Catastrophe Models (and “Cat” Risk)

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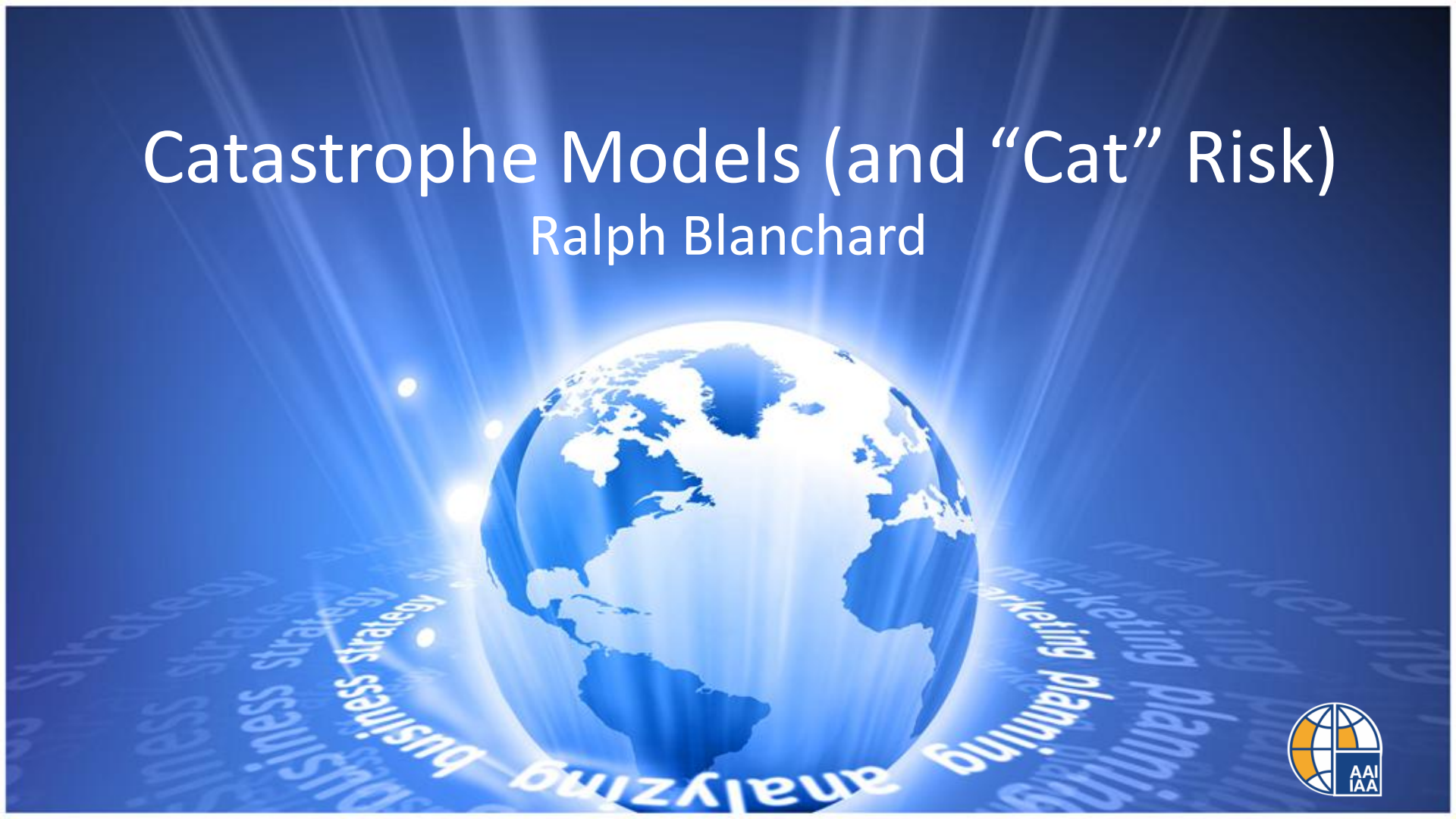

Outline

- What are “cats” (chapter scope)
- Impact of cats
- Current trends
- Quantifying the risk
- Other factors

What are “cats” – chapter scope

- Property events with time limited impact
- This definition/scope excludes
  - Tort events (e.g., mass torts)
  - Biometric events, solar flares, cyber (generally)
  - Longer term trends
- Can be natural (e.g., windstorms, earthquake)
- Can be man-made (e.g., terrorist attack)

Impact of cats

- Property, Life, Health, Business Interruption
- Focus is on immediate impact, not long term
- Societal impact ≠ Insurance impact (take-up rates)
- Insurer solvency impacted by size and concentration
  - Lower the risk by increasing geographic spread
  - Company capacity vs. Industry capacity for a cat
  - Some risks bigger than the industry capacity

Current Trends

- Number and size of events increasing
- Much of this (so far) is due to demographic trends, not weather or other trends
- People and property are moving into harms way

Quantifying the risk

- Large cats are too infrequent to rely just on past experience
- No practical alternative to models
- Rarity of events also means model uncertainty is unavoidable

Cat Model Modules

- Event catalogs *(Physical characteristics, return periods)*
- Intensity formulas *(Physical impact on a location)*
- Damage functions *(Damage caused by that intensity, varying by property exposed – e.g., brick vs. wood)*
- Financial Module *(Claims/losses given exposed property, lives and insurance contract terms. Gross and net)*

Cat Model Data Needs

- Frequency of events
- Physical nature of events
- Physical nature of items exposed to the hazard
- Damage susceptibility given the above

Cat Model Uncertainties

- Frequency of events
  - Return period or even possibility of an event
- Footprint of event
- Damage from an event
- Contract, legal interpretations (in a stressed environment)

Other factors

- Non-modeled items
- Cash flow impacts
  - Models don’t estimate cashflows
  - The bigger the event, the slower the payout
  - Concentrated events overwhelm local resources – extended payouts

Other factors (continued)

- Data quality (including location, building type precision)
- Mitigation impacts/possibilities
  - Building codes
  - Risk-based rates *(incentives/disincentives to avoid areas)*
- Societal Impacts
- Environmental data *(soil characteristics, fault location/stress, floodplain changes)*

Thank you

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