



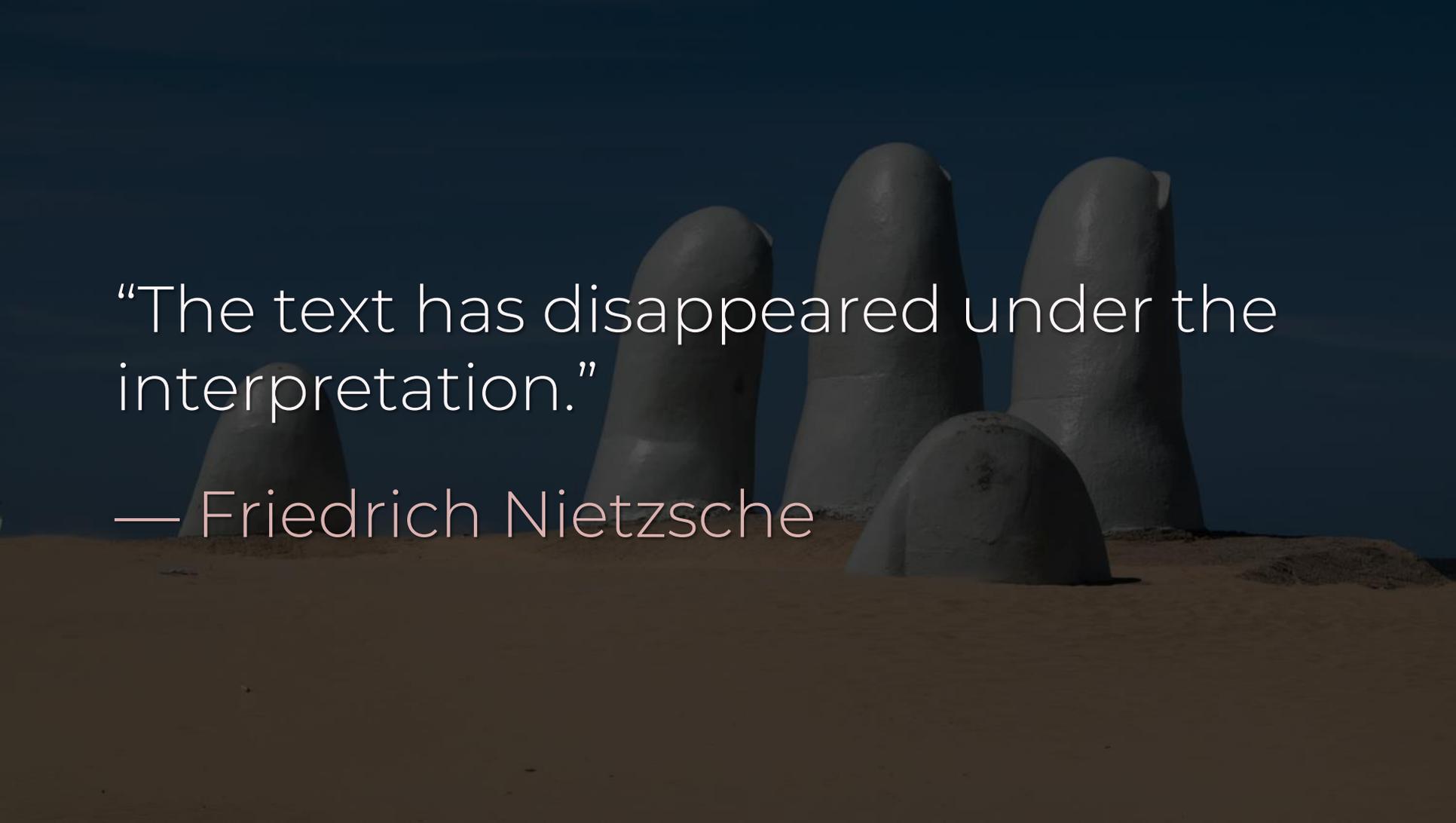
Risk Quicksand in Information Security

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Art into Science 2019

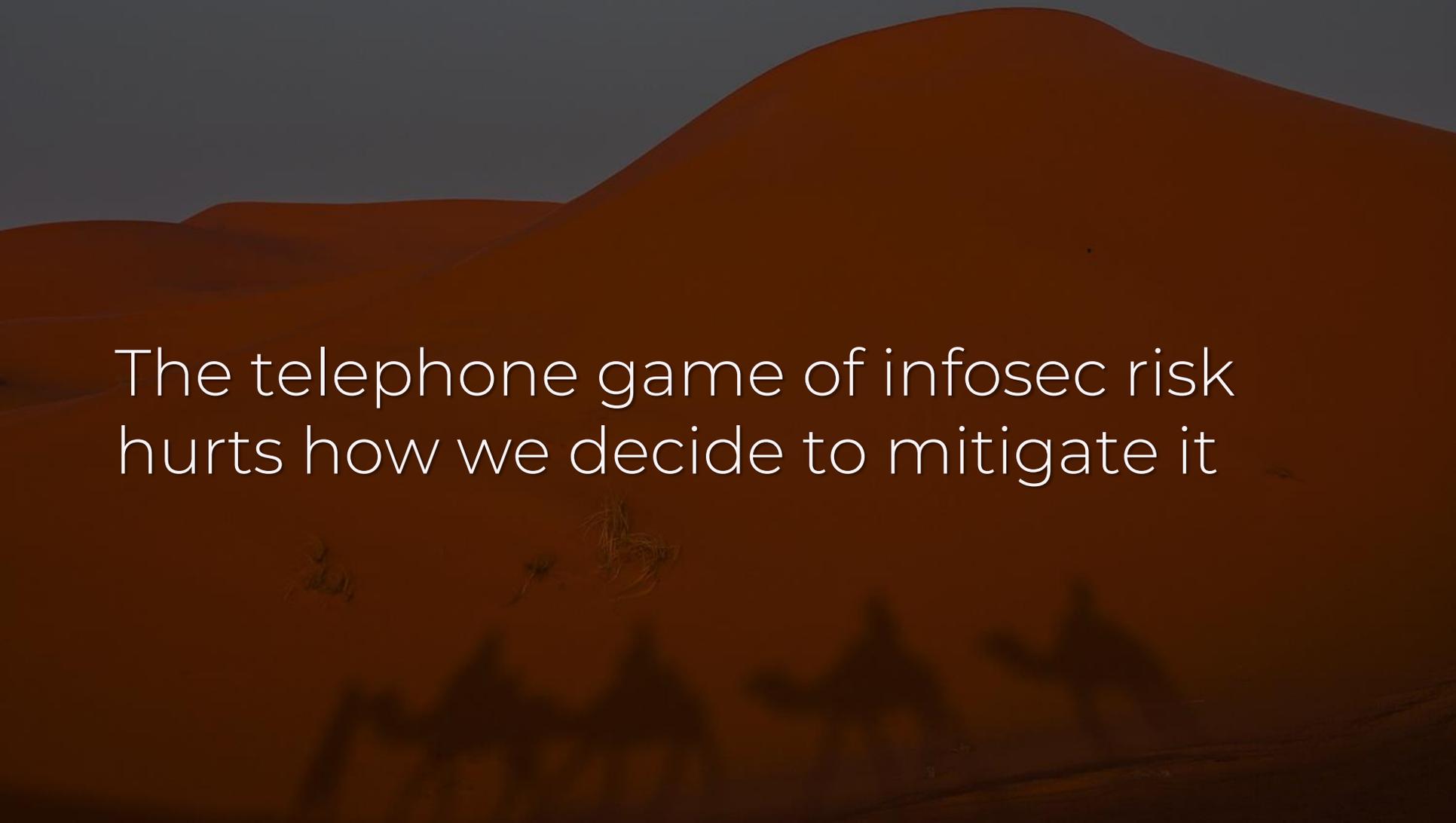
A white and orange tabby cat is walking towards the camera on a dirt path. The background is a blurred outdoor setting with some structures. The text "Hi, I'm Kelly" is overlaid on the image in a white and orange font.

Hi, I'm Kelly



“The text has disappeared under the interpretation.”

— Friedrich Nietzsche



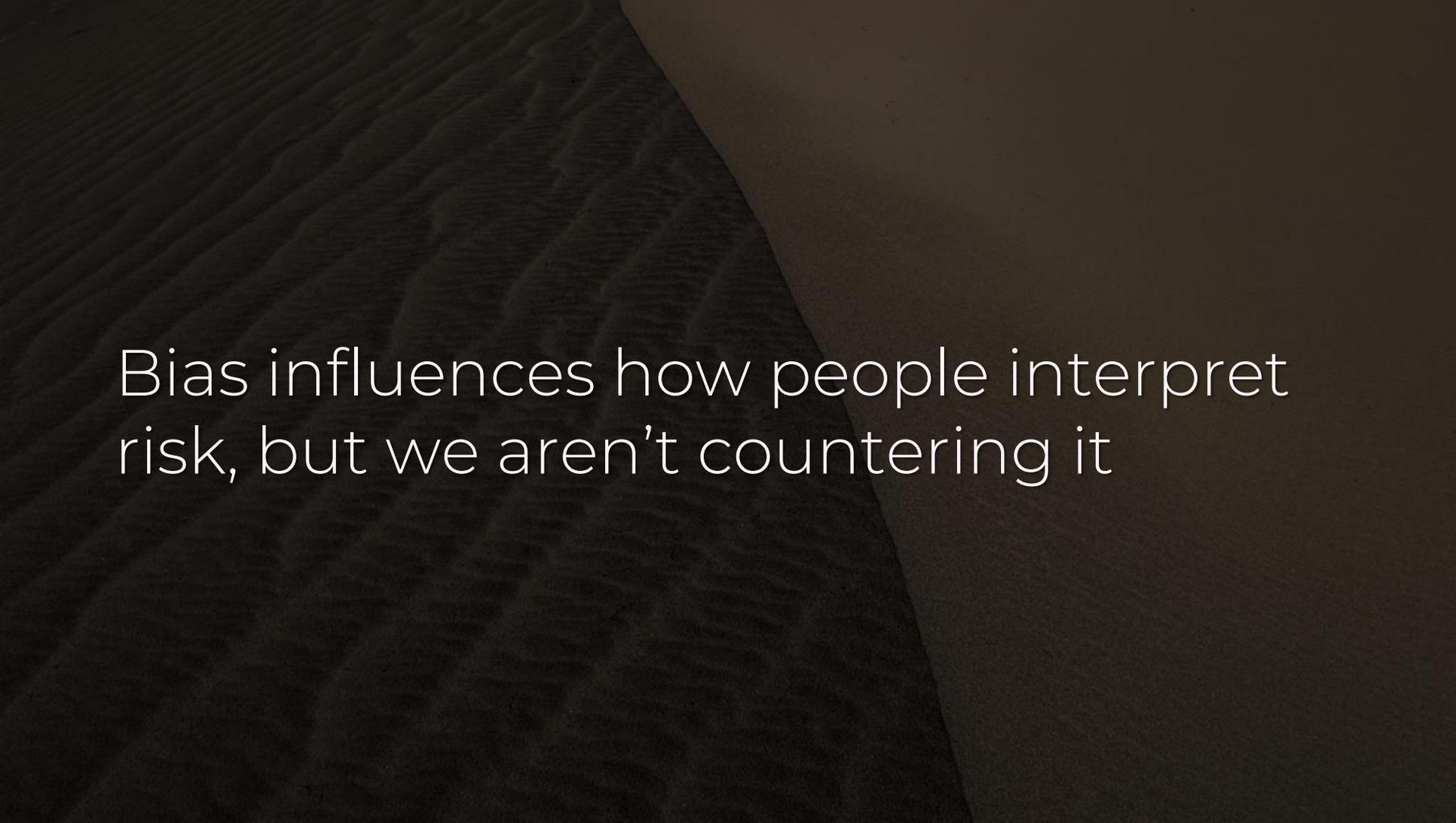
The telephone game of infosec risk
hurts how we decide to mitigate it

A dark, atmospheric landscape with a gnarled tree in the foreground and rocky formations in the background. The scene is dimly lit, suggesting dusk or dawn, with a deep purple and blue sky. The ground is dark and sandy, and the rocky formations are silhouetted against the sky. The overall mood is somber and contemplative.

Full implications of transitions & feedback are not properly uncovered

The background of the image is a close-up photograph of parched, cracked earth. The soil is a dark, muted brown color, and the cracks are deep and irregular, forming a complex, web-like pattern across the entire frame. The lighting is somewhat dim, emphasizing the texture and the desolation of the scene.

Uncertainty is seen as a threat, drying
up our range of potential responses



Bias influences how people interpret risk, but we aren't countering it

How can we avoid sinking & ensure infosec risk is properly considered?



- 
1. Understanding transitions
 2. Uncertainty management
 3. Communicating risk

A landscape photograph of a desert. In the foreground, there are several tall, thin, columnar cacti (cholla) growing on a rocky, brownish slope. The middle ground shows a large, flat, light-colored area that appears to be a salt flat or a dry lake bed, extending towards a dark, distant horizon. The sky is a deep, dark blue, suggesting dusk or dawn. The overall scene is desolate and expansive.

Understanding Transitions

What is the riskiness of implementing a mitigation?

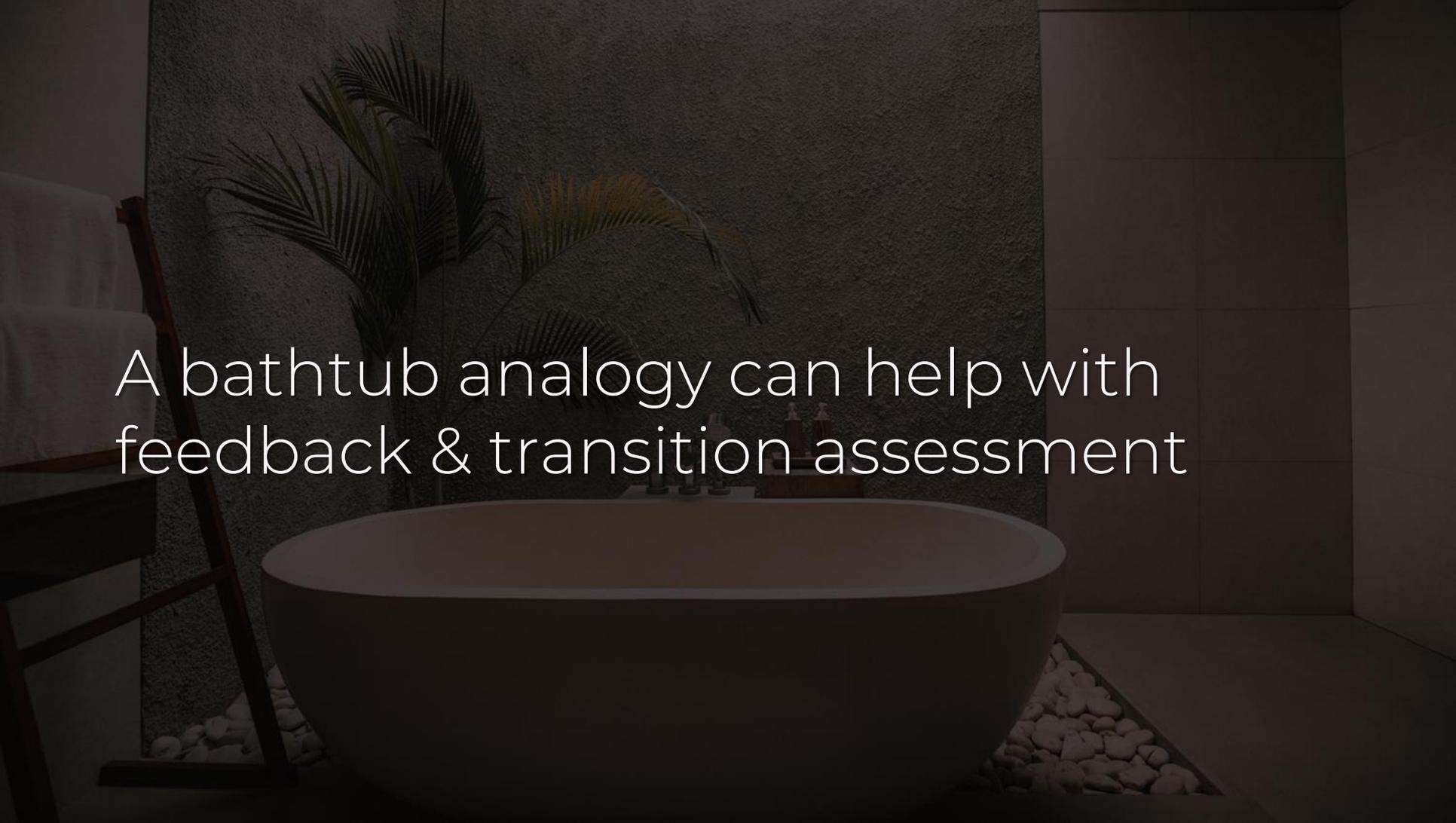


Adaptation Deficit – gap between
current status & goal implementation

ZTN takes years to fully deploy; are transition costs in your risk model?

Transition costs don't justify inaction,
but you do need to quantify them

Ignoring Adaptation Deficits creates a false sense of resolution



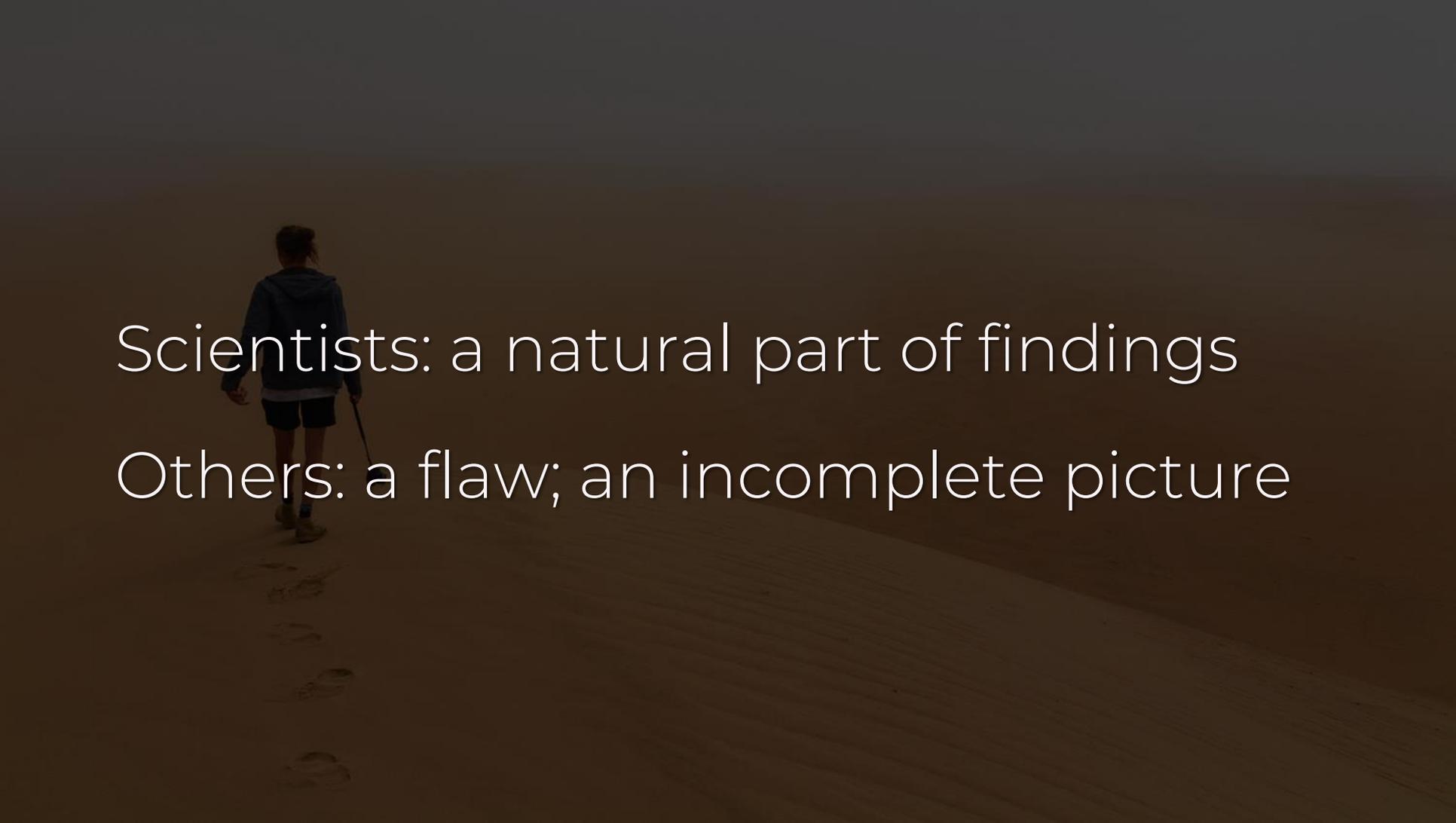
A bathtub analogy can help with
feedback & transition assessment

The “Cyber Tub” – the infosec version
of the bathtub analogy



Uncertainty Management

What do we mean by uncertainty?

A person is walking away from the camera on a sandy beach. They are wearing a blue hoodie and dark shorts. The person is leaving a trail of footprints in the sand behind them. The background is a vast, flat expanse of sand meeting a dark, overcast sky.

Scientists: a natural part of findings

Others: a flaw; an incomplete picture

High uncertainty can encourage a
“wait & see” approach for policy

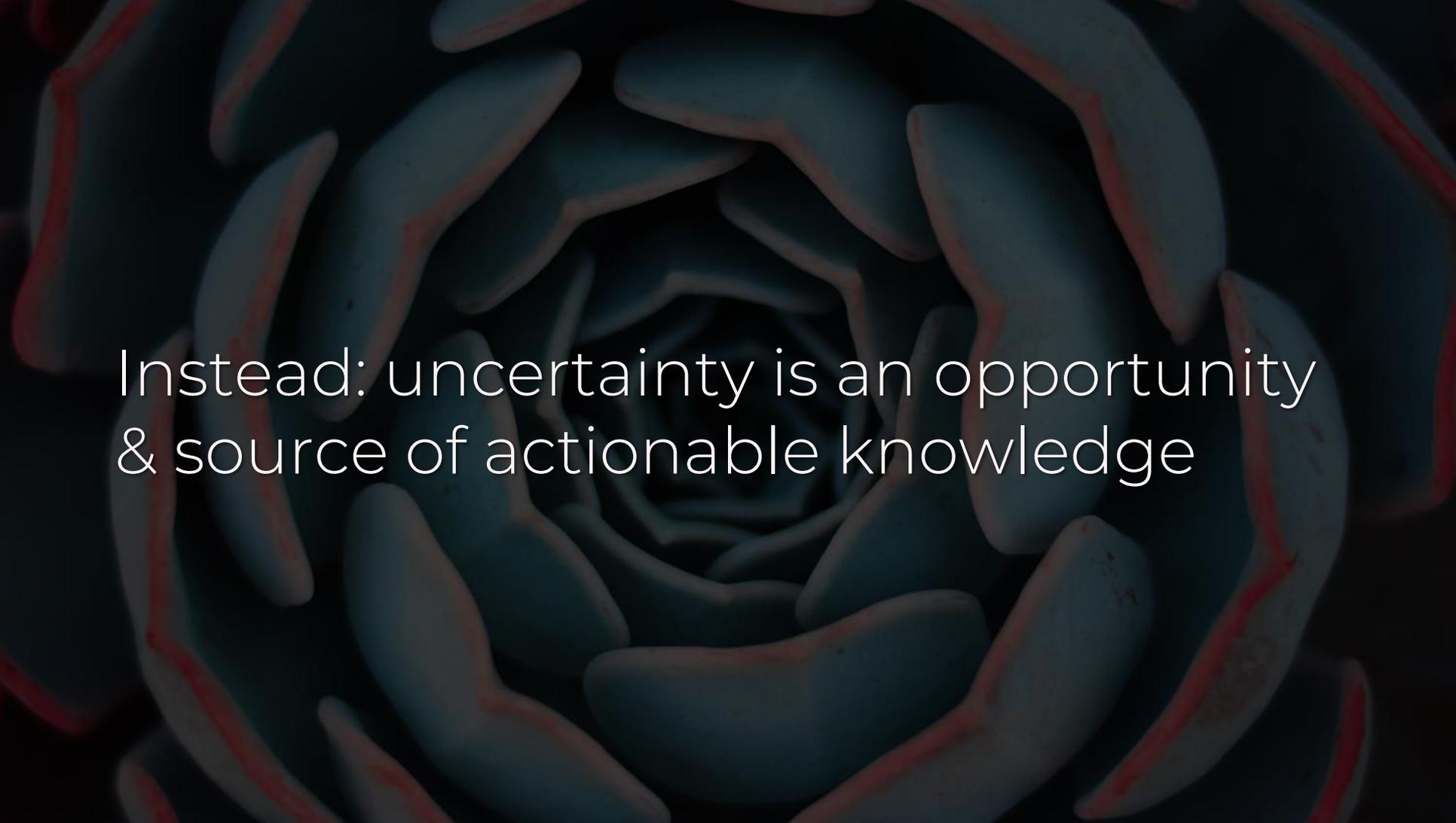
“Wait & see” means the problem worsens & mitigation is too late

Action today can help lessen future uncertainty by creating data points

A field of tall, thin cacti, possibly cholla, stands against a dark, overcast sky. The cacti are densely packed and reach varying heights, creating a textured, vertical pattern. The overall tone is somber and atmospheric.

Mistake: trying to reduce uncertainty
to appease policy makers

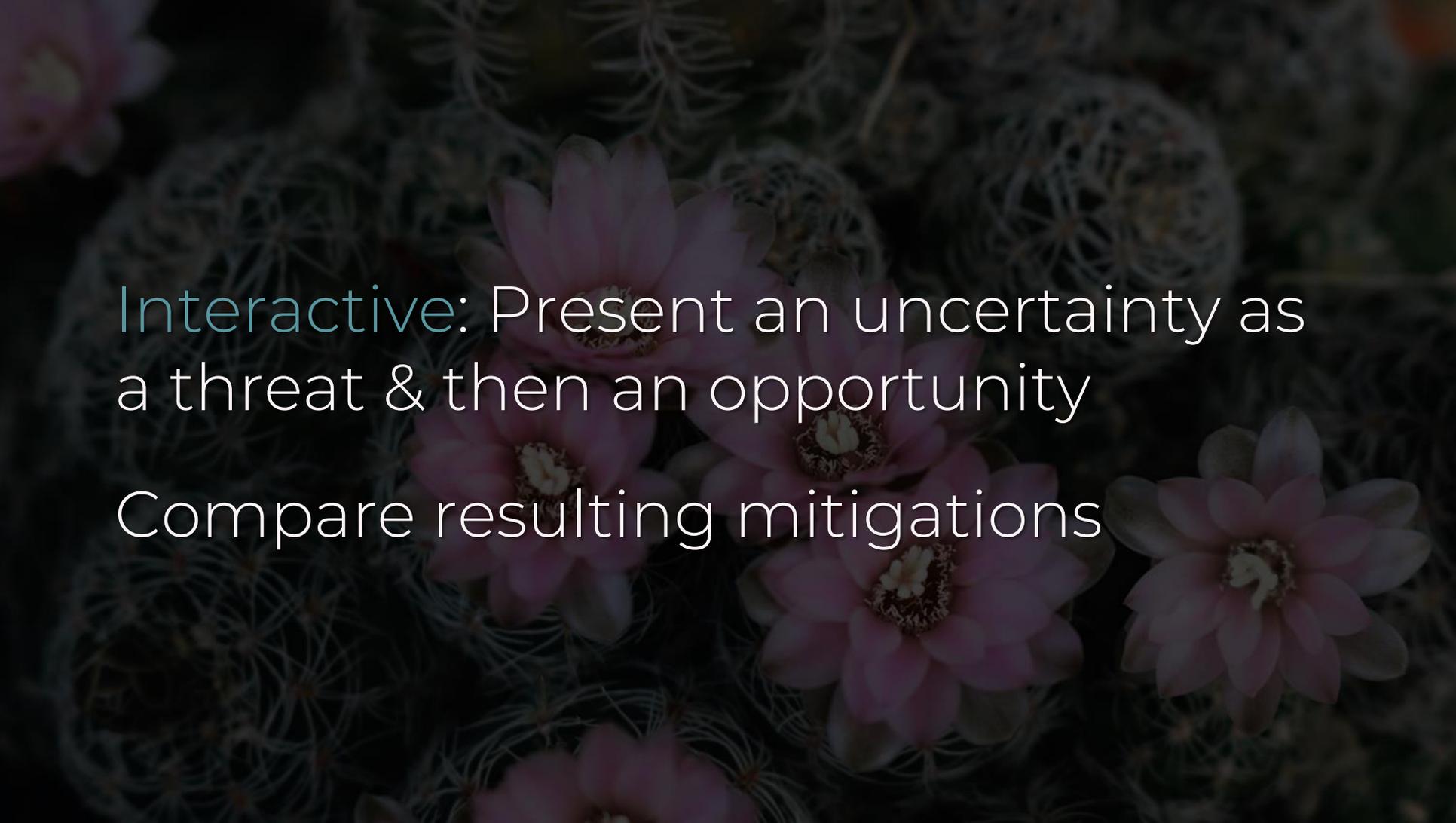
Risk people should craft the narrative
– it's not a threat, nor a call to inaction



Instead: uncertainty is an opportunity
& source of actionable knowledge

“Web app can be taken offline” vs.

“Uncertainty about app availability”

The background features several pink lotus flowers in various stages of bloom, set against a dark, almost black background. A delicate, white lace-like pattern is overlaid on the image, creating a textured, intricate effect. The text is centered and reads:

Interactive: Present an uncertainty as
a threat & then an opportunity
Compare resulting mitigations

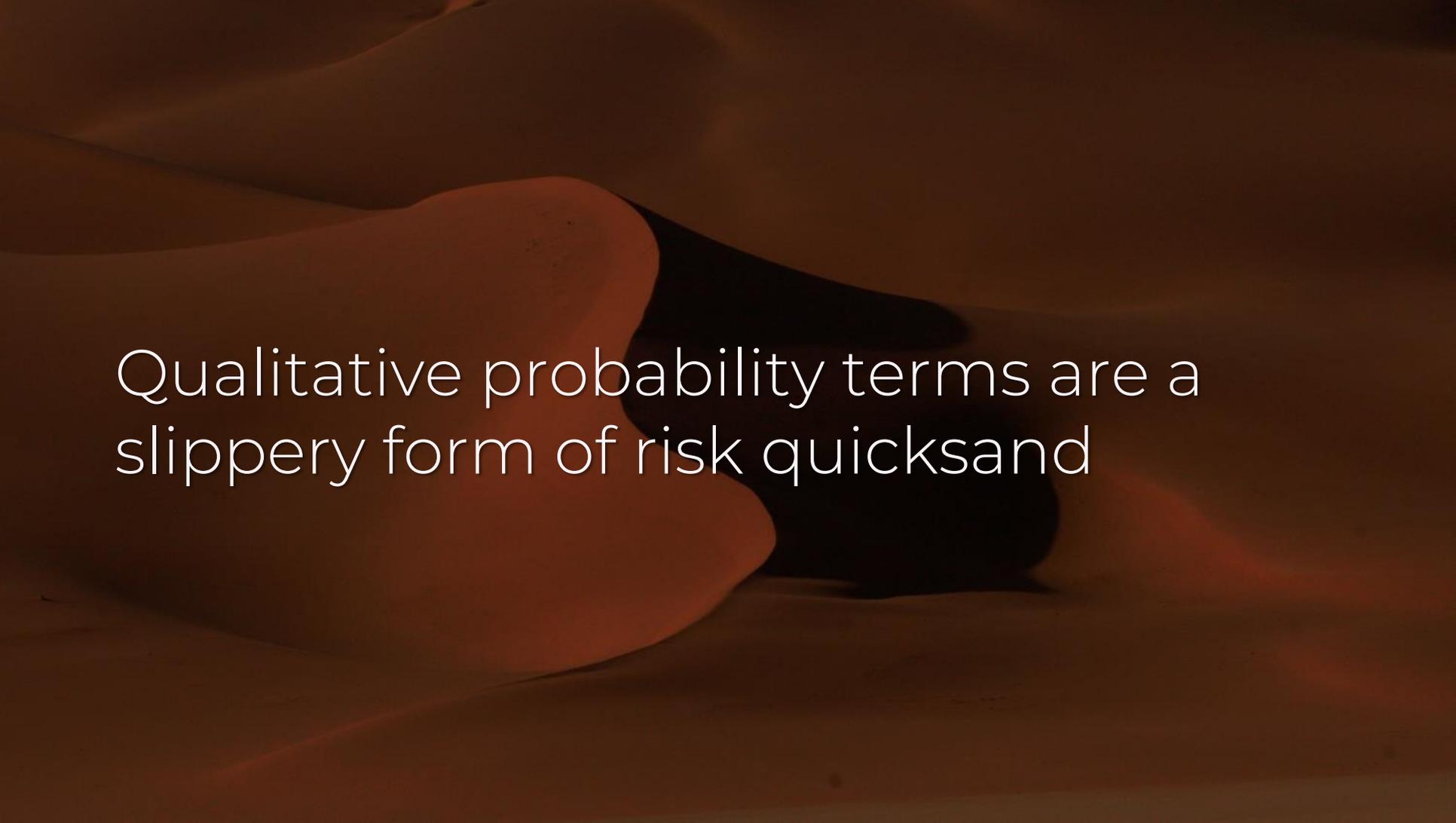
A dark, leafless tree stands in the center of the frame, its gnarled branches reaching upwards. Several birds are perched on the branches, their forms silhouetted against the sky. The background is a vast, open landscape under a cloudy, overcast sky. The overall tone is somber and atmospheric.

Present a judgment on likelihood,
otherwise non-experts will

Probability density functions are your friends, full ranges are not

50% chance of 20mm user records &
90% chance of 5mm user records
vs. 100k – 50mm user records at risk

Science for policy = policymakers
need expert judgement, even if it has
a considerable degree of subjectivity

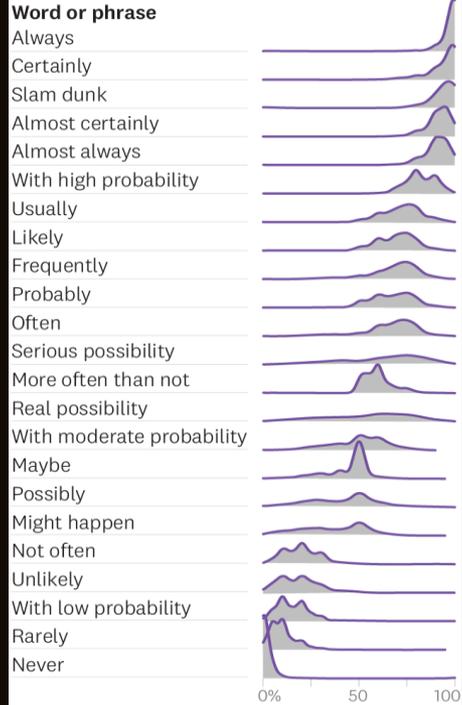
A close-up photograph of a hand holding a black pen, poised to write on a document. The background is a warm, brownish-orange color, possibly the cover of a book or a folder. The lighting is soft, highlighting the texture of the skin and the smooth surface of the pen.

Qualitative probability terms are a
slippery form of risk quicksand

How People Interpret Probabilistic Words

"Always" doesn't always mean always.

Distribution of responses according to respondents' estimate of likelihood



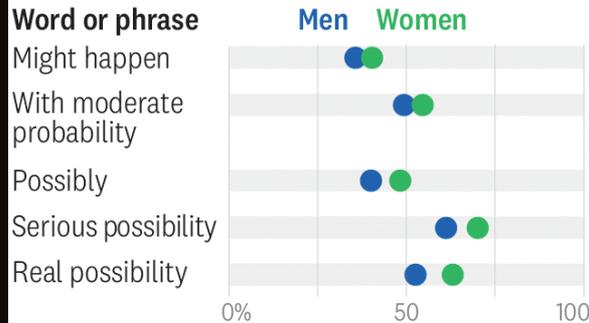
Source: Andrew Mauboussin and Michael J. Mauboussin



What's a "Real Possibility"? Men and Women Answer Slightly Differently

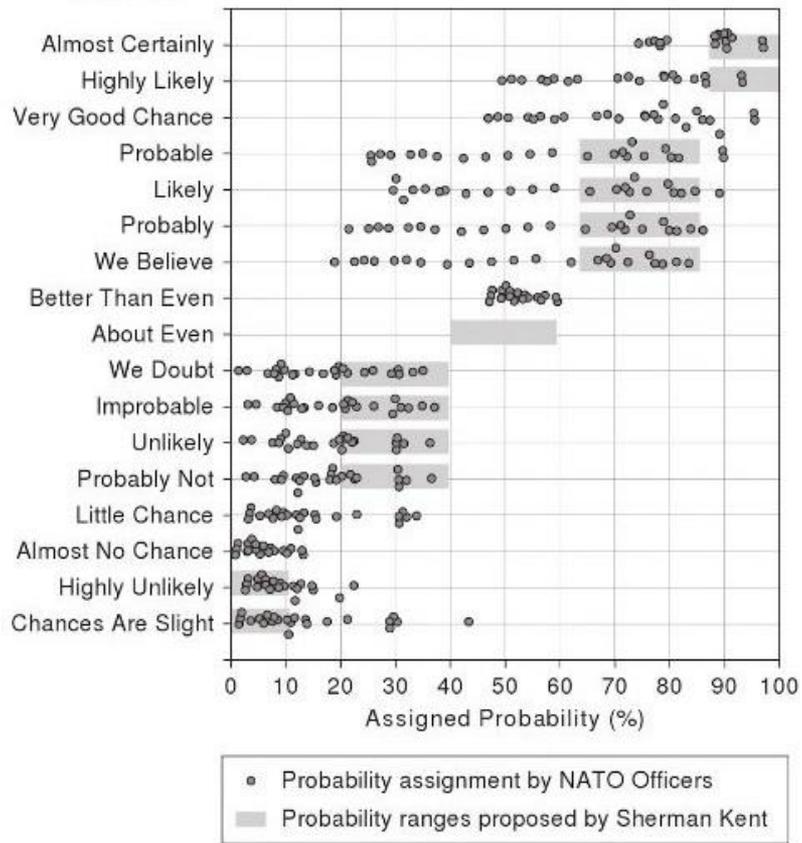
Women are more likely than men to interpret certain probabilistic words or phrases positively (i.e., as indicating that an event will occur).

Average of responses according to respondents' estimate of likelihood



Source: Andrew Mauboussin and Michael J. Mauboussin

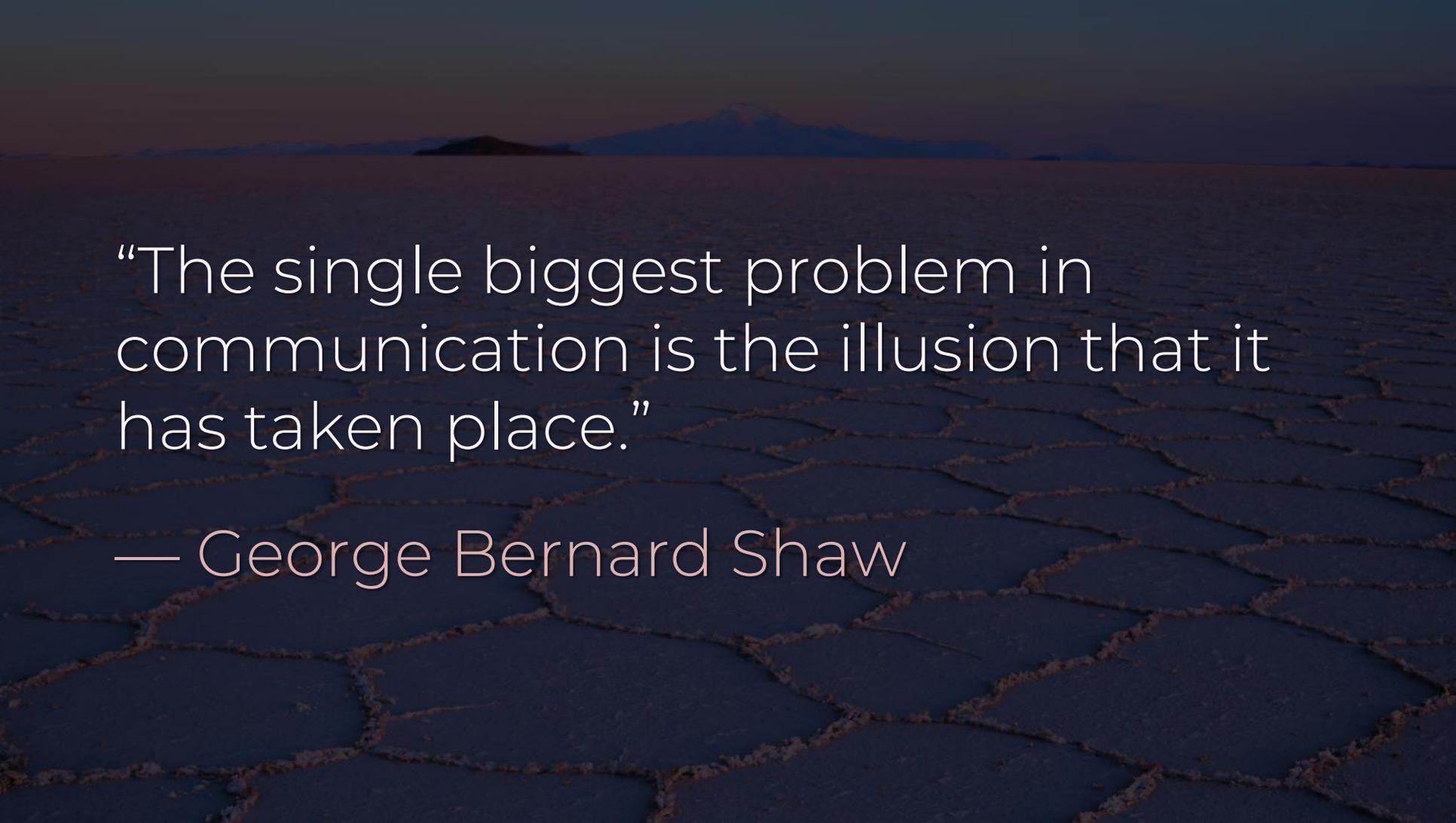




Use percentages & PDFs when possible to avoid misinterpretation



Communicating Risk



“The single biggest problem in communication is the illusion that it has taken place.”

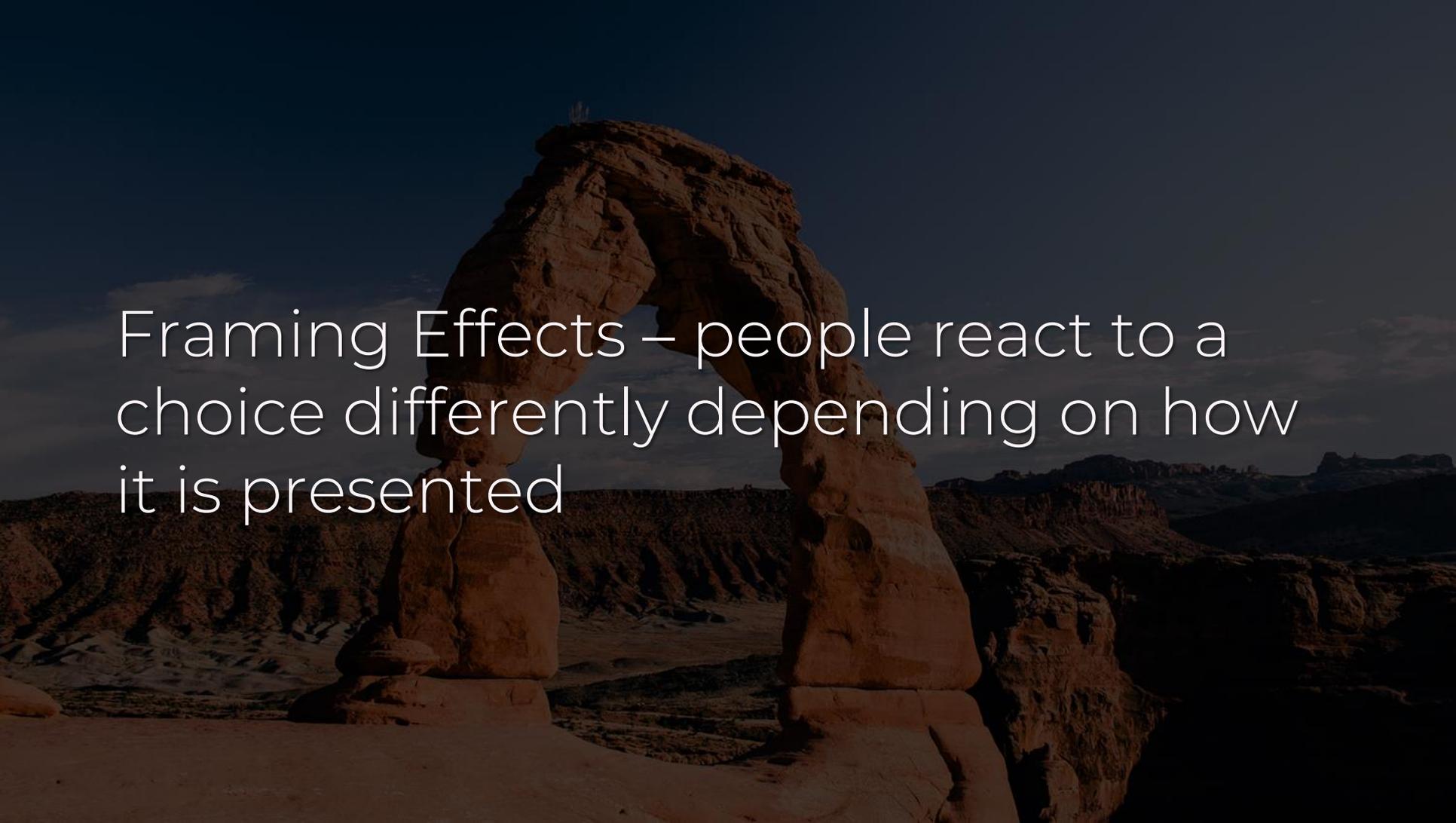
— George Bernard Shaw

Risk is not an abstract concept –
attitudes & tolerance to risk by
decision makers influence it



“Science as policy” – provide info in order of its impact on decisions

Consider biases – & gently remind others when they succumb to them

A photograph of a natural rock arch in a desert landscape. The arch is made of reddish-brown sandstone and stands prominently in the foreground. The background shows a vast, arid valley with rolling hills and a clear sky. The lighting is soft, suggesting late afternoon or early morning.

Framing Effects – people react to a choice differently depending on how it is presented

Portray the risk in both past and present terms

“We’ll have less client confidence than in the past” / “Our ability to attract new clients will be eroded”

Availability bias – how easily you recall an event affects your perception

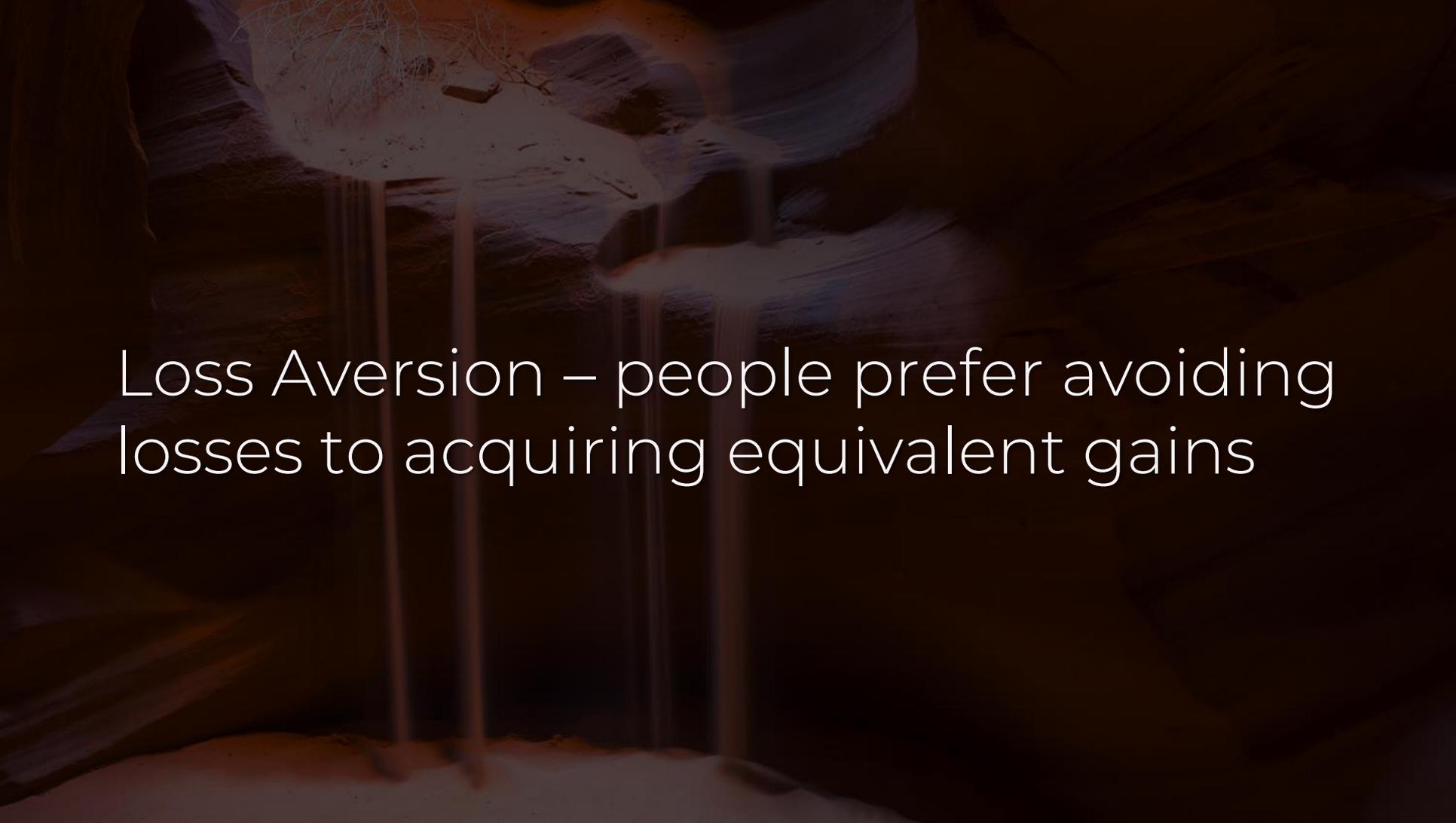
Dramatic headlines will be top of mind & influence risk perception

Counter: anticipate what might be top of mind or not & come with data

Status quo bias – moving away from current plans can be seen as failure

“We can create our own canaries!” but then you never do, wasting more time than it would cost to buy & deploy

Counter: delay decision time &
present a narrow range of options



Loss Aversion – people prefer avoiding losses to acquiring equivalent gains

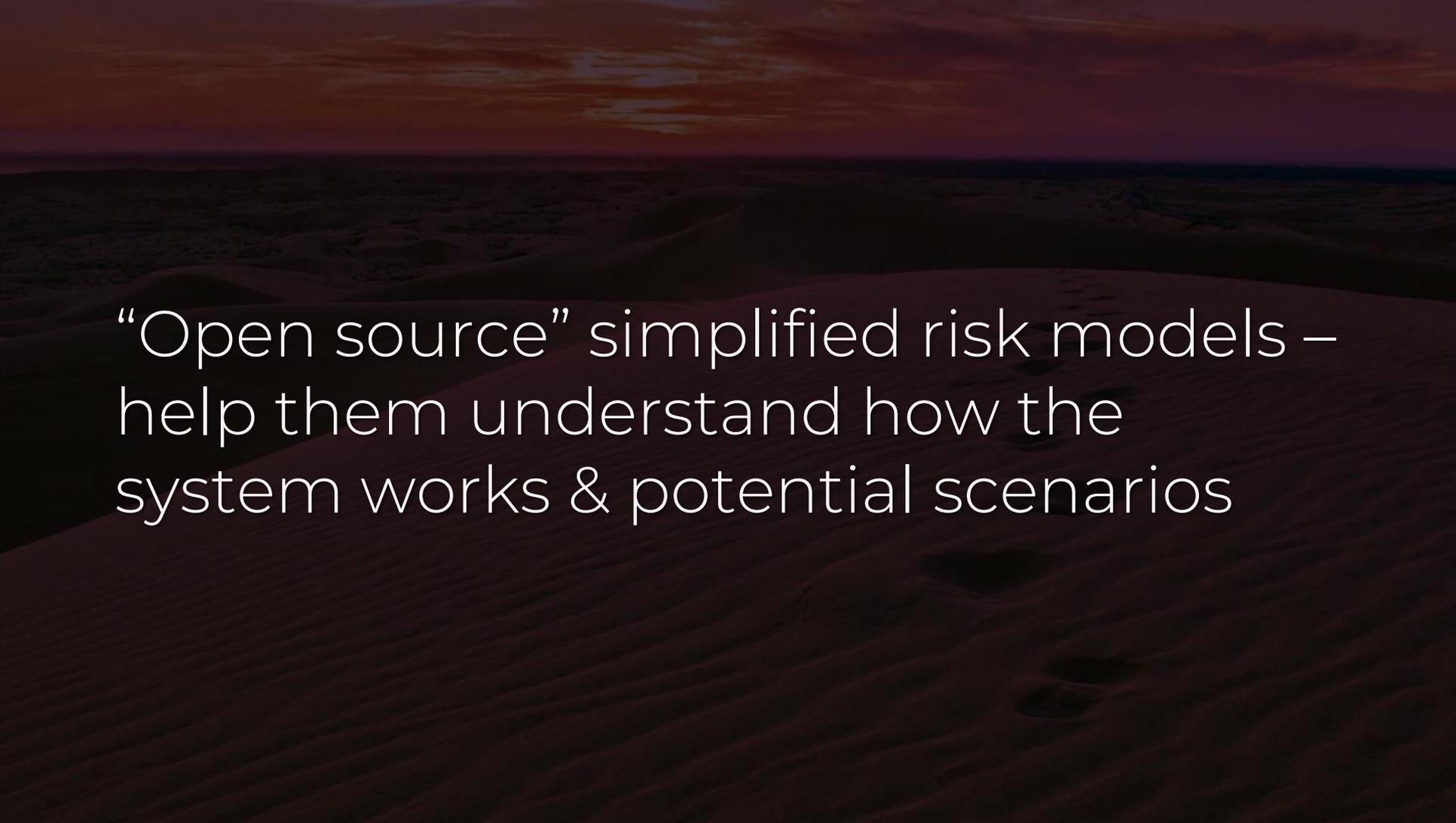
Counter: Use the endowment effect
to emphasize irreversible loss

“We will lose our software velocity, with a 90% chance of slowing our time to deploy by 33% if ___ happens.”

A group of meerkats is shown in a desert environment, with one meerkat prominently in the center foreground looking towards the camera. The background consists of dry, brownish vegetation and a clear sky. The overall lighting is somewhat dim, suggesting dusk or dawn. The text is overlaid in white, sans-serif font.

Scientists learn through iterative,
interactive learning processes

But we tell results to others with
presentations, facts, & figures



“Open source” simplified risk models –
help them understand how the
system works & potential scenarios

Create your own “Cyber Tub,” or use straightforward causal diagrams

Choose the *right* data – aim for the highest impact vs. completion

Conclusion

A wide-angle photograph of a desert landscape at sunset. The sky is a mix of deep purple, blue, and orange, with wispy clouds. In the foreground, there's a large, rounded rock formation with distinct horizontal layers. In the middle ground, several flat-topped mesas and buttes are visible, including a prominent one on the right. The ground is dry and rocky with sparse, low-lying vegetation.

An aerial photograph of a desert landscape featuring a winding road that cuts through sand dunes. The road is dark and has yellow and white lane markings. The dunes are light-colored and have a rippled texture. The overall scene is captured in a slightly desaturated, dark tone.

Understand & communicate
feedback processes & transition costs



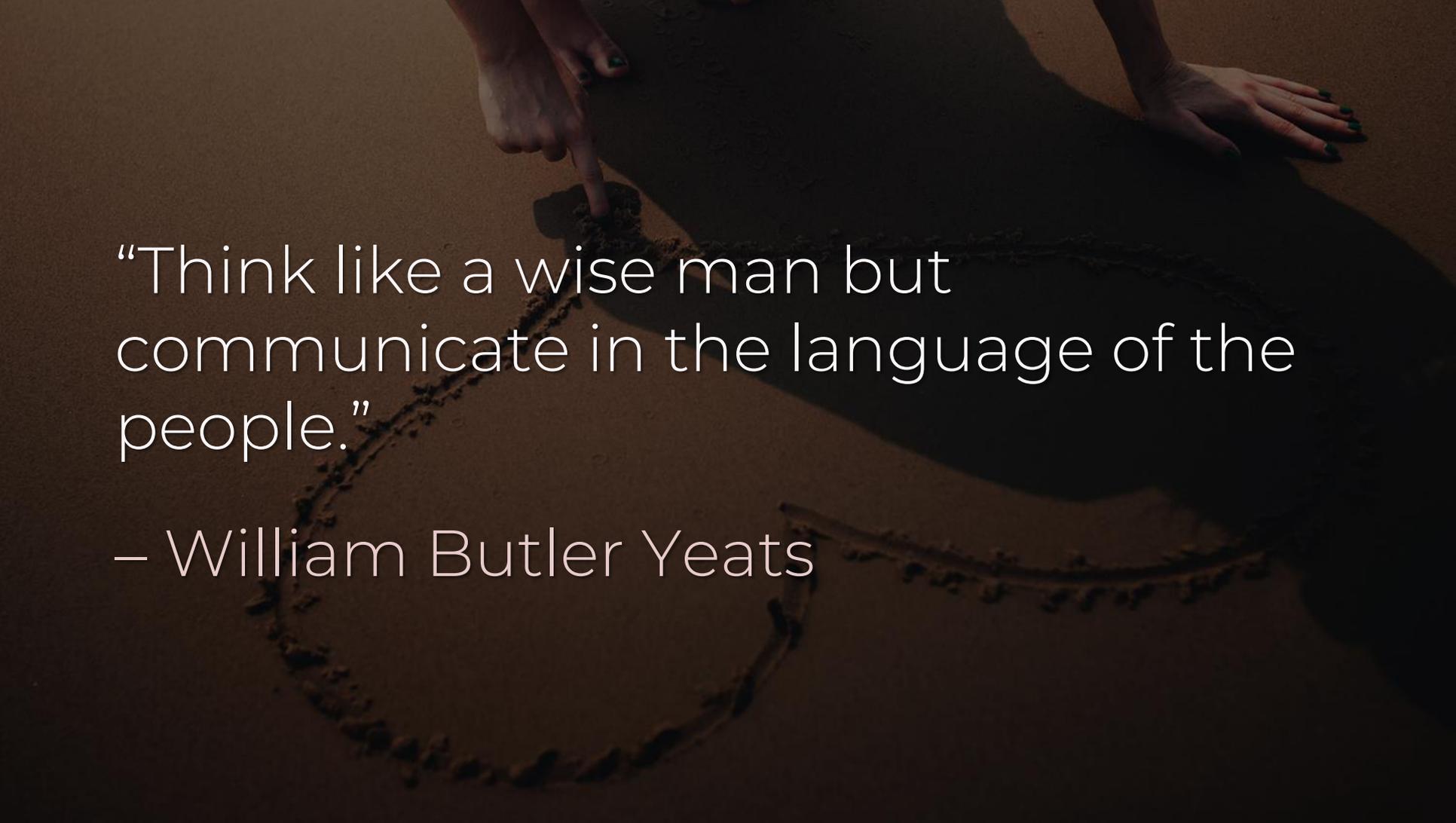
Embrace uncertainty as an
opportunity, not a threat

A photograph of a camel in a desert landscape, with the text overlaid on the image. The camel is shown in profile, facing right, with its head tilted upwards. The background is a vast, flat desert under a clear sky. The text is white and centered on the camel's body.

Communicate through a “science for policy” lens & give your expert stance



Anticipate bias & frame data so
decision makers are empowered

A close-up, top-down view of a person's hands drawing a large heart shape on a sandy beach. The person's right hand is actively drawing the heart's outline with their index finger, while their left hand rests on the sand nearby. The sand is a warm, golden-brown color, and the lighting is soft, creating a gentle glow around the hands and the heart. The heart is drawn with a slightly irregular, hand-drawn quality, and its outline is composed of small, dark grains of sand.

“Think like a wise man but
communicate in the language of the
people.”

– William Butler Yeats



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