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POSTER ABSTRACT

**New Digital Surface Geological and Chronostratigraphic Maps of Trinidad – field data
and GIS support Revisions and Reversions.**

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A comprehensive digital database of surface geological, topographic, geographic, cultural, infrastructure and administrative data for the island of Trinidad, West Indies, has been compiled as part of a GIS project undertaken by Latinum Limited in 2005. Three cartographically designed maps that were produced for the project are presented and reviewed. These are a new state-of-the-art Geological Map of Trinidad at 1:100,000 scale (1 sheet) and 1:50,000 scale (4 sheets), and the first ever detailed Chronostratigraphic Map of Trinidad at 1:150,000 scale (1 sheet).

The Kugler (1959) 1:50,000 eight sheet geological map series was digitized and is the core of the Latinum Trinidad Geological GIS 2005[©] product. There are, however, major projection, mapping and interpretational changes from the Kugler maps, and the new maps incorporate a compilation of many data sets and original observations from the authors' field research. Two critical updates are the transformation from Cassini to Transverse Mercator projection (UTM Zone 20) — and from links to metres — and adjustment to a new coastline mapped from 1994 vintage aerial photography. The rivers and roads are also newly mapped data sets. Our focus here, however, is upon the key structural and stratigraphic changes in the new maps.

Our new interpretation of the Northern Range metamorphic province is fundamentally changed from all previous maps. Here the mapped units are metamorphic rock bodies; now sedimentary protolith formations and chronostratigraphic and structural relations are implied. The concept of the (overturned) Northern Range Anticline is abandoned — no north-to-south correlations are made. The subtle but significant east-to-west increase in metamorphic grade across the range is reflected in the mapped metamorphic rock units. The GIS also includes a Northern Range lineament map derived from mapping on a DEM and radar image.

In the Northern Basin, a significant change has been made by abandoning the concept of widespread unconformable Pleistocene terrace deposits, previously mapped as the Cedros Formation. Our field work has shown that the major Pleistocene sand and gravel deposits at surface around Valencia were deposited from the north and belong to the late stage basin fill. They dip structurally about 10 degrees to the south and are being exhumed and actively incised. Broadly age and genetically equivalent gravel and sand deposits occur all along the Churchill Roosevelt Highway below the recent alluvium, and climb gently to the east. These are the “Northern Gravels” of the hydrogeological literature.

The former Cedros unit in the Northern Basin has been remapped with the Matura and Chin Chin members of the Talparo Formation pending further study of their precise genetic context.

In the Central Range we maintain the distinction between the age equivalent Brasso and Tamana formations, based upon lithological criteria: the Brasso is a variably calcareous mudstone unit and the Tamana is a variably argillaceous limestone unit. The limestone beds of the Concord Estate in Pointe-a-Pierre can be shown in the field to be horizon equivalent with the foraminiferally dated quarries at Guaracara, and so we do not recognize the Concord formation shown on the 1997 Saunders map.

In the Southern Basin little has been changed of the mapped stratigraphy. Our preliminary field studies, however, do indicate that there are several areas where significant (but not fundamental) revisions can be anticipated. The emphasis to date has instead been on evaluating the age relationships between the western and eastern stratigraphy of the upper Neogene section. In this regard the map favours correlations based on palynology that support a fundamental upper Morne L’Enfer – Mayaro age equivalence, as shown on the Kugler map. This is in contrast to the later, foraminiferal based, Cruse – Mayaro correlation of the 1997 Saunders Map.

Special attention has been given to the mapping of two major neotectonic (active) faults at surface. These are the Central Range Fault and the onshore Los Bajos Fault. Both faults have been mapped on digital elevation models and aerial photographs using standard geomorphic methods, combined with field study. The Central Range Fault, which is not present on the Kugler and Saunders maps, has been confirmed to be active by GPS studies and paleoseismic trenching. We also include other significant, previously unmapped faults. One example is the south dipping, east-west striking, Three Sisters Fault, at Los Gallos Point on the southwestern tip of Trinidad.

The 1:150,000 Chronostratigraphic Map of Trinidad uses revised stratigraphic unit ages, together with the power of GIS database queries, to create new groupings that show the outcrop pattern of age-equivalent strata to the best of our current understanding.

The maps presented are supported by a detailed text report, extensive GIS attribute tables for most data sets, and full metadata documentation of the vintage and limitations of all the incorporated data.