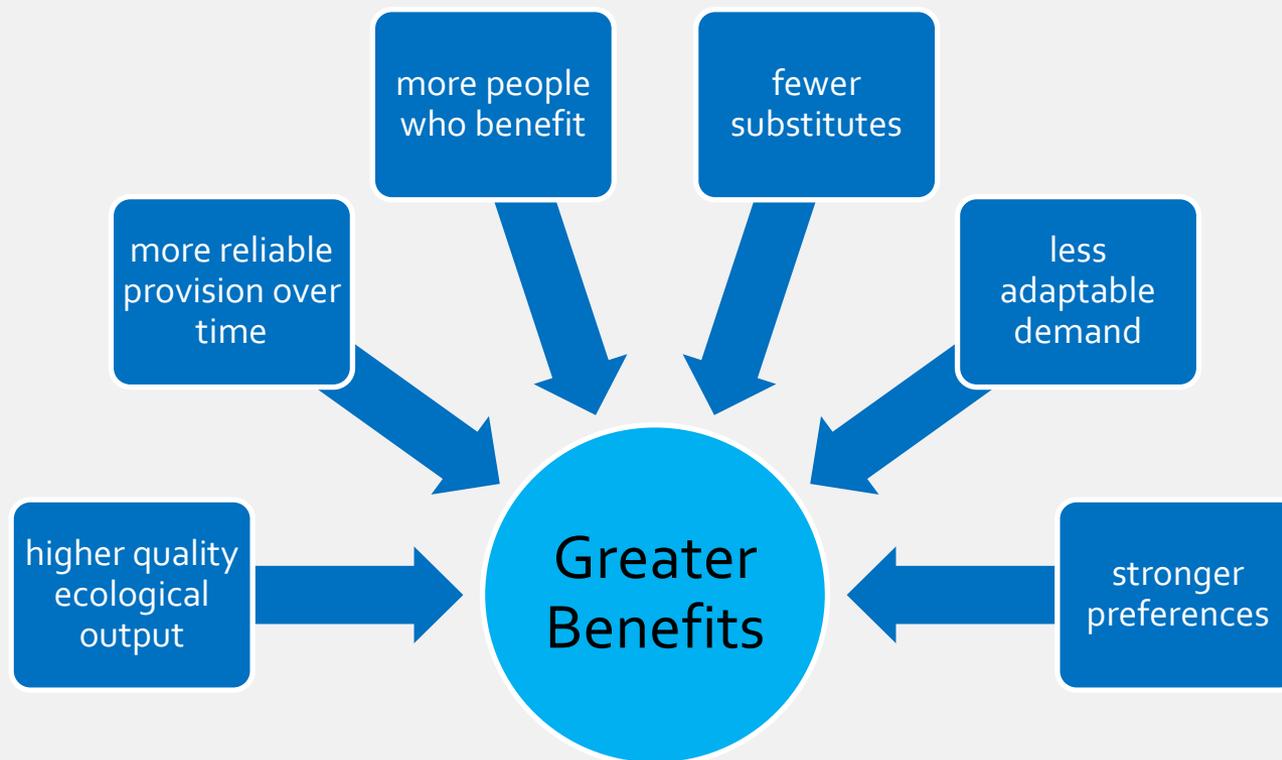
How sure are we that benefits will continue?

More reliable → Greater value



Source: NOAA.gov

Putting it all together – a set of benefit indicators



Thank You!



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