Thoughts on the Cluster for Cloud to Coast Climate Change Adaptation project

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Preface

This document is meant as a living thing, a document where we lay our thoughts on the more theoretical and philosophical background of C5a to rest and ripen. We try to illustrate our thoughts and explain our illustrations here. The document is meant to provide insight in the coherence of the different lines of thought and bridge between paradigms. In this respect it will always fall short, yet is an attempt to take a small step in our thinking.

Context

We live in a complex world, a world of various systems and interactions. As each species we try to cope with our habitat and make it a comfortable niche. We have adjusted our world to meet our needs, primarily safety and health and preferably also wealth. A changing system, like the weather, is much difficult to understand and model than a system that changes only little, like a granite mountain. The complexity of each system increases when it goes from static to dynamic. Put in other words, when the predictability of the system is lowered, the complexity goes up. In C5a we work on systems that show this increase in complexity. In this story the different elements at hand, such as there are weather changes, inhabitation patterns, infrastructure decay, are unraveled and illustrated. It comes together in the statement of the Greek philosopher Heraclitus: No man steps into the same river twice, for it's not the same river and he's not the same man. See a modern version depicted in figure 1.

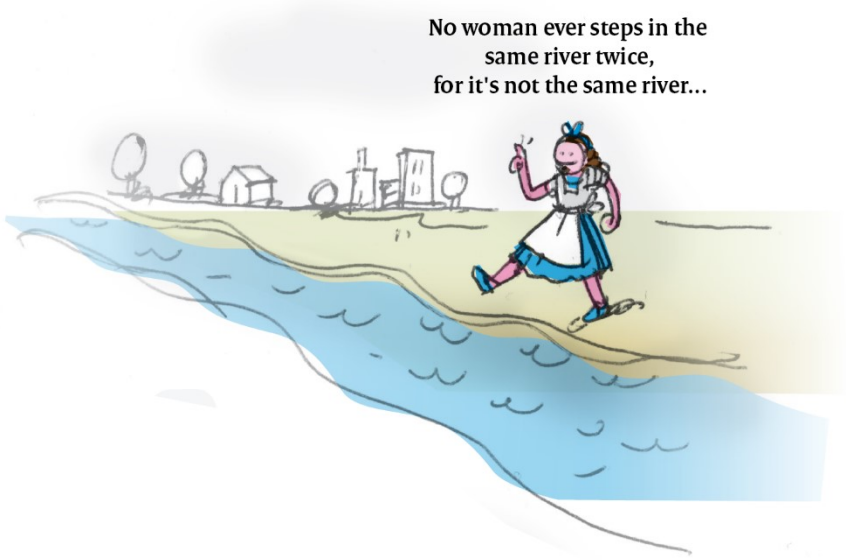
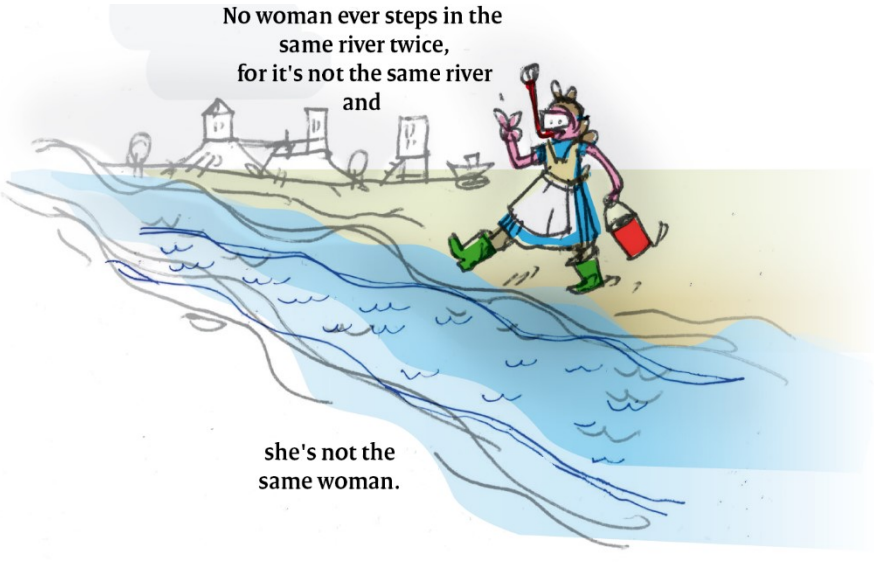


Figure 1. Free after Heraclitus. Note that also the change in landscape.



The physical system

We work on the water system from the drop rain from a cloud all the way through the soil via streams and lakes to rivers and, eventually, the coast. Several constituent systems are distinguished here: the soil,the catchment and the coast. Also the water encounters our human society. It passes villages and cities, vital infrastructure threatening them with flooding or the opposite, an absence of water. In our integrative approach we therefore distinguish the cities and villages and the infrastructure also as separate constituent systems. See fig 2.

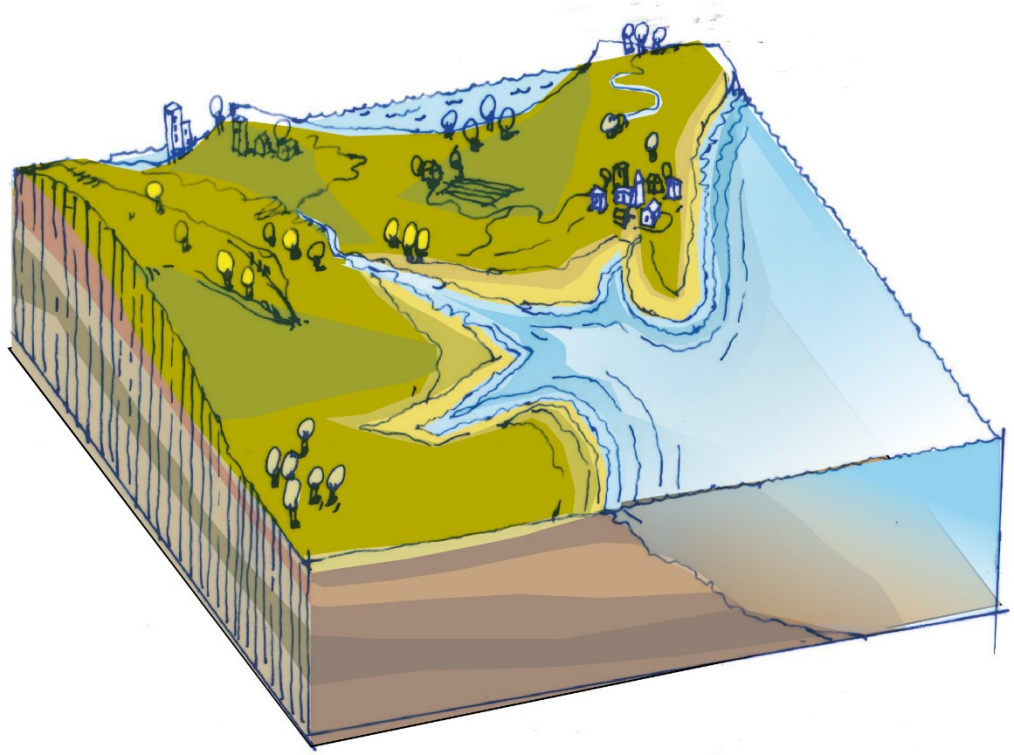


Fig 2. Our basic landscape of constituent systems

The changes in these systems consist of on the one hand a tendency towards more extreme rains, allowing for more pluvial and indirectly fluvial and ground water flooding.

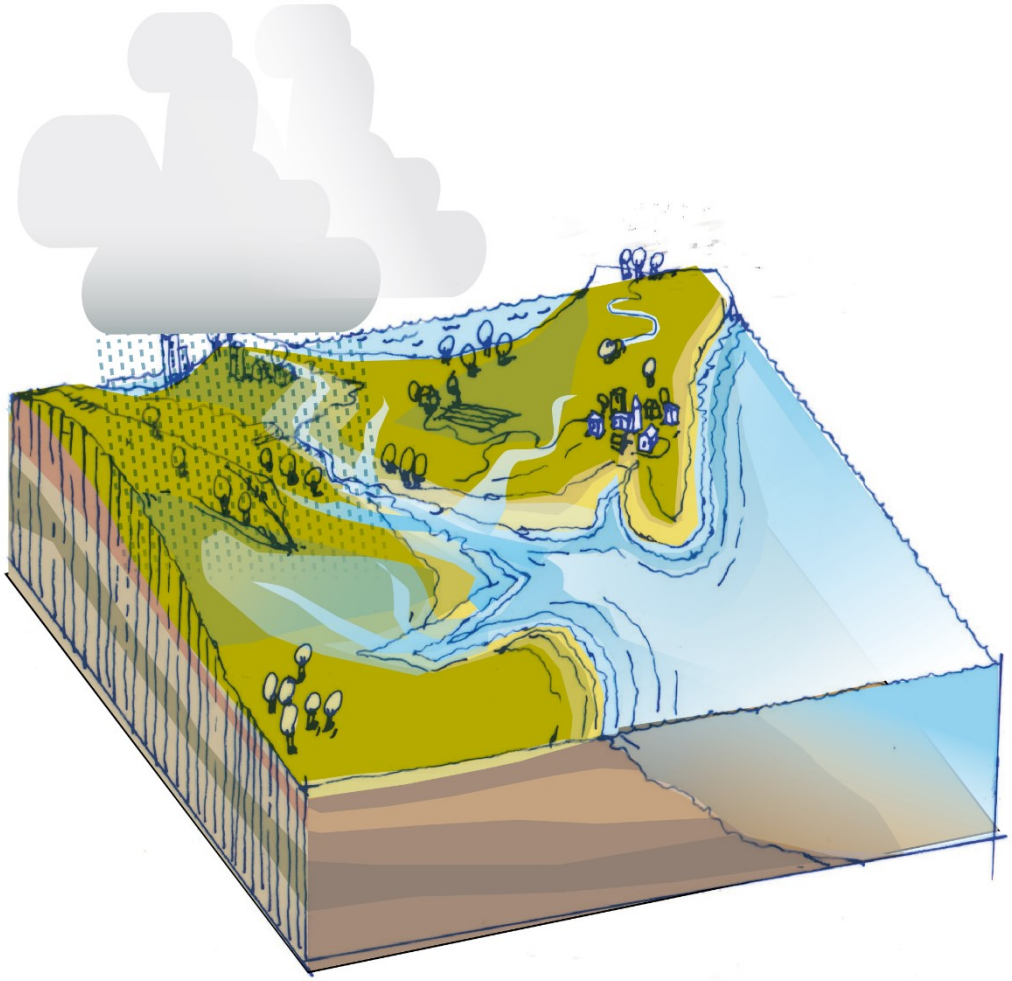


Fig 3. This figure shows changes in pluvial patterns, relative to figure 2.

On the other hand a rise of the sea level is a scenario that threatens the coastal and low lying areas directly through increasing the chance on floodingIndirectly sea level rise reduces river discharge potential to the sea, elevating river levels.

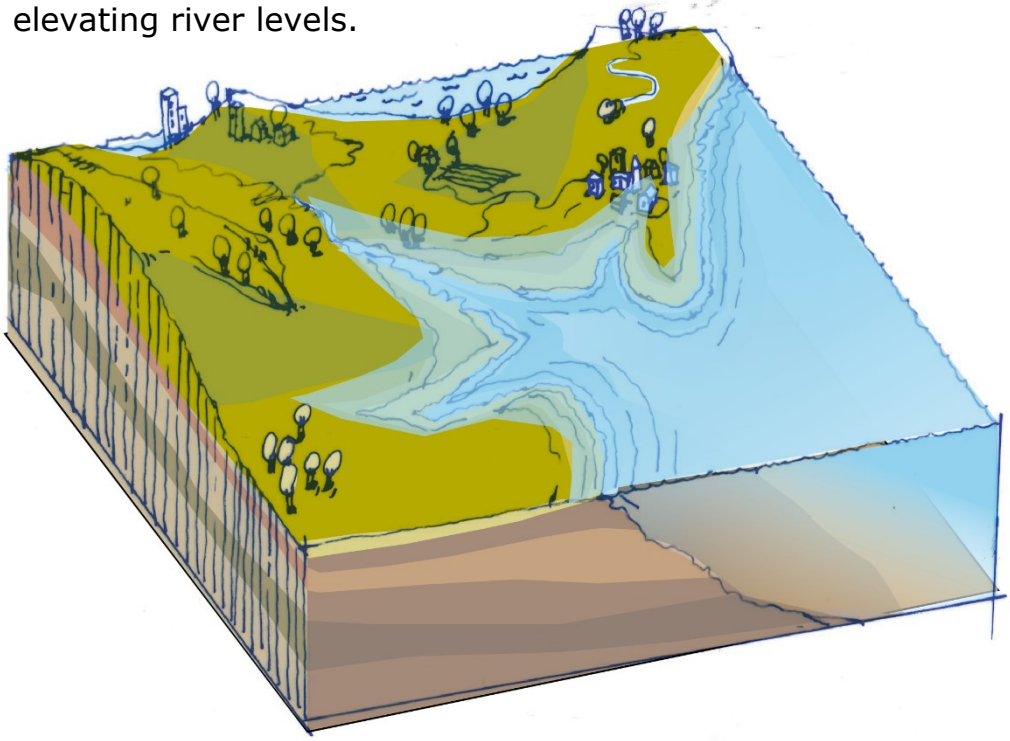


Fig 4. The effect increased sea level on our basic land relative to figure 2.

C5a is on how we deal with these changes, not only from the physical point of view but also as a society. How can we adapt? How can we anticipate? In modern jargon, how can we become resilient? Several options are available. One consists of adapting to the changing conditions but largely doing the same thing as before. This is depicted in fig 5.

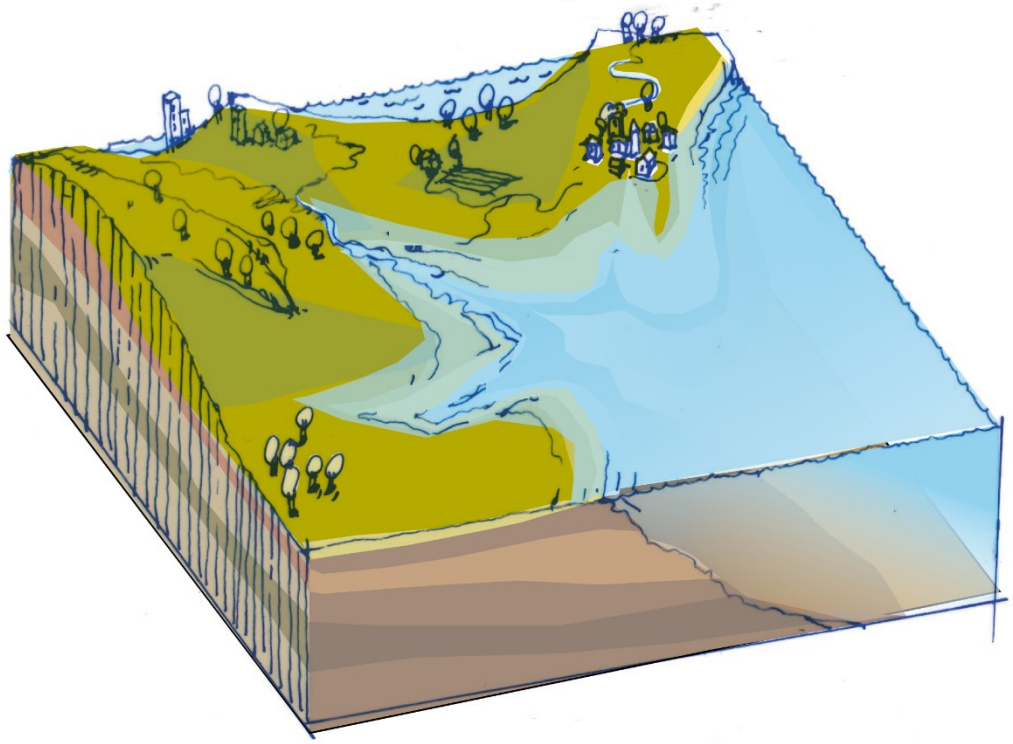


Fig 5. Adaptation by living higher up the hill to avoid flooding relative to fig.2. We still live near the shore in similar houses as we did. We adapted to the situation but did not fundamentally change.

Another option is doing this totally different and transforming our way of living and working in a way that allows for the change to happen. See fig. 6.

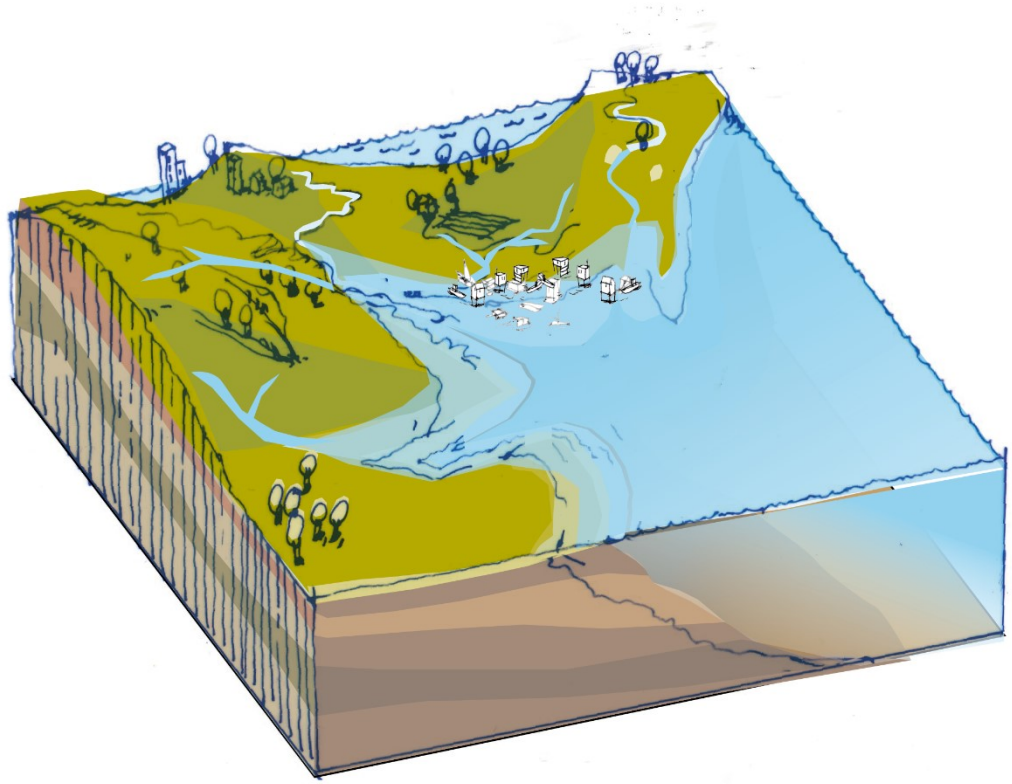
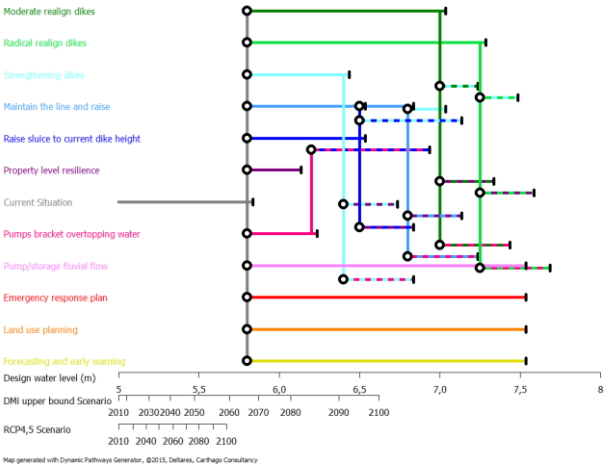


Fig 6. The inhabitants of our basic land now have become inhabitants of our basic coastline relative to fig 2. The houses are on or above the water. We adapted by changing the way we live fundamentally.

Since we do this primarily from a flood management perspective, we approach these changes from two different scopes. One being the aim of socio-ecological resilience. This is the ultimate goal for each system: being able to cope with change and thriving in it. It requires proactive thinking on how the system, and thus its inhabitants, can handle thie changes that will come. The other important paradigm in achieving thisd is the concept of adaptive asset management.



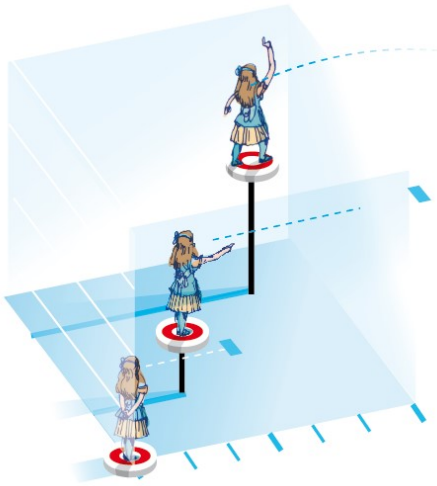


Figure 7. Adaptive asset management: trying to look further in event time to be able to better time decision making and create space for development of insight on what choices can be made later on. Alice is able to look further into the future if she raises her overview.

The disciplines

How to build adaptive or transformative systems? American (but born Scottish) Naturalist John Muir stated that "if I try to pick out anything by itself, I find it hitched to everything else in the universe." A strong statement on interrelatedness and maybe one that puts you off to start the change at all. C5a attempts to acknowledge this point and take on the challenge. It starts with identifying and embracing the complexity of the system and identifying the individual actors in it.

Fig. 8. A selection of different disciplines working on related matters in a Delta area.

And the point is that each of the disciplines in its own right is a bubble of thoughts and information. This leads to a Babylonic situation where in a number of cases the disciplines, if they try to interact at all, misinterpret or misunderstand the realities of the others. This is depicted in figure 9.

Figure 9. A depiction of the tower of Babel. The individual disciplines are separated in their work to build the tower while the rains are falling. Note that at the red level people start agreeing and cooperating. A first step.

In order to approach complex decisions in a non-sectoral cross-silo way we need specialists that are prepared to look at the world from a different angle, one that may stretch their original thoughts and paradigms.

The Cloud to Coast approach

The great German philosopher Peter Sloterdijk described in his "Spheres" trilogy that everyone lives in his or her own bubble. A sfae area in which we know how to act and behave. The acknowledgement of the changing system, the complexity and interactions and the need to integrate disciplines leads to the need for combining of the bubbles. The desperate outcry of this moment is how we go about this.

We know that the world is changing, and we know to a certain extent what we can do about that in a patchy manner. A lot of that knowledge comes from the Interreg NSR projects FAIR, Building with Nature, Catch, Canape, Topsoil, Begin and Frames. These are the founding projects the C5a is built upon.We can identify this and what was mentioned earlier: the constituent systems, the disciplines. This gives us an overview and tools.

Yet, how to work on this in a real life situation: does C5a yield a method to approach this multilayered complexity ? Yes and no. It's like Alice in Wonderland, see fig. 9. C5a is the Cheshire Cat. It doesn't point the way, it offers you a map on how to go about it.

Fig. 10. Alice asks the cat where she needs to go. The cat responds that Alice has to decide on where she wants to get to. Note the Delta and the various disciplines coming back.

Theory towards reality

The Cloud to Coast approach is the main product of the C5a project. It consists of the overview of disciplines and systems and solutions. This is written in the book of concepts including a guideline towards workshops and a set of cases worked out in workshops in the 6 countries. Also we may have two additional cases. One in Indonesia and one in the United States of America. This is shown in figures 11 and 12.

Fig. 11. The C5a cases.

Fig. 12. the potential bonus: two additional cases in Bontang, Indonesia and Swansboro, North Carolina, United States.