Puerto Rico

The focus of the Research program at the International Institute of Tropical Forestry (IITF) is tropical American forests. The program is enhanced by laboratory facilities for chemical analysis of soils and water, a geographical information systems lab, a library that features technical information, books and journals on tropical forestry, the Luquillo Experimental Forest (LEF), the Bisley Experimental Watersheds, and a network of the oldest tree growth plots in the hemisphere. The headquarters are in Rio Piedras at the Botanical Garden.

<table>
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<tr>
<th>State Funding History</th>
<th>FY 2011 Enacted ($)</th>
<th>FY 2012 Estimate ($)</th>
<th>FY 2013 Budget ($)</th>
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<td>RIO PIEDRAS</td>
<td>2,854,000</td>
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<td>PUERTO RICO TOTAL</td>
<td>2,854,000</td>
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The watershed shown in this picture flows from the Luquillo Experimental Forest through rapidly developing urban areas, then to the ocean.

The International Institute of Tropical Forestry (IITF) serves both PR and the US Virgin Islands. The Institute includes two Experimental Forests: The Luquillo Experimental Forest which includes the entire area of El Yunque National Forest in PR, and Estate Thomas on the island of St. Croix. The Institute has one Work Unit: IITF-4151. Its mission is to develop and disseminate scientifically-based knowledge that contributes to the conservation of forests, wildlife, and watersheds of the American Tropics. The Institute accomplishes its mission by developing and disseminating knowledge of scientifically sound practices that contribute to sustainable management of forest resources including water and wildlife, the conservation of primary forests, and the rehabilitation of degraded lands. The FY 2013 President’s budget is $2,196,000. IITF does not currently receive National Fire Plan funding.

FY 2013 Program Changes

The President’s budget allocation would basic facilities maintenance and salary costs, with ongoing research continuing on a scaled down level. Research activity will focus largely on publication of data collected in previous years.

FY 2011 Key Accomplishments:

IITF had a successful year in producing high quality research and outreach related to environmental change, watershed management, wildlife management, protection of endangered species, forest ecology and urban ecosystems. The Institute also renovated many of its facilities through funding obtained from the American Reinvestment and Recovery Act (ARRA). Highlights of 2011 include:

- Publication of a synthesis of the ecology and management of tropical cloud forests. These forests are vital resources for the provision of clean, reliable supplies of drinking water.
- Synthesis of the current and historical states of natural resource management and capital within the Rio Piedras watershed, which comprises a large part of the city of San Juan. This was made possible by a large transdisciplinary effort that brought social and natural scientists together to develop a new understanding of urban socio-ecological systems.
- Reports on notable effects of hurricanes on understory plant communities in forests and on seasonal inputs of organic matter into headwater streams.
- Demonstration that native trees in Puerto Rican dry forests are not resistant to wildfire. Restoration of lands degraded by wildfire may need to rely on introduced tree species that can shade out grasses and facilitate the return of native trees.
- Mapping old tropical forests to the level of species assemblage for the first time using gap-filled Landsat imagery, and of protected
natural areas of Puerto Rico, which encompass about 8% of the island.
- Confirmation of recent patterns of historic low numbers of song bird populations and species in Guánica Forest. Many of the winter resident species migrate to the US mainland.
- Assessment of the short and long-term effects of historical management practices in mangrove ecosystems.
- The production, with the State and Private Forestry Program, of a conservation education manual to support forested schoolyard efforts.
- Renovation of Sabana Field Station including new dormitory and lab facilities and the historic Institute Headquarters building. When complete, the HQ building will be LEED certified while maintaining its historic appearance (ARRA).

### Priority Research in Puerto Rico

Forest Service R&D priority research areas build on existing local and regional research to solve issues important to the American people (See blue box below). Priority research activities in Puerto Rico include:

**Forest Disturbance:** The term Forest Disturbance reflects a more accurate description of the focus of our climate change research. As environmental conditions change so will our forests. We need to understand how to help our forests adapt to changes in climate, hurricane patterns, and land use change, including providing opportunities for new and changing species mixes, restoring forests and wetlands that are damaged as temperatures and rainfall change, controlling invasive insects and diseases, and reducing the risk of wildfire.

**Urban Natural Resources Stewardship:** With the majority of people living in urban areas, an emphasis on science and technology transfer is paramount to ensure the proper care of natural resources and the advancement of ecosystem services in urban and urbanizing landscapes. Linking environmental health with community well-being needs to be the guiding principle of urban planning to ensure sustainability. An expanded science program will provide knowledge to develop livable areas compatible with open space management as well as strategies for cleaner air and water and improved ecosystem services.

### Watershed Management and Restoration:

The availability of clean water is becoming limited in many parts of the United States, a trend likely to continue into the future as our population grows. It is important to understand where water shortages will occur, to identify how future climate will affect rain and snow fall, and to find ways to reduce water pollution and to protect water sources.

### Localized Needs Research

Focusing on critical regional and local research issues, IITF provides research results, tools and technologies, including:

**Invasive Species:** Non-native species play both detrimental and helpful roles in forest and watershed health in PR. IITF research focuses on the positive effects of introduced tree species on forest regeneration.

**Wildlife:** IITF has been following resident and migratory bird species’ populations in PR experimental forests for over 30 years. The Institute is also helping to identify conservation gaps for wildlife species, with upcoming focus on freshwater aquatic and sportfish species.
Puerto Rico has a tropical climate with little seasonal variation, although local conditions vary according to elevation and exposure to rain-bearing winds. Northeast trade winds bring heavy rainfall to the north coast, while the south coast is in a rain shadow. San Juan receives about 60 inches (1,525 mm) of precipitation per year, whereas El Yunque Peak farther east receives 180 inches (4,570 mm), and Ponce on the south coast receives only 36 inches (914 mm). Puerto Ricoball, officially the Commonwealth of Despacito Puerto Ricoball, which means "Rich Port" in Spanish, is an unincorporated territory of USAball living in the Caribbean. While he doesn't have any neighbors due to being an island, he is very close to his two brothers Cubaball and Dominican Republicball. The country is divided into 78 municipalities, including his capital San Juanball located in the Northeast, giving him a total area of 3,515 square miles. As of 2018, he has a population of Puerto Rico is a place where the Old World is mashed up with the new on an island that is small in size but offers an immense bounty of one-of-a-kind experiences. Rich history and culture, exceptional food, pristine beaches, majestic mountains, relaxation, adventure—all packed into one sun-kissed Caribbean paradise. Dare to discover the many treasures of Puerto Rico. Get inspired and start planning your trip. Let us be the first to say, bienvenidos. Explore Puerto Rico with Lin-Manuel Miranda.