



# :Turning Points in Climate Change Adaptation

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Main message:

- Starts from stakeholder preferences and policy to frame assessm.
- Focus: what change acceptable + when / how likely change




## Today

- Illustrate challenge for assessing and communicating implications of climate change and adaptation planning
- Introduce assessment: ‘adaptation turning points’
- Case study / conclusions
- Get your feed-back



*Amsterdam  
Januari 2008*

## Making Acquaintance

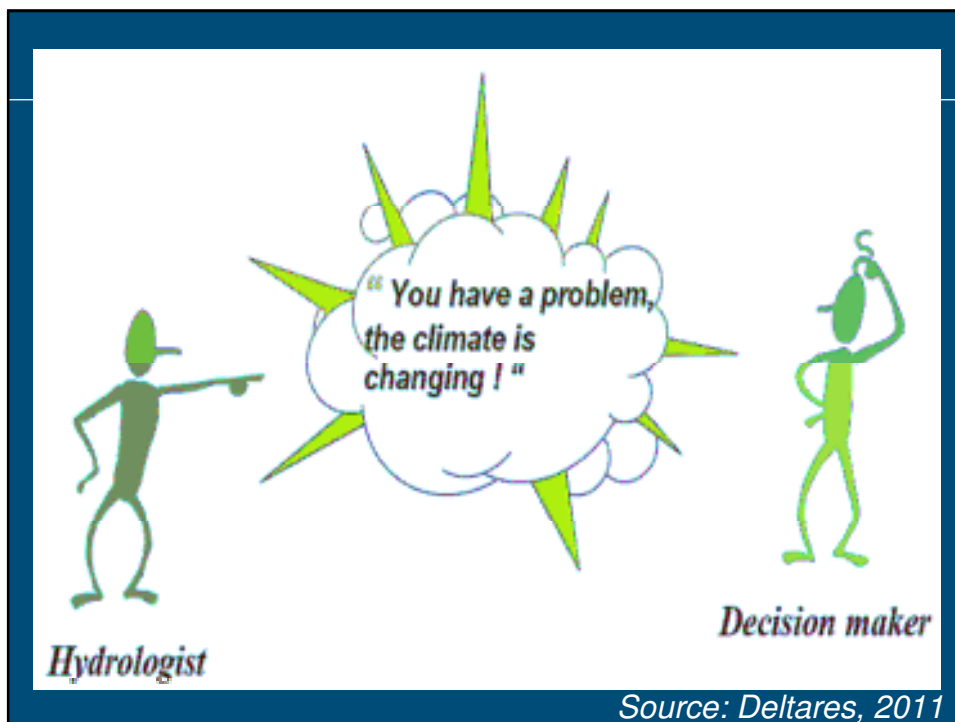


**Adaptation to climate related risks in managed river basins**

Diversifying land use and water management activities to adapt to climate related risks in the Netherlands and Hungary

Saskia E. Werners

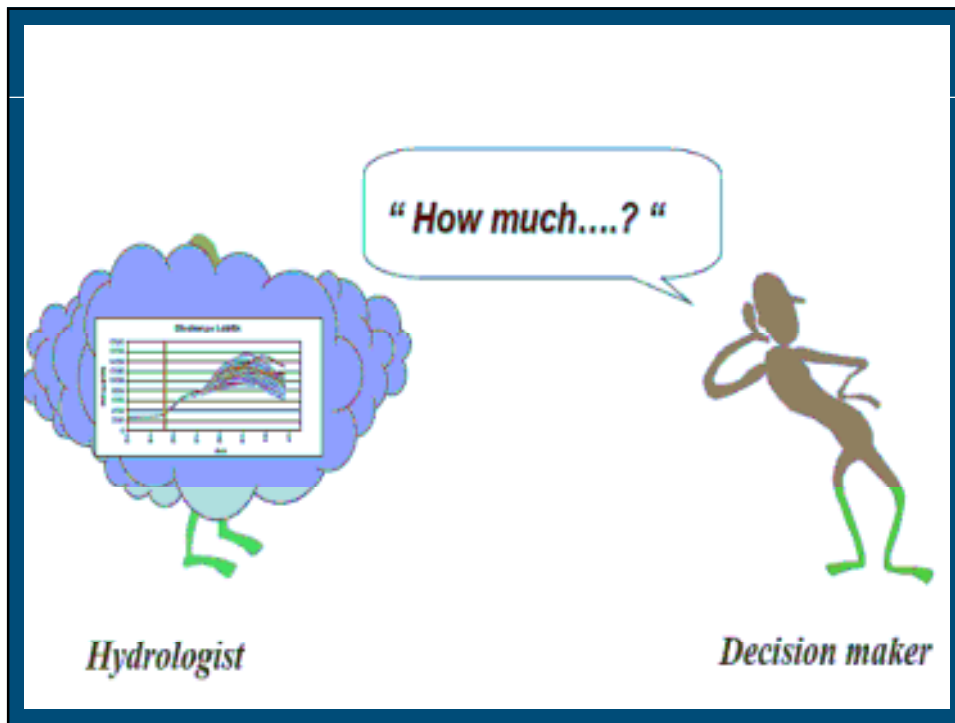
Consulting for national government, EU research  
[www.newater.info](http://www.newater.info), [www.adamproject.eu](http://www.adamproject.eu), [mediation-project.eu](http://mediation-project.eu)  
Interest: how to adapt to climate change in water management



**Hydrologist**

**Decision maker**

*Source: Deltares, 2011*



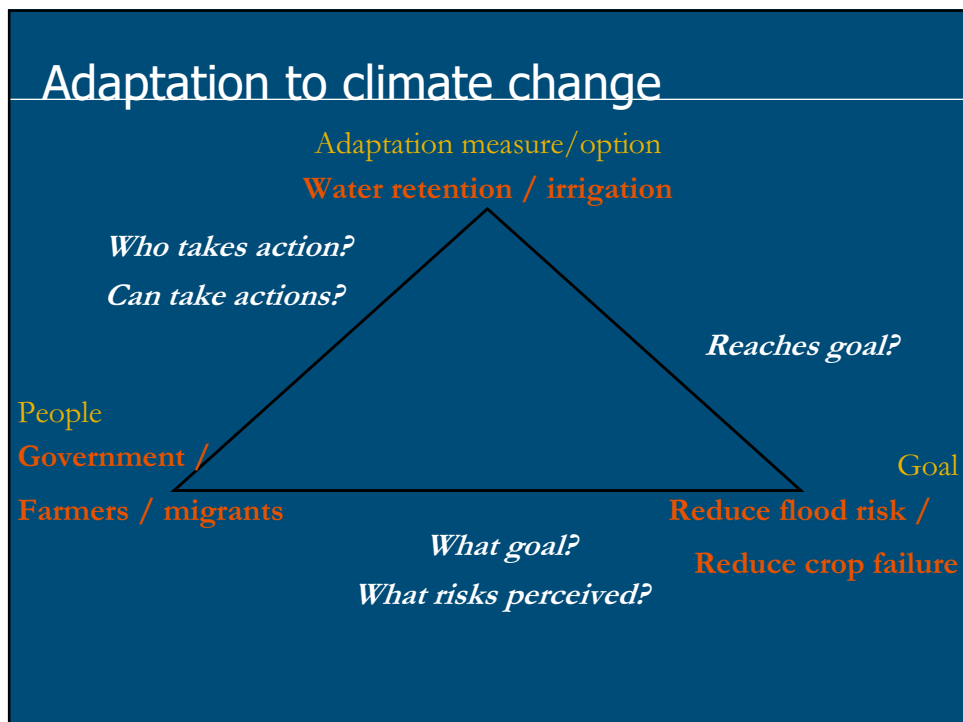
Context: Dutch Delta Programme: Long term (2100) water safety, fresh water supply. Capitalise on opportunities water offers

Deltacommissioner Wim Kuijken (29 September 2010):  
*One of the biggest challenges is dealing with uncertainties in the future climate, but also in population, economy and society. This requires a new way of planning, which we call **adaptive delta planning**. It seeks to maximise flexibility; keeping options open and avoiding 'lock-in'. In the meantime, we prepare the so-called delta decisions about the measures to take **if our current water system reaches its limits**.*

*Base values:  
Solidarity, Flexibility, Sustainability*



A collage of three images. The top image shows four men in a panel discussion at a table with a red cloth. A speech bubble from the man on the right contains the text: "It is difficult to convince people of the benefits of conservation as long as there is water in the river. People look upon rivers with water as a waste." The bottom-left image shows a large green field with a marina in the background. The bottom-right image shows a man in a brown polo shirt standing in a field. In the center, overlapping the bottom images, is a blue sign with the text "TOGETHER WE CONSERVE" in white capital letters.



## Assessment of 'adaptation turning points'

Why:

Climate change becomes relevant to policy makers if it threatens management objectives or results in conditions that society perceives as undesirable.

If such a situation is thinkable, next to knowing the extent of the threat, at least equally important is to know **when** and **how likely** it is.

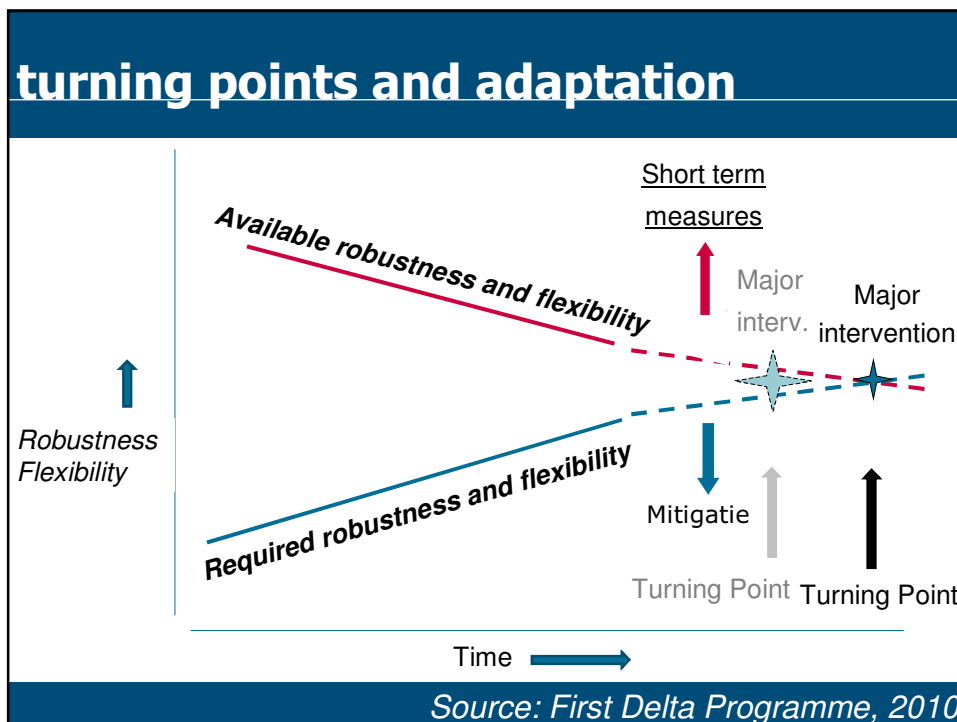
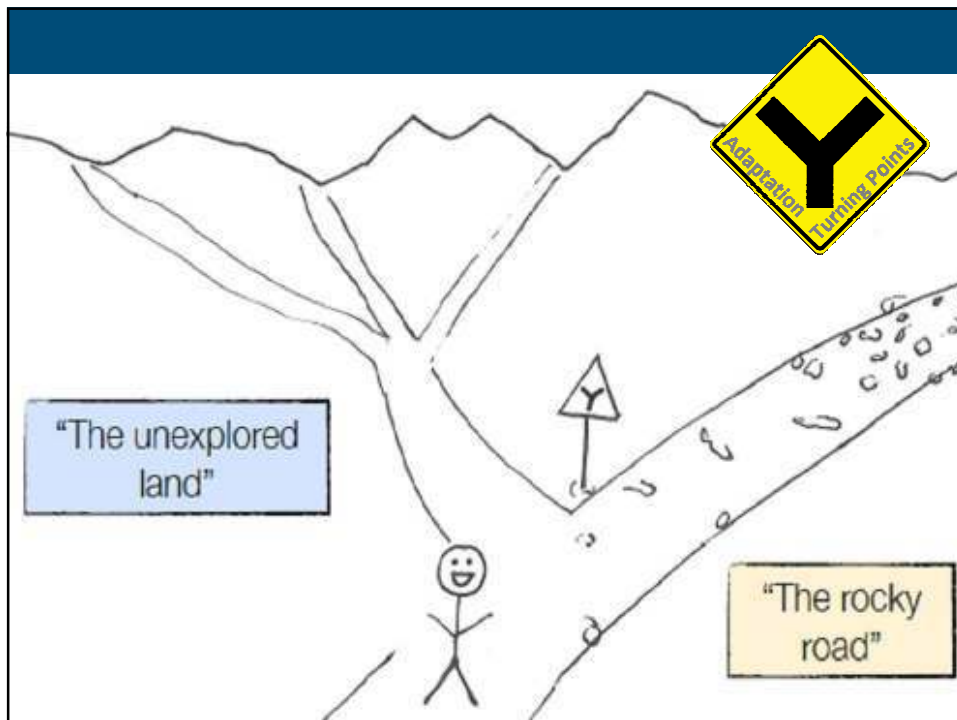
The question is how much longer current policies and management are expected to suffice and when adjustments will be required. In other words, when are thresholds in the socio-political system reached?

### Adaptation turning points:

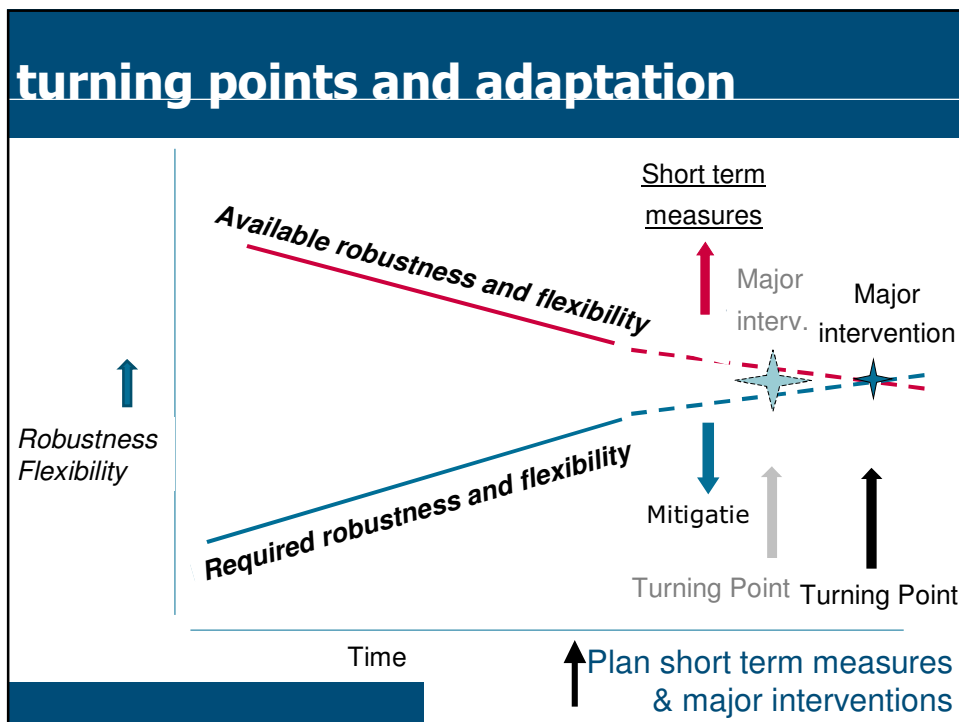
a situation where a **socio-political threshold** is reached, due to climate change induced changes in the **bio-physical system**.

Socio-political thresholds:

- formal policy objectives
- informal societal preferences(willingness to invest, protect cultural identity)



Source: First Delta Programme, 2010



## Research objective

Adaptation turning point perspective:

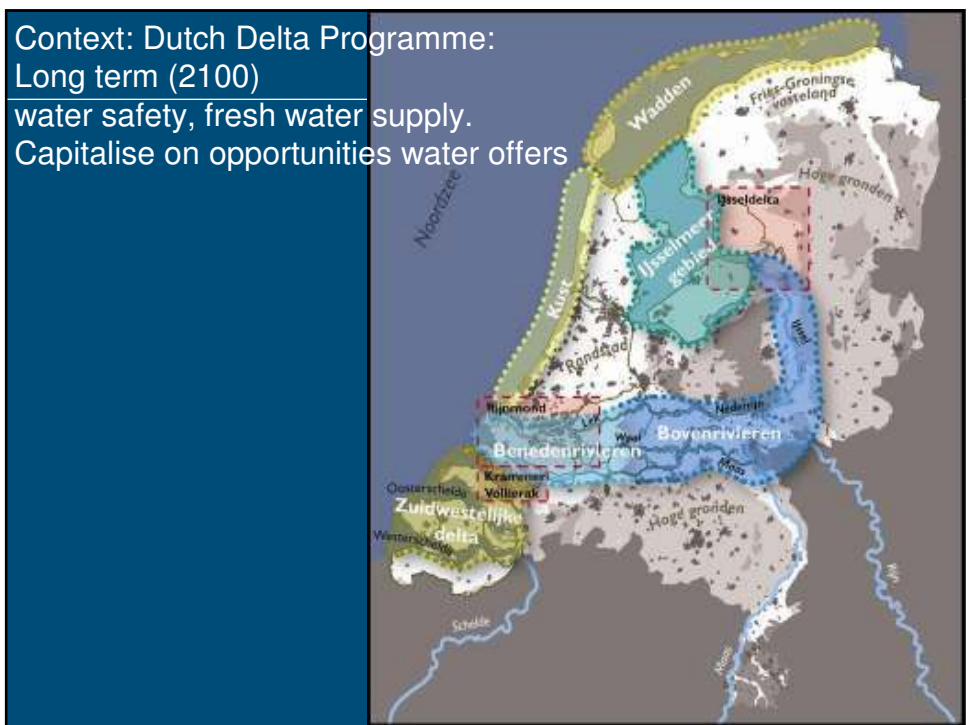
timely concept: how much change willing to accept? much stress a system can absorb before losing its function and when this is likely to happen

Practical objective:

Explore whether adaptation turning points are useful concept for assessing and communicating implications of climate change, which can help decision makers in planning adaptation

Scientific objective:

Role turning points in adaptation to climate change +  
For identification of structural properties and mechanisms that make socio-ecological systems robust and/or receptive to external shocks or internal perturbations



### Assessment of vuln. / adaptation turning points

1. Scoping the assessment: make a long list of possible consequences of climate change for a region or sectors

		Hoeveelheid effecten in de toekomst	Belangrijkheid van effecten in de toekomst	Belangrijkheid van effecten in de toekomst	Belangrijkheid van effecten in de toekomst	Belangrijkheid van effecten in de toekomst
Verandering in de hoeveelheid regenval in de toekomst	Verandering in de hoeveelheid regenval in de toekomst	1	2	3	4	5
Verandering in de temperatuur in de toekomst	Verandering in de temperatuur in de toekomst	1	2	3	4	5
Verandering in de zeespiegel in de toekomst	Verandering in de zeespiegel in de toekomst	1	2	3	4	5
Verandering in de hoeveelheid sneeuwval in de toekomst	Verandering in de hoeveelheid sneeuwval in de toekomst	1	2	3	4	5
Verandering in de hoeveelheid uren met vorst in de toekomst	Verandering in de hoeveelheid uren met vorst in de toekomst	1	2	3	4	5
Verandering in de hoeveelheid uren met onvriespunt in de toekomst	Verandering in de hoeveelheid uren met onvriespunt in de toekomst	1	2	3	4	5
Verandering in de hoeveelheid uren met vriespunt in de toekomst	Verandering in de hoeveelheid uren met vriespunt in de toekomst	1	2	3	4	5
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**Rows:** Effects of climate change + scores of likelihood  
**Columns:** Impacts (on flood safety, fresh water supply, economic activities (navigation, drinking water, power production)+ scores of severity)



## Assessment of adaptation turning points

Prioritise climate change trends and impacts: From long list to short list.  
 Select impacts, sectors & regions based on potential severity and likelihood (e.g. build urgency matrix)

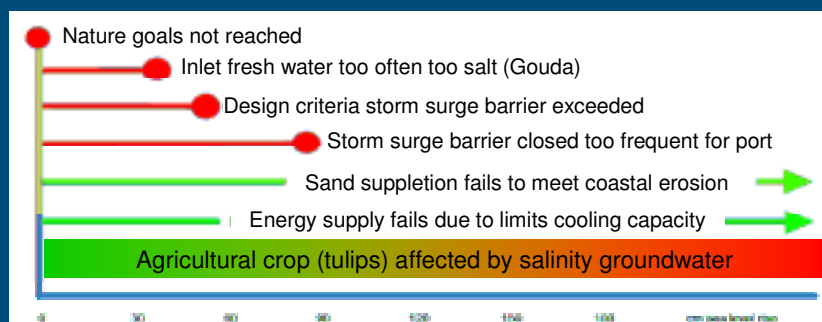
	Impact			
Likelihood	Major	Moderate	Minor	Insignificant
very likely				
likely				
fifty/fifty				
unlikely				
very unlikely				

When carried out with stakeholders provides commitment to those issues that need to be addressed

## Assessment of adaptation turning points

Ask: What are **socio-political objectives**? Determine what situation is acceptable.

Next: What climate conditions are critical for objectives? What are threshold conditions for reaching objectives (beyond which current strategy fails)

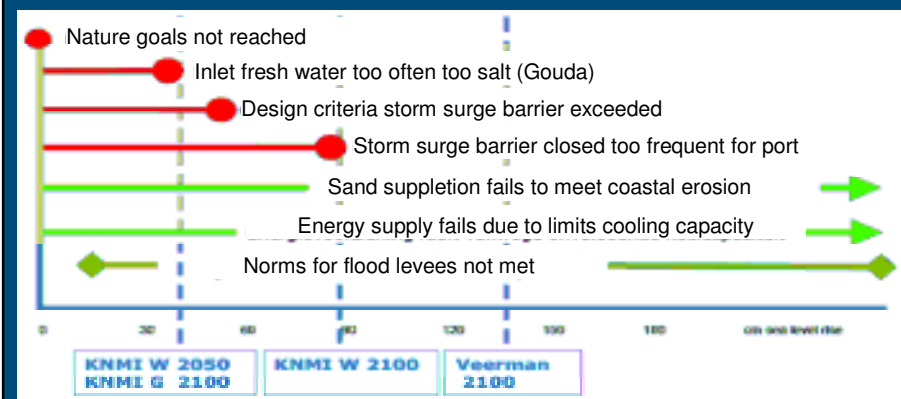


Turning points for Rijnmond region (red dots). Green line: no turning point (Jeuken et al., 2010).

## Assessment of adaptation turning points

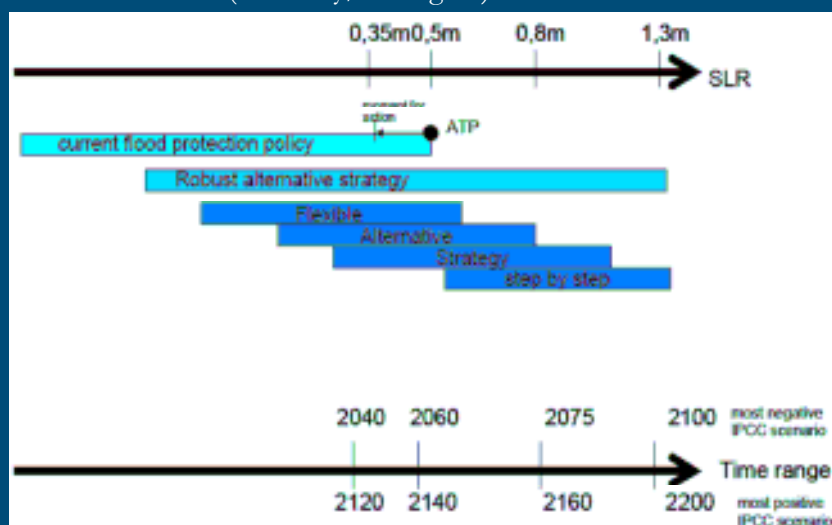
Translate turning points to timescale: Use existing scenario (eg IPCC, or from national agencies) to assess when turning points are likely to occur.

Methods: use climate scenario's, extreme/moderate (depends on sector); interpolate between projection year and now; express uncertainty: earliest date/ latest date that climate change will have reached a certain value



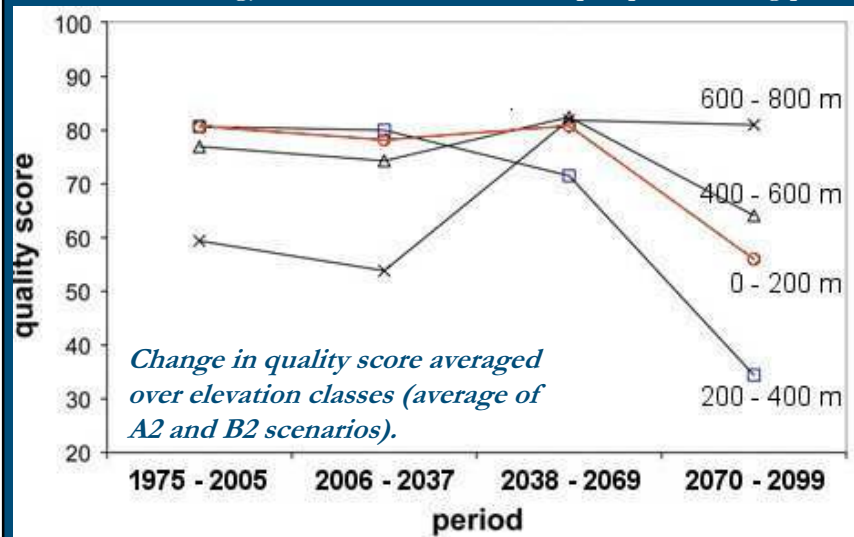
## Assessment of adaptation turning points

Determine decision tree & adaptation pathways. Assess how easy it is to switch in time (flexibility/'no regret')



## Assessment of adaptation turning points

Determine alternative adaptation strategies: assess how to implement a different strategy or additional measures to postpone turning point

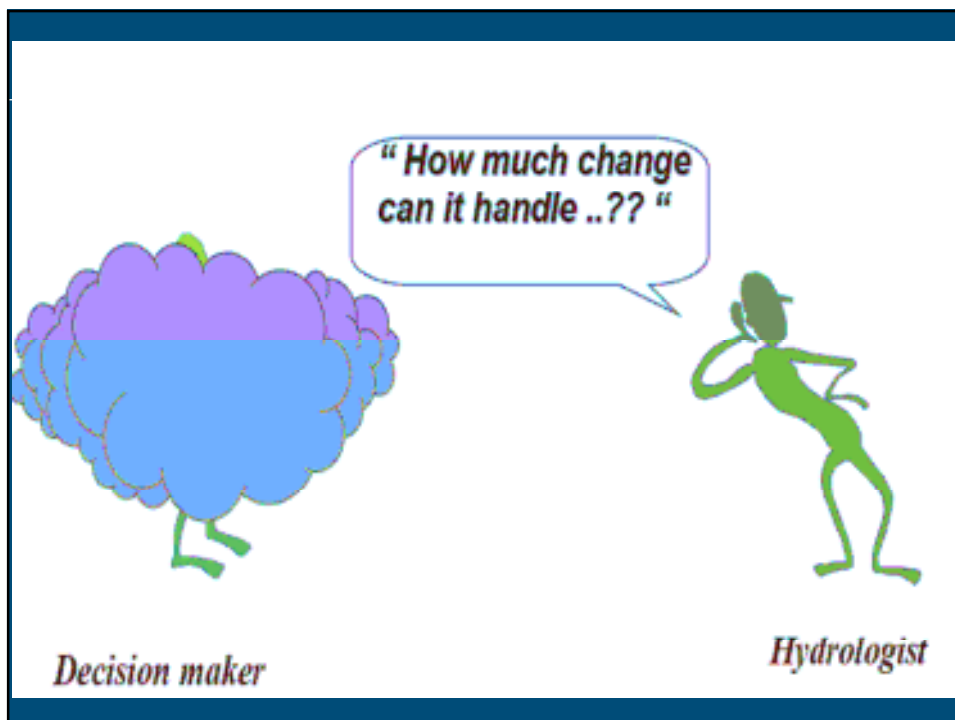
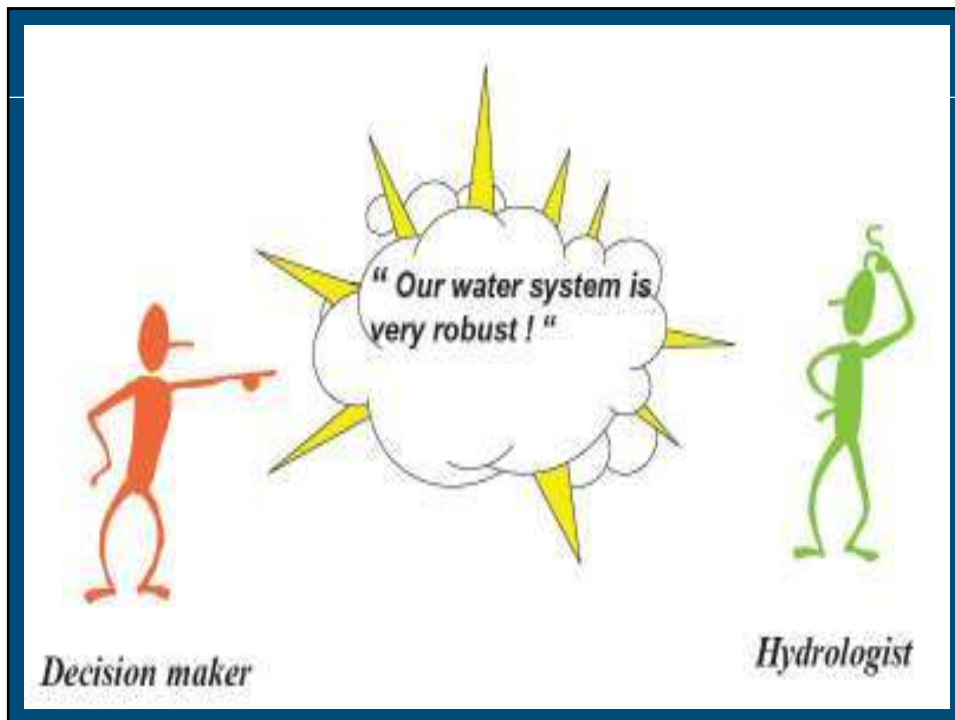


## Conclusions / Experience

**Question:** Are adaptation tipping points an appropriate concept for assessing and communicating the implication of climate change & planning adaptation? (& related: how to identify, causes, ....)

- **Risk perception & uncertainty:** Expressing uncertainty in time (when will a critical point be reached) is easier to understand than % change in a certain projection year.
- **Framing:** Close to question of policy maker/manager/stakeholder (experience Dutch Delta Program)
- Allows for dialogue between science & policy community
- Some times far from trivial (not the silver bullet) because.....





## Thank you, discussion?

- ☞ Comments on method
- ☞ Cooperation? Use in your case study?
- ☞ Bring in governance aspects
- ☞ Other feed-back?

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## Extras

