



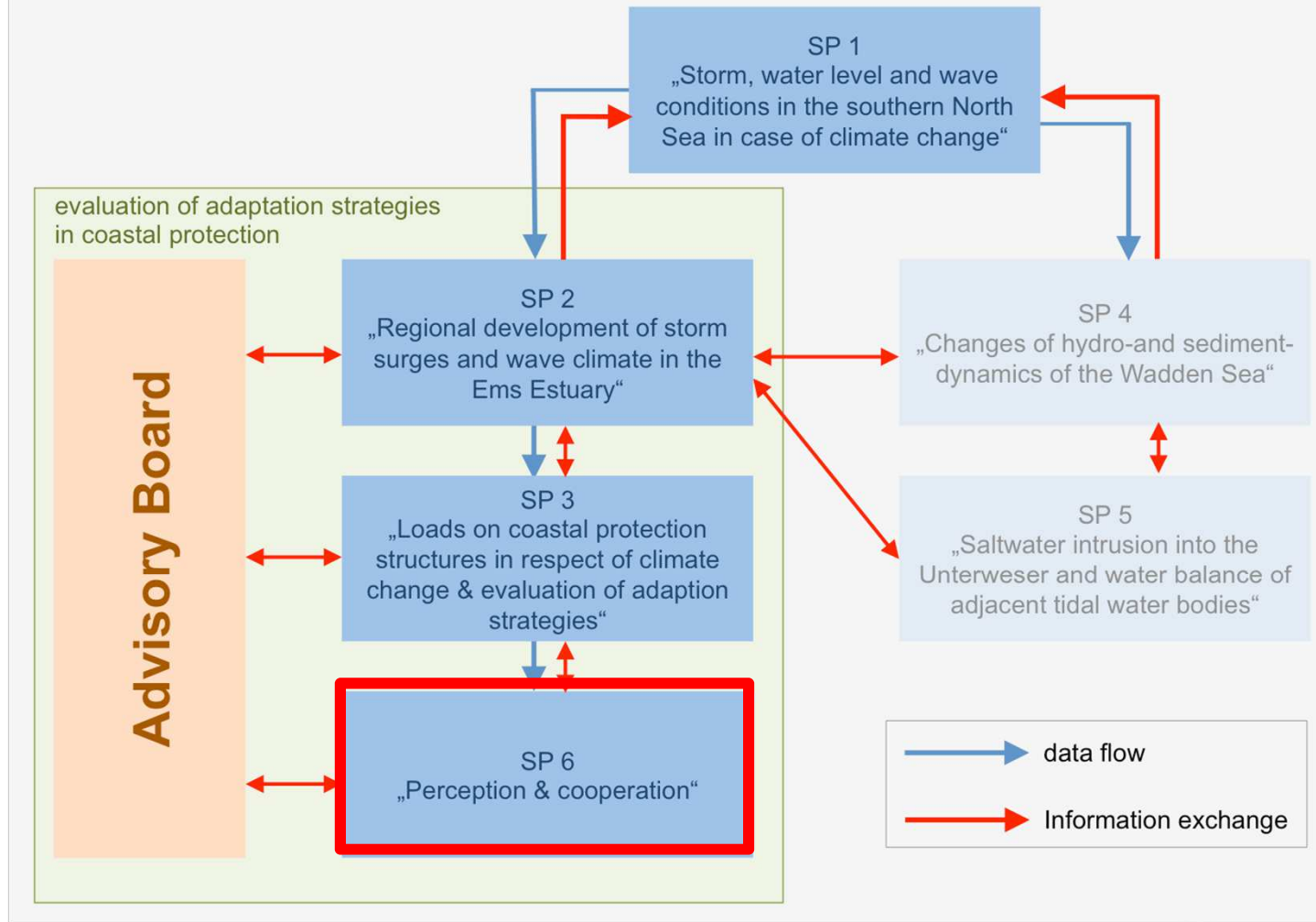
# Reflexive Multi-Criteria Evaluation as a Tool to Integrate Multiple Values of Scientists and Stakeholders

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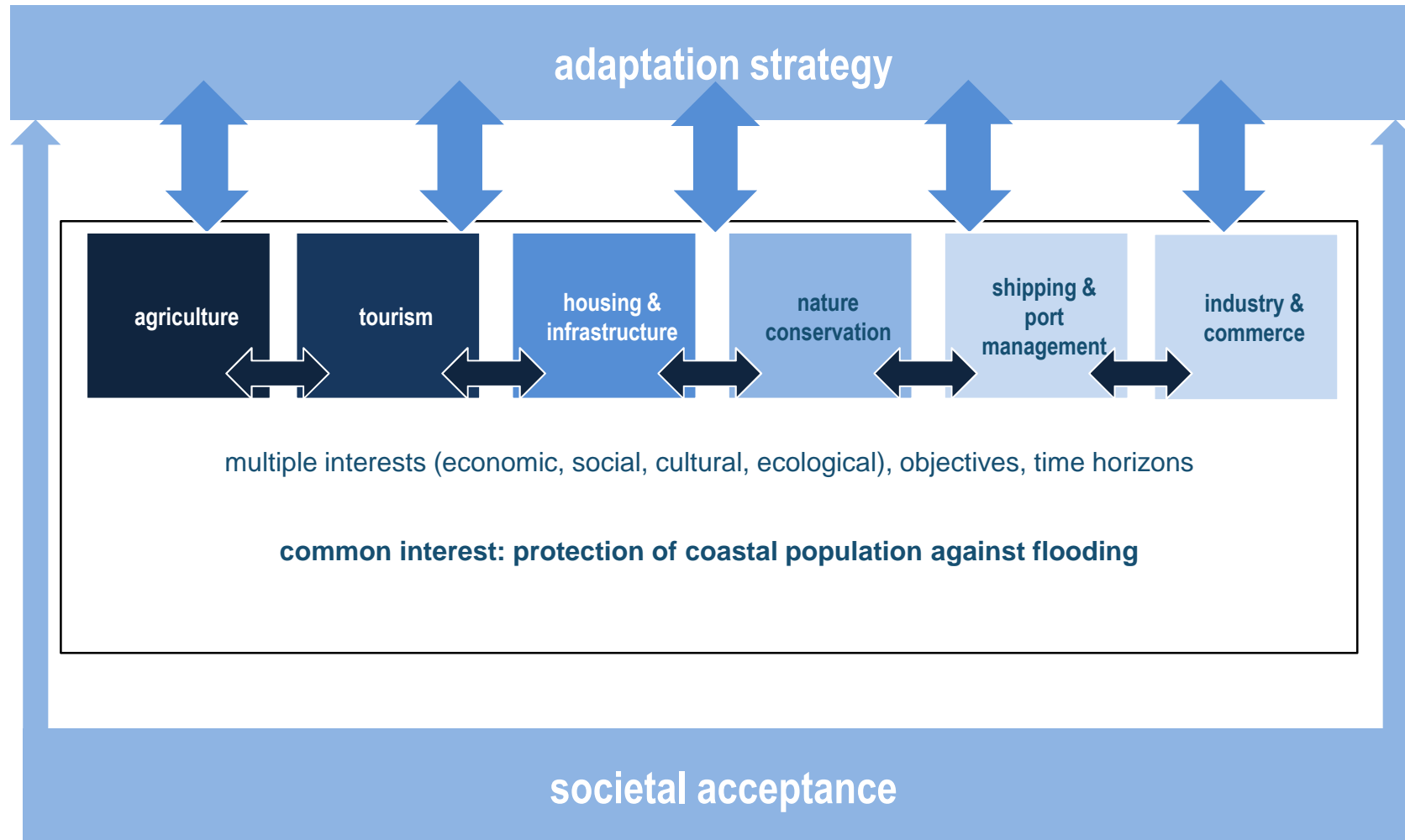
## A-KÜST „Changes in the Coastal Climate – Evaluation of Alternative Strategies in Coastal Protection“



## Overview

- 1. Climate change adaptation & coastal protection: decision-making process**
- 2. Evaluation: a transdisciplinary approach**
- 3. Reflexive Multi-Criteria Evaluation**
- 4. Output & Outcome**

- common understanding of coastal protection & its principles
- longstanding history: coastal protection traces back to app. 1000 A.D
- current (traditional) strategy is socially accepted
  
- climate change increases uncertainty (societal and economic changes)
- scientific & political consensus about the need of an adaptation strategy
- implementation of adaptation strategy may cause conflicts



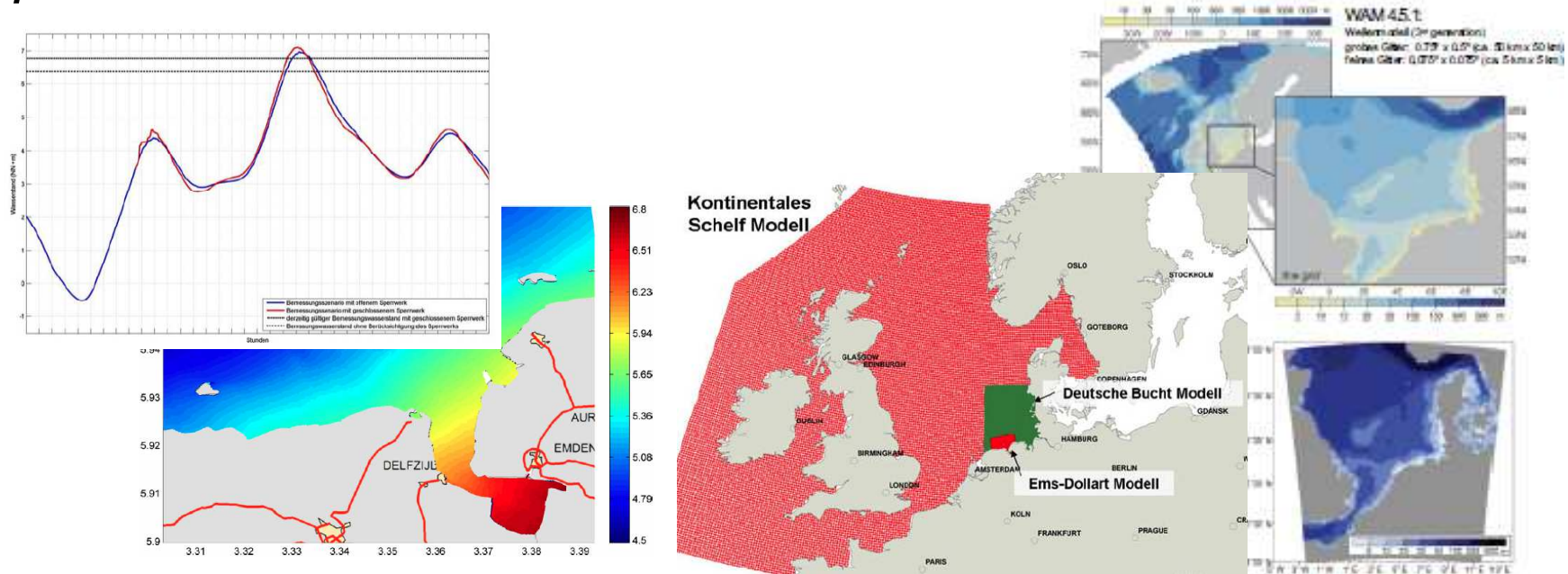
## The decision-making process

- decision-making is often reduced to only a few, mainly economic and engineering criteria
- ecological and socio-cultural criteria have been merely neglected
- all relevant interests and criteria need to be considered
- basis: spatio-temporal concretization of climate change implication
- consider alternative strategies additionally

## A transdisciplinary approach

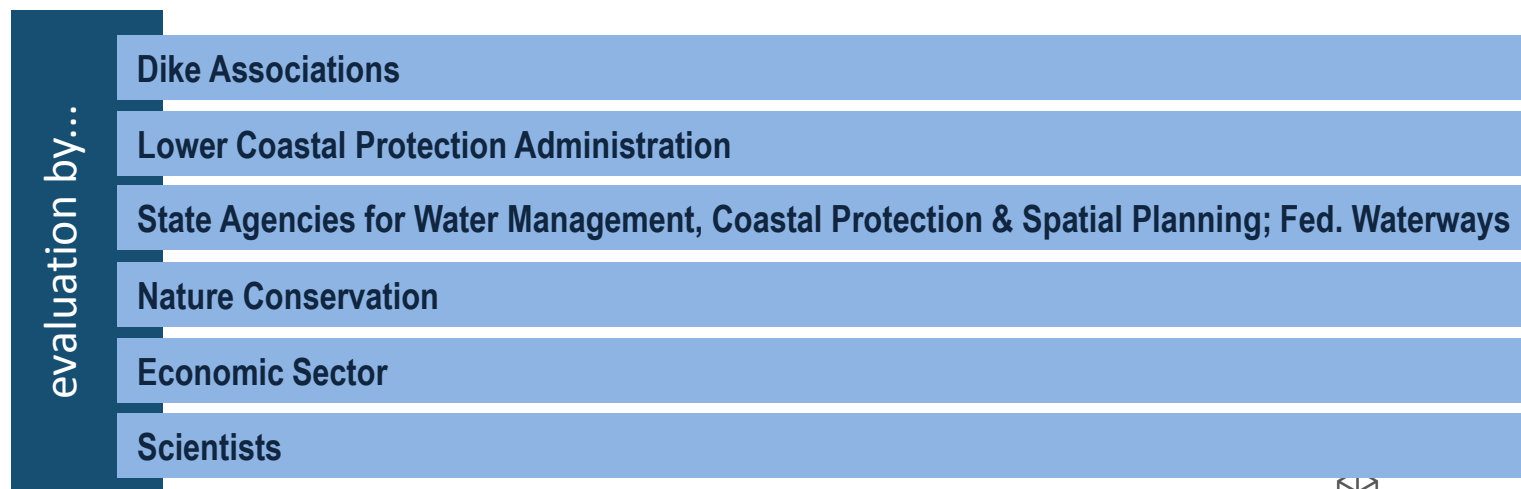
A-KÜST: Changes in the Coastal Climate– Evaluation of Alternative Strategies in Coastal Protection

*Identify an optimal and long-term strategy in coastal protection that is both, robust and flexible.*



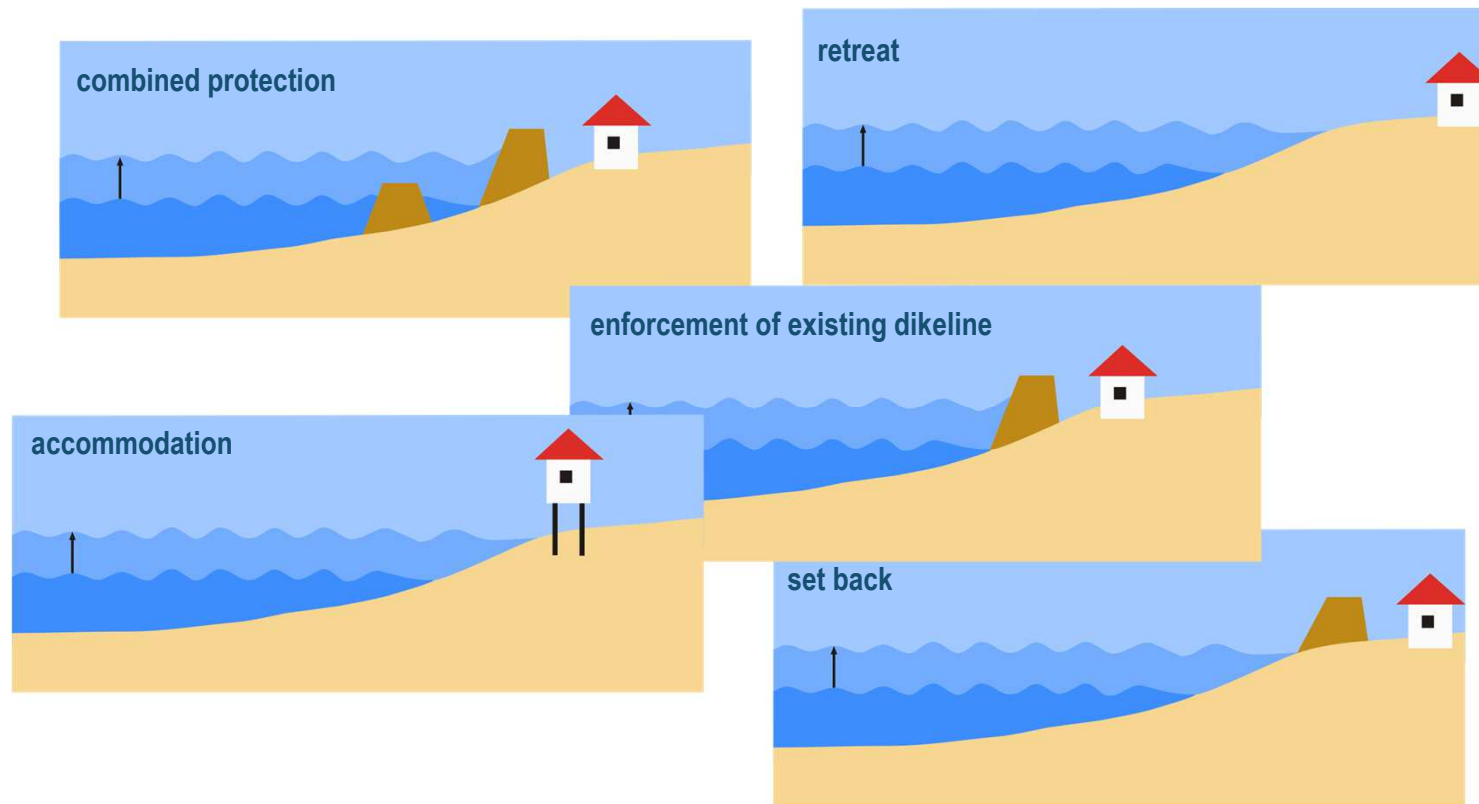


- Evaluation of alternative adaptation strategies in an early phase of developing a longterm strategic course
- reflexive = reflecting, feed-back, questioning critically, considering different perspectives
- Multiattribute Utility Theorie





- „Profiles“ with detailed informations



- Identification of relevant evaluation criteria by means of value tree procedure

**Engineering criteria**

- Flexibility
- robustness
- optimal drainage of the hinterland

**Economic criteria**

- construction costs
- effort for upkeep
- land use and values
- costs for relocating infrastructure components

**Socio-economic criteria**

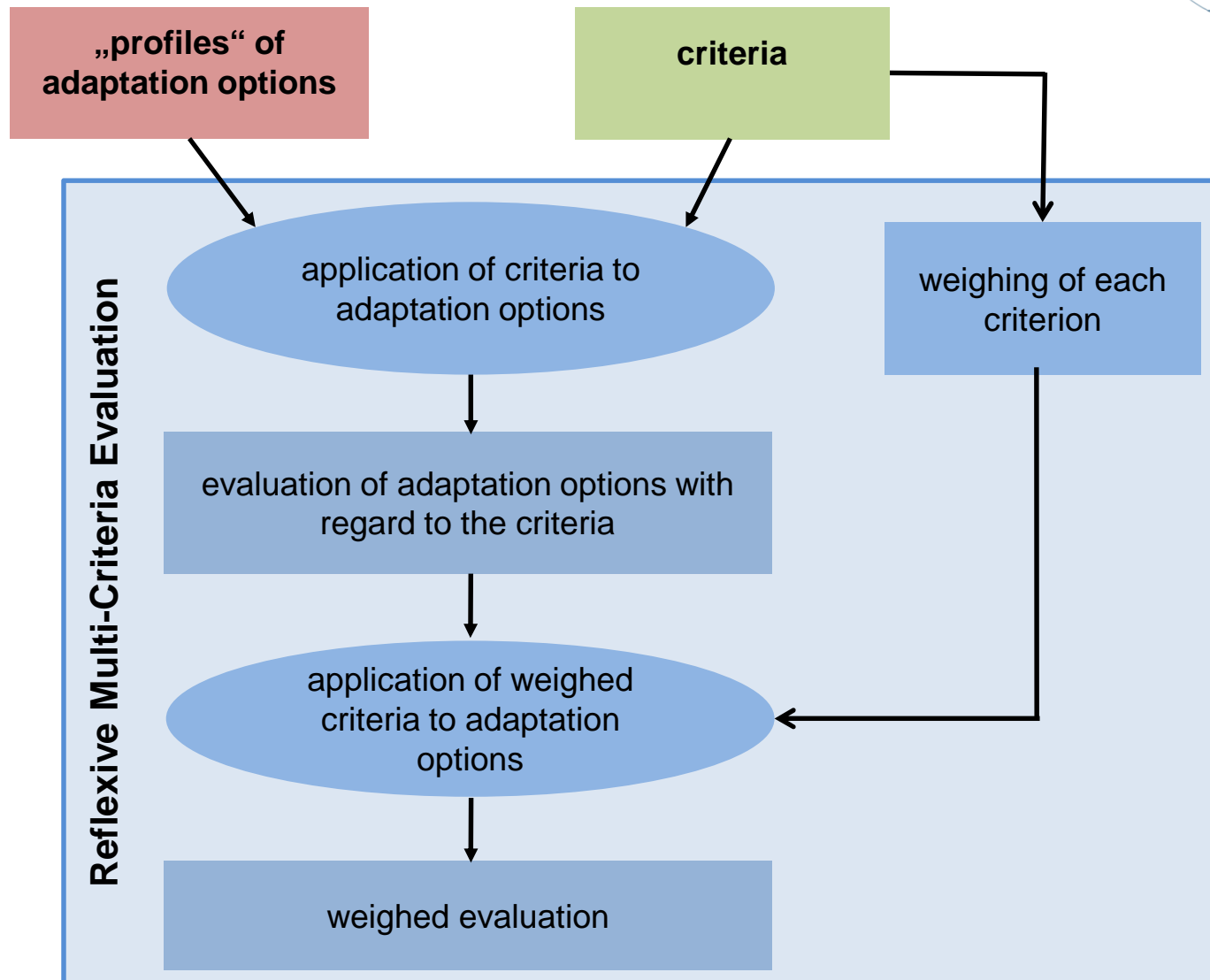
- associated potential for conflicts
- regional economic development
- social stability

**socio-cultural criteria**

- local cultural tradition / heritage
- visual aesthetics of the landscape

**Criteria from nature conservation**

- maintenance of natural dynamic processes
- biodiversity
- creation and maintenance floodplains
- maintenance of wadden sea floodplains



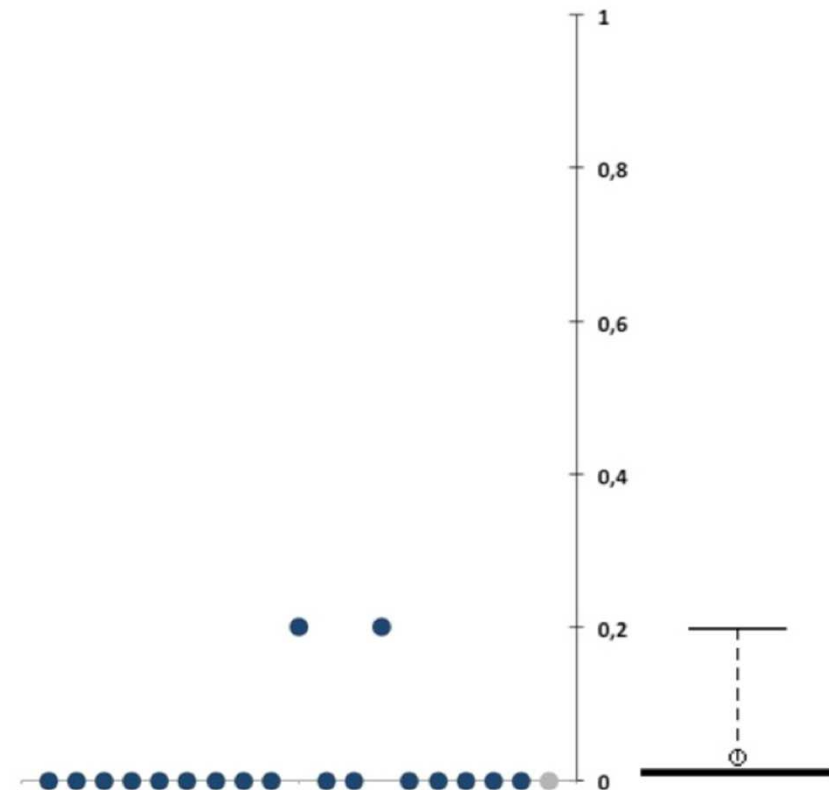
## Contextual meaning of „reflexive“?

- Delphi-procedure including two evaluation processes with an intermediate discussion
  1. Is clarification needed regarding the common understanding of the evaluation objects and the evaluation criteria?
  2. Are the profiles of the adaptation options sufficiently precise?
  3. Critical reflection on the evaluation criteria.

Homogeneous pictures may indicate agreement and similar perspectives

Homogeneous picture

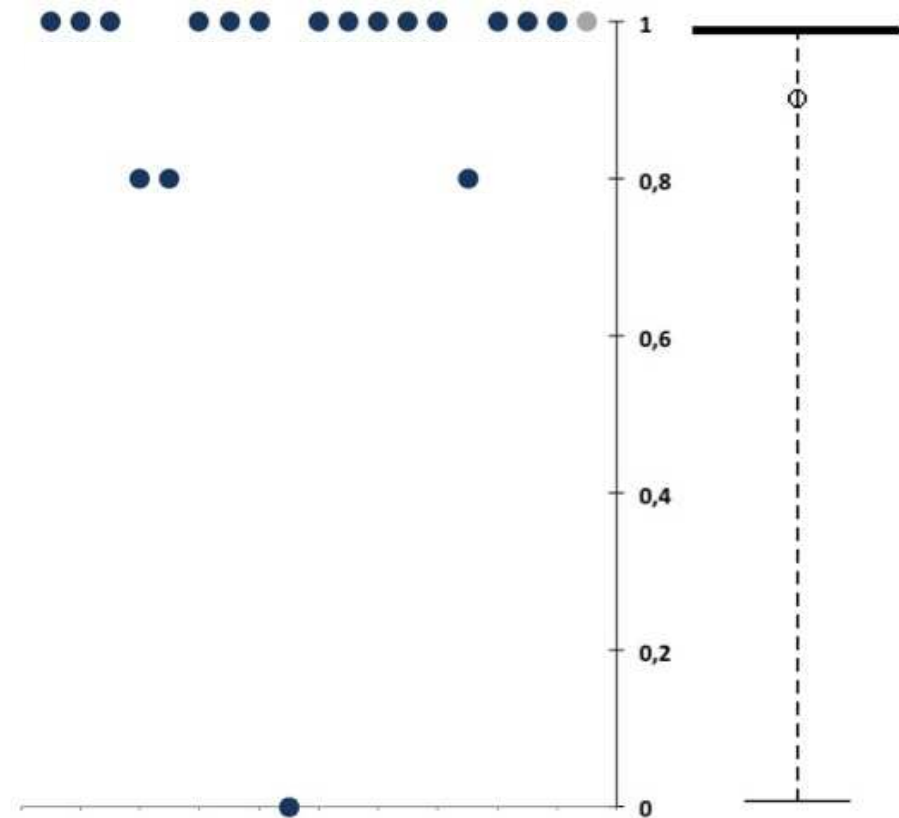
- **Retreat** evaluated against “potential of conflicts”
- Evaluators agreed that **retreat** has a high potential of conflicts
- Indicates a broad consensus



Homogeneous pictures may indicate agreement and similar perspectives

Homogeneous picture

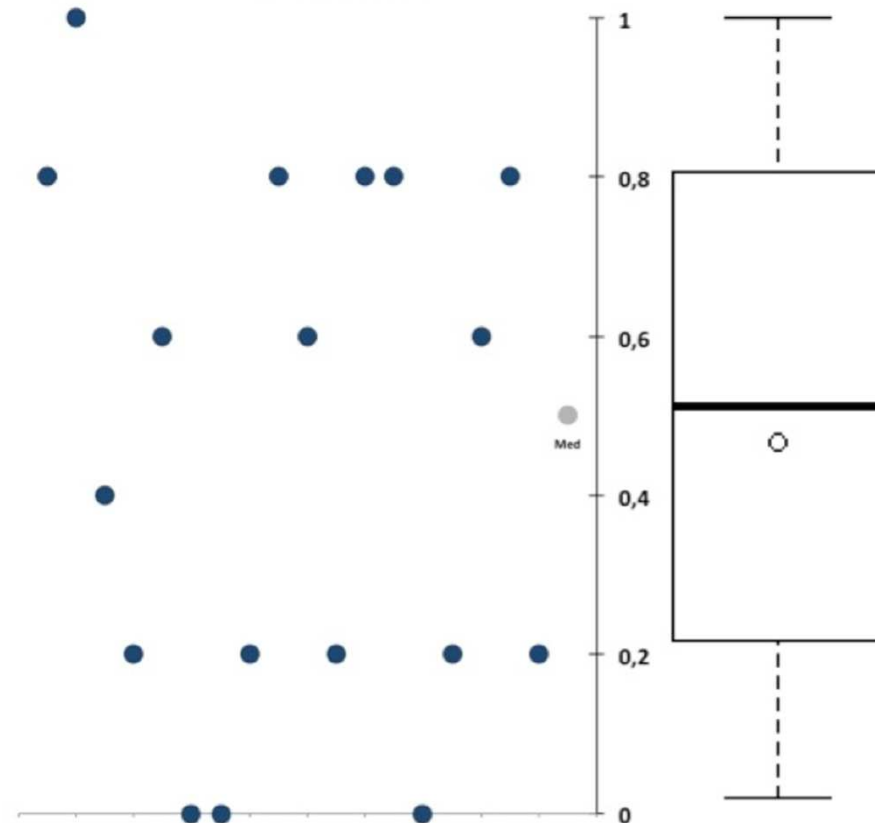
- **Reinforcement** evaluated against “potential of conflicts”
- Evaluators agreed that **reinforcement** has a low potential of conflicts
- but giving reason to clarify whether there might be a misunderstanding



Heterogeneous pictures may indicate diverging perspectives, lack of information, misunderstanding

Heterogeneous picture

- **Accommodation** evaluated against “visual aesthetics of the landscape”
- indicating diverging perspectives and values

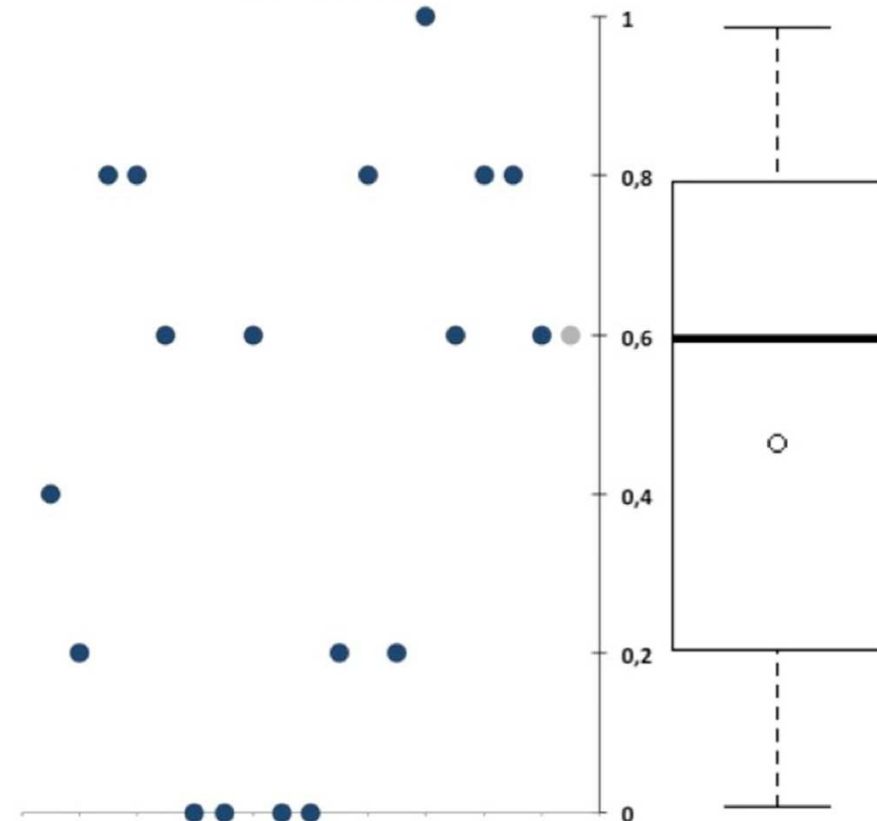




Heterogeneous pictures may indicate diverging perspectives, lack of information, misunderstanding

Heterogeneous picture

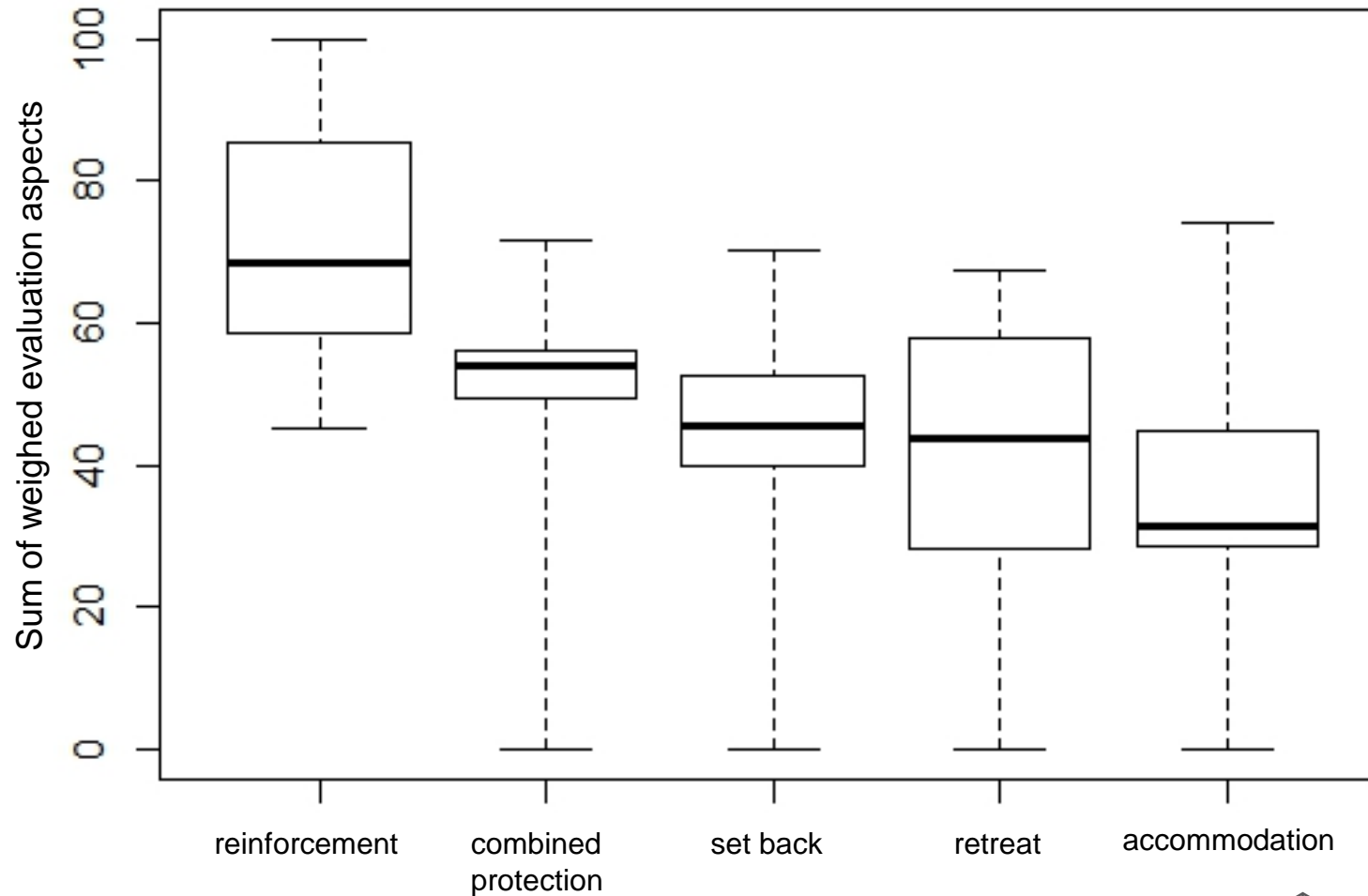
- **Set back** evaluated against “costs for relocating infrastructure components”
- indicating lack of information and or uncertainty



### Output

- All criteria are relevant
- „**Consensus**“ on the evaluation of the adaptation options *reinforcement of existing dike line and retreat*
- **Heterogeneous evaluation** of the adaptation options *set back, accomodation and combined protection.*
- **Description** of adaptation options “profile” not sufficiently precise?
- **Formation of groups**
- **Ecological criteria from nature conservation:** heterogeneous evaluation

# Hierarchy of adaptation options



# Outcome

## **contribution to transdisciplinary strategy development by ...**

- integrating all relevant actors
- integrating various interests, amenities and value orientations
- open and transparent procedure

## **This approach fosters the collaboration between science and practice by**

- developing a common understanding / common ground
  - revealing likely unconsidered aspects
  - communicating about the background of diverging perspectives
- **This collaborative approach fosters the societal anchoring of an adaptation strategy in the regional context and within the network of regional actors.**



# Thank you very much!

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