Central America Seismological Center (CASC)  
Building regional capacities  

and  

University of Costa Rica  
Institute of Electricity  
Building national capacities  

Dr. Mauricio Mora Fernandez  
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Central America Seismological Center (CASC)

1992 to 2009-09

Dr. Mauricio Mora Fernandez
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1. CASC started to operate in 1992. At that time, it moves from one country to another. It was created with the support of Norway, through NORSAR, University of Bergen and CEPREDENAC (Centro para la Prevencion y Mitigacion de Desastres Naturales en America Central).

2. Since May 1998, the Region decided to stop moving CASC and leave it in Costa Rica, at the Escuela Centroamericana de Geología of the Universidad de Costa Rica which also operates the Red Sismologica Nacional (RSN: ICE-UCR).

3. By that time, the Region also decided to leave the Central American Tsunami Warning System at INETER in Nicaragua.

4. Primary objectives:

   • Locate automatically events with magnitude $\geq 4.0$ with all stations of the area and make a preliminary report in almost real time. (Not fully accomplished because of problems of connectivity).

   • Compile a permanent database for research and other applications. (OK)
Partners (1)

Guatemala:
Instituto Nacional de Vulcanología, Metereología e Hidrología, INSIVUMEH

El Salvador:
Centro de Investigaciones Geofísicas, GIC, now SNET
Servicio Nacional de Estudios Territoriales.

Honduras:
Universidad Nacional Autonoma de Honduras, UNAH

Nicaragua:
Instituto Nicaraguense de Estudios Territoriales, INETER
Partners (2)

Costa Rica
Red Sismologica Nacional, Universidad de Costa Rica, (RSN: UCR-ICE)
Instituto Costarricense de Electricidad, ICE
Observatorio Vulcanológico y Sismológico de la Universidad Nacional, OVSICORI

Panamá
Instituto de Geociencias de la Universidad de Panamá, Panamá, UPA
DATA PROVIDED BY THE REGIONAL NETWORKS FROM 1992-01 TO 2009-09

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Network code</th>
<th>N° of events shared</th>
<th>N° of waveforms</th>
<th>Waveforms used in CAM</th>
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</thead>
<tbody>
<tr>
<td>Costa Rica (UCR)</td>
<td>RSN</td>
<td>76020</td>
<td>32350</td>
<td>14364</td>
</tr>
<tr>
<td>Nicaragua (INETER)</td>
<td>NIC</td>
<td>33997</td>
<td>28106</td>
<td>10924</td>
</tr>
<tr>
<td>El Salvador (CIG) y (SNET)</td>
<td>SAL</td>
<td>74664</td>
<td>32302</td>
<td>14745</td>
</tr>
<tr>
<td>Panamá (UPA)</td>
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<td>7523</td>
<td>5350</td>
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<td>Panamá (CHIRIQUI)</td>
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<td>1400</td>
<td>2337</td>
</tr>
<tr>
<td>Guatemala (INSIVUMEH)</td>
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<td>20324</td>
<td>10102</td>
<td>9170</td>
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<td>Honduras (UNAH)</td>
<td>HON</td>
<td>5087</td>
<td>3900</td>
<td>3841</td>
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<tr>
<td>Costa Rica (ICE)</td>
<td>BOR</td>
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<td>1021</td>
<td>768</td>
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<tr>
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<tr>
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<td>3012</td>
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<td>México (UNAM)</td>
<td>CUIG</td>
<td>0</td>
<td>105</td>
<td>101</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>229267</strong></td>
<td><strong>123029</strong></td>
<td><strong>84552</strong></td>
</tr>
</tbody>
</table>
Map of the first stations (since 1998) from which CASC have received data, now there are more...
The CAM database has a total of 28,519 events which are reported to the ISC (International Seismological Center) database.
From the 28,519 events, 15,975 have magnitudes ≤ 3.9 and are located with data of at least 2 countries.
The data has been used for...

- Research.
- Regional studies of seismic hazard.
- We keep the original database for each country. So, it is also a very important backup for those countries that for any reason lose their databases...
PROYECTO RESIS II
Evaluación de la Amenaza Sísmica en Centroamérica

Informe preparado por:
Guatemala: Enrique Molina
El Salvador: Griselda Marroquín
Honduras: José Jorge Escobar
Nicaragua: Emilio Talavera
Costa Rica: Wilfredo Rojas y Álvaro Climent
Panamá: Eduardo Camacho Astigarrabia
España: Belén Benito
Noruega: Conrad Lindholm

Abril de 2008
Figura 4. Zonificación sísmica a detalle nacional. Zonas corticales superpuestas a la sismicidad superficial, con epicentros de sismos para profundidad h < 25 km.

Figura 4.19 Modelo en perfil de zonas sísmicas en profundidad. Mw es la magnitud máxima esperada, Nz es el número de zonas locales asociadas a la región sísmica, b es el índice sísmico característico de la región sísmotectónica.
In Costa Rica, the results were officially delivered to the:

3. Civil Protection authorities.
This example means that:

- It is possible to do things together.
- Specially when we have foreign support.

But the point is:

1. When does Central America will be able to make things by itself?

2. What do we need to reach that goal?
The problem is not simple:

- We have different kinds of limitations at each country (social, political, economical, technological …).

What might be needed?

- Improve technology.
- A better scientific formation of the personnel and adequate working conditions (good salaries, budget for equipment, research, …)
- More coordination and collaboration among countries of the region and from outside.
- Move CASC to another level through international cooperation?
- Better politicians? THAT’S A DREAM!!!
Building national (interinstitutional) capacities in Geological Sciences, Seismology and Seismic Engineering:

1. Central American School of Geology (ECG): Provides formation in Geological Sciences at undergraduate level. It also has a graduate programs (Master level) in Hydrogeology and in Risk Management.

2. The ECG also operates the National Seismological Network (Red Sismologica Nacional: RSN) in collaboration with the National Institute of Electricity (ICE).

3. Laboratory of Seismic Engineering (LIS) operated by Engineering Research Institute.

4. Recently the UCR created the Geological Sciences Research Center (CICG).
UCR (24 short and 10 BB + 15 coming soon) + ICE (>50 short period) + LIS (~33 Acc)

http://rsn.geologia.ucr.ac.cr
http://www.lis.ucr.ac.cr/
Seismic Engineering Laboratory
Accelerometers network
UCR (24 short and 10 BB + 15 coming soon) + ICE (>50 short period) + LIS (~33 Acc)
Figura 1: Mapa con ubicación de Estación Sismica ICCO en Isla del Coco
P.H. BORUCA
Total de estaciones sismológicas: 8