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# Session D3: Net Ecosystem Services Analysis as a Floodplain Restoration and Management Tool

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## NET ECOSYSTEM SERVICES ANALYSIS AS A FLOODPLAIN RESTORATION AND MANAGEMENT TOOL

#### **FISH PASSAGE 2015 JUNE 22 – 24** GREG REUB - ECOLOGIST, OLYMPIA, WA. USA GRETCHEN GREENE - ECONOMIST, VANCOUVER, WA. USA STEVE MATHIES – ECOLOGIST – NEW ORLEANS, LA. USA





### PRESENTATION FOCUS NET ECOSYSTEM SERVICES ANALYSIS (NESA)

Overview of Floodplain Ecosystem Services and NESA Framework

#### **Example Results**

#### Summary and Conclusions









## WATERSHED/FLOODPLAIN ECOSYSTEM SERVICES



Millennium Ecosystem Assessment Ecosystems and Human Well Being (2005)

- Common Metrics, or Currencies –Money
  - –Number of fish
  - -Acres of suitable habitat
  - -Water quantity
  - -Water quality
  - -Carbon tons
  - -Recreation visitor days
  - -Health and well-being
  - -Jobs Created

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### FRAMEWORK: NESA APPROACH

- "Goal" is to incorporate future values related to ecosystem service <u>for management</u> <u>decisions</u>
- Key is to convert ecosystem attributes into a currency (common metric) so they can be quantified, valued, compared, traded or sold
- Estimates (debit) and ecological lift (credit)
- Comprehensive, interdisciplinary approach
- Allows for easy revision of analysis for scenario development and decision support
- Transparent for stakeholder input and scientifically defensible





### FRAMEWORK: NET ECOSYSTEM SERVICES FRAMEWORK A PROCESS-DRIVEN APPROACH





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### **NONMONETARY - ECOSYSTEM SERVICES** COASTAL FLOODPLAIN - CLIMATE CHANGE

Serivce Acres

- NESA (Net Ecosystem Services Analysis)
  - Calculate net benefits/declines in services from the environment to humans
- HEA (Habitat Equivalency Analysis) applied to results from hydrology model to evaluate changes in ecosystem services by land cover type
- HEA converts estimates into Service Acre Years (SAYs) – ecosystem services provided by one acre of land cover/habitat for one year
- These results can be discounted or turned into net gain or loss

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Land Cover Type

Change in Service Acres from 2010 to 2100
Baseline NBA CAA

### **NONMONETARY - ECOSYSTEM SERVICES** COASTAL FLOODPLAIN - CLIMATE CHANGE



### **MONETARY ANALYSIS EXAMPLES** COASTAL FLOODPLAIN – CLIMATE CHANGE



Net Present Value of Costs and Benefits of CAA and NBA Scenarios from 2014 to 2100

Net Present Value of Net Benefits of CAA and NBA Scenarios from 2014 to 2100



### PRESENTATION FOCUS NET ECOSYSTEM SERVICES ANALYSIS (NESA)

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### Conclusions - NESA Framework

- The NESA framework is an ecosystem services management tool
- Integrates chemical, physical, biological, and social ecosystem services
- Quantifies ecosystem service loss and gains not just monetary value
- Provides for analysis of alternatives
- Transparent process that satisfies regulatory requirements through sound science
- Forms hypotheses about monitoring and adaptive management outcomes
- Stakeholder interests are included up front.



### CONTACT

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