

Government of Chile
Ministry of Housing and Urbanism

MINVU RECONSTRUCTION PLAN **“United Reconstructing a Better Chile”**

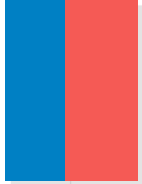


**Ministerio de
Vivienda y
Urbanismo**

Gobierno de Chile

27th February, 2010 - Earthquake and Tsunami

Resilience Workshop 2013 in Sendai
Accelerating Disaster Recovery Efforts to Build
Disaster Resilient Society



Región de Arica - Parinacota

Región de Tarapaca

Región de Antofagasta

Pob. 16.7 Millions



Estimated 2012

Región de Atacama

15 Regions 345 Municipalities



Coquimbo

Valparaíso

Metropolitan

Libertad

de los Ríos

Región del Maule

Región de Bio Bio

Región de la Araucanía

Región de los Ríos

Región de los Lagos

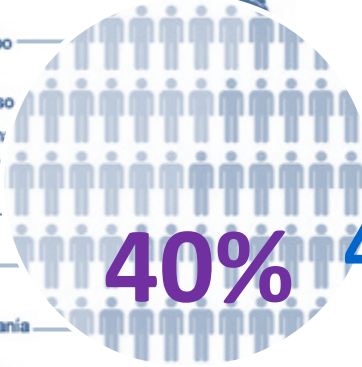
Región Aysén del General Carlos

Ibañez del Campo

Región de Magallanes y la

Antártica Chilena

Chile



40%

87% Pop. urban

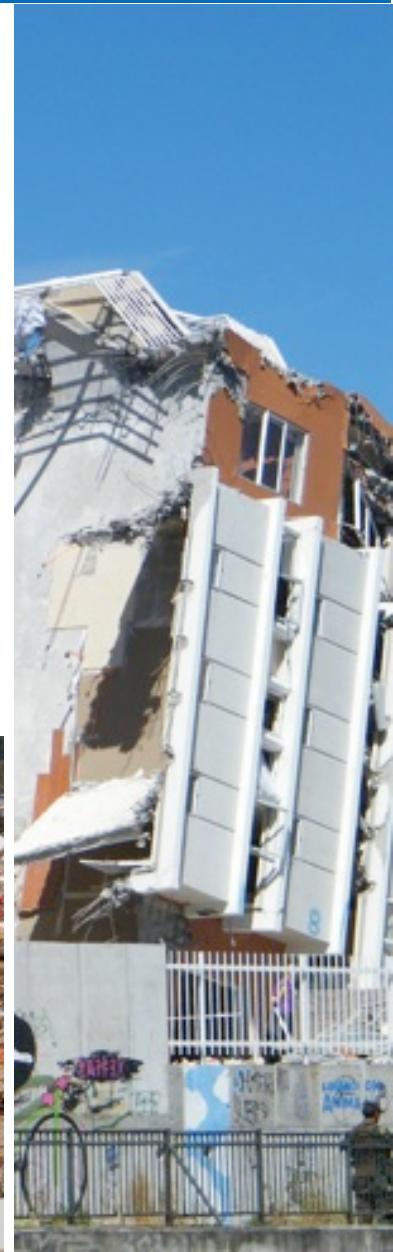
4.300 km



← 170 km →

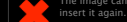


Chile: a country exposed to natural disasters



Chile: a country exposed to natural disasters





The image cannot be displayed. Your computer may not have enough memory to open the image, or the image may have been corrupted. Restart your computer, and then open the file again. If the red x still appears, you may have to delete the image and then insert it again.

CHILE

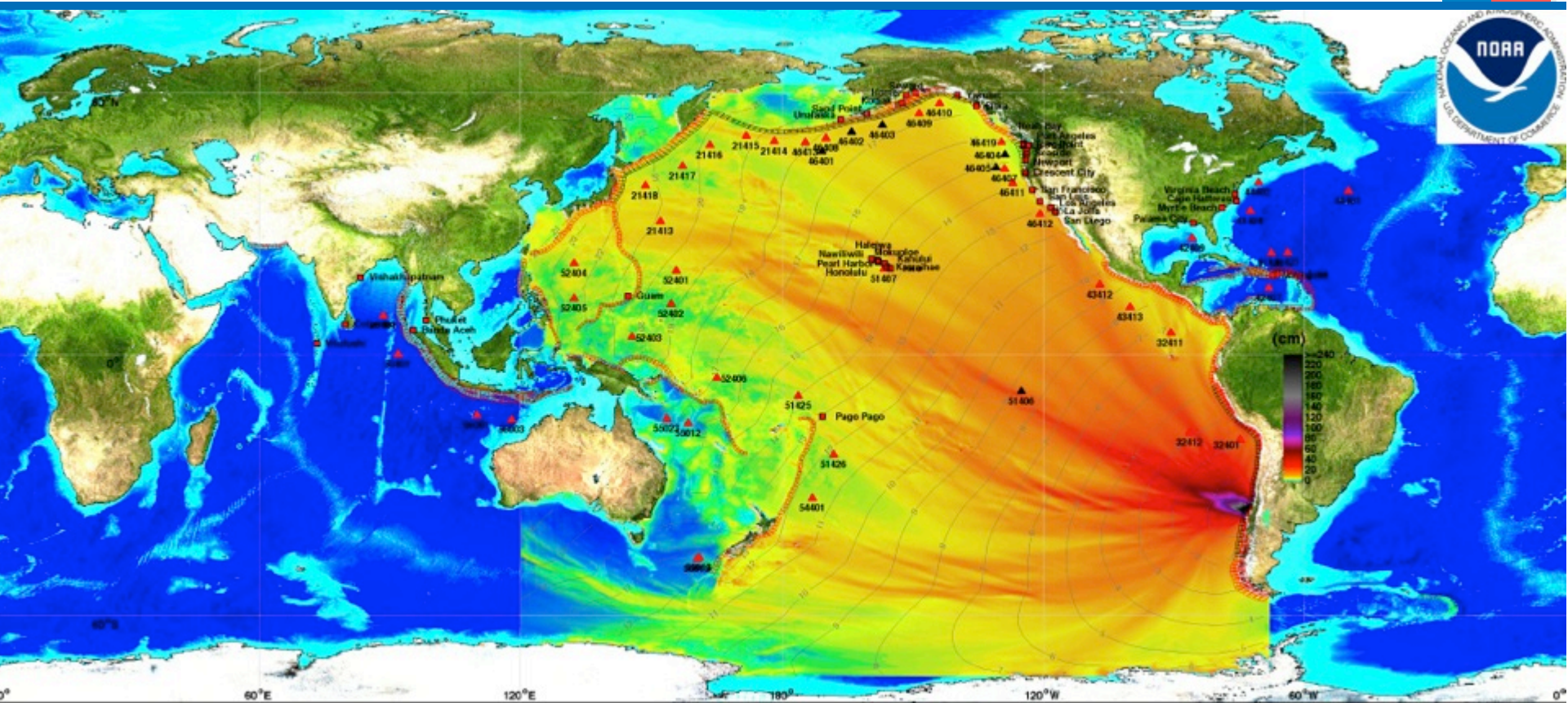
27F 2010

03:34AM

8,8 Richter

134 Secs

Recent experience of an event of great magnitude



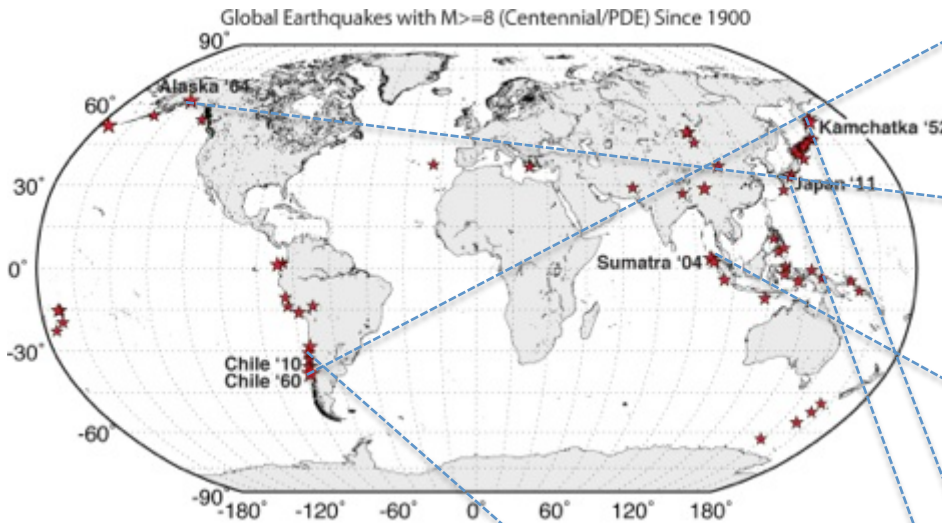
6
Largest
Earthquake
in the world

➤ **Offshore**
2010, Chile

8,8
Richter Scale
➤ **524 fatal
victims**

27F 2010
➤ Largest urban earthquake
in extension and spread
Of damage

World largest earthquakes



1

Valdivia, 1960, Chile

9,5 Richter Scale. 1,655 fatal victims.

2

Alaska, 1964, United States

9,2 Richter Scale. 128 fatal victims.

3

Sumatra Island, 2004, Indonesia

9,1 Richter Scale. 227,898 fatal victims.

4

Coast of Northern Kamchatka, 1952, Russia

9,0 Richter Scale. No fatal victims.

5

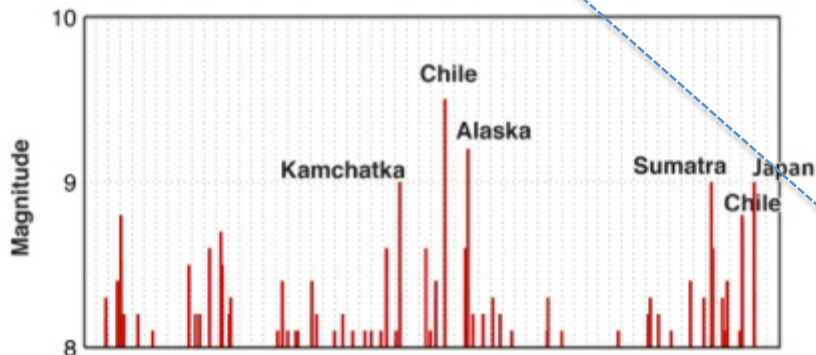
Coast of Honshu, 2011, Japan

9,0 Richter Scale. 15,703 fatal victims.

6

Offshore Maule (Cobquecura), 2010, Chile

8,8 Richter Scale. 524 fatal victims.



27F 2010: earthquake & tsunami

Magnitud / Dispersion

27F 2010: Largest urban earthquake in extension and spread of damage.

69,3%
of municipalities affected

81.3%
of the urban population

Población urbana nacional:
15.116.435 habitantes

Región Metropolitana: 41%

Región de Valparaíso: 11%

Región de O'Higgins: 5.2%

Región del Maule: 6%

Región del Biobío: 12.3%

Región de la Araucanía:
5.8%

345 Municipalities in 15 regions.

239 Municipalities affected

(Fuente ACHM)



27th February, 2010

Extension and magnitude of the catastrophe

524 fatal victims and 31 missing



27th February, 2010

Extension and magnitude of the catastrophe

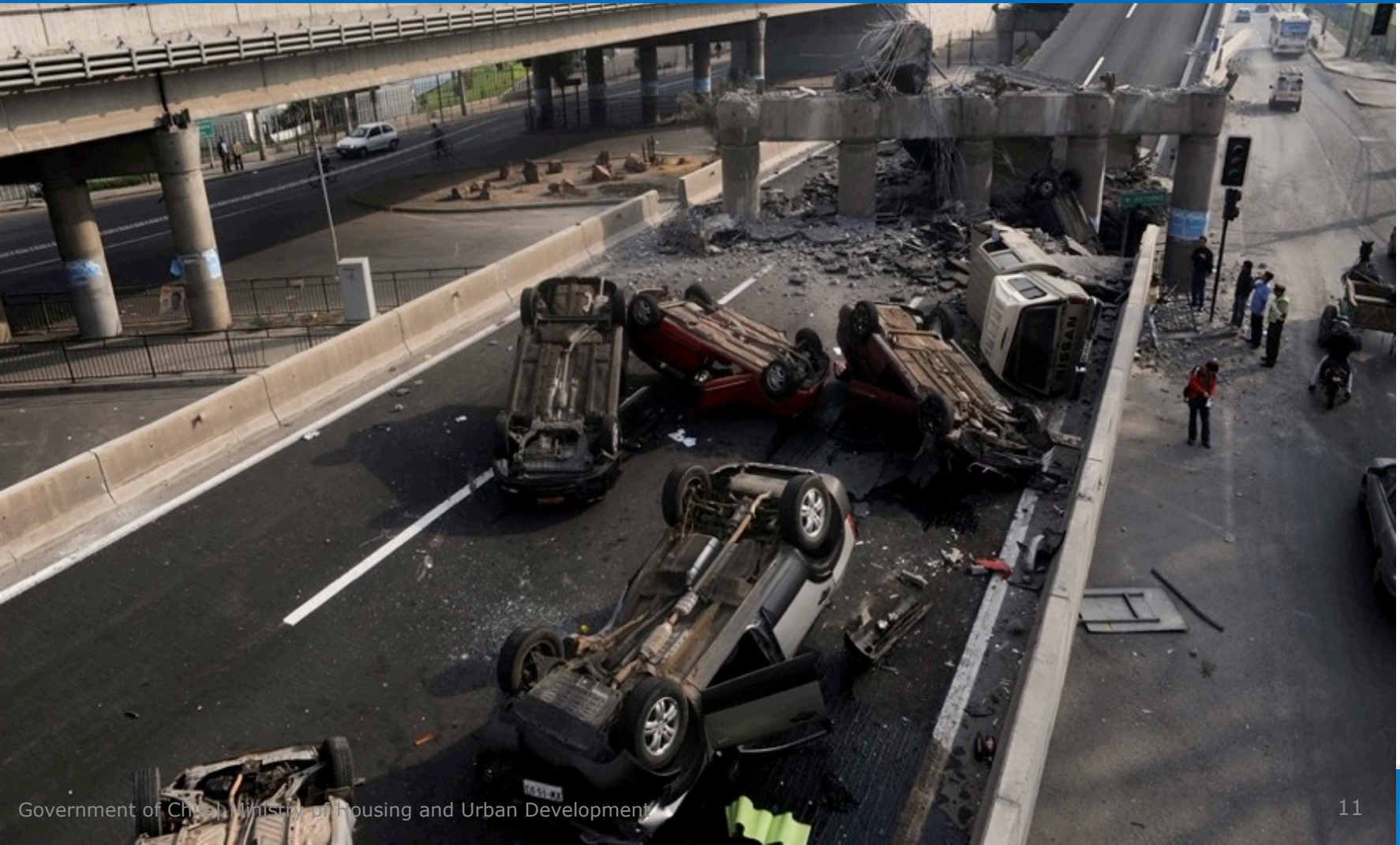
40 Hospitals with severe damage and 17 completely destroyed.
75% of the Health Network of the country was affected.



27th February, 2010

Extension and magnitude of the catastrophe

1,554 kilometers of roadways severely damaged



27th February, 2010

Extension and magnitude of the catastrophe

Destroyed 2 mayor ports and 28 fishermen coves



27th February, 2010

Extension and magnitude of the catastrophe

Devastating an area of more than 630 kilometers along the Chilean coastline and central valleys



27th February, 2010

Extension and magnitude of the catastrophe

109,000 homes destroyed and 105,000 severely damaged
(an overturn of 4 years of successful housing policy).



27th February, 2010

Extension and magnitude of the catastrophe

210 bridges severely damaged or destroyed



27th February, 2010

Extension and magnitude of the catastrophe

4,538 damaged schools (1 of every 3 schools located in the area of catastrophe). Including more than 1,250,000 students.



27th February, 2010






Extension and magnitude of the catastrophe

5 Cities with more than 100 thousand hab / 45 Cities over 5 thousand hab / More than 900 small towns and villages



Summary of the damage

The total cost of the disaster is estimated in US\$ 30 billion, which is equivalent to **18% of the GNP** (Gross National Product).

-  **4,000** schools
-  **40** hospitals
-  **2,500** connectivity points
-  **8** airports and aerodromes
-  **53** port works

damage

222 Thousand
Houses to reconstruct or to repair



Stages Reconstruction Plan

1. Early emergency

Immediate Actions

- To bury the victims and find the missing.
- Restore public order and providing basic services.
- Reset transportation and communications systems.

Winter emergency

- 80,000 emergency housing.
- Educational services to 1.5 million students.
- Health Network.

2. Reconstruction Plan (Housing 4 years)

- Housing 222,000 housing solutions (MINVU)
- City and Territory (Planning coastal cities) (MINVU)
- Public works (roads, bridges, ports, etc..) (MOP)
- Schools (Ministry of Education)
- Public buildings (M. Interior)

Reconstruction Plan Stages

1. Early emergency

Immediate Actions

- To bury the victims and find the missing.
- Restore public order and providing basic services.
- Reset transportation and communications systems.

Winter emergency

- 80,000 emergency housing.
- Educational services to 1.5 million students.
- Health Network.

2. Reconstruction Plan (Housing 4 years)

- **Housing 222,000 housing solutions (MINVU)**
- **City and Territory (Planning coastal cities) (MINVU)**
- Public works (roads, bridges, ports, etc..) (MOP)
- Schools (Ministry of Education)
- Public buildings (M. Interior)

THE HOUSING PROBLEM: Spread of Damage

=

- Different Problems
- Different Locations
- Different Cultures

Decentralized Implementation



Problems

Owner of a
Repairable House

Owner of a non-
repairable house

Non-Owner
displaced Families

110.000

57.000

53.000



Approach	
Bottom – Up Community level	<ul style="list-style-type: none"> • Cases where each family is actually able to lead its own house reconstruction. • Promote community involvement and empowerment
Top – Down State Level	<ul style="list-style-type: none"> • Cases where families by themselves are not able to lead the process. • Multi family cases (buildings/villas). • When urban regeneration/ planning is needed.
Third Party Intermediate level (EGIS)	<ul style="list-style-type: none"> • Cases where the local actors (Municipalities, NGO, Comitees) have the means to lead the process and the complexity of the problem is not that hard.

Problems Approach	Repairable House Land Owner	Non-Repairable House Land Owner	Non-Land Owner
Self - Lead Community level	<div data-bbox="347 214 705 321"> Bank of Materials </div>	<div data-bbox="830 214 1188 321"> Relocation Subsidy </div> <div data-bbox="830 371 1188 478"> Bank of Materials + Technical Assistance </div>	<div data-bbox="1323 214 1680 321"> Acquisition Subsidy </div>
State - Lead State Level	<div data-bbox="338 578 705 799"> Social Condominiums Repair Program (major damage) </div>	<div data-bbox="859 614 1207 714"> Social Condominiums for demolition </div> <div data-bbox="850 771 1197 878"> Pre-Certified Houses </div>	<div data-bbox="1313 578 1671 685"> New Developments </div>
Third Party - Lead Intermediate level	<div data-bbox="357 992 724 1170"> Social Condominiums Repair Program (minor damage) </div> <div data-bbox="357 1192 705 1292"> House Repair Subsidy </div>	<div data-bbox="850 978 1207 1085"> Pre-Certified Houses </div> <div data-bbox="850 1178 1197 1278"> Ad – Hoc Houses Project </div>	<div data-bbox="1323 985 1671 1085"> New Developments </div> <div data-bbox="1333 1163 1690 1306"> Urban Densification/ Renovation Program </div>

Problems

Repairable House
Land Owner

Non-Repairable House
Land Owner

Non-Land Owner

Approach

Self - Lead
Community level

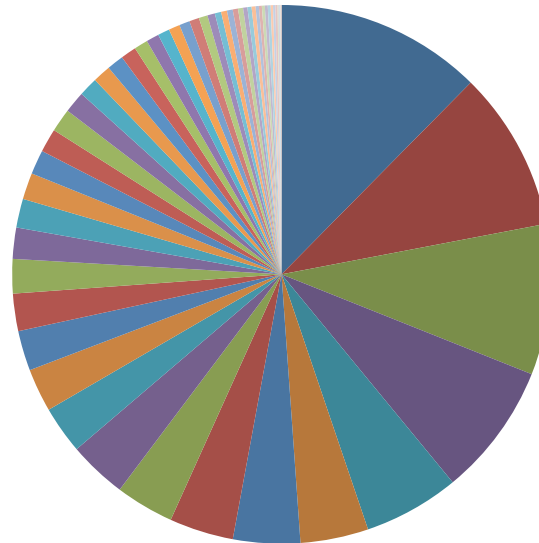
Bank of Materials



State - Lead
State Level



Participation of material Suppliers



- Sodimac Constructor Viña del Mar
- Ferretería San Fermín
- Ferretería 100
- Easy
- Ferretería La Bodega

Third Party - Lead
Intermediate level



Problems

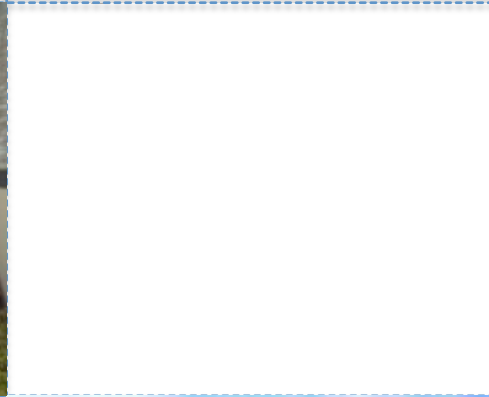
Repairable House
Land Owner

Non-Repairable House
Land Owner

Non-Land Owner

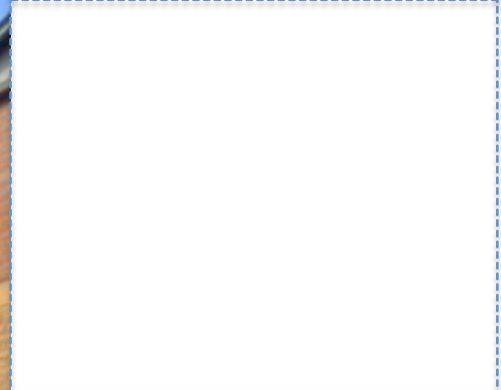
Approach

Self - Lead
Community level



State - Lead
State Level

**Social Condominiums
Repair Program
(major damage)**



Third Party - Lead
Intermediate level





Problems

Repairable House
Land Owner

Non-Repairable House
Land Owner

Non-Land Owner

Approach

Self - Lead
Community level

Bank of Materials +
Technical Assistance

State - Lead
State Level

Third Party - Lead
Intermediate level



Problems

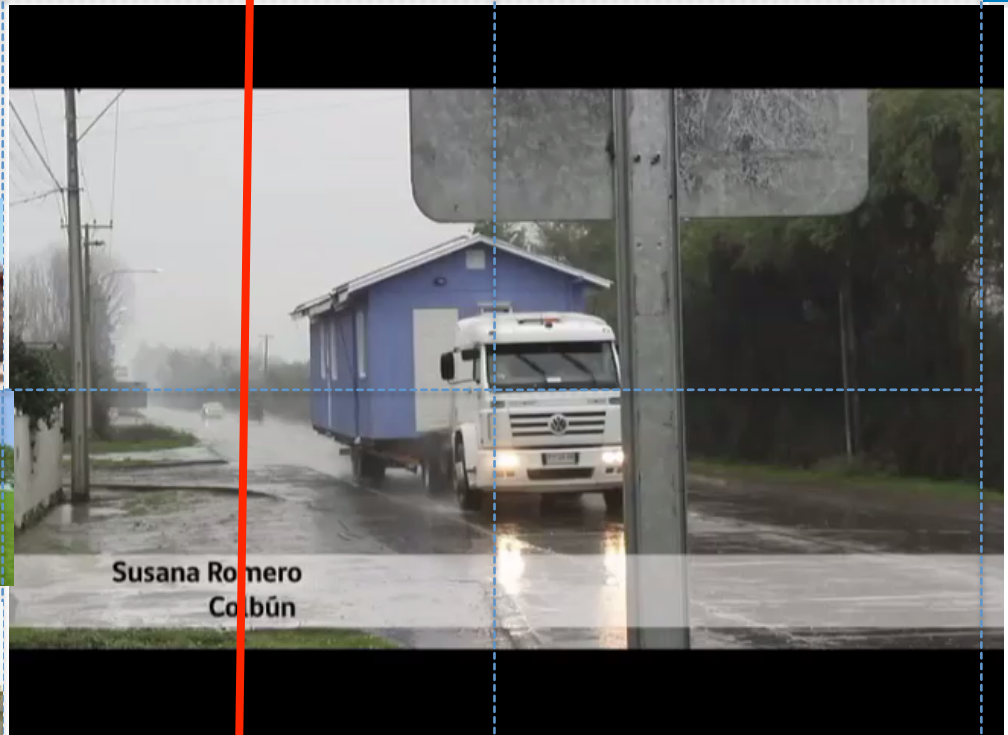
Repairable House
Land Owner

Non-Repairable House
Land Owner

Non-Land Owner

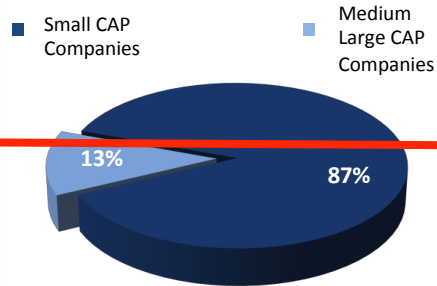
Approach

Self - Lead
Community level




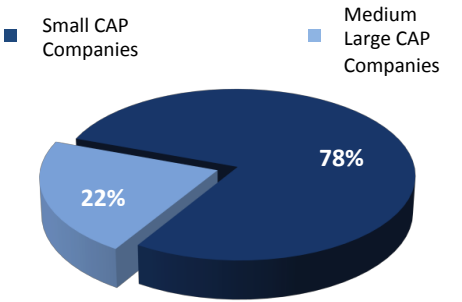






State - Lead
State Level

Third Party - Lead
Intermediate level



Pre-Certified Housesç



<p>Problems</p>	<p>Repairable House Land Owner</p>	<p>Non-Repairable House Land Owner</p>	<p>Non-Land Owner</p>
<p>Approach</p>		 <p> ■ Small CAP Companies ■ Medium Large CAP Companies </p>	
<p>Self - Lead Community level</p>			<p>New Developments</p>
<p>State - Lead State Level</p>			
<p>Third Party - Lead Intermediate level</p>			

Problems

Repairable House
Land Owner

Non-Repairable House
Land Owner

Non-Land Owner

Approach

Self - Lead
Community level



State - Lead
State Level



Third Party - Lead
Intermediate level



Urban Densification/
Renovation Program

**Housing
Reconstruction**

General Principles

**and Lessons
Learned**

Principle #1

Politically Risky, but.....

**Governments
should lead the
process.**

Lead does not mean do.



LUNES

29 de marzo de 2010

Santiago de Chile

Año LXXIX N° 11.978

\$350

La Segunda

GRIETA DE 4 KILOMETROS DETECTADA EN ISLA DE MAIPO MOVILIZA A LOS GEOLOGOS

PAGINA 7

Gobierno dio a conocer Plan de Reconstrucción para 200 mil familias más damnificadas

US\$ 2.500 millones a viviendas definitivas





Ministerio de
Vivienda y
Urbanismo

Gobierno de Chile

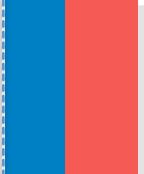
Principle#2

**In the event of a Major
Catastrophe...**

**Crete a set of
flexible solutions
with decentralized
execution.**

**Not a centralized agency
with standard solutions.**

Problems Approach	Repairable House Land Owner	Non-Repairable House Land Owner	Non-Land Owner
Community level	Bank of Materials	Subsidy for acquisition or construction DIY-Construction	Acquisition Subsidy
Government Level	Social Condominiums Repair Program (major damage)	Social Condominiums for demolition	New Developments
Intermediate level	Repair Subsidy	Pre-Certified Houses	Urban Densification Renovation Program



Principle#3

Slower and Harder, but....

**Whenever you can,
try not to displace
families.**

The closer the better.



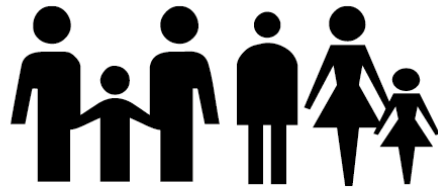


Principle #4

It is more expensive, but...

**Focus on the victims
and not in the
buildings.**

**You may be able to solve
two problems
simultaneously.**



Family # 1



Family # 2





Familia 1



Familia 2





53.000

Principle#5

**It may be complicated,
politically dangerous, but...**

**Transparency and
Openness.**

**You will be gaining
people's trust.**

Tracking System

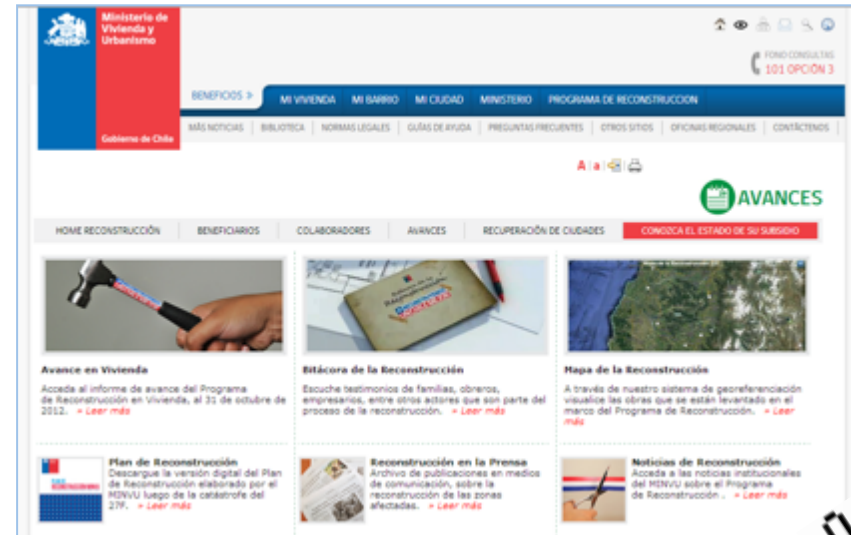
Innovation (obrasreconstruccion.minvu.cl)

1. National Report (every 6 months)

2. Housing Report (every month)

3. Online tracking system

4. Online control system for beneficiary families



National Report

All areas

Gobierno de Chile

Gestión de cumplimiento

Estado: marzo 2012

INICIO PRESIDENTE PRIMERA DAMA LA MONEDA AUTORIDADES BLOG CENTRO DE PRENSA CONTACTATE

INICIO GESTIÓN DE CUMPLIMIENTO OBJETIVOS ESTRATEGICOS

Ejes de cumplimiento

- Crecimiento
- Empleo
- Seguridad ciudadana
- Educación
- Salud
- Pobreza
- Calidad de la democracia, descentralización y modernización del Estado

Cuenta Pública 2011

Estas en: Reportes de Cumplimiento

Reportes de Cumplimiento (versión PDF)

> Reporte de la agenda de modernización del Estado - septiembre 2012 (03/10/2012).

> Reporte de Reconstrucción - agosto 2012 (31/08/2012).

> Reporte de cumplimiento legislativo (31/05/2012).

> Rindiendo cuenta: Balance de dos años de Gobierno del Presidente Sebastián Piñera (12/03/2012).

> Reporte de Reconstrucción - enero 2012 (10/02/2012).

> Reporte de cumplimiento eje crecimiento - octubre 2011 (31/10/2011).

> Reporte de cumplimiento eje empleo - octubre 2011 (31/10/2011).

> Reporte de cumplimiento eje seguridad ciudadana - octubre 2011 (31/10/2011).

> Reporte de cumplimiento eje salud - octubre 2011 (31/10/2011).

> Reporte de cumplimiento eje pobreza - octubre 2011 (31/10/2011).

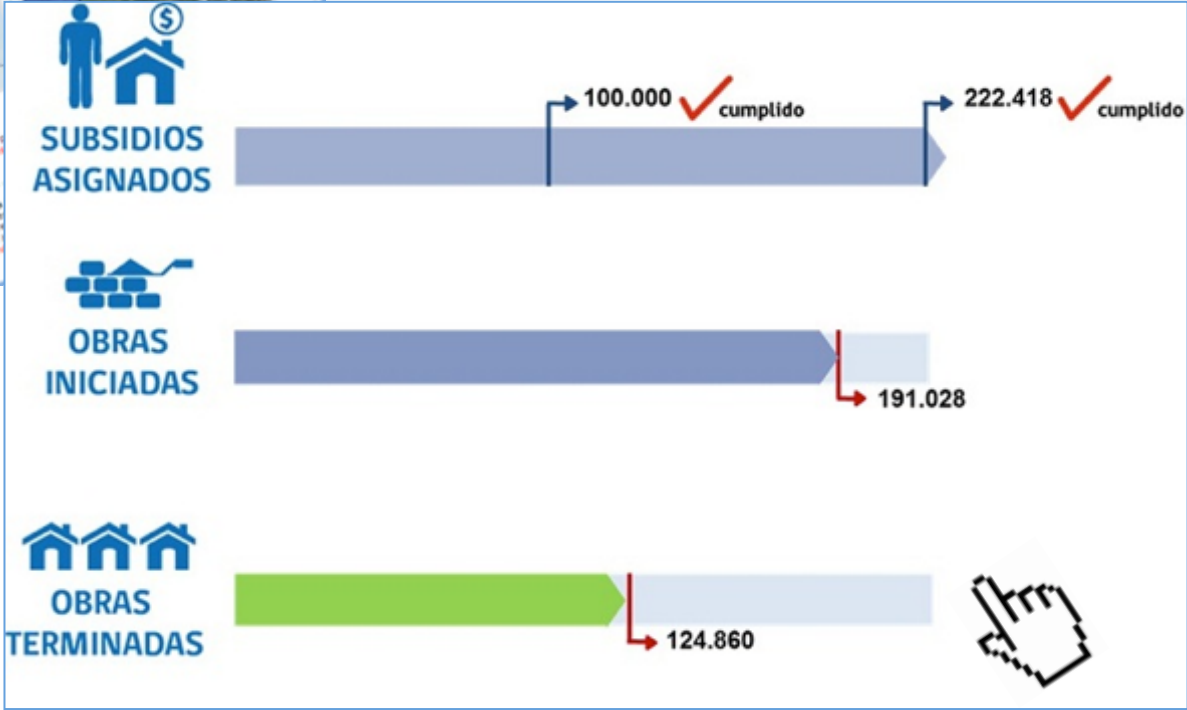
Gobierno de Chile

REPORTE DE CUMPLIMIENTO DE LA RECONSTRUCCIÓN DEL TERREMOTO DEL 27 DE FEBRERO DE 2010

AGOSTO 2012

Housing Report

General monthly progress



Tracking System

Innovation (obrasreconstruccion.minvu.cl)



Ministerio de Vivienda y Urbanismo
Gobierno de Chile

Mapa de la Reconstrucción 27F

Fecha: 14/12/2011

Filtros de búsqueda

UBICACIÓN:
Región del Maule
Empedrado

TIPO DE SUBSIDIO:

CONSTRUCCIONES DE VIVIENDAS:

- CONJUNTOS HABITACIONALES
- VIVIENDAS INDIVIDUALES
- VIVIENDAS TIPO
- VIVIENDAS AUTOCONSTRUIDAS

REPARACIONES DE VIVIENDAS:

- REPARACIONES COLECTIVAS
- REPARACIONES INDIVIDUALES
- BANCO DE MATERIALES

ESTADOS DE AVANCE:

- CON SUBSIDIOS ASIGNADOS
- OBRAS EN EJECUCIÓN
- OBRAS TERMINADAS

Buscar

mostrando 39/151 registros

Estado: OBRA TERMINADA
Programa: FSV I-CRPT
Familias: 1
Comuna: Empedrado
Proyecto: INDIVIDUAL
Asesoría: ÁLVARO PÉREZ RAMOS
Constructora: CONSTRUCTORA DEFLUV SOCIEDAD ANONIMA

La información de este sitio está en permanente actualización, por lo que no necesariamente representa la totalidad de los subsidios otorgados, la cantidad de proyectos iniciados, ni el estado de avance de éstos.
Ministerio de Vivienda y Urbanismo, Alameda 924 - Santiago - Chile. Código postal: 8513482 - Teléfono (56-2) 351 3000 - Fax (56-2) 633 7830

Control System

For beneficiary families

Programa de Reconstrucción



Fiscalización de Avance de Obras para Familias Damnificadas

Bienvenido al Sistema de Fiscalización de Avance de Obras de Reconstrucción. Si usted fue damnificado con la catástrofe del 27 de febrero de 2010, y resultó beneficiado con un subsidio hábitacional, acceda a una cartola con información del avance de sus obras e infórmenos sobre atrasos y otras irregularidades que dificulten la ejecución de su subsidio.

Comuníquese con nosotros para fiscalizar juntos el avance de la reconstrucción de su vivienda.

INGRESE SUS DATOS:

Nombres * :

Apellidos * :

Rut * : -

Ver Cartola

- * Los nombres y apellidos deben ser idénticos a los de su Cédula de Identidad.
- * Datos requeridos.

Desarrollado



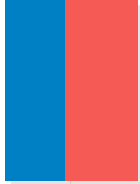
Principle#6

**It may be slower, but it is
theirs house...**

**Let people
Choose.**

**It actually increases the
quality and size of the
houses.**

Bank of pre certified projects





Principle#7

**It's Time to
innovate**

If not now, when

Flood Resilient Houses



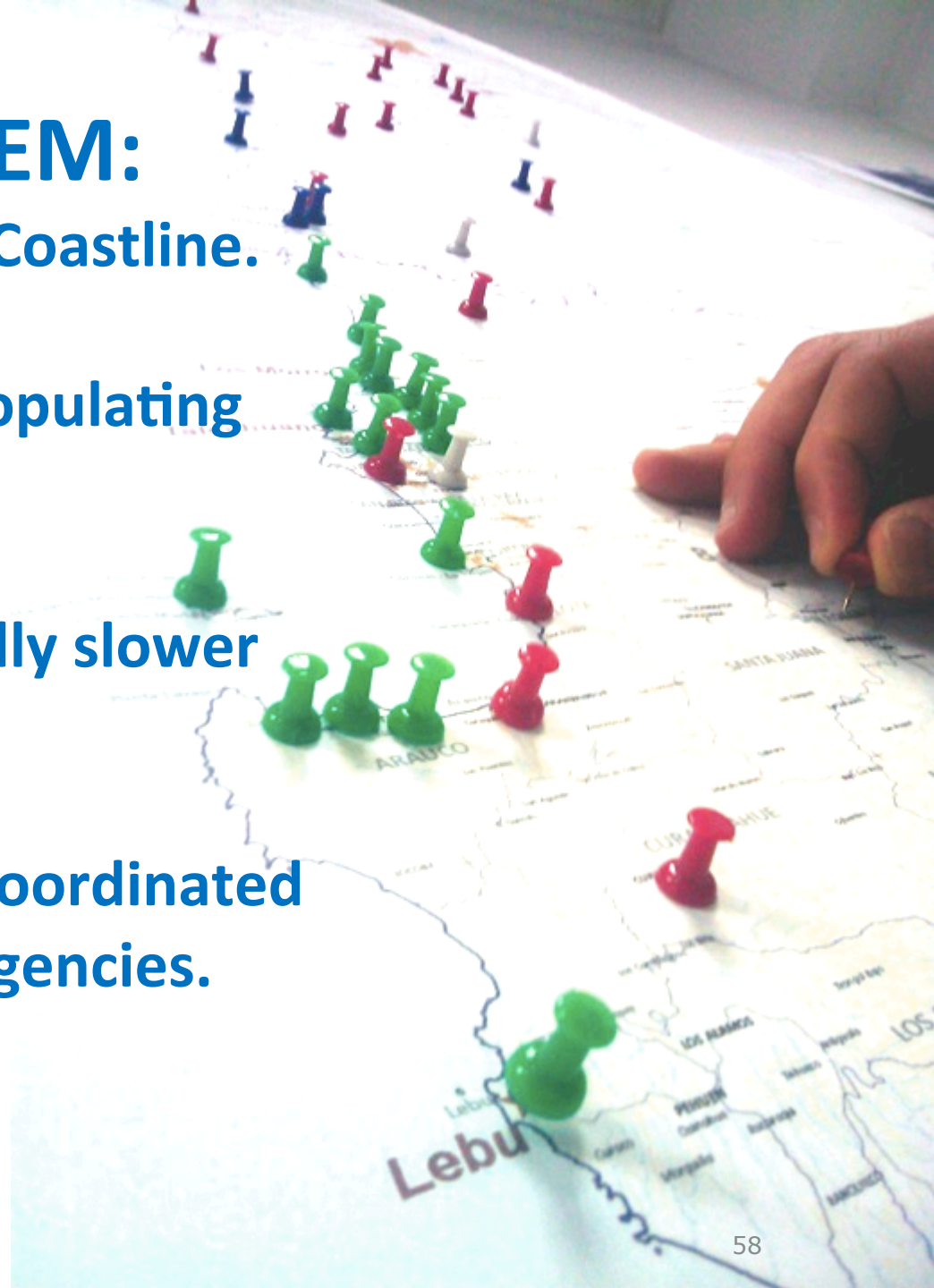
3D industrialized houses



THE URBAN PROBLEM:

Intensity of Damage in the Coastline.

- People afraid about repopulating the coast.
- Planning process is usually slower than what people need.
- Investment need to be coordinated among many different agencies.



27th February, 2010

Extension and magnitude of the catastrophe

Hundreds of fishermen boats lost

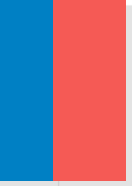


27th February, 2010

Extension and magnitude of the catastrophe

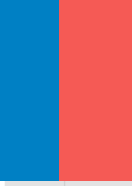
Coastal cities completely wiped out by the tsunami





View of Constitución before the earthquake and tsunami





View of Constitución after the earthquake and tsunami



Dichato

4/25/2006
2003 2012

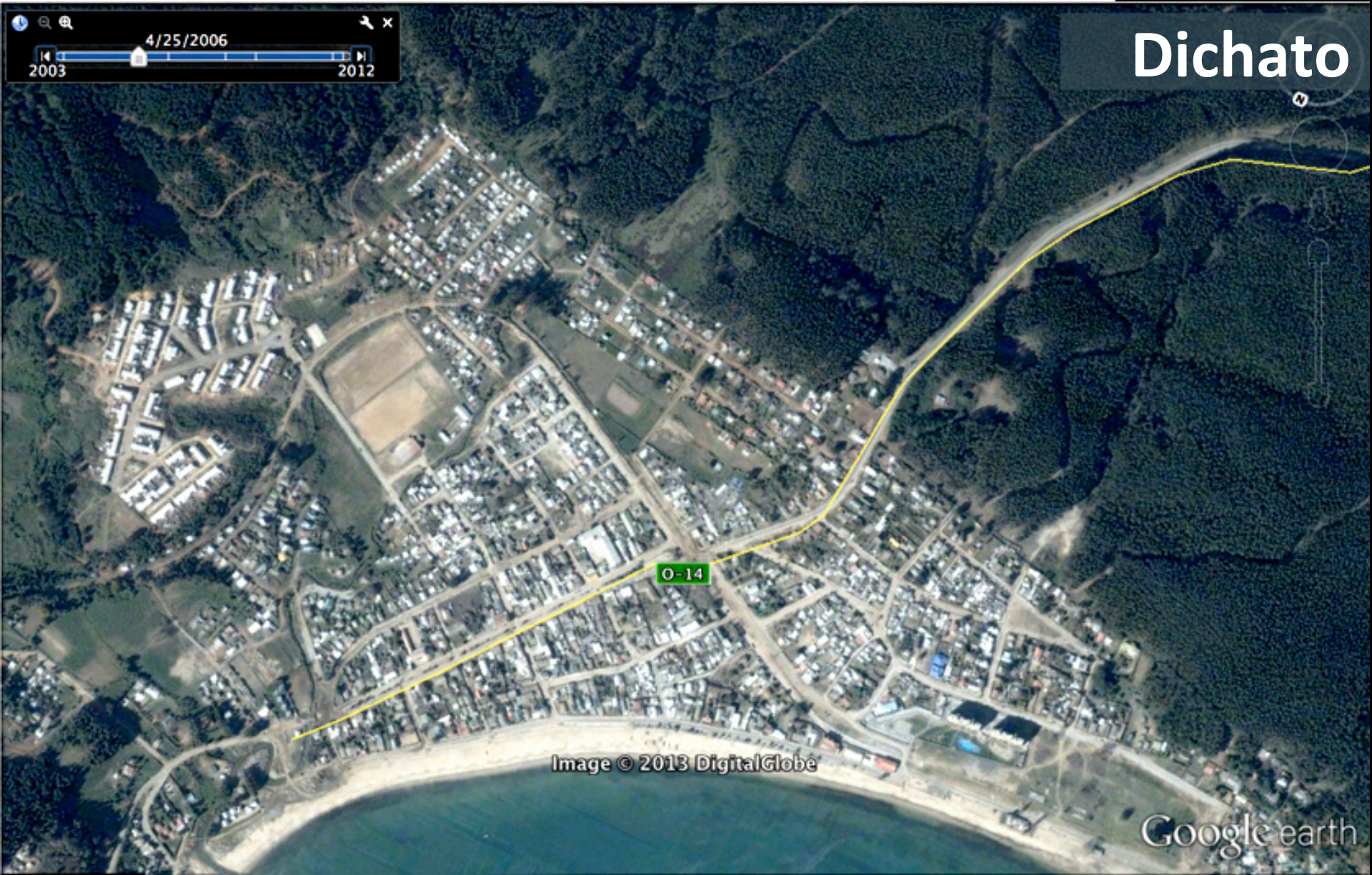


Image © 2013 DigitalGlobe

Google earth

Dichato

3/4/2010
2003 2012

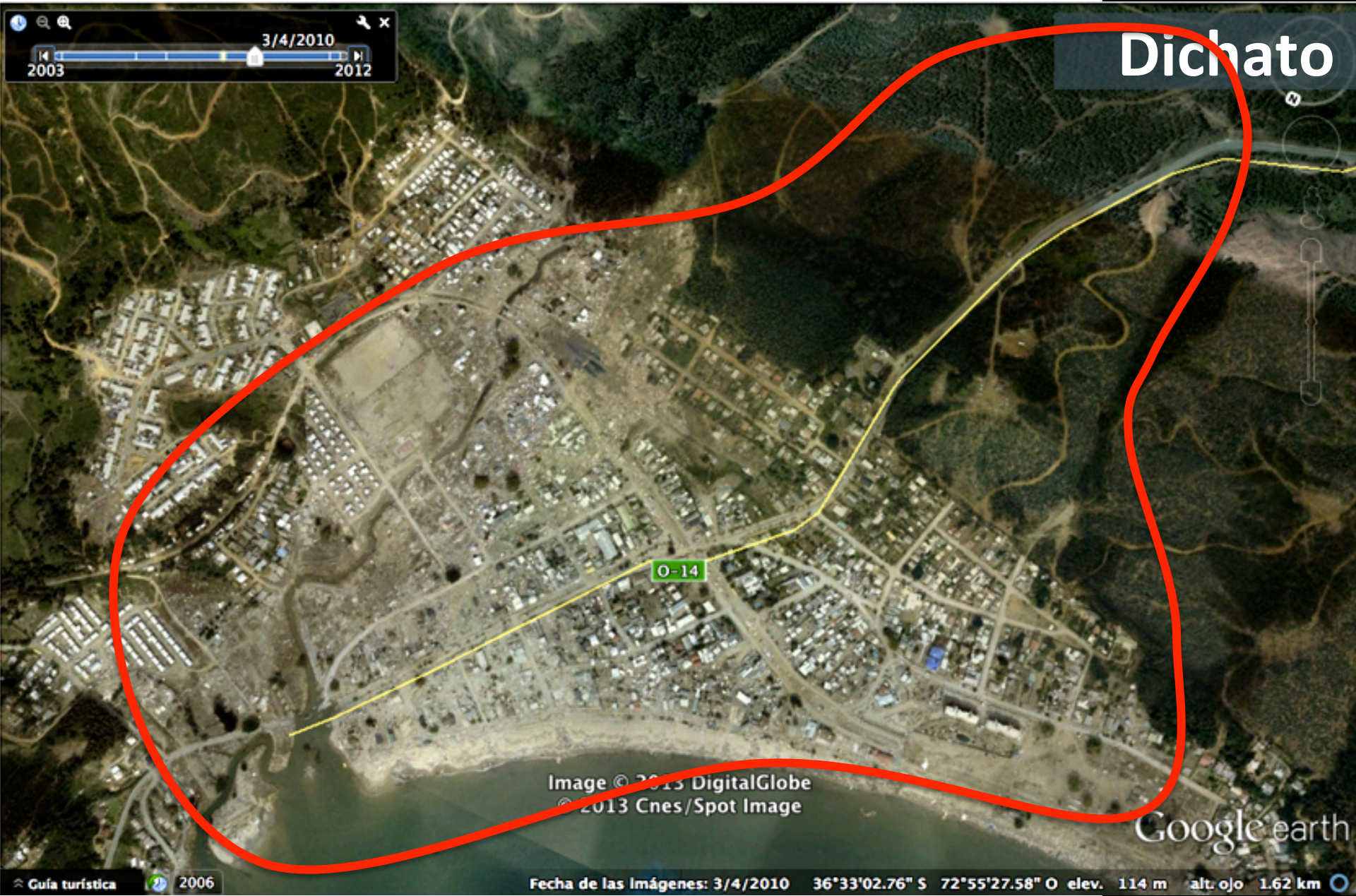


Image © 2013 DigitalGlobe
© 2013 Cnes/Spot Image

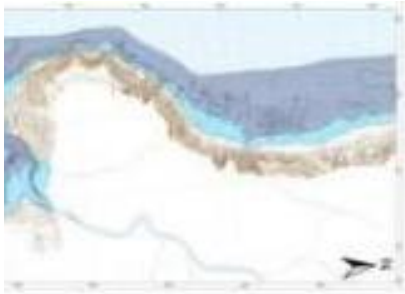
Google earth

8th principle

Build resilient cities



➤ Each location counts with 3 different products



1. RISK STUDIES

- Risk studies elaborated by SERNAGEOMIN and Universidad Católica and Universidad del Biobío
- Risk zoning and landslide



2. MASTER PLANS AND MITIGATION PROJECTS

- Master plans for each location include a plan of urban infrastructure and mitigation projects



3. ZONING AND POLYGONS FOR SPECIAL SUBSIDIES

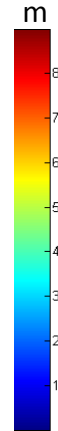
- definition of zones of exclusion and polygons where will be possible to construct tsunami resilient houses with special subsidies



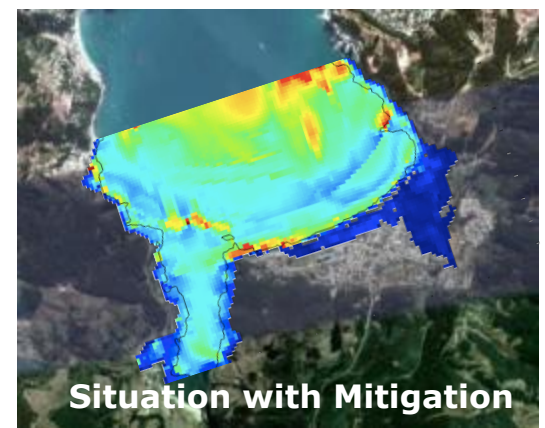
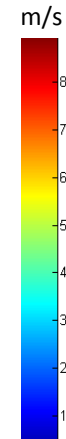
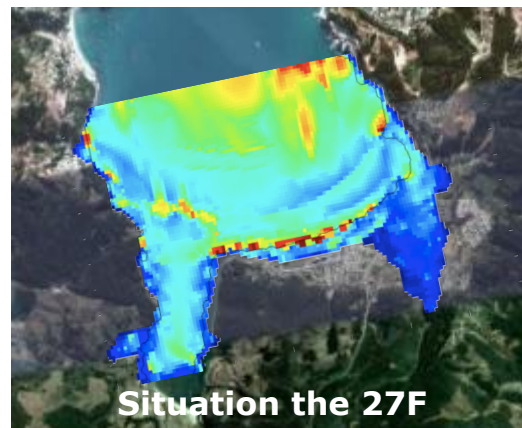
➔ Product 1: Risk Studies

Tsunami simulation studies conducted for the city of Dichato

Reduce the high of the waves with mitigation projects from 5-9 mts. to 1,5-2 m.



Reduce the speed of the waves with mitigation projects from 8 m a 1,5 m.



These models confirm that with tsunami mitigation works is possible a viable and safer reconstruction in the area exposed to inundation in Dichato.

➤ Product 2: Master Plans and Mitigation Projects

The master plans incorporate mitigation projects that will improve the security and identity of the affected locations.



Example of execution of Urban Mitigation Projects in Dichato

Preliminar profile of mitigation infraestructure, wall and park, against the risk of tsunami in Dichato, that reduce the high and energy of the wave.



Master Plans for 25 coastal cities

➔ Product 3: Special Subsidies

➔ Example: Special subsidies for tsunami resilient building codes.

A house in
Dichato

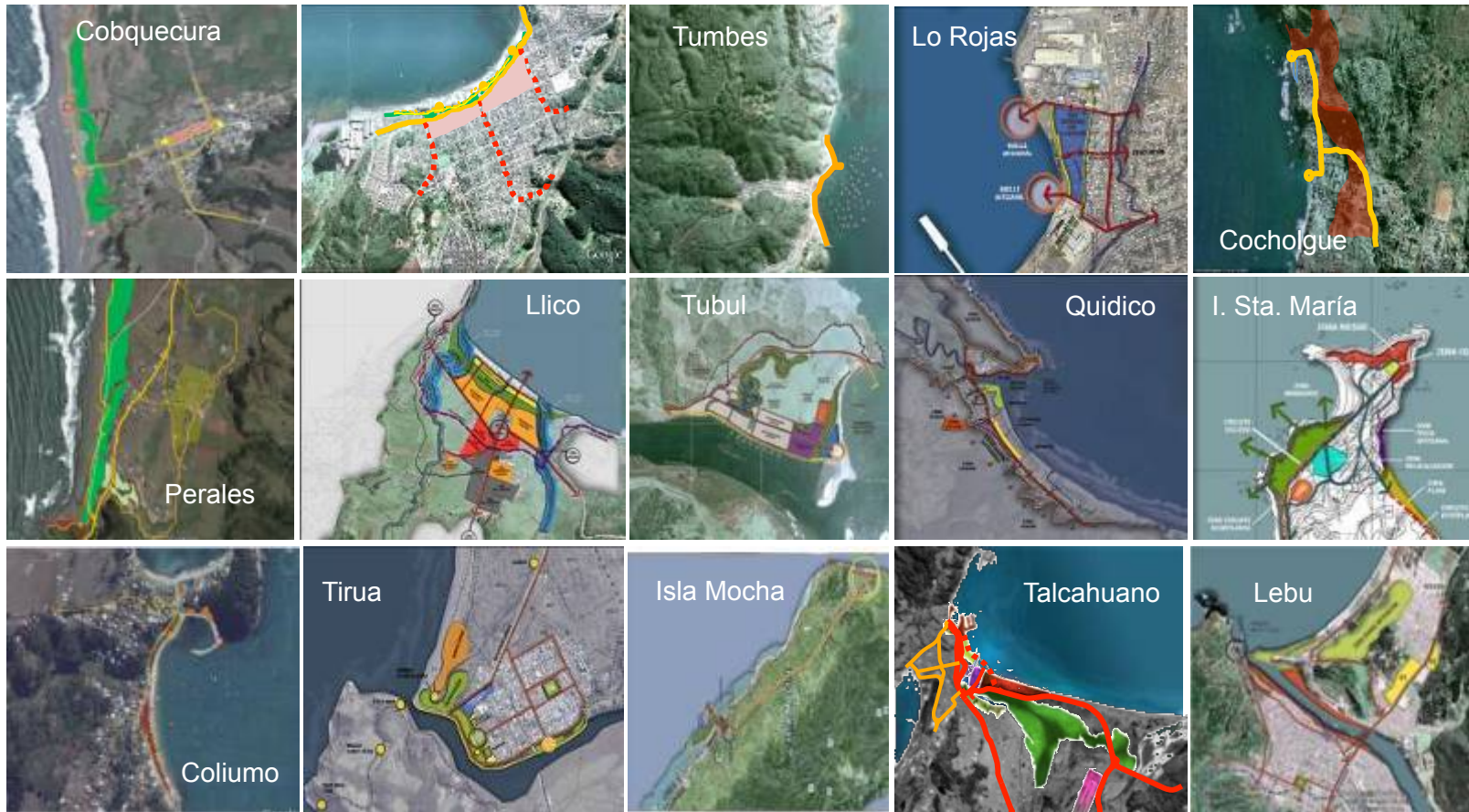


Resistant
tsunami
houses in
Dichato



Risk zoning and special polygon in Dichato.

Master Plans for 25 coastal cities



Master Plans for 112 inland cities
180 Heritage Recovery Area were declared

Principle #9

In the aftermath of a large Scale Catastrophe, you may be focus on the emergency, but..

Create long term risk managment institutions.

You will be saving even more lives

Chilean urban planning History



HISTORIA



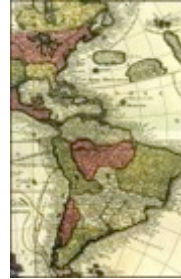
1541-1567

- Capitanía General de Chile
- Virreinato - Gobernación - Provincias - Cabildos
- Fundaciones Ciudades y Fuertes



1680

Recopilación de las Leyes de Indias



1786

Reformas Borbónicas: Creación de Intendencias Santiago, Concepción, Chiloé

1778

Virreinato del Río de la Plata

1810

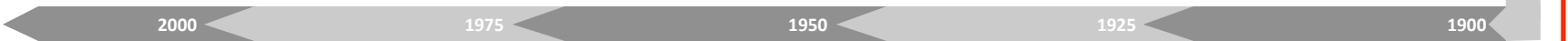
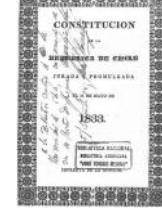
Primer Congreso

1833

Constitución de 1833 Reorganiza administración territorio: provincia – departamento – delegación - distrito

1891

- Decreto de Creación de Municipalidades
- Ley de la Comuna Autónoma



2007

Programa Barrios



2003

Ley de Financiamiento Urbano Compartido

1997

Desarrollo Urbano Condicionado

1978

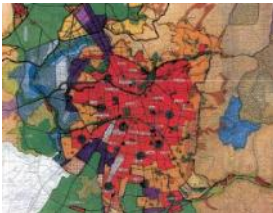
Subsidio Habitacional

1976

D.L.1.305 Restructuración y Regionalización del MINVU

1994

Plan Regulador Metropolitano de Santiago



1965

Ley 16.391 Creación del Ministerio de Vivienda y Urbanismo



1960

Plan Regulador Intercomunal de Santiago

1959

DFL 2

1953

Creación de la CORVI



1936

Caja de Habitación Popular

1931

Ley General de Urbanismo y Construcciones

1928

Terremoto de Talca

1920-1930

Primer Plan Regulador de Santiago



1925

Constitución de 1925

1906

Consejos de Habitaciones Obreras



Institutional/Regulatory changes

take advantage of political times



	Talca, 1928. 8,3°.	Chillan, 1939. 8,3°.	Valdivia, 1960. 9,5°	27 F, 2010. 8,8°
Institutions		<ul style="list-style-type: none"> - Reconstruction Corporation (CORVI's predecessor) (1939) - CORFO (1939) 	Ministry of Housing and Urban Development (1965)	<ul style="list-style-type: none"> - Civil Protection Agency (in Parliament discussion) - National Early Warning System (2013)
Regulation	<ul style="list-style-type: none"> - Urban Transformation Law (1929)* - Urbanism and Construction Law. (1931) 			<ul style="list-style-type: none"> - Urban Plan actualization (Risk zones, mitigation projects). - Territorial management instruments (PRES/PRUS) - Technical building standards

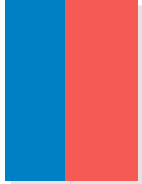
*every city with more than 20,000 inhabitants, must have an Urban Plan.



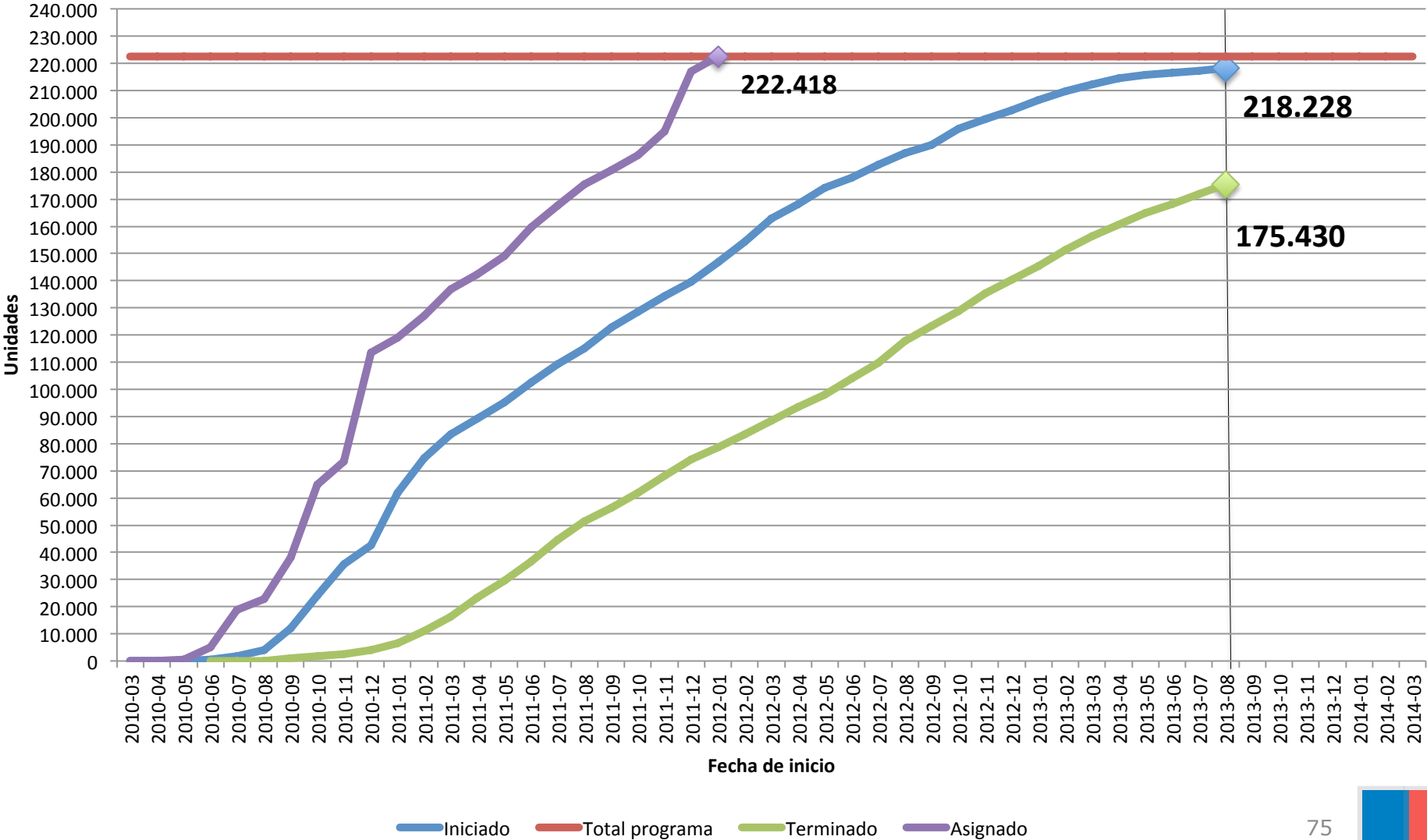
A collage of various construction and development scenes. The top row shows a street view, a blue archway, men in suits, and a colorful apartment building. The middle row features a worker on a roof, a construction site with workers, a building under construction, and a row of colorful modular units. The bottom row includes a crane, a yellow building, a construction site with workers, and a row of colorful modular units. The text 'PROGRESS TODAY' is overlaid in large white letters across the center.

PROGRESS TODAY

Historical Evolution of Housing rebuilding process



Started and Finished Units



Housing reconstruction current status

(Delivered, under construction and started houses)



222 thousand



175 thousand

43 thousand

4 thousand

Delivered houses

Under Construction

Started



77 thousand
New houses

98 thousand
Repaired houses

40 thousand
New houses

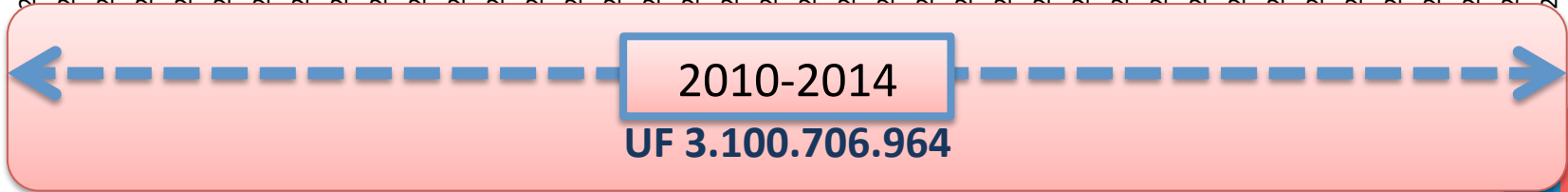
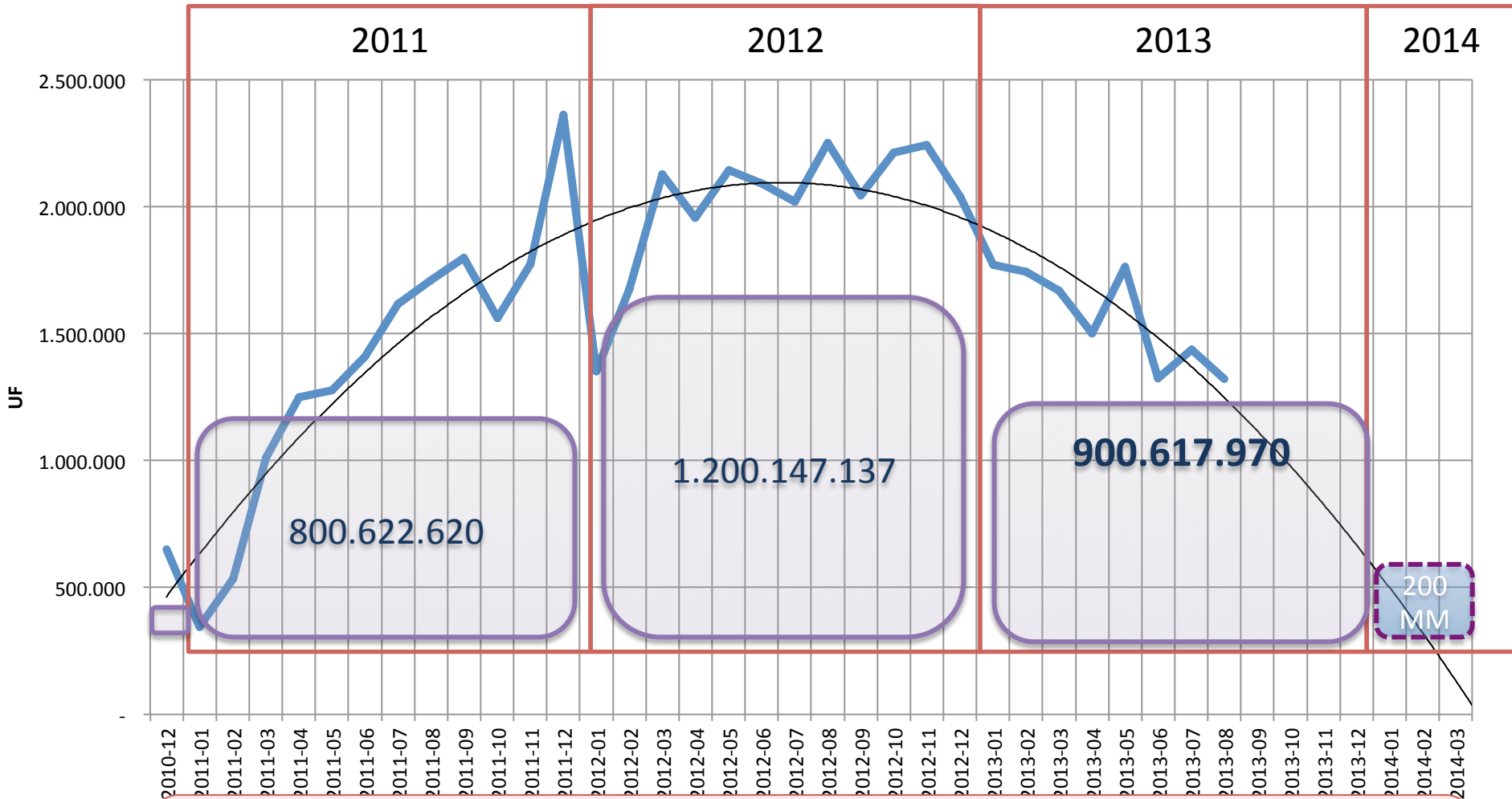
3 thousand
Repaired houses

3 thousand
New houses

1 thousand
Reparable houses



Annual budget expenditure USDMM



- ✓ 25 Master Plans developed for main coastal cities
- ✓ 112 Master Plans developed for inland cities, towns, and villages
- ✓ Heritage Recovery Plans developed for 180 zones of historic preservation

Our main challenge

“What makes a natural event in a disaster is the degree of vulnerability, that is to say, in which extent a geographic area, a community or a structure is able to face the negative effects of the event.”

*Status Report of the cities of Latin America and the Caribbean 2012
Towards a New Urban Transition
ONU Habitat*

Our main challenge is to plan and prepare our cities for the future, considering the underlying risks of our geography, such as earthquakes, volcanos, floods, and , mass remotion.

Thanks.