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

April 8, 2016

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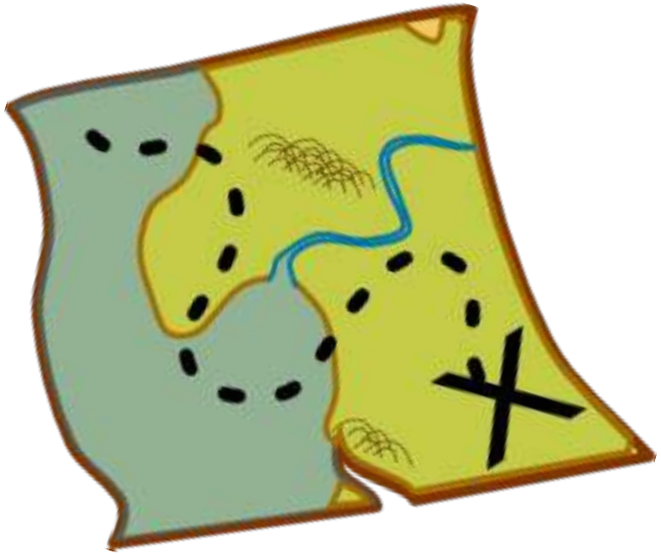
Presentation roadmap

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

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

- **Conclusions**

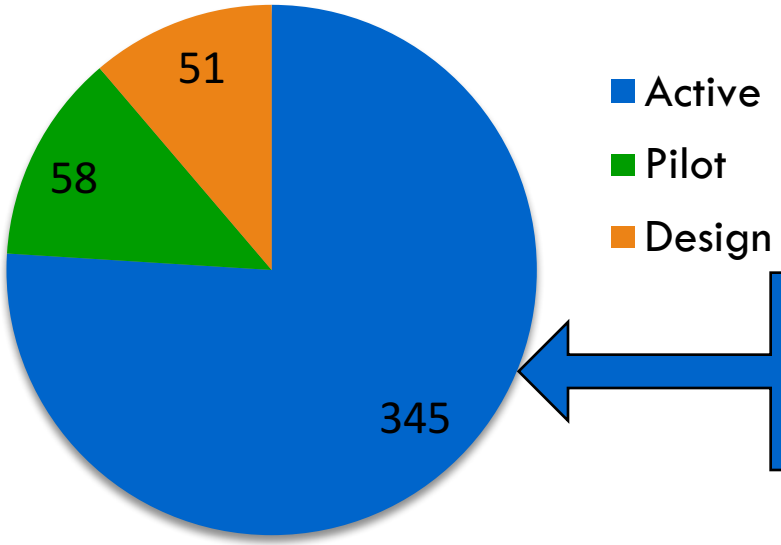


Investments in Watershed Services

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:



Transaction value: $12.3 billion

Hectares managed: 365 million

Total: 454

Bennett & Carroll, 2014

Investments in Watershed Services (IWS)

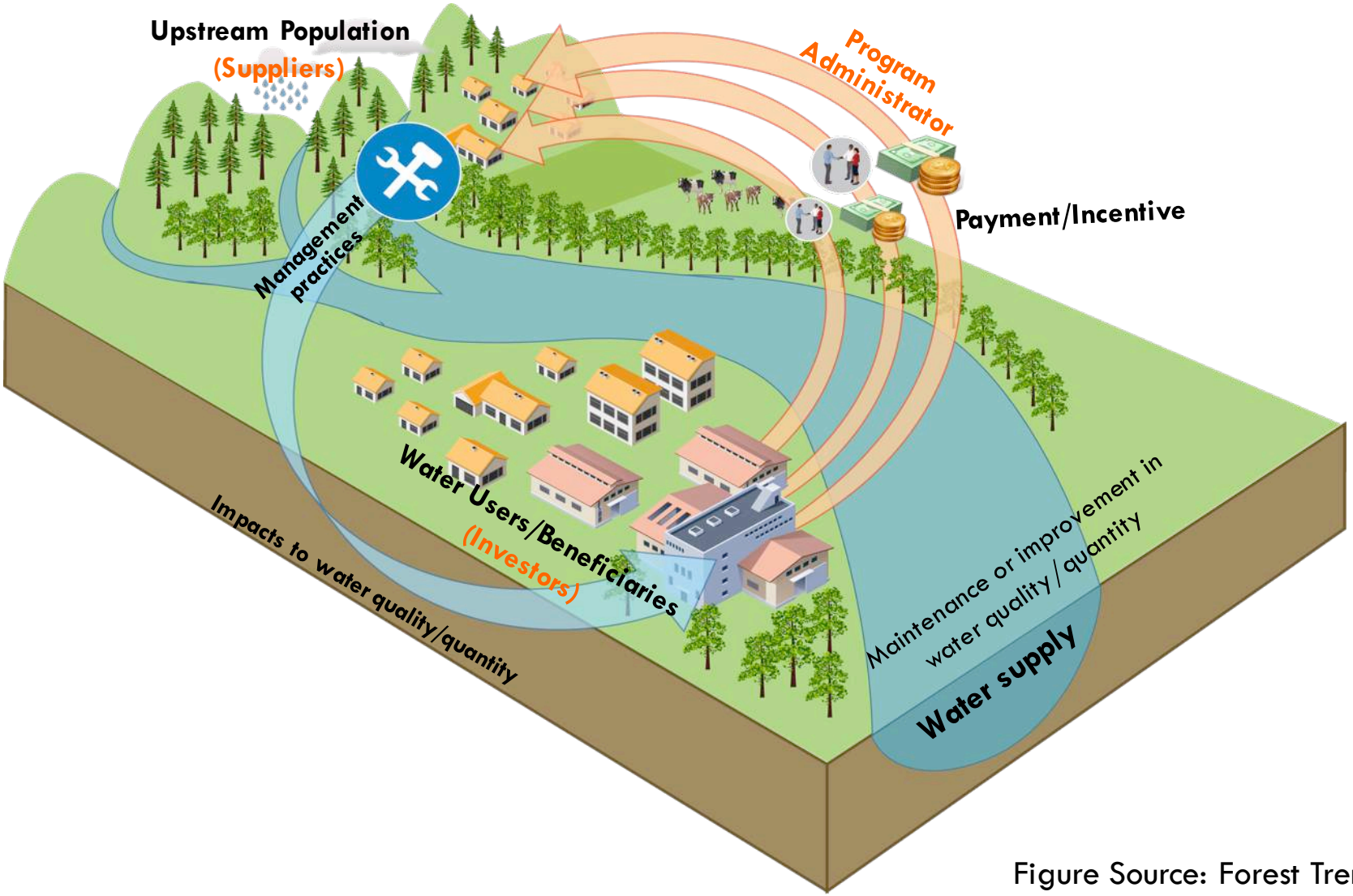
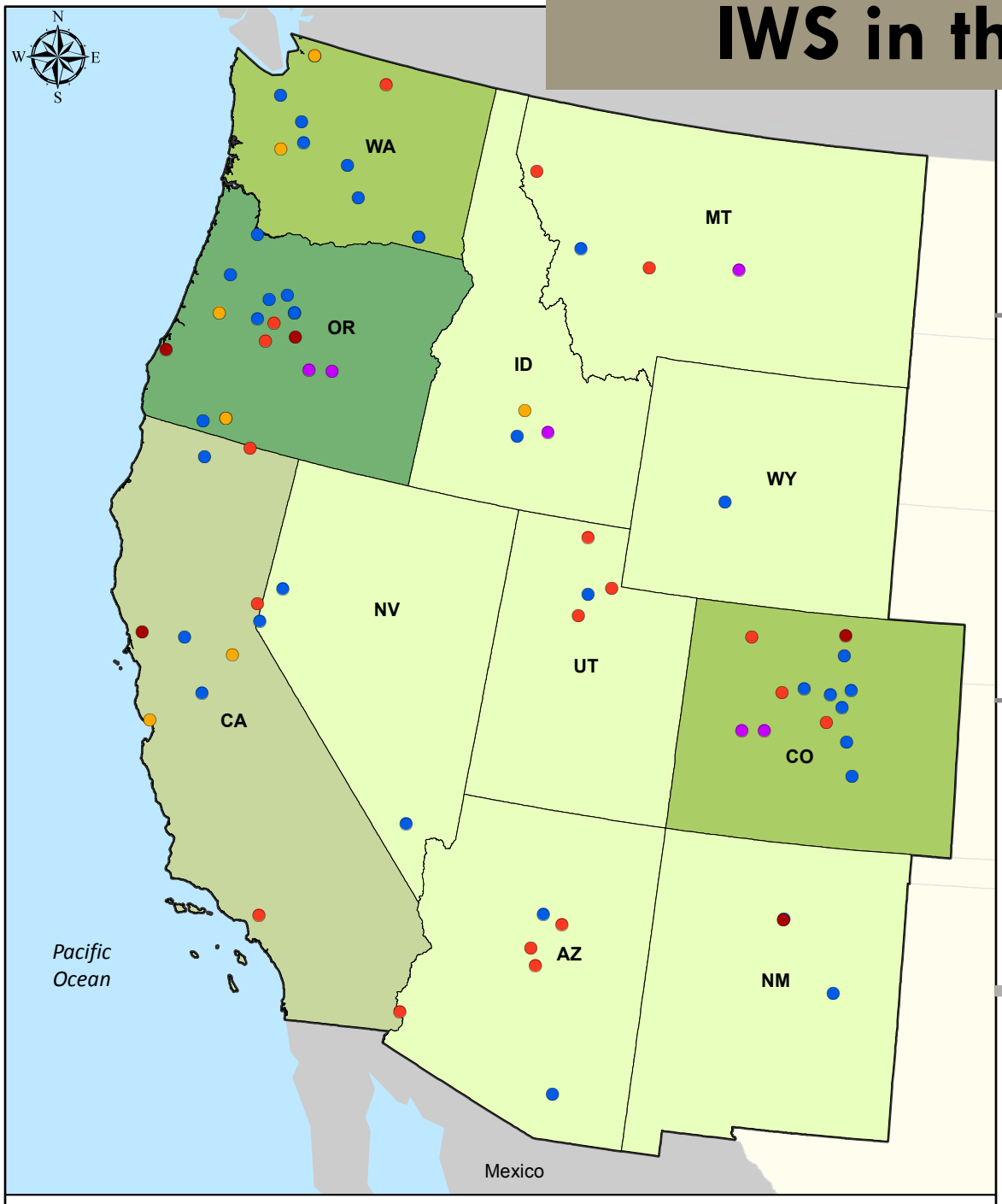


Figure Source: Forest Trends

IWS in the Western US



As of 2014:

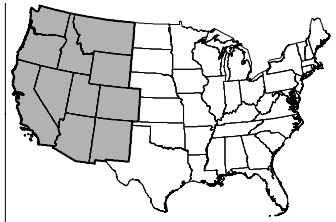
- 48 active programs
- 12 pilot or design programs

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

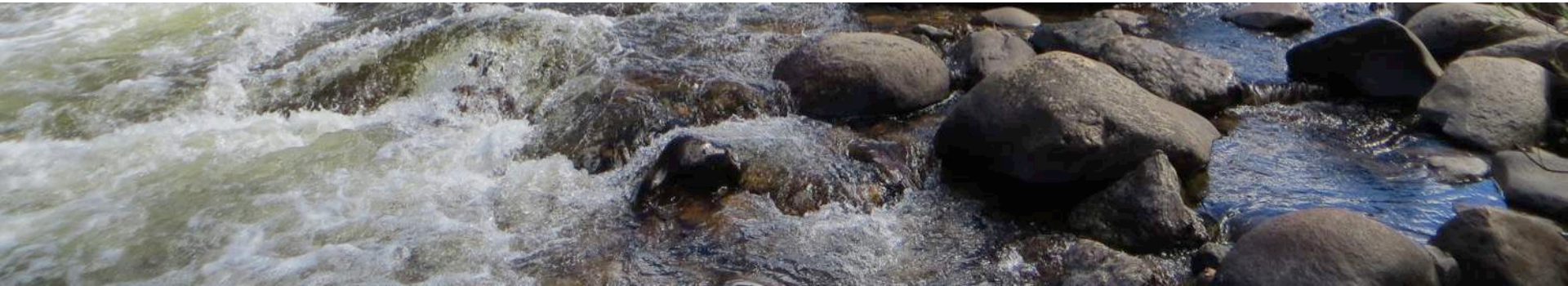


Author: Katherine Sever
Colorado State University
Projection: North America Albers Equal Area Conic
Date: 04/20/2015

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"

- Colorado case studies

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

- US case studies

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

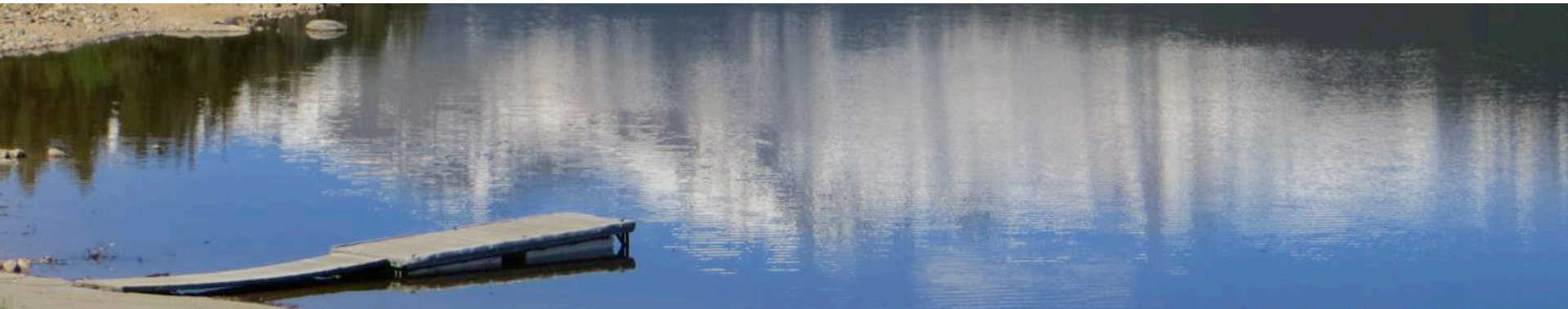
Authors: Suzanne Ozment, Heidi Huber-Stearns, Todd Gartner, and Nathaniel Lichten

I. Forested Source Water Protection

47 identified source water protection IWS programs:

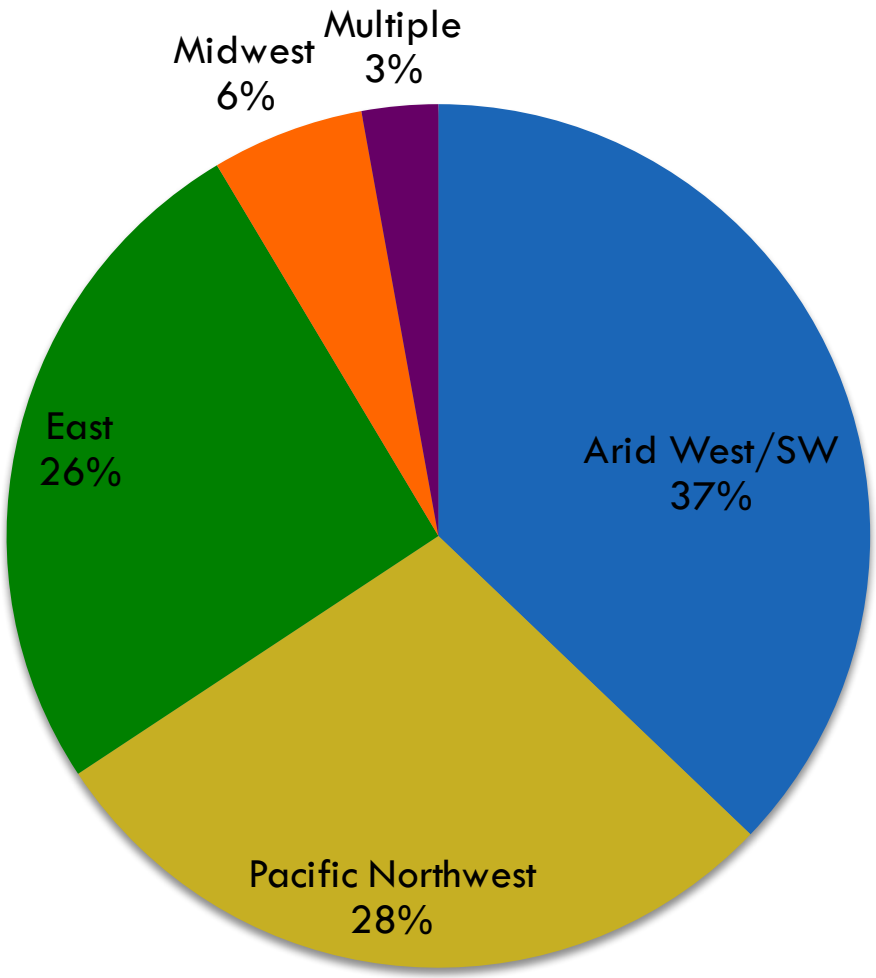
- 35 programs in forested watersheds

- Main drivers:
  - Catastrophic ecological events
  - Consequences of land use change

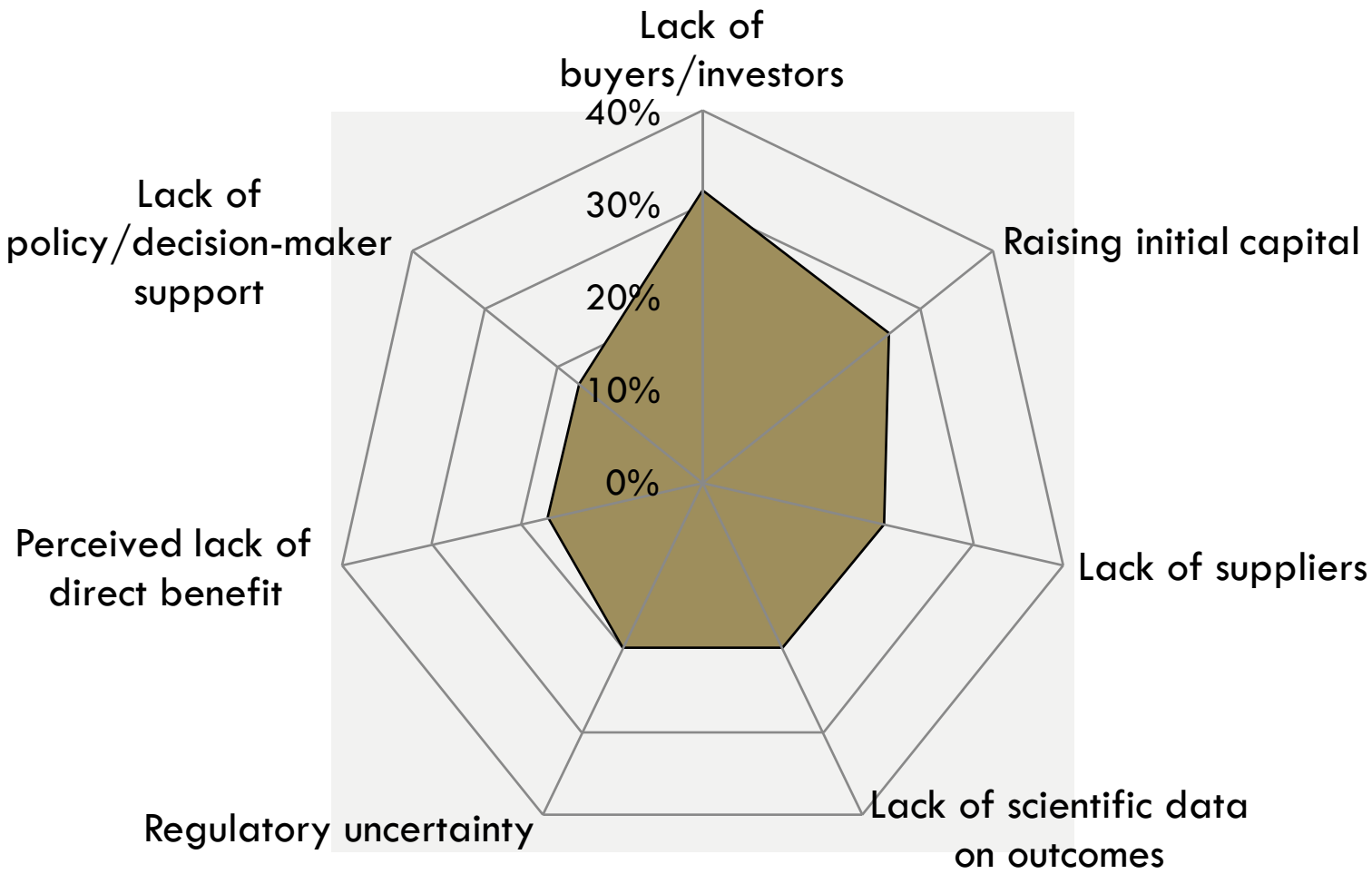


Forested Source Water Protection in the US

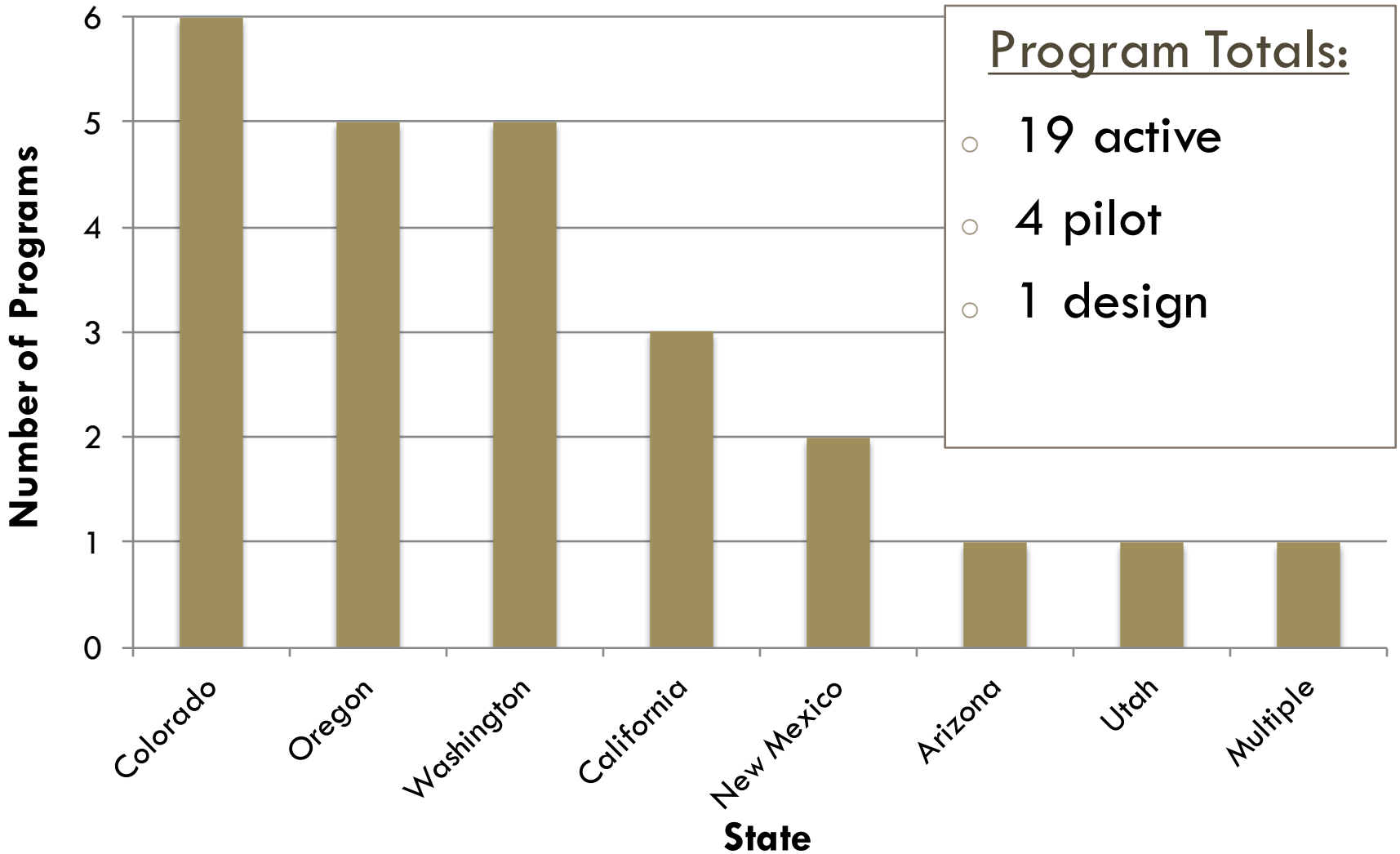
Forested Drinking Water Programs by Region



Forested Source Water Protection Challenges



II. Western US: Forested Source Water Protection



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

Photo from Denver Water

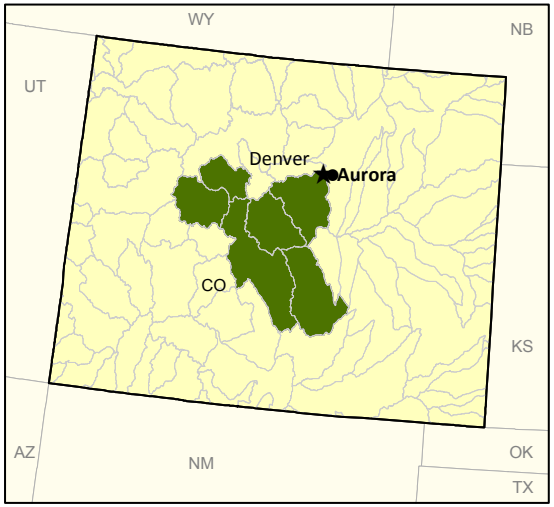
Source Water Protection Types: 2. Watershed Protection

- **Main driver:** mix of land development, recreational usage, forest health protection
- **Management actions:** land acquisition, patrols, easements
- **Land type:** municipality, public, private

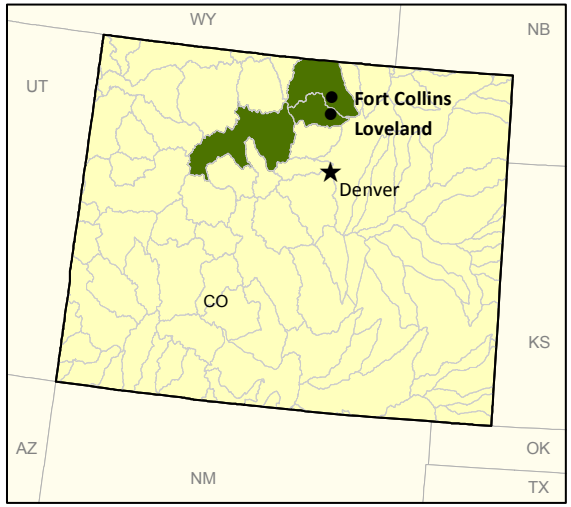
Source Water Protection Types: 3. Water Flow Restoration

- **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

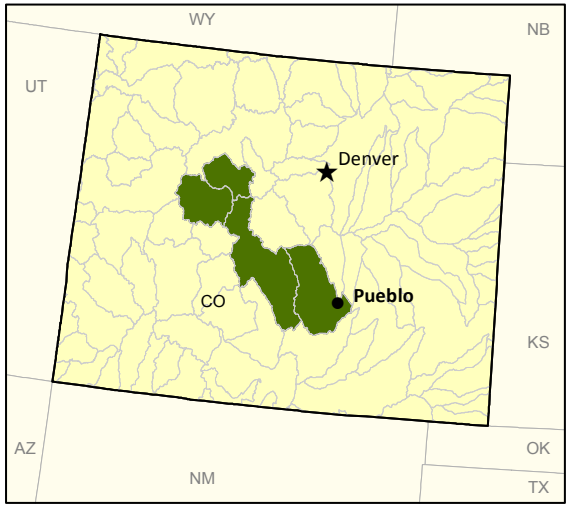
Watershed Wildfire Protection Partnerships (WPPs) in Colorado



Aurora Water-USFS



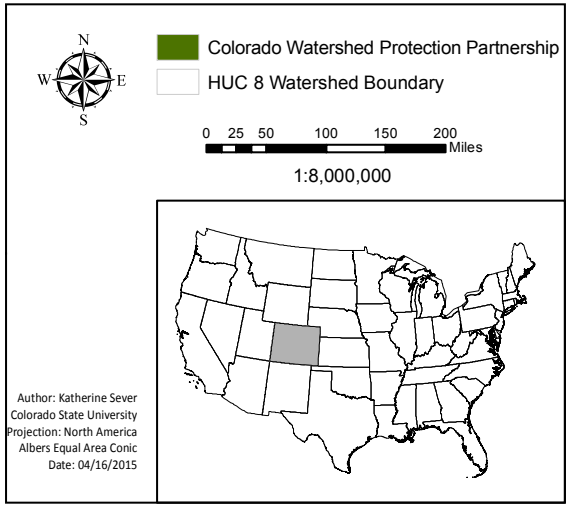
Colorado-Big Thompson



Pueblo Board of Water Works-USFS

Denver Water-USFS

Colorado Springs Utilities-USFS



Watershed Protection Partnerships

WPP formation

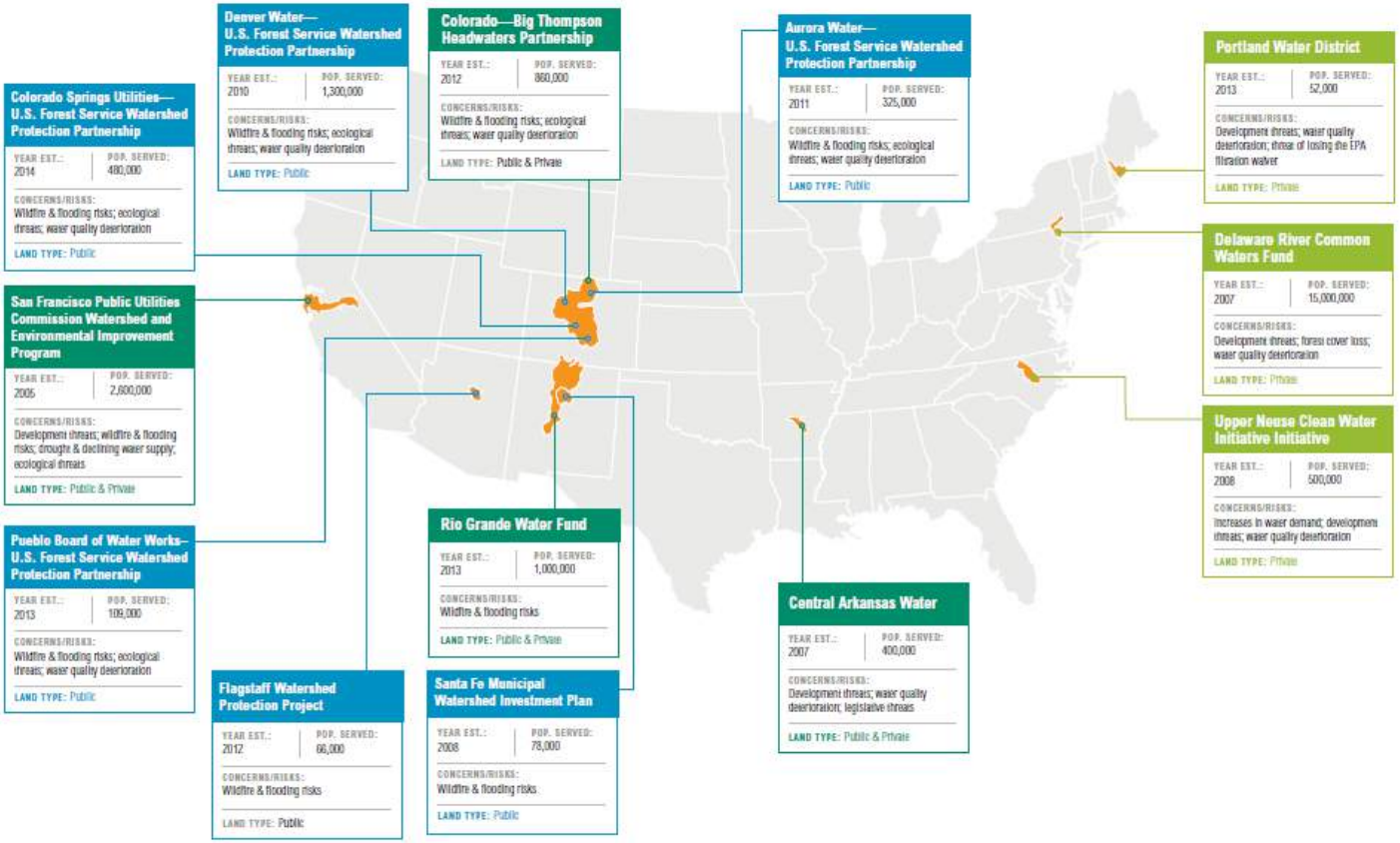
- Wildfires created window of opportunity to:
  - Generate political support
  - Form coalitions for collaborative learning
  - Craft responses (solutions)

- 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

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