COASTAL FACTORS
&
COASTAL + INLAND
FLOODING MANAGEMENT

Javier Díez González.
Madrid Polytechnic University (Spain)
INDEX

• FLOOD TYPOLOGY

• COASTAL vs INLAND FLOODINGS /CITIES

• WHICH SHOULD BE MEANT BY “COASTAL ZONE”?
FLOOD TYPES

While flowing in the form of run-off, continental waters come through several states that causes a variety of flood types:

• PLUVIAL FLOOD
  • flash flood
  • strict pluvial flood

• FLUVIAL FLOOD:
  • levels
  • levels + stream drag

• GROUND FLOOD

• COASTAL FLOOD: ...
COASTAL vs INLAND FLOODS

At the end of its way through continents, waters are finally drained to oceanic basins according to an hydraulic process highly sensitive to the sea-level at the river mouth.

A relatively small and ephemeral sea level rise at the mouth, (storm surge, water set-up or meteorologic high waters and so on) can causes upstream important hydraulic backwards curves that may causes this fourth flood type

CONCOMITENCE:
Indeed, concomitance among different flood types is often responsible for enhancing the flood power of each flood type regarded separatly.

In practice, two or more flood types are likely to merge. This happens under monzoons, or it was the case of the 1982 Saint Irene flood (Valencia, Spain), when Tous dam failled.
WHAT SHOULD BE MEANT BY “COASTAL ZONE”?

“Coastal zone” is a vague term that can adopt several meanings:

- in geomorphologics: the “coastal zone” as the extension of the beach
- in urban planning: the “coastal zone” as an area of special urban protection
- in geologics: in this case the “coastal zone” encloses huge areas

... Which are we understanding as “coastal zone”? 
LET US SEE....

SEVERAL CASES of STUDY:

Barcelona/(Sevilla)/Valencia (Venice) - SE England/Netherlands - Rhin Basin –
Mersey/Elbe/Donaut -Mississippi - Plata - Ganges
BARCELONA (shore line city)
SEVILLA (Coastal Zona city)
VALENСIA (Coastal city)
TURIA FLOOD AT VALENCIA

Valencia flood, 1957
TURIA FLOOD AT VALENCIA

Bed of the Turia River till 1970

The new bed of the Turia River
VALENCIA AREA: COASTAL, PLUVIAL AND FLUVIAL FLOODS
VALENCIA AREA: COASTAL, PLUVIAL AND FLUVIAL FLOODS
THAMES (LONDON: Coastal zone cities)
RHIN BASIN (ROTTERDAM: coastal cities)
MERSEY (MANCHESTER: coastal zone cities)
ELBE (HAMBOURGH: Coastal zone cities)
MISSISSIPPI BASIN vs FLORIDA

Hurricane Andrew
NOAA-12 AVHRR HRPT Multi-spectral False Color Image

E.T.S. de Ingenieros de Caminos, Canales y Puertos,
C/Profesor Aranguren, s/n 28040 Madrid
gi.memarcp@upm.es
BANGLADESH FLOOD RISK

Potential impact of sea-level rise on Bangladesh

Today
Total population: 112 Million
Total land area: 134,000 km²

1.5 m - Impact
Total population affected: 17 Million (15%)
Total land area affected: 22,000 km² (16%)

1 : UNEPGRID Geneva; University of Dacca; JRC/Munich; The World Bank; World Resources Institute, Washington D.C.
THANKS

TILL NEXT TIME
WHAT SHOULD BE MEANT BY “COASTAL ZONE”?

“Coastal zone” is a vague term that can adopt several meanings:

• in geomorphologics: the “coastal zone” as the extension of the beach
• in urban planning: the “coastal zone” as an area of special urban protection
• in geologics: in this case the “coastal zone” encloses huge areas
  • from the Mississippi mouth to the Great Lakes, in USA
  • from the Atlantic coast to the Ural mountain, in Europe
  • from the coast line to the Meseta foot, in Spain
• so ... What are we supposed to understand by “coastal zone”?

COASTAL FACTORS & COASTAL + INLAND FLOODING MANAGEMENT

Professor: Javier Díez González. Costs and Ports Head Professor at Madrid Polytechnic University (Spain)