

# 2007 Summer Academy

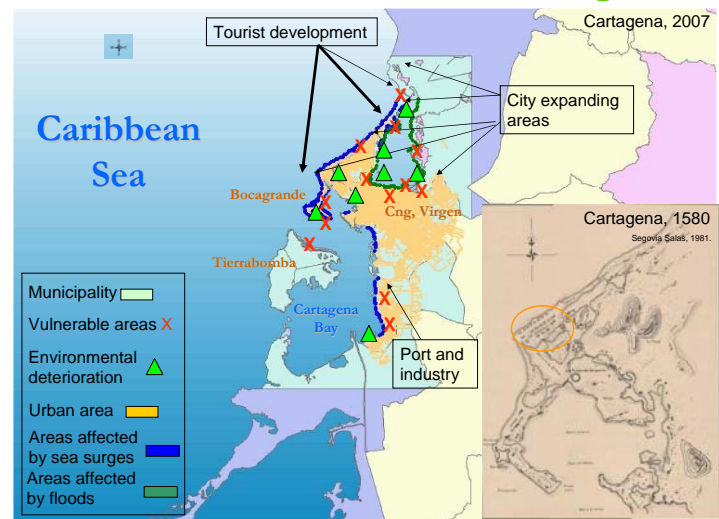
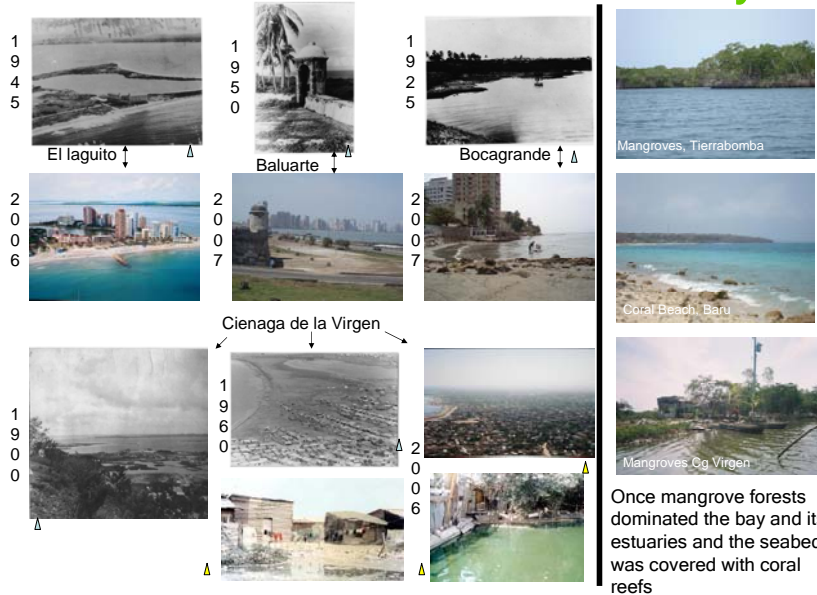
## Megacities: Social vulnerability and resilience building

# Assessing the Vulnerability of Cartagena de Indias (Colombia) to Natural Disasters

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The fortress city of Cartagena de Indias, located on the Caribbean coast of Colombia, was built during the 16<sup>th</sup> Century by the Spanish conquistadors. During the colonial period it was one of the most flourishing cities of America, and the architecture, monuments and fortress of this UNESCO world heritage site are a standing testimony of such historic wealth. At present more than 60% of Cartagena's population live under conditions of poverty. Although recently there have not been any high impact disasters, floods and storm surges affect more than 20,000 people annually, putting the city's entire infrastructure, water and sewerage services under stress.

## Historical change      Ecosystems      Cartagena



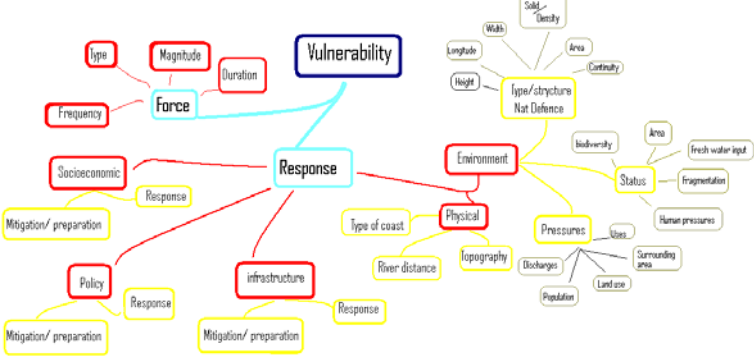
Cartagena was built, and continues growing by claiming land from estuaries and the sea. It is a very dynamic area that has been drastically altered by human activities

Once mangrove forests dominated the bay and its estuaries and the seabed was covered with coral reefs

## Impacts



## Working Vulnerability Model



Colours represent different levels. This diagram highlights the forces and responses related to vulnerability to natural disasters. The degree of vulnerability depends on the capacity of a system to respond to such forces. The physical, socioeconomic, policy and infrastructure characteristics of an area will increase or diminish the magnitude or energy of such forces. The natural environment has intrinsic and imposed characteristics that will influence a specific site's vulnerability. Such characteristics have been classified according to the ecosystems' natural structure as a physical barrier and energy disperser; and to their health, which is related to their capacity to respond and to the pressures placed upon them.

## Preliminary assessment

- Taking ecosystem services into account Cartagena's vulnerability to natural disasters has increased by 50% over the past 50 years
- Mangroves within the city are very damaged; healthy ecosystems in the outskirts of the city are under increasing tourism and development pressure
- Development plans aim to enhance tourism and expand the city into environmentally vulnerable areas
- Development plans lack historical information on natural disasters
- No disasters prevention policy exist
- Planning, environmental, disaster response and emergency policies are not integrated
- Developers and investors seem unaware of the city's vulnerability and environmental condition.

## Sources of Information

Baseline information Map of Cartagena. Invemar. <http://www.invemar.org.co> & Cartagena's Flooding Contingency Plan. Cartagena Municipality  
Data on events. Desinventar (La Red), Invemar & collected by the author  
Historical Photographs: Colección Fototeca de Cartagena <http://www.cartagenacaribe.com/cultura/fototeca.htm> & Segovia 1981. Las fortificaciones de Cartagena de Indias: estrategia e historia. SADE-CONSISA. Colombia  
Impact's photographs. El Universal and El Tiempo News papers  
Cienaga de la Virgen 2007 Photographs. Cardique, Cartagena. Colombia