

Smithsonian Institution Global Earth Observatory Initiative (SIGEO)

Description

Objective: The Smithsonian Tropical Research Institute (STRI) will expand the development of its network of tropical forest plots to become a system of Smithsonian Institution Global Earth Observatories (SIGEO), which will provide scientific data about ecological, hydrological, soil, and meteorological processes openly and quickly via the world wide web to scientists, politicians, and other people around the world who need to monitor climate change, carbon budgets, nutrient cycling, and biodiversity.

Methods:

- 1. Expansion of Forest Dynamics Plots into the Temperate Zone;
- 2. Biodiversity Inventory and Assessment; and
- 3. Monitoring Forest Health from Space.

Data:

This international collaboration is now monitoring the growth and survival of 3.5 million trees at 20 sites in 15 countries - over 12 percent of all known tropical tree species. In addition, it will integrate temperate plots into the network of tropical forest plots and conduct focused surveys of vertebrates, invertebrates, and microbes across the Global Earth Observatories. These surveys will also include an assessment of vertebrate health and physiologic change as a sentinel for the impact of environmental change on human and domestic animal health.

Results/Impact:

SIGEO is poised to critically monitor the effects of anthropogenic increases in atmospheric CO₂, nitrogen, and general air pollution at local, regional and global scales. Global Earth Observatories will provide a concerted effort to help solve real-world problems based on the real-time dissemination of critical data and cutting-edge science.



Added Value

1. SIGEO promotes large-scale environmental monitoring, and maintains enormous banks of data and metadata that galvanize advanced data networks and sophisticated analyses from single forest plots to outer space;
2. Cost Saving: can link with current GEO tasks to reduce redundant data collection, management and analyses;
3. Integrated Analysis: Data Sharing and Interoperability among partners allows for analyses that would not be performed; and
4. Capacity Building: providing data and decision support tools for monitoring biodiversity, climate change for better management of terrestrial ecosystems and biodiversity conservation.

Relevance to GEO

Societal Benefit Areas and Transverse Areas:

- Understanding environmental factors affecting human health and well-being.
- Understanding, assessing, predicting, mitigating, and adapting to climate variability and change.
- Improving the management and protection of terrestrial, coastal and marine ecosystems.
- Understanding, monitoring and conservation biodiversity.

GEO Work Plan reference (SBA, Task, Target):

- Biodiversity Observation Network Task #B1-07-01
- Capturing Historical Biodiversity Data Task #B1-06-03

Participants

Institutions and universities from 15 countries around the world as well as developing partnerships with:

- EPA
- NASA
- NOAA
- USGS
- U.S. Forest Service.

Current Status and Next Steps

Long-term continuity:

There is long-term institutional commitment to the project demonstrated by the continued monitoring of the network's oldest plots over the past 25 years.

Gaps:

The purpose of SIGEO is to have a complete observatory with few, if any, gaps, hence the desire for establishing strong partnerships.