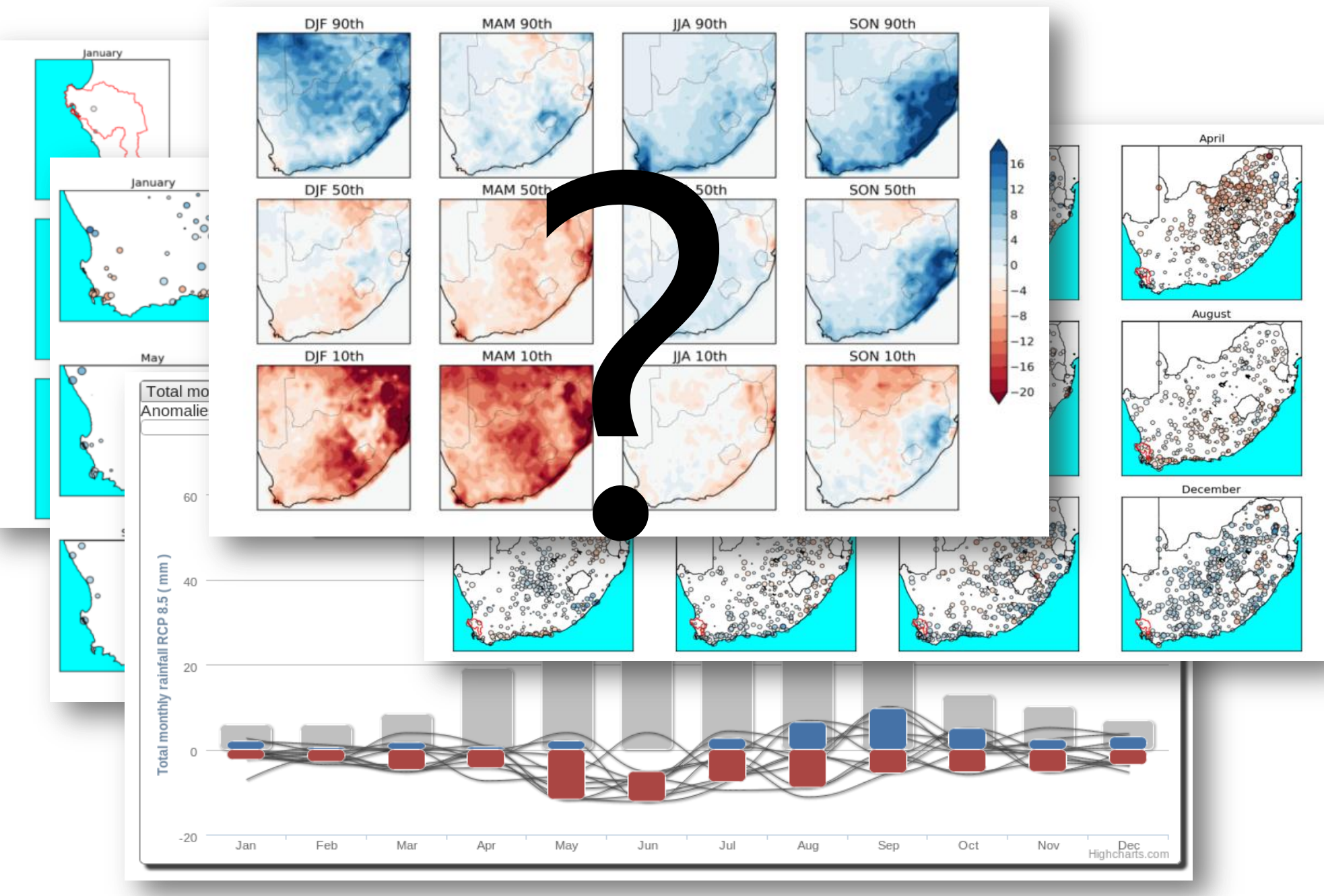


Communicating Climate Change Information through Climate Risk Narratives

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Moving from this... and/or this...



West African precipitation projections in the CMIP3 and CMIP5 archives show inter-model variation in both the amplitude and direction of change that is partially attributed to the inability of GCMs to resolve convective rainfall (WGI AR5 Section 14.8.7; Biasutti et al., 2008; Druyan, 2011; Fontaine et al., 2013). Many CMIP5 models indicate a wetter core rainfall season with a small delay to season by the end of the 21st century (WGI AR5 Section 14.8.7; Cook and Vizi, 2013; Saeed et al., 2013). There is a complex change of the driving GCM, especially in regions of complex topography (WGI AR5 Sections 9.6.4, 14.3.7.1; Sylvestre et al., 2008; Engelbrecht et al., 2009; Shongwe et al., 2009; Seth et al., 2011). The sign, magnitude, and spatial extent of projected precipitation changes are also projected to be different in the southeast of southern Africa (Hewitson and Crane, 2006; Rocha et al., 2008). Changes in the parameterization schemes used and their interaction with model produced opposite rainfall biases over the region (Crétat et al., 2012) through CORDEX, are important to more fully describe the uncertainty associated with projected rainfall changes across the African continent (WGI AR5 Section 9.6.5; Laprise et al., 2013).

to decisions here...

introduces **problems and challenges**

- Requires comprehension and interpretation of complex scientific visuals representing signal, noise, and uncertainty over different spatial and temporal scales
- Requires understanding and interpretation of languages of uncertainty (eg. what does a decision maker take from a statement of *high agreement, limited evidence?*)
- Requires implicit (or explicit in some form) downscaling to decision relevant scales, risk, and impacts

The result is that **decision makers implicitly construct their own stories or narratives** through interpretation of the complex and opaque evidence they are presented with. Often, these implicit narratives reflect miss-understandings and misinterpretations of the evidence.

Climate Risk Narratives are one part of the solution

Climate Risk Narratives are an attempt to explicitly construct **evidence based, physically plausible** (based on climate science/modeling) **narratives of the future** climate risk in a particular context (eg. a city) including non-climate elements such as population growth and socio-economic futures in a **co-production, participatory process**

Climate Risk Narratives are written with absolute certainty to avoid the pitfalls of uncertainty language and/or visualizing uncertainty. **Multiple narratives** are used to describe a **range of possible futures** given underlying uncertainty in the evidence. **Probabilities are not assigned** to each narrative.

Climate Risk Narratives are "conversation starters" to facilitate starting productive conversations with decision makers around potential changes in climate related risks and impacts

Climate Risk Narratives are an **iteratively evolving** "framework" for ongoing engagement between decision makers and scientists. Decision makers and other knowledge holders can critique and change language, terminology, socio-economic futures, etc. to make the narratives more relevant to their context. Climate researchers can iterate the climate evidence/interpretation to better address the non-climate context. And repeat...



City of Cape Town¹ Climate Change Narratives

Narrative #1 | Hotter and drier

The Cape Town region continues to experience cycles of wet and dry seasons and wet and dry decades due to cycles of natural variability in the climate system. However, failure of the Paris agreement results in global mean temperatures reaching 2C above pre-industrial by the early 2040s. This means that Cape Town mean temperatures are 2C above pre-industrial and 1.5C above the 1986-2005 baseline. Frequent extremely hot days, as well as higher extreme month exceeding 36C in inland locations is double that of the 1986-2005 period. The average summer is now hotter than the hottest summer of the inner city are now fairly common in mid-summer.

Higher summer temperatures has increased demand for power for cooling in low income areas where housing is less well adapted to higher temperatures. Higher temperatures have reduced runoff into dams from its relative humidity results in higher evaporative losses from dams. High wind speeds combined with high relative humidity results in higher evaporative losses from dams. Rain fed agriculture is impacted by higher evaporative losses from dams. Irrigated crops demand more irrigation. Some export large wine grapes are no longer viable due to insufficient cool periods.

Narrative #2 | Warmer and no rainfall change

The Cape Town region continues to experience cycles of wet and dry seasons and wet and dry decades due to cycles of natural variability in the climate system. However, failure of the Paris agreement results in global mean temperatures reaching 2C above pre-industrial by the early 2040s. This means that Cape Town mean temperatures are 2C above pre-industrial and 1.5C above the 1986-2005 baseline. Frequent extremely hot days, as well as higher extreme month exceeding 36C in inland locations is double that of the 1986-2005 period. The average summer is now hotter than most of the hottest mid-summer. The number of days per month exceeding 36C in inland locations is 1.5 times that of the baseline period. The average summer is now hotter than most of the hottest mid-summer. The number of days per month exceeding 36C in inland locations is 1.5 times that of the baseline period. The average summer is now hotter than most of the hottest mid-summer.

Higher summer temperatures has increased demand for power for cooling in low income areas where housing is less well adapted to higher temperatures. Higher temperatures have reduced runoff into dams from its relative humidity results in higher evaporative losses from dams. High wind speeds combined with high relative humidity results in higher evaporative losses from dams. Rain fed agriculture is impacted by higher evaporative losses from dams. Irrigated crops demand more irrigation. Some export large wine grapes are no longer viable due to insufficient cool periods.

Narrative #3 | Hotter and mixed rainfall change

The Cape Town region continues to experience cycles of wet and dry seasons and wet and dry decades due to cycles of natural variability in the climate system. However, failure of the Paris agreement results in global mean temperatures reaching 2C above pre-industrial by the early 2040s. This means that Cape Town mean temperatures are 2C above pre-industrial and 1.5C above the 1986-2005 baseline. Frequent extremely hot days, as well as higher extreme month exceeding 36C in inland locations is double that of the 1986-2005 period. The average summer is now hotter than most of the hottest mid-summer. The number of days per month exceeding 36C in inland locations is 1.5 times that of the baseline period. The average summer is now hotter than most of the hottest mid-summer.

Higher summer temperatures has increased demand for power for cooling in low income areas where housing is less well adapted to higher temperatures. Higher temperatures have reduced runoff into dams from its relative humidity results in higher evaporative losses from dams. High wind speeds combined with high relative humidity results in higher evaporative losses from dams. Rain fed agriculture is impacted by higher evaporative losses from dams. Irrigated crops demand more irrigation. Some export large wine grapes are no longer viable due to insufficient cool periods.

written narratives

infographics

Scenario 1 Hotter & drier	Scenario 2 Warmer & more erratic and extreme rainfall	Scenario 3 Warmer & more extreme rainfall
Natural System Extreme hot days and heat waves becoming much more frequent. More severe and more frequent droughts.	Natural System Less predictable rainfall, more contrast between wet and dry seasons. Wetter wet seasons- and drier dry season.	Natural System Stable water sources. Increased evaporation.
Areas of impact Water shortages. Highly impacted agriculture - insecure food supply. Hydro power shortages.	Areas of impact Agriculture impacted - more irrigation needed. Crop failures possible due to erratic rainfall. More flooding. Health impact: more heat stress.	Areas of impact Agriculture impacted - more irrigation needed. Crop failures possible due to increased evaporation or extreme rainfall. More flooding.
Societal Consequences Political instability. Health crisis. Conflict.	Societal Consequences Humanitarian Crises. Health impact.	Societal Consequences Humanitarian Crises. Health impact.
Responses Adapt agricultural systems. Develop adequate building design standards. Use alternative energy sources. Alternative water technology.	Responses Adapt agricultural systems. Develop adequate building design standards. Use alternative energy sources. Alternative water technology.	Responses Adapt agricultural systems. Develop adequate building design standards. Alternative water technology.

Often identified responses end up very similar despite climate uncertainty