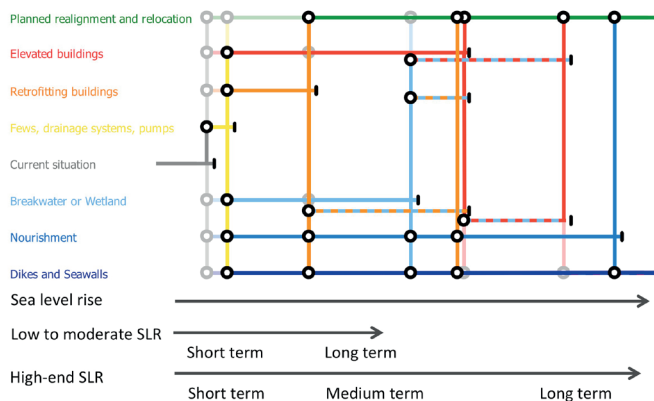


# Adaptation pathways for vulnerable coastal zones



Global sea levels have risen almost twenty centimetres over the past century and they will continue to rise even if the Paris Agreement is fully implemented. Only a limited number of the coastal zones at risk (examples being the Thames Estuary, UK and the Rhine delta, Netherlands) are planning ahead and devising measures to respond to possible sea-level-rise scenarios. Measures of this kind are known as **adaptation pathways**. Since **sea-level rise could have severe effects, adaptation is essential and may require extensive transformative action.**

*Generic adaptation pathways for an open, urbanised coast with beach and/or sand dunes*

The speed and magnitude of sea-level rise are uncertain, and some adaptation measures require major investments. The exploration of different adaptation pathways is therefore needed to support decision-making and to ensure that the right investment is made in a timely, cost-effective manner. Every coastal zone at risk should therefore have an adaptation plan. Pathways can support awareness and link short-term decisions to long-term adaptation options, providing support for decision-making in coastal zones at risk.

The RISES-AM project has assessed the impacts of future sea-level rise and the effectiveness of adaptation strategies and options. It has also considered the barriers to the implementation of adaptation at the local, regional and global scales in a range of representative concentration pathways (RCPs) and shared socio-economic pathways (SSPs). Furthermore, the project has explored high-end scenarios not included in IPCC reports. The analysis is centred around scenario RCP 4.5 and extends to 2100 but it also looks at a new high-end sea-level-rise scenario developed as part



*The sandy coast of Aveiro Portugal, one of the RISES-AM case studies*

of RISES-AM. High-end scenarios are particularly important for the management of situations involving high exposure and risk aversion which are found in many densely-populated coastal zones.

Six archetypical coastal zones were identified that are at particular risk as a result of high-end climate change and the possible adaptation pathways were mapped out for each of them. These types are Open, Urbanised coast with beach and/or sand dunes, Open rural coast, Urban delta, Rural delta, Urban estuary, and Rural estuary. The effects of sea-level rise in these zones are flooding, erosion, saltwater intrusion and rising groundwater levels. Generic pathways consisting of current and future adaptation measures were developed for these six archetypes.

Local, regional and national governments should be encouraged to develop adaptive planning methods as a way of reducing the uncertainties in impacts associated with sea-level rise. Exploring adaptation pathways supports planning and decision-making by evaluating tipping points, alternatives and long-term uncertainties in terms of the decisions that need to be made today. Managers of coastal zones at risk should consider customising adaptation pathways as the main component in adaptive plans for coping with the impacts and uncertainties associated with sea-level rise.

**Further reading:**  
<http://www.risesam.eu/>