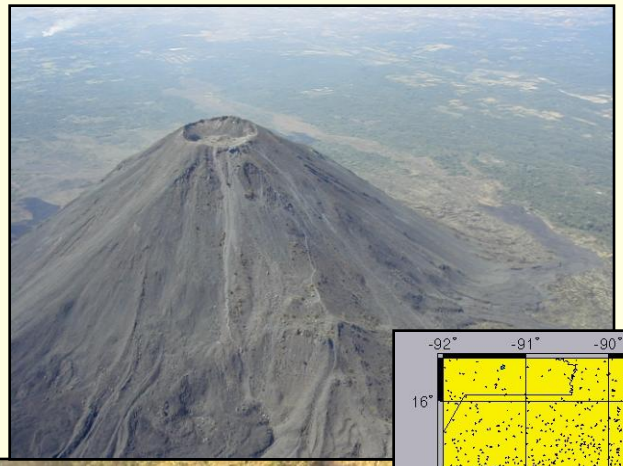
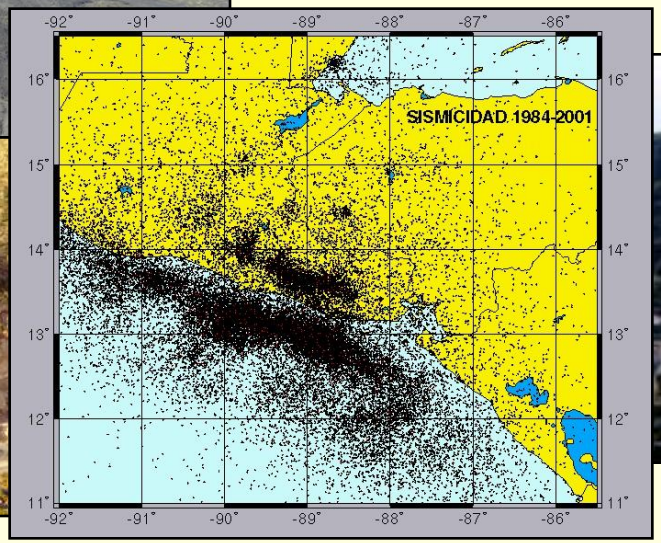
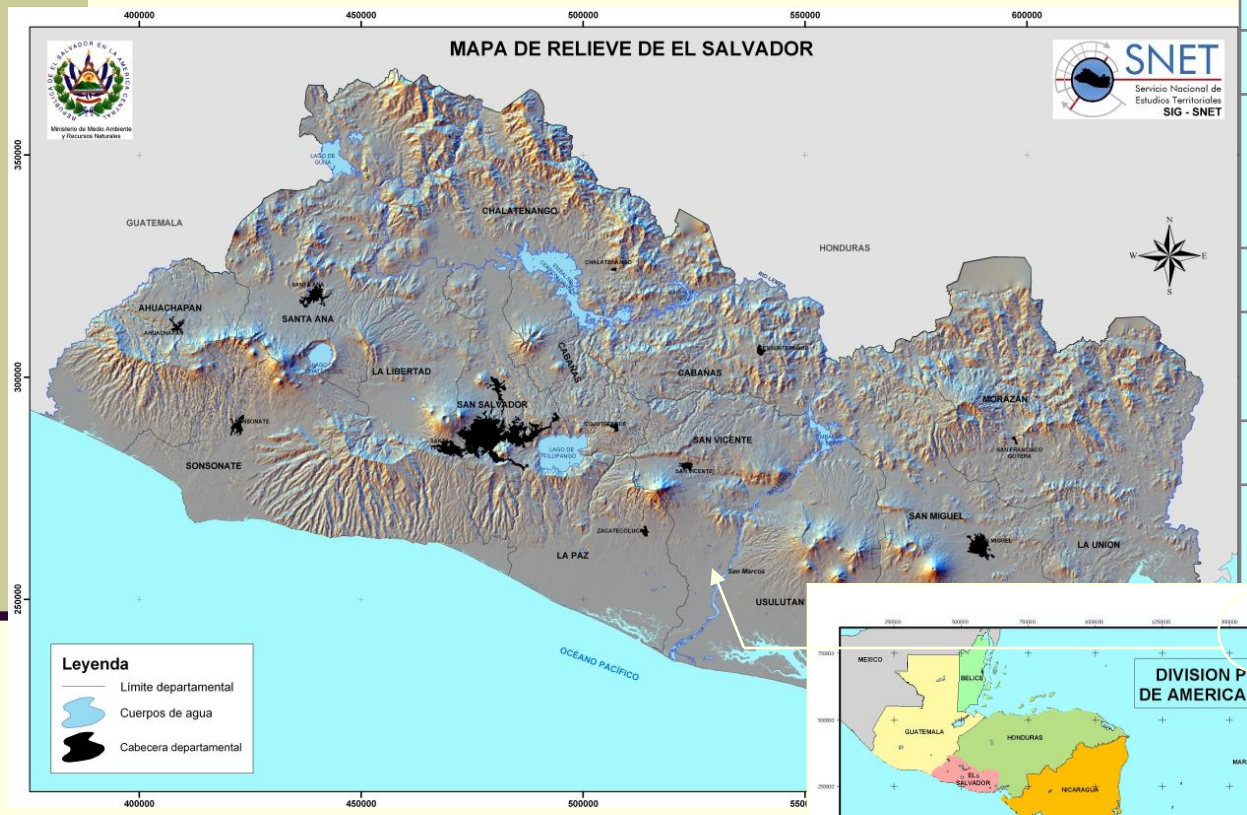
El Salvador

Risk Management and Early Warning System

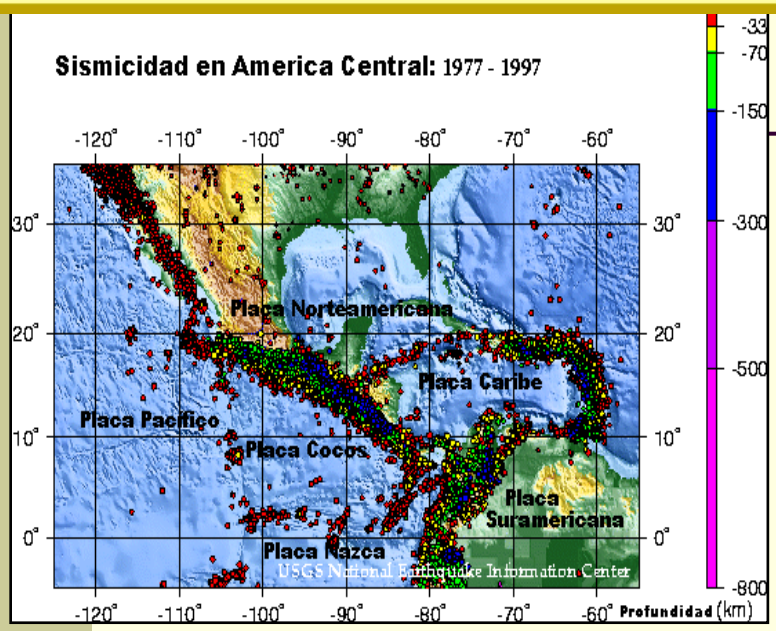


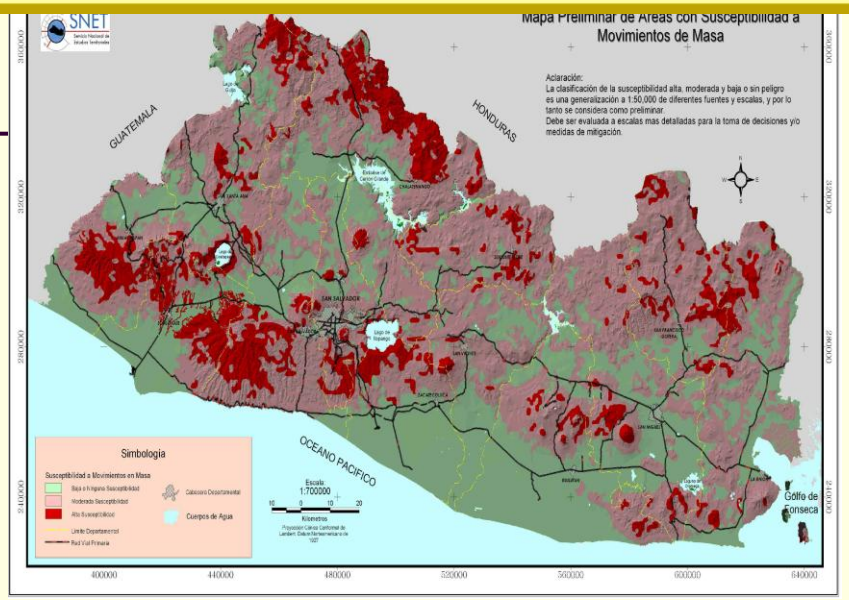


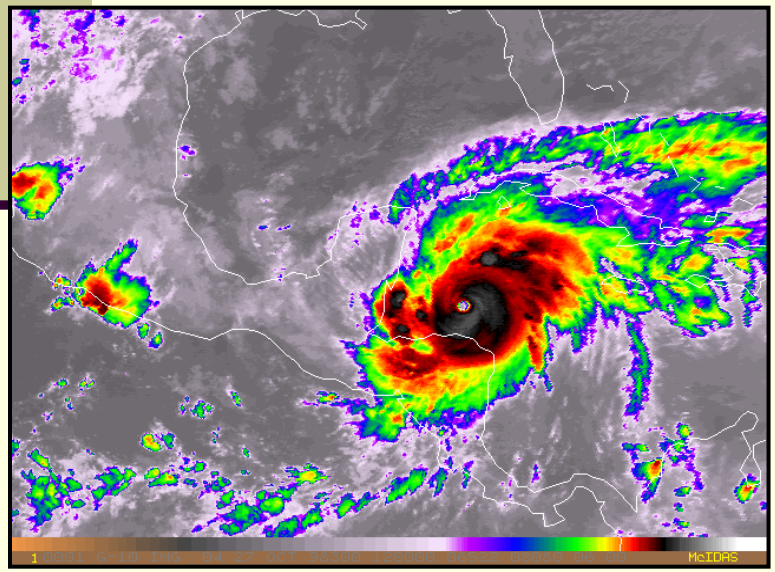
El Salvador General Data

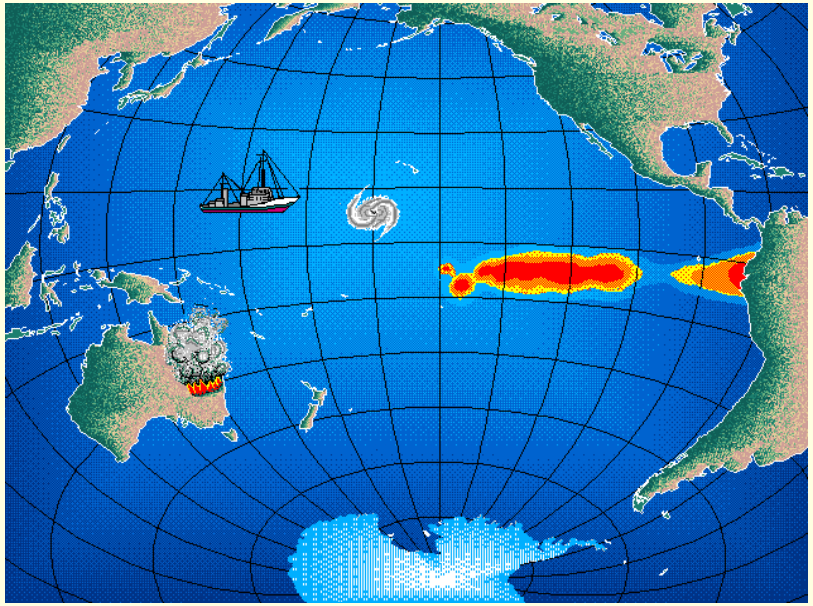


GENERAL DATA	
Land Extension	21,040.79 km^2
Population	6 Millions
Population density	285 inhabitants per scuare kilometer
Capital city	San Salvador
Important cities	Santa Ana and San Miguel
Currency	USD
Weather	Dry season: November-April Wet season: May-October

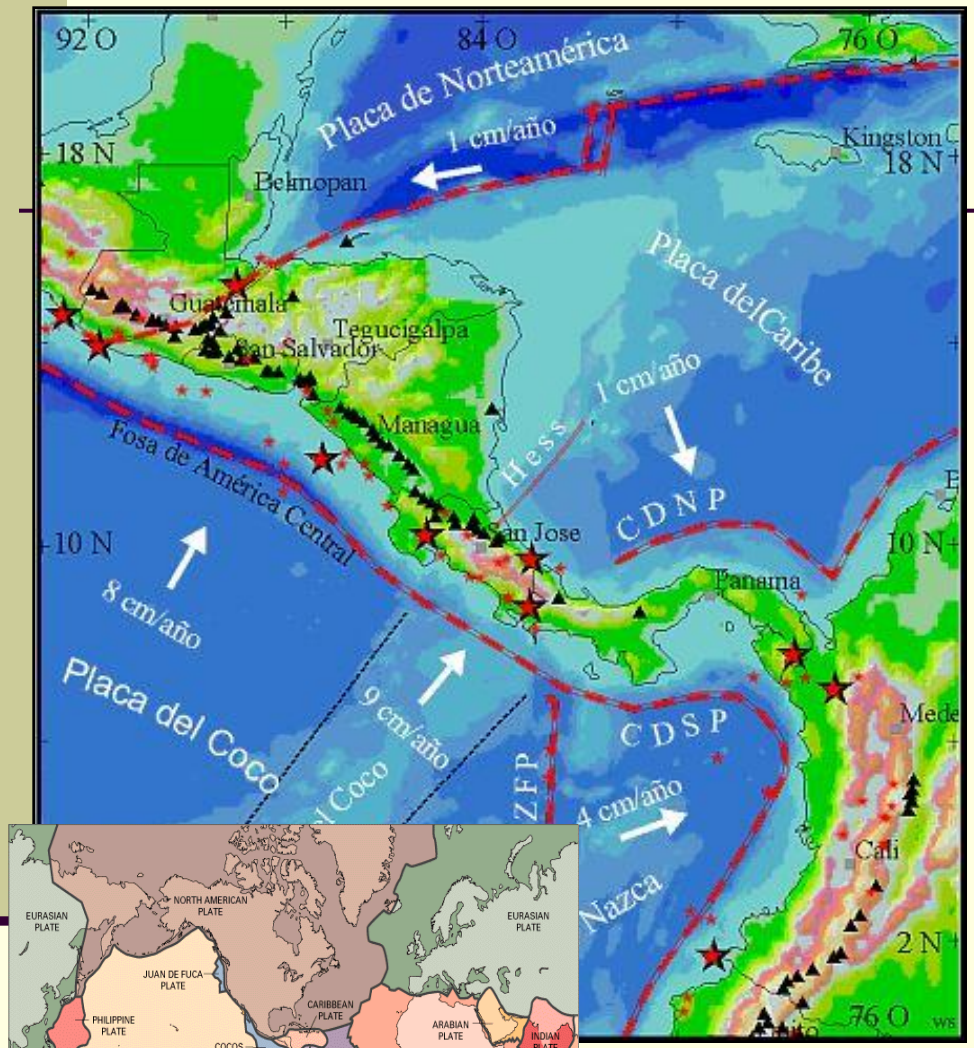

Sismicidad en America Central: 1977 - 1997
-120° -110° -100° -90° -80° -70° -60°
30° 20° 10° 0°
Placa Norteamericana
Placa Caribe
Placa Pacífico
Placa Cocos
Placa Suramericana
Placa Nazca
USGS National Earthquake Information Center
-33
-70
-150
-300
-500
-800
Profundidad (km)

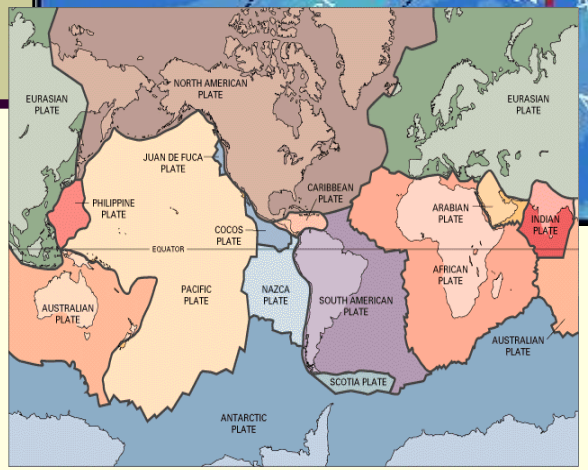

SNET
Mapa Preliminar de Áreas con Susceptibilidad a Movimientos de Masa
GUATEMALA
HONDURAS
OCEANO PACIFICO
Golfo de Fonseca
Simbología


McIDAS



Tectonics Plates

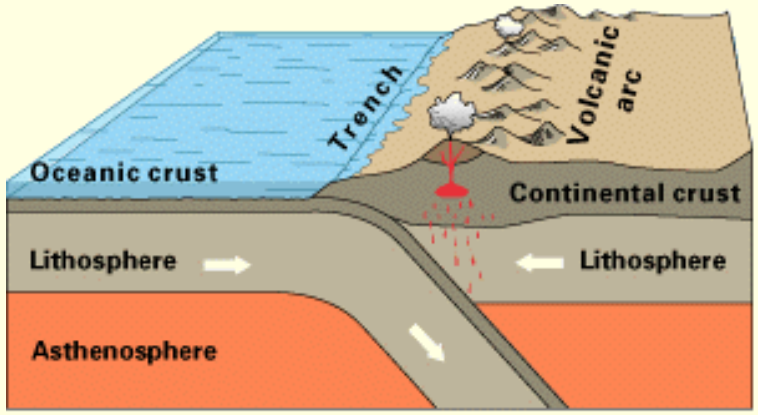




Central America Is located between:

- **Cocos Plate**
- **Caribbean Plate**

Subduction zone: oceanic plate collides with a continental plate



Oceanic-continental convergence

Earthquakes in El Salvador 2001

- January 13th 7.6 Richter
- February 13th 6.6 Richter

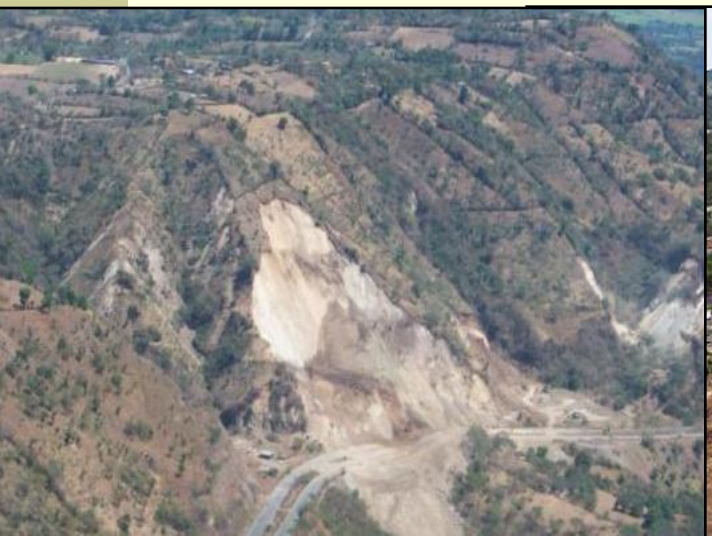
These Earthquakes had affected the whole national territory causing human losses and countless damages in infrastructures, mainly in working class housing in rural areas.

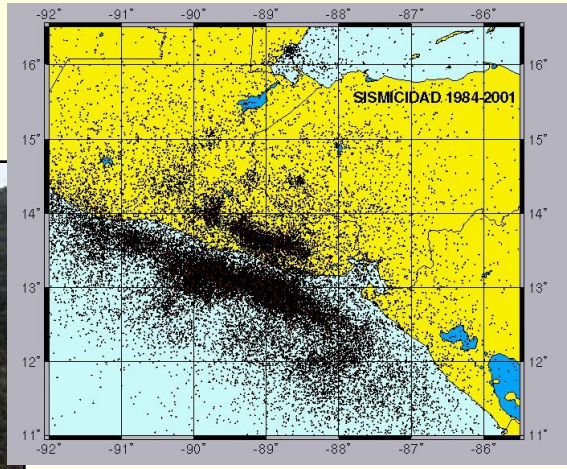
- Lanslide on Suburb Las Colinas in Santa Tecla
- About 536 dieds and about 300 destroyed houses

- **Landslide on the Panamerican higway, about 1 millon mt^3 of earth.**

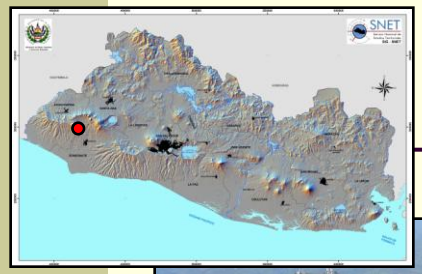
DEBRIS FLOW
Triggering factors

- Heavy Rainfall (humidity and high water content, acumulated rainfall)
- Seismic activity
  - Topography (moderate to high sloping)
  - Geology of the area.
  - Others…



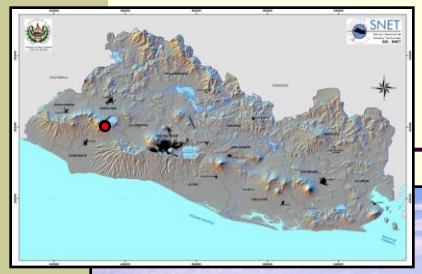


Apaneca Debris Flow 2005

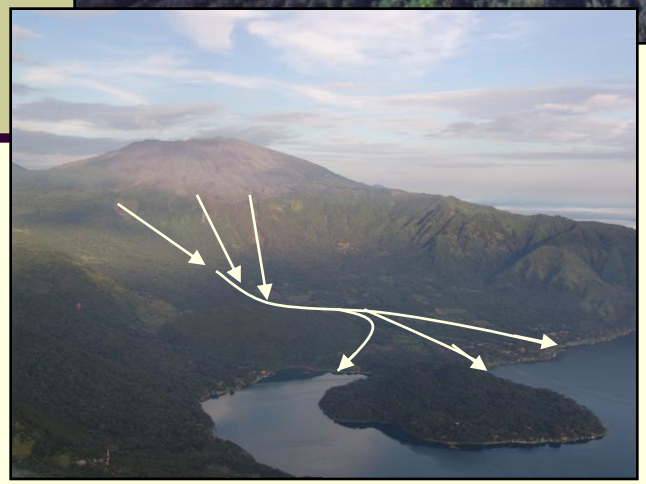


- June 26 de 2005.
- Cerro de Apaneca, West El Salvador.
- 7 Debris Flow
- Volume 5,000m3.
- Heavy rainfall, 180mm in 7 hours
- 4 lives lost and several houses destroyed

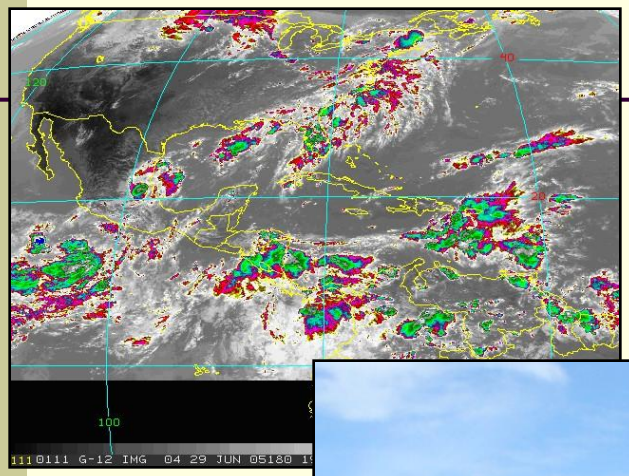
Santa Ana Debris Flow

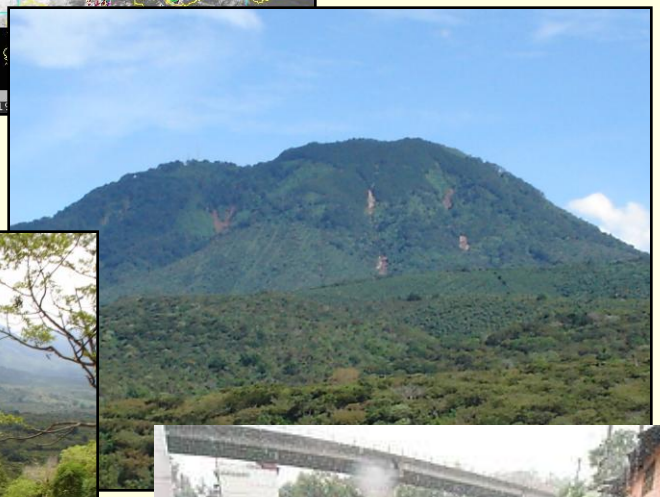


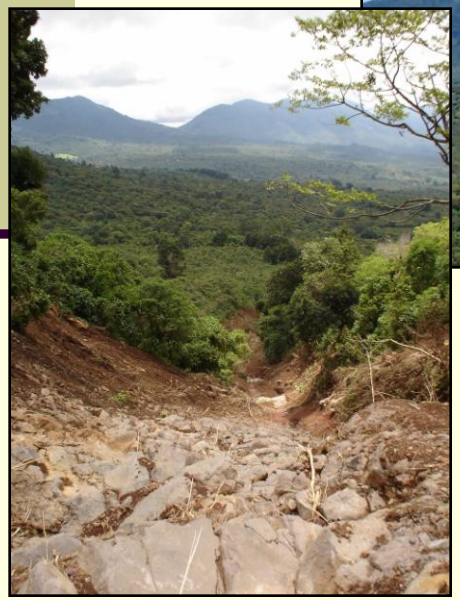
- October /2 /2005.
- Santa Ana volcano.
- Volume = 450,000 m3
- Eruption + Stan hurricane.
- 300 mm of rain in 24 hrs.
- Volcanic Ash, rocks and organic material such are trees, branches, etc
- the debris flow travel 7 km from its source to lake Coatepeque
- Several houses destroyed and damaged



Rainy Season (May to Octuber)







Convective rainfall: Localized Hight intensity event that occured in short period of time aproximately one Hour

They are associated with the displacement of the tropical wave over Central America and caribbean.

The Average daily rainfall in the country is about 50mm, if the tropical wave is very active till 150mm in specifics areas.

TYPES OF FLOODS IN EL SALVADOR

- a) **Floodplains:** Floods in the lowest part of the basins of medium and big rivers : Caused by "temporales", hidrometeorological events as Hurricanes in the Caribbean. (Sept-Oct)

- b) **Flashfloods:** Floods in basins of rapid responses: Caused by highly convective precipitations - intense and localized - 2 -3 hours of duration. (May – June)

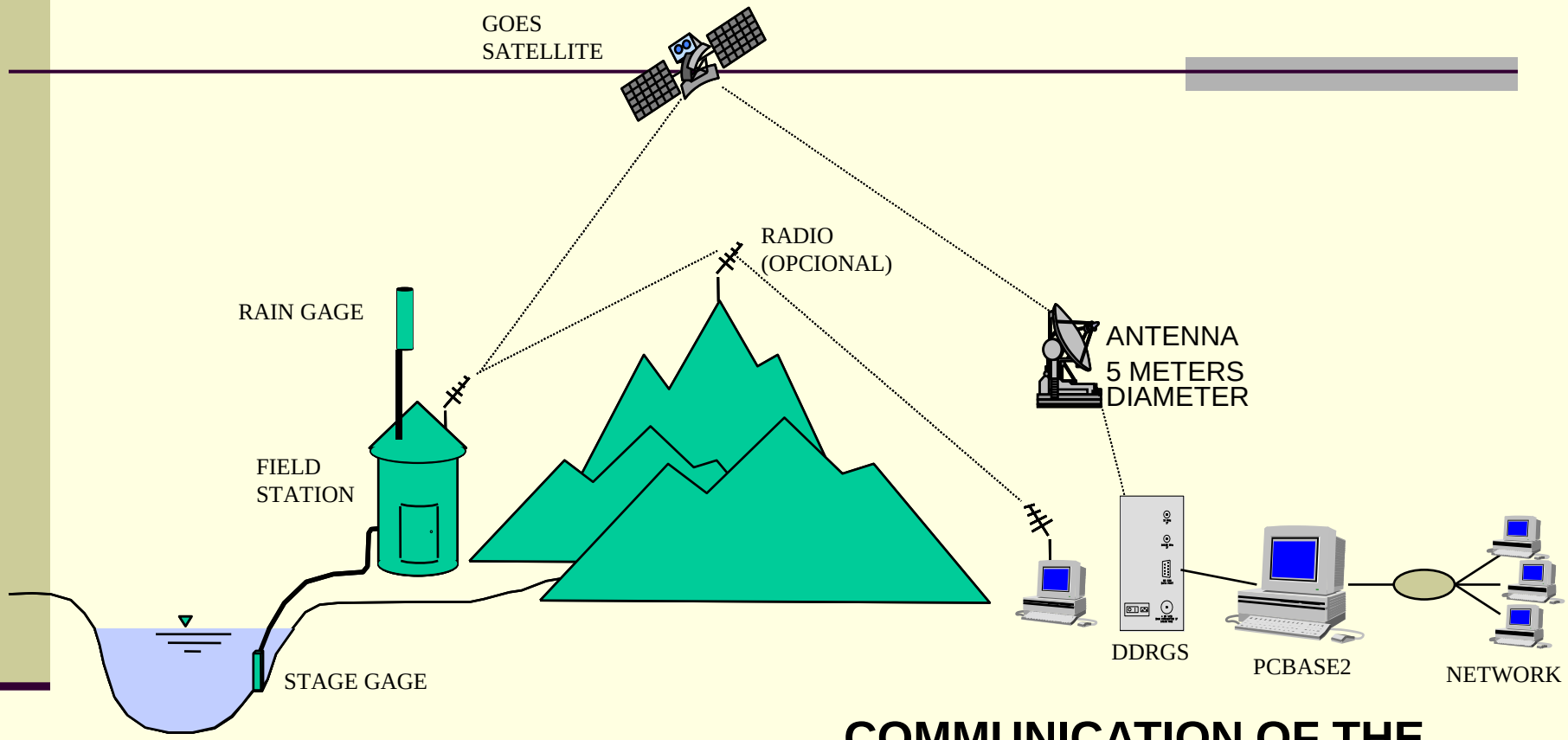
c) Floods in urban Basins also caused by highly precipitations (convectives rainfalls). The problems is generated by the poor efficiency or limitations in the system of urban drainage, works without control in riverbeds, excess of solid garbage in the drainage and urbanization process

Early Warning System

1. Monitoring Natural Phenomena
2. The institutional and community early warning network

Everytime 24/7

SCHEMATIC DATA FLOW FROM THE STATIONS



The river water level is automatically monitored and the information is sent directly to a satellite which immediately sent the data to SNET.

COMMUNICATION OF THE INFORMATION:
SOCIAL NETWORK, INTERNET, TELEPHONE,
RADIO, FAX, ETC.

LOCAL MONITORING, FEEDBACK AND COMMUNICATION OF THE ALERTS

The social network includes a representative number of citizens, local and communal leaders, decentralized governmental institutions (Health Units, schools), Civil National Police, Navy Forces, Military Headquarters, Municipalities, NGO's.

They have 2 roles:

1. Who is located at the upper basins support the monitoring of the hydrometeorologic variables – feedback of what we are observing in real time at SNET.

2.Who lives at the flood areas has to communicate the information coming from Emergency Committee and SNET – Feedback about the impacts of the events.

SOCIAL NETWORK

To develop their roles, they are being trained to observe and interpretated the information and also to interpretated correctly the warnings emitted by the national entities.

THANKS

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