



ROYAL HASKONING



LEVEES, EMBANKMENTS, DIKES

FINDING COMMON GROUND BETWEEN THE FLOOD RISK
MANAGEMENT CULTURES OF THE USA, ENGLAND AND THE
NETHERLANDS

ISFD4, Toronto

7 May 2008

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thinking in
all dimensions

Involvement in FRM in various countries

→ **Notice differences**

→ **Why?**

**Culture, Geography, History
Or Coincidence?**



- **No thorough scientific study...**
- **...just discussions at the coffee machine**
- **Work in progress!**

**Thanks to Mathijs van Ledden
(Haskoning Inc, New Orleans)**

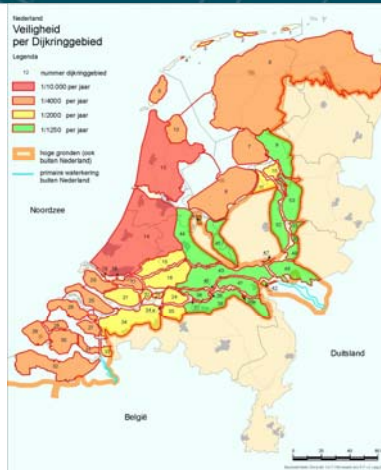
Lay out of presentation

9 Aspects:

- Nature and level of flood risk
- Legal arrangements
- Role of insurance
- How to manage the risk
- Events driving developments
- Dealing with future changes
- Structural flood risk management
- Asset management
- Public perception of flood risk

Conclusions

Nature and level of flood risk



NL:

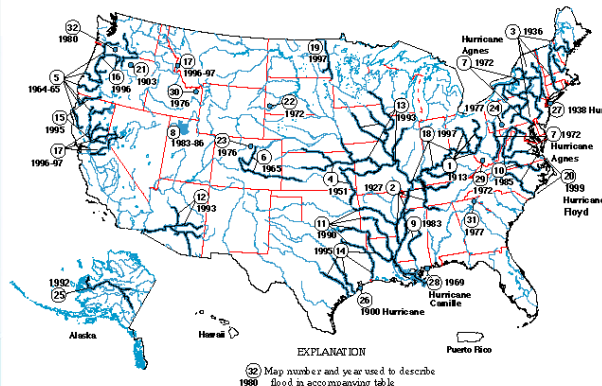
- Defining feature, national issue
- Infinite x Infinitesimal = ?

EN:

- One of the important issues
- Variability, regional issue
- £ 1.3 billion / year (2005)
(C\$ 2.5 billion)

USA:

- One of the important issues
- Variability, regional issue
- \$ 4.5 billion / year (1991-2000)
(C\$ 5 billion)



graphic: USGS

thinking in
all dimensions

EN/USA more comparable

Legal arrangements & funding

NL:

- Legal standards and roles
- Ministry of infrastructure
- €500 million → C\$ 785 million

EN:

- Permissive powers (legal)
- Department for the Environment (formerly Agriculture, Fisheries and Food)
- £600 - £800 million → C\$ 1.2 – 1.6 billion

USA:

- Insurance & certification
- Department of Defense
- \$280 million → C\$ 285 million (USACE, excl improvement works; New Orleans \$15 billion)



Role of insurance

NL:

- None – 1953 event (*f*1.5 billion ~ C\$ 10 billion)
- The state in practice
- Some debate

EN:

- Private insurance if $< 1/75$ per year
- Important lobby → trigger for risk reduction

USA:

- Driving force, legal basis
- Federal backed insurance
- Impact on many aspects of flood risk management



NL different due to geography & history. EN / USA: culture?

How to manage the risk

NL:

- History: structural (defences+source control)
- Recent: evacuation & land use

EN:

- Combination of structural & non-structural
- Emphasis on development planning

USA:

- Defence plus evacuation
- Choice of measures driven by insurability

General move to balanced portfolio



Events driving developments

NL:

- Throughout history
- 1953



EN:

- 1953: Thames defences & warning
- 1998: change of focus



USA:

- 1927 Mississippi flood
- Various hurricanes



Dealing with future changes

NL:

- Existential question
- For now, technically solvable
- Commissions at work

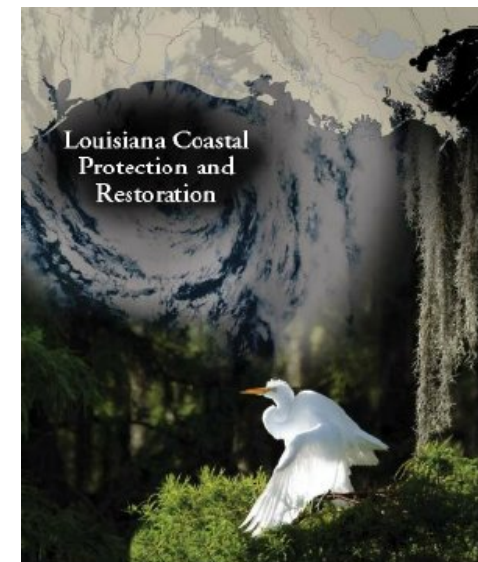
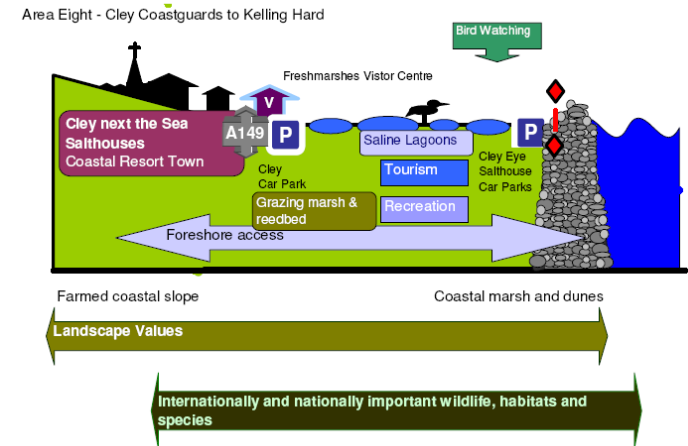
EN:

- Very explicit
- Government led studies
- Catchment & shoreline planning

USA:

- Sea level rise in design & strategy
- NO: subsidence at equal rate

Each in his own way



Structural flood risk management



NL:

- Legal safety standard
- Detailed & complete guidance

EN:

- Indicative standards
- Benefit / cost plus 'Outcome measures'
- Limited guidance

USA:

- Up to 1% per year (insurance)
- Certification requirements drive design

Three different mechanisms

Asset management

NL:

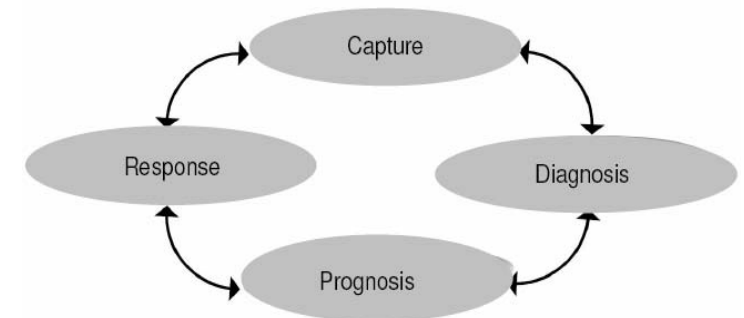
- Large professional dedicated organisations
- Legal roles, but 'how' is up to asset manager

EN:

- One national organisation
- Detailed strict procedures

USA:

- USACE and others
- Good management is criterium for certification
- Guidance from USACE



Public perception

NL:

- Paradox: awareness, trust & expectation
- Recent changes f(Katrina, climate change)

EN:

- Growing awareness (events & communication)
- Natural risk?

USA:

- Well aware
- Limited confidence in authorities



Conclusions

UK and USA more comparable; NL as extreme reference

Optimisation problem Performance / Risk / Cost:

- **NL: fixed performance standard, minimise cost**
- **EN & USA: fixed budget, minimise risk**

Each their own recipe for FRM, based on history, geography, culture

Events as opportunities for readjustment?

Invitation to extend analysis