SMITHSONIAN TROPICAL RESEARCH INSTITUTE

APPLICATION OF OPERATING RESOURCES

<table>
<thead>
<tr>
<th></th>
<th>FEDERAL APPROPRIATIONS</th>
<th>GENERAL TRUST</th>
<th>DONOR/SPONSOR DESIGNATED</th>
<th>GOVT GRANTS &amp; CONTRACTS</th>
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<tbody>
<tr>
<td></td>
<td>FTE $000</td>
<td>FTE $000</td>
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<td>FY 2005 ACTUAL</td>
<td>252 12,499</td>
<td>14 1,356</td>
<td>50 4,256</td>
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<td>FY 2006 ESTIMATE</td>
<td>248 11,489</td>
<td>13 966</td>
<td>54 2,872</td>
<td>9 1,211</td>
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<td>FY 2007 ESTIMATE</td>
<td>248 12,116</td>
<td>13 966</td>
<td>54 2,971</td>
<td>9 1,200</td>
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STRATEGIC GOALS: INCREASED PUBLIC ENGAGEMENT; STRENGTHENED RESEARCH; AND ENHANCED MANAGEMENT EXCELLENCE

Federal Resource Summary by Performance Objective and Program Category

<table>
<thead>
<tr>
<th>Performance Objective/ Program Category</th>
<th>FY 2006</th>
<th>FY 2007</th>
<th>Change</th>
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<tbody>
<tr>
<td></td>
<td>FT E $000</td>
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<tr>
<td>Increased Public Engagement</td>
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<tr>
<td>Public Programs</td>
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<tr>
<td>Engage and inspire diverse audiences</td>
<td>5 255</td>
<td>5 269</td>
<td>0 14</td>
</tr>
<tr>
<td>Provide reference services and information</td>
<td>4 172</td>
<td>4 182</td>
<td>0 10</td>
</tr>
<tr>
<td>Strengthened Research</td>
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<td></td>
<td></td>
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<tr>
<td>Engage in research and discovery</td>
<td>119 6,283</td>
<td>119 6,625</td>
<td>0 342</td>
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<tr>
<td>Enhanced Management Excellence</td>
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<tr>
<td>Facilities</td>
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<td>Execute an aggressive, long-range revitalization program and limited construction of new facilities</td>
<td>7 404</td>
<td>7 426</td>
<td>0 22</td>
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<tr>
<td>Implement an aggressive and professional maintenance program</td>
<td>25 918</td>
<td>25 968</td>
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<tr>
<td>Improve the overall cleanliness and efficient operation of Smithsonian facilities</td>
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<tr>
<td>Security and Safety</td>
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<td>Provide world-class protection for Smithsonian facilities, collections, staff, visitors, and volunteers</td>
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<td>Provide a safe and healthy environment</td>
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<td>Modernize the Institution’s information technology systems and infrastructure</td>
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<td>0 15</td>
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<tr>
<td>Management Operations</td>
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Performance Objective/ FY 2006 FY 2007 Change
Program Category FT $000 FT $000 FT $000
Strengthen an institutional culture that is customer centered and results oriented 12 408 12 430 0 22
Ensure that the workforce is efficient, collaborative, committed, innovative, and diverse 8 714 8 753 0 39
Modernize the Institution's financial management and accounting operations 17 582 17 614 0 32
Enhance the reputation of the Smithsonian by maintaining good relations with the news media and with federal, state, and local governments 3 205 3 216 0 11
Total 248 11,489 248 12,116 0 627

BACKGROUND AND CONTEXT

The Smithsonian Tropical Research Institute (STRI) is the principal U.S. organization dedicated to discovering and understanding biological diversity in the tropics and its relevance to human welfare. The innovative and long-term research conducted by STRI scientists and collaborators makes critical contributions to the science themes presented in the Smithsonian Institution’s “Science Matters” strategic plan. STRI’s “Forces of Change” research seeks to understand the role that tropical environments play in global climate change. STRI has developed a new tropical soils science program to complement outstanding research strength in forest ecology and tropical plant physiology. This program furthers understanding of how the global carbon cycle is impacted by massive conversion of tropical landscapes from old-growth forests to impoverished agricultural land. STRI scientists are also productive contributors to the focal research area “Encyclopedia of Life,” and new discoveries each year expand our understanding of tropical biodiversity and its importance to our well-being. STRI research in the “Biology of Extinction” and “Human-Environmental Interactions through Time” strategic areas has highlighted the role that the Central American isthmus has played in human history, as well as the impact of expanding agriculture and logging in the Amazon Basin.

STRI plays a critical role for the U.S. Government and the Smithsonian by maintaining world-class research facilities in Panama where each year more than 800 resident and visiting scientists can easily access diverse tropical environments, including rain forest and coral reef ecosystems. STRI serves as official custodian for the Barro Colorado Nature Monument, which is the only mainland tropical reserve under U.S. stewardship. STRI’s marine facilities on both the Atlantic and Pacific coasts of Panama facilitate comparative oceanographic and coastal zone studies of both oceans, and the Institute’s marine and terrestrial facilities measure the environmental health of critical ecosystems, particularly tropical rainforests and coral reefs. In view of the increased interest in tropical medicine by Panamanian and U.S. medical research organizations, STRI’s expertise in ecological research is sought increasingly for studies of tropical diseases such as malaria and hanta. Because of its excellent research staff and superb facilities, STRI has developed an
outstanding reputation for providing essential training to students and professionals who conduct tropical research, and for increasing the public’s understanding of tropical biodiversity and its importance for humans.

To achieve the Institution’s goal of Strengthened Research, STRI will provide research scientists and visiting researchers and students with access to habitats and world-class facilities where innovative research on diverse tropical environments and cultures can be advanced. To achieve the goal of Increased Public Engagement, STRI will interpret its research for diverse audiences through its public programs, and has recently increased its commitment to disseminating its findings through the Internet and other media. The goal of Enhanced Management Excellence will be addressed by continuing to provide superbly maintained facilities and instrumentation necessary to meet research requirements, and by strategic planning to support researchers seeking enhanced knowledge of tropical environments.

For FY 2007, the budget estimate includes a program increase of $332,000 for necessary pay for existing staff funded under this line item and $295,000 for mandated increases in Panamanian social security.

MEANS AND STRATEGY

To maintain its leadership in tropical research, STRI provides basic support for its staff scientists to conduct projects that contribute to two of the four science themes presented in the Smithsonian Science strategic plan: “Discovering and Understanding Biological Diversity” and “Human Diversity and Cultural Change,” and to all six research areas within these themes. The theme of “Discovering and Understanding Biological Diversity” will be advanced as STRI continues to lead in the fields of tropical forest ecology, plant physiology, canopy biology, and tropical evolution. STRI biologists are making fundamental discoveries about tropical nature, and are using this information to understand such things as plant defense systems that yield new chemical compounds of potential use in treating cancer and HIV. STRI archaeologists and social anthropologists strongly support the strategic science theme of “Human Diversity and Cultural Change,” and will continue to study how different peoples survived and flourished in fragile, endangered tropical environments. By drawing on their knowledge of the history and development of tropical regional economies and social formation, STRI scientists have contributed critical information and insight about the future of the Amazon, including predictive models that establish the rates of Amazonian deforestation under alternative development plans 20 years into the future.

STRI’s focus on soils in tropical landscapes will substantially improve the ability of the United States to forecast fluctuations in carbon dioxide emission rates that influence the world’s climate. Given the rapid rate of forest loss in the tropics, the rate of carbon moving in and out of tropical soils is probably the most important missing variable in models that aim to predict the future of global
climate change. By building on current programmatic strengths at STRI in forest ecology and tropical plant physiology, the Smithsonian Institution can maintain its leadership in tropical environmental science, and help ensure that global change models are informed by the best possible quantitative data regarding carbon flux in tropical soils and forests.

The goal of Enhanced Management Excellence will be achieved by continuing to modernize administrative processes and by bringing STRI programs into compliance with modern safety standards. One such example is in Gamboa, where for the last 80 years STRI has conducted research in facilities rented from the U.S. or Panamanian Governments. These out-of-date facilities house laboratories and dormitories that currently support important research on ecologically guided drug discoveries, global climate change, and reforestation with native species, which require laboratories constructed to ensure safe scientific practices. The site also serves as an outdoor laboratory for researchers and as a training ground for students and fellows, primarily from U.S. universities, who come to STRI during various stages of their academic careers.

STRI will address the goal of Increased Public Engagement by offering high-quality public programs that increase our understanding of the diversity of life in the tropics and its relevance to global processes. New information about the tropics will be disseminated to the public through the Smithsonian science website, as well as through targeted seminars and symposia for news media and decision makers.

STRATEGIC GOALS AND FY 2007 ANNUAL PERFORMANCE GOALS

Increased Public Engagement

Engage and inspire diverse audiences (5 FTEs and $269,000)

- Engage and inspire diverse audiences in a lifelong exploration and understanding of science through high-quality public programs and products, such as the Smithsonian Biodiversity Series, which provides information on tropical biodiversity and cultures

Provide reference services and information (4 FTEs and $182,000)

- Provide reference services and information to the public through the STRI library and the Smithsonian website

Strengthened Research

Engage in research and discovery focused on biological diversity and human culture (119 FTEs and $6,625,000)

- Continue studies on tropical soils chemistry of relevance to climate change models and complete soils map of Barro Colorado Island
- Conduct studies on animal behavior and environmental monitoring, which contribute to science priority themes, using scientific research
computing capabilities such as automated animal tracking methods and Geographic Information Systems (GIS)

- Publish at least 200 scientific papers in peer-reviewed journals to share research results with the scientific community worldwide on the origins, maintenance, and loss of tropical biodiversity
- Facilitate tropical research for at least 750 visiting scientists and students working in STRI facilities, including projects funded by the National Science Foundation and National Institutes of Health, to increase our understanding of the distribution, interactions, and evolution of tropical organisms and their relevance to human health and global climate change
- Offer scientists opportunities to test research hypotheses on tropical forests, and disseminate the basic information needed to restore degraded areas and provide enhanced environmental services
- Strengthen the Smithsonian Marine Science Network collaborative projects on marine environments, such as on coral reefs and mangroves in the tropical eastern Pacific and Caribbean, to better understand their diversity, threats, and conservation opportunities
- Build inter-unit collaboration through joint appointments (with staff, collaborators, and postdoctoral Fellows)
- Support the work of terrestrial paleoecologists studying changes in tropical communities over geologic time frames, and determine conditions that lead to the depletion of tropical forests
- Continue archaeological research aimed at revealing the importance of prehistoric tropical societies in New World cultural development
- Develop improved understanding of human occupation in neotropical forests, from the first colonization 15,000 to 11,000 years ago

Enhanced Management Excellence

**Execute an aggressive, long-range revitalization program and limited construction of new facilities (7 FTEs and $426,000)**
- Review all STRI facilities and develop plans which integrate educational and research needs, and which also meet current safety and laboratory standards

**Implement an aggressive and professional maintenance program (25 FTEs and $968,000)**
- Continue structural assessment of STRI facilities to ensure their continued safe and effective use for tropical research and education
- Continue staff training to implement the reliability centered maintenance program throughout STRI facilities

**Improve the overall cleanliness and efficient operation of Smithsonian facilities (15 FTEs and $417,000)**
• Conduct regular monitoring of all facilities, including buildings, vessels, vehicles, and docks, to ensure their safety and operational capacity to serve ongoing research

*Provide world-class protection for Smithsonian facilities, staff, visitors, and volunteers (23 FTEs and $691,000)*

• Introduce new patrolling procedures and electronic surveillance of the Barro Colorado Nature Monument to increase protection of the area against poachers
• Expand existing electronic security system to remote facilities such as Bocas del Toro Research Laboratory

*Provide a safe and healthy environment (6 FTEs and $232,000)*

• Bring STRI facilities into compliance with safety standards to ensure safety and protection of staff, visitors, volunteers, collections, infrastructure, and equipment

*Modernize the Institution’s information technology systems and infrastructure (4 FTEs and $293,000)*

• Strengthen STRI’s scientific capability to analyze tropical biodiversity information by implementing new technologies for automated animal tracking and environmental monitoring, including GIS
• Increase information-sharing within the Institute via improved connectivity between STRI facilities through the Local Area Network (LAN) system
• Increase efficiency of administrative procedures by promoting time-saving and error-reducing practices such as online transactions via the STRI intranet

*Strengthen an institutional culture that is customer centered and results oriented (12 FTEs and $430,000)*

• Increase internal customer satisfaction (i.e., STRI staff and visitors) by streamlining the acquisitions process and adopting the Enterprise Resource Planning (ERP) system for financial, budget, procurement, and human resources management

*Ensure that the Smithsonian workforce is efficient, collaborative, committed, innovative, and diverse (8 FTEs and $753,000)*

• Evaluate performance appraisal system and make necessary changes to ensure its effectiveness in reinforcing the Institution’s strategic vision and goals

*Modernize the Institution’s financial management and accounting operations (17 FTEs and $614,000)*

• Improve financial management by providing all internal clients with accurate and timely transaction records and reports

*Enhance the reputation of the Smithsonian by maintaining good relations with the news media and with federal, state, and local governments (3 FTEs and $216,000)*
• Conduct targeted seminars for journalists and policy makers to keep them informed about relevant research discoveries

NONAPPROPRIATED RESOURCES—General trust funds provide support and salaries for a small percentage of STRI employees involved in research, public outreach and fund raising. Donor/sponsor-designated funds support specific programs and projects, such as the global network of 17 sites monitoring 10 percent of all tree species in the tropics, and projects related to reforestation initiatives. Donor-designated support includes an endowed staff position in tropical paleoecology that studies past climates and environments in the tropics, postdoctoral positions that study the relationship between brain size and behavioral complexity, and postdoctoral fellowships in tropical marine biology which are based at STRI’s Bocas del Toro field station. Government grants and contracts, such as the Panama International Cooperative Biodiversity Group (ICBG) administered by STRI, support innovative research in areas such as the biomedical sciences, as well as scientific training.