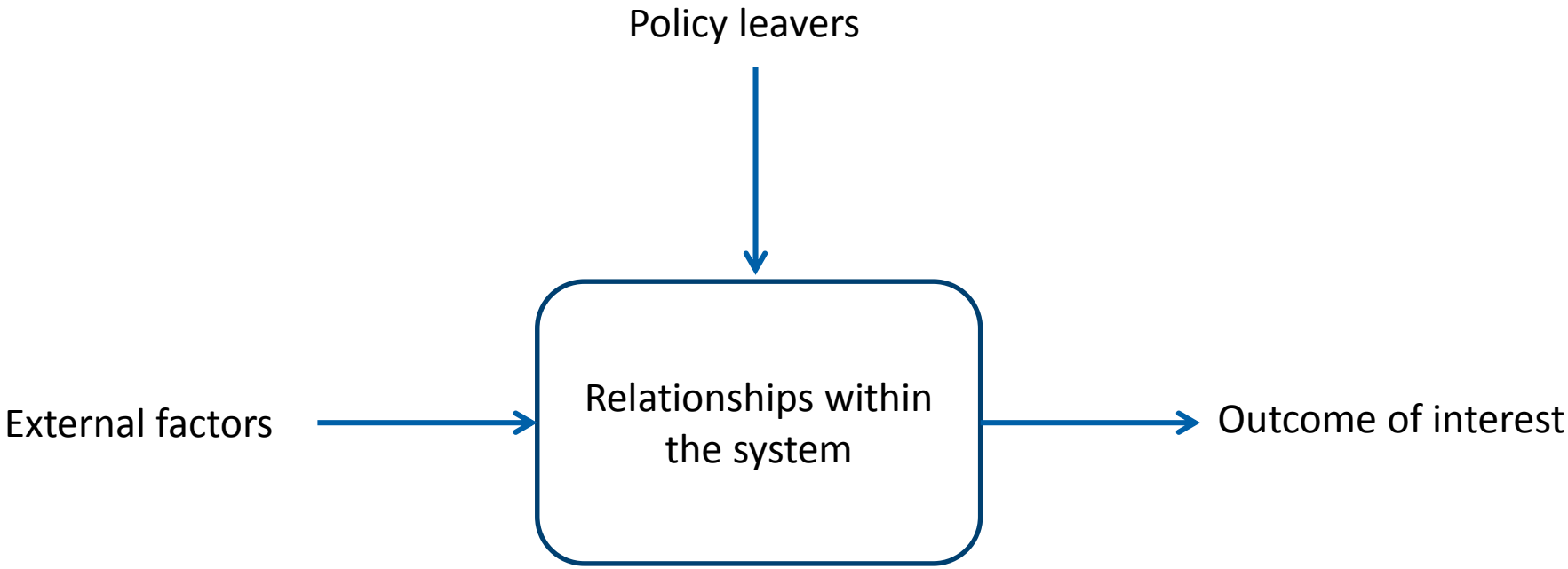
OzEWEX 4th annual workshop, 6th Dec 2017

System resilience and stress testing

Imagine a system…

Imagine a system…



XLRM Framework, courtesy of Jan Kwakkel from Monday's MODSIM keynote

Compound weather/climate events refer to multiple drivers that combine to affect hazards contributing to societal or environmental risk.

Jakob Zscheischler et al, *Future climate risk: The challenge of compound events*, in review.

Interactions of storm surge, waves, pluvial and fluvial floods…

Figure credit: Liam Reading, University of Maine; in Wahl et al, Hydrologic compound events: unappreciated hazards, *EOS,* in press.

Interaction of heat wave, absence of rainfall, upstream water abstractions…

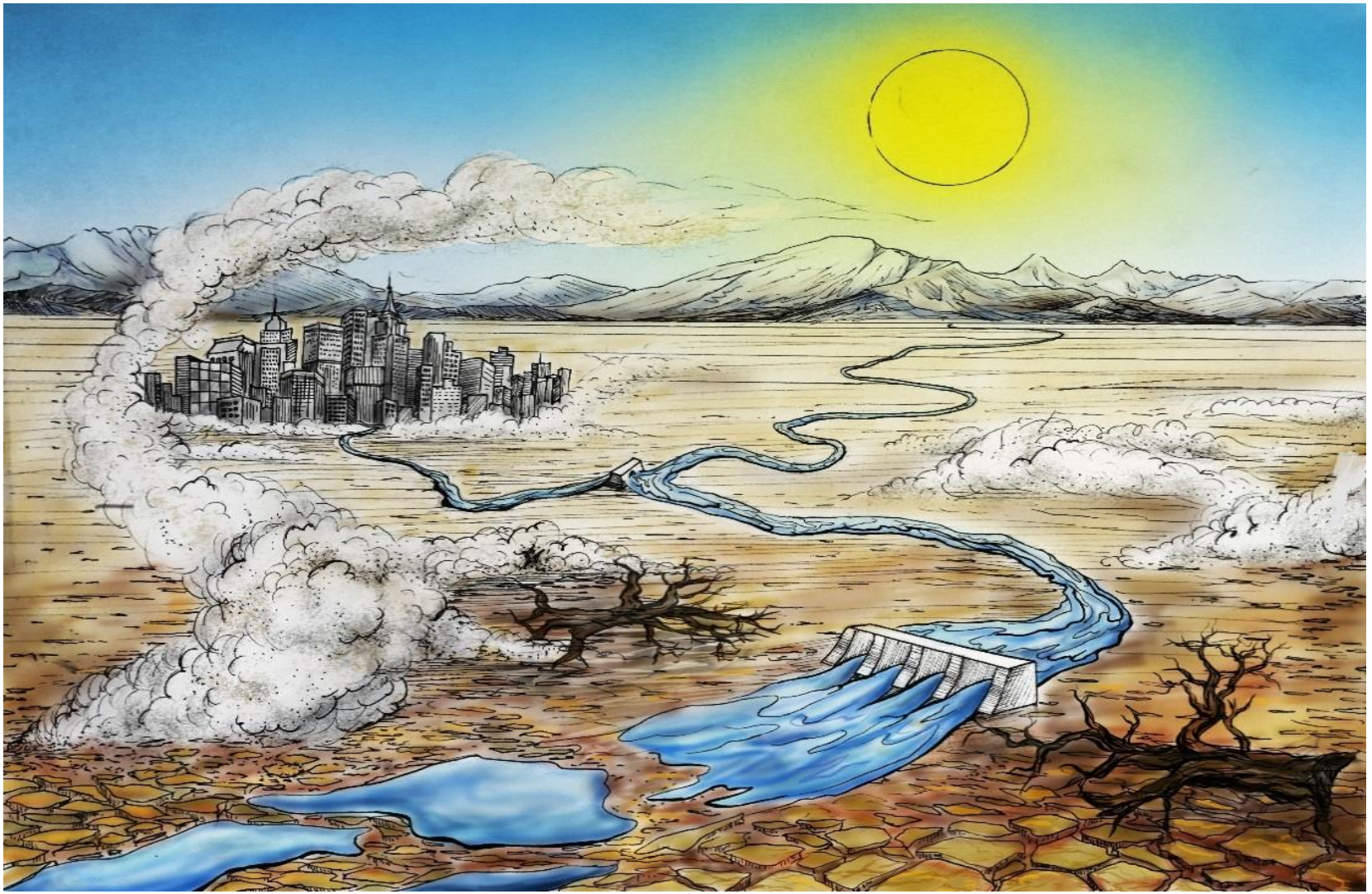


Figure credit: Liam Reading, University of Maine; in Wahl et al, Hydrologic compound events: unappreciated hazards, *EOS,* in press.

"Resilience first conjures up in the mind pictures of bouncing back from adversity... [but should also describe] the characteristic of managing the organisation's activity to anticipate and circumvent threats to its existence and primary goals."

- ***Buffering capacity****: size or kinds of disruptions that a system can absorb*
- ***Flexibility vs stiffness****: ability to restructure in response to external forcings*
- ***Margin****: how close the system is operating relative to a performance boundary*
- ***Tolerance****: behaviour of a system near a performance boundary (e.g. degrades gracefully or collapses)*

Hollnagel, E., Woods, D.D. & Leveson, N. (2006), Resilience Engineering: Concepts and Precepts

What might this systems focus mean for the development of a national prediction system?