

**Workshop to improve the compilation of reliable data on disaster  
occurrence and impact**

**Proventium Consortium, CRED, UNDP**

**April 2-4, 2006, Bangkok**

## **Regional/country experiences with DesInventar in Latin America**

**www.desinventar.org**

**Cristina Rosales**

**cristina@desinventar.org**



**LA RED**

# Methodological aspects

- There is a great dependant relationship between little and big disasters. The first ones can became in a alarm warning system of those big ones.
- Frequency of occurrence and representation scale seems to be the main problems to allow dispose of an entire dimension of disasters at every scale considered.
- The efforts to take an account the effects and losses associated to disasters have been of interest of governments,

The proposal that LA RED have been developed in the last 8 years is interested put in service of the communities, local and national governments, and also international organizations a data base that have at least the following 4 main characteristics:



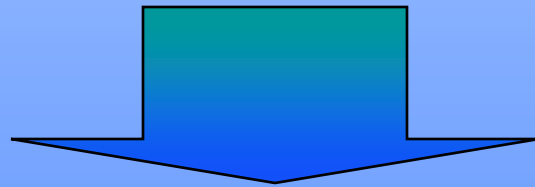
Focus on cumulative and daily disasters and disaggregation of big and sporadic disaster

An homogeneous relative resolution scale (similar to municipalitie) for the different countries.

Homogeneous and constant data for different countries.

Public domain.

**To satisfy these basic concepts,  
homogeneous and comparative  
data bases are needed,  
that acquired information in  
standard and rigorous way.**

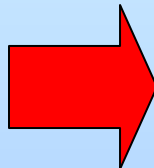


**Information System**

# Focus on daily disaster

## Panama

3 floods  
1 fire  
1 structure

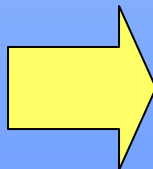


Deaths	0
Injured	2
People affected	213
Houses destroyed	15
Houses affected	45
Damnified	92

January, 2001

## Colombia

4 epidemic  
2 forest fire  
1 fire  
1 frost  
1 rain  
1 explosion  
1 pollution



Deaths	5
Injured	27
People affected	61
Houses destroyed	0
Houses affected	12
Crop hectares (ha)	122

# Disaster.

**DesInventar use the term related to effects on life, infraestructure, represented at municipalitie level, district or similar.**

Methodology and criteria to define,  
homogenize and gather data about losses

**Time: date and duration**

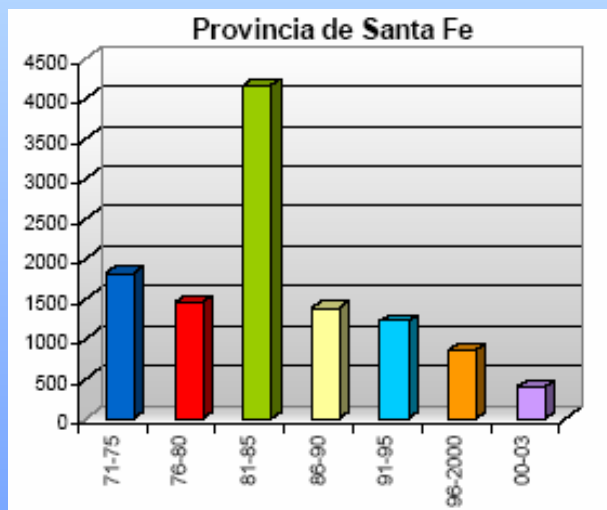
**Georeferencing: scale of  
resolution**

**Effects: damage and losses,  
homogeneous (ADD)**

**Triggering factor: predefined events**

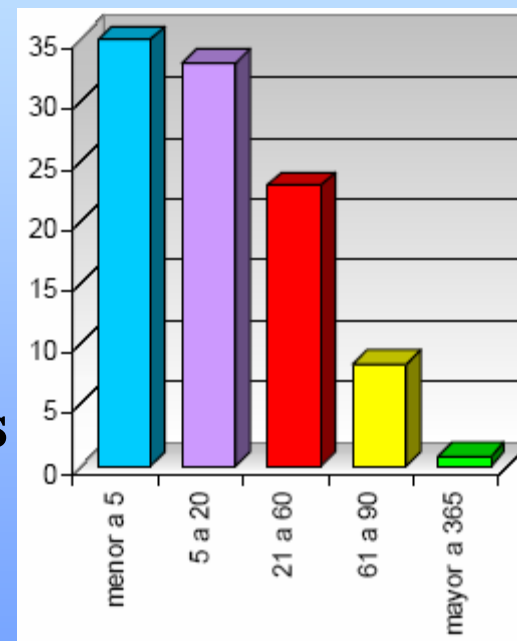
# Time: date and duration

**Impact**



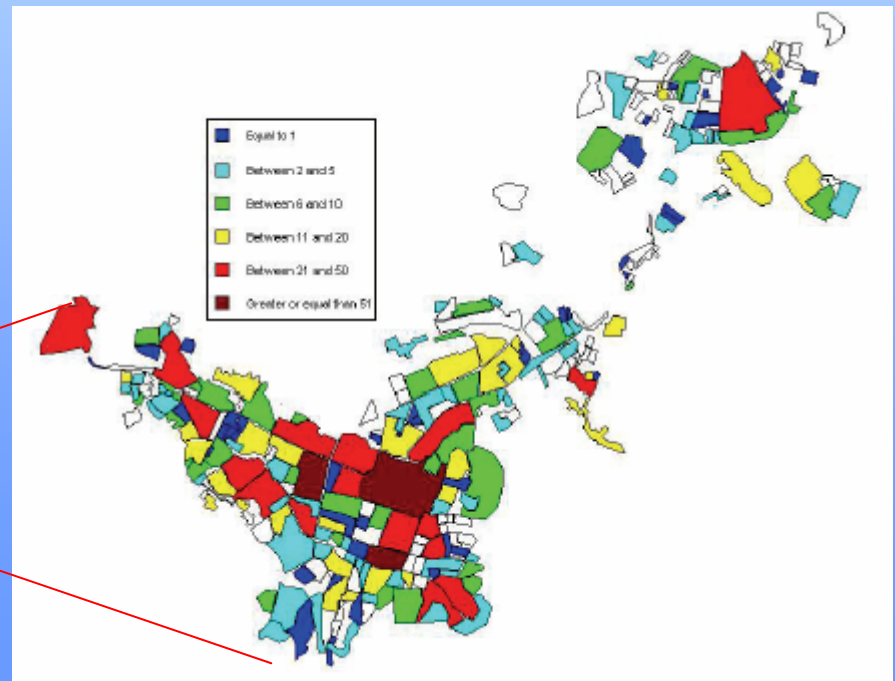
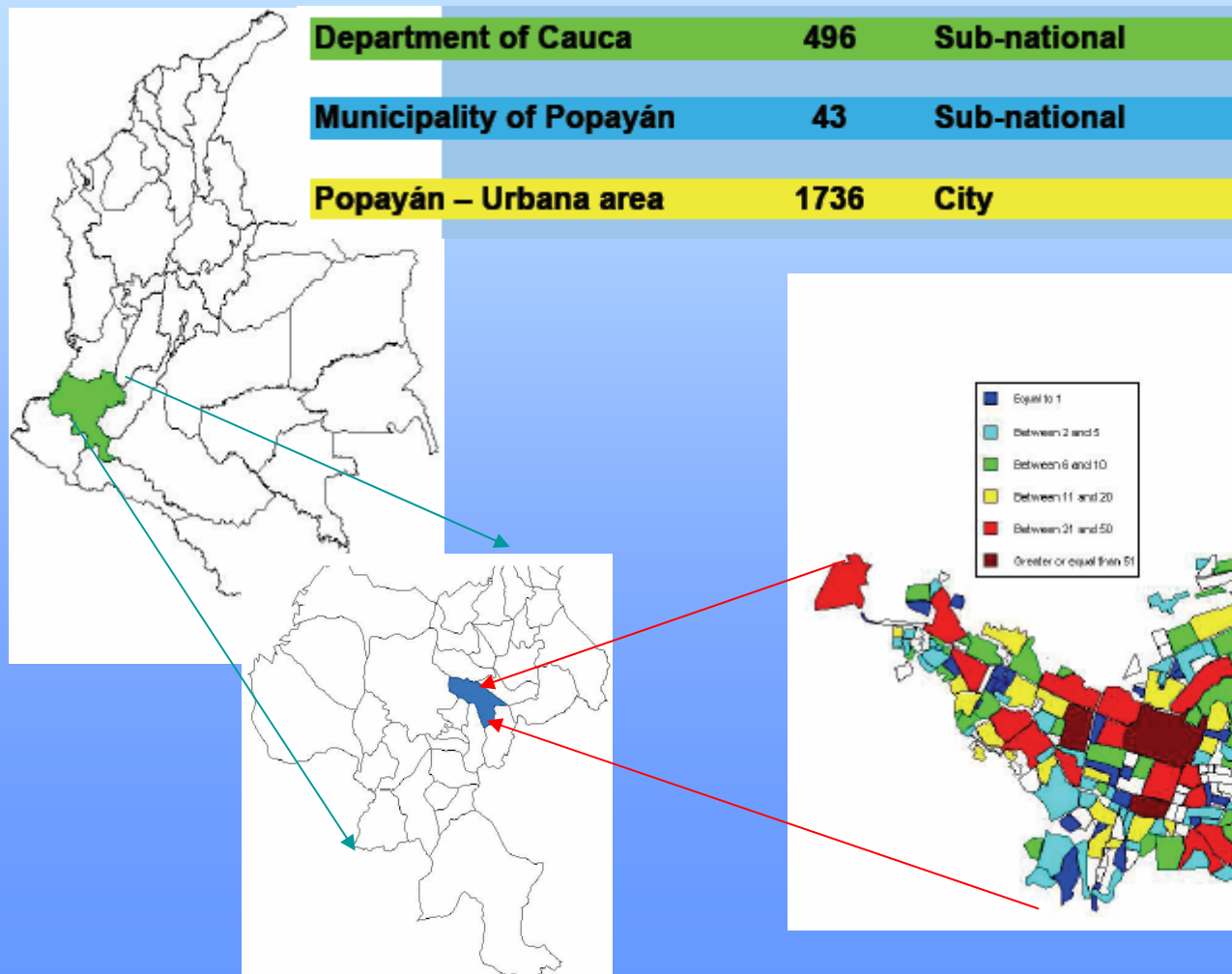
**Decades**

**%  
of  
records**



**Duration of the  
flood in days in  
Santafé Argentina**

# Georeferencing: scale of resolution



# Triggering factor: predefined events

Flood  
Flashflood  
Rain  
Gale  
Thunderstorm

Storm  
Hail storm  
Tidal wave  
Hurricane  
Snow fall

Landslide  
Alluvion  
Coastal dag  
Avalanche  
Sedimentation

Eruption  
Tsunami  
Fault  
Earthquake

Drought

Heat wave

Fire  
Forest fire  
Explosion  
Leak

Structual collapse  
Panic  
Accident

Epidemic  
Pollution  
Biological  
Plague



# Effects: damage and losses, homogeneous

**Effects**

Dead	<input type="text" value="0"/>	<input type="checkbox"/>	People Missing	<input type="text" value="0"/>	<input type="checkbox"/>	People Injured	<input type="text" value="0"/>	<input type="checkbox"/>	People Sick	<input type="text" value="0"/>	<input type="checkbox"/>	Victims	<input type="text" value="500"/>	<input type="checkbox"/>
People Affected	<input type="text" value="90000"/>	<input checked="" type="checkbox"/>	Houses Destroyed	<input type="text" value="80"/>	<input checked="" type="checkbox"/>	Houses Damaged	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	People Evacuated	<input type="text" value="1000"/>	<input type="checkbox"/>			
Road Mts.	<input type="text" value="0"/>		Hectares	<input type="text" value="120000"/>		Livestock	<input type="text" value="0"/>		Centres Education	<input type="text" value="0"/>		People Relocated	<input type="text" value="0"/>	<input type="checkbox"/>
Transportation	<input checked="" type="checkbox"/>		Agriculture	<input checked="" type="checkbox"/>		Communications	<input type="checkbox"/>		Power	<input type="checkbox"/>		Centres Hospitals	<input type="text" value="0"/>	
Relief	<input checked="" type="checkbox"/>		Water Supply	<input type="checkbox"/>		Sewerage and Drainage	<input type="checkbox"/>		Industries	<input checked="" type="checkbox"/>		Health	<input type="checkbox"/>	
Other												Other	<input checked="" type="checkbox"/>	
Loss value	<input type="text" value="0"/>		Loss Value U\$	<input type="text" value="40000000"/>		Magnitude	<input type="text" value="26"/>							
Other losses	<input type="text" value="Comercios"/>													

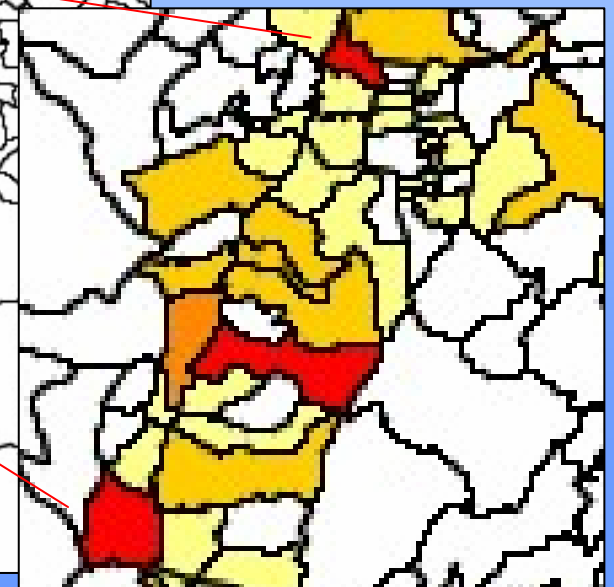
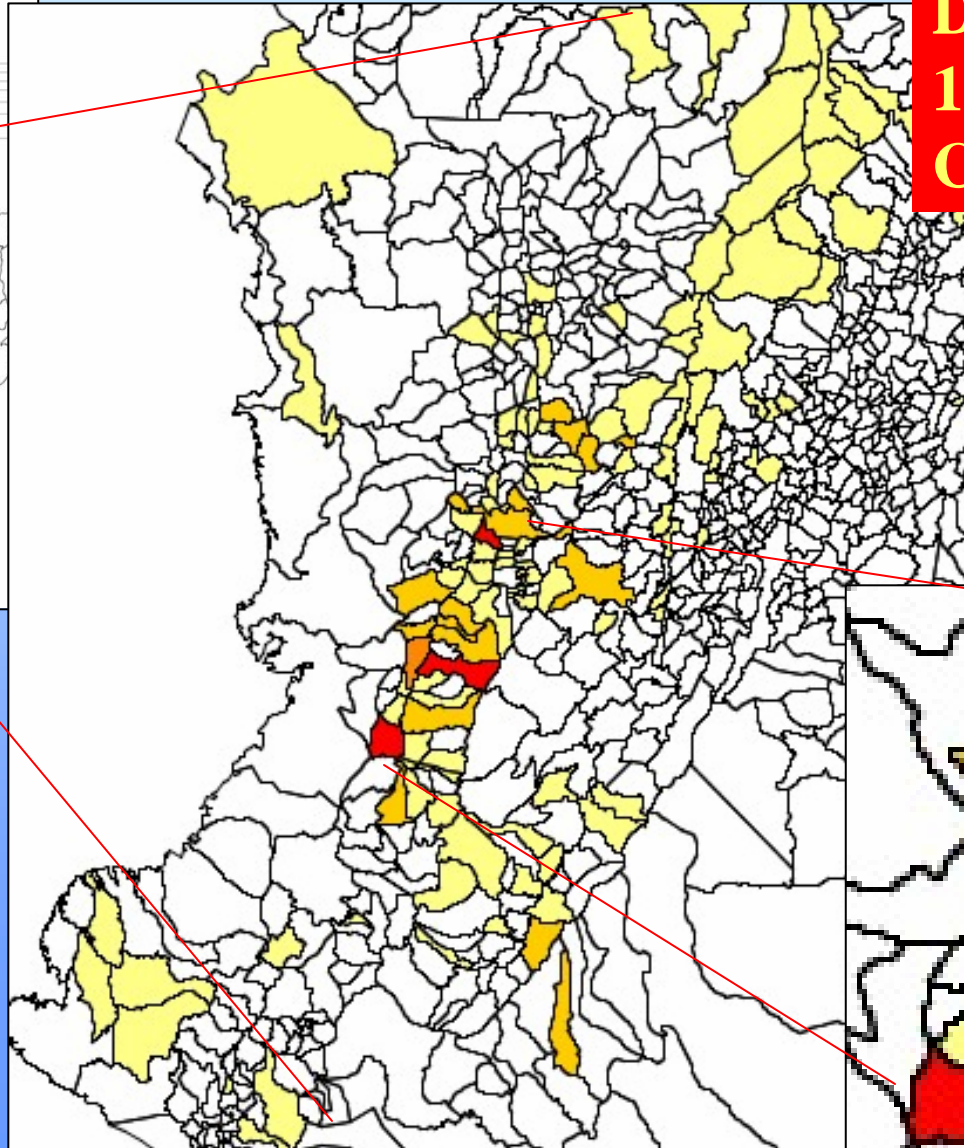
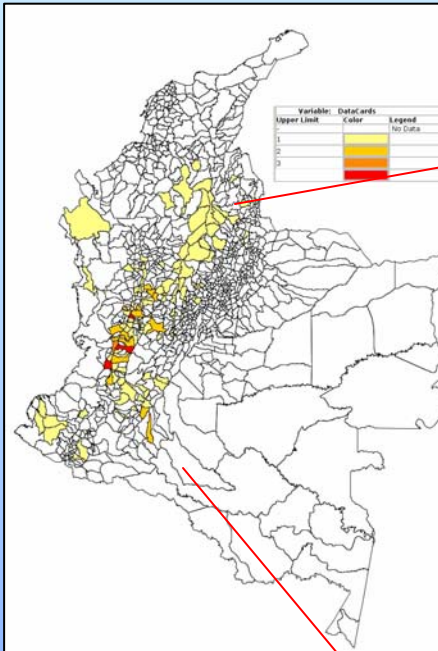
Option to add more fields with

**Extended data card**

e.g. Bridges, tall buildings, schools, etc

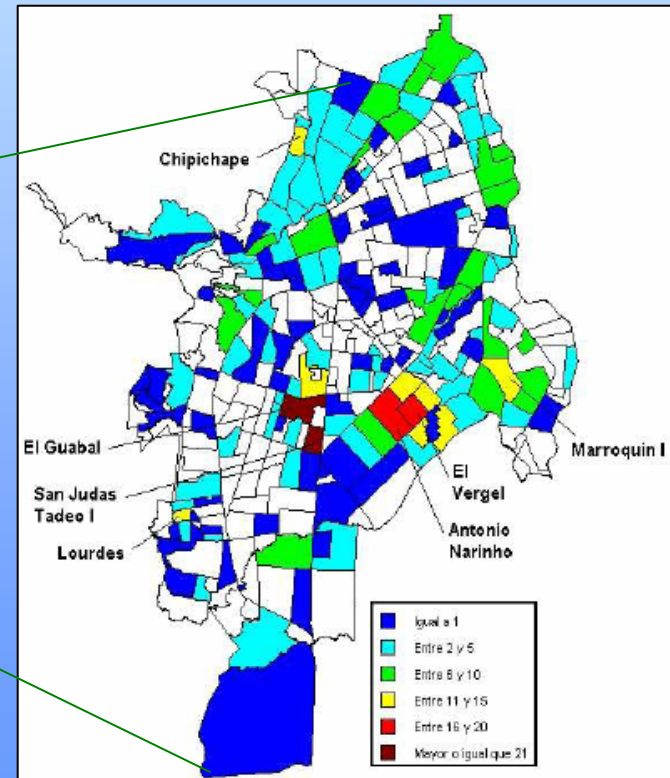
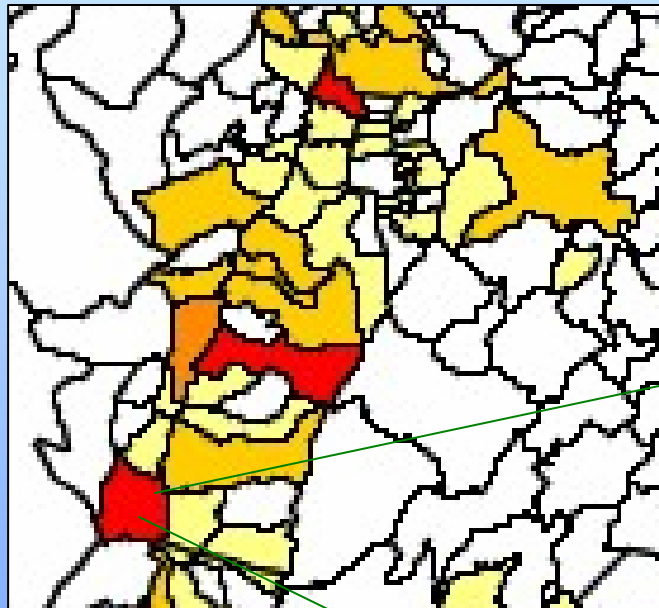
# Challenge of resolution

**Meteorological  
Disasters, february  
1999  
Colombia database**



# Challenge of resolution

**Meteorological  
Disasters, february  
1999  
Colombia database**



# Challenge of resolution

**At very local level**

...

...

...

...

...

**Communes**

**Communes**

**Communes**

**Communes**

**Municipalities**

**Municipalities**

**Municipalities**

**States**

**States**

**National**

# Challenge of resolution

## Coverage and Resolution

### Media

### Official

#### Daily

Inhabitated zones  
When official data  
is not collected

**Data must be recovered  
at local level (municipality)**

#### Historic

**Very useful, and  
In most of the  
Cases the only one**

**Mainly big  
disasters**

# Selection of information sources and the impact of the choice in the

## Accuracy

### Media

### Official

### Daily

Not precise

It is supposed  
that is precised

### Historic

Not precise

It is supposed  
that is precised

# Political issues

**Official**

**Relief  
institutions**

**Planning,  
housing  
ministries**

**National**

**Neglect daily  
disasters, only record  
of some disasters  
(own criteria)**

**Need and use  
statistics about  
disasters**

# Gathering data about losses

## Daily

**The data must be acquired at unit the of resolution**

**Relief institutions from government must used a hard copy to gather data *in situ***

## Historic

**The secondary or original source:**

- **Must be interpreted**
- **Sometimes imposible to disaggregate**
- **Inhomegeneus definitions of effects**
- **Different names of events**

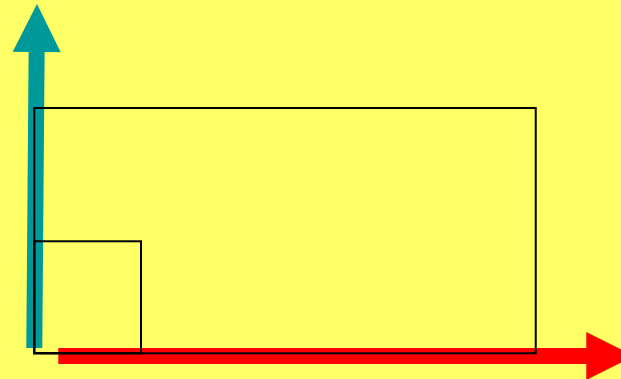


# Thresholds

**Desinventar**  
**Consider a**  
**Disaster**  
**When it has:**

**More than 0 dead people**  
**or**  
**More than 0 destroyed houses**  
**or**  
**More than 0 ...**  
**Or**  
**...**

**Number of disasters  
recorded**



**Capability to attend disasters**

# Status development of databases

# Status of database development

## National databases

Country	Period	Records	Dead	Houses destroyed	Type	Resolution	Sources
Argentina	1970-2002	15466	4767	52849	NGO	Municip.	Media
Chile	1970-2003	11337	4341	78422	University	Municip	Media
Colombia	1914-2002	21982	41623	16497	University	Municip	Official, media
Costa Rica	1968-2004	6832	602	7462	Int. University	Municip	Media
Dominican Rep.	1966-2000	2112	1152	3603	Int. University	Municip	Media
Ecuador	1970-2004	3589	6967	12207	University	Municip	Official, media
El Salvador	1980-1998 *	648	1154	2161	Government	Municip	Official
Guatemala 1	1990-1999	1419	1390	3802	Government	Municip	Official
Guatemala 2	1988-2000	2418	1712	6708	Int. University	Municip	Official, media
Jamaica	1973-2002	853	535	213	University	Municip	Media
Mexico	1970-2002	11164	27605	326296	Research Institute	Municip	Official, media
Panama	1996- 2002 *	1953	611	3221	Government	Municip	Official
Peru	1970-2003	19408	47197	408150	NGO	Municip	Media
Trinidad	1966-2000	661	276	155	NGO	Municip	Media

\* Updated to 2006

# Status of database development

## Subnational and local databases

Country	Period	Records	Houses destroyed	Type	Type	Coberture
<b>Colombia</b>						
Antioquia	1884-1999	1701	932	Govern - U	Official, media	Subnational unit
Medellin	1901-2002	9351	5122	Govern - U	Official, media	Metropolitan area
Cali	1950-2000	1280	574	University	Media, historic	City
Popayán	1990-2003	1736	110	University	Official, media	City
Risaralda	1927-2003	8283	2269	Government	Official, media	Subnational unit
Cali	1950-2000					City - n
Valle	1921-2003	3898	9256	Government	Official, media	Subnational unit
<b>Venezuela</b>						
Caracas city	1753-2000 *	795	34161	Government	Official	Metropolitan area
<b>Argentina</b>						
Chascomús	1990-2001	850	9	NGO	NGO	City
Zarate	1979-2002	189	0	NGO	NGO	City
Pergamino	1884-2002	115	6	NGO	NGO	City
<b>USA</b>						
La Florida	1970-2001	9810	256277	University	University	Subnational unit

\* Updated to 2006

# Status of database development

## Thematic databases

Region	Period	Interest	Records	Dead	Houses destroyed	Type	Sources
Venezuela	1530 - 2003	Landslides Earthquakes	...	...	..	Government	Historic, Media, official
Medellin	..	Traffic accidentes	...	...	...	University	Official

# Status of development

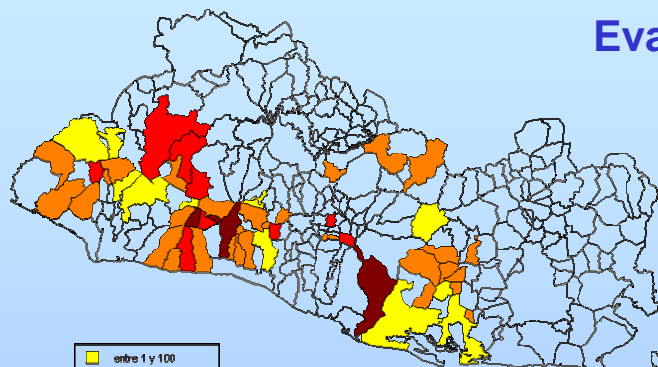
Post disaster

1998	Hurricane Mitch	Honduras, Nicaragua
1999	Rains	Venezuela
2001	Earthquakes	El Salvador
2001	Earthquake	Peru

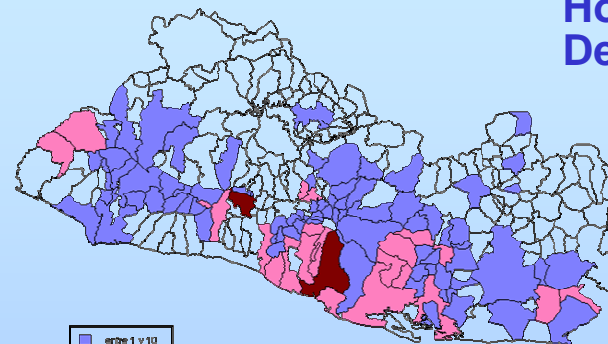
# Collection of results, experiences and applications

# El salvador Earthquake, 13th jan. 2001

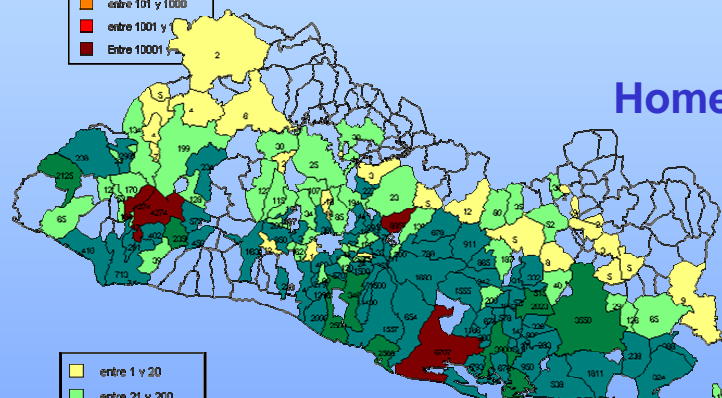
Evacuated



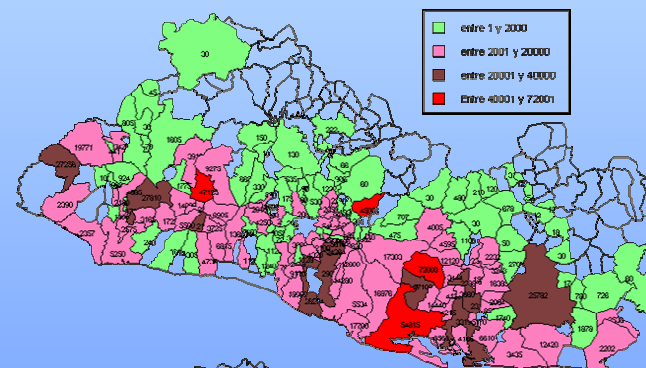
Houses Destroyed



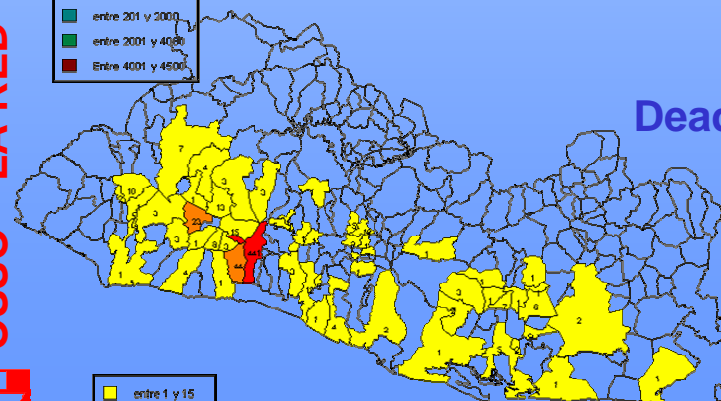
Homeless



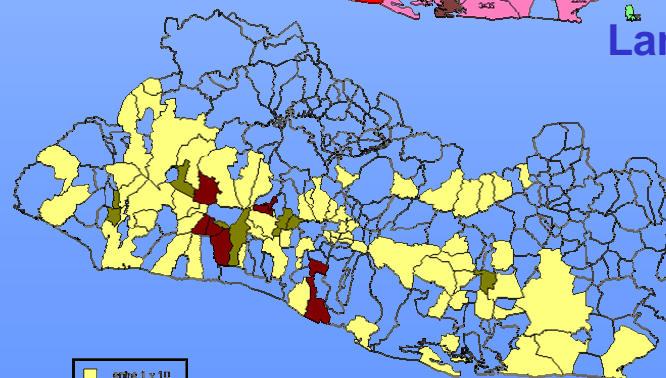
Affected houses



Dead



Landslides



LA RED



OSSO - LA RED

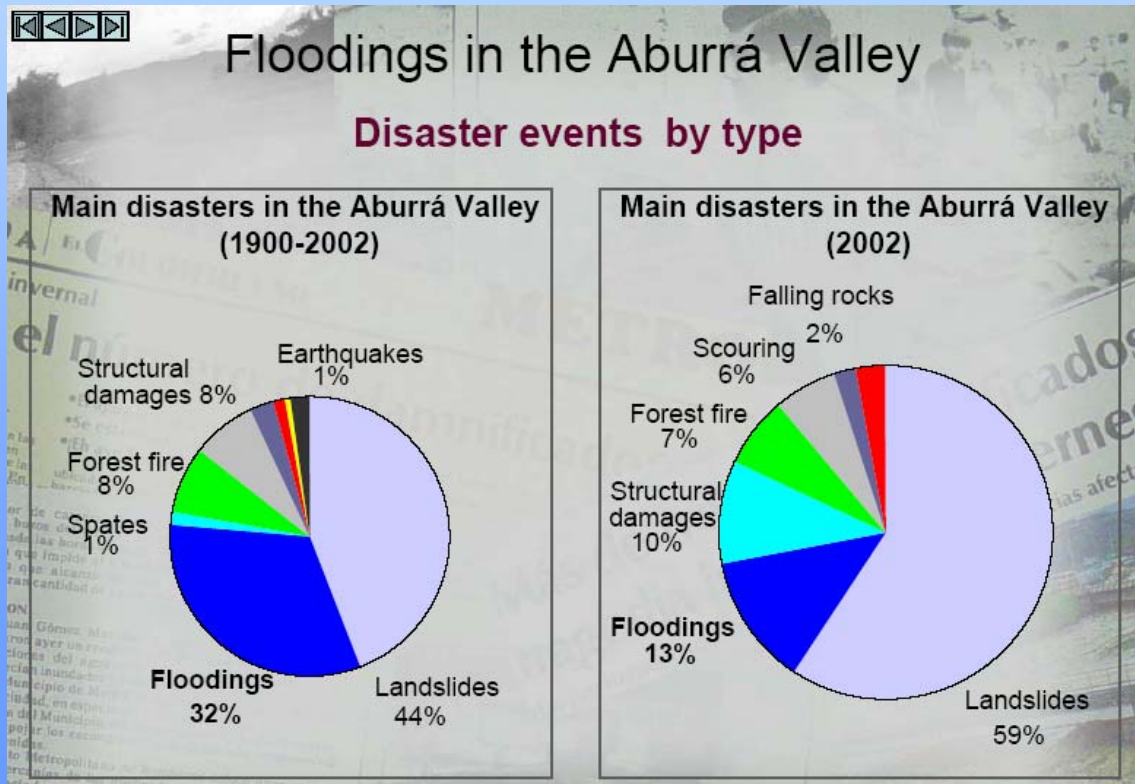


Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH



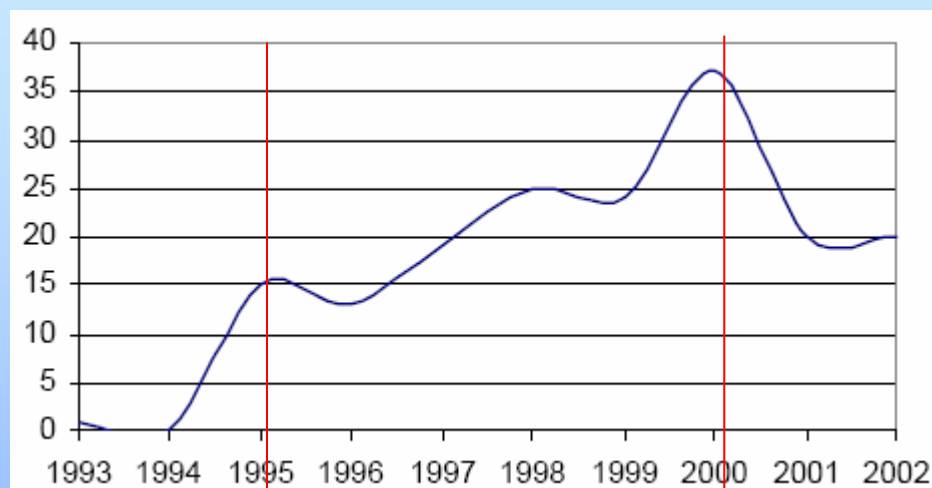
# Metropolitan database in Colombia: Medellin (Aburra Valley).

A look to the deterioration of the  
water resources and floodings in  
the Aburrá Valley, Colombia

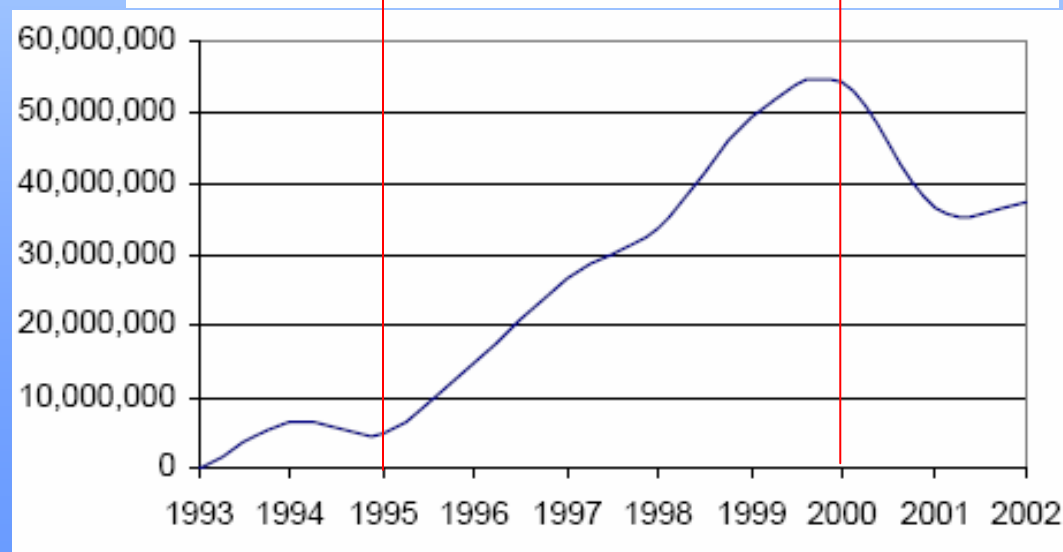


# Public investment on prevention and attention of disasters vs disaster occurrence

Number of  
disasters



\$ pesos



Years

**Balboa  
Municipality  
(Risaralda,  
Colombia)**

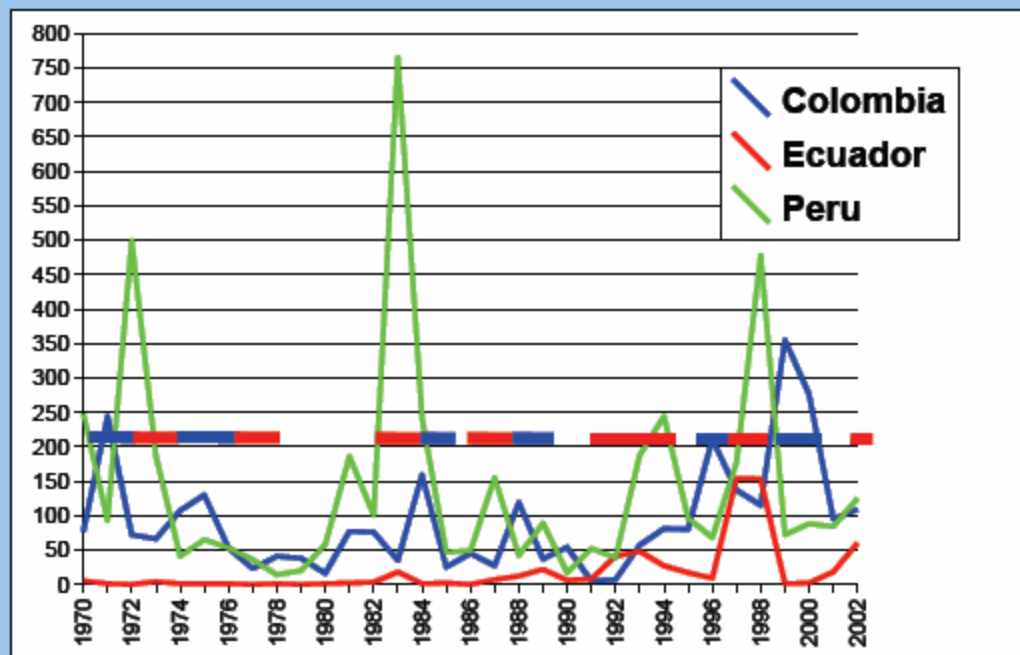
# **ENSO Project IAI – LA RED**

**Comparative and collaborative research project  
on risk patterns of El Niño Phenomena in Latin America**

**[www.cambioglobal.org](http://www.cambioglobal.org)**

# ENSO Project IAI – LA RED

## Global change: interannual climate vulnerability



■ ENSO - El Niño\*

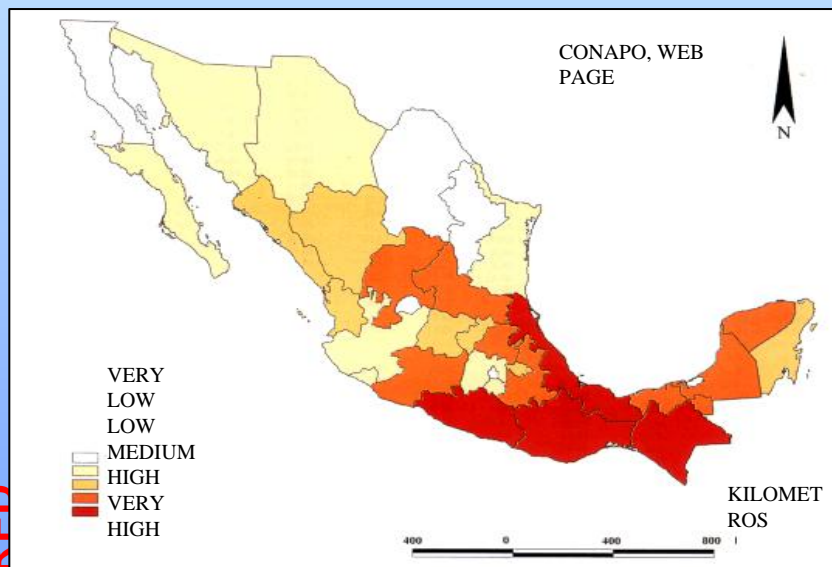
■ ENSO - La Niña\*

\* Source: NOAA, 2005

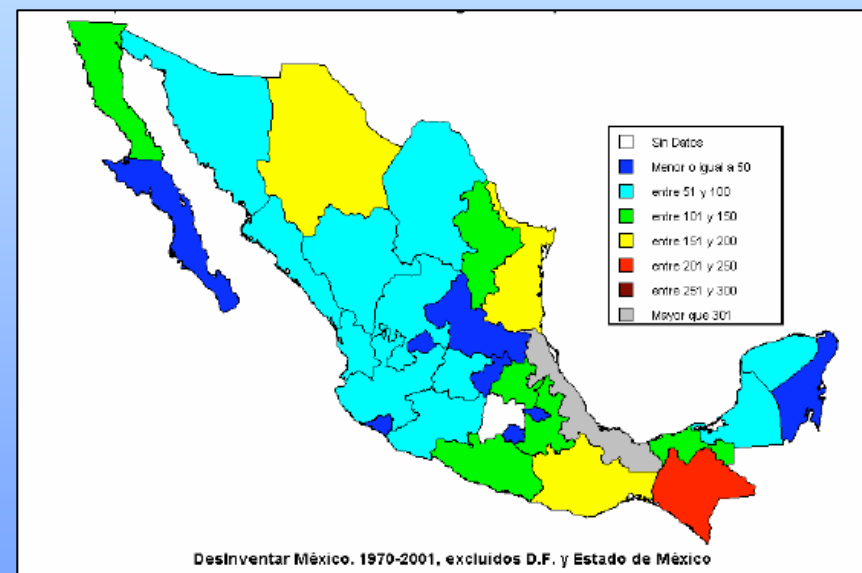
# ENSO Project IAI – LA RED

## Marginality and disaster related with excess of water

### Marginality index in Mexico



### Disaster by excess of water in Mexico 1970 - 2001

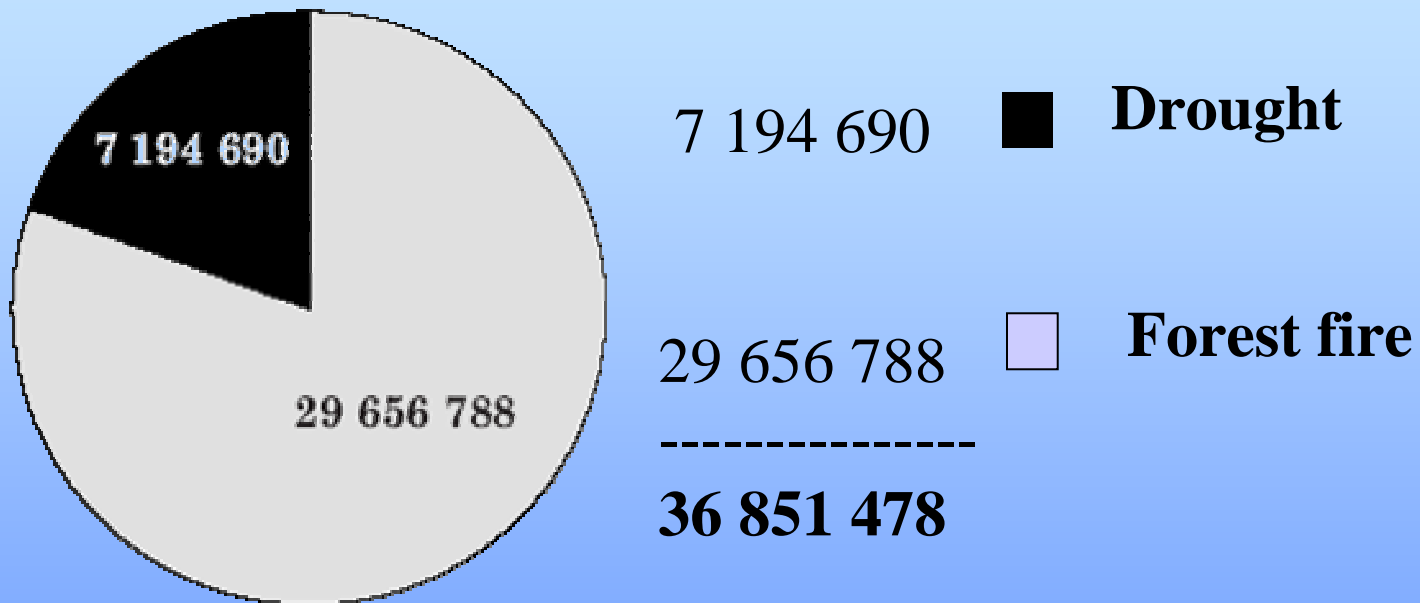


**“El Niño phenomenon”: Social construction of risk in the Isthmus of Tehuantepec. A multidisciplinary approach**

Briones y Garcia, 2002

# Affected hectareas by lack of water

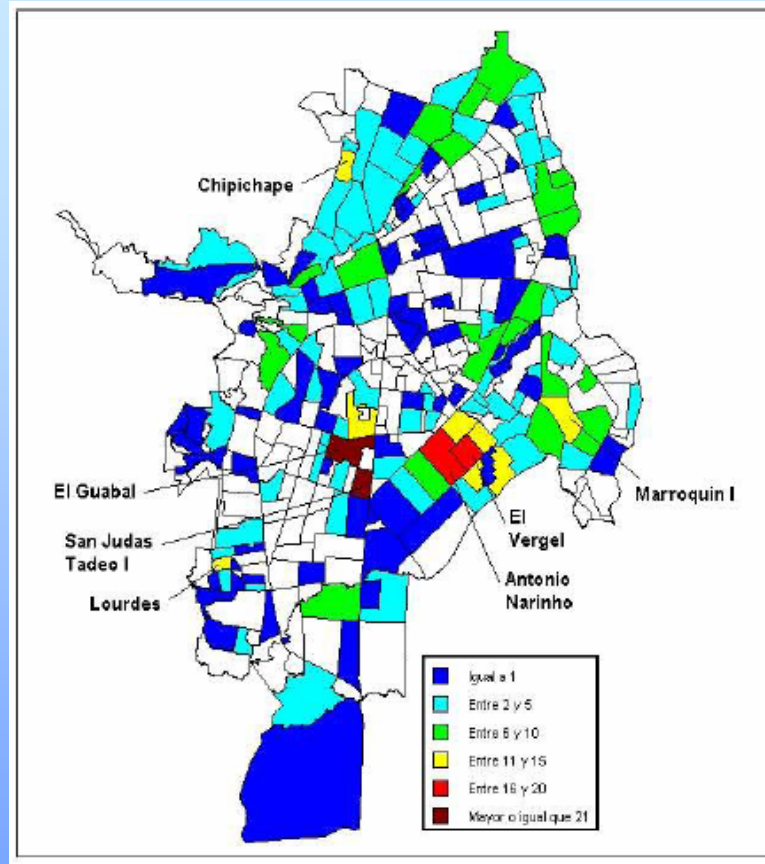
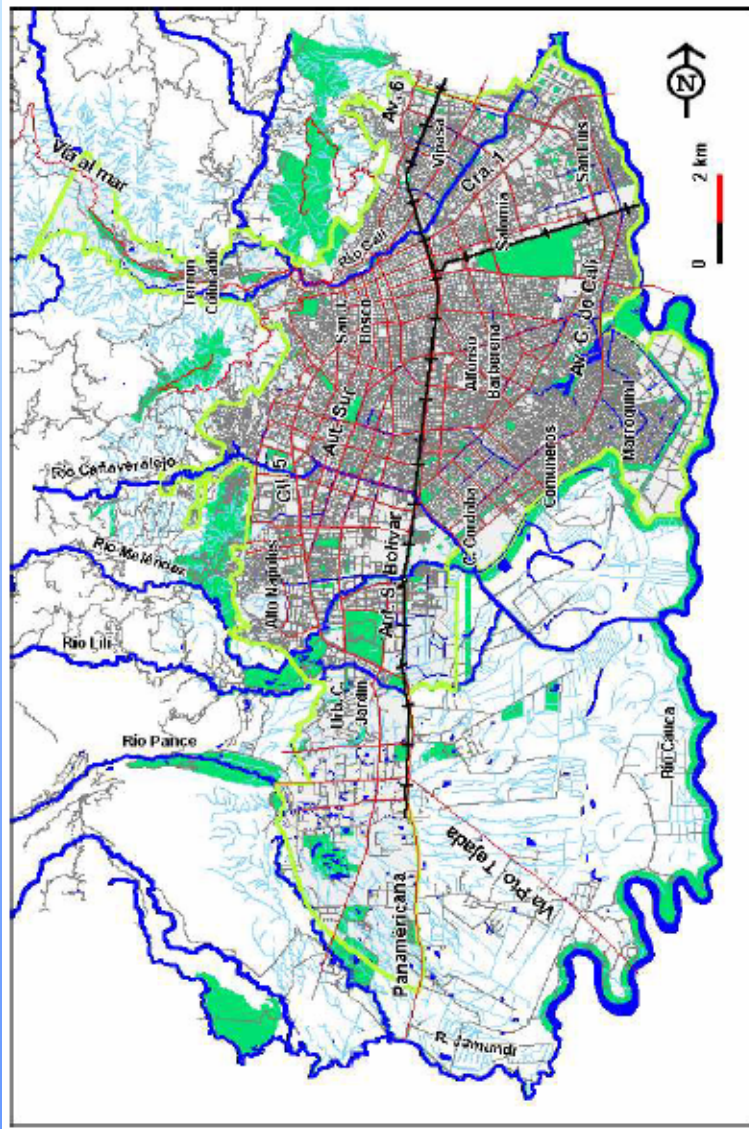
**DesInventar Mexico 1970 - present**



**More than 18 times of  
existing crops in Mexico!!!!**



# Planning vs Disasters: Cali case



**Disaster by floods in Cali  
1950 – 2000**

**Jiménez 2002**

# ENSO Project IAI – LA RED

## DesDocumentar

**SRID Regional System of disaster information**

**Disaster  
Digital  
Library  
On ENSO**

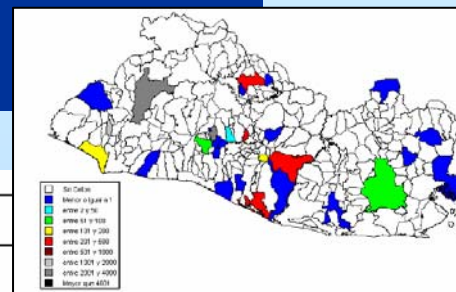


**DesInvenar  
databases**

[www.cambioglobal.org/desdoc](http://www.cambioglobal.org/desdoc)

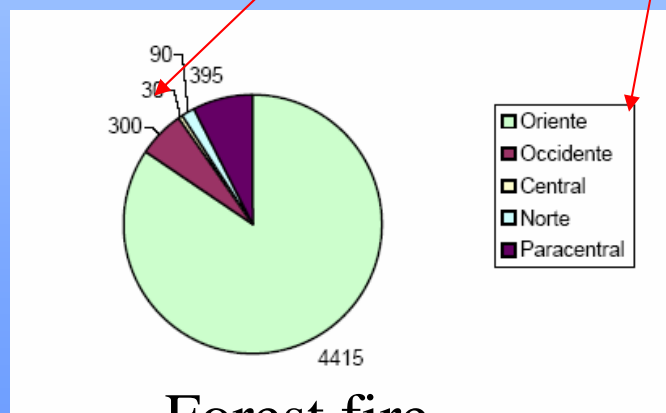
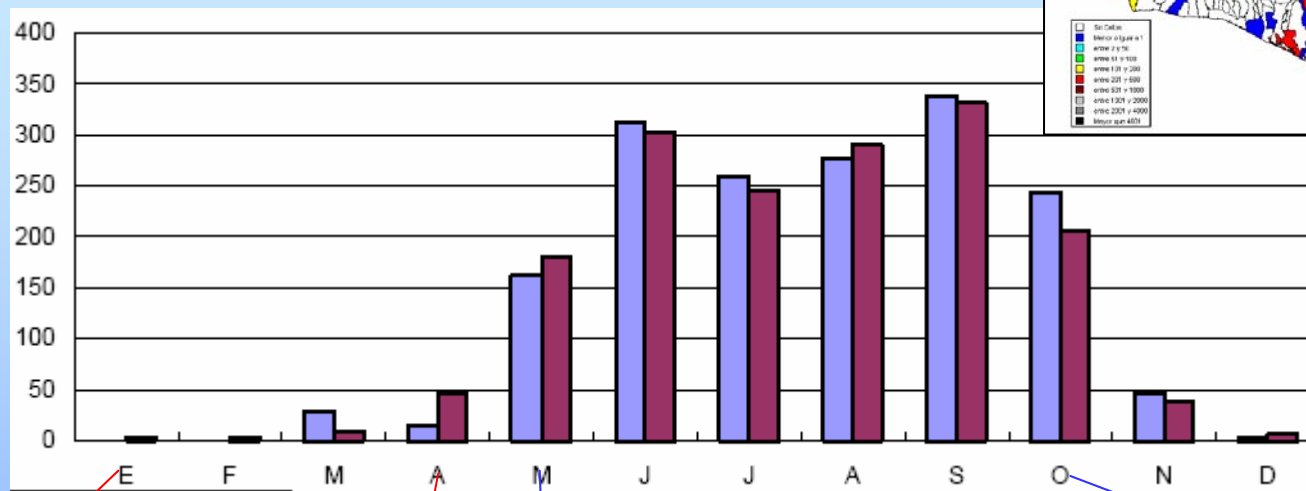


# Influence of meteorological conditions on disasters, El Salvador

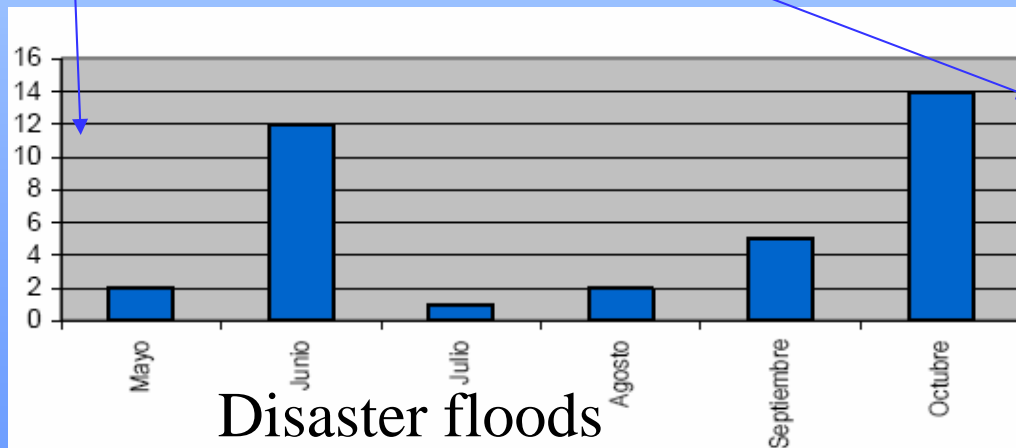


Average Rainfall

2003  
1970 - 2000



Forest fire



Disaster floods

# National official investment and planning

Documento

## Conpes

3318

Consejo Nacional de Política Económica y Social  
República de Colombia  
Departamento Nacional de Planeación

**AUTORIZACIÓN A LA NACIÓN PARA CONTRATAR OPERACIONES DE CRÉDITO EXTERNO CON LA BANCA MULTILATERAL HASTA POR US \$ 260 MILLONES PARA FINANCIAR PARCIALMENTE EL PROGRAMA DE REDUCCIÓN DE LA VULNERABILIDAD FISCAL DEL ESTADO FRENTE A LOS DESASTRES NATURALES**

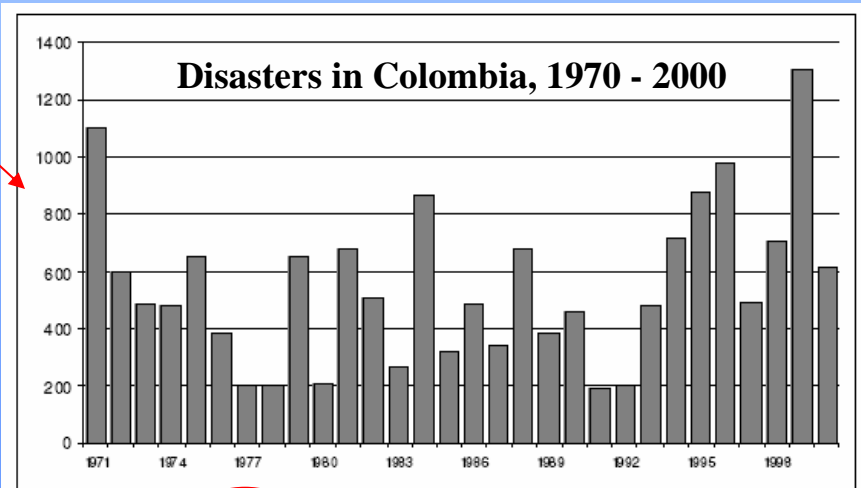
Ministerio de Hacienda y Crédito Público - MHCP  
Ministerio del Interior y de Justicia - Dirección de Prevención y Atención de Desastres - DPAD  
Ministerio de Ambiente, Vivienda y Desarrollo Territorial - MAVDT  
Departamento Nacional de Planeación - DNP: DDUPA - SC

Versión aprobada

Bogotá, D.C., 29 de noviembre de 2004

Country	Annual average of diasters
Colombia	597.7
Perú	585.5
México	241.9
Argentina	213.3
Costa Rica	168.6
Guatemala	83.3
Ecuador	74.5
República Dominicana	60.3

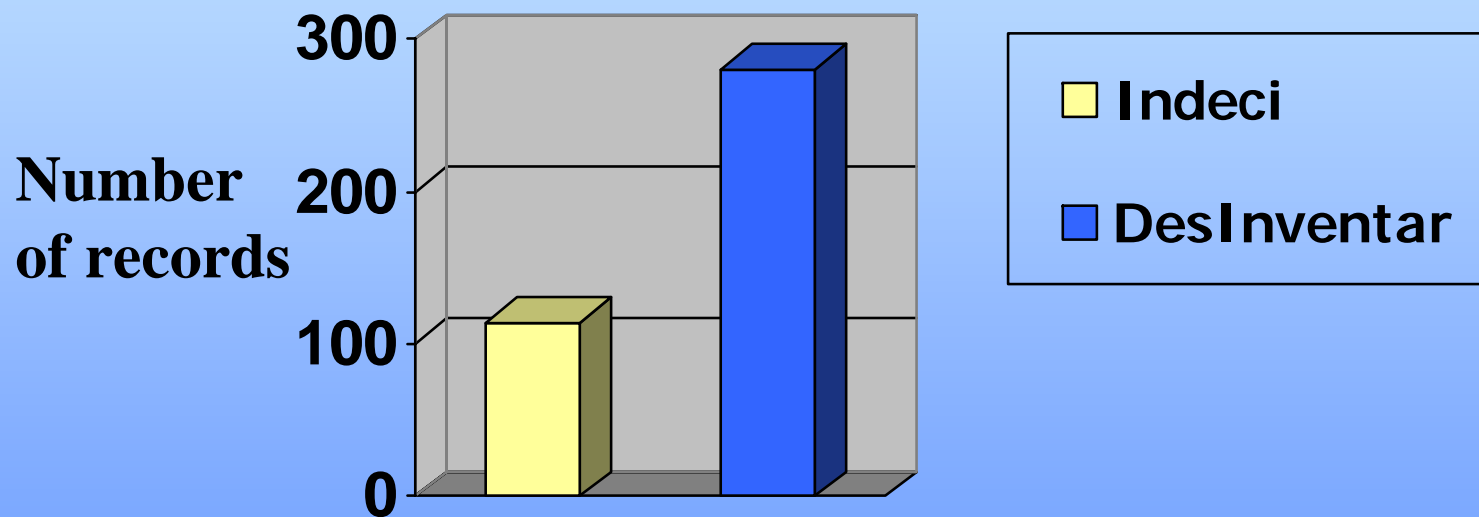
Fuente: Desinventar<sup>3</sup> LA RED, en ERN Colombia (2004)



Fuente: Desinventar LA RED en ERN Colombia, 2004

Conpes document (2004)

# Floods in Peru in 1994



# Effects by floods in 1994

	INDECI	DesInventar
Deaths	5	60*
Damnificados	116,236	502,782
Houses destroyed	1,636	3,557
Houses affected	16,090	20,120
Losses estimated (houses)	4,447,500	47,664,917
Crop hectareas (ha)	40,450	248,449

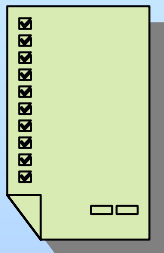
INDECI: Civil Defense Institute of Peru.

\* Deaths + People missing

## Panama: government application case.

- The National Civil Protection System - SINAPROC in Panama started using DesInventar in 1996, to systematize, homogenize and centralize data from all types of disasters independent of magnitude or impact, at municipality level in the entire country. This includes small, medium and large scale events.

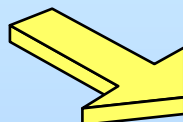
# Panamá: Disaster Information System of SINAPROC.



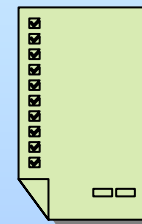
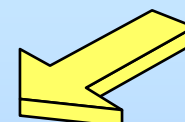
**Incident report form  
(hard copy)**

# Panamá: Disaster Information System of SINAPROC.

SINAPROC  
Regional  
Offices



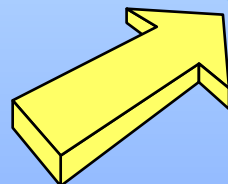
SINAPROC  
Major  
offices.



**Operations Center**



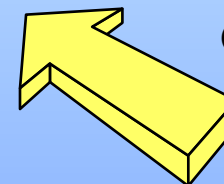
Red Cross,  
universities,  
etc.



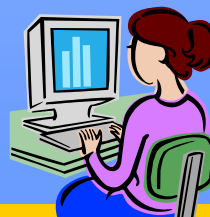
Quasi real time



Community



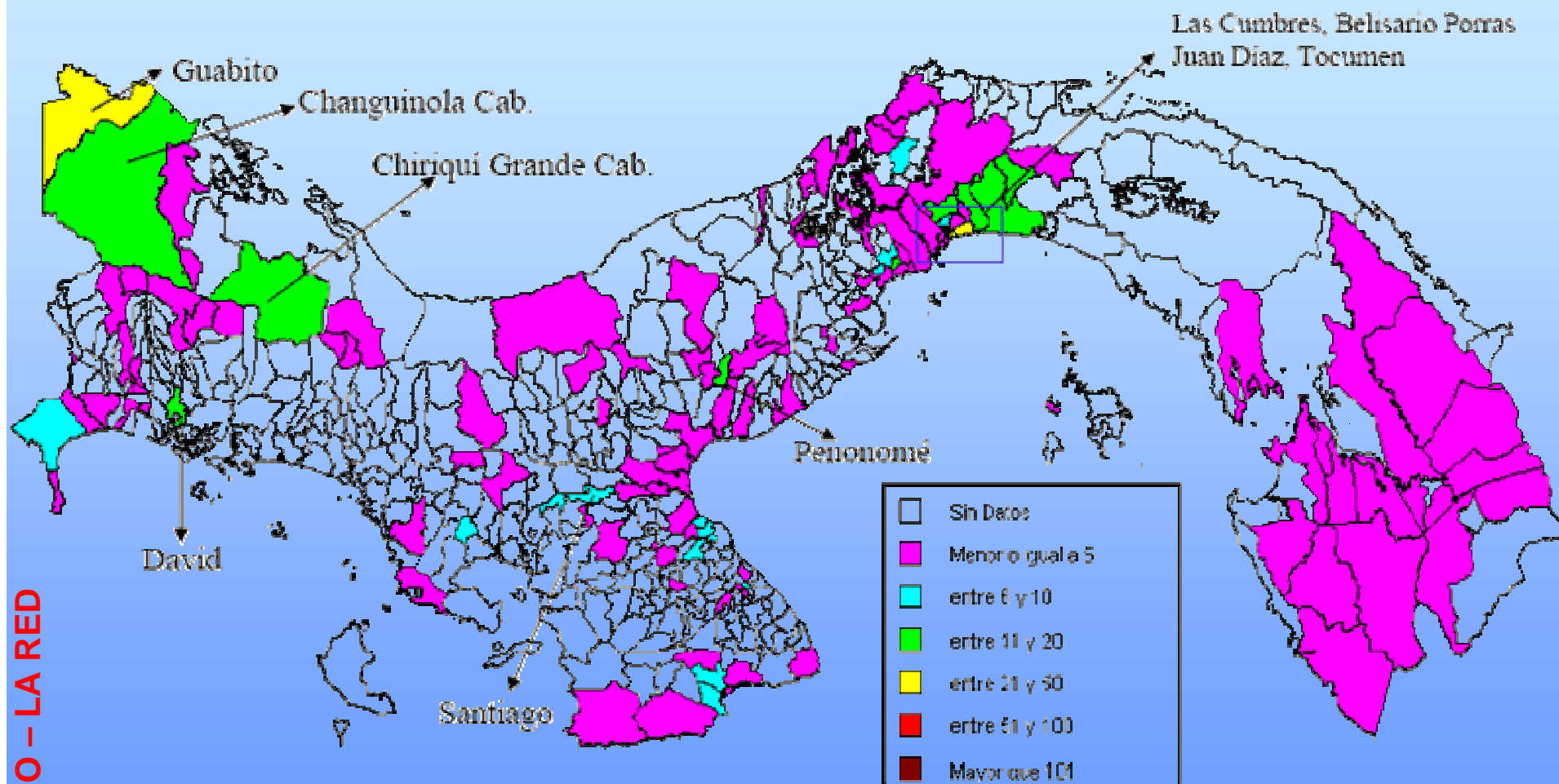
**Informatic office**



**Desinventar**



# Panamá: Floods by district 1990 – 2003





# Magnitude index using DesInventar data

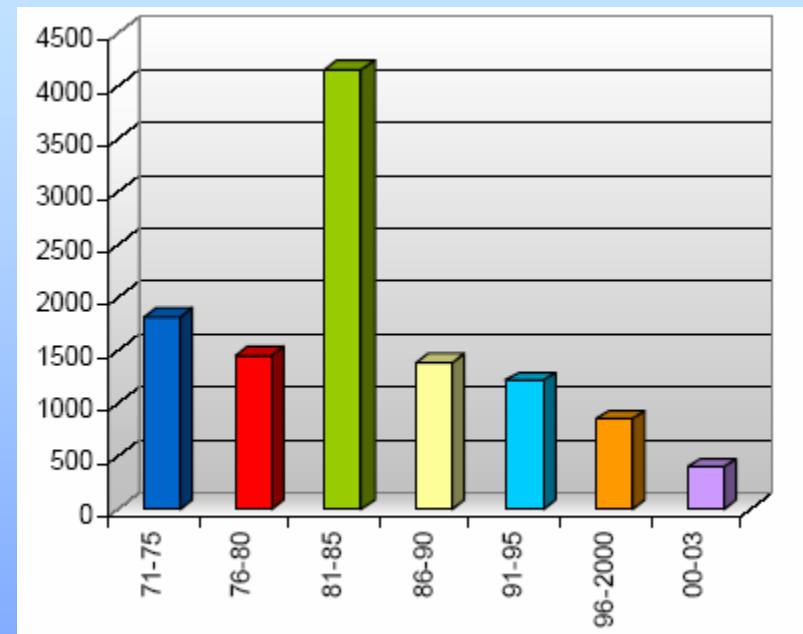
## Magnitude index

Simple sum of  
DesInventar  
effects fields:

1. Houses and sectors.
2. Human
3. Duration in days

Magnitude  
index

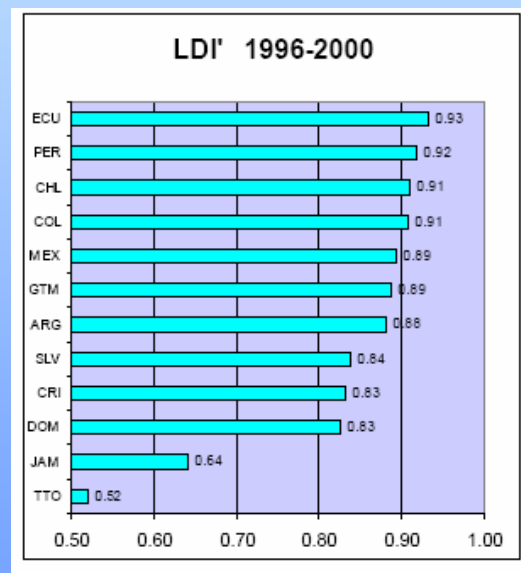
## Santafe Province, Argentina



Decades

# Local disaster index using desinventar data

The objective of this index is to represent the proneness of a country to lower level or small scale disasters and the type of impact these have on local development. Such an index attempts to represent the spatial variability and dispersion of risk in a country as a result of small and recurrent events.



The higher the *LDI*, the greater the regularity in the magnitude and distribution of effects between all the countries municipalities due to the different types of hazard

# Some references

Briones, F. and V. Garcia. **(2005)** “El Niño phenomenon”: Social construction of risk in the Isthmus of Tehuantepec. A multidisciplinary approach.+

Garcia, V **(2001)** Information, vulnerability and disaster process in Mexico.

Rojas, E. Y. **(2005)** A look to the deterioration of the water resources and floodings in the Aburrá Valley, Colombia.

Velásquez, A. **(2005)** DesInventar: Databases and Applications Latin America and Caribe.

INETER **(2003)** Impacto de los fenómenos meteorológicos Devastadores del 2003 en el Salvador

Celis, A. **(2001)** Conocer es poder anticipar. 15 p.

Velásquez A., C. Rosales **(1999)** Scanning on disaster of every scale

UNDP **(2001)** Marco estratégico para la recuperación sostenible y la Reducción de la vulnerabilidad en la zona afectada por el sismo del 23 de junio de 2001 en Peru.

Muñoz, M **(2002)** Analysis of inversion on prevention and attention of disasters in Risaralda Department during 1993 – 2002.

Jimenez, N. **(2002)** Urban and historical issues in the generation of disasters by floods and landslide in Cali (Colombia), 1950 - 2000

**Thanks for your attention**  
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