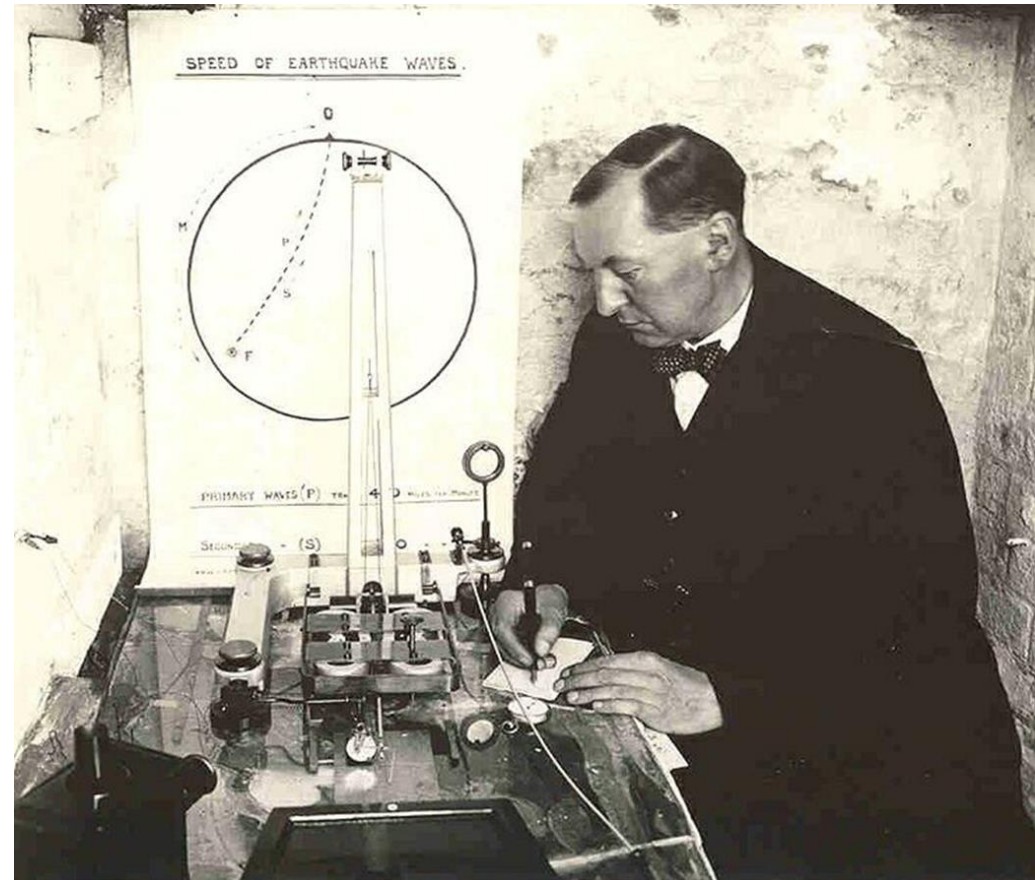


Evolution of Catastrophe Modeling

*Roger Grenier, Ph.D.
Senior Vice President,
Resilience Practice Lead*



In the beginning, there was only data



Underwriter Crunching the Numbers before AIR



Hewlett Packard HP-97

- Magnetic card to record data
- 26 data storage registers
- 224 steps of program memory
- Printer to record results

The First AIR Models Ran on IBM Mainframes



How Client Data Was Shipped and Stored



First “Powerful” Computer In House



Sun SPARCserver

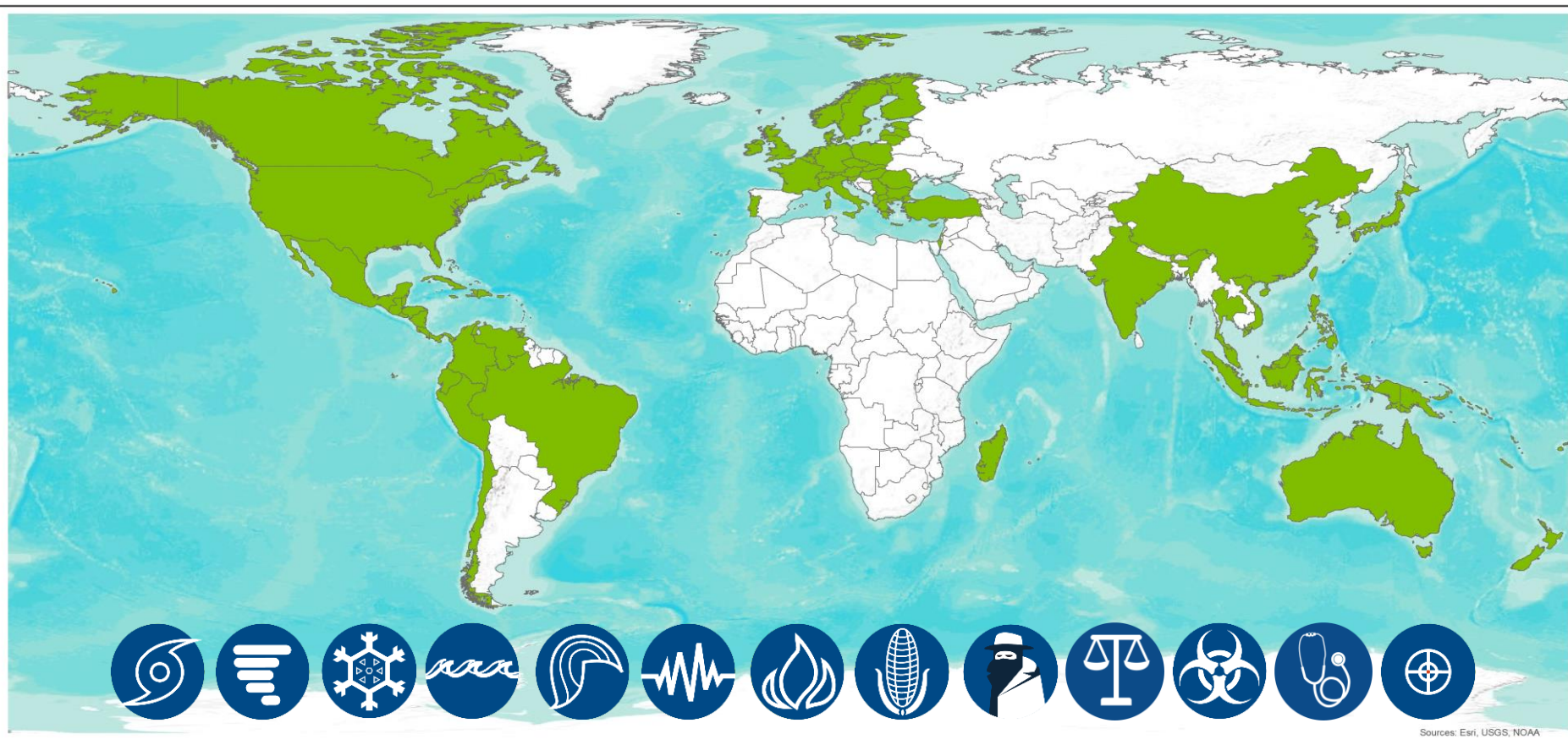
RAM: 32 Megabytes

Hard Drive: 1 Gigabyte

Price: \$57,000

Weight: 250 lbs

Today: Extreme Event Models in 110+ Countries



Extreme Event Portfolio Beyond Natural Catastrophes

**Natural
Catastrophes**

**Crop &
Agriculture**

**Terrorism &
Political Risk**

**Life &
Health**

**Casualty &
Cyber**



AIR Models Support Multiple Asset Classes



Modeling Continues to Evolve in Several Streams



Science



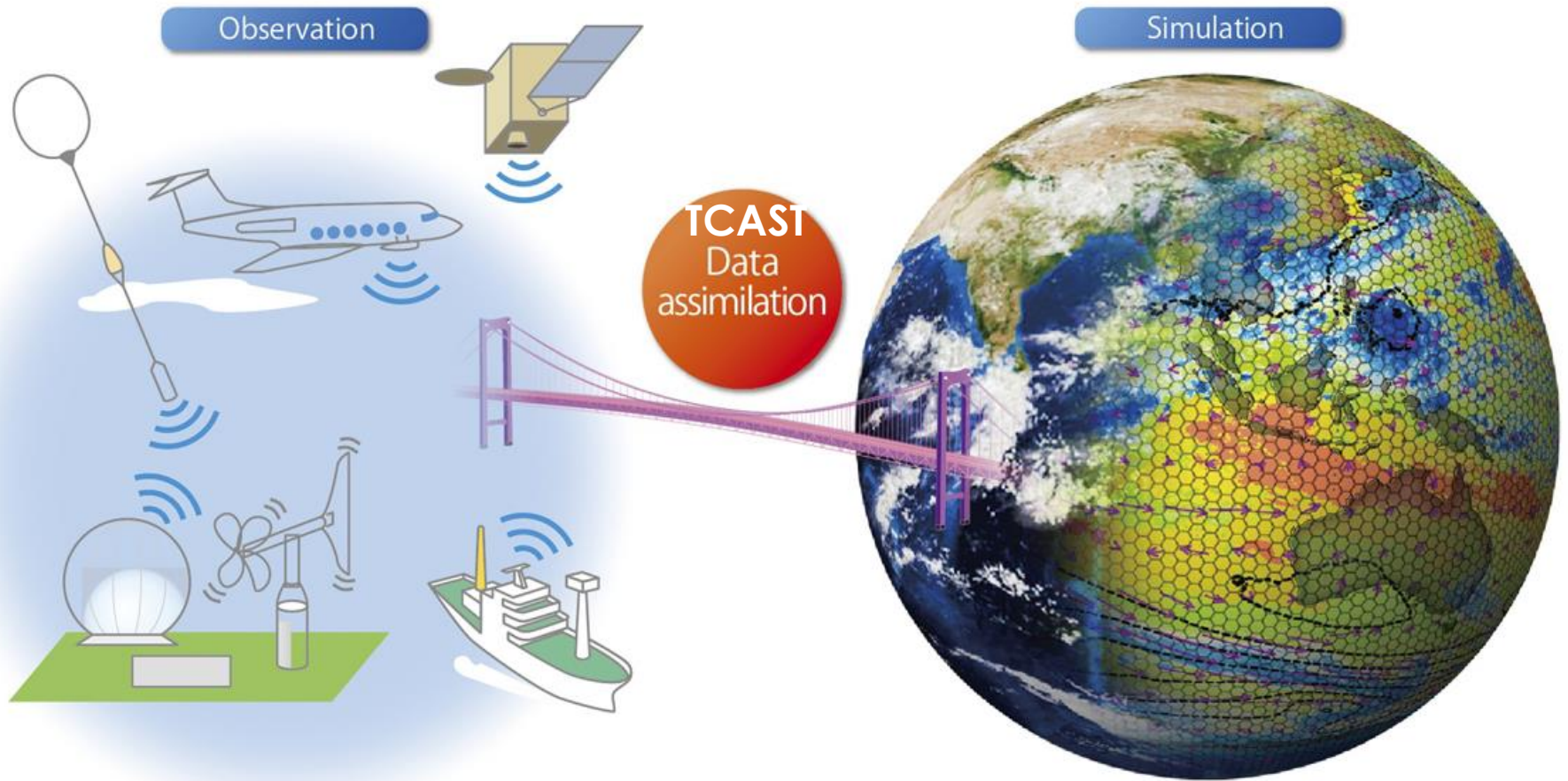
Data



Technology

Engineering

Data Acquisition and Assimilation Drives Innovation



Exposure Information is Increasing in Quantity and Detail



Roof shape, roof cover material, square footage

Chimneys, skylights, dormers, ...

Walls, doors, windows, siding, ...

Tree canopies

Swimming pools

and many more ...



A New Generation of Risks Is Emerging

Digitization and
Globalization-Driven



Man-Made

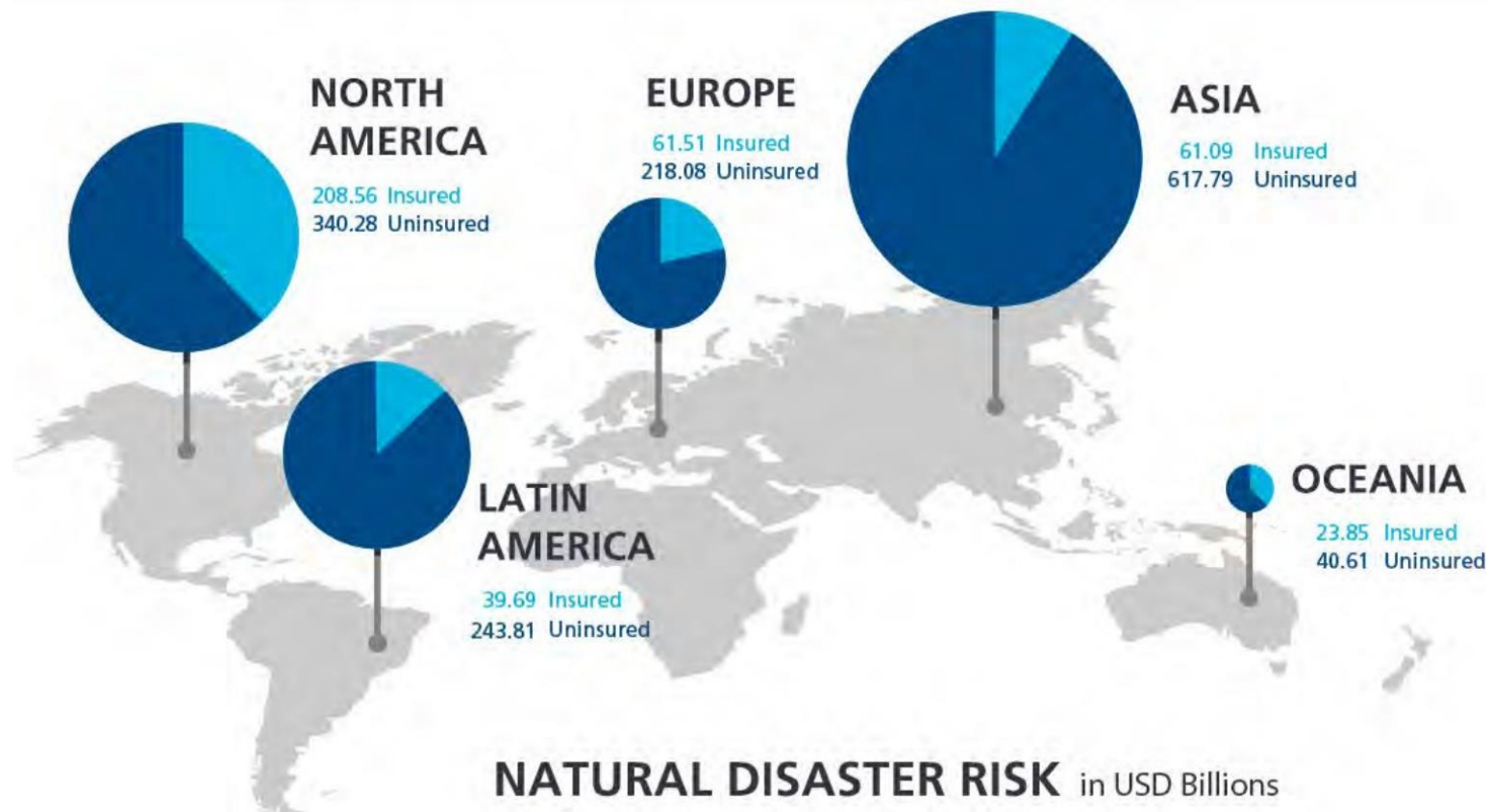


Dynamic



The Protection Gap Persists

The Protection Gap



NATURAL DISASTER RISK in USD Billions

1% exceedance probability

60-70%

of loss is not insured