

THE RESTORATION LAB AT PANAMA'S CITY OF KNOWLEDGE

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Overview: The Restoration Lab at Panama's City of Knowledge, an initiative led by local Panamanian partners working with an alliance of ecological organizations, identifies and implements nature-based solutions (NbS) for coordination of large-scale restoration of the strategically and biologically important Panama Canal Watershed (PCW). The lab will be a hub for cutting-edge research, piloting innovative nature-based solutions (NbS) tailored to the watershed's unique challenges and opportunities and serve as a model for global climate and watershed restoration initiatives. The EcoRestoration Alliance (ERA), a US-based 501(c)(3) entity, will manage initial funding to build and operate, in partnership with private, nonprofit, and governmental collaborators, a state-of-the-art, multidisciplinary action-research facility in the City of Knowledge, Ciudad del Saber (CDS), on the bank of the Panama Canal.

- **Location:** Republic of Panama, Panama Canal Watershed.
 - **Duration:** November 2024 - November 2027 (Phase 1)
- Seeking \$3M for 3 Years**

Primary Objectives:

1. Establish a Panamanian special purpose organization with functional operation of the Restoration Lab at the City of Knowledge, convene partners, and initiate research and restoration activities.
2. Characterize and correlate Panama Canal (sub)watershed hydrogeology, soils, biodiversity, and microclimates, using existing data collected by partners, field sampling, and supervised and unsupervised remote sensing techniques.
3. Develop and execute nature-based community-level pilot restoration interventions, and assess impacts on hydrology, soil quality, and biodiversity.
4. Advance scientific investigations for mechanisms by which ecosystem processes influence hydrological, atmospheric, and climatic processes on land and in the air at variable scales.
5. Implement community-based pilot projects across the watershed using the new science of NbS ecorestoration to foster entrepreneurship, new sustainable economic models, and recommend public policies to improve water security, ecosystem health, public welfare, and the Panamanian economy.
6. Prepare and publish comprehensive Feasibility Study for restoration of the entire Panama Canal Watershed.

Partners and Associates: We are advancing partnerships with interested local and international institutions, including the Geoversity Foundation, CREHO Ramsar, CITEC, SENACYT, ESRI, iGrow Sustainable Industries, STRI, the Ministry of Environment (Directorate of Climate Change), Info Plazas, Guna Yala Research Institute, and the City of Knowledge Foundation. We will soon expand our collaborative network to international and local universities, research institutes, and funders to encourage knowledge exchange, support capacity building, and to co-design and finance sustainable restoration initiatives by local communities.



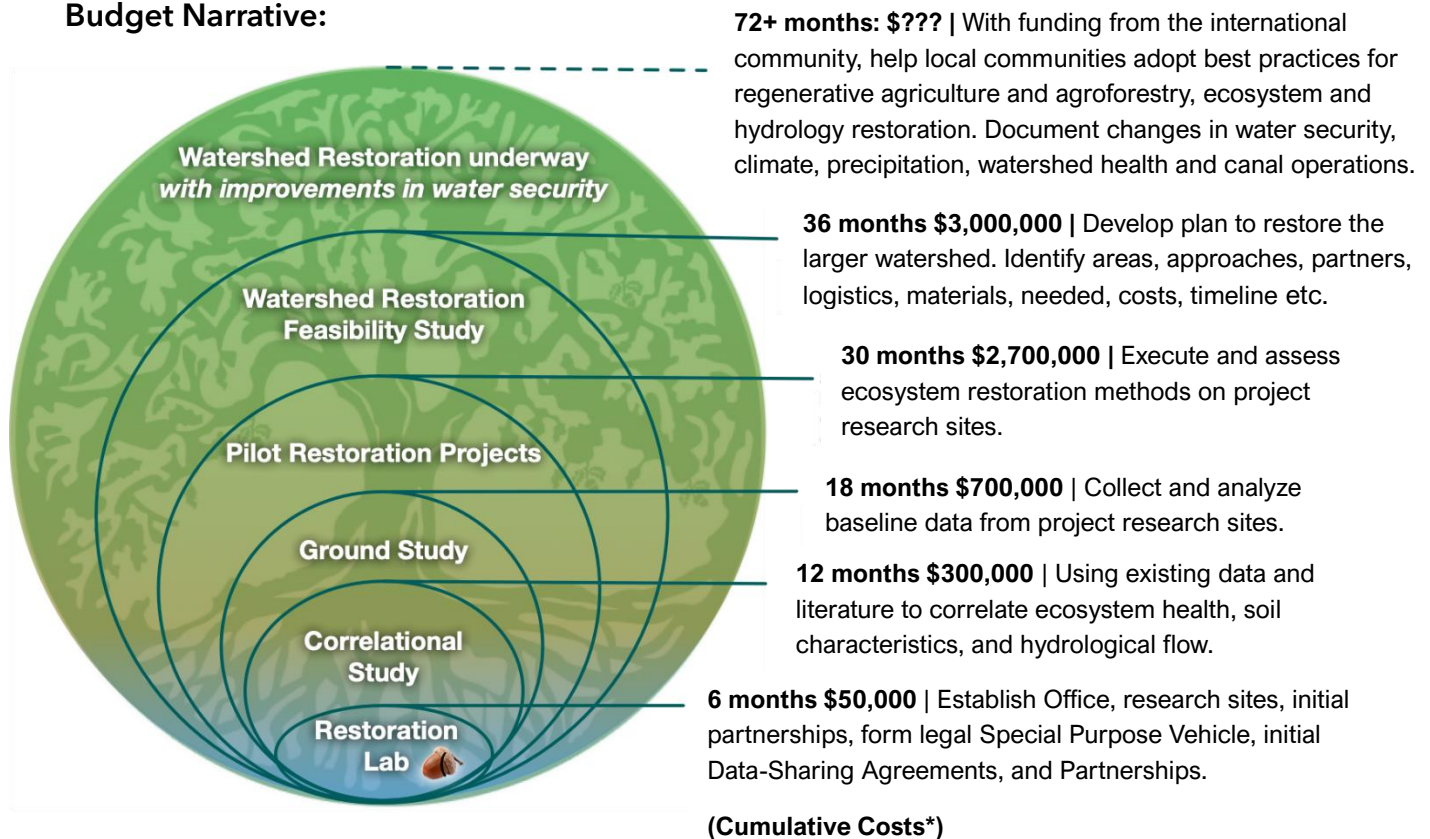
Hypothesis: Community-led, economically viable, self-sustaining, and nature-based ecological restoration of the PCW can significantly enhance atmospheric precipitation and groundwater storage within its watersheds, and increase resilience to Panama Canal operations, the environment, and local communities

Estimated Budget: \$3M

Environmental degradation of the Panama Canal Watershed is particularly significant, given emerging findings "that tropical deforestation causes large reductions in observed precipitation" ([Nature 615, 270–275, 2023](#)). Strategic restoration of this watershed could restore precipitation, improve water quality and quantity, reduce sedimentation, moderate climate, increase resilience and preserve biodiversity, and deliver **return on Investment** through carbon credit revenues and revival of full capacity shipping traffic.

We seek Phase 1 funding to collaboratively establish the foundation for large-scale community- based restoration of the Panama Canal Watershed, and to serve as a model for other climate restoration efforts around the world.

Budget Narrative:



To demonstrate the efficacy and urgency of innovative nature-based approaches for sustainable water security, we will establish a **Restoration Lab** located in the **City of Knowledge (CDS)** in **Panama City, Panama**. An internationally recognized hub for academic, scientific, and business collaborative innovation. Located strategically near the Panama Canal (PC), the 120-hectare CDS campus will bring together land and water stewards, entrepreneurs, researchers, and international organizations to drive social and environmental change. Located on the Canal in Panama City, CDS offers a vibrant entrepreneurial community, advanced infrastructure for research, knowledge-sharing, and logistical coordination, as well as proximity to national and international agencies.

Building on the critical scientific insight that healthy ecosystems influence weather and climate, the **Restoration Lab at Panama City of Knowledge** will pioneer research and development (R&D) of **nature-based solutions** ("NbS") that can address critical challenges like drought, flood vulnerability, biodiversity conservation, food, energy, and water security, and public (One)health. Through experimental research and community-based focus groups, the Lab will investigate, implement, and disseminate practical knowledge of science-based ecosystem restoration solutions to **build environmental and social resilience** within the Panama Canal Watershed, a region of environmental, cultural, and economic strategic importance.