

Country / City	United Kingdom / London
University / School	Kingston University London / Kingston School of Art
Academic year	2019/2020
Title of the project	Kelp Breakwaters
Authors	Katie Curson-Graham

TECHNICAL DOSSIER

Title of the project	Kelp Breakwaters
Authors	Katie Curson-Graham
Title of the course	MLA Landscape Architecture
Academic year	2019/2020
Teaching Staff	Enrico Evangelisti, Íñigo Cornago Bonal, Kristof Fatsar
Department/Section/Program of belonging	Department of Architecture and Landscape
University/School	Kingston University London / Kingston School of Art



Written statement, short description of the project in English, no more than 250 words

Brighton coastline faces many issues that in some areas jeopardise the continuity of existing uses and programs of the site. These **threats include erosion, flooding and storm damage**. The project **aims to rejuvenate and re-establish the lost kelp forests** of West Sussex with the use of temporary breakwaters that protect the shoreline and establishment of the kelp.

Over time the temporary breakwaters will degrade and the kelp forests, with the ability to reduce wave impact by up to 70%, will become the breakwater. The shoreline will be greatly impacted by this, with a new range of programs due to calmer water and shingle accretion. Kelp debris that is washed ashore will provide nutrients that assist in the growth of shingle vegetation, a **rare coastal habitat**.

Shingle vegetation will be encouraged to develop in areas most likely to receive kelp deposits over the years of beach growth. This will be done by **strategically placed boardwalks** and in some areas, the complete removal of program. A new shared space will replace the main road with layers of planting providing some **sun and wind protection** for the wide range of programs that can take place along the new promenade. Maintaining and **prioritising pedestrian and ecological connectivity** is key.

For further information
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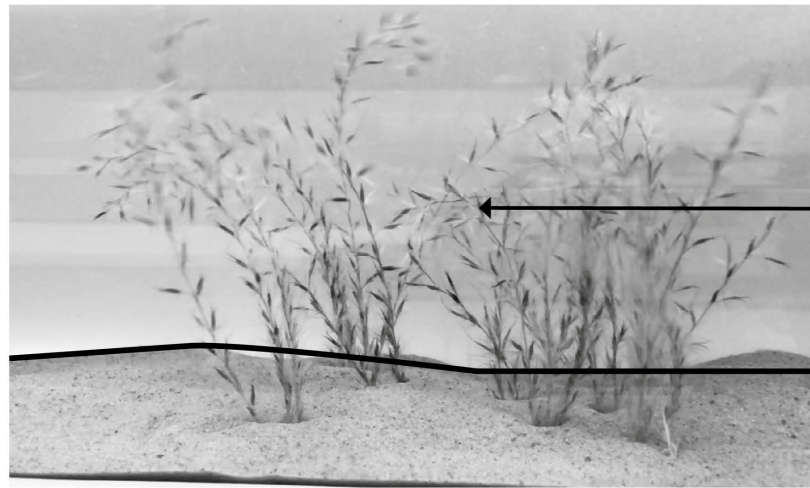
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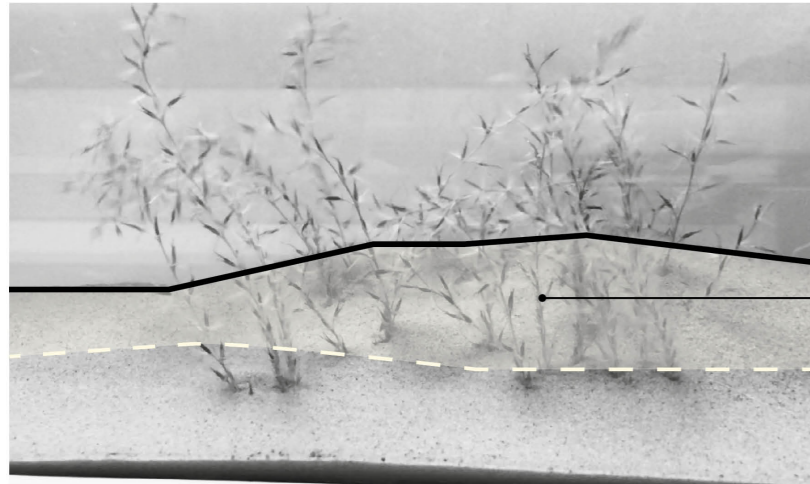
CLIMATE CHANGE AGAIN

11th International Biennial Landscape Barcelona

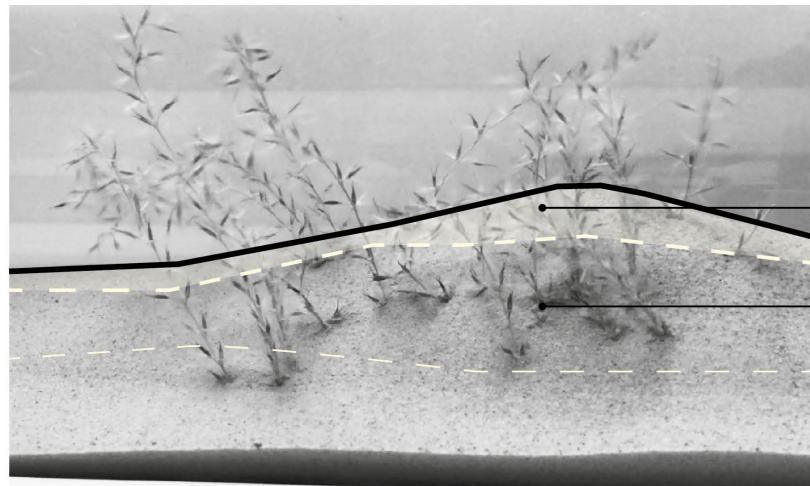
Barcelona September 2020
SCHOOL PRIZE



Wind

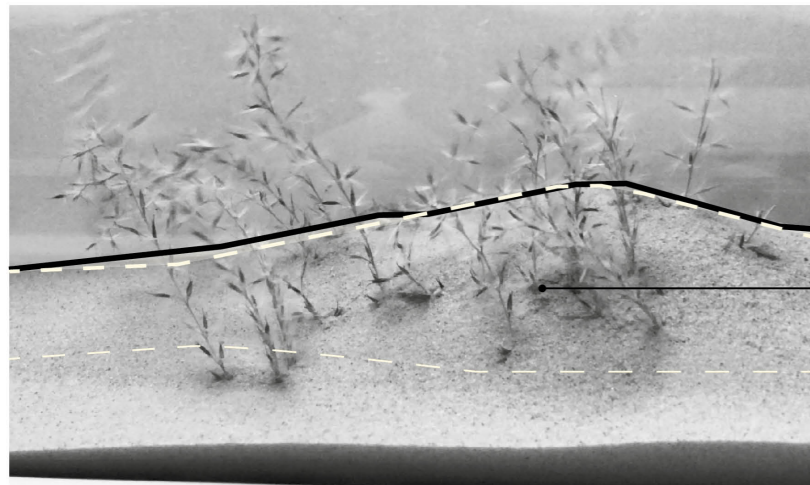


Sand accumulation



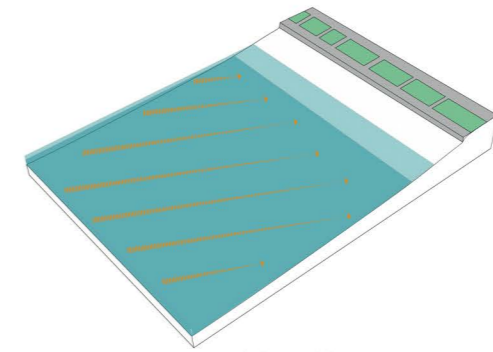
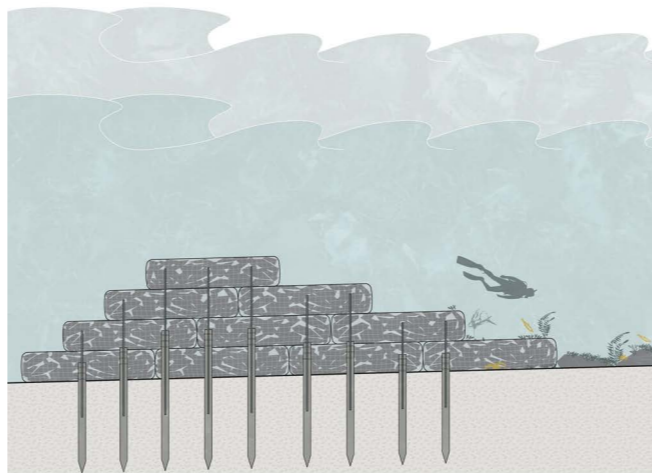
Sand accumulation

Area of stabilised sand

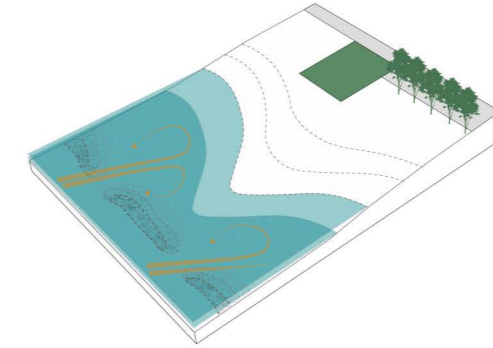


Area of stabilised sand

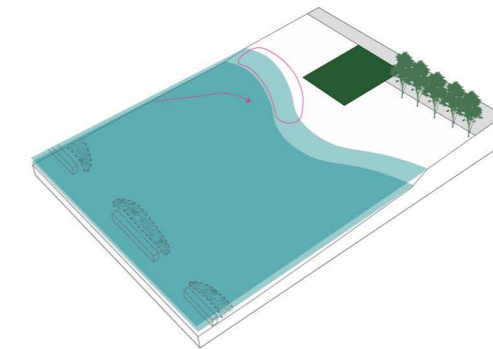
Preventing erosion



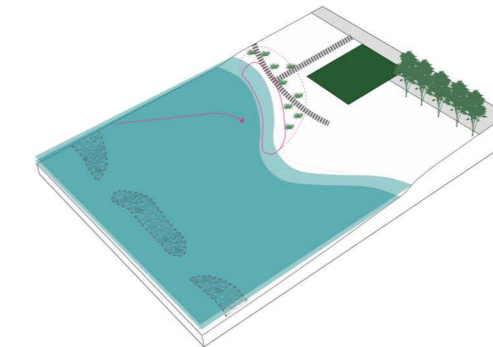
Existing Conditions
-Wave Movement



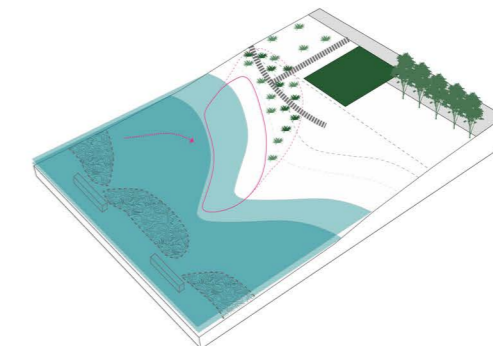
Proposed 15 Years
-Kelp Breakwater Growth
-Shingle Accumulation
-Wave Movement



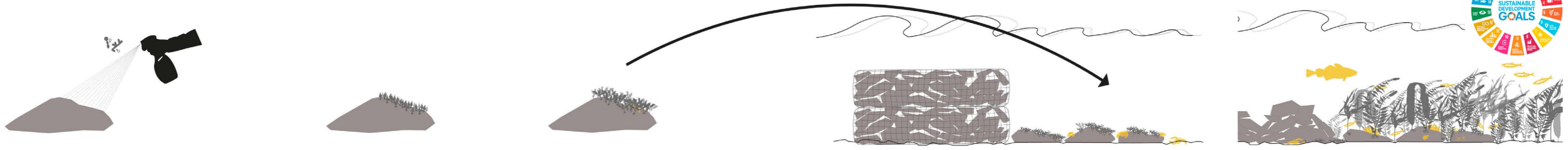
Proposed 5 Years
-Breakwater Installation
-Shingle Accumulation
-Vegetation Establishment



Proposed 10 Years
-Kelp Breakwater Growth
-Shingle Accumulation
-Shingle Vegetation Growth



Proposed 15 Years
-Kelp Breakwater Growth
-Shingle Accumulation
-Shingle Vegetation Growth



A mix of male & female kelp spores sprayed onto 'grippable' surface, in this case rocks.

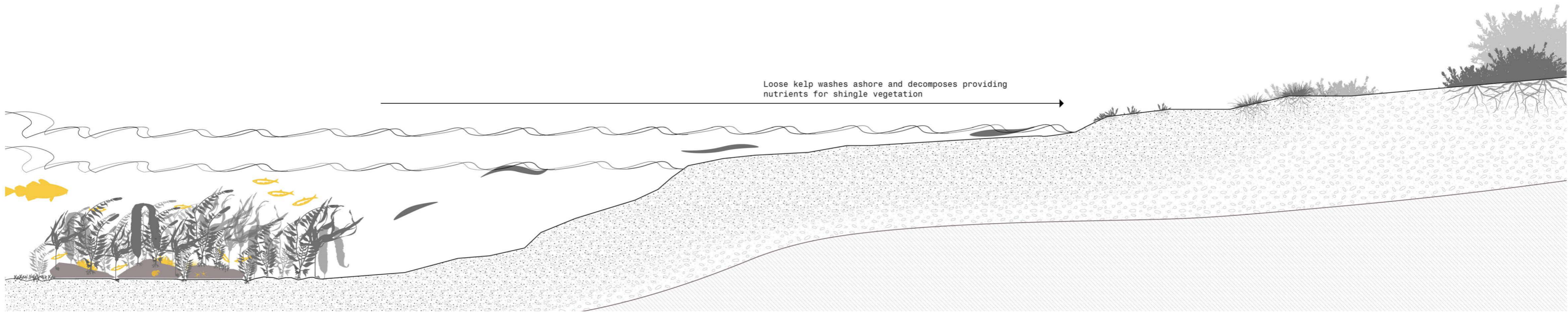
The sprayed stone is left in a water tank to develop into kelp sporophytes.

Once the juvenile kelp sporophytes have developed, the stone can be transferred into the sea behind a protective temporary breakwater on the lee side. The temporary breakwater will be a 100% biodegradable rock mattress created with a coir mesh.

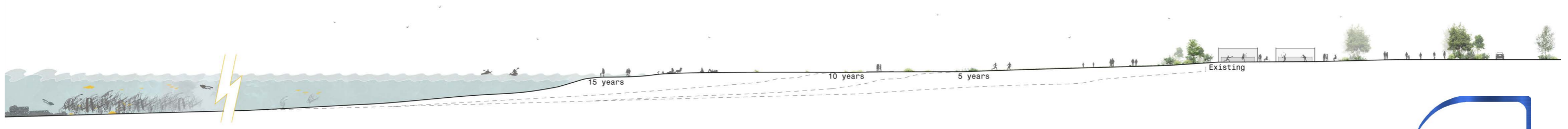
Juvenile kelp sporophytes develop into adult kelp and release spores of themselves which self-colonise other parts of the seabed attracting a variety of aquatic species. The temporary breakwater will naturally break down over a period of a period of 5 years, leaving behind rock piles that in turn, will be colonised by the kelp.

Kelp breakwater installation

Ephemeral Community | Pioneer Community | Established Community



Shoreline vegetal relationships

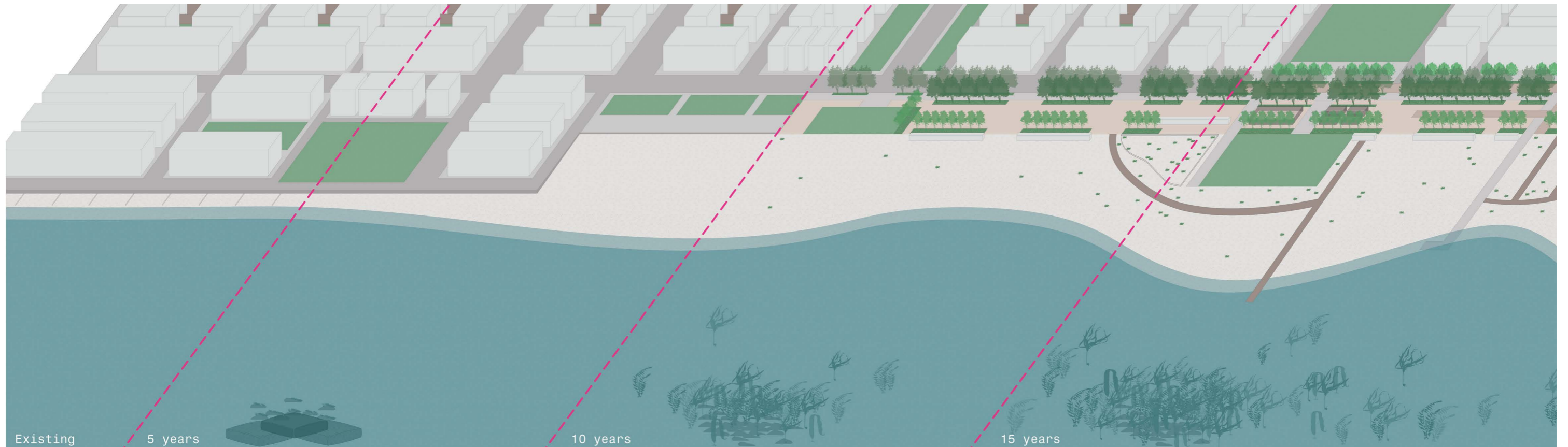


Shoreline growth





Varied weather conditions at Brighton



Oblique elevation of the proposal through time