

International Day for Disaster Reduction
Sasakawa Award 2007

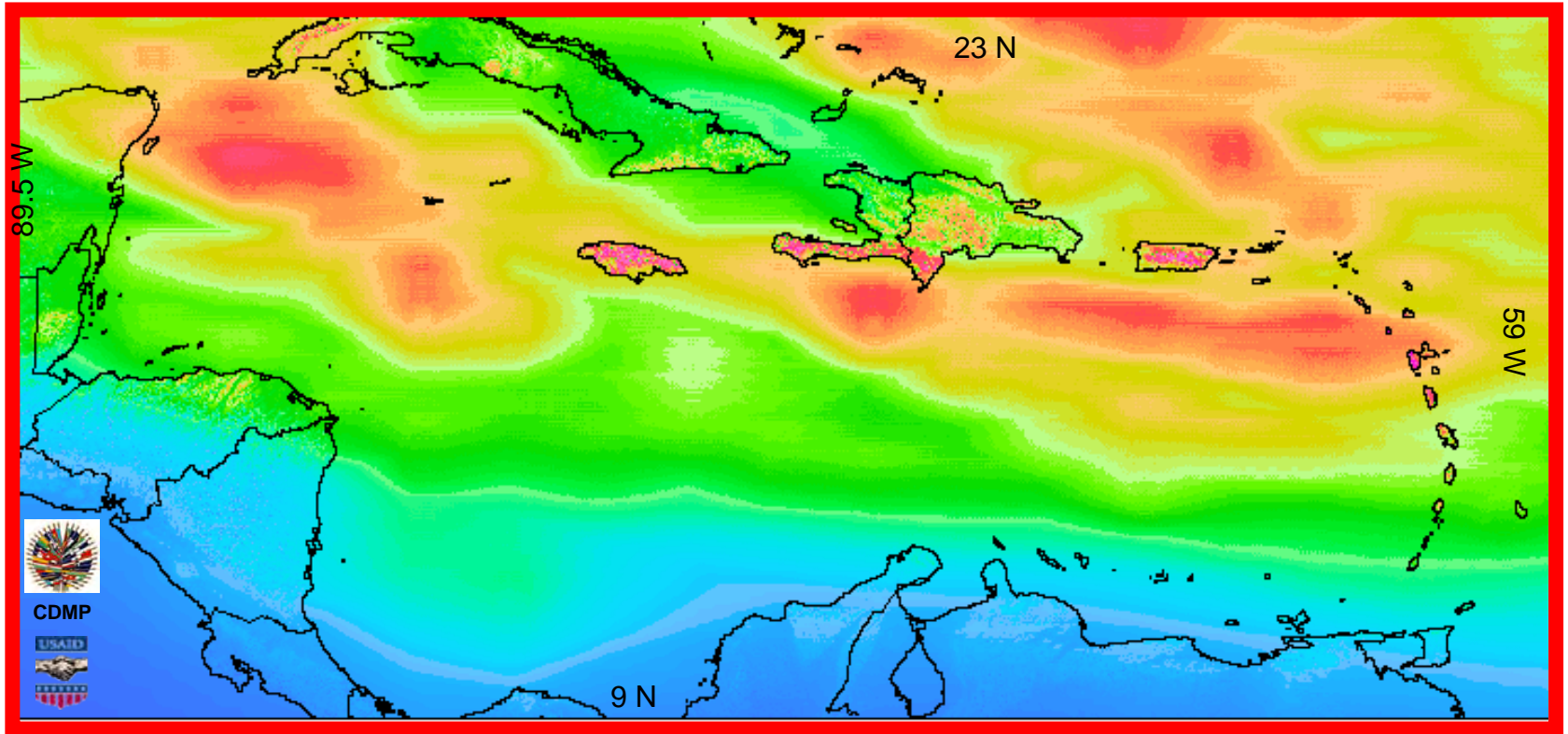
Tony Gibbs

Achievements and Recommendations



The Caribbean – an area of multiple hazards

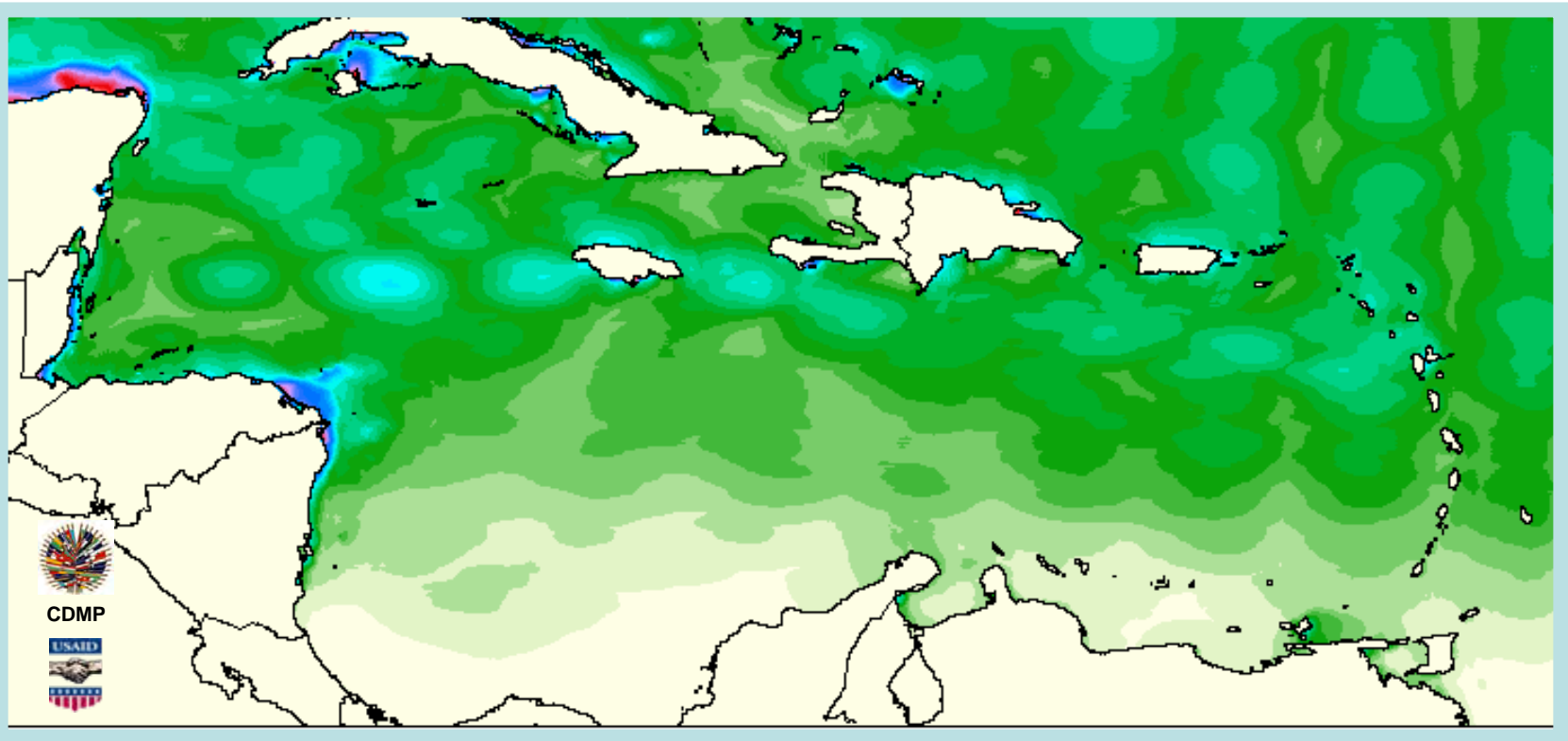
Maximum Wind Speeds (50-year return)



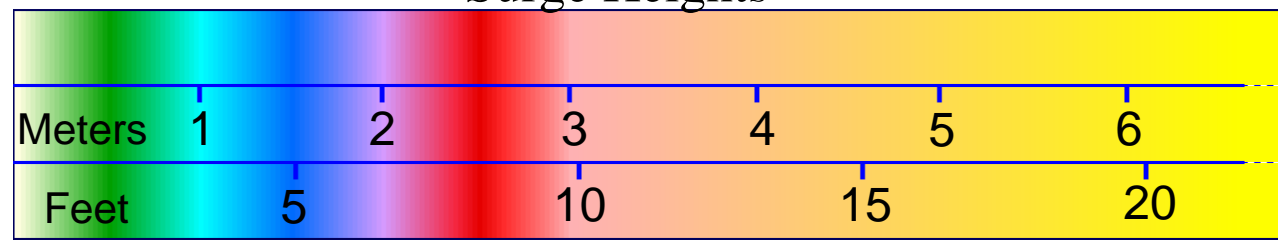
The Hurricane Hazard

		Wind Speeds					
Storm Category		0	1	2	3	4	5
knots	25	50	75	100	125		
mph	25	50	75	100	125	150	
kph	50	100	150	200	250		
m/s	10	20	30	40	50	60	70

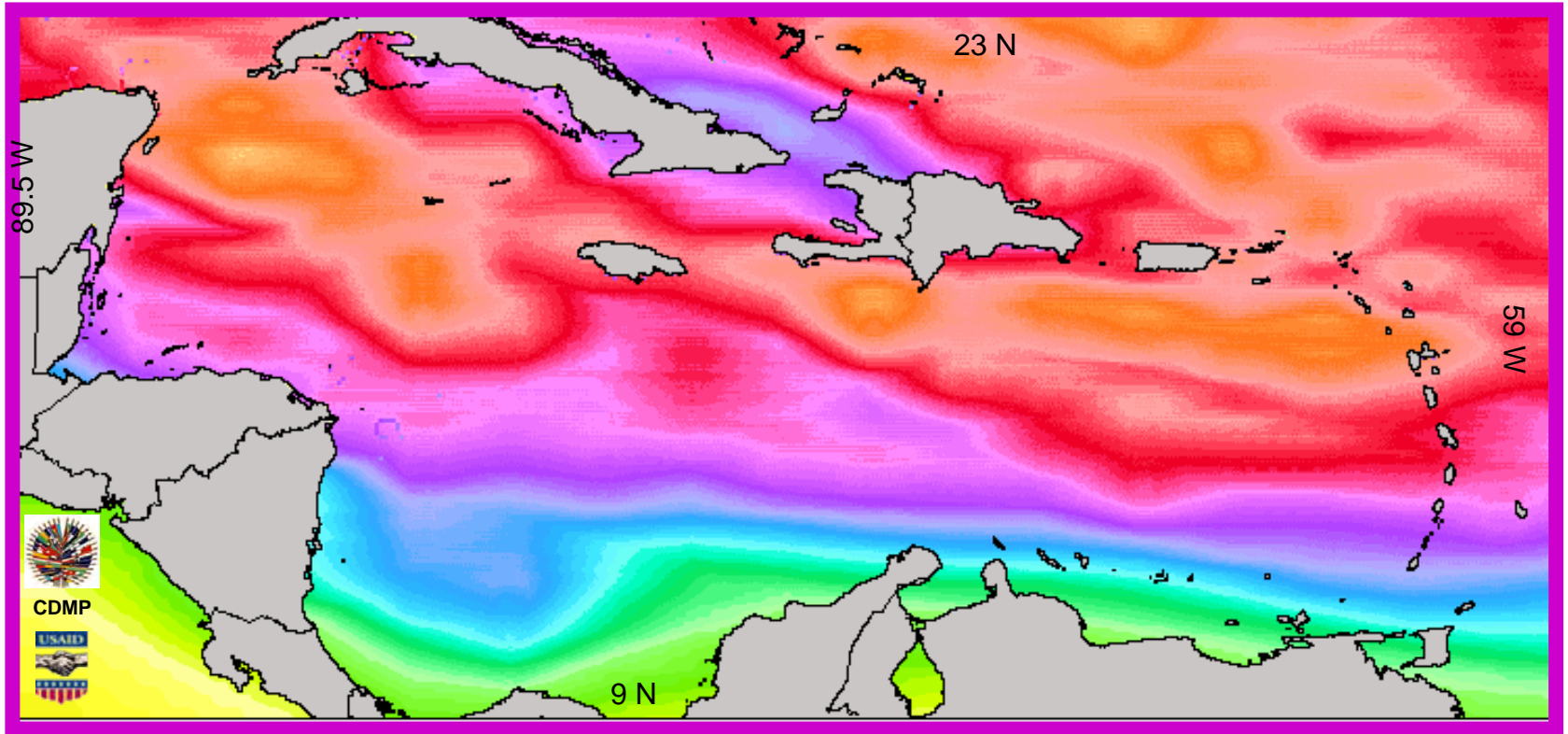
Maximum Storm Surge (50-year return)



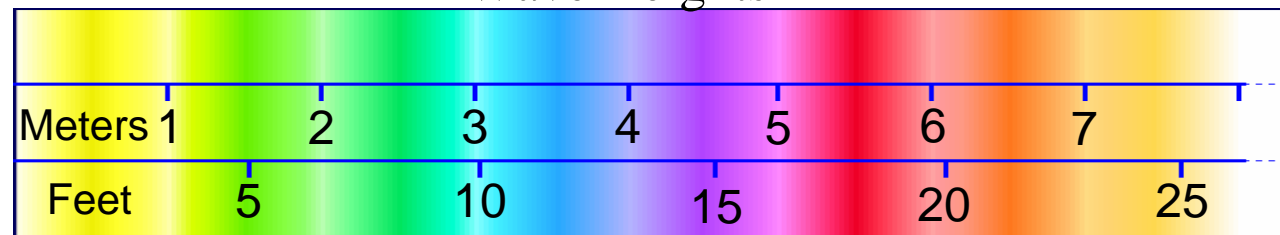
Surge Heights

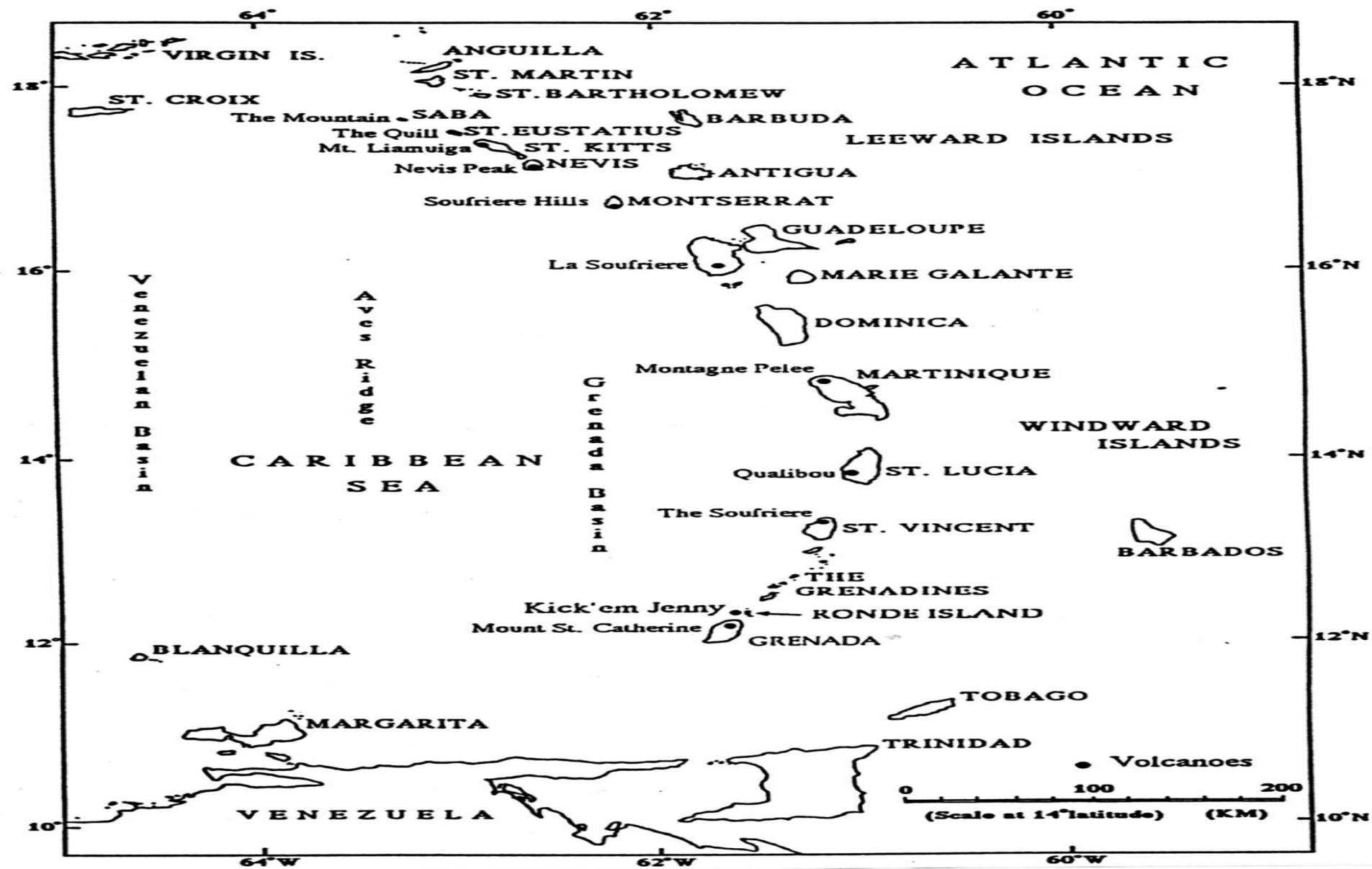


Maximum Wave Heights (50-year return)



Wave Heights

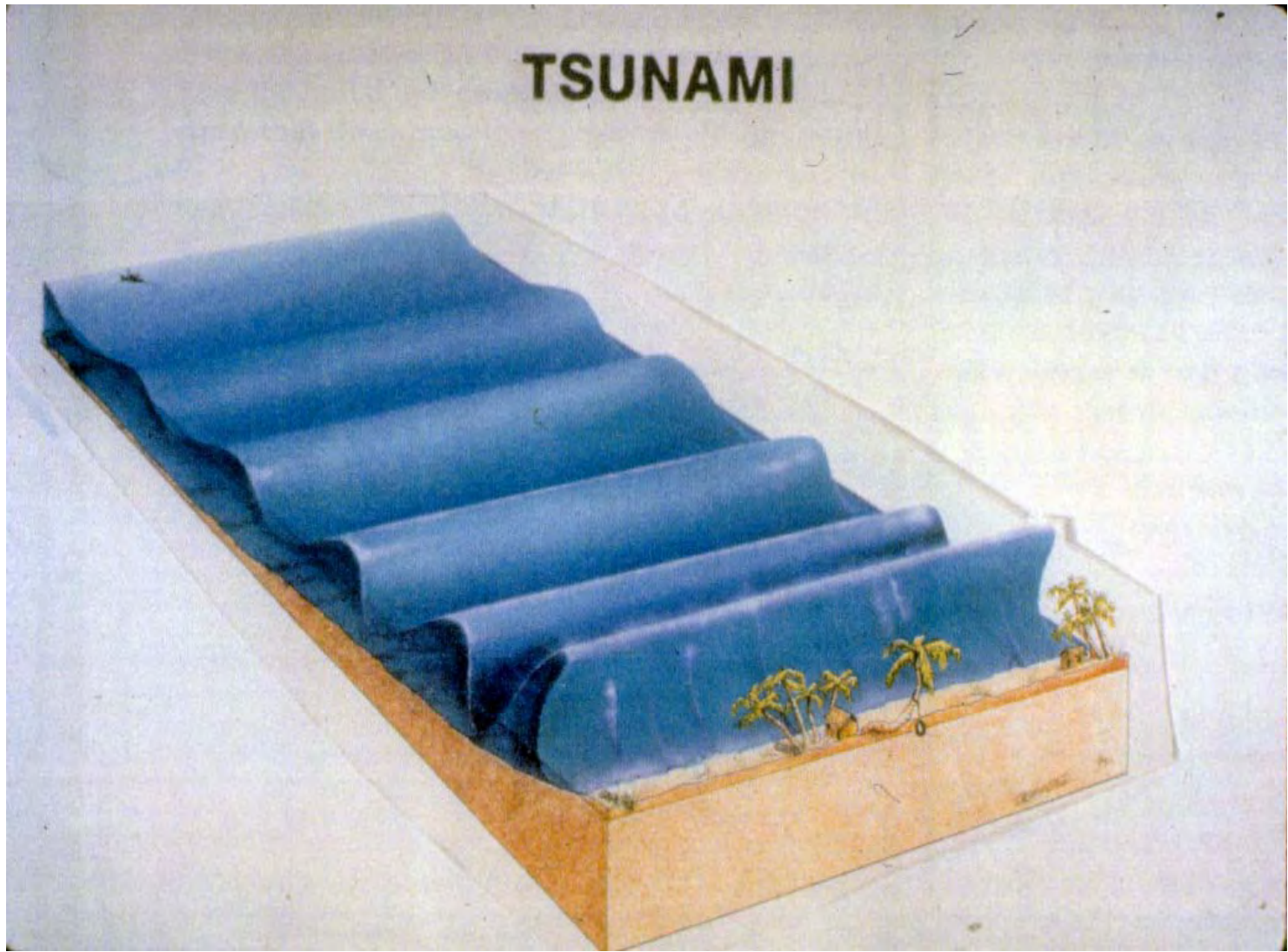




Outline map of the Lesser Antilles showing locations of main volcanic centres (Martin S Smith and John Shepherd, Dec 1992)

Figure 11

TSUNAMI



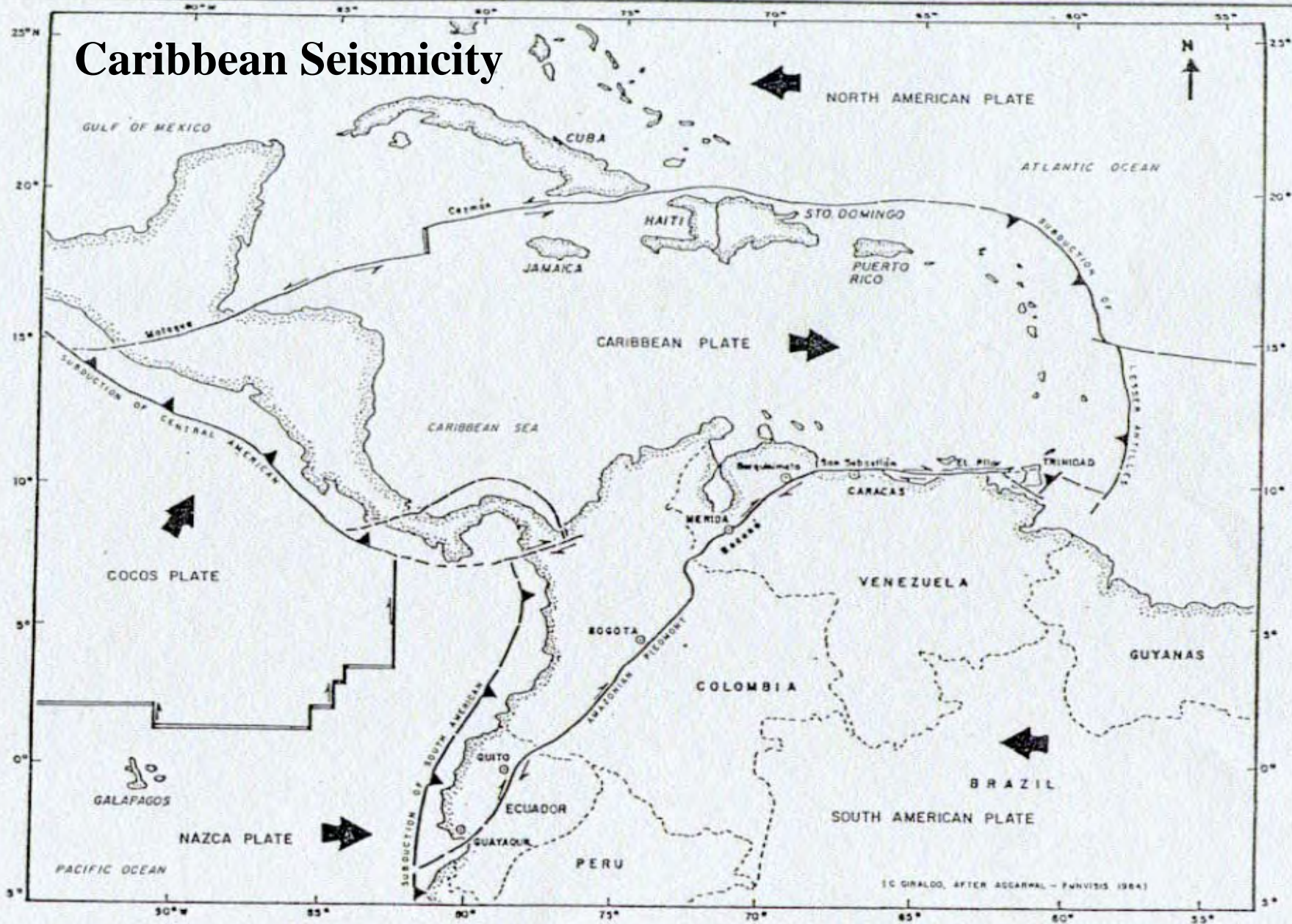
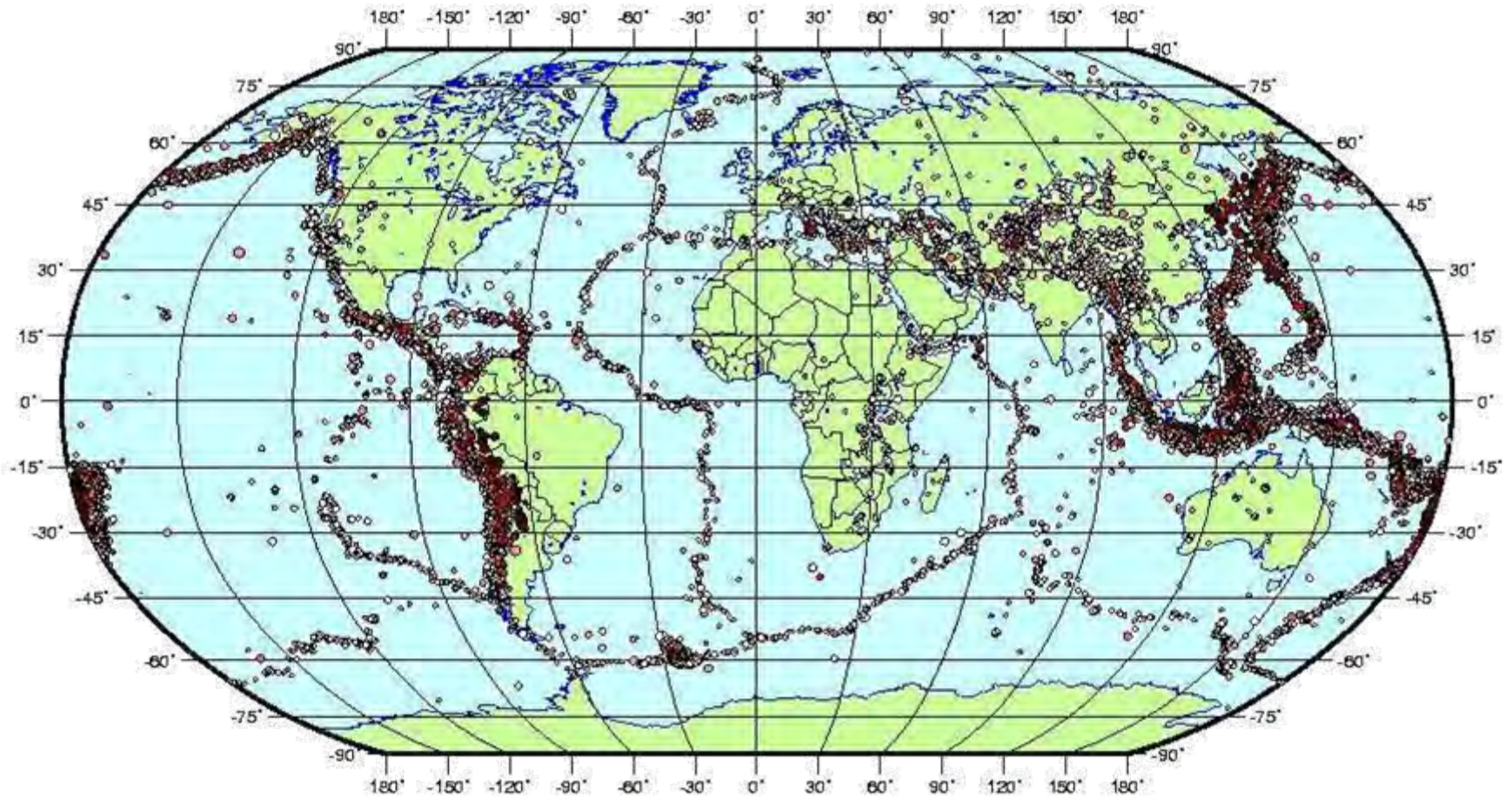
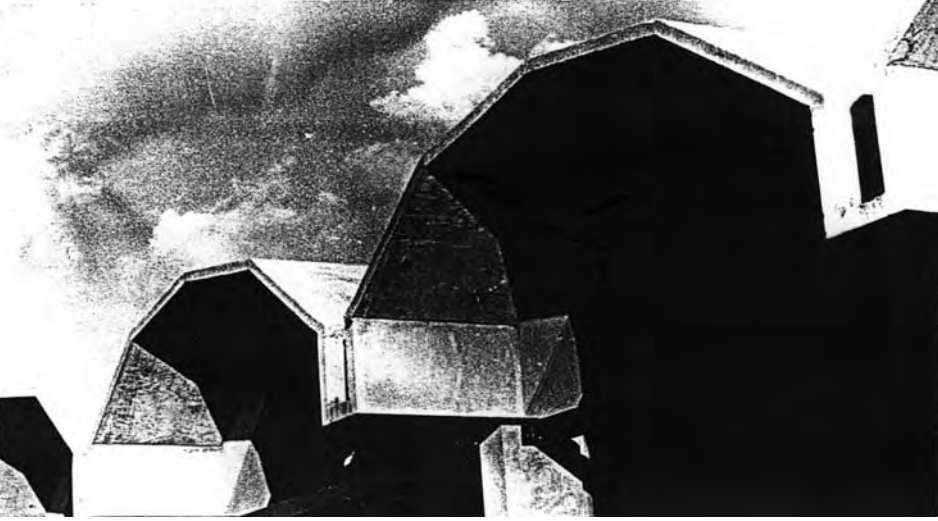


FIGURE 1 Geodynamics Setting of the Caribbean Region (modified after Giraldo 90)

Worldwide Seismic Activity



British Geological Survey



Thin concrete shells and folded plates
for economical, utilitarian structures



CUBiC – Caribbean Uniform Building Code – 1985



Nevis tested at the Boundary Layer Wind Tunnel Laboratory (UWO)



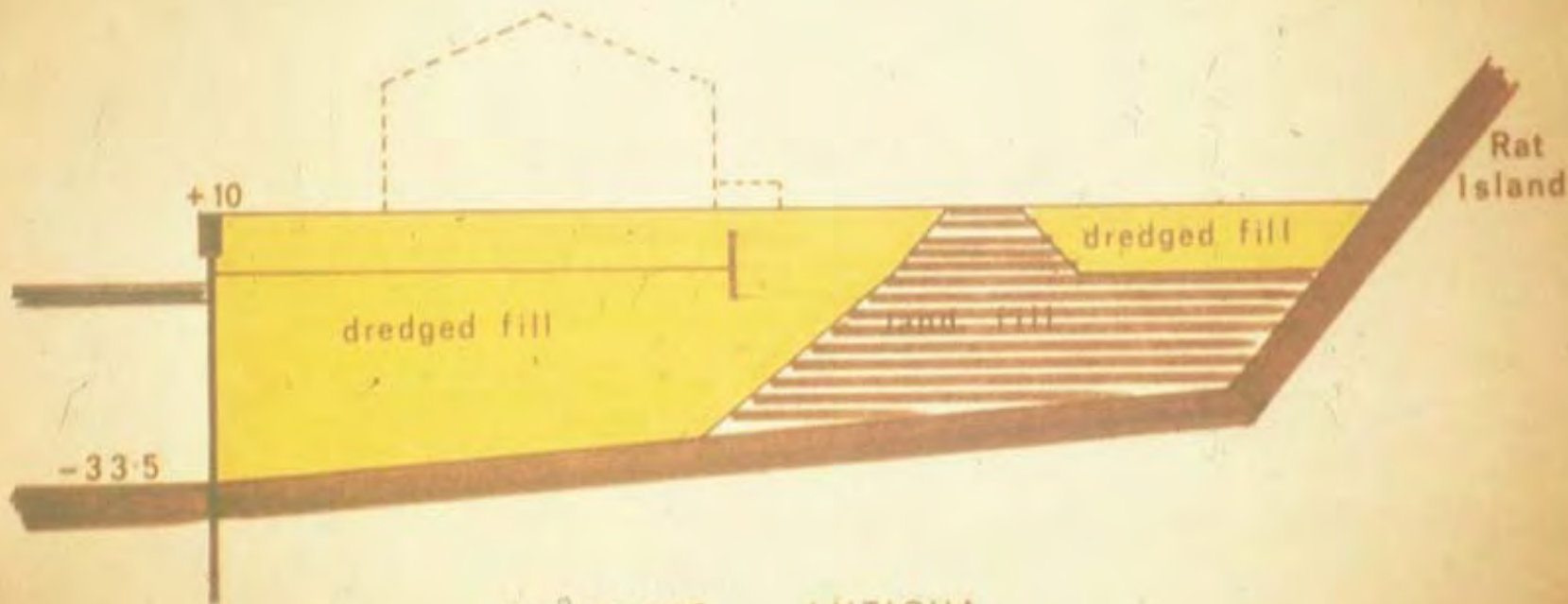
**Hurricane Gilbert in Jamaica 1988 – Princess Margaret Hospital
PAHO Photo**



The Cariaco (Venezuela) earthquake – 1997

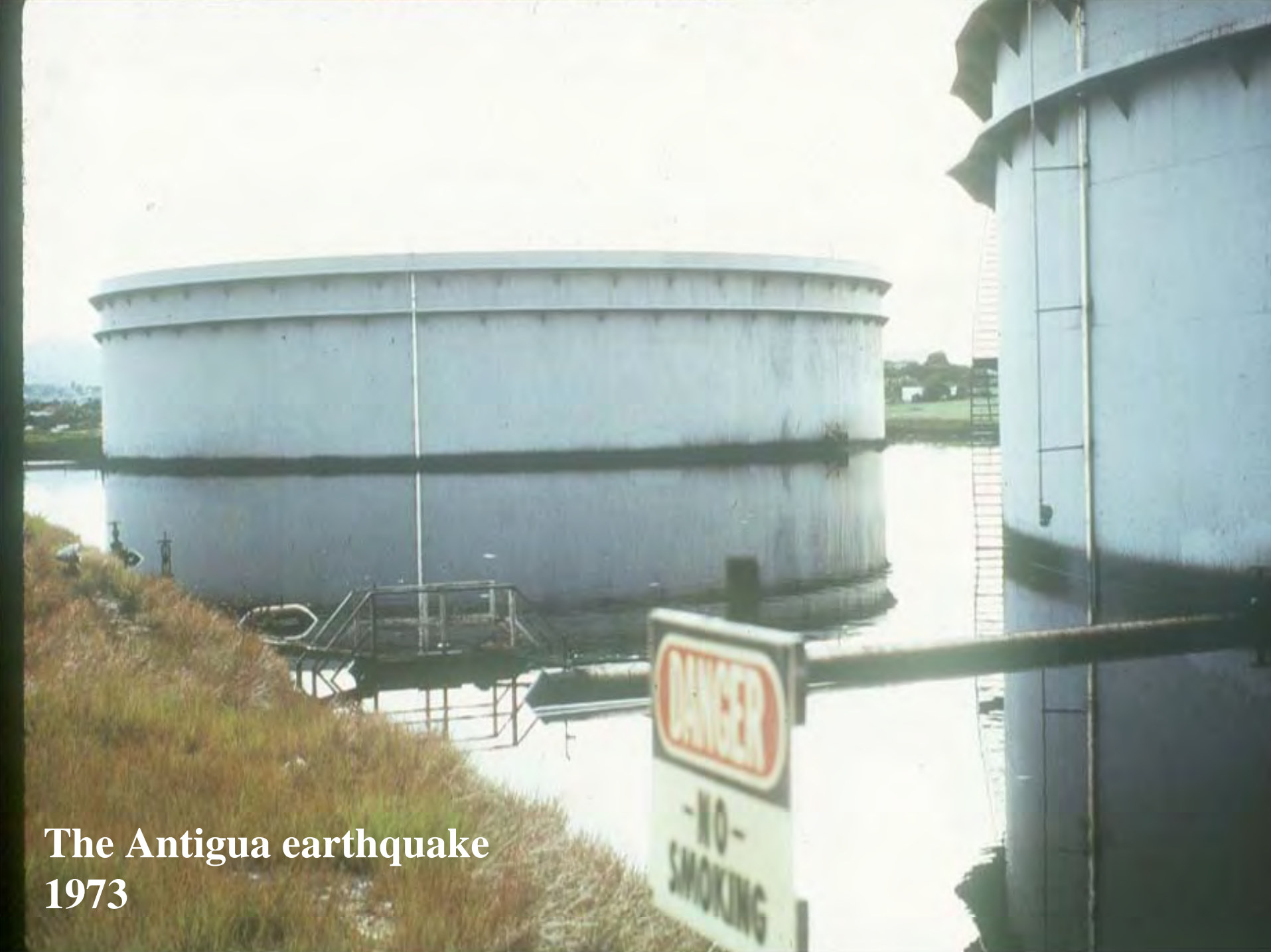


The Cariaco (Venezuela) earthquake – 1997

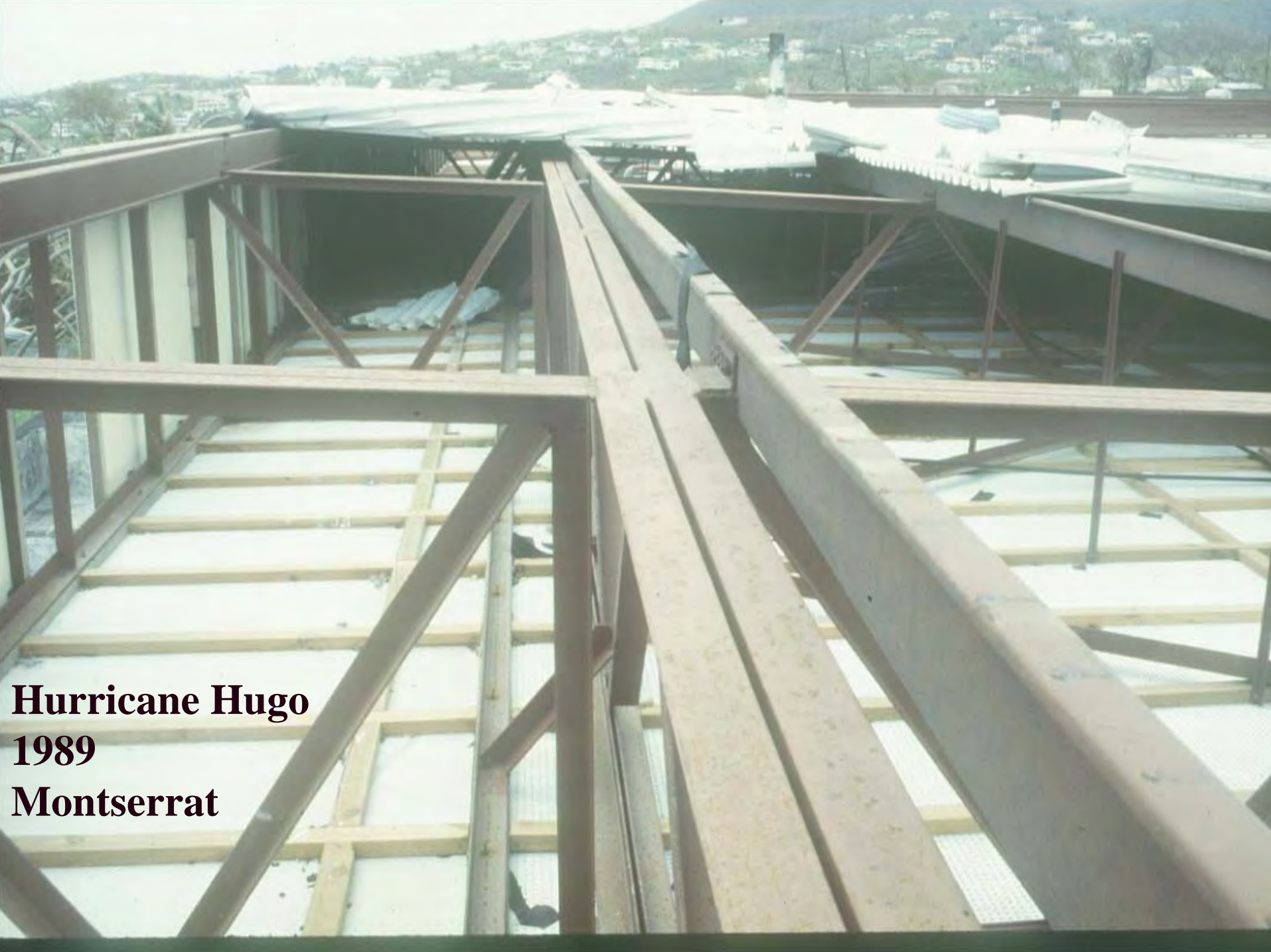


ST^o JOHNS ANTIGUA
DOCK SECTION

The Antigua earthquake – 1973



**The Antigua earthquake
1973**



Hurricane Hugo
1989
Montserrat





Hurricane Gilbert
1988
Jamaica





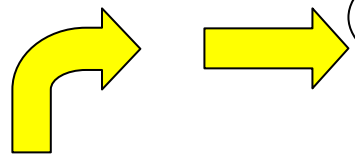
Hurricane Gilbert
1988
Jamaica

Hurricane Georges 1998 in St Kitts

Structure lost in spite of clips



CAUSES
OF
DAMAGE



WIND PENETRATING
BUILDING ENVELOPE

UPLIFT OF ROOF SYSTEM

FLYING DEBRIS

STORM SURGE, FLOODING,
AND LANDSLIDES

IRREGULARITIES IN
ELEVATION AND PLAN

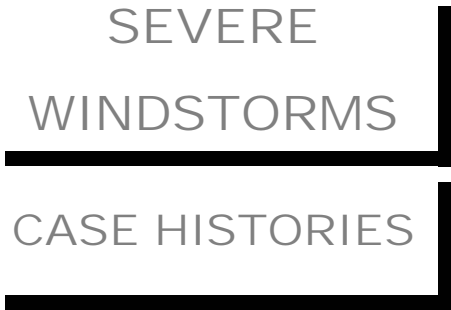
POOR WORKMANSHIP

IGNORING NON-STRUCTURAL
ELEMENTS

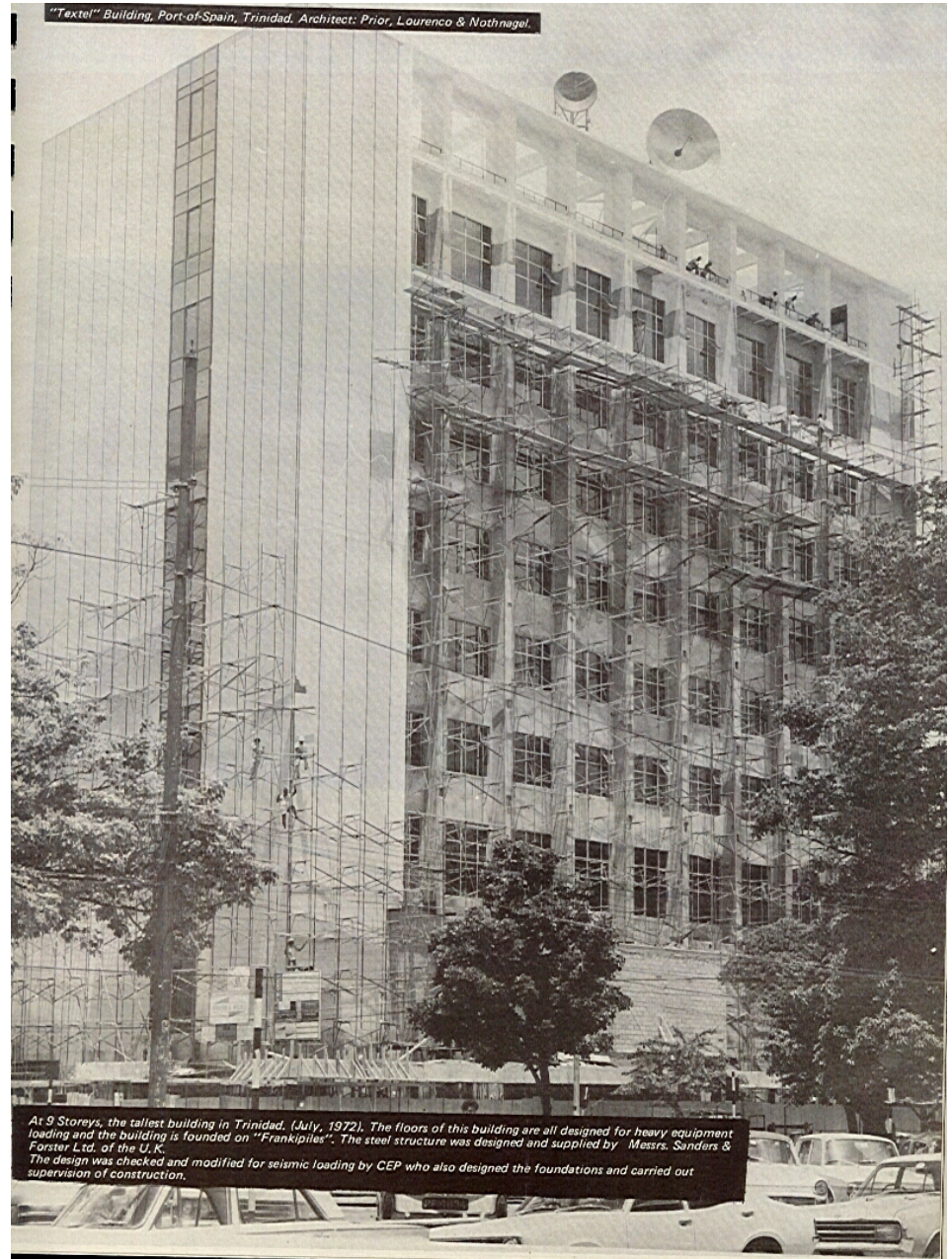
SEVERE

WINDSTORMS

CASE HISTORIES

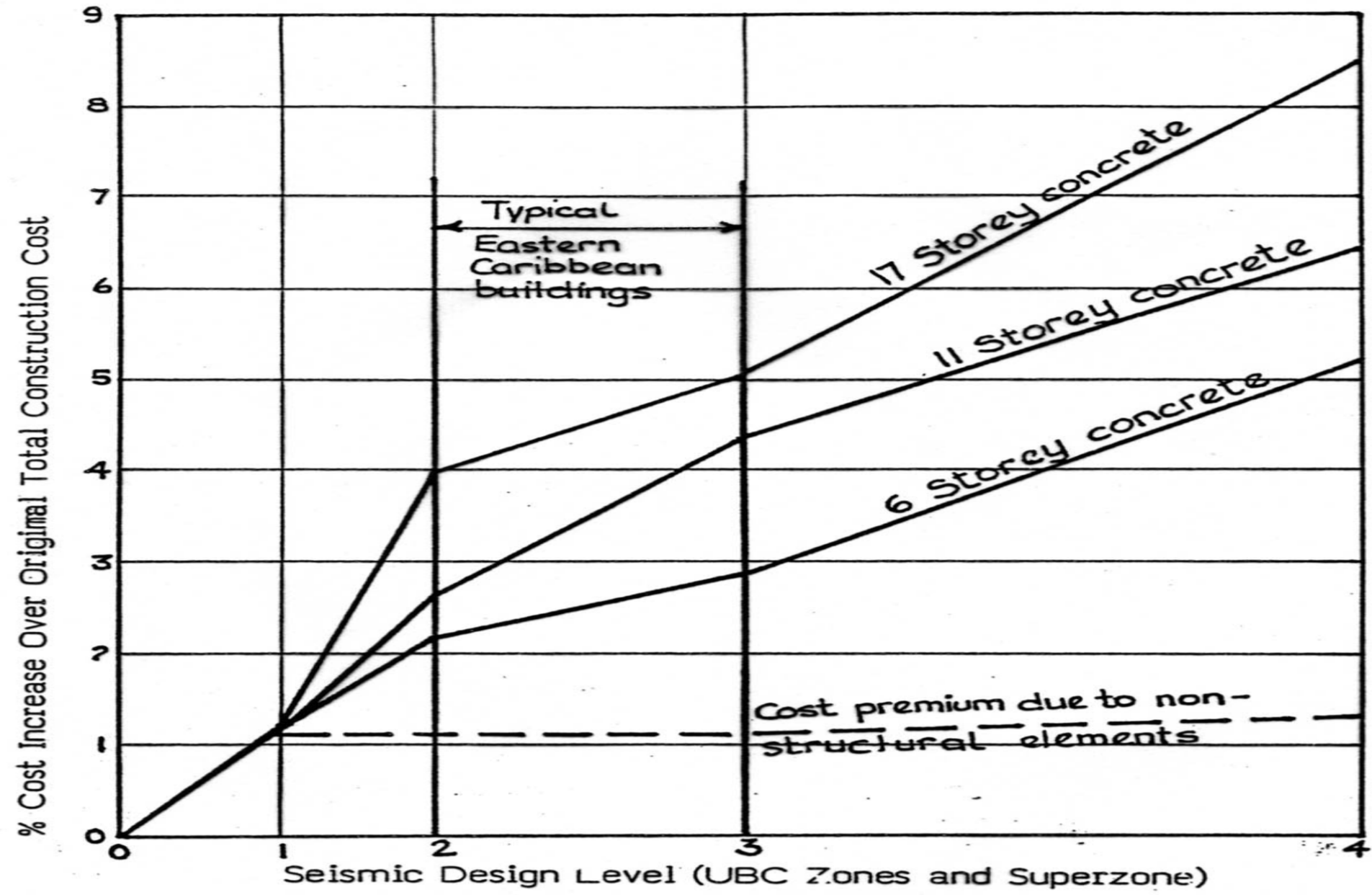


Installation of
**Strong-motion
accelerographs**
in buildings to record
earthquakes
so as to improve
knowledge of ground
accelerations and
their attenuation



In the best of circumstances there would be:

- o legally-mandated codes (laws and regulations);**
- o defined technical standards;**
- o effective enforcement of standards.**

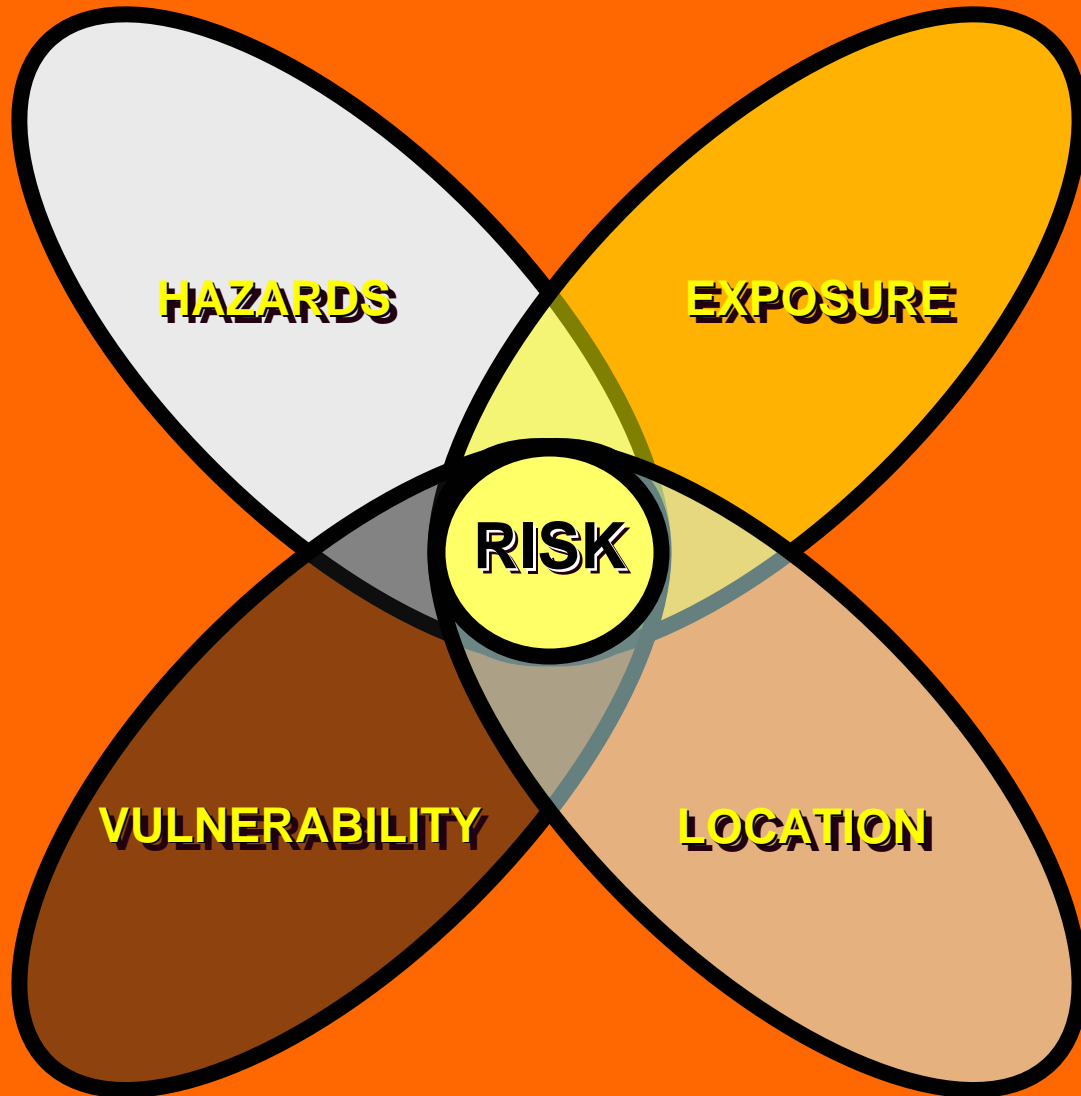


Effect on Cost of a Seismic Design
of Typical Concrete Apartment Buildings
(after Whitman et al)

**The most expensive hospital
is the one that fails.**

**What we need:
better designs
not better accounting**

ELEMENTS OF RISK

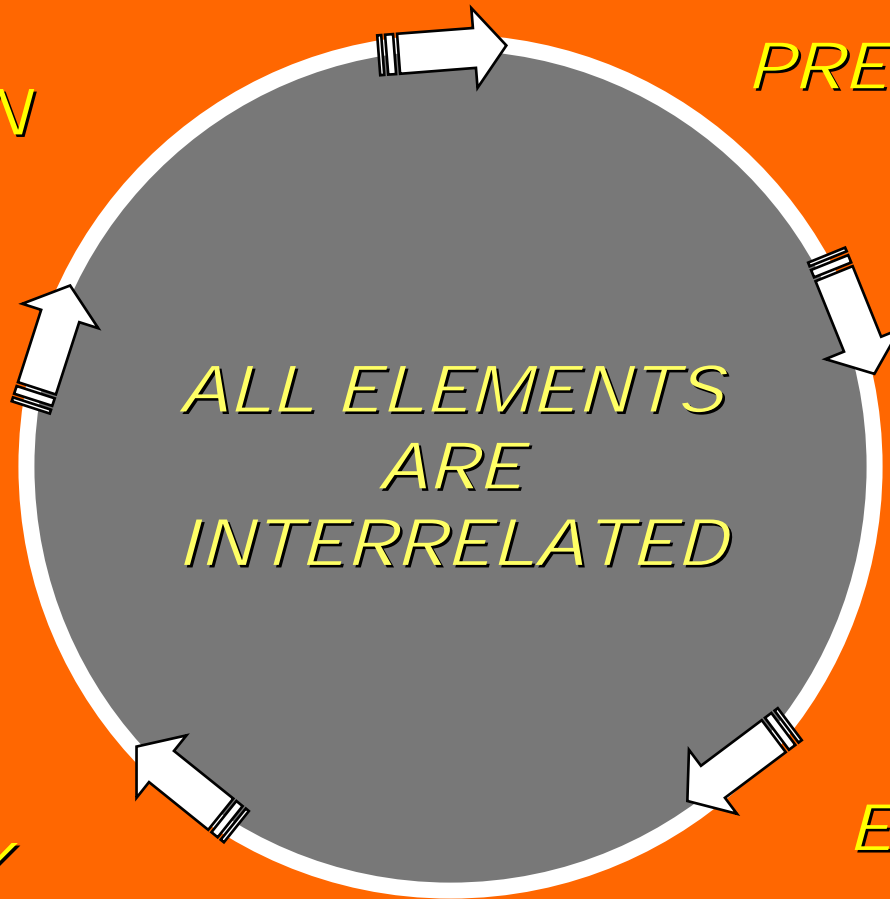


RISK MANAGEMENT

PLANNING CYCLE ON COMMUNITY SCALE :

*DAMAGE
MITIGATION*

PREPAREDNESS



*EMERGENCY
RESPONSE*

RECOVERY