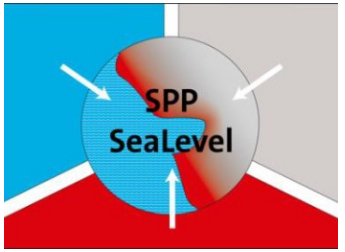


Learning scenarios

The missing link between sea level science and coastal decision making

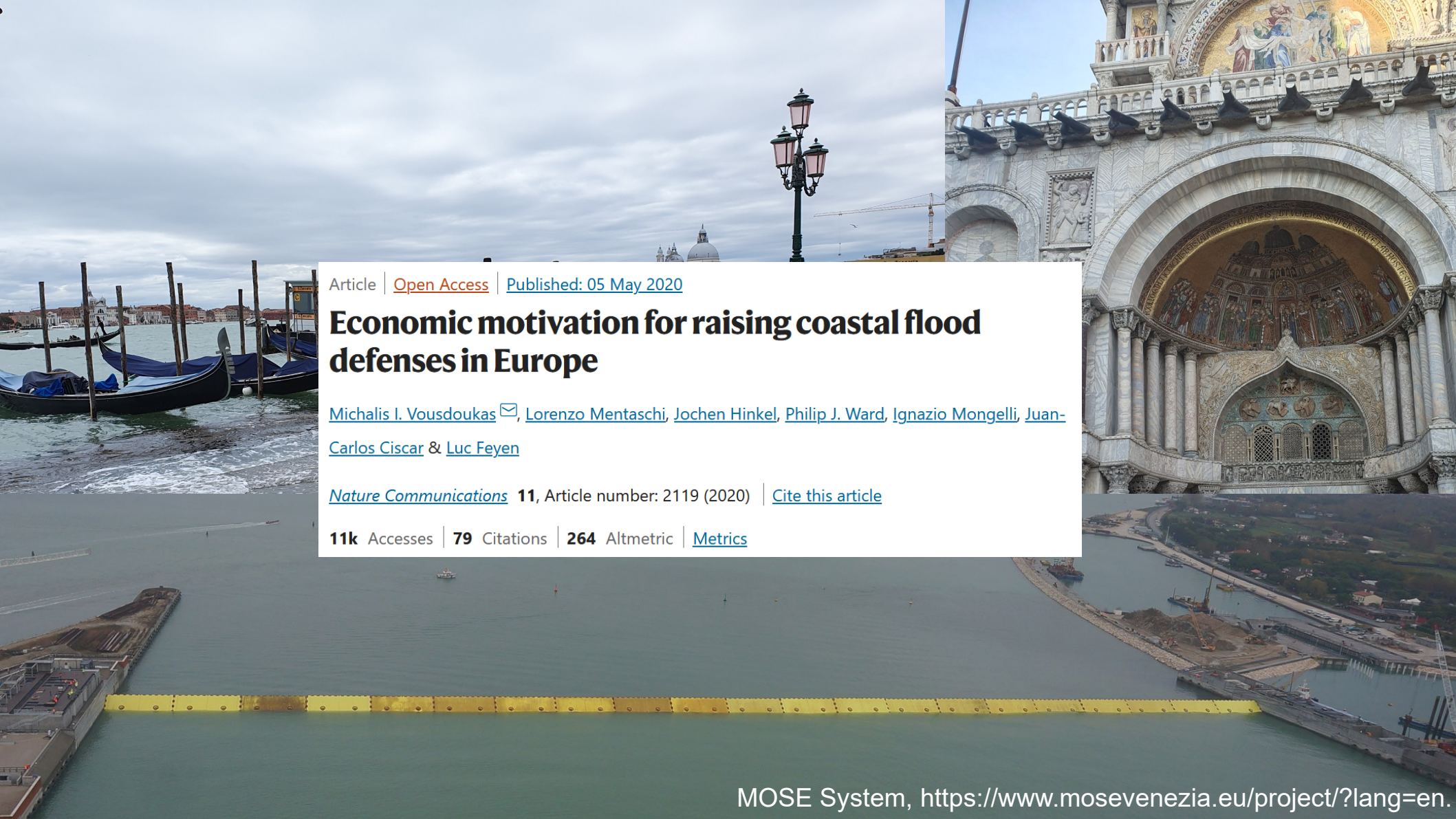
Vanessa Völz, PD Dr. Jochen Hinkel

Venice, Italy, 2023, V. Völz.

Venice, Italy, 2023, V. Völz.

Venice, St Mark’s Basilica, 2023, V. Völz.

MOSE System, https://www.mosevenezia.eu/project/?lang=en.



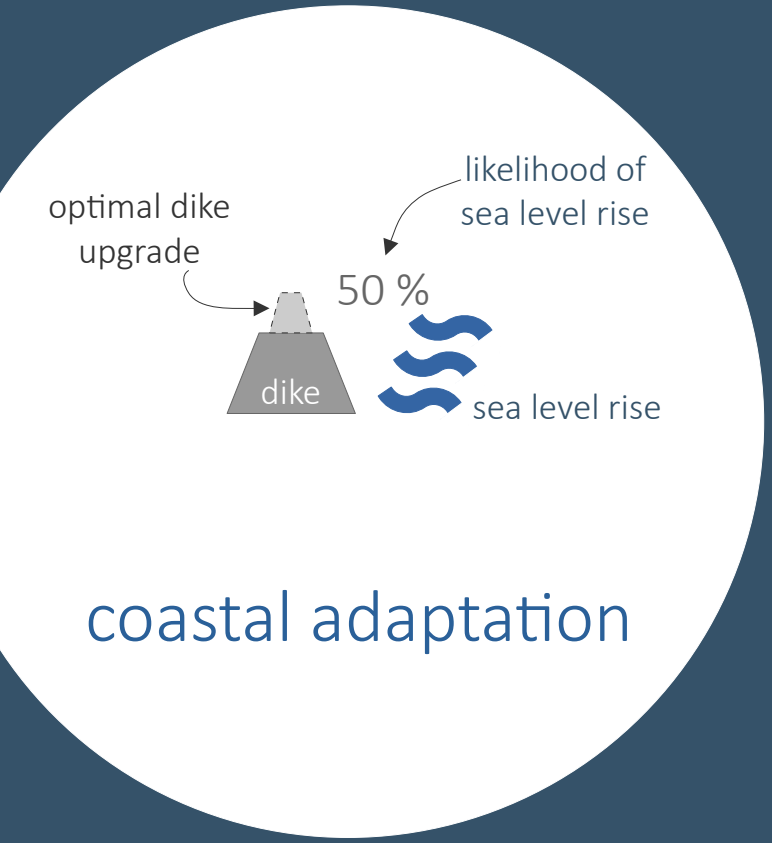
Article | Open Access | Published: 05 May 2020

Economic motivation for raising coastal flood defenses in Europe

Michalis I. Vousdoukas ✉, Lorenzo Mentaschi, Jochen Hinkel, Philip J. Ward, Ignazio Mongelli, Juan-Carlos Ciscar & Luc Feyen

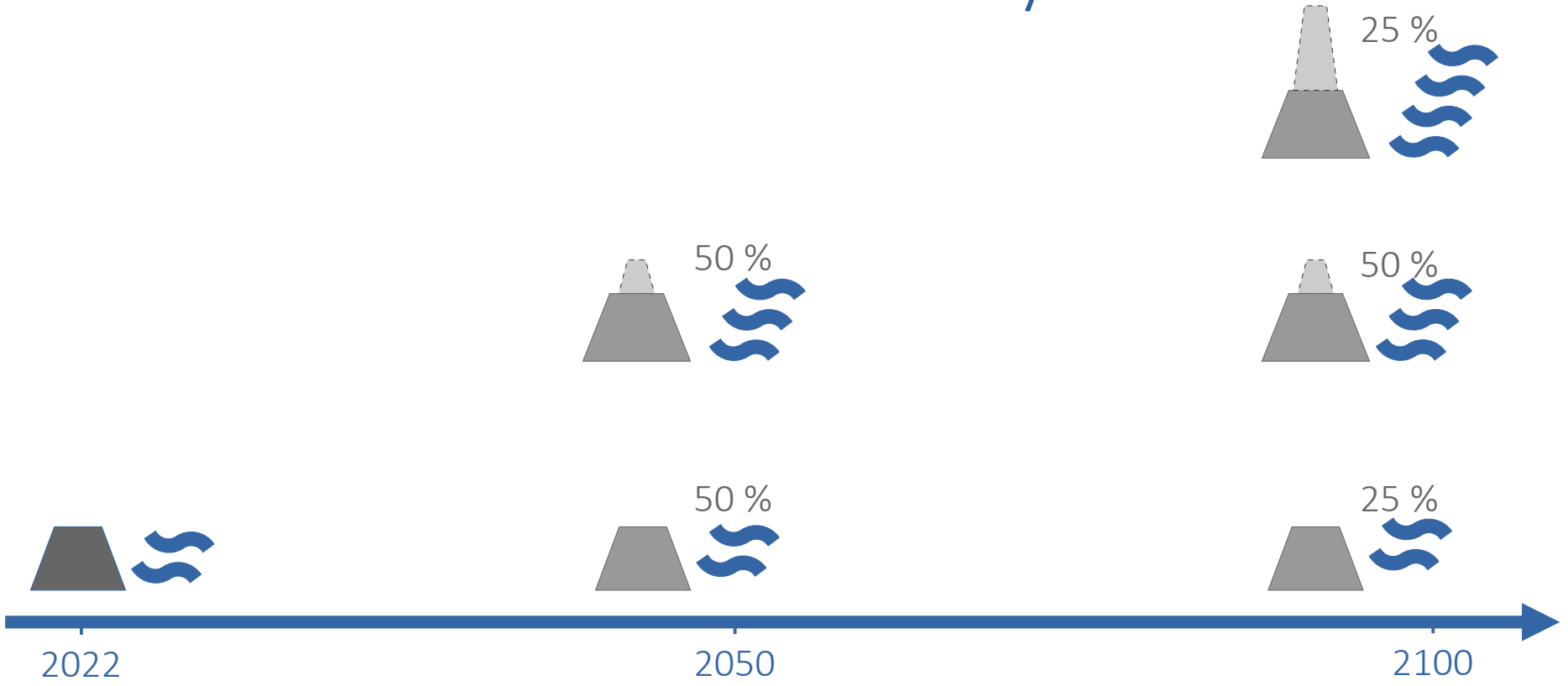
Nature Communications **11**, Article number: 2119 (2020) | Cite this article

MOSE System, https://www.mosevenezia.eu/project/?lang=en.

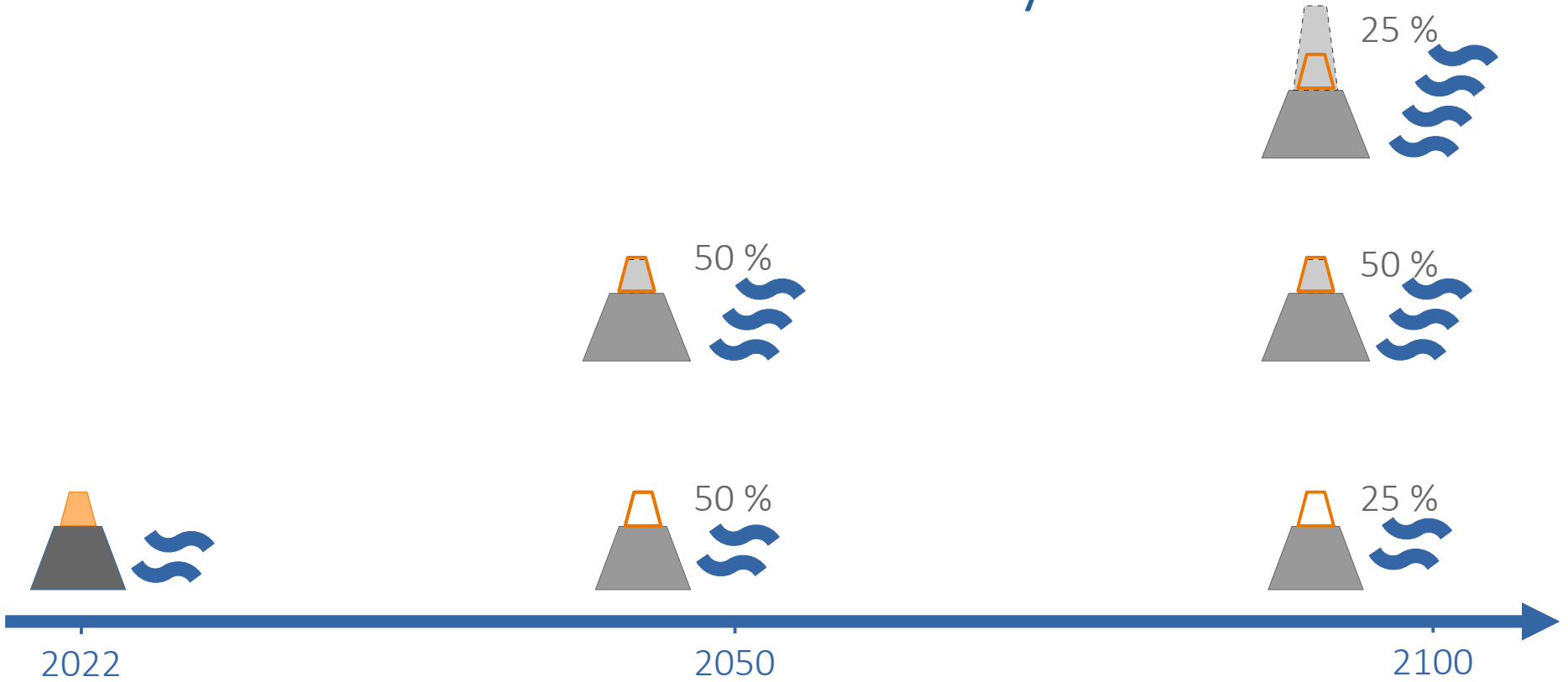


Economic decision making methods

Cost-Benefit analysis



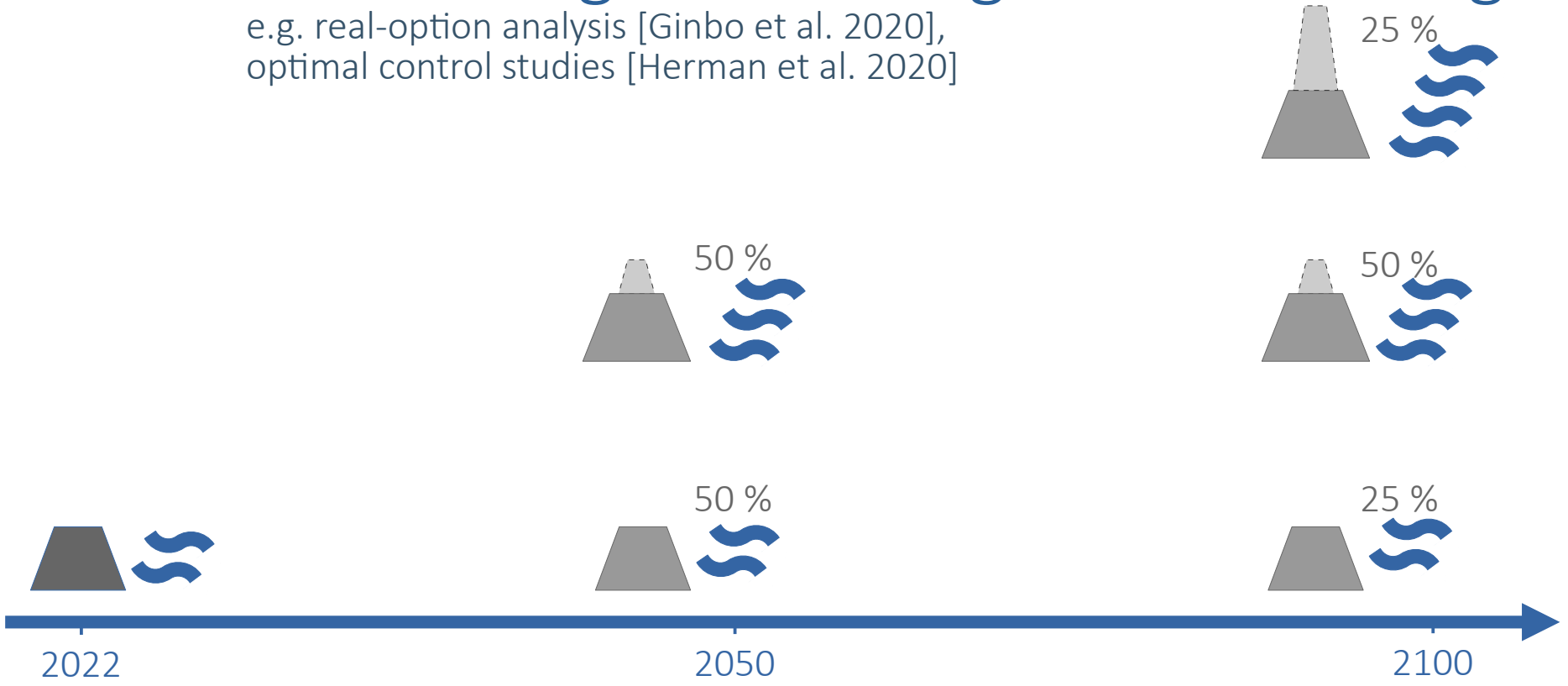
Cost-Benefit analysis



static decision today

Decision making considering future learning

e.g. real-option analysis [Ginbo et al. 2020],
optimal control studies [Herman et al. 2020]



Decision making considering future learning

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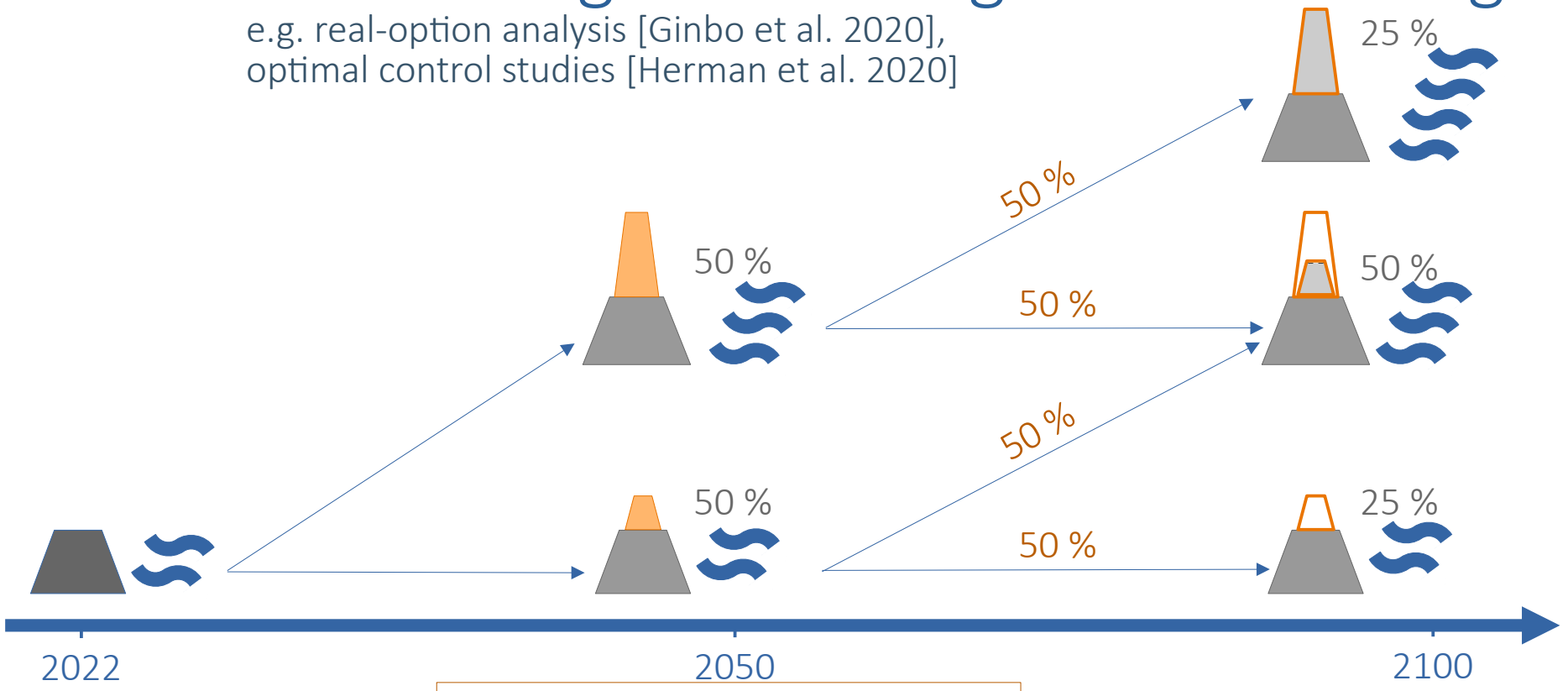


dynamic decision in 2050 depending on actual SLR and learning

Static scenarios vs. Learning scenarios

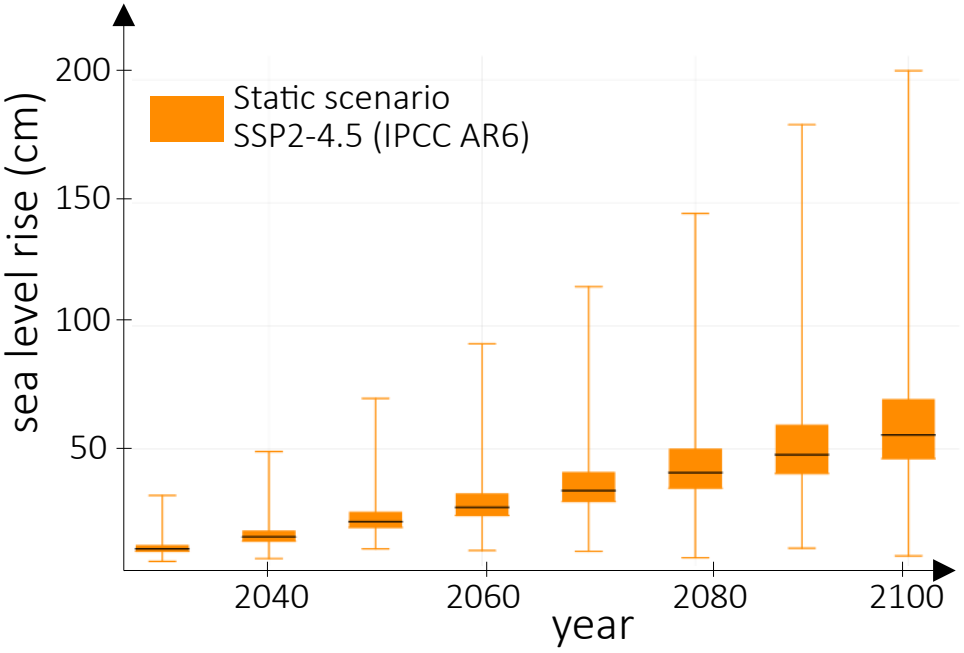
Static scenarios vs. Learning scenarios

Cost-benefit analysis requires static scenarios.

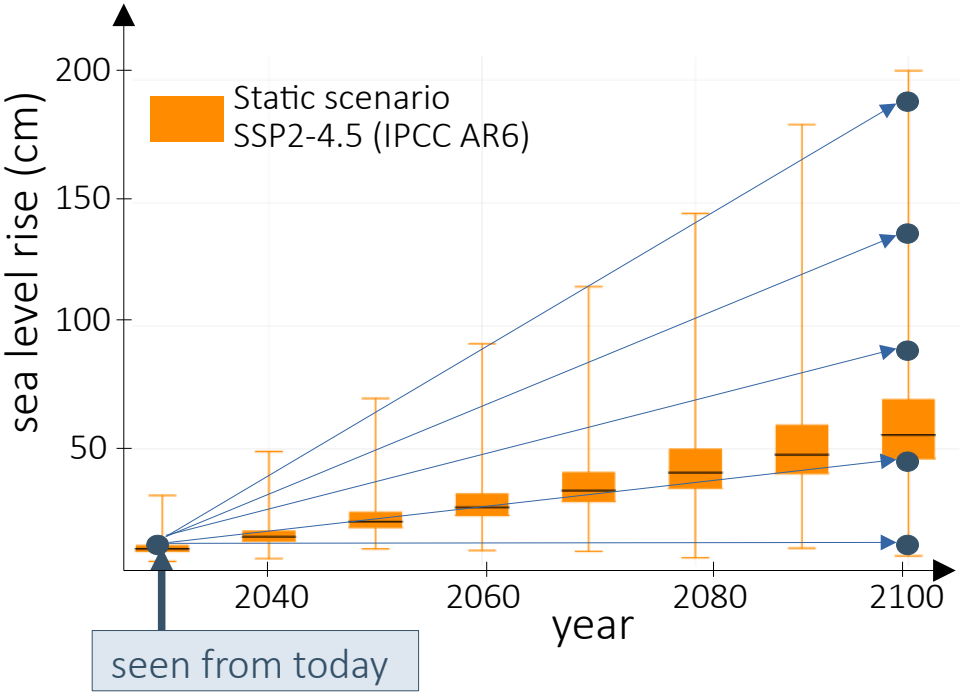
Economic decision making methods that consider future learning require learning scenarios [Hinkel et al. 2019].

Static scenarios vs. Learning scenarios

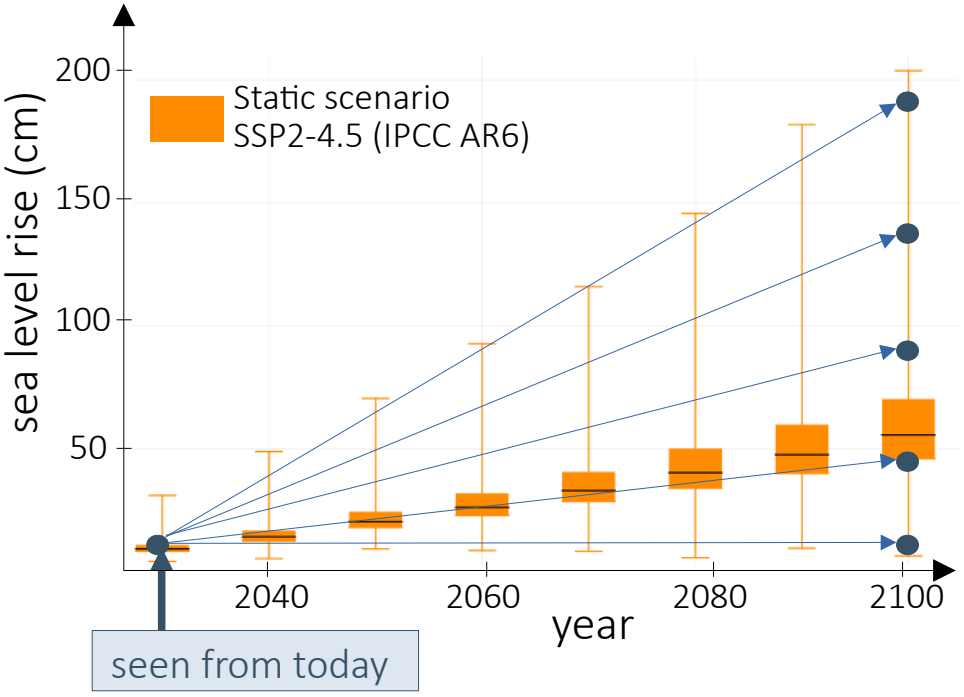
Static scenarios vs. Learning scenarios

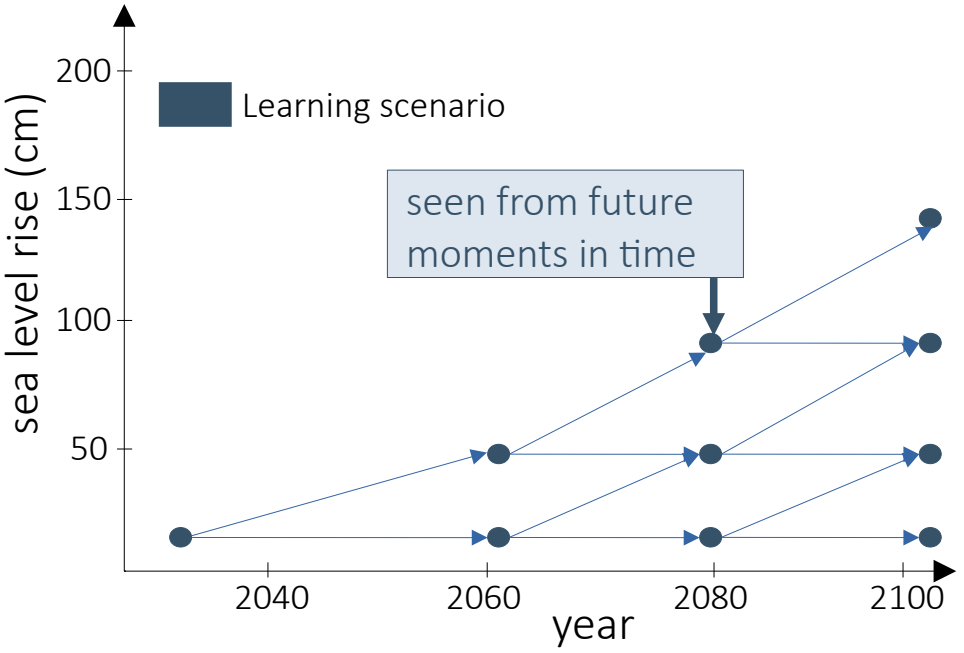


Static scenarios vs. Learning scenarios

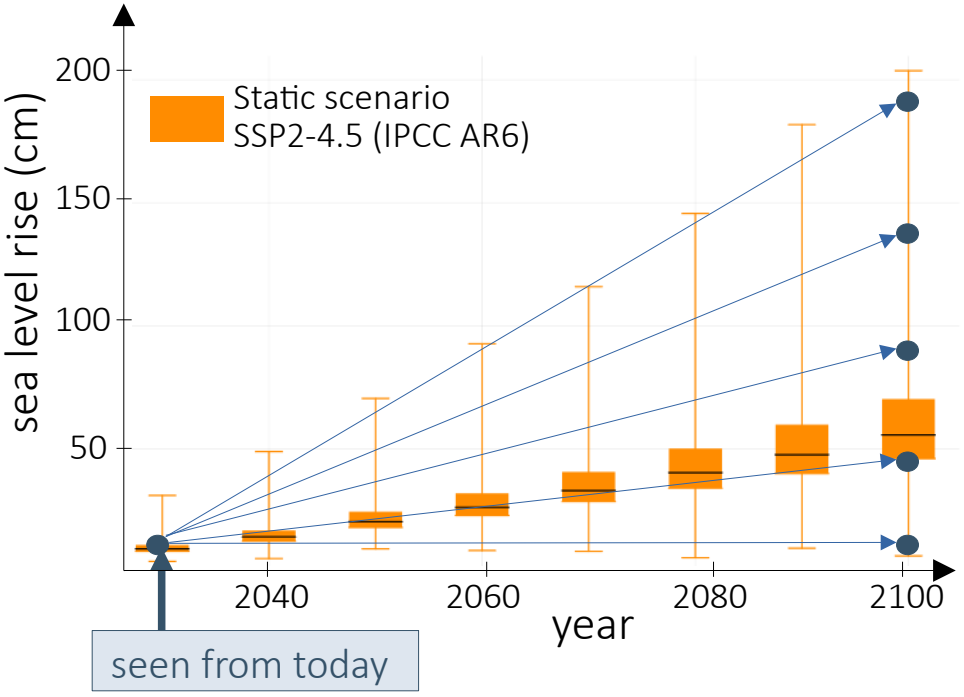


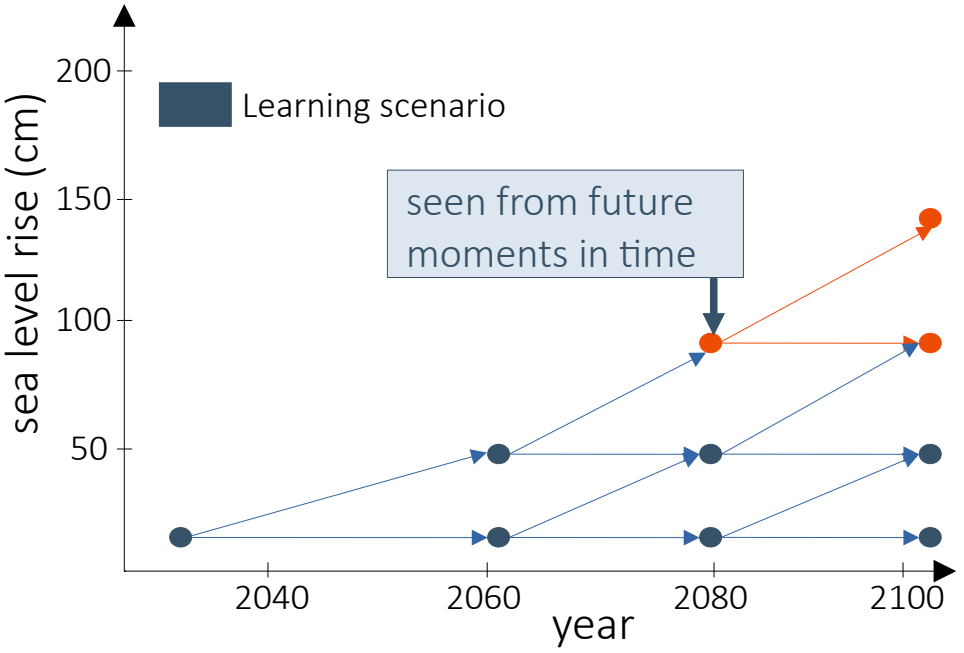
Static scenarios vs. Learning scenarios





Static scenarios vs. Learning scenarios





Generate Learning scenarios

ELSEVIER

Climate Risk Management

Volume 40, 2023, 100512

Climate learning scenarios for adaptation decision analyses: Review and classification

Vanessa Völz [a b], Jochen Hinkel [a b]

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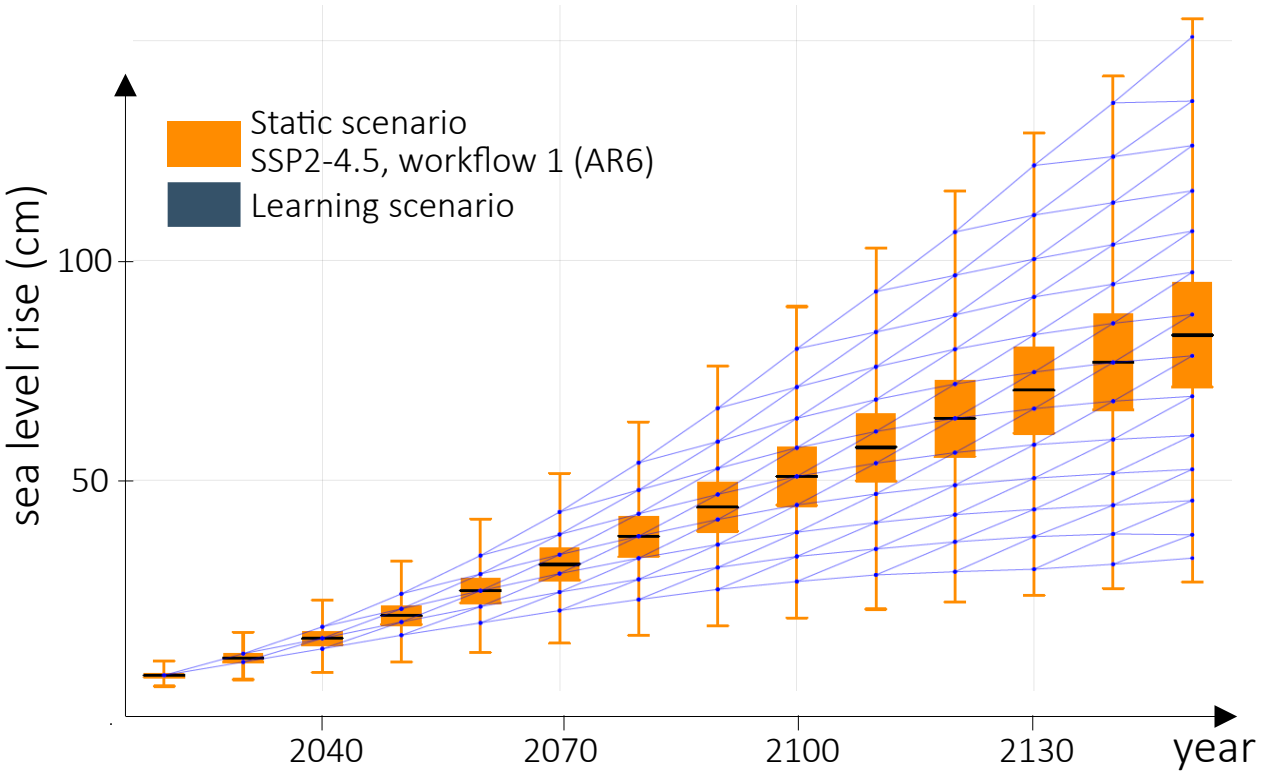
Generate Learning scenarios

Direct fit method

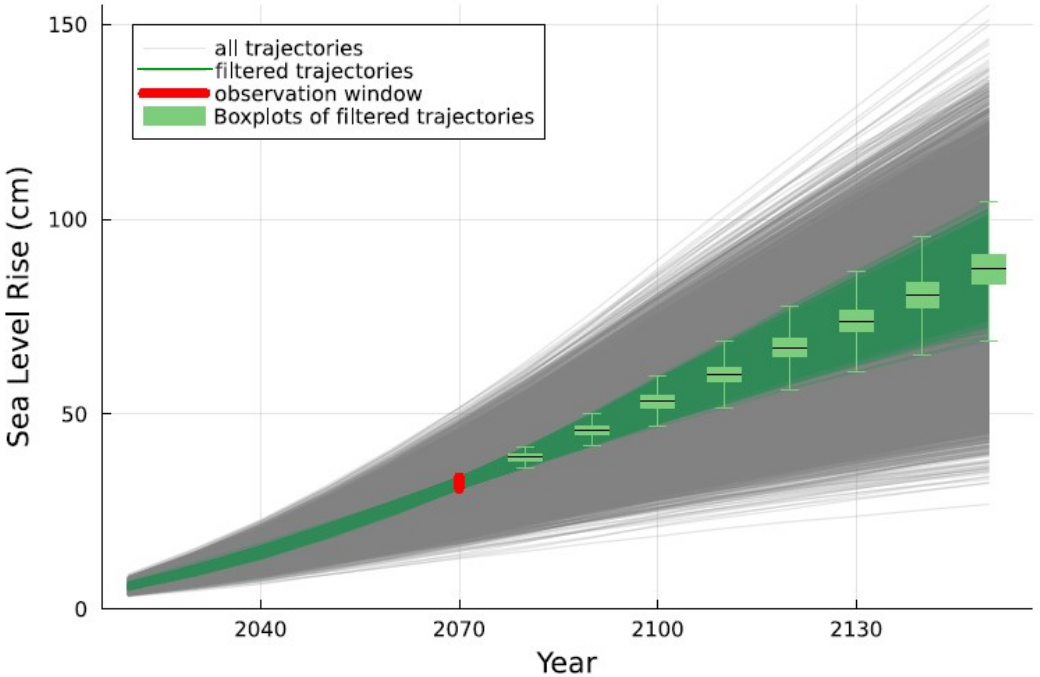
Good representation of sea level rise. A lattice with a highly flexible structure is fitted directly on a static scenario.

Computational efficiency. The binomial and recombining structure of the lattice creates a low number of nodes.



Völz, V. & Hinkel, J. (2023). Sea Level Rise Learning Scenarios for Adaptive Decision-Making based on IPCC AR6, under review in Earth's Future.

Validation



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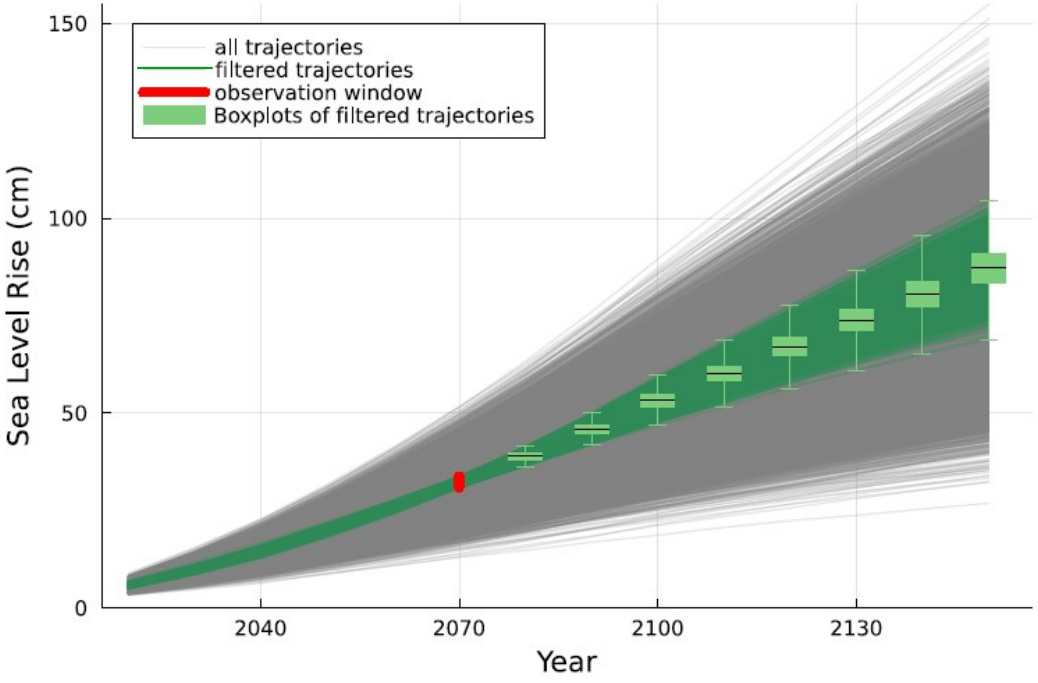
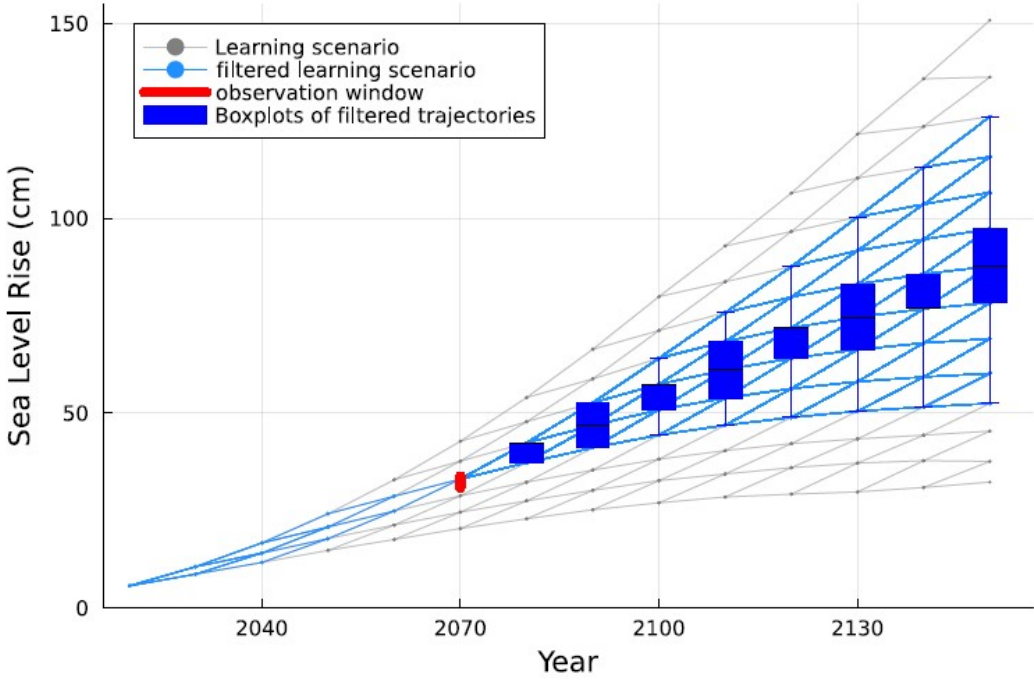


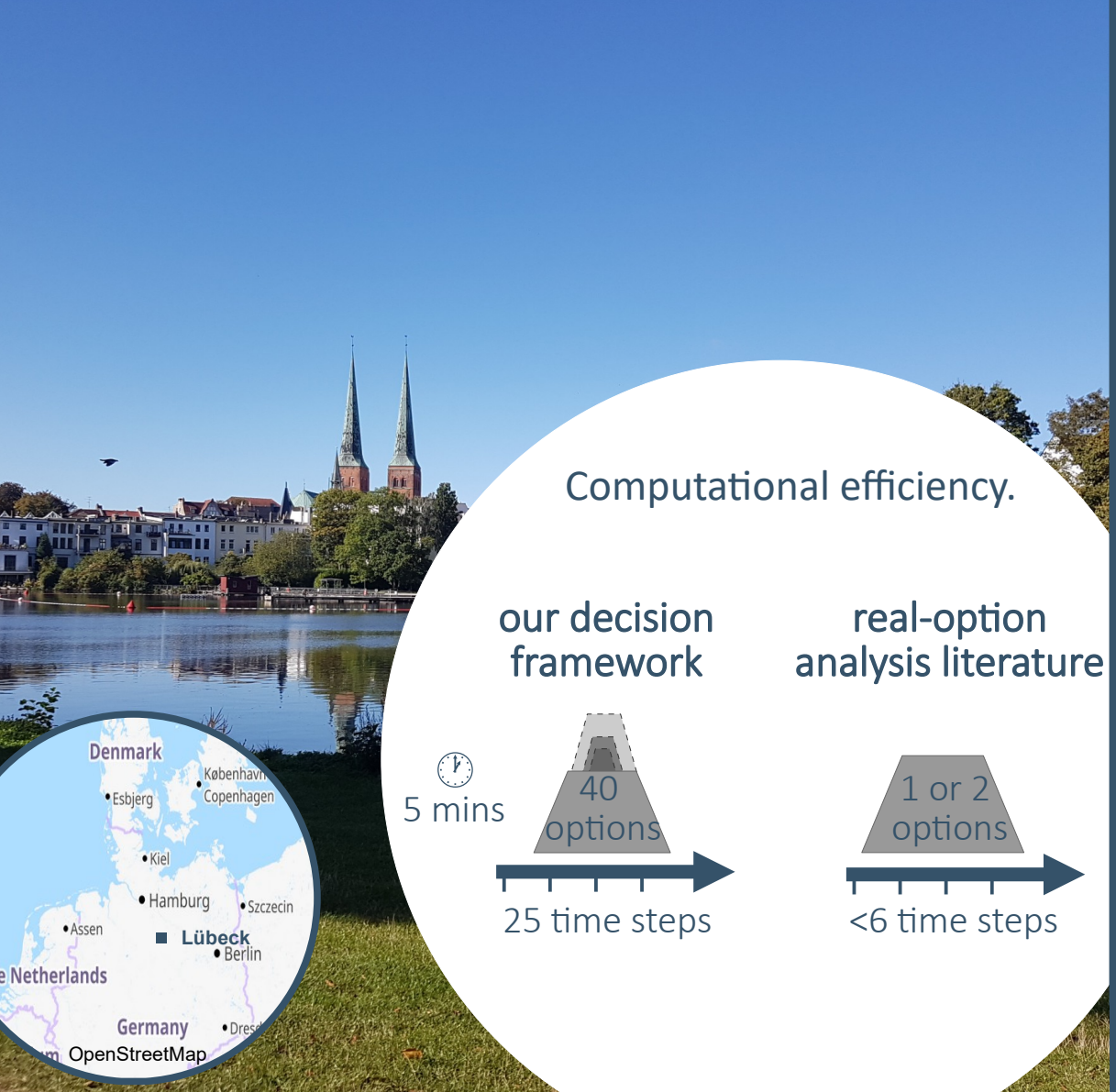


Völz, V. & Hinkel, J. (2023). Sea Level Rise Learning Scenarios for Adaptive Decision-Making based on IPCC AR6, under review in Earth's Future.

Case study Lübeck

Case study Lübeck

- generate sea level rise learning scenarios
- setup decision framework
- feed framework with flood impacts



Computational efficiency.

our decision framework	real-option analysis literature
5 mins	
40 options	1 or 2 options
25 time steps	<6 time steps

Case study Lübeck

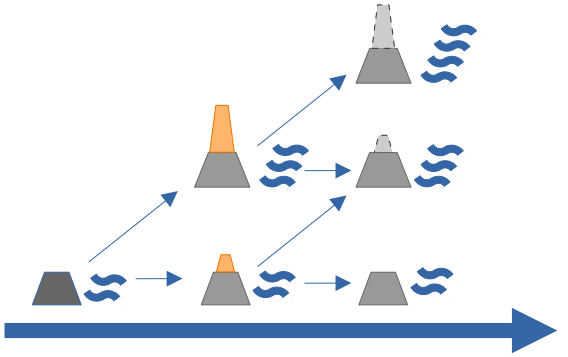
generate sea level rise learning scenarios

setup decision framework

feed framework with flood impacts

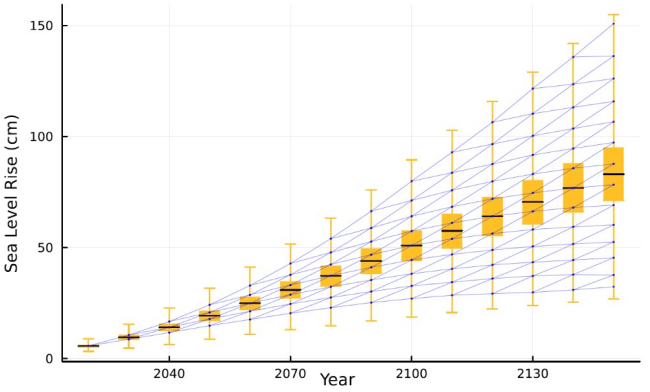
Key messages

Considering **future learning** in decision making methods leads to more precise decision rules and can **reduce costs** [Wreford et al. 2020].



This **requires learning scenarios**, i.e. probabilistic information seen from future moments in time.

Learning scenarios for sea level rise can be generated with our direct fit method [Völz and Hinkel, under review].



Questions?

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