

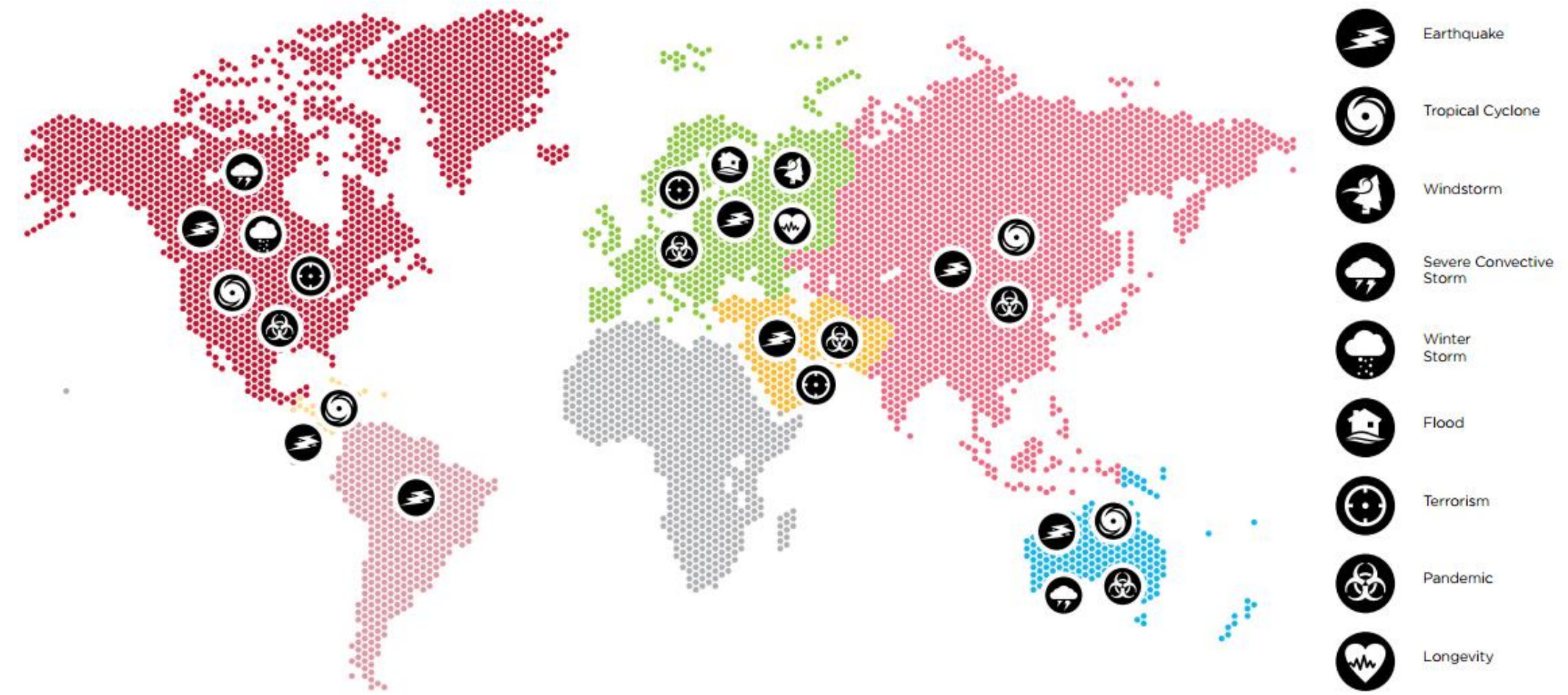


INNOVATION IN ENVIRONMENTAL STRESS TESTING

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ABOUT RMS



- Work with most major insurance and reinsurance companies across the **globe**
- Best known for our **catastrophe risk** models for property and human impact of environmental and man-made hazards
- **\$2 trillion** worth of insurance and capital markets transactions based on RMS Risk Models
- Contributions to scientific literature and policy around **environmental risk**, including climate change

HISTORICAL EXPERIENCE ALONE IS RARELY SUITABLE WHEN MODELLING THE RISK OF LONG-TAILED EVENTS



“We were seeing things that were 25-standard deviation moves, several days in a row”

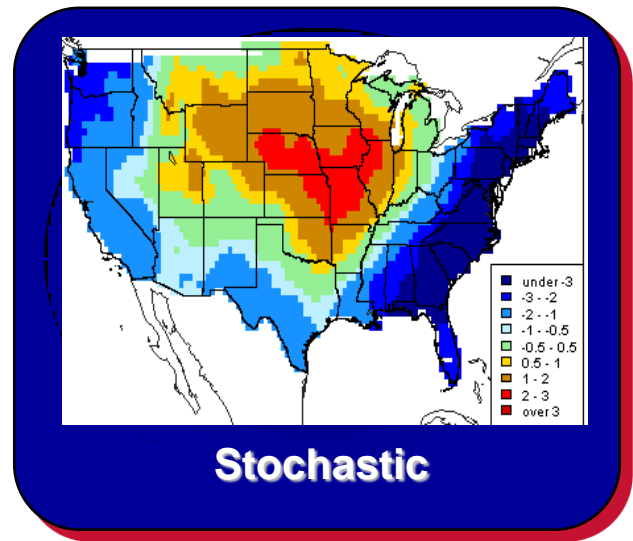
David Viniar, CFO,
Goldman Sachs

2 SD = 1 in 44 days

25 SD = 1 in 1.3×10^{135} yrs *

* Age of universe = 1.4×10^9 yrs

CAT MODELS: THE INSURANCE INDUSTRY STANDARD FOR ESTIMATING THE DISTRIBUTION OF IMPACT OF EXTREME EVENTS



Stochastic

Probabilistic model of scientifically credible scenarios



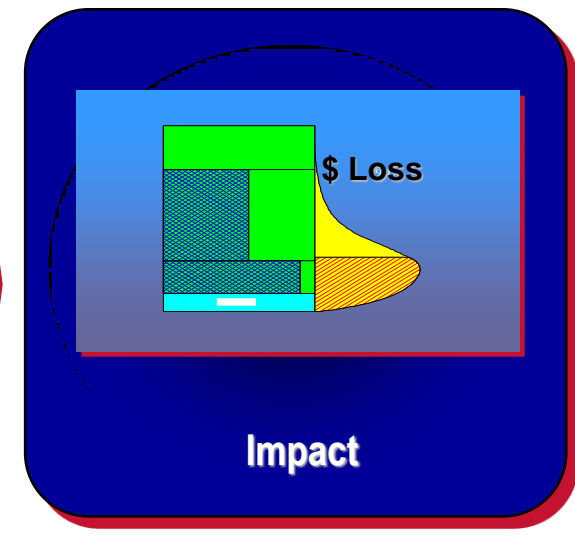
Hazard

Detailed data at relevant geographic scale



Vulnerability

Engineering and network models yield damage



Impact

Overall impact of peril on stakeholder

GIZ/NCD/RMS DROUGHT STRESS TESTING PROJECT

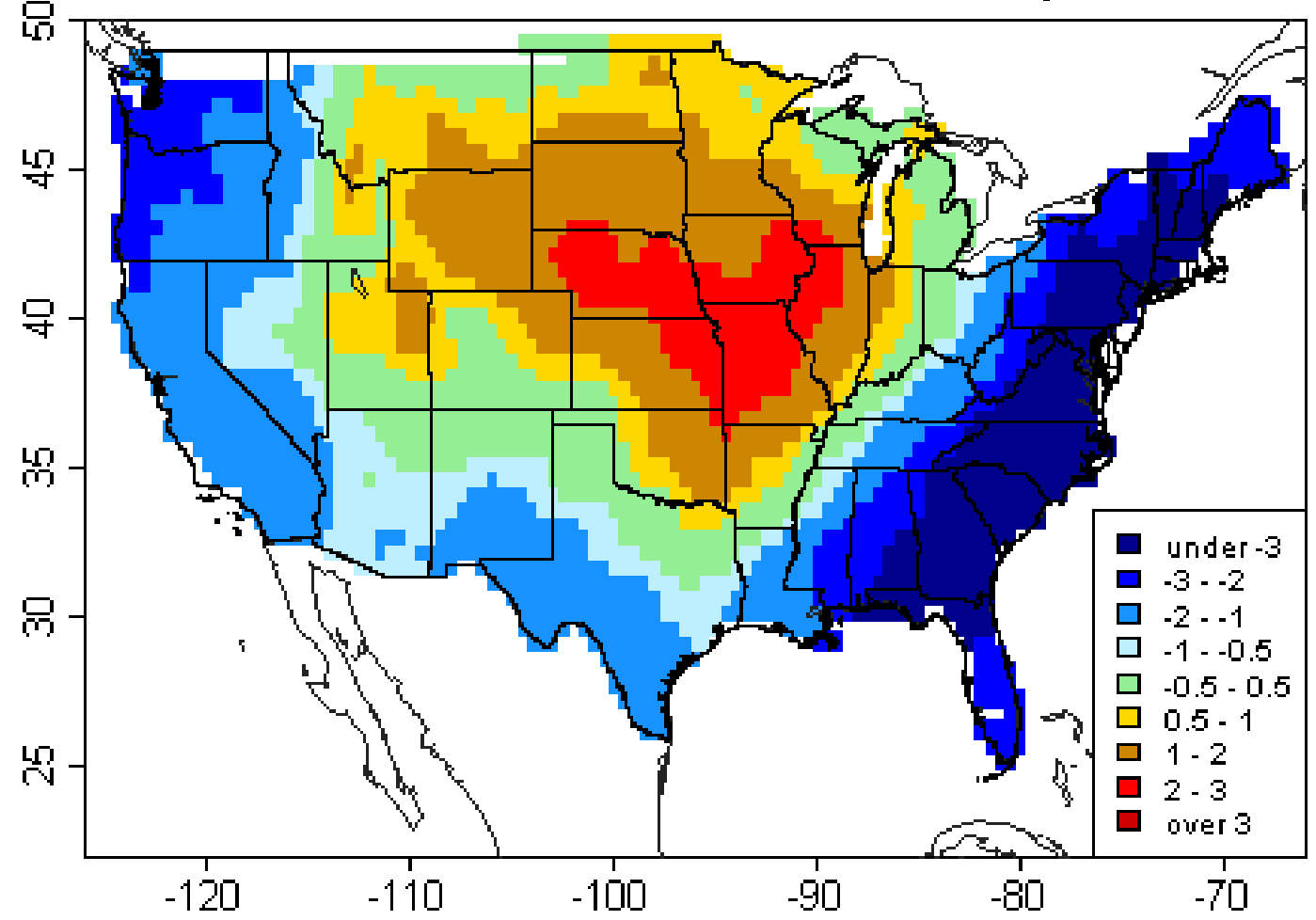
Objective: Develop and test tool to assess risks from environmental shocks to corporate loan portfolios.

1. Develop 2-3 probabilistic drought scenarios in China, India, Brazil, Mexico and the U.S. to model potential impacts on water availability between 2017 and 2021.
2. Develop a model to estimate the effects of drought on up to 8-12 industries as well as potential macroeconomic implications.
3. Deliver modelling tool to link drought impacts to drivers of corporate credit quality to inform banks' internal stress testing models.

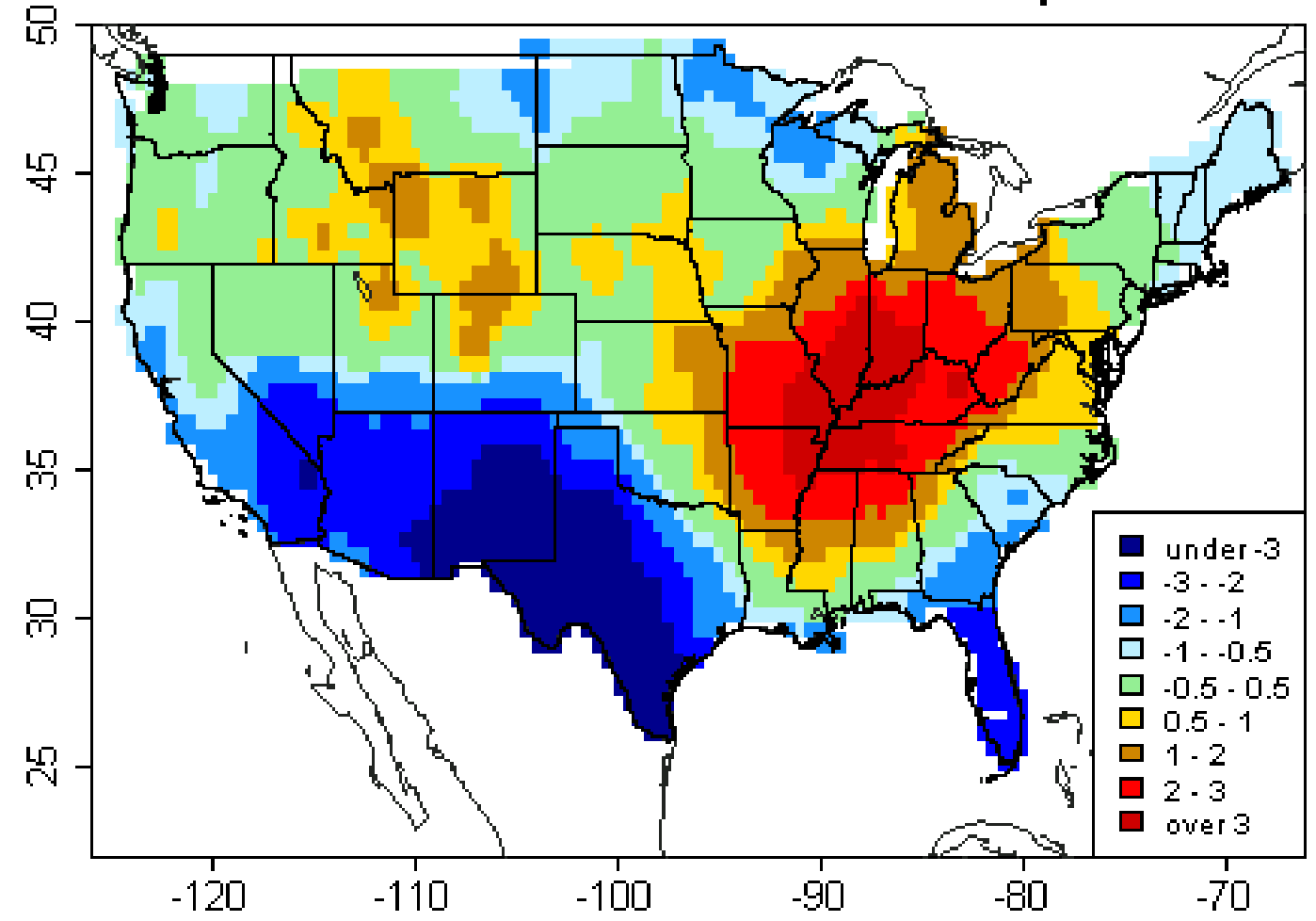


SIMULATE FUTURE POSSIBLE DROUGHTS AT VARIOUS PERCENTILES

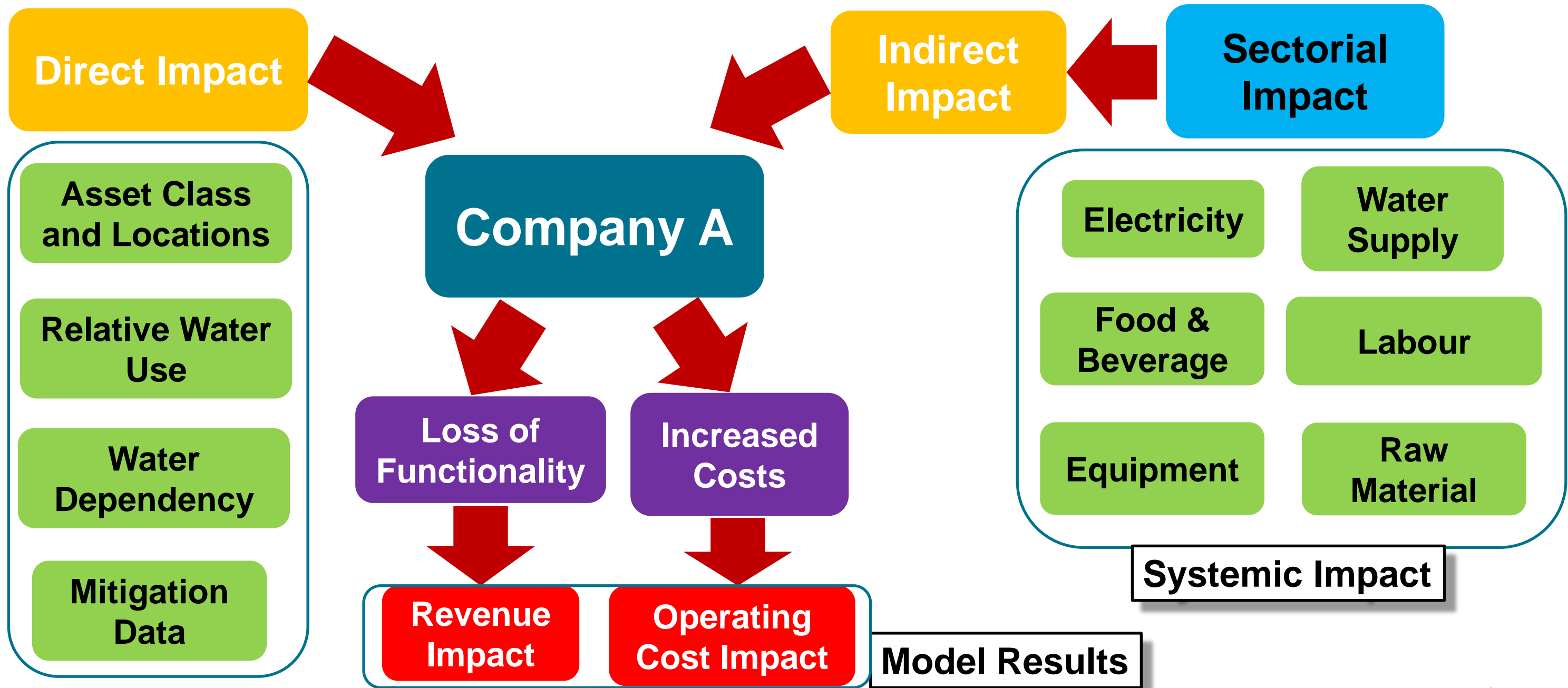
DCA mode 2: VAR=5.4%, TotPrecip=-13



DCA mode 3: VAR=6.9%, TotPrecip=-5.7

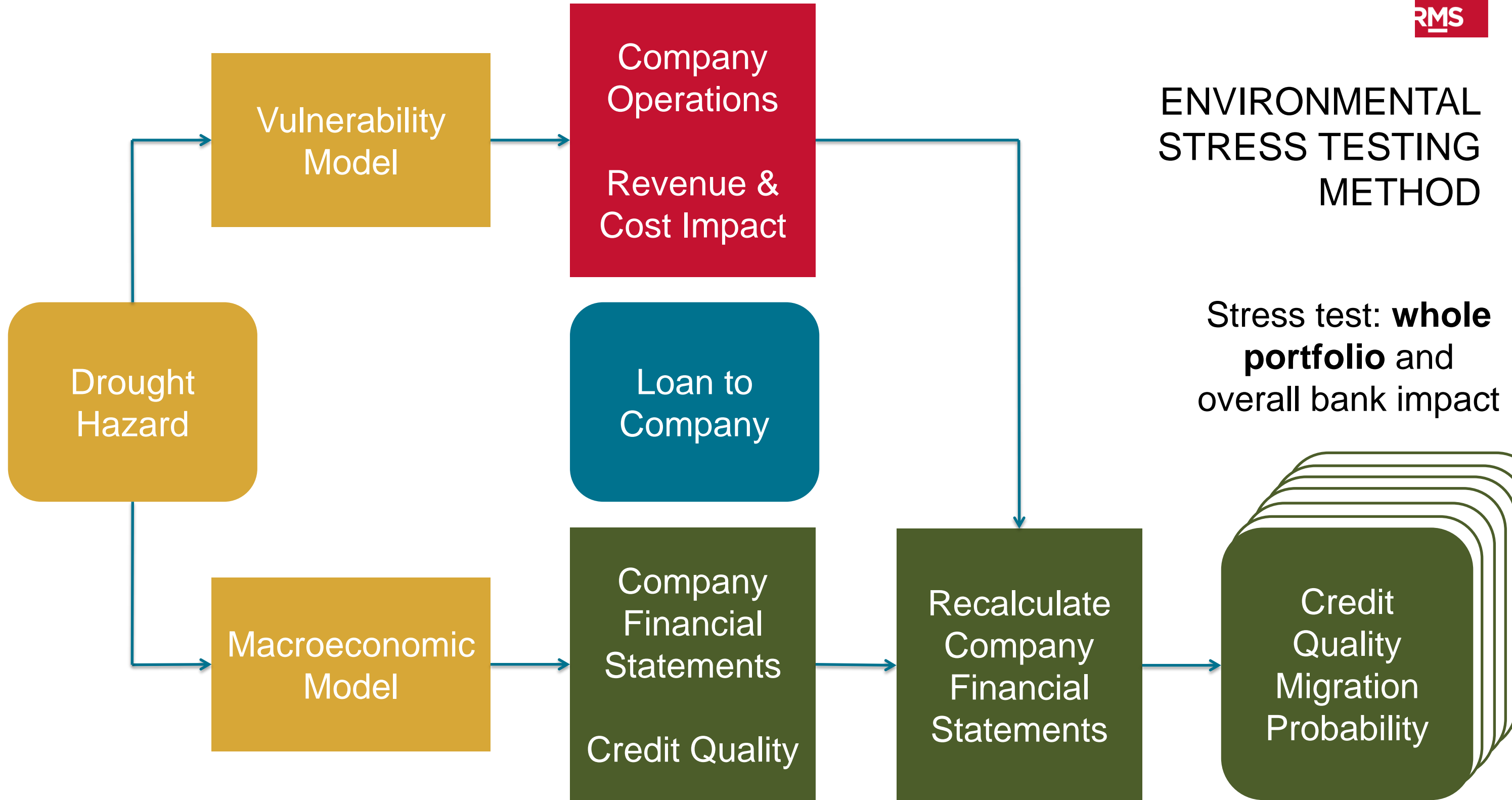


CALCULATE THE IMPACT OF A DROUGHT ON A BUSINESS / LOAN



ENVIRONMENTAL STRESS TESTING METHOD

Stress test: **whole portfolio** and overall bank impact



PARTNER BANKS ACROSS THE GLOBE ARE ACTIVELY CONTRIBUTING TO THIS WORK

