Wednesday 28th October UK Climate Resilience Webinar Series

Speakers: Robert Nicholls (Tyndall Centre, UEA) and Charlie Thompson (respondent) for the CoastalRes Consortium

Coastal resilience to flood and erosion hazard: A demonstration for England

Comments from chat:

- **Greg Guthrie:** the reliance definition seems to be very "event" focussed. rather than an on-going process.
- **Greg Guthrie:** but to manage the resilience to long term change is not about bouncing back. it is longer term adaptation.
- **Greg Guthrie:** cannot be justified by FCERM funding but may need to be funded from a broader perspective.

Response: Agree that that broader funding may be viable in many cases. As resilience now forms part of the FCERM strategy, there may be opportunities to further address how funding is approached for FCERM centrally.

- **Neil Watson:** Fragile landforms and historic defence systems have a tipping point from which bounce back cannot be achieved, and should not be attempted.

Response: We do not disagree and would consider these landforms and defences as system elements – resilience is examining the system as a whole rather than these components which contribute to the coastal resilience but are not the sole determinants of it.

- **Dan Osborn:** Thanks to everyone who contributed to the project and to today's panellists and to Kate. All very intriguing.
- **Uwe Dornbusch:** Thanks for the Talk!

Questions from Q&A	
On Natural environment should this not be looking at enhancement not just minimising damage. *Additional Comments:* If land use planning is included then there could be the idea of biodiversity net gain in play. Some England LAs seem quite keen to build housing near the coast ... so more people might become exposed requiring measures that might not help biodiversity	*A good aspiration, but there are trade—offs to consider so I do not think this can be an a priori principle. The environment is one component of resilience and our method explicitly recognised environmental, economic and social dimensions of resilience. The relative importance depends on societal preference which would need to be evaluated by survey and analysed with multi-criteria analysis utilising the stakeholder perspectives aspects of the method In our work we polled the project team to illustrate this aspect. Operationalising resilience in practise would have to grapple with these difficult issues. However, if the public wants environmental enhancement resilience becomes a powerful policy lever.*

Again the environment is about loss rather than creating a functional health system.	*See above comment. The flexibility of the method allows users to incorporate a range of resilience metrics, and does not preclude environmental gain.*
I really liked the diagram early on that provided a definition of resilience and ability to bounce back. However, in the rest of the presentation I am seeing a definition of resilience measures and results, but not clear how the 'ability to bounce back' is actually being measured/quantified? *Additional Comments:* Are there any case studies or examples where the modelled resilience can be validated by the change in socio/economic/environmental factors?	*We selected indicators of resilience building on existing government priorities –so our approach maps to existing government priorities. So it is a demonstration of a method.* *The bounce back, transition and adaptation is addressed through:* *(a) Having a range of policy options that enable a full range of actions to be considered; and* *(b) Being able to test the potential success or otherwise of the various options.* *This is embedded in the models used within the CRM. For the pilot these were simple but this aspect could be developed to capture the system 'bounce back capacity' and examine how this is likely to change in response to adaptation measures (i.e., implementation of policy options).*
Can this method of operationalisation of resilience be applied on a global scale? Given its data intensive nature to take into account of the stakeholder view? *Additional Comments:* Any alternative to MCA?	*As the method depends on societal weighting a global application seems inappropriate. Rather tailored national applications seem the best way forward. It should also be noted that there is likely insufficient data or consistency in data to undertake the method at a global scale. Note that the US Army Corps of Engineers approach focusses on disaster risk management reflecting their different setting to the UK and England.* *There are alternatives to MCA but this is the standard method employed by the UK government for these types of problems.*
There are examples of economic land use - green tourism, for example - where proactive development of resilience could enhance the capacity of these areas to contribute to the national economy. This might include carefully thought-through provision of a range of accommodation types. Can the approach distinguish between traditional house-building and other development that might be appropriate to the locality?	*This is not part of the method.*
What is the uncertainty in the quantification of the resilience? Sometimes variables are so hard to quantify that the output can be misinterpreted.	*This is a good question which goes beyond the method illustration we have accomplished in a short-term project. But operationalising resilience in practise would need to consider this question.*
Based on the map output would it be worth having a follow-up project to focus on those locations where resilience would appear to be low? There are very complex governance issues in some areas	*This could certainly be interesting. But as this talk emphasised the method and process of assessment rather than the results, we feel that this wold be premature. A refinement of the*

which perhaps get in the way of dealing with issues. A project to help resolve these might be really interesting and helpful?	*method including more detailed scenario trends with time and more stakeholder involvement in the weighting and interpretation would most useful. Then the spatial and temporal patterns of resilience would be useful to investigate as suggested here.*
Charlie, was there not the Annual Beach Monitoring Survey in the Southeast that started in the early 1970s?	*Beach monitoring has been undertaken in the Southeast on a local scale since the 1970s, however the strategic, regional scale monitoring was not formalised until the early 2000s. There is a long history of localised monitoring in the UK, but much was inconsistent and not spatially coherent, hence the need for a strategic monitoring programme with regional/national overview.*
There is also harmonising different datasets. See: There is also the need to harmonise different datasets: See: Pollard JA, Brooks SM, Spencer T 2019 Harmonising topographic & remotely sensed datasets, a reference dataset for shoreline and beach change analysis. Scientific Data 6: 42 [doi: https://doi.org/10.1038/s41597-019-0044-3]	*Thank you for this suggestion which we will consider.*
Rumson AG, Garcia AP, Hallett SH. 2020. The role of data within coastal resilience assessments: an East Anglia, UK, case study. Ocean & coastal management 185: 105004. https://doi.org/10.1016/j.ocecoaman.2019.105004 This work concluded that subjectivity is inevitable when quantifying coastal resilience. What are the thoughts on how the stakeholders are selected?	*We agree that stakeholder input is essential. In the approach we considered an overall resilience and weightings from environmental, social and economic perspectives. This was quite instructive about the different views and relative importance that might be placed on different dimensions of resilience. If this is to be operationalised in practise, appropriate representation will be important.*
There is an interaction between trend and events because the trend gives a changing base for the extreme events over time - see Wolf and Flather on 1953 storm surge under a higher sea level	*We agree and think that our approach can address both trends and events. We note that risk analysis has addressed these issues for at least a couple of decades.*
As others have said, a part of the resilience definition needs to include 'ability to adapt' (or bounce back!). Undoubtedly a complex problem requiring cross organisational collaboration. Who takes the lead here: communities, politicians, planners, risk managers? One group can't solve the issue alone, that is certain, a framework (CRM?) is needed but how do we embed such a framework and ensure sufficient support from the right leads?	*We think that the method proposed here which thinks across environmental, economic and social issues will promote more integrated thinking. We also recognise that it is likely to be challenging for government structures as it crosses budget boundaries – this could be a significant barrier to resilience approaches in practise.*
The discussion on 'bouncing around to different places' really relates to distance to threshold and the likelihood of a threshold being crossed (that doesn't just have to relate to biophysical thresholds)	*We agree which is why we stress the importance of considering socio-economic dimensions.*
Capacity to adapt formed part of the climate change report on flooding. This was wider than just deprivation I think?	*Not sure precisely to which climate change report you are referring – there are many such reports. The flexibility of the method ensures that a range*

	of adaptation metrics can be included in the resilience assessment.
I'd be interested to see the final spatial variability in resilience around the Country. It places emphasis on engagement with our communities, some areas may need more support in understanding their risks in the long term	*This is exactly what the method is designed to achieve by further development into an operational approach.*
Thanks, really interesting thanks.	
The following questions were answered live and can be found on the Q&A recording.	
There may be a difference between resilience with respect to trends over time and resilience in relation to extreme events. Any views on this and whether approaches to managing the two things would differ ?	
What is your view that resilience is not only 'bouncing back into the same place' but 'bouncing into a new, more resilient place' based on the ecological rather than the engineering concept in terms of coastal resilience? (Kombiadou, K. et al. (2019) 'Bridging the gap between resilience and geomorphology of complex coastal systems', Earth-Science Reviews, 198, p. 102934. doi: 10.1016/j.earscirev.2019.102934.)	
The new Defra FCERM Policy Statement talks about transforming the current approach to local flood and coastal erosion risk planning so that every area of England will have a more strategic and comprehensive "Local flood and coastal erosion plan" that drives long-term local action and investment, linked with wider plans for an area such as water resource plans and local nature recovery strategies to seize opportunities to secure multiple benefits. Do you think this framework presented by this research could form the basis for this different approach and expanded to cover all sources of flooding?	
Can you comment on the resilience index (hexagonal units). Is it not a vulnerability map showing the need for resilience rather than the presence of resilience?	
Has (loss of/damage to) the Historic Environment been factored in to your analysis at all? You can build back to replace loss, but not replace the historic character of what has been lost	
The issue we always face with trying to find preferred ways forward is balancing objectives, which often conflict. The same will surely exist with the various resilience measures? So how do we address the conflicting aspirations (otherwise are we not simply changing the parameters but left with the same challenges?)	

Part of the resilience discussion is the capacity to adapt, how do we measure and monitor that? not just physical monitoring!	