EFTERUDDANNELSE I BÆREDYGTIGHED OG GRØN OMSTILLING

Casepræsentation: Lynetteholmen – en case om at udvikle, planlægge og designe byer

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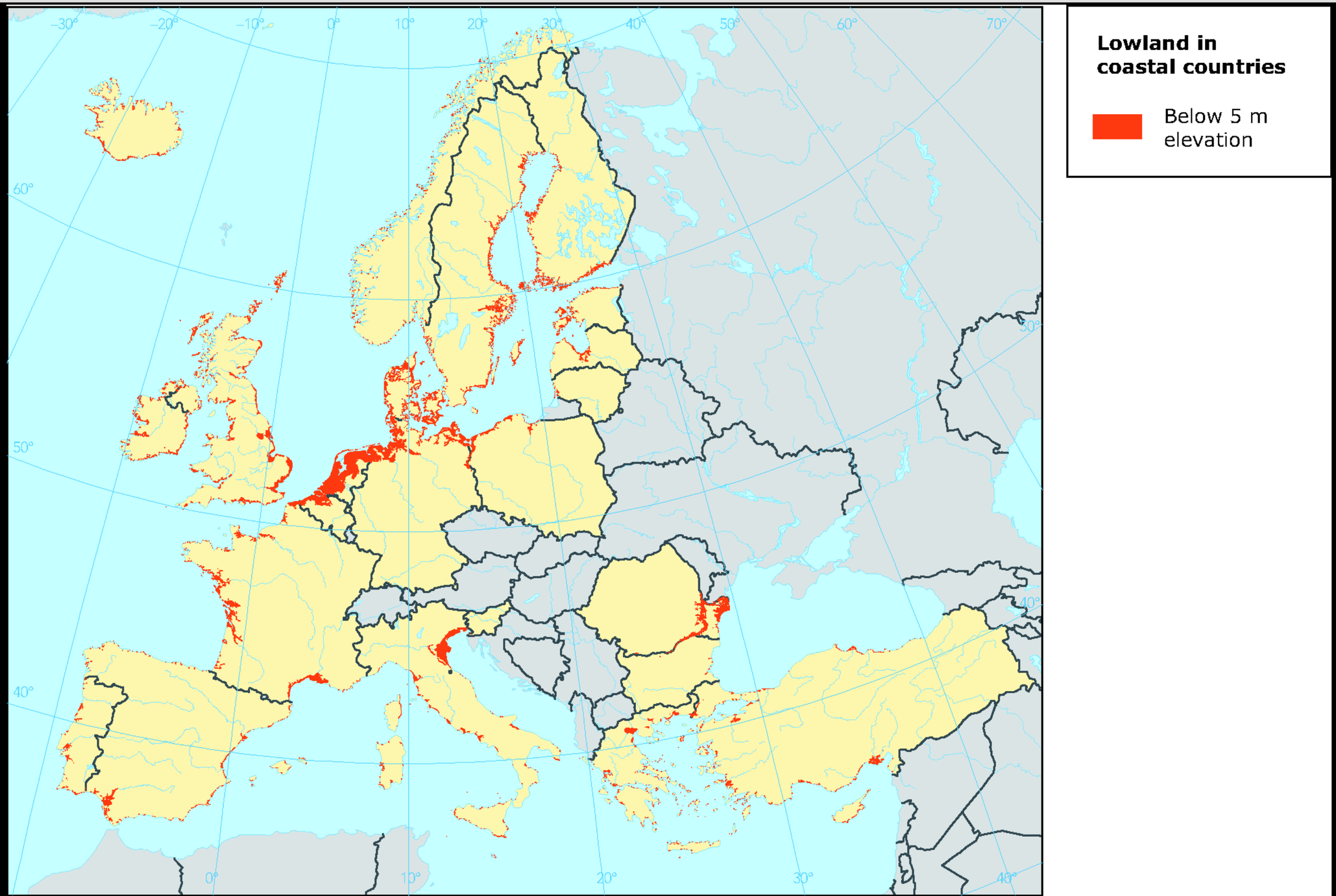
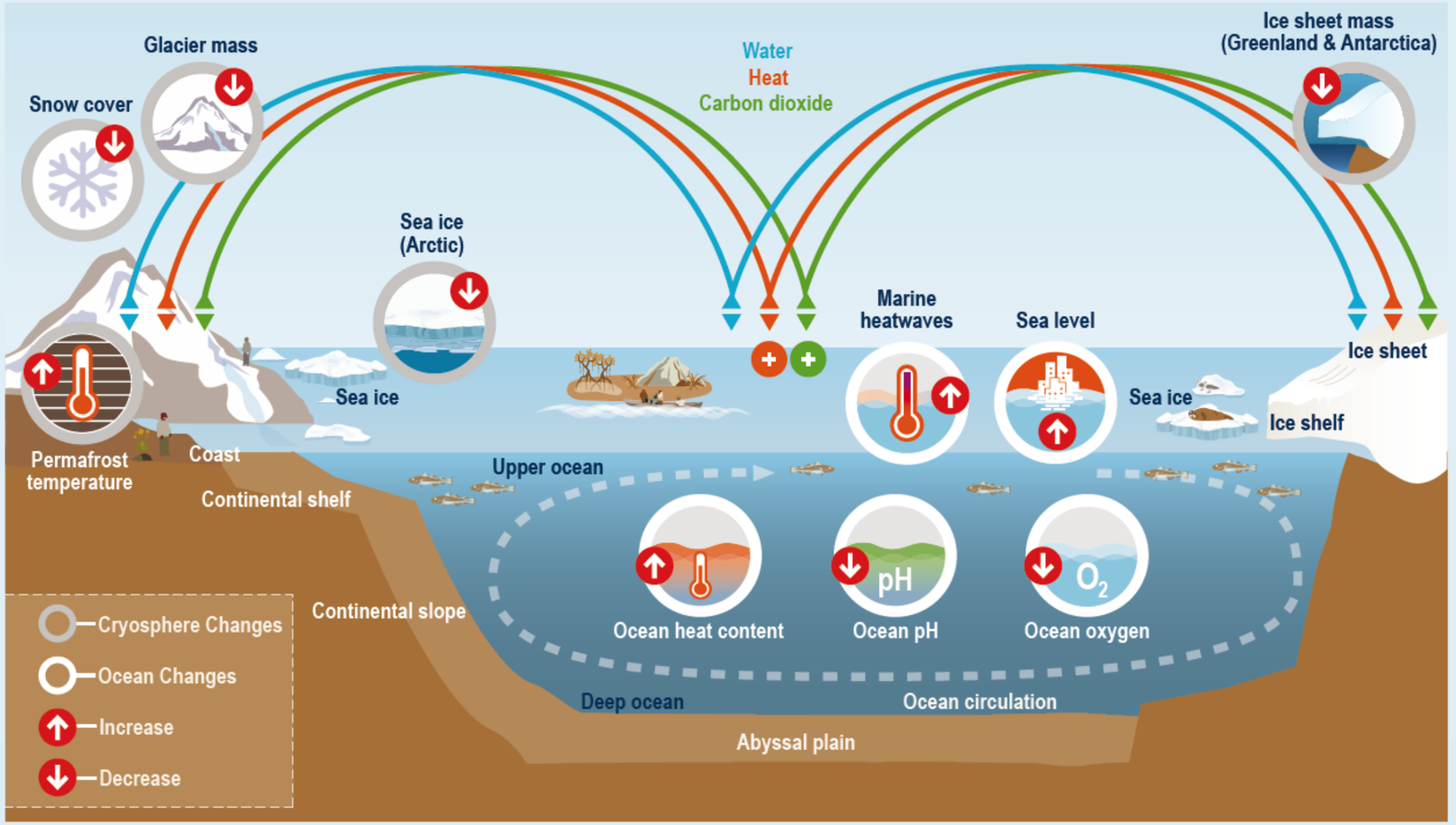
KØBENHAVNS UNIVERSITET


Lowland in coastal countries
Below 5 m elevation



Box 1.1, Figure 1 | Schematic illustration of key components and changes of the ocean and cryosphere, and their linkages in the Earth system through the movement of heat, water, and carbon dioxide (Section 1.2). Climate change-related effects in the ocean include sea level rise, increasing ocean heat content and marine heat waves, ocean deoxygenation, and ocean acidification (Section 1.4.1). Changes in the cryosphere include the decline of Arctic sea ice extent, Antarctic and Greenland ice sheet mass loss, glacier mass loss, permafrost thaw and decreasing snow cover extent (Section 1.4.2). For illustration purposes, a few examples of where humans directly interact with ocean and cryosphere are shown.

IPCC, 2019: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer

Box SPM.1 | Use of Climate Change Scenarios in SROCC

Assessments of projected future changes in this report are based largely on CMIP5[14] climate model projections using Representative Concentration Pathways (RCPs). RCPs are scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use / land cover. RCPs provide only one set of many possible scenarios that would lead to different levels of global warming. {Annex I: Glossary}

This report uses mainly RCP2.6 and RCP8.5 in its assessment, reflecting the available literature. RCP2.6 represents a low greenhouse gas emissions, high mitigation future, that in CMIP5 simulations gives a two in three chance of limiting global warming to below 2°C by 2100[15]. By contrast, RCP8.5 is a high greenhouse gas emissions scenario in the absence of policies to combat climate change, leading to continued and sustained growth in atmospheric greenhouse gas concentrations. Compared to the total set of RCPs, RCP8.5 corresponds to the pathway with the highest greenhouse gas emissions. The underlying chapters also reference other scenarios, including RCP4.5 and RCP6.0 that have intermediate levels of greenhouse gas emissions and result in intermediate levels of warming. {Annex I: Glossary, Cross-Chapter Box 1 in Chapter 1}

Table SPM.1 provides estimates of total warming since the pre-industrial period under four different RCPs for key assessment intervals used in SROCC. The warming from the 1850–1900 period until 1986–2005 has been assessed as 0.63°C (0.57°C to 0.69°C *likely* range) using observations of near-surface air temperature over the ocean and over land.[16] Consistent with the approach in AR5, modelled future changes in global mean surface air temperature relative to 1986–2005 are added to this observed warming. {Cross-Chapter Box 1 in Chapter 1}

Table SPM.1 | Projected global mean surface temperature change relative to 1850–1900 for two time periods under four RCPs[15] {Cross-Chapter Box 1 in Chapter 1}

	Near-term: 2031–2050		End-of-century: 2081–2100	
Scenario	Mean (°C)	*Likely* range (°C)	Mean (°C)	*Likely* range (°C)
RCP2.6	1.6	1.1 to 2.0	1.6	0.9 to 2.4
RCP4.5	1.7	1.3 to 2.2	2.5	1.7 to 3.3
RCP6.0	1.6	1.2 to 2.0	2.9	2.0 to 3.8
RCP8.5	2.0	1.5 to 2.4	4.3	3.2 to 5.4

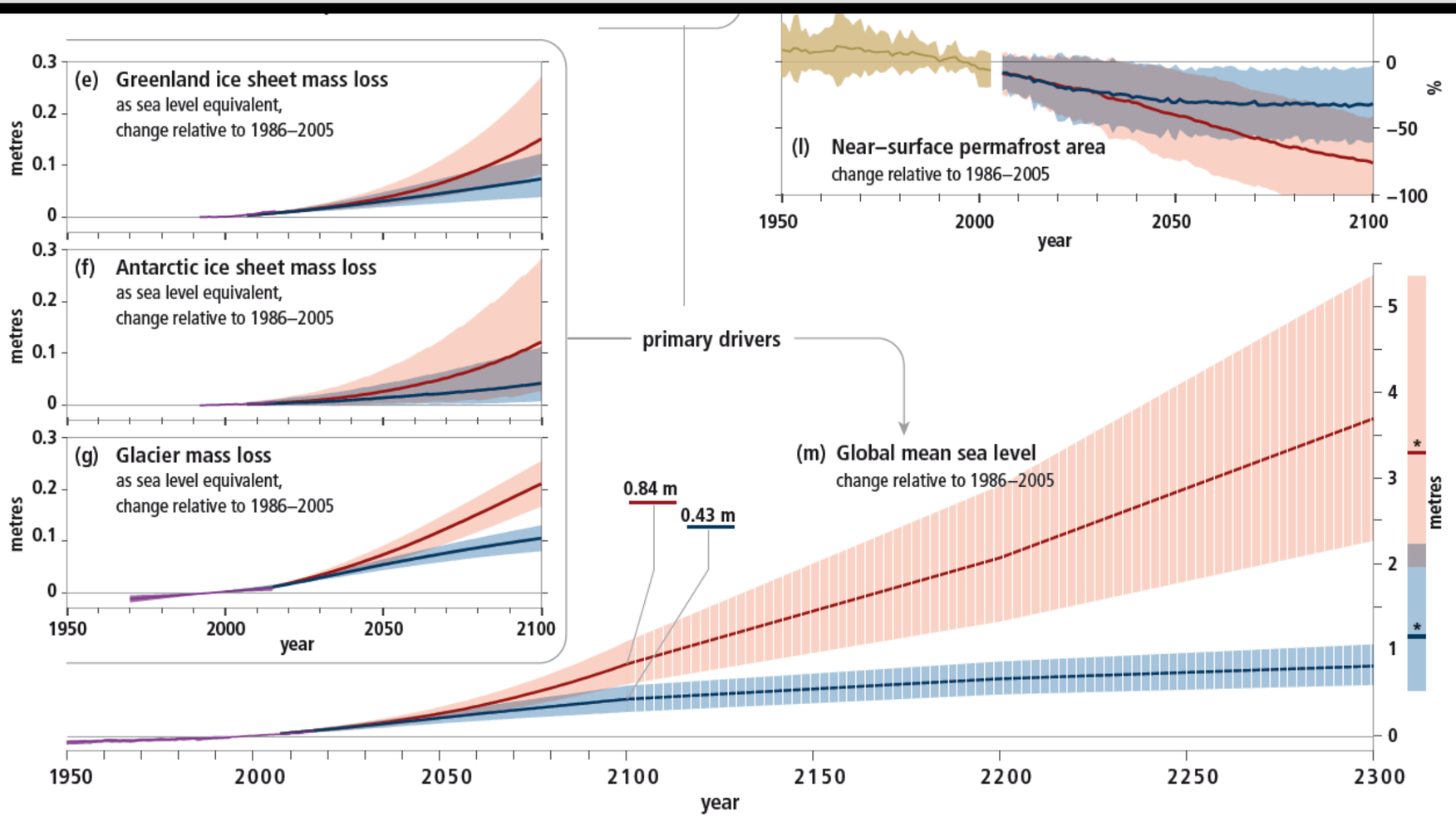
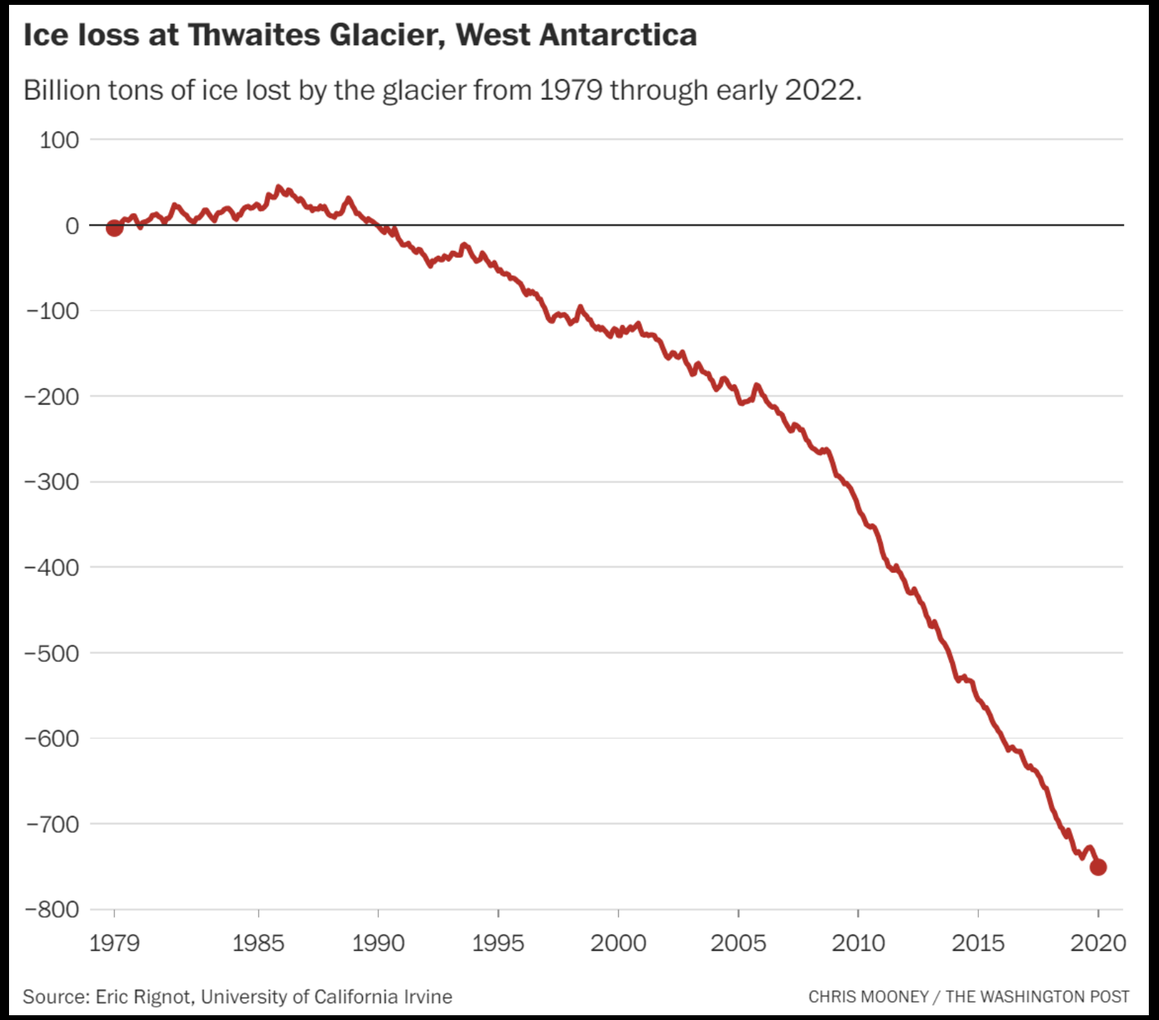
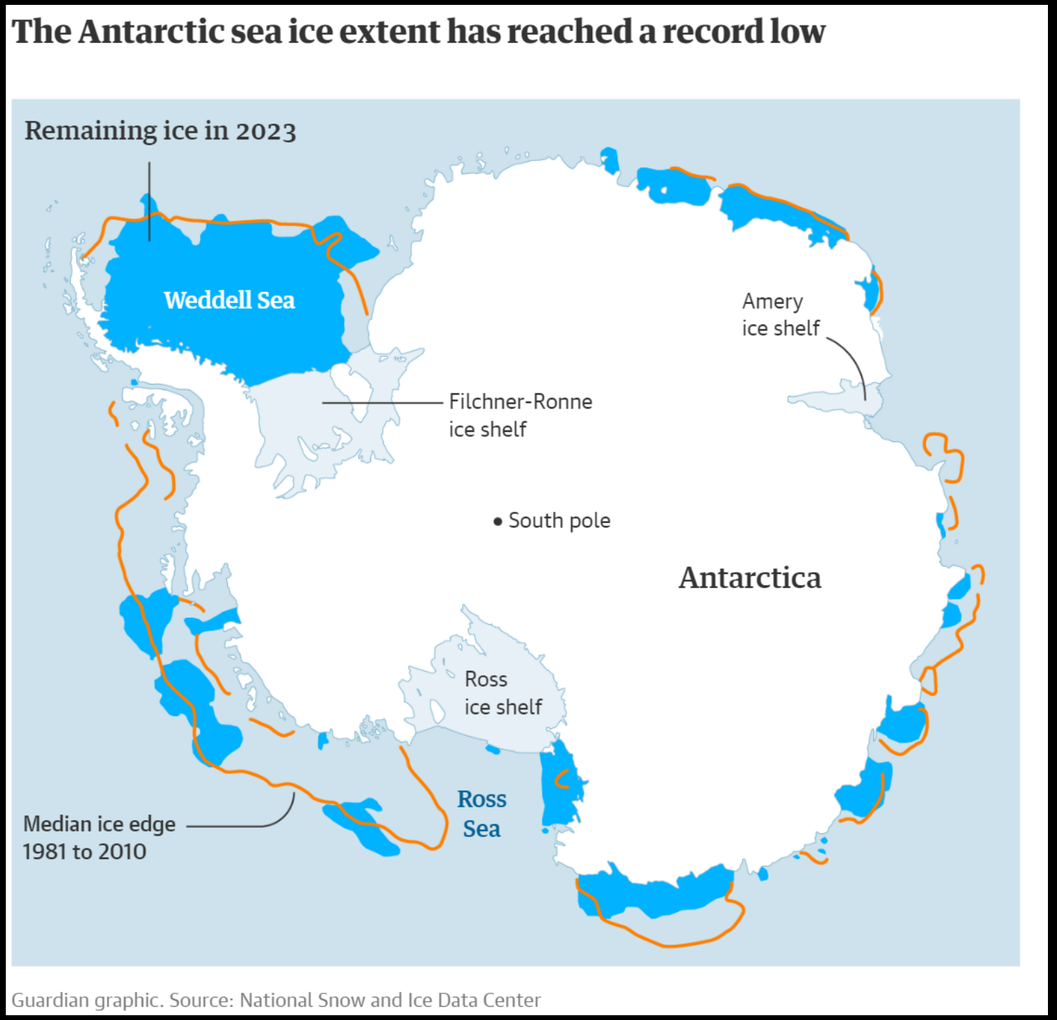


Figure SPM.1 | Observed and modelled historical changes in the ocean and cryosphere since 1950[11], and projected future changes under low (RCP2.6) and high (RCP8.5) greenhouse gas emissions scenarios. {Box SPM.1}

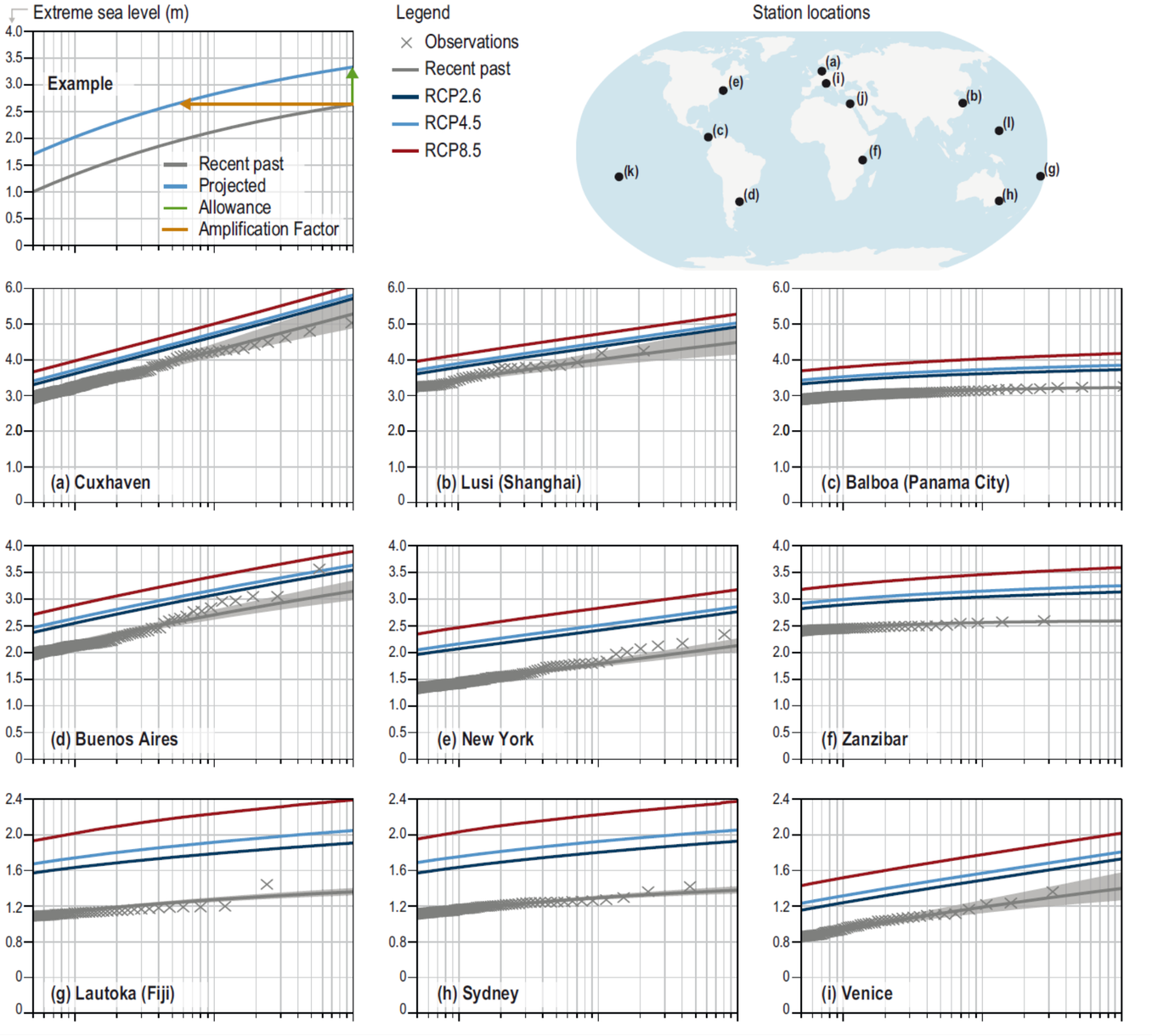
[11] This does not imply that the changes started in 1950. Changes in some variables have occurred since the pre-industrial period.



https://www.washingtonpost.com/climate-environment/2023/02/15/glacier-ice-melt-ocean-warming/



https://www.theguardian.com/world/2023/feb/15/antarctic-sea-ice-hits-record-low-climate-crisis


Extreme sea level (m)
Example
Recent past
Projected
Allowance
Amplification Factor
Legend
Observations
Recent past
RCP2.6
RCP4.5
RCP8.5
Station locations
(a)
(i)
(e)
(j)
(b)
(l)
(c)
(f)
(k)
(g)
(d)
(h)
(a) Cuxhaven
(b) Lusi (Shanghai)
(c) Balboa (Panama City)
(d) Buenos Aires
(e) New York
(f) Zanzibar
(g) Lautoka (Fiji)
(h) Sydney
(i) Venice

Et filmisk fremtidsscenarie – QEDA (2017)


HOTEL

Resiliens som miljømentalitet

Jeg er her i dag med en case -- som blå humanist, som socialt orienteret kulturvidenskabsmand, og som teknisk velinformeret forsker i bydesign og planlægning.

Jeg er her for at diskutere med jer, hvordan man designer *resiliente* byer.

Hvordan designer man byen med blå miljømentalitet, dvs. med en resilient, økoton relation for by og havet, der kan forventes at stige ift. i dag?

Resiliens som miljømentalitet

- Ikke den tidligere forestilling om kontrol over byen som stabilt, struktureret system, hvor havforandringer leder tilbage til ækvilibrium.

- Snarere forestillingen om at generere, vedligeholde og styrke byen som et social-økologisk metabolsk system, specifikt byens kapacitet til at tilpasse sig til hydrologiske usikkerheder og overraskelser.
- Dvs. det at kunne absorbere gentagne forstyrrelser og dog beholde essentielle strukturer, processer og typer af feedback.
- Mao. afspejler 'resiliens' i hvilken grad en by som et komplekst adaptivt system kan selv-organisere og lære nye tilpasninger i samspil med omgivelserne, her havet som vand fra siden.

Case: Lynetteholm

Arbejde med case

Ideen er først at høre lidt mere om Lynetteholm som case, derefter at arbejde med diskussion i mindre grupper

Tre mål med arbejdet på denne case:

- at du ved en del mere om det presserende og komplekse i at designe blå omstilling for en kystby som København, her bydelen Lynetteholm

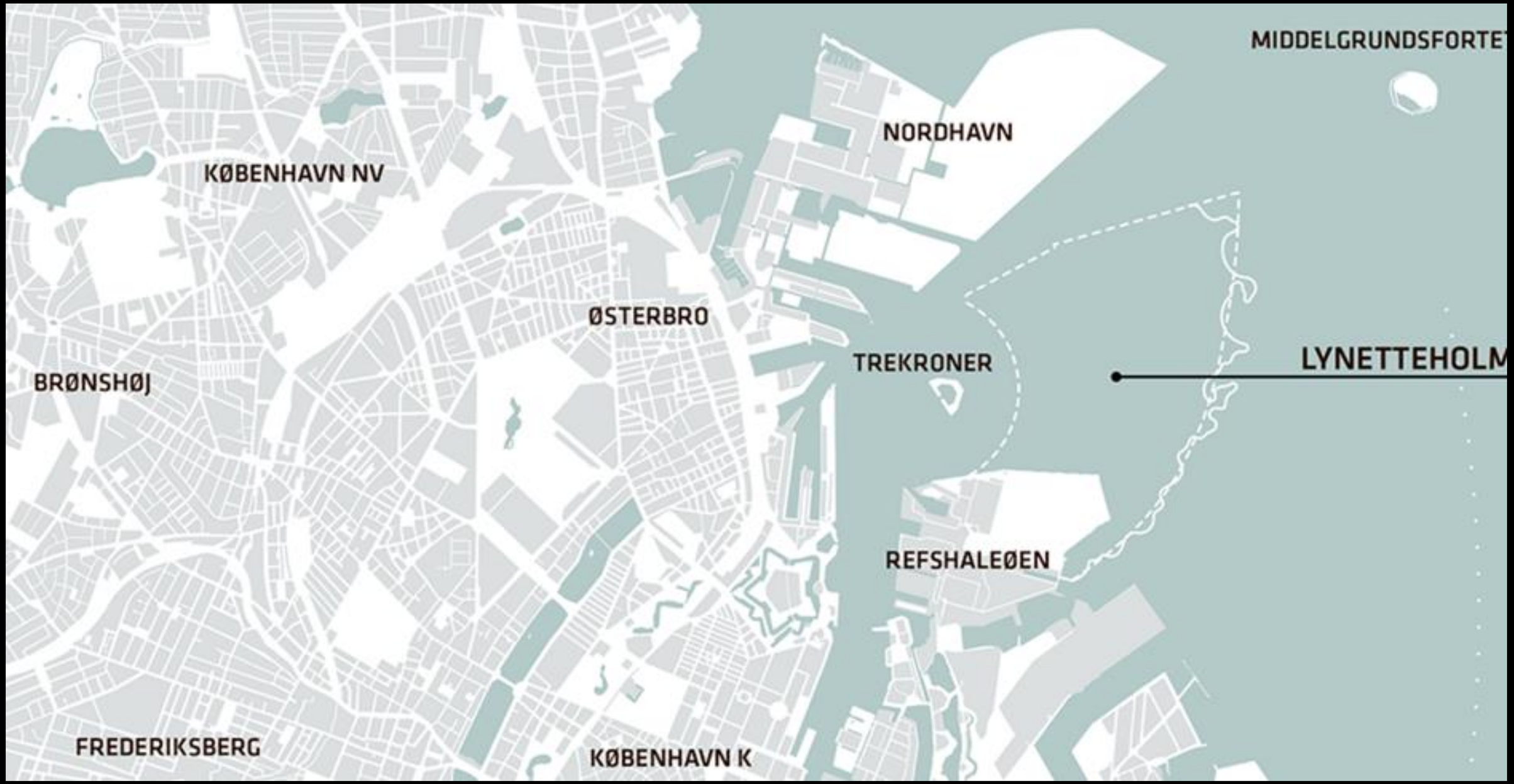
- at du har et par første ideer til ændring af vores miljømentalitet og til øget socialt engagement i design og planlægningsprocesser som denne

- at du har et par første nye, konkrete ideer til, hvordan man med din faglighed kan undervise i blå-grøn omstilling af design og planlægning af kystbyen

Case: processen for den nye bydel i København, Lynetteholm

Tre spørgsmål til efterfølgende gruppediskussion:

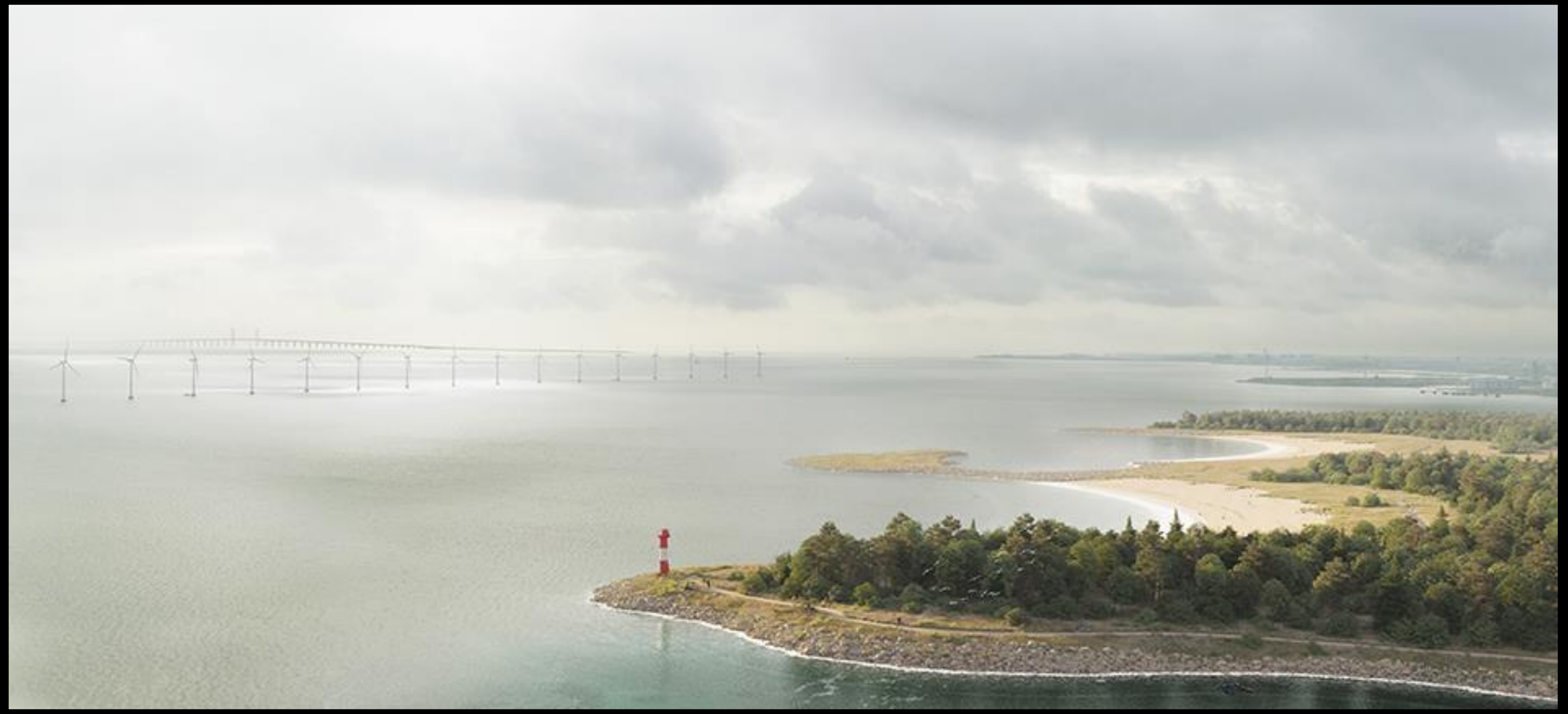
- Er Lynetteholms tekniske og naturbaserede løsninger mere eller snarere mindre resiliente – hvordan og hvorfor?
- Hvordan kan vores miljømentalitet ændres og vores engagement i planlægningen øges (‘vi’ og ‘vores’, hvor inklusive er de termer)?
- Hvordan vil du undervise med din faglige baggrund på en måde, der kan understøtte en diskussion af urban resiliens og en blå-grøn omstilling af design og planlægning?


MIDDELGRUNDSFORTE
NORDHAVN
KØBENHAVN NV
ØSTERBRO
TREKRONER
LYNETTEHOLM
BRØNSHØJ
REFSHALEØEN
FREDERIKSBERG
KØBENHAVN K

FORSLAG


YDRE AFGRÆNSNING
DOCKPORT
JORDDEPOT
PROCESLANDSKAB
- REKREATIV LANDSKAB
- STORMFLODSSIKRING
- BIODIVERSITET
INDRE AFGRÆNSNING
0m
200m
1000m

TREDJE NATUR

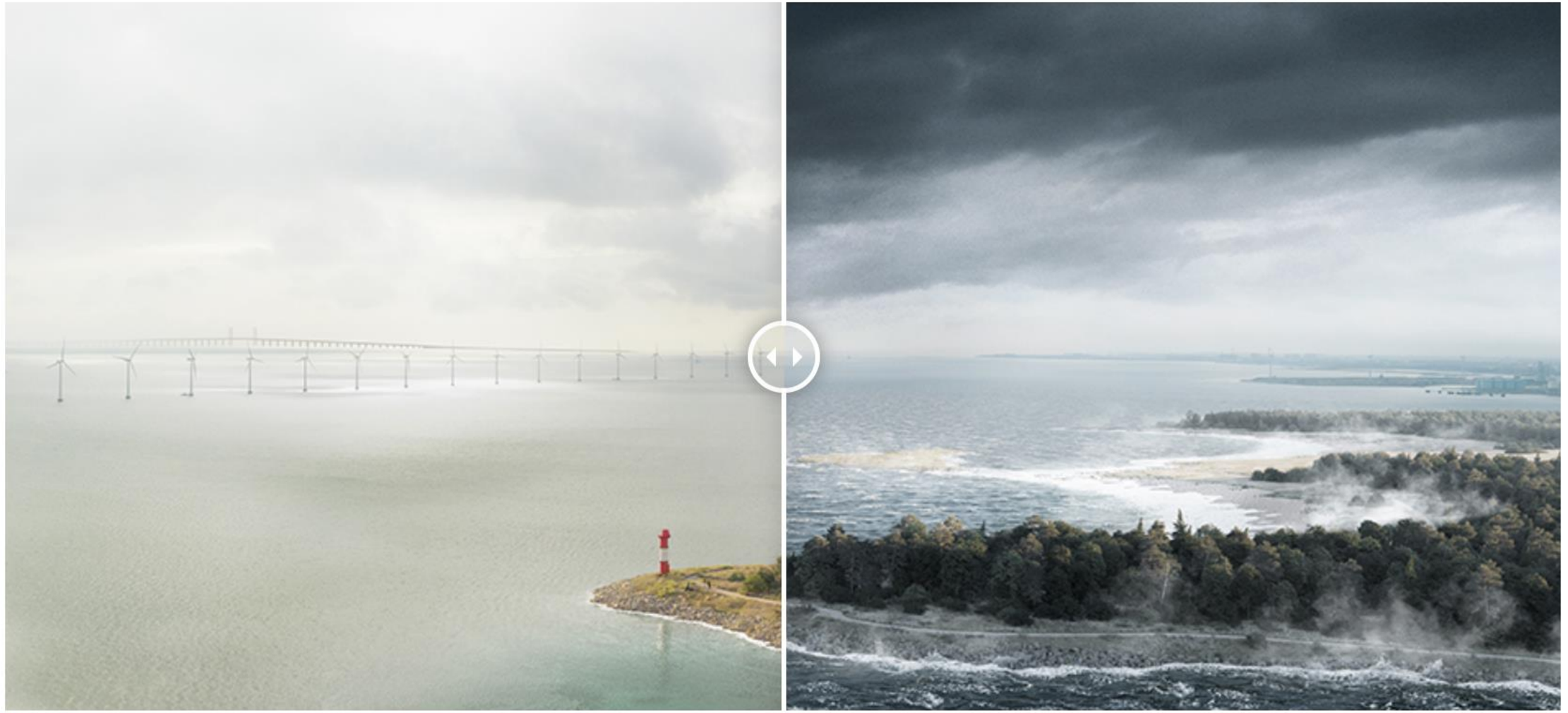


https://www.tredjenatur.dk/portfolio/lynetteholm/

Slaget mod klimaforandringerne

København historiske udvidelser og fortificering har været præget af behov for at beskytte sig mod fjenden – både på land- og vandsiden. Fjendebilledet er dog i nyere tid blevet et andet og i dag er en af vores største opgaver at beskytte byen mod klimaforandringerne, så vi i tide når at sikre København mod hyppigere stormflod og stigende vandmasser.

Samme sted som 'Slaget på Reden' fandt sted i 1801 er der nu behov for en ny fortificering af København, som den tredje byring, der beskytter byen mod klimaforandringer. Vi etablerer med øen en klima- og stormflodssikring og dokport, der kan lukke det nordlige havneløb ved behov. Det er en kompleks opgave, men etableringen af en helt ny ø i havneløbet indeholder også en stor mulighed for at udvikle København med en mere naturbaseret tilgang.

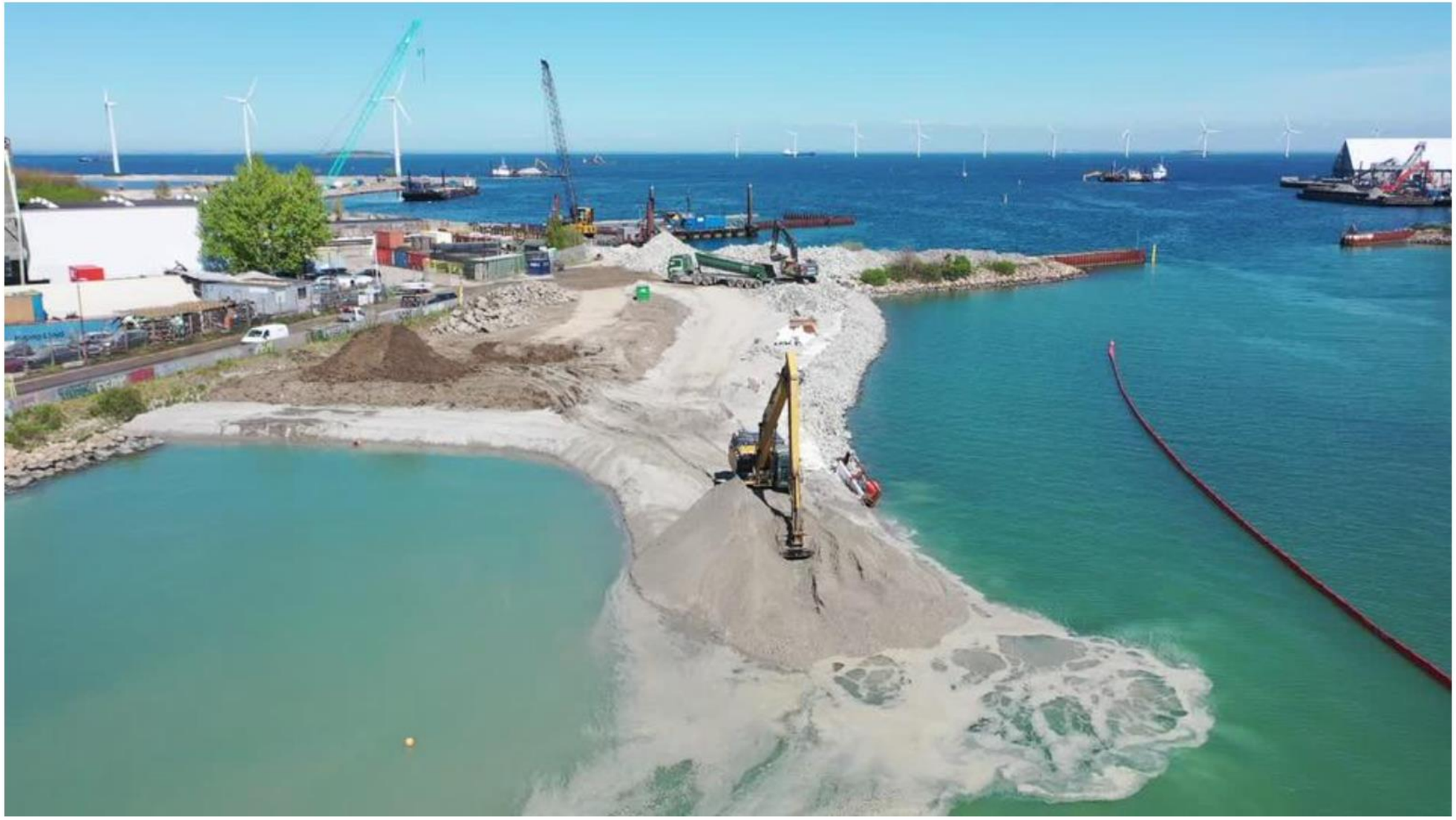


Tidsplanen for Lynetteholm

Maj 2021:	Lovforslag om anlæg af Lynetteholm blev fremsat i Folketinget.
2021:	Diverse landanlæg etableres, og selve anlægget af øens perimeter med spunsvægge påbegyndes.
2021-2023:	VVM-undersøgelse af metro og havnetunnel.
2023-:	Selve opfyldet af Lynetteholm påbegyndes.
2023:	Beslutning om anlæg af metro og en havnetunnel skal træffes.
2024-:	Udbud, projektering og anlæg af metro og havnetunnel igangsættes.
2025-2035:	Konkurrence om overordnet strukturplan for Lynetteholm. Efterfølgende udarbejdes masterplaner for holmens delområder samt kommuneplanrammer og lokalplaner.
2035:	Havnetunnel og metroforbindelse til Lynetteholm forventes åbnet.
2035:	Dele af kystlandskabet ventes at kunne tages i brug.
2035:	De første boliger på Lynetteholm kan være klar til indflytning.
2035-2045:	Rensningsanlægget Lynetten forventes flyttet eller overdækket.
2070:	De sidste beboere forventes at flytte ind på Lynetteholmen.

Lynetteholm får ekstraregning på 320 millioner og bliver et år forsinket

politiken.dk • 12.05.2022



CLIMATE • ADAPTATION

How an Artificial Island in Denmark Became One of Europe's Most Controversial Climate Projects

The perimeter of Lynetteholm, a future artificial island, is seen at the entrance to Copenhagen's harbor in January 2023. By&Havn

BY CIARA NUGENT

MARCH 22, 2023 10:30 AM EDT

https://time.com/6264861/copenhagen-lynetteholm-artificial-island-climate-change/

Større kritikpunkter i offentlig debat inkluderer…

- Langt mere omfattende miljøproblemer end planen og miljørapporten lader ane, bl.a. fordi rapporten er lavet efter en ikke brugbar model
- Den politiske beslutningsproces har været delvist hemmeligholdt og sker med statens som større beslutningstager; omegnskommuner og borgere er kun i ringe omfang medinvolveret og da typisk for sent
- Den økonomiske del af planen er uigennemsigtig og sat urealistisk lavt; det bliver mindst en halv milliard dyrere end oprindelig budgetteret
- Sociokulturelt er den nye bydel med til at forstærke *gentrification* og socio-økonomisk ulighed
- *Designet er ikke tilstrækkeligt resilient i sine teknisk-videnskabelige og naturbaserede tiltag ift. havstigninger*

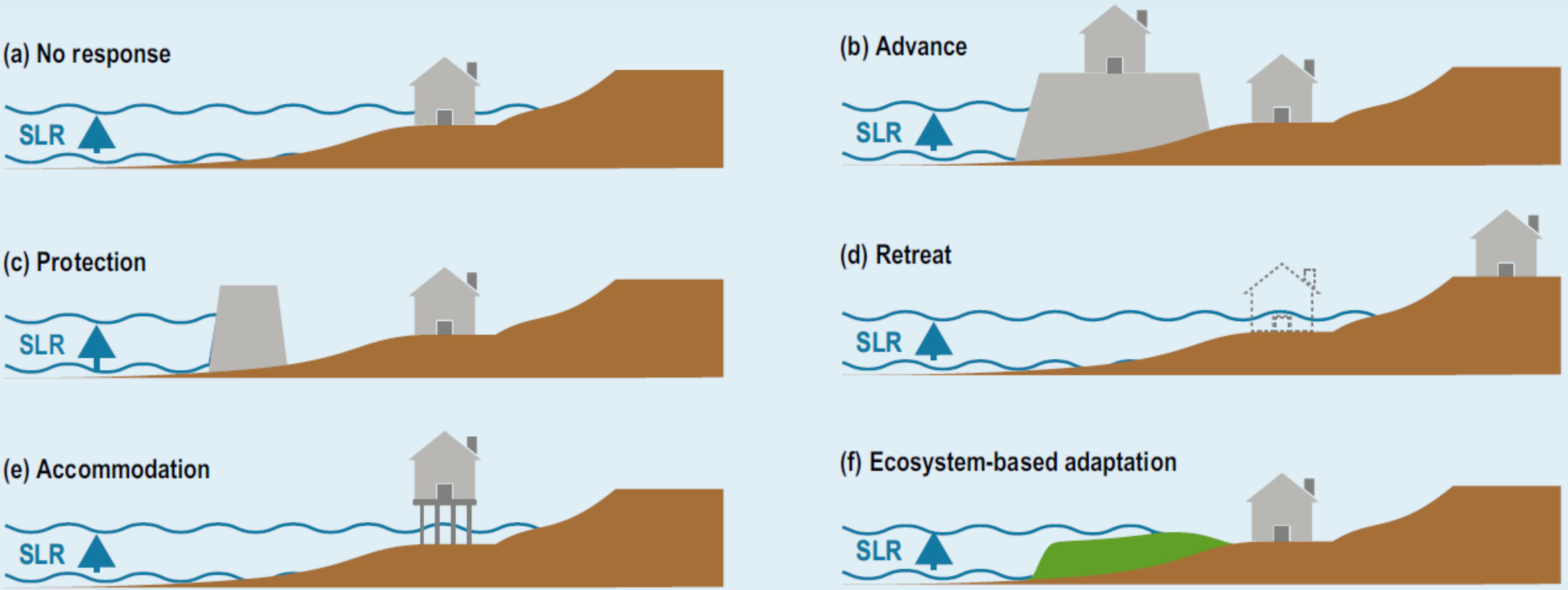
Design- og planlægningstilgange

- Climate denial, og/eller det intet at gøre
- Afbødning, mindre eller mere omfattende (*mitigation*)
- Tilpasning, mere eller mindre radikal (*adaption*)
- Regenerative og transformative tilgange

Designtilgange – responsmuligheder ift. havstigninger

- Beskyttelse
  - Hård (diger, bølgebrydere, barrierer)
  - Sediment-baseret (strand- og kystbeskyttelse, bløde strukturer som klitter)
  - Økosystem-baserede tilpasninger (vådområder, marsk, mangrove, rev)
- Afbødning
  - Byggelovgivning der mindsker sårbarhed (ændre brug af land, hæve bygninger, beskytte mod vands indtrængen)
  - Forsikringer, varslingssystemer, nødplaner (inkl. tilbagetrækningszoner)
- Fremgang
  - Bygning mod havet, kreere nyt land, inkl. beskyttelsesforanstaltninger, pumper m.m.
- Tilbagetrækning
  - Migration
  - Forskydning

Box 4.3 (continued)



Box 4.3, Figure 1 | Different types of responses to coastal risk and sea level rise (SLR).

Rotterdam

Rotterdam in the Netherlands is known to be at risk of being submerged due to sea level rise. Standing 20 feet below this threshold, the city has implemented innovative measures to live with Mother Nature instead of fighting it. Their best flood mitigation procedure is increasing the capacity of their whole city to capture water.

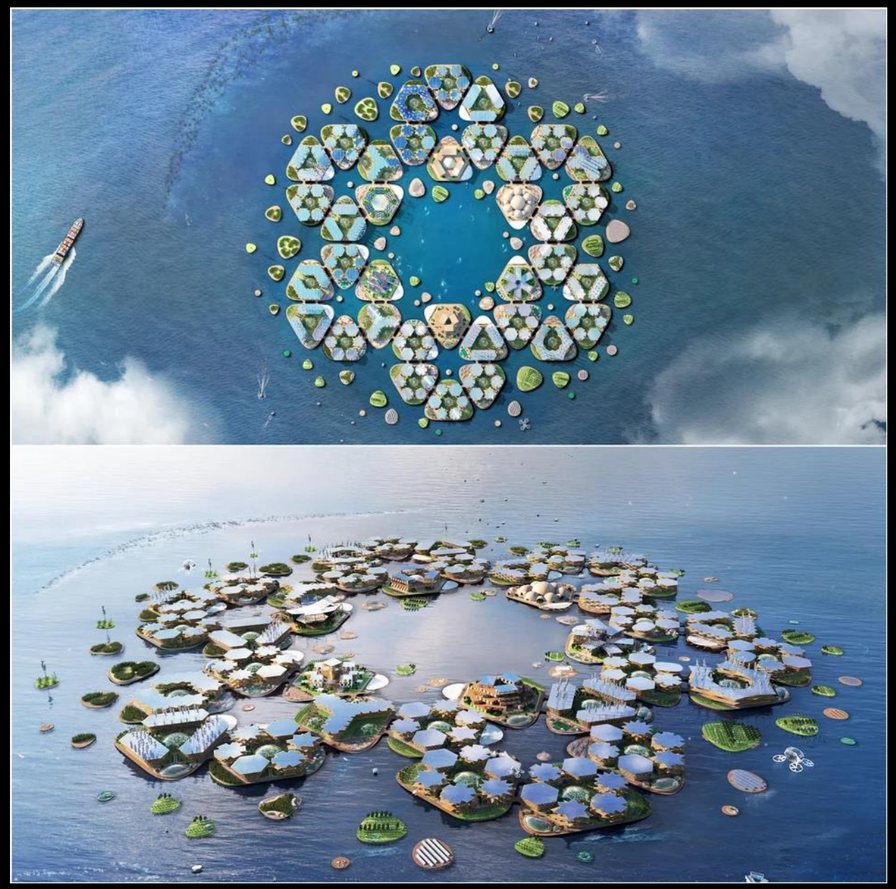
Sponge Cities, Kina – Sanya Mangrove Park, Cengdu & Wuhan

https://www.youtube.com/watch?v=8gLl50h8YWk

Amsterdam

Den flydende by, efter vestligt moderne tilsnit

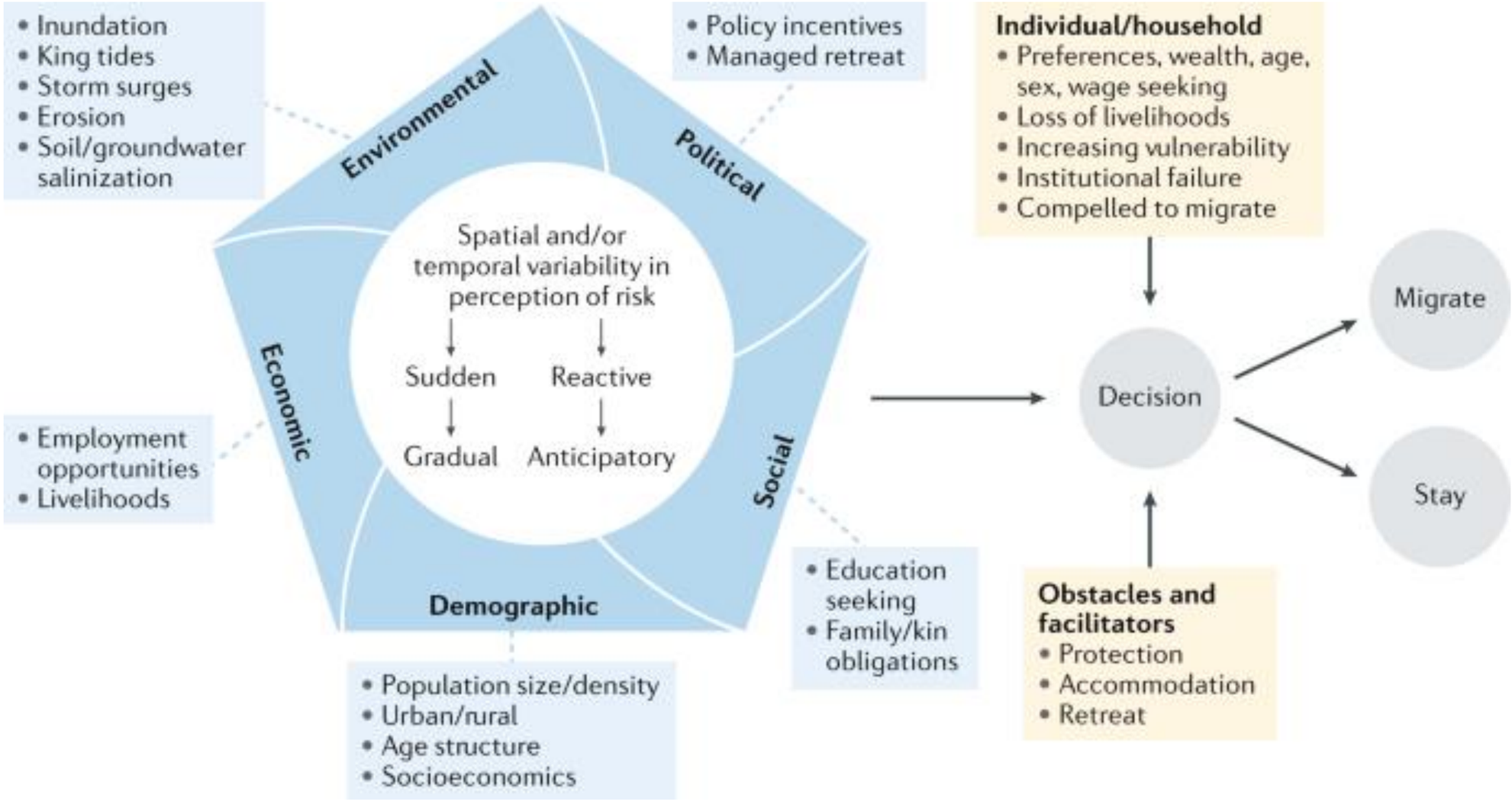
Busan, Sydkorea, planen for Oceanix, delvis som FN designet fra bl.a. Ingels (højre)



Maldiverne

Designet for flydende by

Den blinde plet: planlagt retræte, og tvungen migrering



Hauer, Mathew E., Elizabeth Fussell, Valerie Mueller, Maxine Burkett, Maia Call, Kali Abel, Robert Mcleman, and David Wrathall. "Sea-Level Rise and Human Migration." Nature Reviews Earth & Environment 1, no. 1 (2020/01/01 2020): 28-39.

Den mere transformativt regenerative tilgang
Mekong Deltaet – den langsigtede, komplekse planlægning for water management

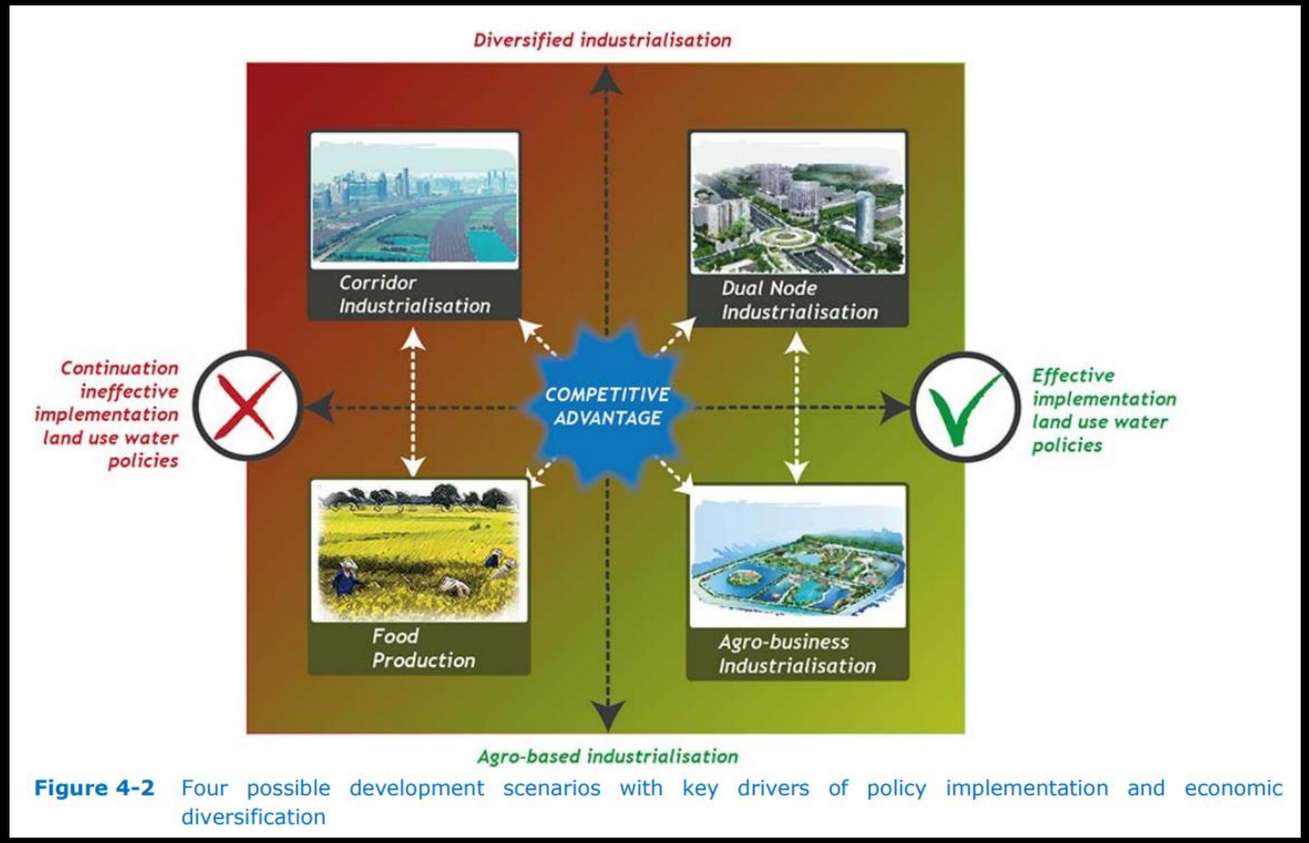


Figure 4-2 Four possible development scenarios with key drivers of policy implementation and economic diversification

https://www.wur.nl/upload_mm/2/c/3/b5f2e669-cb48-4ed7-afb6-682f5216fe7d_mekong.pdf

Hvordan vil du gerne undervise i blå-grøn byomstilling?

Pædagogisk-didaktiske overvejelser…

Fokus på det holistiske, situerede, transdisciplinære og udviklingsmæssige

- Kan din undervisning tilrettelægges som et levende by-laboratorie? Kan gymnasial dannelse ske ved, at undervisningen tager form som udviklingsprocessen for et levende laboratorie?

WHAT IS AN URBAN LIVING LAB?

There is a growing trend to involve citizens in city development, in order to make urban areas more adapted to citizens' needs. When addressing the consequences of climate change and urbanisation in cities, such as air pollution, flooding, and heat stress, it is important to think ahead, and at the same time, to consider the social implications of the solutions that are introduced in our urban areas. Addressing complex problems, such as climate change and the social implications linked to it, entails a wide range of aspects to consider. It should be addressed by involving a range of stakeholders, including citizens, companies, research, academia and the public sector, to ensure the successful collaboration towards the shared solutions.

Urban Living Labs are the orchestrators of this collaboration, bringing together the different stakeholders - companies, research institutions, the public sector and citizens - through co-creation. Co-creation involves different phases of development to reach the final solution. The first phase consists of a joint exploration to identify the challenges and the different needs from the perspectives of all stakeholders. The second phase is the experimentation phase, which includes building a prototype of the proposed solution, testing it, and building it again - each time improving the solution based on the feedback gathered from the previous stages. In Living Labs, the place for experimentation is always a real-life setting: the solution is tested in the real-life environment, right where it is planned to be implemented. The third phase of the co-creation process is evaluation and implementation. In this final phase, the solution is evaluated and the final version of it can be built.

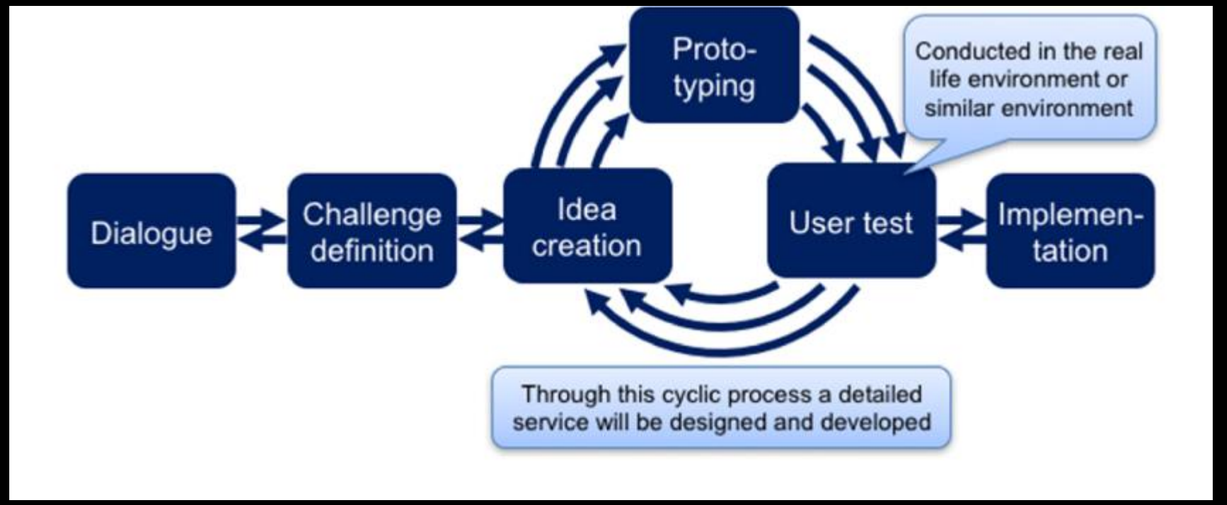
https://unalab.eu/en/urban-living-labs

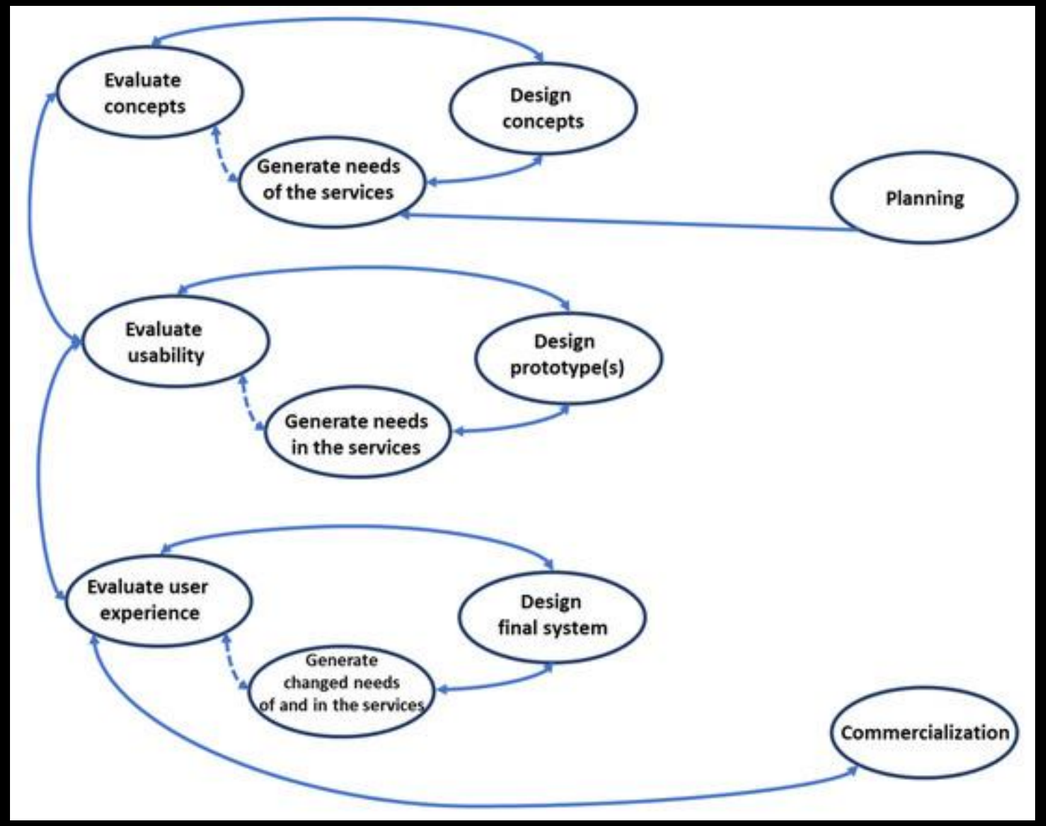
In accordance, the FormIT method is iterative, and interaction with users is an understood prerequisite. The idea is that knowledge increases through iterative interactions between phases and people with diverse competences and perspectives (Holst and Mirijamdotter 2006; Mirijamdotter, Somerville, and Holst 2006). In this way, knowledge increases through dialogue among participants. The idea is that the cross-functional interaction enables the processes of taking knowledge from one field to another to gain fresh insights, which then facilitates innovative ideas. The shared understanding of the situation informs and enriches the learning processes and thus facilitates changes in perspective and leads toward innovative design-processes. This, in turn, increases our

The FormIT process can be seen as a spiral in which the focus and shape of the design becomes clearer, while the attention of the evaluation broadens from a focus on concepts and usability aspects to a holistic view on the use of the system; see figure 2.

In this process three phases – Generate Needs, Design, and Evaluate – are repeated in three iterative cycles. The first cycle is called Concept Design, the second Prototype Design, and the third Final System Design. The name of the cycle indicates the expected output of each cycle. Besides these three cycles, two additional phases are included in the figure. The first is planning, seen in the upper right hand corner of the figure, and the second is commercialisation. The focus of this paper is concept design, which is managed

Bergvall-Kåreborn et al,





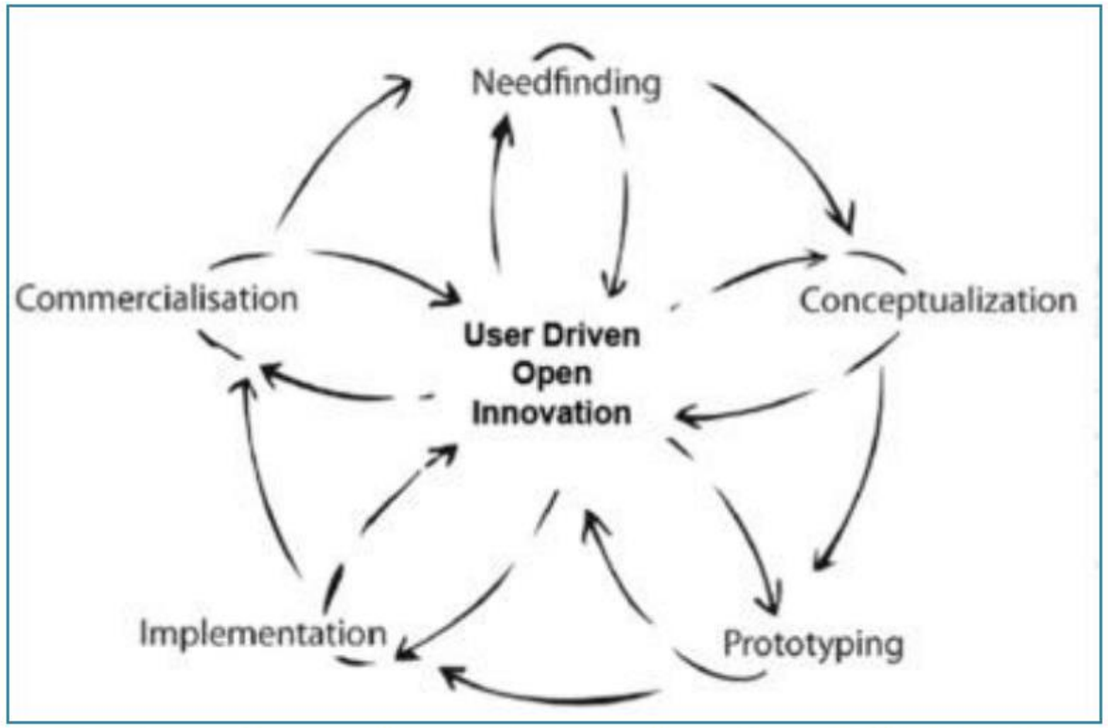


Fig 1. Participatory design and learning/action cycles in a Living Lab Methodology

Case: processen for den nye bydel i København, Lynetteholm

Tre spørgsmål til efterfølgende gruppediskussion:

- Er Lynetteholms tekniske og naturbaserede løsninger mere eller snarere mindre resiliente – hvordan og hvorfor?
- Hvordan kan vores miljømentalitet ændres og vores engagement i planlægningen øges (‘vi’ og ‘vores’, hvor inklusive er de termer)?
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