

 Pontificia Universidad Católica de Chile

# International Cooperation on Earthquake Disaster Management to Protect Lives

Raúl Alvarez Medel, Pontificia Universidad Católica de Chile.  
*Credits for Photos and Information: Faculty, Students, WW Web, Onemi, Other Universities, own.*

## UNESCO – IPRED5 Workshop

27 June 2012, Tokyo, Japan

Structural and Geotechnical Engineering

 Chile, un país con múltiples amenazas





Seismic /  
Earthquake



Volcanic  
Eruptions

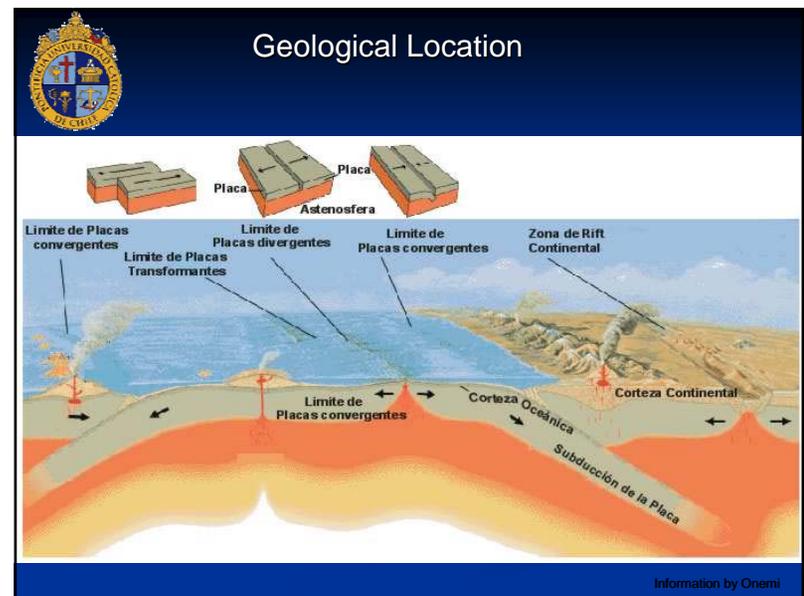
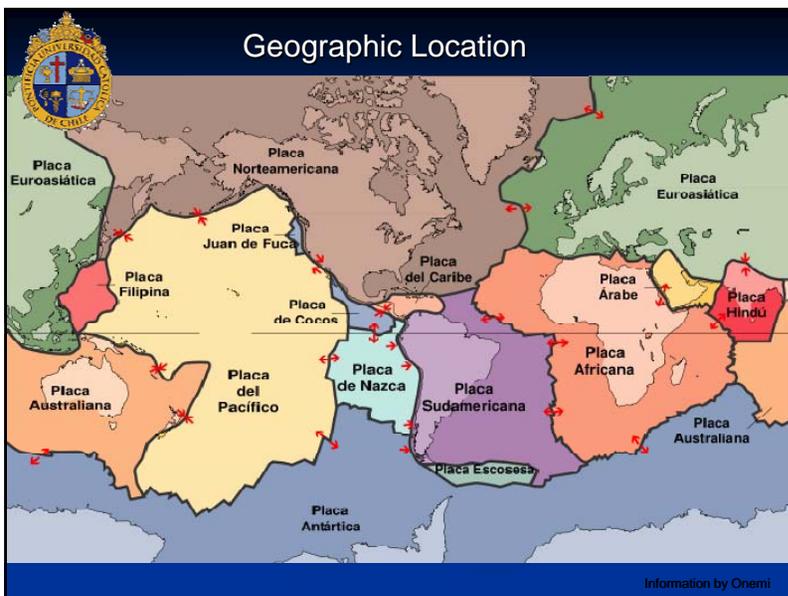


Tidal waves /  
tsunamis



Flood /  
drought

Information by Onemi

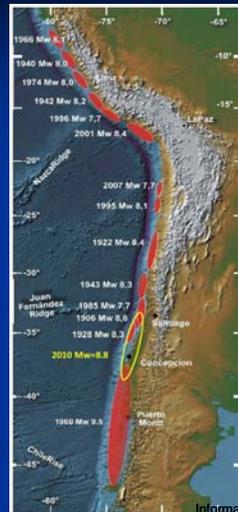




## Footprint historic earthquake in Chile

### Earthquakes

- About 90 earthquakes since 1570
- 200 earthquakes per day (between perceptible and imperceptible)
- Greater magnitude earthquake recorded in the world



Information by Onemi



## Footprint historic earthquake in Chile

Earthquake, Santiago 1647



El terremoto del 13 de Mayo de 1647



Earthquake, Valparaíso 1907

Information by Onemi



## Footprint historic earthquake in Chile

Earthquake, Santiago 1985



Earthquake, Cauquenes 2010

Information by Onemi



## Experiences of the last earthquake

### Government and Institutions

- Lack of coordination between different Government Departments, Onemi, Shoa, Regional Governments, Municipalities.
- The institution that was closer to disaster management, was not up to the circumstances (Onemi). It was overtaken by events.
- Personnel in charge of management, did not have enough technical competence, and autonomy, and budget according to circumstances.



## Experiences of the last earthquake

### Government and Institutions

- Overlay of political power over the technical. It was not clear chain of command, there was obstruction of orders between technicians and politicians during the emergency.
- There was no communication between government institutions and expeditious transport to assess the situation.
- Dual power. Example Onemi-Shoa. Sometimes pointed out different things. Different protocols.



## Experiences of the last earthquake

### Government and Institutions

- The buildings of some government institutions were destroyed during the earthquake or tsunami, so there was no basis from which to coordinate.
- Lack of unique methodology of evaluation of structures after the earthquake, so that the interpretation of the data was very difficult.
- Local pressures were accepted to build in areas unsuitable (poor soil, areas affected by tsunami, etc..). Lack of strong and consistent policy of the Municipalities and the Government



## Experiences of the last earthquake

### Government and Institutions

- It depends on the willingness of other institutions like the U of Chile, but have other purposes.
- Absence of a crisis management plan internalized in the population, where tsunamis be taught drills, earthquake drills, where to evacuate, have places to take in people injured, define where welcome, hopefully with insulation systems or energy dissipation that were operational after the earthquake.



## Experiences of the last earthquake

### Government and Institutions

- Delayed reaction of political power to establish strict protection measures for civility against looting and vandalism.
- None of the tsunami early warning.
- Serious problems in mobile communication during the crisis.
- Concentration of knowledge in the capital.
- Great extension of the country and affected areas.



## Experiences of the last earthquake

### Of Civility

- Lack of volunteers to assess the damage after an earthquake
- Using materials not suitable even for a seismic country like adobe.
- Auto building without control.
- Lack of coordination and management of civility to the crisis in some areas.
- Acceptance of economic structural solutions from non-seismic countries, very easily.



## Experiences of the last earthquake

### Equipment

- Lack of proper equipment, in order to have a monitoring of the country (accelerographs, seismographs, equipment at sea), considering the vast extension of the country.
- Lack of maintenance of existing instruments, for lack of funds and lack of qualified personnel, especially outside of Santiago.
- Data from the few devices that work are not accesibles the scientific community, so you have the information months or years of delay.



## Implement Improvements

### Government and Institutions

- Completely restructure the ONEMI, giving emphasis in management. Change its organic law. Major institutional change.
- Provide it with sufficient budget.
- Empower them against the conjunctural political power.
- Professionalize their members and provide them with professional training in seismology, volcanology, tsunami experts, engineers, seismic, etc.
- Develop a strong research area in all subjects listed above.



## Implement Improvements

### Government and Institutions

- Create an early warning network nationwide, with sufficient resources to operate and maintain, with appropriate staff in evaluating the information obtained.
- Knowledge permeate the province.
- Share this information with local and international scientific community.
- Ensuring the continuous operation of the communication network at the country level, citizen.



## Implement Improvements

### Government and Institutions

- Implement a quick inspection of structures and create and coordinate a volunteer at the country level for implementing disaster.
- It seems obvious, but provide the necessary budget to function and operate as indicated in the course of time.
- In schools the curriculum incorporate the issues of natural disasters.
- Crisis management education to the population.



## Tips to Japan and UNESCO

- Share positive experiences in institutional issues, management and monitoring of successful countries.
- Exchange of technical personnel and experts in risk management, methodologies, studies of human behavior in emergencies, etc.
- Help create a critical mass of experts in each area of risk, to permeate this knowledge throughout the country.



## End of Presentation



Thanks