

Resource Investment Optimization System

**natural
capital**
PROJECT

RIOS is a free and open source software tool to help design cost-effective investments in watershed services.

RIOS provides a standardized, science-based approach to watershed management in contexts throughout the world. It combines biophysical, social, and economic data to help users identify the best locations for protection and restoration activities in order to maximize the ecological return on investment, within the bounds of what is socially and politically feasible.



RIOS

On June 13th, the Natural Capital Project and the Latin America Water Funds Partnership will launch RIOS (Resource Investment Optimization System), a free, open source software that can be used to design green infrastructure solutions for a secure water future.



Investing in Nature to Secure Water

Every year, \$400 billion is spent on water infrastructure, and that amount will increase with riskier and more polluted supplies. People are starting to recognize that investments in nature, as part of a comprehensive approach for water management, are a cost-effective way to secure clean water for the future. Watershed investments aim to improve multiple water-related benefits such as sustaining water supplies, maintaining quality, and mitigating flood risks. Investors in watershed management have many options for where and how to invest, but often lack information about how to prioritize land use changes that are both feasible and cost-effective.

RIOS helps answer key questions for water investors:

- Which set of investments (in which activities, and where) will yield the greatest returns towards multiple objectives?
- What change in ecosystem services can I expect from these investments?
- How do the benefits of these investments compare to what would have been achieved under an alternate investment strategy?

RIOS introduces a science-based approach to prioritizing watershed investments by identifying where protection or restoration activities are likely to yield the greatest benefits for both people and nature at the lowest cost. RIOS can facilitate the design of investments for a single management goal or several at once, including erosion control, water quality improvement (for nitrogen and phosphorus), flood regulation, groundwater recharge, dry season water supply, and terrestrial and freshwater biodiversity. RIOS can also incorporate other goals into the portfolio design such as avoiding high opportunity cost areas such as production agriculture, or directing investments to poor populations. As a software tool built for diverse environments and socio political contexts, RIOS can accommodate analyses of varying scale according to investors' budgets, desired outcomes, and available data.





RIOS designs investment portfolios that show *where* investments will be most cost-effective and feasible, then uses a suite of quantitative models (InVEST) to estimate *how much benefit* investors can expect to receive from those investments.

Results can be in biophysical terms, used to compare to regulatory standards, or in monetary terms to calculate investors' expected savings.

Creating Investment Portfolios with RIOS

■ Social Information

- Stakeholder preferences
- Feasible activities
e.g., fencing, protection, restoration, irrigation, pasture or fertilizer improvements

■ Economic Information

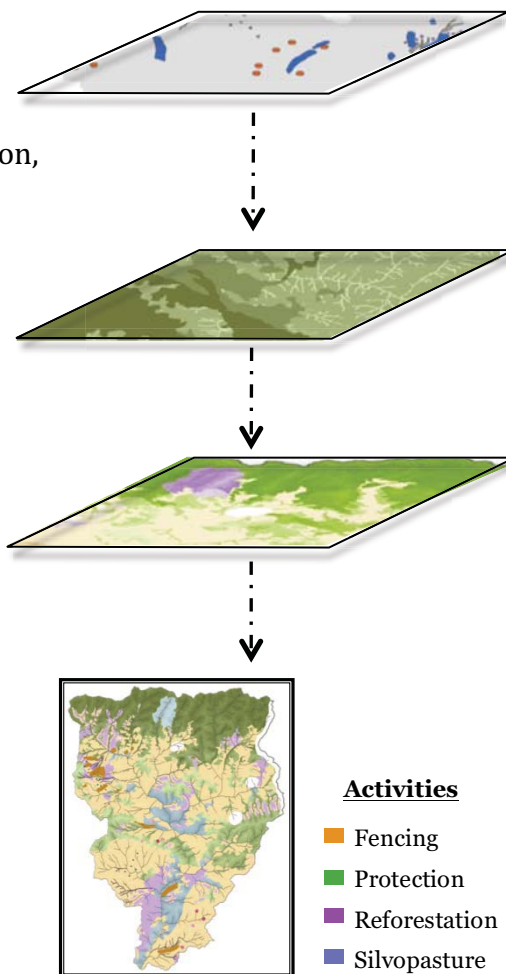
- Cost of activities data
- Investors' budget

■ Ecological Information

- Physical setting
- Land uses
- Demand for services (where people benefit)

■ RIOS Investment Portfolio

- Which activities to invest in
- Where to spend budget for the greatest returns
- Single- or multi-year plans



Generalized Tool, Flexible Approach

RIOS was developed through an extensive stakeholder engagement process, including input from more than 11 water funds (watershed investment programs) across Latin America. The tool has been tested in diverse ecological, social and political contexts. Depending on the context, RIOS-designed investment portfolios improved watershed services up to 6 times more than typical investment approaches. RIOS enables watershed investors to use a consistent, transparent, stakeholder-driven approach to evaluate projects within a region, or even between regions, making it easier to track the places where their investments are most needed and most effective. Private entities, government agencies or NGOs can use RIOS to develop plans within their budgets that maximize their desired water benefits.

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