Final Ecosystem Goods and Services: An ESRP Approach

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= Endpoints, Boyd Endpoints, Valued Attributes
With

• Jim Boyd, Resources for the Future
• Dixon Landers, Matt Weber, Amanda Nahlik, Tony Olsen, US EPA, Office of Research and Development
• Attendees at Two Workshops
Why

• Biophysical units best suited for analyses of social well being
  – Well understood meaning for people
  – Avoid double counting
    • Requirement for bundling/stacking, benefits analysis
  – Ensure complete counting

• Communication
What would we do with them?

- Include in monitoring programs
- Model output
- Maps
- Benefits analysis
- Stacking and Bundling
Definition

- **Final ecosystem goods and services** are biophysical features, quantities or qualities that require little further translation to make clear their relevance to human well-being.

See --
—. In Preparation. A Framework for Identifying Indicators of Ecosystem Contributions to Human Well Being: A Case Study with Streams.
Requirement

• If we really want to know what is relevant to people
  – Ask them
    • Work with social scientists
Ecosystems to Benefits
Step 1

\[ m_1, m_2, \ldots, m_n \]
Ecosystems to Benefits
Step 2

\[ I_b = f_b(m_1, m_2, \ldots, m_n) \]
Ecosystems to Benefits
Step 3

- Ecosystem Goods and Services
- Metrics of Final Services
- Indicators of Final Services
- Benefits to People
- Other Goods and Services
- Beneficiaries
- Beneficiary Values
Two Workshops Three Ecosystems

• Identify users/beneficiaries of ecosystems
  – e.g. irrigators, trappers, drinking water source, barge operators, recreational anglers, non-use
  – Streams, Estuaries, Wetlands

• Identify metrics of final services for each

• Results are a working hypothesis.
# Form of Results

<table>
<thead>
<tr>
<th>Beneficiary Classes and Subclasses</th>
<th>Ecosystem Attributes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Amount of Water</td>
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<td>...</td>
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<td></td>
<td>Vertebrates</td>
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<td></td>
<td>Visual Appearance</td>
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<td>Crop Irrigation</td>
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<td>Recreational Angling</td>
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<td>...</td>
<td></td>
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<tr>
<td>Non-Use</td>
<td>X</td>
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</tbody>
</table>
Metrics for Estuaries

http://www.epa.gov/nheerl/arm/streameco/index.html
A Practical Principle

Final Ecosystem Goods and Services are Ecosystem Attributes Not Human Ones
Principle

• Fish in the Water vs. Fish Landings
• Native or Naturalized Fish vs Stocked Fish*
• Drinking Water Intake vs Water at My Tap
• Site Condition Index vs Wood Fiber
• Ecosystem Condition vs Happiness
• Soil Condition vs Corn Harvest
Why is this important?

• Conceptual Consistency
• Accounting and tracking
  – Ecosystem status or human activity
• Communication and Interpretation
Is corn production an ecosystem feature?

You can get more and more harvest (Because of human and technological inputs) even though nature is in decline.

So if we rely on “harvests” as a signal of natural conditions, that can be misleading.
Getting these units right is key to:

1. Connecting ecosystems to human well-being
   • Connecting social and natural sciences
2. Informing trade-off decisions
3. Supporting decisions on sustainability
4. Managing nature’s wealth