

A Remote sensing - “smart” ground based Monitoring System to support natural capital accounting and monitoring- in the Guiana Shield ecoregion.

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The Guiana Shield ecoregion provides ecosystem services of global importance, including storage of approximately 10-15% of global freshwater supply, about 50 billion tonnes of carbon, habitat for rich biodiversity, and livelihood to many thriving local communities and cultures with knowledge and skills indispensable for proper management of the ecoregion. Despite its importance, this natural capital is poorly understood, scarcely monitored, and, in many cases, is undergoing rapid degradation and depletion. Nevertheless, if the private sector invests in protecting natural capital, US\$2-6 trillion in business opportunities could be realized by 2050. The interest in payments for ecosystem services (PES), natural capital accounting and monitoring needs is growing; see for example WorldBank WAVES, InVEST, and Guiana Shield Initiative (GSI).

WU-SarVision is testing and implementing new geo-information technology for improved monitoring of natural capital of the Guiana Shield ecoregion, including advanced (radar) satellites that can provide near-real time information on ecosystem status independently from cloud cover when integrated with the use of smart phones engaging local communities in participatory monitoring on the ground. The monitoring systems should help to provide information to site managers and coordinators, to ensure that the terms of PES contracts are being followed and the ecosystem services paid for are actually delivered. Within the framework of the GSI such new (radar) approaches for automated production of time-series maps have now been successfully tested:

- 1.Low resolution satellite monitoring (250 – 100m)
- 2.High resolution satellite monitoring (60 – 20m)
- 3.Very high resolution satellite monitoring (6 – 1m)

Service/product examples include:

1. Carbon stocks per vegetation type / strata
2. Extent and condition of ecosystems / vegetation types
3. Extent of permanently flooded areas
4. Extent and dynamics of seasonally flooded areas

The work of the WU-SarVision within the framework of the GSI could provide valuable insights and lessons for the realization of the Forest and Remote Sensing Exchange Network (FORESEEN). The Guiana Shield Facility (GSF), successor to the GSI, is committed to facilitating and supporting a FORESEEN for the Guiana Shield ecoregion.