INTEGRATING RISK AND STRATEGY IN INSURANCE

EXTREME WEATHER MANAGEMENT IN THE INSURANCE INDUSTRY

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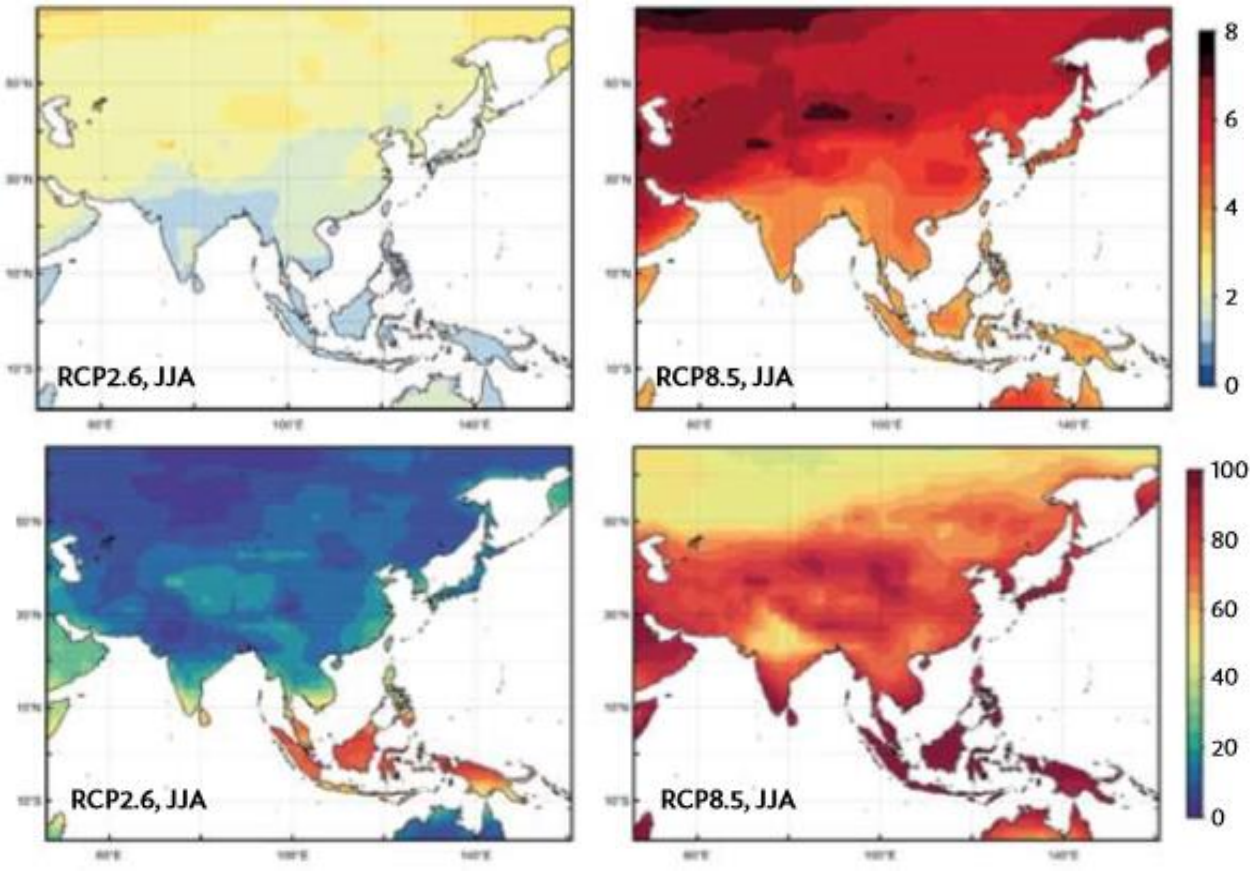
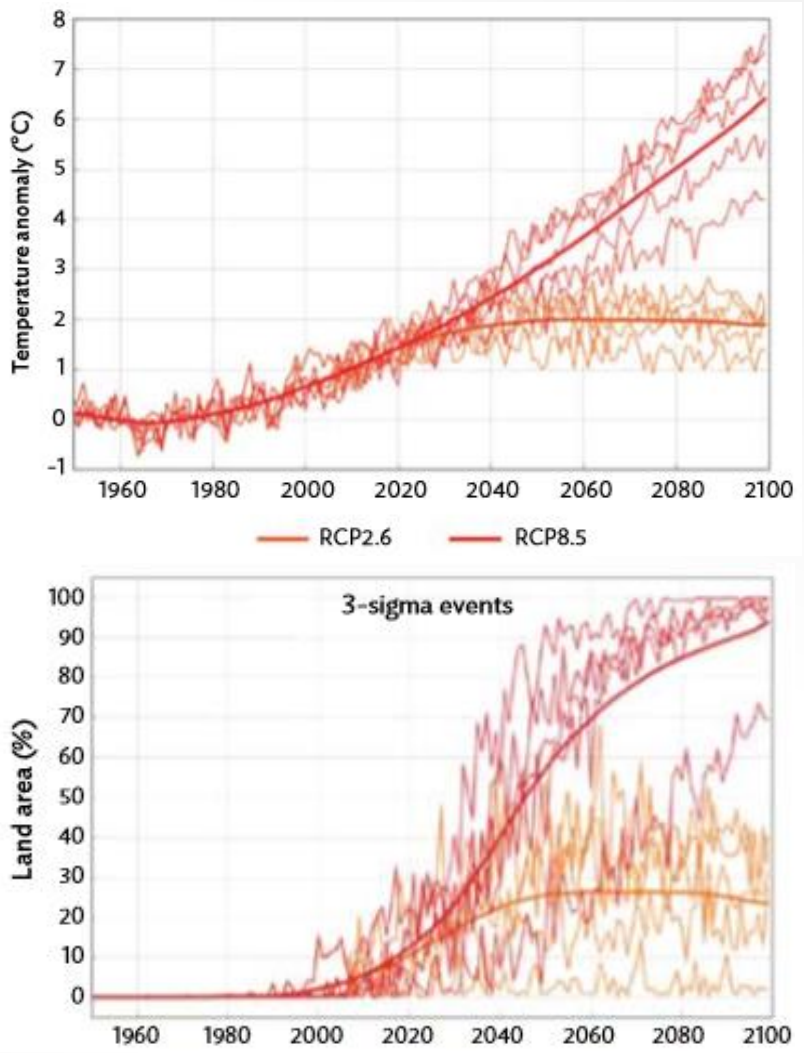
CLIMATE CHANGE AND ENVIRONMENTAL RISK



JJA = June, July and August; RCP = Representative Concentration Pathway. Temperature anomalies are averaged over the time period of 2071-99 relative to the base period 1951-1980 and given in units of degree Celsius **(upper panels).**

Colors indicate the multi-model average of the percentage of boreal summer months in the time period 2071-2099 with temperatures greater than 3 standard deviations for the RCP2.6 and RCP 8.5 scenarios **(bottom panels)** (ADB, 2017)



Thick lines represent multi-model average and thin lines individual model projections derived under the RCP2.6 and RCP8.5 scenarios for JJA **(upper panel),** simulations of the percentage of Asian land area with monthly mean temperatures during JJA warmer than 3-sigma for the RCP2.6 and RCP8.5 scenarios **(bottom panel)** (ADB, 2017)

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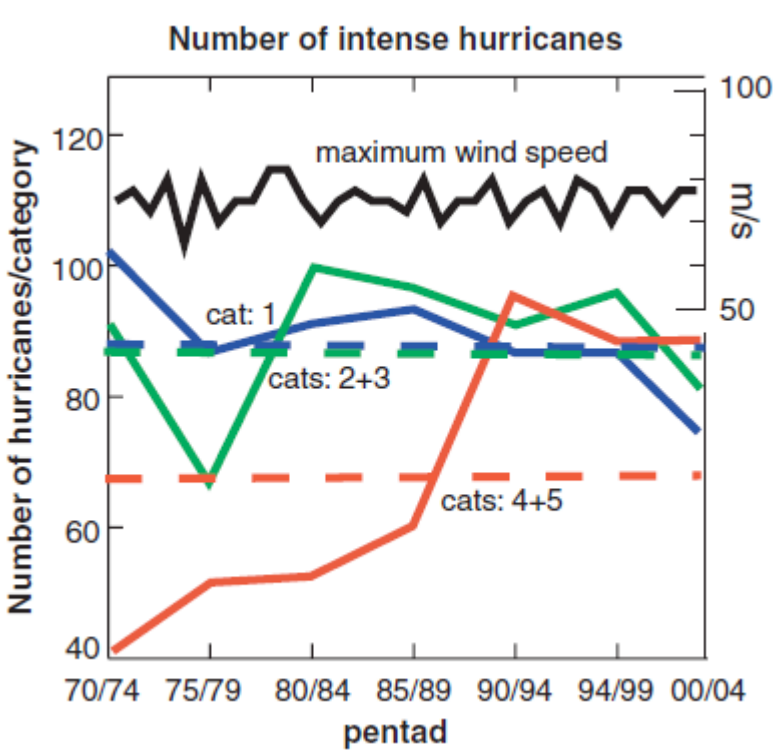
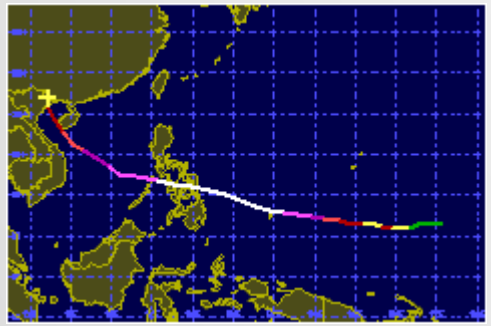
CLIMATE CHANGE AND ENVIRONMENTAL RISK

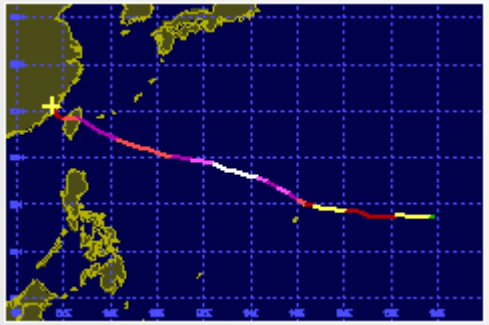
- **Tropical cyclones**
  - **Frequency and intensity**
- Storm surge flooding, huge amount of rainfall, wind damage, transport (air and sea) disrupted, casualties
- Western North Pacific
  - Haiyan 海燕 (CAT 5) 2013
  - Soudelor 蘇迪羅 (CAT 5) 2015
  - Hato 天鴿 (CAT 2) 2017



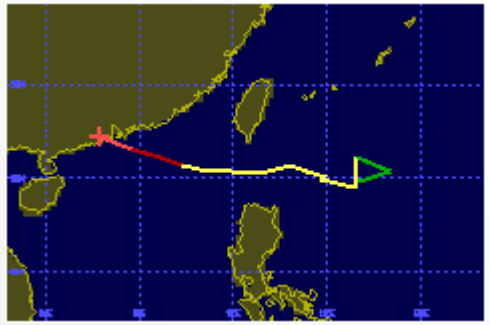
Webster et al., 2005



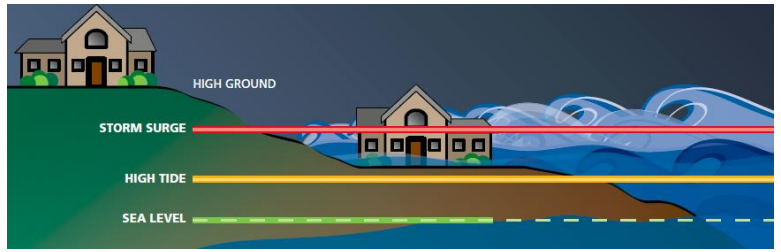
Haiyan 3-11/11/2013



Soudelor 30/7-8/8/2015



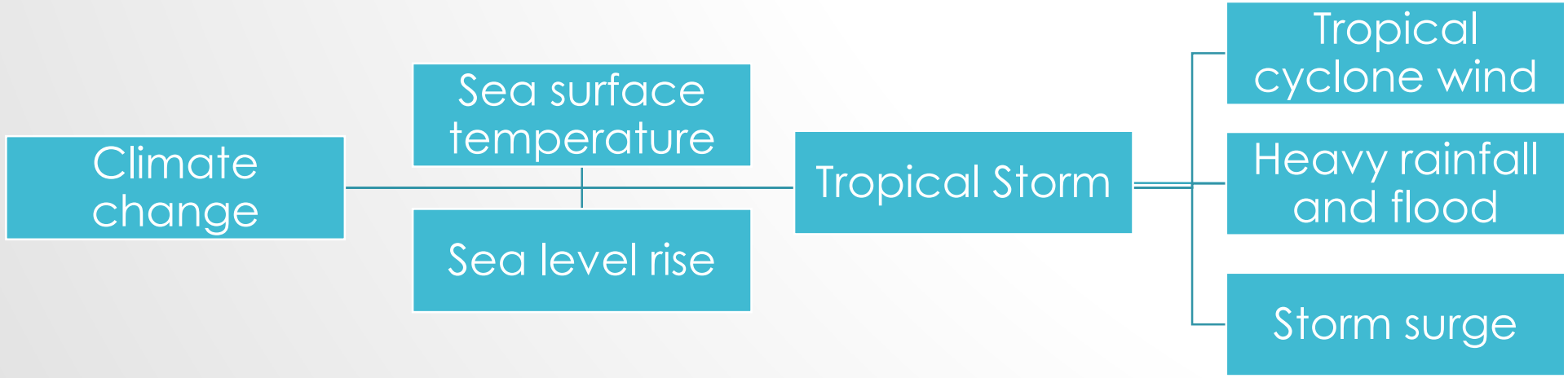
Hato 20-23/8/2017



PROBLEMS FACING INSURANCE COMPANIES

Tropical Storms

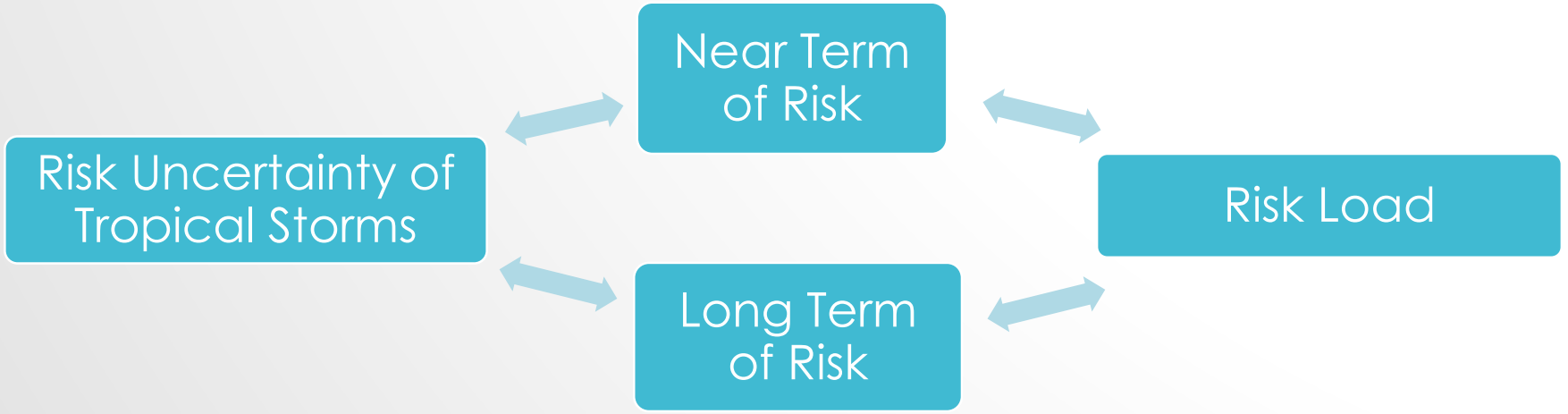
- The recent rise in sea surface temperature and increasing tropical cyclone intensity, destructiveness (increasing Annual Average Loss, AAL)



PROBLEMS FACING INSURANCE COMPANIES

Tropical Storms

- A significant poleward shift of the maximum intensity of tropical cyclones
- Subbasin storm track characteristics are expected to change due to global warming (increasing risk load)



PROBLEMS FACING INSURANCE COMPANIES

Premium

$$AAL = \sum_i p_i L_i$$

where p_i is the probability that an event occurs and L_i is the associated loss.

Annual Average Loss is the sum of losses from all events affecting a location divided by the number of sampling years; used for calculating the catastrophe load.

Risk load is subjective (risk perception, reinsurer's capital, reinsurance market), determined by the *uncertainty* surrounding the AAL.

Expense load is the administrative costs, loss adjustment expense, processing fees, premium taxes, commission and profits.

CLIMATE CHANGE AND ENVIRONMENTAL RISK

- Smog – burning of coals
- Climate change - the Artic Ocean Frozen less than it usually does, Siberia is covered with snow and especially cold, then combined to reduce the atmospheric-pressure gradient across Asia, weakening the pull of the East Asian monsoon, leaving the air stagnant across eastern China.
- Water – Just 25% of drinking water reaches national quality standards

PROBLEMS FACING INSURANCE COMPANIES

Insurance products

- Accurately estimate the catastrophe risk in a region where it was not exposed to such an extent in the past
- Properly assess air pollution (smog) and poor water quality in China

WHAT POSSIBLE ROLES FOR HONG KONG TO BE A HUB FOR GREEN FINANCE

- Proposing a possible participation of Insurance Authority, work cooperatively with academia and insurance and reinsurance companies
- To adopt environmental risk management system for China's external investments, understanding of the catastrophe risk in countries under the belt and road initiative
- To mandate environmental pollution liability insurance


THANK YOU