Pereira R.[1], **Bovolo C. I.[2]**, Parkin G.[3], Wagner T[4]., Investigating the climate transition zone in Guyana, South America *Abstract H51A-0849* presented at 2010 Fall Meeting, AGU, San Francisco, Calif. 13-17 Dec. 2010

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Abstract: Current knowledge suggests that the two largest threats to ecosystems are changes in land use and climate variability. Focussing on the tropics, these changes put an immediate threat on the health and fate of rainforest ecosystems. It has been shown for Amazonia that natural seasonal variability when linked to transitional periods of extreme weather events, can trigger an almost instantaneous and large increase in the release of nutrients and carbon from soils into rivers driven by variation in precipitation (Raymond, 2005; Mayorga et al., 2005). A new hydrology and climate monitoring program at the Iwokrama International Centre for Rainforest Conservation and Development in Guyana will investigate the ability of the rainforest and its soils to generate, store and recycle carbon, nutrients and water over a multi-year period; and to address the issue of the forests response to combined natural and anthropogenic induced change. It is important to establish the range of variability between wet and dry seasons, thereby characterising the current state of the forest and how it responds to external forcing. A detailed understanding of the quality and cycling of key soil properties, including carbon and nutrients, is critical to assess the status and potential change of forest vegetation and ecosystems. Comparisons of the processes and impacts of natural climate variability and forestry activity in pristine and sustainably used forest areas will be made. We introduce the conceptual strategy and experimental design of the new research program and present first geochemical results based on field work in March and July 2010 comparing dry and wet seasons. The preliminary analyses of elemental and spectrophotometric (UV-absorbance) data generated from top soil, river water and river bed sediments from the Burro Burro River transect through pristine and managed forest will be presented. The data will be used to assess the nature and variability of low and high molecular, dissolved and particulate organic matter geochemistry both spatially and temporally.