

A Playful Approach to Flood Defence



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Outline

1. Introduction
2. Playful approach
3. Usefulness of this approach to flood defence
4. Case: "Levee Patroller"

Flooding



Natural and
devastating disasters

Occur “rarely” and
unexpected



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How to get prepared for the unexpected?

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Videogames



Playing = learning?



Acquirement of a
mental model

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Can videogames be a beneficiary tool to flood defence?

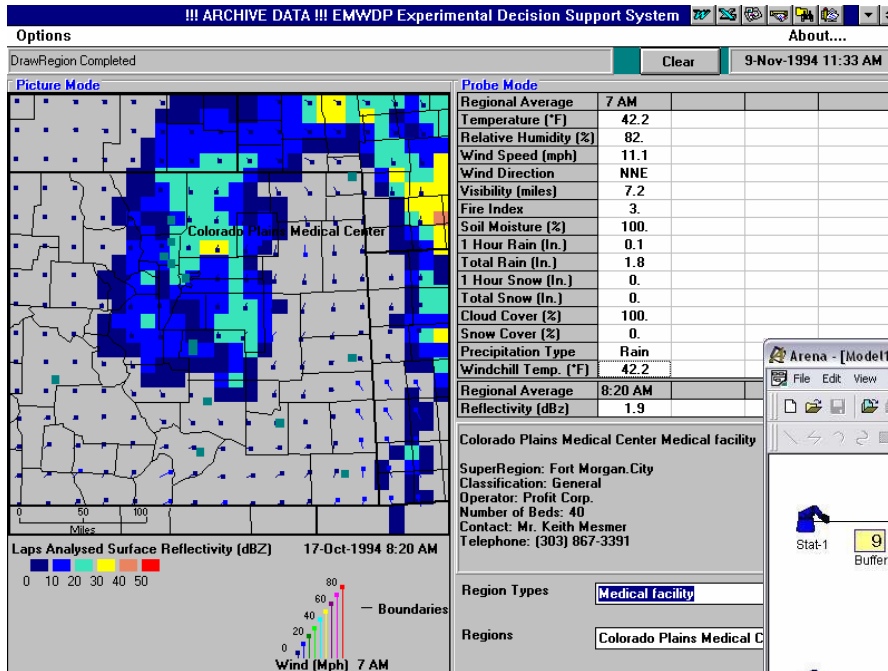
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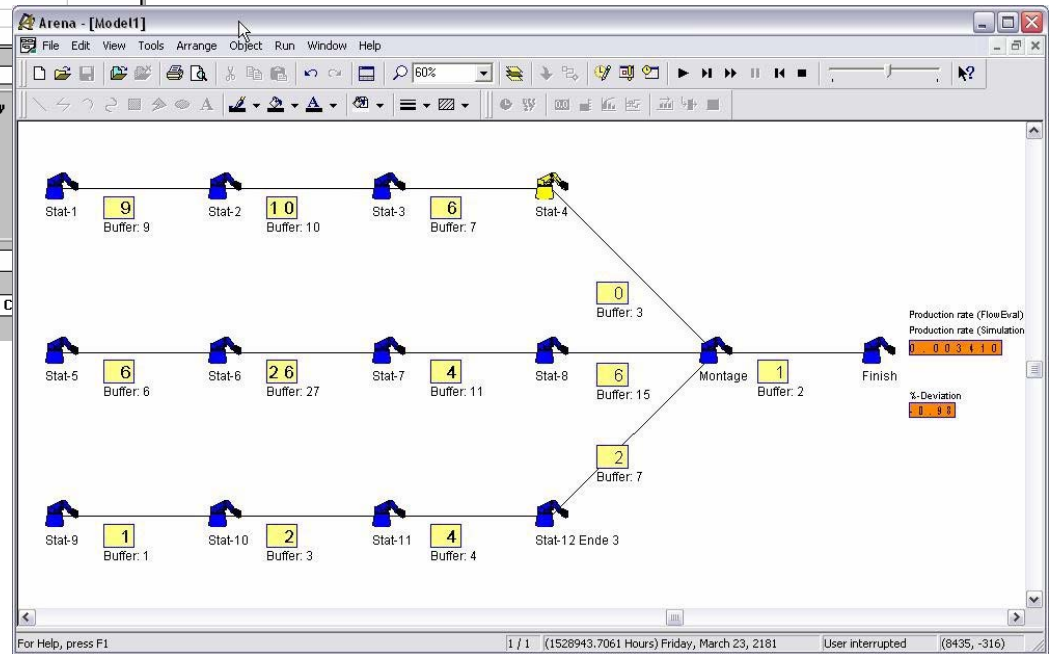
Definition of a game

Games are rule-based systems with variable outcomes that players can exert influence on by manipulating the rules (adapted from Juul, 2005).

Games vs. DSSs & Simulations



"Humans"



"Outcomes"

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Serious gaming

- Non-entertainment purpose
- Meaningful
- Valid
- Fun

Examples of serious games



Peacemaker

Hazmat: Hotzone

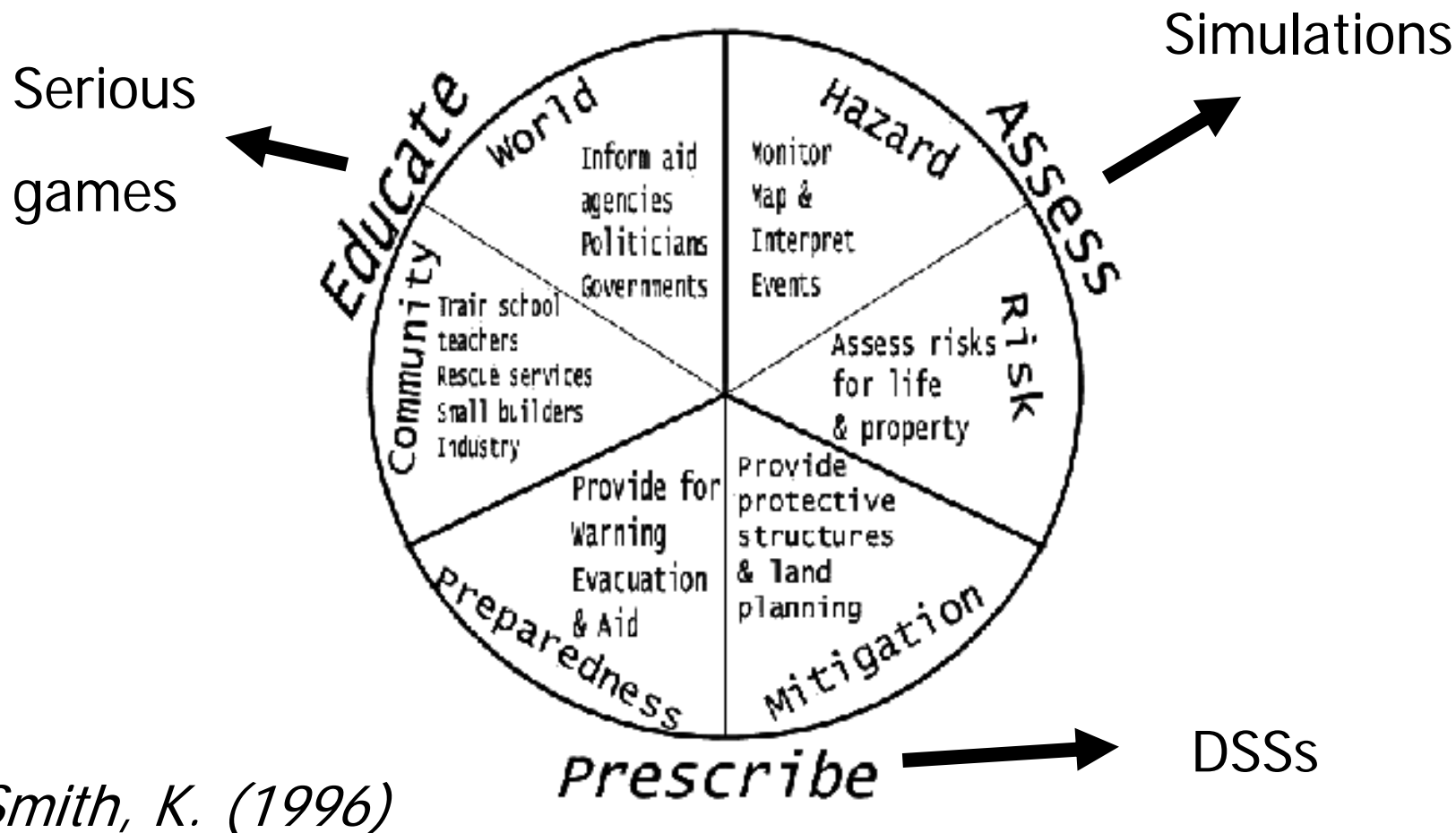


Advantages of serious gaming

- Experiential
- Safe
- Authentic
- Motivating
- (Inexpensive)

**With these characteristics in mind...
how can serious games be beneficial
to flood defence?**

Educational value



Educational value

- **Practice**
 - Decision making knowledge & skills
 - Procedural knowledge & skills
 - Mental simulation
- **Mindfulness**
 - Test assumptions & expectations
 - Self-consciousness
 - Open-mindedness
- **Inform**
 - Awareness creation

Organizational value

- Knowledge repository
- Shared and explicit vision
- Stimulate discussions

Flood games



Flood

Flood Ranger

The screenshot shows the 'Flood Ranger' game interface. At the top, it displays 'Climate Scenario: UKCIP02 - Low Emissions' and a timeline from 2020 to 2100. The main view is a 3D landscape with a blue sky and green ground. On the right, there are 'Playing Cards' and 'Gauges'.

Playing Cards

- Packs: 3
- Housing
- Cards: 3
- Small Eco Housing
- Cost/unit: 25000 ECOs
- Max age: 60 years
- People/map unit: 5000
- People/house: 8
- Click on terrain to add the card

Gauges

- Game Score 8.8 out of 10.0
- Health of Environment 75%
- Public Opinion 75%
- Regional Insurance Premium 50%
- Water Demand 58%
- Areas at Risk of Flood 54%

Balance Sheet

	Count	Cost (ECOs)
Sea Defences	0	0
River Defences	0	0
Housing	0	0
Industry LE	0	0
Industry SME	0	0
Total	0	0
Balance		1,913,760,836

Indicative Flood Plain

Cost Surface

During the next 10 years (2000 to 2010) you have a budget of 1.91 billion ECOs and you should:

1. Update/install/modify flood defences.
2. Create housing for 207000 people
3. Create industrial accommodation for 1000 small-medium enterprise units

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Levee Patroller



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Levee patrollers



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Levee failures

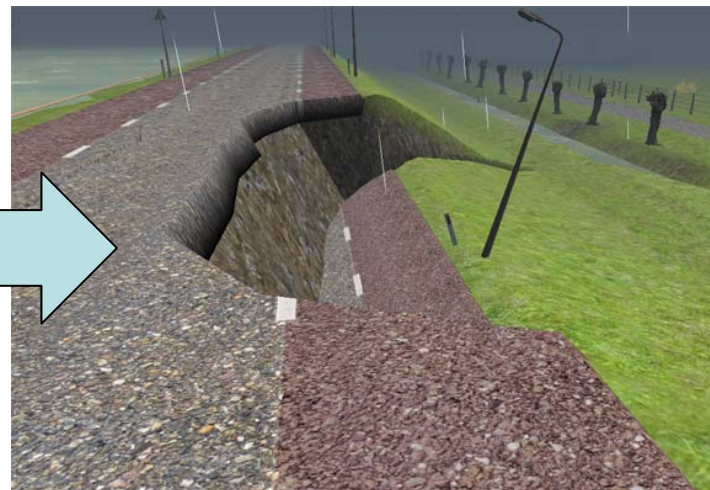


Wilnis, the Netherlands, 2003

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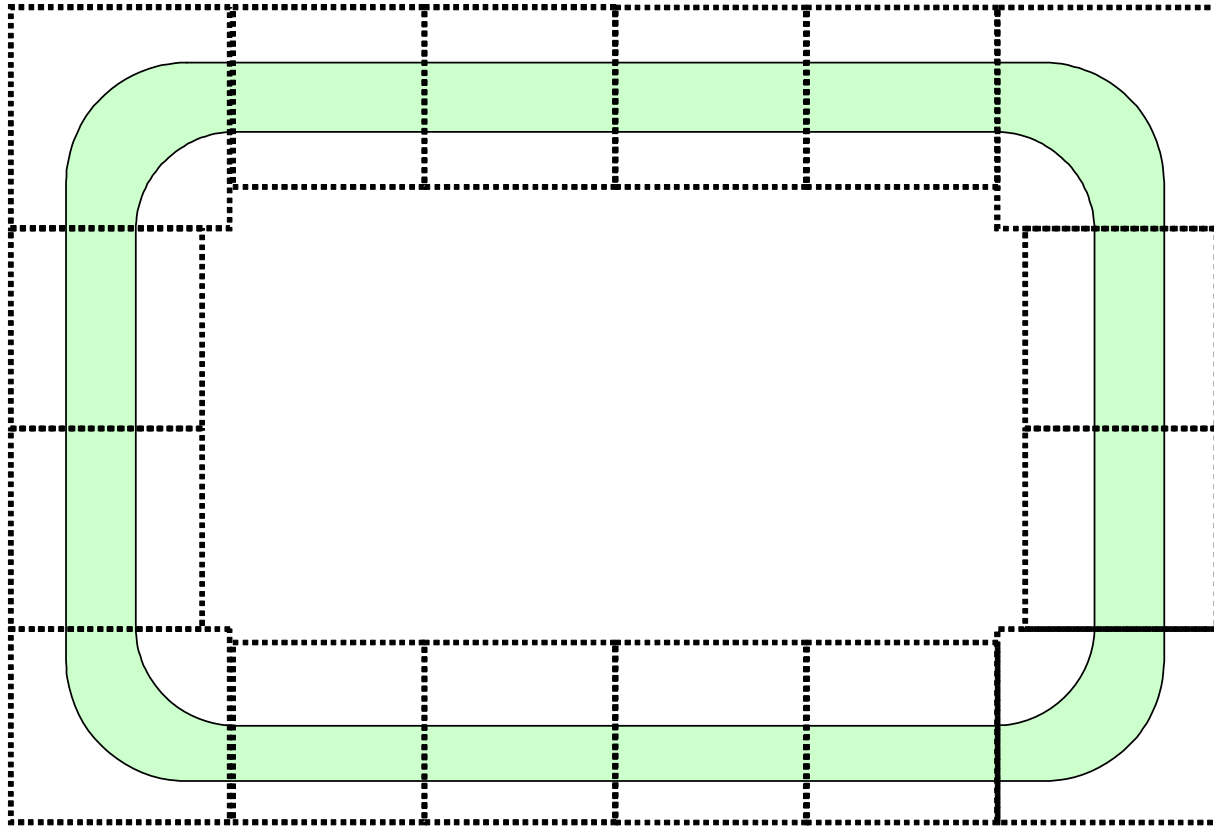
Levee failures



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Levee rings



Levee Patroller demo



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Conclusion

- **Problem** → Floods occur rarely and unexpectedly:
 - Situations cannot be trained
 - Measures cannot be tested
- **A solution** → serious games:
 - Differ from DSSs & Simulations
 - Have an educational & organizational value
- **But** → more convincing evidence is needed (PhD?)
 - Design
 - Effects

Questions?

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More information about Levee Patroller:

<http://www.delftgeosystems.nl/leveepatroller>

More information about serious gaming:

<http://www.seriousgaming.tudelft.nl>