From Headwaters to Downtown

Informing Conservation and Restoration Priorities with Spatial Analytics and Ecosystem Service Valuation

Zachary Christin
Project Director
ACES Conference - December 7, 2016
About the Natural Capital Resource Assessment

- Bringing together stakeholders and datasets
- Prioritizing restoration
- Evaluation restoration plans
South Platte River Watershed
Ecosystem Service Framework
Process: Green Infrastructure Mapping

- Mapping
- Prioritization
- Evaluation
Mapping Green Infrastructure

GI Mapping Process – ArcGIS Methods

Green Infrastructure = Parks & Open Space + Wetlands + Rivers + Lakes & Reservoirs + Contiguous Area + Forest Treatments + Trails – Urban Wildfire – Human Modification
Mapping Green Infrastructure
Mapping Green Infrastructure
Mapping Green Infrastructure

Ecosystem Services

- Wetlands
- Rivers
- Lakes & Reservoirs
- Parks & Open Space
- Elevation
- Recreation Density
- Habitat for Imperiled Species
- Contiguous Area
- Urban Forest

- Riparian
- Agriculture
- Forest Treatment Area
- Trails
- Urban
- Wildfire
- Human Modification

Natural Capital Resource Assessment
South Platte River Watershed
Mapping Green Infrastructure

Green Infrastructure Raw Values
- High (34)
- Low (-4)
Mapping Green Infrastructure
Process: Economic Evaluation

- Mapping
- Evaluation
- Prioritization
Economics Evaluation

Baseline GIS Data

GIS Output

<table>
<thead>
<tr>
<th>Land Cover</th>
<th>Attributes</th>
<th>Acreage</th>
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# Economics Evaluation

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Economics Evaluation

- Historic Wildfire
- Human Modification

Modify Baseline Value

- Invasive Species Control
- Carbon Sequestration
- Storm Water Runoff
- Soil Erosion Control
- Water Quality
- Habitat

Aesthetic Information
- Recreation and Tourism
- Water Supply
- Air Quality
Economics Evaluation

Historic Wildfire - Carbon Sequestration

![Graph showing carbon sequestration over time for different tree species.](image)
Economics Evaluation

Historic Wildfire - Recreation

\[ y = 0.0002x^2 - 0.0135x + 0.0889 \]

\[ R^2 = 0.9906 \]
Economics Evaluation

Restoration Year vs. Function Restoration

- Vegetation Restoration
- Soil Restoration

Function Restoration (0-1) vs. Restoration Year

Restoration Year:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Function Restoration (0-1):
0 0.2 0.4 0.6 0.8 1.0 1.2

Natural Capital Resource Assessment
South Platte River Watershed
Process: Prioritization

Mapping

Evaluation

Prioritization
Prioritization

Upper Watershed

- Clean Water: CSFS Priority Drinking Water Areas
- Healthy Waterways – TMDL 303d listed streams
- Access to Nature – Trust for Public Lands (TPL) Children’s access to parks
Project Timeline

• January 2017
  - Finalize Prioritization

• January– Feb 2017
  - Economic Analysis & Prioritization
  - Incorporate stakeholder input & feedback

• Feb – May 2017
  - Draft Assessment Report & User Guide
  - Final Stakeholder Workshop

Thank you

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