

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Personal information	
<i>Name</i>	Laura Conijn

Studio		
<i>Name / Theme</i>	Transitional Territories	
<i>Main mentor</i>	Fransje Hooimeijer	Environmental Technology & Design
<i>Second mentor</i>	Marcin Dabrowski	Spatial Planning & Strategies
<i>Argumentation of choice of the studio</i>	The Transitional Territories studio involves the transition between land and sea. Also the transition between the urban environment and the natural environment can be found at often coastal areas. For my graduation project I am interested in this studio as the project involves the urban effects of (accelerated) coastal erosion which can only be found in transitional territories. In specific, the English cliffs are a point of interest with their coastal cliff cities. The transitional territories studio focuses on different lines of inquiry that are involved in the process of creating a strategy for urban settlements to adapt to coastal erosion.	

Graduation project	
<i>Title of the graduation project</i>	Developing Strategies: planning cities affected by Coastal Erosion <i>The case of the southeast England's coastline</i>
Goal	
<i>Location:</i>	The location for this project is the southeast English coastline. The counties of Kent and East-Sussex include The White Cliffs of Dover that are of great interest to the United Kingdom and are a representation of the nationhood of England. These white cliffs have a habit of fast retreat due to their soft soils affected by coastal erosion, creating problems for the urban environments and several living habitats that are located near these cliffs. Without interventions these urban landscapes will disappear. This while the cliffs are a symbol for the return home from a land of strangers according to Readman (2014), and create great value to the coastal landscape for the English population. Coastal cliff cities that will be considered for the design of the project are located in coastal Southeast England including the cities of Margate, Ramsgate, Herne Bay, Dover, Fairlight, Hastings, Bexhill, Seaford and Peacehaven that are shown in figure 1.

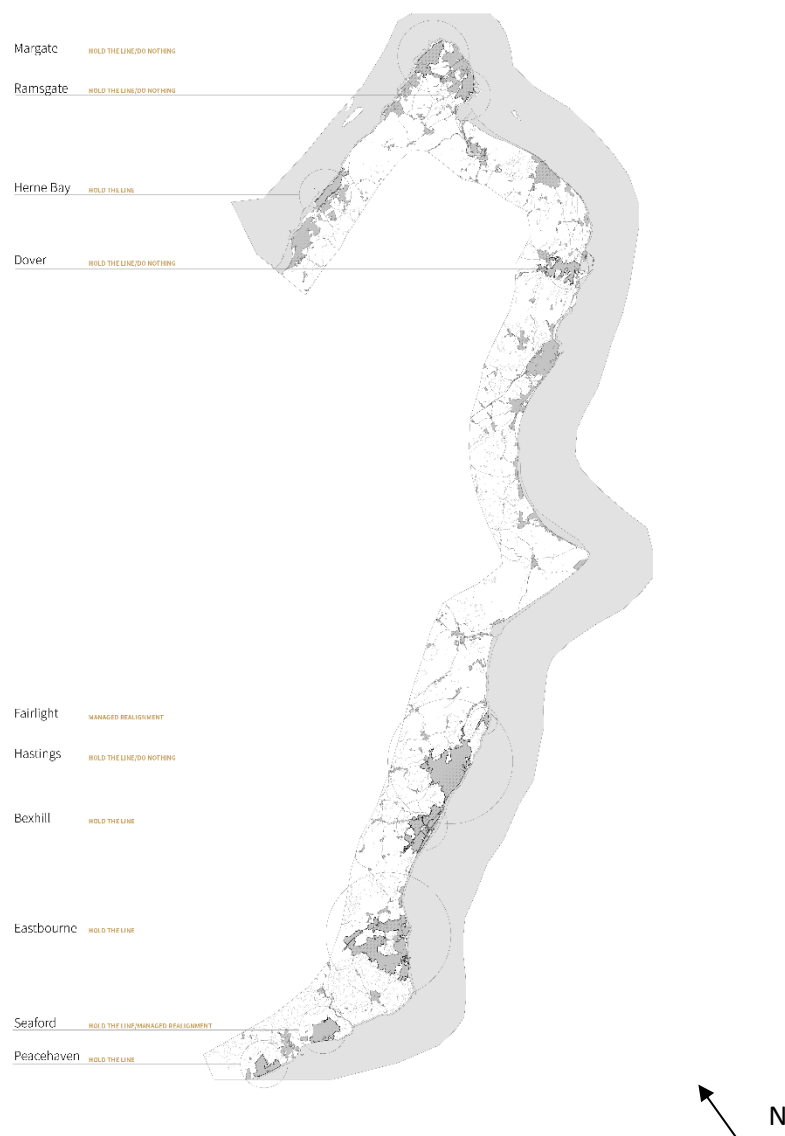


Figure 1: Coastal cliff cities in southeast England (Conijn, 2021).

The posed problem,

In England 29,8% of the coastline is experiencing erosion and 45,6% of the coastline is protected with coastal defence works (EUROSION, 2004). This great percentage of protection corresponds with the English landscape. The landscape of the South East of England is in most areas rather flat and low than high or steep. This protection is also needed due to the geology of England's coastline that is continuous experiencing effects of coastal erosion due to weaker types of sediments that are exposed to wave action. These cliffs consisting of weak sediments are called 'soft rock' cliffs and have a tendency to be instable and changing rapidly. In figure 2 the effects of instability in cliffs due to coastal erosion is shown.



Figure 2: Effects on urban environment due to cliff instability caused by coastal erosion in Fairlight, East-Sussex, southeast England (Lycett, 2005).

Coastal erosion and the accelerated erosion rate will be a problem when the anthropogenic landscape is at risk and the use of infrastructure and livability of an urban environment is endangered. In Europe, the effects of coastal erosion have a significant effect on vulnerability of the anthropogenic landscape and, therefore, causes a great economic loss, ecological damage and societal problems (Marchand, 2010).

In England, a great part of the population is living in vulnerable locations that are affected by coastal erosion. In southeast England the vulnerable locations can be defined by coastal cliff cities. Currently, in these cliff cities there are no solutions for people that are almost losing their homes due to coastal erosion. There is no strategy to adapt other than: 'move away before it is too late'. There is a lack of ability to adapt to the (increased) erosion rate and the long-term consequences of coastal erosion. Other than the lack of ability to adapt, the management of erosion in coastal England also creates issues. When adding the rising sea level and the increase of extreme climate weather events to these issues, a conflict rises that should be solved through the use of spatial planning.

As response to anticipate to the current and expected increase of coastal erosion a new type of management is introduced in the United Kingdom. This management is called: 'Managed realignment', and is defined by the removal of coastal defences along the English coastline and the allowance of natural processes. Managed realignment often goes hand in hand with the term Managed Retreat, where urban environments are moved land inwards to make room for nature and decrease risks for anthropogenic landscapes. With the managed realignment management policy, residents of risk environments are expected to move land inwards, away from the vulnerable coasts and will cause residents to lose their current living environment and land they currently own.

A living environment that is located in a safe environment is the basis of the strategy that is needed in the case of coastal southeast England. This strategy should provide a

	safe solution for current coastal residents and local governments, and should be able to deal with and balance livability, the socio-environmental justice and urban risks that are the result of the effects of coastal erosion. This strategy should be a regional strategy that involves several coastal urban settlements in the southeast of England and can involve collaboration between several coastal counties in England, but also creates possibilities for the United Kingdom. With this regional strategy, a local scale design should provide local scale opportunities for innovation to adapt to the issues that are caused by coastal erosion in these locations.
<i>research questions</i>	The main question of the graduation project is: How needs an Urban Planning Strategy for vulnerable English cliff cities to steer to create a Sustainable Urban Environment that adapts to (accelerated) Coastal Erosion? This question leads to the research of different themes involving Urban Planning Strategies, Sustainable Urban Environments and (accelerated) Coastal Erosion. Subquestions for these themes are: What are Climate Change effects and how do they impact Spatial Planning and Management in cities aiming for Sustainability? What are current Urban Planning Strategies and how do they influence Coastal Erosion Management? How can an Urban Environment adapt to the effects of Coastal Erosion and the impact on the Socio-Environmental System? These questions will help to find the implications and effects of climate change involving spatial planning and urban management, but are also used to research current involvement of coastal management. Another purpose of these questions is to research how the current system can adapt to these implications and effects.
<i>design assignment in which these result.</i>	The research aim of the thesis is to understand gaps in current urban spatial planning practices related to or affected by coastal erosion. The societal, ecological and urban environmental risks that have effects or are effected by coastal erosion should be researched, but also the risk management that is needed to deal with coastal erosion can be implemented in the research and the formulation of a strategy. The overall coastal erosion effects that threaten livability, such as cliff retreat and landslides, but also long-term effects of erosion management measures and the response to these effects, should be assessed to be able to formulate a strategy for an adaptable cliff city. When researching these risks propositions should be developed based on research by design to create a feasible strategy. With the help of this research aim, the research output can be formulated and designed. As mentioned, a strategy for southeast English coastal cliff cities, that are affected by coastal erosion, will be formulated on the basis of local case studies that are located on this coastline. This strategy will aim to create an adaptable and sustainable environment in cliff cities using different local innovation tools. Resulting from this strategy another output will be expected. This second output is expected to be at least two local designs for coastal southeast English cliff cities affected by coastal erosion in accordance with the formulated strategy involving the effects of coastal erosion.

Process

Method description

The analytical and design framework is a framework that describes the tools and methods that are used for the thesis.

Methods

During the project, a different methods are needed to understand the challenges and conflicts in different present environments. The aim for the use of these methods is to find conclusions on different topics that can provide the foundation of the final strategy and design.

The methods that are used during this project are

1. Literature Review
2. Data Collection
3. Critical Mapping
4. Scenario Development
5. Stakeholder Analysis
6. Spatio-Temporal Analysis

Within these methods two types of research approaches are used:

- Six-step approach
- DOCA approach

1. Literature review

The literature review is used to understand the relationship between Shoreline Management Plans (SMPs) and Spatial Planning Strategies and relate this to Socio-Environmental Justice. With keywords that include these concepts, the literature review will add a conceptual, theoretical and scientific perspective to the thesis research with the use of Google Scholar, Research Gate, Science Direct and Jstor.

2. Data Collection

Gathering data is need to create knowledge about the topic of the thesis. This data collection can result in qualitative and quantitative information about locations, conflicts and relations.

3. Critical Mapping

Critical mapping is used to extract critical information from the data collection. Vulnerable systems and risks will be identified with the processes and flows related to matter, topos, habitat and geopolitics in different (time)scales.

4. Scenario Development

Scenario Development can be used to explore propositions and goals that are related to adaptation and management. The scenarios will be an exploration of exaggerated circumstances.

5. Stakeholder Analysis

The stakeholder analysis is needed to assess the involvement of different actors including their power and interests in relation to spatial planning strategies. This analysis is needed to test feasibility of the interventions and/or strategies.

6. Spatio-Temporal Analysis

A spatio-temporal analysis is a tool that is used to understand the development of the design and/or strategy in time. Phasing of the project is a critical part of this analysis.

- Six-step approach

The six-step approach is focused on the formulation of a design, but will for this thesis also be used for the formulation of a strategy. Step 1 and 2 are described by Hooimeijer et al (2020) as the analysis of the original situation of the case area. For this thesis, the DOCA approach is integrated in these steps and is used during the analysis of the thesis.

During **step 1 and 2** of the six-step approach the goal is to find the data on (qualitative) social-spatial conflicts, the environmental conflicts and the spatial context and policies and map these. Also land-use, surfaces and functions will be explored in a quantitative analysis. This step is critical for defining the problems in the case area, which is in this case southeast England. **Step 2** is the part of the analysis where the opportunities challenges and anecdotes are extracted from the analysis. The DOCA approach elaborates further on these steps.

After this analysis, **step 3** can be initiated. In this step the analysis can be used to redesign the case area. This redesign is based on the outcomes of step 2 and should include resolving urban issues as well as societal and environmental issues.

In **step 4**, the design/strategy will be evaluated and the effect of the implemented opportunities and challenges can be analysed. This step will often lead to new ideas which can be used in **step 5**, which is defined as a phase where the strategy/design can be adapted to new standards.

Step 6 is the last step and focuses on a redesign of the public space for the design and a phasing for the strategy.

- DOCA approach

In the DOCA approach, developed by urban design office FABRIC and integrated in a Japan project by Vafa (2018), the foundation relies on literature review, data collection and critical mapping. Critical mapping is in this project needed as a form of study to explore the spatial drivers and their relations in the coastal locations. After this process, opportunities should be extracted from these critical mappings. In this project opportunities can be found in potential innovative designs that involve the flows and connections within the local scales of coastal southeast England. The challenges in this approach can be found in the reverse engineering of spatial planning conflicts that are currently present in the cities affected by coastal erosion. During this process the flaws in the past and present spatial planning systems can be explored and possible scenarios can be developed and can be integrated in a spatio-temporal analysis. The last part of the approach focuses on anecdotes by stakeholders which are not translated into maps. For the case of southeast England this part is covered by the meaning of social and environmental justice for coastal cliff cities through the use of interviews with locals. For this approach, the analysis should involve a layered approach where different aspects of a problem will be brought together to form a whole. This approach is used to create an integrated perspective on the development of spatial planning related to coastal erosion.

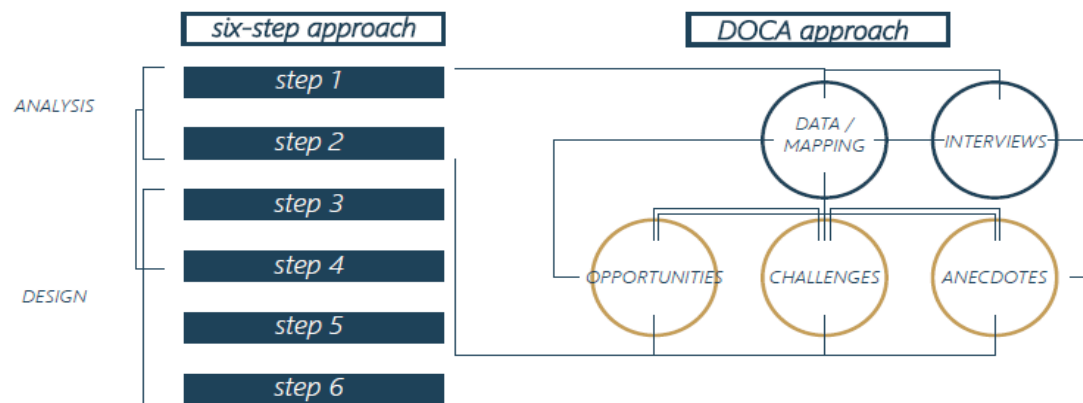


Figure 3: Methodology steps within the different approaches that are used in the graduation project (Conijn, 2021).

Literature and general practical preference

In the project several concepts from other fields of knowledge are used to include in the research. This creates a need for understanding of concepts through the use of the theoretical framework. For this framework a literature review about the management of coastal erosion in relation to spatial planning and the socio-environmental justice that is the result of this spatial planning system. The use of Shoreline Management Plans (SMPs) to prevent complications regarding coastal erosion that can cause implications for spatial planning systems.

Social and ecological aspects of the effects of coastal erosion should be taken into account during this thesis and should always be kept in mind during the research for this project. Other important themes within urban planning strategies are:

- local adaptation and planning
- regional planning
- geopolitical boundaries
- risk assessment
- socio-environmental justice
- risk management

Knowledge about these themes should be gathered through the use of plans of local governmental bodies, including the regulations and visions concerning adaptation to the next topics:

- protection measures + knock-on effects
- coastal erosion predictions + geology
- climate change effects
- human impacts

Through the use of the 4 lines of inquiry facilitated by the Transitional Territories Studio, data on matter, topos, habitat and geopolitical boundaries is collected and compared to the mentioned themes. Other data that is imported to be collected is data on social justice, which will be collected through the use of interviews with residents or local governments that are involved in spatial planning within coastal cliff cities.

Within this graduation project, I intend to consult my first mentor: Fransje Hooimeijer, my second mentor: Marcin Dabrowski, the members and mentors of the TT studio and local governmental planning experts that are experienced with the spatial planning of southeast England.

Reflection

What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

What is the relevance of your graduation work in the larger social, professional and scientific framework.

The Transitional Territories studio deals with the changing nature of territorial areas, which is defined in this graduation project as a maritime area that includes cliffs. This changing nature is caused in this area by the coastal erosion that is accelerated due to the effects of climate change and sea level rise. In this project this theme of coastal erosion is related to Urbanism as an effect-cause. The coastal erosion is the effect that causes a need to adapt in the coastal urban settlements located in the transitional territories that are affected by this coastal erosion. With this project urban design, landscape architecture, spatial planning and engineering is combined to integrate social, cultural, economic and political perspectives in a coastal English environment located in a transitional territory.

Erosion to the English cliffs is accelerated due to climate change, this is very relevant nowadays (Dornbusch et al, 2006). If these cliffs that are not only heritage but also part of England's flood protection and urban landscape, want to be maintained in the future, the actual impact of this erosion on the urban area should be analyzed and possible strategic solutions could be designed. Current solutions in these cliff villages are more focused on finding a solution to prevent erosion. These solutions are often very expensive and short term, however, a strategy for these coastal villages and cities could be an economic benefit and long-term solution.

The topic of creating strategies for urban adaptation to coastal erosion is relevant for society as due to climate change cliff retreat accelerates and endangers settlements and infrastructure on the clifftop, creating dangers for the livability in coastal agglomerations causing implications for the English society (de la Vega-Leinert & Nicholls, 2008). The aim for this project is to create design proposals for a strategy in which the ecology and society remain central, in that way the design serves the urban area but still provides ecological aspects by creating a pleasant and sustainable environment.

Bibliography:

EUROSION. (2004). *Living with Coastal Erosion in Europe: Sediment and Space for Sustainability*. <http://www.euroSION.org/reports-online/part1.pdf>

Hooimeijer, F., Rizzetto, F., Acheilas, I., ter Heijden, W., de Vette, K., von der Tann, L., & Durand Lopez, L. (2020). Subsurface Equilibrium: Transformation towards synergy in construction of urban systems. Delft University of Technology.

Lycett, J. (2005). *Fairlight Cove* [Photo]. Rye and Battle Observer. Accessed on 14 October 2020, from <https://www.ryeandbattleobserver.co.uk/news/aps18-million-fairlight-cove-erosion-project-set-start-1211901>

Marchand, M. (2010). Concepts and Science for Coastal Erosion Management. Concise report for policy makers. Deltares. Delft. 2010. Accessed on 16 November 2020, from <http://www.conscience-eu.net/documents/concise-report-final.pdf>

Readman, P. (2014). The Cliffs are not Cliffs: The Cliffs of Dover and National Identities in Britain, c.1750-c.1950. *History*. 99(335). 241–269. <https://doi.org/10.1111/1468-229x.12054>

Vafa, N. (2018). *Activate Resilience on the Myagi Coast* (Thesis).
<http://resolver.tudelft.nl/uuid:9200c56a-e0c8-4e9e-b5b3-38e69511c49f>

de la Vega-Leinert, A. C., & Nicholls, R. J. (2008). Potential Implications of Sea-Level Rise for Great Britain. *Journal of Coastal Research*. 2008(242). 342–357. <https://doi.org/10.2112/07a-0008.1>