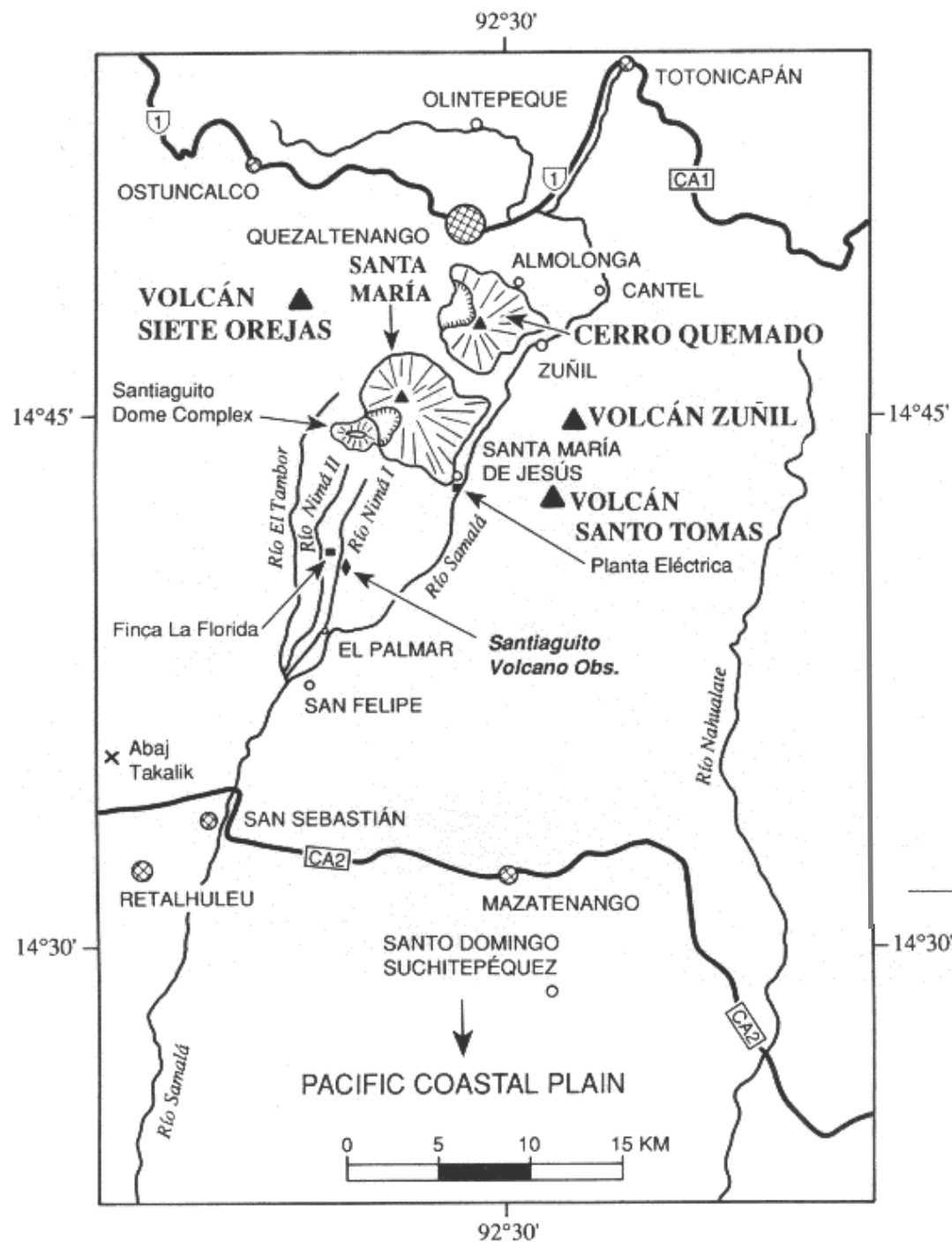


Regional Action Program for Central America (RAPCA) Capacity Building for Natural Disaster Reduction (CBNDR)

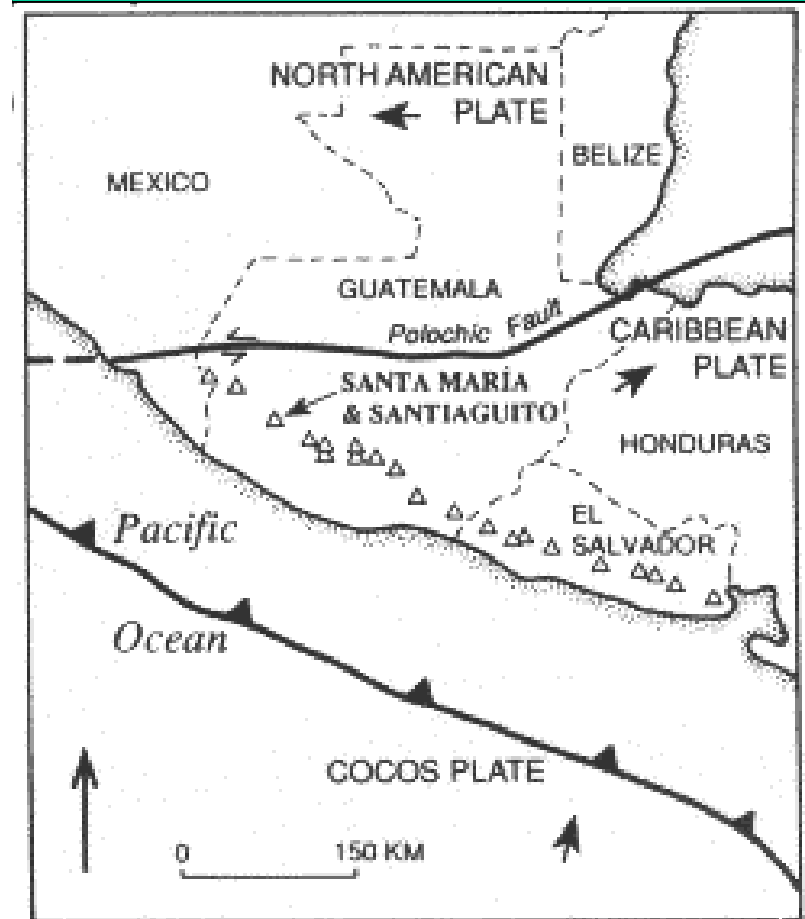


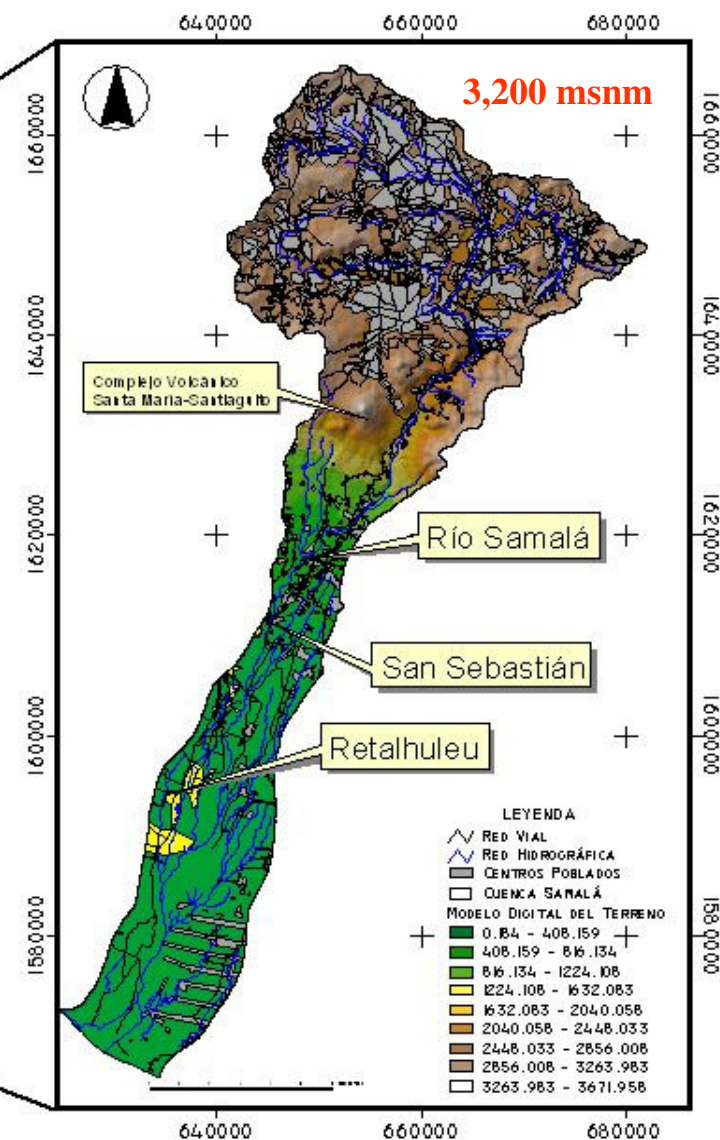
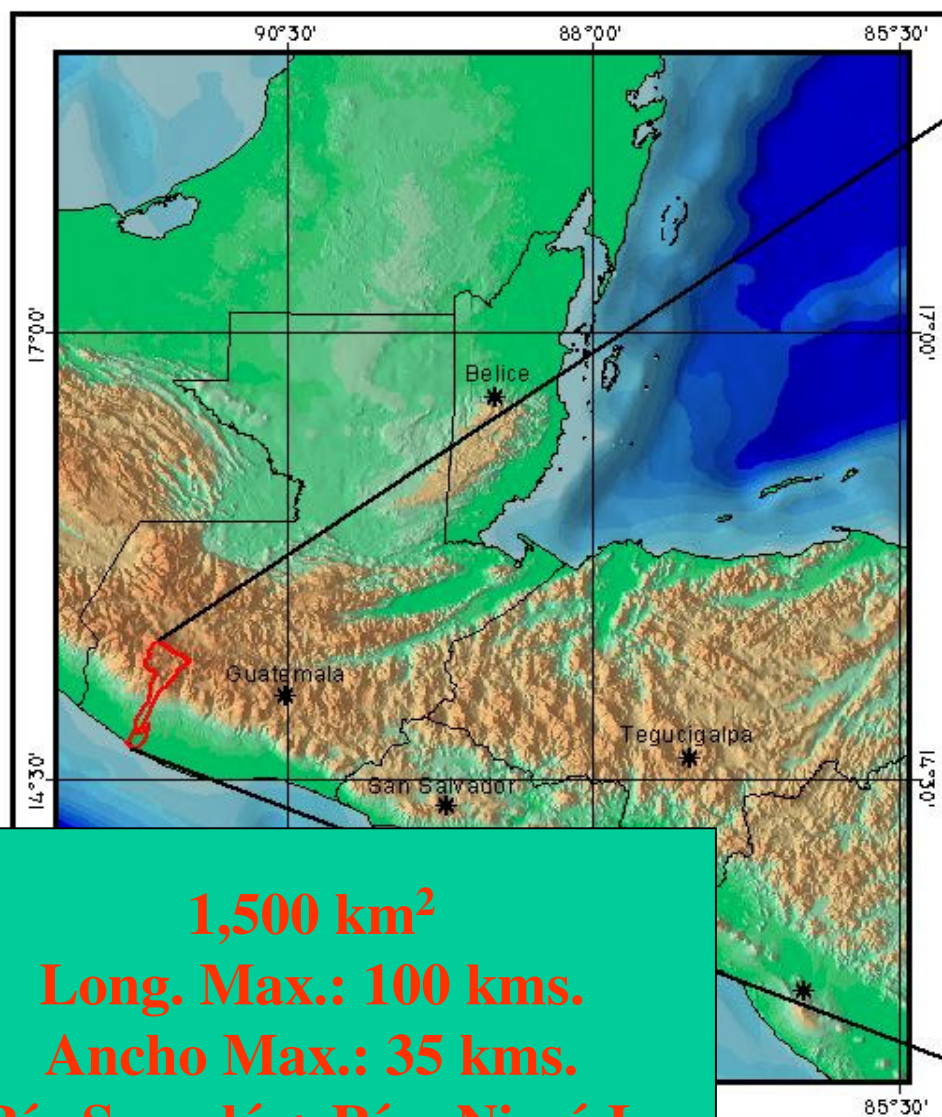
Zonificación de Amenazas Naturales en la cuenca del río Samalá y Análisis de Vulnerabilidad y Riesgo en San Sebastián, Retalhuleu, Guatemala.





**Zona de Subducción.
Z.F. Polochic-Motagua.
Complejo Volcánico.
Centros Poblados.**





1,500 km²
Long. Max.: 100 kms.
Ancho Max.: 35 kms.
Río Samalá + Ríos Nimá I,
Nimá II, El Tambor e Ixpatz.
Población: 655,077 (740,000)

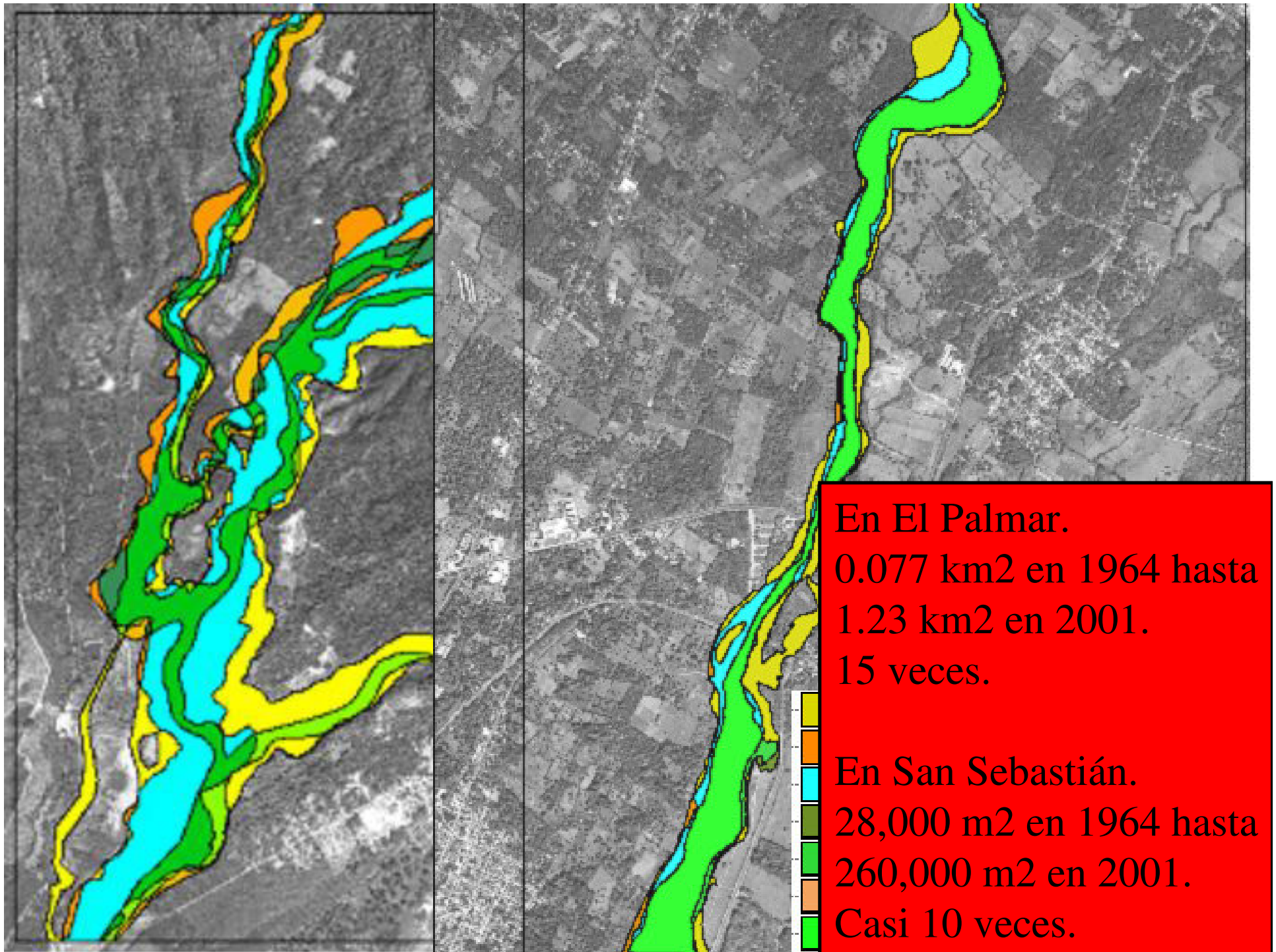
CIÓN GENERAL Y ELEMENTOS BÁSICOS
 Á, GUATEMALA, CENTRO AMÉRICA

M GEOMOR

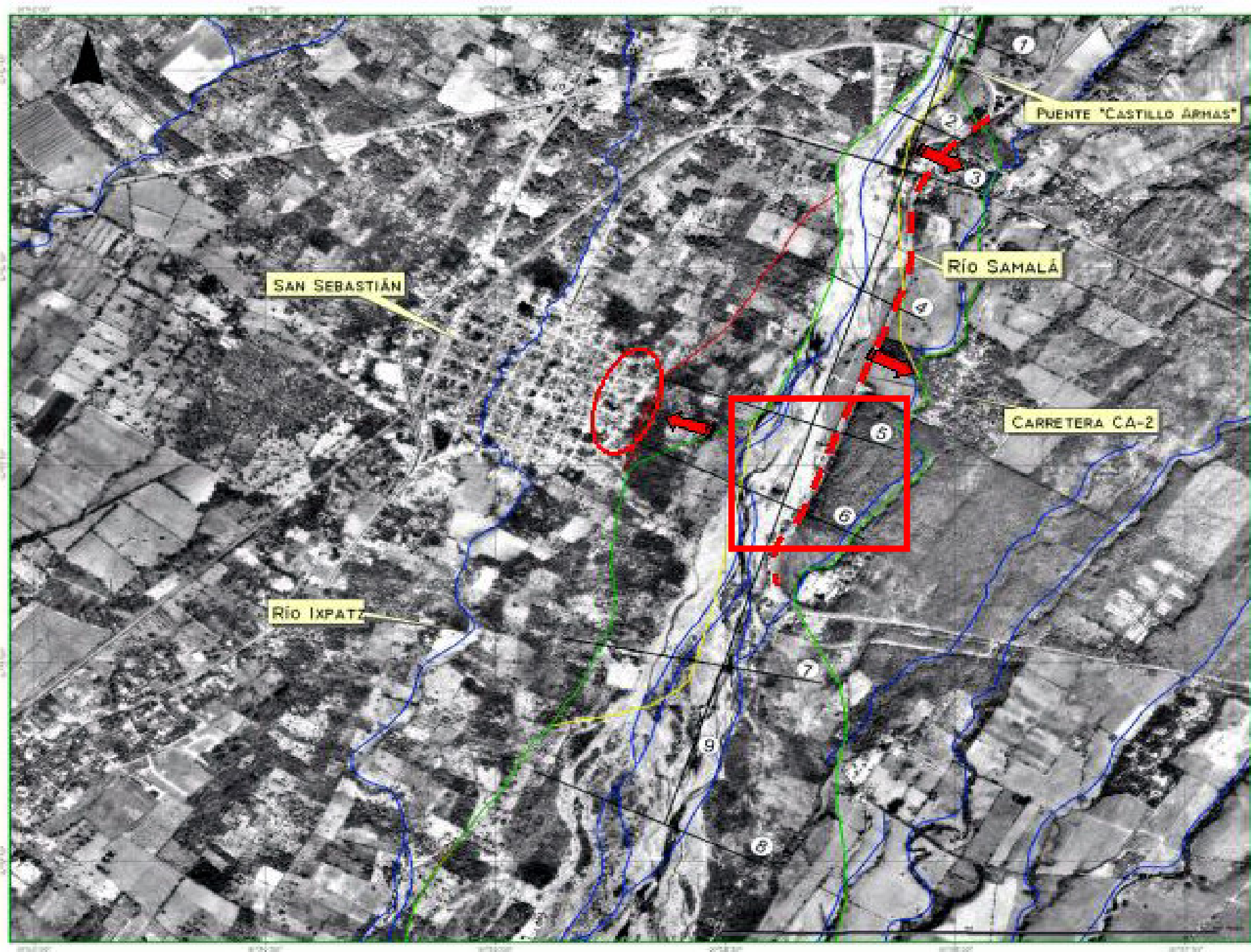
Francis

- Foto-in
- Trabajo
- Análisis

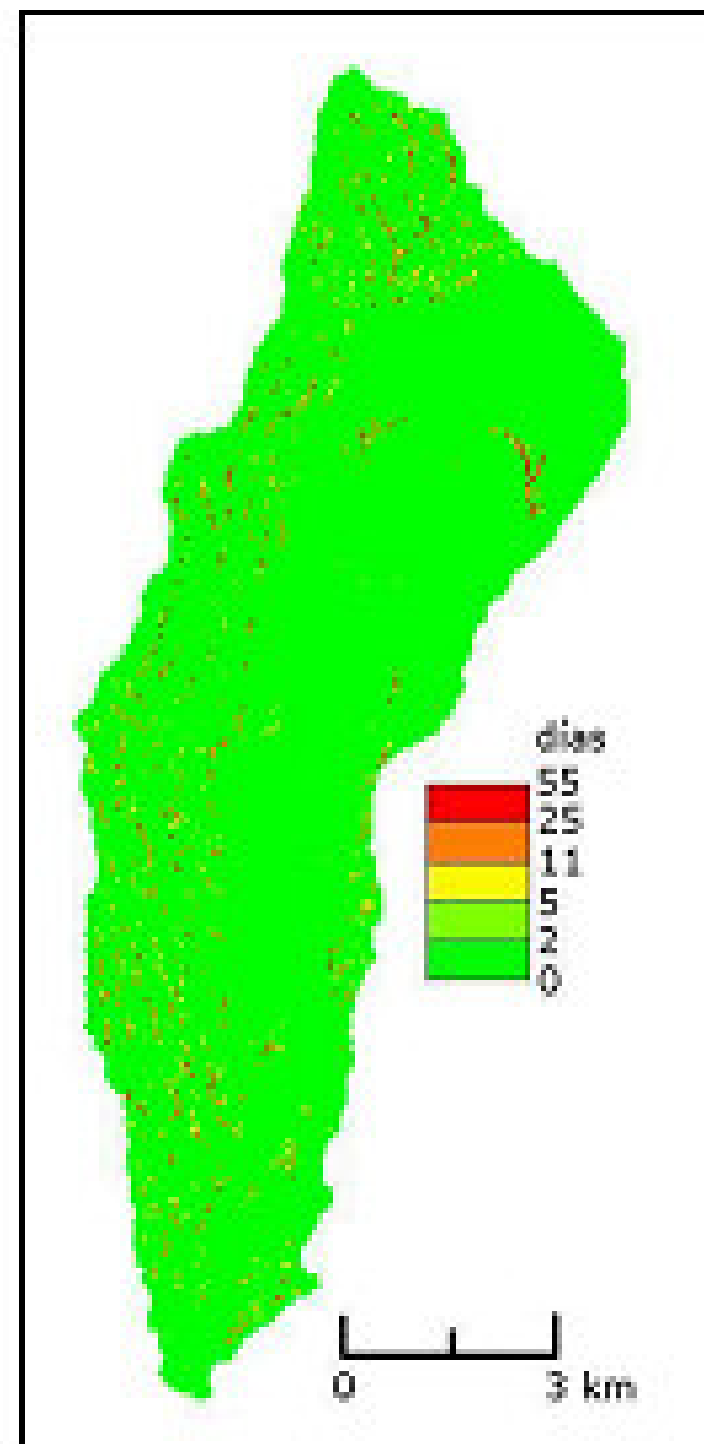
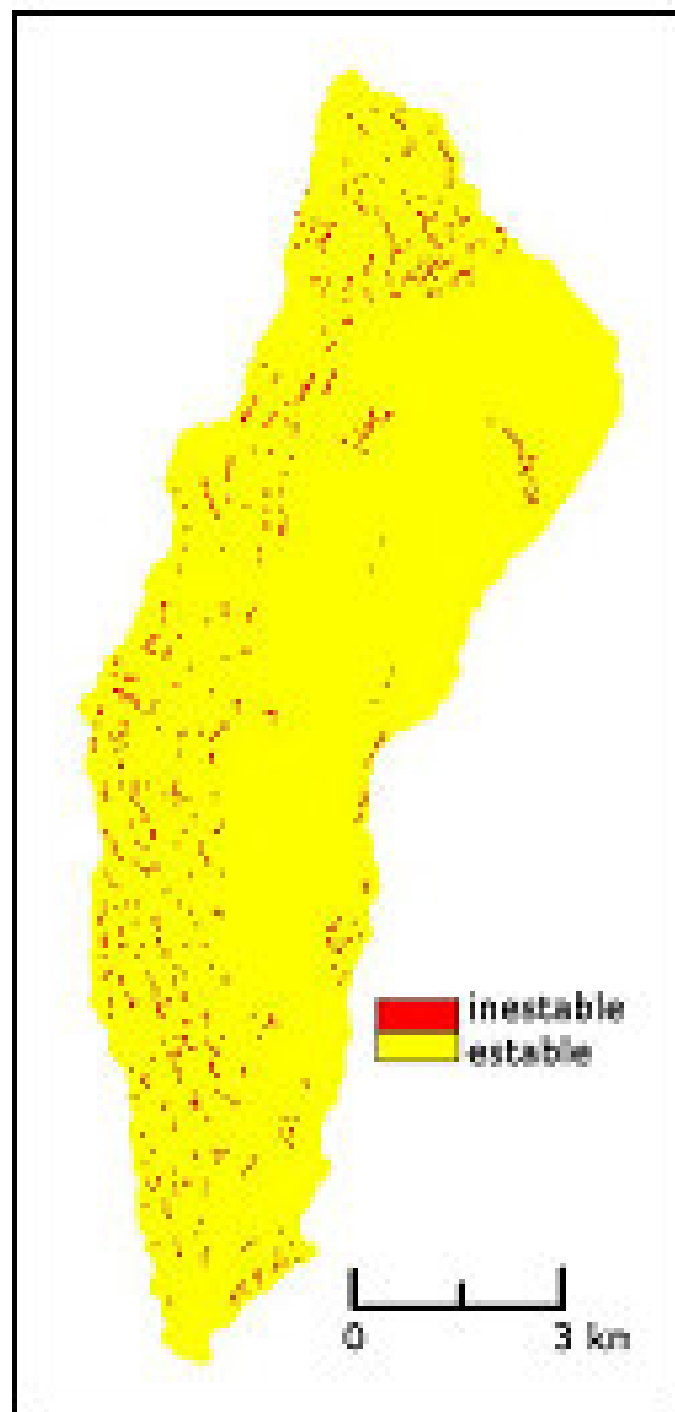
110: Deep and narrow river channels
111: Actual river course infilled by alluvial sediments
112: Riverbed infilled by alluvial and laharc sediments frequently flooded
121: High alluvial terraces
122: Medium-high alluvial terraces
123: Low alluvial terraces and floodplain
133: Lahar terraces related to the eruption of 1929
134: Lahar terraces related to the eruption of 1984
135: Flat to gentle slopes in lahar and pyroclastic flow fan, slightly dissected
135a: Flat to gentle slopes in old pyroclastic flows, mixed with lahar sediments
211: Fluvial scarps with active lateral erosion
212: Fluvial scarps without erosion
232: Flat areas covered by recent lahar deposits, composed of sands and gravels
234: Gravel and sand bars in the lahar flood plain
311: Structural-Denudational Slopes in old pyroclastic Deposits
312: Fault scarps
321: Footslopes covered with colluvial sediments, slightly dissected
322: Footslopes with active mass wasting; composed of volcanic material and colluvial sediments.
323: Moderately steep slopes in pyroclastic deposits from Santa Maria volcano, slightly dissected
324: Flow fan, composed of colluvial and volcanic detritus
331: Large scarps with active erosion
332: Large complex landslides
333: Landslide body
411: Lava flows pre-eruption 1902 from Santa Maria volcano. In the terrain, they form large and narrows ridges
412: Lava flows formed after 1902 eruption from El Brujo dome composed of dacitic. They form narrow lava fields with a southwest direction.
413: Recent lavas flows from El Caliente dome, related to different stages of eruptionThey form elongated and narrow ridges.
414: Moderate to steep talus slopes related to Santiaguito complex.
421: Moderate to steep slopes in oldest pyroclastic flows from Zunil volcano,highly dissected.
422: Moderately steep slopes, in pyroclastic flows ,formed before the eruption of 1902 of Santa Maria volcano.
423: Moderately to steep slopes in pyroclastic flows related to eruption 1902 Santa Maria volcano,slightly dissected.
424: Intervolcanic basin, filled with pyroclastic deposits, mixed with slope deposits.
425: Gentle to moderately steep slopes in pyroclastic deposits from Siete Orejas Volcano, moderately dissected.
425a: Steep slopes in pyroclastic deposits from Siete Orejas volcano, moderately dissected.
426: Slopes in pyroclastic flows of 1902 eruption of SantaMaria volcano.
431: Non-active Volcanic cone of Santa Maria volcano, highly dissected with steep slopes
432: Volcanic cones related to El Brujo, El Monje, and La Mitad domes composed of ashes, dacitic lavas and fragmental rocks.
433: Volcanic cone related to El Caliente Dome, formed in ash, dacitic lavas and fragmental rocks.
441: Main crater related to the 1902 explosion, with moderately to steep slopes and highly dissected
442: Secondary crater related to the 1902 explosion, with moderates slopes and highly dissected.
443: Steep crater walls, in loose volcanic materials (andesitic-basaltic fragmental rocks) highly dissected with rotational landslides
444: Currently inactive craters belonging to El Brujo, El Monje, and La Mitad domes, composed of ashes, dacitic lavas and fragmental rocks.
445: Currently active crater belonging to El Caliente Dome, formed by ash, dacitic lavas and fragmental rocks.





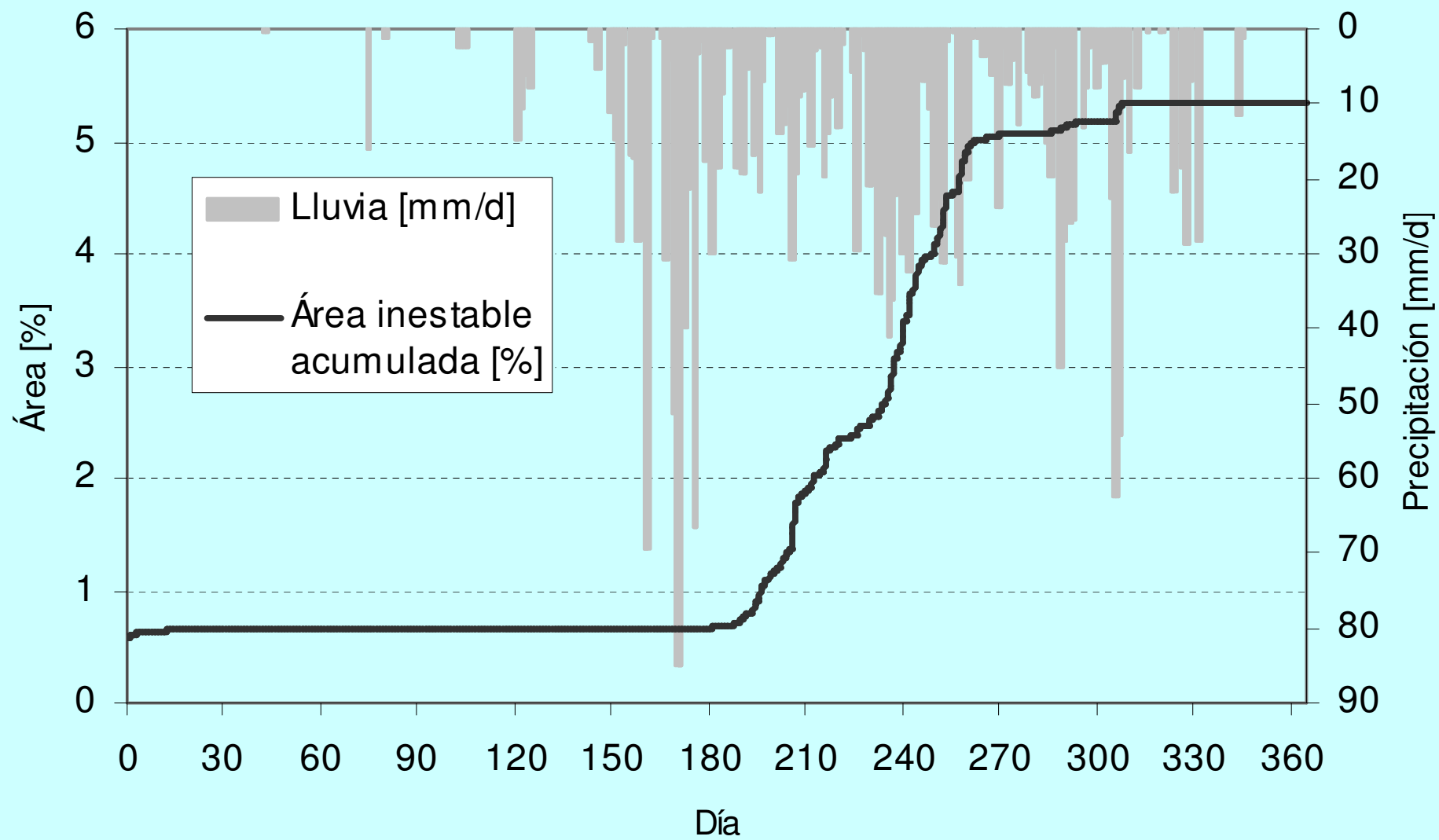


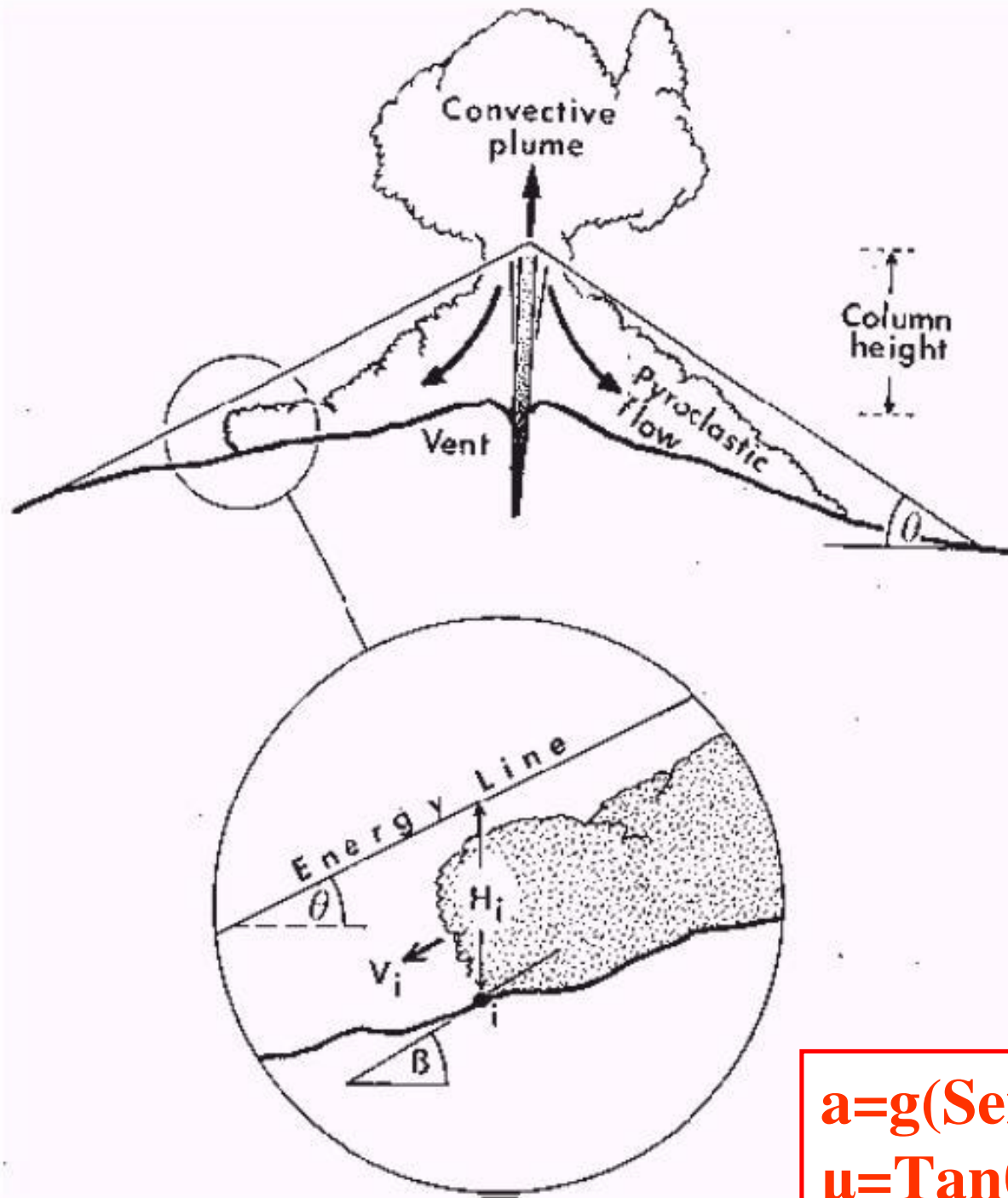




**Vista Aérea Nimá I (desde el Sur).
Cortesía Manuel Motta, INSIVUMEH.**



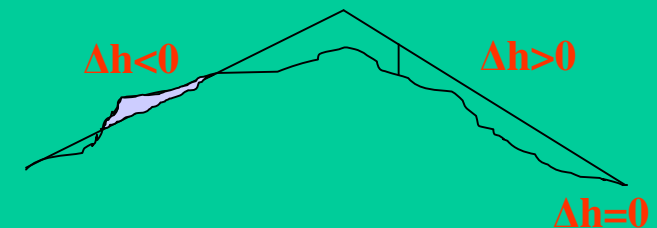




Fundamentos Básicos

H/L se determinan por mediciones de campo.
O volcanes similares?

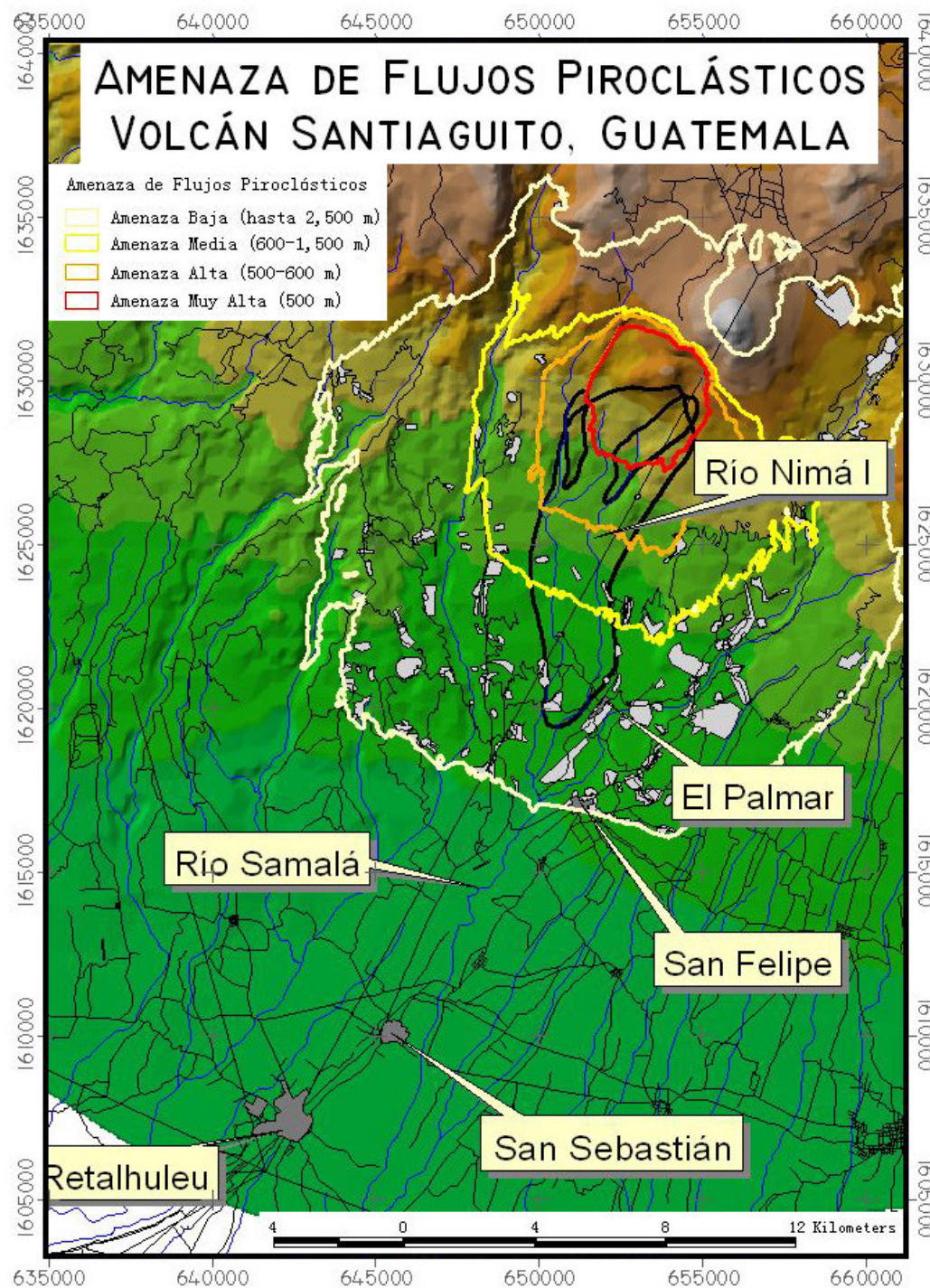
ΔH es la diferencia de altitud entre la “línea de energía” y el DTM.



Análisis común: círculo=cono intersectando plano
Análisis realístico: IRREGULAR.

$$a = g(\text{Sen}\beta - \text{Tan}\theta \text{Cos}\beta)$$

$$\mu = \text{Tan}\theta = H/L = \text{Coef. de Heim}$$



Resultados

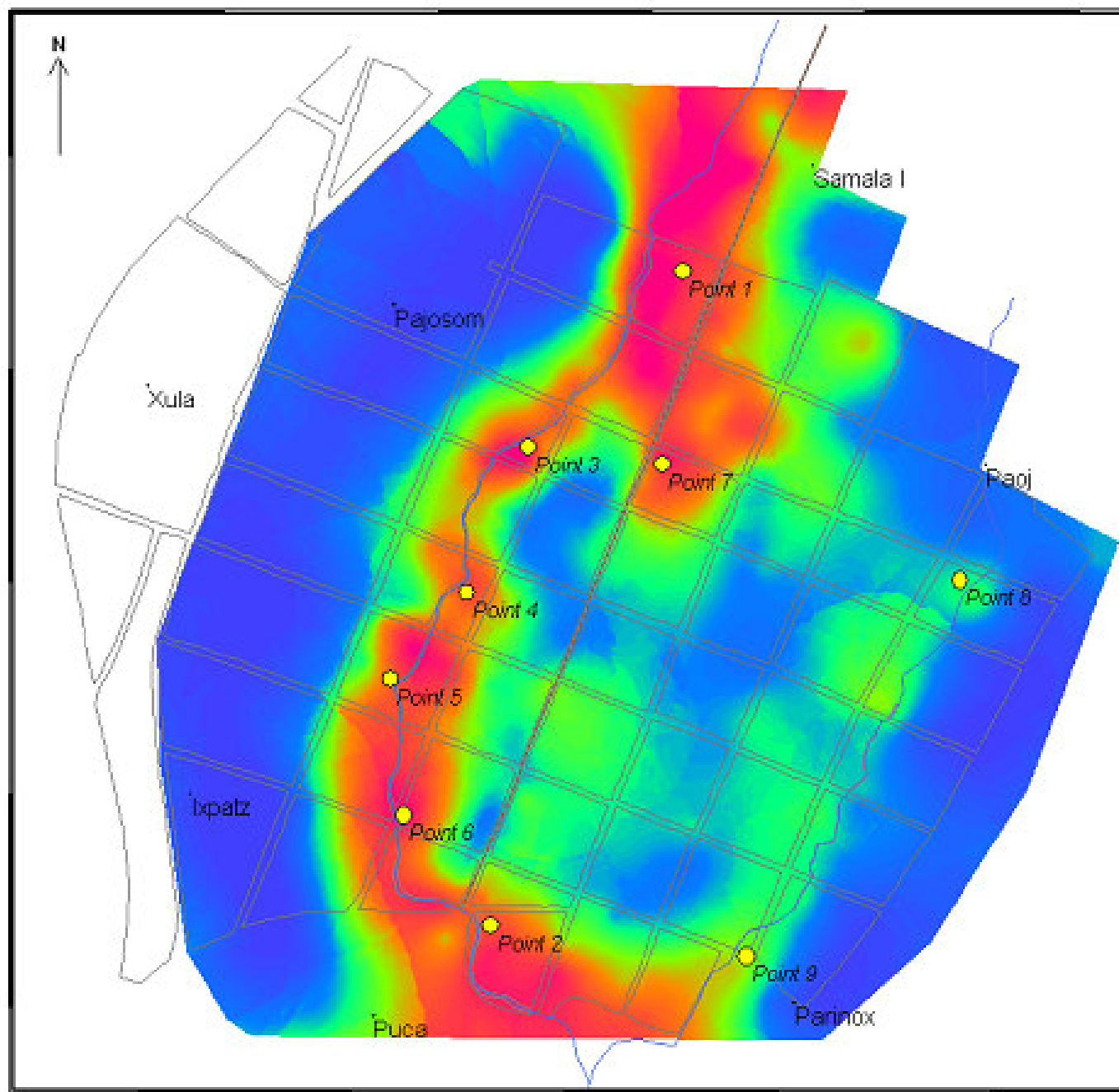
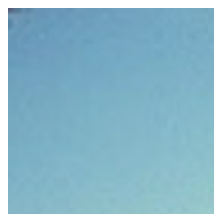
Amenaza alta-muy alta:
2 centros poblados=47 personas
Area “fuente” de material.

Amenaza media (amarillo):
19 centros poblados =
hasta 1,500 personas.
Zona de transición eventos
moderados (1929) y pequeños
(1973). Flujos de lava

Amenaza baja (amarillo claro):
>120 centros poblados ~
más de 40,000 personas.
Flujo piroclástico de 1929
(15 millones de m³)

Centros poblados mayores,
carreteras y Línea 60Kv.

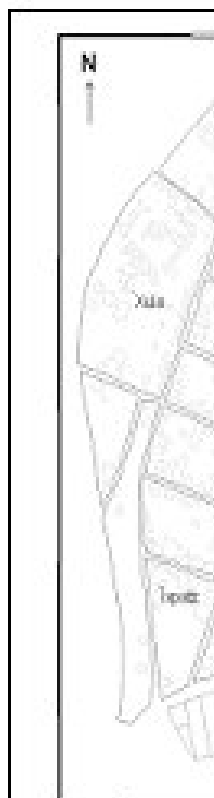


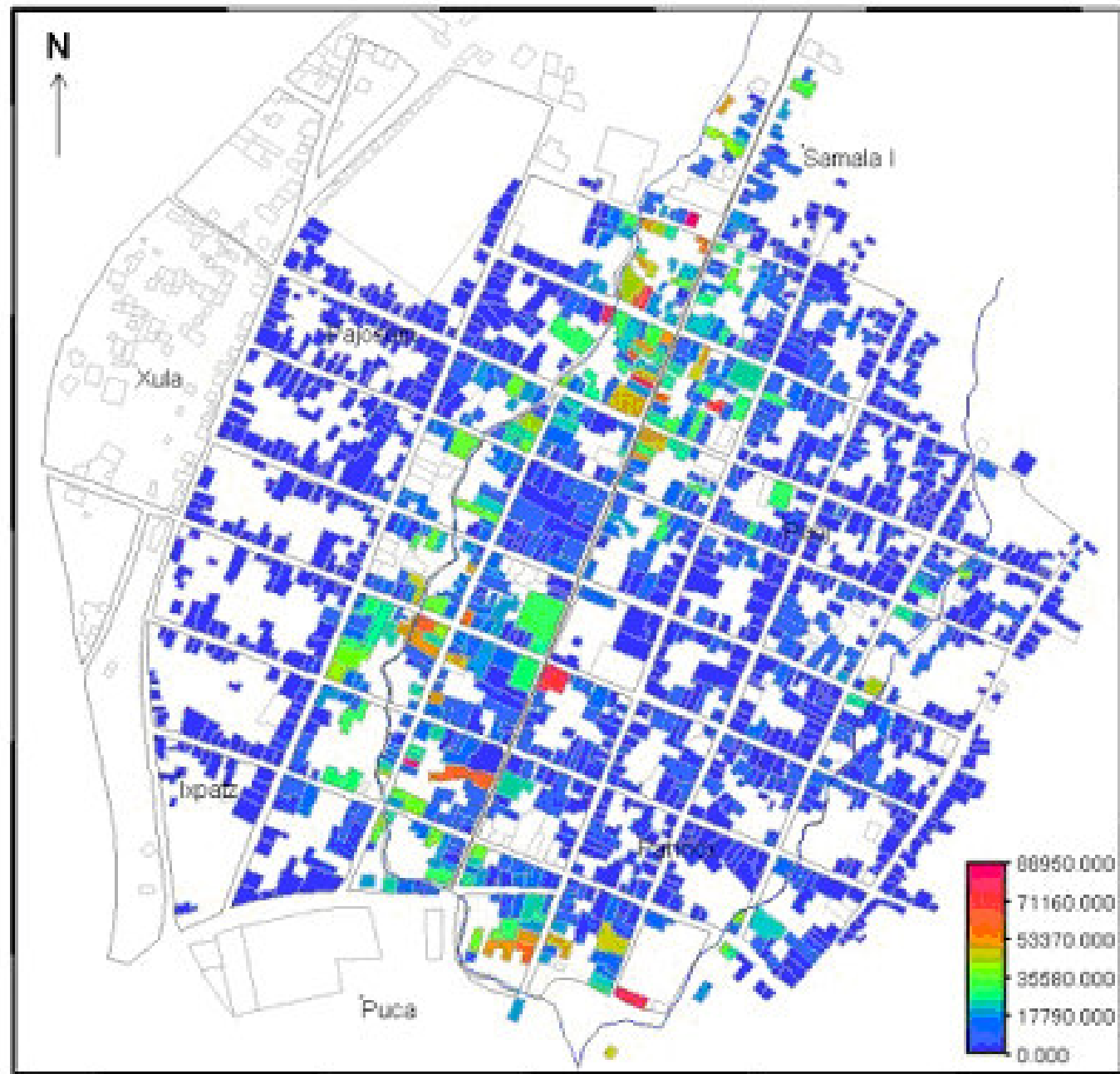
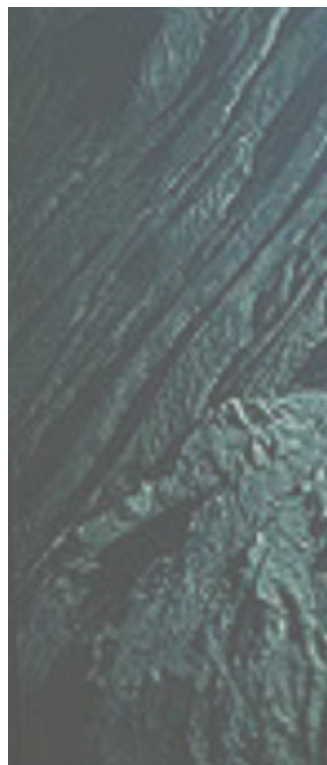
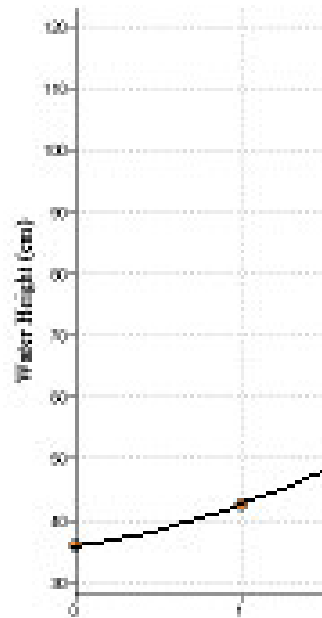


1610500

1 (m)

0
42
85
127
170





1610500

1610000

Daños Esperados Total

0 400



CONCLUSIONES.

- **Actividad volcánica cíclica:** maquinaria generadora.
- **Complejo Volcánico:** 1902, 1922, 1929, 1973, etc.
- **Temporada lluviosa:** lahares (Nimá I y II, El Tambor, y Samalá) e inundaciones (Samalá e Ixpatz). Inundación similar a la del Mitch (1998) puede producir pérdidas en edificios y contenidos de hasta 800 mil dólares más los acumulados en la red vial de hasta 500 mil dólares.

