Targeting Investments in Resource Conservation with RIOS (Resource Investment Optimization System)

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Watersheds as Green Infrastructure

How should $10 M be spent?

What activities?

Where?
The Promise of Water Funds

Major opportunity to affect

- Land Management
- Freshwater Systems

Major opportunity to engage diverse stakeholders as partners with the potential to benefit
Waterfunds status
April 2012

- Mature and strengthened Water Funds
- Water funds created and operating
- Water funds in design
- Evaluate potential to Establish a Water Fund
The Problem for Water Funds

Need to make good investments!
Can we do a better job of targeting investments in watershed services by using a science-based approach with biophysical and social data?
Can We Do Better? YES!

Deep Dive Sites

30% to 600% better estimated returns than business as usual
Can We Scale Up?

Deep Dive Sites

Continental Alignment

Bogotá Water Fund

[Map indicating various locations across Latin America with text annotations and logos for Latin American Water Funds Partnership, The Nature Conservancy, FEMSA, and IDB.]
Science-based approaches

• Use biophysical data with models to target where services are highest

• Scenario analyses of vulnerability or sensitivity to interventions

• Specific to context and available data
Resource Investment Optimization System

• An approach **general** enough to work everywhere in Latin America

• Easy with **available** data

• Give **standard outputs**
RIOS Structure

OUTPUTS

PORTFOLIO BUILDER
- Erosion Control (Hydro, Drinking Water)
- Nitrogen Regulation
- Phosphorus Regulation
- Groundwater Recharge
  - Flood Mitigation
  - Dry Season Baseflow
    - Biodiversity
    - “Other”

PORTFOLIO TRANSLATOR

BENEFITS ESTIMATOR
- Erosion Control
- Nitrogen Regulation
- Phosphorus Regulation
- Flood Mitigation

25% ↑ Erosion Control
32% ↑ N Regulation

Better than Business as Usual
OUTPUT I
INVESTMENT PORTFOLIO
**Land Use Changes**
- Which land use transitions do you want to cause?
- Will some be more effective than others?
- Will some factors be more important than others in determining the impact of each transition?

**Activities**
- Which activities can be used for each land use transition? Do you prefer some over others?
- Where can each activity be done?
- How much does each activity cost?

**Diagnostic Screening**

**Priority Area Selection**

**Budget**
- What is the budget?
- How do you want to spend it?

**Activities**
- How much does each activity cost?

**Investment Portfolio**
OUTPUT II
SCENARIOS OF IMPLEMENTATION
Portfolio Translator Scenarios

Base

+ Activities

No Protection
OUTPUT III
ESTIMATE SERVICE RETURNS
<table>
<thead>
<tr>
<th>LULC base</th>
<th>Exp</th>
<th>Ret</th>
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<tbody>
<tr>
<td>Pasture</td>
<td>0.8</td>
<td>0.3</td>
<td>0.95</td>
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<tr>
<td>Forest</td>
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<td>0.9</td>
<td>0.97</td>
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<td>Grassland</td>
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Biophysical information

InVEST
integrated valuation of environmental services and tradeoffs
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**Biophysical information**

- + 0.1%
- - 15%
Case study: Cauca Valley, Colombia

- Created in 2009
- Goals: Reduce sediment, maintain base flow
- 9 Watersheds near Cali, Colombia
- Investments to date: US $500,000
- Partners: Sugarcane growers, Watershed associations, The Nature Conservancy
Case study: Cauca Valley, Colombia

Activity scores
Where do stakeholders prefer activities to be allowed or prevented?

Activity:
- Fencing
- Protection
- Native revegetation
- Tree planting
- Silvopastoral systems
Investment Portfolio

- Protection
- Reforestation
- Silvopasture
- Fencing
- Enrichment
- Streams
Case study: Cauca Valley, Colombia

Activity scores + Water fund budget = Total watershed change: -3400 tons/year = ~ 8% improvement

Recommended restoration activities

Potential improvement in erosion

Total watershed change: -3400 tons/year = ~ 8% improvement
Case study: Cauca Valley, Colombia

Return on Investment

Tulua

Guabas

Total budget (US$ millions)

Total budget (US$ millions)
Acknowledgments

Core Team:
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Advisory Group

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