Investing in natural infrastructure for drinking water: Reporting on lessons from Colorado and the USA
Presentation roadmap

- **Background**: defining watershed investments, explanation of projects

- **Findings**:
  - Forested source water protection across US
  - Colorado findings
  - Overall lessons

- **Conclusions**
Investments in Watershed Services

Agreements or transactions between two or more parties that compensate a land manager for restoring, maintaining or enhancing the natural infrastructure that maintains clean water supplies

(Bennett & Carroll, 2014)

Global IWS tracked in 2013:

- Total: 454
- Active: 345
- Pilot: 58
- Design: 51

Transaction value: $12.3 billion
Hectares managed: 365 million

Bennett & Carroll, 2014
Investments in Watershed Services (IWS)

Upstream Population (Suppliers)

Management practices

Water Users/Beneficiaries (Investors)

Maintenance or improvement in water quality/quantity

Payment/Incentive

Program Administrator

Water supply

Impacts to water quality/quantity

Figure Source: Forest Trends
As of 2014:
- 48 active programs
- 12 pilot or design programs

**Program Status and Scale**
- Program In Design
- Demonstration/Pilot Program
- Active Program
- Regional Program
- Statewide Program

**Program Count**
- 1 - 3
- 4 - 6
- 7 - 11
- 12 - 14

Author: Katherine Sever
Colorado State University
Projection: North America Albers Equal Area Conic
Date: 04/20/2015
The need for new approaches & research

- In response to complex water resource issues, new partnerships and programs have emerged, such as IWS.

- Research studying programs:
  - What works, what mechanisms are being used?
  - Colorado: most watershed protection partnerships in the western US.
Research Projects

- Dissertation research:
  "Investments in watershed services: Understanding a new arena of environmental governance in the western US"

- World Resources Institute:
  "Analysis & support tools for investment-based forested source water protection programs"

- Colorado case studies

- US case studies

WRI Report:
Investing In Natural Infrastructure for Drinking Water: Lessons from 13 Watershed Investment Programs in the US

Authors: Suzanne Ozment, Heidi Huber-Stearns, Todd Gartner, and Nathaniel Lichten
I. Forested Source Water Protection

47 identified source water protection IWS programs:

- 35 programs in forested watersheds

- Main drivers:
  - Catastrophic ecological events
  - Consequences of land use change
Forested Source Water Protection in the US

Forested Drinking Water Programs by Region

- Arid West/SW: 37%
- Pacific Northwest: 28%
- East: 26%
- Midwest: 6%
- Multiple: 3%

Pine Tree Source Water Protection in the US

- Arid West/SW: 37%
- Pacific Northwest: 28%
- East: 26%
- Midwest: 6%
- Multiple: 3%

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Forested Source Water Protection Challenges

- Lack of buyers/investors (40%)
- Lack of policy/decision-maker support
- Perceived lack of direct benefit
- Regulatory uncertainty
- Lack of suppliers
- Raising initial capital
- Lack of scientific data on outcomes

The chart indicates the percentage of challenges faced in protecting forested source water sources.
II. Western US: Forested Source Water Protection

Program Totals:
- 19 active
- 4 pilot
- 1 design
Western US: Source Water Protection Types

1. Watershed restoration, risk reduction
2. Watershed protection
3. Water flow restoration
Source Water Protection Types:
1. Watershed Restoration, Risk Reduction

- **Main Drivers:** wildfires and subsequent flooding
- **Management actions:** forested watershed treatments
- **Land type:** mainly public, some private
Source Water Protection Types: 2. Watershed Protection

- **Main driver**: mix of land development, recreational usage, forest health protection

- **Management actions**: land acquisition, patrols, easements

- **Land type**: municipality, public, private
Source Water Protection Types: 3. Water Flow Restoration

- **Main Drivers:** competing water uses, changes in climate affecting available water supplies

- **Management actions:** purchasing water leases and rights to improve water flow (quality and quantity)

- **Land type:** mainly private landowner water rights

Kingdon, 2003
Watershed Wildfire Protection Partnerships (WPPs) in Colorado

Aurora Water-USFS

Colorado-Big Thompson

Pueblo Board of Water Works-USFS

Denver Water-USFS

Colorado Springs Utilities-USFS
Watershed Protection Partnerships

- Buffalo Creek Fire
- Hayman Fire
- Formation of the Front Range Fuels Treatment Partnership
- Pinchot: "Protecting Front Range Forest Watersheds from High-Severity Wildfires"
- Watershed Wildfire Protection Group: Watershed Prioritization
- Denver Water-US Forest Service Partnership
- Aurora Water-US Forest Service Partnership
- High Park Fire
- Waldo Canyon Fire
- Northern Water Conservancy District, US Forest Service, Bureau of Reclamation, and Colorado State Forest Service Partnership
- Pueblo Board of Water Works-US Forest Service Partnership
- Black Forest Fire
- Colorado Springs Utilities-US Forest Service Partnership
WPP formation

- Wildfires created window of opportunity to:
  - Generate political support
  - Form coalitions for collaborative learning
  - Craft responses (solutions)

- Key individuals within organizations were crucial to partnership formation
Innovation & adaptation

- The unpredictability of disasters leaves decision makers with challenges to which they do not have a pre-formed response.

- WPPs = recombination of existing ideas to forge novel solutions and partnerships.

- All of these changes show innovation and adaptation in managing natural resources.
III. Forested Source Water Protection Case Studies

World Resources Institute Report:
Investing In Natural Infrastructure for Drinking Water: Lessons from 13 Watershed Investment Programs in the US

-Ozment, Huber-Stearns, Gartner, and Lichten  (in review, to be released summer 2016)
Key lessons from watershed investment programs

- New or unlikely partnerships to address shared risks
- No blueprint
- Learning and adaptation
- Quantifying and measuring program performance can be key to program longevity
Key lessons from watershed investment programs: Report structure

Building Momentum

• Identifying a need and purpose for the program, and securing commitment from the necessary partners

Designing the Program

• Assessing the scientific and economic underpinnings of the program, and creating a strategy to achieve program goals

Implementing an Action Plan

• Putting action on the ground by investing in natural infrastructure and tracking results
Key lessons: Building momentum

1. Identifying risks and opportunities to rally support

2. Building partnerships to fill essential roles and responsibilities

3. Creating a shared vision of success

4. Cultivating champions and advocates
Key lessons: Designing the program

5. Developing a scientifically based plan to prioritize where and how to improve watershed management

6. Evaluating the business case for investment (return on investment)

7. Identifying funding and financing mechanisms
Key lessons: Implementing an action plan

8. Managing and administering a program

9. Engaging landowners to protect and restore natural infrastructure

10. Monitoring and evaluating program performance