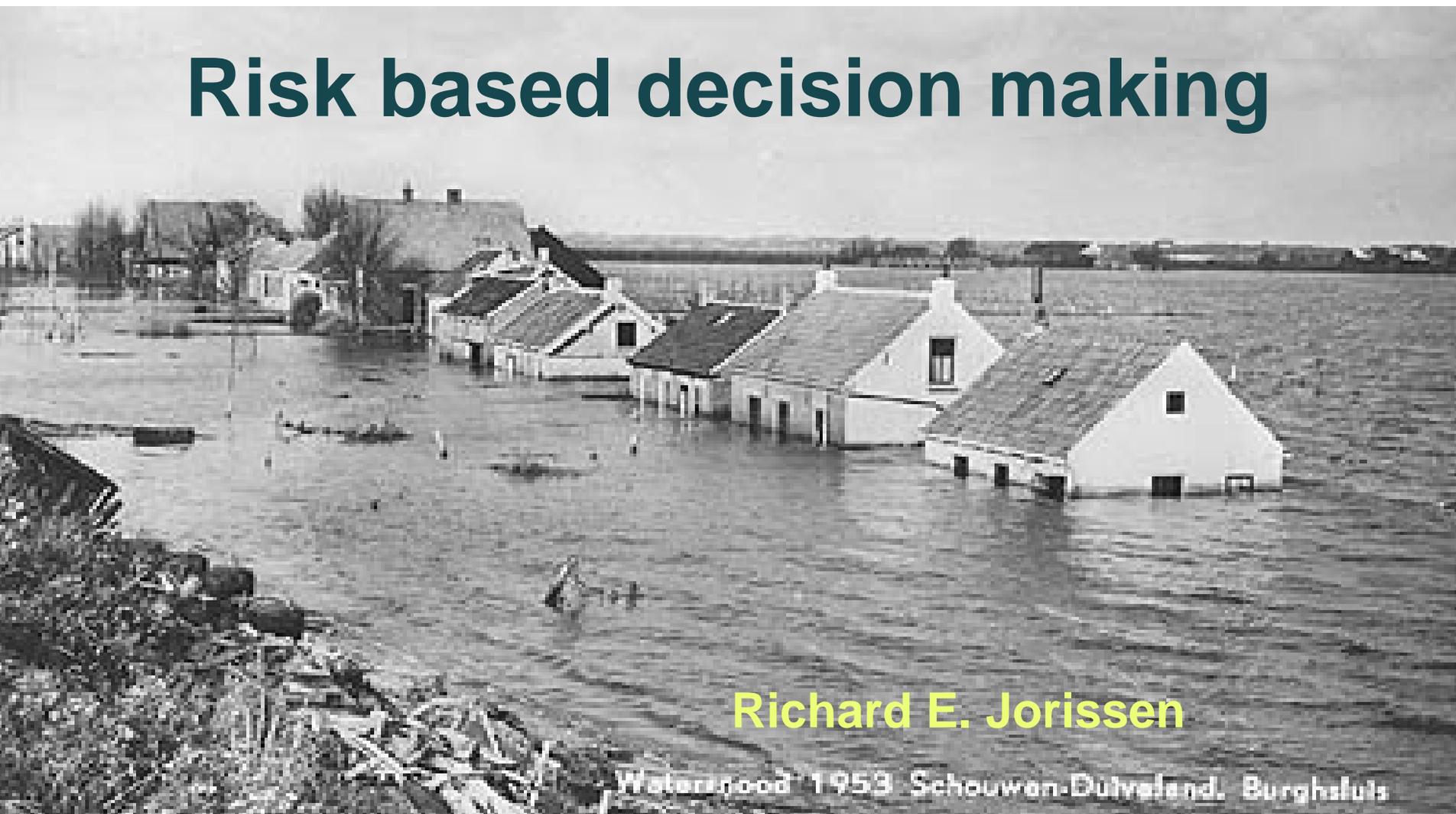




Risk based decision making



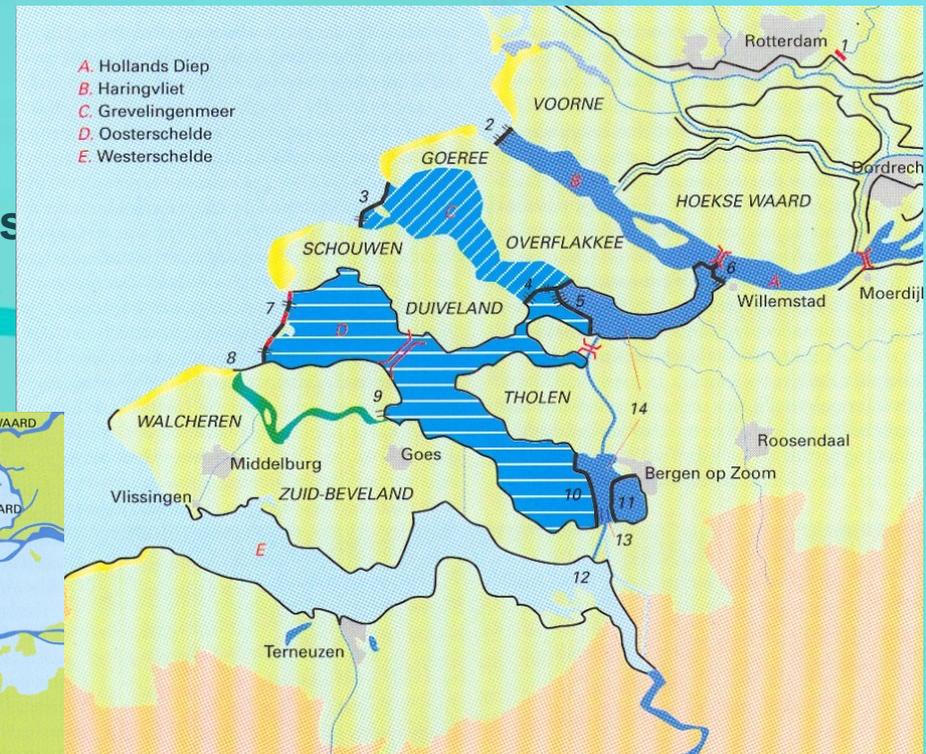
Richard E. Jorissen

Waterinood 1953 Schouwen-Duiveland, Burghsluis

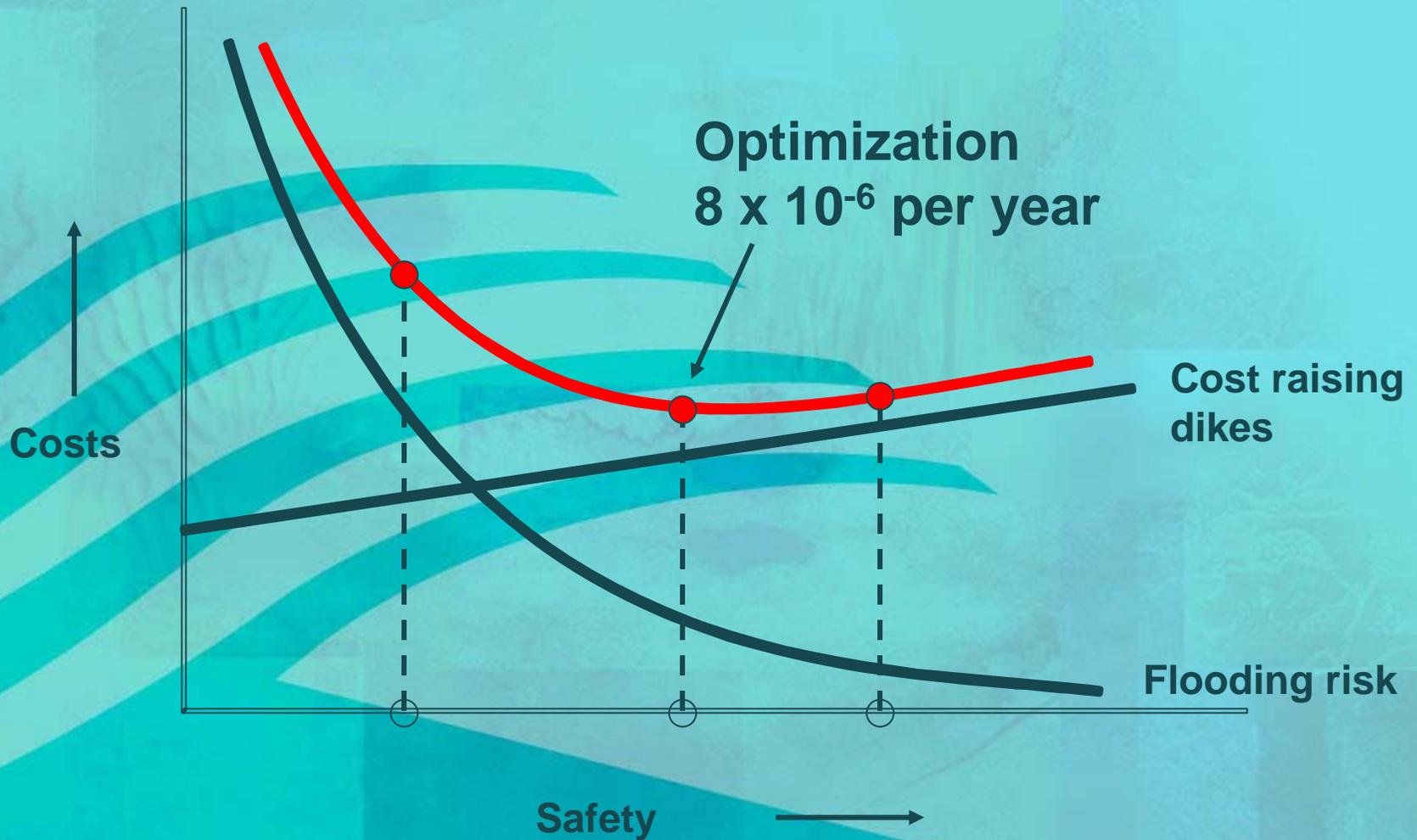
Floods 1953 and the Deltaplan

A new start with:

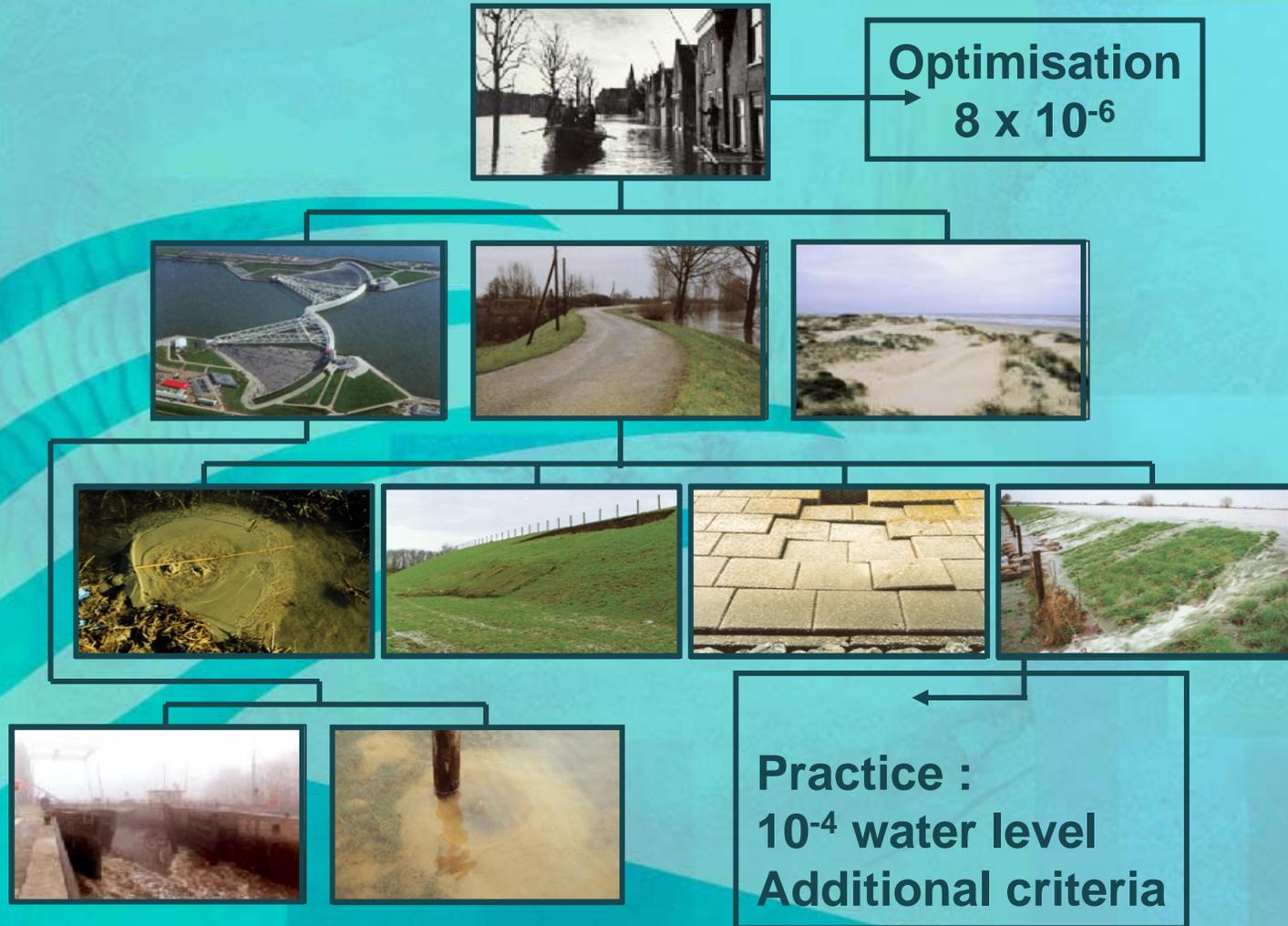
- closing off estuaries
- safety standards, based on economics
- national dike improvement scheme



Economic optimization (1956)



Engineering application



Safety standards

- Decided upon by politics, based on multi-criteria analysis, taking into account:

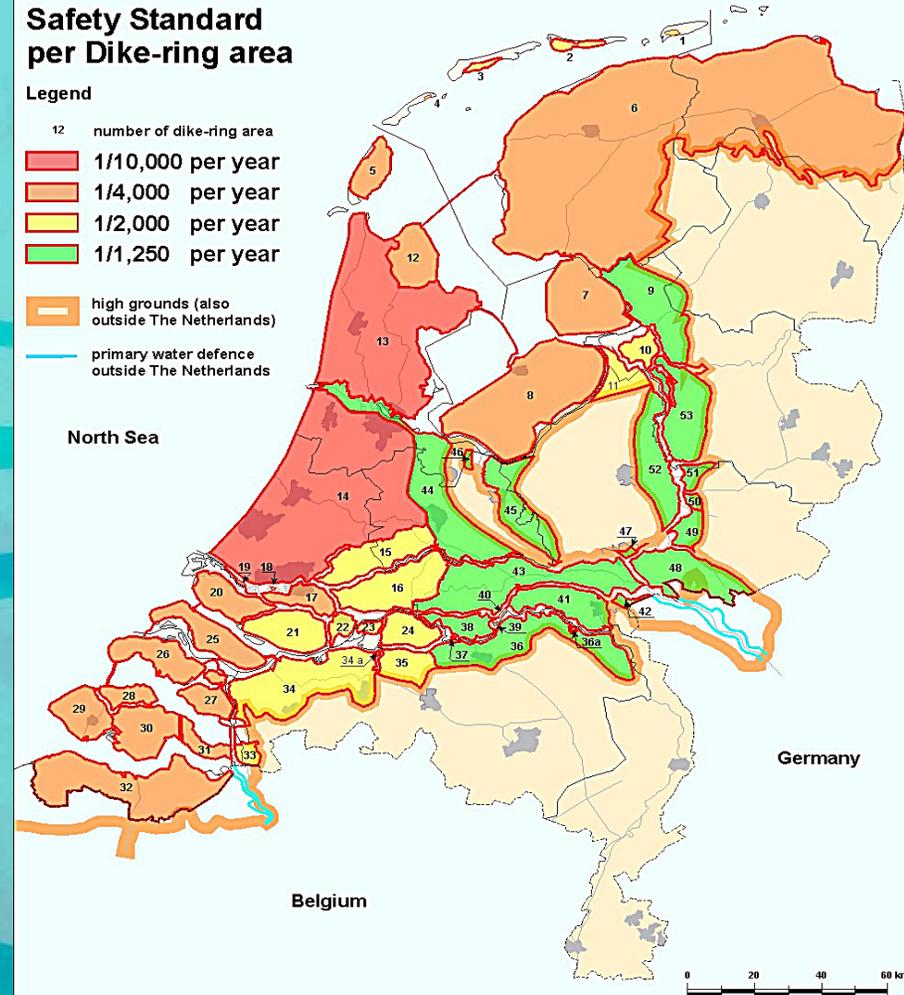
- Flooding risk
- Construction and maintenance costs
- Environmental impact
- ...
- ...

- Laid down in Flood Protection Act

The Netherlands Safety Standard per Dike-ring area

Legend

- 12 number of dike-ring area
- 1/10,000 per year
- 1/4,000 per year
- 1/2,000 per year
- 1/1,250 per year
- high grounds (also outside The Netherlands)
- primary water defence outside The Netherlands



Application in practice

•Overtopping:

- Pr (overtopping exceeding critical volume) < safety standard



•Other failure modes:

- Pr (failure due to other failure modes | no overtopping) < safety standard / 10



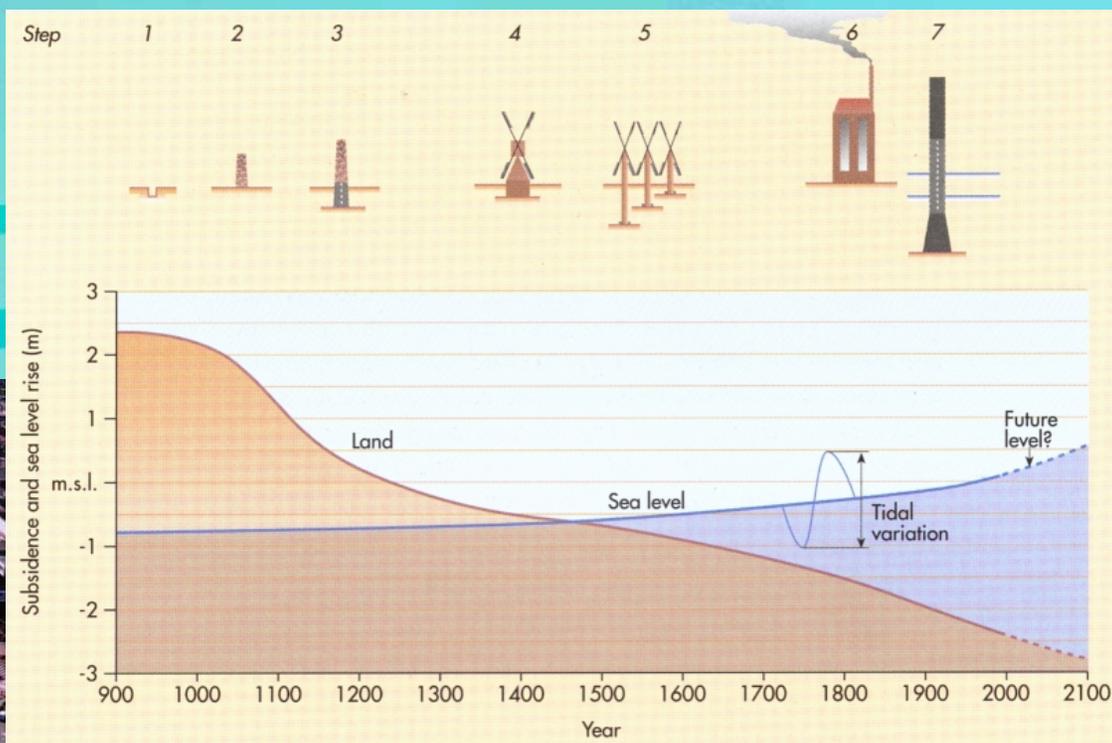
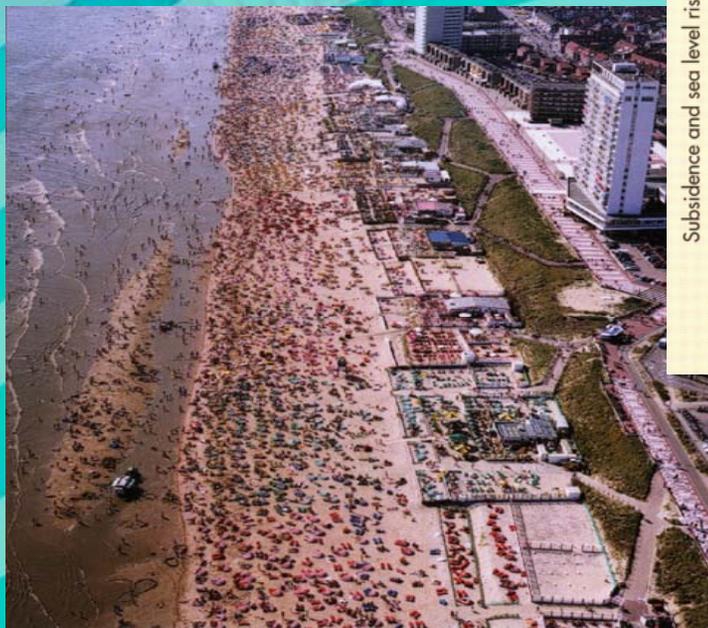
•Guidelines

- These two design criteria form up till today the basis for the technical guidelines.
- The technical guidelines also give the tools how to include technical developments (such as sea level rise, land subsidence)

Future developments

Where do we go from here?

- sea level rise
- drainage, compaction
- societal developments



Future developments

Safety versus risk:

- the lower circle depicts the present policy of maintaining a fixed safety level (including technical developments like sea level rise)
- the upper circle shows the risk-based policy development, which may lead to different standards and/or different measures

