Title
A Rainforest Ecological Portal

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Publication Date
2005
## Introduction:

**Tropical rainforest biodiversity**

Tropical rainforests are the planet’s most important source of biological diversity. They also contain a significant portion of the global carbon stocks, and are, therefore, critical in regulating world climate. Because of their significance and complexity, considerable ecological research and training is focused on tropical systems.

## Problem Description:

There is a critical need to apply developing technologies to problems of scaling in tropical ecosystem and ecophysiological processes, from local levels up to stands, communities, biomes, and beyond. Such scaling is critical if we are to accurately predict changes in the composition, structure, and dynamics and understand how those changes are likely to affect tropical rainforests.

Fixed and mobile sensor arrays provide a solution to meet these needs.

## Proposed Solution:

**Collaboration with the Organization for Tropical Studies**

The La Selva Biological Biological Station in Costa Rica, arguably the best-studied tropical rainforest site in the world, is located in the Caribbean lowlands of northeastern Costa Rica. Here, in a rainforest site with more than 4,200 mm of rainfall annually. Research facilities are operated by the Organization of Tropical Studies, a consortium of more than 60 universities and museums in the United States and beyond. More than 1,500 research papers have been published on studies from this site over the past 40 years.

The on-going activity of research and existing laboratory facilities at La Selva Biological Station makes this site an ideal location for the establishment of a testbed of networked sensor arrays, utilizing NIMS technology in a major way. The facility would consist of large arrays of fixed environmental sensors as well as mobile NIMS systems capable of sampling vertical and horizontal gradients of forest canopy and understory. This would be a multi-user facility designed to collect spatially and temporally dense measurements of core environmental parameters, but flexible in allowing additions of other specialized sensors or sampling instrumentation. These added features might potentially include specialized spectral or video devices, acoustic sensors, gas or water sampling manifolds, and soil sensors.